MANNESMANN REXROTH

Meter-out Check-Q-Meter Sandwich plate Type SC$\frac{A}{B}$ 32.. /Series 1X

RE 29 249/02.96

Size 32	up to 350 bar	up to 700 L/min

Replaces: 12.90

– Sandwich plate model

– Load compensated flow control optionally in line A and B or only in A or only B together with a pilot operated proportional directional control valve **(only W-spool)**

– Brake function optionally in line A and B, or only A or only B together with a pilot operated proportional directional control valve and with or without meter-in pressure compensator

– Leak free isolation, optionally in one or both service ports

– Porting pattern to DIN 24 340 form A32, ISO 4401 and CETOP-RP 121 H

Type SCA 32 Z1X/..

Functional description, section

The type SCA... meter-out check-Q-meter, pressure compensator can, together with a proportional directional control valve, be used as a flow controller for the load compensated control of positive and negative loads.

The type SCB... meter-out check-Q-meter, pressure compensator can, together with a proportional directional control valve, be used as a brake valve for the control of negative loads. When fitted with an additional meter-in pressure compensator, the actuator can be load compensated controlled. Leak free isolation of the A2 and B2 actuator ports for load support.

The volume and direction of flow is set at the command value potentiometer of the proportional directional control valve.

Type SCA
If for example the pump is switched to port A1, the pressure fluid flows via the valve insert (2.1) to the actuator. The valve inserts (2.1) in this case act as a check valve. At the same time the pump pressure is applied to the pressure reducing valve (3). The pressure reducing valve (3) holds a constant pressure in area (4) which acts on the pilot piston (5). In addition the 3rd way of the pressure reducing valve (3) is connected to port T.

The pilot piston (5) opens the unloading poppet (6) against the load pressure in connection B2 and spring chamber (7) (max. 350 bar). Thereby the unloading poppet (6) closes the connection to the load pressure . Now, pressure is present via the internal connection of the unloading poppet (6) in chamber (7) and at the same time in chamber (8) against the pilot piston (5), as well as in front of the proportional directional control valve in port B1.

The pressure drop from B to T across the proportional directional control valve is therefore constant. This pressure drop is controlled by control land (9) and is the pressure difference in chamber (4) minus Δp of the compression springs (10 and 11).

It must be noted that the pump pressure muliplied by the intensification ratio of the cylinder ± the load pressure plus the brake pressure is present in port B2.

If via the proportional directional valve the pump is switched to B, the valve insert (2.1) in A acts as described above.

Type SCB
If the proportional directional control valve switches the pump to port A1, the pressure fluid flows via the valve insert (2.1) to the actuator. The valve insert (2.1) acts in this case as a check valve. At the same time the pressure in port A acts on the pilot poppet (5) via the insert (3.1). The pilot piston (5) opens the unloading poppet (6) against the load pressure (max. 350 bar) present in spring chamber (7). The unloading poppet (6) closes the connection to the load pressure. Now, pressure is present via the internal connection of the unloading poppet (6) in chamber (7) and at the same time in chamber (8) against the pilot piston (5), as well as in front of the proportional directional control valve in port B1.

With a meter-in pressure compensator in port P before the proportional valve, the control land (9) begins to control, when the pressure in port A has fallen due to the pressure drop within the meter-in pressure compensator plus that which is set (10 bar) by the springs (10 and 11). A precondition, is that the area ratio of the actuator (cylinder) and the area ratio of the throttle cross sections in the proportional valve are the same.

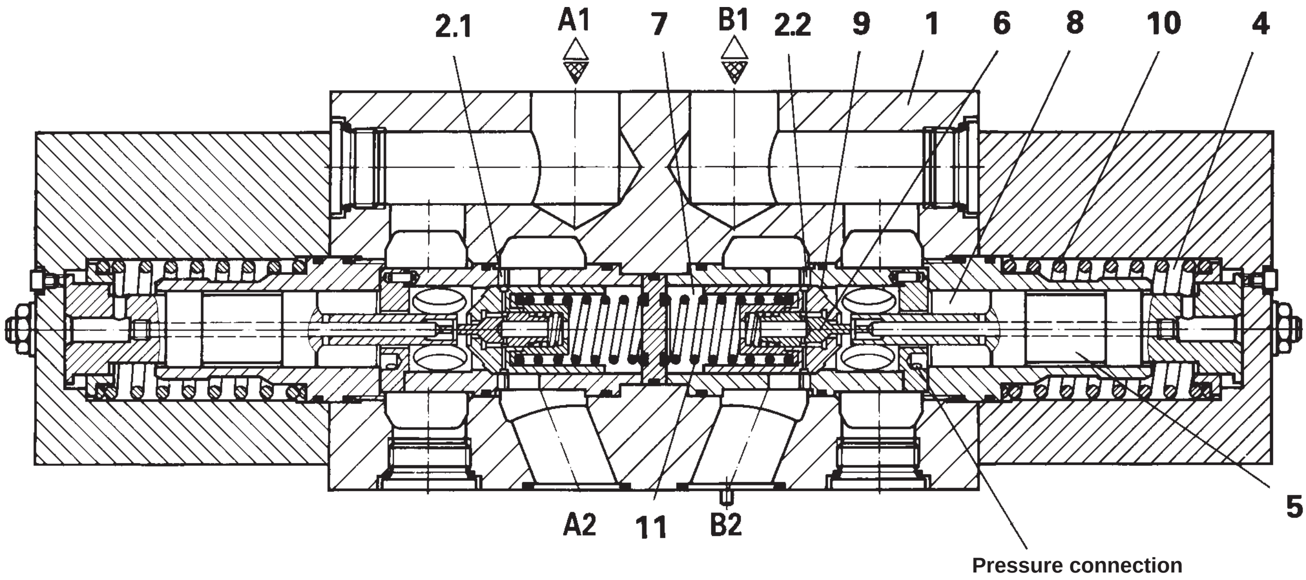
When the brake valve starts to react via the control land (9) then the pressure in port B2 is the sum of the load pressure plus brake pressure [the pressure drop of the meter-in pressure compensator plus the pressure drop (10 bar) resulting from the springs (10 and 11)] multiplied by the cylinder area ratio.

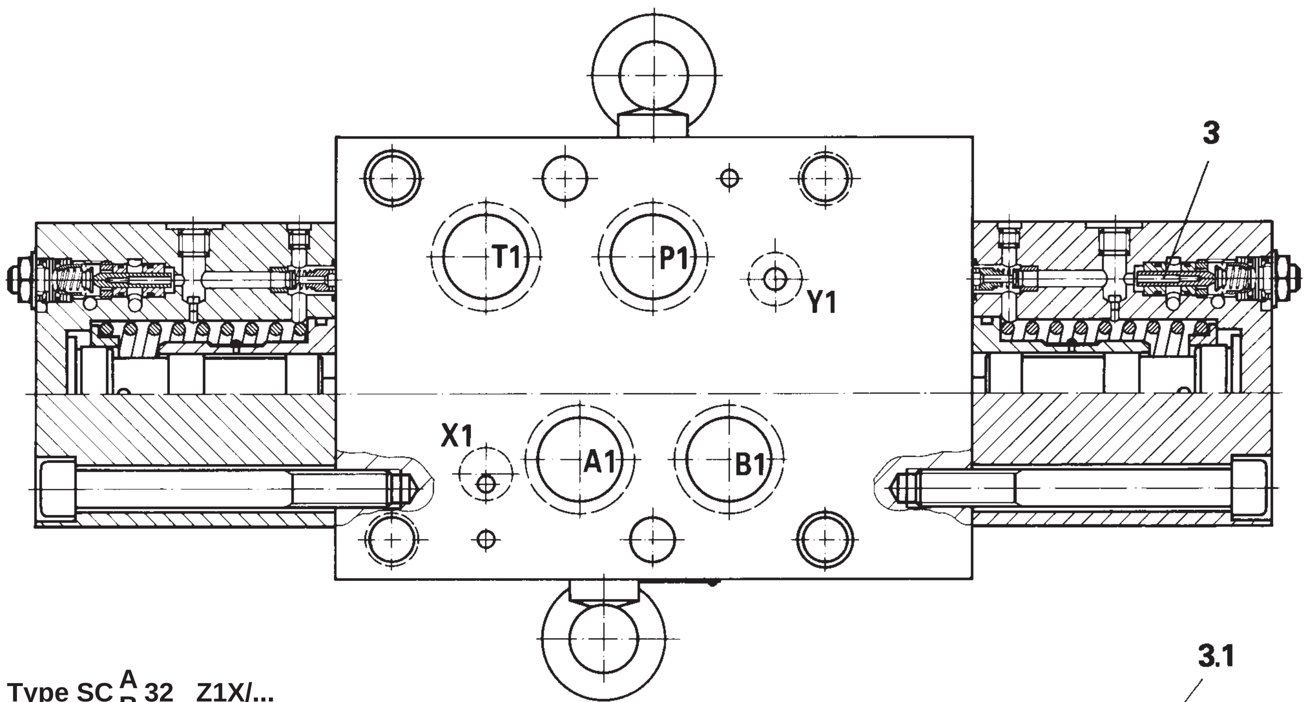
Funtional description, section

The brake valve can also be fitted in the port P before the proportional directional control valve without the meter-in pressure compensator. When the proportional directional control valve is in the switched position where P is to A, the valve insert (2.1) acts as a check valve. Until the pressure in port A is > 0.5 x pump pressure + 5 bar the valve insert (2.2) is fully open at control land (9). If this pressure drops slightly, the control land (9) starts to throttle and controls in port A a constant pressure which is 0.5 x pump pressure + 5 bar.

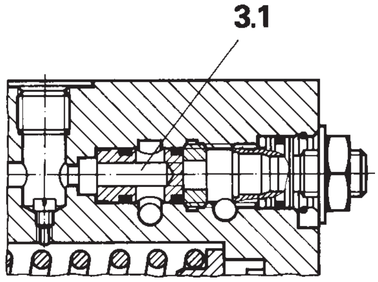
In port B the pressure 0.5 x pump pressure – 5 bar is constant. This pressure is the sum of the pressure drops of P to A and A to T when the area ratio of the cylinder and throttle area are the same.
When the brake valve starts to regulate with the control land (9), then the pressure in connection B2 is the load pressure plus brake pressure (0.5 x pump pressure + 5 bar) multiplied by the area ratio of the cylinder.

When the pump is connected to port B by the proportional valve, valve insert (2.1) operates as described above.





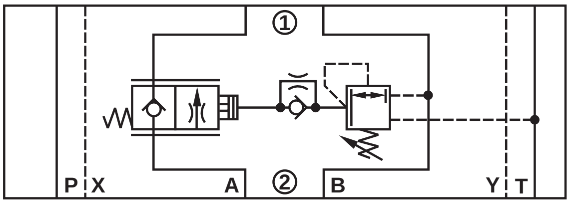
Type SC A/B 32 Z1X/...



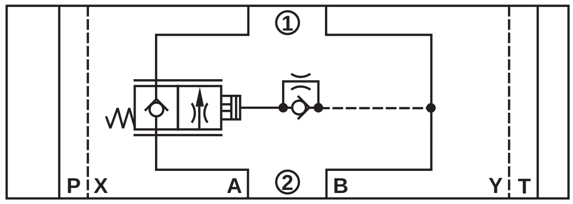
Type SCB 32..Z 1X/...

Symbols, simplified (codes: ① = component side, ② = sub-plate side)

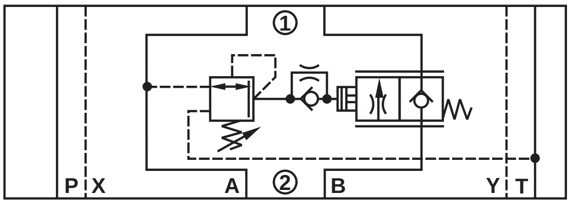
Type SCA 32 AZ1X/...



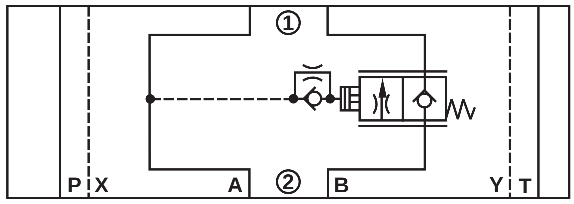
Type SCB 32 AZ1X/...



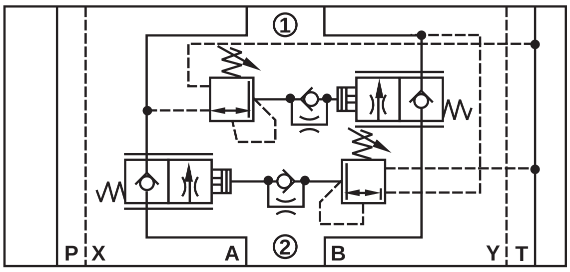
Type SCA 32 BZ1X/...



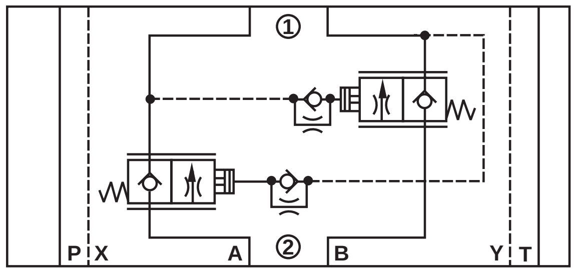
Type SCB 32 BZ1X/...



Type SCA 32 CZ1X/...

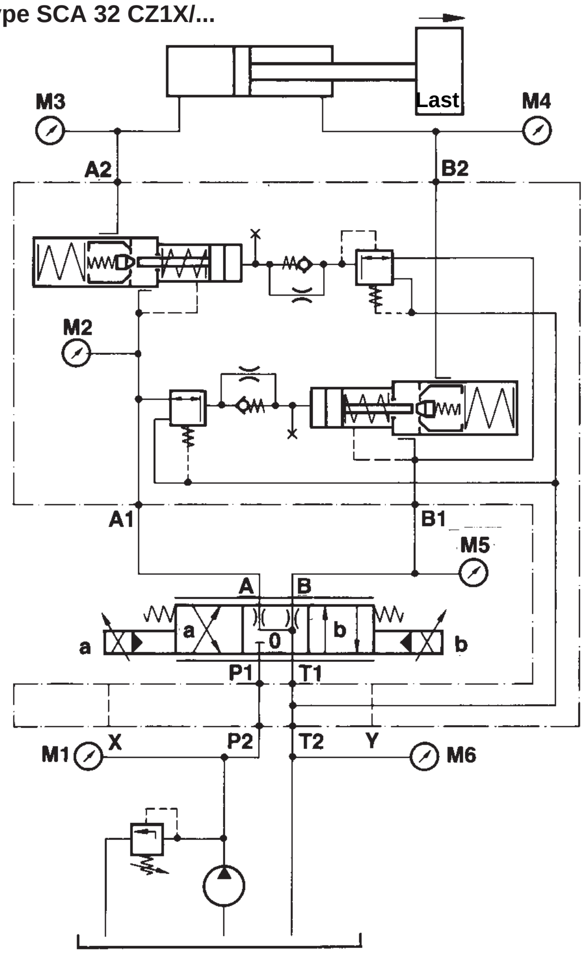


Type SCB 32 CZ1X/...

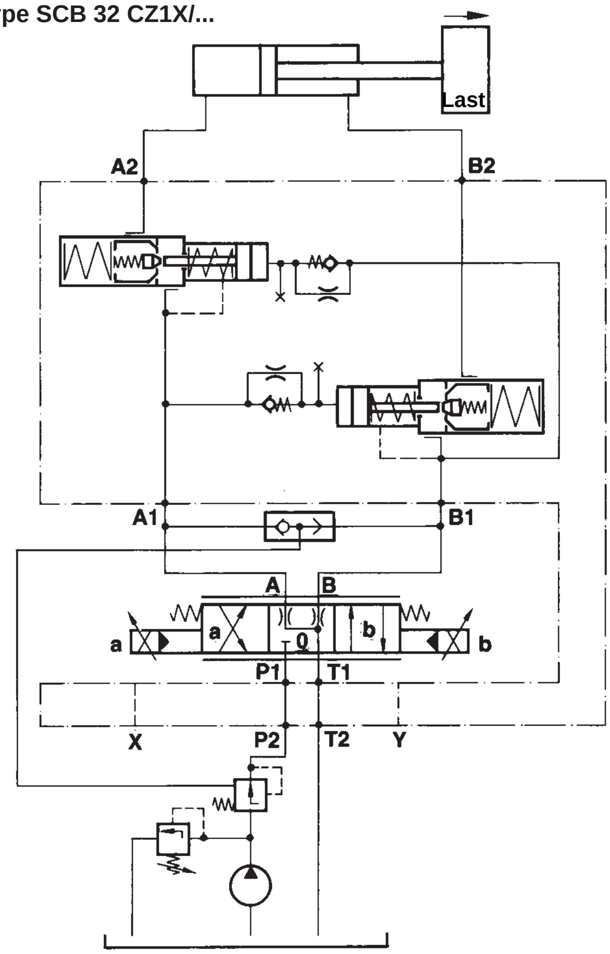


Circuit examples, comprehensive

Type SCA 32 CZ1X/...



Type SCB 32 CZ1X/...



Ordering code

	32		Z	1X /		*

Meter-out check-Q-meter
For load compensation = SCA
As counter balance valve = SCB

Nominal size 32 = 32

Function in line A = A
Function in line B = B
Function in lines A and B = C

Valve types which are marked in grey are readily available!

Further details in clear text

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

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

1X = Series 10 to 19
(10 to 19 : unchanged installation and connection dimensions)

Z = Sandwich plate model

Technical data (for applications outside these parameters, please consult us!)

Operating pressure:
- Ports A1, A2, B1, B2, p_{max} perm. 350 bar
  Attention: When using a single rod cylinder, please note the possibility of pressure intensification!
- Ports T1, T2 separate to tank
- Ports X1, X2 max. 350 bar
- Ports Y1, Y2 max. 30 bar

Flow: max. 700 L/min

Minimum pressure drop: see diagram below

Pressure differential across the check valve: see diagrams on page 5

Pressure/flow characteristics: see diagrams on page 5

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

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

Pressure fluid - temperature range: – 20 to + 70 °C

Viscosity range: 15 to 380 mm^2/s

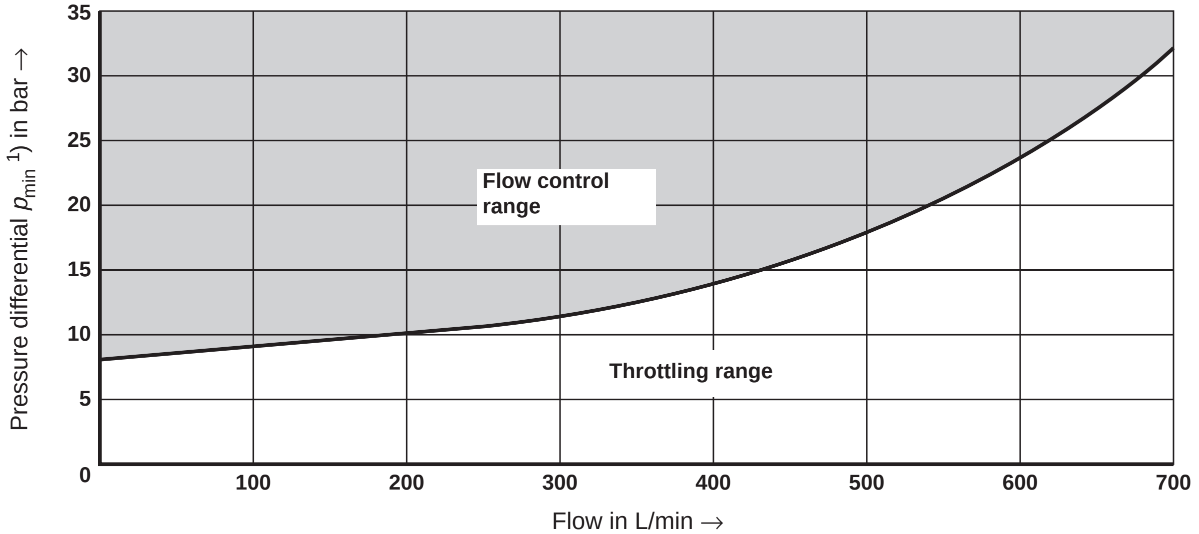
Installation position: optional

Weight:
– Type SC A/B 32 A/B Z1X/.. 81 kg
– Type SC A/B 32 CZ1X/.. 91 kg

Note: Good setting characteristics will be achieved with systems having natural frequencies > 5 Hz.

Characteristic curves (measured at ν = 41 mm^2/s and t = 50 °C)

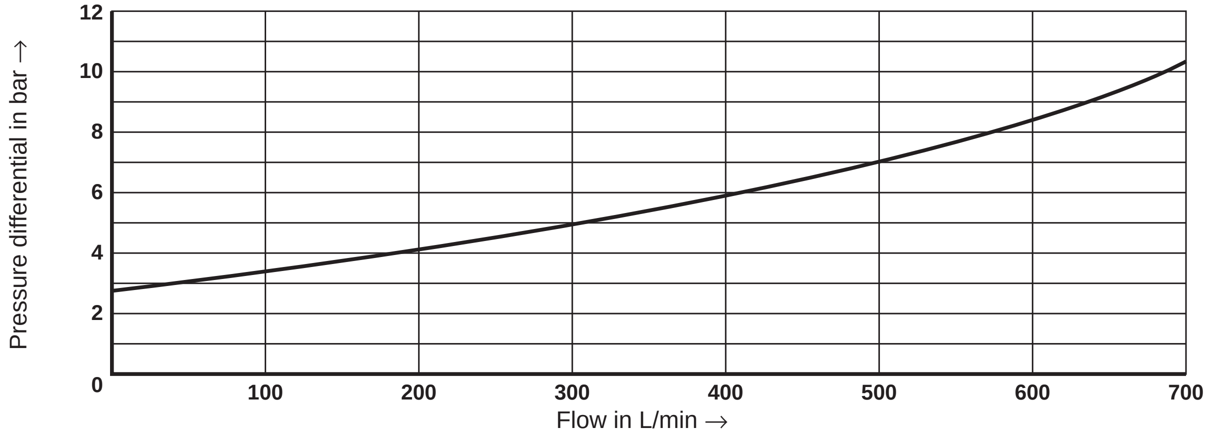
Minimum pressure differential $\Delta p = f(q_V)$
Start of control



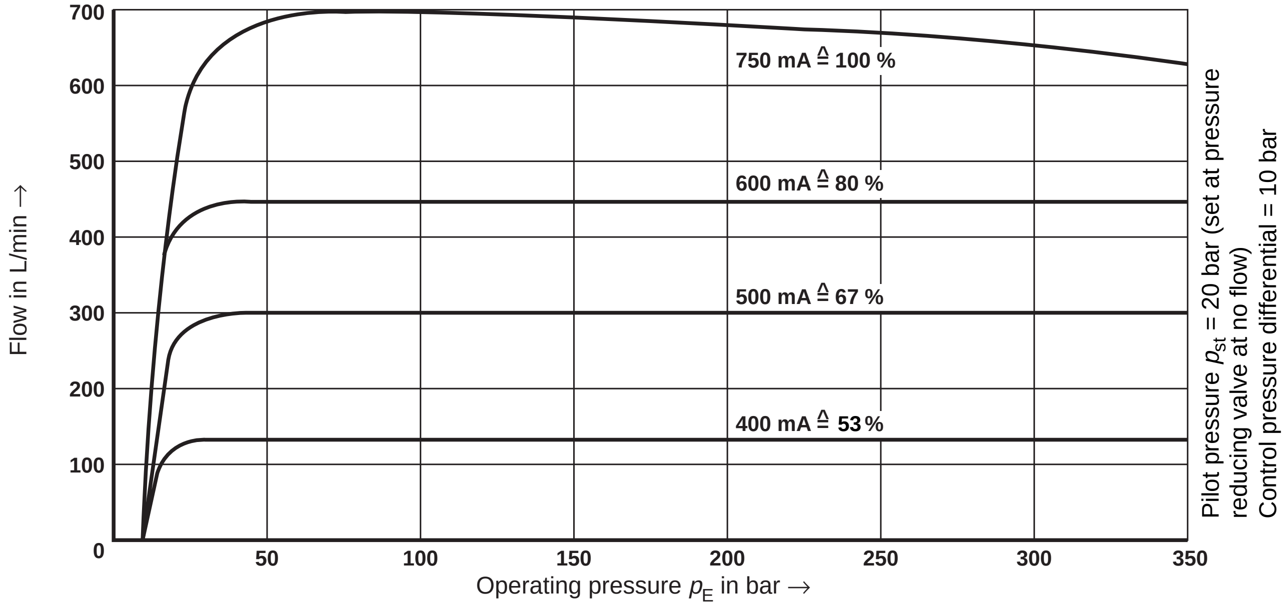
[1]) $p_{min} = p_{M4} - p_{M5}$ (measured at M4, M5 see circuit examples on page 3)

Characteristic curves (measured at ν = 41 mm^2/s and t = 50 °C)

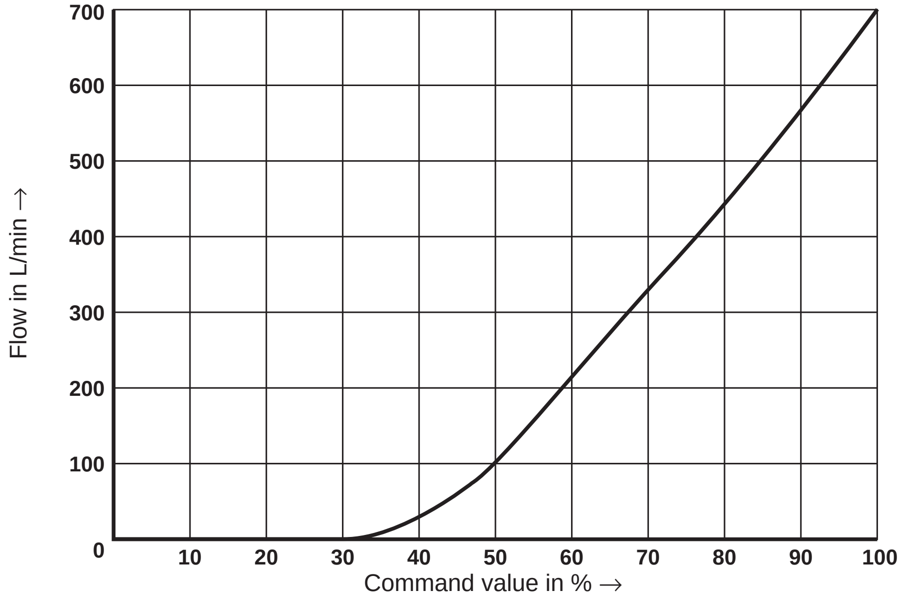
Pressure differential $\Delta p = f\,(q_V)$ Check valve function (measured at: M2 – M3 or M5 – M4) [1])



Pressure flow relationship $q_V = f\,(p_E$ + command value); the command value is constant (measured at: M4 or M3) [1])



Command value - flow $q_V = f$ (command value)
Flow control function



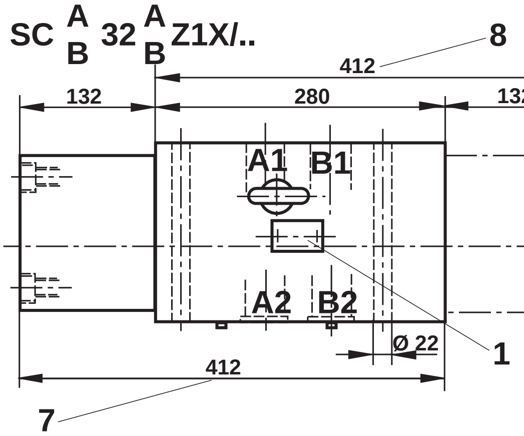
Meter-out check-Q-meter with proportional valve type 4WRZ 32 W520...
(P → A)

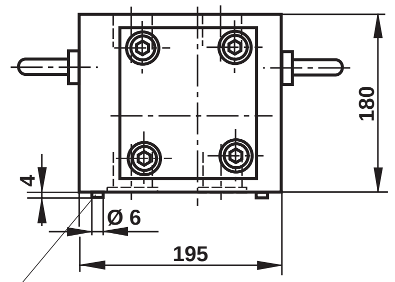
p_E = 50 bar (constant)

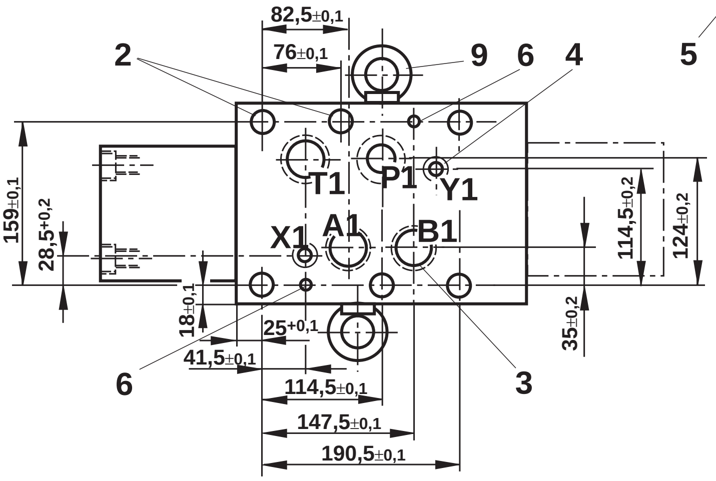
[1]) see circuit examples on page 3

Unit dimensions (Dimensions in mm)

Type SC A/B 32 A/B Z1X/..

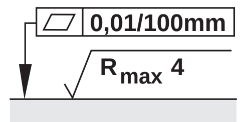




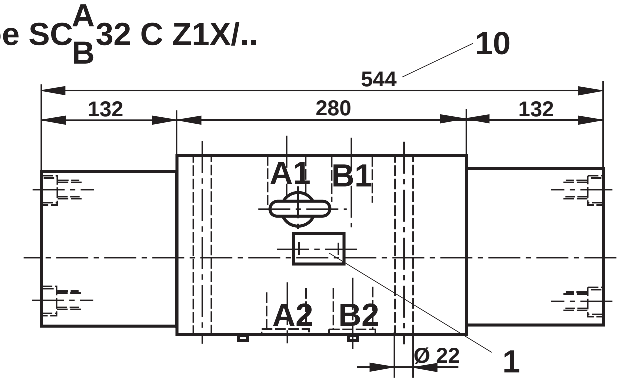


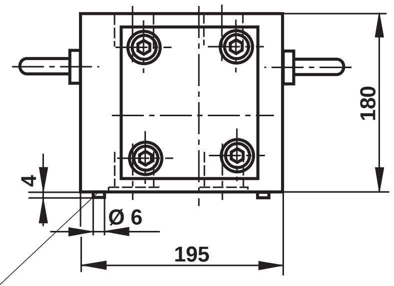
1 Name plate
2 6 through holes for valve fixing screws
3 R-ring 42.5 x 3.0 x 3.0 for ports A2, B2, P2, T2
4 R-ring 19 x 3.0 x 3.0 for ports X2, Y2
5 Locating pin
6 Drilling for locating pin
7 Valve with function in port A (type SC. 32 A1X/..)
8 Valve with function in port B (type SC. 32 B1X/..)
9 Ring bolt

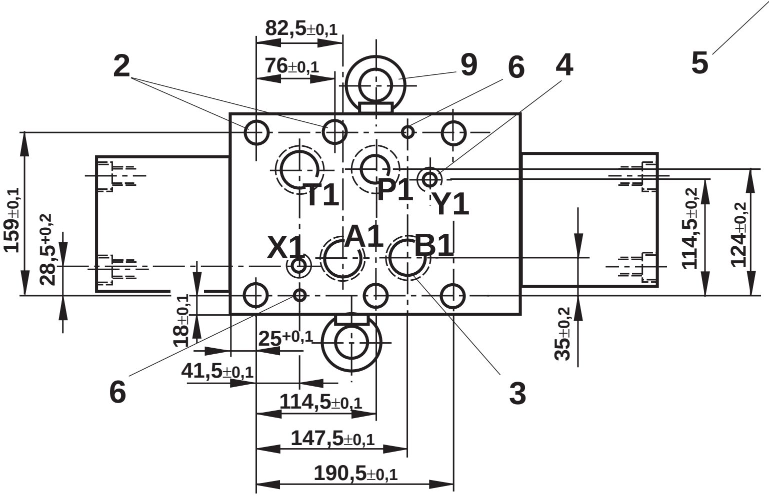
Required surface finish of mating piece



Type SC A/B 32 C Z1X/..







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2 6 through holes for valve fixing screws
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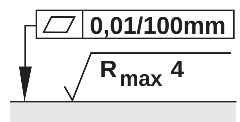
4 R-ring 19 x 3.0 x 3.0 for ports X2, Y2
5 Locating pin
6 Drilling for locating pin
9 Ring bolt
10 Valve with function in ports A and B

Required surface finish of mating piece



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