Directly Operated Pressure Relief Valves

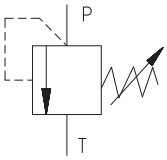
SR1A-A2

3/4-16 UNF • p_{max} 350 bar (5080 PSI) • Q_{max} 30 L/min (7.9 GPM)

HA 5063
7/2012

Replaces
HA 5063 8/2010

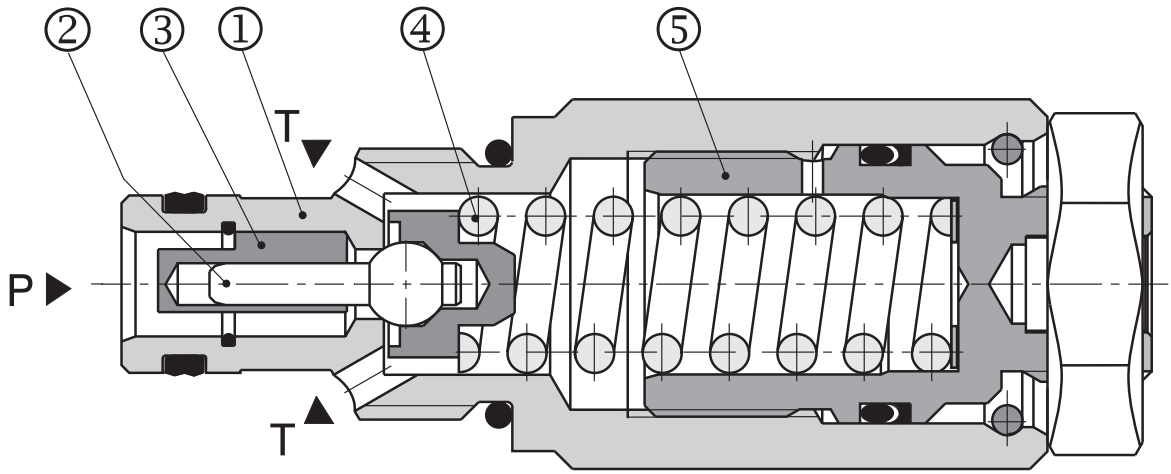
- ❑ **Screw-in cartridge design**
- ❑ **4 pressure ranges**
- ❑ **Pressure setting by hexagon socket**



Functional Description

The directly operated pressure relief valve SR1A-A2 consists basically of the valve housing (1), ball with damping spool (2), damping bush (3), spring (4) and setting screw (5). The pressure setting is accomplished by setting screw (5) with hexagon socket. The spring pushes the ball into the valve seat created directly in the valve housing and holds the valve closed. When the pressure in port P exceeds the pressure magnitude set by the setting screw, the ball is lifted up from the seat and the fluid flows out to port T. To optimize the valve performance, the whole pressure range is divided into 4 pressure ranges. Choosing the next higher pressure range is always recommended.

In basic version the valve housing and the setting screw are zinc coated.



Ordering Code

SR1A-A2 / □ □

Directly Operated Pressure Relief Valve
3/4-16 UNF

Standard **S**

Pressure range
6 up to 60 bar (870 PSI)
10 up to 100 bar (1450 PSI)
16 up to 160 bar (2320 PSI)
25 up to 250 bar (3626 PSI)
35 up to 350 bar (5076 PSI)

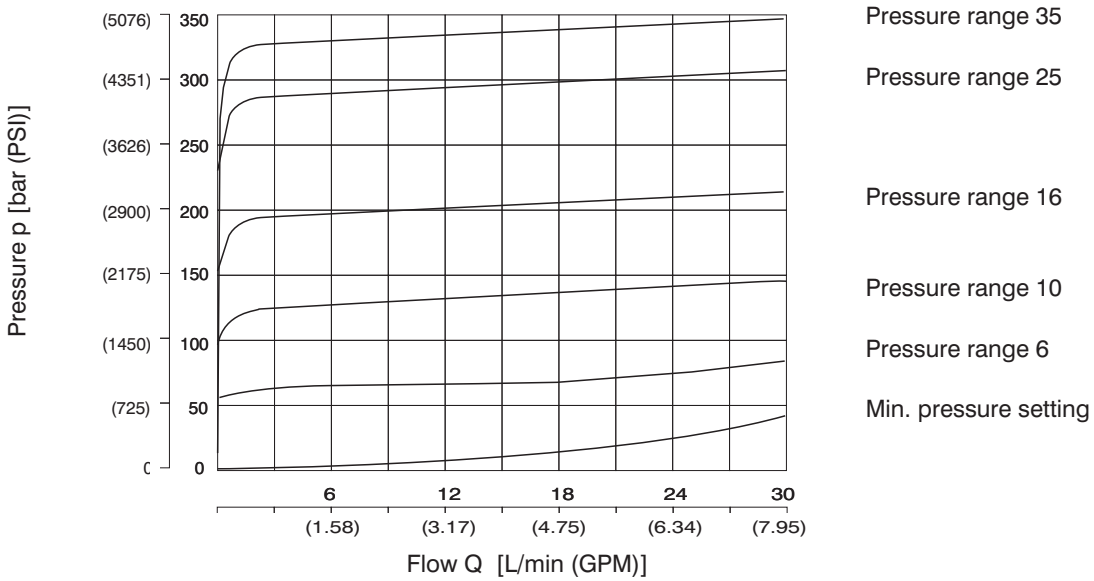
Seals
without designation NBR
V FPM (Viton)

Technical Data

Valve size		A2
Cartridge cavity		3/4 -16 UNF-2A
Max. flow rate	L/min (GPM)	30 (7.9)
Max. service pressure port P)	bar (PSI)	350 (5076)
Max. output pressure (port T)	bar (PSI)	160 (2320)
Working pressure related to flow	bar (PSI)	see p-Q characteristics
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51524
Fluid temperature range for standard (NBR)	°C (°F)	-30 ... +100 (-22 ... 212)
Fluid temperature range for Viton FPM)	°C (°F)	-20 ... +120 (-4 ... 248)
Viscosity range	mm^2/s (SUS)	10 ... 500 (49 ... 2450)
Max. degree of fluid contamination		Class 21/18/15 according to ISO 4406
Weight	kg (lbs)	0.13 (2.866)
Maximum valve tightening torque	Nm (lbf.ft)	30+2 (22.13+1.48 lbf.ft)
Mounting position		unrestricted
Valve body (data sheet HA 0018)		SB-A2

p-Q Characteristics

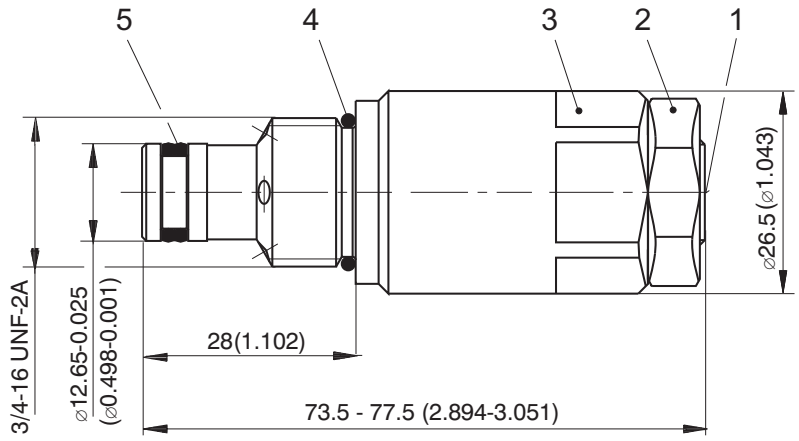
Measured at $\nu = 32\ mm^2/s$ (156 SUS)



Valve Dimensions

Dimensions in millimetres (inches)

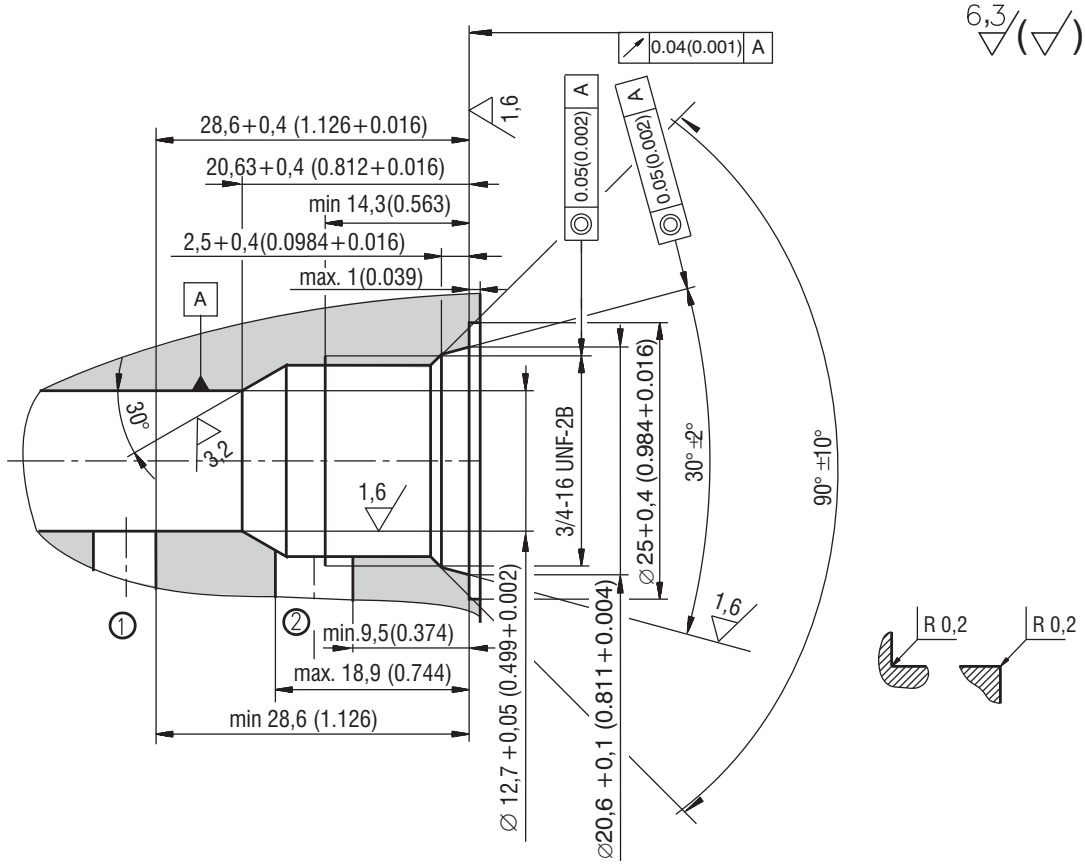
Screw-in Cartridge Design



1 Adjustment element (screw with internal HEX 6)
Clockwise rotation = pressure increase
Anticlockwise rotation = pressure decrease
2 Locknut HEX 21
- tightening torque 15 Nm (11 lbf.ft)
3 Wrench flats HEX 24
- tightening torque 30 Nm (22 lbf.ft)
4 O-ring 17 x 1.8 (supplied with valve)
5 Combined sealing:
Dualseal DRYZ000004Z20
10.3 x 12.7 x 3.1 (supplied with valve)

Cavity

Dimensions in millimetres (inches)



Spare Parts

Seal kit				Ordering number
Dualseal - PU	**O-ring - NBR**	**O-ring - NBR**	**Back-up ring - NBR**	22531100
10.3 x 12.7 x 3.1 (1pc.)	17 x 1.8 (1pc.)	17.17 x 1.78 (1pc.)	16.33 x 19.03 x 1.14 (1pc.)	
Dualseal - PU	**O-ring - Viton**		**Back-up ring - Viton**	22531000
10.3 x 12.7 x 3.1 (1pc.)	17.17 x 1.78 (2pcs.)		16.33 x 19.03 x 1.14 (1pc.)	

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Directly Operated Pressure Relief Valves

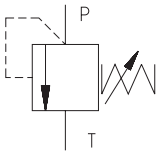
SR1A-B2

7/8-14 UNF • p_{max} 420 bar (6092 PSI) • Q_{max} 60 L/min (15.85 GPM)

HA 5064
7/2012

Replaces
HA 5064 1/2011

- **Screw-in cartridge design**
- **7 pressure ranges**
- **Pressure setting by**
  - **Hexagon set screw lock**
  - **Adjustable handknob**



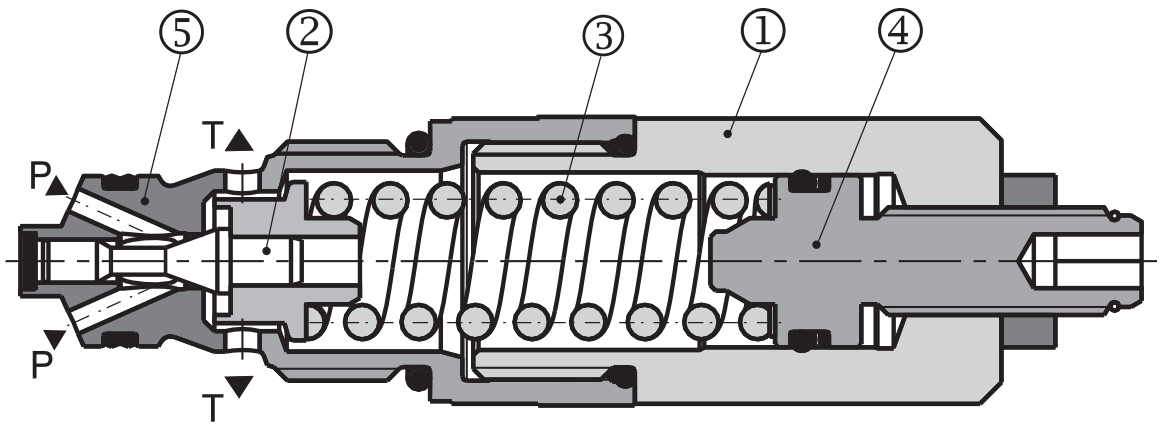
Functional Description

Directly operated pressure relief valves SR1A-B2 were designed for applications requiring a safety valve or a pressure regulating valve working over a wide range of pressures and flow rates.
The valve basically consists of the valve body (1), poppet with damping spool (2), spring (3) and adjusting screw (4). The spring pushes the poppet into the seat (5) and holds the valve in its normally closed position. When the force, caused by the input pressure, exceeds the spring force, the valve opens and and the flow passes from port P to port T.

To optimize the valve performance seven pressure ranges the valve are available. Choosing the closest range is recommended.

The design enables the valve to be used as a screw-in cartridge for manifold mounting, or in a subplate and/or in-line mounted housing.

The valve body and the adjustment screw are zinc coated.



Ordering Code

SR1A-B2 / □ □ □ □

Directly Operated Pressure Relief Valve
7/8-14 UNF

High performance — **H**

Pressure range

up to 25 bar (363 PSI)	**2,5**
up to 63 bar (914 PSI)	**6,3**
up to 100 bar (1450 PSI)	**10**
up to 160 bar (2321 PSI)	**16**
up to 250 bar (3626 PSI)	**25**
up to 350 bar (5076 PSI)	**35**
up to 420 bar (6092 PSI)	**42**

Adjustment option

S	Hexagon set screw locknut 5 mm
R	Adjustable handknob

Seals

without designation	NBR (Standard)
V	FPM (Viton)

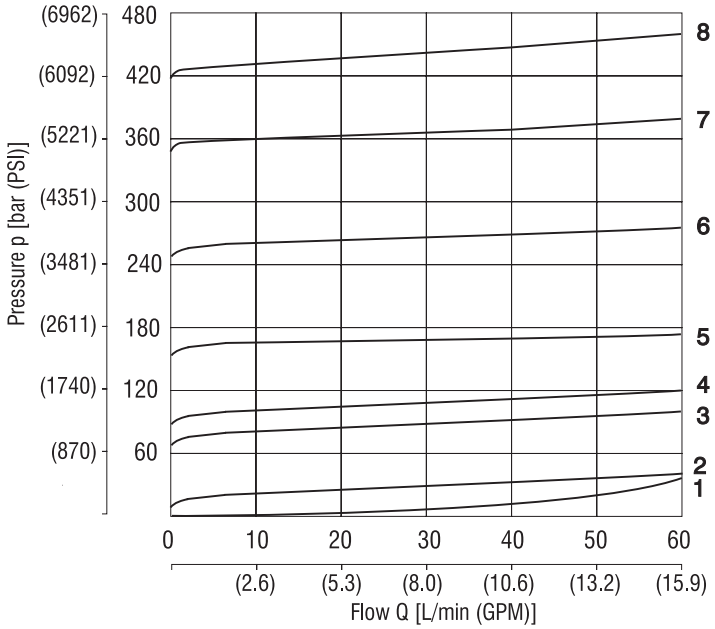
Technical Data

Valve size		B2
Cartridge thread		7/8-14UNF-2A
Maximum flow	L/min (GPM)	60 (15.85)
Max. input pressure (port P)	bar (PSI)	420 (6092)
Max. output pressure (port T)	bar (PSI)	250 (3626)
Pressure drop	bar (PSI)	see Δp-Q characteristics
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51524
Fluid temperature range for standard sealing (NBR)	°C (°F)	-30 ... +100 (-22 ... 212)
Fluid temperature range for Viton sealing (FPM)	°C (°F)	-20 ... +120 (-4 ... 248)
Viscosity range	mm^2/s (SUS)	10 ... 500 (49 ... 2450)
Maximum degree of fluid contamination		Class 21/18/15 according to ISO 4406
Weight	kg (lbs)	0,25(0.55)
Maximum valve tightening torque	Nm (lbf.ft)	50+5 (36.88+3.68)
Mounting position		unrestricted
Valve body (data sheet HA 0018)		SB-B2

p-Q Characteristics

Measured at $\nu = 32\ mm^2/s$ (156 SUS)

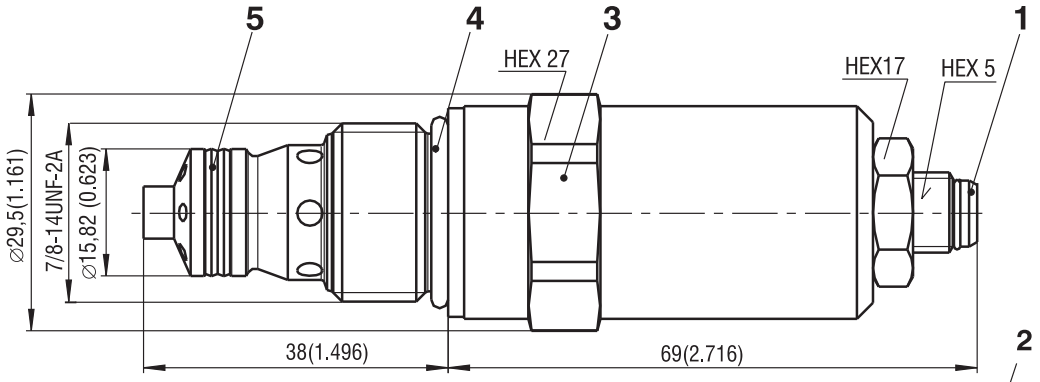
Pressure drops related to flow rate.

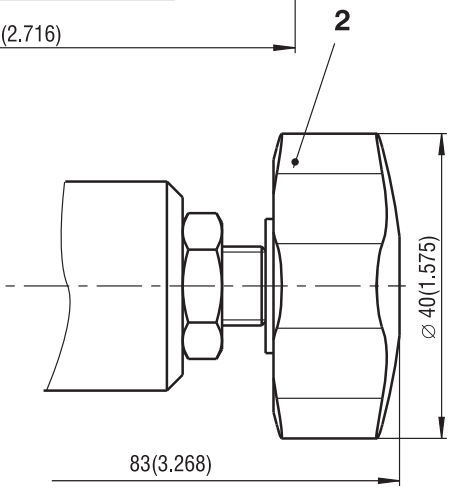


8	Pressure range 42
7	Pressure range 35
6	Pressure range 25
5	Pressure range 16
4	Pressure range 10
3	Pressure range 6,3
2	Pressure range 2,5
1	Min. pressure setting

Valve Dimensions

Dimensions in millimetres (inches)

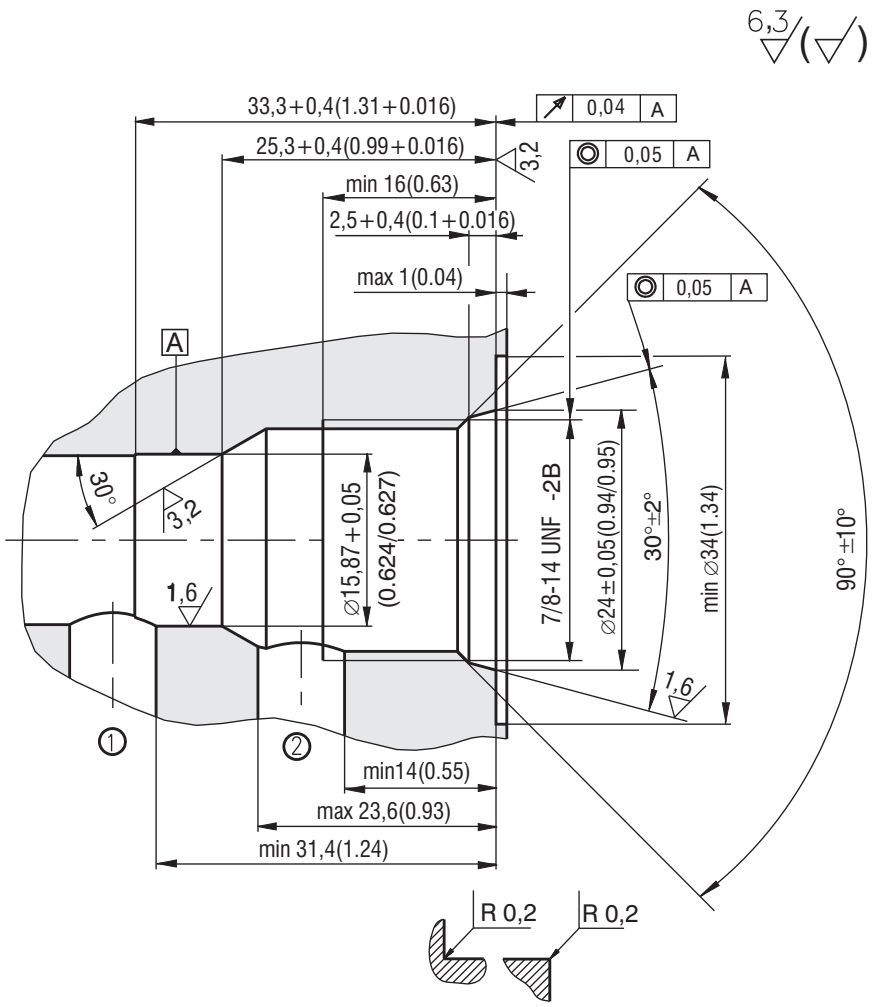




1 Adjustment element "S" (inside HEX 5)
Clockwise rotation = pressure increase
Anticlockwise rotation = pressure decrease
2 Adjustable handknob model "R"
3 Wrench flats HEX 27 - tightening torque 50+5 Nm (36.88+3.68 lbf.ft)
4 O-ring 19,4 x 2,1 -supplied with valve
5 Combined sealing:
Dualseal DRYZ000004Z20
13,47 x 15,87 x 3,1(PU) - supplied with valve

Cavity

Dimensions in millimetres (inches)



Spare Parts

Seal kit		Ordering number
Dualseal - PU	**O-ring - NBR**	18775600
DRYZ000002Z20 13,47 x 15,87 x 3,1 (1pc.)	19,4 x 2,1 (1pc.)	

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Pilot Operated Pressure Relief Valves

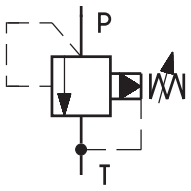
SR4A-B2

7/8-14 UNF • p_{max} 350 bar (5076 PSI) • Q_{max} 100 L/min (26.4 GPM)

HA 5065
01/2014

Replaces
HA 5065 Ęąć20áđ

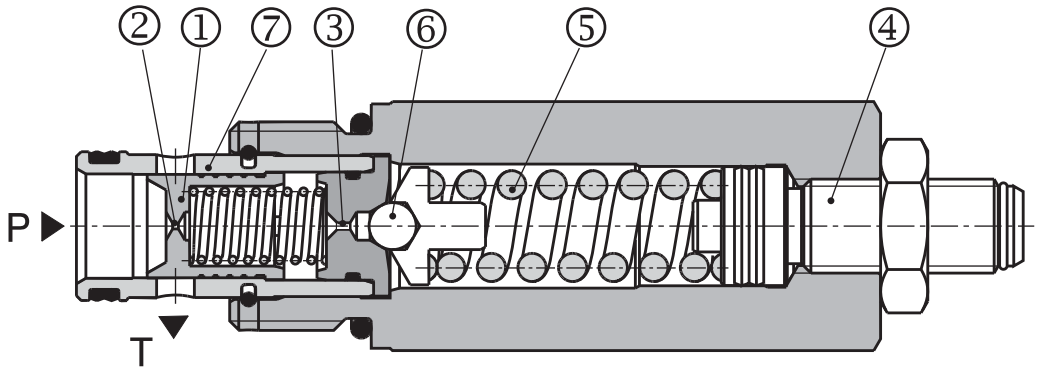
- ❑ **Screw-in cartridge design**
- ❑ **5 pressure ranges**
- ❑ **Pressure setting by**
  - Hexagon set screw lock
  - Adjustable handknob



Functional Description

Pressure relief valves SR4A-B2 are pilot operated pressure valves designed for system pressure limitation. The pressure adjustment provides the adjustment screw (4). In its basic state, the valve is closed. The pressure acts on the face area of the control spool (1) and at the same time through orifice (2) on the control spool rear side, which is preloaded by a spring and further on through orifice (3) on the pilot valve ball (6). When the increasing system pressure reaches the value, which is preset by spring (5), the valve opens and the control flow passes through the pilot valves. The spool area which is preloaded by the spring becomes relieved, the spool control edge opens the radial bores in bushing (7) and the fluid passes from port P to T. The control flow is routed through groove to channel T.

The valve body and the adjustment screw are zinc coated.



Ordering Code

SR4A-B2 / □ □ □ □

Pilot Operated Pressure Relief Valve
7/8 -14 UNF

High performance **H**

Pressure range

up to 63 bar (914 PSI)	**6,3**
up to 100 bar (1450 PSI)	**10**
up to 160 bar (2320 PSI)	**16**
up to 250 bar (3626 PSI)	**25**
up to 350 bar (5076 PSI)	**35**

Seals

without designation	NBR
V	FPM (Viton)

Adjustment option

S	Hexagon set screw locknut 5mm)
R	Adjustable handknob

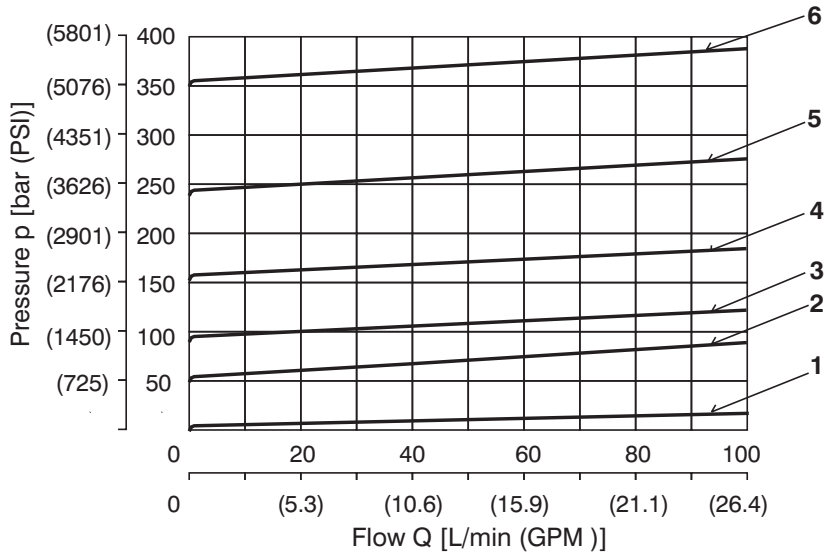
Technical Data

Valve size		B2
Cartridge thread		7/8 -14 UNF-2A
Max. flow rate	L/min (GPM)	100 (26.4)
Max. input pressure (port P)	bar (PSI)	6.3 (914) 100 (1450) 160 (2320) 250 (3626) 350 (5076)
Max. output pressure (port T)	bar (PSI)	100 (1450)
Working pressure related to flow	bar (PSI)	see p-Q characteristics
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51524
Fluid temperature range for standard sealing (NBR)	°C (°F)	-30 ... +100 (-22 ... 212)
Fluid temperature range for Viton sealing (FPM)	°C (°F)	-20 ... +120 (-4 ... 248)
Viscosity range	mm^2/s (SUS)	10 ... 500 (49 ... 2450
Max. degree of fluid contamination		Class 21/18/15 according to ISO 4406
Weight	kg (lbs)	0.24 (0.53)
Maximum valve tightening torque	Nm (lbf.ft)	35+5 (25.8+3.7 lbf.ft)
Mounting position		unrestricted
Valve body (data sheet HA 0018)		SB-B2

p-Q Characteristics

Measured at $\nu = 32\ mm^2/s$ (156 SUS)

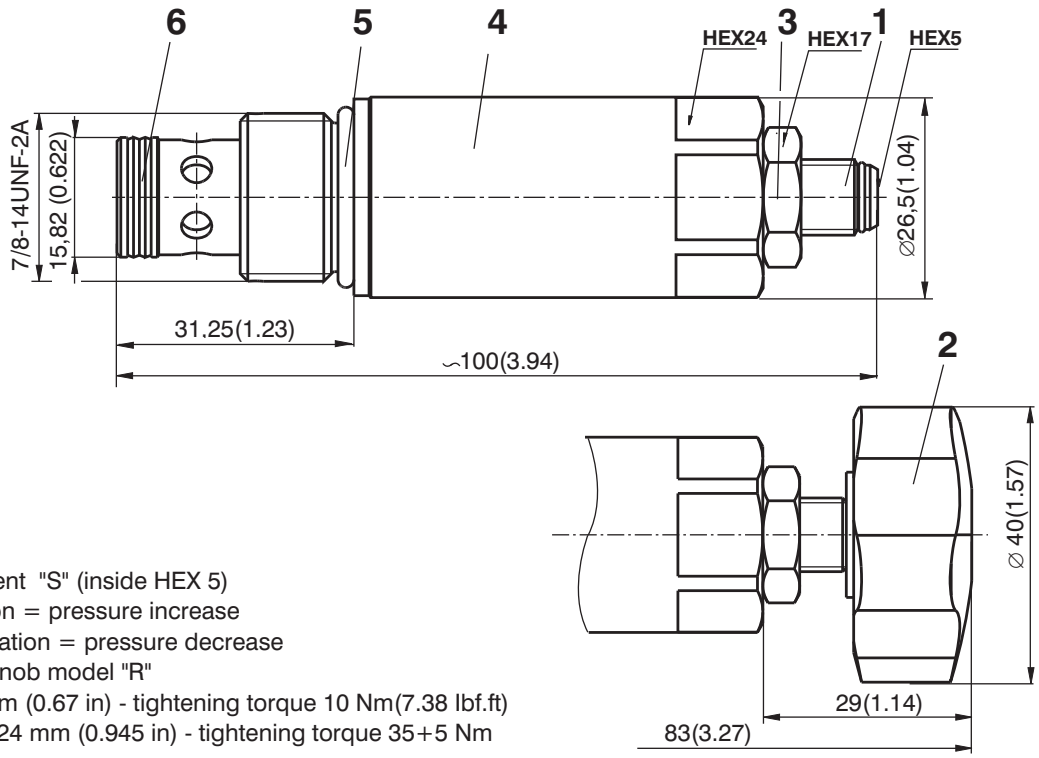
Pressure drops related to flow rate.



6	Pressure range 35
5	Pressure range 25
4	Pressure range 16
3	Pressure range 10
2	Pressure range 6,3
1	Min. pressure setting

Valve Dimensions

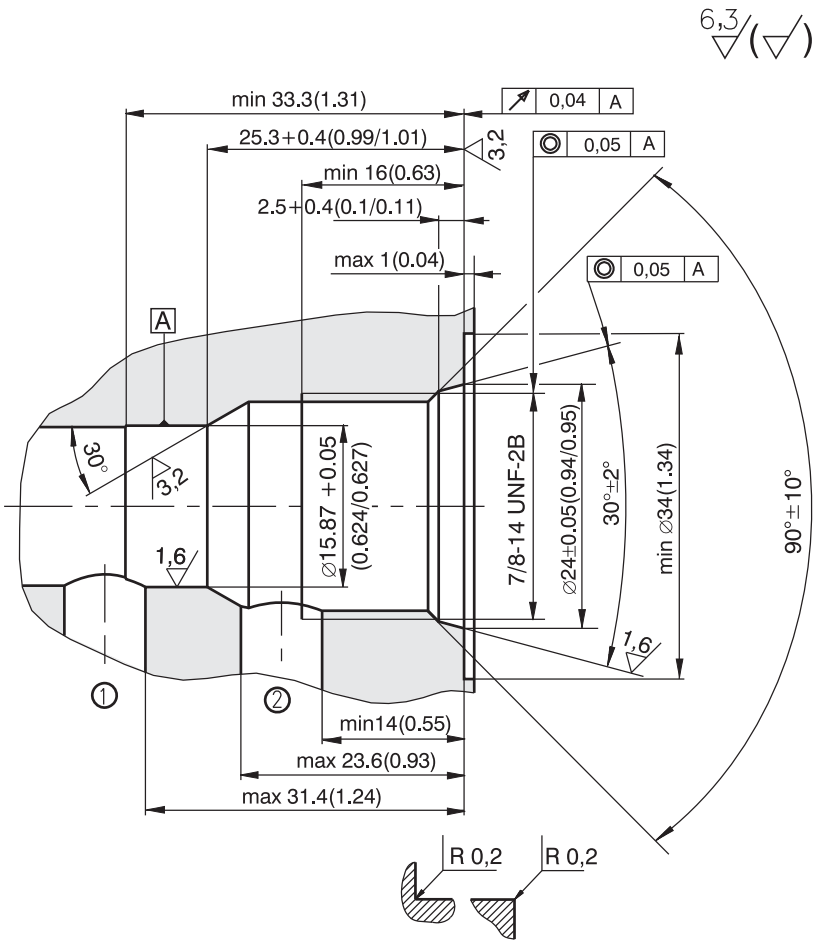
Dimensions in millimetres (inches)



1 Adjustment element "S" (inside HEX 5)
Clockwise rotation = pressure increase
Anticlockwise rotation = pressure decrease
2 Adjustable handknob model "R"
3 Locknut s = 17mm (0.67 in) - tightening torque 10 Nm(7.38 lbf.ft)
4 Wrench flats s = 24 mm (0.945 in) - tightening torque 35+5 Nm (25.8+3.7 lbf.ft)
5 O-ring 19,4 x 2,1 (supplied with valve)
6 Combined sealing:
Dualseal DRYZ000002Z20 13,47x15,87x3,1 (supplied with valve)

Cavity

Dimensions in millimetres (inches)



Spare Parts

Seal kit		Ordering number
Dualseal - PU	**O-ring - NBR**	18775600
DRYZ000002Z20 13,47 x 15,87 x 3,1 (1pc.)	19,4 x 2,1 (1pc.)	

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Solenoid Controlled Pilot Operated Pressure Relief Valve

SR4E2-B2

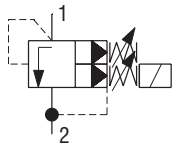
7/8-14 UNF • p_{max} 350 bar (5076 PSI) • Q_{max} 60 L/min (15.85 GPM)

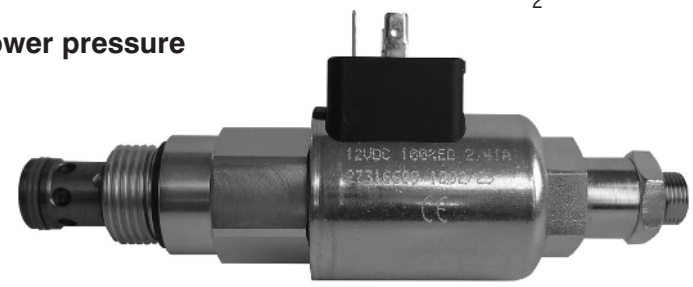
HA 5068
6/2014

Replaces
HA 5068 3/2013

- ❑ **Built-in design**
- ❑ **Three pressure ranges**
- ❑ **Mechanical adjustment of upper and lower pressure**

Expanded symbol:
(when lower pressure is set to 0 bar)

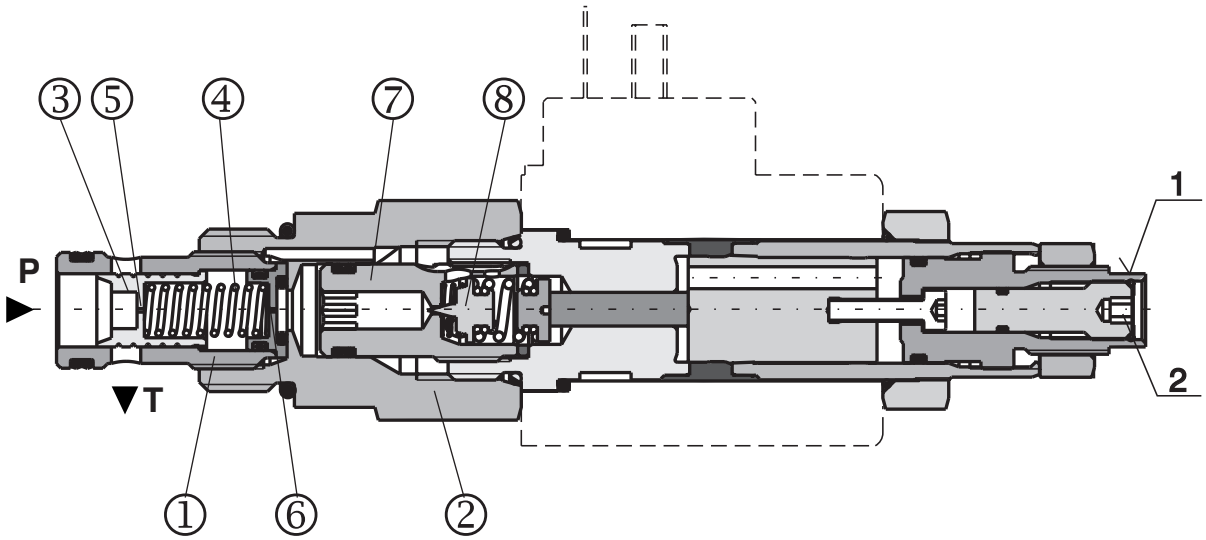




Functional Description

The valve is used as integrated double functional valve for unloading the flow passage and when energized by electrical signal it lock the flow passage and allows to set the relief pressure in hydraulic circuit. Pressure level is manually adjustable on the valve.
Valve is of pilot operated design and thus suitable for operation of high hydraulic powers.
The valve consists of a control (pilot) valve and the main stage valve. The main stage is a spool valve, control valve is a poppet valve.
Setting of the upper pressure limit is achieved with energized solenoid using the screw pos.1. Setting of the lower pressure limit is achieved with switched off solenoid using the screw pos. 2. Port P, where the pressure is controlled, is connected by orifices (5) and (6) to the pilot valve. The hydraulic fluid is drained by the main valve body radial holes (2) to port T.
When the valve is closed, the pressure affects the face of the spool (3) and simultaneously through orifice (5) to the other side loaded by the spring (4) and then through the orifice (6) to the cone (8) of the pilot valve. The control cone (8) creates a variable resistance against the seat (7). When the increasing pressure in the system reaches the values preset by the pilot valve, the fluid begins to flow through it, allowing flow through orifices (5) and (6), at which a pressure drop occurs. This leads to power balance change and the spool (3) of the main stage compress spring (4) opening the radial holes in the housing (1). This creates a flow P-T. To ensure self bleeding it is recommended to install the valve in a vertical position with the solenoid facing downwards. Self bleeding is necessary for proper function of the valve.

The body of the main and pilot valve are zinc coated.



Ordering Code

SR4E2-B2 / ☐ ☐ ☐

Solenoid Controlled Pilot Operated Pressure Relief Valve

High Performance — **H**

Pressure Range
- **12** — up to 120 bar (1740 PSI)
- **21** — up to 210 bar (3046 PSI)
- **35** — up to 350 bar (5076 PSI)

Seals
- **V** — FPM (Viton)

Solenoid coil must be ordered separately.
For solenoid selection please use catalogue HA 8007.

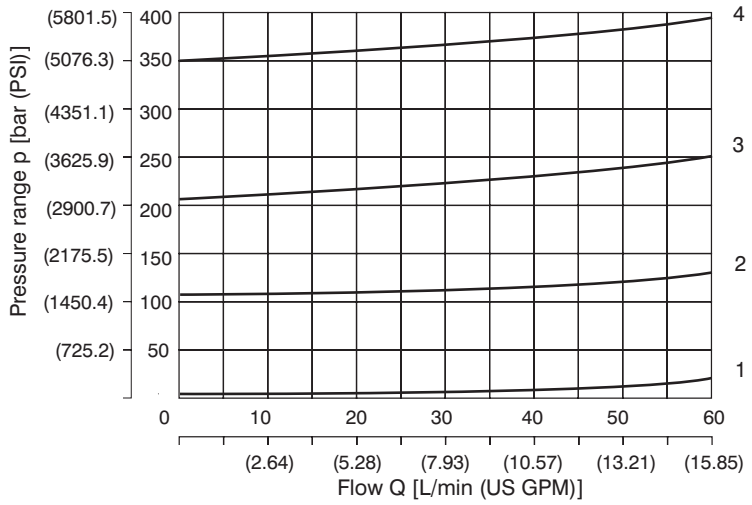
Technical Data

Valve size		B2
Cartridge Cavity		7/8-14UNF-2A
Maximum operating pressure at ports P	bar (PSI)	350 (5076)
Maximum operating pressure at ports T*	bar (PSI)	100 (1450)
Flow range	l/min (GPM)	0 ... 60 (0 ...15.85)
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51524
Fluid temperature range (FPM)	°C (°F)	-30 ...+90 (-22 ... +194)
Ambient temperature max	°C (°F)	+50 (122)
Viscosity range	mm^2/s (SUS)	10 ... 500 (49 ... 2450)
Maximum valve tightening torque	Nm (lbf.ft)	50+5 (36.9+3.7)
Maximum degree of fluid contamination		Class 21/18/15 according to ISO 4406 (1999)
Minimum reachable pressure for Q = 5 L/min (1.321 GPM)	bar (PSI)	~ 7 (101,5)
Weight	kg (lb)	0,556 (1.226)
Mounting position		When possible, the valve should be mounted vertically with the solenoid faced down.
Valve body (data sheet HA 0018)		SB-B2

*Pressure in T influences p = f(I) a p = f(Q) valve performance

p-Characteristic

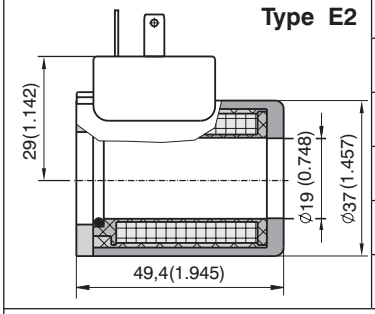
Measured at ν = 32 mm^2/s (156 SUS)



4	Pressure range 35	Typical performance
3	Pressure range 21	
2	Pressure range 12	
1	Min. pressure (range 35)	Deenergized

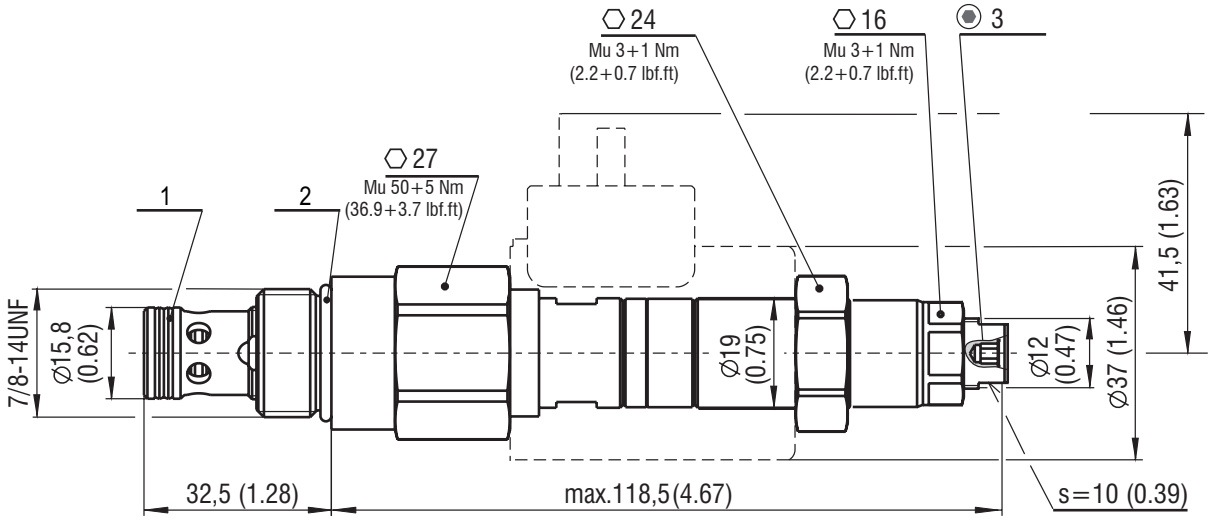
Solenoid Coil Data Sheet

Note:
Examples of most frequent coil types.
For complete range of valve coils with technical information about voltage, enclosure type and terminal, please refer to coil data sheet HA 8007.

Coil example	Voltage	Connector	Type code
	12 VDC	E2 - EN 175301-803-A with quenching diode	C19B-01200E1-4,9NA
	24 VDC	E2 - EN 175301-803-A with quenching diode	C19B-02400E1-20,8NA
	12 VDC	E4 - AMP Junior Timer with quenching diode	C19B-01200E3-4,9NA
	24 VDC	E4 - AMP Junior Timer with quenching diode	C19B-02400E3-20,8NA
	12 VDC	E13 - Deutsch DT04-2P with quenching diode	C19B-01200E12-4,9NA
	24 VDC	E13 - Deutsch DT04-2P with quenching diode	C19B-02400E12-20,8NA

Valve Dimensions

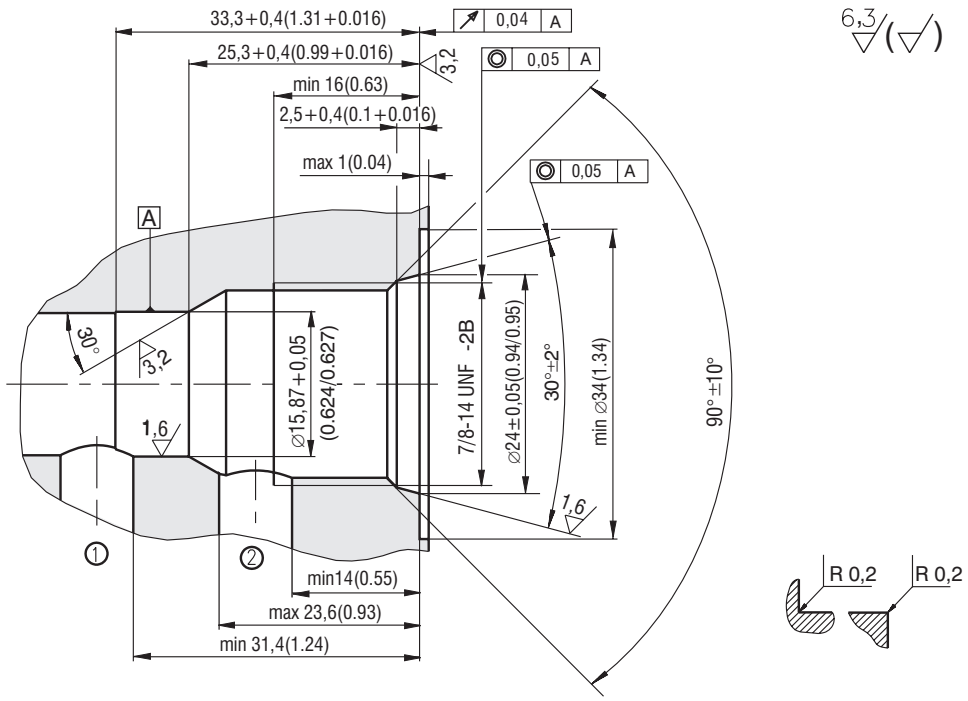
Dimensions in millimeters and (inches)



Seal kit (Main valve)
- see Spare Parts
1. Dualseal - PU
2. O-ring - Viton

Cavity

Dimensions in millimeters and (inches)



Spare Parts

Solenoid coil	Type of the coil		
	E2	E4	E13
Nominal voltage coil	Ordering number		
12 V DC	27631400	27631600	27632000
24 V DC	27632400	27633200	27633500
Main valve	Designation		Ordering number
	SR6H2-B2/HV		29248100
Seal kit (Pilot valve)	Designation		Ordering number
	Dualseal - PU	O-ring	
	10,3 x 12,7 x 3,1 (1 pcs)	17,17 x 1,78 (1 pcs)	17014300
Seal kit (Main valve)	Dualseal - PU	O-ring	
	13,47x15,87x3,1 (1 pcs)	19,4x2,1 (1 pcs)	18960500

Caution!

- The packing foil is recyclable.
- The technical information regarding the product presented in this catalog is for descriptive purposes only. It should not be construed in any case as a guaranteed representation of the product properties in the sense of the law.

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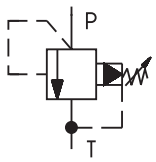
Pilot Operated Pressure Relief Valves

VPN1-06

Size 06 • p_{max} up to 320 bar • Q_{max} up to 70 L/min

HA 5161
4/2008

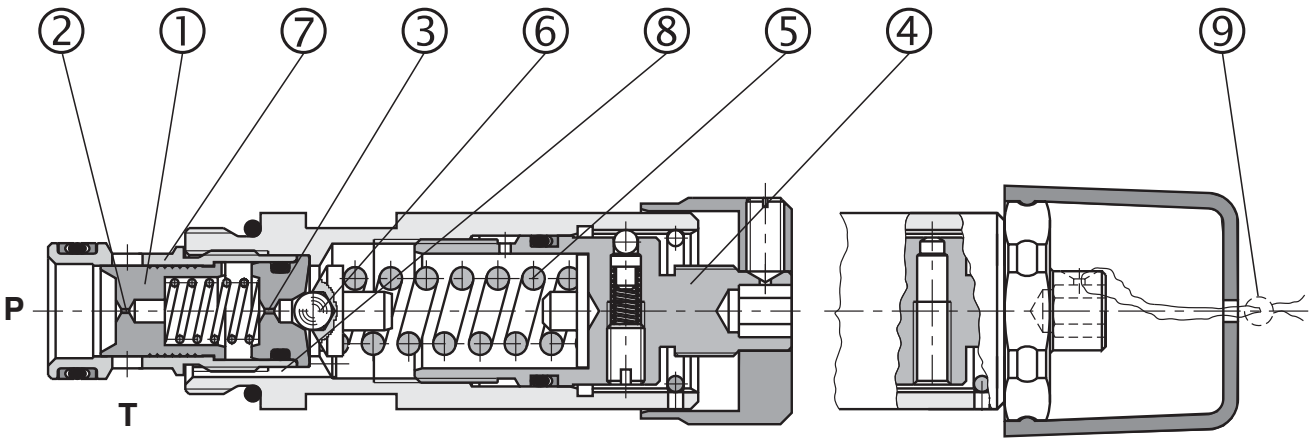
Replaces
HA 5161 3/2002



- ❑ **Cartridge, modular and in-line design**
- ❑ **Five pressure ranges**
- ❑ **Two pressure adjustment options:**
  - screw with internal hexagon
  - hand knob with arrestment

Functional Description

Pressure relief valves VPN1 are pilot operated pressure valves designed for system pressure limitation.
The pressure adjustment provides the adjustment screw (4). In its basic state, the valve is closed. The pressure acts on the face area of the control spool (1) and at the same time through orifice (2) on the control spool rear side, which is preloaded by a spring and further on through orifice (3) on the pilot valve ball (6). When the increasing system pressure reaches the value, which is preset by spring (5), the valve opens and the control flow passes through the pilot valves. The spool area which is preloaded by the spring becomes relieved, the spool control edge opens the radial bores in bushing (7) and the fluid passes from port P to T. The control flow is routed through groove (8) to channel T. Valve adjustment can be lockwired (9).
The valve body and the adjustment screw are zinc coated. With models M and R the valve bodies are phosphate coated.



Ordering Code

VPN1-06/ ☐ - ☐ ☐ ☐

Pilot Operated Pressure Relief Valve

Nominal size

Model

screw in cartridge	**S**
modular valve, flow from A to T	MA
modular valve, flow from B to T	MB
modular valve, flow from P to T	**MP**
modular valve, flow from A to B and B to A	MC
modular valve, flow from A and B to T	MD
in-line valve, thread G3/8	RA1
in-line valve, thread G1/2	**RA2**
in-line valve, thread G3/8	RB1
in-line valve, thread G1/2	RB2

Sealing

without designation	NBR
V	FPM (Viton)

Adjustment element

S	screw with internal hexagon
R	hand knob

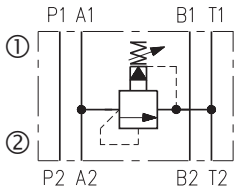
Pressure range

6	up to 63 bar
10	up to 100 bar
16	up to 160 bar
21	up to 210 bar
32	up to 320 bar

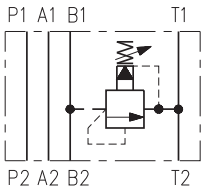
FOR PREFERRED TYPES SEE BOLD TYPING IN ORDERING CODE AND TABLE OF PREFERRED TYPES ON PAGE 10

Functional Symbols

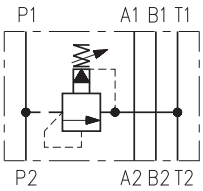
Model **MA**



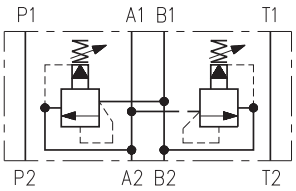
Model **MB**



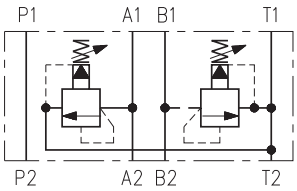
Model **MP**



Model **MC**

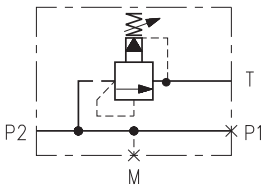


Model **MD**

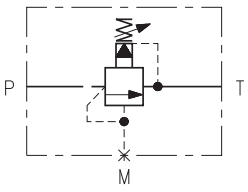


① Valve side
② Subplate side

Model **RA**



Model **RB**



Ordering Numbers of Sandwich / Valve Bodies (without screw-in cartridge)

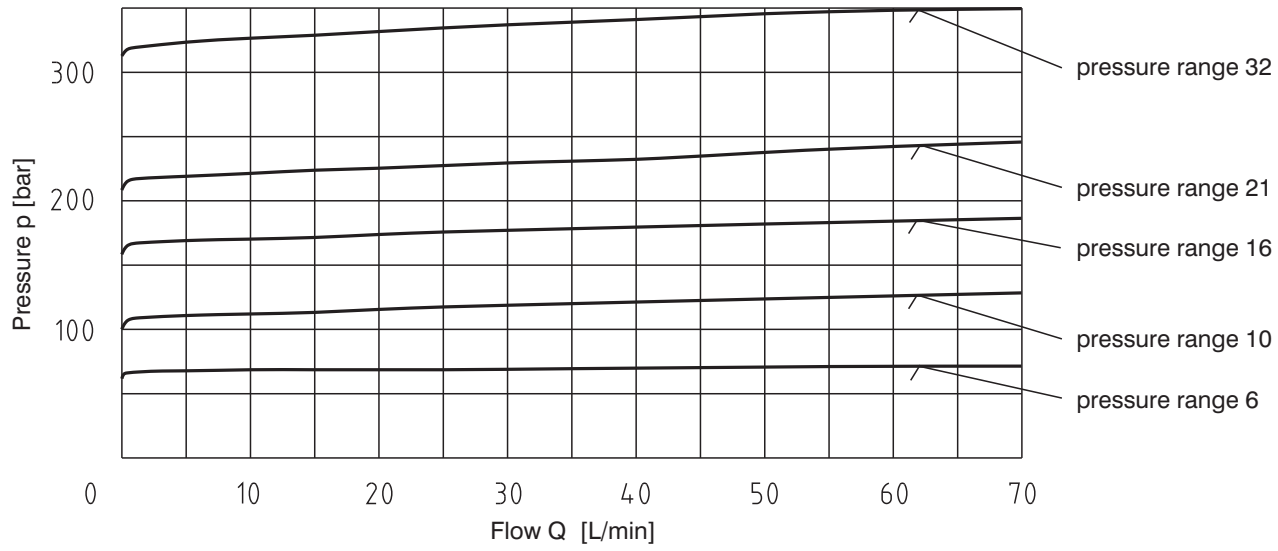
Valve body for modular valve - NBR	Ordering number	Valve body for modular valve - Viton	Ordering number
MA06-VP	15988600	MA06-VP/V	22949600
MB06-VP	15988800	MB06-VP/V	16661700
MP06-VP	15989000	MP06-VP/V	22949800
MC06-VP	15989200	MC06-VP/V	16758800
MD06-VP	15989300	MD06-VP/V	22950100
Valve body for in-line valve - NBR	**Ordering number**	**Valve body for in-line valve - Viton**	**Ordering number**
RA1-06-VP	15989800	RA3-06-VP/V	22939200
RA2-06-VP	15989900	RA4-06-VP/V	22939300
RB1-06-VP	15990000	RB3-06-VP/V	22939400
RB2-06-VP	15990100	RB4-06-VP/V	22939500

Technical Data

Nominal size	mm	06
Max. flow rate	L/min	70
Max. control flow	L/min	0.35
Max. service pressure ports (P, T, A, B)	bar	350
Working pressure related to flow	bar	see p-Q characteristics
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51524
Fluid temperature range for standard sealing (NBR)	°C	-30 ... +100
Fluid temperature range for Viton sealing (FPM)	°C	-20 ... +120
Viscosity range	mm^2/s	20 ... 400
Max. degree of fluid contamination		Class 21/18/15 according to ISO 4406
Weight	kg	0.25
Weight - models MA, MB, MP - models MC, MD - models RA1, RA2, RB1, RB2	kg	1.2 1.5 1.25
Mounting position		unrestricted

p-Q Characteristics for Model S

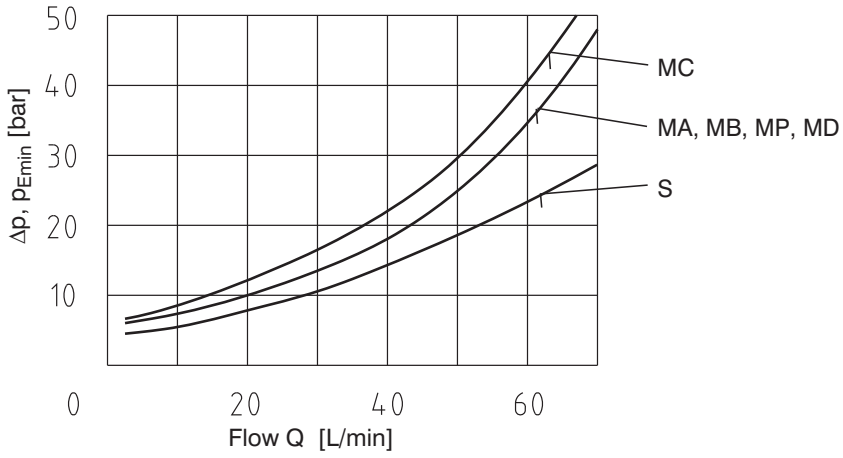
Measured at $\nu = 32\ mm^2/s$



Δp-Q Characteristics

Measured at $\nu = 32\ mm^2/s$

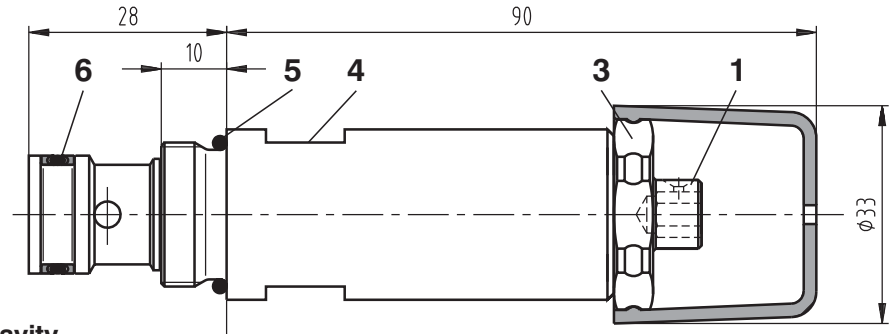
Pressure drop Δp related to flow rate.



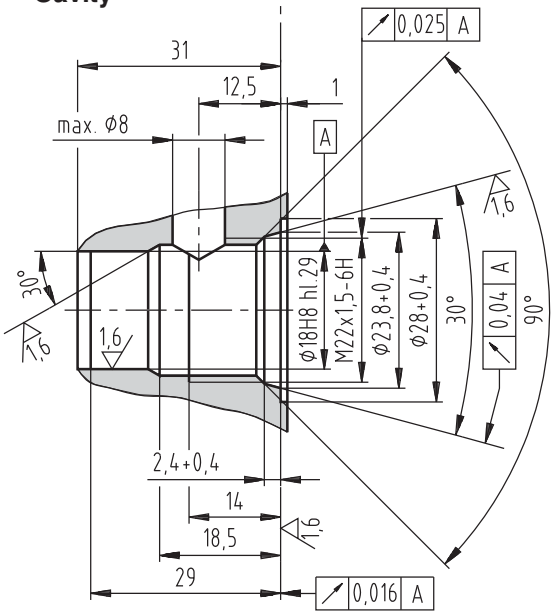
Valve Dimensions

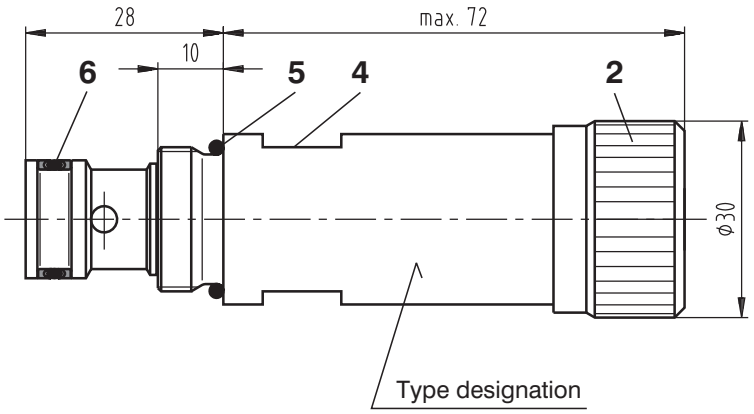
Dimensions in millimetres

Model S



Cavity





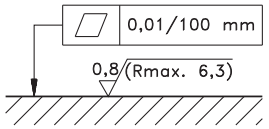
1 Adjustment element (screw with internal HEX 6)
2 Adjustment element R (hand knob)
With all adjustment elements:
- clockwise rotation - pressure increase
- anticlockwise rotation - pressure decrease

3 Locknut HEX 27
4 Wrench flats (s=24 mm) - tightening torque 30 Nm
5 O-ring 19.4 x 2.1 NBR 80 (1 pc.)
supplied with valve
6 Combined sealing:
O-ring 14 x 1.78 NBR 90 (1 pc.)
Back-up ring BBP80B015-N9 14.73 x 17.43 x 1.14 (2 pcs.)
supplied with valve

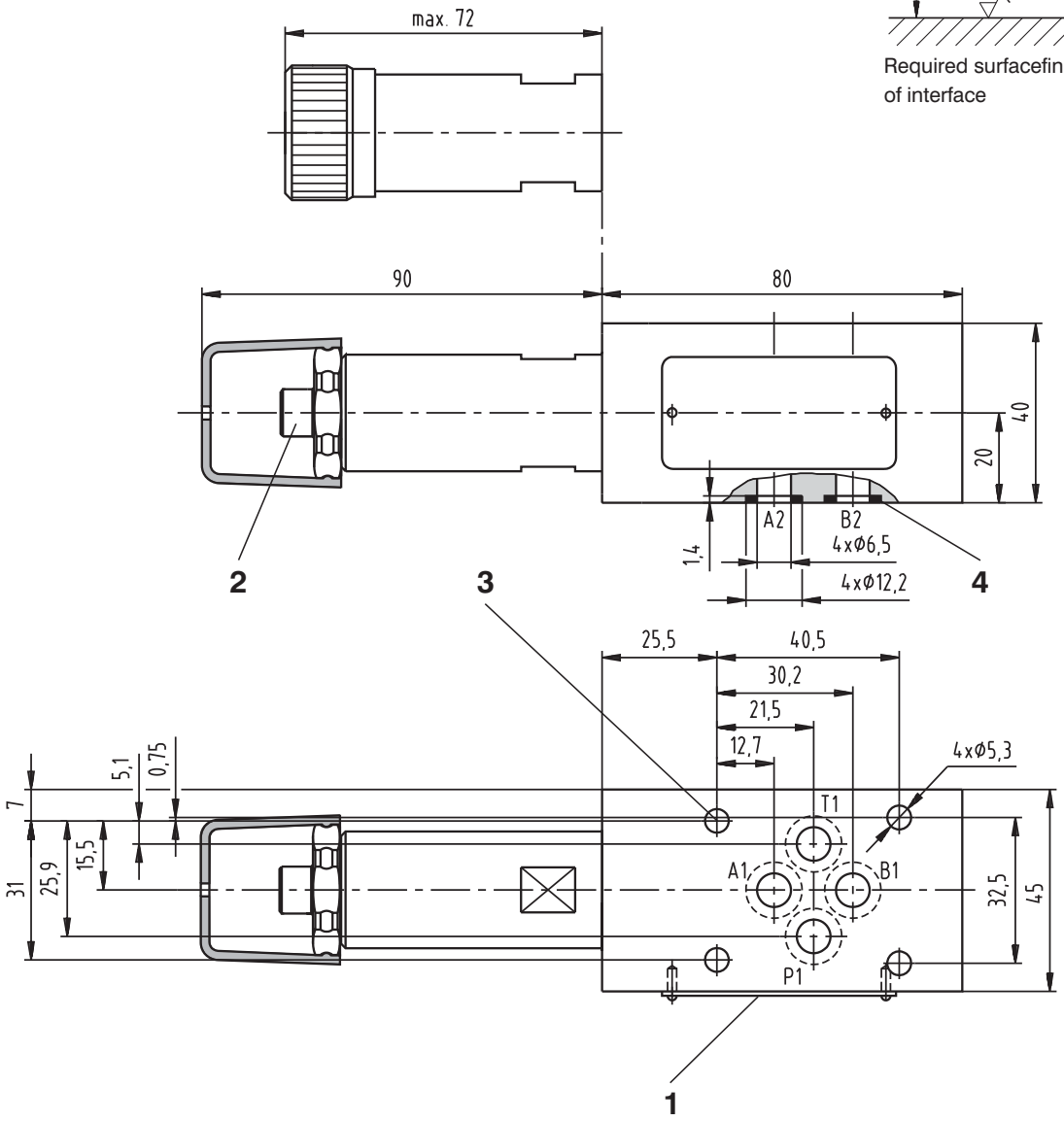
Valve Dimensions

Dimensions in millimetres

Model MA



Required surfacefinish
of interface

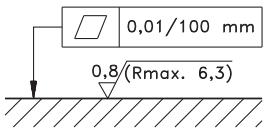


1 Name plate
2 Adjustment element for pressure setting
3 4 through mounting holes
4 Square rings 9.25 x 1.68 (4 pcs.) supplied with valve

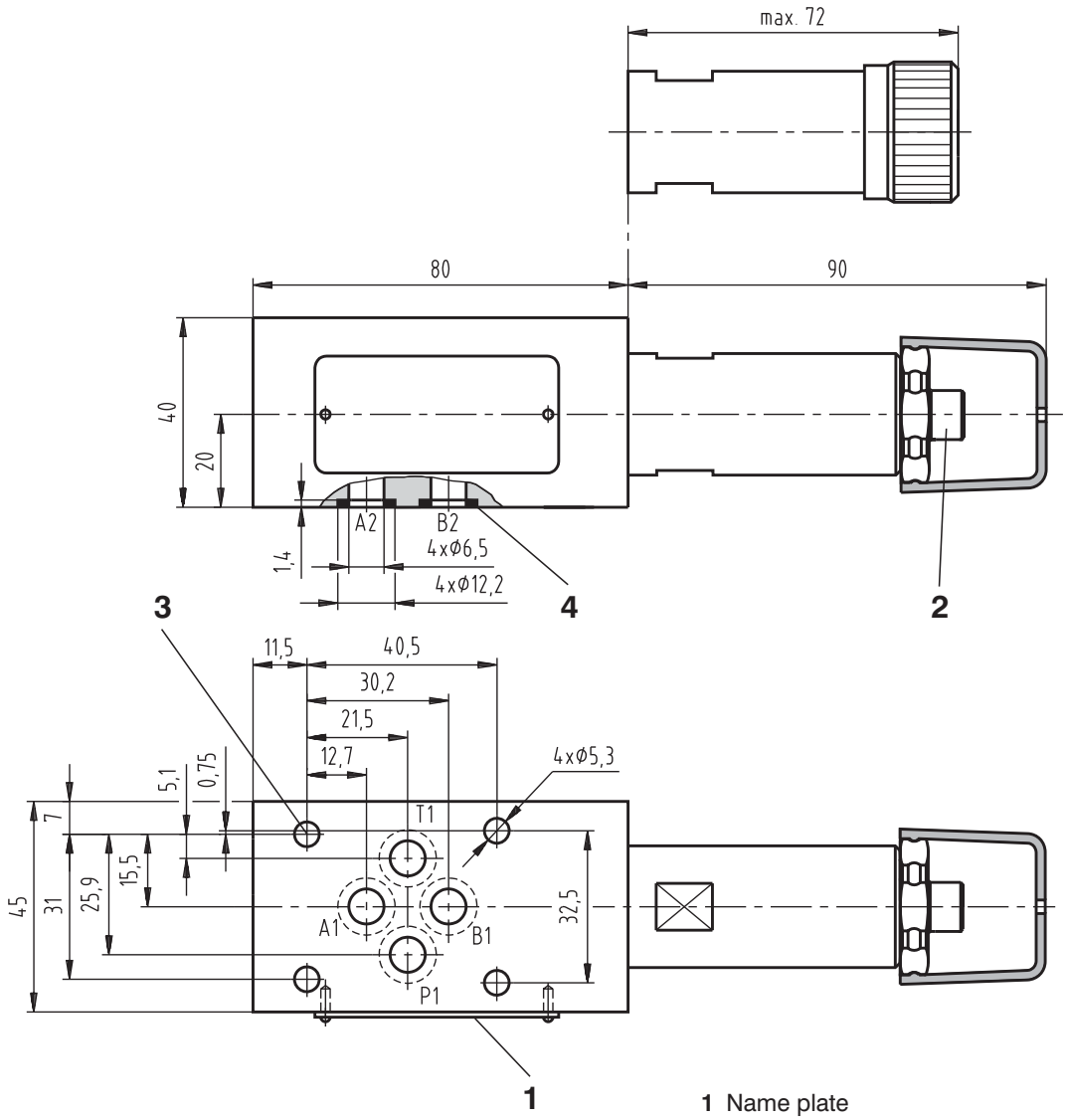
Valve Dimensions

Dimensions in millimetres

Models MB and MP



Required surfacefinish
of interface

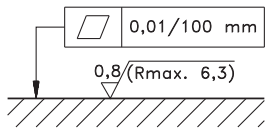


1 Name plate
2 Adjustment element for pressure setting
3 4 through mounting holes
4 Square rings 9.25 x 1.68 (4 pcs.) supplied with valve

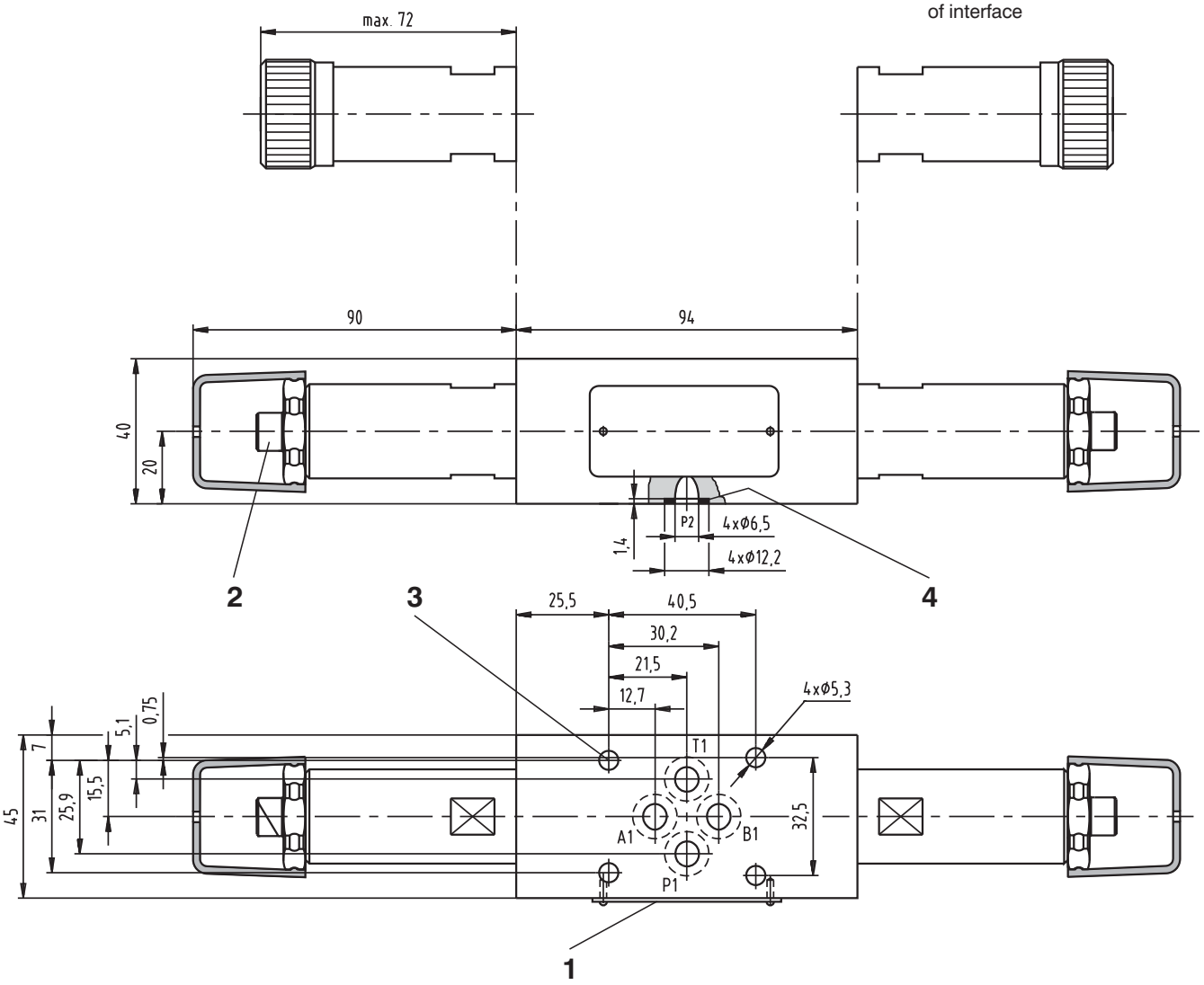
Valve Dimensions

Dimensions in milimetres

Models MC and MD



Required surfacefinish
of interface



1 Name plate
2 Adjustment element for pressure setting
3 4 through mounting holes
4 Square rings 9.25 x 1.68 (4 pcs.) supplied with valve

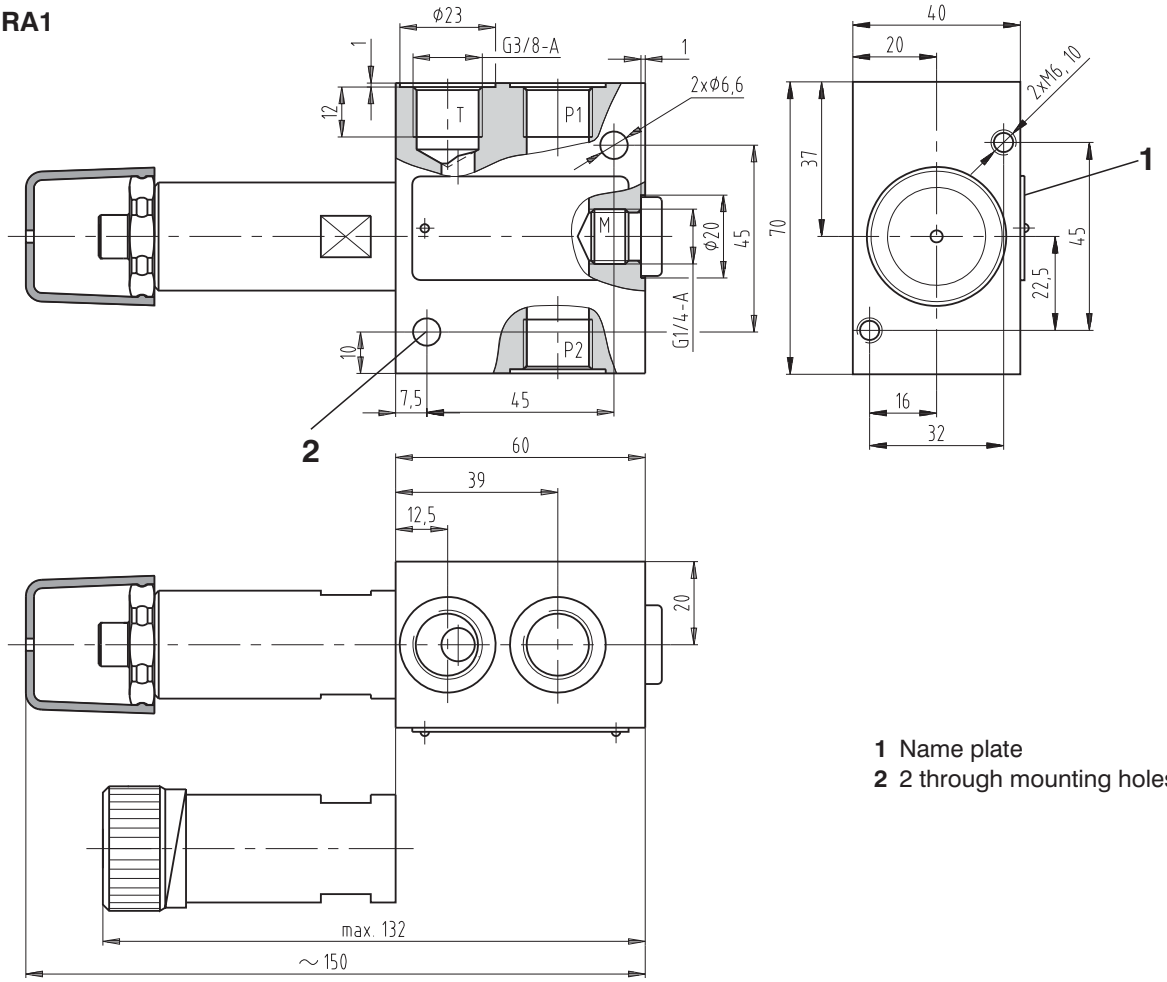
Caution!

- The packing foil is recyclable.
- The protecting plate can be returned to the manufacturer.
- Mounting studs must be ordered separately. Tightening torque is 8.9 Nm.
- The technical information regarding the product presented in this catalogue is for descriptive purposes only. It should not be construed in any case as a guaranteed representation of the product properties in the sense of the law

Valve Dimensions

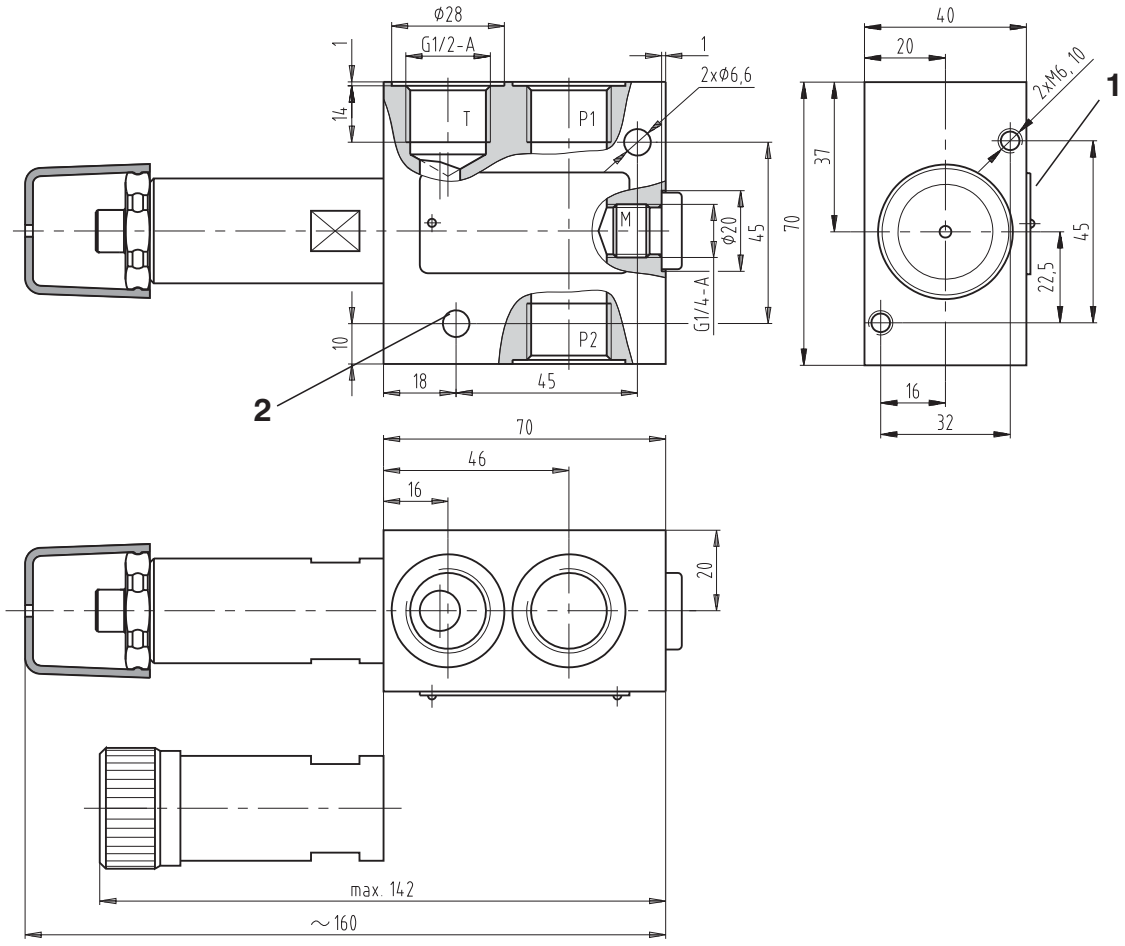
Dimensions in millimetres

Model RA1



1 Name plate
2 2 through mounting holes

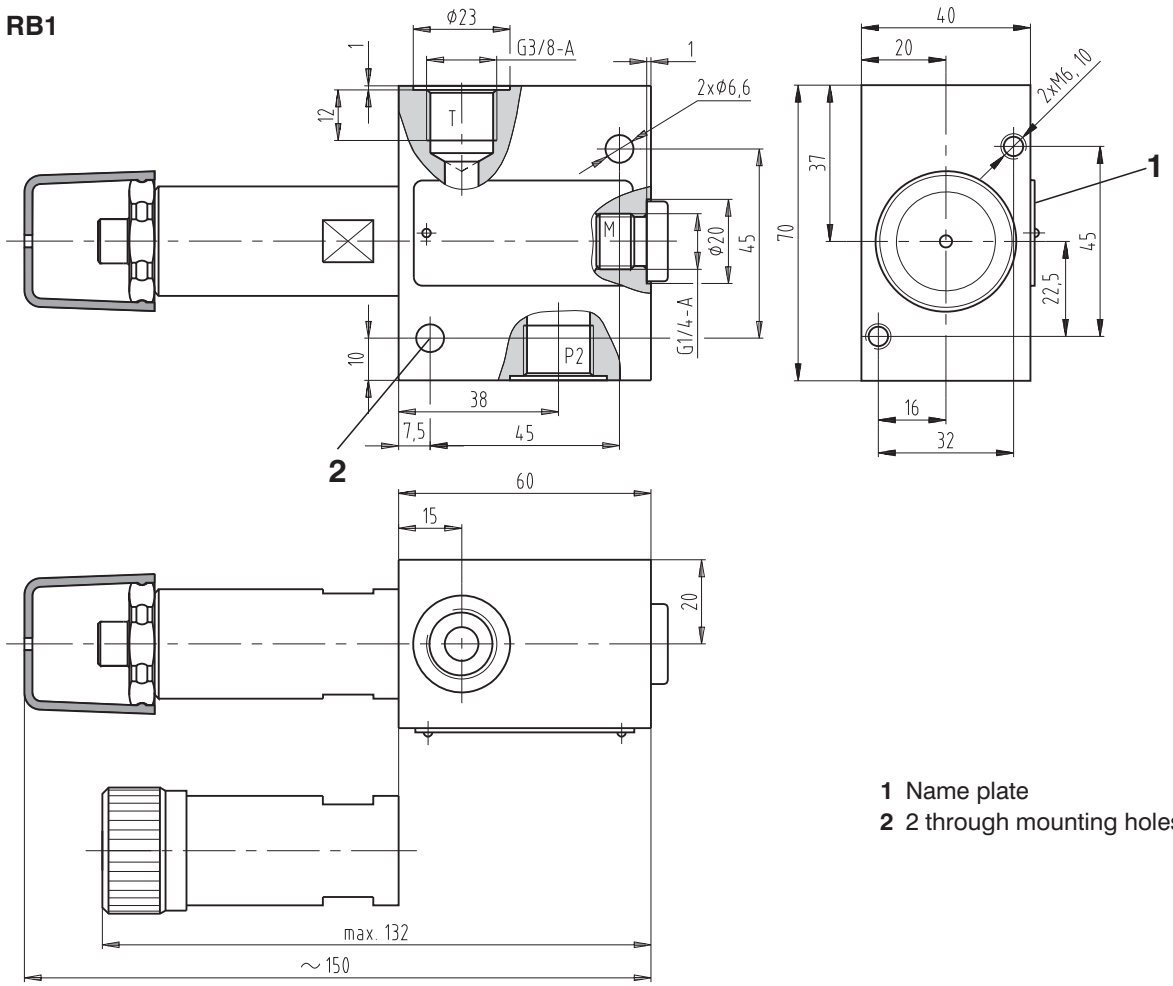
Model RA2



Valve Dimensions

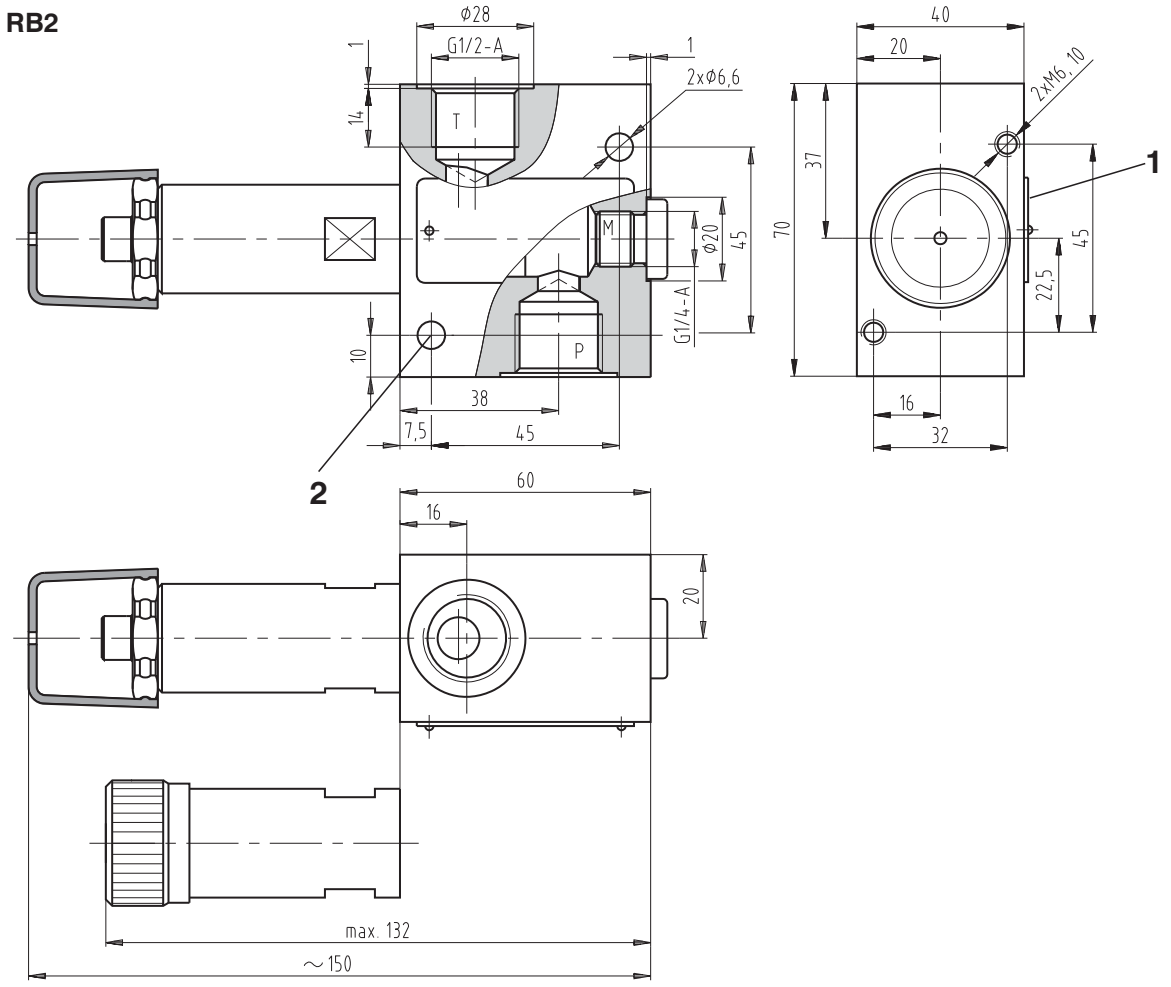
Dimensions in milimetres

Model RB1

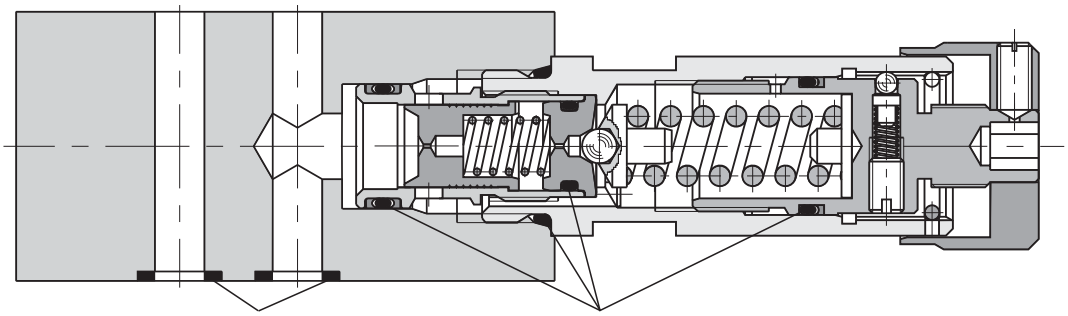


1 Name plate
2 2 through mounting holes

Model RB2



Spare Parts



Set of the seals for modular valve

Set of the seals for screw-in cartridge

Model	Dimensions, number	Ordering number
Screw-in cartridge - NBR	O-ring 14 x 1.78 NBR 90 (1 pc.)	15991900
	O-ring 17 x 1.8 NBR 70 (1 pc.)	
	O-ring 19.4 x 2.1 NBR 80 (1 pc.)	
	O-ring 9.25 x 1.78 NBR 90 (1 pc.)	
	Back-up ring BBP80B015-N9 14.73 x 17.43 x 1.14 (2 pc.)	
	Back-up ring BBP80B016-N9 16.33 x 19.03 x 1.14 (1 pc.)	
Screw-in cartridge - Viton	O-ring 14 x 1.78 (1 pc.)	15991800
	O-ring 17 x 1.8 (1 pc.)	
	O-ring 19.4 x 2.1 (1 pc.)	
	O-ring 9.25 x 1.78 (1 pc.)	
	Back-up ring BBP80B015 14.73 x 17.43 x 1.14 (2 pc.)	
	Back-up ring BBP80B016 16.33 x 19.03 x 1.14 (1 pc.)	
Model	**Dimensions, number**	**Ordering number**
Modular valve - NBR	Square-Ring 9.25 x 1.68 (4 pcs.)	15991700
Modular valve - Viton	O-ring 9.25 x 1.78 (4 pcs.)	22944700
Model	**Typ, number**	**Ordering number**
In-line valve RA1 - NBR	VSTI R1/4-ED (1 pc.) VSTI R3/8-ED (1 pc.)	22944200
In-line valve RA2 - NBR	VSTI R1/4-ED (1 pc.) VSTI R1/2-ED (1 pc.)	22944400
In-line valve RB1 - NBR	VSTI R1/4-ED (1 pc.)	22944600
In-line valve RB2 - NBR		
In-line valve RA1 - Viton	VSTI R1/4-ED - Viton (1 pc.) VSTI R3/8-ED - Viton (1 pc.)	22944100
In-line valve RA2 - Viton	VSTI R1/4-ED - Viton (1 pc.) VSTI R1/2-ED - Viton (1 pc.)	22944300
In-line valve RB1 - Viton	VSTI R1/4-ED - Viton (1 pc.)	22944500
In-line valve RB2 - Viton		

Preferred Types of Valves

Type	Ordering number	Type	Ordering number
VPN1-06/S-10S	15987800	VPN1-06/MP-32S	15992800
VPN1-06/S-21S	15988000	VPN1-06/RA2-10S	22964100
VPN1-06/S-32S	15988100	VPN1-06/RA2-21S	22964300
VPN1-06/MP-10S	22947800	VPN1-06/RA2-32S	22964500
VPN1-06/MP-21S	15992600		

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E-mail: sales.cz@argo-hytos.com
www.argo-hytos.com

ARGO HYTOS

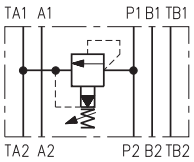
Pilot Operated Pressure Relief Valves

VPN2-10/MR

Size 10 • p_{max} up to 350 bar • Q_{max} up to 150 L/min

HA 5164
6/2012

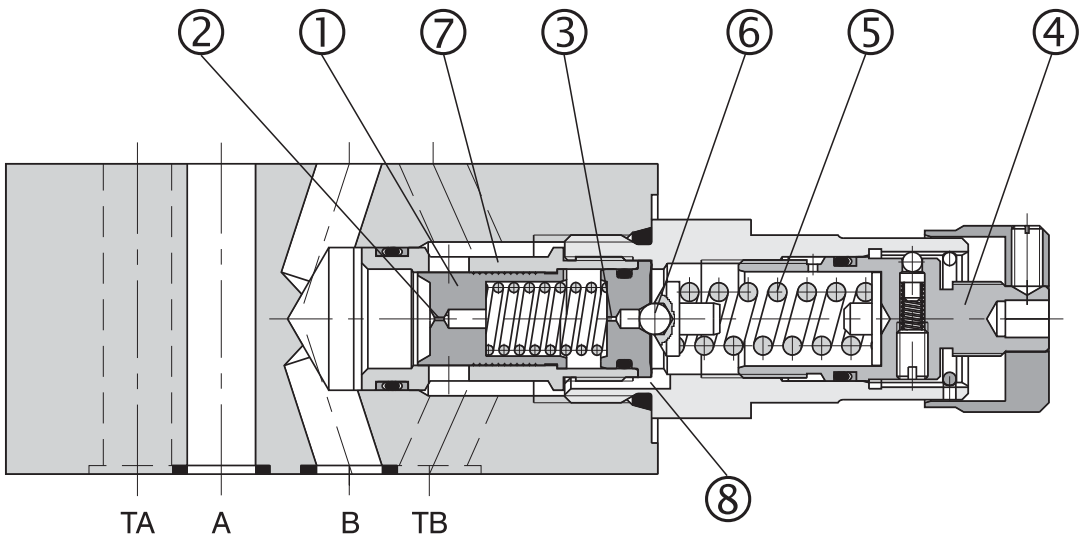
Replaces
HA 5164 7/2008



- **Modular and in-line design**
- **Five pressure ranges**
- **Two pressure adjustment options:**
  - screw with internal hexagon
  - hand knob with arrestment
- **Installation dimensions to ISO 4401 and DIN 24 340-A10**

Functional Description

Pressure relief valves VPN2 are pilot operated pressure valves designed for system pressure limitation.
The pressure adjustment is controled by the adjustment screw (4). In its basic state, the valve is closed. The pressure acts on the face area of the control spool (1) and at the same time through orifice (2) on the control spool rear side, which is preloaded by a spring and further on through orifice (3) on the pilot valve ball (6).
When the increasing system pressure reaches the value, which is preset by spring (5), the valve opens and the control flow passes through the pilot valve. The spool area which is preloaded by spring becomes relieved, the spool control edge opens the radial bores in bushing (7) and the fluid passes from port B to T. The control flow is routed through slot (8) to port T.
When an accurate pressure control, which does not depend on pressure variations in port T (only for models RC2 and RC3, see Functional Symbols), is required the model "Y" with external port for pilot flow is to be used. If a relieving of the valve on a lower pressure as that set up by the spring (5) is needed, the model with port "X" is to be used.
The valve body and the adjustment screw are zinc coated. With models M and R the valve bodies are phosphate coated.



Ordering Code

VPN2-10/ □ - □ □ □

Pilot Operated Pressure Relief Valve

Nominal size

Model

modular valve, flow from A to TA	MA
modular valve, flow from B to TB	MB
modular valve, flow from P to TA	**MP**
modular valve, flow from A to B and B to A	MC
modular valve, flow from A to TA and B to TB	MD
in-line valve, thread P1, P2 - G3/4; T - G1	**RA2**
in-line valve, thread P - G3/4; T - G1	RB2
in-line valve, thread P - G3/4; T - G1; X - G1/4	RC2
in-line valve, thread P - G3/4; T - G1; Y - G1/4	RC3

Pressure range

6	up to 913 PSI (63 bar)
10	up to 1450 PSI (100 bar)
16	up to 2321 PSI (160 bar)
21	up to 3045 PSI (210 bar)
32	up to 5076 PSI (350 bar)

Model with two pressure relief cartridges
32/10 pressure setting 5076 PSI (350 bar)
in port A and 1450 PSI (100 bar) in port B, etc.

Adjustment element

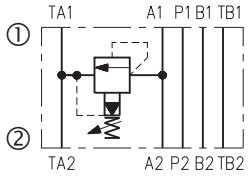
S	screw with internal hexagon
R	hand knob

Seals

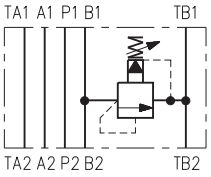
without designation	NBR
V	FPM (Viton)

Functional Symbols

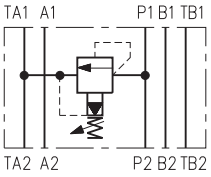
Model **MA**



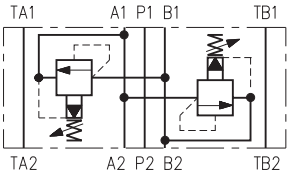
Model **MB**



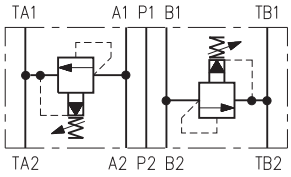
Model **MP**



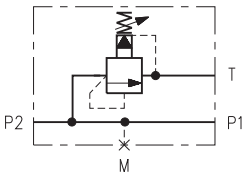
Model **MC**



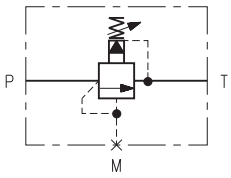
Model **MD**



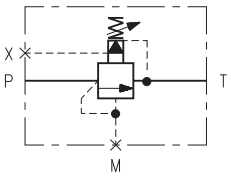
Model **RA2**



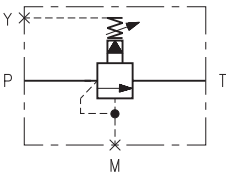
Model **RB2**



Model **RC2**



Model **RC3**



① Valve side
② Subplate side

Ordering Numbers of Sandwich / Valve Bodies (without screw-in cartridge)

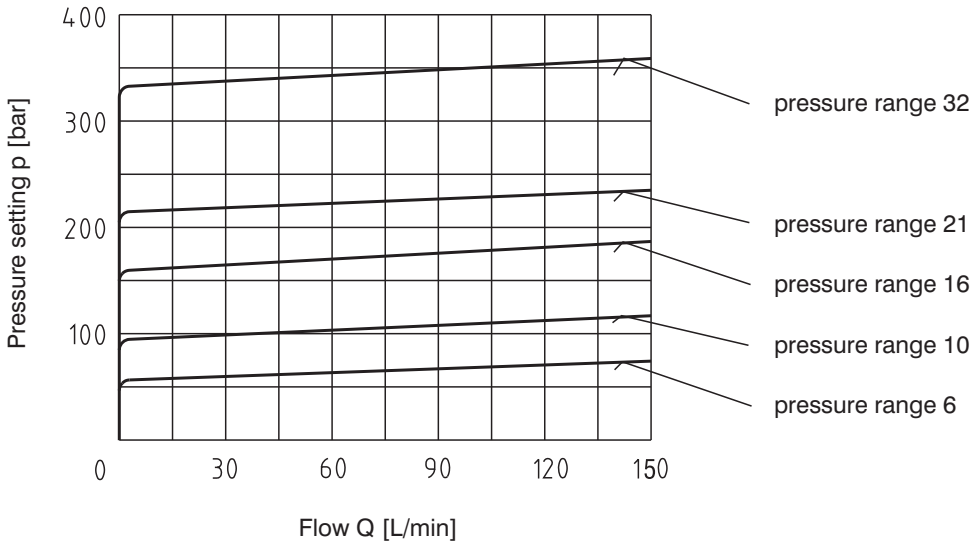
Valve body for modular valve - NBR	Ordering number	Valve body for modular valve - Viton	Ordering number
MA10-VP	15995800	MA10-VP/V	22975100
MB10-VP	15995900	MB10-VP/V	22975200
MP10-VP	15996000	MP10-VP/V	22975300
MC10-VP	15996100	MC10-VP/V	22975400
MD10-VP	15996200	MD10-VP/V	22975500
Valve body for in-line valve - NBR	**Ordering number**	**Valve body for in-line valve - Viton**	**Ordering number**
RA2-10-VP	15996500	RA2-10-VP/V	22976600
RB2-10-VP	15996300	RB2-10-VP/V	22976300
RC2-10-VP (RC3-10-VP)	15996400	RC2-10-VP/V (RC3-10-VP/V)	22976400

Technical Data

Nominal size	mm	10
Max. flow rate	L/min	150
Max. control flow	L/min	0,5
Max. service pressure ports (P, T, A, B)	bar	350
Working pressure related to flow	bar	see p-Q characteristics
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51524
Fluid temperature range for standard sealing (NBR)	°C	-30 ... +100
Fluid temperature range for Viton sealing (FPM)	°C	-20 ... +120
Viscosity range	mm^2/s	20 ... 400
Max. degree of fluid contamination		Class 21/18/15 according to ISO 4406
Weight - models MA, MB, MP - models MC, MD - models RA2, RB2, RC2, RC3	kg	2,6 3.0 2.7
Mounting position		unrestricted

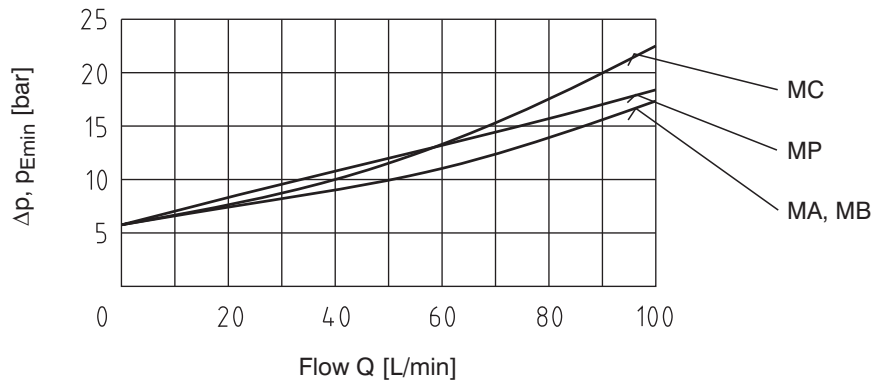
p-Q Characteristics

Measured at $\nu = 32\ mm^2/s$



Δp-Q Characteristics

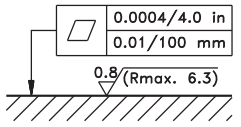
Measured at $\nu = 32\ mm^2/s$



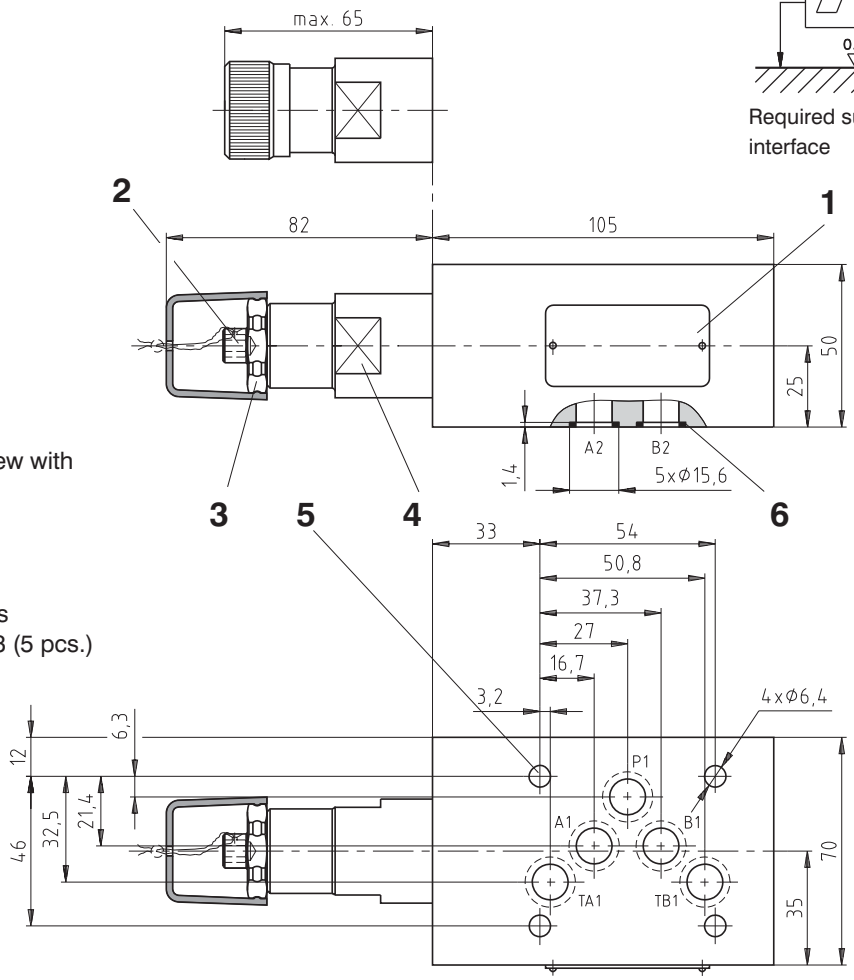
Valve Dimensions

Dimensions in millimetres

Model MA

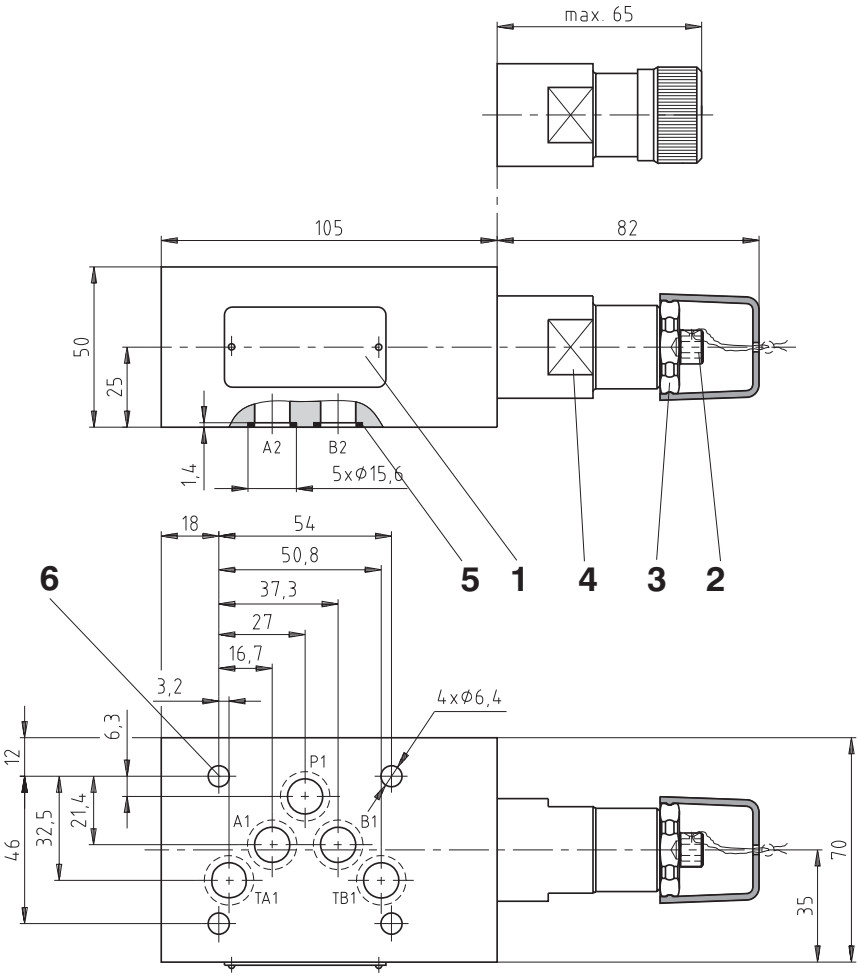


Required surface finish of interface



1 Name plate
2 Adjustment element (screw with internal HEX 6)
3 Locknut HEX 27
4 Wrench flats s = 27
- tightening torque 60Nm
5 4 through mounting holes
6 Square rings 12.42 x 1.68 (5 pcs.) supplied with each valve

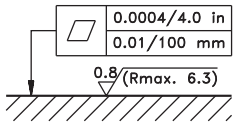
Model MB



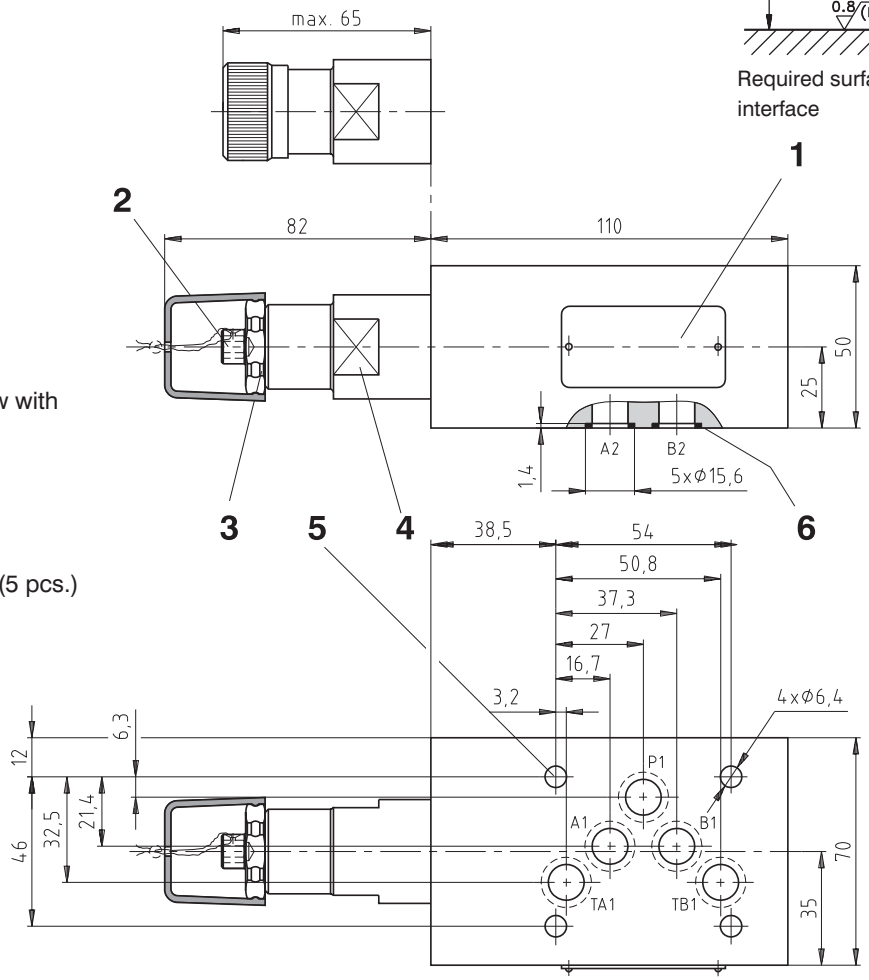
Valve Dimensions

Dimensions in millimetres

Model MP

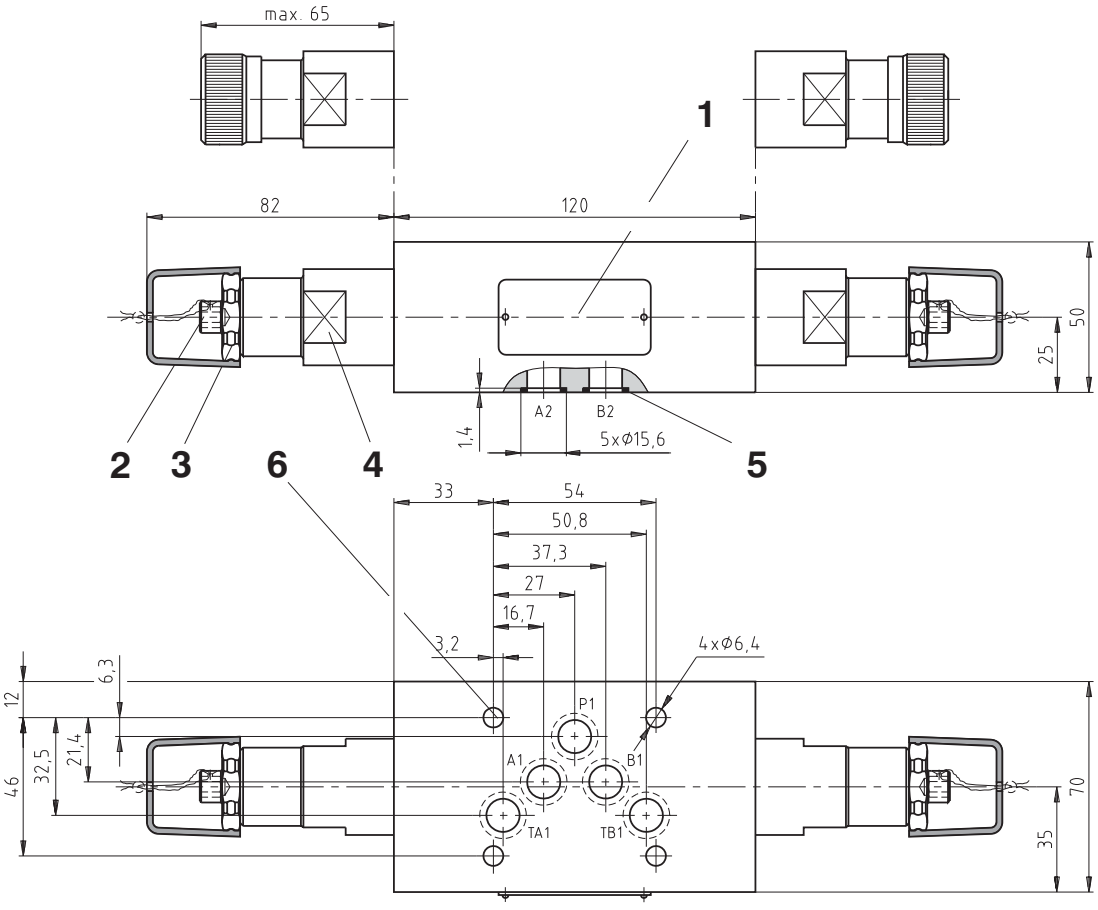


Required surface finish of interface



1 Name plate
2 Adjustment element (screw with internal HEX 6)
3 Locknut HEX 27
4 Wrench flats s=27
- tightening torque 60Nm
5 4 through mounting holes
6 Square rings 12,42 x 1,68 (5 pcs.) supplied with each valve

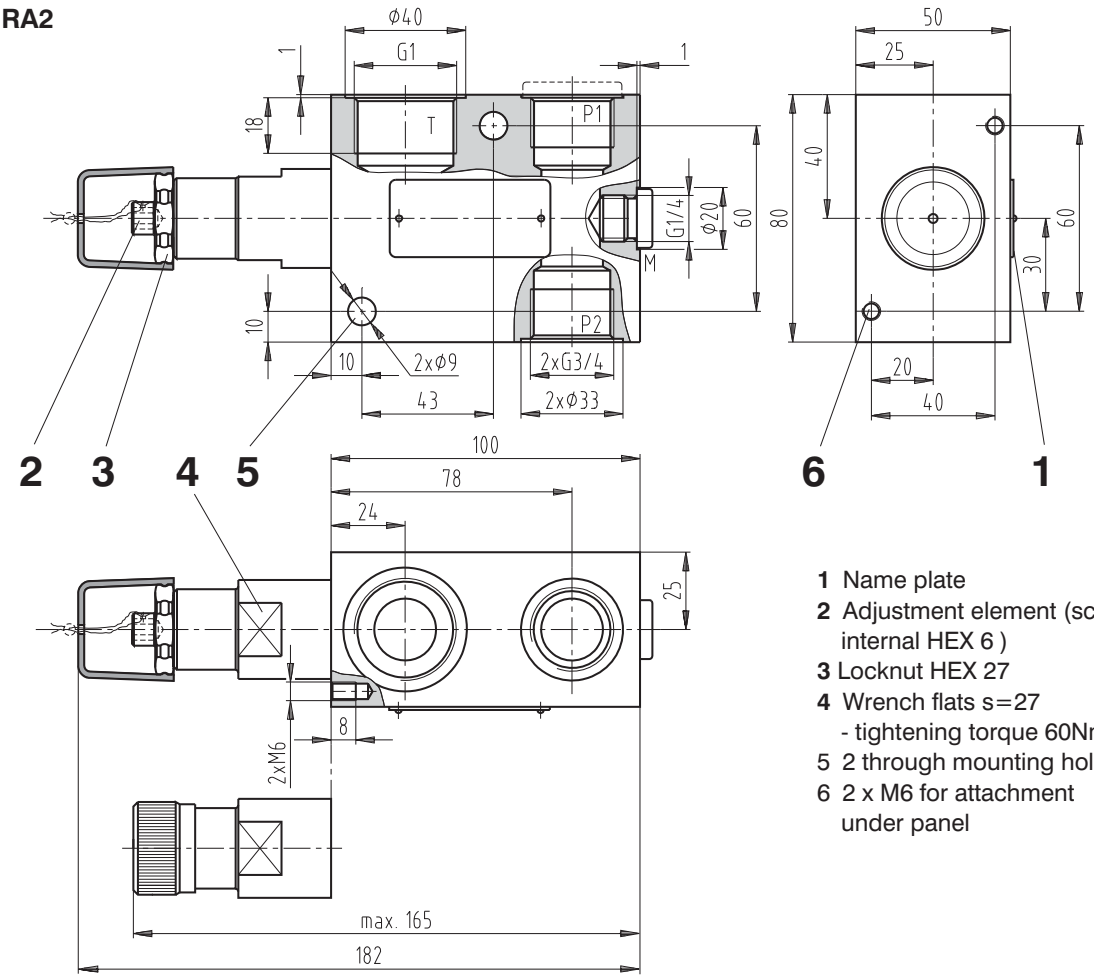
Models MC, MD



Valve Dimensions

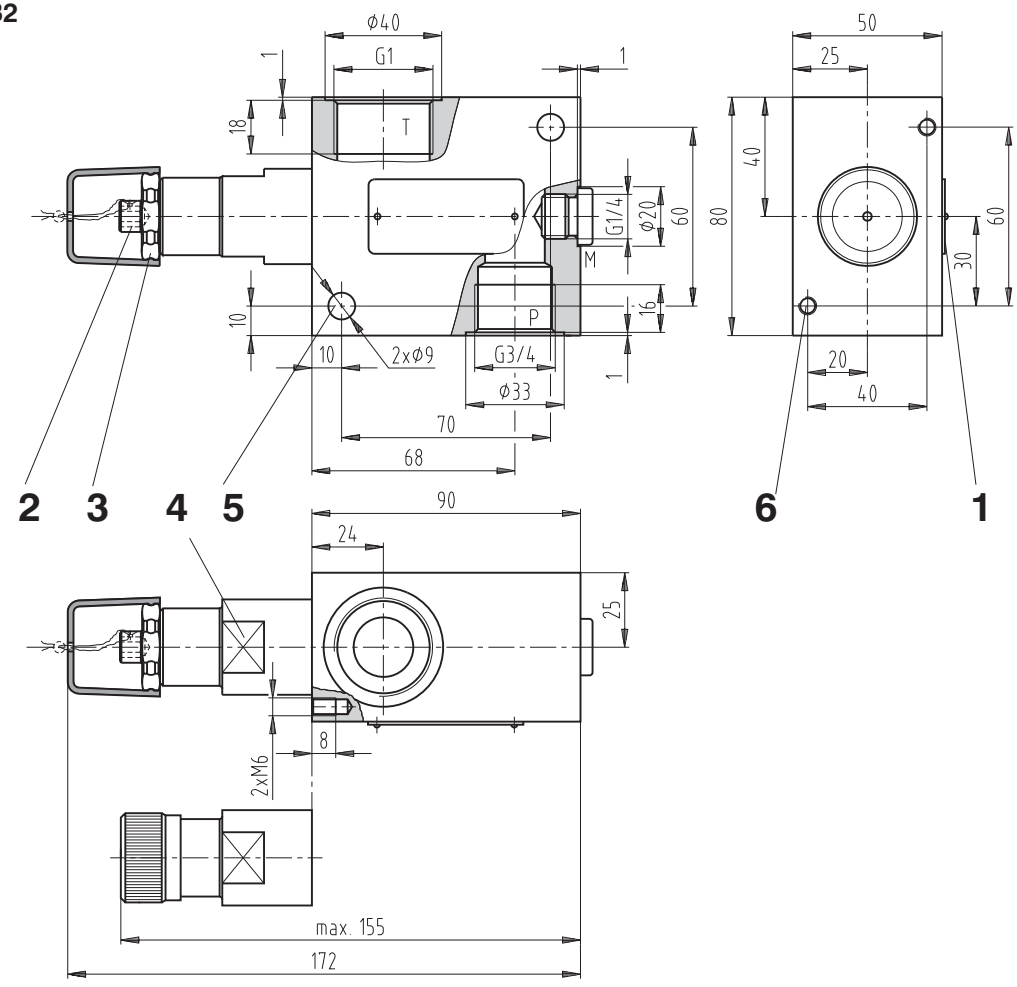
Dimensions in millimetres

Model RA2



1 Name plate
2 Adjustment element (screw with internal HEX 6)
3 Locknut HEX 27
4 Wrench flats s=27
- tightening torque 60Nm
5 2 through mounting holes
6 2 x M6 for attachment under panel

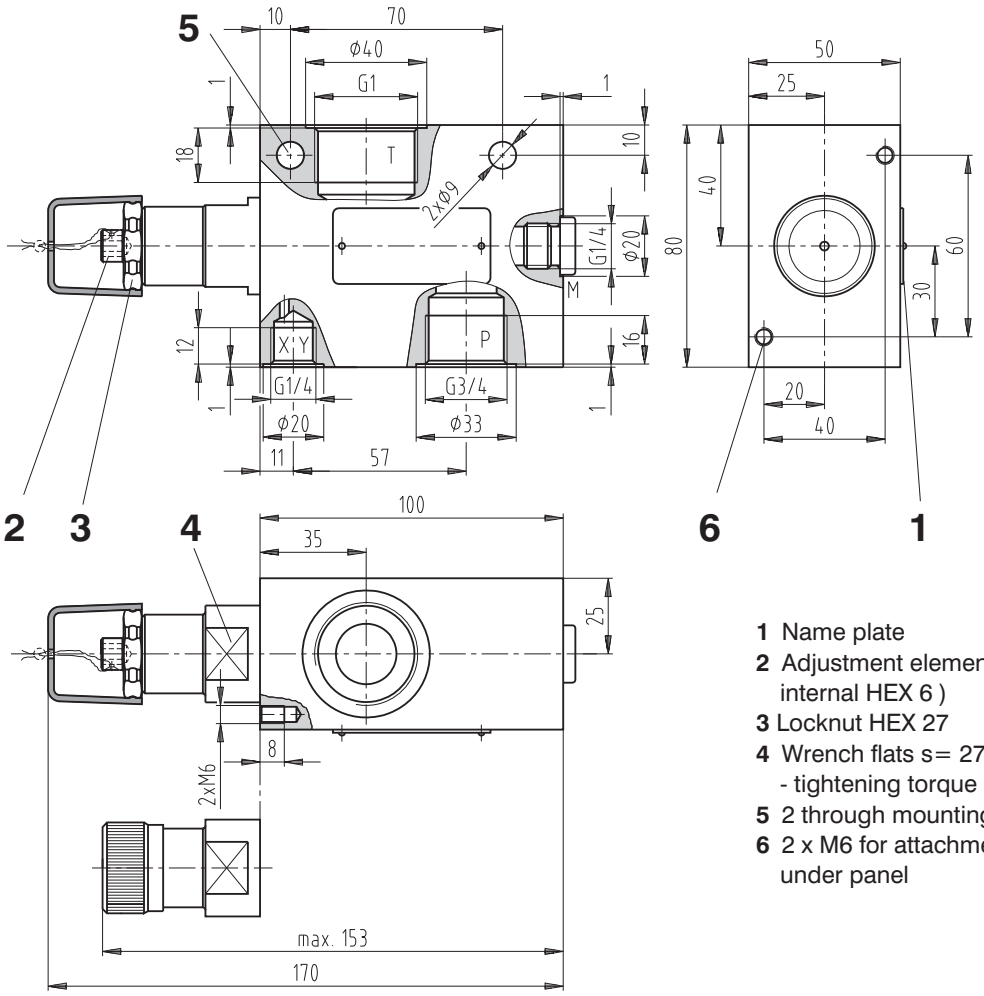
Model RB2



Valve Dimensions

Dimensions in millimetres

Model RC2, RC3



1 Name plate
2 Adjustment element (screw with internal HEX 6)
3 Locknut HEX 27
4 Wrench flats s= 27
- tightening torque 60Nm
5 2 through mounting holes
6 2 x M6 for attachment under panel

Spare Parts

Model	Dimensions, number	Ordering number
Modular valve - NBR	Square ring 12.42 x 1.68 NBR 70 (5 pcs.)	15991600
Modular valve - Viton	O-ring 12.42 x 1.78 (5 pcs.)	22943800
Model	**Typ, number**	**Ordering number**
In-line valve RA2 - NBR	VSTI R1/4-ED (1 pc.) VSTI R3/4-ED (1 pc.)	22972200
In-line valve RB2, RC2, RC3 - NBR	VSTI R1/4-ED (1 pc.)	22972400
In-line valve RA2 - Viton	VSTI R1/4-ED - Viton (1 pc.) VSTI R3/4-ED - Viton (1 pc.)	22972300
In-line valve RB2, RC2, RC3 - Viton	VSTI R1/4-ED - Viton (1 pc.)	22972500

Caution!

- The packing foil is recyclable.
- The protecting plate can be returned to the manufacturer.
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ARGO HYTOS

Pilot Operated Pressure Relief Valves

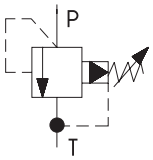
VPN2-10/S

Size 10 • p_{max} 350 bar • Q_{max} 150 L/min

HA 5163
7/2012

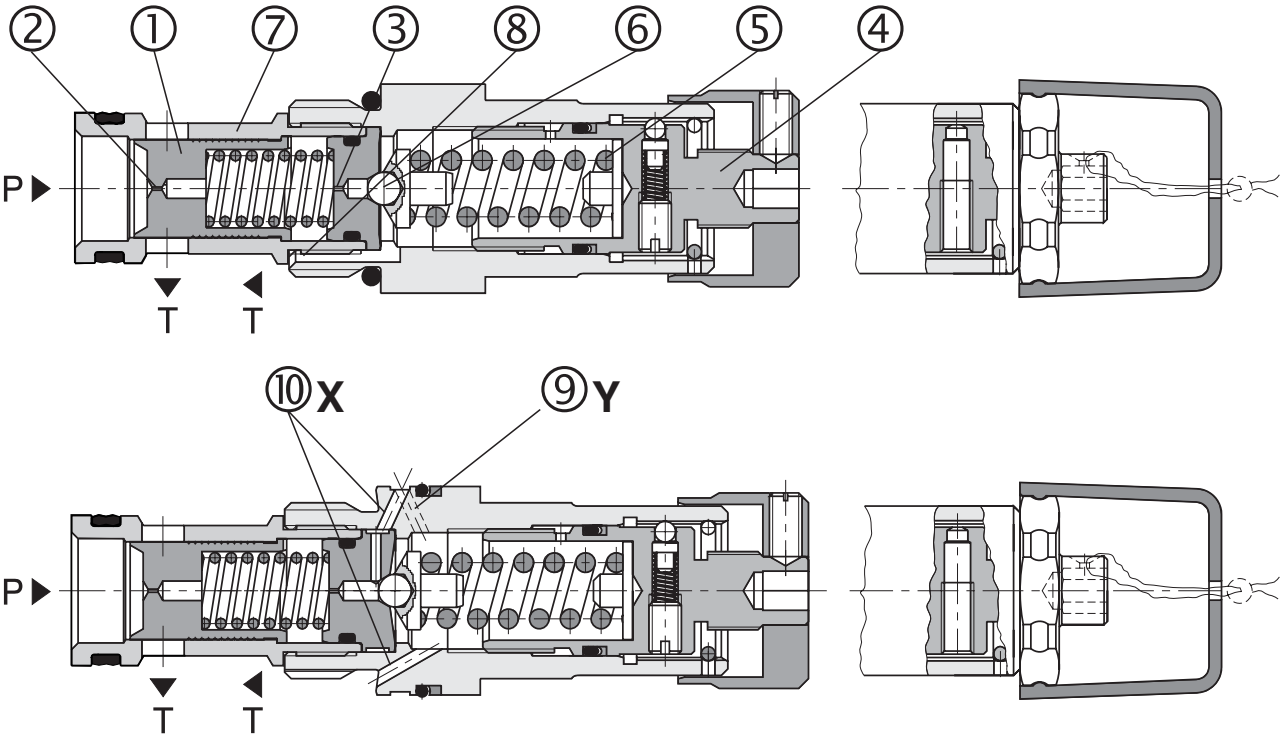
Replaces
HA 5163 7/2008

- ❑ **Screw in cartridge design**
- ❑ **Five pressure ranges**
- ❑ **Two pressure adjustment options:**
  - screw with internal hexagon
  - hand knob with arrestment
- ❑ **Installation dimensions to ISO 4401 and DIN 24 340-A10**



Functional Description

Pressure relief valves VPN2 are pilot operated pressure valves designed for system pressure limitation.
The pressure adjustment is controled by the adjustment screw (4). In its basic state, the valve is closed. The pressure acts on the face area of the control spool (1) and at the same time through orifice (2) on the control spool rear side, which is preloaded by a spring and further on through orifice (3) on the pilot valve ball (6).
When the increasing system pressure reaches the value, which is preset by spring (5), the valve opens and the control flow passes through the pilot valve. The spool area which is preloaded by spring becomes relieved, the spool control edge opens the radial bores in bushing (7) and the fluid passes from port P to T. The control flow is routed through slot (8) to port T.
When an accurate pressure control, which does not depend on pressure variations in port T, is required, the model "Y" with external port for pilot flow is to be used.
If a relieving of the valve on a lower pressure as that set up by the spring (5) is needed, the model with port "X" (10) is to be used.
The basic surface treatment of the valve body and the adjustment screw are zinc coated.



Ordering Code

VPN2-10/ □ - □ □ □

Pilot Operated Pressure Relief Valve

Nominal size

Model

screw in cartridge - internally piloted, internally drained	**S**
screw in cartridge - externally piloted, internally drained	SX
screw in cartridge - internally piloted, externally drained	SY

Pressure range

6	up to 63 bar
10	up to 100 bar
16	up to 160 bar
21	up to 210 bar
32	up to 350 bar

Adjustment element

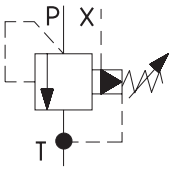
S	screw with internal hexagon
R	hand knob

Seals

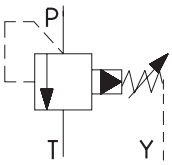
without designation	NBR
V	FPM (Viton)

Functional Symbols

Model **X**



Model **Y**



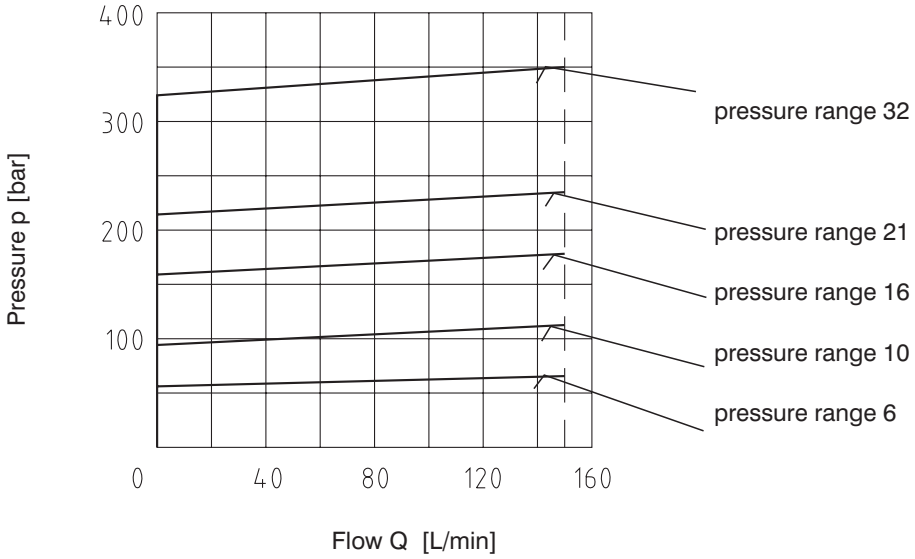
Technical Data

Nominal size	mm	10
Max. flow rate	L/min	150
Max. control flow	L/min	0,5
Max. service pressure ports (P, T, X, Y)	bar	350
Working pressure related to flow	bar	see p-Q Characteristics
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51524
Fluid temperature range for standard sealing (NBR)	°C	-30 ... +100
Fluid temperature range for Viton sealing (FPM)	°C	-20 ... +120
Viscosity range	mm^2/s	20 ... 400
Max. degree of fluid contamination		Class 21/18/15 according to ISO 4406
Weight	kg	0.3
Mounting position		unrestricted

p-Q Characteristics

Measured at ν= 32 mm^2/s

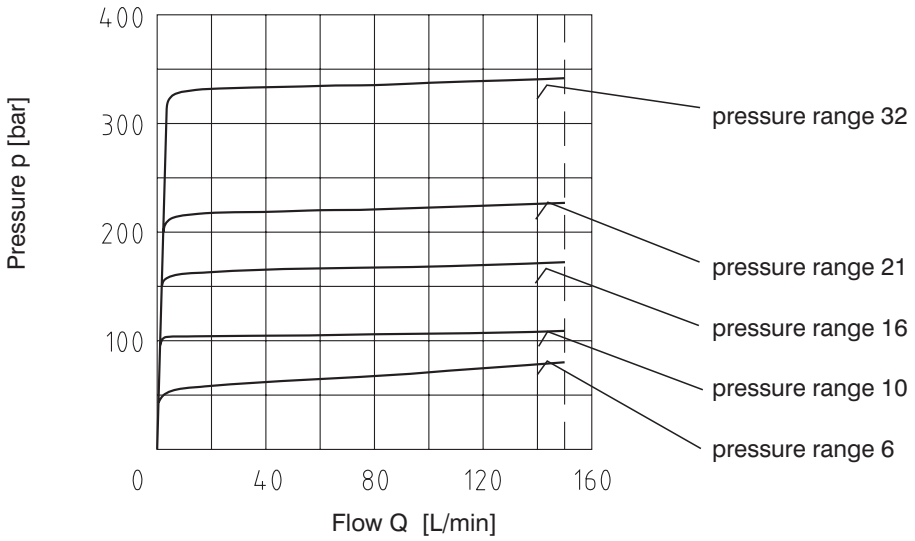
Model S, SX



p-Q Characteristics

Measured at ν= 32 mm^2/s

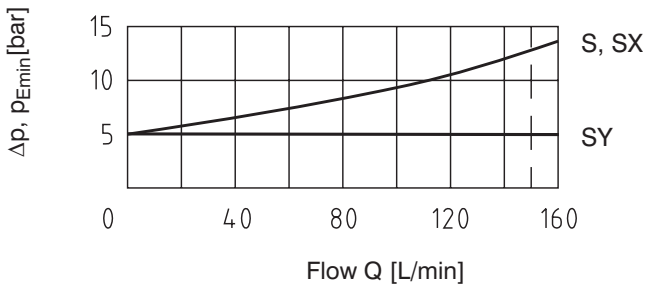
Model SY



Δp-Q Characteristics

Measured at n= 32 mm^2/s

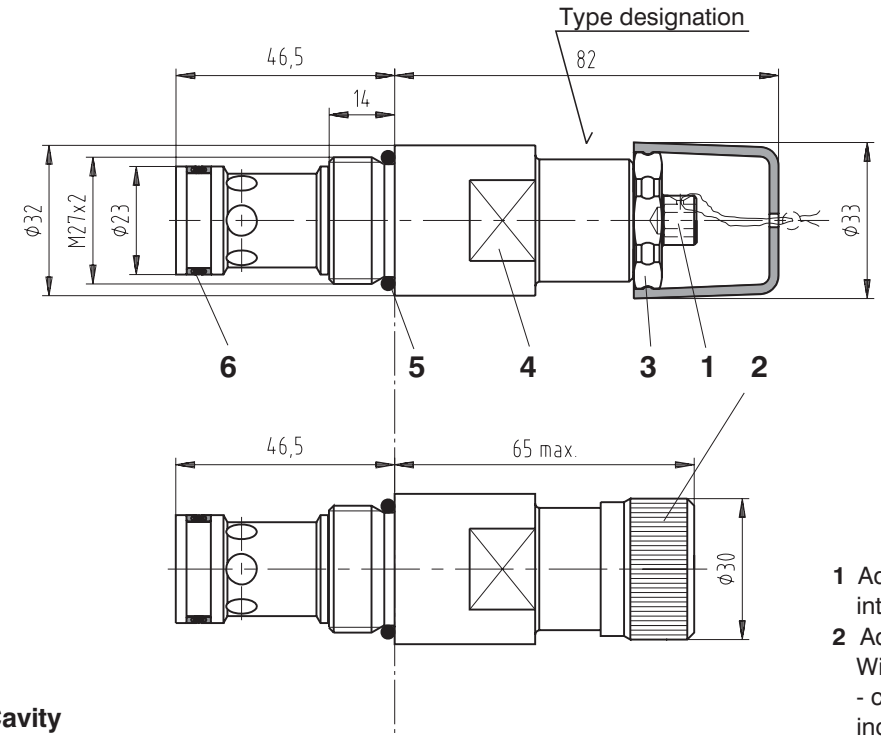
Model S, SX, SY



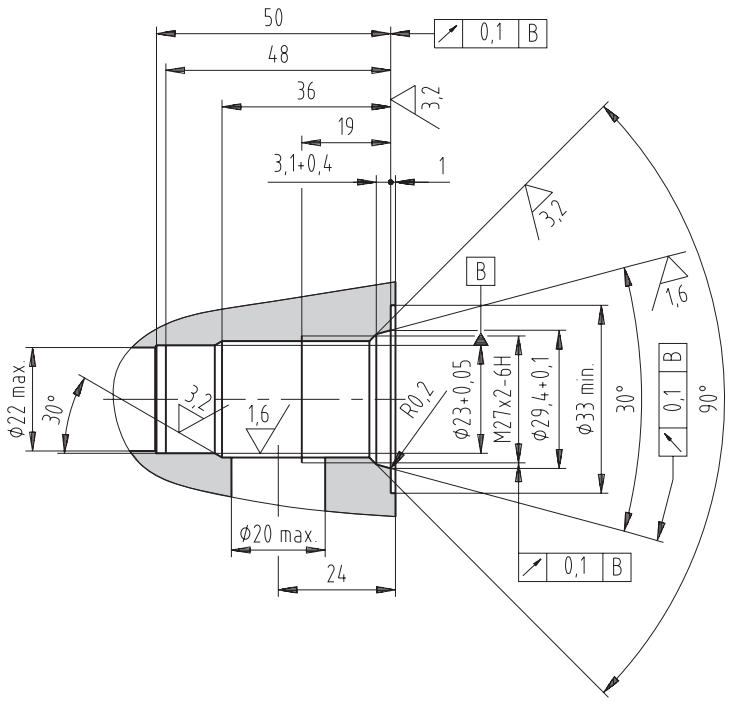
Valve Dimensions

Dimensions millimetres

Model S



Cavity



1 Adjustment element (screw with internal HEX 6)

2 Adjustment element R (hand knob)
With all adjustment elements:
- clockwise rotation - pressure increase
- anticlockwise rotation - pressure decrease

3 Locknut HEX 27

4 Wrench flats s= 27
- tightening torque 60 Nm

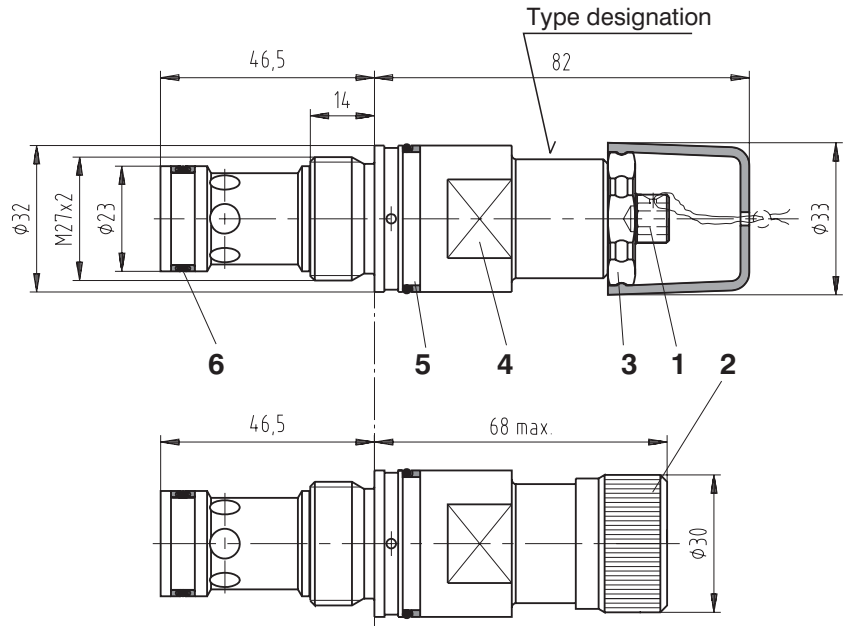
5 O-ring 23.47 x 2.62 NBR 70 (1 pc.) supplied with each valve

6 DUAL DU0100230-Z20
19,6 x 23 x 4,4 (1 pcs.)
supplied with each valve

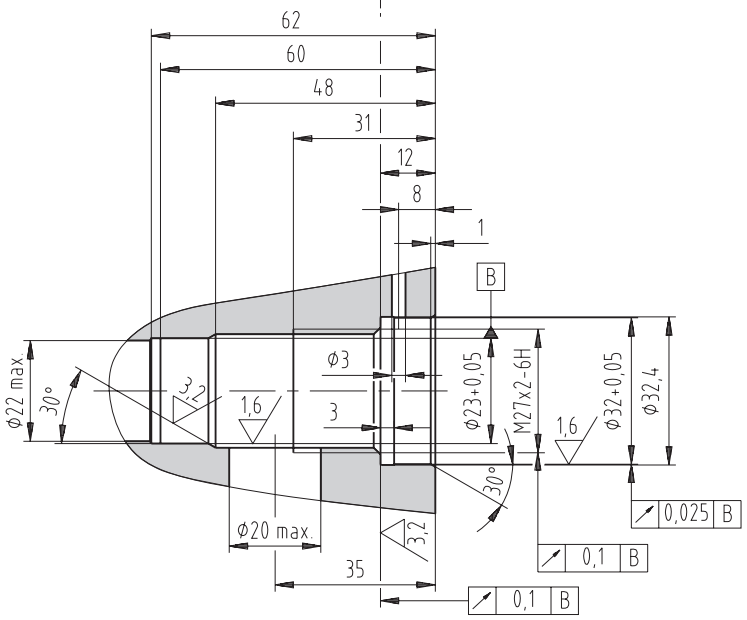
Valve Dimensions

Dimensions millimetres

Model SX, SY



Cavity



1 Adjustment element (screw with internal HEX 6)
2 Adjustment element R (hand knob)
With all adjustment elements:
- clockwise rotation - pressure increase
- anticlockwise rotation - pressure decrease

3 Locknut HEX 27
4 Wrench flats s=27
- tightening torque 60 Nm

5 Combined sealing:
O-ring 28.3 x 1.78 (1 pc.)
Back-up ring BBP80B024
29.03 x 31.73 x 1.14 (1 pc.)
supplied with each valve

6 Combined sealing:
DUAL DU0100230-Z20
19,6 x 23 x 4,4 (1 pcs.)
supplied with each valve

Spare Parts

Model	Dimensions, number	Ordering number
S - NBR	O-ring 23.47 x 2.95 NBR 90 (1 pc.)	15991500
	DUAL DU0100230-Z20 19,6 x 23 x 4,4 (1 pcs.)	
S - Viton	O-ring 23.47 x 2.95 V 90 (1 pc.)	22943400
	DUAL DU0100230-Z20 19,6 x 23 x 4,4 (1 pcs.)	
Model	**Dimensions, number**	**Ordering number**
SX, SY - NBR	O-ring 28.3 x 1.78 NBR 90 (1 pc.)	22943500
	DUAL DU0100230-Z20 19,6 x 23 x 4,4 (1 pcs.)	
	Back-up ring BBP80B024 29.03 x 31.73 x 1.14 (1 pc.)	
SX, SZ - Viton	O-ring 28.3 x 1.78 V 80 (1 pc.)	22943600
	DUAL DU0100230-Z20 19,6 x 23 x 4,4 (1 pcs.)	
	Back-up ring BBP80B024-V96 29.03 x 31.73 x 1.14 (1 pc.)	

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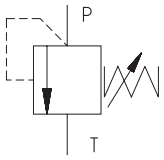
www.argo-hytos.com

Directly Operated Pressure Relief Valves VPP1

Size 06, 10 • p_{max} 320 bar • Q_{max} 120 L/min

HA 5061
7/2012

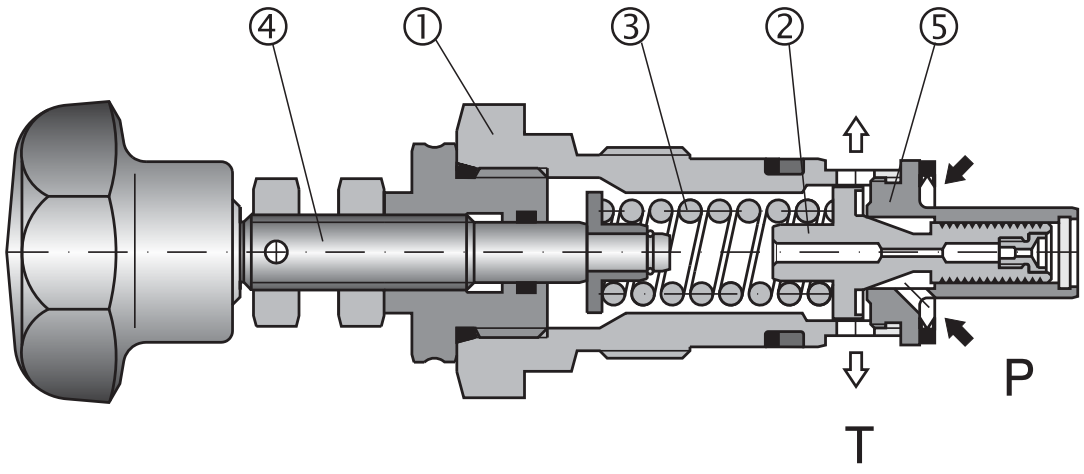
Replaces
HA 5061 9/2011



- ❑ **Screw-in cartridge, modular and in-line design**
- ❑ **Six pressure ranges**
- ❑ **Four pressure adjustment options**
- ❑ **Subplates - see catalogue HA 0002**

Functional Description

Pressure relief valves VPP1 were designed for applications requiring a safety valve or a pressure regulating valve working over a wide range of pressures and flow rates.
The valve basically consists of the valve body (1), poppet with damping spool (2) and compression spring (3). Pressure is manually set by an adjustment screw (4). The spring pushes the poppet into the seat (5) holding the valve in its normally closed position. When the force, caused by the pressure acting on the exposed surface area of the poppet, exceeds the spring force, the valve opens and the flow passes from port P to port T. To optimize the valve performance, five pressure ranges are available. Choosing the closest range is recommended. The design enables the valve to be used as a screw-in cartridge for manifold mounting, built into a threaded housing or in a subplate mounted housing. Both the threaded and the subplate mounted housings can be delivered either with metric or pipe threads.
The basic surface treatment of the valve body and the adjustment screw are zinc coated.



Ordering Code

VPP1- □ **-** □ □ **/** □ □

Direct Operated Relief Pressure Valve

Nominal size

Size 06	**06**
Size 08 - only models M and G	**08**
Size 10	**10**

Adjustment option

Screw with internal hexagon	**S**
Adjustable handknob	**R**
Lockable cylindrical handknob	**O**
Non-lockable cylindrical handknob	**Z**

Model

V	screw-in cartridge valve
M	cartridge in threaded housing - with metric threads
G	cartridge in threaded housing - with BSP threads
P	cartridge in subplate mounted housing

Pressure range in bar

2,5	up to 25
6,3	up to 63
10	up to 100
16	up to 160
25	up to 250
32	up to 320

Seals

without designation	NBR

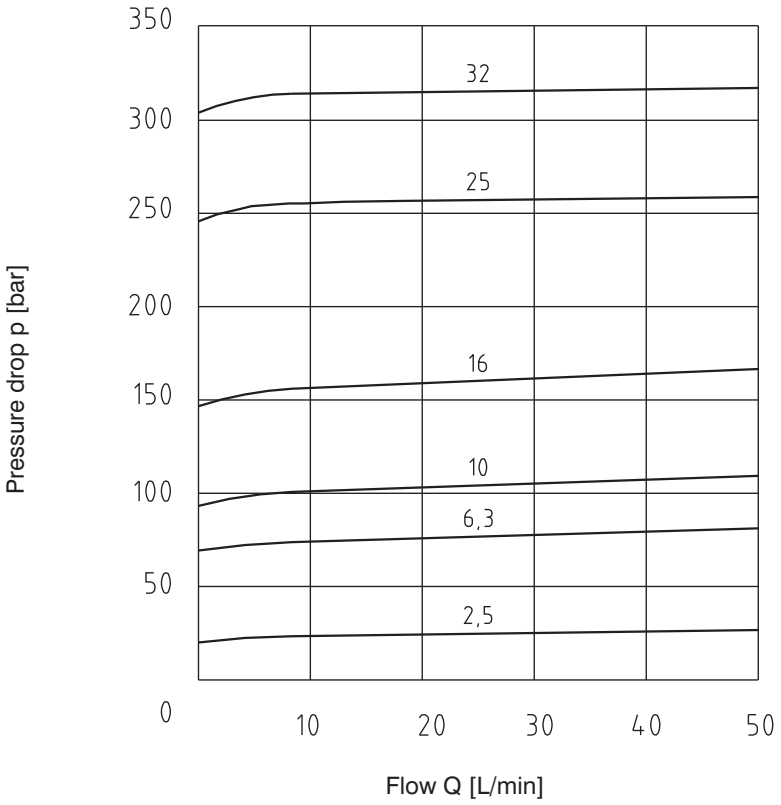
Technical Data

Nominal size	mm	06	10
Maximum flow	L/min	50	120
Max. service pressure ports (P, T, A, B)	bar	350	
Working pressure related to flow	bar	see p-Q characteristics	
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51524	
Fluid temperature range for standard sealing (NBR)	(°C)	-30 ... +100	
Viscosity range	(mm^2/s)	20 ... 400	
Maximum degree of fluid contamination		Class 21/18/15 to ISO 4406	
Weight - screw-in cartridge valve other models	kg	0,4 1,5	0,5 3,7
Mounting position		unrestricted	

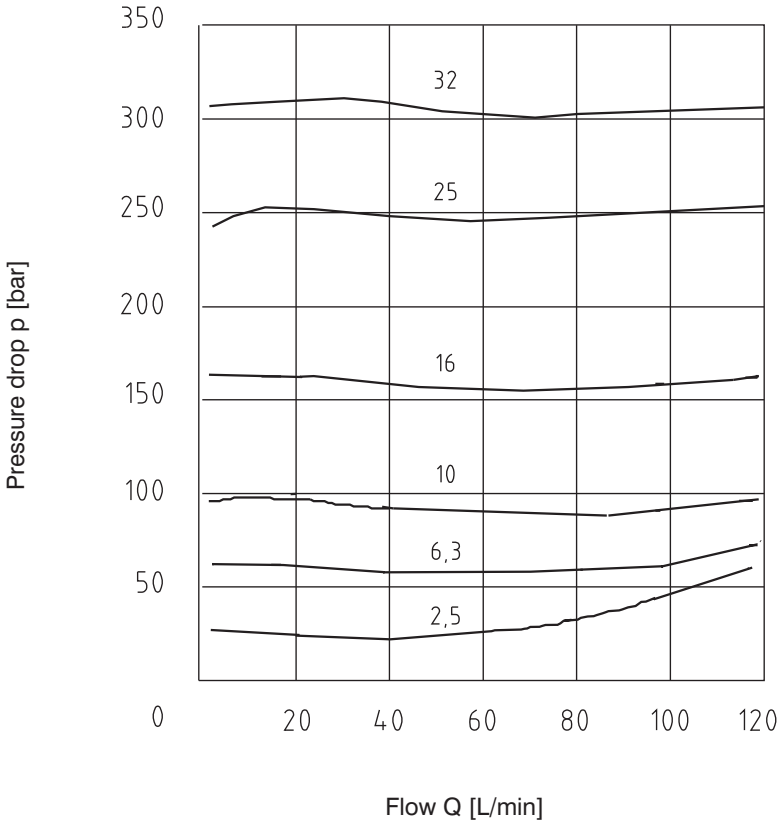
p-Q Characteristics

Measured at $\nu = 32\ mm^2/s$

Size 06



Size 10

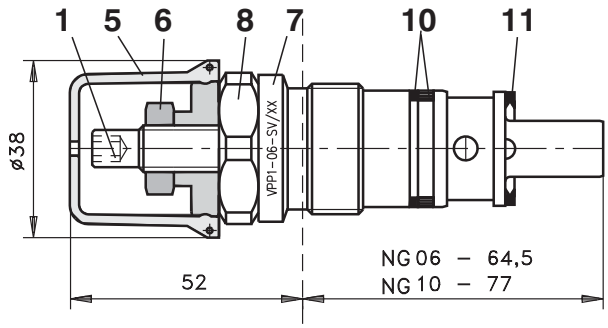


Valve Dimensions

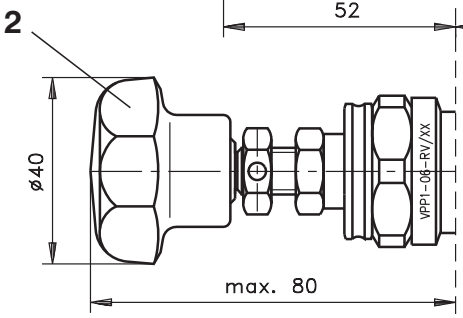
Dimensions in imillimeters

Cartridge valve - model „V“

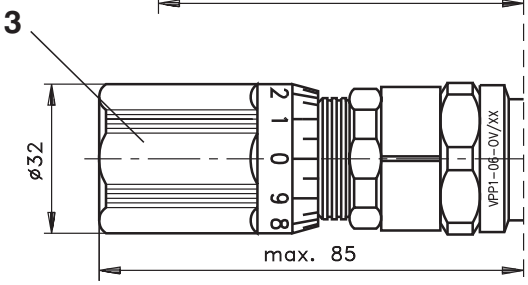
S



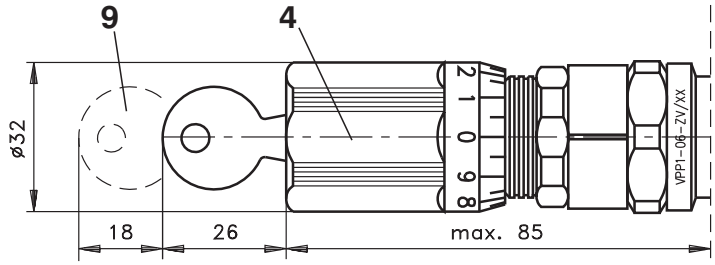
R



O

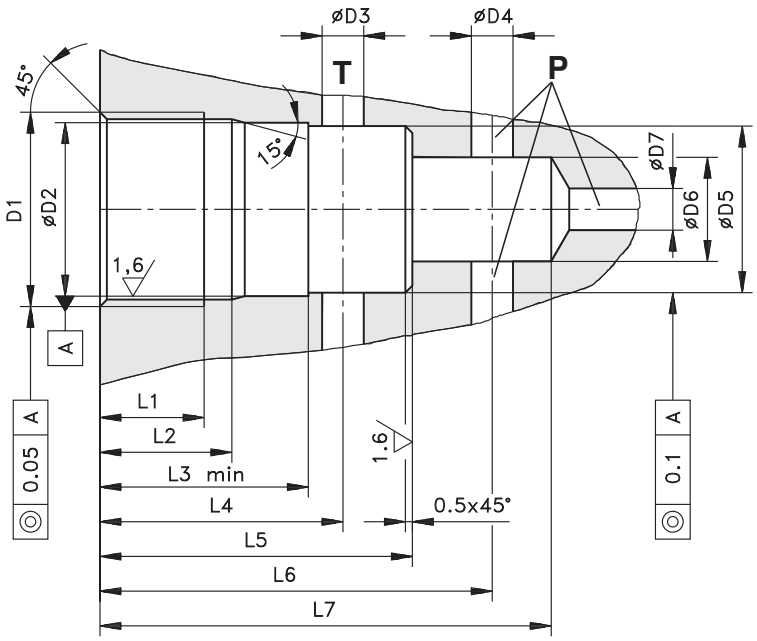


Z



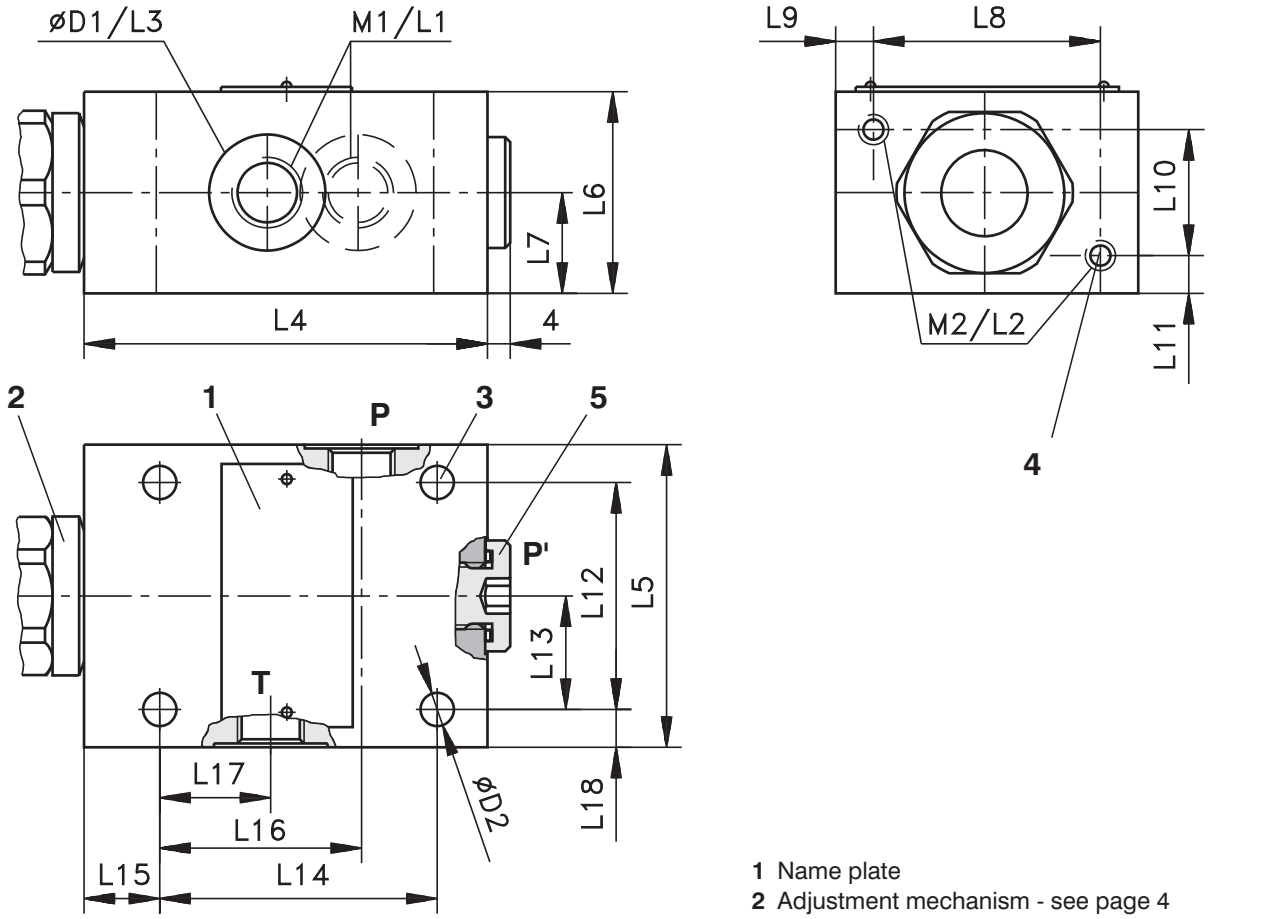
1 Screw adjustment model „S“ [inside HEX 5]
2 Adjustable handknob model „R“
3 Non-lockable cylindrical handknob model „O“
4 Lockable cylindrical handknob model „Z“
With all adjustmen mechanisms:
rotation = pressure decrease
rotation = pressure increase
5 Protective cap
6 Locknut HEX 16
7 Valve model code engraved
8 Wrench flats HEX 32
Tightening torque 80 Nm for Size 06
Wrench flats HEX 36
Tightening torque 140 Nm for Size 10
9 Distance to remove the key
10 Seal:
Size 06: Back-up ring M8-116 (1 pc.)
O-ring 20x2.65 NBR70 (1 pc.)
Size 10: Back-up ring BBP80-B121-N9 (1 pc.)
O-ring 26.64x2.62 NBR70 (1 pc.)
11 Seal:
Size 06: D 17.4x24x1.5-NSA (1 pc.)
Size 10: D 24.7x32x2 (adapted) (1pc.)

Cavity



	Size 06	Size 10
	(mm)	(mm)
D1	M28 x 1,5	M35 x 1,5
∅D2	25 H9	32 H9
∅D3	6	10
∅D4	6	10
∅D5	24,9	31,9
∅D6	15	18,5
∅D7	6	10
L1	15	18
L2	19	21+0,4
L3	32	35
L4	35	41
L5	45	52
L6	56,5±5,5	67,5±7,5
L7	65	80

Cartridge in threaded housing - models „M“ and „G“

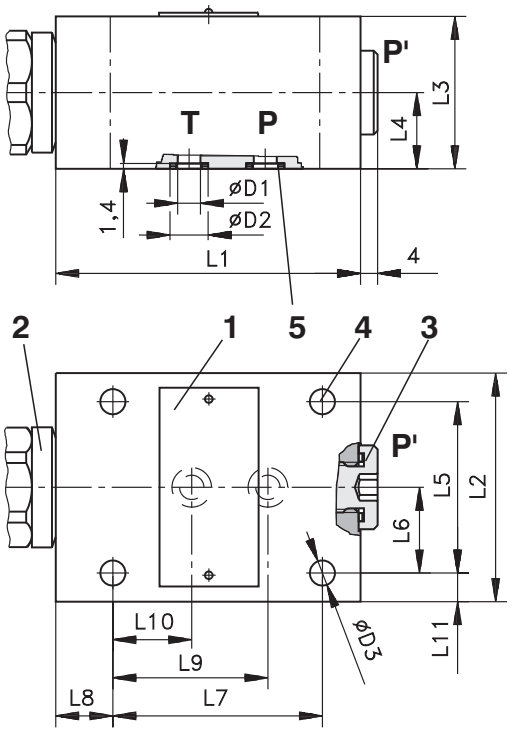


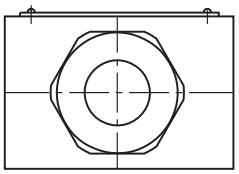
1 Name plate
2 Adjustment mechanism - see page 4
3 4 mounting holes
4 2 threaded holes (other mounting possibility)
5 Port P’ (as input can be used P or P’)
thread M1/L1

Model	**M1**	**M2**	**⌀D1**	**⌀D2**	**L1**	**L2**	**L3**	**L4**	**L5**	**L6**	**L7**
VPP1-06-xM/x	M14 x 1,5	M6	25	6,6	12	10	0,5	80	60	40	20
VPP1-06-xG/x	G 1/4										
VPP1-08-xM/x	M18 x 1,5	M8	30	9	16	20		100	80	60	30
VPP1-08-xG/x	G 3/8		28								
VPP1-10-xM/x	M22 x 1,5		34								
VPP1-10-xG/x	G 1/2										

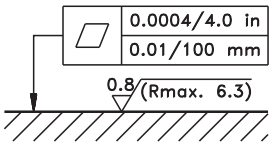
Model	**L8**	**L9**	**L10**	**L11**	**L12**	**L13**	**L14**	**L15**	**L16**	**L17**	**L18**
VPP1-06-xM/x	45	7.5	25	7.5	45	22,5	55	15	40	20	7,5
VPP1-06-xG/x											
VPP1-08-xM/x	60	10	40	10	60	30	70	20	49	21	10
VPP1-08-xG/x											
VPP1-10-xM/x											
VPP1-10-xG/x											

Cartridge in subplate mounted housing - model „P“





1 Name plate
2 Adjustment mechanism - see page 4
3 Port P', thread M1/H1 can be used as input pressure or for measuring
4 4 mounting holes
5 Square ring:
size 06 - DKAR 00011 [7.65x1.68 (2 pcs.)]
size 10 - DKAR 00014 [12.42x1.68 (2 pcs.)]



Required surface finish of interface

Note: Subplates - see catalog HA 0002

Model	M1	H1	⌀D1	⌀D2	⌀D3	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11
VPP1-06-xP/x	G 1/4	12	6	10,8	6,6	80	60	40	20	45	22,5	55	15	40	20	7,5
VPP1-10-xP/x			10	15,6	9	100	80	60	30	60	30	70	20	45	21	10

Spare Parts

Accessories (delivered with subplate model „P“)

	Bolt kit	Square ringe
Size 06	M6x50 DIN 912-10.9 (4 pcs.) Tightening torque 8.9 Nm	DKAR 00011 7,65 x 1,68 (2 pcs.)
Size 10	M8x70 DIN 912-10.9 (4 pcs.) Tightening torque 15 Nm	DKAR 00014 12,42 x 1,68 (2 pcs.)

Seak kit for cartridge valve

Type		Dimensions, quantity			Ordering number
		O-ring	Back-up ring	U-Seal	
Size 06	Standard NBR	8 x 1,8 (1 pc.)	19,43 x 23,79 x 1,14 (1 pc.)	17,4 x 24 x 1,5 (1 pc.)	15972100
		20 x 2,65 (1 pc.)	-	-	
		20 x 2 (1 pc.)	-	-	
Size 10	Standard NBR	8 x 1,8 (1 pc.)	27,46 x 31,8 2 x1,1 (1 pc.)	24,7 x 30,8 x 2 (1 pc.)	15972200
		20 x 2 (1 pc.)	-	-	
		26,64 x 2,62 (1 pc.)	-	-	

Caution!

- The packing foil is recyclable.
- The protecting plate can be returned to the manufacturer.
- For applications outside these parameters, please consult the manufacturer.
- The technical information regarding the product presented in this catalogue is for descriptive purposes only. It should not be construed in any case as a guaranteed representation of the product properties in the sense of the law.

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www.argo-hytos.com

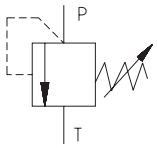
Directly Operated Pressure Relief Valves

VPP2-04

Size 04, 06 • p_{max} up to 320 bar • Q_{max} up to 40 L/min

HA 5093
06/2010

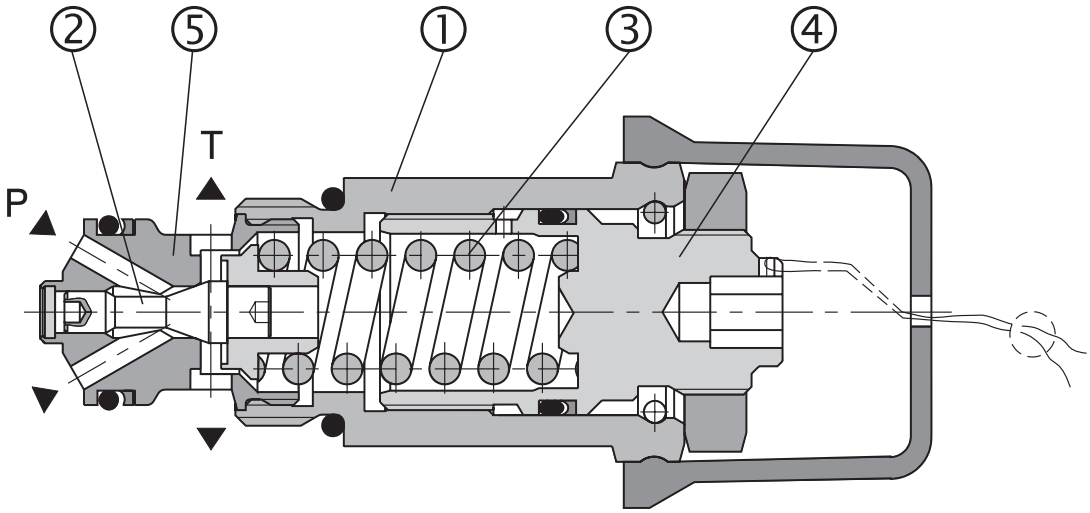
Replaces
HA 5093 1/2003



- ❑ **Screw-in cartridge, modular and in-line design**
- ❑ **Six pressure ranges**
- ❑ **Two pressure adjustment options**
- ❑ **Subplates see data sheet HA 0002**

Functional Description

Pressure relief valves VPP2-04 were designed for applications requiring a safely valve or a pressure regulating valve working over a wide range of pressures and flow rates.
The valve basically consists of the valve body (1), poppet with damping spool (2) and compression spring (3). The spring pushes the poppet onto the seat (5) holding the valve in its normally closed position. When the force, caused by the pressure acting on the exposed surface area of the poppet, exceeds the spring force, the valve opens and and the flow passes from port P to port T.
To optimize the valve performance, six pressure ranges are available. Choosing the closest range is recommended. The design enables the valve to be used as a screw-in cartridge for manifold mounting, or in a subplate and/or in-line mounted housing.
The valve body and the adjustment screw are zinc coated. With models M and R the valve bodies are phosphate coated.



Ordering Code

VPP2-04/ □ □ □ - □ □

Directly Operated Pressure Relief Valve

Model

screw in cartridge	**S**
modular valve, connection A - T	MA04
modular valve, connection B - T	MB04
modular valve, connection P - T	**MP04**
modular valve, connection A - B and B - A	MC04
modular valve, connection A - T and B - T	MD04
modular valve, connection A - T	MA06
modular valve, connection B - T	MB06
modular valve, connection P - T	**MP06**
modular valve, connection A - B and B - A	MC06
modular valve, connection A - T and B - T	MD06
in-line valve, thread G3/8 - P1, P2, T	RA1
in-line valve, thread G1/2 - P1, P2, T	**RA2**
in-line valve, thread G3/8 - P, T	RB1
in-line valve, thread G1/2 - P, T	RB2

Seals

without designation	NBR
V	Viton (FPM)

Adjustment option

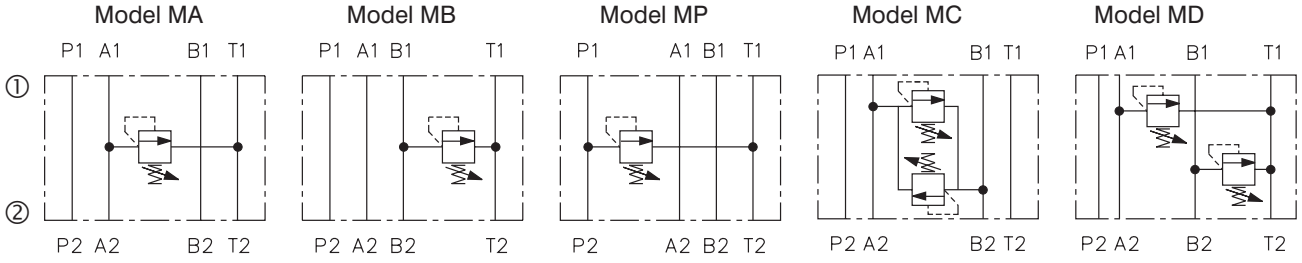
without designation	Hexagon set screw locknut
R	Adjustable handknob

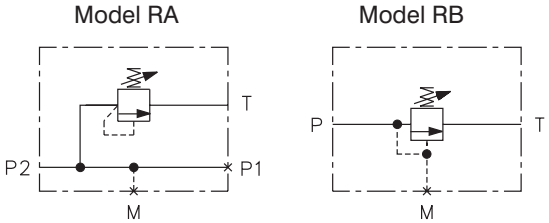
Pressure range

2	up to 25 bar
6	up to 63 bar
10	up to 100 bar
16	up to 160 bar
25	up to 250 bar
32	up to 320 bar

FOR PREFERRED TYPES SEE BOLD TYPING IN ORDERING CODE AND TABLE OF PREFERRED TYPES ON PAGE 11

Functional Symbols





Ordering Numbers of Sandwich / Valve Bodies (without screw-in cartridge)

Valve body for modular valve - NBR	Ordering number	Valve body for modular valve - Viton	Ordering number
MA04-VP	15907500	MA04-VP/V	22501800
MB04-VP	15907600	MB04-VP/V	22501900
MP04-VP	15907700	MP04-VP/V	22502000
MC04-VP	15907800	MC04-VP/V	22502100
MD04-VP	15907900	MD04-VP/V	22502200
Valve body for modular valve - NBR	**Ordering number**	**Valve body for modular valve - Viton**	**Ordering number**
MA06-VP	15988600	MA06-VP/V	22949600
MB06-VP	15988800	MB06-VP/V	16661700
MP06-VP	15989000	MP06-VP/V	22949800
MC06-VP	15989200	MC06-VP/V	16758800
MD06-VP	15989300	MD06-VP/V	22950100

Ordering Numbers of Sandwich / Valve Bodies (without screw-in cartridge)

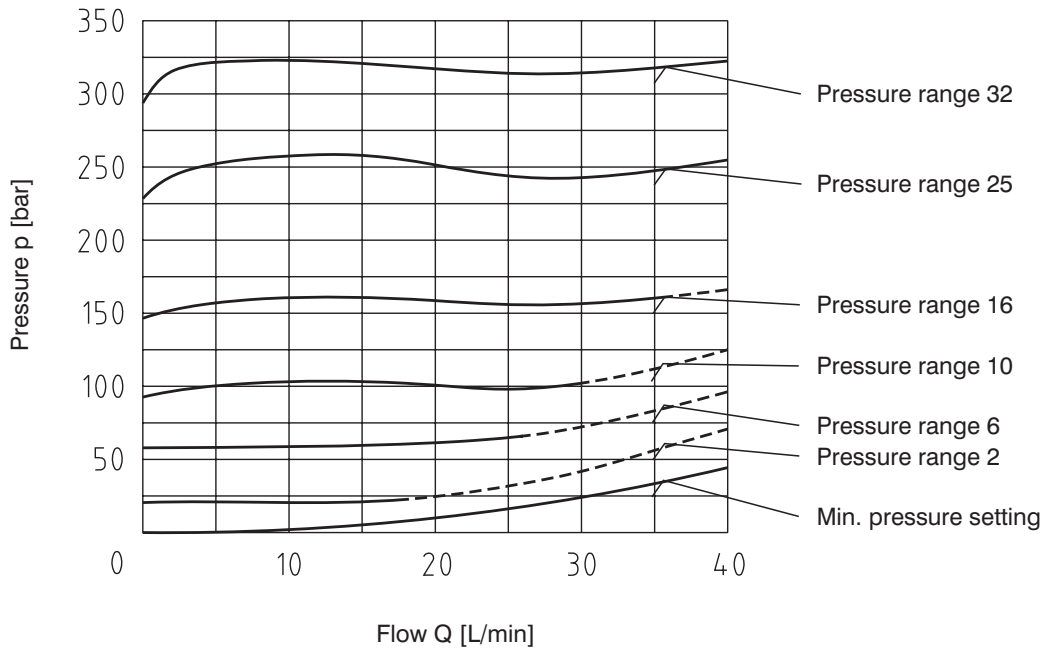
Valve body for in-line valve - NBR	Ordering number	Valve body for in-line valve - Viton	Ordering number
RA1-06-VP	15989400	RA1-06-VP/V	22950200
RA2-06-VP	15989500	RA2-06-VP/V	22950300
RB1-06-VP	15989600	RB1-06-VP/V	22950400
RB2-06-VP	15989700	RB2-06-VP/V	22950500

Technical Data for Model S

Nominal size	mm	04
Max. flow rate	L/min	40
Max. service pressure ports (P, T, A, B)	bar	350
Working pressure related to flow	bar	see p-Q characteristics
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51 524
Fluid temperature range for standard sealing (NBR)	°C	-30 ... +100
Fluid temperature range for Viton sealing (FPM)	°C	-20 ... +120
Viscosity range	mm^2/s	20 ... 400
Max. degree of fluid contamination		Class 21/18/15 according to ISO 4406 (1999)
Weight - model S	kg	0,17
Weight - models MA04, MB04, MP04 - models MC04, MD04 - models MA06, MB06, MP06 - models MC06, MD06 - models RA1, RA2, RB1, RB2	kg	0.82 1.32 1.12 1.42 1.17
Mounting position		optional

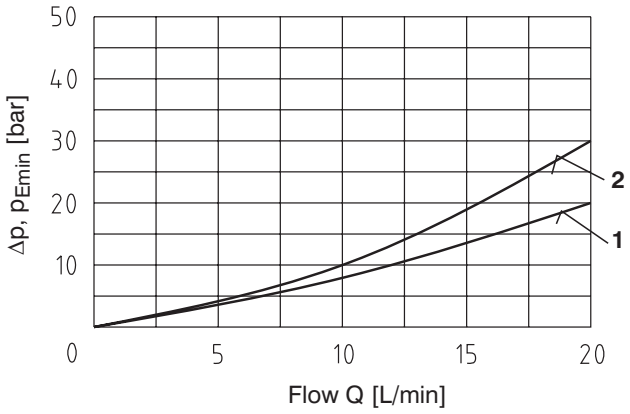
p-Q Characteristics for Model S

Measured at $\nu = 32\ mm^2/s$

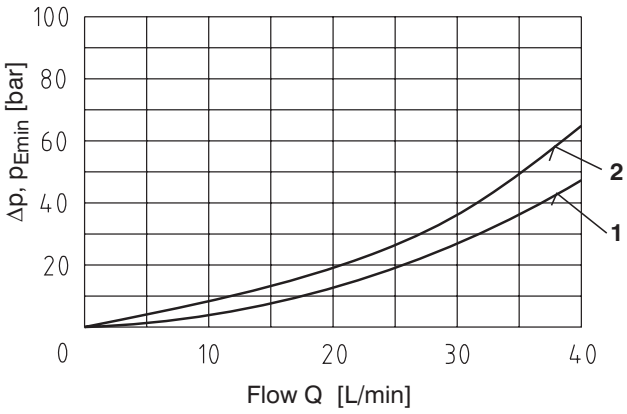


Δp-Q Characteristics (min. pressure setting)

Measured at $\nu = 32\ mm^2/s$



1 - MA04, MB04, MP04, MD04
2 - MC04

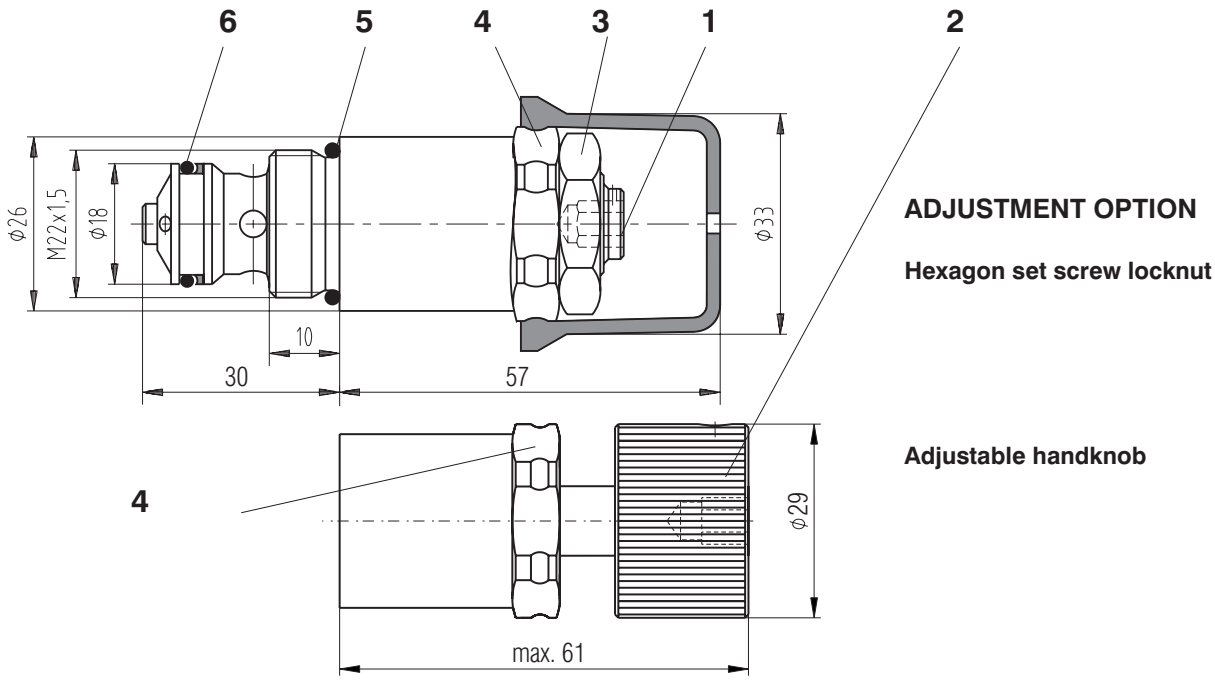


1 - MA06, MB06, MP06, MD06
2 - MC06

Valve Dimensions

Dimensions in millimetres

Model S

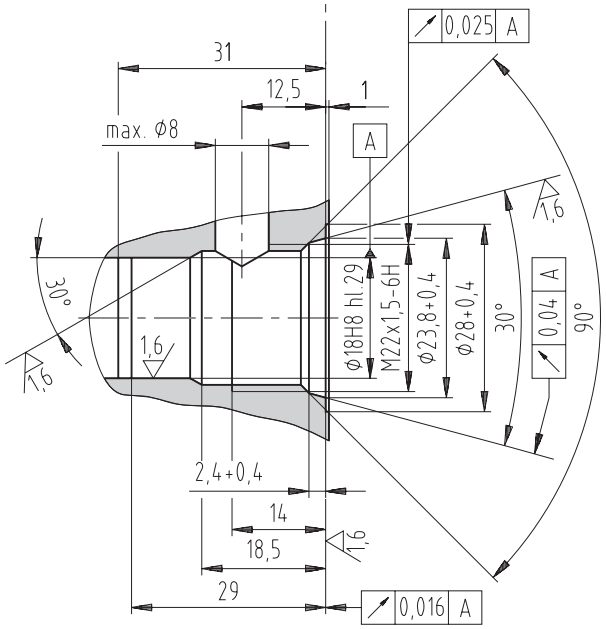


ADJUSTMENT OPTION

Hexagon set screw locknut

Adjustable handknob

Cavity



Dimensions in millimeters:

1 Adjustment element (screw with internal HEX 6)
- clockwise rotation - pressure increase
- anticlockwise rotation - pressure decrease

2 Adjustable handknob model "R"

3 Locknut HEX 24

4 Wrench flats HEX 27
- tightening torque 30 Nm

5 O-ring 19.4 x 2.1 (1 pc.) supplied with valve

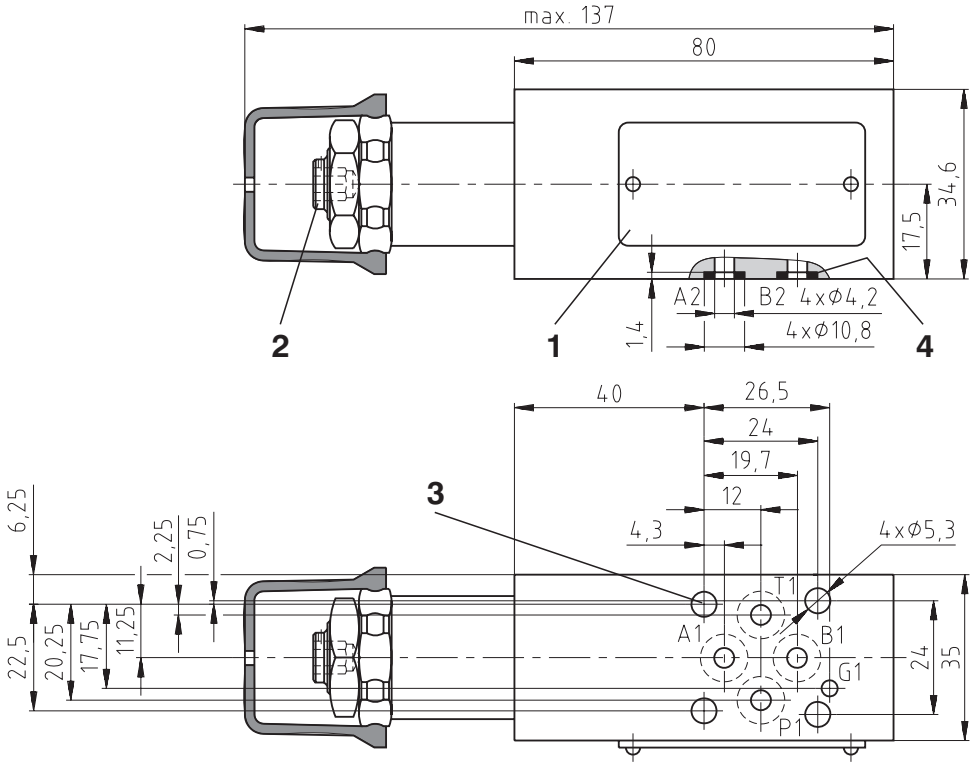
6 Combined seal:
O-ring 14 x 1.78 (1 pc.)
Back-up ring BBP80B015-N9
14,73 x 17,43 x 1,14 (1 pc.)
supplied with valve

Valve Dimensions

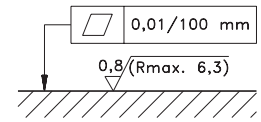
Dimensions in millimetres

Size 04 (Installation dimensions to ISO 4401, CETOP- RP 121H)

Model MA

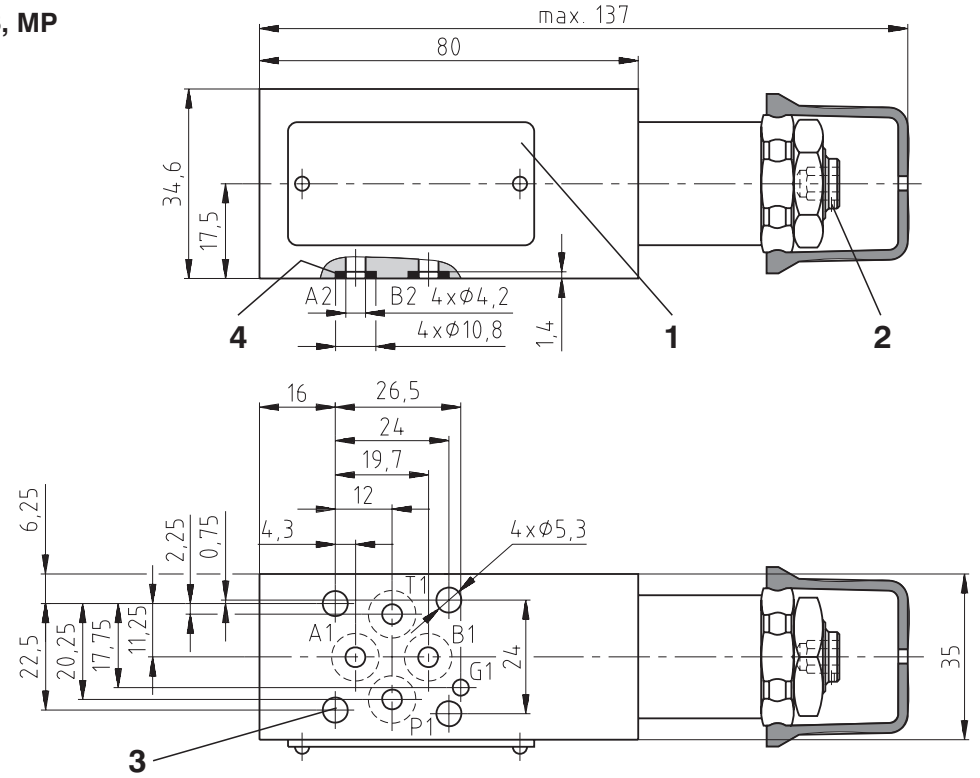


1 Name plate
2 Adjustment element (screw with internal HEX 6)
3 4 through mounting holes
4 Square rings 7.65 x 1.68 (4 pcs.) supplied with valve



Required surface finish of interface

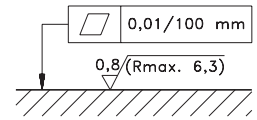
Models MB, MP



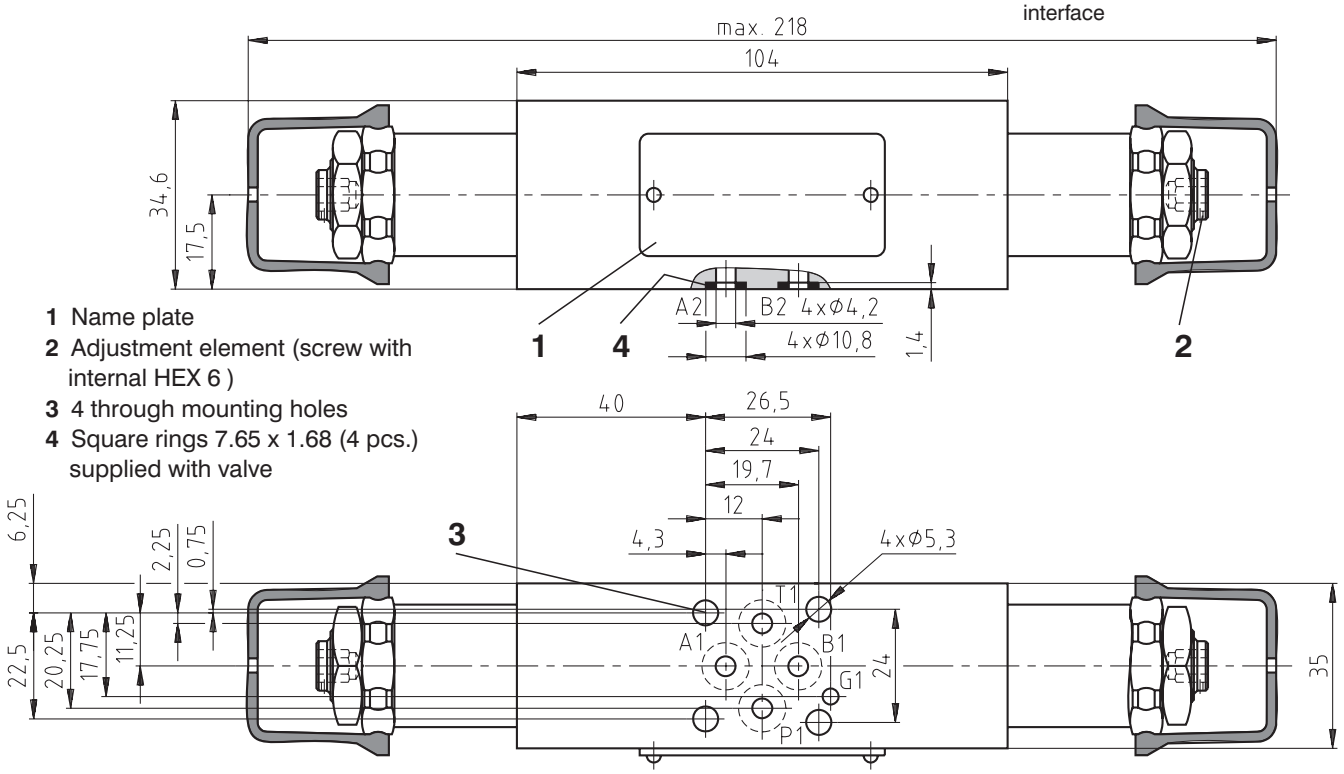
Valve Dimensions

Dimensions in millimetres

Models MC, MD



Required surface finish of interface



1 Name plate
2 Adjustment element (screw with internal HEX 6)
3 4 through mounting holes
4 Square rings 7.65 x 1.68 (4 pcs.) supplied with valve

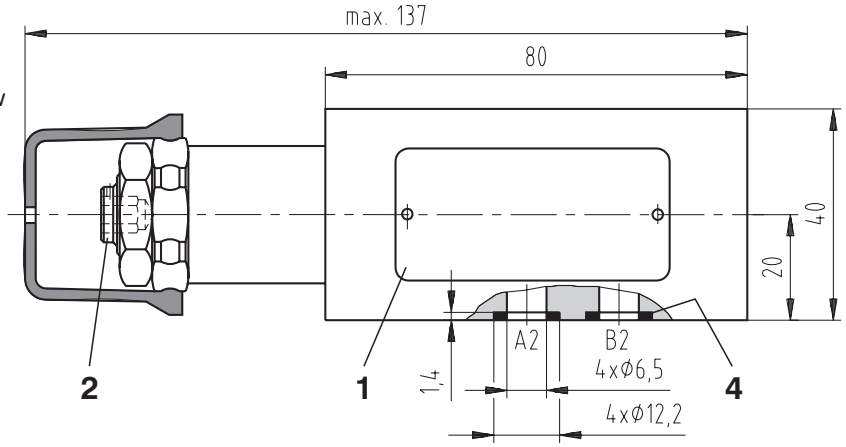
Valve Dimensions

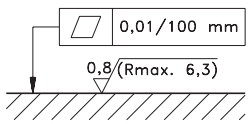
Dimensions in millimetres

Size 06 (Installation dimensions to ISO 4401, DIN 24 340)

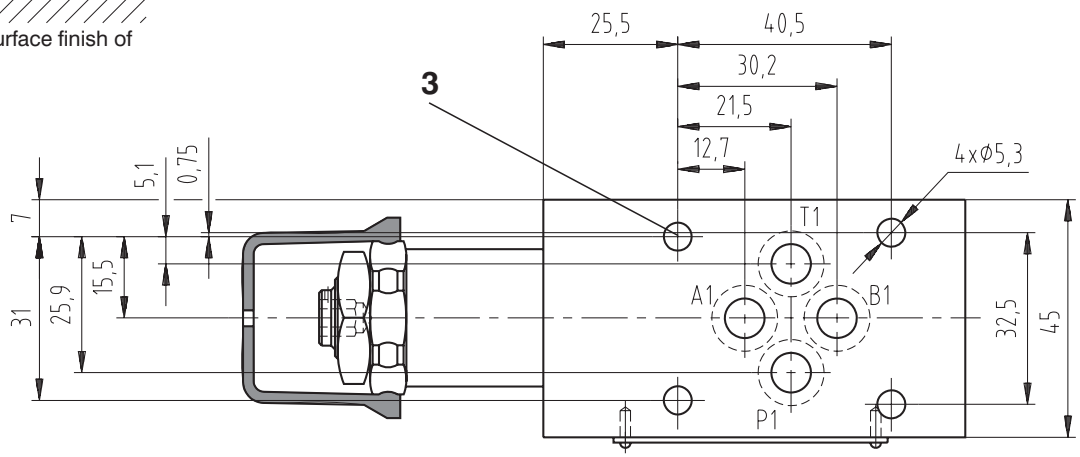
Model MA

1 Name plate
2 Adjustment element (screw with internal HEX 6)
3 4 through mounting holes
4 Square rings 9.25 x 1.68 (4 pcs.) supplied with valve





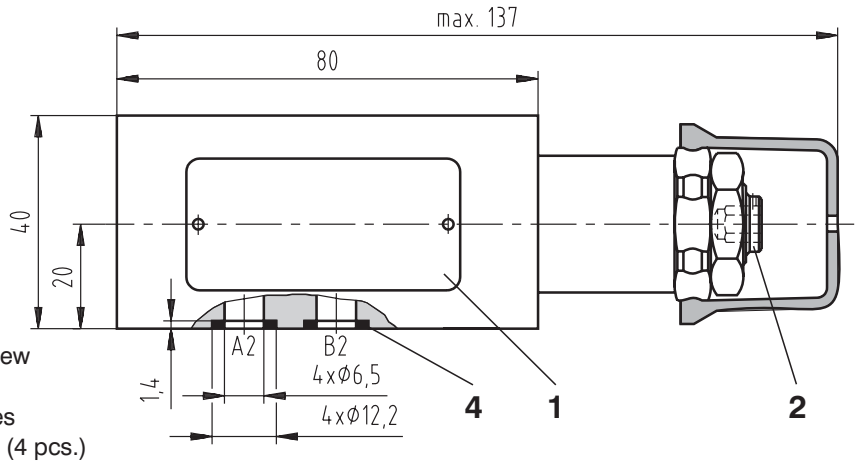
Required surface finish of interface



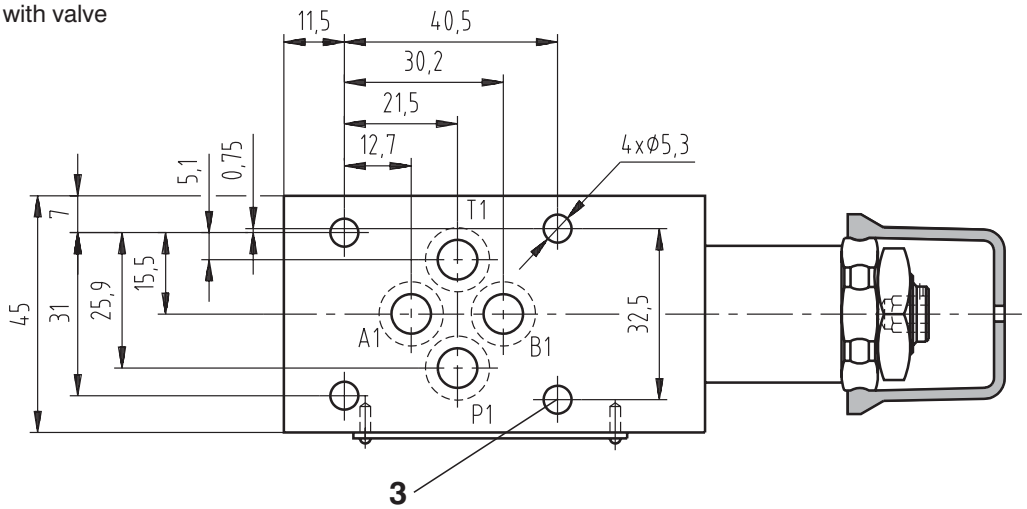
Valve Dimensions

Dimensions in millimetres

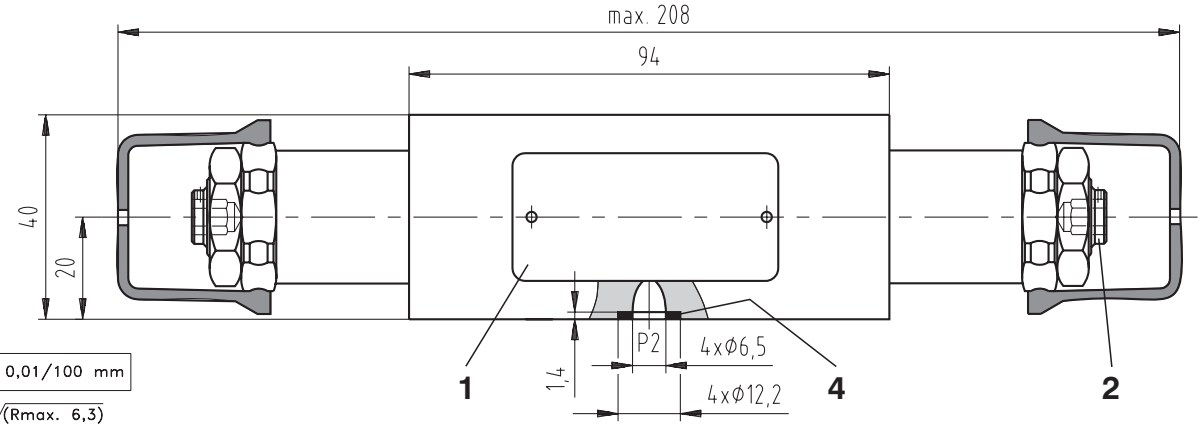
Models MB, MP

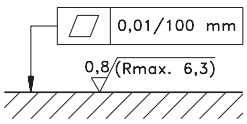


1 Name plate
2 Adjustment element (screw with internal HEX 6)
3 4 through mounting holes
4 Square rings 9.25 x 1.68 (4 pcs.) supplied with valve

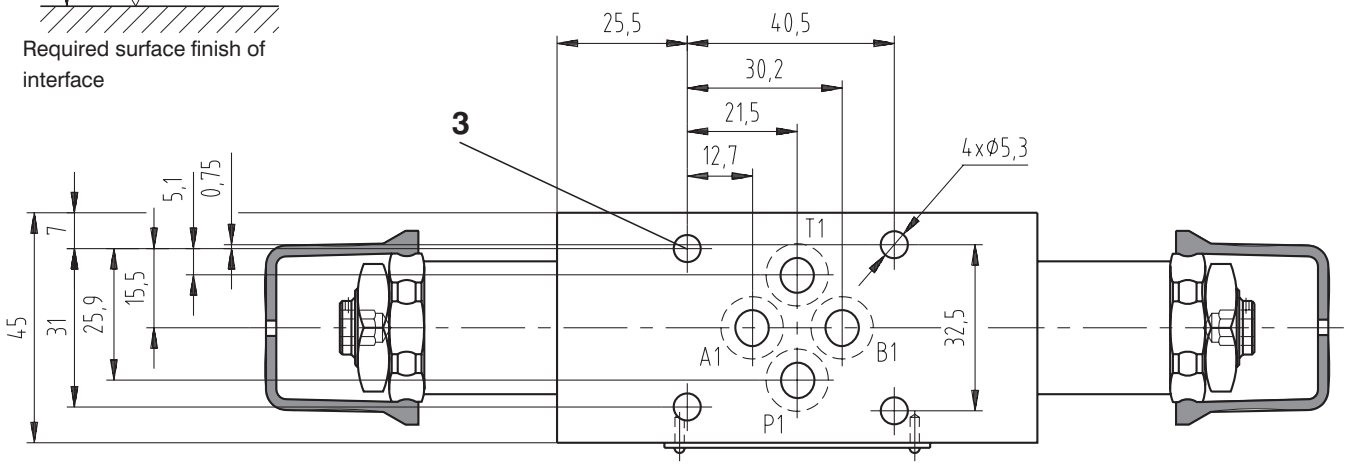


Models MC, MD





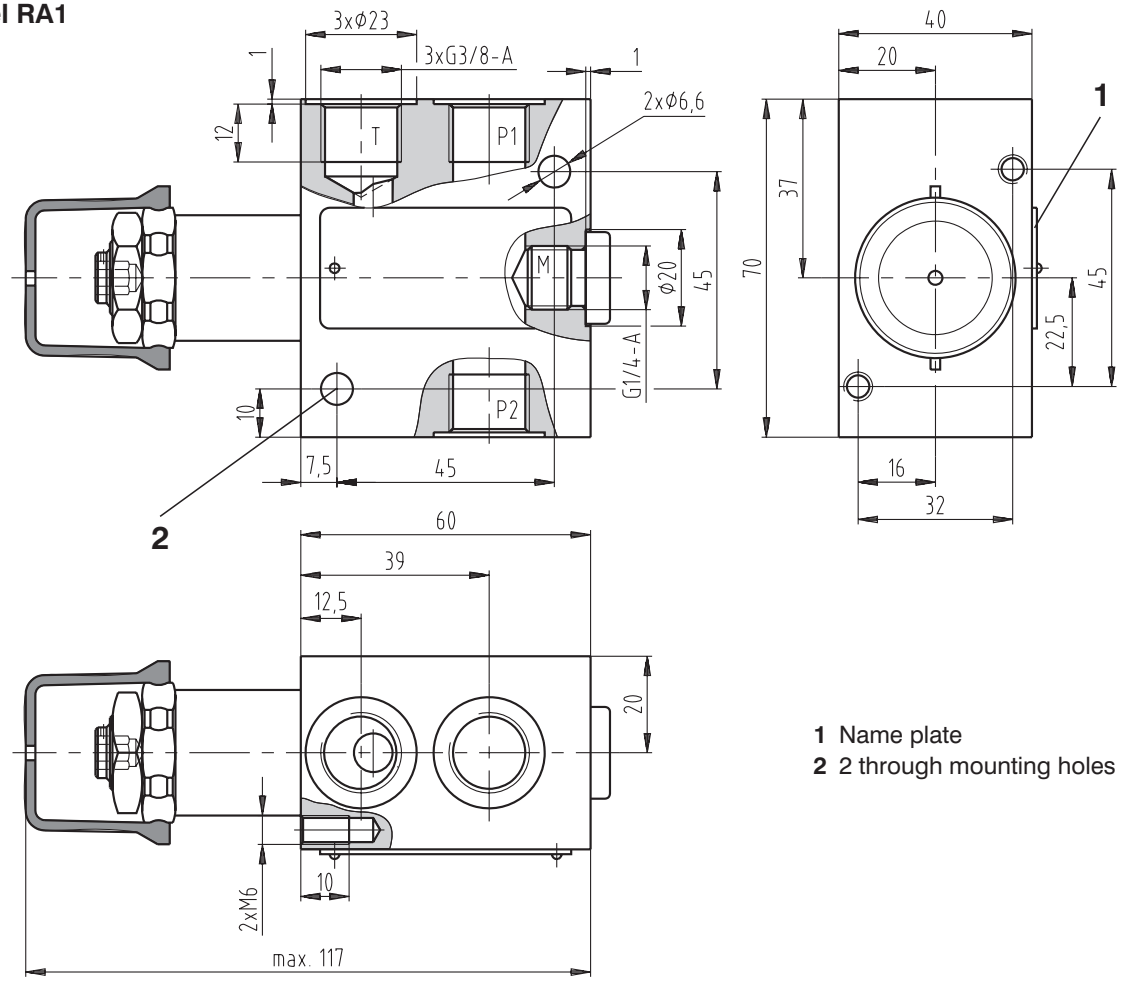
Required surface finish of interface



Valve Dimensions

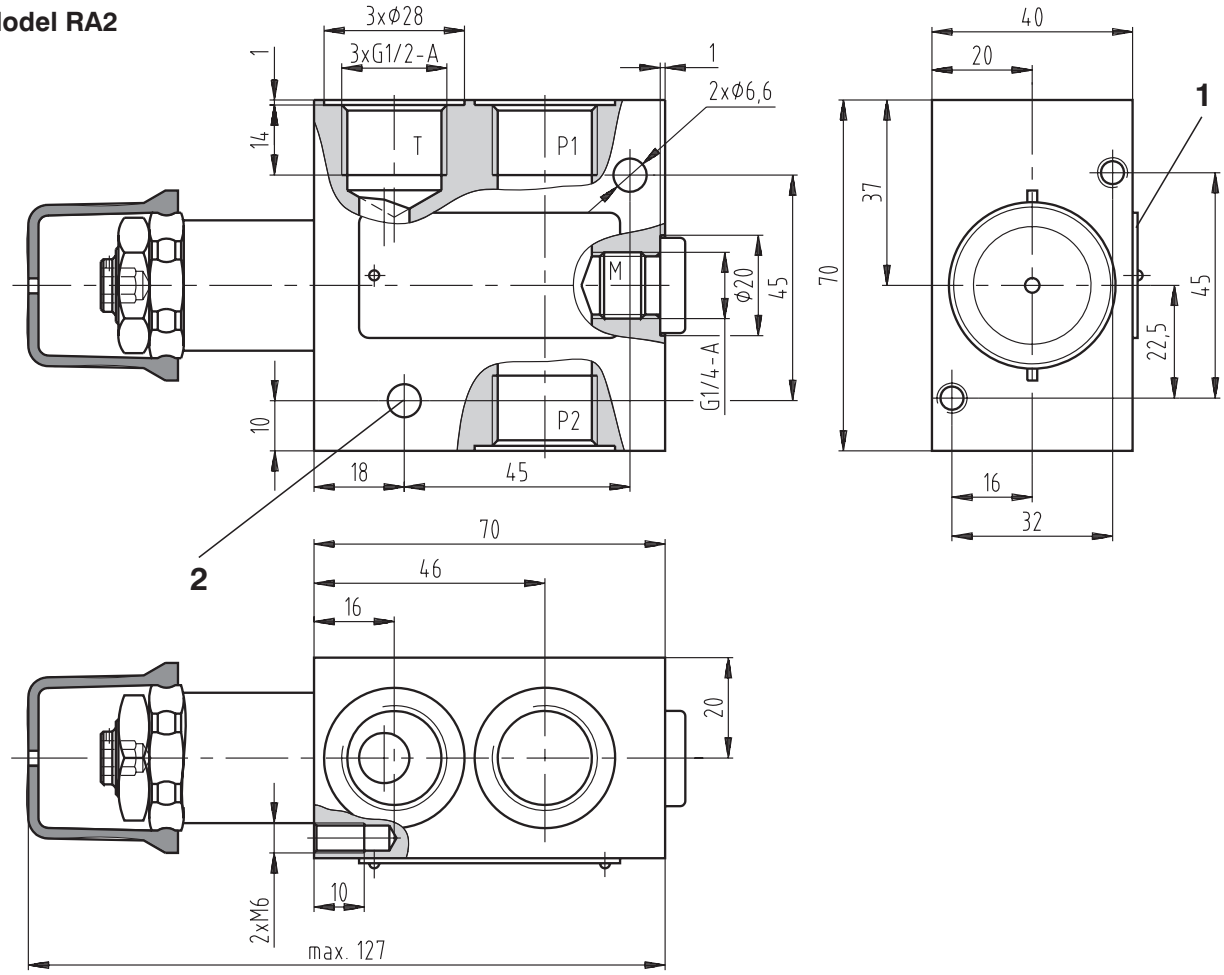
Dimensions in millimetres

Model RA1



1 Name plate
2 2 through mounting holes

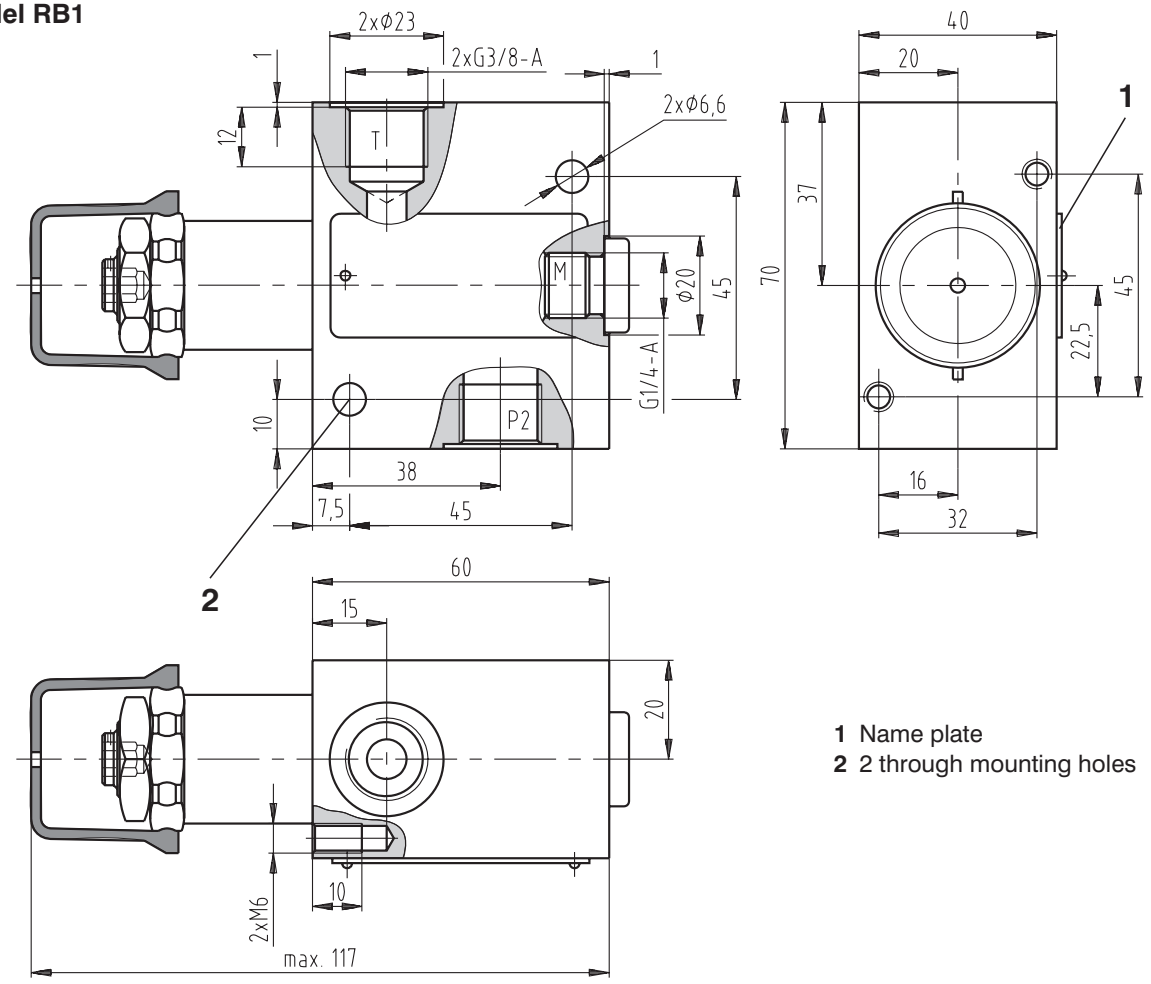
Model RA2



Valve Dimensions

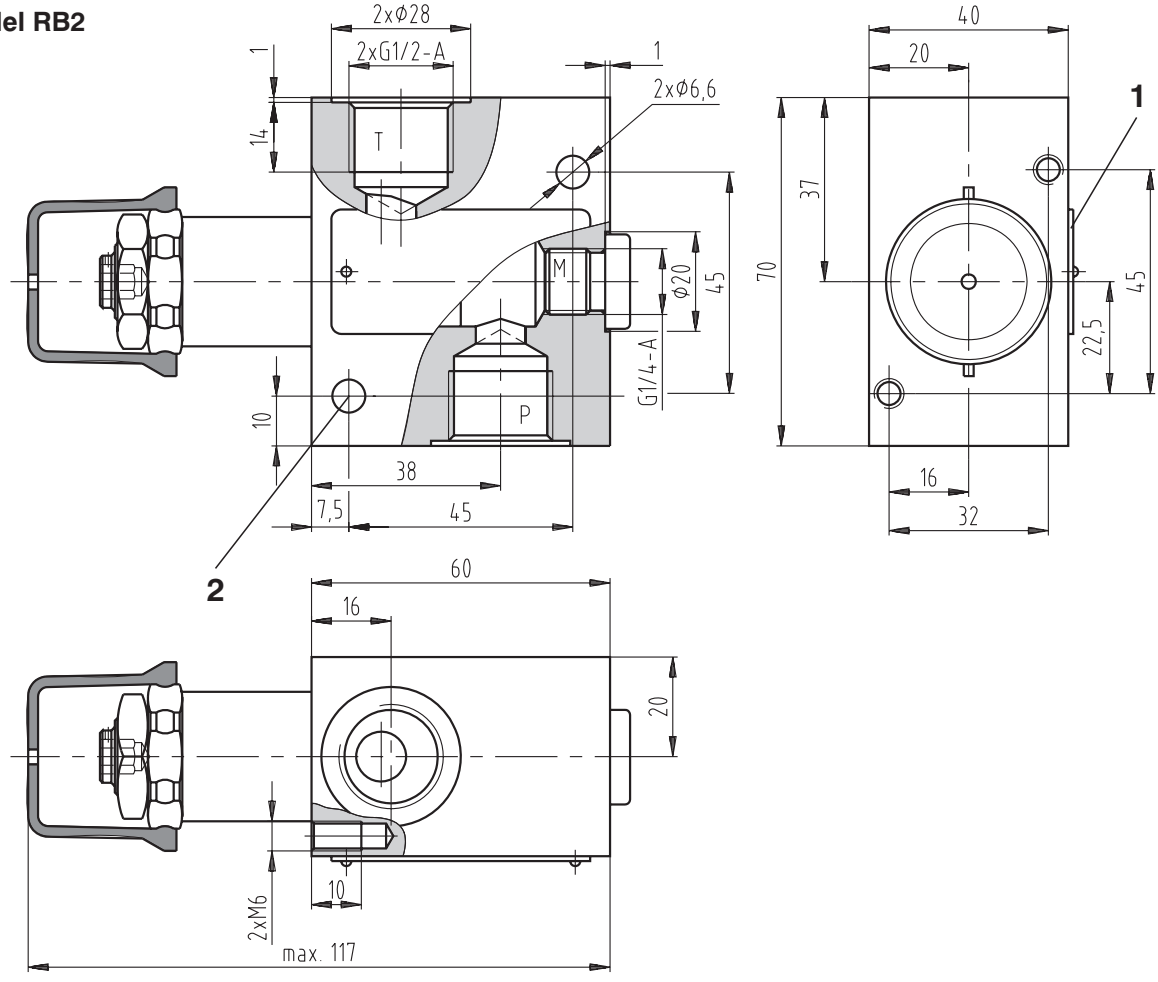
Dimensions in millimetres

Model RB1

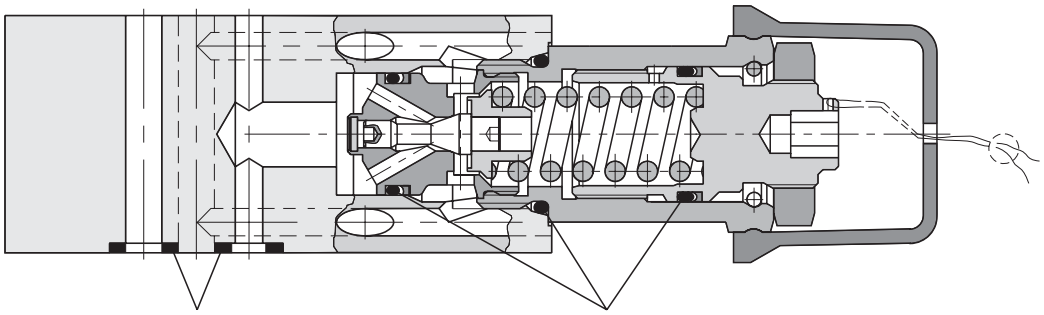


1 Name plate
2 2 through mounting holes

Model RB2



Spare Parts



Model	Dimensions, quantity	Ordering number
Screw-in cartridge - NBR	O-ring 14 x 1.78 NBR 90 (1 pc.)	15908000
	O-ring 17 x 1.8 NBR 70 (1 pc.)	
	O-ring 19.4 x 2.1 NBR 80 (1 pc.)	
	Back-up ring BBP80B015-N9 14.73 x 17.43 x 1.14 (1 pc.)	
	Back-up ring BBP80B016-N9 16.33 x 19.03 x 1.14 (1 pc.)	
Screw-in cartridge - Viton	O-ring 14 x 1.78 (1 pc.)	15908100
	O-ring 17.17 x 1.78 (1 pc.)	
	O-ring 19.4 x 2.1 (1 pc.)	
	Back-up ring BBP80B015 14.73 x 17.43 x 1.14 (1 pc.)	
	Back-up ring BG1300174-PT00 17.4 x 1.3 (1 pc.)	
Model	**Dimensions, quantity**	**Ordering number**
Modular valve size 04 - NBR	Square ring 7.65 x 1.68 (4 pcs.)	15908200
Modular valve size 04 - Viton	O-ring 7.65 x 1.78 (4 pcs.)	22502600
Modular valve size 06 - NBR	Square ring 9.25 x 1.68 (4 pcs.)	15991700
Modular valve size 06 - Viton	O-ring 9.25 x 1.78 (4 pcs.)	22944700
Model	**Typ, quantity**	**Ordering number**
In-line valve RA1 - NBR	VSTI R1/4-ED (1 pc.) VSTI R3/8-ED (1 pc.)	22944600
In-line valve RA2 - NBR	VSTI R1/4-ED (1 pc.) VSTI R1/2-ED (1 pc.)	22944400
In-line valve RB1 - NBR	VSTI R1/4-ED (1 pc.)	22944500
In-line valve RB2 - NBR		
In-line valve RA1 - Viton	VSTI R1/4-ED - Viton (1 pc.) VSTI R3/8-ED - Viton (1 pc.)	22944300
In-line valve RA2 - Viton	VSTI R1/4-ED - Viton (1 pc.) VSTI R1/2-ED - Viton (1 pc.)	22944100
In-line valve RB1 - Viton	VSTI R1/4-ED - Viton (1 pc.)	22944200
In-line valve RB2 - Viton		

Preferred Types of Valves

Type	Ordering Number	Type	Ordering Number
VPP2-04/S-10	15906300	VPP2-04/MP06-10	15909300
VPP2-04/S-25	15906700	VPP2-04/MP06-25	15911600
VPP2-04/S-32	15907000	VPP2-04/MP06-32	15912700
VPP2-04/MP04-10	22507400	VPP2-04/RA2-10	22509900
VPP2-04/MP04-25	15911100	VPP2-04/RA2-25	22516100
VPP2-04/MP04-32	15912100	VPP2-04/RA2-32	22519400

Caution!

- The packing foil is recyclable.
- The protecting plate can be returned to the manufacturer.
- Mounting studs must be ordered separately. Tightening torques are: size 04 - 5 Nm, size 06 - 8.9 Nm.
- The technical information regarding the product presented in this catalogue is for descriptive purposes only. It should not be construed in any case as a guaranteed representation of the product properties in the sense of the law.

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www.argo-hytos.com

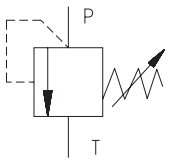
Directly Operated Pressure Relief Valves

VPP2-06

Size 06 • p_{max} up to 320 bar • Q_{max} up to 50 L/min

HA 5062
6/2012

Replaces
HA 5062 11/2011

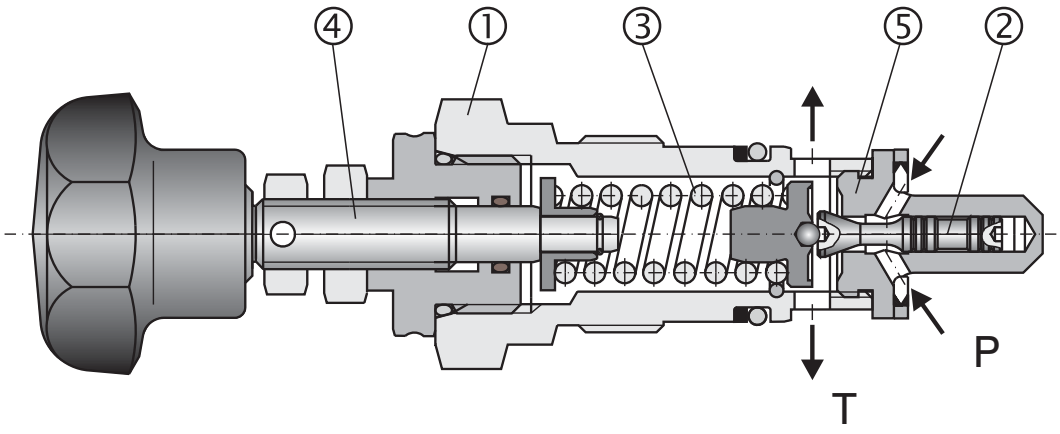


- **Screw-in cartridge, modular and in-line design**
- **Six pressure ranges**
- **Four pressure adjustment options**
- **Subplates - see catalogue HA 0002**

Functional Description

Pressure relief valves VPP2-06 were designed for applications requiring a safety valve or a pressure regulating valve working over a wide range of pressures and flow rates.
The valve basically consists of the valve body (1), poppet with damping spool (2) and compression spring (3). Pressure is manually set by an adjustment screw (4). The spring pushes the poppet into the seat (5) holding the valve in its normally closed position. When the force, caused by the pressure acting on the exposed surface area of the poppet, exceeds the spring force, the valve opens and the flow passes from port P to port T.

To optimize the valve performance, five pressure ranges are available. Choosing the closest range is recommended. The design enables the valve to be used as a screw-in cartridge for manifold mounting, built into a threaded housing or in a subplate mounted housing. Both the threaded and the subplate mounted housings can be delivered either with metric or pipe threads.
The basic surface treatment of the valve body and the adjustment screw are zinc coated.



Ordering Code

VPP2-06 □ □ / □ □

Direct Operated Relief Pressure Valves

Nominal size

Adjustment option

Hexagon set screw locknut 5 mm	S
Adjustable handknob	R
Non-lockable cylindrical handknob	O
Lockable cylindrical handknob	Z

Model

V	screw-in cartridge valve
M	cartridge in threaded housing - with metric threads
G	cartridge in threaded housing - with BSP threads
P	cartridge in subplate mounted housing

Pressure range

2,5	up to 25 bar
6,3	up to 63 bar
10	up to 100 bar
16	up to 160 bar
25	up to 250 bar
32	up to 320 bar

Seals

without designation NBR

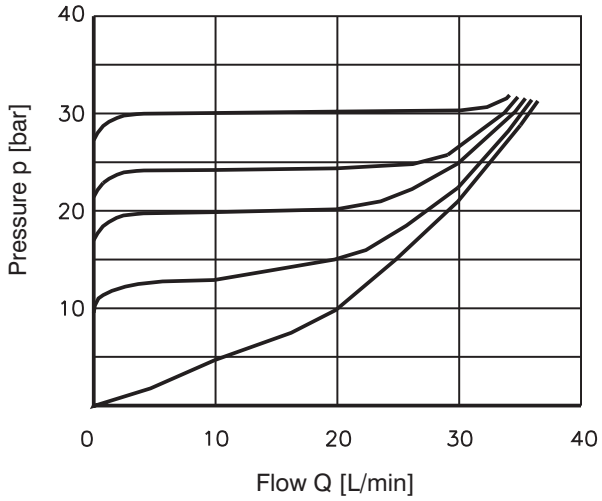
Technical Data

Nominal size	mm	06
Maximal flow rate	L/min	50
Max. service pressure ports (P, T, A, B)	bar	350
Working pressure related to flow	bar	see p-Q characteristics
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51 524
Fluid temperature range for standard sealing (NBR)	°C	-30 ... +100
Viscosity range	mm^2/s	20 ... 400
Maximum degree of fluid contamination		Class 21/18/15 to ISO 4406
Weight	kg	0,4 1,5
Mounting position		unrestricted

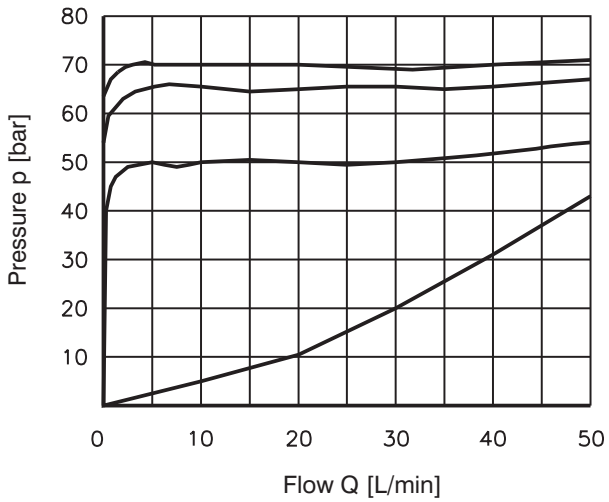
p-Q Characteristics

Measured at $\nu = 32\ mm^2/s$

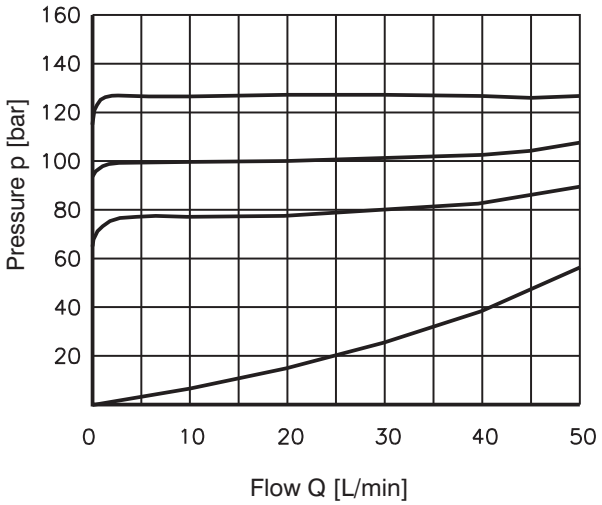
Pressure range 2,5



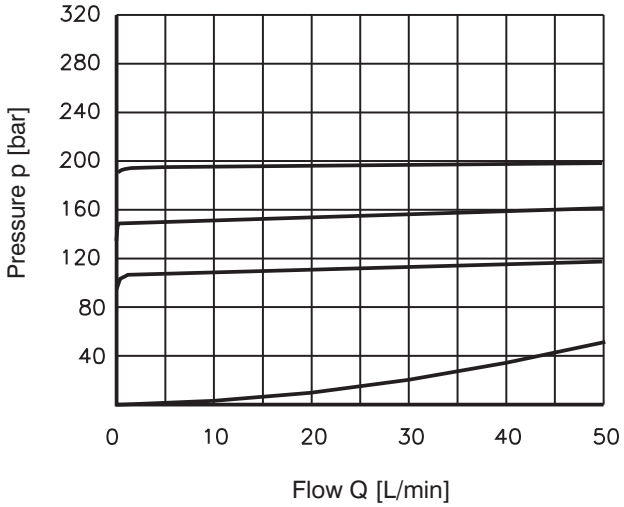
Pressure range 6,3



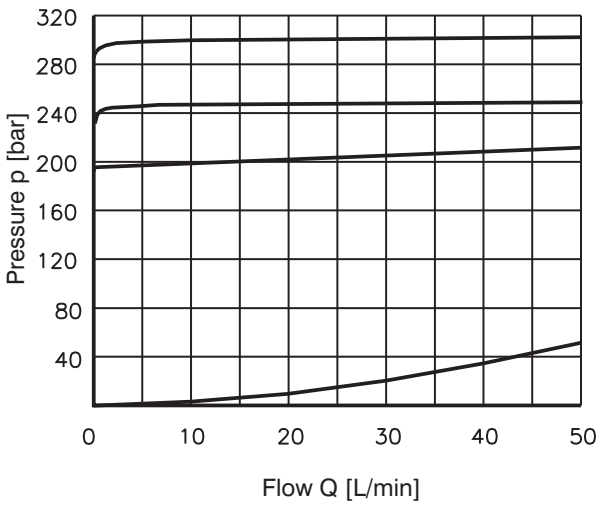
Pressure range 10



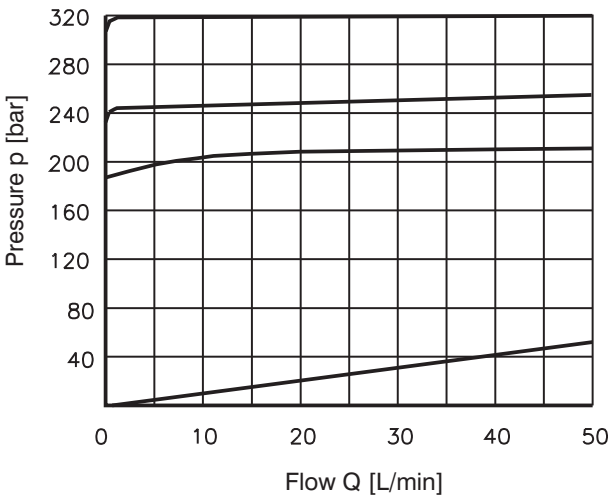
Pressure range 16



Pressure range 25



Pressure range 32

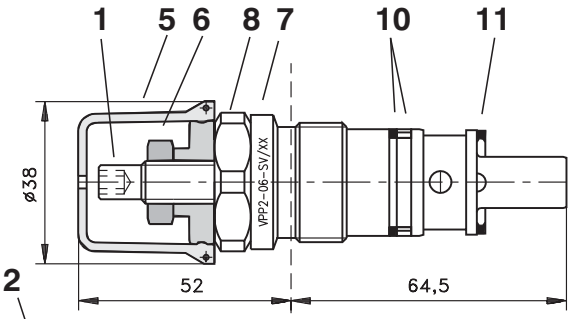


Valve Dimensions

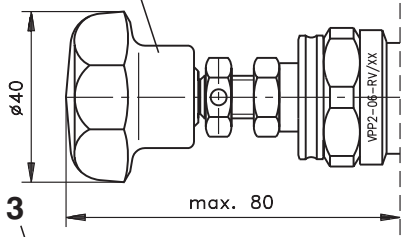
Dimensions in millimeters

Cartridge valve - model "V"

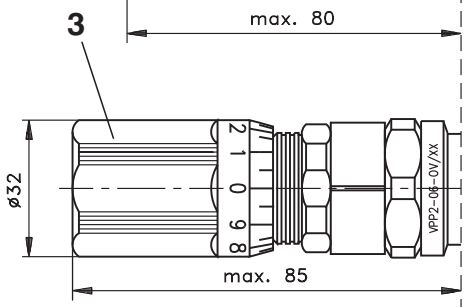
S



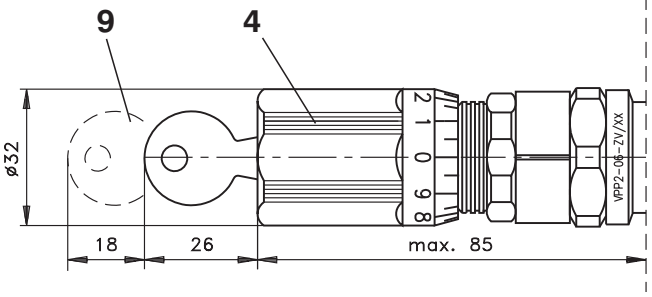
R



O

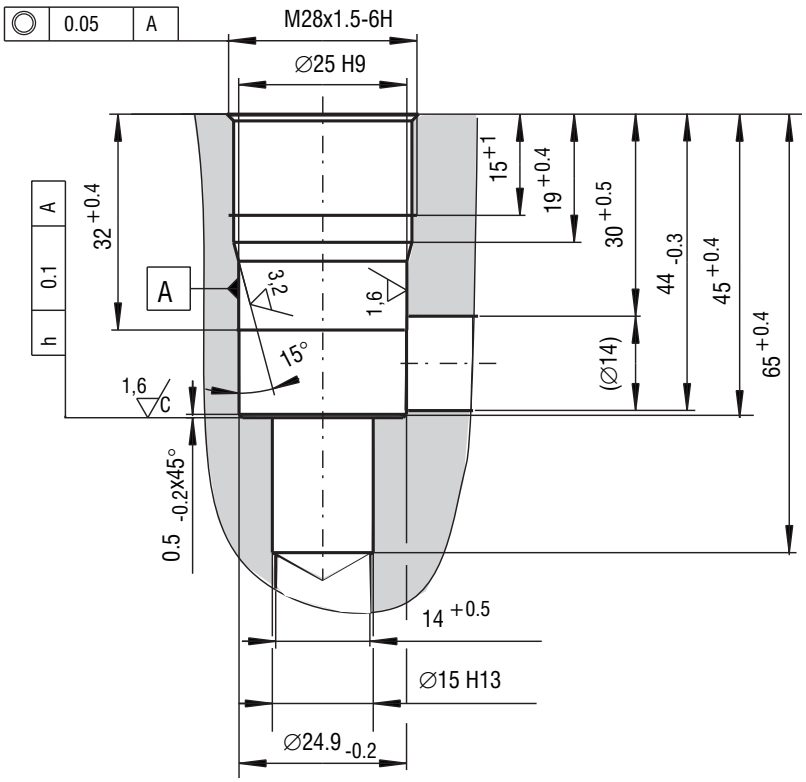


Z



1 Screw adjustment model "S" (inside HEX 5)
2 Adjustable handknob model "R"
3 Non-lockable cylindrical handknob model "O"
4 Lockable cylindrical handknob model "Z"
With all adjustmen mechanisms:
rotation = pressure decrease
rotation = pressure increase
5 Protective cap
6 Locknut (HEX 16)
7 Valve model code engraved
8 Wrench flats HEX 32, tightening torque 80 Nm
9 Distance to remove the key
10 Seal: Back-up ring M8-116
O-ring 20 x 2.65 NBR70
supplied with valve
11 Seal: D 17.4 x 24 x 1.5-NSA
supplied with delivery

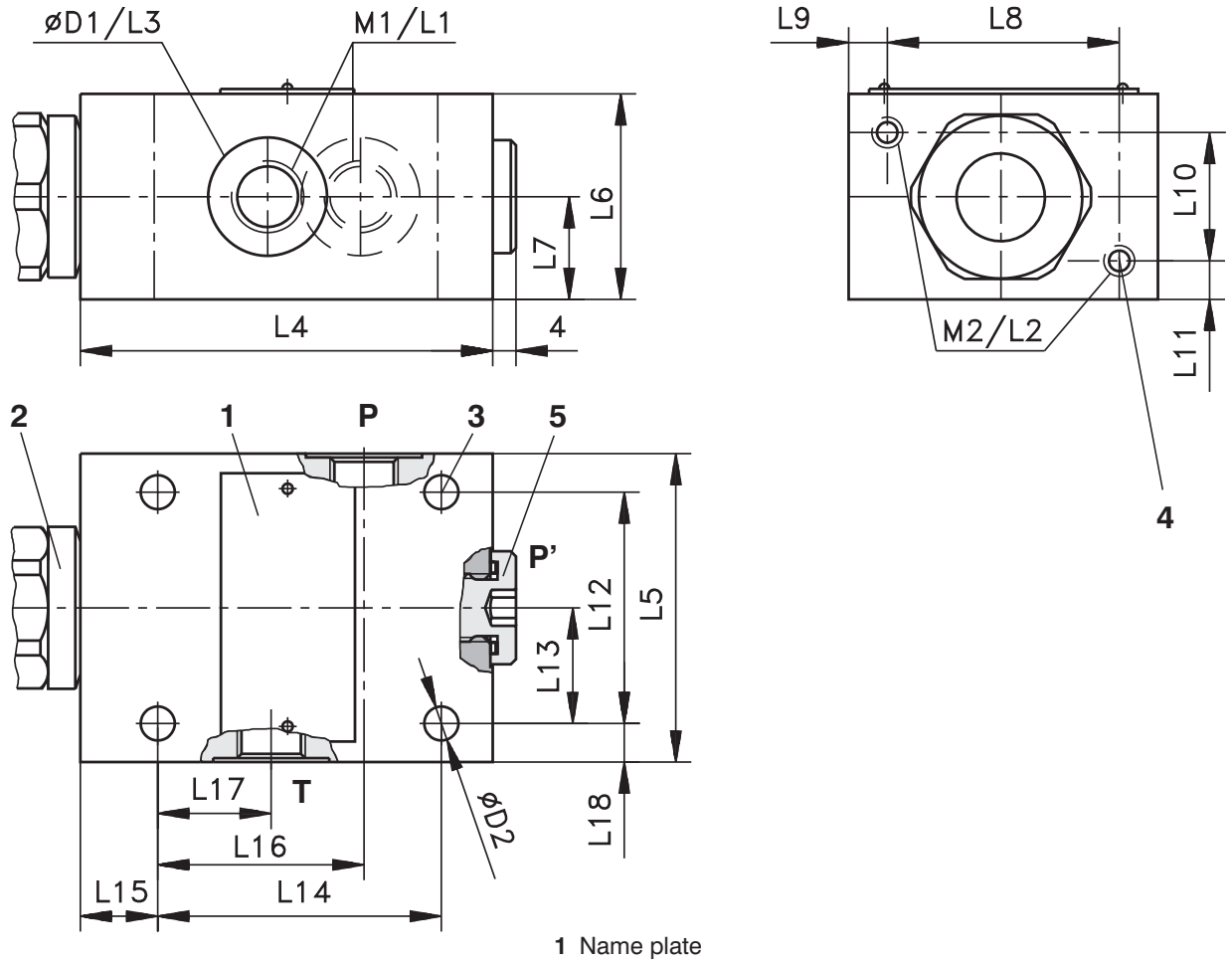
Cavity



Valve Dimensions

Dimensions in millimeters

Cartridge in threaded housing - models „M“ and „G“



1 Name plate
2 Adjustment mechanism - see page 4
3 4 mounting through - holes
4 2 threaded holes
5 Port P’ (either P or P’ can be used as input port), thread M1 / L1

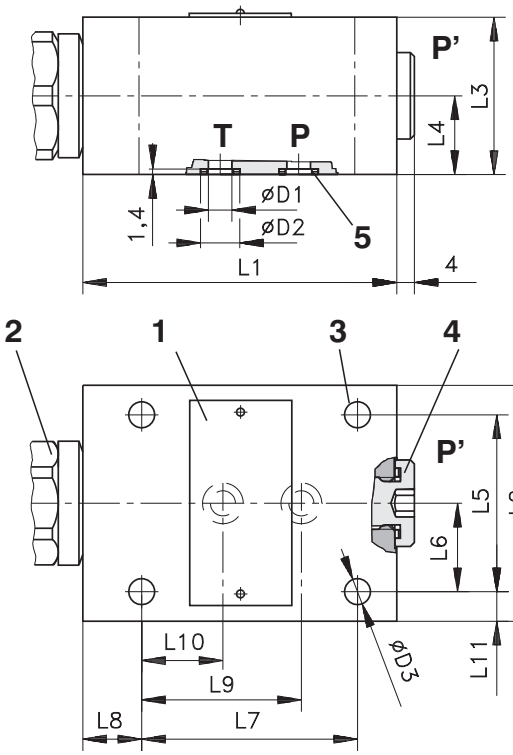
Model	M1	M2	D1	D2	L1	L2	L3	L4	L5	L6	L7
VPP2-06-xM/x	M14x1.5	M6	25	6.6	12	10	0.5	80	60	40	20
VPP2-06-xG/x	G1/4										

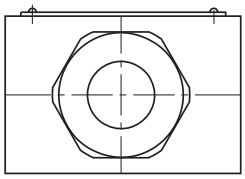
Model	L8	L9	L10	L11	L12	L13	L14	L15	L16	L17	L18
VPP2-06-xM/x	45	7.5	25	7.5	45	22.5	55	15	40	20	7.5
VPP2-06-xG/x											

Valve Dimensions

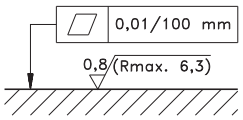
Dimensions in millimeters

Cartridge in subplate mounted housing - model „P“





1 Name plate
2 Adjustment mechanism - see page 4
3 4 mounting through - holes
4 Port P' (e.g. for pressure measuring), thread M14 x 1.5 deep 12 mm
5 Square ring:
DKAR 00011 [7.65x1.68 (2 pcs.)]



Required surface finish of interface

Note: Subplates - see catalog HA 0002

Model	D1	D2	D3	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	L11
VPP2-06-xP/x	6	10.8	6.6	80	60	40	20	45	22.5	55	15	40	20	7.5

Spare Parts

Accessories (delivered with subplate model „P“)

Bolt kit	Square ringe
M6x50 DIN 912-10.9 (4 pcs.) Tightening torque 6.6 ft-lbs (8.9 Nm)	DKAR 00011 7.65 x 1.68 (2 pcs.)

Seak kit for cartridge valve

Type	Dimensions, quantity			Ordering number
	O-ring	Back-up ring	U-Seal	
Standard NBR	20 x 2.65 (1 pc.)	19.43 x 23.79 x 1.14 (1 pc.)	17.4 x 24 x 1.5 (1 pc.)	16757100

Caution!

- The packing foil is recyclable.
- The protective plate can be returned to manufacturer.
- Tightening torque of the screws is 8.9 Nm.
- The technical information regarding the product presented in this catalogue is for descriptive purposes only. It should not be construed in any case as a guaranteed representation of the product properties in the sense of the law.

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www.argo-hytos.com

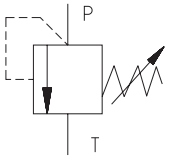
VPP2-06-SV/xx-CE1017

Directly Operated Pressure Relief Valves

Size to 06 • 320 bar (4600 PSI) • 50 L/min (13.2 GPM)

HA 5066
11/2011

Declaration of Conformity according to Act No. 22/1997, Coll., CE 1017



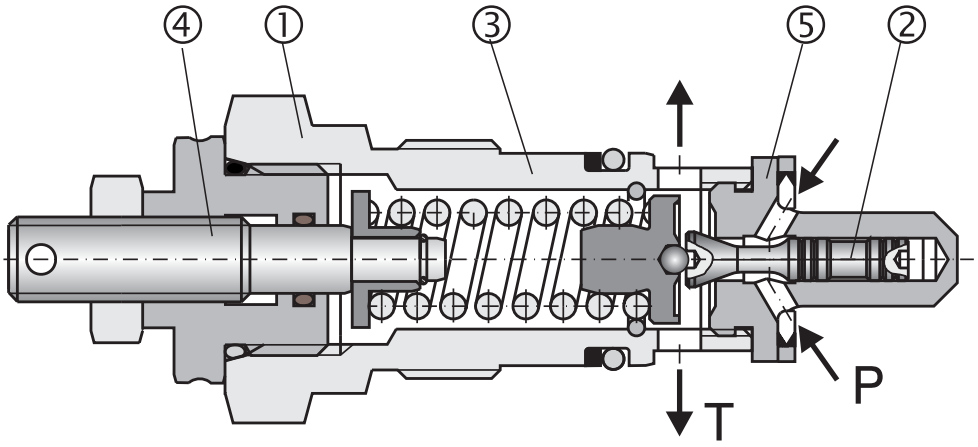
- ❑ **The product has been certified by TÜV SÜD Czech s.r.o.**
- ❑ **The product is supplied together with the Declaration of Conformity according to Act No. 22/1997, Coll., CE 1017**
- ❑ **Each product is supplied with the "Instructions for use of the safety valve" VPP2-06-SV/xx-CE1017"**
- ❑ **Single-stare pressure relief valve**
- ❑ **Screw-in cartridge valve**

Functional Description

Pressure relief valves VPP2 were designed for applications requiring a safety valve or a pressure regulating valve working over a wide range of pressures and flow rates.

The valve consists of the valve body (1), poppet with damping spool (2) and compression spring (3). Pressure is manually set by an adjustment screw (4). The spring pushes the poppet into the seat (5) holding the valve in its normally closed position. When the force, caused by the pressure acting on the exposed surface area of the poppet, exceeds the spring force, the valve opens and the flow passes from port P to port T.

Blackening is used as the product basic finish.



Technical Data

Valve size		06
Maximum flow	L/min (GPM)	50 (13.2)
Max. service pressure ports (P, T)	bar (PSI)	320 (4600)
Working pressure related to flow	bar (PSI)	see p-Q characteristics
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51 524
Fluid temperature range for standard sealing (NBR)	°C (°F)	-30 ... +100 (-22 ... +212)
Viscosity range	mm^2/s (SUS)	20 ... 400 (98 ... 1840)
Maximum degree of fluid contamination		Class 21/18/15 to ISO 4406
Weight	kg (lbs)	0,4 (0.879)
Mounting position		unrestricted

Ordering Code

VPP2-06-S V/ [ ] - CE1017- [ ] - [ ]

Directly Operated Pressure Relief Valves

Valve size

Adjustment option
Hexagon set screw locknut 5mm

Model
Screw-in cartridge valve

Pressure range in bar (PSI)

2	Max. up to 25 (360)
6	Max. up to 63 (910)
10	Max. up to 100 (1450)
16	Max. up to 160 (2300)
25	Max. up to 250 (3600)
32	Max. up to 320 (4600)

Declaration of Conformity
according to Act No. 22/1997, Coll., CE 1017

Adjusted pressure (MPa)

Setting at flow rate (L/min)

If not preset valves are ordered, pressure and flow rate information is not shown.

Valves adjusted at the manufacturer

- The valves are adjusted for the specified pressure at the relevant flow rate and they are fitted with tamper-indicating seals. The pressure and flow rate values are indicated in the valve description on the product [pressure: in MPa, flow rate in L/min].
- The seals bear the company logo

Not preset Valves at the manufacturer

- These valves have no tamper-indicating seals.
- No adjusted pressure and flow rate are indicated for not presetvalves - VPP2-06-SV/xx-CE1017.
- After the completion of the functional test, the adjusting screw is completely loosened and the pressure is set to p = 0 bar.
- For the adjustment of the valve required pressure, proceed as follows:
  - by turning the adjusting screw to the right (position 4), the pressure is increasing;
  - by turning to the left, the pressure is decreasing.
- The manufacturer accepts no responsibility for the adjustment, securing and sealing the valve.

Residual risks

Preventive measures against the occurrence of residual risks

a) Use and performance properties

- The product may be used only within the range of parameters as set out herein.
- The parameters of the source of the operating pressure liquid must not exceed the valve maximum parameters. The selected range of valve setting (pressure level) must correspond to the intended use.

b) Identification and adjustment

- The product type marking must remain clearly visible.
- The valve adjustment, as guaranteed by the manufacturer, must not be changed.
- No damage and/or removal of the manufacturer's tamper-indicating seal are permissible.

c) Handling and storage

- Any valve dismantling by the customer is strictly forbidden.
- While handled and stored, the valve must be protected against any damage, corrosion or contamination.

d) Installation

- Dimensions and geometry of the valve chamber must correspond to the drawing shown herein.
- Before the installation, the valve and the chamber must be protected against contamination.
- The valve external gasket must not be damaged.
- Sealing surfaces in the chamber must not be damaged.
- In order to prevent any damage, adequate tools must be used for the valve installation.
- If fitted into a block, the tightening torque specified for the valve must be observed.

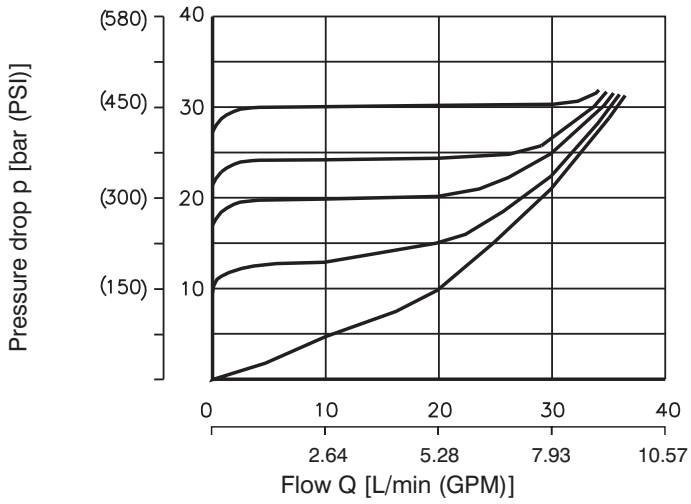
e) In service

- The working liquid in the circuit must meet the approved level of purity.
- While under pressure, any handling with the valve is prohibited. An exception from this rule is the adjustment of the opening pressure in the case of valves not presetat the manufacturer's place.
- The adjusting screw position must be secured by tightening of the safety nut.
- Any damaged or leaking valve, as well as any valve affected by corrosion or showing a function loss or malfunction must be immediately withdrawn from the service and replaced by a fully functional one.

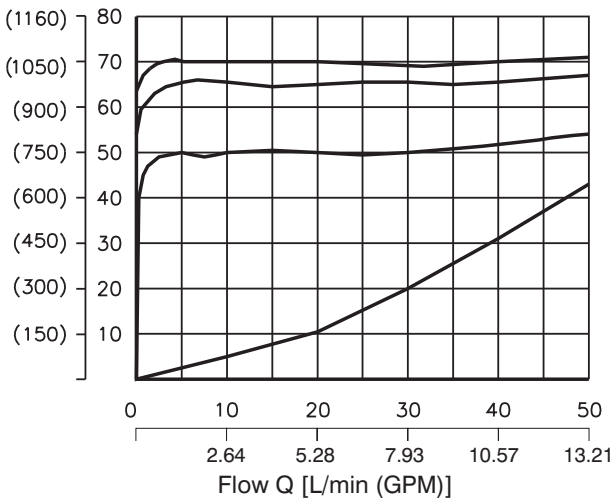
p-Q Characteristic

Measured at ν = 32 mm^2/s (156 SUS)

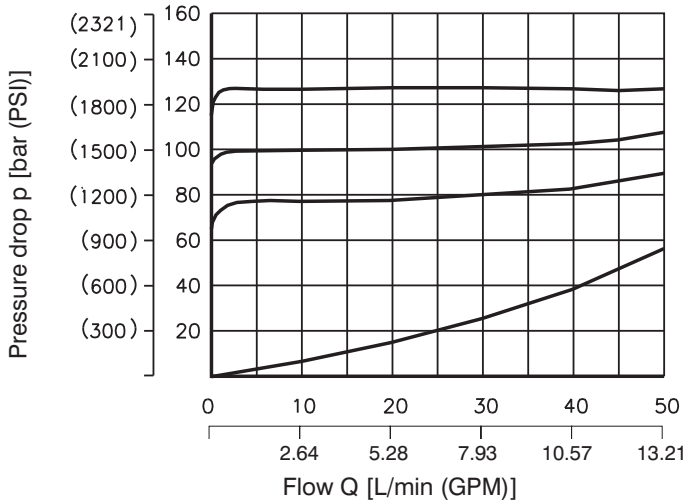
Pressure range 2.5



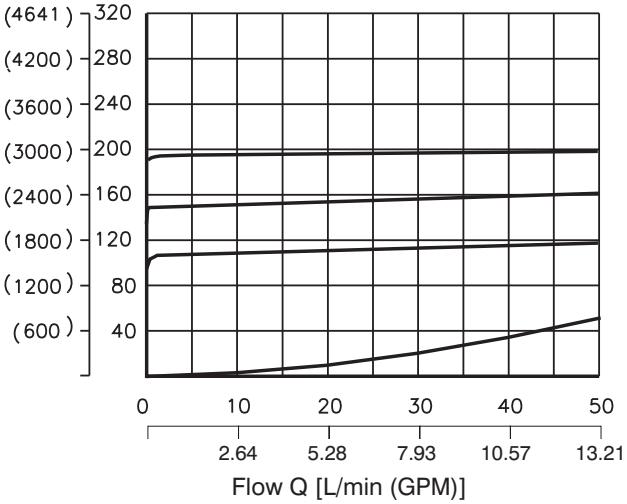
Pressure range 6.3



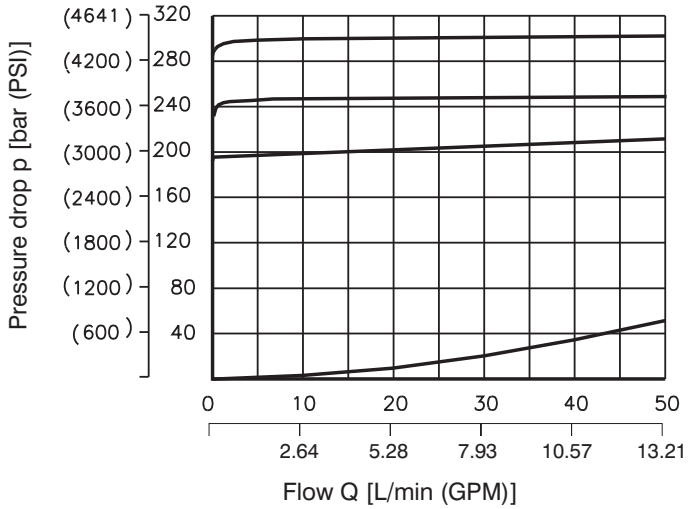
Pressure range 10



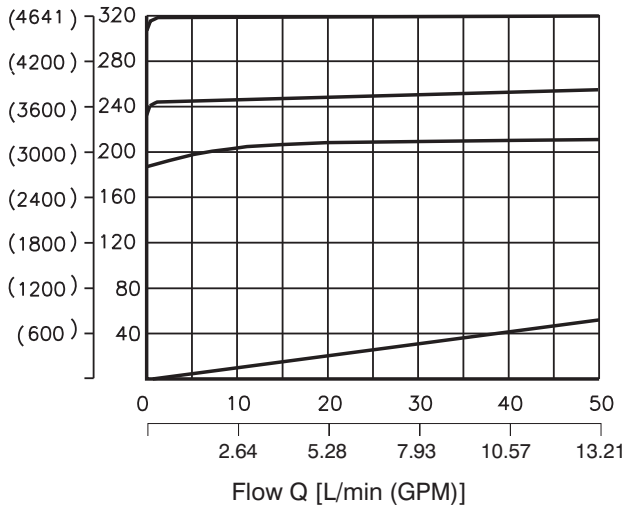
Pressure range 16



Pressure range 25



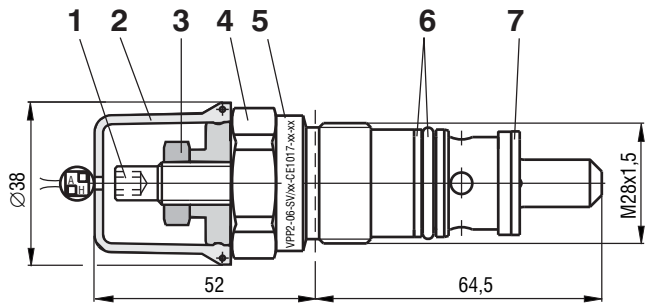
Pressure range 32



Valve Dimensions

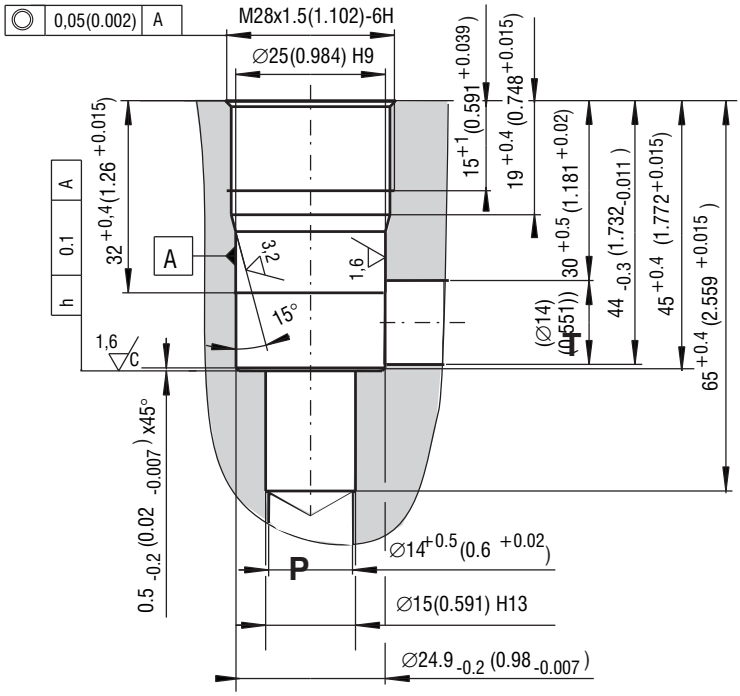
Dimensions in millimeters (inches)

Cartridge valve - model „V“



1 Screw adjustment model „S“ (inside HEX 5)
2 Protective cap
3 Locknut HEX16
4 Wrench flats HEX 32
Tightening torque 80 Nm (59ft-lbf)
5 Distance to remove the key
6 Seal: Back-up ring M8-116
O-ring 20 x 2,65 NBR70
supplied with valve
7 Seal: D 17,4 x 24 x 1,5-NSA
supplied with valve

Cavity



Spare Parts

Dimensions in millimeters

Seak kit for cartridge valve

Type	Dimensions, quantity			Order number
	O-ring	Back-up ring	U-Seal	
Standard NBR	20 x 2,65 (1 pc)	19,43 x 23,79 x 1,14 (1 pc)	17,4 x 24 x 1,5 (1 pc)	16757100

Caution!

- The packing foil is recyclable.
- The protective plate can be returned to manufacturer.
- The valves are wrapped in polyethylene bags (vacuum packed) and fitted with paper labels bearing the product number, name and manufacturing order.
- The valves should be stored in boxes and protected against weather effects that may cause corrosion.
- Except for the replacement of the external gasket, any other repairs of the valve are prohibited. They must be carried out at the manufacturer’s place only.
- Any possibility of using the valve outside the range of the specified parameters must be consulted with the manufacturer. The technical information regarding the product presented in this catalogue is for descriptive purposes only. It should not be construed in any case as a guaranteed representation of the product properties in the sense of the law.

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Directly Operated Pressure Reducing Valves

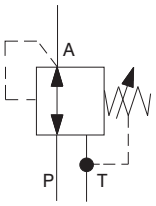
SP2A-A3

3/4-16 UNF • p_{max} 350 bar (5076 PSI) • Q_{max} 20 L/min (5.3 GPM)

HA 5143
05/2014

Replaces
HA 5143 10/2012

- ❑ **Screw-in cartridge design**
- ❑ **3 pressure ranges**
- ❑ **Pressure setting by hexagon socket**

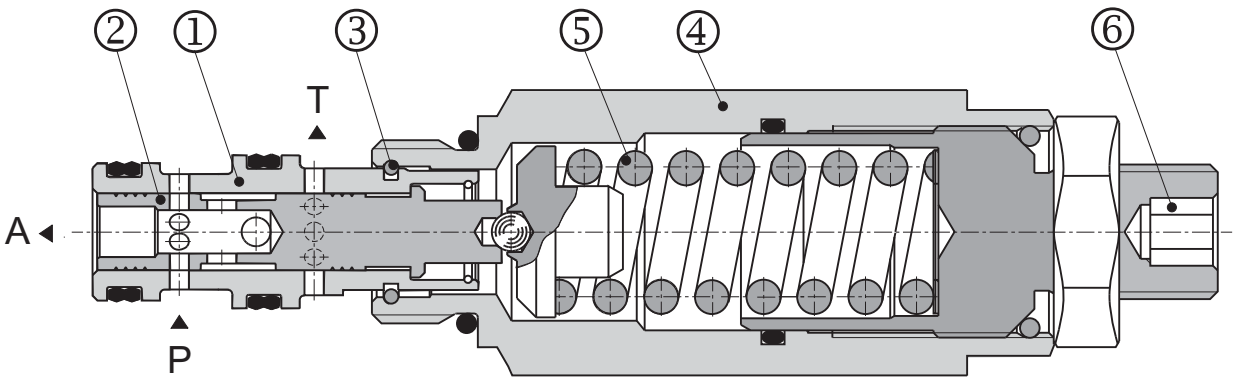


Functional Description

This 3 way direct operated pressure reducing valve is designed to reduce the system pressure. Due to its 3 way design the valve is capable to relief as well the secondary pressure. The pressure can be set by an adjustment screw (6).

In its initial position the valve allows free flow from port P to A. The pressure in port A acts on the front face of the control spool (2) against the spring (5). When the pressure in port A reaches the pressure set at the spring the control spool moves into the regulating position and closes the flow from port P to A until the pressure falls back to the set pressure. This will maintain a constant pressure in line A. A further pressure increase in port A caused by a potential external force on the actuator will cause the spool to shift against the spring until the spool opens port T and allows the oil flow pass to tank.

The valve bush (1) is fixed to the cartridge (4) by a wire ring (3). Decoupling the bush from the cartridge makes a transmission of tensions caused by high tightening torques impossible. In the basic version the valve corpus and the adjustment screw are zinc plated



Ordering Code

SP2A-A3 / □ □ □

Directly Operated Pressure Reducing Valve 3/4-16 UNF

Standard **S**

Pressure range
06 up to 63 bar (914 PSI)
16 up to160 bar (2321 PSI)
21 up to 210 bar (3046 PSI)

Sealing
without designation NBR
V FPM (Viton)

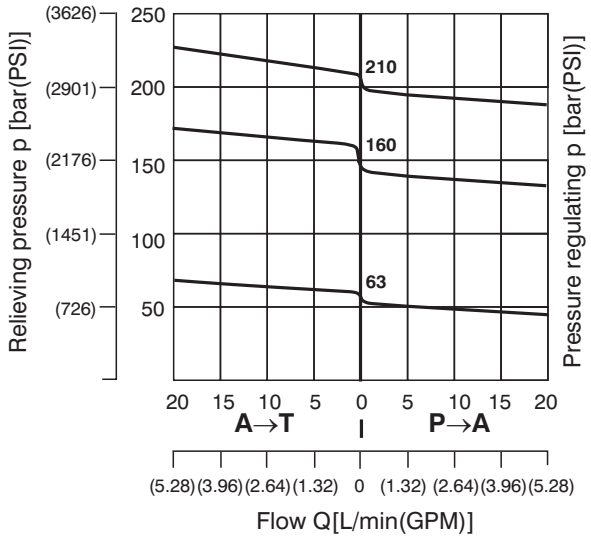
Technical Data

Valve size		A3		
Cartridge cavity		3/4-16 UNF-2A		
Max. flow rate	L/min (GPM)	20 (5,28)		
Max. input pressure (port P)	bar (PSI)	150 (2176) (pressure range 06)	250 (3626) (pressure range 16)	350 (5076) (pressure range 21)
Regulated pressure	bar (PSI)	63 (914)	50-160 (725-2321)	100-210 (1450-3046)
Working pressure related to flow	bar (PSI)	see p-Q characteristics		
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51524		
Fluid temperature range for standard sealing (NBR)	°C (°F)	-30 ... +100 (-22 ... 212)		
Fluid temperature range for Viton sealing (FPM)	°C (°F)	-20 ... +120 (-4 ... 248)		
Viscosity range	mm^2/s (SUS)	10 ... 500 (49 ... 2450)		
Max. degree of fluid contamination		Class 21/18/15 according to ISO 4406		
Weight	kg (lbs)	0,13 (0,286)		
Maximum valve tightening torque	Nm (lbf.ft)	30+2 (22.13+1.48 lbf.ft)		
Mounting position		unrestricted		
Valve body (data sheet HA 0018)		SB-A3		

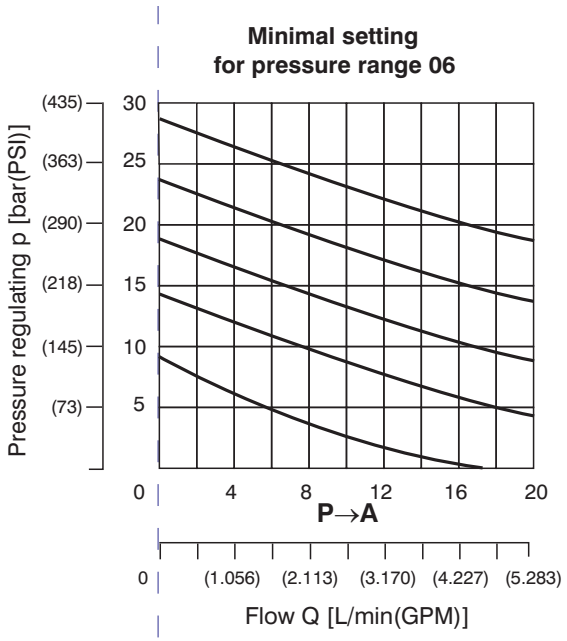
p-Q Characteristics

Measured at $\nu = 32\ mm^2/s$ (156,8 SUS)

Pressure range 06, 16, 21

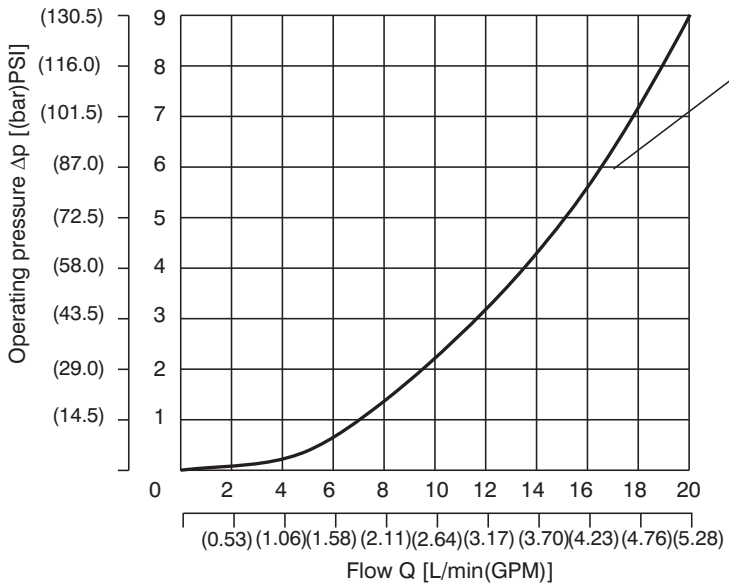


Minimal setting for pressure range 06



Δp-Q Characteristic

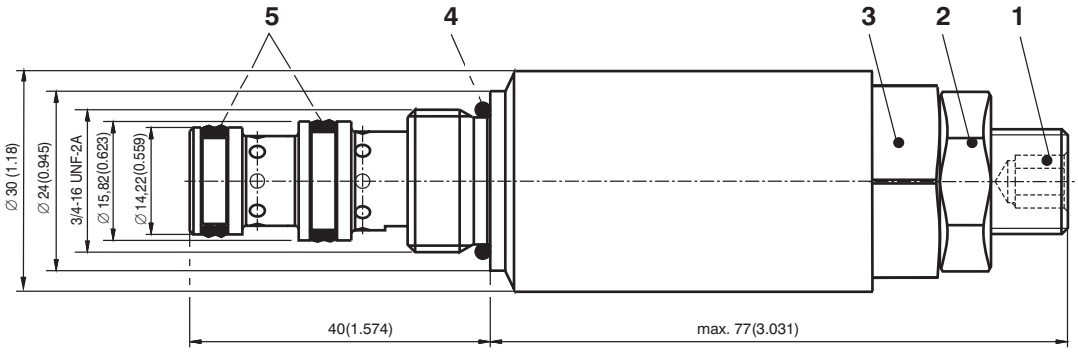
Measured at ν= 32 mm^2/s (156,8 SUS)



Valve Dimensions

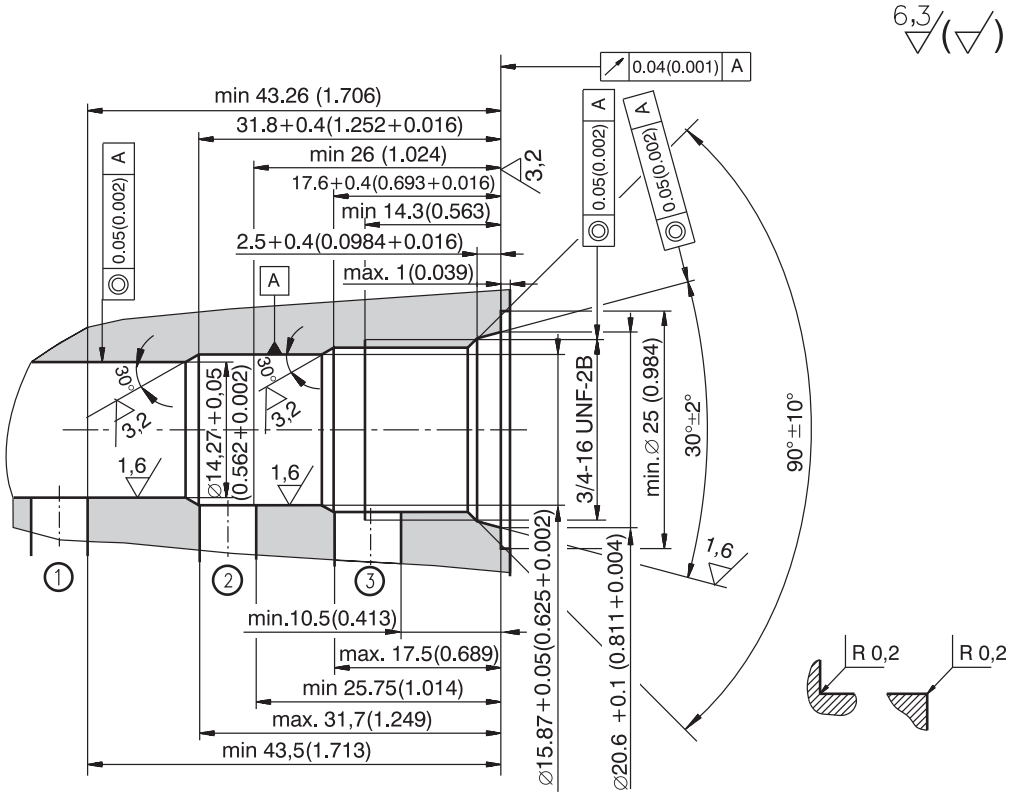
Dimensions in millimeters (inches)

1 Adjustment element (screw with internal HEX 6)
Clockwise rotation = pressure increase
Atniclockwise rotation =pressure decrease
2 Locknut HEX 21 - tightening torque 15 Nm
3 Wrench flats HEX 27- tightening torque 30 Nm
4 O-ring 17 x 1,8 (supplied with valve)
5 Combined sealing:
Dualseal DRYZ000004Z20 11,87 x 14,27 x 3,1
Dualseal DRYZ000002Z20 13,47 x 15,87 x 3,1(supplied with valve)



Cavity

Dimensions in millimeters (inches)



Spare Parts

Seal kit

Dualseal - PU	O-ring - NBR	O-ring - Viton	Order number
11,87 x 14,27 x 3,1 (1pcs.)	17 x 1,8 (1 pcs.)	-	22565200
13,47 x 15,87 x 3,1 (1pcs.)	20,35 x 1,78 (1 pcs.)	-	
11,87 x 14,27 x 3,1 (1pcs.)	-	17 x 1,8 (1 pcs.)	22565100
13,47 x 15,87 x 3,1 (1pcs.)	-	20,35 x 1,78 (1 pcs.)	

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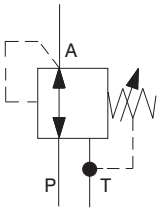
Directly Operated Pressure Reducing Valve

SP2A-B3

HA 5146
09/2013

7/8-14 UNF • p_{max} 420 bar (6092 PSI) • Q_{max} 60 L/min (15.85 GPM)

- ❑ **High pressure valve up to 420 bar**
- ❑ **Hardened and precision working parts**
- ❑ **Four Optional spring ranges**
- ❑ **Stabile pressure characteristic over the complete pressure range**
- ❑ **Quiet performance over complete power range**



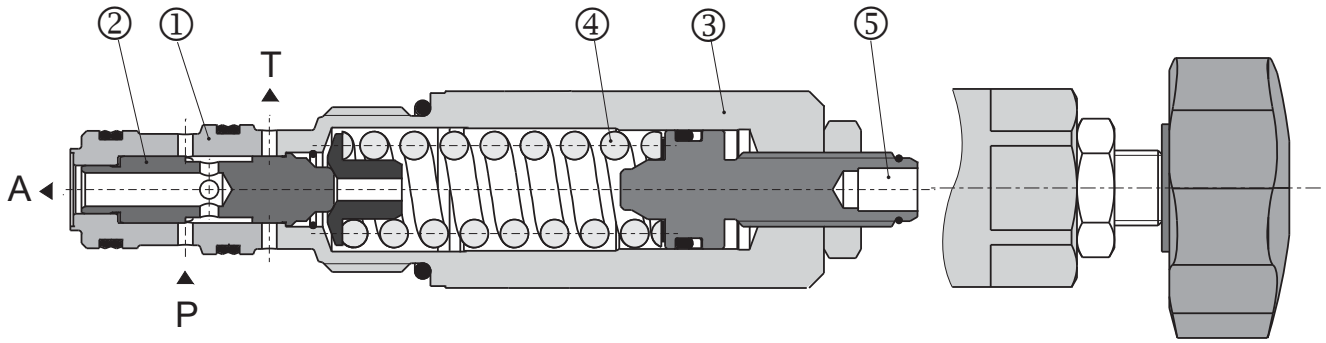
Functional Description

This 3 way direct operated pressure reducing valve is designed to reduce the system pressure. Due to its 3 way design the valve is also capable of relieving the secondary pressure. The pressure can be set by an adjustment screw (5).

In its initial position the valve allows free flow from port P to A. The pressure in port A acts on the front face of the control spool (2) against the spring (4). When the pressure in port A reaches the set pressure, the control spool moves into the regulating position and closes the flow from port P to A until the pressure falls back to the set pressure. This will maintain a constant pressure in line A. A further pressure increase in port A caused by a potential external force on the actuator will cause the spool to shift against the spring until the spool opens port T and allows the oil flow pass to tank.

The valve bush (1) is fixed to the cartridge (3). Uncoupling the bush from the cartridge makes a transference of tensions caused by high tightening torques impossible. In the basic version the valve body and the adjustment screw are zinc plated.

Model S **Model R**



Ordering Code

SP2A-B3/ □ □ □ □

Directly Operated Pressure Reducing Valve 7/8-14UNF

High performance — **H**

Pressure range

3	Up to 30 bar (435 PSI)
8	Up to 80 bar (1160 PSI)
11	Up to 110 bar (1595 PSI)
15	Up to 150 bar (2176 PSI)

Adjustment option

S	Inside hexagon 5 mm
R	Adjustable handknob

Seals

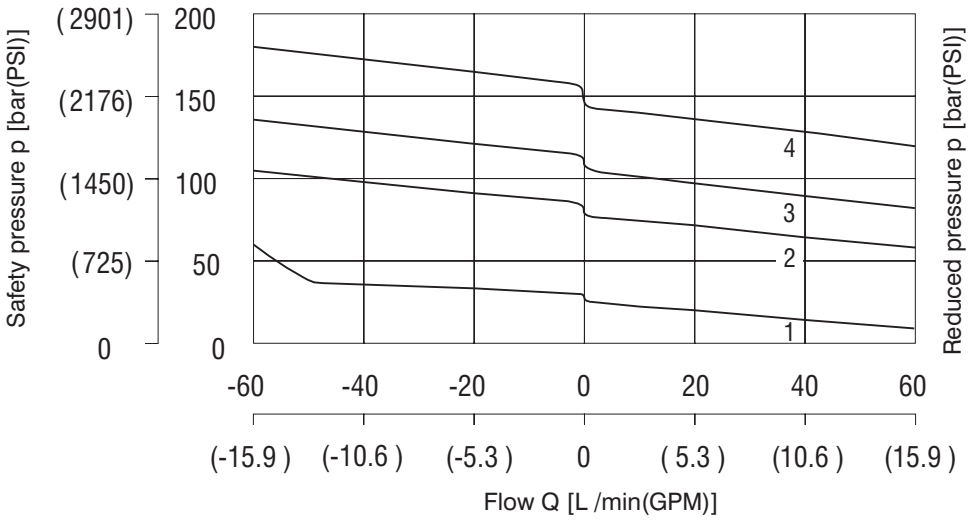
no designation	NBR
V	FPM (Viton)

Technical Data

Valve size		B3			
Cartridge cavity		7/8-14 UNF-2A			
Flow range	L/min (GPM)	0 ÷ 60 (0 ÷15.85)			
Max. inlet pressure (port P)	bar (PSI)	420 (6092)			
Max. output pressure (port T)	bar (PSI)	200 (3626)			
Regulated pressure	bar (PSI)	30 (435)	80 (1160)	110 (1595)	150 (2176)
Working pressure related to flow	bar (PSI)	see p-Q characteristics			
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51524			
Fluid temperature range (NBR)	°C (°F)	-30 ...100 (-22 ... 212)			
Fluid temperature range (FPM)	°C (°F)	-20 ... 120 (-4 ...248)			
Viscosity range	mm^2/s (SUS)	10 ... 500 (49 ... 2450)			
Maximum degree of fluid contamination		Class 21/18/15 according to ISO 4406			
Weight	kg (lb)	0,26 (0.573)			
Maximum valve tightening torque	Nm (lbf.ft)	55+3 (40.57+2.21)			
Mounting position		unrestricted			
Valve body (data shee HA 0018)		SB-B3			

p-Q Characteristics

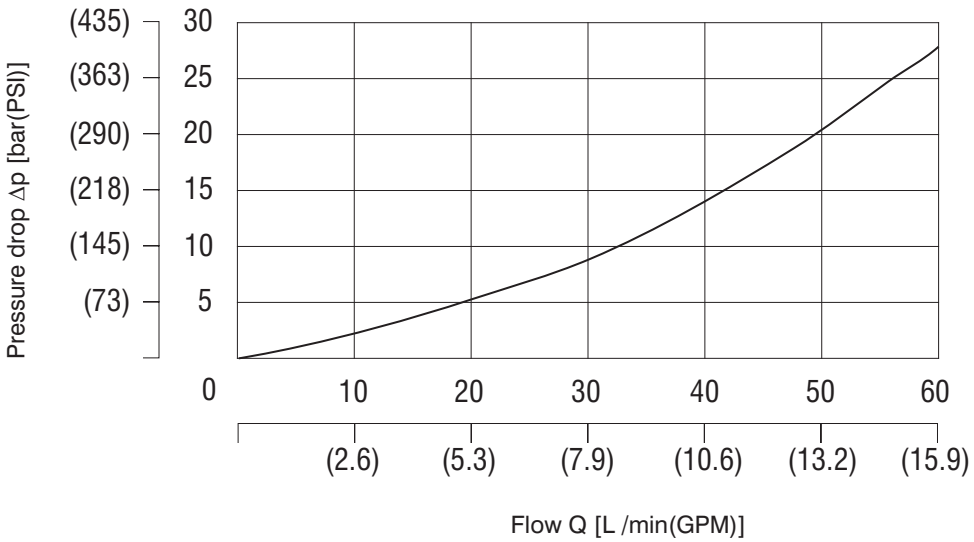
Measured at ν = 32 mm^2/s (156 SUS)



4	Pressure range 15
3	Pressure range 11
2	Presseure range 8
1	Presseure range 3

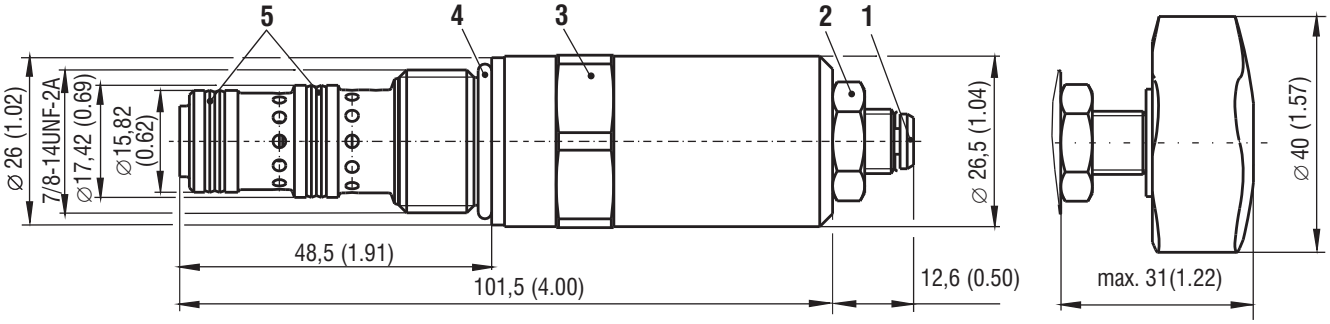
Δ p-Q Characteristics

Measured at ν = 32 mm²/s (156 SUS)



Valve Dimensions

Dimensions in millimeters (inches)



1 Screw for fine flow adjustment -
- inside HEX 5 mm
- anticlockwise rotation = pressure decrease
- clockwise rotation = pressure increase

2 Locking nut HEX 17 mm
[tightening torque 10+2 Nm (7.4+1.5 lbf.ft)]

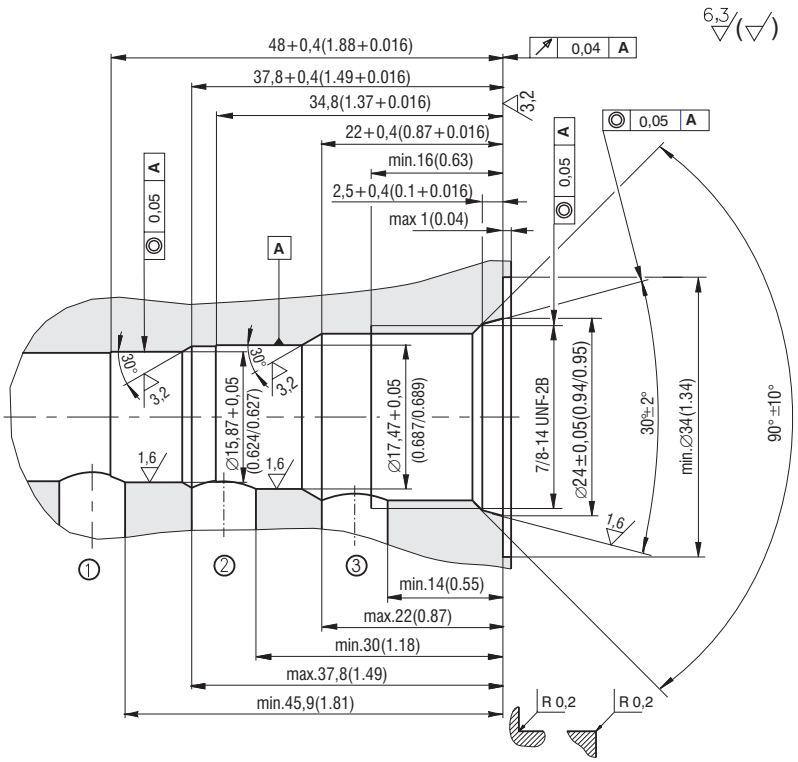
3 Spanner size 27 mm
[tightening torque 50+5 Nm (36.9+3.7 lbf.ft)]

4 Sealing: O-ring 19,4 x 2,1
(supplied with valve)

5 Sealing: Dualseal 17,47 x 15,07 x 3,1; 11,87 x 14,27 x 3,1
(supplied with valve)

Cavity

Dimensions in millimeters (inches)



Spare Parts

Dimensions in millimeters

Type	Dimensions, quantity		Ordering number
	O-ring	Dualseal - PU	
NBR	19.4 x 2.1(1pc)		20143900
		17.47 x 15.07 x 3.1(1pc)	24220800
		11.87 x 14.27 x 3.1(1pc)	20158500
FPM (Viton)	19.4 x 2.1(1pc)		20144100
		17.47 x 15.07 x 3.1(1pc)	24220800
		11.87 x 14.27 x 3.1(1pc)	20158500

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Pilot Operated Pressure Reducing Valves

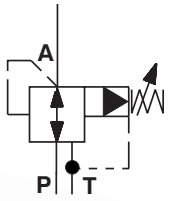
SP4A-B3

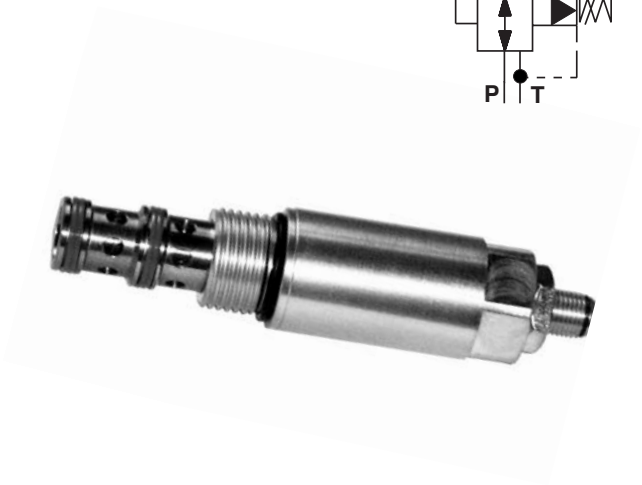
7/8-14 UNF • p_{max} 350 bar (5076 PSI) • Q_{max} 60 L/min (15.85)GPM)

HA 5144
7/2012

Replaces
HA 5144 11/2008

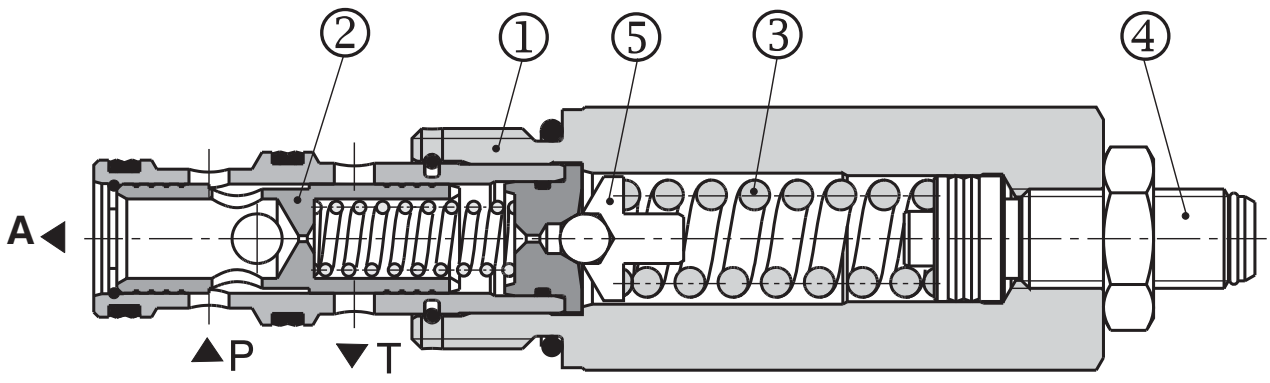
- **Screw-in cartridge design**
- **5 pressure ranges**
- **Pressure setting by**
  - **Hexagon set screw lock**
  - **Adjustable handknob**





Functional Description

The pressure valves SP4A-B3 are pilot operated screw-in cartridge pressure reducing valves designed as 3 way valves, i.e. with pressure protection of the secondary circuit. The reducing valve consists of a body (1) with thread 7/8-14 UNF, control spool (2), spring (3) and the adjustment element (4). The flow from the primary circuit flows to the first metering edge, where its pressure is reduced. The reduced pressure corresponds with the adjustment of the control spring of the ball pilot valve (5). The reduced pressure is continuously controlled and compared with the pressure preset. If any control error appears, the respective control action takes place and the reduced pressure returns to its preset value. If pressure behind the valve increases due to the effect of external load acting on the user, the control spool shifts further against the spring, the reducing metering edge closes and the second metering edge opens. The fluid passes through the „third way“ to port T. The control flow of the pilot valve (from the spring room) is also routed to port T.
The valve body and the adjustment screw are zinc coated.



Ordering Code

SP4A-B3 / □ □ □ □

Directly Operated Pressure Relief Valve
7/8-14 UNF

Standard **S**

Pressure range

up to 63 bar (914 PSI)	**6**
up to 100 bar (1450 PSI)	**10**
up to 160 bar (2320 PSI)	**16**
up to 250 bar (3626 PSI)	**25**
up to 350 bar (5076 PSI)	**35**

Adjustment option

S	Hexagon set screw locknut 5 mm
R	Adjustable handknob

Seals

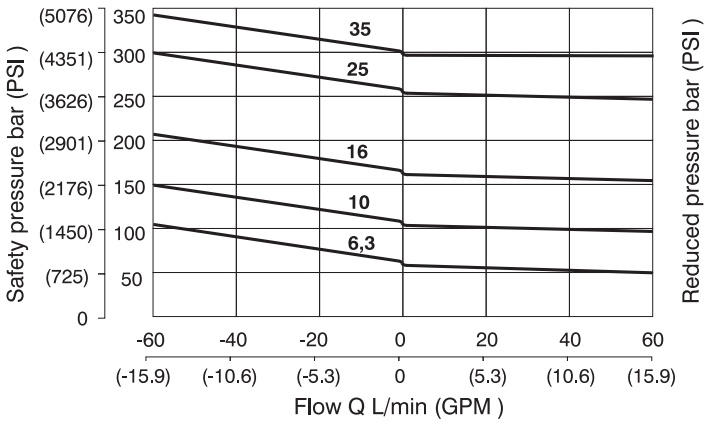
without designation	NBR
V	FPM (Viton)

Technical Data

Valve size		B3
Cartridge thread		7/8-14 UNF-2A
Max. flow rate	L/min (GPM)	60 (15.85)
Max. input pressure (port P)	bar (PSI)	350 (5076)
Max. output pressure (port T)	bar (PSI)	100 (1450)
Working pressure related to flow	bar (PSI)	see p-Q characteristics
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51524
Fluid temperature range for standard (NBR)	°C (°F)	-30 ... +100 (-22 ... 212)
Fluid temperature range for Viton (FPM)	°C (°F)	-20 ... +120 (-4 ... 248)
Viscosity range	mm^2/s (SUS)	10 ... 500 (49 ... 2450)
Max. degree of fluid contamination		Class 21/18/15 according to ISO 4406
Weight	kg (lbs)	0.24 (0.53)
Maximum valve tightening torque	Nm (lbf.ft)	35+5 (25.8+3.7)
Mounting position		unrestricted
Valve body (data sheet HA 0018)		SB-B3

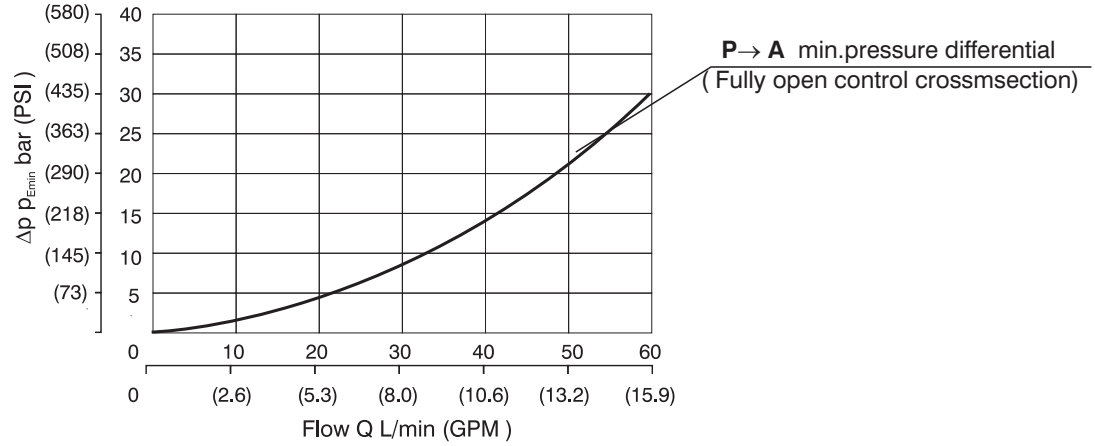
p-Q Characteristics

Measured at $\nu = 32\ mm^2/s$ (156 SUS)



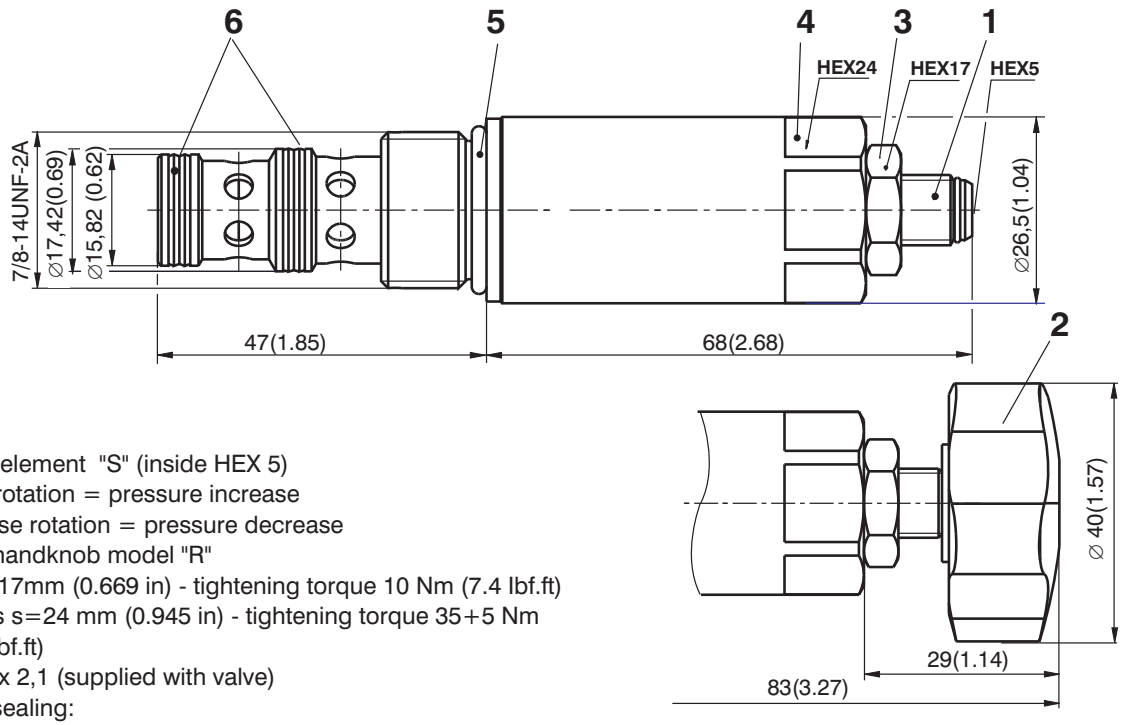
Δp-Q Characteristic

Measured at $\nu = 32\ mm^2/s$ (156 SUS)



Valve Dimensions

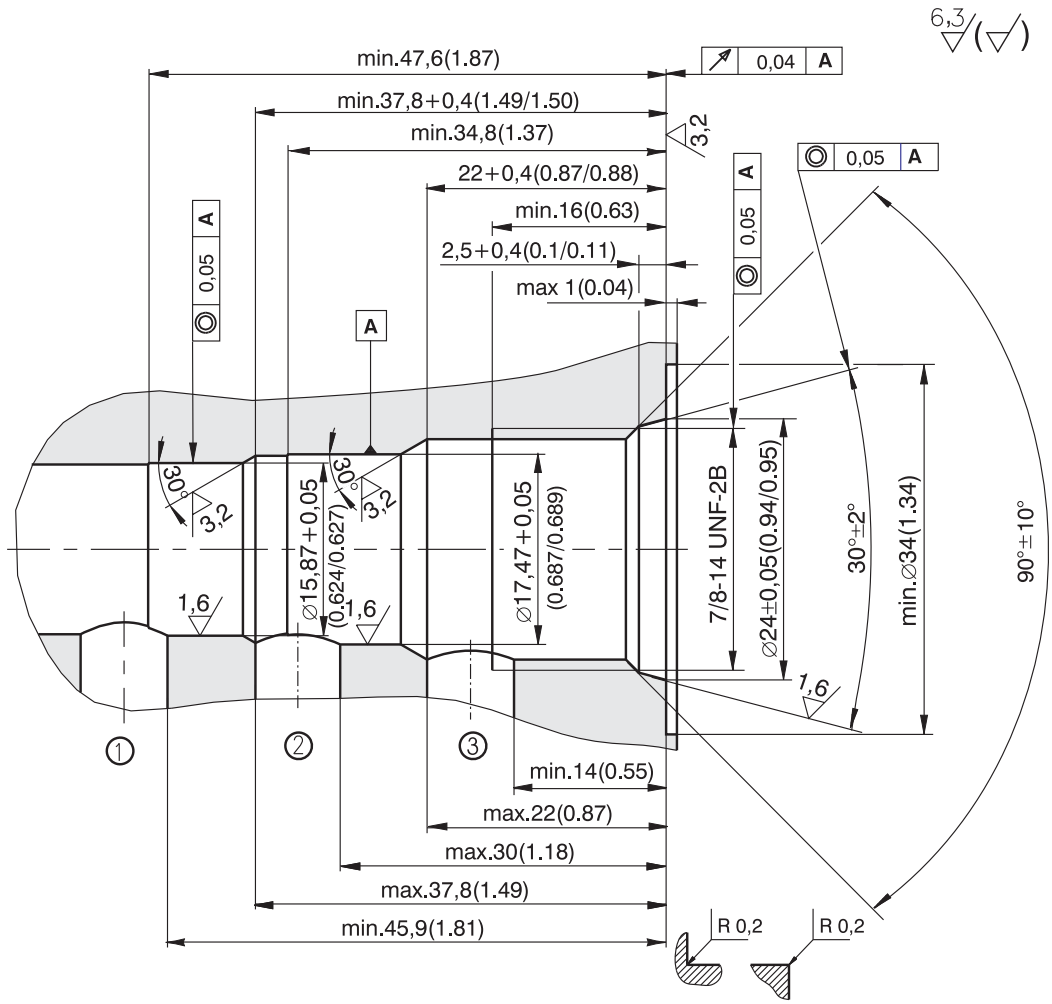
Dimensions in millimeters (inches)



1 Adjustment element "S" (inside HEX 5)
Clockwise rotation = pressure increase
Anticlockwise rotation = pressure decrease
2 Adjustable handknob model "R"
3 Locknut s=17mm (0.669 in) - tightening torque 10 Nm (7.4 lbf.ft)
4 Wrench flats s=24 mm (0.945 in) - tightening torque 35+5 Nm (25.8+3.7 lbf.ft)
5 O-ring 19,4 x 2,1 (supplied with valve)
6 Combined sealing:
DRYZ000002Z20 13,47 x 15,87 x 3,1
DUYZ000001Z20 17,47 x 15,07 x 3,1 (supplied with valve)

Cavity

Dimensions in millimeters (inches)



Spare Parts

Seal kit

Dualseal - PU	O-ring - Viton	Ordering number
DRYZ000002Z20 13,47 x 15,87 x 3,1 (1pc.)	19,4 x 2,1 (1pc.)	18775700
DUYZ000001Z20 17,47 x 15,07 x 3,1 (1pc.)	-	

Caution!

- The packing foil is recyclable.
- The technical information regarding the product presented in this catalogue is for descriptive purposes only. It should not be construed in any case as a guaranteed representation of the product properties in the sense of the law.

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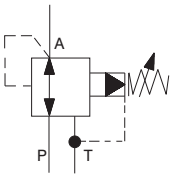
Pilot Operated Pressure Reducing Valve VRN2-06

Size 06 • p_{max} up to 320 bar • Q_{max} up to 40 L/min

HA 5153
4/2008

Replaces
HA 5153 2/2007

- ❑ **Screw-in cartridge valve for manifold mounting and stacking assemblies**
- ❑ **4 pressure ranges**
- ❑ **Two pressure adjustment options**
- ❑ **Pressure reduction in ports A or P**
- ❑ **Model MA with check valve**
- ❑ **Installation dimensions to ISO 4401-AB-03-4-A and DIN 24 340-A6**



Functional Description

The pressure valves VRN2 are pilot operated screw-in cartridge pressure reducing valves designed as 3 way valves, i.e. with pressure protection of the secondary circuit. For the use in vertical stacking assemblies, two models of valve bodies are available, with pressure reduction in ports A and P. Incorporated into the valve bodies MA are the check valves which enable the reverse flow to pass through the valve.

The reducing valve consists of a cartridge (1) with thread M22x1.5, control spool (2), spring (3) and the adjustment element (4). With the models for stacking assemblies also the respective valve body (5) and alternatively a check valve (6) complete the valve.

Screw-in cartridge valve

The flow from the primary circuit flows to the first metering edge, where its pressure is reduced. The reduced pressure corresponds with the adjustment of the control spring of the ball pilot valve. The reduced pressure is continuously controlled and compared with the pressure preset. If any control error appears, the respective control action takes place and the reduced pressure returns to its preset value. After the pressure reduction, the fluid flows through the spool bore and is then routed to the output port of the module valve body. If pressure behind the valve increases due to the effect of external load acting on the user, the control spool shifts further against the spring, the reducing metering edge closes and the second metering edge opens. The fluid passes through the „third way“ to port T. The control flow of the pilot valve (from the spring room) is also routed to port T.

Model MA

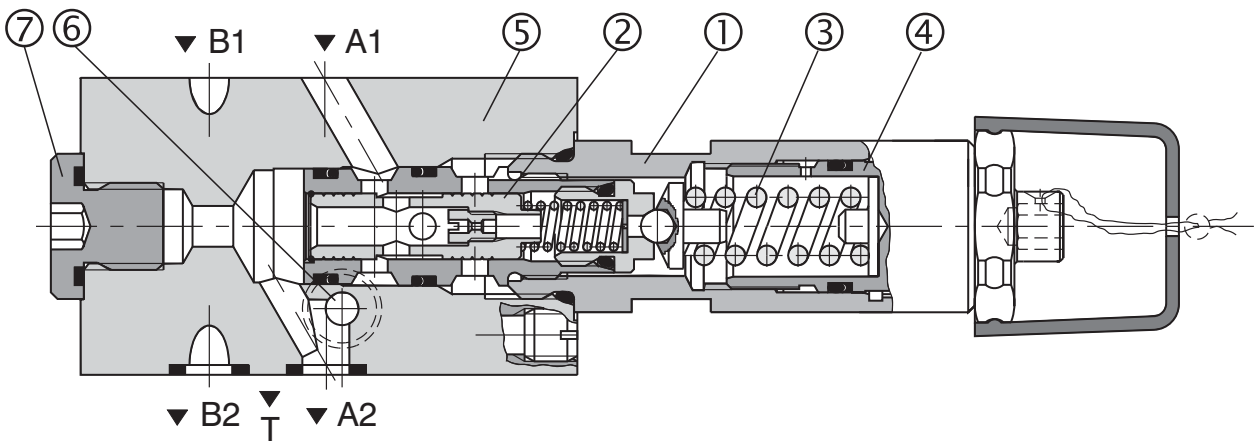
With this model, the flow enter into the valve body through port A1. The input pressure is reduced, routed to port A2 and further to the user. The reverse flow passes through a check valve which is connected parallel to the metering edge.

Model MP

With the model MP, the pressure is reduced from port P2 to port P1.

With all models, a control pressure gauge can be connected to port G 1/4 (7).

The valve body and the adjustment screw are zinc coated. With model M the valve bodies are phosphate coated.



Ordering Code

VRN2-06/ □ - □ □ □

Pilot Operated Pressure Reducing Valve

Nominal size

Model
screw in cartridge **S**
modular valve, pressure reduction in port A MA
modular valve, pressure reduction in port P **MP**

Pressure range
6 up to 63 bar
10 up to 100 bar
16 up to 160 bar
21 up to 210 bar

Adjustment element
S screw with internal hexagon 6 mm
R hand knob

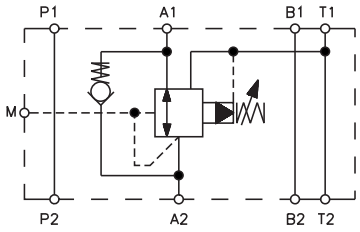
Sealing
without designation NBR
V Viton

FOR PREFERRED TYPES SEE BOLD TYPING IN ORDERING CODE AND TABLE OF PREFERRED TYPES ON PAGE 6

Functional Symbols

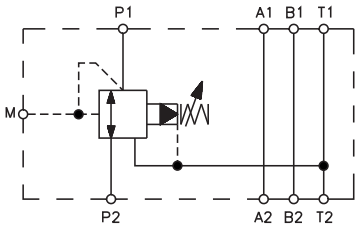
Model **MA**

Valve side



Subplate side

Model **MP**



Ordering Numbers of Sandwich / Valve Bodies (without screw-in cartridge)

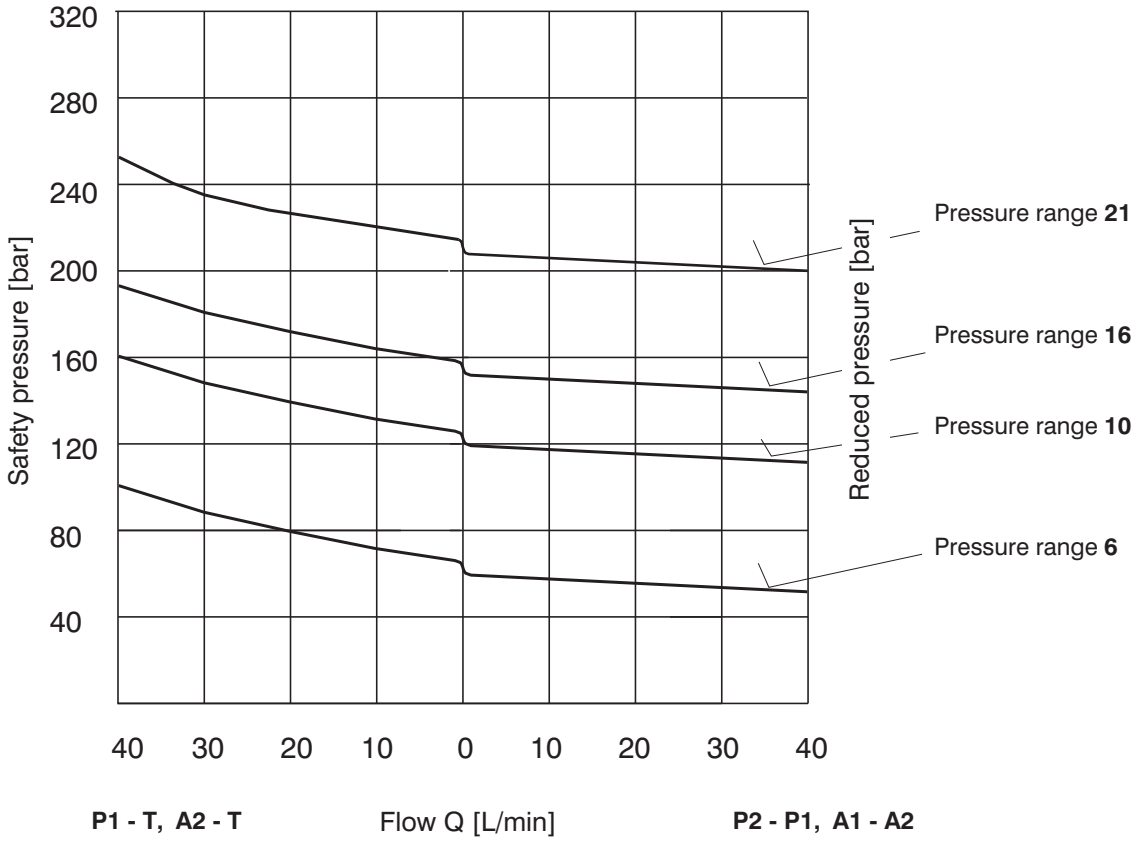
Valve body for modular valve - NBR	Ordering number	Valve body for modular valve - Viton	Ordering number
MA06-VRN2	16002400	MA06-VRN2/V	22995500
MP06-VRN2	16002200	MP06-VRN2/V	22995000

Technical Data

Nominal size	mm	06
Maximal flow rate	L/min	40
Maximum pilot flow	L/min	0.25
Max. input pressure (port P)	bar	320
Max. output pressure (port T)	bar	160
Working pressure related to flow	bar	see p-Q characteristics
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51524
Fluid temperature range (NBR / Viton)	°C	-30 ... +100 / -20 ... +120
Viscosity range	mm^2/s	20 ... 400
Maximum degree of fluid contamination		Class 21/18/15 according to ISO 4406
Weight: model S model MA model MP	kg	0,22 1,20 1,10
Mounting position		unrestricted

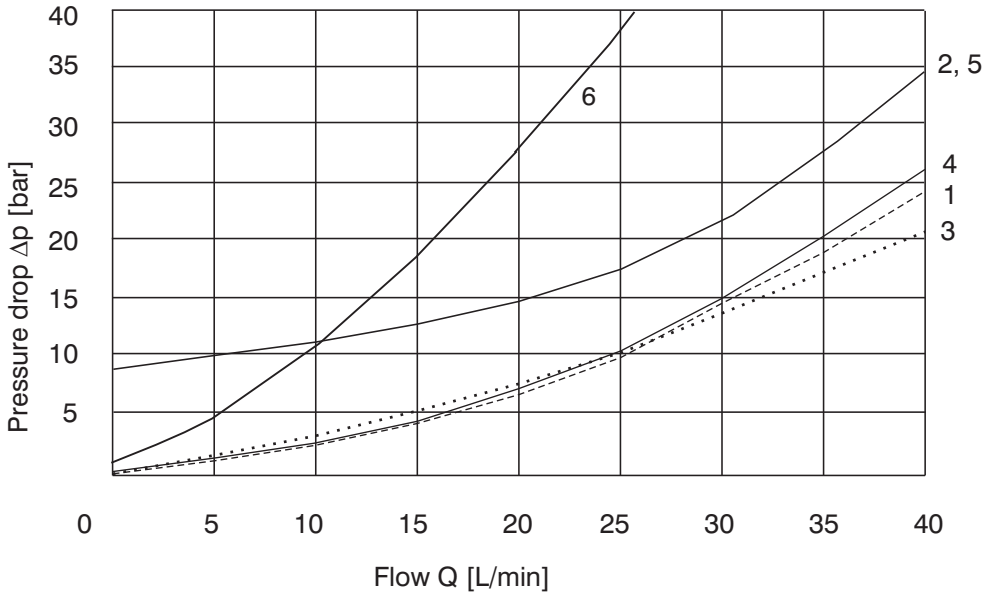
p-Q Characteristics

Measured at $\nu = 32\ mm^2/s$



Δp-Q Characteristics

Measured at $\nu = 32\ mm^2/s$

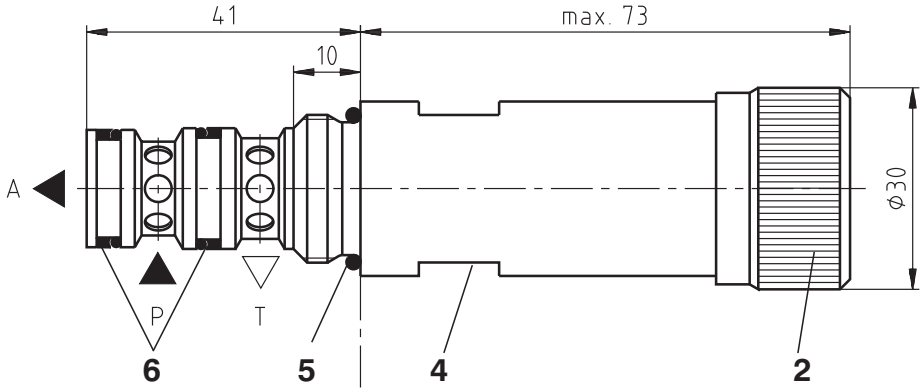


1 - A1 to A2
2 - A2 to T (3rd. direction of flow)
3 - A2 to A1 flow across check valve and the fully opened main spool
4 - P2 to P1
5 - P1 to T (3rd. Direction of flow)
6 - A2 to A1 flow only across check valve

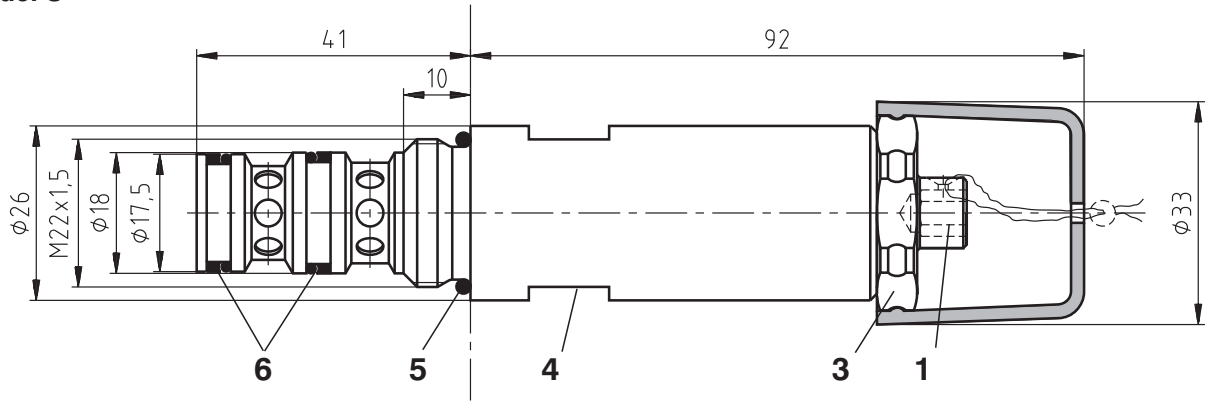
Valve Dimensions

Dimensions in millimeters

Model R

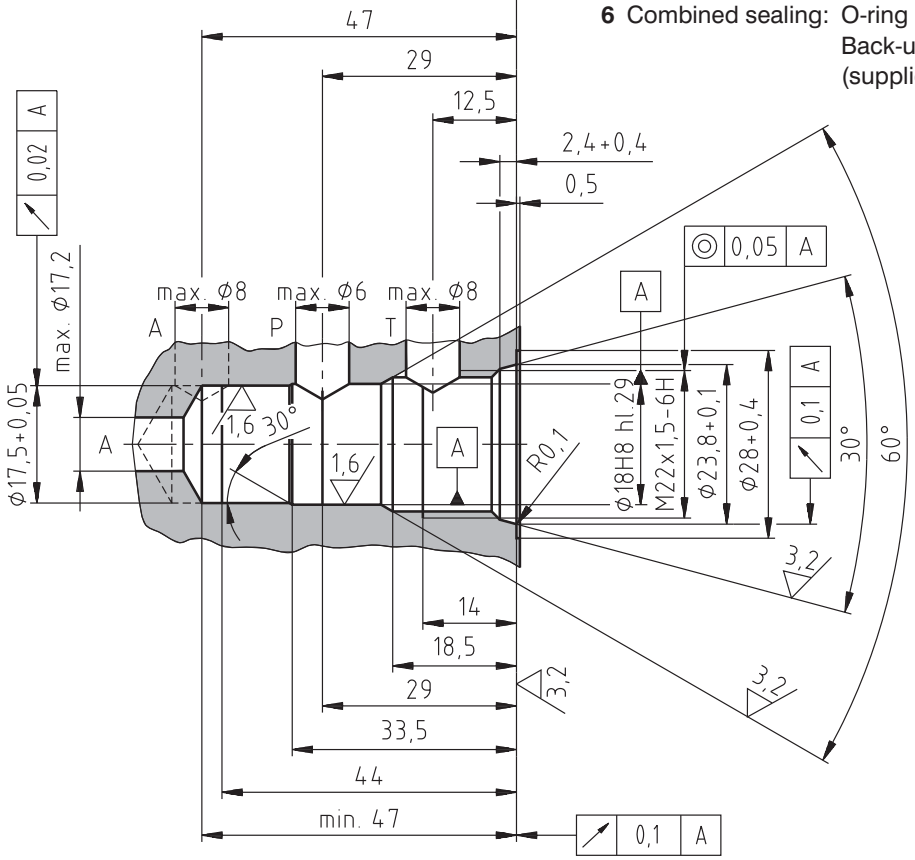


Model S



1 Adjustment element S [screw with internal HEX 6]
2 Adjustment element R (hand knob)
3 Locknut HEX 27
4 Wrench flats s = 24 mm - tightening torque 30 Nm
5 O-ring 19,4 x 2,1 NBR 80 (1 pc.), supplied with valve
6 Combined sealing: O-ring 14 x 1,78 NBR 90 (2 pcs.)
Back-up ring 14,73 x 17,43 x 1,14 (2 pcs.)
(supplied with valve)

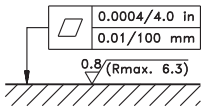
Cavity



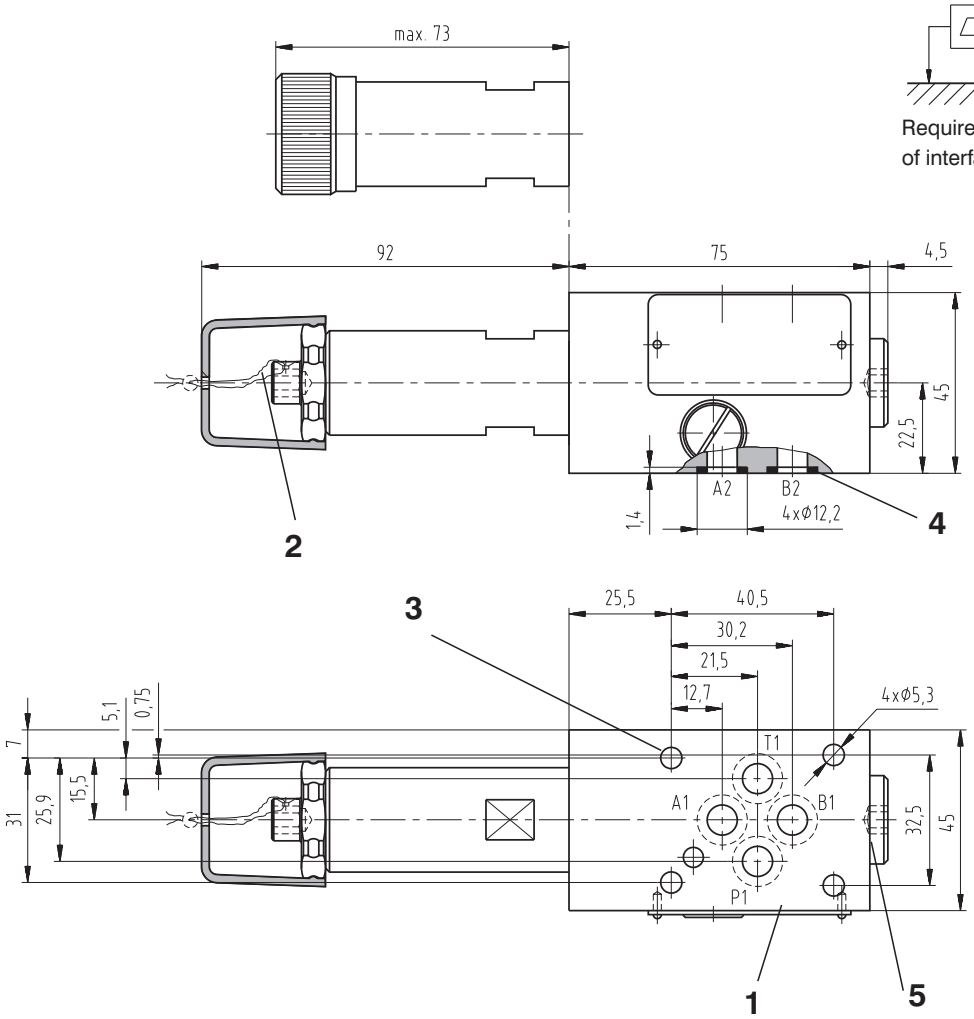
Valve Dimensions

Dimensions in millimeters

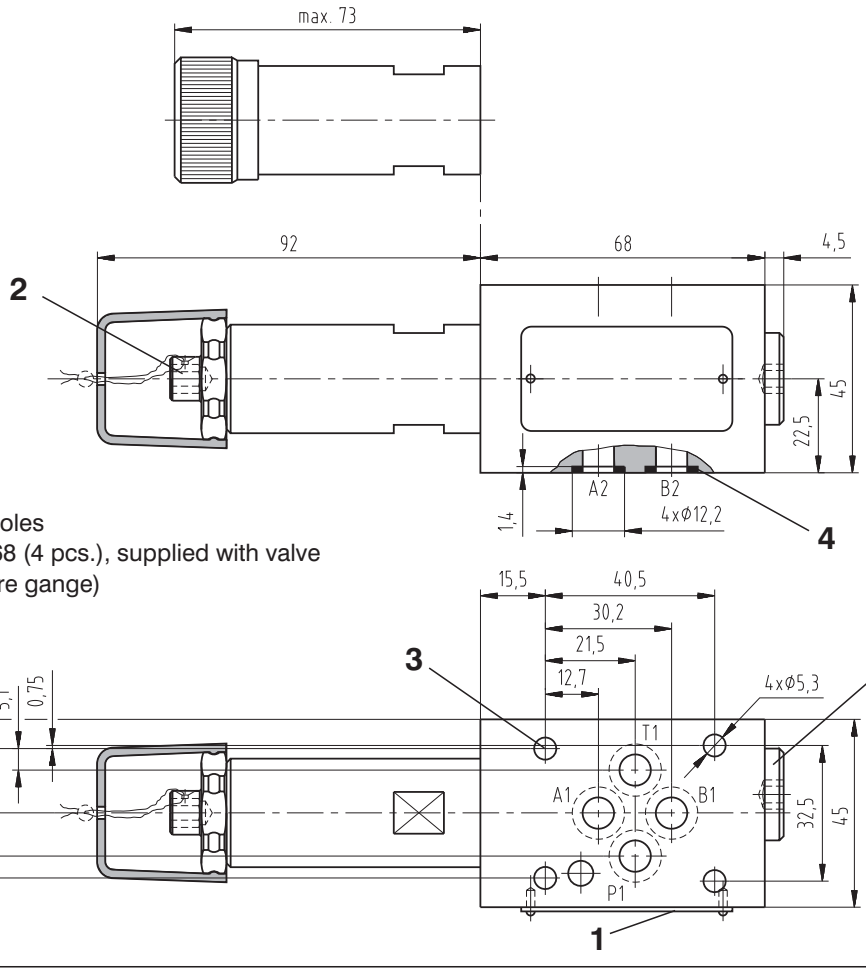
Model MA



Required surface finish of interface



Model MP



1 Name plate
2 Adjustment elements
3 4 through mounting holes
4 Square ring 9.25 x 1.68 (4 pcs.), supplied with valve
5 Plug G1/4 (for pressure gange)

Spare Parts

Model	Dimensions, quantity	Ordering number
Screw-in cartridge - NBR	O-ring 9 x 1,8 NBR 70 (1 pc.)	17363800
	O-ring 14 x 1,78 NBR 90 (2 pc.)	
	O-ring 17 x 1,8 NBR 70 (1 pc.)	
	O-ring 19,4 x 2,1 NBR 80 (1 pc.)	
	Back-up ring BBP80B015-N9 14,73 x 17,43 x 1,14 (2 pcs.)	
	Back-up ring BBP80-B-016-N9 16,33 x 19,03 x 1,14 (1 pc.)	
Screw-in cartridge - Viton	O-ring 9,25 x 1,78 (1 pc.)	22925500
	O-ring 14 x 1,78 (2 pcs.)	
	O-ring 17,17 x 1,78 (1 pc.)	
	O-ring 19,4 x 2,1 (1 pc.)	
	Back-up ring 14,73 x 17,43 x 1,14 (2 pcs.)	
Model	**Dimensions, quantity**	**Ordering number**
Modular valve - NBR	O-ring 9 x 1,8 (1 pc.)	15987200
	O-ring 14 x 1,78 (2 pcs.)	
	O-ring 17 x 1,8 (1 pc.)	
	O-ring 9,75 x 1,78 (1 pc.)	
	O-ring 19,4 x 2,1 (1 pc.)	
	Back-up ring 14,73 x 17,43 x 1,14 (2 pcs.)	
	Back-up ring 16,33 x 19,03 x 1,14 (1 pc.)	
	Square ring 9,25 x 1,68 (4 pcs.)	
Modular valve - Viton	O-ring 9,25 x 1,78 (5 pcs.)	22925600
	O-ring 14 x 1,78 (2 pcs.)	
	O-ring 17.17 x 1.78 1 pc.)	
	O-ring 19,4 x 2,1 (1 pc.)	
	Back-up ring 14,73 x 17,43 x 1,14 (2 pcs.)	
	Back-up ring 17,4 x 1,3 (1 pc.)	

Preferred Types of Valves

Type	Ordering Number
VRN2-06/S-10S	15997200
VRN2-06/S-21S	15997500
VRN2-06/MP-10S	15998400
VRN2-06/MP-21S	15999000

Caution!

- The packing foil is recyclable.
- The protecting plate can be returned to the manufacturer.
- Mounting studs must be ordered separately. Tightening torque is 8.9 Nm.
- The technical information regarding the product presented in this catalogue is for descriptive purposes only. It should not be construed in any case as a guaranteed representation of the product properties in the sense of the law.

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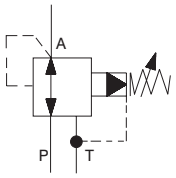
Pilot Operated Pressure Reducing Valves VRN2-10

Size 10 • p_{max} up to 320 bar • Q_{max} up to 150 L/min

HA 5154
6/2012

Replaces
HA 5154 11/2011

- **Screw-in cartridge valve for manifold mounting and stacking assemblies**
- **4 pressure ranges**
- **Two pressure adjustment options**
- **Pressure reduction in ports A, B or P**
- **Model MA a MB with check valve**
- **Installation dimensions to ISO 4401 and DIN 24 340-A10**



Functional Description

The pressure valves VRN2 are pilot operated screw-in cartridge pressure reducing valves designed as 3 way valves. For the use in vertical stacking assemblies, three models of valve bodies are available, with pressure reduction in ports A, B and P. Incorporated into the valve bodies MA, MB are the check valves which enable the reverse flow to pass through the valve.
The reducing valve consists of a cartridge (1) with thread M27x2, control spool (2), spring (3) and the adjustment element (4). With the models for stacking assemblies also the respective valve body (5) and alternatively a check valve (6) complete the valve.

Screw-in cartridge valve

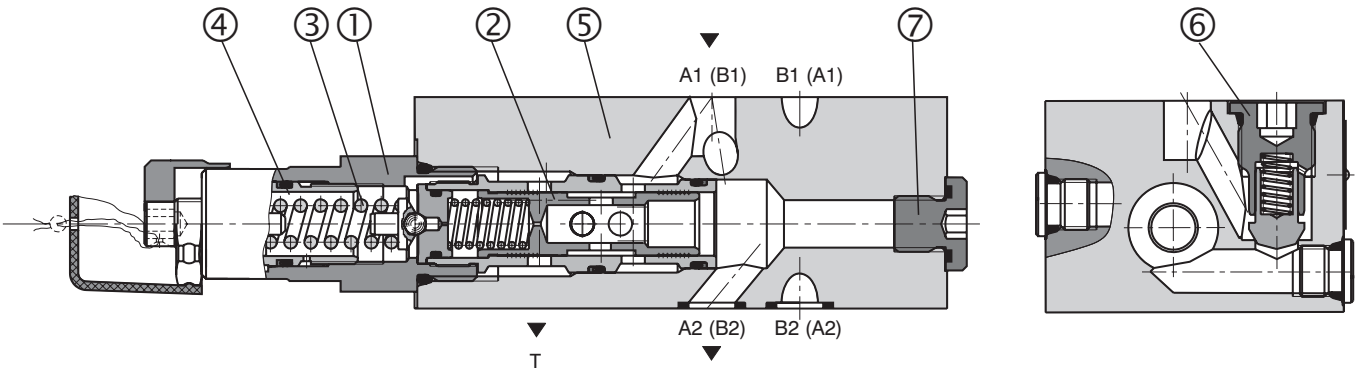
At rest, the valves are open, i.e. oil can flow from input line via the main spool to output line . At the same time there is pressure from output line via the main spool with bore and jets and at the spring-loaded side of the main spool and at the side opposite the spring. If pressure in output line exceeds the value set at the spring the pilot poppet opens. Oil now flows from the spring loaded side of the main spool vis the jet and pilot poppet into the chamber. The main spool moves into control position and holds the value set at the spring in output line constant. If pressure behind the valve increases due to the effect of external load acting on the user, the control spool shifts further against the spring, the input line closes and the flow from output line to port T opens. The control flow of the pilot valve (from the spring room) is also routed to port T.

Model MA and MB

With these models, the flow enters into the valve body through port A1 (B1). The input pressure is reduced, routed to port A2 (B2) and further to the user. The reverse flow passes through a check valve which is connected parallel to the metering edge.

Model MP

With the model MP, the pressure is reduced from port P2 to port P1. With all models, a control pressure gauge can be connected to port G 1/4 (7).
The screw-in cartridge valve body and the adjustment screw are zinc coated. With models for stacking assemblies the valve bodies are phosphate coated.



Ordering Code

VRN2-10/ □ - □ □ □

Pilot Operated Pressure Reducing Valve

Nominal size

Model

screw in cartridge	**S**
modular valve, pressure reduction in port A	MA
modular valve, pressure reduction in port B	MB
modular valve, pressure reduction in port P	**MP**

Pressure range

6	up to 63 bar
10	up to 100 bar
16	up to 160 bar
21	up to 210 bar

Adjustment element

S	screw with internal hexagon 6 mm
R	hand knob

Sealing

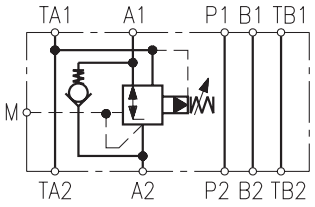
without designation	NBR
V	Viton

FOR PREFERRED TYPES SEE BOLD TYPING IN ORDERING CODE AND TABLE OF PREFERRED TYPES ON PAGE 7

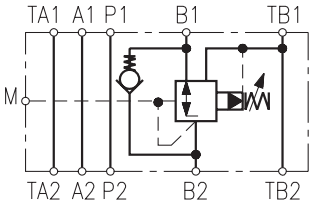
Functional Symbols

Valve side

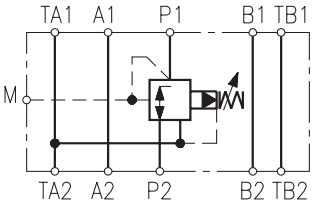
Model **MA**



Model **MB**



Model **MP**



Subplate side

Ordering Numbers of Sandwich / Valve Bodies (without screw-in cartridge)

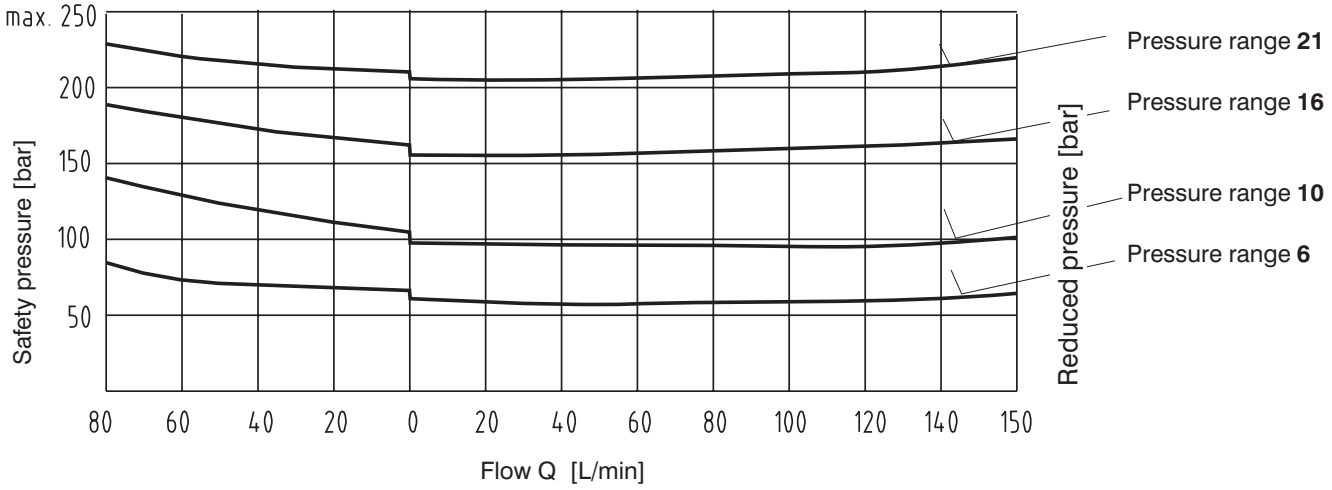
Valve body for modular valve - NBR	Ordering number	Valve body for modular valve - Viton	Ordering number
MA10-VR	15984300	MA10-VR/V	22909700
MB10-VR	15984400	MB10-VR/V	22909800
MP10-VR	15984500	MP10-VR/V	22909900

Technical Data

Nominal size	mm	10
Maximum flow rate - screw in cartridge	L/min	150
Maximum flow rate - modular valve	L/min	80
Maximum pilot flow	L/min	0.65
Max. input pressure (port P)	bar	320
Max. output pressure (port T)	bar	160
Working pressure related to flow	bar	see p-Q characteristics
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51524
Fluid temperature range (NBR)	°C	-30 ... +100
Fluid temperature range (Viton)	°C	-20 ... +120
Viscosity range	mm^2/s	20 ... 400
Maximum degree of fluid contamination		Class 21/18/15 according to ISO 4406
Weight: model S model MA, MB model MP	kg	0.35 3.20 2.85
Mounting position		unrestricted

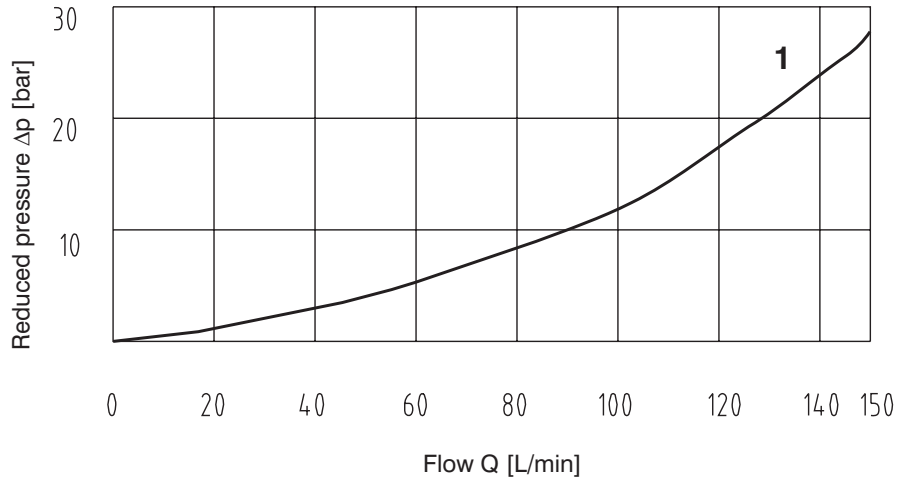
p-Q Characteristics Screw in Cartridge

Measured at $\nu = 32\ mm^2/s$



Δp-Q Characteristics Screw in Cartridge

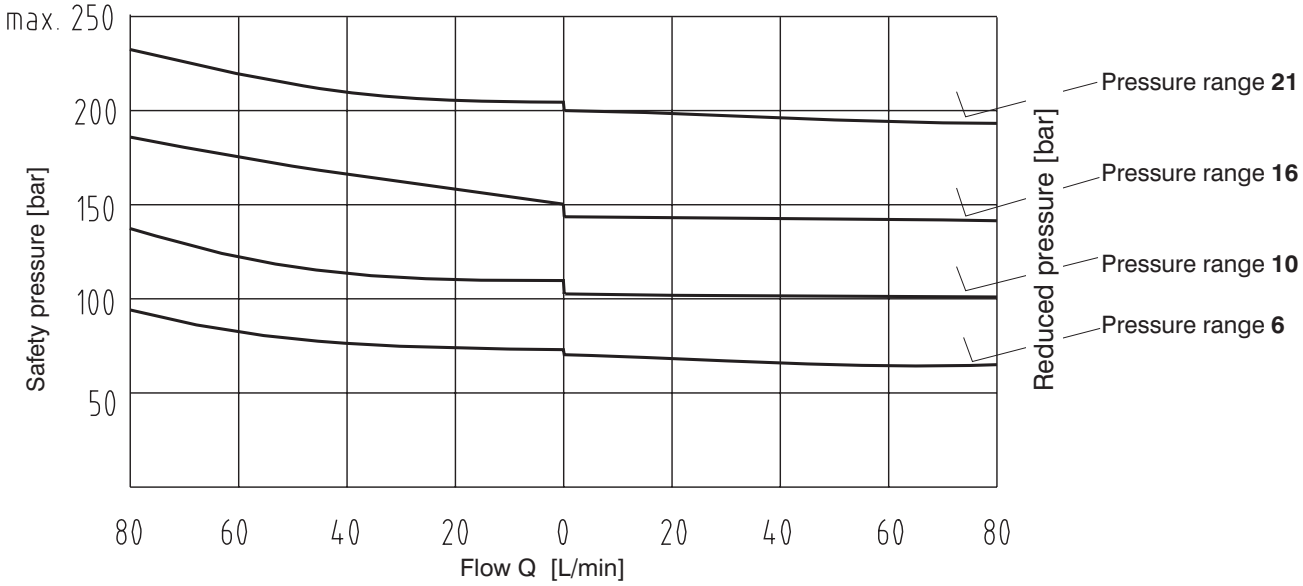
Measured at $\nu = 32\ mm^2/s$



	Model	Direction
1	Model S	A - P

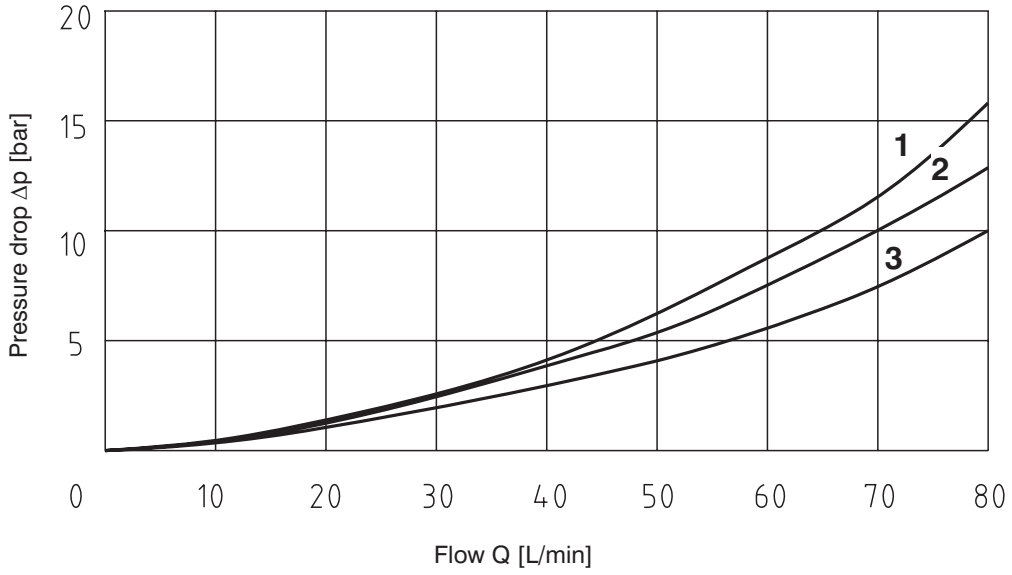
p-Q Characteristics Modular Valve

Measured at $\nu = 32\ mm^2/s$



Δp-Q Characteristics Modular Valve

Measured at $\nu = 32\ mm^2/s$

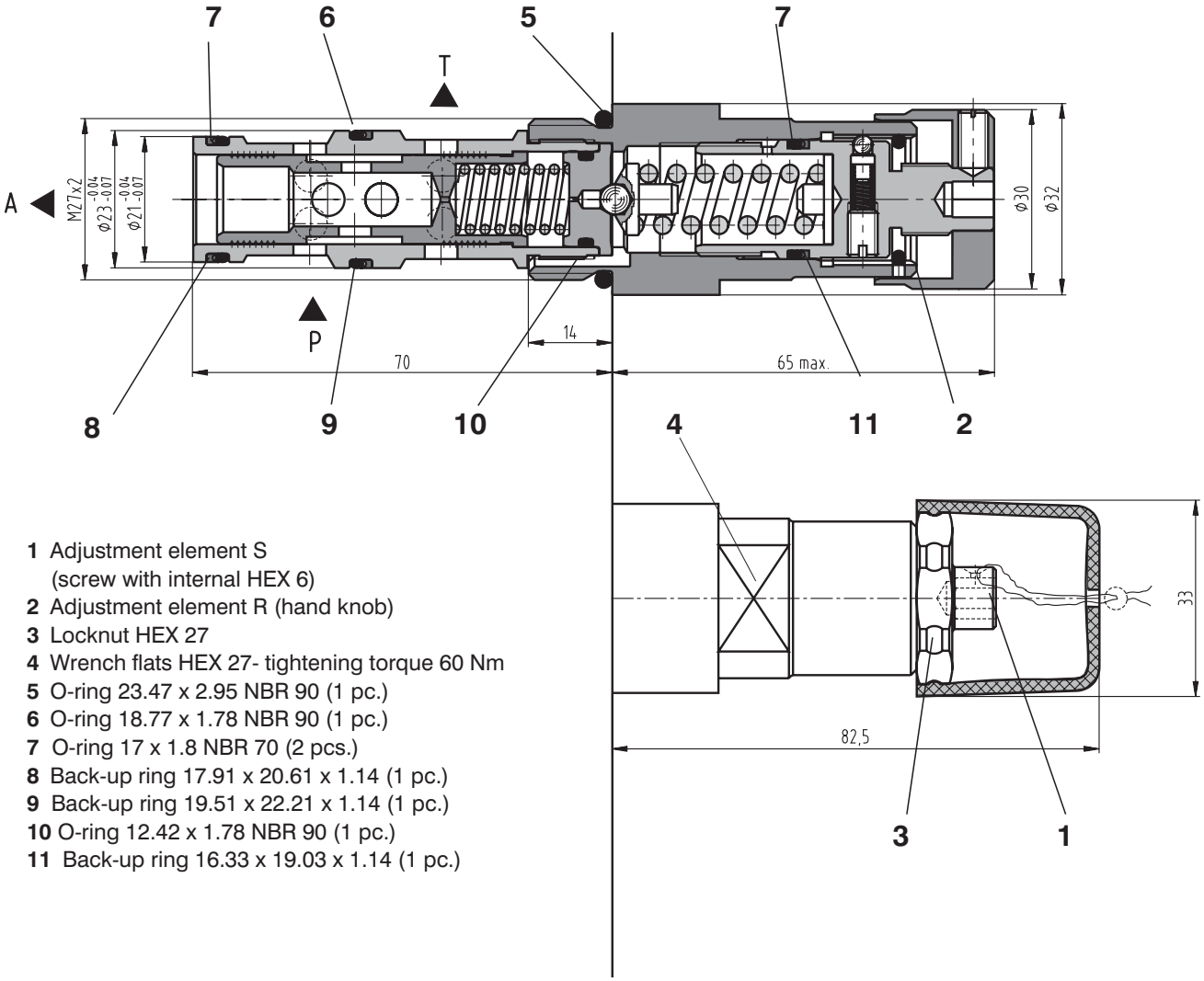


	Model	Direction
1	Model MA, MB	A1 - A2 (B1 - B2)
2	Model MP	P2 - P1
3	Model MA, MB	A2 - A1 (B2 - B1

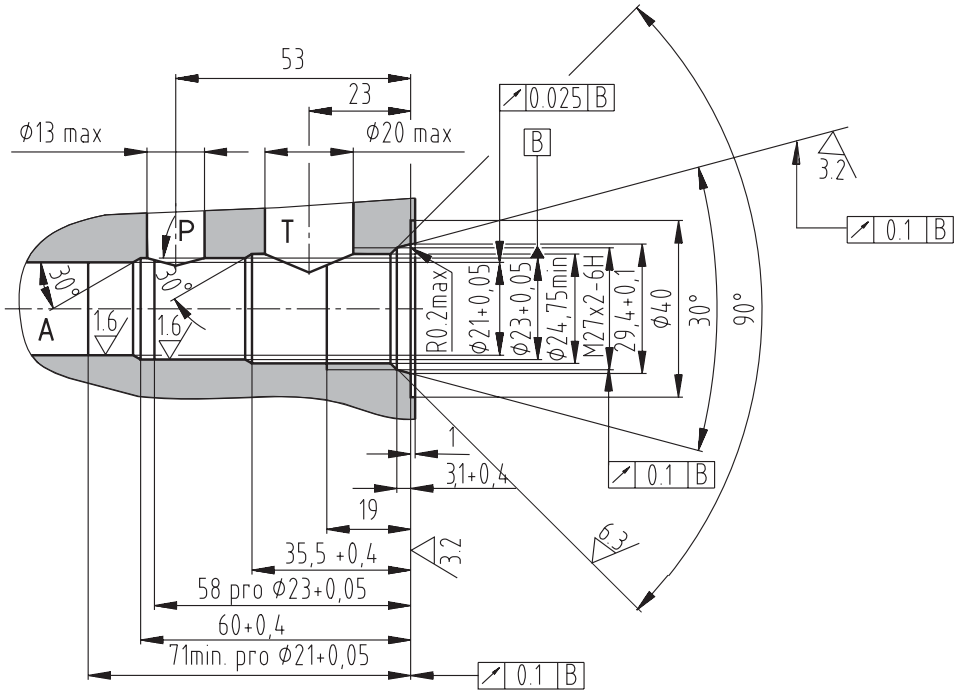
Valve Dimensions

Dimensions in millimeters

Model S

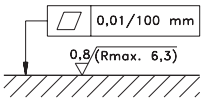


1 Adjustment element S
(screw with internal HEX 6)
2 Adjustment element R (hand knob)
3 Locknut HEX 27
4 Wrench flats HEX 27- tightening torque 60 Nm
5 O-ring 23.47 x 2.95 NBR 90 (1 pc.)
6 O-ring 18.77 x 1.78 NBR 90 (1 pc.)
7 O-ring 17 x 1.8 NBR 70 (2 pcs.)
8 Back-up ring 17.91 x 20.61 x 1.14 (1 pc.)
9 Back-up ring 19.51 x 22.21 x 1.14 (1 pc.)
10 O-ring 12.42 x 1.78 NBR 90 (1 pc.)
11 Back-up ring 16.33 x 19.03 x 1.14 (1 pc.)



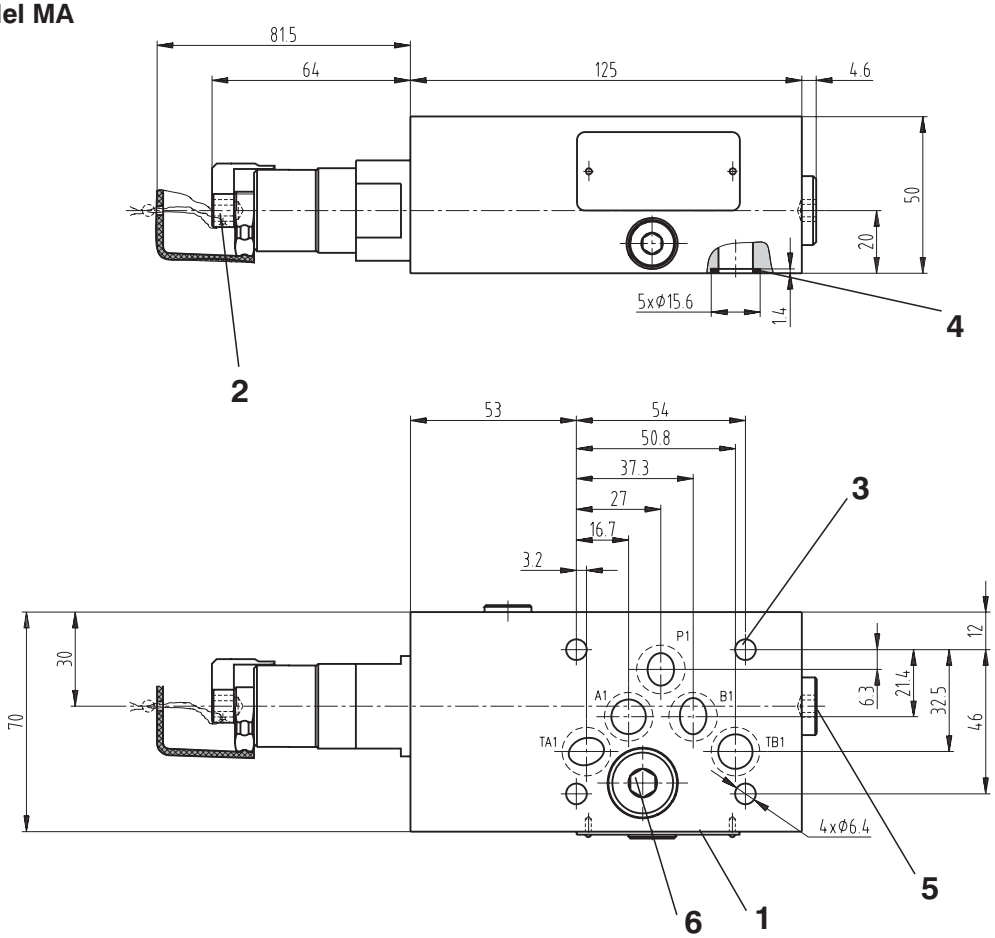
Valve Dimensions

Dimensions in millimeters

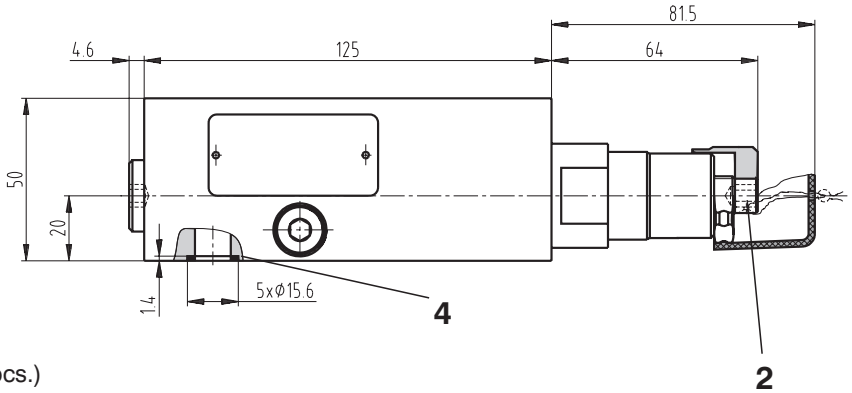


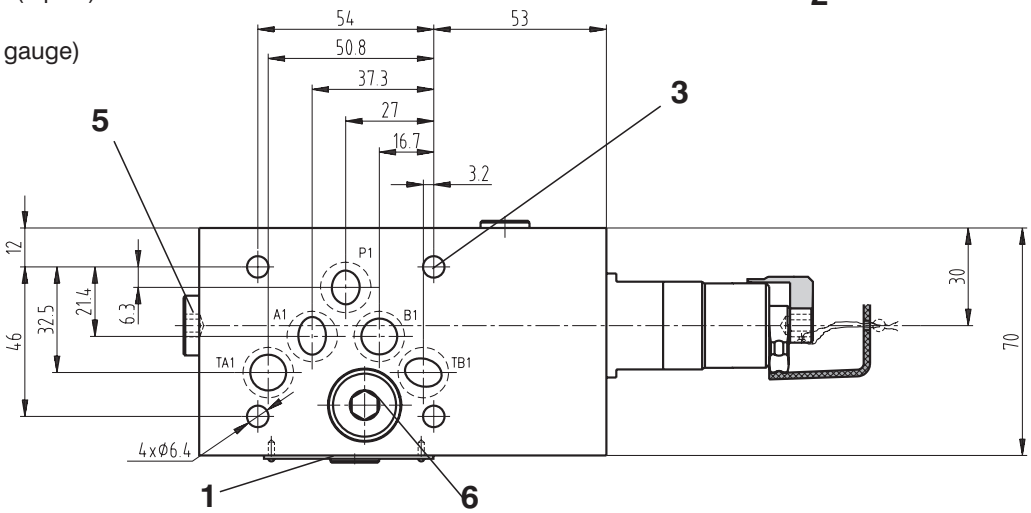
Required surface finish of interface

Model MA



Model MB



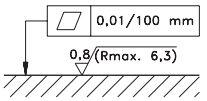


1 Name plate
2 Adjustment elements
3 4 through mounting holes
4 Square ring 12.42 x 1.68 (5 pcs.) supplied with valve
5 Plug G1/4 (for pressure gauge)
6 Check valve

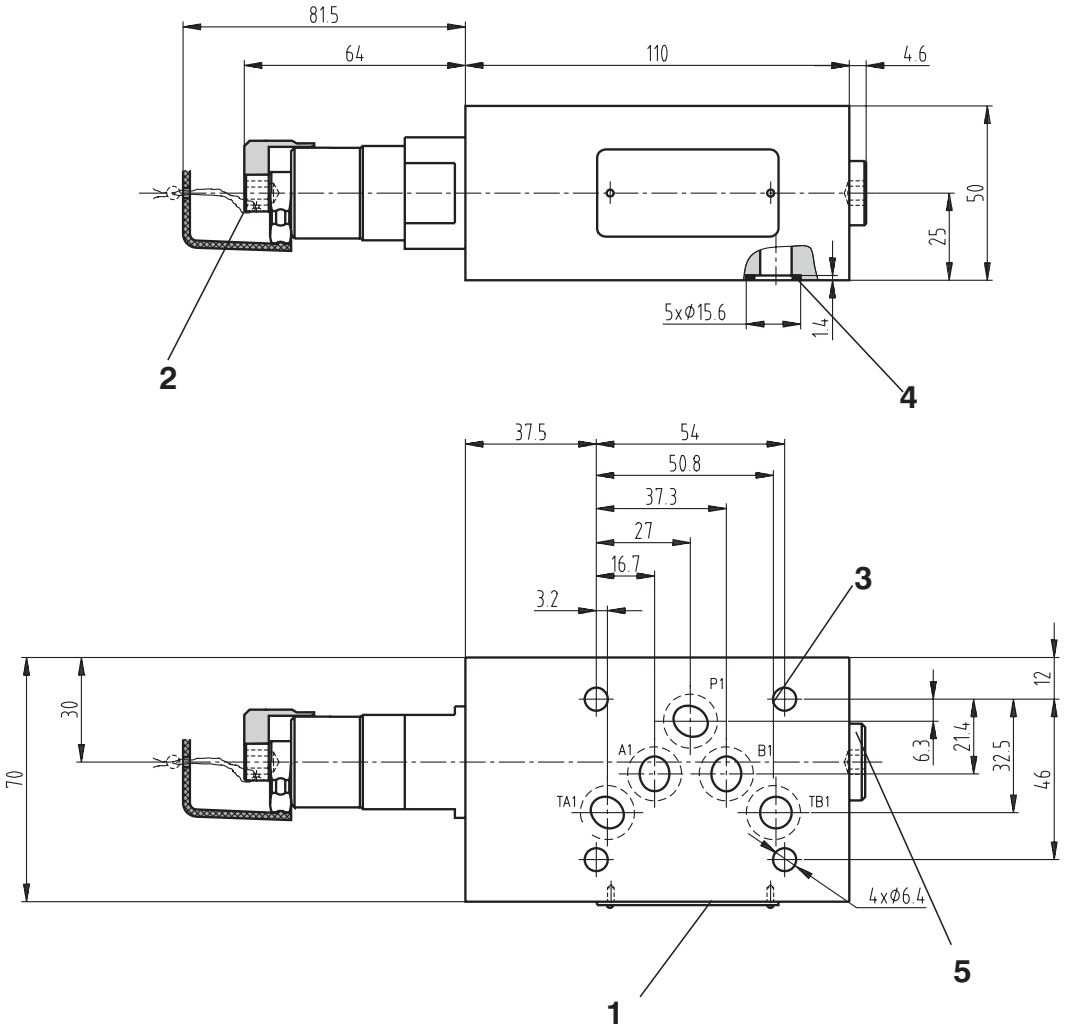
Valve Dimensions

Dimensions in millimeters

Model MP



Required surface finish
of interface

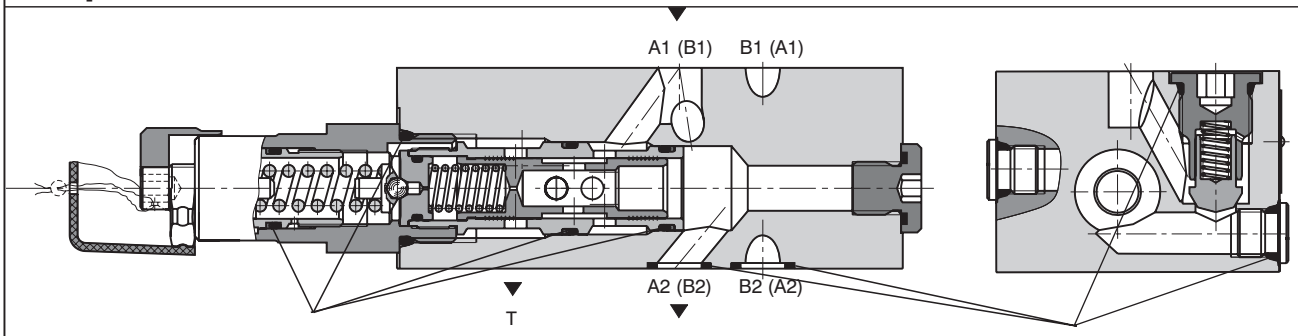


1 Name plate
2 Adjustment elements
3 4 through mounting holes
4 Square ring 12.42 x 1.68 (5 pcs.), supplied with valve
5 Plug G1/4 (for pressure gauge)

Preferred Types of Valves

Type	Ordering Number
VRN2-10/S-10S	15983800
VRN2-10/S-21S	15984000
VRN2-10/MP-10S	22915100
VRN2-10/MP-21S	15986200

Spare Parts - Seal Kits



Seal kit for screw-in cartridge

Seal kit for modular valve

Model	Dimensions, quantity	Ordering number
Screw-in cartridge - NBR	O-ring 17 x 1.8 NBR 70 (2 pcs.)	22916600
	O-ring 12.42 x 1.78 NBR 90 (1 pc.)	
	O-ring 18.77 x 1.78 NBR 90 (1 pc.)	
	O-ring 23.47 x 2.95 NBR 90 (1 pc.)	
	Back-up ring BBP80B018N962N 19.51 x 22.21 x 1.14 (1 pc.)	
	Back-up ring BBP80B017N962N 17.91 x 20.61 x 1.14 (1 pc.)	
	Back-up ring BBP80B016N9 16.33 x 19.03 x 1.14 (1 pc.)	
Screw-in cartridge - Viton	O-ring 17.17 x 1.78 (2 pcs.)	22916700
	O-ring 12.42 x 1.78 (1 pc.)	
	O-ring 18.77 x 1.78 (1 pc.)	
	O-ring 23.47 x 2.95 (1 pc.)	
	Back-up ring BBP80B017V96E1 17.91 x 20.61 x 1.14 (1 pc.)	
	Back-up ring BG1300174-PT00 17.4 x 20 x 1.4 (1 pc.)	
	Back-up ring BBP80B018V9 19.51 x 22.21 x 1.14 (1 pc.)	
Modular valve - NBR	O-ring 15.4 x 2.1 (1 pc.)	22916800
	O-ring 10 x 1.8 (2 pcs.)	
	O-ring 17 x 1.8 (2 pcs.)	
	O-ring 12.42 x 1.78 (1 pc.)	
	O-ring 18.77 x 1.78 (1 pc.)	
	O-ring 23.47 x 2.95 (1 pc.)	
	Back-up ring BBP80B016N9 16.33 x 19.03 x 1.14 (1 pc.)	
	Back-up ring BBP80B018N962N 19.51 x 22.21 x 1.14 (1 pc.)	
	Back-up ring BBP80B017N962N 17.91 x 20.61 x 1.14 (1 pc.)	
	Square ring 12.42 x 1.68 (5 pcs.)	
Modular valve - Viton	O-ring 15.4 x 2.1 (1 pc.)	22916900
	O-ring 9.75 x 1.78 (2 pcs.)	
	O-ring 12.42 x 1.78 (6 pcs.)	
	O-ring 17.17 x 1.78 (2 pcs.)	
	O-ring 18.77 x 1.78 (1 pc.)	
	O-ring 23.47 x 2.95 (1 pc.)	
	Back-up ring BBP80B017V96E1 17.91 x 20.61 x 1.14 (1 pc.)	
	Back-up ring BG1300174-PT00 17.4 x 20 x 1.4 (1 pc.)	
	Back-up ring BBP80B18-V9 19.51 x 22.21 x 1.14 (1 pc.)	

Caution!

- The packing foil is recyclable. The protecting plate can be returned to the manufacturer.
- The technical information regarding the product presented in this catalogue is for descriptive purposes only. It should not be construed in any case as a guaranteed representation of the product properties in the sense of the law.

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www.argo-hytos.com

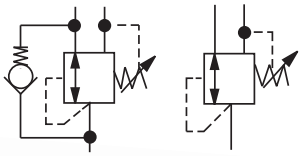
Directly Operated Pressure Reducing Valves

VRP2-04

Size 04 (D 02) • 320 bar (4600 PSI) • 20 L/min (5.3 US GPM)

HA 5142
6/2012

Replaces
HA 5142 4/2008



- ❑ **For stacking assemblies**
- ❑ **4 pressure ranges**
- ❑ **Pressure reduction in ports A or P**
- ❑ **Model “A” with check valve**
- ❑ **Installation dimensions to ISO 4401/CETOP-RP 121H**

Functional Description

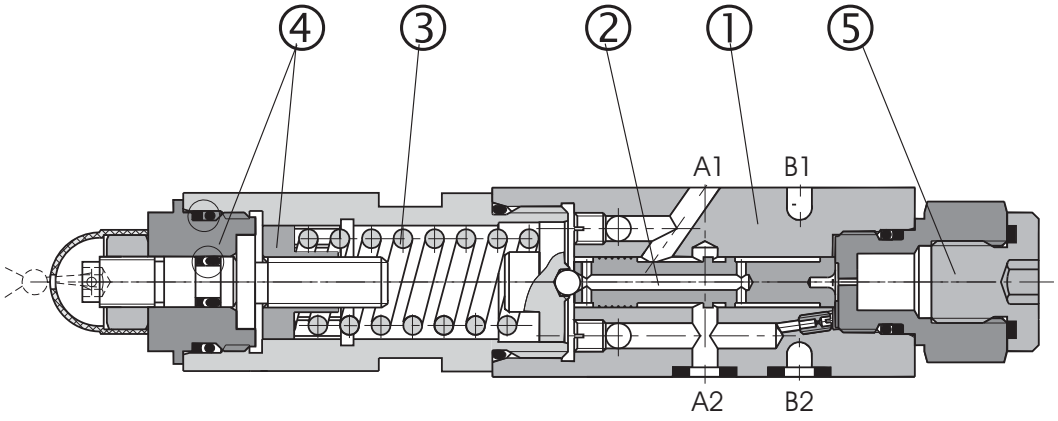
The pressure valves VRP2 are directly operated reducing valves for vertical stacking assemblies designed as 3 way valves, i.e. with pressure protection of the secondary circuit.
The valve consists of the valve body (1), control spool (2), spring (3), adjustment element (4) and the plug G 1/4 (5) for pressure measuring and, if necessary, of a check valve.

Model “A”
With this model, the fluid enters into the valve body from the primary circuit through port A1 and passes through the metering edge, where its pressure is reduced. The reduced pressure corresponds with the setting of the control spring. At the same time, this pressure affects also the surface area of the control spool opposed to the spring (the pressure can be measured at the port G 1/4 which is normally closed by plug 5). Thus the static balance of the spool is ensured. If the reduced pressure changes, a respective control action takes place and the reduced pressure returns to its preset value. The flow from the output port A2 passes then to the user. If pressure behind the valve increases due to the effect of the load acting on the user, the spool shifts further against the spring until the second metering edge opens and the excessive flow drains through port T. The leakage from the spring room is also routed to port T. The reverse free-flow from port A2 to port A1 passes through a check valve which is connected parallel to the metering edge.

Model “B”
With model “B”, the pressure reduction follows from port P2 to port P1, but it takes place only when the flow in port B passes in the direction to the user (not opposite). The protection of the secondary circuit is also ensured for one flow direction only.

Model “P”
With model “P”, the pressure reduction follows from port P2 to port P1, but is effective in both flow directions through the directional valve (as well as the protection of the secondary circuit).

The valves are delivered with basic surface treatment. The valve body is phosphate coated, whereas the surfaces of the other parts are zinc coated.



Ordering Code

VRP2-04- □ □ / □ □

Reducing valve, directly operated

Nominal size — **04 (D 02)**

Pressure reduction	**Pressure control**	
In port A2	from port A2	A
In port P1	from port B1	B
In port P1	from port P1	**P**

S — **Adjustment element**: Screw with outside HEX 4

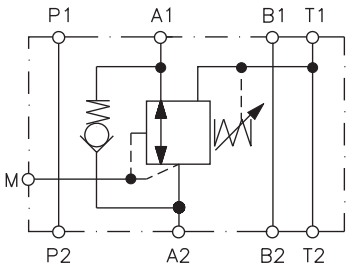
Pressure range

2	Adjustable up to 25 bar(363 PSI)
6	Adjustable up to 63 bar (914 PSI)
16	Adjustable up to 160 bar(2321 PSI)
21	Adjustable up to 210 bar (3046 PSI)

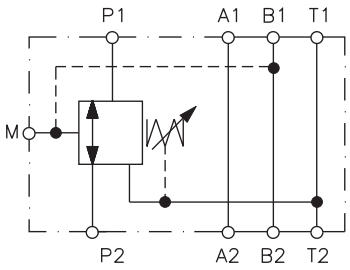
no designation — **Seals**: NBR

Functional Symbols

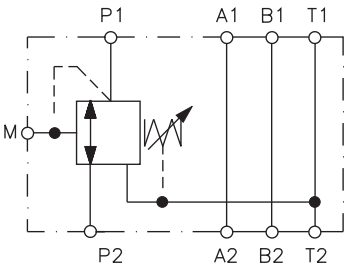
VRP 2-04-**A** . / . .



VRP 2-04-**B** . / . .



VRP 2-04-**P** . / . .



Technical Data

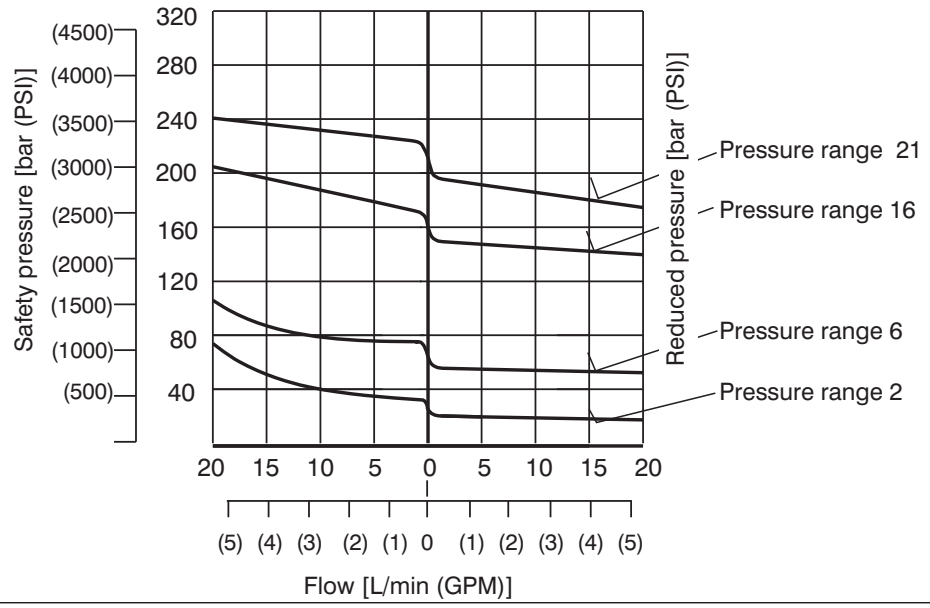
Nominal size	mm	04 (D02)
Maximal flow	L/min (GPM)	20 (5.3)
Max. service pressure ports (P, T, A, B)	bar (PSI)	320 (4600)
Working pressure related to flow	bar (PSI)	see p-Q characteristics
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51524
Fluid temperature range	°C (°F)	-30 ... +100 (-22 ... +212)
Viscosity range	mm^2/s (SUS)	20 .. 400 (98 ... 1840)
Maximum degree of fluid contamination		Class 21/18/15 to ISO 4406
Weight - model “A” model “B”, “P”	kg (lb)	0.82 (1.81) 0.60 (1.32)
Mounting position		unrestricted

Caution!

- The packing foil is recyclable. The protecting plate can be returned to the manufacturer.
- If the valve is used separately without a directional valve, a cover plate DK1-04/32-3 with the same installation dimensions can be ordered. This plate connect port A1 with port P1 - see catalogue Adapter and Blanking Plates HA 0003.
- Mounting bolts M5x50 or studs must be ordered separately. Tightening torque of the screws is 5 Nm (3.7 ft-lbs).
- For applications outside these parameters, please consult the manufacturer.
- The technical information regarding the product presented in this catalogue is for descriptive purposes only. It should not be construed in any case as a guaranteed representation of the product properties in the sense of the law.

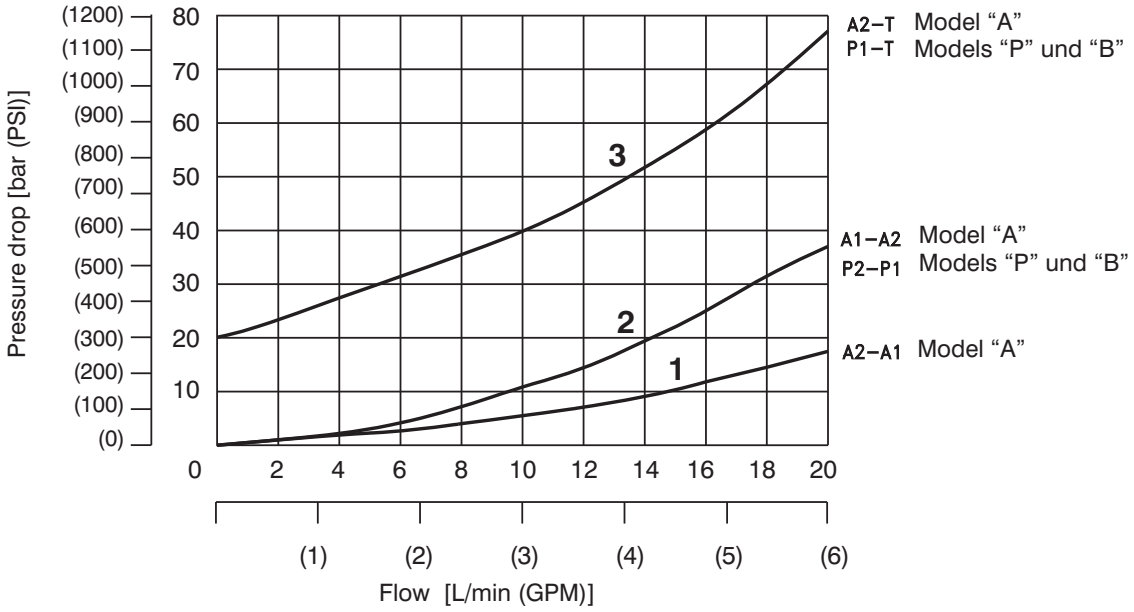
p-Q Characteristics

Measured at $\nu = 32\ mm^2/s$ (156 SUS)



Δp-Q Characteristics

Measured at $\nu = 32\ mm^2/s$ (156 SUS)



1 - Pressure drop of check valve
2 - Pressure drop of reducing valve = Min. adjustable pressure range
3 - Pressure drop of relief valve = Min. adjustable safety pressure

Spare Parts

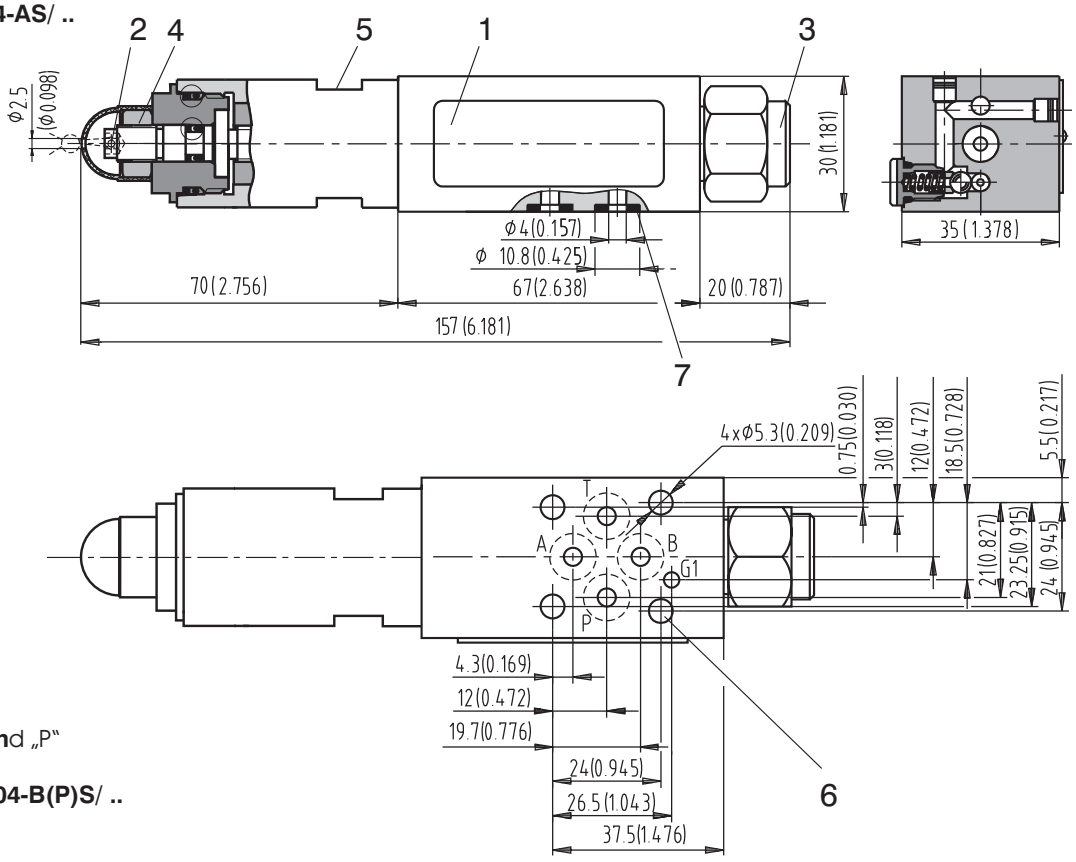
Type	Dimensions, quantity	Ordering number
Standard NBR	O-ring 5 x 1,8 NBR 80 (1pcs)	15915600
	O-ring 12,42 x 1,78 NBR 70 (1pcs)	
	O-ring 18 x 2,65 NBR 70 (1pcs)	
	O-ring 6 x 1,5 OR1500600-N7003 (1pcs)	
	O-ring 20,35 x 1,78 ORAR00019-N9002 (1pcs)	
	DKAR 00009-N7028 5,28 x 1,68 NBR 70 (1pcs)	
	DKAR 00011-N7028 7,65x1,68 (4pcs)	
	Back-up ring BBP80B014-N9 13,16 x 15,86 x 1,14 (1pcs)	
	Back-up ring BBP80B115-N962N 17,83 x 22,19 x 1,14 (1pcs)	

Valve Dimensions

Dimensions in millimetres and inches

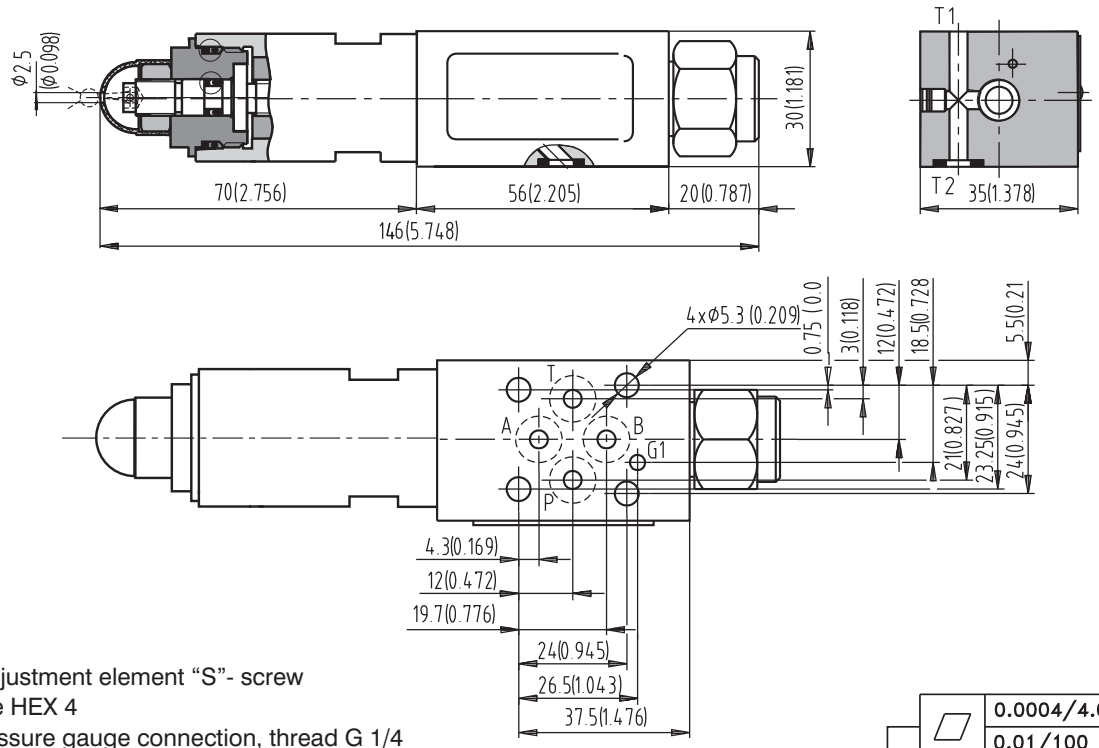
Model „A“

Type VRP2-04-AS/ ..

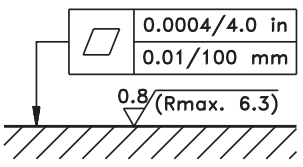


Model „B“ and „P“

Type VRP2-04-B(P)S/ ..



1 Name plate
2 Pressure adjustment element “S”- screw with outside HEX 4
3 Plug for pressure gauge connection, thread G 1/4
4 Locknut HEX 13
5 Wrench flats s=24mm
5 4 through mounting holes
6 Square ring 7.65x1.68 (4 pcs.), supplied with each valve



Required surface finish of interface.

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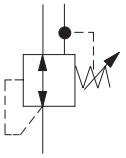
Directly Operated Pressure Reducing Valves

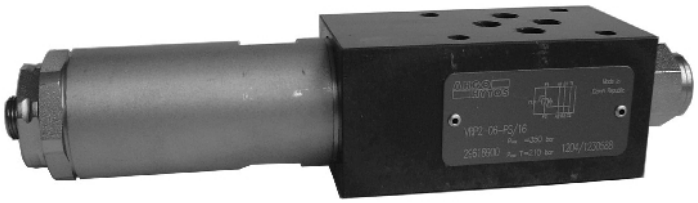
VRP2-06

Dn 06 • pmax 350 bar (5076 PSI) • Qmax 50 l/min (13.2 GPM)

HA 5145
11/2012



- ❑ **For stacking assemblies**
- ❑ **4 pressure ranges**
- ❑ **Pressure reduction in ports P**
- ❑ **Installation dimensions to ISO 4401/CETOP-RP 121H**



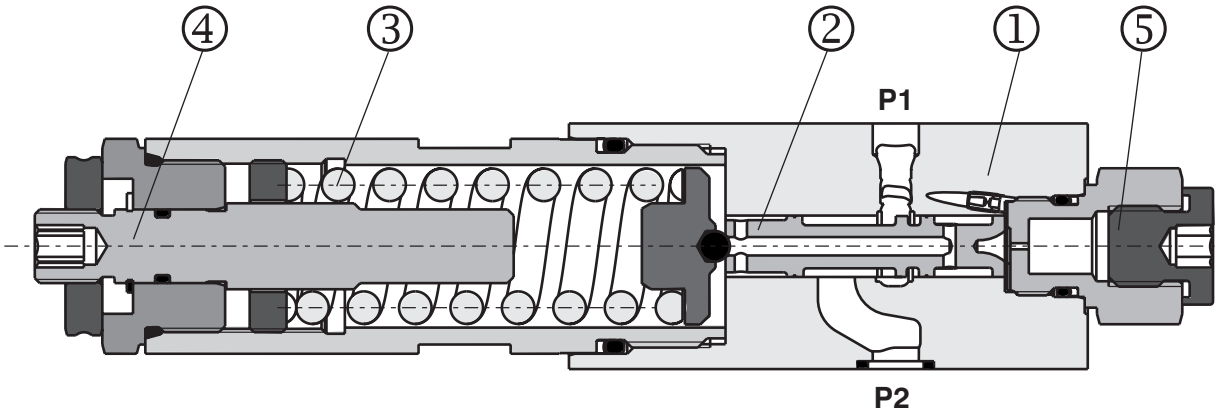
Functional Description

The pressure valves VRP2 are directly operated reducing valves for vertical stacking assemblies designed as 3 way valves, i.e. with pressure protection of the secondary circuit.
The valve consists of the valve body (1), control spool (2), spring (3), adjustment element (4) and the plug G1/4 (5) for pressure measuring

Model “B”
With model “B”, the pressure reduction follows from port P2 to port P1, but it takes place only when the flow in port B passes in the direction to the user (not opposite). The protection of the secondary circuit is also ensured for one flow direction only.

Model “P”
With model “P”, the pressure reduction follows from port P2 to port P1, but is effective in both flow directions through the directional valve (as well as the protection of the secondary circuit).

The valves are delivered with basic surface treatment. The valve body is phosphate coated, whereas the surfaces of the other parts are zinc coated.



Ordering Code

VRP2 - 06 - □ □ / □ □

Reducing valve, directly operated

Nominal size

Pressure reduction	**Pressure control**	
in port P1	from port B1	**B**
in port P1	from port P1	**P**

Adjustment element

Screw with outside HEX 6 — **S**

Seals

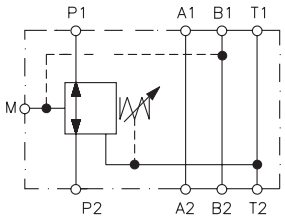
no designation — Standard (NBR)

Pressure range

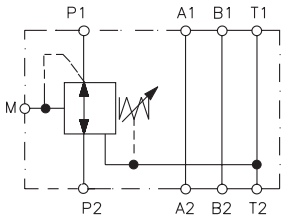
2	Adjustable up to 25 bar(363 PSI)
6	Adjustable up to 63 bar (914 PSI)
16	Adjustable up to 165 bar (2321 PSI)
21	Adjustable up to 210 bar (3046 PSI)

Functional Symbols

VRP 2-06-B . / . .



VRP 2-06-P . / . .

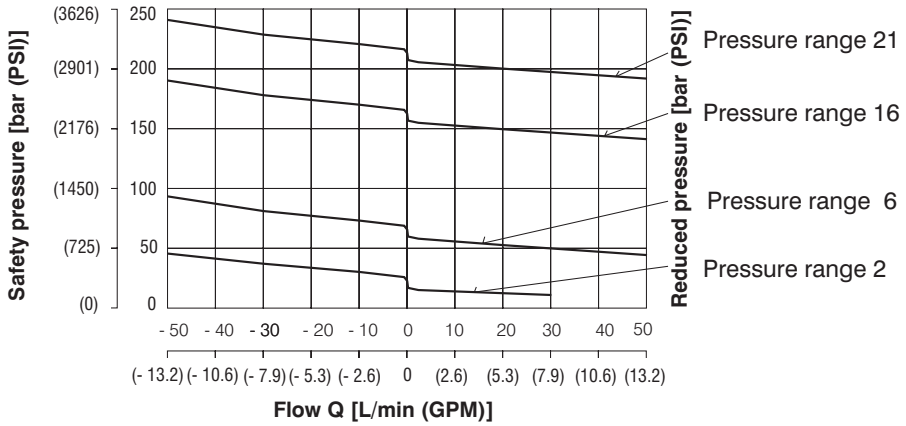


Technical Data

Nominal size		06 (D03)
Maximal flow	l/min (GPM)	50 (13.2)
Max. service pressure ports (P, T)	bar (PSI)	350 (5076)
Working pressure related to flow	bar (PSI)	see p-Q characteristics
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51524
Fluid temperature range	°C (°F)	-30 ... +100 (-22 ... +212)
Viscosity range	mm^2/s (SUS)	20 .. 400 (98 ... 1840)
Maximum degree of fluid contaminationy		Class 21/18/15 to ISO 4406
Weight	kg (lb)	1,50 (3.31)
Mounting position		unrestricted

p-Q Characteristics

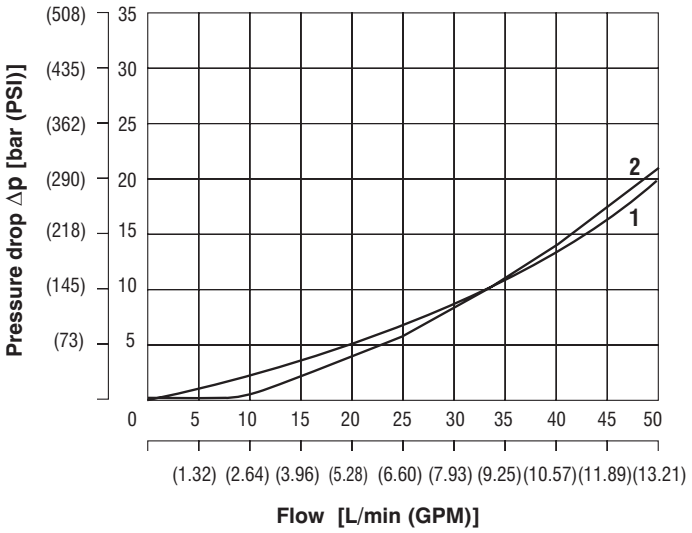
Measured at $\nu = 32\ mm^2/s$ (156 SUS)



Δp-Q Characteristics

Measured at ν = 32 mm²/s (156 SUS)

Pressure drop of reducing valve



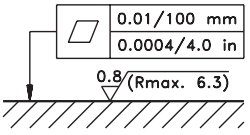
Model „B" and „P"

Flow in direction	
1	P2 → P1
2	P1 →T

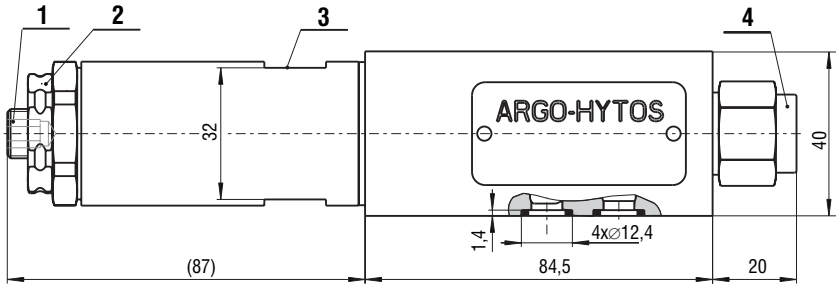
Valve Dimensions

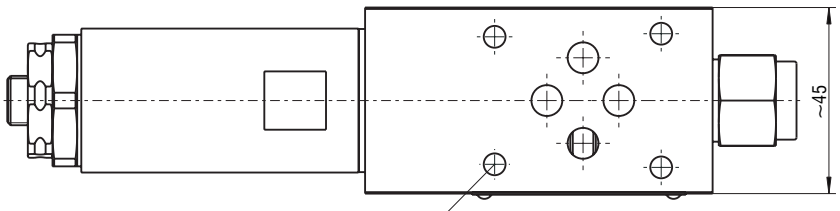
Dimensions in millimeters (inches)

Model „B" and „P"



Required surface finish of interface.





Dimensions to ISO 4401

1 Pressure adjustment element "S"- screw with outside HEX 6
2 Locknut HEX 27
3 Wrench flats s= 32 mm (1.26 inch)
4 Plug for pressure gauge connection, thread G 1/4

Spare Parts

Seal kit

Type	Dimension, quantity	Ordering number
	Square ring	
Standard - NBR	9,25x1,6 DKAR00012BN7033 (4 pc.)	15650300

Caution!

- The plastic packing foil is recyclable.
- The transport plate can be returned to the manufacturer.
- If the valve is used separately without a directional valve, a cover plate DK1-06/32-3 with the same installation dimensions can be ordered. This plate connect port A1 with port P1 - see catalogue Adapter and Blanking Plates HA 0003.
- Mounting bolts M5x55 or studs must be ordered separately. Tightening torque of the screws is 8,9 Nm (6.56 lbf-ft).
- For applications outside these parameters, please consult the manufacturer.
- The technical information regarding the product presented in this catalogue is for descriptive purposes only. It should not be construed in any case as a guaranteed representation of the product properties in the sense of the law.

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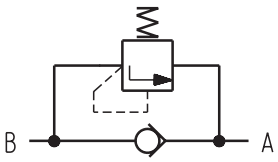
Combined Relief-Check Valves DBV2-420

Size 10 • 420 bar (6092 PSI) • 200 L/min (52.84 GPM)

HA 5092
11/2010

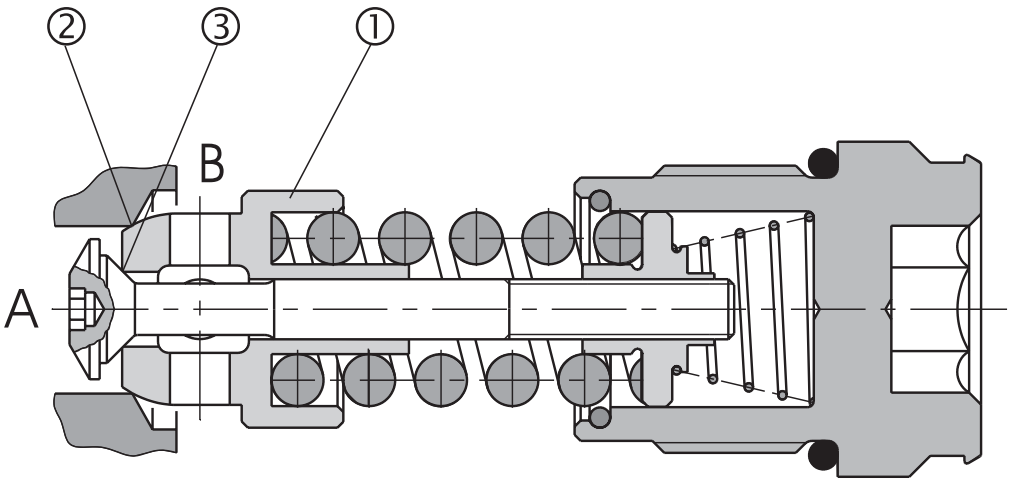
Replaces
HA 5092 04/2008



- ❑ **Compact design**
- ❑ **High pressure capabilities**
- ❑ **Cartridge model – built into the mounting cavity with the seat in manifold**
- ❑ **Factory set pressure setting**
- ❑ **Simple mounting – the valve and the screw plug build up an integral unit**

Functional Description

The high-pressure relief-check valve DBV2-420 is delivered as a cartridge unit without bushing, i.e. for direct mounting into the cavity with the seat machined directly in the manifold. In the direction A-B the fluid passes freely through the check valve (1). The direction B-A is closed by main seat (2) and as the pressure increases above the factory set value the fluid is drained through the seat of the main cone (3). The adjusted pressure is defined as the pressure, which is necessary to open the relief valve at the flow rate 20 L/min (5.28 GPM).
The valve is delivered without any surface treatment.



Ordering Code

DBV2 - 420

Combined Relief-Check Valves

Pressure
adjusted pressure 420 bar (6092 PSI)

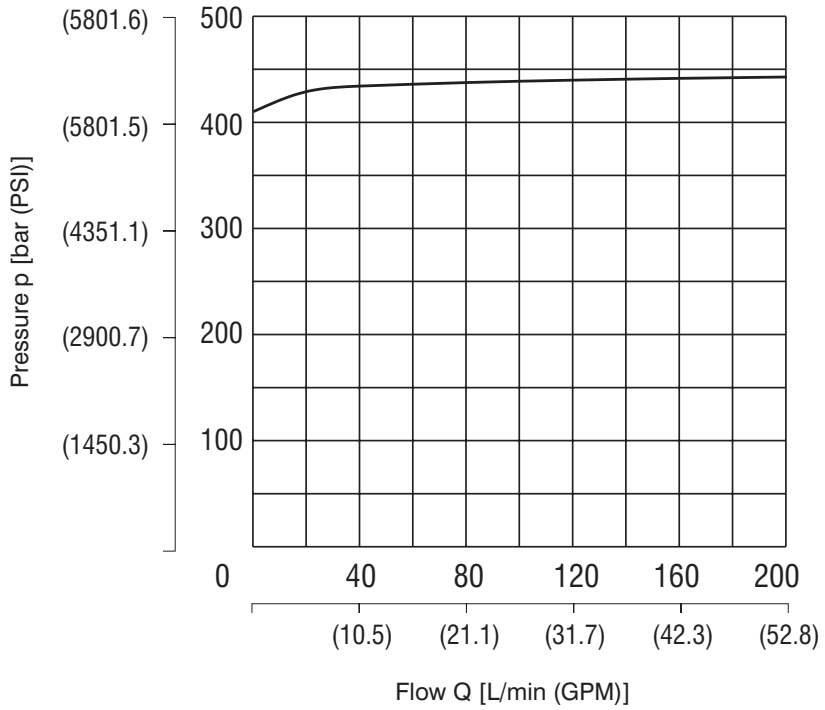
Technical Data

Nominal size		10
Maximum flow rate	L/min (GPM)	200 (52.84)
Nominal pressure	bar (PSI)	420+15 (6091+218)
Pressure losses	bar (PSI)	see the characteristics
Hydraulic fluid		Hydraulic oils of power classes (HL, HLP) to DIN 51 524
Fluid temperature range	°C (°F)	-30 ... +100 (-22 ... +212)
Viscosity range	mm^2/s (SUS)	20 ... 400 (97.3 ... 1840)
Maximum degree of fluid contamination		Class 21/18/15 to ISO 4406
Weight	kg (lbs)	0,138 (0.300)
Mounting position		unrestricted

p-Q Characteristics

Measured at ν = 32 mm^2/s (156 SUS)

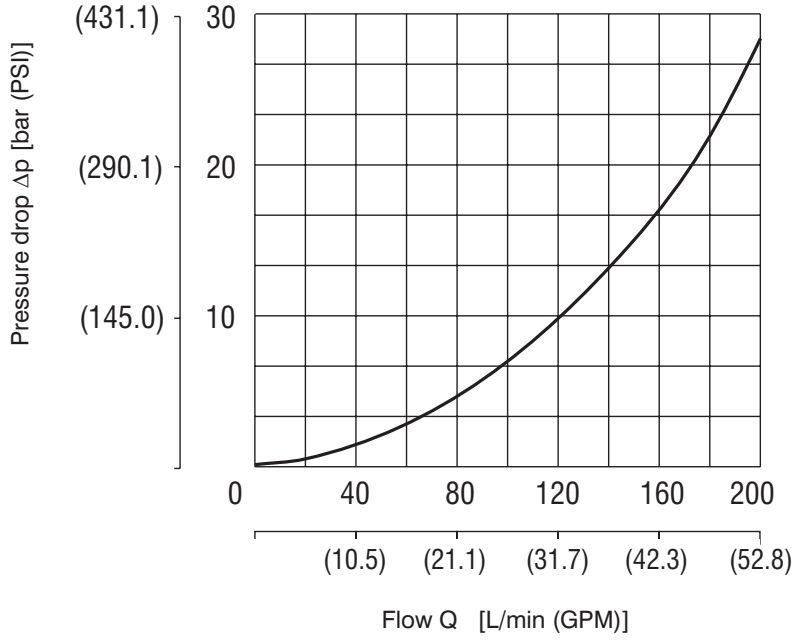
Pressure Relief Valve, flow direction **B** → **A**
Static characteristic



Δp-Q Characteristics

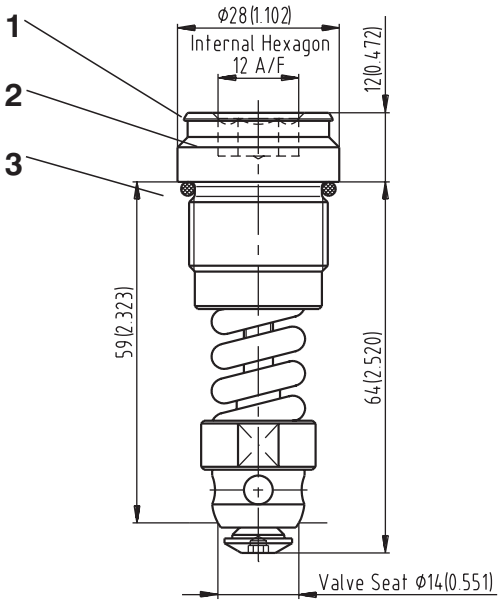
Measured at ν = 32 mm^2/s (156 SUS)

Check Valve, flow direction **A** → **B**
Pressure drop of the check valve alone, measure at test manifold.



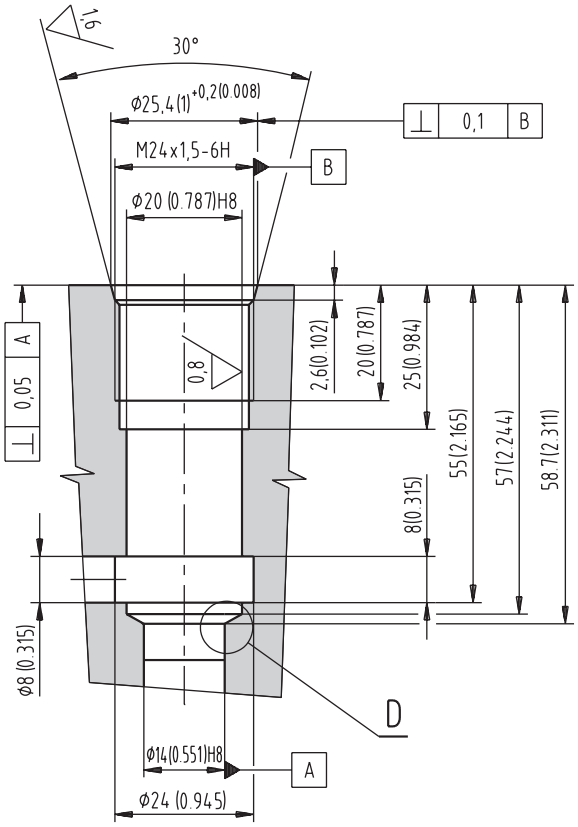
Valve Dimensions

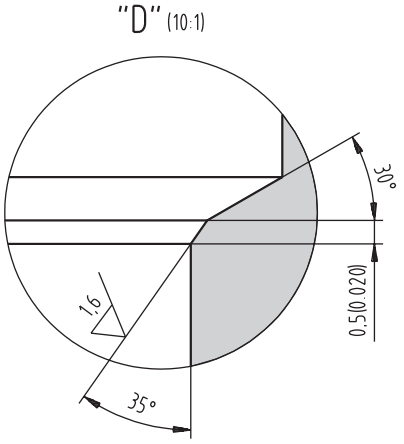
Dimensions in millimeters and inches



1 Nominal pressure
2 Inside hexagon for valve mounting into the cavity
Tightening torque 50 +10 Nm (36.97 + 7.37 ft-lbs)
3 Seals: O-Ring 20.35 x 1.78
(supplied with valve)

Cavity





Caution!

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ARGO HYTOS

Pilot Operated Priority
Unloading Valves

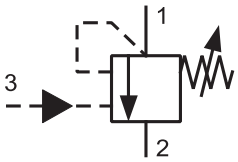
SU6A-U3/I

1-1/8-12 UNF-2A • p_{max} 350 bar • Q 60 L/min

HA 5224
7/2008

Replaces
HA 5224 9/2006

- ❑ **May be used as accumulator charging valve**
- ❑ **For unloading a high flow – low pressure pump to tank.**

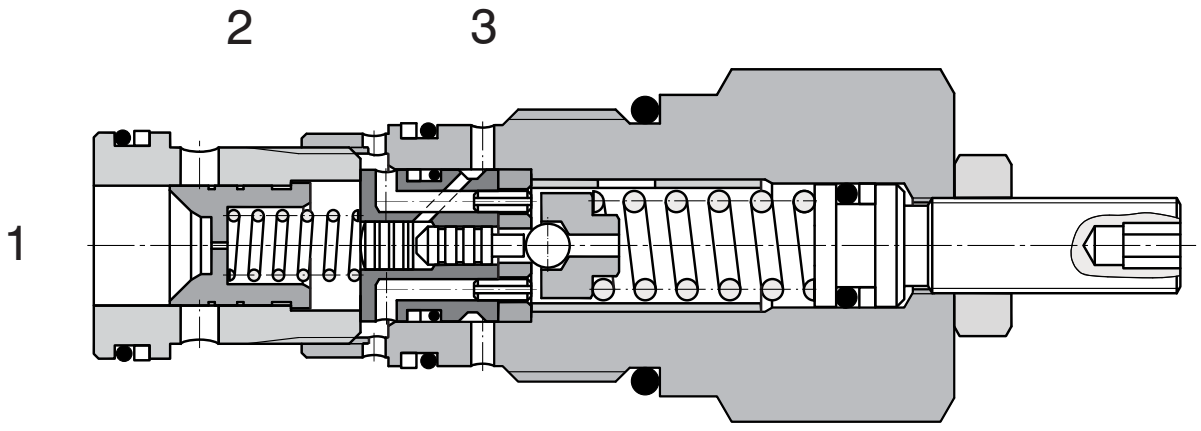


Functional Description

The valve consists of a ball control stage with a common drain into the storage tank, a main stage with a gate valve and a switching stage consisting of a bushing and a control gate valve. It is built-in in a secondary line in view of the feeding line. At the same time connections (1) and (3) are connected to the feeding line however they are separated mutually with the use of a one-way valve. For channel (1) on the side of the pump and channel (3) on the side of the system see page No 4.
The pressure in channel (1) acts through the nozzle hole in the longitudinal axis of the main gate valve also on its side loaded by the spring and through another nozzle hole in the switching stage to the control valve ball. As soon as this pressure exceeds a preset value of the spring force the ball is lifted from its seat and the control oil flows out to the storage tank. As a result of pressure difference the main gate valve is shifted against weak spring and the flow into the side channel (2) is released in this way.

The system pressure in channel (3) acting through the nozzle hole to the control gate valve prevents the control, stage from being shut off. The action of this pressure results in shifting the control gate valve in the direction against the ball of the control stage and in maintaining the ball in the lifted position from the seat. As soon as the system pressure drops to a value of 85% corresponding to the percentage to a ratio of areas of the control stage valve ball seat and the control gate valve the control stage and the main stage are shut off again and a new cycle can start.

As for appropriate basic surface finish the external parts are zinc coated.



Ordering Code

SU6A-U3/I □ □

Pilot Operated Unloading Valve

Adjustable pressure

40 - 100 bar	**10**
70 - 200 bar	**20**
150 - 350 bar	**35**

Seals

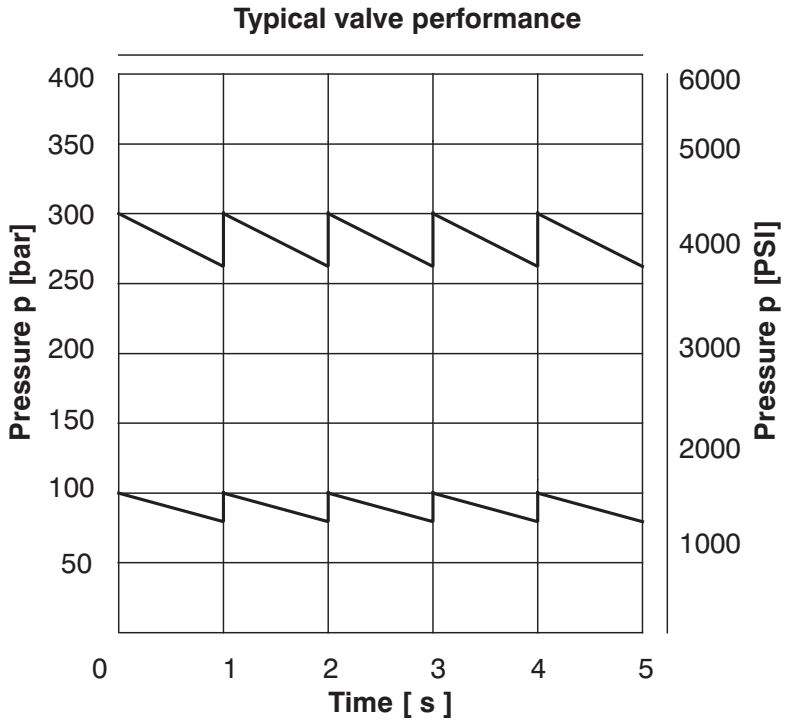
no designation	NBR

Technical Data

Cavity		1-1/8-12 UNF-2A
Maximum flow	L/min	60
Max. pressure	bar	350
Differential unload/reload	%	10 - 15
Hydraulic fluid		Hydraulic oil (HM, HV) according to DIN 51524
Fluid temperature range	°C	-20 ... +90
Viscosity	mm^2/s	20 ... 400
Maximum degree of fluid contamination		According to ISO 4406, Class 21/18/15
Weight	kg	0.46
Maximum valve tightening torque in valve body or in control block	Nm	75^{+2}
Mounting position		unrestricted

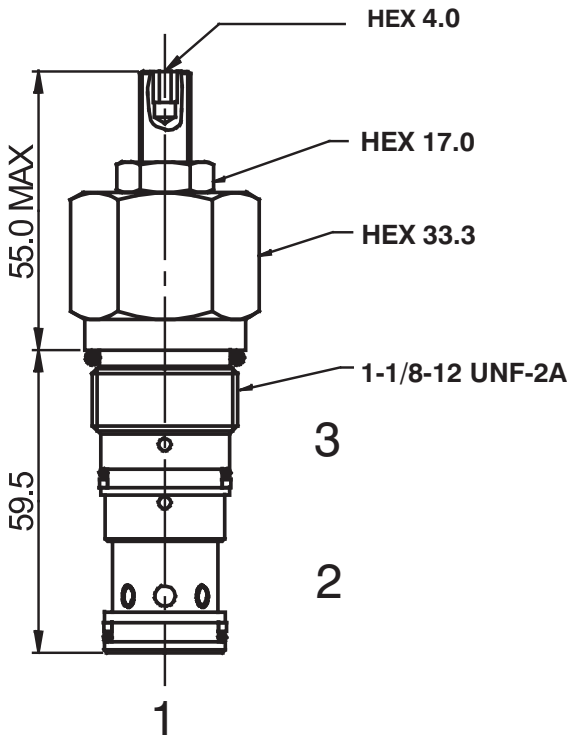
p-Q Characteristics

Measured at $\nu = 40\ mm^2/s$



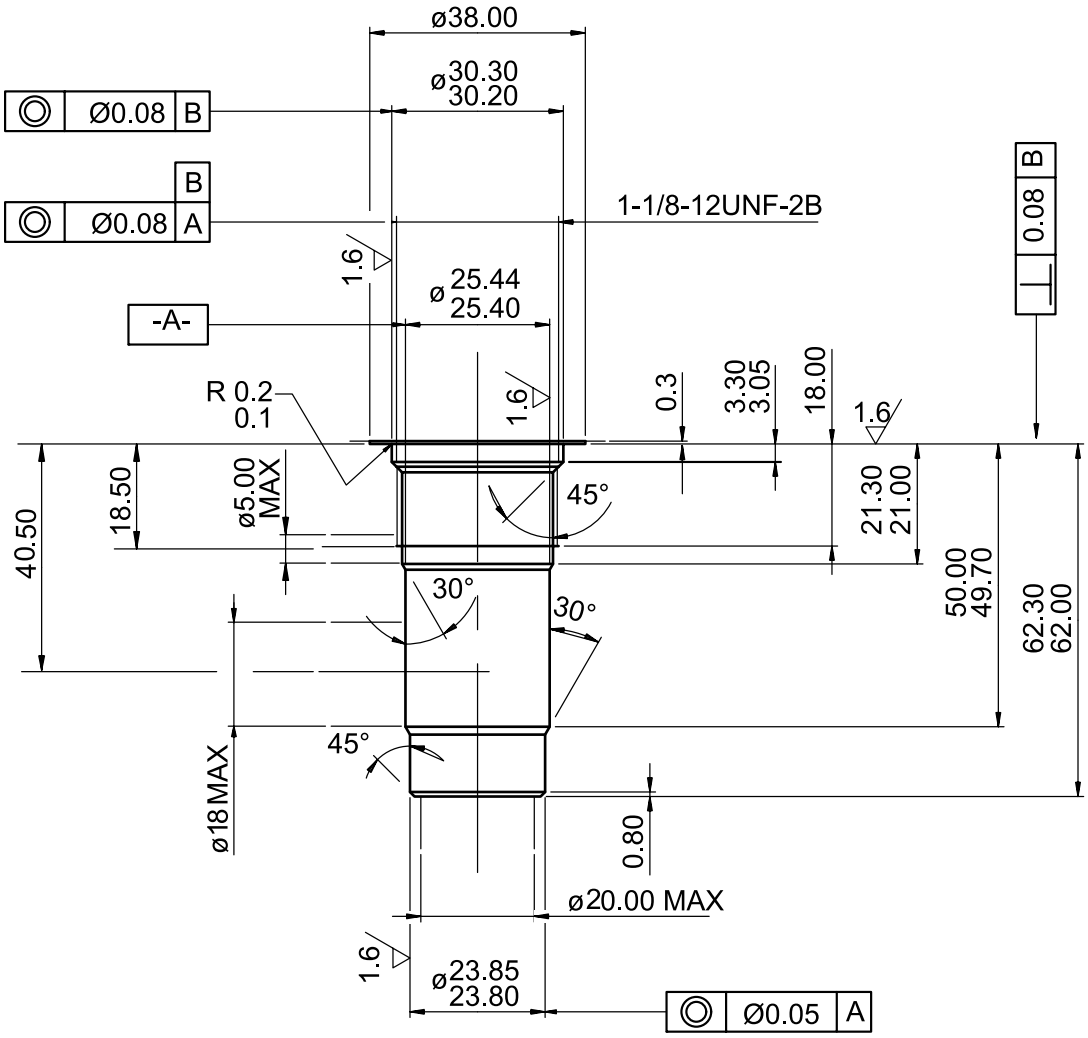
Dimensions

Measurements in millimeters



Cavity

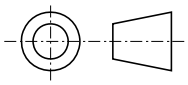
Measurements in millimeters

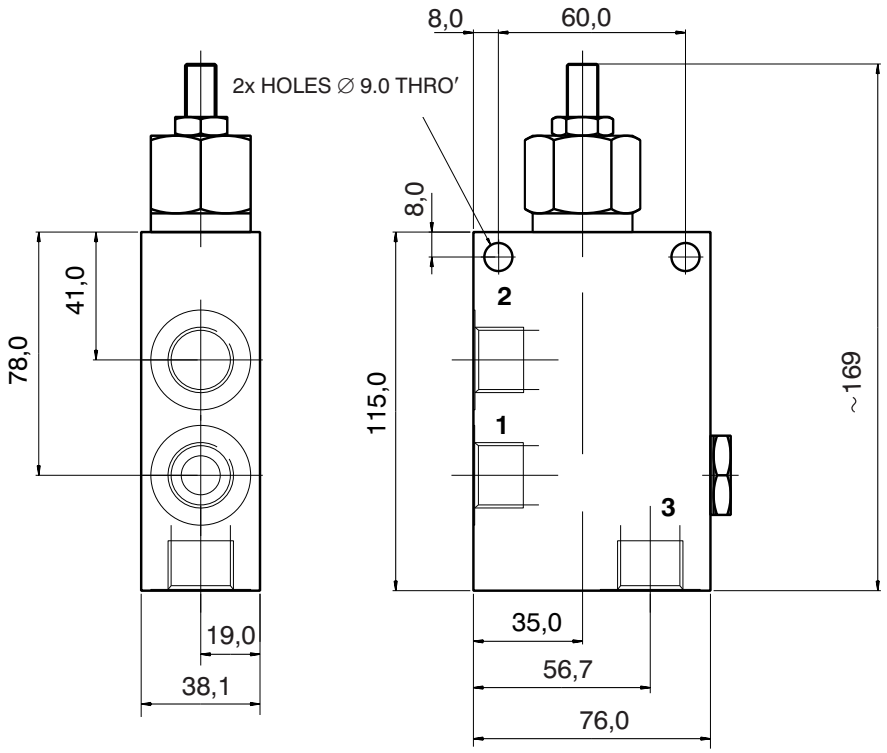


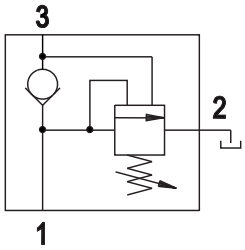
Valve Bodies

Measurements in millimeters

ISO A







Body without valve			
Material	**Ports**	**Port size**	**Type code**
Aluminium	1, 2, 3	G1/2	SB-U3-0105AL
	1, 2, 3	SAE10, 7/8-14	SB-U3-0106AL
Steel	1, 2, 3	G1/2	SB-U3-0105ST
	1, 2, 3	SAE10, 7/8-14	SB-U3-0106ST

The use of aluminium bodies is limited to a maximum operating pressure of 210 bar.

Spare Parts

Seal kits on request.

Caution!

- The packing foil is recyclable.
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ARGO HYTOS

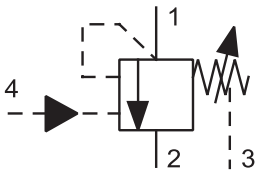
Pilot Operated Unloading Valves

SUD6A-U4/I

1-1/8-12 UNF-2A • p_{max} 350 bar • Q 60 L/min

HA 5226
7/2008

Replaces
HA 5226 9/2006



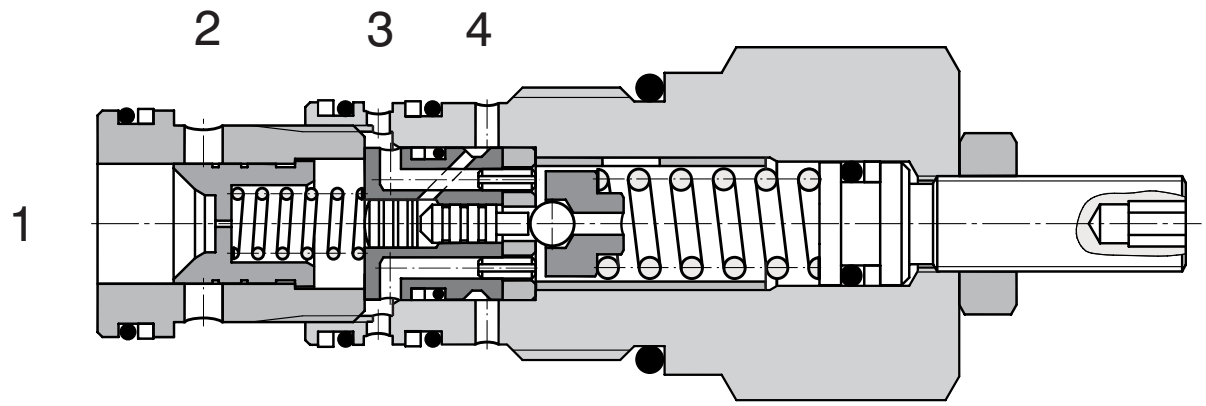
- ❑ **May be used as accumulator charging valve**
- ❑ **For unloading a high flow – low pressure pump to tank**
- ❑ **May be used as priority circuit for steering and braking circuits**
- ❑ **Unloads to secondary system**

Functional Description

The valve consists of a ball control stage with a common drain into the storage tank, a main stage with a gate valve and a switching stage consisting of a bushing and a control gate valve. It is built-in in a secondary line in view of the feeding line. At the same time connections (1) and (4) are connected to the feeding line however they are separated mutually with the use of a one-way valve. For channel (1) on the side of the pump and channel (4) on the side of the system see page No 4.
The pressure in channel (1) acts through the nozzle hole in the longitudinal axis of the main gate valve also on its side loaded by the spring and through another nozzle hole in the switching stage to the control valve ball. As soon as this pressure exceeds a preset value of the spring force the ball is lifted from its seat and the control oil flows out to the storage tank. As a result of pressure difference the main gate valve is shifted against weak spring and the flow into the side channel (2) is released in this way.

The system pressure in channel (4) acting through the nozzle hole to the control gate valve prevents the control, stage from being shut off. The action of this pressure results in shifting the control gate valve in the direction against the ball of the control stage and in maintaining the ball in the lifted position from the seat. As soon as the system pressure drops to a value of 85% corresponding to the percentage to a ratio of areas of the control stage valve ball seat and the control gate valve the control stage and the main stage are shut off again and a new cycle can start.

As for appropriate basic surface finish the external parts are zinc coated.



Ordering Code

SUD6A-U4/I □ □

Pilot Operated Unloading Valve

Adjustable pressure

40 - 100 bar	**10**
70 - 200 bar	**20**
150 - 350 bar	**35**

Seals

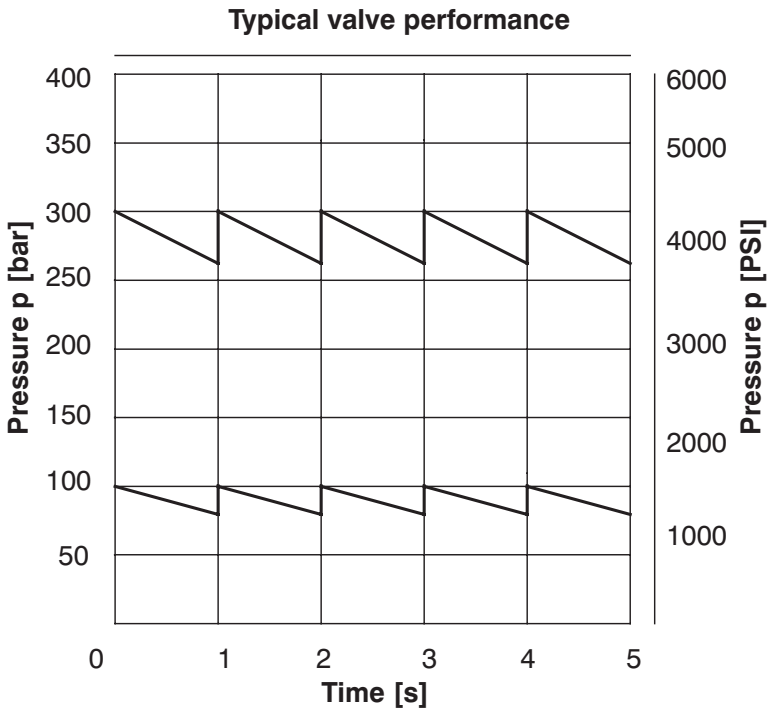
no designation	NBR

Technical Data

Cavity		1-1/8-12 UNF-2A
Maximum flow	L/min	60
Max. pressure	bar	350
Differential unload/reload	%	10 - 15
Hydraulic fluid		Hydraulic oil (HM, HV) according to DIN 51524
Fluid temperature range	°C	-20 ... +90
Viscosity	mm^2/s	20 ... 400
Maximum degree of fluid contamination		According to ISO 4406 (1999), Class 21/18/15
Weight	kg	0.46
Maximum valve tightening torque in valve body or in control block	Nm	75^{+2}
Mounting position		unrestricted

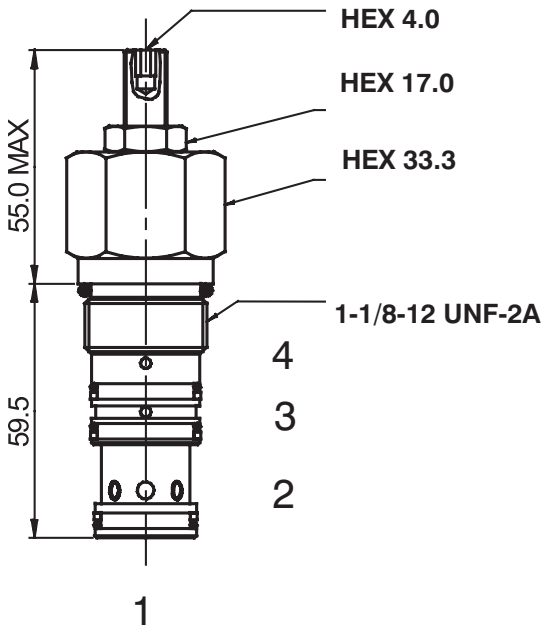
p-Q Characteristics

Measured at $\nu = 40\ mm^2/s$



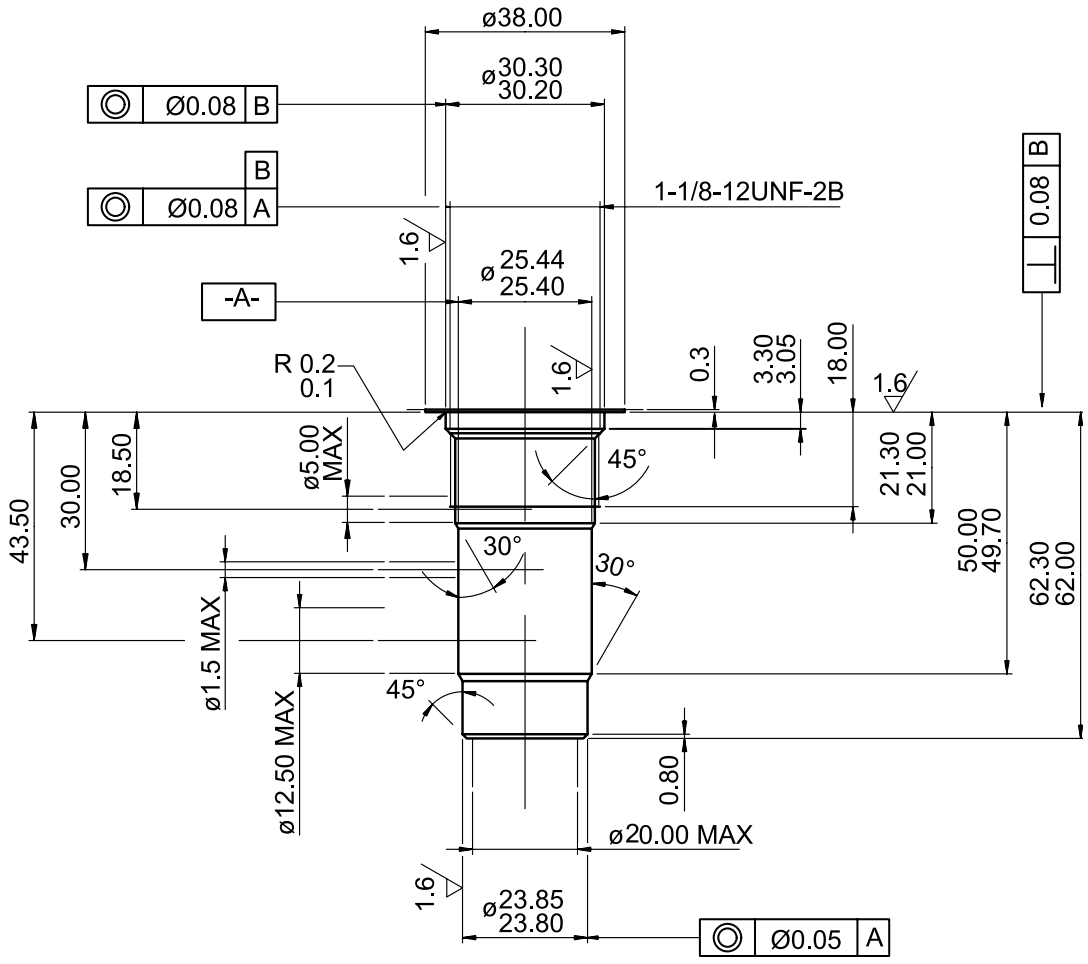
Dimensions

Measurements in millimeters



Cavity

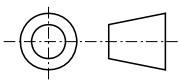
Measurements in millimeters

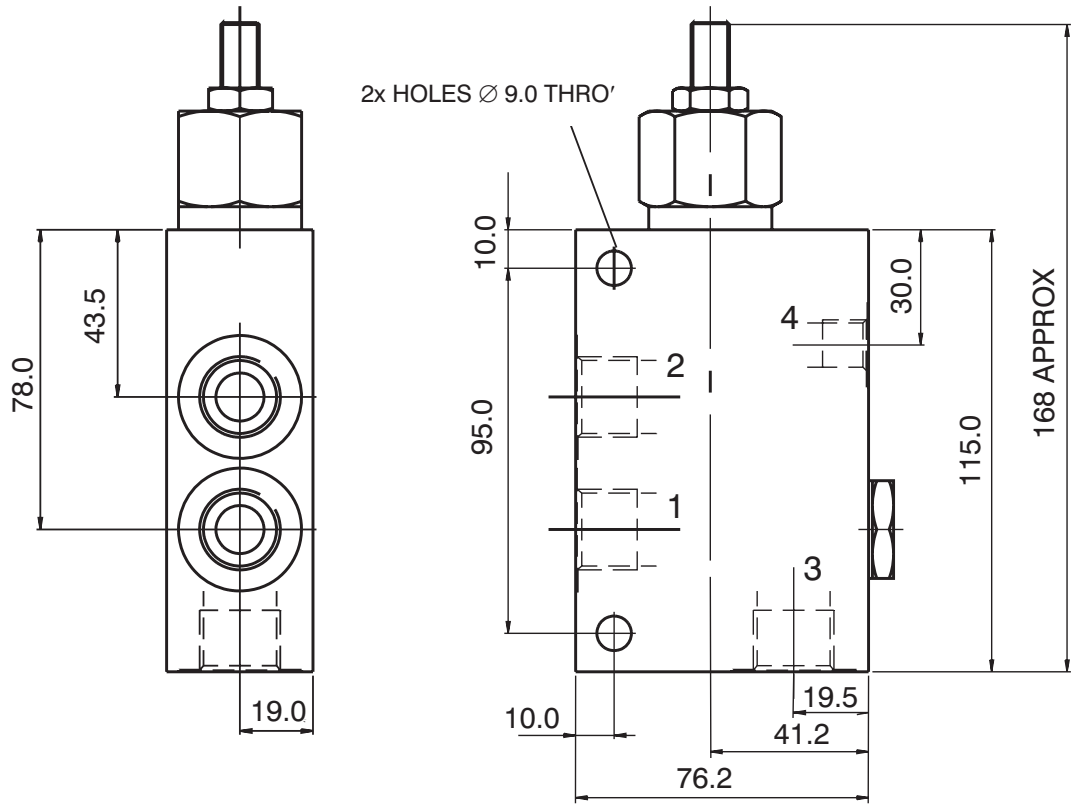


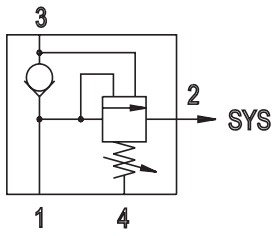
Valve Bodies

Measurements in millimeters

ISO A







Body without valve			
Material	**Ports**	**Port size**	**Type code**
Aluminium	1, 2, 3	G1/2	SB-U4-0105AL
	4	G1/4	
	1, 2, 3	SAE 10, 7/8-14	SB-U4-0106AL
	4	SAE 6, 3/4-16	
Steel	1, 2, 3	G1/2	SB-U4-0105ST
	4	G1/4	
	1, 2, 3	SAE 10, 7/8-14	SB-U4-0106ST
	4	SAE 6, 3/4-16	

The use of aluminium bodies is limited to a maximum operating pressure of 210 bar.

Spare Parts

Seal kits on request.

Caution!

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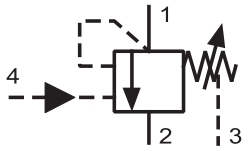
Pilot Operated Priority
Unloading Valves

SUD6A-V4/I

1-5/16-12 UNS • p_{max} 350 bar • Q 200 L/min

HA 5225
7/2008

Replaces
HA 5225 9/2006



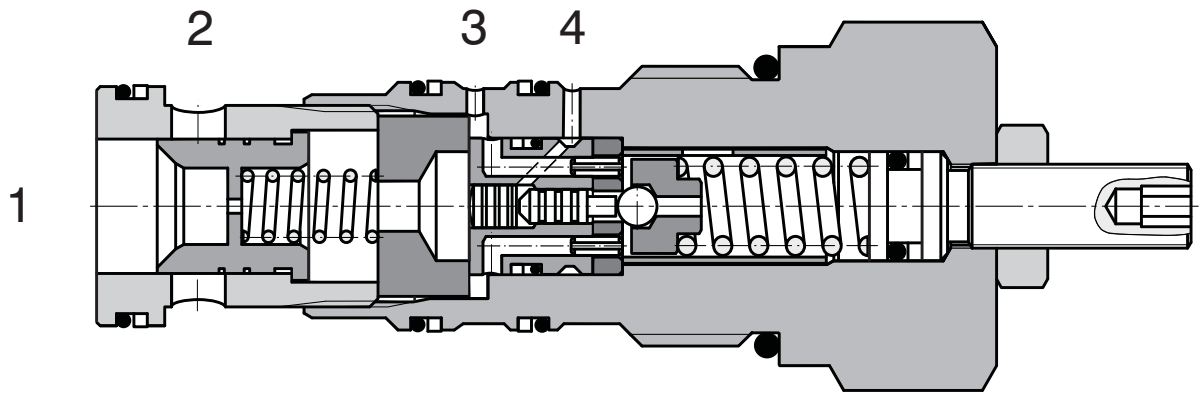
- **May be used as accumulator charging valve**
- **For unloading a high flow – low pressure pump to tank.**

Functional Description

The valve consists of a ball control stage with a common drain into the storage tank, a main stage with a gate valve and a switching stage consisting of a bushing and a control gate valve. It is built-in in a secondary line in view of the feeding line. At the same time connections (1) and (4) are connected to the feeding line however they are separated mutually with the use of a one-way valve. For channel (1) on the side of the pump and channel (4) on the side of the system see page No 4.
The pressure in channel (1) acts through the nozzle hole in the longitudinal axis of the main gate valve also on its side loaded by the spring and through another nozzle hole in the switching stage to the control valve ball. As soon as this pressure exceeds a preset value of the spring force the ball is lifted from its seat and the control oil flows out to the storage tank. As a result of pressure difference the main gate valve is shifted against weak spring and the flow into the side channel (2) is released in this way.

The system pressure in channel (4) acting through the nozzle hole to the control gate valve prevents the control, stage from being shut off. The action of this pressure results in shifting the control gate valve in the direction against the ball of the control stage and in maintaining the ball in the lifted position from the seat. As soon as the system pressure drops to a value of 85% corresponding to the percentage to a ratio of areas of the control stage valve ball seat and the control gate valve the control stage and the main stage are shut off again and a new cycle can start.

As for appropriate basic surface finish the external parts are zinc coated.



Ordering Code

SUD6A-V4/I □ □

Pilot Operated Priority
Unloading Valve

Adjustable pressure

30 - 200 bar	**20**
150 - 350 bar	**35**

Seals

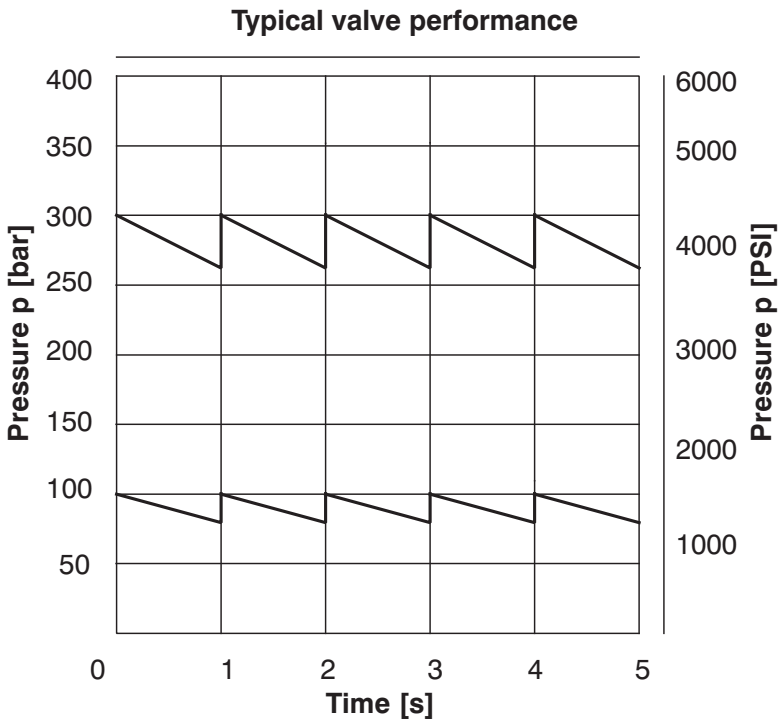
no designation	NBR

Technical Data

Cavity		1-5/16-12 UNS
Maximum flow	L/min	200
Max. pressure	bar	350
Differential unload/reload	%	10 - 15
Hydraulic fluid		Hydraulic oil (HM, HV) according to DIN 51524
Fluid temperature range	°C	-20 ... +90
Viscosity	mm^2/s	20 ... 400
Maximum degree of fluid contamination		According to ISO 4406 (1999), Class 21/18/15
Weight	kg	0.74
Maximum valve tightening torque in valve body or in control block	Nm	100^{+2}
Mounting position		any

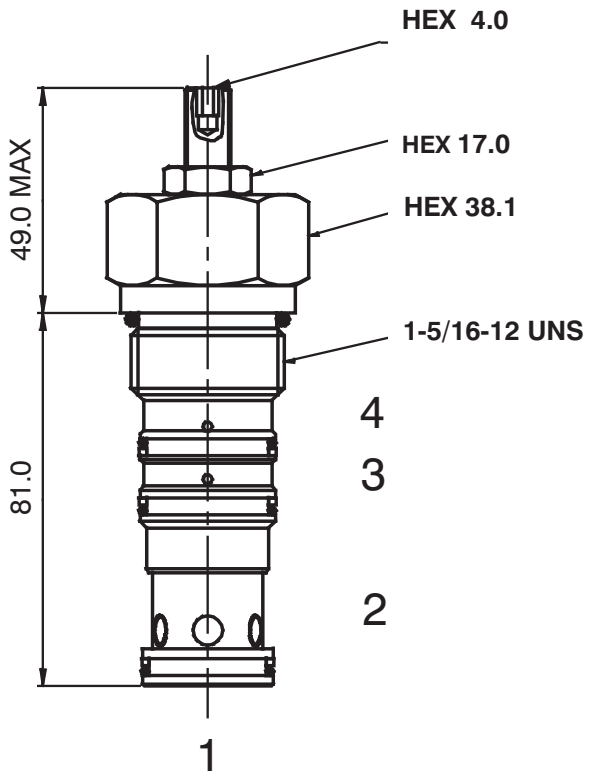
p-Q Characteristics

Measured at $\nu = 40\ mm^2/s$



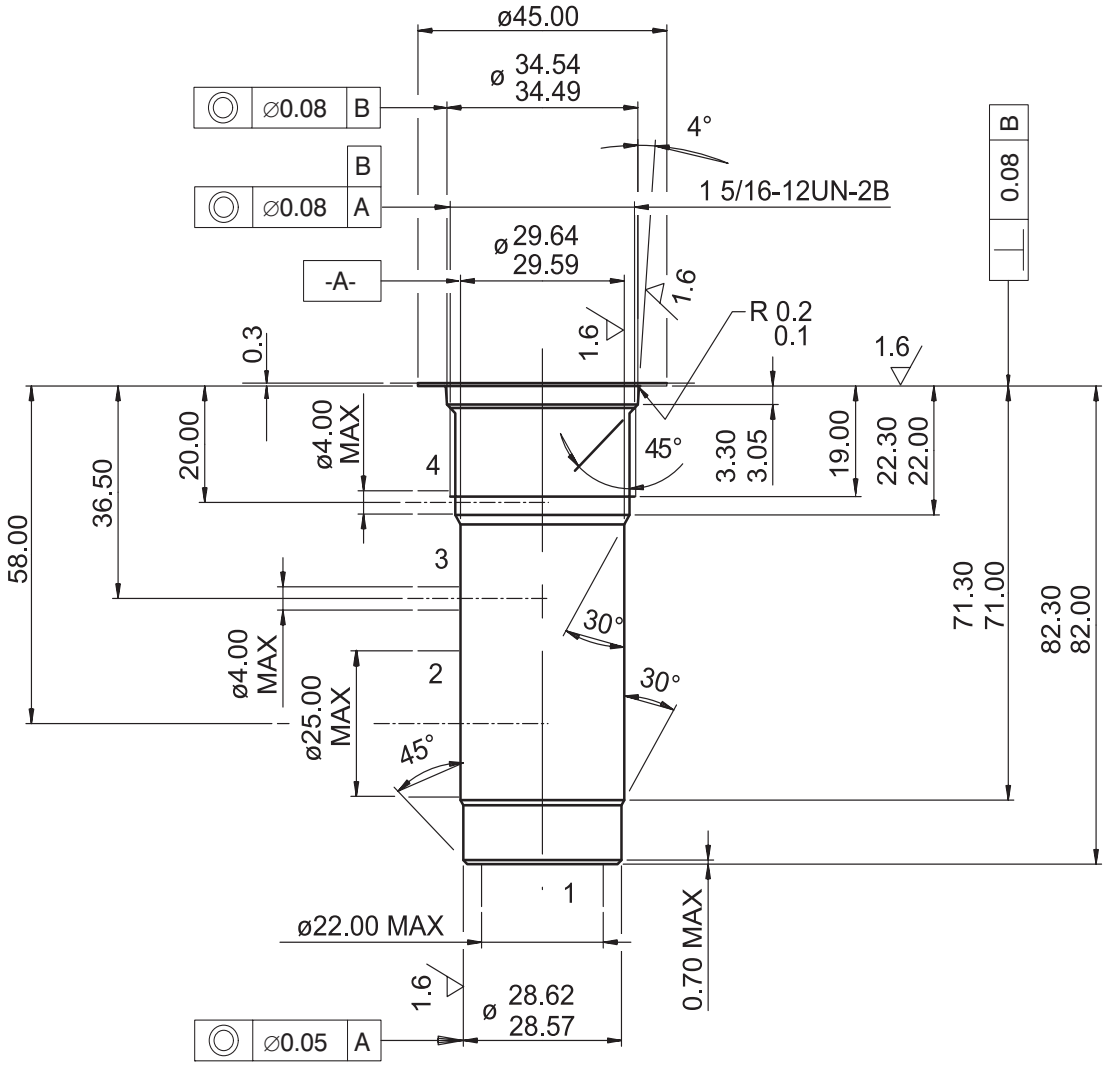
Dimensions

Measurements in millimeters



Cavity

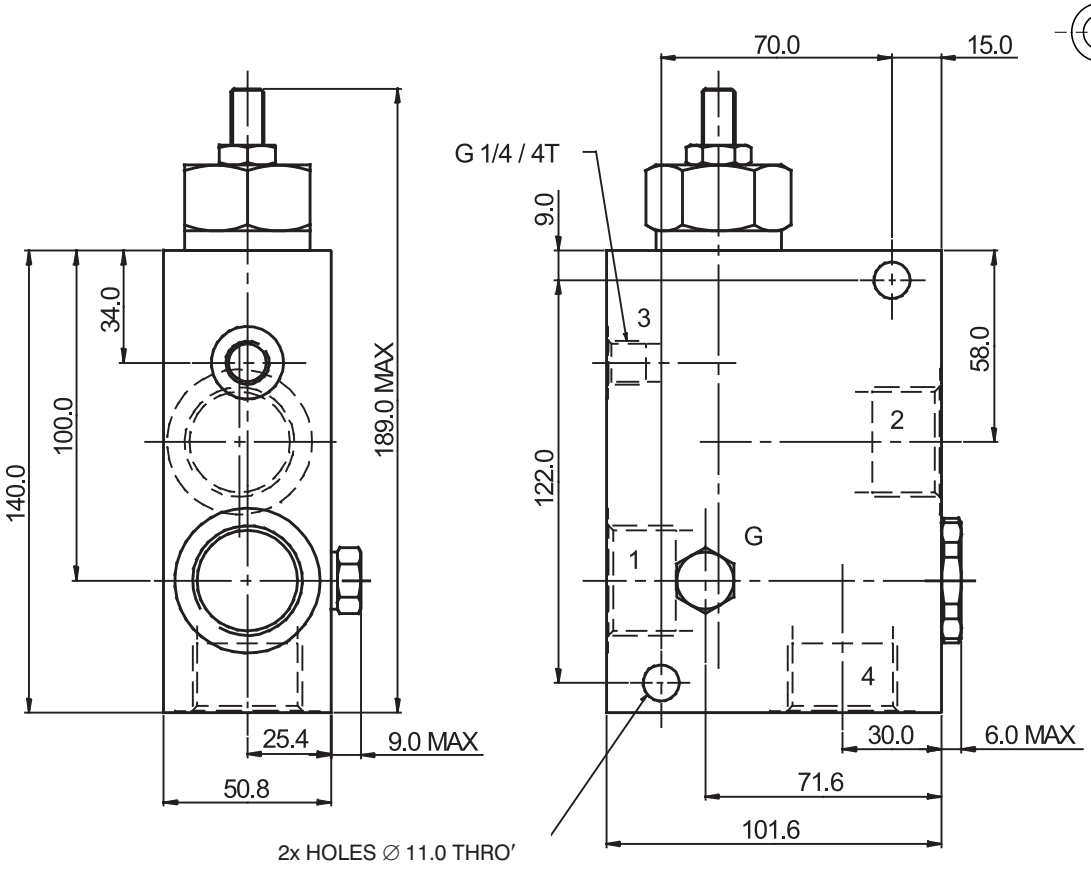
Measurements in millimeters

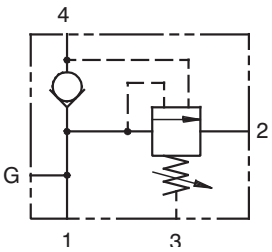


Valve Bodies

Measurements in millimeters

ISO A





Body without valve			
Material	**Ports**	**Port size**	**Type code**
Aluminium	1, 2, 4	G1	SB-V4-0109AL
	3	G1/4	
	1, 2, 4	SAE 16, 1-5/16-12	SB-V4-0110AL
	3	SAE 6, 9/16-18	
Steel	1, 2, 4	G1/2	SB-V4-0109ST
	3	G1/4	
	1, 2, 4	SAE 16, 1-5/16-12	SB-V4-0110ST
	3	SAE 6, 9/16-18	

The use of aluminium bodies is limited to a maximum operating pressure of 210 bar.

Spare Parts

Seal kits on request.

Caution!

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