

Pressure cut-off valve, pilot operated, with mechanical actuation Type KAV



- ▶ Size 2
- ▶ Series A
- ▶ Maximum working pressure 350 bar
- ▶ Maximum flow 140 l/min

Suited for potentially explosive environments per Directive 2014/34/EU |
Statutory Instruments 2016/1107
(NO own potential ignition sources such as sparks, arcs, or dangerous
hot surfaces).

Features

- ▶ Mounting cavity R/KAV.2
- ▶ High switching performance
- ▶ Available in four pressure stages (50, 100, 200, 350 bar)
- ▶ Infinitely adjustable switching pressure differential
- ▶ Hexagon with protective cap
- ▶ Pilot control unit with main spool

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Type code

01	02	03	04	05	06	07	08	09	10	11
KAV	2		2	A	A	/	A		-	

Valve type

01	Pressure cut-off valve, pilot operated	KAV
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Adjustment element

02	Hexagon with protective cap	2
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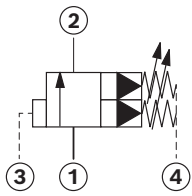
Pressure stage

03	50 bar	C
	100 bar	F
	200 bar	K
	350 bar	R

Size

04	Size 2	2
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4 main ports

05		A
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Series

06	Series A	A
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Mounting cavity

07	Mounting cavity R/KAV.2 (see page 7)	A
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Pressure pre-setting

08	Without pressure pre-setting (no code)	
	With pressure pre-setting	-
	With pressure pre-setting, lead-sealed	P

Switching pressure¹⁾

09	Upper switching pressure in bar	...
10	Lower switching pressure in bar	...

Sealing material

11	FKM (fluorocarbon rubber)	V
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Preferred types

Pressure rating	Type	Material number
C	KAV2C2AA/AV	R901058924
F	KAV2F2AA/AV	R901058926
K	KAV2K2AA/AV	R901058929
R	KAV2R2AA/AV	R901058934

1) Please enter values, see characteristic curves of “switching pressure differential” on page 5; required only for variant with pressure pre-setting (“-” or “P”):
The pressure is pre-set at
– a pump flow of approx. 10 l/min
– an actuator flow of approx. 2 l/min

Functional description

General

Pressure control valves of type KAV are pilot operated pressure cut-off valves with infinitely variable switching pressure differentials. They basically consist of a pilot stage (1) and main stage (2).

Function

The pump flow (port ①) is fed via port ③ to the accumulator of the system. When the actuator pressure in port ③ rises above the set upper switching pressure, the connections to Y (port ④) and T (port ②) open, and the pump flow is changed over to pressureless circulation (① to ②). When the actuator pressure (port ③) falls below the set lower switching pressure, the connections to Y (port ④) and T (port ②) close, the pump flow is again directed to the accumulator of the system.

When used as accumulator charging valve, a check valve (7) is required additionally, which closes the connection between port ③ and port ① in order to prevent the oil in the accumulator from flowing back.

When used for pressureless pump start-up, an additional bore Z is required in the mounting cavity (see page 7) in order to utilize port Z of the valve.

A directional valve (8) must be connected between Z and Y (port ④), which allows a remotely controlled cut-off (from port ① to port ②) below the set switching pressure.

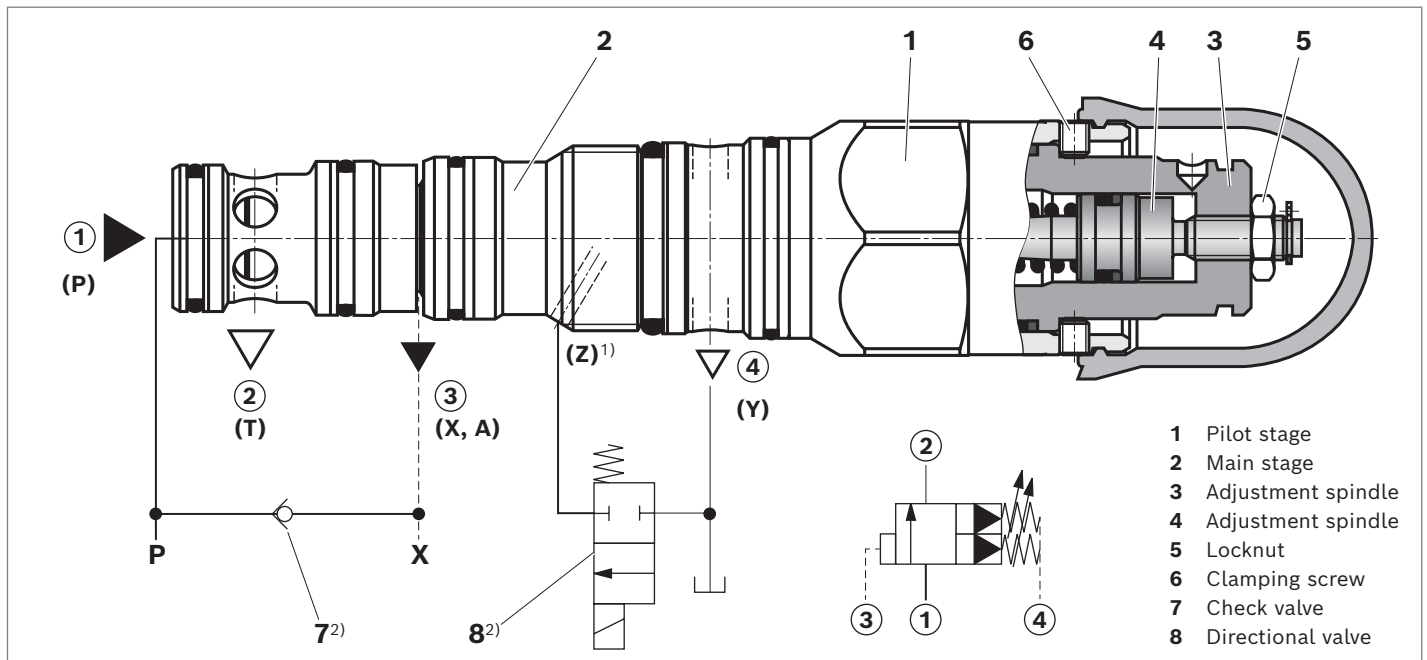
Adjustment of the switching pressure differential

Notice

The valves are factory-set to a switching pressure differential of approx. 10 % to 12 % at nominal pressure. Settings up to 50 % of the nominal pressure are possible.

Adjustment spindle (3) is factory-set to the minimum upper switching pressure, i.e. the adjustment spindle is turned out to the mechanical limit stop. The upper switching pressure can be increased by turning adjustment spindle (3) in. The lower switching pressure differential is increased by turning adjustment spindle (4) in, which results in a reduction in the switching pressure differential. Turning adjustment spindle (4) out results in a reduction in the lower switches and hence in an increase in the switching pressure differential. The pressure setting is secured by clamping screw (6) and locknut (5). For the adjustment range, see characteristic curve "switching pressure differential" on page 5.

▼ Cross-section and symbol KAV



1) When used for pressureless pump start-up, port Z can be utilized in conjunction with a directional valve (see Mounting cavity on page 7).

2) Not included in the scope of supply! (see circuit examples on page 8)

Technical data

General				
Weight		kg		0.42
Installation position				Any
Ambient temperature range		°C		–20 ... +80
Hydraulics				
Maximum working pressure		p	bar	350
Maximum set pressure	Variant C	Δp	bar	50
	Variant F		bar	100
	Variant K		bar	200
	Variant R		bar	350
Maximum permissible return line pressure	Port T		bar	200
	Port Y		bar	100 ¹⁾
Maximum flow		$q_{V\max}$	l/min	140
Hydraulic fluid				See table on page 5
Hydraulic fluid temperature range		ϑ	°C	–20 ... +80
Viscosity range		ν	mm ² /s	10 ... 800
Maximum admissible degree of contamination of hydraulic fluid (cleanliness level) according to ISO 4406 (c)				Level 20/18/15 ²⁾
Load cycles				10 million
Adjustable switching pressure differential ³⁾			%	10 ...50 of nominal value

Notice

For applications outside these values, please consult us!

1) **Attention!**

- The applied pressure is added to the set pressure!
The switching pressure differential remains unchanged within the adjustment range.
- 2) The cleanliness classes stated for the components has to be maintained in hydraulic systems. Effective filtration prevents faults and at the same time increases the service life of the components.
For the selection of the filters see www.boschrexroth.com/filter.
We recommend using a filter with a minimum retention rate of $\beta_{10} \geq 75$.

The following points must be observed when setting the switching pressure differential:

- The upper and lower switching points must be within the setting range of the pressure stage (e.g. for a 100 bar pressure stage: upper switching point 100 bar, lower switching point 50 bar $\pm$ 50 % switching pressure differential).
- The lowest possible switching pressure differential is largely dependent on the system (set pressure, pump and consumer flow, accumulator size and preload, line length and resistances, etc.). Here, the valve offers the possibility of optimally adapting the switching pressure difference to the system. For the reasons mentioned above, however, the smallest adjustable switching pressure differential of the valve cannot always be realized at the plant.

Hydraulic fluid

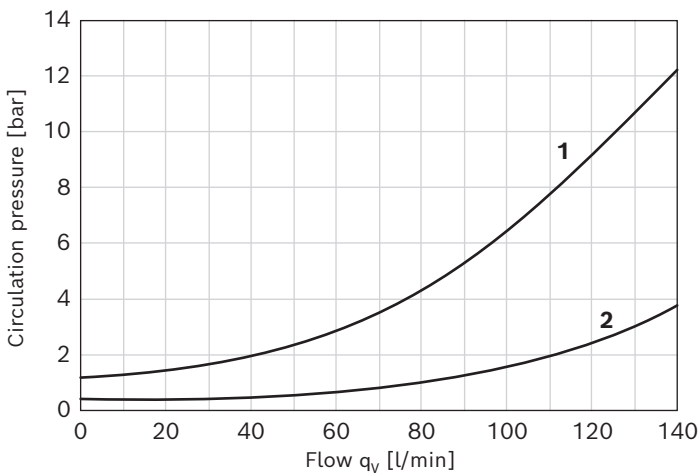
Hydraulic fluid		Classification	Suitable sealing materials	Standards	Data sheet
Mineral oils		HL, HLP	FKM	DIN 51524	90220
Environmentally acceptable	Insoluble in water	HEES	FKM	ISO 15380	90221
	Soluble in water	HEPG	FKM	ISO 15380	90221

Notice

- Further information and details on using other hydraulic fluids are available in the above data sheets or on request.
- Restrictions are possible with the technical valve data (temperature, pressure range, service life, maintenance intervals, etc.).
- The flash point of the hydraulic fluid used must be 40 K above the maximum solenoid surface temperature.
- **Environmentally acceptable:** If environmentally acceptable hydraulic fluids are used that are also zinc-dissolving, there may be an accumulation of zinc.

Characteristic curves

▼ Circulation pressure in dependence on pump flow q_{VP}

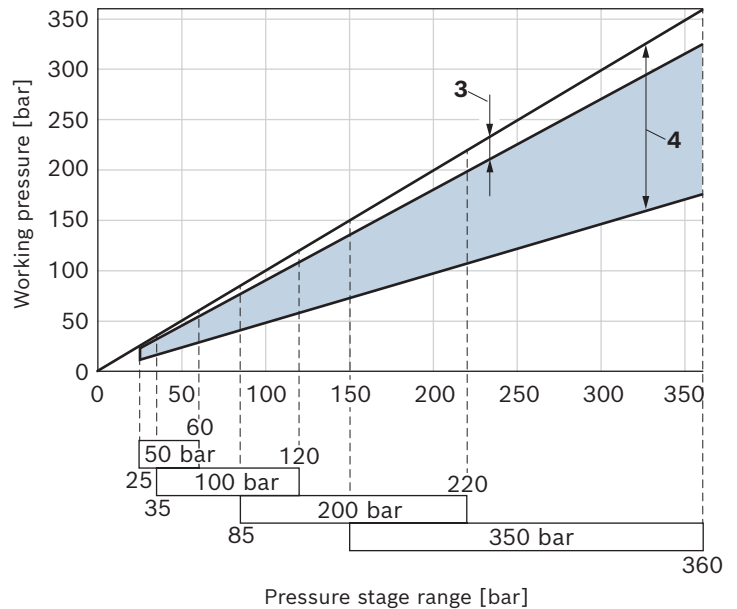


- 1 Circulation pressure for housing with supply and return diameter of 13 mm
- 2 Circulation pressure for pure cartridge resistance

Notice

Characteristic curves measured with HLP46,
 $\vartheta_{oil} = 50 \pm 5 \text{ } ^\circ\text{C}$.

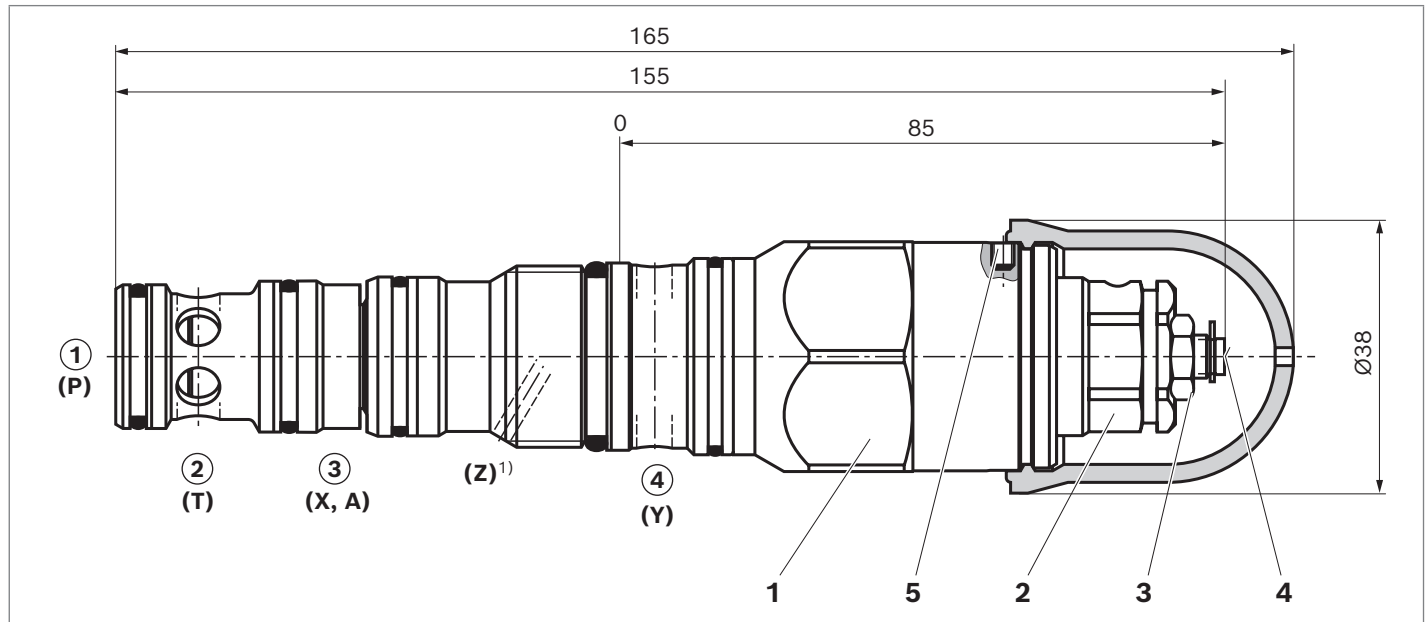
▼ Switching pressure differential (P → X)



- 3 Minimum switching pressure differential (10 % of nominal value)
 - 4 Maximum switching pressure differential (50 % of nominal value)
- Adjustment range of switching pressure differential

Dimensions

▼ Pressure cut-off valve KAV



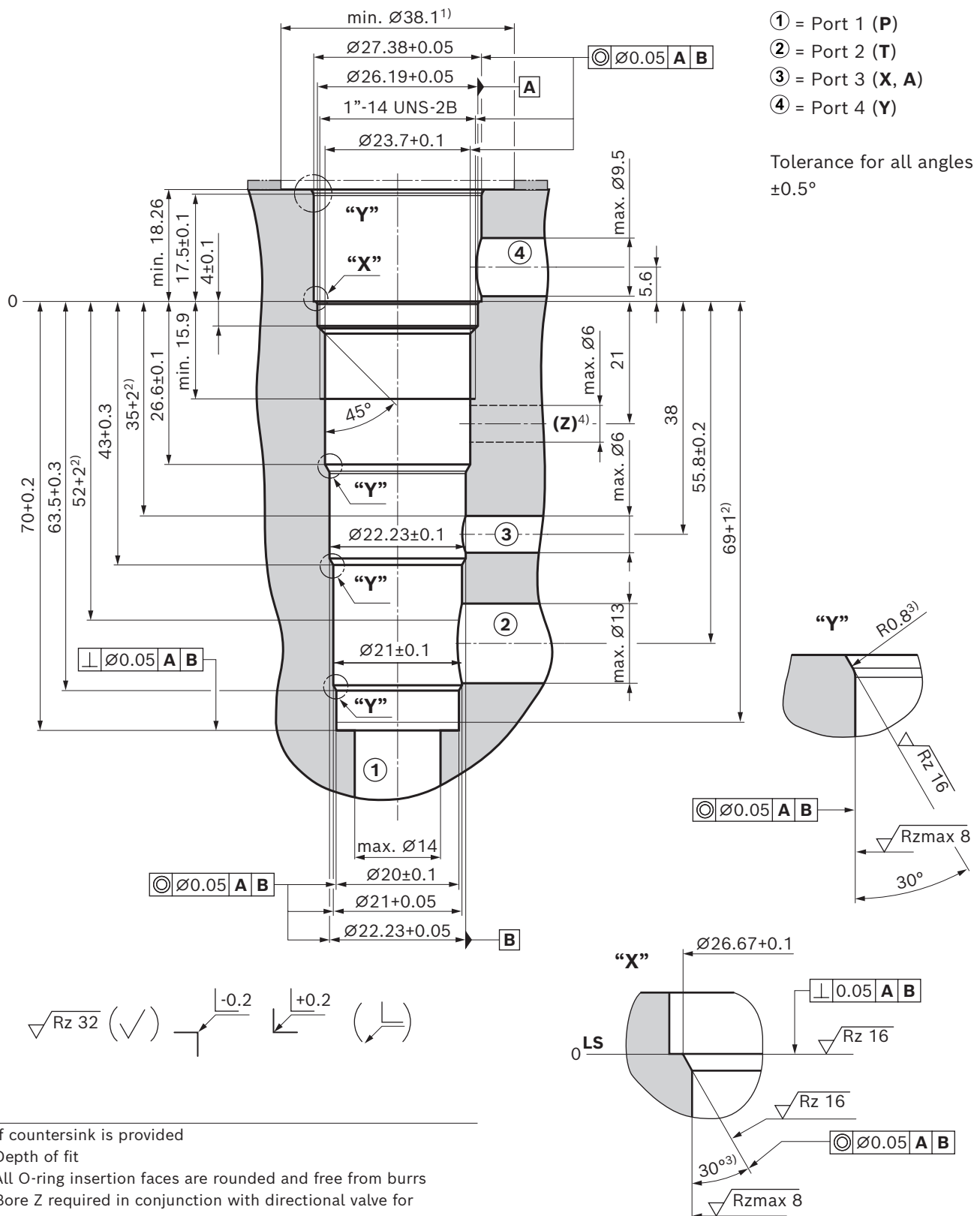
- 1 Hexagon A/F32
Tightening torque $M_A = 60 \text{ Nm}$
- 2 Adjustment element "2"
Hexagon with protective cap A/F19
- 3 Hexagon A/F10
- 4 Hexagon socket A/F3
- 5 Lock screw A/F2

- ① = Port 1 (P)
- ② = Port 2 (T)
- ③ = Port 3 (X, A)
- ④ = Port 4 (Y)

¹⁾ When used for pressureless pump start-up, port Z can be utilized in conjunction with a directional valve (see Mounting cavity on page 7).

Mounting cavity

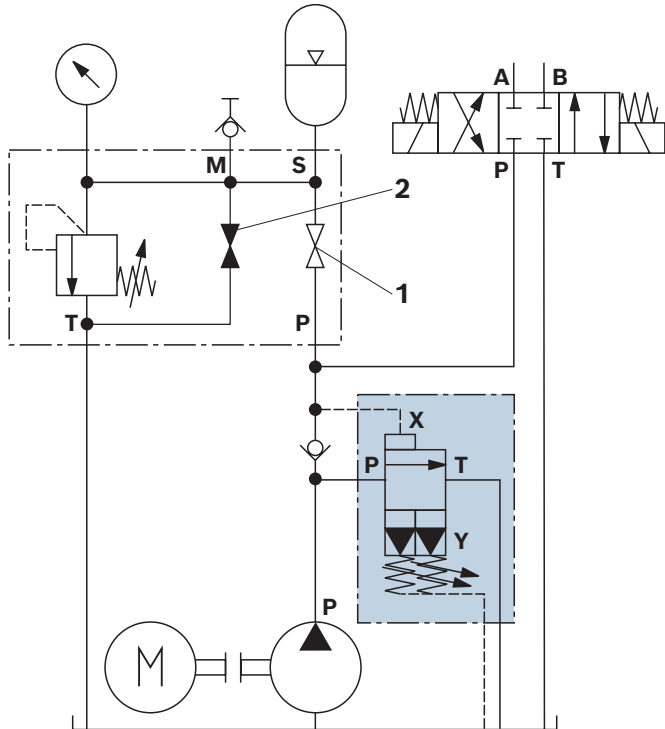
▼ 4 main ports; thread 1"–14 UNS-2B



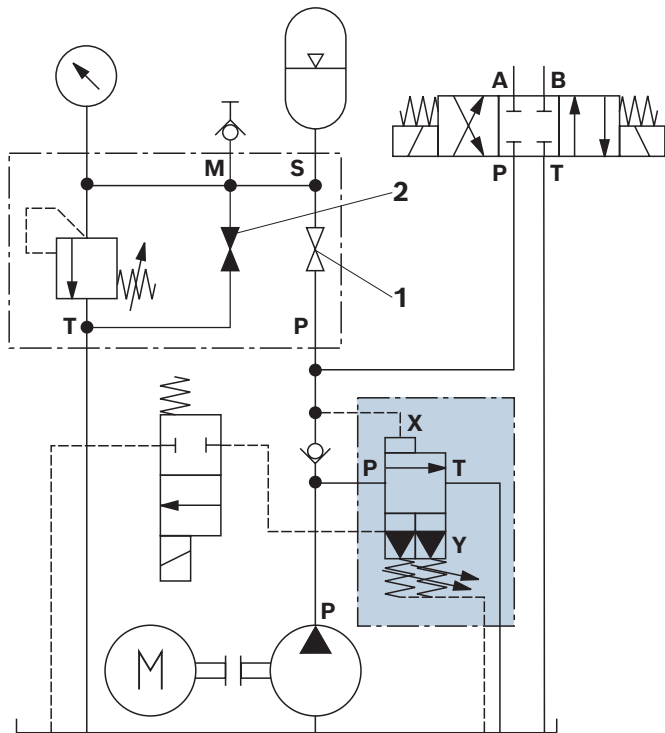
- 1) If countersink is provided
- 2) Depth of fit
- 3) All O-ring insertion faces are rounded and free from burrs
- 4) Bore Z required in conjunction with directional valve for pressureless pump start-up

Circuit examples

▼ Hydraulic system with pressure accumulator

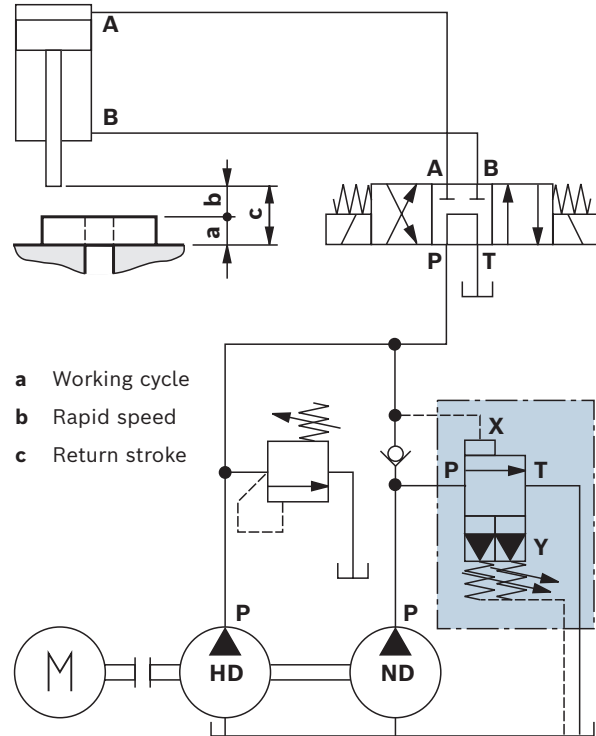


▼ ... with directional valve (not included in the scope of supply!)

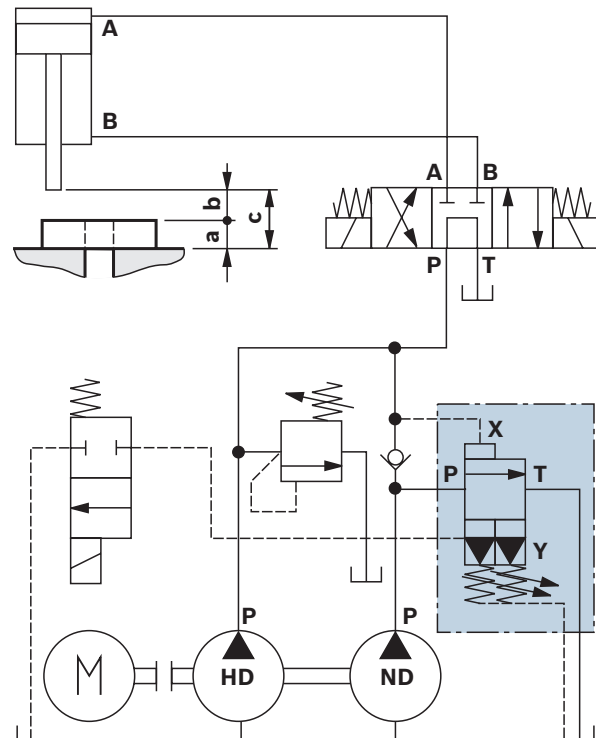


- 1 Keep always open! Close only for maintenance work!
- 2 Keep always closed! Open only for maintenance work!

▼ Hydraulic system with high and low pressure pump



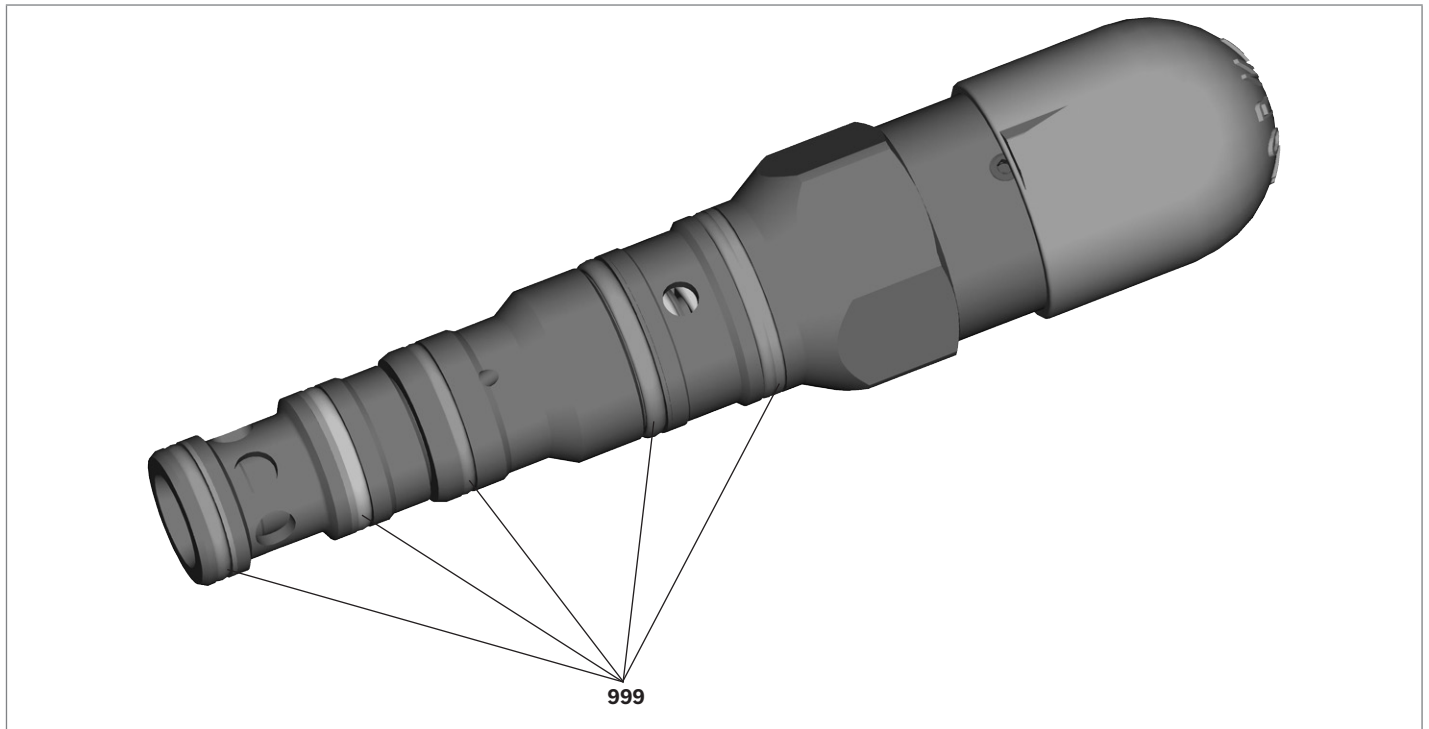
▼ ... with directional valve (not included in the scope of supply!)



Notice

Connect DA valve and hydraulic accumulators with short pipes ensuring low resistance!

Available individual components



Item	Designation	Sealing material	Material number
999	Seal kit of the valve	FKM	R961001575

Related documentation

- ▶ Mineral oil-based hydraulic fluids
- ▶ Environmentally acceptable hydraulic fluids
- ▶ Filter selection
- ▶ $MTTF_D$ values

Data sheet 90220
Data sheet 90221
www.boschrexroth.com/filter
Data sheet 90294

Bosch Rexroth Oil Control S.p.A.

Via Leonardo da Vinci 5
P.O. Box no. 5
41015 Nonantola – Modena, Italy
Tel. +39 059 887 611
Fax +39 059 547 848
compact-hydraulics-cv@boschrexroth.com
www.boschrexroth.com/compacthydraulics

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