Proportional pressure reducing valve, direct operated, increasing characteristic curve Type MHDRE 06 FK (high-performance)

RE 64656
Edition: 07.2018
Replaces: 11.2016

H8039

- Size 6
- Series 3X
- Maximum control pressure 30 bar
- Max. flow 40 l/min

Features

- Direct operated proportional pressure reducing valve for reducing the system pressure
- Pilot control valve
- Screw-in cartridge valve
- Suitable for mobile applications
- Operation by means of proportional solenoid
- In case of power failure, the maximum pressure is set
- Recommended control electronics: Type RA and RC mobile amplifiers

Contents

Ordering code

01	02	03	04	05		06	07	08	09	10	11
MHDRE	**06**	**F**	**K**	**3X**	**/**		**A**	**G24**		**V**	*****

Valve type

01	Proportional pressure reducing valve, direct operated	**MHDRE**
02	Size 6	**06**
03	Decreasing characteristic curve	**F**
04	Screw-in cartridge valve	**K**

Series

05	Series 30 ... 39 (30 ... 39; unchanged installation and connection dimensions)	**3X**

Maximum control pressure

06	18 bar	**18**
	30 bar[1)]	**30**

07	Proportional solenoid, wet-pin	**A**

Supply voltage

08	Control electronics 24 V DC (12 V DC on request)	**G24**

Electrical connection[2)]

09	Device connector according to DIN EN 175301-803	**K4**
	Device connector 2-pin DT 04-2P (Deutsch)	**K40**
	Device connector 2-pin, Junior Timer (AMP)	**C4**

Sealing material

10	FKM seals Observe compatibility of seals with hydraulic fluid used! (Other seals upon request)	**V**

11	Further details in plain text	*****

Preferred types

Type	Material number
MHDRE 06 FK3X/18AG24C4V	R901297359
MHDRE 06 FK3X/30AG24C4V–012	R901475223

1) 30 bar pressure stage only available in the flow-optimized version **–012**

2) Plug-in connectors are not included in the scope of delivery and must be ordered separately, see data sheet 08006.

Functional description

General

The type MHDRE 06 FK proportional pressure reducing valve is a direct operated, 3-way version screw-in cartridge valve. It reduces the control pressure (port **A**) proportionally to the solenoid current and largely works independently of the inlet pressure (port **P**).

When the command value = 0 or in the event of power failure, the maximum pressure is set. Operation is effected by means of proportional solenoid. The solenoid's interior is connected to the port **T** and filled with hydraulic fluid. Depending on the electric command value, these valves can be used to continuously reduce the system pressure. The valve is suitable for controlling couplings, pumps, and directional valves, and is also suitable for use in proportional pilot controls (especially in mobile applications).

Basic principle

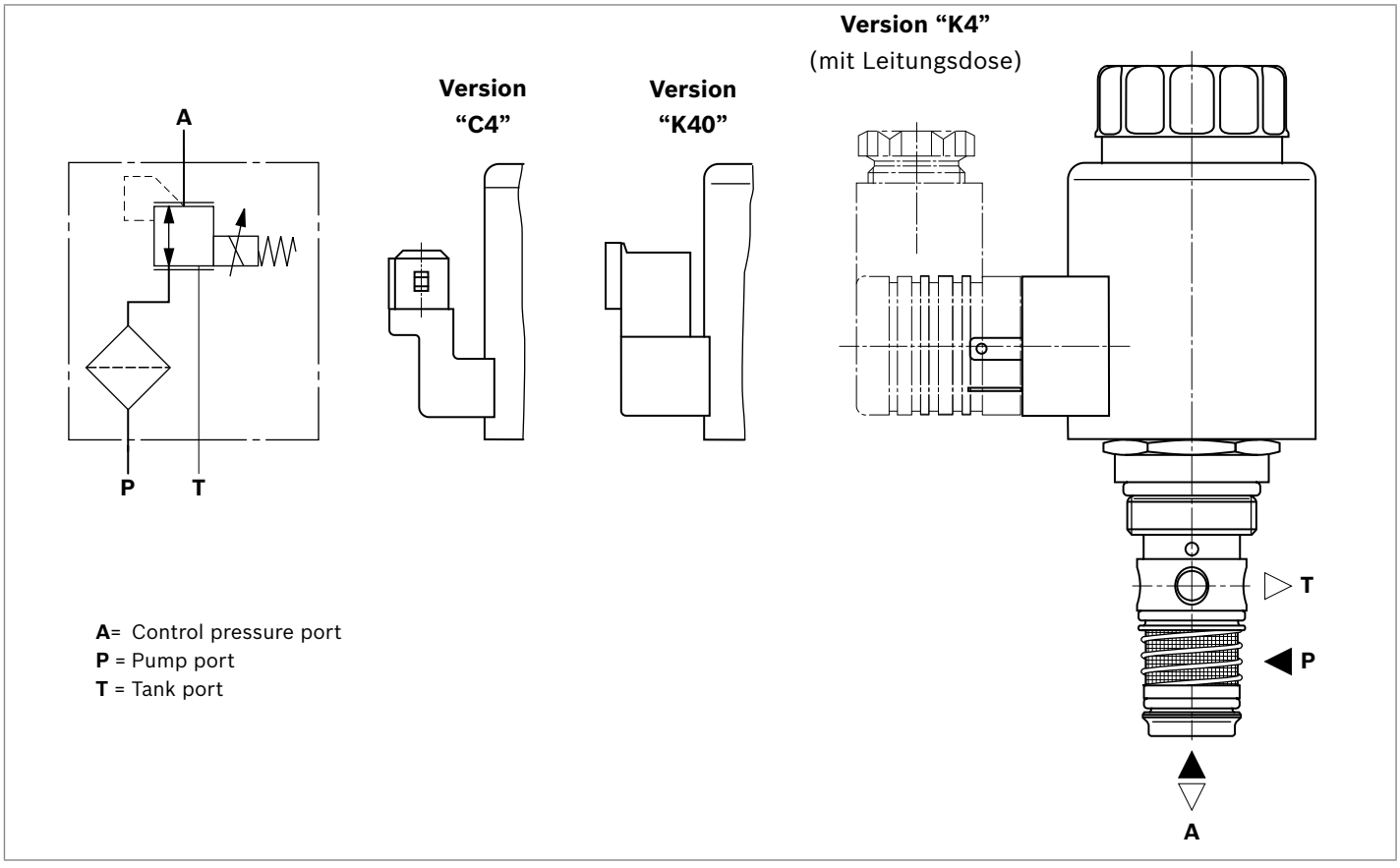
The valve regulates the pressure in the port **A** proportional to the current on the solenoid.

The **F** version signifies a decreasing characteristic curve, i.e. an increasing current causes reduced pressure (see characteristic curves on pages 7).

The proportional solenoid converts the electric current into mechanical force that acts upon the control spool via the armature. The control spool controls the connection between the main ports.

Notice

The tank pressure that occurs (port **T**) is added to the control pressure (port **A**).



Technical data

General				
Weight			kg	0.7
Installation position				Any – if it is ensured that no air can collect upstream of the valve. Otherwise, we recommend suspended installation of the valve.
Ambient temperature range			°C	See “Permissible working range” on page 6
Storage temperature range			°C	–40 ... +80
Salt spray test according to EN ISO 9227			h	720 (NSS test)
Solenoid surface protection				Coating according to DIN 50962-Fe//ZnNi with thick film passivation

Hydraulics				
Maximum control pressure	Port **A**	p_A	bar	18; 30
Maximum inlet pressure	Port **P**	p_E	bar	100
Counter pressure	Port **T**	p_T	bar	Depressurized (max. 100 bar; the tank pressures that occur are added to the control pressure (port **A**))
Flow		q_V	l/min	See characteristic curves page 7
Maximum leakage flow	Port **T**	q_L	ml/min	120 (p_E = 50 bar; I = 0 A; ν = 46 mm²/s)
Maximum pilot oil flow			ml/min	120 (p_E = 50 bar; $I = I_{max}$; ν = 46 mm²/s)
Hydraulic fluid				See table on page 5
Hydraulic fluid temperature range		ϑ	°C	–40 ... +120
Viscosity range		ν	mm²/s	5 ... 400
Maximum admissible degree of contamination of the hydraulic fluid Cleanless class according to ISO 4406 (c)				Class 20/18/15 [1)]
Hysteresis (within the tolerance band)			bar	≤1.5 (control pressure 18 bar) ≤2.0 (control pressure 30 bar)
Step response (T_u + T_g) 0 % → 100 %; 100 % → 0 %			ms	≤100 (p_E = 50 bar; ν = 46 mm²/s; q_V = 0 l/min; dead volume in **A** = 140 cm³)
Repetition accuracy			%	<2 % of the maximum control pressure
Load cycles				10 million
Mesh width mesh filter element	Port **P**		µm	240

1) 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. For the selection of the filters see www.boschrexroth.com/filter. We recommend using a filter with a minimum retention rate of $\beta_{10} \geq 75$.

Electrical					
Voltage type				DC voltage	
Supply voltage		U	V	**12**	**24**
Maximum control current		I_{max}	A	1.45	0.7
Coil resistance at 20 °C			Ω	5	22.5
Duty cycle (ED)[2]			%	100	
Maximum coil temperature[3]			°C	185	
Protection class according to ISO 20653	Connector version “K4”			IP6K5 with mating connector mounted and locked	
	Connector version “C4”			IP6K6 with mating connector mounted and locked	
				IP6K9K with Rexroth mating connector, material no. R901022127	
	Connector version “K40”			IP6K9K with mating connector mounted and locked	
Dither frequency (recommended)[4]			Hz	150	
Control electronics (separate order)				Analog amplifier type RA... (Data sheet 95230)	
				BODAS control unit type RC... (Data sheet 95204, 95205, 95206)	
Design according to VDE 0580					

Notice

- The technical data was determined at a viscosity of ν = 46 mm²/s (HLP46; ϑ_{oil} = 40 °C)
- Please contact us if the unit will be used outside the specified range of values.
- For the electrical connection, a protective earth (PE ⏚) connection is mandatory based on the specification.

Hydraulic fluid

Hydraulic fluid		**Classification**	**Suitable sealing materials**	**Standards**	**Data sheet**
Mineral oils		HL, HLP	NBR, FKM	DIN 51524	90220
Biodegradable	insoluble in water	HEES	FKM	ISO 15380	90221
	soluble in water	HEPG	FKM	ISO 15380	

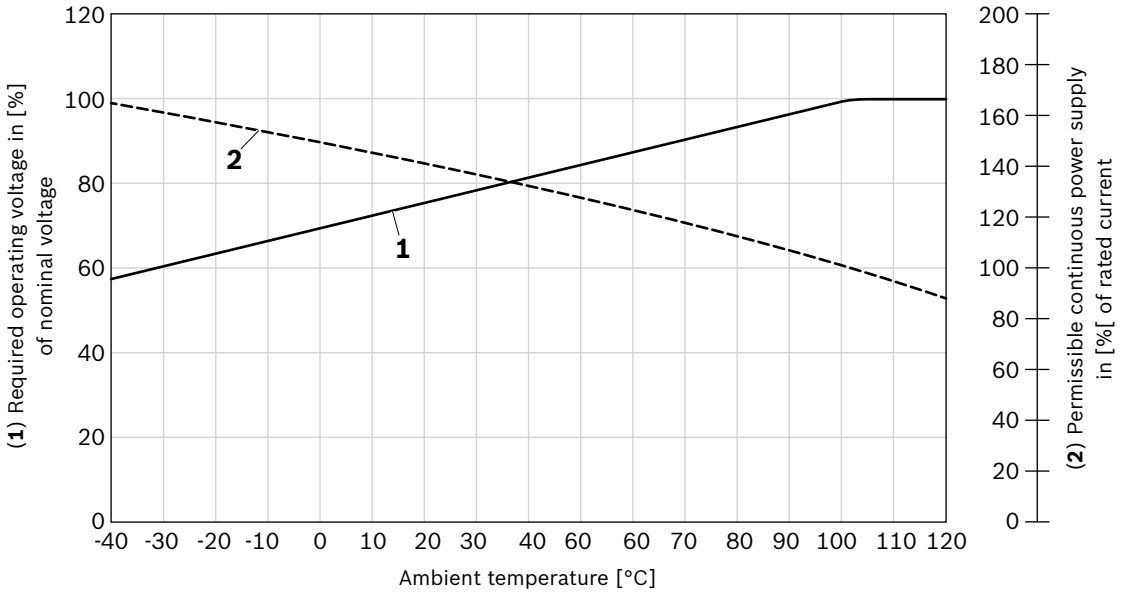
Notice

- 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.
- **Biodegradable:** When using biodegradable hydraulic fluids that are also zinc-solving, zinc may accumulate in the fluid.

2) Consultation is recommended for use at >2000 m above sea level.
3) Due to the arising surface temperatures of the solenoid coils, the standards ISO 13732-1 and ISO 4413 must be observed.
4) The dither frequency should be optimized for the application. The working temperature range is to be observed.

Permissible working range

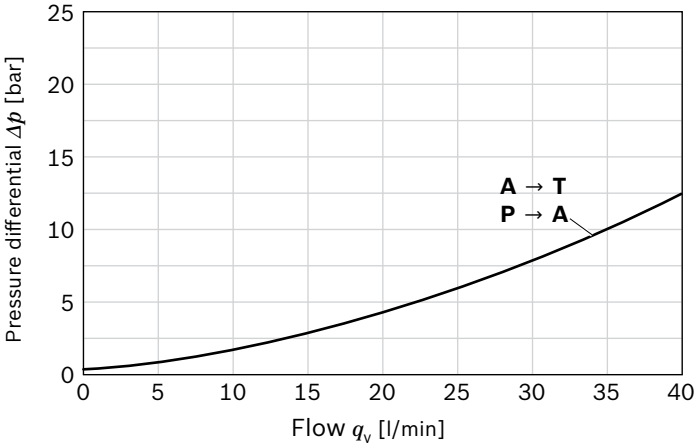
▼ **Permissible working range depending on the ambient temperature**



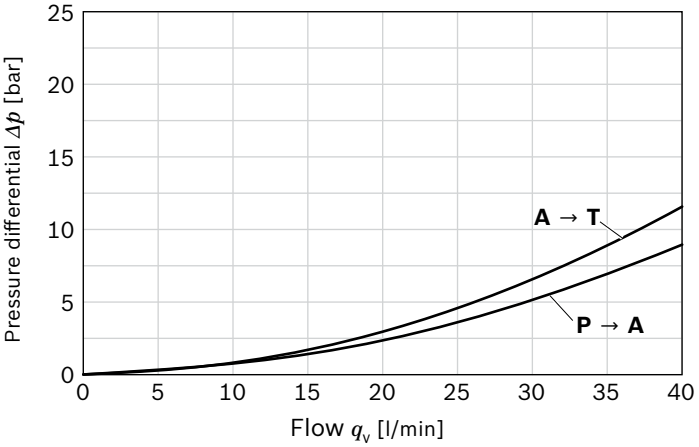
Characteristic curves

Δp-q_V flow characteristic curves

▼ **Control pressure 18 bar**

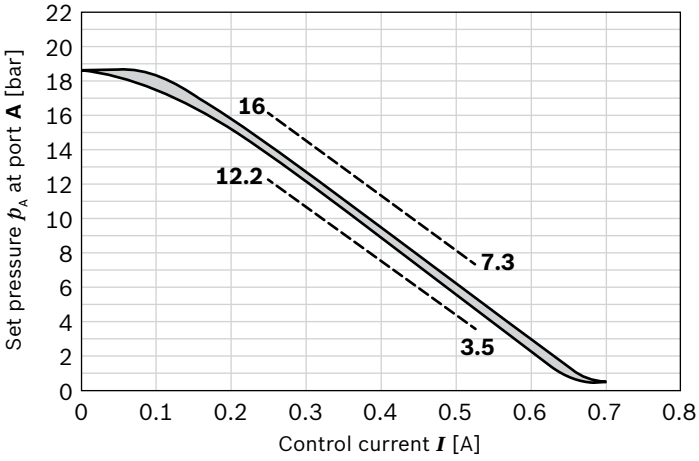


▼ **Control pressure 30 bar (Version –012)**

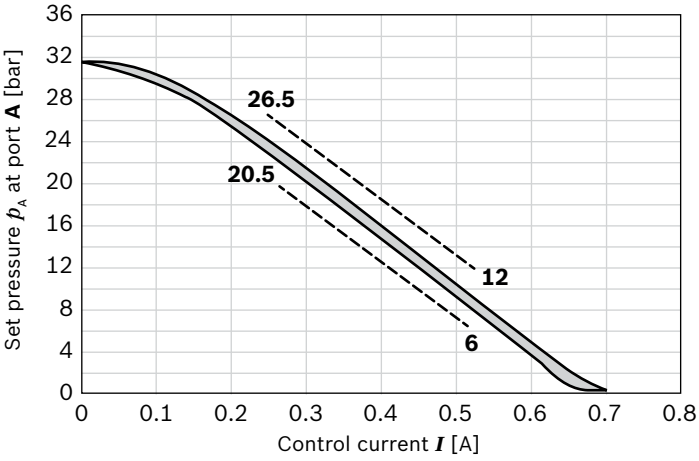


p_A-I characteristic curves with tolerance band

▼ **Control pressure 18 bar**



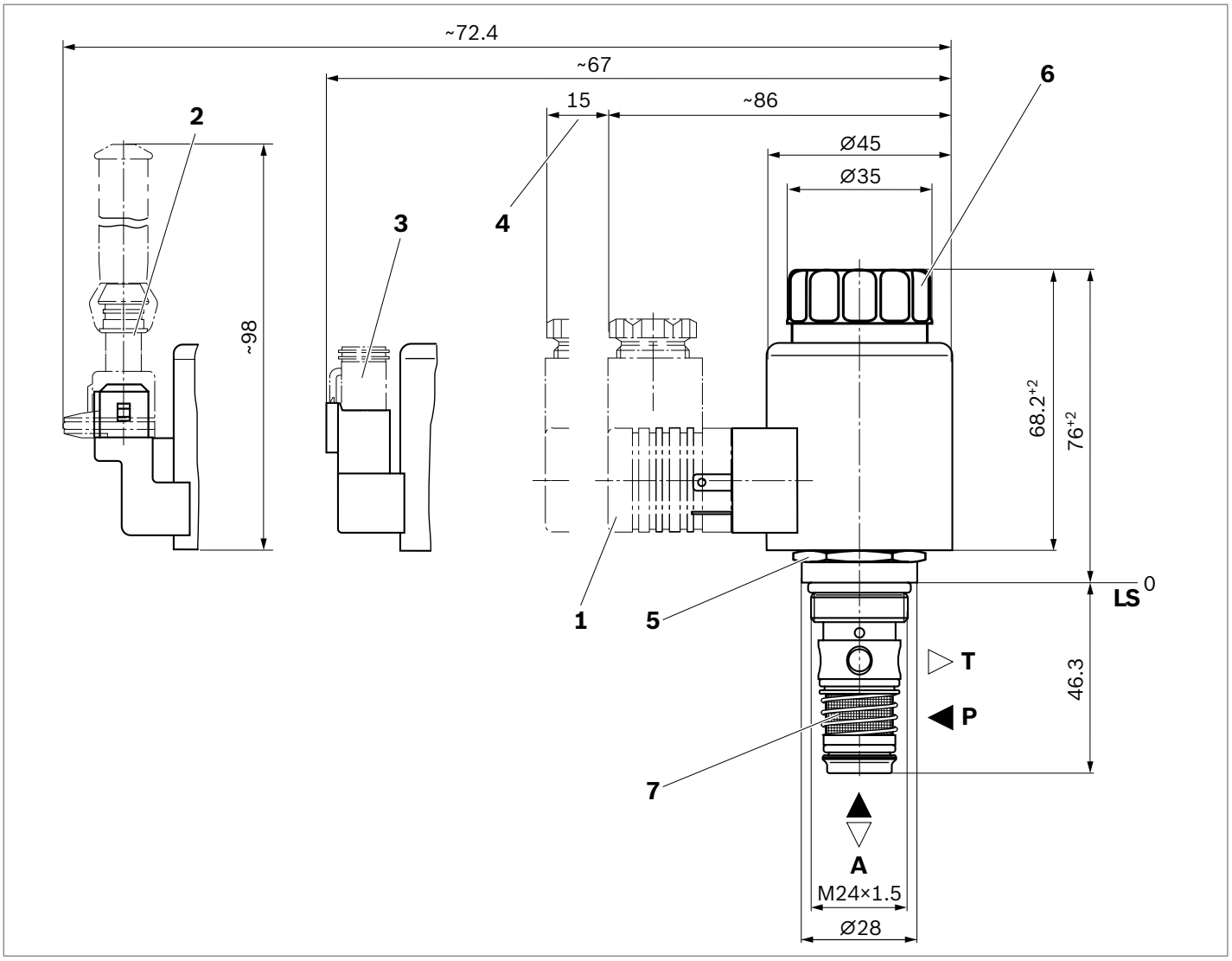
▼ **Control pressure 30 bar**



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

Dimensions

▼ **MHDRE 06**

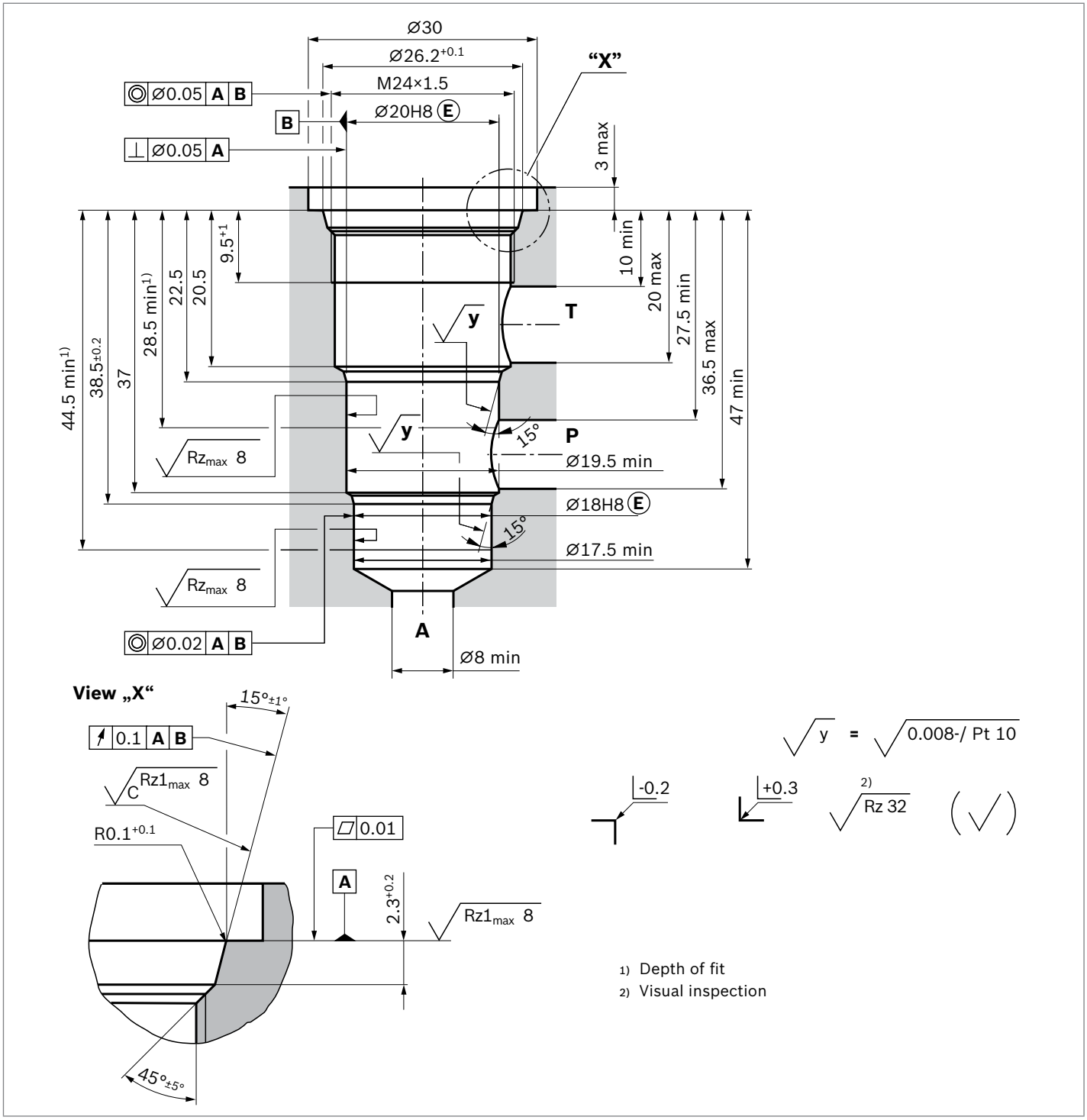


1 Plug-in connector for device connector “K4” (separate order, see data sheet 08006)
2 Plug-in connector for device connector “C4” (separate order, see data sheet 08006)
3 Plug-in connector for device connector “K40” (separate order, see data sheet 08006)
4 Space required for removing the mating connector
5 SW28 hexagon; tightening torque M_A = 10^{+2} Nm
6 Solenoid nut, tightening torque M_A = 5^{+1} Nm
7 Filter element

A= Control pressure port
P = Pump port
T = Tank port

LS = Location Shoulder

▼ **Mounting cavity R/MHDRE 06; 3 main ports**



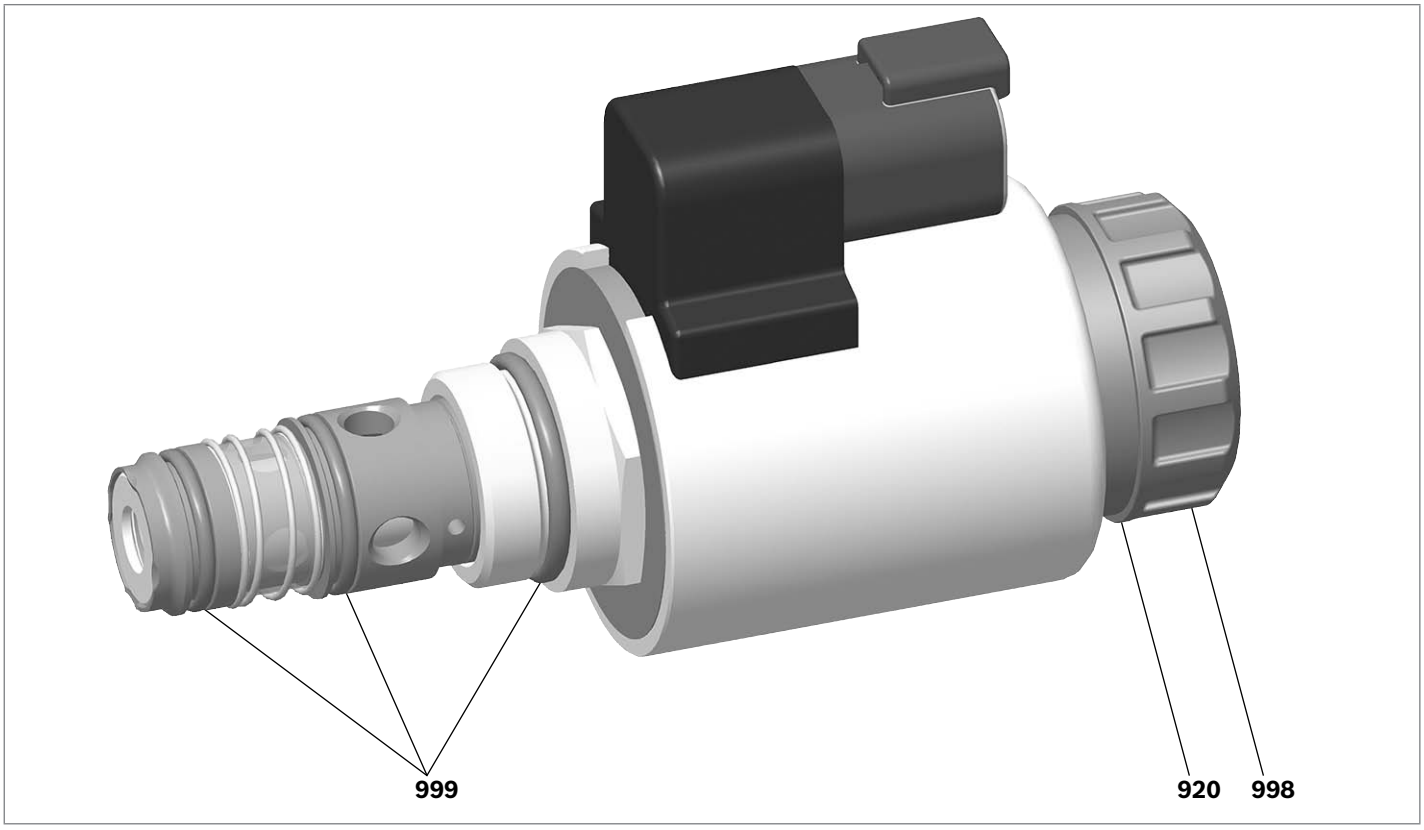
Standards:

Workpiece edges	DIN ISO 13715
Form and position tolerance	DIN EN ISO 1101
General tolerance for metal-cutting procedures	DIN ISO 2768-mK
Tolerance	DIN ISO 8015
Surface condition	DIN EN ISO 1302

A= Control pressure port
P = Pump port
T = Tank port

LS = Location Shoulder

Individual components available



Item	Denomination	Material no.
998	Nut GZ45-01V BG	R961004245
999	Seal kit of the valve	R961003854
920	O-ring	R900002507

Related documents

- Control electronics:
  - Analog amplifier — Type RA... — Data sheet 95230
  - BODAS control unit — Type RC... — Data sheet 95204, 95205, 95206
- Mineral-oil-based hydraulic fluids — Data sheet 90220
- Environmentally acceptable hydraulic fluids — Data sheet 90221
- Filter selection — www.boschrexroth.com/filter
- $MTTF_D$ values — Data sheet 90294

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