

in. (mm)

The phaser check is a pair of checks, back-to-back, with the poppet at port 1 mechanically actuated. The valve is meant to be installed into the piston of a cylinder. When the cylinder reaches the end of its stroke the poppet in the phaser check is shoved off its seat allowing flow through the piston. This allows two cylinders to get back into phase.

TECHNICAL DATA

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

Cavity	T-162DP
Series	0
Capacity	4,7 L/min.
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Valve Internal Hex Size	8 mm
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	Viton: 990162006
Model Weight	0.03 kg.

CONFIGURATION OPTIONS

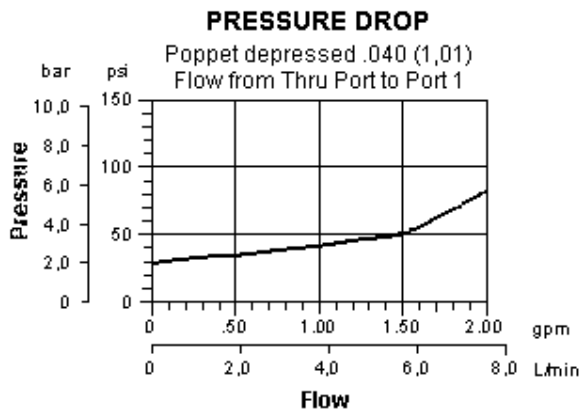
Model Code Example: CDAPMCN

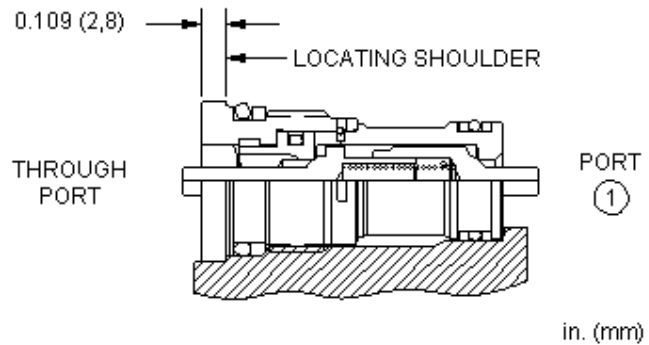
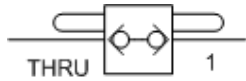
CONTROL	(M)	CRACKING PRESSURE	(C)	SEAL MATERIAL	(N)
M Mechanical Actuation		C 30 psi (2 bar)		N Buna-N	
B External 1/4 BSPP Port				V Viton	
E External 4-SAE Port					

TECHNICAL FEATURES

- This valve is not designed to handle side forces. Actuating direction must be axial, and contact surface must be perpendicular to valve axis to within 5°.
- This valve is NOT meant to be cam operated.
- This valve is NOT to be used in place of a mechanical stop.
- Maximum stroke of the poppet must be limited to .047 in. (1,2 mm) by a mechanical stop other than the valve itself.
- Note: Port 2 of the T-162A cavity is not used with this valve.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- A cylinder that does its work while extending can put a large load on the rod gland at the end of its stroke. A phaser check in the piston can limit the unnecessary force on the gland.
- If you need to monitor the pressure in a cylinder, a phaser check can prevent the trapping of a false pressure value by a load holding valve.
- A phaser check in the piston of a vertically mounted cylinder will bleed air at the end of the stroke.
- Phaser checks in the pistons of master/slave cylinders will synchronize the cylinders simply by taking the mechanism to the end of its travel in both directions. This lends itself to dual cylinder steering 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





The phaser check is a pair of checks, back-to-back, with both poppets mechanically actuated. The valve is meant to be installed into the piston or rod of a cylinder. When the cylinder reaches the end of its stroke the poppet in the phaser check is shoved off its seat allowing flow through the piston. This allows two cylinders to get back into phase.

TECHNICAL DATA

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

Cavity	T-162DP
Series	0
Capacity	4,7 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Valve Internal Hex Size	8 mm
Valve Installation Torque	27 - 33 Nm
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	Polyurethane: 990162002
Seal kit - Cartridge	Viton: 990162006
Model Weight	0.03 kg.

NOTES A special tool is required to install this cartridge. Use part number 998-101 to order this tool.

CONFIGURATION OPTIONS

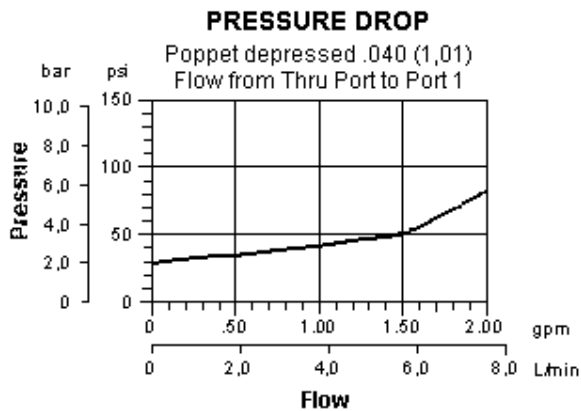
Model Code Example: CDAQMCN

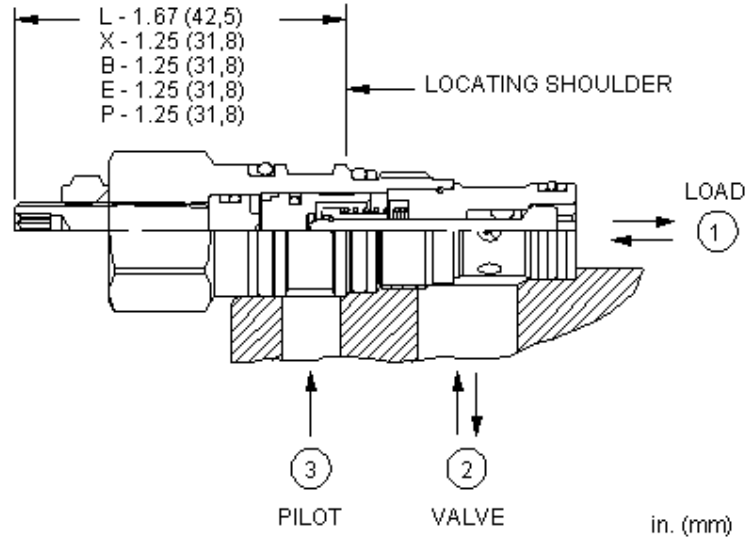
CONTROL	(M)	CRACKING PRESSURE	(C)	SEAL MATERIAL	(N)
M Mechanical Actuation		C 30 psi (2 bar)		N Buna-N	
				V Viton	

TECHNICAL FEATURES

- This valve is not designed to handle side forces. Actuating direction must be axial, and contact surface must be perpendicular to valve axis to within 5°.
- This valve is NOT meant to be cam operated.
- This valve is NOT to be used in place of a mechanical stop.
- Maximum stroke of the poppet must be limited to .047 in. (1,2 mm) by a mechanical stop other than the valve itself.
- Note: Port 2 of the T-162A cavity is not used with this valve.
- A cylinder that does its work while extending can put a large load on the rod gland at the end of its stroke. A phaser check in the piston can limit the unnecessary force on the gland.
- If you need to monitor the pressure in a cylinder, a phaser check can prevent the trapping of a false pressure value by a load holding valve.
- A phaser check in the piston of a vertically mounted cylinder will bleed air at the end of the stroke.
- Phaser checks in the pistons of master/slave cylinders will synchronize the cylinders simply by taking the mechanism to the end of its travel in both directions. This lends itself to dual cylinder steering applications.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (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





This valve is a pilot to open check valve. It has a non-sealed pilot, a steel seat, and is non-vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) will open the valve from port 1 to port 2. Pilot pressure needed at port 3 to open the valve is directly proportional to the load pressure at port 1. Pressure at port 2 directly opposes pilot pressure.

TECHNICAL DATA

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

Cavity	T-163A
Series	0
Capacity	30 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	EPDM: 990163014
Seal kit - Cartridge	Polyurethane: 990163002
Seal kit - Cartridge	Viton: 990163006
Model Weight	0.09 kg.

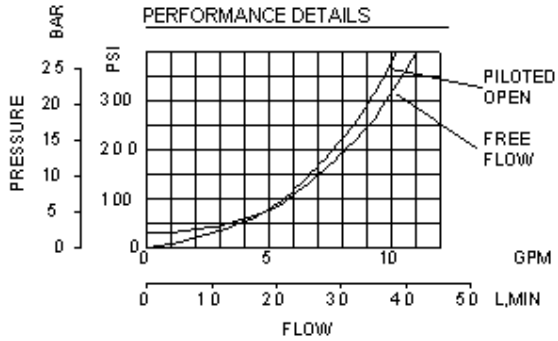
CONFIGURATION OPTIONS
Model Code Example: CKBBXCN

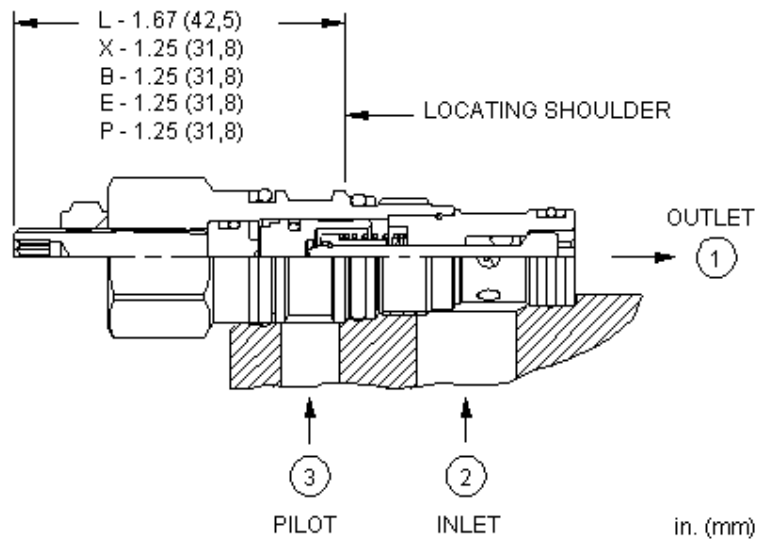
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
L Manual Load Release	E 75 psi (5 bar)	E EPDM	/AP Stainless Steel, Passivated
		V Viton	/LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Standard unsealed pilot allows air trapped in the pilot line to be purged from the circuit.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Note: Available only with 30 psi or 75 psi (2 bar or 5 bar) check valve cracking pressures.
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance valves.
- For models with manual load release control option, turn load release clockwise to release load.
- 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 pilot to open check valve. It has a sealed pilot, a steel seat, and is non-vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) will open the valve from port 1 to port 2. Pilot pressure needed at port 3 to open the valve is directly proportional to the load pressure at port 1. Pressure at port 2 directly opposes pilot pressure.

TECHNICAL DATA

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

Cavity	T-163A
Series	0
Capacity	30 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	EPDM: 990163014
Seal kit - Cartridge	Polyurethane: 990163002
Seal kit - Cartridge	Viton: 990163006
Model Weight	0.09 kg.

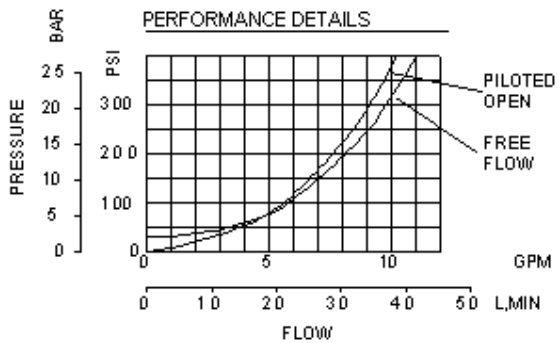
CONFIGURATION OPTIONS
Model Code Example: CKBDXCN

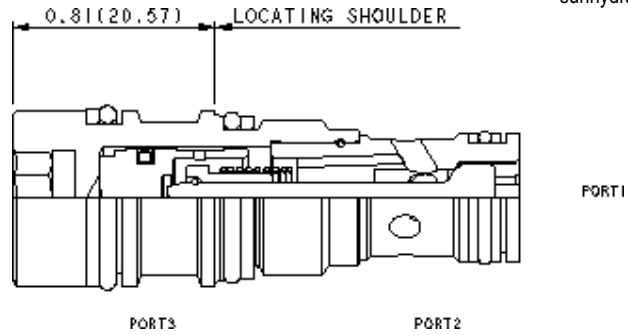
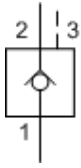
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
L Manual Load Release	E 75 psi (5 bar)	E EPDM	/AP Stainless Steel, Passivated
		V Viton	/LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Sealed pilot for use in circuits where cross port leakage is undesirable.
- Note: Available only with 30 psi or 75 psi (2 bar or 5 bar) check valve cracking pressures.
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance valves.
- For models with manual load release control option, turn load release clockwise to release load.
- 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





This valve is a pilot to open check valve. It has a sealed pilot, a steel seat, and is non-vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) will open the valve from port 1 to port 2. Pilot pressure needed at port 3 to open the valve is directly proportional to the load pressure at port 1. Pressure at port 2 directly opposes pilot pressure.

TECHNICAL DATA

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

Cavity	T-163A
Series	0
Capacity	30 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Valve Internal Hex Size	8 mm
Valve Installation Torque	27 - 33 Nm
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	Polyurethane: 990163002
Seal kit - Cartridge	Viton: 990163006
Model Weight	0.06 kg.

CONFIGURATION OPTIONS

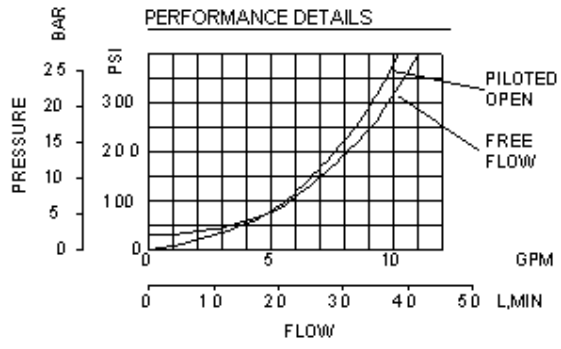
Model Code Example: **CKBGXCN**

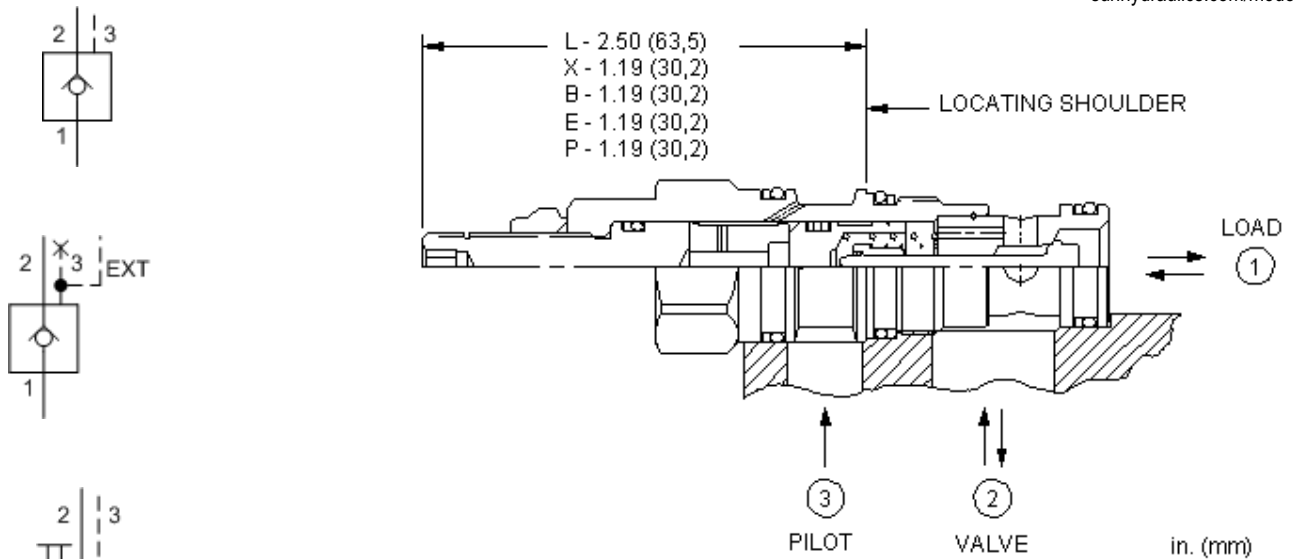
CONTROL	(X) BIAS PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable, Standard Hydraulic Pilot	C 30 psi (2 bar) E 75 psi (5 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Sealed pilot for use in circuits where cross port leakage is undesirable.
- Note: Available only with 30 psi or 75 psi (2 bar or 5 bar) check valve cracking pressures.
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance 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





This valve is a pilot to open check valve. It has a non-sealed pilot, a steel seat, and is non-vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) will open the valve from port 1 to port 2. Pilot pressure needed at port 3 to open the valve is directly proportional to the load pressure at port 1. Pressure at port 2 directly opposes pilot pressure.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	60 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.13 kg.

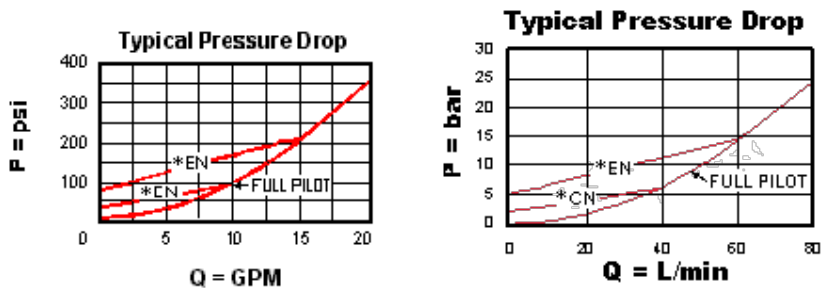
CONFIGURATION OPTIONS
Model Code Example: CKCBXCN

CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
L Manual Load Release	A 4 psi (0,3 bar)	E EPDM	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		

TECHNICAL FEATURES

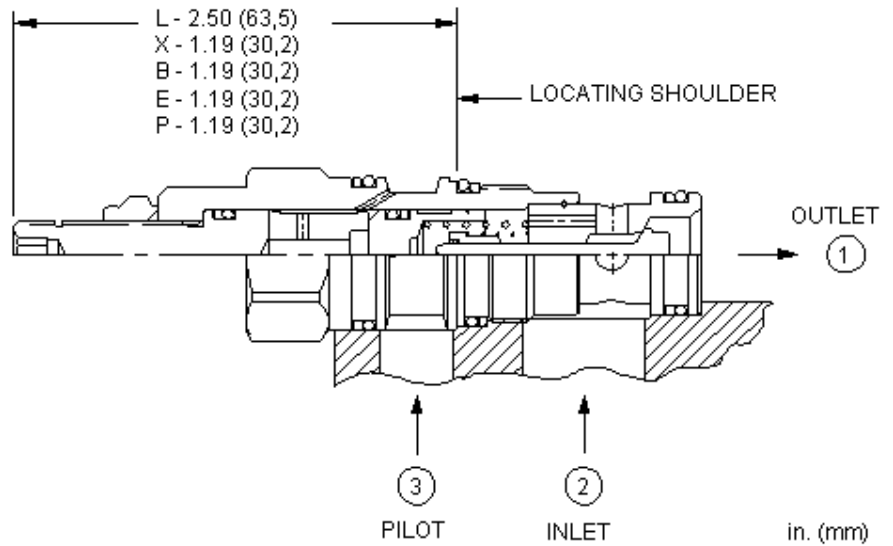
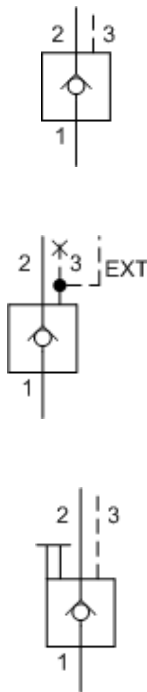
- This 3 port pilot-to-open check valve and 3 port counterbalance valves are physically interchangeable (i.e. same cavities, same flow path for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Standard unsealed pilot allows air trapped in the pilot line to be purged from the circuit.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Optional external porting out of the hex end of the cartridge is available for external piloting. In this configuration, port 3 is blocked. See Control options E, and P.
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance valves.
- For models with manual load release control option, turn load release clockwise to release load.
- 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

- [CKCBS](#) Vented pilot-to-open check valve with SAE-4 external pilot port and standard pilot
- [CKCBV](#) Vented pilot-to-open check valve with 1/4 NPTF external pilot port and standard pilot



This valve is a pilot to open check valve. It has a sealed pilot, a steel seat, and is non-vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) will open the valve from port 1 to port 2. Pilot pressure needed at port 3 to open the valve is directly proportional to the load pressure at port 1. Pressure at port 2 directly opposes pilot pressure.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	60 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.13 kg.

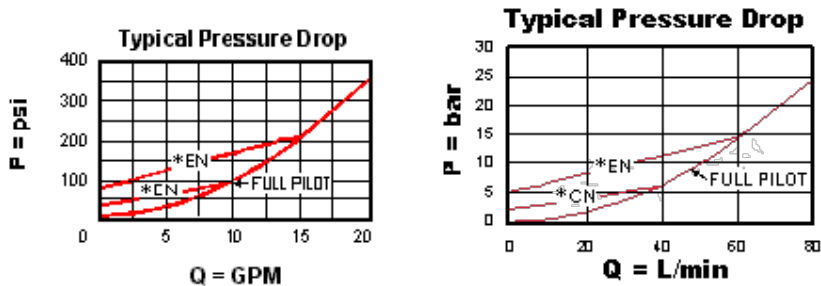
CONFIGURATION OPTIONS
Model Code Example: CKCDXCN

CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
L Manual Load Release	A 4 psi (0,3 bar)	E EPDM	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		
	G 150 psi (10,5 bar)		

TECHNICAL FEATURES

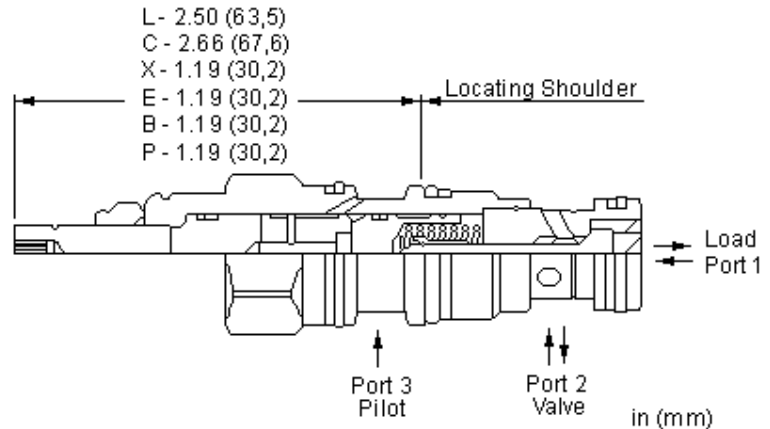
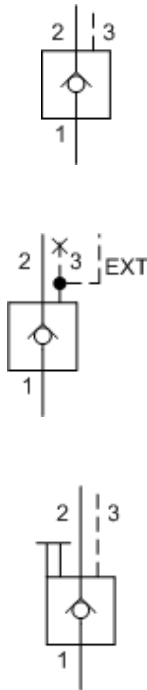
- This 3 port pilot-to-open check valve and 3 port counterbalance valves are physically interchangeable (i.e. same cavities, same flow path for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Sealed pilot for use in circuits where cross port leakage is undesirable.
- Optional external porting out of the hex end of the cartridge is available for external piloting. In this configuration, port 3 is blocked. See Control options E, and P.
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance valves.
- For models with manual load release control option, turn load release clockwise to release load.
- 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

- [CKCDS](#) Vented pilot-to-open check valve with SAE-4 external pilot port and sealed pilot
- [CKCDV](#) Vented pilot-to-open check valve with 1/4 NPTF external pilot port and sealed pilot



This valve is a pilot to open check valve. It has a non-sealed pilot, a steel seat, and is non-vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) will open the valve from port 1 to port 2. Pilot pressure needed at port 3 to open the valve is directly proportional to the load pressure at port 1. Pressure at port 2 directly opposes pilot pressure.

TECHNICAL DATA

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

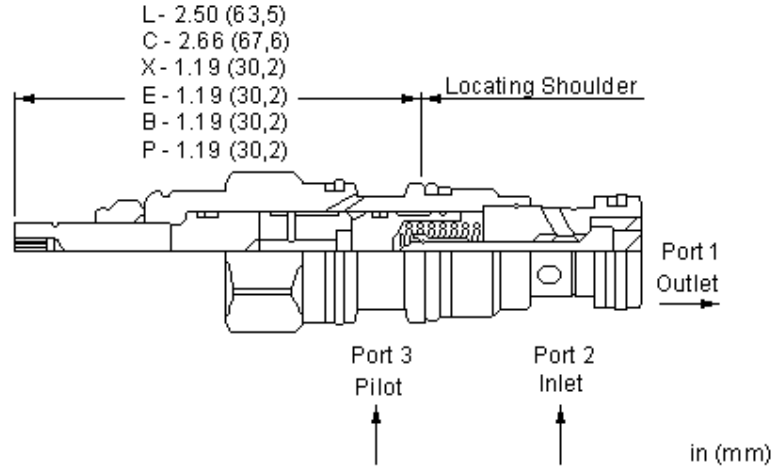
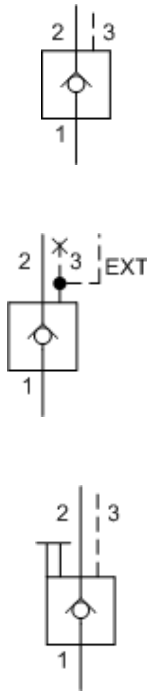
Cavity	T-11A
Series	1
Capacity	60 L/min.
Pilot Ratio	5:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.13 kg.

CONFIGURATION OPTIONS
Model Code Example: CKCRXCN

CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
B External 1/4 BSPP Pilot Port, Port 3 blocked	A 4 psi (0,3 bar)	V Viton	/AP Stainless Steel, Passivated
C Manual Load Release - Tamper Resistant	B 15 psi (1 bar)		/LH Mild Steel, Zinc-Nickel
E External 4-SAE Pilot Port, Port 3 Blocked	D 50 psi (3,5 bar)		
L Manual Load Release	E 75 psi (5 bar)		
P External 1/4 NPTF Pilot Port, Port 3 Blocked	F 100 psi (7 bar)		
	Z 1 psi (0,07 bar)		

TECHNICAL FEATURES

- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Standard unsealed pilot allows air trapped in the pilot line to be purged from the circuit.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Optional external porting out of the hex end of the cartridge is available for external piloting. In this configuration, port 3 is blocked. See Control options E, and P.
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance valves.
- This 3 port pilot-to-open check valve and 3 port counterbalance valves are physically interchangeable (i.e. same cavities, same flow path for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- For models with manual load release control option, turn load release clockwise to release load.
- 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.



This valve is a pilot to open check valve. It has a sealed pilot, a steel seat, and is non-vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) will open the valve from port 1 to port 2. Pilot pressure needed at port 3 to open the valve is directly proportional to the load pressure at port 1. Pressure at port 2 directly opposes pilot pressure.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	60 L/min.
Pilot Ratio	5:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.13 kg.

CONFIGURATION OPTIONS

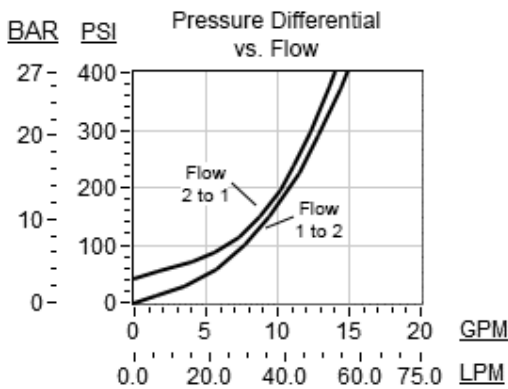
Model Code Example: CKCSXCN

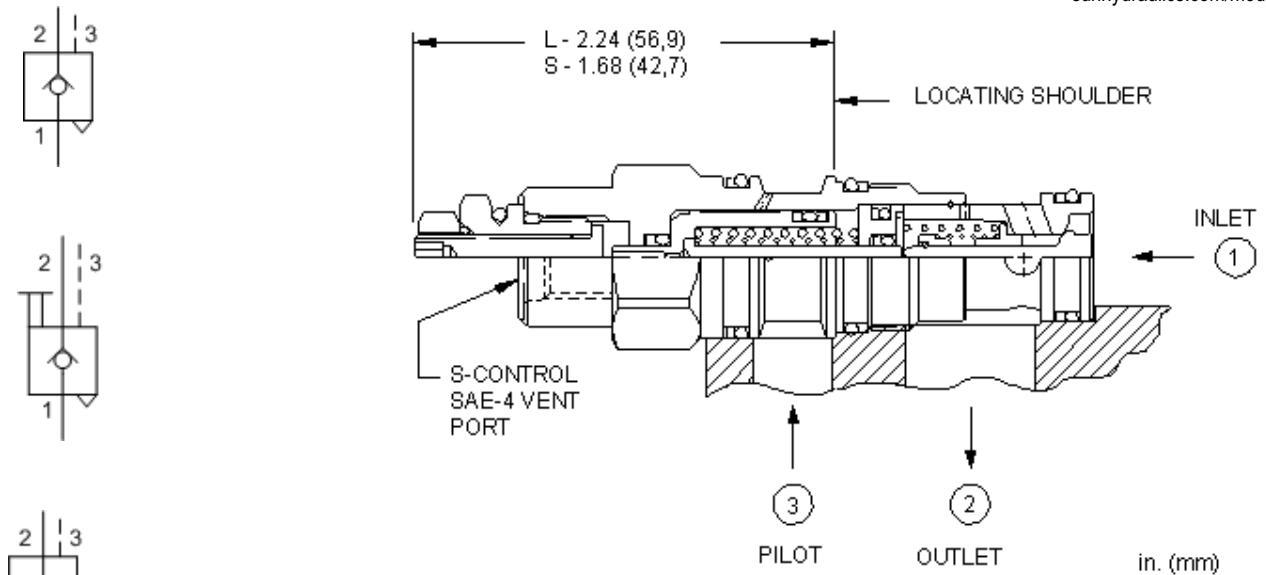
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N)
X Standard Pilot	C 30 psi (2 bar)	N Buna-N	
B External 1/4 BSPP Pilot Port, Port 3 blocked	A 4 psi (0,3 bar)	V Viton	
C Manual Load Release - Tamper Resistant	B 15 psi (1 bar)		
E External 4-SAE Pilot Port, Port 3 Blocked	D 50 psi (3,5 bar)		
L Manual Load Release	E 75 psi (5 bar)		
P External 1/4 NPTF Port, Port 3 blocked	F 100 psi (7 bar)		
	Z 1 psi (0,07 bar)		

TECHNICAL FEATURES

- This 3 port pilot-to-open check valve and 3 port counterbalance valves are physically interchangeable (i.e. same cavities, same flow path for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- For models with manual load release control option, turn load release clockwise to release load.
- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Sealed pilot for use in circuits where cross port leakage is undesirable.
- Optional external porting out of the hex end of the cartridge is available for external piloting. In this configuration, port 3 is blocked. See Control options E, and P.
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance valves.
- 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





This valve is a pilot to open check valve. It has a sealed pilot, a steel seat, and is vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) pilot port will open the valve from port 1 to port 2. Pilot pressure needed to open the valve is directly proportional to the load pressure at port 1. The valve is insensitive to pressure at port 2 because the spring chamber is referenced out the back of the hex body.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	60 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990311007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990311006
Model Weight	0.15 kg.

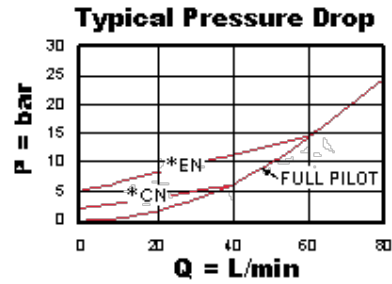
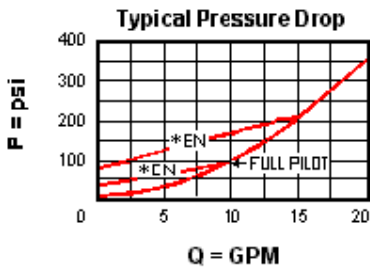
CONFIGURATION OPTIONS
Model Code Example: CKCVXCN

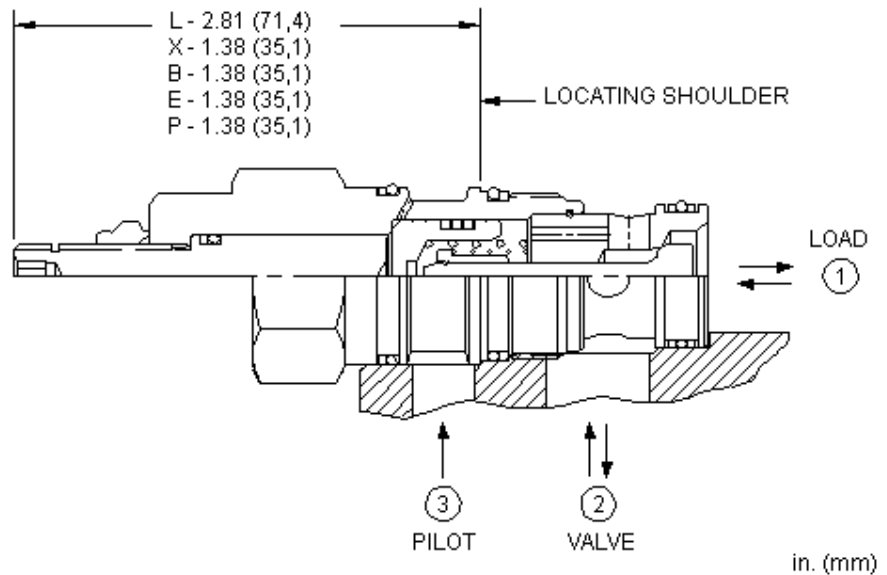
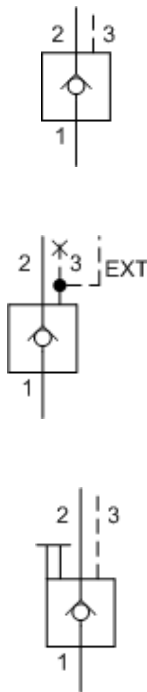
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot, Atmospheric Vent	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
S External 4- <small>SAE</small> Vent Port	A 4 psi (0,3 bar)	V Viton	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)		/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		

TECHNICAL FEATURES

- Pilot pressure as low as 75 psi (5 bar) higher than the pressure at the vent can prevent the valve from closing.
- Atmospherically referenced pilot-to-open check valves are considered problem solvers for existing circuits using non-vented valves. However, the atmospherically referenced valve will eventually leak externally or allow moisture into the spring chamber. Four-port vented pilot-to-open check cartridges are recommended for new applications.
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance valves.
- Approximately 1 drop (0,07 cc) of fluid will pass from the pilot area to the vented spring chamber every 4000 cycles.
- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Sealed pilot for use in circuits where cross port leakage is undesirable.
- 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 pilot to open check valve. It has a non-sealed pilot, a steel seat, and is non-vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) will open the valve from port 1 to port 2. Pilot pressure needed at port 3 to open the valve is directly proportional to the load pressure at port 1. Pressure at port 2 directly opposes pilot pressure.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	120 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.24 kg.

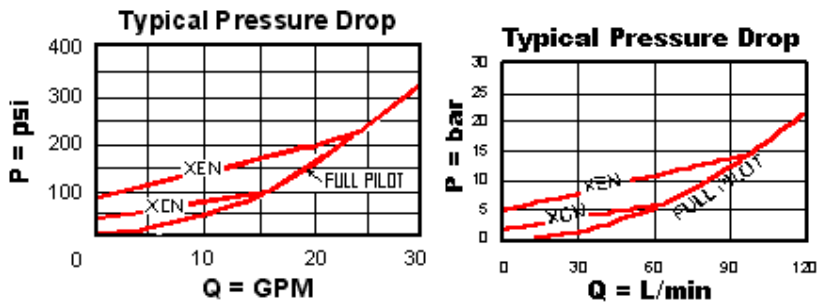
CONFIGURATION OPTIONS
Model Code Example: CKEBXC�

CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
L Manual Load Release	A 4 psi (0,3 bar)	E EPDM	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		

TECHNICAL FEATURES

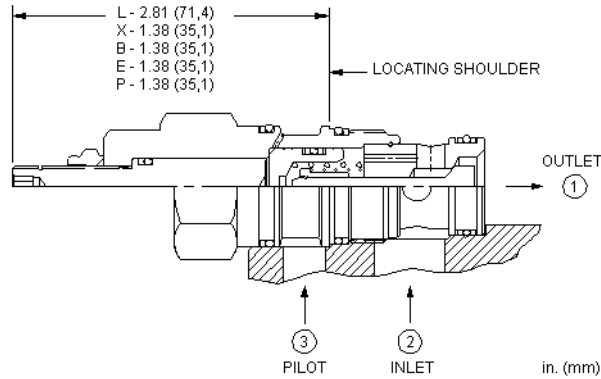
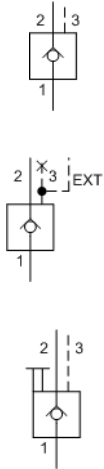
- This 3 port pilot-to-open check valve and 3 port counterbalance valves are physically interchangeable (i.e. same cavities, same flow path for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Standard unsealed pilot allows air trapped in the pilot line to be purged from the circuit.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Optional external porting out of the hex end of the cartridge is available for external piloting. In this configuration, port 3 is blocked. See Control options E, and P.
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance valves.
- For models with manual load release control option, turn load release clockwise to release load.
- 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

- [CKEBS](#) Vented pilot-to-open check valve with SAE-4 external pilot port and standard pilot
- [CKEBV](#) Vented pilot-to-open check valve with 1/4 NPTF external pilot port and standard pilot



This valve is a pilot to open check valve. It has a sealed pilot, a steel seat, and is non-vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) will open the valve from port 1 to port 2. Pilot pressure needed at port 3 to open the valve is directly proportional to the load pressure at port 1. Pressure at port 2 directly opposes pilot pressure.

TECHNICAL DATA

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

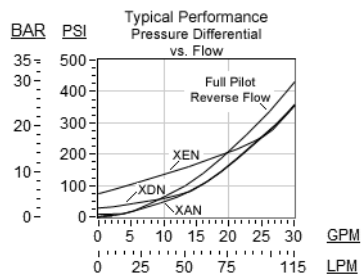
Cavity	T-2A
Series	2
Capacity	120 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0,24 kg.

CONFIGURATION OPTIONS
Model Code Example: CKEDXCN

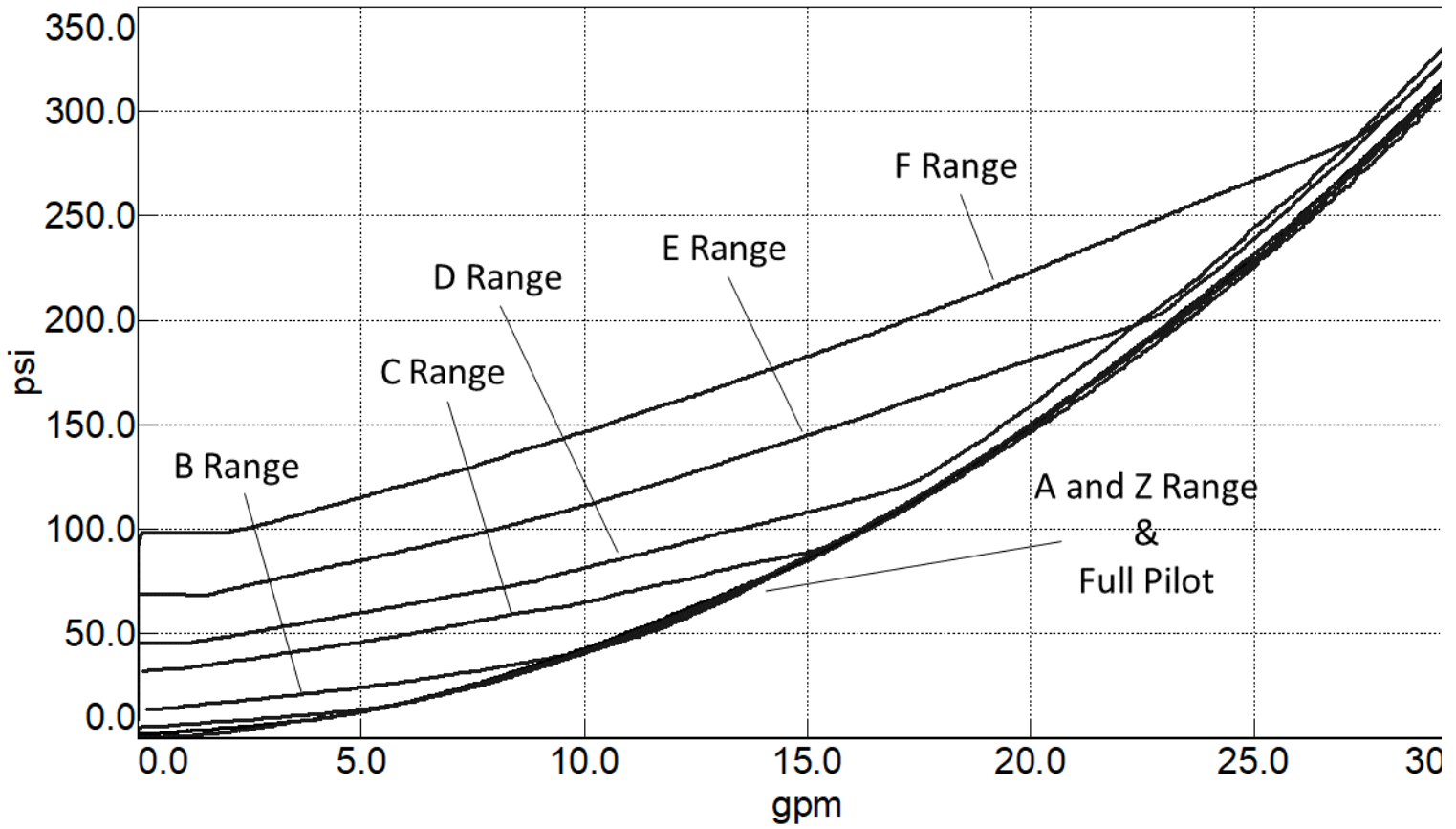
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
L Manual Load Release	A 4 psi (0,3 bar) B 15 psi (1 bar) D 50 psi (3,5 bar) E 75 psi (5 bar) F 100 psi (7 bar)	V Viton	/AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

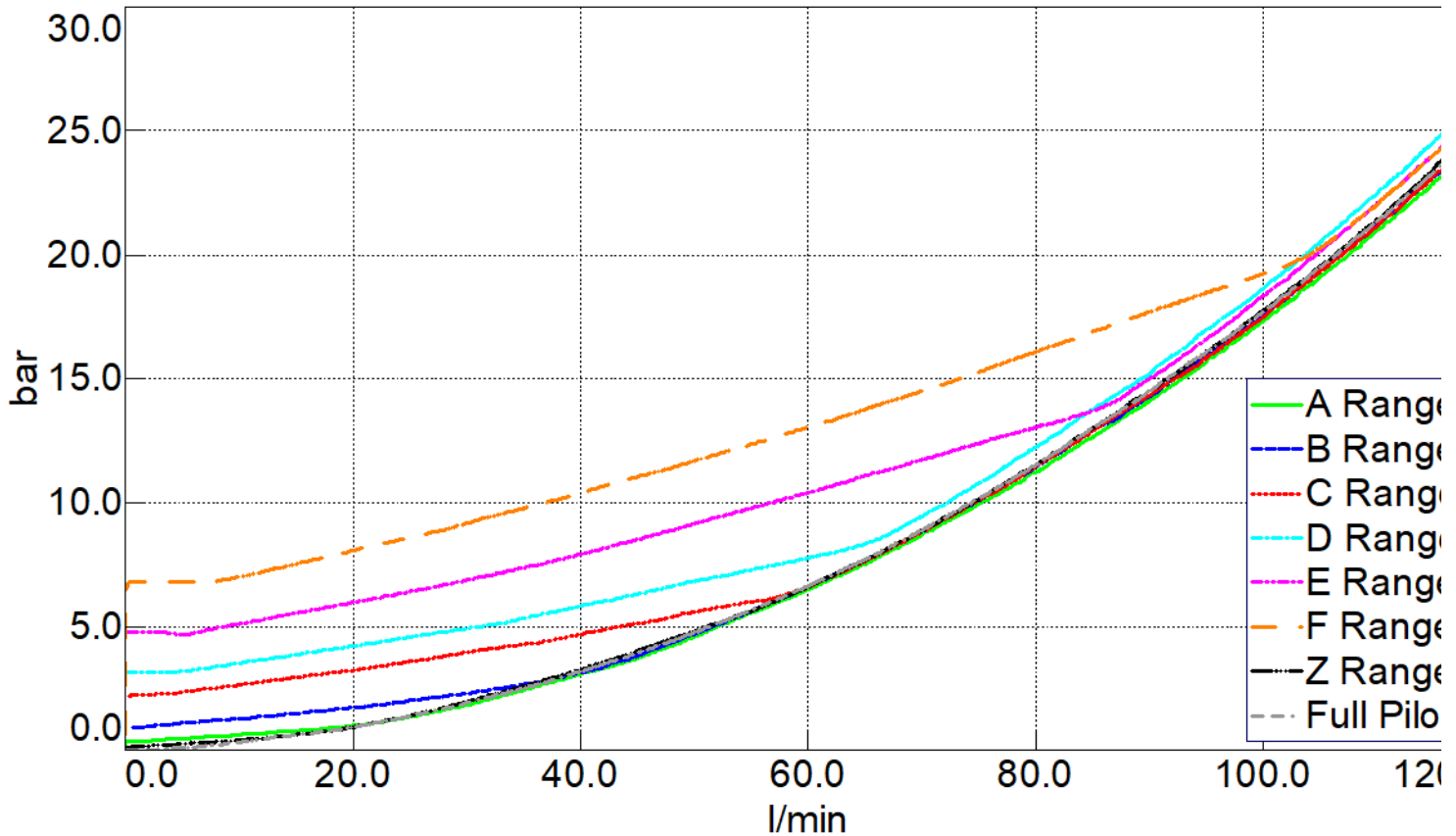
- For models with manual load release control option, turn load release clockwise to release load.
- This 3 port pilot-to-open check valve and 3 port counterbalance valves are physically interchangeable (i.e. same cavities, same flow path for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Sealed pilot for use in circuits where cross port leakage is undesirable.
- Optional external porting out of the hex end of the cartridge is available for external piloting. In this configuration, port 3 is blocked. See Control options E, and P.
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance valves.
- 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


CKED Performance Curve Test

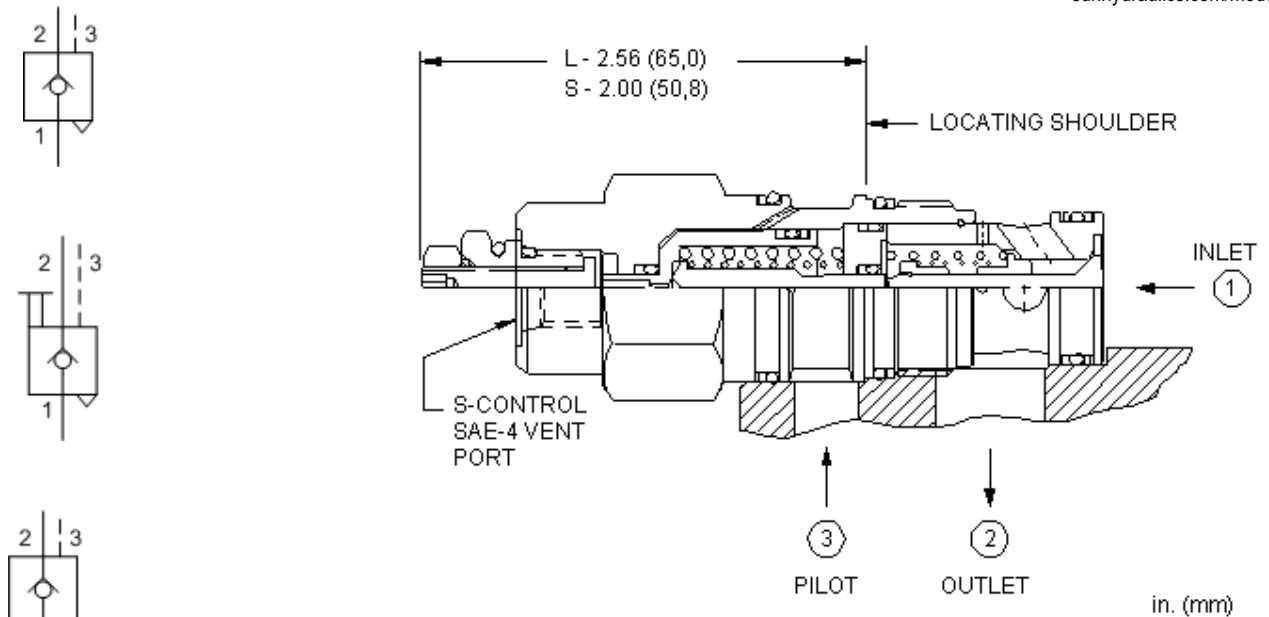


CKED Website Curve Test



RELATED MODELS

- [CKEDS](#) Vented pilot-to-open check valve with SAE-4 external pilot port and sealed pilot
- [CKEDV](#) Vented pilot-to-open check valve with 1/4 NPTF external pilot port and sealed pilot



This valve is a pilot to open check valve. It has a sealed pilot, a steel seat, and is vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) pilot port will open the valve from port 1 to port 2. Pilot pressure needed to open the valve is directly proportional to the load pressure at port 1. The valve is insensitive to pressure at port 2 because the spring chamber is referenced out the back of the hex body.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	120 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.29 kg.

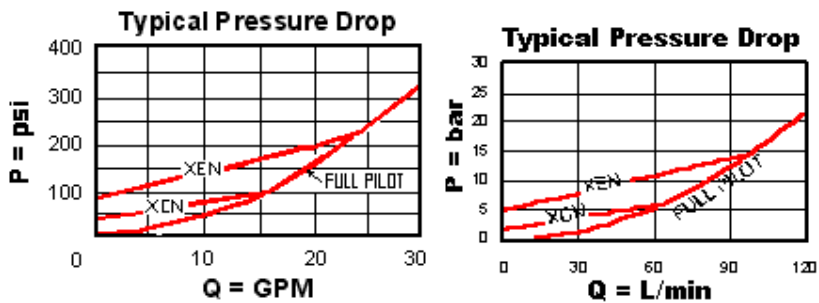
CONFIGURATION OPTIONS
Model Code Example: CKEVXCN

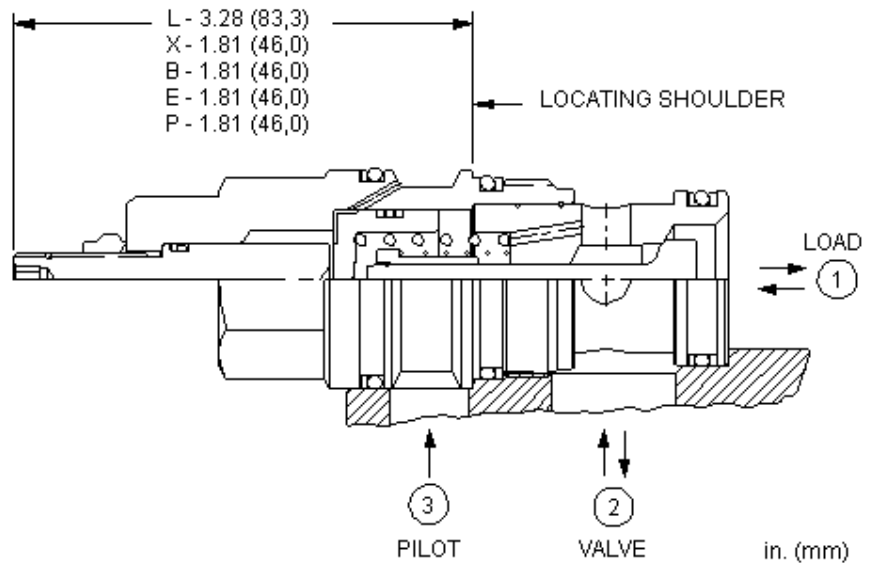
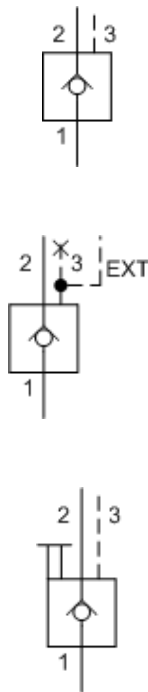
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N)
X Standard Pilot, Atmospheric Vent	C 30 psi (2 bar)	N Buna-N	
S External 4-SAE Vent Port	A 4 psi (0,3 bar)	V Viton	
	B 15 psi (1 bar)		
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		

TECHNICAL FEATURES

- There is a positive seal between ports 2 and 3.
- Pilot pressure as low as 75 psi (5 bar) higher than the pressure at the vent can prevent the valve from closing.
- Atmospherically referenced pilot-to-open check valves are considered problem solvers for existing circuits using non-vented valves. However, the atmospherically referenced valve will eventually leak externally or allow moisture into the spring chamber. Four-port vented pilot-to-open check cartridges are recommended for new applications.
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance valves.
- Approximately 1 drop (0,07 cc) of fluid will pass from the pilot area to the vented spring chamber every 4000 cycles.
- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Sealed pilot for use in circuits where cross port leakage is undesirable.
- For models with manual load release control option, turn load release clockwise to release load.
- 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 pilot to open check valve. It has a non-sealed pilot, a steel seat, and is non-vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) will open the valve from port 1 to port 2. Pilot pressure needed at port 3 to open the valve is directly proportional to the load pressure at port 1. Pressure at port 2 directly opposes pilot pressure.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	240 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.53 kg.

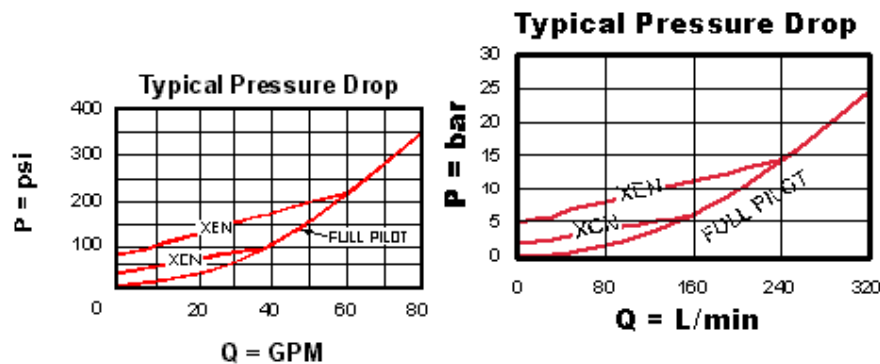
CONFIGURATION OPTIONS
Model Code Example: CKGBXCN

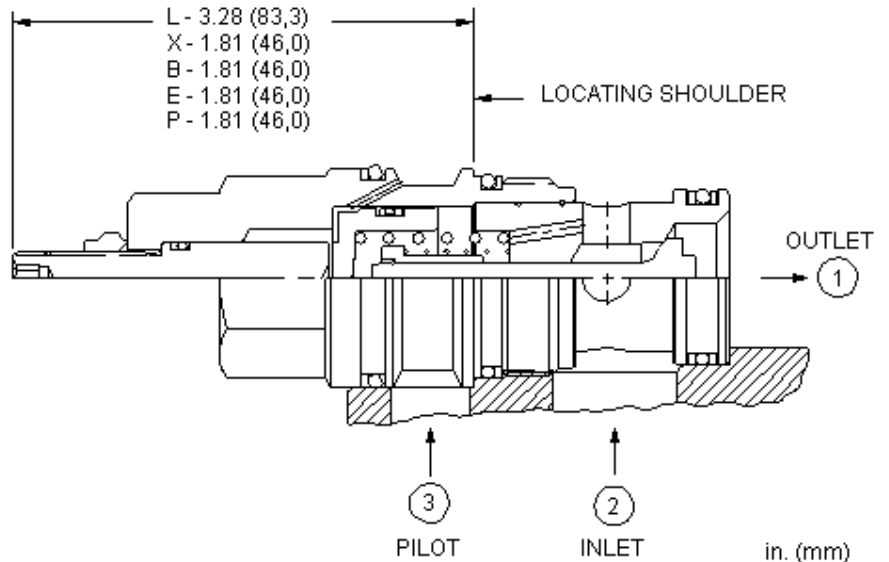
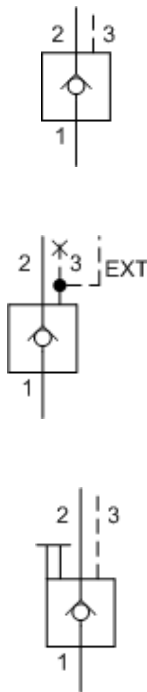
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
L Manual Load Release	A 4 psi (0,3 bar)	E EPDM	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		

TECHNICAL FEATURES

- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Standard unsealed pilot allows air trapped in the pilot line to be purged from the circuit.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Optional external porting out of the hex end of the cartridge is available for external piloting. In this configuration, port 3 is blocked. See Control options E, and P.
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance valves.
- This 3 port pilot-to-open check valve and 3 port counterbalance valves are physically interchangeable (i.e. same cavities, same flow path for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- For models with manual load release control option, turn load release clockwise to release load.
- 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





This valve is a pilot to open check valve. It has a sealed pilot, a steel seat, and is non-vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) will open the valve from port 1 to port 2. Pilot pressure needed at port 3 to open the valve is directly proportional to the load pressure at port 1. Pressure at port 2 directly opposes pilot pressure.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	240 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.53 kg.

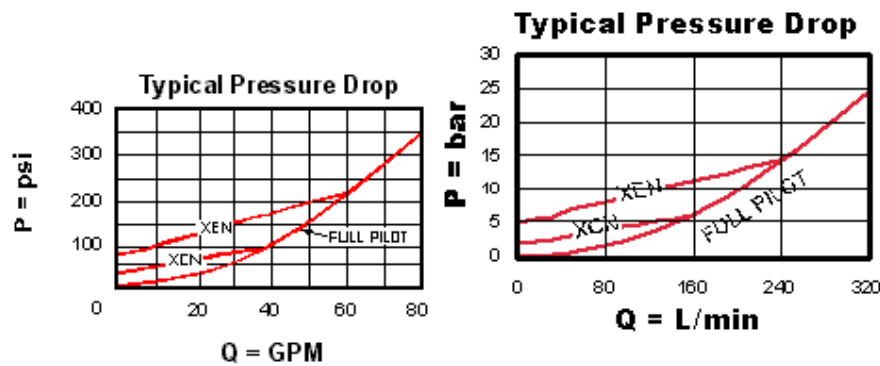
CONFIGURATION OPTIONS
Model Code Example: CKGDXCN

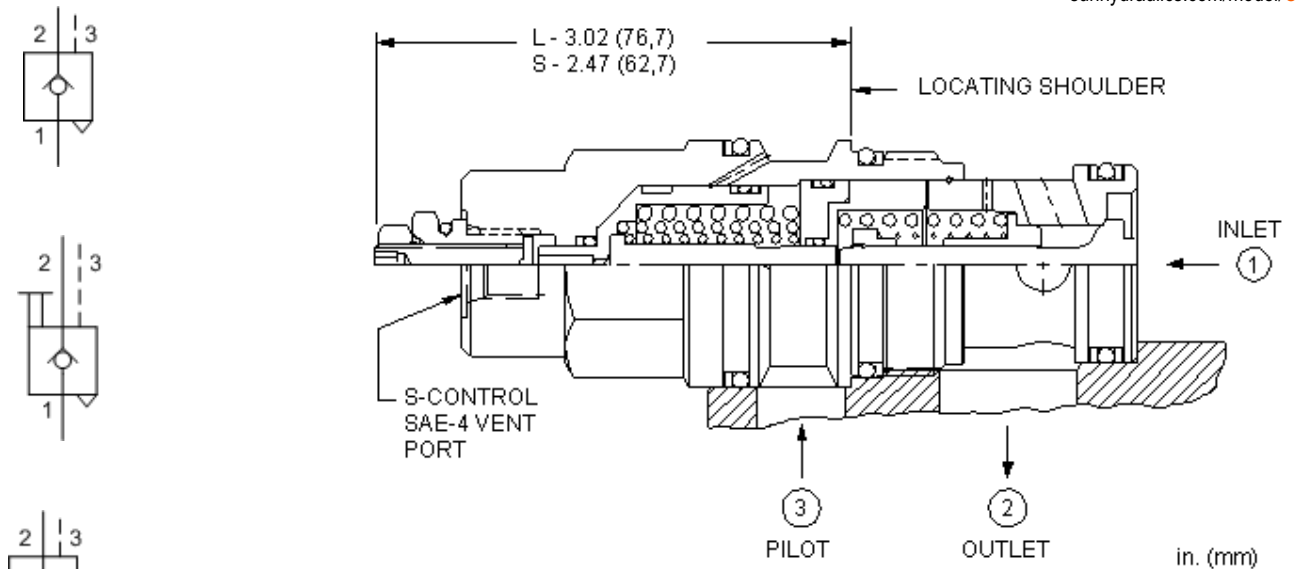
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
L Manual Load Release	A 4 psi (0,3 bar)	E EPDM	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		

TECHNICAL FEATURES

- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Sealed pilot for use in circuits where cross port leakage is undesirable.
- Optional external porting out of the hex end of the cartridge is available for external piloting. In this configuration, port 3 is blocked. See Control options E, and P.
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance valves.
- This 3 port pilot-to-open check valve and 3 port counterbalance valves are physically interchangeable (i.e. same cavities, same flow path for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- For models with manual load release control option, turn load release clockwise to release load.
- 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





This valve is a pilot to open check valve. It has a sealed pilot, a steel seat, and is vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) pilot port will open the valve from port 1 to port 2. Pilot pressure needed to open the valve is directly proportional to the load pressure at port 1. The valve is insensitive to pressure at port 2 because the spring chamber is referenced out the back of the hex body.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	240 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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.

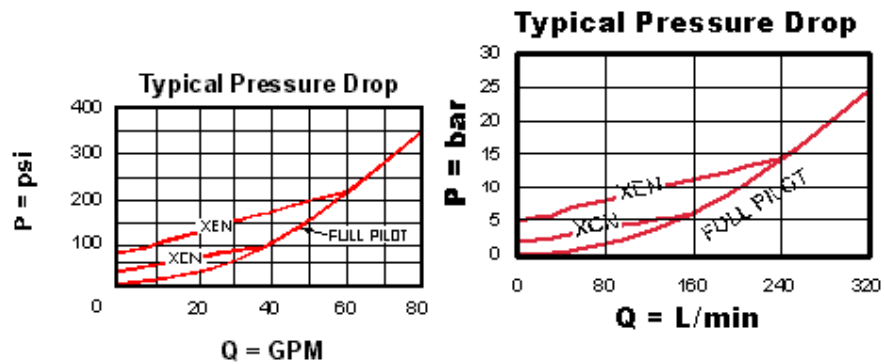
CONFIGURATION OPTIONS
Model Code Example: CKGVXCN

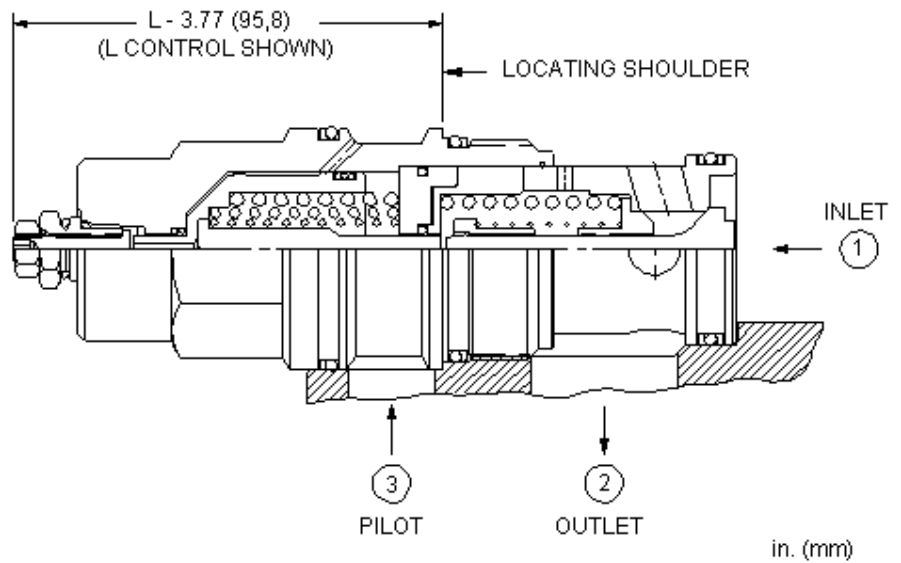
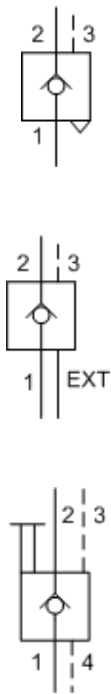
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot, Atmospheric Vent	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
S External 4-SAE Vent Port	A 4 psi (0,3 bar)	V Viton	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)		
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		

TECHNICAL FEATURES

- There is a positive seal between ports 2 and 3.
- Pilot pressure as low as 75 psi (5 bar) higher than the pressure at the vent can prevent the valve from closing.
- Atmospherically referenced pilot-to-open check valves are considered problem solvers for existing circuits using non-vented valves. However, the atmospherically referenced valve will eventually leak externally or allow moisture into the spring chamber. Four-port vented pilot-to-open check cartridges are recommended for new applications.
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance valves.
- Approximately 1 drop (0,07 cc) of fluid will pass from the pilot area to the vented spring chamber every 4000 cycles.
- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Sealed pilot for use in circuits where cross port leakage is undesirable.
- For models with manual load release control option, turn load release clockwise to release load.
- 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 pilot to open check valve. It has a sealed pilot, a steel seat, and is vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) pilot port will open the valve from port 1 to port 2. Pilot pressure needed to open the valve is directly proportional to the load pressure at port 1. The valve is insensitive to pressure at port 2 because the spring chamber is referenced out the back of the hex body.

TECHNICAL DATA

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

Cavity	T-19A
Series	4
Capacity	480 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	1.39 kg.

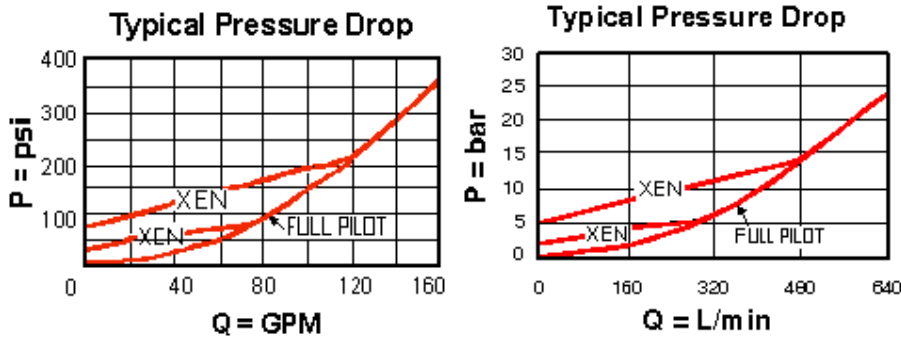
CONFIGURATION OPTIONS
Model Code Example: CKIVXCN

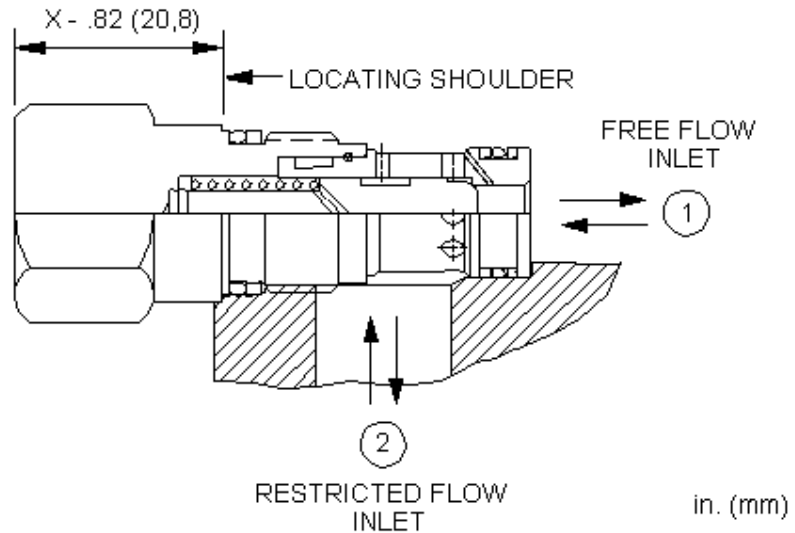
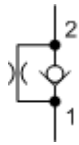
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot, Atmospheric Vent	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
S External 4-SAE Vent Port	A 4 psi (0,3 bar)	V Viton	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)		
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		

TECHNICAL FEATURES

- There is a positive seal between ports 2 and 3.
- Pilot pressure as low as 75 psi (5 bar) higher than the pressure at the vent can prevent the valve from closing.
- Atmospherically referenced pilot-to-open check valves are considered problem solvers for existing circuits using non-vented valves. However, the atmospherically referenced valve will eventually leak externally or allow moisture into the spring chamber. Four-port vented pilot-to-open check cartridges are recommended for new applications.
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance valves.
- Approximately 1 drop (0,07 cc) of fluid will pass from the pilot area to the vented spring chamber every 4000 cycles.
- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Sealed pilot for use in circuits where cross port leakage is undesirable.
- For models with manual load release control option, turn load release clockwise to release load.
- 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





Free-flow, nose-to-side check valves with a bypass orifice allow free flow from port 1 to port 2. A customer specified orifice is included to restrict flow from port 2 to port 1. See technical data below for orifice range.

TECHNICAL DATA

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

Cavity	T-162A
Series	0
Capacity	30 L/min.
Maximum Operating Pressure	350 bar
Orifice Range	0,4 - 1,6 mm
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	EPDM: 990162014
Seal kit - Cartridge	Polyurethane: 990162002
Seal kit - Cartridge	Viton: 990162006
Model Weight	0.08 kg.

CONFIGURATION OPTIONS

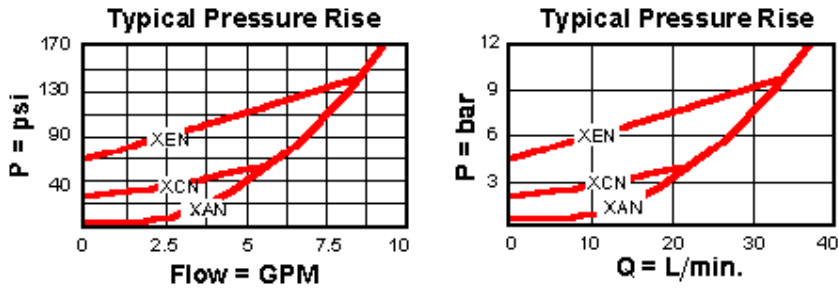
Model Code Example: **CNBCXCN**

CONTROL	(X) SETTING RANGE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	<p>C 30 psi (2 bar) Cracking Pressure, .016 - .062 in. (0,4 - 1,6 mm)</p> <p>A 4 psi (0,3 bar) Cracking Pressure, .016 - .062 in. (0,4 - 1,6 mm)</p> <p>B 15 psi (1 bar) Cracking Pressure, .016 - .062 in. (0,4 - 1,6 mm)</p> <p>D 50 psi (3,5 bar) Cracking Pressure, .016 - .062 in. (0,4 - 1,6 mm)</p> <p>E 75 psi (5 bar) Cracking Pressure, .016 - .062 in. (0,4 - 1,6 mm)</p> <p>F 100 psi (7 bar) Cracking Pressure, .016 - .062 in. (0,4 - 1,6 mm)</p>	<p>N Buna-N</p> <p>E EPDM</p> <p>V Viton</p>	<p>Standard Material/Coating</p> <p>/AP Stainless Steel, Passivated</p>

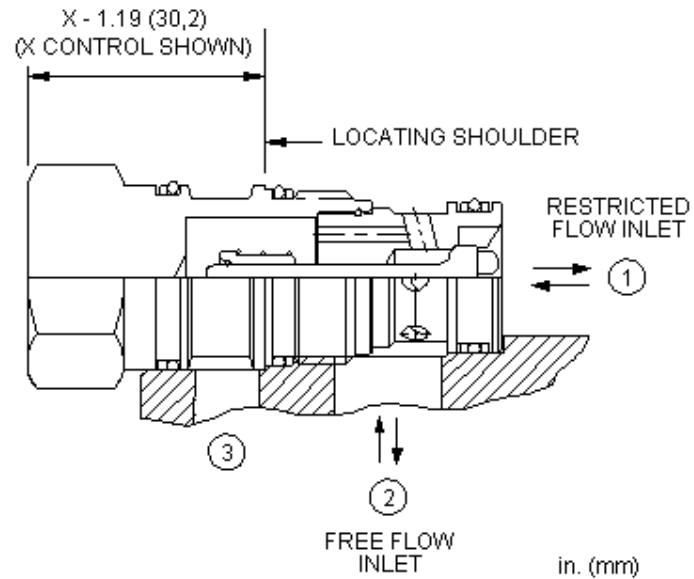
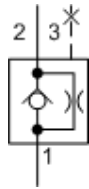
TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- Valves with the opposite flow path (free flow from 2 to 1) are considered flow controls and may be found listed as fixed orifice, non-pressure compensated flow control valve with reverse flow check.
- 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 customer specified orifice diameter is stamped on one of the cartridge's hex faces.
- 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



Note: Performance data shown reflects a blocked orifice.



Free-flow, side-to-nose cheater check valves with a bypass orifice function as a 2-port check valve in a 3-port cavity. They allow free flow from port 2 to port 1 with a customer specified orifice that controls flow from port 1 to port 2. Port 3 of the cartridge is blocked off.

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
Orifice Range	0,4 - 3,9 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	0.12 kg.

CONFIGURATION OPTIONS

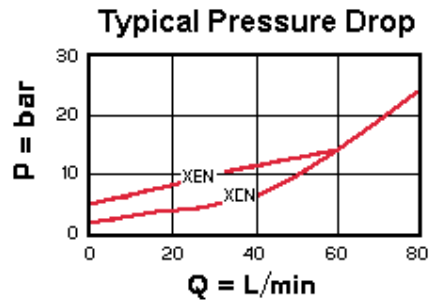
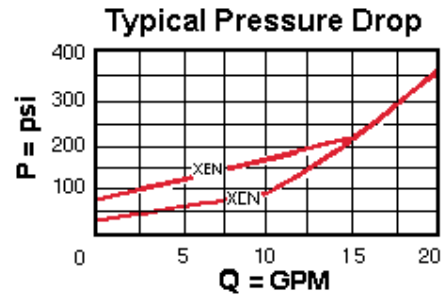
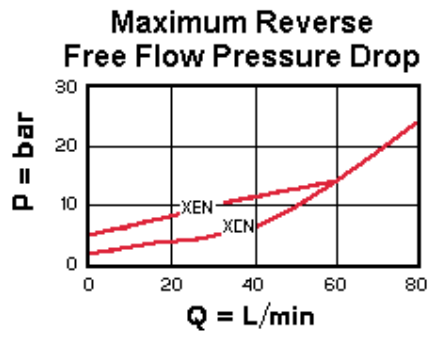
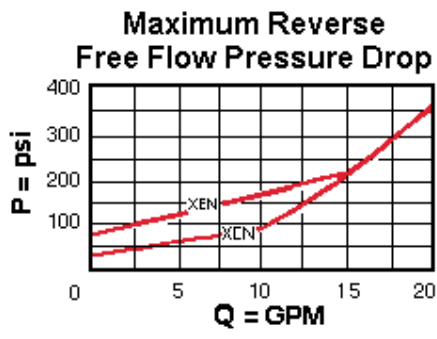
Model Code Example: **CNCDXCN**

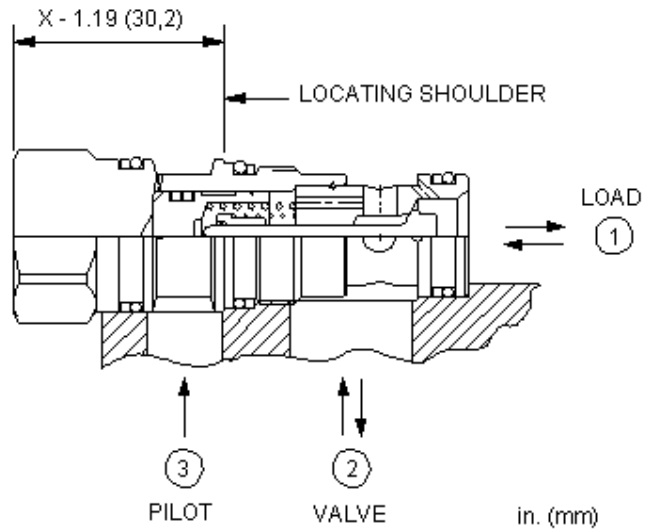
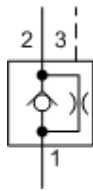
CONTROL	(X) SETTING RANGE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) Cracking Pressure, .016 - .153 in. (0,4 - 3,9 mm)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- When used in a full time regeneration circuit these valves allow full force to be developed by the cylinder when it comes to a stop. The bypass orifice drops the rod end pressure to zero when flow out of the rod stops.
- The customer specified orifice diameter is stamped on one of the cartridge's hex faces.
- 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 pilot to open check valve with a bypass orifice. It incorporates a sealed pilot, a steel seat, and is non-vented. It allows free flow from the valve (port 2) to the load (port 1) and restricts flow in the opposite direction. Pressure at the pilot (port 3) will open the valve from port 1 to port 2. The pilot pressure needed at port 3 to open the valve is directly proportional to the load pressure at port 1. Pressure at port 2 directly opposes the pilot pressure. Note: The bypass orifice diameter is specified by the customer. See Technical Data below for the allowable orifice range.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	60 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Orifice Range	0,4 - 3,9 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	0.13 kg.

CONFIGURATION OPTIONS

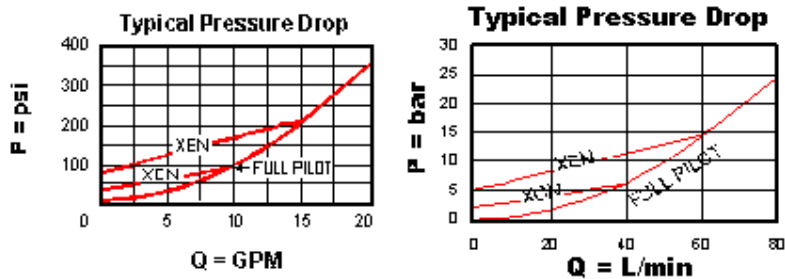
Model Code Example: CNCEXCN

CONTROL	(X) SETTING RANGE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) Cracking Pressure, .016 - .153 in. (0,4 - 3,9 mm) A 4 psi (0,3 bar) Cracking Pressure, .016 - .153 in. (0,4 - 3,9 mm) B 15 psi (1 bar) Cracking Pressure, .016 - .153 in. (0,4 - 3,9 mm) D 50 psi (3,5 bar) Cracking Pressure, .016 - .153 in. (0,4 - 3,9 mm) E 75 psi (5 bar) Cracking Pressure, .016 - .153 in. (0,4 - 3,9 mm) F 100 psi (7 bar) Cracking Pressure, .016 - .153 in. (0,4 - 3,9 mm)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

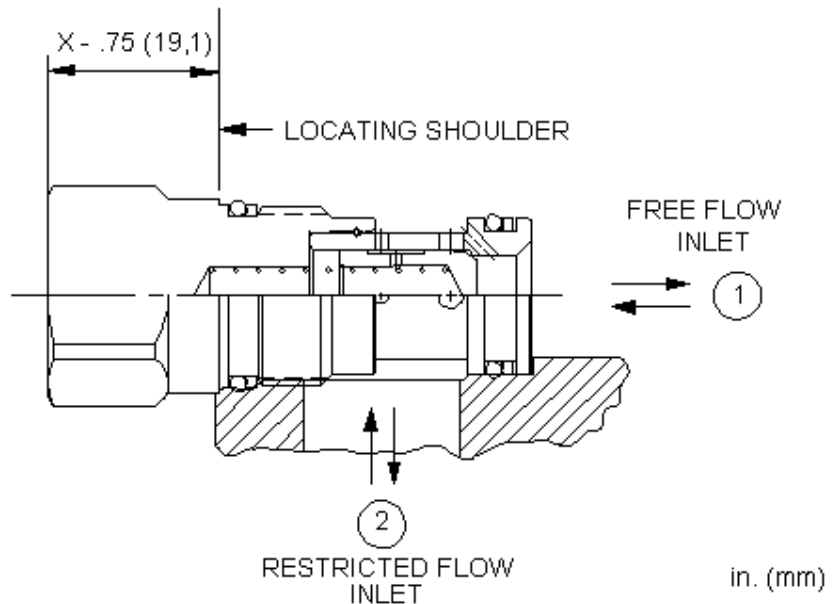
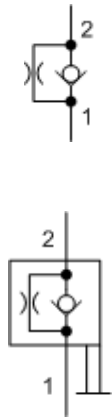
TECHNICAL FEATURES

- Sealed pilot for use in circuits where cross port leakage is undesirable.
- The customer specified orifice diameter is stamped on one of the cartridge's hex faces.
- For models with manual load release control option, turn load release clockwise to release load.
- This 3 port pilot-to-open check valve and 3 port counterbalance valves are physically interchangeable (i.e. same cavities, same flow path for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- 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



Note: Performance data shown reflects a blocked orifice.



Free-flow, nose-to-side check valves with a bypass orifice allow free flow from port 1 to port 2. A customer specified orifice is included to restrict flow from port 2 to port 1. See technical data below for orifice range.

TECHNICAL DATA

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

Cavity	T-13A
Series	1
Capacity	60 L/min.
Maximum Operating Pressure	350 bar
Orifice Range	0,4 - 2,7 mm
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990010007
Seal kit - Cartridge	Polyurethane: 990010002
Seal kit - Cartridge	Viton: 990010006
Model Weight	0.11 kg.

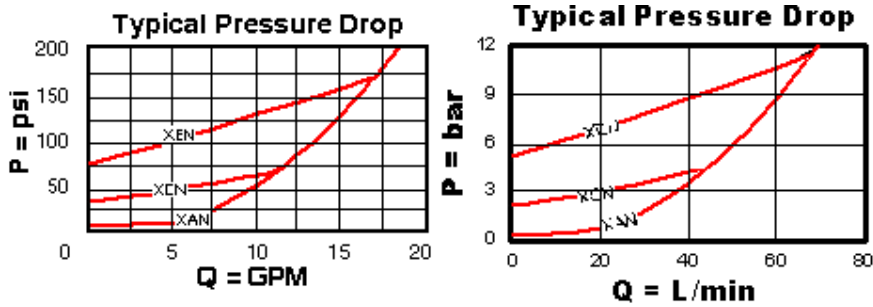
CONFIGURATION OPTIONS
Model Code Example: CNDCXCN

CONTROL	(X) SETTING RANGE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) Cracking Pressure, .016 - .107 in. (0,4 - 2,7 mm)	N Buna-N	Standard Material/Coating
L Manual Load Release	A 4 psi (0,3 bar) Cracking Pressure, .016 - .107 in. (0,4 - 2,7 mm)	V Viton	/AP Stainless Steel, Passivated
	B 15 psi (1 bar) Cracking Pressure, .016 - .107 in. (0,4 - 2,7 mm)		/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar) Cracking Pressure, .016 - .107 in. (0,4 - 2,7 mm)		
	E 75 psi (5 bar) Cracking Pressure, .016 - .107 in. (0,4 - 2,7 mm)		
	F 100 psi (7 bar) Cracking Pressure, .016 - .107 in. (0,4 - 2,7 mm)		

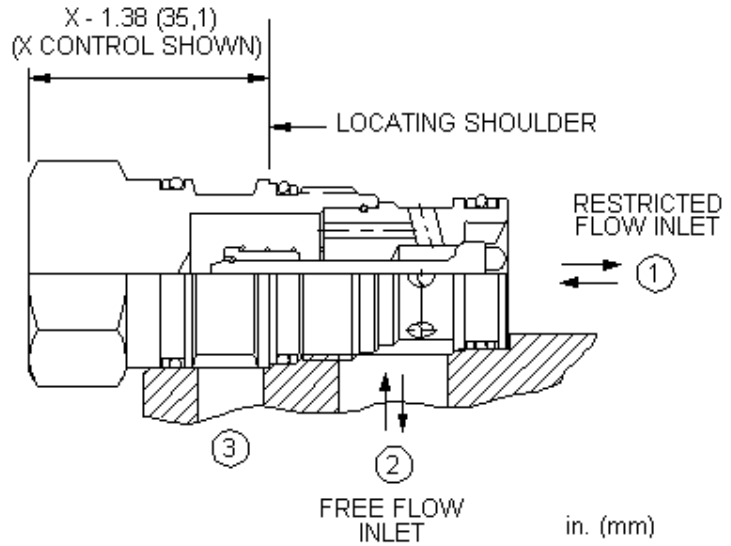
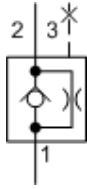
TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- Valves with the opposite flow path (free flow from 2 to 1) are considered flow controls and may be found listed as fixed orifice, non-pressure compensated flow control valve with reverse flow check.
- The customer specified orifice diameter is stamped on one of the cartridge's hex faces.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page.
- 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



Note: Performance data shown reflects a blocked orifice.



Free-flow, side-to-nose cheater check valves with a bypass orifice function as a 2-port check valve in a 3-port cavity. They allow free flow from port 2 to port 1 with a customer specified orifice that controls flow from port 1 to port 2. Port 3 of the cartridge is blocked off.

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
Orifice Range	0,4 - 3,4 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	0.22 kg.

CONFIGURATION OPTIONS

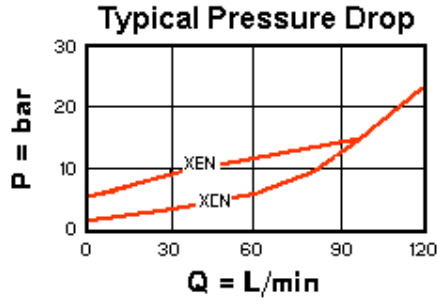
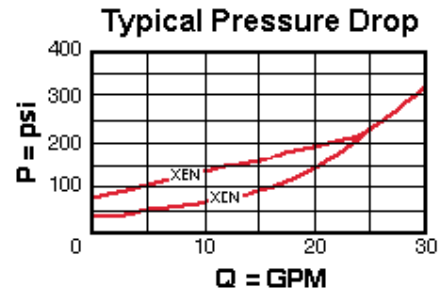
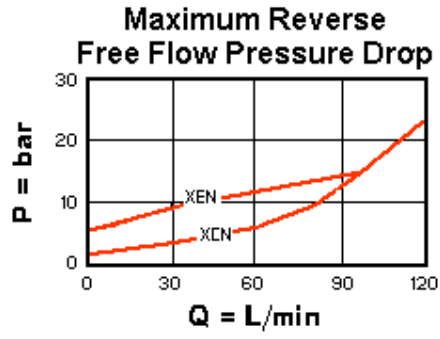
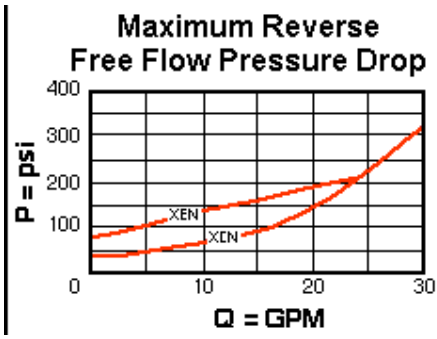
Model Code Example: **CNEDXCN**

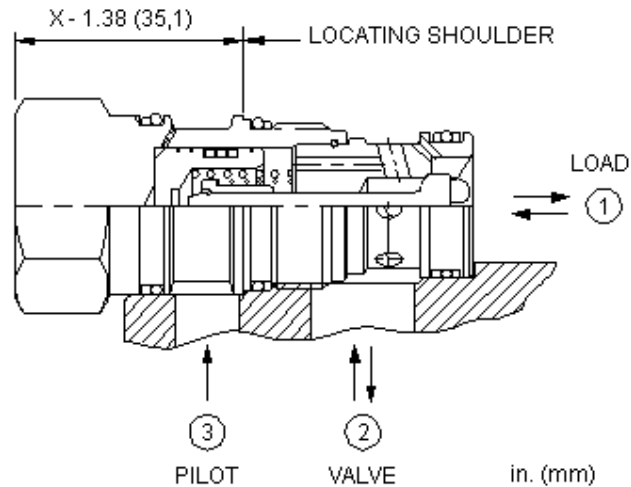
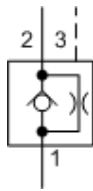
CONTROL	(X) SETTING RANGE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) Cracking Pressure, .016 - .135 in. (0,4 - 3,4 mm)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- When used in a full time regeneration circuit these valves allow full force to be developed by the cylinder when it comes to a stop. The bypass orifice drops the rod end pressure to zero when flow out of the rod stops.
- 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 pilot to open check valve with a bypass orifice. It incorporates a sealed pilot, a steel seat, and is non-vented. It allows free flow from the valve (port 2) to the load (port 1) and restricts flow in the opposite direction. Pressure at the pilot (port 3) will open the valve from port 1 to port 2. The pilot pressure needed at port 3 to open the valve is directly proportional to the load pressure at port 1. Pressure at port 2 directly opposes the pilot pressure. Note: The bypass orifice diameter is specified by the customer. See Technical Data below for the allowable orifice range.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	120 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Orifice Range	0,4 - 3,4 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	0.24 kg.

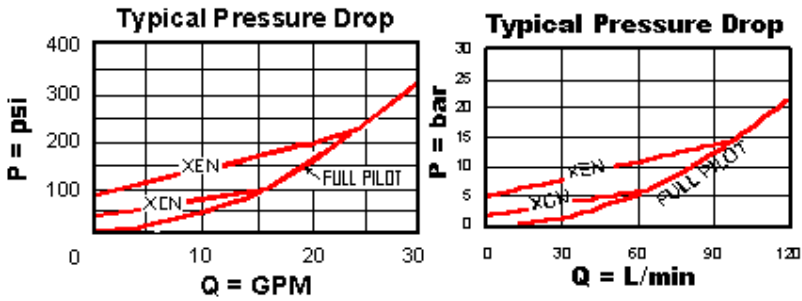
CONFIGURATION OPTIONS
Model Code Example: CNEEXCN

CONTROL	(X)	SETTING RANGE	(C)	SEAL MATERIAL	(N)
X Not Adjustable		C 30 psi (2 bar) Cracking Pressure, .016 - .135 in. (0,4 - 3,4 mm)		N Buna-N	
		A 4 psi (0,3 bar) Cracking Pressure, .016 - .135 in. (0,4 - 3,4 mm)		V Viton	
		B 15 psi (1 bar) Cracking Pressure, .016 - .135 in. (0,4 - 3,4 mm)			
		D 50 psi (3,5 bar) Cracking Pressure, .016 - .135 in. (0,4 - 3,4 mm)			
		E 75 psi (5 bar) Cracking Pressure, .016 - .135 in. (0,4 - 3,4 mm)			
		F 100 psi (7 bar) Cracking Pressure, .016 - .135 in. (0,4 - 3,4 mm)			

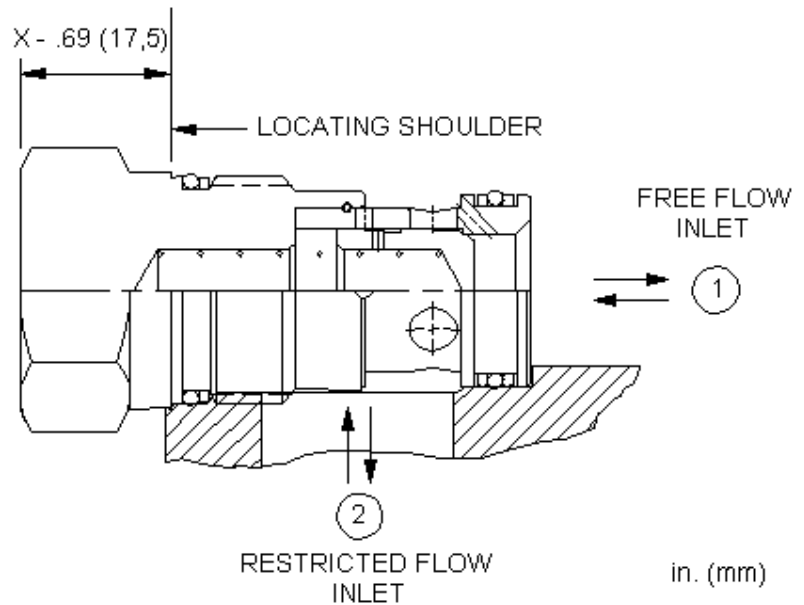
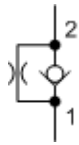
TECHNICAL FEATURES

- This 3 port pilot-to-open check valve and 3 port counterbalance valves are physically interchangeable (i.e. same cavities, same flow path for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Sealed pilot for use in circuits where cross port leakage is undesirable.
- The customer specified orifice diameter is stamped on one of the cartridge's hex faces.
- For models with manual load release control option, turn load release clockwise to release load.
- 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



Note: Performance data shown reflects a blocked orifice.



Free-flow, nose-to-side check valves with a bypass orifice allow free flow from port 1 to port 2. A customer specified orifice is included to restrict flow from port 2 to port 1. See technical data below for orifice range.

TECHNICAL DATA

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

Cavity	T-5A
Series	2
Capacity	120 L/min.
Maximum Operating Pressure	350 bar
Orifice Range	0,4 - 3,2 mm
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	Viton: 990203006
Model Weight	0.19 kg.

CONFIGURATION OPTIONS

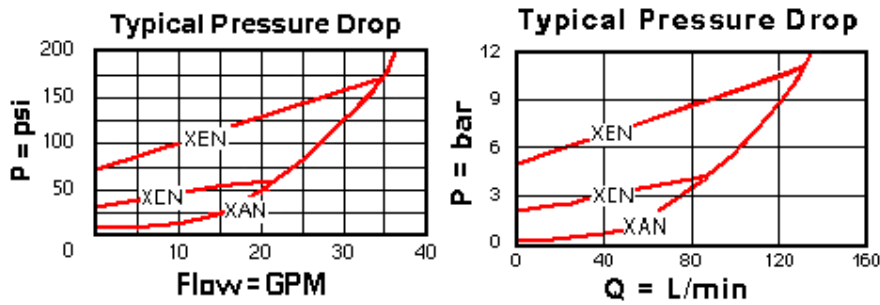
Model Code Example: CNFCXCN

CONTROL	(X) SETTING RANGE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	<p>C 30 psi (2 bar) Cracking Pressure, .016 - .127 in. (0,4 - 3,2 mm)</p> <p>A 4 psi (0,3 bar) Cracking Pressure, .016 - .127 in. (0,4 - 3,2 mm)</p> <p>B 15 psi (1 bar) Cracking Pressure, .016 - .127 in. (0,4 - 3,2 mm)</p> <p>D 50 psi (3,5 bar) Cracking Pressure, .016 - .127 in. (0,4 - 3,2 mm)</p> <p>E 75 psi (5 bar) Cracking Pressure, .016 - .127 in. (0,4 - 3,2 mm)</p> <p>F 100 psi (7 bar) Cracking Pressure, .016 - .127 in. (0,4 - 3,2 mm)</p>	<p>N Buna-N</p> <p>V Viton</p>	<p>Standard Material/Coating</p> <p>/AP Stainless Steel, Passivated</p> <p>/LH Mild Steel, Zinc-Nickel</p>

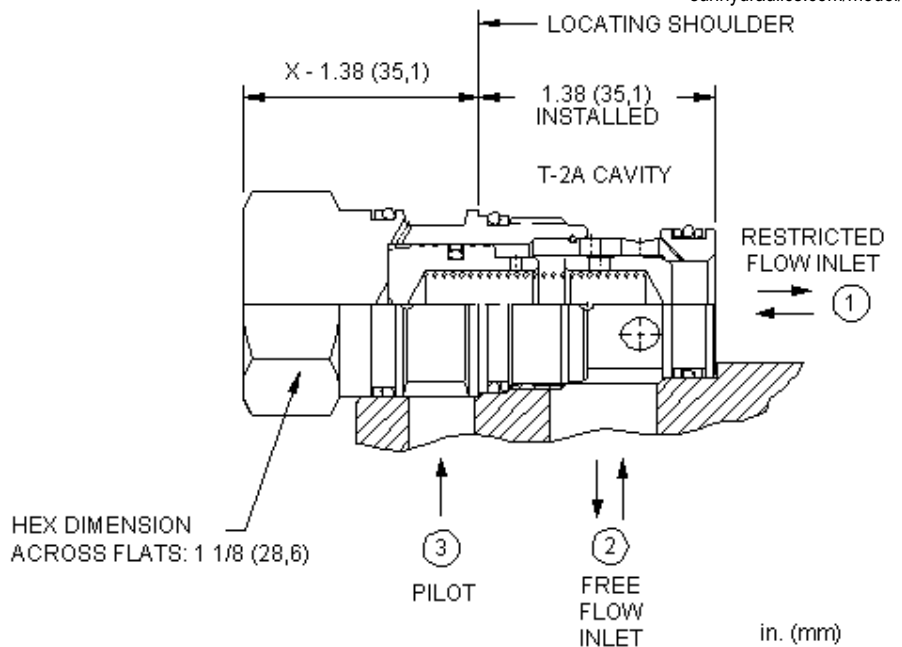
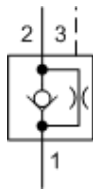
TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- Valves with the opposite flow path (free flow from 2 to 1) are considered flow controls and may be found listed as fixed orifice, non-pressure compensated flow control valve with reverse flow check.
- The customer specified orifice diameter is stamped on one of the cartridge's hex faces.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page.
- 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



Note: Performance data shown reflects a blocked orifice.



This valve is a spring biased closed, pilot-to-close check cartridge with a bypass orifice. It incorporates a steel seat and is non-vented. The valve allows flow from port 1 to port 2 and restricts flow from port 2 to port 1. Pressure at the pilot (port 3) opposes pressure at port 1 at a ratio of 1.8:1. Pressure at port 2 directly opposes the pilot pressure. Note: The bypass orifice diameter is specified by the customer. See Technical Data below for the allowable orifice range.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	160 L/min.
Pilot Ratio	1.8:1
Orifice Range	0,4 - 3,2 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	0.23 kg.

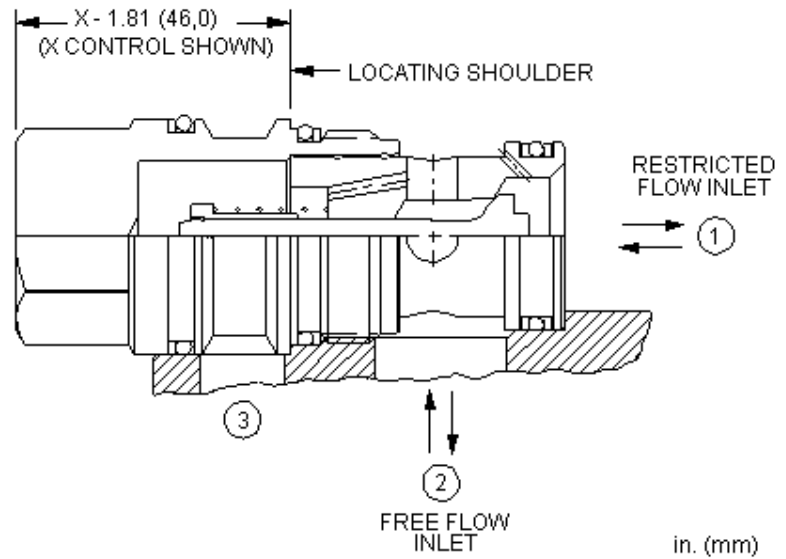
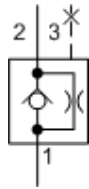
CONFIGURATION OPTIONS

Model Code Example: CNFEXCN

CONTROL	(X)	SETTING RANGE	(C)	SEAL MATERIAL	(N)
X Not Adjustable		C 30 psi (2 bar) Cracking Pressure, .016 - .127 in. (0,4 - 3,2 mm)		N Buna-N	
		A 4 psi (0,3 bar) Cracking Pressure, .016 - .127 in. (0,4 - 3,2 mm)		V Viton	
		B 15 psi (1 bar) Cracking Pressure, .016 - .127 in. (0,4 - 3,2 mm)			
		D 50 psi (3,5 bar) Cracking Pressure, .016 - .127 in. (0,4 - 3,2 mm)			
		E 75 psi (5 bar) Cracking Pressure, .016 - .127 in. (0,4 - 3,2 mm)			
		F 100 psi (7 bar) Cracking Pressure, .016 - .127 in. (0,4 - 3,2 mm)			

TECHNICAL FEATURES

- Features hardened steel seats for excellent wear characteristics and contamination tolerance.
- Nominal pilot ratio is 1.8:1. This means that a pressure of 1000 psi (70 bar) at the pilot port will close a valve against a pressure of 1800 psi (125 bar) at port 1. Any decay or loss of pilot pressure could allow the valve to open, even if it is a momentary decay or loss.
- Pressure at the port 2 area directly opposes pilot pressure.
- With equal pressures at all ports the valve is closed.
- 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.



Free-flow, side-to-nose cheater check valves with a bypass orifice function as a 2-port check valve in a 3-port cavity. They allow free flow from port 2 to port 1 with a customer specified orifice that controls flow from port 1 to port 2. Port 3 of the cartridge is blocked off.

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
Orifice Range	0,4 - 5,5 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	0.48 kg.

CONFIGURATION OPTIONS

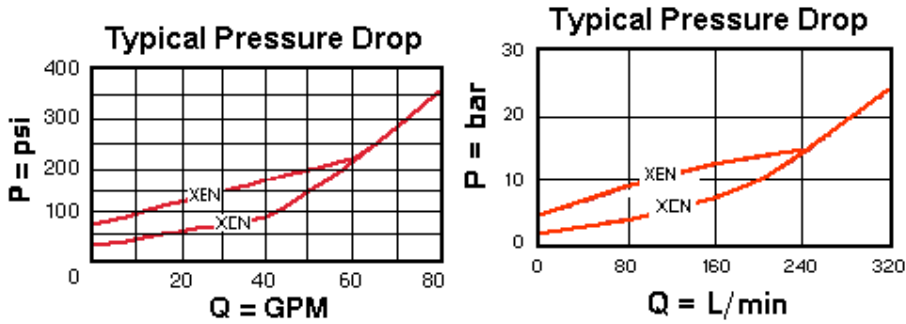
Model Code Example: CNGDXCN

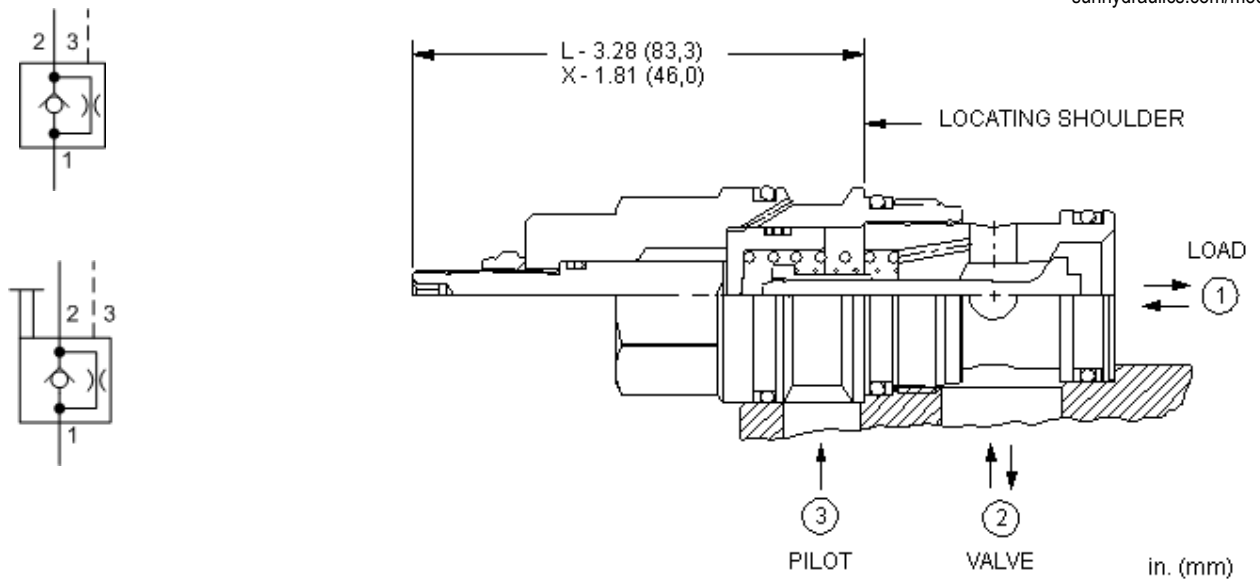
CONTROL	(X) SETTING RANGE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm) A 4 psi (0,3 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm) B 15 psi (1 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm) D 50 psi (3,5 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm) E 75 psi (5 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm) F 100 psi (7 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

- When used in a full time regeneration circuit these valves allow full force to be developed by the cylinder when it comes to a stop. The bypass orifice drops the rod end pressure to zero when flow out of the rod stops.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page.
- 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 pilot to open check valve with a bypass orifice. It incorporates a sealed pilot, a steel seat, and is non-vented. It allows free flow from the valve (port 2) to the load (port 1) and restricts flow in the opposite direction. Pressure at the pilot (port 3) will open the valve from port 1 to port 2. The pilot pressure needed at port 3 to open the valve is directly proportional to the load pressure at port 1. Pressure at port 2 directly opposes the pilot pressure. Note: The bypass orifice diameter is specified by the customer. See Technical Data below for the allowable orifice range. An 'L' control option is available to manually release the load. See Option Selection below.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	240 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Orifice Range	0,4 - 5,5 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	0.53 kg.

CONFIGURATION OPTIONS

Model Code Example: CNGEXCN

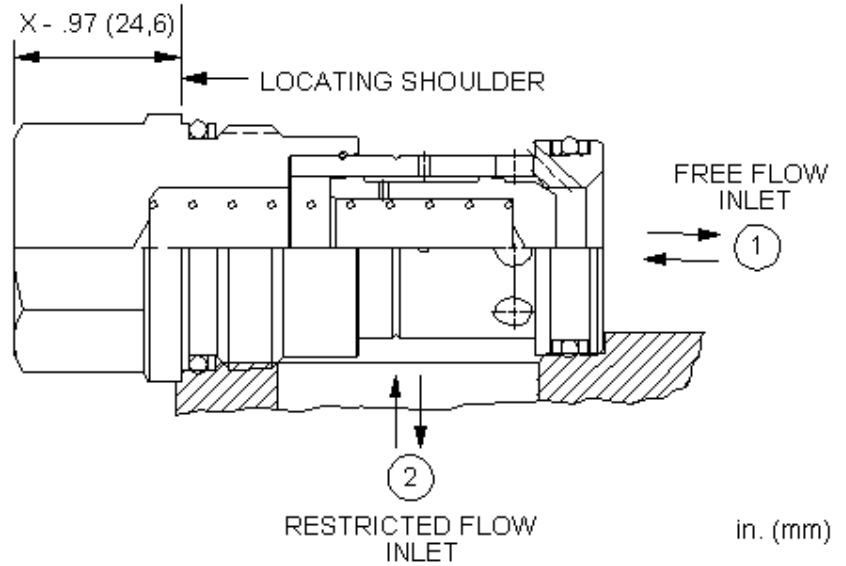
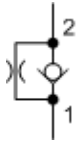
CONTROL	(X)	SETTING RANGE	(C)	SEAL MATERIAL	(N)
X		Not Adjustable			
		C	30 psi (2 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm)		N Buna-N
		A	4 psi (0,3 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm)		V Viton
		B	15 psi (1 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm)		
		D	50 psi (3,5 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm)		
		E	75 psi (5 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm)		
		F	100 psi (7 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm)		

TECHNICAL FEATURES

- This 3 port pilot-to-open check valve and 3 port counterbalance valves are physically interchangeable (i.e. same cavities, same flow path for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Sealed pilot for use in circuits where cross port leakage is undesirable.
- The customer specified orifice diameter is stamped on one of the cartridge's hex faces.
- For models with manual load release control option, turn load release clockwise to release load.
- 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

□



Free-flow, nose-to-side check valves with a bypass orifice allow free flow from port 1 to port 2. A customer specified orifice is included to restrict flow from port 2 to port 1. See technical data below for orifice range.

TECHNICAL DATA

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

Cavity	T-16A
Series	3
Capacity	240 L/min.
Maximum Operating Pressure	350 bar
Orifice Range	0,4 - 6,4 mm
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	0.43 kg.

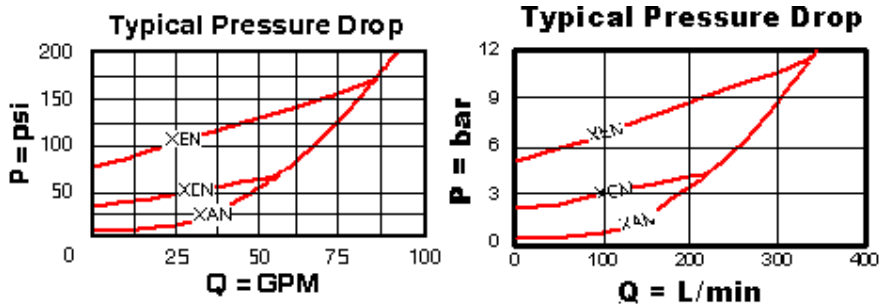
CONFIGURATION OPTIONS
Model Code Example: CNHCXCN

CONTROL	(X) SETTING RANGE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) Cracking Pressure, .016 - .252 in. (0,4 - 6,4 mm) A 4 psi (0,3 bar) Cracking Pressure, .016 - .252 in. (0,4 - 6,4 mm) B 15 psi (1 bar) Cracking Pressure, .016 - .252 in. (0,4 - 6,4 mm) D 50 psi (3,5 bar) Cracking Pressure, .016 - .252 in. (0,4 - 6,4 mm) E 75 psi (5 bar) Cracking Pressure, .016 - .252 in. (0,4 - 6,4 mm) F 100 psi (7 bar) Cracking Pressure, .016 - .252 in. (0,4 - 6,4 mm)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

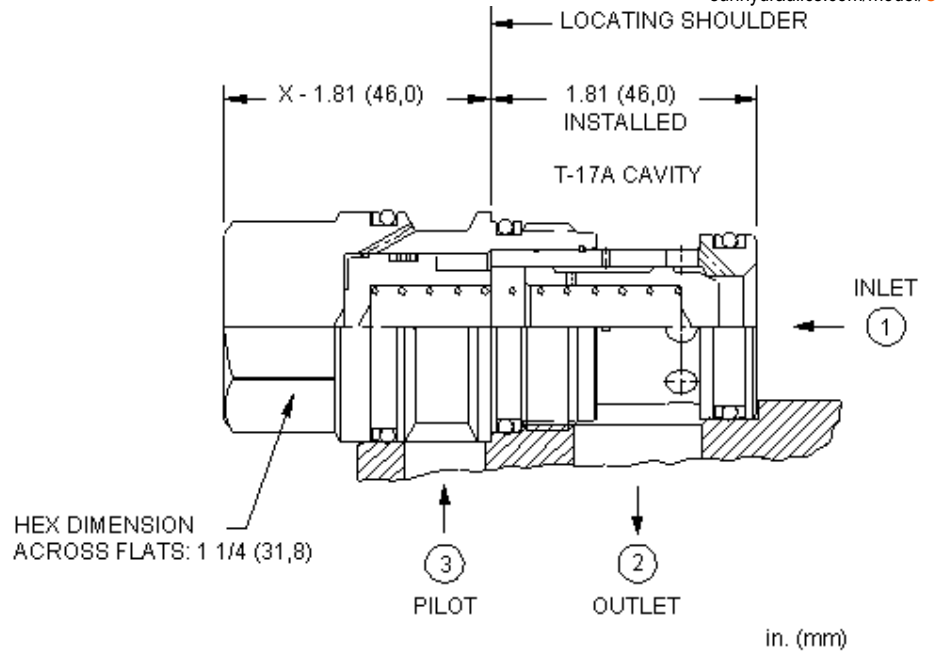
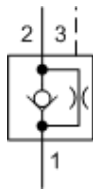
TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- Valves with the opposite flow path (free flow from 2 to 1) are considered flow controls and may be found listed as fixed orifice, non-pressure compensated flow control valve with reverse flow check.
- 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 customer specified orifice diameter is stamped on one of the cartridge's hex faces.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page.
- 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



Note: Performance data shown reflects a blocked orifice.



This valve is a spring biased closed, pilot-to-close check cartridge with a bypass orifice. It incorporates a steel seat and is non-vented. The valve allows flow from port 1 to port 2 and restricts flow from port 2 to port 1. Pressure at the pilot (port 3) opposes pressure at port 1 at a ratio of 1.8:1. Pressure at port 2 directly opposes the pilot pressure. Note: The bypass orifice diameter is specified by the customer. See Technical Data below for the allowable orifice range.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	320 L/min.
Orifice Range	0,4 - 6,4 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	0.50 kg.

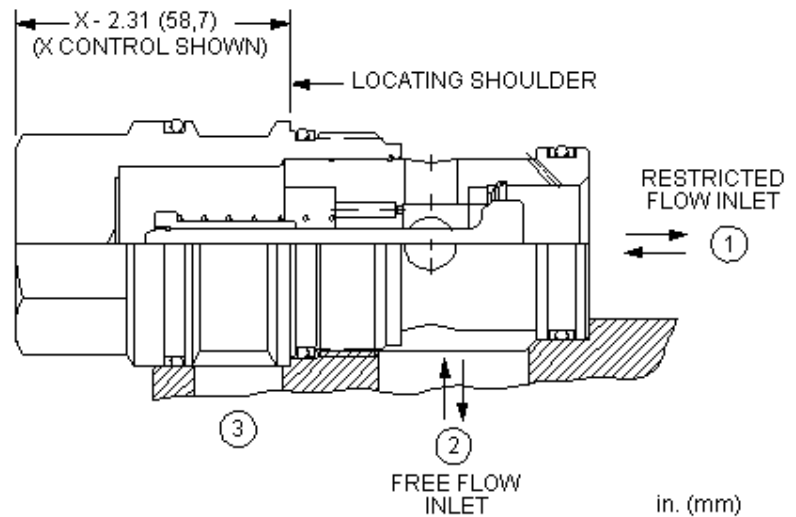
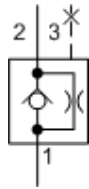
CONFIGURATION OPTIONS

Model Code Example: CNHEXCN

CONTROL	(X)	SETTING RANGE	(C)	SEAL MATERIAL	(N)
X Not Adjustable		C 30 psi (2 bar) Cracking Pressure, .016 - .252 in. (0,4 - 6,4 mm)		N Buna-N	
		A 4 psi (0,3 bar) Cracking Pressure, .016 - .252 in. (0,4 - 6,4 mm)		V Viton	
		B 15 psi (1 bar) Cracking Pressure, .016 - .252 in. (0,4 - 6,4 mm)			
		D 50 psi (3,5 bar) Cracking Pressure, .016 - .252 in. (0,4 - 6,4 mm)			
		E 75 psi (5 bar) Cracking Pressure, .016 - .252 in. (0,4 - 6,4 mm)			
		F 100 psi (7 bar) Cracking Pressure, .016 - .252 in. (0,4 - 6,4 mm)			

TECHNICAL FEATURES

- Features hardened steel seats for excellent wear characteristics and contamination tolerance.
- Nominal pilot ratio is 1.8:1. This means that a pressure of 1000 psi (70 bar) at the pilot port will close a valve against a pressure of 1800 psi (125 bar) at port 1. Any decay or loss of pilot pressure could allow the valve to open, even if it is a momentary decay or loss.
- Pressure at the port 2 area directly opposes pilot pressure.
- With equal pressures at all ports the valve is closed.
- 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.



Free-flow, side-to-nose cheater check valves with a bypass orifice function as a 2-port check valve in a 3-port cavity. They allow free flow from port 2 to port 1 with a customer specified orifice that controls flow from port 1 to port 2. Port 3 of the cartridge is blocked off.

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
Orifice Range	0,4 - 5,5 mm
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	1.06 kg.

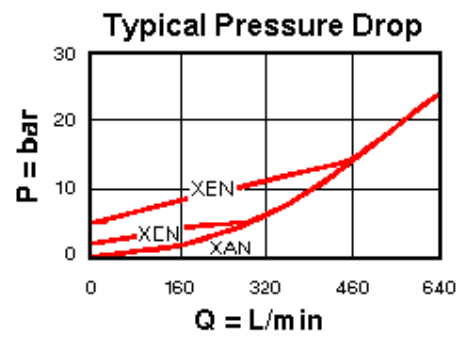
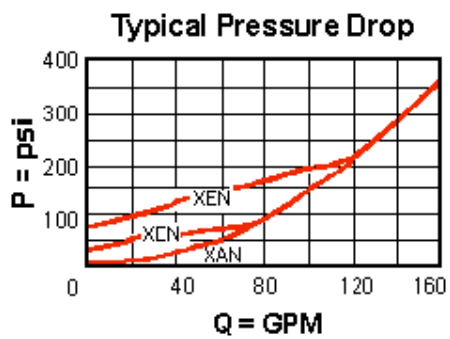
CONFIGURATION OPTIONS
Model Code Example: CNIDXCN

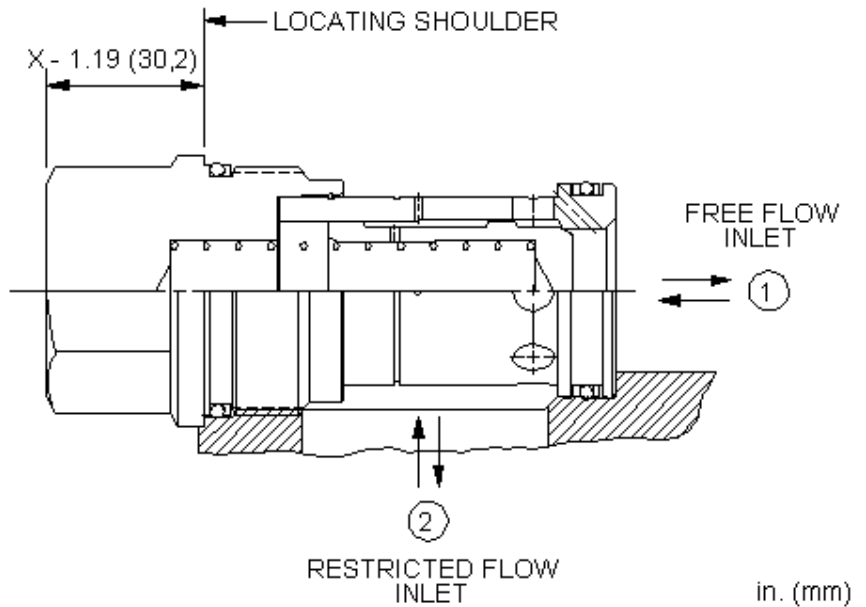
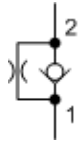
CONTROL	(X) SETTING RANGE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) Cracking Pressure, .016 - .218 in. (0,4 - 5,5 mm)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

- When used in a full time regeneration circuit these valves allow full force to be developed by the cylinder when it comes to a stop. The bypass orifice drops the rod end pressure to zero when flow out of the rod stops.
- 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





Free-flow, nose-to-side check valves with a bypass orifice allow free flow from port 1 to port 2. A customer specified orifice is included to restrict flow from port 2 to port 1. See technical data below for orifice range.

TECHNICAL DATA

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

Cavity	T-18A
Series	4
Capacity	480 L/min.
Maximum Operating Pressure	350 bar
Orifice Range	0,4 - 9 mm
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
Model Weight	0.95 kg.

CONFIGURATION OPTIONS

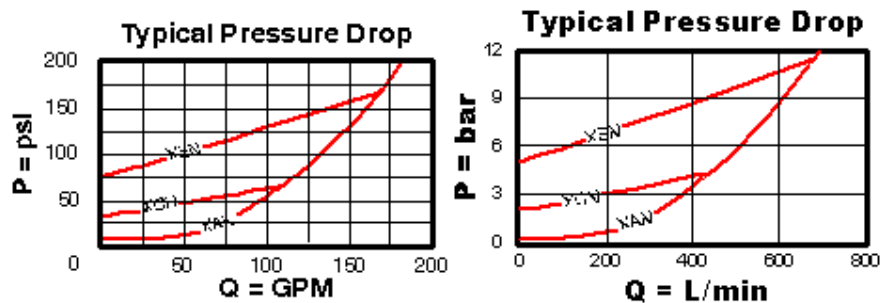
Model Code Example: CNJCXCN

CONTROL	(X) SETTING RANGE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm) A 4 psi (0,3 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm) B 15 psi (1 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm) D 50 psi (3,5 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm) E 75 psi (5 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm) F 100 psi (7 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm) G 150 psi (10 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

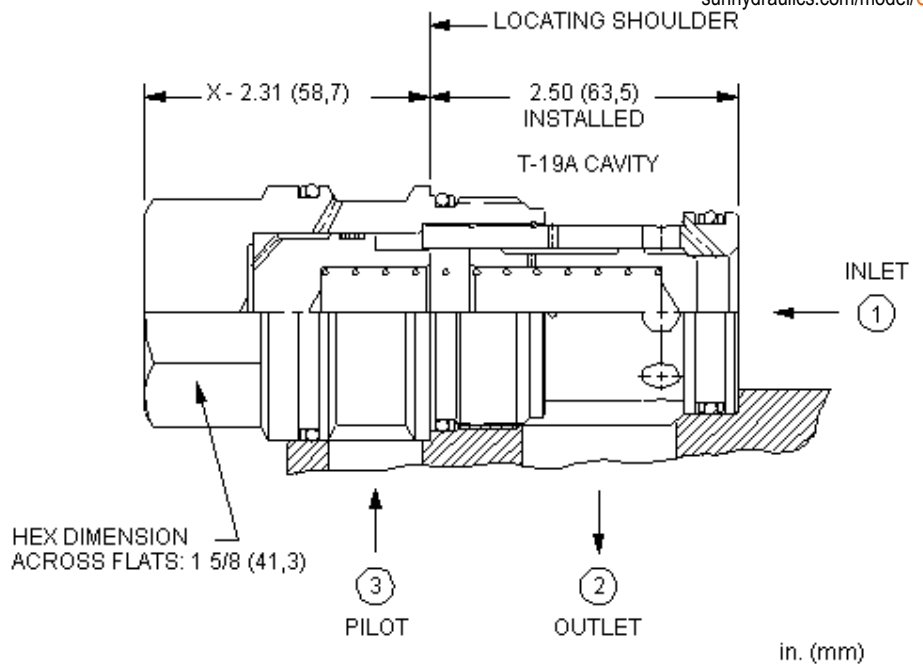
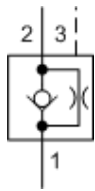
TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- Valves with the opposite flow path (free flow from 2 to 1) are considered flow controls and may be found listed as fixed orifice, non-pressure compensated flow control valve with reverse flow check.
- The customer specified orifice diameter is stamped on one of the cartridge's hex faces.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page.
- 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



Note: Performance data shown reflects a blocked orifice.



This valve is a spring biased closed, pilot-to-close check cartridge with a bypass orifice. It incorporates a steel seat and is non-vented. The valve allows flow from port 1 to port 2 and restricts flow from port 2 to port 1. Pressure at the pilot (port 3) opposes pressure at port 1 at a ratio of 1.8:1. Pressure at port 2 directly opposes the pilot pressure. Note: The bypass orifice diameter is specified by the customer. See Technical Data below for the allowable orifice range.

TECHNICAL DATA

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

Cavity	T-19A
Series	4
Capacity	610 L/min.
Orifice Range	0,4 - 9 mm
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	1.18 kg.

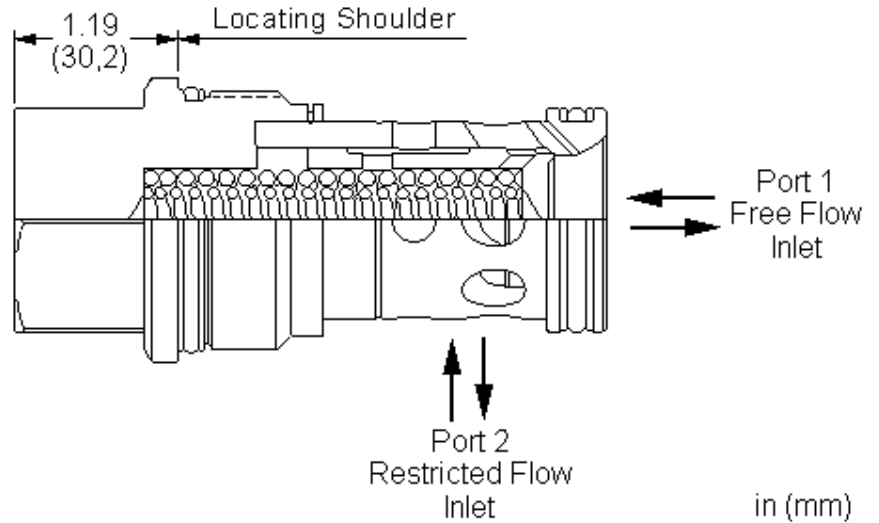
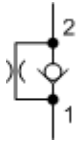
CONFIGURATION OPTIONS

Model Code Example: CNJEXCN

CONTROL	(X)	SETTING RANGE	(C)	SEAL MATERIAL	(N)
X Not Adjustable		C 30 psi (2 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm)		N Buna-N	
		A 4 psi (0,3 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm)		V Viton	
		B 15 psi (1 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm)			
		D 50 psi (3,5 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm)			
		E 75 psi (5 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm)			
		F 100 psi (7 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm)			

TECHNICAL FEATURES

- Features hardened steel seats for excellent wear characteristics and contamination tolerance.
- Nominal pilot ratio is 1.8:1. This means that a pressure of 1000 psi (70 bar) at the pilot port will close a valve against a pressure of 1800 psi (125 bar) at port 1. Any decay or loss of pilot pressure could allow the valve to open, even if it is a momentary decay or loss.
- Pressure at the port 2 area directly opposes pilot pressure.
- With equal pressures at all ports the valve is closed.
- 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.



Free-flow, nose-to-side check valves with a bypass orifice allow free flow from port 1 to port 2. A customer specified orifice is included to restrict flow from port 2 to port 1. See technical data below for orifice range.

TECHNICAL DATA

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

Cavity	T-18AU
Series	4
Capacity	680 L/min.
Maximum Operating Pressure	350 bar
Orifice Range	0,4 - 9 mm
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Seal kit - Cartridge	Buna: 990018007
Seal kit - Cartridge	Viton: 990018006
Model Weight	0.90 kg.

CONFIGURATION OPTIONS

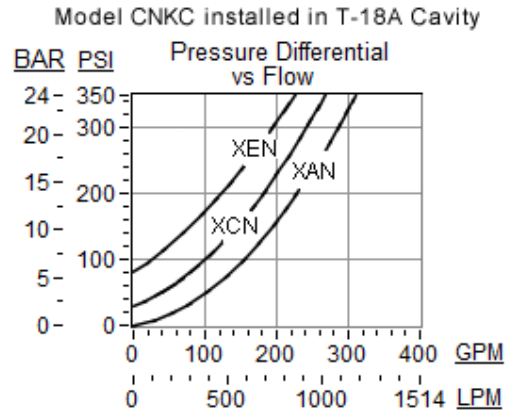
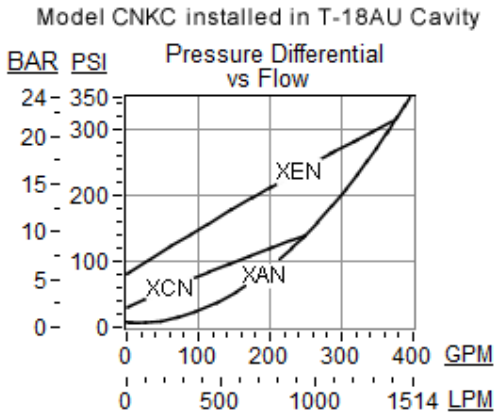
Model Code Example: CNKCXAN

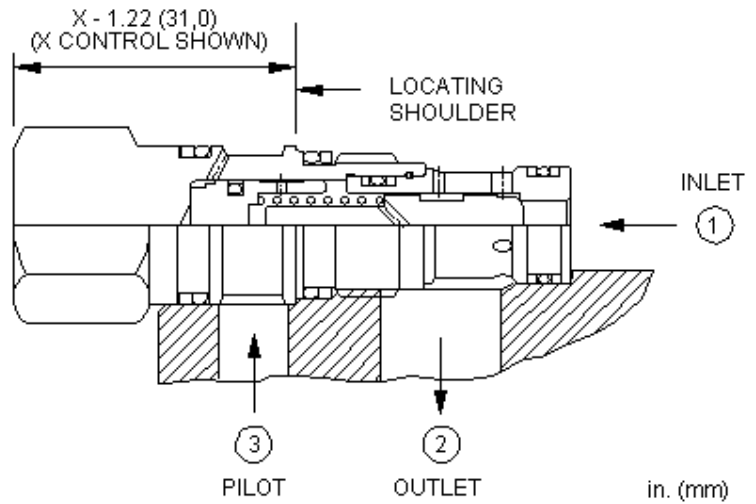
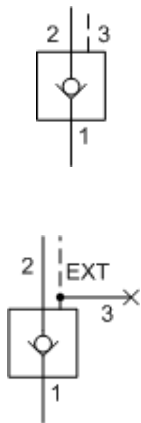
CONTROL	(X)	SETTING RANGE	(A)	SEAL MATERIAL	(N)
X Not Adjustable		A 4 psi (0,3 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm)		N Buna-N	
		B 15 psi (1 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm)		V Viton	
		C 30 psi (2 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm)			
		D 50 psi (3,5 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm)			
		E 75 psi (5 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm)			
		F 100 psi (7 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm)			
		G 150 psi (10 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm)			
		Z 1 psi (0,07 bar) Cracking Pressure, .016 - .354 in. (0,4 - 9 mm)			

TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- These valves will work in Sun's standard T-18A cavity at lower capacity. To realize the full stated capacity, the T-18AU cavity should be used.
- Valves with the opposite flow path (free flow from 2 to 1) are considered flow controls and may be found listed as fixed orifice, non-pressure compensated flow control valve with reverse flow check.
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- The customer specified orifice diameter is stamped on one of the cartridge's hex faces.
- 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 spring biased closed, pilot-to-close check cartridge that has a 3:1 pilot ratio. The valve allows flow from port 1 to port 2 and blocks reverse flow. Pressure at the pilot port opposes pressure at port 1 at a ratio of 3:1. This valve is most often used in regeneration circuits.

TECHNICAL DATA

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

Cavity	T-163A
Series	0
Capacity	40 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	EPDM: 990163014
Seal kit - Cartridge	Polyurethane: 990163002
Seal kit - Cartridge	Viton: 990163006
Model Weight	0.09 kg.

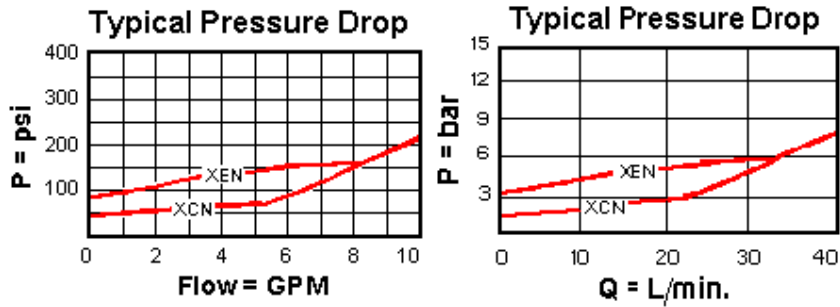
CONFIGURATION OPTIONS
Model Code Example: COBAXCN

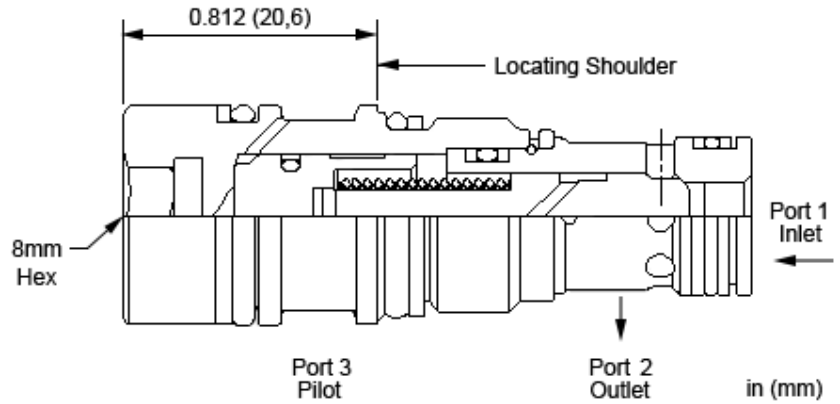
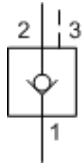
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
B External 1/4 BSPP Pilot Port, Port 3 blocked	D 50 psi (3,5 bar)	E EPDM	/AP Stainless Steel, Passivated
	E 75 psi (5 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
	F 100 psi (7 bar)		

TECHNICAL FEATURES

- Features hardened steel seats for excellent wear characteristics and contamination tolerance.
- Product is not available with A and B spring ranges (4 and 15 psi (0,3 and 1 bar)).
- Pressure at the port 2 area directly opposes pilot pressure.
- Reverse flow through the valve from port 2 to port 1 is not possible under any condition.
- Nominal pilot ratio is 3:1. This means that a pressure of 1000 psi (70 bar) at the pilot port will close a valve against a pressure of 3000 psi (205 bar) at port 1. Any decay or loss of pilot pressure could allow the valve to open, even if it is a momentary decay or loss.
- 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





This valve is a spring biased closed, pilot-to-close check cartridge that has a 1.8:1 pilot ratio. The valve allows flow from port 1 to port 2 and blocks reverse flow. Pressure at the pilot port opposes pressure at port 1 at a ratio of 1.8:1. This valve is most often used in regeneration circuits.

TECHNICAL DATA

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

Cavity	T-163A
Series	0
Capacity	40 L/min.
Pilot Ratio	3.4:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Valve Internal Hex Size	8 mm
Valve Installation Torque	27 - 33 Nm
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	Polyurethane: 990163002
Seal kit - Cartridge	Viton: 990163006
Model Weight	0.06 kg.

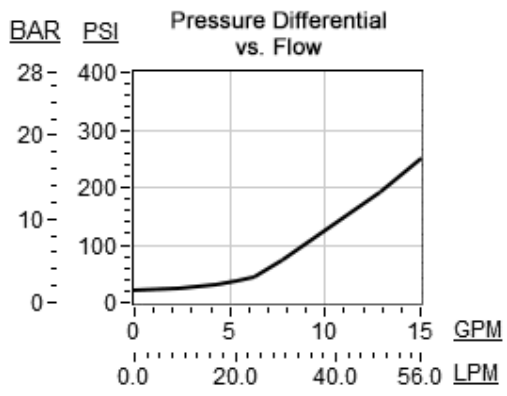
CONFIGURATION OPTIONS
Model Code Example: COBGXCN

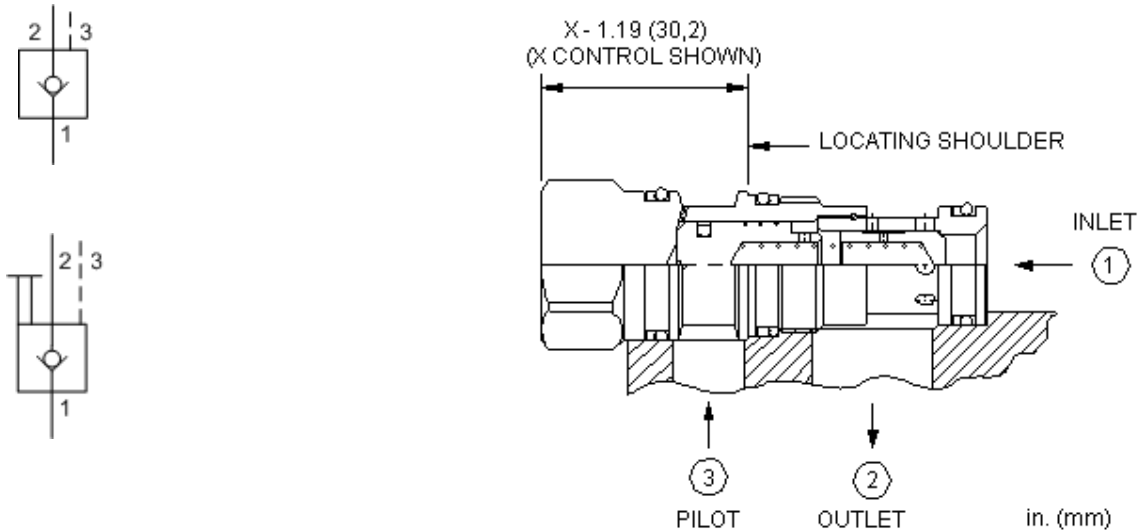
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable, Standard Hydraulic Pilot	C 30 psi (2 bar) D 50 psi (3,5 bar) E 75 psi (5 bar) F 100 psi (7 bar)	N Buna-N V Viton	N Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

- Features hardened steel seats for excellent wear characteristics and contamination tolerance.
- Product is not available with A and B spring ranges (4 and 15 psi (0,3 and 1 bar)).
- Nominal pilot ratio is 1.8:1. This means that a pressure of 1000 psi (70 bar) at the pilot port will close a valve against a pressure of 1800 psi (125 bar) at port 1. Any decay or loss of pilot pressure could allow the valve to open, even if it is a momentary decay or loss.
- Pressure at the port 2 area directly opposes pilot pressure.
- Reverse flow through the valve from port 2 to port 1 is not possible under any condition.
- 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 spring biased closed, pilot-to-close check cartridge that has a 1.8:1 pilot ratio. The valve allows flow from port 1 to port 2 and blocks reverse flow. Pressure at the pilot port opposes pressure at port 1 at a ratio of 1.8:1. This valve is most often used in regeneration circuits.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	80 L/min.
Pilot Ratio	1.8:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.13 kg.

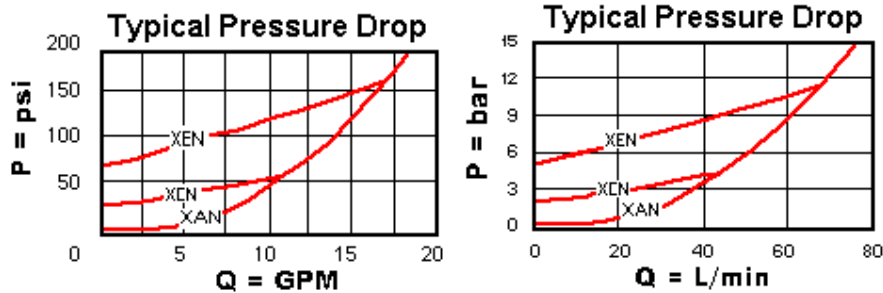
CONFIGURATION OPTIONS
Model Code Example: CODAXCN

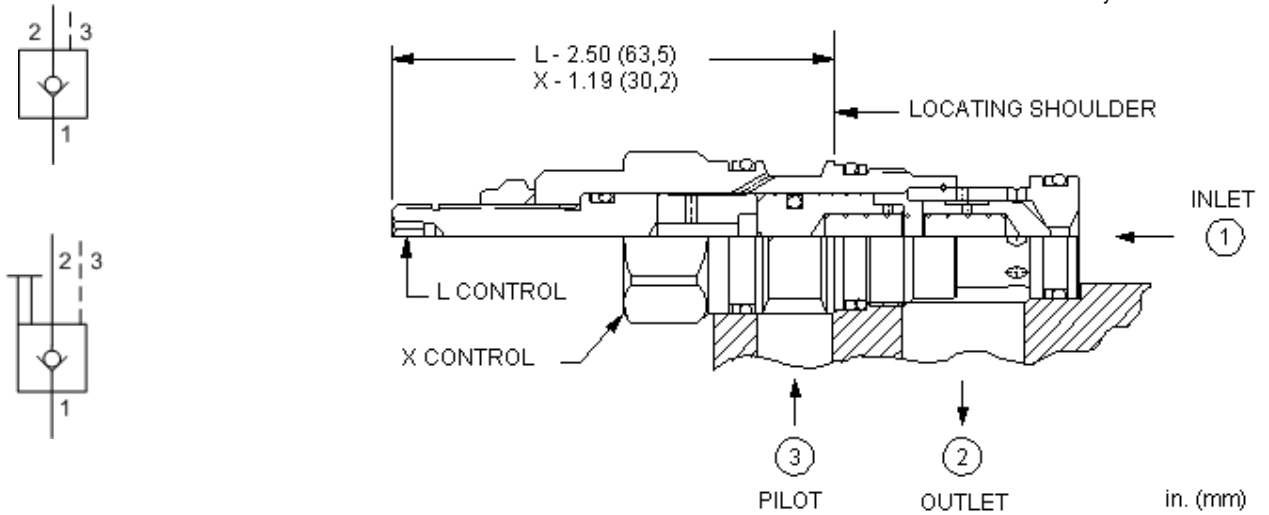
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
	A 4 psi (0,3 bar)	E EPDM	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		
	G 150 psi (10,5 bar)		

TECHNICAL FEATURES

- Minimum clearances between the spool and sleeve and a seal on the pilot piston diameter significantly reduce the potential for silting.
- Nominal pilot ratio is 1.8:1. This means that a pressure of 1000 psi (70 bar) at the pilot port will close a valve against a pressure of 1800 psi (125 bar) at port 1. Any decay or loss of pilot pressure could allow the valve to open, even if it is a momentary decay or loss.
- Pressure at the port 2 area directly opposes pilot pressure.
- Reverse flow through the valve from port 2 to port 1 is not possible under any condition.
- With equal pressures at all ports the valve is closed.
- In the beginning the CO*A's did not have a positive seal on the pilot pistons and the CO*B's did. Now the CO*A's are positively sealed and the 2 valves are mechanically identical. CO*A's are more readily available and cost less.
- 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 or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page under TECHNICAL 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





This valve is a spring biased closed, pilot-to-close check cartridge that has a 20:1 pilot ratio. The valve allows flow from port 1 to port 2 and blocks reverse flow. Pressure at the pilot (port 3) opposes pressure at port 1 at a ratio of 20:1.

TECHNICAL DATA

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

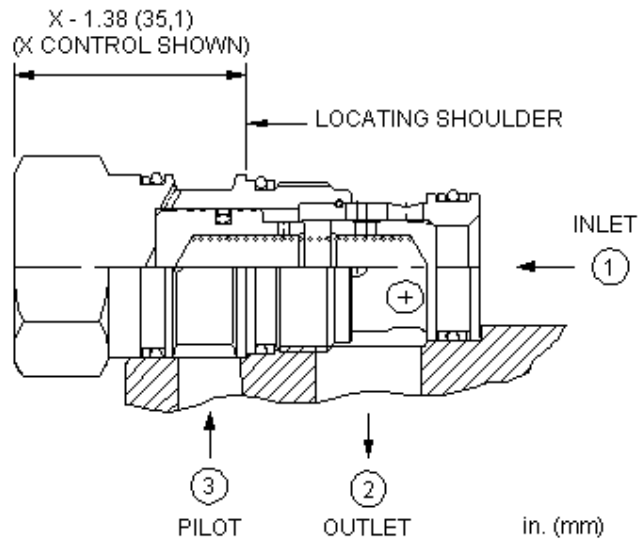
Cavity	T-11A
Series	1
Capacity	2,8 mm
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	EPDM: 990011014
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.13 kg.

CONFIGURATION OPTIONS
Model Code Example: CODDXDN

CONTROL	(X) CRACKING PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	D 50 psi (3,5 bar) H 200 psi (14 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

- Pressure at the port 2 area directly opposes pilot pressure.
- Reverse flow through the valve from port 2 to port 1 is not possible under any condition.
- The valve is a poppet design that results in very low leakage of stored fluid from the accumulator.
- With equal pressures at all ports the valve is closed.
- Capacity is the equivalent of a .109 in. (2,8 mm) diameter orifice.
- 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.



This valve is a spring biased closed, pilot-to-close check cartridge that has a 1.8:1 pilot ratio. The valve allows flow from port 1 to port 2 and blocks reverse flow. Pressure at the pilot port opposes pressure at port 1 at a ratio of 1.8:1. This valve is most often used in regeneration circuits.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	160 L/min.
Pilot Ratio	1.8:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.23 kg.

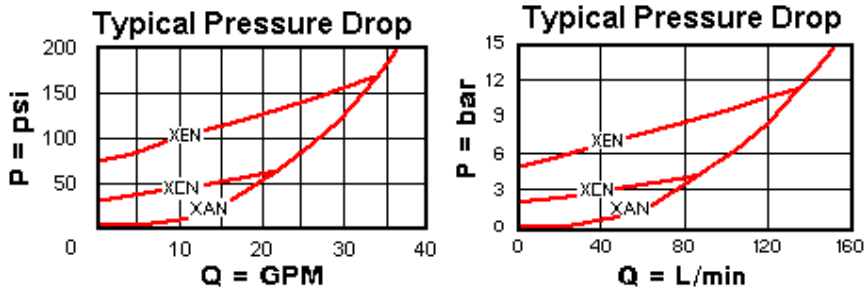
CONFIGURATION OPTIONS
Model Code Example: COFAXCN

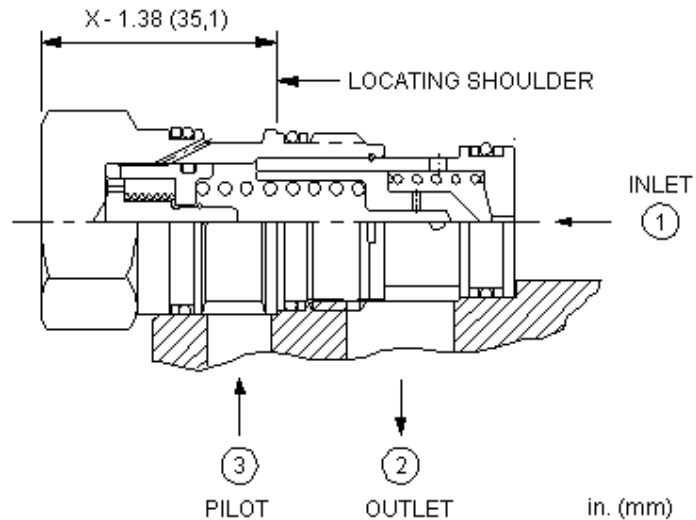
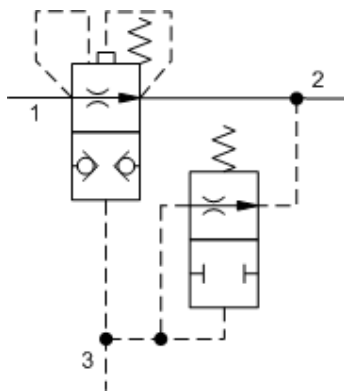
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
	A 4 psi (0,3 bar)	E EPDM	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		
	J 135 psi (9,5 bar)		

TECHNICAL FEATURES

- Nominal pilot ratio is 1.8:1. This means that a pressure of 1000 psi (70 bar) at the pilot port will close a valve against a pressure of 1800 psi (125 bar) at port 1. Any decay or loss of pilot pressure could allow the valve to open, even if it is a momentary decay or loss.
- Pressure at the port 2 area directly opposes pilot pressure.
- Reverse flow through the valve from port 2 to port 1 is not possible under any condition.
- With equal pressures at all ports the valve is closed.
- In the beginning the CO*A's did not have a positive seal on the pilot pistons and the CO*B's did. Now the CO*A's are positively sealed and the 2 valves are mechanically identical. CO*A's are more readily available and cost less.
- 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 or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page under TECHNICAL 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





This valve is a pilot-to-close check cartridge that has a 120:1 pilot ratio. The valve is designed specifically to discharge an accumulator when the pump is turned off. With no pressure at the pump port (port 3), the valve is open between the accumulator (port 1) and tank (port 2). 60 psi (4 bar) at port 3 will close the valve for accumulator pressures up to 5000 psi (350 bar). When pump pressure at port 3 is below 300 psi (20 bar) there is a leak path from port 3 to tank (port 2) to ensure accumulator discharge when the pump is turned off. When pump pressure is above 300 psi (20 bar) the leak path closes for efficiency.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	4 L/min. (1,3 mm)
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,3 cc/min.
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	0.22 kg.

CONFIGURATION OPTIONS

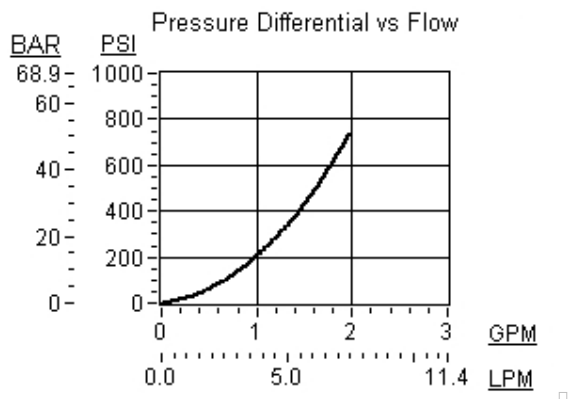
Model Code Example: COFOXDN

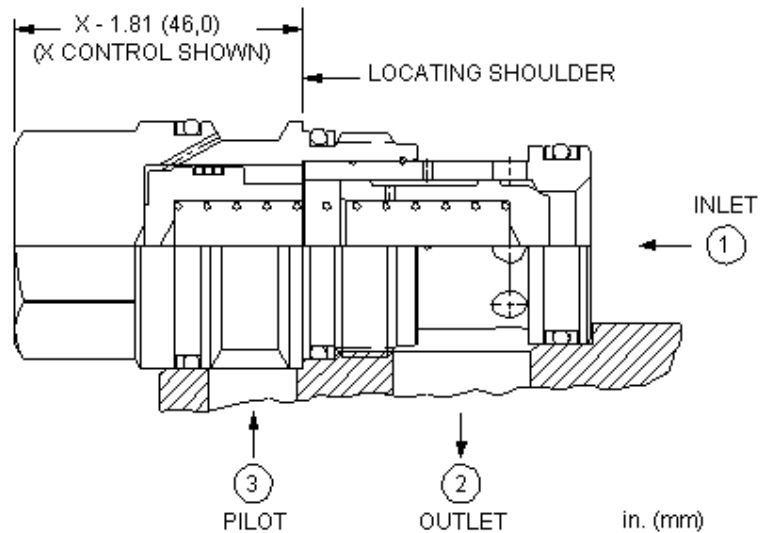
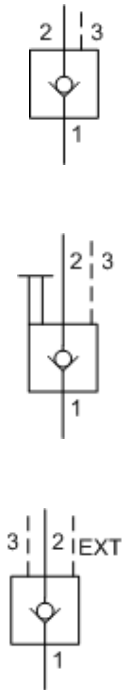
CONTROL	(X)	MINIMUM PILOT PRESSURE	(D)	SEAL MATERIAL	(N)
X Standard Pilot		D 60 psi (4 bar)		N Buna-N	
				V Viton	

TECHNICAL FEATURES

- Features hardened steel seats for excellent wear characteristics and contamination tolerance.
- Note: The discharge of the accumulator is across an .05 inch (1,27 mm) diameter orifice. The discharge time for large accumulators with low pre-charge pressures may be too long. In this case there are 2-valve circuits that greatly increase the capacity. See the Tech Tips (FAQs).
- The valve is a poppet design that results in very low leakage of stored fluid from the accumulator.
- Leakage of the pump signal only occurs when the pump is unloaded to below 300 psi (20 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





This valve is a spring biased closed, pilot-to-close check cartridge that has a 1.8:1 pilot ratio. The valve allows flow from port 1 to port 2 and blocks reverse flow. Pressure at the pilot port opposes pressure at port 1 at a ratio of 1.8:1. This valve is most often used in regeneration circuits.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	320 L/min.
Pilot Ratio	1.8:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.50 kg.

CONFIGURATION OPTIONS

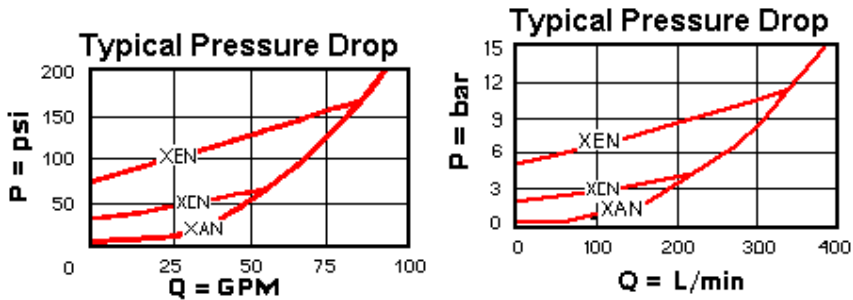
Model Code Example: COHAXCN

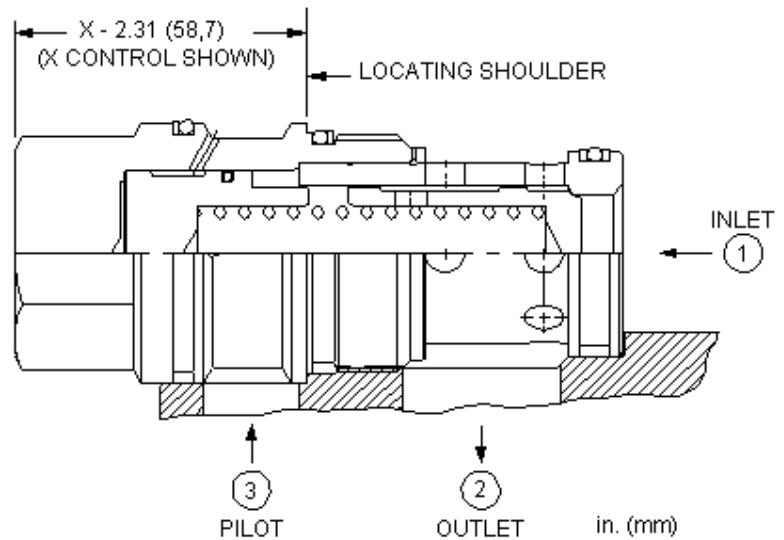
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	C 30 psi (2 bar) A 4 psi (0,3 bar) B 15 psi (1 bar) D 50 psi (3,5 bar) E 75 psi (5 bar) F 100 psi (7 bar) G 150 psi (10,5 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Nominal pilot ratio is 1.8:1. This means that a pressure of 1000 psi (70 bar) at the pilot port will close a valve against a pressure of 1800 psi (125 bar) at port 1. Any decay or loss of pilot pressure could allow the valve to open, even if it is a momentary decay or loss.
- Pressure at the port 2 area directly opposes pilot pressure.
- Reverse flow through the valve from port 2 to port 1 is not possible under any condition.
- With equal pressures at all ports the valve is closed.
- In the beginning the CO*A's did not have a positive seal on the pilot pistons and the CO*B's did. Now the CO*A's are positively sealed and the 2 valves are mechanically identical. CO*A's are more readily available and cost less.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page under TECHNICAL 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





This valve is a spring biased closed, pilot-to-close check cartridge that has a 1.8:1 pilot ratio. The valve allows flow from port 1 to port 2 and blocks reverse flow. Pressure at the pilot port opposes pressure at port 1 at a ratio of 1.8:1. This valve is most often used in regeneration circuits.

TECHNICAL DATA

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

Cavity	T-19A
Series	4
Capacity	610 L/min.
Pilot Ratio	1.8:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	1.18 kg.

CONFIGURATION OPTIONS

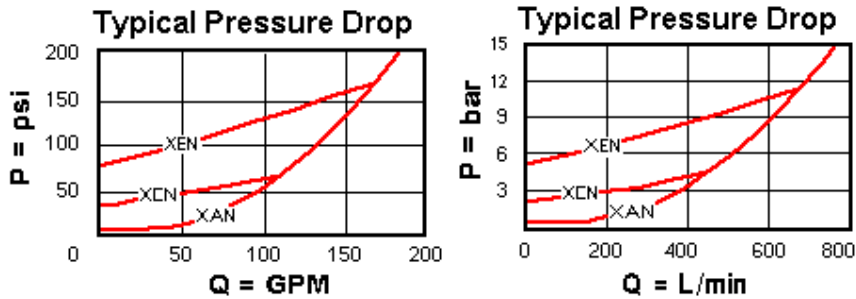
Model Code Example: COJAXCN

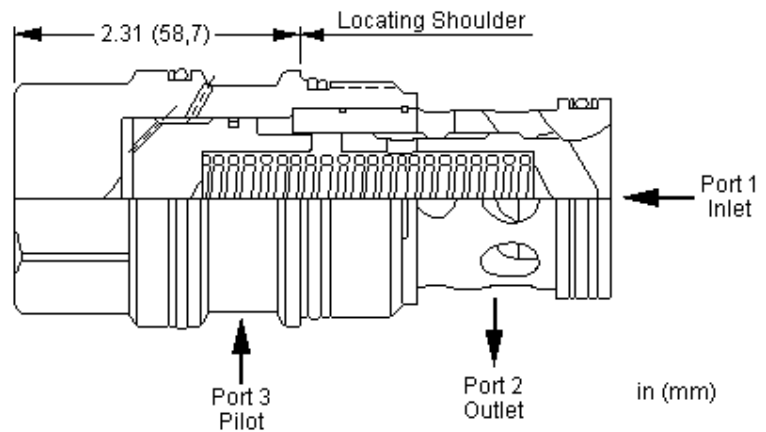
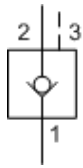
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
	A 4 psi (0,3 bar)	E EPDM	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		
	G 150 psi (10,5 bar)		

TECHNICAL FEATURES

- Nominal pilot ratio is 1.8:1. This means that a pressure of 1000 psi (70 bar) at the pilot port will close a valve against a pressure of 1800 psi (125 bar) at port 1. Any decay or loss of pilot pressure could allow the valve to open, even if it is a momentary decay or loss.
- Pressure at the port 2 area directly opposes pilot pressure.
- Reverse flow through the valve from port 2 to port 1 is not possible under any condition.
- With equal pressures at all ports the valve is closed.
- In the beginning the CO*A's did not have a positive seal on the pilot pistons and the CO*B's did. Now the CO*A's are positively sealed and the 2 valves are mechanically identical. CO*A's are more readily available and cost less.
- 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 or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page under TECHNICAL 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





This valve is a spring biased closed, pilot-to-close check cartridge that has a 1.8:1 pilot ratio. The valve allows flow from port 1 to port 2 and blocks reverse flow. Pressure at the pilot port opposes pressure at port 1 at a ratio of 1.8:1. This valve is most often used in regeneration circuits.

TECHNICAL DATA

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

Cavity	T-19AU
Series	4
Capacity	900 L/min.
Pilot Ratio	1.8:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	1.13 kg.

CONFIGURATION OPTIONS

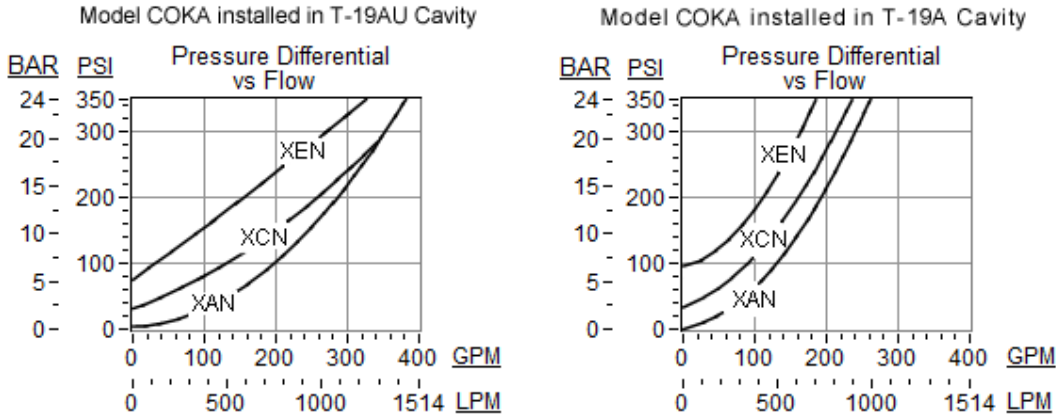
Model Code Example: COKAXAN

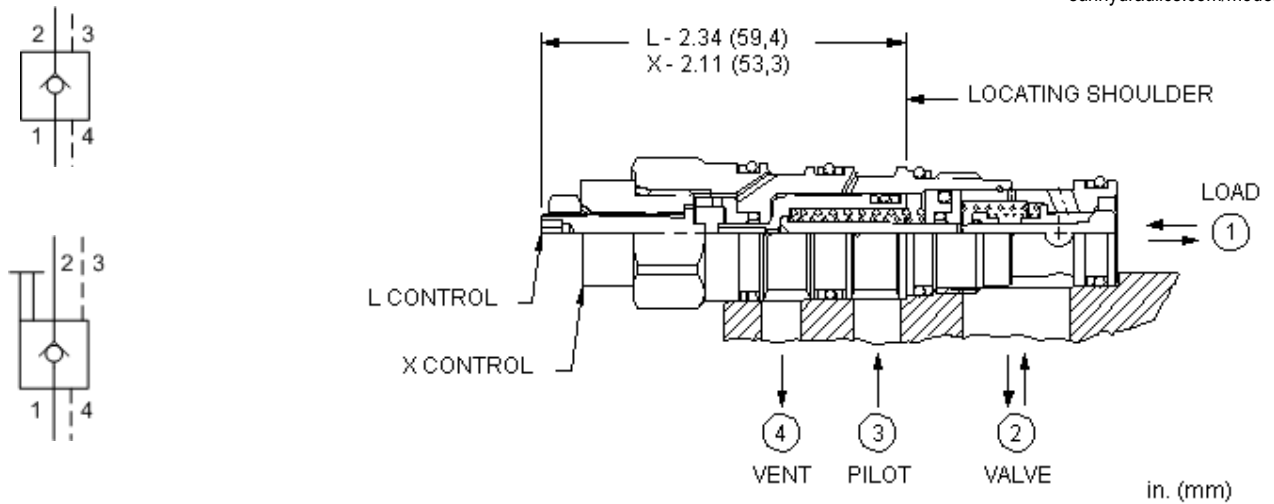
CONTROL	(X) CRACKING PRESSURE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	A 4 psi (0,3 bar) B 15 psi (1 bar) C 30 psi (2 bar) D 50 psi (3,5 bar) E 75 psi (5 bar) F 100 psi (7 bar)	N Buna-N V Viton	Standard Material/Coating /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- These valves will work in Sun's standard T-19A cavity at lower capacity. To realize the full stated capacity, the T-19AU cavity should be used.
- Nominal pilot ratio is 1.8:1. This means that a pressure of 1000 psi (70 bar) at the pilot port will close a valve against a pressure of 1800 psi (125 bar) at port 1. Any decay or loss of pilot pressure could allow the valve to open, even if it is a momentary decay or loss.
- Pressure at the port 2 area directly opposes pilot pressure.
- Reverse flow through the valve from port 2 to port 1 is not possible under any condition.
- With equal pressures at all ports the valve is closed.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page under TECHNICAL 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





This valve is a pilot to open check valve. It has a sealed pilot, a steel seat, and is vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) will open the valve from port 1 to port 2. Pilot pressure needed to open the valve is directly proportional to the load pressure at port 1. The valve is insensitive to pressure at port 2 because the spring chamber is referenced to the vent (port 4).

TECHNICAL DATA

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

Cavity	T-21A
Series	1
Capacity	60 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 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	0.18 kg.

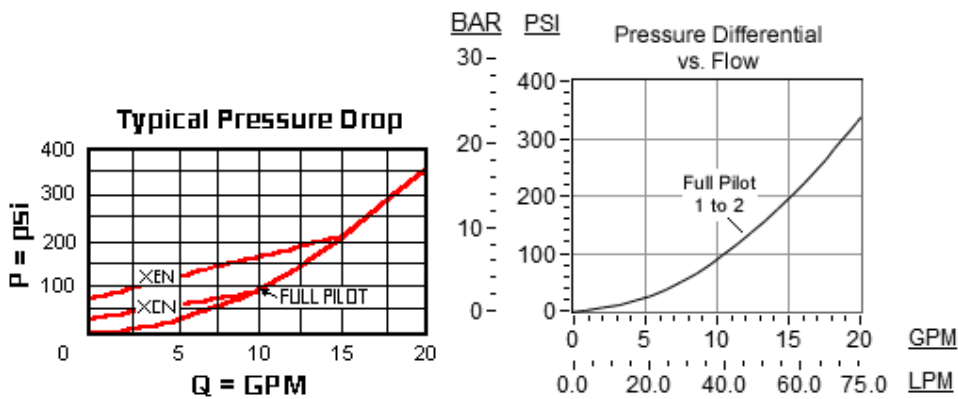
CONFIGURATION OPTIONS
Model Code Example: CVCVXCN

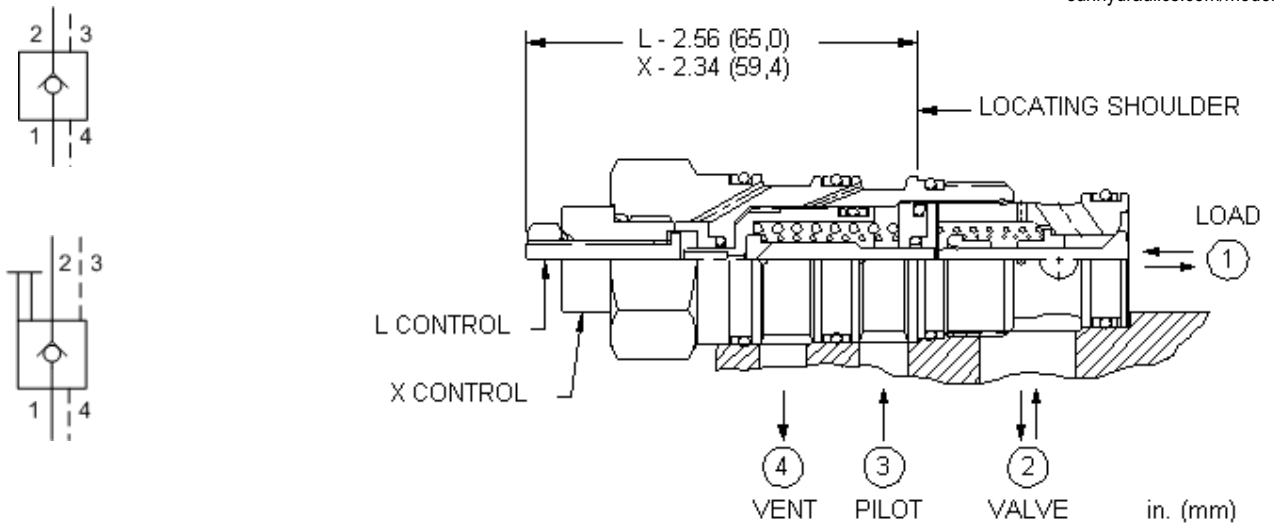
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
L Manual Load Release	A 4 psi (0,3 bar)	E EPDM	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		

TECHNICAL FEATURES

- Pilot pressure as low as 75 psi (5 bar) higher than the pressure at the vent can prevent the valve from closing.
- Will accept pressure at port 4 (vent) but can not exceed 5000 psi (350 bar).
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance valves.
- Four-port pilot-to-open check cartridges and four-port counterbalance cartridges are physically interchangeable (i.e. same cavities, same flow path for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Approximately 1 drop (0,07 cc) of fluid will pass from the pilot area to 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.
- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Sealed pilot for use in circuits where cross port leakage is undesirable.
- Port 4 (vent) should never be blocked as seal weepage will eventually cause valve to malfunction.
- 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 pilot to open check valve. It has a sealed pilot, a steel seat, and is vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) will open the valve from port 1 to port 2. Pilot pressure needed to open the valve is directly proportional to the load pressure at port 1. The valve is insensitive to pressure at port 2 because the spring chamber is referenced to the vent (port 4).

TECHNICAL DATA

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

Cavity	T-22A
Series	2
Capacity	120 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.30 kg.

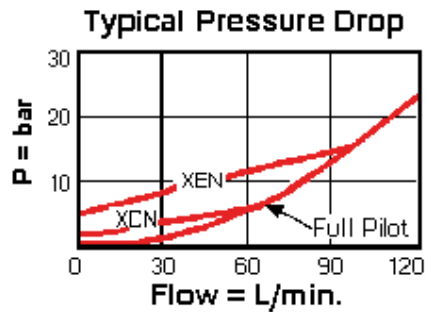
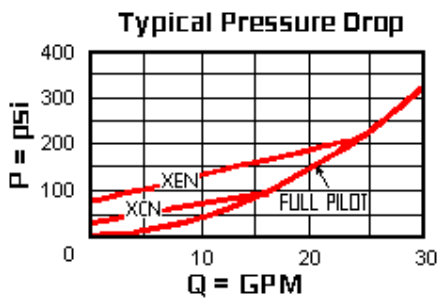
CONFIGURATION OPTIONS
Model Code Example: CVEVXCN

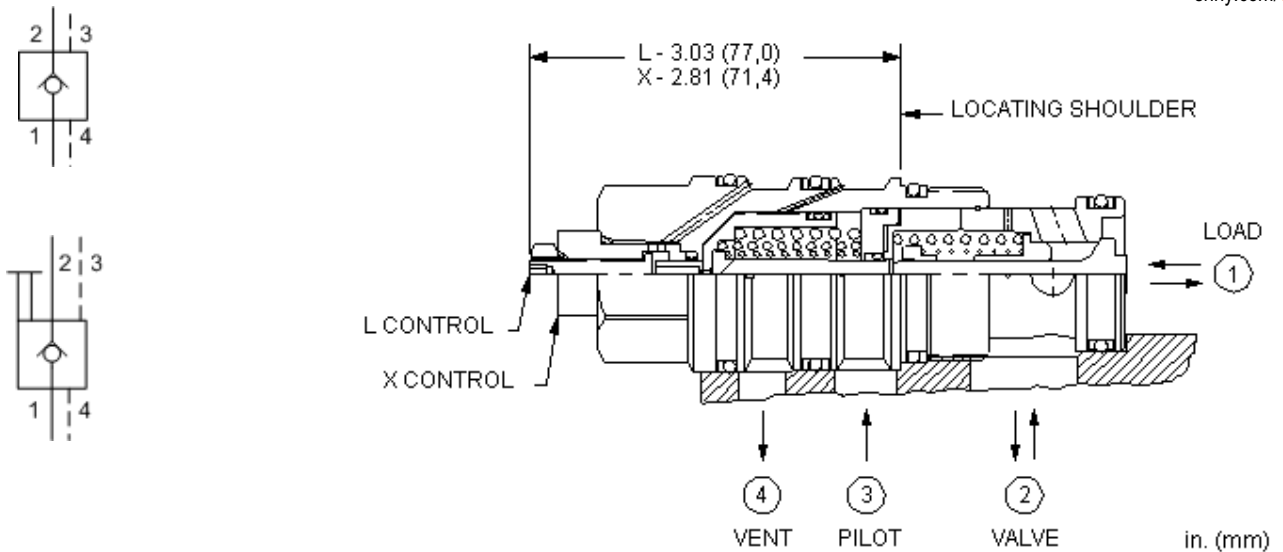
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
L Manual Load Release	A 4 psi (0,3 bar)	E EPDM	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		

TECHNICAL FEATURES

- Pilot pressure as low as 75 psi (5 bar) higher than the pressure at the vent can prevent the valve from closing.
- Will accept pressure at port 4 (vent) but can not exceed 5000 psi (350 bar).
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance valves.
- Four-port pilot-to-open check cartridges and four-port counterbalance cartridges are physically interchangeable (i.e. same cavities, same flow path for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Approximately 1 drop (0,07 cc) of fluid will pass from the pilot area to the vented spring chamber every 4000 cycles.
- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Sealed pilot for use in circuits where cross port leakage is undesirable.
- Port 4 (vent) should never be blocked as seal weepage will eventually cause valve to malfunction.
- 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 pilot to open check valve. It has a sealed pilot, a steel seat, and is vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) will open the valve from port 1 to port 2. Pilot pressure needed to open the valve is directly proportional to the load pressure at port 1. The valve is insensitive to pressure at port 2 because the spring chamber is referenced to the vent (port 4).

TECHNICAL DATA

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

Cavity	T-23A
Series	3
Capacity	240 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.68 kg.

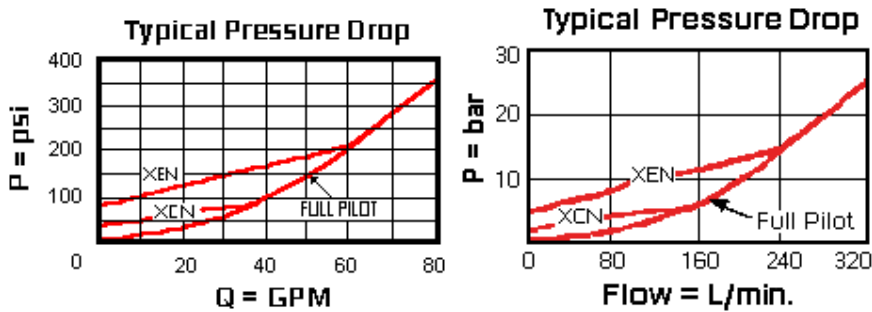
CONFIGURATION OPTIONS
Model Code Example: CVGVXCN

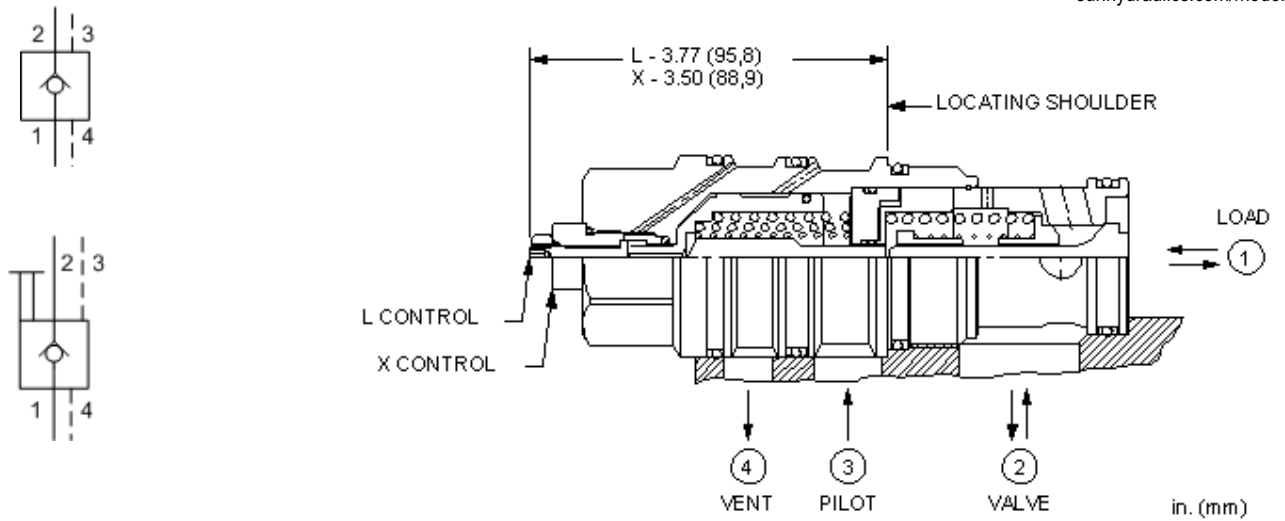
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
L Manual Load Release	A 4 psi (0,3 bar)	V Viton	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)		/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		

TECHNICAL FEATURES

- Pilot pressure as low as 75 psi (5 bar) higher than the pressure at the vent can prevent the valve from closing.
- Will accept pressure at port 4 (vent) but can not exceed 5000 psi (350 bar).
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance valves.
- Four-port pilot-to-open check cartridges and four-port counterbalance cartridges are physically interchangeable (i.e. same cavities, same flow path for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Approximately 1 drop (0,07 cc) of fluid will pass from the pilot area to the vented spring chamber every 4000 cycles.
- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Sealed pilot for use in circuits where cross port leakage is undesirable.
- Port 4 (vent) should never be blocked as seal weepage will eventually cause valve to malfunction.
- 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 pilot to open check valve. It has a sealed pilot, a steel seat, and is vented. It allows free flow from the valve (port 2) to the load (port 1) and blocks flow in the opposite direction. Pressure at the pilot (port 3) will open the valve from port 1 to port 2. Pilot pressure needed to open the valve is directly proportional to the load pressure at port 1. The valve is insensitive to pressure at port 2 because the spring chamber is referenced to the vent (port 4).

TECHNICAL DATA

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

Cavity	T-24A
Series	4
Capacity	480 L/min.
Pilot Ratio	3:1
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Pilot Volume Displacement	4,9 cc
Pilot Passage into Valve	2,3 mm
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	1.53 kg.

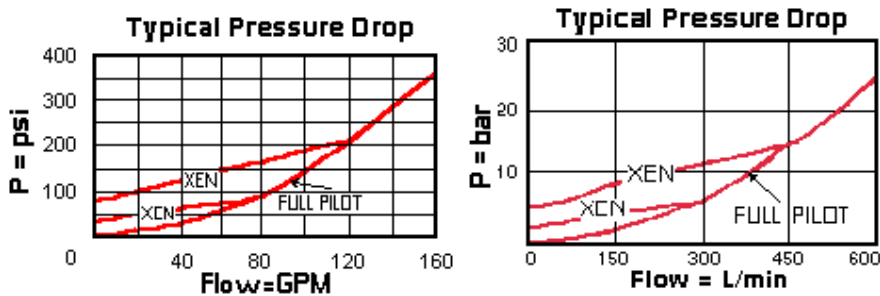
CONFIGURATION OPTIONS
Model Code Example: CVIVXCN

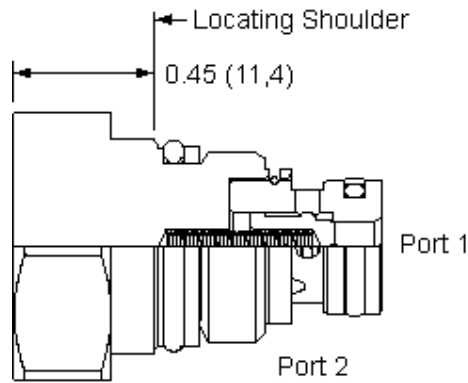
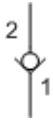
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
L Manual Load Release	A 4 psi (0,3 bar)	V Viton	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)		/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		

TECHNICAL FEATURES

- Pilot pressure as low as 75 psi (5 bar) higher than the pressure at the vent can prevent the valve from closing.
- Will accept pressure at port 4 (vent) but can not exceed 5000 psi (350 bar).
- Pilot-to-open check cartridges are locking valves, not motion control valves. For motion control applications, use counterbalance valves.
- Four-port pilot-to-open check cartridges and four-port counterbalance cartridges are physically interchangeable (i.e. same cavities, same flow path for a given frame size). However, cartridge extension dimensions from the mounting surface may vary.
- Approximately 1 drop (0,07 cc) of fluid will pass from the pilot area to the vented spring chamber every 4000 cycles.
- For models with manual load release control option, turn load release clockwise to release load.
- 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.
- Provides hose break protection, prevents loads from drifting and positively locks pressurized loads.
- Extremely low leakage. The seat and poppet are heat treated for long life. If the load drifts due to the valve, the seat has probably been damaged by contamination and the valve should be replaced.
- Sealed pilot for use in circuits where cross port leakage is undesirable.
- Port 4 (vent) should never be blocked as seal weepage will eventually cause valve to malfunction.
- 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





Free-flow, nose-to-side check valves are on/off circuit components that allow free flow from the inlet (port 1) to the outlet (port 2) and block flow in the opposite direction.

TECHNICAL DATA

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

Cavity	T-8A
Series	P
Capacity	20 L/min.
Valve Hex Size	22,2 mm
Valve Installation Torque	27 - 33 Nm
Seal kit - Cartridge	Buna: 990608007
Seal kit - Cartridge	EPDM: 990608014
Seal kit - Cartridge	Viton: 990608006
Model Weight	0.05 kg.

CONFIGURATION OPTIONS

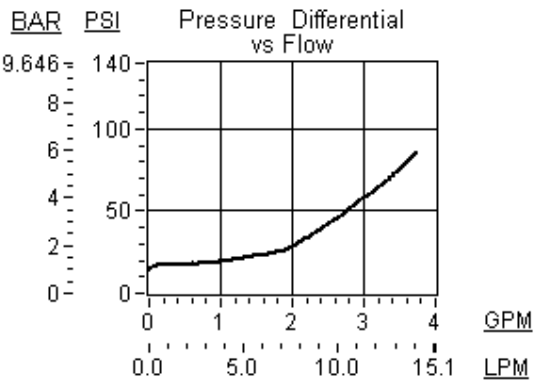
Model Code Example: **CXAAXBN**

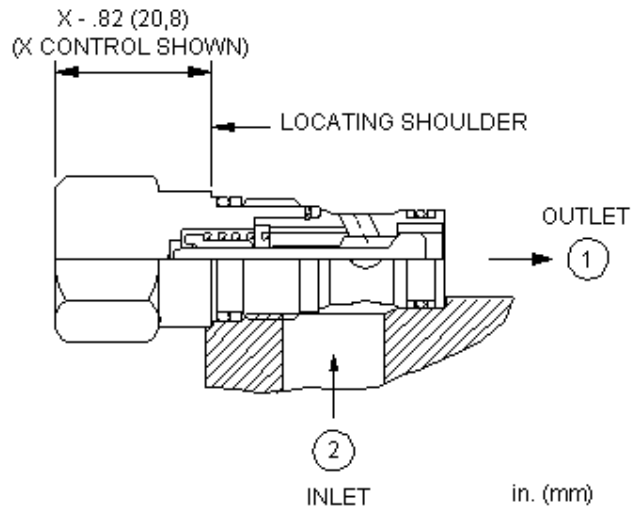
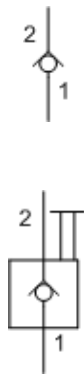
CONTROL	(X) CRACKING PRESSURE	(B) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	B 15 psi (1 bar)	N Buna-N	Standard Material/Coating
	F 100 psi (7 bar)	E EPDM	/AP Stainless Steel, Passivated
	Z 1 psi (0,07 bar)	V Viton	/LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- 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





Free-flow, side-to-nose check valves are on/off circuit components that allow free flow from the inlet (port 2) to the outlet (port 1) and block flow in the opposite direction.

TECHNICAL DATA

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

Cavity	T-162A
Series	0
Capacity	30 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	EPDM: 990162014
Seal kit - Cartridge	Polyurethane: 990162002
Seal kit - Cartridge	Viton: 990162006
Model Weight	0.08 kg.

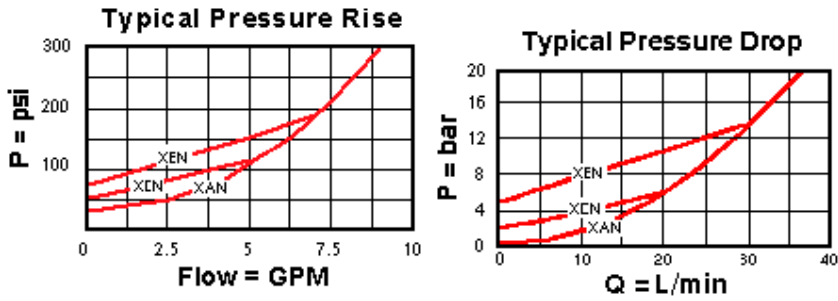
CONFIGURATION OPTIONS
Model Code Example: CXADXCN

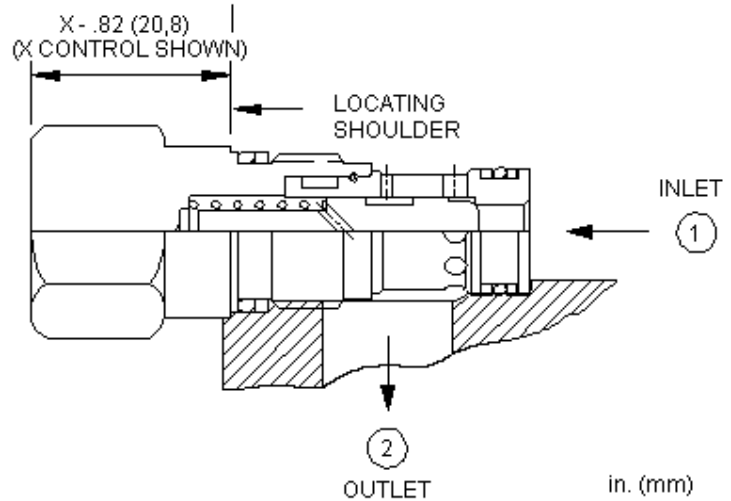
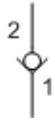
CONTROL	(X) NOMINAL CONTROL PRESSURE (C)	SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) A 4 psi (0,3 bar) D 50 psi (3,5 bar) E 75 psi (5 bar) Z 1 psi (0,07 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- These check valves are considered circuit savers for existing circuits where manifold drillings are incorrect. The capacity of side-to-nose (port 2 to port 1) 2-port check valves is approximately 30% less than preferred models with a nose-to-side (port 1 to port 2) flow path.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- Only available with 4, 30 and 75 psi (0,3, 2 and 5 bar) cracking pressures.
- 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





Free-flow, nose-to-side check valves are on/off circuit components that allow free flow from the inlet (port 1) to the outlet (port 2) and block flow in the opposite direction.

TECHNICAL DATA

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

Cavity	T-162A
Series	0
Capacity	40 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Valve Hex Size	19,1 mm
Valve Installation Torque	27 - 33 Nm
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	EPDM: 990162014
Seal kit - Cartridge	Polyurethane: 990162002
Seal kit - Cartridge	Viton: 990162006
Model Weight	0.08 kg.

CONFIGURATION OPTIONS

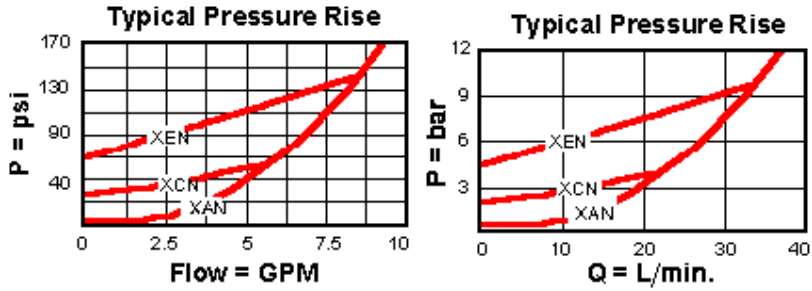
Model Code Example: CXBAXCN

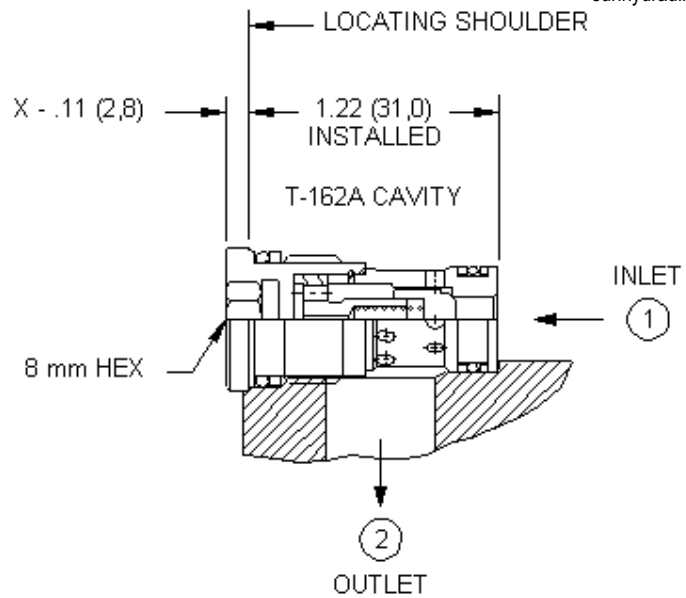
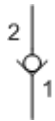
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) A 4 psi (0,3 bar) B 15 psi (1 bar) D 50 psi (3,5 bar) E 75 psi (5 bar) F 100 psi (7 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- 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





in. (mm)

Free-flow, nose-to-side check valves are on/off circuit components that allow free flow from the inlet (port 1) to the outlet (port 2) and block flow in the opposite direction.

TECHNICAL DATA

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

Cavity	T-162A
Series	0
Capacity	40 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Valve Internal Hex Size	8 mm
Valve Installation Torque	27 - 33 Nm
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	Polyurethane: 990162002
Seal kit - Cartridge	Viton: 990162006
Model Weight	0.03 kg.

CONFIGURATION OPTIONS

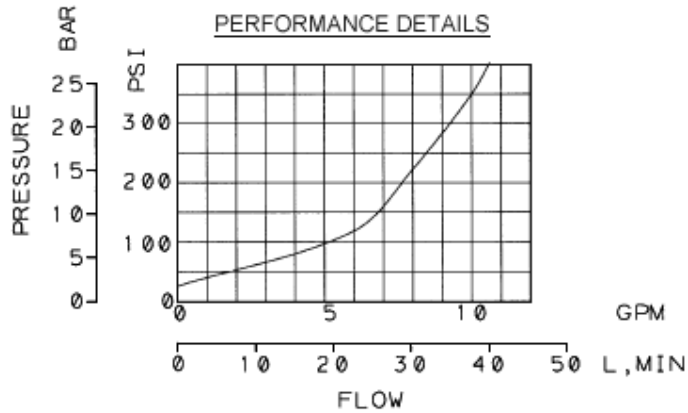
Model Code Example: CXBGXAN

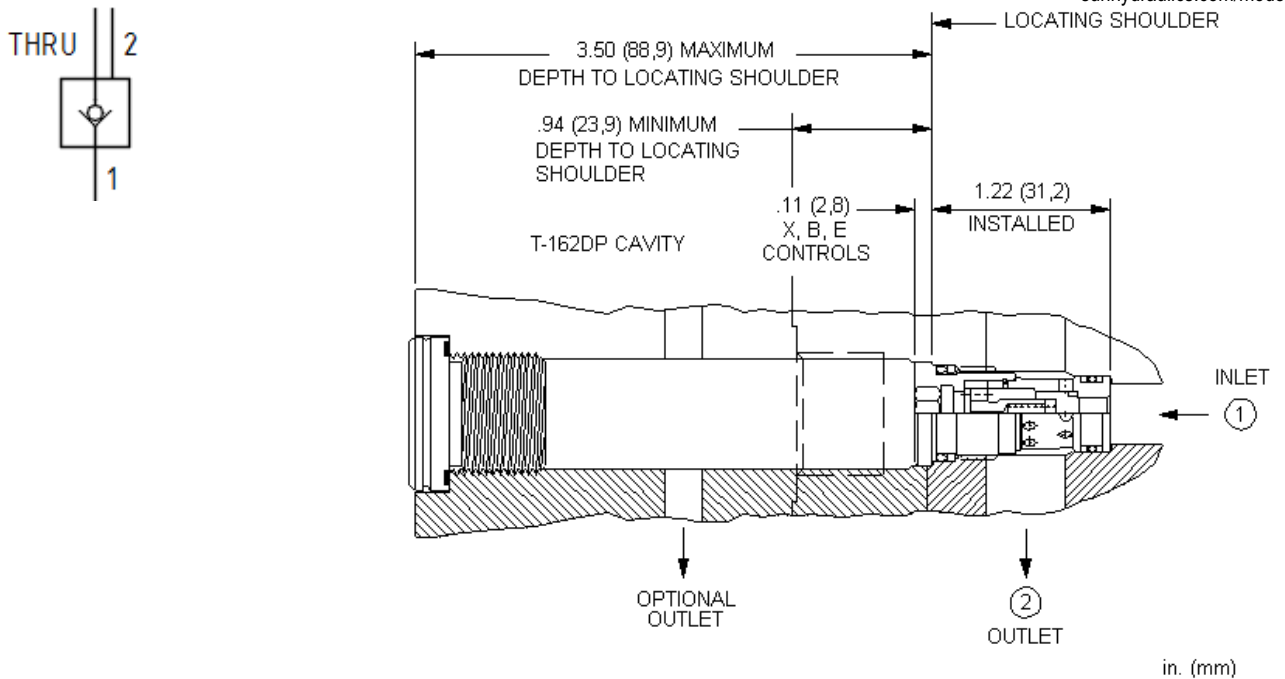
CONTROL	(X) CRACKING PRESSURE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	A 4 psi (0,3 bar) B 15 psi (1 bar) C 30 psi (2 bar) D 50 psi (3,5 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Flush mount valves provide a small footprint. They can easily be mounted flush with the surface of the manifold.
- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 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





Free-flow, nose-to-side check valves are on/off circuit components that allow free flow from the inlet (port 1) to the outlet (port 2) and block flow in the opposite direction.

TECHNICAL DATA

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

Cavity	T-162DP
Series	0
Capacity	40 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Valve Internal Hex Size	8 mm
Valve Installation Torque	27 - 33 Nm
Seal kit - Cartridge	Buna: 990162007
Seal kit - Cartridge	EPDM: 990162014
Seal kit - Cartridge	Polyurethane: 990162002
Seal kit - Cartridge	Viton: 990162006
Model Weight	0.03 kg.

CONFIGURATION OPTIONS

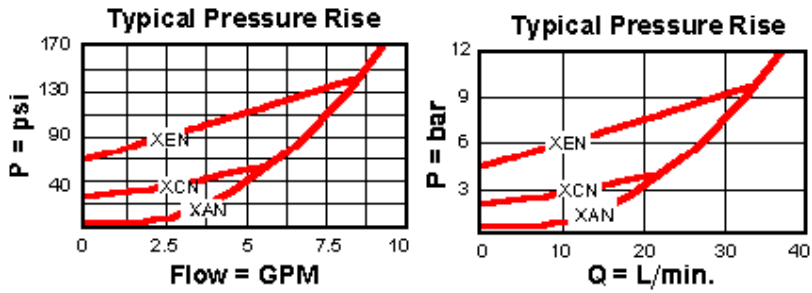
Model Code Example: CXBMXAN

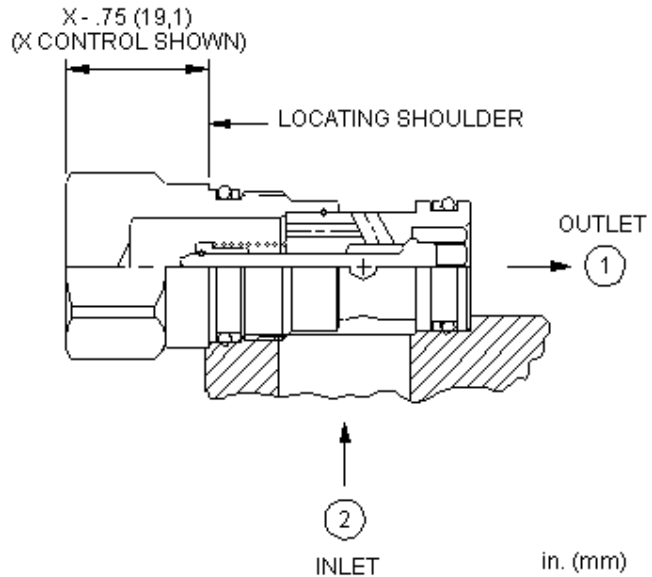
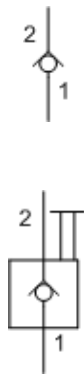
CONTROL	(X)	CRACKING PRESSURE	(A)	SEAL MATERIAL	(N)
X Not Adjustable		A 4 psi (0,3 bar)		N Buna-N	
		B 15 psi (1 bar)		E EPDM	
		C 30 psi (2 bar)		V Viton	

TECHNICAL FEATURES

- This valve is what we call an Insert style. It is meant to be buried in a manifold or actuator. The cavity drawing for the T-162DP cavity contains a lot of detailed information and should be studied closely when applying this valve.
- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- 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.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 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





Free-flow, side-to-nose check valves are on/off circuit components that allow free flow from the inlet (port 2) to the outlet (port 1) and block flow in the opposite direction.

TECHNICAL DATA

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

Cavity	T-13A
Series	1
Capacity	60 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.10 kg.

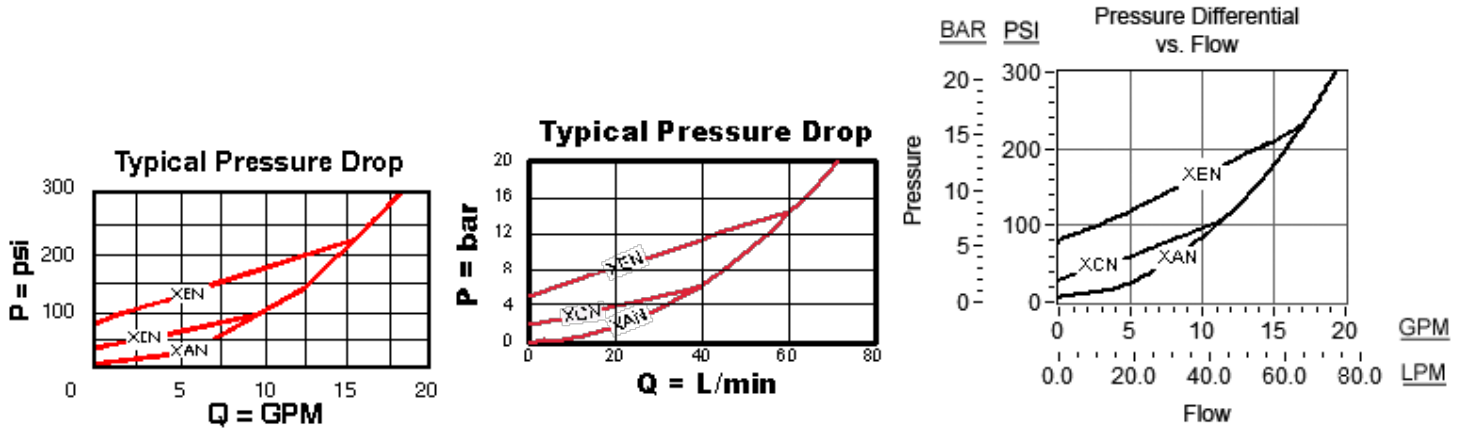
CONFIGURATION OPTIONS
Model Code Example: CXCDXCN

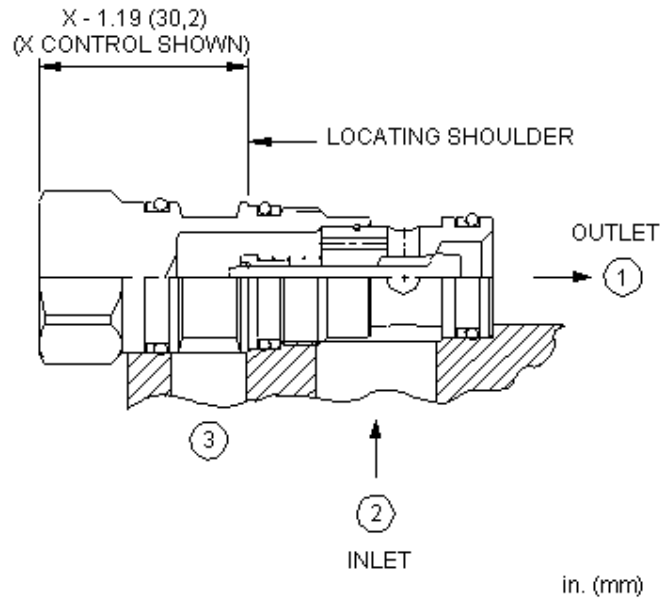
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
L Manual Override	A 4 psi (0,3 bar)	E EPDM	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		

TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- These check valves are considered circuit savers for existing circuits where manifold drillings are incorrect. The capacity of side-to-nose (port 2 to port 1) 2-port check valves is approximately 30% less than preferred models with a nose-to-side (port 1 to port 2) flow path.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 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





Free-flow, side-to-nose cheater check valves function as a standard 2-port check valve in a 3-port cavity with port 3 of the cartridge blocked off. These valves are useful in circuits where a check valve is required in an existing three port cavity.

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
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.12 kg.

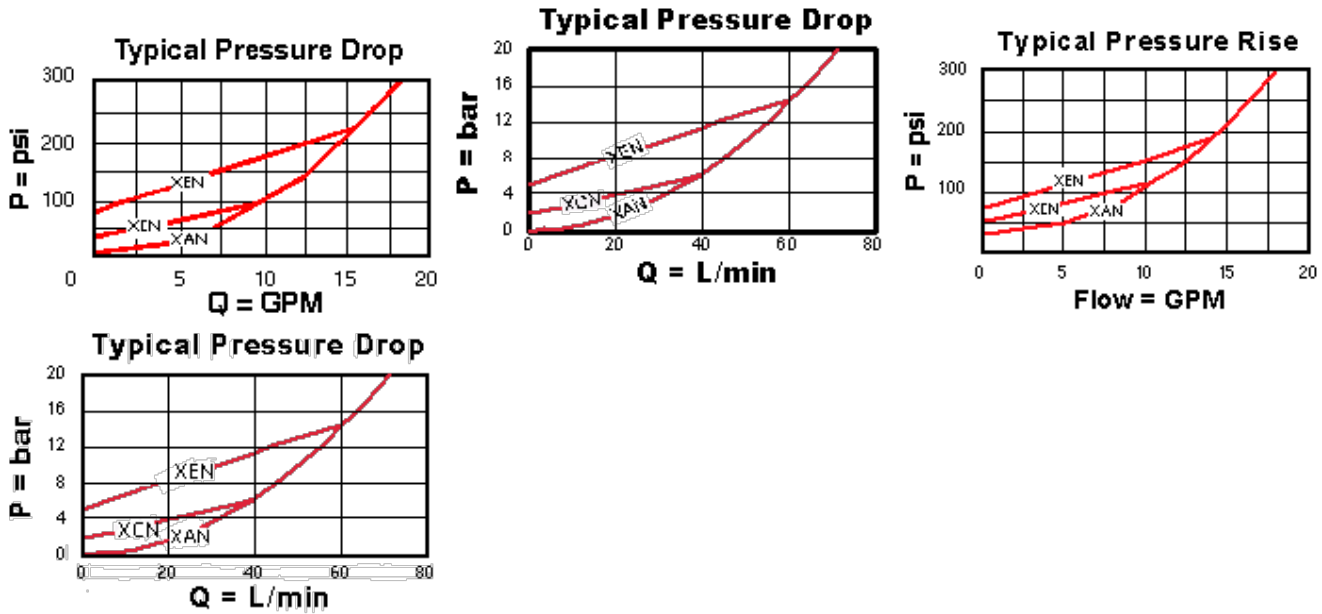
CONFIGURATION OPTIONS
Model Code Example: CXCEXCN

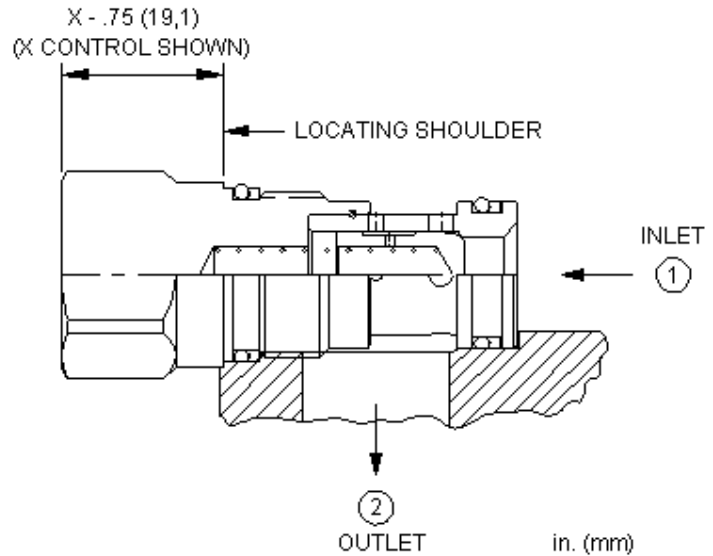
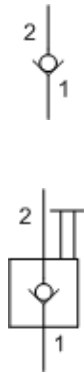
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) A 4 psi (0,3 bar) B 15 psi (1 bar) D 50 psi (3,5 bar) E 75 psi (5 bar) F 100 psi (7 bar)	N Buna-N V Viton	N Standard Material/Coating /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page.
- 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





Free-flow, nose-to-side check valves are on/off circuit components that allow free flow from the inlet (port 1) to the outlet (port 2) and block flow in the opposite direction.

TECHNICAL DATA

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

Cavity	T-13A
Series	1
Capacity	80 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.11 kg.

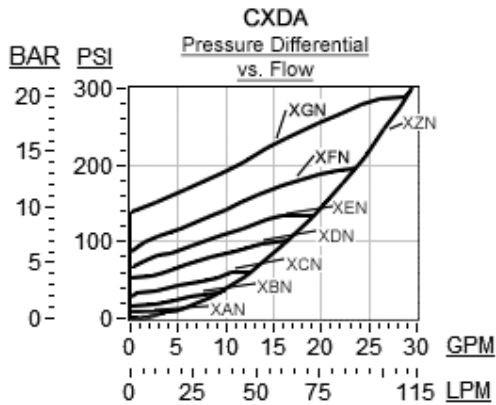
CONFIGURATION OPTIONS
Model Code Example: CXDAXCN

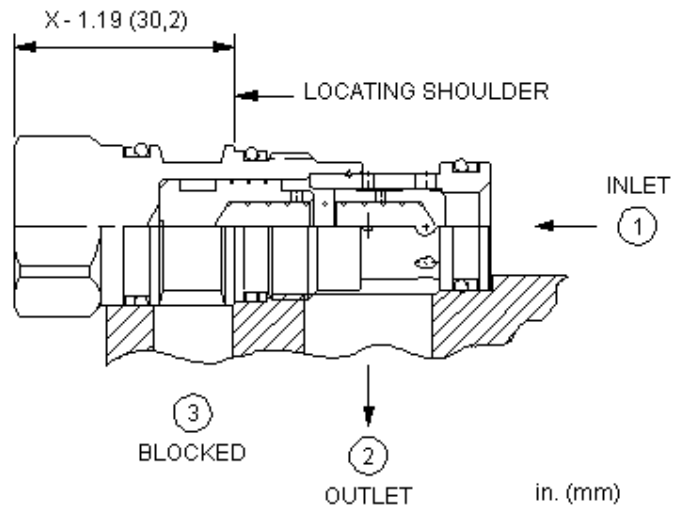
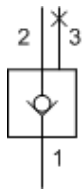
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) A 4 psi (0,3 bar) B 15 psi (1 bar) D 50 psi (3,5 bar) E 75 psi (5 bar) F 100 psi (7 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- 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 or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page.
- 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





Free-flow, nose-to-side cheater check valves function as a standard 2-port check valve in a 3-port cavity with port 3 of the cartridge blocked off. These valves are useful in circuits where a check valve is required in an existing three port cavity.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	80 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.13 kg.

CONFIGURATION OPTIONS

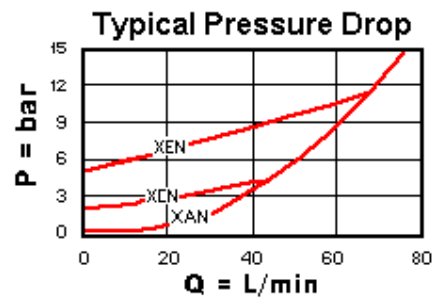
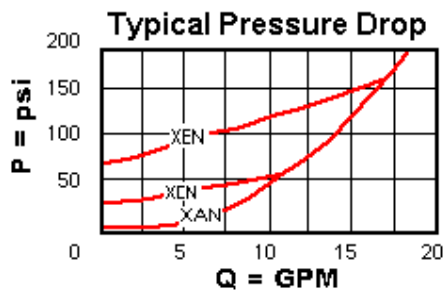
Model Code Example: **CXDCXCN**

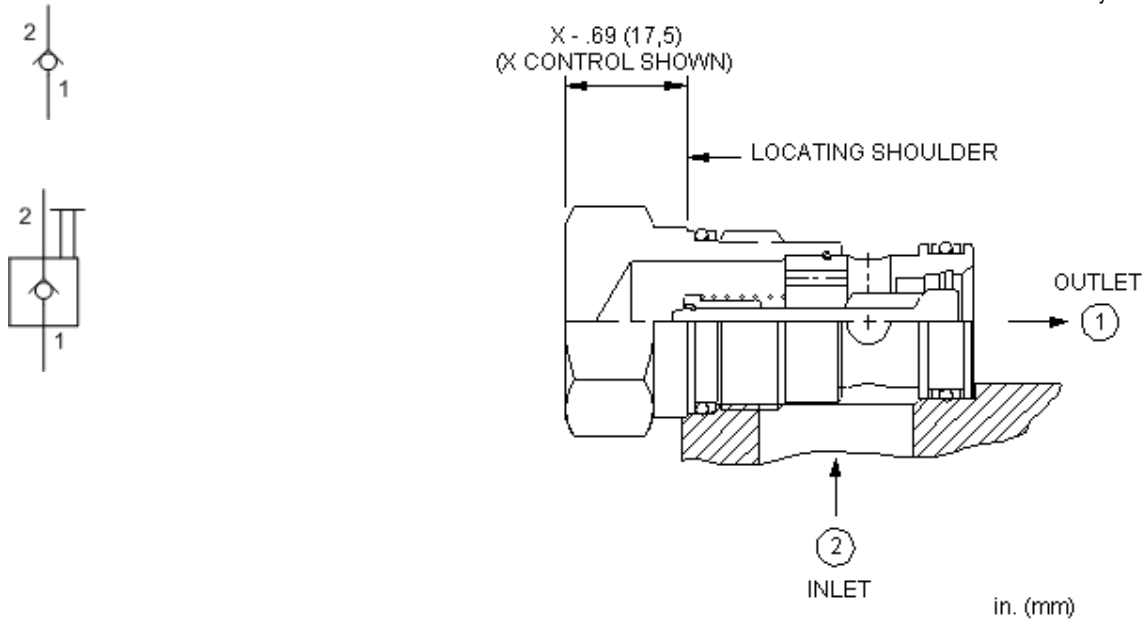
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) A 4 psi (0,3 bar) B 15 psi (1 bar) D 50 psi (3,5 bar) E 75 psi (5 bar) F 100 psi (7 bar) Z 1 psi (0,07 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (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





Free-flow, side-to-nose check valves are on/off circuit components that allow free flow from the inlet (port 2) to the outlet (port 1) and block flow in the opposite direction.

TECHNICAL DATA

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

Cavity	T-5A
Series	2
Capacity	120 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	Viton: 990203006
Model Weight	0.17 kg.

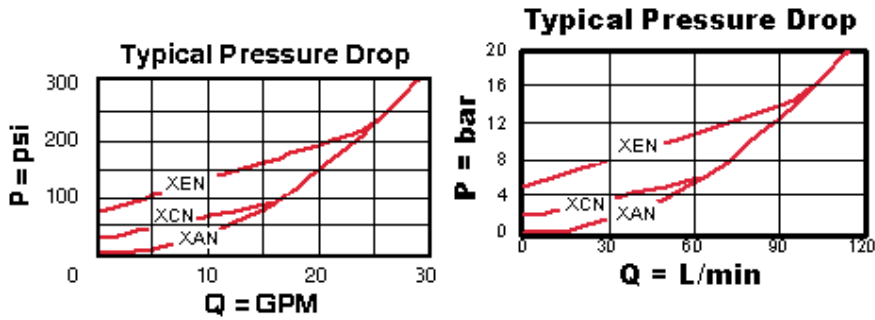
CONFIGURATION OPTIONS
Model Code Example: CXEDXCN

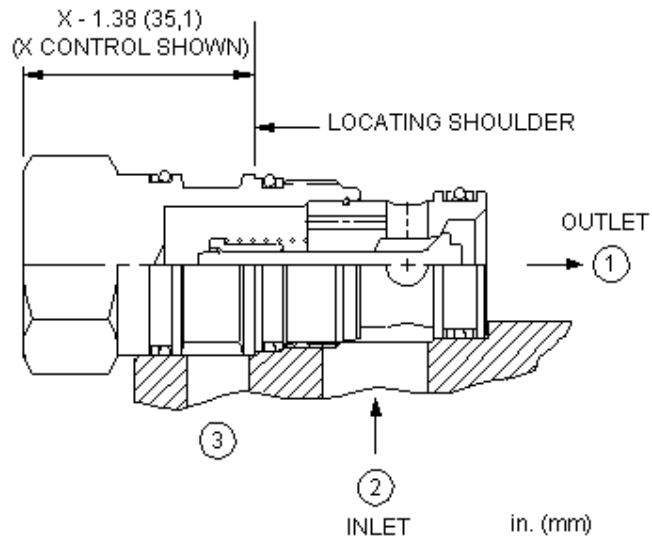
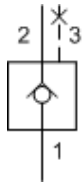
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
	A 4 psi (0,3 bar)	E EPDM	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		

TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- These check valves are considered circuit savers for existing circuits where manifold drillings are incorrect. The capacity of side-to-nose (port 2 to port 1) 2-port check valves is approximately 30% less than preferred models with a nose-to-side (port 1 to port 2) flow path.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 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





Free-flow, side-to-nose cheater check valves function as a standard 2-port check valve in a 3-port cavity with port 3 of the cartridge blocked off. These valves are useful in circuits where a check valve is required in an existing three port cavity.

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
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.22 kg.

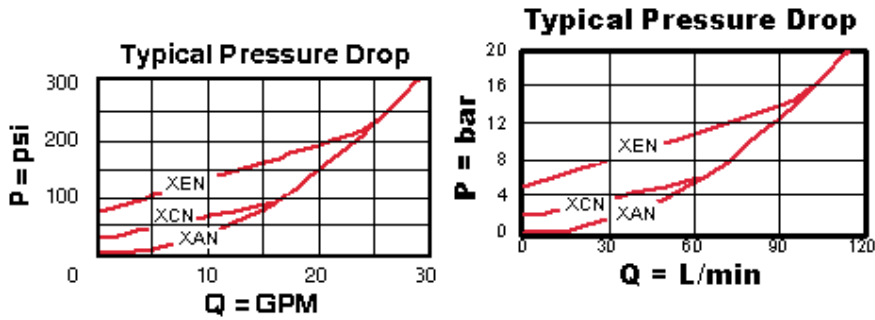
CONFIGURATION OPTIONS
Model Code Example: CXEEXCN

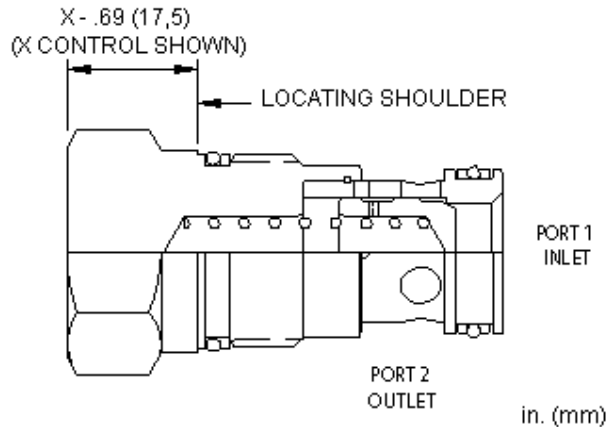
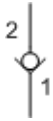
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
	A 4 psi (0,3 bar)	V Viton	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)		/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		

TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page.
- 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





Free-flow, nose-to-side check valves are on/off circuit components that allow free flow from the inlet (port 1) to the outlet (port 2) and block flow in the opposite direction.

TECHNICAL DATA

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

Cavity	T-5A
Series	2
Capacity	160 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	Viton: 990203006
Model Weight	0.19 kg.

CONFIGURATION OPTIONS

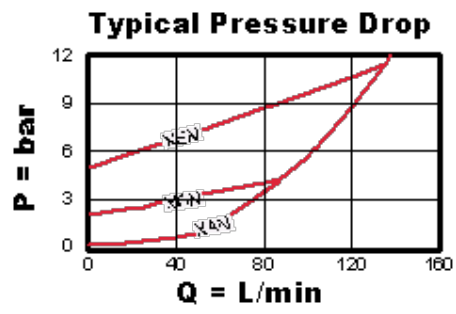
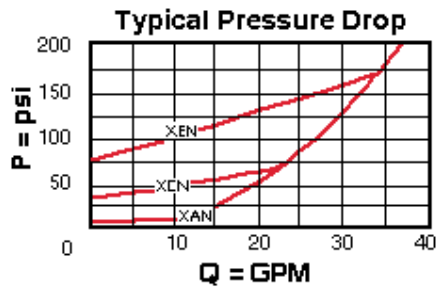
Model Code Example: **CXFAXCN**

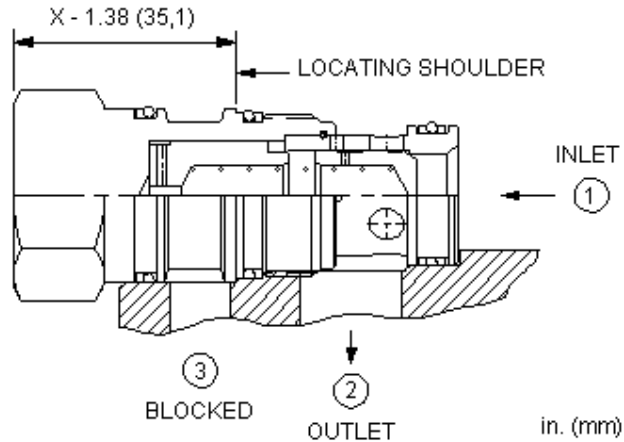
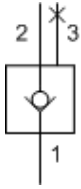
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) A 4 psi (0,3 bar) B 15 psi (1 bar) D 50 psi (3,5 bar) E 75 psi (5 bar) F 100 psi (7 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- 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 or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page.
- 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





Free-flow, nose-to-side cheater check valves function as a standard 2-port check valve in a 3-port cavity with port 3 of the cartridge blocked off. These valves are useful in circuits where a check valve is required in an existing three port cavity.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	160 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.23 kg.

CONFIGURATION OPTIONS

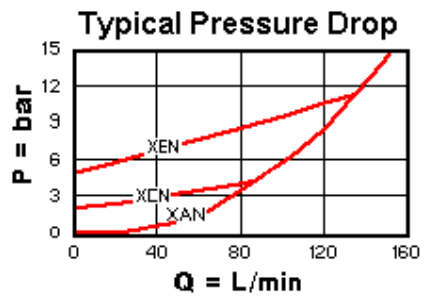
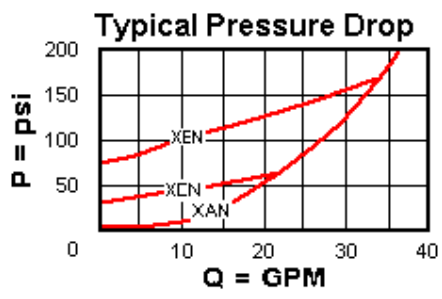
Model Code Example: **CXFCXCN**

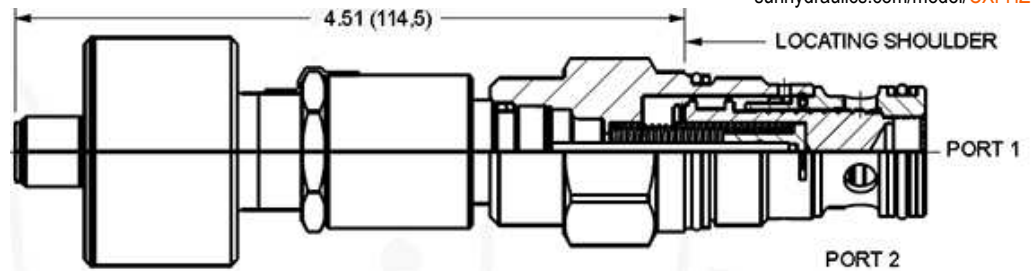
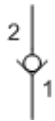
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) A 4 psi (0,3 bar) B 15 psi (1 bar) D 50 psi (3,5 bar) E 75 psi (5 bar) F 100 psi (7 bar) Z 1 psi (0,07 bar)	N Buna-N V Viton	Standard Material/Coating /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (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





Free-flow, nose-to-side check valves are on/off circuit components that allow free flow from the inlet (port 1) to the outlet (port 2) and block flow in the opposite direction.

This valve incorporates a position switch to provide confirmation that the valve is in the transition position or seated (closed).

TECHNICAL DATA

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

Cavity	T-5A
Series	2
Capacity	120 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Transition leakage at 110 SUS (24 cSt)	30 cc/min.@70 bar
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990203007
Seal kit - Cartridge	Viton: 990203006
Model Weight	0.62 kg.

SWITCH SPECIFICATIONS

Supply Voltage	20-30 VDC
Operating Temperature Range	-25 to 80 °C
Vibration	≥ 50g, 0-500 impulses/sec
Shock	>50 g, 1ms
Reverse Polarity Protection	Yes
Maximum Output Load	≤ 400 mA, Duty Ratio 100%
Short Circuit Protection	Yes, Load Short Unlimited
Turn On Time	≤ 25 ms
Hysteresis	≤ .002 in.
Thermal Shift - 0 to 80 °C ≤ ±	0,1 mm
EMC	DIN EN 61000-6-1/2/3/4
Connector	M12 X 1 (4) Pin
Connector Environment Rating	IP65

CONFIGURATION OPTIONS

Model Code Example: **CXFHZCN**

CRACKING PRESSURE (C) **SEAL MATERIAL** (N)

C 30 psi (2 bar)

N Buna-N

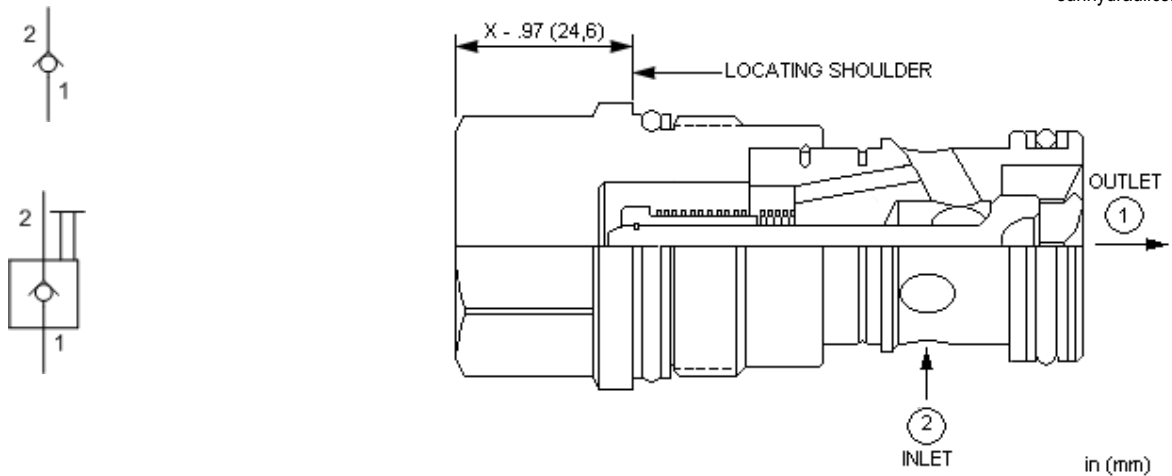
A 4 psi (0,3 bar)

V Viton

TECHNICAL FEATURES

- The position switch in this valve provides confirmation that the valve is closed.
- This cartridge is supplied as a sealed, factory set unit and is not field serviceable. Any tampering will violate the product warranty.
- When torquing this cartridge into its cavity, a crow's foot wrench or similar will be required since the position switch precludes the use of a deep socket wrench.
- All ports will accept 5000 psi (350 bar).
- An optional protective cover, with mounting hardware included, may be ordered separately. See kit number: 991-043.
- 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



Free-flow, side-to-nose check valves are on/off circuit components that allow free flow from the inlet (port 2) to the outlet (port 1) and block flow in the opposite direction.

TECHNICAL DATA

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

Cavity	T-16A
Series	3
Capacity	240 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.46 kg.

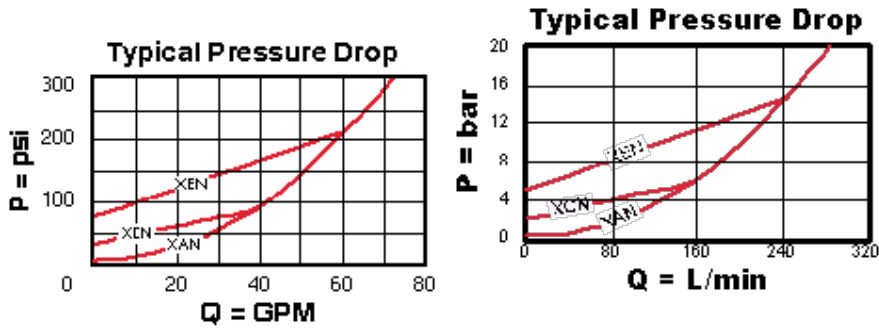
CONFIGURATION OPTIONS
Model Code Example: CXGDXCN

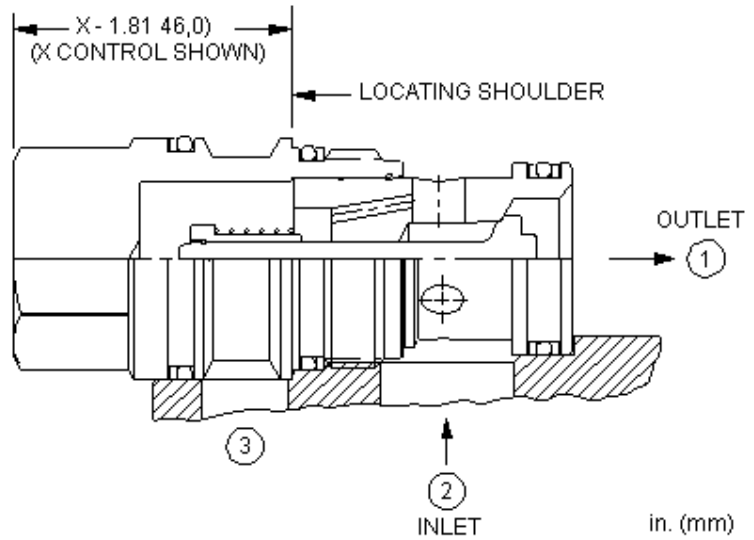
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) A 4 psi (0,3 bar) B 15 psi (1 bar) D 50 psi (3,5 bar) E 75 psi (5 bar) F 100 psi (7 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- These check valves are considered circuit savers for existing circuits where manifold drillings are incorrect. The capacity of side-to-nose (port 2 to port 1) 2-port check valves is approximately 30% less than preferred models with a nose-to-side (port 1 to port 2) flow path.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- 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





Free-flow, side-to-nose cheater check valves function as a standard 2-port check valve in a 3-port cavity with port 3 of the cartridge blocked off. These valves are useful in circuits where a check valve is required in an existing three port cavity.

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
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.48 kg.

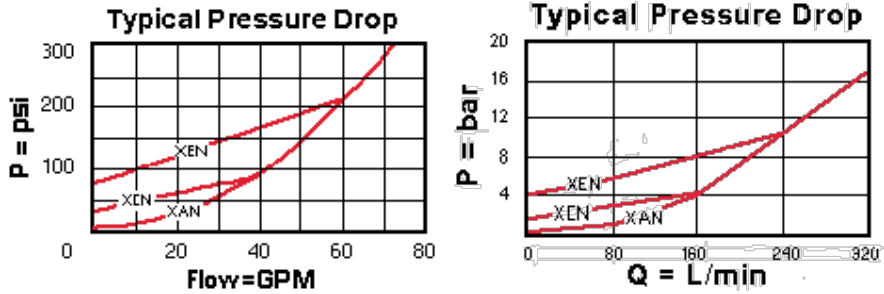
CONFIGURATION OPTIONS
Model Code Example: CXGEXCN

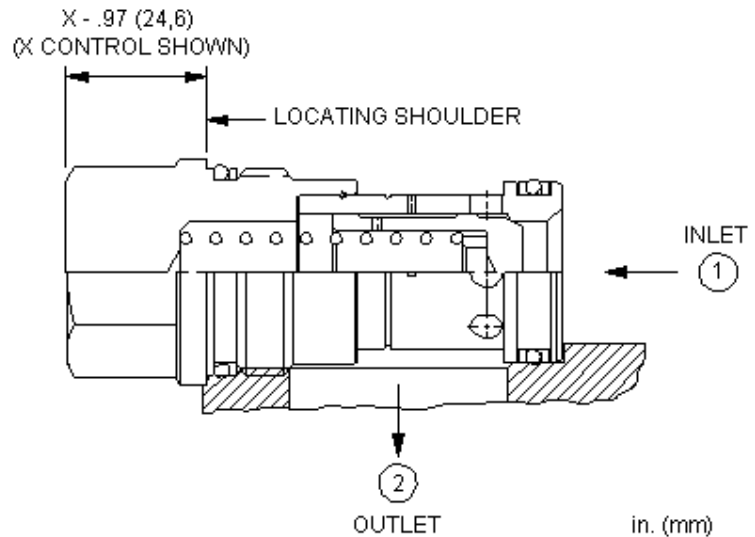
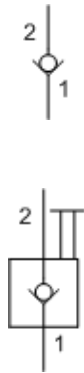
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) A 4 psi (0,3 bar) B 15 psi (1 bar) D 50 psi (3,5 bar) E 75 psi (5 bar) F 100 psi (7 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page.
- 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





Free-flow, nose-to-side check valves are on/off circuit components that allow free flow from the inlet (port 1) to the outlet (port 2) and block flow in the opposite direction.

TECHNICAL DATA

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

Cavity	T-16A
Series	3
Capacity	320 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.43 kg.

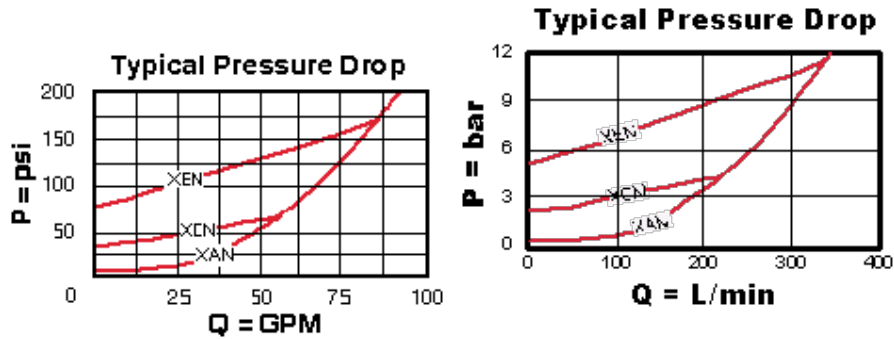
CONFIGURATION OPTIONS
Model Code Example: CXHAXCN

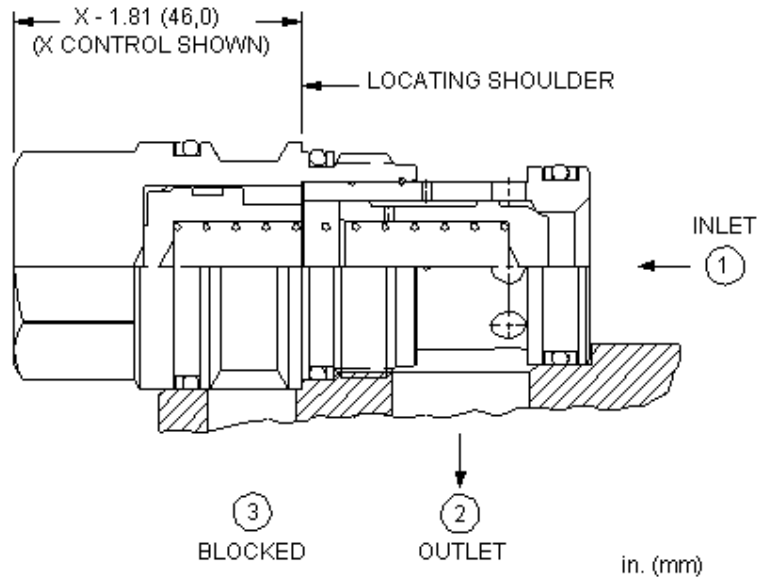
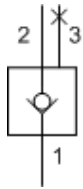
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
L Manual Override	A 4 psi (0,3 bar)	E EPDM	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		

TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- 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 or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page.
- 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





Free-flow, nose-to-side cheater check valves function as a standard 2-port check valve in a 3-port cavity with port 3 of the cartridge blocked off. These valves are useful in circuits where a check valve is required in an existing three port cavity.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	320 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.50 kg.

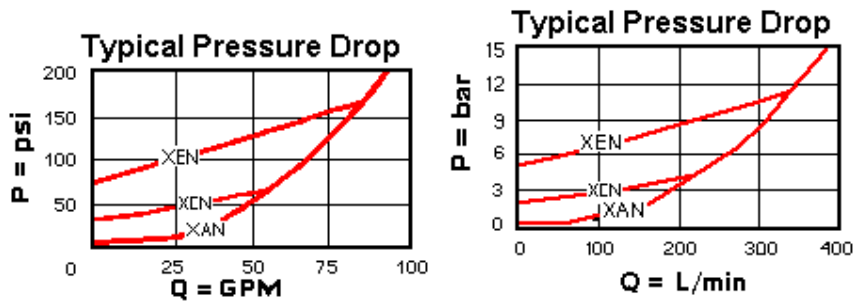
CONFIGURATION OPTIONS
Model Code Example: CXHCXCN

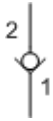
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) A 4 psi (0,3 bar) B 15 psi (1 bar) D 50 psi (3,5 bar) E 75 psi (5 bar) F 100 psi (7 bar) Z 1 psi (0,07 bar)	N Buna-N V Viton	Standard Material/Coating /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (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





Free-flow, nose-to-side check valves are on/off circuit components that allow free flow from the inlet (port 1) to the outlet (port 2) and block flow in the opposite direction.

This valve incorporates a position switch to provide confirmation that the valve is in the transition position or seated (closed).

TECHNICAL DATA

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

Cavity	T-16A
Series	3
Capacity	240 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Transition leakage at 110 SUS (24 cSt)	30 cc/min.@70 bar
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
Model Weight	0.92 kg.

SWITCH SPECIFICATIONS

Supply Voltage	20-30 VDC
Operating Temperature Range	-25 to 80 °C
Vibration	≥ 50g, 0-500 impulses/sec
Shock	>50 g, 1ms
Reverse Polarity Protection	Yes
Maximum Output Load	≤ 400 mA, Duty Ratio 100%
Short Circuit Protection	Yes, Load Short Unlimited
Turn On Time	≤ 25 ms
Hysteresis	≤ .002 in.
Thermal Shift - 0 to 80 °C ≤ ±	0,1 mm
EMC	DIN EN 61000-6-1/2/3/4
Connector	M12 X 1 (4) Pin
Connector Environment Rating	IP65

CONFIGURATION OPTIONS

Model Code Example: CXHHZCN

CRACKING PRESSURE (C) **SEAL MATERIAL** (N)

C 30 psi (2 bar)

N Buna-N

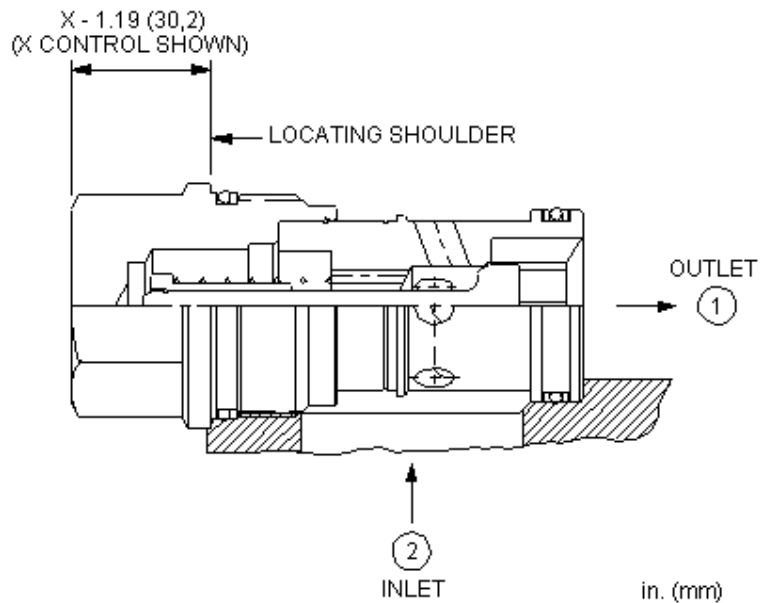
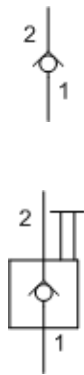
A 4 psi (0,3 bar)

V Viton

TECHNICAL FEATURES

- The position switch in this valve provides confirmation that the valve is closed.
- This cartridge is supplied as a sealed, factory set unit and is not field serviceable. Any tampering will violate the product warranty.
- When torquing this cartridge into its cavity, a crow's foot wrench or similar will be required since the position switch precludes the use of a deep socket wrench.
- All ports will accept 5000 psi (350 bar).
- An optional protective cover, with mounting hardware included, may be ordered separately. See kit number: 991-043.
- 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



Free-flow, side-to-nose check valves are on/off circuit components that allow free flow from the inlet (port 2) to the outlet (port 1) and block flow in the opposite direction.

TECHNICAL DATA

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

Cavity	T-18A
Series	4
Capacity	480 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.93 kg.

CONFIGURATION OPTIONS

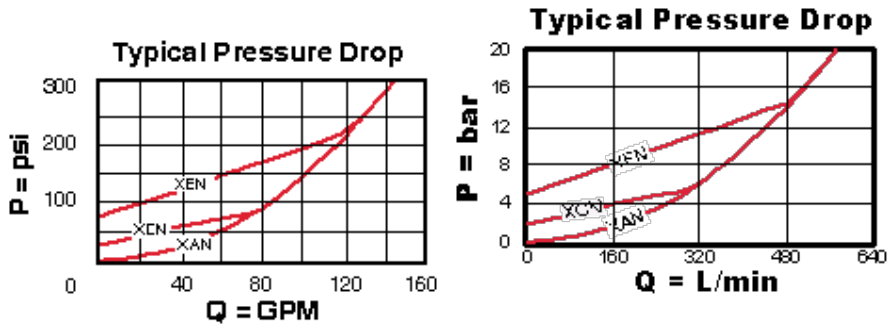
Model Code Example: CXIDXCN

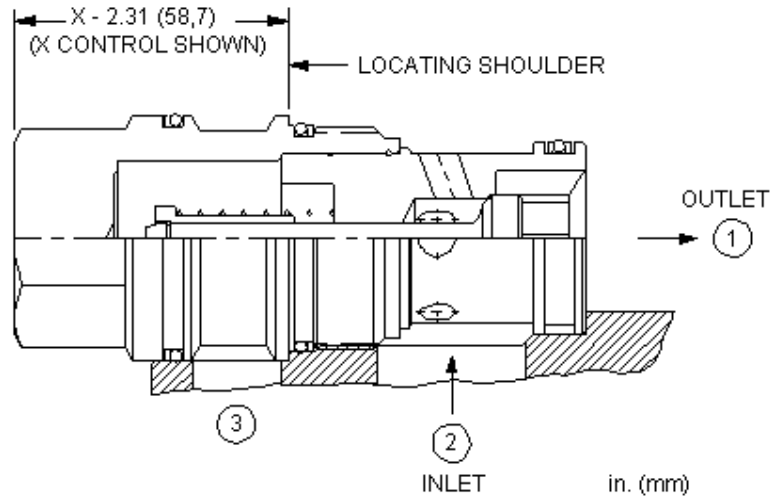
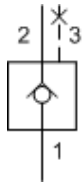
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) A 4 psi (0,3 bar) B 15 psi (1 bar) D 50 psi (3,5 bar) E 75 psi (5 bar) F 100 psi (7 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- These check valves are considered circuit savers for existing circuits where manifold drillings are incorrect. The capacity of side-to-nose (port 2 to port 1) 2-port check valves is approximately 30% less than preferred models with a nose-to-side (port 1 to port 2) flow path.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- 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





Free-flow, side-to-nose cheater check valves function as a standard 2-port check valve in a 3-port cavity with port 3 of the cartridge blocked off. These valves are useful in circuits where a check valve is required in an existing three port cavity.

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
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	1.08 kg.

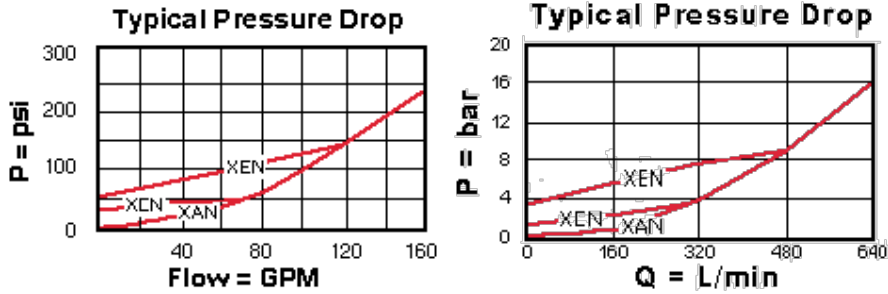
CONFIGURATION OPTIONS
Model Code Example: CXIEXCN

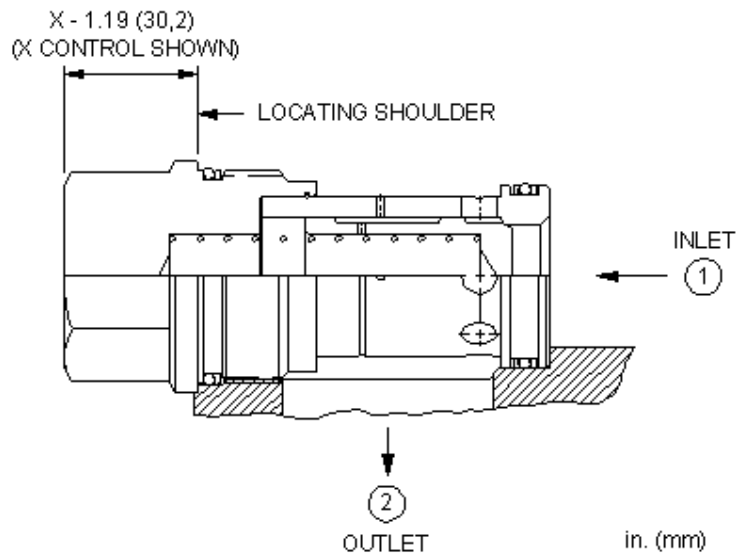
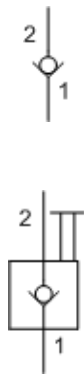
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) A 4 psi (0,3 bar) B 15 psi (1 bar) D 50 psi (3,5 bar) E 75 psi (5 bar) F 100 psi (7 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page.
- 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





Free-flow, nose-to-side check valves are on/off circuit components that allow free flow from the inlet (port 1) to the outlet (port 2) and block flow in the opposite direction.

TECHNICAL DATA

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

Cavity	T-18A
Series	4
Capacity	610 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	0.95 kg.

CONFIGURATION OPTIONS

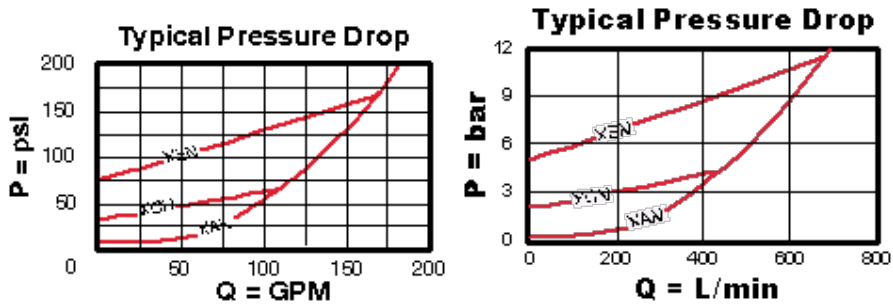
Model Code Example: **CXJAXCN**

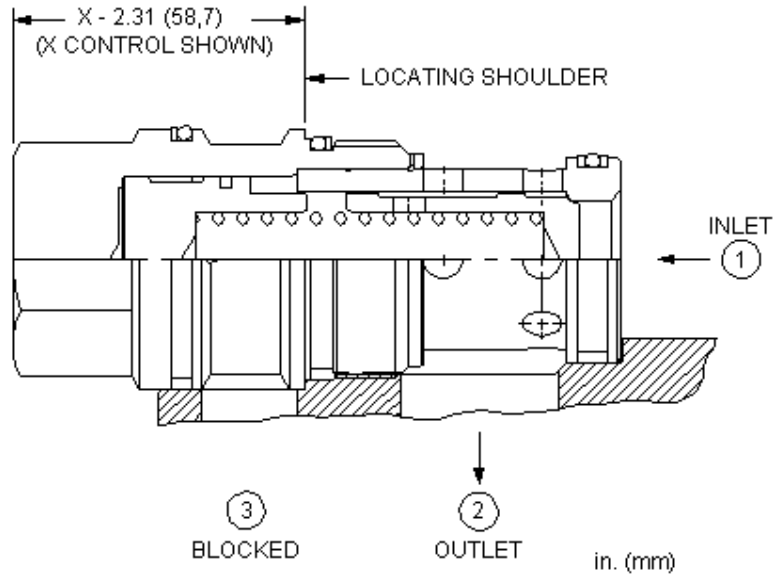
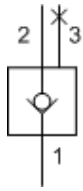
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
	A 4 psi (0,3 bar)	E EPDM	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		
	G 150 psi (10,5 bar)		

TECHNICAL FEATURES

- Two-port check valves share the same cavity for a given frame size, however, pay close attention as flow paths may be in opposite directions.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- 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 or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page.
- 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





Free-flow, nose-to-side cheater check valves function as a standard 2-port check valve in a 3-port cavity with port 3 of the cartridge blocked off. These valves are useful in circuits where a check valve is required in an existing three port cavity.

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
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	1.18 kg.

CONFIGURATION OPTIONS

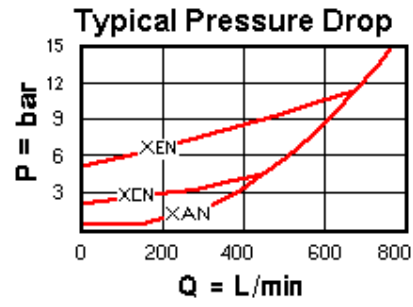
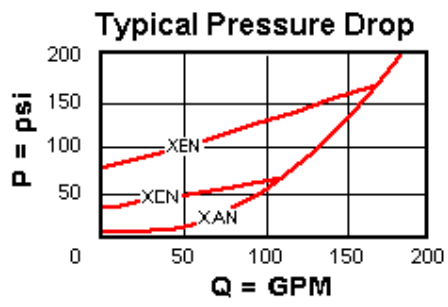
Model Code Example: CXJCXCN

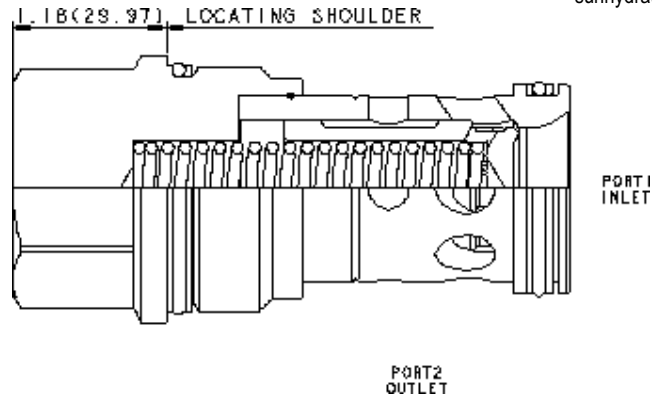
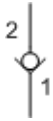
CONTROL	(X)	CRACKING PRESSURE	(C)	SEAL MATERIAL	(N)
X Not Adjustable		C 30 psi (2 bar)		N Buna-N	
		A 4 psi (0,3 bar)		V Viton	
		B 15 psi (1 bar)			
		D 50 psi (3,5 bar)			
		E 75 psi (5 bar)			
		F 100 psi (7 bar)			
		Z 1 psi (0,07 bar)			

TECHNICAL FEATURES

- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (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





Free-flow, nose-to-side check valves are on/off circuit components that allow free flow from the inlet (port 1) to the outlet (port 2) and block flow in the opposite direction.

TECHNICAL DATA

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

Cavity	T-18AU
Series	4
Capacity	900 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
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	Viton: 990018006
Model Weight	0.92 kg.

CONFIGURATION OPTIONS

Model Code Example: **CXKAXCN**

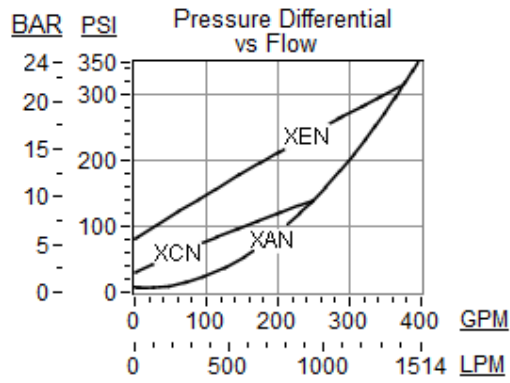
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar)	N Buna-N	Standard Material/Coating
	A 4 psi (0,3 bar)	E EPDM	/AP Stainless Steel, Passivated
	B 15 psi (1 bar)	V Viton	/LH Mild Steel, Zinc-Nickel
	D 50 psi (3,5 bar)		
	E 75 psi (5 bar)		
	F 100 psi (7 bar)		
	G 150 psi (10,5 bar)		

TECHNICAL FEATURES

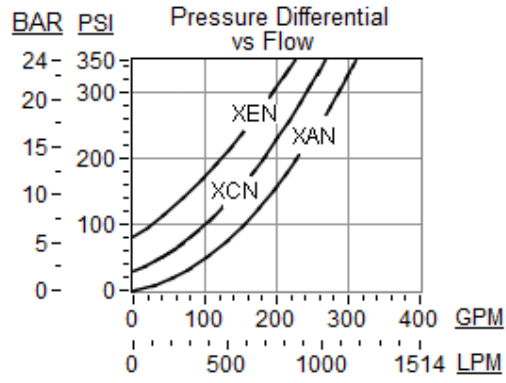
- These valves will work in Sun's standard T-18A cavity at lower capacity. To realize the full stated capacity, the T-18AU cavity should be used.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 2.
- Corrosion resistant cartridge valves are intended for use in corrosive environments and are identified by the model code suffix /AP or /LH (see CONFIGURATION section). For further details, please see the Materials of Construction page.
- 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.

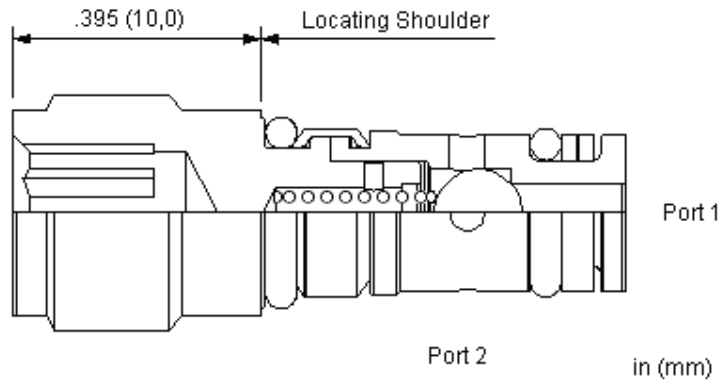
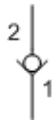
PERFORMANCE CURVES

Model CXKA installed in T-18AU Cavity



Model CXKA installed in T-18A Cavity





Shown to depict scale

Free-flow, nose-to-side check valves are on/off circuit components that allow free flow from the inlet (port 1) to the outlet (port 2) and block flow in the opposite direction.

TECHNICAL DATA

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

Cavity	T-382A
Series	Z
Capacity	4 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	0,07 cc/min.
Valve Internal Hex Size	5 mm
Valve Installation Torque	11 - 14 Nm
Seal kit - Cartridge	Buna: 990382007
Seal kit - Cartridge	EPDM: 990382014
Seal kit - Cartridge	Viton: 990382006
Model Weight	0.01 kg.

CONFIGURATION OPTIONS

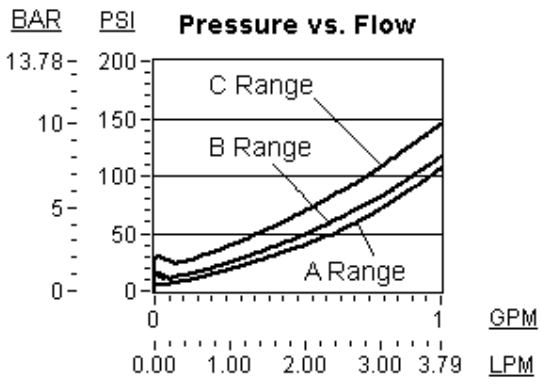
Model Code Example: CXZAXCN

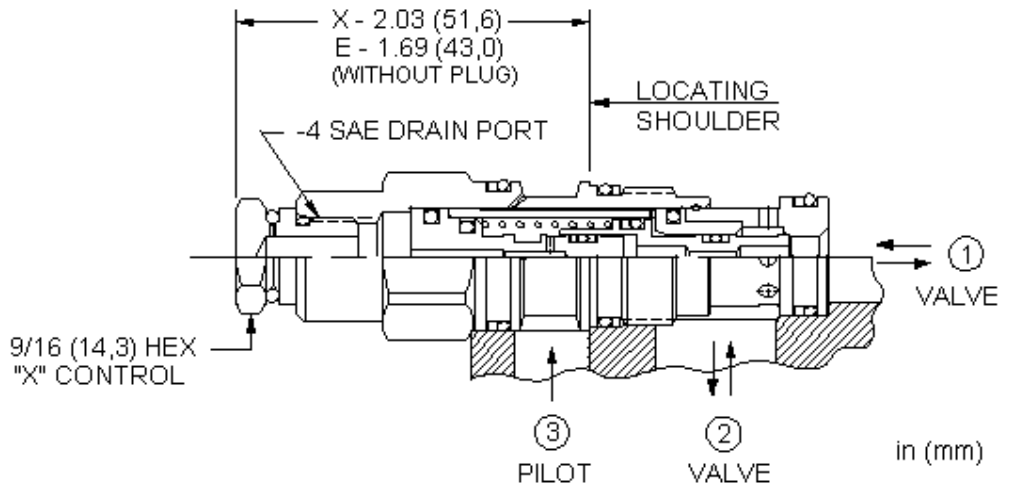
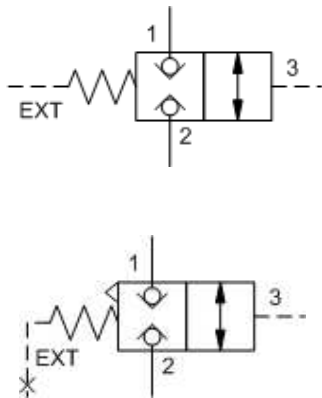
CONTROL	(X) CRACKING PRESSURE	(C) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	C 30 psi (2 bar) A 4 psi (0,3 bar) B 15 psi (1 bar)	N Buna-N E EPDM V Viton	N Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Due to size constraints, this valve has a .188 (3/16) inch internal hex. There is no metric equivalent.
- 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.
- Check valves offer extremely low leakage rates with a maximum leakage of less than 1 drop per minute (0,07 cc/min).
- Will accept 5000 psi (350 bar) at ports 1 and 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





This is a normally closed, balanced poppet, switching element. Pilot pressure at port 3 shifts the valve to the open position.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	15 gpm
Minimum Pilot Pressure Required to Shift Valve	400 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.01 in ³
Valve Hex Size	7/8 in.
Valve Installation Torque	30 - 35 lbf ft
Seal kit - Cartridge	Buna: 990311007
Seal kit - Cartridge	Viton: 990311006
Model Weight	0.30 lb.

CONFIGURATION OPTIONS

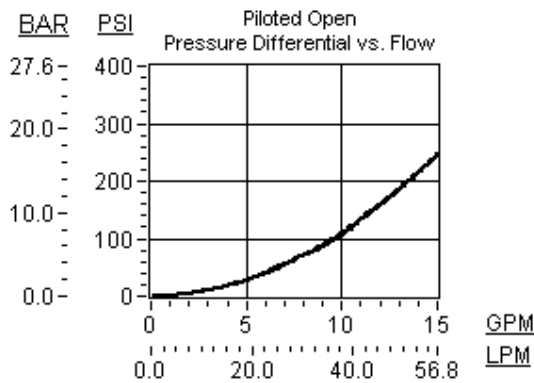
Model Code Example: DKDC**EH**N

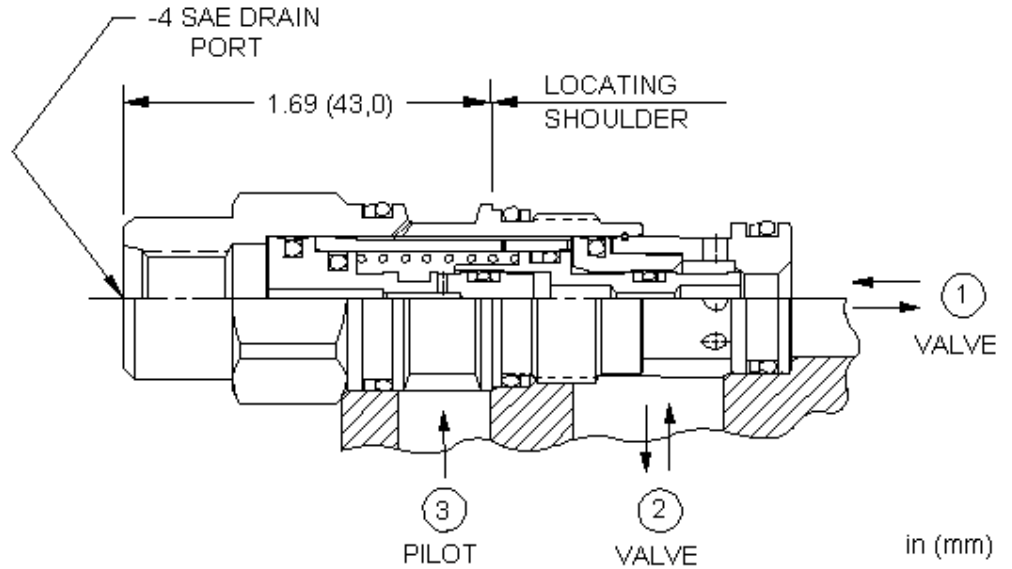
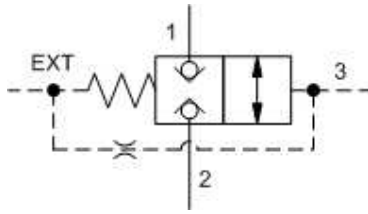
CONTROL	(E) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
E External 4- SAE Drain Port	H 400 psi (28 bar)	N Buna-N	Standard Material/Coating
X Standard Pilot, Atmospheric Vent		E EPDM	/LH Mild Steel, Zinc-Nickel
		V Viton	

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the external drain open and a minimum pilot pressure of 400 psi (30 bar).
- These 3-port balanced logic valves use the same cavity as unbalanced logic valves of the same frame size and can be considered functional replacements.
- Available in external atmospheric vent (X control) or static external drain (E control) configurations.
- Three-port vented logic elements with the X control are atmospherically referenced and considered problem solvers for existing circuits using non-vented valves. Over time, these valves will eventually leak externally and/or allow moisture into the spring chamber. Four-port valves are recommended for new applications. Alternately, the external vent port can be connected to drain if the static drain port option (control option E) is selected. Removing the vent plug will convert an X control to an E control.
- These valves have positive seals between port 2 and the pilot area.
- These valves are hydraulically balanced between port 1 and port 2.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will reseal when the pilot pressure falls below 145 psi (10 bar).
- Port 1 and port 2 are fully sealed from port 3.
- All ports will accept 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





This is a normally closed, balanced poppet, switching element. When the external vent port is blocked, the poppet remains in the closed position. Venting the external port shifts it to the open position, provided there is sufficient pressure at port 3.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	15 gpm
Minimum Pilot Pressure Required to Shift Valve	400 psi
Maximum Operating Pressure	5000 psi
Control Pilot Flow	See Performance Data
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.01 in ³
Pilot Passage into Valve	.031 in.
Valve Hex Size	7/8 in.
Valve Installation Torque	30 - 35 lbf ft
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.30 lb.

CONFIGURATION OPTIONS

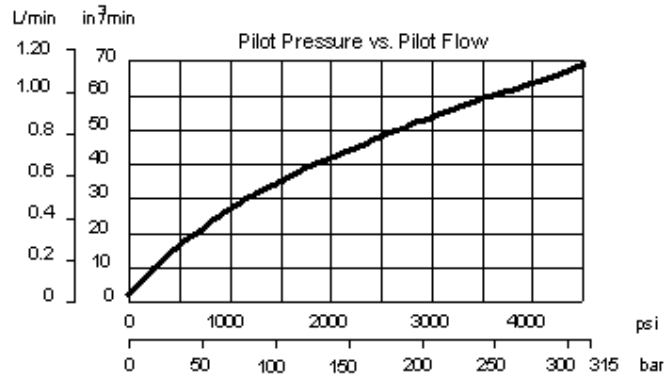
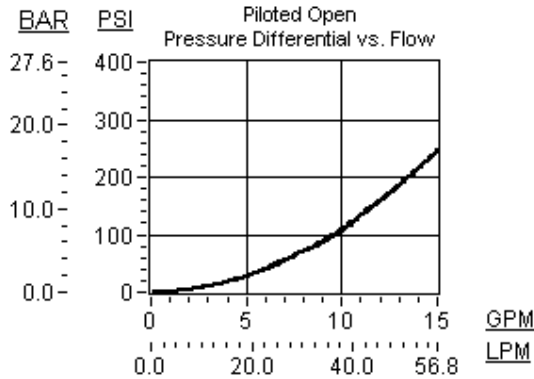
Model Code Example: DKDDEHN

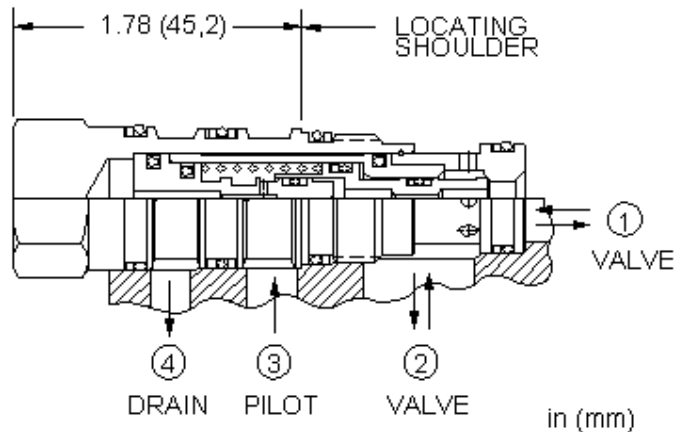
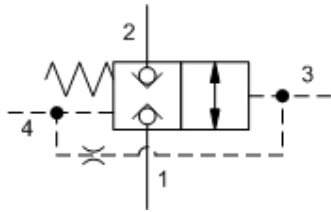
CONTROL	(E) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N)
E External 4- SAE Drain Port	H 400 psi (28 bar)	N Buna-N V Viton	

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the external drain open and a minimum pilot pressure of 400 psi (30 bar).
- The external -4 SAE vent port may be directly connected to a pilot switching valve. The pilot valve should have a leakage rate of less than 10 drops/min (0,7 cc/min) and be able to satisfy the pilot flow requirements. Sun model DAA*-*** solenoid pilot valve is ideal for this application.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will reseat when the pilot pressure falls below 145 psi (10 bar).
- Port 1 and port 2 are fully sealed from port 3.
- All ports will accept 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





This is a normally closed, balanced poppet, switching element. When the vent port (port 4) is blocked, the poppet remains in the closed position. Venting port 4 shifts it to the open position, provided there is sufficient pressure at port 3.

TECHNICAL DATA

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

Cavity	T-21A
Series	1
Capacity	15 gpm
Minimum Pilot Pressure Required to Shift Valve	400 psi
Maximum Operating Pressure	5000 psi
Control Pilot Flow	See Performance Data
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Valve Hex Size	7/8 in.
Valve Installation Torque	30 - 35 lbf ft
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006
Model Weight	0.35 lb.

CONFIGURATION OPTIONS

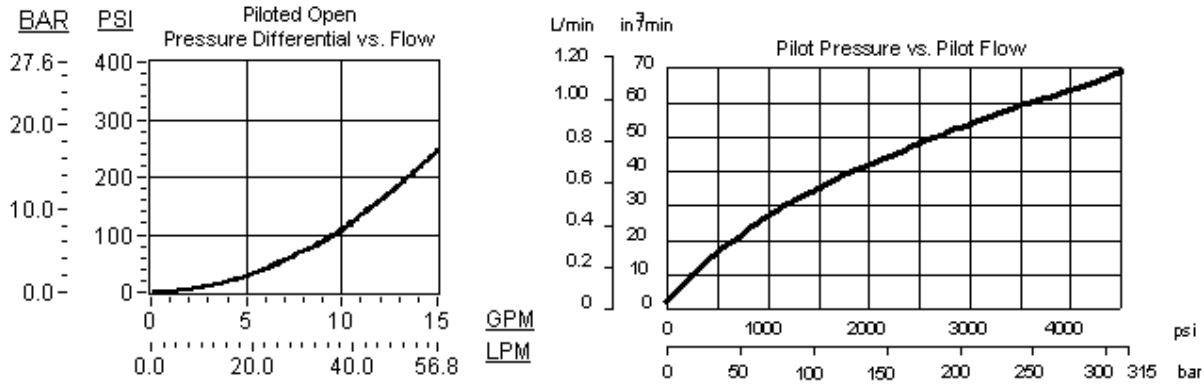
Model Code Example: **DKDRXHN**

CONTROL	(X) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
X Vent to Operate	H 400 psi (28 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

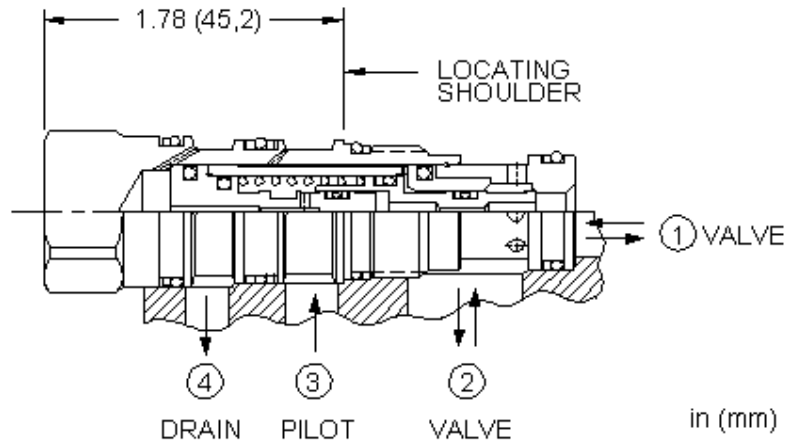
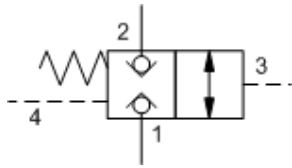
- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the vent (port 4) open and a minimum pilot pressure of 400 psi (30 bar) at port 3.
- Port 1 and port 2 are fully sealed from port 3 and port 4. Ports 3 and 4 are positively sealed.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will reseal when the pilot pressure falls below 145 psi (10 bar).
- Port 4 may be externally connected to a pilot switching valve. The pilot valve should have a leakage rate of less than 10 drops/min. and be able to satisfy the pilot flow requirements. Sun model DAA*-*** solenoid pilot valve is ideal for this application.
- All ports will accept 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

- [DKDR8](#) Normally closed, balanced poppet, logic element with integral T-8A control cavity - vent-to-open



This is a normally closed, balanced poppet, switching element. Pilot pressure at port 3 shifts the valve to the open position.

TECHNICAL DATA

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

Cavity	T-21A
Series	1
Capacity	15 gpm
Minimum Pilot Pressure Required to Shift Valve	400 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.01 in ³
Pilot Passage into Valve	.03 in.
Valve Hex Size	7/8 in.
Valve Installation Torque	30 - 35 lbf ft
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	EPDM: 990021014
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006
Model Weight	0.35 lb.

CONFIGURATION OPTIONS

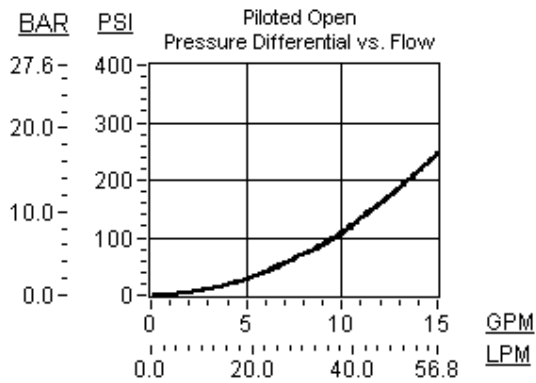
Model Code Example: **DKDSXHN**

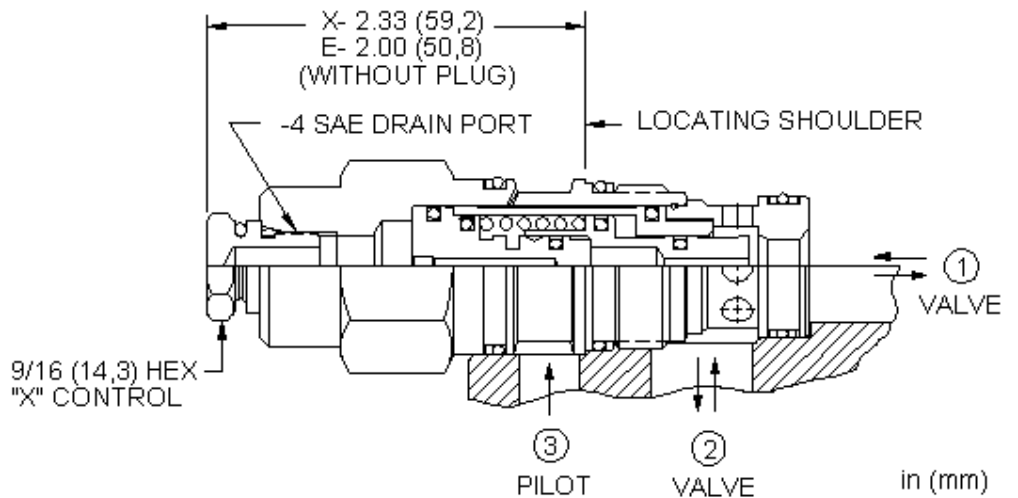
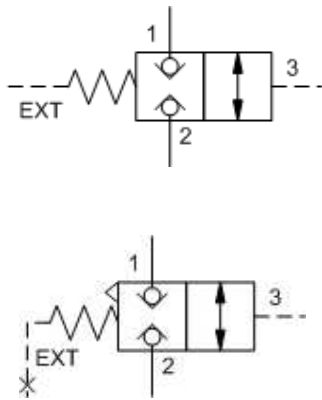
CONTROL	(X) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	H 400 psi (28 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the external drain open and a minimum pilot pressure of 400 psi (30 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.
- These valves are hydraulically balanced between port 1 and port 2.
- Port 1 and port 2 are fully sealed from port 3 and port 4. Ports 3 and 4 are positively sealed.
- Any backpressure at the drain port is directly additive to the required pilot pressure for reliable operation.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will reseal when the pilot pressure falls below 145 psi (10 bar).
- All ports will accept 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





This is a normally closed, balanced poppet, switching element. Pilot pressure at port 3 shifts the valve to the open position.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	30 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	5 drops/min.@1000 psi
Pilot Volume Displacement	.02 in ³
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.60 lb.

CONFIGURATION OPTIONS

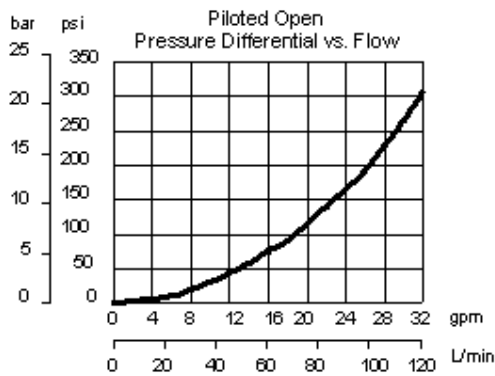
Model Code Example: **DKFCEHN**

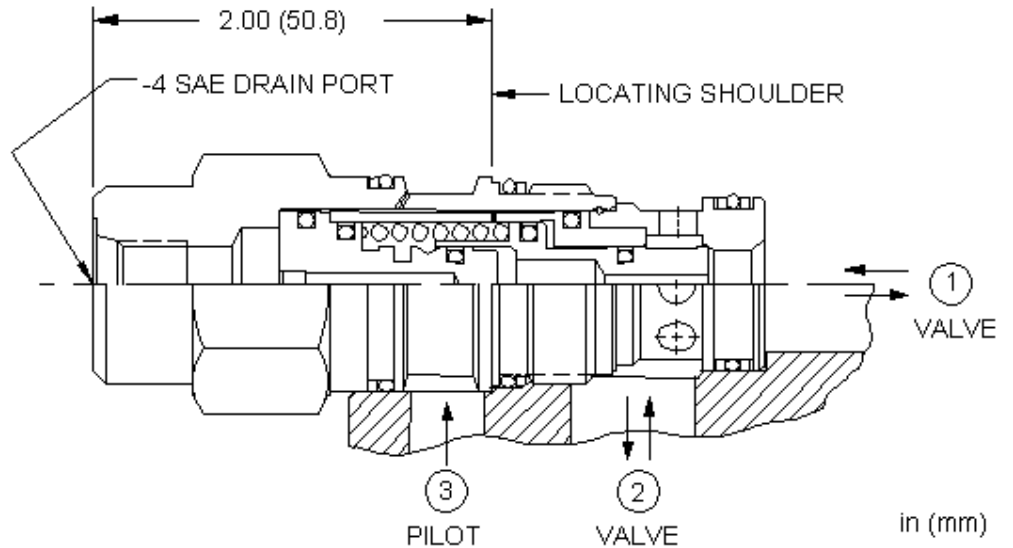
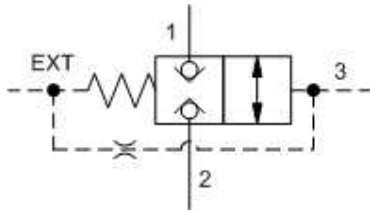
CONTROL	(E) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N)
E External 4-SAE Drain Port	H 300 psi (20 bar)	N Buna-N	
X Standard Pilot, Atmospheric Vent		V Viton	

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the external drain open and a minimum pilot pressure of 300 psi (20 bar).
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will reseal when the pilot pressure falls below 145 psi (10 bar).
- These valves are hydraulically balanced between port 1 and port 2.
- These 3-port balanced logic valves use the same cavity as unbalanced logic valves of the same frame size and can be considered functional replacements.
- Available in external atmospheric vent (X control) or static external drain (E control) configurations.
- Three-port vented logic elements with the X control are atmospherically referenced and considered problem solvers for existing circuits using non-vented valves. Over time, these valves will eventually leak externally and/or allow moisture into the spring chamber. Four-port valves are recommended for new applications. Alternately, the external vent port can be connected to drain if the static drain port option (control option E) is selected. Removing the vent plug will convert an X control to an E control.
- Port 1 and port 2 are fully sealed from port 3.
- All ports will accept 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





This is a normally closed, balanced poppet, switching element. When the external vent port is blocked, the poppet remains in the closed position. Venting the external port shifts it to the open position, provided there is sufficient pressure at port 3.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	30 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Control Pilot Flow	See Performance Data
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.02 in ³
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.60 lb.

CONFIGURATION OPTIONS

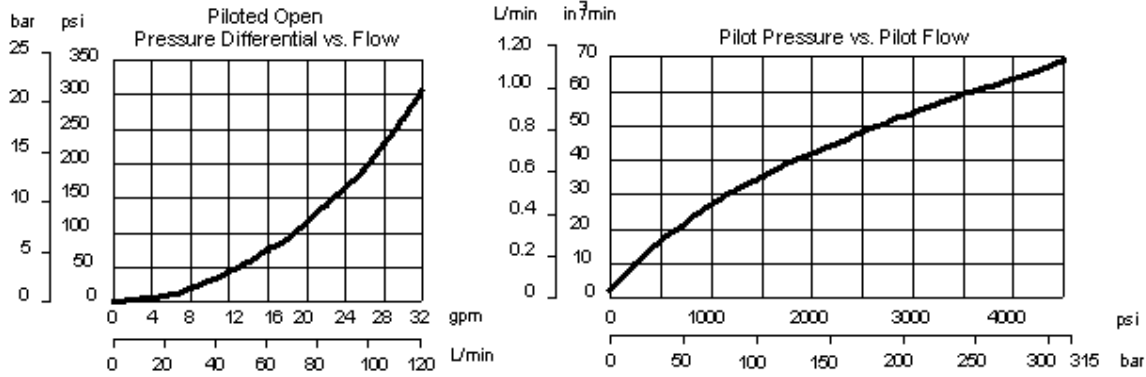
Model Code Example: DKFDEHN

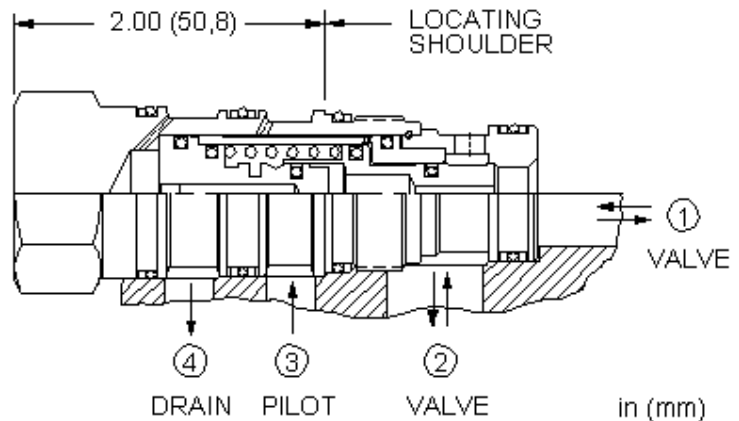
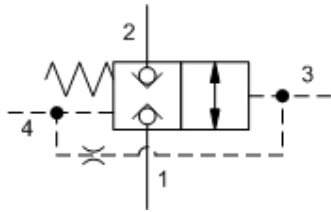
CONTROL	(E) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N)
E External 4- SAE Drain Port	H 300 psi (20 bar)	N Buna-N V Viton	

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at port 1 and port 2, with the external drain port open and a minimum pilot pressure of 300 psi (20 bar).
- The external -4 SAE vent port may be directly connected to a pilot switching valve. The pilot valve should have a leakage rate of less than 10 drops/min (0,7 cc/min) and be able to satisfy the pilot flow requirements. Sun model DAA*-*** solenoid pilot valve is ideal for this application.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will reseal when the pilot pressure falls below 145 psi (10 bar).
- Port 1 and port 2 are fully sealed from port 3.
- All ports will accept 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





This is a normally closed, balanced poppet, switching element. When the vent port (port 4) is blocked, the poppet remains in the closed position. Venting port 4 shifts it to the open position, provided there is sufficient pressure at port 3.

TECHNICAL DATA

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

Cavity	T-22A
Series	2
Capacity	30 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Control Pilot Flow	See Performance Data
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990022007
Seal kit - Cartridge	Polyurethane: 990022002
Seal kit - Cartridge	Viton: 990022006
Model Weight	0.63 lb.

CONFIGURATION OPTIONS

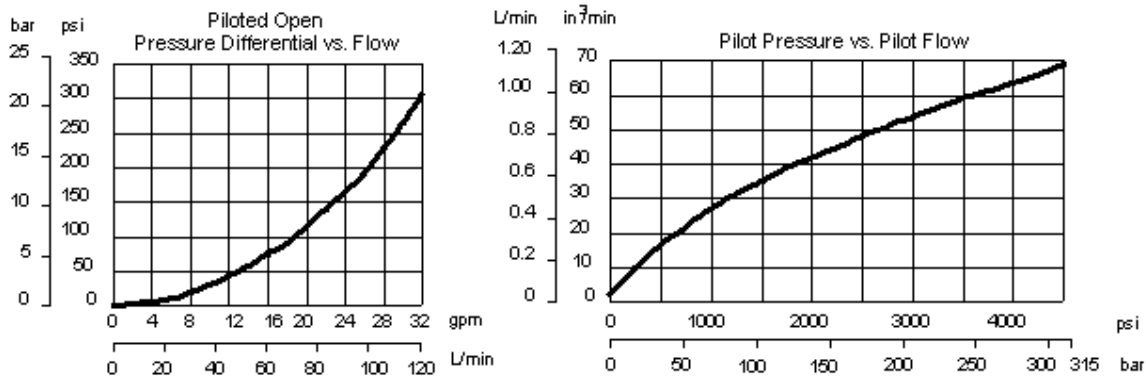
Model Code Example: **DKFRXHN**

CONTROL	(X) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N)
X Vent to Operate	H 300 psi (20 bar)	N Buna-N	V Viton

TECHNICAL FEATURES

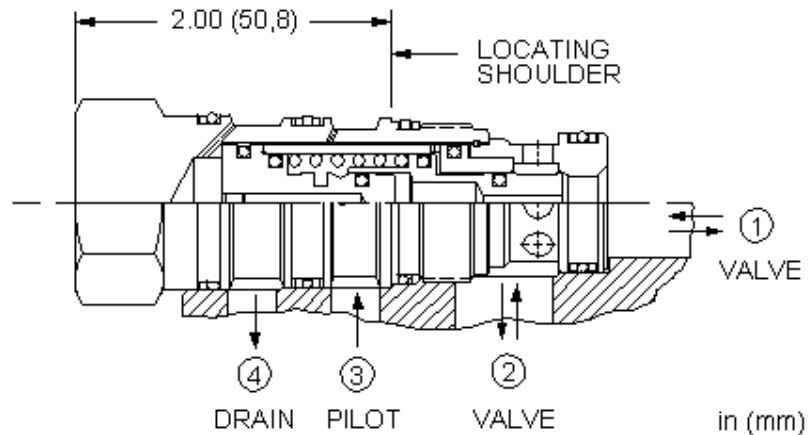
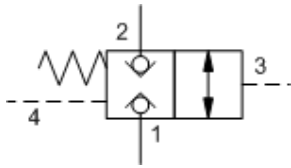
- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the vent (port 4) open and a minimum pilot pressure of 400 psi (30 bar) at port 3.
- Port 1 and port 2 are fully sealed from port 3 and port 4. Ports 3 and 4 are positively sealed.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will reseal when the pilot pressure falls below 145 psi (10 bar).
- Port 4 may be externally connected to a pilot switching valve. The pilot valve should have a leakage rate of less than 10 drops/min. and be able to satisfy the pilot flow requirements. Sun model DAA*-*** solenoid pilot valve is ideal for this application.
- All ports will accept 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

- [DKFR8](#) Normally closed, balanced poppet, logic element with integral T-8A control cavity - vent-to-open



This is a normally closed, balanced poppet, switching element. Pilot pressure at port 3 shifts the valve to the open position.

TECHNICAL DATA

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

Cavity	T-22A
Series	2
Capacity	30 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.02 in ³
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990022007
Seal kit - Cartridge	EPDM: 990022014
Seal kit - Cartridge	Polyurethane: 990022002
Seal kit - Cartridge	Viton: 990022006
Model Weight	0.63 lb.

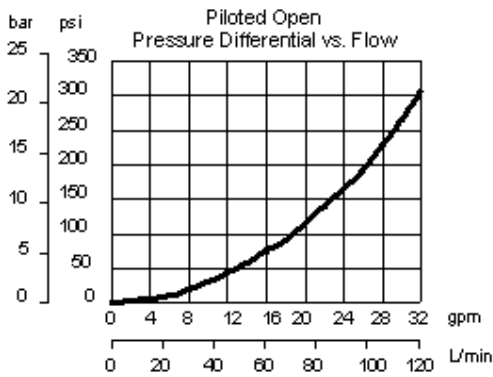
CONFIGURATION OPTIONS
Model Code Example: DKFSXHN

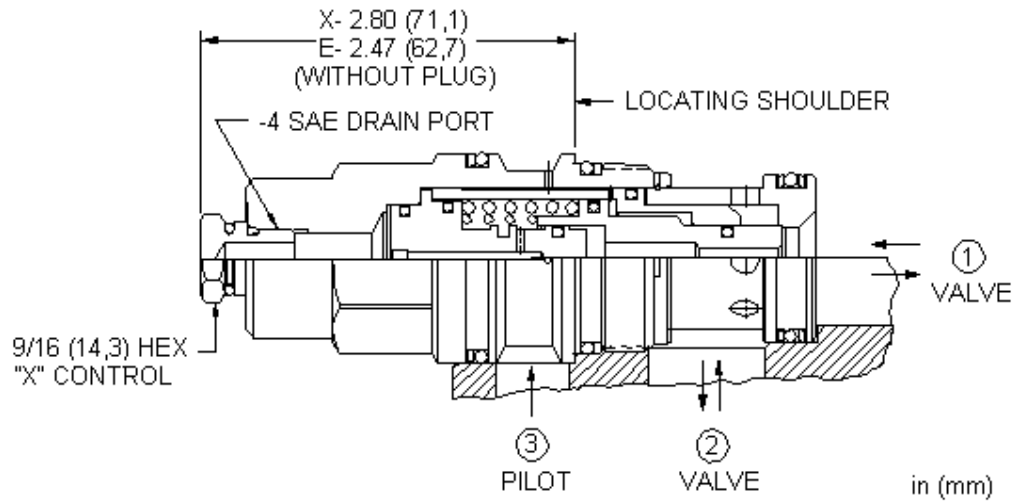
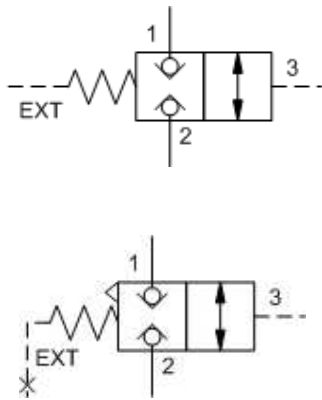
CONTROL	(X) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	H 300 psi (20 bar)	N Buna-N E EPDM V Viton	N Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the external drain open and a minimum pilot pressure of 300 psi (20 bar).
- Port 1 and port 2 are fully sealed from port 3 and port 4. Ports 3 and 4 are positively sealed.
- Any backpressure at the drain port is directly additive to the required pilot pressure for reliable operation.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will reseal when the pilot pressure falls below 145 psi (10 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.
- These valves are hydraulically balanced between port 1 and port 2.
- All ports will accept 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





This is a normally closed, balanced poppet, switching element. Pilot pressure at port 3 shifts the valve to the open position.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	60 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.05 in ³
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	1.33 lb.

CONFIGURATION OPTIONS

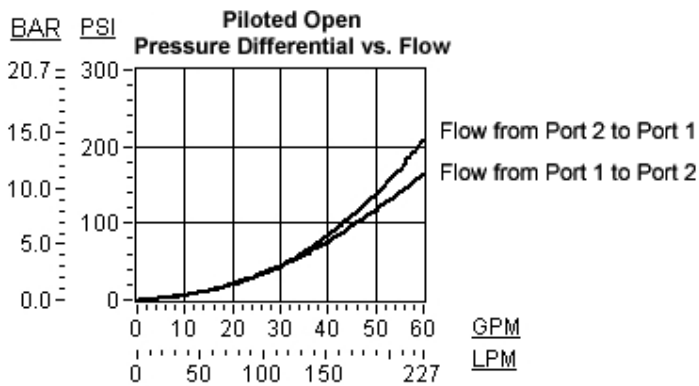
Model Code Example: DKHCENH

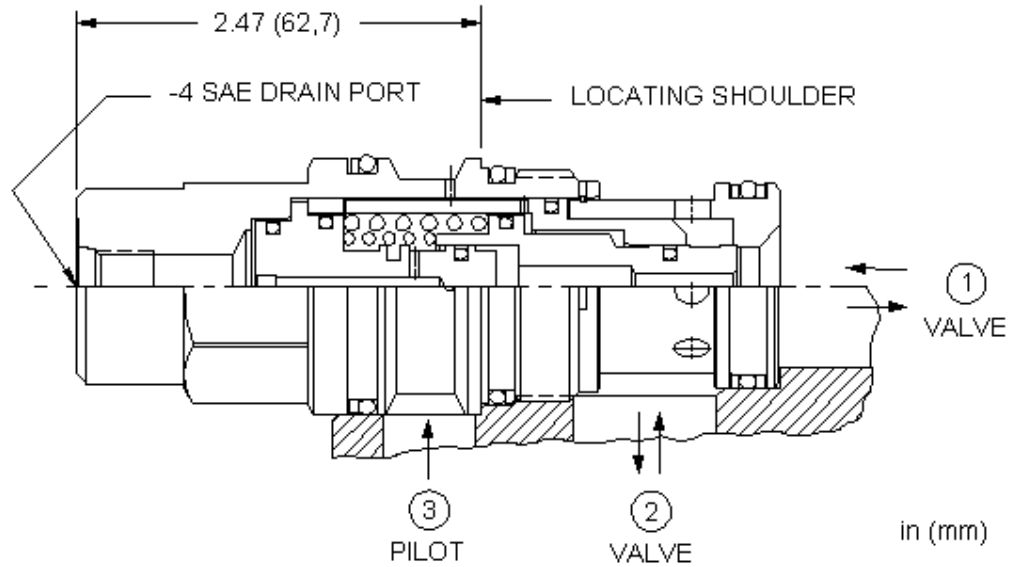
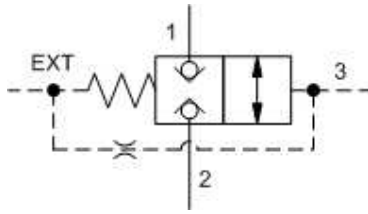
CONTROL	(E) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N)
E External 4- SAE Drain Port	H 300 psi (20 bar)	N Buna-N	
X Standard Pilot, Atmospheric Vent		V Viton	

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the external drain open and a minimum pilot pressure of 300 psi (20 bar).
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will reseal when the pilot pressure falls below 145 psi (10 bar).
- These valves are hydraulically balanced between port 1 and port 2.
- These 3-port balanced logic valves use the same cavity as unbalanced logic valves of the same frame size and can be considered functional replacements.
- Available in external atmospheric vent (X control) or static external drain (E control) configurations.
- Three-port vented logic elements with the X control are atmospherically referenced and considered problem solvers for existing circuits using non-vented valves. Over time, these valves will eventually leak externally and/or allow moisture into the spring chamber. Four-port valves are recommended for new applications. Alternately, the external vent port can be connected to drain if the static drain port option (control option E) is selected. Removing the vent plug will convert an X control to an E control.
- Port 1 and port 2 are fully sealed from port 3.
- All ports will accept 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





This is a normally closed, balanced poppet, switching element. When the external vent port is blocked, the poppet remains in the closed position. Venting the external port shifts it to the open position, provided there is sufficient pressure at port 3.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	60 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Control Pilot Flow	See Performance Data
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.05 in ³
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	1.34 lb.

CONFIGURATION OPTIONS

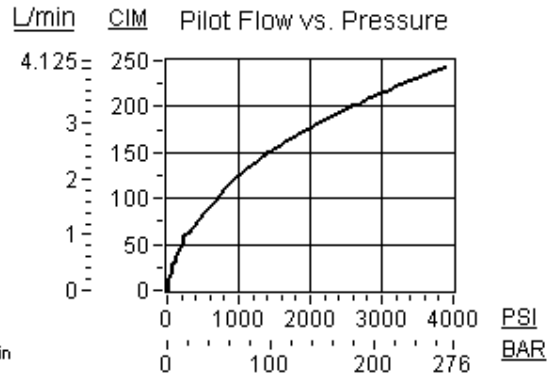
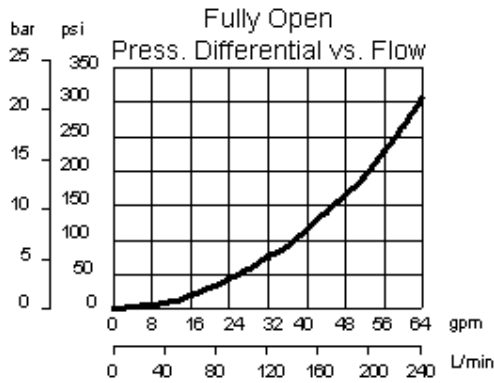
Model Code Example: DKHDEHN

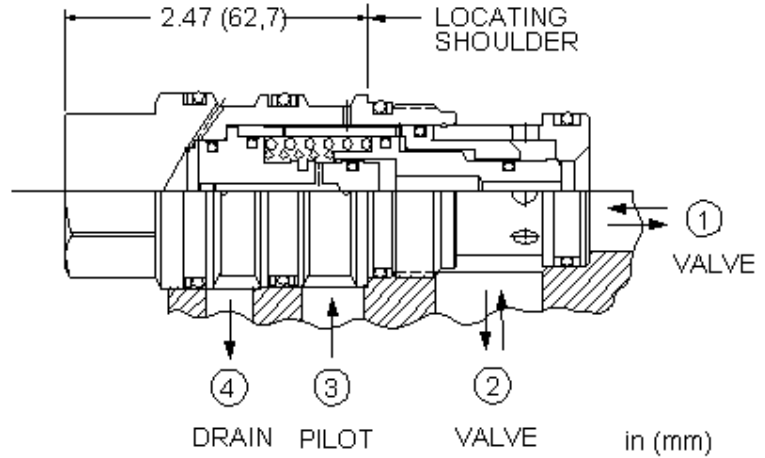
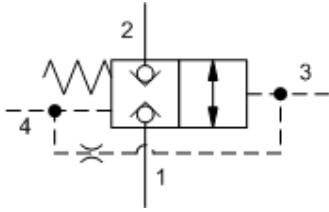
CONTROL	(E) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N)
E External 4-SAE Drain Port	H 300 psi (20 bar)	N Buna-N	V Viton

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at port 1 and port 2, with the external drain port open and a minimum pilot pressure of 300 psi (20 bar).
- The external -4 SAE vent port may be directly connected to a pilot switching valve. The pilot valve should have a leakage rate of less than 10 drops/min (0,7 cc/min), and be able to satisfy the pilot flow requirements. Sun model DAA*-*** solenoid pilot valve is ideal for this application.
- These valves are hydraulically balanced between port 1 and port 2.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Port 1 and port 2 are fully sealed from port 3.
- All ports will accept 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





This is a normally closed, balanced poppet, switching element. When the vent port (port 4) is blocked, the poppet remains in the closed position. Venting port 4 shifts it to the open position, provided there is sufficient pressure at port 3.

TECHNICAL DATA

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

Cavity	T-23A
Series	3
Capacity	60 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Control Pilot Flow	See Performance Data
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006
Model Weight	1.48 lb.

CONFIGURATION OPTIONS

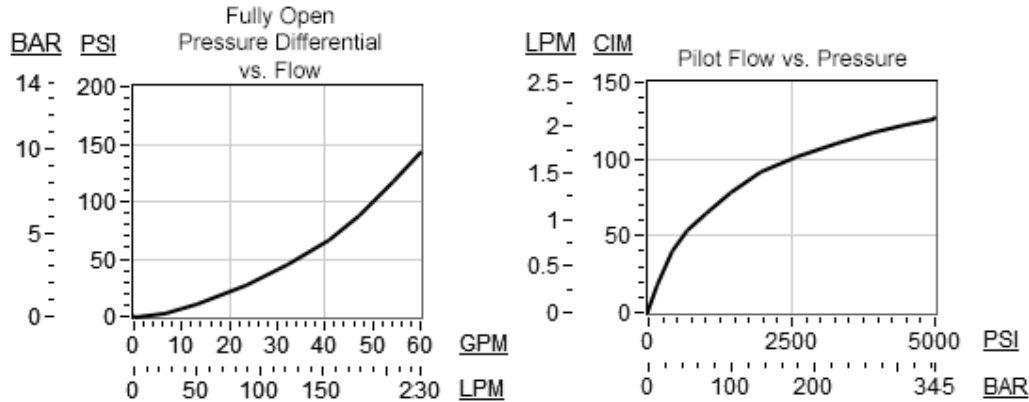
Model Code Example: **DKHRXHN**

CONTROL	(X) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N)
X Vent to Operate	H 300 psi (20 bar)	N Buna-N	V Viton

TECHNICAL FEATURES

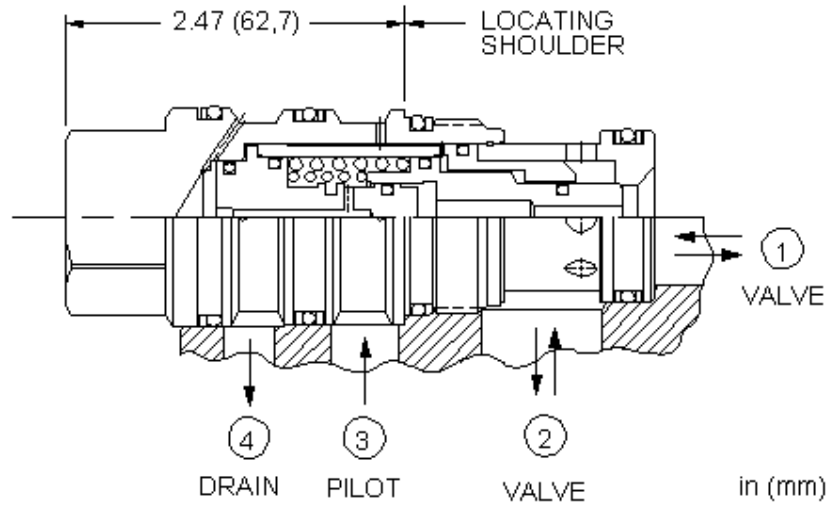
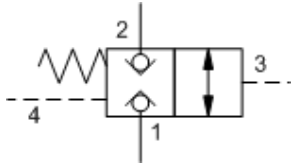
- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the vent (port 4) open and a minimum pilot pressure of 400 psi (30 bar) at port 3.
- Port 1 and port 2 are fully sealed from port 3 and port 4. Ports 3 and 4 are positively sealed.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will reseal when the pilot pressure falls below 145 psi (10 bar).
- Port 4 may be externally connected to a pilot switching valve. The pilot valve should have a leakage rate of less than 10 drops/min. and be able to satisfy the pilot flow requirements. Sun model DAA*-*** solenoid pilot valve is ideal for this application.
- All ports will accept 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

- [DKHR8](#) Normally closed, balanced poppet, logic element with integral T-8A control cavity - vent-to-open



This is a normally closed, balanced poppet, switching element. Pilot pressure at port 3 shifts the valve to the open position.

TECHNICAL DATA

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

Cavity	T-23A
Series	3
Capacity	60 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.05 in ³
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	EPDM: 990023014
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006
Model Weight	1.47 lb.

CONFIGURATION OPTIONS

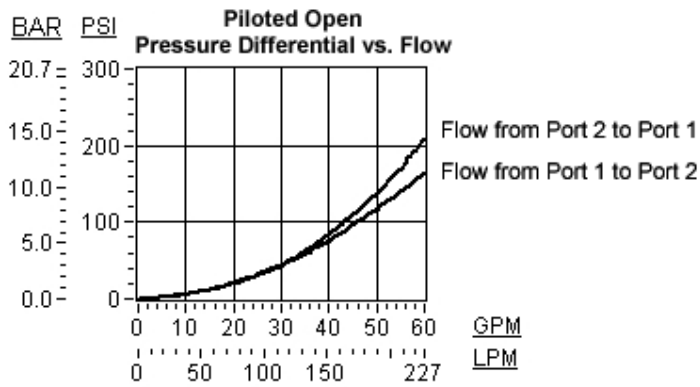
Model Code Example: **DKHSXHN**

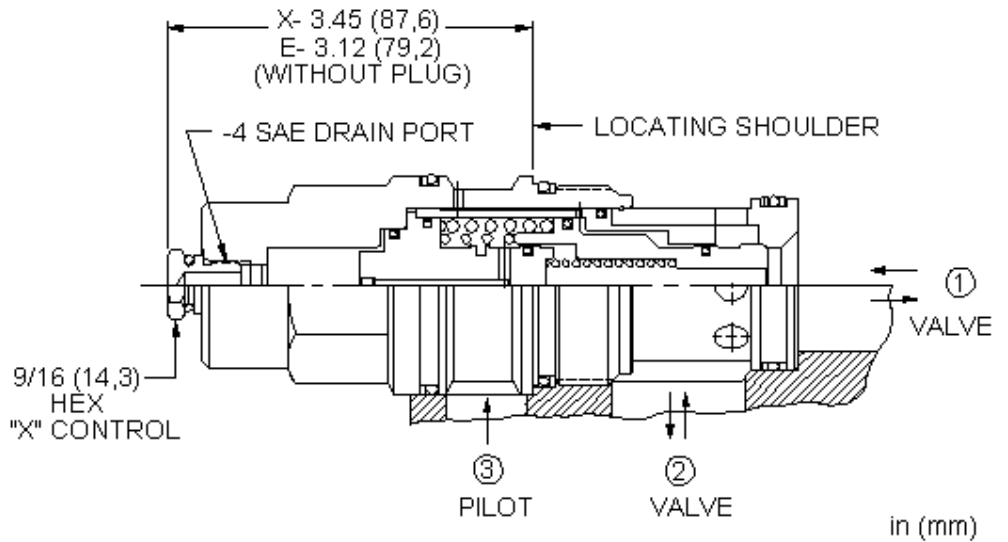
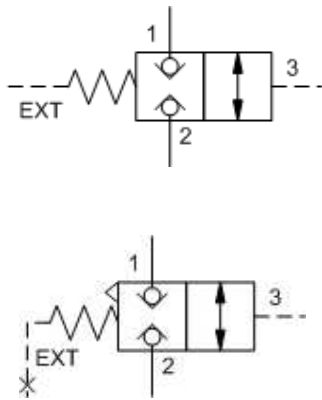
CONTROL	(X) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	H 300 psi (20 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the external drain open and a minimum pilot pressure of 300 psi (20 bar).
- Port 1 and port 2 are fully sealed from port 3 and port 4. Ports 3 and 4 are positively sealed.
- Any backpressure at the drain port is directly additive to the required pilot pressure for reliable operation.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will reseal when the pilot pressure falls below 145 psi (10 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.
- These valves are hydraulically balanced between port 1 and port 2.
- All ports will accept 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





This is a normally closed, balanced poppet, switching element. Pilot pressure at port 3 shifts the valve to the open position.

TECHNICAL DATA

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

Cavity	T-19A
Series	4
Capacity	120 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.17 in ³
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	3.02 lb.

CONFIGURATION OPTIONS

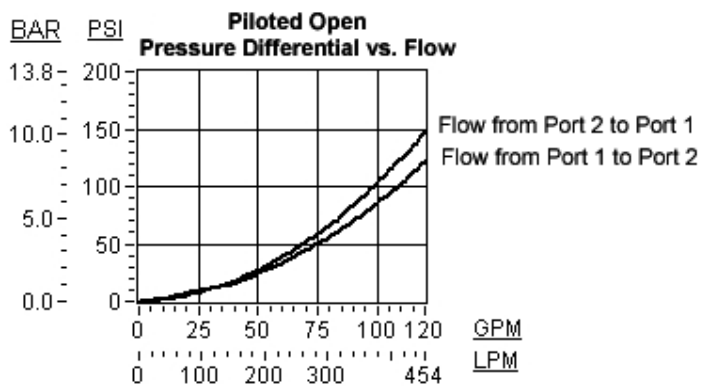
Model Code Example: DKJCEHN

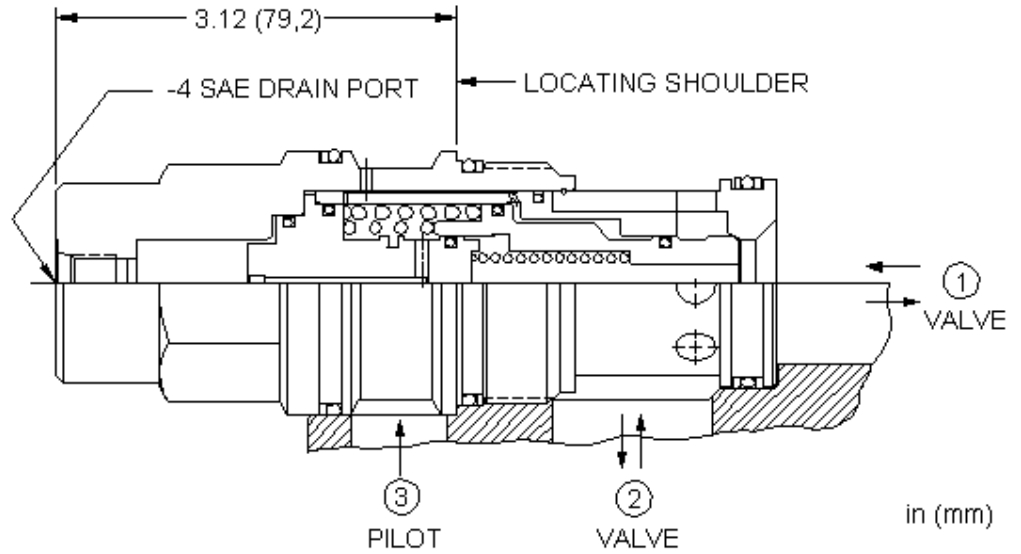
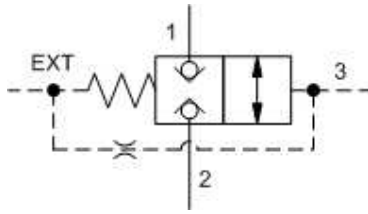
CONTROL	(E) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
E External 4-SAE Drain Port	H 300 psi (20 bar)	N Buna-N	Standard Material/Coating
X Standard Pilot, Atmospheric Vent		E EPDM	/AP Stainless Steel, Passivated
		V Viton	

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the external drain open and a minimum pilot pressure of 300 psi (20 bar).
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will reseal when the pilot pressure falls below 145 psi (10 bar).
- These 3-port balanced logic valves use the same cavity as unbalanced logic valves of the same frame size and can be considered functional replacements.
- Available in external atmospheric vent (X control) or static external drain (E control) configurations.
- Three-port vented logic elements with the X control are atmospherically referenced and considered problem solvers for existing circuits using non-vented valves. Over time, these valves will eventually leak externally and/or allow moisture into the spring chamber. Four-port valves are recommended for new applications. Alternately, the external vent port can be connected to drain if the static drain port option (control option E) is selected. Removing the vent plug will convert an X control to an E control.
- These valves are hydraulically balanced between port 1 and port 2.
- Port 1 and port 2 are fully sealed from port 3.
- All ports will accept 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





This is a normally closed, balanced poppet, switching element. When the external vent port is blocked, the poppet remains in the closed position. Venting the external port shifts it to the open position, provided there is sufficient pressure at port 3.

TECHNICAL DATA

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

Cavity	T-19A
Series	4
Capacity	120 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Control Pilot Flow	See Performance Data
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.17 in ³
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	3.02 lb.

CONFIGURATION OPTIONS

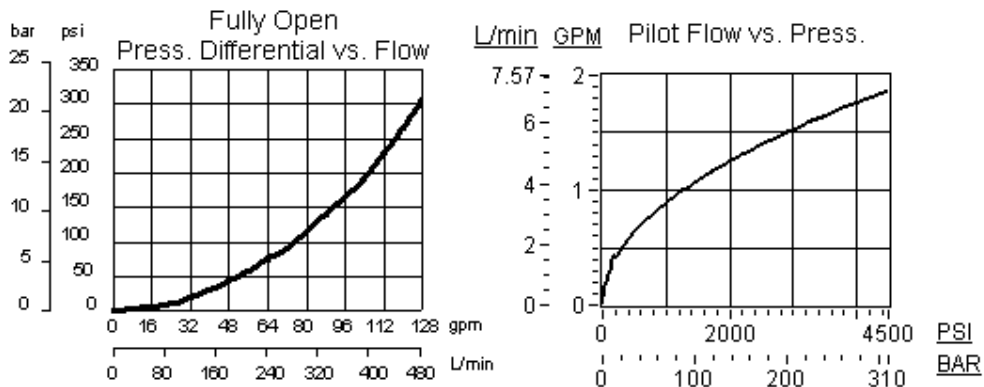
Model Code Example: DKJDEHN

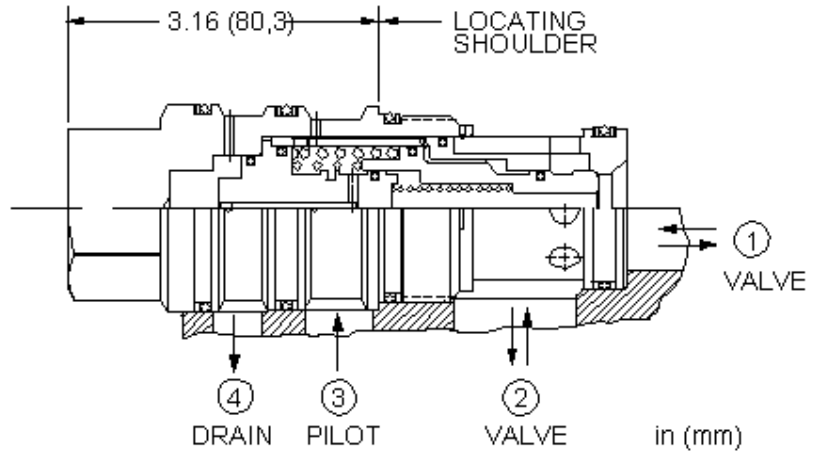
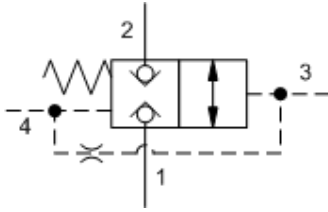
CONTROL	(E) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N)
E External 4-SAE Drain Port	H 300 psi (20 bar)	N Buna-N	V Viton

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at port 1 and port 2, with the external drain port open and a minimum pilot pressure of 300 psi (20 bar).
- These valves are hydraulically balanced between port 1 and port 2.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will reseal when the pilot pressure falls below 145 psi (10 bar).
- The external -4 SAE vent port may be directly connected to a pilot switching valve. The pilot valve should have a leakage rate of less than 10 drops/min (0,7 cc/min). and be able to satisfy the pilot flow requirements. Sun model DAA*-*** solenoid pilot valve is ideal for this application.
- Port 1 and port 2 are fully sealed from port 3.
- All ports will accept 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





This is a normally closed, balanced poppet, switching element. When the vent port (port 4) is blocked, the poppet remains in the closed position. Venting port 4 shifts it to the open position, provided there is sufficient pressure at port 3.

TECHNICAL DATA

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

Cavity	T-24A
Series	4
Capacity	120 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Control Pilot Flow	See Performance Data
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990024007
Seal kit - Cartridge	Polyurethane: 990024002
Seal kit - Cartridge	Viton: 990024006
Model Weight	3.33 lb.

CONFIGURATION OPTIONS

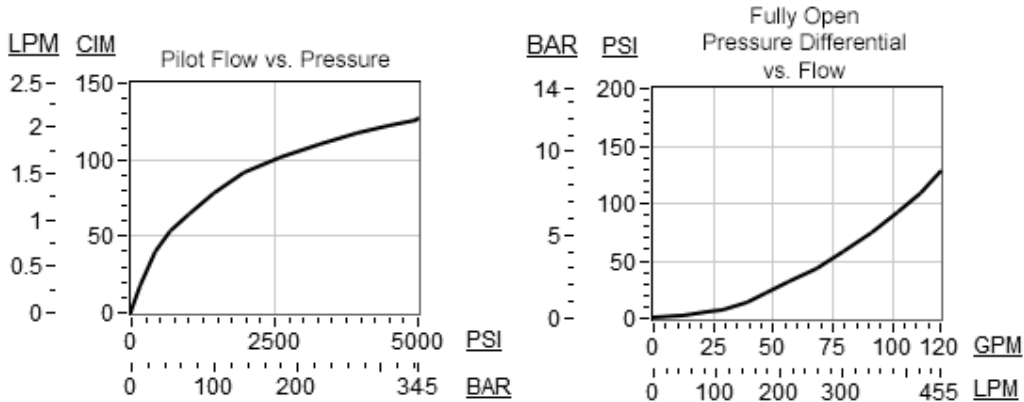
Model Code Example: **DKJRXHN**

CONTROL	(X) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N)
X Vent to Operate	H 300 psi (20 bar)	N Buna-N	V Viton

TECHNICAL FEATURES

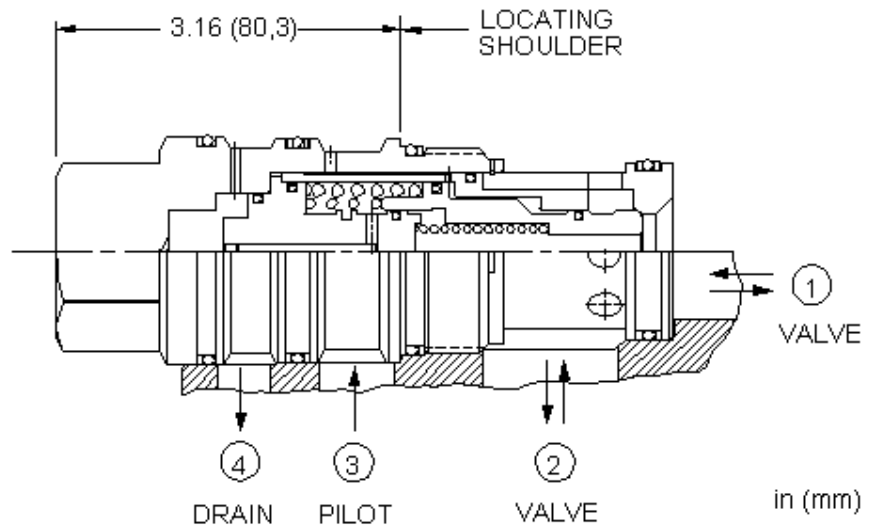
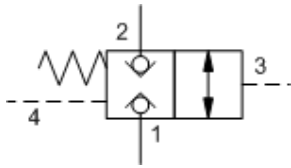
- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the vent (port 4) open and a minimum pilot pressure of 400 psi (30 bar) at port 3.
- Port 1 and port 2 are fully sealed from port 3 and port 4. Ports 3 and 4 are positively sealed.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will reseal when the pilot pressure falls below 145 psi (10 bar).
- Port 4 may be externally connected to a pilot switching valve. The pilot valve should have a leakage rate of less than 10 drops/min. and be able to satisfy the pilot flow requirements. Sun model DAA*-*** solenoid pilot valve is ideal for this application.
- All ports will accept 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

- [DKJR8](#) Normally closed, balanced poppet, logic element with integral T-8A control cavity - vent-to-open



This is a normally closed, balanced poppet, switching element. Pilot pressure at port 3 shifts the valve to the open position.

TECHNICAL DATA

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

Cavity	T-24A
Series	4
Capacity	120 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.17 in ³
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990024007
Seal kit - Cartridge	EPDM: 990024014
Seal kit - Cartridge	Polyurethane: 990024002
Seal kit - Cartridge	Viton: 990024006
Model Weight	3.33 lb.

CONFIGURATION OPTIONS

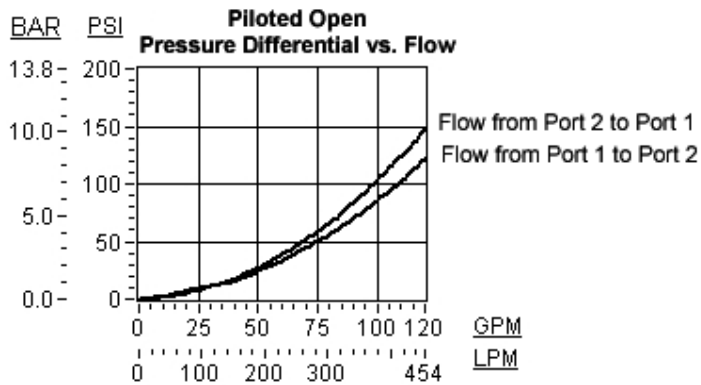
Model Code Example: DKJSXHN

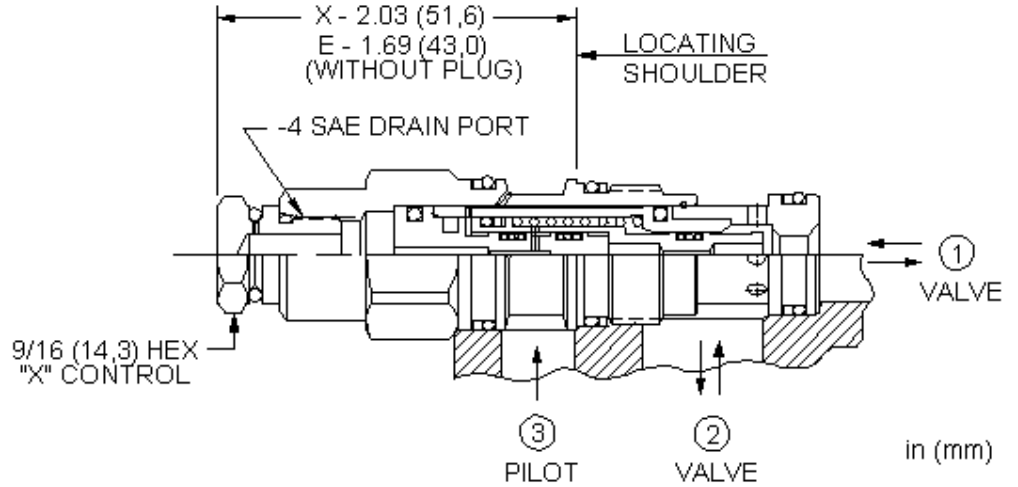
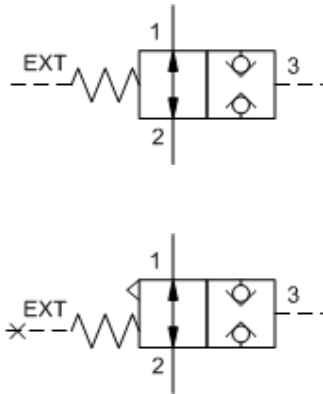
CONTROL	(X) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	H 300 psi (20 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the external drain open and a minimum pilot pressure of 300 psi (20 bar).
- Port 1 and port 2 are fully sealed from port 3 and port 4. Ports 3 and 4 are positively sealed.
- Any backpressure at the drain port is directly additive to the required pilot pressure for reliable operation.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will reseal when the pilot pressure falls below 145 psi (10 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.
- These valves are hydraulically balanced between port 1 and port 2.
- All ports will accept 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





This is a normally open, balanced poppet, switching element. Pilot pressure at port 3 shifts the valve to the closed position.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	15 gpm
Minimum Pilot Pressure Required to Shift Valve	400 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.01 in ³
Valve Hex Size	7/8 in.
Valve Installation Torque	30 - 35 lbf ft
Seal kit - Cartridge	Buna: 990311007
Seal kit - Cartridge	Viton: 990311006
Model Weight	0.31 lb.

CONFIGURATION OPTIONS

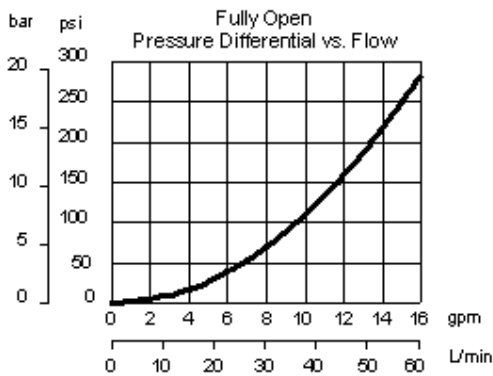
Model Code Example: DODCEHN

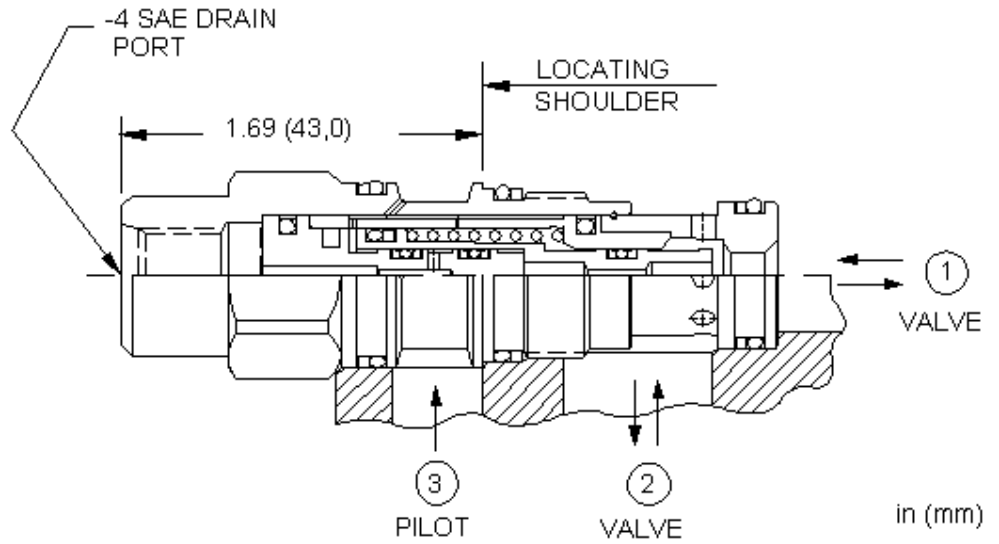
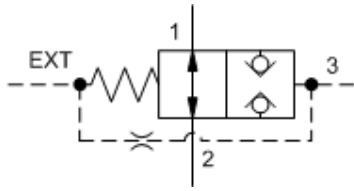
CONTROL	(E) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
E External 4- X Standard Pilot, Atmospheric Vent	H 400 psi (28 bar)	N Buna-N V Viton	N Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the external drain open and a minimum pilot pressure of 400 psi (30 bar).
- Valve will open when the pilot pressure falls below 145 psi (10 bar).
- These valves are hydraulically balanced between port 1 and port 2.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- These 3-port balanced logic valves use the same cavity as unbalanced logic valves of the same frame size and can be considered functional replacements.
- Available in external atmospheric vent (X control) or static external drain (E control) configurations.
- Three-port vented logic elements with the X control are atmospherically referenced and considered problem solvers for existing circuits using non-vented valves. Over time, these valves will eventually leak externally and/or allow moisture into the spring chamber. Four-port valves are recommended for new applications. Alternately, the external vent port can be connected to drain if the static drain port option (control option E) is selected. Removing the vent plug will convert an X control to an E control.
- Port 1 and port 2 are fully sealed from port 3.
- All ports will accept 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





This is a normally open, balanced poppet, switching element. When the external vent port is blocked, the poppet remains in the open position. Venting the external port shifts it to the closed position, provided there is sufficient pressure at port 3.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	15 gpm
Minimum Pilot Pressure Required to Shift Valve	400 psi
Maximum Operating Pressure	5000 psi
Control Pilot Flow	See Performance Data
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.01 in ³
Valve Hex Size	7/8 in.
Valve Installation Torque	30 - 35 lbf ft
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.31 lb.

CONFIGURATION OPTIONS

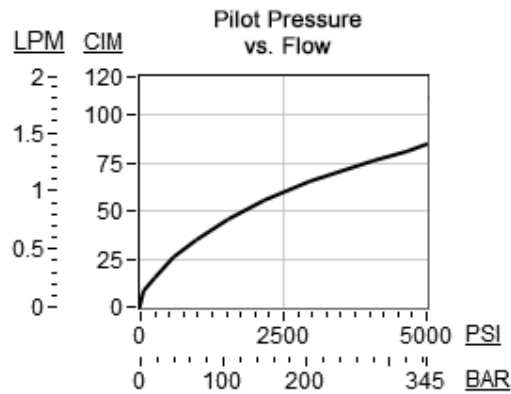
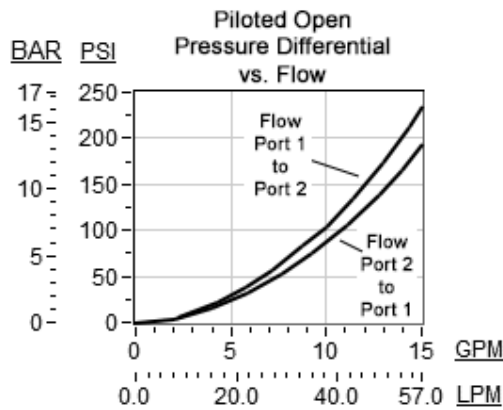
Model Code Example: DODDEHN

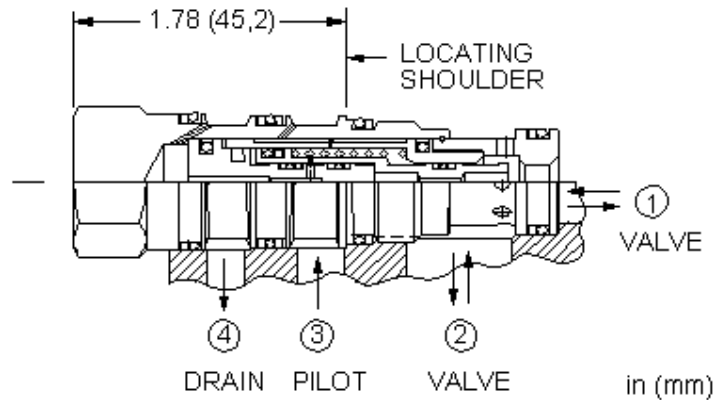
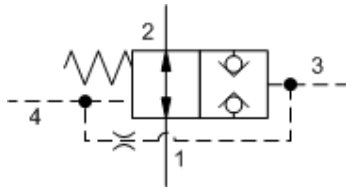
CONTROL	(E) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N)
E External 4- SAE Drain Port	H 400 psi (28 bar)	N Buna-N	V Viton

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the external drain open and a minimum pilot pressure of 400 psi (30 bar).
- The external -4 SAE vent port may be directly connected to a pilot switching valve. The pilot valve should have a leakage rate of less than 10 drops/min (0,7 cc/min), and be able to satisfy the pilot flow requirements. Sun model DAA*-*** solenoid pilot valve is ideal for this application.
- These valves are hydraulically balanced between port 1 and port 2.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will open when the pilot pressure falls below 145 psi (10 bar).
- Port 1 and port 2 are fully sealed from port 3.
- All ports will accept 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





This is a normally open, balanced poppet, switching element. When the vent port (port 4) is blocked, the poppet remains in the open position. Venting port 4 shifts it to the closed position, provided there is sufficient pressure at port 3.

TECHNICAL DATA

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

Cavity	T-21A
Series	1
Capacity	15 gpm
Minimum Pilot Pressure Required to Shift Valve	400 psi
Maximum Operating Pressure	5000 psi
Control Pilot Flow	See Performance Data
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Valve Hex Size	7/8 in.
Valve Installation Torque	30 - 35 lbf ft
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006
Model Weight	0.35 lb.

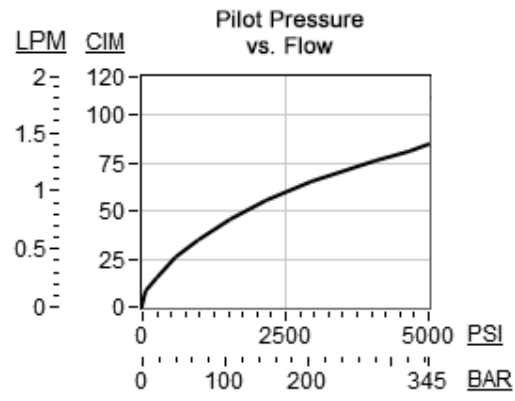
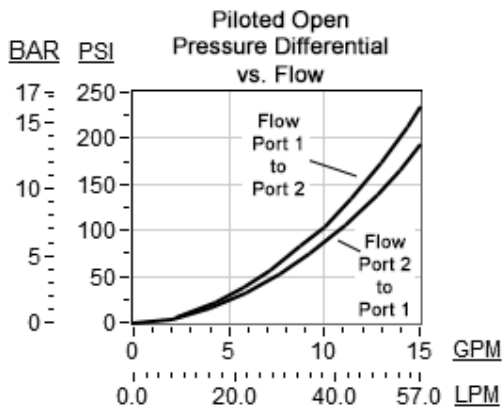
CONFIGURATION OPTIONS
Model Code Example: DODRXHN

CONTROL	(X) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
X Vent to Operate	H 400 psi (28 bar)	N Buna-N V Viton	Standard Material/Coating /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

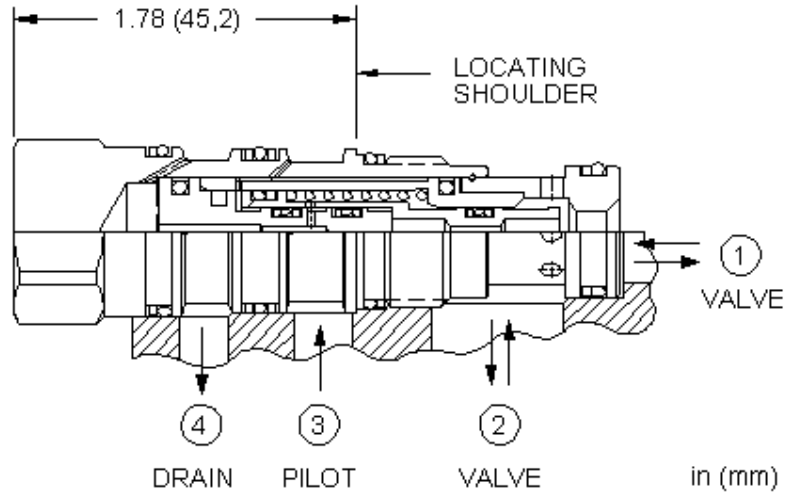
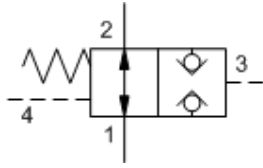
- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the vent (port 4) open and a minimum pilot pressure of 400 psi (30 bar) at port 3.
- Valve will open when the pilot pressure falls below 145 psi (10 bar).
- These valves are hydraulically balanced between port 1 and port 2.
- Port 1 and port 2 are fully sealed from port 3 and port 4. Ports 3 and 4 are positively sealed.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Port 4 may be externally connected to a pilot switching valve. The pilot valve should have a leakage rate of less than 10 drops/min. and be able to satisfy the pilot flow requirements. Sun model DAA* -*** solenoid pilot valve is ideal for this application.
- All ports will accept 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

- [DODR8](#) Normally open, balanced poppet, logic element with integral T-8A control cavity - vent-to-close



This is a normally open, balanced poppet, switching element. Pilot pressure at port 3 shifts the valve to the closed position.

TECHNICAL DATA

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

Cavity	T-21A
Series	1
Capacity	15 gpm
Minimum Pilot Pressure Required to Shift Valve	400 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.01 in ³
Pilot Passage into Valve	.03 in.
Valve Hex Size	7/8 in.
Valve Installation Torque	30 - 35 lbf ft
Seal kit - Cartridge	Buna: 990021007
Seal kit - Cartridge	EPDM: 990021014
Seal kit - Cartridge	Polyurethane: 990021002
Seal kit - Cartridge	Viton: 990021006
Model Weight	0.35 lb.

CONFIGURATION OPTIONS

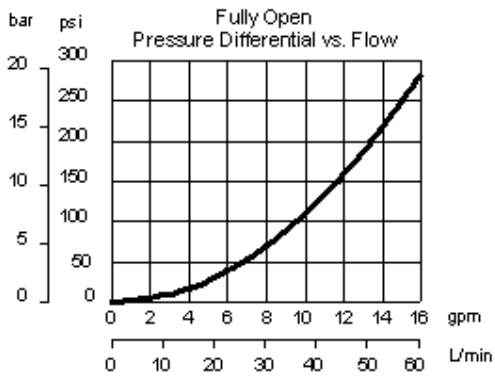
Model Code Example: DODSXHN

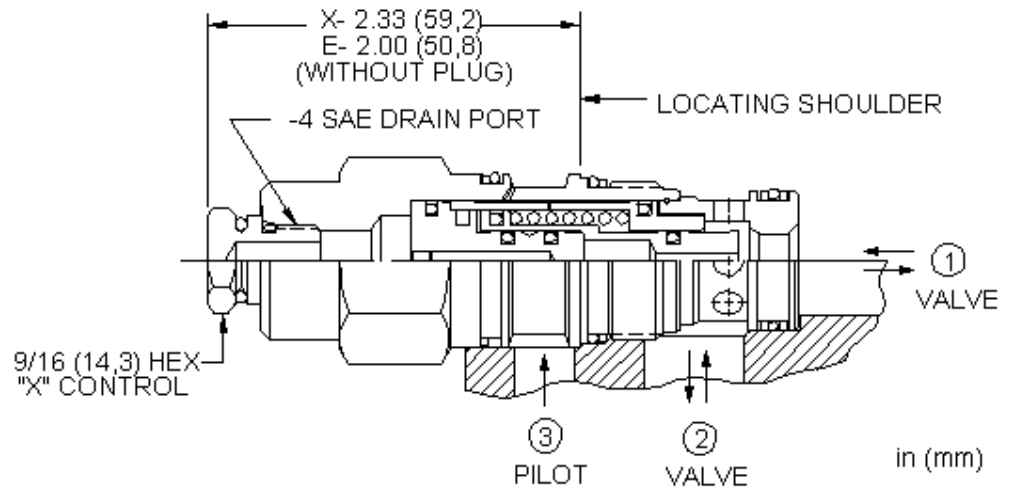
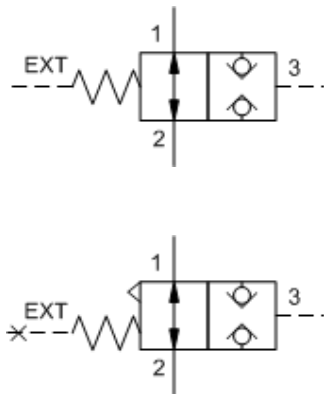
CONTROL	(X) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	H 400 psi (28 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the external drain open and a minimum pilot pressure of 400 psi (30 bar).
- Valve will open when the pilot pressure falls below 145 psi (10 bar).
- These valves are hydraulically balanced between port 1 and port 2.
- Port 1 and port 2 are fully sealed from port 3 and port 4. Ports 3 and 4 are positively sealed.
- Any backpressure at the drain port is directly additive to the required pilot pressure for reliable operation.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 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.
- All ports will accept 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





This is a normally open, balanced poppet, switching element. Pilot pressure at port 3 shifts the valve to the closed position.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	30 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.02 in ³
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.60 lb.

CONFIGURATION OPTIONS

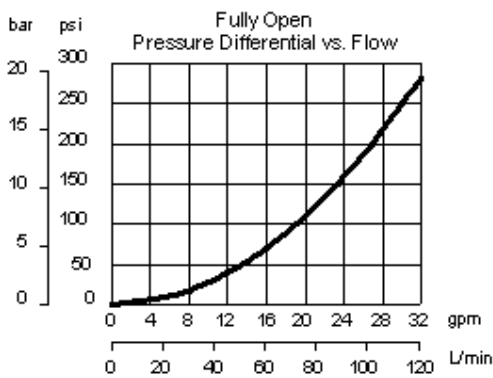
Model Code Example: DOFC**EHN**

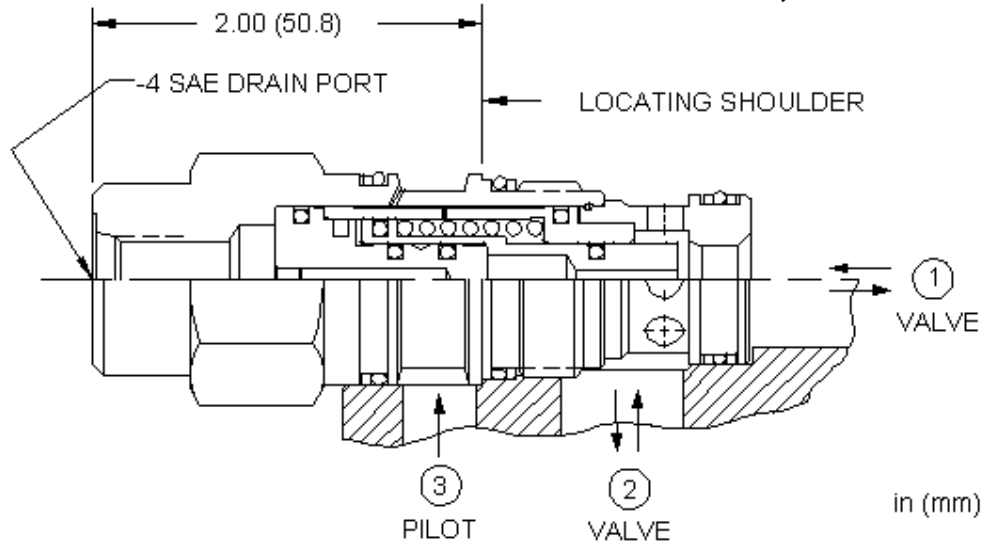
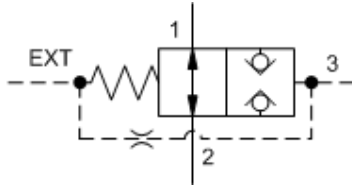
CONTROL	(E) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N)
E External 4-SAE Drain Port	H 300 psi (20 bar)	N Buna-N	
X Standard Pilot, Atmospheric Vent		V Viton	

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the external drain open and a minimum pilot pressure of 300 psi (20 bar).
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will open when the pilot pressure falls below 145 psi (10 bar).
- These 3-port balanced logic valves use the same cavity as unbalanced logic valves of the same frame size and can be considered functional replacements.
- Available in external atmospheric vent (X control) or static external drain (E control) configurations.
- Three-port vented logic elements with the X control are atmospherically referenced and considered problem solvers for existing circuits using non-vented valves. Over time, these valves will eventually leak externally and/or allow moisture into the spring chamber. Four-port valves are recommended for new applications. Alternately, the external vent port can be connected to drain if the static drain port option (control option E) is selected. Removing the vent plug will convert an X control to an E control.
- These valves are hydraulically balanced between port 1 and port 2.
- Port 1 and port 2 are fully sealed from port 3.
- All ports will accept 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





This is a normally open, balanced poppet, switching element. When the external vent port is blocked, the poppet remains in the open position. Venting the external port shifts it to the closed position, provided there is sufficient pressure at port 3.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	30 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Control Pilot Flow	See Performance Data
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.02 in ³
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.60 lb.

CONFIGURATION OPTIONS

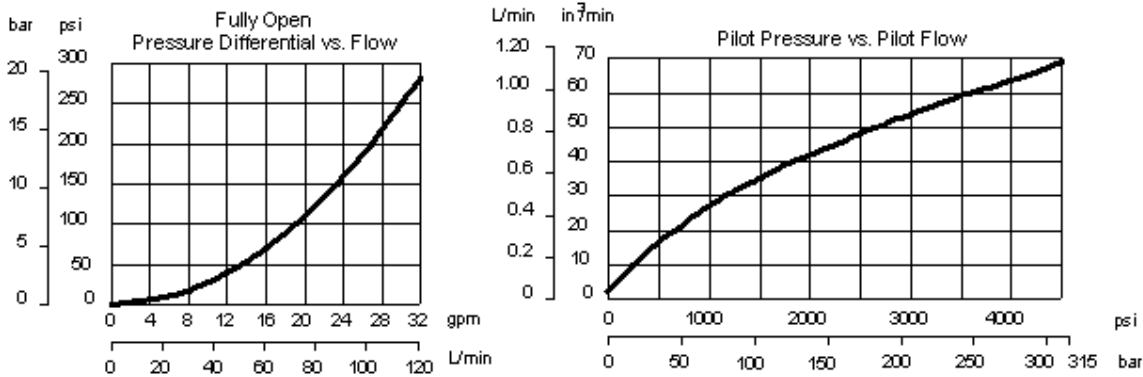
Model Code Example: DOFDEHN

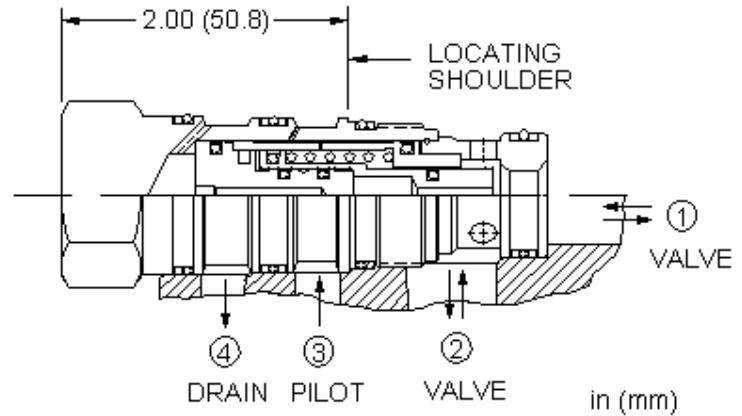
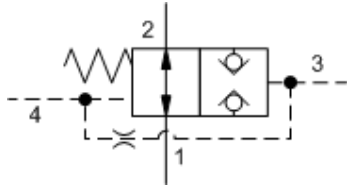
CONTROL	(E) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N)
E External 4-SAE Drain Port	H 300 psi (20 bar)	N Buna-N V Viton	

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at port 1 and port 2, with the external drain port open and a minimum pilot pressure of 300 psi (20 bar).
- These valves are hydraulically balanced between port 1 and port 2.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will open when the pilot pressure falls below 145 psi (10 bar).
- The external -4 SAE vent port may be directly connected to a pilot switching valve. The pilot valve should have a leakage rate of less than 10 drops/min (0,7 cc/min). and be able to satisfy the pilot flow requirements. Sun model DAA*-*** solenoid pilot valve is ideal for this application.
- Port 1 and port 2 are fully sealed from port 3.
- All ports will accept 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





This is a normally open, balanced poppet, switching element. When the vent port (port 4) is blocked, the poppet remains in the open position. Venting port 4 shifts it to the closed position, provided there is sufficient pressure at port 3.

TECHNICAL DATA

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

Cavity	T-22A
Series	2
Capacity	30 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Control Pilot Flow	See Performance Data
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990022007
Seal kit - Cartridge	Polyurethane: 990022002
Seal kit - Cartridge	Viton: 990022006
Model Weight	0.63 lb.

CONFIGURATION OPTIONS

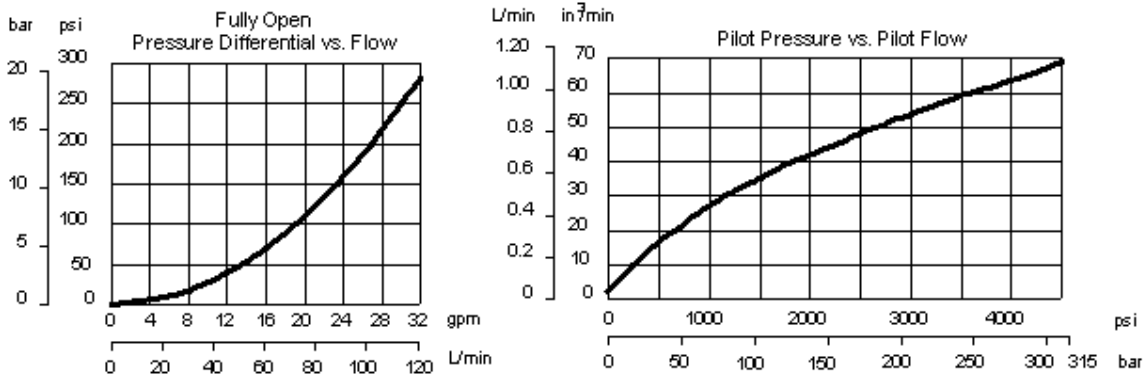
Model Code Example: DOFRXHN

CONTROL	(X) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N)
X Vent to Operate	H 300 psi (20 bar)	N Buna-N	V Viton

TECHNICAL FEATURES

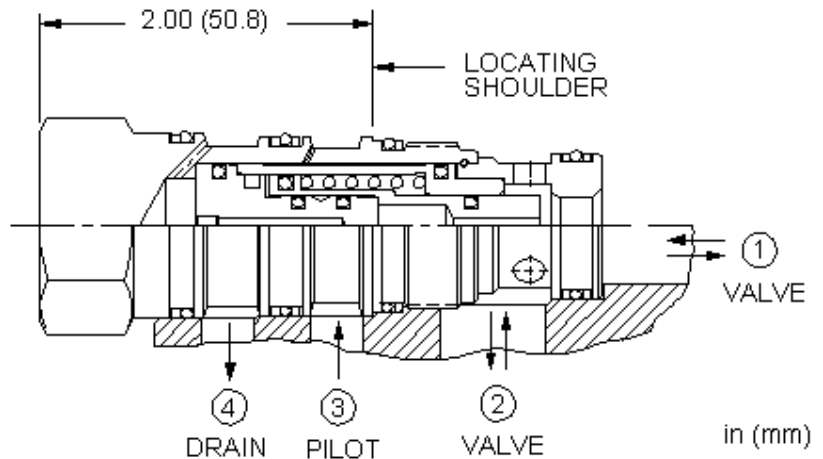
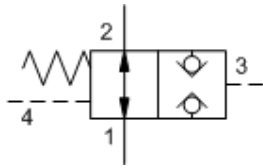
- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the vent (port 4) open and a minimum pilot pressure of 400 psi (30 bar) at port 3.
- Valve will open when the pilot pressure falls below 145 psi (10 bar).
- These valves are hydraulically balanced between port 1 and port 2.
- Port 1 and port 2 are fully sealed from port 3 and port 4. Ports 3 and 4 are positively sealed.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Port 4 may be externally connected to a pilot switching valve. The pilot valve should have a leakage rate of less than 10 drops/min. and be able to satisfy the pilot flow requirements. Sun model DAA*-*** solenoid pilot valve is ideal for this application.
- All ports will accept 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

- [DOFR8](#) Normally open, balanced poppet, logic element with integral T-8A control cavity - vent-to-close



This is a normally open, balanced poppet, switching element. Pilot pressure at port 3 shifts the valve to the closed position.

TECHNICAL DATA

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

Cavity	T-22A
Series	2
Capacity	30 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.02 in ³
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990022007
Seal kit - Cartridge	EPDM: 990022014
Seal kit - Cartridge	Polyurethane: 990022002
Seal kit - Cartridge	Viton: 990022006
Model Weight	0.63 lb.

CONFIGURATION OPTIONS

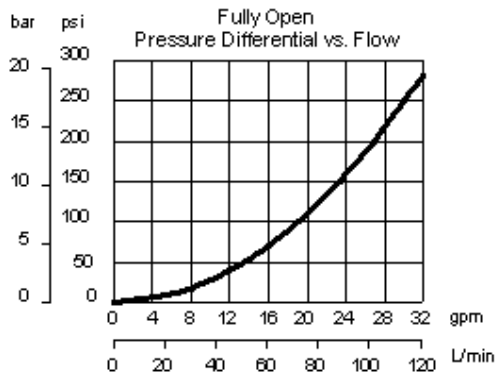
Model Code Example: DOFSXHN

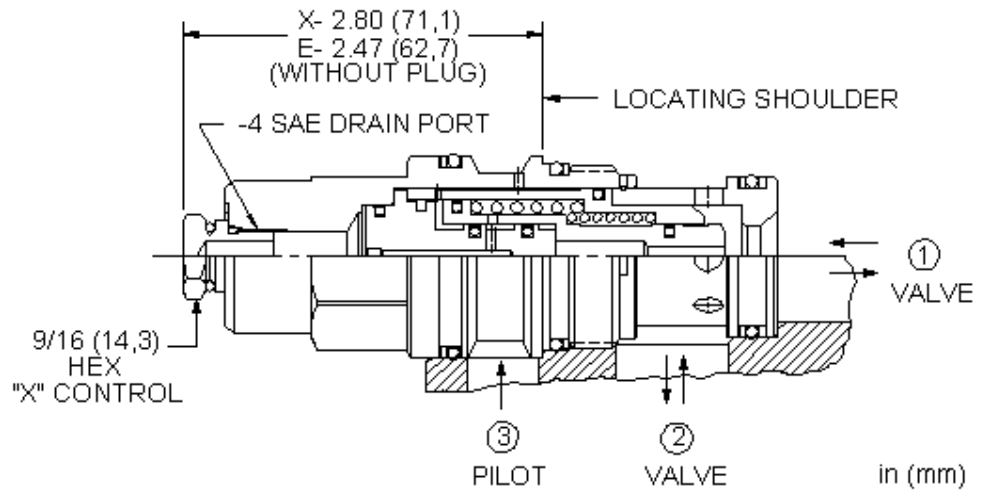
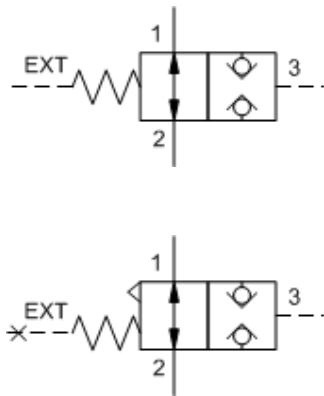
CONTROL	(X) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	H 300 psi (20 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the external drain open and a minimum pilot pressure of 300 psi (20 bar).
- Port 1 and port 2 are fully sealed from port 3 and port 4. Ports 3 and 4 are positively sealed.
- Any backpressure at the drain port is directly additive to the required pilot pressure for reliable operation.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will open when the pilot pressure falls below 145 psi (10 bar).
- These valves are hydraulically balanced between port 1 and port 2.
- 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 ports will accept 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





This is a normally open, balanced poppet, switching element. Pilot pressure at port 3 shifts the valve to the closed position.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	60 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.05 in ³
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	1.33 lb.

CONFIGURATION OPTIONS

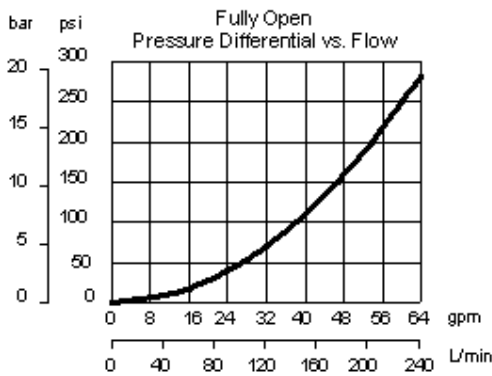
Model Code Example: DOHCENH

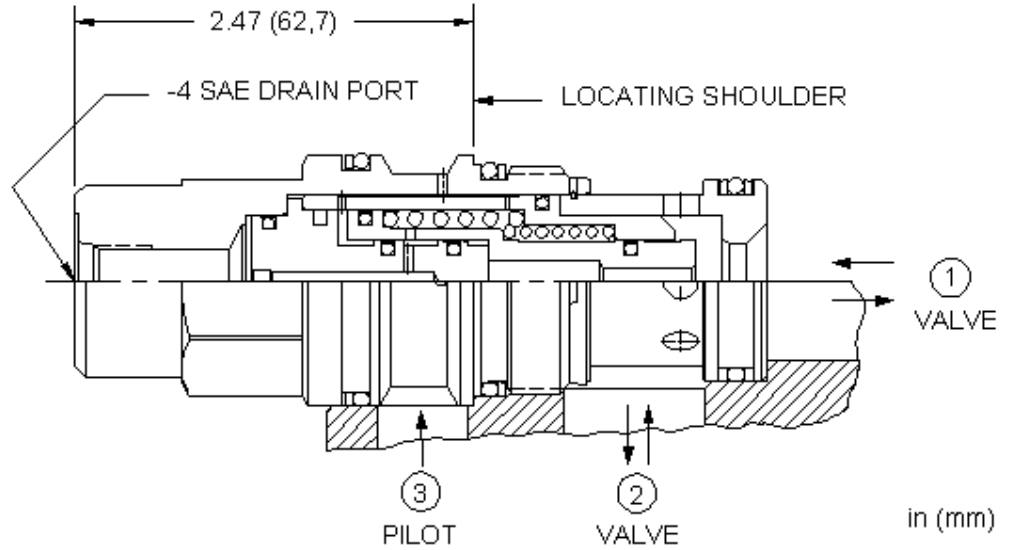
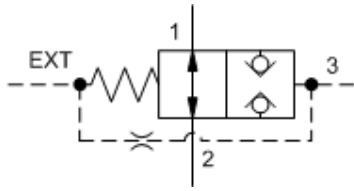
CONTROL	(E) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
E External 4-SAE Drain Port	H 300 psi (20 bar)	N Buna-N	Standard Material/Coating
X Standard Pilot, Atmospheric Vent		E EPDM	/LH Mild Steel, Zinc-Nickel
		V Viton	

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the external drain open and a minimum pilot pressure of 300 psi (20 bar).
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- These valves are hydraulically balanced between port 1 and port 2.
- Valve will open when the pilot pressure falls below 145 psi (10 bar).
- These 3-port balanced logic valves use the same cavity as unbalanced logic valves of the same frame size and can be considered functional replacements.
- Available in external atmospheric vent (X control) or static external drain (E control) configurations.
- Three-port vented logic elements with the X control are atmospherically referenced and considered problem solvers for existing circuits using non-vented valves. Over time, these valves will eventually leak externally and/or allow moisture into the spring chamber. Four-port valves are recommended for new applications. Alternately, the external vent port can be connected to drain if the static drain port option (control option E) is selected. Removing the vent plug will convert an X control to an E control.
- Port 1 and port 2 are fully sealed from port 3.
- All ports will accept 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





This is a normally open, balanced poppet, switching element. When the external vent port is blocked, the poppet remains in the open position. Venting the external port shifts it to the closed position, provided there is sufficient pressure at port 3.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	60 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Control Pilot Flow	See Performance Data
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.05 in ³
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	1.33 lb.

CONFIGURATION OPTIONS

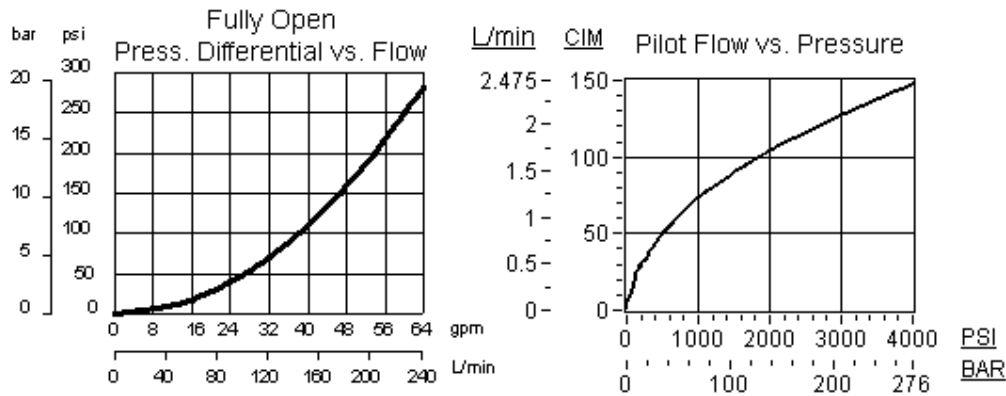
Model Code Example: DOHDEHN

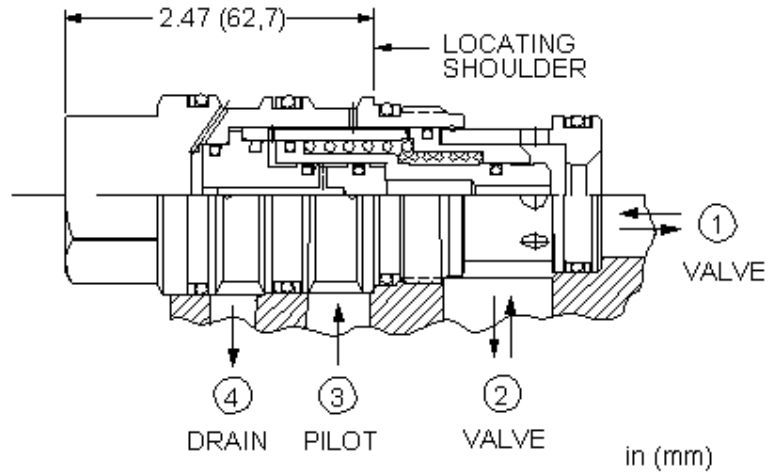
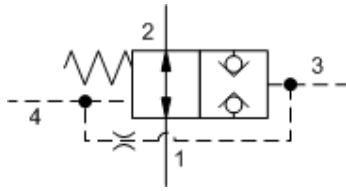
CONTROL	(E) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N)
E External 4- SAE Drain Port	H 300 psi (20 bar)	N Buna-N	V Viton

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at port 1 and port 2, with the external drain port open and a minimum pilot pressure of 300 psi (20 bar).
- Valve will open when the pilot pressure falls below 145 psi (10 bar).
- The external -4 SAE vent port may be directly connected to a pilot switching valve. The pilot valve should have a leakage rate of less than 10 drops/min (0,7 cc/min). and be able to satisfy the pilot flow requirements. Sun model DAA*-*** solenoid pilot valve is ideal for this application.
- These valves are hydraulically balanced between port 1 and port 2.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Port 1 and port 2 are fully sealed from port 3.
- All ports will accept 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





This is a normally open, balanced poppet, switching element. When the vent port (port 4) is blocked, the poppet remains in the open position. Venting port 4 shifts it to the closed position, provided there is sufficient pressure at port 3.

TECHNICAL DATA

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

Cavity	T-23A
Series	3
Capacity	60 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Control Pilot Flow	See Performance Data
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006
Model Weight	1.47 lb.

CONFIGURATION OPTIONS

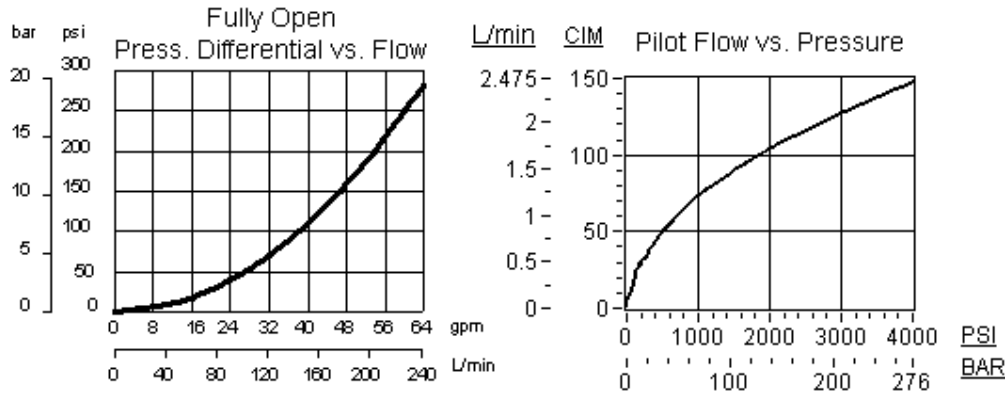
Model Code Example: DOHRXHN

CONTROL	(X)	MINIMUM PILOT PRESSURE	(H)	SEAL MATERIAL	(N)
X Vent to Operate		H 300 psi (20 bar)		N Buna-N	
				V Viton	

TECHNICAL FEATURES

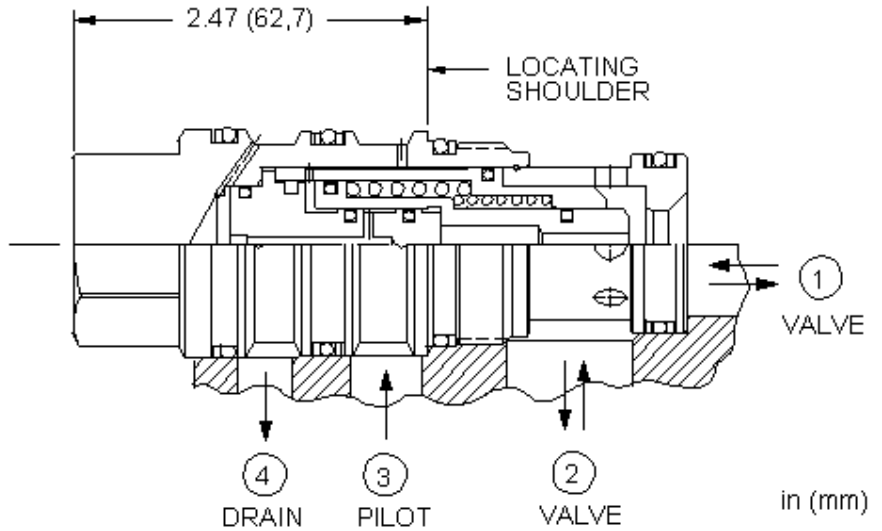
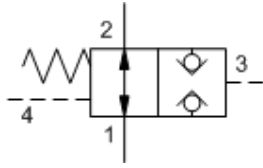
- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the vent (port 4) open and a minimum pilot pressure of 400 psi (30 bar) at port 3.
- These valves are hydraulically balanced between port 1 and port 2.
- Port 1 and port 2 are fully sealed from port 3 and port 4. Ports 3 and 4 are positively sealed.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Port 4 may be externally connected to a pilot switching valve. The pilot valve should have a leakage rate of less than 10 drops/min. and be able to satisfy the pilot flow requirements. Sun model DAA*-*** solenoid pilot valve is ideal for this application.
- Valve will open when the pilot pressure falls below 145 psi (10 bar).
- All ports will accept 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

- [DOHR8](#) Normally open, balanced poppet, logic element with integral T-8A control cavity - vent-to-close



This is a normally open, balanced poppet, switching element. Pilot pressure at port 3 shifts the valve to the closed position.

TECHNICAL DATA

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

Cavity	T-23A
Series	3
Capacity	60 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.05 in ³
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990023007
Seal kit - Cartridge	EPDM: 990023014
Seal kit - Cartridge	Polyurethane: 990023002
Seal kit - Cartridge	Viton: 990023006
Model Weight	1.47 lb.

CONFIGURATION OPTIONS

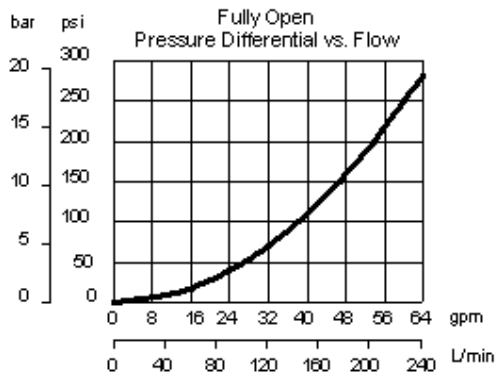
Model Code Example: DOHSXHN

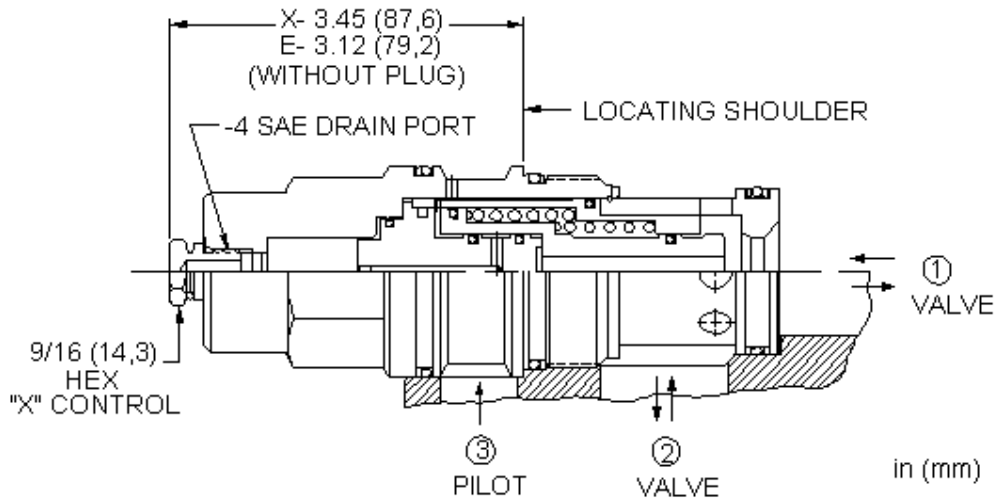
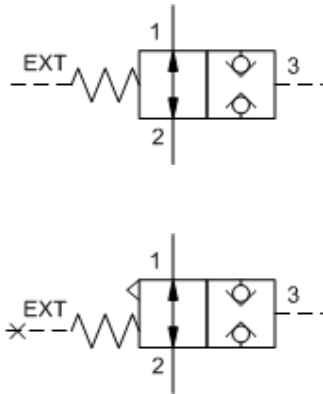
CONTROL	(X) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	H 300 psi (20 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the external drain open and a minimum pilot pressure of 300 psi (20 bar).
- Port 1 and port 2 are fully sealed from port 3 and port 4. Ports 3 and 4 are positively sealed.
- Any backpressure at the drain port is directly additive to the required pilot pressure for reliable operation.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will reseal when the pilot pressure falls below 145 psi (10 bar).
- These valves are hydraulically balanced between port 1 and port 2.
- 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 ports will accept 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





This is a normally open, balanced poppet, switching element. Pilot pressure at port 3 shifts the valve to the closed position.

TECHNICAL DATA

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

Cavity	T-19A
Series	4
Capacity	120 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.17 in ³
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	3.04 lb.

CONFIGURATION OPTIONS

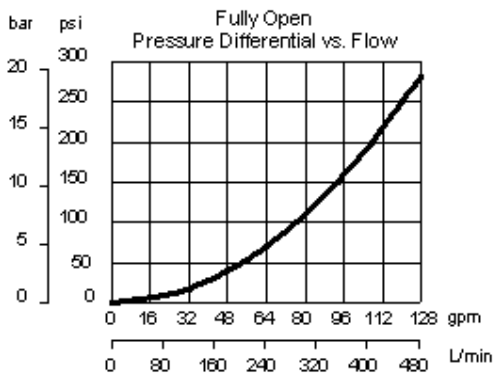
Model Code Example: **DOJCEHN**

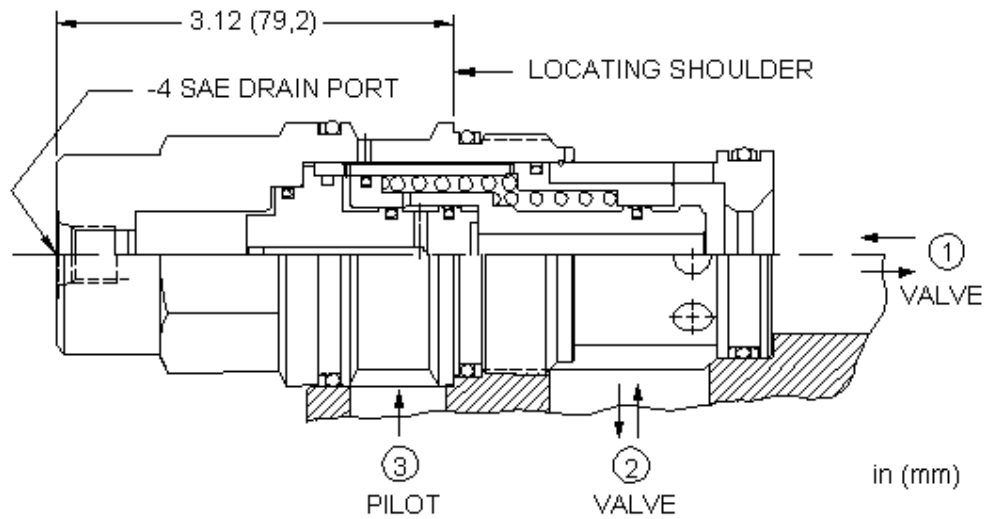
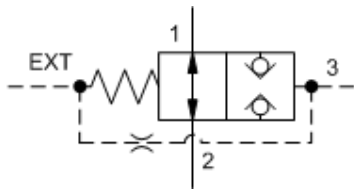
CONTROL	(E)	MINIMUM PILOT PRESSURE	(H)	SEAL MATERIAL	(N)
E External 4- SAE Drain Port		H 300 psi (20 bar)		N Buna-N	
X Standard Pilot, Atmospheric Vent				V Viton	

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the external drain open and a minimum pilot pressure of 300 psi (20 bar).
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- These 3-port balanced logic valves use the same cavity as unbalanced logic valves of the same frame size and can be considered functional replacements.
- Available in external atmospheric vent (X control) or static external drain (E control) configurations.
- Three-port vented logic elements with the X control are atmospherically referenced and considered problem solvers for existing circuits using non-vented valves. Over time, these valves will eventually leak externally and/or allow moisture into the spring chamber. Four-port valves are recommended for new applications. Alternately, the external vent port can be connected to drain if the static drain port option (control option E) is selected. Removing the vent plug will convert an X control to an E control.
- Valve will open when the pilot pressure falls below 145 psi (10 bar).
- These valves are hydraulically balanced between port 1 and port 2.
- Port 1 and port 2 are fully sealed from port 3.
- All ports will accept 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





This is a normally open, balanced poppet, switching element. When the external vent port is blocked, the poppet remains in the open position. Venting the external port shifts it to the closed position, provided there is sufficient pressure at port 3.

TECHNICAL DATA

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

Cavity	T-19A
Series	4
Capacity	120 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Control Pilot Flow	See Performance Data
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.17 in ³
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	3.04 lb.

CONFIGURATION OPTIONS

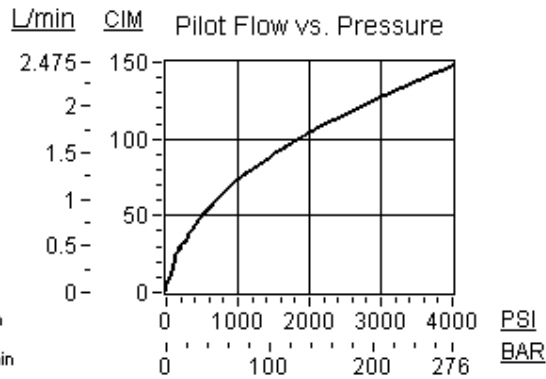
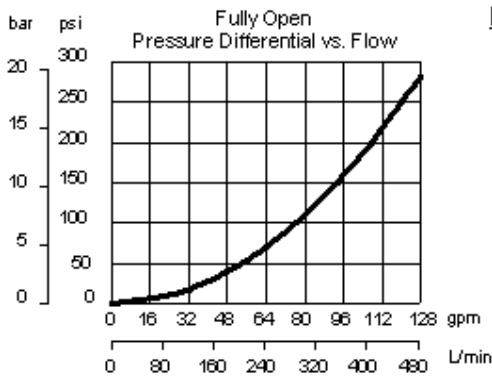
Model Code Example: DOJDEHN

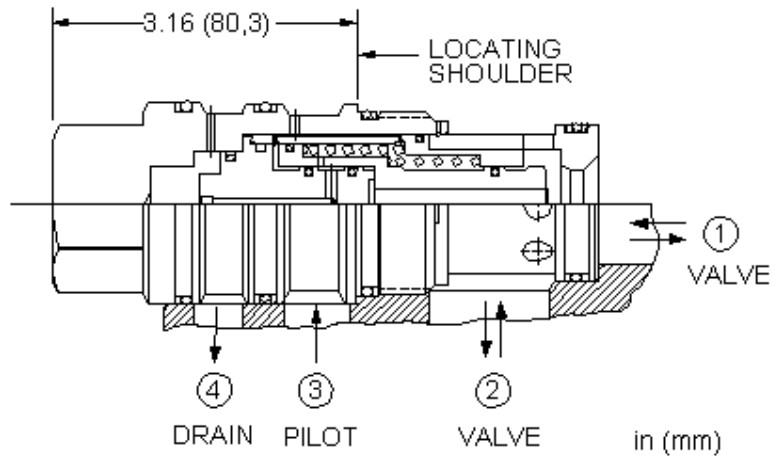
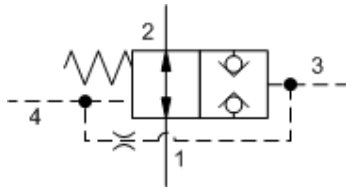
CONTROL	(E) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N)
E External 4- <small>SAE</small> Drain Port	H 300 psi (20 bar)	N Buna-N	V Viton

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at port 1 and port 2, with the external drain port open and a minimum pilot pressure of 300 psi (20 bar).
- The external -4 SAE vent port may be directly connected to a pilot switching valve. The pilot valve should have a leakage rate of less than 10 drops/min (0,7 cc/min), and be able to satisfy the pilot flow requirements. Sun model DAA*-*** solenoid pilot valve is ideal for this application.
- These valves are hydraulically balanced between port 1 and port 2.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Valve will open when the pilot pressure falls below 145 psi (10 bar).
- Port 1 and port 2 are fully sealed from port 3.
- All ports will accept 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





This is a normally open, balanced poppet, switching element. When the vent port (port 4) is blocked, the poppet remains in the open position. Venting port 4 shifts it to the closed position, provided there is sufficient pressure at port 3.

TECHNICAL DATA

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

Cavity	T-24A
Series	4
Capacity	120 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Control Pilot Flow	See Performance Data
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990024007
Seal kit - Cartridge	Polyurethane: 990024002
Seal kit - Cartridge	Viton: 990024006
Model Weight	3.35 lb.

CONFIGURATION OPTIONS

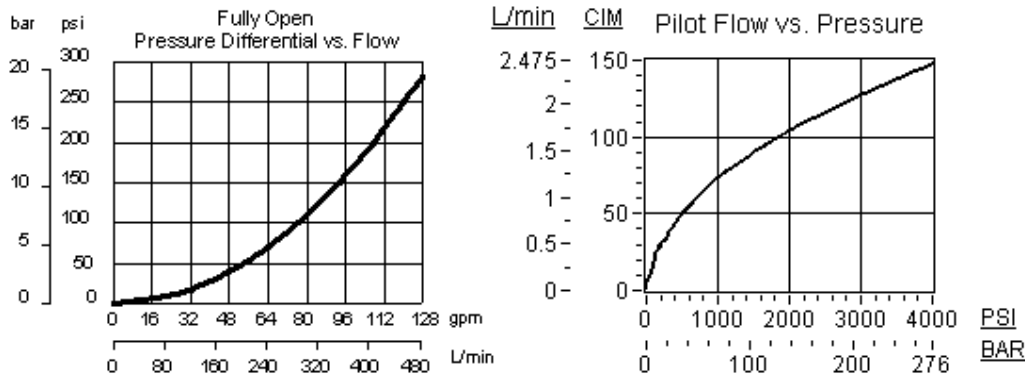
Model Code Example: DOJRXHN

CONTROL	(X)	MINIMUM PILOT PRESSURE	(H)	SEAL MATERIAL	(N)
X Vent to Operate		H 300 psi (20 bar)		N Buna-N	
				V Viton	

TECHNICAL FEATURES

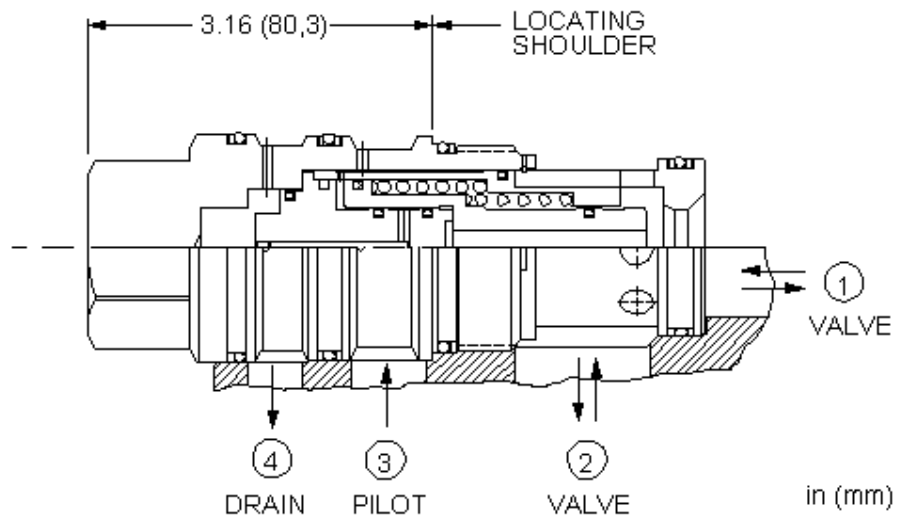
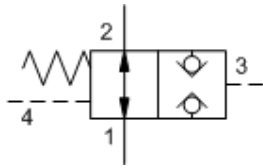
- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the vent (port 4) open and a minimum pilot pressure of 400 psi (30 bar) at port 3.
- These valves are hydraulically balanced between port 1 and port 2.
- Port 1 and port 2 are fully sealed from port 3 and port 4. Ports 3 and 4 are positively sealed.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 350 bar).
- Port 4 may be externally connected to a pilot switching valve. The pilot valve should have a leakage rate of less than 10 drops/min. and be able to satisfy the pilot flow requirements. Sun model DAA*-*** solenoid pilot valve is ideal for this application.
- Valve will open when the pilot pressure falls below 145 psi (10 bar).
- All ports will accept 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

- [DOJR8](#) Normally open, balanced poppet, logic element with integral T-8A control cavity - vent-to-close



This is a normally open, balanced poppet, switching element. Pilot pressure at port 3 shifts the valve to the closed position.

TECHNICAL DATA

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

Cavity	T-24A
Series	4
Capacity	120 gpm
Minimum Pilot Pressure Required to Shift Valve	300 psi
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@5000 psi
Pilot Volume Displacement	.17 in ³
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990024007
Seal kit - Cartridge	EPDM: 990024014
Seal kit - Cartridge	Polyurethane: 990024002
Seal kit - Cartridge	Viton: 990024006
Model Weight	3.35 lb.

CONFIGURATION OPTIONS

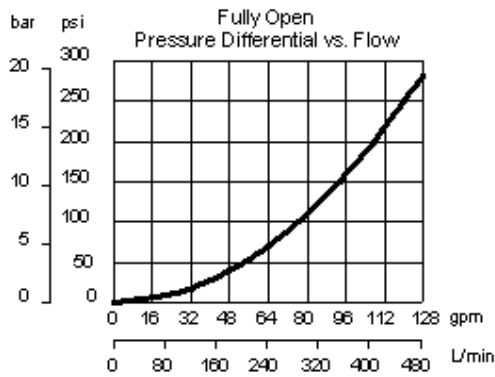
Model Code Example: DOJSXHN

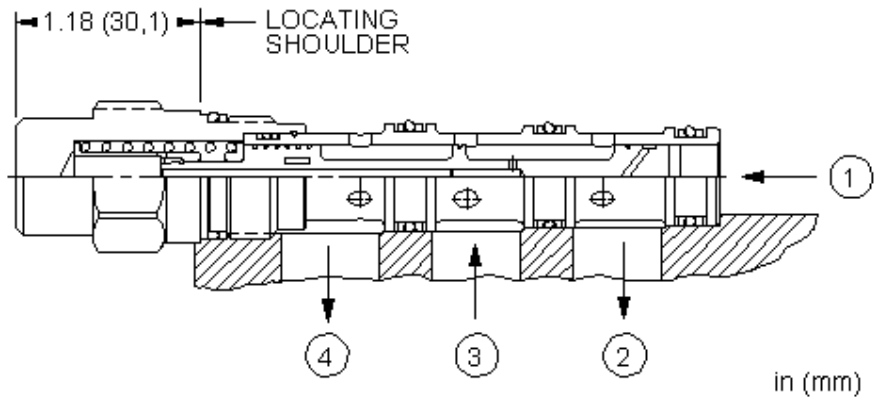
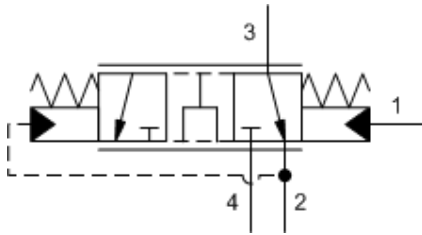
CONTROL	(X) MINIMUM PILOT PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	H 300 psi (20 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- Unique balanced construction provides predictable switching with 5000 psi (350 bar) at both ports 1 and 2, with the external drain open and a minimum pilot pressure of 300 psi (20 bar).
- Port 1 and port 2 are fully sealed from port 3 and port 4. Ports 3 and 4 are positively sealed.
- Any backpressure at the drain port is directly additive to the required pilot pressure for reliable operation.
- Leakage rate between port 1 and port 2 is very low, typically less than 10 drops/min. at 5000 psi (0,7 cc/min at 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.
- Valve will open when the pilot pressure falls below 145 psi (10 bar).
- These valves are hydraulically balanced between port 1 and port 2.
- All ports will accept 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





Bypass/restrictive modulating elements, when combined with an external orifice, create a bypass/restrictive flow control. Input flow (port 3) is directed to the priority or control flow at port 2. Once the priority requirements are met, excess flow is bypassed out port 4. The after-orifice signal is connected to port 1. The before-orifice design allows both pressure and flow to be controlled on the priority side of the circuit regardless of pressure in the bypass circuit. These valves work equally well in either closed or open center systems. Their main use is to allow after-market accessories to be driven off the host machine's hydraulic system without adding an additional pump.

TECHNICAL DATA

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

Cavity	T-31A
Series	1
Capacity	60 L/min.
Maximum Operating Pressure	350 bar
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990031007
Seal kit - Cartridge	Polyurethane: 990031002
Seal kit - Cartridge	Viton: 990031006
Model Weight	0.17 kg.

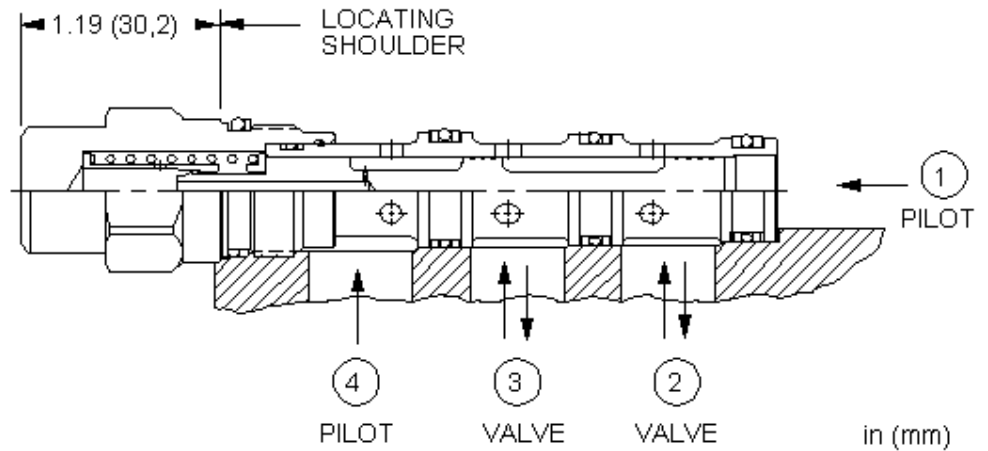
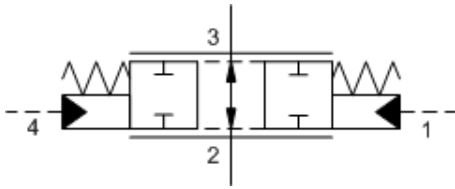
CONFIGURATION OPTIONS

Model Code Example: LHDAXFN

CONTROL	(X) DIFFERENTIAL PRESSURE	(F) SEAL MATERIAL	(N)
X Not Adjustable	F 100 psi (7 bar) E 75 psi (5 bar)	N Buna-N E EPDM V Viton	

TECHNICAL FEATURES

- Bypass flow is not available until priority flow requirements are satisfied.
- Priority flow can be turned on or off with a pilot-sized, three-way solenoid valve on port 1.
- Bypass pressure at port 4 can be higher than pressure at control port 2.
- Cartridges 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.



These bi-directional, normally open, modulating elements used with an external orifice, create a bi-directional, pressure compensated flow control.

TECHNICAL DATA

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

Cavity	T-31A
Series	1
Capacity	60 L/min.
Maximum Operating Pressure	350 bar
Valve Hex Size	22,2 mm
Valve Installation Torque	41 - 47 Nm
Seal kit - Cartridge	Buna: 990031007
Seal kit - Cartridge	EPDM: 990031014
Seal kit - Cartridge	Polyurethane: 990031002
Seal kit - Cartridge	Viton: 990031006
Model Weight	0.17 kg.

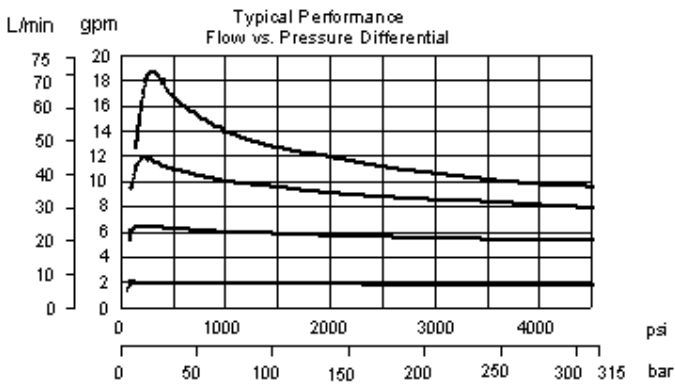
CONFIGURATION OPTIONS
Model Code Example: LHDTXFN

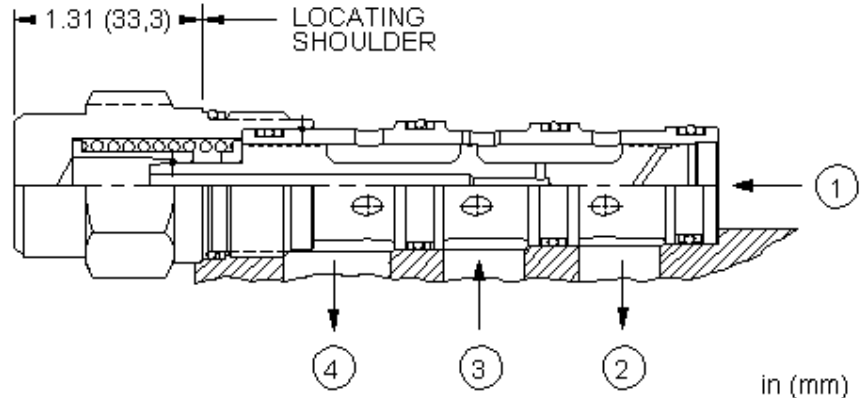
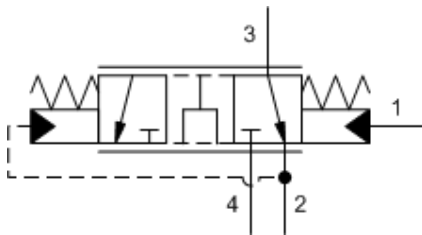
CONTROL	(X) NOMINAL CONTROL PRESSURE (F)	SEAL MATERIAL (N)
X Not Adjustable	F 100 psi (7 bar) D 50 psi (3,5 bar) E 75 psi (5 bar)	N Buna-N E EPDM V Viton

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 ports will accept 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





Bypass/restrictive modulating elements, when combined with an external orifice, create a bypass/restrictive flow control. Input flow (port 3) is directed to the priority or control flow at port 2. Once the priority requirements are met, excess flow is bypassed out port 4. The after-orifice signal is connected to port 1. The before-orifice design allows both pressure and flow to be controlled on the priority side of the circuit regardless of pressure in the bypass circuit. These valves work equally well in either closed or open center systems. Their main use is to allow after-market accessories to be driven off the host machine's hydraulic system without adding an additional pump.

TECHNICAL DATA

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

Cavity	T-32A
Series	2
Capacity	120 L/min.
Maximum Operating Pressure	350 bar
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990032007
Seal kit - Cartridge	EPDM: 990032014
Seal kit - Cartridge	Polyurethane: 990032002
Seal kit - Cartridge	Viton: 990032006
Model Weight	0.31 kg.

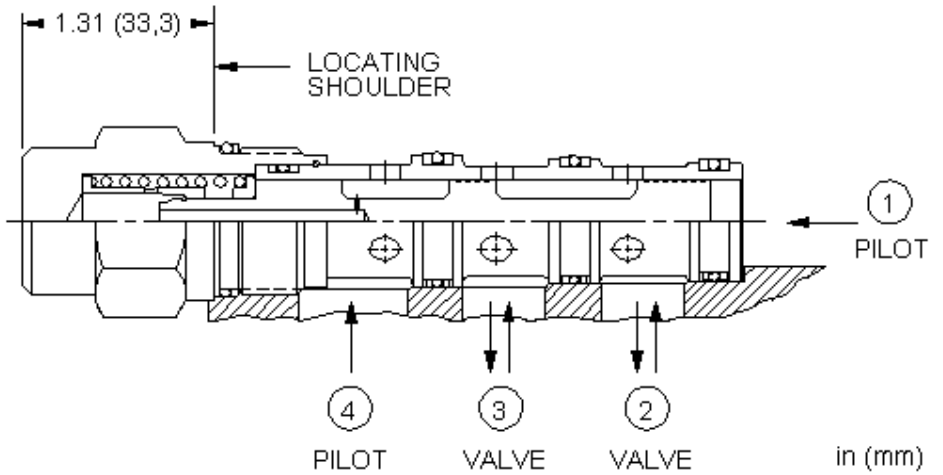
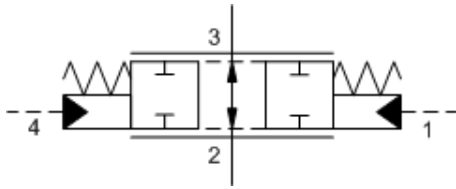
CONFIGURATION OPTIONS

Model Code Example: LHFAXFN

CONTROL	(X) DIFFERENTIAL PRESSURE	(F) SEAL MATERIAL	(N)
X Not Adjustable	F 100 psi (7 bar) E 75 psi (5 bar)	N Buna-N E EPDM V Viton	

TECHNICAL FEATURES

- Bypass flow is not available until priority flow requirements are satisfied.
- Priority flow can be turned on or off with a pilot-sized, three-way solenoid valve on port 1.
- Bypass pressure at port 4 can be higher than pressure at control port 2.
- Cartridges 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.



These bi-directional, normally open, modulating elements used with an external orifice, create a bi-directional, pressure compensated flow control.

TECHNICAL DATA

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

Cavity	T-32A
Series	2
Capacity	120 L/min.
Maximum Operating Pressure	350 bar
Valve Hex Size	28,6 mm
Valve Installation Torque	61 - 68 Nm
Seal kit - Cartridge	Buna: 990032007
Seal kit - Cartridge	EPDM: 990032014
Seal kit - Cartridge	Polyurethane: 990032002
Seal kit - Cartridge	Viton: 990032006
Model Weight	0.32 kg.

CONFIGURATION OPTIONS

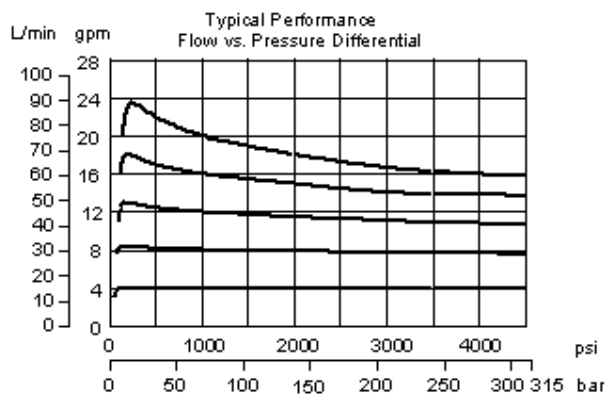
Model Code Example: LHFTXFN

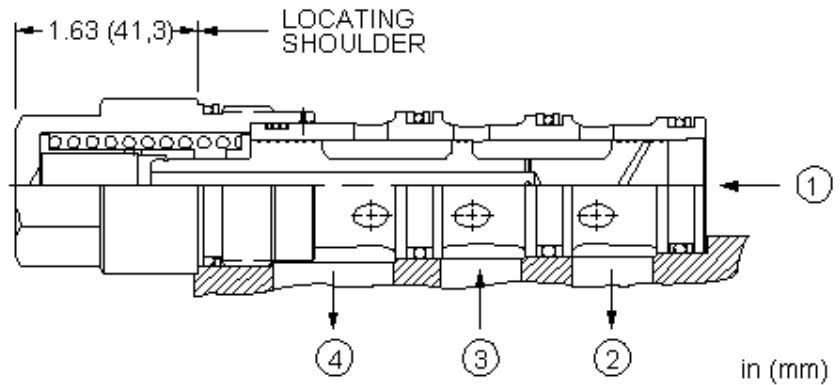
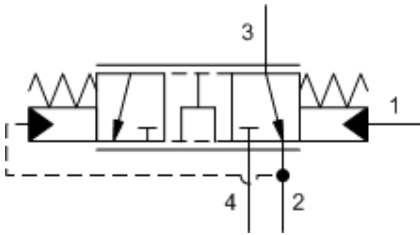
CONTROL	(X) NOMINAL CONTROL PRESSURE (F)	SEAL MATERIAL (N)
X Not Adjustable	F 100 psi (7 bar) D 50 psi (3,5 bar) E 75 psi (5 bar)	N Buna-N E EPDM V Viton

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 ports will accept 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





Bypass/restrictive modulating elements, when combined with an external orifice, create a bypass/restrictive flow control. Input flow (port 3) is directed to the priority or control flow at port 2. Once the priority requirements are met, excess flow is bypassed out port 4. The after-orifice signal is connected to port 1. The before-orifice design allows both pressure and flow to be controlled on the priority side of the circuit regardless of pressure in the bypass circuit. These valves work equally well in either closed or open center systems. Their main use is to allow after-market accessories to be driven off the host machine's hydraulic system without adding an additional pump.

TECHNICAL DATA

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

Cavity	T-33A
Series	3
Capacity	240 L/min.
Maximum Operating Pressure	350 bar
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990033007
Seal kit - Cartridge	EPDM: 990033014
Seal kit - Cartridge	Polyurethane: 990033002
Seal kit - Cartridge	Viton: 990033006
Model Weight	0.72 kg.

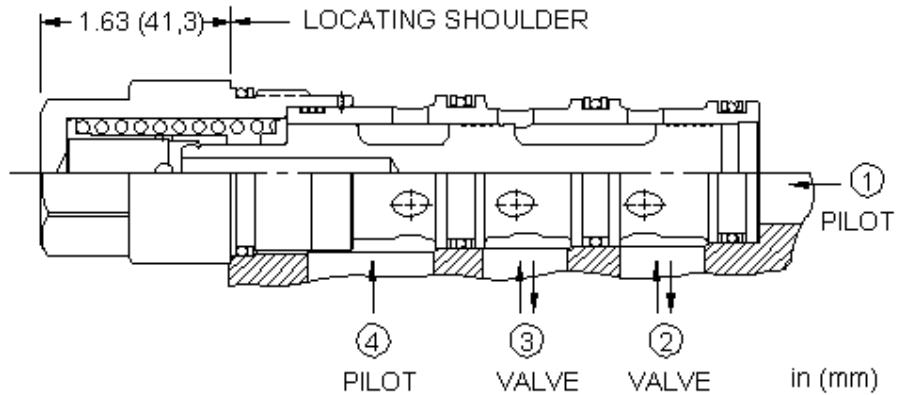
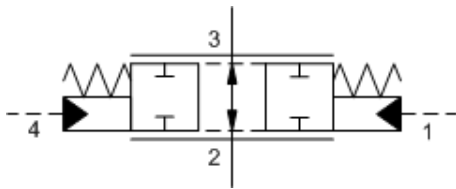
CONFIGURATION OPTIONS

Model Code Example: LHHAXFN

CONTROL	(X) DIFFERENTIAL PRESSURE	(F) SEAL MATERIAL	(N)
X Not Adjustable	F 100 psi (7 bar) E 75 psi (5 bar)	N Buna-N E EPDM V Viton	

TECHNICAL FEATURES

- Bypass flow is not available until priority flow requirements are satisfied.
- Priority flow can be turned on or off with a pilot-sized, three-way solenoid valve on port 1.
- Bypass pressure at port 4 can be higher than pressure at control port 2.
- Cartridges 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.



These bi-directional, normally open, modulating elements used with an external orifice, create a bi-directional, pressure compensated flow control.

TECHNICAL DATA

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

Cavity	T-33A
Series	3
Capacity	240 L/min.
Maximum Operating Pressure	350 bar
Valve Hex Size	31,8 mm
Valve Installation Torque	203 - 217 Nm
Seal kit - Cartridge	Buna: 990033007
Seal kit - Cartridge	EPDM: 990033014
Seal kit - Cartridge	Polyurethane: 990033002
Seal kit - Cartridge	Viton: 990033006
Model Weight	0.78 kg.

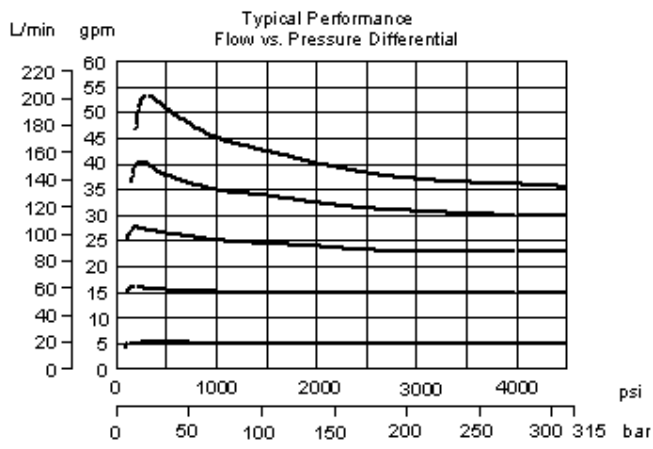
CONFIGURATION OPTIONS
Model Code Example: LHHTXFN

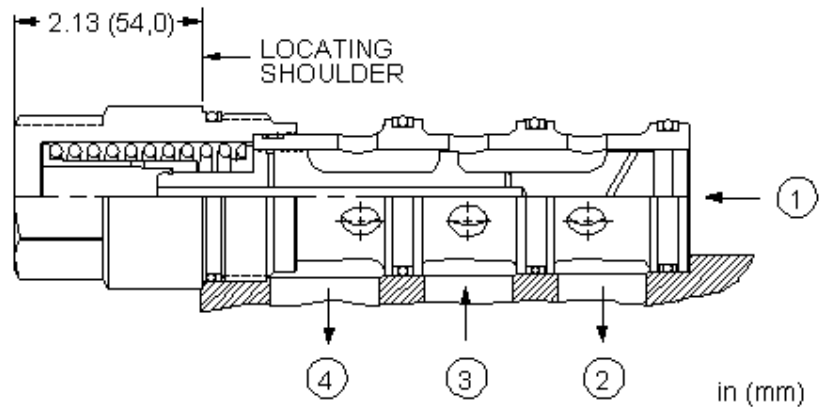
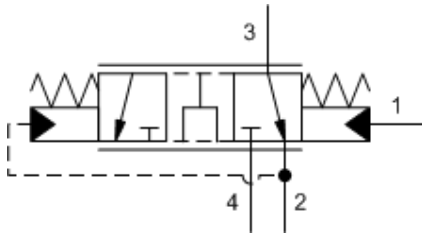
CONTROL	(X) DIFFERENTIAL PRESSURE	(F) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	F 100 psi (7 bar) D 50 psi (3,5 bar) E 75 psi (5 bar)	N Buna-N E EPDM V Viton	N Standard Material/Coating /AP Stainless Steel, Passivated

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 ports will accept 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





Bypass/restrictive modulating elements, when combined with an external orifice, create a bypass/restrictive flow control. Input flow (port 3) is directed to the priority or control flow at port 2. Once the priority requirements are met, excess flow is bypassed out port 4. The after-orifice signal is connected to port 1. The before-orifice design allows both pressure and flow to be controlled on the priority side of the circuit regardless of pressure in the bypass circuit. These valves work equally well in either closed or open center systems. Their main use is to allow after-market accessories to be driven off the host machine's hydraulic system without adding an additional pump.

TECHNICAL DATA

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

Cavity	T-34A
Series	4
Capacity	480 L/min.
Maximum Operating Pressure	350 bar
Valve Hex Size	41,3 mm
Valve Installation Torque	474 - 508 Nm
Seal kit - Cartridge	Buna: 990034007
Seal kit - Cartridge	EPDM: 990034014
Seal kit - Cartridge	Polyurethane: 990034002
Seal kit - Cartridge	Viton: 990034006
Model Weight	1.57 kg.

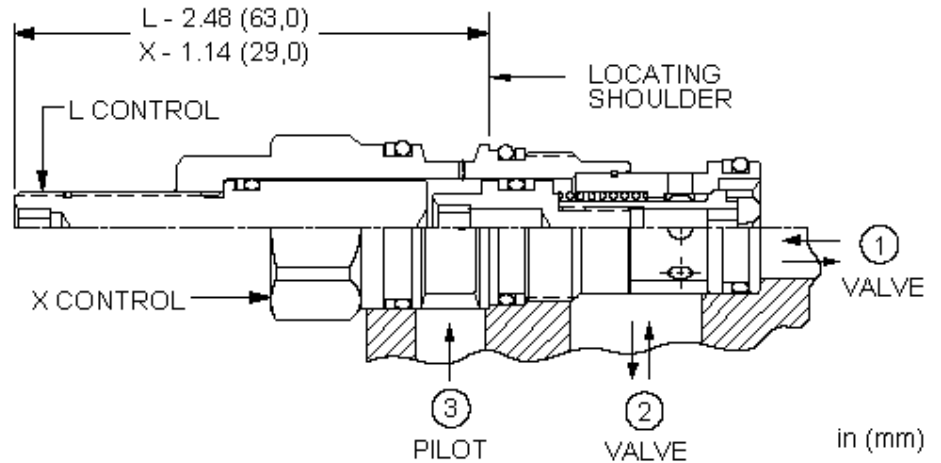
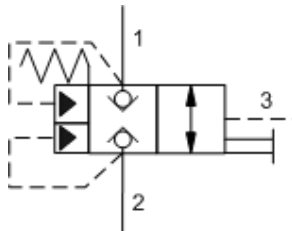
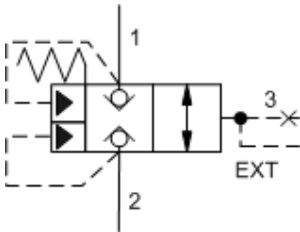
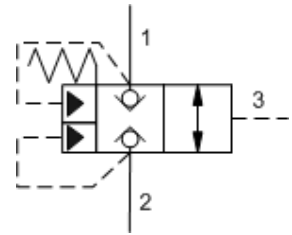
CONFIGURATION OPTIONS

Model Code Example: LHJAXFN

CONTROL	(X) DIFFERENTIAL PRESSURE	(F) SEAL MATERIAL	(N)
X Not Adjustable	F 100 psi (7 bar) E 75 psi (5 bar)	N Buna-N E EPDM V Viton	

TECHNICAL FEATURES

- Bypass flow is not available until priority flow requirements are satisfied.
- Priority flow can be turned on or off with a pilot-sized, three-way solenoid valve on port 1.
- Bypass pressure at port 4 can be higher than pressure at control port 2.
- Cartridges 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.



These unbalanced poppet, logic valves are 2-way switching elements that are spring-biased closed. Pressure at either work port 1 or 2 will further bias the valve to the closed position while pressure at port 3 will tend to open it. The force generated at port 3 must be greater than the sum of the forces acting at port 1 and port 2 plus the spring force for the valve to open. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	15 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@1000 psi
Pilot Volume Displacement	.02 in ³
Pilot Passage into Valve	.031 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Valve Hex Size	7/8 in.
Valve Installation Torque	30 - 35 lbf ft
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.28 lb.

CONFIGURATION OPTIONS

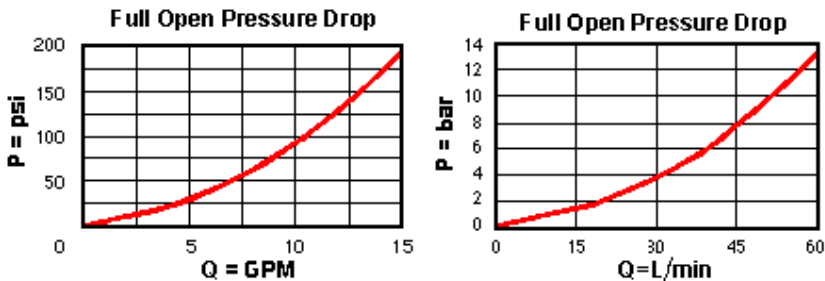
Model Code Example: LKDCXDN

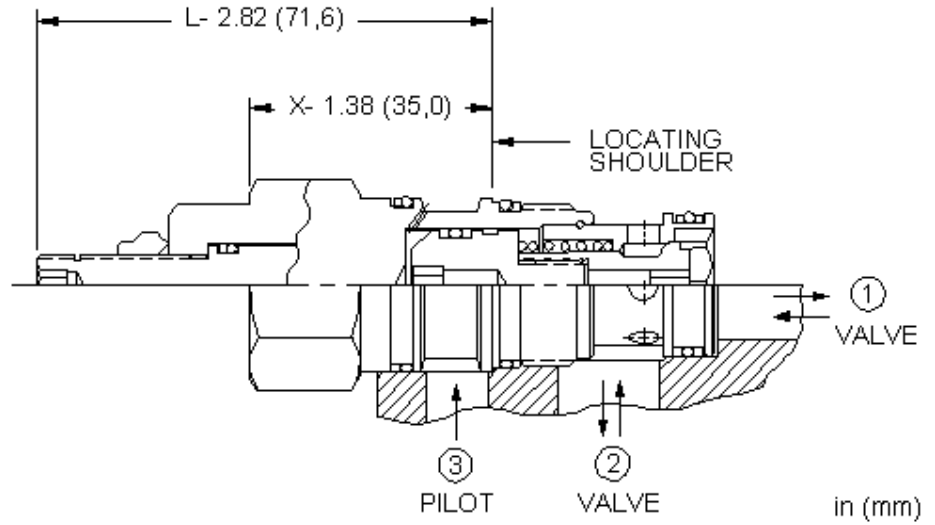
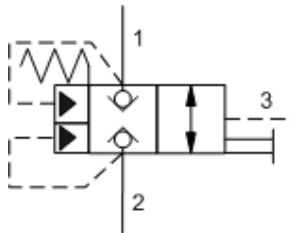
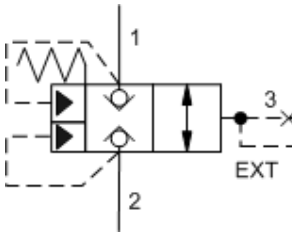
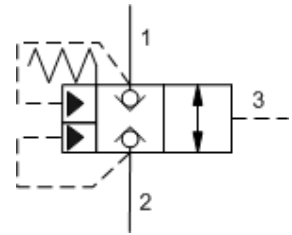
CONTROL	(X) MINIMUM PILOT PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- These valves have positive seals between port 2 and the pilot area.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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





These unbalanced poppet, logic valves are 2-way switching elements that are spring-biased closed. Pressure at either work port 1 or 2 will further bias the valve to the closed position while pressure at port 3 will tend to open it. The force generated at port 3 must be greater than the sum of the forces acting at port 1 and port 2 plus the spring force for the valve to open. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	30 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@1000 psi
Pilot Volume Displacement	.06 in ³
Pilot Passage into Valve	.035 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	EPDM: 990202014
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.51 lb.

CONFIGURATION OPTIONS

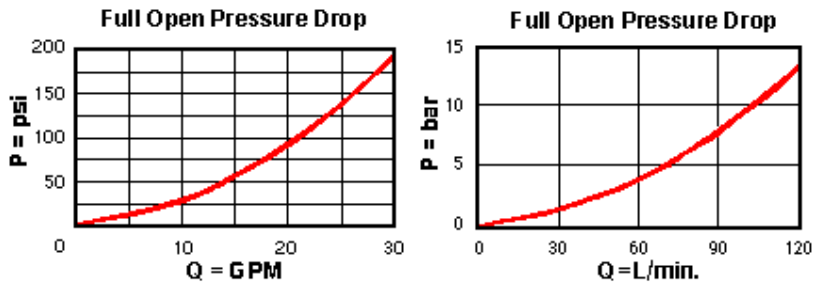
Model Code Example: LKFCXDN

CONTROL	(X) MINIMUM PILOT PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

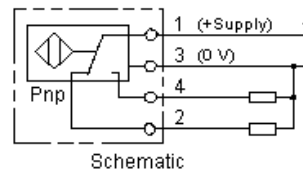
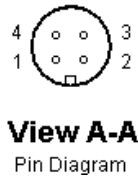
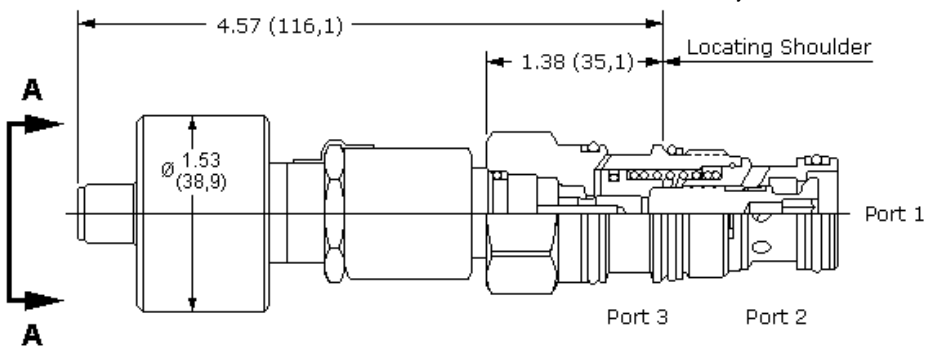
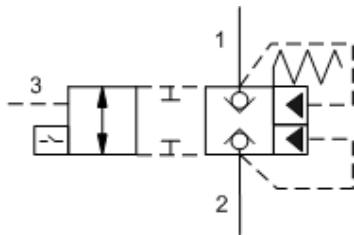
- These valves have positive seals between port 2 and the pilot area.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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

- [LKFCZ](#) Pilot-to-open, spring-biased closed, unbalanced poppet logic element with position switch



in (mm)

These unbalanced poppet, logic valves are 2-way switching elements that are spring-biased closed. Pressure at either work port 1 or 2 will further bias the valve to the closed position while pressure at port 3 will tend to open it. The force generated at port 3 must be greater than the sum of the forces acting at port 1 and port 2 plus the spring force for the valve to open. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

This valve incorporates a position switch to provide confirmation that the valve is closed.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	20 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	1 drops/min.
Pilot Volume Displacement	.06 in ³
Pilot Passage into Valve	.035 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Transition leakage at 110 SUS (24 cSt)	2 in ³ /min.@1000 psi
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	EPDM: 990202014
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	1.34 lb.

SWITCH SPECIFICATIONS

Supply Voltage	20-30 VDC
Operating Temperature Range	-25 to 80 °C
Vibration	≥ 50g, 0-500 impulses/sec
Shock	>50 g, 1ms
Reverse Polarity Protection	Yes
Maximum Output Load	≤ 400 mA, Duty Ratio 100%
Short Circuit Protection	Yes, Load Short Unlimited
Turn On Time	≤ 25 ms
Hysteresis	≤ .002 in.
Thermal Shift - 0 to 80 °C ≤ ±	.004 in.
EMC	DIN EN 61000-6-1/2/3/4
Connector	M12 X 1 (4) Pin
Connector Environment Rating	IP65

CONFIGURATION OPTIONS

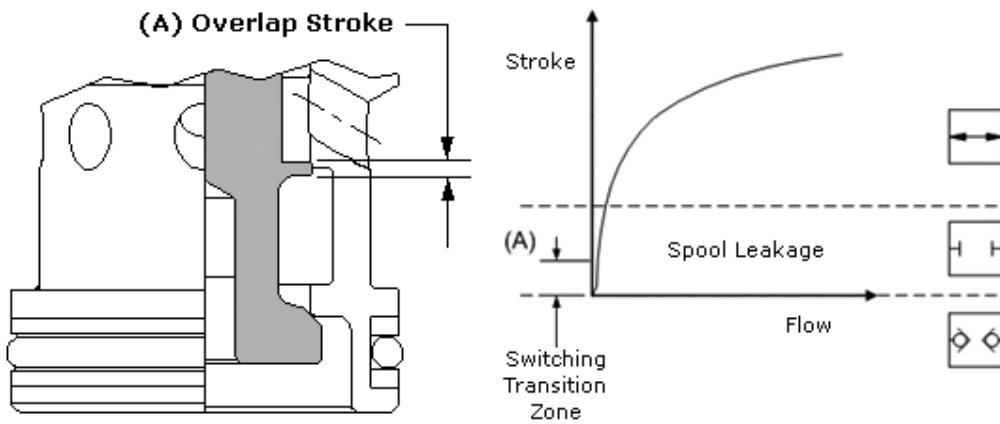
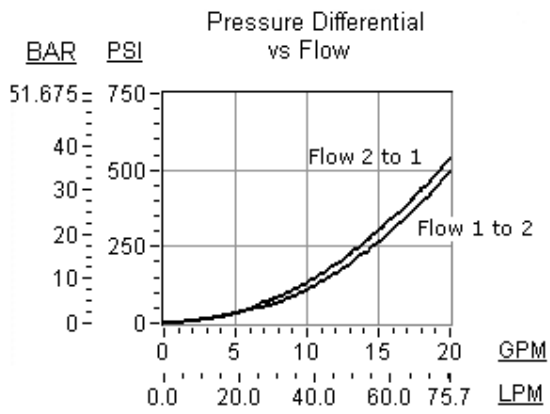
Model Code Example: LKFCZDN

MINIMUM PILOT PRESSURE	(D)	SEAL MATERIAL	(N)
D	50 psi (3,5 bar)	N	Buna-N
		E	EPDM
		V	Viton

TECHNICAL FEATURES

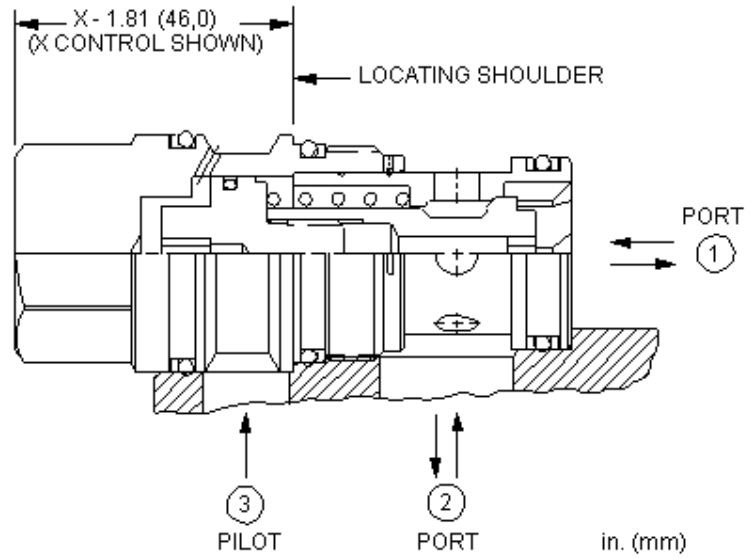
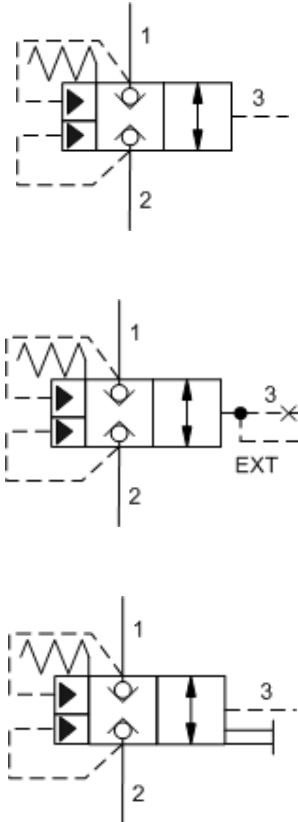
- The position switch in this valve provides confirmation that the valve is closed.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- These valves have positive seals between port 2 and the pilot area.
- This cartridge is supplied as a sealed, factory set unit and is not field serviceable. Any tampering will violate the product warranty.
- When torquing this cartridge into its cavity, a crow's foot wrench or similar will be required since the position switch precludes the use of a deep socket wrench.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- Position switch is CE approved.
- 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

- [LKFC](#) Pilot-to-open, spring-biased closed, unbalanced poppet logic element



These unbalanced poppet, logic valves are 2-way switching elements that are spring-biased closed. Pressure at either work port 1 or 2 will further bias the valve to the closed position while pressure at port 3 will tend to open it. The force generated at port 3 must be greater than the sum of the forces acting at port 1 and port 2 plus the spring force for the valve to open. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	60 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@1000 psi
Pilot Volume Displacement	.15 in ³
Pilot Passage into Valve	.06 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	EPDM: 990017014
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	1.14 lb.

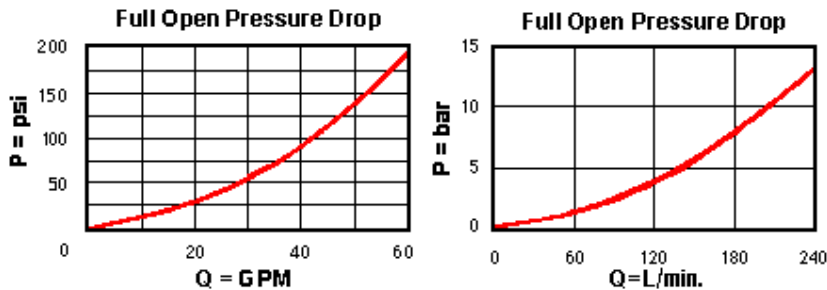
CONFIGURATION OPTIONS
Model Code Example: LKHCXDN

CONTROL	(X) MINIMUM PILOT PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

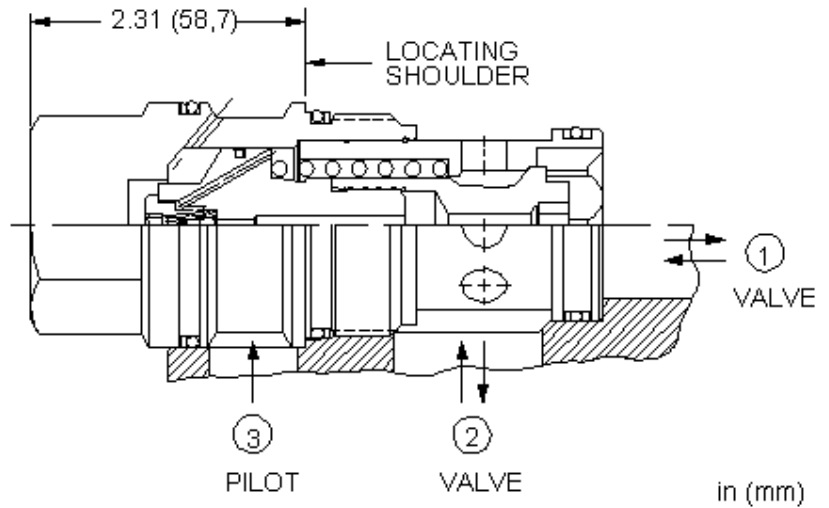
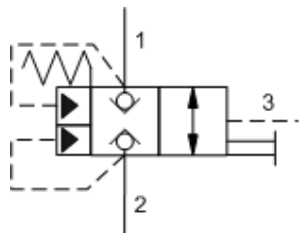
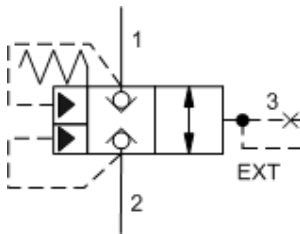
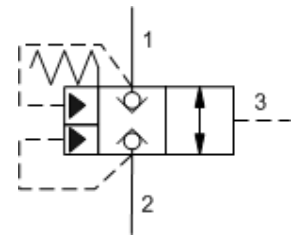
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- These valves have positive seals between port 2 and the pilot area.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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

- [LKH CZ](#) Pilot-to-open, spring-biased closed, unbalanced poppet logic element with position switch



These unbalanced poppet, logic valves are 2-way switching elements that are spring-biased closed. Pressure at either work port 1 or 2 will further bias the valve to the closed position while pressure at port 3 will tend to open it. The force generated at port 3 must be greater than the sum of the forces acting at port 1 and port 2 plus the spring force for the valve to open. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-19A
Series	4
Capacity	120 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.@1000 psi
Pilot Volume Displacement	.30 in ³
Pilot Passage into Valve	.09 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	EPDM: 990019014
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	2.64 lb.

CONFIGURATION OPTIONS

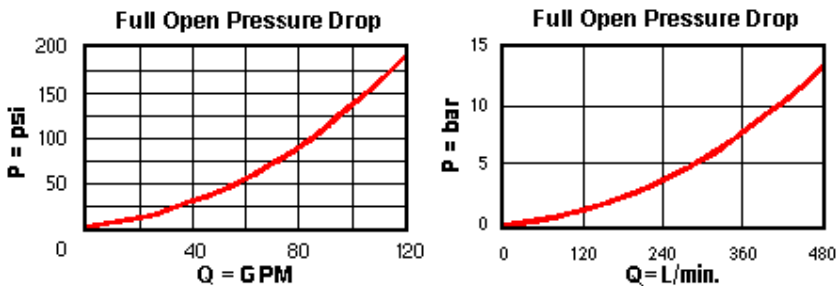
Model Code Example: LKJCXDN

CONTROL	(X) MINIMUM PILOT PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

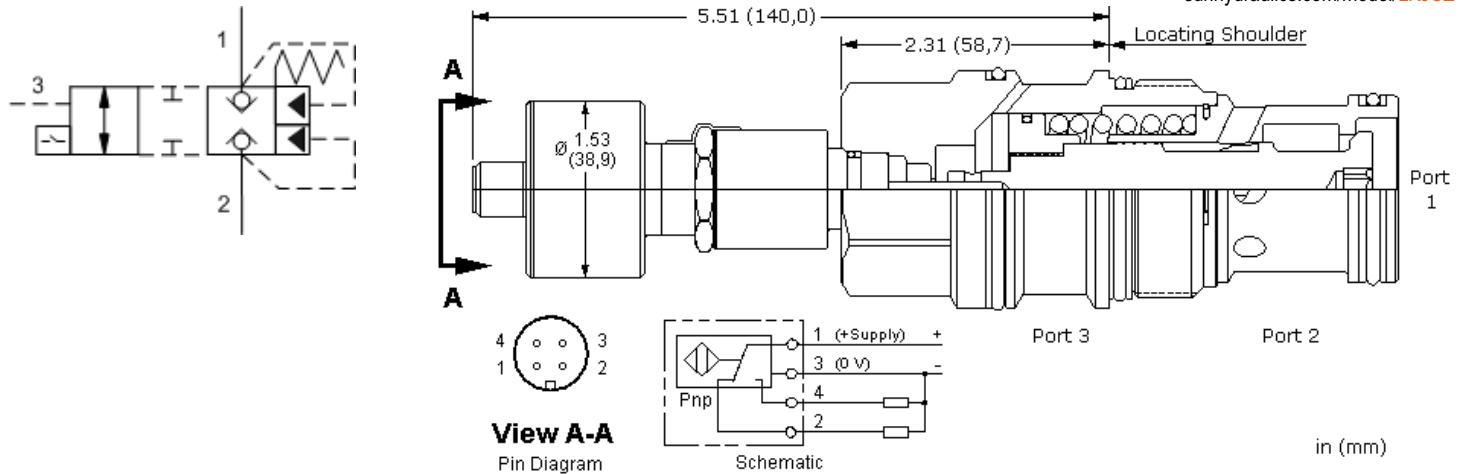
- These valves have positive seals between port 2 and the pilot area.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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

- [LKJ CZ](#) Pilot-to-open, spring-biased closed, unbalanced poppet logic element with position switch



These unbalanced poppet, logic valves are 2-way switching elements that are spring-biased closed. Pressure at either work port 1 or 2 will further bias the valve to the closed position while pressure at port 3 will tend to open it. The force generated at port 3 must be greater than the sum of the forces acting at port 1 and port 2 plus the spring force for the valve to open. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

This valve incorporates a position switch to provide confirmation that the valve is closed.

TECHNICAL DATA

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

Cavity	T-19A
Series	4
Capacity	80 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	1 drops/min.
Pilot Volume Displacement	.30 in ³
Pilot Passage into Valve	.09 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Transition leakage at 110 SUS (24 cSt)	2 in ³ /min.@1000 psi
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	3.40 lb.

SWITCH SPECIFICATIONS

Supply Voltage	20-30 VDC
Operating Temperature Range	-25 to 80 °C
Vibration	≥ 50g, 0-500 impulses/sec
Shock	>50 g, 1ms
Reverse Polarity Protection	Yes
Maximum Output Load	≤ 400 mA, Duty Ratio 100%
Short Circuit Protection	Yes, Load Short Unlimited
Turn On Time	≤ 25 ms
Hysteresis	≤ .002 in.
Thermal Shift - 0 to 80 °C ≤ ±	.004 in.
EMC	DIN EN 61000-6-1/2/3/4
Connector	M12 X 1 (4) Pin
Connector Environment Rating	IP65

CONFIGURATION OPTIONS

Model Code Example: LKJCZDN

MINIMUM PILOT PRESSURE (D) SEAL MATERIAL (N)

D 50 psi (3,5 bar)

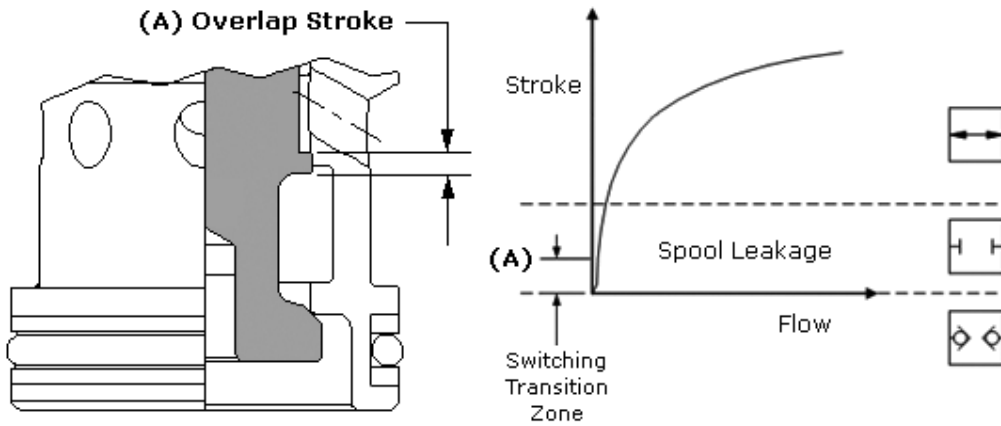
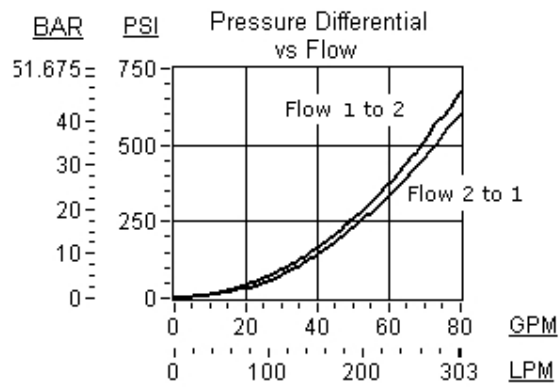
N Buna-N

V Viton

TECHNICAL FEATURES

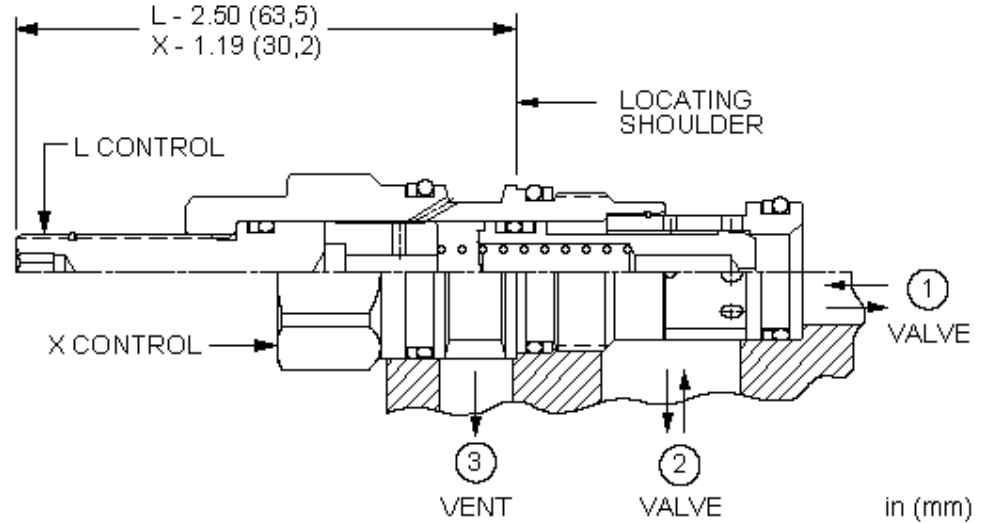
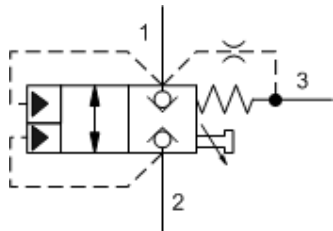
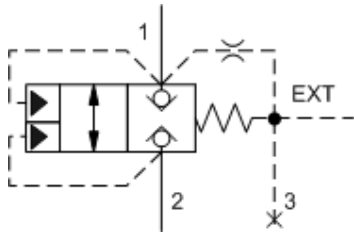
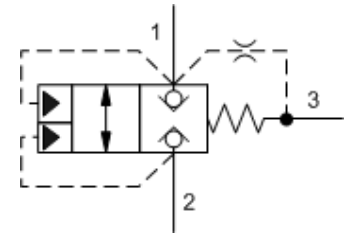
- The position switch in this valve provides confirmation that the valve is closed.
- These valves have positive seals between port 2 and the pilot area.
- This cartridge is supplied as a sealed, factory set unit and is not field serviceable. Any tampering will violate the product warranty.
- When torquing this cartridge into its cavity, a crow's foot wrench or similar will be required since the position switch precludes the use of a deep socket wrench.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- Position switch is CE approved.
- 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

- [LKJC](#) Pilot-to-open, spring-biased closed, unbalanced poppet logic element



These unbalanced, vent-to-open logic valves are 2-way switching elements that are spring-biased closed and have port 1 as a pilot source. With port 3 blocked, the valve will remain in the closed position in the 1 to 2 direction and will function as a check valve from 2 to 1. With port 3 vented, the valve will open provided there is sufficient pressure to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	25 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.04 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Control Orifice Diameter	.021 in.
Valve Hex Size	7/8 in.
Valve Installation Torque	30 - 35 lbf ft
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.27 lb.

CONFIGURATION OPTIONS

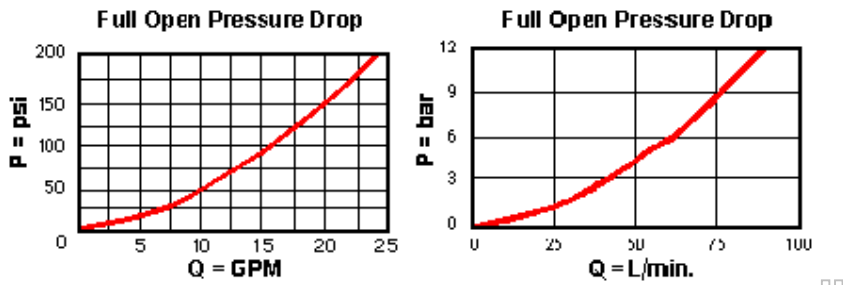
Model Code Example: LODAXDN

CONTROL	(X) CRACKING PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

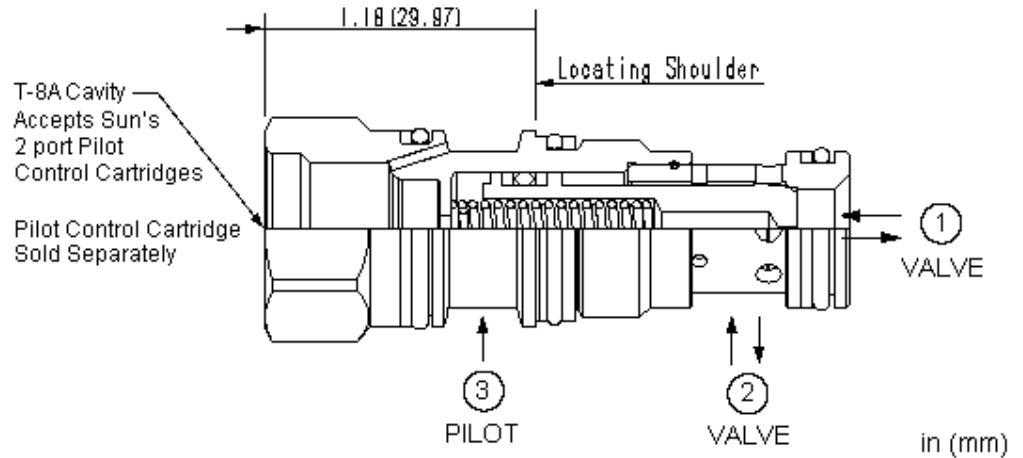
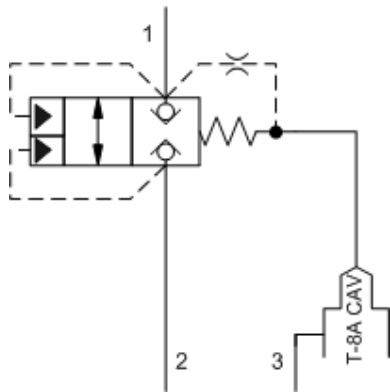
- These valves have positive seals between port 2 and the pilot area.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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

- [LODA8](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 1 and integral T-8A control cavity



This valve is an unbalanced, vent-to-open, 2-way logic switching element with an integral pilot control cavity. It is spring biased closed and uses port 1 as a pilot source. With a pilot 2-way valve in the closed position installed in the T-8A cavity, the logic element will remain in the closed position. With the pilot valve open, the logic element will open providing there is a sufficient combination of pressures to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	25 gpm
Maximum Operating Pressure	5000 psi
Pilot Volume Displacement	.04 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Pilot Control Cavity	T-8A
Control Orifice Diameter	.021 in.
Valve Hex Size	7/8 in.
Valve Installation Torque	30 - 35 lbf ft
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.22 lb.

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: LODA8DN
CRACKING PRESSURE
(D) SEAL MATERIAL
(N) MATERIAL/COATING
D 50 psi (3,5 bar)

N Buna-N

Standard Material/Coating

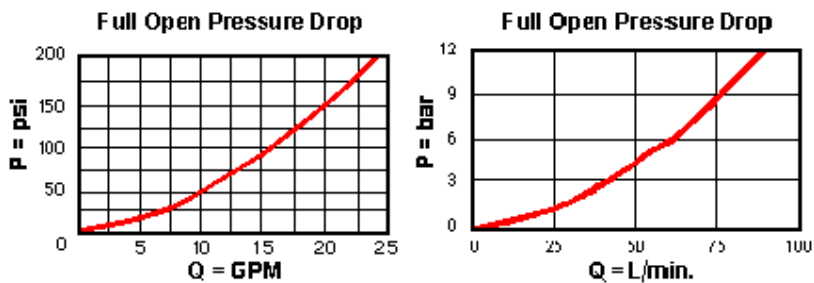
V Viton

/AP Stainless Steel, Passivated

TECHNICAL FEATURES

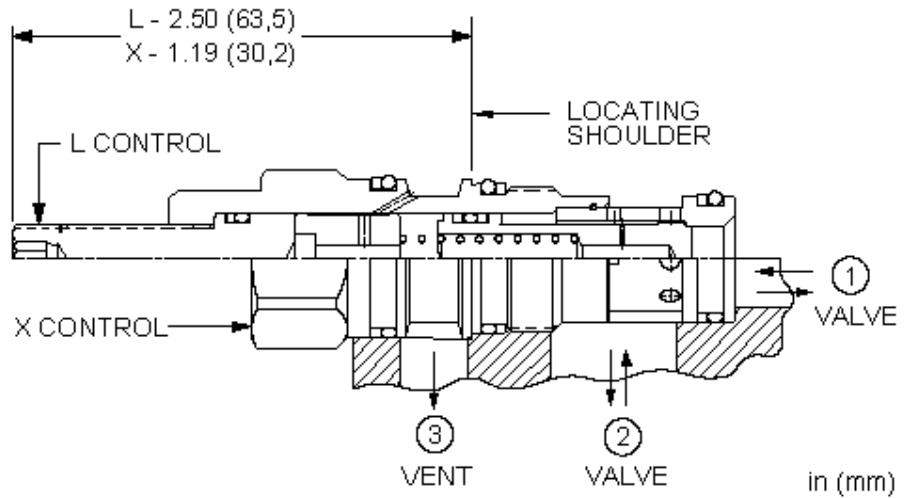
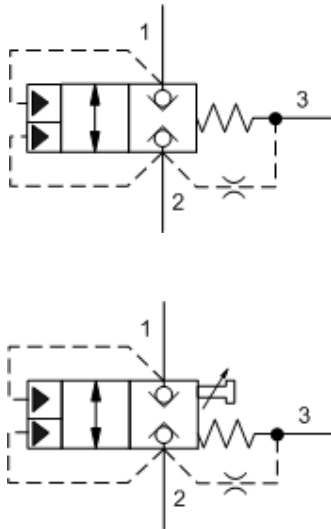
- These valves have positive seals between port 2 and the pilot area.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the logic 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.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 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

- [LODA](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 1



These unbalanced, vent-to-open logic valves are 2-way switching elements that are spring-biased closed and have port 2 as a pilot source. With port 3 blocked, the valve will remain in the closed position in the 2 to 1 direction and will function as a check valve from 1 to 2. With port 3 vented, the valve will open provided there is sufficient pressure to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	25 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.04 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Control Orifice Diameter	.021 in.
Valve Hex Size	7/8 in.
Valve Installation Torque	30 - 35 lbf ft
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.27 lb.

CONFIGURATION OPTIONS

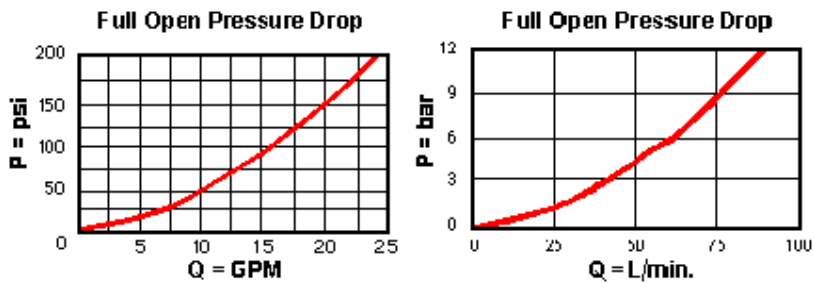
Model Code Example: LOBxDN

CONTROL	(X) CRACKING PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

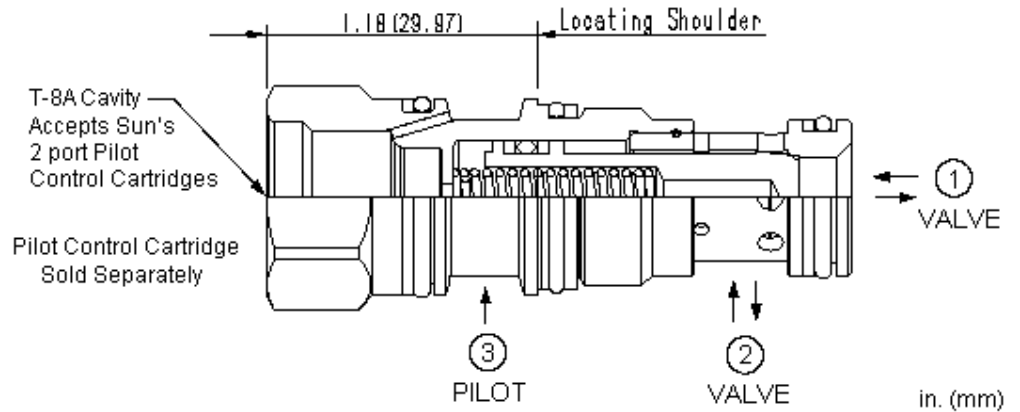
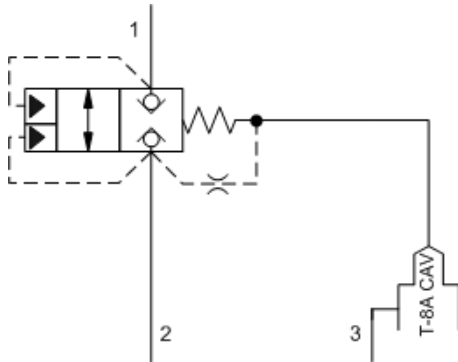
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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

- [LODB8](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 2 and integral T-8A control cavity



This valve is an unbalanced, vent-to-open, 2-way logic switching element with an integral pilot control cavity. It is spring biased closed and uses port 2 as a pilot source. With a pilot 2-way valve in the closed position installed in the T-8A cavity, the logic element will remain in the closed position. With the pilot valve open, the logic element will open providing there is a sufficient combination of pressures to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	25 gpm
Maximum Operating Pressure	5000 psi
Pilot Volume Displacement	.04 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Pilot Control Cavity	T-8A
Control Orifice Diameter	.021 in.
Valve Hex Size	7/8 in.
Valve Installation Torque	30 - 35 lbf ft
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.22 lb.

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

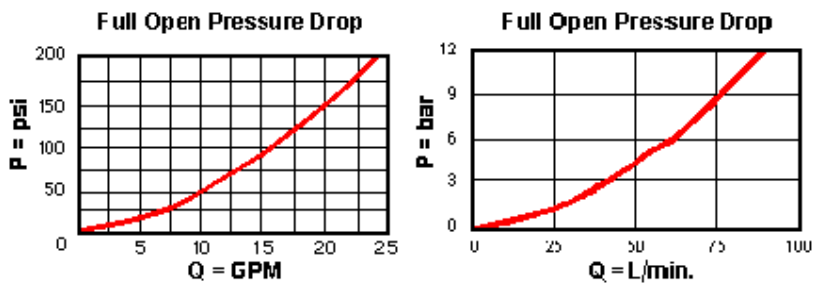
Model Code Example: LODB8DN

BIAS PRESSURE	(D)	SEAL MATERIAL	(N)
D 50 psi (3,5 bar)		N Buna-N	
		V Viton	

TECHNICAL FEATURES

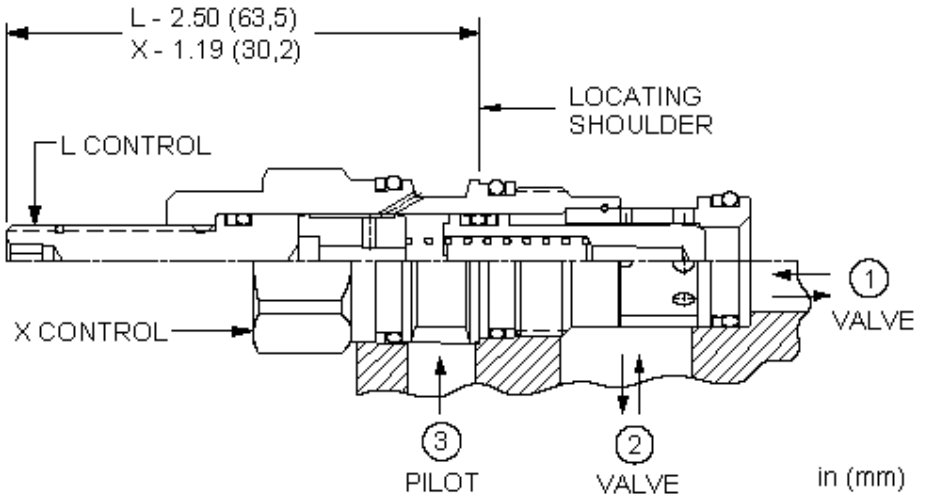
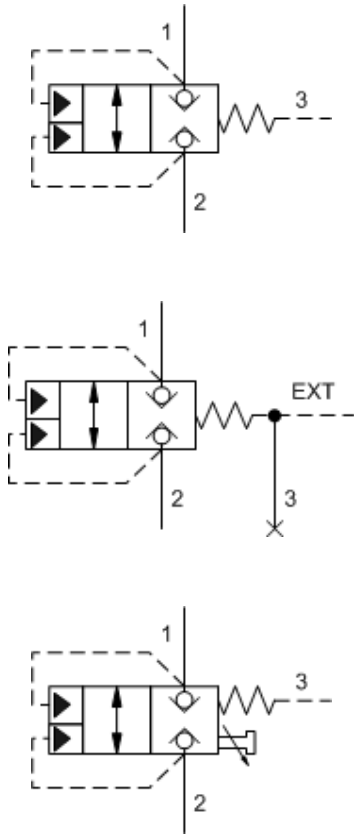
- These valves have positive seals between port 2 and the pilot area.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the logic 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.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 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

- [LODB](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 2



These unbalanced, pilot-to-close logic valves are 2-way switching elements that are spring biased closed. Pressure at either work port 1 or 2 will oppose the spring and tend to open the valve while pressure at port 3 will tend to close it. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	25 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.04 in ³
Pilot Passage into Valve	.031 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Valve Hex Size	7/8 in.
Valve Installation Torque	30 - 35 lbf ft
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.27 lb.

CONFIGURATION OPTIONS

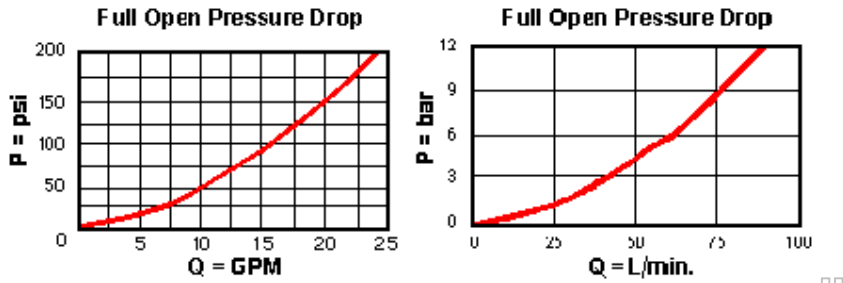
Model Code Example: LODCXDN

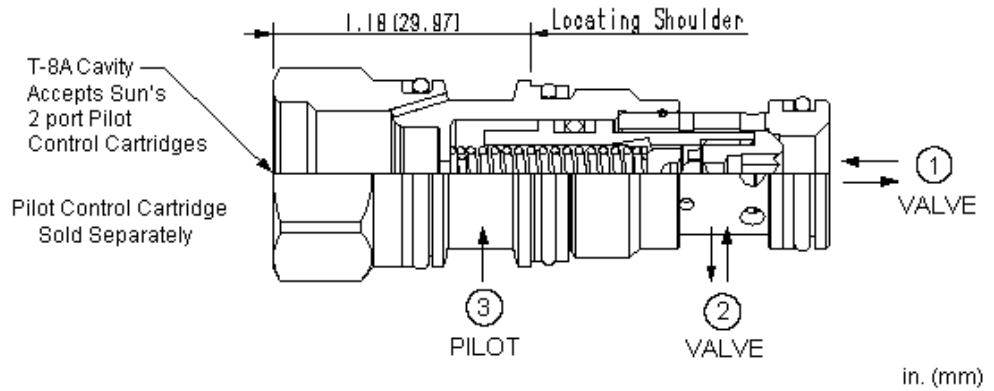
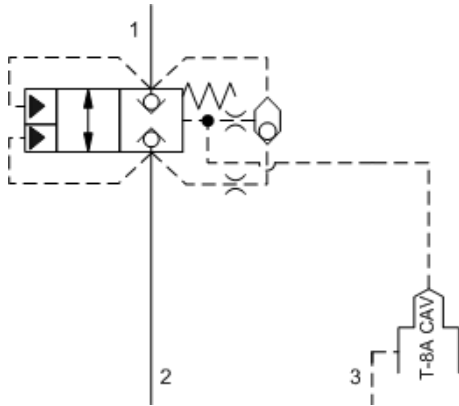
CONTROL	(X) CRACKING PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- These valves have positive seals between port 2 and the pilot area.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
-
- All ports will accept 5000 psi (350 bar).
- 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





This valve is an unbalanced, vent-to-open 2-way logic switching element with an integral pilot control cavity. It is spring biased closed and incorporates an integral shuttle so that the higher of pressures at either port 1 or port 2 can be used as a pilot source. With a pilot 2-way valve in the closed position installed in the T-8A cavity, the logic element will remain in the closed position. With the pilot valve open, the logic element will open providing there is a sufficient combination of pressures to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	25 gpm
Maximum Operating Pressure	5000 psi
Pilot Volume Displacement	.04 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Pilot Control Cavity	T-8A
Control Orifice Diameter	.021 in.
Valve Hex Size	7/8 in.
Valve Installation Torque	30 - 35 lbf ft
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	EPDM: 990011014
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.22 lb.

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

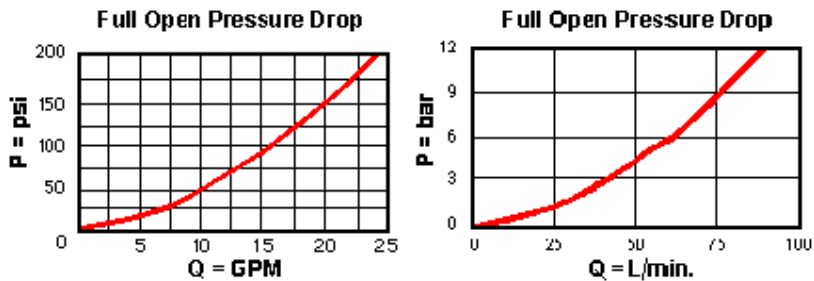
Model Code Example: LODD8DN

CRACKING PRESSURE	(D)	SEAL MATERIAL	(N)
D 50 psi (3,5 bar)		N Buna-N	
		E EPDM	
		V Viton	

TECHNICAL FEATURES

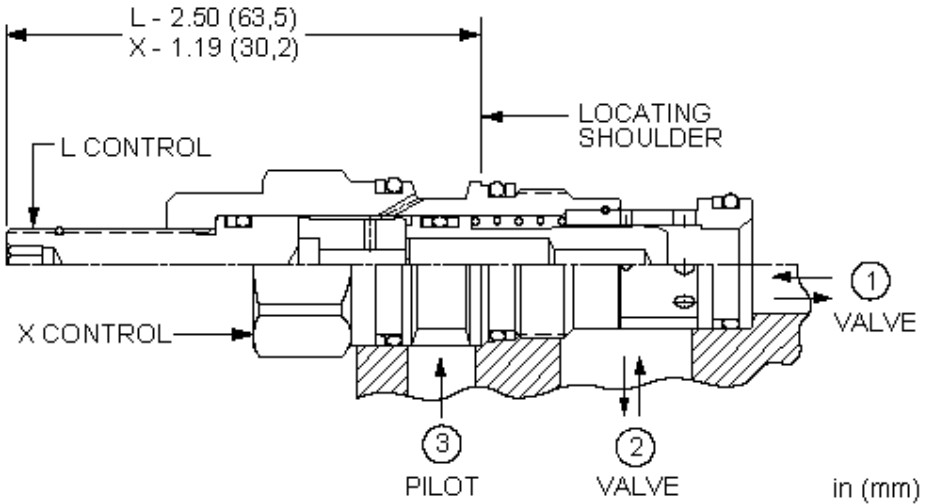
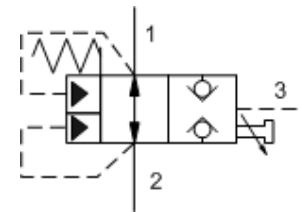
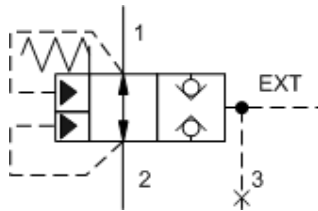
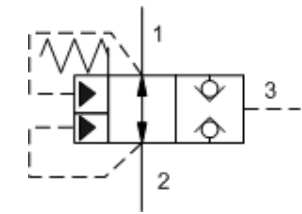
- These valves have positive seals between port 2 and the pilot area.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the logic 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.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- 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.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 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

- [LODD](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 1 or 2



These unbalanced, pilot-to-close logic valves are 2-way switching elements that are spring biased open. Pressure at either work port 1 or 2 will tend to keep the valve open while pressure at port 3 will tend to close it. The force generated at port 3 must be greater than the sum of the forces acting at port 1 and port 2 plus the spring force for the valve to close. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	25 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.04 in ³
Pilot Passage into Valve	.031 in.
Valve Hex Size	7/8 in.
Valve Installation Torque	30 - 35 lbf ft
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	EPDM: 990011014
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.27 lb.

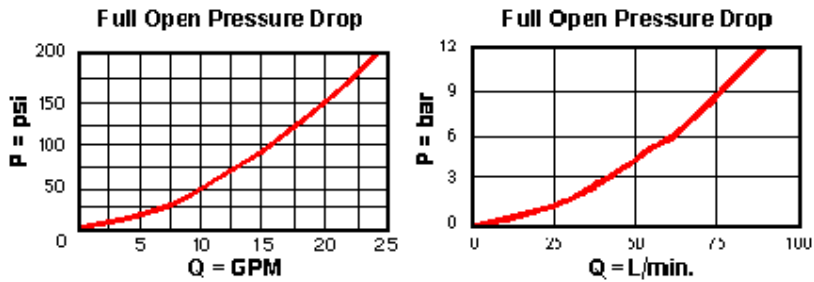
CONFIGURATION OPTIONS
Model Code Example: LODOXDN

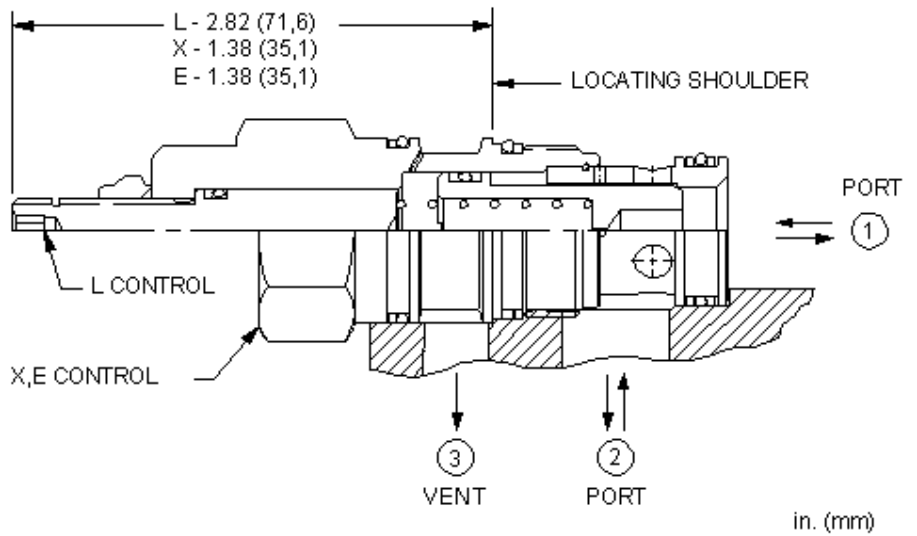
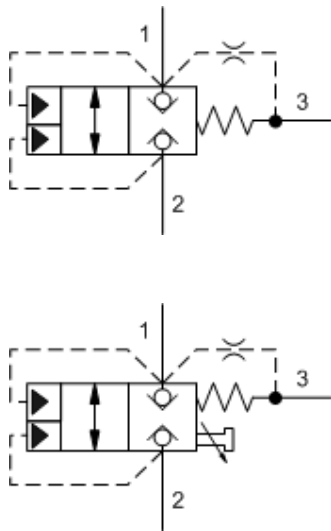
CONTROL	(X) MINIMUM PILOT PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- These valves have positive seals between port 2 and the pilot area.
- 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.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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





These unbalanced, vent-to-open logic valves are 2-way switching elements that are spring-biased closed and have port 1 as a pilot source. With port 3 blocked, the valve will remain in the closed position in the 1 to 2 direction and will function as a check valve from 2 to 1. With port 3 vented, the valve will open provided there is sufficient pressure to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	50 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.07 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Control Orifice Diameter	.021 in.
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.49 lb.

CONFIGURATION OPTIONS

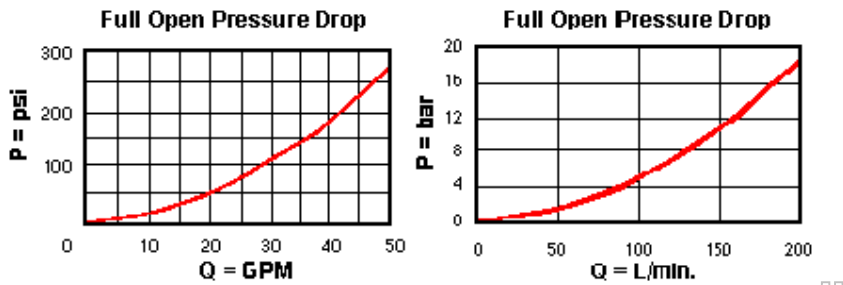
Model Code Example: LOFAXDN

CONTROL	(X) CRACKING PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

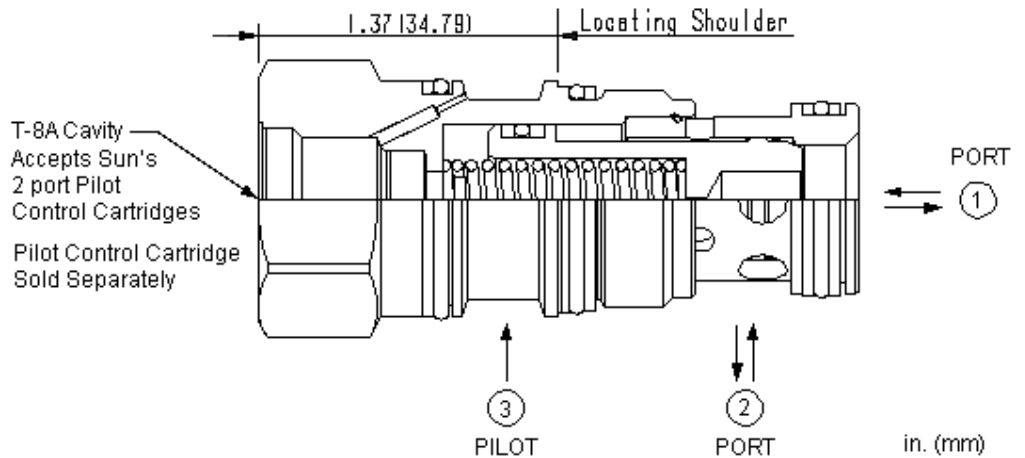
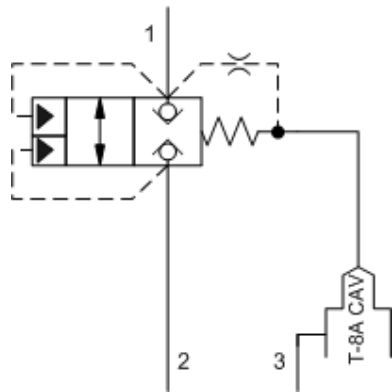
- These valves have positive seals between port 2 and the pilot area.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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

- [LOFA8](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 1 and integral T-8A control cavity



This valve is an unbalanced, vent-to-open, 2-way logic switching element with an integral pilot control cavity. It is spring biased closed and uses port 1 as a pilot source. With a pilot 2-way valve in the closed position installed in the T-8A cavity, the logic element will remain in the closed position. With the pilot valve open, the logic element will open providing there is a sufficient combination of pressures to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	50 gpm
Maximum Operating Pressure	5000 psi
Pilot Volume Displacement	.07 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Pilot Control Cavity	T-8A
Control Orifice Diameter	.021 in.
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.43 lb.

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

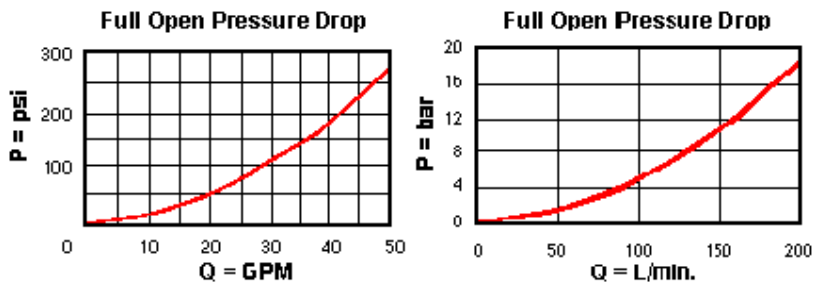
Model Code Example: LOFA8DN

CRACKING PRESSURE	(D)	SEAL MATERIAL	(N)
D 50 psi (3,5 bar)		N Buna-N	
		V Viton	

TECHNICAL FEATURES

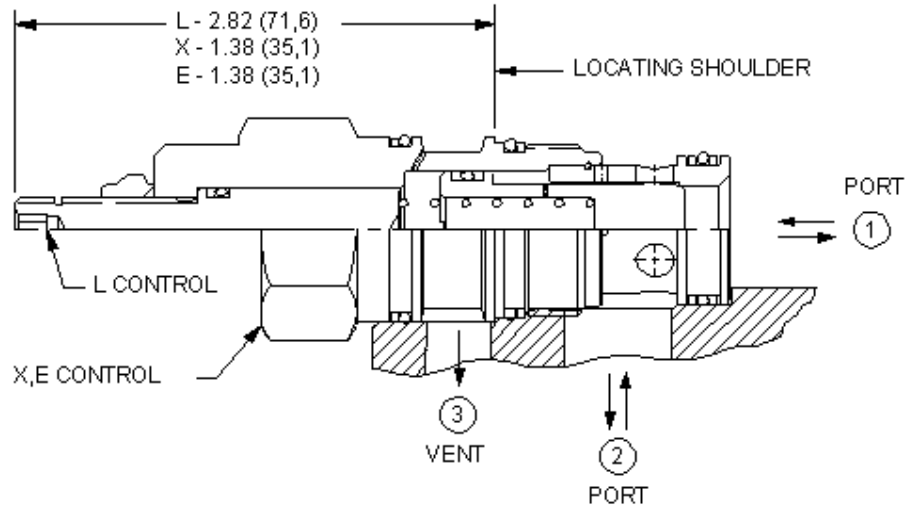
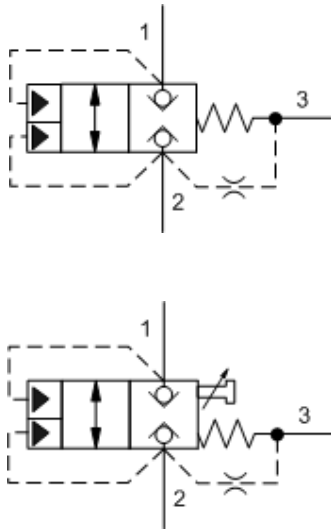
- These valves have positive seals between port 2 and the pilot area.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the logic 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.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 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

- [LOFA](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 1



These unbalanced, vent-to-open logic valves are 2-way switching elements that are spring-biased closed and have port 2 as a pilot source. With port 3 blocked, the valve will remain in the closed position in the 2 to 1 direction and will function as a check valve from 1 to 2. With port 3 vented, the valve will open provided there is sufficient pressure to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	50 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.07 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Control Orifice Diameter	.021 in.
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.49 lb.

CONFIGURATION OPTIONS

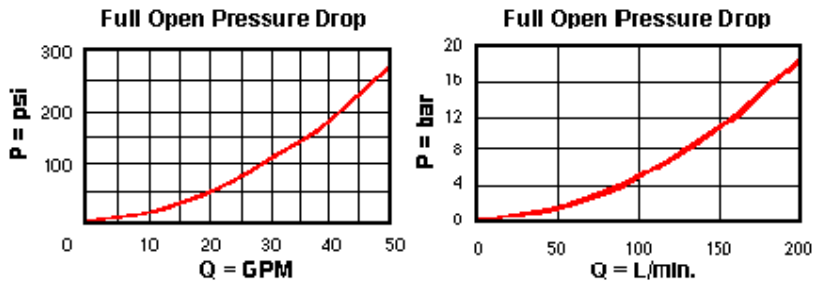
Model Code Example: LOFBXDN

CONTROL	(X) CRACKING PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

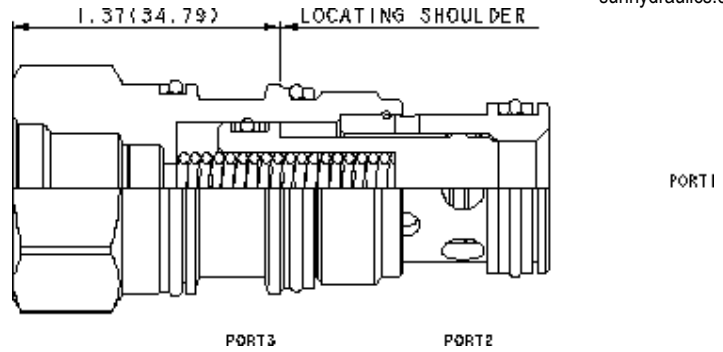
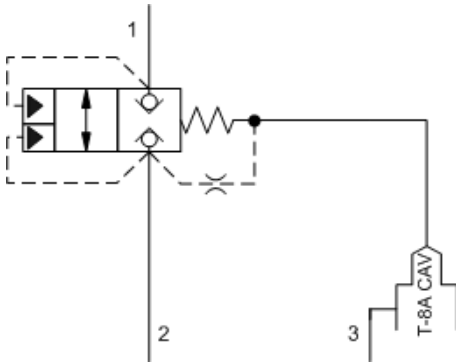
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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

- [LOFB8](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 2 and integral T-8A control cavity



This valve is an unbalanced, vent-to-open, 2-way logic switching element with an integral pilot control cavity. It is spring biased closed and uses port 2 as a pilot source. With a pilot 2-way valve in the closed position installed in the T-8A cavity, the logic element will remain in the closed position. With the pilot valve open, the logic element will open providing there is a sufficient combination of pressures to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	50 gpm
Maximum Operating Pressure	5000 psi
Pilot Volume Displacement	.07 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Pilot Control Cavity	T-8A
Control Orifice Diameter	.021 in.
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.44 lb.

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

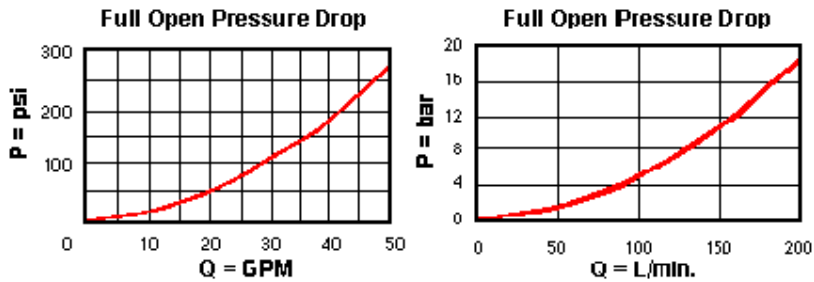
Model Code Example: LOFB8DN

CRACKING PRESSURE	(D)	SEAL MATERIAL	(N)
D 50 psi (3,5 bar)		N Buna-N	
		V Viton	

TECHNICAL FEATURES

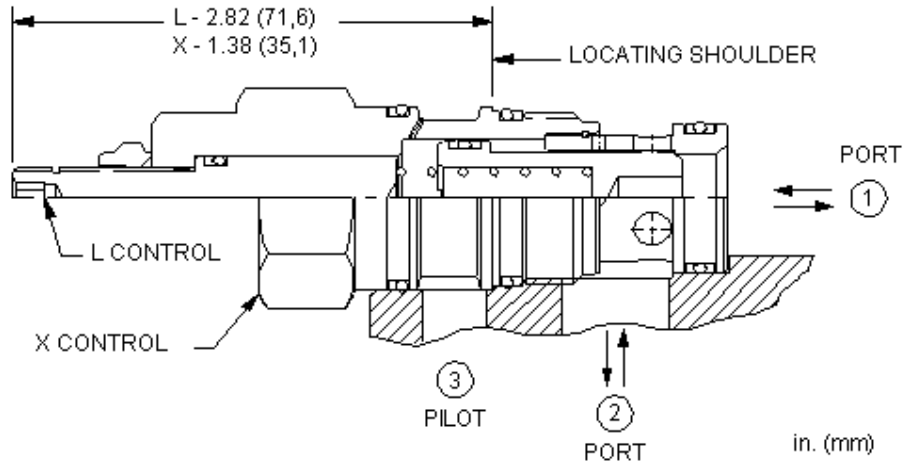
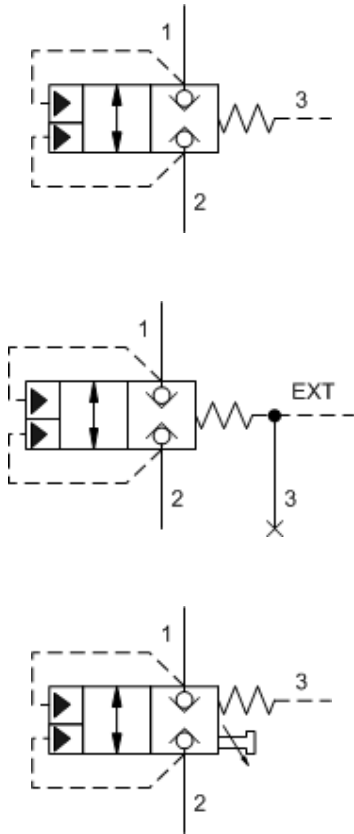
- These valves have positive seals between port 2 and the pilot area.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the logic 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.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 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

- [LOFB](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 2



These unbalanced, pilot-to-close logic valves are 2-way switching elements that are spring biased closed. Pressure at either work port 1 or 2 will oppose the spring and tend to open the valve while pressure at port 3 will tend to close it. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	50 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.07 in ³
Pilot Passage into Valve	.035 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.49 lb.

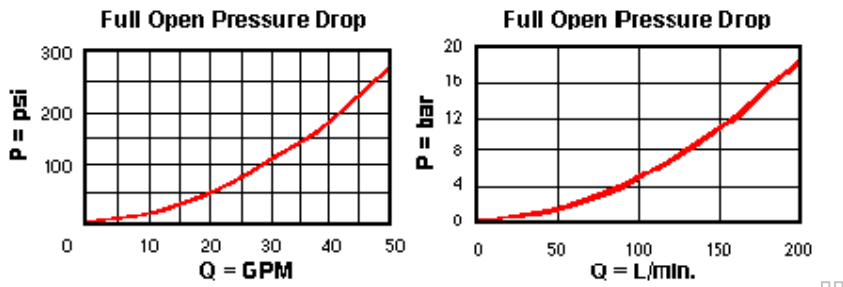
CONFIGURATION OPTIONS
Model Code Example: LOFCXDN

CONTROL	(X) CRACKING PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Standard Pilot	D 50 psi (3,5 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

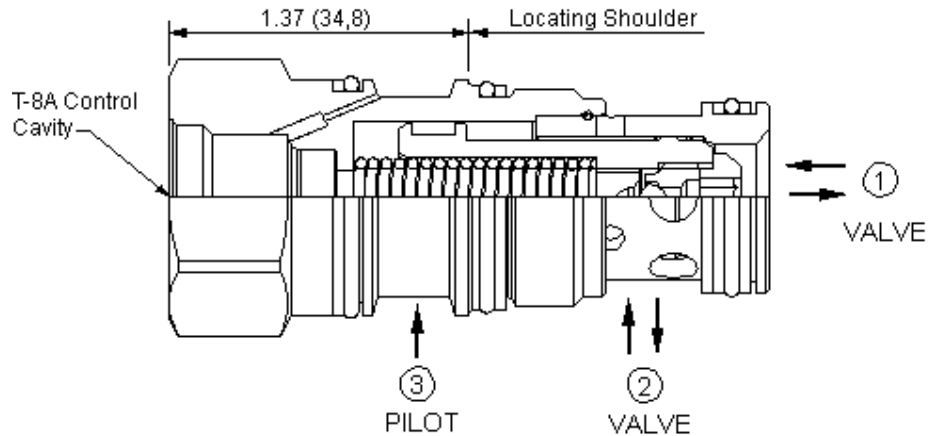
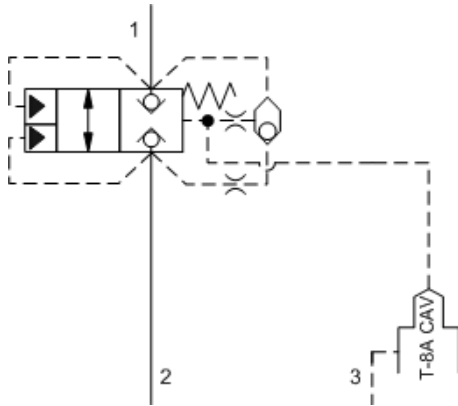
- These valves have positive seals between port 2 and the pilot area.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
-
- All ports will accept 5000 psi (350 bar).
- 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

- [LOFCZ](#) Pilot-to-close, spring-biased closed, unbalanced poppet logic element with position switch



This valve is an unbalanced, vent-to-open 2-way logic switching element with an integral pilot control cavity. It is spring biased closed and incorporates an integral shuttle so that the higher of pressures at either port 1 or port 2 can be used as a pilot source. With a pilot 2-way valve in the closed position installed in the T-8A cavity, the logic element will remain in the closed position. With the pilot valve open, the logic element will open providing there is a sufficient combination of pressures to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	50 gpm
Maximum Operating Pressure	5000 psi
Pilot Volume Displacement	.07 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Pilot Control Cavity	T-8A
Control Orifice Diameter	.021 in.
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	EPDM: 990202014
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.44 lb.

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

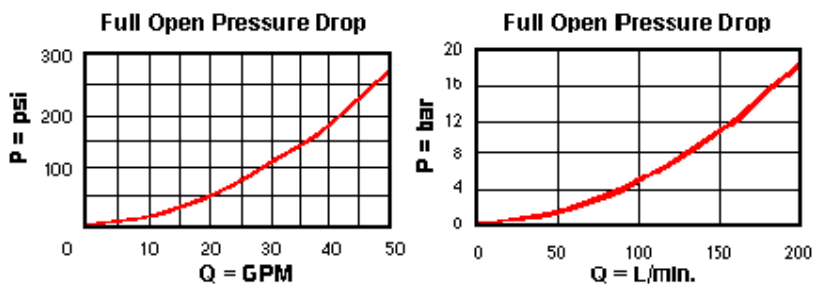
Model Code Example: LOFD8DN

CRACKING PRESSURE	(D)	SEAL MATERIAL	(N)
D 50 psi (3,5 bar)		N Buna-N	
		E EPDM	
		V Viton	

TECHNICAL FEATURES

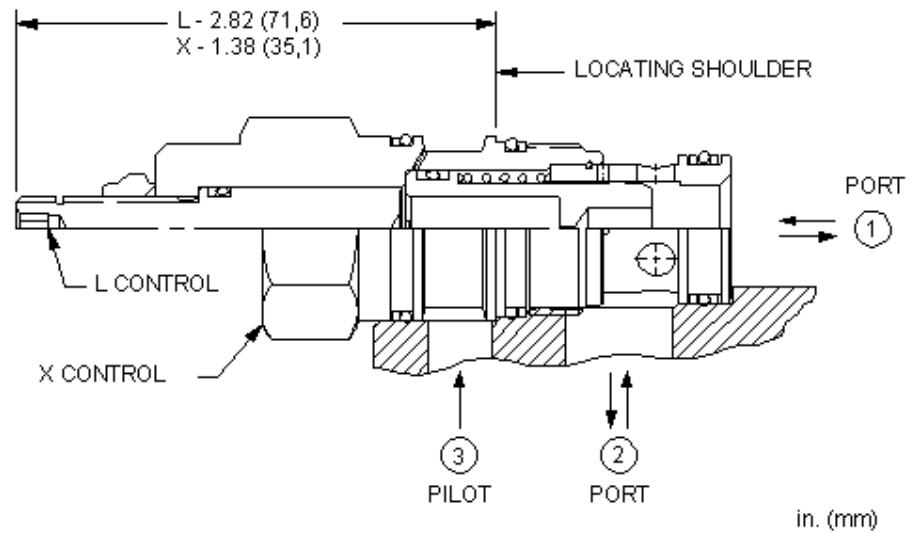
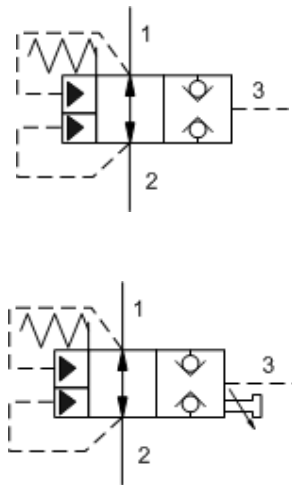
- These valves have positive seals between port 2 and the pilot area.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the logic 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.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- 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.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 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

- [LOFD](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 1 or 2



These unbalanced, pilot-to-close logic valves are 2-way switching elements that are spring biased open. Pressure at either work port 1 or 2 will tend to keep the valve open while pressure at port 3 will tend to close it. The force generated at port 3 must be greater than the sum of the forces acting at port 1 and port 2 plus the spring force for the valve to close. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	50 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.07 in ³
Pilot Passage into Valve	.035 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.49 lb.

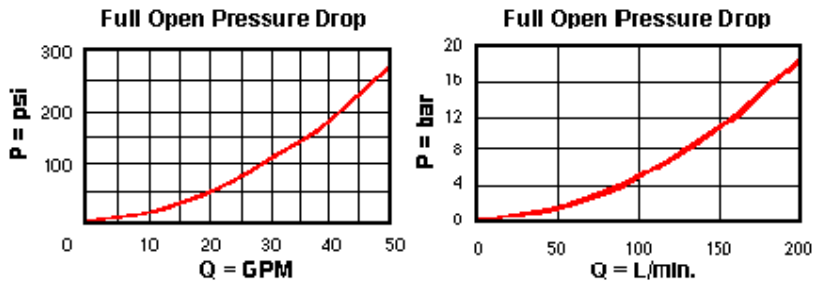
CONFIGURATION OPTIONS
Model Code Example: LOFOXDN

CONTROL	(X) MINIMUM PILOT PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

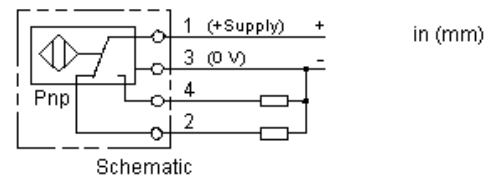
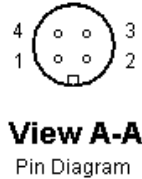
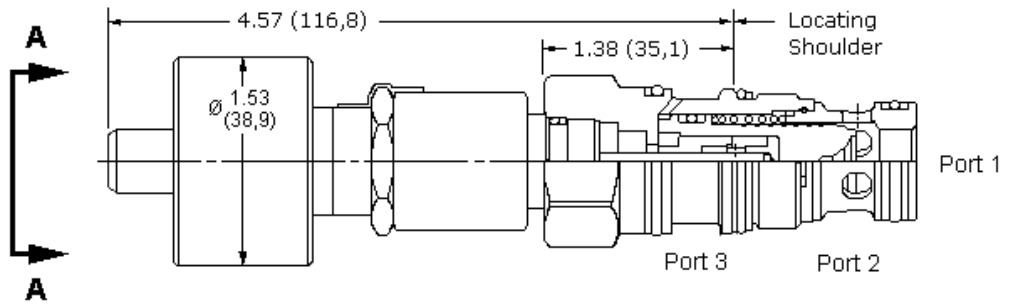
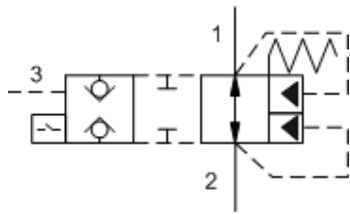
- These valves have positive seals between port 2 and the pilot area.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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

- [LOFOZ](#) Pilot-to-close, spring-biased open, unbalanced poppet logic element with position switch



in (mm)

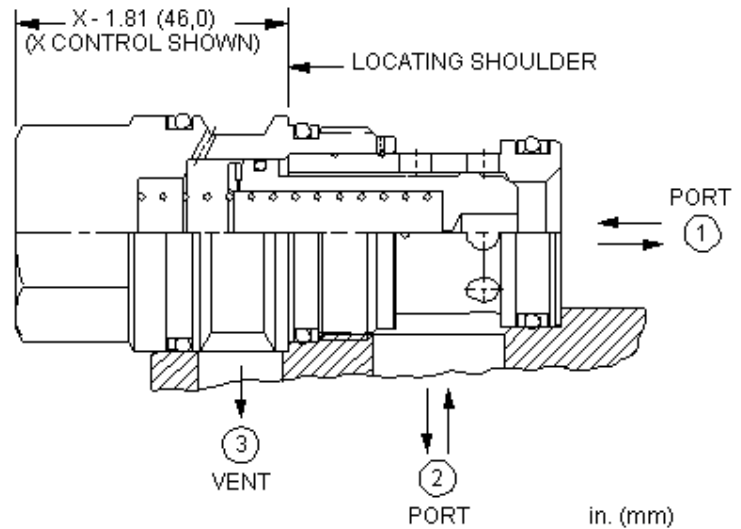
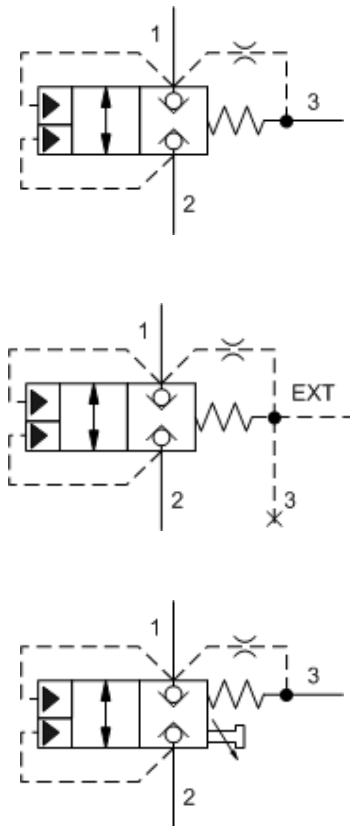
These unbalanced, pilot-to-close logic valves are 2-way switching elements that are spring biased open. Pressure at either work port 1 or 2 will tend to keep the valve open while pressure at port 3 will tend to close it. The force generated at port 3 must be greater than the sum of the forces acting at port 1 and port 2 plus the spring force for the valve to close. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

This valve incorporates a position switch to provide confirmation that the valve is spring biased to the fully open position.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	50 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	1 drops/min.
Pilot Volume Displacement	.07 in ³
Pilot Passage into Valve	.035 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	1.34 lb.



These unbalanced, vent-to-open logic valves are 2-way switching elements that are spring-biased closed and have port 1 as a pilot source. With port 3 blocked, the valve will remain in the closed position in the 1 to 2 direction and will function as a check valve from 2 to 1. With port 3 vented, the valve will open provided there is sufficient pressure to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	100 gpm
Maximum Operating Pressure	5000 psi
Pilot Volume Displacement	.25 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Control Orifice Diameter	.031 in.
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	1.10 lb.

CONFIGURATION OPTIONS

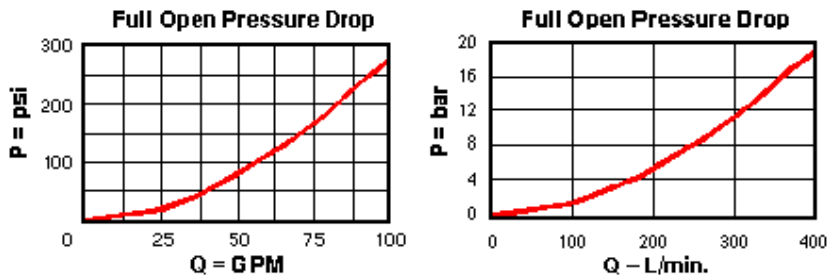
Model Code Example: LOHAXDN

CONTROL	(X) CRACKING PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

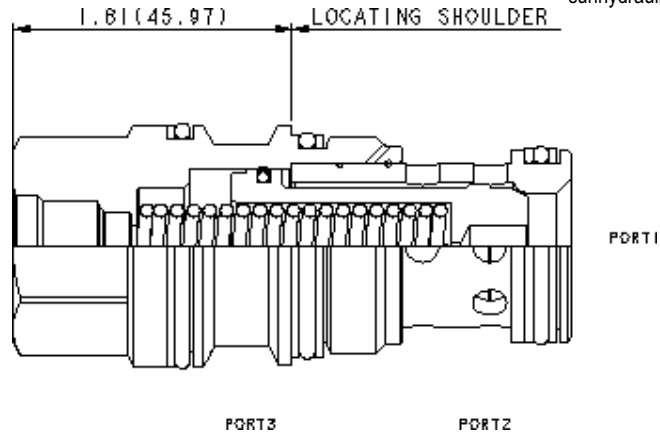
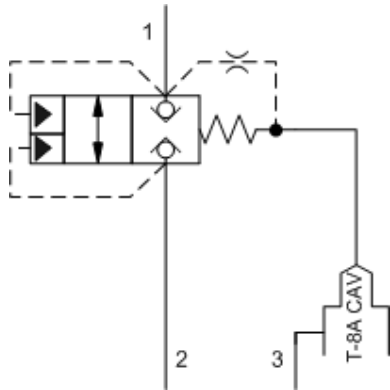
- These valves have positive seals between port 2 and the pilot area.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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

- [LOHA8](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 1 and integral T-8A control cavity



This valve is an unbalanced, vent-to-open, 2-way logic switching element with an integral pilot control cavity. It is spring biased closed and uses port 1 as a pilot source. With a pilot 2-way valve in the closed position installed in the T-8A cavity, the logic element will remain in the closed position. With the pilot valve open, the logic element will open providing there is a sufficient combination of pressures to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	100 gpm
Maximum Operating Pressure	5000 psi
Pilot Volume Displacement	.25 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Pilot Control Cavity	T-8A
Control Orifice Diameter	.031 in.
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	1.05 lb.

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

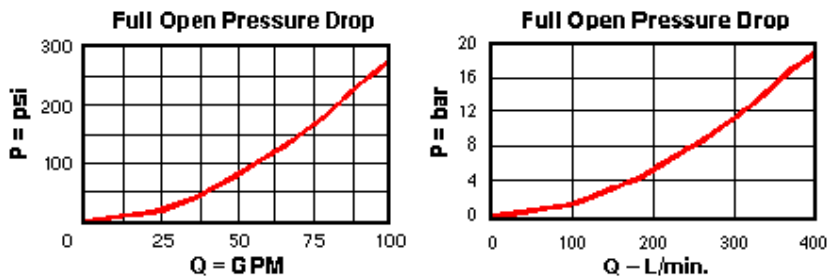
Model Code Example: LOHA8DN

CRACKING PRESSURE	(D)	SEAL MATERIAL	(N)
D 50 psi (3,5 bar)		N Buna-N	
		V Viton	

TECHNICAL FEATURES

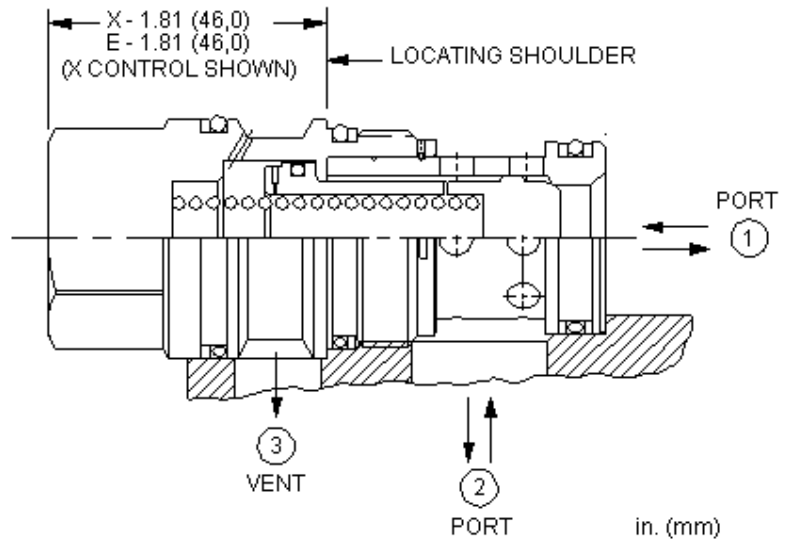
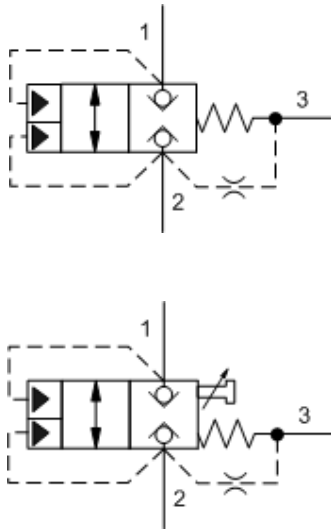
- These valves have positive seals between port 2 and the pilot area.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the logic 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.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 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

- [LOHA](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 1



These unbalanced, vent-to-open logic valves are 2-way switching elements that are spring-biased closed and have port 2 as a pilot source. With port 3 blocked, the valve will remain in the closed position in the 2 to 1 direction and will function as a check valve from 1 to 2. With port 3 vented, the valve will open provided there is sufficient pressure to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	100 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.25 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Control Orifice Diameter	.031 in.
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	EPDM: 990017014
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	1.11 lb.

CONFIGURATION OPTIONS

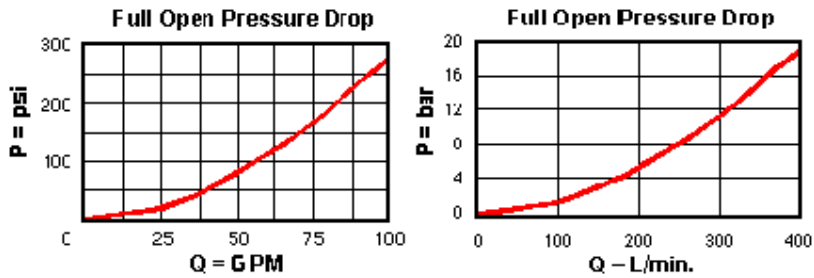
Model Code Example: LOHBXDN

CONTROL	(X) CRACKING PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

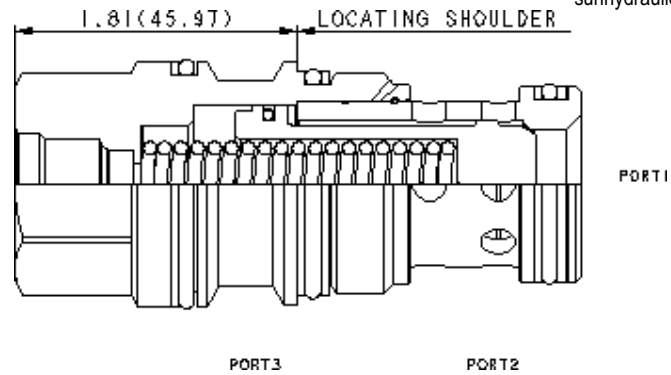
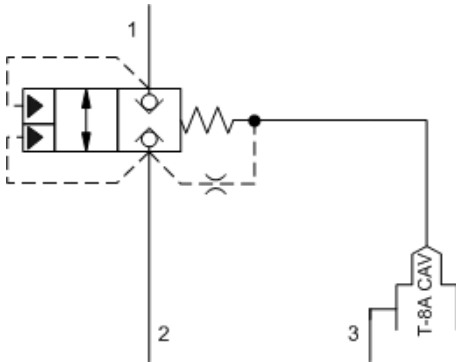
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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

- [LOHB8](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 2 and integral T-8A control cavity



This valve is an unbalanced, vent-to-open, 2-way logic switching element with an integral pilot control cavity. It is spring biased closed and uses port 2 as a pilot source. With a pilot 2-way valve in the closed position installed in the T-8A cavity, the logic element will remain in the closed position. With the pilot valve open, the logic element will open providing there is a sufficient combination of pressures to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	100 gpm
Maximum Operating Pressure	5000 psi
Pilot Volume Displacement	.25 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Pilot Control Cavity	T-8A
Control Orifice Diameter	.031 in.
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	1.05 lb.

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

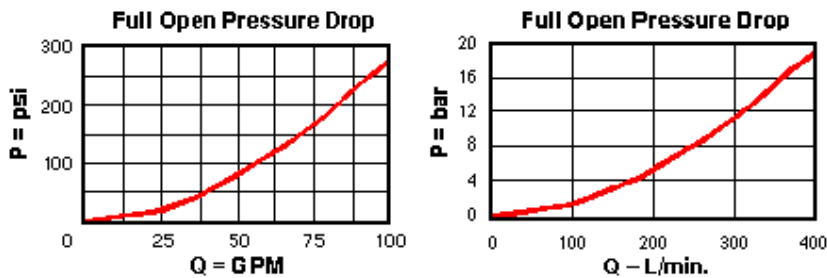
Model Code Example: LOHB8DN

CRACKING PRESSURE	(D)	SEAL MATERIAL	(N)
D 50 psi (3,5 bar)		N Buna-N	
		E EPDM	
		V Viton	

TECHNICAL FEATURES

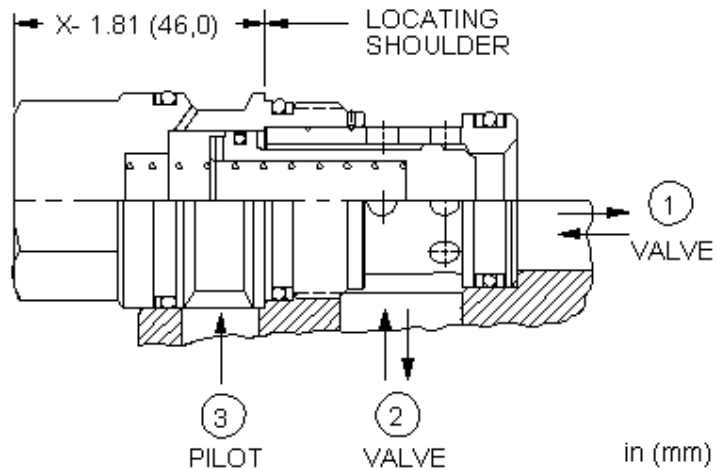
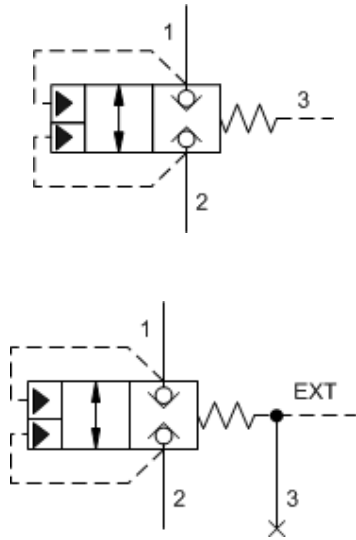
- These valves have positive seals between port 2 and the pilot area.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the logic 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.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 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

- [LOHB](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 2



These unbalanced, pilot-to-close logic valves are 2-way switching elements that are spring biased closed. Pressure at either work port 1 or 2 will oppose the spring and tend to open the valve while pressure at port 3 will tend to close it. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	100 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.25 in ³
Pilot Passage into Valve	.06 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	EPDM: 990017014
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	1.11 lb.

CONFIGURATION OPTIONS

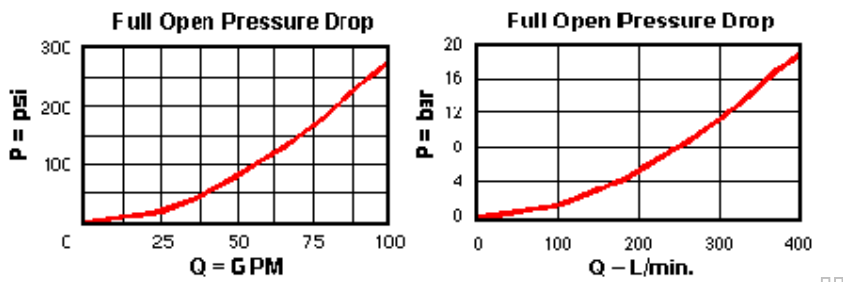
Model Code Example: LOHCXDN

CONTROL	(X) CRACKING PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

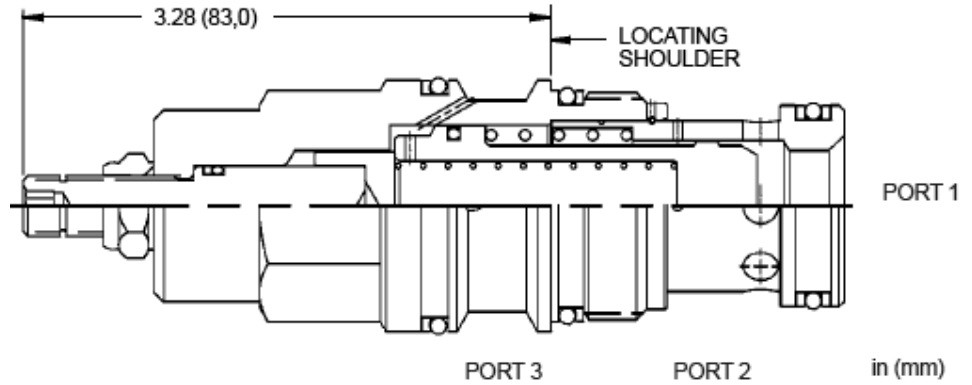
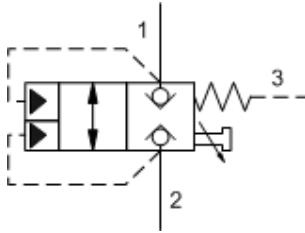
- These valves have positive seals between port 2 and the pilot area.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
-
- All ports will accept 5000 psi (350 bar).
- 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

- [LOHCK](#) Pilot-to-close, spring-biased closed, unbalanced poppet logic element
- [LOHCL](#) Pilot-to-close, spring-biased closed, unbalanced poppet logic element
- [LOHCZ](#) Pilot-to-close, spring-biased closed, unbalanced poppet logic element with position switch



These unbalanced, pilot-to-close logic valves are 2-way switching elements that are spring biased closed. Pressure at either work port 1 or 2 will oppose the spring and tend to open the valve while pressure at port 3 will tend to close it. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	100 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.25 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	EPDM: 990017014
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	2.19 lb.

CONFIGURATION OPTIONS

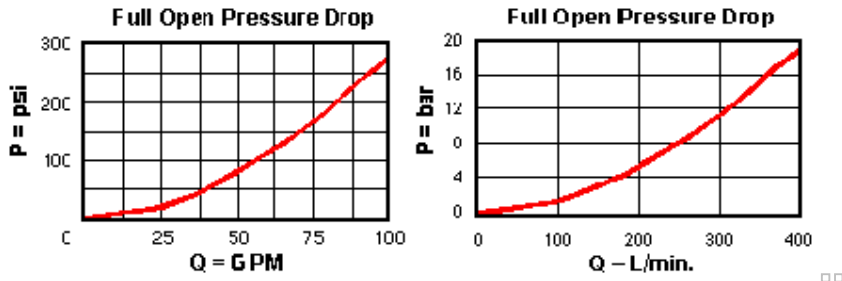
Model Code Example: LOHCLDN

CRACKING PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
D 50 psi (3,5 bar)	N Buna-N	Standard Material/Coating
	E EPDM	/AP Stainless Steel, Passivated
	V Viton	/LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

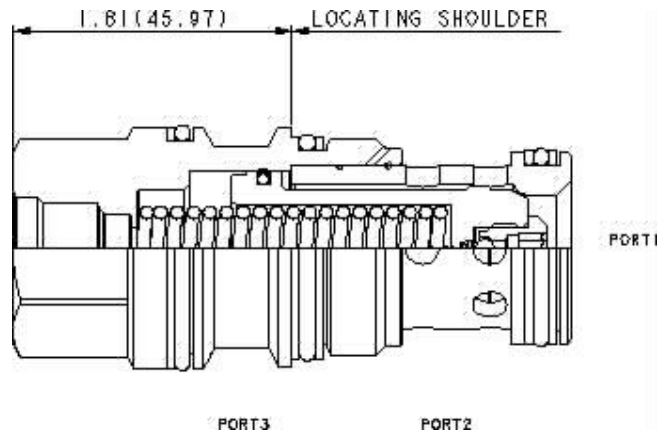
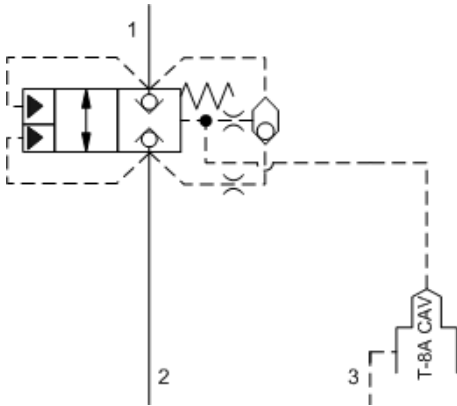
- These valves have positive seals between port 2 and the pilot area.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 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

- [LOHC](#) Pilot-to-close, spring-biased closed, unbalanced poppet logic element
- [LOHCK](#) Pilot-to-close, spring-biased closed, unbalanced poppet logic element
- [LOHCZ](#) Pilot-to-close, spring-biased closed, unbalanced poppet logic element with position switch



This valve is an unbalanced, vent-to-open 2-way logic switching element with an integral pilot control cavity. It is spring biased closed and incorporates an integral shuttle so that the higher of pressures at either port 1 or port 2 can be used as a pilot source. With a pilot 2-way valve in the closed position installed in the T-8A cavity, the logic element will remain in the closed position. With the pilot valve open, the logic element will open providing there is a sufficient combination of pressures to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	100 gpm
Maximum Operating Pressure	5000 psi
Pilot Volume Displacement	.25 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Pilot Control Cavity	T-8A
Control Orifice Diameter	.031 in.
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	1.05 lb.

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

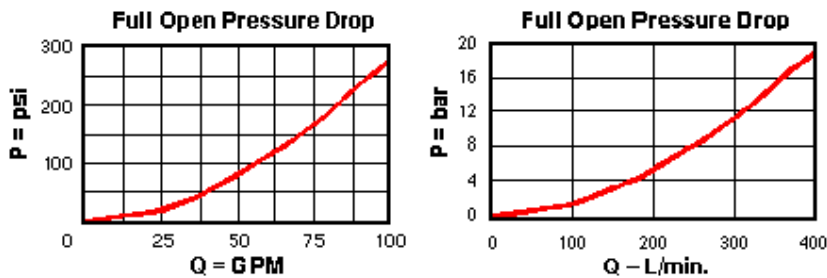
Model Code Example: LOHD8DN

CRACKING PRESSURE	(D)	SEAL MATERIAL	(N)
D 50 psi (3,5 bar)		N Buna-N	
		E EPDM	
		V Viton	

TECHNICAL FEATURES

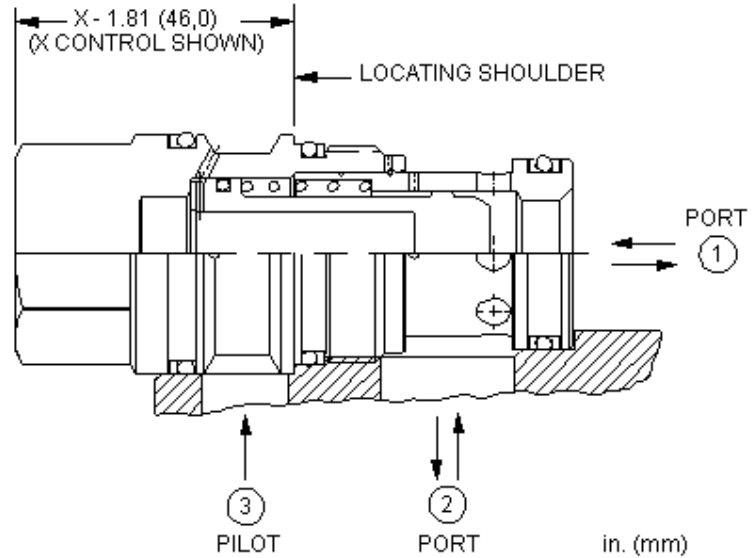
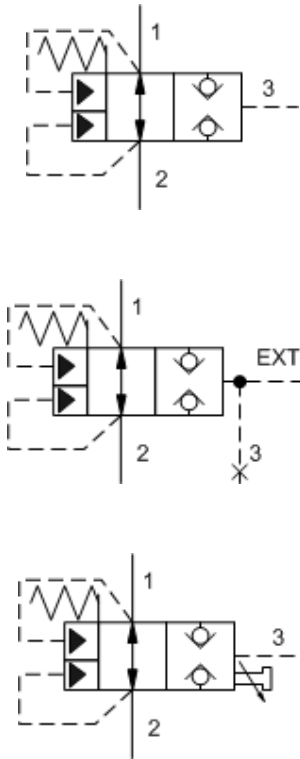
- These valves have positive seals between port 2 and the pilot area.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the logic 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.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 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

- [LOHD](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 1 or 2
- [LOHDL](#) Pilot-to-close, spring-biased closed, unbalanced poppet logic element with pilot source from port 1 or 2



These unbalanced, pilot-to-close logic valves are 2-way switching elements that are spring biased open. Pressure at either work port 1 or 2 will tend to keep the valve open while pressure at port 3 will tend to close it. The force generated at port 3 must be greater than the sum of the forces acting at port 1 and port 2 plus the spring force for the valve to close. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	100 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.25 in ³
Pilot Passage into Valve	.06 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	EPDM: 990017014
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	1.06 lb.

CONFIGURATION OPTIONS

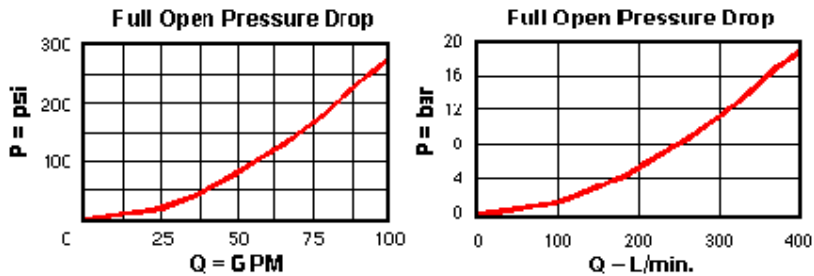
Model Code Example: LOHOXDN

CONTROL	(X) MINIMUM PILOT PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

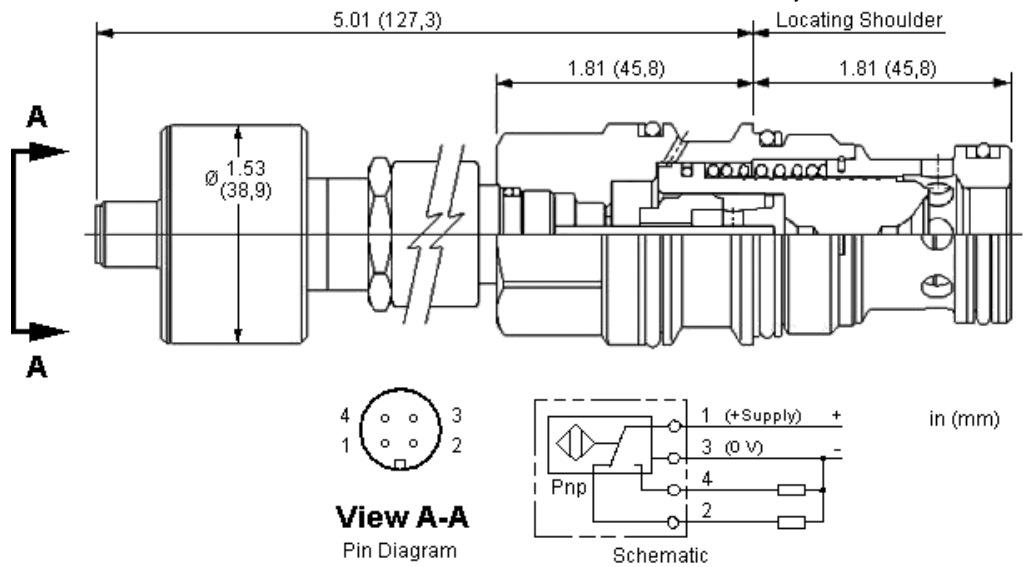
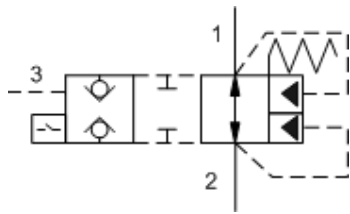
- These valves have positive seals between port 2 and the pilot area.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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

- [LOHOZ](#) Pilot-to-close, spring-biased open, unbalanced poppet logic element with position switch



These unbalanced, pilot-to-close logic valves are 2-way switching elements that are spring biased open. Pressure at either work port 1 or 2 will tend to keep the valve open while pressure at port 3 will tend to close it. The force generated at port 3 must be greater than the sum of the forces acting at port 1 and port 2 plus the spring force for the valve to close. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

This valve incorporates a position switch to provide confirmation that the valve is spring biased to the fully open position.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	100 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	1 drops/min.
Pilot Volume Displacement	.25 in ³
Pilot Passage into Valve	.06 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990117006
Model Weight	2.00 lb.

SWITCH SPECIFICATIONS

Supply Voltage	20-30 VDC
Operating Temperature Range	-25 to 80 °C
Vibration	≥ 50g, 0-500 impulses/sec
Shock	>50 g, 1ms
Reverse Polarity Protection	Yes
Maximum Output Load	≤ 400 mA, Duty Ratio 100%
Short Circuit Protection	Yes, Load Short Unlimited
Turn On Time	≤ 25 ms
Hysteresis	≤ .002 in.
Thermal Shift - 0 to 80 °C ≤ ±	.004 in.
EMC	DIN EN 61000-6-1/2/3/4
Connector	M12 X 1 (4) Pin
Connector Environment Rating	IP65

CONFIGURATION OPTIONS

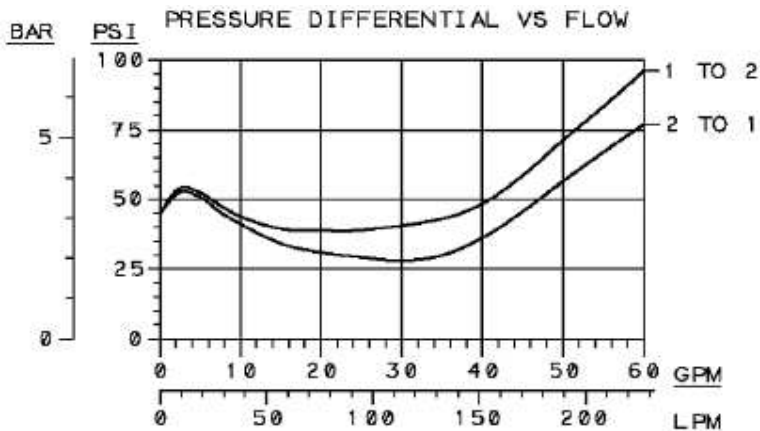
Model Code Example: LOHOZDN

CRACKING PRESSURE	(D)	SEAL MATERIAL	(N)
D 50 psi (3,5 bar)		N Buna-N	
		V Viton	

TECHNICAL FEATURES

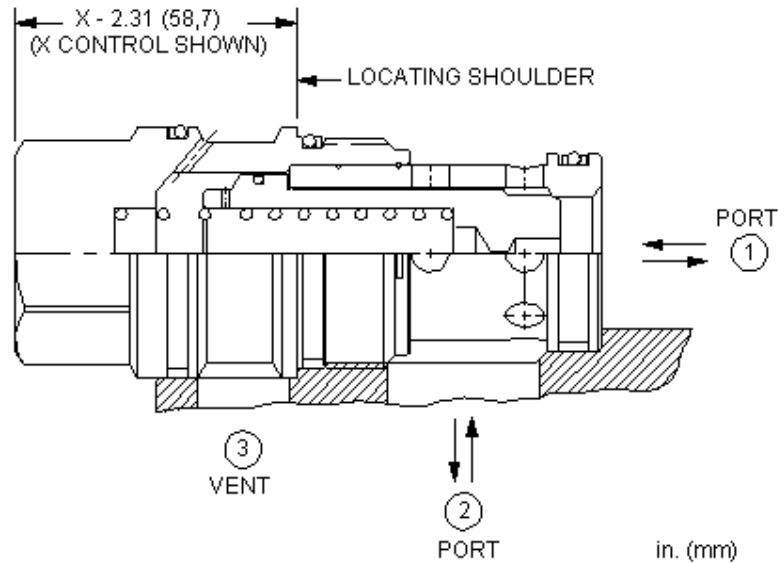
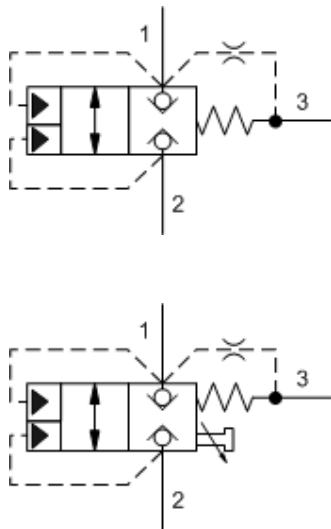
- These valves have positive seals between port 2 and the pilot area.
- This cartridge is supplied as a sealed, factory set unit and is not field serviceable. Any tampering will violate the product warranty.
- When torquing this cartridge into its cavity, a crow's foot wrench or similar will be required since the position switch precludes the use of a deep socket wrench.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- Position switch is CE approved.
- An optional protective cover, with mounting hardware included, may be ordered separately. See kit number: 991-043.
- 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

- [LOHO](#) Pilot-to-close, spring-biased open, unbalanced poppet logic element



These unbalanced, vent-to-open logic valves are 2-way switching elements that are spring-biased closed and have port 1 as a pilot source. With port 3 blocked, the valve will remain in the closed position in the 1 to 2 direction and will function as a check valve from 2 to 1. With port 3 vented, the valve will open provided there is sufficient pressure to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-19A
Series	4
Capacity	200 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.42 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Control Orifice Diameter	.035 in.
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	2.62 lb.

CONFIGURATION OPTIONS

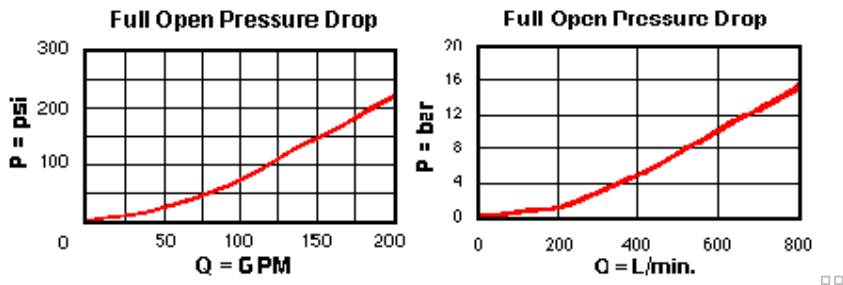
Model Code Example: LOJAXDN

CONTROL	(X) CRACKING PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable L Stroke Adjustment	D 50 psi (3,5 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

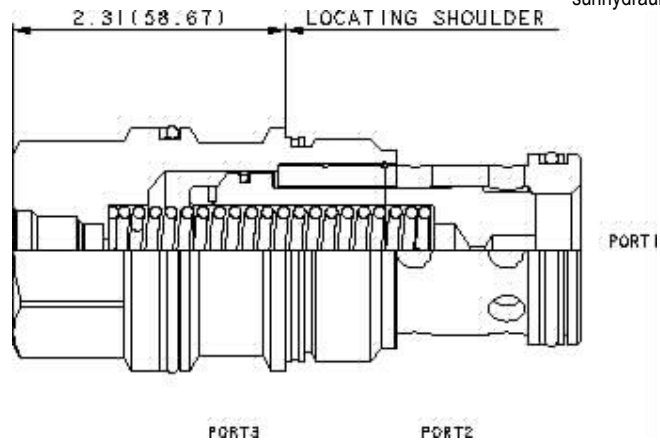
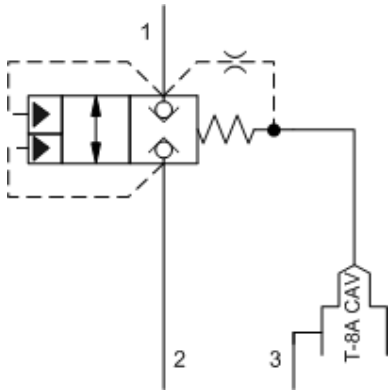
- These valves have positive seals between port 2 and the pilot area.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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

- [LOJA8](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 1 and integral T-8A control cavity



This valve is an unbalanced, vent-to-open, 2-way logic switching element with an integral pilot control cavity. It is spring biased closed and uses port 1 as a pilot source. With a pilot 2-way valve in the closed position installed in the T-8A cavity, the logic element will remain in the closed position. With the pilot valve open, the logic element will open providing there is a sufficient combination of pressures to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-19A
Series	4
Capacity	200 gpm
Maximum Operating Pressure	5000 psi
Pilot Volume Displacement	.42 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Pilot Control Cavity	T-8A
Control Orifice Diameter	.035 in.
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	2.56 lb.

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

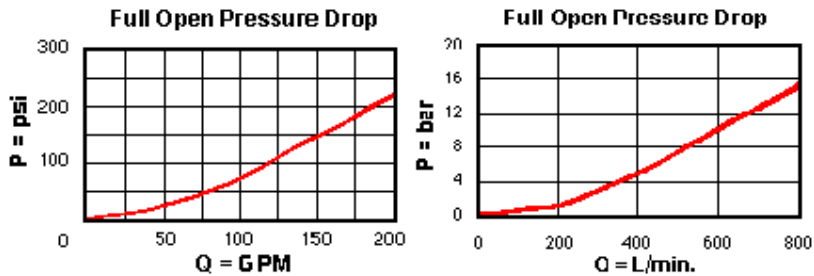
Model Code Example: LOJA8DN

CRACKING PRESSURE	(D)	SEAL MATERIAL	(N)
D 50 psi (3,5 bar)		N Buna-N	
		V Viton	

TECHNICAL FEATURES

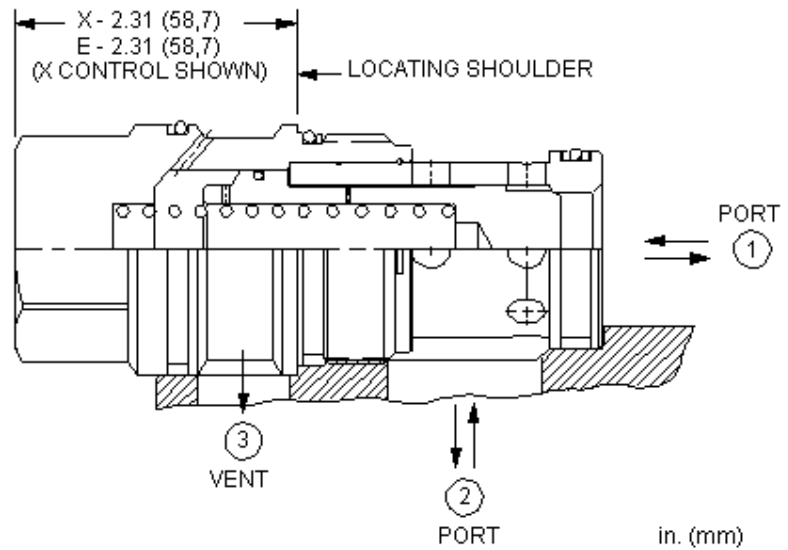
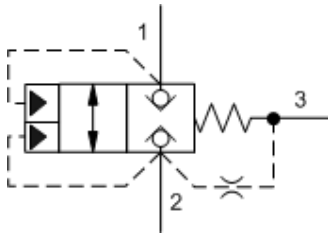
- These valves have positive seals between port 2 and the pilot area.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the logic 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.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 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

- [LOJA](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 1



These unbalanced, vent-to-open logic valves are 2-way switching elements that are spring-biased closed and have port 2 as a pilot source. With port 3 blocked, the valve will remain in the closed position in the 2 to 1 direction and will function as a check valve from 1 to 2. With port 3 vented, the valve will open provided there is sufficient pressure to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-19A
Series	4
Capacity	200 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.42 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Control Orifice Diameter	.035 in.
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	2.62 lb.

CONFIGURATION OPTIONS

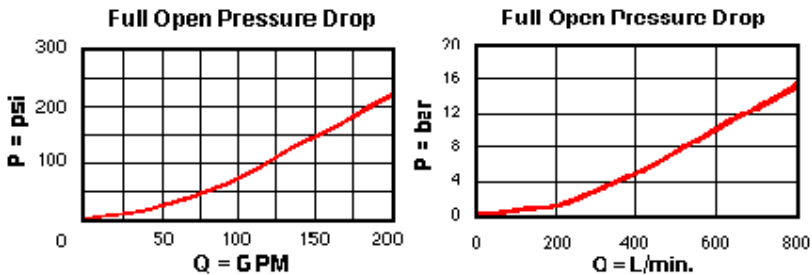
Model Code Example: LOJBXDN

CONTROL	(X) CRACKING PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

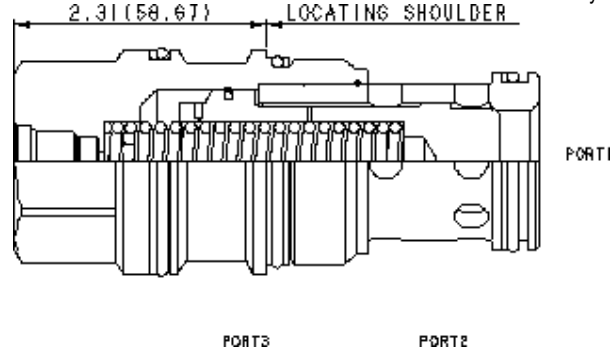
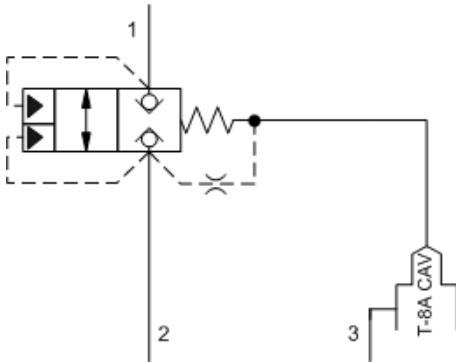
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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

- [LOJB8](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 2 and integral T-8A control cavity



This valve is an unbalanced, vent-to-open, 2-way logic switching element with an integral pilot control cavity. It is spring biased closed and uses port 2 as a pilot source. With a pilot 2-way valve in the closed position installed in the T-8A cavity, the logic element will remain in the closed position. With the pilot valve open, the logic element will open providing there is a sufficient combination of pressures to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-19A
Series	4
Capacity	200 gpm
Maximum Operating Pressure	5000 psi
Pilot Volume Displacement	.42 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Pilot Control Cavity	T-8A
Control Orifice Diameter	.035 in.
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	2.57 lb.

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

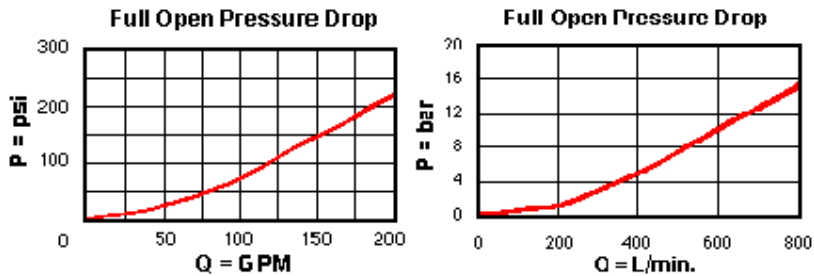
Model Code Example: LOJB8DN

CRACKING PRESSURE	(D)	SEAL MATERIAL	(N)
D 50 psi (3,5 bar)		N Buna-N	
		V Viton	

TECHNICAL FEATURES

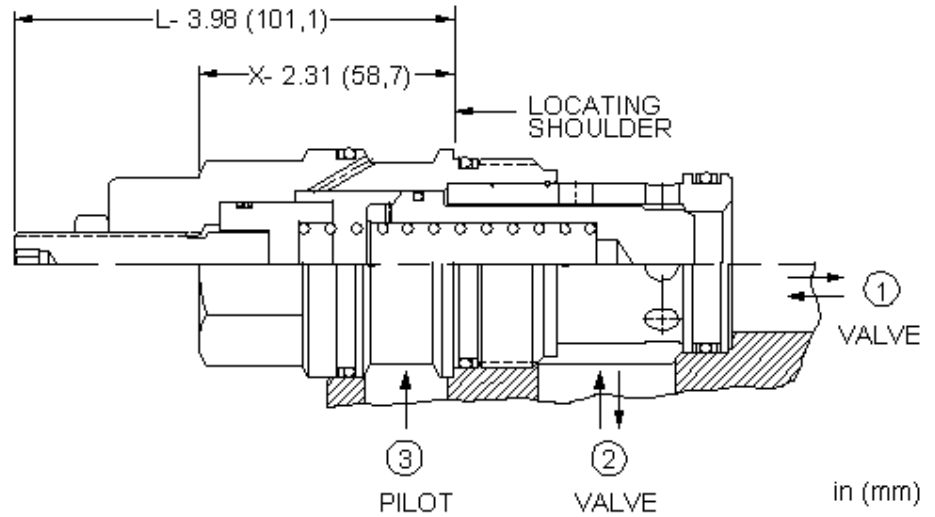
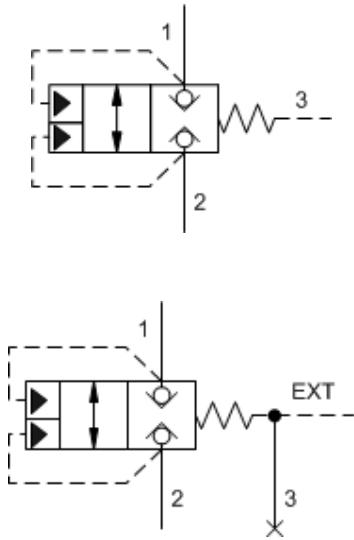
- These valves have positive seals between port 2 and the pilot area.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the logic 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.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 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

- [LOJB](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 2



These unbalanced, pilot-to-close logic valves are 2-way switching elements that are spring biased closed. Pressure at either work port 1 or 2 will oppose the spring and tend to open the valve while pressure at port 3 will tend to close it. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-19A
Series	4
Capacity	200 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.42 in ³
Pilot Passage into Valve	.09 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	2.62 lb.

CONFIGURATION OPTIONS

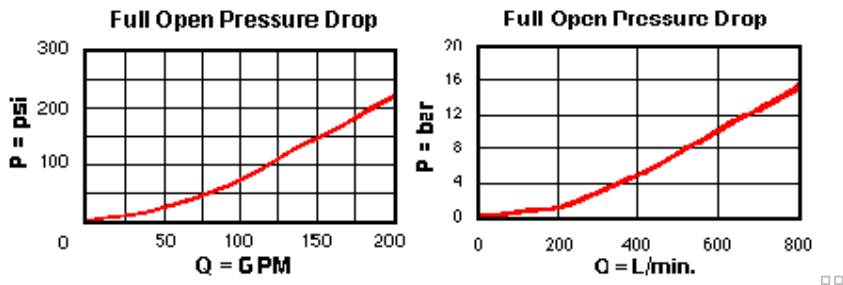
Model Code Example: **LOJCDN**

CONTROL	(X) CRACKING PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N V Viton	Standard Material/Coating IAP Stainless Steel, Passivated

TECHNICAL FEATURES

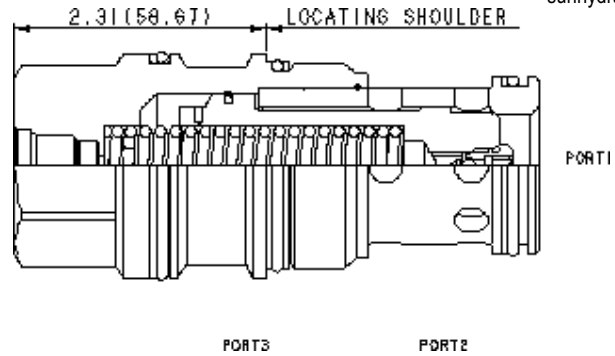
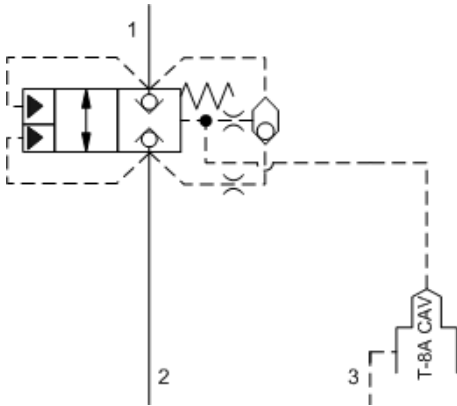
- These valves have positive seals between port 2 and the pilot area.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- Pilot port 3 requires a controlled pressure. A blocked port 3 may result in pressure intensification due to the floating design of the sleeve.
- All ports will accept 5000 psi (350 bar).
- 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

- [LOJCL](#) Pilot-to-close, spring-biased closed, unbalanced poppet logic element
- [LOJCZ](#) Pilot-to-close, spring-biased closed, unbalanced poppet logic element with position switch



This valve is an unbalanced, vent-to-open 2-way logic switching element with an integral pilot control cavity. It is spring biased closed and incorporates an integral shuttle so that the higher of pressures at either port 1 or port 2 can be used as a pilot source. With a pilot 2-way valve in the closed position installed in the T-8A cavity, the logic element will remain in the closed position. With the pilot valve open, the logic element will open providing there is a sufficient combination of pressures to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-19A
Series	4
Capacity	200 gpm
Maximum Operating Pressure	5000 psi
Pilot Volume Displacement	.42 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Pilot Control Cavity	T-8A
Control Orifice Diameter	.035 in.
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	2.57 lb.

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

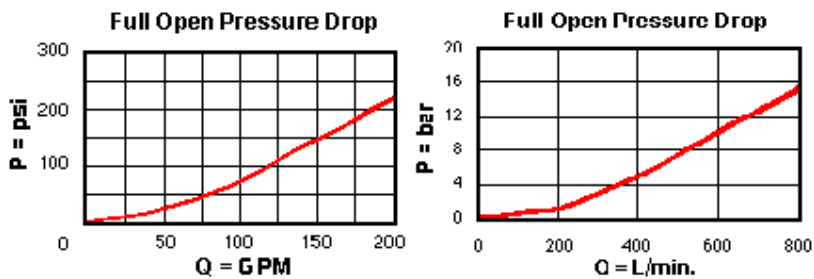
Model Code Example: LOJD8DN

CRACKING PRESSURE	(D)	SEAL MATERIAL	(N)
D 50 psi (3,5 bar)		N Buna-N	
		V Viton	

TECHNICAL FEATURES

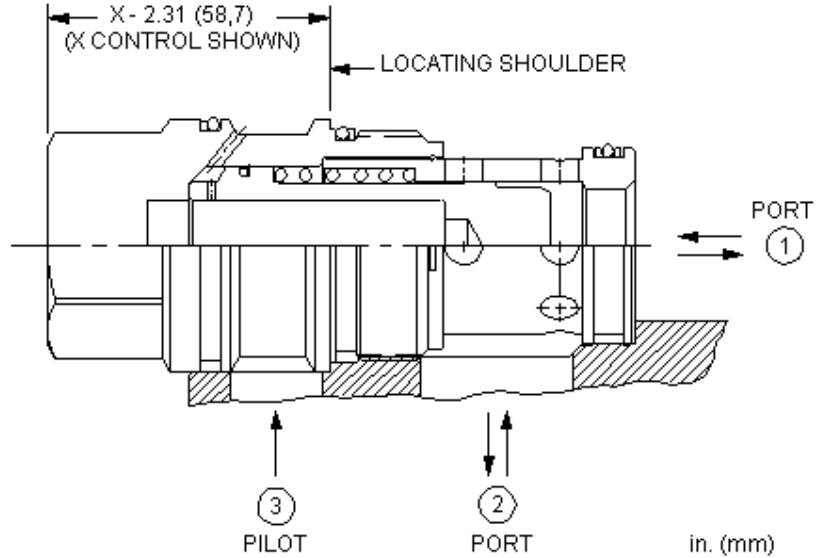
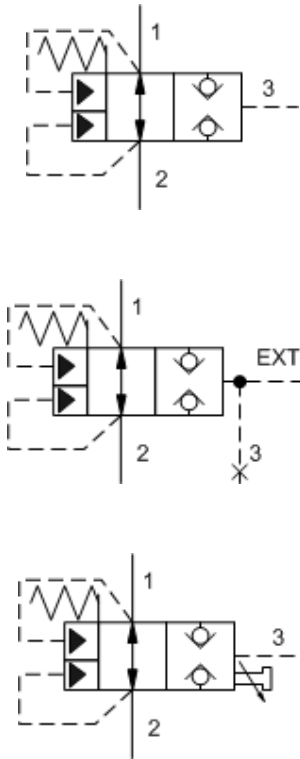
- These valves have positive seals between port 2 and the pilot area.
- NOTE: With the -8 control option, the main stage valve should first be installed to the correct torque value. The T-8A pilot control valve should then be installed into the main stage valve to its required torque value.
- The -8 control option allows the pilot control valve to be incorporated directly into the end of the logic 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.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 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

- [LOJD](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 1 or 2



These unbalanced, pilot-to-close logic valves are 2-way switching elements that are spring biased open. Pressure at either work port 1 or 2 will tend to keep the valve open while pressure at port 3 will tend to close it. The force generated at port 3 must be greater than the sum of the forces acting at port 1 and port 2 plus the spring force for the valve to close. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-19A
Series	4
Capacity	200 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.42 in ³
Pilot Passage into Valve	.09 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	EPDM: 990019014
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	2.50 lb.

CONFIGURATION OPTIONS

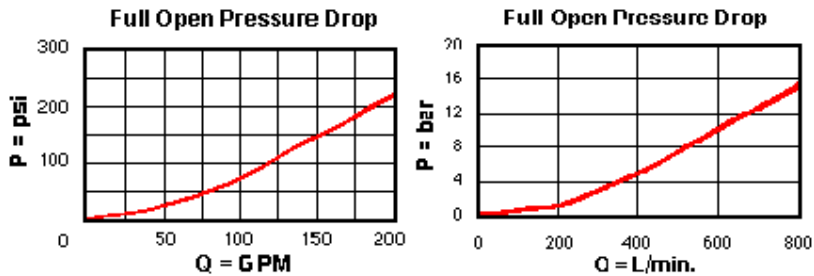
Model Code Example: LOJXDND

CONTROL	(X) MINIMUM PILOT PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

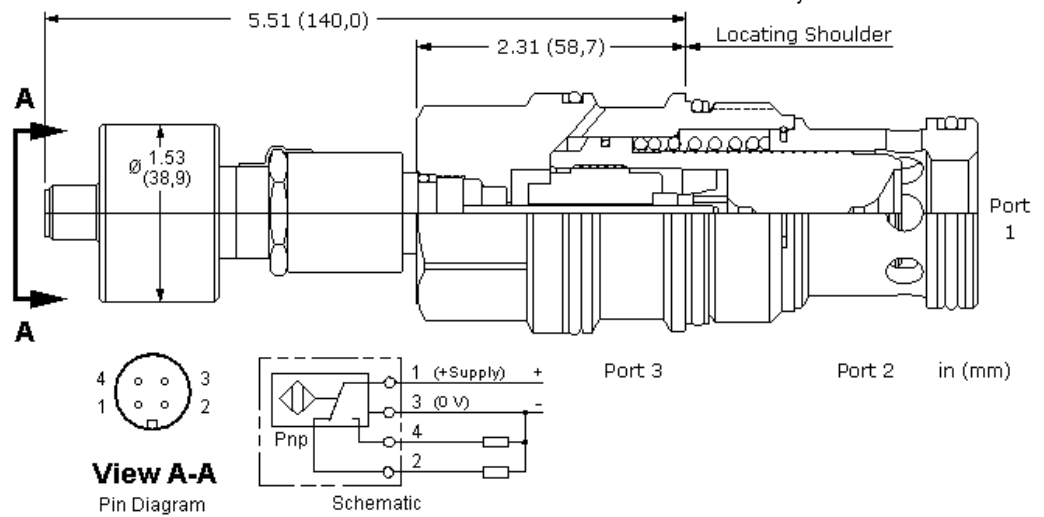
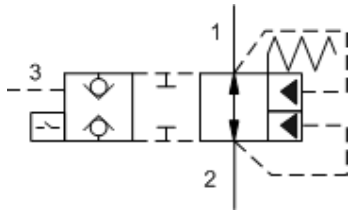
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- These valves have positive seals between port 2 and the pilot area.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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

- [LOJOZ](#) Pilot-to-close, spring-biased open, unbalanced poppet logic element with position switch



These unbalanced, pilot-to-close logic valves are 2-way switching elements that are spring biased open. Pressure at either work port 1 or 2 will tend to keep the valve open while pressure at port 3 will tend to close it. The force generated at port 3 must be greater than the sum of the forces acting at port 1 and port 2 plus the spring force for the valve to close. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

This valve incorporates a position switch to provide confirmation that the valve is spring biased to the fully open position.

TECHNICAL DATA

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

Cavity	T-19A
Series	4
Capacity	200 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	1 drops/min.
Pilot Volume Displacement	.42 in ³
Pilot Passage into Valve	.09 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	3.55 lb.

SWITCH SPECIFICATIONS

Supply Voltage	20-30 VDC
Operating Temperature Range	-25 to 80 °C
Vibration	≥ 50g, 0-500 impulses/sec
Shock	>50 g, 1ms
Reverse Polarity Protection	Yes
Maximum Output Load	≤ 400 mA, Duty Ratio 100%
Short Circuit Protection	Yes, Load Short Unlimited
Turn On Time	≤ 25 ms
Hysteresis	≤ .002 in.
Thermal Shift - 0 to 80 °C ≤ ±	.004 in.
EMC	DIN EN 61000-6-1/2/3/4
Connector	M12 X 1 (4) Pin
Connector Environment Rating	IP65

CONFIGURATION OPTIONS

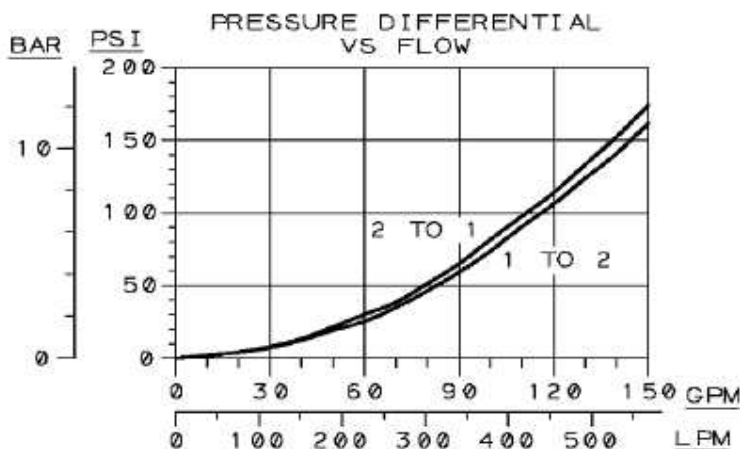
Model Code Example: LOJOZDN

CRACKING PRESSURE	(D)	SEAL MATERIAL	(N)
D 50 psi (3,5 bar)		N Buna-N	
		V Viton	

TECHNICAL FEATURES

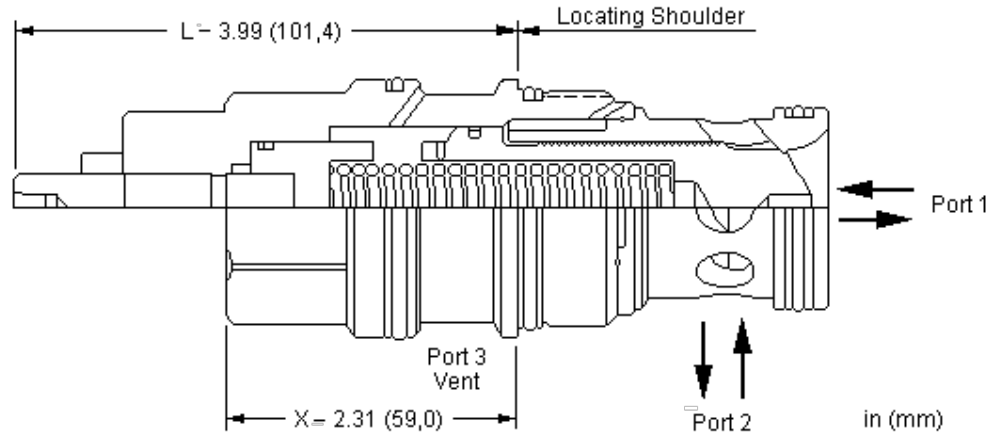
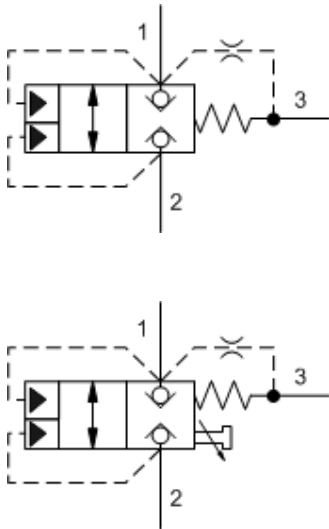
- These valves have positive seals between port 2 and the pilot area.
- This cartridge is supplied as a sealed, factory set unit and is not field serviceable. Any tampering will violate the product warranty.
- When torquing this cartridge into its cavity, a crow's foot wrench or similar will be required since the position switch precludes the use of a deep socket wrench.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- Position switch is CE approved.
- 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

- [LOJO](#) Pilot-to-close, spring-biased open, unbalanced poppet logic element



These unbalanced, vent-to-open logic valves are 2-way switching elements that are spring-biased closed and have port 1 as a pilot source. With port 3 blocked, the valve will remain in the closed position in the 1 to 2 direction and will function as a check valve from 2 to 1. With port 3 vented, the valve will open provided there is sufficient pressure to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-19AU
Series	4
Capacity	300 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.47 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Control Orifice Diameter	.035 in.
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	2.55 lb.

CONFIGURATION OPTIONS

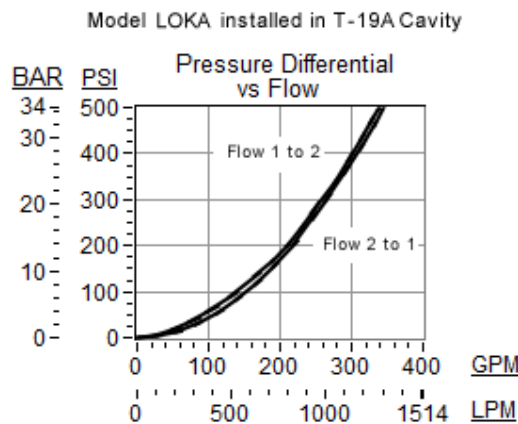
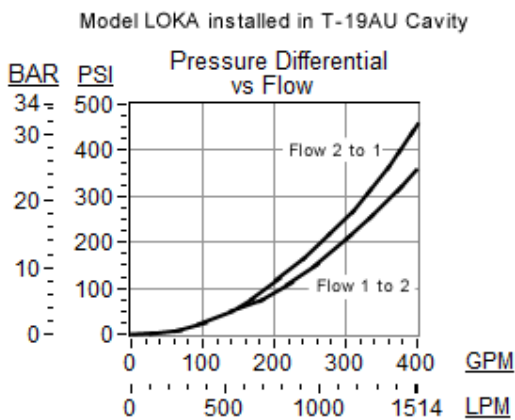
Model Code Example: LOKAXDN

CONTROL	(X) CRACKING PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable L Stroke Adjustment	D 50 psi (3,5 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

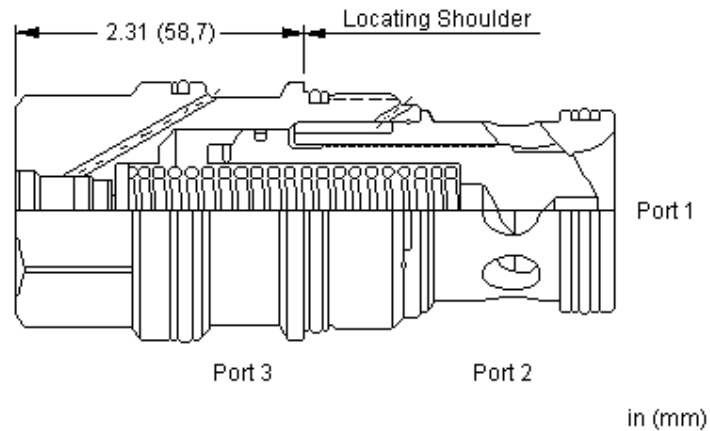
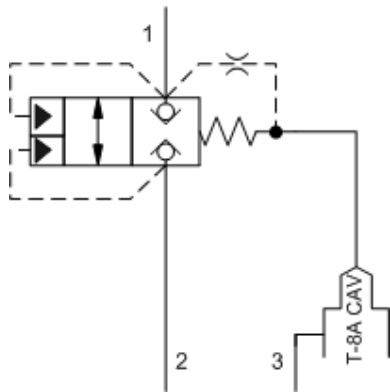
- These valves will work in Sun's standard T-19A cavity at lower capacity. To realize the full stated capacity, the T-19AU cavity should be used.
- These valves have positive seals between port 2 and the pilot area.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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

- [LOKA8](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 1 and integral T-8A control cavity



This valve is an unbalanced, vent-to-open, 2-way logic switching element with an integral pilot control cavity. It is spring biased closed and uses port 1 as a pilot source. With a pilot 2-way valve in the closed position installed in the T-8A cavity, the logic element will remain in the closed position. With the pilot valve open, the logic element will open providing there is a sufficient combination of pressures to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-19AU
Series	4
Capacity	300 gpm
Maximum Operating Pressure	5000 psi
Pilot Volume Displacement	.47 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Pilot Control Cavity	T-8A
Control Orifice Diameter	.035 in.
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	2.50 lb.

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

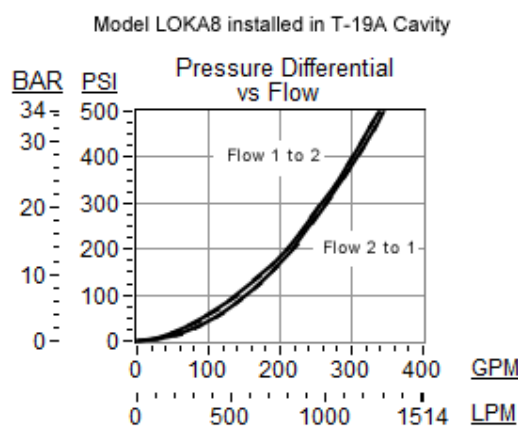
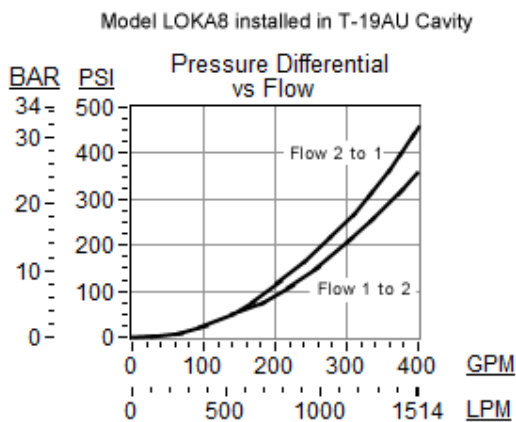
Model Code Example: LOKA8DN

CRACKING PRESSURE	(D)	SEAL MATERIAL	(N)
D 50 psi (3,5 bar)		N Buna-N	
		V Viton	

TECHNICAL FEATURES

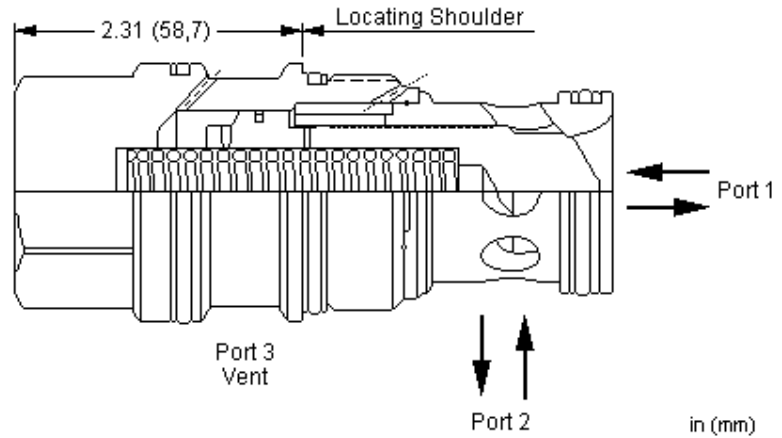
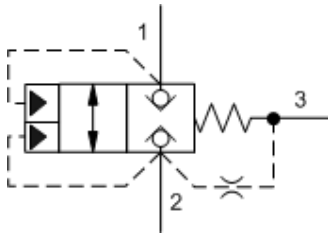
- These valves will work in Sun's standard T-19A cavity at lower capacity. To realize the full stated capacity, the T-19AU cavity should be used.
- These valves have positive seals between port 2 and the pilot area.
- NOTE: With the -8 control option, the main stage valve should first be installed to 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 logic 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.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 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

- [LOKA](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 1



These unbalanced, vent-to-open logic valves are 2-way switching elements that are spring-biased closed and have port 2 as a pilot source. With port 3 blocked, the valve will remain in the closed position in the 2 to 1 direction and will function as a check valve from 1 to 2. With port 3 vented, the valve will open provided there is sufficient pressure to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-19AU
Series	4
Capacity	300 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.47 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Control Orifice Diameter	.035 in.
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	2.56 lb.

CONFIGURATION OPTIONS

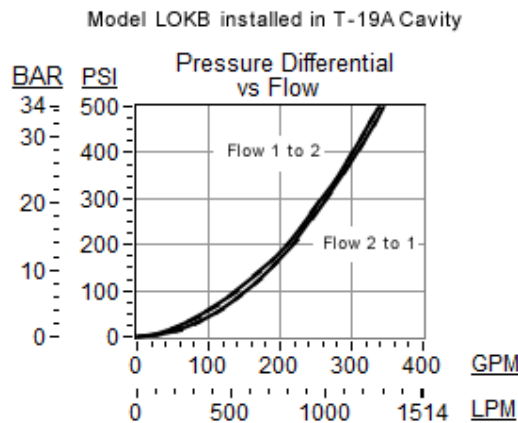
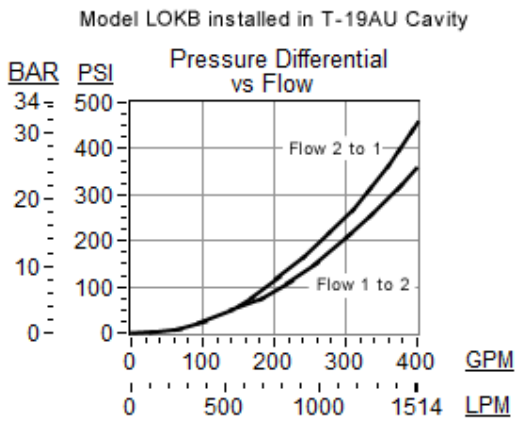
Model Code Example: LOKBXDN

CONTROL	(X) CRACKING PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

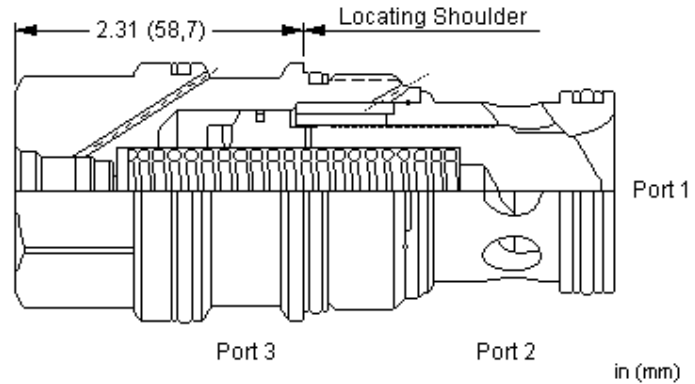
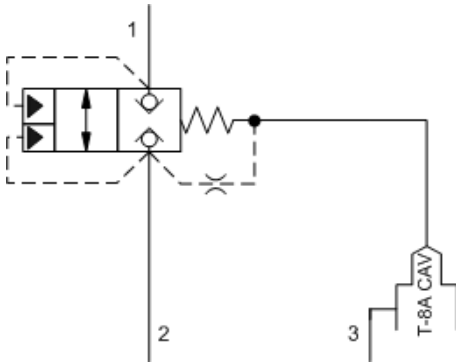
- These valves will work in Sun's standard T-19A cavity at lower capacity. To realize the full stated capacity, the T-19AU cavity should be used.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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

- [LOKB8](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 2 and integral T-8A control cavity



This valve is an unbalanced, vent-to-open, 2-way logic switching element with an integral pilot control cavity. It is spring biased closed and uses port 2 as a pilot source. With a pilot 2-way valve in the closed position installed in the T-8A cavity, the logic element will remain in the closed position. With the pilot valve open, the logic element will open providing there is a sufficient combination of pressures to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-19AU
Series	4
Capacity	300 gpm
Maximum Operating Pressure	5000 psi
Pilot Volume Displacement	.47 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Pilot Control Cavity	T-8A
Control Orifice Diameter	.035 in.
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	2.50 lb.

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

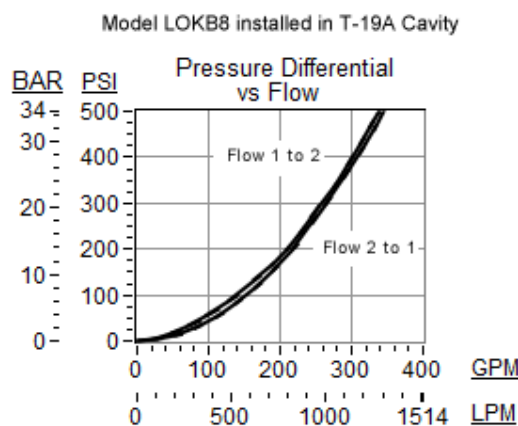
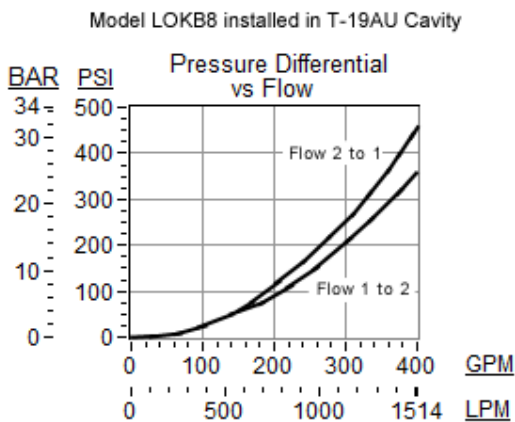
Model Code Example: LOKB8DN

CRACKING PRESSURE	(D)	SEAL MATERIAL	(N)
D 50 psi (3,5 bar)		N Buna-N	
		V Viton	

TECHNICAL FEATURES

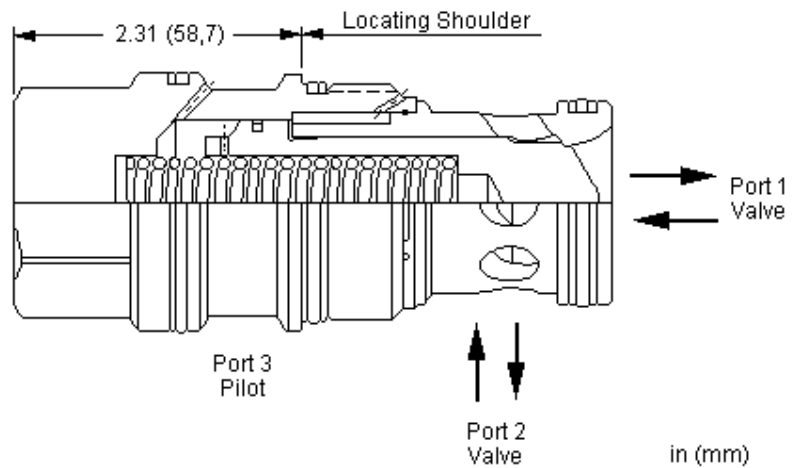
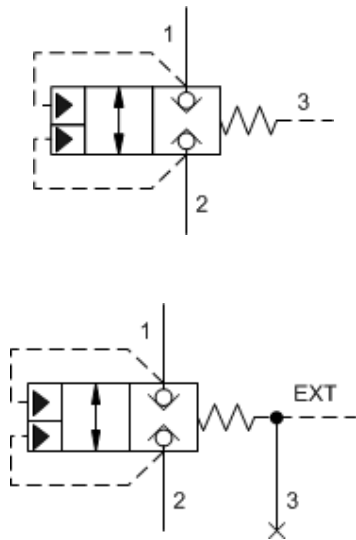
- These valves will work in Sun's standard T-19A cavity at lower capacity. To realize the full stated capacity, the T-19AU cavity should be used.
- These valves have positive seals between port 2 and the pilot area.
- NOTE: With the -8 control option, the main stage valve should first be installed to 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 logic 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.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 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

- [LOKB](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 2



These unbalanced, pilot-to-close logic valves are 2-way switching elements that are spring biased closed. Pressure at either work port 1 or 2 will oppose the spring and tend to open the valve while pressure at port 3 will tend to close it. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-19AU
Series	4
Capacity	300 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.47 in ³
Pilot Passage into Valve	.09 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	EPDM: 990019014
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	2.56 lb.

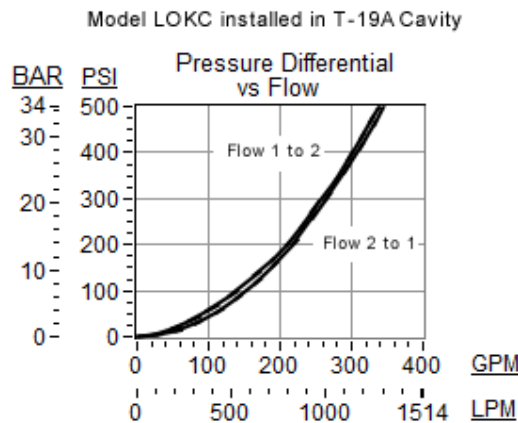
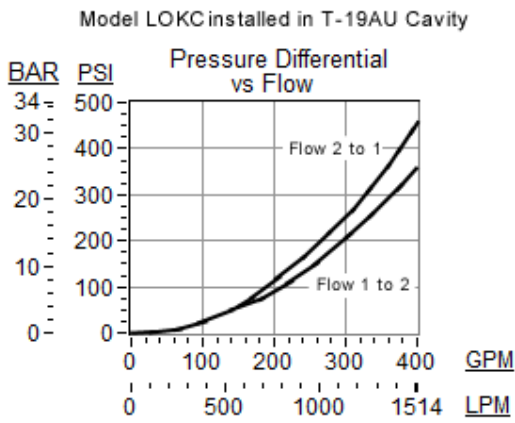
CONFIGURATION OPTIONS
Model Code Example: LOKCXDN

CONTROL	(X) CRACKING PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N E EPDM V Viton	Standard Material/Coating /AP Stainless Steel, Passivated /LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

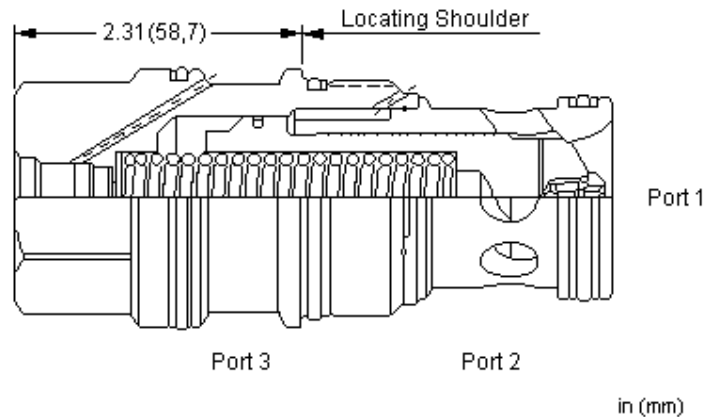
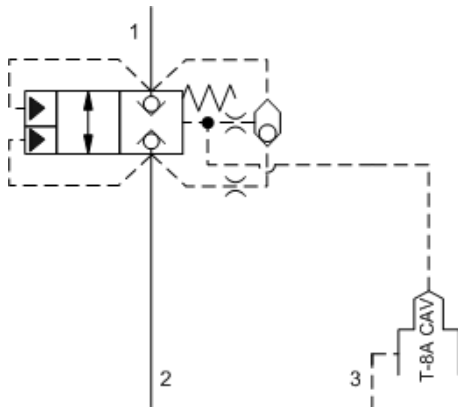
- These valves will work in Sun's standard T-19A cavity at lower capacity. To realize the full stated capacity, the T-19AU cavity should be used.
- Cartridges configured with EPDM seals are for use in systems with phosphate ester fluids. Exposure to petroleum based fluids, greases and lubricants will damage the seals.
- These valves have positive seals between port 2 and the pilot area.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
-
- All ports will accept 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

- [LOKZ](#) Pilot-to-close, spring-biased closed, unbalanced poppet logic element with position switch



This valve is an unbalanced, vent-to-open 2-way logic switching element with an integral pilot control cavity. It is spring biased closed and incorporates an integral shuttle so that the higher of pressures at either port 1 or port 2 can be used as a pilot source. With a pilot 2-way valve in the closed position installed in the T-8A cavity, the logic element will remain in the closed position. With the pilot valve open, the logic element will open providing there is a sufficient combination of pressures to overcome the spring force. The force generated at port 3, plus the spring force, must be greater than the sum of the forces acting at port 1 and port 2 for the valve to remain closed. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-19AU
Series	4
Capacity	300 gpm
Maximum Operating Pressure	5000 psi
Pilot Volume Displacement	.47 in ³
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Pilot Control Cavity	T-8A
Control Orifice Diameter	.035 in.
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	2.50 lb.

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

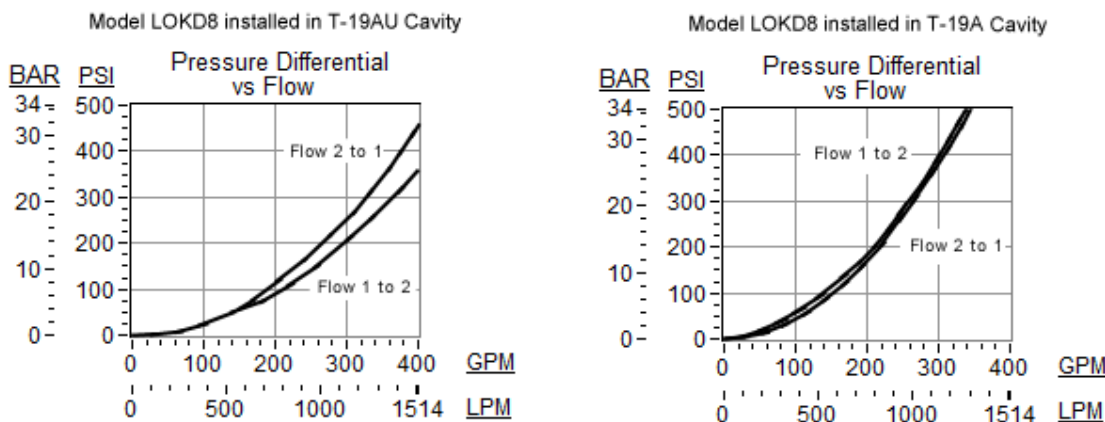
Model Code Example: LOKD8DN

CRACKING PRESSURE	(D)	SEAL MATERIAL	(N)
D 50 psi (3,5 bar)		N Buna-N	
		V Viton	

TECHNICAL FEATURES

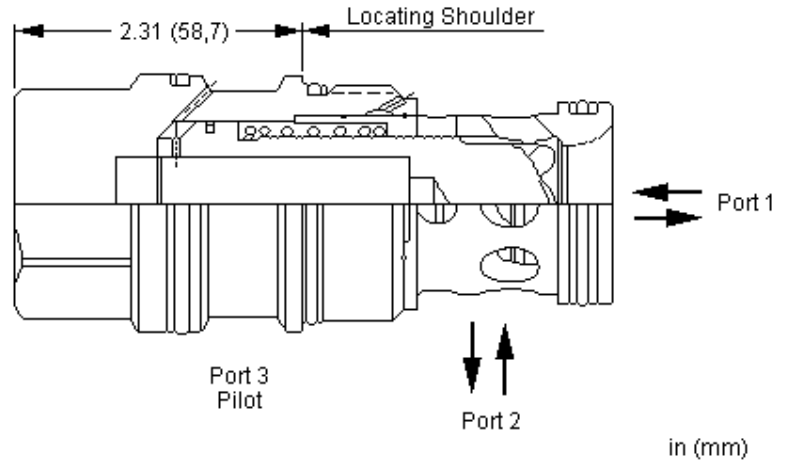
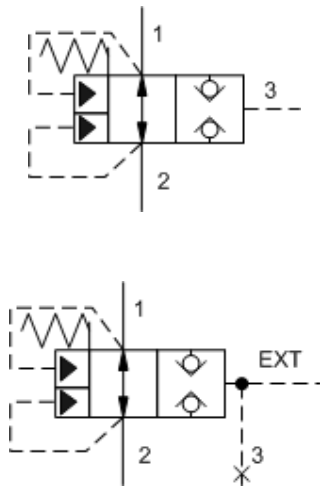
- These valves will work in Sun's standard T-19A cavity at lower capacity. To realize the full stated capacity, the T-19AU cavity should be used.
- These valves have positive seals between port 2 and the pilot area.
- NOTE: With the -8 control option, the main stage valve should first be installed to 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 logic 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.
- These valves open quickly when vented. Time to close is difficult to predict as it is dependent on the rate of flow and the pressure drop created as it closes.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 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

- [LOKD](#) Vent-to-open, spring-biased closed, unbalanced poppet logic element with pilot source from port 1 or 2



These unbalanced, pilot-to-close logic valves are 2-way switching elements that are spring biased open. Pressure at either work port 1 or 2 will tend to keep the valve open while pressure at port 3 will tend to close it. The force generated at port 3 must be greater than the sum of the forces acting at port 1 and port 2 plus the spring force for the valve to close. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

TECHNICAL DATA

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

Cavity	T-19AU
Series	4
Capacity	300 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	10 drops/min.
Pilot Volume Displacement	.47 in ³
Pilot Passage into Valve	.09 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	2.49 lb.

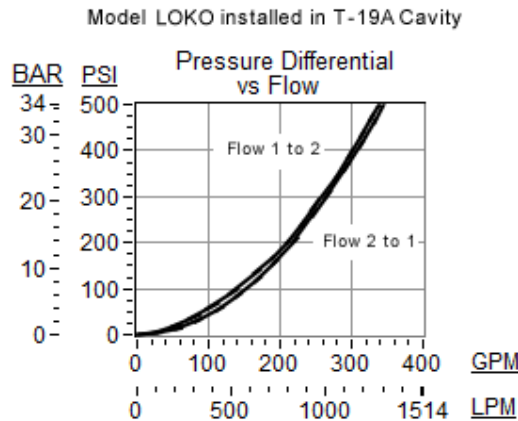
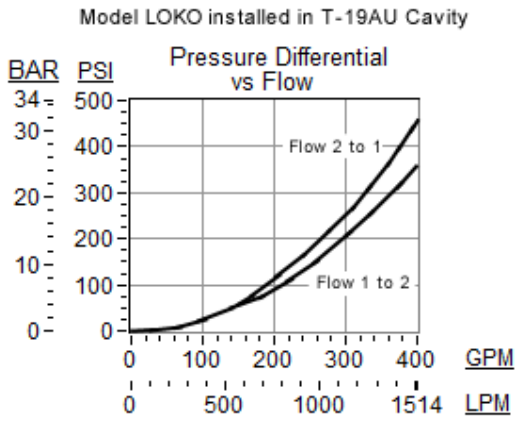
CONFIGURATION OPTIONS
Model Code Example: LOKOXDN

CONTROL	(X) MINIMUM PILOT PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

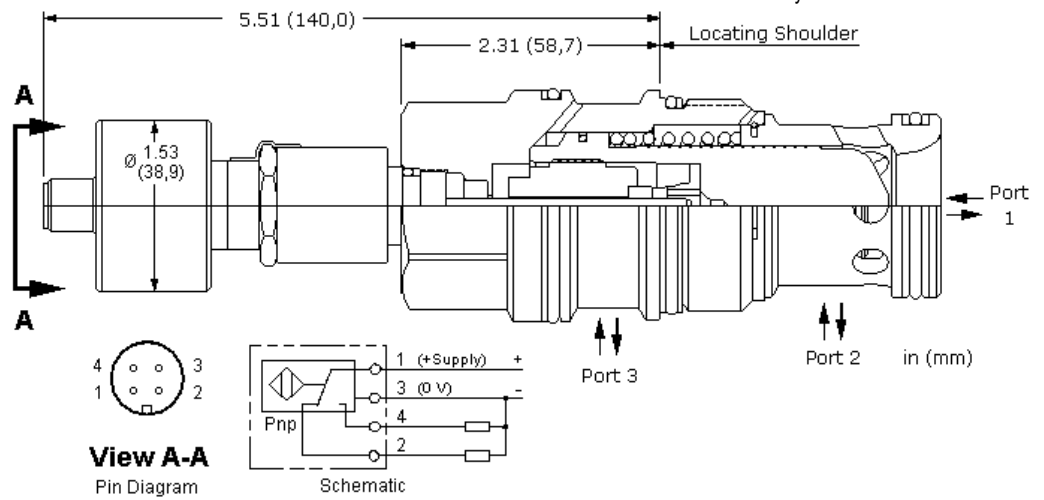
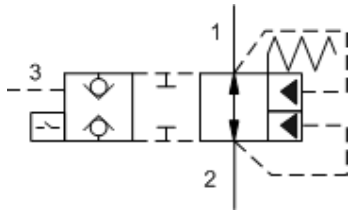
- These valves will work in Sun's standard T-19A cavity at lower capacity. To realize the full stated capacity, the T-19AU cavity should be used.
- These valves have positive seals between port 2 and the pilot area.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- 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

- [LOKOZ](#) Pilot-to-close, spring-biased open, unbalanced poppet logic element with position switch



These unbalanced, pilot-to-close logic valves are 2-way switching elements that are spring biased open. Pressure at either work port 1 or 2 will tend to keep the valve open while pressure at port 3 will tend to close it. The force generated at port 3 must be greater than the sum of the forces acting at port 1 and port 2 plus the spring force for the valve to close. NOTE: The pilot area (port 3) is 1.8 times the area at port 1 and 2.25 times the area at port 2.

This valve incorporates a position switch to provide confirmation that the valve is spring biased to the fully open position.

TECHNICAL DATA

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

Cavity	T-19AU
Series	4
Capacity	300 gpm
Maximum Operating Pressure	5000 psi
Maximum Valve Leakage at 110 SUS (24 cSt)	1 drops/min.
Pilot Volume Displacement	.47 in ³
Pilot Passage into Valve	.09 in.
Area Ratio, A3 to A1	1.8:1
Area Ratio, A3 to A2	2.25:1
Valve Hex Size	1 5/8 in.
Valve Installation Torque	350 - 375 lbf ft
Seal kit - Cartridge	Buna: 990019007
Seal kit - Cartridge	Polyurethane: 990019002
Seal kit - Cartridge	Viton: 990019006
Model Weight	3.55 lb.

SWITCH SPECIFICATIONS

Supply Voltage	20-30 VDC
Operating Temperature Range	-25 to 80 °C
Vibration	≥ 50g, 0-500 impulses/sec
Shock	>50 g, 1ms
Reverse Polarity Protection	Yes
Maximum Output Load	≤ 400 mA, Duty Ratio 100%
Short Circuit Protection	Yes, Load Short Unlimited
Turn On Time	≤ 25 ms
Hysteresis	≤ .002 in.
Thermal Shift - 0 to 80 °C ≤ ±	.004 in.
EMC	DIN EN 61000-6-1/2/3/4
Connector	M12 X 1 (4) Pin
Connector Environment Rating	IP65

CONFIGURATION OPTIONS

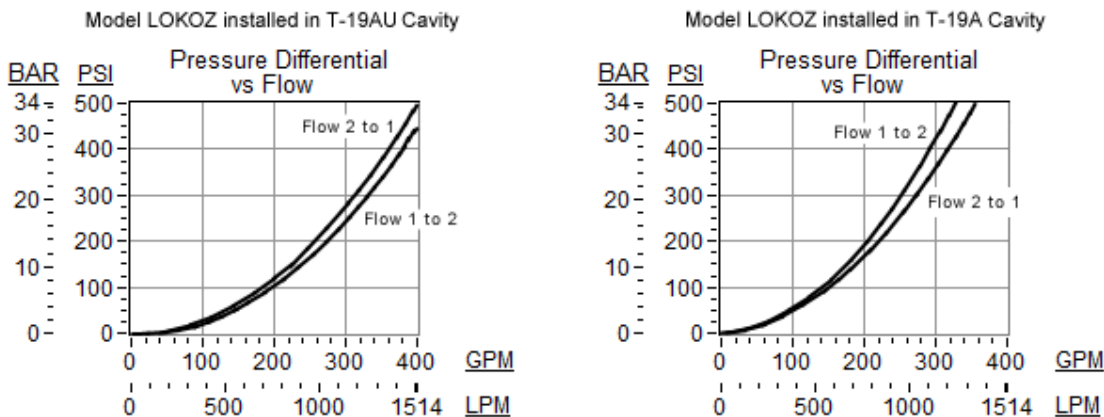
Model Code Example: LOKOZDN

CRACKING PRESSURE	(D)	SEAL MATERIAL	(N)
D 50 psi (3,5 bar)		N Buna-N	
		V Viton	

TECHNICAL FEATURES

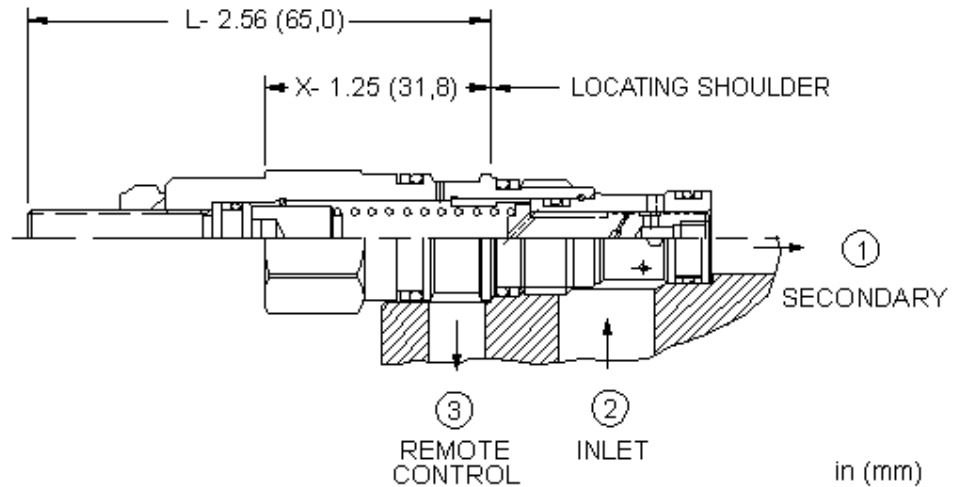
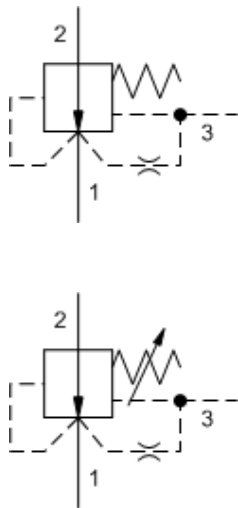
- These valves will work in Sun's standard T-19A cavity at lower capacity. To realize the full stated capacity, the T-19AU cavity should be used.
- These valves have positive seals between port 2 and the pilot area.
- This cartridge is supplied as a sealed, factory set unit and is not field serviceable. Any tampering will violate the product warranty.
- When torquing this cartridge into its cavity, a crow's foot wrench or similar will be required since the position switch precludes the use of a deep socket wrench.
- Because these valves are unbalanced, operation is pressure dependent. Opening and closing of the poppet are functions of the force balances on three areas: Port 1 = 100%, Port 2 = 80%, and the Pilot Area = 180%.
- These valves are pressure responsive at all ports, therefore it is essential to consider all aspects of system operation through a complete cycle. Pressure changes at any one port may cause a valve to switch from a closed to an open position, or vice versa. All possible pressure changes in the complete circuit must be considered to assure a safe, functional system design.
- All ports will accept 5000 psi (350 bar).
- Position switch is CE approved.
- 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

- [LOKO](#) Pilot-to-close, spring-biased open, unbalanced poppet logic element



These normally open modulating elements with an internal orifice between port 1 and port 3 can be used as a main-stage reducing valve. The valve can be controlled remotely using a pilot relief or pilot solenoid valve.

TECHNICAL DATA

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

Cavity	T-163A
Series	0
Capacity	7.5 gpm
Maximum Operating Pressure	5000 psi
Control Orifice Diameter	.016 in.
Valve Hex Size	3/4 in.
Valve Installation Torque	20 - 25 lbf ft
Seal kit - Cartridge	Buna: 990163007
Seal kit - Cartridge	Polyurethane: 990163002
Seal kit - Cartridge	Viton: 990163006
Model Weight	0.20 lb.

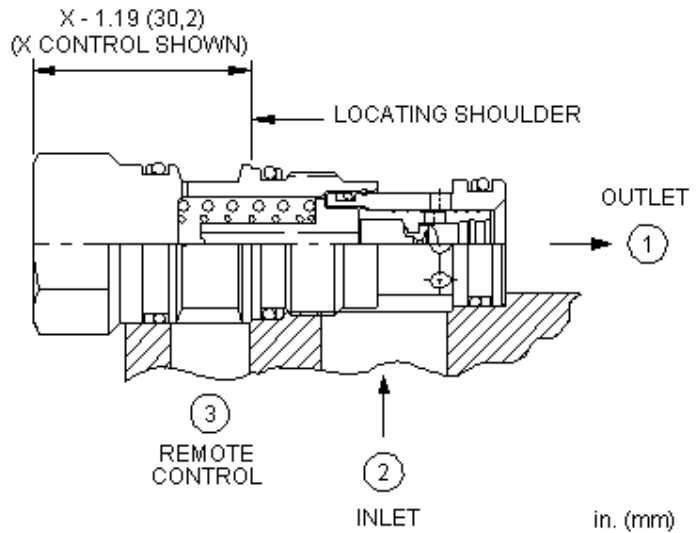
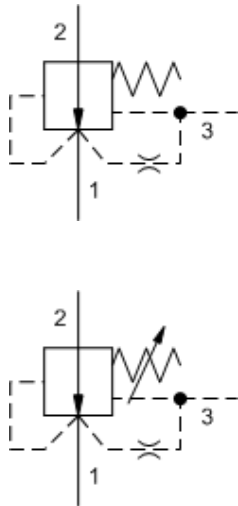
CONFIGURATION OPTIONS

Model Code Example: LPBAXHN

CONTROL	(X) BIAS PRESSURE	(H) SEAL MATERIAL	(N)
X Not Adjustable	H 200 psi (14 bar)	N Buna-N	
L Tuning Adjustment	D 50 psi (3,5 bar)	V Viton	
	F 100 psi (7 bar)		

TECHNICAL FEATURES

- Sun offers a variety of pressure and solenoid pilot control valves than can be used as remote control operators. See Pilot Control Cartridges.
- A tuning adjustment (models configured with an L control) is available to vary the pressure drop across the compensator to increase/decrease flow within +/-25% of setting.
- All ports will accept 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.



These normally open modulating elements with an internal orifice between port 1 and port 3 can be used as a main-stage reducing valve. The valve can be controlled remotely using a pilot relief or pilot solenoid valve.

TECHNICAL DATA

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

Cavity	T-11A
Series	1
Capacity	15 gpm
Maximum Operating Pressure	5000 psi
Control Pilot Flow	10 - 15 in ³ /min.
Control Orifice Diameter	.016 in.
Valve Hex Size	7/8 in.
Valve Installation Torque	30 - 35 lbf ft
Seal kit - Cartridge	Buna: 990011007
Seal kit - Cartridge	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.28 lb.

CONFIGURATION OPTIONS

Model Code Example: LPDAXHN

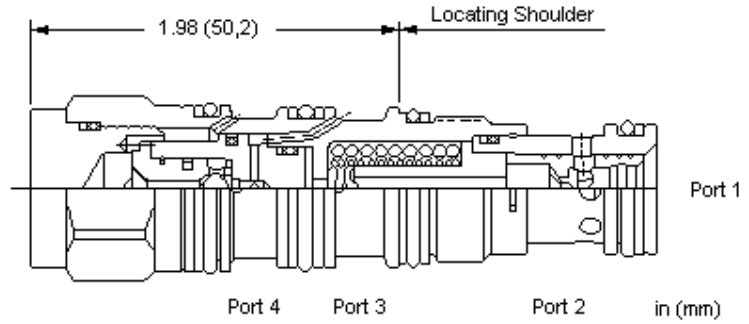
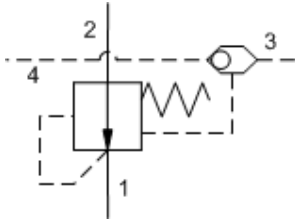
CONTROL	(X) BIAS PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	H 200 psi (14 bar)	N Buna-N	Standard Material/Coating
L Tuning Adjustment	D 50 psi (3,5 bar)	V Viton	/AP Stainless Steel, Passivated
	F 100 psi (7 bar)		

TECHNICAL FEATURES

- Sun offers a variety of pressure and solenoid pilot control valves that can be used as remote control operators. See Pilot Control Cartridges.
- A tuning adjustment (models configured with an L control) is available to vary the pressure drop across the compensator to increase/decrease flow within +/-25% of setting.
- All ports will accept 5000 psi (350 bar).
- 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.

RELATED MODELS

- [LPDA8](#) Normally open, modulating element with integral T-8A control cavity and pilot source from port 1



A normally open modulating element, used as a restrictive compensator, ensures a constant pressure drop across an external orifice to create a pressure compensated flow control. The resulting flow remains constant regardless of variations in upstream or downstream pressure.

A ball shuttle connects the after orifice signal from the higher of port 3 or 4 to the pilot area.

TECHNICAL DATA

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

Cavity	T-21A
Series	1
Capacity	60 L/min.
Nominal Compensating Pressure	14 bar
Maximum Operating Pressure	350 bar
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	0.17 kg.

CONFIGURATION OPTIONS

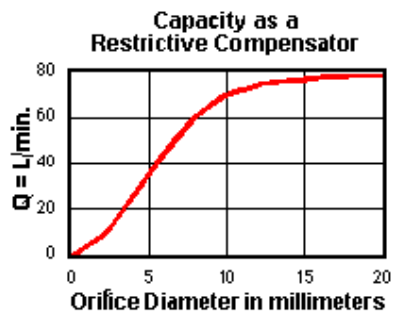
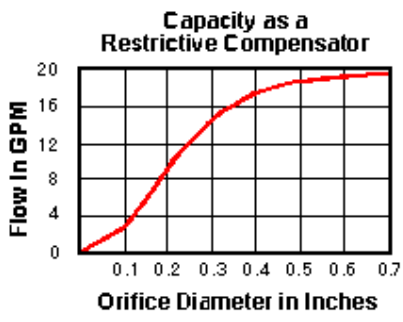
Model Code Example: LPDSXHN

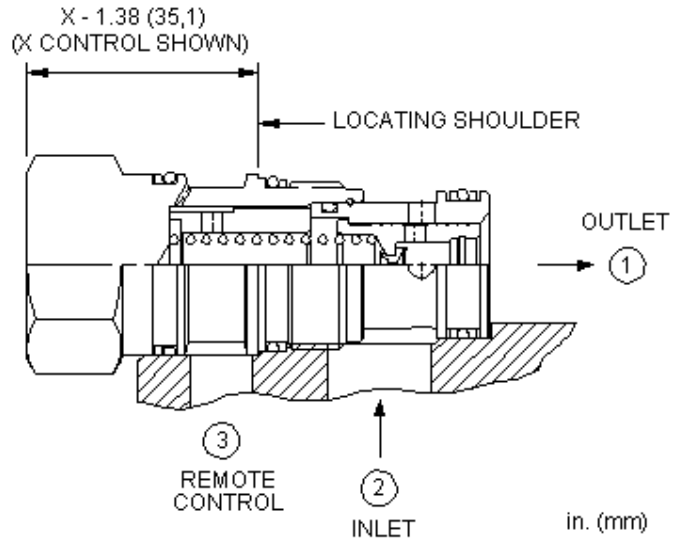
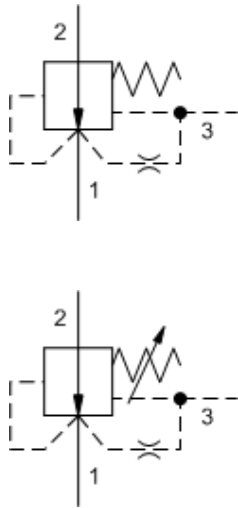
CONTROL	(X) DIFFERENTIAL PRESSURE	(H) SEAL MATERIAL	(N)
X Not Adjustable	H 200 psi (14 bar)	N Buna-N V Viton	

TECHNICAL FEATURES

- The shuttle features hardened steel balls and seats for excellent wear characteristics and contamination tolerance.
- The single ball shuttle allows for the decay of the pressure signal when both load ports drop to a lower pressure.
- All ports will accept 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





These normally open modulating elements with an internal orifice between port 1 and port 3 can be used as a main-stage reducing valve. The valve can be controlled remotely using a pilot relief or pilot solenoid valve.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	30 gpm
Maximum Operating Pressure	5000 psi
Control Pilot Flow	10 - 15 in ³ /min.
Control Orifice Diameter	.016 in.
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.50 lb.

CONFIGURATION OPTIONS

Model Code Example: LPFAXHN

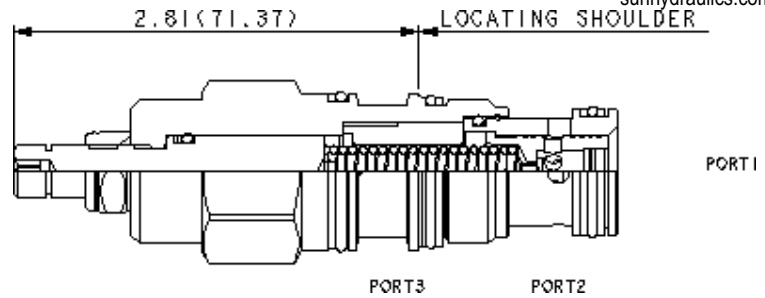
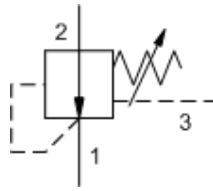
CONTROL	(X) BIAS PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable L Tuning Adjustment	H 200 psi (14 bar) D 50 psi (3,5 bar)	N Buna-N V Viton	Standard Material/Coating /AP Stainless Steel, Passivated

TECHNICAL FEATURES

- Sun offers a variety of pressure and solenoid pilot control valves that can be used as remote control operators. See Pilot Control Cartridges.
- A tuning adjustment (models configured with an L control) is available to vary the pressure drop across the compensator to increase/decrease flow within +/-25% of setting.
- All ports will accept 5000 psi (350 bar).
- 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.

RELATED MODELS

- [LPFA8](#) Normally open, modulating element with integral T-8A control cavity and pilot source from port 1



Normally open modulating elements without an internal orifice act as a restrictive compensator to maintain a constant pressure drop across an orifice, regardless of variations in upstream or downstream pressure.

TECHNICAL DATA

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

Cavity	T-2A
Series	2
Capacity	30 gpm
Maximum Operating Pressure	5000 psi
Valve Hex Size	1 1/8 in.
Valve Installation Torque	45 - 50 lbf ft
Seal kit - Cartridge	Buna: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.68 lb.

CONFIGURATION OPTIONS

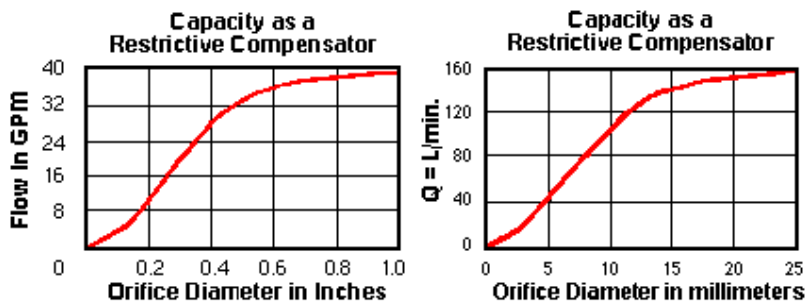
Model Code Example: LPFCLDN

DIFFERENTIAL PRESSURE	(D)	SEAL MATERIAL	(N)	MATERIAL/COATING
D 50 psi (3,5 bar)		N Buna-N		Standard Material/Coating
		E EPDM		/LH Mild Steel, Zinc-Nickel
		V Viton		

TECHNICAL FEATURES

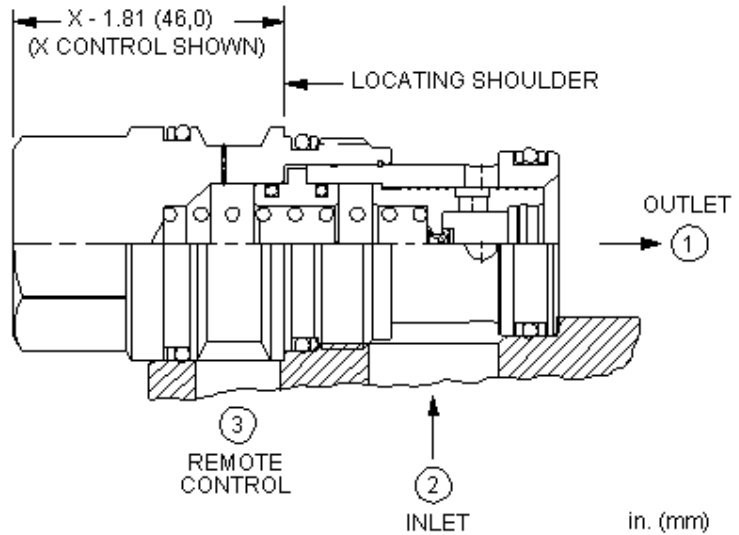
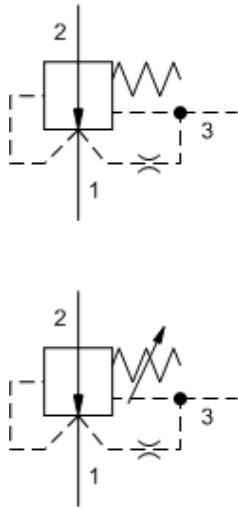
- A tuning adjustment (models configured with an L control) is available to vary the pressure drop across the compensator to increase/decrease flow within +/-25% of setting.
- All ports will accept 5000 psi (350 bar).
- Incorporates the Sun floating style construction to minimize the possibility of internal parts binding due to excessive installation torque and/or cavity/cartridge machining variations.

PERFORMANCE CURVES



RELATED MODELS

- [LPFC](#) Normally open, modulating element



These normally open modulating elements with an internal orifice between port 1 and port 3 can be used as a main-stage reducing valve. The valve can be controlled remotely using a pilot relief or pilot solenoid valve.

TECHNICAL DATA

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

Cavity	T-17A
Series	3
Capacity	60 gpm
Maximum Operating Pressure	5000 psi
Control Pilot Flow	15 - 30 in ³ /min.
Control Orifice Diameter	.021 in.
Valve Hex Size	1 1/4 in.
Valve Installation Torque	150 - 160 lbf ft
Seal kit - Cartridge	Buna: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	1.16 lb.

CONFIGURATION OPTIONS

Model Code Example: LPHAXDN

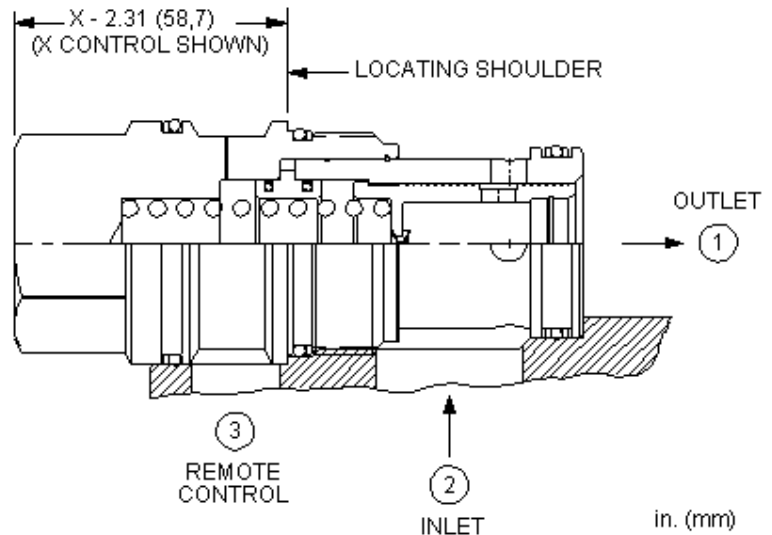
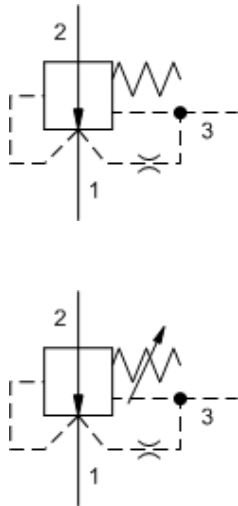
CONTROL	(X) BIAS PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	D 50 psi (3,5 bar)	N Buna-N	Standard Material/Coating
L Tuning Adjustment	F 100 psi (7 bar)	E EPDM	/AP Stainless Steel, Passivated
	G 150 psi (10,5 bar)	V Viton	
	H 200 psi (14 bar)		

TECHNICAL FEATURES

- Sun offers a variety of pressure and solenoid pilot control valves that can be used as remote control operators. See Pilot Control Cartridges.
- A tuning adjustment (models configured with an L control) is available to vary the pressure drop across the compensator to increase/decrease flow within +/-25% of setting.
- All ports will accept 5000 psi (350 bar).
- 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.

RELATED MODELS

- [LPHA8](#) Normally open, modulating element with integral T-8A control cavity and pilot source from port 1



These normally open modulating elements with an internal orifice between port 1 and port 3 can be used as a main-stage reducing valve. The valve can be controlled remotely using a pilot relief or pilot solenoid valve.

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 - 0,50 L/min.
Control Orifice Diameter	0,53 mm
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	1.17 kg.

CONFIGURATION OPTIONS
Model Code Example: LPJAXHN

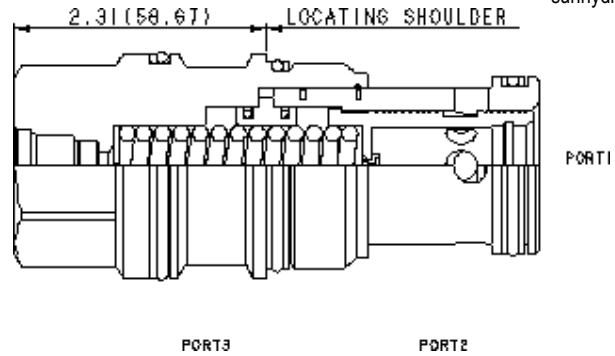
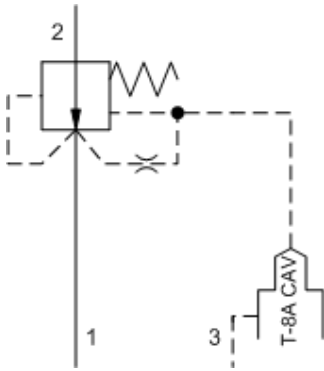
CONTROL	(X) BIAS PRESSURE	(H) SEAL MATERIAL	(N) MATERIAL/COATING
X Not Adjustable	H 200 psi (14 bar)	N Buna-N	Standard Material/Coating
L Tuning Adjustment	D 50 psi (3,5 bar)	E EPDM	/AP Stainless Steel, Passivated
	F 100 psi (7 bar)	V Viton	
	G 150 psi (10,5 bar)		

TECHNICAL FEATURES

- A tuning adjustment (models configured with an L control) is available to vary the pressure drop across the compensator to increase/decrease flow within +/-25% of setting.
- All ports will accept 5000 psi (350 bar).
- 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.

RELATED MODELS

- [LPJA8](#) Normally open, modulating element with integral T-8A control cavity and pilot source from port 1



These normally open modulating elements with an internal orifice between port 1 and port 3 can be used as a main-stage reducing valve. The valve can be controlled remotely using a pilot relief or pilot solenoid valve.

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 - 0,50 L/min.
Pilot Control Cavity	T-8A
Control Orifice Diameter	0,53 mm
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: LPJA8DN

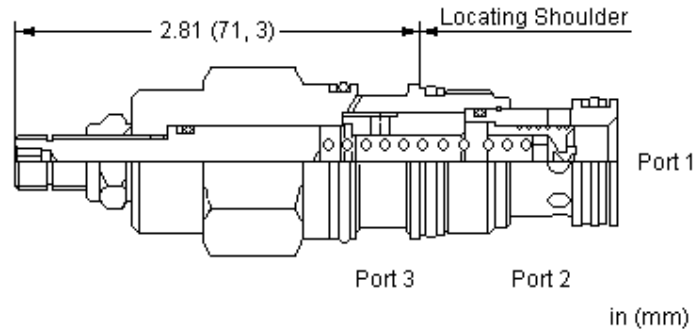
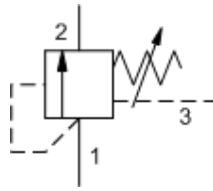
BIAS PRESSURE	(D)	SEAL MATERIAL	(N)
D 50 psi (3,5 bar)		N Buna-N	
		E EPDM	
		V Viton	

TECHNICAL FEATURES

- 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 logic 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 ports will accept 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.

RELATED MODELS

- [LPJA](#) Normally open, modulating element with pilot source from port 1



Normally closed modulating elements without an internal orifice act as a bypass compensator to maintain a constant pressure drop across an orifice, regardless of variations in upstream or downstream pressure.

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
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	0.31 kg.

CONFIGURATION OPTIONS

Model Code Example: LRFCLDN

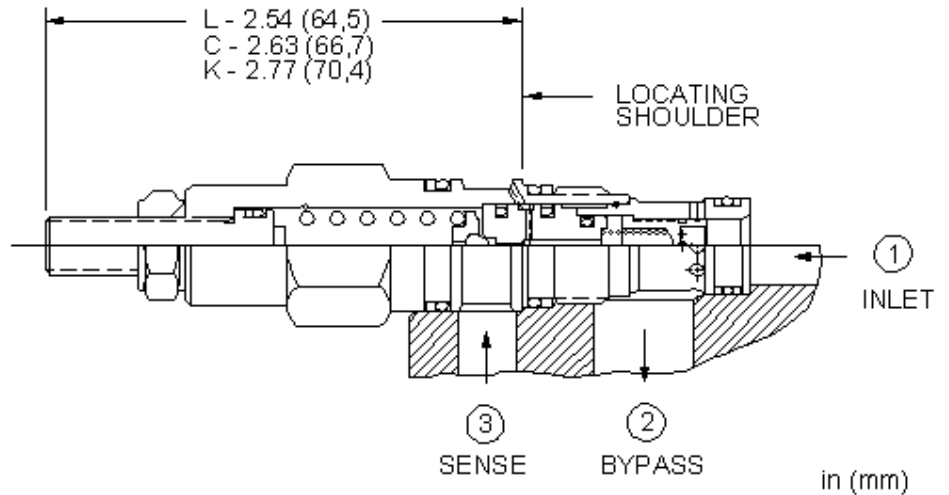
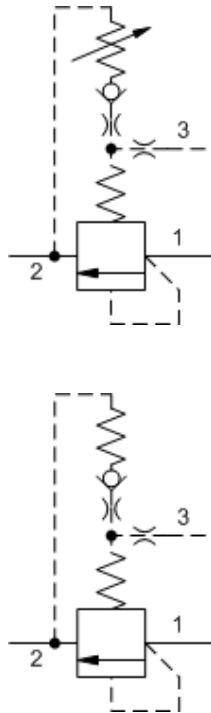
DIFFERENTIAL PRESSURE	(D) SEAL MATERIAL	(N) MATERIAL/COATING
D 50 psi (3,5 bar)	N Buna-N	Standard Material/Coating
F 100 psi (7 bar)	E EPDM	/AP Stainless Steel, Passivated
	V Viton	/LH Mild Steel, Zinc-Nickel

TECHNICAL FEATURES

- A tuning adjustment (models configured with an L control) is available to vary the pressure drop across the compensator to increase/decrease flow within +/-25% of setting.
- All ports will accept 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.

RELATED MODELS

- [LRFC](#) Normally closed, modulating element



Three-port normally closed modulating elements with relief provide two functions when combined with an external orifice. The mainstage is a bypass compensator that controls a priority flow into the circuit, determined by the external orifice. Input flow in excess of the priority flow is bypassed to tank (port 2). If the inlet (port 1) pressure rises to the valve setting, the valve operates as a normal relief valve.

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	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	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

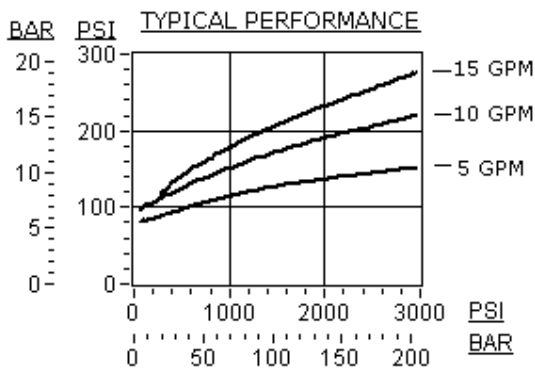
Model Code Example: RVBBLAN

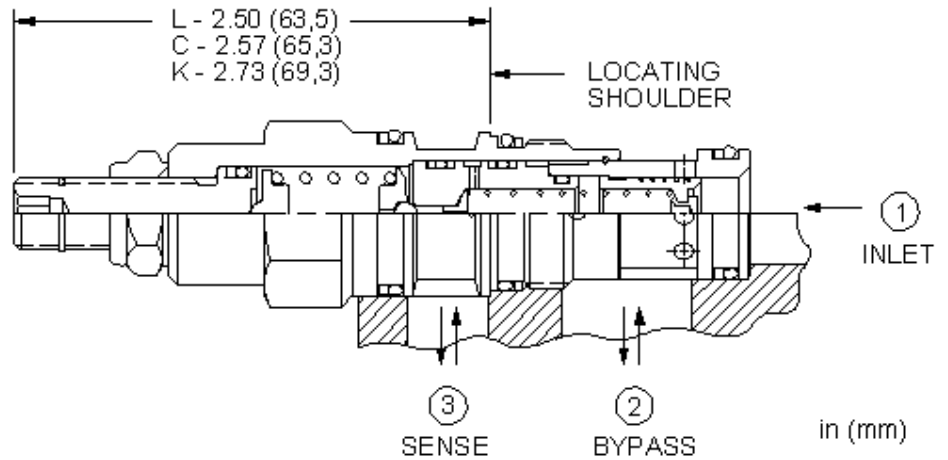
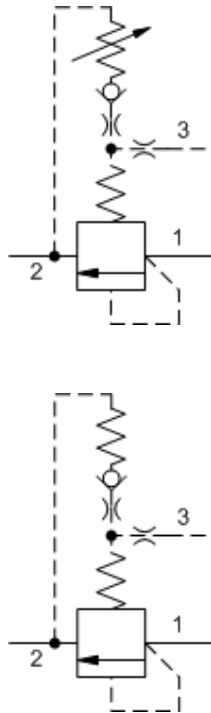
CONTROL	(L)	ADJUSTMENT RANGE	(A)	SEAL MATERIAL	(N)
L	Standard Screw Adjustment	A	75 - 3000 psi (5 - 210 bar), 1000 psi (70 bar) Standard Setting	N	Buna-N
C	Tamper Resistant - Factory Set	B	75 - 1500 psi (5 - 105 bar), 1000 psi (70 bar) Standard Setting	V	Viton
K	Handknob	C	75 - 6000 psi (5 - 420 bar), 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

- Compensating pressure for all ranges is 50 psi (3,5 bar).
- Explanation of the performance curve: The X axis is system pressure. The Y axis shows the pressure differential that the valve creates across the control orifice. The curves represent various bypass flows (pump flow minus control flow). The capacity and performance of this valve is determined by the bypass flow, control flow is not a factor.

PERFORMANCE CURVES





Three-port normally closed modulating elements with relief provide two functions when combined with an external orifice. The mainstage is a bypass compensator that controls a priority flow into the circuit, determined by the external orifice. Input flow in excess of the priority flow is bypassed to tank (port 2). If the inlet (port 1) pressure rises to the valve setting, the valve operates as a normal relief valve.

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 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	Polyurethane: 990011002
Seal kit - Cartridge	Viton: 990011006
Model Weight	0.16 kg.

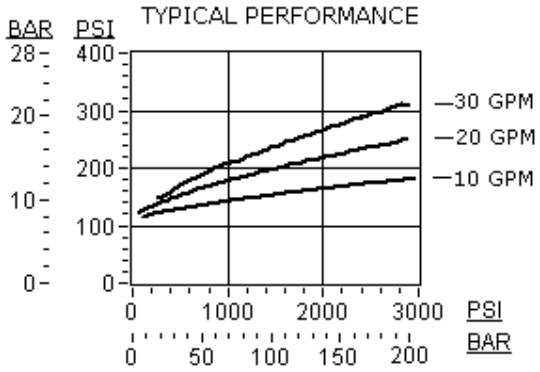
CONFIGURATION OPTIONS
Model Code Example: RVCBLAN

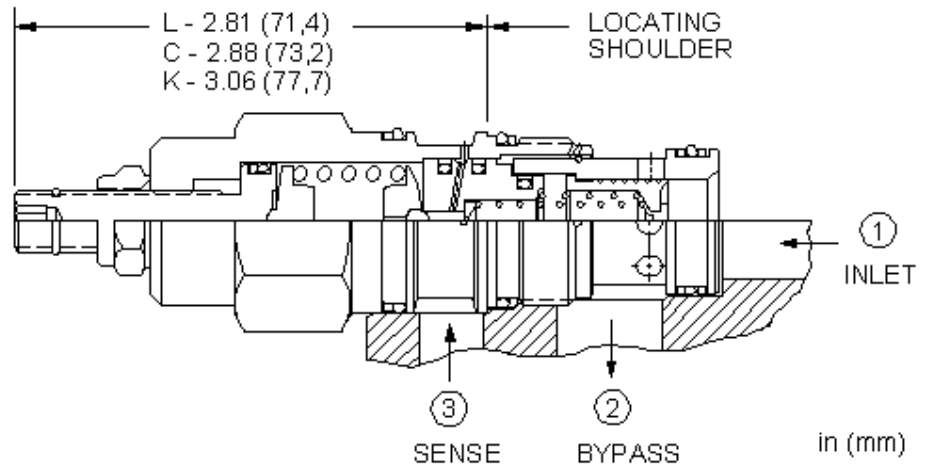
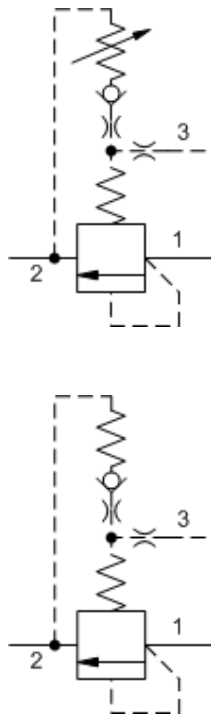
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	A 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	N Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set	B 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting	V 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

TECHNICAL FEATURES

- Compensating pressure for the A range is 45 psi (3 bar), for the B range 30 psi (2 bar), and for the C range 100 psi (7 bar).
- Explanation of the performance curve: The X axis is system pressure. The Y axis shows the pressure differential that the valve creates across the control orifice. The curves represent various bypass flows (pump flow minus control flow). The capacity and performance of this valve is determined by the bypass flow, control flow is not a factor.

PERFORMANCE CURVES





Three-port normally closed modulating elements with relief provide two functions when combined with an external orifice. The mainstage is a bypass compensator that controls a priority flow into the circuit, determined by the external orifice. Input flow in excess of the priority flow is bypassed to tank (port 2). If the inlet (port 1) pressure rises to the valve setting, the valve operates as a normal relief valve.

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	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: 990202007
Seal kit - Cartridge	Polyurethane: 990002002
Seal kit - Cartridge	Viton: 990202006
Model Weight	0.29 kg.

CONFIGURATION OPTIONS

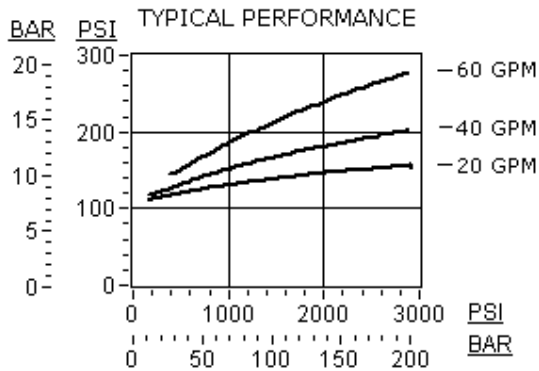
Model Code Example: RVEBLAN

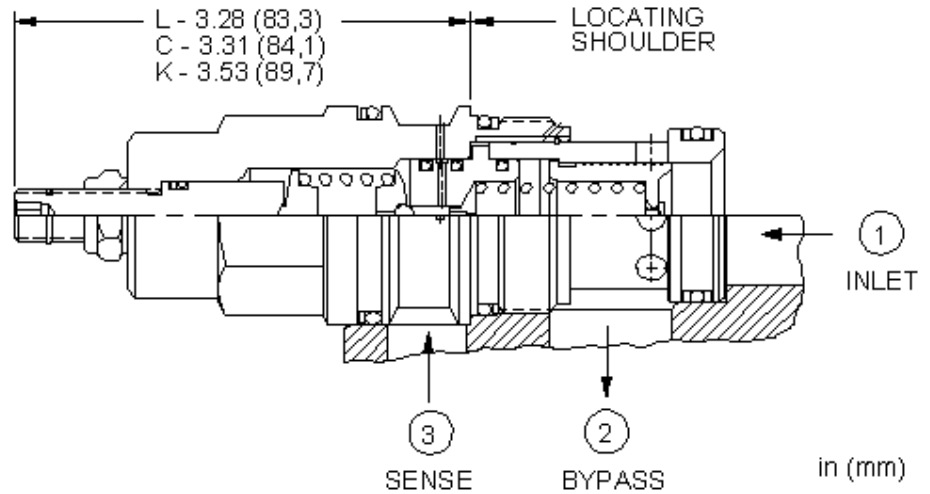
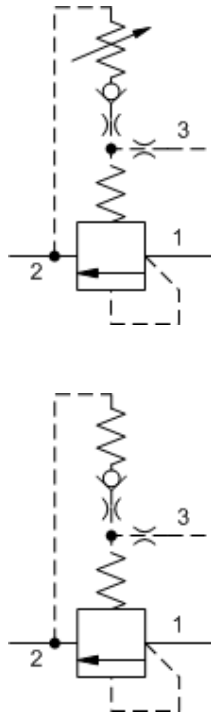
CONTROL	(L) ADJUSTMENT RANGE	(A) SEAL MATERIAL	(N) MATERIAL/COATING
L Standard Screw Adjustment	A 100 - 3000 psi (7 - 210 bar), 1000 psi (70 bar) Standard Setting	N Buna-N	Standard Material/Coating
C Tamper Resistant - Factory Set		V Viton	/AP Stainless Steel, Passivated
K Handknob	B 50 - 1500 psi (3,5 - 105 bar), 1000 psi (70 bar) Standard Setting		
W Hex Wrench Adjustment	C 100 - 6000 psi (7 - 420 bar), 1000 psi (70 bar) Standard Setting		
Y Tri-Grip Handknob	W 100 - 4500 psi (7 - 315 bar), 1000 psi (70 bar) Standard Setting		

TECHNICAL FEATURES

- Compensating pressure for all ranges is 120 psi (8 bar).
- Explanation of the performance curve: The X axis is system pressure. The Y axis shows the pressure differential that the valve creates across the control orifice. The curves represent various bypass flows (pump flow minus control flow). The capacity and performance of this valve is determined by the bypass flow, control flow is not a factor.
- 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.

PERFORMANCE CURVES





Three-port normally closed modulating elements with relief provide two functions when combined with an external orifice. The mainstage is a bypass compensator that controls a priority flow into the circuit, determined by the external orifice. Input flow in excess of the priority flow is bypassed to tank (port 2). If the inlet (port 1) pressure rises to the valve setting, the valve operates as a normal relief valve.

TECHNICAL DATA

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

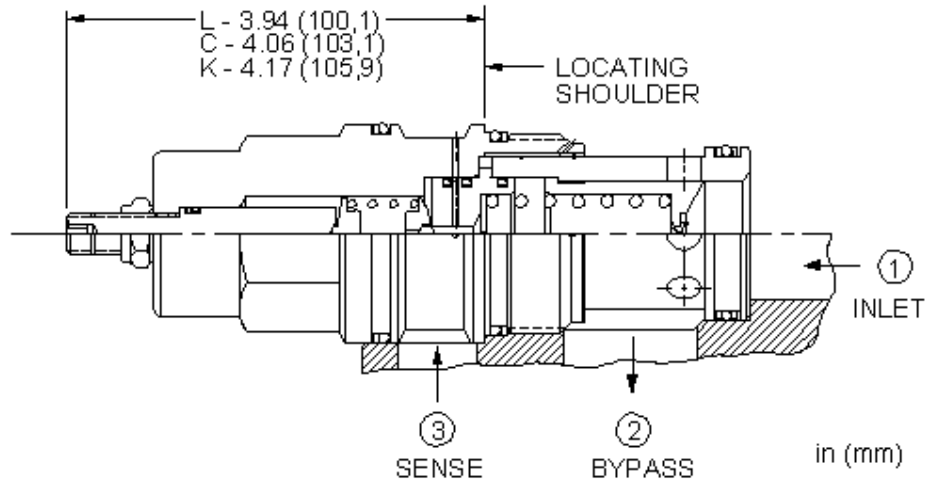
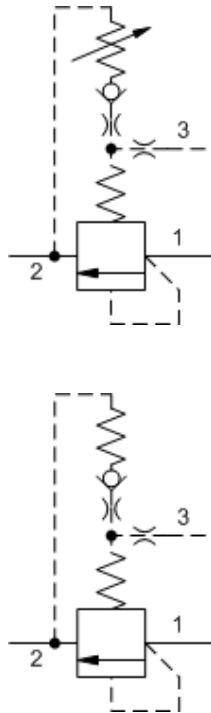
Cavity	T-17A
Series	3
Capacity	160 L/min.
Factory Pressure Settings Established at	15 L/min.
Maximum Operating Pressure	350 bar
Maximum Valve Leakage at 110 SUS (24 cSt)	65 cc/min.@70 bar
Response Time - Typical	10 ms
Adjustment - No. of CW Turns from Min. to Max. setting	5
Valve Hex Size	31,8 mm
Valve 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: 990017007
Seal kit - Cartridge	Polyurethane: 990017002
Seal kit - Cartridge	Viton: 990017006
Model Weight	0.62 kg.

CONFIGURATION OPTIONS
Model Code Example: RVGBLAN

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 150 - 1500 psi (10,5 - 105 bar), 1000 psi (70 bar) Standard Setting	V Viton	/AP Stainless Steel, Passivated
K Handknob	C 100 - 6000 psi (7 - 420 bar), 1000 psi (70 bar) Standard Setting		

TECHNICAL FEATURES

- Compensating pressure for all ranges is 120 psi (8 bar).
- Explanation of the performance curve: The X axis is system pressure. The Y axis shows the pressure differential that the valve creates across the control orifice. The curves represent various bypass flows (pump flow minus control flow). The capacity and performance of this valve is determined by the bypass flow, control flow is not a factor.



Three-port normally closed modulating elements with relief provide two functions when combined with an external orifice. The mainstage is a bypass compensator that controls a priority flow into the circuit, determined by the external orifice. Input flow in excess of the priority flow is bypassed to tank (port 2). If the inlet (port 1) pressure rises to the valve setting, the valve operates as a normal relief valve.

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	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: 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: RVIBLAN

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		E EPDM	
K Handknob		C 150 - 6000 psi (10,5 - 420 bar), 1000 psi (70 bar) Standard Setting		V Viton	

TECHNICAL FEATURES

- Compensating pressure for all ranges is 90 psi (6 bar).
- Explanation of the performance curve: The X axis is system pressure. The Y axis shows the pressure differential that the valve creates across the control orifice. The curves represent various bypass flows (pump flow minus control flow). The capacity and performance of this valve is determined by the bypass flow, control flow is not a factor.
- 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.

PERFORMANCE CURVES

