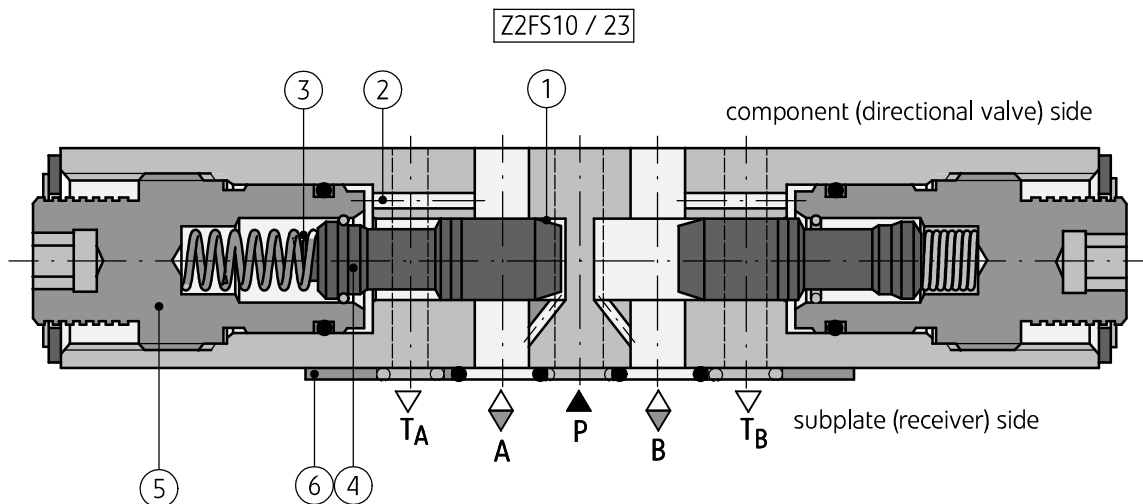


### APPLICATION

Throttle/check valve type Z2FS10... is used to control main flow rate (or pilot flow rate) in one direction of flow and to allow free flow in the opposite direction. The valve may be designed as double version (twin version - valve function is realized in two ports **A** and **B**) or single version (valve function is realized in one port **A** or **B**). The valve is applied to **vertical stack mounting (sandwich plate)** - generally is fitted between a subplate and a directional valve of the same nominal size and in this case is used to limit main flow rate (to control the speed of a receiver movement).



### DESCRIPTION OF OPERATION



Hydraulic fluid from directional valve via port **A** (or **B**) flows to receiver through throttling slot (1). At the same time the fluid under operating pressure acts via line **A** on spring loaded side of spool (4). The spool (4) is thus hold in the throttle position by both spring and hydrostatic force. Hydraulic fluid flowing back from a receiver through port **B** (or **A**) shifts the spool (4) in the direction of adjustment and allows the fluid to flow freely (the valve operates as a check valve). Throttle rate (volume of fluid flow) can be adjusted by means of adjustment screw (5). Depending on the way the valve is fitted in relation to

the seal ring plate (6), throttling effect can be achieved either in the supply of a receiver (option shown on the drawing) or drain (by rotating the valve about the cross horizontal axis by 180°).

#### NOTE:

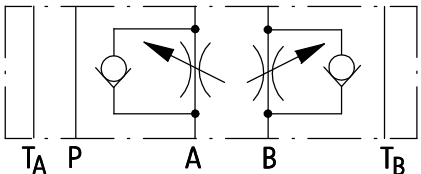
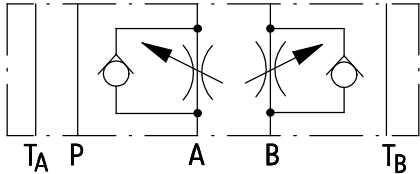
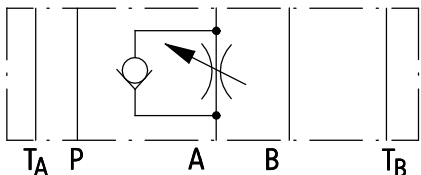
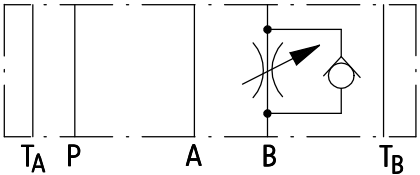
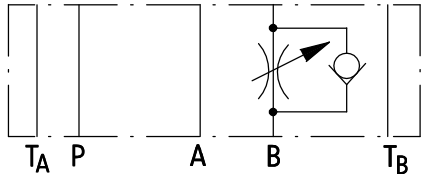
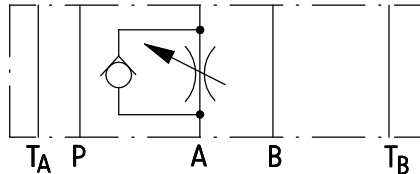
For valve version with throttling effect in one port (**A** or **B**) when changing throttling effect in the supply to throttling in the drain at the same time changes the throttling location (from port **A** to **B** or from port **B** to **A**).

## TECHNICAL DATA

Hydraulic fluid	mineral oil	
Required filtration	up to 16 $\mu\text{m}$	
Recommended filtration	up to 10 $\mu\text{m}$	
Nominal fluid viscosity	37 $\text{mm}^2/\text{s}$ at temperature 55 °C	
Viscosity range	2,8 up to 380 $\text{mm}^2/\text{s}$	
Fluid temperature range (in a tank)	recommended	40°C up to 55°C
	max	-20°C up to +70°C
Ambient temperature range	-20°C up to +70°C	
Maximum operating pressure	31,5 MPa	
Cracking pressure	0,03 MPa	
Maximum flow	80 $\text{dm}^3/\text{min}$	
Weight	2 kg	

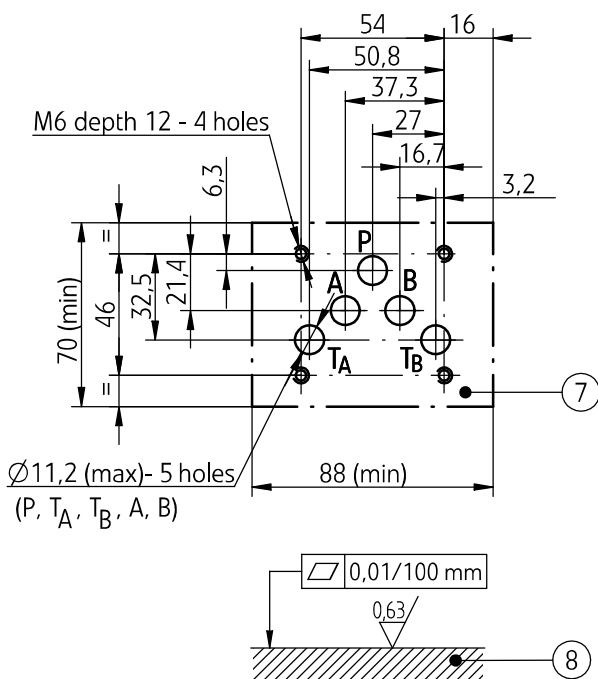
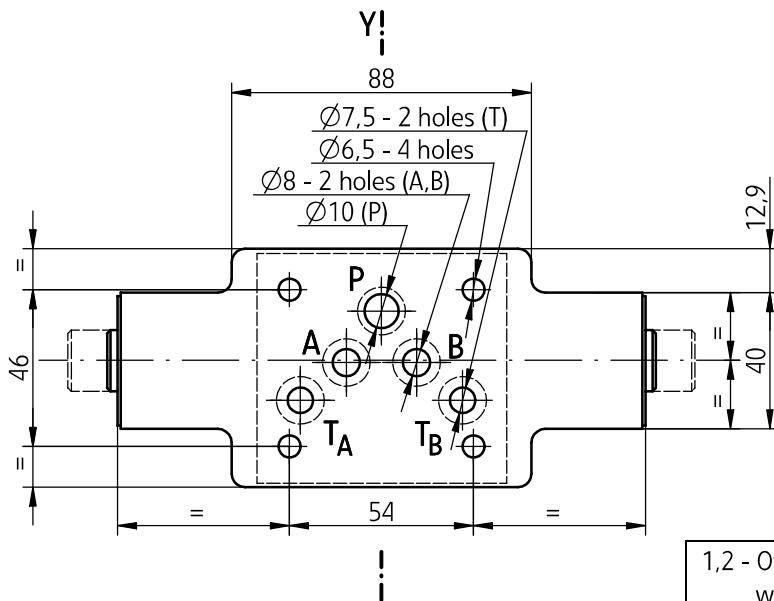
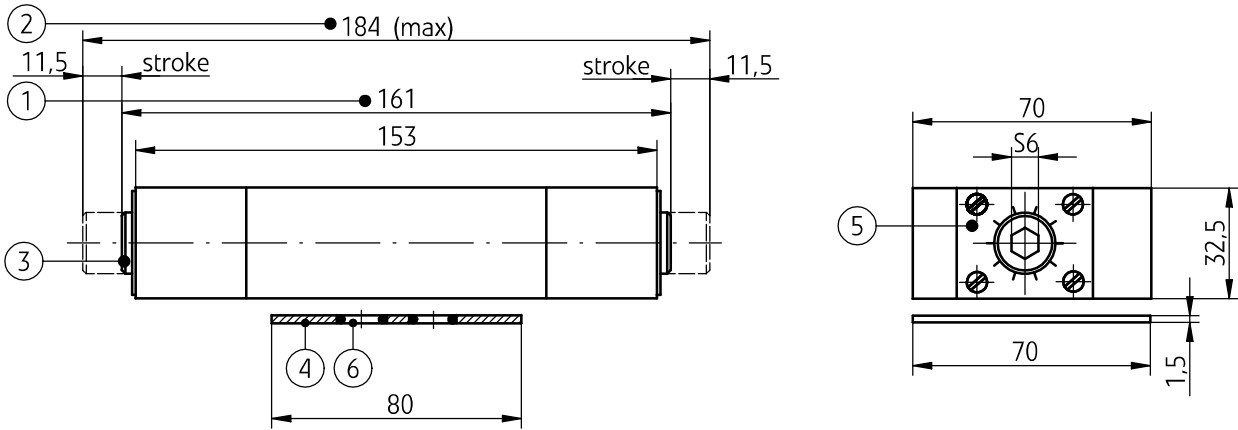
## SCHEMES

Hydraulic schemes of valves type Z2FS10...

double version Z2FS10...	
<b>supply throttling in ports A and B</b> component (directional valve) side  subplate (receiver) side	<b>drain throttling in ports A and B (valve rotated by 180°)</b> component (directional valve) side  subplate (receiver) side
single version Z2FS10 A...	
<b>supply throttling in port A</b> component (directional valve) side  subplate (receiver) side	<b>drain throttling in port B (valve rotated by 180°)</b> component (directional valve) side  subplate (receiver) side
single version Z2FS10 B...	
<b>supply throttling in port B</b> component (directional valve) side  subplate (receiver) side	<b>drain throttling in port A (valve rotated by 180°)</b> component (directional valve) side  subplate (receiver) side

# OVERALL AND CONNECTION DIMENSIONS

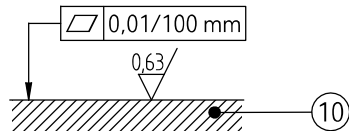
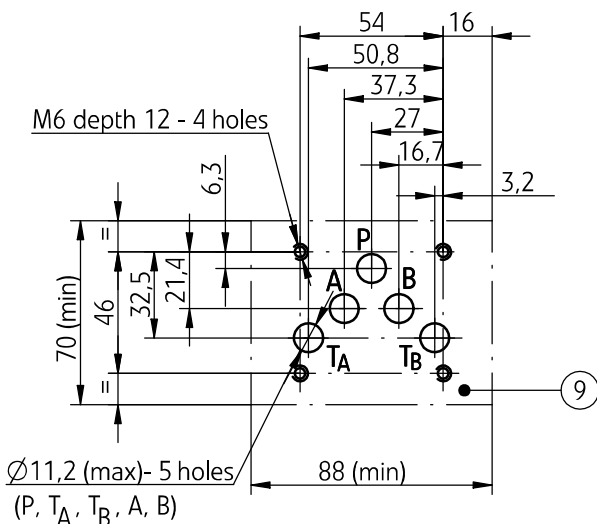
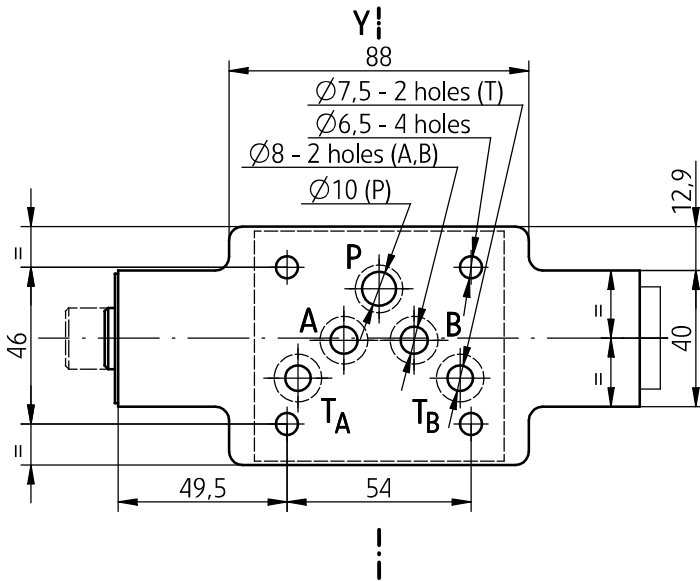
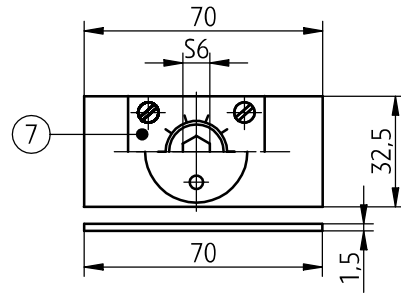
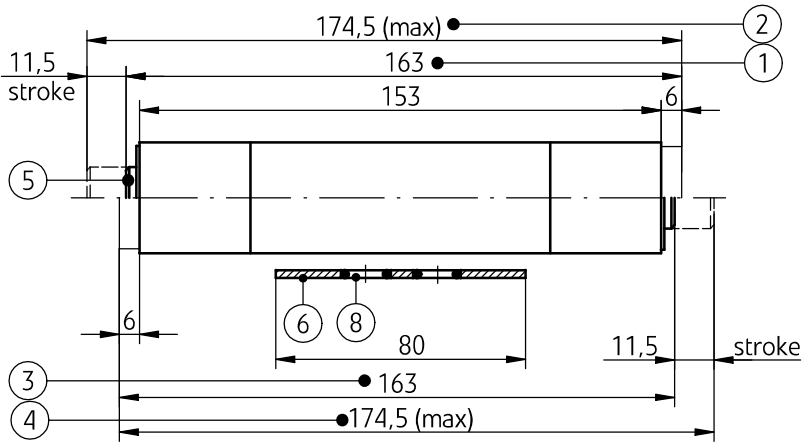
double version Z2FS10...



- 1,2 - Overall dimensions for the valve version Z2FS10... with throttling effect in ports **A, B**
  - 3 - Adjustment screw; rotation to the right - increasing flow throttling effect; rotation to the left - decreasing flow throttling effect
  - 4 - Seal ring plate - enables to arrange throttling effect in the supply or in the drain by changing the way in which the valve is fitted in relation to the plate - rotation the valve about the axis Y by 180° (see examples on page 5)
  - 5 - Plate with adjustment scale and valve scheme
  - 6 - Seal **o-ring 12 x 2** - 5 pcs/kit (P, TA, TB, A, B)
  - 7 - Mounting holes configuration of a subplate in accordance with the standards listed below:
    - CETOP RP 121H - symbol CETOP 4.2-4-05 (nominal size CETOP 05)
    - ISO 4401 - symbol ISO 4401-05-04-0-94
  - 8 - Required surface finish of a subplate
- NOTE:**
- (\*) - Required length of the screws **L** is related to type and the number of hydraulic components sandwich fitted

# OVERALL AND CONNECTION DIMENSIONS

single versions: Z2FS10A...; Z2FS10B...



- 1.2 - Overall dimensions for the valve version Z2FS10A... with supply throttling in port **A** or drain throttling in port **B**
- 3.4 - Overall dimensions for the valve version Z2FS10B... with supply throttling in port **B** or drain throttling in port **A**
- 5 - Adjustment screw; rotation to the right - increasing flow throttling effect; rotation to the left - decreasing flow throttling effect
- 6 - Seal ring plate - enables to arrange throttling effect in the supply or in the drain by changing the way in which the valve is fitted in relation to the plate - rotation the valve about the axis **Y\*** by 180° (see examples on page 5)

**NOTE:**

- (\*) - For the valve version with throttling effect in only one port (**A** or **B**) at the same time changes the throttling location (from port **A** to **B** or from port **B** to **A**)
- 7 - Plate with adjustment scale and valve scheme
- 8 - Seal o-ring 12 x 2 - 5 pcs/kit (P, T<sub>A</sub>, T<sub>B</sub>, A, B)
- 9 - Mounting holes configuration of a subplate in accordance with the standards listed below:
  - CETOP RP 121H - symbol CETOP 4.2-4-05 (nominal size CETOP 05)
  - ISO 4401 - symbol ISO 4401-05-04-0-94
- fixing screws M6 x L\*\* - 10.9 - 4 pcs/kit in accordance with PN - EN ISO 4762 tightening torque **Md = 15 Nm**
- 10- Required surface finish of a subplate

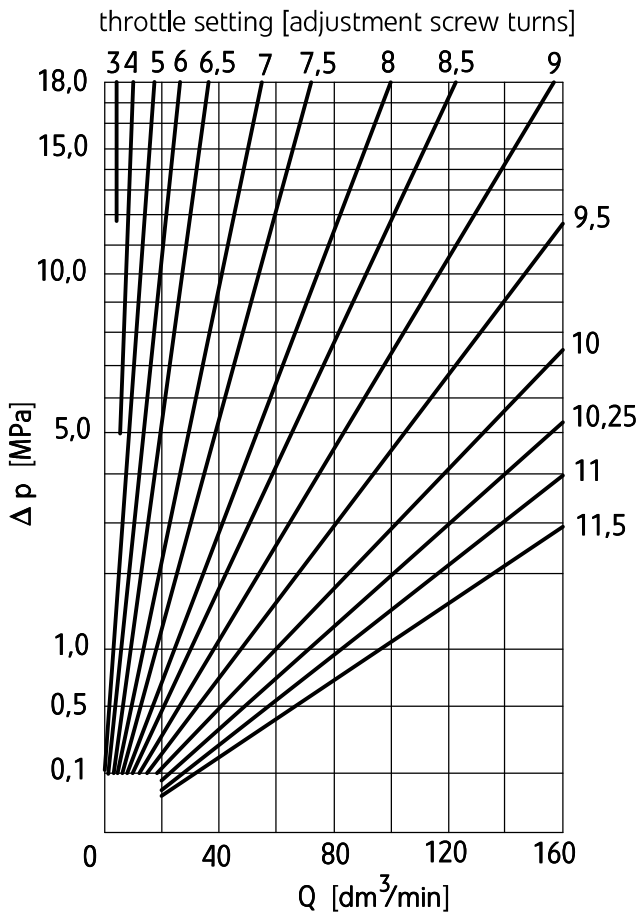
**NOTE:**

(\*\*) - Required length of the screws **L** is related to type and the number of hydraulic components sandwich fitted

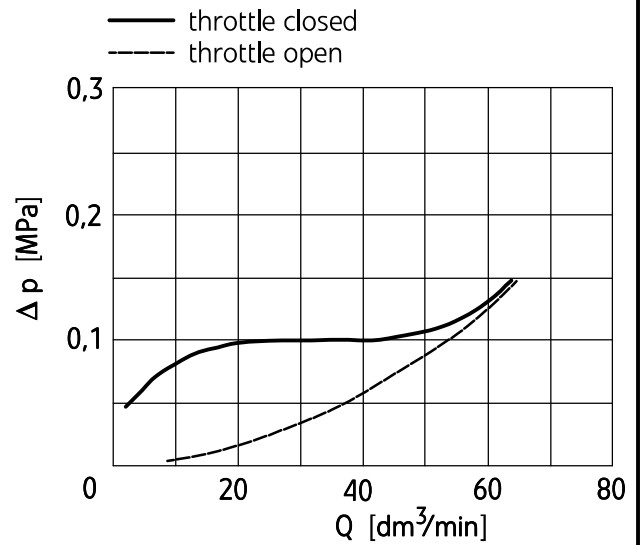
## PERFORMANCE CURVES

measured at viscosity  $\nu = 41 \text{ mm}^2/\text{s}$  and temperature  $t = 50^\circ\text{C}$

Characteristic curves  $\Delta p(Q)$  for the valve type Z2FS10... for various throttle settings

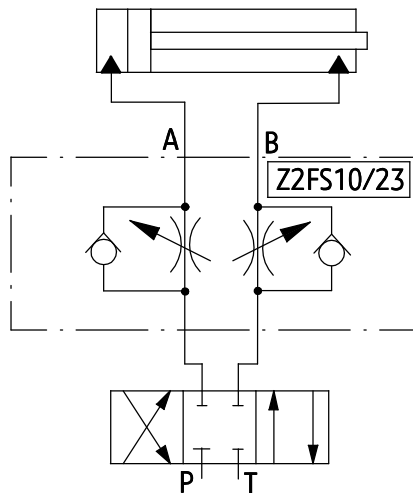


Flow resistance curves  $\Delta p(Q)$  for the check valve

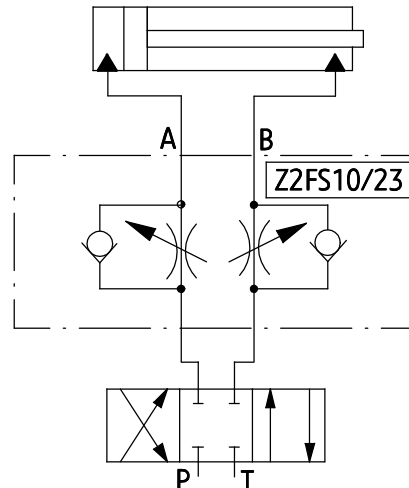


## EXAMPLES OF APPLICATION IN HYDRAULIC SYSTEM

Flow throttling in the supply of the receiver (actuator)



Flow throttling in the drain of the receiver (actuator) - valve fitted in rotated position by  $180^\circ$



## HOW TO ORDER

<b>Z2FS</b>		<b>10</b>	/		*
<b>Nominal size (NS)</b> <b>NS10</b>		= 10			
<b>Throttling location</b> (hydraulic schemes on page 2) <b>throttle valves on the side of ports A and B</b>		= no code			
throttle valve on the side of <u>port A</u> in the supply or <u>port B</u> in the drain		= A			
throttle valve on the side of <u>port B</u> in the supply or <u>port A</u> in the drain		= B			
<b>Series number</b> (20-29) - connection and installation dimensions unchanged		= 2X			
<b>series 23</b>		= 23			
<b>Sealing</b> <b>NBR</b> (for fluids on mineral oil base)		= no code			
FKM (for fluids on phosphate ester base)		= V			
Further requirements in clear text (to be agreed with the manufacturer)					

### NOTES:

The throttle/check valve should be ordered according to the above coding.

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

Coding example: Z2FS10/23

## SUBPLATES AND FIXING SCREWS

Subplates must be ordered according to catalogue sheet

**WK 496 520.** Subplate symbols:

G 66/01 - threaded connections G 3/8

**G 67/01** - threaded connections **G 1/2**

G 89/01 - threaded connections G 1/4

G 67/02 - threaded connections M22 x 1,5

Subplates and screws fixing the throttle/check valve

**M6 x L\*** - 10,9 - 4 pcs/kit in accordance with

PN - EN ISO 4762 must be ordered separately.

Tightening torque **Md = 15 Nm**

### NOTES:

(\*) - Required length of the screws L is related to type and the number of hydraulic components sandwich fitted.

The subplate symbol in bold is the preferred version available in short delivery time.

PONAR Wadowice S.A.  
ul. Wojska Polskiego 29  
34-100 Wadowice  
tel. +48 33 488 21 00  
fax. +48 33 488 21 03  
[www.ponar-wadowice.pl](http://www.ponar-wadowice.pl)

