

2-way flow control valve 2 FRM 10, 16

NS 10, 16 | p_{max} 35 MPa | Q_{max} 160 dm³/min | WK 450 570



DATA SHEET - OPERATION MANUAL

APPLICATION

2-way flow control valve **2FRM10, 16...** type is used for control of the fluid flow rate in one direction and free flow in the opposite direction, independent from pressure and temperature. The valve can be mounted in any position in hydraulic system.

DESCRIPTION OF OPERATION

In order to set a specific flow rate, a pressurised fluid is supplied to line **A**. Flow rate is adjusted by the sleeve **1** and curved bolt **4** which rotation creates a cross-section at the outlet of the fluid. Curved bolt is rotated by the hand knob with a key lock **2** within a setting range from **0** (flow closed) to **300°** (flow fully open). Pressure compensator **3**, shutter and adjustable curved bolt make the flow rate independent from pressure and temperature of the fluid. In order to avoid start-up jump, a stroke limiter can be applied **6** (see **page 2, pos. 2**), i.e. a threaded **M6** pin with a hexagon **M4** nut. To provide a free flow from **B** to **A**, a check valve **5** was installed.

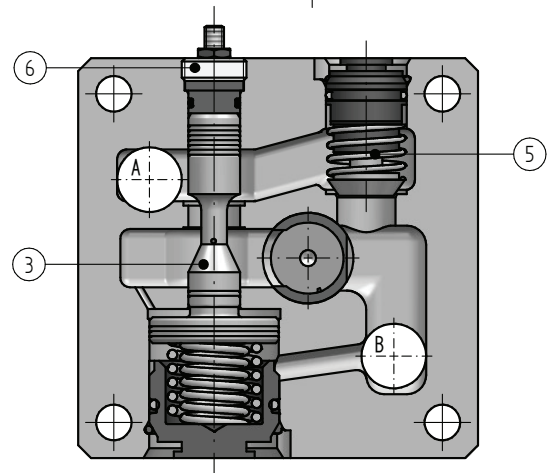
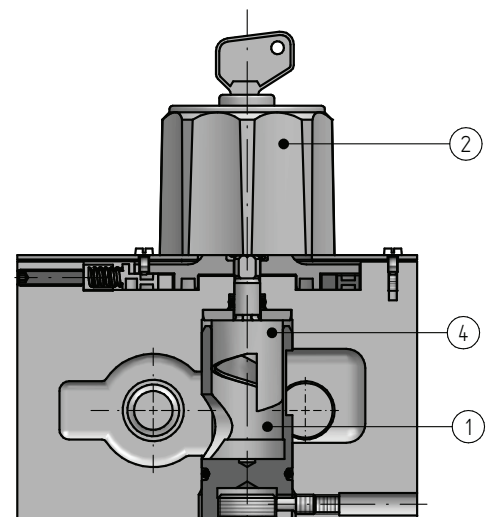
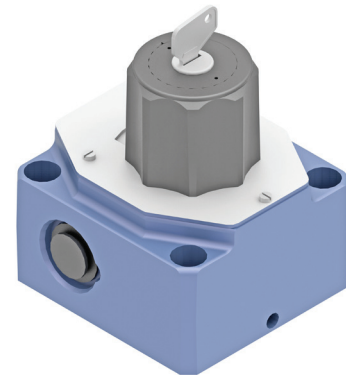
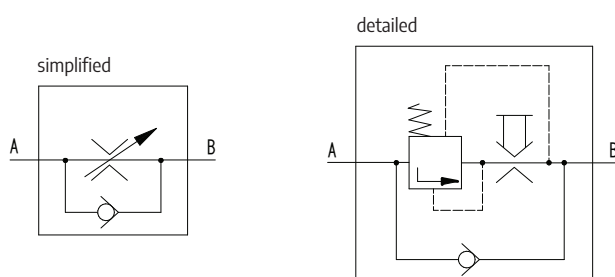
WARNING: Do not adjust under pressure (unload the valve first).

TECHNICAL PARAMETERS

hydraulic fluid	mineral oil	
required fluid cleanliness class	ISO 4406 class 20/18/15	
nominal fluid viscosity	37 mm ² /s at temp. 55 °C	
viscosity range	2,8 ÷ 380 mm ² /s	
fluid temperature range (in tank)	max. -20 ÷ 70 °C; rec. 40 ÷ 55 °C	
ambient temperature range	-20 ÷ 70 °C	
max. working pressure (port A)	35 MPa	
minimal pressure difference	2FRM10	0,3 ÷ 0,7 MPa
	2FRM16	0,5 ÷ 1,5 MPa
flow control tolerance	± 2% Q_{max} (for constant pressure and temp.)	
weight	2FRM10	5,6 kg
	2FRM16	11,3 kg

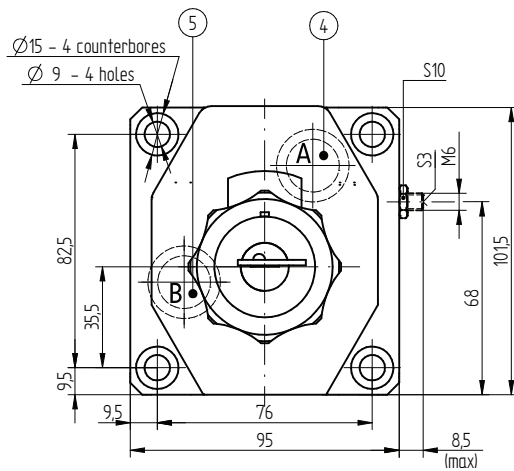
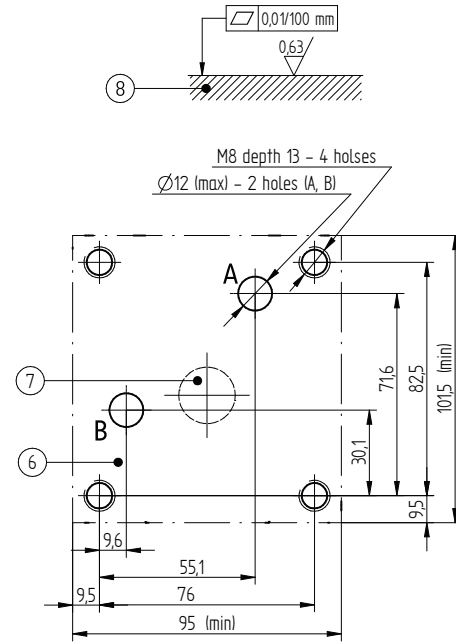
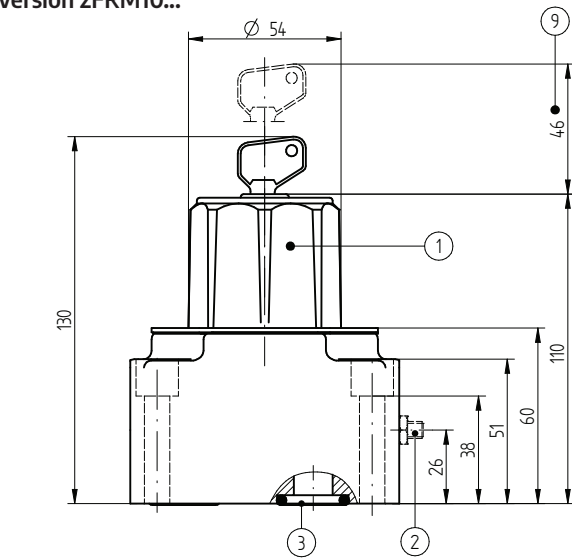
assembly and operation requirements at: www.operating-conditions.ponar.pl

HYDRAULIC DIAGRAMS



OVERALL AND CONNECTION DIMENSIONS

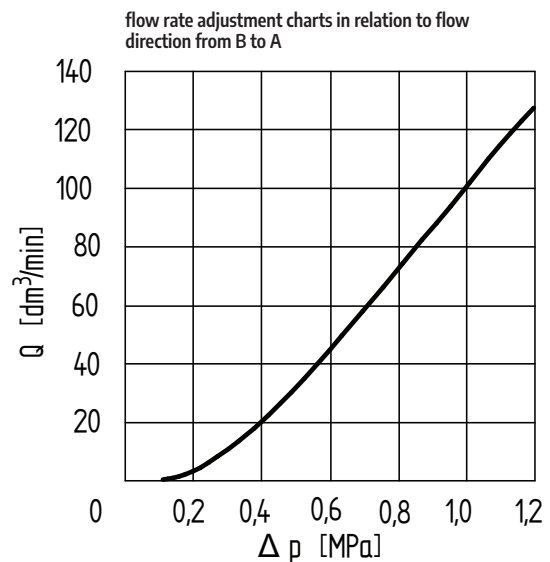
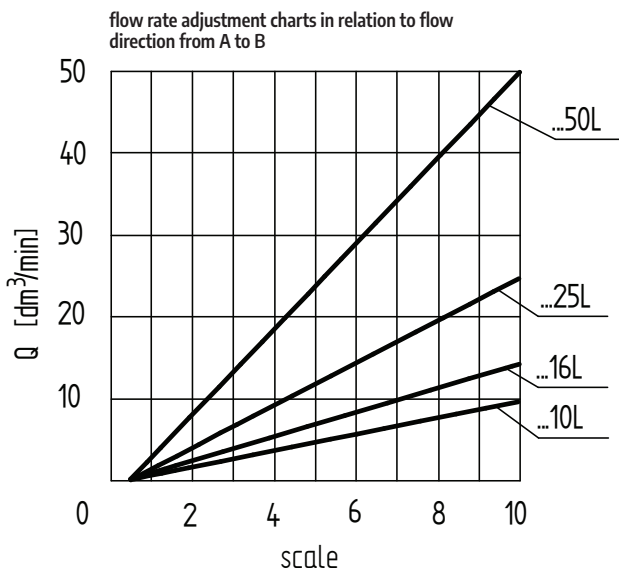
version 2FRM10...



1. adjustment element (hand knob with a key lock, rotation range $300^\circ = 10$ scale sections)
2. pressure compensator stroke limiter (optional equipment - version **2FRM10...B...** setting screw **M6** with an internal socket **S3**, lock nut **M6 - S10**)
3. o-ring **18,7 × 3,5** - 2 pcs/set
4. inlet port (A)
5. outlet port (B)
6. porting pattern of the subplate
7. distance for the sleeve ($\varnothing 20$)
8. required surface quality of the valve contact surface
9. space required to remove the key from the lock of the adjustment element

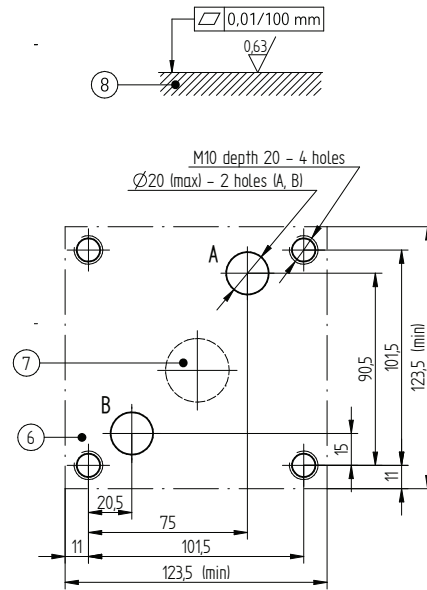
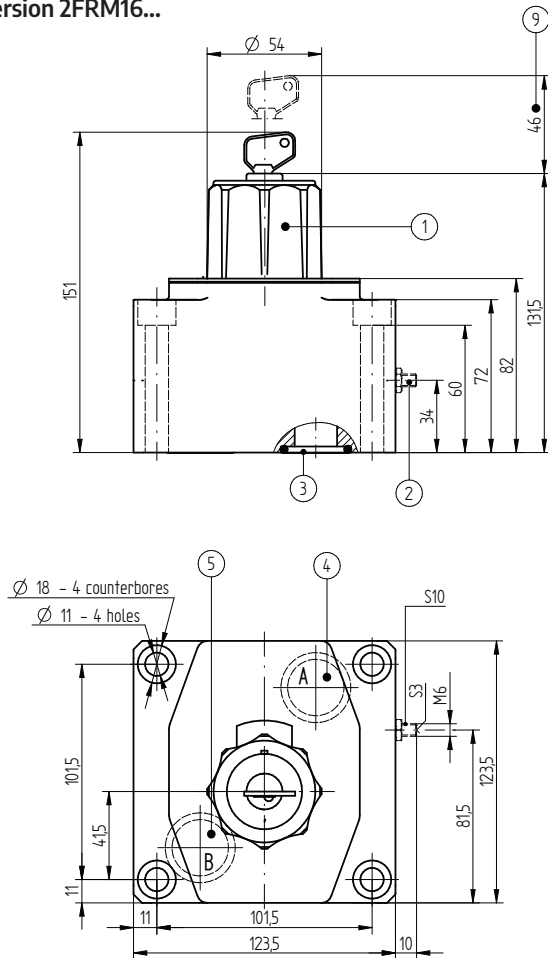
PERFORMANCE CURVES - 2FRM10

for fluid viscosity $\nu = 41 \text{ mm}^2/\text{s}$ and temp. $t = 50^\circ \text{C}$



OVERALL AND CONNECTION DIMENSIONS

version 2FRM16...

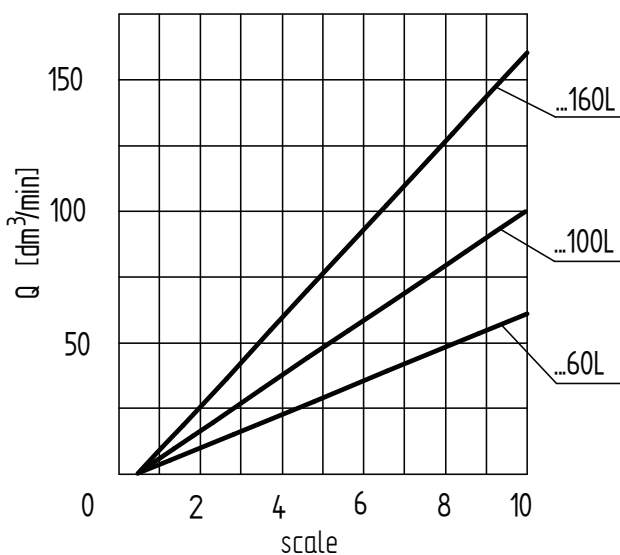


1. adjustment element (hand knob with a key lock, rotation range $300^\circ = 10$ scale sections)
2. pressure compensator stroke limiter (optional equipment - version 2FRM16...B... setting screw M6 type with an internal socket S3, lock nut M6 - S10)
3. o-ring $26,6 \times 3,5$ - 2 pcs/set
4. inlet port (A)
5. outlet port (B)
6. porting pattern of the subplate
7. distance for the sleeve ($\varnothing 30$)
8. required surface quality of the valve contact surface
9. space required to remove the key from the lock of the adjustment element

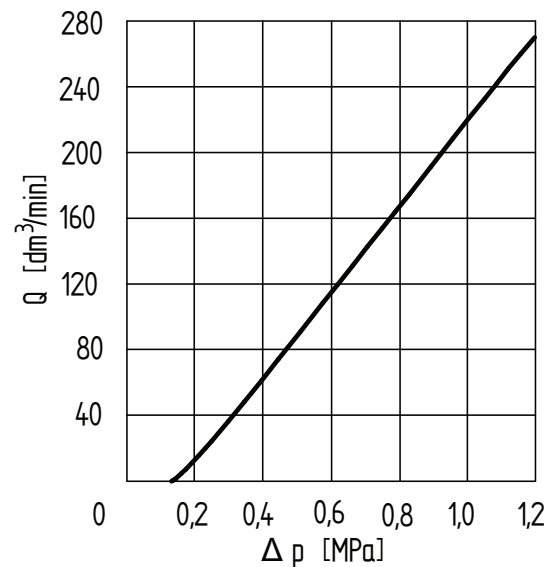
PERFORMANCE CURVES - 2FRM16

for fluid viscosity $\nu = 41 \text{ mm}^2/\text{s}$ and temp. $t = 50^\circ \text{C}$

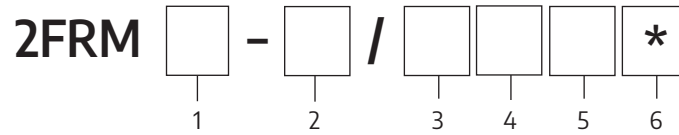
flow rate adjustment charts in relation to flow direction from A to B



flow rate adjustment charts in relation to flow direction from B to A



HOW TO ORDER



1 nominal size

NS 10 =	10
NS 16 =	16

2 series number

series 22 =	22
(20 ÷ 29) - connection and installation dimensions unchanged	

3 flow range (A → B)

for WN 10 - linear	
up to 2 dm ³ /min =	2L
up to 5 dm ³ /min =	5L
up to 10 dm ³ /min =	10L
up to 16 dm ³ /min =	16L
up to 25 dm ³ /min =	25L
up to 35 dm ³ /min =	35L
up to 50 dm ³ /min =	50L

for WN 10 - progressive	
up to 1 dm ³ /min =	1Q
up to 2 dm ³ /min =	2Q
up to 10 dm ³ /min =	10Q
up to 16 dm ³ /min =	16Q
up to 25 dm ³ /min =	25Q

for WN 16 - linear	
up to 40 dm ³ /min =	40L
up to 60 dm ³ /min =	60L
up to 80 dm ³ /min =	80L
up to 100 dm ³ /min =	100L
up to 125 dm ³ /min =	125L
up to 160 dm ³ /min =	160L

4 additional equipment

without a pressure compensator stroke limiter =	Ø
with a pressure compensator stroke limiter =	B

5 seal type

NBR (for fluids on mineral oil base) =	Ø
FKM (for fluids on phosphate ester base) =	V

6 further requirements = *

(to be agreed upon with the Manufacturer)

Ø indicates that the box should be left blank.

The **symbols in bold** are the preferred versions available in short delivery time.

Coding example: **2FRM10-22/10L**

SUBPLATES AND MOUNTING SCREWS

subplates should be ordered according to the data sheet:

valve version	subplate type	data sheet	threaded connection of subplate	screws fixing the valve to the subplate
2FRM10	G279/01	WK 470 011	A, B - G1/2	M8 x 50 - 10.9 wg PN - EN ISO 4762 (PN/M - 82302) - 4 pcs/set tightening torque of the screws M _d = 35 Nm
	G280/01		A, B - G3/4	
2FRM16	G281/01	WK 450 795	A, B - G1	M10 x 80 - 10.9 wg PN - EN ISO 4762 (PN/M - 82302) - 4 pcs/set tightening torque of the screws M _d = 70 Nm
	G282/01		A, B - G1 1/4	

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