4.6

Flow Control Valve

Type 2FRM6

Rectifier Plate

Type Z4S6

Size 6
Up to 315 bar
Up to 32 L/min

Contents

Features

- For subplates see catalogue
- External closing of the pressure compensator, optional
- Check valve, optional
- Rotary knob with scale, optional lockable

Function and configurations

Flow control valve of type 2FRM is a two-way flow control valve, used for maintaining a constant flow and is independent of pressure and temperature. It consists of housing(1), knob rotary(2), orifice(3), pressure compensator(4), optional check valve(9).

Flow control valve 2FRM6B~L3X/~M

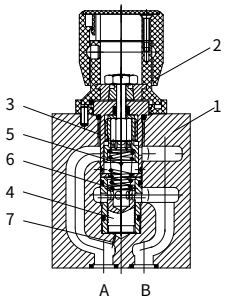
Flow from A to B is throttled at throttle channel (5). Throttle cross-section is varied by turning the knob rotary(2). To avoid effects of pressure at port B on constant flow, a compensator (4) is fitted. Spring (6) separately compress the compensator (4) and orifice (3) tightly.

Spring (6) compresses the compensator (4) tightly to maintain it open when no fluid flows through the valve. Once the fluid flows across the valve, the pressure in port A applies a force to pressure compensator (4) through the orifice (7). The pressure compensator (4) moves into the compensating position until the force is balanced. If the pressure in port A rises, the compensator (4) moves to its closing direction until force is balanced again. Due to the compensator (4) continuous action, a constant flow is obtained.

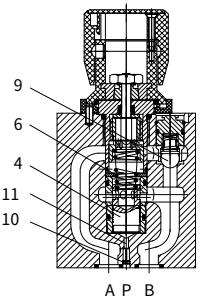
2FRM6A~L3X/~R

The function of this valve is basically the same as that of valve type 2FRM6B~L3X/~R. However, pressure compensator (4) of this type of valve is connected with port P (11) so that pressure compensator (4) can be closed by external pressure. Any pressure in port P through the orifice (10) can make the compensator (4) closed against the force of compression spring (6). When the directional valve (12) acts, fluid flows from P to B, control is achieved as type 2FRM6B.

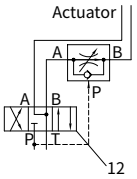
This flow controls the valve with the external pressure compensator which can be closed. It only works by controlling the inlet flow.



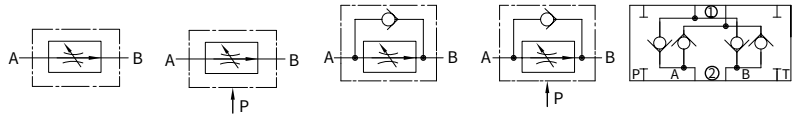
2FRM6B76~L3X/~M~



2FRM6A76~L3X/~R~



Symbols

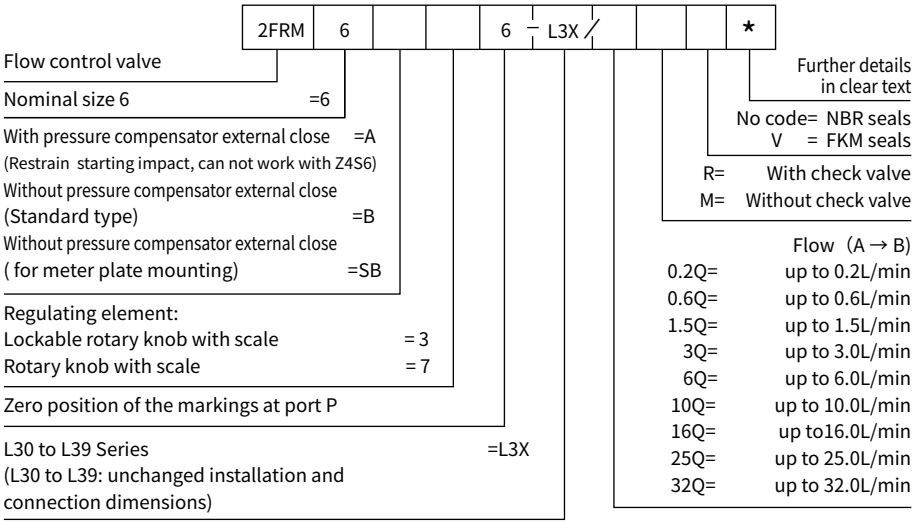


Type 2FRM6B ..L3X/..M | Type 2FRM6A ..L3X/..M | Type 2FRM6B ..L3X/..R | Type 2FRM6A ..L3X/..R | Rectifier type Z4S6-L1X

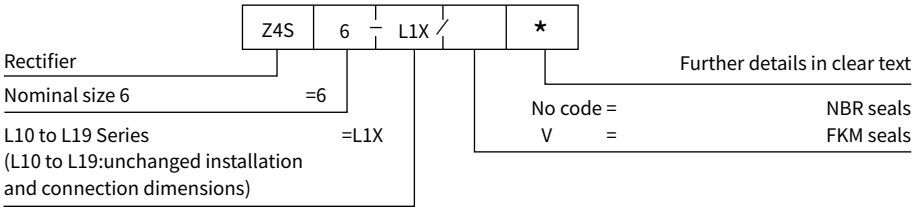
① = Valve side
② = sub-plate side

Ordering code

· For flow control valve



· For rectifier plate



Technical data

· Flow control valve

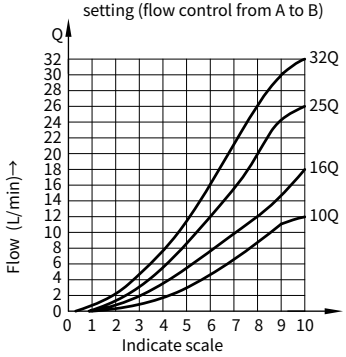
Max. operating pressure at port A		bar	315							
Pressure differential ΔP for free return flow B to A			See characteristic curves							
Minimum pressure differential		bar	6 to 14							
Pressure stability up to P= 315 bar		%	±2(Qmax)							
Flow -rate	Qmax	L/min	0.2	0.6	1.5	3	6	10	16	25	32
	Qmin to 100bar	mL/min	15	15	15	15	25	50	70	100	250
	Qmin to 315bar	mL/min	25	25	25	25	25	50	70	100	250
Fluid			Mineral oil suit, Phosphoric acid 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								
Installation position			Optional								
Circumstances temperature range		°C	-20 to +50								
Weight	2FRM6A...2FRM6B...	kg	Approx.1.3								
	2FRM6SB...	kg	Approx.1.5								

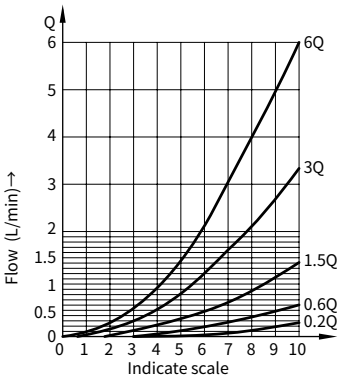
· Rectifier

Nominal flow	bar	320
Maximum operating pressure	bar	To 210
Cracking pressure	bar	0.7
Weight	kg	Approx.0.9

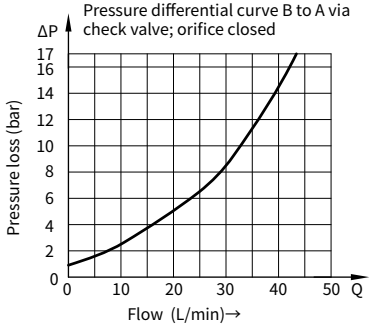
Characteristic curves (Measured at ϑ_{oil}=40°C ±5°C , using HLP46)

Flow in relation to the scale setting (flow control from A to B)

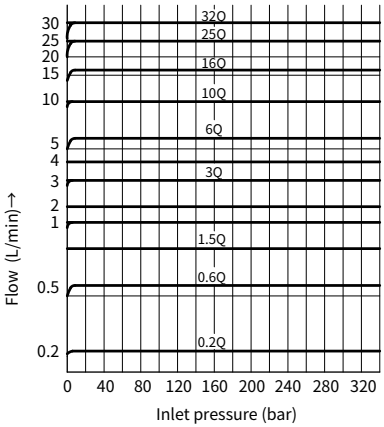




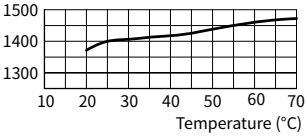
Pressure differential curve B to A via check valve; orifice closed

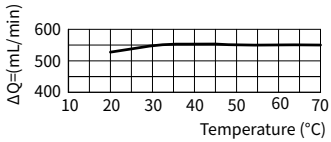


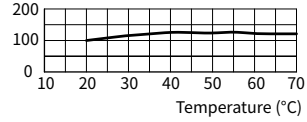
P-Q curve



Temperature effects at ΔP=20bar

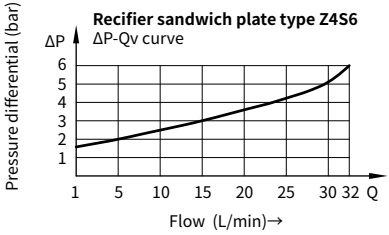






Recifier sandwich plate type Z4S6

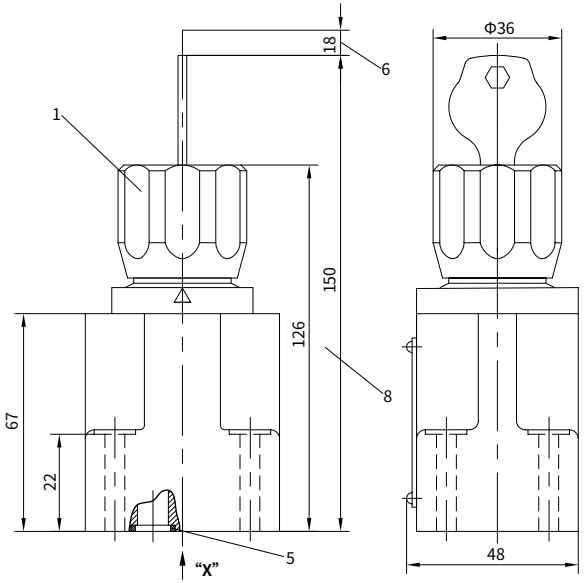
ΔP-Qv curve



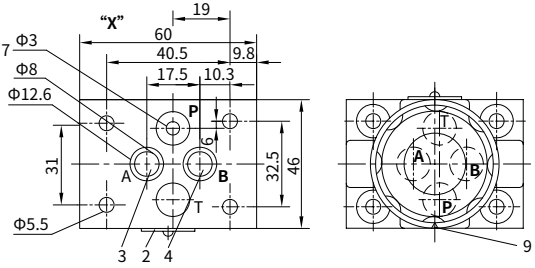
Unit dimensions

(Dimensions in mm)

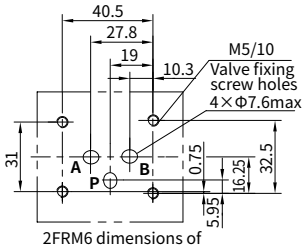
Type 2FRM6A...and 2FRM6B



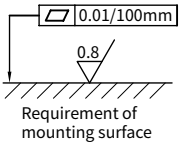
1 Lockable rotary knob with scale (adjustment element "3")
2 Name plate
3 Inlet "A"
4 Outlet "B"
5 O-rings 9.25×1.78 for ports A, B, P and T
6 Space required to remove key
7 Hole Ø 3 for version 2FRM6B is not drilled. (without external connection)
8 Rotary knob with scale (adjustment element "7")
9 Position of marking at port P, A, T or B



Valve fixing screws:
Without rectifier GB/T 70.1-M5×30-10.9, internal hexagon screw, tightening torque M_A=8.9 Nm.
With rectifier GB/T 70.1-M5×70-10.9, internal hexagon screw, tightening torque M_A=8.9 Nm must be ordered separately.



2FRM6 dimensions of mounting surface



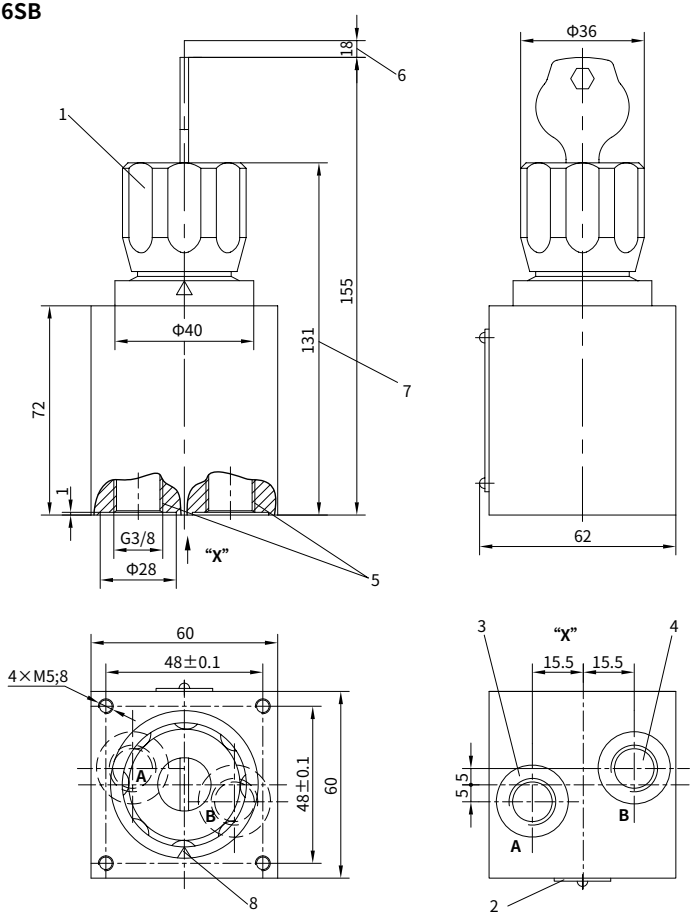
Requirement of mounting surface

Sub-plates:
Type G 341/01 (G 1/4)
Type G 342 /01 (G 3/8)
Type G 502/01 (G1/2)

Unit dimensions

(Dimensions in mm)

Type 2FRM6SB

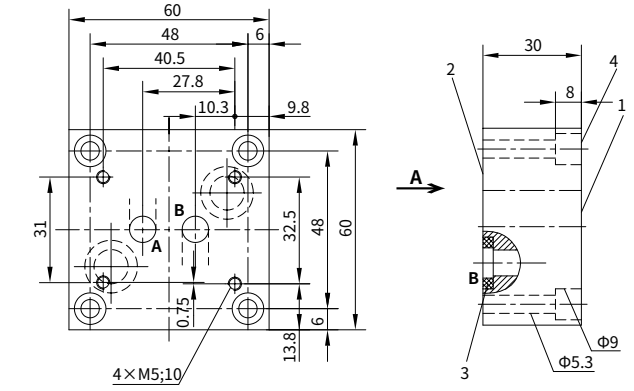


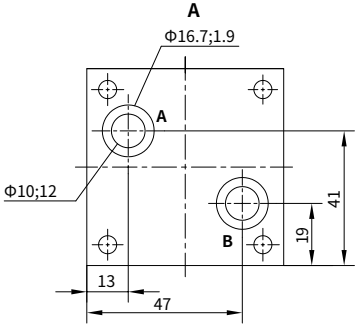
1 Lockable rotary knob with scale (adjustment element "3")
2 Name plate
3 Inlet a
4 Outlet "B"
5 Connection thread G 3/8 to ISO 228/1
6 Space required to remove key
7 Rotary knob with scale (adjustment element "7")
8 Position of marking opposite to the nameplate

Unit dimensions

(Dimensions in mm)

Transition plate AG5075





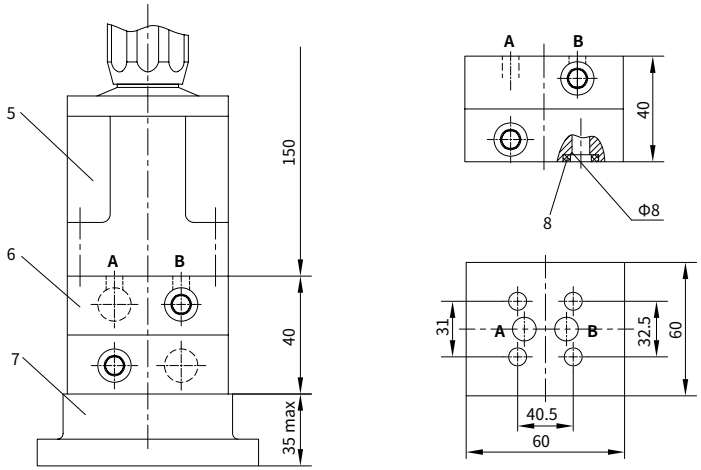
1 Mounting surface matching flow control valve Type 2FRM6
2 Mounting surface matching flow control valve Type 2FRM5
3 O-rings 12×2.5
4 **Valve fixing screws:**
M5×30 GB/T 70.1-10.9
internal hexagon screw
(Tightening torque M_A =6.1Nm)

Note:
The transition plate type AG5075 is specially designed for mounting flow control valve type 2FRM6B..-L3X/.. onto an existing porting pattern of flow control valve type 2FRM5-30/...

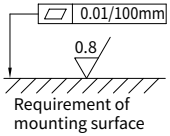
Unit dimensions

(Dimensions in mm)

Rectifier type Z4S6-L1X



5 Flow control valve
6 Rectifier
7 Sub-plate
8 O-rings 9.25×1.78



Caution:
Rectifier sandwich plate type Z4S6-L1X can not be used in conjunction with flow control valve type 2FRM6A..-L3X/.. with built-in external connection of the pressure compensator.