

2-way flow control valve Type 2FRM



- ▶ Sizes 6 and 10
- ▶ Series 1X
- ▶ Maximum working pressure 315 bar
- ▶ Maximum flow 60 l/min

Features

- ▶ Cartridge valve
- ▶ Adjustment element with internal hexagon
- ▶ With built-in check valve
- ▶ Low start-up jump

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Type code

01	02	03	04	05		06	07	08	09	
2FRM		K	2	-	1X	/		R	V	*

Valve type			
01	2-way flow control valve		2FRM
Size			
02	Size 6		6
	Size 10		10
03	Cartridge valve		K
Adjustment element			
04	Grub screw with internal hexagon		2
Series			
05	Series 10 to 19 (unchanged installation and connection dimensions)		1X
Flow (A → B)			
06	Size 6	Up to 6.0 l/min	6Q
		Up to 16.0 l/min	16Q
		Up to 32.0 l/min	32Q
	Size 10	Up to 60.0 l/min	60Q
Check valve			
07	With check valve		R
Sealing material			
08	FKM (fluorocarbon rubber) (Other seals on request.)		V
09	Further details in clear text		*

Notice
 Preferred types and standard components can be found in the EPS (Standard Price List).

Functional description

General

Flow control valves type 2FRM.K are 2-way flow control valves suitable for fitting into manifold systems. They are used for maintaining a constant flow, independent of pressure and temperature.

The valve basically consists of the housing (1), adjustment element (2), throttling area (3), throttle bolt (4), pressure compensator (5) and check valve (6).

Function

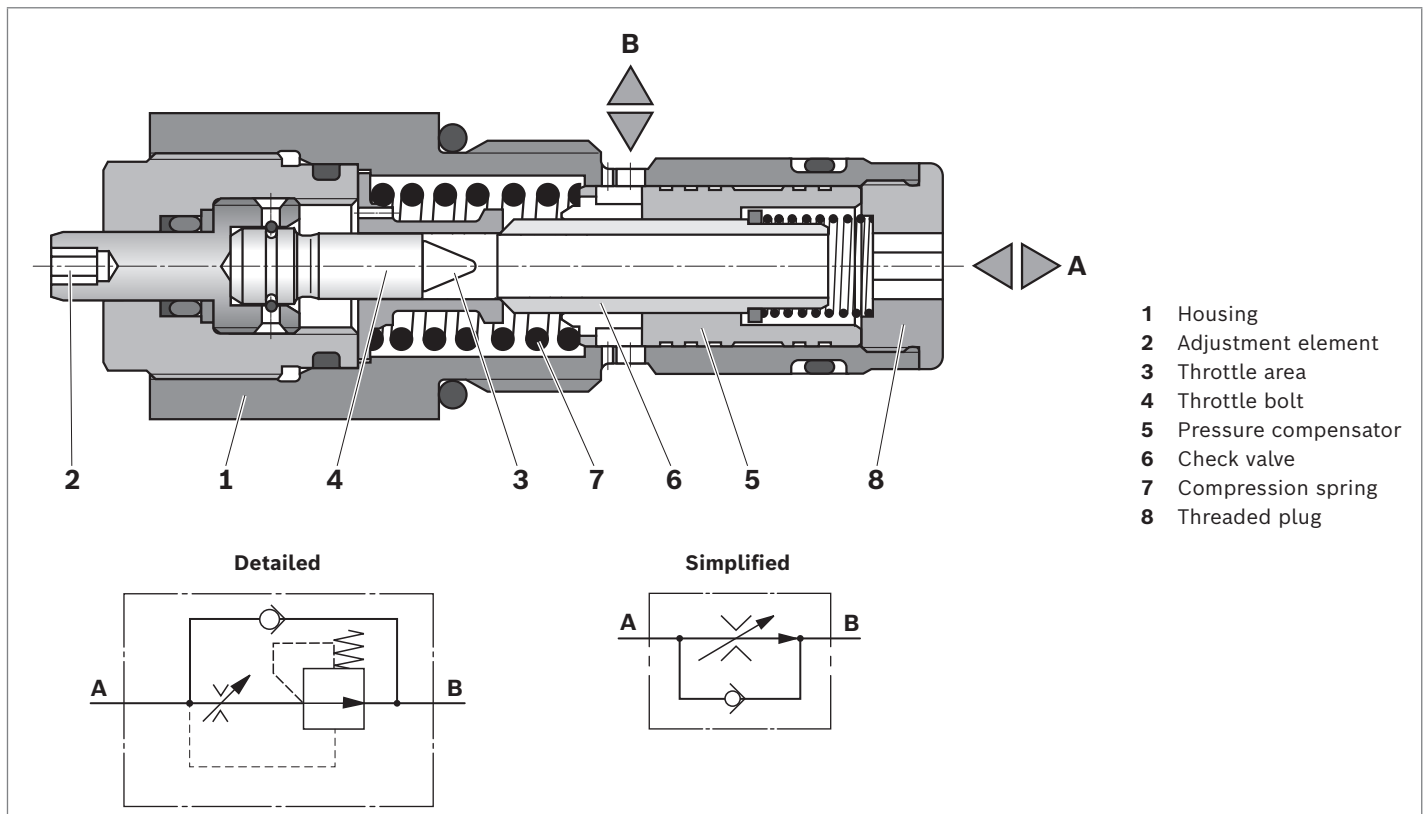
Throttling of the flow from port **A** to port **B** occurs at the throttle area (3). The throttle cross-section is changed by turning the adjustment element (2). This takes place between the throttle area (3) and the throttle bolt (4).

In order to hold the flow constant, independent from the pressure, in port **B** a pressure compensator (5) is fitted downstream of the throttle area (3).

The pressure compensator (5) is pressed against the plug (8) by the compression spring (7) and so stays in the open position as long as there is no flow through the valve. When flow takes place through the valve the pressure, which is present in port **A**, applies a force onto the pressure compensator (5). The pressure compensator moves into the compensating position until the forces are balanced. If the pressure increases in port **A**, then the pressure compensator (5) moves towards its closed position until the forces are balanced. Due to this continuous compensating action a constant flow is obtained.

Free return flow from port **B** to port **A** is obtained via the check valve (6).

▼ Cross-section and symbol 2FRM



Technical data

General			Size		6			10	
Weight		kg	0.19			0.6			
Installation position			Any						
Ambient temperature range		°C	−20 ... +50						
Hydraulics			Size		6			10	
Maximum working pressure		Port A	p	bar	315			210	
Pressure differential Δp for free return flow ¹⁾		B → A	Δp	bar	See characteristic curves on page 5				
Minimum pressure differential			bar	18					
Pressure stable up to $\Delta p = 315$ bar / 210 bar			%	$\pm 3 (q_{V \max})$					
Flow		$q_{V \max}$	l/min	6	16	32	60		
		$q_{V \min}$	cm ³ /min	50	150	250	500		
Hydraulic fluid			See table below						
Hydraulic fluid temperature range		ϑ	°C	−20 ... +80 (FKM seal)					
Viscosity range		ν	mm ² /s	10 ... 800					
Maximum admissible degree of contamination of hydraulic fluid (cleanliness level) according to ISO 4406 (c)				Level 20/18/15 ²⁾					

Notice

For applications outside these values, please consult us!

Hydraulic fluid

Hydraulic fluid		Classification	Suitable sealing materials	Standards	Data sheet
Mineral oils		HL, HLP	FKM	DIN 51524	90220
Environmentally acceptable	Insoluble in water	HEES	FKM	ISO 15380	90221
	Soluble in water	HEPG	FKM	ISO 15380	90221

Notice

- Further information and details on using other hydraulic fluids are available in the above data sheets or on request.
- Restrictions are possible with the technical valve data (temperature, pressure range, service life, maintenance intervals, etc.).
- The flash point of the hydraulic fluid used must be 40 K above the maximum solenoid surface temperature.
- **Environmentally acceptable:** If environmentally acceptable hydraulic fluids are used that are also zinc-dissolving, there may be an accumulation of zinc.

1) The minimum pressure differential between A and B must be between 10 and 25 bar, depending on the nominal size.

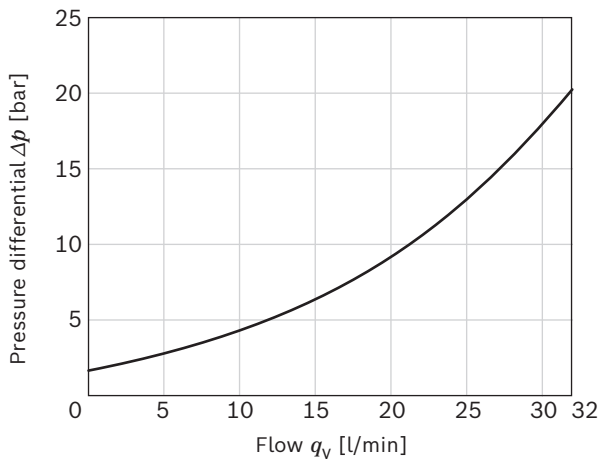
2) The cleanliness classes stated for the components has to be maintained in hydraulic systems. Effective filtration prevents faults and at the same time increases the service life of the components.

For the selection of the filters see www.boschrexroth.com/filter. We recommend using a filter with a minimum retention rate of $\beta_{10} \geq 75$.

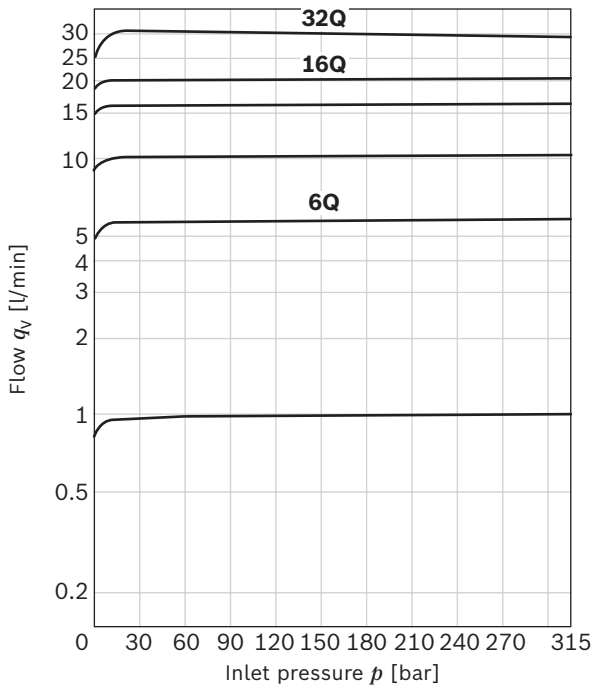
Characteristic curves

Size 6

▼ Δp - q_V -characteristic curve via the check valve (B → A) Orifice closed

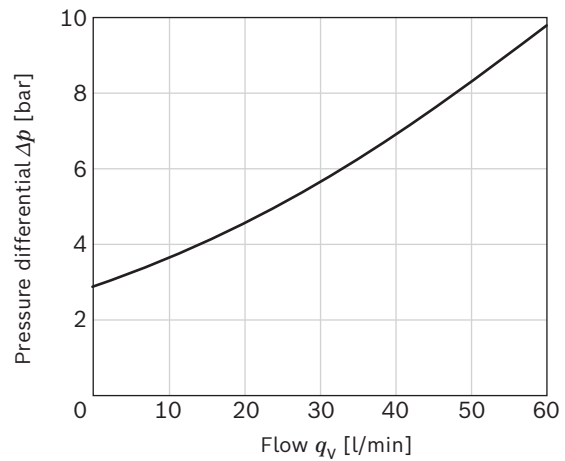


▼ Flow q_V in relation to the inlet pressure p

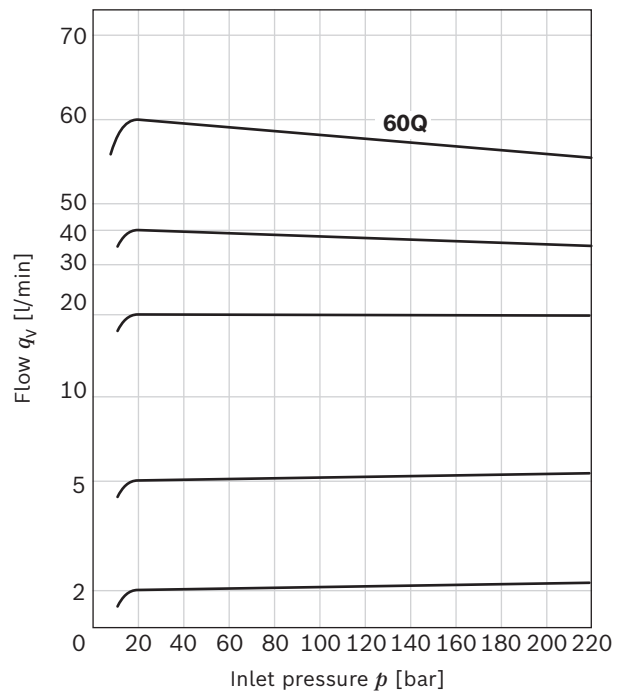


Size 10

▼ Δp - q_V -characteristic curve via the check valve (B → A) Orifice closed



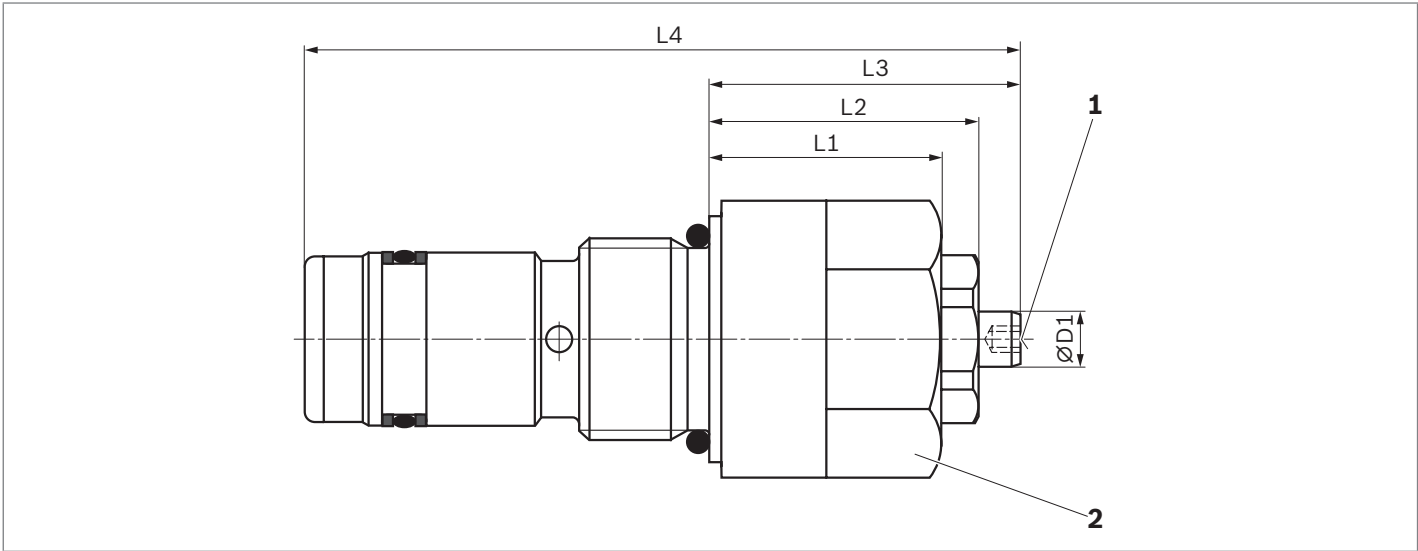
▼ Flow q_V in relation to the inlet pressure p



Notice

Characteristic curves measured with HLP46,
 $\vartheta_{oil} = 40 \pm 5 \text{ } ^\circ\text{C}$.

Dimensions

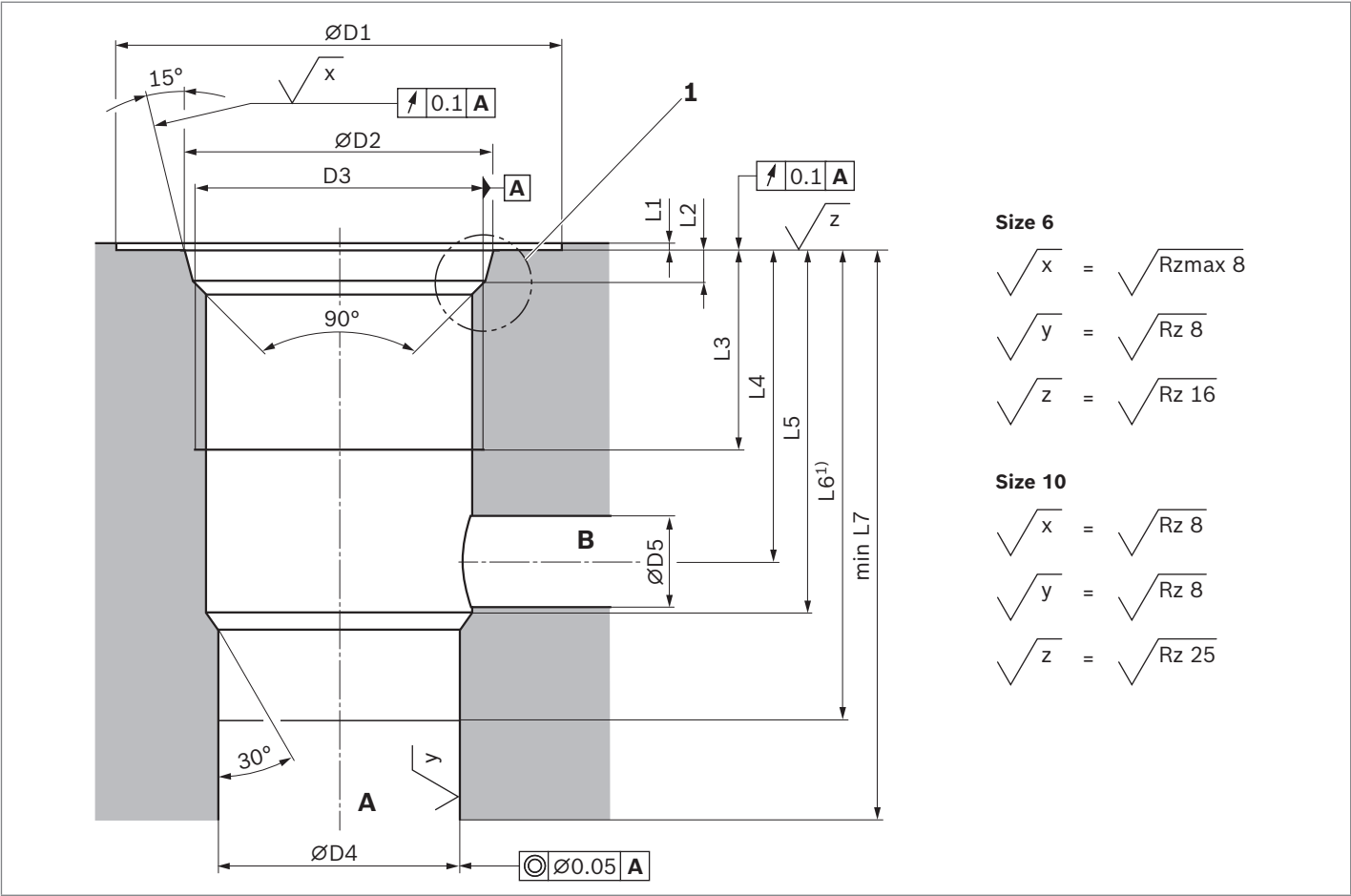


- 1 Internal hexagon SW3
- 2 External hexagon
 - Size 6: WAF27; $M_A = 40\text{ Nm}$
 - Size 10: WAF41; $M_A = 120\text{ Nm}$

Size	L1	L2	L3	L4	ØD1
6	25	29	33.5	77	6
10	36	41	45.5	109	6

Mounting cavity

▼ Version according to DIN ISO 7789

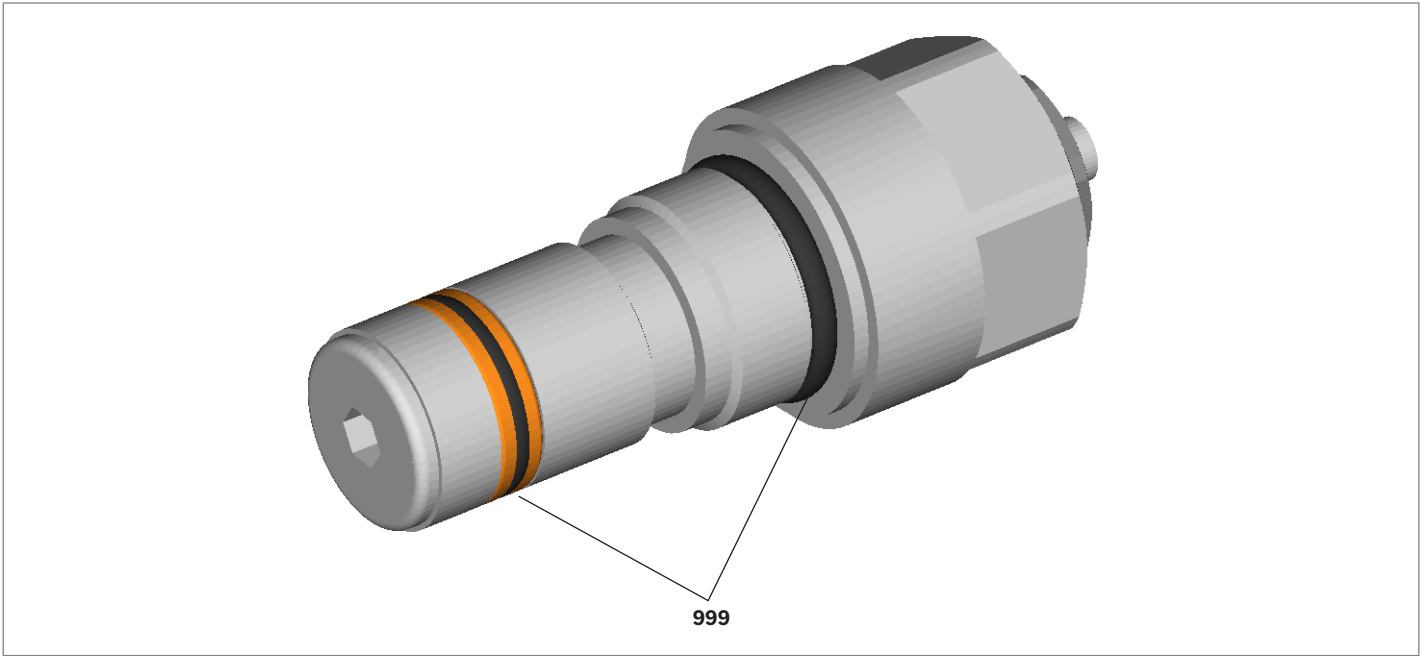


1 According to DIN 3852-W

Size	L1	L2	L3	L4	L5	L6 ¹⁾	L7	ØD1	ØD2	D3	ØD4	ØD5
6	0.5	2.4 ^{+0.4}	17	24 ₋₄	28±0.1	38.5	45 ^{+0.2}	34	23.8±0.1	M22 × 1.5	19H7	7
10	0.5	3.1 ^{+0.4}	23	32 ₋₄	39 ^{+0.4}	55	65	46	35.4±0.1	M33 × 2	29H8	11

1) Depth of fit

Available individual components



Item	Designation	Sealing material	Material number
999	Seal kit of the valve for size 6	FKM	R961000741
	Seal kit of the valve for size 10	FKM	R961000742

Related documentation

- Electronic controls:

– Analog amplifier

– BODAS controller

Type RA...

Type RC...
- Data sheet 95230

Data sheet 95204, 95205, 95206
- Mineral oil-based hydraulic fluids

Data sheet 90220
- Environmentally acceptable hydraulic fluids

Data sheet 90221
- Filter selection

www.boschrexroth.com/filter
- MTTF_D values

Data sheet 90294

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