

# 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

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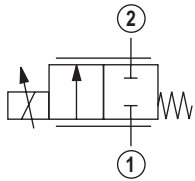
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## Features

- 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

Information on available spare parts:  
[www.boschrexroth.com/spc](http://www.boschrexroth.com/spc)

## Ordering code

KKDS	R	2	N	A / H	C				V	*
Proportional directional valve, direct operated										Further details in the plain text
Maximum operating pressure 350 bar		= R								<b>Seal material</b> FKM seals Attention! Observe compatibility of seals with hydraulic fluid used!
Component size		= 2								
2 main ports										<b>Electrical connection</b> <sup>1)</sup> <b>K4 =</b> Without mating connector, with connector according to DIN EN 175301-803 <b>K40 =</b> Without mating connector, with connector DT 04-2PA (Deutsch plug) <b>C4 =</b> Without mating connector, with connector AMP Junior-Timer <b>N0 =</b> Without manual override <b>N9 =</b> With concealed manual override
Symbol		Normally closed	= N							
Component series		= A								<b>Supply voltage</b> <b>G24 =</b> Control electronics DC 24 V <b>G12 =</b> Control electronics DC 12 V
High Performance and mounting cavity R/T-5A (see page 9)		= H								
Proportional solenoid, wet-pin		= C								

<sup>1)</sup> Mating connectors, separate order, see data sheet 08006

## 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.

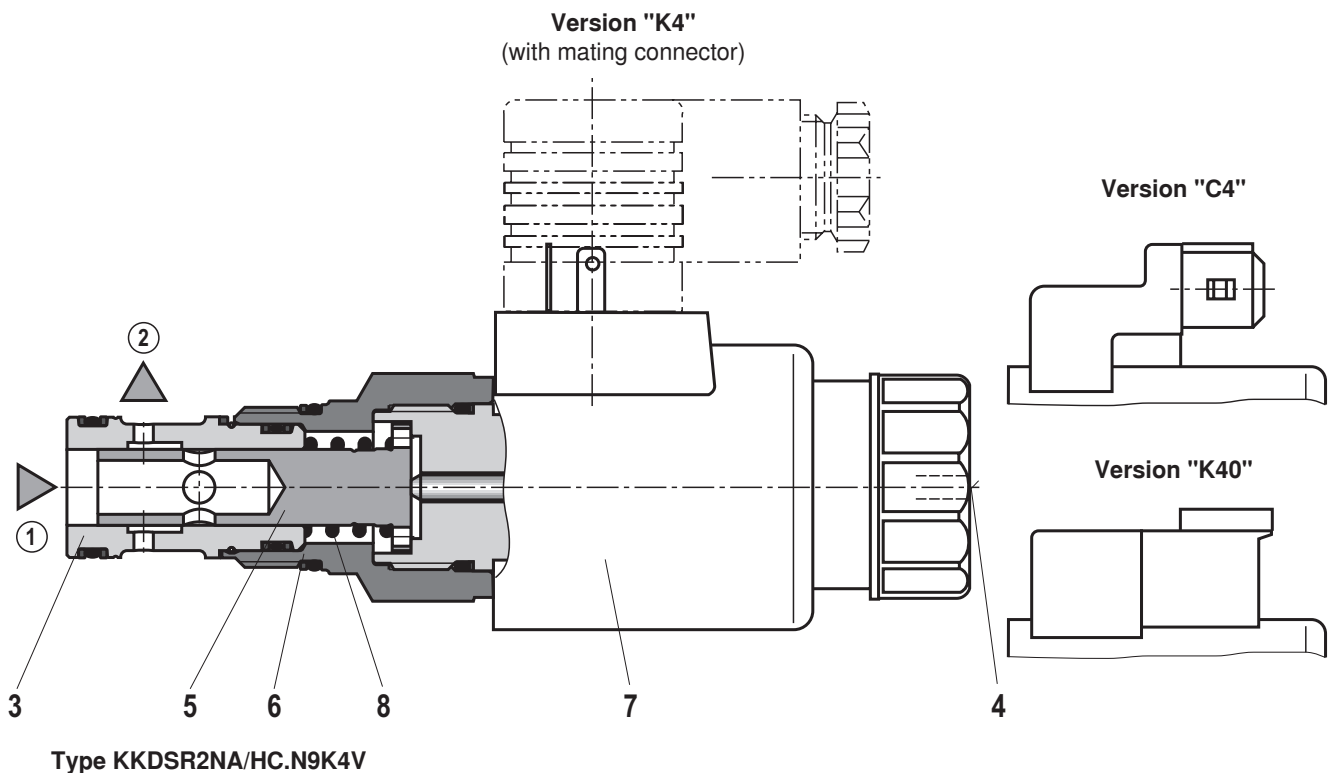
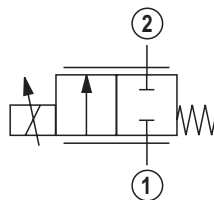
The valve basically comprises of a bushing (6) with male thread for the mounting cavity, socket (3), control spool (5) with compression spring (8) as well as proportional solenoid (7) with central thread and removable coil.

### 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



**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 $\Delta p = 100$ bar in ①; HLP46, $\vartheta_{oil} = 40$ °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 <sup>2</sup> /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 <sup>1)</sup>	
Hysteresis <sup>2)</sup>	%	≤ 5	
Range of inversion <sup>2)</sup>	%	≤ 2	
Response sensitivity <sup>2)</sup>	%	≤ 1	
Load cycles		10 million	

<sup>1)</sup> 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](http://www.boschrexroth.com/filter).

<sup>2)</sup> 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	ISO 15380
		HEPR	
	– Soluble in water	HEPG	ISO 15380
Flame-resistant	– Water-free	HFDU, HFDR	ISO 12922
	– Water-containing	HFAS	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-soluble, zinc may accumulate in the medium (700 mg zinc per pole tube).

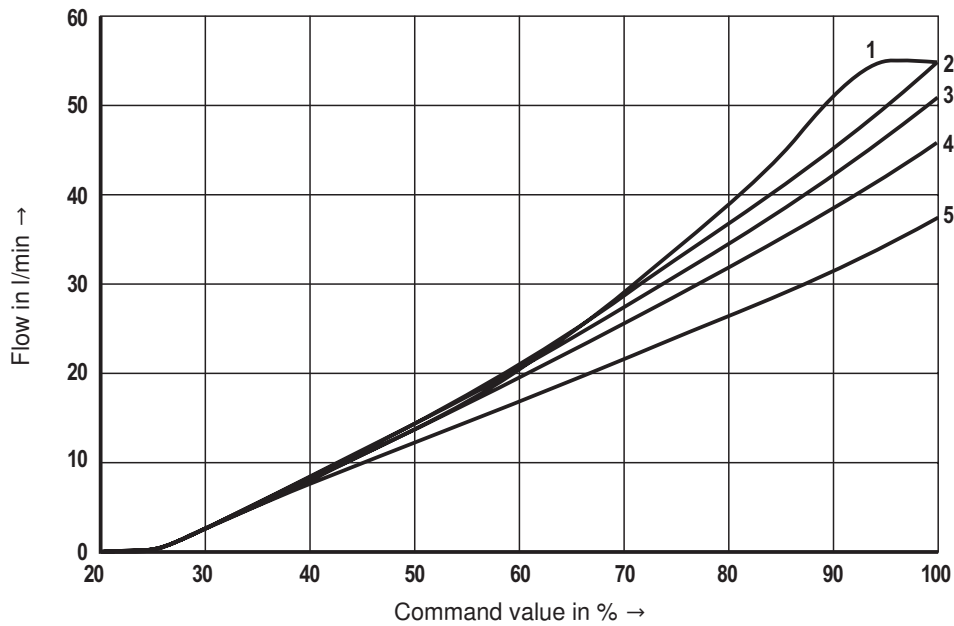
### electric

Voltage type	Direct voltage (DC)
Supply voltage	V
Maximum solenoid current	A
Coil resistance	– Cold value at 20 °C
	– Max. hot value
Switch-on duration	%
Maximum coil temperature <sup>3)</sup>	°C
Protection class according to DIN EN 60529	– Version "K4"
	– Version "K40"
	– Version "C4"
Control electronics (separate order)	
Design according to VDE 0580	

<sup>3)</sup> Due to the surface temperatures of the solenoid coils, the standards ISO 13732-1 and EN 982 need to be adhered to!

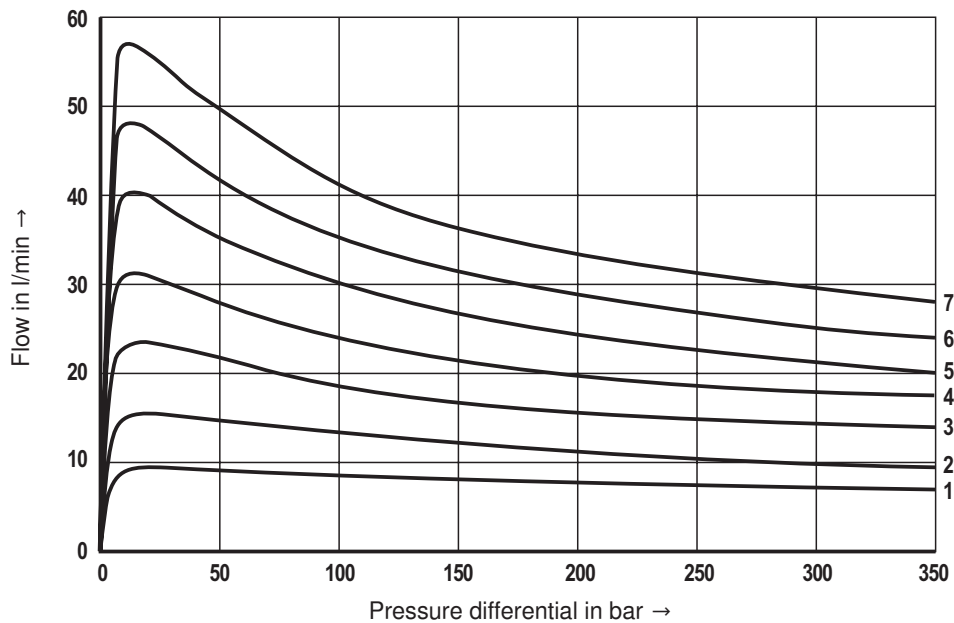
**In the electrical connection, the protective earthing conductor (PE  $\perp$ ) must be connected properly.**

### Characteristic curves (measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$ )



- 1  $\Delta p = 10$  bar constant
- 2  $\Delta p = 20$  bar constant
- 3  $\Delta p = 30$  bar constant
- 4  $\Delta p = 50$  bar constant
- 5  $\Delta p = 100$  bar constant

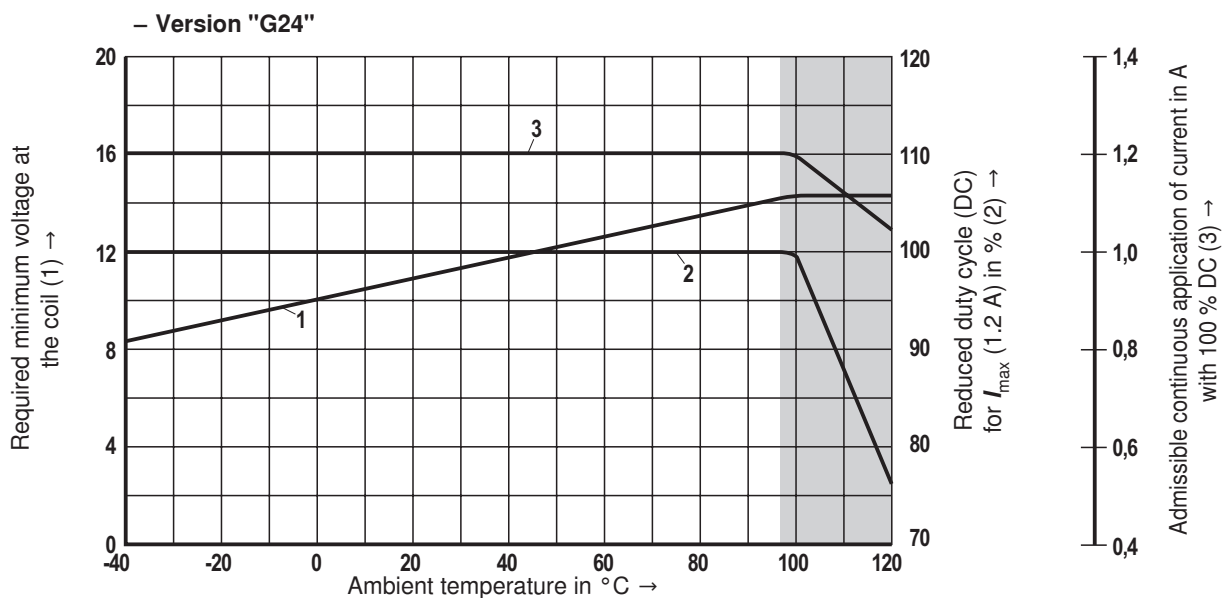
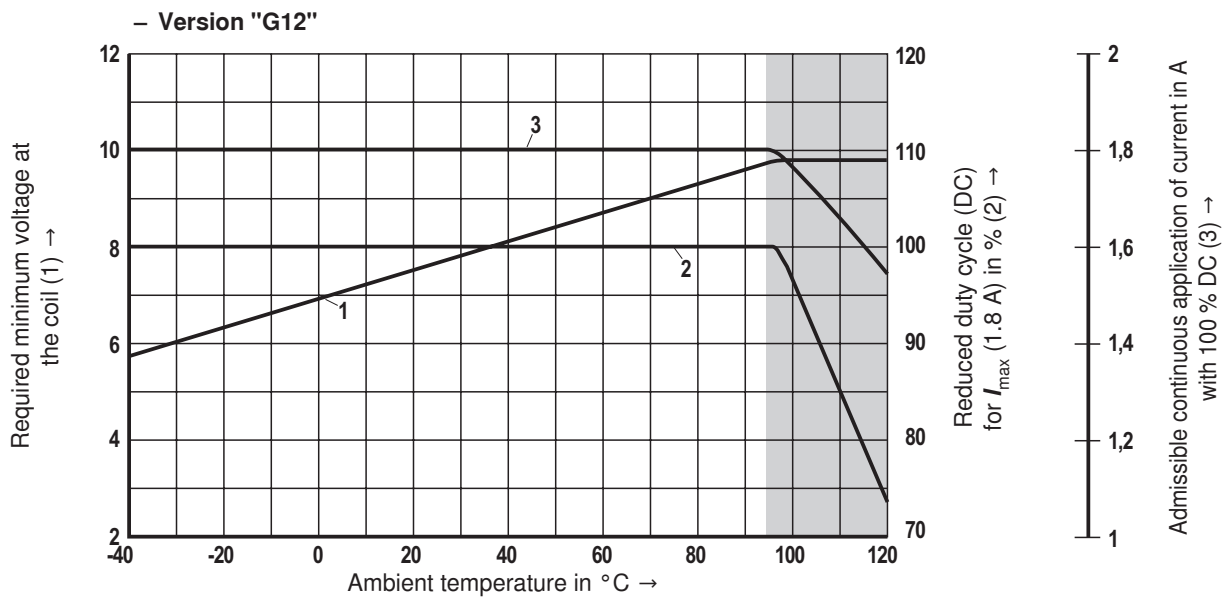
### Limits of performance (measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$ )



- 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



■ Limited valve performance

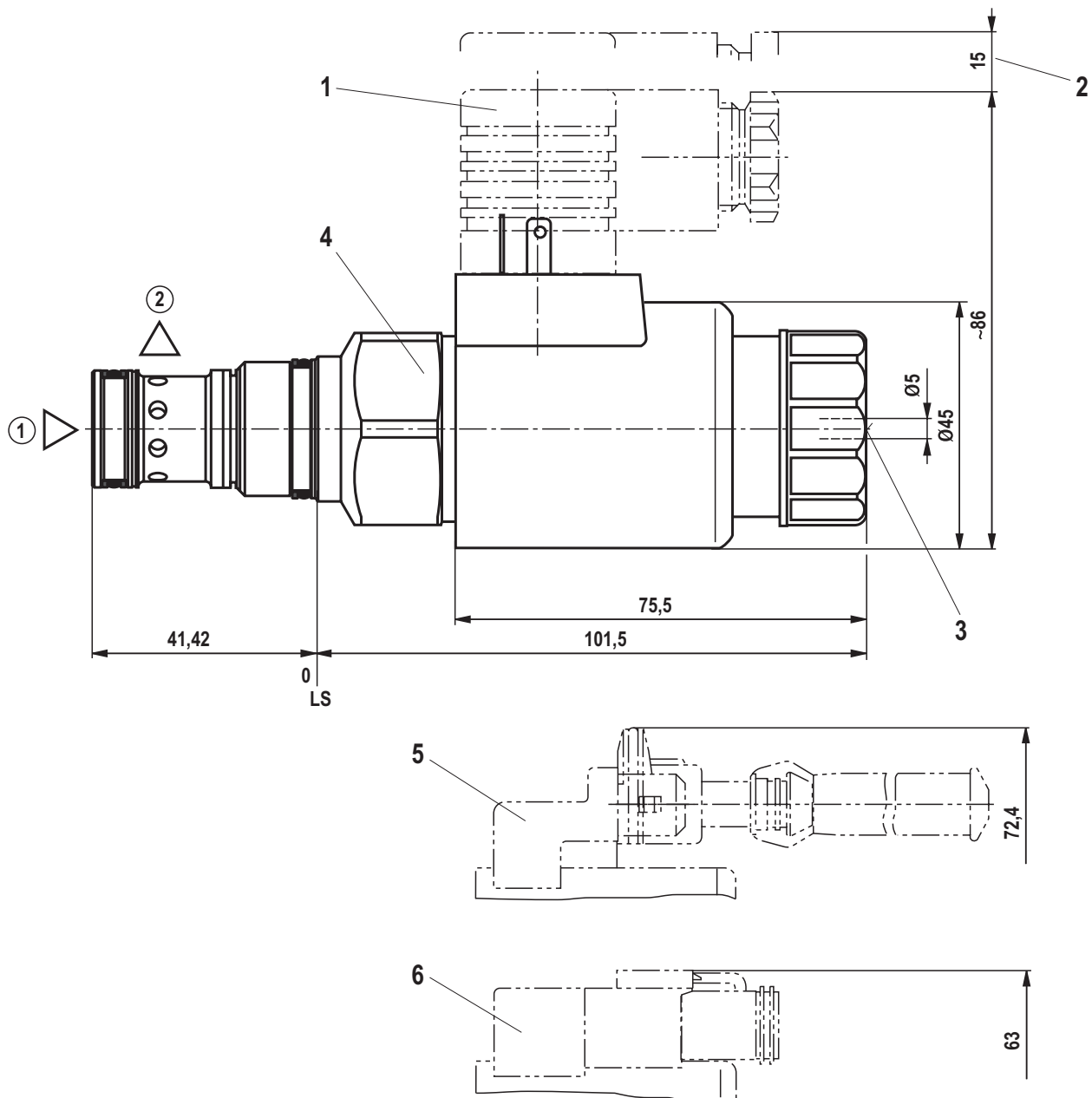
#### Notice!

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

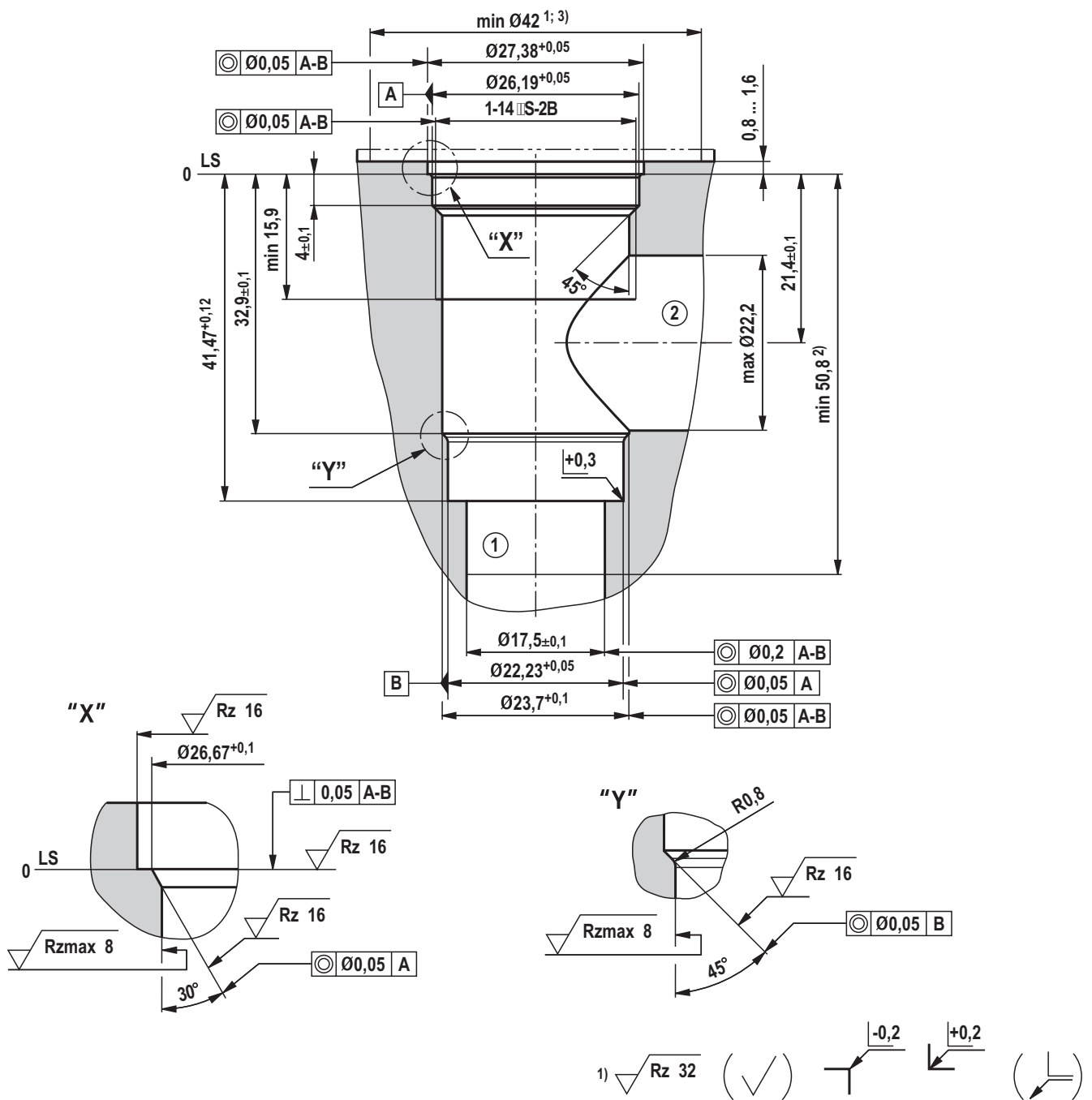
② = Main port 2

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<sup>1)</sup>; 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

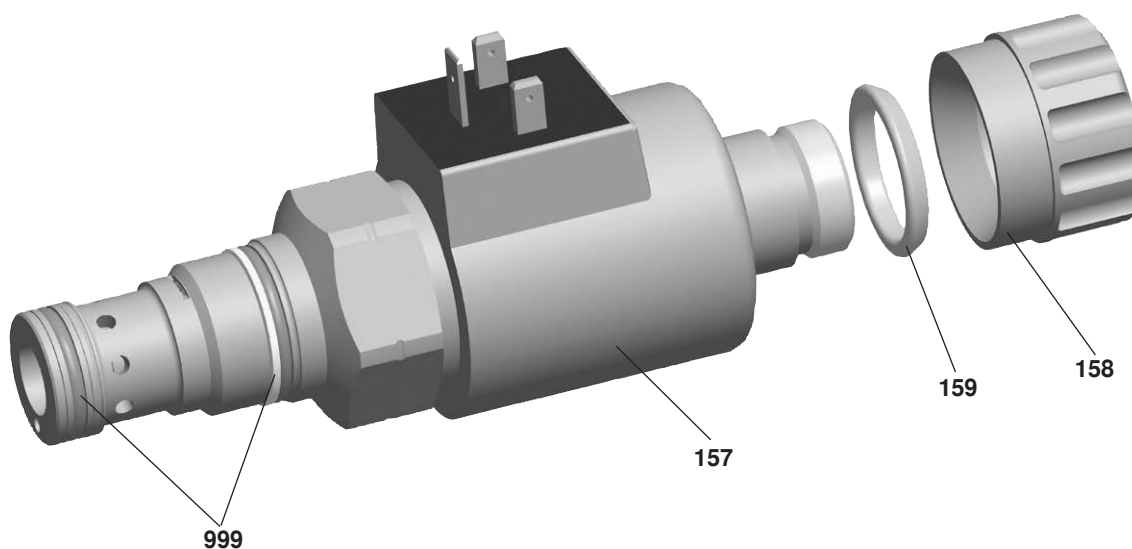
2) Depth for moving parts

3) With counterbore

All seal ring insertion faces are rounded and free of burrs

Tolerance for all angles  $\pm 0.5^\circ$

## 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	

## Notes

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## Notes

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