MANNESMANN REXROTH

Meter out pressure compensator
Sandwich plate design
Type SCA... /Series 2X

Sizes 16, 25	up to 315 bar	up to 325 L/min

RE 29 247/02.96

Replaces: 09.87

– Sandwich plate design

– Load compensation in lines A + B, or only A, or only B, used in conjunction with a pilot operated proportional directional valve

– Leak tight closing in one or both service lines

– Connection dimensions to DIN 24 340 Form A, ISO 4401 and CETOP-RP 121 H

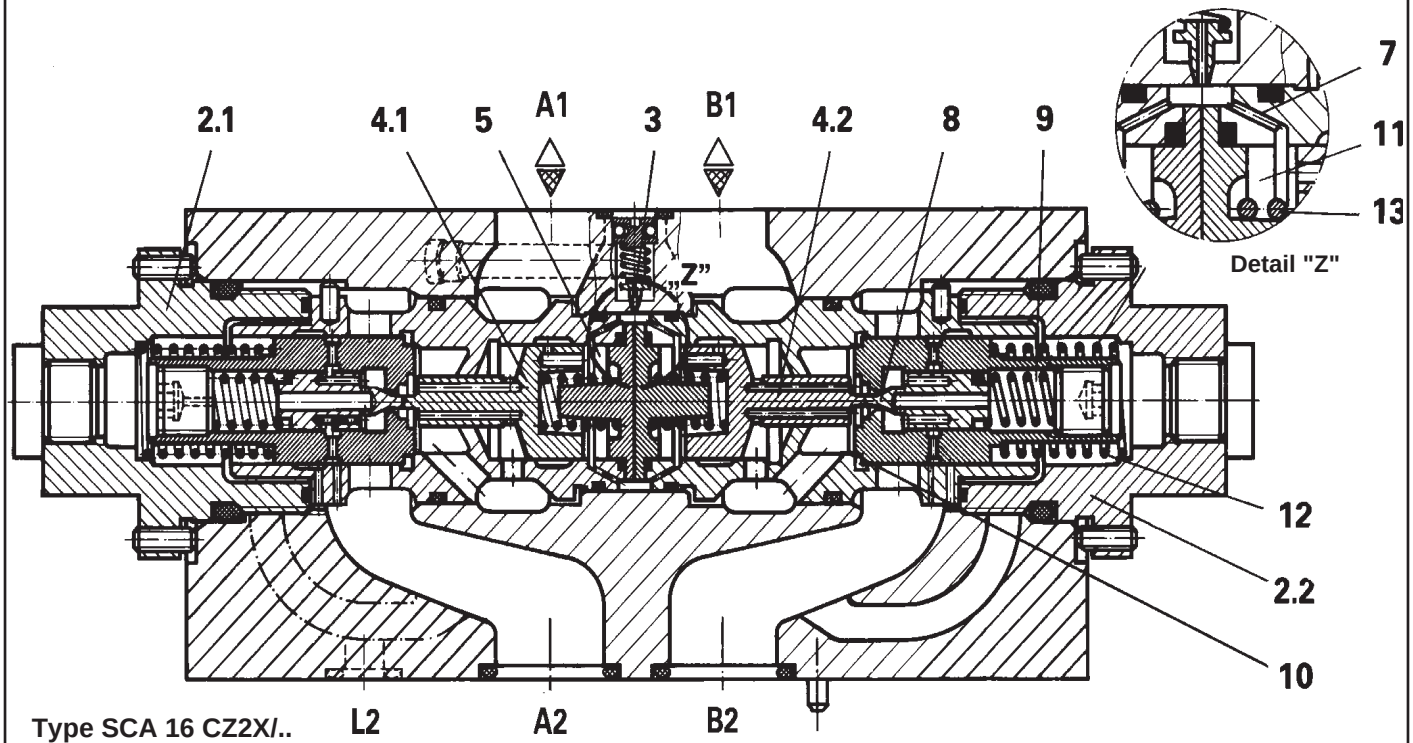
K 3807/5

Type SCA 16 CZ2X/..

Description of function, Section

This valve is used in conjunction with a proportional directional valve to form a meter out flow control circuit to control both negative and positive loads.
Service ports A2 and B2 may be locked to support loads.
The value and direction of an oil flow can be set at the potentiometer controlling the proportional directional valve.
If, for example, the pump is directed to port A1, oil flows via valve set (2.1) to the actuator. Valve set (2.1) in this case, functions as a non return valve. At the same time, a pilot oil flow is taken from the main oil flow, and passes through the pilot piston (4.1) (acting as a pressure compensated flow control), into chamber (5). This pilot flow causes a pressure to build up at the relief valve (3), and an the pilot piston (4.2), via orifice (7), on the B side.

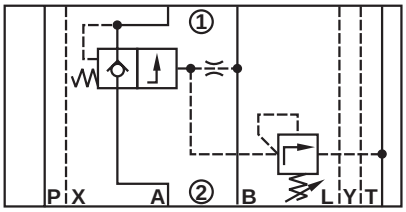
In addition, the outlet of the pressure relief valve is connected to the T port of the main valve.
The unloading poppet (8) thus cuts off the connection to the load pressure. The pressure before the proportional valve is then present in chamber (9) via the pressure take off at the unloading poppet (8). Pressure is also present on both the full bore and the annulus sides of the opening piston (4.2)
The pressure drop from B to T via the proportional directional valve is thus held constant. This pressure drop in controlled by land (10), and is the pressure in chamber (11) minus the spring (12). The force of spring (13) plays no part at this stage.
When the pump pressure is directed to port B, valve set (2.1) operates in exactly the same way in port A.



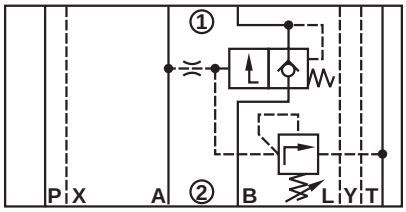
Type SCA 16 CZ2X/..

Simplified symbols (Subscripts: ① = Component Side, ② = Mounting Interface Side)

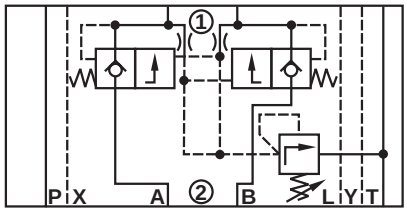
Type SCA.. AZ2X/...



Type SCA.. BZ2X/...

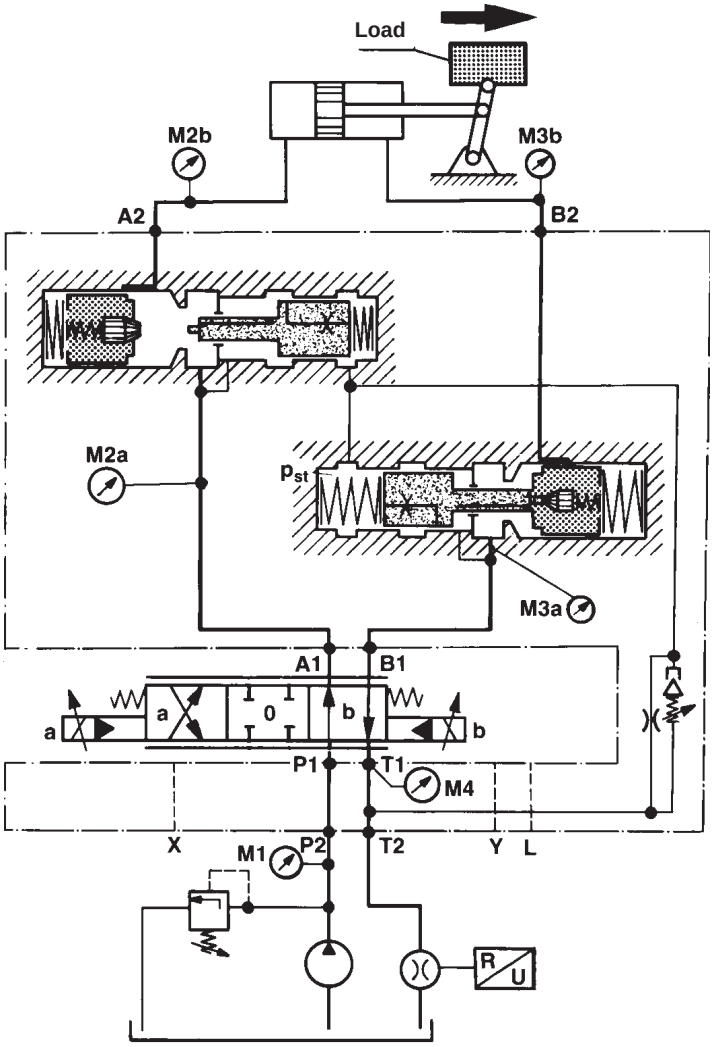


Type SCA.. CZ2X/...



Typical circuit (detailed)

Operation in lines A and B



Ordering Code

SCA			Z	2X	/		*

Meter out pressure compensator = **SCA**

Size 16 = **16**
Size 25 = **25**

Operation in line A = **A**
Operation in line B = **B**
Operation in lines A and B = **C**

Special insulations on request!
Valve types which result from the order variations in the grey-shaded areas are available at short notice!

Further details in clear text

M = NBR seals, suitable for mineral oil to DIN 51 524 (HL, HLP)

V = FPM seals, suitable for phosphate ester (HFD-R)

2X = Series 20 to 29 (20 to 29: installation and connection dimensions remain unchanged)

Z = Sandwich plate design

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

Operating Pressure:
– Ports A1, A2, B1, B2, p_{max} 315 bar
Warning: When used with single rod cylinders, beware of intensification.
– Ports T1, T2 separat to tank
– Ports X1, X2 max. 315 bar
– Ports Y1, Y2 max. 30 bar

Flow:
Size 16 max. 130 L/min
Size 25 max. 325 L/min

Min. pressure differential: } see diagrams
Flow resistance: } pages 3,4 and 5

Dynamic charact: (measured at a load pressure of 150 bar with prop. valve type 4WRZ $\frac{16}{25}$ E $\frac{150}{325}$ ...)

Size	Response in % [1] (type 4WRZ... + type SCA...)	$q_{V\,min}$ to $q_{V\,max}$ $T_u + T_g$ in ms	$q_{V\,max}$ to $q_{V\,min}$ $T_u + T_g$ in ms
16	0 to 100	270	80
	50 to 75	100	70
25	0 to 100	280	200
	50 to 75	130	100

[1]) 100 % input signal = 700 mA Solenoid current T_g = setting time T_u = signal delay

Pilot oil volume
from pressure relief valve to tank:
for size 16 max. 1,8 L/min
for size 25 max. 2,5 L/min

Pressure/Flow relationship:
see diagrams pages 4 and 5

Fluids: Mineral oil to DIN 51 524 (HL, HLP)
Phosphate ester (HFD-R)

Maximum degree of contamination of the fluid
to NAS 1638 classes 7 to 9. We therefore recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$.

Fluid temperature range: – 20 to + 70 °C

Viscosity range: 15 to 380 mm²/s

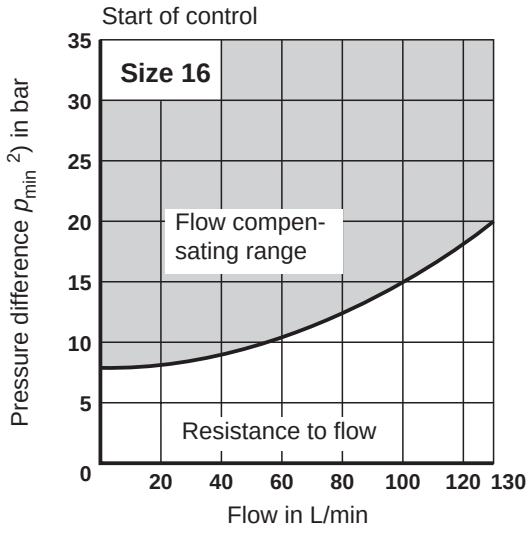
Installation position: optional

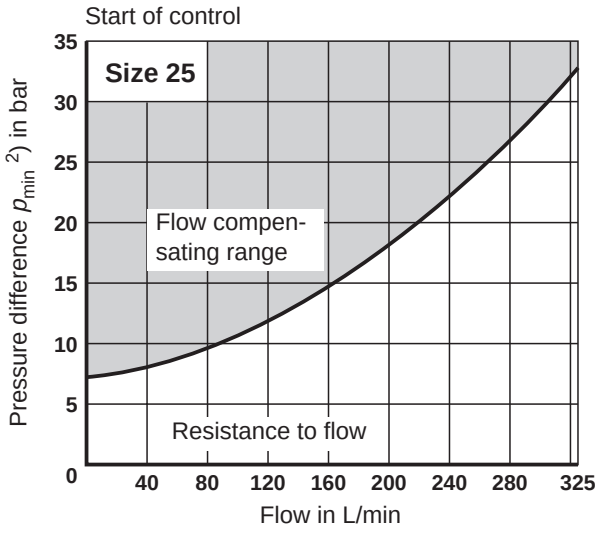
Weights: Size 16 6,0 kg
Size 25 11,3 kg

Note: Good settling characteristics are achieved with systems having natural frequencies > 4 Hz.

Operation Curves (measured at ν = 41 mm²/s and t = 50 °C)

Minimum differential pressure $\Delta p = f(q_V)$



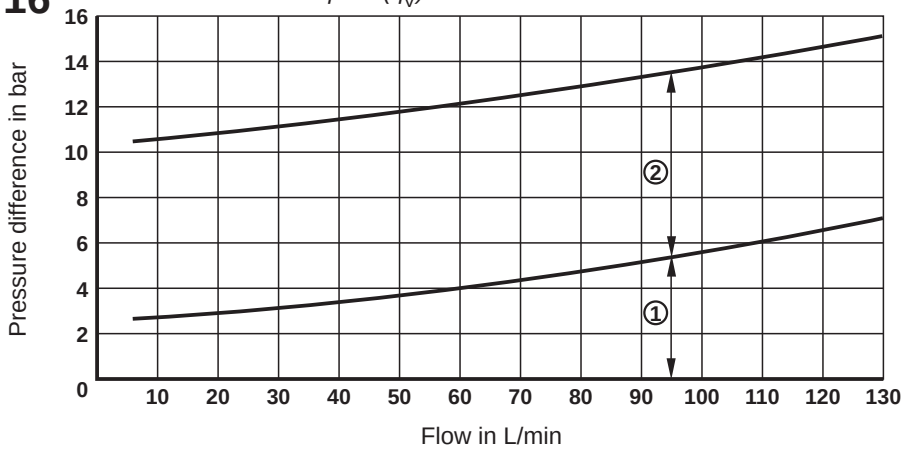


[2]) $p_{min} = p_{M3b} - p_{M4}$ (For test points M3b, M4 see page 2)

Operating Curves (measured at ν = 41 mm²/s and t = 50 °C)

Size 16

Resistance to flow $\Delta p = f(q_V)$

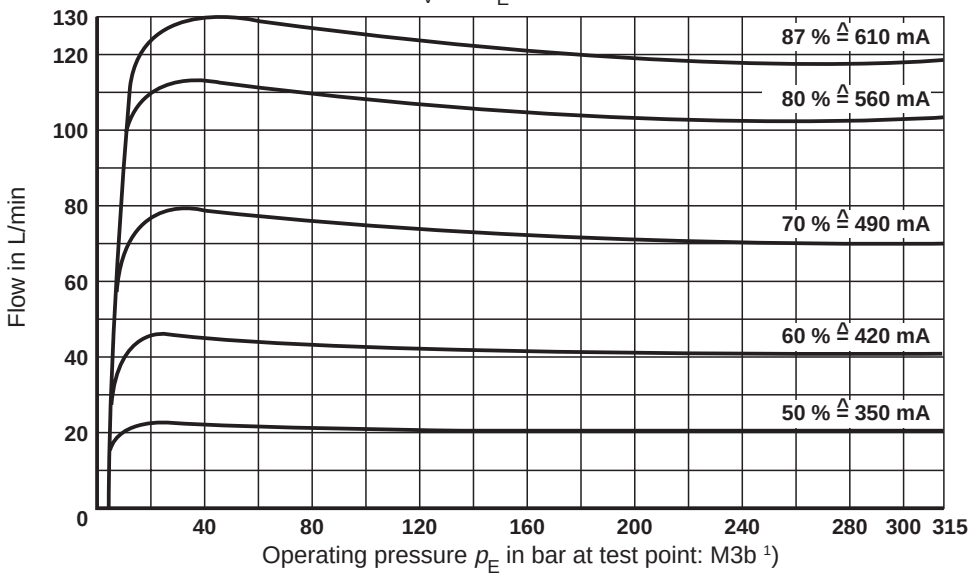


① Resistance in flow:
Non return valve function
(Test point: M2a - M2b or M3a - M3b) [1])

② Resistance to flow at proportional directional valve input land
(Test point: M1 - M2a or M4 - M3a) [1])

Note:
In the "one side" model, "no compensator in A",the resistance to flow in the "A" line M1 - M2a (8 bar).
In the "one side" model "no compensator in B", the resistance to flow in the "B" line M3a - M4 (8 bar).

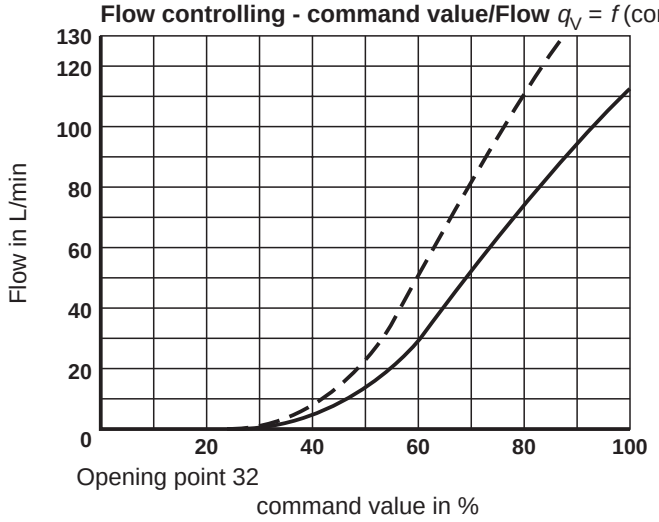
Flow/Pressure relationship $q_V = f(p_E$ + command value); command value constant



p_E-Test point M3b [1]) in ports A and B.

Note:
The diagram refers to a spool for 150 L/min nominal flow (Valve Type 4WRZ 16 E150..)

Flow controlling - command value/Flow $q_V = f$ (command value)



Meter out pressure compensator Type SCA 16...
with proportional directional valve
Type 4WRZ 16 E100... ——————
Type 4WRZ 16 E150... — — — —
(P → A, B → T)

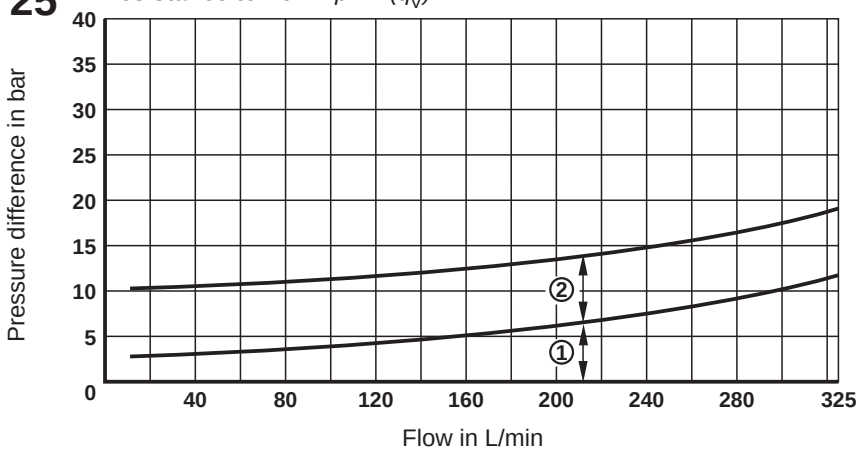
Curve $q_V = f$ (command value) in ports A and B;
p_E = 50 bar constant at test point M3b [1])

[1]) see cicuit page 2

Operating Curves (measured at v = 41 mm²/s and t = 50 °C)

Size 25

Resistance to flow $\Delta p = f(q_V)$

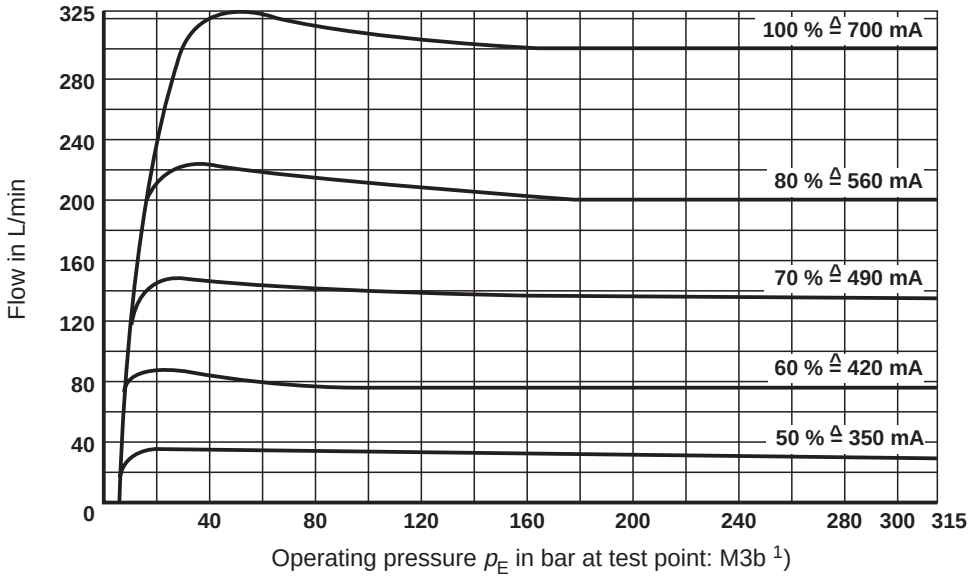


① Resistance to flow:
Non return valve function
(Test point: M2a - M2b or M3a - M3b) [1])

② Resistance to flow at proportional directional valve input land
(Test point: M1 - M2a or M4 - M3a) [1])

Note:
In the "one sided" model, "no compensator in A" the resistance to flow in the "A" line M1 - M2a (8 bar).
In the "one sided" model, "no compensator in B" the resistance to flow in the "B" line M3a - M4 (8 bar).

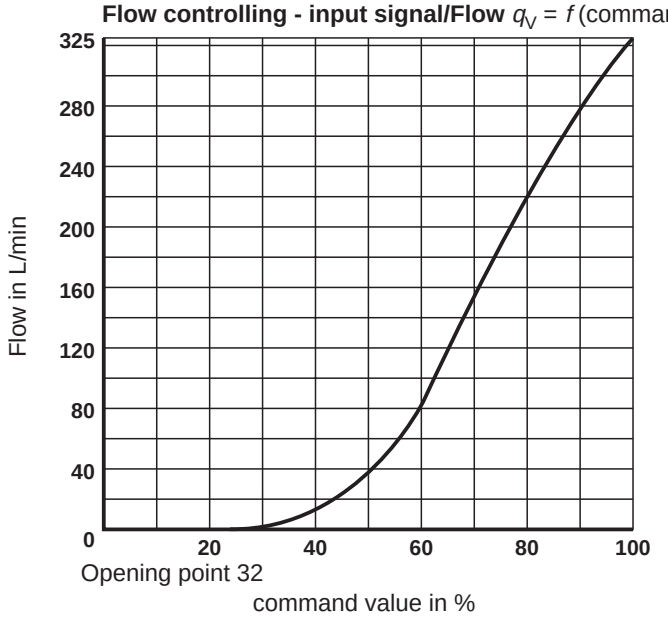
Flow/Pressure relationship $q_V = f(p_E$ + command value); command value constant



p_E-Test point M3b [1]) in ports A and B.

Note:
The diagram refers to a spool for 325 L/min nominal flow (Valve Type 4WRZ 25 E325...)

Flow controlling - input signal/Flow $q_V = f$ (command value)



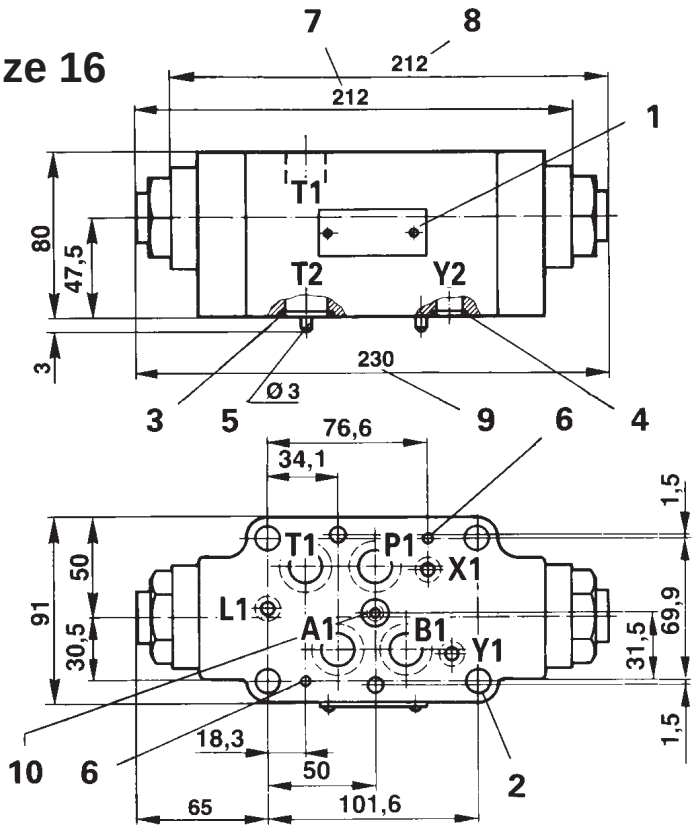
Meter out pressure compensator Typw SCA 25... with proportional directional valve
Type 4WRZ 25 E325...
(P → A)

Curve $q_V = f$ (command value)
p_E = 50 bar constant at test point M3b [1])

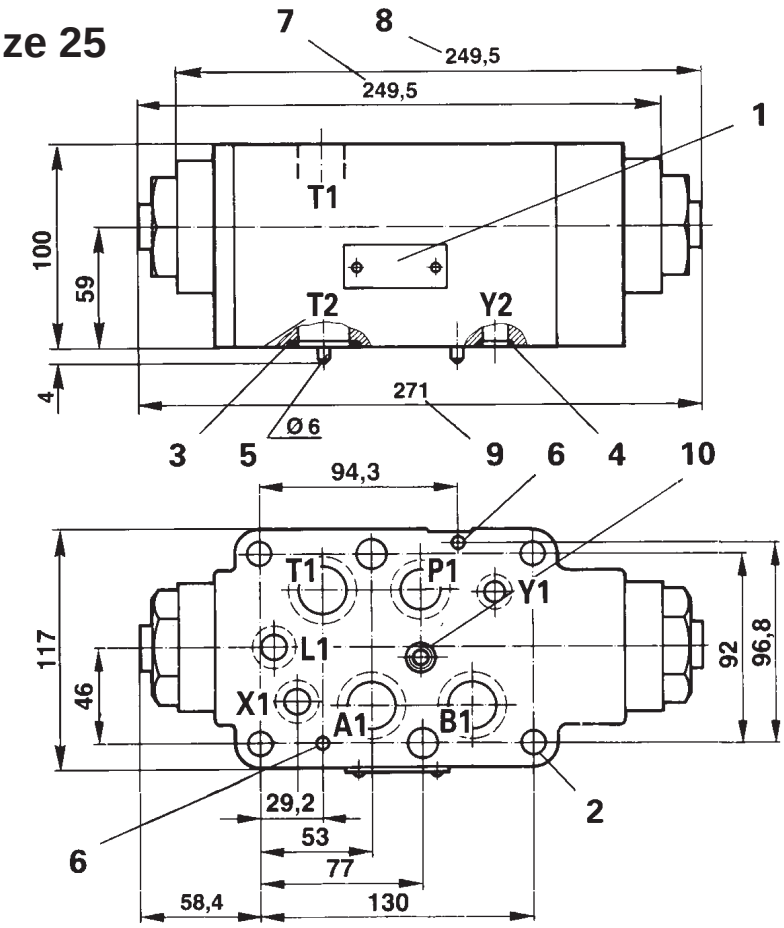
[1]) see circuit on page 2

Unit dimensions (in mm)

Size 16



Size 25



1 Nameplate

2 6 thro' holes for fixing screws

3 R-rings for ports A2, B2, P2, T2
Size 16 R-ring 22,53 x 2,3 x 2,62
Size 25 R-ring 27,8 x 2,6 x 3,0

4 R-rings for ports X2, Y2, L2
Size 16 R-ring 10 x 2,0 x 2,0
Size 25 R-ring 19 x 3,0 x 3,0

5 Locating pin

6 Drilling for locating pin

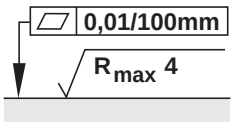
7 Valve operational in port A (Type SCA.. AZ2X/...)

8 Valve operational in port B (Type SCA..BZ2X/...)

9 Valve operational in port A and B (Type SCA..CZ2X/...)

10 Pressure relief valve

Required surface finish of mating piece



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