RE 64658/2019-09-12
Replaces: 02.2010

Proportional pressure reducing valve, direct operated
Type MHDRE 02 K


H7457

- Size 2
- Series 1X
- Maximum control pressure 30 bar
- Maximum flow 2.5 l/min

Features

- Direct operated proportional pressure reducing valve for reducing a system pressure
- Cartridge valve
- Suitable for mobile and industrial applications
- Operation by means of proportional solenoid
- In case of power failure, the minimum pressure is set
- Recommended control electronics:
  Mobile amplifier type RA and RC

Contents

Ordering details

01	02	03	04		05	06	07	08	09	10
MHDRE	**02**	**K**	**1X**	**/**		**A**		**K40**	**V**	*****

Valve type

01	Proportional pressure reducing valve, direct operated	**MHDRE**
02	Size 2	**02**
03	Cartridge valve	**K**

Series

04	Series 10 ... 19 (unchanged installation and connection dimensions)	**1X**

Maximum control pressure

05	18 bar	**18**
	30 bar	**30**

06	Proportional solenoid, switching in oil	**A**

Supply voltage

07	Electronic controls 12 V DC	**G12**
	Electronic controls 24 V DC	**G24**

Electrical connection[1)]

08	Device connector 2-pin, DT 04-2P (DEUTSCH)	**K40**

Sealing material

09	FKM (fluoroelastomer)	**V**

10	Further details in plain text	*****

Preferred types

Type	**Material number**	
	12 V	**24 V**
MHDRE 02 K1X/18AG .. K40V	R901123950	R901123965
MHDRE 02 K1X/30AG .. K40V	R901048962	R901048970

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

Functional description

General

The proportional pressure reducing valve type MHDRE 02 K is a direct operated installation valve in 3-way design. It reduces the control pressure (port **A**) proportionally to the solenoid current and functions largely independently from the input pressure (port **P**).
With a command value of 0 or in case of power failure, the minimum 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 reduce the system pressure continuously. The valve is suitable for controlling couplings, pumps and directional valves as well as for use in proportional pilot controls (particularly in the mobile area, however also for industrial applications).

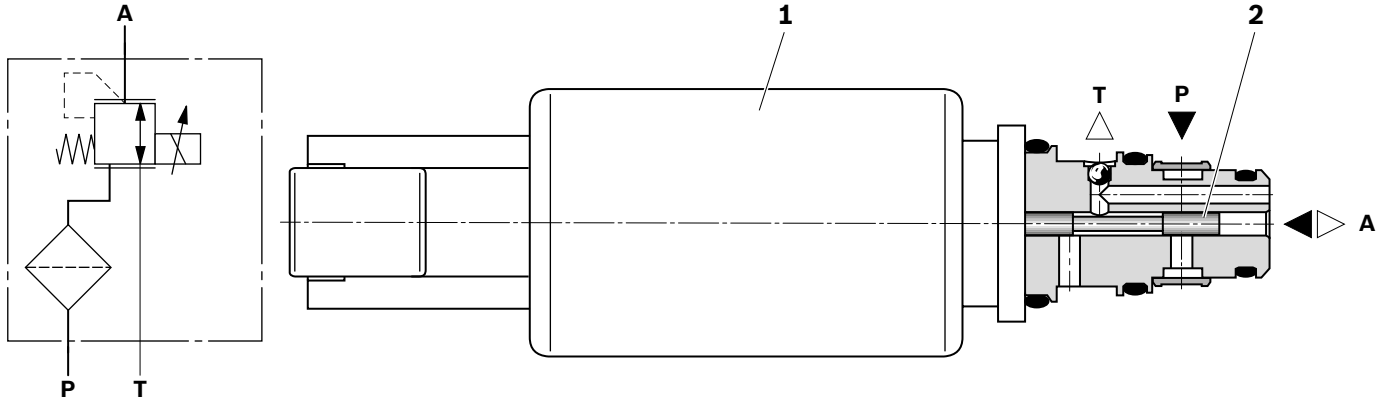
Basic principle

The valve controls the pressure in the port **A** proportionally to the current at the solenoid.
The proportional solenoid (**1**) converts the electric current into mechanical force that acts on the spool (**2**) via the armature. The spool controls the connection between the main ports.

Notice
Occurring tank pressure (port **T**) adds up to the control pressure (port **A**).

Attention!

If the valve is not installed or installed in a system that is not completely bled, the valve must not be energized as otherwise, the entering air has a very negative effect on the valves' dynamic behavior.



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

Technical data

General				
Weight (approx.)			kg	0.24
Installation position				Any – if it is ensured that no air can collect upstream the valve. Otherwise, we recommend suspended installation of the valve (electric connection downwards).
Ambient temperature range			°C	See “Permissible working range” on page 6
Storage temperature range			°C	–40 to +80
Salt spray test according to EN ISO 9227			h	600 (NSS test)
Surface protection Solenoid				Coating according to DIN 50962-Fe//ZnNi with thick layer passivation

Hydraulics				
Maximum control pressure	Port **A**	p_A	bar	18; 30
Maximum inlet pressure	Port **P**	p_E	bar	50 (with mounting clip “50”)[1)]
Back pressure	Port **T**	p_T	bar	At zero pressure (max. 3 bar with mounting clip “50”, occurring tank pressures are added up to the control pressure (Port **A**))[1)]
Maximum flow (Δp = 7 bar)		q_V	l/min	2.5
Maximum leakage flow	Port **T**	q_L	ml/min	50 (p_E = 50 bar; I = 0 mA; ν = 46 mm²/s)
Average pilot flow			ml/min	250 (p_E = 50 bar; $I = I_{max}$; ν = 46 mm²/s) (maximum 350)
Hydraulic fluid				Mineral oil (HL, HLP) according to DIN 51524, see data sheet 90220. Other hydraulic fluids on request, e.g. environmentally acceptable fluids per ISO 15380 as specified in data sheet 90221.
Hydraulic fluid temperature range		ϑ	°C	–30 to +110
Viscosity range		ν	mm²/s	5 to 400
Maximum admissible degree of contamination of hydraulic fluid Cleanliness level per ISO 4406 (c)				Class 20/18/15 [2)]
Hysteresis (within tolerance range)			bar	≤1.5
Step response (T_u + T_g) 0 % → 100 %; 100 % → 0 %			ms	≤60 (p_E = 50 bar; ν = 46 mm²/s; q_V = 0 l/min; dead volume in **A** = 140 cm³)
Repeatability			%	<2 % of the maximum control pressure
Load cycles				10^7
Mesh width mesh filter element	Port **P**		µm	160

1) **Attention!** The specified value describes only the capability of the valve. In addition, the capability of the selected mounting clip must be observed:
Mounting clip “50” and fastening screw ISO 4762 – M5×14 – 8.8 (separate order), see page 10.

2) Cleanliness levels specified for the components must be maintained in the hydraulic systems. Effective filtration prevents malfunctions and simultaneously extends the service life of the components.
To select filters, visit www.boschrexroth.com/filter.
We recommend 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	1.7	0.95
Coil resistance at 20 °C			Ω	3.5	11.1
Duty cycle (ED)[3]			%	See “Permissible working range” on page 6	
Maximum coil temperature[4]			°C	185	
Type of protection according to ISO 20653	Connector version “K40”			IP6K5, IP6K7 and IP6K9K with installed and locked plug-in connector	
Chopper frequency (recommended) [5]			Hz	150	
Control electronics (separate order)				Type RA... analog amplifier (data sheet 95230)	
				Type RC... BODAS controller (data sheets 95204, 95205, 95206)	
Design according to VDE 0580					

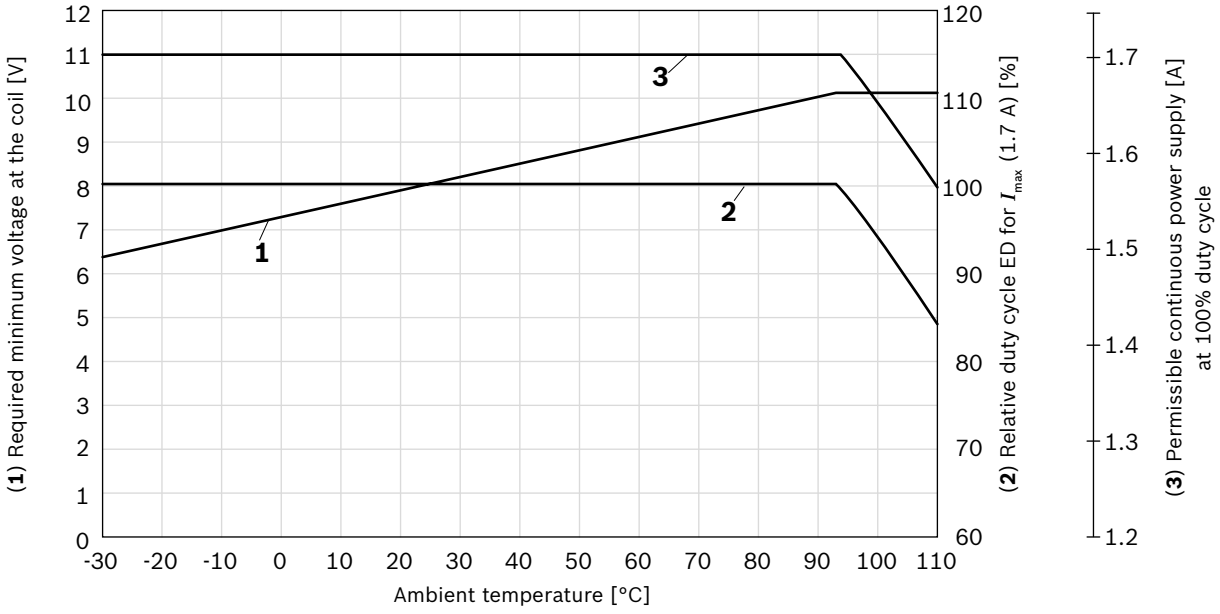
Notice

- 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.

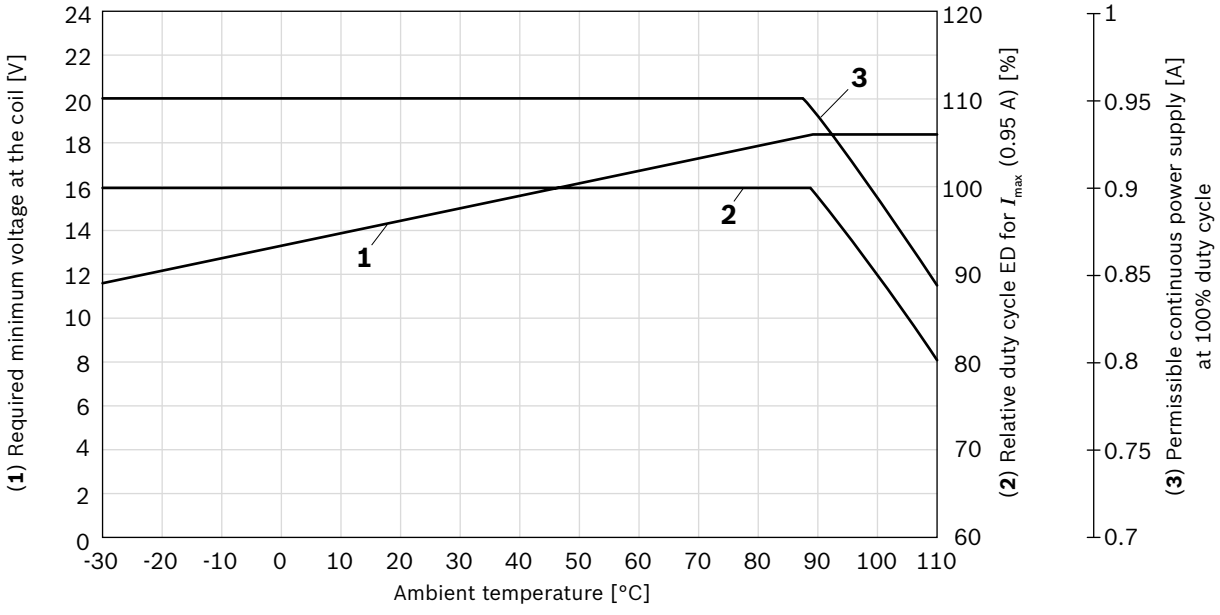
3) In case of use at an altitude of more than 2000 m a.s.l., we recommend consulting the manufacturer.
4) Due to the arising surface temperatures of the solenoid coils, the standards ISO 13732-1 and ISO 4413 must be observed.
5) The chopper frequency is to be optimized after the application. The use temperature range is to be observed.

Permissible working range

▼ **Permissible working range against the ambient temperature**
Version “G12” (DC 12 V)



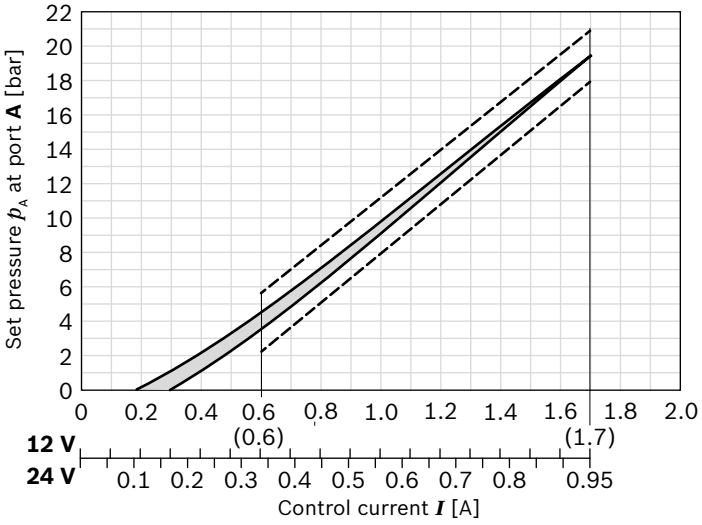
▼ **Permissible working range against the ambient temperature**
Version “G24” (DC 24 V)



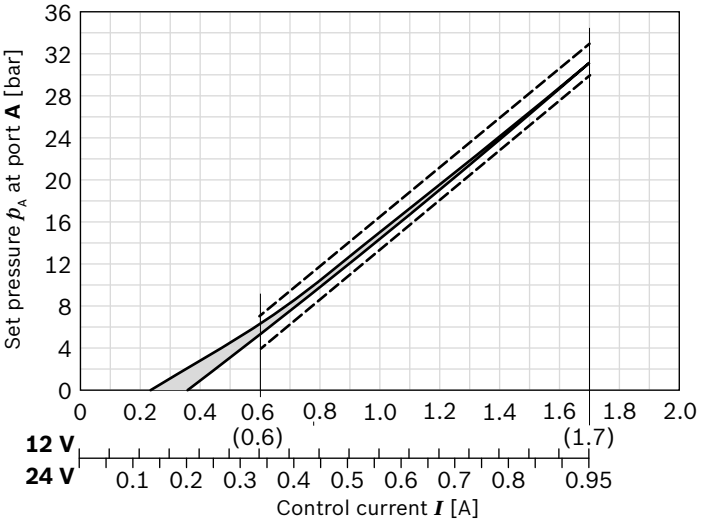
Characteristic curves

p_A-I-characteristic curves with tolerance band

▼ **Control pressure 18 bar**



▼ **Control pressure 30 bar**



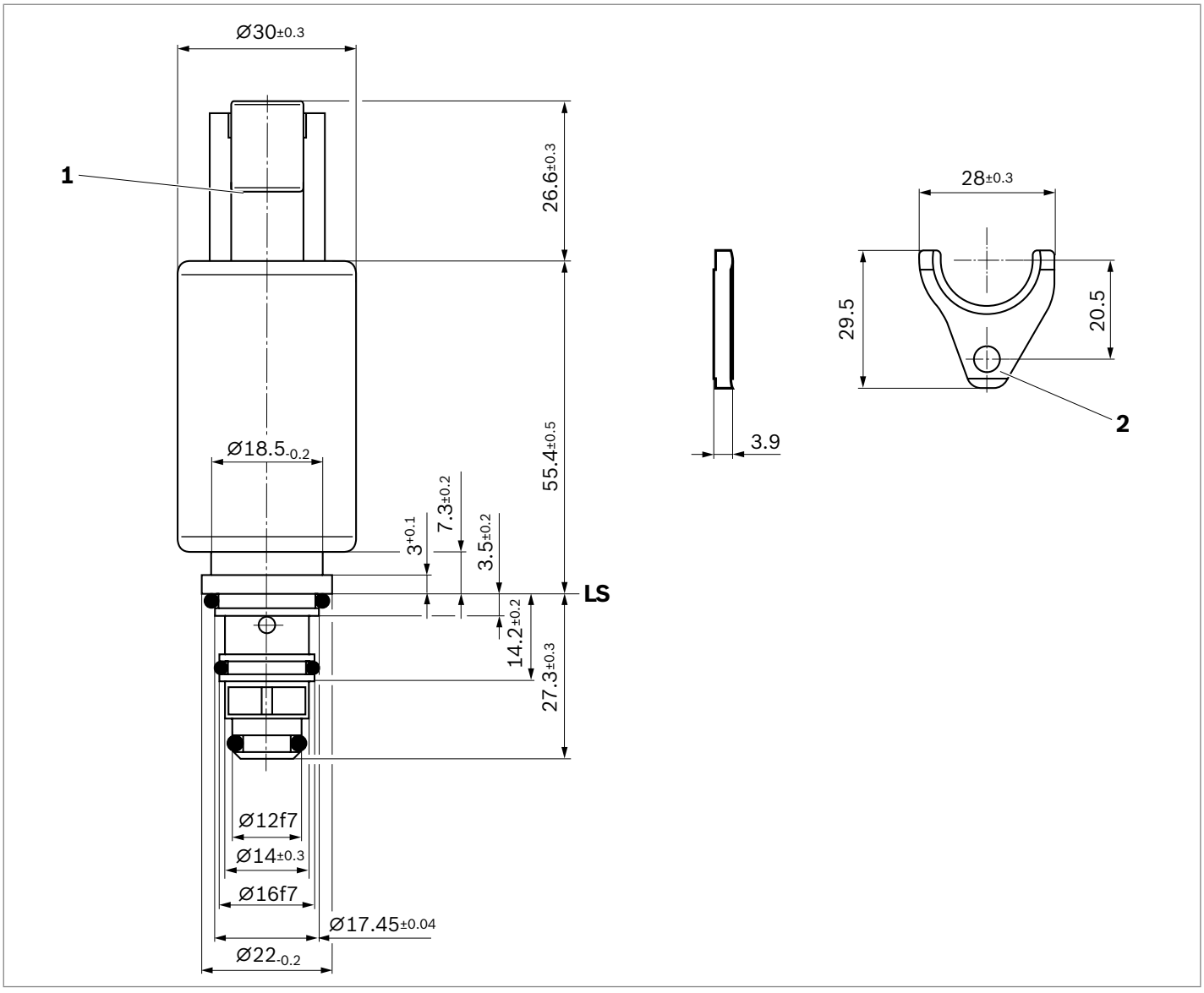
Measuring conditions:

Amplifier	Analog amplifier RA (data sheet 95230)
Chopper frequency	150 Hz
Inlet pressure	50 bar
Dead volume at port **A**	135 ml

Notice
Characteristic curves measured with HLPD46,
ϑ_{oil} = 50$^{\pm 5}$ °C.

Dimensions

▼ **MHDRE 02 K**



1 Plug-in connector for device connector “K40” (separate order, see Data Sheet 08006)

2 Mounting clip “50” and fastening screw ISO 4762 – M5 × 14 – 8.8 – to 30 bar (separate order), see page 10

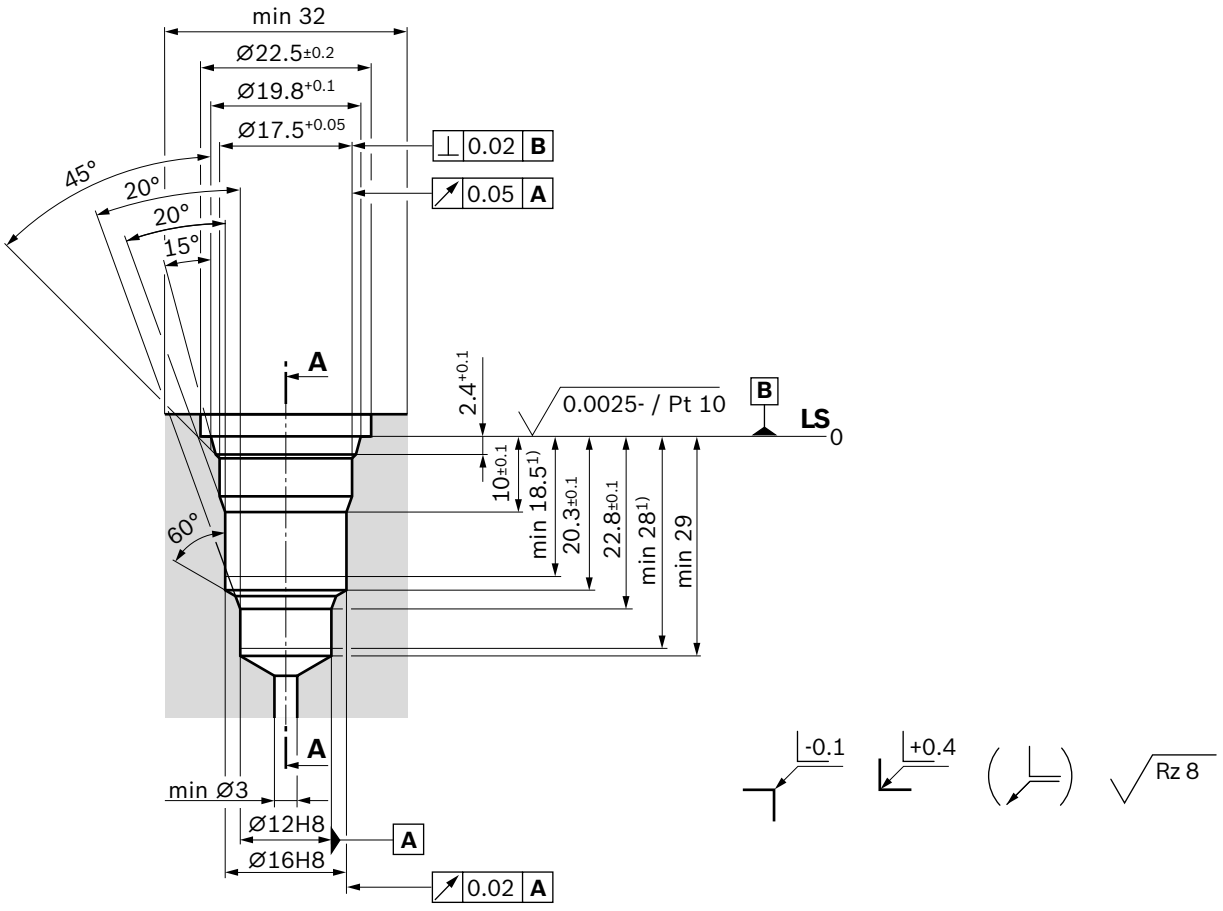
A= Control pressure port

P = Pump port

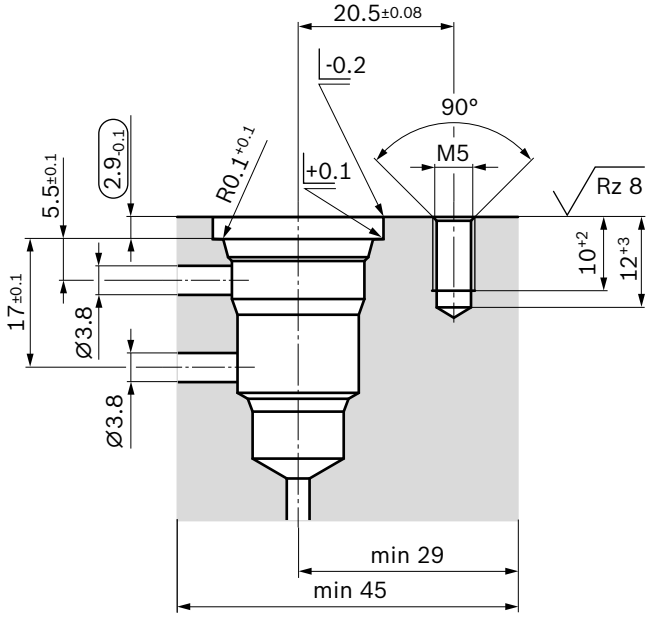
T = Tank port

LS = Location Shoulder

▼ **Mounting cavity**



Section A – A, mounting clip “50”



A= Control pressure port
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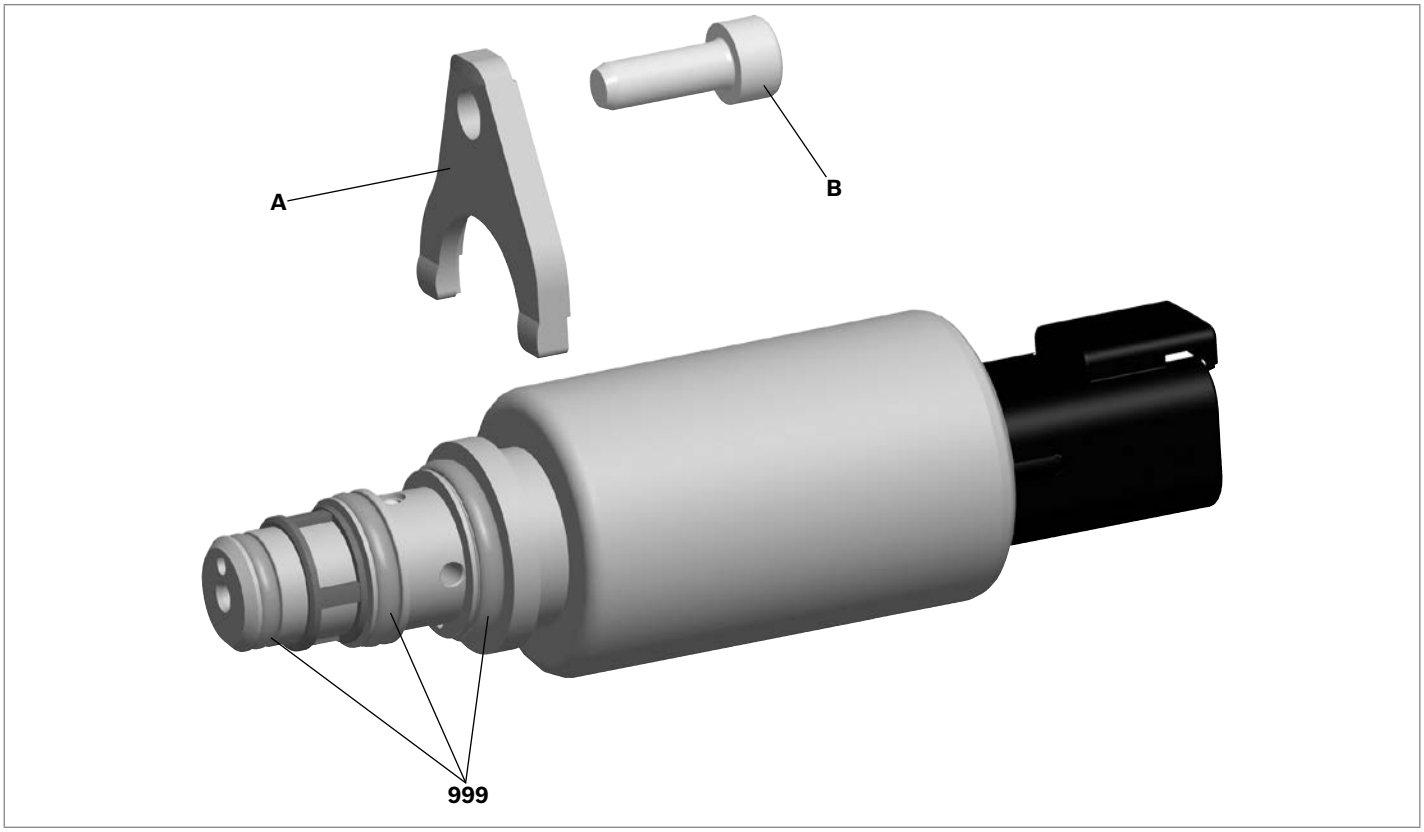
Standards:

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

1) Depth of fit

Available individual components



Item	Designation	Material no.
999	Seal kit of the valve (for 2 valves)	R961003681
A	Mounting clip “50” (Maximum inlet pressure 50 bar)	R908105638
B	Socket-head screw ISO 4762 – M5 × 14 – 8.8 (mounting clip “50”)	2910141156

Related documentation

- Electronic controls:
  - Analog amplifier Type RA Data sheet 95230
  - BODAS controller Type RC Data sheets 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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