



# Sun FLeX Series Solenoid Valves

## HIGH RELIABILITY

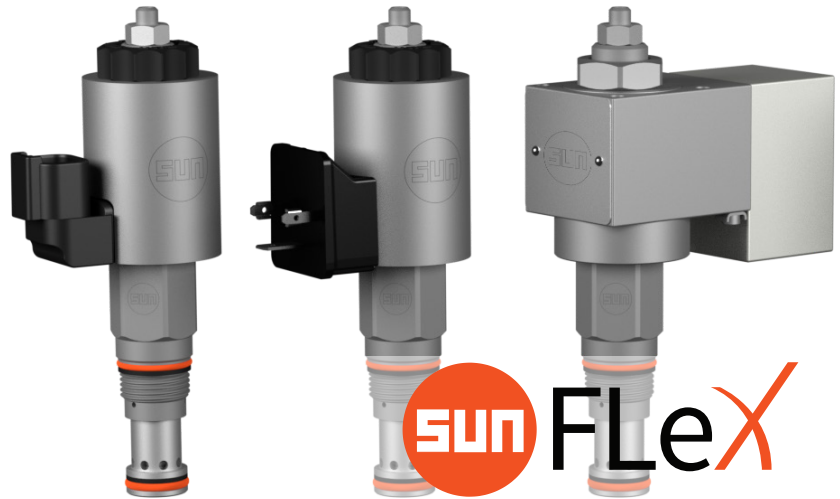
*Designed & tested to 10-million operational cycles at full rated pressure*

## ADJUSTABLE RELIEF FUNCTIONS

*Ideal for use in fixed-displacement pump applications*

## USES 740 & 747 SERIES COILS

*High-power & hazardous location coils*

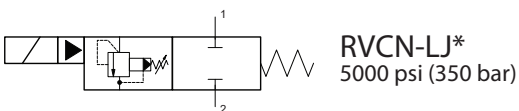
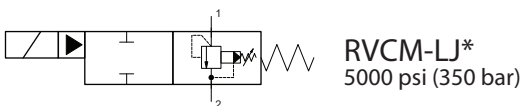
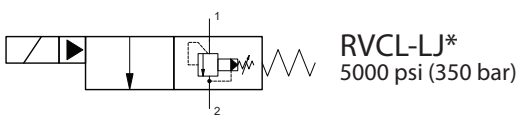
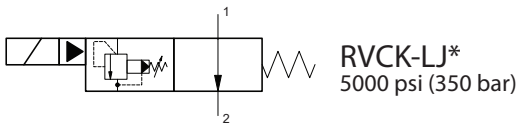


## RVC\*

5000 psi (350 bar)  
T-10A cavity

## 2-STAGE, SOLENOID-OPERATED ADJUSTABLE RELIEF VALVES

### PATENT PENDING



## TABLE OF CONTENTS

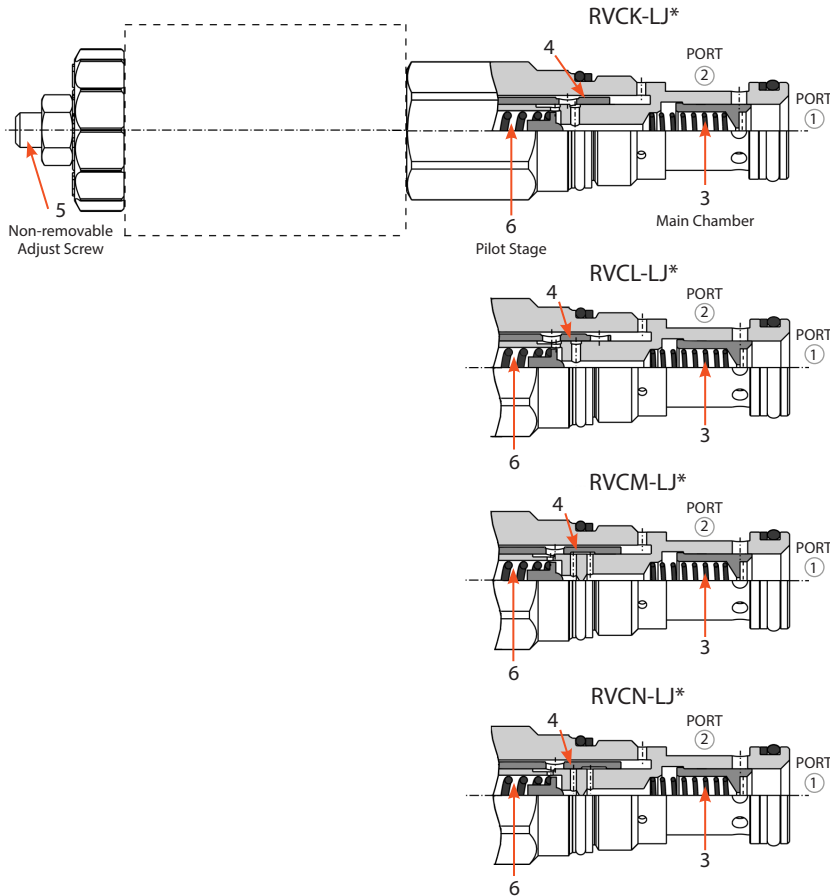
Technical Features	2
Model Configurations & Options	3
Technical Specifications	4
Performance Curves	4
Symbols & Cavity Information	5
Applications	6
Dimensional Drawings	8

[sunhydraulics.com/model/RVC\\*](http://sunhydraulics.com/model/RVC*)

## RVC\* 2-STAGE, SOLENOID-OPERATED ADJUSTABLE RELIEF VALVE

## SERIES 1, CAVITY: T-10A

Solenoid-operated, 2-stage, adjustable balanced piston relief cartridges are pressure regulating valves. Energizing the solenoid activates or deactivates the relief function. Four versions are available.



### RVCK-LJ\*

**Function:** The RVCK is normally vented. The pressure drop from port 1 (supply, pump) to port 2 (tank) is typically 100 psi (see performance curves). When the solenoid is energized, the tube (4) moves and blocks the direct connection between main chamber (3) and tank (port 2). Pilot flow can no longer flow to tank directly. The valve is in relief mode. The pressure setting is adjustable (5).

### RVCL-LJ\*

**Function:** The RVCL is normally in relief mode. The pressure setting is adjustable (5). When the solenoid is energized, the tube moves and opens a direct connection between main chamber (3) and tank (port 2). The valve is now vented. Pressure drop from port 1 (supply, pump) to port 2 (tank) is typically 100 psi (see performance curves).

### RVCM-LJ\*

**Function:** The RVCM is normally in relief mode. The pressure setting is adjustable (5). When the solenoid is energized, the tube (4) moves and blocks the connection between main chamber (3) and pilot stage (6). Without pilot flow, the main chamber is closed. The valve blocks the flow path from port 1 to port 2 like a spool-type directional valve.

### RVCN-LJ\*

**Function:** The RVCN is normally blocked. De-energized, the valve blocks the flow path from port 1 to port 2 like a spool-type directional valve. When the solenoid is energized, the tube (4) moves and allows flow through the main chamber (3) to the pilot stage (6). The valve is in relief mode. The pressure setting is adjustable (5).

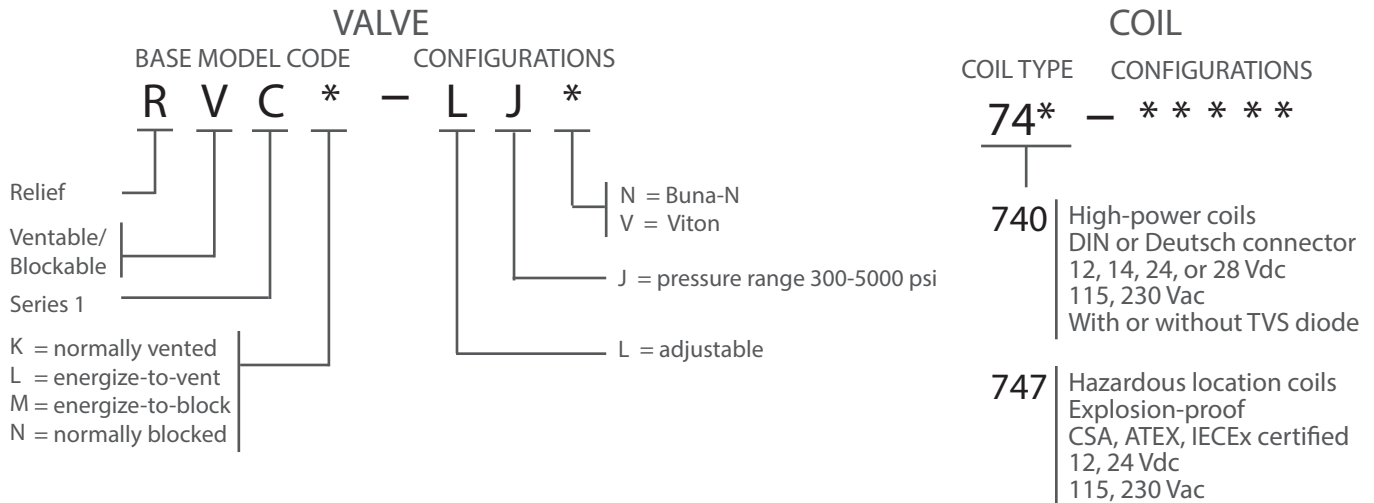
## TECHNICAL FEATURES

- All FLeX Series valves incorporate the Sun floating-style construction.
- Designed and tested to 10-million operational cycles at full rated pressure.
- Exceeds the new NFPA test standard T2.6.1 R2014 for fatigue and burst pressure ratings.
- A 150-micron stainless steel screen protects the main stage orifice of all valves.
- Zinc-nickel plating standard for 1000-hour salt fog protection.
- All RVC\* valves are adjustable under pressure, featuring a leak-free adjustment screw with a mechanical stop to prevent the screw from backing out.
- All valves in the RVC\* family use the high-power (25-W) and hazardous location coils. See table on P 3.
- Coil connector options offer ratings up to IP69K. See individual coil product pages for details.
- Includes high flow rates of 15 gpm (60 L/min) and 25 gpm (100 L/min).
- FLeX Series solenoid valves are compatible with the XMD Mobile Drivers from Sun.
- All four valves are patent pending.

## MODEL CODE EXPLANATION

Sun cartridges have a base seven-digit part number. Each of the digits in the sequence has significance as shown in the model code explanation below. Available options and

modifiers for specific cartridges, manifolds, and valve packages are shown on the individual product pages and data sheets. Not all modifiers are applicable for every model.



### Important Note:

When performing model code searches on [www.sunhydraulics.com](http://www.sunhydraulics.com), do not include setting(s). When ordering, no spaces or dashes are used.

See individual coil data sheets for full coil configuration.

## COMPATIBLE COILS

The RVC\*-LJ\* valves use the 740 Series high-power (25-W) and 747 Series hazardous location coils.

### High-Power (25-W) Coils

Voltage	DIN 43650 Form A (IP65/IP67)	Deutsch DT04-2P (IP69K)	Resistance @20°C (ohms) ±10% (with diode*)	TVS Diode (Nominal) Breakdown Voltage (with diode*)
	High-Power	High-Power	High-Power	
12 Vdc	740-212	740-912	5.8 Ω	68 Vdc
14 Vdc	740-214	740-914	7.8 Ω	68 Vdc
24 Vdc	740-224	740-924	23.0 Ω	68 Vdc
28 Vdc	740-228	740-928	31.4 Ω	68 Vdc
115 Vac	740-211	N/A	416 Ω	250 Vac
230 Vac	740-223	N/A	1686 Ω	400 Vac

\* Above model codes are shown without transient voltage suppression (TVS) diodes. To order 740 series coils with a TVS diode, append model code with "D" (Example: 740-212D).

### Hazardous Location, Explosion-Proof (30-W) Coils

Voltage	M20 x 1.5 180°	M20 x 1.5 90°	1/2" NPT 180°	1/2" NPT 90°	Wattage @ 20°C	Circuitry
12 Vdc	747-JM12BD	747-JM12CD	747-JN12BD	747-JN12CD	29.6 W	With diode
24 Vdc	747-JM24BD	747-JM24CD	747-JN24BD	747-JN24CD	29.9 W	With diode
115 Vac	747-JM11BD	747-JM11CD	747-JN11BD	747-JN11CD	29.7 W	Rectified
230 Vac	747-JM23BD	747-JM23CD	747-JN23BD	747-JN23CD	28.9 W	Rectified

# TECHNICAL SPECIFICATIONS

# FLeX Series



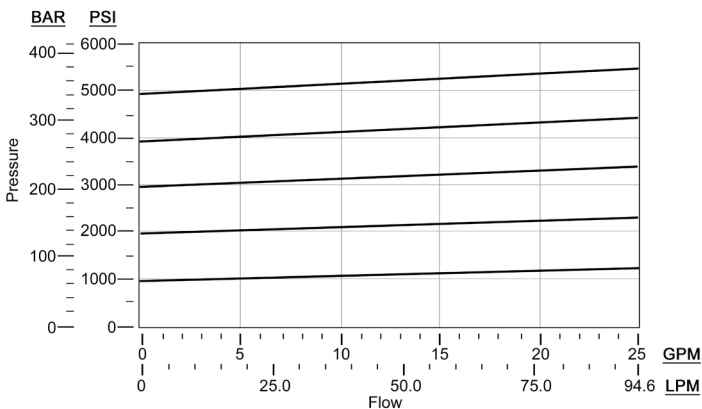
2-STAGE, SOLENOID-OPERATED  
ADJUSTABLE RELIEF VALVE

SERIES 1, CAVITY: T-10A

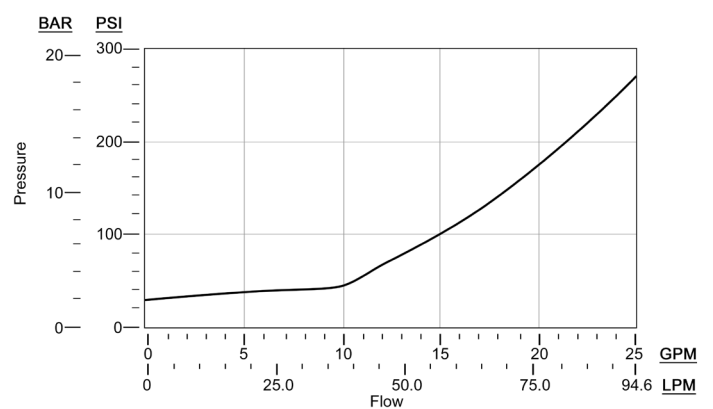
TECHNICAL SPECIFICATIONS	RVCK	RVCL	RVCM	RVCN
Nominal Flow Rate/Capacity	15 gpm (60 L/min)	15 gpm (60 L/min)	25 gpm (100 L/min)	25 gpm (100 L/min)
Maximum Internal Leakage at 110 SUS (24 cSt)	5.0 in <sup>3</sup> /min (80 cc/min) at 2000 psi (140 bar)		5.0 in <sup>3</sup> /min (80 cc/min) at 3000 psi (210 bar) when blocked	
Maximum Operating Pressure	5000 psi (350 bar)			
Sun Cavity	T-10A			
Sun Cartridge Series	Series 1			
Factory Pressure Setting Established	4 gpm (15 L/min)			
Response Time - Typical Relief	10 ms			
Response Time - Typical Solenoid	50 ms			
Adjustment - No. of CW turns from Min. to Max. setting	3.5			
Valve Hex Size	7/8 in (22,2 mm)			
Valve Installation Torque	30 - 35 lbf ft (41 - 47 N-m)			
Adjustment Screw Internal Hex Size	1/8 in (3,2 mm)			
Locknut Hex Size	7/16 in (11,1 mm)			
Locknut Torque	45 - 55 lbf in (5 - 6 N-m)			
Valve Weight (excluding coil)	6.4 oz (181 g)			
Seal Kit - Buna N	990-010-007			
Seal Kit - Viton	990-010-006			

## PERFORMANCE CURVES

RVC\* - TYPICAL PRESSURE DIFFERENTIAL VS. FLOW

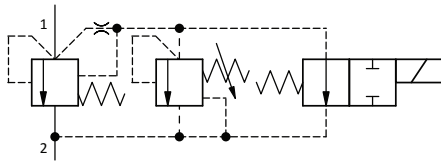


RVCK & RVCL - VENTED PRESSURE DIFFERENTIAL

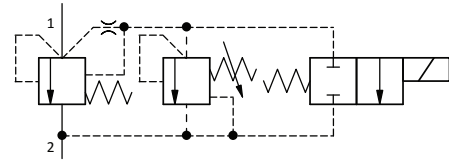




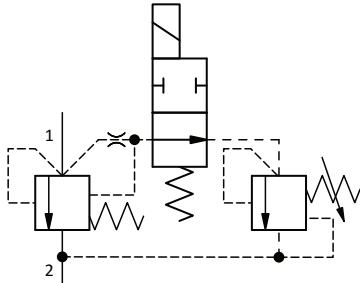
## DETAILED SYMBOLS



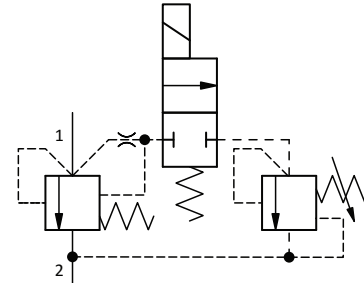
**RVCK-LJ\***  
5000 psi (350 bar)



**RVCL-LJ\***  
5000 psi (350 bar)



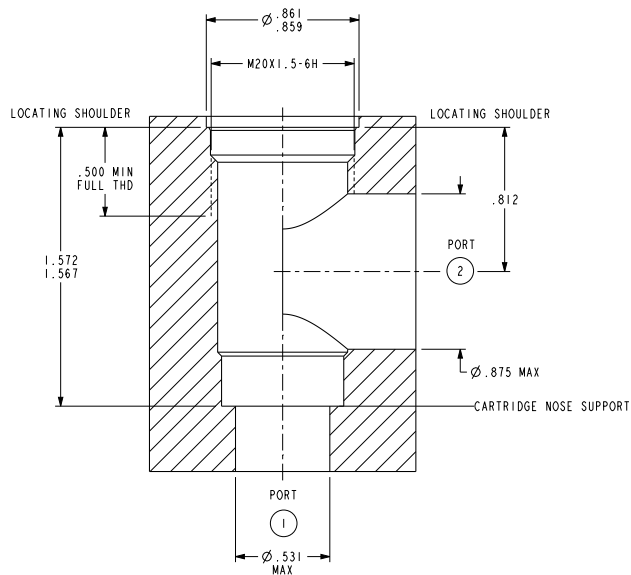
**RVCM-LJ\***  
5000 psi (350 bar)



**RVCN-LJ\***  
5000 psi (350 bar)

NOTE: Back pressure on the tank port (2) is additive to the valve setting at a 1:1 ratio.

## T-10A CAVITY DIMENSIONAL DRAWING & TOOLING

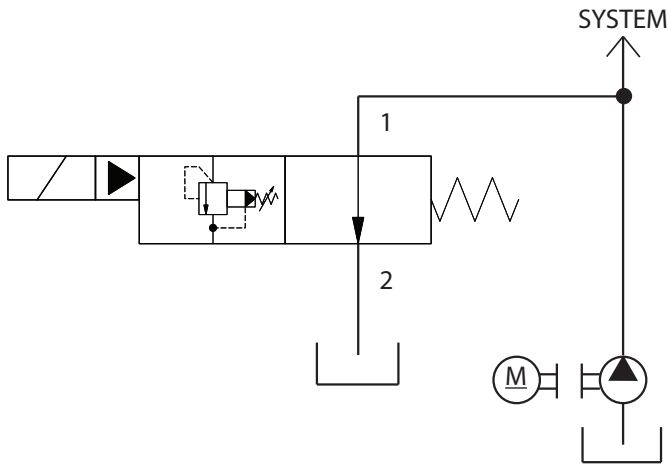


NOTE: For cavity tooling, see table below.

For full cavity detail, download the latest drawings from our website.

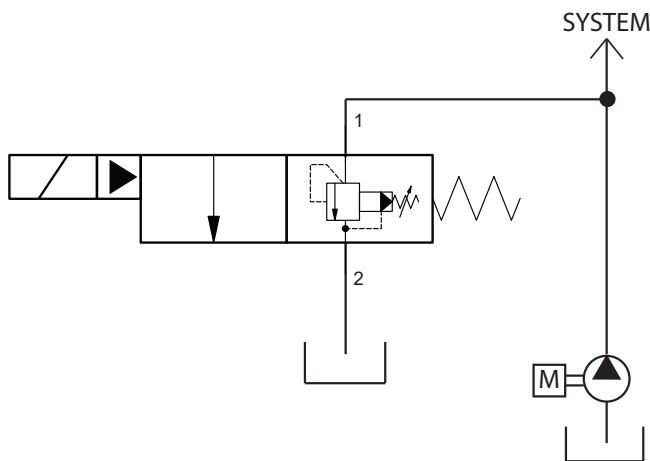
<https://www.sunhydraulics.com/cavity/T-10A>

DESCRIPTION	HIGH-SPEED STEEL	TITANIUM COATED
M20 X 1.5-6H tap, straight shank	998998	998998101
Series 1 deep hex socket	998100001	
T-10A cavity form drill, morse taper	994010001	994010101
T-10A cavity form drill, straight shank	994010002	994010102
T-10A cavity form reamer, morse taper	995010001	995010101
T-10A cavity form reamer, straight shank	995010002	995110102



**RVCK-LJ\***  
**PUMP START-UP CIRCUIT**

The normally open ventable relief RVCK is the ideal valve to use in a system when starting up a prime mover connected to a large pump with load. Unloading the pump is good practice and will be less stressful on the system. Since these valves can be switched at pressure, once the prime mover is up to full speed, the relief valve can be energized to build up system pressure. The pressure is user adjustable up to 5000 psi.

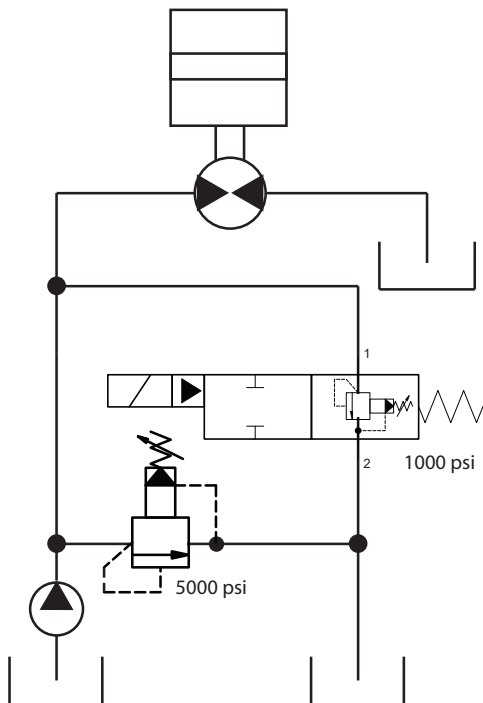


**RVCL-LJ\***  
**PUMP START-UP FOR ON/OFF FAN DRIVE CONTROL**

The ventable relief RVCL is normally in relief mode. It is another option for pump start-up. Unlike the normally open RVCK, the RVCL is in relief mode when de-energized for more energy savings during normal system operation.

Because the RVCL is in relief mode when de-energized, it is only necessary to power the solenoid when the valve needs to unload during prime mover start up.

This makes the valve an obvious choice for a simple hydraulic on-off fan drive circuit as shown here and is a better choice when safety requires system pressure in the event of electric power loss.



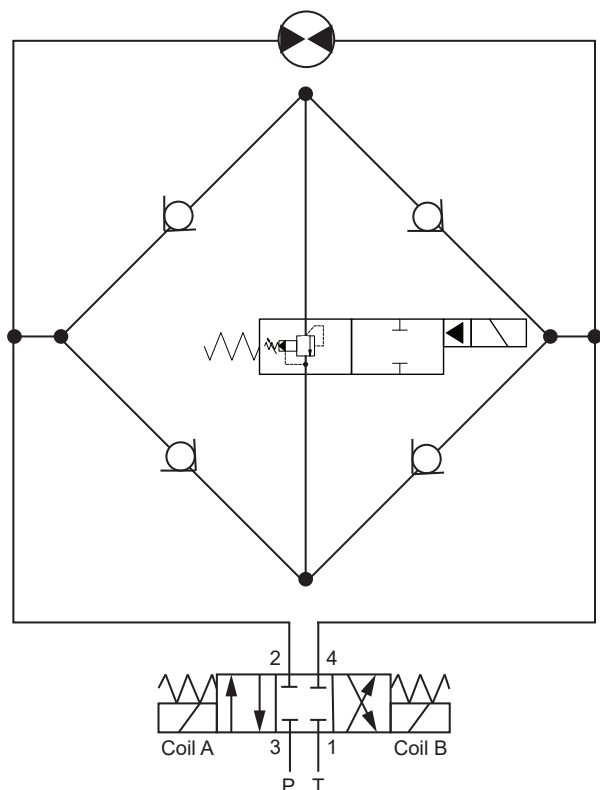
**RVCM-LJ\***  
**CONVEYOR BELT MOTOR CONTROL**

The blockable relief RVCM is normally in relief mode. When energized the valve blocks flow like a spool type 2-position, 2-way valve. The valve is ideal for circuits that require two pressure setting.

In the example of a conveyor belt, the high inertia load requires a high pressure to accelerate from stop. When the conveyor is in motion and motor speed is constant, a lower relief setting maintains motion at a lower pressure.

Compared to a circuit with two relief valves and one solenoid-operated directional valve, the blockable RVCM eliminates the need for the directional valve, creating a much simpler two-valve solution instead of three.

**NOTE:** Sample circuits are shown for application illustration only and are not intended as circuit designs.

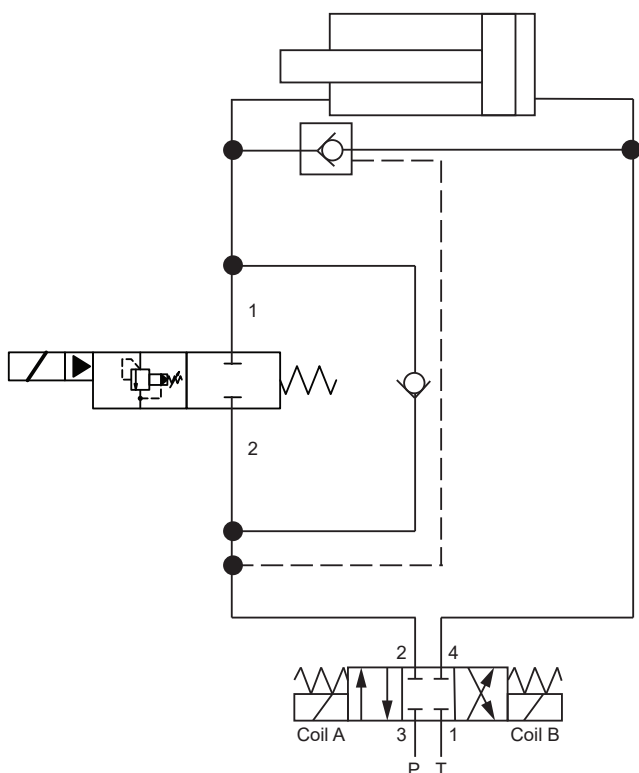


**RVCM-LJ\***

**BI-DIRECTIONAL PUMP PRESSURE DIFFERENTIAL LIMIT**

The blockable relief RVCM is normally in relief mode. The valve can be used to limit the pressure differential across the motor. The relief valve setting then allows the motor to accelerate with a limited torque using the controlled pressure, smoothing out the load movement.

In a rectifier circuit, the RVCM limits the torque of the motor in both directions.



**RVCM-LJ\***

**ADJUSTABLE COMPRESSION FOR MATERIAL COMPACTORS & BAILING PRESSES**

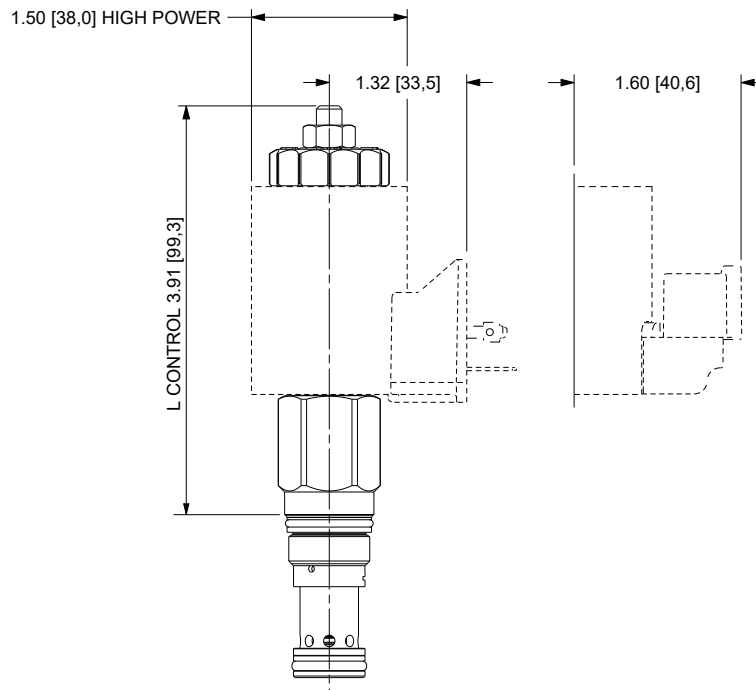
The RVCM is normally blocked and, when energized, turns into an adjustable relief valve.

The valve can be used as a pilot-operated 2-position, 2-way valve with high capacity. When energized, the relief function of the valve can be used to avoid decompression shock. In a continuous regeneration circuit, the valve can unload the rod end side of the cylinder. Preloading the cylinder avoids the decompression shock. And because the valve is adjustable, it can be adjusted to control the amount of compression in the compactor or press when the cylinder goes from regen to normal mode.

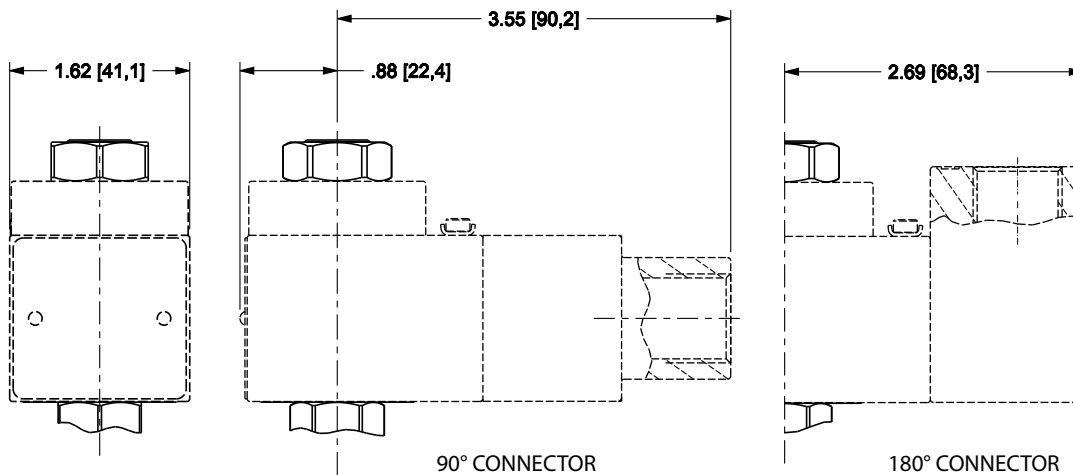
**NOTE:** Sample circuits are shown for application illustration only and are not intended as circuit designs.

# DIMENSIONAL DRAWINGS

## RVC\* FAMILY WITH 740 SERIES HIGH-POWER COILS



## 747 SERIES HAZARDOUS LOCATION COILS



NOTE: Please verify cartridge clearance requirements when choosing a Sun manifold. Different valve controls and coils require different clearances. An additional minimum 2.0 in. (50,8 mm) beyond the valve extension is needed for coil installation and removal.



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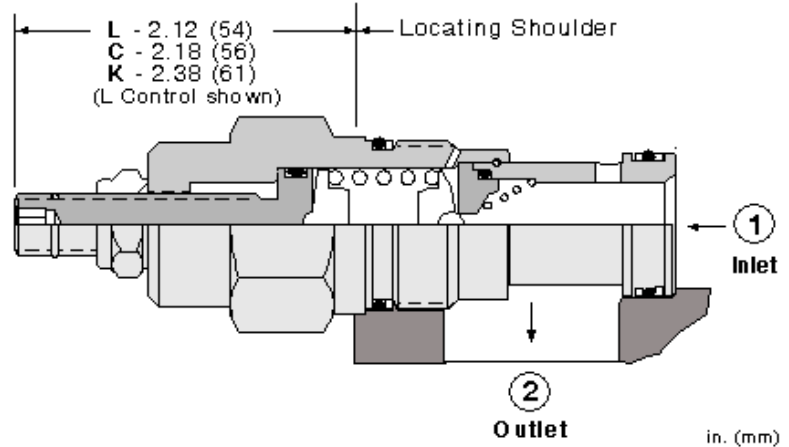
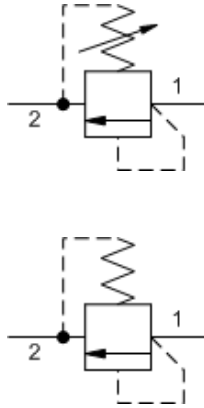
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October 2018



Direct-acting, pilot relief cartridges are used to remotely control the pressure setting of other pilot-operated valves. Because capacity is limited to pilot flow, these valves should be used with other higher flow valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-3A
Series	2
Capacity	2 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,3 cc/min.
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	EPDM: 990203014
Seal kit - Cartridge	Polyurethane: 990003002
Seal kit - Cartridge	Viton: 990203006
Model Weight	0.26 kg.

**NOTES**

For Series 2 cartridges configured with an O control (panel mount handknob), a 1.00 in. (25,4 mm) diameter hole is required in the panel.

**CONFIGURATION OPTIONS**

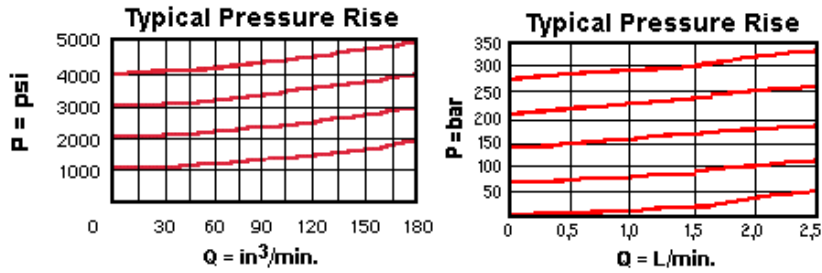
**Model Code Example: RBAALAN**

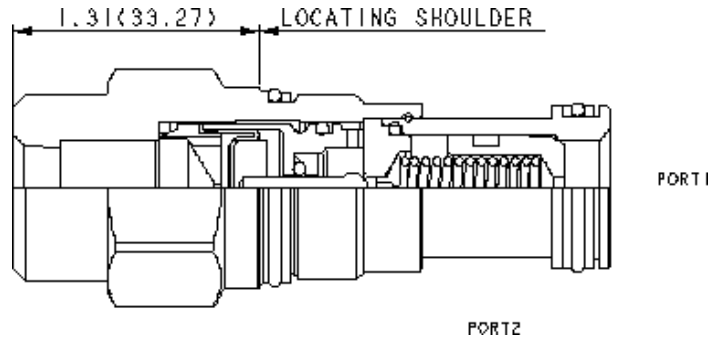
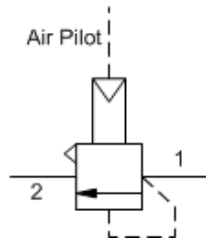
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 25 - 3000 psi (1,7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 25 - 1500 psi (1,7 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>J</b> Capped Screw Adjustment	<b>C</b> 25 - 6000 psi (1,7 - 420 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>K</b> Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
<b>O</b> Handknob with Panel Mount	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>W</b> 25 - 4500 psi (1,7 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- Main stage orifice is protected by a 150-micron stainless steel screen.
- Suitable for use in load holding applications.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Air-controlled, pilot relief cartridges are used to remotely control the pressure setting of other pilot operated valves. Because capacity is limited to pilot flow, these valves should be used with valves with compatible pilot flows. They use compressed air over a diaphragm instead of an adjustable spring to control pressure setting, the air signal is supplied through a port in the hex-end of the cartridge.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-3A
Series	2
Capacity	2 L/min.
Pilot Ratio	20:1
Maximum Operating Pressure	140 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,3 cc/min.
Response Time - Typical	2 ms
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	Viton: 990203006
Model Weight	0.24 kg.

**CONFIGURATION OPTIONS**

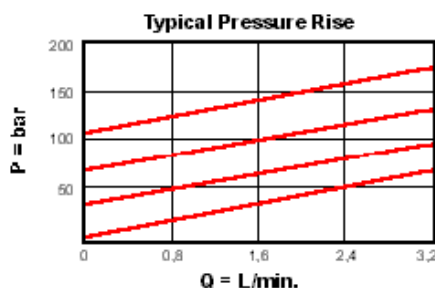
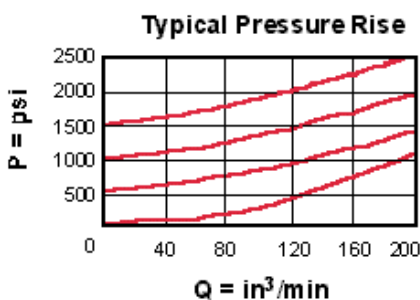
Model Code Example: **RBABABN**

<b>CONTROL</b>	<b>(A) OPERATING RANGE</b>	<b>(B) SEAL MATERIAL</b>	<b>(N)</b>
<b>A</b> External 1/4 NPTF Port	<b>B</b> 50 - 1500 psi (3,5 - 105 bar)	<b>N</b> Buna-N	<b>V</b> Viton

**TECHNICAL FEATURES**

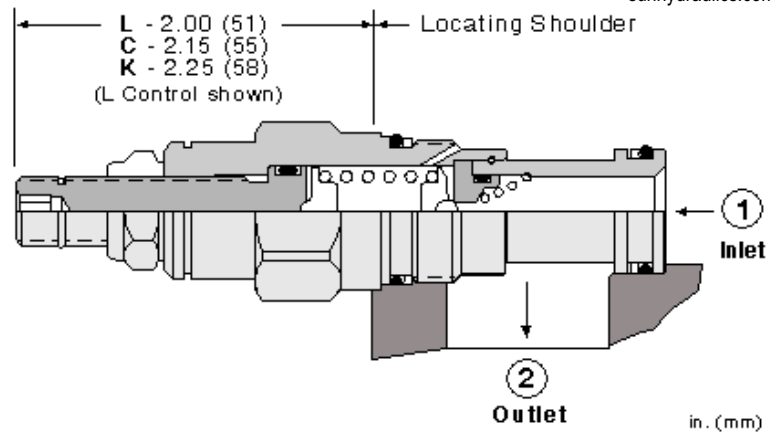
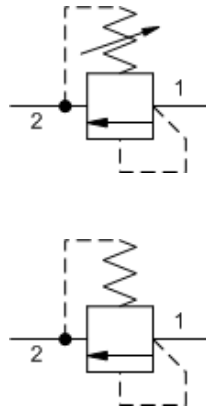
- Maximum air pressure should not exceed 150 psi (10 bar).
- Pressure settings are insensitive to back pressure at the tank port (port 2). Back pressure should not exceed 1000 psi (70 bar).
- Capable of providing explosion proof remote control of the pressure setting, the hydraulic setting is directly proportional to the air setting at a ratio of 20:1 (hydraulic:air).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

**PERFORMANCE CURVES**









Direct-acting, pilot relief cartridges are used to remotely control the pressure setting of other pilot-operated valves. Because capacity is limited to pilot flow, these valves should be used with other higher flow valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-10A
Series	1
Capacity	1 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,3 cc/min.
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	EPDM: 990010014
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006
Model Weight	0.14 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

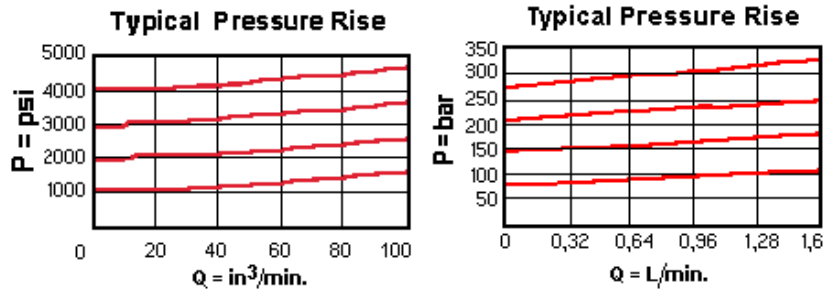
**CONFIGURATION OPTIONS**
**Model Code Example: RBACLAN**

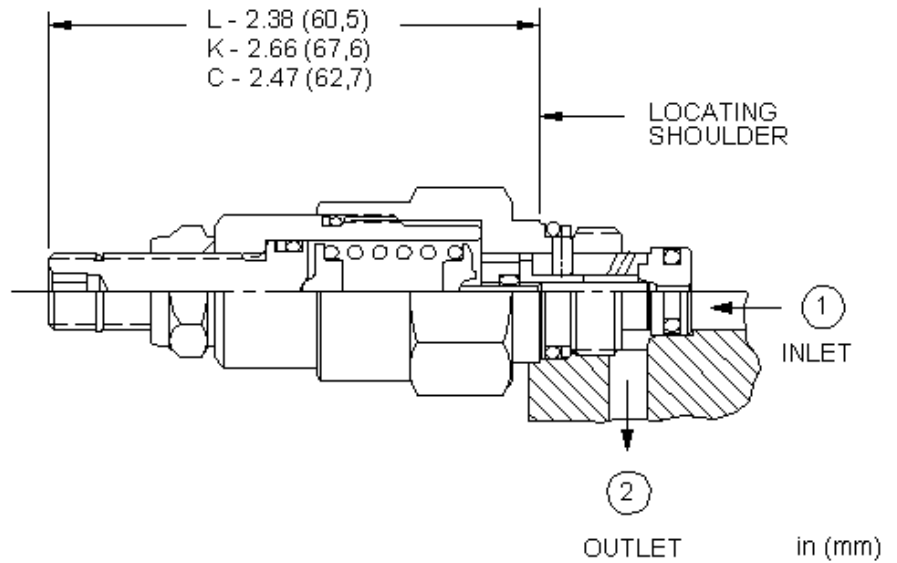
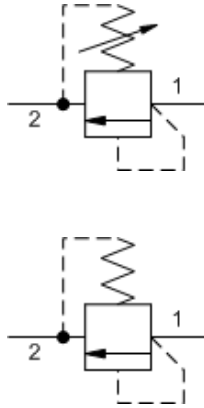
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 25 - 3000 psi (1,7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 25 - 4500 psi (1,7 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>J</b> Capped Screw Adjustment	<b>B</b> 25 - 1500 psi (1,7 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>K</b> Handknob	<b>C</b> 25 - 6000 psi (1,7 - 420 bar), 1000 psi (70 bar) Standard Setting		
<b>O</b> Handknob with Panel Mount	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

- Main stage orifice is protected by a 150-micron stainless steel screen.
- Suitable for use in load holding applications.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Two-port, pilot-stage, direct-acting relief cartridges are fully adjustable, normally closed pressure regulating valves. When the pressure at port 1 (inlet) is sufficient to overcome the spring force (valve setting), a flow path is opened from port 1 to port 2 (tank).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-8A
Series	P
Capacity	10 L/min.
Factory Pressure Settings Established at	30 cc/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	1 cc/min.
Response Time - Typical	2 ms
Valve Hex Size	22,2 mm
Valve Installation Torque	27 - 33 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990608007
Seal kit - Cartridge	EPDM: 990608014
Seal kit - Cartridge	Polyurethane: 990008002
Seal kit - Cartridge	Viton: 990608006
Model Weight	0.13 kg.

**NOTES**

For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

## CONFIGURATION OPTIONS

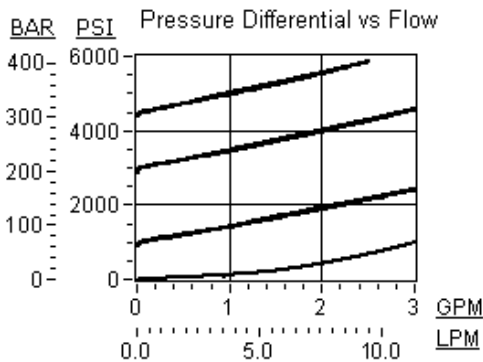
### Model Code Example: RBAELAN

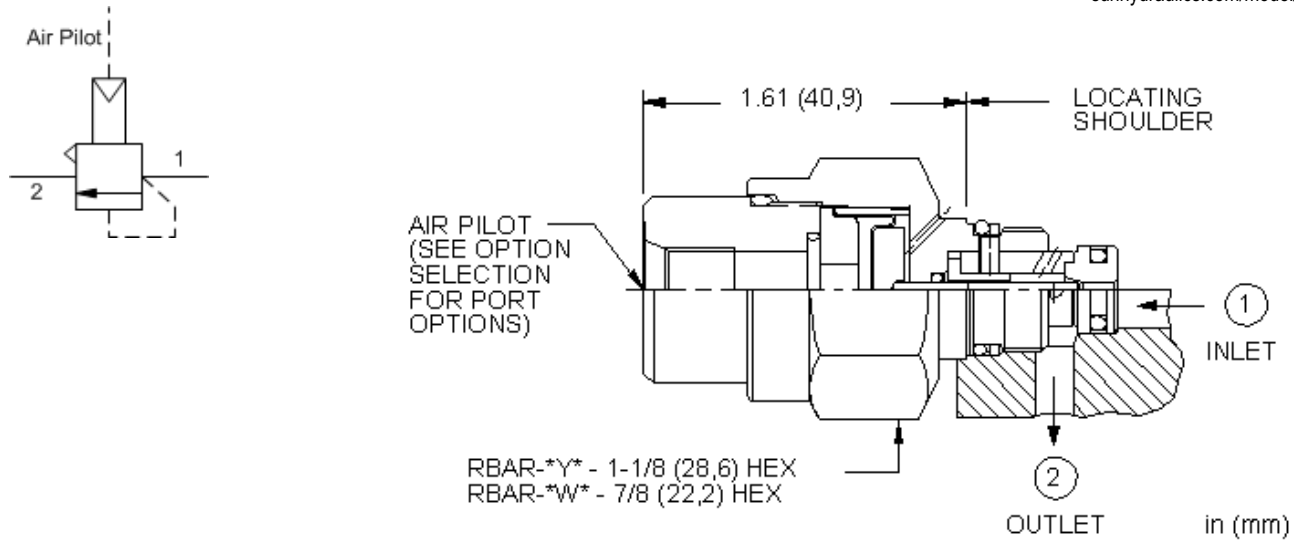
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 25 - 3000 psi (1,7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set		<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>B</b> 25 - 1500 psi (1,7 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>O</b> Handknob with Panel Mount	<b>C</b> 25 - 6000 psi (1,7 - 420 bar), 1000 psi (70 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 25 - 4500 psi (1,7 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- Utilizes the Sun T-8A 2-port cavity making it the ideal choice to use in conjunction with Sun's main stage pilot or vent-to-operate cartridges. Separate pilot lines are eliminated and only one cavity needs to be machined to accommodate both the control and primary function. Note: All 2-position, 2-way pilot stage control cartridges utilize the same cavity and are physically interchangeable. Functionality is the only consideration.
- Note: The main stage valve should first be installed to the correct torque value followed by the T-8A pilot control section into the main stage valve to its required torque value.
- Ports 1 and 2 may be pressured to 5000 psi (350 bar).
- Hardened poppet and seat provide consistent operation, low leakage rates and superior wear characteristics.
- Backpressure at port 2 (outlet) is directly additive to the pressure setting at port 1 (inlet).
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Two-port, pilot-stage, air-controlled, direct-acting relief cartridges are normally closed pressure regulating valves. When the pressure at port 1 (inlet) is sufficient to overcome the force due to the air signal, a flow path is opened from port 1 to port 2 (tank). These cartridges are designed for pilot flow applications and utilize Sun's T-8A cavity so they can be used in conjunction with Sun's pilot-operated, main-stage valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-8A
Series	P
Capacity	10 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	1 cc/min.
Maximum Pilot Pressure	10,5 bar
Pilot Control Port	See Control Options
Valve Installation Torque	27 - 33 Nm
Seal kit - Cartridge	Buna: 990608007
Seal kit - Cartridge	EPDM: 990608014
Seal kit - Cartridge	Polyurethane: 990008002
Seal kit - Cartridge	Viton: 990608006
Model Weight	0.11 kg.

**CONFIGURATION OPTIONS**

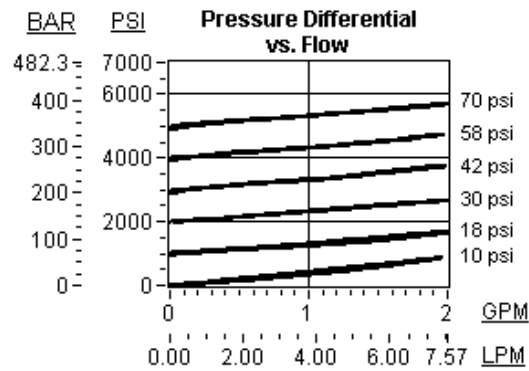
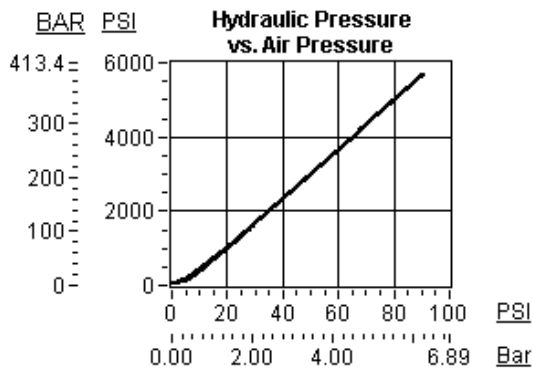
Model Code Example: **RBARBWN**

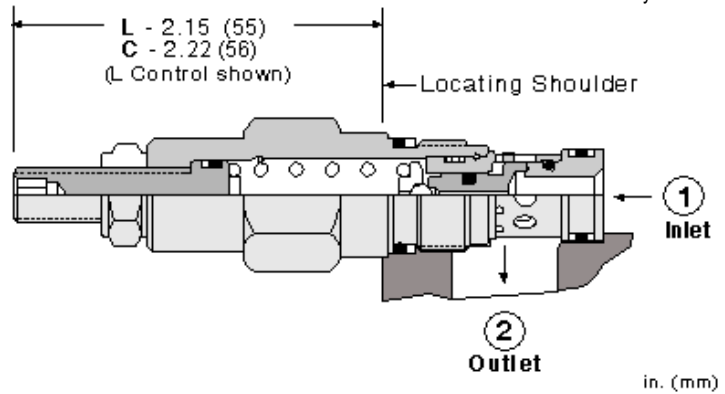
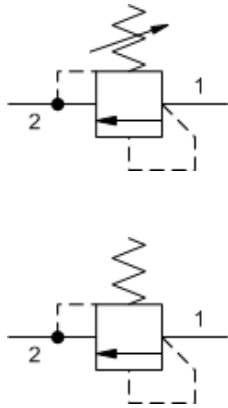
CONTROL	(B)	AIR PILOT RATIO	(W)	SEAL MATERIAL	(N)
<b>B</b> External 4-SAE Port	<b>W</b> 50:1	<b>N</b> Buna-N			
<b>A</b> External 1/8 NPTF Port	<b>Y</b> 75:1	<b>E</b> EPDM			
<b>D</b> External 1/8 BSPP Port		<b>V</b> Viton			

## TECHNICAL FEATURES

- Utilizes the Sun T-8A 2-port cavity making it the ideal choice to use in conjunction with Sun's main stage pilot or vent-to-operate cartridges. Separate pilot lines are eliminated and only one cavity needs to be machined to accommodate both the control and primary function. Note: All 2-position, 2-way pilot stage control cartridges utilize the same cavity and are physically interchangeable. Functionality is the only consideration.
- Note: The main stage valve should first be installed to the correct torque value followed by the T-8A pilot control section into the main stage valve to its required torque value.
- Different pilot control port options are available. See Option Selection for details.
- Ports 1 and 2 may be pressured to 5000 psi (350 bar).
- Hardened poppet and seat provide consistent operation, low leakage rates and superior wear characteristics.
- Two different oil-to-air pilot ratios are available; 50:1 and 75:1. See Option Selection.
- Maximum pilot control port pressure is 150 psi (10 bar).
- Backpressure at port 2 increases the relief setting by a .43 multiplier.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Direct-acting relief cartridges are normally closed, pressure-limiting valves used to protect hydraulic components from pressure transients. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to limit the pressure rise. These valves are smooth and quiet, essentially zero leak, dirt tolerant, immune to silting and are very fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-162A
Series	0
Capacity	45 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Response Time - Typical	2 ms
Reseat	>85% of crack setting
Adjustment - No. of CW Turns from Min. to Max. setting	6
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	12,7 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	EPDM: 990162014
Seal kit - Cartridge	Polyurethane: 990162002
Seal kit - Cartridge	Viton: 990162006
Model Weight	0.10 kg.

**NOTES** U.S. Patent #4,742,846; European Patent Pending

## CONFIGURATION OPTIONS

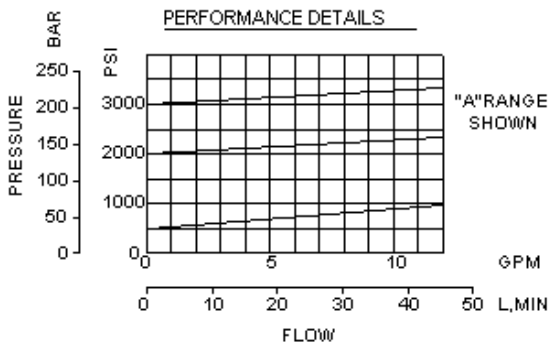
### Model Code Example: RDBALAN

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	<b>A</b> 500 - 3000 psi (35 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	<b>W</b> 800 - 4500 psi (55 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
K Handknob	<b>B</b> 300 - 1500 psi (20 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
	<b>C</b> 1000 - 6000 psi (70 - 420 bar), 1000 psi (70 bar) Standard Setting		
	<b>D</b> 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>S</b> 50 - 200 psi (3,5 - 14 bar), 100 psi (7 bar) Standard Setting		

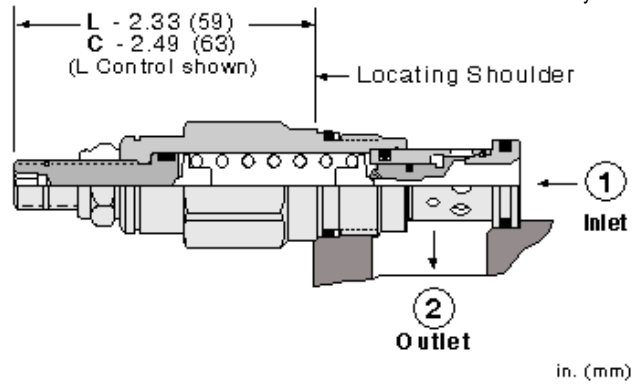
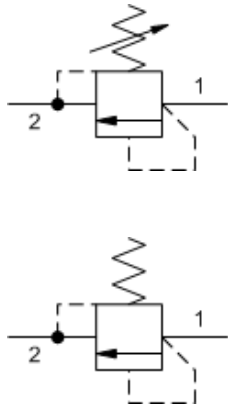
## TECHNICAL FEATURES

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- The seals on the adjust screw are exposed to system pressure which means this valve can only be adjusted when the pressure is removed. The setting procedure is; check the setting, remove the pressure, adjust the valve, check the new setting.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Select a spring range where the desired relief setting is approximately mid-range to high between the minimum and maximum pressure to ensure maximum valve repeatability.
- Suitable for use in load holding applications.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Test pressure for each range is as follows: A range - 2000 psi (138 bar), B range - 1000 psi (69 bar), C range - 4000 psi (276 bar), D range - 800 psi (55 bar), E range - 400 psi (28 bar), S range - 150 psi (10 bar), W range - 3000 psi (207 bar).
- Reseat meets or exceeds 85% of crack pressure at test setting. Settings lower than the test pressure may result in lower reseat percentages.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES







Direct-acting relief cartridges are normally closed, pressure-limiting valves used to protect hydraulic components from pressure transients. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to limit the pressure rise. These valves are smooth and quiet, essentially zero leak, dirt tolerant, immune to silting and are very fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-10A
Series	1
Capacity	95 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Response Time - Typical	2 ms
Reseat	>90% of setting
Adjustment - No. of CW Turns from Min. to Max. setting	6
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990310007
Seal kit - Cartridge	EPDM: 990310014
Seal kit - Cartridge	Viton: 990310006
Model Weight	0.17 kg.

**CONFIGURATION OPTIONS**

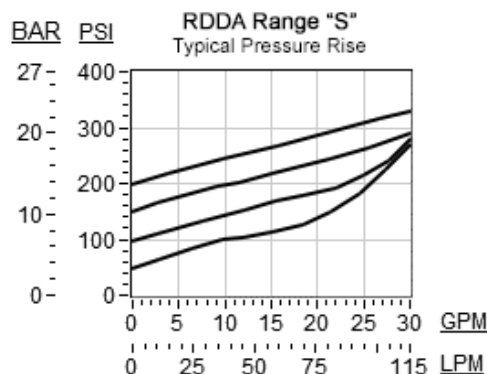
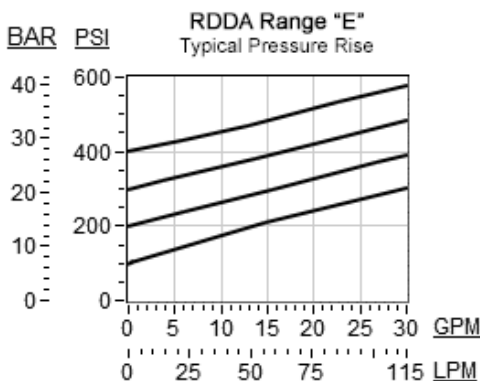
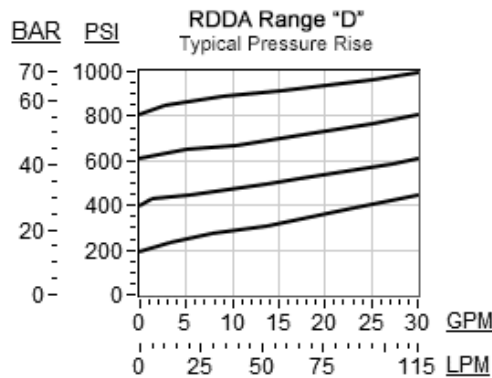
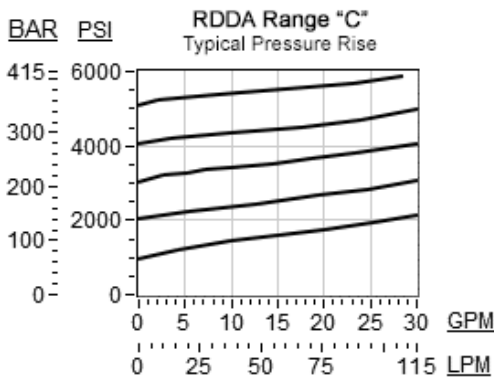
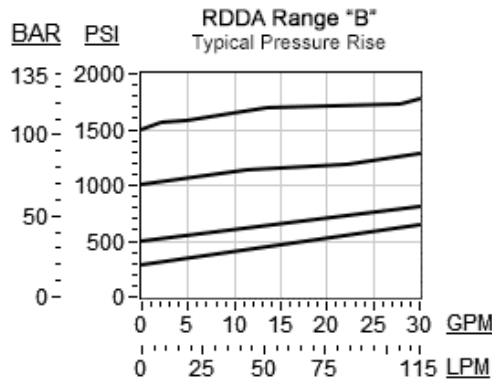
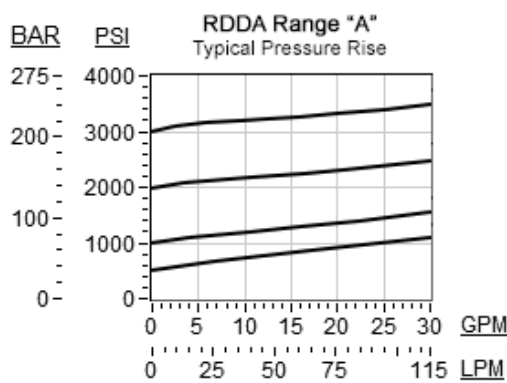
**Model Code Example: RDDALCN**

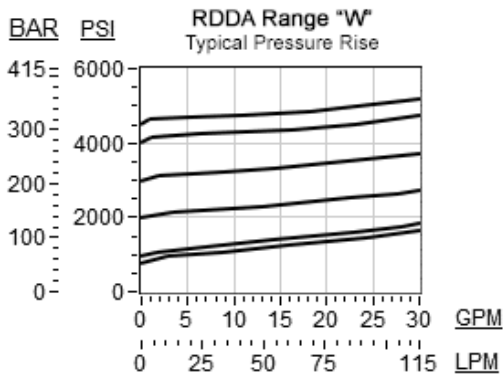
CONTROL	(L) ADJUSTMENT RANGE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>C</b> 1000 - 6000 psi (70 - 420 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>A</b> 500 - 3000 psi (35 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>Y</b> Tri-Grip Handknob	<b>W</b> 800 - 4500 psi (55 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
	<b>B</b> 300 - 1500 psi (20 - 105 bar), 1000 psi (70 bar) Standard Setting		
	<b>D</b> 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>S</b> 50 - 200 psi (3,5 - 14 bar), 100 psi (7 bar) Standard Setting		

## TECHNICAL FEATURES

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- The seals on the adjust screw are exposed to system pressure which means this valve can only be adjusted when the pressure is removed. The setting procedure is; check the setting, remove the pressure, adjust the valve, check the new setting.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Select a spring range where the desired relief setting is approximately mid-range to high between the minimum and maximum pressure to ensure maximum valve repeatability.
- Suitable for use in load holding applications.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Test pressure for each range is as follows: A range - 2000 psi (138 bar), B range - 1000 psi (69 bar), C range - 4000 psi (276 bar), D range - 800 psi (55 bar), E range - 400 psi (28 bar), S range - 150 psi (10 bar), W range - 3000 psi (207 bar).
- Reseat meets or exceeds 90% of crack pressure at test setting. Settings lower than the test pressure may result in lower reseat percentages.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

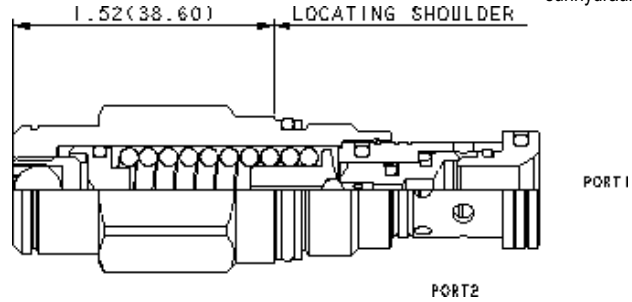
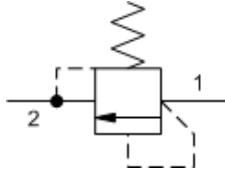
## PERFORMANCE CURVES





## RELATED MODELS

- [RDDA3](#) Non-adjustable direct-acting relief valve



Non-adjustable direct-acting relief cartridges are normally closed, pressure-limiting valves used to protect hydraulic components from pressure transients. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to limit the pressure rise. These valves are smooth and quiet, essentially zero leak, dirt tolerant, immune to silting and are very fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-10A
Series	1
Capacity	95 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Response Time - Typical	2 ms
Reseat	>90% of setting
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990310007
Seal kit - Cartridge	Viton: 990310006
Model Weight	0.15 kg.

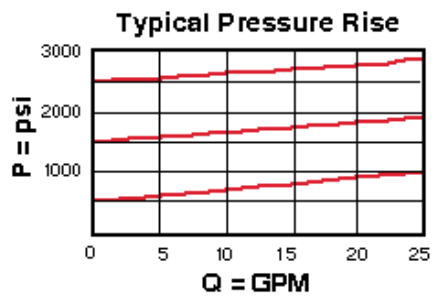
**CONFIGURATION OPTIONS**
**Model Code Example: RDDA3AN**

ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>A</b> 500 - 3000 psi (35 - 210 bar)	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> 1000 - 6000 psi (70 - 420 bar)	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>D</b> 200 - 800 psi (14 - 55 bar)		

**TECHNICAL FEATURES**

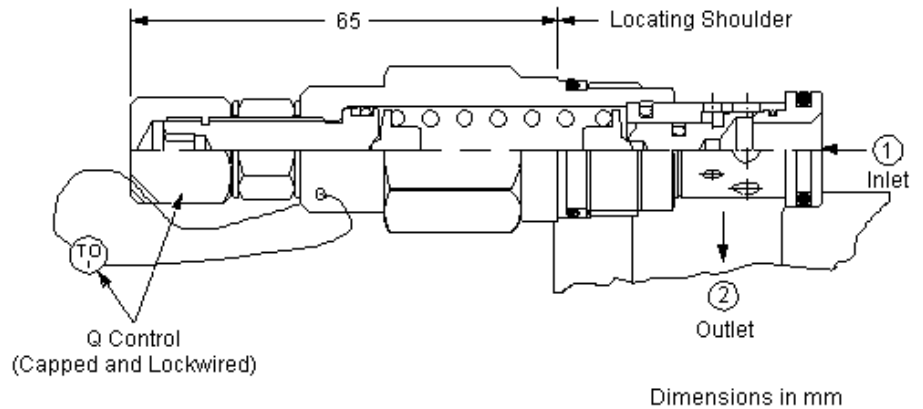
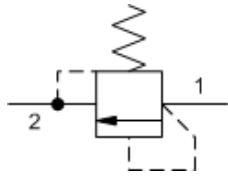
- Customer must specify setting. The valve will be factory set and is tamper proof.
- Test pressure for each range is as follows: A range - 2000 psi (138 bar), B range - 1000 psi (69 bar), C range - 4000 psi (276 bar), D range - 800 psi (55 bar), E range - 400 psi (28 bar), S range - 150 psi (10 bar), W range - 3000 psi (207 bar).
- Reseat meets or exceeds 90% of crack pressure at test setting. Settings lower than the test pressure may result in lower reseal percentages.
- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Select a spring range where the desired relief setting is approximately mid-range to high between the minimum and maximum pressure to ensure maximum valve repeatability.
- Suitable for use in load holding applications.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

**PERFORMANCE CURVES**



#### RELATED MODELS

- [RDDA](#) Direct-acting relief valve



Direct-acting relief cartridges are normally closed, pressure-limiting valves used to protect hydraulic components from pressure transients. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to limit the pressure rise. These valves are smooth and quiet, essentially zero leak, dirt tolerant, immune to silting and are very fast.

The CE marked valve is a safety valve that meets the requirements of the European Directive for Pressurized Devices (PED) 2014/68/EU. The valve setting represents the excess operating pressure at which the valve opens. Valve capacity can be determined from the performance curve. It shows an approved flow which depends on the excess operating pressure. As a requirement of the PED, the system pressure at the maximum approved flow is a maximum of 10% above the excess operating pressure.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-10A
Series	1
Capacity	75 L/min.
Maximum Valve Leakage at Reseat	0,7 cc/min.
Response Time - Typical	2 ms
Reseat	>90% of setting
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990310007
Seal kit - Cartridge	Viton: 990310006
Model Weight	0.19 kg.

**CONFIGURATION OPTIONS**

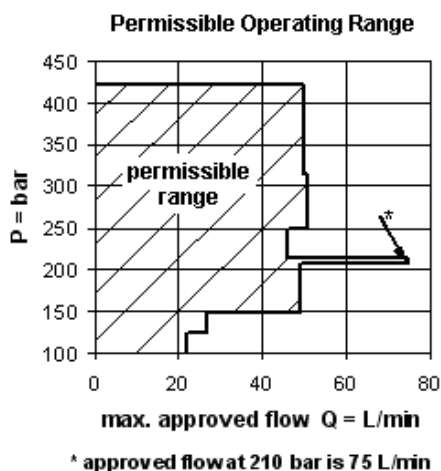
**Model Code Example: RDDTQAN**

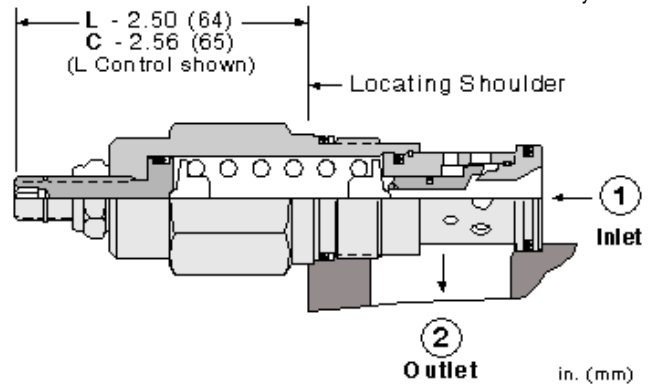
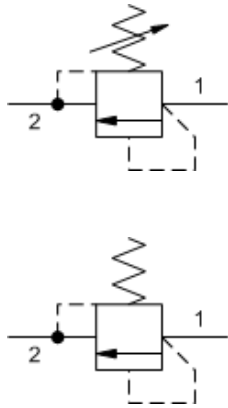
CONTROL	(Q) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N)
<b>Q</b> Capped and Lockwired	<b>A</b> 100 - 210 bar (100 - 210 bar) <b>B</b> 90 - 99 bar (90 - 99 bar) <b>C</b> 315 - 422 bar (315 - 422 bar) <b>W</b> 211 - 314 bar (211 - 314 bar)	<b>N</b> Buna-N <b>V</b> Viton	

## TECHNICAL FEATURES

- Standard settings for preset valves include:
  - A adjustment range: 100 bar, 140 bar, 160 bar and 210 bar
  - W adjustment range: 250 bar
  - C adjustment range: 330 barOther settings are available upon request.
- At this time RDDT and RDFT are the only Sun relief valves that are CE marked.
- Each delivery contains a TÜV-Approval, which is a certification of the excess operating pressure and the approved flow, an EC Declaration of conformity and an instructional manual.
- Pressure settings from 90 bar up to 422 bar are approved and certified by TÜV
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Suitable for use in load holding applications.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Direct-acting relief cartridges are normally closed, pressure-limiting valves used to protect hydraulic components from pressure transients. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to limit the pressure rise. These valves are smooth and quiet, essentially zero leak, dirt tolerant, immune to silting and are very fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-3A
Series	2
Capacity	200 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Response Time - Typical	2 ms
Reseat	>90% of setting
Adjustment - No. of CW Turns from Min. to Max. setting	6
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990303007
Seal kit - Cartridge	EPDM: 990303014
Seal kit - Cartridge	Polyurethane: 990303002
Seal kit - Cartridge	Viton: 990303006
Model Weight	0.30 kg.

**NOTES** U.S. Patent #4,742,846; European Patent Pending



## CONFIGURATION OPTIONS

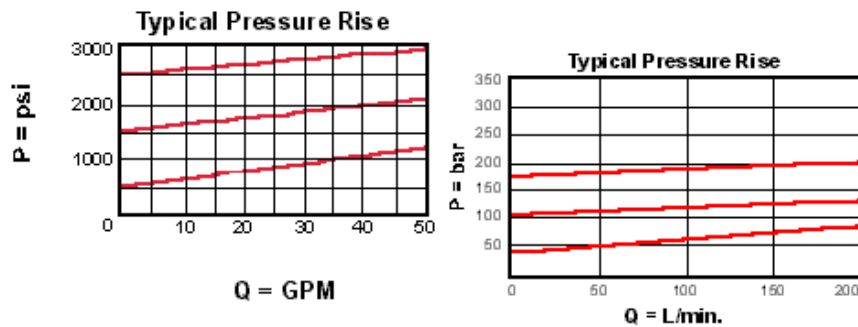
### Model Code Example: RDFALAN

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 500 - 3000 psi (35 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 800 - 4500 psi (55 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>Q</b> Capped and Lockwired	<b>B</b> 300 - 1500 psi (20 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
	<b>C</b> 1000 - 6000 psi (70 - 420 bar), 1000 psi (70 bar) Standard Setting		
	<b>D</b> 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>S</b> 50 - 200 psi (3,5 - 14 bar), 100 psi (7 bar) Standard Setting		

## TECHNICAL FEATURES

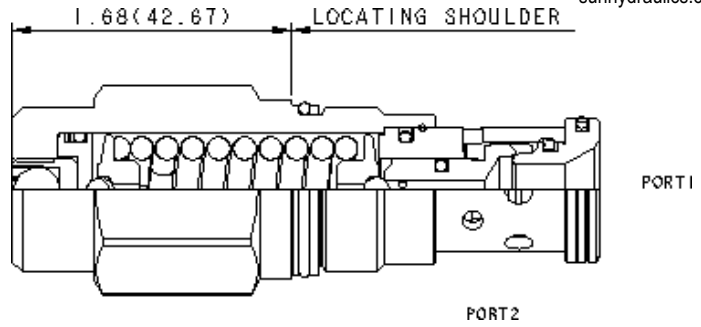
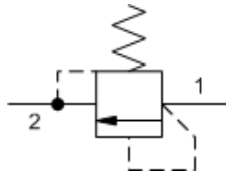
- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- The seals on the adjust screw are exposed to system pressure which means this valve can only be adjusted when the pressure is removed. The setting procedure is; check the setting, remove the pressure, adjust the valve, check the new setting.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Select a spring range where the desired relief setting is approximately mid-range to high between the minimum and maximum pressure to ensure maximum valve repeatability.
- Suitable for use in load holding applications.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Test pressure for each range is as follows: A range - 2000 psi (138 bar), B range - 1000 psi (69 bar), C range - 4000 psi (276 bar), D range - 800 psi (55 bar), E range - 400 psi (28 bar), S range - 150 psi (10 bar), W range - 3000 psi (207 bar).
- Reseat meets or exceeds 90% of crack pressure at test setting. Settings lower than the test pressure may result in lower reseat percentages.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RDFA3](#) Non-adjustable direct-acting relief valve



Non-adjustable direct-acting relief cartridges are normally closed, pressure-limiting valves used to protect hydraulic components from pressure transients. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to limit the pressure rise. These valves are smooth and quiet, essentially zero leak, dirt tolerant, immune to silting and are very fast.

### TECHNICAL DATA

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-3A
Series	2
Capacity	200 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Response Time - Typical	2 ms
Reseat	>90% of setting
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990303007
Seal kit - Cartridge	EPDM: 990303014
Seal kit - Cartridge	Polyurethane: 990303002
Seal kit - Cartridge	Viton: 990303006
Model Weight	0.28 kg.

### CONFIGURATION OPTIONS

**Model Code Example: RDFA3AN**

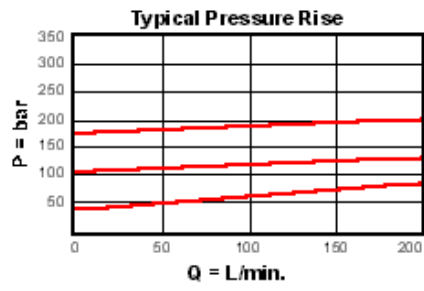
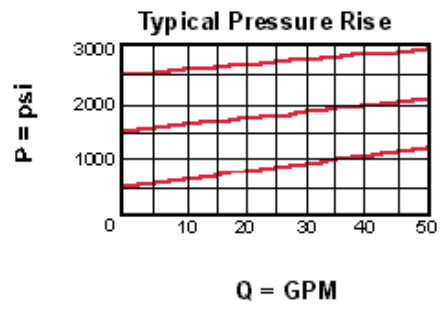
**ADJUSTMENT RANGE (A) SEAL MATERIAL (N)**

<b>A</b> 500 - 3000 psi (35 - 210 bar)	<b>N</b> Buna-N
<b>C</b> 1000 - 6000 psi (70 - 420 bar)	<b>V</b> Viton
<b>D</b> 200 - 800 psi (14 - 55 bar)	

### TECHNICAL FEATURES

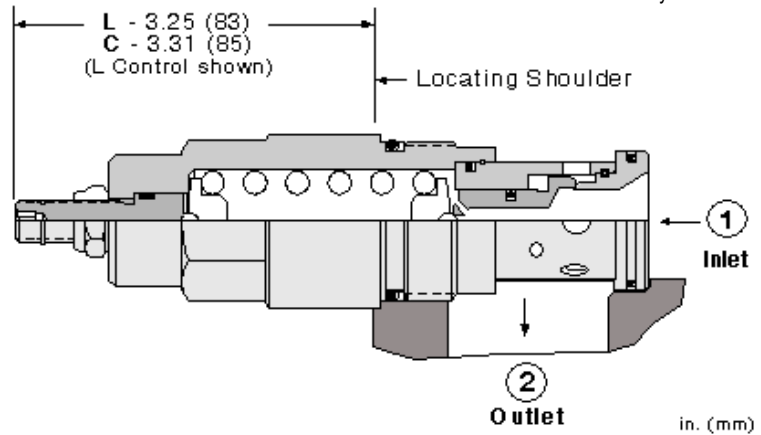
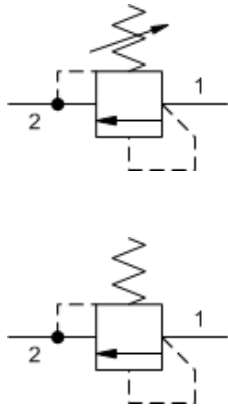
- Customer must specify setting. The valve will be factory set and is tamper proof.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Test pressure for each range is as follows: A range - 2000 psi (138 bar), B range - 1000 psi (69 bar), C range - 4000 psi (276 bar), D range - 800 psi (55 bar), E range - 400 psi (28 bar), S range - 150 psi (10 bar), W range - 3000 psi (207 bar).
- Reseat meets or exceeds 90% of crack pressure at test setting. Settings lower than the test pressure may result in lower reseat percentages.
- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Select a spring range where the desired relief setting is approximately mid-range to high between the minimum and maximum pressure to ensure maximum valve repeatability.
- Suitable for use in load holding applications.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RDFA](#) Direct-acting relief valve



Direct-acting relief cartridges are normally closed, pressure-limiting valves used to protect hydraulic components from pressure transients. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to limit the pressure rise. These valves are smooth and quiet, essentially zero leak, dirt tolerant, immune to silting and are very fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-16A
Series	3
Capacity	380 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Response Time - Typical	2 ms
Reseat	>90% of setting
Adjustment - No. of CW Turns from Min. to Max. setting	6
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990316007
Seal kit - Cartridge	Viton: 990316006
Model Weight	0.68 kg.

**NOTES** U.S. Patent #4,742,846; European Patent Pending

**CONFIGURATION OPTIONS**

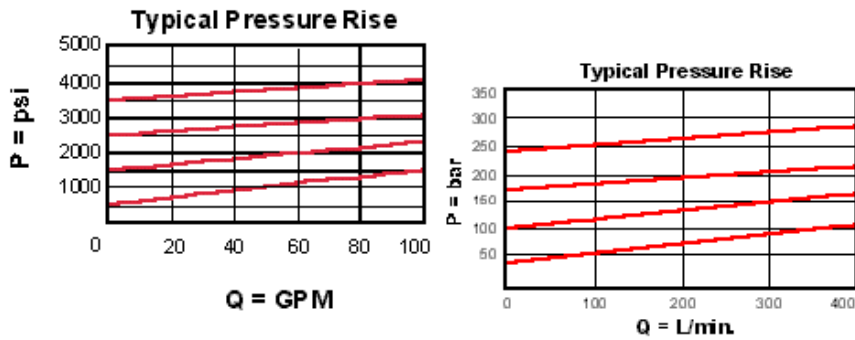
**Model Code Example: RDHALAN**

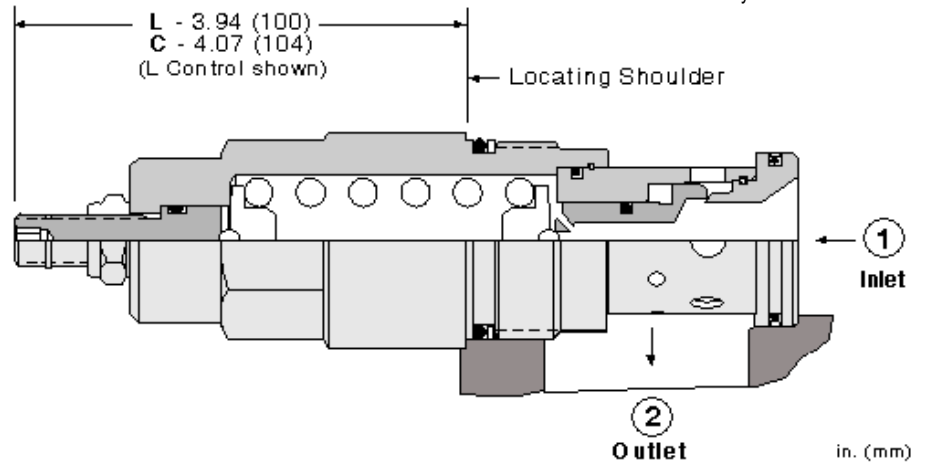
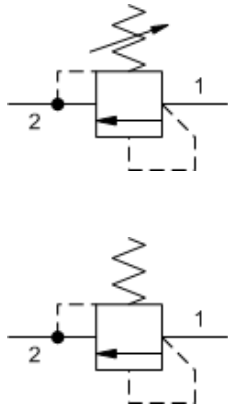
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 500 - 3000 psi (35 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 800 - 4500 psi (55 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
	<b>B</b> 300 - 1500 psi (20 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
	<b>C</b> 1000 - 6000 psi (70 - 420 bar), 1000 psi (70 bar) Standard Setting		
	<b>D</b> 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>S</b> 50 - 200 psi (3,5 - 14 bar), 100 psi (7 bar) Standard Setting		

## TECHNICAL FEATURES

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- The seals on the adjust screw are exposed to system pressure which means this valve can only be adjusted when the pressure is removed. The setting procedure is; check the setting, remove the pressure, adjust the valve, check the new setting.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Select a spring range where the desired relief setting is approximately mid-range to high between the minimum and maximum pressure to ensure maximum valve repeatability.
- Suitable for use in load holding applications.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Test pressure for each range is as follows: A range - 2000 psi (138 bar), B range - 1000 psi (69 bar), C range - 4000 psi (276 bar), D range - 800 psi (55 bar), E range - 400 psi (28 bar), S range - 150 psi (10 bar), W range - 3000 psi (207 bar).
- Reseat meets or exceeds 90% of crack pressure at test setting. Settings lower than the test pressure may result in lower reseal percentages.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Direct-acting relief cartridges are normally closed, pressure-limiting valves used to protect hydraulic components from pressure transients. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to limit the pressure rise. These valves are smooth and quiet, essentially zero leak, dirt tolerant, immune to silting and are very fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-18A
Series	4
Capacity	760 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Response Time - Typical	2 ms
Reseat	>90% of setting
Adjustment - No. of CW Turns from Min. to Max. setting	6
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990318007
Seal kit - Cartridge	EPDM: 990318014
Seal kit - Cartridge	Viton: 990318006
Model Weight	1.50 kg.

**NOTES** U.S. Patent #4,742,846; European Patent Pending

## CONFIGURATION OPTIONS

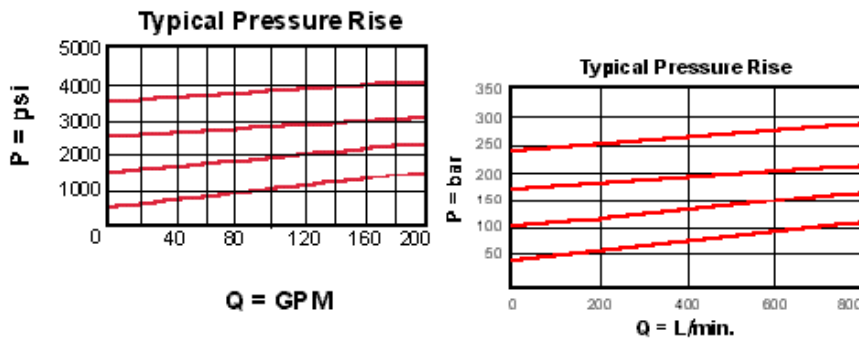
### Model Code Example: RDJALAN

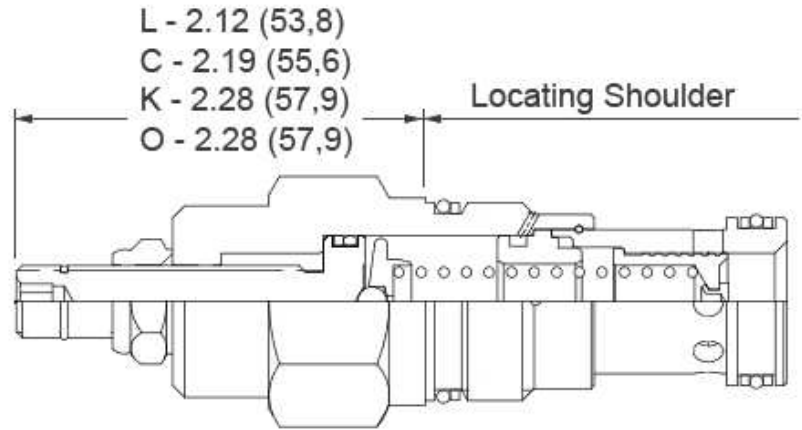
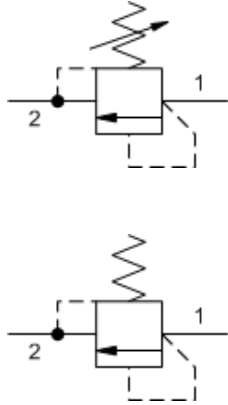
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	A 500 - 3000 psi (35 - 210 bar), 1000 psi (70 bar) Standard Setting	N Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	W 800 - 4500 psi (55 - 315 bar), 1000 psi (70 bar) Standard Setting	E EPDM	/AP Stainless Steel, Passivated
Q Capped and Lockwired	B 300 - 1500 psi (20 - 105 bar), 1000 psi (70 bar) Standard Setting	V Viton	/LH Mild Steel, Zinc-Nickel
	C 1000 - 6000 psi (70 - 420 bar), 1000 psi (70 bar) Standard Setting		
	D 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting		
	E 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting		
	S 50 - 200 psi (3,5 - 14 bar), 100 psi (7 bar) Standard Setting		

## TECHNICAL FEATURES

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- The seals on the adjust screw are exposed to system pressure which means this valve can only be adjusted when the pressure is removed. The setting procedure is; check the setting, remove the pressure, adjust the valve, check the new setting.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Select a spring range where the desired relief setting is approximately mid-range to high between the minimum and maximum pressure to ensure maximum valve repeatability.
- Suitable for use in load holding applications.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Test pressure for each range is as follows: A range - 2000 psi (138 bar), B range - 1000 psi (69 bar), C range - 4000 psi (276 bar), D range - 800 psi (55 bar), E range - 400 psi (28 bar), S range - 150 psi (10 bar), W range - 3000 psi (207 bar).
- Reseat meets or exceeds 90% of crack pressure at test setting. Settings lower than the test pressure may result in lower reseat percentages.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





in (mm)

Direct-acting relief cartridges are normally closed, pressure-limiting valves used to protect hydraulic components from pressure transients. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to limit the pressure rise.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-3A
Series	2
Capacity	200 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	50 cc/min. @70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	6
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	EPDM: 990203014
Seal kit - Cartridge	Polyurethane: 990003002
Seal kit - Cartridge	Viton: 990203006
Model Weight	0.25 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.



## CONFIGURATION OPTIONS

Model Code Example: RGFALCN

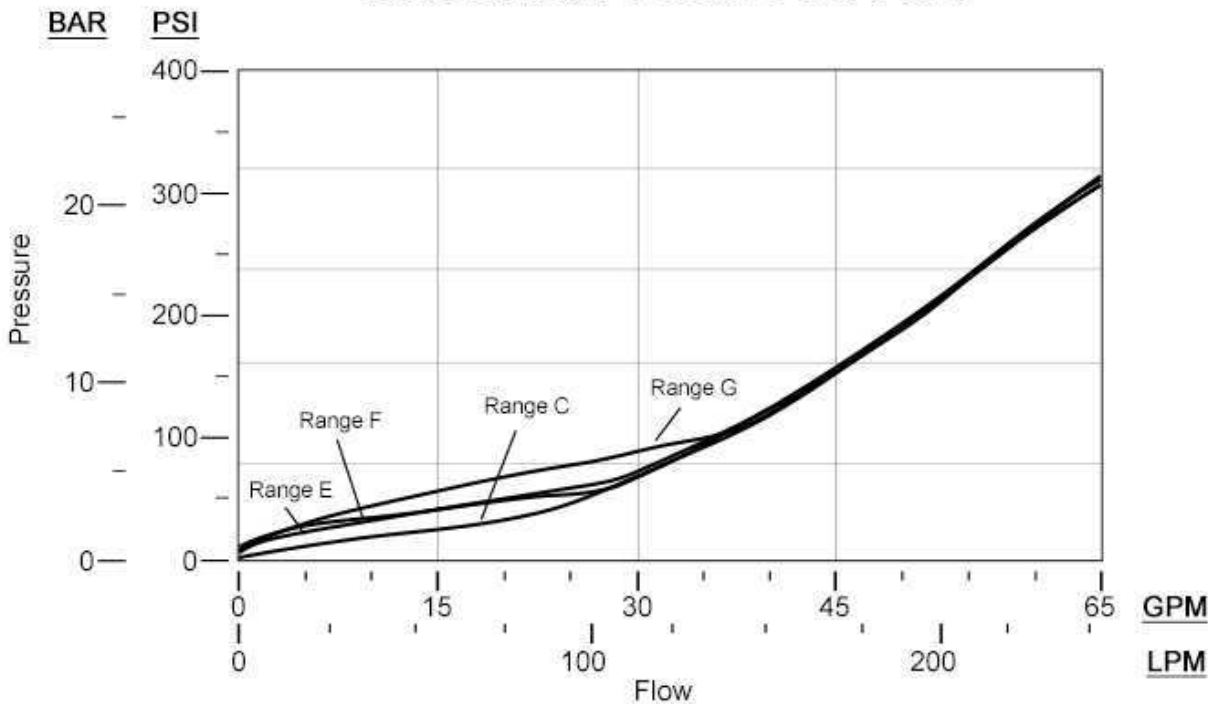
CONTROL	(L) ADJUSTMENT RANGE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>C</b> 18 - 50 psi (1,2 - 3,5 bar), 50 psi (3,5 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>E</b> 20 - 75 psi (1,4 - 5 bar), 75 psi (5 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>F</b> 35 - 80 psi (2,4 - 5,5 bar), 80 psi (5,5 bar) Standard Setting	<b>V</b> Viton	
<b>O</b> Handknob with Panel Mount	<b>G</b> 30 - 150 psi (2 - 10,5 bar), 150 psi (10,5 bar) Standard Setting		

## TECHNICAL FEATURES

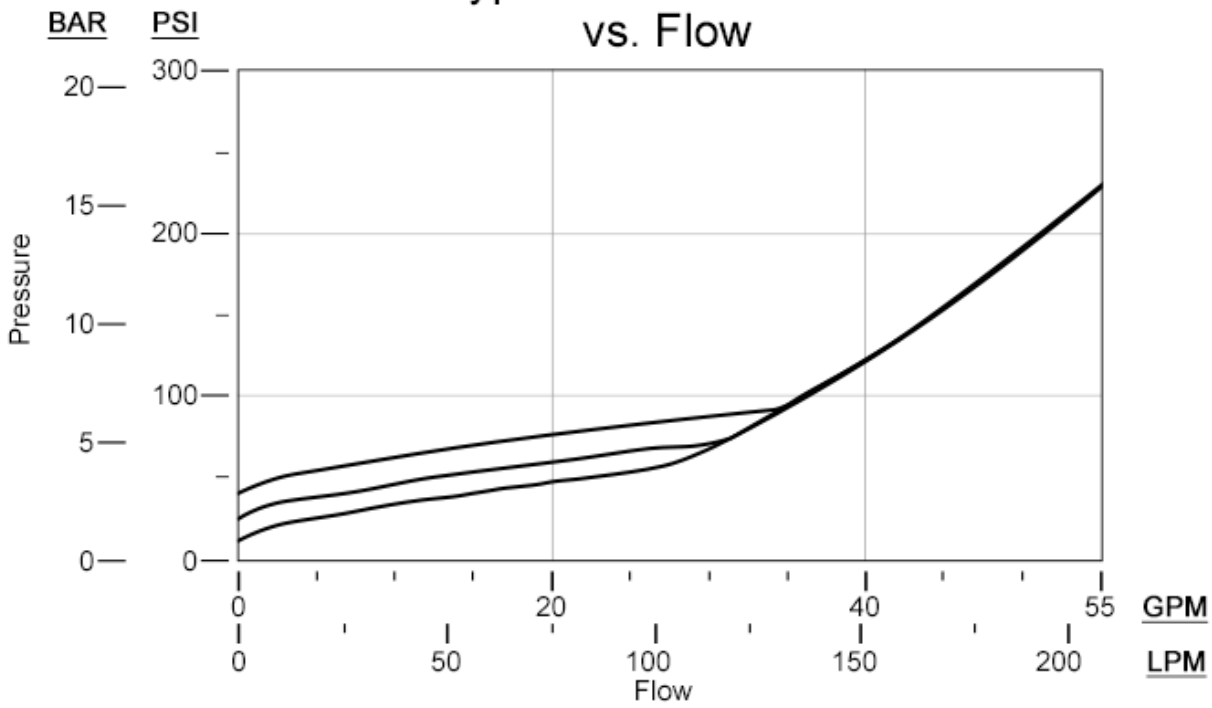
- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES

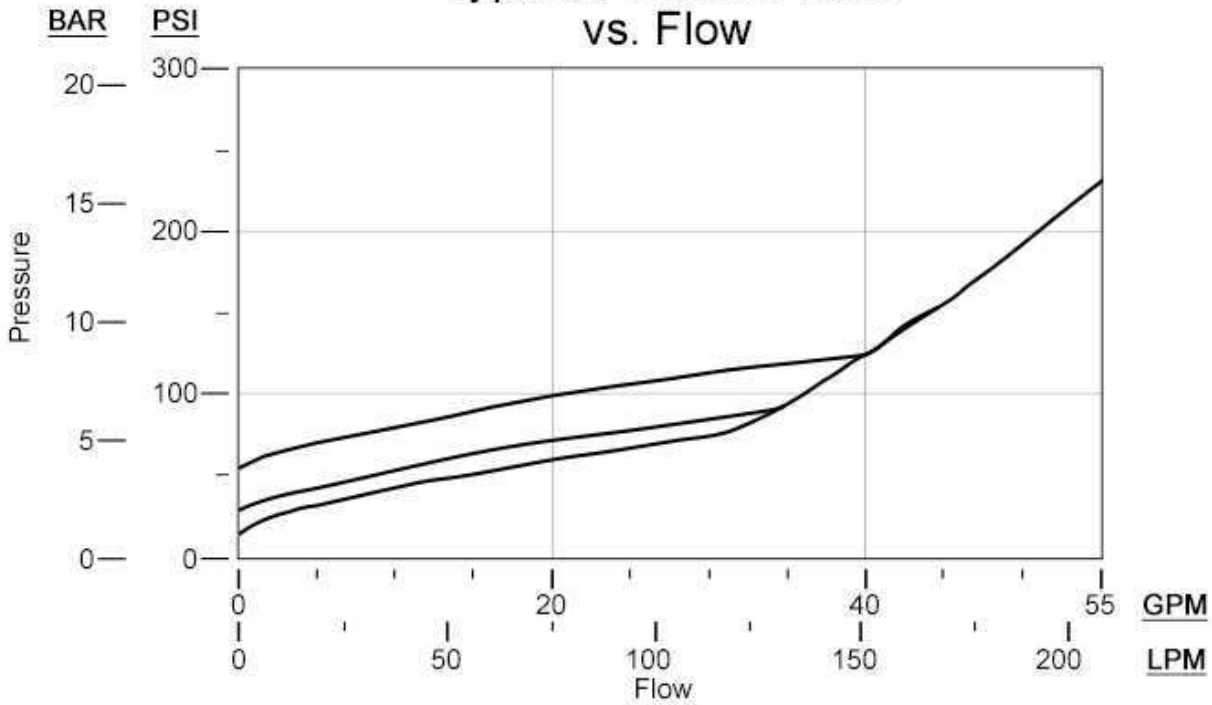
RGFA L\*N  
Differential Pressure vs. Flow



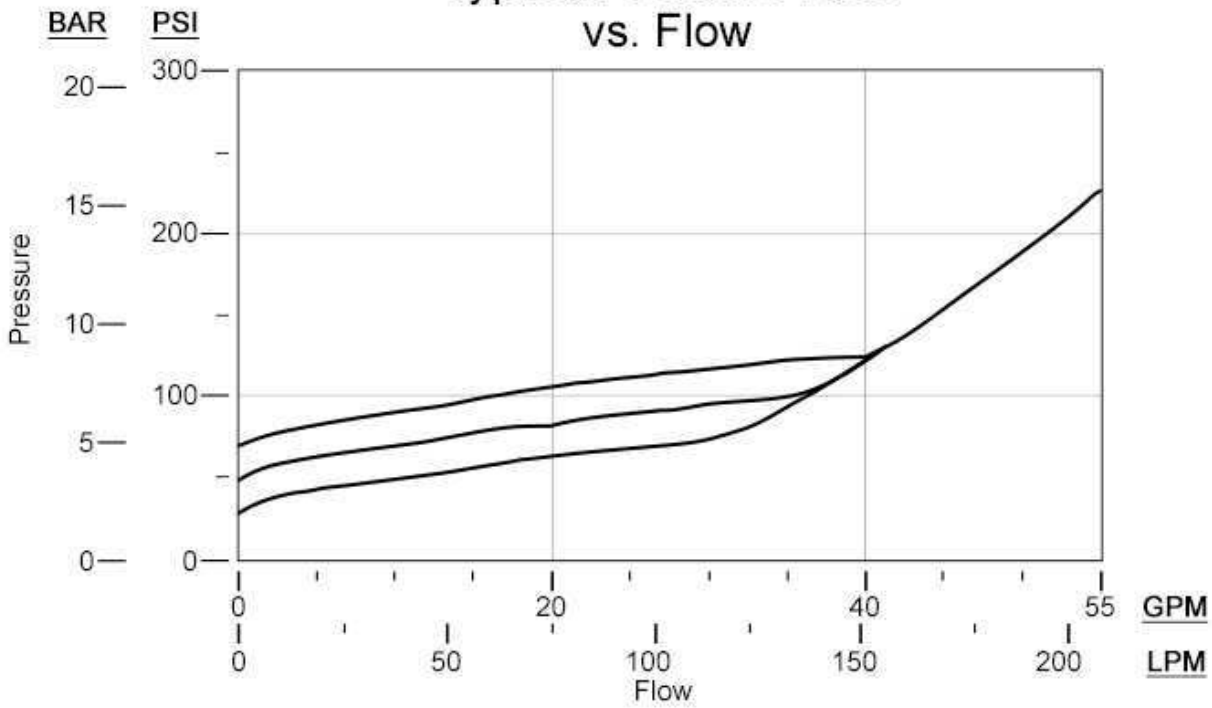
### RGFA LCN Typical Pressure Rise vs. Flow



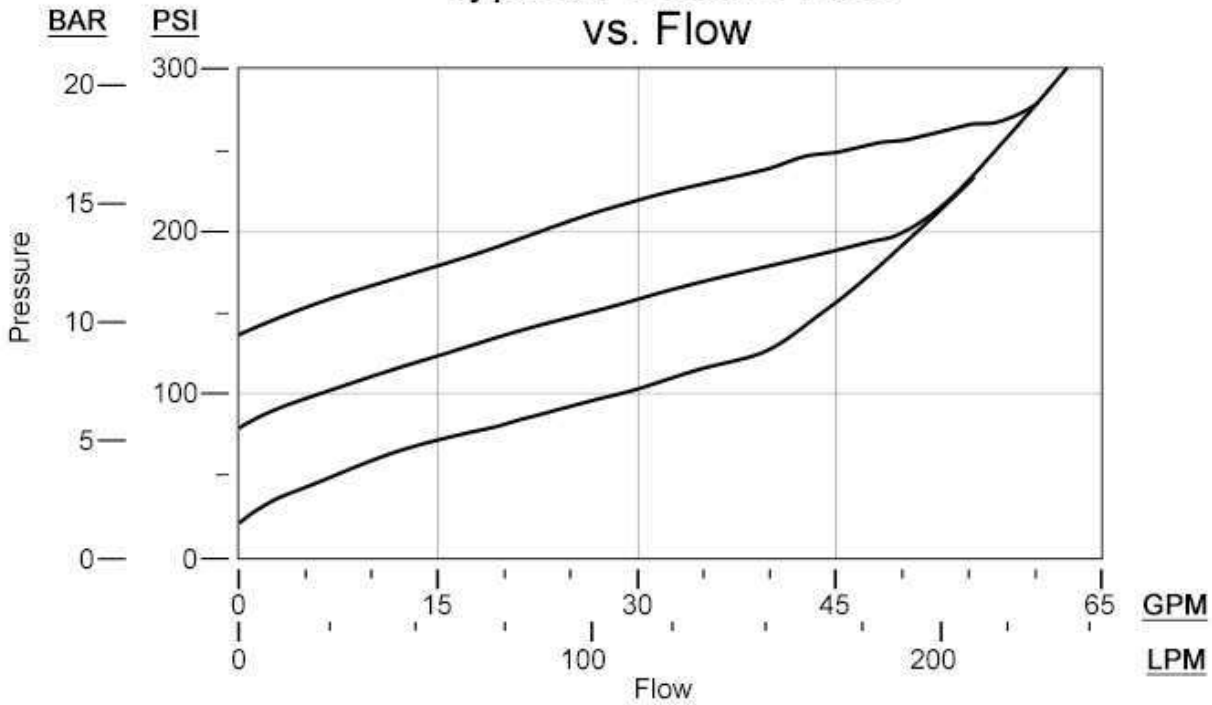
### RGFA LEN Typical Pressure Rise vs. Flow

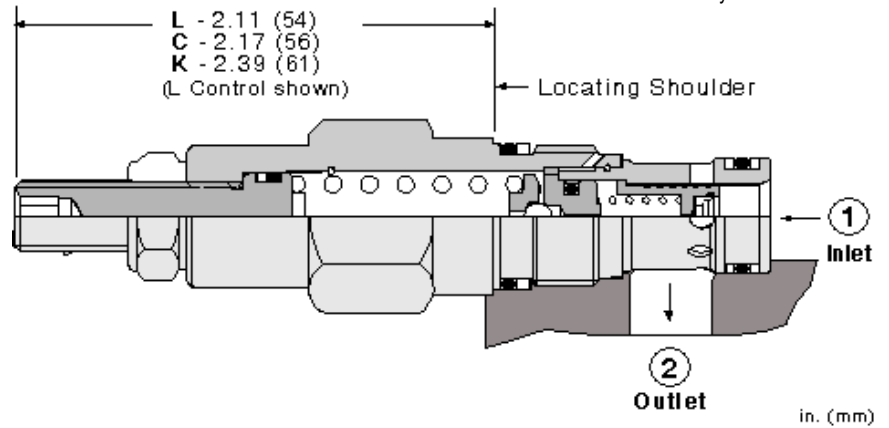
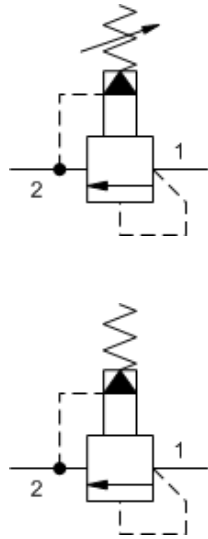


### RGFA LFN Typical Pressure Rise vs. Flow



### RGFA LGN Typical Pressure Rise vs. Flow





Pilot-operated, balanced-piston relief cartridges are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-162A
Series	0
Capacity	45 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.@70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	12,7 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	EPDM: 990162014
Seal kit - Cartridge	Polyurethane: 990162002
Seal kit - Cartridge	Viton: 990162006
Model Weight	0.10 kg.

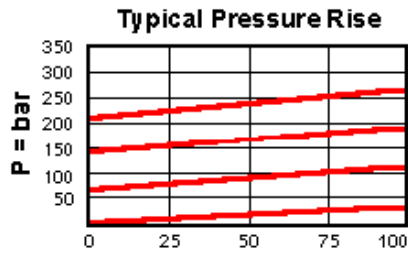
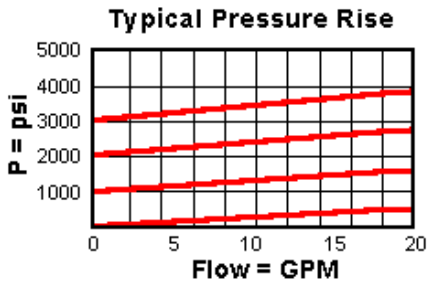
**CONFIGURATION OPTIONS**
**Model Code Example: RPCCLAN**

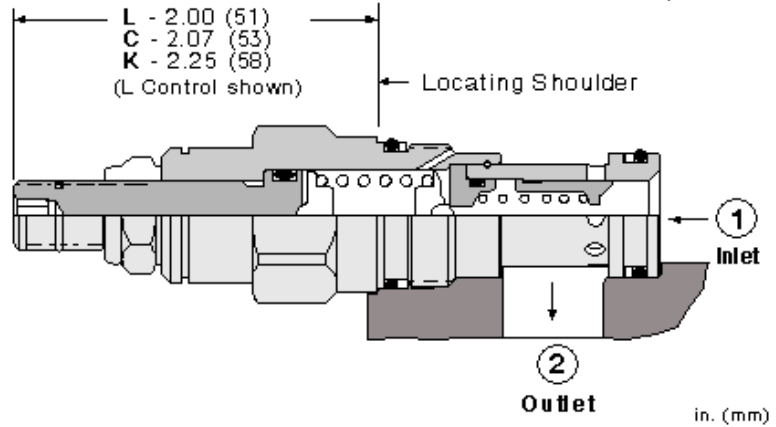
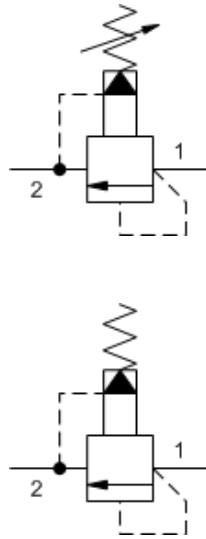
<b>CONTROL</b>	<b>(L) ADJUSTMENT RANGE</b>	<b>(A) SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>L</b> Standard Screw Adjustment	<b>A</b> 75 - 3000 psi (5 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 75 - 4500 psi (5 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>B</b> 75 - 1500 psi (5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
	<b>C</b> 75 - 6000 psi (5 - 420 bar), 1000 psi (70 bar) Standard Setting		
	<b>N</b> 75 - 800 psi (5 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>Q</b> 75 - 400 psi (5 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Minimum setting is 75 psi (5 bar) for all spring ranges.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- The main stage orifice is protected against contamination.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, balanced-piston relief cartridges are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-10A
Series	1
Capacity	95 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.@70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	EPDM: 990010014
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006
Model Weight	0.14 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

**CONFIGURATION OPTIONS**

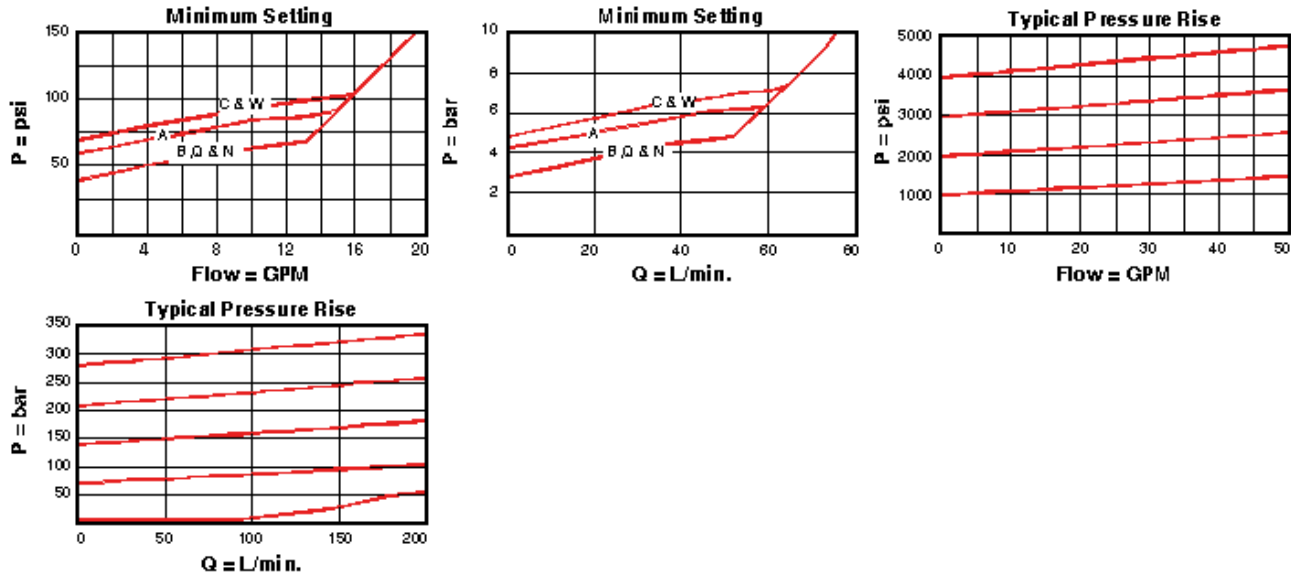
**Model Code Example: RPECLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>O</b> Handknob with Panel Mount	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
<b>W</b> Hex Wrench Adjustment	<b>N</b> 60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

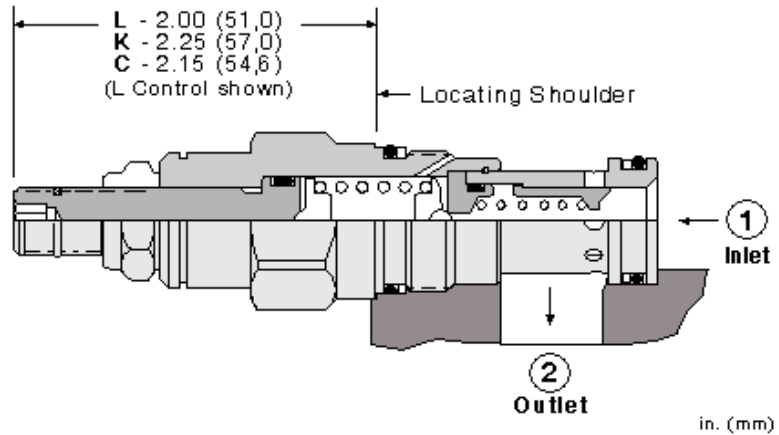
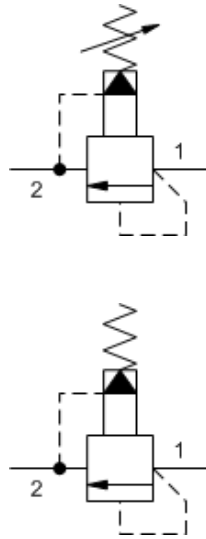
- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RPEC8](#) Pilot-operated, balanced piston relief main stage with integral T-8A control cavity



Fast-acting, pilot-operated, balanced piston relief cartridges are normally closed, pressure-limiting valves used to protect hydraulics components from pressure transients. Fast opening and closing is gained at the expense of smoothness. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to limit the pressure rise. These valves have low pressure rise vs. flow and are very fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-10A
Series	1
Capacity	95 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.@70 bar
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006
Model Weight	0.14 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

**CONFIGURATION OPTIONS**

**Model Code Example: RPEELAN**

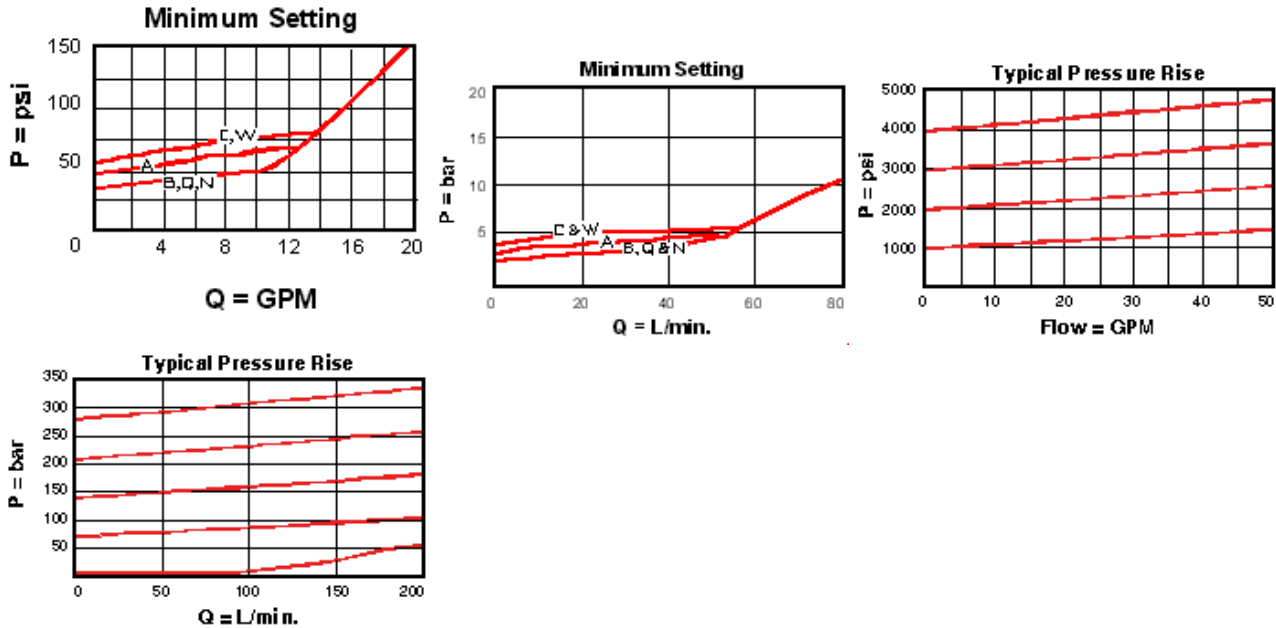
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
<b>O</b> Handknob with Panel Mount	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

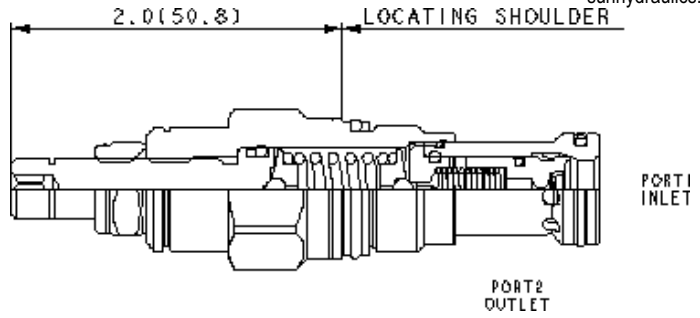
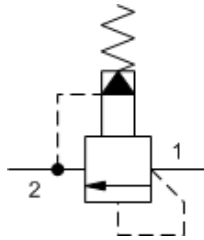
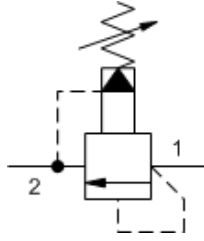


## TECHNICAL FEATURES

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, balanced-poppet relief cartridges are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. These valves are accurate, smooth, quiet, fast, and have low pressure rise vs. flow.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-10A
Series	1
Capacity	95 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,7 cc/min.
Response Time - Typical	7 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990310007
Seal kit - Cartridge	Viton: 990310006
Model Weight	0.14 kg.

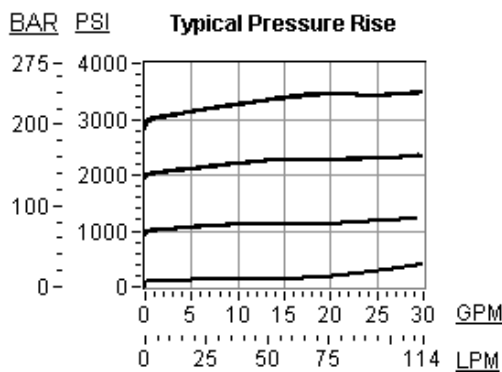
**CONFIGURATION OPTIONS**
**Model Code Example: RPESLAN**

<b>CONTROL</b>	<b>(L) ADJUSTMENT RANGE</b>	<b>(A) SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob	<b>N</b> 60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 100 - 4500 psi (7 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

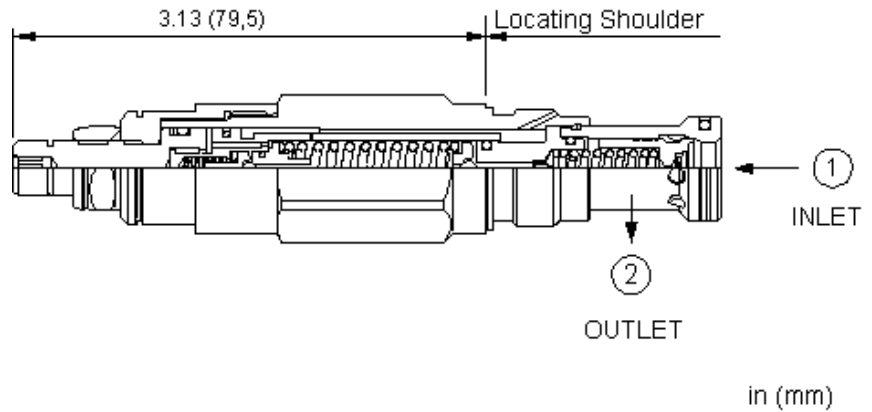
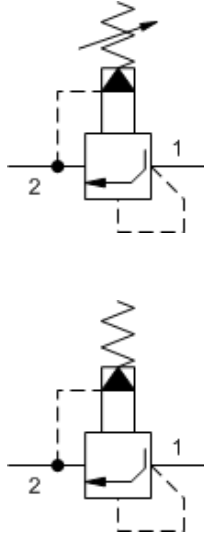
- Because the modulating occurs inside the cartridge, these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Suitable for use in load holding applications.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RPES8](#) Pilot-operated, balanced poppet relief main stage with integral T-8A control cavity



Pilot-operated, anti shock relief cartridges limit maximum system pressure and also limit the rate of pressure rise. The valve opens and then ramps closed at a constant speed, independent of settings and flows. The adjust screw determines the maximum (relief) setting and the minimum (threshold) setting.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-10A
Series	1
Capacity	95 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,41 L/min.
Pressure Ramp Up Time	100 - 300 ms
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	4.5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
U.S. Patent #	6,039,070
Seal kit - Cartridge	Buna: 990310007
Seal kit - Cartridge	Viton: 990310006
Model Weight	0.22 kg.

**CONFIGURATION OPTIONS**

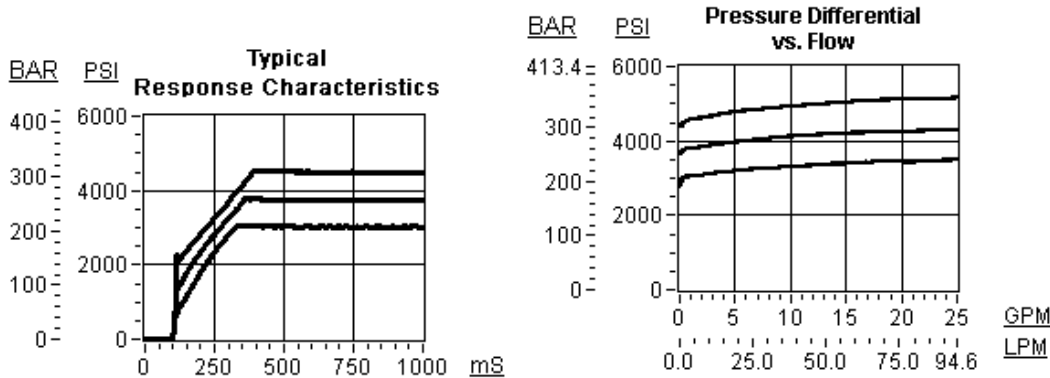
**Model Code Example: RPETLWN**

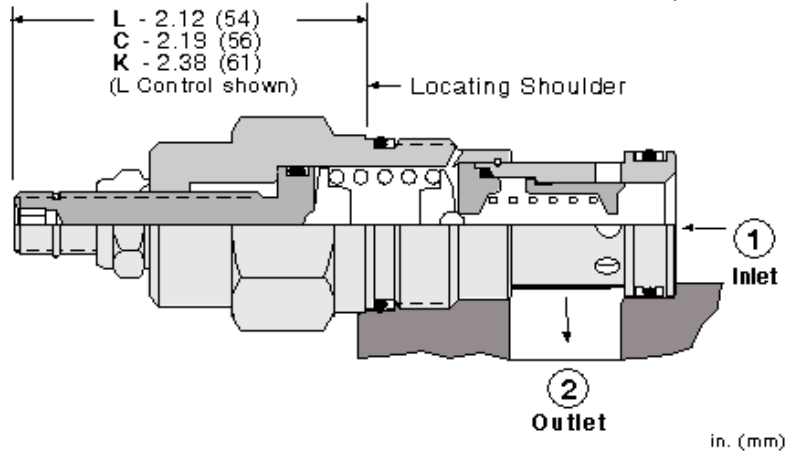
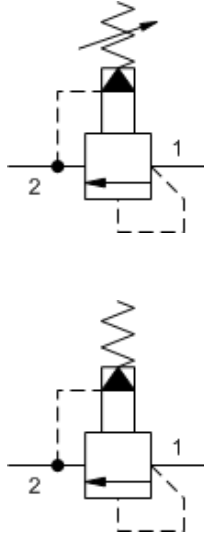
CONTROL	(L) ADJUSTMENT RANGE	(W) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>W</b> 3000 - 4500 psi (210 - 315 bar), 3000 psi (210 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>A</b> 2000 - 3000 psi (140 - 210 bar), 2000 psi (140 bar) Standard Setting <b>C</b> 4500 - 6000 psi (315 - 420 bar), 4500 psi (315 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

## TECHNICAL FEATURES

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Not suitable for use in load holding applications.
- When pressure at the inlet (port 1) exceeds the threshold setting, the valve opens to tank (port 2). The pilot section moves forward at a steady rate, increasing the setting by compressing the pilot spring. Maximum setting is achieved when the pilot section reaches a mechanical stop.
- Valve provides protection for pumps and motors from pressure transients due to sudden load changes, especially variable displacement pumps, since the displacement mechanism is sometimes too slow to catch these pressure transients.
- Valve provides protection for hydrostatic drives by reducing the jerk caused by sudden reversals. The valve is suitable for cross-port applications.
- When used with a switching device, the valve can provide the ramp characteristic typically provided by proportional valves.
- Small power units can be started against an anti shock relief to provide longer pump life.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, balanced-piston relief cartridges are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-3A
Series	2
Capacity	200 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	50 cc/min.@70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	EPDM: 990203014
Seal kit - Cartridge	Polyurethane: 990003002
Seal kit - Cartridge	Viton: 990203006
Model Weight	0.26 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

## CONFIGURATION OPTIONS

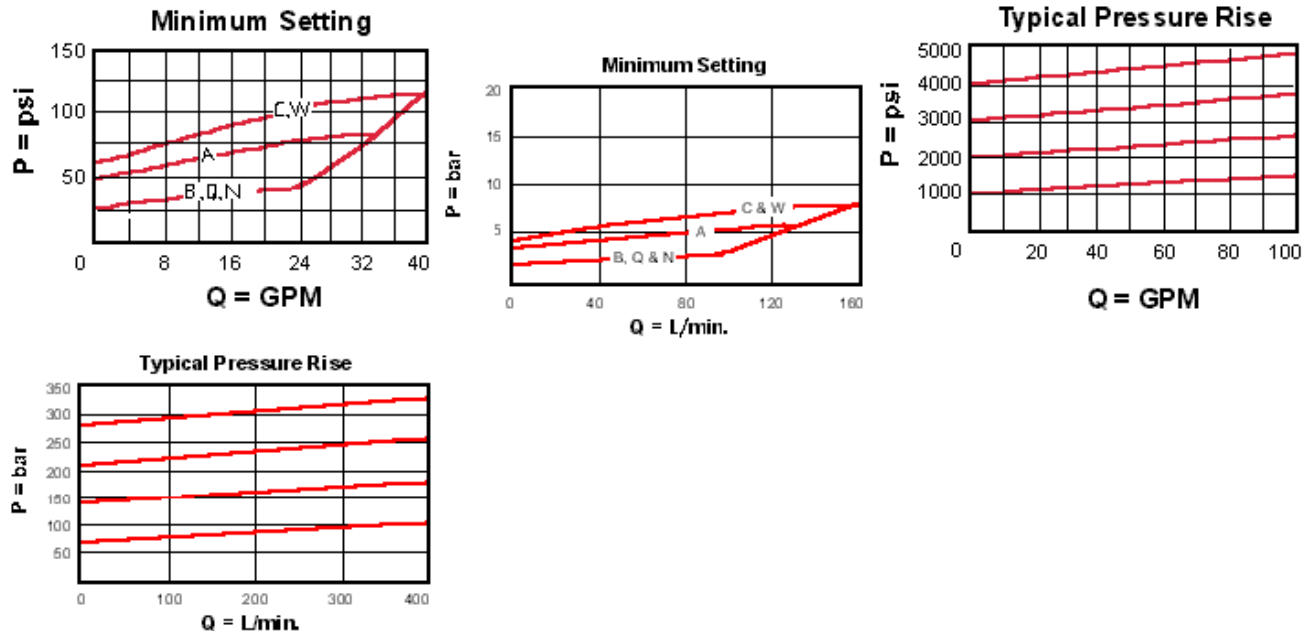
## Model Code Example: RPGCLAN

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>J</b> Capped Screw Adjustment	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
<b>O</b> Handknob with Panel Mount	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
<b>W</b> Hex Wrench Adjustment	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>N</b> 60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

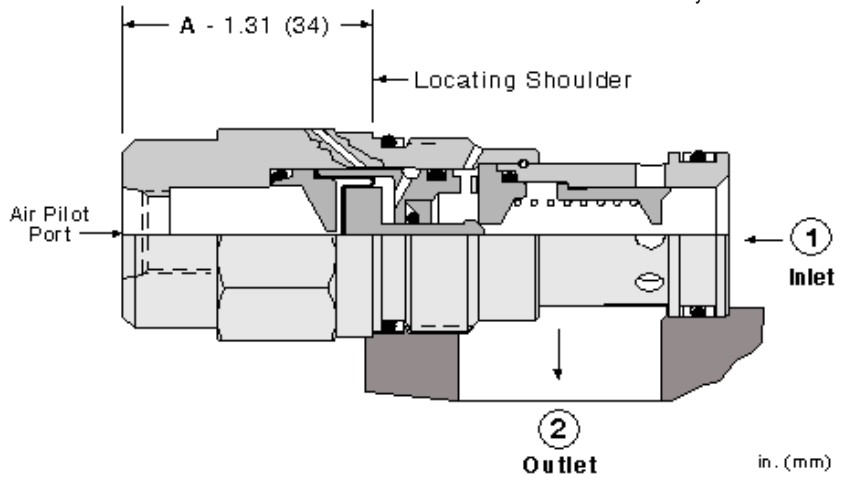
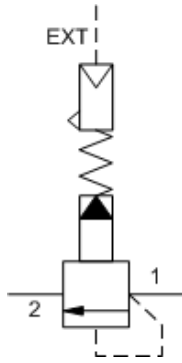
- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RPGC3](#) Non-adjustable pilot-operated, balanced piston relief valve
- [RPGC8](#) Pilot-operated, balanced piston relief main stage with integral T-8A control cavity



Air-controlled, pilot-operated, balanced piston relief cartridges use compressed air over a diaphragm instead of an adjustable spring to control pressure setting. The air signal is supplied through a port in the hex-end of the cartridge. They are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-3A
Series	2
Capacity	200 L/min.
Pilot Ratio	20:1
Maximum Operating Pressure	140 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	50 cc/min.@70 bar
Maximum Air Pressure	10,5 bar
Response Time - Typical	10 ms
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	Polyurethane: 990003002
Seal kit - Cartridge	Viton: 990203006
Model Weight	0.24 kg.

**CONFIGURATION OPTIONS**

**Model Code Example: RPGDABN**

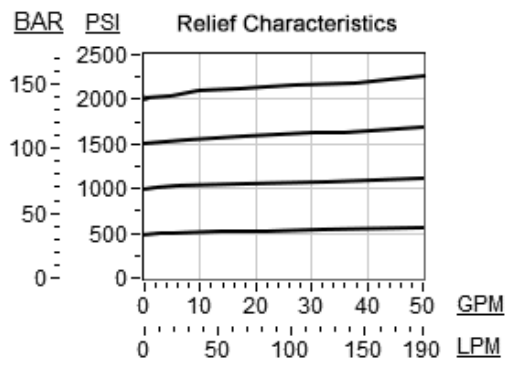
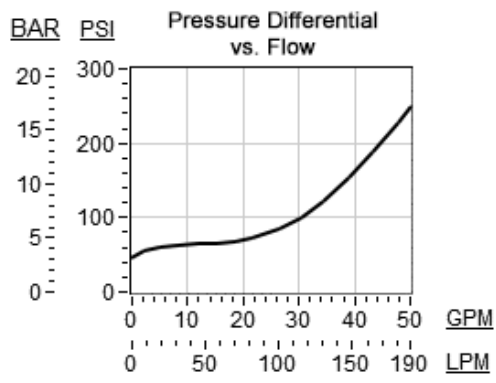
<b>CONTROL</b>	<b>(A) OPERATING RANGE</b>	<b>(B) SEAL MATERIAL</b>	<b>(N)</b>
A External 1/4 NPTF Port	B 50 - 1500 psi (3,5 - 105 bar)	N Buna-N V Viton	

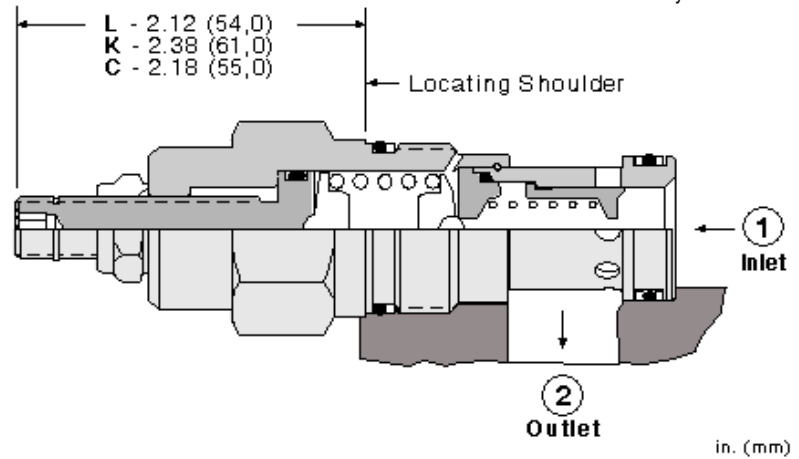
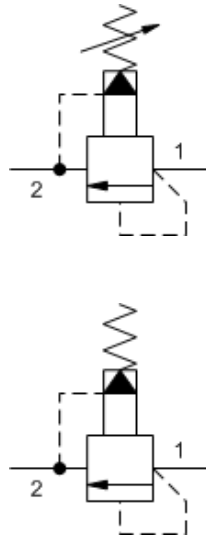
**TECHNICAL FEATURES**

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Maximum air pressure should not exceed 150 psi (10 bar).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

**PERFORMANCE CURVES**







Fast-acting, pilot-operated, balanced piston relief cartridges are normally closed, pressure-limiting valves used to protect hydraulics components from pressure transients. Fast opening and closing is gained at the expense of smoothness. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to limit the pressure rise. These valves have low pressure rise vs. flow and are very fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-3A
Series	2
Capacity	200 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	50 cc/min.@70 bar
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	EPDM: 990203014
Seal kit - Cartridge	Polyurethane: 990003002
Seal kit - Cartridge	Viton: 990203006
Model Weight	0.26 kg.

**NOTES**

For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

## CONFIGURATION OPTIONS

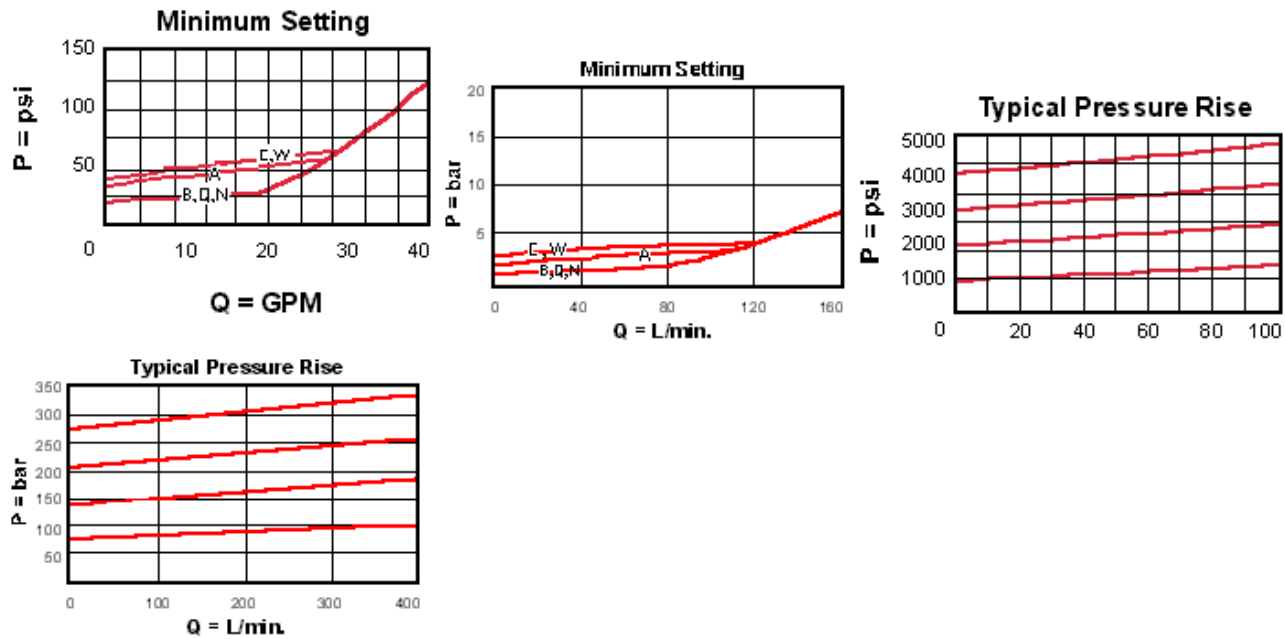
## Model Code Example: RPGELAN

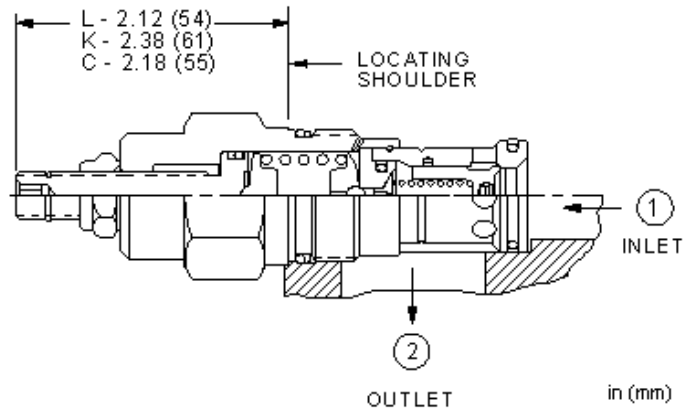
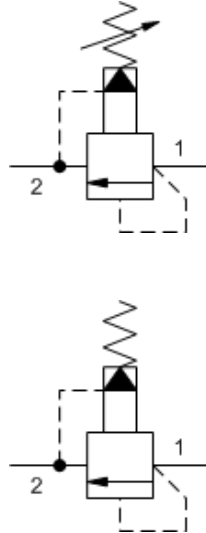
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	
<b>O</b> Handknob with Panel Mount	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, balanced-poppet relief cartridges are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. These valves are accurate, smooth, quiet, fast, and have low pressure rise vs. flow.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-3A
Series	2
Capacity	200 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Response Time - Typical	7 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990303007
Seal kit - Cartridge	EPDM: 990303014
Seal kit - Cartridge	Polyurethane: 990303002
Seal kit - Cartridge	Viton: 990303006
Model Weight	0.26 kg.

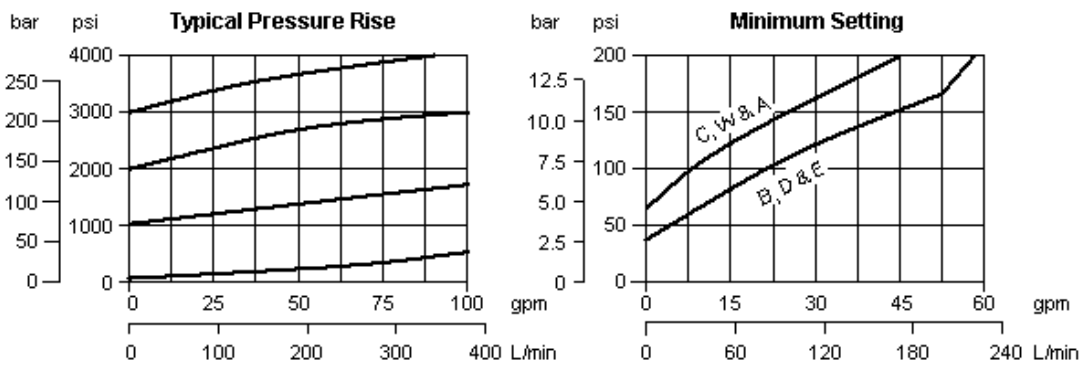
**CONFIGURATION OPTIONS**
**Model Code Example: RPGSLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob	<b>N</b> 60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 100 - 4500 psi (7 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

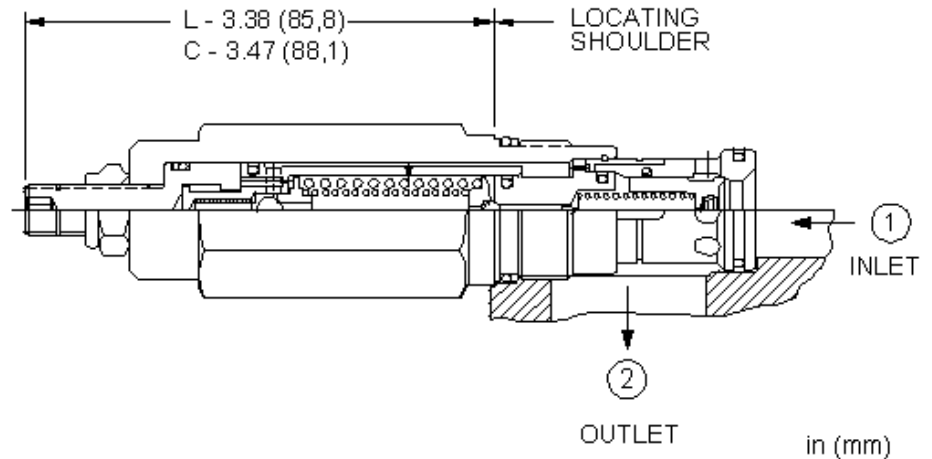
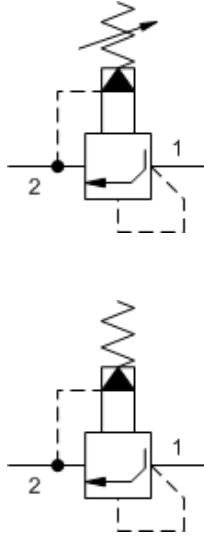
- Because the modulating occurs inside the cartridge, these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Suitable for use in load holding applications.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RPGS8](#) Pilot-operated, balanced poppet relief main stage with integral T-8A control cavity



Pilot-operated, anti shock relief cartridges limit maximum system pressure and also limit the rate of pressure rise. The valve opens and then ramps closed at a constant speed, independent of settings and flows. The adjust screw determines the maximum (relief) setting and the minimum (threshold) setting.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-3A
Series	2
Capacity	200 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,41 L/min.
Pressure Ramp Up Time	200 - 400 ms
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	4.5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
U.S. Patent #	6,039,070
Seal kit - Cartridge	Buna: 990303007
Seal kit - Cartridge	Polyurethane: 990303002
Seal kit - Cartridge	Viton: 990303006
Model Weight	0.40 kg.

**NOTES** Patents: US#6,039,070; Germany EP 1 001 197; Japan #3,119,230

**CONFIGURATION OPTIONS**

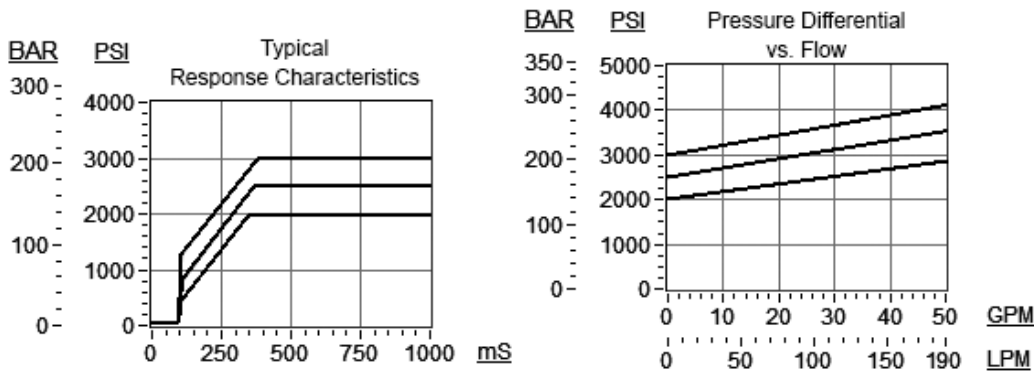
**Model Code Example: RPGTLAN**

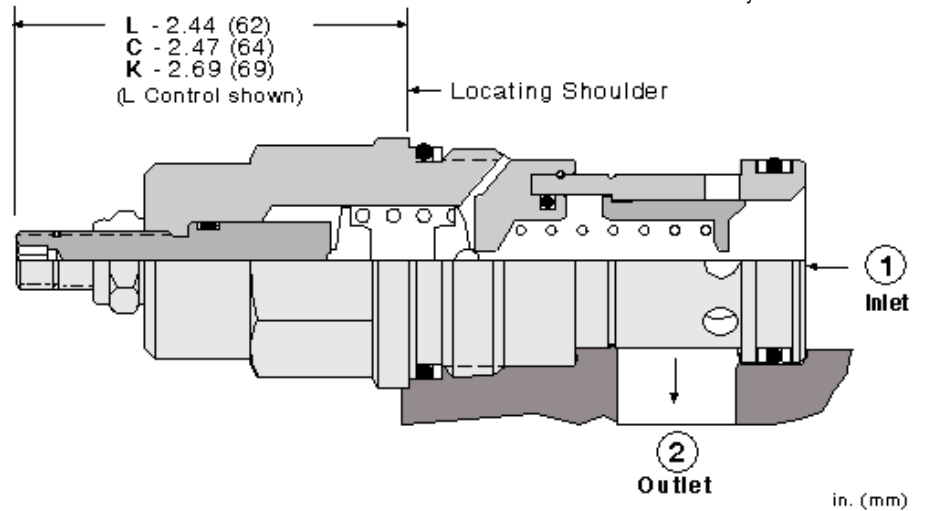
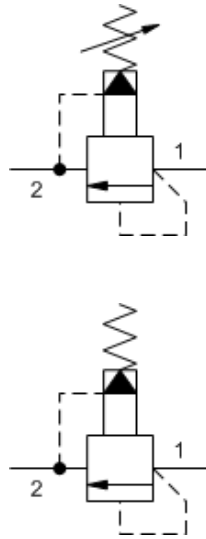
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 2000 - 3000 psi (140 - 210 bar), 2000 psi (140 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>C</b> 4500 - 6000 psi (315 - 420 bar), 4500 psi (315 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel
	<b>W</b> 3000 - 4500 psi (210 - 315 bar), 3000 psi (210 bar) Standard Setting		

## TECHNICAL FEATURES

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Not suitable for use in load holding applications.
- When pressure at the inlet (port 1) exceeds the threshold setting, the valve opens to tank (port 2). The pilot section moves forward at a steady rate, increasing the setting by compressing the pilot spring. Maximum setting is achieved when the pilot section reaches a mechanical stop.
- Valve provides protection for pumps and motors from pressure transients due to sudden load changes, especially variable displacement pumps, since the displacement mechanism is sometimes too slow to catch these pressure transients.
- Valve provides protection for hydrostatic drives by reducing the jerk caused by sudden reversals. The valve is suitable for cross-port applications.
- When used with a switching device, the valve can provide the ramp characteristic typically provided by proportional valves.
- Small power units can be started against an anti shock relief to provide longer pump life.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, balanced-piston relief cartridges are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-16A
Series	3
Capacity	380 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	65 cc/min.@70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	EPDM: 990016014
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990016006
Model Weight	0.54 kg.



## CONFIGURATION OPTIONS

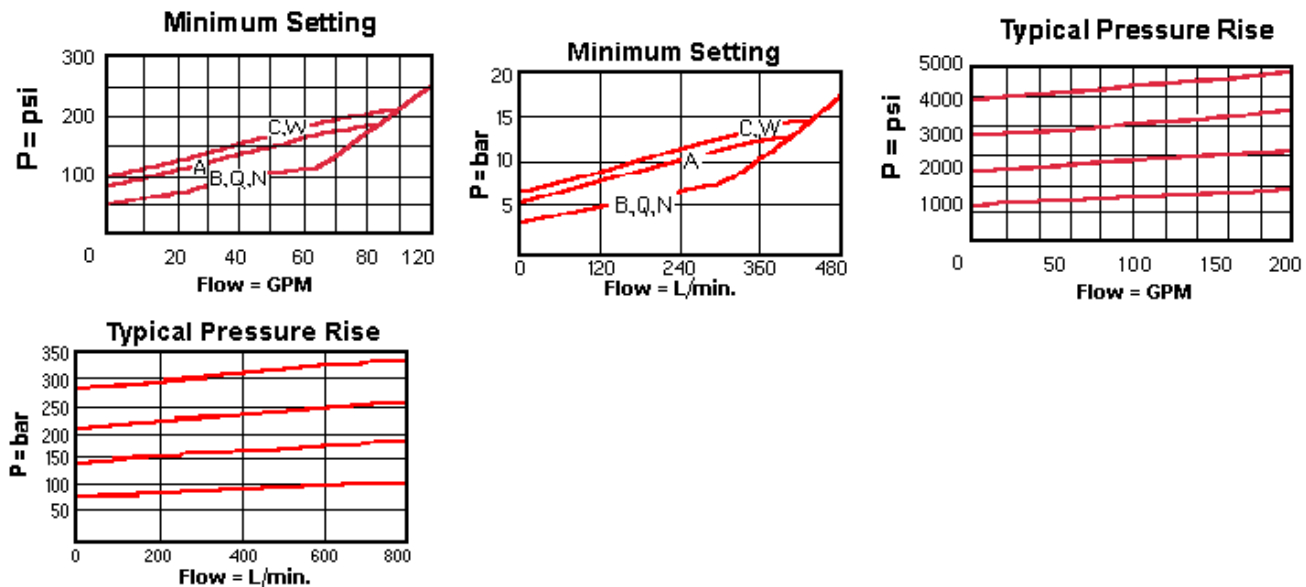
## Model Code Example: RPICLAN

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>W</b> Hex Wrench Adjustment	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>N</b> 60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

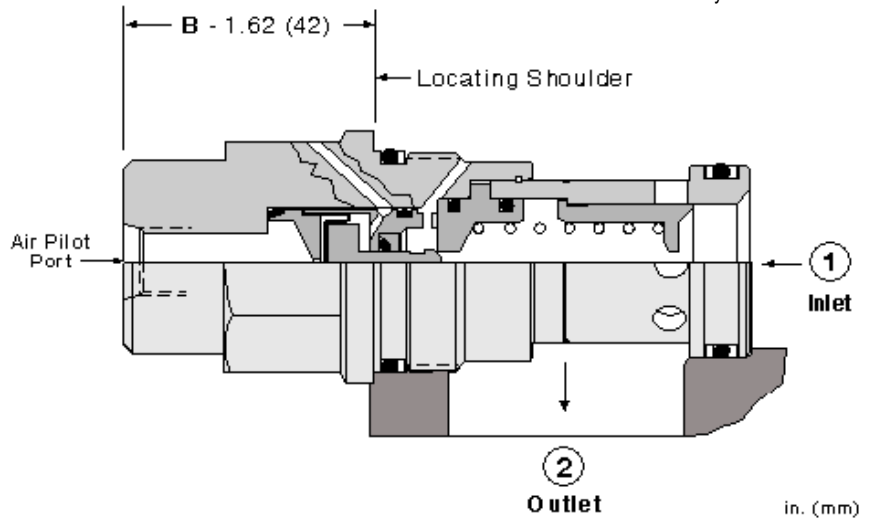
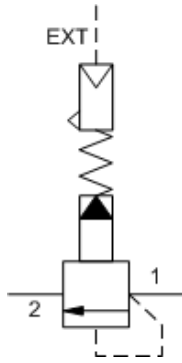
- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RPIC8](#) Pilot-operated, balanced piston relief main stage with integral T-8A control cavity



Air-controlled, pilot-operated, balanced piston relief cartridges use compressed air over a diaphragm instead of an adjustable spring to control pressure setting. The air signal is supplied through a port in the hex-end of the cartridge. They are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-16A
Series	3
Capacity	380 L/min.
Pilot Ratio	20:1
Hysteresis (with dither)	<4%
Maximum Operating Pressure	140 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	65 cc/min.@70 bar
Maximum Air Pressure	10,5 bar
Response Time - Typical	10 ms
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990016006

**CONFIGURATION OPTIONS**

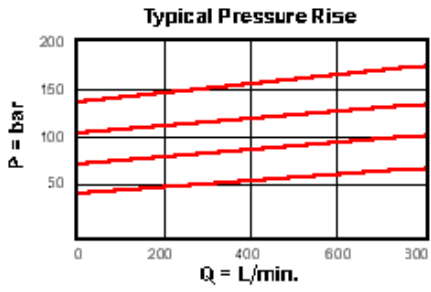
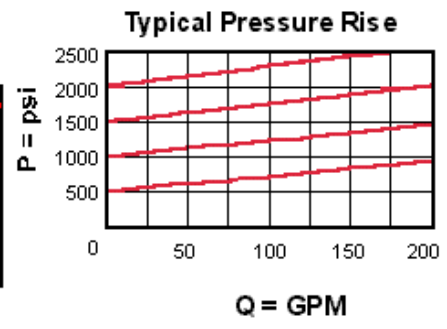
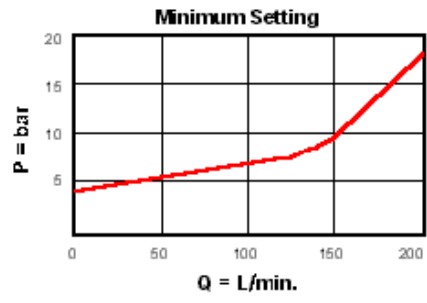
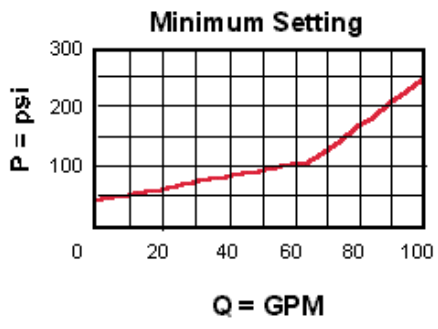
**Model Code Example: RPIDBBN**

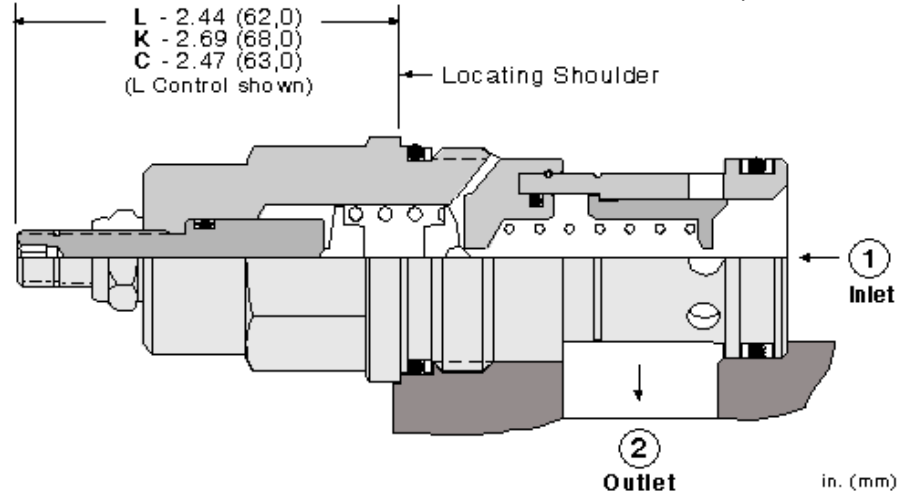
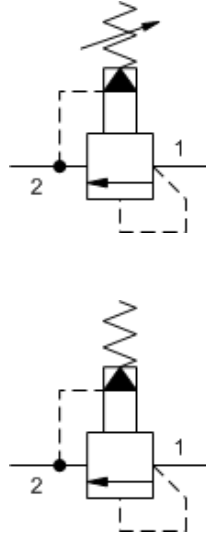
<b>CONTROL</b>	<b>(B)</b>	<b>OPERATING RANGE</b>	<b>(B)</b>	<b>SEAL MATERIAL</b>	<b>(N)</b>
<b>B</b> External 4- <small>SAE</small> Port		<b>B</b> 50 - 1500 psi (3,5 - 105 bar)		<b>N</b> Buna-N	
				<b>V</b> Viton	

**TECHNICAL FEATURES**

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Maximum air pressure should not exceed 150 psi (10 bar).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

**PERFORMANCE CURVES**





Fast-acting, pilot-operated, balanced piston relief cartridges are normally closed, pressure-limiting valves used to protect hydraulics components from pressure transients. Fast opening and closing is gained at the expense of smoothness. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to limit the pressure rise. These valves have low pressure rise vs. flow and are very fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-16A
Series	3
Capacity	380 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	65 cc/min.@70 bar
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990016006
Model Weight	0.54 kg.

**CONFIGURATION OPTIONS**

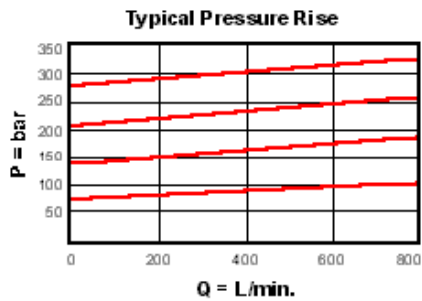
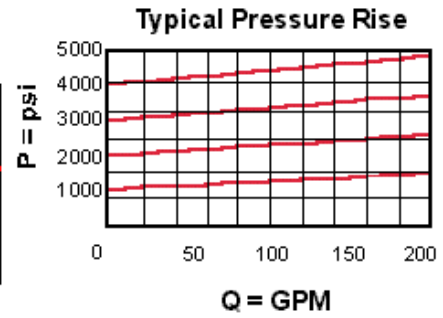
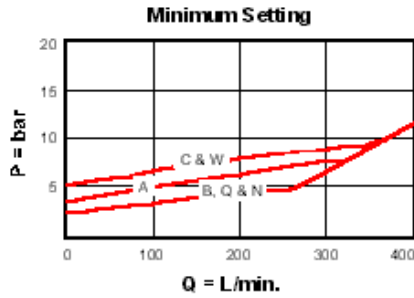
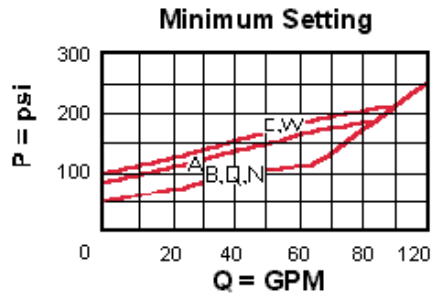
**Model Code Example: RPIELAN**

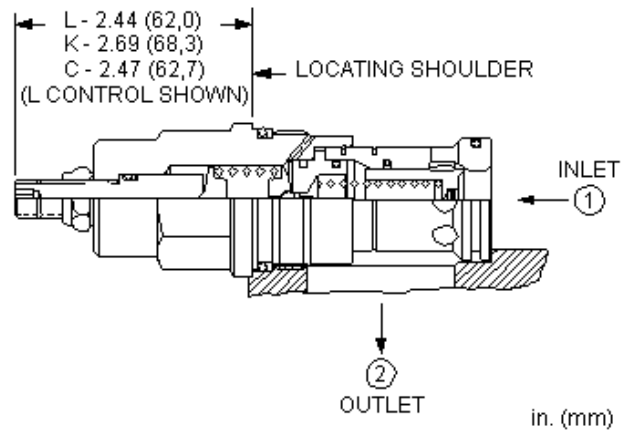
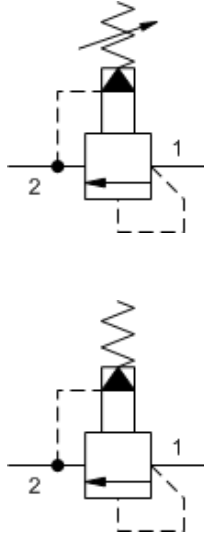
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, balanced-poppet relief cartridges are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. These valves are accurate, smooth, quiet, fast, and have low pressure rise vs. flow.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-16A
Series	3
Capacity	380 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Response Time - Typical	7 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990316007
Seal kit - Cartridge	EPDM: 990316014
Seal kit - Cartridge	Viton: 990316006
Model Weight	0.55 kg.

**CONFIGURATION OPTIONS**

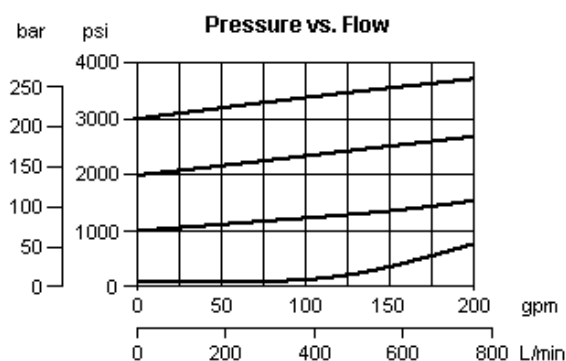
**Model Code Example: RPISLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob	<b>N</b> 60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

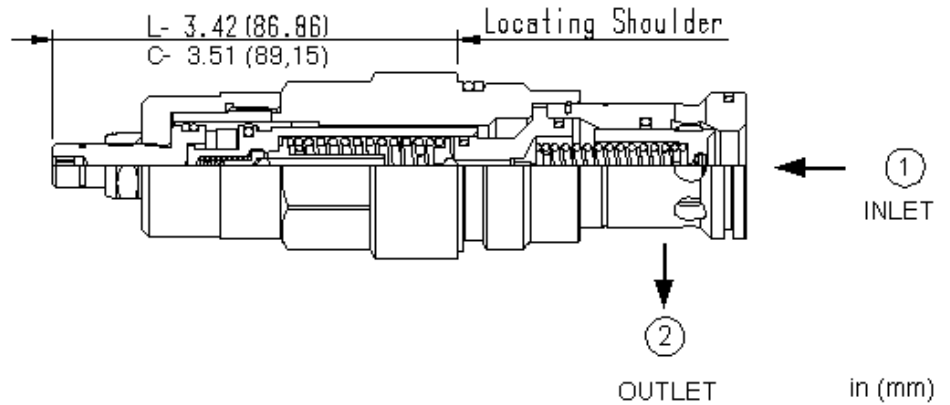
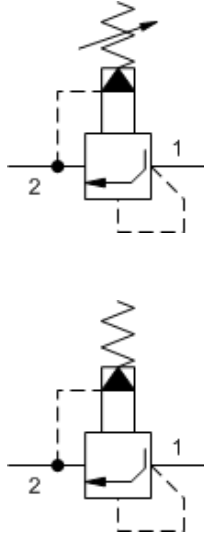
- Because the modulating occurs inside the cartridge, these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Suitable for use in load holding applications.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RPIS8](#) Pilot-operated, balanced poppet relief main stage with integral T-8A control cavity



Pilot-operated, anti shock relief cartridges limit maximum system pressure and also limit the rate of pressure rise. The valve opens and then ramps closed at a constant speed, independent of settings and flows. The adjust screw determines the maximum (relief) setting and the minimum (threshold) setting.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-16A
Series	3
Capacity	380 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,41 L/min.
Pressure Ramp Up Time	300 - 500 ms
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	4.5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
U.S. Patent #	6,039,070
Seal kit - Cartridge	Buna: 990316007
Seal kit - Cartridge	Viton: 990316006
Model Weight	0.73 kg.

- NOTES**
- Patents: US#6,039,070; Germany EP 1 001 197; Japan #3,119,230
  - Patents: US#6,039,070; Germany EP 1 001 197; Japan #3,119,230

**CONFIGURATION OPTIONS**

**Model Code Example: RPITLAN**

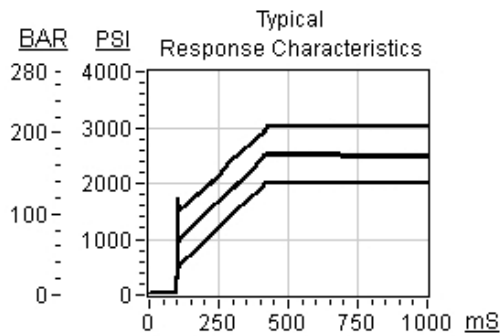
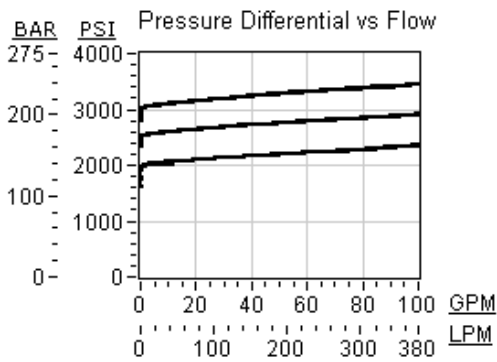
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 2000 - 3000 psi (140 - 210 bar), 2000 psi (140 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>C</b> 4500 - 6000 psi (315 - 420 bar), 4500 psi (315 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
	<b>W</b> 3000 - 4500 psi (210 - 315 bar), 3000 psi (210 bar) Standard Setting		

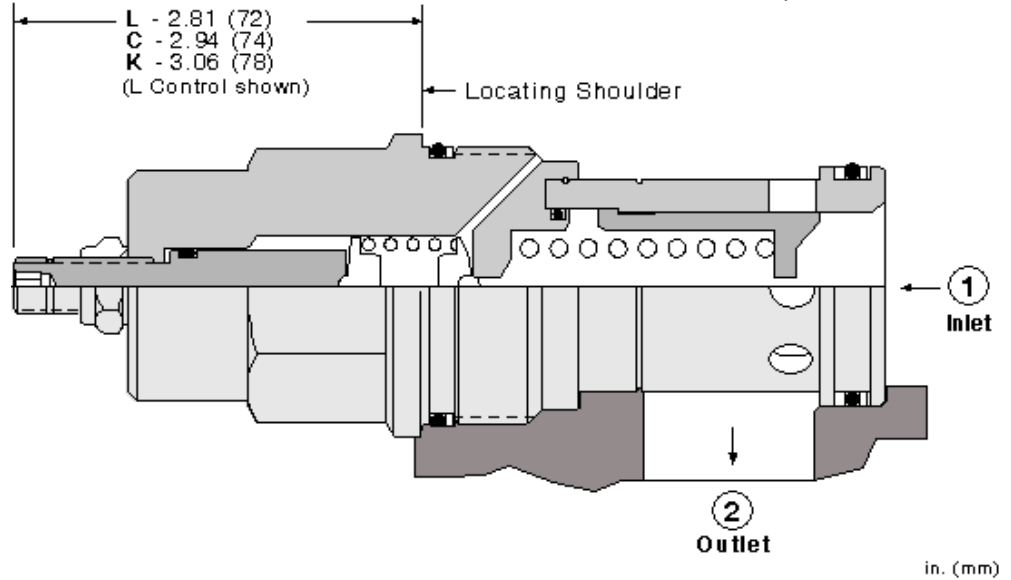
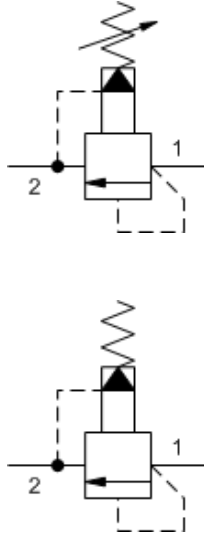


## TECHNICAL FEATURES

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Not suitable for use in load holding applications.
- When pressure at the inlet (port 1) exceeds the threshold setting, the valve opens to tank (port 2). The pilot section moves forward at a steady rate, increasing the setting by compressing the pilot spring. Maximum setting is achieved when the pilot section reaches a mechanical stop.
- Valve provides protection for pumps and motors from pressure transients due to sudden load changes, especially variable displacement pumps, since the displacement mechanism is sometimes too slow to catch these pressure transients.
- Valve provides protection for hydrostatic drives by reducing the jerk caused by sudden reversals. The valve is suitable for cross-port applications.
- When used with a switching device, the valve can provide the ramp characteristic typically provided by proportional valves.
- Small power units can be started against an anti shock relief to provide longer pump life.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, balanced-piston relief cartridges are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-18A
Series	4
Capacity	760 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	80 cc/min. @70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990018007
Seal kit - Cartridge	EPDM: 990018014
Seal kit - Cartridge	Polyurethane: 990018002
Seal kit - Cartridge	Viton: 990018006
Model Weight	1.18 kg.

## CONFIGURATION OPTIONS

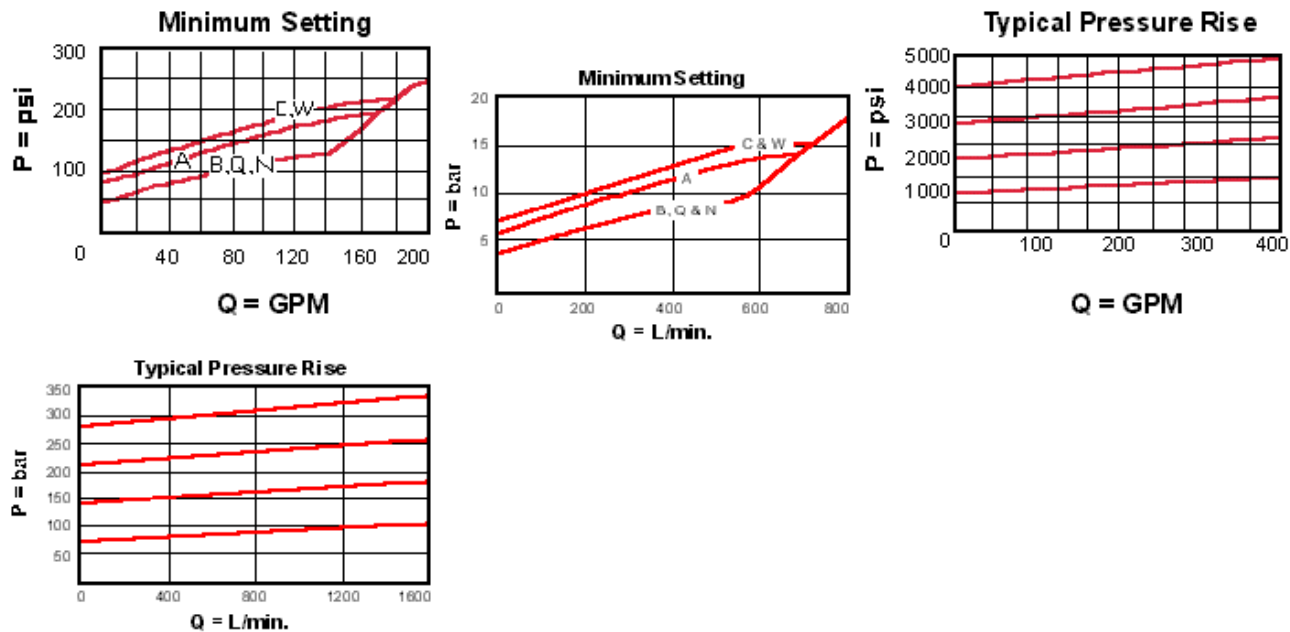
## Model Code Example: RPKCLAN

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>W</b> Hex Wrench Adjustment	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>N</b> 60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

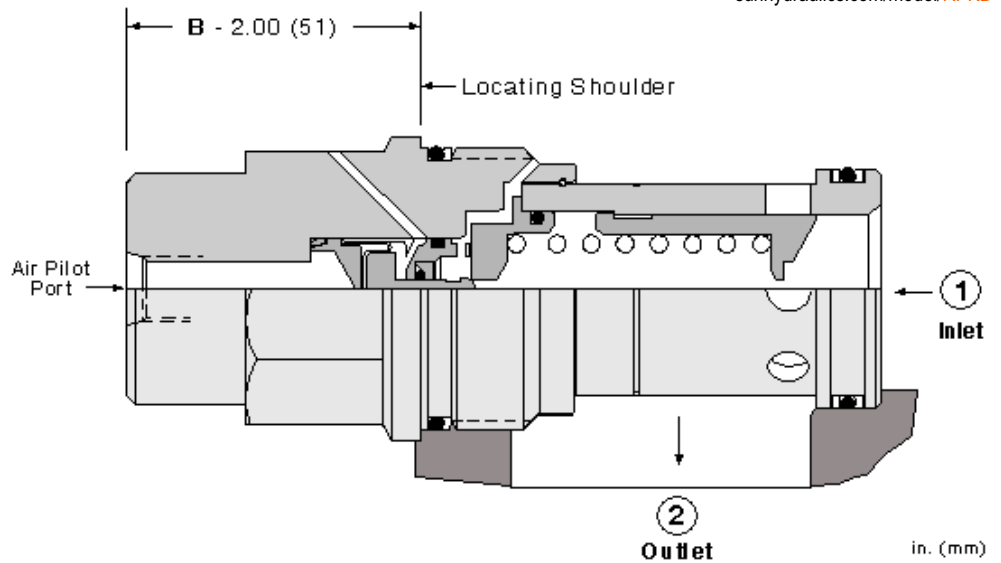
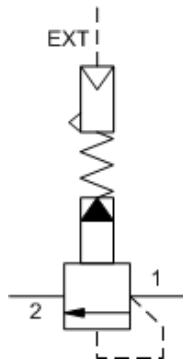
- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RPKC8](#) Pilot-operated, balanced piston relief main stage with integral T-8A control cavity



Air-controlled, pilot-operated, balanced piston relief cartridges use compressed air over a diaphragm instead of an adjustable spring to control pressure setting. The air signal is supplied through a port in the hex-end of the cartridge. They are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-18A
Series	4
Capacity	760 L/min.
Pilot Ratio	20:1
Maximum Operating Pressure	140 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	80 cc/min.@70 bar
Maximum Air Pressure	10,5 bar
Response Time - Typical	10 ms
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Seal kit - Cartridge	Buna: 990018007
Seal kit - Cartridge	Polyurethane: 990018002
Seal kit - Cartridge	Viton: 990018006

**CONFIGURATION OPTIONS**

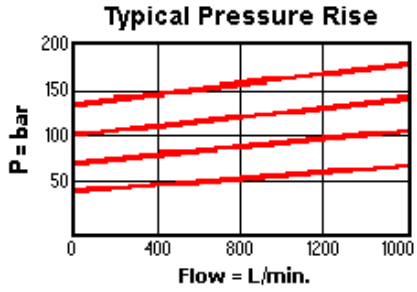
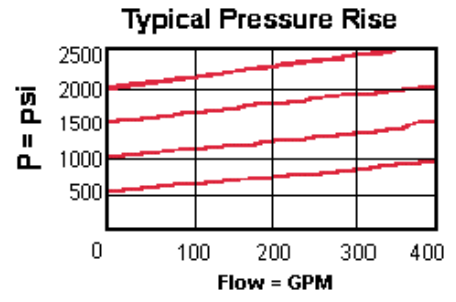
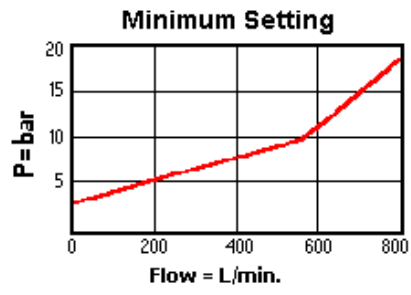
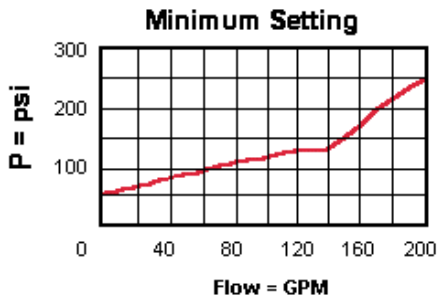
**Model Code Example: RPKDBBN**

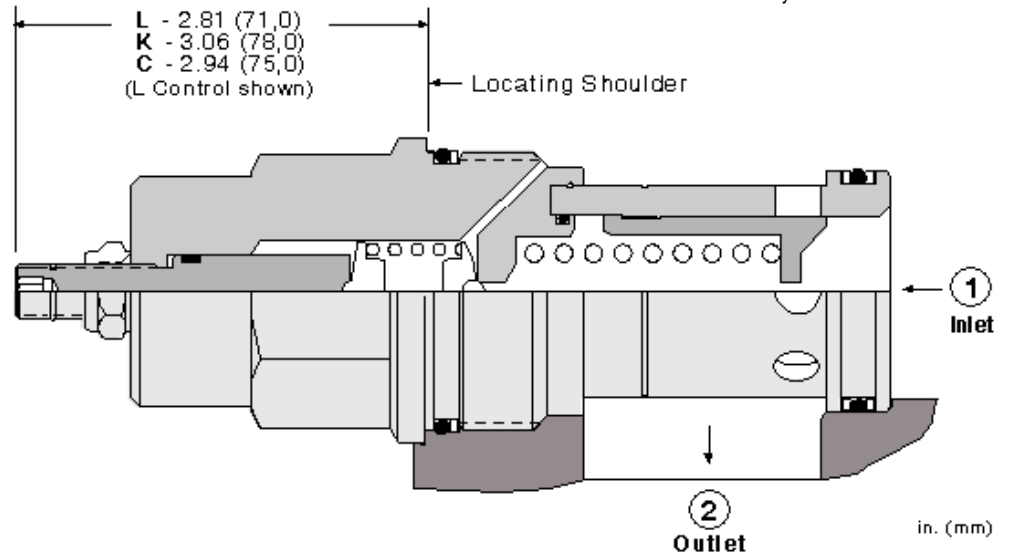
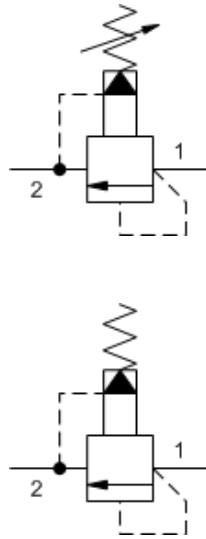
<b>CONTROL</b>	<b>(B) OPERATING RANGE</b>	<b>(B) SEAL MATERIAL</b>	<b>(N)</b>
<b>B</b> External 4-SAE Port	<b>B</b> 50 - 1500 psi (3,5 - 105 bar)	<b>N</b> Buna-N	
		<b>V</b> Viton	

**TECHNICAL FEATURES**

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Maximum air pressure should not exceed 150 psi (10 bar).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

**PERFORMANCE CURVES**





Fast-acting, pilot-operated, balanced piston relief cartridges are normally closed, pressure-limiting valves used to protect hydraulics components from pressure transients. Fast opening and closing is gained at the expense of smoothness. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to limit the pressure rise. These valves have low pressure rise vs. flow and are very fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-18A
Series	4
Capacity	760 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	80 cc/min.@70 bar
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990018007
Seal kit - Cartridge	Polyurethane: 990018002
Seal kit - Cartridge	Viton: 990018006
Model Weight	1.17 kg.

## CONFIGURATION OPTIONS

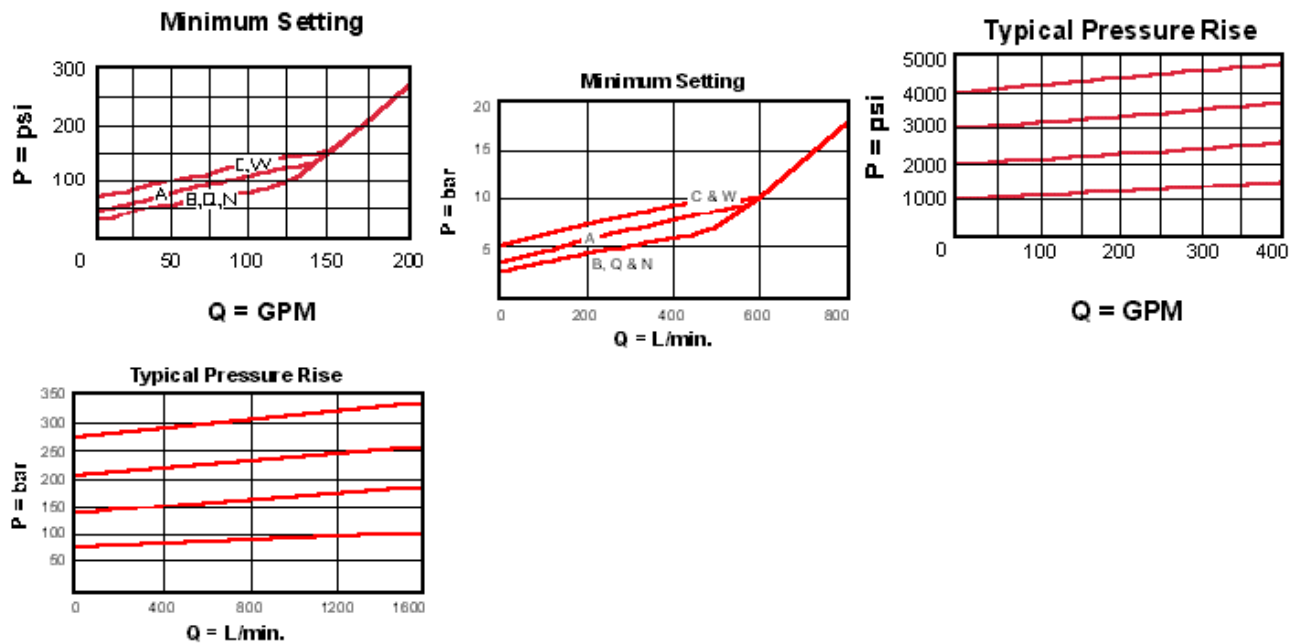
## Model Code Example: RPKELAN

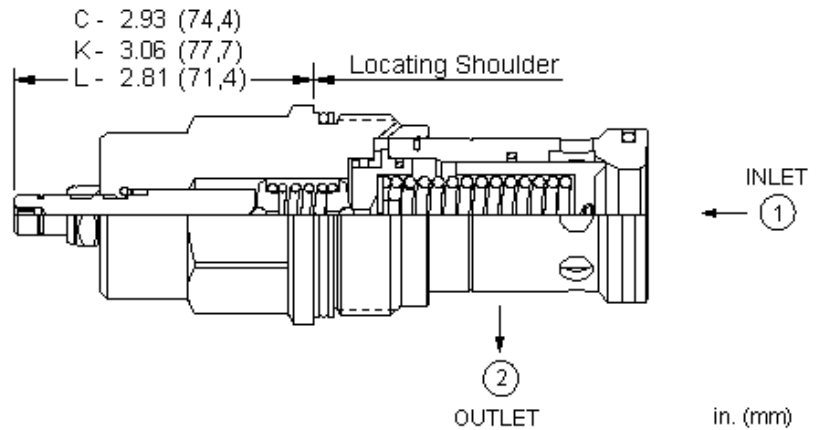
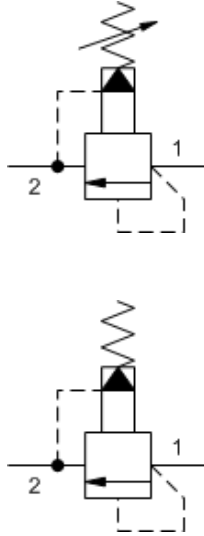
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	A 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	N Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	B 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	V Viton	/AP Stainless Steel, Passivated
K Handknob	C 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		/LH Mild Steel, Zinc-Nickel
	D 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	E 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	W 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, balanced-poppet relief cartridges are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. These valves are accurate, smooth, quiet, fast, and have low pressure rise vs. flow.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-18A
Series	4
Capacity	760 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Response Time - Typical	7 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990318007
Seal kit - Cartridge	EPDM: 990318014
Seal kit - Cartridge	Polyurethane: 990018002
Seal kit - Cartridge	Viton: 990318006
Model Weight	1.17 kg.

**CONFIGURATION OPTIONS**

**Model Code Example: RPKSLAN**

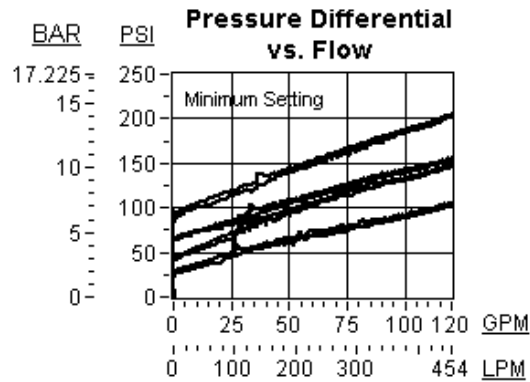
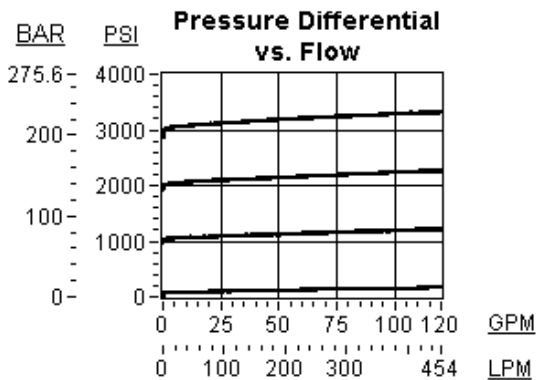
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>W</b> Hex Wrench Adjustment	<b>N</b> 60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		



## TECHNICAL FEATURES

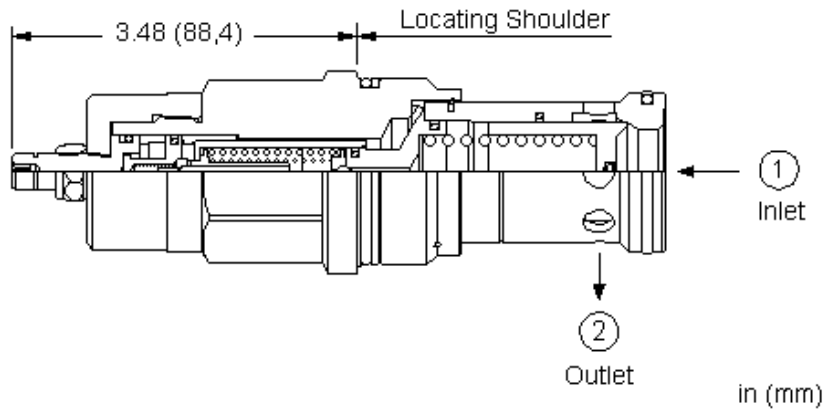
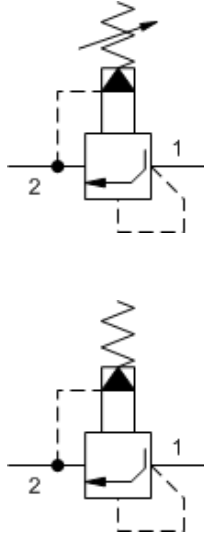
- Because the modulating occurs inside the cartridge, these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RPKS8](#) Pilot-operated, balanced poppet relief main stage with integral T-8A control cavity



Pilot-operated, anti shock relief cartridges limit maximum system pressure and also limit the rate of pressure rise. The valve opens and then ramps closed at a constant speed, independent of settings and flows. The adjust screw determines the maximum (relief) setting and the minimum (threshold) setting.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-18A
Series	4
Capacity	760 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,41 L/min.
Pressure Ramp Up Time	400 - 600 ms
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	4.5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
U.S. Patent #	6,039,070
Seal kit - Cartridge	Buna: 990318007
Seal kit - Cartridge	Viton: 990318006
Model Weight	1.36 kg.

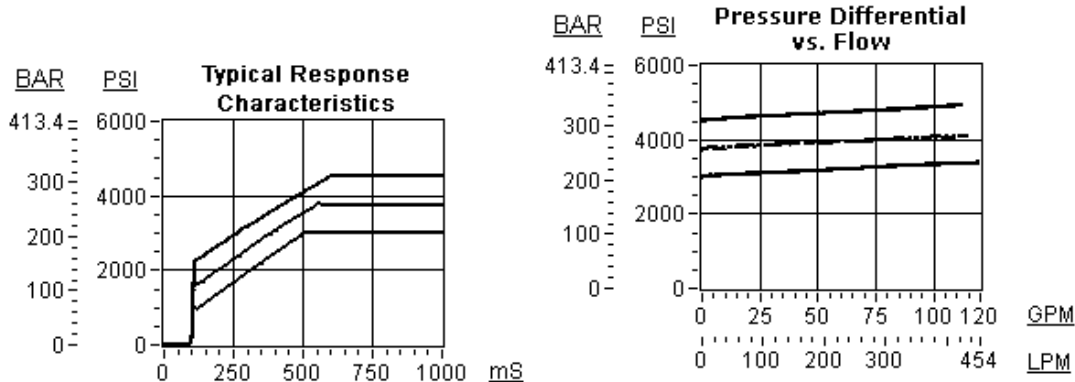
**CONFIGURATION OPTIONS**
**Model Code Example: RPKTLAN**

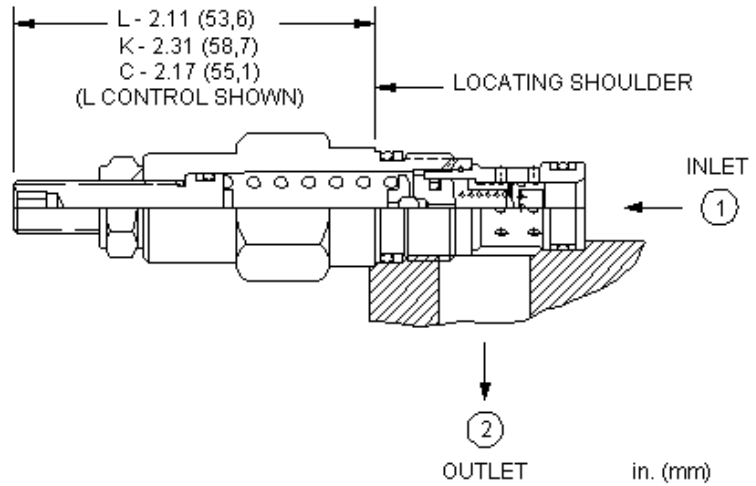
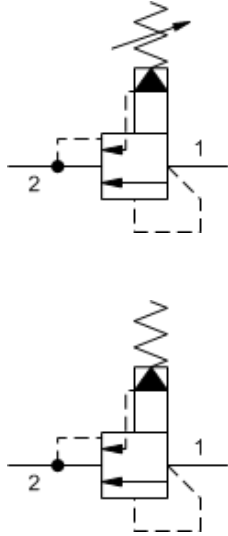
<b>CONTROL</b>	<b>(L) ADJUSTMENT RANGE</b>	<b>(A) SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>L</b> Standard Screw Adjustment	<b>A</b> 2000 - 3000 psi (140 - 210 bar), 2000 psi (140 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>C</b> 4500 - 6000 psi (315 - 420 bar), 4500 psi (315 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
	<b>W</b> 3000 - 4500 psi (210 - 315 bar), 3000 psi (210 bar) Standard Setting		

## TECHNICAL FEATURES

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- The seals on the adjust screw are exposed to system pressure which means this valve can only be adjusted when the pressure is removed. The setting procedure is; check the setting, remove the pressure, adjust the valve, check the new setting.
- Not suitable for use in load holding applications.
- When pressure at the inlet (port 1) exceeds the threshold setting, the valve opens to tank (port 2). The pilot section moves forward at a steady rate, increasing the setting by compressing the pilot spring. Maximum setting is achieved when the pilot section reaches a mechanical stop.
- Valve provides protection for pumps and motors from pressure transients due to sudden load changes, especially variable displacement pumps, since the displacement mechanism is sometimes too slow to catch these pressure transients.
- Valve provides protection for hydrostatic drives by reducing the jerk caused by sudden reversals. The valve is suitable for cross-port applications.
- When used with a switching device, the valve can provide the ramp characteristic typically provided by proportional valves.
- Small power units can be started against an anti shock relief to provide longer pump life.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Kick-down relief cartridges act similar to a circuit breaker in an electrical system. The valves will kick completely open and remain open once the pressure at the inlet (port 1) exceeds the valve setting, creating an unrestricted flow path from port 1 to tank (port 2). The valve remains open as long as the pressure at port 1 exceeds the pressure at port 2. To reset the valve, flow from port 1 to port 2 must cease and pressure at port 2 must be equal to or greater than the pressure at port 1.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-162A
Series	0
Capacity	45 L/min.
Factory Pressure Settings Established at	Kick down point
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.@70 bar
Response Time - Typical	25 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	Polyurethane: 990162002
Seal kit - Cartridge	Viton: 990162006
Model Weight	0.10 kg.

**NOTES** Do not use in load holding applications.

## CONFIGURATION OPTIONS

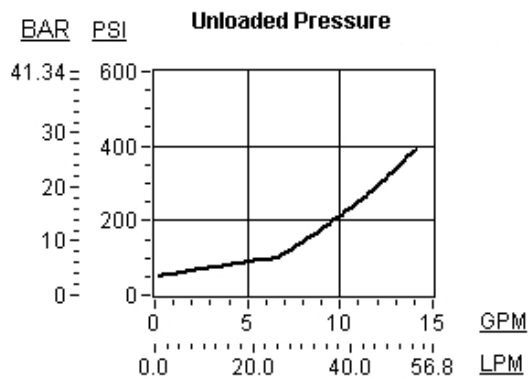
Model Code Example: RQCBLAN

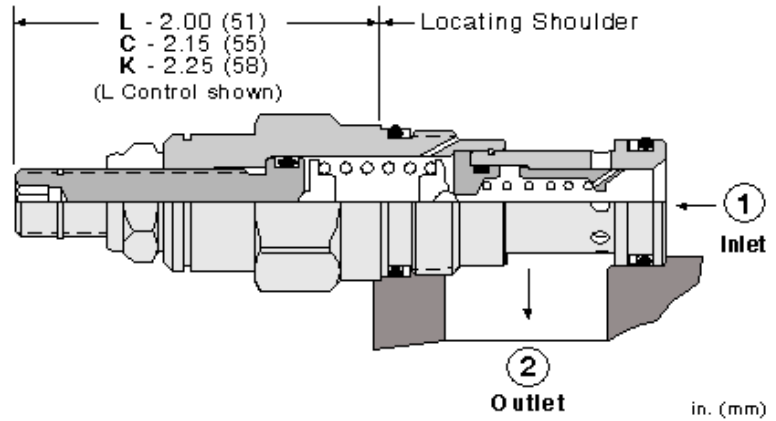
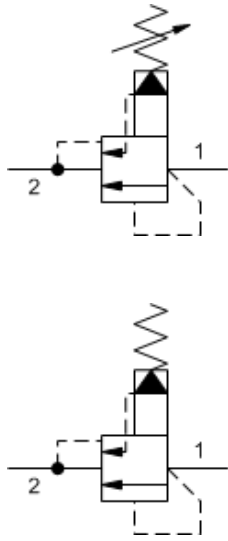
CONTROL	(L)	ADJUSTMENT RANGE	(A)	SEAL MATERIAL	(N)
L Standard Screw Adjustment		A 75 - 3000 psi (5 - 210 bar), 1000 psi (70 bar) Standard Setting		N Buna-N	
C Tamper Resistant - Factory Set		B 75 - 1500 psi (5 - 105 bar), 1000 psi (70 bar) Standard Setting		V Viton	
K Handknob		C 75 - 6000 psi (5 - 420 bar), 1000 psi (70 bar) Standard Setting			
		N 75 - 800 psi (5 - 55 bar), 400 psi (28 bar) Standard Setting			
		Q 75 - 400 psi (5 - 28 bar), 200 psi (14 bar) Standard Setting			
		W 75 - 4500 psi (5 - 315 bar), 1000 psi (70 bar) Standard Setting			

## TECHNICAL FEATURES

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- To reset valve, flow through the cartridge must cease.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications.
- Intended for use on the actuator side of the system as flow through the valve must cease for the valve to reset. If used on the pump side of a system, pump flow must be shut off for the valve to reset.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Kick-down relief cartridges act similar to a circuit breaker in an electrical system. The valves will kick completely open and remain open once the pressure at the inlet (port 1) exceeds the valve setting, creating an unrestricted flow path from port 1 to tank (port 2). The valve remains open as long as the pressure at port 1 exceeds the pressure at port 2. To reset the valve, flow from port 1 to port 2 must cease and pressure at port 2 must be equal to or greater than the pressure at port 1.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-10A
Series	1
Capacity	95 L/min.
Factory Pressure Settings Established at	Kick down point
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.@70 bar
Response Time - Typical	25 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006
Model Weight	0.14 kg.

**NOTES**

- Do not use in load holding applications.
- For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

**CONFIGURATION OPTIONS**

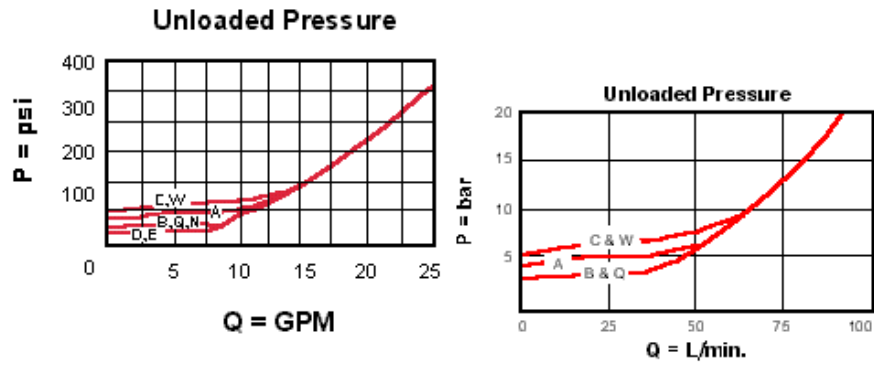
**Model Code Example: RQE<sub>BLAN</sub>**

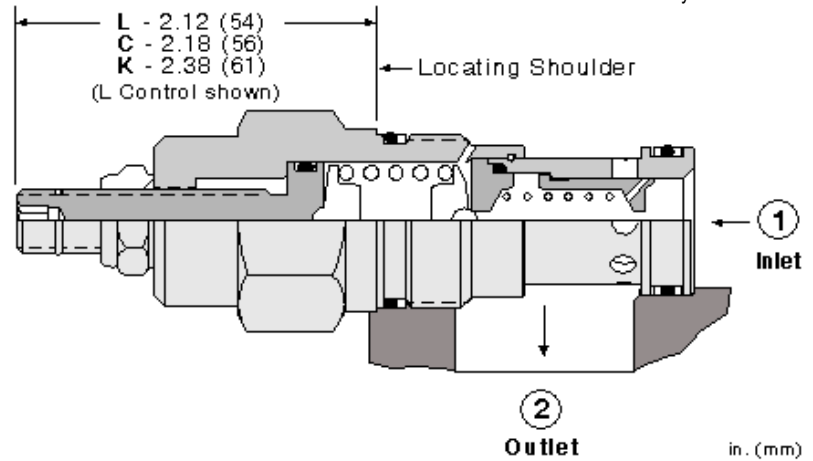
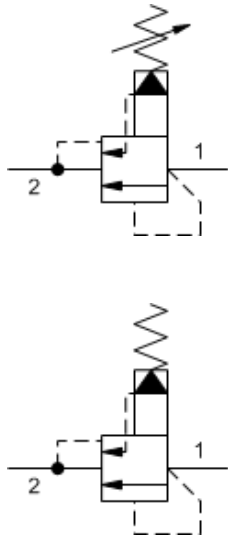
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	A 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	N Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	B 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	V Viton	/AP Stainless Steel, Passivated
K Handknob	C 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
O Handknob with Panel Mount	D 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	E 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	W 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- To reset valve, flow through the cartridge must cease.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications.
- Intended for use on the actuator side of the system as flow through the valve must cease for the valve to reset. If used on the pump side of a system, pump flow must be shut off for the valve to reset.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Kick-down relief cartridges act similar to a circuit breaker in an electrical system. The valves will kick completely open and remain open once the pressure at the inlet (port 1) exceeds the valve setting, creating an unrestricted flow path from port 1 to tank (port 2). The valve remains open as long as the pressure at port 1 exceeds the pressure at port 2. To reset the valve, flow from port 1 to port 2 must cease and pressure at port 2 must be equal to or greater than the pressure at port 1.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-3A
Series	2
Capacity	200 L/min.
Factory Pressure Settings Established at	Kick down point
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	50 cc/min.@70 bar
Response Time - Typical	25 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	Polyurethane: 990003002
Seal kit - Cartridge	Viton: 990203006
Model Weight	0.26 kg.

**NOTES**

- Do not use in load holding applications.
- For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.



## CONFIGURATION OPTIONS

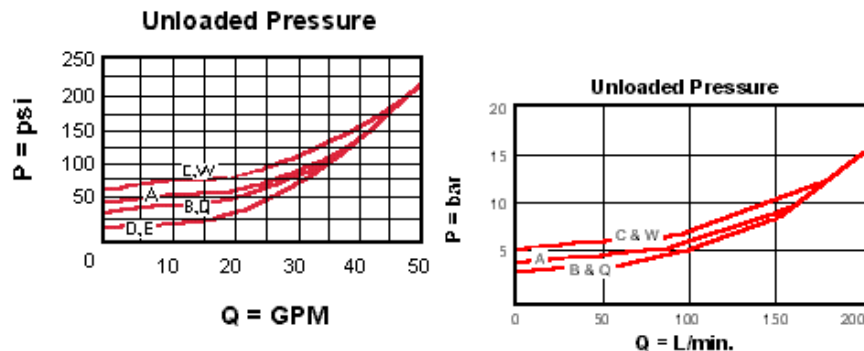
### Model Code Example: RQGBLAN

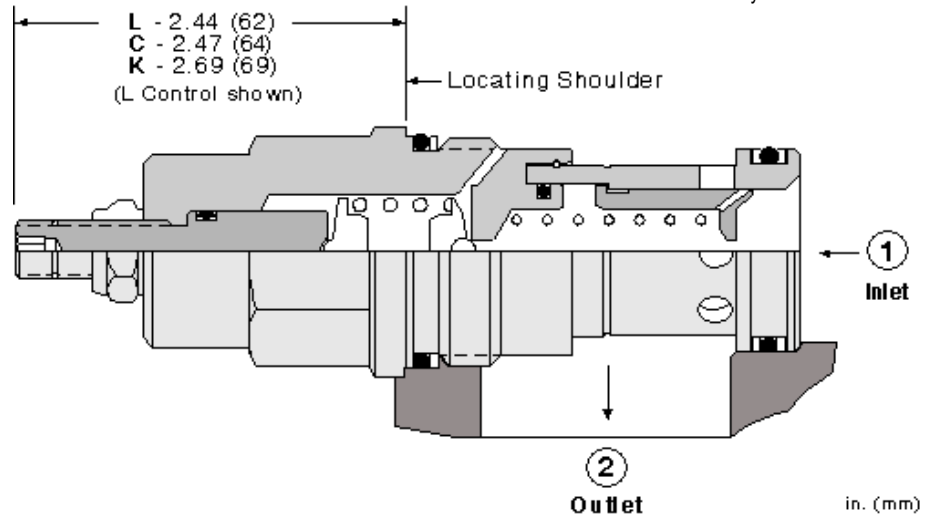
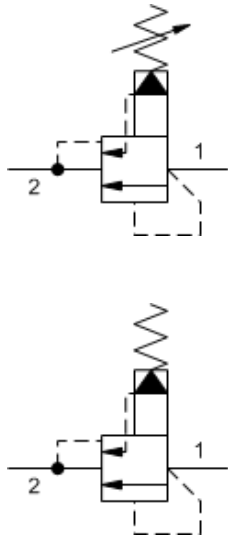
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		/LH Mild Steel, Zinc-Nickel
<b>O</b> Handknob with Panel Mount	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
<b>W</b> Hex Wrench Adjustment	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- To reset valve, flow through the cartridge must cease.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications.
- Intended for use on the actuator side of the system as flow through the valve must cease for the valve to reset. If used on the pump side of a system, pump flow must be shut off for the valve to reset.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Kick-down relief cartridges act similar to a circuit breaker in an electrical system. The valves will kick completely open and remain open once the pressure at the inlet (port 1) exceeds the valve setting, creating an unrestricted flow path from port 1 to tank (port 2). The valve remains open as long as the pressure at port 1 exceeds the pressure at port 2. To reset the valve, flow from port 1 to port 2 must cease and pressure at port 2 must be equal to or greater than the pressure at port 1.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-16A
Series	3
Capacity	380 L/min.
Factory Pressure Settings Established at	Kick down point
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	65 cc/min. @70 bar
Response Time - Typical	25 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990016006
Model Weight	0.54 kg.

**NOTES** Do not use in load holding applications.

## CONFIGURATION OPTIONS

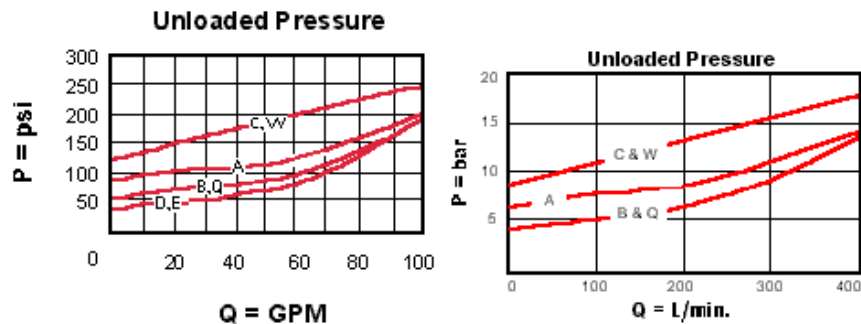
## Model Code Example: RQIBLAN

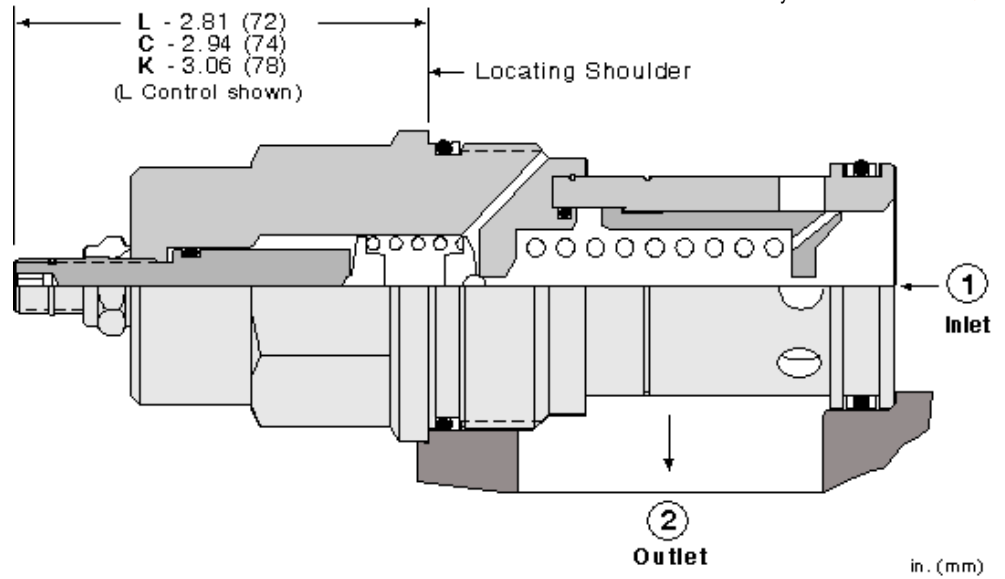
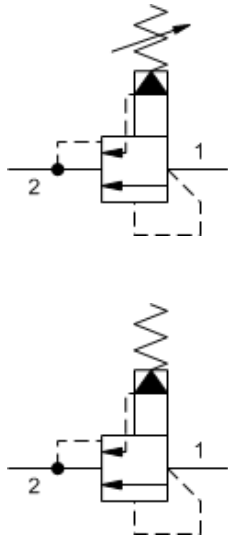
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	A 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	N Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	B 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	V Viton	/AP Stainless Steel, Passivated
K Handknob	C 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
	D 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	E 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	W 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- To reset valve, flow through the cartridge must cease.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications.
- Intended for use on the actuator side of the system as flow through the valve must cease for the valve to reset. If used on the pump side of a system, pump flow must be shut off for the valve to reset.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Kick-down relief cartridges act similar to a circuit breaker in an electrical system. The valves will kick completely open and remain open once the pressure at the inlet (port 1) exceeds the valve setting, creating an unrestricted flow path from port 1 to tank (port 2). The valve remains open as long as the pressure at port 1 exceeds the pressure at port 2. To reset the valve, flow from port 1 to port 2 must cease and pressure at port 2 must be equal to or greater than the pressure at port 1.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-18A
Series	4
Capacity	760 L/min.
Factory Pressure Settings Established at	Kick down point
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	80 cc/min.@70 bar
Response Time - Typical	25 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990018007
Seal kit - Cartridge	Polyurethane: 990018002
Seal kit - Cartridge	Viton: 990018006
Model Weight	1.17 kg.

**NOTES** Do not use in load holding applications.

## CONFIGURATION OPTIONS

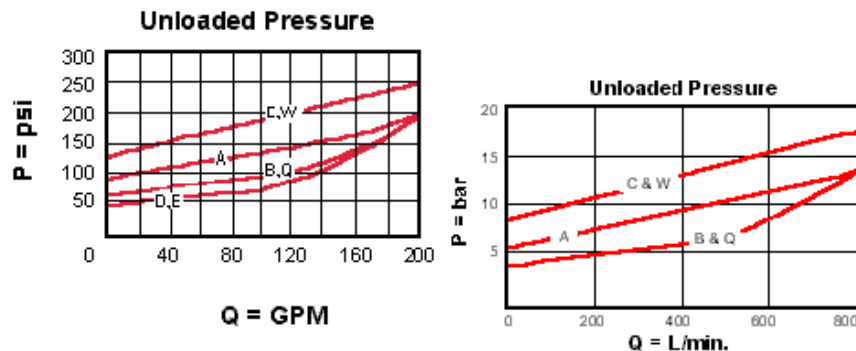
### Model Code Example: RQKBLAN

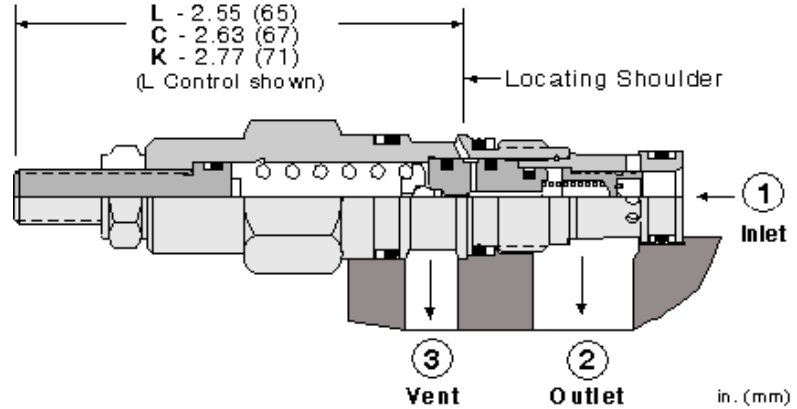
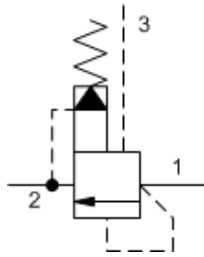
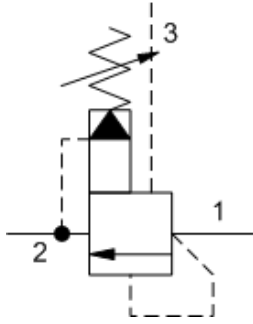
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	A 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	N Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	B 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	V Viton	/AP Stainless Steel, Passivated
K Handknob	C 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
	D 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	E 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	W 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- To reset valve, flow through the cartridge must cease.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications.
- Intended for use on the actuator side of the system as flow through the valve must cease for the valve to reset. If used on the pump side of a system, pump flow must be shut off for the valve to reset.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Ventable, pilot-operated, balanced piston relief cartridges are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. They provide a vent port (port 3) that connects between the main piston and pilot stage to provide for remote control by other pilot or 2-way valves. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-163A
Series	0
Capacity	30 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.@70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	EPDM: 990163014
Seal kit - Cartridge	Polyurethane: 990163002
Seal kit - Cartridge	Viton: 990163006
Model Weight	0.11 kg.

**CONFIGURATION OPTIONS**

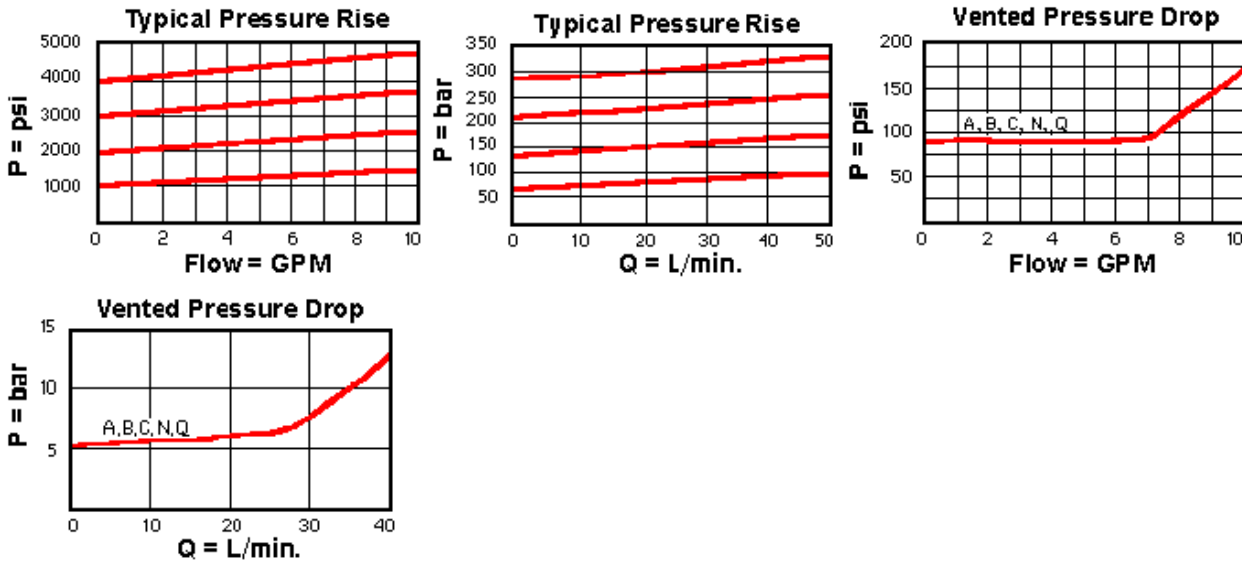
**Model Code Example: RVBALAN**

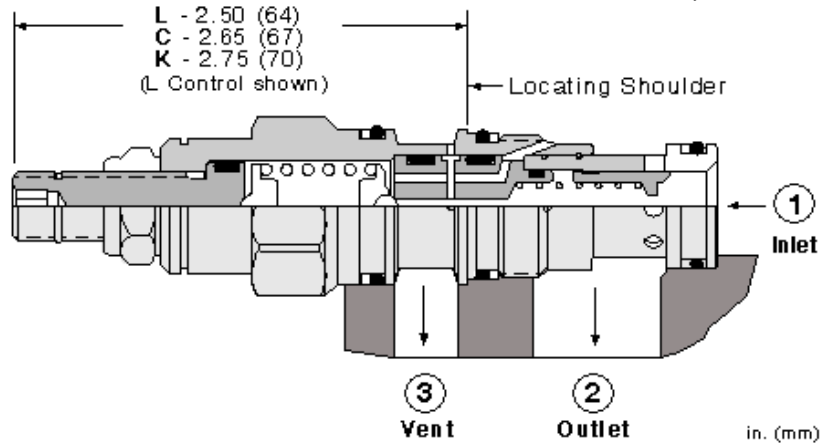
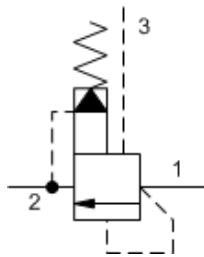
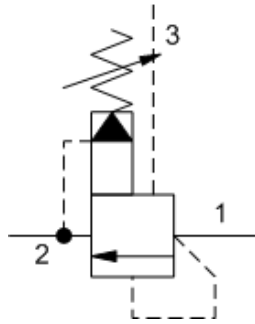
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 75 - 3000 psi (5 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 75 - 4500 psi (5 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>B</b> 75 - 1500 psi (5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	
	<b>C</b> 75 - 6000 psi (5 - 420 bar), 1000 psi (70 bar) Standard Setting		
	<b>N</b> 75 - 800 psi (5 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>Q</b> 75 - 400 psi (5 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

- A remote pilot relief on port 3 (vent) will control the valve below its own setting.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Minimum setting is 75 psi (5 bar) for all spring ranges.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- The main stage orifice is protected against contamination.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Ventable, pilot-operated, balanced piston relief cartridges are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. They provide a vent port (port 3) that connects between the main piston and pilot stage to provide for remote control by other pilot or 2-way valves. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	60 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.@70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	EPDM: 990011014
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.16 kg.

**NOTES**

For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.



## CONFIGURATION OPTIONS

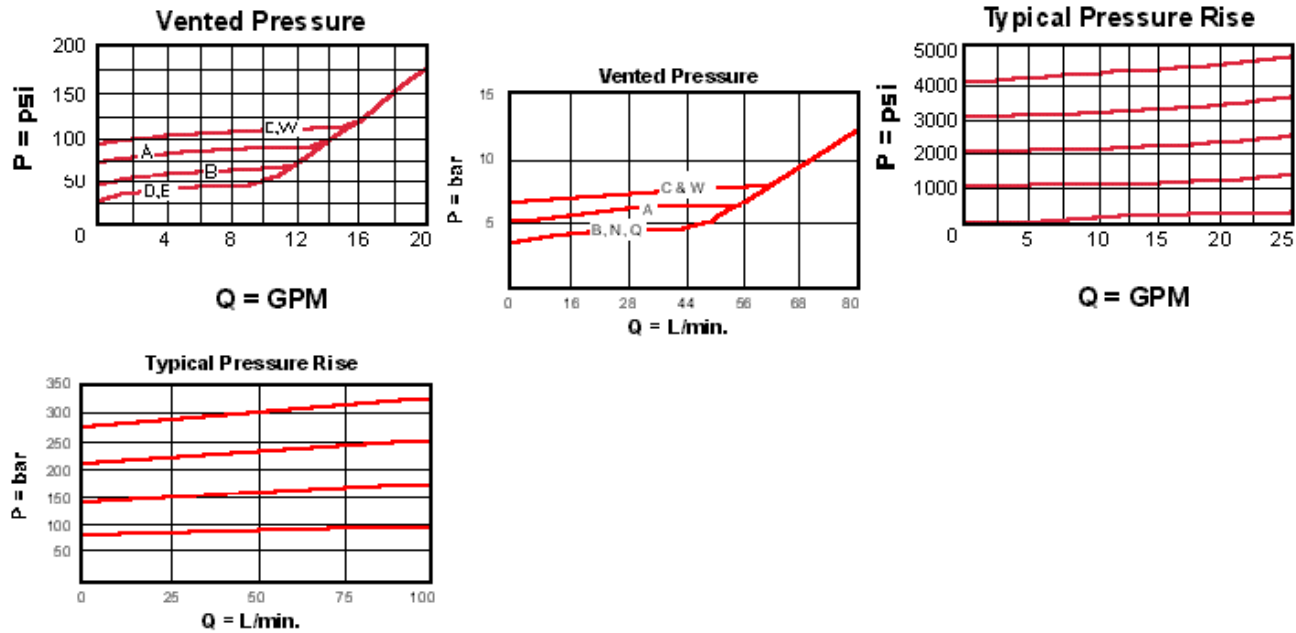
## Model Code Example: RVCALAN

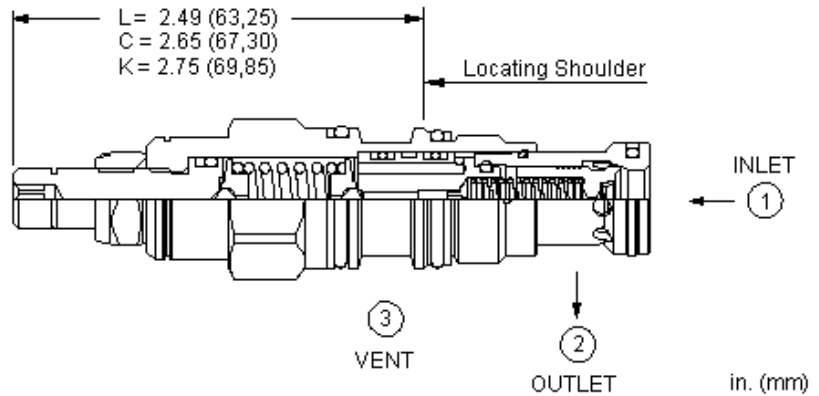
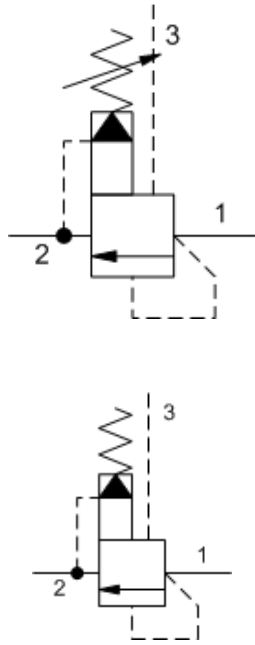
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>O</b> Handknob with Panel Mount	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

- A remote pilot relief on port 3 (vent) will control the valve below its own setting.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Ventable, pilot-operated, balanced-poppet relief cartridges are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. They provide a vent port (port 3) that connects between the main piston and pilot stage to provide for remote control by other pilot or 2-way valves. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	60 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Maximum Valve Leakage at Reset	0,7 cc/min.
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990611007
Seal kit - Cartridge	Viton: 990611006
Model Weight	0.16 kg.

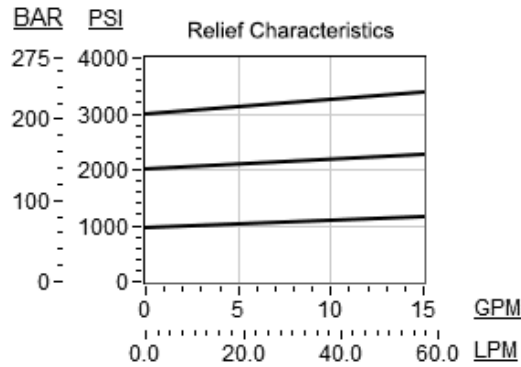
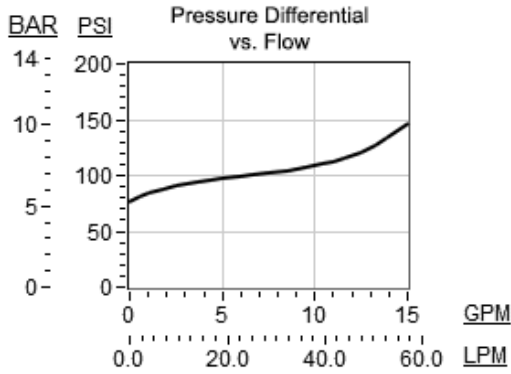
**CONFIGURATION OPTIONS**
**Model Code Example: RVCSLAN**

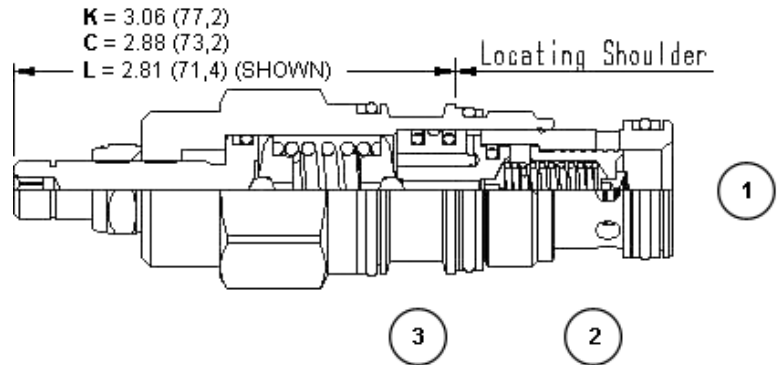
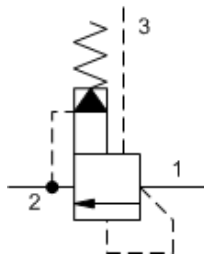
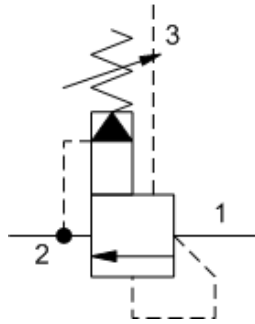
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
	<b>N</b> 60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- Because the modulating occurs inside the cartridge, these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- A remote pilot relief on port 3 (vent) will control the valve below its own setting.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Suitable for use in load holding applications.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Ventable, pilot-operated, balanced piston relief cartridges are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. They provide a vent port (port 3) that connects between the main piston and pilot stage to provide for remote control by other pilot or 2-way valves. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	120 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Maximum Valve Leakage at 110 SUS (24 cSt)	50 cc/min.@70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	EPDM: 990202014
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.29 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

## CONFIGURATION OPTIONS

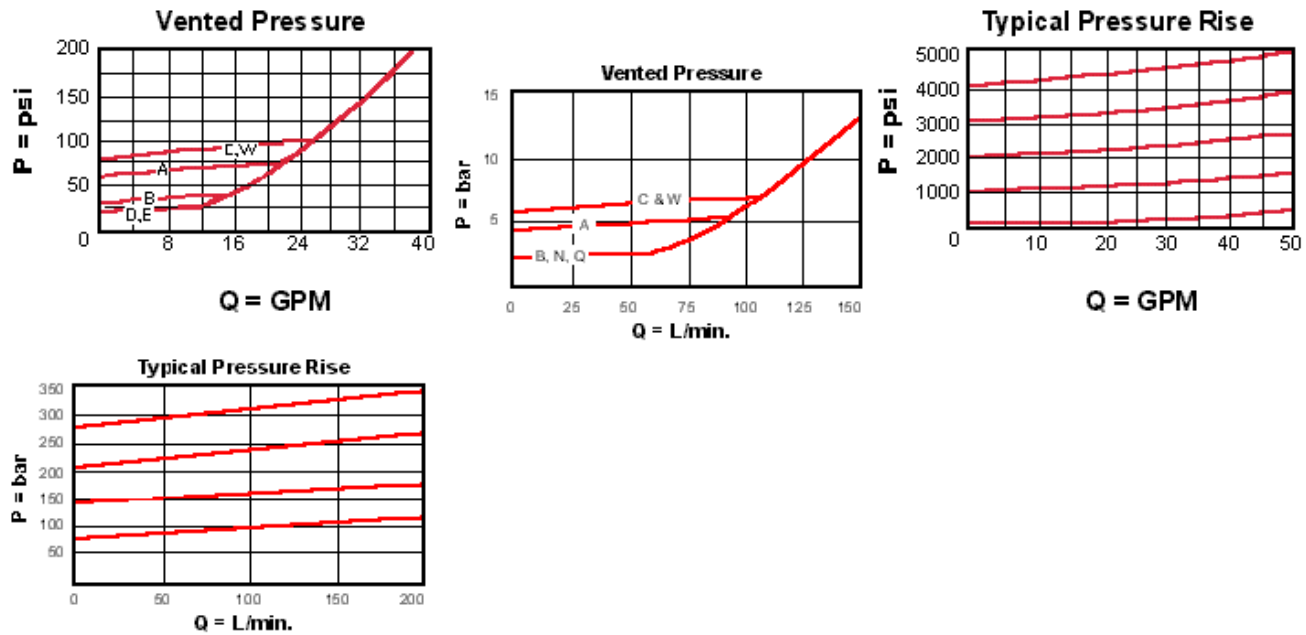
## Model Code Example: RVEALAN

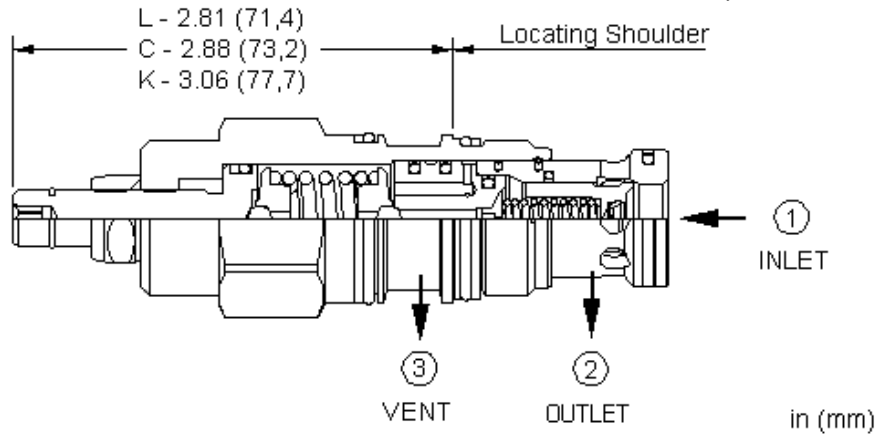
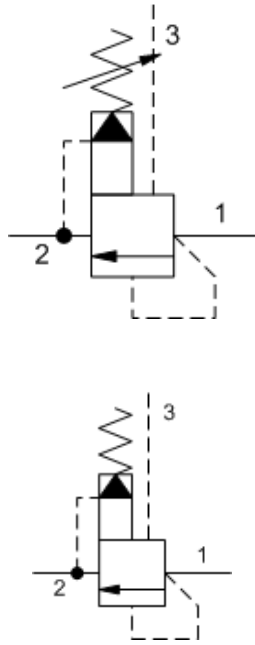
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>O</b> Handknob with Panel Mount	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
<b>W</b> Hex Wrench Adjustment	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

- A remote pilot relief on port 3 (vent) will control the valve below its own setting.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Ventable, pilot-operated, balanced-poppet relief cartridges are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. They provide a vent port (port 3) that connects between the main piston and pilot stage to provide for remote control by other pilot or 2-way valves. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	95 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Maximum Valve Leakage at Reset	0,7 cc/min.
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990402007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990402006
Model Weight	0.29 kg.

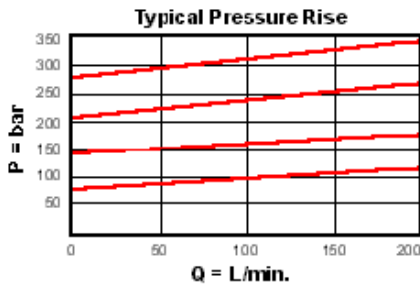
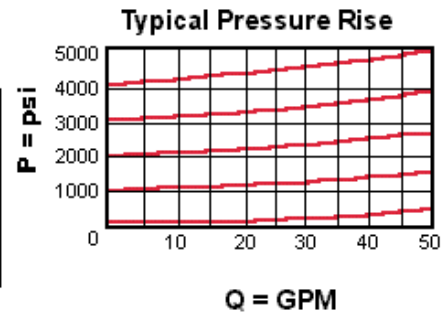
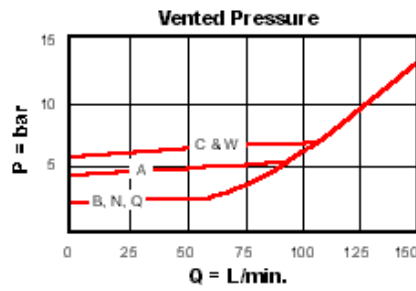
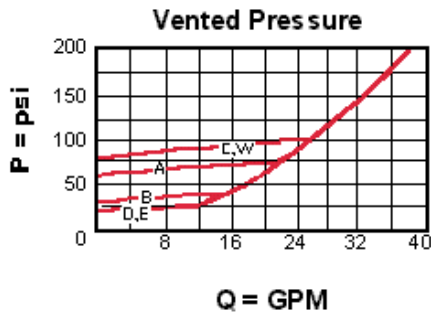
**CONFIGURATION OPTIONS**
**Model Code Example: RVESLAN**

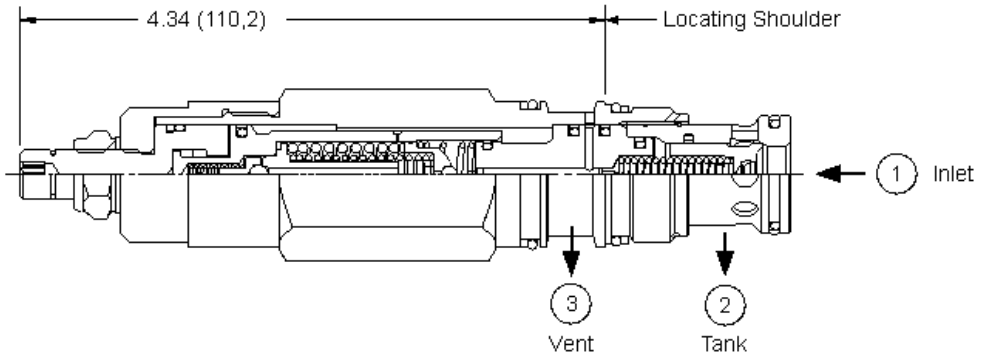
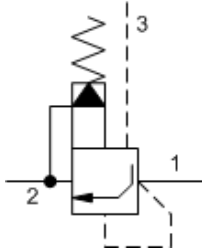
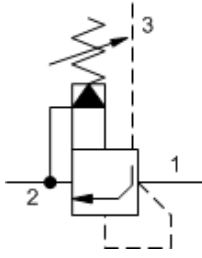
CONTROL	(L)	ADJUSTMENT RANGE	(A)	SEAL MATERIAL	(N)	MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b>	100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b>	Buna-N	<b>N</b>	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b>	50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>E</b>	EPDM	<b>JAP</b>	Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b>	150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting	<b>V</b>	Viton	<b>LH</b>	Mild Steel, Zinc-Nickel
	<b>N</b>	60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting				
	<b>Q</b>	60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting				
	<b>W</b>	150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting				

## TECHNICAL FEATURES

- Because the modulating occurs inside the cartridge, these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Suitable for use in load holding applications, providing that any valving on the vent port (port 3) is zero leak.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- A remote pilot relief on port 3 (vent) will control the valve below its own setting.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Ventable, pilot-operated, anti shock relief cartridges limit maximum system pressure and also limit the rate of pressure rise. The valve opens and then ramps closed at a constant speed, independent of settings and flows. These 3 port valves include a vent port (port 3) that connects between the main piston and the pilot stage to provide for remote control by other pilot or 2-way valves. The adjust screw determines the maximum (relief) setting and the minimum (threshold) setting.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	120 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,41 L/min.
Pressure Ramp Up Time	200 - 400 ms
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	4.5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
U.S. Patent #	6,039,070
Seal kit - Cartridge	Buna: 990402007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990402006
Model Weight	0.47 kg.

**NOTES** Patents are pending for this product.

**CONFIGURATION OPTIONS**
**Model Code Example: RVETLAN**

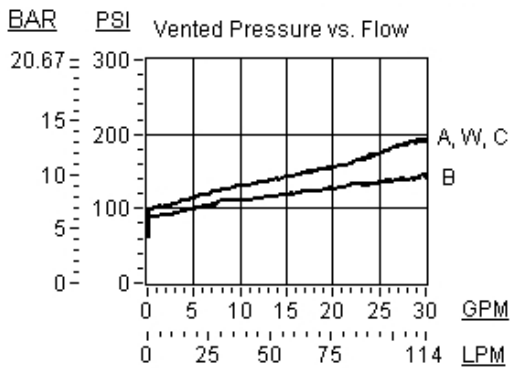
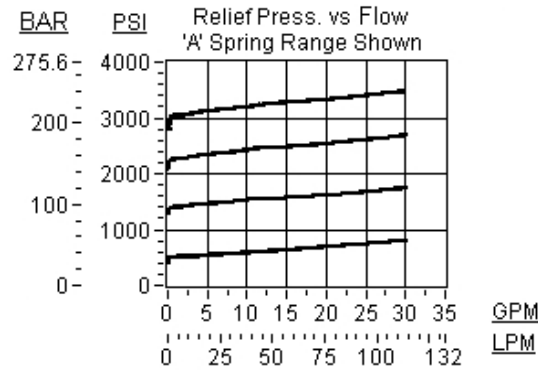
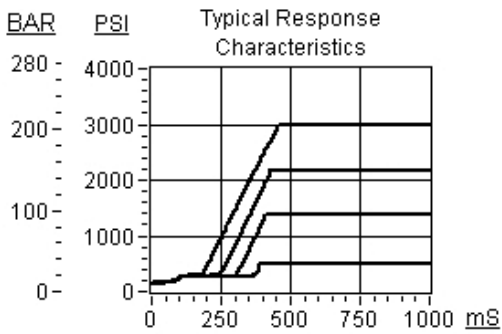
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N)
<b>L</b> Standard Screw Adjustment	<b>A</b> 500 - 3000 psi (35 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 500 - 1500 psi (35 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	
	<b>C</b> 1000 - 6000 psi (70 - 420 bar), 1000 psi (70 bar) Standard Setting		
	<b>W</b> 1000 - 4500 psi (70 - 315 bar), 1000 psi (70 bar) Standard Setting		

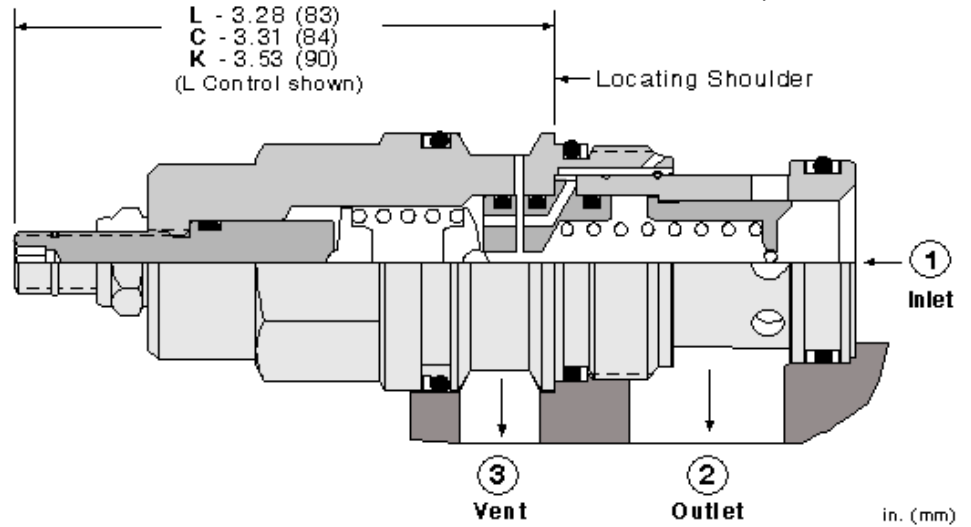
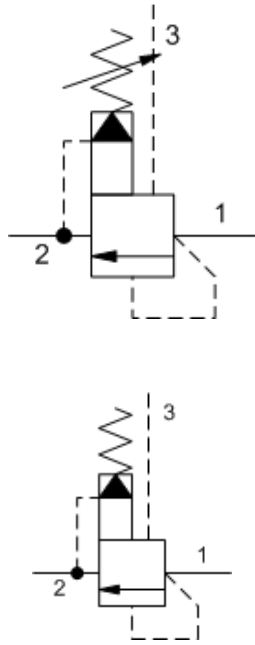


## TECHNICAL FEATURES

- Because the modulating occurs inside the cartridge, these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- A remote pilot relief on port 3 (vent) will control the valve below its own setting.
- Not suitable for use in load holding applications.
- When pressure at the inlet (port 1) exceeds the threshold setting, the valve opens to tank (port 2). The pilot section moves forward at a steady rate, increasing the setting by compressing the pilot spring. Maximum setting is achieved when the pilot section reaches a mechanical stop.
- Valve provides protection for hydrostatic drives by reducing the jerk caused by sudden reversals. The valve is suitable for cross-port applications.
- When used with a switching device, the valve can provide the ramp characteristic typically provided by proportional valves.
- Small power units can be started against an anti shock relief to provide longer pump life.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- The main stage orifice is protected against contamination.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Ventable, pilot-operated, balanced piston relief cartridges are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. They provide a vent port (port 3) that connects between the main piston and pilot stage to provide for remote control by other pilot or 2-way valves. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	240 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Maximum Valve Leakage at 110 SUS (24 cSt)	65 cc/min.@70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	EPDM: 990017014
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	0.62 kg.

## CONFIGURATION OPTIONS

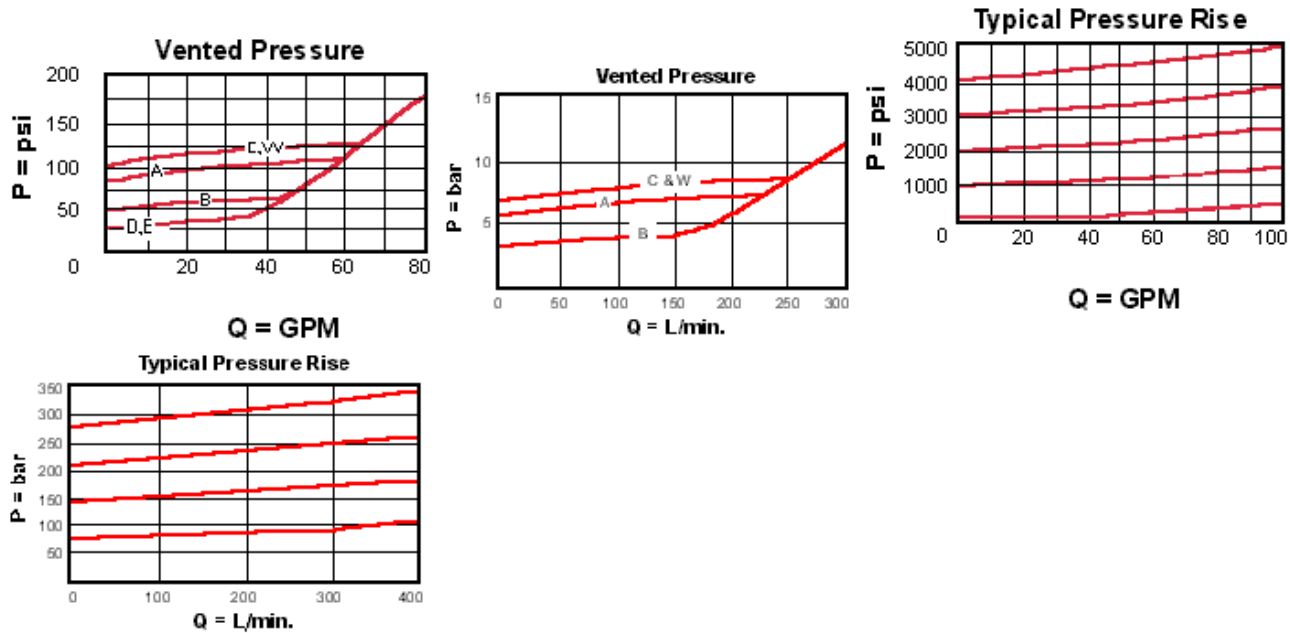
## Model Code Example: RVGALAN

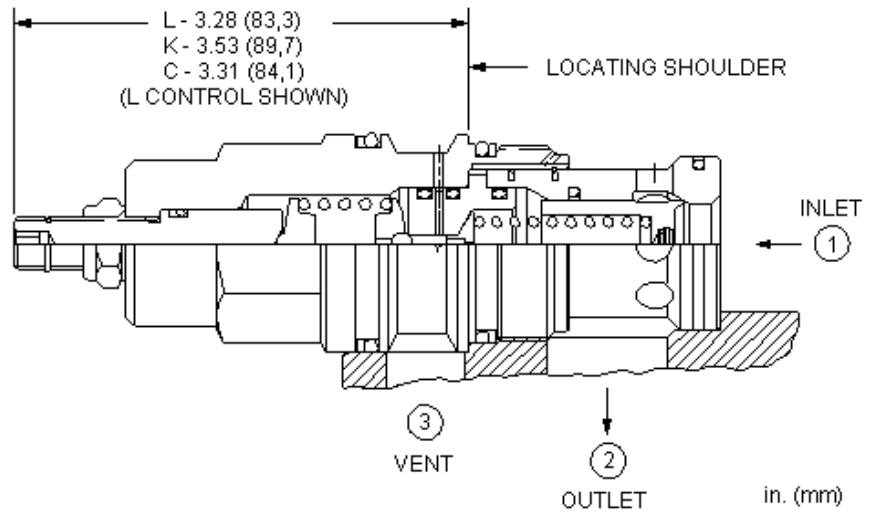
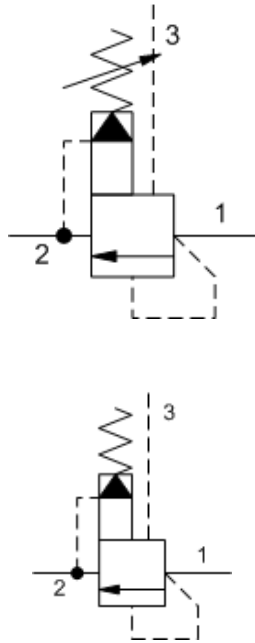
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	A 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	N Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	W 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting	E EPDM	/AP Stainless Steel, Passivated
K Handknob	B 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	V Viton	/LH Mild Steel, Zinc-Nickel
	C 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
	D 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	E 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

- A remote pilot relief on port 3 (vent) will control the valve below its own setting.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Ventable, pilot-operated, balanced-poppet relief cartridges are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. They provide a vent port (port 3) that connects between the main piston and pilot stage to provide for remote control by other pilot or 2-way valves. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	200 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Maximum Valve Leakage at Reseat	0,7 cc/min.
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990217007
Seal kit - Cartridge	Polyurethane: 990217002
Seal kit - Cartridge	Viton: 990217006
Model Weight	0.63 kg.

## CONFIGURATION OPTIONS

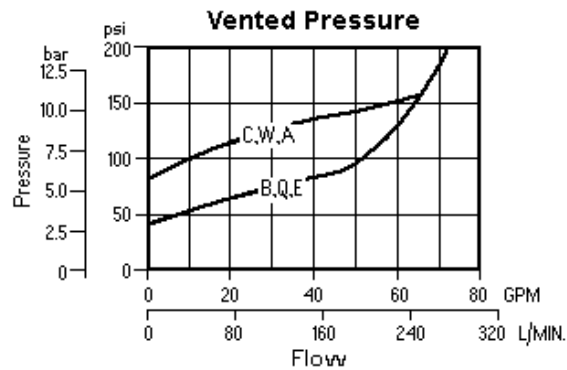
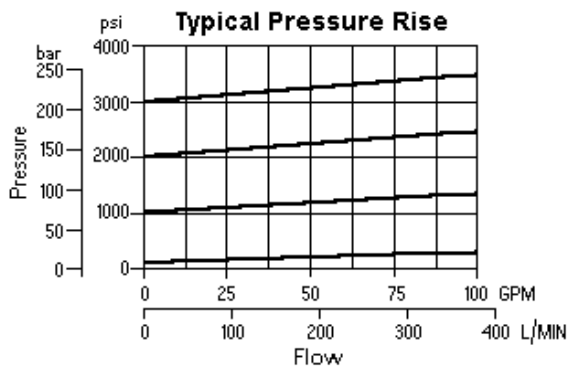
### Model Code Example: RVGSLAN

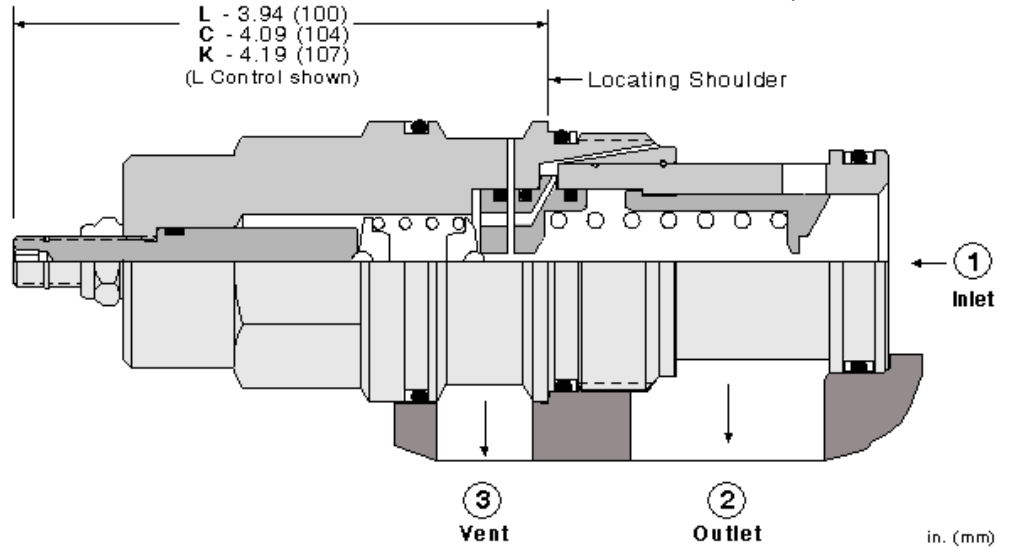
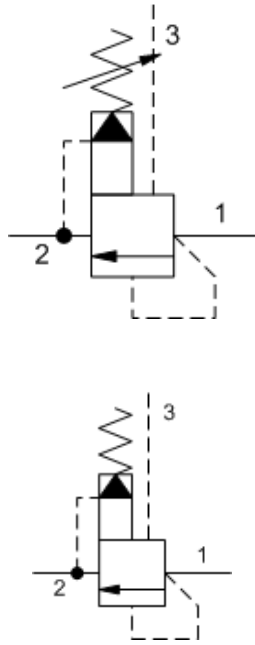
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
	<b>N</b> 60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- Because the modulating occurs inside the cartridge, these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Suitable for use in load holding applications, providing that any valving on the vent port (port 3) is zero leak.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- A remote pilot relief on port 3 (vent) will control the valve below its own setting.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Ventable, pilot-operated, balanced piston relief cartridges are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. They provide a vent port (port 3) that connects between the main piston and pilot stage to provide for remote control by other pilot or 2-way valves. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	480 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Maximum Valve Leakage at 110 SUS (24 cSt)	80 cc/min.@70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	EPDM: 990019014
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	1.43 kg.

## CONFIGURATION OPTIONS

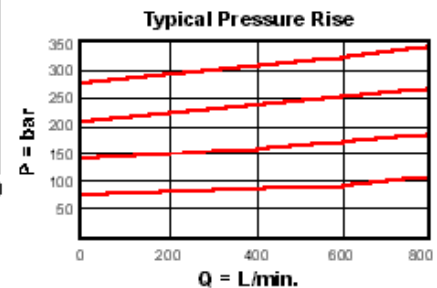
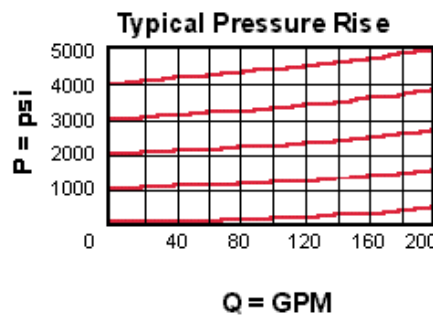
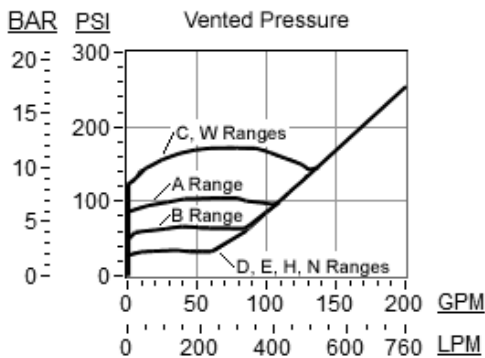
## Model Code Example: RVIALAN

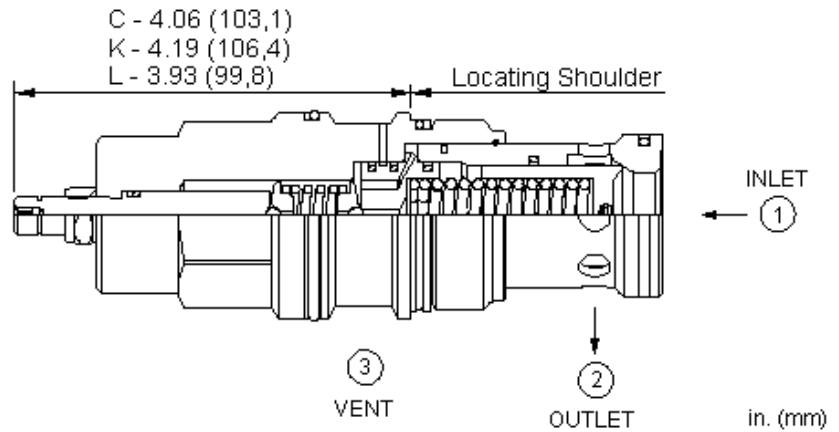
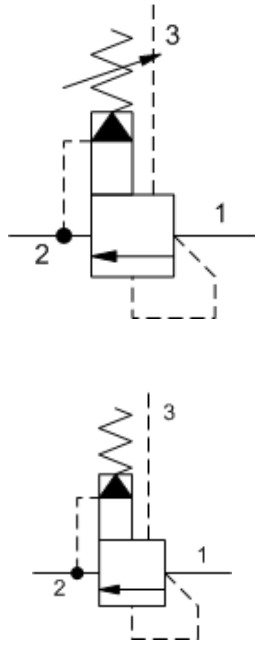
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	A 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	N Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	W 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting	E EPDM	/AP Stainless Steel, Passivated
K Handknob	B 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	V Viton	/LH Mild Steel, Zinc-Nickel
	C 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
	D 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	E 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	N 60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting		

## TECHNICAL FEATURES

- A remote pilot relief on port 3 (vent) will control the valve below its own setting.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Relief valve setting must always be higher than pilot valve setting.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Ventable, pilot-operated, balanced-poppet relief cartridges are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. They provide a vent port (port 3) that connects between the main piston and pilot stage to provide for remote control by other pilot or 2-way valves. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	480 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Maximum Valve Leakage at Reset	0,7 cc/min.
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990219007
Seal kit - Cartridge	Viton: 990219006
Model Weight	1.43 kg.

**CONFIGURATION OPTIONS**
**Model Code Example: RVISLAN**

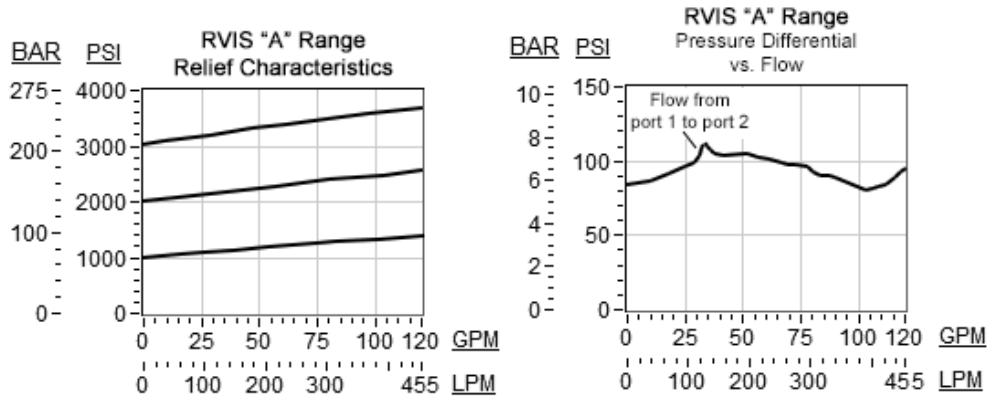
<b>CONTROL</b>	<b>(L) ADJUSTMENT RANGE</b>	<b>(A) SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	JAP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
	<b>N</b> 60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

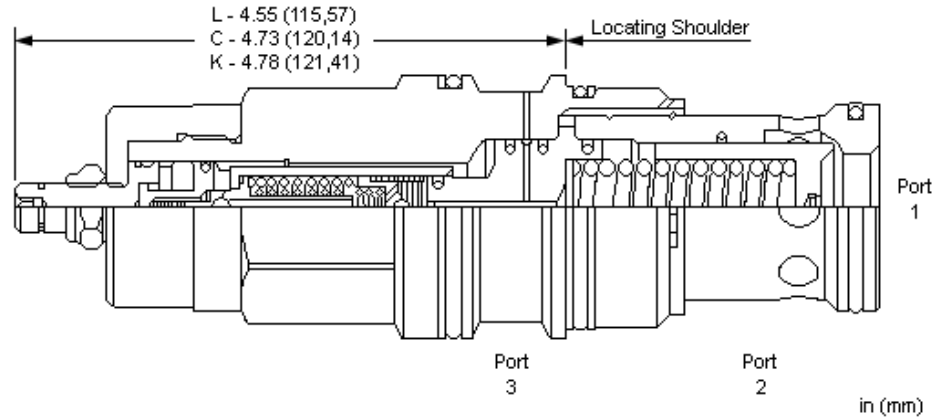
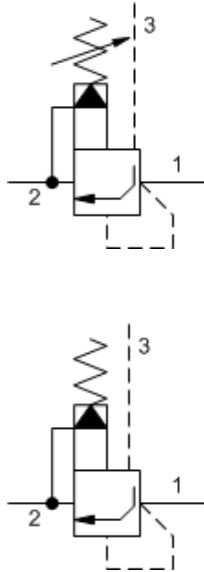


## TECHNICAL FEATURES

- Because the modulating occurs inside the cartridge, these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Suitable for use in load holding applications, providing that any valving on the vent port (port 3) is zero leak.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- A remote pilot relief on port 3 (vent) will control the valve below its own setting.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Ventable, pilot-operated, anti shock relief cartridges limit maximum system pressure and also limit the rate of pressure rise. The valve opens and then ramps closed at a constant speed, independent of settings and flows. These 3 port valves include a vent port (port 3) that connects between the main piston and the pilot stage to provide for remote control by other pilot or 2-way valves. The adjust screw determines the maximum (relief) setting and the minimum (threshold) setting.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	480 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pressure Ramp Up Time	400 - 850 ms
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990219007
Seal kit - Cartridge	Viton: 990219006
Model Weight	1.60 kg.

**CONFIGURATION OPTIONS**

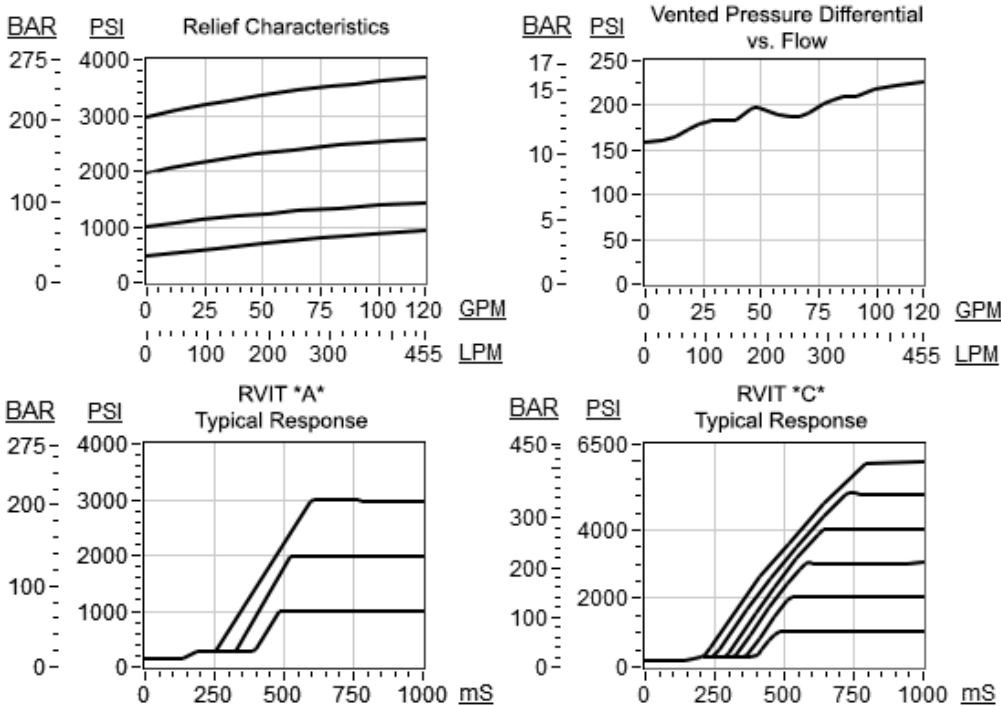
**Model Code Example: RVITLAN**

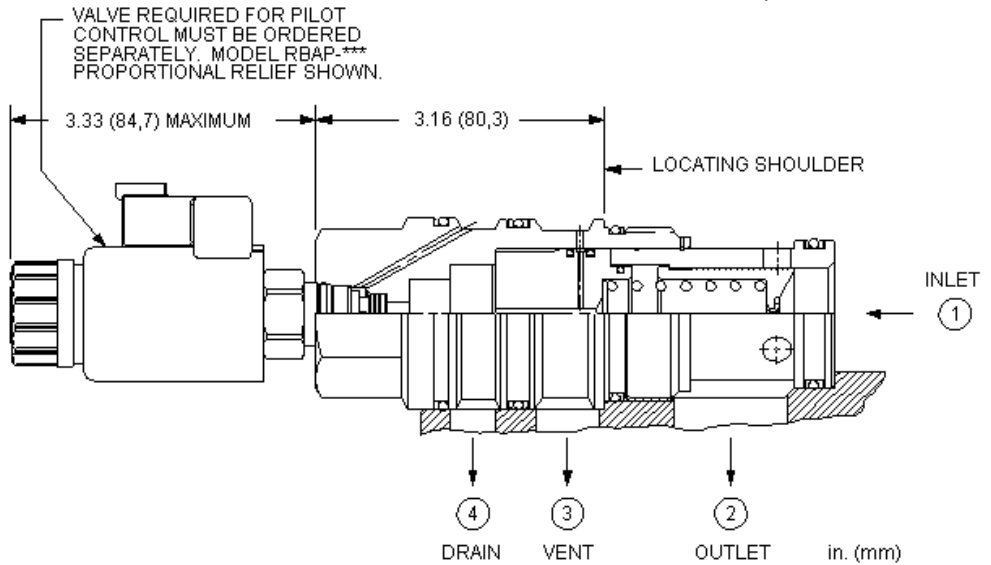
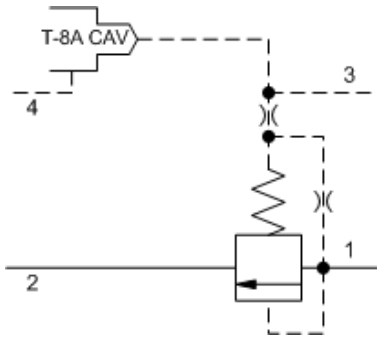
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	A 500 - 3000 psi (35 - 210 bar), 1000 psi (70 bar) Standard Setting	N Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	C 1000 - 6000 psi (70 - 420 bar), 1000 psi (70 bar) Standard Setting	V Viton	/AP Stainless Steel, Passivated
K Handknob	W 1000 - 4500 psi (70 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- Because the modulating occurs inside the cartridge, these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- A remote pilot relief on port 3 (vent) will control the valve below its own setting.
- Not suitable for use in load holding applications.
- When pressure at the inlet (port 1) exceeds the threshold setting, the valve opens to tank (port 2). The pilot section moves forward at a steady rate, increasing the setting by compressing the pilot spring. Maximum setting is achieved when the pilot section reaches a mechanical stop.
- Valve provides protection for hydrostatic drives by reducing the jerk caused by sudden reversals. The valve is suitable for cross-port applications.
- When used with a switching device, the valve can provide the ramp characteristic typically provided by proportional valves.
- Small power units can be started against an anti shock relief to provide longer pump life.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- The main stage orifice is protected against contamination.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





This valve is a normally closed modulating element that incorporates an integral pilot control cavity. It is ventable, externally drained, and is a balanced piston design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge setting, the modulating element starts to open to tank (port 2), throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between the inlet (port 1) and the drain (port 4). The vent port (port 3) that tees in between the main piston and pilot control cartridge, allows the modulating element to also be controlled by remote pilot or 2-way valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-24A
Series	4
Capacity	480 L/min.
Maximum Operating Pressure	350 bar
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Pilot Control Valve Hex Size	22,2 mm
Main stage leakage at 110 SUS (24 cSt)	80 cc/min.@70 bar
Response Time - Typical	10 ms
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Seal kit - Cartridge	Buna: 990024007
Seal kit - Cartridge	Polyurethane: 990024002
Seal kit - Cartridge	Viton: 990024006
Model Weight	1.48 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

**Model Code Example: RVID8WN**

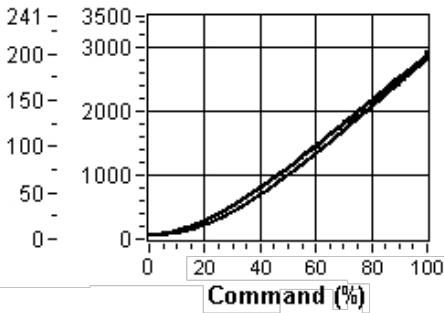
<b>MINIMUM CONTROL PRESSURE (W)</b>	<b>SEAL MATERIAL (N)</b>
<b>W</b> 100 psi (7 bar)	<b>N</b> Buna-N
D 25 psi (1,7 bar)	V Viton

## TECHNICAL FEATURES

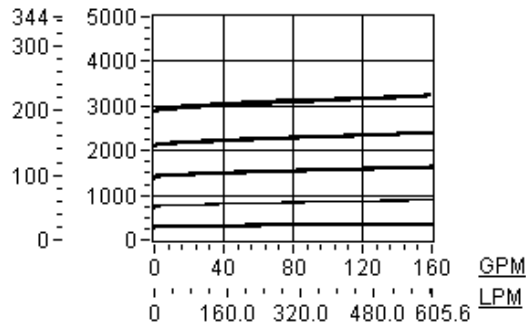
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Pressure at port 4 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES

BAR PSI **Pressure vs. Command**

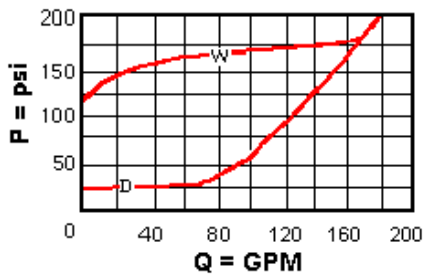


BAR PSI **Pressure vs. Flow**

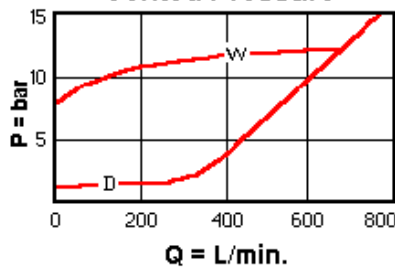


Pilot control provided by  
Proportional Pilot Relief, Model RBAP-MAN

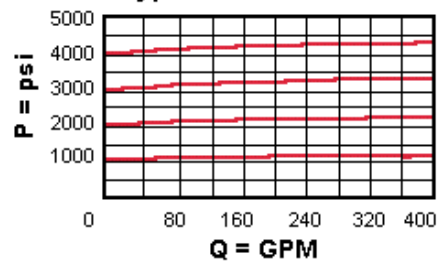
**Vented Pressure**



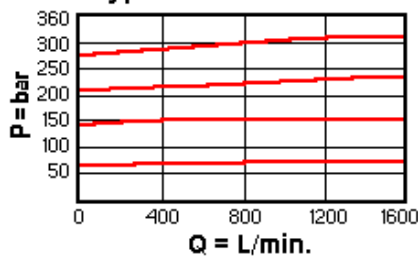
**Vented Pressure**



**Typical Pressure Rise**

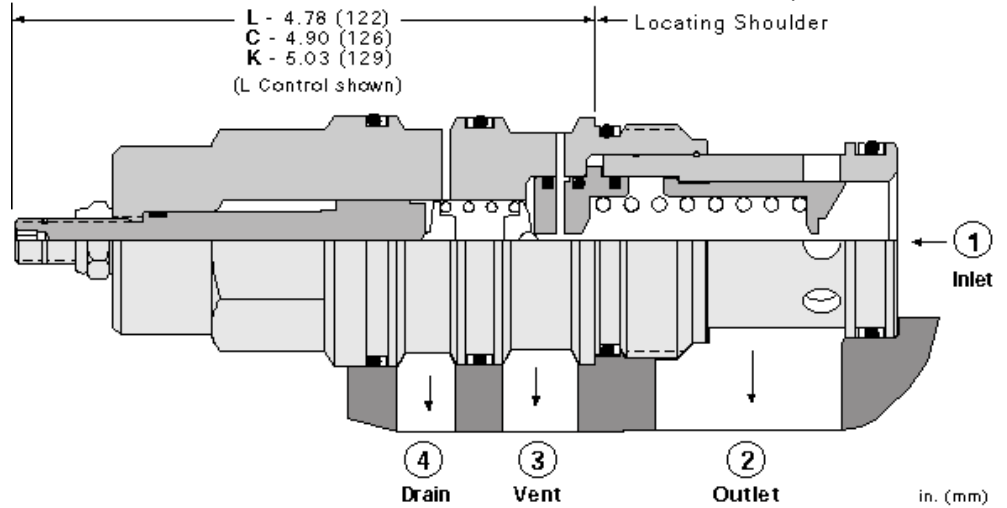
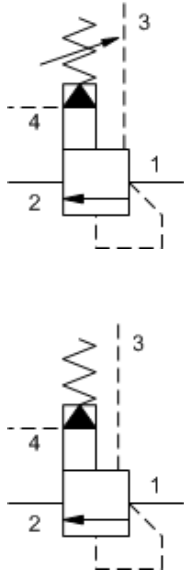


**Typical Pressure Rise**



## RELATED MODELS

- [RVID](#) Ventable, pilot-operated, balanced piston relief valve with drain to port 4



Ventable, pilot-operated, balanced piston relief cartridges with external drain are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. They provide a vent port (port 3) that connects between the main piston and pilot stage to provide for remote control by other pilot or 2-way valves and a drain (port 4) that makes them insensitive to back pressure. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-24A
Series	4
Capacity	480 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Maximum Valve Leakage at 110 SUS (24 cSt)	80 cc/min.@70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990024007
Seal kit - Cartridge	EPDM: 990024014
Seal kit - Cartridge	Polyurethane: 990024002
Seal kit - Cartridge	Viton: 990024006
Model Weight	1.75 kg.

## CONFIGURATION OPTIONS

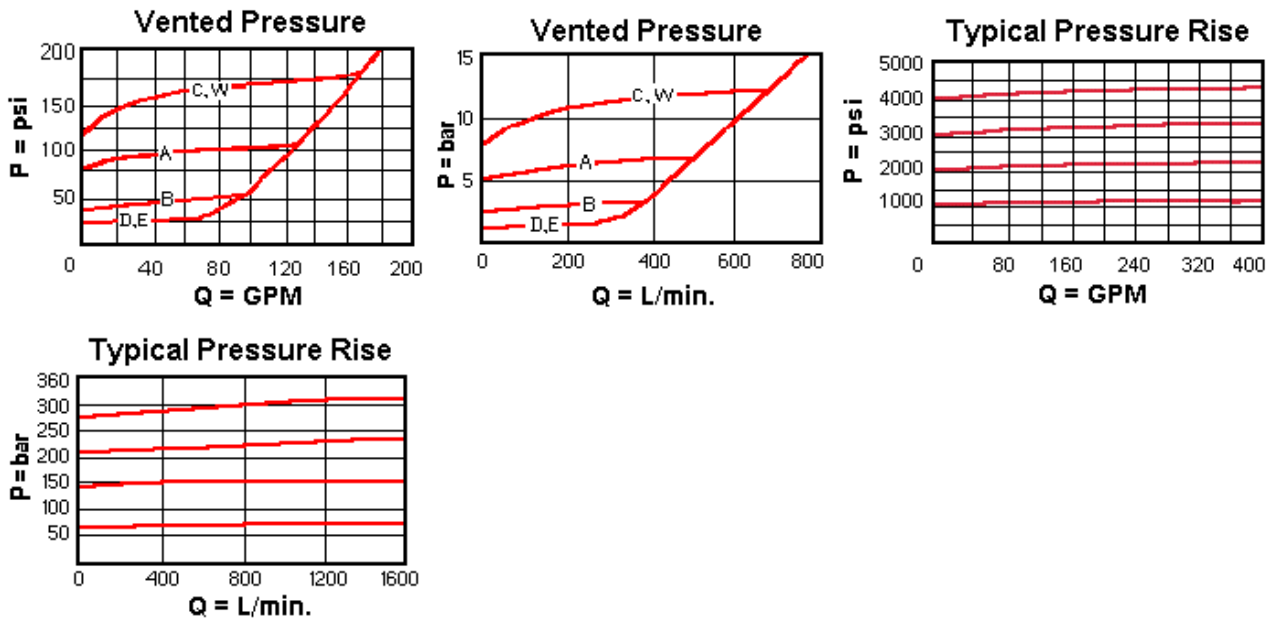
## Model Code Example: RVIDLAN

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

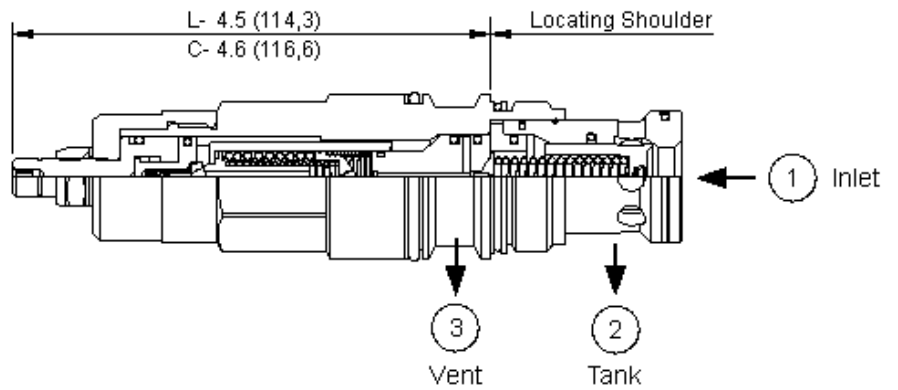
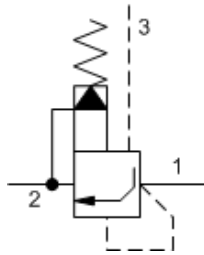
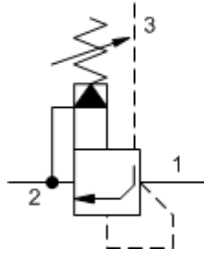
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Pressure at port 4 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RVID8](#) Ventable, pilot-operated, balanced piston relief main stage with integral T-8A control cavity and drain to port 4



Ventable, pilot-operated, anti shock relief cartridges limit maximum system pressure and also limit the rate of pressure rise. The valve opens and then ramps closed at a constant speed, independent of settings and flows. These 3 port valves include a vent port (port 3) that connects between the main piston and the pilot stage to provide for remote control by other pilot or 2-way valves. The adjust screw determines the maximum (relief) setting and the minimum (threshold) setting.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	240 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pressure Ramp Up Time	300 - 500 ms
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	4.5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
U.S. Patent #	6,039,070
Seal kit - Cartridge	Buna: 990217007
Seal kit - Cartridge	Polyurethane: 990217002
Seal kit - Cartridge	Viton: 990217006
Model Weight	0.85 kg.

**NOTES** Patents are pending for this product.

**CONFIGURATION OPTIONS**

**Model Code Example: RVGTLAN**

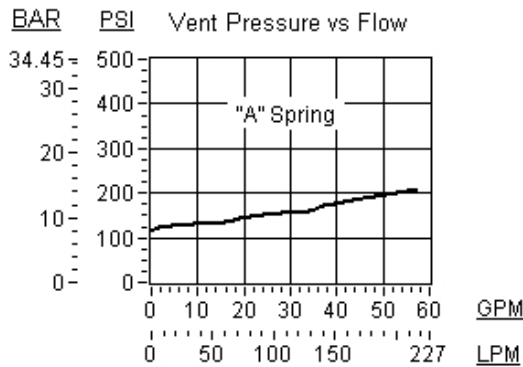
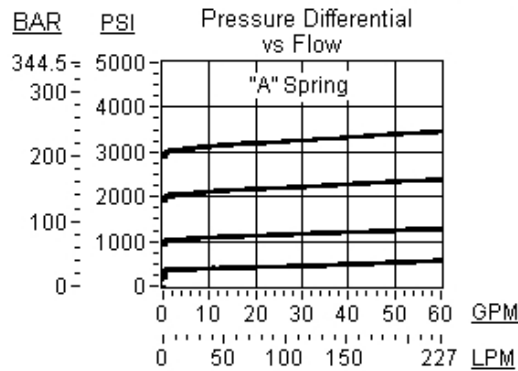
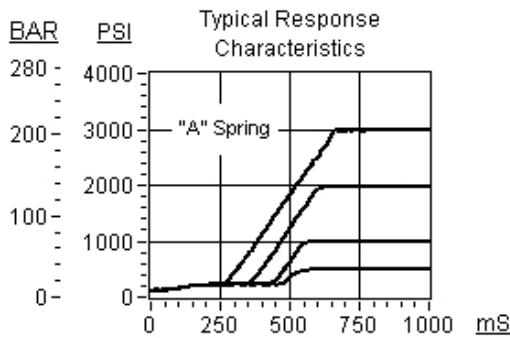
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 500 - 3000 psi (35 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 500 - 1500 psi (35 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	JAP Stainless Steel, Passivated
	<b>C</b> 1000 - 6000 psi (70 - 420 bar), 1000 psi (70 bar) Standard Setting		
	<b>W</b> 1000 - 4500 psi (70 - 315 bar), 1000 psi (70 bar) Standard Setting		

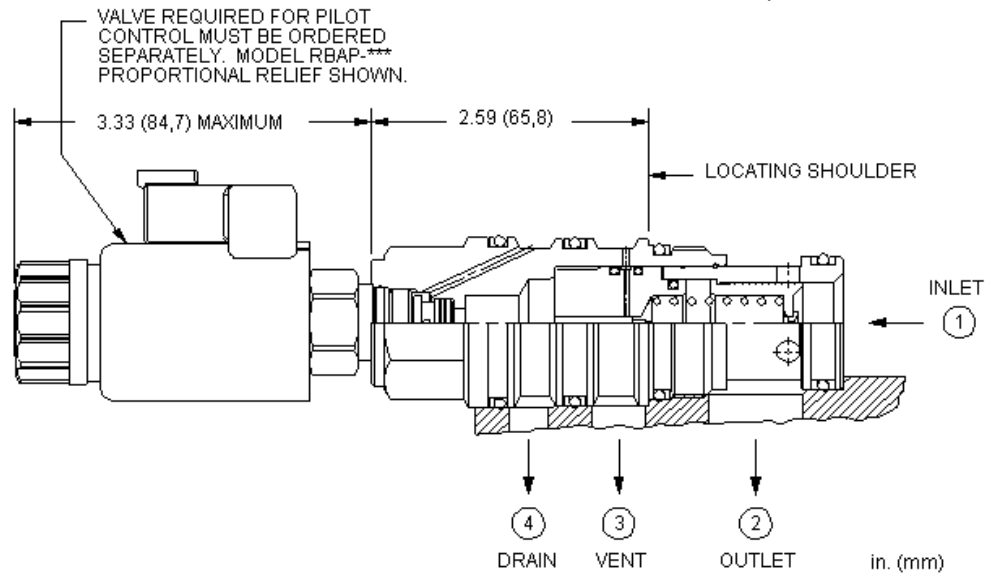
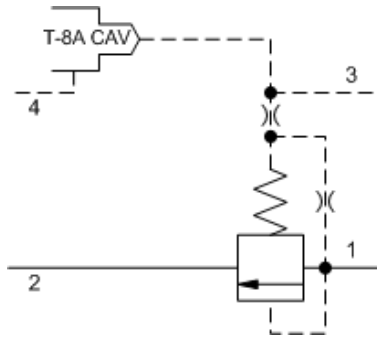


## TECHNICAL FEATURES

- Because the modulating occurs inside the cartridge, these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- A remote pilot relief on port 3 (vent) will control the valve below its own setting.
- Not suitable for use in load holding applications.
- When pressure at the inlet (port 1) exceeds the threshold setting, the valve opens to tank (port 2). The pilot section moves forward at a steady rate, increasing the setting by compressing the pilot spring. Maximum setting is achieved when the pilot section reaches a mechanical stop.
- Valve provides protection for hydrostatic drives by reducing the jerk caused by sudden reversals. The valve is suitable for cross-port applications.
- When used with a switching device, the valve can provide the ramp characteristic typically provided by proportional valves.
- Small power units can be started against an anti shock relief to provide longer pump life.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- The main stage orifice is protected against contamination.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





This valve is a normally closed modulating element that incorporates an integral pilot control cavity. It is ventable, externally drained, and is a balanced piston design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge setting, the modulating element starts to open to tank (port 2), throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between the inlet (port 1) and the drain (port 4). The vent port (port 3) that tees in between the main piston and pilot control cartridge, allows the modulating element to also be controlled by remote pilot or 2-way valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-23A
Series	3
Capacity	240 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Main stage leakage at 110 SUS (24 cSt)	65 cc/min.@70 bar
Response Time - Typical	10 ms
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	EPDM: 990023014
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006
Model Weight	0.64 kg.

**NOTES**

Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

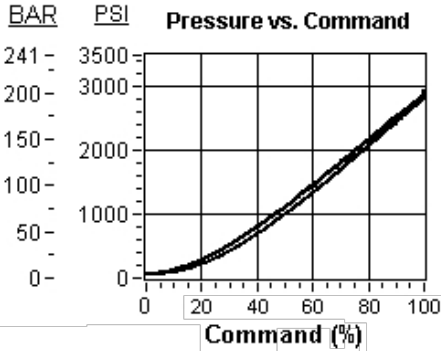
**Model Code Example: RVGD8WN**

MINIMUM CONTROL PRESSURE (W)	SEAL MATERIAL (N)
W 100 psi (7 bar)	N Buna-N
D 25 psi (1,7 bar)	E EPDM
	V Viton

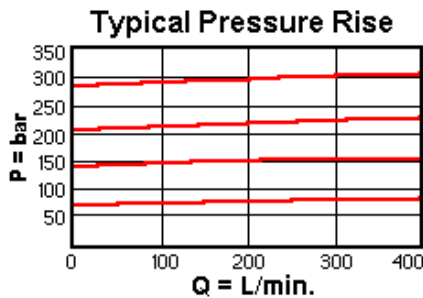
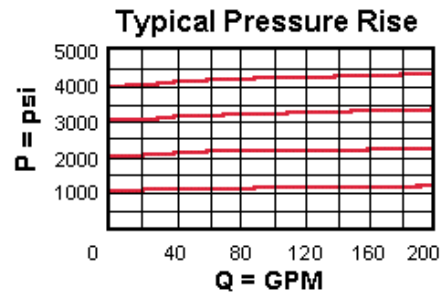
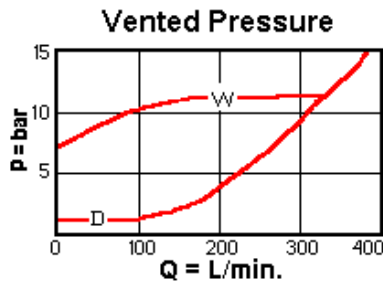
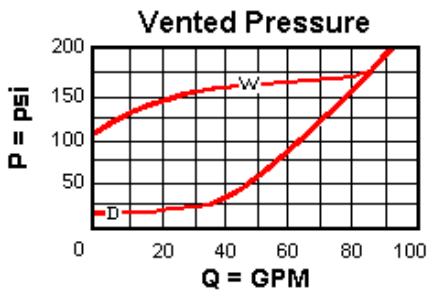
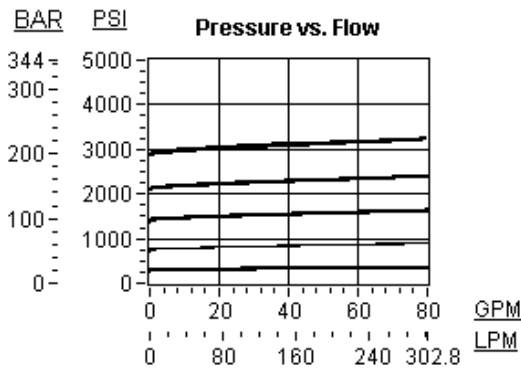
## TECHNICAL FEATURES

- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Pressure at port 4 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES

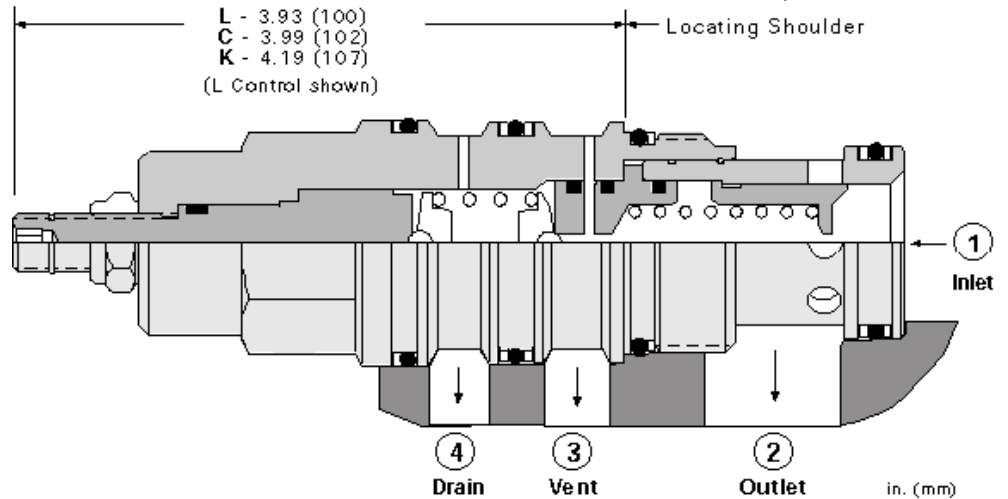
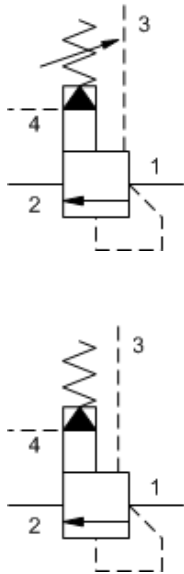


Pilot control provided by  
Proportional Pilot Relief, Model RBAP-MAN



## RELATED MODELS

- [RVGD](#) Ventable, pilot-operated, balanced piston relief valve with drain to port 4



Ventable, pilot-operated, balanced piston relief cartridges with external drain are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. They provide a vent port (port 3) that connects between the main piston and pilot stage to provide for remote control by other pilot or 2-way valves and a drain (port 4) that makes them insensitive to back pressure. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-23A
Series	3
Capacity	240 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Maximum Valve Leakage at 110 SUS (24 cSt)	65 cc/min.@70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006
Model Weight	0.75 kg.

## CONFIGURATION OPTIONS

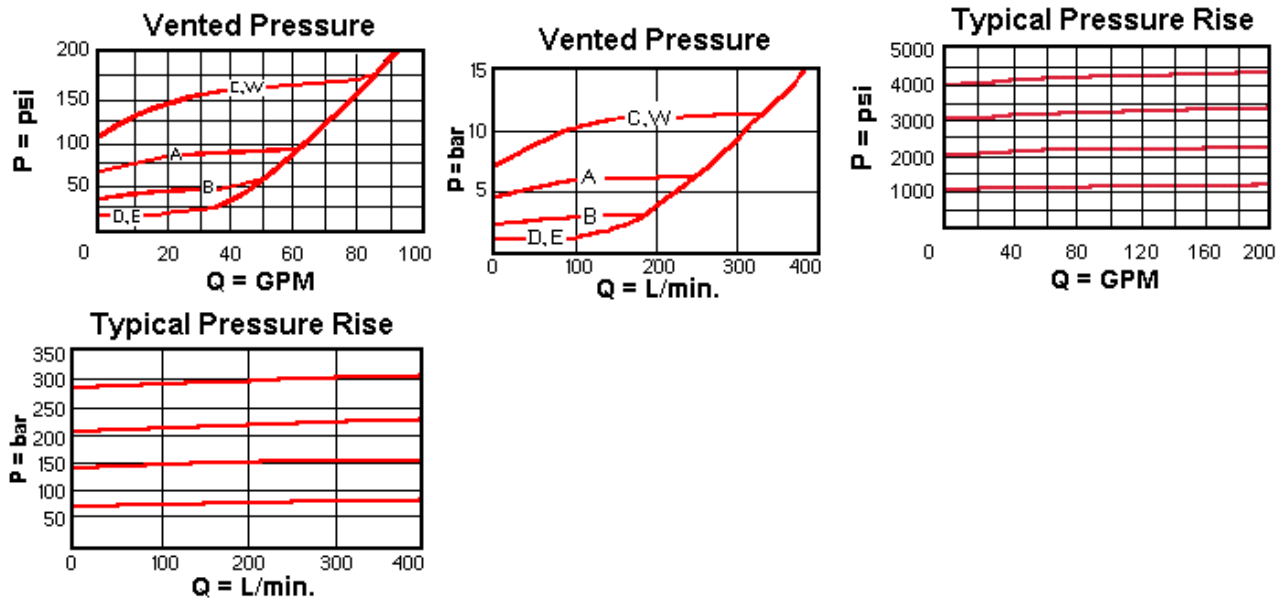
## Model Code Example: RVGDLAN

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	A 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	N Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	B 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	V Viton	/AP Stainless Steel, Passivated
K Handknob	C 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
	D 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	E 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	W 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

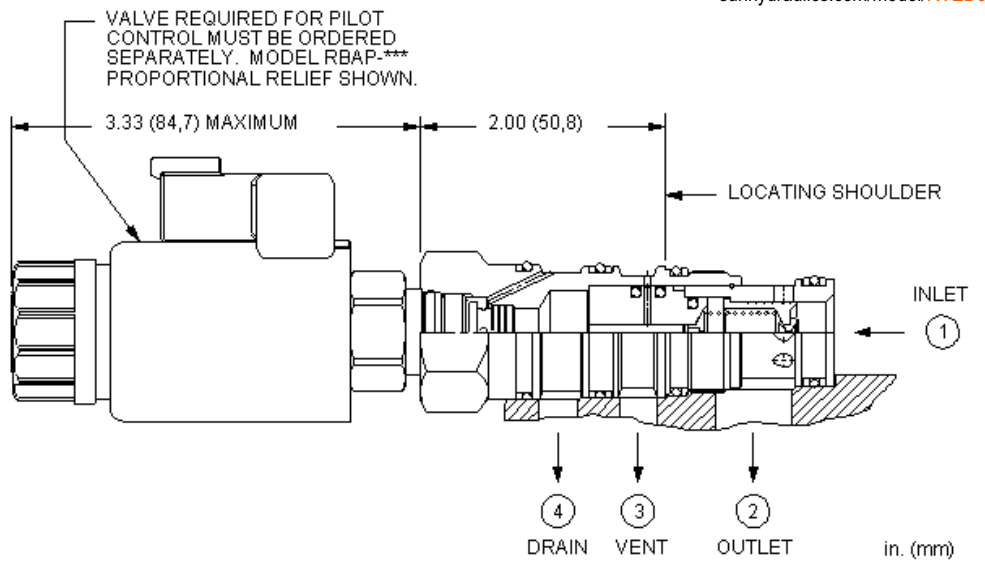
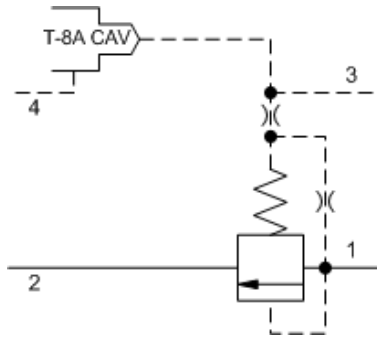
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Pressure at port 4 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RVGD8](#) Ventable, pilot-operated, balanced piston relief main stage with integral T-8A control cavity and drain to port 4



This valve is a normally closed modulating element that incorporates an integral pilot control cavity. It is ventable, externally drained, and is a balanced piston design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge setting, the modulating element starts to open to tank (port 2), throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between the inlet (port 1) and the drain (port 4). The vent port (port 3) that tees in between the main piston and pilot control cartridge, allows the modulating element to also be controlled by remote pilot or 2-way valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-22A
Series	2
Capacity	120 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Pilot Control Valve Hex Size	22,2 mm
Main stage leakage at 110 SUS (24 cSt)	50 cc/min.@70 bar
Response Time - Typical	10 ms
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990022007
Seal kit - Cartridge	EPDM: 990022014
Seal kit - Cartridge	Polyurethane: 990022002
Seal kit - Cartridge	Viton: 990022006
Model Weight	0.26 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

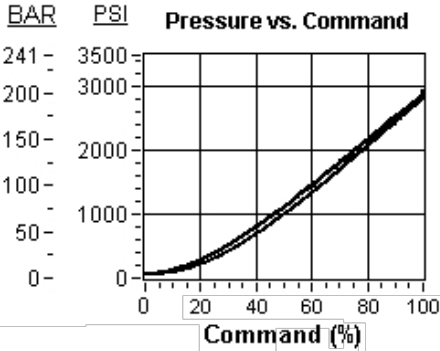
**Model Code Example: RVED8WN**

MINIMUM CONTROL PRESSURE (W)	SEAL MATERIAL (N)
W 100 psi (7 bar)	N Buna-N
D 25 psi (1,7 bar)	E EPDM
	V Viton

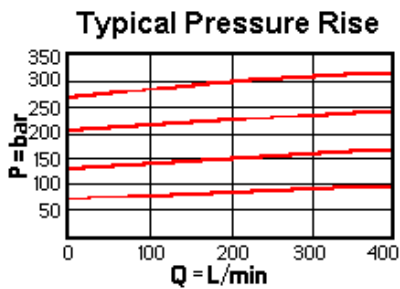
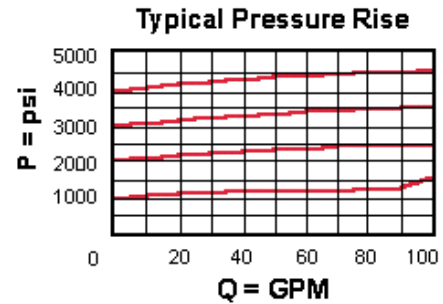
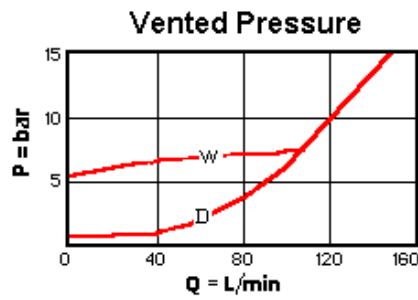
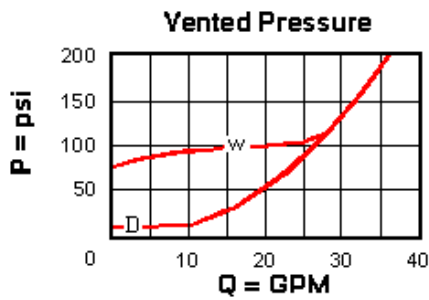
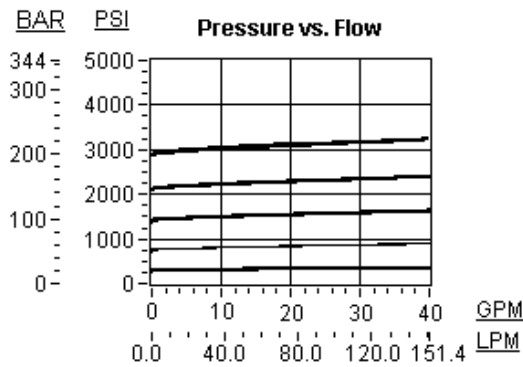
## TECHNICAL FEATURES

- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Pressure at port 4 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES

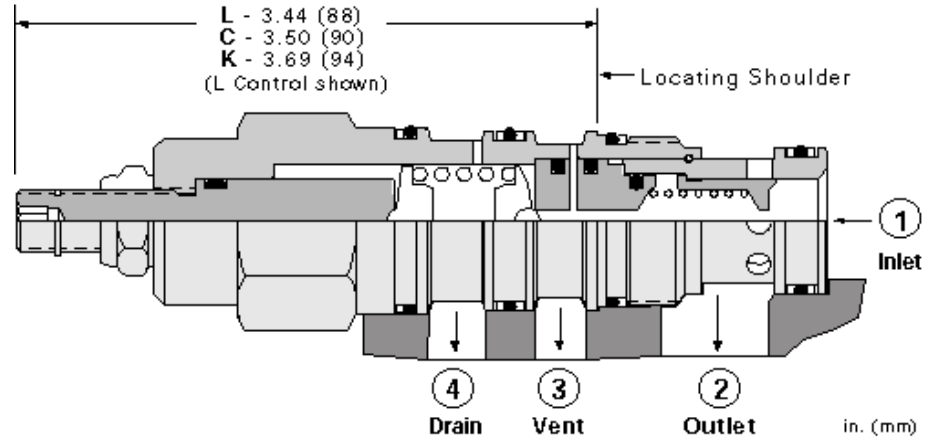
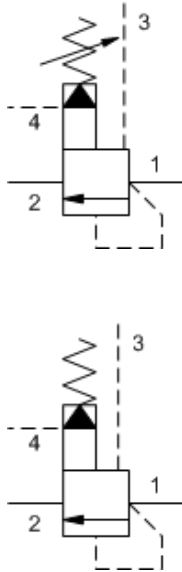


Pilot control provided by  
Proportional Pilot Relief, Model RBAP-MAN



## RELATED MODELS

- [RVED](#) Ventable, pilot-operated, balanced piston relief valve with drain to port 4



Ventable, pilot-operated, balanced piston relief cartridges with external drain are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to open to tank (port 2), throttling flow to regulate the pressure. They provide a vent port (port 3) that connects between the main piston and pilot stage to provide for remote control by other pilot or 2-way valves and a drain (port 4) that makes them insensitive to back pressure. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-22A
Series	2
Capacity	120 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Maximum Valve Leakage at 110 SUS (24 cSt)	50 cc/min.@70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990022007
Seal kit - Cartridge	Polyurethane: 990022002
Seal kit - Cartridge	Viton: 990022006
Model Weight	0.35 kg.

**CONFIGURATION OPTIONS**

**Model Code Example: RVEDLAN**

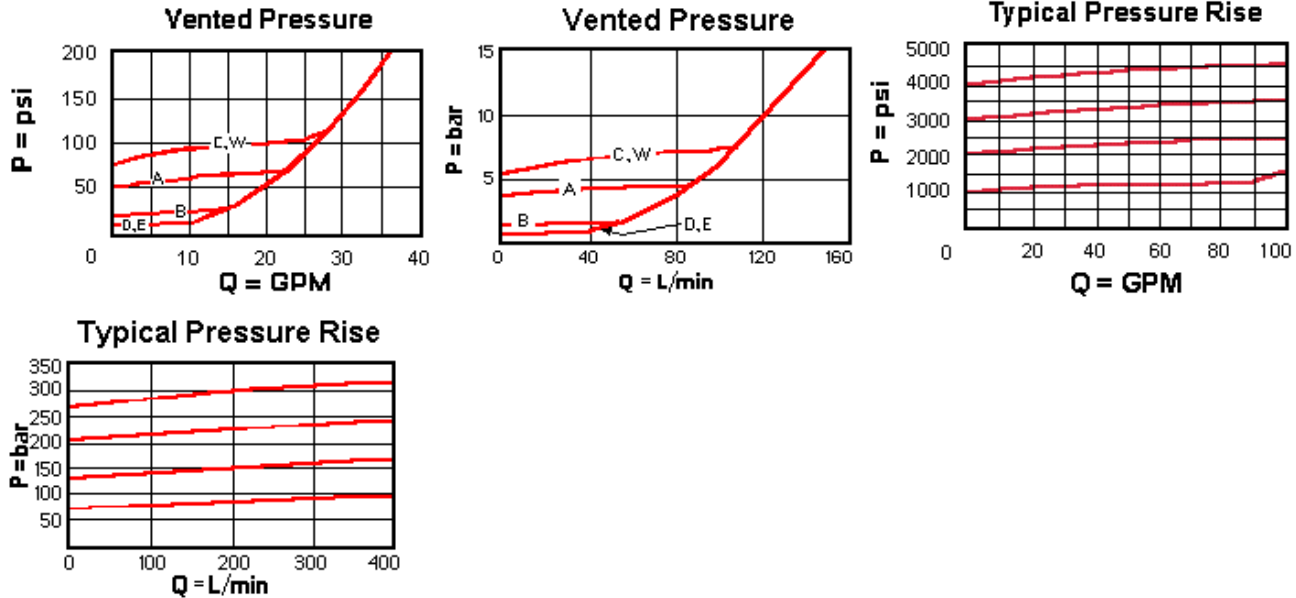
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N)
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	
<b>W</b> Hex Wrench Adjustment	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		



## TECHNICAL FEATURES

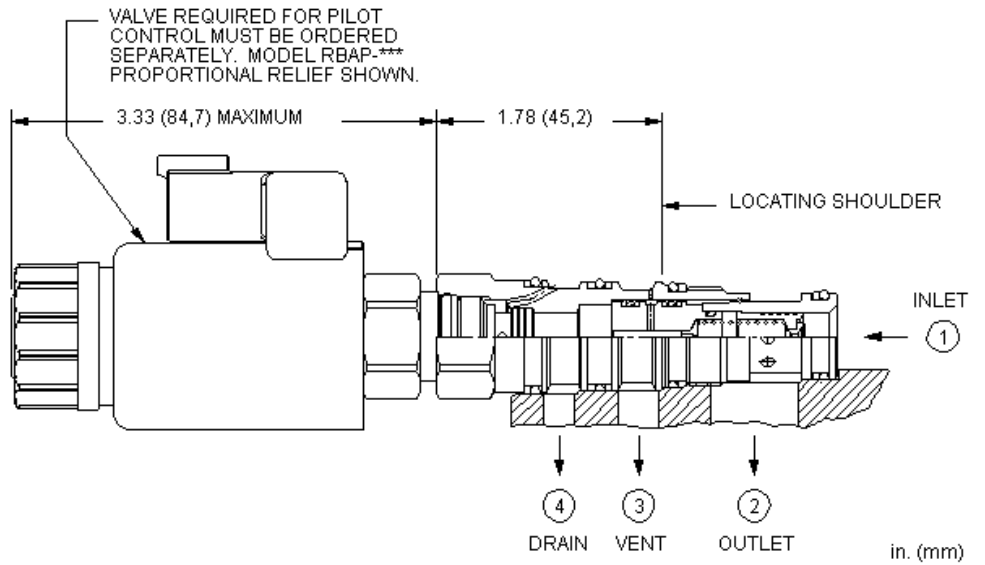
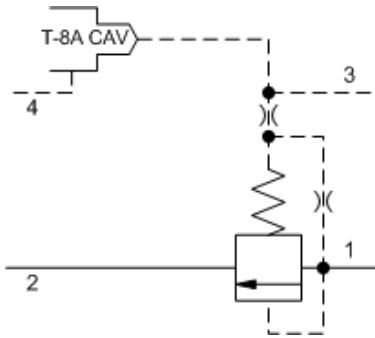
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Pressure at port 4 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RVED8](#) Ventable, pilot-operated, balanced piston relief main stage with integral T-8A control cavity and drain to port 4



This valve is a normally closed modulating element that incorporates an integral pilot control cavity. It is ventable, externally drained, and is a balanced piston design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge setting, the modulating element starts to open to tank (port 2), throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between the inlet (port 1) and the drain (port 4). The vent port (port 3) that tees in between the main piston and pilot control cartridge, allows the modulating element to also be controlled by remote pilot or 2-way valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-21A
Series	1
Capacity	60 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Pilot Control Cavity	T-8A
Main stage leakage at 110 SUS (24 cSt)	30 cc/min.@70 bar
Response Time - Typical	10 ms
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	EPDM: 990021014
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006
Model Weight	0.13 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

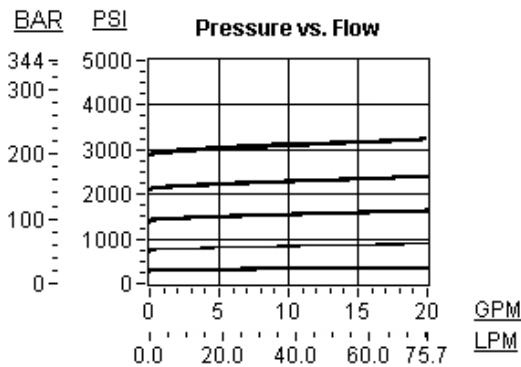
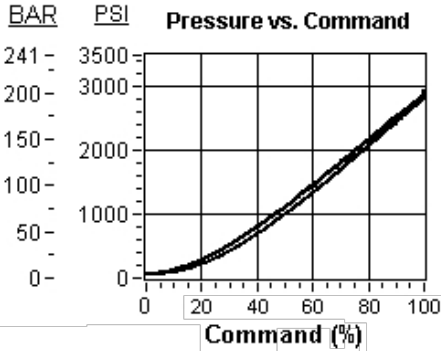
**Model Code Example: RVCD8WN**

MINIMUM CONTROL PRESSURE (W)	SEAL MATERIAL (N)
<b>W</b> 100 psi (7 bar)	<b>N</b> Buna-N
D 25 psi (1,7 bar)	E EPDM
	V Viton

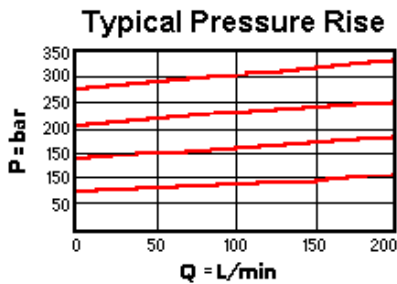
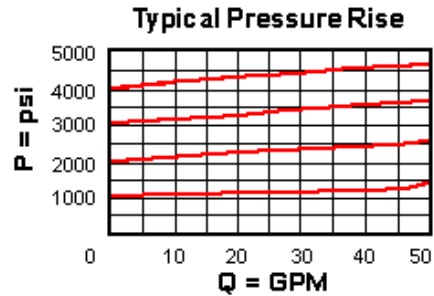
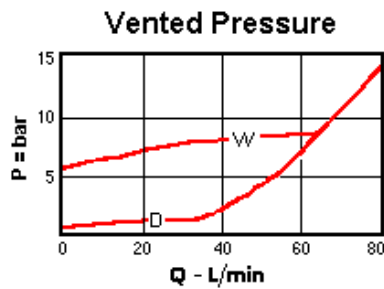
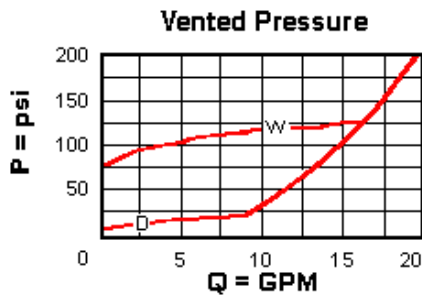
## TECHNICAL FEATURES

- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Pressure at port 4 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES

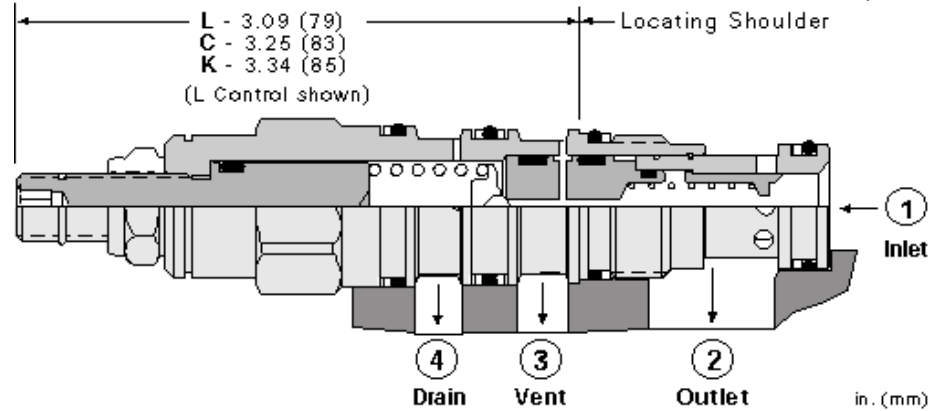
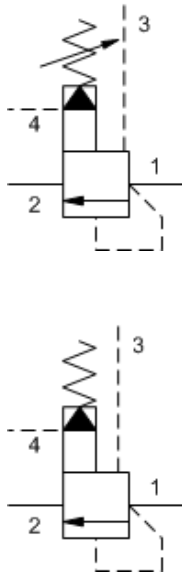


Pilot control provided by  
Proportional Pilot Relief, Model RBAP-MAN



## RELATED MODELS

- [RVCD](#) Ventable, pilot-operated, balanced piston relief valve with drain to port 4



Ventable, pilot-operated, balanced piston relief cartridges with external drain are normally closed pressure regulating valves. When the pressure at the inlet (port 1) reaches the valve setting, the valve starts to tank (port 2), throttling flow to regulate the pressure. They provide a vent port (port 3) that connects between the main piston and pilot stage to provide for remote control by other pilot or 2-way valves and a drain (port 4) that makes them insensitive to back pressure. These valves are accurate, have low pressure rise vs. flow, they are smooth and quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-21A
Series	1
Capacity	60 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.@70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	EPDM: 990021014
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006
Model Weight	0.20 kg.

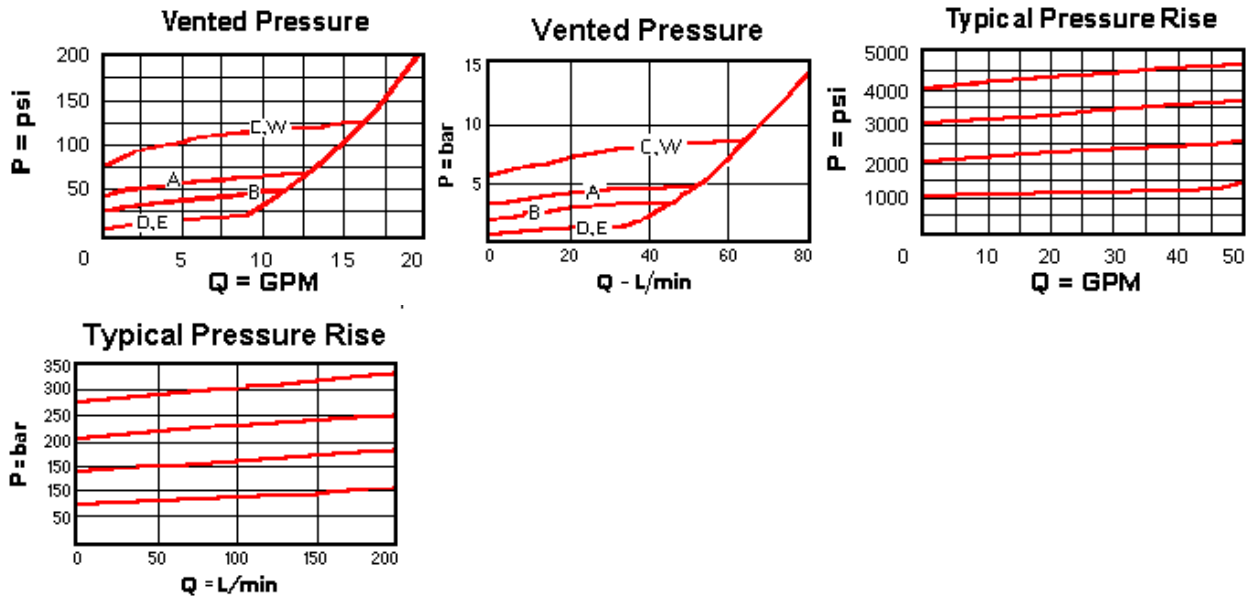
**CONFIGURATION OPTIONS**
**Model Code Example: RVCDLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

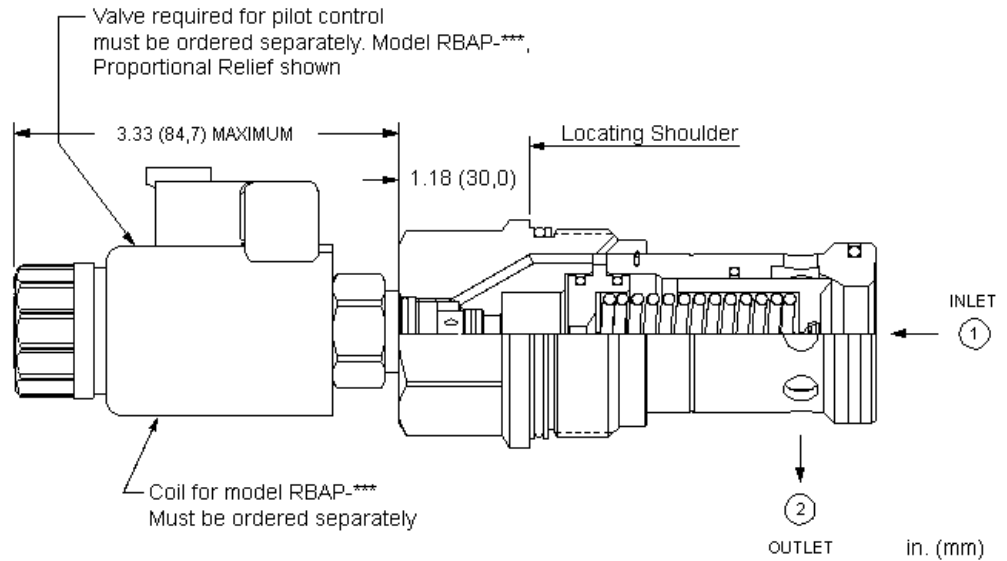
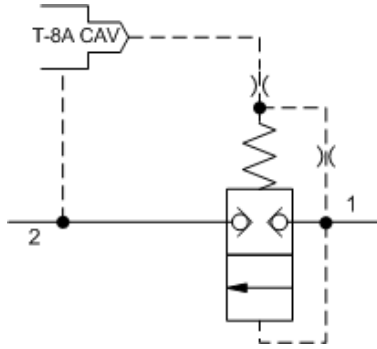
- A remote pilot relief on port 3 (vent) will control the valve below its own setting.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Pressure at port 4 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RVCD8](#) Ventable, pilot-operated, balanced piston relief main stage with integral T-8A control cavity and drain to port 4



This valve is a normally closed modulating element that incorporates an integral pilot control cavity. It is a balanced poppet design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge's setting, the poppet element starts to open to tank (port 2), throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between port 1 and port 2.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-18A
Series	4
Capacity	760 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Pilot Control Valve Hex Size	22,2 mm
Main stage leakage at reseal	0,7 cc/min.
Response Time - Typical	2 ms
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Seal kit - Cartridge	Buna: 990318007
Seal kit - Cartridge	Polyurethane: 990018002
Seal kit - Cartridge	Viton: 990318006
Model Weight	0.90 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

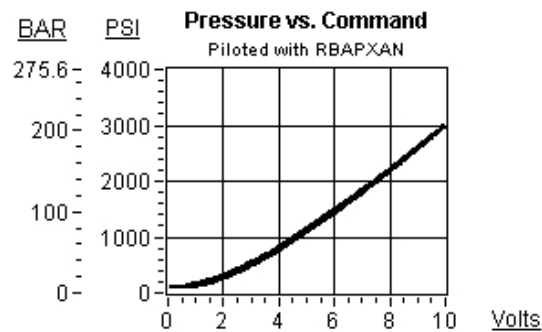
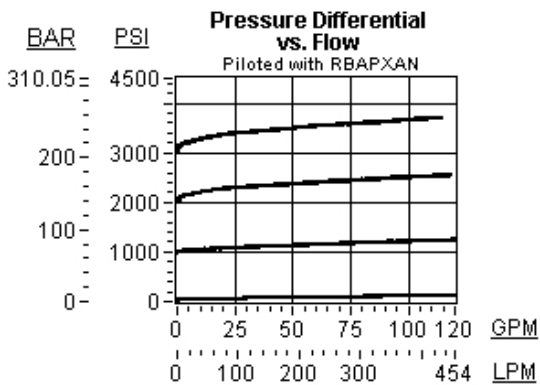
**Model Code Example: RPKS8BN**

ADJUSTMENT RANGE	(B)	SEAL MATERIAL	(N)
B 50 - 1500 psi (3,5 - 105 bar)		N Buna-N	
W 100 - 5000 psi (7 - 350 bar)		V Viton	

## TECHNICAL FEATURES

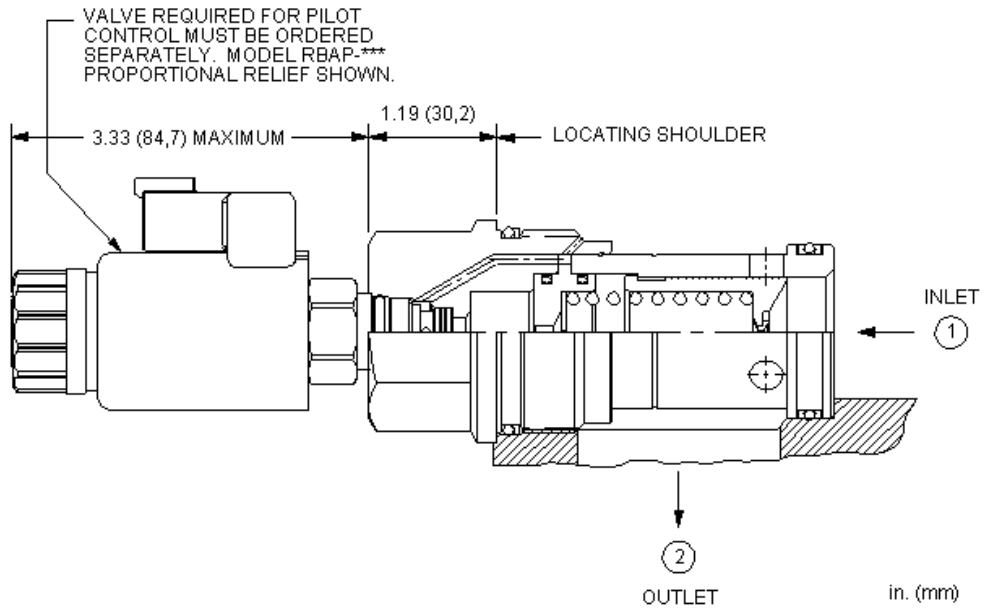
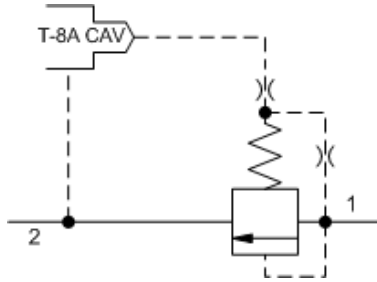
- Because the modulating occurs inside the cartridge, these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RPKS](#) Pilot-operated, balanced poppet relief valve



This valve is a normally closed modulating element that incorporates an integral pilot control cavity. It is a balanced piston design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge's setting, the modulating element starts to open to tank (port 2), throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between port 1 and port 2.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-18A
Series	4
Capacity	760 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Main stage leakage at 110 SUS (24 cSt)	80 cc/min.@70 bar
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Seal kit - Cartridge	Buna: 990018007
Seal kit - Cartridge	EPDM: 990018014
Seal kit - Cartridge	Polyurethane: 990018002
Seal kit - Cartridge	Viton: 990018006
Model Weight	0.59 kg.

**NOTES**

Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

**Model Code Example: RPKC8WN**

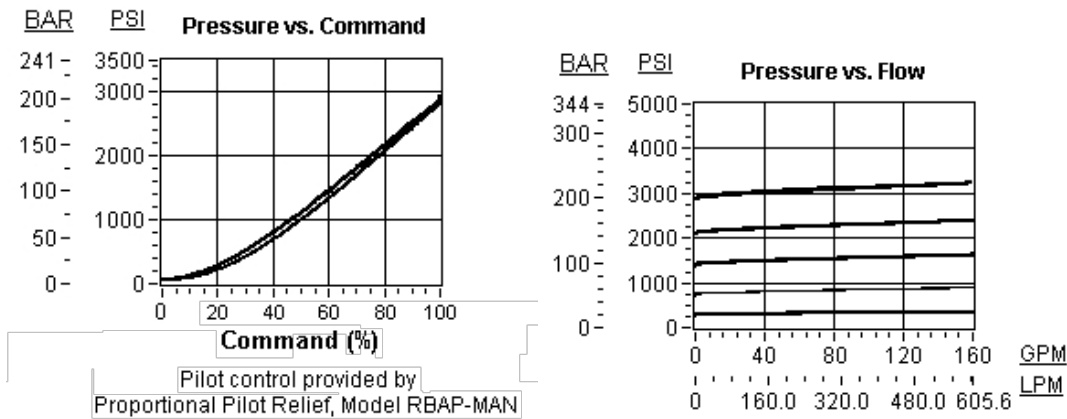
ADJUSTMENT RANGE	(W)	SEAL MATERIAL	(N)
W 100 - 5000 psi (7 - 350 bar)		N Buna-N	
D 25 - 3000 psi (1,7 - 210 bar)		E EPDM	
		V Viton	



## TECHNICAL FEATURES

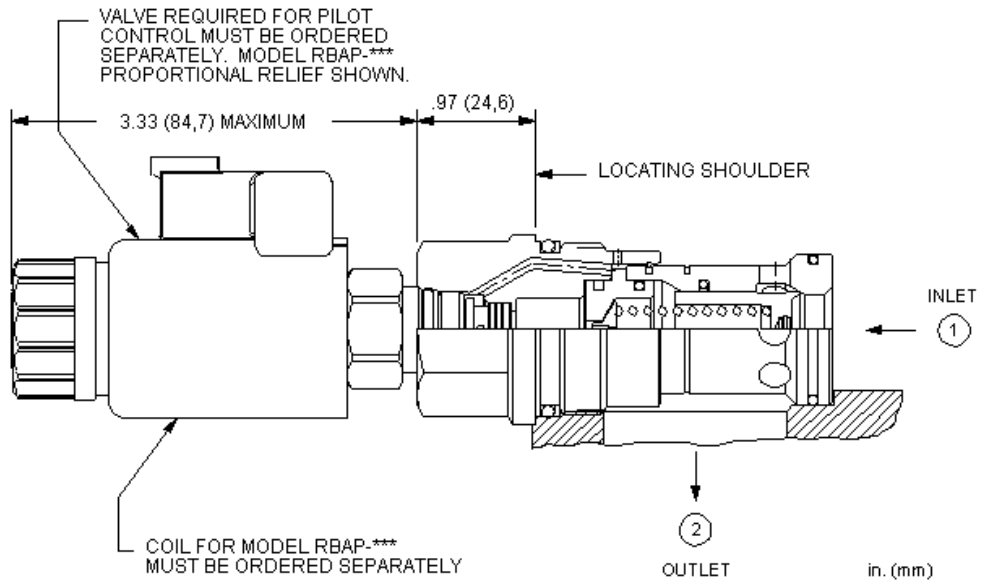
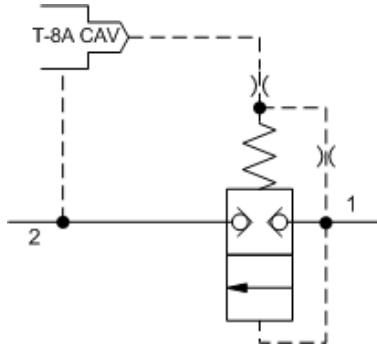
- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RPKC](#) Pilot-operated, balanced piston relief valve



This valve is a normally closed modulating element that incorporates an integral pilot control cavity. It is a balanced poppet design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge's setting, the poppet element starts to open to tank (port 2), throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between port 1 and port 2.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-16A
Series	3
Capacity	380 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Main stage leakage at reseal	0,7 cc/min.
Response Time - Typical	2 ms
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990316007
Seal kit - Cartridge	EPDM: 990316014
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990316006
Model Weight	0.43 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

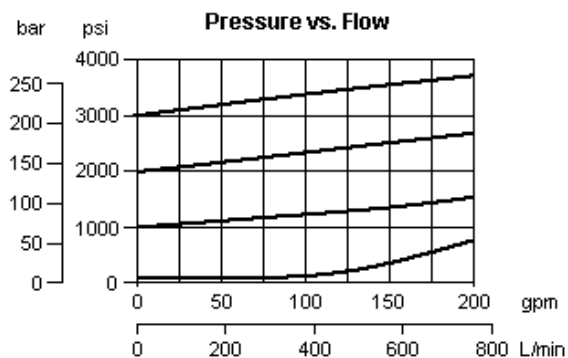
**Model Code Example: RPIS8BN**

<b>ADJUSTMENT RANGE</b>	<b>(B)</b>	<b>SEAL MATERIAL</b>	<b>(N)</b>
<b>B</b> 50 - 1500 psi (3,5 - 105 bar)		<b>N</b> Buna-N	
<b>W</b> 100 - 5000 psi (7 - 350 bar)		<b>E</b> EPDM	
		<b>V</b> Viton	

## TECHNICAL FEATURES

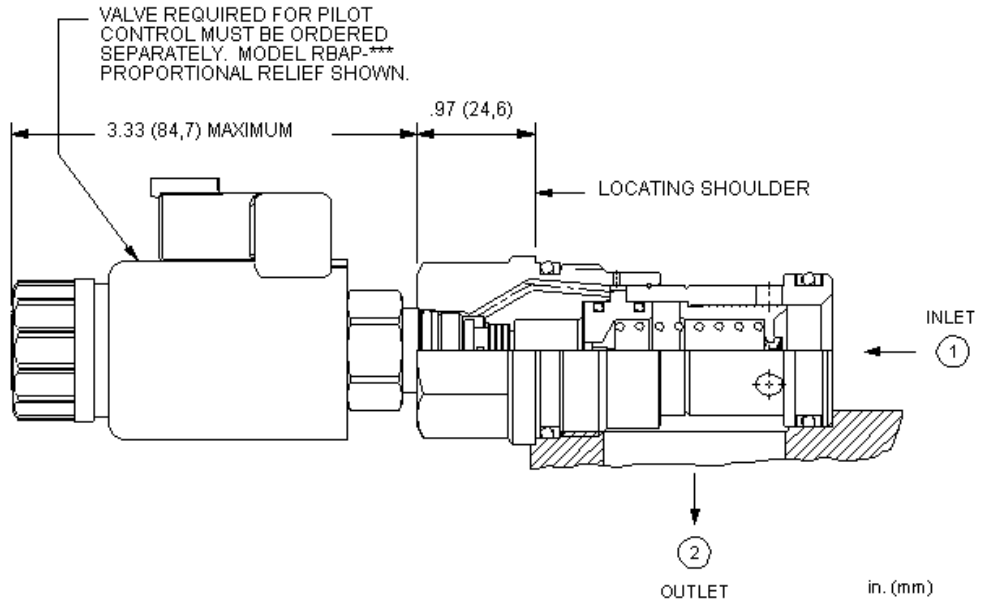
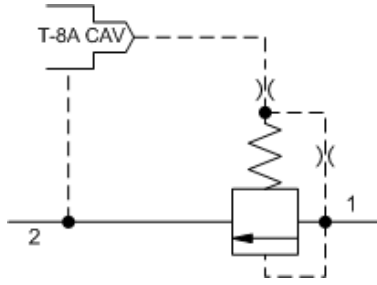
- Because the modulating occurs inside the cartridge, these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RPIS](#) Pilot-operated, balanced poppet relief valve



This valve is a normally closed modulating element that incorporates an integral pilot control cavity. It is a balanced piston design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge's setting, the modulating element starts to open to tank (port 2), throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between port 1 and port 2.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-16A
Series	3
Capacity	380 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Main stage leakage at 110 SUS (24 cSt)	65 cc/min.@70 bar
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990016007
Seal kit - Cartridge	EPDM: 990016014
Seal kit - Cartridge	Polyurethane: 990016002
Seal kit - Cartridge	Viton: 990016006
Model Weight	0.30 kg.

**NOTES**

Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

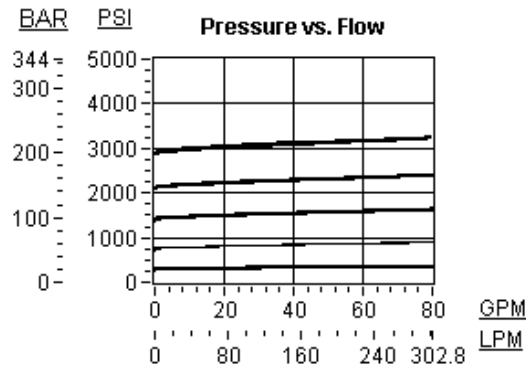
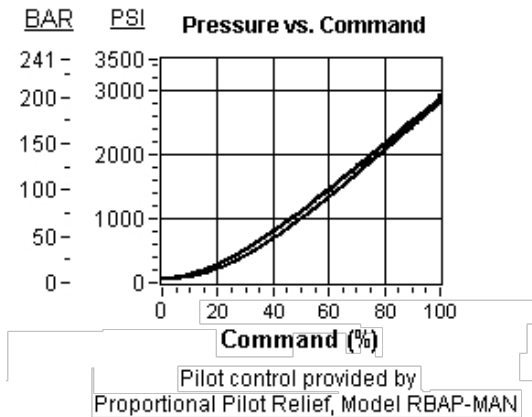
**Model Code Example: RPIC8WN**

ADJUSTMENT RANGE	(W)	SEAL MATERIAL	(N)
W 100 - 5000 psi (7 - 350 bar)		N Buna-N	
D 25 - 3000 psi (1,7 - 210 bar)		E EPDM	
		V Viton	

## TECHNICAL FEATURES

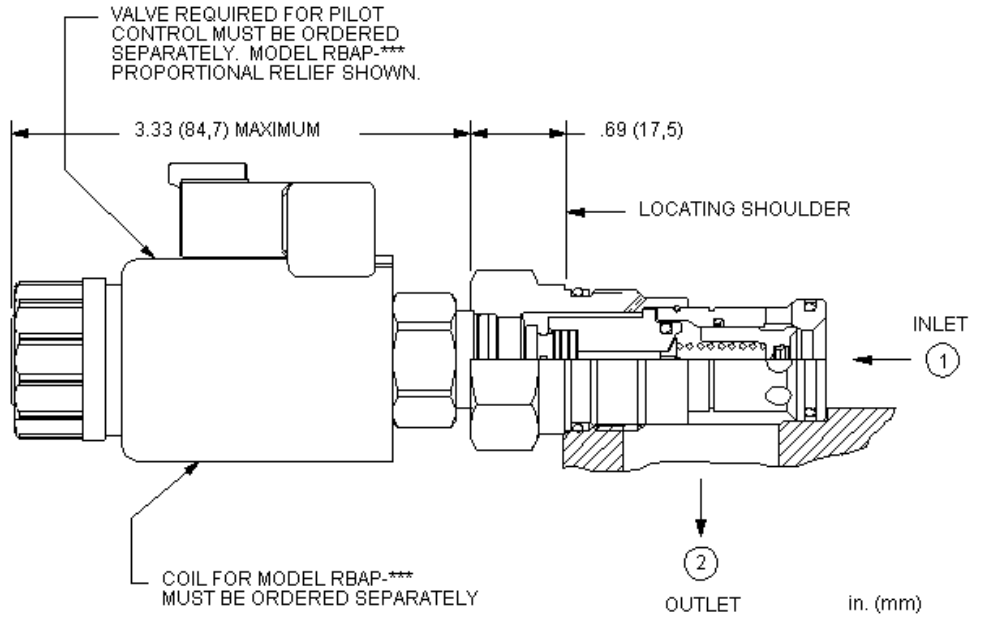
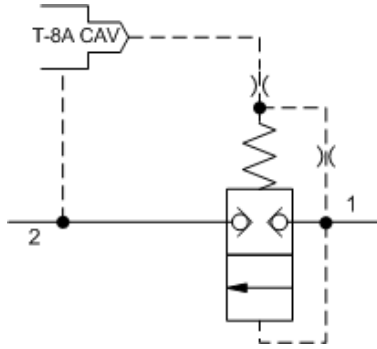
- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RPIC](#) Pilot-operated, balanced piston relief valve



This valve is a normally closed modulating element that incorporates an integral pilot control cavity. It is a balanced poppet design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge's setting, the poppet element starts to open to tank (port 2), throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between port 1 and port 2.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-3A
Series	2
Capacity	200 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Pilot Control Valve Hex Size	22,2 mm
Main stage leakage at reseal	0,7 cc/min.
Response Time - Typical	2 ms
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990303007
Seal kit - Cartridge	EPDM: 990303014
Seal kit - Cartridge	Polyurethane: 990303002
Seal kit - Cartridge	Viton: 990303006
Model Weight	0.18 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

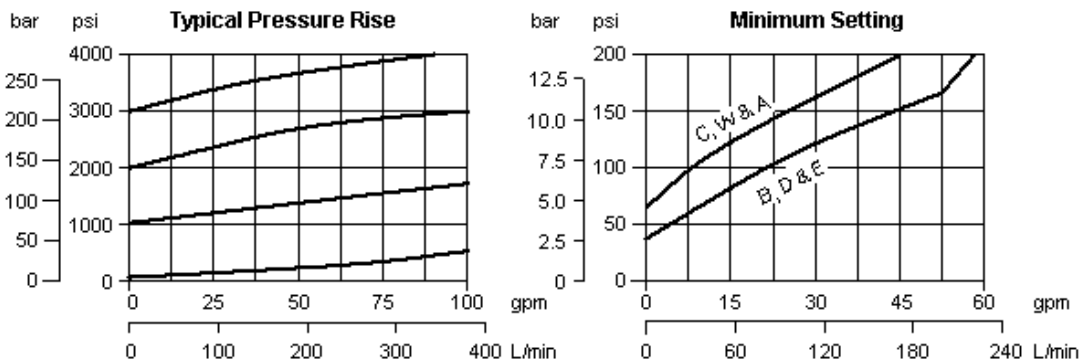
**Model Code Example: RPGS8BN**

ADJUSTMENT RANGE	(B)	SEAL MATERIAL	(N)
B 50 - 1500 psi (3,5 - 105 bar)		N Buna-N	
W 100 - 5000 psi (7 - 350 bar)		E EPDM	
		V Viton	

## TECHNICAL FEATURES

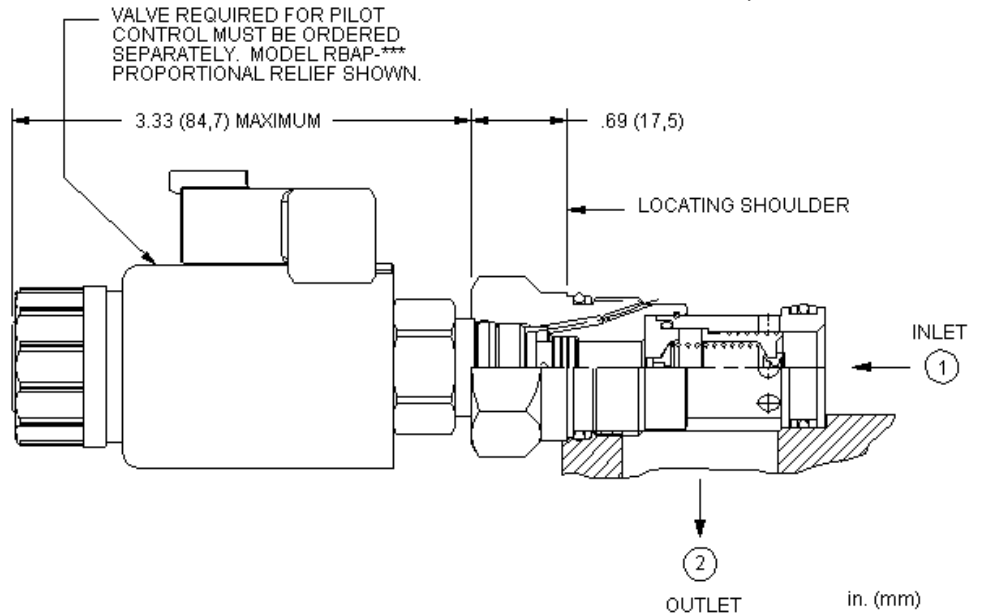
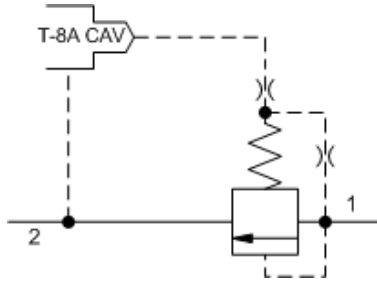
- Because the modulating occurs inside the cartridge, these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RPGS](#) Pilot-operated, balanced poppet relief valve



This valve is a normally closed modulating element that incorporates an integral pilot control cavity. It is a balanced piston design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge's setting, the modulating element starts to open to tank (port 2), throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between port 1 and port 2.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-3A
Series	2
Capacity	200 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Pilot Control Cavity	T-8A
Main stage leakage at 110 SUS (24 cSt)	50 cc/min.@70 bar
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	EPDM: 990203014
Seal kit - Cartridge	Polyurethane: 990003002
Seal kit - Cartridge	Viton: 990203006
Model Weight	0.13 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

**Model Code Example: RPGC8WN**

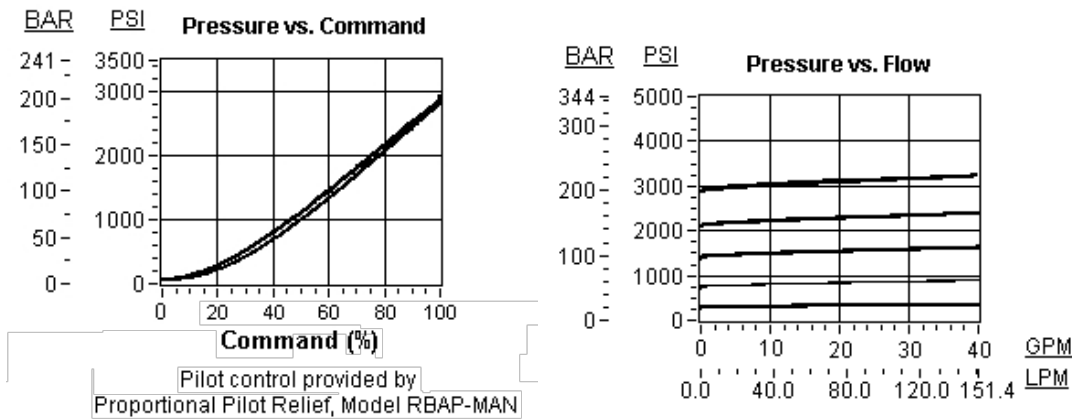
ADJUSTMENT RANGE	(W)	SEAL MATERIAL	(N)
W 100 - 5000 psi (7 - 350 bar)		N Buna-N	
D 25 - 3000 psi (1,7 - 210 bar)		E EPDM	
		V Viton	



## TECHNICAL FEATURES

- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

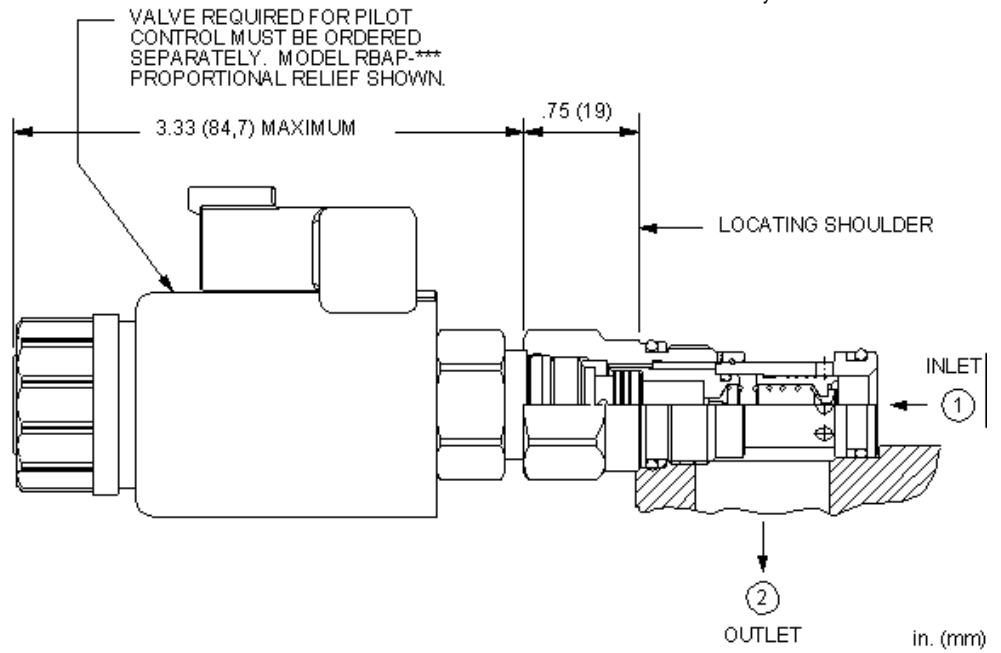
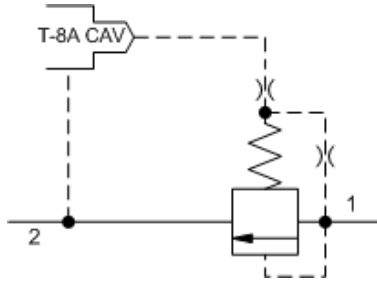
## PERFORMANCE CURVES



## RELATED MODELS

- [RPGC](#) Pilot-operated, balanced piston relief valve
- [RPGC3](#) Non-adjustable pilot-operated, balanced piston relief valve





This valve is a normally closed modulating element that incorporates an integral pilot control cavity. It is a balanced piston design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge's setting, the modulating element starts to open to tank (port 2), throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between port 1 and port 2.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-10A
Series	1
Capacity	95 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Pilot Control Valve Hex Size	22,2 mm
Main stage leakage at 110 SUS (24 cSt)	30 cc/min.@70 bar
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	EPDM: 990010014
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006
Model Weight	0.09 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

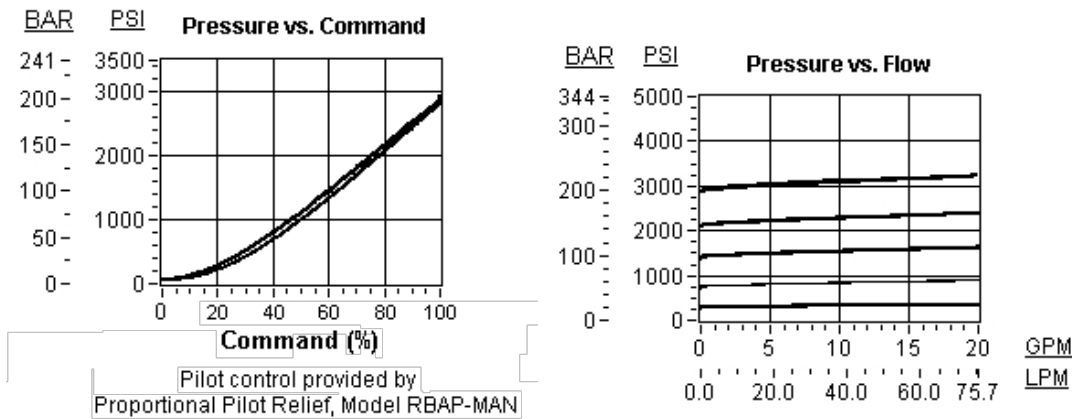
**Model Code Example: RPEC8WN**

ADJUSTMENT RANGE	(W)	SEAL MATERIAL	(N)
W 100 - 5000 psi (7 - 350 bar)		N Buna-N	
D 25 - 3000 psi (1,7 - 210 bar)		E EPDM	
		V Viton	

## TECHNICAL FEATURES

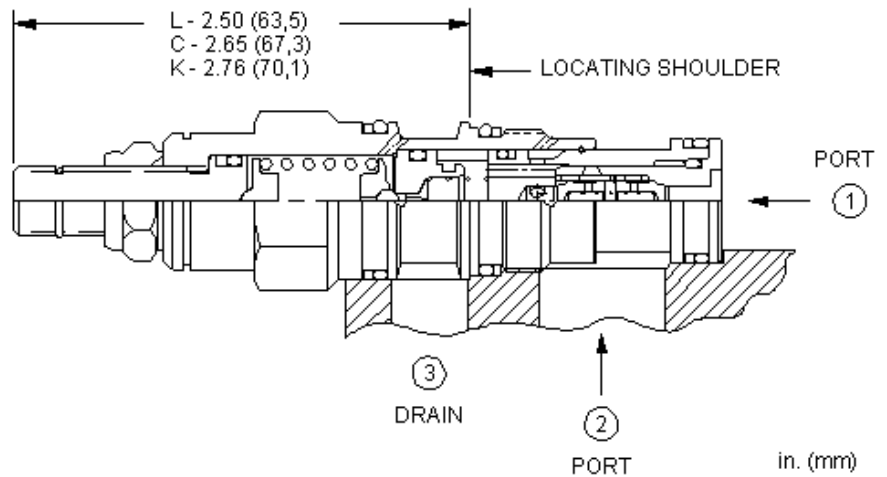
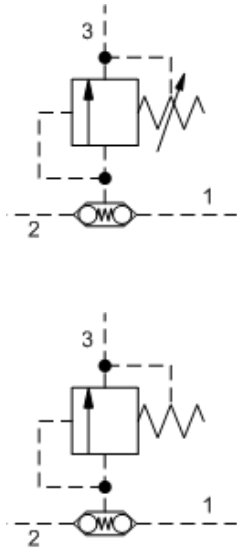
- All 2-port relief cartridges (except pilot reliefs) are physically and functionally interchangeable (same flow path, same cavity for a given frame size).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Main stage orifice is protected by a 150-micron stainless steel screen.
- Not suitable for use in load holding applications due to spool leakage.
- Back pressure on the tank port (port 2) is directly additive to the valve setting at a 1:1 ratio.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RPEC](#) Pilot-operated, balanced piston relief valve



This direct-acting, pilot relief cartridge incorporates back-to-back check valves. This allows it to remotely control 2 other pilot-operated valves or act as a thermal relief for both ends of an actuator. Because capacity is limited to pilot flow, this valve should be used with other valves with comparable pilot flows.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	1 L/min.
Maximum Valve Leakage at 110 SUS (24 cSt)	0,3 cc/min.
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.16 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

**CONFIGURATION OPTIONS**

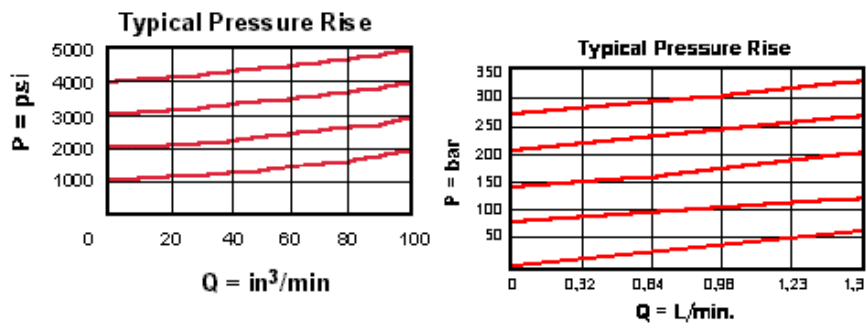
**Model Code Example: RBADLAN**

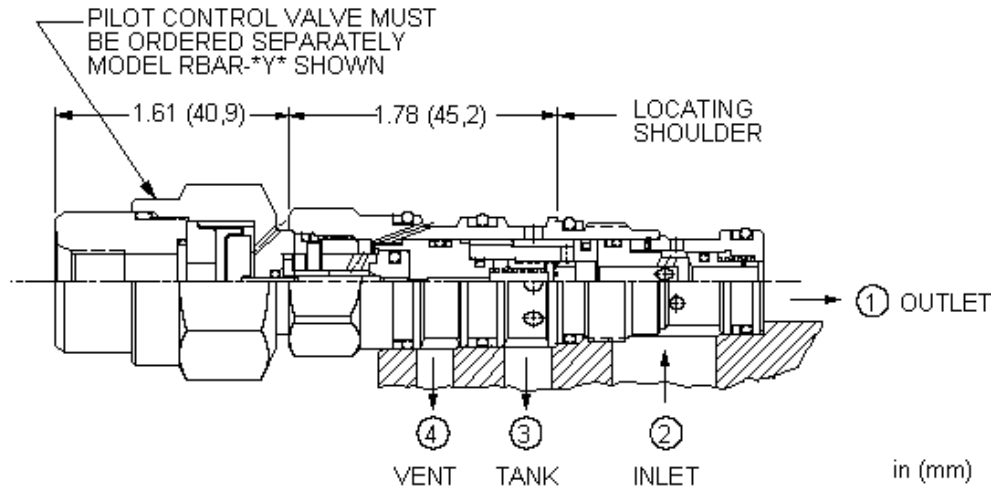
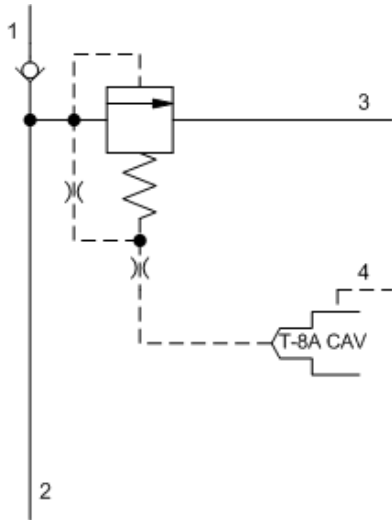
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 25 - 3000 psi (1,7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 25 - 1500 psi (1,7 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 25 - 6000 psi (1,7 - 420 bar), 1000 psi (70 bar) Standard Setting		/LH Mild Steel, Zinc-Nickel
<b>O</b> Handknob with Panel Mount	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 25 - 4500 psi (1,7 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- The back-to-back check valves prevent cross talk between the two valves that are being remote controlled.
- One adjustment controls two valves.
- Check cracking pressure is 15 psi (1 bar).
- Pressure at port 3 is directly additive to the valve setting.
- Suitable for load holding applications
- The term thermal relief means it prevents overpressure due to thermal expansion of the fluid.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





The relief-before-check cartridge is a CavitySaver™ (multi-function) valve incorporating a normally closed, balanced piston modulating element tee'd in before a check function. The valve incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 2) reaches the pilot control valve setting, the modulating element starts to open to tank (port 3), throttling flow to regulate the pressure. The T-8A pilot section is drained to port 4. The check valve flow is from the inlet (port 2) to the system port (port 1).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-21A
Series	1
Capacity	40 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.@70 bar
Check Cracking Pressure	1,7 bar
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Response Time - Typical	10 ms
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	EPDM: 990021014
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006
Model Weight	0.14 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

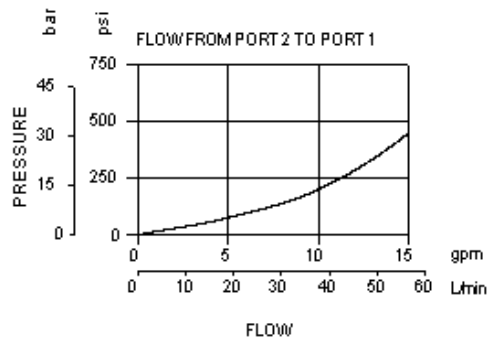
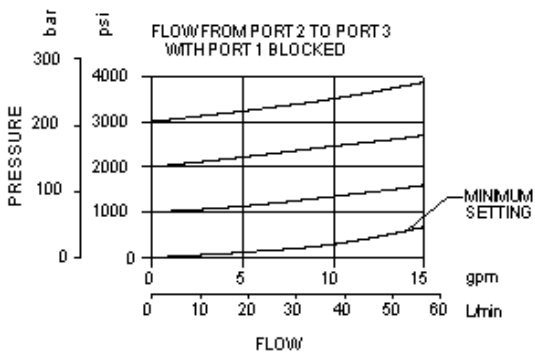
**CONFIGURATION OPTIONS**
**Model Code Example: HVCA8DN**

BIAS PRESSURE	(D)	SEAL MATERIAL	(N)
D 75 psi (5 bar)		N Buna-N	
		E EPDM	
		V Viton	

## TECHNICAL FEATURES

- Note! This valve deviates from Sun's normal flow path for relief valves. It is probably not useable in current Sun relief manifolds.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- The main stage orifice is protected against contamination.
- The check portion of the valve has a maximum leakage rate of less than 1 drop/minute (0,07 cc/min).
- One purpose of this dual function cartridge is to offer pump isolation and relief protection in single and/or multiple pump circuits. Another purpose is to act as a main stage in an accumulator sense, pump unload circuit.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

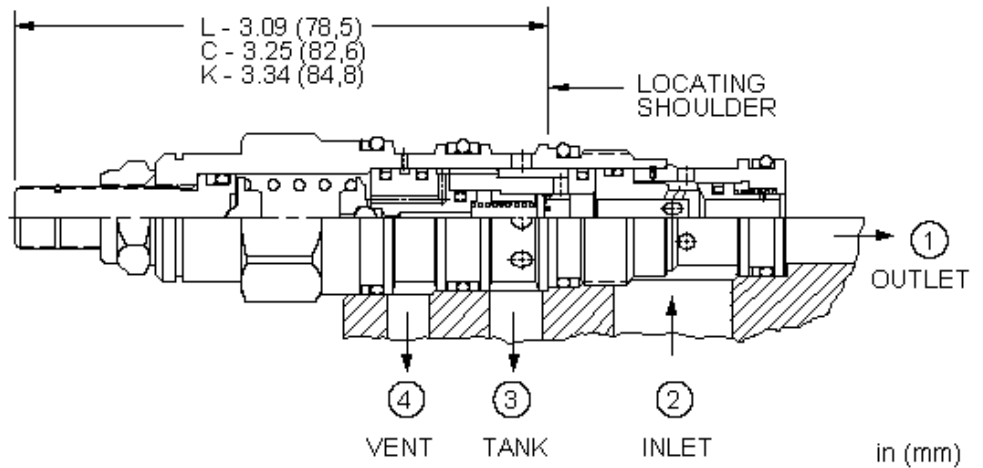
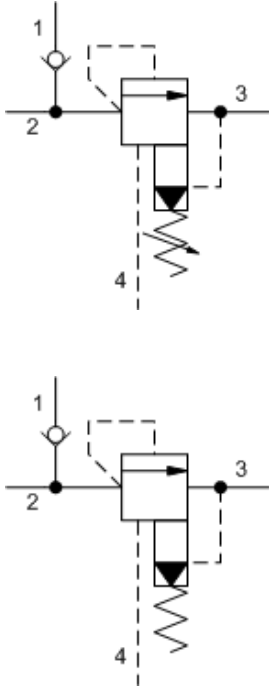
## PERFORMANCE CURVES



## RELATED MODELS

- [HVCA](#) Ventable, pilot-operated, balanced piston relief valve - before check





The ventable relief-before-check cartridge is a CavitySaver™ (multi-function) valve incorporating a ventable, pilot-operated, balanced piston relief tee'd in before a check function. When the pressure at the inlet (port 2) reaches the relief valve setting, the valve starts to open to tank (port 3), throttling flow to regulate the pressure. The check valve flow is from the inlet (port 2) to the system port (port 1). The valve includes a vent port (port 4) that connects between the main piston and pilot stage to provide for remote control by other pilot or 2-way valves.

These valves are accurate, have low pressure rise vs. flow, are smooth, quiet, and are moderately fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-21A
Series	1
Capacity	40 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.@70 bar
Check Cracking Pressure	1,7 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006
Model Weight	0.19 kg.

**CONFIGURATION OPTIONS**

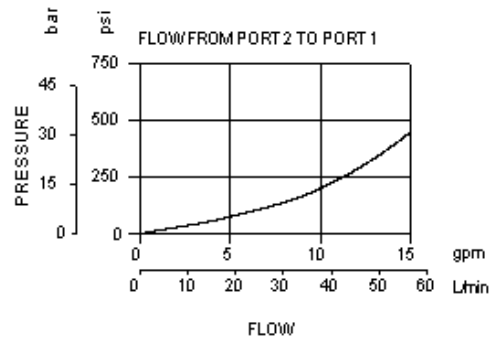
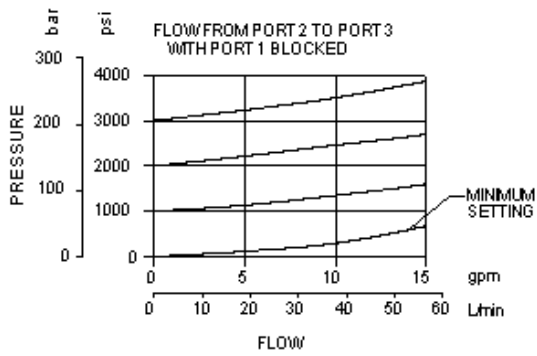
**Model Code Example: HVCALAN**

CONTROL	(L)	ADJUSTMENT RANGE	(A)	SEAL MATERIAL	(N)
L Standard Screw Adjustment		A 75 - 3000 psi (5 - 210 bar), 1000 psi (70 bar) Standard Setting		N Buna-N	
C Tamper Resistant - Factory Set		B 75 - 1500 psi (5 - 105 bar), 1000 psi (70 bar) Standard Setting		V Viton	
K Handknob		D 75 - 800 psi (5 - 55 bar), 400 psi (28 bar) Standard Setting			
		W 75 - 4500 psi (5 - 315 bar), 1000 psi (70 bar) Standard Setting			

## TECHNICAL FEATURES

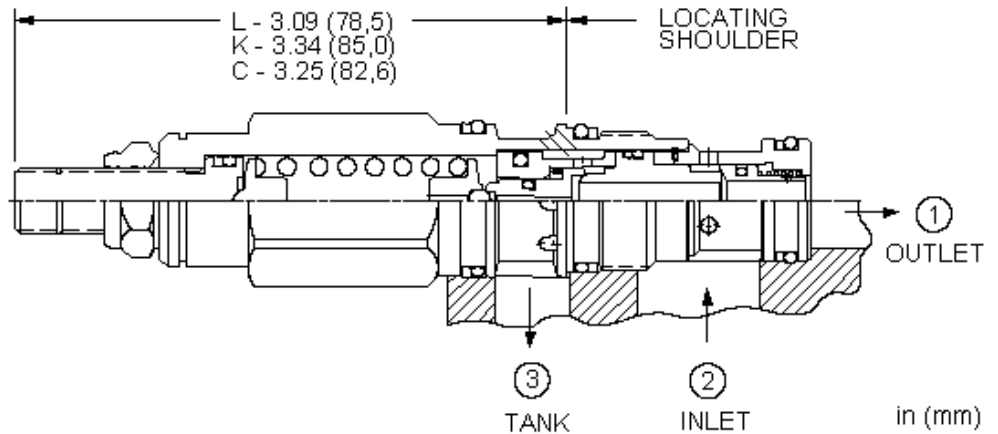
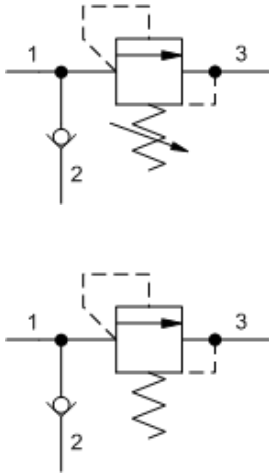
- Note! This valve deviates from Sun's normal flow path for relief valves. It is probably not useable in current Sun relief manifolds.
- Minimum setting is 75 psi (5 bar) for all spring ranges.
- Back pressure at port 3 (tank) is directly additive to the valve setting at a 1:1 ratio.
- The check portion of the valve has a maximum leakage rate of less than 1 drop/minute (0,07 cc/min).
- One purpose of this dual function cartridge is to offer pump isolation and relief protection in single and/or multiple pump circuits. Another purpose is to act as a main stage in an accumulator sense, pump unload circuit.
- A remote pilot relief on port 4 (vent) will control the valve below its own setting.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [HVCA8](#) Ventable, pilot-operated, balanced piston relief main stage with integral T-8A control cavity - before check



The relief-after-check cartridge is a CavitySaver™ (multi-function) valve incorporating a direct-acting relief tee'd in after a check function. The check valve flow is from the inlet (port 2) to the system port (port 1). When the pressure in the system (port 1) reaches the relief valve setting, the valve starts to open to tank (port 3), throttling flow to limit the pressure rise. These valves are smooth and quiet, essentially zero-leak, dirt-tolerant, immune to silting and are very fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	40 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,3 cc/min.
Check Cracking Pressure	1,7 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	6
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.20 kg.

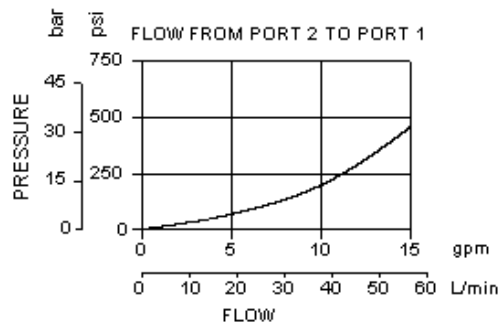
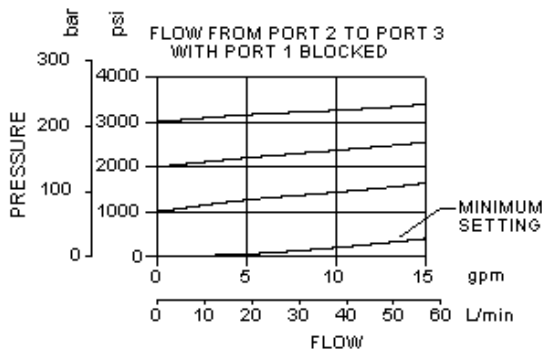
**CONFIGURATION OPTIONS**
**Model Code Example: HRDBLAN**

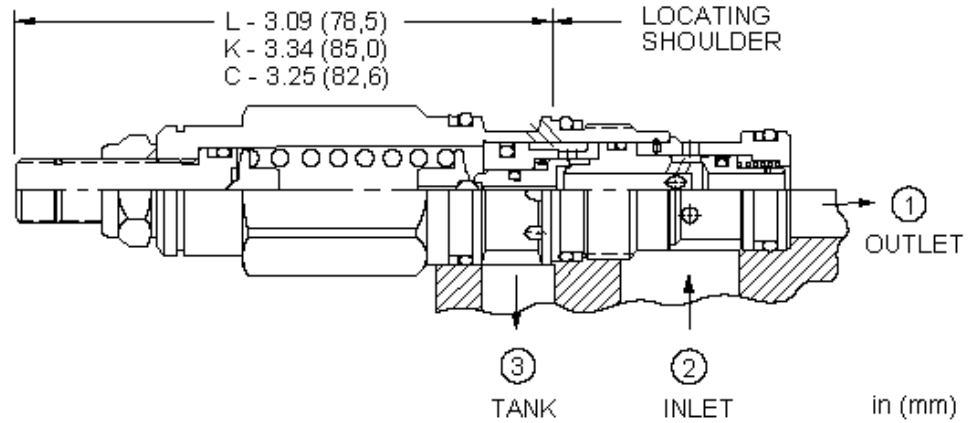
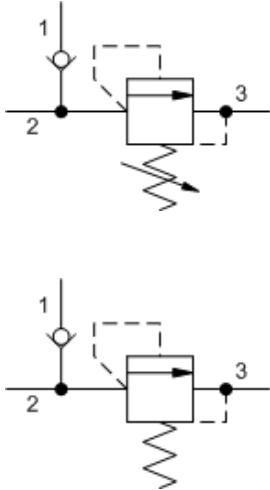
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 500 - 3000 psi (35 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 800 - 4500 psi (55 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
<b>K</b> Handknob			/LH Mild Steel, Zinc-Nickel

## TECHNICAL FEATURES

- Note! This valve deviates from Sun's normal flow path for relief valves. It is probably not useable in current Sun relief manifolds.
- This cartridge can be used to provide relief protection on the system side of the circuit.
- The seals on the adjust screw are exposed to system pressure which means this valve can only be adjusted when the pressure is removed. The setting procedure is; check the setting, remove the pressure, adjust the valve, check the new setting.
- Select a spring range where the desired relief setting is approximately mid-range to high between the minimum and maximum pressure to ensure maximum valve repeatability.
- Suitable for use in load holding applications.
- The check portion of the valve has a maximum leakage rate of less than 1 drop/minute (0,07 cc/min).
- The direct acting relief exhibits rapid response characteristics that minimize pressure overshoot and also provides low reseal leakage (less than 5 drops/min (0,3 cc/min) @ 85% of cracking pressure), check valve leakage is less than 1 drop/min (0,07 cc/min).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





The relief-before-check cartridge is a CavitySaver™ (multi-function) valve incorporating a direct-acting relief tee'd in before a check function. When the pressure at the inlet (port 2) reaches the relief valve setting, the valve starts to open to tank (port 3), throttling flow to limit the pressure rise. The check valve flow is from the inlet (port 2) to the system port (port 1). These valves are smooth and quiet, essentially zero leak, dirt tolerant, immune to silting and are very fast.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	40 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reset	0,3 cc/min.
Check Cracking Pressure	1,7 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	6
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.20 kg.

**CONFIGURATION OPTIONS**

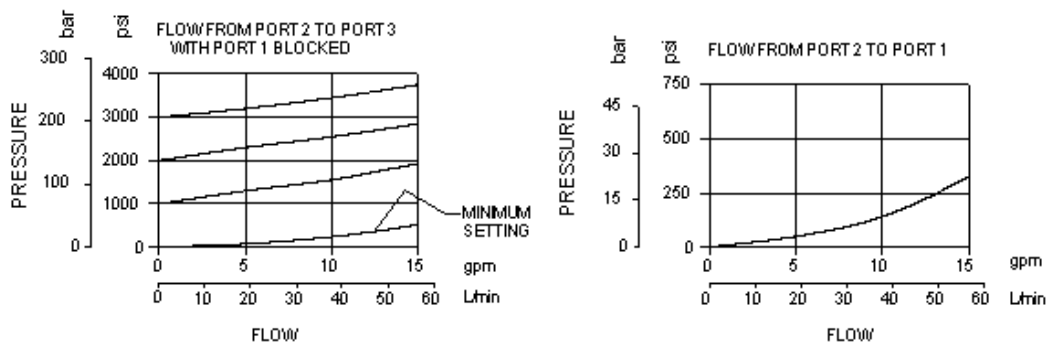
**Model Code Example: HRDALAN**

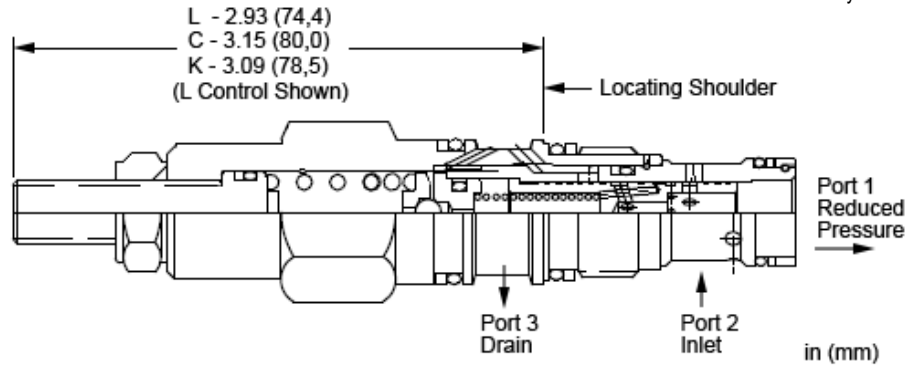
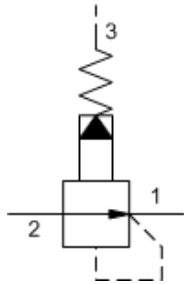
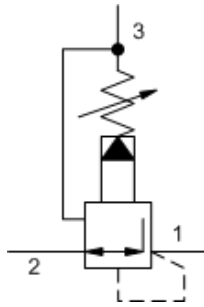
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 500 - 3000 psi (35 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>D</b> 200 - 700 psi (14 - 50 bar), 400 psi (28 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>W</b> 800 - 4500 psi (55 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- Note! This valve deviates from Sun's normal flow path for relief valves. It is probably not useable in current Sun relief manifolds.
- The seals on the adjust screw are exposed to system pressure which means this valve can only be adjusted when the pressure is removed. The setting procedure is; check the setting, remove the pressure, adjust the valve, check the new setting.
- Select a spring range where the desired relief setting is approximately mid-range to high between the minimum and maximum pressure to ensure maximum valve repeatability.
- Suitable for use in load holding applications.
- The check portion of the valve has a maximum leakage rate of less than 1 drop/minute (0,07 cc/min).
- One purpose of this dual function cartridge is to offer pump isolation and relief protection in single and/or multiple pump circuits. Another purpose is to act as a main stage in an accumulator sense, pump unload circuit.
- The direct acting relief exhibits rapid response characteristics that minimize pressure overshoot and also provides low reseal leakage (less than 5 drops/min (0,3 cc/min) @ 85% of cracking pressure), check valve leakage is less than 1 drop/min (0,07 cc/min).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-163A
Series	0
Capacity	20 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	12,7 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	EPDM: 990163014
Seal kit - Cartridge	Polyurethane: 990163002
Seal kit - Cartridge	Viton: 990163006
Model Weight	0.13 kg.

**NOTES** Maximum pressure differentials for spring ranges: A and B are 3000 psi (210 bar) N and Q are 2000 psi (140 bar) W is 5000 psi (350 bar) inlet pressure

**CONFIGURATION OPTIONS**

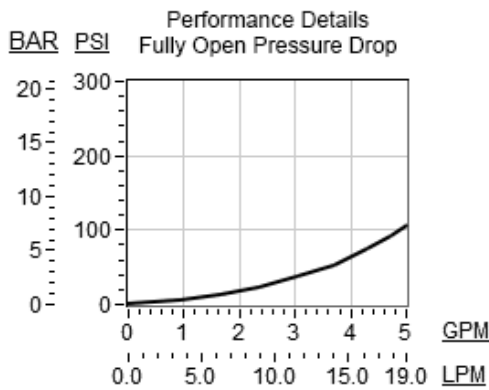
**Model Code Example: PPBBLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 75 - 3000 psi (5 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 75 - 1500 psi (5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>N</b> 75 - 800 psi (5 - 55 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
	<b>Q</b> 75 - 400 psi (5 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 100 - 4500 psi (7 - 315 bar), 200 psi (14 bar) Standard Setting		

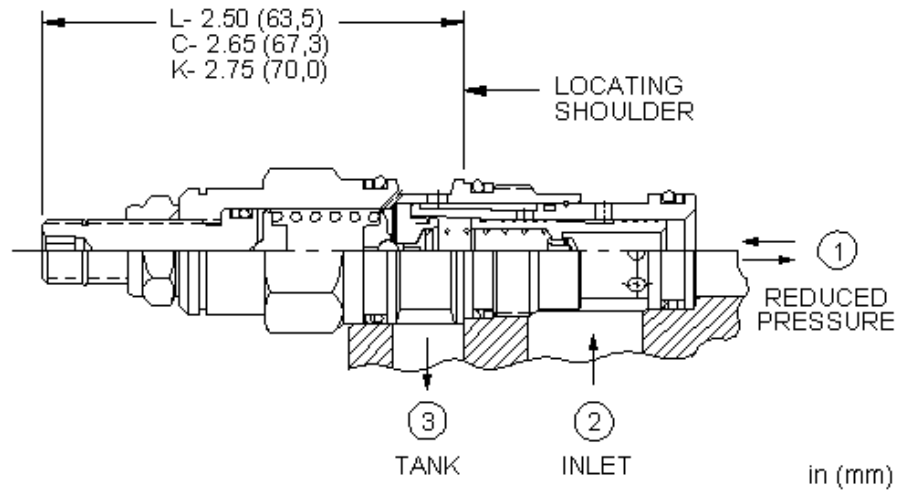
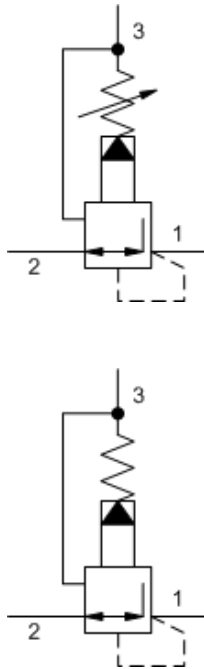
## TECHNICAL FEATURES

- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- If pilot flow consumption is critical, consider using direct acting reducing/relieving valves.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES







Pilot-operated, pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	40 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	EPDM: 990011014
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.15 kg.

**NOTES**

- Maximum pressure differentials for spring ranges: A and B are 3000 psi (210 bar) N and Q are 2000 psi (140 bar) W is 5000 psi (350 bar) inlet pressure
- For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

## CONFIGURATION OPTIONS

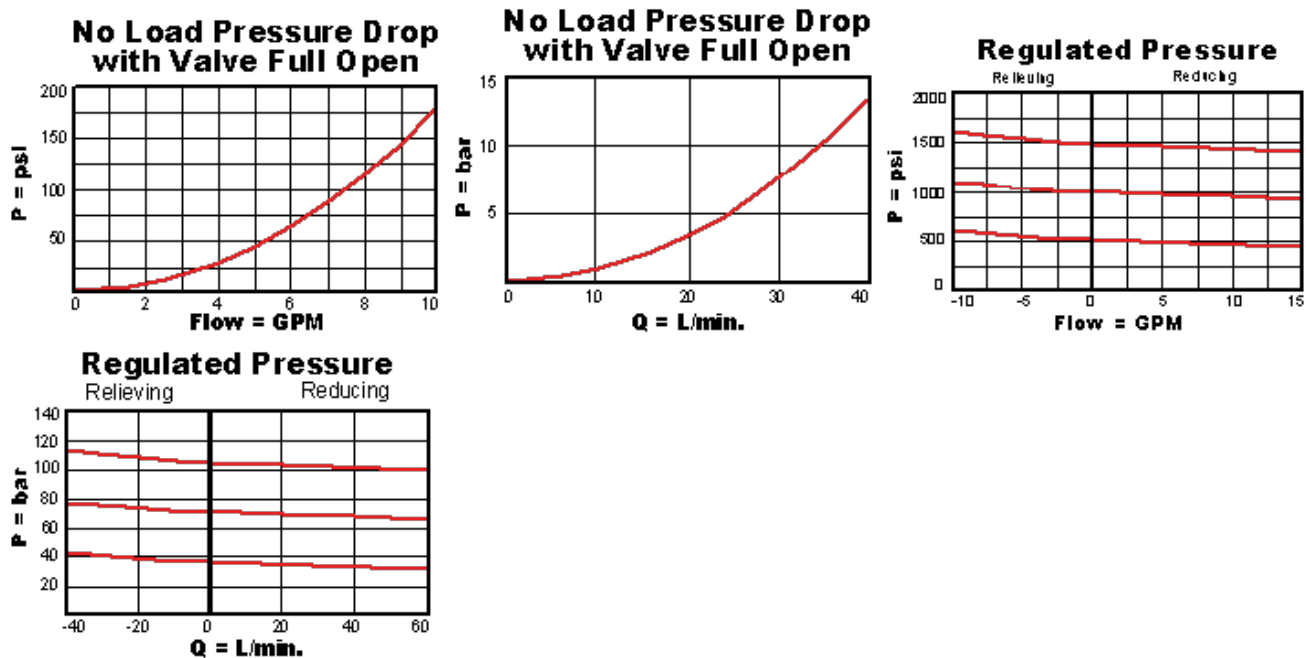
## Model Code Example: PPDBLAN

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting		/LH Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob	<b>N</b> 60 - 800 psi (4 - 55 bar), 200 psi (14 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

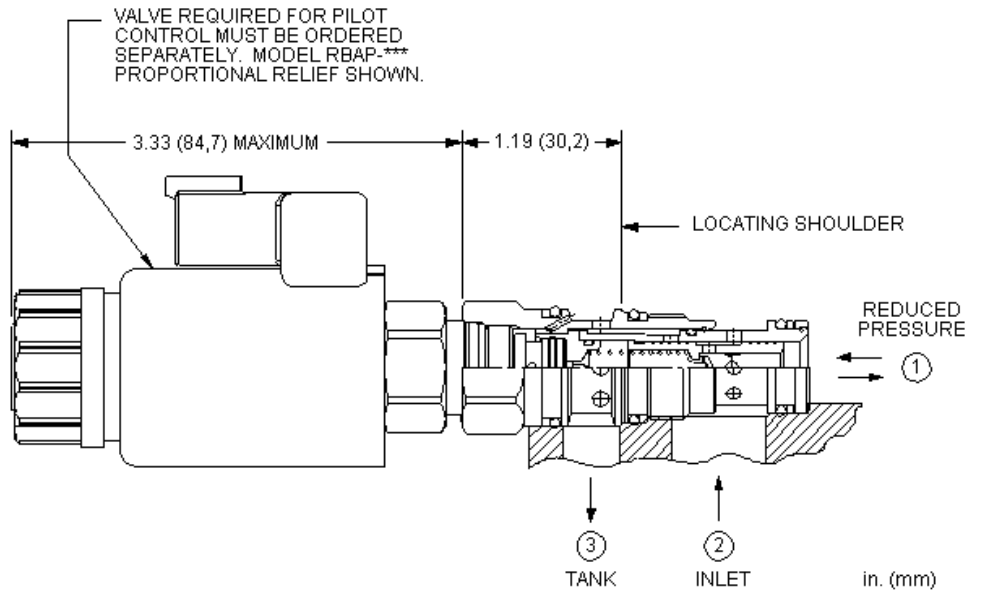
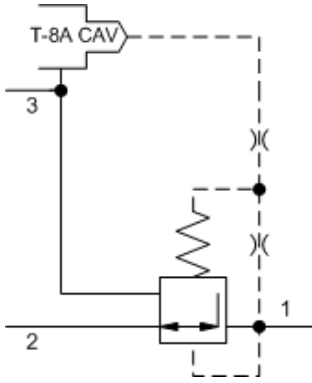
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- If pilot flow consumption is critical, consider using direct acting reducing/relieving valves.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PPDB8](#) Pilot-operated, pressure reducing/relieving main stage with integral T-8A control cavity



This valve is a 3-way, normally open modulating element that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full flow relief function from port 1 to tank (port 3). The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the tank (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	40 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Pilot Control Valve Hex Size	22,2 mm
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	EPDM: 990011014
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.10 kg.

**NOTES**

Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**
**Model Code Example: PPDB8WN**
**MINIMUM CONTROL PRESSURE (W) SEAL MATERIAL (N)**
**W** 100 psi (7 bar)

**N** Buna-N

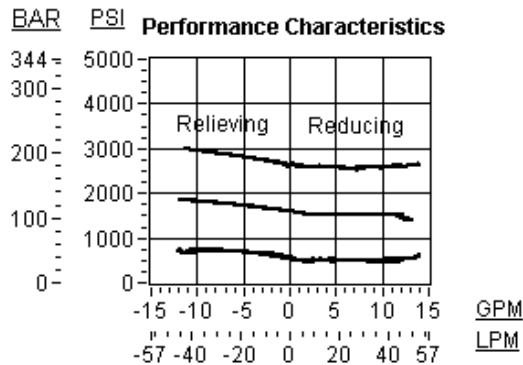
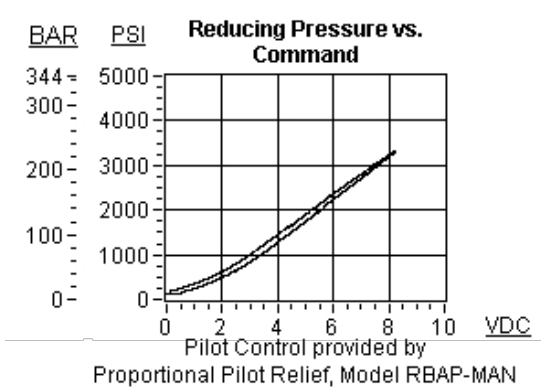
**D** 25 psi (1,7 bar)

**V** Viton

## TECHNICAL FEATURES

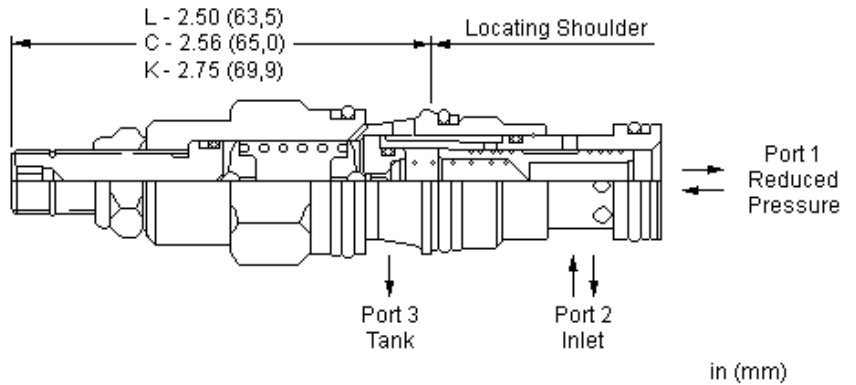
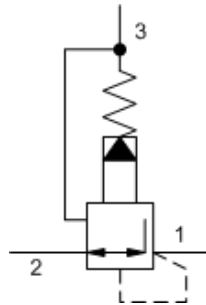
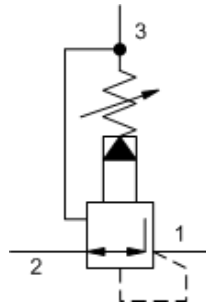
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PPDB](#) Pilot-operated, pressure reducing/relieving valve



Pilot-operated, pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	40 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.15 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

**CONFIGURATION OPTIONS**

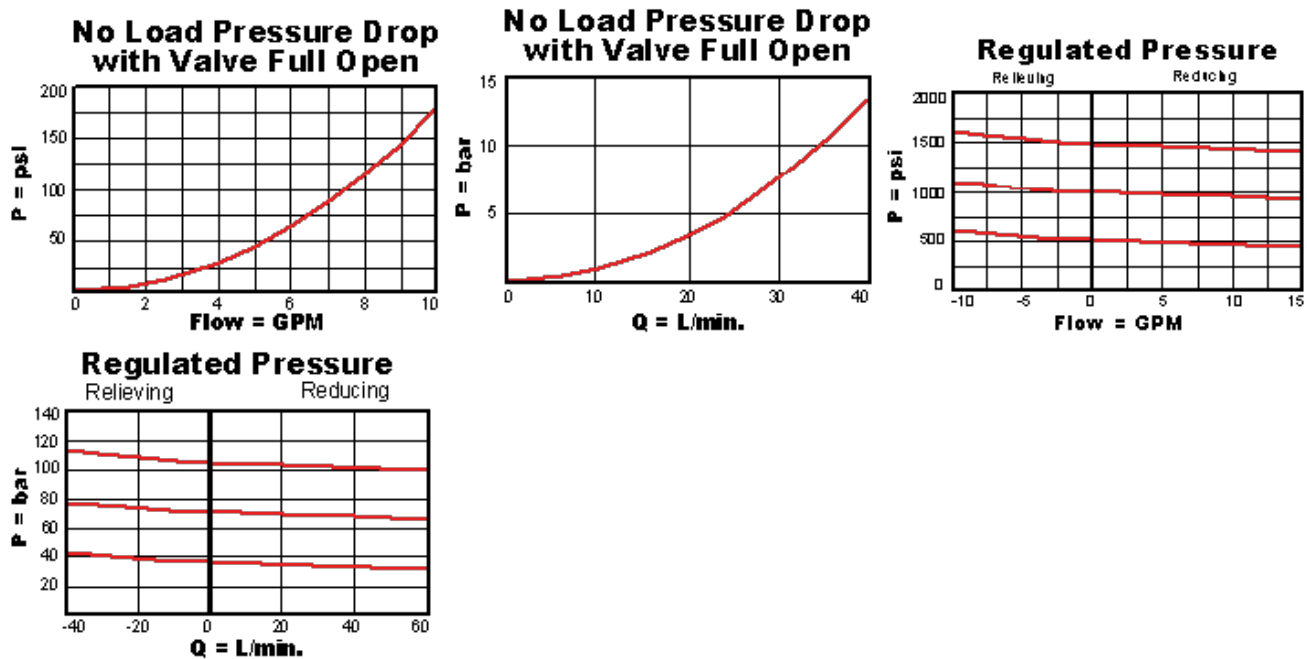
**Model Code Example: PPDFLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N)
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	
<b>K</b> Handknob	<b>N</b> 60 - 800 psi (4 - 55 bar), 200 psi (14 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

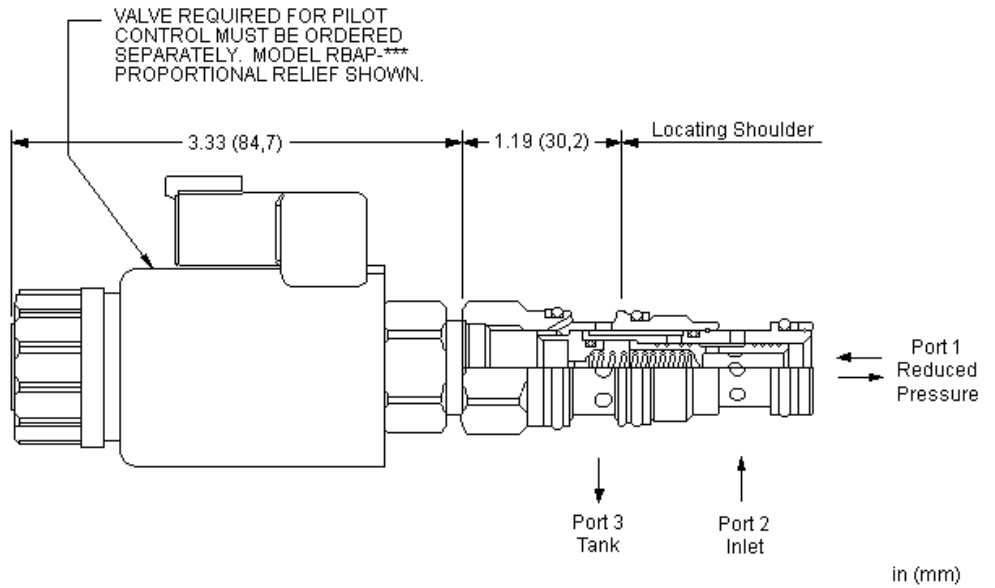
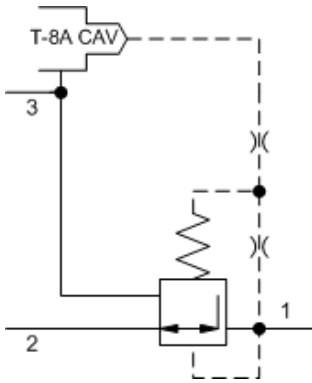
- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- If pilot flow consumption is critical, consider using direct acting reducing/relieving valves.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PPDF8](#) Pilot-operated, pressure reducing/relieving main stage with drilled piston orifice and integral T-8A control cavity



This valve is a 3-way, normally open modulating element that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full flow relief function from port 1 to tank (port 3). The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the tank (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	40 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Pilot Control Valve Hex Size	22,2 mm
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.10 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

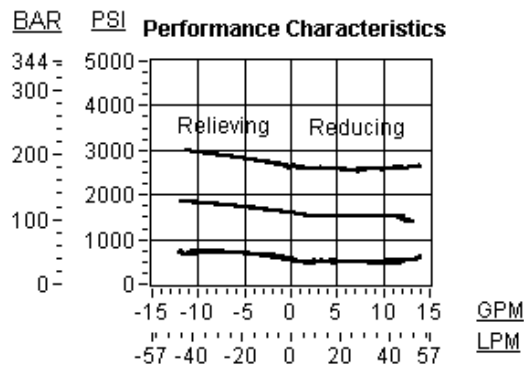
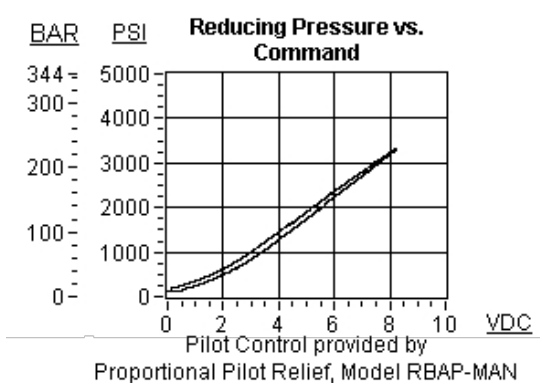
**Model Code Example: PPDF8WN**

MINIMUM CONTROL PRESSURE (W)	SEAL MATERIAL (N)
<b>W</b> 100 psi (7 bar)	<b>N</b> Buna-N
<b>D</b> 25 psi (1,7 bar)	<b>V</b> Viton

## TECHNICAL FEATURES

- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

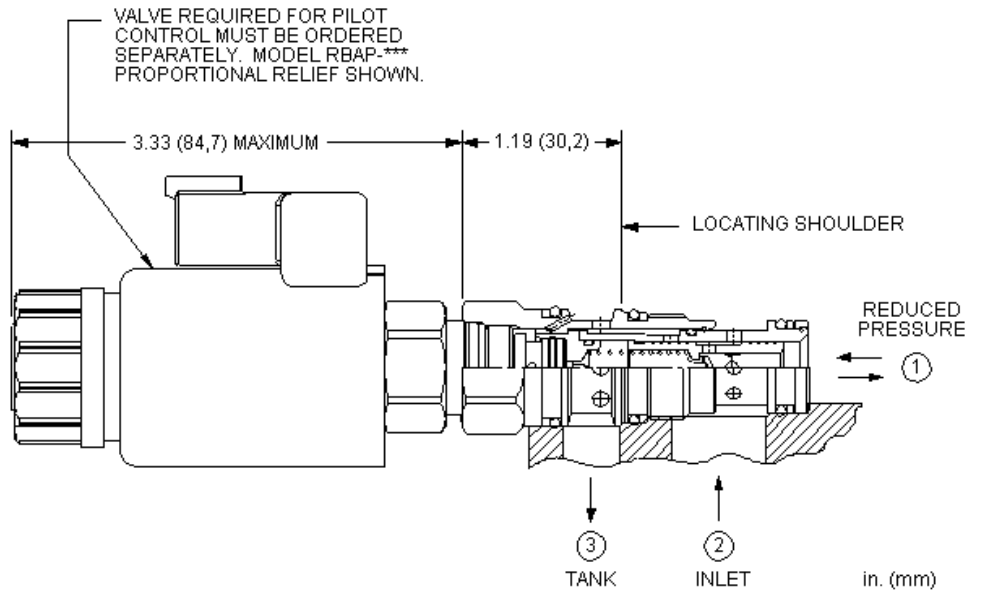
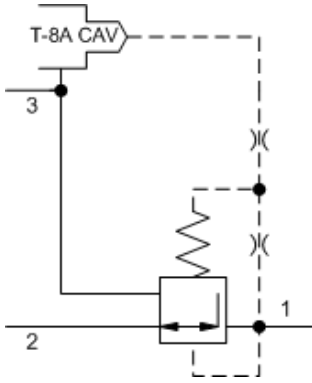
## PERFORMANCE CURVES



## RELATED MODELS

- [PPDF](#) Pilot-operated, pressure reducing/relieving valve with drilled piston orifice





This valve is a 3-way, normally open modulating element that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full flow relief function from port 1 to tank (port 3). The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the tank (port 3).

This valve is open in the transition from reducing to relieving which provides good pressure control and dynamic response at the expense of higher pilot flow in the deadheaded condition.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	40 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,40 - 0,50 L/min.
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Pilot Control Valve Hex Size	22,2 mm
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	EPDM: 990011014
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.10 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

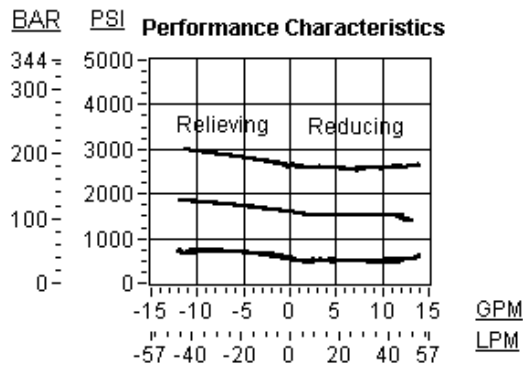
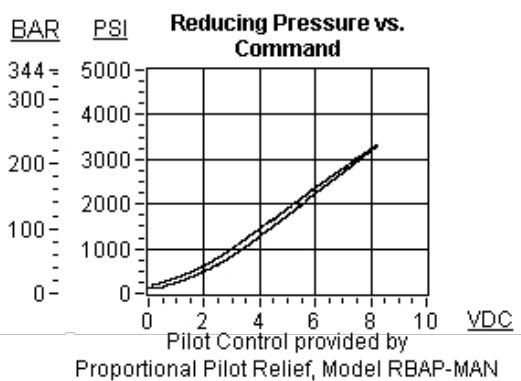
**CONFIGURATION OPTIONS**
**Model Code Example: PPDL8WN**
**MINIMUM CONTROL PRESSURE (W) SEAL MATERIAL (N)**

<b>W</b> 150 psi (10,5 bar)	<b>N</b> Buna-N
<b>D</b> 100 psi (7 bar)	<b>E</b> EPDM
	<b>V</b> Viton

## TECHNICAL FEATURES

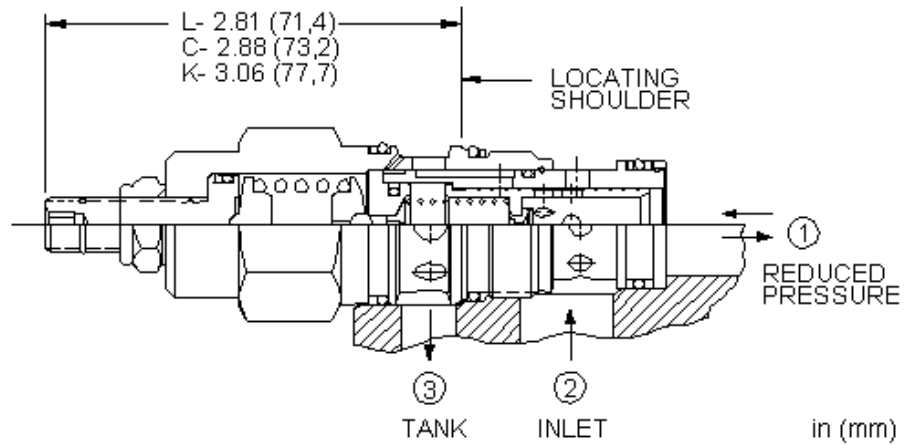
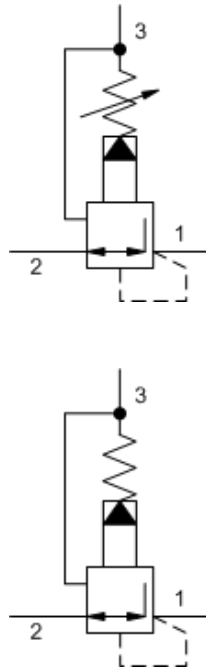
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- This valve has been optimized to work with the RBAP X\*\*, RBAP L\*\*, and RBAN electro-proportional pilot reliefs.
- The transition from reducing to relieving is slightly open. The result is very good pressure control with oil consumption of about 0.1 gpm (0,4 L/min.). The relatively high pilot control flow is only a factor in a dead-headed condition.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PPDL](#) Pilot-operated, pressure reducing/relieving valve



Pilot-operated, pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	80 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	EPDM: 990202014
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.27 kg.

**NOTES**

- Maximum pressure differentials for spring ranges: A and B are 3000 psi (210 bar) N and Q are 2000 psi (140 bar) W is 5000 psi (350 bar) inlet pressure
- For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

**CONFIGURATION OPTIONS**

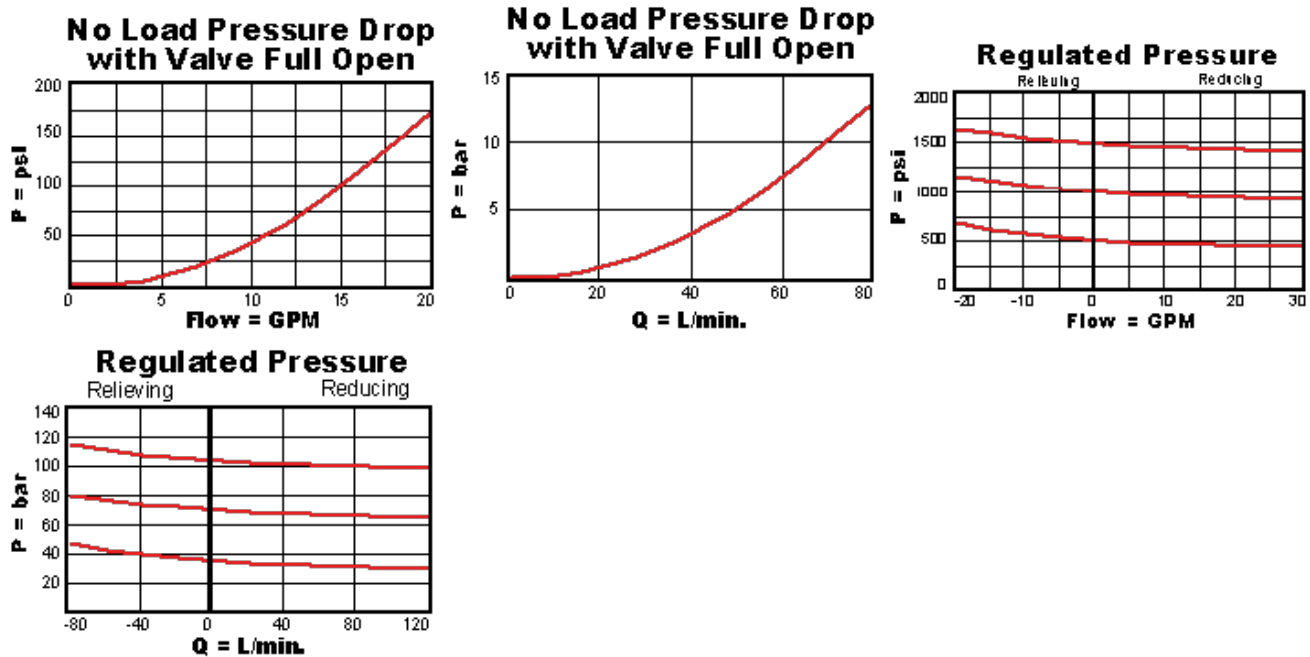
**Model Code Example: PPFBLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>M</b> Capped Screw Adjustment with Lockwire Holes	<b>N</b> 60 - 800 psi (4 - 55 bar), 200 psi (14 bar) Standard Setting		
<b>Q</b> Capped and Lockwired	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
<b>W</b> Hex Wrench Adjustment			
<b>Y</b> Tri-Grip Handknob			

## TECHNICAL FEATURES

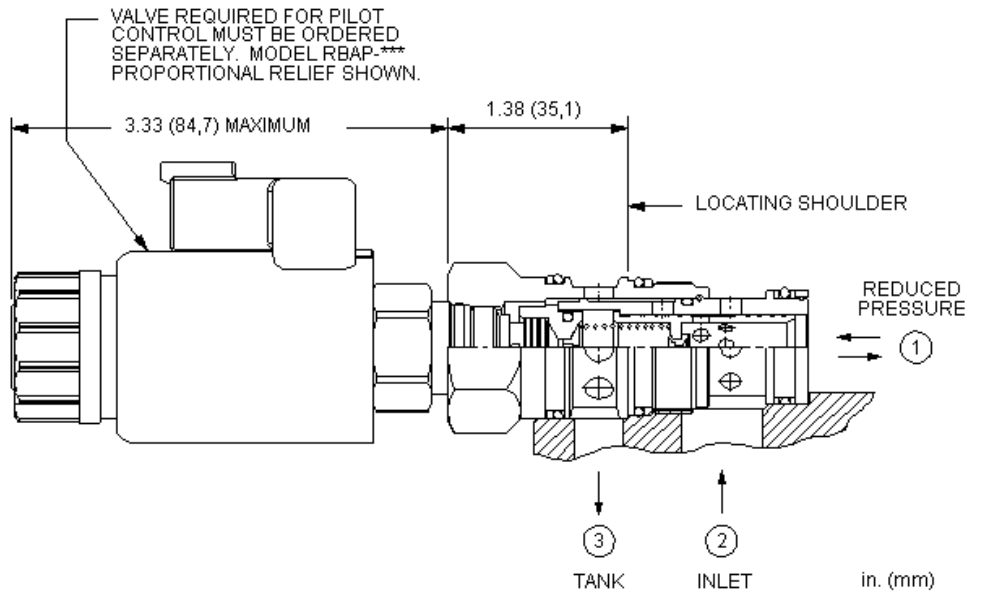
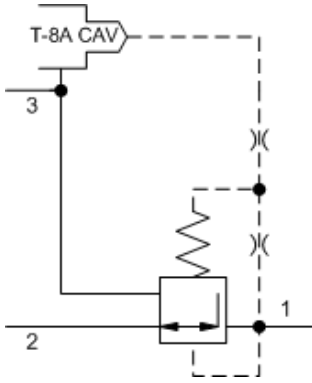
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- If pilot flow consumption is critical, consider using direct acting reducing/relieving valves.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PPFB8](#) Pilot-operated, pressure reducing/relieving main stage with integral T-8A control cavity



This valve is a 3-way, normally open modulating element that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full flow relief function from port 1 to tank (port 3). The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the tank (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	80 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Pilot Control Valve Hex Size	22,2 mm
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	EPDM: 990202014
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.18 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

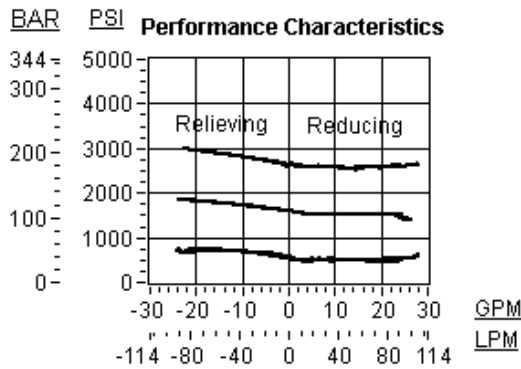
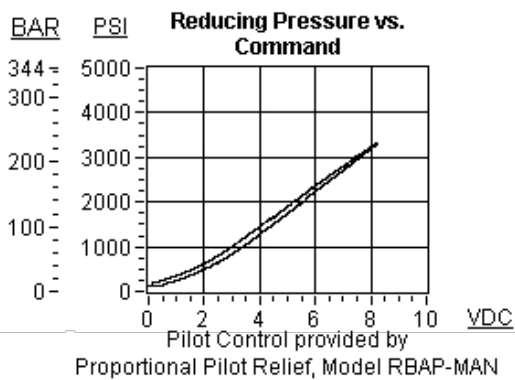
**Model Code Example: PPFB8WN**

<b>MINIMUM CONTROL PRESSURE (W)</b>	<b>SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>W</b> 100 psi (7 bar)	<b>N</b> Buna-N	Standard Material/Coating
<b>D</b> 25 psi (1,7 bar)	<b>E</b> EPDM	/AP Stainless Steel, Passivated
	<b>V</b> Viton	

## TECHNICAL FEATURES

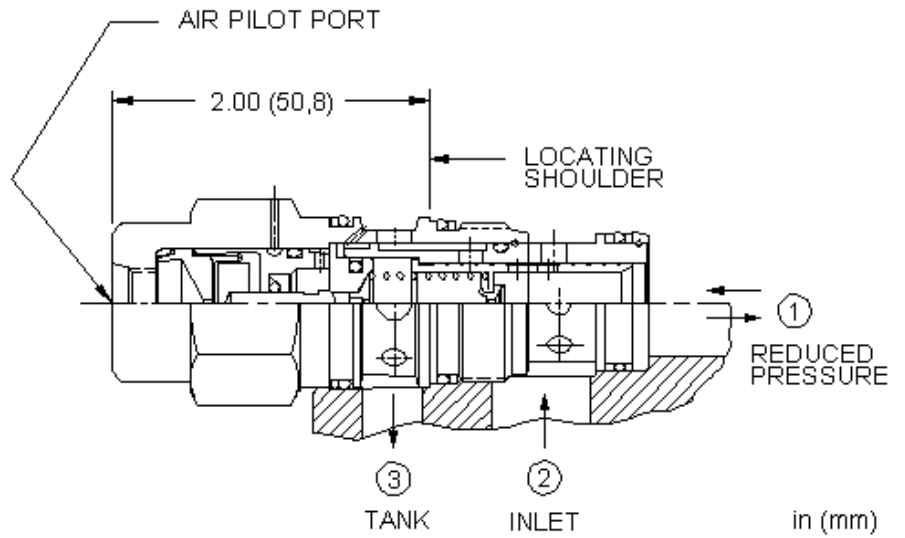
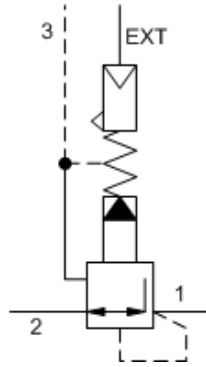
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PPFB](#) Pilot-operated, pressure reducing/relieving valve



Air-controlled, pilot-operated pressure reducing/relieving valves use compressed air over a diaphragm instead of an adjustable spring to control the setting. These valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). The air signal is supplied through a port in the hex-end of the cartridge and the hydraulic setting is directly proportional to the air setting at a ratio of 20:1 (hydraulic:air).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	80 L/min.
Pilot Ratio	20:1
Maximum Operating Pressure	140 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Maximum Air Pressure	10,5 bar
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006

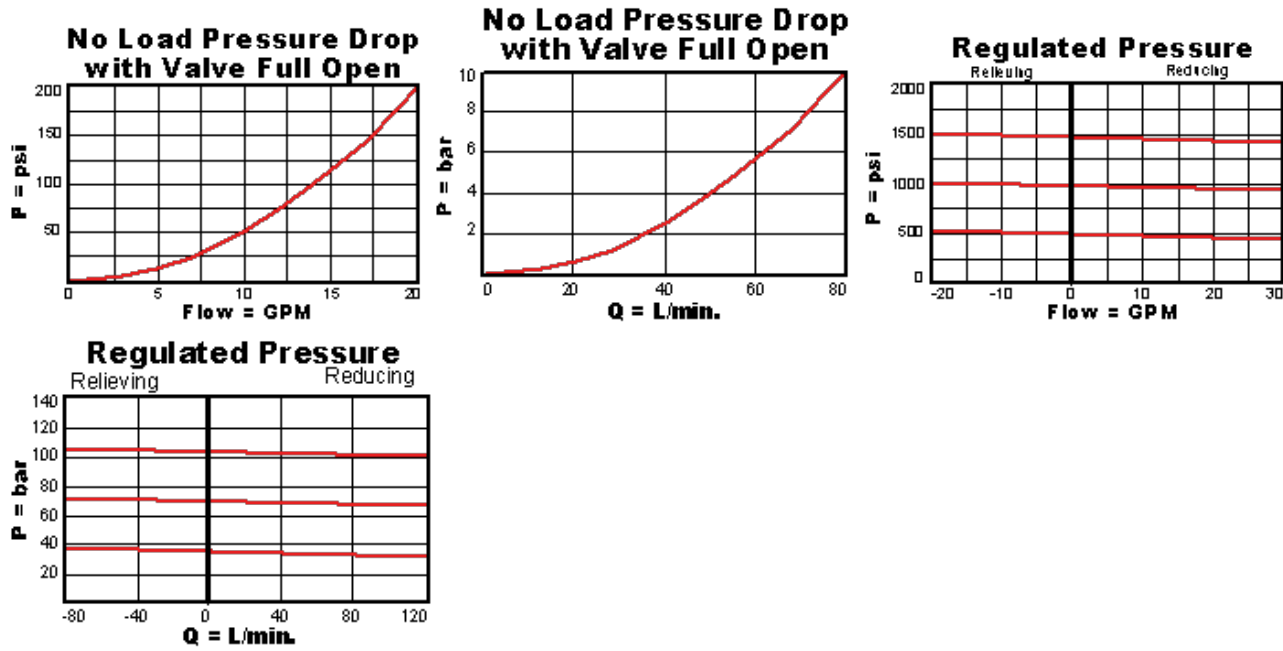
**CONFIGURATION OPTIONS**
**Model Code Example: PPFCABN**

<b>CONTROL</b>	<b>(A) OPERATING RANGE</b>	<b>(B) SEAL MATERIAL</b>	<b>(N)</b>
<b>A</b> External 1/4 NPTF Port	<b>B</b> 50 - 1500 psi (3,5 - 105 bar)	<b>N</b> Buna-N <b>V</b> Viton	

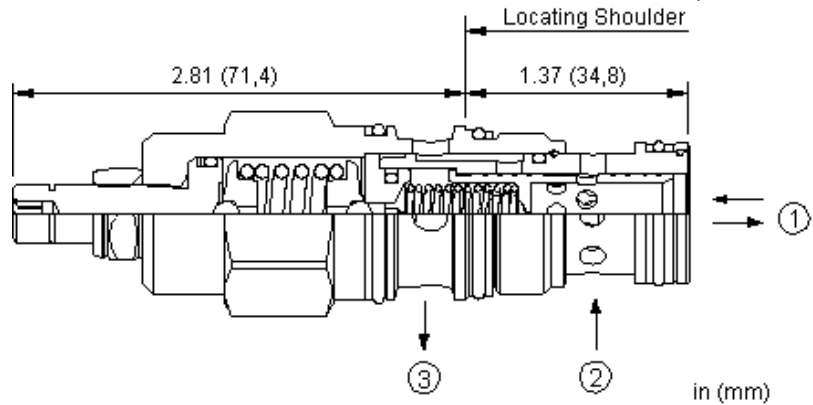
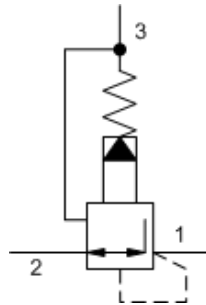
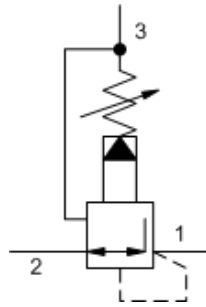
## TECHNICAL FEATURES

- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- The pressure at port 3 determines the minimum valve setting and should not exceed 1000 psi (70 bar).
- The full adjustment range is 50 to 1500 psi (3,5 to 105 bar).
- Maximum air pressure should not exceed 150 psi (10,5 bar) due to the strength of the diaphragm.
- Maximum pressure differential, inlet to outlet, should not exceed 3000 psi (210 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- The air control feature allows explosion proof remote control.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES







Pilot-operated, pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	80 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.27 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

**CONFIGURATION OPTIONS**

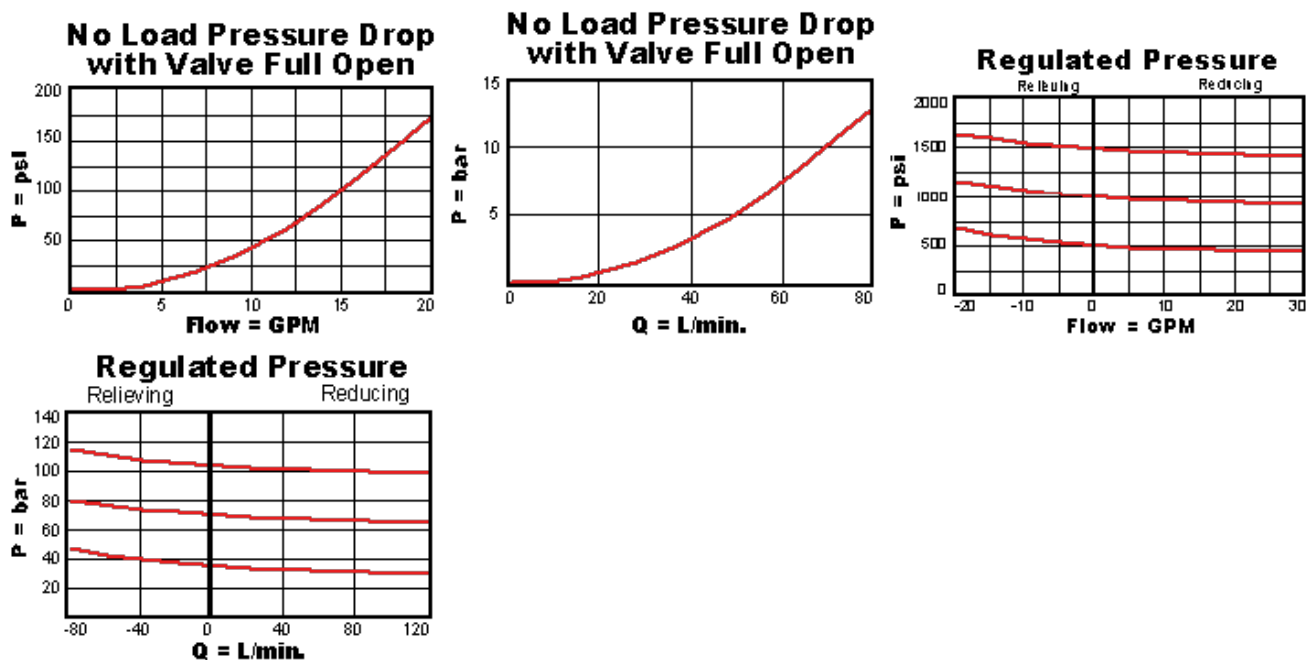
**Model Code Example: PPFFLAN**

CONTROL	(L)	ADJUSTMENT RANGE	(A)	SEAL MATERIAL	(N)
L Standard Screw Adjustment	A	100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	N	Buna-N	
C Tamper Resistant - Factory Set	B	50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	V	Viton	
K Handknob	N	60 - 800 psi (4 - 55 bar), 200 psi (14 bar) Standard Setting			
	Q	60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting			
	W	100 - 5000 psi (7 - 350 bar), 200 psi (14 bar) Standard Setting			

## TECHNICAL FEATURES

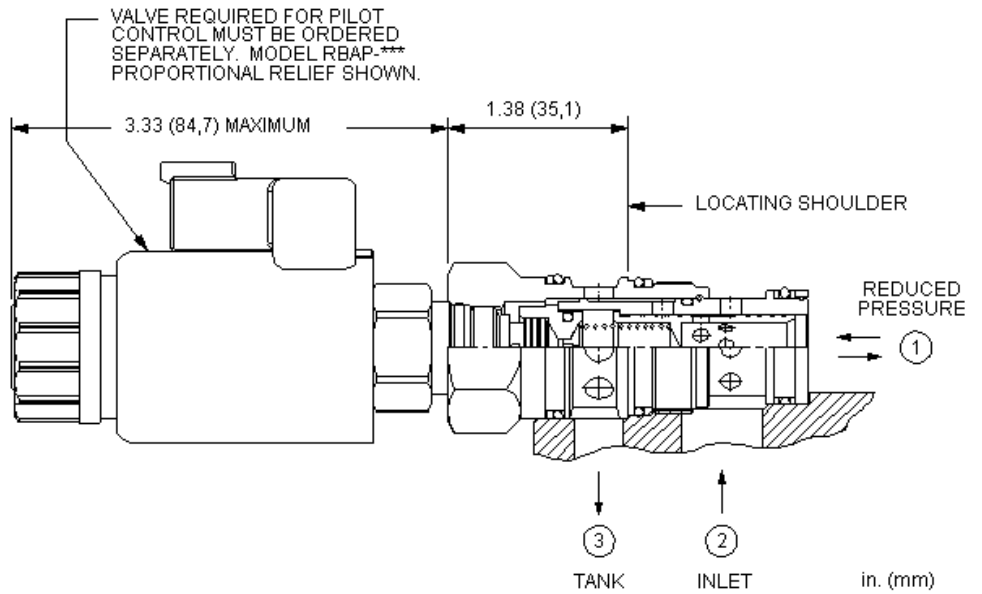
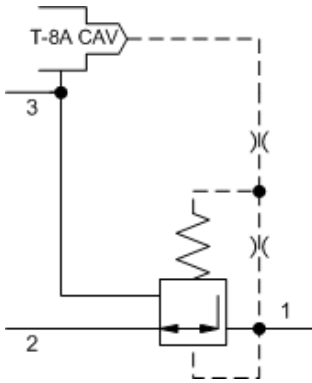
- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- If pilot flow consumption is critical, consider using direct acting reducing/relieving valves.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PPFF8](#) Pilot-operated, pressure reducing/relieving main stage with drilled piston orifice and integral T-8A control cavity



This valve is a 3-way, normally open modulating element that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full flow relief function from port 1 to tank (port 3). The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the tank (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	80 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Pilot Control Valve Hex Size	22,2 mm
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.18 kg.

**CONFIGURATION OPTIONS**

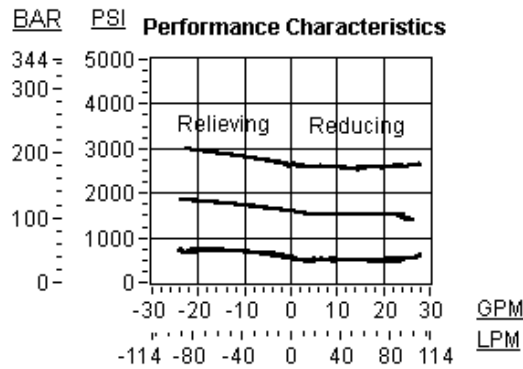
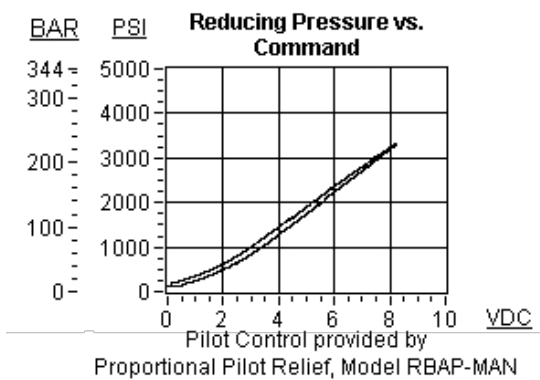
**Model Code Example: PPFF8WN**

MINIMUM CONTROL PRESSURE (W)	SEAL MATERIAL (N)
<b>W</b> 100 psi (7 bar)	<b>N</b> Buna-N
<b>D</b> 25 psi (1,7 bar)	<b>V</b> Viton

## TECHNICAL FEATURES

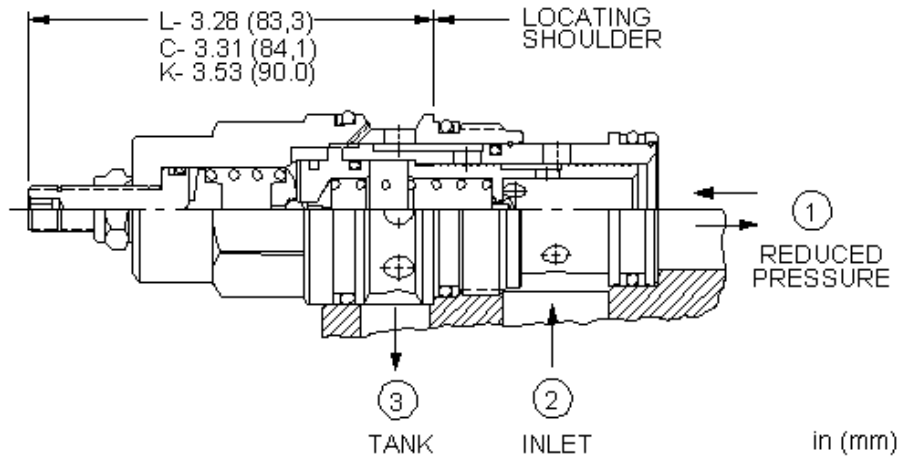
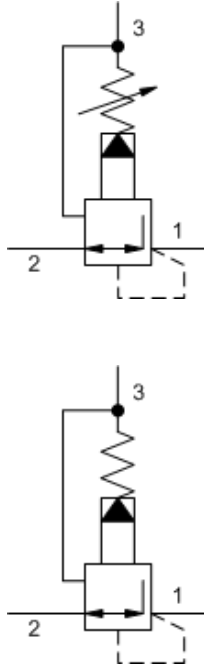
- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PPFF](#) Pilot-operated, pressure reducing/relieving valve with drilled piston orifice



Pilot-operated, pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	160 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	EPDM: 990017014
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	0.56 kg.

**NOTES**

Maximum pressure differentials for spring ranges: A and B are 3000 psi (210 bar) N and Q are 2000 psi (140 bar) W is 5000 psi (350 bar) inlet pressure

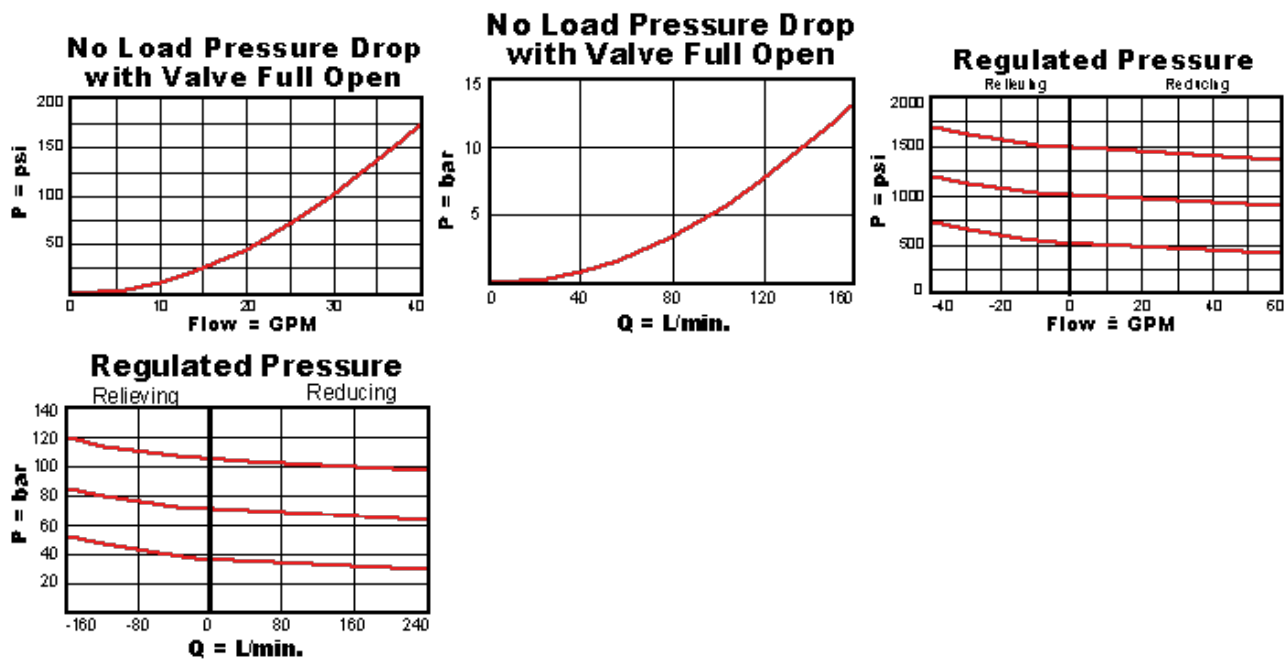
**CONFIGURATION OPTIONS**
**Model Code Example: PPHBLAN**

CONTROL	(L)	ADJUSTMENT RANGE	(A)	SEAL MATERIAL	(N)	MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b>	100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b>	Buna-N	<b>N</b>	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b>	150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting	<b>E</b>	EPDM	<b>JAP</b>	Stainless Steel, Passivated
<b>K</b> Handknob	<b>B</b>	50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b>	Viton	<b>LH</b>	Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob	<b>C</b>	150 - 6000 psi (10,5 - 420 bar), 200 psi (14 bar) Standard Setting				
	<b>N</b>	60 - 800 psi (4 - 55 bar), 200 psi (14 bar) Standard Setting				
	<b>Q</b>	60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting				

## TECHNICAL FEATURES

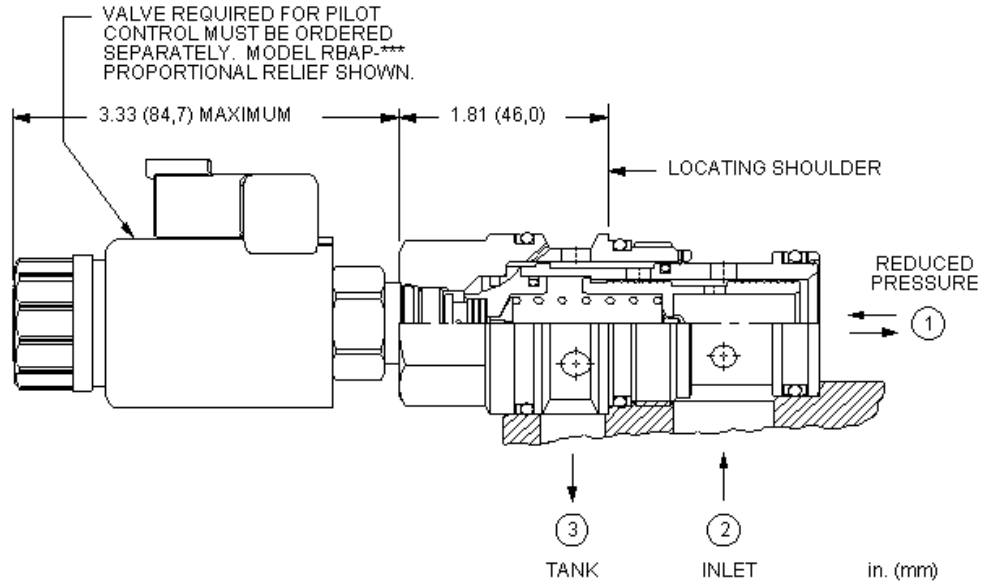
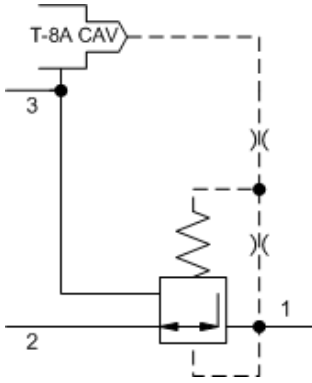
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- If pilot flow consumption is critical, consider using direct acting reducing/relieving valves.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PPHB8](#) Pilot-operated, pressure reducing/relieving main stage with integral T-8A control cavity



This valve is a 3-way, normally open modulating element that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full flow relief function from port 1 to tank (port 3). The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the tank (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	160 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	0.46 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

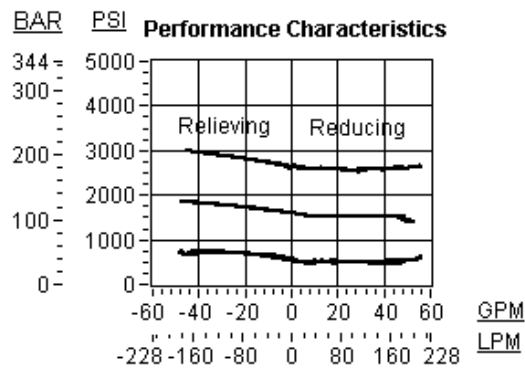
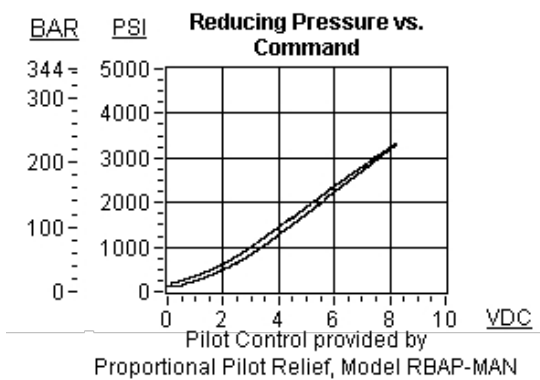
**Model Code Example: PPHB8WN**

MINIMUM CONTROL PRESSURE (W)	SEAL MATERIAL (N)
<b>W</b> 100 psi (7 bar)	<b>N</b> Buna-N
<b>D</b> 25 psi (1,7 bar)	<b>E</b> EPDM
	<b>V</b> Viton

## TECHNICAL FEATURES

- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

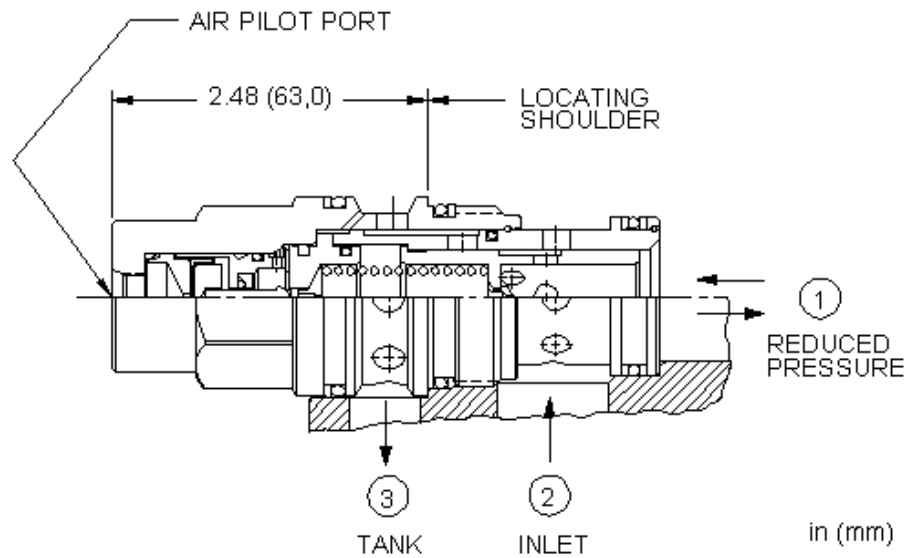
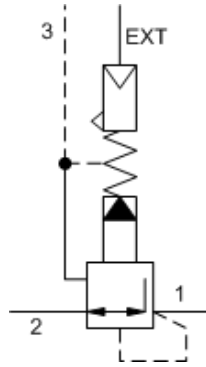
## PERFORMANCE CURVES



## RELATED MODELS

- [PPHB](#) Pilot-operated, pressure reducing/relieving valve





Air-controlled, pilot-operated pressure reducing/relieving valves use compressed air over a diaphragm instead of an adjustable spring to control the setting. These valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). The air signal is supplied through a port in the hex-end of the cartridge and the hydraulic setting is directly proportional to the air setting at a ratio of 20:1 (hydraulic:air).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	160 L/min.
Pilot Ratio	20:1
Maximum Operating Pressure	140 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Maximum Air Pressure	10,5 bar
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006

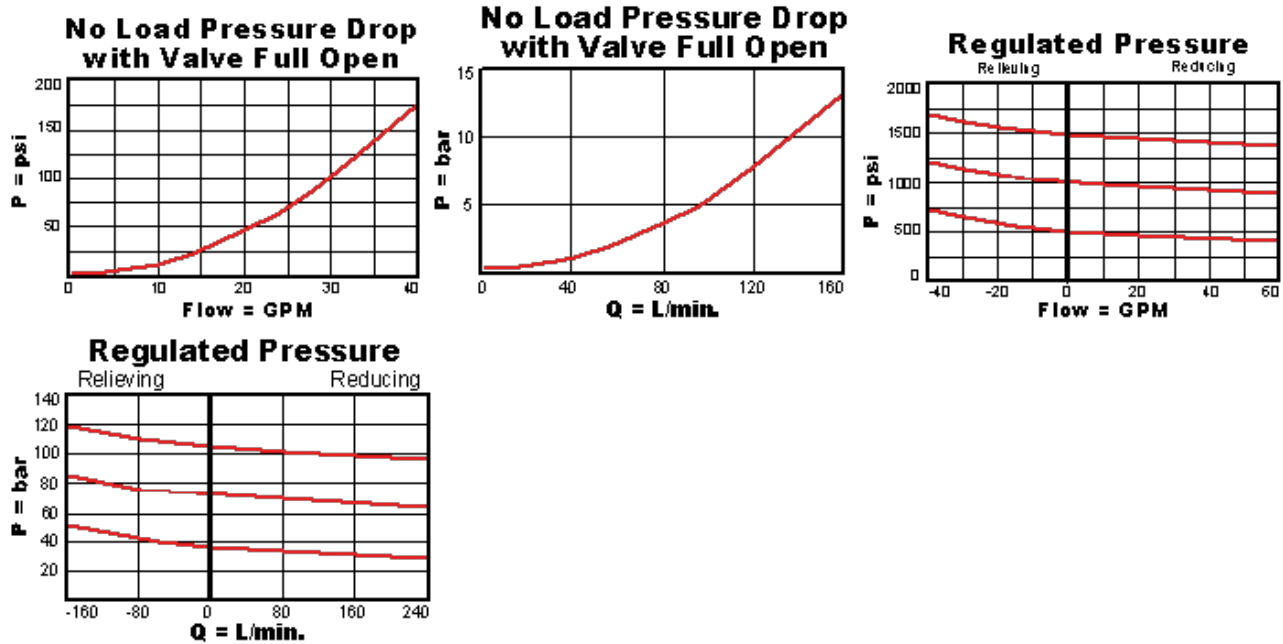
**CONFIGURATION OPTIONS**
**Model Code Example: PPHCBBN**

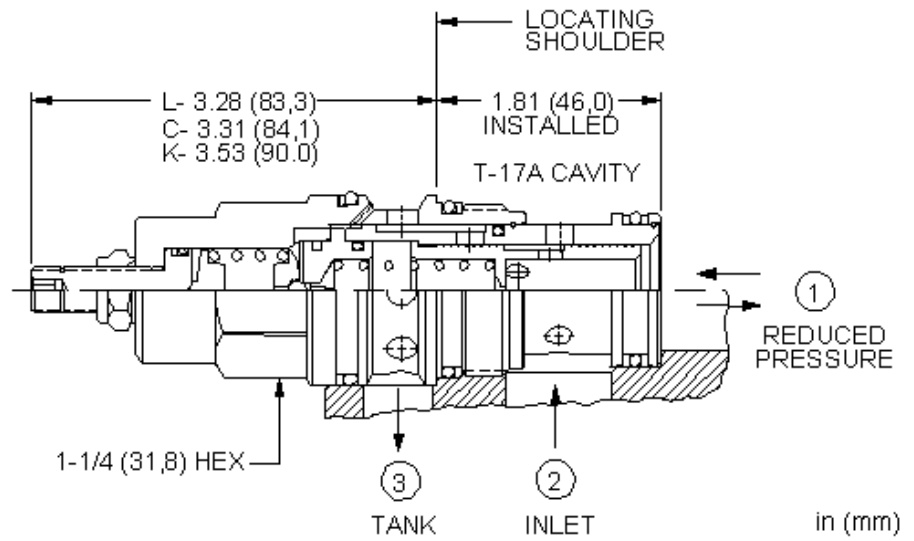
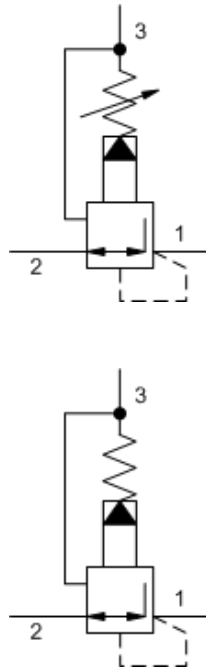
<b>CONTROL</b>	<b>(B)</b>	<b>OPERATING RANGE</b>	<b>(B)</b>	<b>SEAL MATERIAL</b>	<b>(N)</b>
<b>B</b> External 4- <small>SAE</small> Port		<b>B</b> 50 - 1500 psi (3,5 - 105 bar)		<b>N</b> Buna-N	
				<b>V</b> Viton	

## TECHNICAL FEATURES

- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- The pressure at port 3 determines the minimum valve setting and should not exceed 1000 psi (70 bar).
- The full adjustment range is 50 to 1500 psi (3,5 to 105 bar).
- Maximum air pressure should not exceed 150 psi (10,5 bar) due to the strength of the diaphragm.
- Maximum pressure differential, inlet to outlet, should not exceed 3000 psi (210 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- The air control feature allows explosion proof remote control.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	160 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	0.56 kg.

## CONFIGURATION OPTIONS

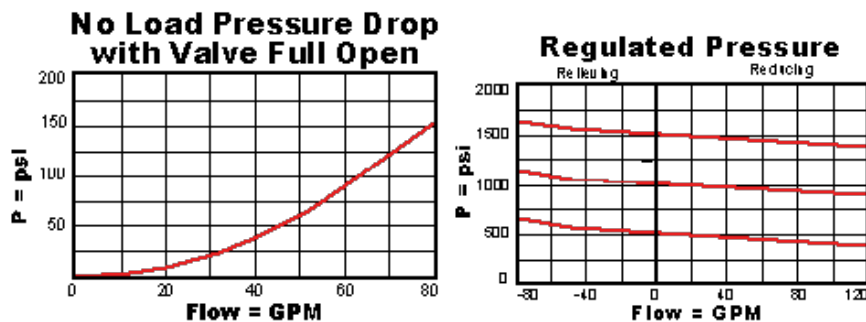
### Model Code Example: PPHFLAN

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N)
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 200 psi (14 bar) Standard Setting		
<b>Q</b> Capped and Lockwired	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>H</b> 30 - 3000 psi (2 - 210 bar), 200 psi (14 bar) Standard Setting		
	<b>N</b> 60 - 800 psi (4 - 55 bar), 200 psi (14 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

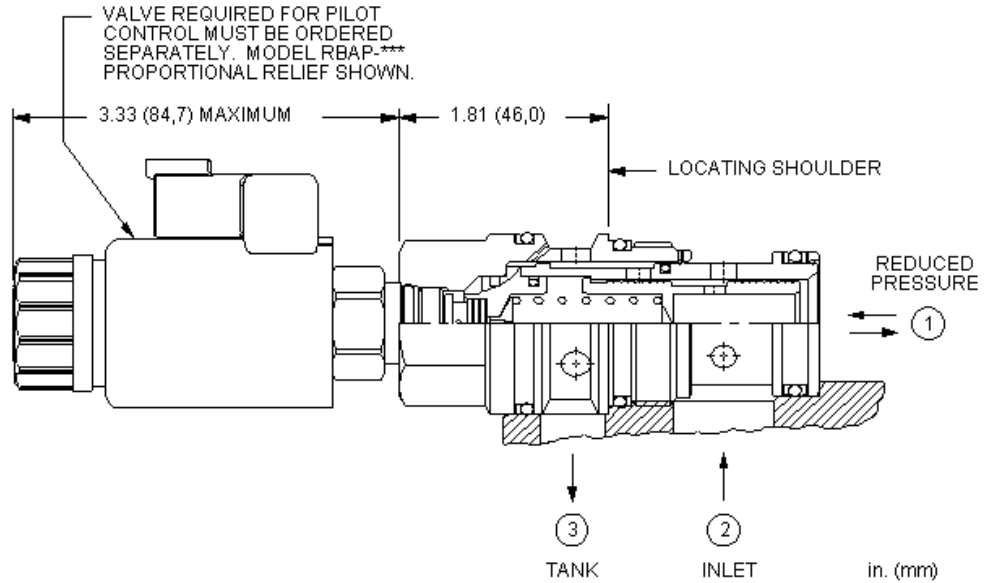
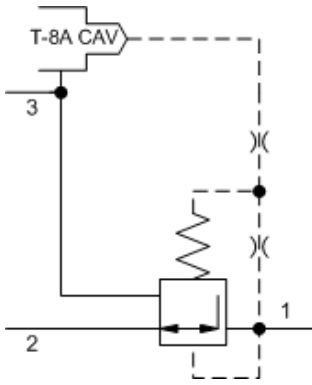
- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- If pilot flow consumption is critical, consider using direct acting reducing/relieving valves.
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PPHF8](#) Pilot-operated, pressure reducing/relieving main stage with drilled piston orifice and integral T-8A control cavity



This valve is a 3-way, normally open modulating element that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full flow relief function from port 1 to tank (port 3). The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the tank (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	160 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Pilot Control Valve Hex Size	22,2 mm
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	0.46 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

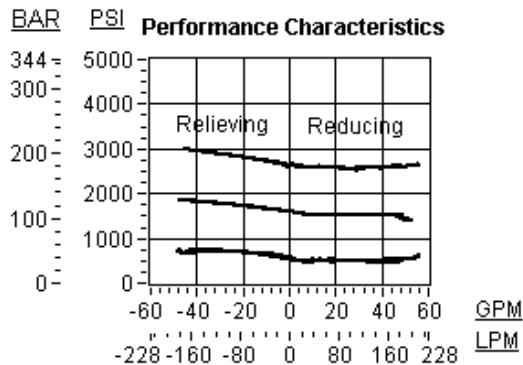
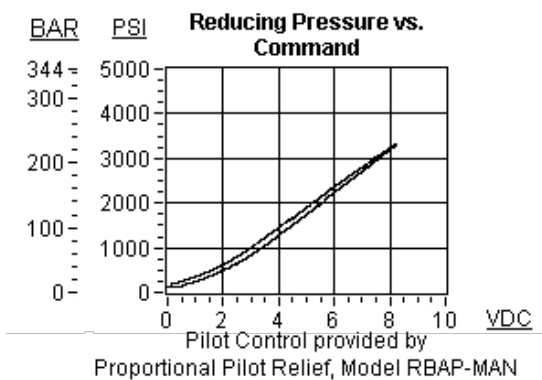
**Model Code Example: PPHF8WN**

<b>MINIMUM CONTROL PRESSURE (W)</b>	<b>SEAL MATERIAL (N)</b>
W 100 psi (7 bar)	N Buna-N
D 25 psi (1,7 bar)	V Viton

## TECHNICAL FEATURES

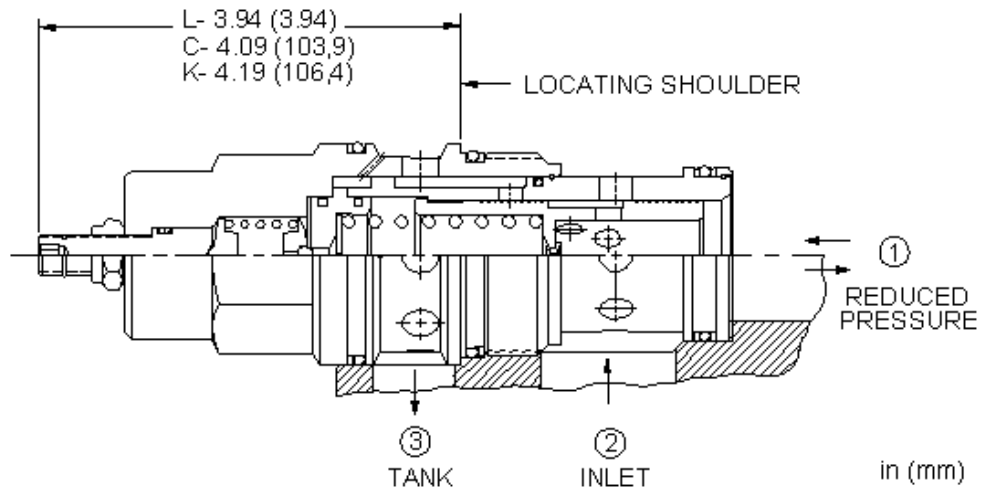
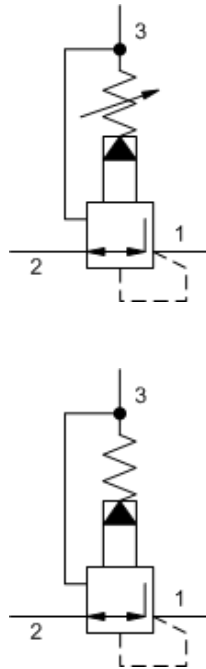
- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PPHF](#) Pilot-operated, pressure reducing/relieving valve with drilled piston orifice



Pilot-operated, pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	320 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	1.29 kg.

**NOTES**

Maximum pressure differentials for spring ranges: A and B are 3000 psi (210 bar) N and Q are 2000 psi (140 bar) W is 5000 psi (350 bar) inlet pressure

**CONFIGURATION OPTIONS**

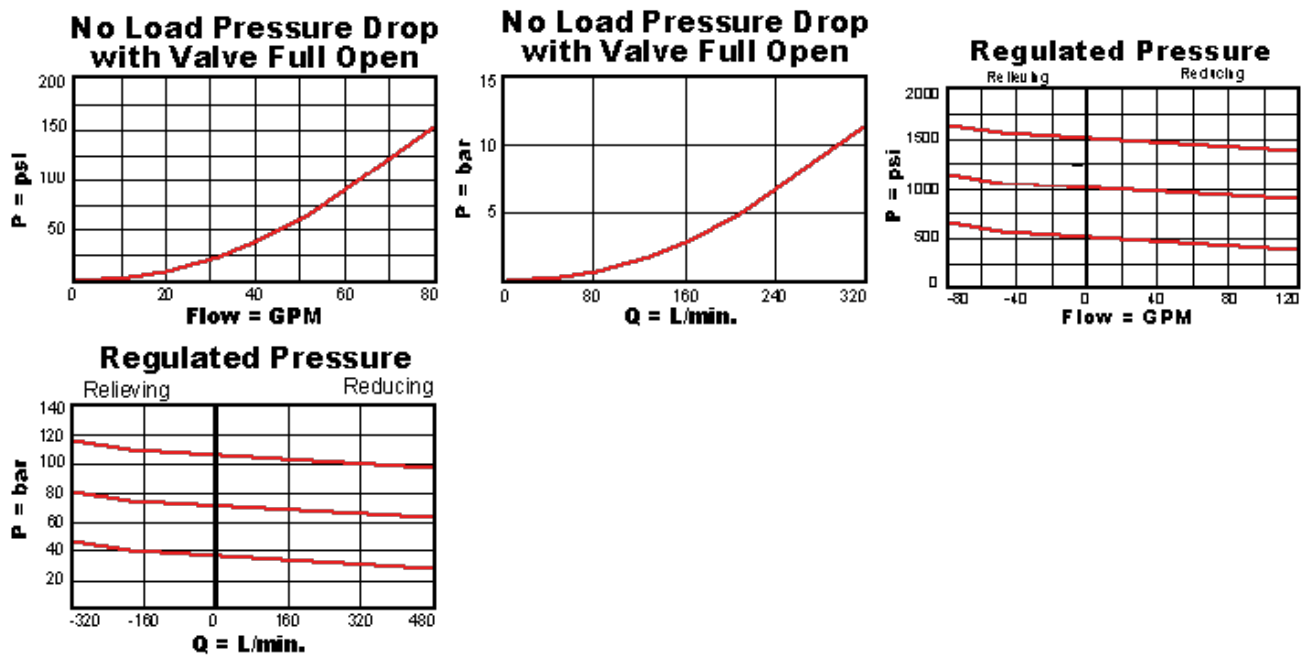
**Model Code Example: PPJBLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>W</b> Hex Wrench Adjustment	<b>N</b> 60 - 800 psi (4 - 55 bar), 200 psi (14 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- If pilot flow consumption is critical, consider using direct acting reducing/relieving valves.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

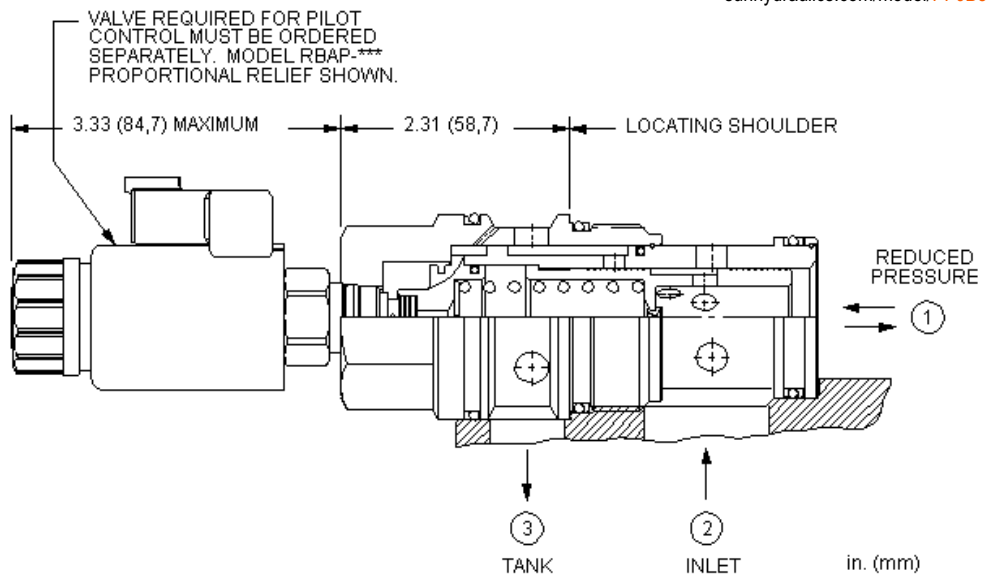
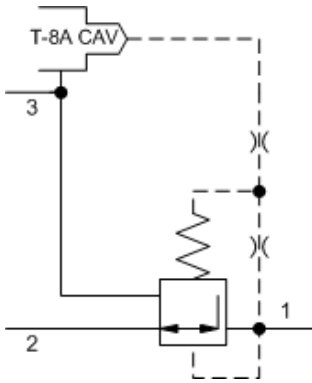
## PERFORMANCE CURVES



## RELATED MODELS

- [PPJB8](#) Pilot-operated, pressure reducing/relieving main stage with integral T-8A control cavity





This valve is a 3-way, normally open modulating element that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full flow relief function from port 1 to tank (port 3). The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the tank (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	320 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	1.03 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

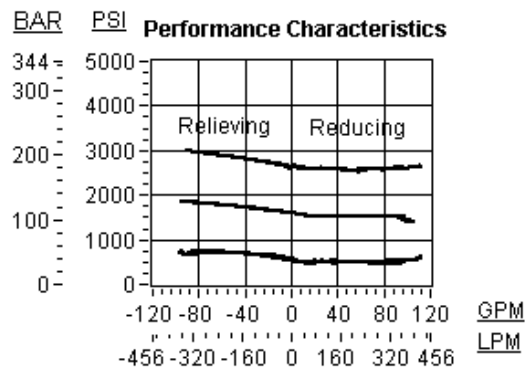
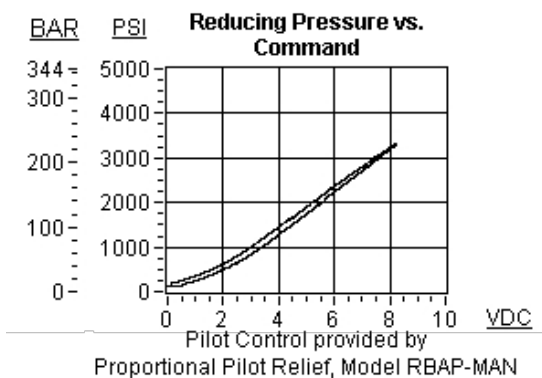
**Model Code Example: PPJB8WN**

MINIMUM CONTROL PRESSURE (W)	SEAL MATERIAL (N)
<b>W</b> 100 psi (7 bar)	<b>N</b> Buna-N
D 25 psi (1,7 bar)	V Viton

## TECHNICAL FEATURES

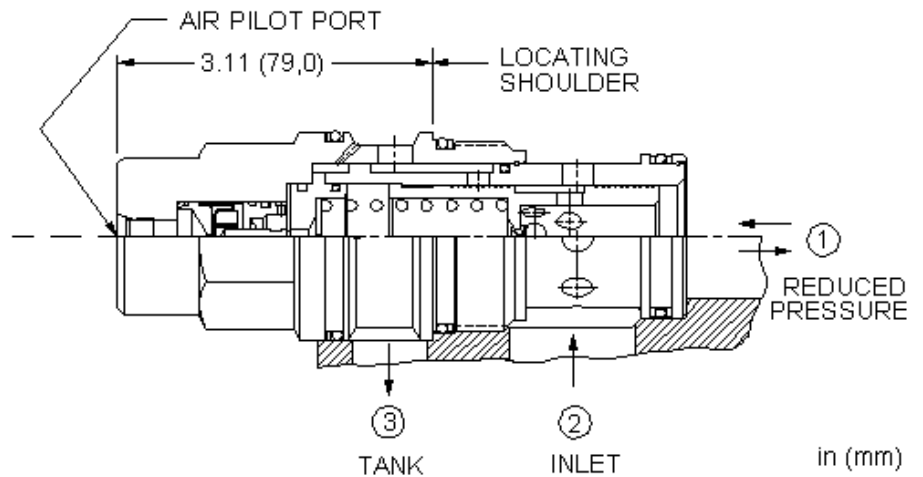
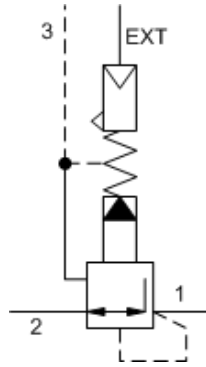
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PPJB](#) Pilot-operated, pressure reducing/relieving valve



Air-controlled, pilot-operated pressure reducing/relieving valves use compressed air over a diaphragm instead of an adjustable spring to control the setting. These valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). The air signal is supplied through a port in the hex-end of the cartridge and the hydraulic setting is directly proportional to the air setting at a ratio of 20:1 (hydraulic:air).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	320 L/min.
Pilot Ratio	20:1
Maximum Operating Pressure	140 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Maximum Air Pressure	10,5 bar
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006

**CONFIGURATION OPTIONS**

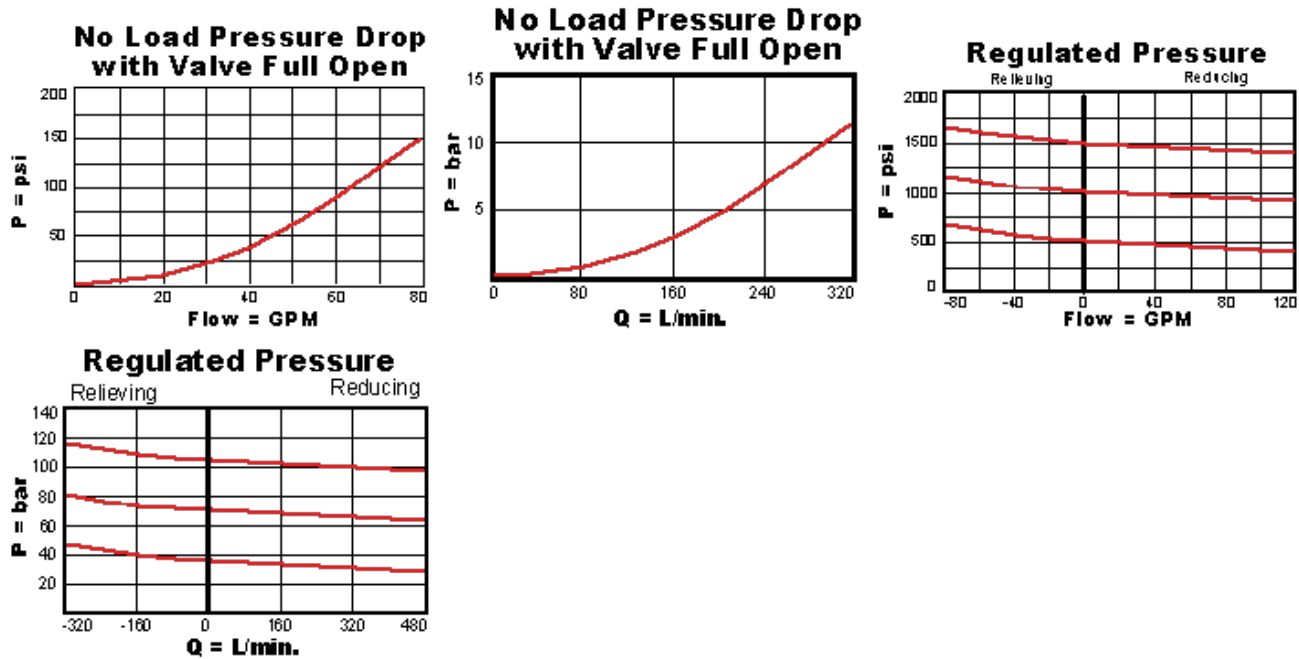
**Model Code Example: PPJCBBN**

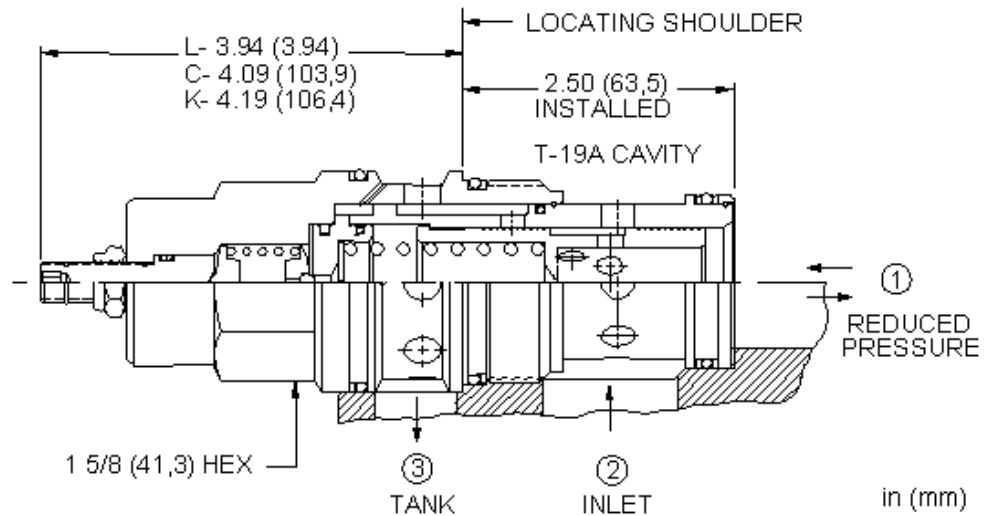
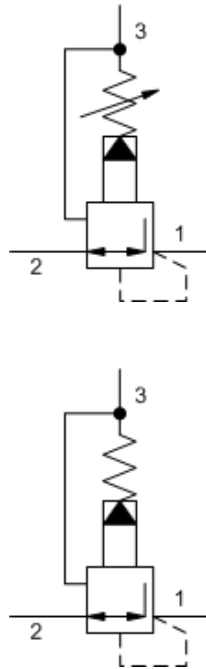
<b>CONTROL</b>	<b>(B) OPERATING RANGE</b>	<b>(B) SEAL MATERIAL</b>	<b>(N)</b>
<b>B</b> External 4- <small>SAE</small> Port	<b>B</b> 50 - 1500 psi (3,5 - 105 bar)	<b>N</b> Buna-N	<b>V</b> Viton

## TECHNICAL FEATURES

- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- The pressure at port 3 determines the minimum valve setting and should not exceed 1000 psi (70 bar).
- The full adjustment range is 50 to 1500 psi (3,5 to 105 bar).
- Maximum air pressure should not exceed 150 psi (10,5 bar) due to the strength of the diaphragm.
- Maximum pressure differential, inlet to outlet, should not exceed 3000 psi (210 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- The air control feature allows explosion proof remote control.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	320 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	1.29 kg.

## CONFIGURATION OPTIONS

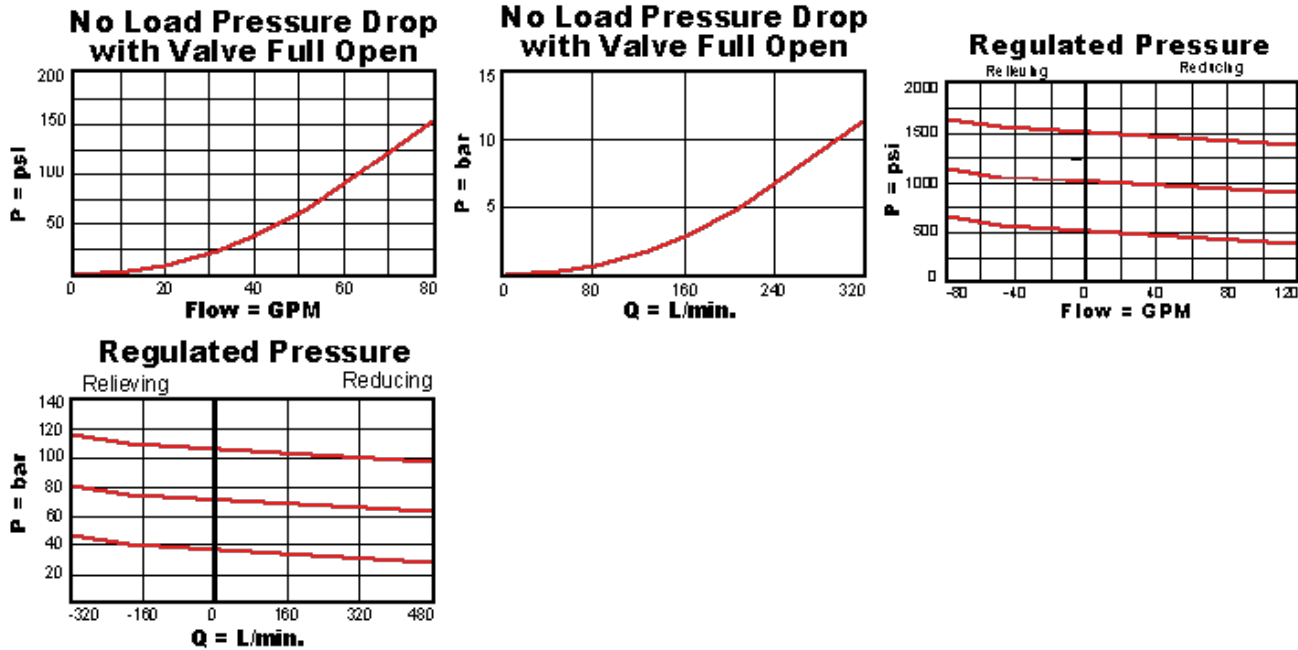
## Model Code Example: PPJFLAN

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N)
L Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	
C Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	
K Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>H</b> 30 - 3000 psi (2 - 210 bar), 200 psi (14 bar) Standard Setting		
	<b>N</b> 60 - 800 psi (4 - 55 bar), 200 psi (14 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

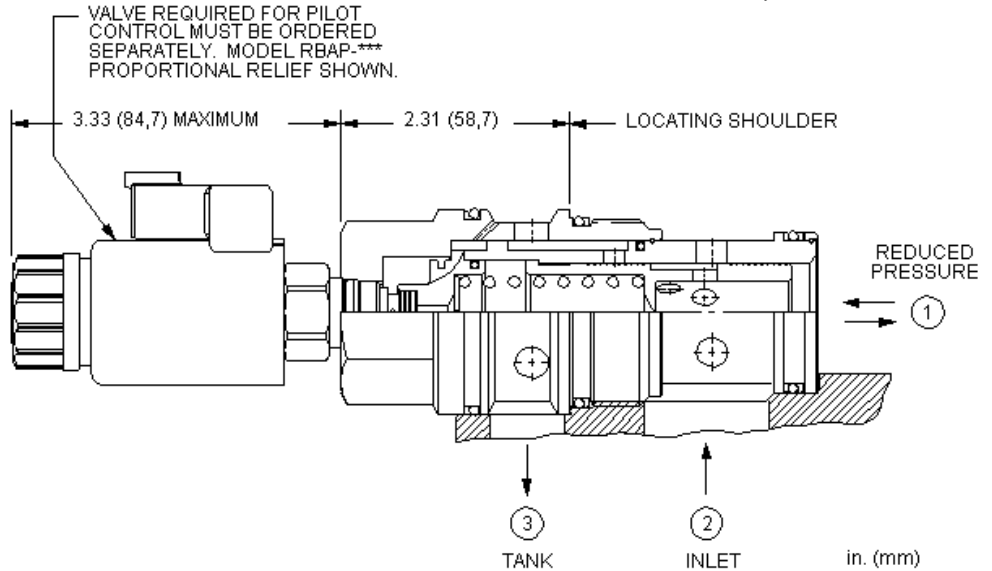
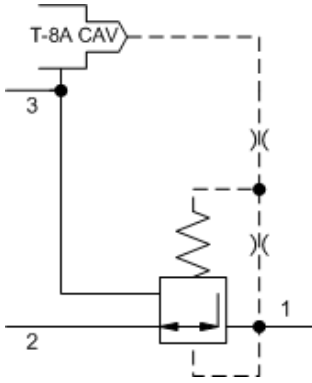
- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- If pilot flow consumption is critical, consider using direct acting reducing/relieving valves.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PPJF8](#) Pilot-operated, pressure reducing/relieving main stage with drilled piston orifice and integral T-8A control cavity



This valve is a 3-way, normally open modulating element that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full flow relief function from port 1 to tank (port 3). The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the tank (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	320 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	1.03 kg.

**NOTES**

Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

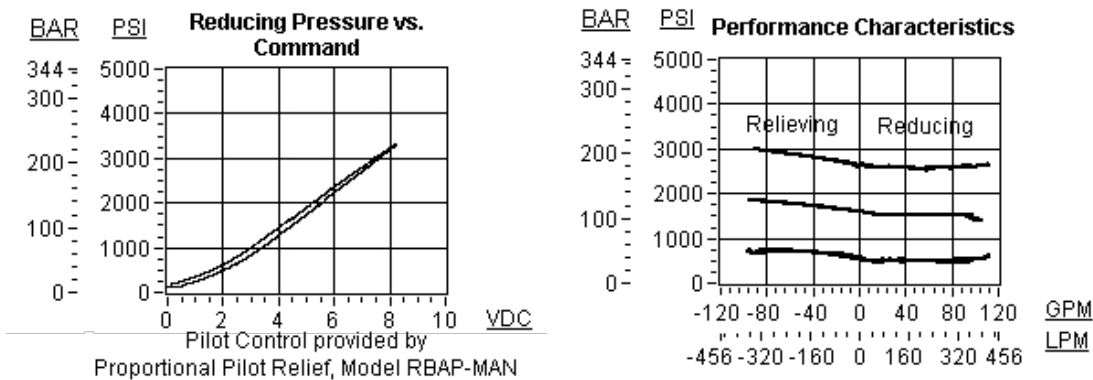
**CONFIGURATION OPTIONS**
**Model Code Example: PPJF8WN**

MINIMUM CONTROL PRESSURE (W)	SEAL MATERIAL (N)
W 100 psi (7 bar)	N Buna-N
D 25 psi (1,7 bar)	V Viton

## TECHNICAL FEATURES

- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

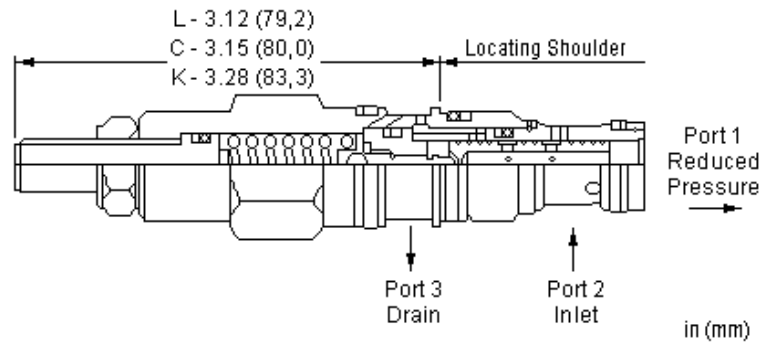
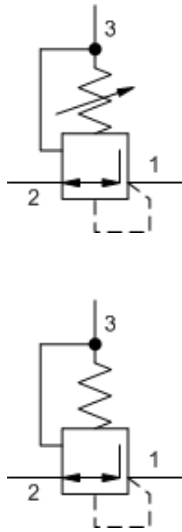
## PERFORMANCE CURVES



## RELATED MODELS

- [PPJF](#) Pilot-operated, pressure reducing/relieving valve with drilled piston orifice





Direct-acting, pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). These valves incorporate a damped construction for stable operation allowing the use of high reduced pressure.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-163A
Series	0
Capacity	20 L/min.
Factory Pressure Settings Established at	0.25 gpm
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.
Adjustment - No. of CW Turns from Min. to Max. setting	7
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Locknut Hex Size	12,7 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	EPDM: 990163014
Seal kit - Cartridge	Viton: 990163006
Model Weight	0.14 kg.

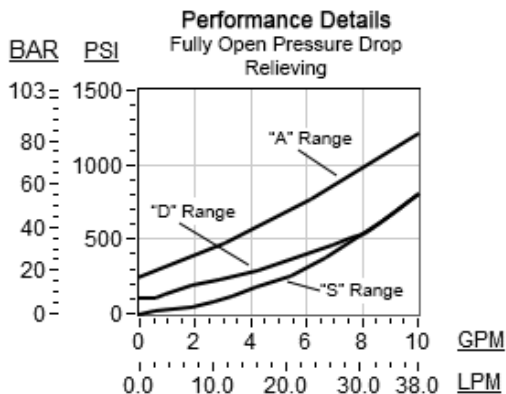
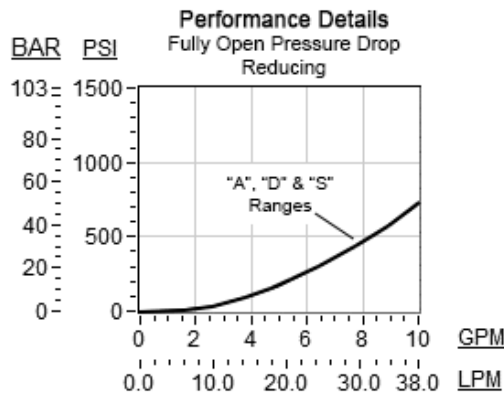
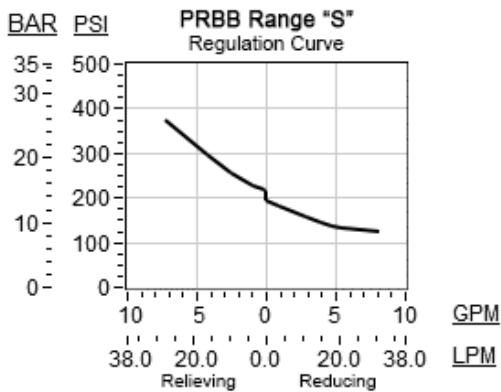
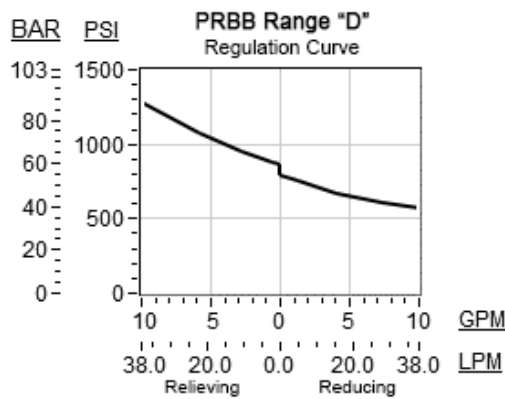
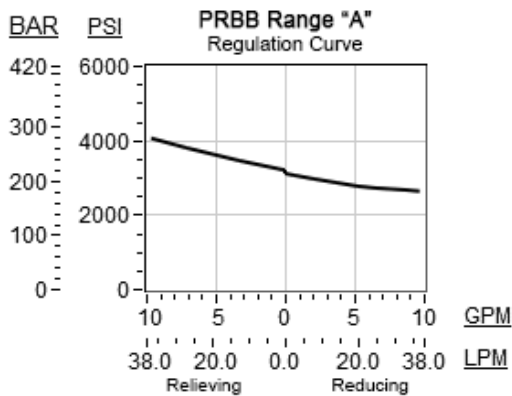
**CONFIGURATION OPTIONS**
**Model Code Example: PRBBLAN**

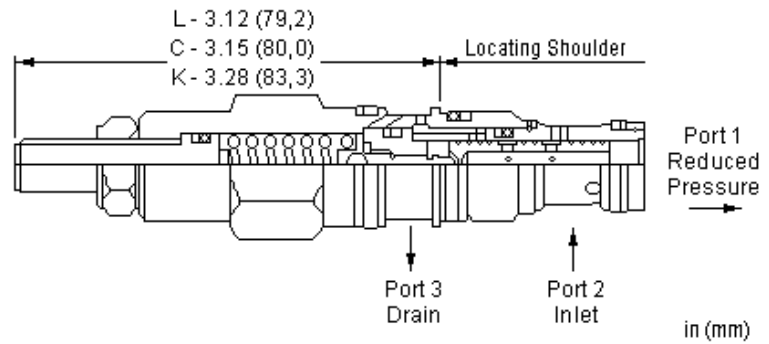
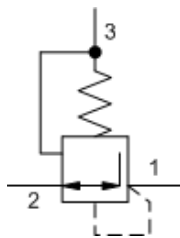
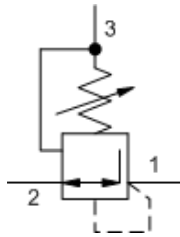
<b>CONTROL</b>	<b>(L) ADJUSTMENT RANGE</b>	<b>(A) SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>L</b> Standard Screw Adjustment	<b>A</b> 500 - 3000 psi (35 - 210 bar), 700 psi (50 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>S</b> 25 - 200 psi (1,7 - 14 bar), 100 psi (7 bar) Standard Setting		
	<b>W</b> 750 - 4500 psi (50 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- All spring ranges are tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Suitable for accumulator circuits since the absence of pilot control flow results in reduced secondary circuit leakage.
- Direct acting concept provides highly reliable operation in contaminated systems, especially at dead headed conditions.
- Unlike pilot operated versions, direct acting valves exhibit a transitional step between reducing and relieving modes. This step equals 5% of the high end of the adjustment range, independent of the valve setting. Therefore, these valves may not be suitable for counterbalancing applications.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Direct-acting, pressure reducing valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1. These valves incorporate a damped construction for stable operation allowing the use of high reduced pressure. This valve is open in the transition from reducing to relieving. It provides good pressure control and dynamic response.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-163A
Series	0
Capacity	20 L/min.
Factory Pressure Settings Established at	0.25 gpm
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	330 cc/min.
Adjustment - No. of CW Turns from Min. to Max. setting	7
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	12,7 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	Viton: 990163006
Model Weight	0.14 kg.

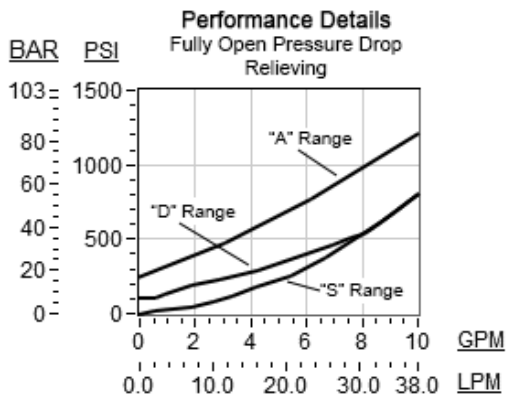
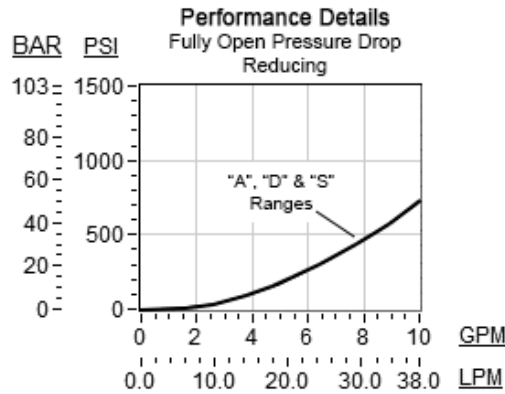
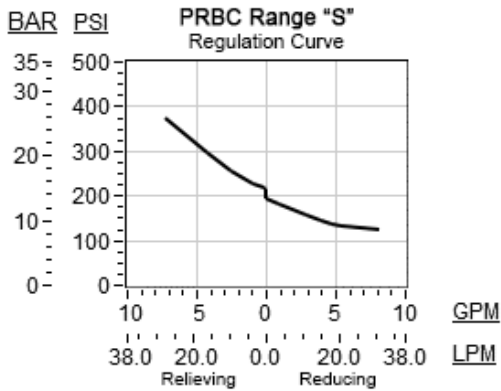
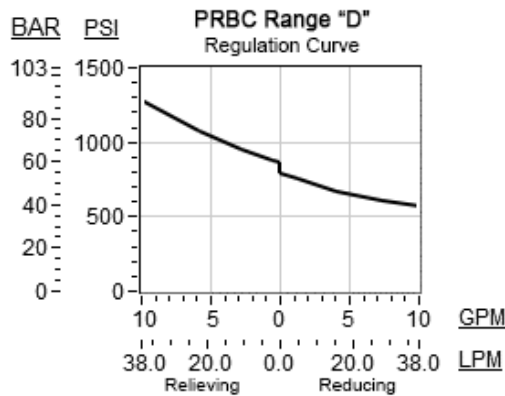
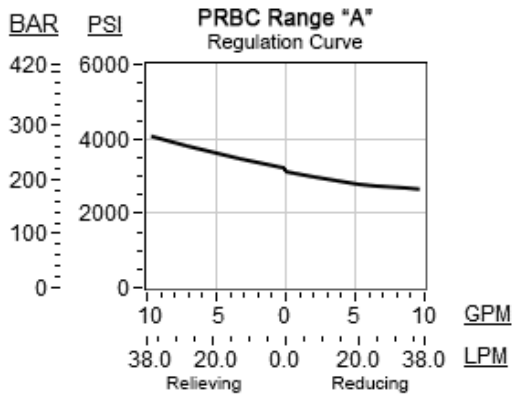
**CONFIGURATION OPTIONS**
**Model Code Example: PRBCLAN**

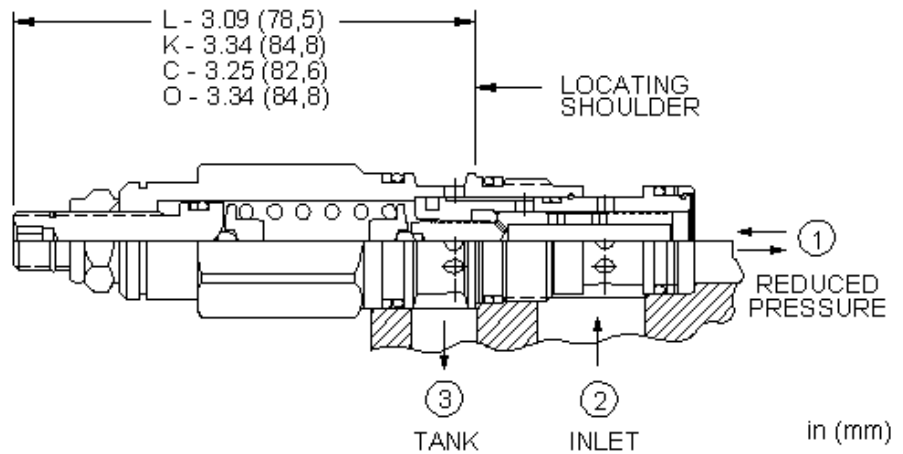
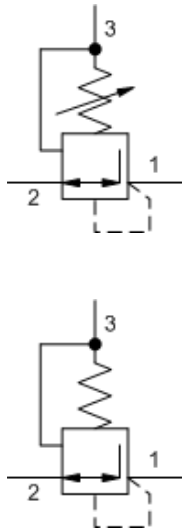
CONTROL	(L)	ADJUSTMENT RANGE	(A)	SEAL MATERIAL	(N)
<b>L</b> Standard Screw Adjustment	<b>A</b>	500 - 3000 psi (35 - 210 bar), 700 psi (50 bar) Standard Setting	<b>N</b>	Buna-N	
<b>C</b> Tamper Resistant - Factory Set	<b>B</b>	50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b>	Viton	
<b>K</b> Handknob	<b>D</b>	25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting			
	<b>E</b>	25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting			
	<b>S</b>	25 - 200 psi (1,7 - 14 bar), 100 psi (7 bar) Standard Setting			
	<b>W</b>	750 - 4500 psi (50 - 315 bar), 1000 psi (70 bar) Standard Setting			

## TECHNICAL FEATURES

- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- The transition from reducing to relieving is slightly open. The result is very good pressure control with oil consumption of about 0.1 gpm (0,4 L/min.).
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- All spring ranges are tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Direct acting concept provides highly reliable operation in contaminated systems, especially at dead headed conditions.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Direct-acting, pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). These valves incorporate a damped construction for stable operation allowing the use of high reduced pressure.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	40 L/min.
Factory Pressure Settings Established at	0.25 gpm
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	EPDM: 990011014
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.20 kg.

**NOTES**

For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

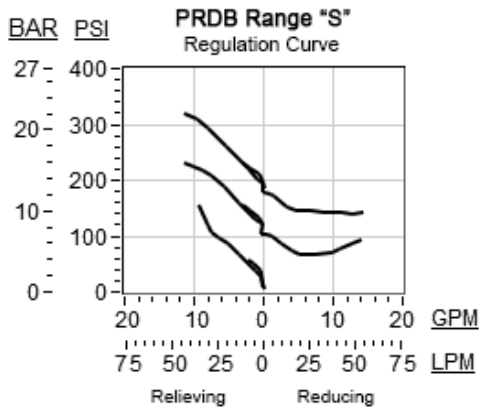
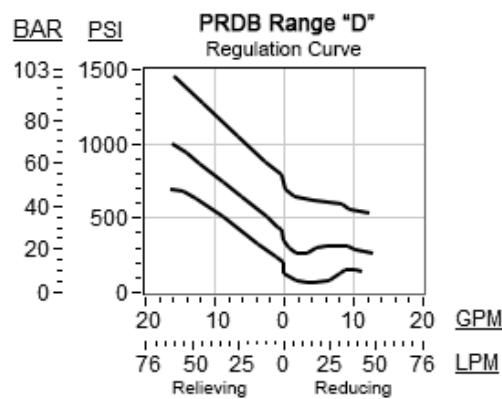
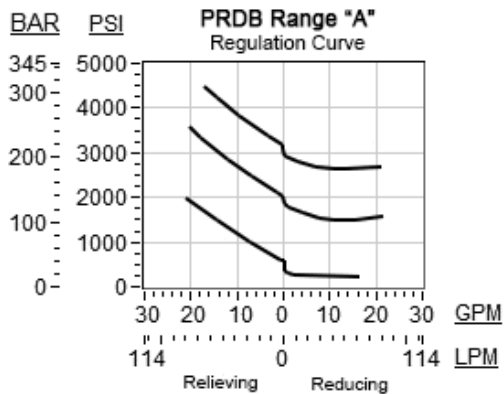
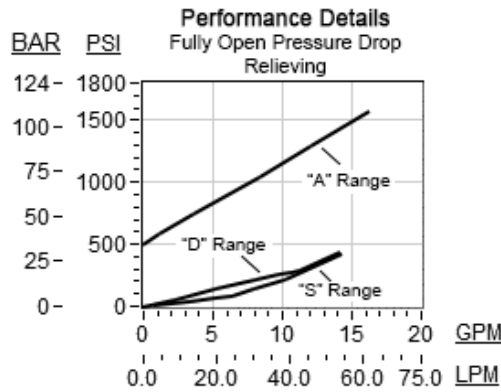
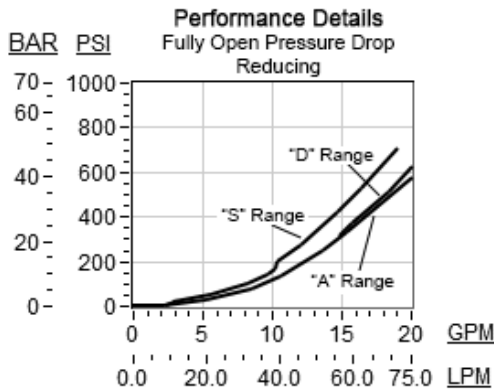
**CONFIGURATION OPTIONS**
**Model Code Example: PRDBLAN**

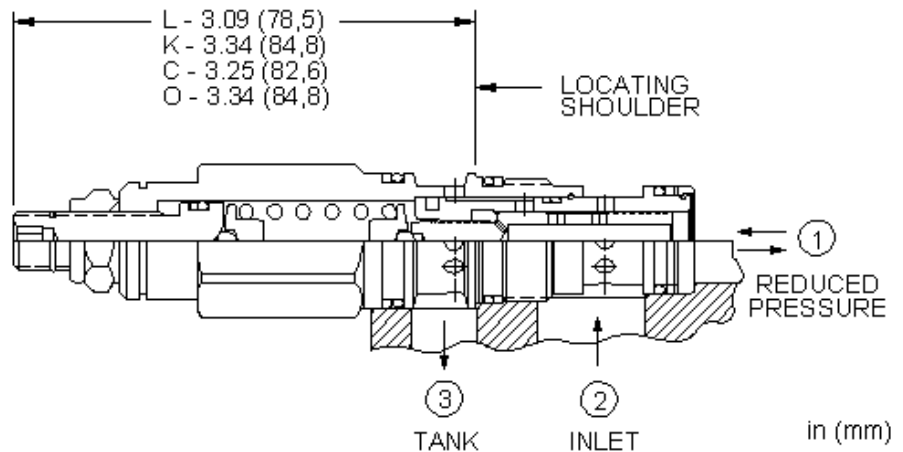
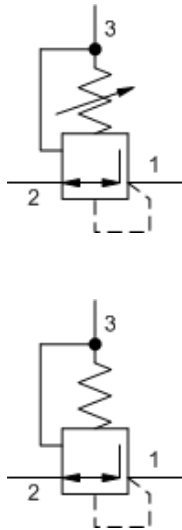
CONTROL	(L)	ADJUSTMENT RANGE	(A)	SEAL MATERIAL	(N)	MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b>	500 - 3000 psi (35 - 210 bar), 700 psi (50 bar) Standard Setting	<b>N</b>	Buna-N		Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b>	750 - 4500 psi (50 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>E</b>	EPDM		/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>B</b>	50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b>	Viton		/LH Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob	<b>D</b>	25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting				
	<b>E</b>	25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting				
	<b>S</b>	25 - 200 psi (1,7 - 14 bar), 100 psi (7 bar) Standard Setting				

## TECHNICAL FEATURES

- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- All spring ranges are tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Suitable for accumulator circuits since the absence of pilot control flow results in reduced secondary circuit leakage.
- Direct acting concept provides highly reliable operation in contaminated systems, especially at dead headed conditions.
- Unlike pilot operated versions, direct acting valves exhibit a transitional step between reducing and relieving modes. This step equals 5% of the high end of the adjustment range, independent of the valve setting. Therefore, these valves may not be suitable for counterbalancing applications.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Direct-acting, pressure reducing valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1. These valves incorporate a damped construction for stable operation allowing the use of high reduced pressure. This valve is open in the transition from reducing to relieving. It provides good pressure control and dynamic response.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	40 L/min.
Factory Pressure Settings Established at	0.25 gpm
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	330 cc/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	EPDM: 990011014
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.20 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

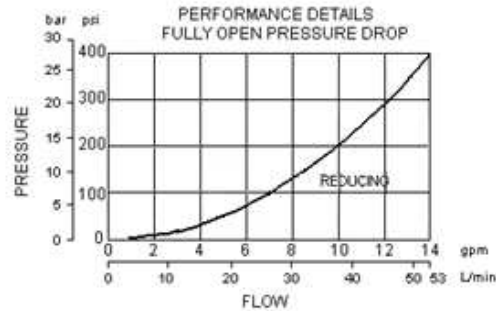
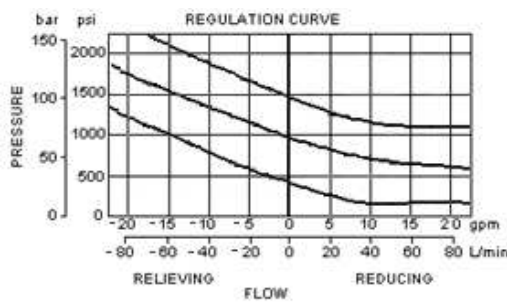
**CONFIGURATION OPTIONS**
**Model Code Example: PRDCLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 500 - 3000 psi (35 - 210 bar), 700 psi (50 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>E</b> EPDM	<b>IAP</b> Stainless Steel, Passivated
<b>K</b> Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	
<b>O</b> Handknob with Panel Mount	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>S</b> 25 - 200 psi (1,7 - 14 bar), 100 psi (7 bar) Standard Setting		
	<b>W</b> 750 - 4500 psi (50 - 315 bar), 1000 psi (70 bar) Standard Setting		

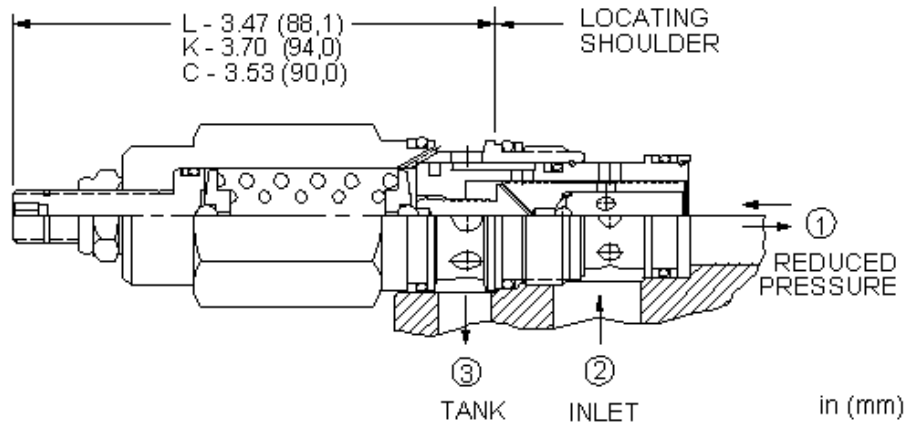
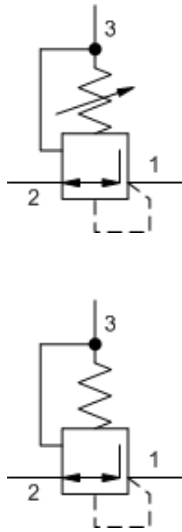
## TECHNICAL FEATURES

- The transition from reducing to relieving is slightly open. The result is very good pressure control with oil consumption of about 0.1 gpm (0,4 L/min.). The relatively high pilot control flow is only a factor in a dead-headed condition.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- All spring ranges are tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Direct acting concept provides highly reliable operation in contaminated systems, especially at dead headed conditions.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES







Direct-acting, pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). These valves incorporate a damped construction for stable operation allowing the use of high reduced pressure.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	80 L/min.
Factory Pressure Settings Established at	0.25 gpm
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	50 cc/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.36 kg.

**CONFIGURATION OPTIONS**

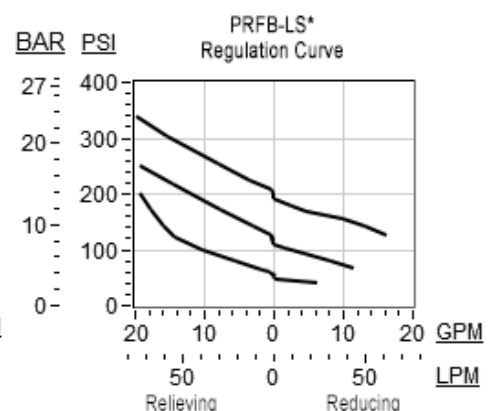
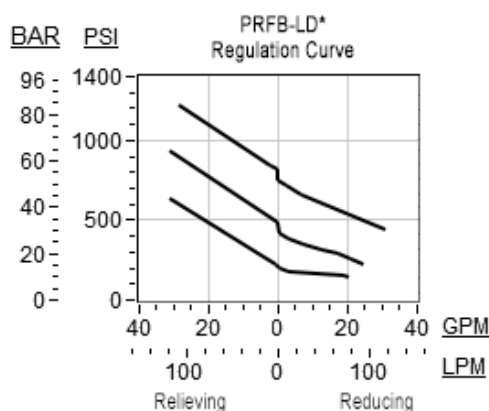
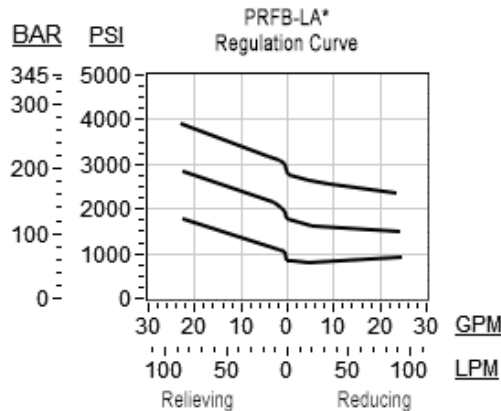
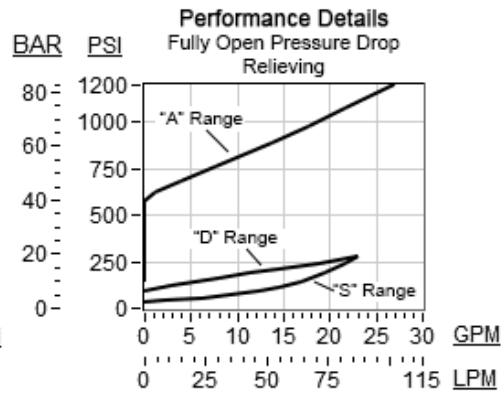
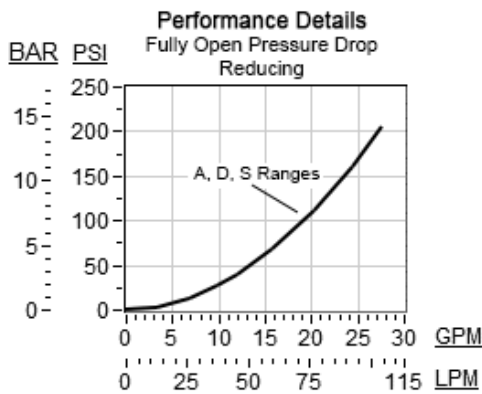
**Model Code Example: PRFBLAN**

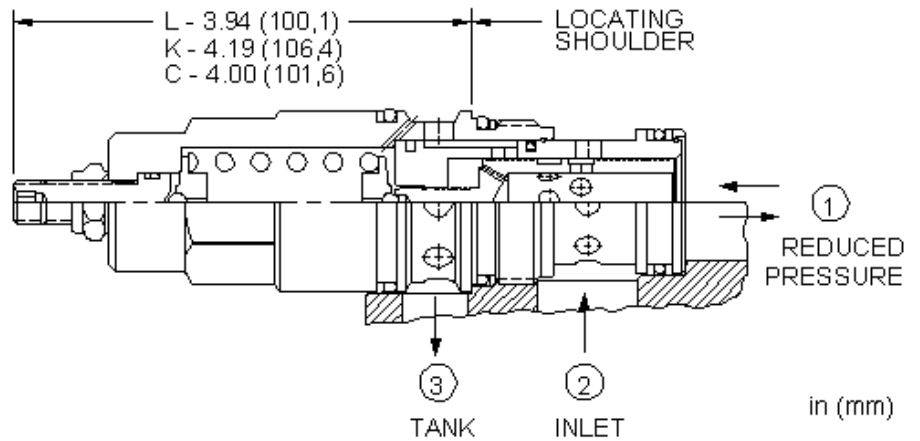
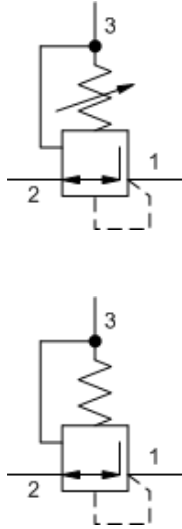
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 750 - 3000 psi (50 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 300 - 1500 psi (20 - 105 bar), 500 psi (35 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>D</b> 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
	<b>E</b> 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>S</b> 50 - 200 psi (3,5 - 14 bar), 100 psi (7 bar) Standard Setting		
	<b>W</b> 1000 - 4500 psi (70 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- All spring ranges are tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Suitable for accumulator circuits since the absence of pilot control flow results in reduced secondary circuit leakage.
- Direct acting concept provides highly reliable operation in contaminated systems, especially at dead headed conditions.
- Unlike pilot operated versions, direct acting valves exhibit a transitional step between reducing and relieving modes. This step equals 5% of the high end of the adjustment range, independent of the valve setting. Therefore, these valves may not be suitable for counterbalancing applications.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Direct-acting, pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). These valves incorporate a damped construction for stable operation allowing the use of high reduced pressure.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	160 L/min.
Factory Pressure Settings Established at	0.25 gpm
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	65 cc/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	EPDM: 990017014
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	0.70 kg.

**CONFIGURATION OPTIONS**

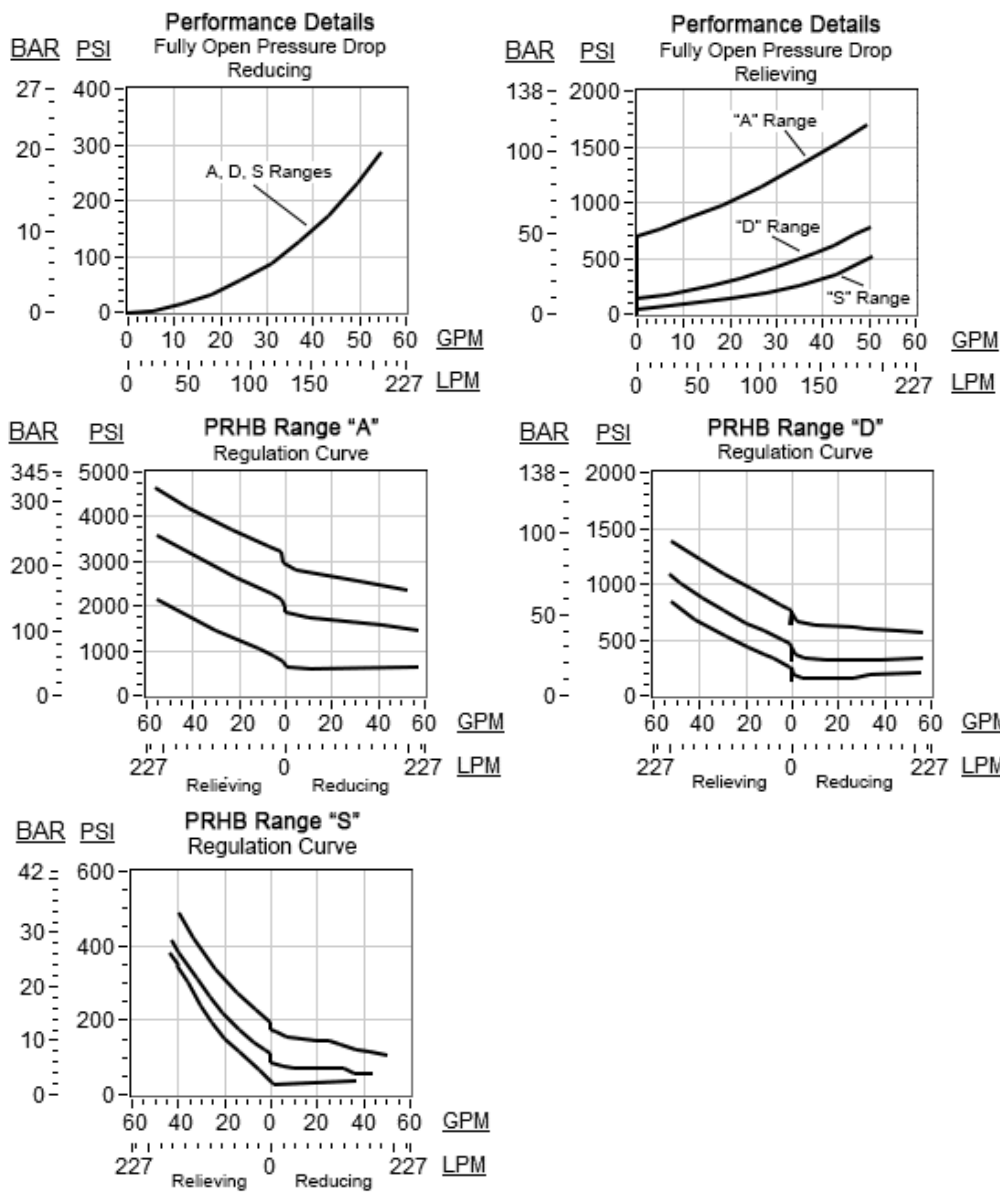
**Model Code Example: PRHBLAN**

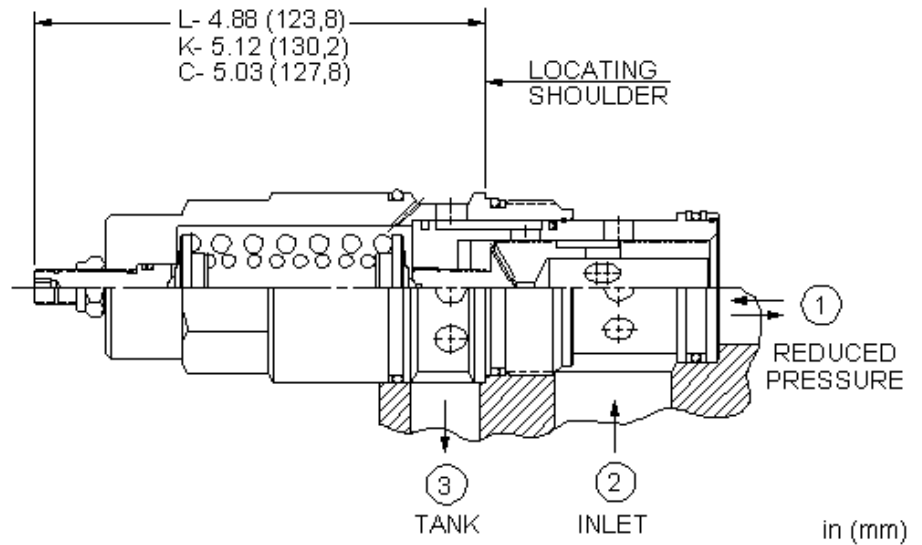
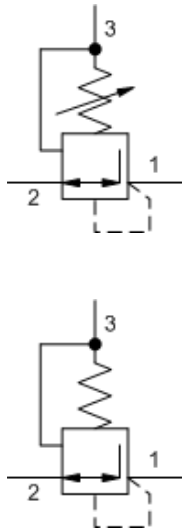
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 750 - 3000 psi (50 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 300 - 1500 psi (20 - 105 bar), 500 psi (35 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>D</b> 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
	<b>E</b> 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>S</b> 50 - 200 psi (3,5 - 14 bar), 100 psi (7 bar) Standard Setting		
	<b>W</b> 1100 - 4500 psi (76 - 315 bar), 1100 psi (76 bar) Standard Setting		

## TECHNICAL FEATURES

- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- All spring ranges are tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Suitable for accumulator circuits since the absence of pilot control flow results in reduced secondary circuit leakage.
- Direct acting concept provides highly reliable operation in contaminated systems, especially at dead headed conditions.
- Unlike pilot operated versions, direct acting valves exhibit a transitional step between reducing and relieving modes. This step equals 5% of the high end of the adjustment range, independent of the valve setting. Therefore, these valves may not be suitable for counterbalancing applications.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Direct-acting, pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). These valves incorporate a damped construction for stable operation allowing the use of high reduced pressure.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	320 L/min.
Factory Pressure Settings Established at	0.25 gpm
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	80 cc/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	1.57 kg.

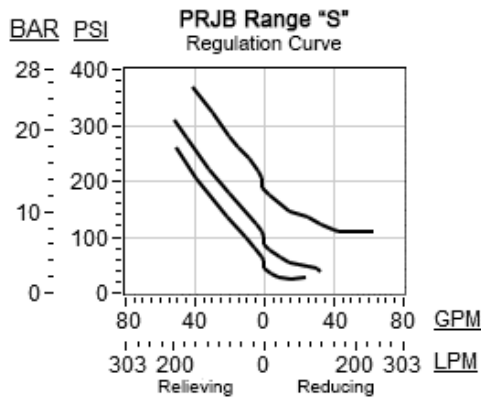
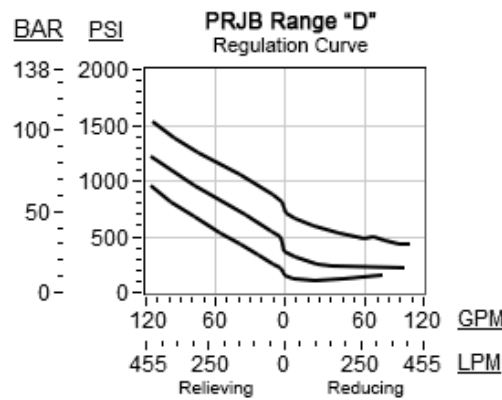
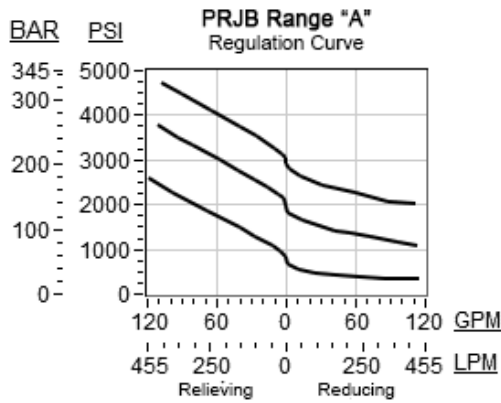
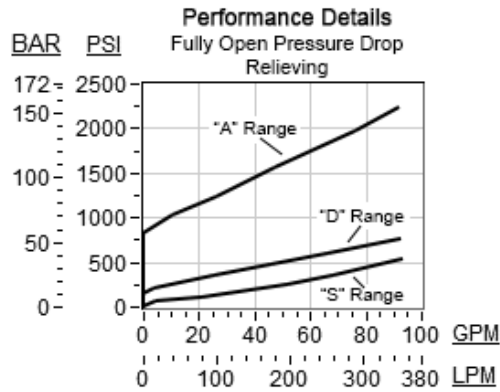
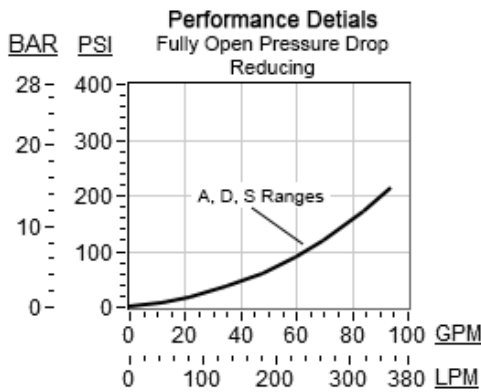
**CONFIGURATION OPTIONS**
**Model Code Example: PRJBLAN**

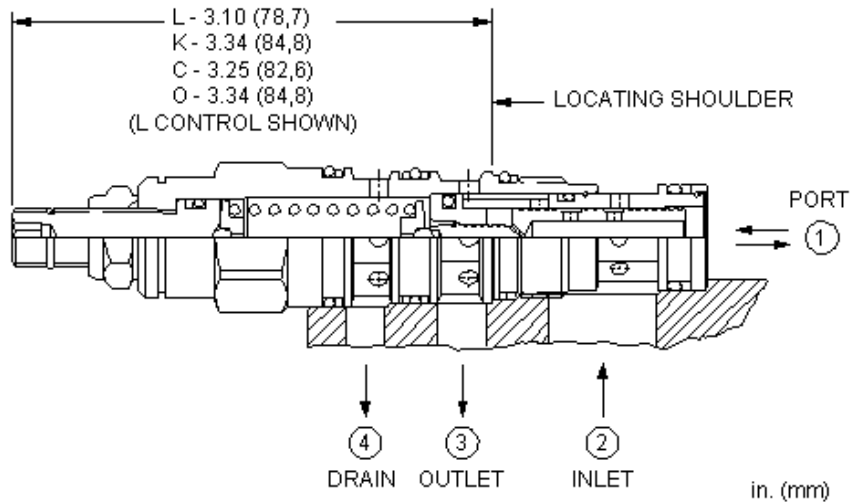
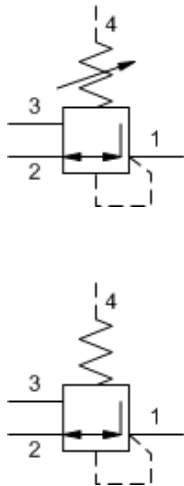
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 750 - 3000 psi (50 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 300 - 1500 psi (20 - 105 bar), 500 psi (35 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>D</b> 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting	<b>V</b> Viton	
	<b>E</b> 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>S</b> 50 - 200 psi (3,5 - 14 bar), 100 psi (7 bar) Standard Setting		
	<b>W</b> 1100 - 4500 psi (76 - 315 bar), 1100 psi (76 bar) Standard Setting		

## TECHNICAL FEATURES

- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- All spring ranges are tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Suitable for accumulator circuits since the absence of pilot control flow results in reduced secondary circuit leakage.
- Direct acting concept provides highly reliable operation in contaminated systems, especially at dead headed conditions.
- Unlike pilot operated versions, direct acting valves exhibit a transitional step between reducing and relieving modes. This step equals 5% of the high end of the adjustment range, independent of the valve setting. Therefore, these valves may not be suitable for counterbalancing applications.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Direct-acting, pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). Draining port 4 makes the valve insensitive to pressure at port 3. These valves incorporate a damped construction for stable operation allowing the use of high reduced pressure.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-21A
Series	1
Capacity	40 L/min.
Factory Pressure Settings Established at	0.25 gpm
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.@70 bar
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006
Model Weight	0.19 kg.

**NOTES**

For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

**CONFIGURATION OPTIONS**

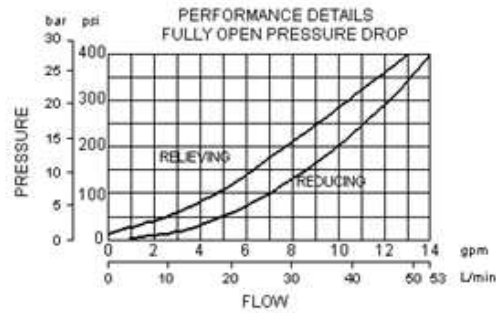
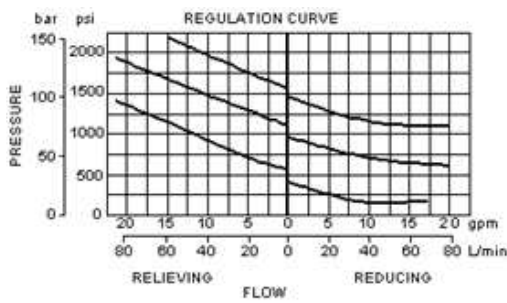
**Model Code Example: PSDBLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 500 - 3000 psi (35 - 210 bar), 700 psi (50 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>K</b> Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting		
<b>O</b> Handknob with Panel Mount	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>S</b> 25 - 200 psi (1,7 - 14 bar), 100 psi (7 bar) Standard Setting		
	<b>W</b> 750 - 4500 psi (50 - 315 bar), 1000 psi (70 bar) Standard Setting		

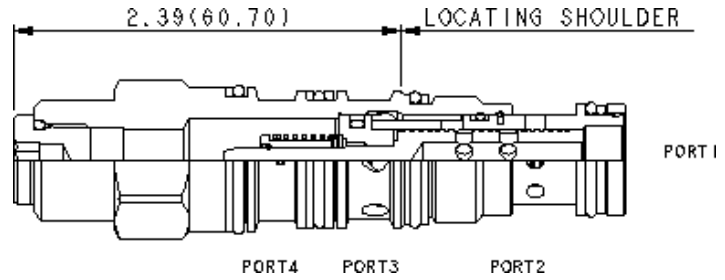
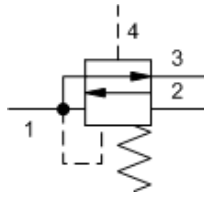
## TECHNICAL FEATURES

- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- All spring ranges are tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Suitable for accumulator circuits since the absence of pilot control flow results in reduced secondary circuit leakage.
- Direct acting concept provides highly reliable operation in contaminated systems, especially at dead headed conditions.
- Unlike pilot operated versions, direct acting valves exhibit a transitional step between reducing and relieving modes. This step equals 5% of the high end of the adjustment range, independent of the valve setting.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- Pressure on the drain (port 4) is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- By controlling the pressure at the drain (port 4), the effective setting of the valve can be increased over the nominal valve setting.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES







The direct-acting reducer/reliever main section is meant to act as an interface between a low flow pressure source at port 4 and a circuit with higher flow requirements. The valve will reduce a high primary pressure at the inlet (port 2) to a reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3).

The valve incorporates a damped construction for stable operation allowing the use of high reduced pressure.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-21A
Series	1
Capacity	40 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	41 cc/min.
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	EPDM: 990021014
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006
Model Weight	0.17 kg.

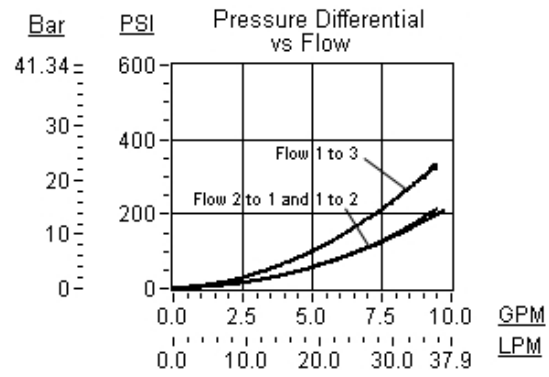
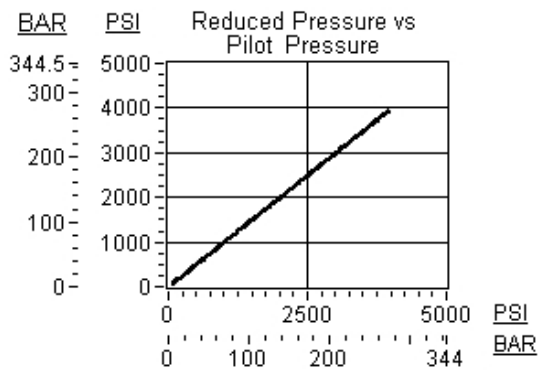
**CONFIGURATION OPTIONS**
**Model Code Example: PSDTXFN**

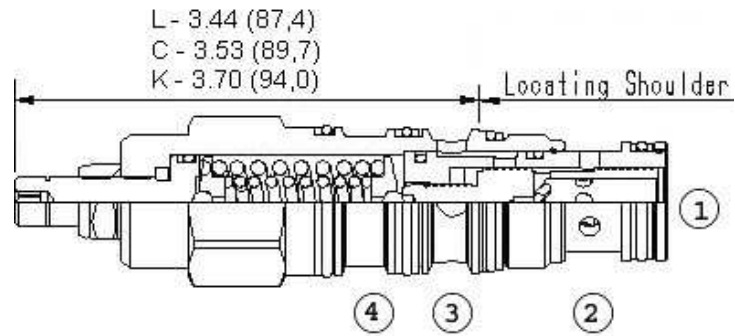
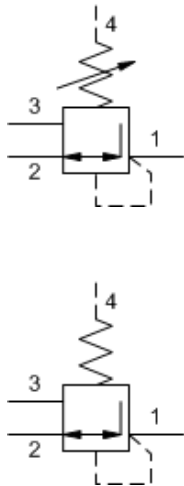
<b>CONTROL</b>	<b>(X)</b>	<b>BIAS PRESSURE</b>	<b>(F)</b>	<b>SEAL MATERIAL</b>	<b>(N)</b>
X Not Adjustable		F 100 psi (7 bar)		N Buna-N E EPDM V Viton	

**TECHNICAL FEATURES**

- The valve is biased to the relieving mode with a 100 psi (7 bar) spring. Pressure at port 4 is directly added to the setting of the valve once this threshold is exceeded. For example, 1000 psi (70 bar) at port 4 will result in a setting of 900 psi (63 bar) at port 1.
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- All spring ranges are tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Suitable for accumulator circuits since the absence of pilot control flow results in reduced secondary circuit leakage.
- Direct acting concept provides highly reliable operation in contaminated systems, especially at dead headed conditions.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- Pressure on the drain (port 4) is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

**PERFORMANCE CURVES**





Direct-acting, pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). Draining port 4 makes the valve insensitive to pressure at port 3. These valves incorporate a damped construction for stable operation allowing the use of high reduced pressure.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-22A
Series	2
Capacity	80 L/min.
Factory Pressure Settings Established at	0.25 gpm
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	50 cc/min.@70 bar
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990022007
Seal kit - Cartridge	Polyurethane: 990022002
Seal kit - Cartridge	Viton: 990022006
Model Weight	0.33 kg.

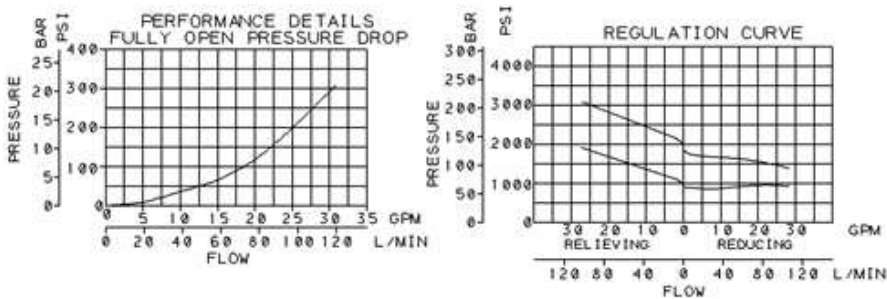
**CONFIGURATION OPTIONS**
**Model Code Example: PSFBLAN**

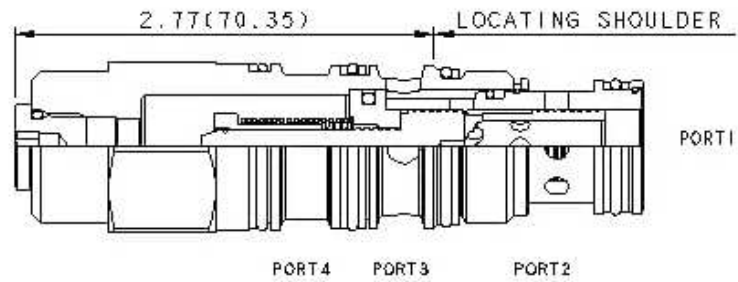
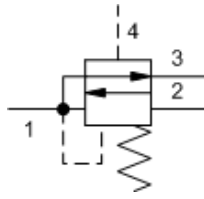
<b>CONTROL</b>	<b>(L)</b>	<b>ADJUSTMENT RANGE</b>	<b>(A)</b>	<b>SEAL MATERIAL</b>	<b>(N)</b>
<b>L</b> Standard Screw Adjustment		<b>A</b> 750 - 3000 psi (50 - 210 bar), 1000 psi (70 bar) Standard Setting		<b>N</b> Buna-N	
<b>C</b> Tamper Resistant - Factory Set		<b>B</b> 300 - 1500 psi (20 - 105 bar), 500 psi (35 bar) Standard Setting		<b>V</b> Viton	
<b>K</b> Handknob		<b>D</b> 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting			
		<b>E</b> 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting			
		<b>S</b> 50 - 200 psi (3,5 - 14 bar), 100 psi (7 bar) Standard Setting			

## TECHNICAL FEATURES

- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- All spring ranges are tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Suitable for accumulator circuits since the absence of pilot control flow results in reduced secondary circuit leakage.
- Direct acting concept provides highly reliable operation in contaminated systems, especially at dead headed conditions.
- Unlike pilot operated versions, direct acting valves exhibit a transitional step between reducing and relieving modes. This step equals 5% of the high end of the adjustment range, independent of the valve setting.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- Pressure on the drain (port 4) is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- By controlling the pressure at the drain (port 4), the effective setting of the valve can be increased over the nominal valve setting.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





The direct-acting reducer/reliever main section is meant to act as an interface between a low flow pressure source at port 4 and a circuit with higher flow requirements. The valve will reduce a high primary pressure at the inlet (port 2) to a reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3).

The valve incorporates a damped construction for stable operation allowing the use of high reduced pressure.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-22A
Series	2
Capacity	80 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	50 cc/min.@70 bar
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990022007
Seal kit - Cartridge	EPDM: 990022014
Seal kit - Cartridge	Polyurethane: 990022002
Seal kit - Cartridge	Viton: 990022006
Model Weight	0.30 kg.

**CONFIGURATION OPTIONS**

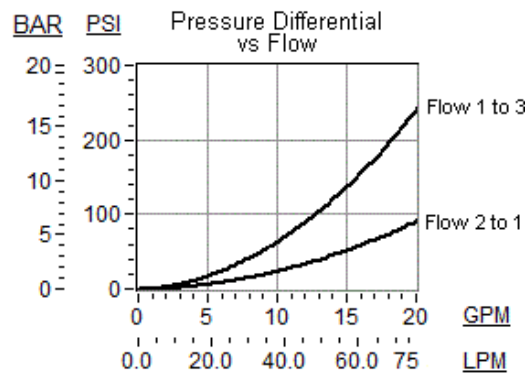
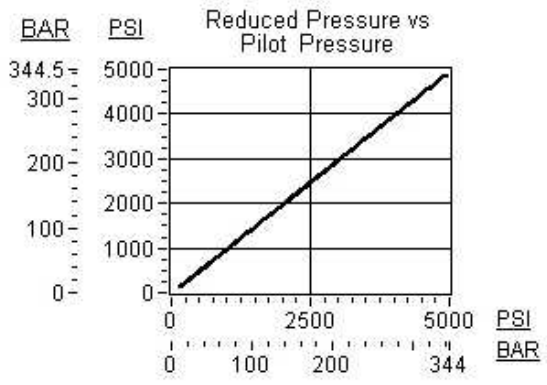
Model Code Example: **PSFTXFN**

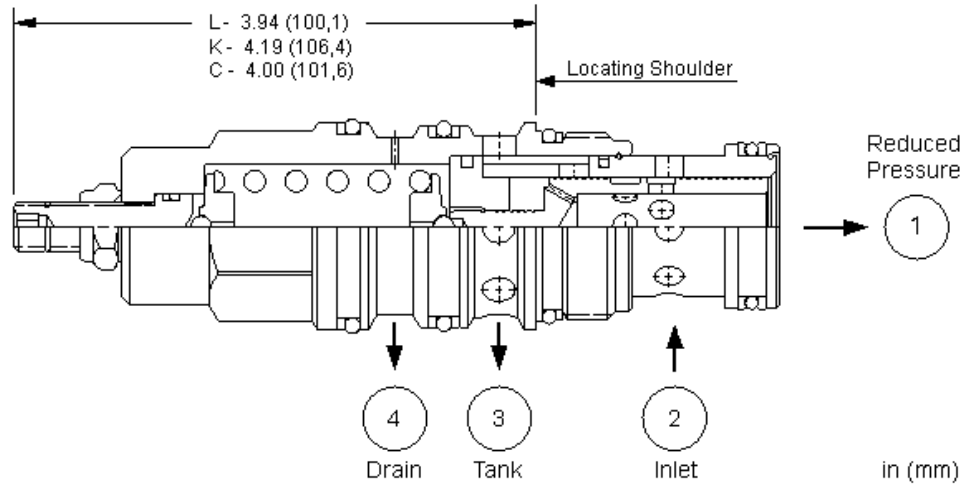
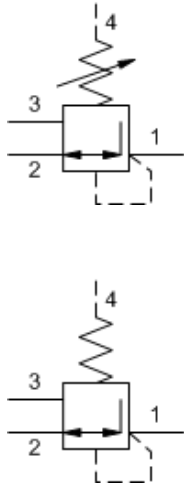
<b>CONTROL</b>	<b>(X) BIAS PRESSURE</b>	<b>(F) SEAL MATERIAL</b>	<b>(N)</b>
X Not Adjustable	F 100 psi (7 bar)	N Buna-N E EPDM V Viton	

**TECHNICAL FEATURES**

- The valve is biased to the relieving mode with a 100 psi (7 bar) spring. Pressure at port 4 is directly added to the setting of the valve once this threshold is exceeded. For example, 1000 psi (70 bar) at port 4 will result in a setting of 900 psi (63 bar) at port 1.
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- All spring ranges are tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Suitable for accumulator circuits since the absence of pilot control flow results in reduced secondary circuit leakage.
- Direct acting concept provides highly reliable operation in contaminated systems, especially at dead headed conditions.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- Pressure on the drain (port 4) is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

**PERFORMANCE CURVES**





Direct-acting, pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). Draining port 4 makes the valve insensitive to pressure at port 3. These valves incorporate a damped construction for stable operation allowing the use of high reduced pressure.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-23A
Series	3
Capacity	160 L/min.
Factory Pressure Settings Established at	0.25 gpm
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	65 cc/min.@70 bar
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	EPDM: 990023014
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006
Model Weight	0.68 kg.

**CONFIGURATION OPTIONS**

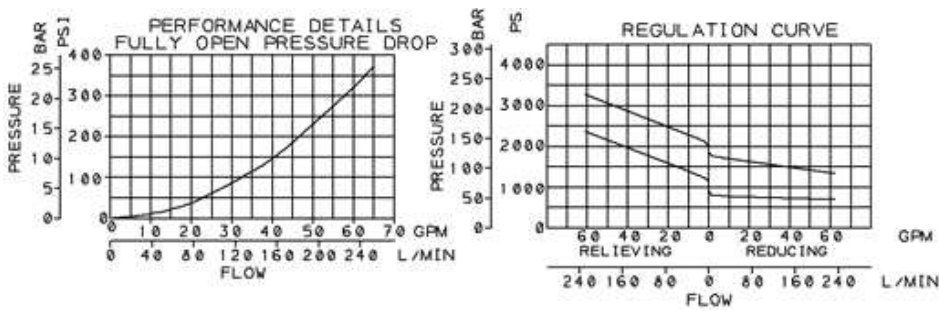
**Model Code Example: PSHBLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N)
<b>L</b> Standard Screw Adjustment	<b>A</b> 750 - 3000 psi (50 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 300 - 1500 psi (20 - 105 bar), 500 psi (35 bar) Standard Setting	<b>E</b> EPDM	
<b>K</b> Handknob	<b>D</b> 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting	<b>V</b> Viton	
	<b>E</b> 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>S</b> 50 - 200 psi (3,5 - 14 bar), 100 psi (7 bar) Standard Setting		
	<b>W</b> 1100 - 4500 psi (76 - 315 bar), 1100 psi (76 bar) Standard Setting		

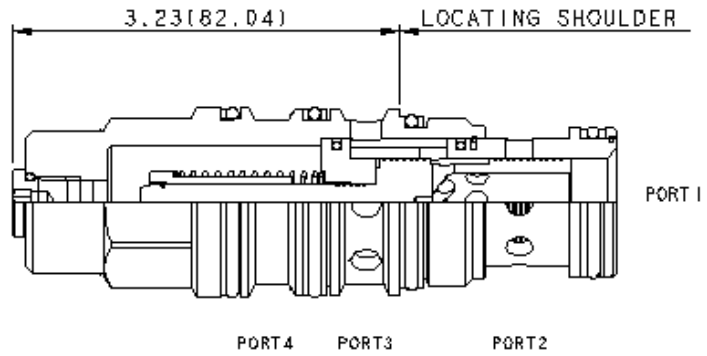
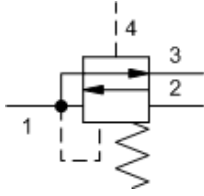
## TECHNICAL FEATURES

- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- All spring ranges are tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Suitable for accumulator circuits since the absence of pilot control flow results in reduced secondary circuit leakage.
- Direct acting concept provides highly reliable operation in contaminated systems, especially at dead headed conditions.
- Unlike pilot operated versions, direct acting valves exhibit a transitional step between reducing and relieving modes. This step equals 5% of the high end of the adjustment range, independent of the valve setting.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- Pressure on the drain (port 4) is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- By controlling the pressure at the drain (port 4), the effective setting of the valve can be increased over the nominal valve setting.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES







The direct-acting reducer/reliever main section is meant to act as an interface between a low flow pressure source at port 4 and a circuit with higher flow requirements. The valve will reduce a high primary pressure at the inlet (port 2) to a reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3).

The valve incorporates a damped construction for stable operation allowing the use of high reduced pressure.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-23A
Series	3
Capacity	160 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	65 cc/min.@70 bar
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	EPDM: 990023014
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006
Model Weight	0.62 kg.

**CONFIGURATION OPTIONS**

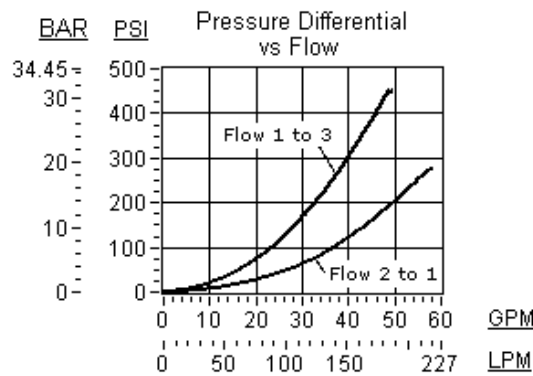
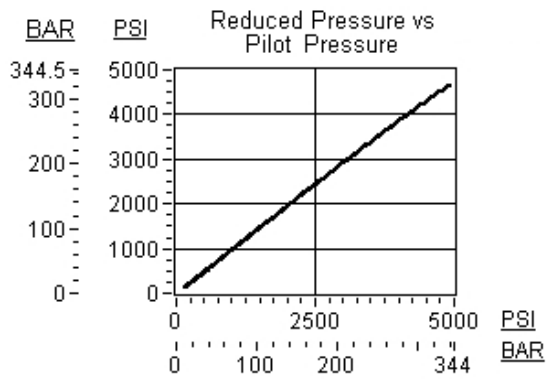
**Model Code Example: PSHTXFN**

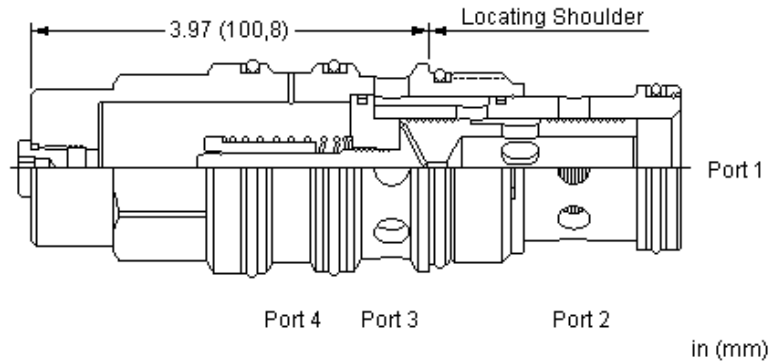
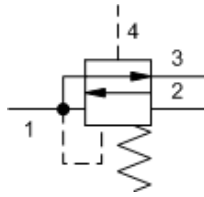
<b>CONTROL</b>	<b>(X) BIAS PRESSURE</b>	<b>(F) SEAL MATERIAL</b>	<b>(N)</b>
<b>X</b> Not Adjustable	<b>F</b> 100 psi (7 bar)	<b>N</b> Buna-N <b>E</b> EPDM <b>V</b> Viton	

## TECHNICAL FEATURES

- The valve is biased to the relieving mode with a 100 psi (7 bar) spring. Pressure at port 4 is directly added to the setting of the valve once this threshold is exceeded. For example, 1000 psi (70 bar) at port 4 will result in a setting of 900 psi (63 bar) at port 1.
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- All spring ranges are tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Suitable for accumulator circuits since the absence of pilot control flow results in reduced secondary circuit leakage.
- Direct acting concept provides highly reliable operation in contaminated systems, especially at dead headed conditions.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- Pressure on the drain (port 4) is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





The direct-acting reducer/reliever main section is meant to act as an interface between a low flow pressure source at port 4 and a circuit with higher flow requirements. The valve will reduce a high primary pressure at the inlet (port 2) to a reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3).

The valve incorporates a damped construction for stable operation allowing the use of high reduced pressure.

### TECHNICAL DATA

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-24A
Series	4
Capacity	320 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	65 cc/min.@70 bar
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Seal kit - Cartridge	Buna: 990024007
Seal kit - Cartridge	EPDM: 990024014
Seal kit - Cartridge	Polyurethane: 990024002
Seal kit - Cartridge	Viton: 990024006
Model Weight	1.31 kg.

### CONFIGURATION OPTIONS

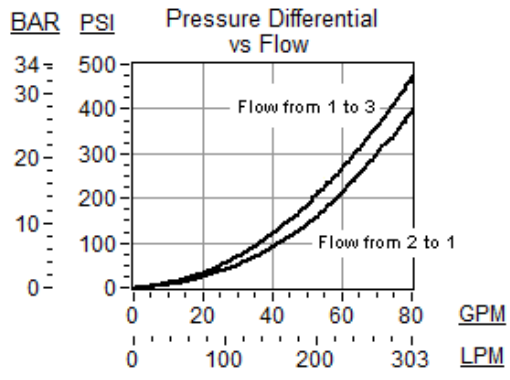
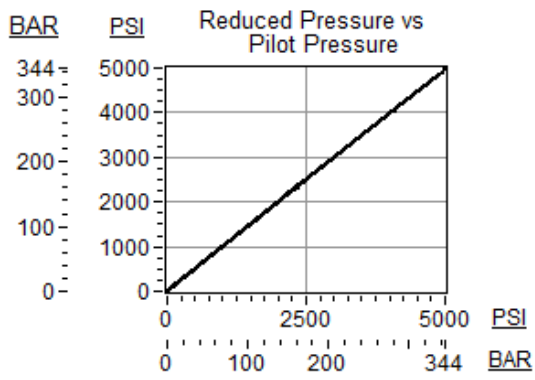
Model Code Example: **PSJTxFN**

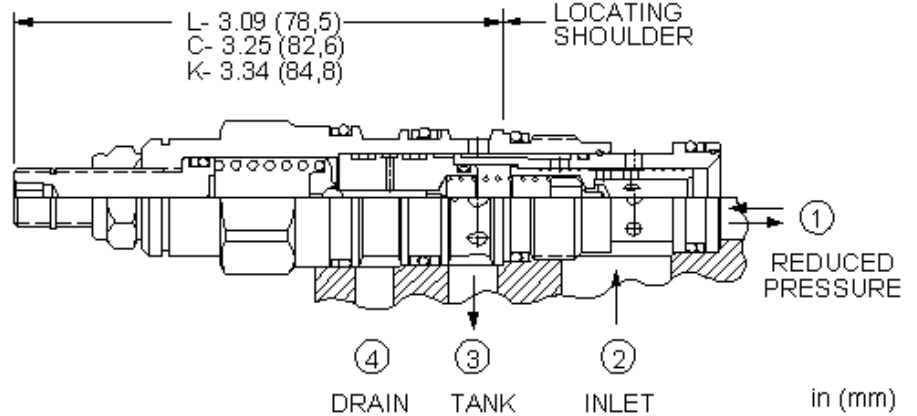
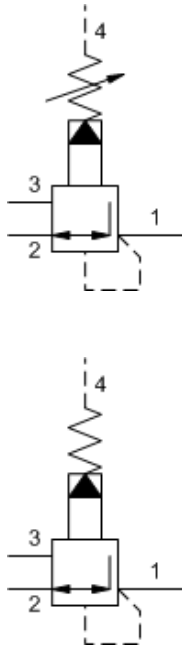
CONTROL	(X) BIAS PRESSURE	(F) SEAL MATERIAL	(N) MATERIAL/COATING
<b>X</b> Not Adjustable	<b>F</b> 100 psi (7 bar)	<b>N</b> Buna-N <b>E</b> EPDM <b>V</b> Viton	Standard Material/Coating /AP Stainless Steel, Passivated

### TECHNICAL FEATURES

- The valve is biased to the relieving mode with a 100 psi (7 bar) spring. Once this threshold is exceeded, pressure at port 4 is directly added to the pressure at port 1 of the valve. For example, 1000 psi (70 bar) at port 4 will result in a pressure reading of 900 psi (63 bar) at port 1.
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Suitable for accumulator circuits since the absence of pilot control flow results in reduced secondary circuit leakage.
- Direct acting concept provides highly reliable operation in contaminated systems, especially at dead headed conditions.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- Valve is tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Pressure on the drain (port 4) is directly additive to the pressure at port 1 at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Externally drained, pilot-operated pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). Draining the pilot section at port 4 makes these valves insensitive to pressure at tank (port 3) and provides a means for remote control by pilot or 2-way valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-21A
Series	1
Capacity	40 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	EPDM: 990021014
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006
Model Weight	0.19 kg.

**NOTES** Maximum pressure differentials for spring ranges: A and B are 3000 psi (210 bar) D and E are 2000 psi (140 bar) W is 5000 psi (350 bar) inlet pressure

**CONFIGURATION OPTIONS**

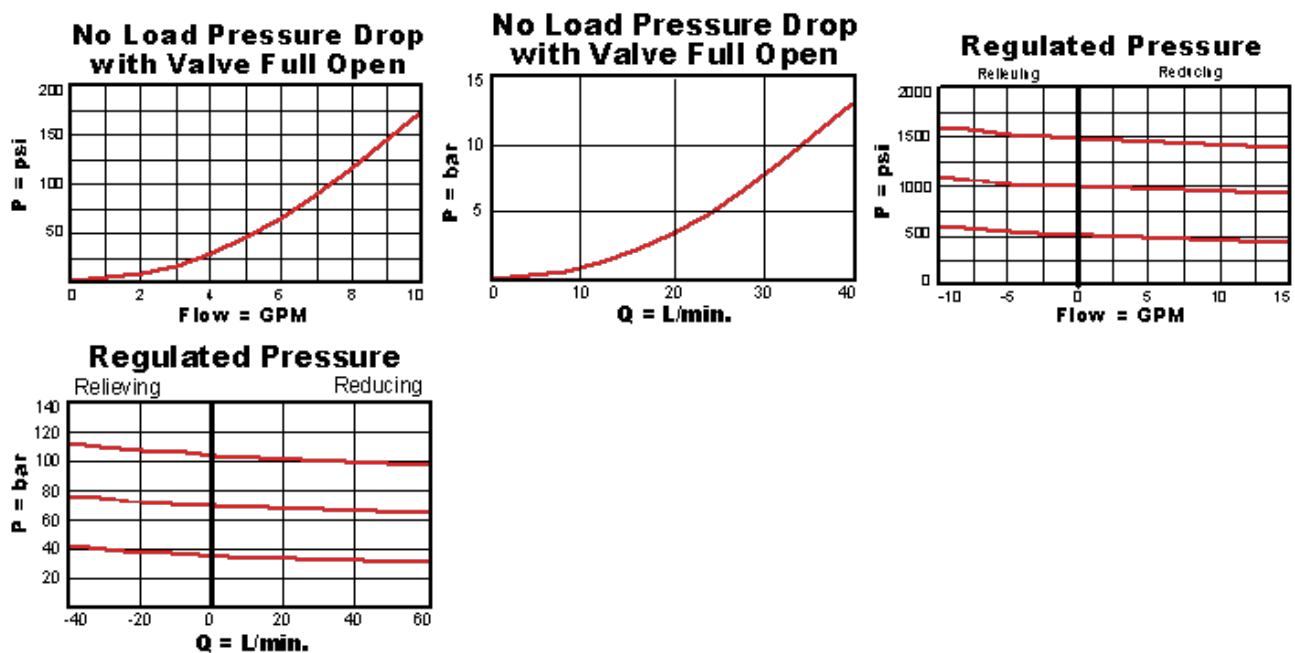
**Model Code Example: PVDALAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting		/LH Mild Steel, Zinc-Nickel
<b>Y</b> Tri-Grip Handknob	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

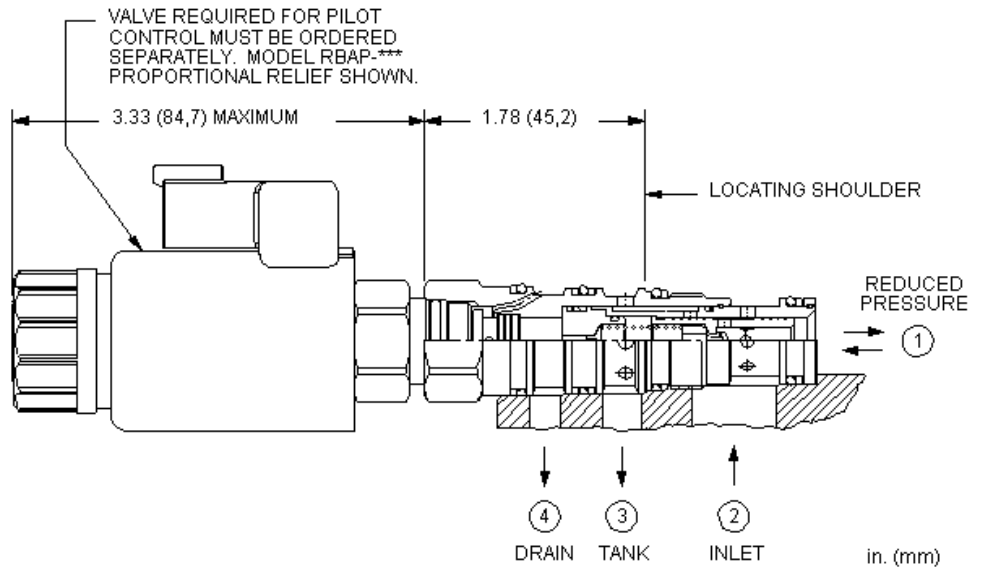
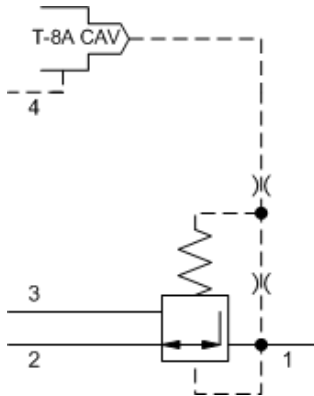
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pressure at port 4 should not exceed 5000 psi (350 bar).
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure on the drain (port 4) is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- By controlling the pressure at the drain (port 4), the effective setting of the valve can be increased over the nominal valve setting.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PVDA8](#) Pilot-operated, pressure reducing/relieving main stage with integral T-8A control cavity and drain to port 4



This valve is a 3-way, normally open modulating element, externally drained, that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full flow relief function from port 1 to tank (port 3). The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the drain (port 4).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-21A
Series	1
Capacity	40 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Pilot Control Cavity	T-8A
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006
Model Weight	0.13 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

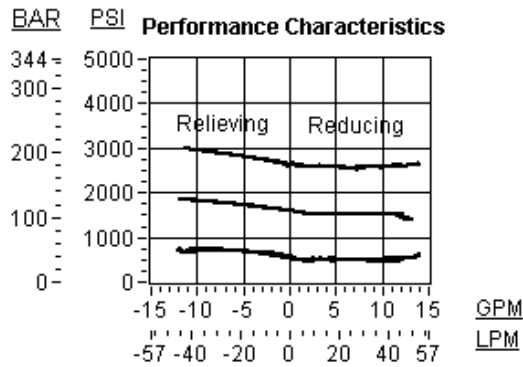
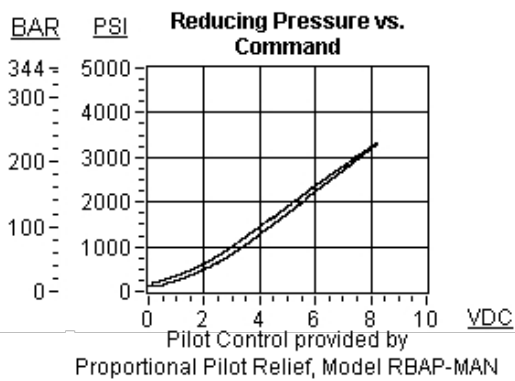
**Model Code Example: PVDA8WN**

<b>MINIMUM CONTROL PRESSURE (W)</b>	<b>SEAL MATERIAL (N)</b>
W 100 psi (7 bar)	N Buna-N
D 25 psi (1,7 bar)	V Viton

## TECHNICAL FEATURES

- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pressure at port 4 should not exceed 5000 psi (350 bar).
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure on the drain (port 4) is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

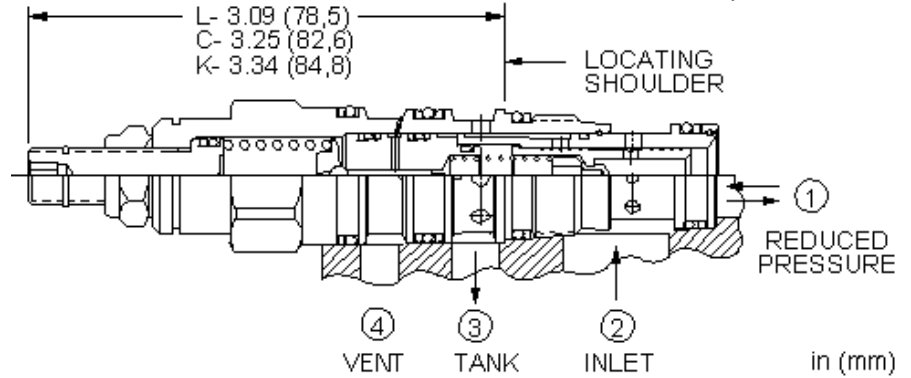
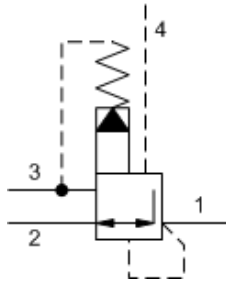
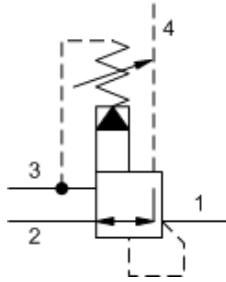
## PERFORMANCE CURVES



## RELATED MODELS

- [PVDA](#) Pilot-operated, pressure reducing/relieving valve with drain to port 4





Ventable, pilot-operated pressure reducing/relieving valves reduce a high primary pressure at the inlet to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). The vent port (port 4) can be used as a means for remote control by pilot or 2-way valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-21A
Series	1
Capacity	40 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	EPDM: 990021014
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006
Model Weight	0.19 kg.

**NOTES** Maximum pressure differentials for spring ranges: A and B are 3000 psi (210 bar) D and E are 2000 psi (140 bar) W is 5000 psi (350 bar) inlet pressure

**CONFIGURATION OPTIONS**

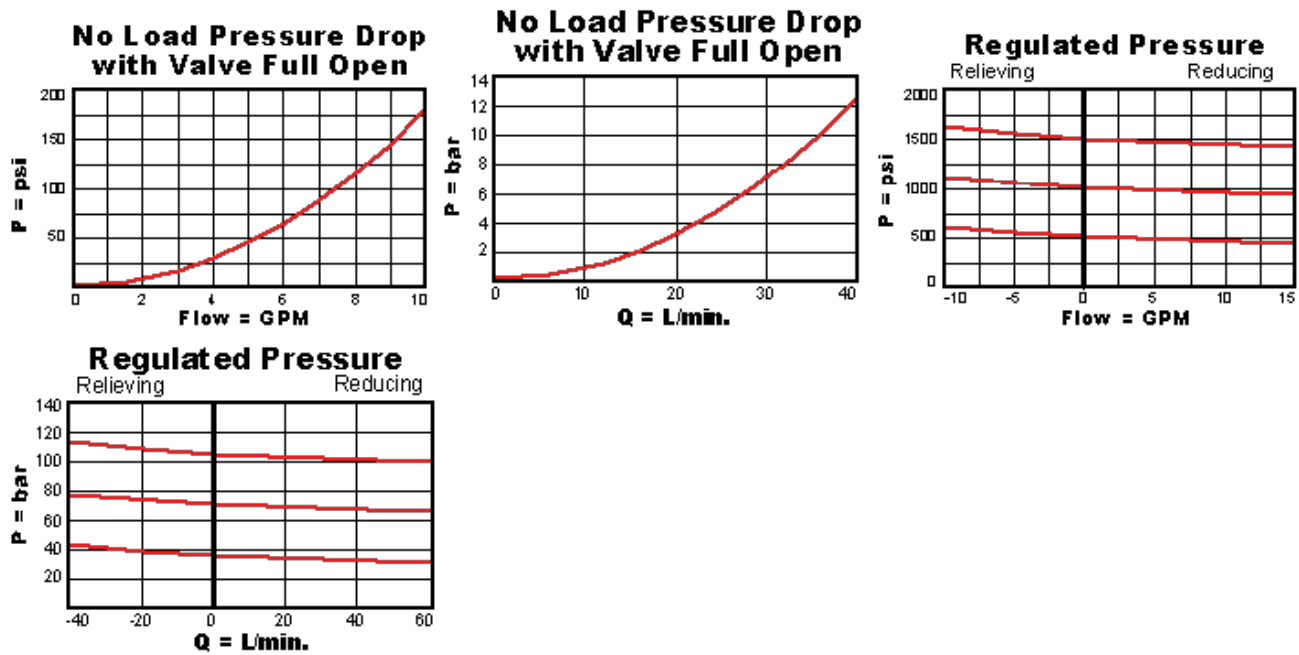
**Model Code Example: PVDBLAN**

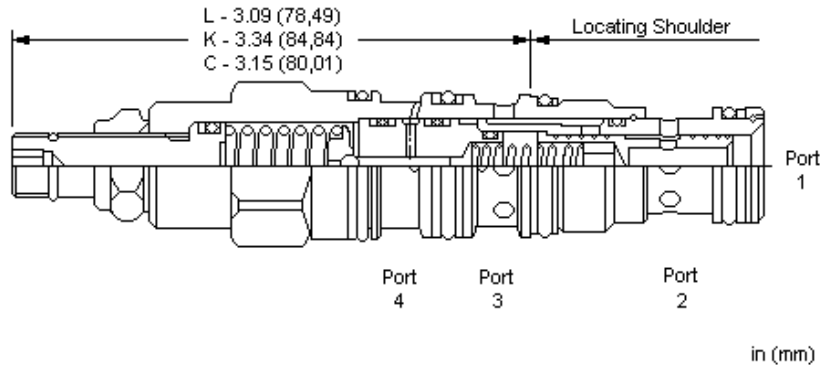
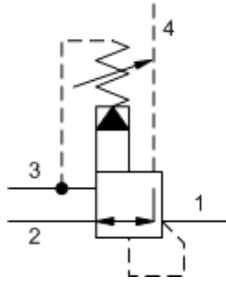
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 200 psi (14 bar) Standard Setting		
	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- By controlling the pressure at the vent (port 4), the effective setting of the valve can be controlled below the nominal valve setting.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Ventable, pilot-operated pressure reducing/relieving valves reduce a high primary pressure at the inlet to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). The vent port (port 4) can be used as a means for remote control by pilot or 2-way valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-21A
Series	1
Capacity	40 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006
Model Weight	0.19 kg.

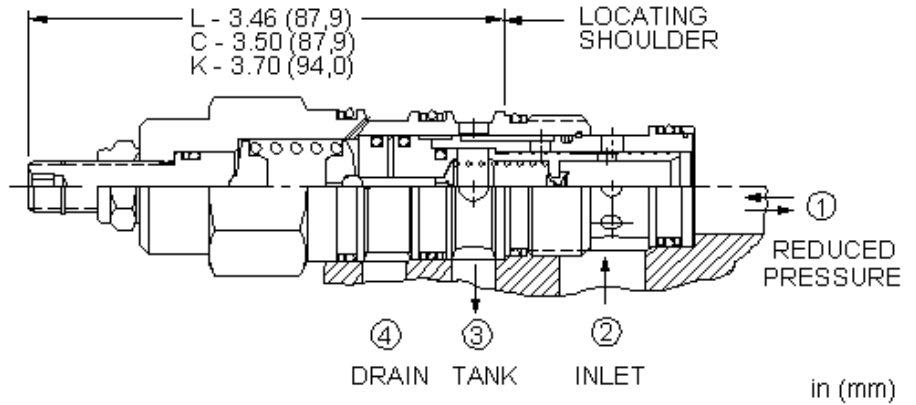
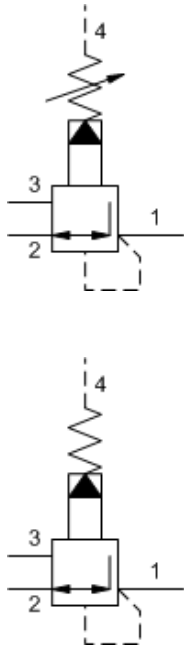
**CONFIGURATION OPTIONS**

**Model Code Example: PVDDLAN**

CONTROL	(L)	ADJUSTMENT RANGE	(A)	SEAL MATERIAL	(N)
L Standard Screw Adjustment		A 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting		N Buna-N	
C Tamper Resistant - Factory Set		B 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting		V Viton	
K Handknob		D 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting			
		E 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting			
		W 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting			

## TECHNICAL FEATURES

- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- By controlling the pressure at the vent (port 4), the effective setting of the valve can be controlled below the nominal valve setting.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.



Externally drained, pilot-operated pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). Draining the pilot section at port 4 makes these valves insensitive to pressure at tank (port 3) and provides a means for remote control by pilot or 2-way valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-22A
Series	2
Capacity	80 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990022007
Seal kit - Cartridge	Polyurethane: 990022002
Seal kit - Cartridge	Viton: 990022006
Model Weight	0.34 kg.

**NOTES**

Maximum pressure differentials for spring ranges: A and B are 3000 psi (210 bar) D and E are 2000 psi (140 bar) W is 5000 psi (350 bar) inlet pressure

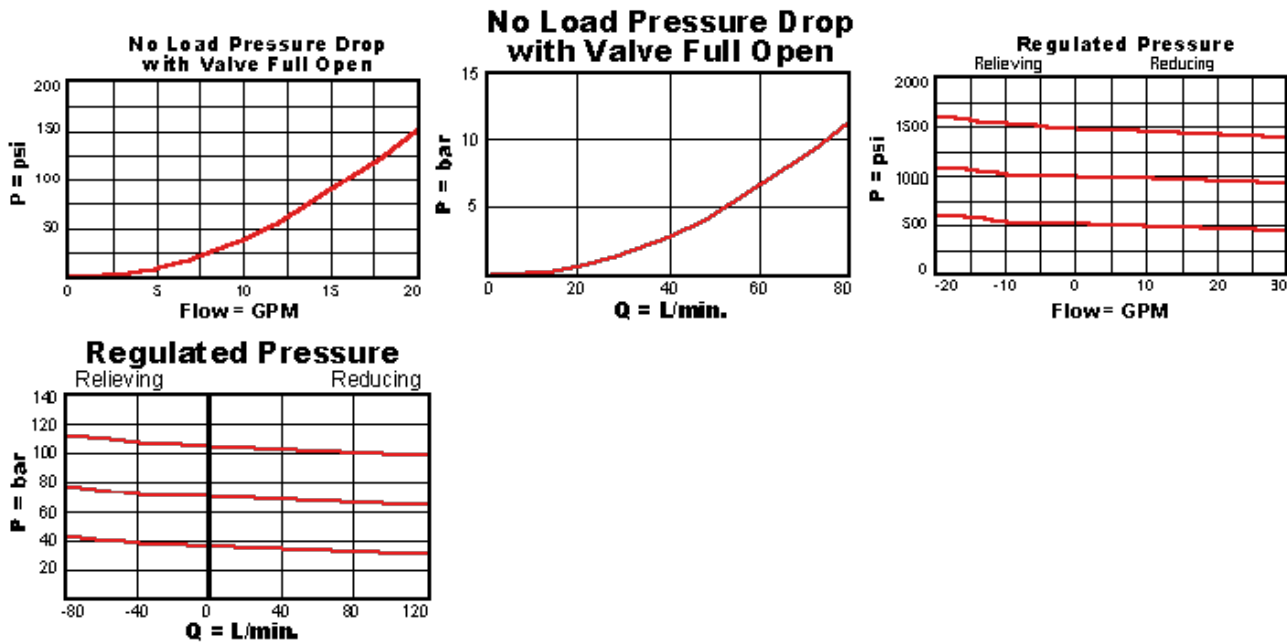
**CONFIGURATION OPTIONS**
**Model Code Example: PVFALAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>W</b> Hex Wrench Adjustment	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

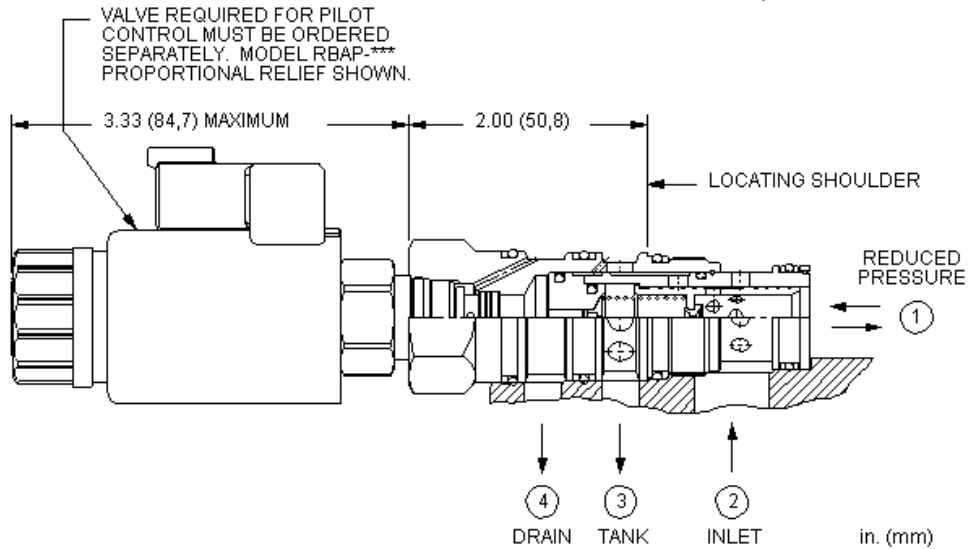
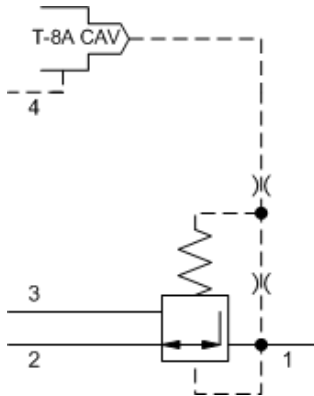
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pressure at port 4 should not exceed 5000 psi (350 bar).
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure on the drain (port 4) is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- By controlling the pressure at the drain (port 4), the effective setting of the valve can be increased over the nominal valve setting.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PVFA8](#) Pilot-operated, pressure reducing/relieving main stage with integral T-8A control cavity and drain to port 4



This valve is a 3-way, normally open modulating element, externally drained, that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full flow relief function from port 1 to tank (port 3). The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the drain (port 4).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-22A
Series	2
Capacity	80 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Pilot Control Cavity	T-8A
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990022007
Seal kit - Cartridge	Polyurethane: 990022002
Seal kit - Cartridge	Viton: 990022006
Model Weight	0.24 kg.

**NOTES**

Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

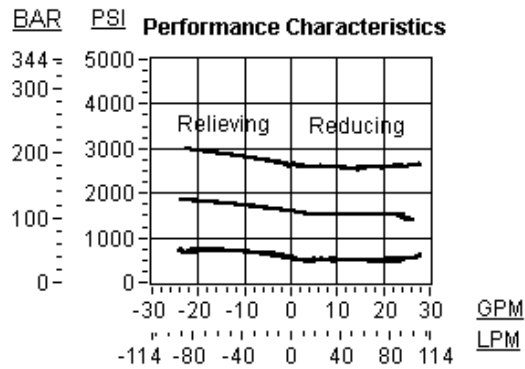
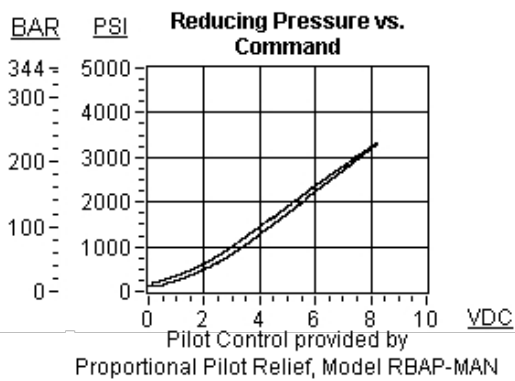
**Model Code Example: PVFA8WN**

<b>MINIMUM CONTROL PRESSURE (W)</b>	<b>SEAL MATERIAL (N)</b>
W 100 psi (7 bar)	N Buna-N
D 25 psi (1,7 bar)	E EPDM
	V Viton

## TECHNICAL FEATURES

- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pressure at port 4 should not exceed 5000 psi (350 bar).
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure on the drain (port 4) is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

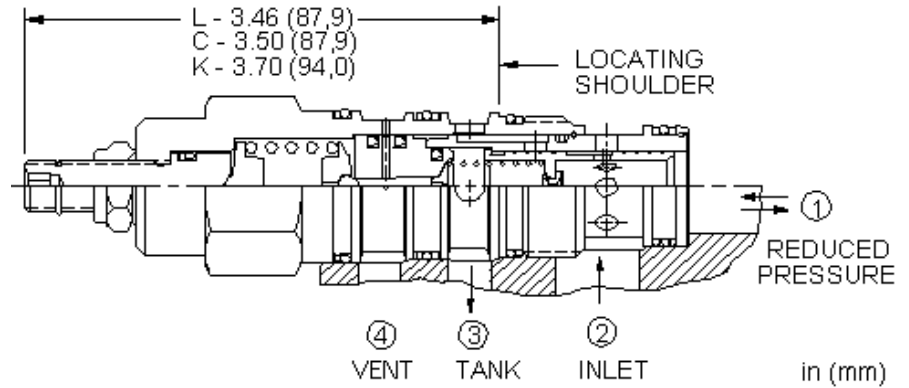
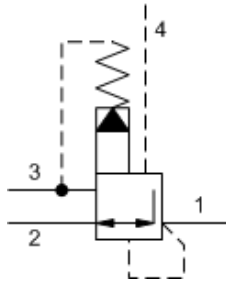
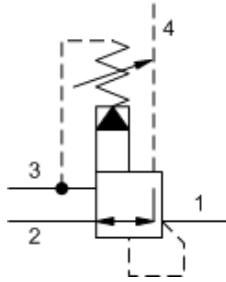
## PERFORMANCE CURVES



## RELATED MODELS

- [PVFA](#) Pilot-operated, pressure reducing/relieving valve with drain to port 4





Ventable, pilot-operated pressure reducing/relieving valves reduce a high primary pressure at the inlet to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). The vent port (port 4) can be used as a means for remote control by pilot or 2-way valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-22A
Series	2
Capacity	80 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990022007
Seal kit - Cartridge	Polyurethane: 990022002
Seal kit - Cartridge	Viton: 990022006
Model Weight	0.34 kg.

**NOTES** Maximum pressure differentials for spring ranges: A and B are 3000 psi (210 bar) D and E are 2000 psi (140 bar) W is 5000 psi (350 bar) inlet pressure

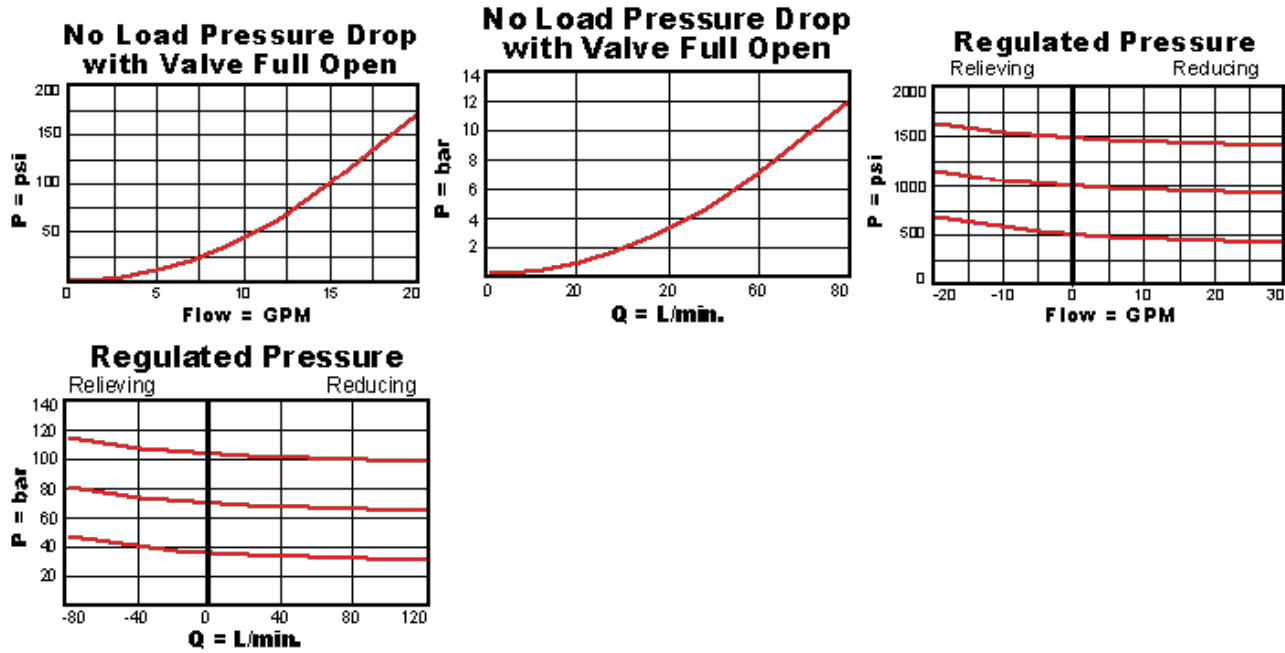
**CONFIGURATION OPTIONS**
**Model Code Example: PVFBLAN**

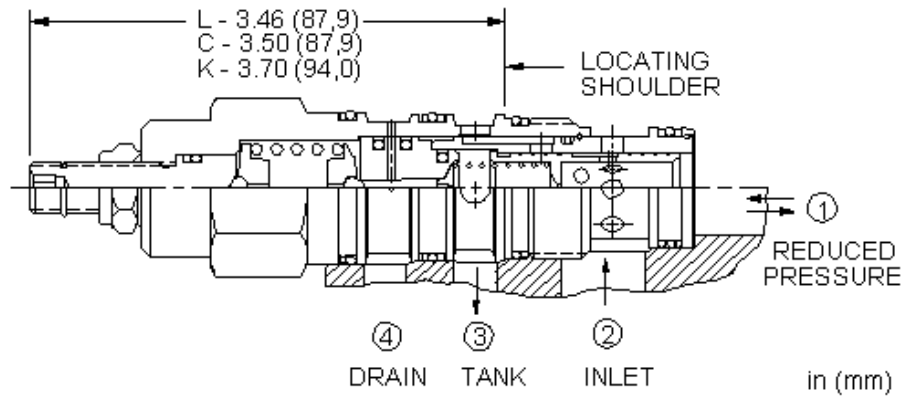
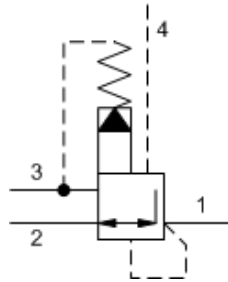
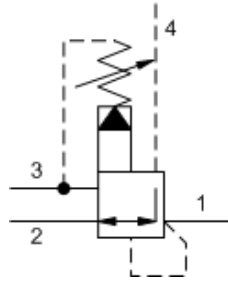
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- By controlling the pressure at the vent (port 4), the effective setting of the valve can be controlled below the nominal valve setting.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Ventable, pilot-operated pressure reducing/relieving valves reduce a high primary pressure at the inlet to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). The vent port (port 4) can be used as a means for remote control by pilot or 2-way valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-22A
Series	2
Capacity	80 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990022007
Seal kit - Cartridge	Polyurethane: 990022002
Seal kit - Cartridge	Viton: 990022006
Model Weight	0.34 kg.

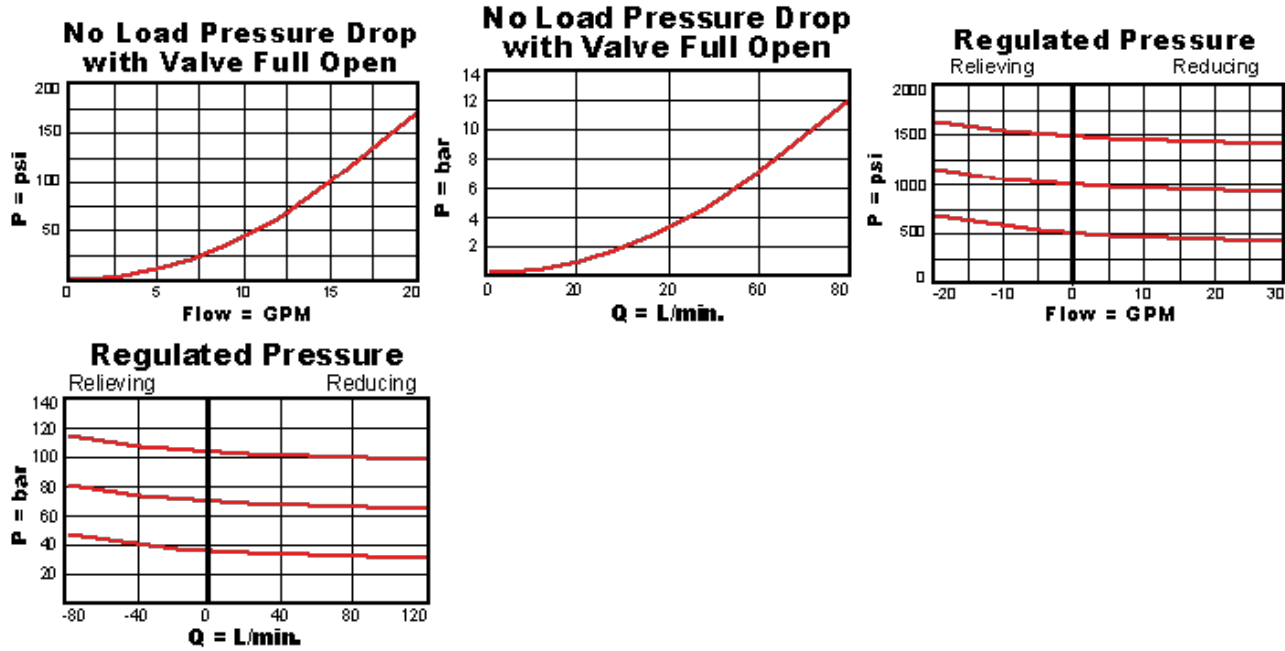
**CONFIGURATION OPTIONS**
**Model Code Example: PVFDLAN**

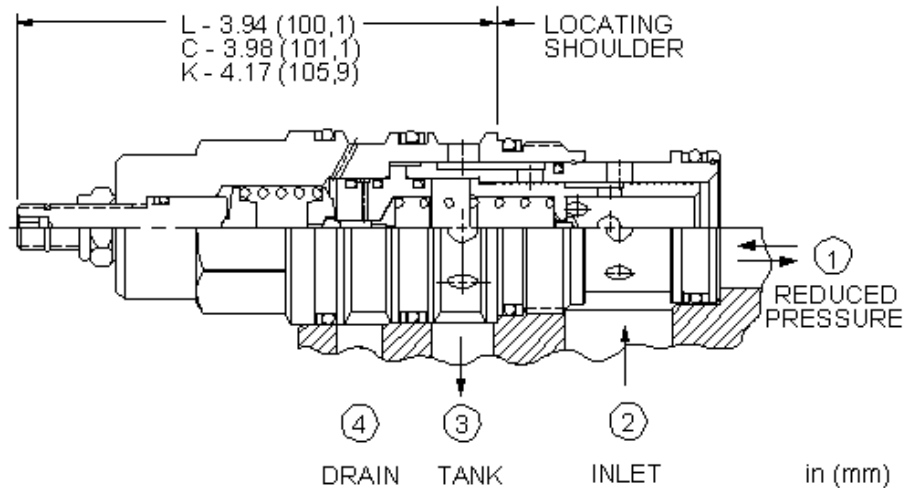
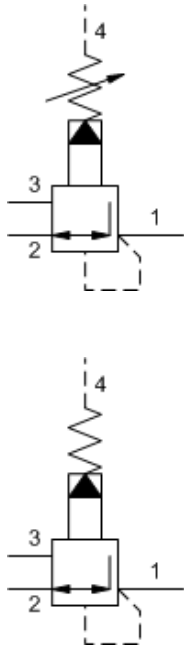
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- By controlling the pressure at the vent (port 4), the effective setting of the valve can be controlled below the nominal valve setting.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Externally drained, pilot-operated pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). Draining the pilot section at port 4 makes these valves insensitive to pressure at tank (port 3) and provides a means for remote control by pilot or 2-way valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-23A
Series	3
Capacity	160 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	EPDM: 990023014
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006
Model Weight	0.70 kg.

**NOTES** Maximum pressure differentials for spring ranges: A and B are 3000 psi (210 bar) D and E are 2000 psi (140 bar) W is 5000 psi (350 bar) inlet pressure

**CONFIGURATION OPTIONS**

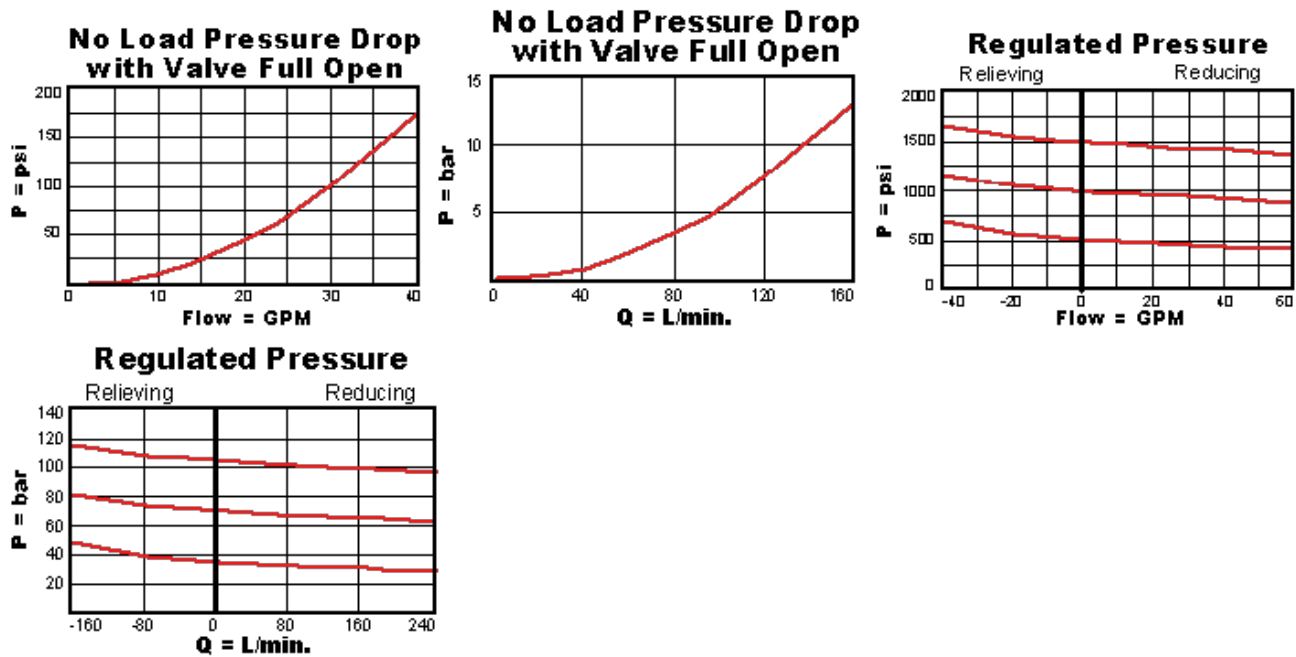
**Model Code Example: PVHALAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

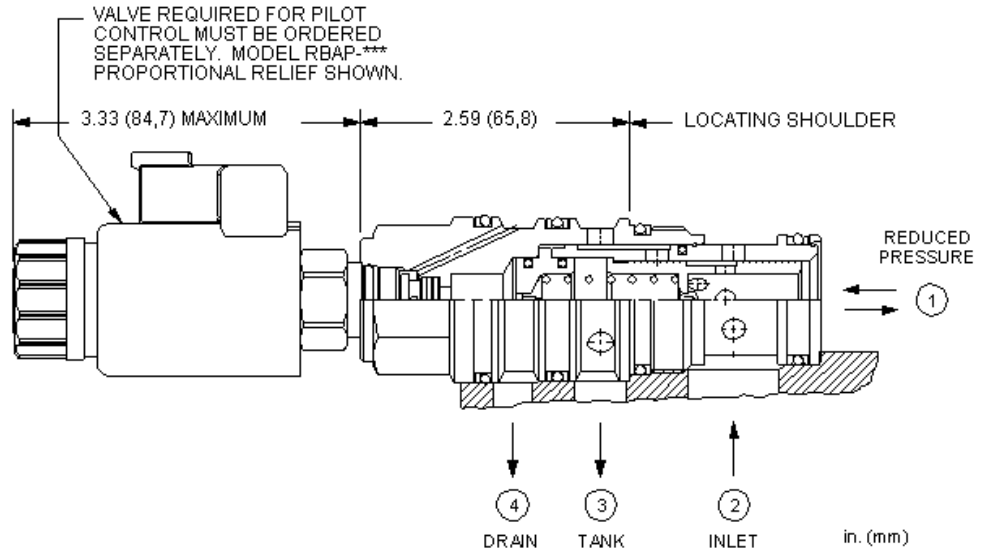
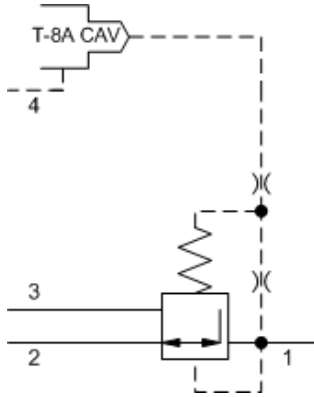
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pressure at port 4 should not exceed 5000 psi (350 bar).
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure on the drain (port 4) is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- By controlling the pressure at the drain (port 4), the effective setting of the valve can be increased over the nominal valve setting.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PVHA8](#) Pilot-operated, pressure reducing/relieving main stage with integral T-8A control cavity and drain to port 4



This valve is a 3-way, normally open modulating element, externally drained, that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full flow relief function from port 1 to tank (port 3). The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the drain (port 4).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-23A
Series	3
Capacity	160 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Pilot Control Valve Hex Size	22,2 mm
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006
Model Weight	0.60 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

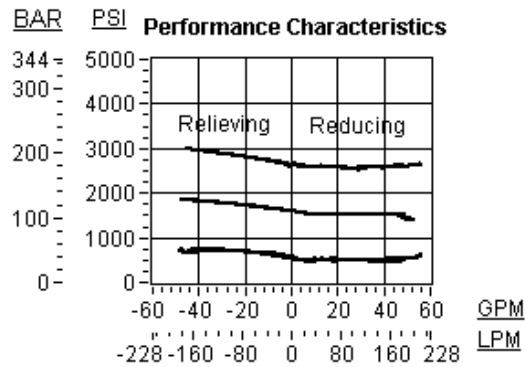
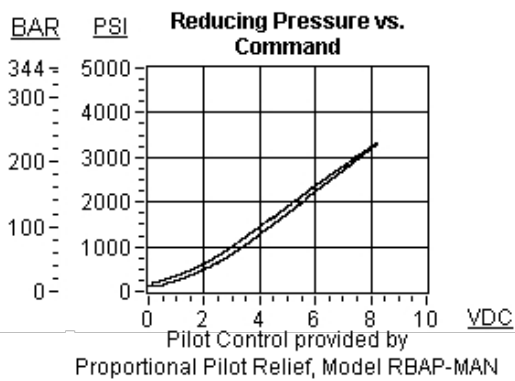
**Model Code Example: PVHA8WN**

MINIMUM CONTROL PRESSURE (W)	SEAL MATERIAL (N)
W 100 psi (7 bar)	N Buna-N
D 25 psi (1,7 bar)	E EPDM
	V Viton

## TECHNICAL FEATURES

- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pressure at port 4 should not exceed 5000 psi (350 bar).
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure on the drain (port 4) is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

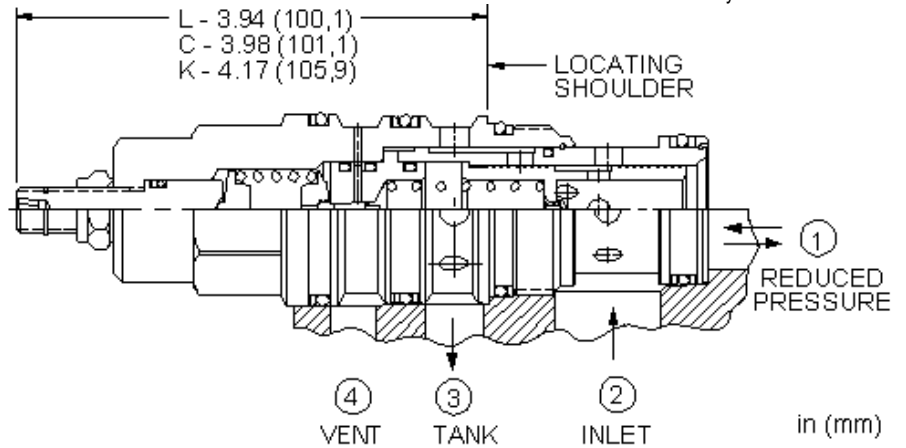
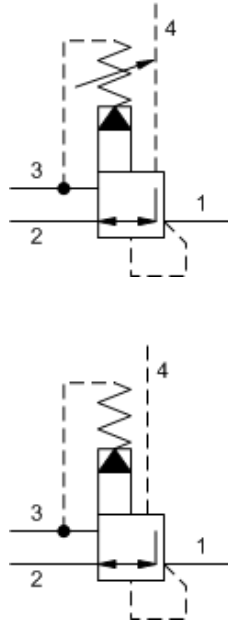
## PERFORMANCE CURVES



## RELATED MODELS

- [PVHA](#) Pilot-operated, pressure reducing/relieving valve with drain to port 4





Ventable, pilot-operated pressure reducing/relieving valves reduce a high primary pressure at the inlet to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). The vent port (port 4) can be used as a means for remote control by pilot or 2-way valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-23A
Series	3
Capacity	160 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	EPDM: 990023014
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006
Model Weight	0.70 kg.

**NOTES**

Maximum pressure differentials for spring ranges: A and B are 3000 psi (210 bar) D and E are 2000 psi (140 bar) W is 5000 psi (350 bar) inlet pressure

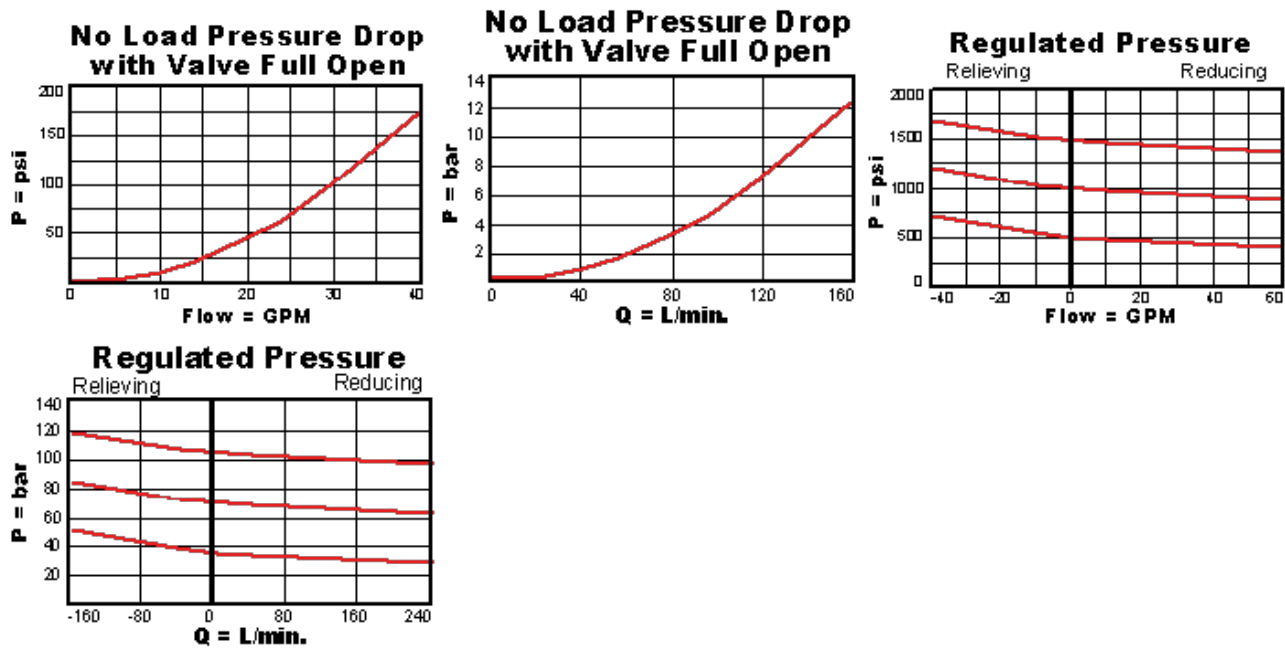
**CONFIGURATION OPTIONS**
**Model Code Example: PVHBLAN**

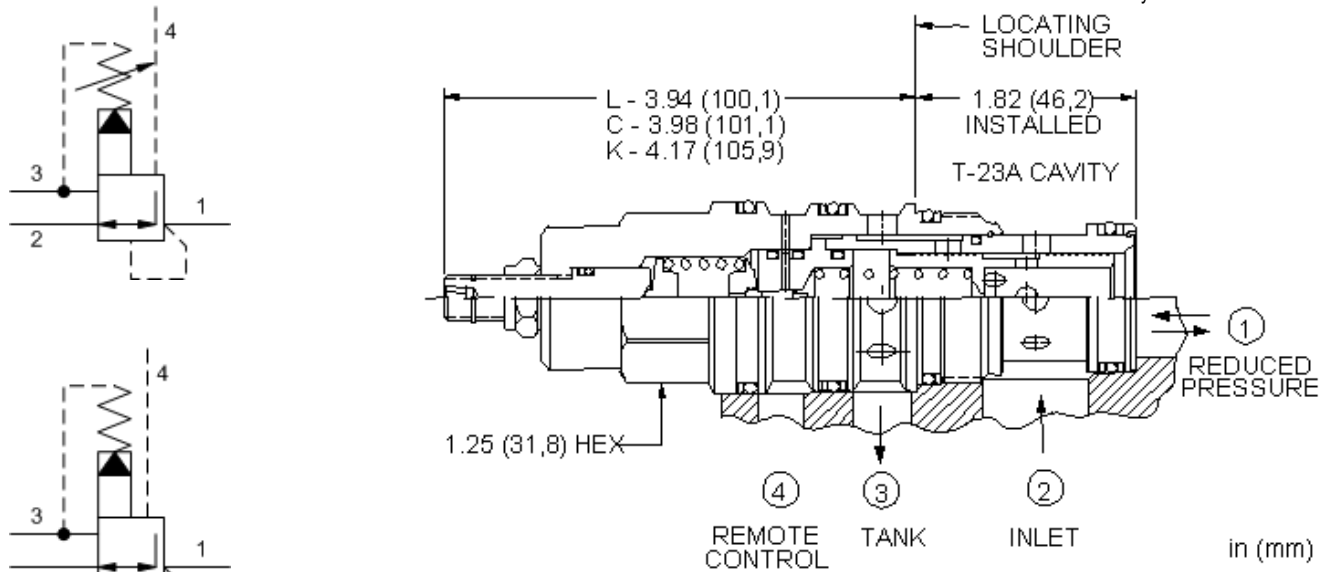
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	A 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	N Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	B 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	E EPDM	/AP Stainless Steel, Passivated
K Handknob	D 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting	V Viton	/LH Mild Steel, Zinc-Nickel
	E 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	W 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- By controlling the pressure at the vent (port 4), the effective setting of the valve can be controlled below the nominal valve setting.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Ventable, pilot-operated pressure reducing/relieving valves reduce a high primary pressure at the inlet to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). The vent port (port 4) can be used as a means for remote control by pilot or 2-way valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-23A
Series	3
Capacity	160 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006
Model Weight	0.70 kg.

## CONFIGURATION OPTIONS

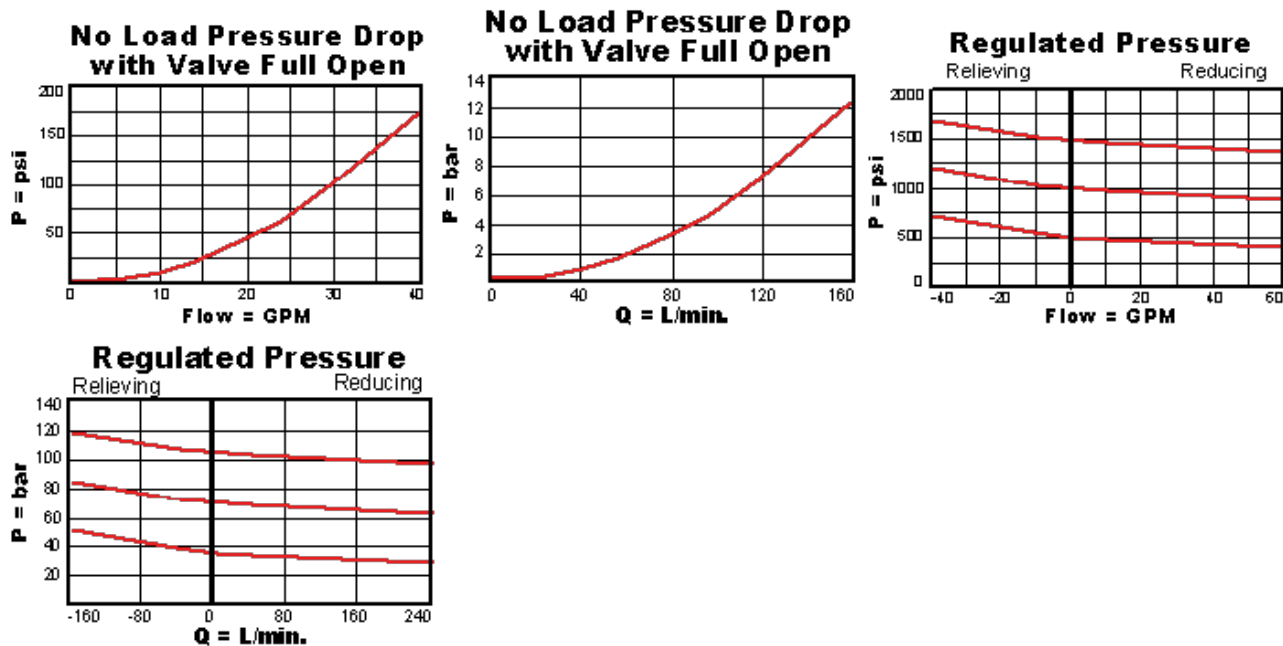
## Model Code Example: PVHDLAN

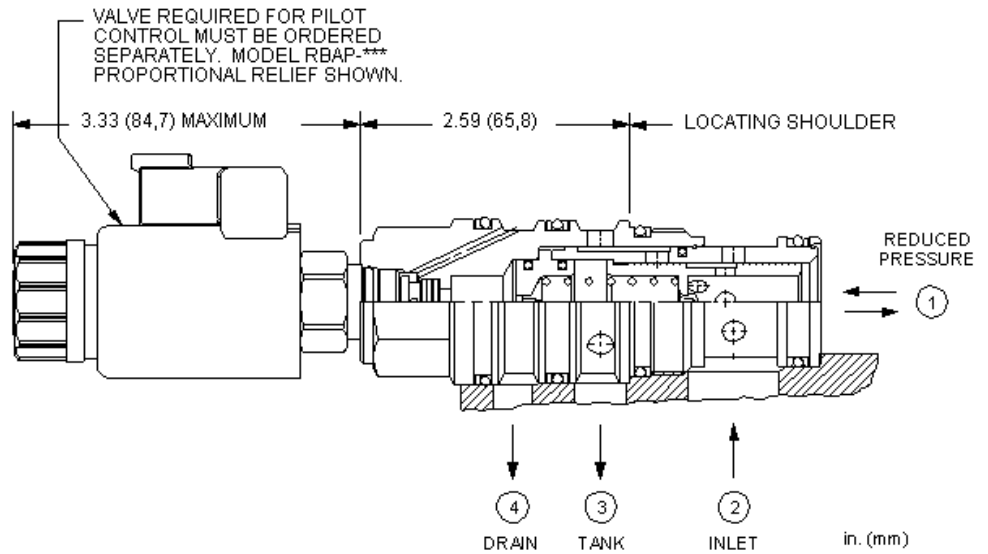
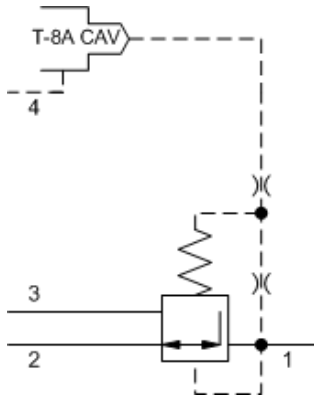
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
K Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>H</b> 30 - 3000 psi (2 - 210 bar), 200 psi (14 bar) Standard Setting		
	<b>J</b> 25 - 1500 psi (1,7 - 105 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- By controlling the pressure at the vent (port 4), the effective setting of the valve can be controlled below the nominal valve setting.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





This valve is a 3-way, normally open modulating element, externally drained, that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full flow relief function from port 1 to tank (port 3). The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the drain (port 4).

This valve is open in the transition from reducing to relieving which provides good pressure control and dynamic response at the expense of higher pilot flow in the deadheaded condition.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-23A
Series	3
Capacity	160 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,40 - 0,50 L/min.
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Pilot Control Valve Hex Size	22,2 mm
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	EPDM: 990023014
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006
Model Weight	0.60 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

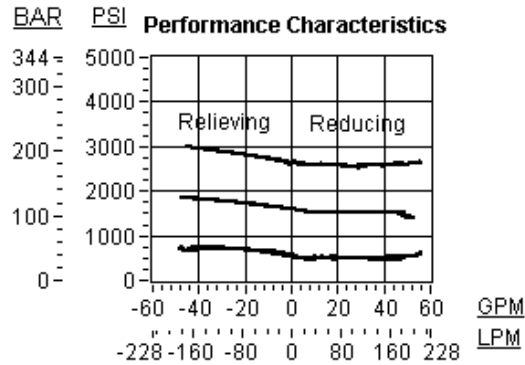
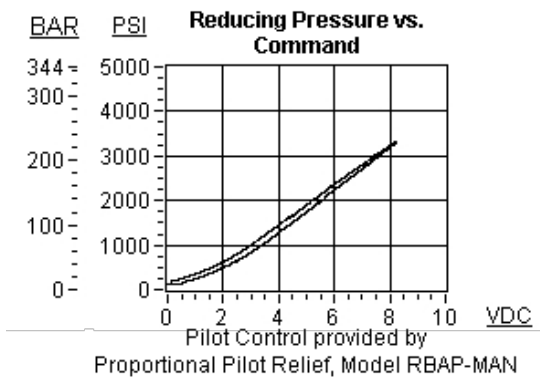
**Model Code Example: PVHL8WN**

<b>MINIMUM CONTROL PRESSURE (W)</b>	<b>SEAL MATERIAL (N)</b>
<b>W</b> 150 psi (10,5 bar)	<b>N</b> Buna-N
<b>D</b> 100 psi (7 bar)	<b>E</b> EPDM
	<b>V</b> Viton

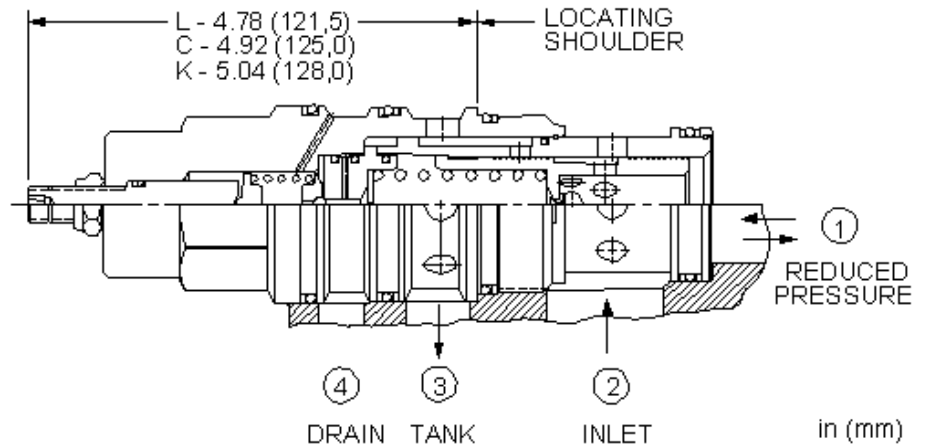
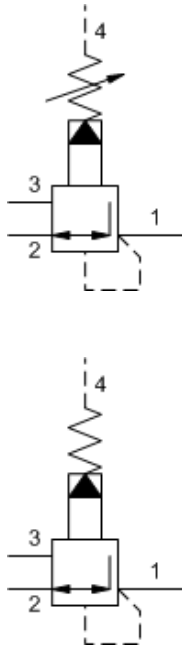
## TECHNICAL FEATURES

- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- This valve has been optimized to work with the RBAP X\*\*, RBAP L\*\*, and RBAN electro-proportional pilot reliefs.
- The transition from reducing to relieving is slightly open. The result is very good pressure control with oil consumption of about 0.1 gpm (0,4 L/min.). The relatively high pilot control flow is only a factor in a dead-headed condition.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure on the drain (port 4) is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS



Externally drained, pilot-operated pressure reducing/relieving valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). Draining the pilot section at port 4 makes these valves insensitive to pressure at tank (port 3) and provides a means for remote control by pilot or 2-way valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-24A
Series	4
Capacity	320 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990024007
Seal kit - Cartridge	EPDM: 990024014
Seal kit - Cartridge	Polyurethane: 990024002
Seal kit - Cartridge	Viton: 990024006
Model Weight	1.60 kg.

**NOTES**

Maximum pressure differentials for spring ranges: A and B are 3000 psi (210 bar) D and E are 2000 psi (140 bar) W is 5000 psi (350 bar) inlet pressure

**CONFIGURATION OPTIONS**

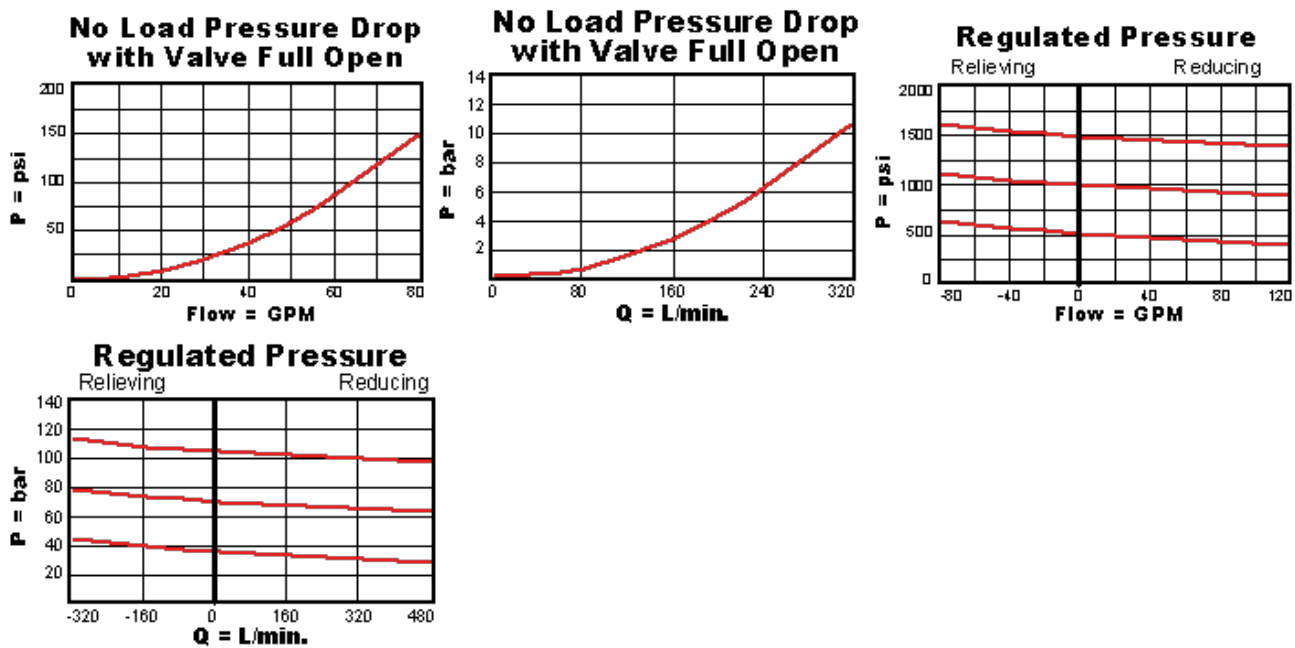
**Model Code Example: PVJALAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure on the drain (port 4) is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- By controlling the pressure at the drain (port 4), the effective setting of the valve can be increased over the nominal valve setting.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

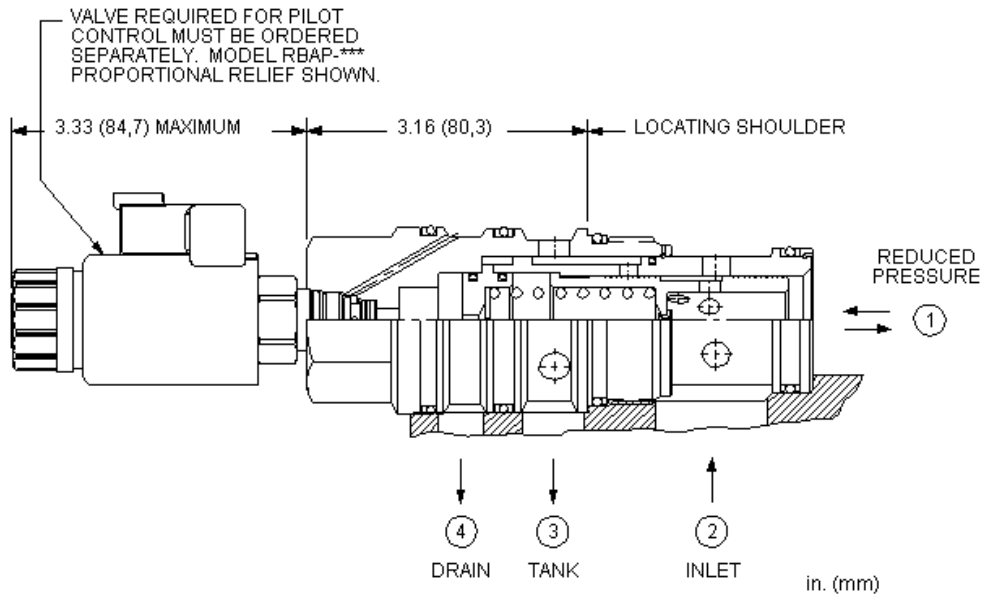
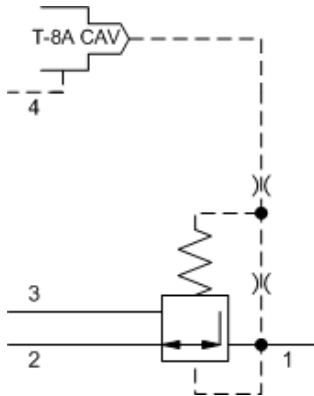
## PERFORMANCE CURVES



## RELATED MODELS

- [PVJA8](#) Pilot-operated, pressure reducing/relieving main stage with integral T-8A control cavity and drain to port 4





This valve is a 3-way, normally open modulating element, externally drained, that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full flow relief function from port 1 to tank (port 3). The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the drain (port 4).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-24A
Series	4
Capacity	320 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Seal kit - Cartridge	Buna: 990024007
Seal kit - Cartridge	Polyurethane: 990024002
Seal kit - Cartridge	Viton: 990024006
Model Weight	1.35 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

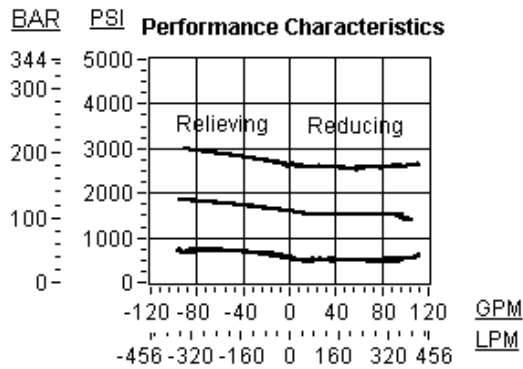
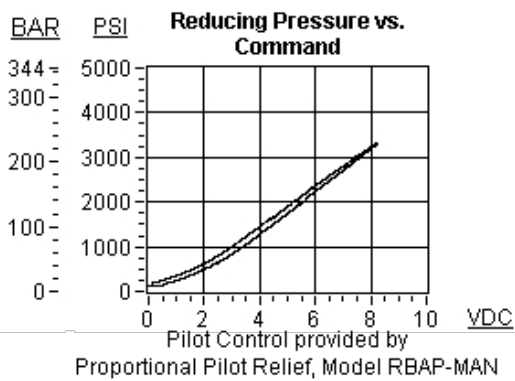
**Model Code Example: PVJA8WN**

MINIMUM CONTROL PRESSURE (W)	SEAL MATERIAL (N)
W 100 psi (7 bar)	N Buna-N
D 25 psi (1,7 bar)	E EPDM
	V Viton

## TECHNICAL FEATURES

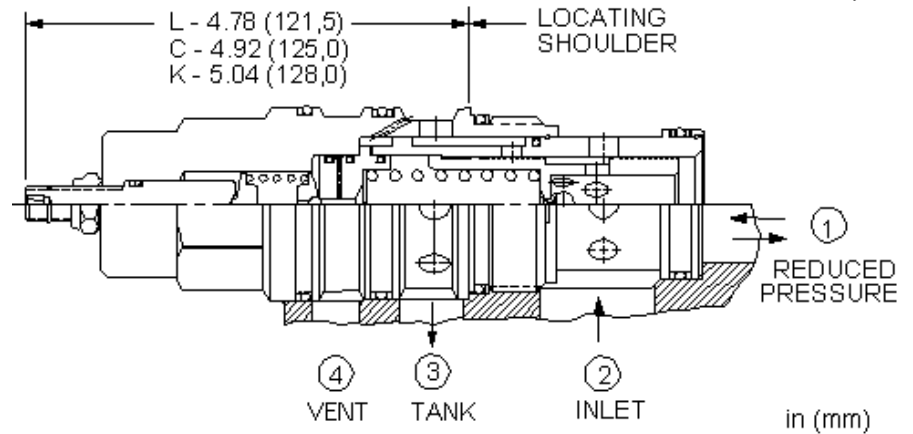
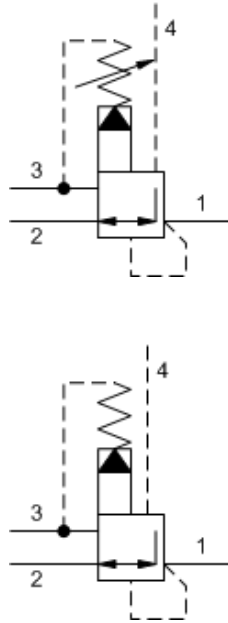
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pressure at port 4 should not exceed 5000 psi (350 bar).
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure on the drain (port 4) is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PVJA](#) Pilot-operated, pressure reducing/relieving valve with drain to port 4



Ventable, pilot-operated pressure reducing/relieving valves reduce a high primary pressure at the inlet to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). The vent port (port 4) can be used as a means for remote control by pilot or 2-way valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-24A
Series	4
Capacity	320 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990024007
Seal kit - Cartridge	Polyurethane: 990024002
Seal kit - Cartridge	Viton: 990024006
Model Weight	1.60 kg.

**NOTES**

Maximum pressure differentials for spring ranges: A and B are 3000 psi (210 bar) D and E are 2000 psi (140 bar) W is 5000 psi (350 bar) inlet pressure

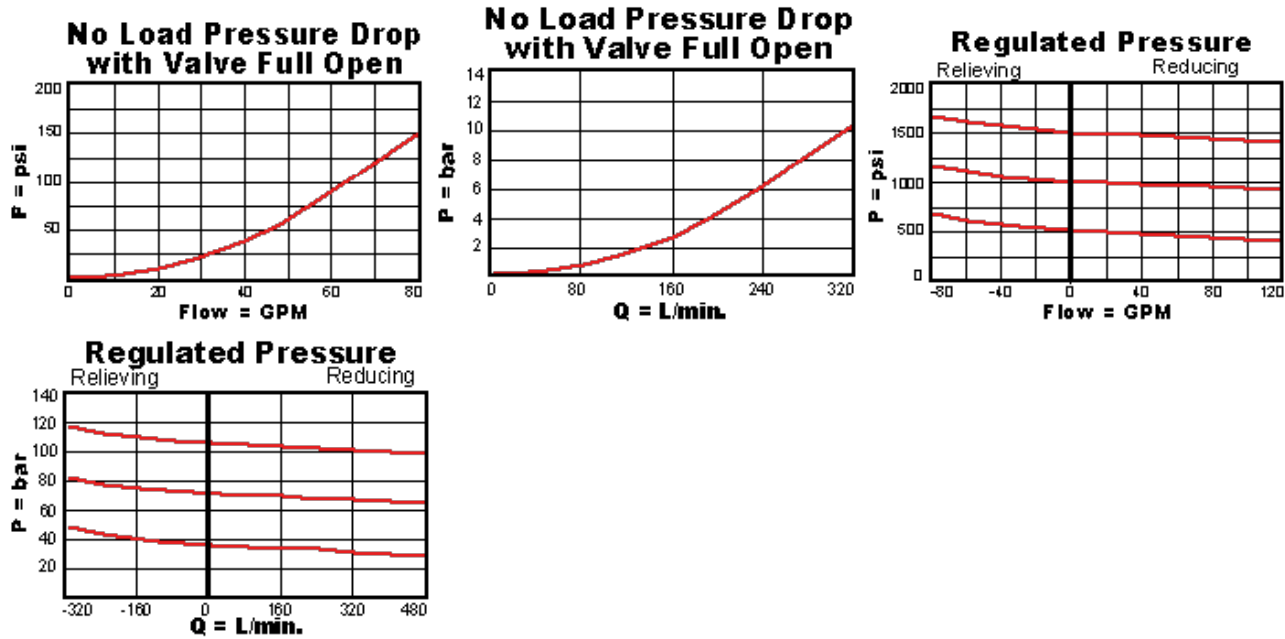
**CONFIGURATION OPTIONS**
**Model Code Example: PVJBLAN**

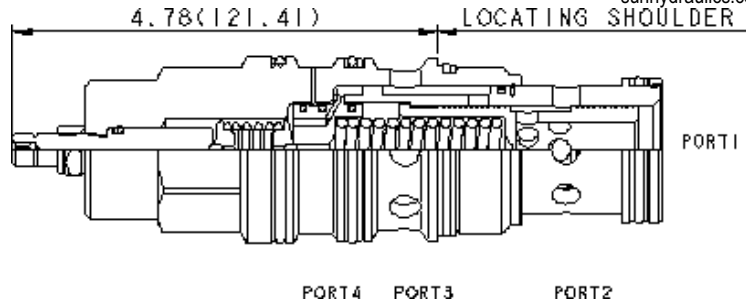
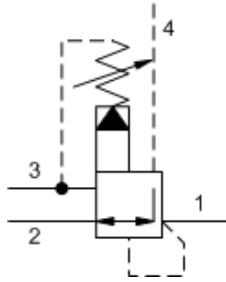
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting		/LH Mild Steel, Zinc-Nickel
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- By controlling the pressure at the vent (port 4), the effective setting of the valve can be controlled below the nominal valve setting.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES

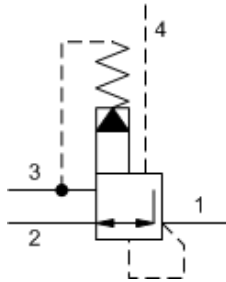




Ventable, pilot-operated pressure reducing/relieving valves reduce a high primary pressure at the inlet to a constant reduced pressure at port 1, with a full-flow relief function from port 1 to tank (port 3). The vent port (port 4) can be used as a means for remote control by pilot or 2-way valves.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.



Cavity	T-24A
Series	4
Capacity	320 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990024007
Seal kit - Cartridge	Polyurethane: 990024002
Seal kit - Cartridge	Viton: 990024006
Model Weight	1.60 kg.

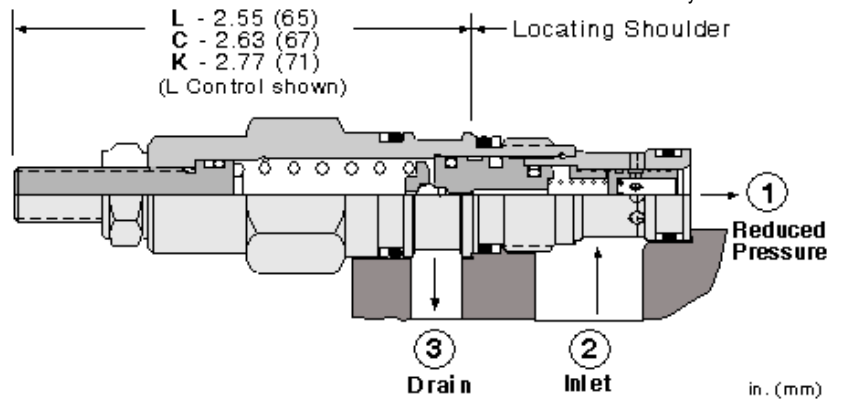
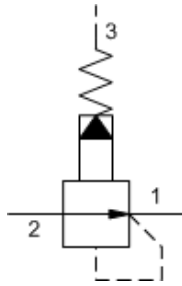
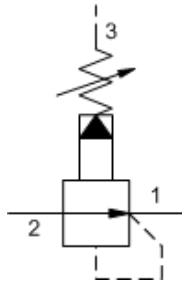
**CONFIGURATION OPTIONS**

**Model Code Example: PVJDLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 200 psi (14 bar) Standard Setting		
	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>H</b> 30 - 3000 psi (2 - 210 bar), 200 psi (14 bar) Standard Setting		
	<b>J</b> 25 - 1500 psi (1,7 - 105 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 100 - 4500 psi (7 - 315 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 3000 psi (210 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- By controlling the pressure at the vent (port 4), the effective setting of the valve can be controlled below the nominal valve setting.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.



Pilot-operated, pressure reducing valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, allowing circuits with multiple pressure requirements to be operated using a single pump.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-163A
Series	0
Capacity	20 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	12,7 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	Polyurethane: 990163002
Seal kit - Cartridge	Viton: 990163006
Model Weight	0.11 kg.

**CONFIGURATION OPTIONS**

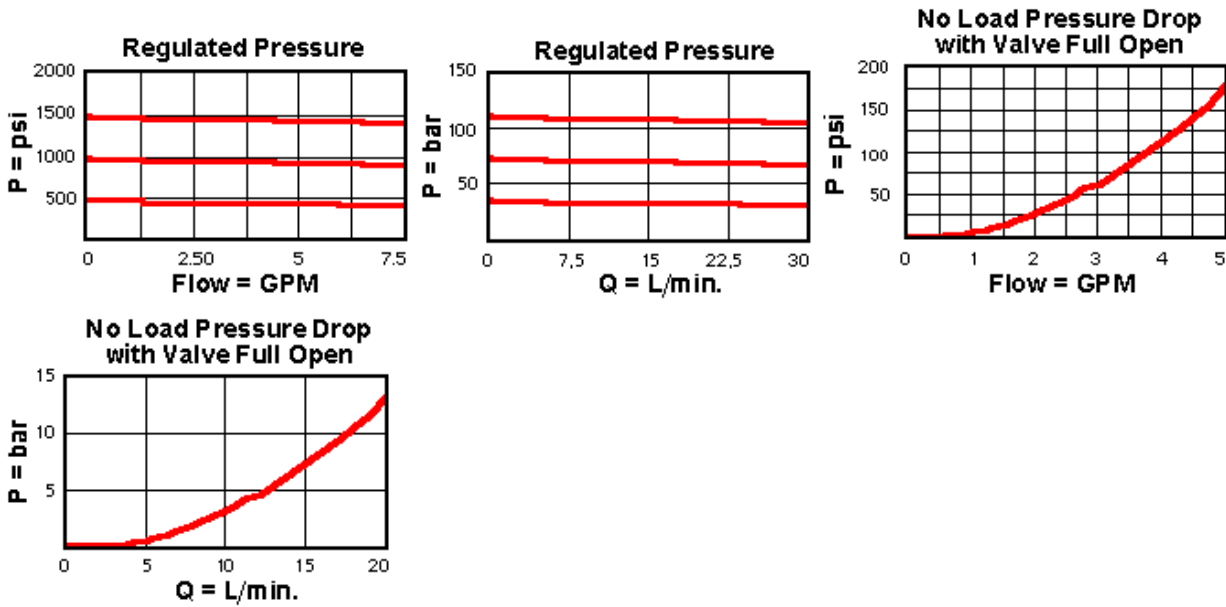
**Model Code Example: PBBBLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 75 - 3000 psi (5 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 75 - 4500 psi (5 - 315 bar), 200 psi (14 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>B</b> 75 - 1500 psi (5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>W</b> Hex Wrench Adjustment	<b>N</b> 75 - 800 psi (5 - 55 bar), 200 psi (14 bar) Standard Setting		
	<b>Q</b> 75 - 400 psi (5 - 28 bar), 200 psi (14 bar) Standard Setting		

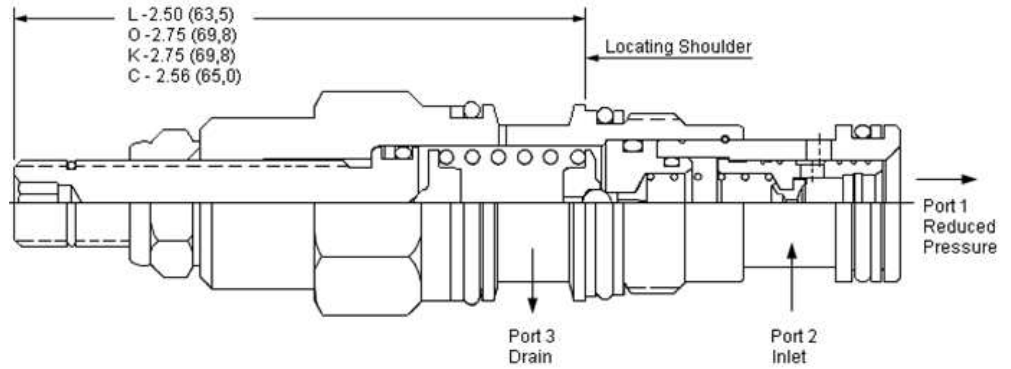
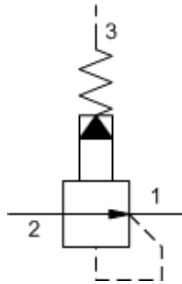
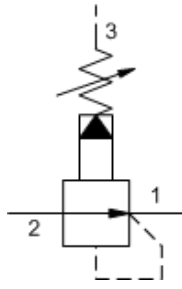
## TECHNICAL FEATURES

- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Minimum setting is 75 psi (5 bar) for all spring ranges.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges A, B, N, and Q are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Range W is tested with 5000 psi (350 bar) of inlet pressure.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES







Pilot-operated, pressure reducing valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, allowing circuits with multiple pressure requirements to be operated using a single pump.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	40 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	EPDM: 990011014
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.16 kg.

- NOTES**
- Maximum pressure differentials for spring ranges: A and B are 3000 psi (210 bar) N and Q are 2000 psi (140 bar) W is 5000 psi (350 bar) inlet pressure
  - For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

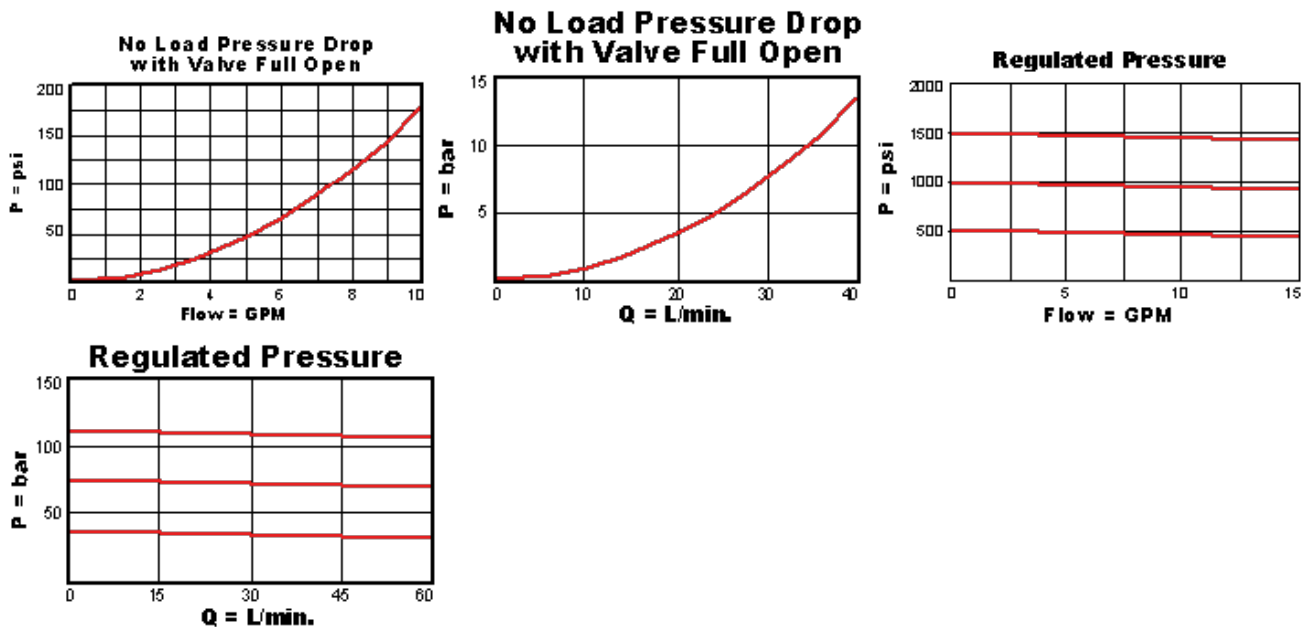
**CONFIGURATION OPTIONS**
**Model Code Example: PBDBLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting		/LH Mild Steel, Zinc-Nickel
<b>W</b> Hex Wrench Adjustment	<b>N</b> 60 - 800 psi (4 - 55 bar), 200 psi (14 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

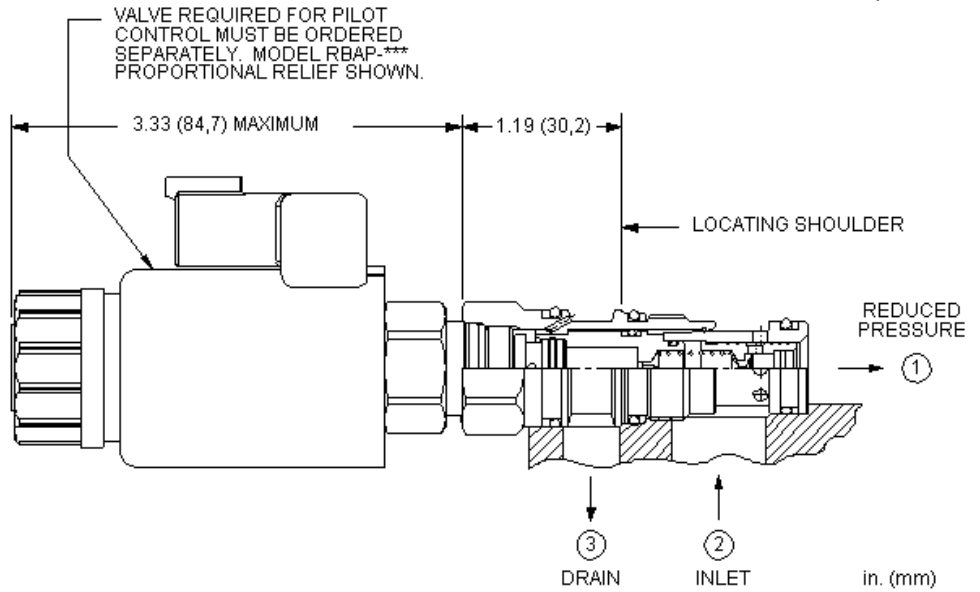
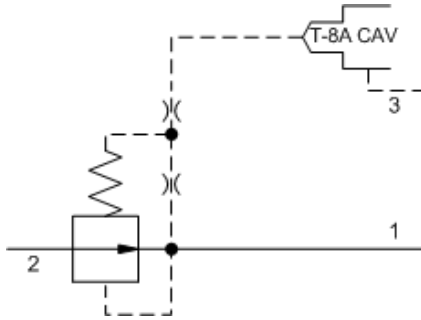
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- If pilot flow consumption is critical, consider using direct acting reducing/relieving valves.
- Main stage orifice is protected by a 150 micron stainless steel screen.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PBDB8](#) Pilot-operated, pressure reducing main stage with integral T-8A control cavity



This valve is a normally open modulating element that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1. The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the drain (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	40 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Pilot Control Cavity	T-8A
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	EPDM: 990011014
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.10 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

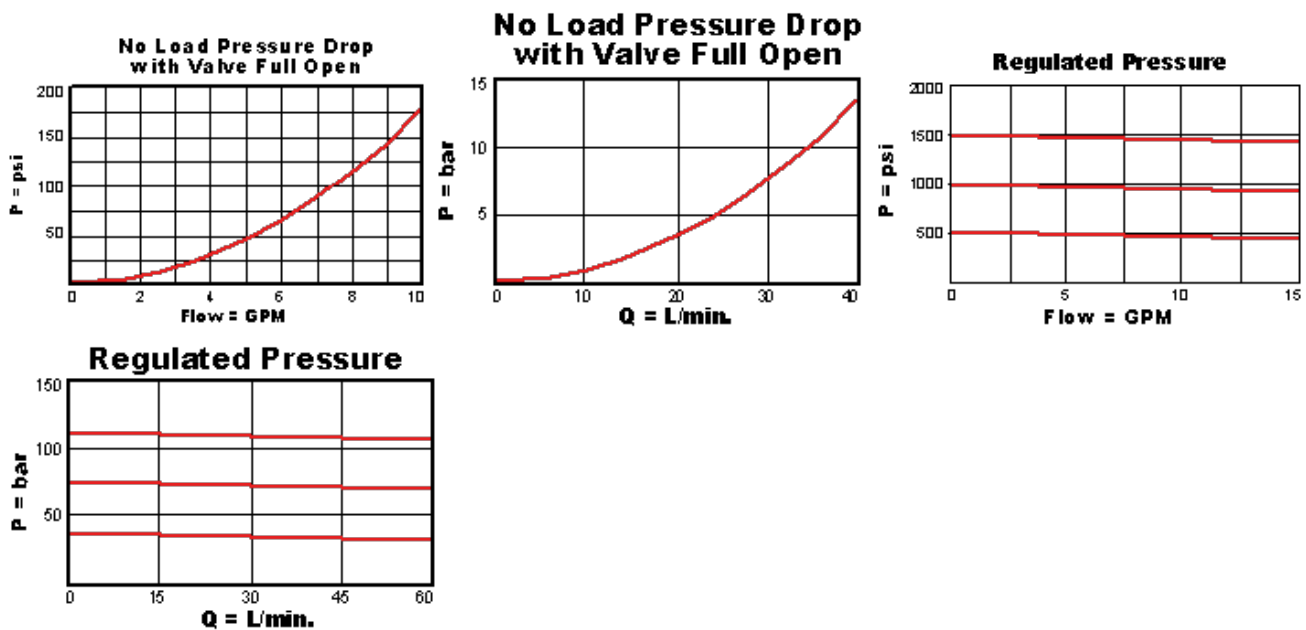
**Model Code Example: PBDB8WN**

BIAS PRESSURE	(W)	SEAL MATERIAL	(N)
W 100 psi (7 bar)		N Buna-N	
D 25 psi (1,7 bar)		V Viton	

## TECHNICAL FEATURES

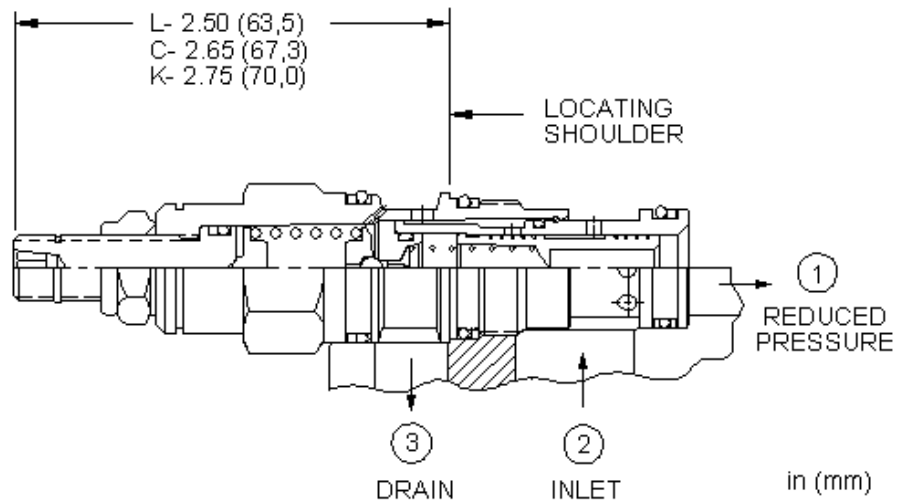
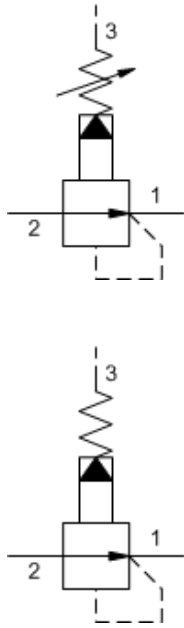
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Main stage orifice is protected by a 150 micron stainless steel screen.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PBDB](#) Pilot-operated, pressure reducing valve



Pilot-operated, pressure reducing valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, allowing circuits with multiple pressure requirements to be operated using a single pump.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	40 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.16 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

## CONFIGURATION OPTIONS

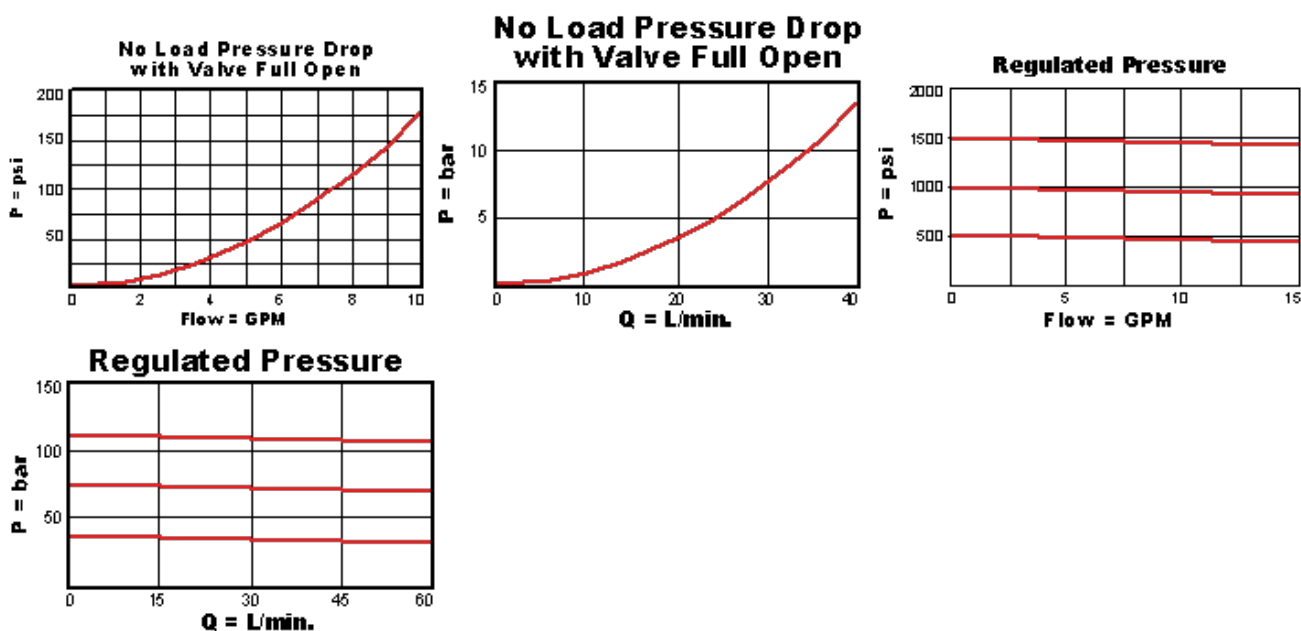
## Model Code Example: PBDFLAN

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N)
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	
<b>K</b> Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>G</b> 60 - 3000 psi (4 - 210 bar), 200 psi (14 bar) Standard Setting		
	<b>K</b> 75 - 1500 psi (5 - 105 bar), 200 psi (14 bar) Standard Setting		
	<b>N</b> 60 - 800 psi (4 - 55 bar), 200 psi (14 bar) Standard Setting		
	<b>P</b> 40 - 400 psi (2,8 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

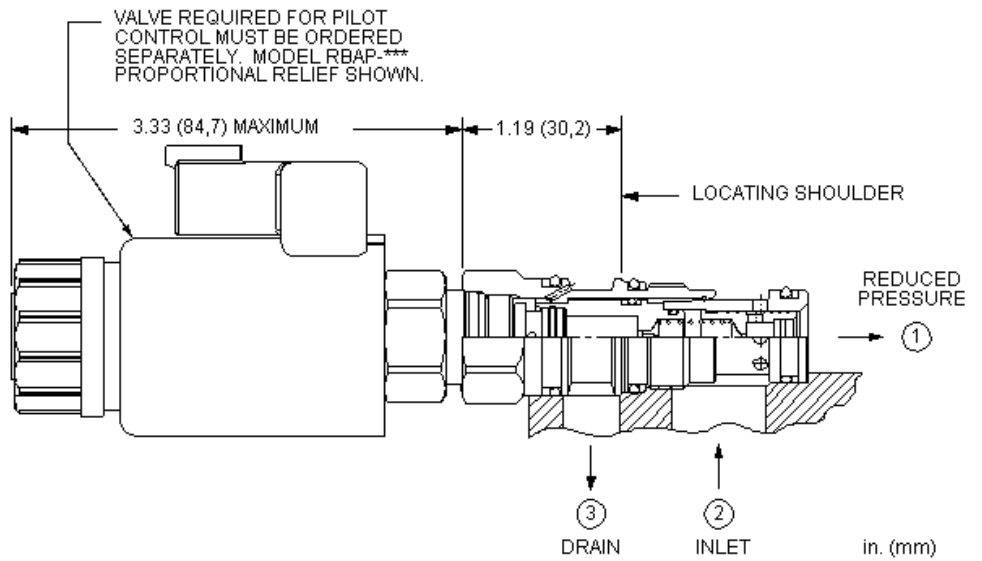
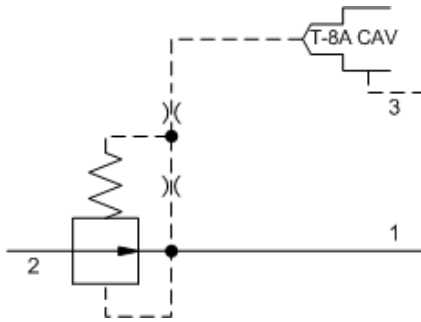
- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- If pilot flow consumption is critical, consider using direct acting reducing/relieving valves.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PBDF8](#) Pilot-operated, pressure reducing main stage with drilled piston orifice and integral T-8A control cavity



This valve is a normally open modulating element that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1. The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the drain (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	40 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Pilot Control Cavity	T-8A
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.10 kg.

**CONFIGURATION OPTIONS**

**Model Code Example: PBDF8WN**

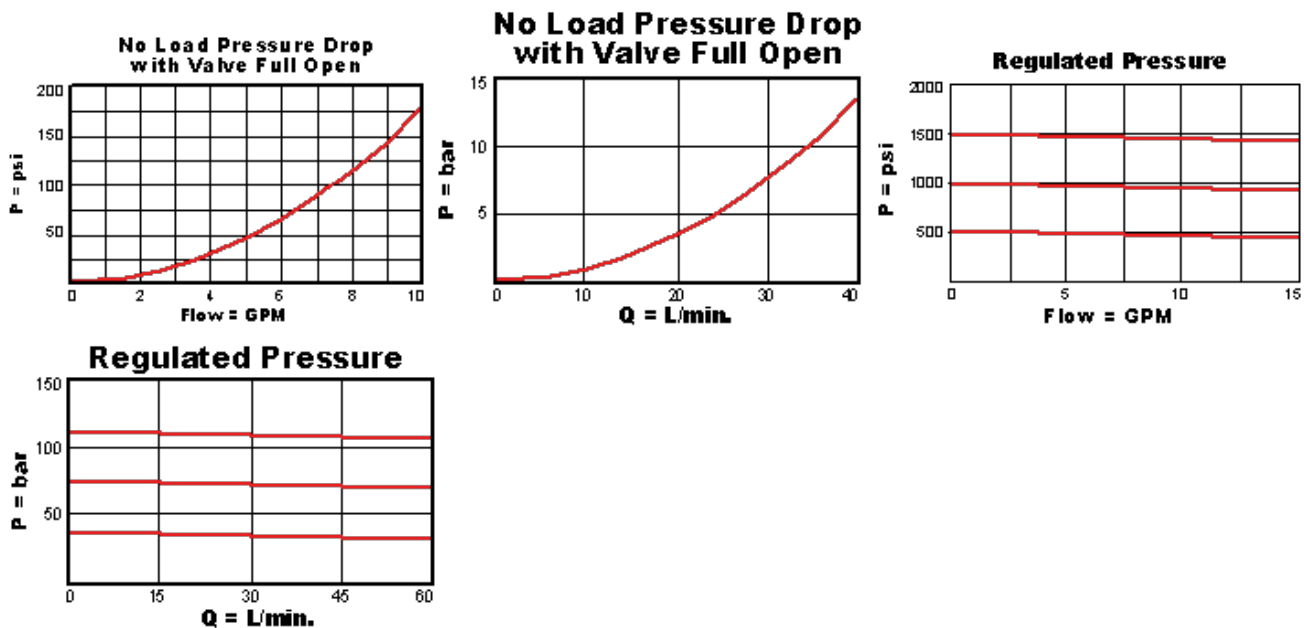
BIAS PRESSURE	(W)	SEAL MATERIAL	(N)
W 100 psi (7 bar)		N Buna-N	
D 25 psi (1,7 bar)		V Viton	



## TECHNICAL FEATURES

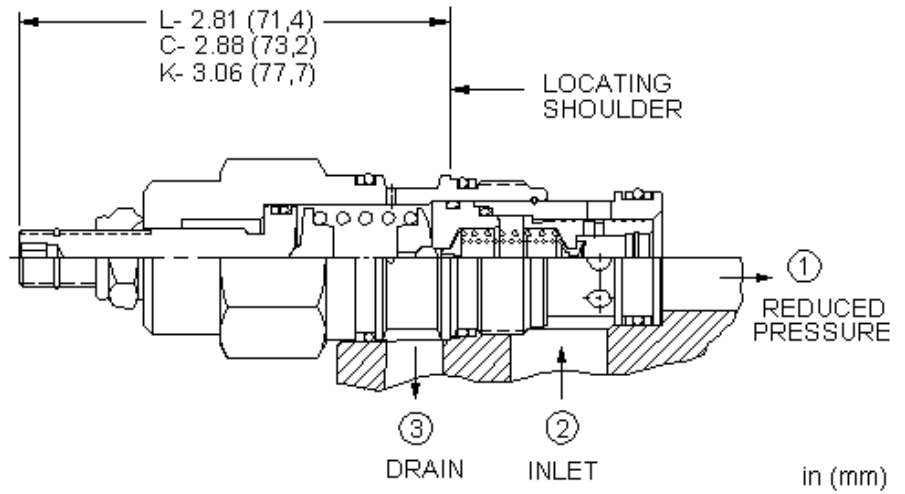
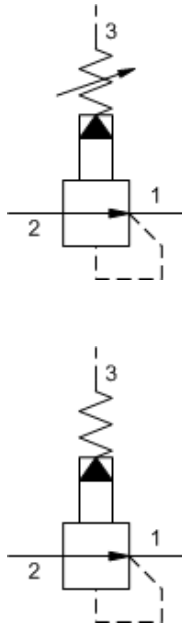
- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PBDF](#) Pilot-operated, pressure reducing valve with drilled piston orifice



Pilot-operated, pressure reducing valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, allowing circuits with multiple pressure requirements to be operated using a single pump.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	80 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	EPDM: 990202014
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.29 kg.

**NOTES**

- Maximum pressure differentials for spring ranges: A and B are 3000 psi (210 bar) N and Q are 2000 psi (140 bar) W is 5000 psi (350 bar) inlet pressure
- For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

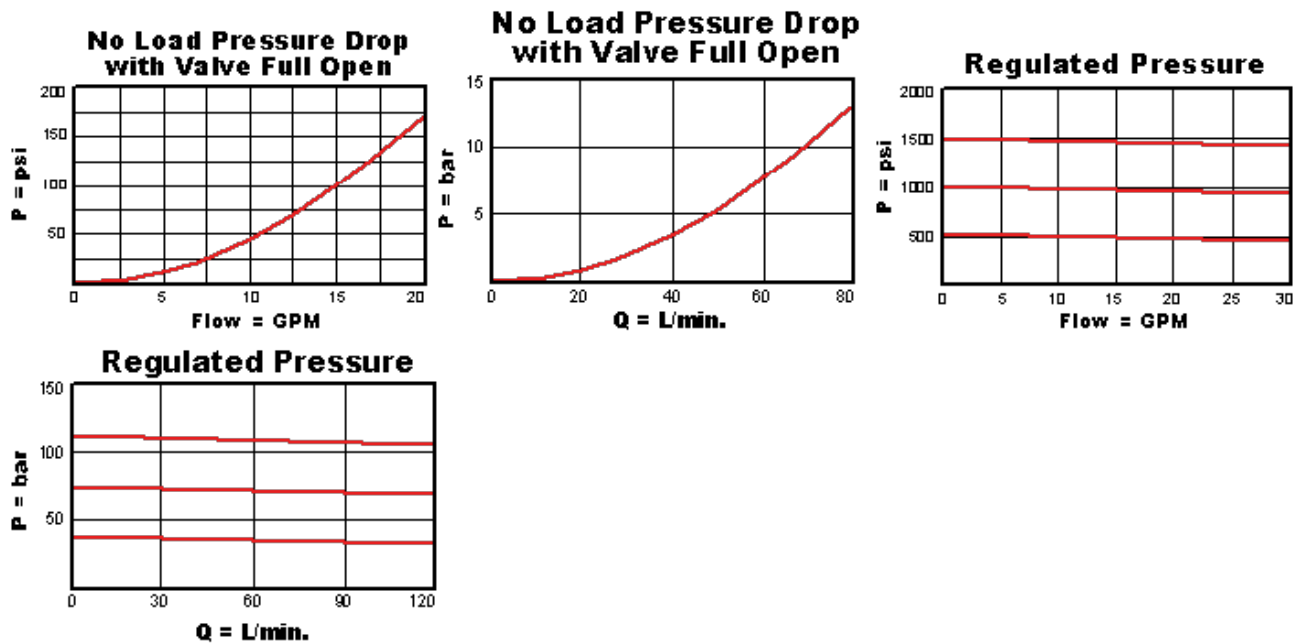
**CONFIGURATION OPTIONS**
**Model Code Example: PBFBLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>W</b> Hex Wrench Adjustment	<b>N</b> 60 - 800 psi (4 - 55 bar), 200 psi (14 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

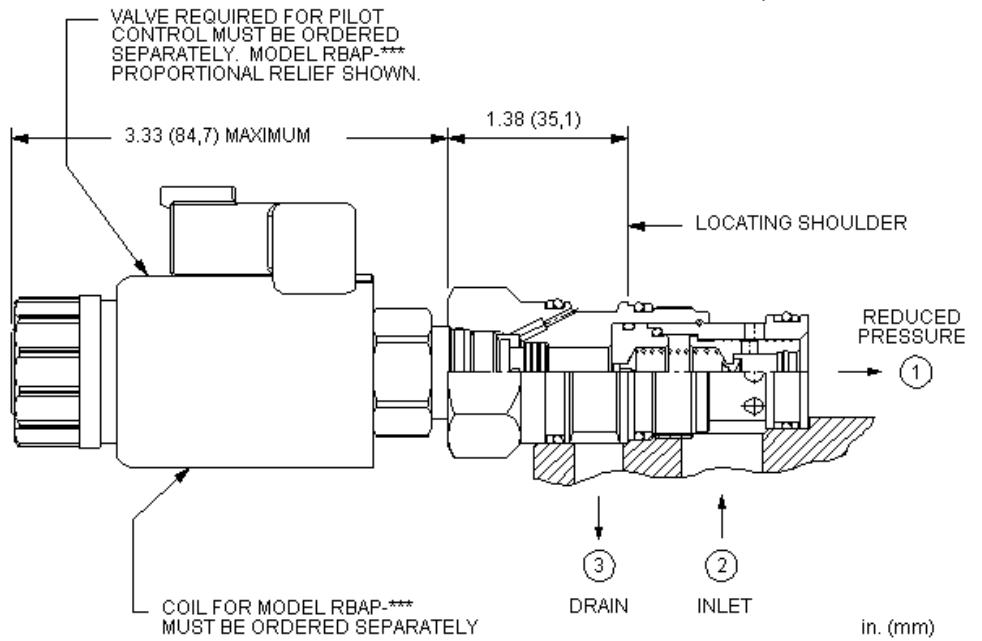
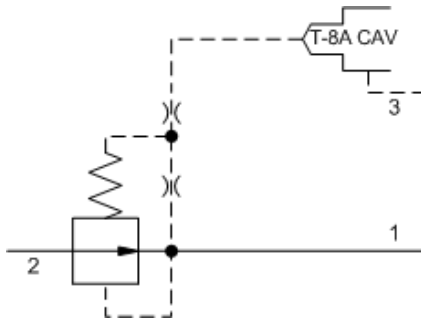
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- If pilot flow consumption is critical, consider using direct acting reducing/relieving valves.
- Main stage orifice is protected by a 150 micron stainless steel screen.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PBF88](#) Pilot-operated, pressure reducing main stage with integral T-8A control cavity



This valve is a normally open modulating element that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1. The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the drain (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	80 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Pilot Control Cavity	T-8A
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	EPDM: 990202014
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.21 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

**Model Code Example: PBFB8WN**

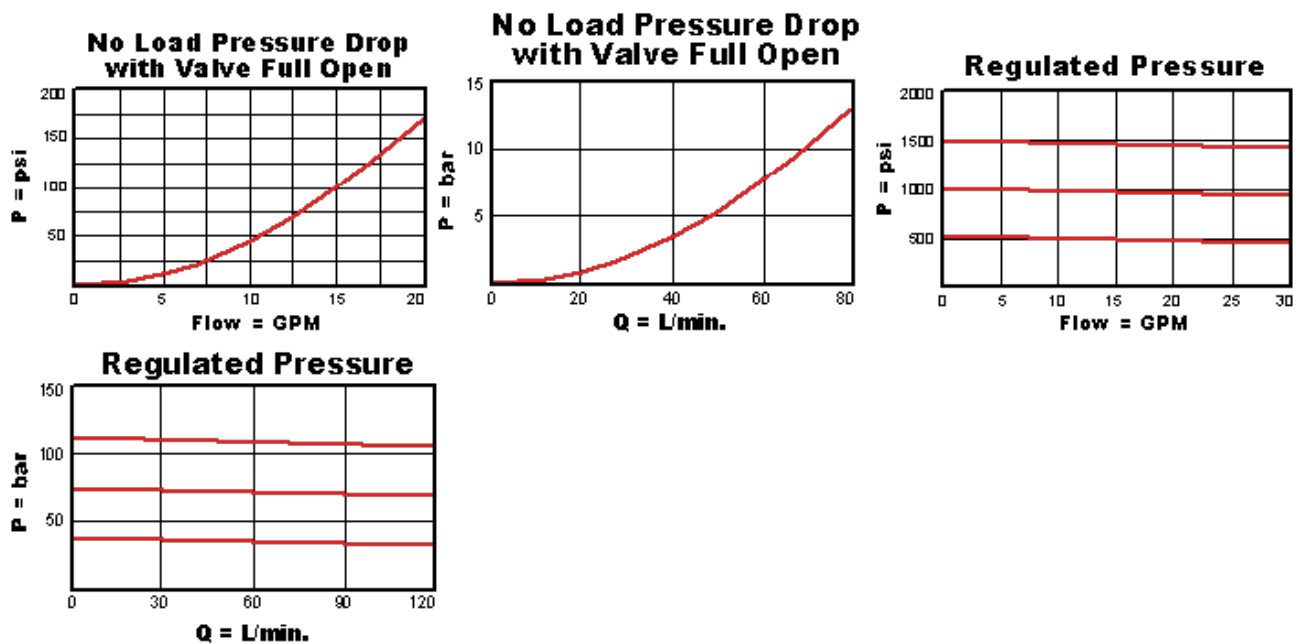
**MINIMUM CONTROL PRESSURE (W) SEAL MATERIAL (N)**

<b>W</b> 100 psi (7 bar)	<b>N</b> Buna-N
<b>D</b> 25 psi (1,7 bar)	<b>E</b> EPDM
	<b>V</b> Viton

## TECHNICAL FEATURES

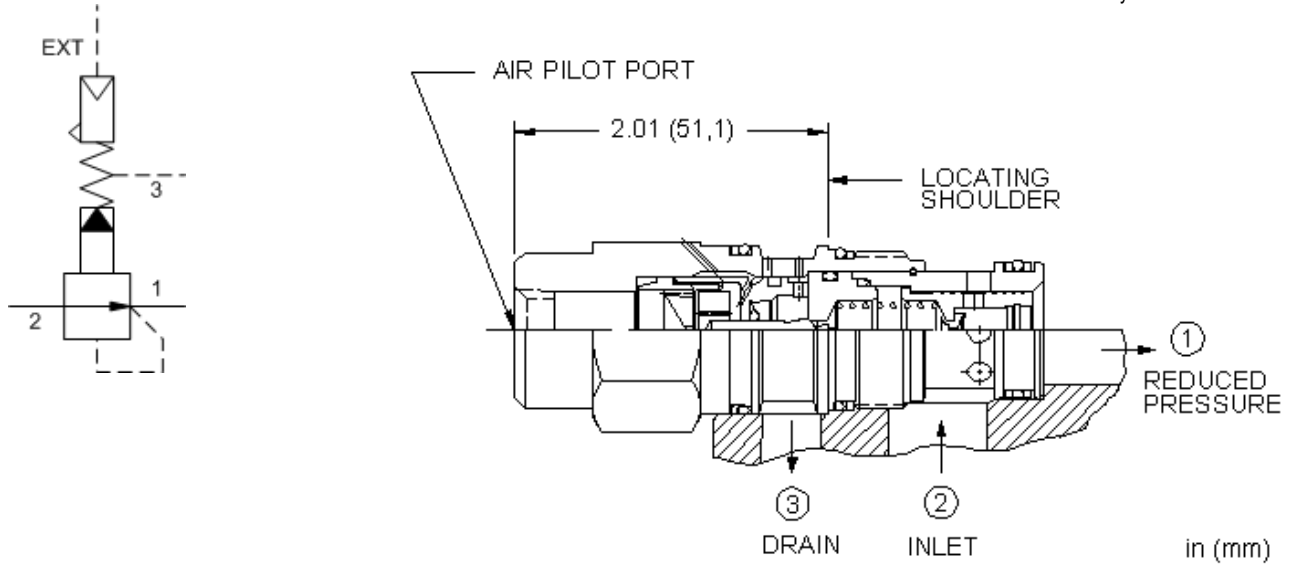
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Main stage orifice is protected by a 150 micron stainless steel screen.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PBF8](#) Pilot-operated, pressure reducing valve



Air-controlled, pilot-operated pressure reducing cartridges use compressed air over a diaphragm instead of an adjustable spring as the setting to reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1. The air signal is supplied through a port in the hex-end of the cartridge and the hydraulic setting is directly proportional to the air setting at a ratio of 20:1 (hydraulic:air).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	80 L/min.
Pilot Ratio	20:1
Maximum Operating Pressure	140 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Maximum Air Pressure	10,5 bar
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.27 kg.

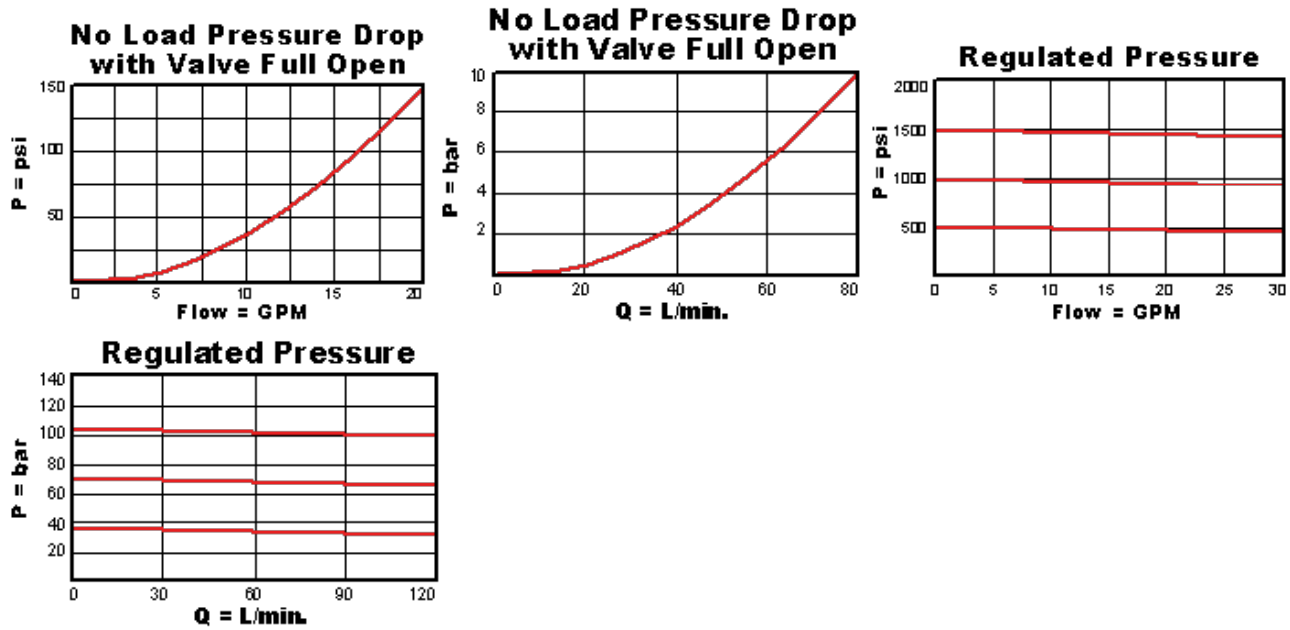
**CONFIGURATION OPTIONS**
**Model Code Example: PBFCABN**

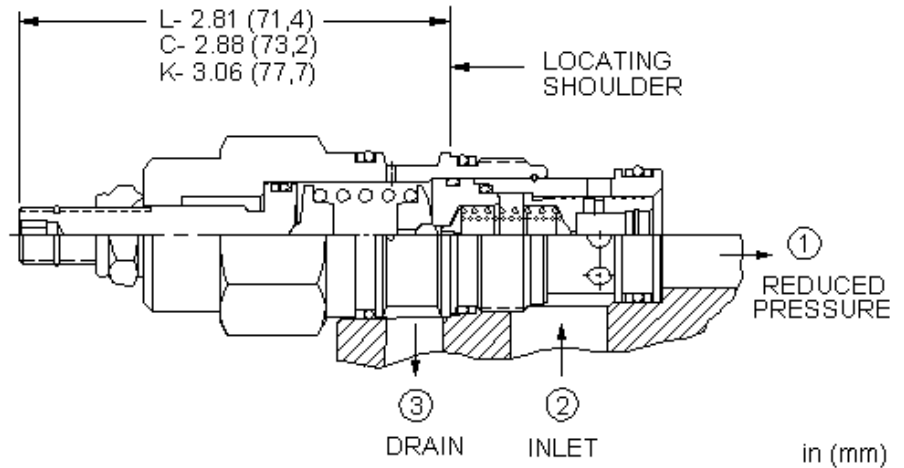
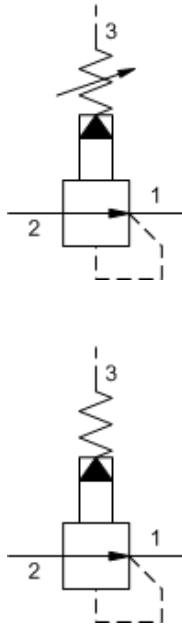
<b>CONTROL</b>	<b>(A) OPERATING RANGE</b>	<b>(B) SEAL MATERIAL</b>	<b>(N)</b>
<b>A</b> External 1/4 NPTF Port	<b>B</b> 50 - 1500 psi (3,5 - 105 bar)	<b>N</b> Buna-N V Viton	

## TECHNICAL FEATURES

- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- The pressure at port 3 determines the minimum valve setting and should not exceed 1000 psi (70 bar).
- The full adjustment range is 50 to 1500 psi (3,5 to 105 bar).
- Maximum air pressure should not exceed 150 psi (10,5 bar) due to the strength of the diaphragm.
- Maximum pressure differential, inlet to outlet, should not exceed 3000 psi (210 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- The air control feature allows explosion proof remote control.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, pressure reducing valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, allowing circuits with multiple pressure requirements to be operated using a single pump.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	80 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Control Pilot Flow	0,16 - 0,25 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	EPDM: 990202014
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.29 kg.

**NOTES**

For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

**CONFIGURATION OPTIONS**
**Model Code Example: PBFFLAN**

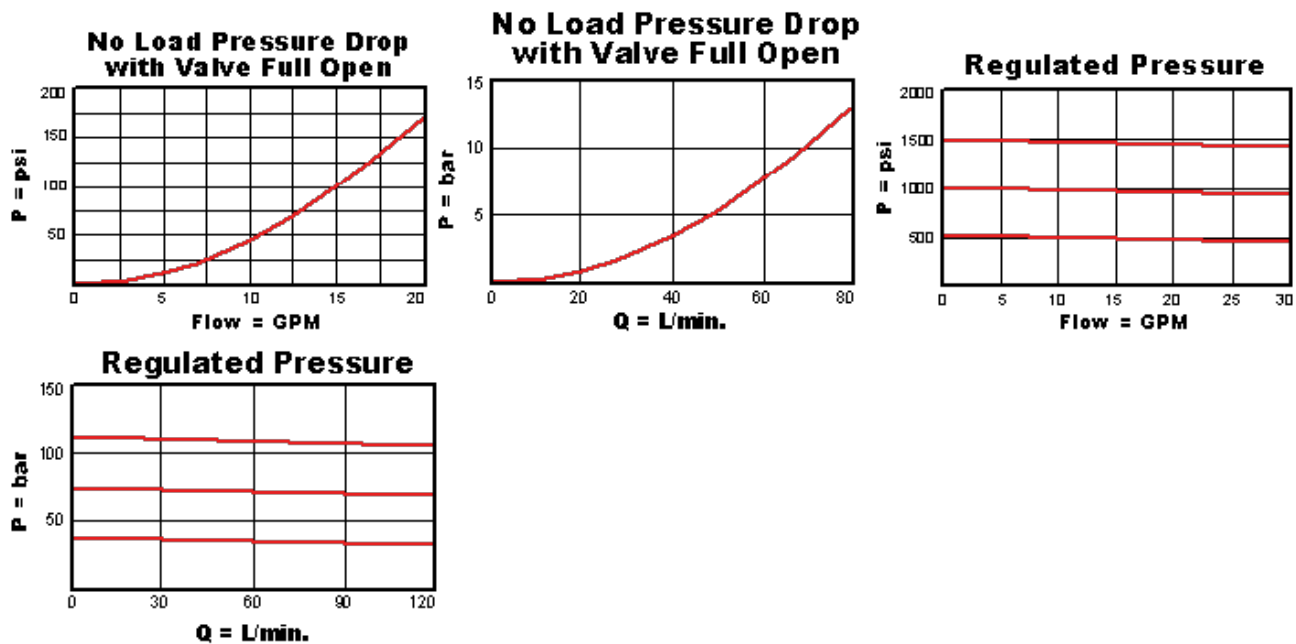
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	A 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	N Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	B 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	E EPDM	/LH Mild Steel, Zinc-Nickel
K Handknob	N 60 - 800 psi (4 - 55 bar), 200 psi (14 bar) Standard Setting	V Viton	
	Q 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
	W 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting		



## TECHNICAL FEATURES

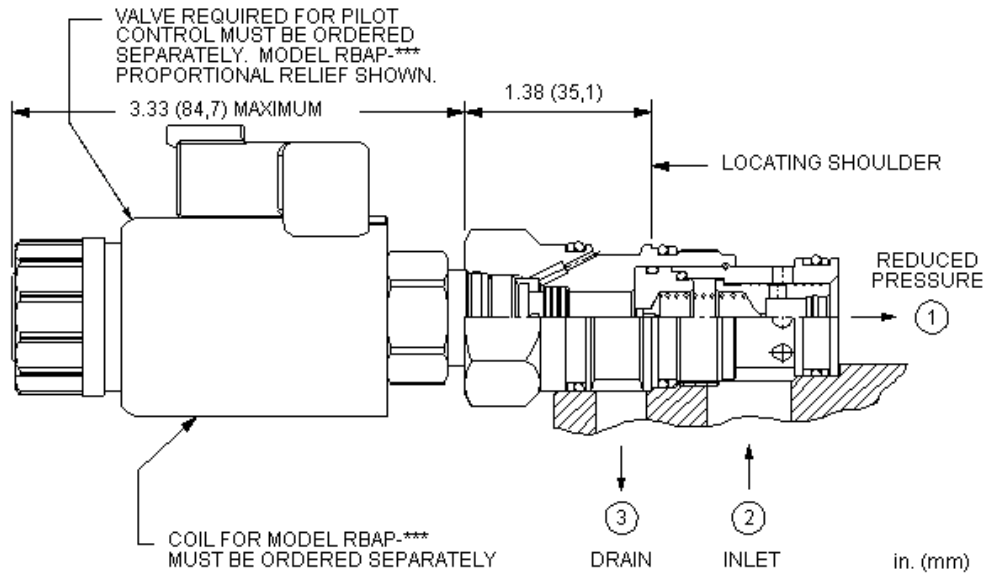
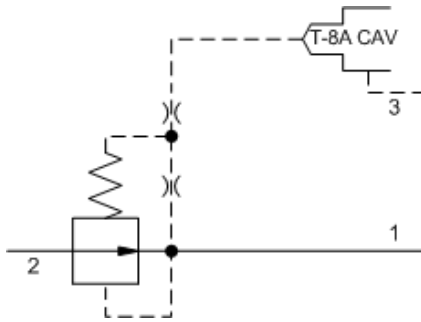
- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- If pilot flow consumption is critical, consider using direct acting reducing/relieving valves.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PBFF8](#) Pilot-operated, pressure reducing main stage with drilled piston orifice and integral T-8A control cavity



This valve is a normally open modulating element that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1. The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the drain (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	80 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Pilot Control Valve Hex Size	22,2 mm
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	EPDM: 990202014
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.21 kg.

**CONFIGURATION OPTIONS**

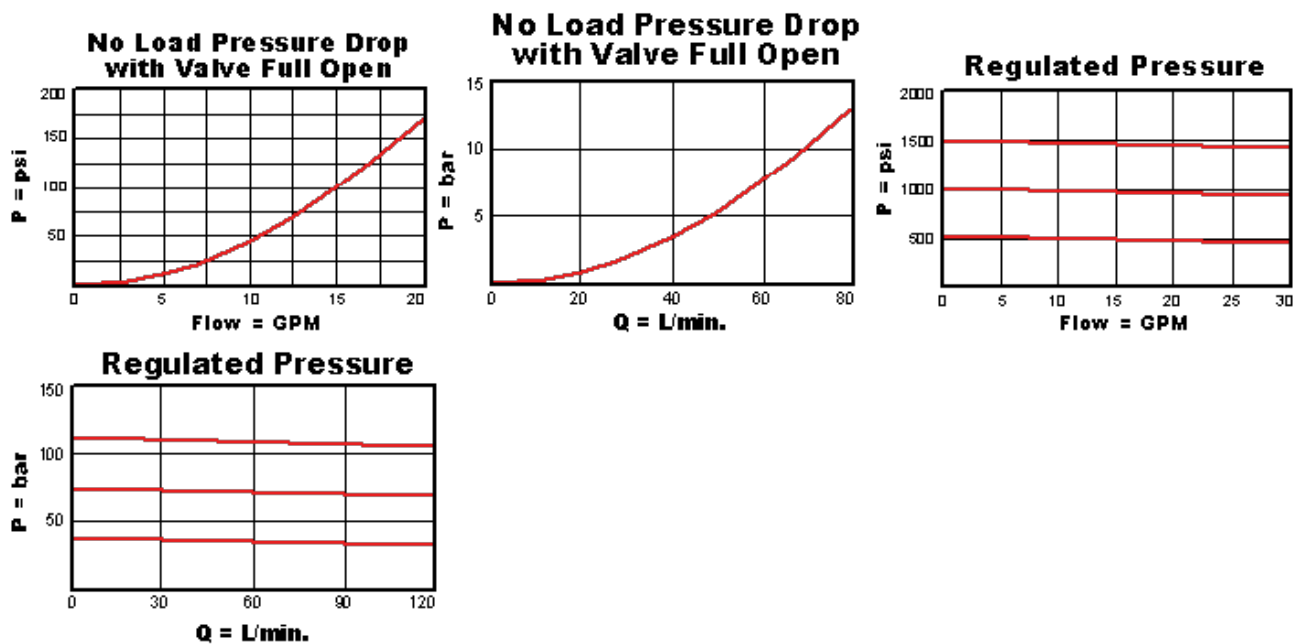
**Model Code Example: PBFF8WN**

MINIMUM CONTROL PRESSURE (W)	SEAL MATERIAL (N)
W 100 psi (7 bar)	N Buna-N
D 25 psi (1,7 bar)	E EPDM
	V Viton

## TECHNICAL FEATURES

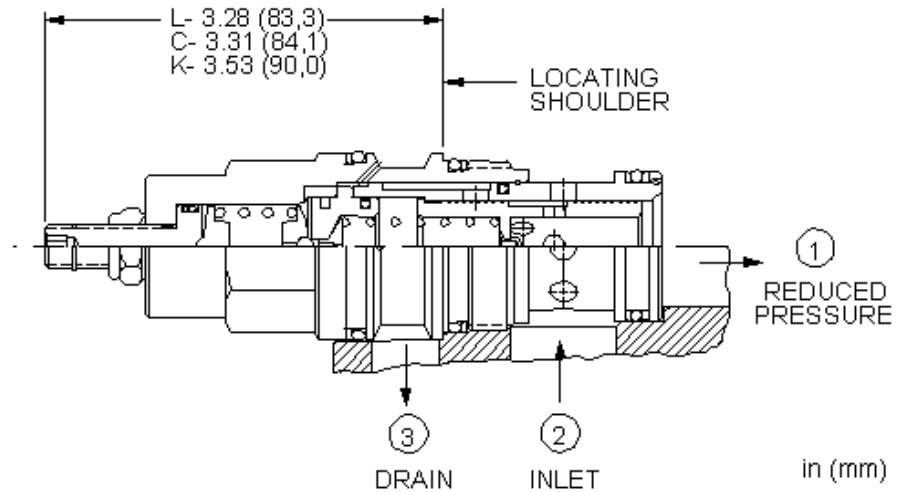
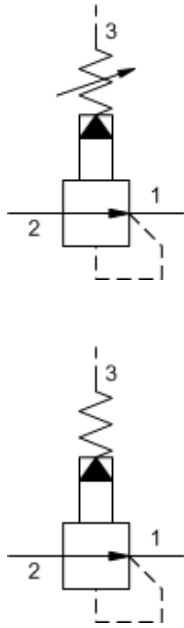
- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PBFF](#) Pilot-operated, pressure reducing valve with drilled piston orifice



Pilot-operated, pressure reducing valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, allowing circuits with multiple pressure requirements to be operated using a single pump.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	160 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	EPDM: 990017014
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	0.57 kg.

**NOTES**

Maximum pressure differentials for spring ranges: A and B are 3000 psi (210 bar) N and Q are 2000 psi (140 bar) W is 5000 psi (350 bar) inlet pressure

**CONFIGURATION OPTIONS**

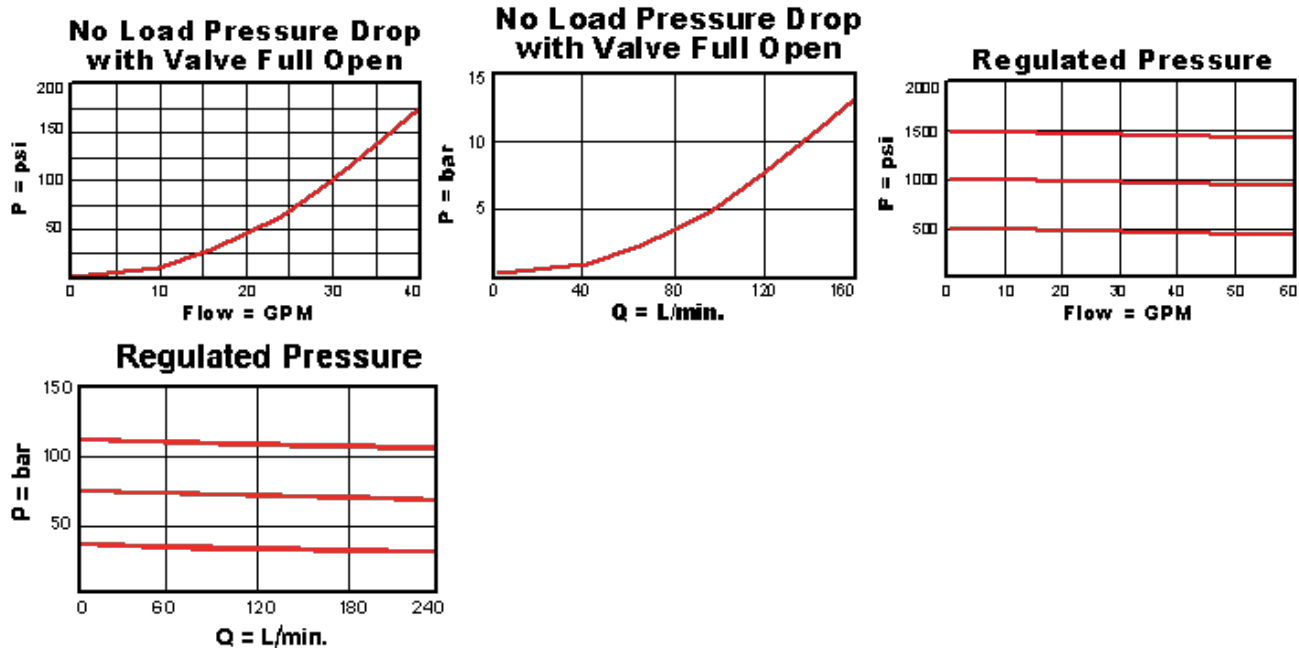
**Model Code Example: PBHBLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>W</b> Hex Wrench Adjustment	<b>N</b> 60 - 800 psi (4 - 55 bar), 200 psi (14 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

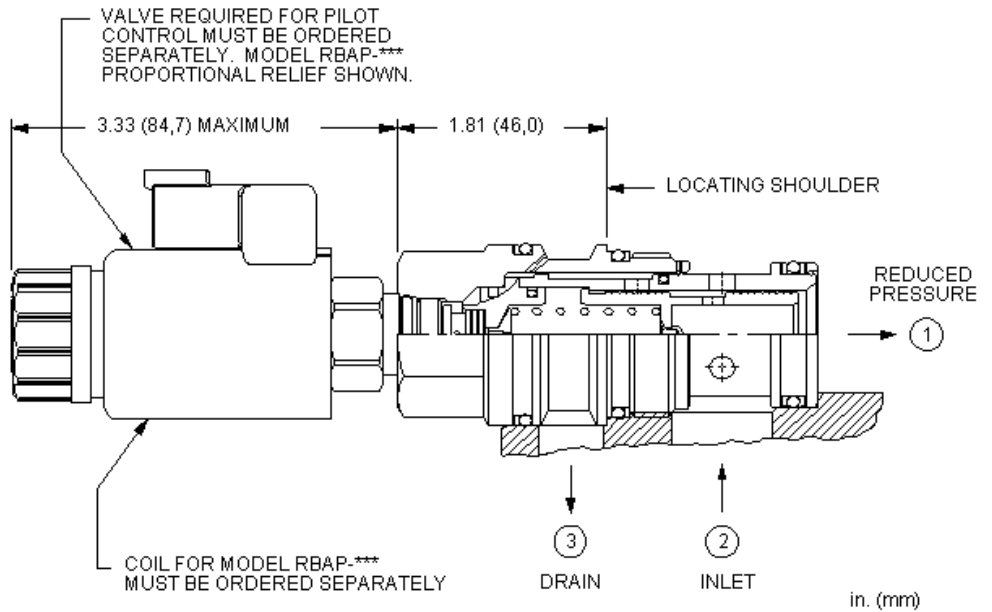
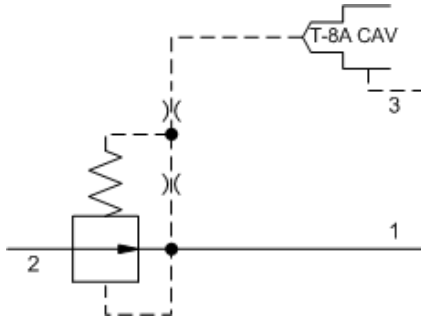
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- If pilot flow consumption is critical, consider using direct acting reducing/relieving valves.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PBHB8](#) Pilot-operated, pressure reducing main stage with integral T-8A control cavity



This valve is a normally open modulating element that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1. The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the drain (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	160 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	EPDM: 990017014
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	0.46 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

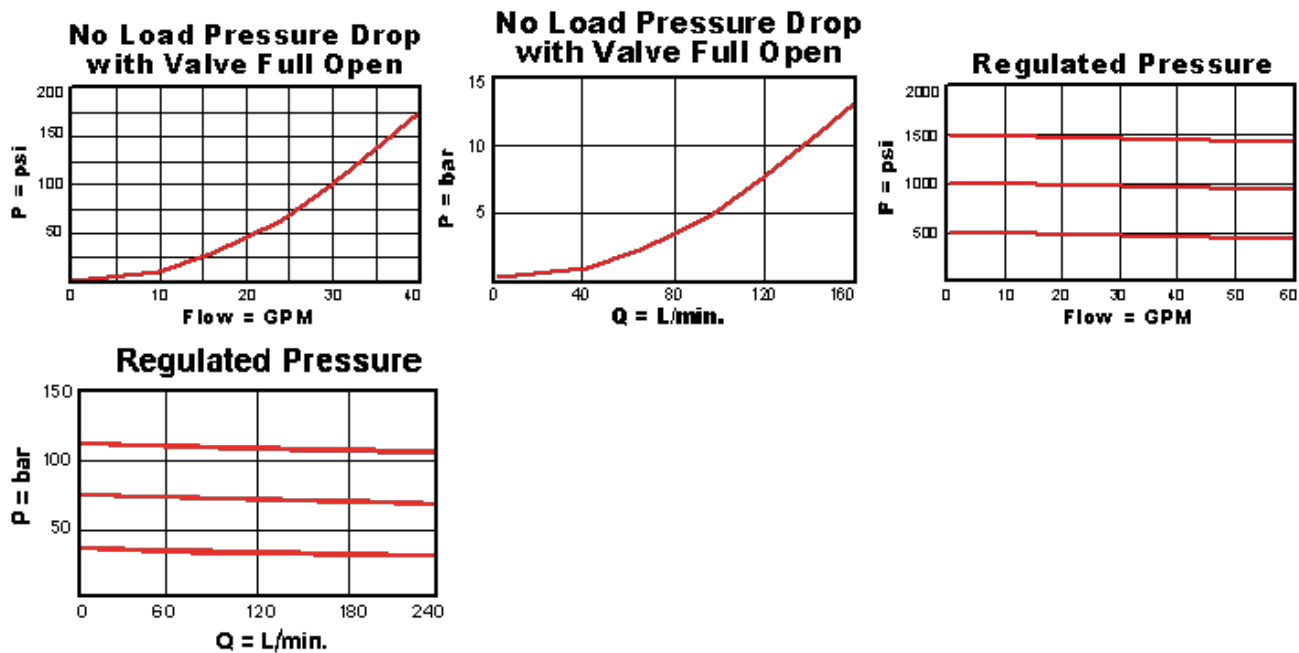
**Model Code Example: PBHB8WN**

MINIMUM CONTROL PRESSURE (W)	SEAL MATERIAL (N)
W 100 psi (7 bar)	N Buna-N
D 25 psi (1,7 bar)	E EPDM
	V Viton

## TECHNICAL FEATURES

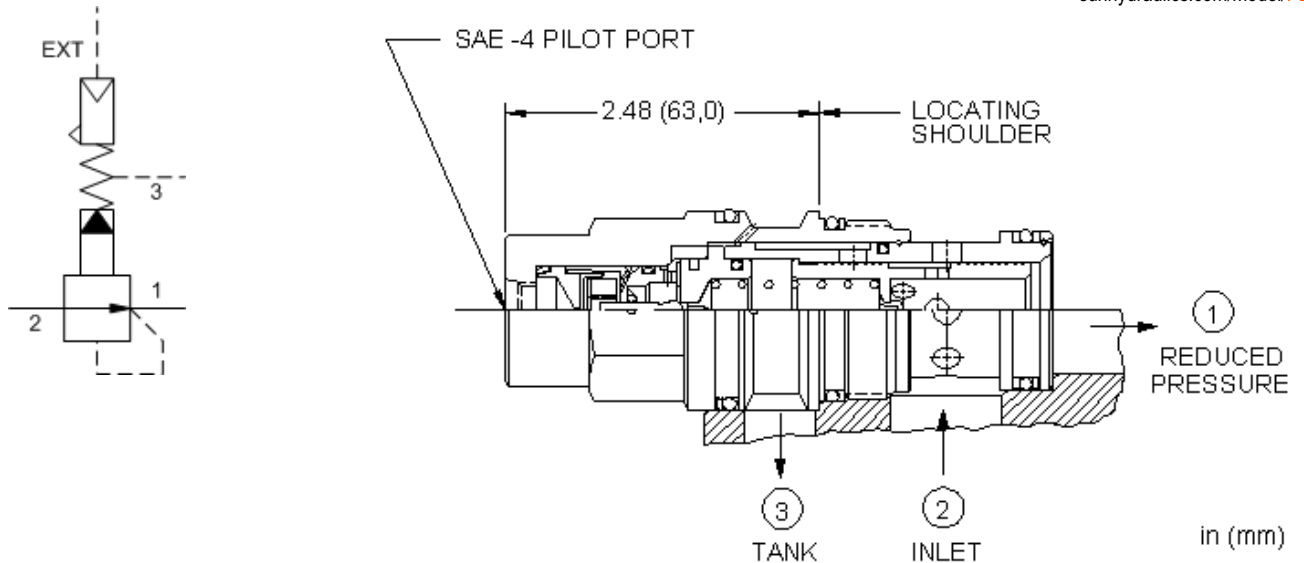
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Main stage orifice is protected by a 150 micron stainless steel screen.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PBHB](#) Pilot-operated, pressure reducing valve



Air-controlled, pilot-operated pressure reducing cartridges use compressed air over a diaphragm instead of an adjustable spring as the setting to reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1. The air signal is supplied through a port in the hex-end of the cartridge and the hydraulic setting is directly proportional to the air setting at a ratio of 20:1 (hydraulic:air).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	160 L/min.
Pilot Ratio	20:1
Maximum Operating Pressure	140 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Maximum Air Pressure	10,5 bar
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006

**CONFIGURATION OPTIONS**
**Model Code Example: PBHCBBN**

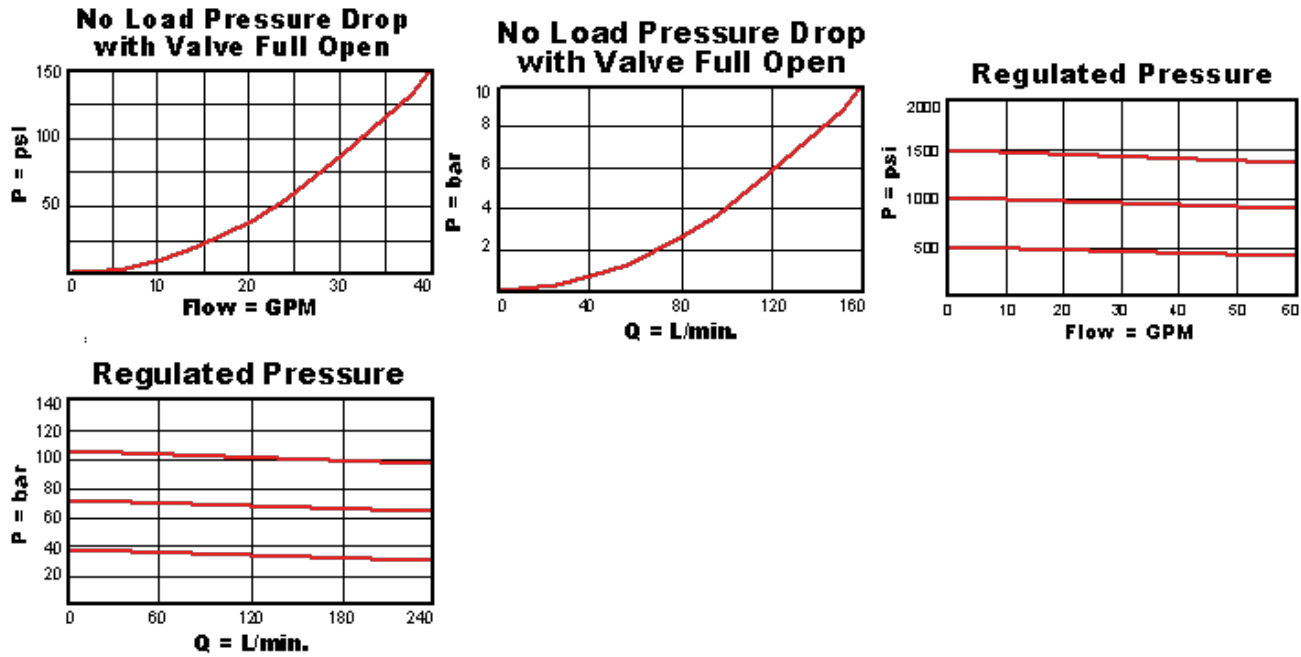
<b>CONTROL</b>	<b>(B) OPERATING RANGE</b>	<b>(B) SEAL MATERIAL</b>	<b>(N)</b>
<b>B</b> External 4- SAE Port	<b>B</b> 50 - 1500 psi (3,5 - 105 bar)	<b>N</b> Buna-N	
		<b>V</b> Viton	

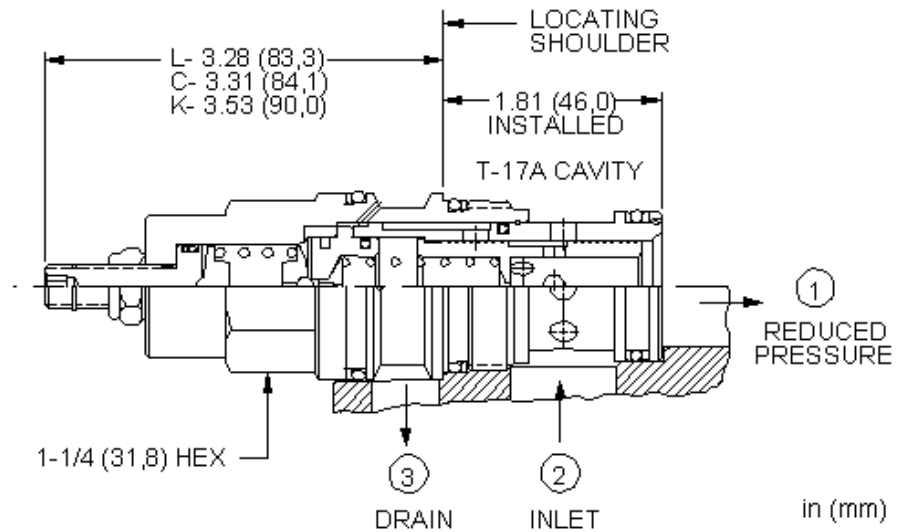
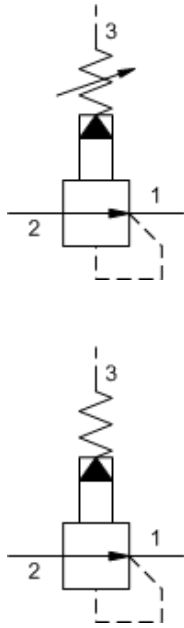


## TECHNICAL FEATURES

- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- The pressure at port 3 determines the minimum valve setting and should not exceed 1000 psi (70 bar).
- The full adjustment range is 50 to 1500 psi (3,5 to 105 bar).
- Maximum air pressure should not exceed 150 psi (10,5 bar) due to the strength of the diaphragm.
- Maximum pressure differential, inlet to outlet, should not exceed 3000 psi (210 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- The air control feature allows explosion proof remote control.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, pressure reducing valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, allowing circuits with multiple pressure requirements to be operated using a single pump.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	160 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	0.57 kg.

## CONFIGURATION OPTIONS

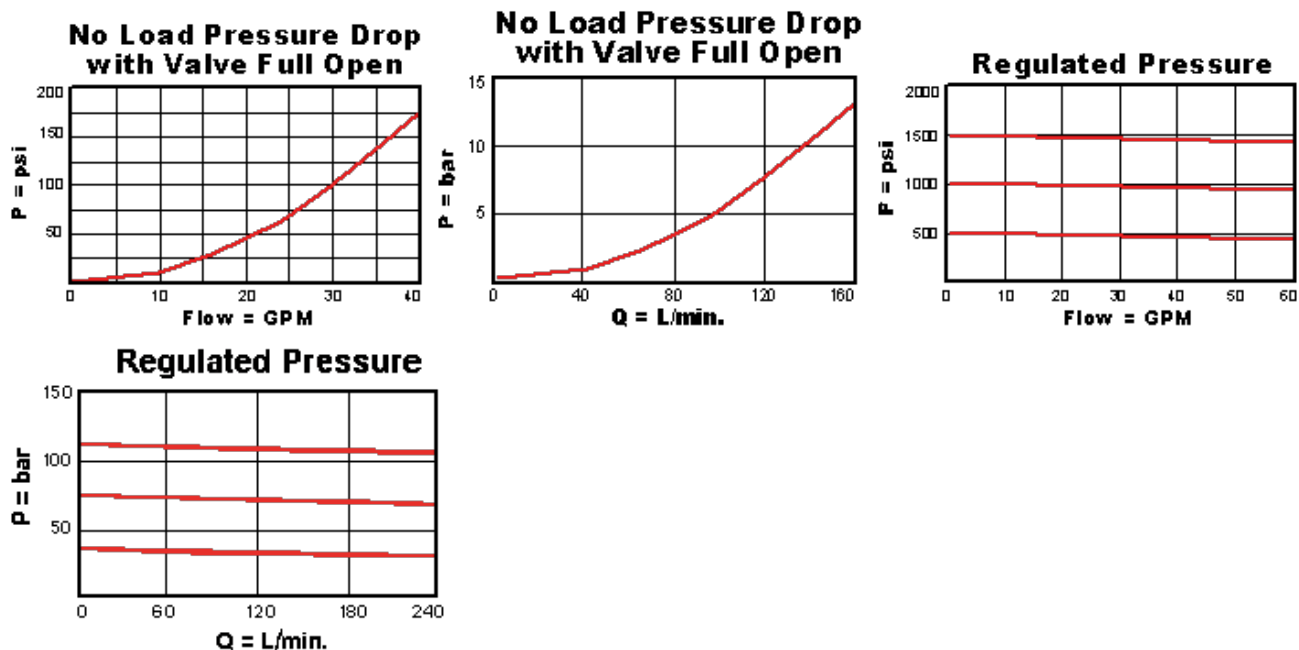
## Model Code Example: PBHFLAN

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N)
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	<b>V</b> Viton
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting		
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 200 psi (14 bar) Standard Setting		
<b>M</b> Capped Screw Adjustment with Lockwire Holes	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting		
<b>Q</b> Capped and Lockwired	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
<b>W</b> Hex Wrench Adjustment	<b>N</b> 60 - 800 psi (4 - 55 bar), 200 psi (14 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

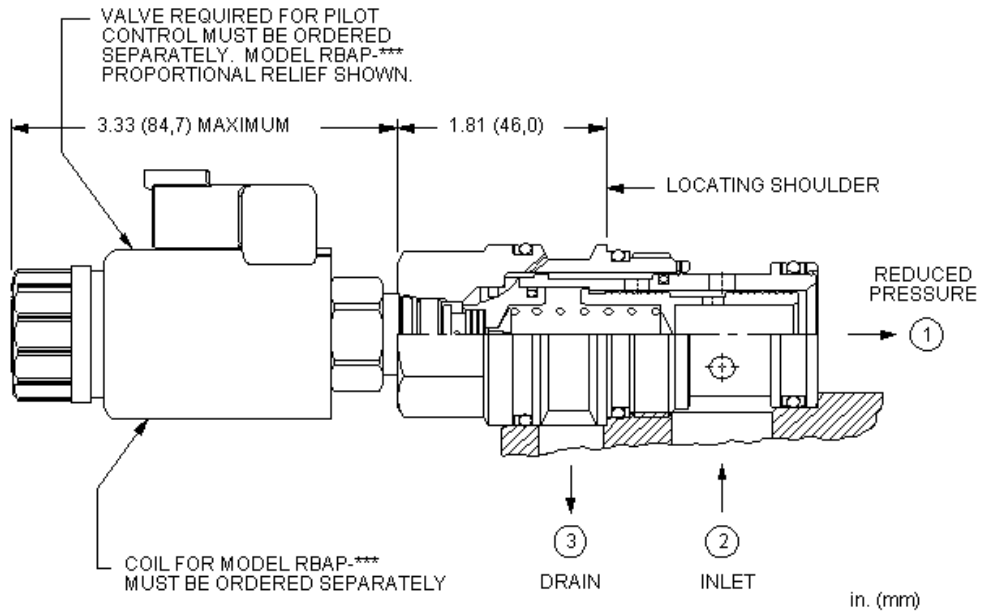
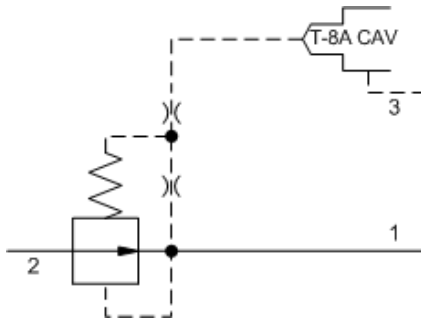
- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- If pilot flow consumption is critical, consider using direct acting reducing/relieving valves.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PBHF8](#) Pilot-operated, pressure reducing main stage with drilled piston orifice and integral T-8A control cavity



This valve is a normally open modulating element that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1. The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the drain (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	160 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	EPDM: 990017014
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	0.46 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

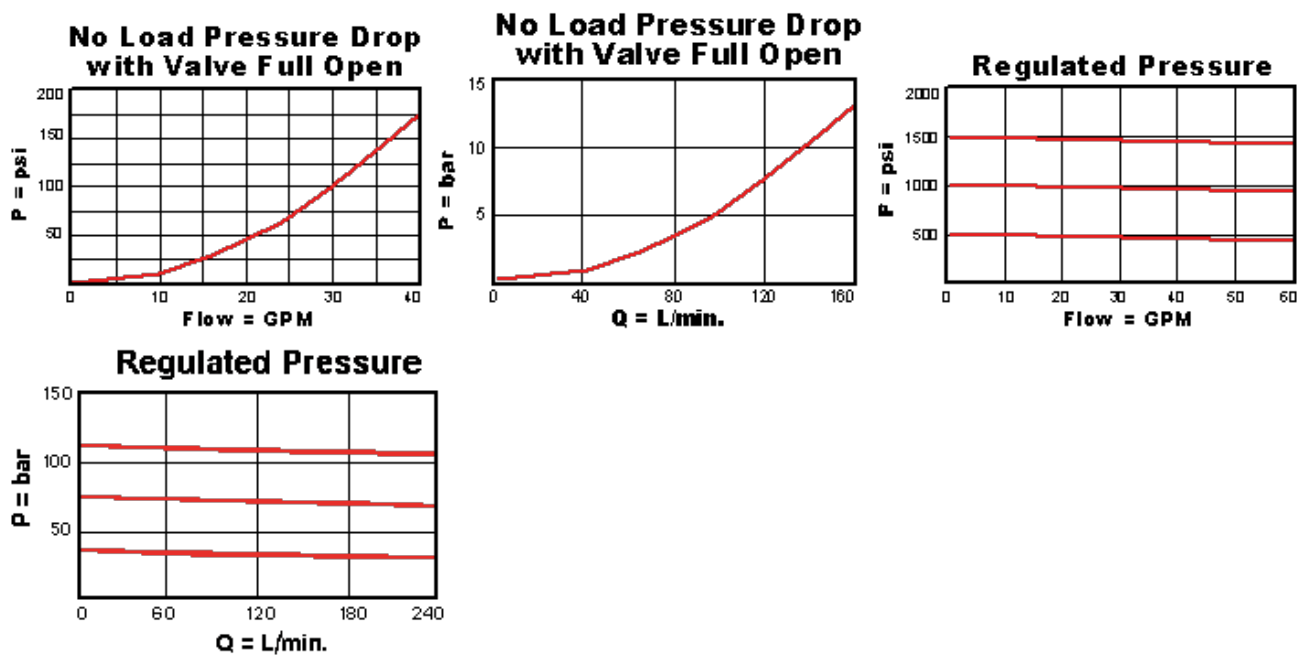
**Model Code Example: PBHF8WN**

MINIMUM CONTROL PRESSURE (W)	SEAL MATERIAL (N)
W 100 psi (7 bar)	N Buna-N
D 25 psi (1,7 bar)	E EPDM
	V Viton

## TECHNICAL FEATURES

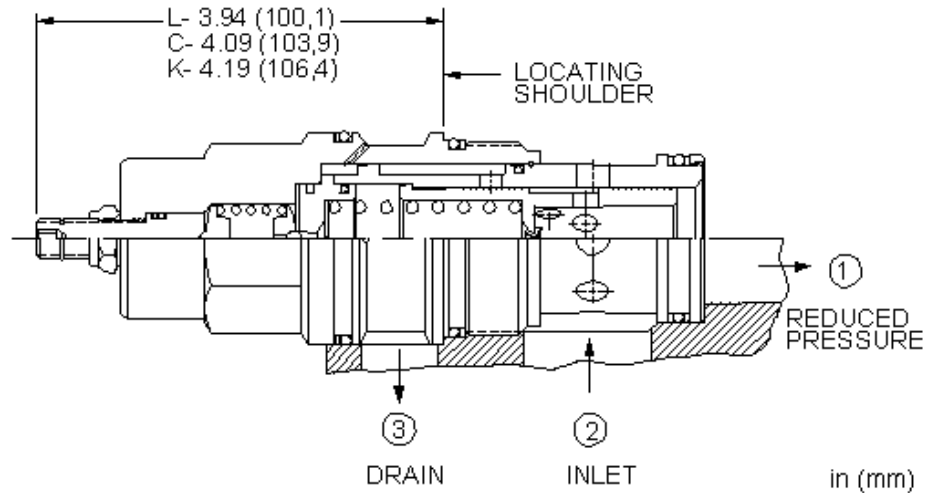
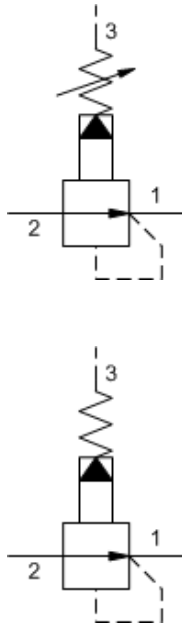
- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PBHF](#) Pilot-operated, pressure reducing valve with drilled piston orifice



Pilot-operated, pressure reducing valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, allowing circuits with multiple pressure requirements to be operated using a single pump.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	320 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	EPDM: 990019014
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	1.31 kg.

**NOTES**

Maximum pressure differentials for spring ranges: A and B are 3000 psi (210 bar) N and Q are 2000 psi (140 bar) W is 5000 psi (350 bar) inlet pressure

**CONFIGURATION OPTIONS**

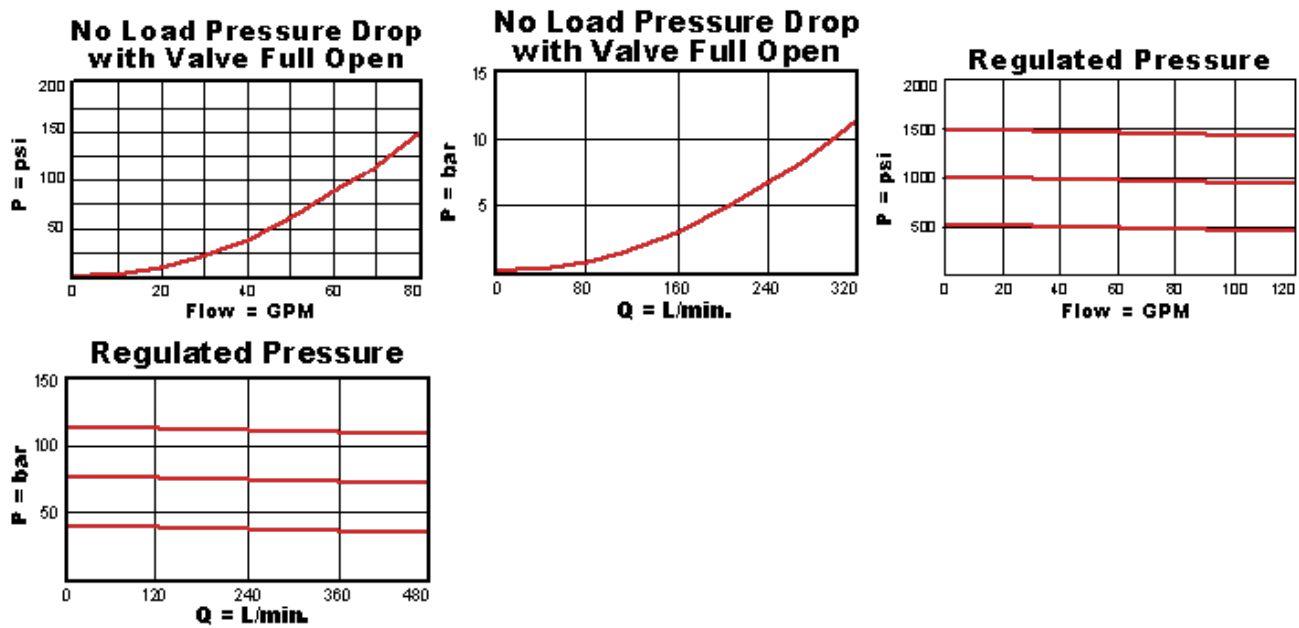
**Model Code Example: PBJBLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 200 psi (14 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>Q</b> Capped and Lockwired	<b>J</b> 25 - 1500 psi (1,7 - 105 bar), 200 psi (14 bar) Standard Setting		
<b>W</b> Hex Wrench Adjustment	<b>N</b> 60 - 800 psi (4 - 55 bar), 200 psi (14 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

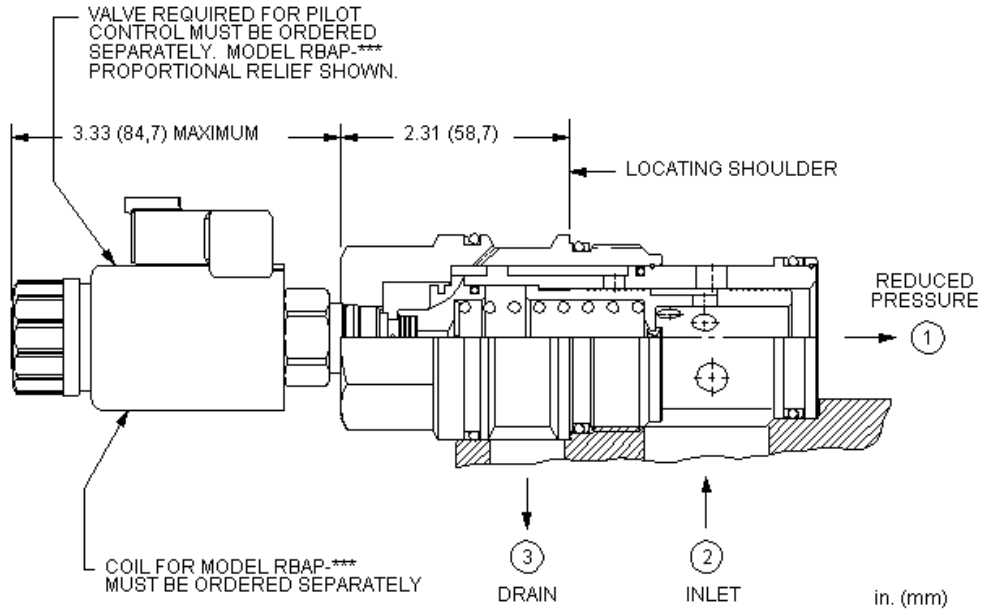
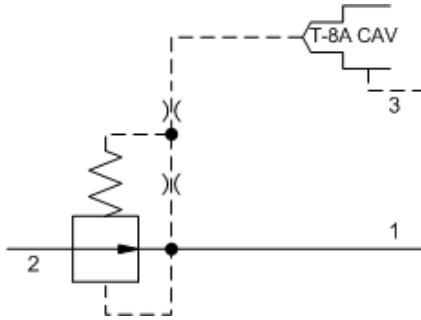
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- If pilot flow consumption is critical, consider using direct acting reducing/relieving valves.
- Main stage orifice is protected by a 150 micron stainless steel screen.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PBJB8](#) Pilot-operated, pressure reducing main stage with integral T-8A control cavity



This valve is a normally open modulating element that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1. The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the drain (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	320 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	EPDM: 990019014
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	1.05 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

**Model Code Example: PJB8WN**

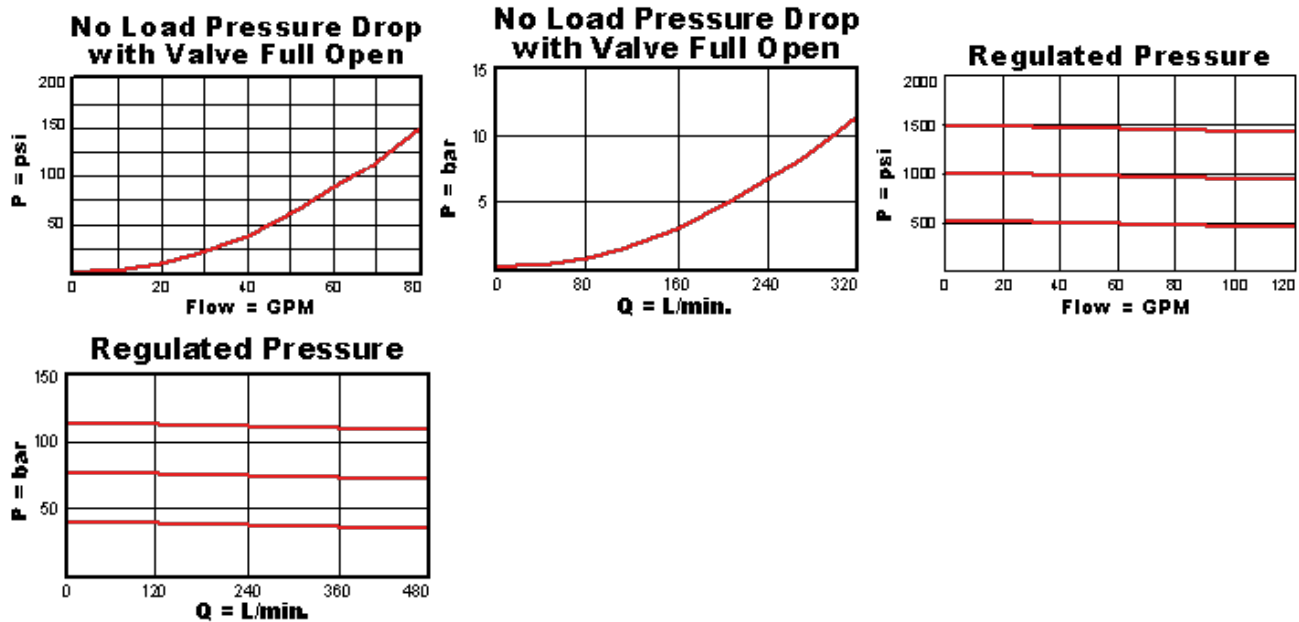
MINIMUM CONTROL PRESSURE (W)	SEAL MATERIAL (N)
W 100 psi (7 bar)	N Buna-N
D 25 psi (1,7 bar)	E EPDM
	V Viton



## TECHNICAL FEATURES

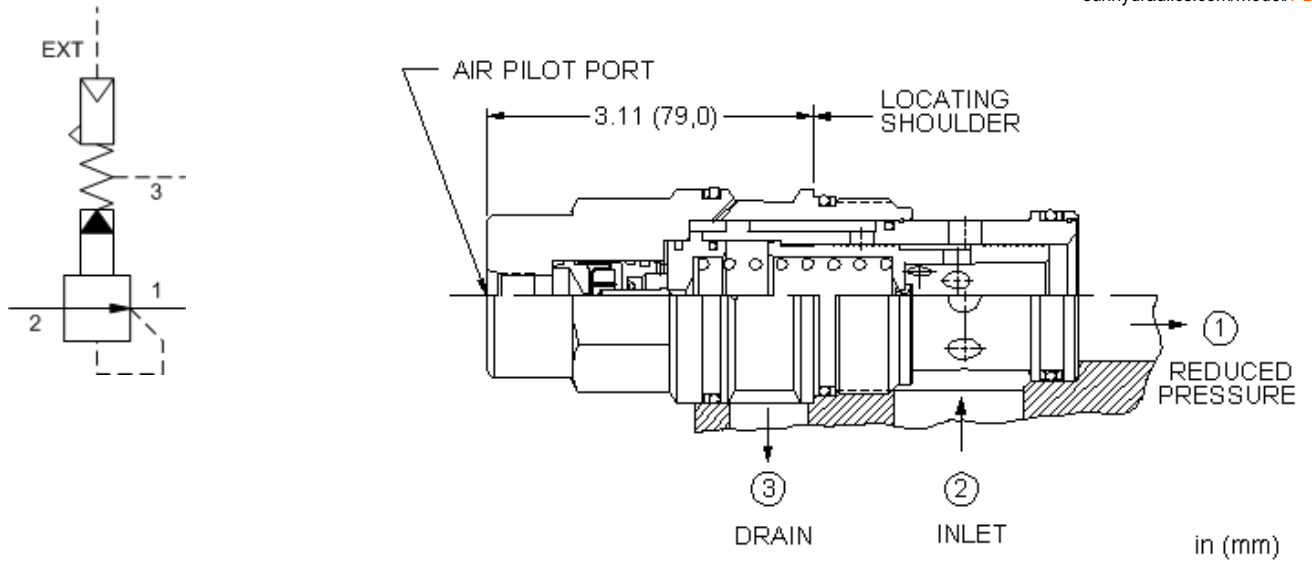
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Main stage orifice is protected by a 150 micron stainless steel screen.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PBJB](#) Pilot-operated, pressure reducing valve



Air-controlled, pilot-operated pressure reducing cartridges use compressed air over a diaphragm instead of an adjustable spring as the setting to reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1. The air signal is supplied through a port in the hex-end of the cartridge and the hydraulic setting is directly proportional to the air setting at a ratio of 20:1 (hydraulic:air).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	320 L/min.
Pilot Ratio	20:1
Maximum Operating Pressure	140 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Maximum Air Pressure	10,5 bar
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006

**CONFIGURATION OPTIONS**
**Model Code Example: PBJCBBN**
**CONTROL** (B) **OPERATING RANGE** (B) **SEAL MATERIAL** (N)

**B** External 4-**SAE** Port

**B** 50 - 1500 psi (3,5 - 105 bar)

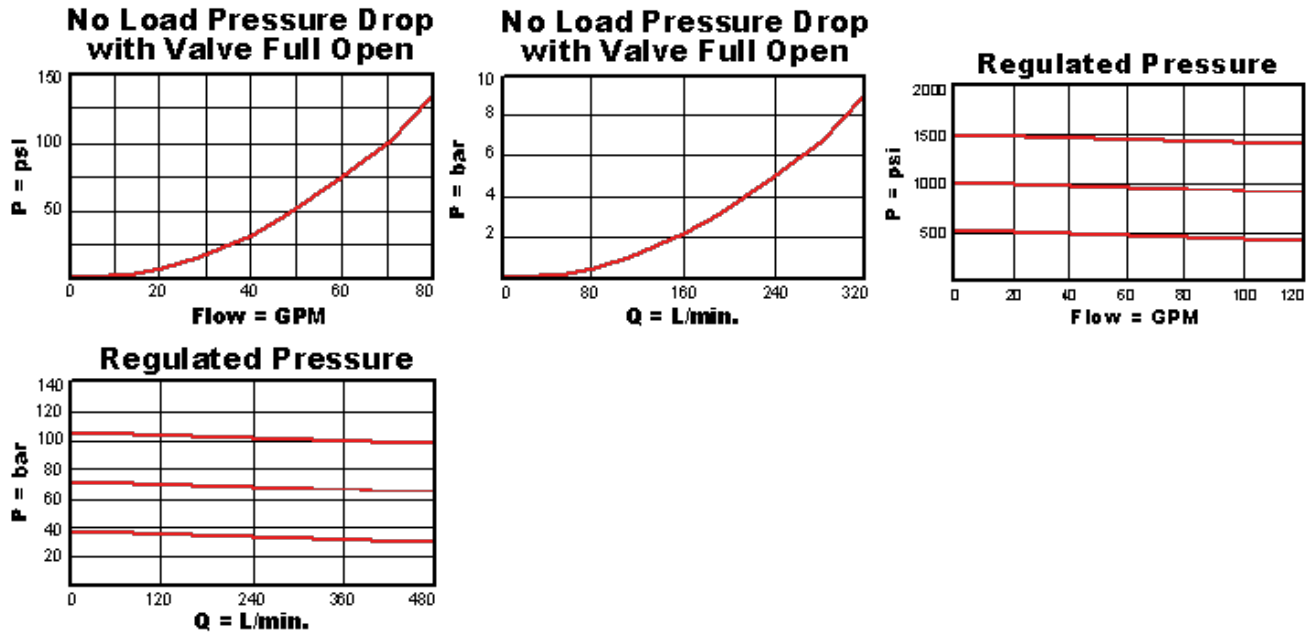
**N** Buna-N

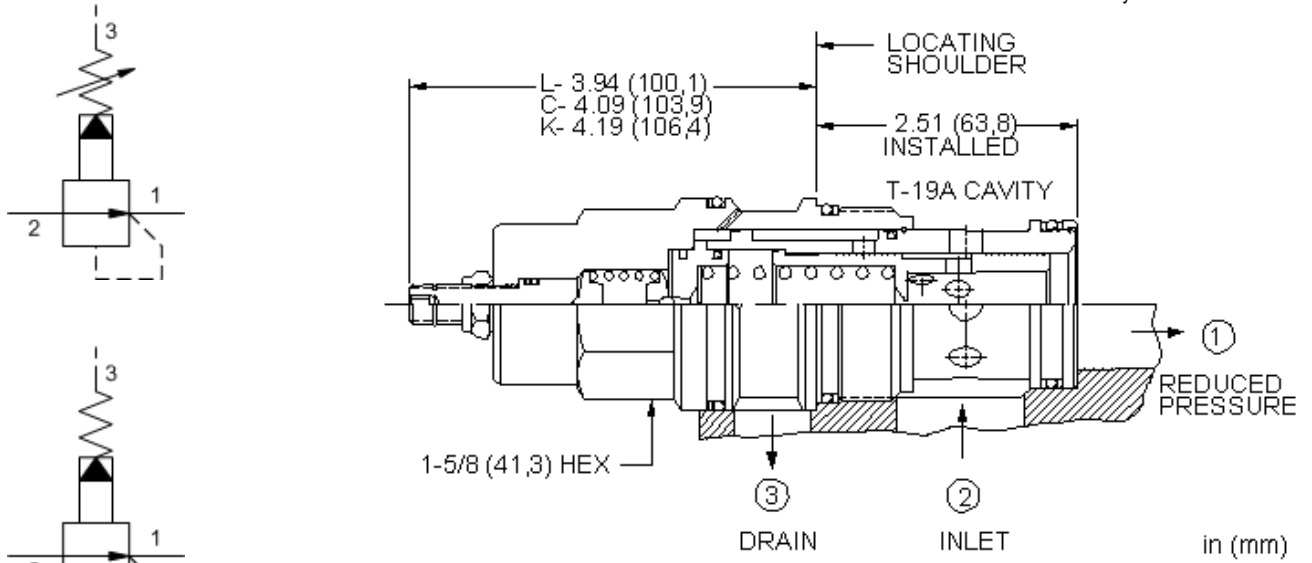
**V** Viton

## TECHNICAL FEATURES

- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- The pressure at port 3 determines the minimum valve setting and should not exceed 1000 psi (70 bar).
- The full adjustment range is 50 to 1500 psi (3,5 to 105 bar).
- Maximum air pressure should not exceed 150 psi (10,5 bar) due to the strength of the diaphragm.
- Maximum pressure differential, inlet to outlet, should not exceed 3000 psi (210 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- The air control feature allows explosion proof remote control.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, pressure reducing valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, allowing circuits with multiple pressure requirements to be operated using a single pump.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	320 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	EPDM: 990019014
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	1.31 kg.

## CONFIGURATION OPTIONS

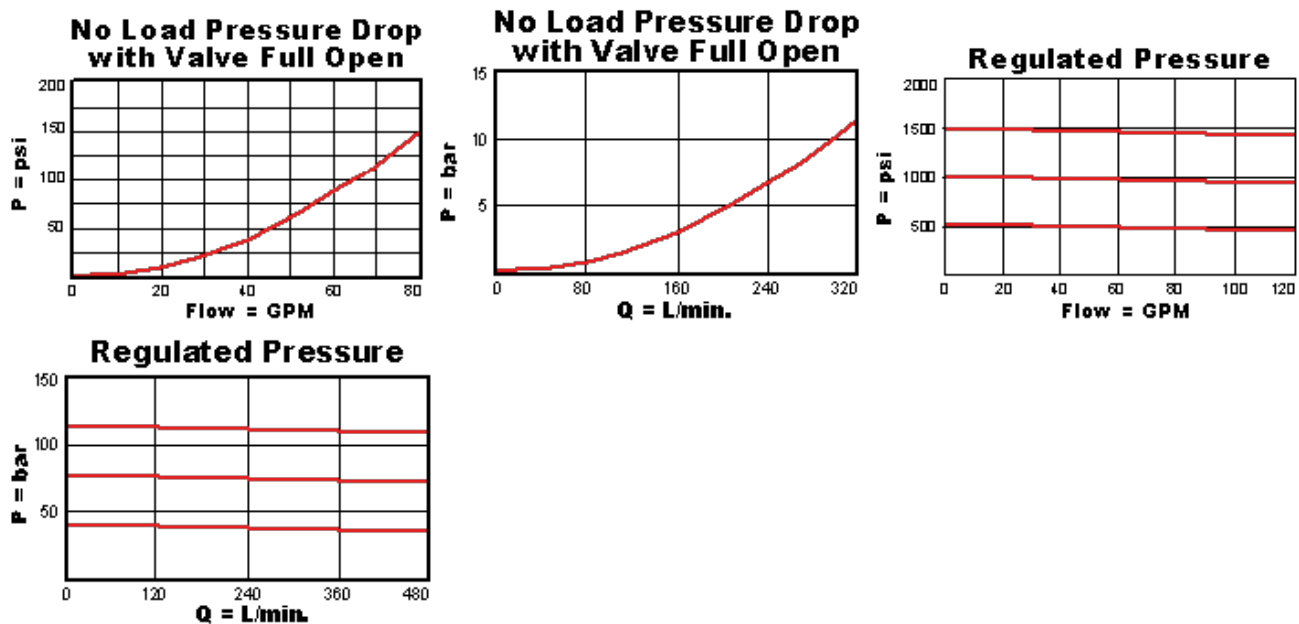
## Model Code Example: PBJFLAN

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N)
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 200 psi (14 bar) Standard Setting	<b>N</b> Buna-N	
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>E</b> EPDM	
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	
<b>N</b> Capped Screw Adjustment with Lockwire Holes	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>N</b> 60 - 800 psi (4 - 55 bar), 200 psi (14 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 100 - 4500 psi (7 - 315 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

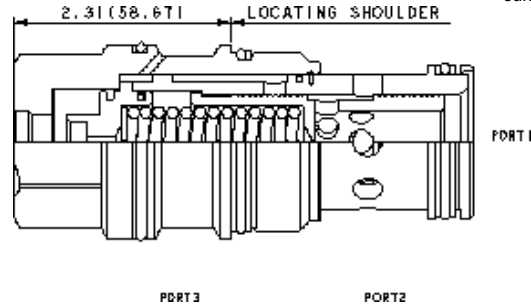
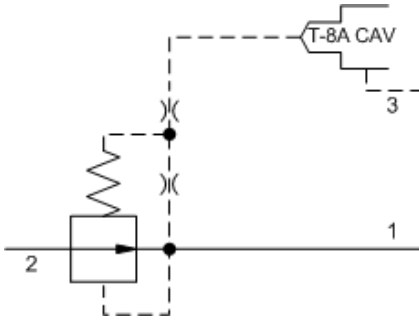
- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- If pilot flow consumption is critical, consider using direct acting reducing/relieving valves.
- Recommended maximum inlet pressure is determined by the adjustment range. Ranges D, E, N, and Q are tested with a 2000 psi (140 bar) maximum differential between inlet and reduced pressure. Ranges A, B, and H are tested with a 3000 psi (210 bar) maximum differential between inlet and reduced pressure. Ranges C and W are tested with 5000 psi (350 bar) of inlet pressure.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Pilot operated reducing, reducing/relieving valves by nature are not fast acting valves. For superior dynamic response, consider direct acting valves.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [PBJF8](#) Pilot-operated, pressure reducing main stage with drilled piston orifice and integral T-8A control cavity



This valve is a normally open modulating element that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1. The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the drain (port 3).

### TECHNICAL DATA

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	320 L/min.
Factory Pressure Settings Established at	blocked control port (dead headed)
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	1.05 kg.

### CONFIGURATION OPTIONS

Model Code Example: **PBJF8WN**

**MINIMUM CONTROL PRESSURE (W) SEAL MATERIAL (N)**

**W** 100 psi (7 bar)

**N** Buna-N

**D** 25 psi (1,7 bar)

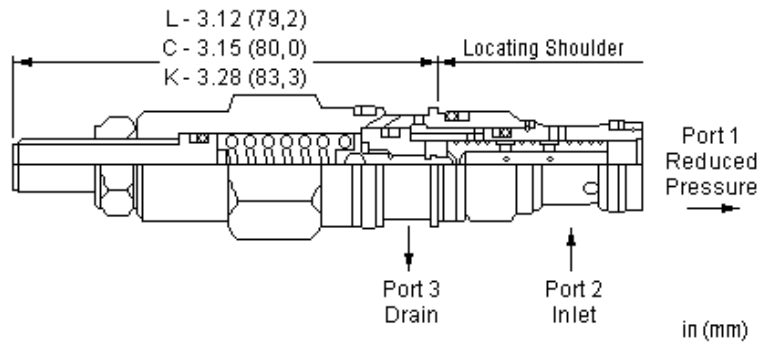
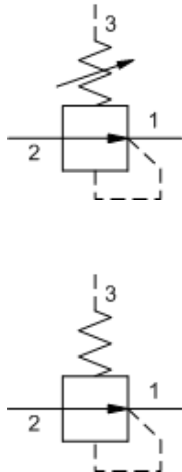
**V** Viton

### TECHNICAL FEATURES

- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- All three-port pressure reducing and reducing/relieving cartridges are physically interchangeable (i.e. same flow path, same cavity for a given frame size). When considering mounting configurations, it is sometimes recommended that a full capacity return line (port 3) be used with reducing/relieving cartridges.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

### RELATED MODELS

- [PBJF](#) Pilot-operated, pressure reducing valve with drilled piston orifice



Direct-acting, pressure reducing valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1. These valves incorporate a damped construction for stable operation allowing the use of high reduced pressure.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-163A
Series	0
Capacity	20 L/min.
Factory Pressure Settings Established at	0.25 gpm
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	12,7 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	EPDM: 990163014
Seal kit - Cartridge	Viton: 990163006
Model Weight	0.14 kg.

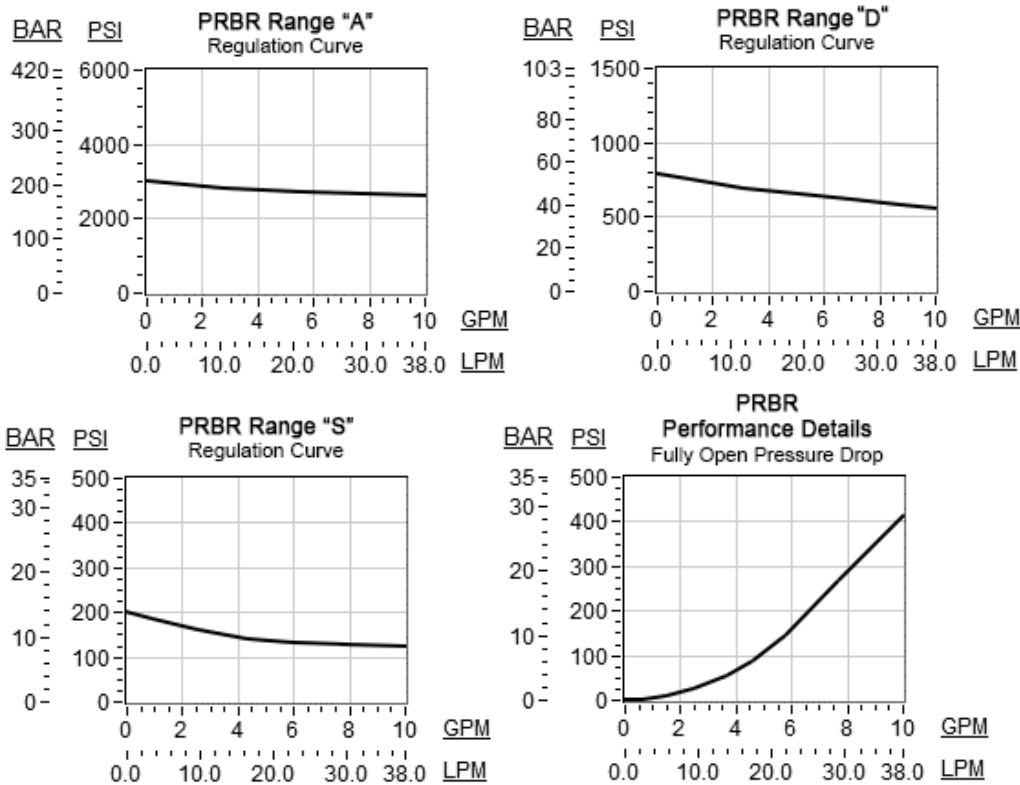
**CONFIGURATION OPTIONS**
**Model Code Example: PRBRLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 500 - 3000 psi (35 - 210 bar), 700 psi (50 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>S</b> 25 - 200 psi (1,7 - 14 bar), 100 psi (7 bar) Standard Setting		
	<b>W</b> 750 - 4500 psi (50 - 315 bar), 1000 psi (70 bar) Standard Setting		

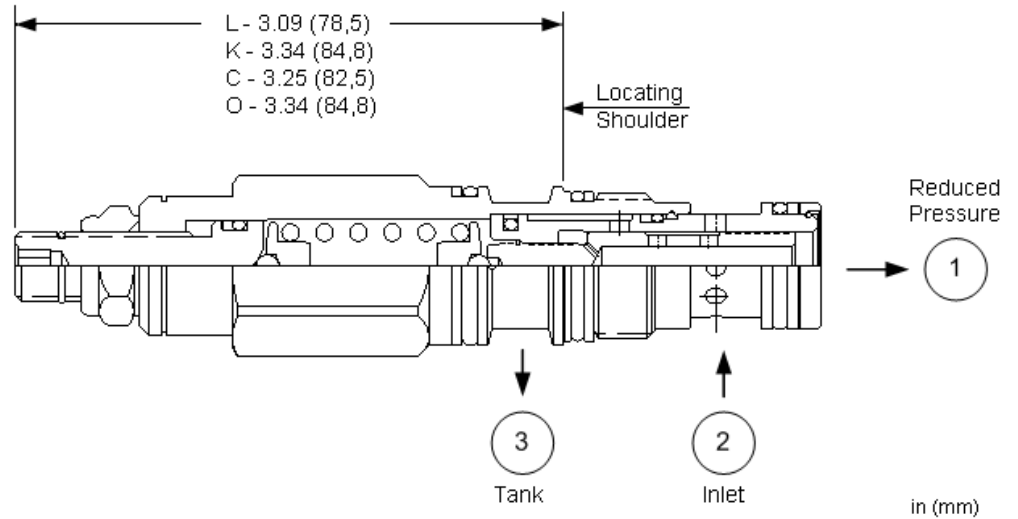
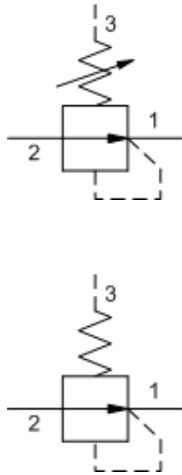
## TECHNICAL FEATURES

- Note: This valve has no relieving capability. It should not be used in a dead-headed application. If the reduced pressure side of the circuit has very low leakage the pressure may rise significantly. The pressure rise will vary from valve to valve.
- This type of valve, PR\*R, is a good replacement for an LP\*C as a normally open, restrictive compensating element if a higher pressure drop across an orifice is needed.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- All spring ranges are tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Suitable for accumulator circuits since the absence of pilot control flow results in reduced secondary circuit leakage.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES







Direct-acting, pressure reducing valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1. These valves incorporate a damped construction for stable operation allowing the use of high reduced pressure.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	40 L/min.
Factory Pressure Settings Established at	0.25 gpm
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	EPDM: 990011014
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.20 kg.

**NOTES**

For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

## CONFIGURATION OPTIONS

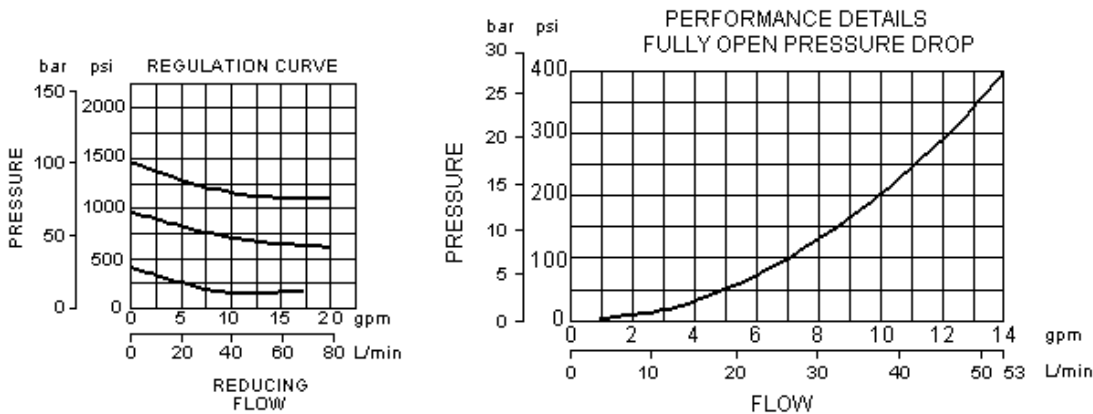
## Model Code Example: PRDRLAN

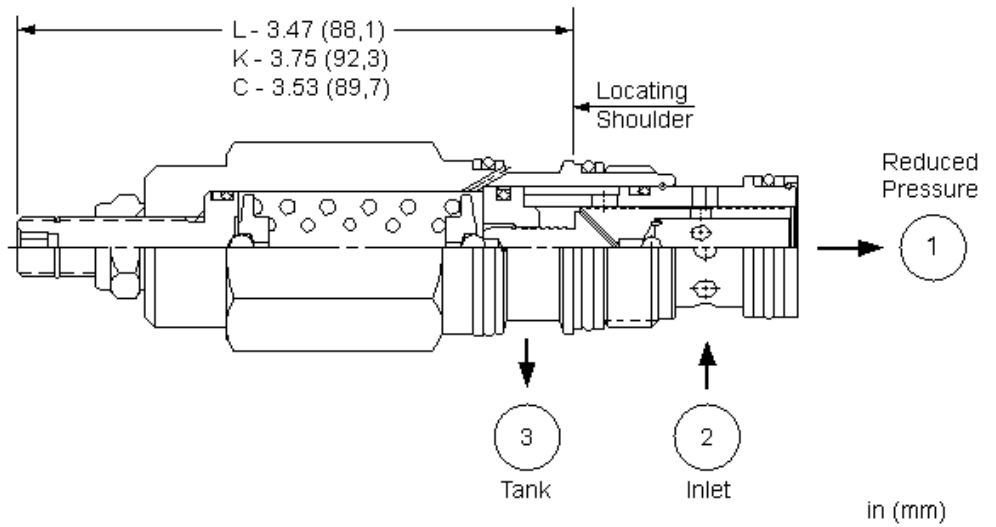
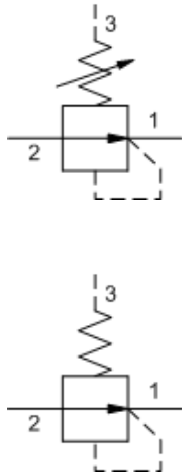
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 500 - 3000 psi (35 - 210 bar), 700 psi (50 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 200 psi (14 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 200 psi (14 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>O</b> Handknob with Panel Mount	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>S</b> 25 - 200 psi (1,7 - 14 bar), 100 psi (7 bar) Standard Setting		
	<b>W</b> 750 - 4500 psi (50 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- Note: This valve has no relieving capability. It should not be used in a dead-headed application. If the reduced pressure side of the circuit has very low leakage the pressure may rise significantly. The pressure rise will vary from valve to valve.
- This type of valve, PR<sup>2</sup>R, is a good replacement for an LP<sup>2</sup>C as a normally open, restrictive compensating element if a higher pressure drop across an orifice is needed.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- All spring ranges are tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Suitable for accumulator circuits since the absence of pilot control flow results in reduced secondary circuit leakage.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Direct-acting, pressure reducing valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1. These valves incorporate a damped construction for stable operation allowing the use of high reduced pressure.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	80 L/min.
Factory Pressure Settings Established at	0.25 gpm
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	50 cc/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	EPDM: 990202014
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.35 kg.

**CONFIGURATION OPTIONS**

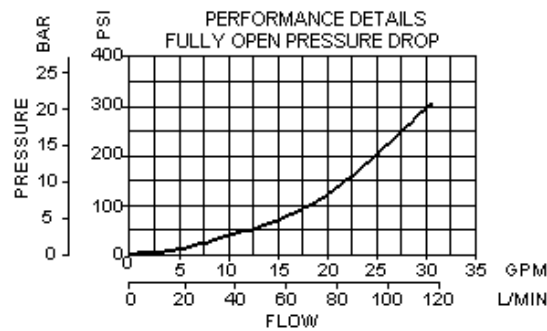
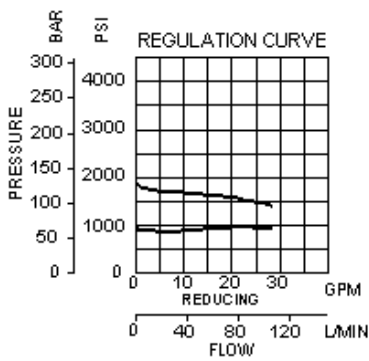
**Model Code Example: PRFRLAN**

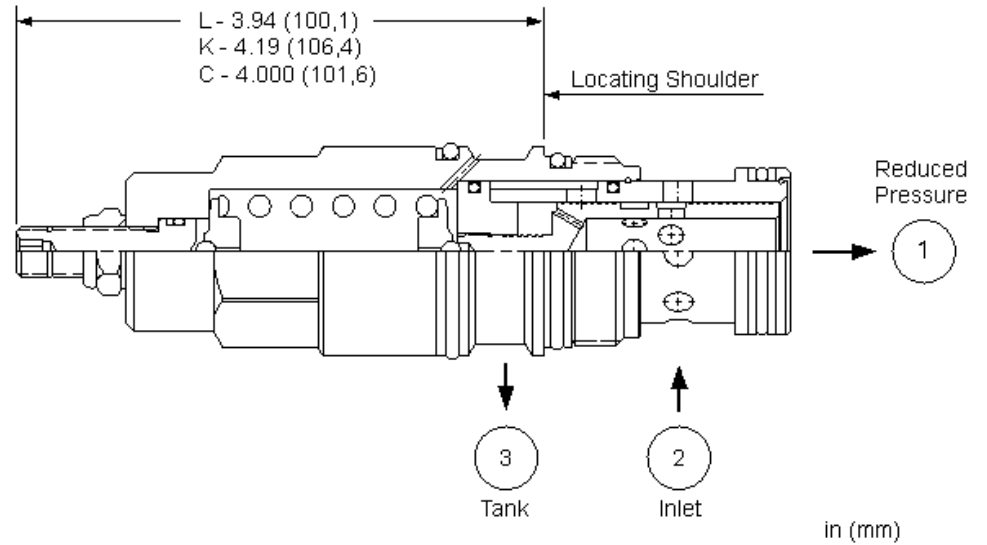
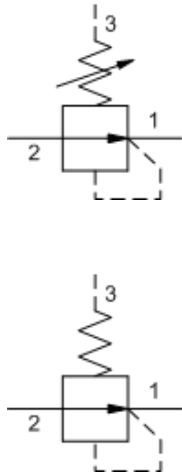
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 750 - 3000 psi (50 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 300 - 1500 psi (20 - 105 bar), 500 psi (35 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>D</b> 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
	<b>E</b> 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>S</b> 50 - 200 psi (3,5 - 14 bar), 100 psi (7 bar) Standard Setting		
	<b>W</b> 1000 - 4500 psi (70 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- Note: This valve has no relieving capability. It should not be used in a dead-headed application. If the reduced pressure side of the circuit has very low leakage the pressure may rise significantly. The pressure rise will vary from valve to valve.
- This type of valve, PR\*R, is a good replacement for an LP\*C as a normally open, restrictive compensating element if a higher pressure drop across an orifice is needed.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- All spring ranges are tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Suitable for accumulator circuits since the absence of pilot control flow results in reduced secondary circuit leakage.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Direct-acting, pressure reducing valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1. These valves incorporate a damped construction for stable operation allowing the use of high reduced pressure.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	160 L/min.
Factory Pressure Settings Established at	0.25 gpm
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	65 cc/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	0.71 kg.

**CONFIGURATION OPTIONS**

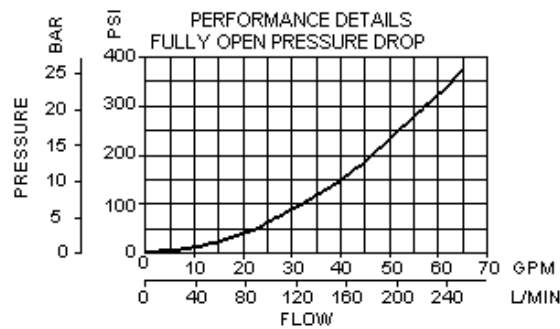
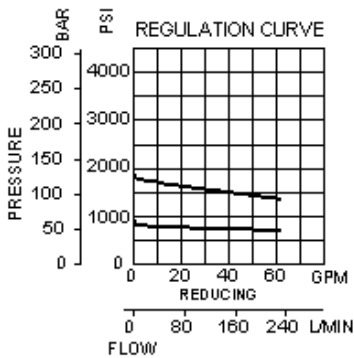
**Model Code Example: PRHRLAN**

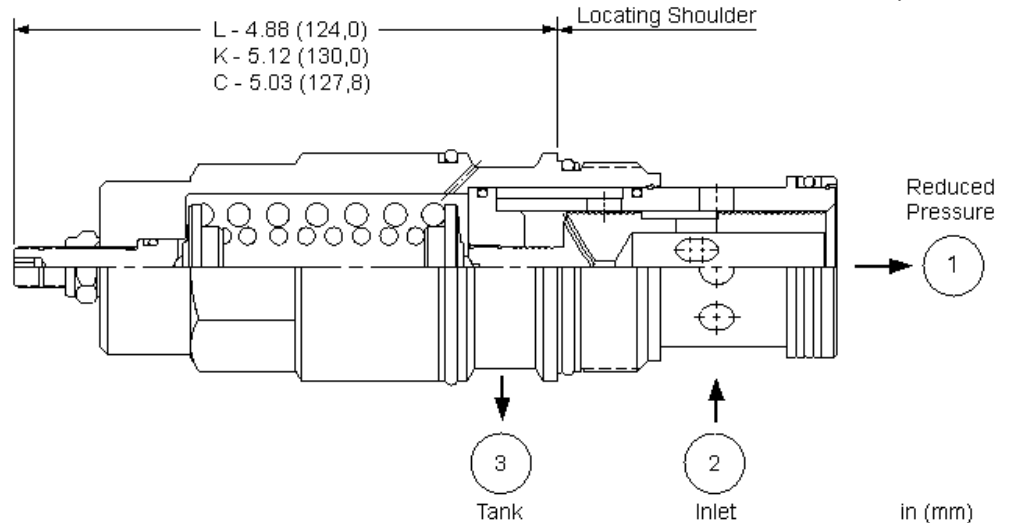
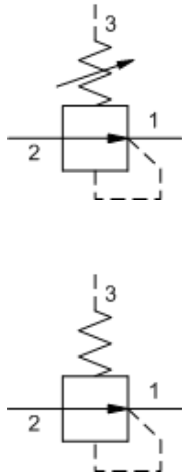
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 750 - 3000 psi (50 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 300 - 1500 psi (20 - 105 bar), 500 psi (35 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>D</b> 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
	<b>E</b> 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>S</b> 50 - 200 psi (3,5 - 14 bar), 100 psi (7 bar) Standard Setting		
	<b>W</b> 1100 - 4500 psi (76 - 315 bar), 1100 psi (76 bar) Standard Setting		

## TECHNICAL FEATURES

- Note: This valve has no relieving capability. It should not be used in a dead-headed application. If the reduced pressure side of the circuit has very low leakage the pressure may rise significantly. The pressure rise will vary from valve to valve.
- This type of valve, PR\*R, is a good replacement for an LP\*C as a normally open, restrictive compensating element if a higher pressure drop across an orifice is needed.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- All spring ranges are tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Suitable for accumulator circuits since the absence of pilot control flow results in reduced secondary circuit leakage.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Direct-acting, pressure reducing valves reduce a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1. These valves incorporate a damped construction for stable operation allowing the use of high reduced pressure.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	320 L/min.
Factory Pressure Settings Established at	0.25 gpm
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	80 cc/min.
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	EPDM: 990019014
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	1.59 kg.

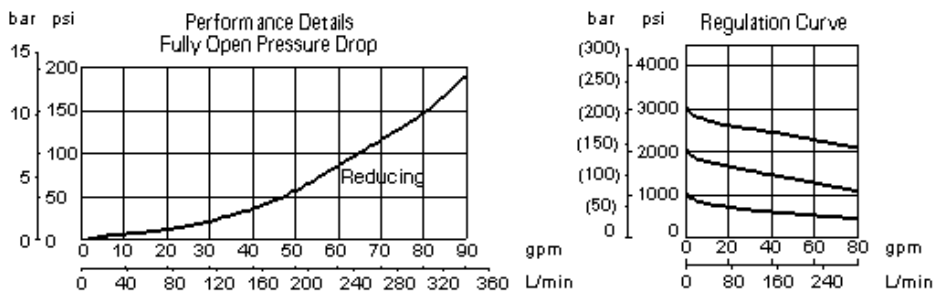
**CONFIGURATION OPTIONS**
**Model Code Example: PRJRLAN**

<b>CONTROL</b>	<b>(L) ADJUSTMENT RANGE</b>	<b>(A) SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>L</b> Standard Screw Adjustment	<b>A</b> 750 - 3000 psi (50 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 300 - 1500 psi (20 - 105 bar), 500 psi (35 bar) Standard Setting	<b>E</b> EPDM	<b>JAP</b> Stainless Steel, Passivated
<b>K</b> Handknob	<b>D</b> 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting	<b>V</b> Viton	
	<b>E</b> 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>S</b> 50 - 200 psi (3,5 - 14 bar), 100 psi (7 bar) Standard Setting		
	<b>W</b> 1100 - 4500 psi (76 - 315 bar), 1100 psi (76 bar) Standard Setting		

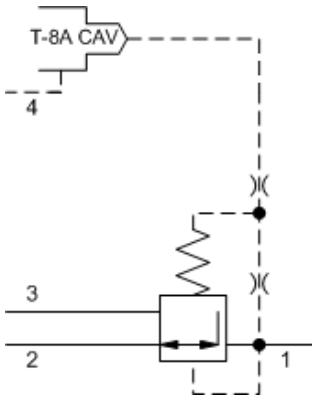
## TECHNICAL FEATURES

- Note: This valve has no relieving capability. It should not be used in a dead-headed application. If the reduced pressure side of the circuit has very low leakage the pressure may rise significantly. The pressure rise will vary from valve to valve.
- This type of valve, PR\*R, is a good replacement for an LP\*C as a normally open, restrictive compensating element if a higher pressure drop across an orifice is needed.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- All spring ranges are tested for correct operation with 5000 psi (350 bar) inlet pressure.
- Suitable for accumulator circuits since the absence of pilot control flow results in reduced secondary circuit leakage.
- Direct operated version offers superior dynamic response compared to equivalent pilot operated models.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Leakage specified in Technical Data is out of port 3 with a supply pressure of 2000 psi (140 bar) and the valve set at mid range. This leakage is directly proportional to pressure differential and inversely proportional to viscosity expressed in centistokes.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES







This valve is a 3-way, normally open modulating element, externally drained, that incorporates an integral pilot control cavity. The pilot control cavity will accept any T-8A pressure control cartridge. The valve reduces a high primary pressure at the inlet (port 2) to a constant reduced pressure at port 1, with a full flow relief function from port 1 to tank (port 3). The pilot cartridge's setting determines the difference in pressure between reduced pressure (port 1) and the drain (port 4).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-21A
Series	1
Capacity	40 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Pilot Control Cavity	T-8A
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006
Model Weight	0.13 kg.

**CONFIGURATION OPTIONS**
**Model Code Example: PVDC8WN**

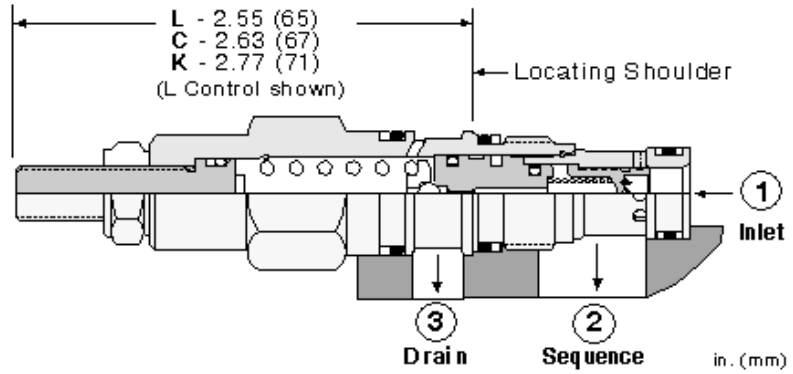
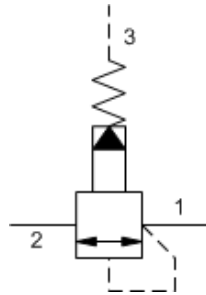
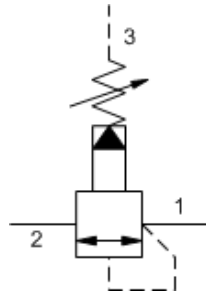
MINIMUM CONTROL PRESSURE (W)	SEAL MATERIAL (N)
<b>W</b> 100 psi (7 bar)	<b>N</b> Buna-N
D 25 psi (1,7 bar)	V Viton

**TECHNICAL FEATURES**

- These valves have the main stage orifice drilled into the piston rather than a staked-in orifice. This allows the valve to survive physically demanding applications.
- Maximum pressure at port 3 should be limited to 3000 psi (210 bar).
- Pilot operated valves exhibit very low dead-band transition between reducing and relieving modes.
- Pressure at port 4 should not exceed 5000 psi (350 bar).
- Pilot operated valves exhibit exceptionally flat pressure/flow characteristics, are very stable and have low hysteresis.
- Pressure on the drain (port 4) is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Maximum inlet pressure is determined by the bias spring. The D spring is tested with 2000 psi (140 bar) maximum differential pressure and the W spring is tested with 5000 psi (350 bar) maximum inlet pressure.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include electro-proportional, solenoid, air pilot, and hydraulic pilot operation. See Pilot Control Cartridges.
- Full reverse flow from reduced pressure (port 1) to inlet (port 2) may cause the main spool to close. If reverse free flow is required in the circuit, consider adding a separate check valve to the circuit.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

**RELATED MODELS**

- [PVDC](#) Pilot-operated, pressure reducing/relieving valve with drain to port 4 and drilled piston orifice



Pilot-operated, balanced piston sequence valves will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. The pressure setting of a sequence valve controls the pressure at port 1 relative to the pressure at the drain (port 3). These valves are insensitive to back pressure at port 2 (sequence), up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-163A
Series	0
Capacity	30 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	Polyurethane: 990163002
Seal kit - Cartridge	Viton: 990163006
Model Weight	0.11 kg.

**CONFIGURATION OPTIONS**

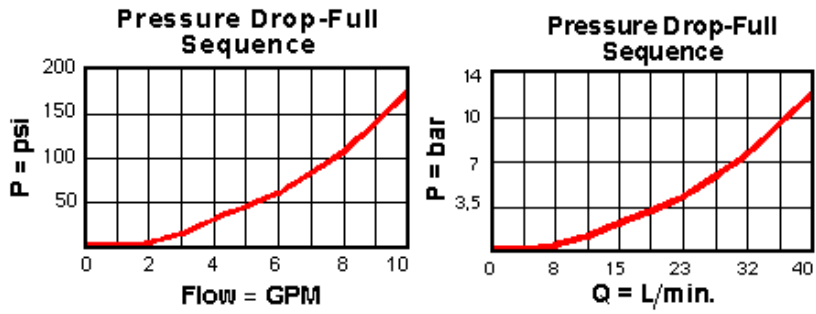
**Model Code Example: RSBCLAN**

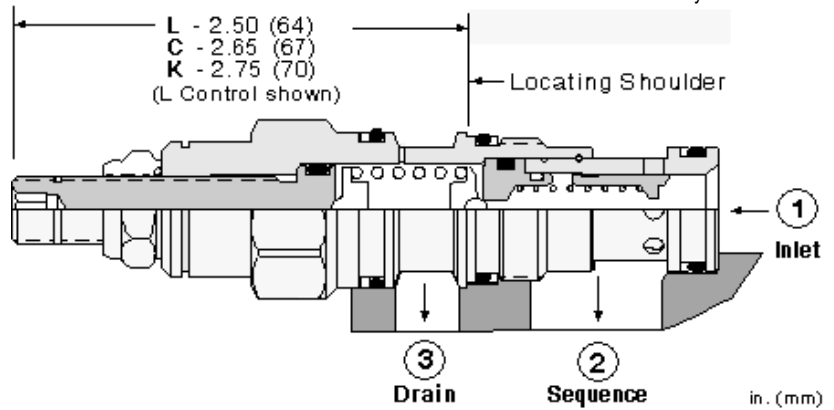
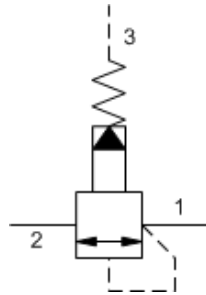
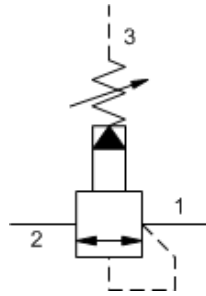
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 75 - 3000 psi (5 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 75 - 4500 psi (5 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>B</b> 75 - 1500 psi (5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
	<b>C</b> 75 - 6000 psi (5 - 420 bar), 1000 psi (70 bar) Standard Setting		
	<b>N</b> 75 - 800 psi (5 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>Q</b> 75 - 400 psi (5 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Minimum setting is 75 psi (5 bar) for all spring ranges.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Not suitable for use in load holding applications due to spool leakage.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, balanced piston sequence valves will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. The pressure setting of a sequence valve controls the pressure at port 1 relative to the pressure at the drain (port 3). These valves are insensitive to back pressure at port 2 (sequence), up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	60 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.@70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	EPDM: 990011014
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.16 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

## CONFIGURATION OPTIONS

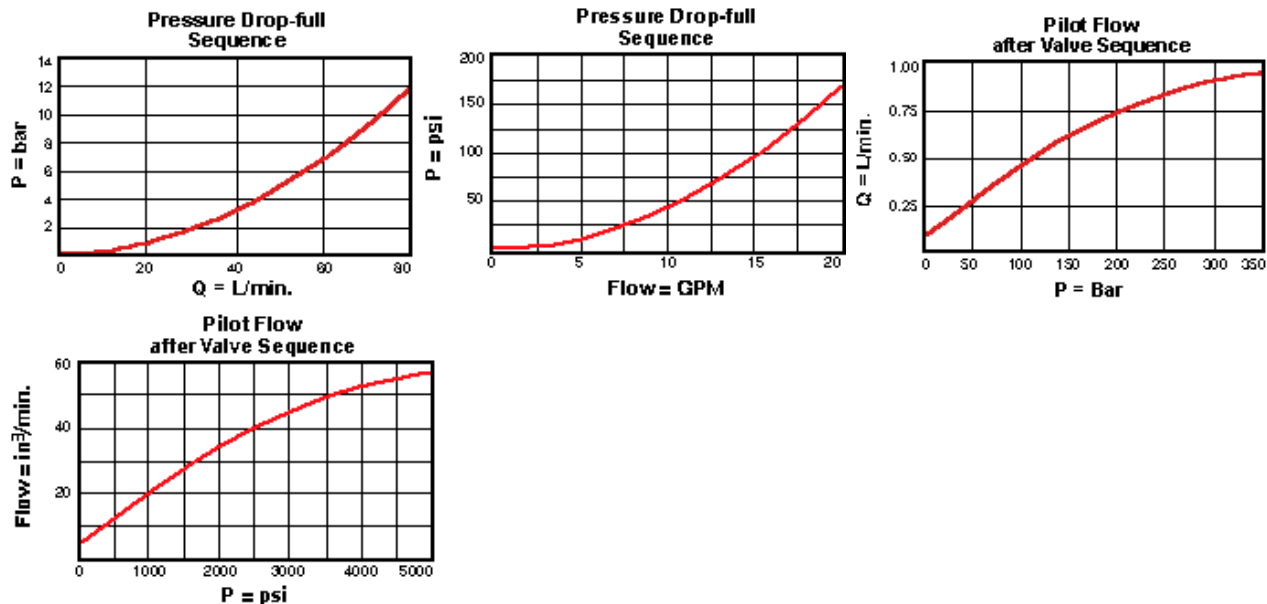
## Model Code Example: RSDCLAN

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>J</b> Capped Screw Adjustment	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
<b>O</b> Handknob with Panel Mount	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
<b>W</b> Hex Wrench Adjustment	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>N</b> 60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

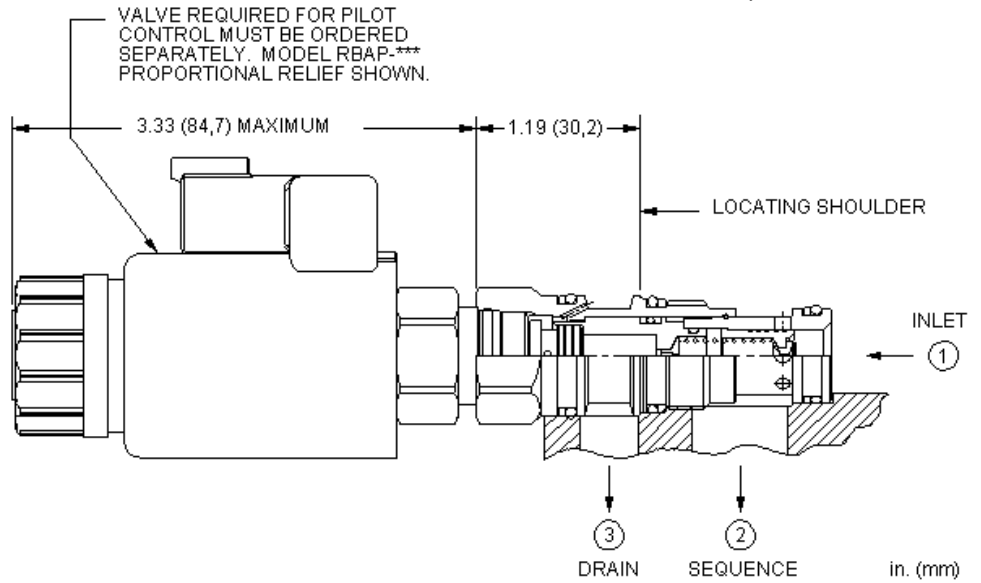
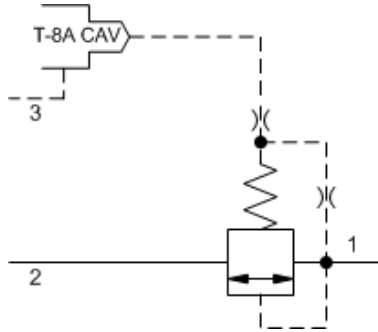
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Not suitable for use in load holding applications due to spool leakage.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RSDC8](#) Pilot-operated, balanced piston sequence main stage with integral T-8A control cavity



This valve is a normally closed modulating element that incorporates an integral pilot control cavity. It is externally drained, and is a balanced piston design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge's setting, the modulating element starts to open to port 2, throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between the inlet (port 1) and the drain (port 3). These valves are insensitive to back pressure at port 2, up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	60 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Pilot Control Cavity	T-8A
Main stage leakage at 110 SUS (24 cSt)	30 cc/min.@70 bar
Response Time - Typical	10 ms
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	EPDM: 990011014
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.10 kg.

**NOTES**

Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

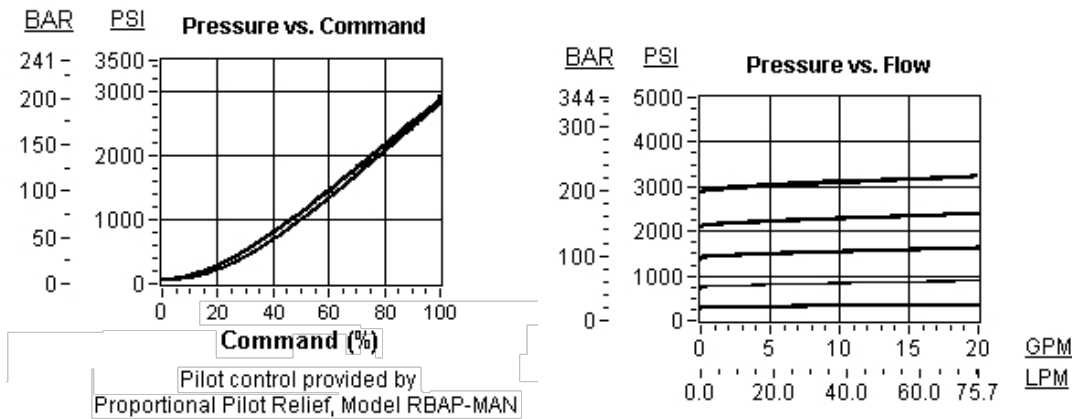
**Model Code Example: RSDC8WN**

<b>MINIMUM CONTROL PRESSURE (W)</b>	<b>SEAL MATERIAL (N)</b>
<b>W</b> 100 psi (7 bar)	<b>N</b> Buna-N
D 25 psi (1,7 bar)	E EPDM
	V Viton

## TECHNICAL FEATURES

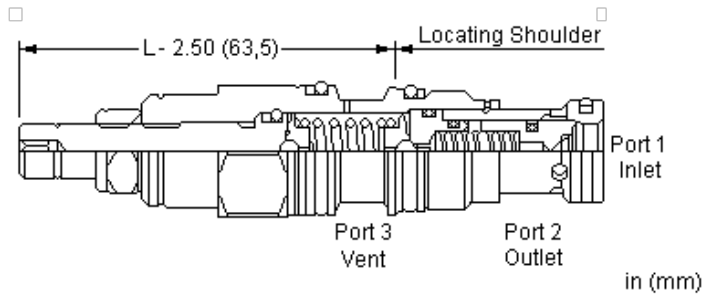
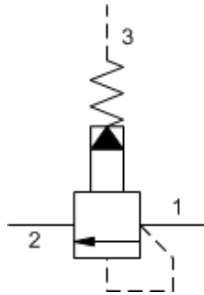
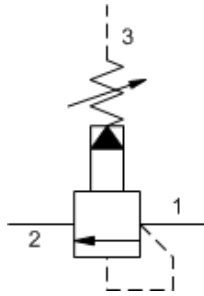
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include solenoid operation, air pilot operation, and hydraulic pilot operation. See Pilot Control Cartridges.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Not suitable for use in load holding applications due to spool leakage.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RSDC](#) Pilot-operated, balanced piston sequence valve



Pilot-operated, balanced poppet sequence valves will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. The pressure setting of a sequence valve controls the pressure at port 1 relative to the pressure at the drain (port 3). These valves are insensitive to back pressure at port 2 (sequence), up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	60 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.16 kg.

**CONFIGURATION OPTIONS**
**Model Code Example: RSDSLAN**

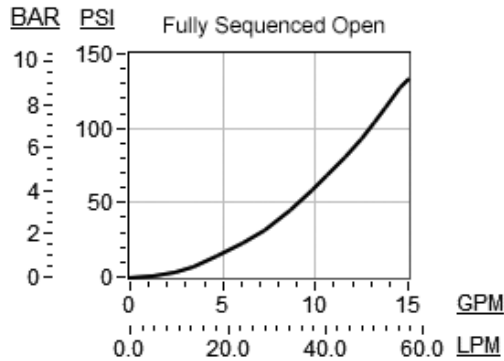
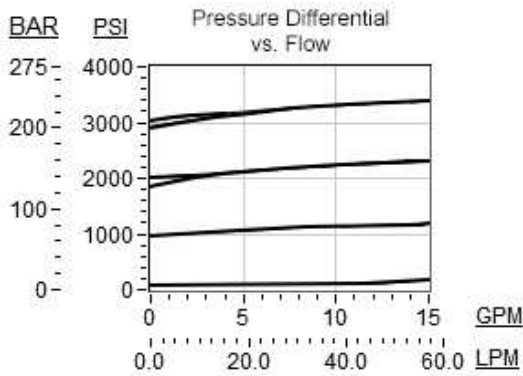
<b>CONTROL</b>	<b>(L) ADJUSTMENT RANGE</b>	<b>(A) SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		/LH Mild Steel, Zinc-Nickel
	<b>N</b> 60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 100 - 4500 psi (7 - 315 bar), 1000 psi (70 bar) Standard Setting		



## TECHNICAL FEATURES

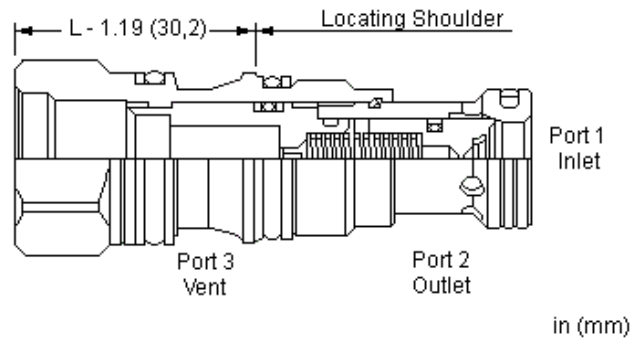
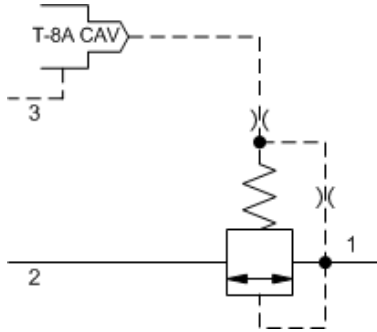
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Suitable for use in load holding applications.
- Because the modulating occurs inside the cartridge these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RSDS8](#) Pilot-operated, balanced poppet sequence main stage with integral T-8A control cavity



This valve is a normally closed poppet element that incorporates an integral pilot control cavity. It is externally drained, and is a balanced poppet design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge's setting, the poppet element starts to open to port 2, throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between the inlet (port 1) and the drain (port 3). These valves are insensitive to back pressure at port 2, up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	60 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,11 - 0,16 L/min.
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Pilot Control Valve Hex Size	22,2 mm
Main stage leakage at reseal	0,7 cc/min.
Response Time - Typical	10 ms
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.10 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

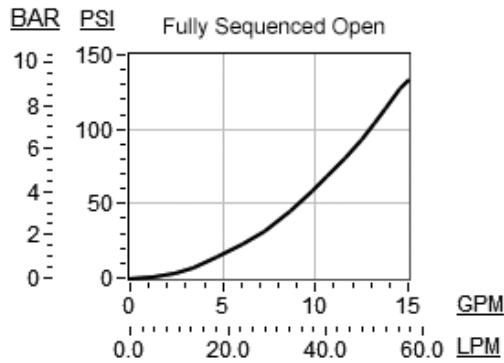
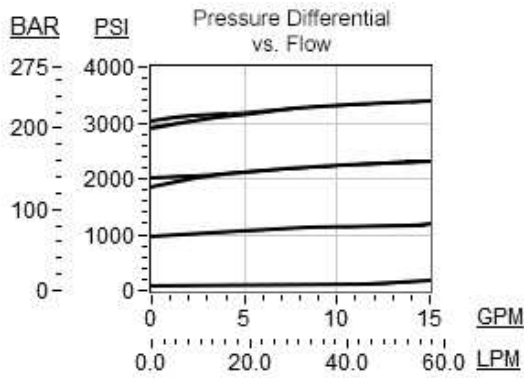
**CONFIGURATION OPTIONS**
**Model Code Example: RSDS8WN**

BIAS PRESSURE	(W)	SEAL MATERIAL	(N)
W 100 psi (7 bar)		N Buna-N	
D 50 psi (3,5 bar)		V Viton	

## TECHNICAL FEATURES

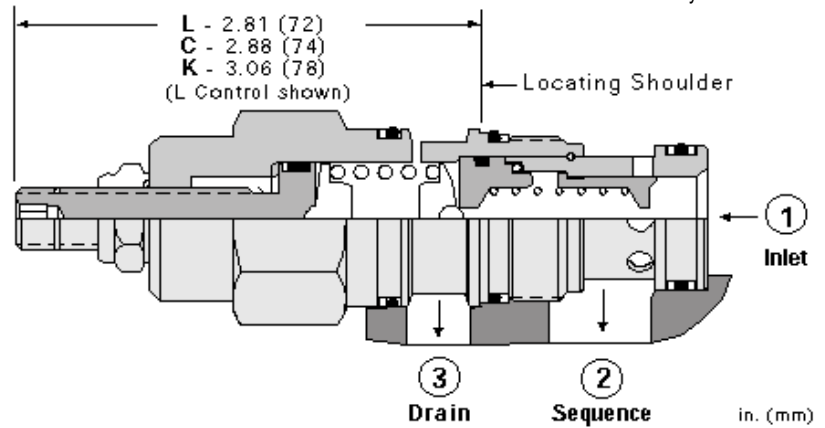
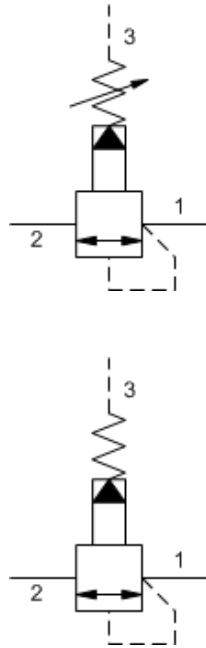
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- Because the modulating occurs inside the cartridge these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RSDS](#) Pilot-operated, balanced poppet sequence valve



Pilot-operated, balanced piston sequence valves will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. The pressure setting of a sequence valve controls the pressure at port 1 relative to the pressure at the drain (port 3). These valves are insensitive to back pressure at port 2 (sequence), up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	120 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Maximum Valve Leakage at 110 SUS (24 cSt)	50 cc/min.@70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	EPDM: 990202014
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.29 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

## CONFIGURATION OPTIONS

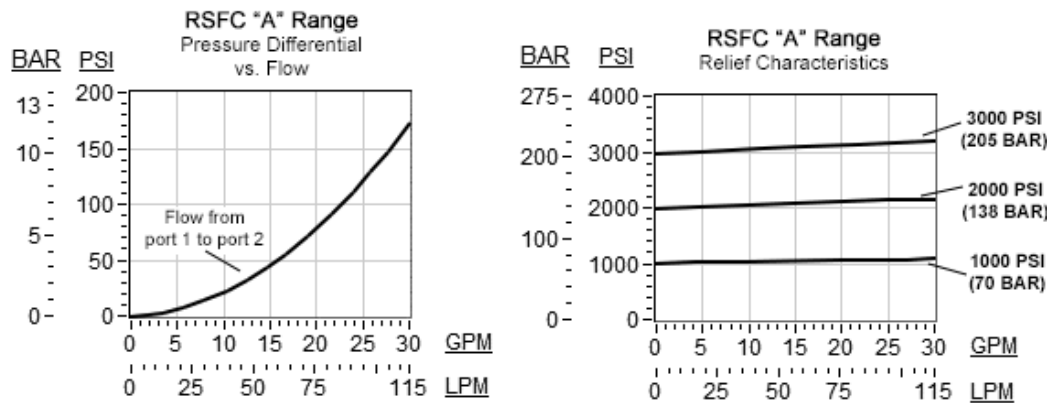
## Model Code Example: RSFCLAN

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>J</b> Capped Screw Adjustment	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
<b>O</b> Handknob with Panel Mount	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
<b>W</b> Hex Wrench Adjustment	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>N</b> 60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

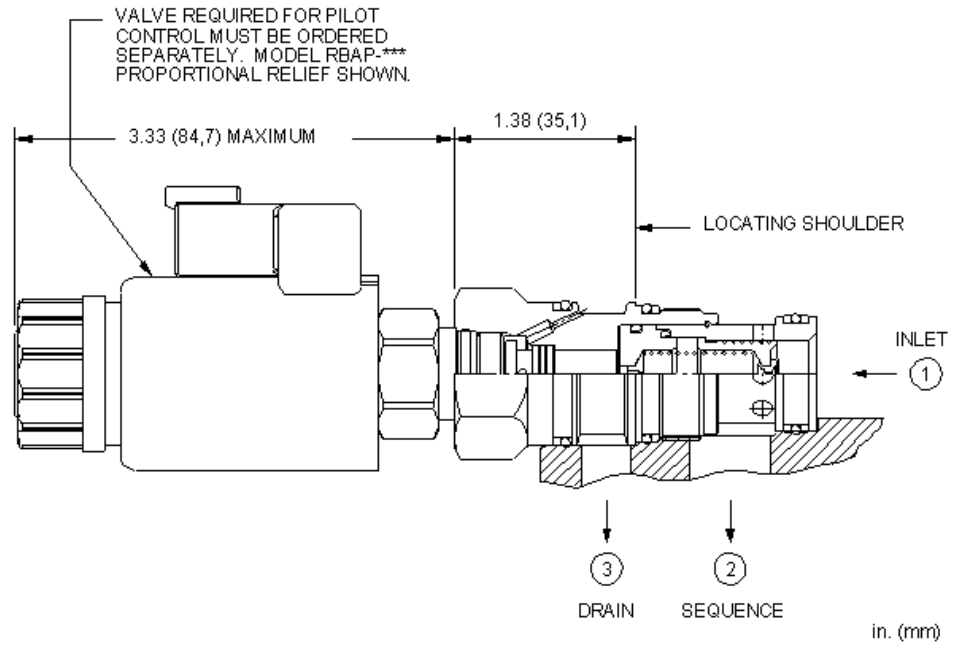
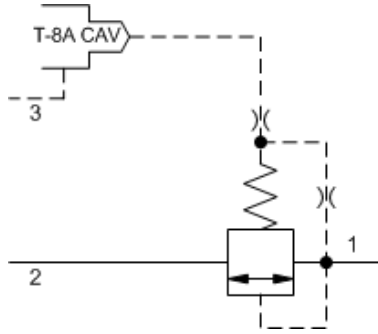
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Not suitable for use in load holding applications due to spool leakage.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RSFC8](#) Pilot-operated, balanced piston sequence main stage with integral T-8A control cavity



This valve is a normally closed modulating element that incorporates an integral pilot control cavity. It is externally drained, and is a balanced piston design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge's setting, the modulating element starts to open to port 2, throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between the inlet (port 1) and the drain (port 3). These valves are insensitive to back pressure at port 2, up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	120 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Pilot Control Cavity	T-8A
Main stage leakage at 110 SUS (24 cSt)	50 cc/min.@70 bar
Response Time - Typical	10 ms
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.20 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

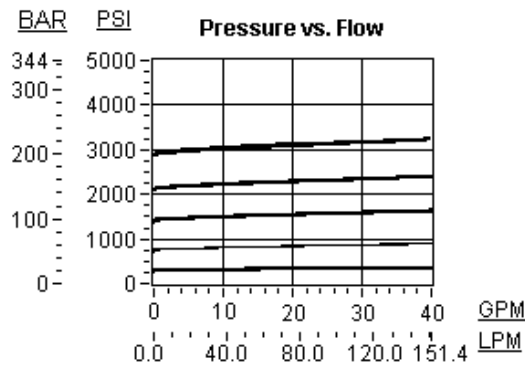
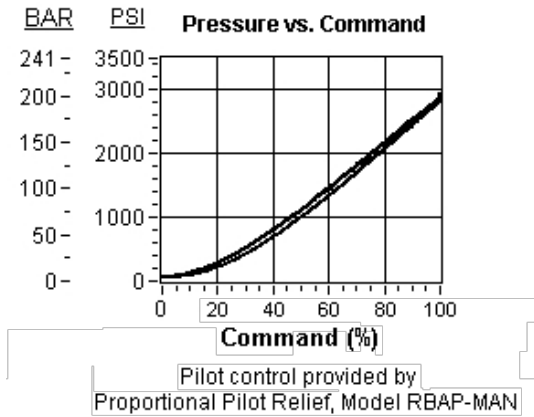
**Model Code Example: RSFC8WN**

<b>MINIMUM CONTROL PRESSURE (W)</b>	<b>SEAL MATERIAL (N)</b>
W 100 psi (7 bar)	N Buna-N
D 25 psi (1,7 bar)	V Viton

## TECHNICAL FEATURES

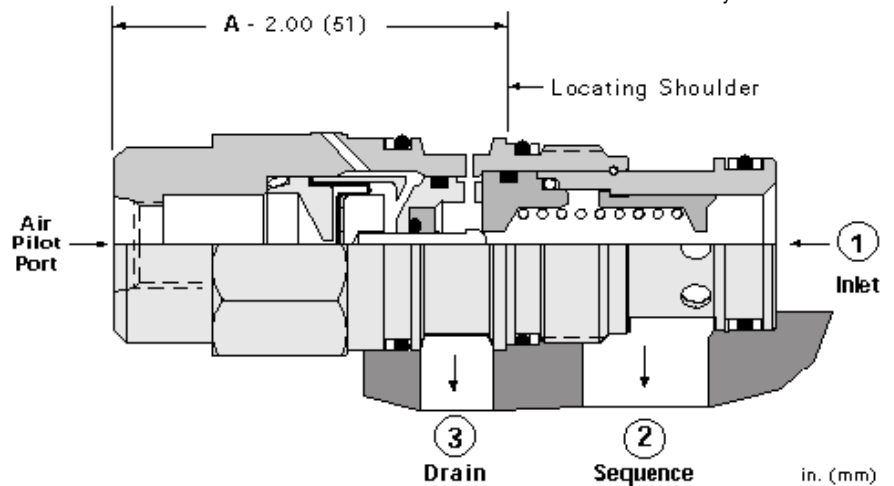
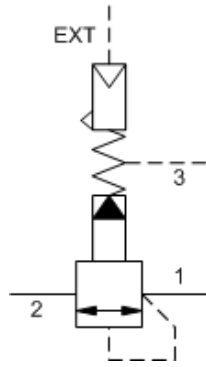
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include solenoid operation, air pilot operation, and hydraulic pilot operation. See Pilot Control Cartridges.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Not suitable for use in load holding applications due to spool leakage.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RSFC](#) Pilot-operated, balanced piston sequence valve



Air-controlled, pilot-operated, balanced piston sequence valves use compressed air over a diaphragm instead of an adjustable spring to control the pressure setting of the valve. The air signal is supplied through a port in the hex-end of the cartridge. They will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. The pressure setting of a sequence valve controls the pressure at port 1 relative to the pressure at the drain (port 3). These valves are insensitive to back pressure at port 2 (sequence), up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	120 L/min.
Pilot Ratio	20:1
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	140 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	50 cc/min.
Maximum Air Pressure	10,5 bar
Response Time - Typical	10 ms
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0,27 kg.

**CONFIGURATION OPTIONS**

Model Code Example: **RSFEABN**

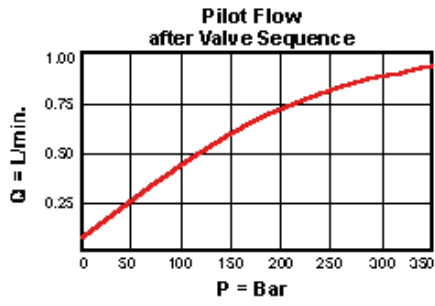
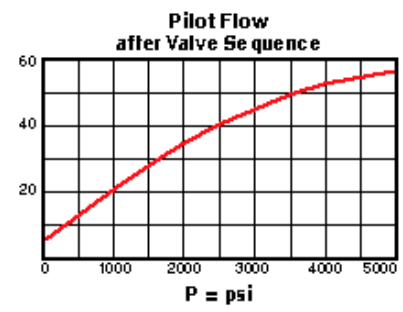
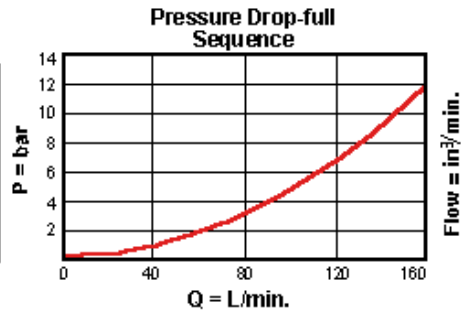
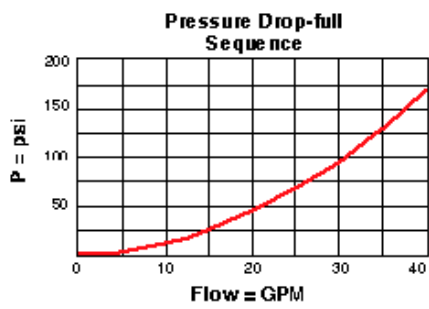
<b>CONTROL</b>	<b>(A) ADJUSTMENT RANGE</b>	<b>(B) SEAL MATERIAL</b>	<b>(N)</b>
A External 1/4 NPTF Port	B 50 - 1500 psi (3,5 - 105 bar)	N Buna-N V Viton	

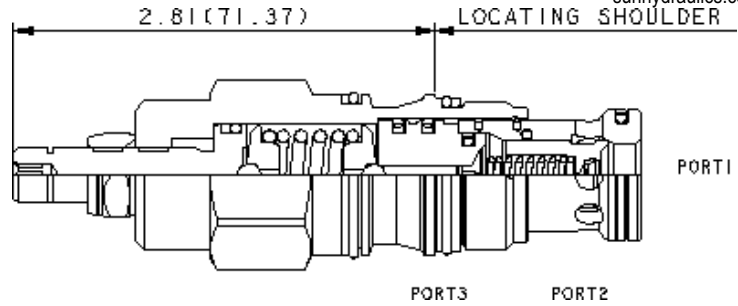
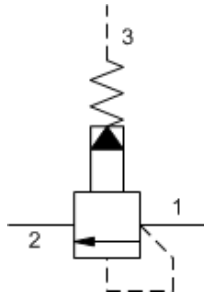
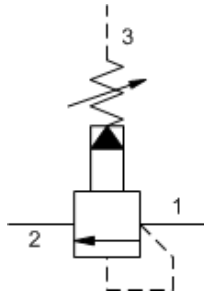
**TECHNICAL FEATURES**

- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- Maximum air pilot pressure should not exceed 150 psi (10,5 bar).
- Pressure at port 3 (drain) determines the minimum valve setting and should not exceed 1000 psi (70 bar).
- Capable of providing explosion proof remote control of the pressure setting, the hydraulic setting is directly proportional to the air setting at a ratio of 20:1 (hydraulic:air).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.



# PERFORMANCE CURVES





Pilot-operated, balanced poppet sequence valves will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. The pressure setting of a sequence valve controls the pressure at port 1 relative to the pressure at the drain (port 3). These valves are insensitive to back pressure at port 2 (sequence), up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	120 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990402007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990402006
Model Weight	0.29 kg.

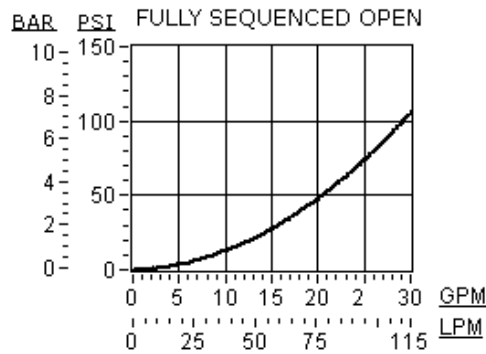
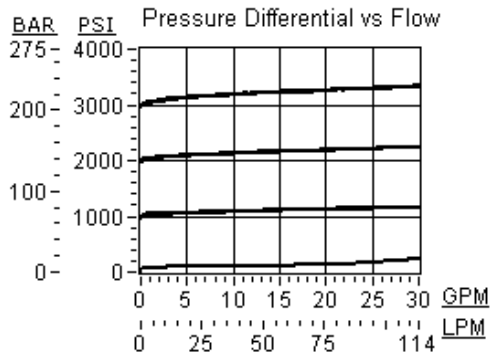
**CONFIGURATION OPTIONS**
**Model Code Example: RSFSLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	JAP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
	<b>N</b> 60 - 800 psi (4 - 55 bar), 200 psi (14 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

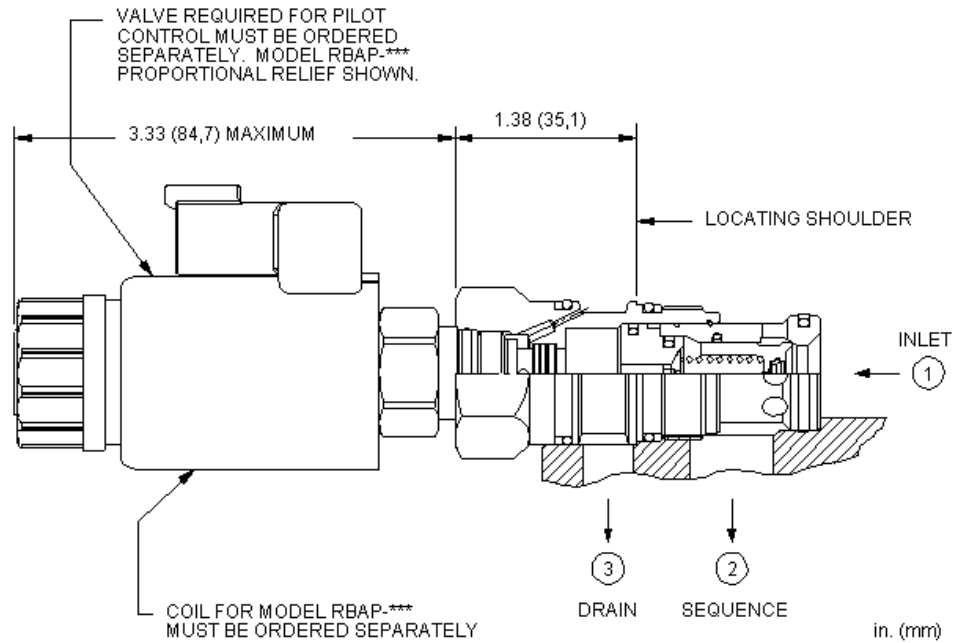
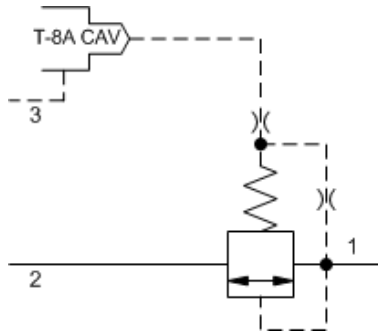
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Suitable for use in load holding applications.
- Because the modulating occurs inside the cartridge these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RSFS8](#) Pilot-operated, balanced poppet sequence main stage with integral T-8A control cavity



This valve is a normally closed poppet element that incorporates an integral pilot control cavity. It is externally drained, and is a balanced poppet design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge's setting, the poppet element starts to open to port 2, throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between the inlet (port 1) and the drain (port 3). These valves are insensitive to back pressure at port 2, up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	120 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,25 L/min.
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Pilot Control Valve Hex Size	22,2 mm
Main stage leakage at reseal	0,7 cc/min.
Response Time - Typical	10 ms
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990402007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990402006
Model Weight	0.20 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

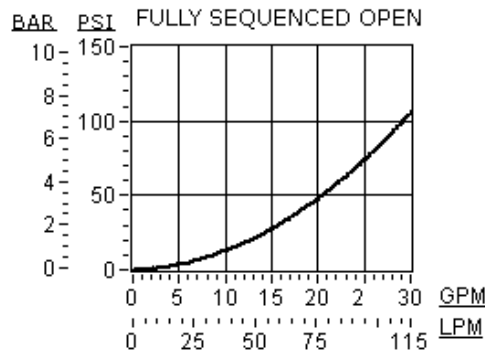
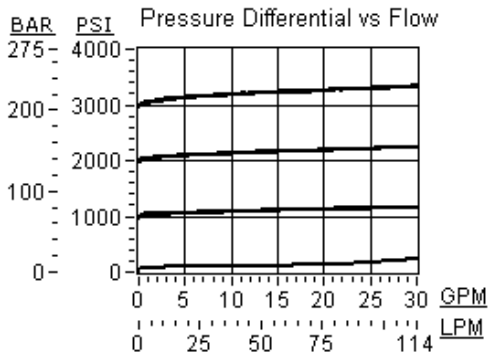
**Model Code Example: RSFS8WN**

<b>MINIMUM CONTROL PRESSURE (W)</b>	<b>SEAL MATERIAL (N)</b>
W 100 psi (7 bar)	N Buna-N
B 50 psi (3,5 bar)	V Viton

## TECHNICAL FEATURES

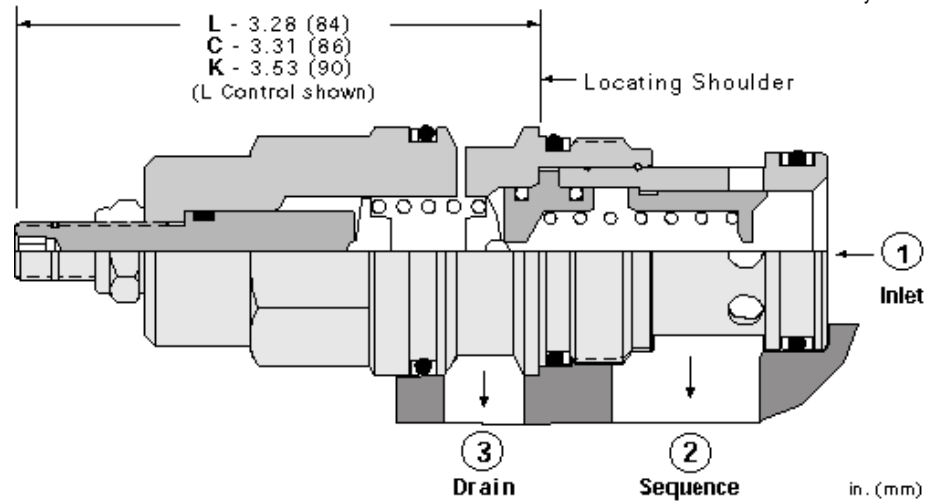
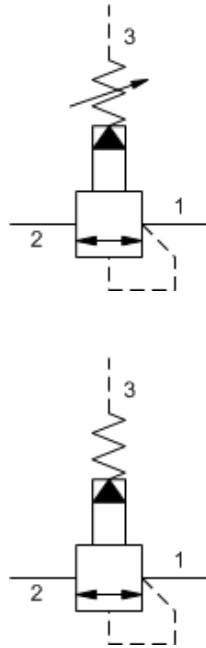
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include solenoid operation, air pilot operation, and hydraulic pilot operation. See Pilot Control Cartridges.
- Because the modulating occurs inside the cartridge these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RSFS](#) Pilot-operated, balanced poppet sequence valve



Pilot-operated, balanced piston sequence valves will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. The pressure setting of a sequence valve controls the pressure at port 1 relative to the pressure at the drain (port 3). These valves are insensitive to back pressure at port 2 (sequence), up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	240 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Maximum Valve Leakage at 110 SUS (24 cSt)	65 cc/min.@70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	0.62 kg.

## CONFIGURATION OPTIONS

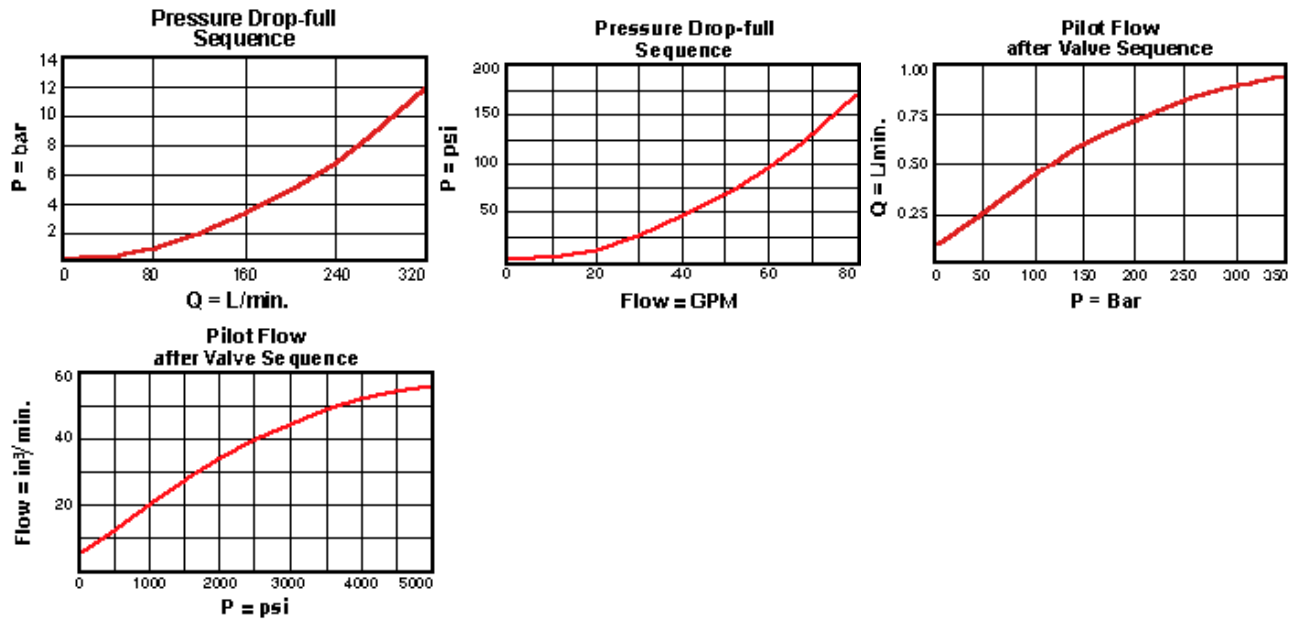
## Model Code Example: RSHCLAN

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	A 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	N Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	W 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting	E EPDM	/AP Stainless Steel, Passivated
K Handknob	B 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	V Viton	/LH Mild Steel, Zinc-Nickel
Y Tri-Grip Handknob	C 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
	D 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	E 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	N 60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting		

## TECHNICAL FEATURES

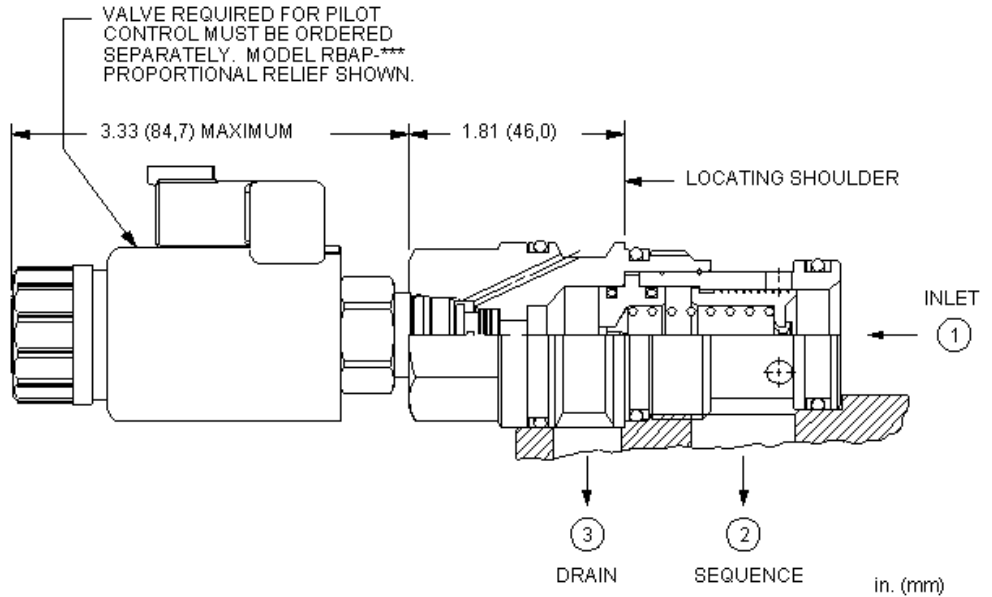
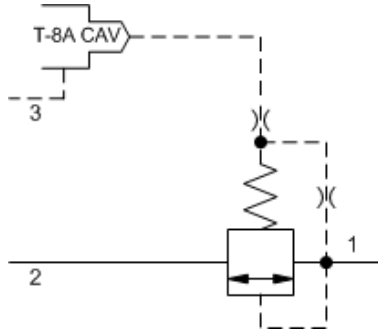
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Not suitable for use in load holding applications due to spool leakage.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RSHC8](#) Pilot-operated, balanced piston sequence main stage with integral T-8A control cavity



This valve is a normally closed modulating element that incorporates an integral pilot control cavity. It is externally drained, and is a balanced piston design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge's setting, the modulating element starts to open to port 2, throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between the inlet (port 1) and the drain (port 3). These valves are insensitive to back pressure at port 2, up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	240 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Main stage leakage at 110 SUS (24 cSt)	65 cc/min.@70 bar
Response Time - Typical	10 ms
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	0.49 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

**Model Code Example: RSHC8WN**

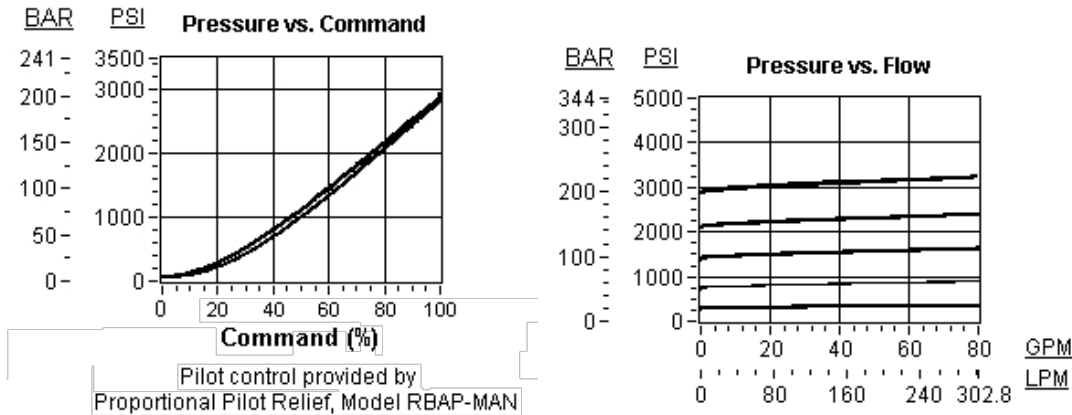
<b>MINIMUM CONTROL PRESSURE (W)</b>	<b>SEAL MATERIAL (N)</b>
W 100 psi (7 bar)	N Buna-N
D 25 psi (1,7 bar)	V Viton



## TECHNICAL FEATURES

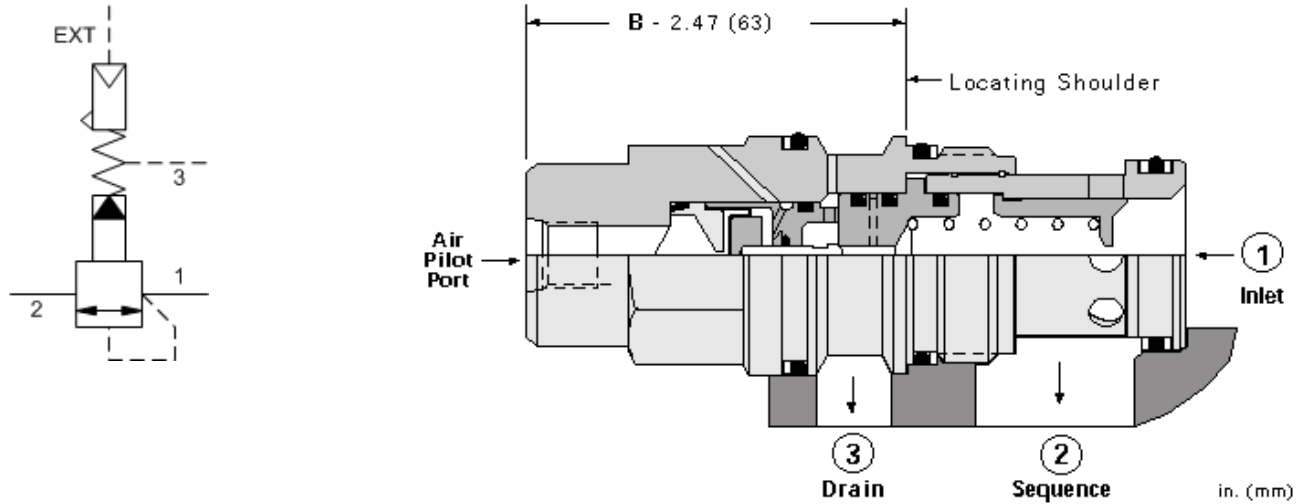
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include solenoid operation, air pilot operation, and hydraulic pilot operation. See Pilot Control Cartridges.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Not suitable for use in load holding applications due to spool leakage.
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RSHC](#) Pilot-operated, balanced piston sequence valve



Air-controlled, pilot-operated, balanced piston sequence valves use compressed air over a diaphragm instead of an adjustable spring to control the pressure setting of the valve. The air signal is supplied through a port in the hex-end of the cartridge. They will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. The pressure setting of a sequence valve controls the pressure at port 1 relative to the pressure at the drain (port 3). These valves are insensitive to back pressure at port 2 (sequence), up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	240 L/min.
Pilot Ratio	20:1
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	140 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	65 cc/min.
Maximum Air Pressure	10,5 bar
Response Time - Typical	10 ms
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	0.60 kg.

**CONFIGURATION OPTIONS**

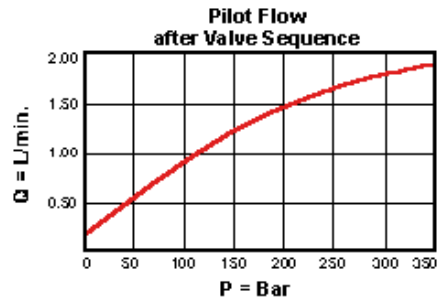
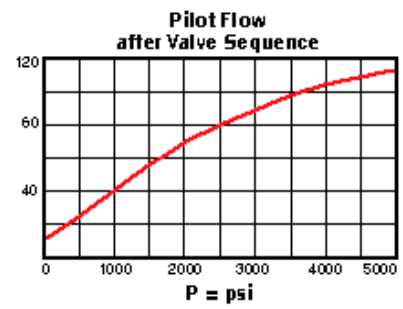
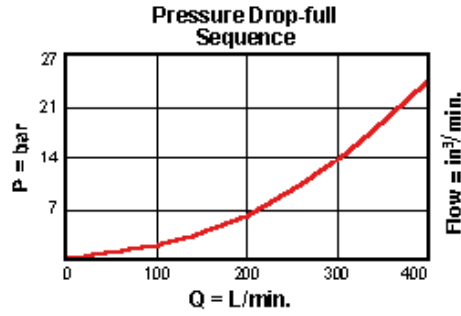
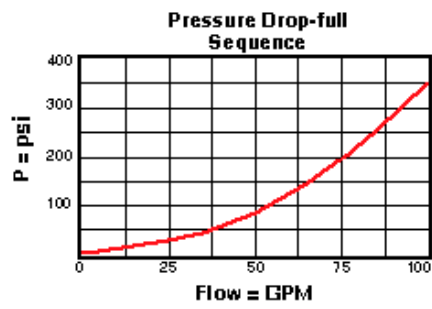
**Model Code Example: RSHEBBN**

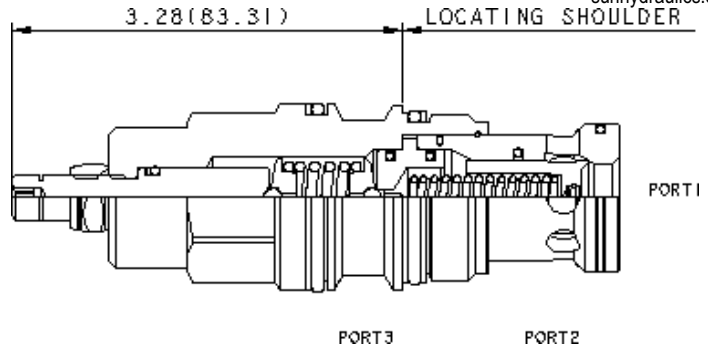
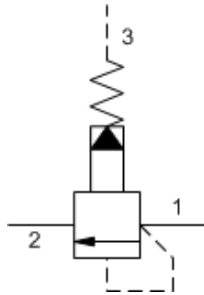
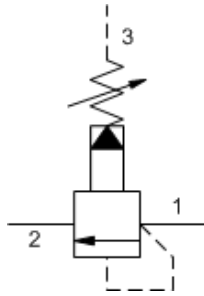
<b>CONTROL</b>	<b>(B) ADJUSTMENT RANGE</b>	<b>(B) SEAL MATERIAL</b>	<b>(N)</b>
<b>B</b> External 4-SAE Port	<b>B</b> 50 - 1500 psi (3,5 - 105 bar)	<b>N</b> Buna-N	
		<b>V</b> Viton	

**TECHNICAL FEATURES**

- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- Maximum air pilot pressure should not exceed 150 psi (10,5 bar).
- Pressure at port 3 (drain) determines the minimum valve setting and should not exceed 1000 psi (70 bar).
- Capable of providing explosion proof remote control of the pressure setting, the hydraulic setting is directly proportional to the air setting at a ratio of 20:1 (hydraulic:air).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

# PERFORMANCE CURVES





Pilot-operated, balanced poppet sequence valves will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. The pressure setting of a sequence valve controls the pressure at port 1 relative to the pressure at the drain (port 3). These valves are insensitive to back pressure at port 2 (sequence), up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	240 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990217007
Seal kit - Cartridge	Polyurethane: 990217002
Seal kit - Cartridge	Viton: 990217006
Model Weight	0.63 kg.

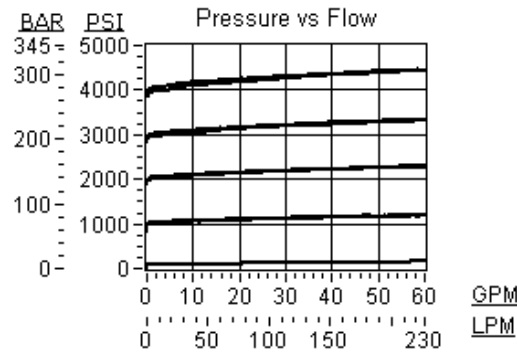
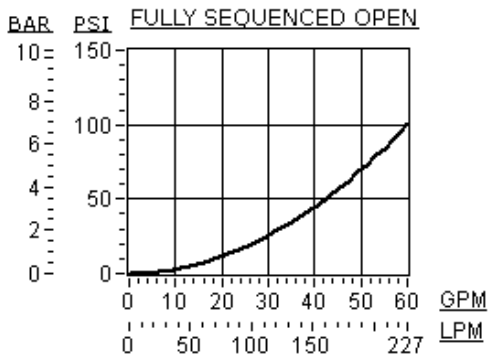
**CONFIGURATION OPTIONS**
**Model Code Example: RSHSLAN**

CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	A 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	N Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	B 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	V Viton	/AP Stainless Steel, Passivated
K Handknob	C 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
	N 60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting		
	Q 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
	W 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

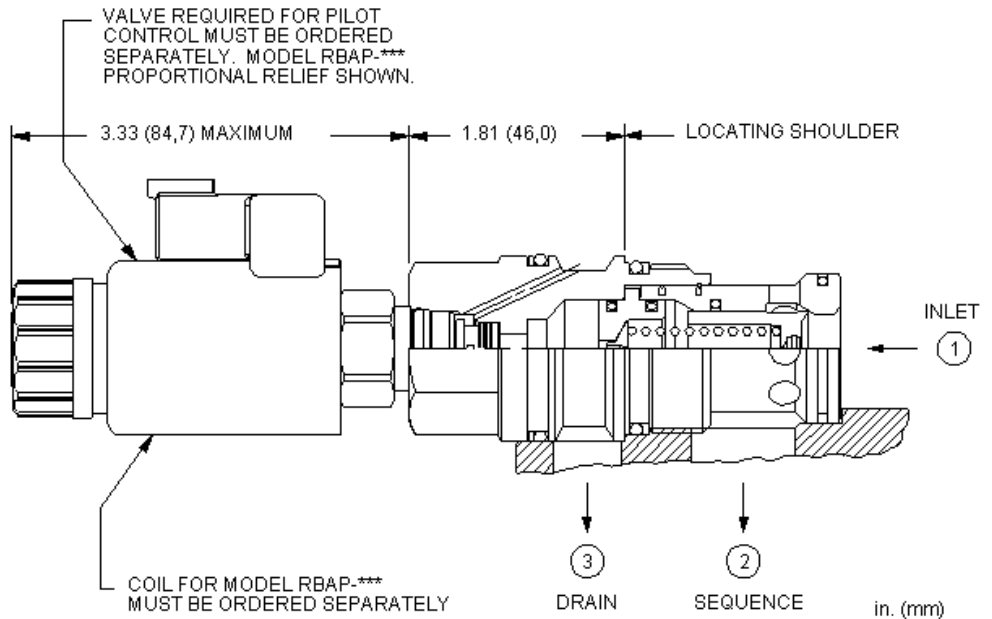
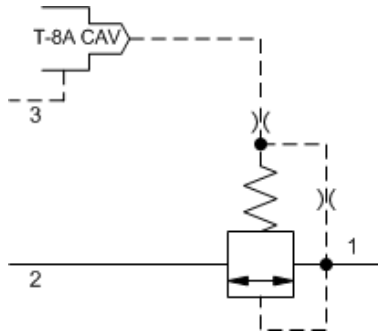
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Suitable for use in load holding applications.
- Because the modulating occurs inside the cartridge these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RSHS8](#) Pilot-operated, balanced poppet sequence main stage with integral T-8A control cavity



This valve is a normally closed poppet element that incorporates an integral pilot control cavity. It is externally drained, and is a balanced poppet design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge's setting, the poppet element starts to open to port 2, throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between the inlet (port 1) and the drain (port 3). These valves are insensitive to back pressure at port 2, up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	240 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Pilot Control Valve Hex Size	22,2 mm
Main stage leakage at reseal	0,7 cc/min.
Response Time - Typical	2 ms
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990217007
Seal kit - Cartridge	Polyurethane: 990217002
Seal kit - Cartridge	Viton: 990217006
Model Weight	0.50 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

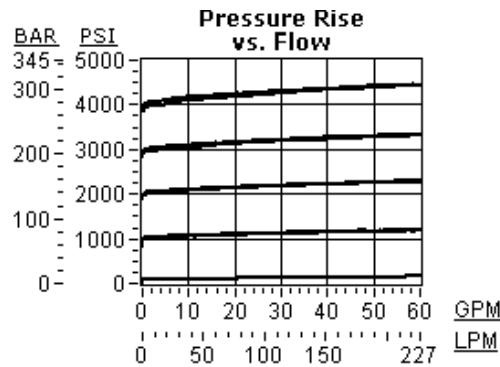
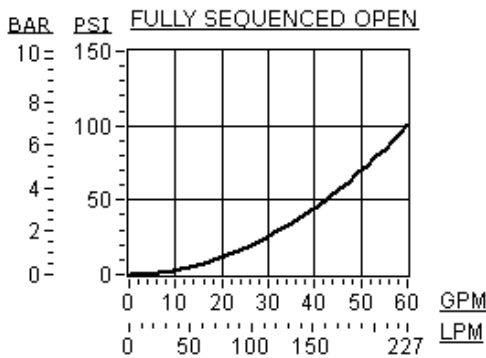
**Model Code Example: RSHS8WN**

MINIMUM CONTROL PRESSURE (W)	SEAL MATERIAL (N)
W 100 psi (7 bar)	N Buna-N
B 50 psi (3,5 bar)	V Viton

## TECHNICAL FEATURES

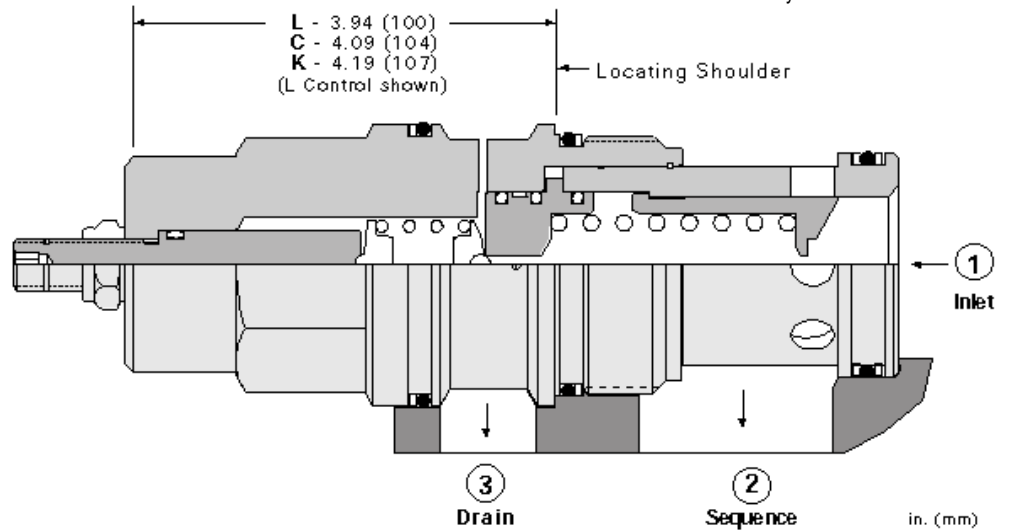
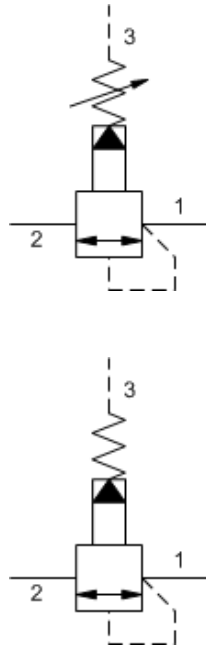
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include solenoid operation, air pilot operation, and hydraulic pilot operation. See Pilot Control Cartridges.
- Because the modulating occurs inside the cartridge these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RSHS](#) Pilot-operated, balanced poppet sequence valve



Pilot-operated, balanced piston sequence valves will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. The pressure setting of a sequence valve controls the pressure at port 1 relative to the pressure at the drain (port 3). These valves are insensitive to back pressure at port 2 (sequence), up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	480 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Maximum Valve Leakage at 110 SUS (24 cSt)	80 cc/min.@70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	1.44 kg.

**CONFIGURATION OPTIONS**
**Model Code Example: RSJCLAN**

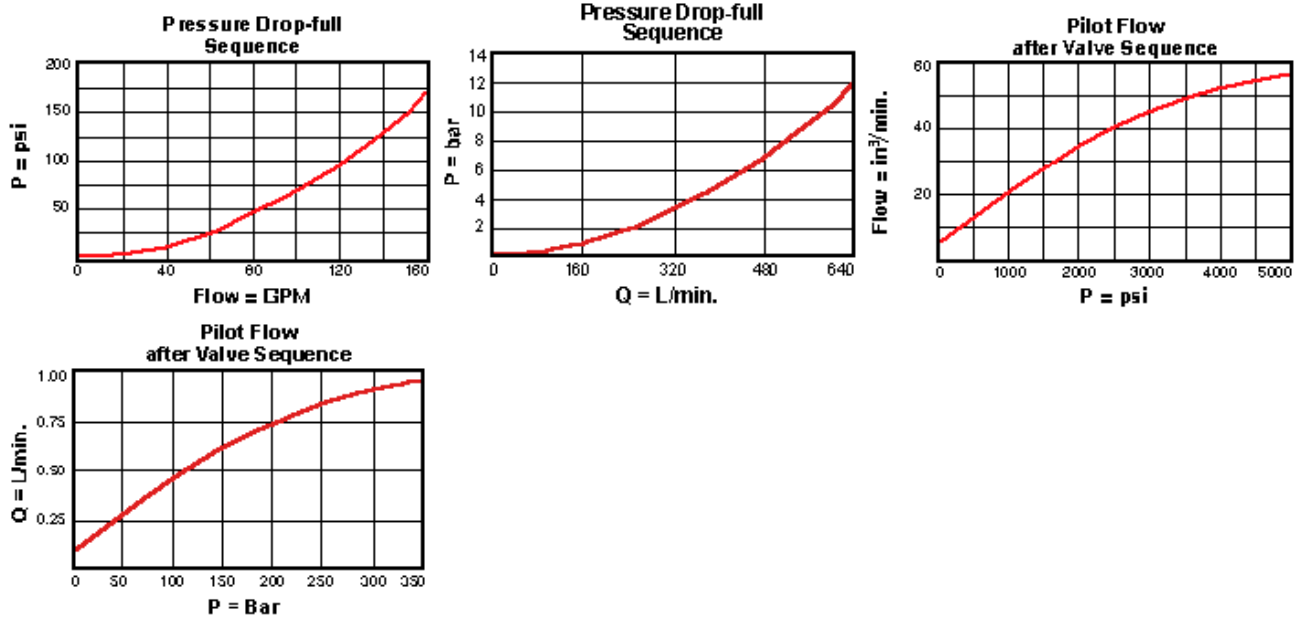
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
<b>K</b> Handknob	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting		
<b>Y</b> Tri-Grip Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		



## TECHNICAL FEATURES

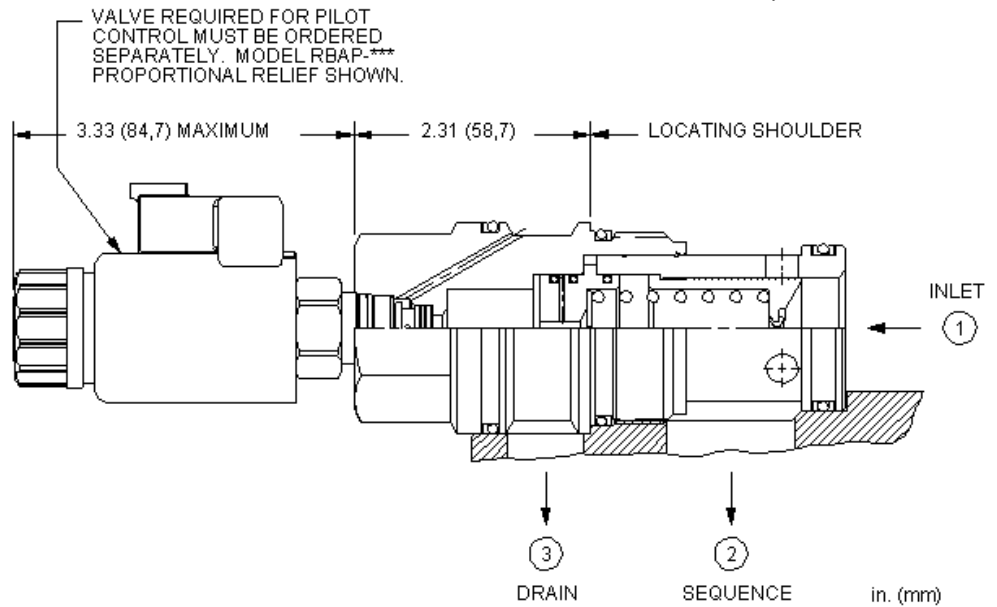
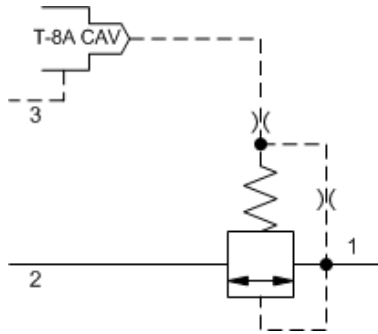
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Not suitable for use in load holding applications due to spool leakage.
- W and Y controls (where applicable) can be specified with or without a special setting. When no special setting is specified, the valve is adjustable throughout its full range using the W or Y control. When a special setting is specified, this setting represents the maximum setting of the valve.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RSJC8](#) Pilot-operated, balanced piston sequence main stage with integral T-8A control cavity



This valve is a normally closed modulating element that incorporates an integral pilot control cavity. It is externally drained, and is a balanced piston design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge's setting, the modulating element starts to open to port 2, throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between the inlet (port 1) and the drain (port 3). These valves are insensitive to back pressure at port 2, up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	480 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Main stage leakage at 110 SUS (24 cSt)	80 cc/min.@70 bar
Response Time - Typical	10 ms
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	1.19 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

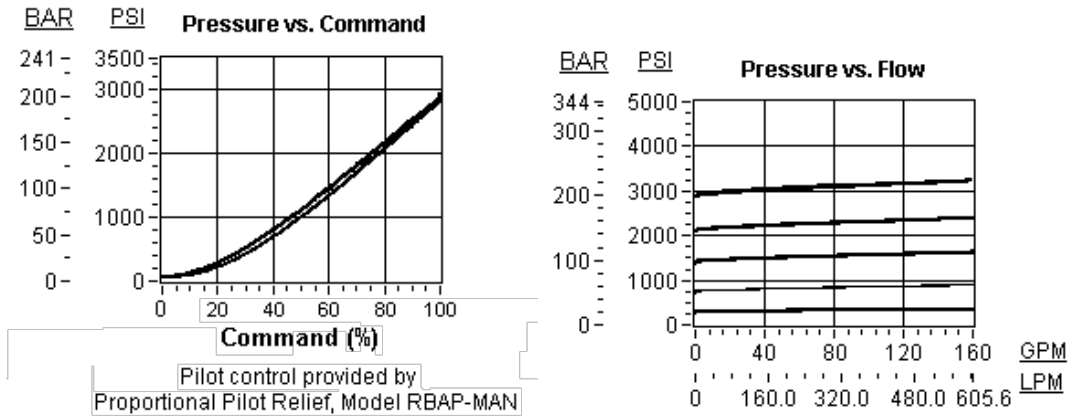
**Model Code Example: RSJC8WN**

MINIMUM CONTROL PRESSURE (W)	SEAL MATERIAL (N)
W 100 psi (7 bar)	N Buna-N
D 25 psi (1,7 bar)	V Viton

## TECHNICAL FEATURES

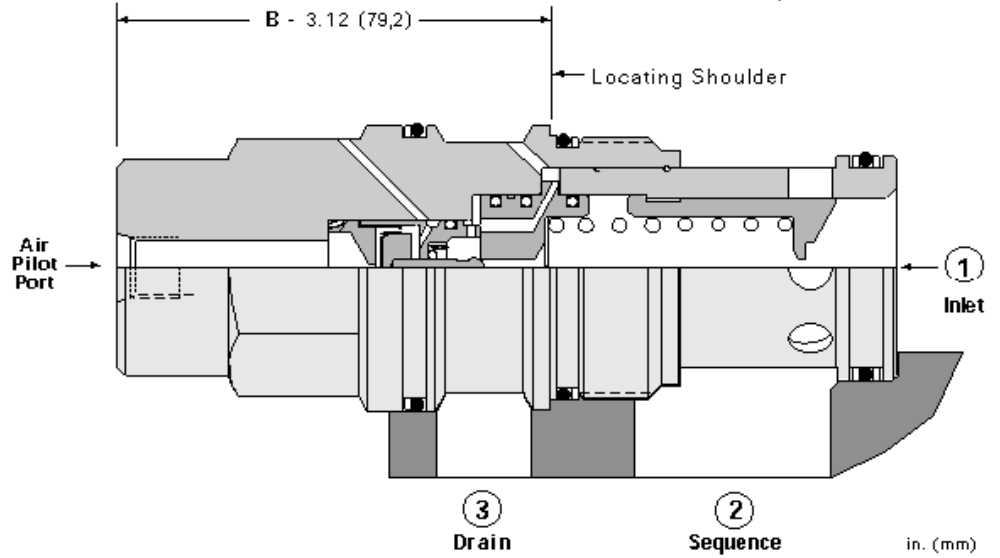
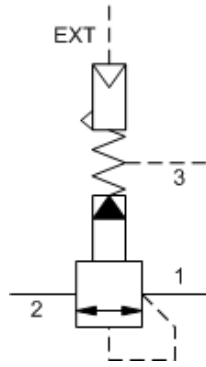
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include solenoid operation, air pilot operation, and hydraulic pilot operation. See Pilot Control Cartridges.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits. If used in cross port relief circuits, consider spool leakage.
- Not suitable for use in load holding applications due to spool leakage.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RSJC](#) Pilot-operated, balanced piston sequence valve



Air-controlled, pilot-operated, balanced piston sequence valves use compressed air over a diaphragm instead of an adjustable spring to control the pressure setting of the valve. The air signal is supplied through a port in the hex-end of the cartridge. They will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. The pressure setting of a sequence valve controls the pressure at port 1 relative to the pressure at the drain (port 3). These valves are insensitive to back pressure at port 2 (sequence), up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	480 L/min.
Pilot Ratio	20:1
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	140 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	80 cc/min.
Maximum Air Pressure	10,5 bar
Response Time - Typical	10 ms
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	1.41 kg.

**CONFIGURATION OPTIONS**

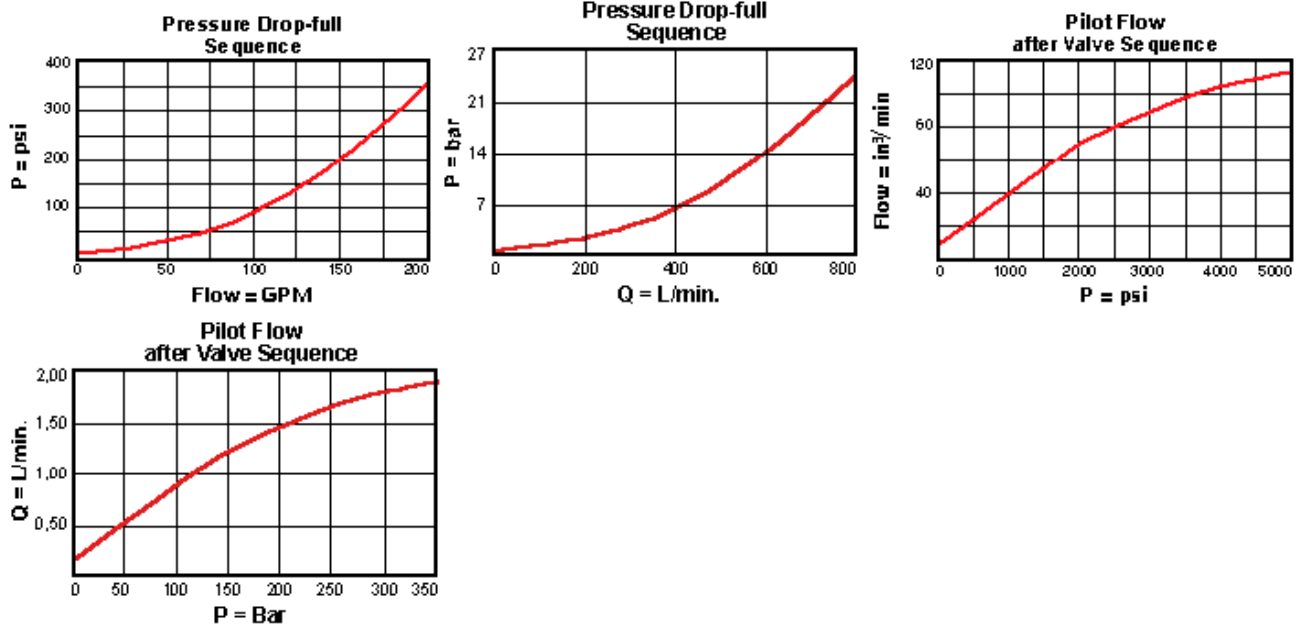
**Model Code Example: RSJE<sup>B</sup>BN**

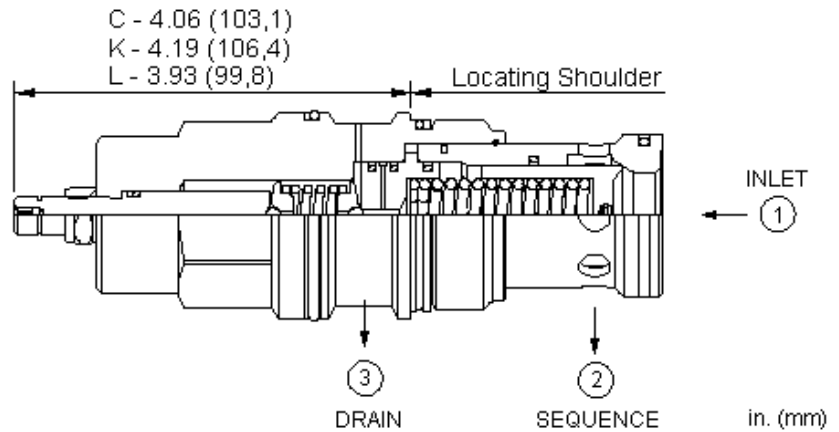
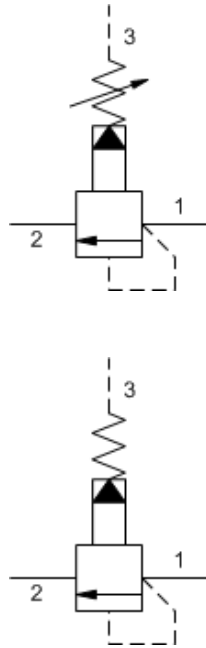
<b>CONTROL</b>	<b>(B) ADJUSTMENT RANGE</b>	<b>(B) SEAL MATERIAL</b>	<b>(N)</b>
<b>B</b> External 4-SAE Port	<b>B</b> 50 - 1500 psi (3,5 - 105 bar)	<b>N</b> Buna-N	<b>V</b> Viton

## TECHNICAL FEATURES

- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- Maximum air pilot pressure should not exceed 150 psi (10,5 bar).
- Pressure at port 3 (drain) determines the minimum valve setting and should not exceed 1000 psi (70 bar).
- Capable of providing explosion proof remote control of the pressure setting, the hydraulic setting is directly proportional to the air setting at a ratio of 20:1 (hydraulic:air).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, balanced poppet sequence valves will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. The pressure setting of a sequence valve controls the pressure at port 1 relative to the pressure at the drain (port 3). These valves are insensitive to back pressure at port 2 (sequence), up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	480 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Maximum Valve Leakage at Reset	0,7 cc/min.
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990219007
Seal kit - Cartridge	Viton: 990219006
Model Weight	1.43 kg.

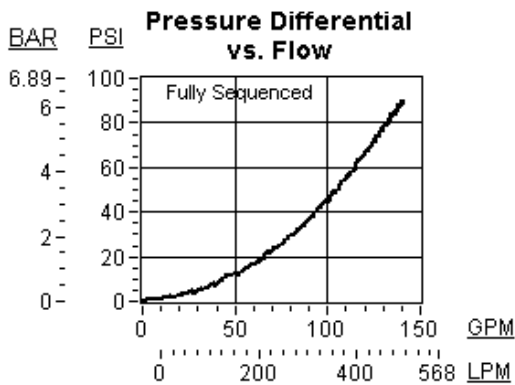
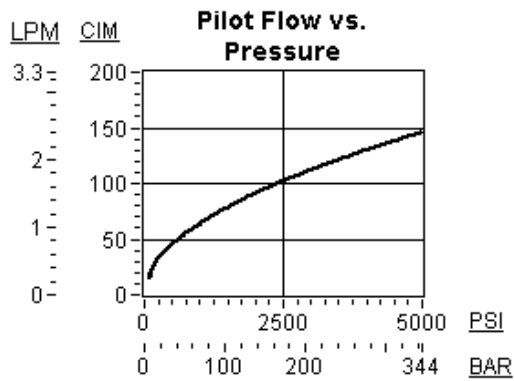
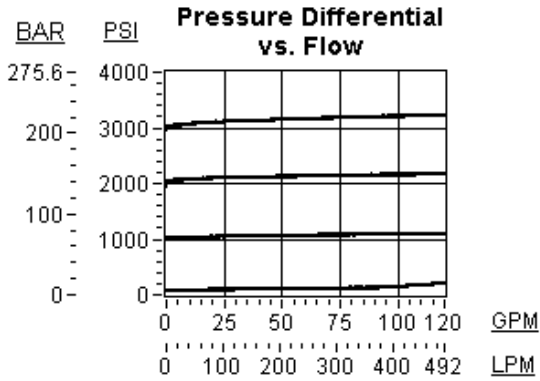
**CONFIGURATION OPTIONS**
**Model Code Example: RSJSLAN**

<b>CONTROL</b>	<b>(L) ADJUSTMENT RANGE</b>	<b>(A) SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		/LH Mild Steel, Zinc-Nickel
	<b>N</b> 60 - 800 psi (4 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>Q</b> 60 - 400 psi (4 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

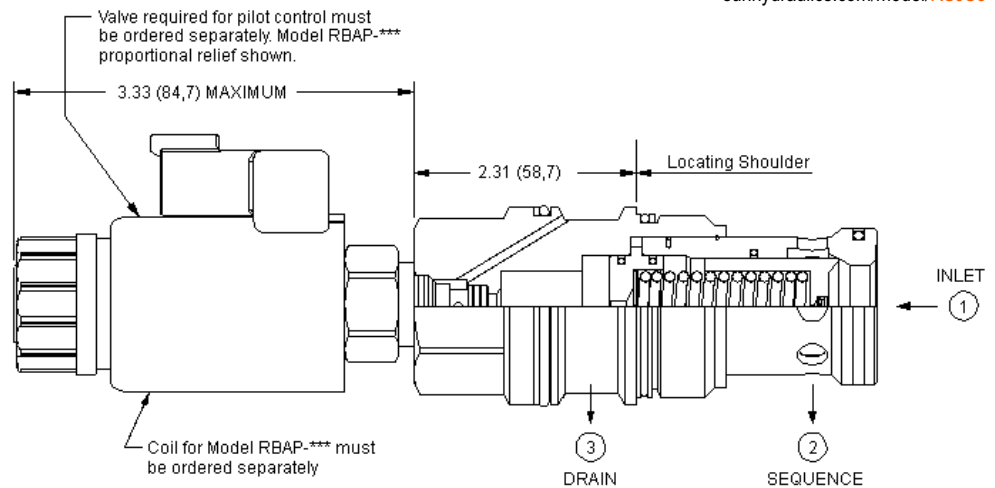
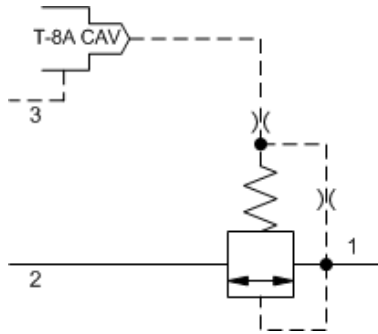
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Because the modulating occurs inside the cartridge these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RSJS8](#) Pilot-operated, balanced poppet sequence main stage with integral T-8A control cavity



This valve is a normally closed poppet element that incorporates an integral pilot control cavity. It is externally drained, and is a balanced poppet design. The pilot control cavity will accept any T-8A pressure control cartridge. When the pressure at the inlet (port 1) reaches the pilot control cartridge's setting, the poppet element starts to open to port 2, throttling flow to regulate the pressure. The pilot cartridge's setting determines the difference in pressure between the inlet (port 1) and the drain (port 3). These valves are insensitive to back pressure at port 2, up to the valve setting. They may be used to regulate pressure in place of 2-port relief valves if there is pressure in the return line.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	480 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,25 - 0,33 L/min.
Pilot Control Cavity	T-8A
Pilot Control Valve Installation Torque	27 - 33 Nm
Pilot Control Valve Hex Size	22,2 mm
Main stage leakage at reseal	0,7 cc/min.
Response Time - Typical	2 ms
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Seal kit - Cartridge	Buna: 990219007
Seal kit - Cartridge	Viton: 990219006
Model Weight	1.16 kg.

**NOTES** Compound cartridge (pilot and main stage) assembly information is provided for reference only. Cartridges must be ordered separately and assembled at point of use.

**CONFIGURATION OPTIONS**

**Model Code Example: RSJS8WN**

**MINIMUM CONTROL PRESSURE (W) SEAL MATERIAL (N)**

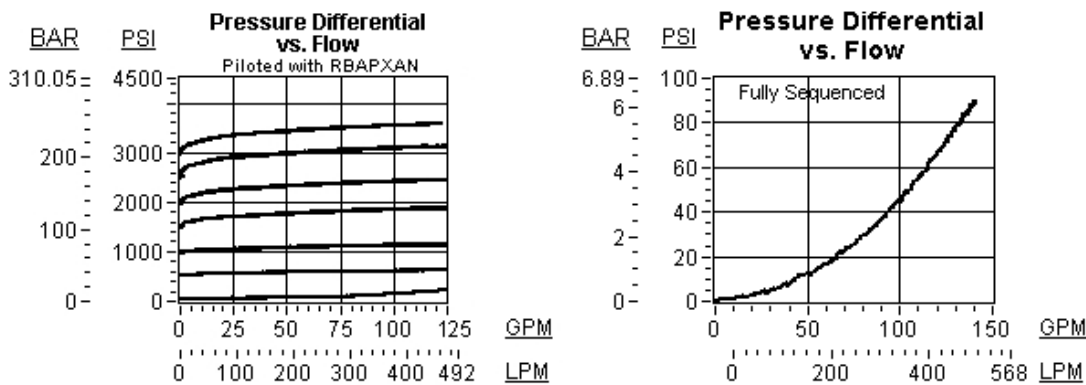
- W** 100 psi (7 bar)      **N** Buna-N
- B** 50 psi (3,5 bar)      **V** Viton



## TECHNICAL FEATURES

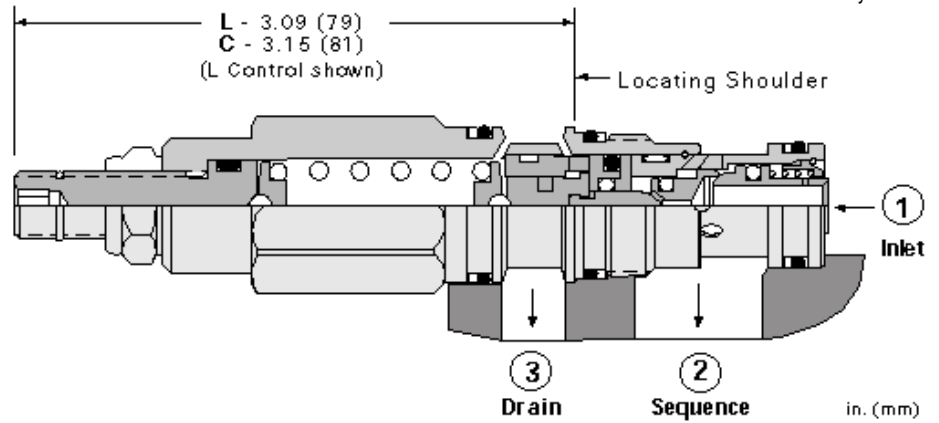
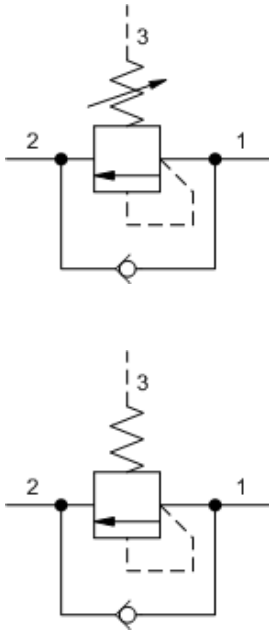
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the relief cartridge via the T-8A cavity. These pilot control cartridges are sold separately and include solenoid operation, air pilot operation, and hydraulic pilot operation. See Pilot Control Cartridges.
- Because the modulating occurs inside the cartridge these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES



## RELATED MODELS

- [RSJS](#) Pilot-operated, balanced poppet sequence valve



Direct-acting sequence valves with reverse-flow check will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. Additionally, these valves incorporate an integral check valve to provide reverse flow from port 2 (sequence) to port 1 (inlet). The pressure setting of a sequence valve controls the pressure at port 1 relative to the pressure at the drain (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	60 L/min.
Factory Pressure Settings Established at	30 cc/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Check Cracking Pressure	2,8 bar
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	EPDM: 990011014
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.20 kg.

**CONFIGURATION OPTIONS**

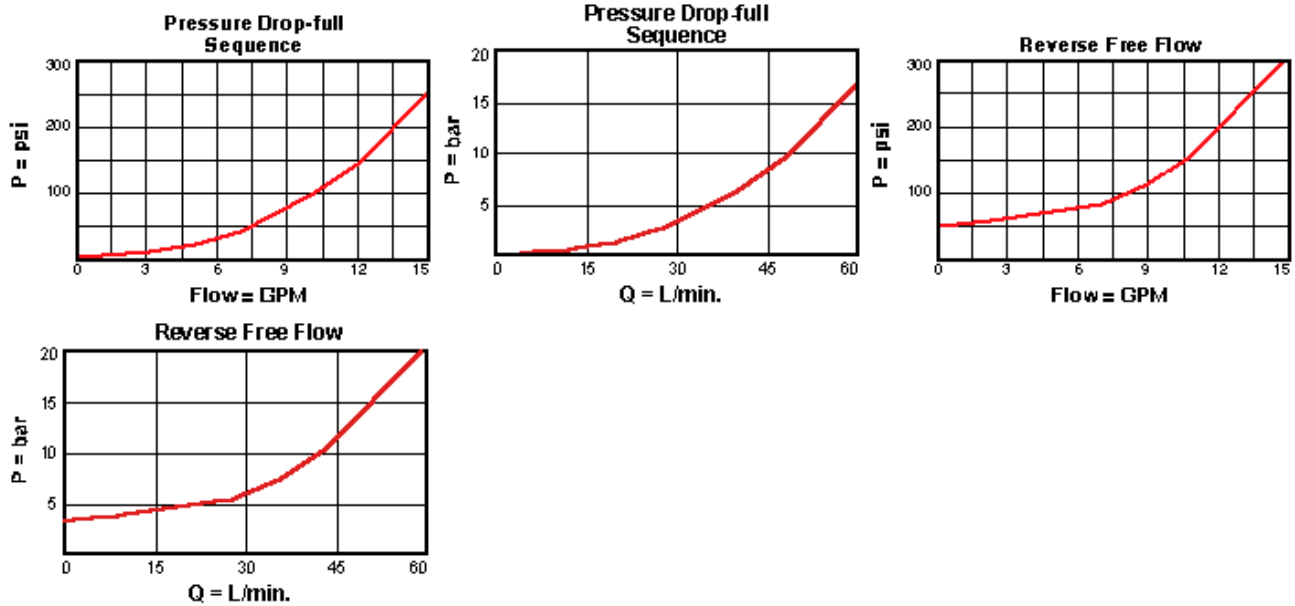
**Model Code Example: SCCALAN**

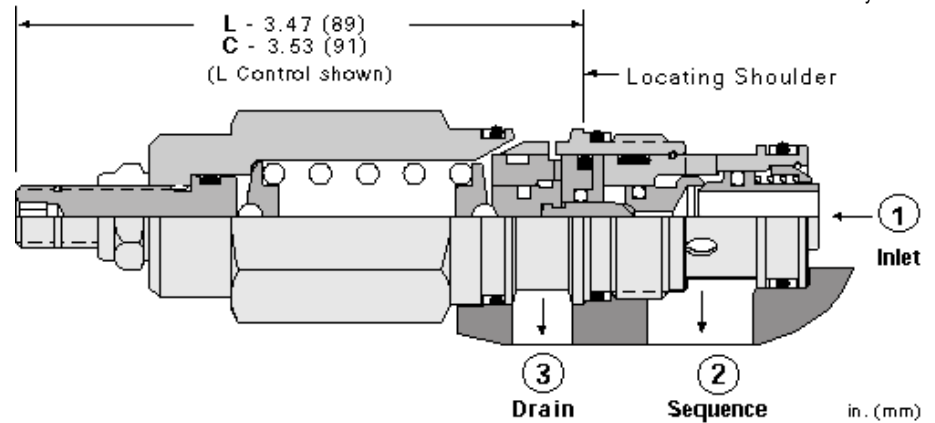
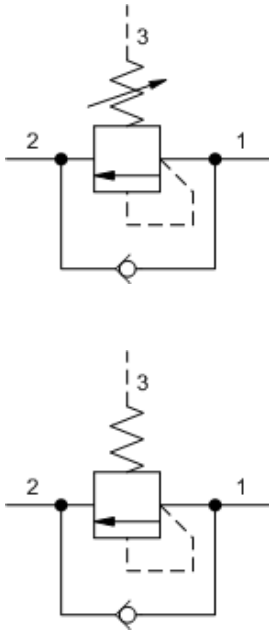
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 500 - 3000 psi (35 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 800 - 4500 psi (55 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
	<b>B</b> 300 - 1500 psi (20 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
	<b>C</b> 2000 - 6000 psi (140 - 420 bar), 2000 psi (140 bar) Standard Setting		
	<b>D</b> 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Although this is a zero pilot flow valve, port 3 (drain) must be connected to maintain a pressure reference in the control chamber. If port 3 is blocked, reciprocating seal weepage will cause the valve to malfunction.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Suitable for use in load holding applications.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Direct-acting sequence valves with reverse-flow check will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. Additionally, these valves incorporate an integral check valve to provide reverse flow from port 2 (sequence) to port 1 (inlet). The pressure setting of a sequence valve controls the pressure at port 1 relative to the pressure at the drain (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	120 L/min.
Factory Pressure Settings Established at	30 cc/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reset	0,7 cc/min.
Check Cracking Pressure	1,7 bar
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.36 kg.

**CONFIGURATION OPTIONS**

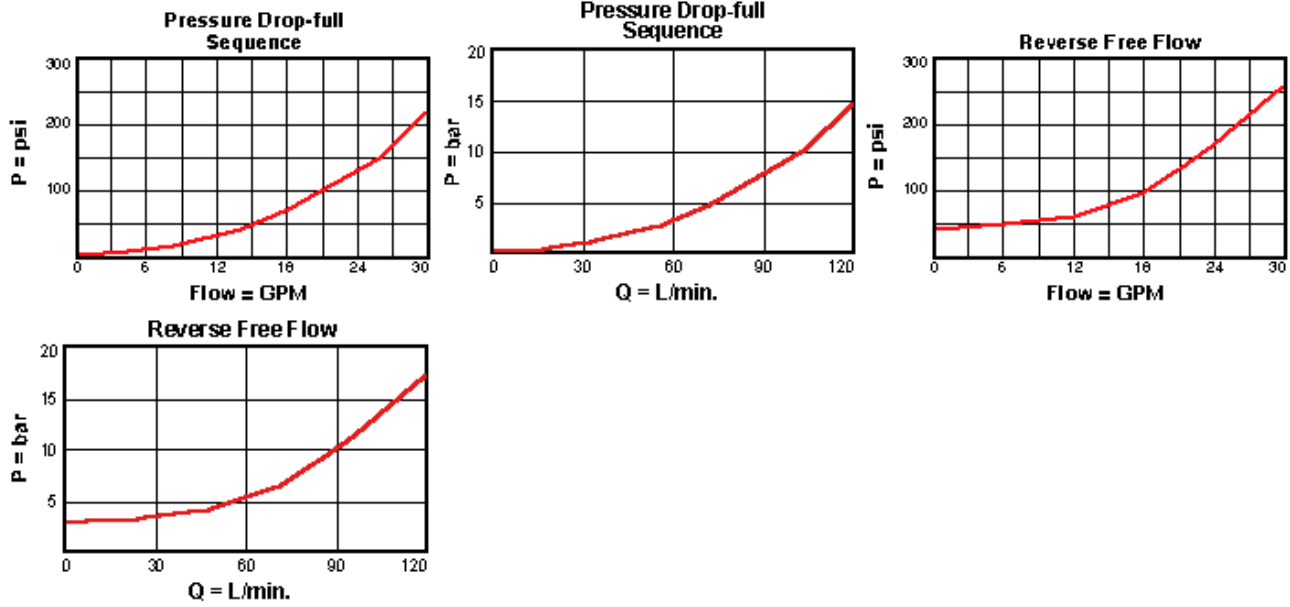
**Model Code Example: SCEALAN**

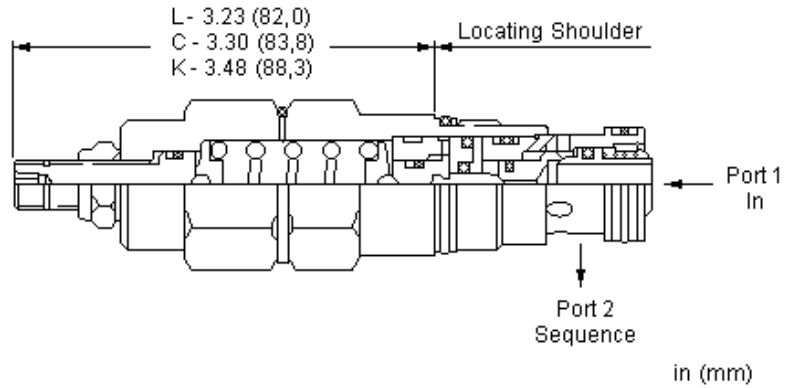
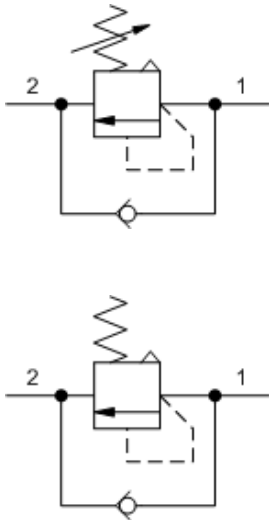
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	A 500 - 3000 psi (35 - 210 bar), 1000 psi (70 bar) Standard Setting	N Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	W 800 - 4500 psi (55 - 315 bar), 1000 psi (70 bar) Standard Setting B 300 - 1500 psi (20 - 105 bar), 1000 psi (70 bar) Standard Setting C 2000 - 6000 psi (140 - 420 bar), 2000 psi (140 bar) Standard Setting D 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting E 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting	V Viton	/AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

## TECHNICAL FEATURES

- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Although this is a zero pilot flow valve, port 3 (drain) must be connected to maintain a pressure reference in the control chamber. If port 3 is blocked, reciprocating seal weepage will cause the valve to malfunction.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Suitable for use in load holding applications.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Atmospherically referenced, direct-acting sequence valves with reverse-flow check will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. Additionally, these valves incorporate an integral check valve to provide reverse flow from port 2 (sequence) to port 1 (inlet). The pressure setting of this sequence valve controls the pressure at port 1 relative to the atmospheric vent.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-5A
Series	2
Capacity	120 L/min.
Factory Pressure Settings Established at	30 cc/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Check Cracking Pressure	1,7 bar
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	Viton: 990203006
Model Weight	0.37 kg.

**CONFIGURATION OPTIONS**

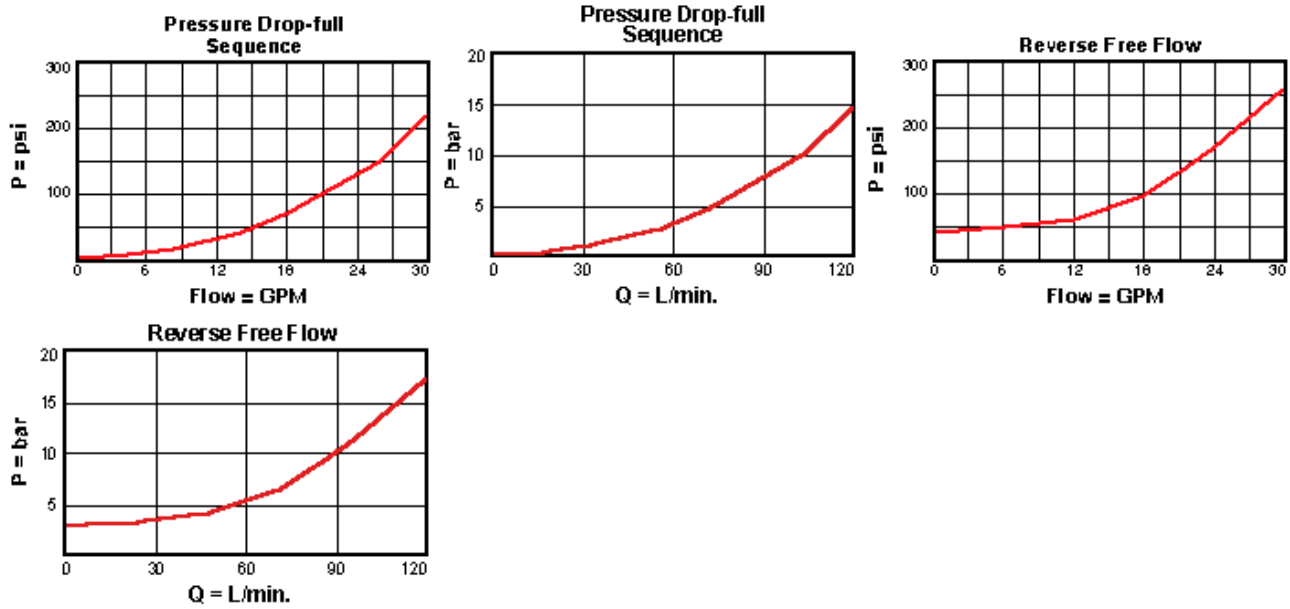
**Model Code Example: SCEBLAN**

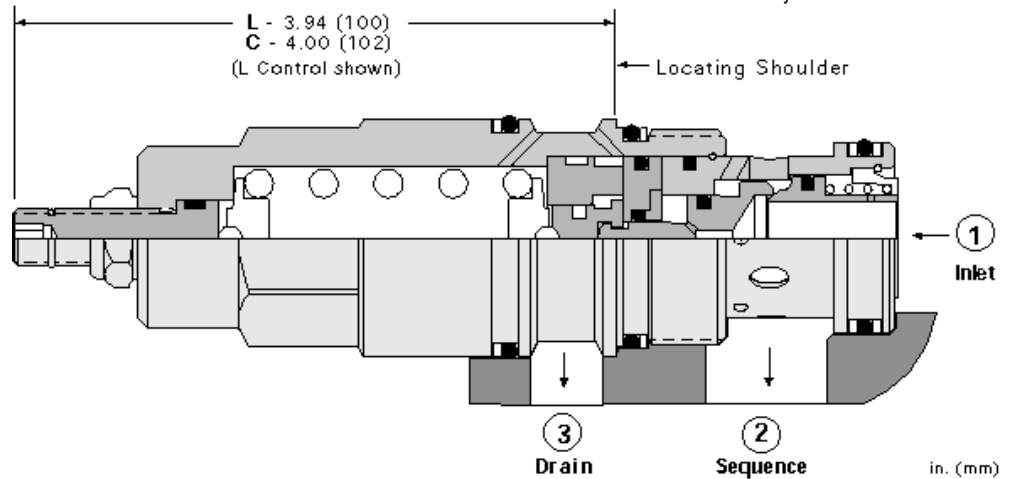
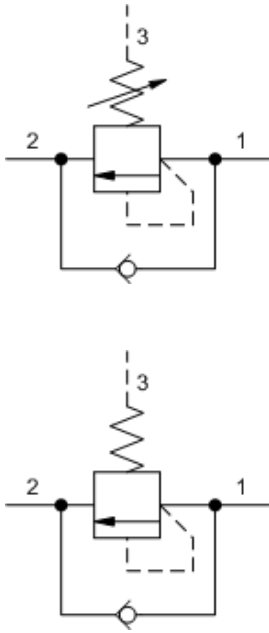
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N)
<b>L</b> Standard Screw Adjustment	<b>A</b> 500 - 3000 psi (35 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 300 - 1500 psi (20 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	
	<b>C</b> 2000 - 6000 psi (140 - 420 bar), 2000 psi (140 bar) Standard Setting		
	<b>D</b> 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 800 - 4500 psi (55 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- Suitable for use in load holding applications.
- Atmospherically referenced valves should only be used where it is impossible have a drain connection. Over time, the atmospherically referenced valves may leak externally or allow moisture into the spring chamber.
- Approximately 1 drop (0,07 cc) of fluid will pass into the vented spring chamber every 4000 cycles.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Direct-acting sequence valves with reverse-flow check will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. Additionally, these valves incorporate an integral check valve to provide reverse flow from port 2 (sequence) to port 1 (inlet). The pressure setting of a sequence valve controls the pressure at port 1 relative to the pressure at the drain (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	240 L/min.
Factory Pressure Settings Established at	30 cc/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Check Cracking Pressure	1,7 bar
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	0.72 kg.

**CONFIGURATION OPTIONS**
**Model Code Example: SCGALAN**

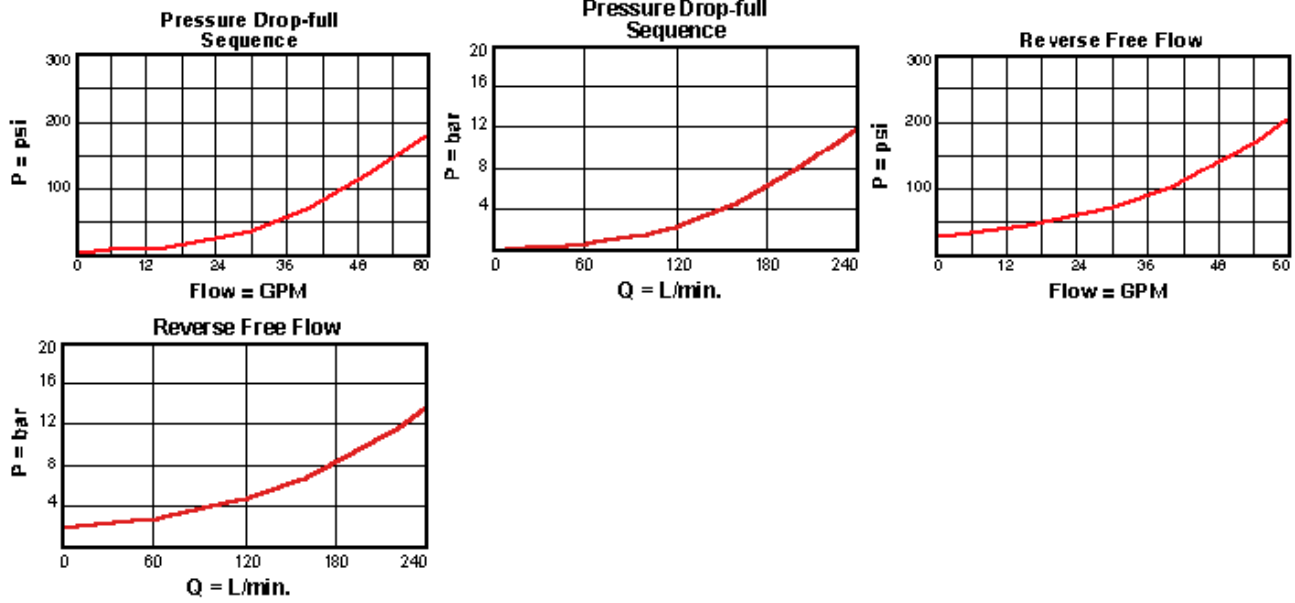
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	A 500 - 3000 psi (35 - 210 bar), 1000 psi (70 bar) Standard Setting	N Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	W 800 - 4500 psi (55 - 315 bar), 1000 psi (70 bar) Standard Setting	V Viton	/AP Stainless Steel, Passivated
	B 300 - 1500 psi (20 - 105 bar), 1000 psi (70 bar) Standard Setting		/LH Mild Steel, Zinc-Nickel
	C 2000 - 6000 psi (140 - 420 bar), 2000 psi (140 bar) Standard Setting		
	D 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting		
	E 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting		

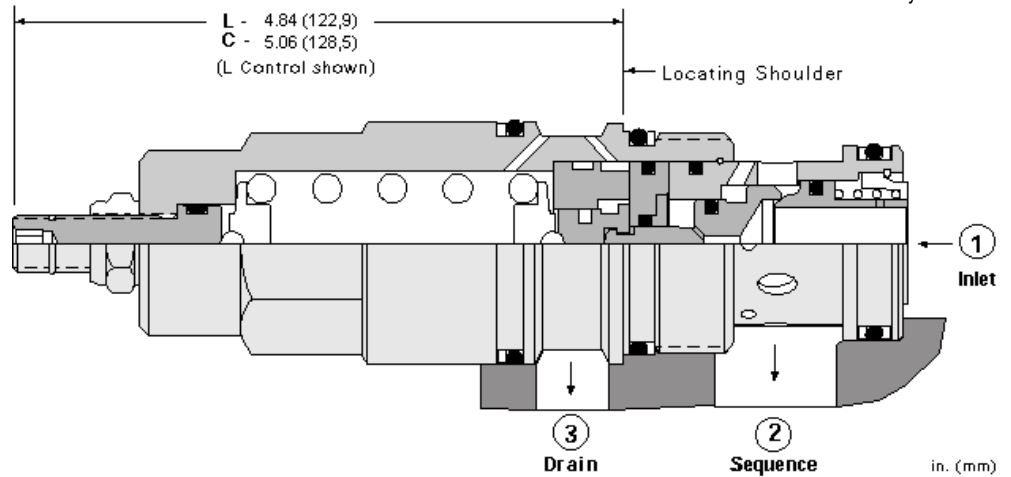
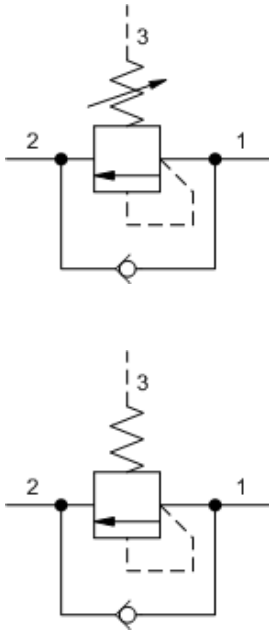


## TECHNICAL FEATURES

- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Although this is a zero pilot flow valve, port 3 (drain) must be connected to maintain a pressure reference in the control chamber. If port 3 is blocked, reciprocating seal weepage will cause the valve to malfunction.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Suitable for use in load holding applications.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Direct-acting sequence valves with reverse-flow check will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. Additionally, these valves incorporate an integral check valve to provide reverse flow from port 2 (sequence) to port 1 (inlet). The pressure setting of a sequence valve controls the pressure at port 1 relative to the pressure at the drain (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	480 L/min.
Factory Pressure Settings Established at	30 cc/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Check Cracking Pressure	1,7 bar
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	EPDM: 990019014
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	1.71 kg.

**CONFIGURATION OPTIONS**

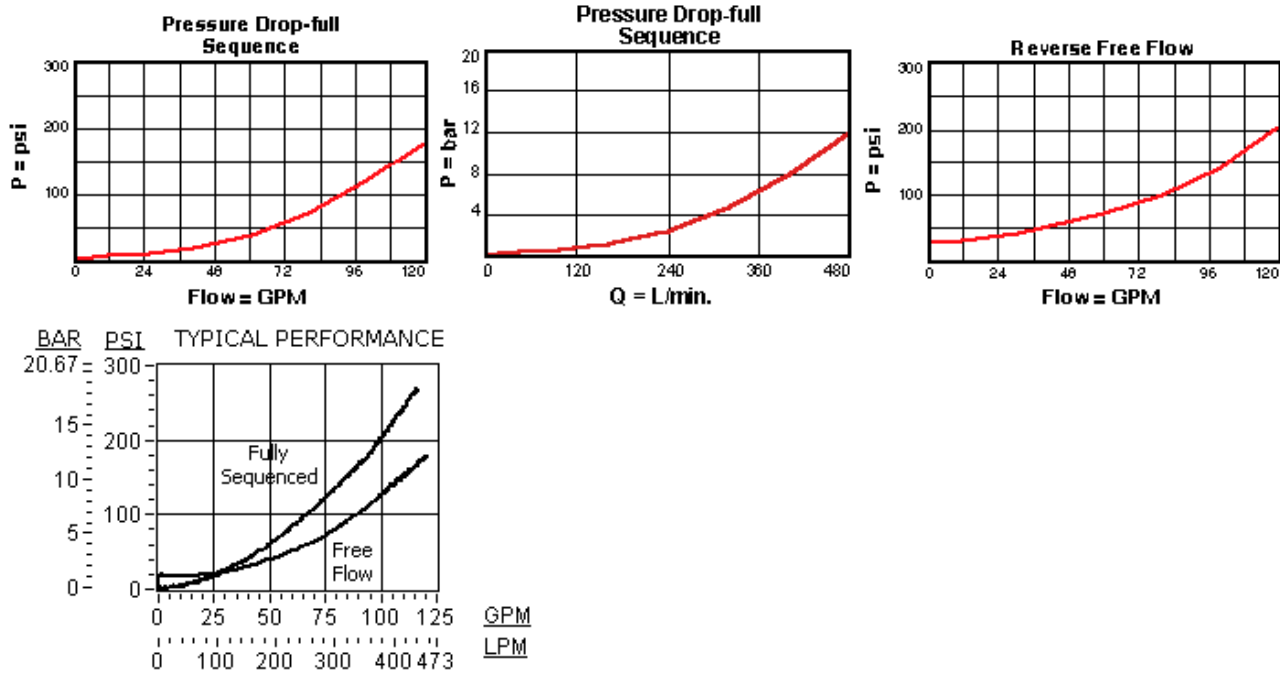
**Model Code Example: SCIALAN**

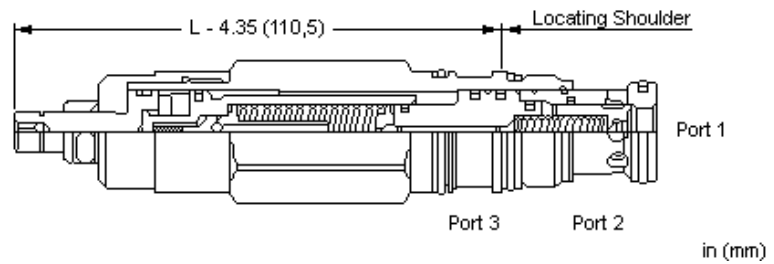
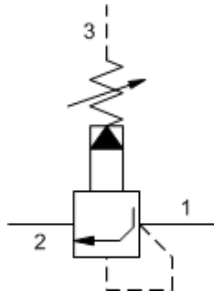
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 500 - 3000 psi (35 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>W</b> 800 - 4500 psi (55 - 315 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
	<b>B</b> 300 - 1500 psi (20 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	
	<b>C</b> 2000 - 6000 psi (140 - 420 bar), 2000 psi (140 bar) Standard Setting		
	<b>D</b> 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting		

## TECHNICAL FEATURES

- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Although this is a zero pilot flow valve, port 3 (drain) must be connected to maintain a pressure reference in the control chamber. If port 3 is blocked, reciprocating seal weepage will cause the valve to malfunction.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Suitable for use in load holding applications.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, anti shock sequence cartridges limit maximum system pressure and also limit the rate of pressure rise. The valve opens and then ramps closed at a constant speed, independent of settings and flows. The adjust screw determines the maximum (relief) setting and the minimum (threshold) setting.

The external drain makes the valve insensitive to pressure at port 2.

### TECHNICAL DATA

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	120 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,41 L/min.
Pressure Ramp Up Time	200 - 400 ms
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	4.5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990402007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990402006
Model Weight	0.47 kg.

### CONFIGURATION OPTIONS

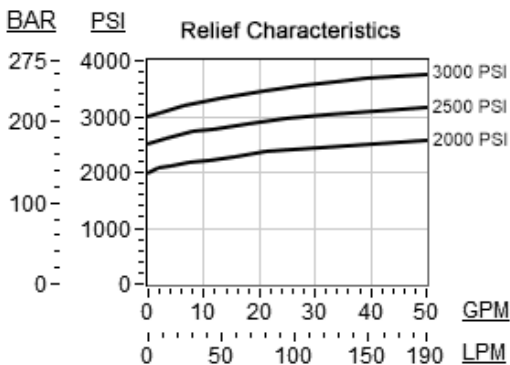
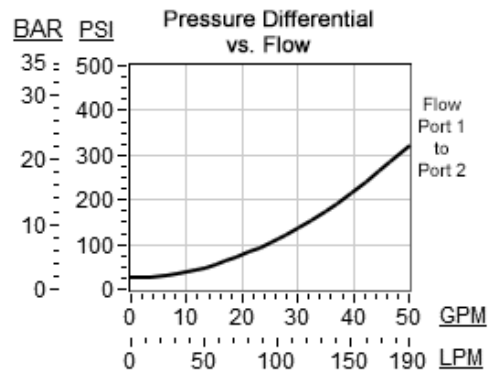
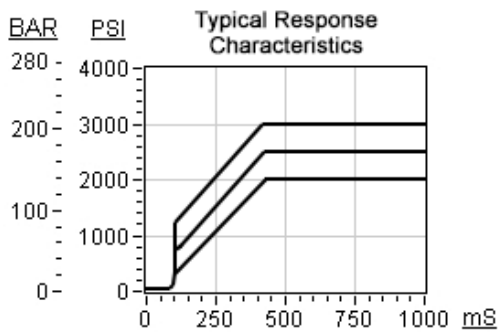
Model Code Example: **SDFTLAN**

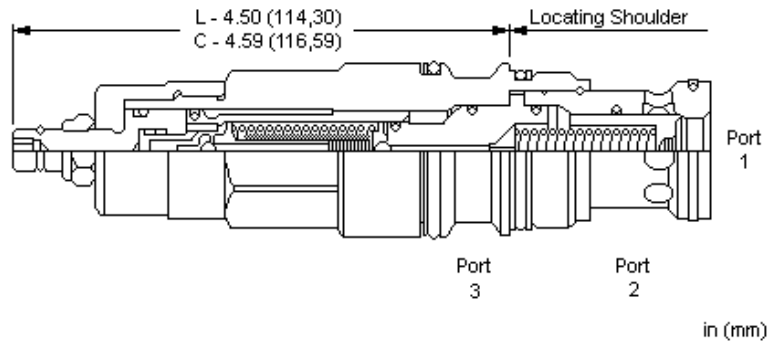
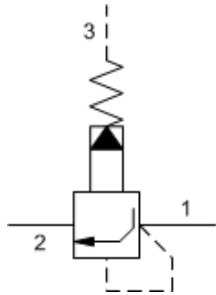
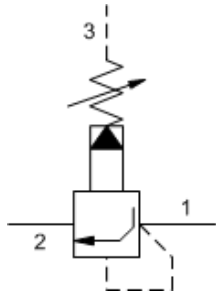
CONTROL	(L)	ADJUSTMENT RANGE	(A)	SEAL MATERIAL	(N)
<b>L</b> Standard Screw Adjustment		<b>A</b> 2000 - 3000 psi (140 - 210 bar), 2000 psi (140 bar) Standard Setting		<b>N</b> Buna-N	
		<b>C</b> 4500 - 6000 psi (315 - 420 bar), 4500 psi (315 bar) Standard Setting		<b>V</b> Viton	
		<b>W</b> 3000 - 4500 psi (210 - 315 bar), 3000 psi (210 bar) Standard Setting			

## TECHNICAL FEATURES

- Because the modulating occurs inside the cartridge, these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- Not suitable for sequencing cylinders.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Pressure settings are insensitive to back pressure at port 2.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Not suitable for use in load holding applications.
- When pressure at the inlet (port 1) exceeds the threshold setting, the valve opens to tank (port 2). The pilot section moves forward at a steady rate, increasing the setting by compressing the pilot spring. Maximum setting is achieved when the pilot section reaches a mechanical stop.
- The main stage orifice is protected against contamination.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, anti shock relief cartridges limit maximum system pressure and also limit the rate of pressure rise. The valve opens and then ramps closed at a constant speed, independent of settings and flows. The adjust screw determines the maximum (relief) setting and the minimum (threshold) setting.

The external drain makes the valve insensitive to pressure at port 2.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	240 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reset	0,7 cc/min.
Pressure Ramp Up Time	300 - 500 ms
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990217007
Seal kit - Cartridge	Polyurethane: 990217002
Seal kit - Cartridge	Viton: 990217006
Model Weight	0.85 kg.

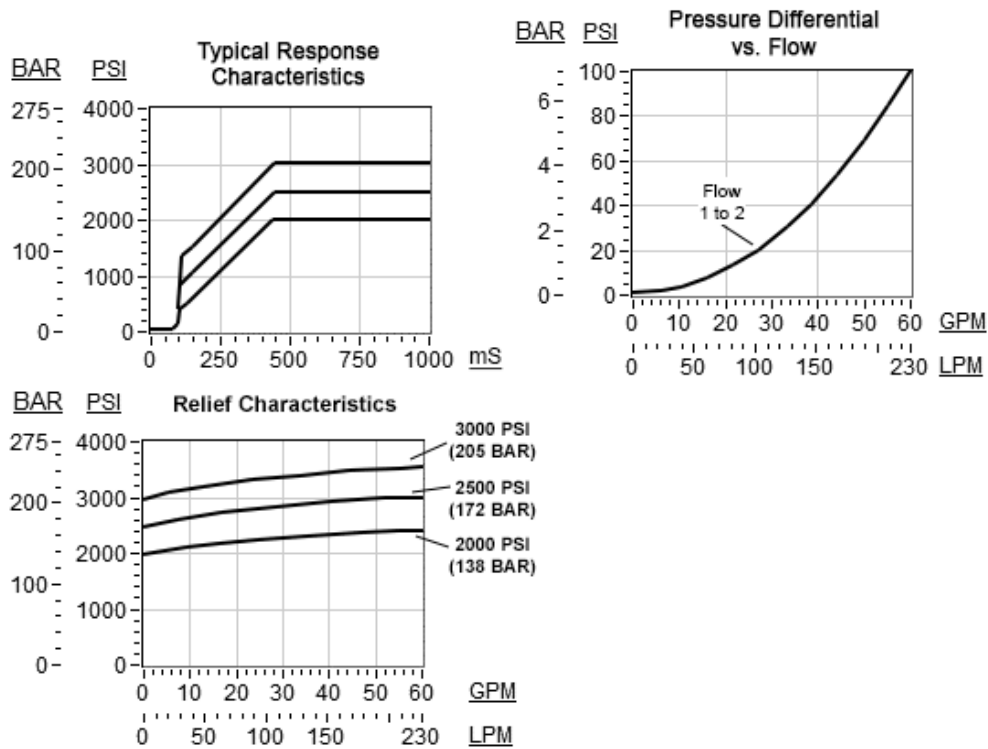
**CONFIGURATION OPTIONS**
**Model Code Example: SDHTLAN**

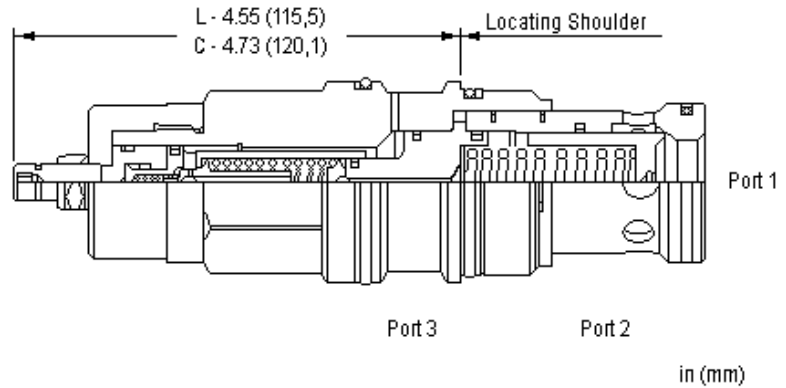
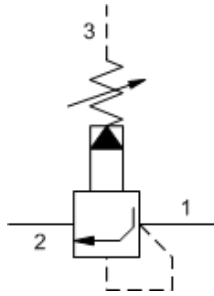
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N)
<b>L</b> Standard Screw Adjustment	<b>A</b> 2000 - 3000 psi (140 - 210 bar), 2000 psi (140 bar) Standard Setting	<b>N</b> Buna-N	
<b>C</b> Tamper Resistant - Factory Set	<b>C</b> 4500 - 6000 psi (315 - 420 bar), 4500 psi (315 bar) Standard Setting	<b>V</b> Viton	
	<b>W</b> 3000 - 4500 psi (210 - 315 bar), 3000 psi (210 bar) Standard Setting		

## TECHNICAL FEATURES

- Because the modulating occurs inside the cartridge, these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- Not suitable for sequencing cylinders.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Pressure settings are insensitive to back pressure at port 2.
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Not suitable for use in load holding applications.
- When pressure at the inlet (port 1) exceeds the threshold setting, the valve opens to tank (port 2). The pilot section moves forward at a steady rate, increasing the setting by compressing the pilot spring. Maximum setting is achieved when the pilot section reaches a mechanical stop.
- The main stage orifice is protected against contamination.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Pilot-operated, anti shock sequence cartridges limit maximum system pressure and also limit the rate of pressure rise. The valve opens and then ramps closed at a constant speed, independent of settings and flows. The adjust screw determines the maximum (relief) setting and the minimum (threshold) setting.

The external drain makes the valve insensitive to pressure at port 2.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	480 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Control Pilot Flow	0,16 - 0,41 L/min.
Pressure Ramp Up Time	200 - 400 ms
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	4.5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990219007
Seal kit - Cartridge	Viton: 990219006
Model Weight	1.60 kg.

**CONFIGURATION OPTIONS**
**Model Code Example: SDJTLAN**

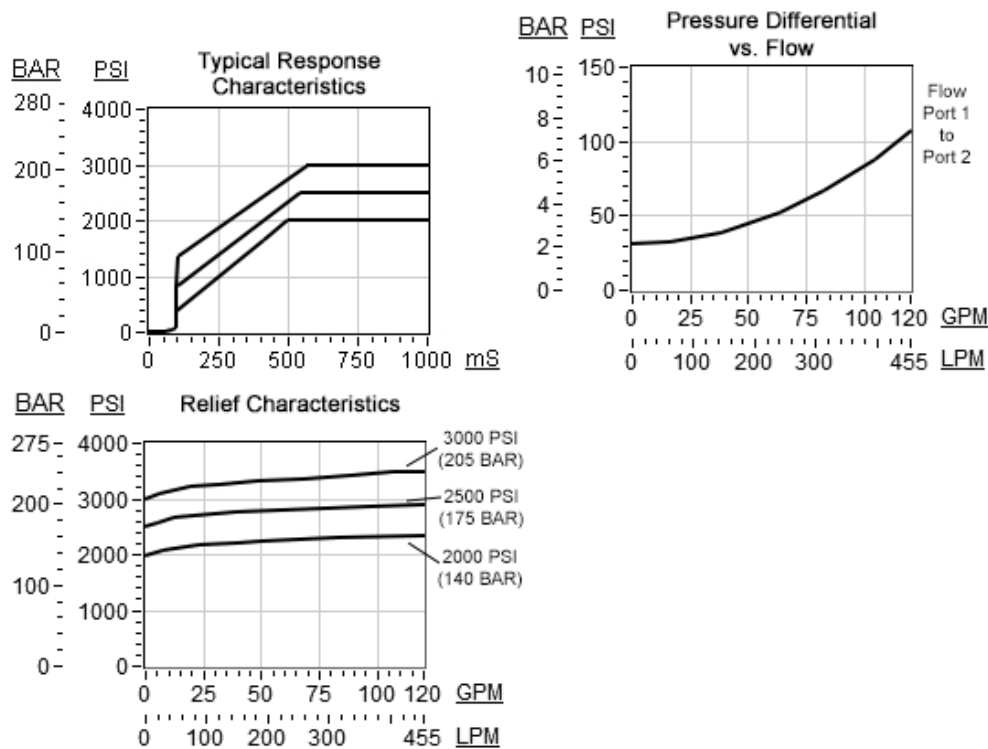
<b>CONTROL</b>	<b>(L) ADJUSTMENT RANGE</b>	<b>(A) SEAL MATERIAL</b>	<b>(N) MATERIAL/COATING</b>
<b>L</b> Standard Screw Adjustment	<b>A</b> 2000 - 3000 psi (140 - 210 bar), 2000 psi (140 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Concealed Manual Override	<b>C</b> 4500 - 6000 psi (315 - 420 bar), 4500 psi (315 bar) Standard Setting	<b>V</b> Viton	/LH Mild Steel, Zinc-Nickel
	<b>W</b> 3000 - 4500 psi (210 - 315 bar), 3000 psi (210 bar) Standard Setting		

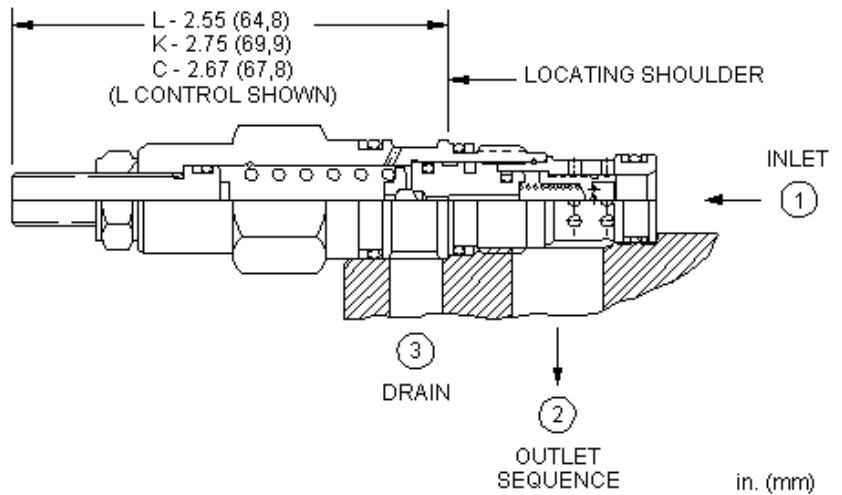
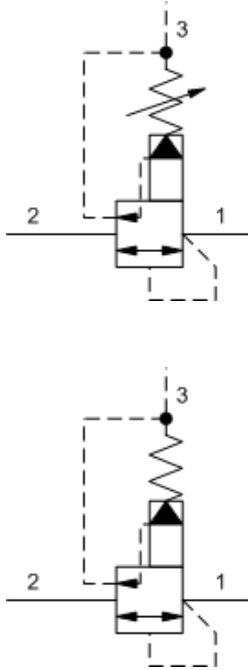


## TECHNICAL FEATURES

- Pilot flow continues to increase as the pressure at port 1 (inlet), relative to the pressure at port 3 (drain), rises above the valve setting.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Will accept maximum pressure at port 2; suitable for use in cross port relief circuits.
- Because the modulating occurs inside the cartridge, these valves are immune to most of the problems associated with cavitation, namely noise and manifold erosion.
- Valve is relatively insensitive to varying oil temperatures and oil borne contamination.
- Not suitable for use in load holding applications.
- When pressure at the inlet (port 1) exceeds the threshold setting, the valve opens to tank (port 2). The pilot section moves forward at a steady rate, increasing the setting by compressing the pilot spring. Maximum setting is achieved when the pilot section reaches a mechanical stop.
- The main stage orifice is protected against contamination.
- Not suitable for sequencing cylinders.
- Pressure settings are insensitive to back pressure at port 2.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Kick-down sequence valves will kick completely open and remain open once the pressure at the inlet (port 1) exceeds the valve setting, creating an unrestricted flow path from port 1 to port 2 (sequence). The pressure setting at port 1 is relative to the drain (port 3). The valve remains open as long as the pressure at port 1 exceeds the pressure at port 2. To reset the valve, pressure at port 1 must fall below the setting of the valve, flow from port 1 to port 2 must cease, and pressure at port 2 must be equal to or greater than the pressure at port 1.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-163A
Series	0
Capacity	30 L/min.
Factory Pressure Settings Established at	Kick down point
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.
Response Time - Typical	25 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	Polyurethane: 990163002
Seal kit - Cartridge	Viton: 990163006
Model Weight	0.11 kg.

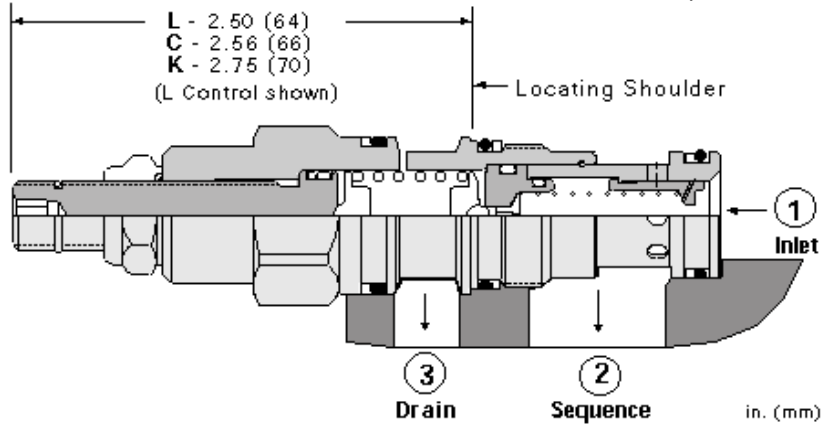
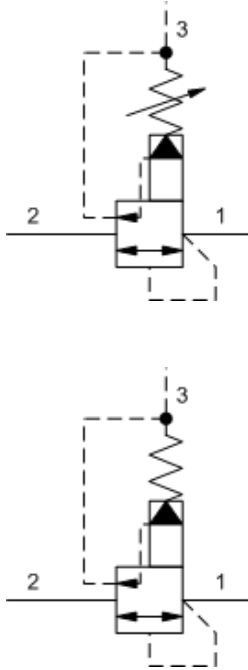
**CONFIGURATION OPTIONS**

**Model Code Example: SQBBLAN**

CONTROL	(L)	ADJUSTMENT RANGE	(A)	SEAL MATERIAL	(N)
<b>L</b> Standard Screw Adjustment		<b>A</b> 75 - 3000 psi (5 - 210 bar), 1000 psi (70 bar) Standard Setting		<b>N</b> Buna-N	
<b>C</b> Tamper Resistant - Factory Set		<b>B</b> 75 - 1500 psi (5 - 105 bar), 1000 psi (70 bar) Standard Setting		<b>V</b> Viton	
<b>K</b> Handknob		<b>C</b> 75 - 6000 psi (5 - 420 bar), 1000 psi (70 bar) Standard Setting			
		<b>N</b> 75 - 800 psi (5 - 55 bar), 400 psi (28 bar) Standard Setting			
		<b>Q</b> 75 - 400 psi (5 - 28 bar), 200 psi (14 bar) Standard Setting			
		<b>W</b> 75 - 4500 psi (5 - 315 bar), 1000 psi (70 bar) Standard Setting			

## TECHNICAL FEATURES

- Should not be used in load holding applications.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Intended for use on the actuator side of the system as flow through the valve must cease for the valve to reset. If used on the pump side of a system, pump flow must be shut off for the valve to reset.
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.



Kick-down sequence valves will kick completely open and remain open once the pressure at the inlet (port 1) exceeds the valve setting, creating an unrestricted flow path from port 1 to port 2 (sequence). The pressure setting at port 1 is relative to the drain (port 3). The valve remains open as long as the pressure at port 1 exceeds the pressure at port 2. To reset the valve, pressure at port 1 must fall below the setting of the valve, flow from port 1 to port 2 must cease, and pressure at port 2 must be equal to or greater than the pressure at port 1.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	60 L/min.
Factory Pressure Settings Established at	Kick down point
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	30 cc/min.
Response Time - Typical	25 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.16 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

**CONFIGURATION OPTIONS**

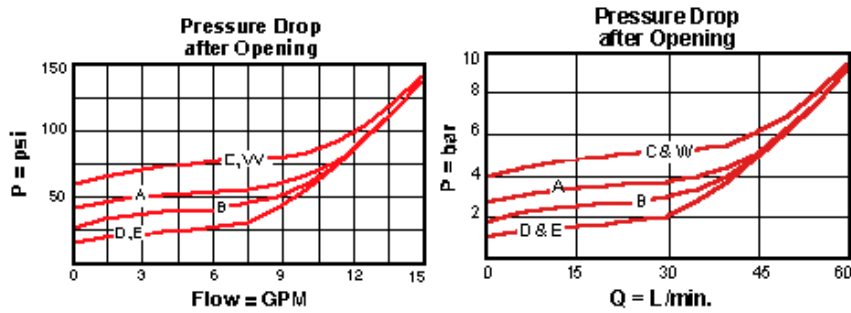
**Model Code Example: SQDBLAN**

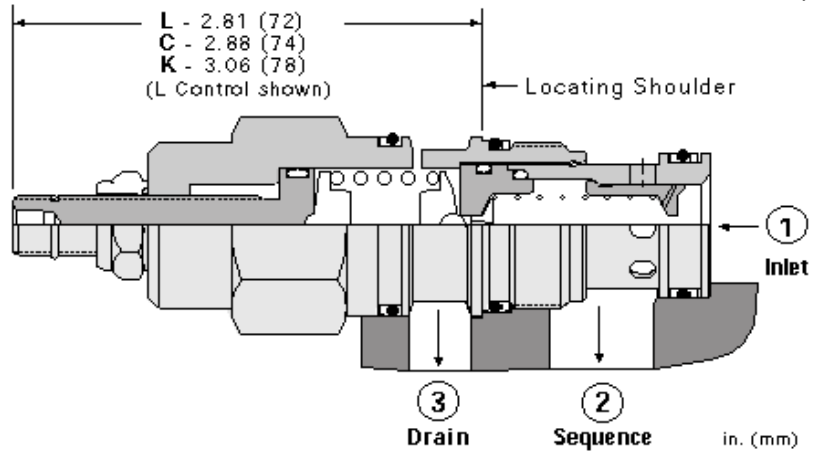
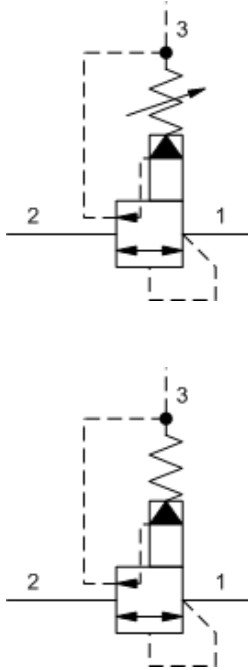
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	A 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	N Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	B 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	V Viton	/AP Stainless Steel, Passivated
K Handknob	C 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
O Handknob with Panel Mount	D 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	E 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	W 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Should not be used in load holding applications.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Intended for use on the actuator side of the system as flow through the valve must cease for the valve to reset. If used on the pump side of a system, pump flow must be shut off for the valve to reset.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Kick-down sequence valves will kick completely open and remain open once the pressure at the inlet (port 1) exceeds the valve setting, creating an unrestricted flow path from port 1 to port 2 (sequence). The pressure setting at port 1 is relative to the drain (port 3). The valve remains open as long as the pressure at port 1 exceeds the pressure at port 2. To reset the valve, pressure at port 1 must fall below the setting of the valve, flow from port 1 to port 2 must cease, and pressure at port 2 must be equal to or greater than the pressure at port 1.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	120 L/min.
Factory Pressure Settings Established at	Kick down point
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	50 cc/min.
Response Time - Typical	25 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.28 kg.

**NOTES** For Series 1 cartridges configured with an O control (panel mount handknob), a .75 in. (19 mm) diameter hole is required in the panel.

**CONFIGURATION OPTIONS**

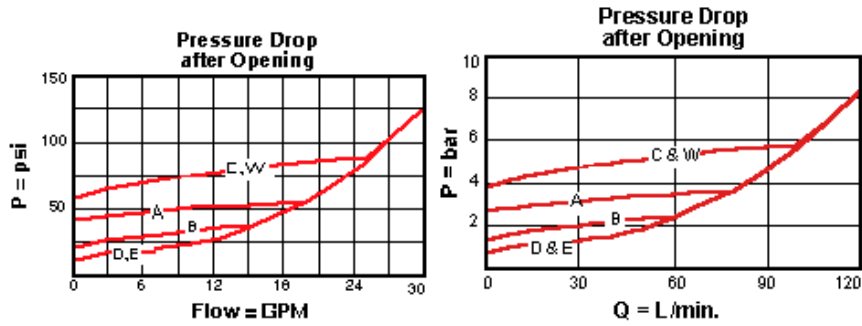
**Model Code Example: SQFBLAN**

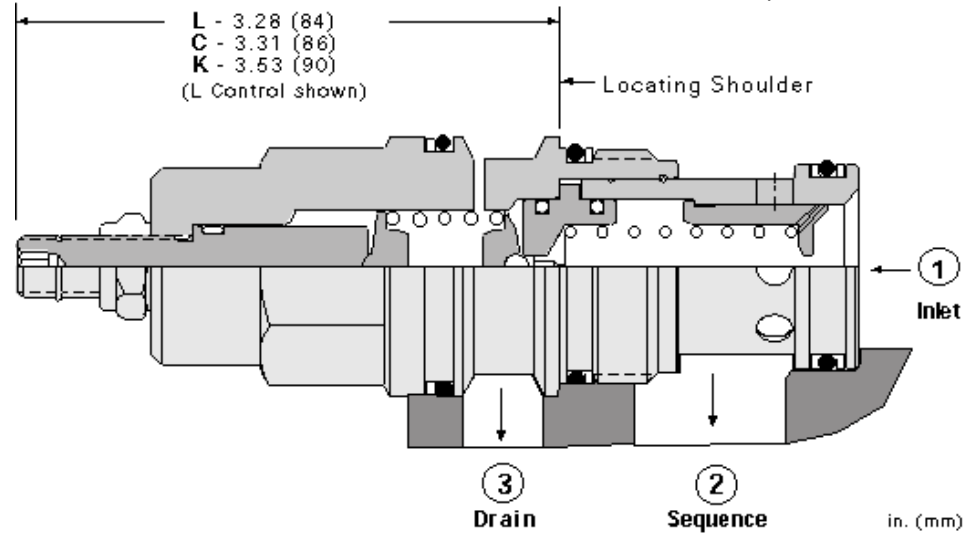
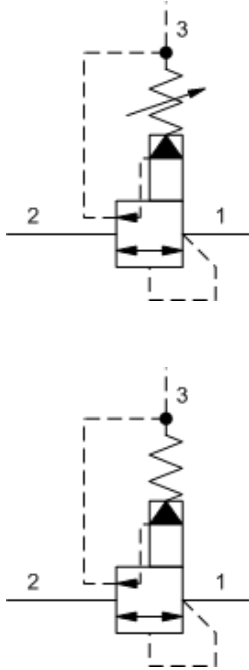
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
<b>O</b> Handknob with Panel Mount	<b>D</b> 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Should not be used in load holding applications.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Intended for use on the actuator side of the system as flow through the valve must cease for the valve to reset. If used on the pump side of a system, pump flow must be shut off for the valve to reset.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Kick-down sequence valves will kick completely open and remain open once the pressure at the inlet (port 1) exceeds the valve setting, creating an unrestricted flow path from port 1 to port 2 (sequence). The pressure setting at port 1 is relative to the drain (port 3). The valve remains open as long as the pressure at port 1 exceeds the pressure at port 2. To reset the valve, pressure at port 1 must fall below the setting of the valve, flow from port 1 to port 2 must cease, and pressure at port 2 must be equal to or greater than the pressure at port 1.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-17A
Series	3
Capacity	240 L/min.
Factory Pressure Settings Established at	Kick down point
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	65 cc/min.
Response Time - Typical	25 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	0.62 kg.



## CONFIGURATION OPTIONS

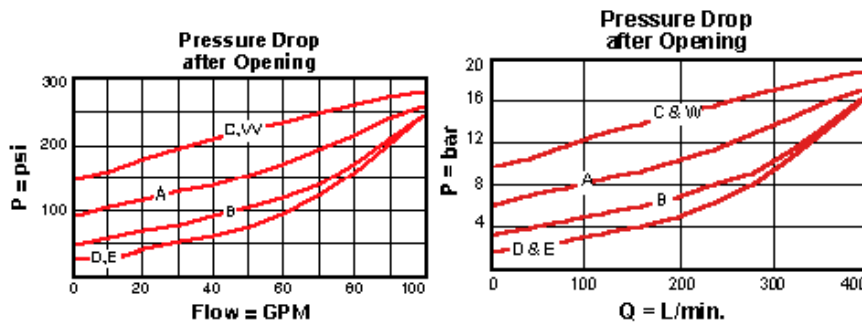
## Model Code Example: SQHBLAN

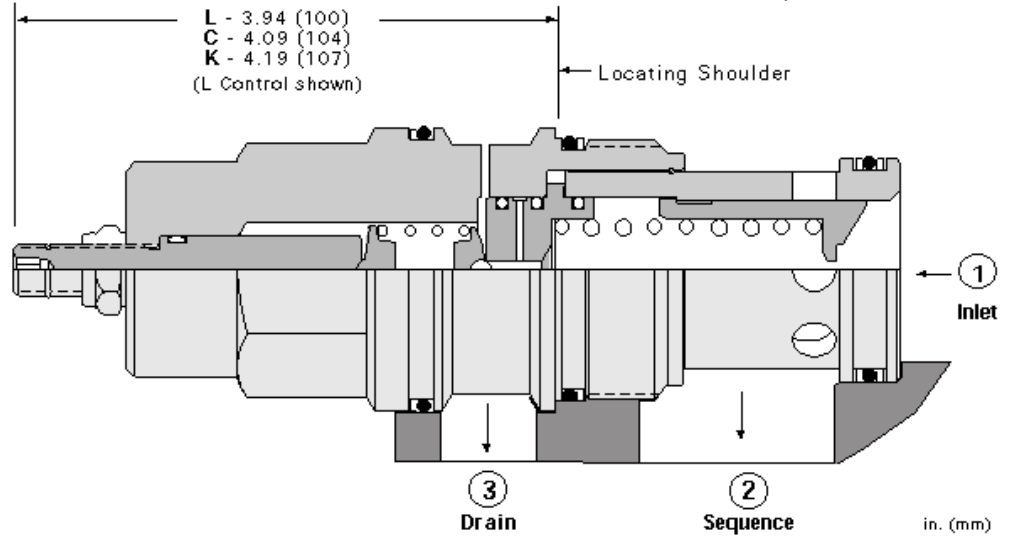
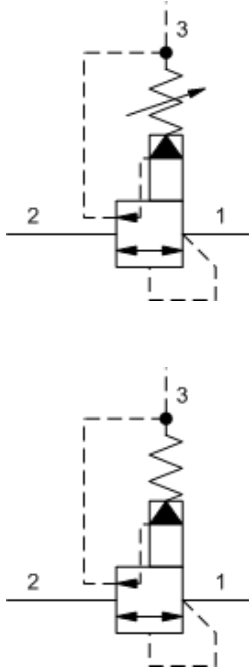
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N)
L Standard Screw Adjustment	A 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	N Buna-N	
C Tamper Resistant - Factory Set	B 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	V Viton	
K Handknob	C 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
	D 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	E 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	W 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- Should not be used in load holding applications.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Intended for use on the actuator side of the system as flow through the valve must cease for the valve to reset. If used on the pump side of a system, pump flow must be shut off for the valve to reset.
- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Kick-down sequence valves will kick completely open and remain open once the pressure at the inlet (port 1) exceeds the valve setting, creating an unrestricted flow path from port 1 to port 2 (sequence). The pressure setting at port 1 is relative to the drain (port 3). The valve remains open as long as the pressure at port 1 exceeds the pressure at port 2. To reset the valve, pressure at port 1 must fall below the setting of the valve, flow from port 1 to port 2 must cease, and pressure at port 2 must be equal to or greater than the pressure at port 1.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-19A
Series	4
Capacity	480 L/min.
Factory Pressure Settings Established at	Kick down point
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	80 cc/min.
Response Time - Typical	25 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	1.43 kg.

## CONFIGURATION OPTIONS

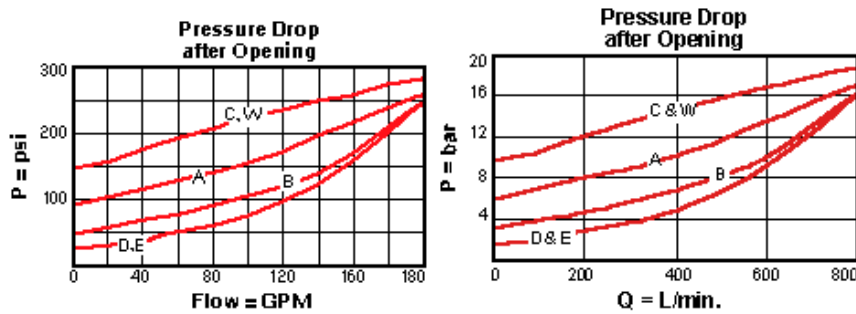
## Model Code Example: SQJBLAN

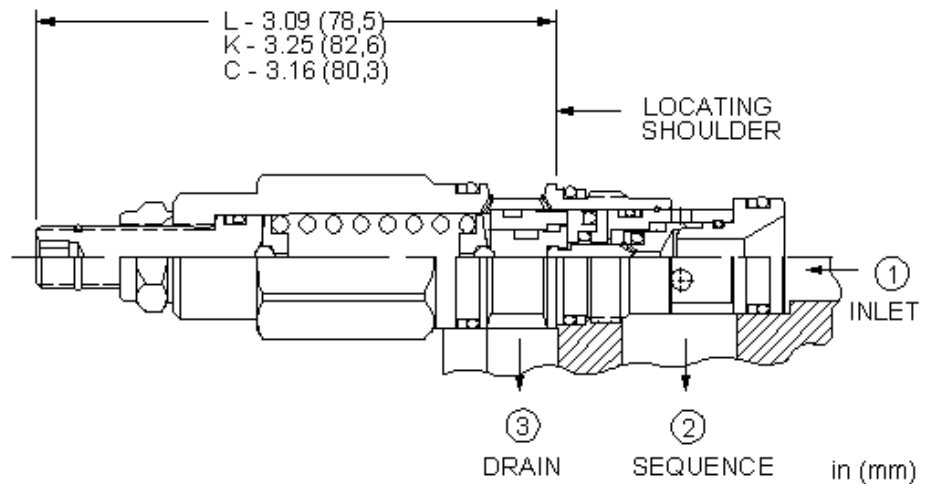
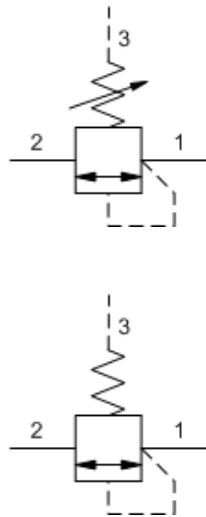
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N)
L Standard Screw Adjustment	A 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	N Buna-N	
C Tamper Resistant - Factory Set	B 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	V Viton	
K Handknob	C 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		
	D 25 - 800 psi (1,7 - 55 bar), 400 psi (28 bar) Standard Setting		
	E 25 - 400 psi (1,7 - 28 bar), 200 psi (14 bar) Standard Setting		
	W 150 - 4500 psi (10,5 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Should not be used in load holding applications.
- The main stage orifice is protected by a 150 micron stainless steel screen.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Intended for use on the actuator side of the system as flow through the valve must cease for the valve to reset. If used on the pump side of a system, pump flow must be shut off for the valve to reset.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Direct-acting sequence valves will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. The pressure setting of a sequence valve controls the pressure at port 1 relative to the pressure at the drain (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-11A
Series	1
Capacity	60 L/min.
Factory Pressure Settings Established at	30 cc/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	4
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.20 kg.

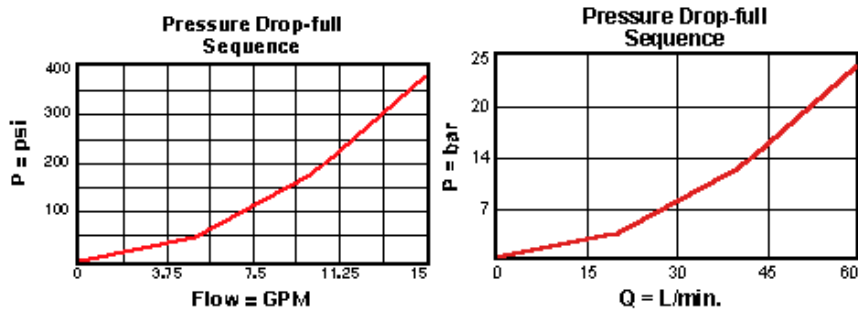
**CONFIGURATION OPTIONS**
**Model Code Example: SXCALAN**

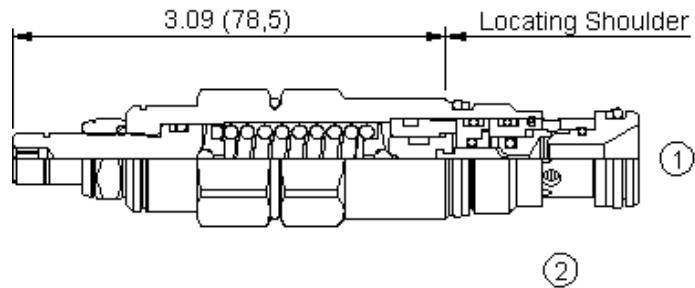
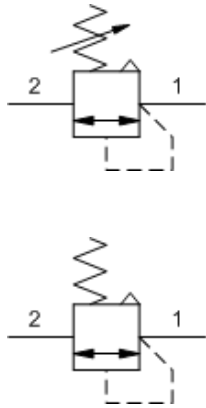
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 500 - 3000 psi (35 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 300 - 1500 psi (20 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>V</b> Viton	/AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel
	<b>C</b> 2000 - 6000 psi (140 - 420 bar), 2000 psi (140 bar) Standard Setting		
	<b>D</b> 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 800 - 4500 psi (55 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Although this is a zero pilot flow valve, port 3 (drain) must be connected to maintain a pressure reference in the control chamber. If port 3 is blocked, reciprocating seal weepage will cause the valve to malfunction.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Suitable for use in load holding applications.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP for external stainless steel components, or /LH for external zinc-nickel plated components. See the CONFIGURATION section for all options. For further details, please see the Materials of Construction page located under TECH RESOURCES.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Atmospherically referenced, direct-acting sequence valves will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. The pressure setting of this sequence valve controls the pressure at port 1 relative to the atmospheric vent.

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-13A
Series	1
Capacity	60 L/min.
Factory Pressure Settings Established at	30 cc/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reseat	0,7 cc/min.
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	4
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	EPDM: 990010014
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006
Model Weight	0.21 kg.

**CONFIGURATION OPTIONS**

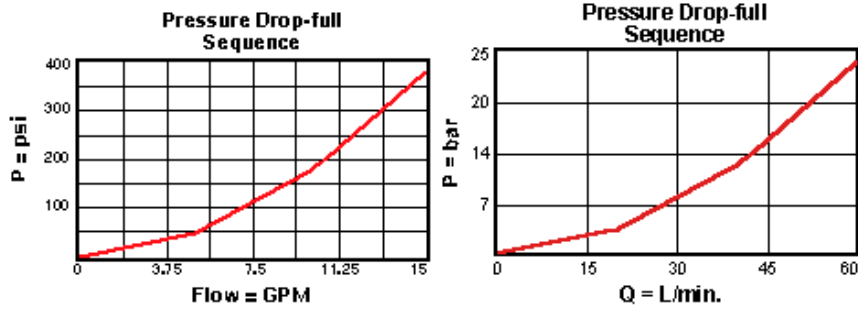
**Model Code Example: SXCBLAN**

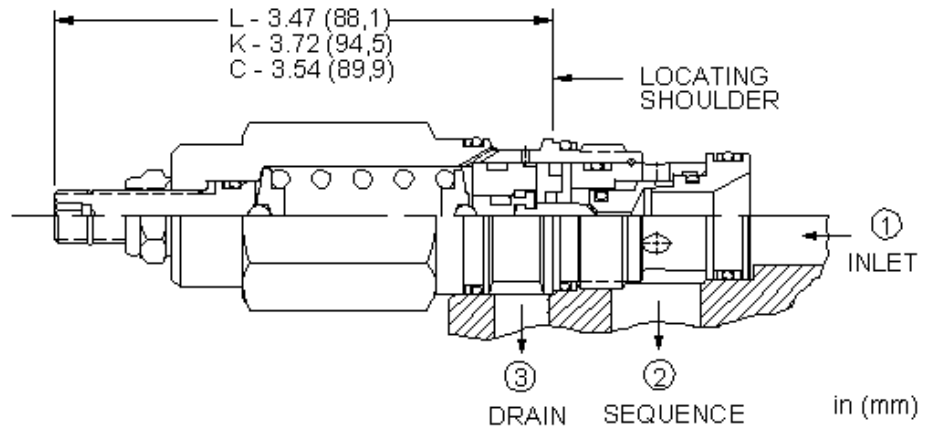
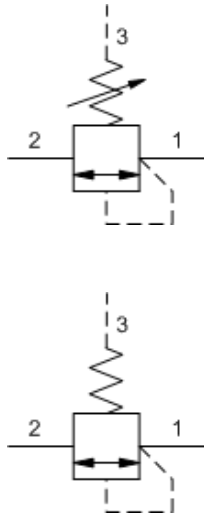
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 500 - 3000 psi (35 - 210 bar), 1000 psi (70 bar) Standard Setting	<b>N</b> Buna-N	Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 300 - 1500 psi (20 - 105 bar), 1000 psi (70 bar) Standard Setting	<b>E</b> EPDM	/AP Stainless Steel, Passivated
<b>K</b> Handknob	<b>C</b> 2000 - 6000 psi (140 - 420 bar), 2000 psi (140 bar) Standard Setting	<b>V</b> Viton	
	<b>D</b> 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting		
	<b>E</b> 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting		
	<b>W</b> 800 - 4500 psi (55 - 315 bar), 1000 psi (70 bar) Standard Setting		

## TECHNICAL FEATURES

- Suitable for use in load holding applications.
- Atmospherically referenced valves should only be used where it is impossible have a drain connection. Over time, the atmospherically referenced valves may leak externally or allow moisture into the spring chamber.
- Approximately 1 drop (0,07 cc) of fluid will pass into the vented spring chamber every 4000 cycles.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES





Direct-acting sequence valves will supply a secondary circuit with flow once the pressure at the inlet (port 1) has exceeded the valve setting. The pressure setting of a sequence valve controls the pressure at port 1 relative to the pressure at the drain (port 3).

**TECHNICAL DATA**

NOTE: DATA MAY VARY BY CONFIGURATION. SEE CONFIGURATION SECTION.

Cavity	T-2A
Series	2
Capacity	120 L/min.
Factory Pressure Settings Established at	30 cc/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at Reset	0,7 cc/min.
Response Time - Typical	2 ms
Adjustment - No. of CW Turns from Min. to Max. setting	4
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Adjustment Screw Internal Hex Size	4 mm
Locknut Hex Size	15 mm
Locknut Torque	9 - 10 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.36 kg.

**CONFIGURATION OPTIONS**

**Model Code Example: SXEALAN**

CONTROL	(L) ADJUSTMENT RANGE	(A)	SEAL MATERIAL	(N)	MATERIAL/COATING
<b>L</b> Standard Screw Adjustment	<b>A</b> 500 - 3000 psi (35 - 210 bar), 1000 psi (70 bar) Standard Setting		<b>N</b> Buna-N		Standard Material/Coating
<b>C</b> Tamper Resistant - Factory Set	<b>B</b> 300 - 1500 psi (20 - 105 bar), 1000 psi (70 bar) Standard Setting		<b>V</b> Viton		JAP Stainless Steel, Passivated
	<b>C</b> 2000 - 6000 psi (140 - 420 bar), 2000 psi (140 bar) Standard Setting				
	<b>D</b> 200 - 800 psi (14 - 55 bar), 400 psi (28 bar) Standard Setting				
	<b>E</b> 100 - 400 psi (7 - 28 bar), 200 psi (14 bar) Standard Setting				
	<b>W</b> 800 - 4500 psi (55 - 315 bar), 1000 psi (70 bar) Standard Setting				



## TECHNICAL FEATURES

- All 3 port sequence cartridges are physically and functionally interchangeable (i.e. same flow path, same cavity for a given frame size).
- Although this is a zero pilot flow valve, port 3 (drain) must be connected to maintain a pressure reference in the control chamber. If port 3 is blocked, reciprocating seal weepage will cause the valve to malfunction.
- Pressure at port 3 is directly additive to the valve setting at a 1:1 ratio and should not exceed 5000 psi (350 bar).
- Suitable for use in load holding applications.
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

## PERFORMANCE CURVES

