

Two Ways Flow Control Valve

Model: 2FRM...2X



- ◆ Size 10 to 16
- ◆ Maximum working pressure 315 bar
- ◆ Maximum working flow 160 L/ min

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Features

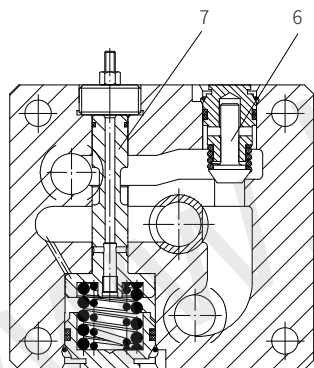
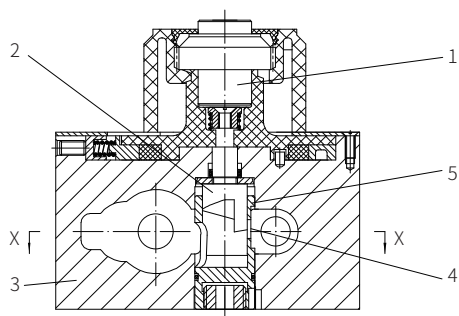
- Optional pressure compensator stroke limiter
- Start-up jump reduction
- Lockable knob
- Flow control in both direction by means of rectifier sandwich plate

Function description, sectional drawing

2FRM model flow valve is two ways flow control valve which is composed of the pressure reducing valve and the throttle valve in series.

When the oil fluid flows into the valve, it is reduced pressure through the pressure reducing valve first and then throttled by the throttle valve. The flow of the flow valve is stable and unaffected by load changing because of the pressure compensation provided from the pressure reducing valve to the throttle valve. At the same time, the orifice is designed into thin blade shape to make little influence to the flow by temperature changing. When the flow valve and check valve is connected in parallel, the oil fluid can flow back in the opposite direction.

The rectifier sandwich plate Z4S is installed under the flow valve, it can stabilize the flow in both directions of the flow valve.



X-X section

- 1 Adjusting element
- 2 Throttle rod
- 3 Valve body
- 4 Orifice
- 5 Valve sleeve
- 6 Check valve
- 7 Reducing valve

Models and specifications

Two ways flow control valve

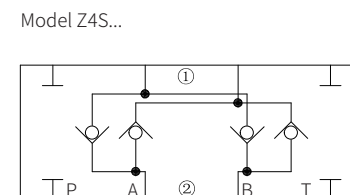
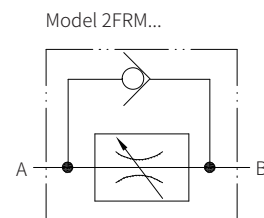
2FRM		-	2X				*
size 10	=10						more information in text
size 16	=16						sealing material
2X series, (20 to 29 series installation and connection size unchanged)			=2X				No code = NBR seals
							V= FKM seals
							(consult for other seals)
to 2L/min	=2L						No code= pressure compensator, without stroke limiter
to 5L/min	=5L						B= pressure compensator, with stroke limiter
to 10L/min	=10L						
to 16L/min	=16L						
to 25L/min	=25L						
to 35L/min	=35L						
to 50L/min	=50L						
size 10 linear						flow range A → B	
to 40L/min	=40L						
to 60L/min	=60L						
size 16 linear							
to 80L/min	=80L						
to 100L/min	=100L						
to 125L/min	=125L						
to 160L/min	=160L						

Rectifier sandwich plate

Z4S		-	1X			*
size 10	=10					more information in text
size 16	=16					sealing material
1X series (10 to 19 series installation and connection size unchanged)			=1X			No code = NBR seals
						V= FKM seals
						(consult for other seals)

Functional symbols

(①=Valve side ②=Subplate side)



Technical parameters

Overview

Oil fluid	Mineral hydraulic oil or phosphate ester hydraulic oil
Oil temperature range °C	-30 to +80 (NBR seals) -20 to +80 (FKM seals)
Viscosity range mm ² /s	10 to 800

Rectifier sandwich plate

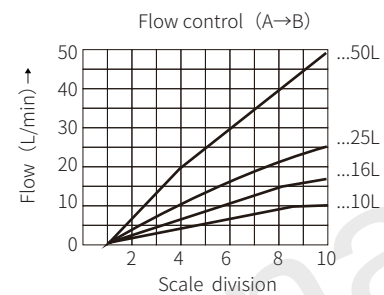
Rated flow L/min	Size 10	Size 16
	50	160
Working pressure Mpa	to 31.5	
Weight kg	Size 10	Size 16
	3.2	9.3

Maximum flow L/min		Size 10				Size 16		
		10	16	25	50	60	100	160
ΔP with free return flow B → A		Size 10				Size 16		
q _v -dependent		2.0	2.5	3.5	6.0	2.8	4.3	7.3
Flow control	Temperature stability -20~70 °C	±2% (Qmax)						
	Pressure stability (to $\Delta P=315$) bar	±2% (Qmax)						
Working pressure at port A		to 315						
Minimum pressure drop		Size 10				Size 16		
		3...12				5...12		
Degree of contamination		25 (Q<5L/min)				10 (Q<0.5L/min)		
Weight kg		Size 10				Size 16		
		5.6				11.3		

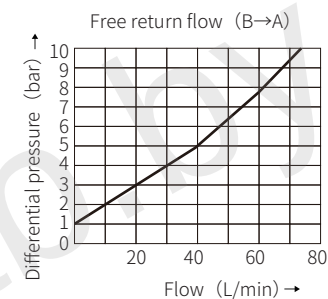
Characteristic curve

(Measured when using HLP 46, $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$)

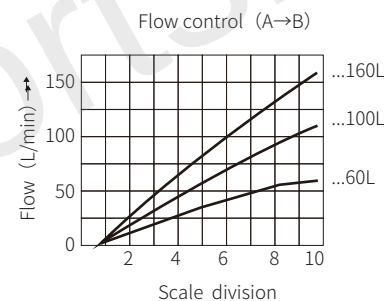
Size 10



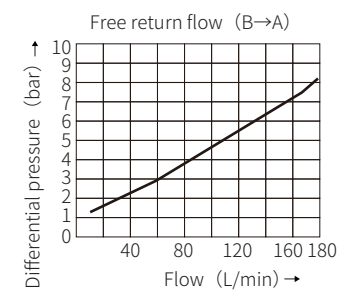
Size 10



Size 16



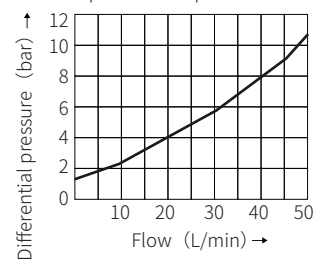
Size 16



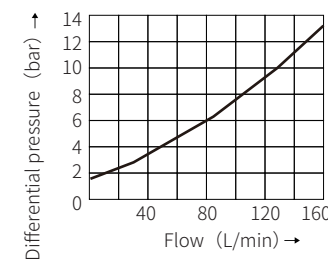
Rectifier sandwich plate

Size 10

Flow from A → B (B → A)
The pressure drop is same in both directions of flow



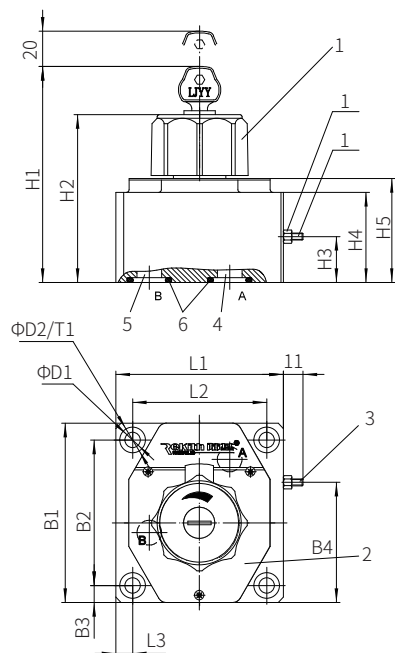
Size 16



Component size

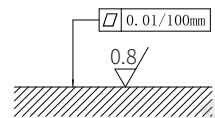
Size unit: mm

Model 2FRM10-2XJ/...and 2FRM16-2XJ/...



- 1 Adjustable handle with lock
- 2 Name plate
- 3 Stroke limiter of pressure reducing valve
- 4 Inlet "A"
- 5 Outlet "B"
- 6 O ring
- NG10: 18.66x3.53
- NG16: 26.58x3.53

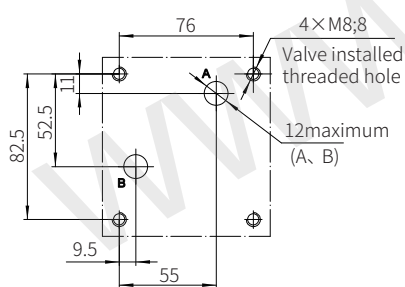
Valve fixing screw
Size 10
M8x50-10.9 grade GB/T70.1-2000
Tightening torque $M_A=34.3\text{Nm}$
Size 16
M10x80-10.9 stage GB/T70.1-2000
Tightening torque $M_A=60\text{Nm}$
Subplate model:
Size 10: G279/01; G279/02
G280/01; G280/02
Size 16: G281/01; G281/02
G282/01; G282/02



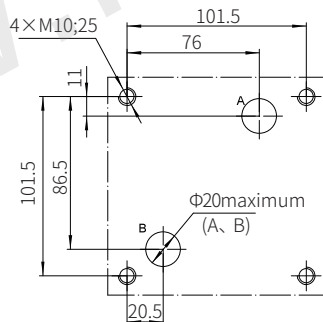
Required surface finishing of mating components

Size	B1	B2	B3	B4	D1	D2	H1	H2	H3	H4	H5	L1	L2	L3	T1
10	101.5	82.5	9.5	68	9	15	125	95	26	51	60	95	76	9.5	13
16	123.5	101.5	11	81.5	11	18	147	117	34	72	82	123.5	101.5	11	12

2FRM10 mounting surface dimensions



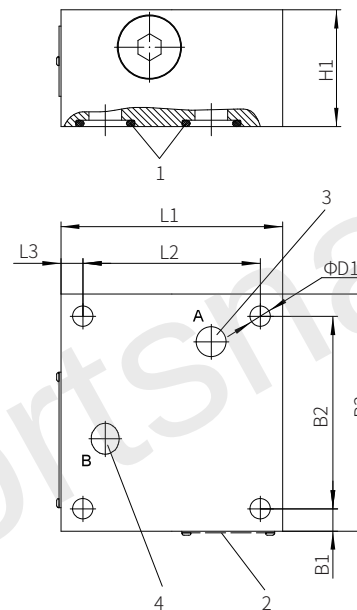
2FRM16 mounting surface dimensions



Component size

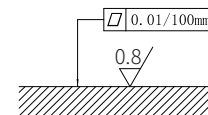
Size unit: mm

Model Z4S10-1XJ.../Z4S16-1XJ/...



- 1 O ring
- NG10: 18.66x3.53
- NG16: 26.58x3.53
- 2 Name plate position at Z4S16
- 3 Inlet "A"
- 4 Outlet "B"

Valve fixing screw
Size 10
M8x100-10.9 grade GB/T70.1-2000
Tightening torque $M_A=34.3\text{Nm}$
Size 16
M10x160-10.9 grade GB/T70.1-2000
Tightening torque $M_A=60\text{Nm}$



Required surface finishing of mating components

Size	B1	B2	B3	D1	H1	L1	L2	L3
10	9.5	82.5	101.5	9	50	95	76	9.5
16	11	101.5	123.5	11	85	123.5	101.5	11