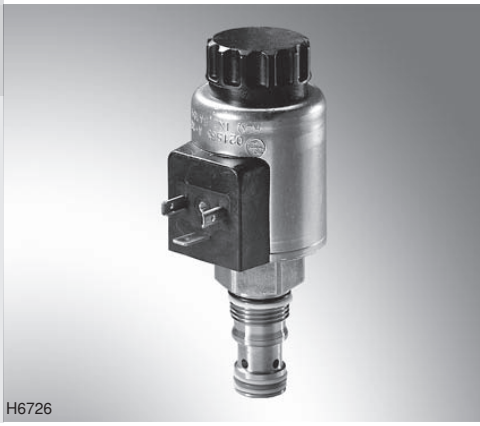
Rexroth
Bosch Group

2/2 proportional directional valve, direct operated

RE 18139-06/12.11 1/12
Replaces: 06.05

Type KKDS (High Performance)

Component size 1
Component series B
Maximum operating pressure 350 bar
Maximum flow 38 l/min


H6726

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Features

- Cartridge valve
- Mounting cavity R/T-13A
- Direct operated proportional valve for controlling the flow size
- Operation by means of proportional solenoid with central thread and detachable coil
- Rotatable solenoid coil
- Free-flowing in both directions
- With concealed manual override, optional
- Control electronics: Data sheet
  - Plug-in proportional amplifier type VT-SSPA1… 30116
  - Analog amplifier type RA… 95230

Ordering code

KKDS	R	1		B / H	C				V	*

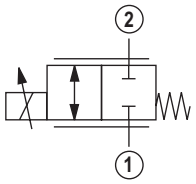
Proportional directional valve, direct operated

Maximum operating pressure 350 bar **= R**

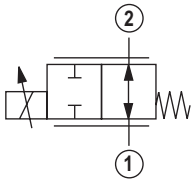
Component size **= 1**

2 main ports

Symbols



normally closed **= N**



normally open **= P**

Component series **= B**

High Performance and mounting cavity R/T-13A (see page 10) **= H**

C = Proportional solenoid, wet-pin

Supply voltage

G24 = Control electronics 24 V DC

G12 = Control electronics 12 V DC

N0 = **Without** manual override

N9 = **With** concealed manual override

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

Seal material

V = FKM seals

Attention!

Observe compatibility of seals with hydraulic fluid used!

Further details in the plain text

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

Preferred types

Type	Material no.
KKDSR1NB/HCG24N0K4V	R901023172
KKDSR1PB/HCG24N0K4V	R901024015
KKDSR1NB/HCG12N0K4V	R901024009
KKDSR1PB/HCG12N0K4V	R901024034

Function, cross-sections, symbols

General

The 2/2 proportional directional valve is a direct operated cartridge spool valve. It steplessly controls the flow from main port ① to ② and from ② to ① in proportion to the input signal.

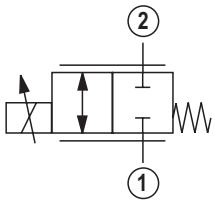
The valve basically consists of a bushing (6) with male thread for the mounting cavity, a socket (3), a control spool (5) with compression spring (8) as well as of a proportional solenoid (7) with central thread and removable coil.

Function (version **"N"** – normally closed)

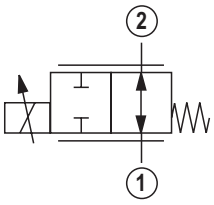
When the solenoid (7) is de-energized, the control spool (5) that is always pressure-compensated in relation to the actuating forces due to its constructive design, is held in the initial position by the compression spring (8) and blocks the flow between main port ① and ②. When the solenoid (7) is energized, the control spool (5) is adjusted directly – in proportion to the electrical input signal – and connects main port ① and ② via orifice-like cross-sections in the spool with progressive flow characteristics. When the solenoid (7) is de-energized, the compression spring (8) returns the control spool (5) to the initial position.

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

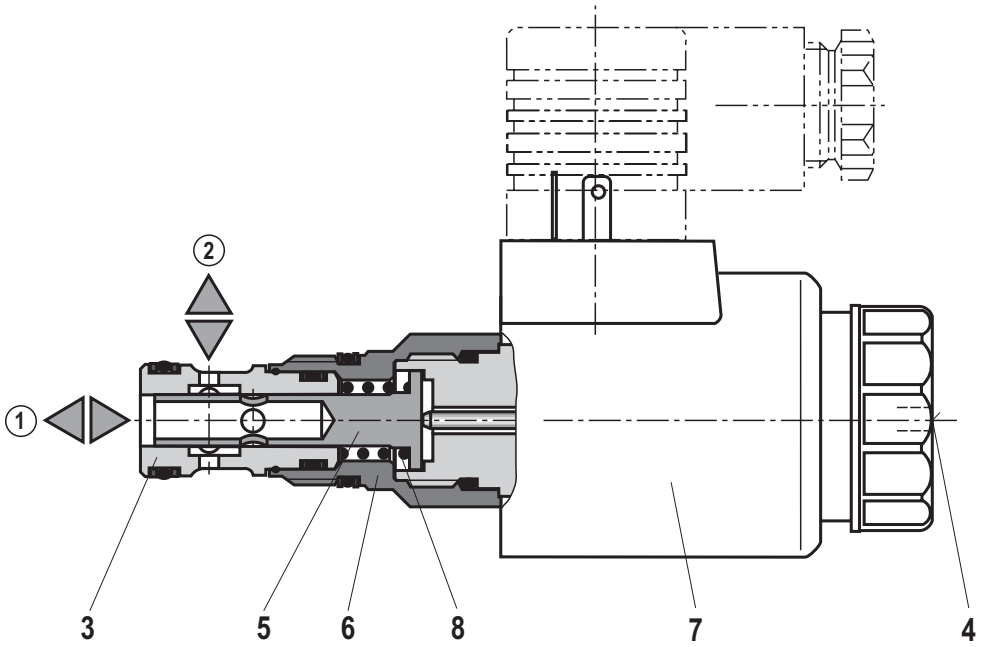
Symbol "N" – normally closed



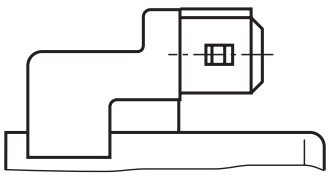
Symbol "P" – normally open



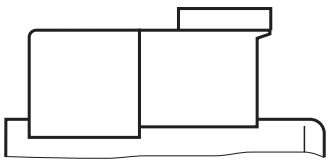
Version "K4"
(with mating connector)



Version "C4"



Version "K40"



Type KKDSR1NB/HC.N9K4V

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

general

Weight		kg	0.66
Installation position			Any - if it is ensured that no air can collect upstream of the valve. Otherwise, we recommend that the valve be mounted in a suspended position.
Ambient temperature range		°C	–40 to +100 (see minimum terminal voltage page 8)
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 film passivation

hydraulic

Maximum operating pressure		bar	350
Maximum flow	– Symbol "N"	l/min	38 (①→ ②), 34 (② → ①); other flows upon request!
	– Symbol "P"	l/min	32 (①→ ②), 45 (② → ①)
Leakage		ml/min	< 30 (at Δp = 100 bar in ①; HLP46, ϑ_{oil} = 40 °C)
Step response	0 to 100 %; 100 to 0 %	ms	< 65 (at 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 admissible 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			2 million

[1)] The cleanliness classes specified for the components must be complied with in hydraulic systems. An effective filtration prevents faults and at the same time increases the service life of the components.

For the selection of 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. The pressure peaks should not exceed the 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

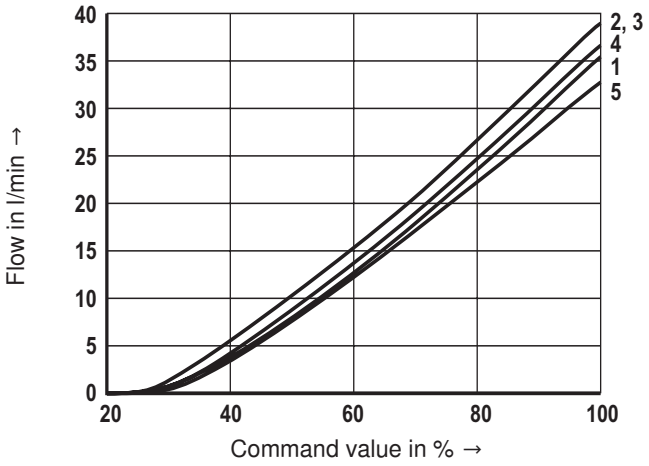
Voltage type			Direct voltage DC	
Supply voltage		V	12	24
Maximum solenoid current		A	1.8	1.2
Coil resistance	– Cold value at 20 °C	Ω	3.3	7.2
	– Max. hot value	Ω	5.0	10.8
Duty cycle		%	100 (see minimum terminal voltage page 8)	
Maximum coil temperature [3]		°C	150	
Protection class according to DIN EN 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)			– Plug-in proportional 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 are to be observed!

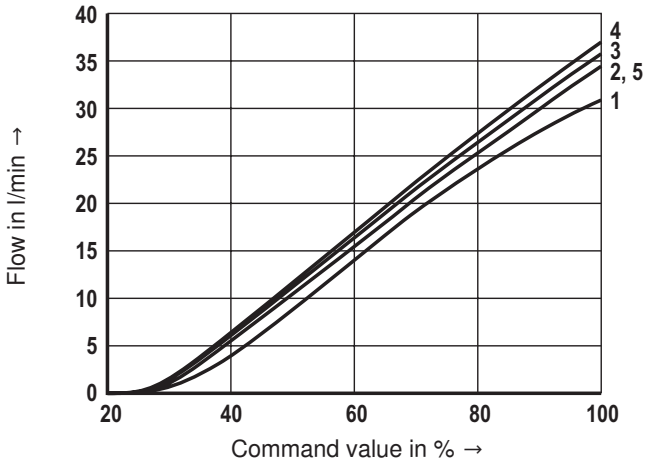
When establishing the electrical connection, the protective earthing conductor (PE ⏚) is to be connected properly.

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

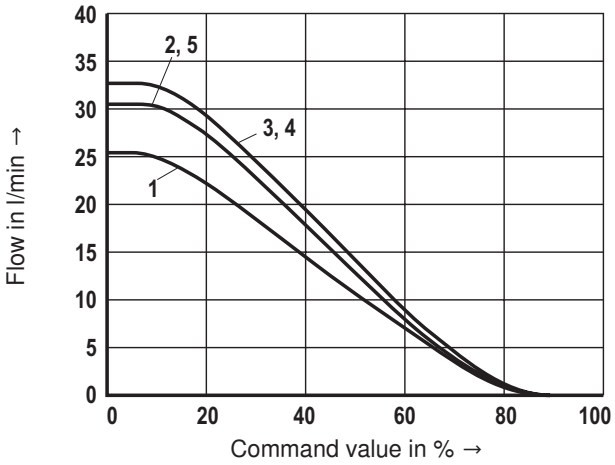
Direction of flow ①→ ②
Symbol "N"



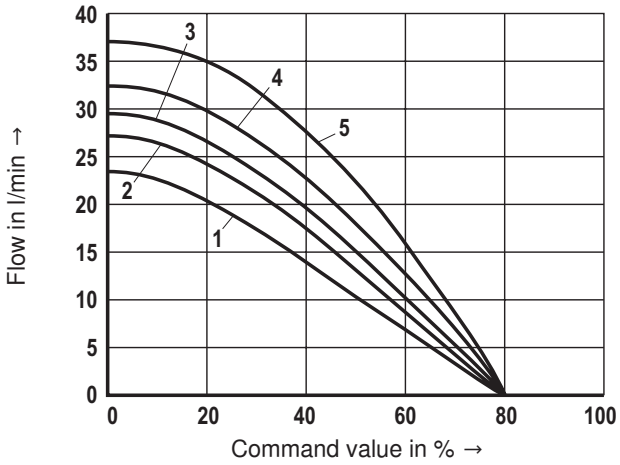
Direction of flow ② → ①
Symbol "N"



Direction of flow ①→ ②
Symbol "P"



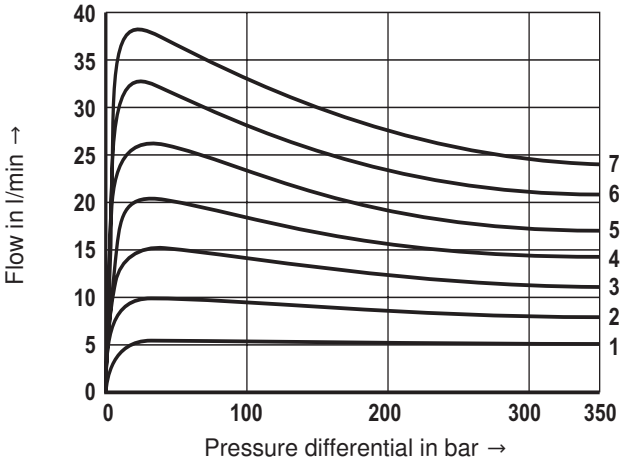
Direction of flow ② → ①
Symbol "P"



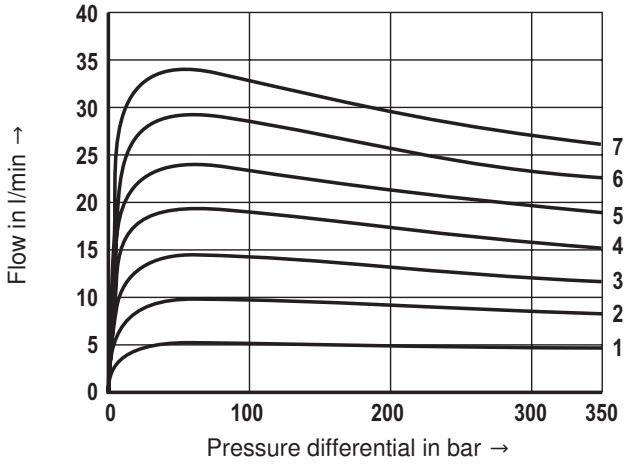
1 Δp = 10 bar constant
2 Δp = 20 bar constant
3 Δp = 30 bar constant
4 Δp = 50 bar constant
5 Δp = 100 bar constant

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

Direction of flow ①→ ②
Symbol "N"

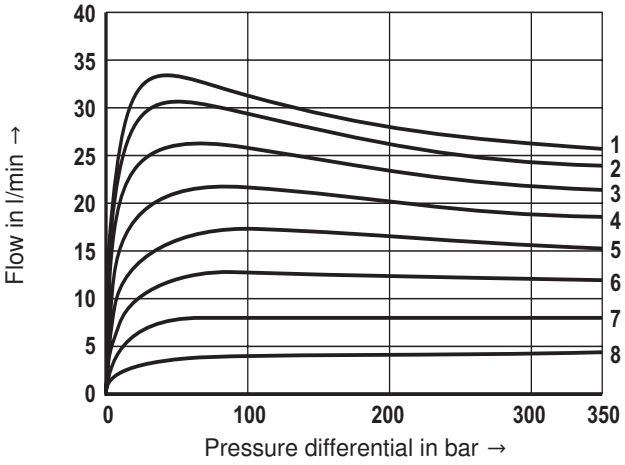


Direction of flow ② → ①
Symbol "N"

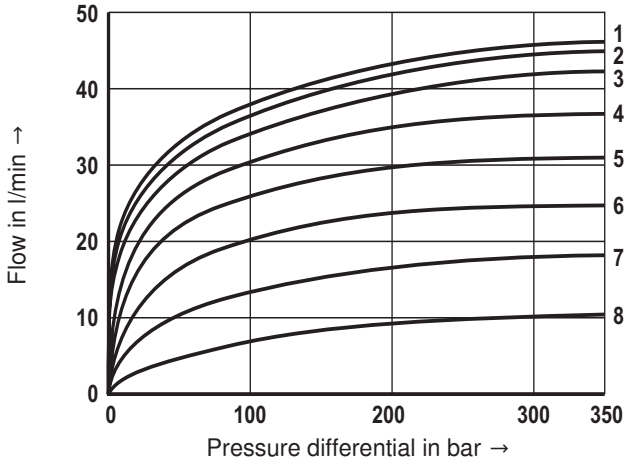


1 Command value = 40 %
2 Command value = 50 %
3 Command value = 60 %
4 Command value = 70 %
5 Command value = 80 %
6 Command value = 90 %
7 Command value = 100 %

Direction of flow ①→ ②
Symbol "P"



Direction of flow ② → ①
Symbol "P"

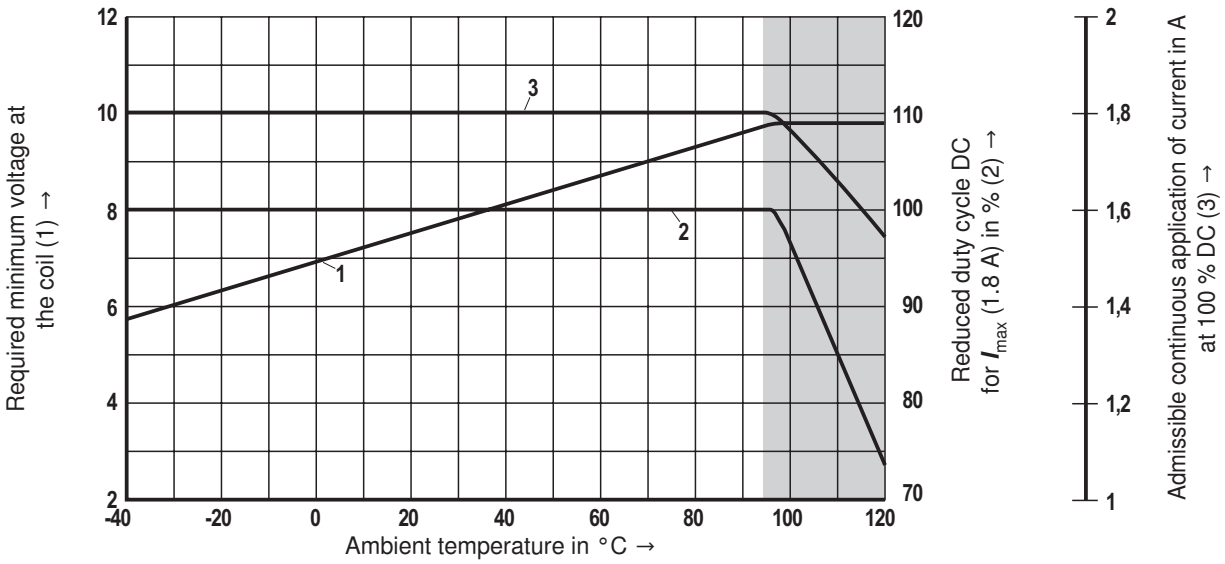


1 Command value = 0 %
2 Command value = 10 %
3 Command value = 20 %
4 Command value = 30 %
5 Command value = 40 %
6 Command value = 50 %
7 Command value = 60 %
8 Command value = 70 %

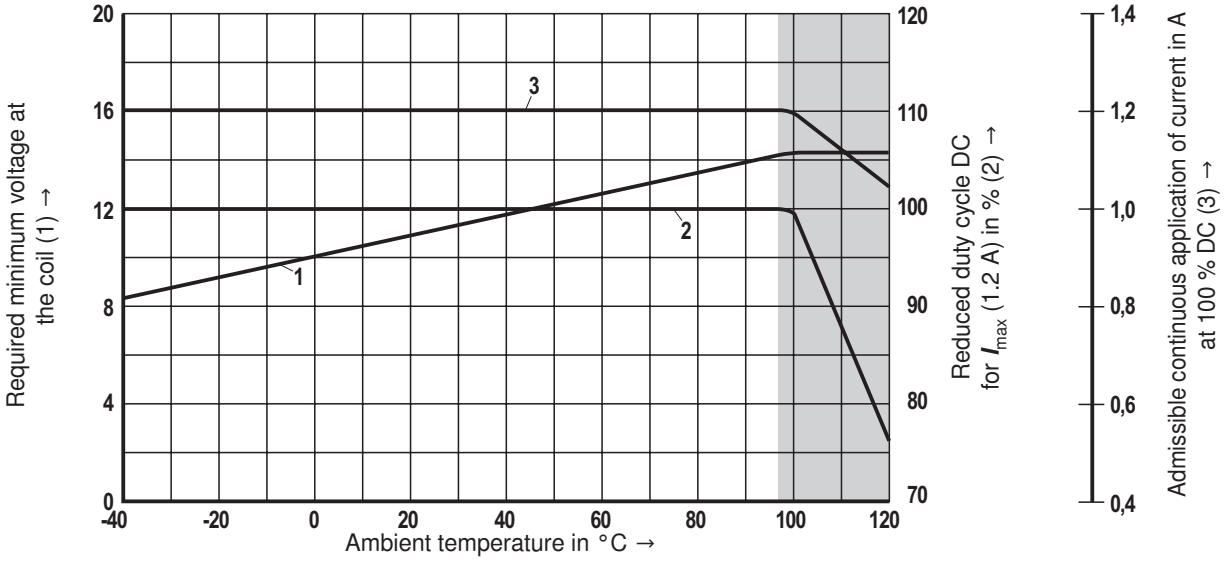
Minimum terminal voltage at the coil and relative duty cycle

Admissible working range depending on the ambient temperature

– Version "G12"



– Version "G24"



Limited valve performance

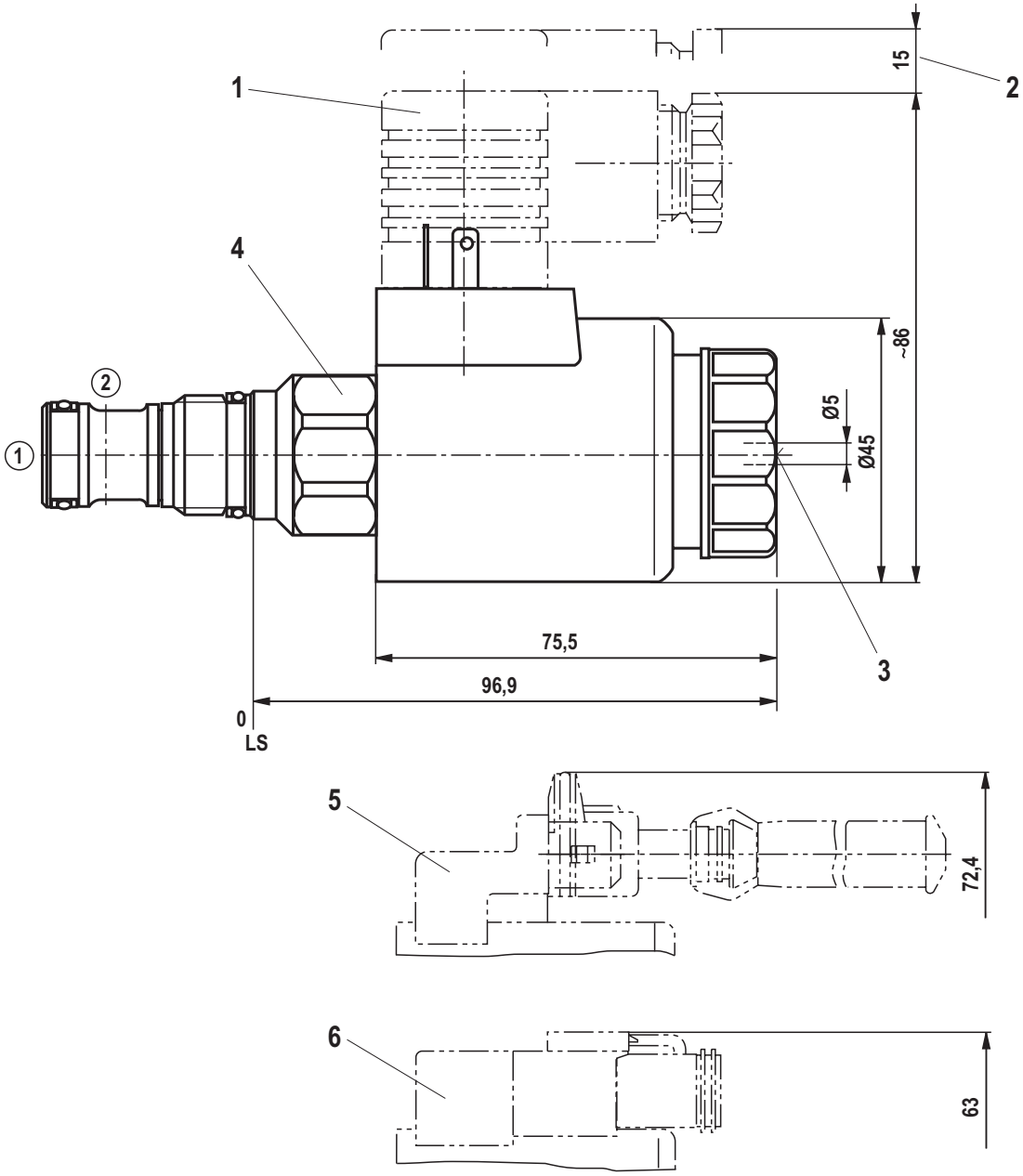
☞ **Notice!**

The characteristic curves have been determined for coils with valve and 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 results in an increased area of application.

In single cases, more unfavorable conditions may lead to limitations of the area 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

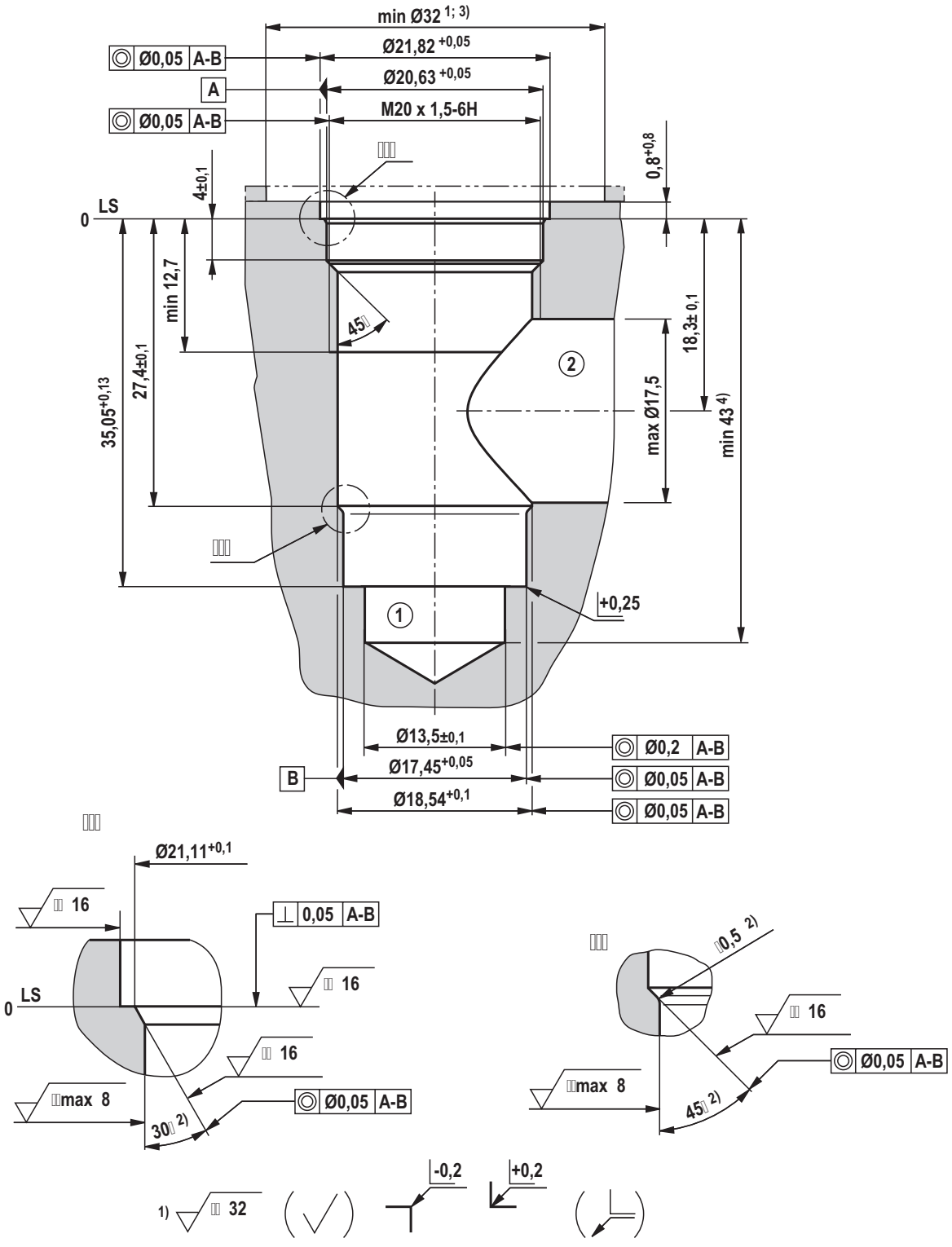
3 Concealed manual override "N9"

4 SW27, tightening torque M_A = 45 to 50 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-13A[1]; 2 main ports; thread M20 x 1.5 (dimensions in mm)



1) Differing from T-13A

2) All seal ring insertion faces are rounded and free of burrs

3) With counterbore

4) Depth for moving parts

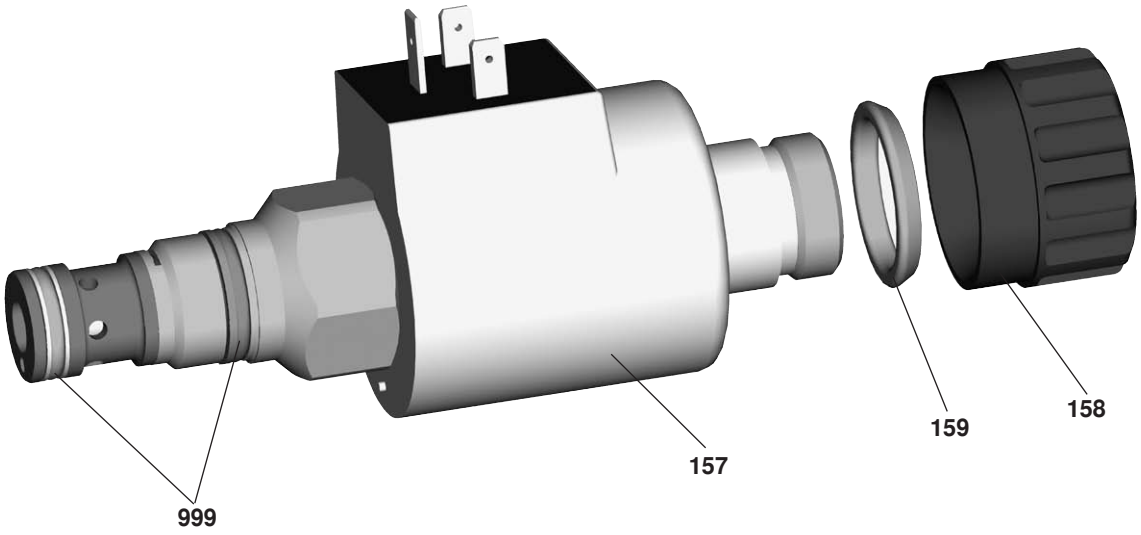
① = Main port 1

② = Main port 2

LS = Location Shoulder

Tolerance for all angles ±0.5°

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			R900071532
999	Seal kit of the valve			R900733593