

| | | | | |
|---|---|---------------|-----------------|------------------------------|
| BEIJING HUADE HYDRAULIC INDUSTRIAL GROUP CO.,LTD. | 2-way flow control valve,Type 2FRM | | | RE:28383/12.2004 |
| | Size 10 and 16 | up to 31.5MPa | up to 160 L/min | Replaces: RE28383/05.2001 |

Features:

- Porting pattern to DIN 24 340, from A,ISO 4401 and CETOP-RP 121H
- Pressure compensator stroke limiter, optional
- Mechanical operation
- Start-up jump reduction
- Flow control in both directions using a rectifier sandwich plate

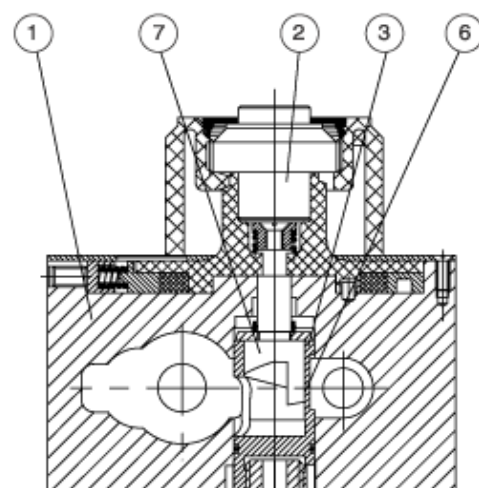
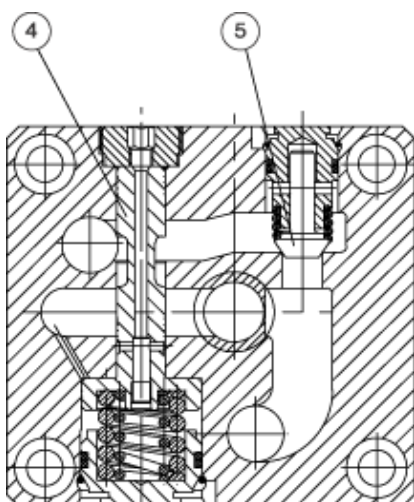


Functional, section

Flow control valves are 2-way flow control valves. They are used to maintain a flow constant independently of pressure and temperature.

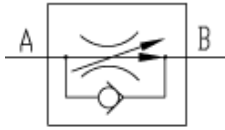
The valves basically consist of the housing (1), orifice bushing(3), pressure compensator (4) with optional stroke limiter,check valve(5), adjustment element (2).

The flow from channel A to channel B is throttle at the orifice (6).In order to maintain the flow across the orifice constant, a pressure compensator is connected upstream of the orifice (6). The flow is maintained largely independent of temperature due to the orifice design.Free return flow from channel B to channel A is directed via the check valve (5). The flow is only controlled from A to B. In order to control the flows in both directions a rectifier sandwich plate type Z4S can be installed below the flow control valve.

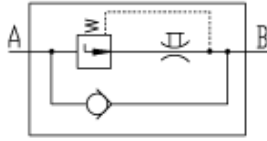


Symbols: 2-way flow control valve

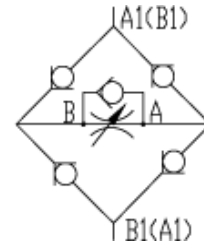
Simplified



Detailed



Rectifier sandwich plate



Ordering code: 2-way flow control valve

2FRM -20 B / *

Size10 =10
Size16 =16

Series 20 to 29(20 to 29: unchanged installation and connection dimensions) = 20

Technology of Beijing Huade Hydraulic =B

| | | | |
|-----------------------|--------------------------|--------------|---------------------|
| Size 10, linearity | to 2L/min | =2L | Flow range A → B |
| | to 5L/min | =5L | |
| | to 10L/min | =10L | |
| | to 16L/min | =16L | |
| | to 25L/min | =25L | |
| | to 35L/min to 50L/min | =35L =50L | |
| Size 16, linearity | to 40L/min | =40L | Flow range A → B |
| | to 60L/min | =60L | |
| | to 80L/min | =80L | |
| | to 100L/min | =100L | |
| | to 125L/min | =125L | |
| | to 160L/min | =160L | |

Further details in clear text

No code = Mineral oil
V = Phosphate ester

No code= Without pressure compensator stroke limiter
B = With pressure compensator stroke limiter

Ordering code: Rectifier sandwich plate

Z4S -13 B / *

Size 10 = 10
Size 16 = 16

Series 10 to 19(10 to 19: unchanged installation and connection dimensions) = 13

Technology of Beijing Huade Hydraulic =B

Further details in clear text

No code= Without pressure compensator stroke limiter
B = With pressure compensator stroke limiter

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

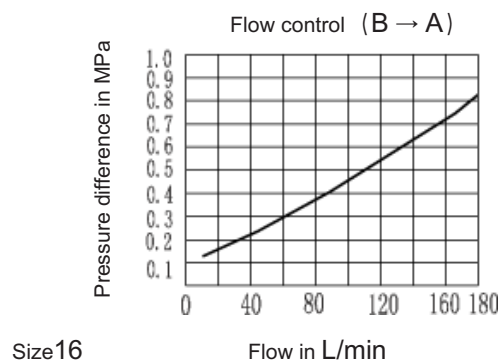
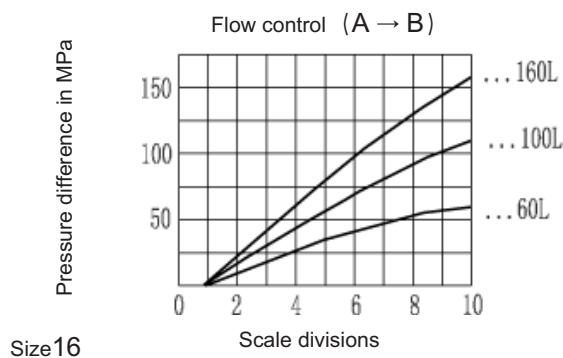
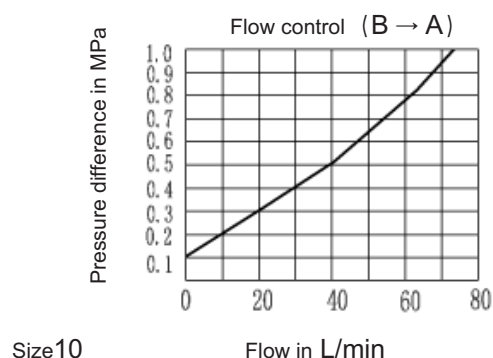
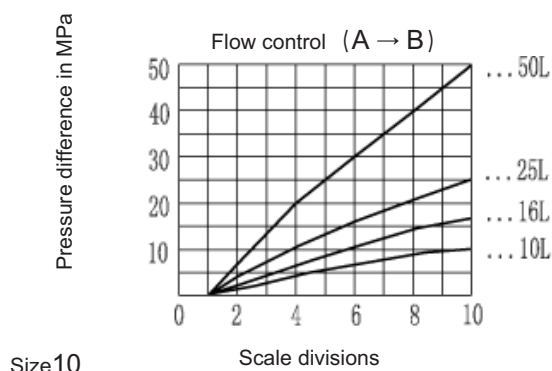
Rectifier sandwich plate

| General | |
|--------------------------------------|---|
| Hydraulic fluid | Mineral oil(for NBR seal) or Phosphate ester (for FPM seal) |
| Temperature range (°C) | -30 to +80 |
| Viscosity range (mm ² /s) | 10 to 800 |

| | | |
|--------------------------|------------|-----------|
| Flow, max (L/min) | Size 10 | Size 16 |
| | up to 50 | up to 160 |
| Operating pressure (MPa) | up to 31.5 | |
| Cracking pressure (MPa) | 0.15 | |
| Weight (Kg) | Size10 | Size16 |
| | 3.2 | 9.3 |

| | | | | | | | |
|--|---|-------------------|------|-----|-----------|-------------------|------|
| Flow q_v max (L/min) | Size10 | | | | Size16 | | |
| | 10 | 16 | 25 | 50 | 60 | 100 | 160 |
| Δp with free return flow B → A q_v -dependent (MPa) | Size10 | | | | Size16 | | |
| | 0.2 | 0.25 | 0.35 | 0.6 | 0.28 | 0.43 | 0.73 |
| Flow control | temperature-stable (-20 to +80°C) | ± 2% (q_v max) | | | | | |
| | pressure-stable (up to $\Delta p = 31.5$ MPa) | ± 2% (q_v max) | | | | ± 5% (q_v max) | |
| Operating pressure, max. - port A (MPa) | up to 31.5 | | | | | | |
| Minimum pressure differential range (MPa) | Size10 | | | | Size16 | | |
| | 0.3...0.7 | | | | 0.5...1.2 | | |
| Degree of contamination (μm) | 25 ($q_v < 5L/min$) 10 ($q_v < 0.5L/min$) | | | | | | |
| Weight (Kg) | Size10 | | | | Size16 | | |
| | 5.6 | | | | 11.3 | | |

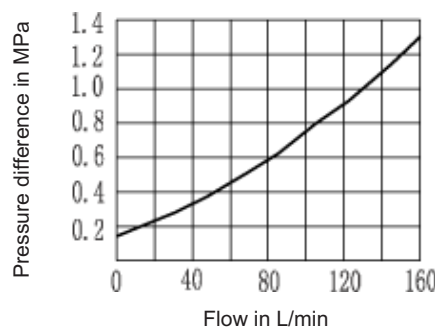
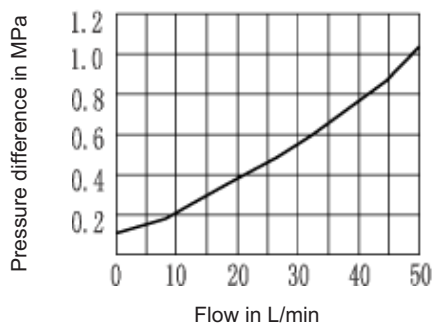
Characteristic curves: 2-way flow control valve (measured at $v = 41$ mm²/s and $t = 50^\circ C$)



Characteristic curves: Rectifier sandwich plate (measured at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50^\circ\text{C}$)

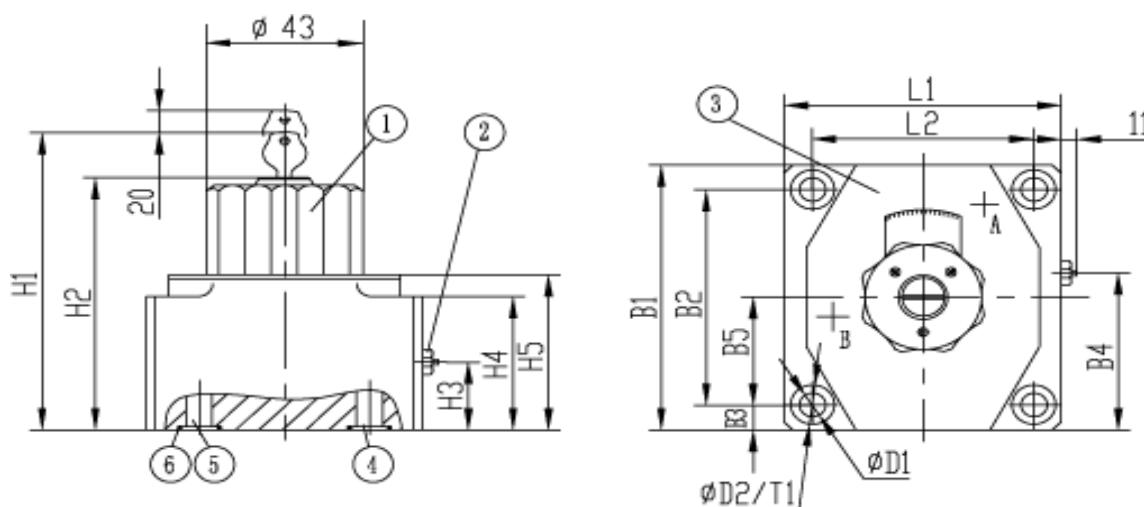
Pressure difference Δp is the same for both directions of flow

Flow q_v from A \rightarrow B (B \rightarrow A)



Unit dimensions: 2-way flow control valve type 2FRM

(Dimensions in mm)



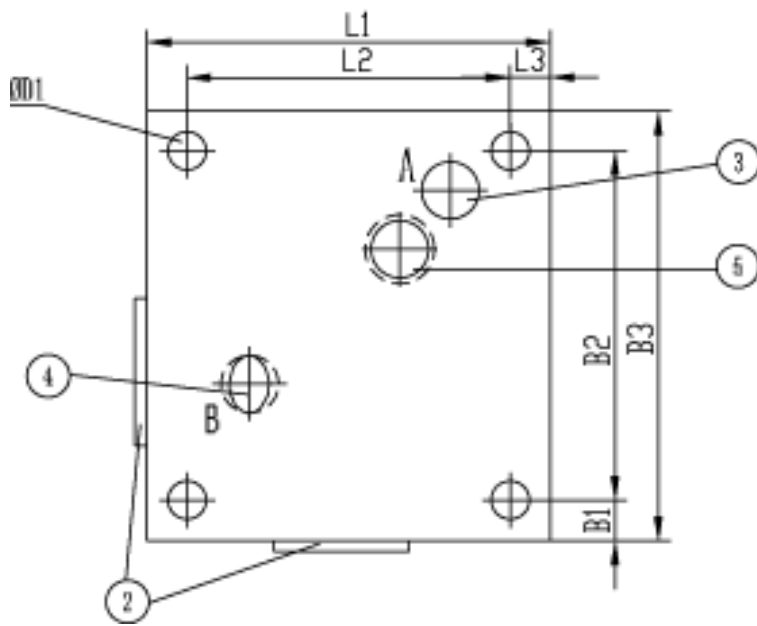
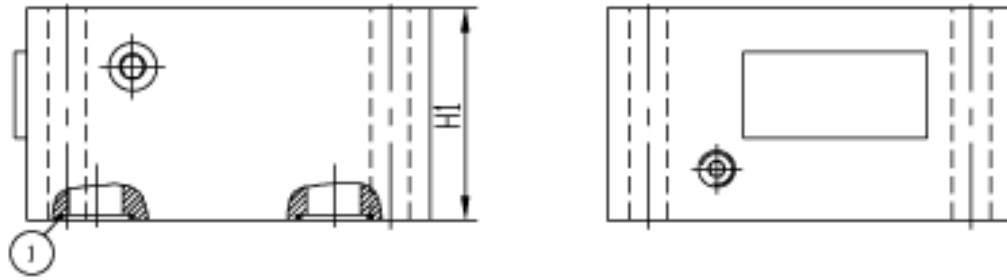
1. Adjustment element, lockable rotary knob (may be locked in any position Turning range $300^\circ = 10$ scale divisions
M A = 0.7 Nm
2. Pressure compensator stroke limiter, optional
3. Nameplate
4. Input "A"
5. Output "B"

6. O-ring 18.66 x 3.53 (size 10)
O-ring 26 x 3 (size 16)
- Subplates for: see page 69
- Size 10: G279/01 (G1/2") G279/02 (M22X1.5)
G280/01 (G3/4") G280/02 (M27X1.5)
- Size 16: G281/01 (G1") G281/02 (M33X2)
G282/01 (G1 1/4") G282/02 (M42X1.5)

| | | | | | | | | |
|------|-------|-------|------|------|-------|-------|----|-----|
| Size | B1 | B2 | B3 | B4 | B5 | D1 | D2 | H1 |
| 10 | 101.5 | 82.5 | 9.5 | 68 | 35.5 | 9 | 15 | 125 |
| 16 | 123.5 | 101.5 | 11.0 | 81.5 | 41.5 | 11 | 18 | 147 |
| Size | H2 | H3 | H4 | H5 | L1 | L2 | T1 | |
| 10 | 95 | 26 | 51 | 60 | 95 | 76 | 13 | |
| 16 | 117 | 34 | 72 | 82 | 123.5 | 101.5 | 12 | |

Unit dimensions: Rectifier sandwich plate

(Dimensions in mm)



- 1. O-ring 18.66 x 3.53 (size 10)
O-ring 26 x 3 (size 16)
- 2 Nameplate
- 3. Input "A"
- 4. Output "B"
- 5 only for size16,the orifice is sealed by o-ring,thus, fitting element doesn't drilling it.

| | | |
|---|--------|--|
| Valve fixing screws for: | Size10 | 4-M8x50-10.9 (GB/T70.1-2000) |
| | Size16 | 4-M8x80-10.9 (GB/T70.1-2000) |
| Valve fixing screws for inserting a rectifier sandwich plate between the flow control valve and subplate have to be ordered separately. | | M8x100-10.9 (GB/T70.1-2000) |
| | Size10 | 4 fixing screws |
| | Size16 | 4 fixing screws M10x160-10.9 (GB/T70.1-2000) |

| Size | B1 | B2 | B3 | φ 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 |

Notice

1. The fluid must be filtered. Minimum filter fineness is 20 μm .
2. The tank must be sealed up and an air breather/filter must be installed on air suction/entrance.
3. Subplate are not supplied, if required, please ordering separately.
4. Valve fixing bolts/screws must be high tensile (class 10.9). Please select and consult manufacturer according to the parameter listed in the datasheet.
5. Roughness of surface mating with the valve is required to $\sqrt{0.8}$.
6. Surface straightness of mating piece is required to 0.01/100mm.

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