



FD...type Balanced Valve

FD...2XJ....type

Sizes 12, 16, 25, 32
Max. Working Pressure: 315 bar
Max. Flow: 560 L/min



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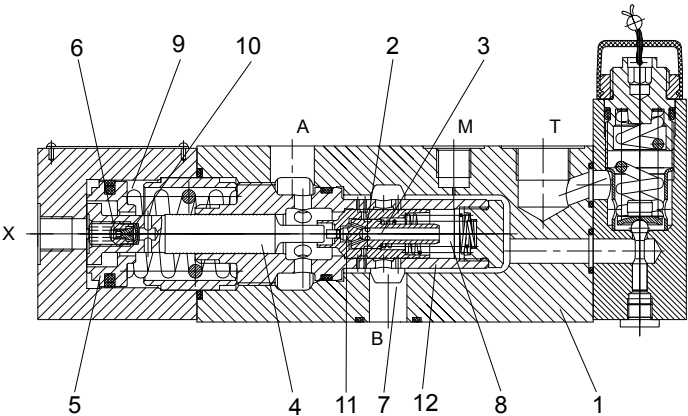
Features

- Installation in manifolds (cartridge valve)
- With SAE flange ports
- Sub-plate connection or block, porting pattern to DIN 24340 form D, ISO 5781 and CETOP-RP121 H
- Check valve pilot operated (leakage-free)
- The check-Q-meter controls the returning flow QV2 in relation to the flow Qv1 in the inlet port of actuator. For the application in cylinders system, the area ratio ($QV2 = QV1 \Phi$) has to be taken into account
- Bypass valve, free flow in opposite direction
- Safety valve, optional

Function and configuration

FD type valve is used to prevent runaway of hydraulic cylinder and motor in hydraulic system. It can also prevent pipe bursting.

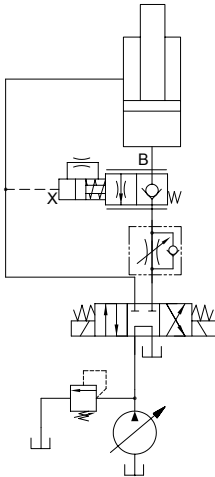
The valve consists of the housing (1), main poppet (2), pilot part (3), steel ball(11), pilot spool (4), spring seat (5) and damping (6). When load is lifted, fluid flows from A to B, the main spool (2) is opened. If pipe is cracked caused by the system, main spool (2) closes immediately as chamber (8) is connected with load pressure.



Circuit examples

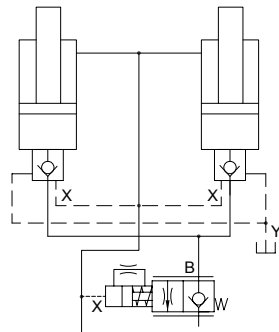
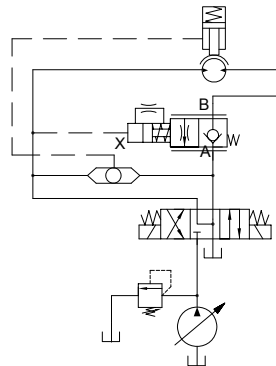
• Cylinder with single rod

On safety grounds, a closed in-between position directional valve should always be used!



• Hydraulic motor

To make sure that brake can be operated, both of the directional valve ports have to be connected to the tank in the in-between position. If the brake is externally unloaded then it is possible to use a closed in-between position directional valve.



Symbols

Without safety valve		With safety valve
Type of valve: FD12KA-2XJ/B03... FD16KA-2XJ/B03... FD25KA-2XJ/B04... FD32KA-2XJ/B06...	Type of valve: FD12PA-2XJ/B03... FD12FA-2XJ/B03... FD16PA-2XJ/B03... FD16FA-2XJ/B03... FD25PA-2XJ/B04... FD25FA-2XJ/B04... FD32PA-2XJ/B06... FD32FA-2XJ/B06...	Type of valve: FD12FB-2XJ/B03... FD12PB-2XJ/B03... FD16FB-2XJ/B03... FD16PB-2XJ/B03... FD25FB-2XJ/B04... FD32FB-2XJ/B06...

Specification

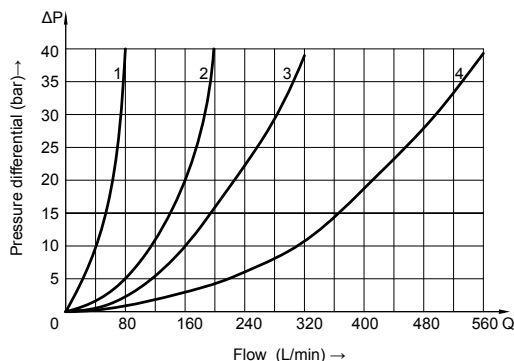
FD		10J			*
Balanced valve					Further details in clear text
Nominal size 12	= 12				No code = NBR seals
Nominal size 16	= 16				V = FKM seals
Nominal size 25	= 25				
Nominal size 32	= 32				
Cartridge valve	= KA				External connection
Sub-plate mounting	= PA				threaded connection (X, M, T)
Flange connections without safety valve	= FA				No code = Inch thread
Flange connections with safety valve	= FB				2 = Metric thread
Sub-plate with safety valve (only nominal size 12 and 16)	=PB				
Series 10J to 19J	=10J				B00 = Without orifice
(10J to 19J: unchanged installation and connection dimensions)					B03 = Orifice Ø 0.3 mm (sizes 12 and 16)
Pressure setting range of safety valve					B04 = Orifice Ø 0.4 mm (size 25)
Pressure setting up to 200 bar	=20				B06 = Orifice Ø 0.6 mm (size 32)
Pressure setting up to 300 bar	=30				(other orifice diameters on request)
Pressure setting up to 400 bar	=40				

Technical data

Operating pressure, ports A, X	bar	to 350
Operating pressure, port B	bar	to 420
Pilot pressure, port X (flow control range)	bar	min.20~60, max.350
Cracking pressure, A to B	bar	2
Setting pressure for secondary pressure relief valve	bar	to 400
Flow -rate	L/min	80(size 12),200(size 16),320(size 25),560(size 32)
Area ratio of the pre-opening	$\frac{\text{poppet seat area}}{\text{area of pilot spool}} = \frac{1}{20}$	
Fluid	Mineral oil, phosphate ester	
Fluid temperature range	°C	-20 to +80
Viscosity range	mm ² /s	10 to 800
Degree of contamination	Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15, ISO4406	

Characteristic curves (Measured at t=40°C ±5°C, using HLP46)

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Pressure differential
Pin relation to flow Q,
measured at throttle position:

Throttle fully open (Px=60bar)

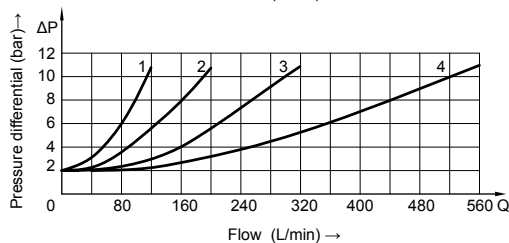
B to A

1 = size 12

2 = size 16

3 = size 25

4 = size 32

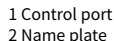


Pressure differential Pin
in relation to flow Q,
measured over the
check valve.

A to B

(Dimensions in mm)

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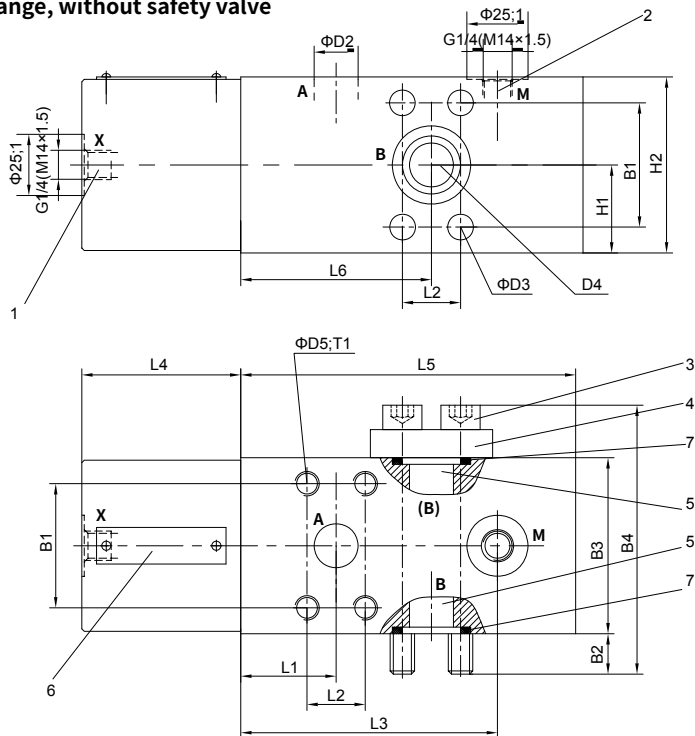
size 12: 65 Nm size 25: 110 Nm size
size 16: 65 Nm size 32: 270 Nm

Type	L6	L7	L8	L9	L10	L11	L12	valve fixing screws/Tighting torque	M _n (Nm)	Weight
FD12KA	60	3	78	128	2.3	191	65	4 pcs M10×70 GB/T70.1-10.9	69	3.5kg
FD16KA	60	3	78	128	2.3	191	65	4 pcs M10×70 GB/T70.1-10.9	69	3.5kg
FD25KA	80	4	105	182	2.3	253	75	4 pcsM12×80 GB/T70.1-10.9	120	5.6kg
FD32KA	85	4	115	198	2.3	289	94	4 pcsM16×100 GB/T70.1-10.9	295	8.0kg

Unit dimensions

(Dimensions in mm)

• SAE flange, without safety valve



SAE flange connection:

Operating pressure 420bar Flange mounting screws and blanking flange are included within the scope of supply.

- | | | | |
|------------------|------------------------|-------------------|----------|
| 1 Control port | 3 Flange fixing screws | 5 Optional port B | 7 O-ring |
| 2 Measuring port | 4 Cover | 6 Name plate | |

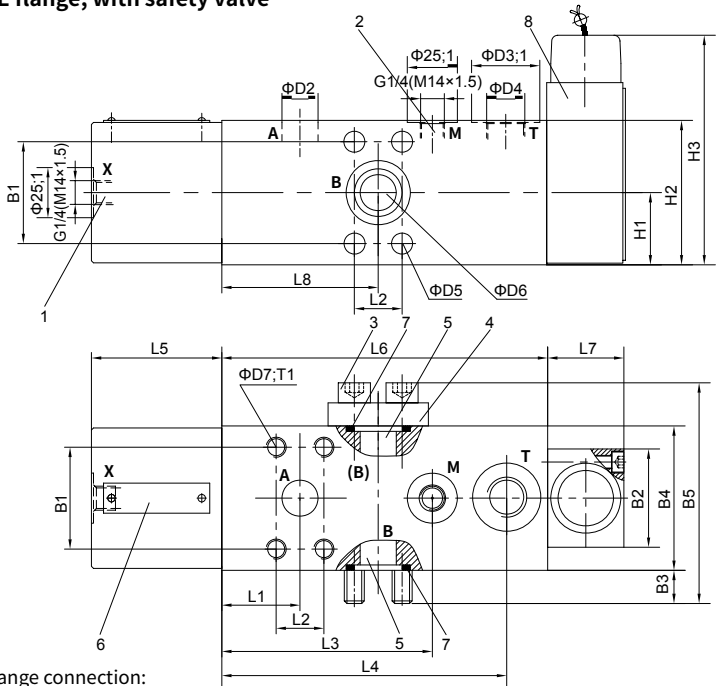
Type	B1	B2	B3	B4	D1	D2	D3	D4	D5	H1	H2	L1	L2	L3	L4
FD12FA	50.8	16.5	72	110	43	18	10.5	18	M10	36	72	39	23.8	105	65
FD16FA	50.8	16.5	72	110	43	18	10.5	18	M10	36	72	39	23.8	105	65
FD25FA	57.2	14.5	90	132	50	25	13.5	25	M12	45	90	50	27.8	148	75
FD32FA	66.7	20	105	154	56	30	15	30	M14	50	105	52	31.8	155	94

Type	L5	L6	T1	Weight	O-ring(7)	Valve fixing screws
FD12FA	140	78	15	7.2kg	25×3.5	4 pcs M10×100 GB/T70.1-10.9
FD16FA	140	78	15	7.2kg	25×3.5	4 pcs M10×100 GB/T70.1-10.9
FD25FA	200	105	18	16kg	32.92×3.53	4 pcs M12×120 GB/T70.1-10.9
FD32FA	215	115	21	23kg	37.7×3.53	4 pcs M14×140 GB/T70.1-10.9

Unit dimensions

(Dimensions in mm)

• SAE flange, with safety valve



SAE flange connection:

Operating pressure 420bar

Flange mounting screws and blanking flange are included within the scope of supply.

- 1 Control port 2 Measuring port 3 Flange fixing screws 4 Cover
5 Optional port B 6 Name plate 7 O-ring 8 Safety valve

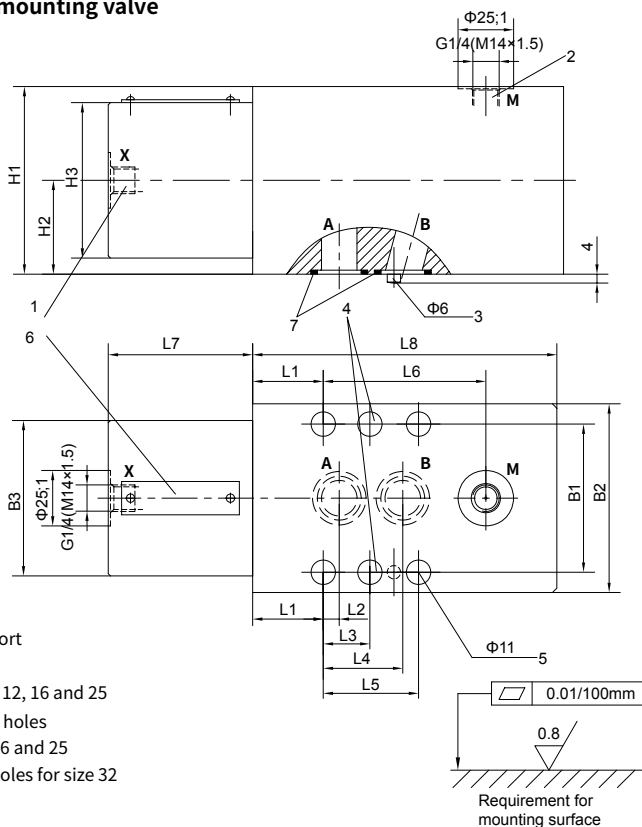
Type	B1	B2	B3	B4	B5	D1	D2	D3	D4		D5	D6	D7	H1	H2	H3	L1
									Inch	Metric							
FD12FB	50.8	49	16.5	72	110	43	18	34	G1/2	M22×1.5	10.5	18	M10	36	72	118	39
FD16FB	50.8	49	16.5	72	110	43	18	34	G1/2	M22×1.5	10.5	18	M10	36	72	118	39
FD25FB	57.2	78	14.5	90	132	50	25	42	G3/4	M27×2	13.5	25	M12	45	90	145	50
FD32FB	66.7	78	20	105	154	56	30	42	G3/4	M27×2	15	30	M14	50	105	145	52

Type	L2	L3	L4	L5	L6	L7	L8	T1	Weight	O-ring(7)	valve fixing screws
FD12FB	23.8	105	141.5	65	162	38	78	15	9kg	25×3.5	4 pcs M10×100
FD16FB	23.8	105	141.5	65	162	38	78	15	9kg	25×3.5	4 pcs M10×100
FD25FB	27.8	148	198	75	225	50	105	18	20kg	32.92×3.53	4 pcs M12×120
FD32FB	31.8	155	215	94	240	50	115	21	28kg	37.7×3.53	4 pcs M14×140

Unit dimensions

(Dimensions in mm)

• Sub-plate mounting valve



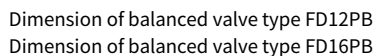
- 1 Control port
- 2 Measuring port
- 3 Locating pin
- 4 Not for sizes 12, 16 and 25
- 5 4 valve fixing holes
for sizes 12, 16 and 25
- 6 valve fixing holes for size 32
- 7 Name plate

Type	B1	B2	B3	H1	H2	H3	L1	L2	L3	L4	L5	L6
FD12PA	66.7	85	70	85	42.5	70	31.8	7.2	-	35.8	42.9	73.2
FD16PA	66.7	85	70	85	42.5	70	31.8	7.2	-	35.8	42.9	73.2
FD25PA	79.4	100	80	100	50	80	38.9	11.1	-	49.2	60.3	109.1
FD32PA	96.8	120	95	120	60	95	35.3	16.7	42.1	67.5	84.2	119.7

Type	L7	L8	Valve fixing screws/tightening torque	M _A (Nm)	Weight	O-ring(7)
FD12PA	65	140	4 pcs M10×100 GB/T70.1-10.9	75	9.3kg	21.3×2.4
FD16PA	65	140	4 pcs M10×100 GB/T70.1-10.9	75	9.3kg	21.3×2.4
FD25PA	75	200	4 pcs M10×120 GB/T70.1-10.9	75	18kg	29.82×2.62
FD32PA	94	215	6 pcs M10×140 GB/T70.1-10.9	75	28kg	38×3

(Dimensions in mm)

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Type	T1	T2	T3	Weight	Fixing screws	O-ring(7)		
FD12PB	2.7	1.9	1.4	10kg	4pcs M10×100	25×3.53	12×2	9.25×1.78
FD16PB	2.7	1.9	1.4	10kg	GB/T70.1-10.9	25×3.53	12×2	9.25×1.78

(Dimensions in mm)

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