2/2 proportional directional valve, direct operated

RE 18139-09/12.11 1/10
Replaces: 04.09

Type KKDS (High Performance)

Component size 2
Component series A
Maximum operating pressure 350 bar
Maximum flow 58 l/min


H7568

Table of contents

Features

- Cartridge valve
- Mounting cavity R/T-5A
- Direct operated proportional valve for controlling the flow size
- Operation by means of proportional solenoid with central thread and detachable coil
- Rotatable solenoid coil
- With concealed manual override, optional
- Control electronics: Data sheet
  - Proportional plug-in amplifier type VT-SSPA1… 30116
  - Analog amplifier type RA… 95230

Ordering code

KKDS	R	2	N	A / H	C				V	*

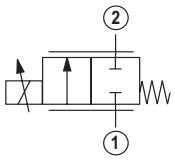
Proportional directional valve, direct operated

Maximum operating pressure 350 bar **= R**

Component size **= 2**

2 main ports

Symbol



Normally closed **= N**

Component series **= A**

High Performance and mounting cavity R/T-5A (see page 9) **= H**

Proportional solenoid, wet-pin **= C**

[1] Mating connectors, separate order, see data sheet 08006

Further details in the plain text

Seal material

V = FKM seals
Attention!
Observe compatibility of seals with hydraulic fluid used!

Electrical connection [1]

K4 = Without mating connector, with connector according to DIN EN 175301-803

K40 = Without mating connector, with connector DT 04-2PA (Deutsch plug)

C4 = Without mating connector, with connector AMP Junior-Timer

N0 = **Without** manual override

N9 = **With** concealed manual override

Supply voltage

G24 = Control electronics DC 24 V

G12 = Control electronics DC 12 V

Preferred types

Type	Material no.
KKDSR2NA/HCG24N9K4V	R901074596
KKDSR2NA/HCG12N9K4V	R901036359
KKDSR2NA/HCG24N9C4V	R901055340

Function, section, symbol

General

The 2/2 proportional directional valve is a direct operated cartridge spool valve. It regulates the flow proportionally to the input signal in a continuous form from main port ① to ②.

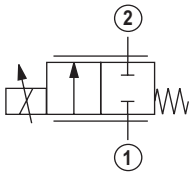
The valve basically comprises of a bushing (6) with male thread for the mounting cavity, socket (3), control spool (5) with compression spring (8) as well as proportional solenoid (7) with central thread and removable coil.

Function

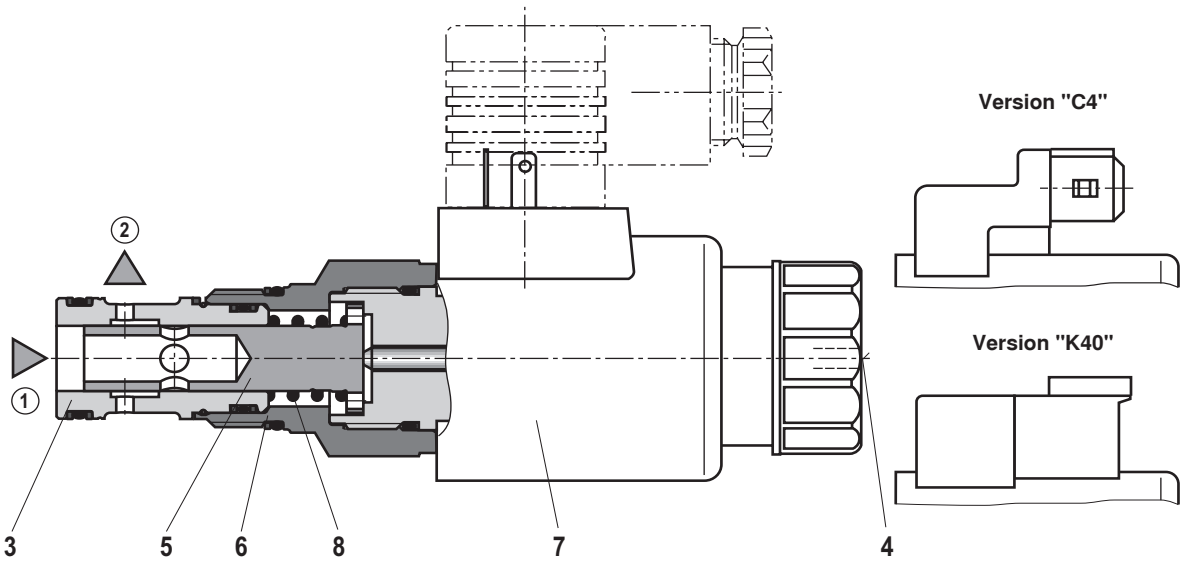
With de-energized solenoid (7), the control spool (5) that is always pressure-compensated to the actuating forces due to its constructive design is held in the initial position by the compression spring (8) and blocks the flow between main port ① and ②. By energizing the solenoid (7), the control spool (5) is directly adjusted – proportional to the electric input signal – and, via orifice-like cross-sections with progressive flow characteristic in the spool, connects the main ports ① and ②. Upon de-excitation of the solenoid (7), the control spool (5) is brought back into the initial position by the compression spring (8).

The manual override (4) allows for the switching of the valve without solenoid energization.

Symbol



Version "K4"
(with mating connector)



Version "C4"

Version "K40"

Type KKDSR2NA/HC.N9K4V

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

general

Weight	kg	0.84
Installation position		Any – if it is ensured that no air can collect upstream the valve. Otherwise, we recommend suspended installation of the valve.
Ambient temperature range	°C	–40 to +100 (see Minimum terminal voltage page 7)
Storage temperature range	°C	–20 to +80

Environmental audits

Salt spray test according to DIN 50021	h	720
Surface protection Proportional solenoid		Coating according to DIN 50962-Fe//ZnNi with thick layer passivation

hydraulic

Maximum operating pressure		bar	350
Maximum flow		l/min	58
Leakage		ml/min	< 60 (with Δp = 100 bar in ①; HLP46, ϑ_{oil} = 40 °C)
Step response	0 to 100 %; 100 to 0 %	ms	< 180 (with p_S = 10 bar)
Hydraulic fluid			See table page 5
Hydraulic fluid temperature range		°C	–40 to +100 (preferably +40 to +50)
Viscosity range		mm^2/s	5 to 400 (preferably 10 to 100)
Maximum permitted degree of contamination of the hydraulic fluid - cleanliness class according to ISO 4406 (c)			Class 20/18/15 [1]
Hysteresis [2]		%	≤ 5
Range of inversion [2]		%	≤ 2
Response sensitivity [2]		%	≤ 1
Load cycles			10 million

[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 service life of the components.

For the selection of the filters see www.boschrexroth.com/filter.

[2] Measured with analog amplifier type RA2-1/10, see data sheet 95230.

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

hydraulic

Hydraulic fluid		Classification	Suitable sealing materials	Standards
Mineral oils and related hydrocarbons		HL, HLP, HLPD, HVLP, HVLPD	FKM	DIN 51524
Environmentally compatible	– Insoluble in water	HEES	FKM	ISO 15380
		HEPR	FKM	
	– Soluble in water	HEPG	FKM	ISO 15380
Flame-resistant	– Water-free	HFDU, HFDR	FKM	ISO 12922
	– Water-containing	HFAS	FKM	ISO 12922

☞ **Important information on hydraulic fluids!**

- For more information and data on the use of other hydraulic fluids refer to data sheet 90220 or contact us!
- There may be limitations regarding the technical valve data (temperature, pressure range, service life, maintenance intervals, etc.)!
- The flash point of the process and operating medium used must be 40 K higher than the maximum solenoid surface temperature.
- **Flame-resistant – water-containing:** Maximum pressure differential per control edge 175 bar, otherwise, increased cavitation erosion!
  Tank pre-loading < 1 bar or > 20 % of the pressure differential. Pressure peaks should not exceed maximum operating pressures!
- **Environmentally compatible:** When using environmentally compatible hydraulic fluids that are simultaneously zinc-solving, zinc may accumulate in the medium (700 mg zinc per pole tube).

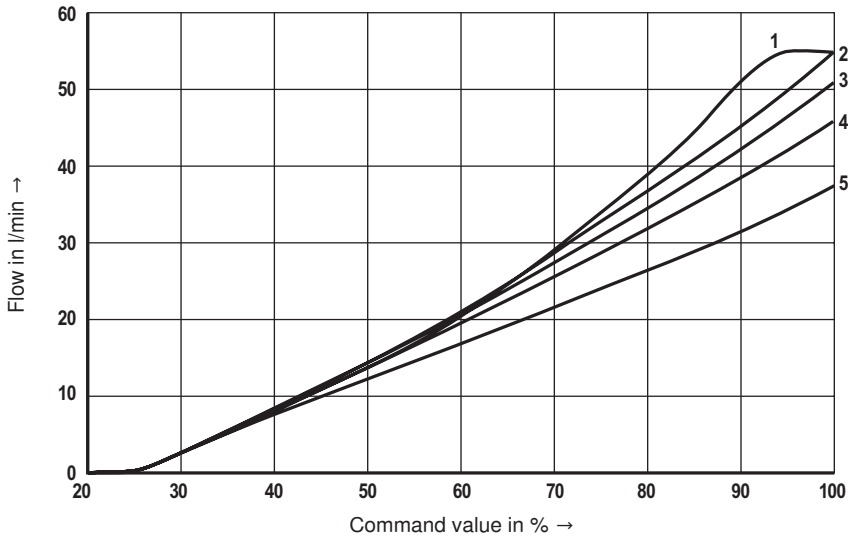
electric

Voltage type			Direct voltage (DC)	
Supply voltage		V	12	24
Maximum solenoid current		A	1.8	1.2
Coil resistance	– Cold value at 20 °C	Ω	3.3	7.2
	– Max. hot value	Ω	5.8	13.0
Switch-on duration		%	100 (see minimum terminal voltage page 7)	
Maximum coil temperature [3]		°C	150	
Protection class according to DIN EN 60529	– Version "K4"		IP 65 with mating connector mounted and locked	
	– Version "K40"		IP 69K with mating connector mounted and locked	
	– Version "C4"		IP 66 with mating connector mounted and locked	
			IP 69K with Rexroth mating connector (Material no. R901022127)	
Control electronics (separate order)			– Proportional plug-in amplifier type VT-SSPA1…, see data sheet 30116 – Analog amplifier type RA..., see data sheet 95230	
Design according to VDE 0580				

[3] Due to the surface temperatures of the solenoid coils, the standards ISO 13732-1 and EN 982 need to be adhered to!

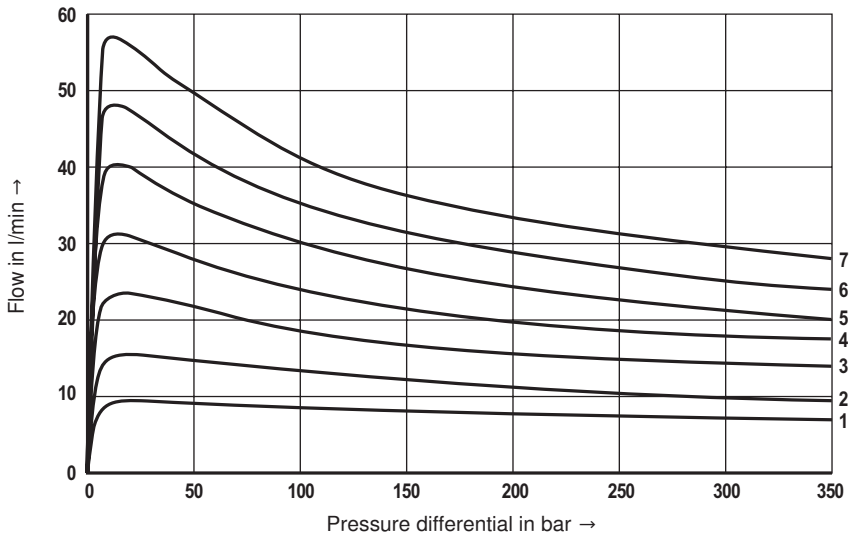
In the electrical connection, the protective earthing conductor (PE ⏚) must be connected properly.

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



1 Δp = 10 bar constant
2 Δp = 20 bar constant
3 Δp = 30 bar constant
4 Δp = 50 bar constant
5 Δp = 100 bar constant

Limits of performance (measured with HLP46, ϑ_{oil} = 40 ± 5 °C)

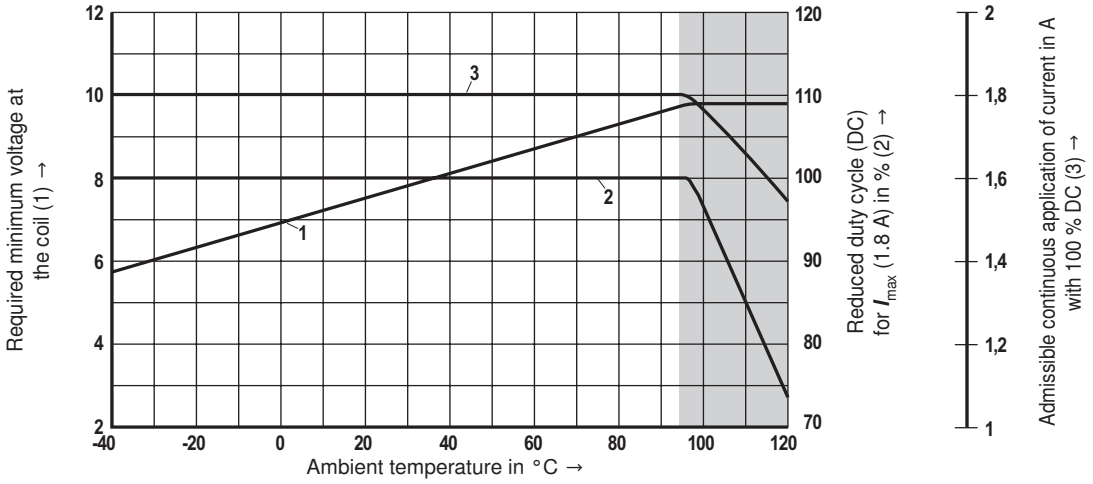


1 Command value = 40 %
2 Command value = 50 %
3 Command value = 60 %
4 Command value = 70 %
5 Command value = 80 %
6 Command value = 90 %
7 Command value = 100 %

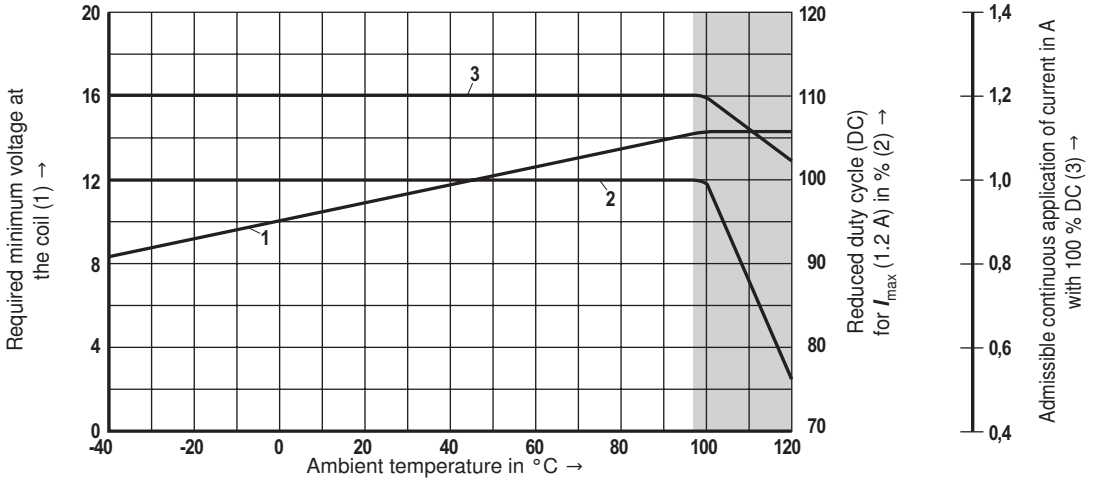
Minimum terminal voltage at the coil and relative duty cycle

Admissible working range against the ambient temperature

– Version "G12"



– Version "G24"



Limited valve performance

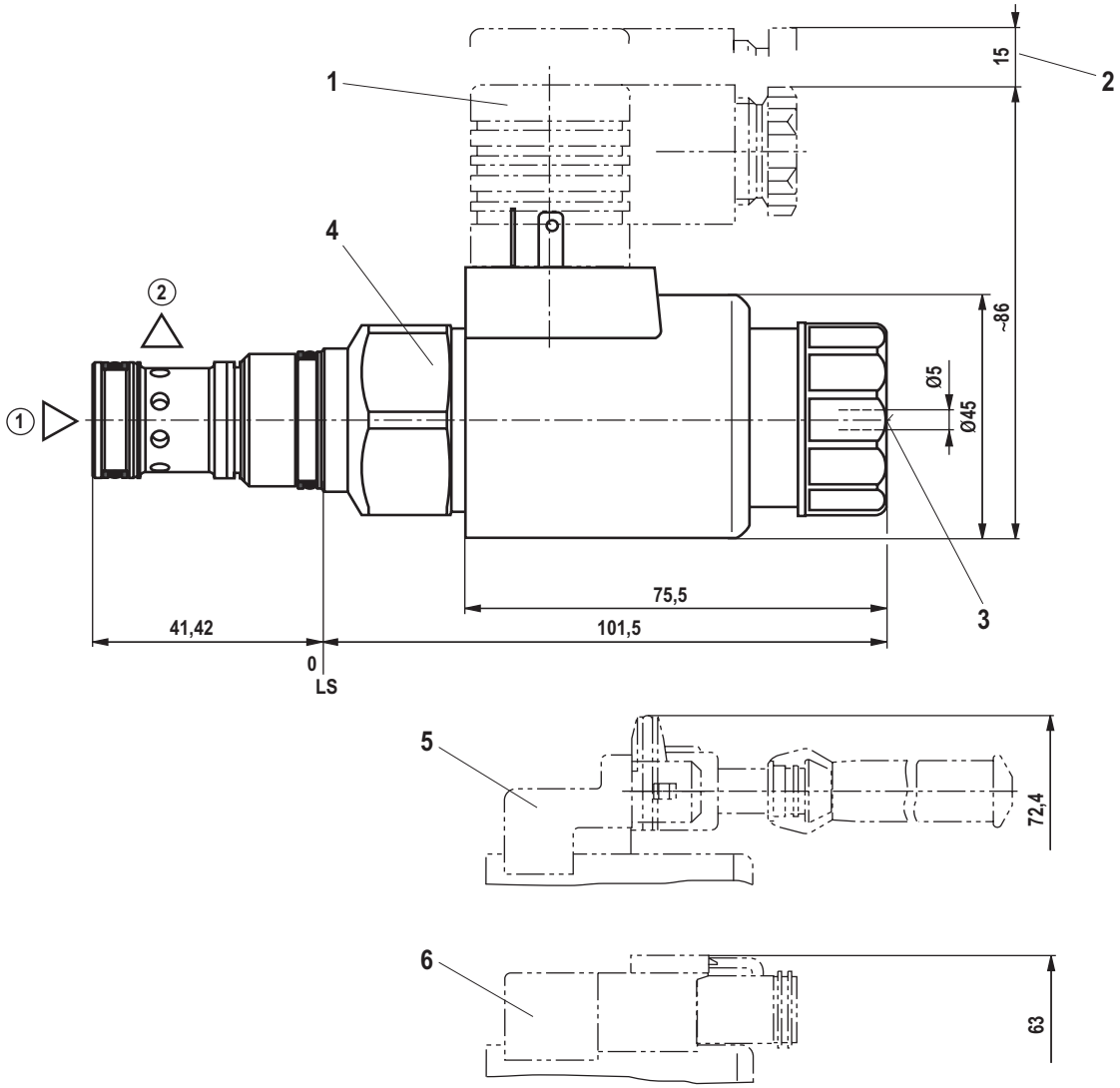
Notice!

The characteristic curves have been determined for coils with valve with medium test block size (80 x 80 x 80 mm), without flow in calm air.

Depending on the installation conditions (block size, flow, air circulation, etc.) there may be a better heat dissipation. This increases the area of application.

In single cases, more unfavorable conditions may lead to limitations of the range of application.

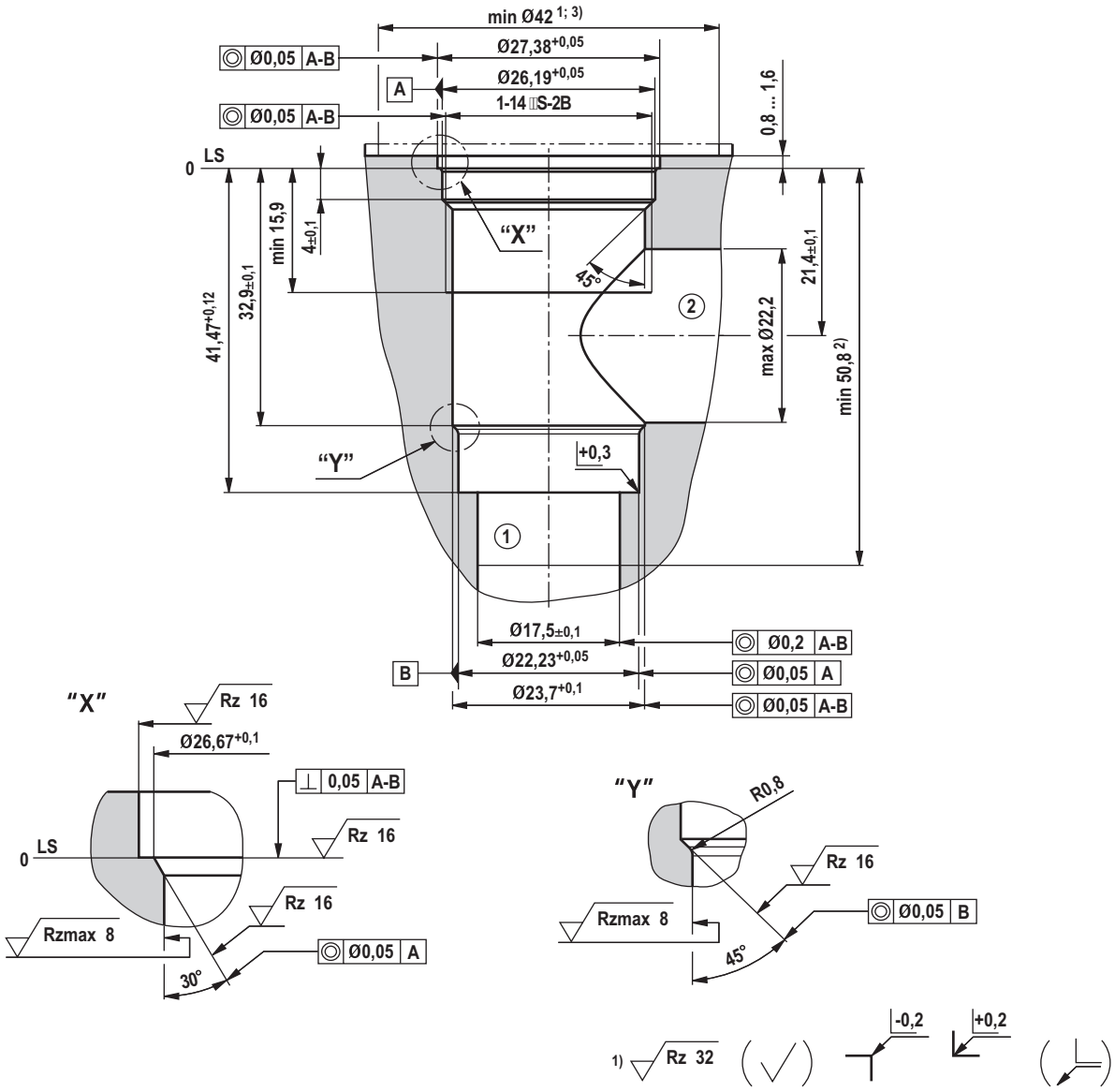
Unit dimensions (dimensions in mm)



① = Main port 1
② = Main port 2
LS = Location Shoulder

1 Mating connector without circuitry for connector "K4" (separate order, see data sheet 08006)
2 Space required for removing the mating connector
3 Concealed manual override "N9"
4 SW36, tightening torque M_A = 60 to 65 Nm
5 Mating connector for connector "C4" (separate order, see data sheet 08006)
6 Mating connector for connector "K40" (separate order, see data sheet 08006)

Mounting cavity R/T-5A[1]; 2 main ports; thread 1-14 UNS-2B (dimensions in mm)



① = Main port 1
② = Main port 2
LS = Location Shoulder

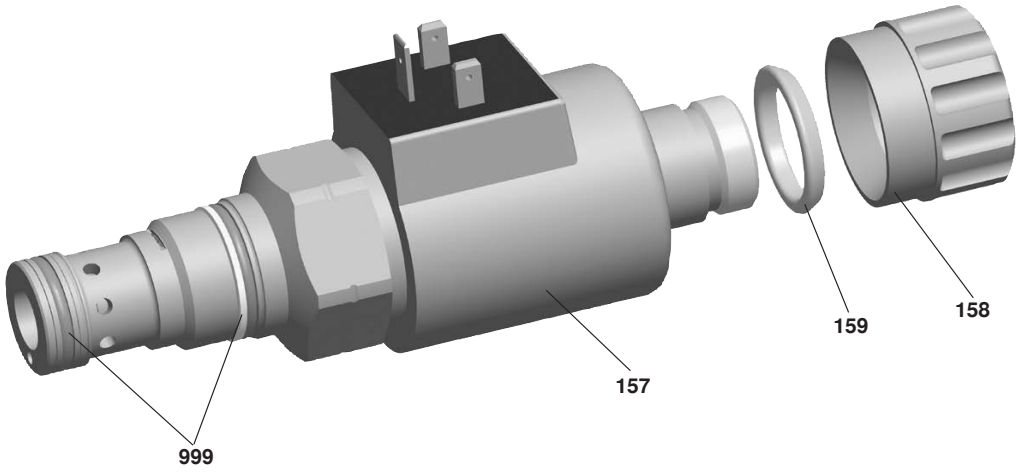
[1] Differing from T-5A
[2] Depth for moving parts
[3] With counterbore

All seal ring insertion faces are rounded and free of burrs
Tolerance for all angles ±0.5°

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

Available individual components



Item	Denomination		Direct voltage	Material no.
157	Coil for individual connection	Version "K4"	12 V	R901022180
			24 V	R901022174
		Version "K40"	12 V	R901272648
			24 V	R901272647
		Version "C4"	12 V	R901022680
			24 V	R901022683
158	Nut			R900029574
159	O-ring for pole tube			R900002507
999	Seal kit of the valve			R961004435