

5/3 directional spool valve,  
 direct operated,  
 with solenoid actuation

Type VEDS..53

**RE 18158**

Edition: 2012-11

Replaces: 05.12



- ▶ Frame size 10
- ▶ Component series 0
- ▶ Maximum operating pressure 250 bar
- ▶ Maximum flow 25 l/min

## Features

- ▶ Mounting cavity R/UNF10-05-0-08
- ▶ Wet-pin DC solenoids
- ▶ Rotatable solenoid coil
- ▶ Manual override optional
- ▶ Integrated load-sensing port

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**Ordering code** (valve without coil) <sup>1)</sup>

01	02	03	04	05	06	07	08	09	10	11	12	
<b>VEDS</b>	<b>-</b>	<b>10A</b>	<b>-</b>	<b>53</b>		<b>OD53</b>		<b>54</b>	<b>KK2</b>		<b>0</b>	<b>0</b>

01	Directional spool valve, direct operated	<b>VEDS</b>
02	Frame size 10	<b>10A</b>
03	5/3 directional design	<b>53</b>

**Symbols**

<b>04</b>		<b>10</b>
		<b>20</b>

05	<b>Without</b> manual override	<b>0</b>
	<b>With</b> pull/push manual override	<b>-M1</b>
06	5/3 directional spool valve, direct operated, with solenoid actuation	<b>OD53</b>

**Symbols**

<b>07</b>	See item 04	<b>10</b>
		<b>20</b>
08	Frame size 10: R/UNF 10-05-0-08, see page 9	<b>54</b>
09	On/off valve with 2 coils	<b>KK2</b>
10	<b>Without</b> manual override	<b>0</b>
	<b>With</b> pull/push manual override	<b>1</b>
11	Standard version	<b>0</b>
12	Revision status	<b>0</b>

**Valve types (without coil) <sup>1)</sup>**

Symbol	Without manual override "0"		With pull/push manual override "-M1", "1"			
	Type	Material no.	Type	Material no.	Material no.	
<b>10</b>	VEDS-10A-5310	OD531054KK2000	R901274118	VEDS-10A-5310-M1	OD531054KK2100	R901300057
<b>20</b>	VEDS-10A-5320	OD532054KK2000	R901274117	VEDS-10A-5320-M1	OD532054KK2100	R901300059

**Available coils (separate order) <sup>1)</sup>**

Direct voltage DC <sup>3)</sup>	Material no. for coil with connector <sup>2)</sup>		
	"K4" 03pol (2+PE) DIN EN 175301-803	"K40" 02pol K40 DT 04-2PA, make Deutsch	"C4" 02pol C4/Z30 AMP Junior-Timer
12 V	R900991678	R900729189	R900315818
24 V	R900991121	R900729190	R900315819

<sup>1)</sup> Complete valves with mounted coil on request.

<sup>2)</sup> Mating connectors, separate order, see data sheet 08006.

<sup>3)</sup> Other voltages upon request.

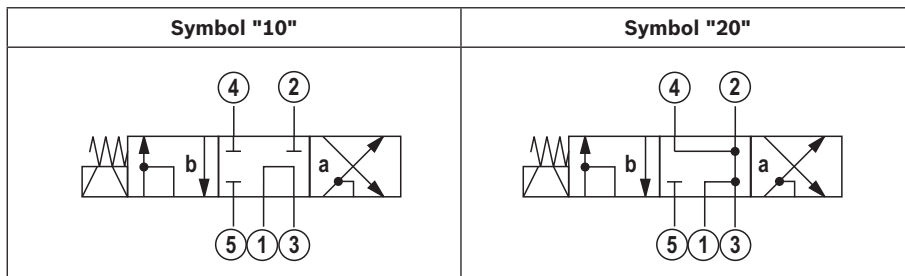
## Function, section, symbols

### General

The 5/3 directional spool valves are direct operated, pressure-compensated cartridge valves. They control the start, stop and direction of a flow and basically comprise of pole tube (1), socket (2), a control spool (5) as well as of a return spring (4).

### Function

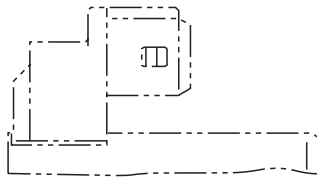
In the de-energized condition, the control spool (5) is held in the initial position by the return spring (4). The control spool (5) is actuated by wet-pin DC solenoids (3.1; 3.2). The symbols are realized by different spools ("10"; "20"). Main ports ①; ②; ③; ④ and ⑤ can be permanently pressurized with an operating pressure of 250 bar. The ports have a fixed pin assignment (see symbols). The manual override (6) allows for the switching of the valve without solenoid energization.



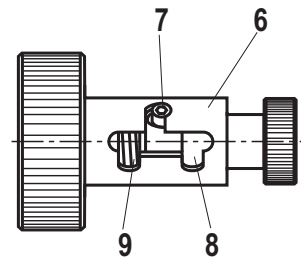
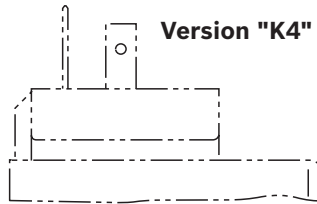
- ① = Main port 1 (LS)
- ② = Main port 2 (A)
- ③ = Main port 3 (T)
- ④ = Main port 4 (B)
- ⑤ = Main port 5 (P)

- 7 Initial position
- 8 Spool position "a"
- 9 Spool position "b"

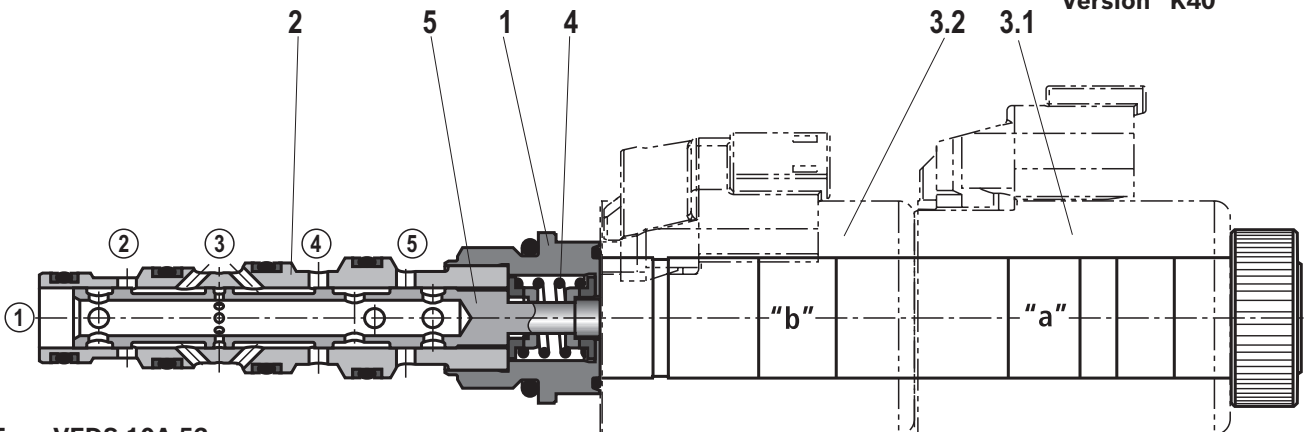
### Version "C4"



### Version "K4"



### Version "K40"



Type VEDS-10A-53...

**Technical data**

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

<b>general</b>			
Weight	- Valve	kg	0.35
	- Coil	kg	0.25 each
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 +110 (see page 6)
Storage temperature		°C	-20 to +80


**Environmental audits**

Salt spray test according to DIN 50021	h	720
Surface protection DC solenoids	Coating according to DIN 50962-Fe//ZnNi with thick film passivation	

**hydraulic**

Maximum operating pressure	bar	250
Maximum flow	l/min	25
Leakage	ml/min	< 60 (with $\Delta p = 250$ bar; HLP46, $\vartheta_{oil} = 40$ °C)
Hydraulic fluid	See table below	
Hydraulic fluid temperature range	°C	-40 to +80
Viscosity range	mm <sup>2</sup> /s	5 to 1000 (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>	
Load cycles	2 million	

Hydraulic fluid	Classification	Suitable sealing materials	Standards
Mineral oils	HL, HLP	FKM	DIN 51524
Bio-degradable	- Insoluble in water	HEES	VDMA 24568
	- Soluble in water	HEPG	

-  **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 hydraulic fluids used must be 40 K higher than the maximum solenoid surface temperature.
- ▶ **Bio-degradable:** When using bio-degradable hydraulic fluids that are simultaneously zinc-soluble, zinc may accumulate in the fluid.

<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).

**Technical data**

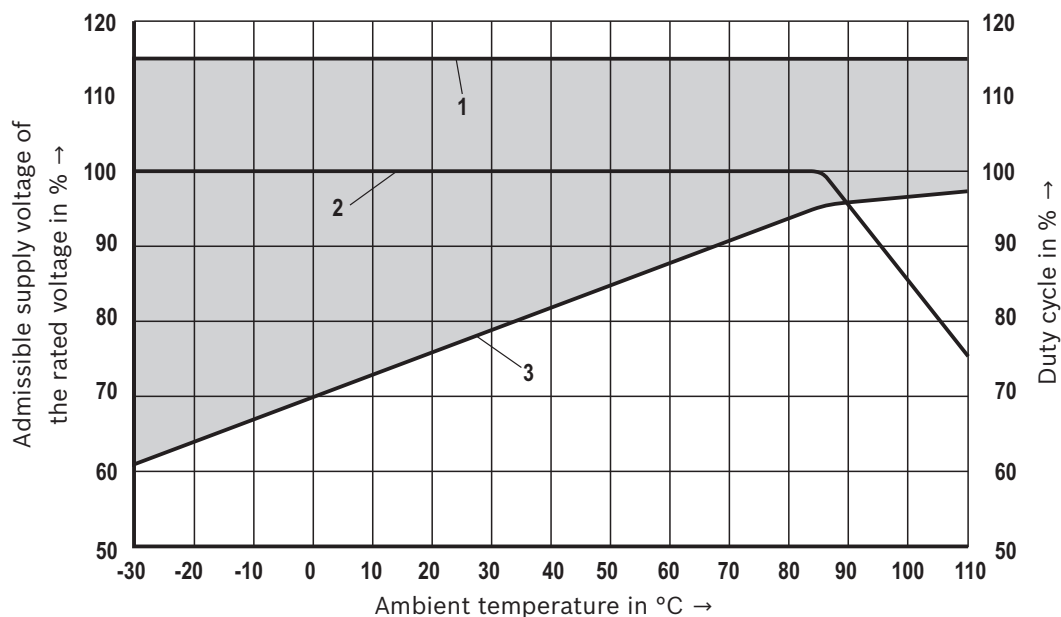
(For applications outside these parameters, please consult us!)

electric			
Voltage type		Direct voltage	
Supply voltages <sup>2)</sup>	V	12 DC; 24 DC	
Voltage tolerance against ambient temperature		See characteristic curve below	
Power consumption	W	22	
Duty cycle	%	See characteristic curve below	
Maximum coil temperature <sup>3)</sup>	°C	150	
Switching time according to ISO 6403 (solenoid horizontal)	- ON	ms	≤ 60
	- OFF	ms	≤ 60
Maximum switching frequency	cy/h	15000	
Protection class according to VDE 0470-1 (DIN EN 60529) DIN 40050-9	- Version "K4"	IP 65 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)	
	- Version "K40"	IP 69K with mating connector mounted and locked	

<sup>2)</sup> Other voltages upon request

<sup>3)</sup> Due to the surface temperatures of the solenoid coils, the standards ISO 13732-1 and ISO 4413 need to be adhered to!

**When establishing the electrical connection, the protective earthing conductor (PE  $\perp$ ) has to be connected properly.**

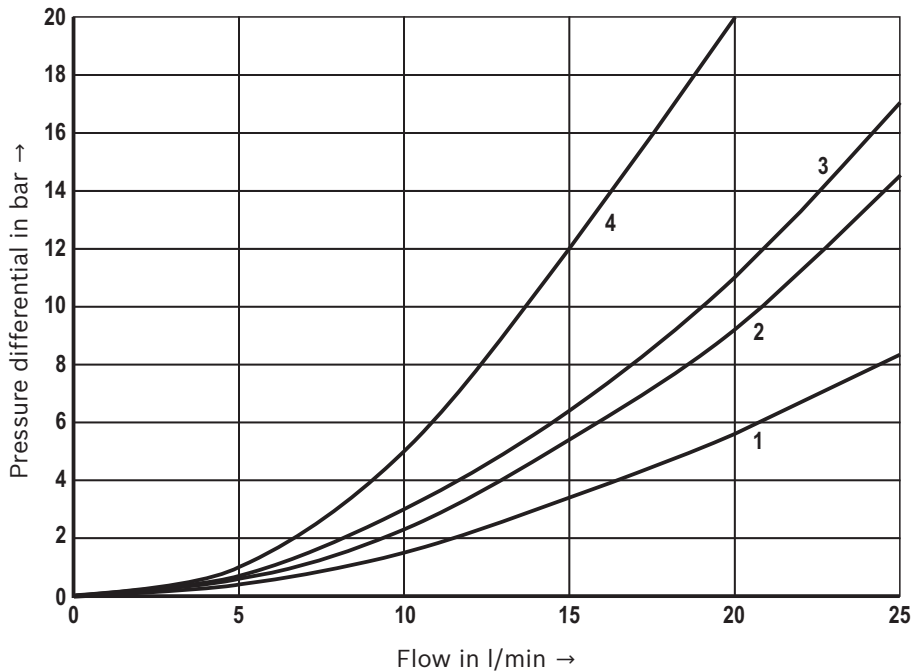
**Voltage tolerance against ambient temperature; duty cycle****Voltage range and duty cycle depending on the ambient temperature**

- 1 Maximum voltage
- 2 Duty cycle
- 3 Minimum response voltage
- Admissible supply voltage range

## Characteristic curves

(measured with HLP46,  $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$  and 24 V coil)

$\Delta p$ - $q_v$  characteristic curves – Symbol "10" and "20"

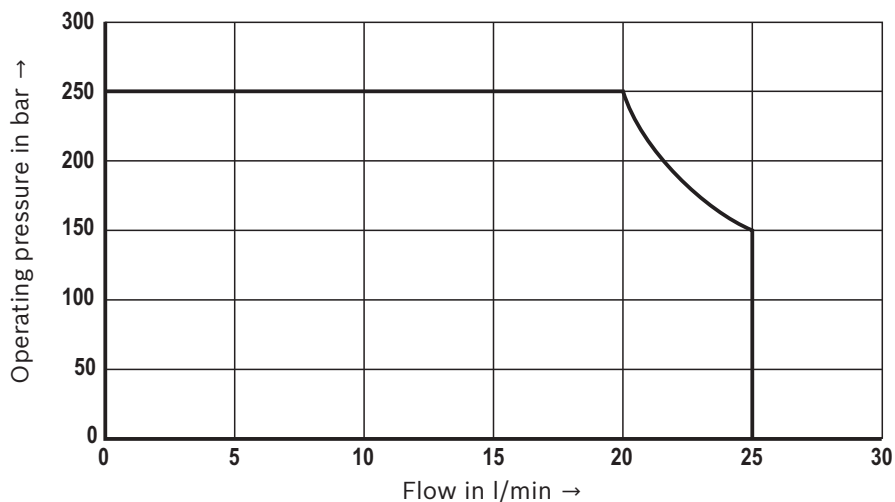


1	④ → ③ ② → ③
2	⑤ → ④
3	⑤ → ②
4	① → ③

## Limits of performance

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

Symbol "10" and "20"



### ⚠ Attention!

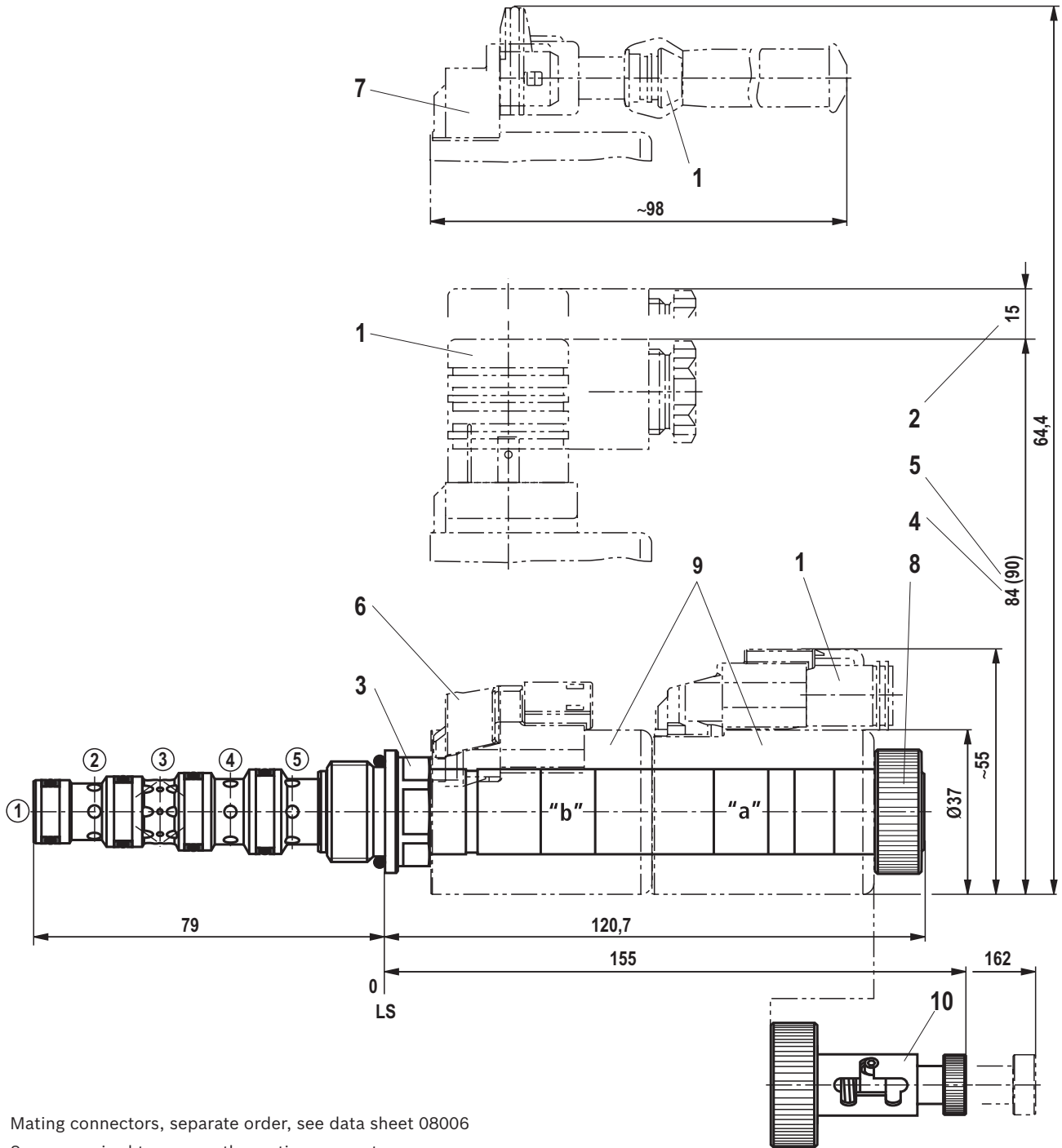
The specified limits of performance are valid for operation with two directions of flow (e.g. from ⑤ to ② and simultaneous return flow from ④ to ③).

Due to the current forces acting within the valves, the permissible performance limit may be considerably lower with only one direction of flow (e.g. from ⑤ to ② and blocked port ④)!

In such applications, please consult us!

**The performance limit was determined when the solenoids were at operating temperature, at 10% undervoltage and without tank pre-loading.**

**Unit dimensions**  
(dimensions in mm)



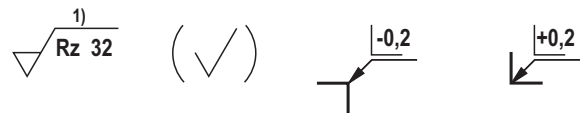
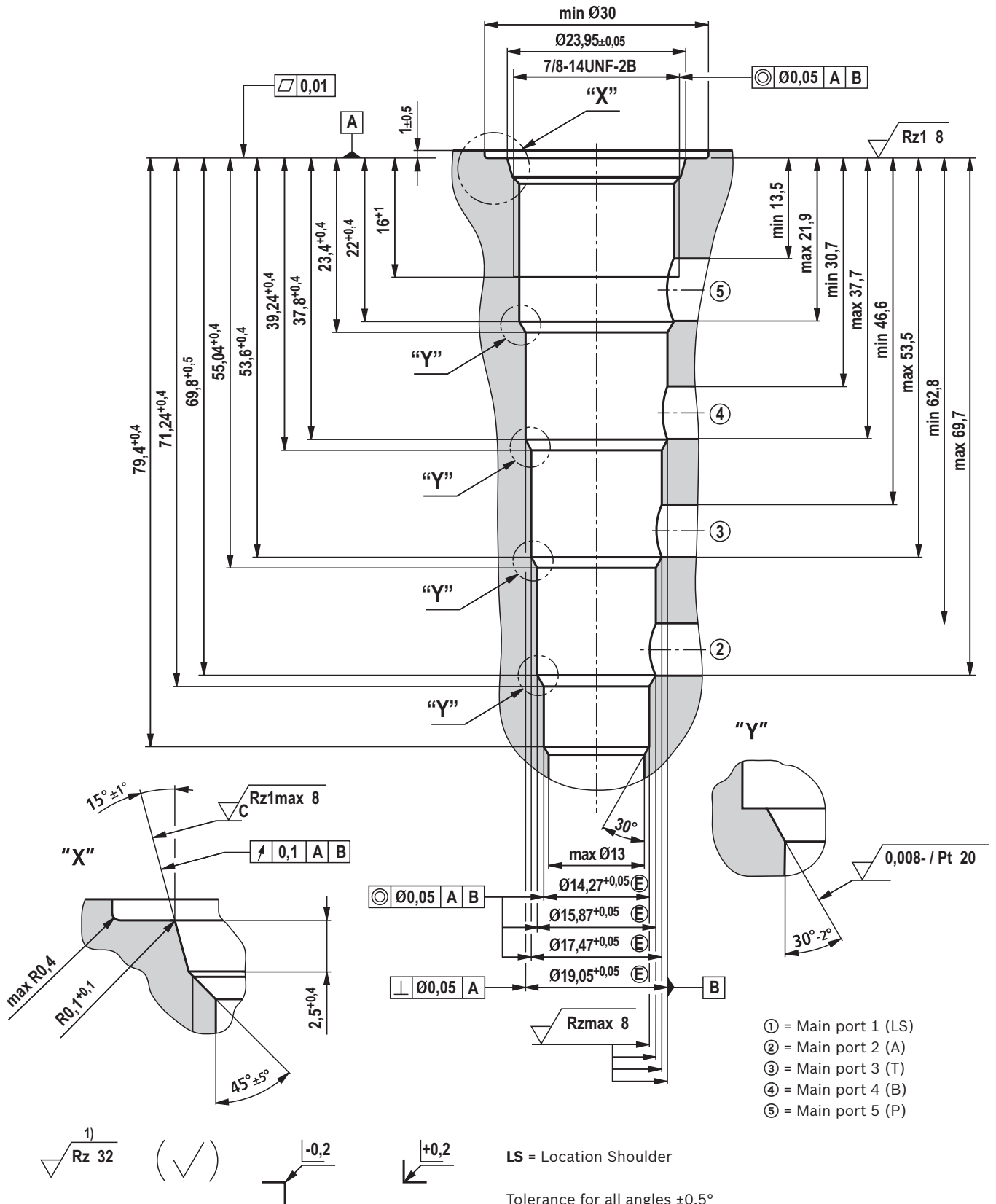
- 1 Mating connectors, separate order, see data sheet 08006
- 2 Space required to remove the mating connector
- 3 SW24, tightening torque  $M_A = 55^{+5}$  Nm
- 4 Dimension for "K4" mating connector, without circuitry
- 5 Dimension ( ) for "K4" mating connector, with circuitry
- 6 Version "K40"
- 7 Version "C4"
- 8 Nut, tightening torque  $M_A = 5^{+1}$  Nm
- 9 Coil (separate order, see page 3)
- 10 Pull/push manual override "1"

- ① = Main port 1 (LS)
- ② = Main port 2 (A)
- ③ = Main port 3 (T)
- ④ = Main port 4 (B)
- ⑤ = Main port 5 (P)

LS = Location Shoulder



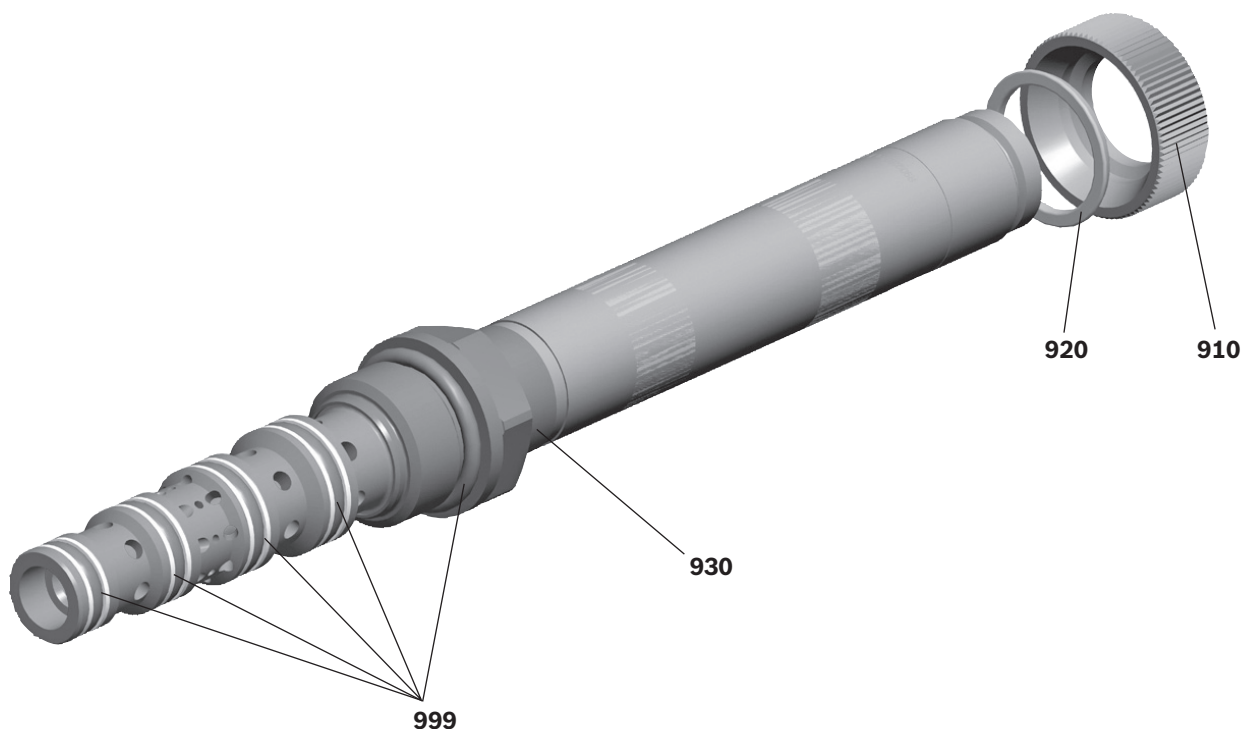
**Mounting cavity R/UNF-10-05-0-08; 5 main ports; thread 7/8-14UNF-2B**  
(dimensions in mm)



LS = Location Shoulder

Tolerance for all angles ±0.5°

All seal ring insertion faces are rounded and free of burrs

**Available individual components**

Item	Denomination	Material no.
910	Nut	R901241052
920	O-ring for pole tube	R900007769
930	O-ring for pole tube	R913014944
999	Seal kit of the valve	R961005837

Coils, separate order, see page 3

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## Notes

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