Pressure cut-off valve, pilot operated

Type DA 6 V

Nominal size 6
Unit series 5X
Maximum operating pressure 350 bar
Maximum flow 40 l/min

Table of contents

Features:

- For subplate mounting
- Position of the ports according to ISO 5781-03-04-0-00 (devi-ating from the standard also without fixing bore)
- As screw-in cartridge valve
- Adjustment type: Sleeve with hexagon and protective cap
- 4 pressure stages
- Switching pressure differential adjustable (10% to 50% of the nominal value)

Order details

DA	6	V		2		5X/	FS			*

Pressure cut-off valve

Nominal size 6 **= 6**

Pilot controlled **= V**

Type of connection

Pump connection in channel P (standard) **= P**

Pump connection in channel A **= A**

Adjustment type

Sleeve with hexagon and protective cap **= 2**

Adjustment on A side **= A**

Adjustment on B side **= B**

Unit series 50 to 59 **= 5X**
(50 to 59: unaltered mounting and connection dimensions)

Further information in the clear text

without designation = without fixing bore

/60 [1] **= with** fixing bore

/62 = with fixing bore and locking pin ISO 8752-3x8-St

Sealing material

M = NBR seals

V = FKM seals

(other seals at request)

Attention!
Observe sealing capability of the hydraulic fluid used!

FS = Freely adjustable switching pressure differential

Pressure range

50 = 25 to 50 bar

100 = 50 to 100 bar

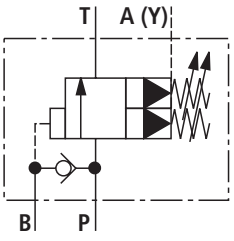
200 = 100 to 200 bar

350 = 150 to 350 bar

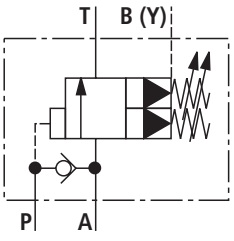
[1] Locking pin ISO 8752-3x8-St,

Symbols

Model “VP”



Model “VA”



Function, Cross-sections

The type DA 6 V pressure valve is a pilot-operated pressure cut-off valve with continuously adjustable switching pressure differential. It basically consists of pilot control stage and main stage of the screw-in cartridge valve (1), check valve (2) and housing (3).

Via connection B, the pump volume flow in P is led into the system accumulator. If the pressure at the consumer in connection B exceeds the set upper switching pressure, the pilot control valve opens and control liquid can flow off via connection A (Y). The check valve (2) closes the connection of connection B to connection P and the pump volume flow is switched to zero-pressure circulation (from P to T).

Type DA 6 VP

– Switch-over of the pump volume flow from P to B (pump → consumer) in P to T (pump → tank)

The pump delivers via the check valve (2) into the hydro system (P to B). Via control line (4) and bore (5), the pressure present in channel B acts on the pilot control of the screw-in cartridge valve (1). At the same time, the pressure in channel P is - via the bore (7) - existent on the spring-loaded side of the main piston (8). As soon as the upper switch-off pressure set via the adjusting spindle (6) in the screw-in cartridge valve (1) has been reached in the hydro system (channel B), the pilot control of the screw-in cartridge valve (1) opens the connection of the spring-loaded side of the main piston (8) to the control line (9) and thus externally via connection A (Y) into the tank. Due to the bore (7), a pressure drop at the main piston (8) results. The main piston (8) raises from the seat and opens the connection P to T. The check valve (2) closes the connection B to P and the pilot control of the screw-in cartridge valve (1) is kept in an open position by the consumer load pressure in B.

– Switch-over of the pump volume flow from P to B (pump → tank) in P to B (pump → consumer).

If, compared with the switch-off pressure, the consumer pressure in B has been reduced according to the lower pressure value set at the adjusting spindle (10), the pilot control of the screw-in cartridge valve (1) moves back into its initial position. Thus, pressure builds up on the spring-loaded side of the main piston (8). This pressure closes the connection P to T by means of the spring (11) and the pump delivers via the check valve (2) into the hydro system from P to B again.

Type DA 6 VA

In this valve type, the pump connection is not designed in P but in A. The valve leads the pump volume flow from A to P or from A to T. The leakage connection is in B (Y).

The switching processes comply with the “VP” design (This valve model serves the simpler linkage with multi-station manifold plates).

☞ **Notes!**

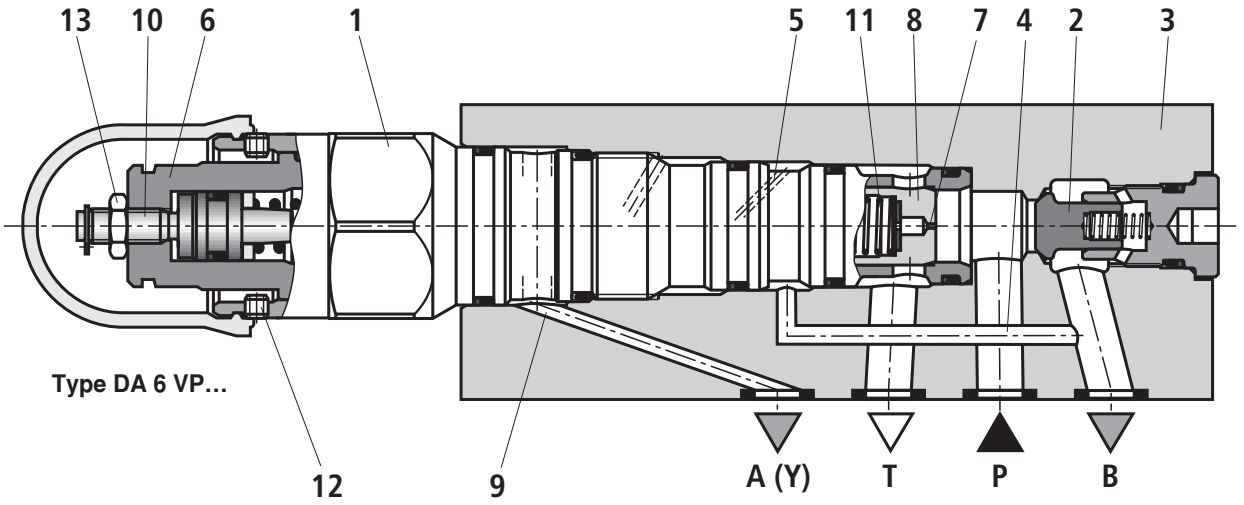
– **Only indirect pressure limitation function:**
There is no direct pressure limitation function of the pump pressure (to the tank), but only an indirect one via the check valve (2) and the control line (4) in the consumer channel.

– **Setting the switching pressure differential:**
In the factory, the valves are with nominal pressure set to a switching pressure differential of approx. 10% to 12%. Settings of up to 50% of the nominal pressure are possible.

Upon delivery, the adjusting spindle (6) is set to the minimum settable, upper switching pressure, i.e. the adjusting spindle (6) is unscrewed to stop. By screwing the adjusting spindle (6) in, the upper switching pressure can be increased.

By screwing the adjusting spindle (10) in, the lower switching pressure is increased and the switching pressure differential is thus reduced. By screwing the adjusting spindle (10) out, the lower switching pressure is reduced and the switching pressure differential is thus increased.

The pressure setting is secured using clamping screws (12) and lock nuts (13).



Type DA 6 VP...

Specifications (Please inquire in case the intended use of unit is outside the given values!)

general

Mass		kg	2,2
Installation position			Any
Ambient temperature range		°C	–30 to +80 (NBR seals) –20 to +80 (FKM seals)

hydraulic

Maximum operating pressure (Type “DA 6 V**P**”)	– Connection A (Y) (leakage pilot control)	bar	100 [1)]
	– Connection B (consumer)	bar	350 (after switch-over P to T)
	– Connection P (pump)	bar	350
	– Connection T (tank)	bar	200
Maximum operating pressure (Type “DA 6 V**A**”)	– Connection A (pump)	bar	350
	– Connection B (Y) (leakage pilot control)	bar	100 [1)]
	– Connection P (consumer)	bar	350 (after switch-over A to T)
	– Connection T (tank)	bar	200
Adjustment pressure range [2)]	– Pressure stage 50	bar	25 to 50
	– Pressure stage 100	bar	50 to 100
	– Pressure stage 200	bar	100 to 200
	– Pressure stage 350	bar	150 to 350
Maximum volume flow		l/min	40
Hydraulic fluid			Mineral oil (HL, HLP) according to DIN 51524 [3)];
Hydraulic liquid temperature range		°C	–30 to +80 (NBR seals) –20 to +80 (FKM seals)
Viscosity range	– Maximum	mm^2/s	10 to 800
	– Recommended	mm^2/s	20 to 60
Maximum permitted degree of pollution of the hydraulic fluid purity level according to ISO 4406 (c)			Class 20/18/15 [4)]
Switching pressure differential [2)]		%	Adjustable from 10% to 50% of the nominal value

1) **Attention!**
The existing pressure adds up to the set pressure! Within the adjustment range, the switching pressure differential remains unchanged!

2) When setting the switching pressure differential, the following instructions have to be complied with:

– The upper and lower switching point must lie within the adjustment range of the pressure stage (e.g. with a pressure stage of 100 bar: upper switching point 100 bar, lower switching point 50 bar ≙ 50% switching pressure differential)

– The lowest switching pressure differential possible largely depends on the system (set pressure, pump and consumer volume flow, accumulator size and initial pressure, line length and resistances, etc.). Here, the valve offers the possibility to optimally adjust the switching pressure differential to the system. For the reasons mentioned above, the smallest settable switching pressure differential of the valve can, however, not always be realized at the system.

– General: Keep the pipe connection between DA valve and hydro accumulator as short and the resistance as low as possible and discharge the control oil (Y) in a depressurized form, if possible.

– Information regarding the factory setting of the switching pressure differential see page 5.

3) Suitable for NBR and FKM seals

4) The purity levels stated for the components need to be maintained in hydraulic systems. Effective filtration prevents faults and at the same time increases the service life of the components.

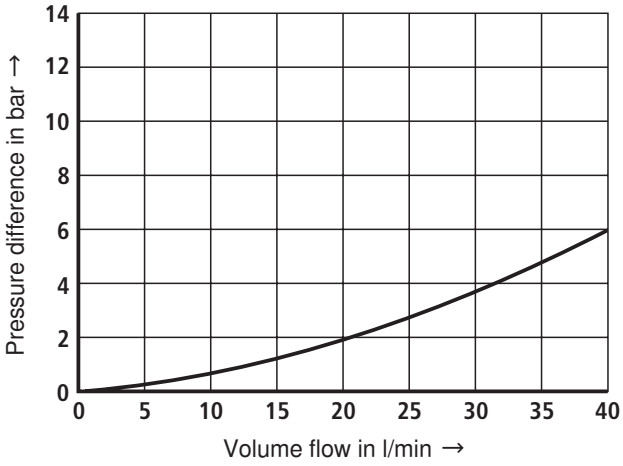
Note: Factory setting of the switching pressure differential

- In the factory, the valves are with nominal pressure set to a switching pressure differential of approx. 10% to 12% and they are delivered in a depressurized condition (adjusting spindle (6) unscrewed to stop, see page 3).
- The setting is made with nominal pressure, a pump volume flow of approx. 10 l/min and a consumer volume flow of approx. 2 l/min.
- With different system conditions (particularly with high pump and consumer volume flow), higher switching pressures could result. Here, the valve offers the possibility to optimally adjust the switching pressure differential to the system.

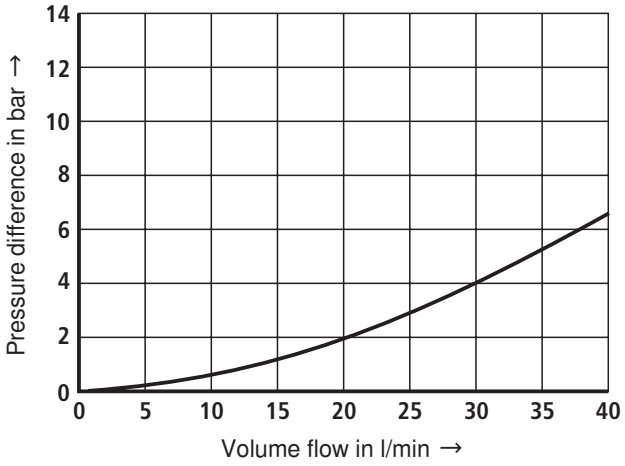
Characteristic curves (measured with HLP46, ϑ_{Oil} = 40 °C ±5 °C)

Δp-q_V characteristic curves, circulation pressure – model "VP" (P to T)

Model "VP2A"

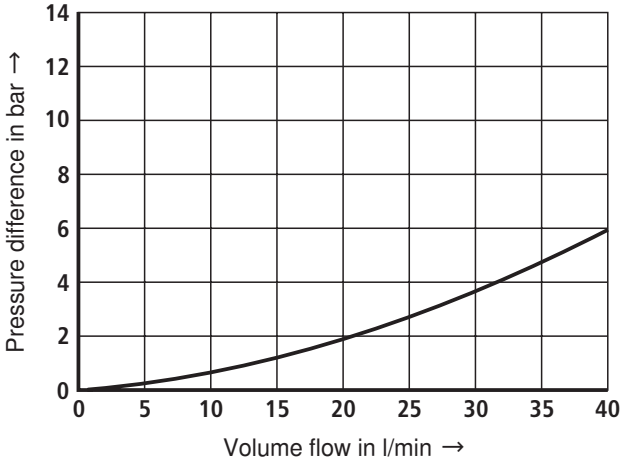


Model "VP2B"

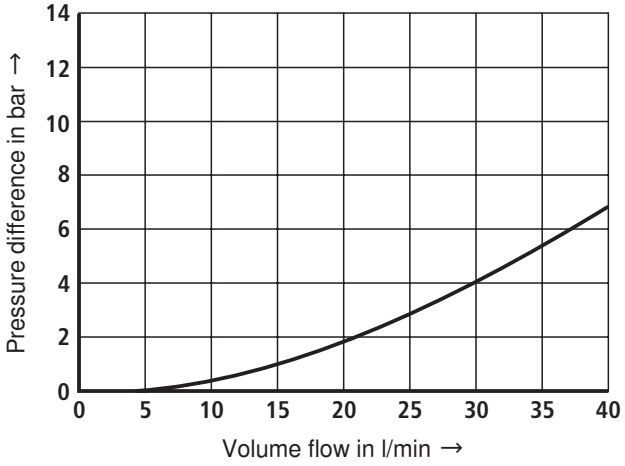


Δp-q_V characteristic curves, circulation pressure – model "VA" (A to T)

Model "VA2A"



Model "VA2B"



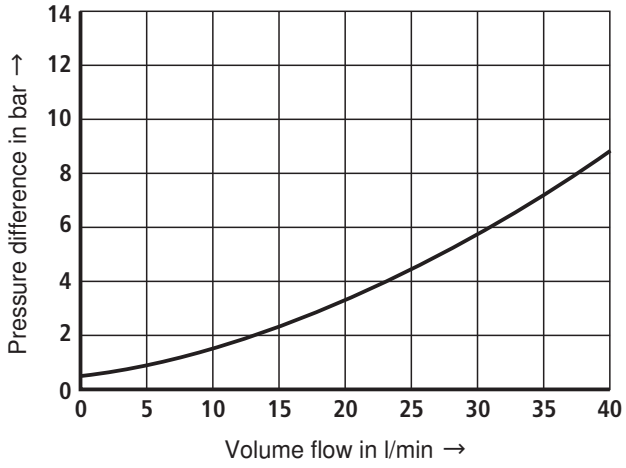
☞ **Note!**

- The characteristic curves have been measured with external, depressurized control oil return (circulation pressure).
- The characteristic curves are valid for output pressure = 0 bar over the whole volume flow range.

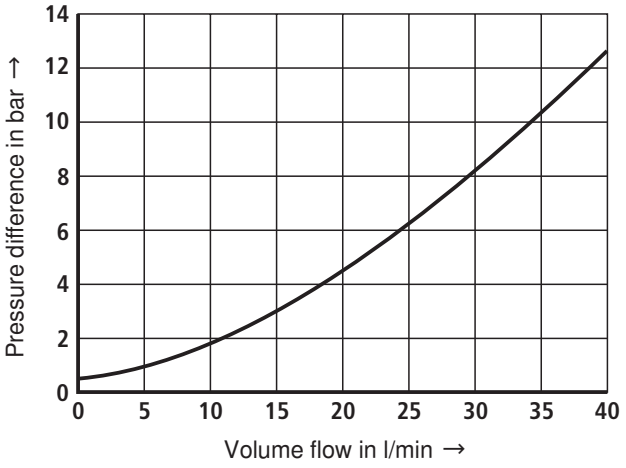
Characteristic curves (measured with HLP46, ϑ_{Oil} = 40 °C ±5 °C)

Δp-q_V characteristic curves via check valve – model "VP" (P to B)

Model "VP2A"

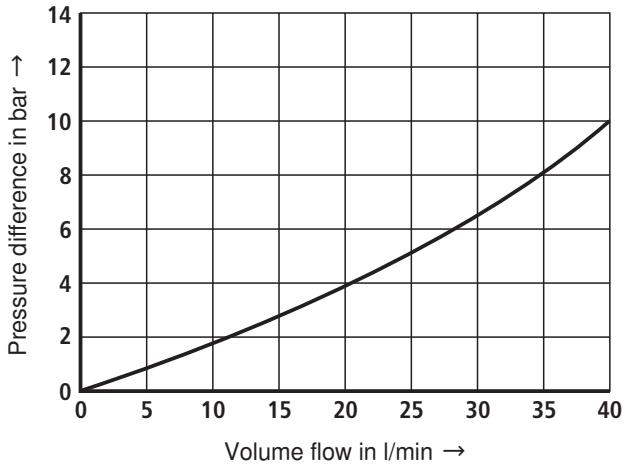


Model "VP2B"

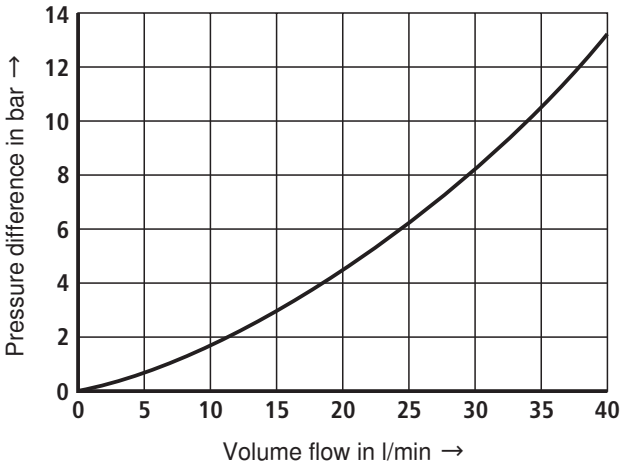


Δp-q_V characteristic curves via check valve – model "VA" (A to T)

Model "VA2A"



Model "VA2B"

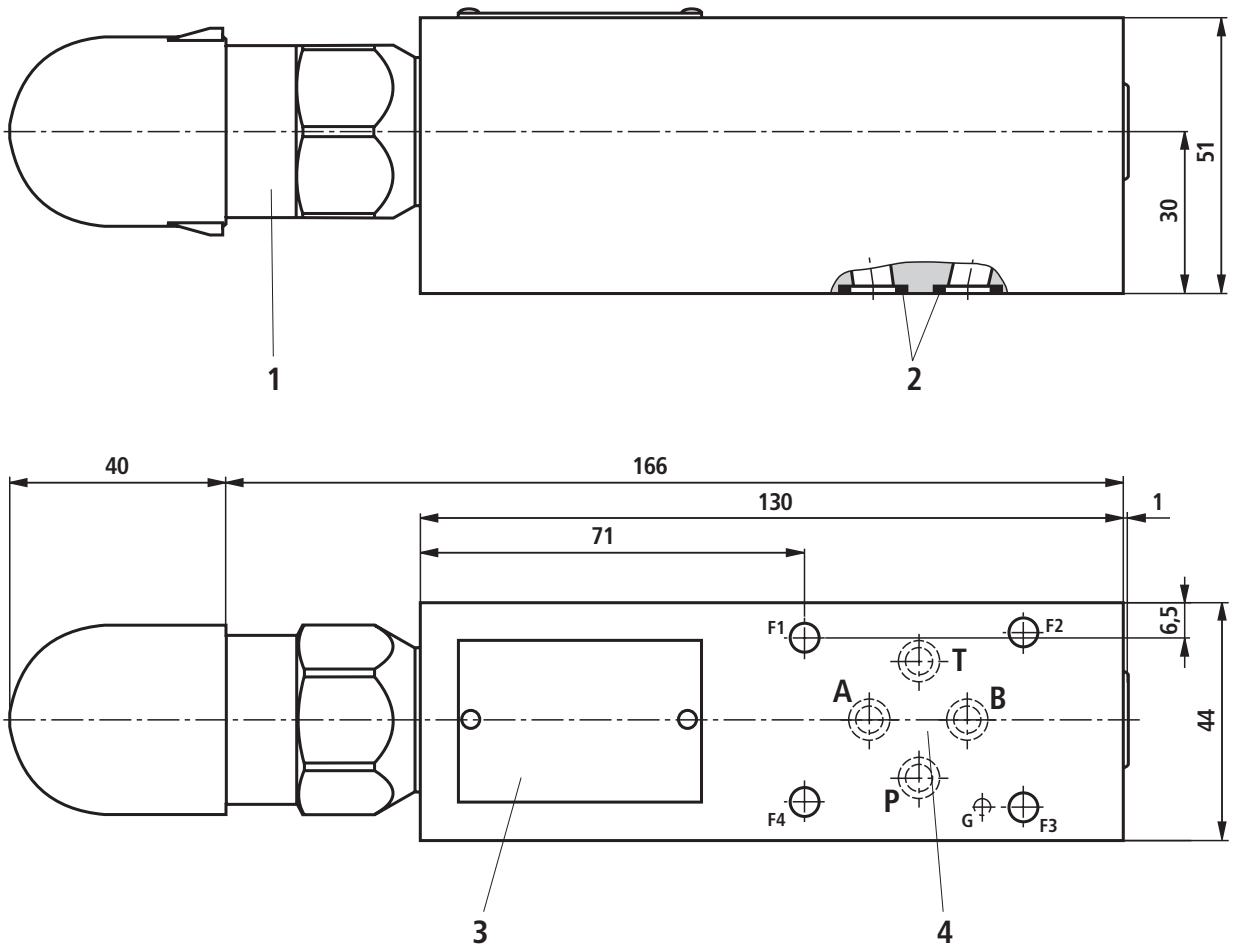


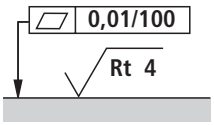
☞ **Note!**

– The characteristic curves have been measured with external, depressurized control oil return (circulation pressure).

– The characteristic curves are valid for output pressure = 0 bar over the whole volume flow range.

Dimensions: Model “2A” (dimensions in mm)





Required surface quality of the valve contact surface

1 Adjustment type “2”

2 Identical sealing rings for connections A, B, P, T

3 Typeplate

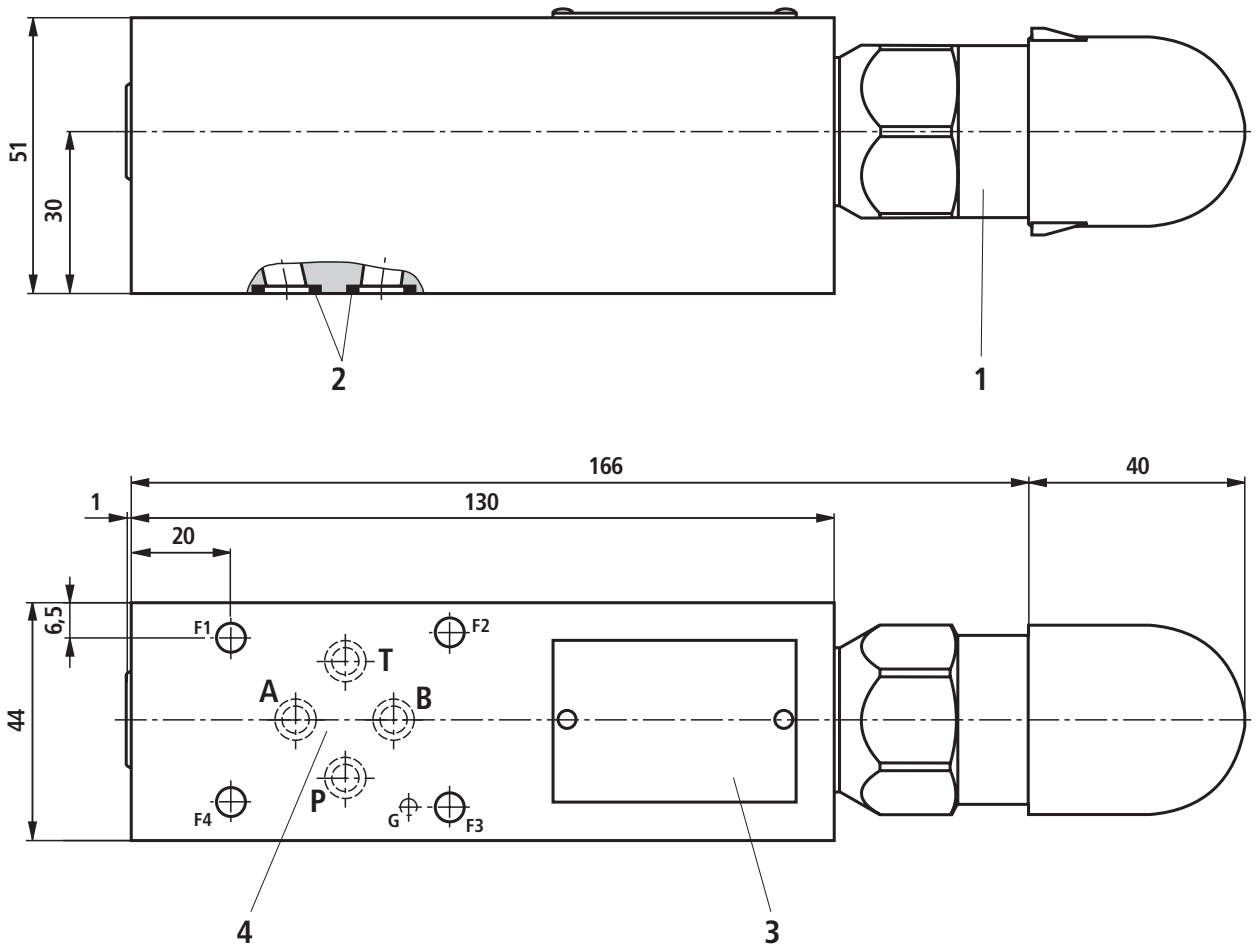
4 Position of the connections according to ISO 5781-03-04-0-00 (**with** fixingbore for locking pin ISO 8752-3x8-St,); deviating from the standard also possible with-out fixing bore

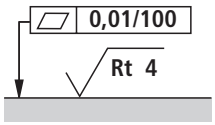
Subplates

– without fixing bore	G 341/01 (G1/4)
	G 342/01 (G3/8)
	G 502/01 (G1/2)
– with fixing bore	G 341/60 (G1/4)
	G 342/60 (G3/8)
	G 502/60 (G1/2)

Valve fastening screws (order separately)
4 x ISO 4762 - M5 x 60 - 10.9flZn-240h-L
with friction coefficient μ_{total} = 0.09 to 0.14,
tightening torque $\boldsymbol{M}_A$ = 7 Nm ±10%,

Dimensions: Model “2B” (dimensions in mm)





Required surface quality of the valve contact surface

1 Adjustment type “2”

2 Identical sealing rings for connections A, B, P, T

3 Typeplate

4 Position of the connections according to ISO 5781-03-04-0-00 (**with** fixingbore for locking pin ISO 8752-3x8-St); deviating from the standard also possible with-out fixing bore

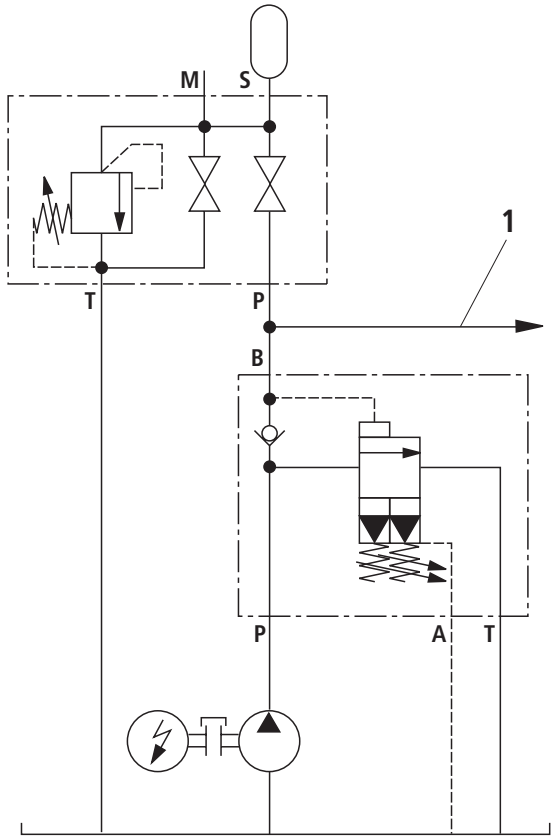
Subplates

– without fixing bore	G 341/01 (G1/4)
	G 342/01 (G3/8)
	G 502/01 (G1/2)
– with fixing bore	G 341/60 (G1/4)
	G 342/60 (G3/8)
	G 502/60 (G1/2)

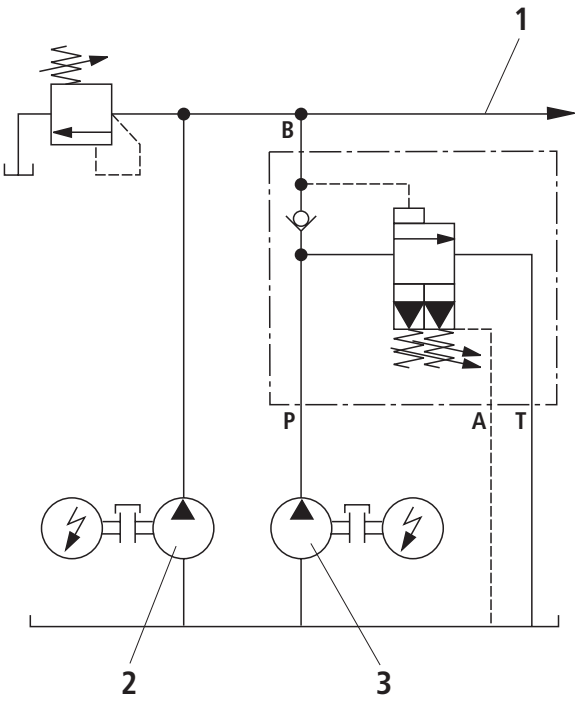
Valve fastening screws (order separately)
4 x ISO 4762 - M5 x 60 - 10.9flZn-240h-L
with friction coefficient μ_{total} = 0.09 to 0.14,
tightening torque M_A = 7 Nm ± 10%,

Sample switching: Type DA 6 VP…

Hydo system with pressure accumulator



Hydo system with high and low pressure pump



1 To the consumer

2 High-pressure pump

3 Low-pressure pump

☞ **Information regarding the use:**

Keep the pipe connection between pressure cut-off valve and hydro accumulator as short and the resistance as low as possible!

Attention!

– Accumulators may only be operated with suitable accumulator safety equipment!

– There is no direct pressure limitation function of the pump pressure (to the tank), but only an indirect one via the check valve and the control line in the consumer channel (see page 3).