



### Functional description

Models DR are pilot operated pressure reducing valves. They "reduce" pressure in a branch circuit lower than that of the main circuit.

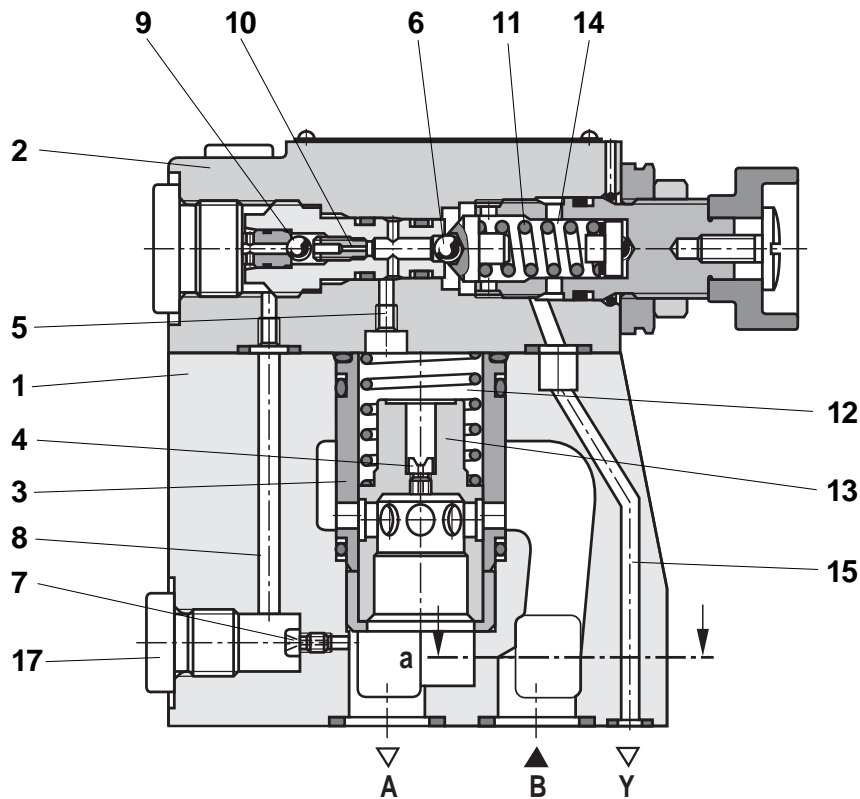
This valve design is capable of maintaining a precise pressure setting even at high flows, since the pilot signal is supplied from the secondary side, (via orifices 4 and 7). These reducing valves consist of main housing (1) pilot valve (2) and main cartridge assembly (3).

The reducing valve is "normally open" permitting flow from port "B" to "A" through main spool (13). Until the pressure setting of the pilot section (2) is reached, system pressure is maintained above the main spool (13) via passageways (8), (5) and orifice (4). The main spool is hydraulically balanced and the spring in chamber (12)

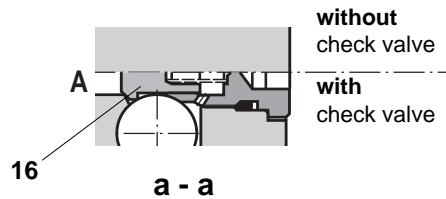
holds main spool (13) open. When pressure increases beyond the set value of spring (11), pilot ball (6) opens, allowing orifices (4), (7) and (10) to maintain flow over pilot ball (6). When pressure in the branch circuit, (pressure at port "A"), exceeds the set value of spring (11) plus the spring force in chamber (12), main spool (13) begins to close thereby orificing flow of fluid to port "A". Main spool (13) then modulates to maintain the set pressure at port "A".

Pilot valve spring chamber (14) must be drained externally via passage (15), or port "Y" in pilot valve (2).

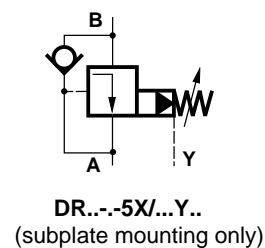
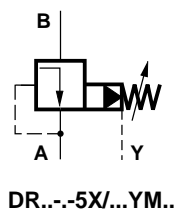
An optional reverse free flow check valve (16) is available if required.



Model DR..-4-5X/...Y...



### Symbols



**Technical data** (For applications outside these parameters, please consult us!)**General**

Mounting position		Optional				
Weight (approx.) – Subplate mounted	Valve size	10	15	20	25	30
	DR lbs (kg)	7.5 (3.4)	–	11.7 (5.3)	–	17.7 (8.0)
	DRC lbs (kg)	2.7 (1.2)				
– Threaded connections	DRC 30 lbs (kg)	3.3 (1.5)				
	DR..G.. lbs (kg)	11.7 (5.3)	11.5 (5.2)	11.3 (5.1)	11.0 (5.0)	10.6 (4.8)

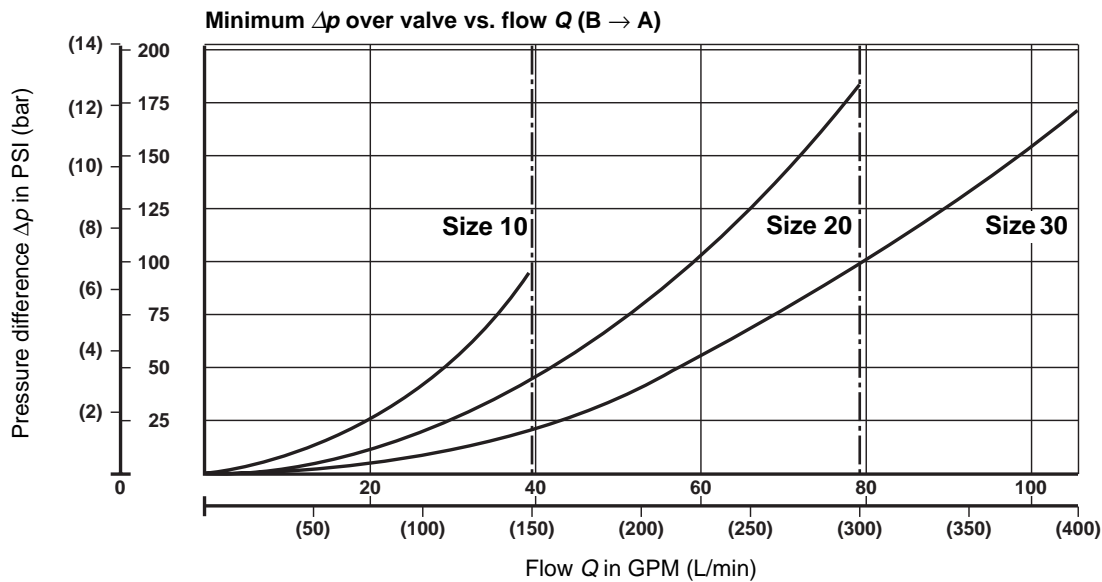
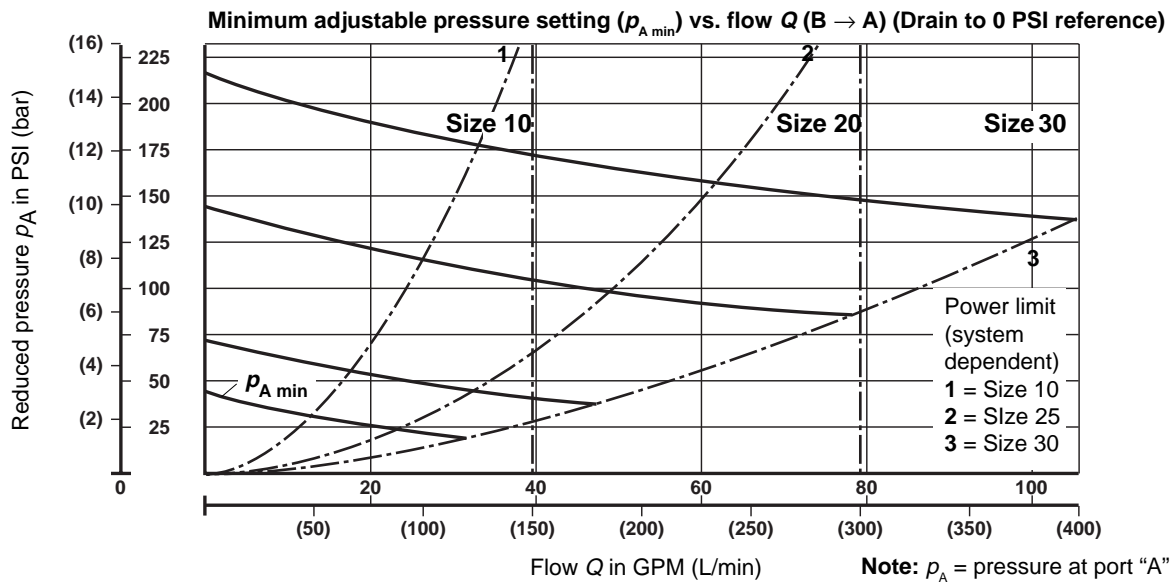
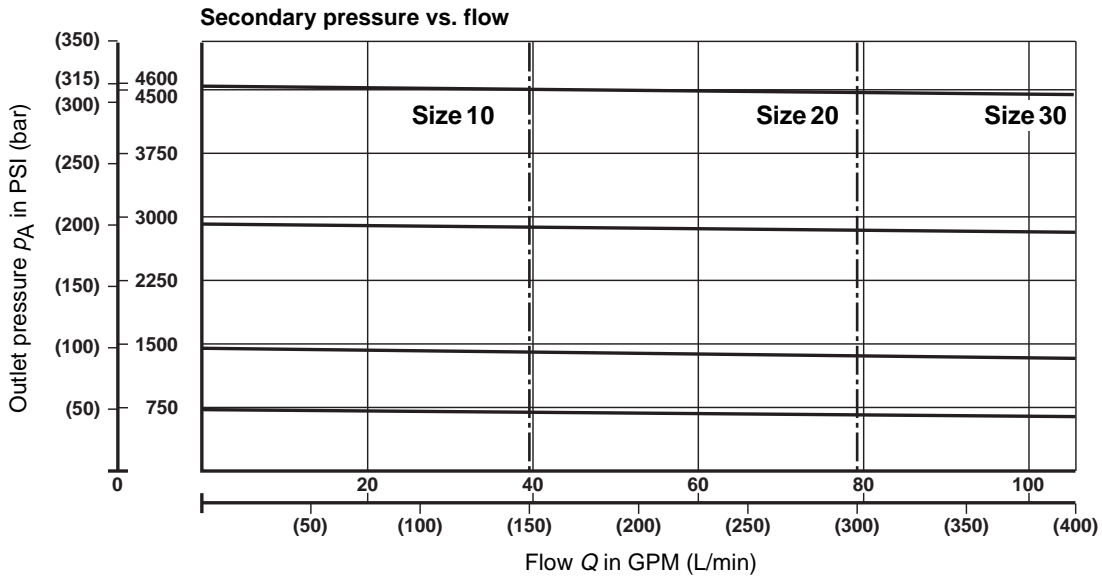
**hydraulic**

Inlet pressure, port B	PSI (bar)	... 4600 (315) *				
Outlet pressure, port A	PSI (bar)	145 ... 4600 PSI (315) *				
Backpressure, port Y	PSI (bar)	... 4600 (315) *				
Setting pressure	minimum PSI (bar)	Q-related, see operating curves page 4				
	maximum PSI (bar)	... 725 (50), ... 1450 (100), ... 2900 (200), ... 4600 (315), ... 5000 (350) *				
Maximum flow – Subplate mounting – Threaded connections	Valve size	10	15	20	25	30
	GPM (L/min)	39.6 (150)	–	79.2 (300)	–	105.7 (400)
	GPM (L/min)	39.6 (150)	79.2 (300)	79.2 (300)	105.7 (400)	105.7 (400)
Hydraulic fluid		Petroleum oils (HM, HL, HLP); Phosphate ester fluids(HFD-R)				
Fluid temperature range	°F (°C)	NBR seals; – 22 ... 176 (– 30 ... 80)				
		FPM seals; – 4 ... 176 (– 20 ... 80)				
Viscosity range	SUS (mm <sup>2</sup> /s)	60 ... 3710 (10 ... 800)				
Maximum degree of fluid contamination		Class 18/15 according so ISO 4406. Therefore, we recommend a filter with a retention rate of $\beta_{10} \geq 75$ .				

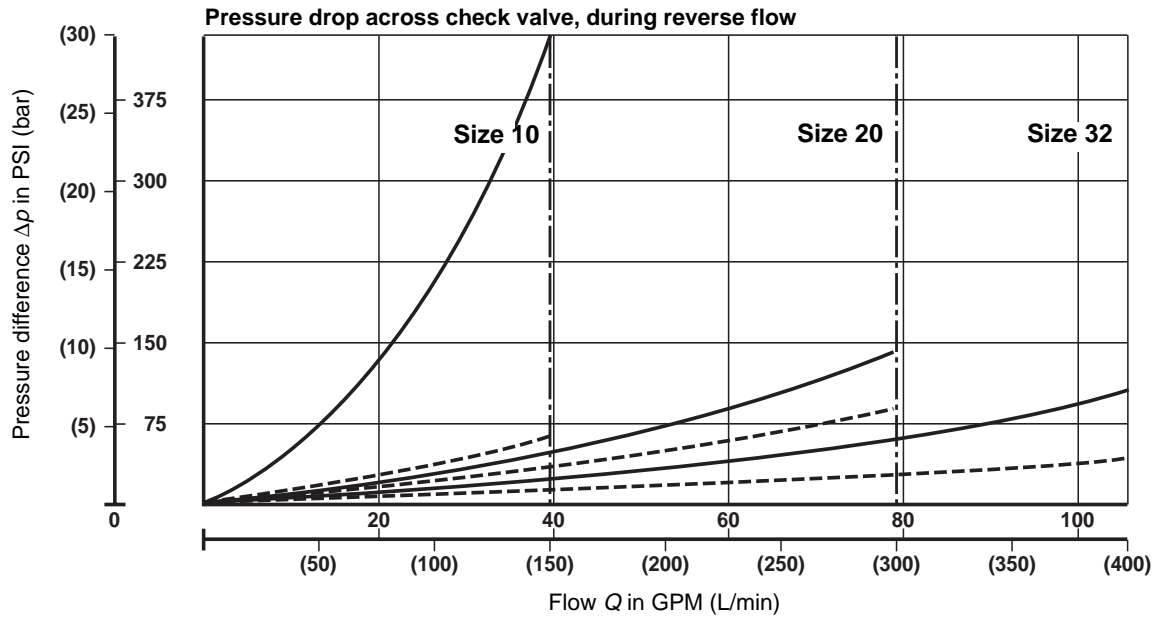
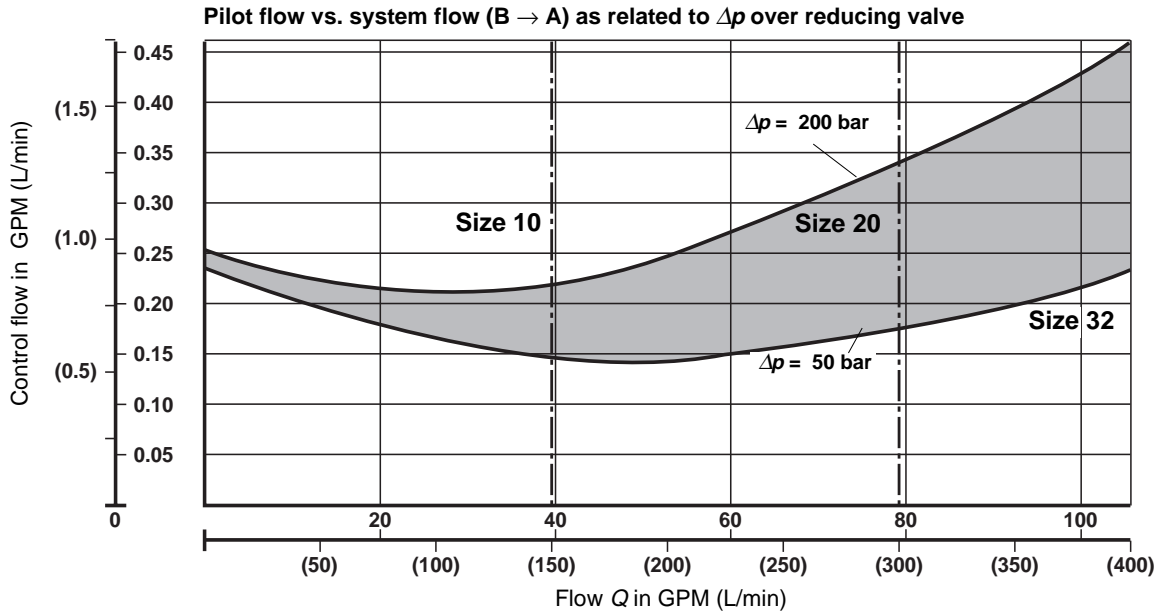
\* ... 5000 PSI (350), only in model without check valve



**Performance Curves, measured at  $v = 190$  SUS ( $41 \text{ mm}^2/\text{s}$ ) and  $t = 122 \text{ }^\circ\text{F}$  ( $50 \text{ }^\circ\text{C}$ )**

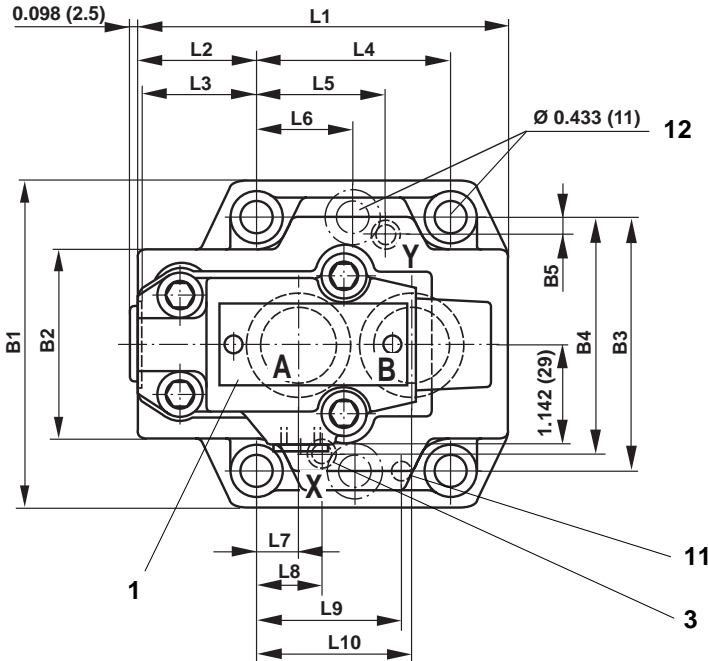


**Performance Curves**, measured at  $v = 190 \text{ SUS}$  ( $41 \text{ mm}^2/\text{s}$ ) and  $t = 122 \text{ }^\circ\text{F}$  ( $50 \text{ }^\circ\text{C}$ )



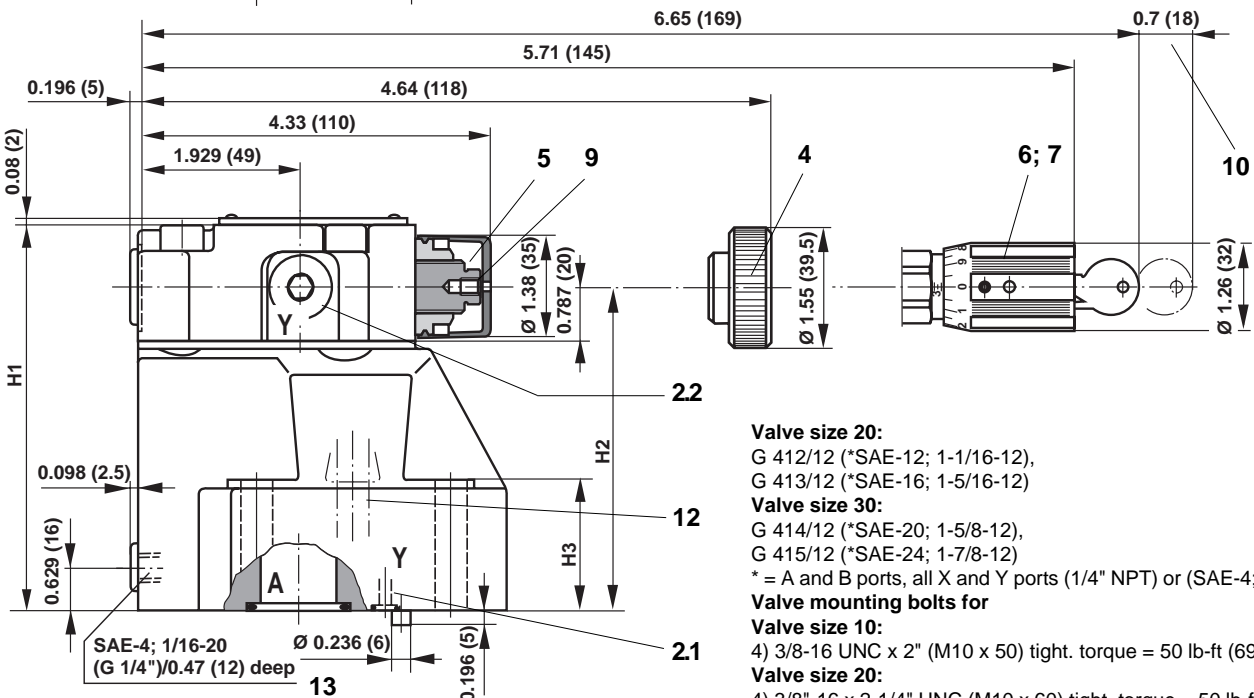
- $\Delta p$  over reverse flow check with main cartridge closed
- - -  $\Delta p$  over reverse flow check with main cartridge fully open

**Unit dimensions, Pressure reducing valve, subplate mounted: dimensions in inches (millimeters)**



- 1 Name plate
- 2.1 Port Y for external drain
- 2.2 Port Y optional for external drain  
SAE-4; 7/16-20 (G 1/4" / 0.47 (12) deep
- 3 Port X for external pilot, (non functional)
- 4 Adjustment mechanism "4"
- 5 Adjustment mechanism "5"
- 6 Adjustment mechanism "6"
- 7 Adjustment mechanism "7"
- 9 Adjustment nut 10 mm A/F
- 10 Space required to remove key
- 11 Locating pin
- 12 4) valve mounting holes for DR 10 and 20  
6) valve mounting holes for DR 30
- 13 Optional pressure gauge connection

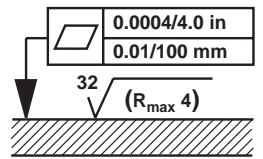
**DRC, DRC 30 mounting**  
**Subplate** (see RA 45 064)  
 G 51/05 (1/4" NPT)  
 G 51/12 (SAE-4; 7/16-20)  
**Mounting bolts:**  
 4) 5/16-18 UNC x 1 1/2" (M8 x 40) socket head cap screw (SAE grade 8 or better) tightening torque 27 lb-ft (37 Nm). Subplate and valve mounting bolts must be ordered separately. Porting pattern to ISO 6264-08 or 10, NFPA/ANSI P 08 or P 10  
**Subplate for,**  
**Valve size 10:**  
 G 460/05 (\*3/8" NPT), G 460/12 (\*SAE-6; 9/16-18), G 461/05 (\*1/2" NPT), G 461/12 (\*SAE-8; 3/4-16)



**Valve size 20:**  
 G 412/12 (\*SAE-12; 1-1/16-12),  
 G 413/12 (\*SAE-16; 1-5/16-12)  
**Valve size 30:**  
 G 414/12 (\*SAE-20; 1-5/8-12),  
 G 415/12 (\*SAE-24; 1-7/8-12)  
 \* = A and B ports, all X and Y ports (1/4" NPT) or (SAE-4; 7/16-20)  
**Valve mounting bolts for**  
**Valve size 10:**  
 4) 3/8-16 UNC x 2" (M10 x 50) tight. torque = 50 lb-ft (69 Nm)  
**Valve size 20:**  
 4) 3/8"-16 x 2-1/4" UNC (M10 x 60) tight. torque = 50 lb-ft (69 Nm)  
**Valve size 30:**  
 6) 3/8"-16 x 2-3/4" UNC (M10 x 70) tight. torque = 50 lb-ft (69 Nm)  
 Socket head cap screws SAE grade 8 or better subplates and valve mounting bolts must be ordered separately, see RA 45 062

Note: A/F = across flats

Required surface finish of interface when mounting the valve without our subplate

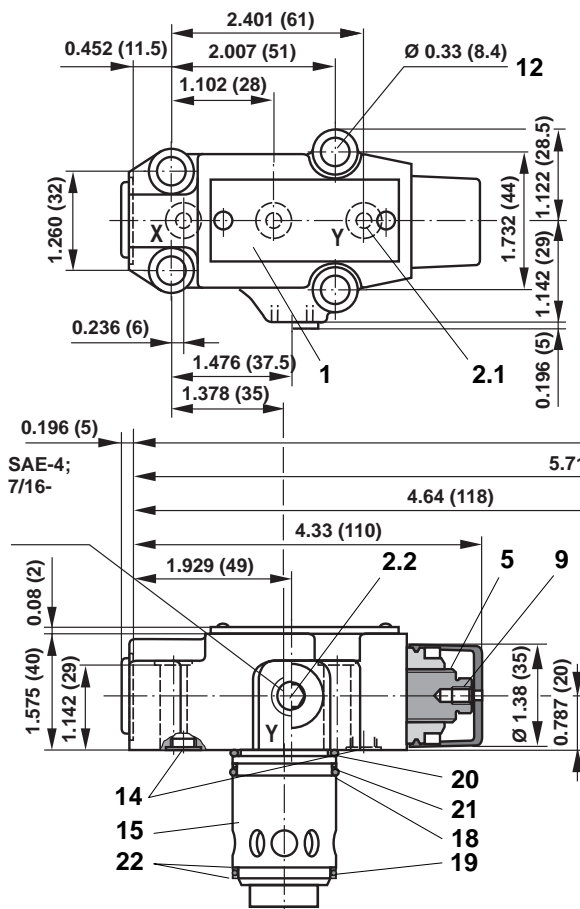


Model	L1	L2	L3	L4	L5	L6	L7	L8
DR 10	3.779 (96)	1.397 (35.5)	1.299 (33)	1.689 (42.9)	0.846 (21.5)	-	0.283 (7.2)	0.846 (21.5)
DR 20	4.567 (116)	1.476 (37.5)	1.394 (35.4)	2.374 (60.3)	1.563 (39.7)	-	0.437 (11.1)	0.811 (20.6)
DR 30	5.708 (145)	1.299 (33)	1.173 (29.8)	3.315 (84.2)	2.342 (59.5)	1.657 (42.1)	0.657 (16.7)	0.968 (24.6)

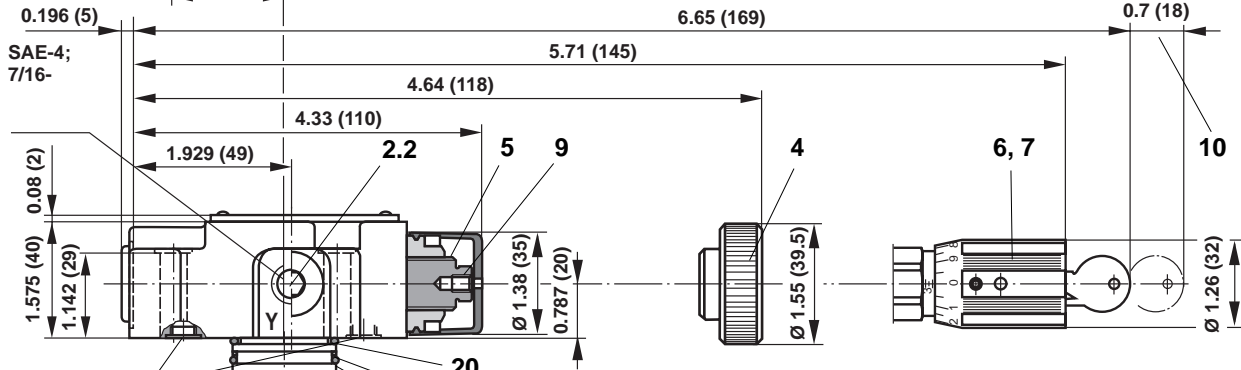
Model	L9	L10	B1	B2	B3	B4	B5	H1	H2	H3	O-ring Ports A, B	O-ring Ports X, Y
DR 10	1.252 (31.8)	1.409 (35.8)	3.346 (85)	1.968 (50)	2.626 (66.7)	2.315 (58.8)	0.311 (7.9)	4.409 (112)	3.622 (92)	1.102 (28)	17.12 mm x 2.62 mm	9.25 mm x 1.78 mm
DR 20	1.752 (44.5)	1.937 (49.2)	4.016 (102)	2.342 (59.5)	3.126 (79.4)	2.874 (73)	0.252 (6.4)	4.803 (122)	4.016 (102)	1.496 (38)	28.17 mm x 3.53 mm	9.25 mm x 1.78 mm
DR 30	2.468 (62.7)	2.657 (67.5)	4.724 (120)	2.992 (76)	3.811 (96.8)	3.653 (92.8)	0.150 (3.8)	5.118 (130)	4.33 (110)	1.811 (46)	34.52 mm x 3.53 mm	9.25 mm x 1.78 mm



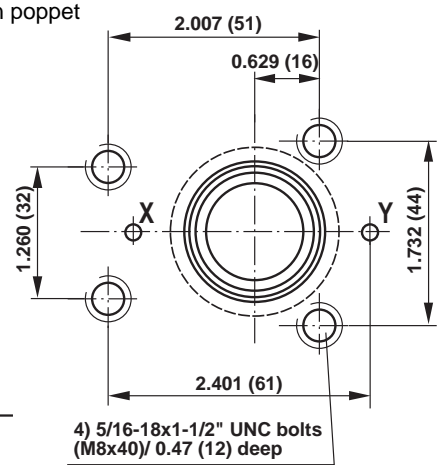
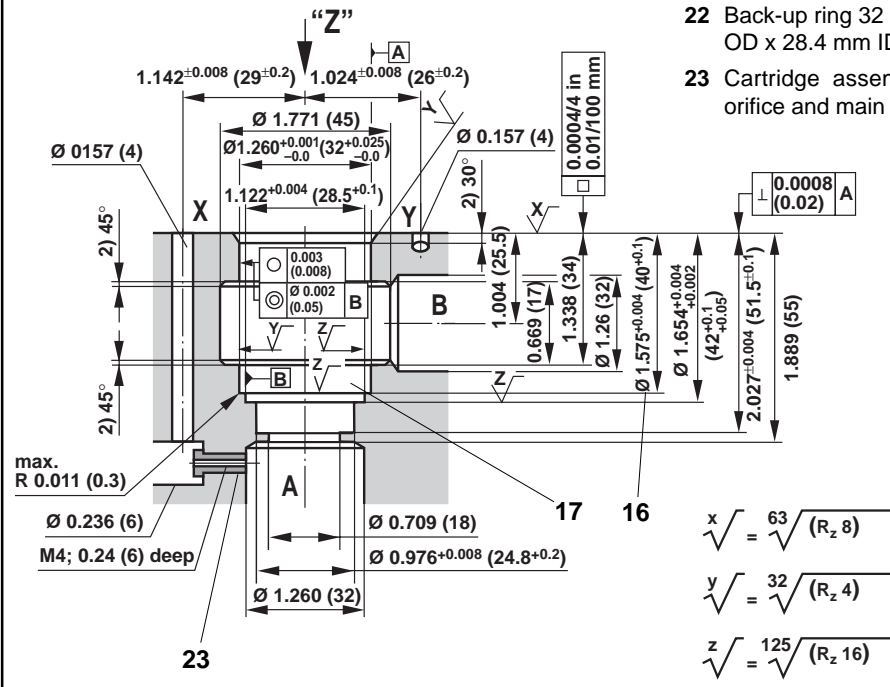
**Unit dimensions, Pressure relief valve, manifold mounting pilot valve with (DBC 30) or without (DBC) cartridge assembly: dimensions in inches (millimeters)**



- 1 Name plate
  - 2.1 Port Y for external drain
  - 2.2 Port Y optional for external drain
  - 4 Adjustment mechanism "4"
  - 5 Adjustment mechanism "5"
  - 6 Adjustment mechanism "6"
  - 7 Adjustment mechanism "7"
  - 9 Adjustment nut 10 mm A/F
  - 10 Space required to remove key
  - 12 Valve mounting hole
  - 14 O-ring 9.25 mm x 1.78 mm  
R-ring 9.81 mm x 1.5 mm x 1.78 mm
  - 15 Main cartridge assembly
  - 16 Drilling **B** can connect to drilling **A** at any position. However, care must be taken not to damage port "X" or the valve mounting holes.
  - 17 Insert back-up ring and O-ring before installing cartridge
- Note: A/F = across flats



- 18 O-ring 28.3 mm x 1.78 mm\*
  - 19 O-ring 27.3 mm x 2.4 mm\*
  - 20 O-ring 28.24 mm x 2.62 mm\*
  - 21 Back-up ring 8-024  
29.03 mm x 1.35 mm
  - 22 Back-up ring 32 mm  
OD x 28.4 mm ID x 0.7 mm
  - 23 Cartridge assembly includes orifice and main poppet
- 4) mounting bolts must be ordered separately and torqued to 27.3 lb-ft (37 Nm)  
\* = included



**View "Z"**

$$x \sqrt{\quad} = 63 \sqrt{(R_z 8)}$$

$$y \sqrt{\quad} = 32 \sqrt{(R_z 4)}$$

$$z \sqrt{\quad} = 125 \sqrt{(R_z 16)}$$



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