

Throttle check valve

Type Z2FS



- ▶ Size 16
- ▶ Component series 3X
- ▶ Maximum operating pressure 350 bar
- ▶ Maximum flow 250 l/min

Features

- ▶ Sandwich plate design
- ▶ For use in vertical stackings
- ▶ Porting pattern according to ISO 4401-07-07-0-05
- ▶ For flow limitation of 2 actuator ports
- ▶ Adjustment type: Spindle with internal hexagon
- ▶ For supply or discharge throttling
- ▶ Corrosion-protected design, optional

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Ordering code

01	02	03	04	05	06	07	08	09	10
Z2FS	16		8	-	3X	/			*

01	Twin throttle check valve, sandwich plate design	Z2FS
02	Size 16	16
03	Throttle check valve side A and B	- ◇
	Throttle check valve side A	A
	Throttle check valve side B	B

Adjustment type


04	Spindle with internal hexagon	8
05	Component series 30 ... 39 (30 ... 39: unchanged installation and connection dimensions)	3X
06	Supply throttling	S
	Discharge throttling	S2

Corrosion resistance

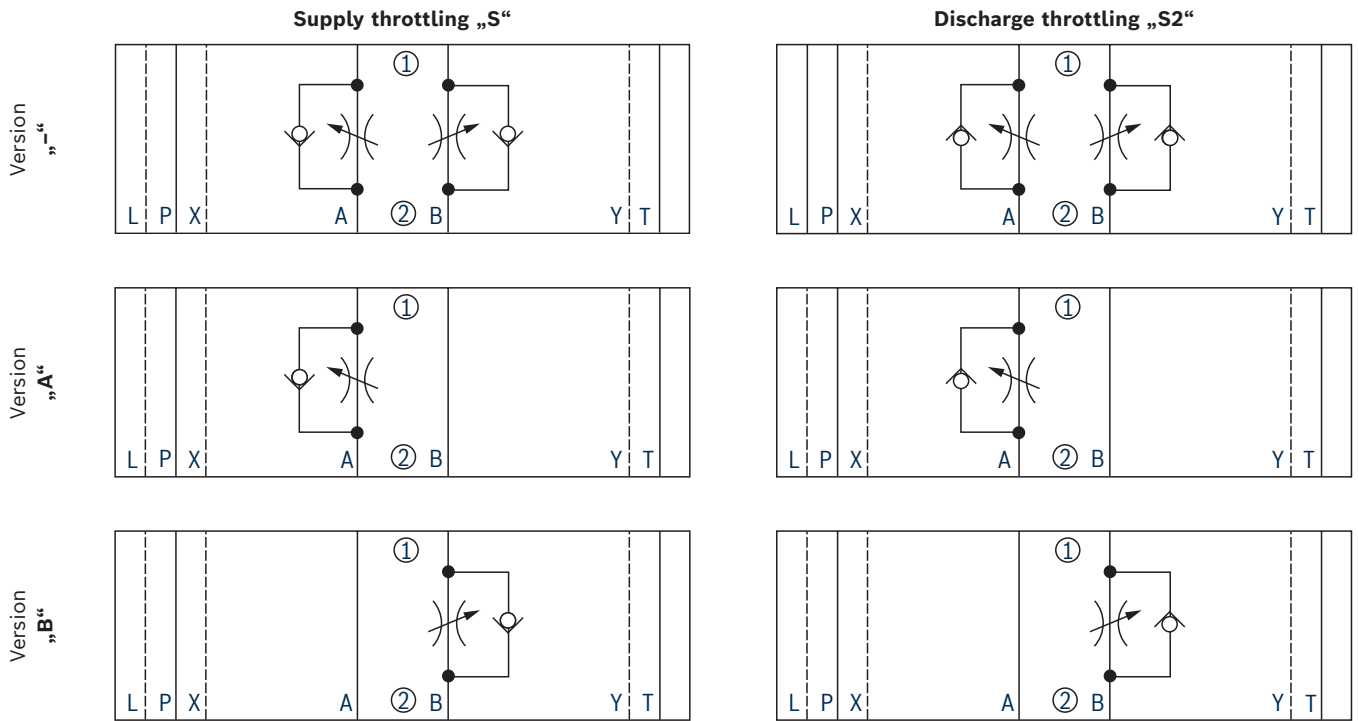
07	None	no code ◇
	Improved corrosion protection (240 h salt spray test according to EN ISO 9227)	J3

Seal material (observe compatibility of seals with hydraulic fluid used, see page 5)

08	NBR seals	no code ◇
	FKM seals	V
09	Further details in the plain text	

 **Notice:** ◇ = Preferred type

Symbols (1 = component side, 2 = plate side)



Function, section

The Z2FS-type valve is a throttle check valve in sandwich plate design. It is used to limit the flow of one or two actuator ports.

Two throttle check valves aligned symmetrically to each other limit the flow in one direction (using an adjustable throttle spool) and allow free return flow in the opposite direction.

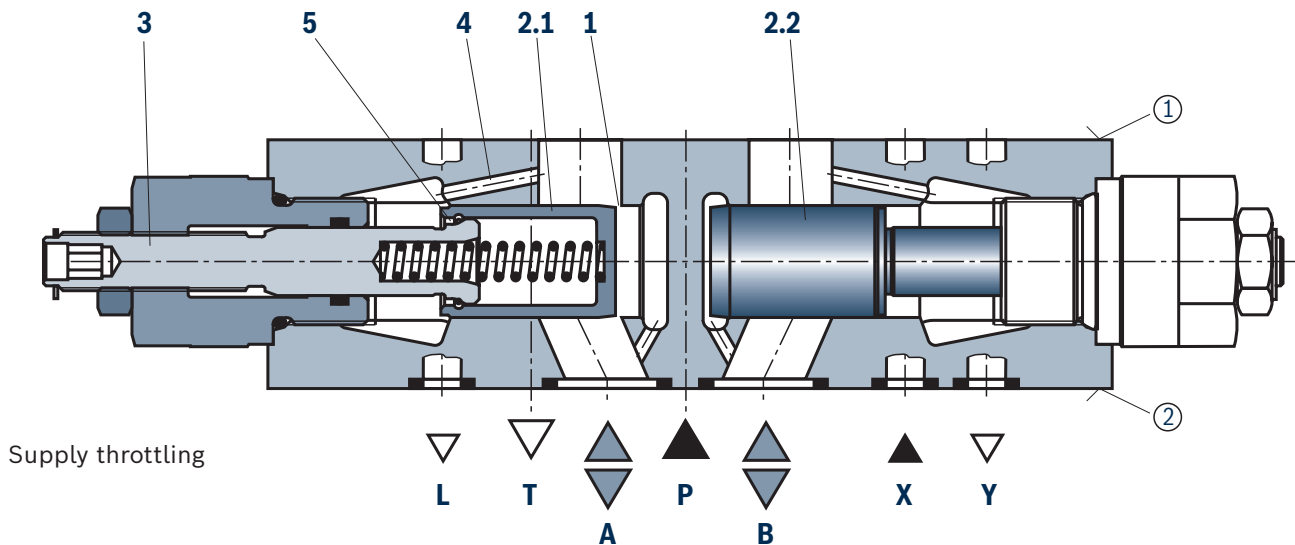
During supply throttling, the hydraulic fluid arrives at actuator A② via channel A① via the throttling point (1). The throttle spool (2.1) can be adjusted axially via the spindle (3), thus enabling the throttling point to be set (1).

Simultaneously, the hydraulic fluid that is present in channel A① reaches the piston side (5) via the bore (4). In addition to the spring force, the applied pressure holds the throttle spool (2.1) in throttle position.

The hydraulic fluid flowing back from actuator B② displaces throttle spool (2.2), thus enabling unhindered flow as a check valve. Depending on the version (“S” or “S2”), the throttle effect can occur in the supply or in the discharge.

Flow limitation

For changing the speed of an actuator, throttle check valve is installed between the directional valve and the subplate.



① = component side

② = plate side

Technical data

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

general	
Type of connection	Sandwich plate design
Porting pattern	ISO 4401-07-07-0-05
Weight	kg Approx 4.7
Installation position	Any
Ambient temperature range	°C -20 ... +80 (NBR seals) -15 ... +80 (FKM seals)

hydraulisch	
Maximum operating pressure	bar 350 ¹⁾
Hydraulic fluid	See table below
Hydraulic fluid temperature range	°C -20 ... +80 (NBR seals) -15 ... +80 (FKM seals)
Viscosity range	mm ² /s 10 ... 800
Maximum admissible degree of contamination of the hydraulic fluid; cleanliness class according to ISO 4406 (c)	Class 20/18/15 ²⁾
Maximum flow	l/min 250
Cracking pressure	bar 0.3

Hydraulic fluid	Classification	Suitable sealing materials	Standards	Data sheet
Mineral oils	HL, HLP, HLPD, HVLP, HVLPD	NBR, FKM	DIN 51524	90220
Bio-degradable	▶ Insoluble in water	HETG	ISO 15380	90221
		HEES		
	▶ Soluble in water	HEPG	ISO 15380	
Flame-resistant	▶ Water-free	HFDU (glycol base)	ISO 12922	90222
		HFDU (ester base)		
		HFDR		
	▶ Containing water	HFC (Fuchs: Hydrotherm 46M, Renosafe 500; Petrofer: Ultra Safe 620; Houghton: Safe 620; Union: Carbide HP5046)	ISO 12922	90223

Important information on hydraulic fluids:

- ▶ For further information and data on the use of other hydraulic fluids, please refer to the data sheets above or contact us.
- ▶ There may be limitations regarding the technical valve data (temperature, pressure range, life cycle, maintenance intervals, etc.).
- ▶ The ignition temperature of the hydraulic fluid used must be 50 K higher than the maximum surface temperature.
- ▶ **Bio-degradable and flame-resistant – containing water:**
If components with galvanic zinc coating (e.g. version „J3“ or „J5“) or parts containing zinc are used, small amounts of dissolved zinc may get into the hydraulic system and cause accelerated aging of the hydraulic fluid. Zinc soap may form as a chemical reaction product, which may clog filters, nozzles and solenoid valves – particularly in connection with local heat input.

▶ Flame-resistant – containing water:

Due to the increased cavitation tendency with HFC hydraulic fluids, the life cycle of the component may be reduced by up to 30% as compared to the use with mineral oil HLP. In order to reduce the cavitation effect, it is recommended - if possible specific to the installation - to back up the return flow pressure in ports T to approx. 20% of the pressure differential at the component.

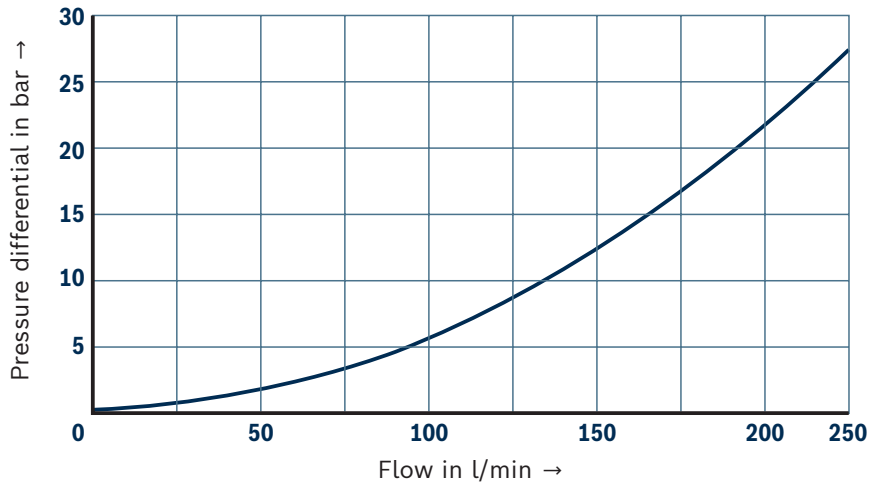
¹⁾ Load cycles maximum 4 million.

²⁾ The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and at the same time increases the life cycle of the components.

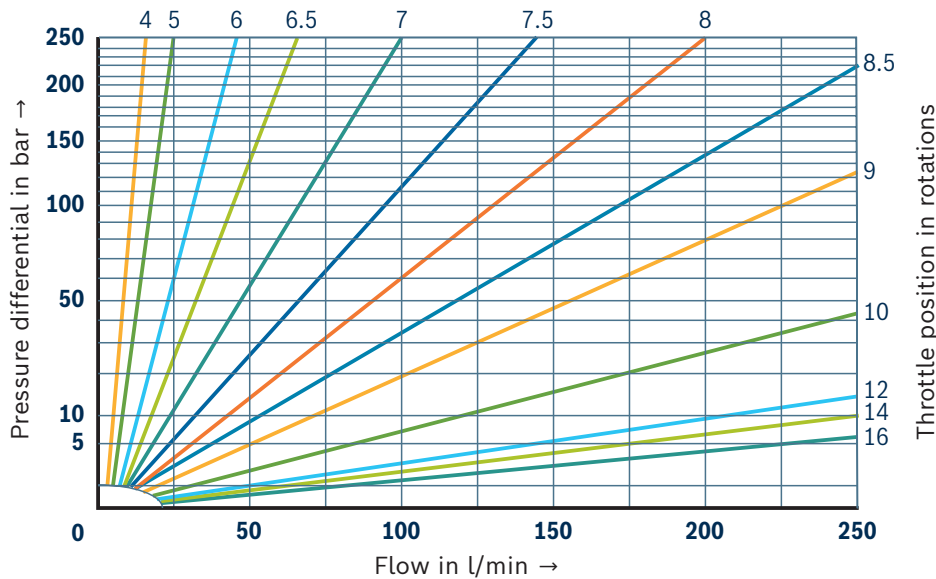
Characteristic curves

(measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$)

Δp - q_v characteristic curves (via check valve)

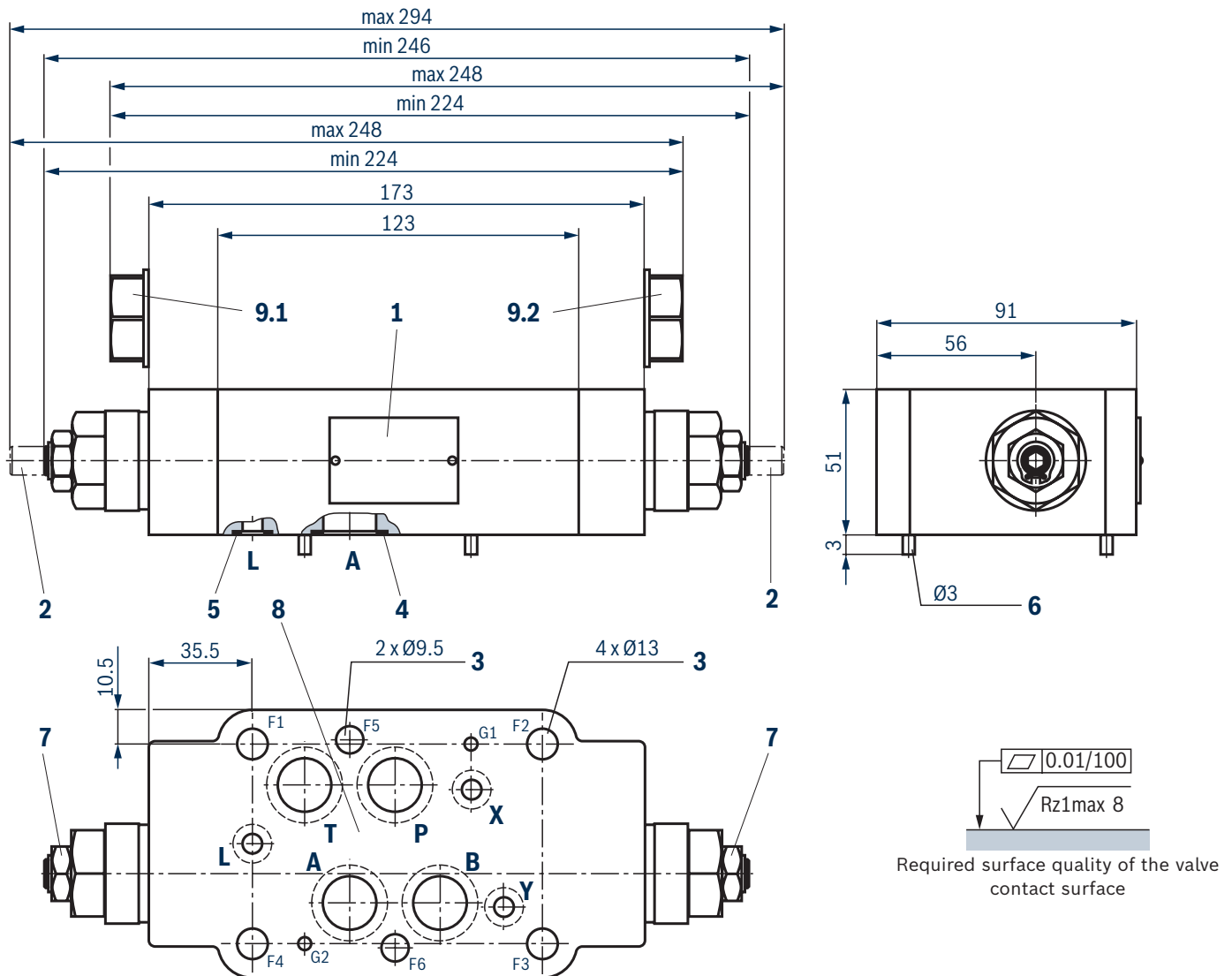


Δp - q_v characteristic curves (Throttle position constant)



- Notes:**
- ▶ At inlet pressure 100 bar and throttle closed, maximum Leakage 0.8 l/min.
 - ▶ Typical characteristic curves which are subject to tolerance variations.

Dimensions (dimensions in mm)



- 1 Name plate
- 2 Adjustment type "8"
Spindle for changing the flow cross-section (internal hexagon SW6)
 - ▶ Anti-clockwise rotation = higher flow
 - ▶ Clockwise rotation = smaller flow
- 3 Through holes for valve mounting
- 4 Identical seal rings for ports A, B, P, T
- 5 Identical seal rings for ports X, Y, L
- 6 Locking pin (not included in the scope of delivery)
- 7 Hexagon SW19, tightening torque $M_A = 25\text{ Nm} \pm 10\%$
- 8 Porting pattern according to ISO 4401-07-07-0-05
- 9.1 Plug screw for version „B“
- 9.2 Plug screw for version „A“

Valve mounting screws (separate order)

- 4 hexagon socket head cap screws ISO 4762 - M10 - 10.9
- 2 hexagon socket head cap screws ISO 4762 - M6 - 10.9-

Notes:

- ▶ Length and tightening torque of the valve mounting screws must be calculated according to the components mounted under and over the sandwich plate valve..
- ▶ The dimensions are nominal dimensions which are subject to tolerances.

Further information

- ▶ Hydraulic fluids on mineral oil basis
 - ▶ Environmentally compatible hydraulic fluids
 - ▶ Flame-resistant, water-free hydraulic fluids
 - ▶ Flame-resistant hydraulic fluids - containing water (HFAE, HFAS, HFB, HFC)
 - ▶ Reliability characteristics according to EN ISO 13849
 - ▶ Hydraulic valves for industrial applications
 - ▶ Information on available spare parts
- Data sheet 90220
Data sheet 90221
Data sheet 90222
Data sheet 90223
Data sheet 08012
Operating instructions 07600-B
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