RE 18136-05/2021-05-11
Replaces: 06.2012

4/2-way directional spool valve, direct-operated, with solenoid actuation KKDE.1


HAD6812

- Size 1
- Series A
- Maximum working pressure 350 bar
- Maximum flow 40 l/min

Features

- Direct-operated directional spool valve with solenoid actuation
- Mounting cavity R/T-31A
- Flow possible in both directions
- DC voltage solenoids switching in oil
- Rotatable solenoid coil
- With concealed auxiliary actuation

Contents

Type code (valve without coil)[1)]

01	02	03	04	05		06	07	08	09
KKDE	**R**	**1**		**A**	**/**	**H**		**V**	*****

01	Directional spool valve, direct-operated, electrically actuated	**KKDE**

Maximum working pressure

02	350 bar	**R**

03	Size 1	**1**

Symbol – 4 main ports

04		**D**
		**E**
		**F**

05	Series A	**A**

06	Mounting cavity R/T-31A (see page 11)	**H**

Auxiliary actuation

07	Without auxiliary actuation	**N0**
	With concealed auxiliary actuation[2)]	**N9**

Sealing material

08	FKM (fluoroelastomer), other seals on request	**V**

09	Further details in plain text	*****

1) Complete valves with mounted coil on request.
2) Screwable auxiliary actuation "N10" optional (Material no. R901051231, separate order)

Preferred types (valve without coil)[1)]

▼ **Without auxiliary actuation "N0"**

Symbol	Type	Material no.
D	KKDER1DA/HN0V	R901070118
E	KKDER1EA/HN0V	R901070123
F	KKDER1FA/HN0V	R901070124

▼ **With concealed auxiliary actuation "N9"**

Symbol	Type	Material no.
D	KKDER1DA/HN9V	R901070125
E	KKDER1EA/HN9V	R901070127
F	KKDER1FA/HN9V	R901070129

Available coils (order separately)[1)]

	Material number for coil with device connector[2)]		
DC voltage [3)]	**"K4"** 03pol (2+PE) DIN EN 175301-803	**"K40"** 02pol K40 DT 04-2PA, Fa. DEUTSCH	**"C4"** 02pol C4/Z30 AMP Junior Timer
12 V	R900991678	R900729189	R900315818
24 V	R900991121	R900729190	R900315819

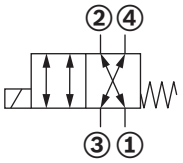
1) Complete valves with mounted coil on request.
2) Plug-in connectors are not included in the scope of delivery and must be ordered separately, see data sheet 08006.
3) Additional voltages available on request

Functional description

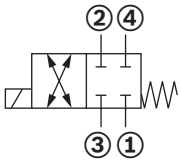
General

4/2-way directional spool valves are direct operated, pressure-compensated cartridge valves. They control start, stop and flow direction, and generally consist of a housing (**1**) including a movably mounted bush (**2**), the control spool (**5**) as well as a return spring (**4**).

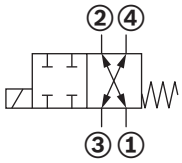
▼ **Symbol "D"**



▼ **Symbol "E"**



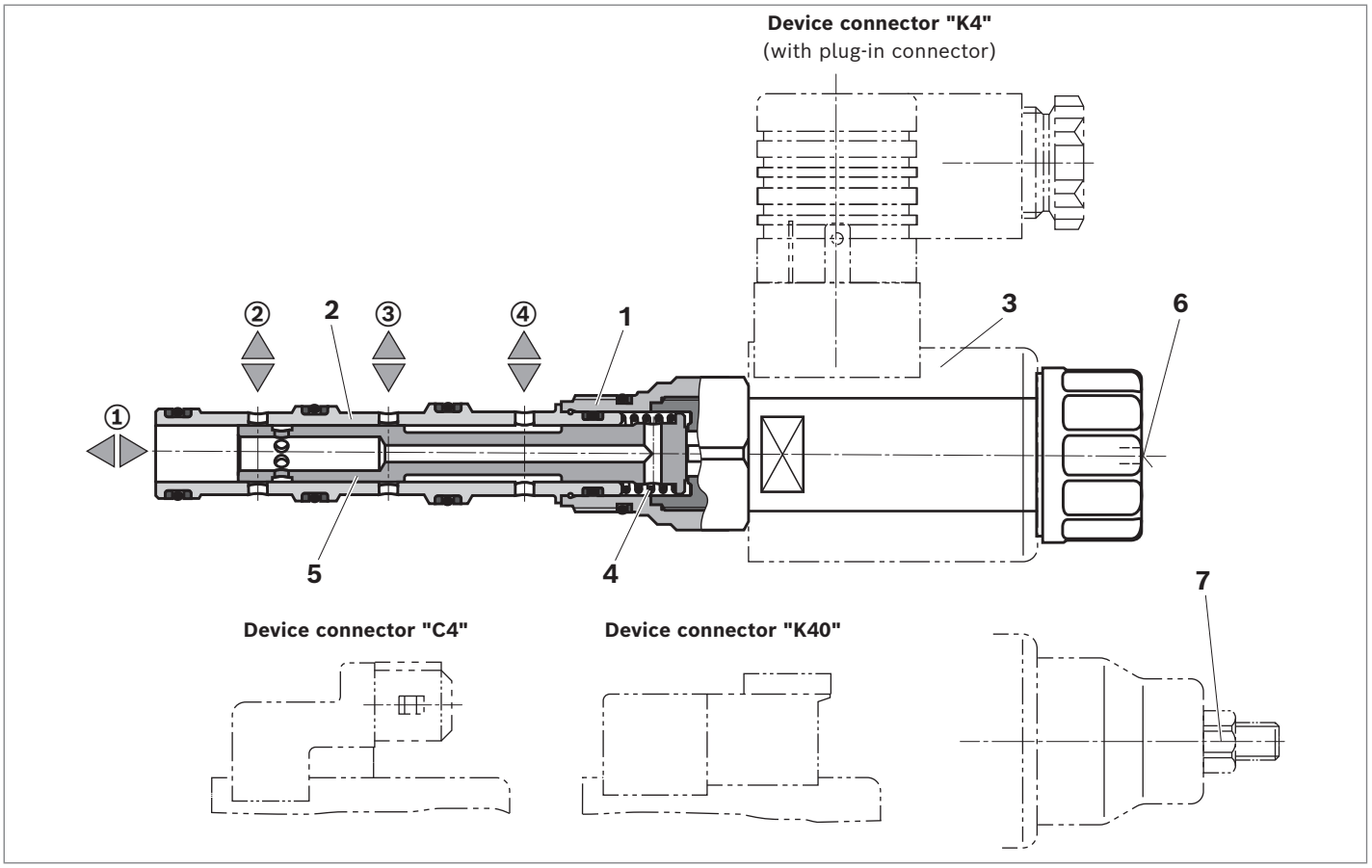
▼ **Symbol "F"**



Function

In non-actuated state, the control spool (**5**) is kept in the initial position by the return spring (**4**). The control spool (**5**) is actuated by DC voltage solenoids (**3**) switching in oil. The symbols are realized by different control spools (**D**, **E** or **F**). The main ports ①, ②, ③ and ④ can be permanently loaded with 350 bar working pressure and the flow can be directed in both directions (see symbols). The auxiliary actuation (**6**) enables switching of the valve without solenoid excitation. It is also available as a screwable version "**N10**" (**7**) (see page 2).

▼ **Type KKDER1EA/HN9V**



Technical data

General			
Weight	Valve	kg	0.35
	Coil	kg	0.25
Installation position			Any
Ambient temperature range		°C	–40 ... +110

Hydraulic			
Maximum working pressure	Port ①, ②, ③, ④	bar	350
Maximum flow		l/min	40
Hydraulic fluid			See table on page 5
Hydraulic fluid temperature range		°C	–40 ... +80
Viscosity range		mm²/s	4 ... 500
Maximum admissible degree of contamination of the hydraulic fluid Cleanliness level per ISO 4406 (c)			Level 20/18/15[1)]
Load cycles			10 mil. (at 350 bar)

Electric			
Voltage type			DC voltage
Supply voltage[2)]		V	12 DC; 24 DC
Voltage tolerance over ambient temperature			See characteristic curve on page 9
Power consumption		W	22
Duty cycle		%	See characteristic curve on page 9
Maximum coil temperature[3)]		°C	150
Switching time according to ISO 6403 (Horizontal solenoid)	ON	ms	≤80
	OFF	ms	≤50
Maximum switching frequency		Switches/h	15000
Type of protection according to ISO 20653	Connector version "K4"		IP6K5[4)]
	Connector version "C4"		IP6K6K[4)]
			IP6K9K[4)] (only with Rexroth type R901022127)
	Connector version "K40"		IP6K7 and IP6K9K[4)]

Notice
For applications outside these values, please consult us!

Notice
For the electrical connection, a protective earth (PE ⏚) connection is mandatory based on the specification.

1) 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.
We recommend a filter with a minimum retention rate of $\beta_{10} \geqq 75$.

2) Additional voltages available on request
3) Due to the occurring surface temperatures of the solenoid coils, the standards ISO 13732-1 and ISO 4413 must be observed!
4) With installed and locked plug-in connector. Plug-in connectors are not included in the scope of delivery and must be ordered separately, see data sheet 08006.

Hydraulic fluid

Hydraulic fluid		Classification	Suitable sealing materials	Standards	Data sheet
Mineral oils		HL, HLP	FKM	DIN 51524	90220
Environmentally acceptable	Insoluble in water	HEES	FKM	ISO 15380	90221
	Soluble in water	HEPG	FKM	ISO 15380	90221

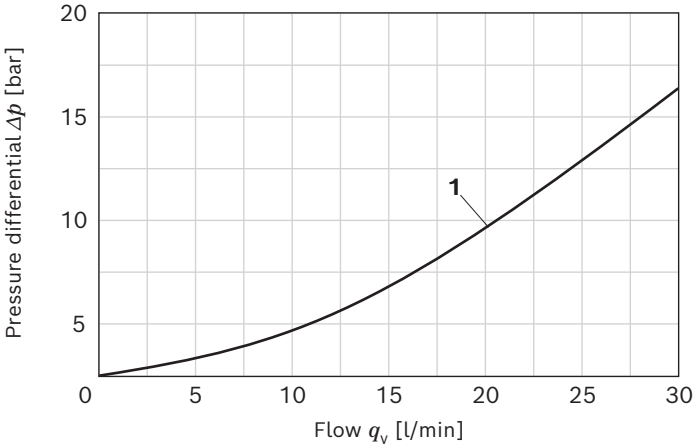
Notice

- 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.
- **Environmentally acceptable:** If environmentally acceptable hydraulic fluids are used that are also zinc-solving, there may be an accumulation of zinc.

Characteristic curves

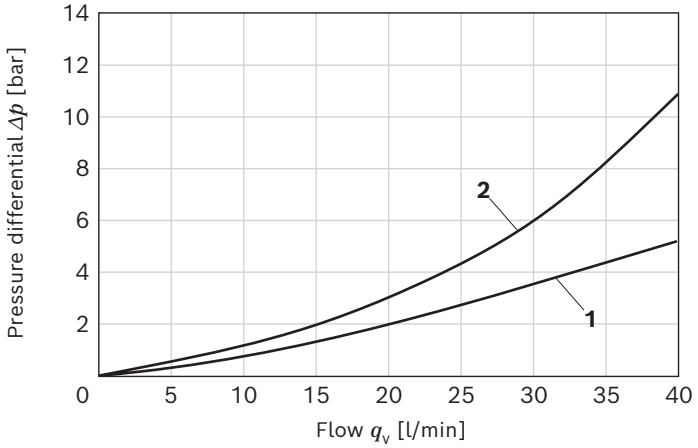
Δp-q_V characteristic curve

▼ **Symbol D**



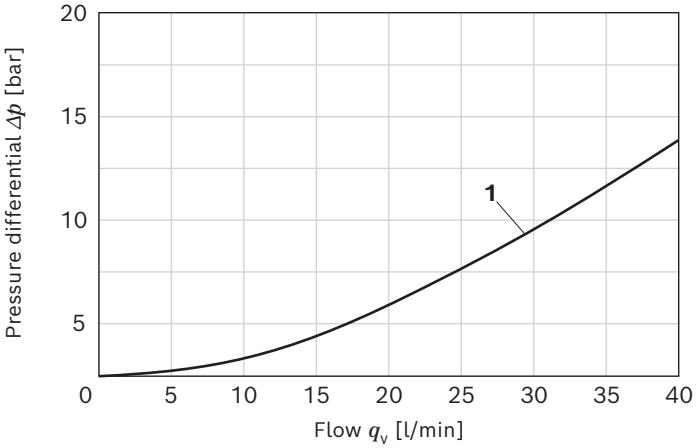
1 ① → ②
② → ①
③ → ④
④ → ③

▼ **Symbol F**



1 ① → ②
② → ①
2 ③ → ④
④ → ③

▼ **Symbol E**

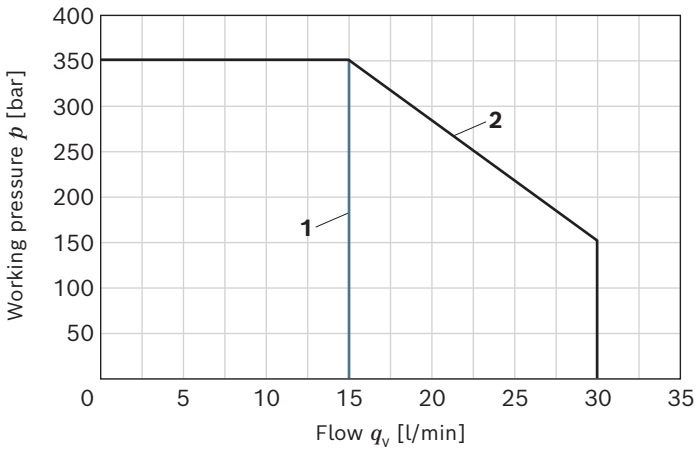


1 ① → ②
② → ①
③ → ④
④ → ③

Notice
The characteristic curves have been measured with HLP46, ϑ_{oil} = 40±5 °C and 24 V coil.

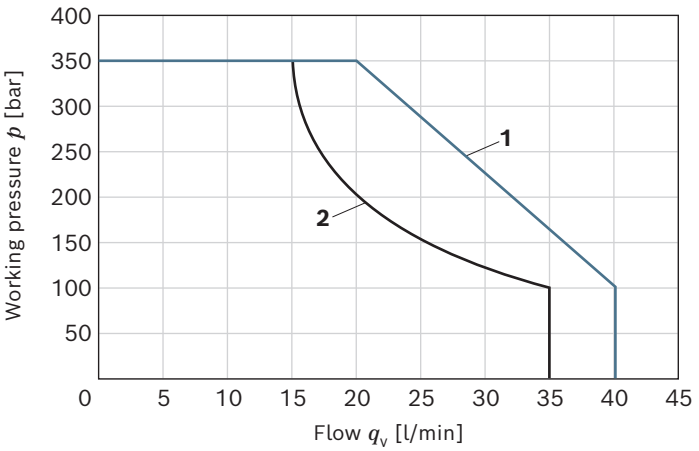
Performance limits

▼ **Symbol D**



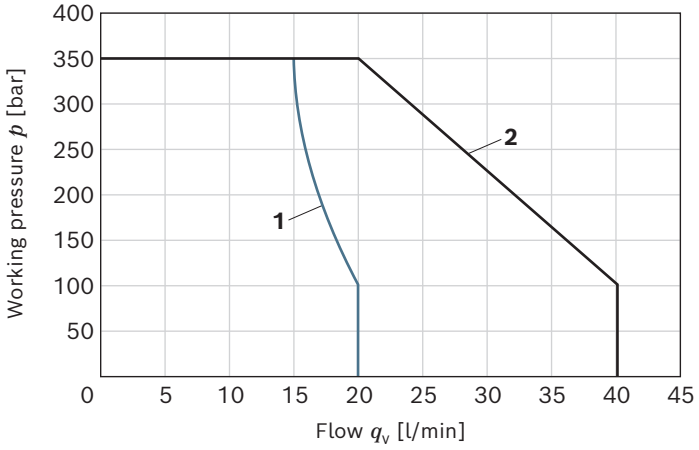
1 ① → ② → ④ → ③
2 ③ → ④ → ② → ①

▼ **Symbol F**



1 ① → ② → ④ → ③
2 ③ → ④ → ② → ①

▼ **Symbol E**



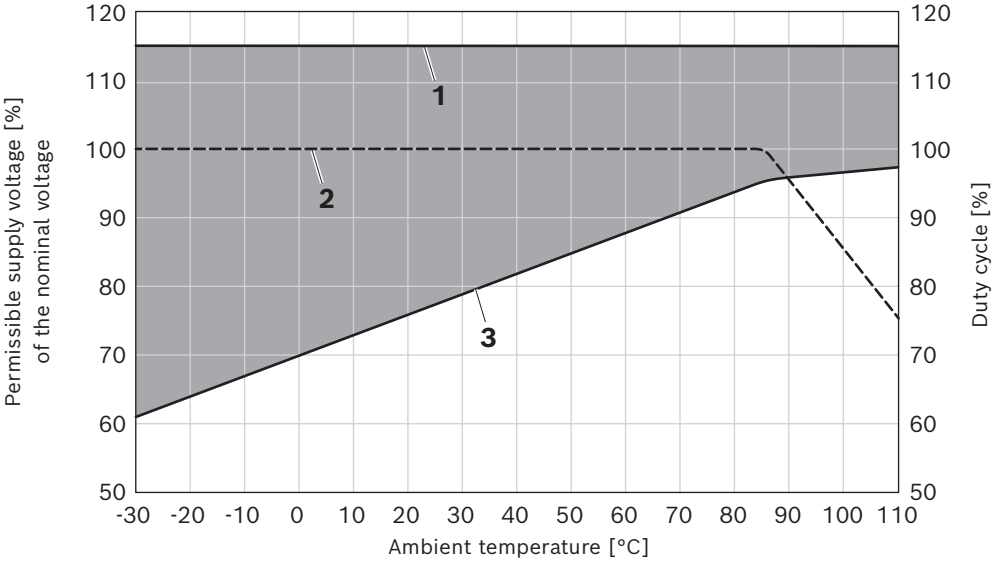
1 ① → ② → ④ → ③
2 ③ → ④ → ② → ①

Notice

- The characteristic curves have been measured with HLP46, ϑ_{oil} = 40±5 °C and 24 V coil.
- The specified performance limits are valid for use with two flow directions (e.g. symbol D: ① to ② and simultaneous return flow from ④ to ③). Due to the flow forces acting within the valves, the permissible performance limit may be considerably lower with only one flow direction (e.g. from ① to ② and blocked port ④)! In this case, please contact us!
- The performance limit was determined with solenoids at operating temperature and 10% undervoltage and without reservoir pre-loading.

Permissible working range

▼ **Voltage range and duty cycle depending on the ambient temperature**

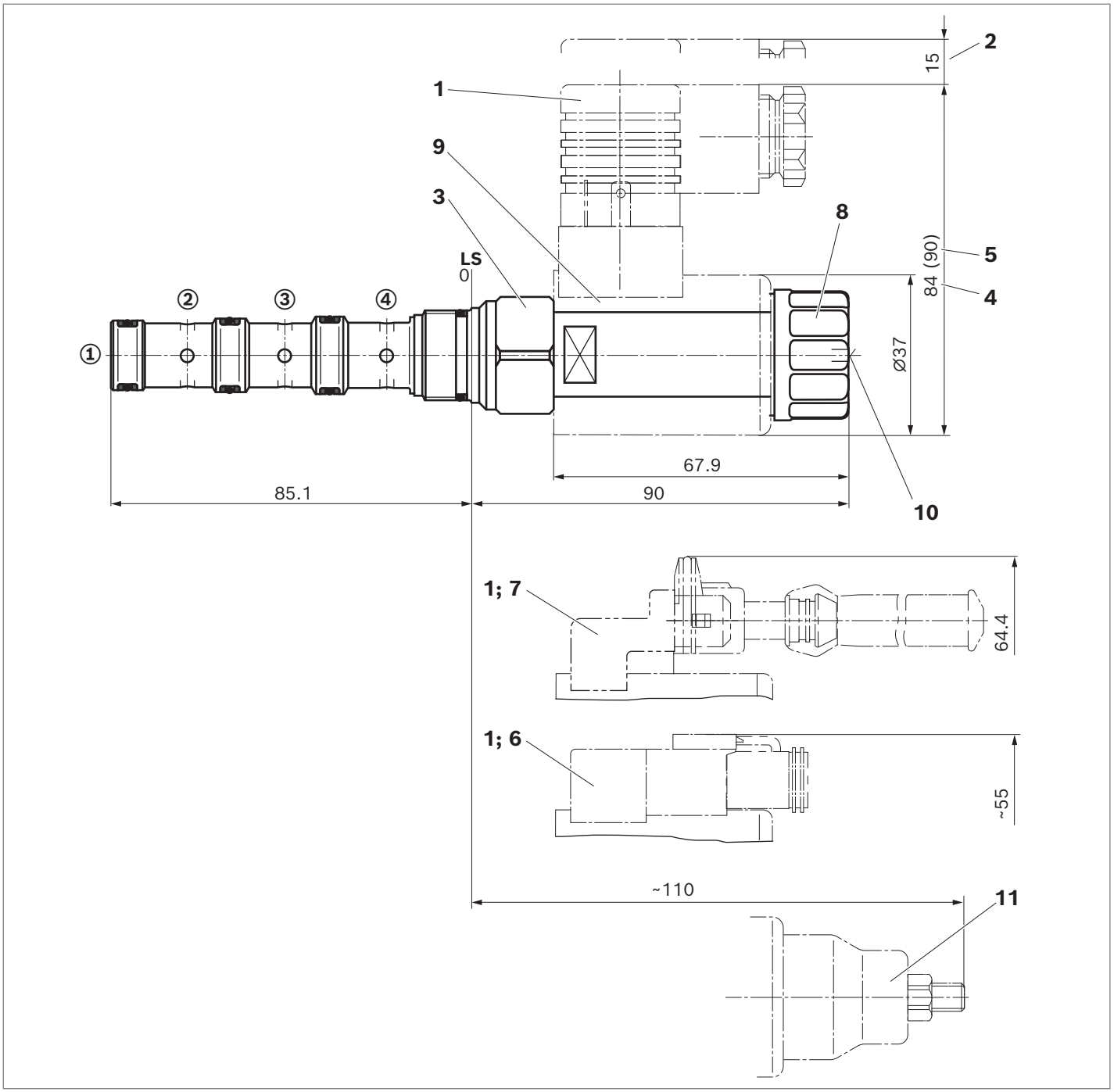


1 Maximum voltage
2 Duty cycle
3 Minimum response voltage

= Permissible supply voltage range

Dimensions

▼ **KKDE.1**

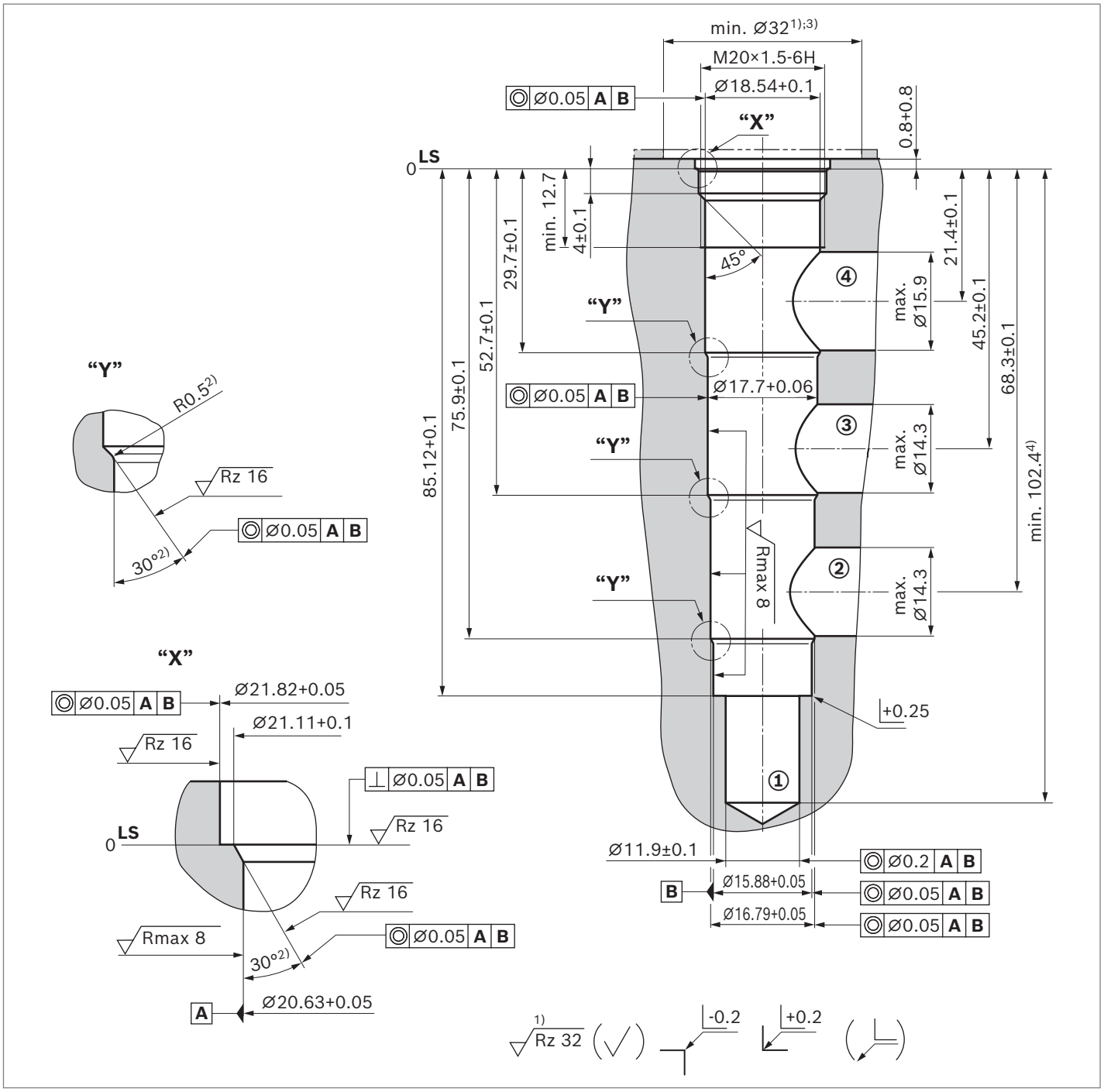


1 Plug-in connectors, separate order, see data sheet 08006
2 Space required to remove the plug-in connector
3 SW24, tightening torque M_A = 45 to 50 Nm
4 Dimensions for plug-in connector "K4", without wiring
5 Dimensions () for plug-in connector "K4", without wiring
6 Device connector "K40"
7 Device connector "C4"
8 Nut, tightening torque M_A = 5+1 Nm
9 Coil (order separately, see page 3)
10 Concealed auxiliary actuation "N9", optional
11 Screwable auxiliary actuation "N10" (order separately, see page 2)

LS = location shoulder
① = main port 1
② = main port 2
③ = main port 3
④ = main port 4

Mounting cavity

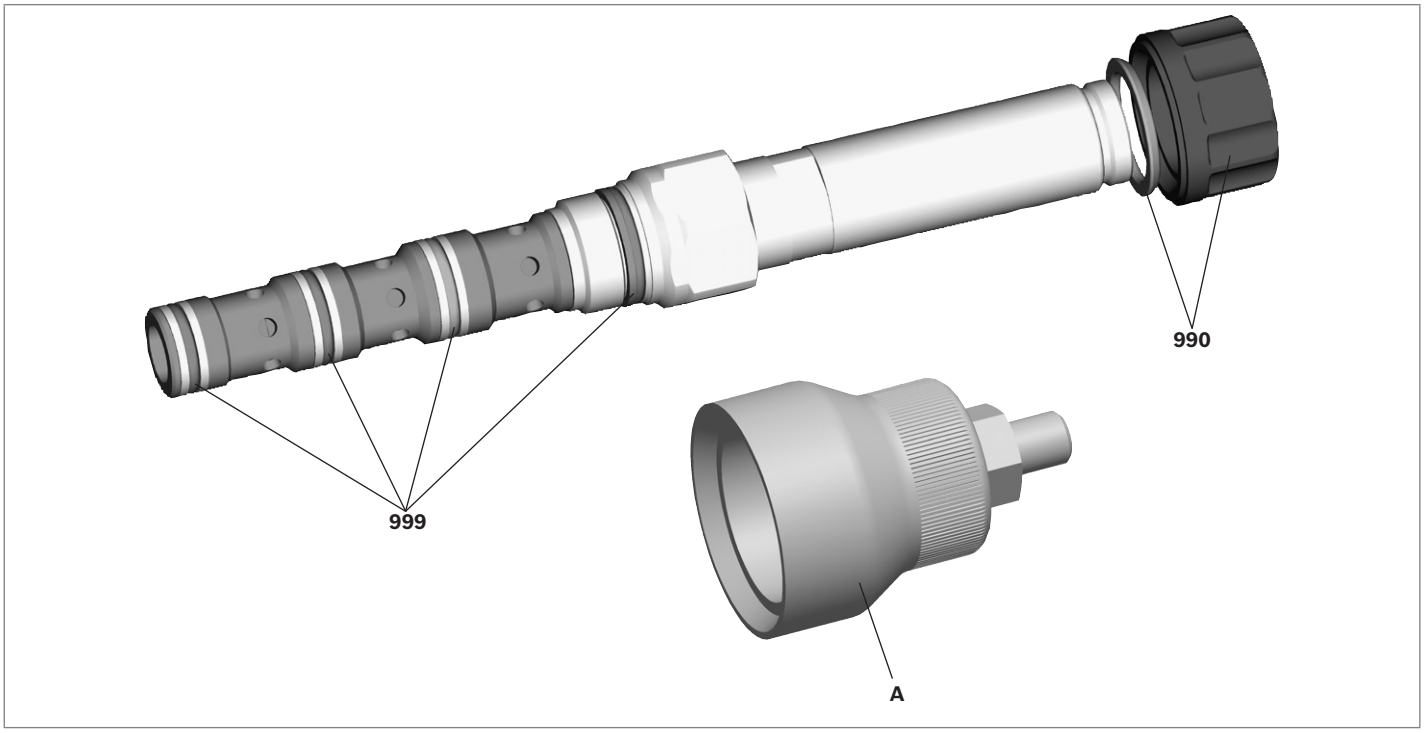
▼ **R/T-31A; 4 main ports; thread M20×1.5**



1) Deviating from T-31A
2) All seal ring insertion faces are rounded and free of burrs
3) At counterbore
4) Depth for movable parts

Tolerance for all angles ±0.5°
LS = location shoulder
① = main port 1
② = main port 2
③ = main port 3
④ = main port 4

Available individual components



Item	Denomination		DC voltage	Material number
	Coil for single connection	K4	12 V	R900991678
			24 V	R900991121
		K40	12 V	R900729189
			24 V	R900729190
		C4	12 V	R900315818
			24 V	R900315819
990	Nut and seal ring for pole tube			R961012130
999	Seal kit of the valve			R961003413
A	Auxiliary actuation "N10" [1]			R901051231

1) Only for ordering code "N9", see page 2

Related documentation

- Mineral oil-based hydraulic fluids — Data sheet 90220
- Environmentally acceptable hydraulic fluids — Data sheet 90221
- $MTTF_D$ values — Data sheet 90294