

# Directional spool valves, direct operated, with solenoid actuation

## Type FTWE 2 K

**RE 58007**

Edition: 2014-07

Replaces: 06.03



- ▶ Size 2
- ▶ Component series 3X
- ▶ Maximum operating pressure 100 bar
- ▶ Maximum flow 2 l/min

### Features

- ▶ 3/2-way version
- ▶ Screw-in cartridge valve
- ▶ Minimized size
- ▶ Wet-pin DC solenoid
- ▶ Electrical connection as individual connection
- ▶ With manual override
- ▶ For use in vehicles and mobile machines

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

01	02	03	04	05	06	07	08	09	10	11
<b>FTWE</b>	<b>2</b>	<b>K</b>		<b>3X</b>	<b>/</b>	<b>100</b>	<b>A</b>		<b>V</b>	<b>*</b>

01	Directional spool valve, non-standard design, electric actuation	<b>FTWE</b>
02	Size 2	<b>2</b>
03	Screw-in cartridge valve	<b>K</b>
04	Switching characteristics (more on request)	<b>C</b>
05	Component series 30 ... 39 (30 ... 39; unchanged installation and connection dimensions)	<b>3X</b>
06	Maximum nominal pressure 100 bar	<b>100</b>
07	Solenoid, wet-pin	<b>A</b>

**Supply voltage**

08	Control electronics 12 V DC	<b>G12</b>
	Control electronics 24 V DC	<b>G24</b>

**Electrical connection** <sup>1)</sup>

09	<b>Without</b> mating connector, with connector DT 04-2P (Deutsch connector)	<b>K40</b>
	<b>Without</b> mating connector, with connector AMP Junior-Timer	<b>C4</b> <sup>2)</sup>

**Seal material**

10	FKM seals	<b>V</b>
	Observe compatibility of seals with hydraulic fluid used! (Other seals on request)	
11	Further details in the plain text (e.g. for special versions see page 3)	<b>*</b>

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

<sup>2)</sup> The manual override can only be performed once the connector is removed!

**Notice:**

For other valve types than those listed in the data sheet, please consult us!

**Valve types**

Type	Material no.
FTWE 2 KC3X/100AG12C4V	<b>R900578533</b>
FTWE 2 KC3X/100AG12K40V	<b>R901047340</b>
FTWE 2 KC3X/100AG24C4V	<b>R900578535</b>
FTWE 2 KC3X/100AG24K40V	<b>R901032720</b>

## Function, section, symbols

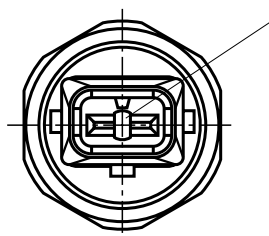
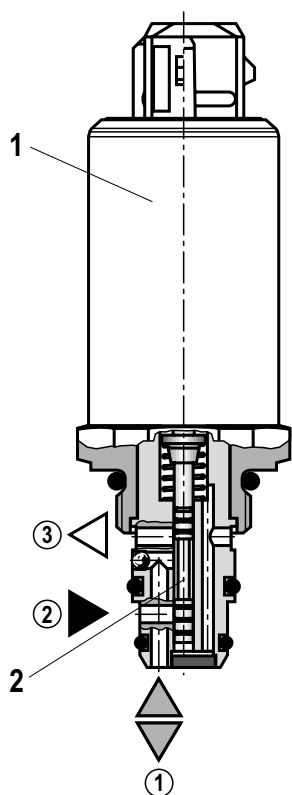
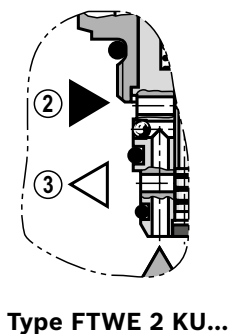
### General

The directional spool valves type FTWE 2 K are direct operated, pressure-compensated screw-in cartridge valves in 3-way design. They control the start, stop and direction of a flow.

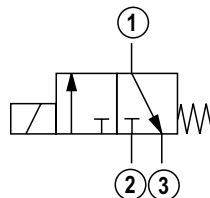
### Function

In the de-energized condition, the control spool (2) is held in the initial position by the return spring.

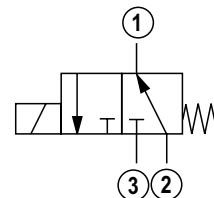
- Version "C" (standard) initial position from ① → ③; on actuation, the valve opens from ② → ①.
- Version "U" (special version on request) initial position from ② → ①, on actuation, the valve opens from ① → ③. The control spool (2) is actuated by wet-pin DC solenoids (1). Main ports ① and ② can be charged continuously with 100 bar operating pressure, main port ③ with a maximum of 30 bar.



Symbol "C"  
(Standard)



Symbol "U"  
(Special version)



#### Notice:

Special versions (e.g. symbol "U") on request.  
Special installation drawings apply for all special versions.

- ① = Main port 1 (A)
- ② = Main port 2 (P)
- ③ = Main port 3 (T)

### Manual override <sup>1)</sup>

<sup>1)</sup> Actuated via pin tool (to actuate the manual override the connector must be removed (version "C4" and "K40"). Maximum number of plug-in processes 10 (specification AMP 108-18013).

**Technical data**

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

<b>General</b>		
Weight	kg	approx. 0.16
Installation position		any
Ambient temperature range	°C	−30 ... +80
Salt spray test according to ISO 9227	h	600 (NSS test)
Solenoid surface protection		Coating according to DIN 50962-Fe//ZnNi with thick film passivation

<b>Hydraulic</b>			
Maximum operating pressure	► Main port ① (A)	bar	100
	► Main port ② (P)	bar	100
Maximum counter pressure	► Main port ③ (T)	bar	30
Maximum flow ( $\Delta p = 5 \text{ bar}$ ) <sup>1)</sup>		l/min	2
Maximum leakage flow	► Main port ③ (T)	cm³/min	≤ 60 ( $p_p = 50 \text{ bar}$ and control current $I = 0$ )
Hydraulic fluid			see table below
Hydraulic fluid temperature range		°C	−30 ... +80
Viscosity range		mm²/s	10 ... 380
Maximum admissible degree of contamination of the hydraulic fluid cleanliness class according to ISO 4406 (c)			Class 20/18/15 <sup>2)</sup>
Load cycles			10 million <sup>1)</sup>

<b>Hydraulic fluid</b>		<b>Classification</b>	<b>Suitable sealing materials</b>	<b>Standards</b>
Mineral oils		HL, HLP	FKM	DIN 51524
Biodegradable	– insoluble in water	HEES	FKM	ISO 15380
	– soluble in water	HEPG	FKM	

**Important information on hydraulic fluids!**

- For more information and data on the use of other hydraulic fluids, please 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 fluid used must be 40 K higher than the maximum solenoid surface temperature.
- Biodegradable: If biodegradable hydraulic fluids are used that are also zinc-solvent, there may be an accumulation of zinc

<sup>1)</sup> Rexroth standard test condition (HLP32;  $\vartheta_{oil} = 40 \text{ °C} \pm 5 \text{ °C}$ )

<sup>2)</sup> The cleanliness classes stated for the components need to be maintained 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).

We recommend using a filter with a minimum retention rate of

$\beta_{10} \geq 75$ .

## Technical data

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

Electrical			
Voltage type		Direct voltage	
Supply voltages ( $\pm 15\%$ )	V	12 DC	24 DC
Power consumption (at 20 °C)	W	14.4	
Coil resistance (cold value at 20 °C)	$\Omega$	10	40
Duty cycle	%	100	
Maximum coil temperature <sup>3)</sup>	°C	150	
Switching time	► ON	ms	$\leq 20$
	► OFF	ms	$\leq 30$
Protection class according to DIN EN 60529	► Version "C4"	IP 65 with mating connector mounted and locked	
		IP 67 and IP 69K with Rexroth mating connector (material no. R901022127)	
	► Version "K40"	IP 67 and IP 69K with mating connector mounted and locked	
Switching frequency	Hz	5	
Design		as per VDE 0580	

<sup>3)</sup> Surface temperature > 50 °C possible, provide contact protection in accordance with standards ISO 13732-1 and ISO 4413 .

**When establishing the electrical connection, the protective earthing conductor (PE  $\frac{1}{2}$ ) has to be connected correctly.**

### Notice:

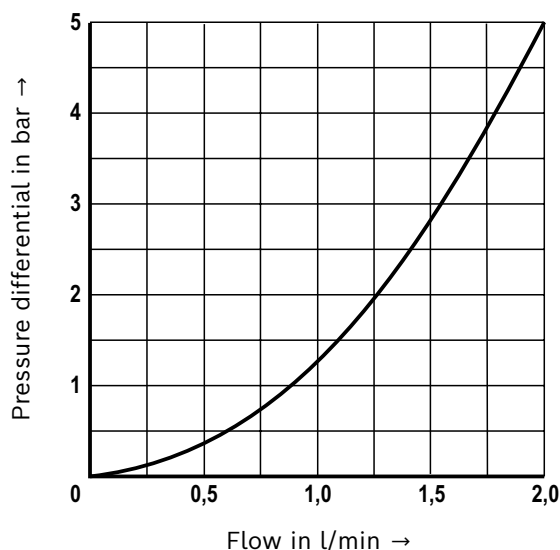
- The technical data were determined at a viscosity of 46 mm<sup>2</sup>/s (HLP46; 40 °C).
- For further information relating to correct usage of Rexroth hydraulic products, refer to data sheet 64020-B, "Hydraulic valves for mobile applications – General information".

## Characteristic curves

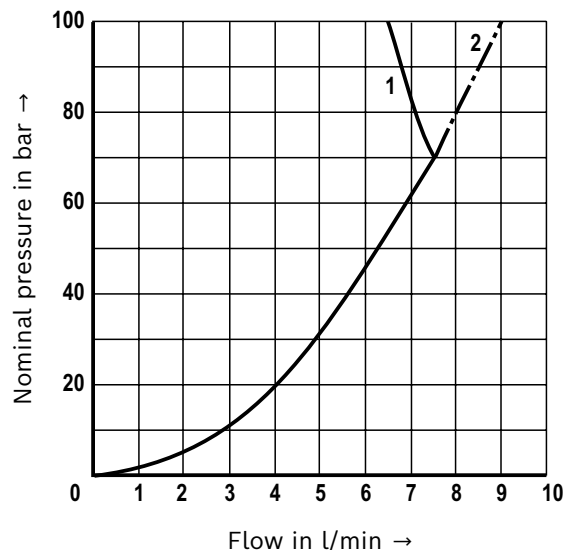
(measured with HLP46,  $\vartheta_{oil} = 40 \pm 5$  °C)

**$\Delta p$ - $q_v$  characteristic curve** ( $q_v$  = minimum value)

②(P) → ①(A); ①(A) → ③(T)



**Power limit**

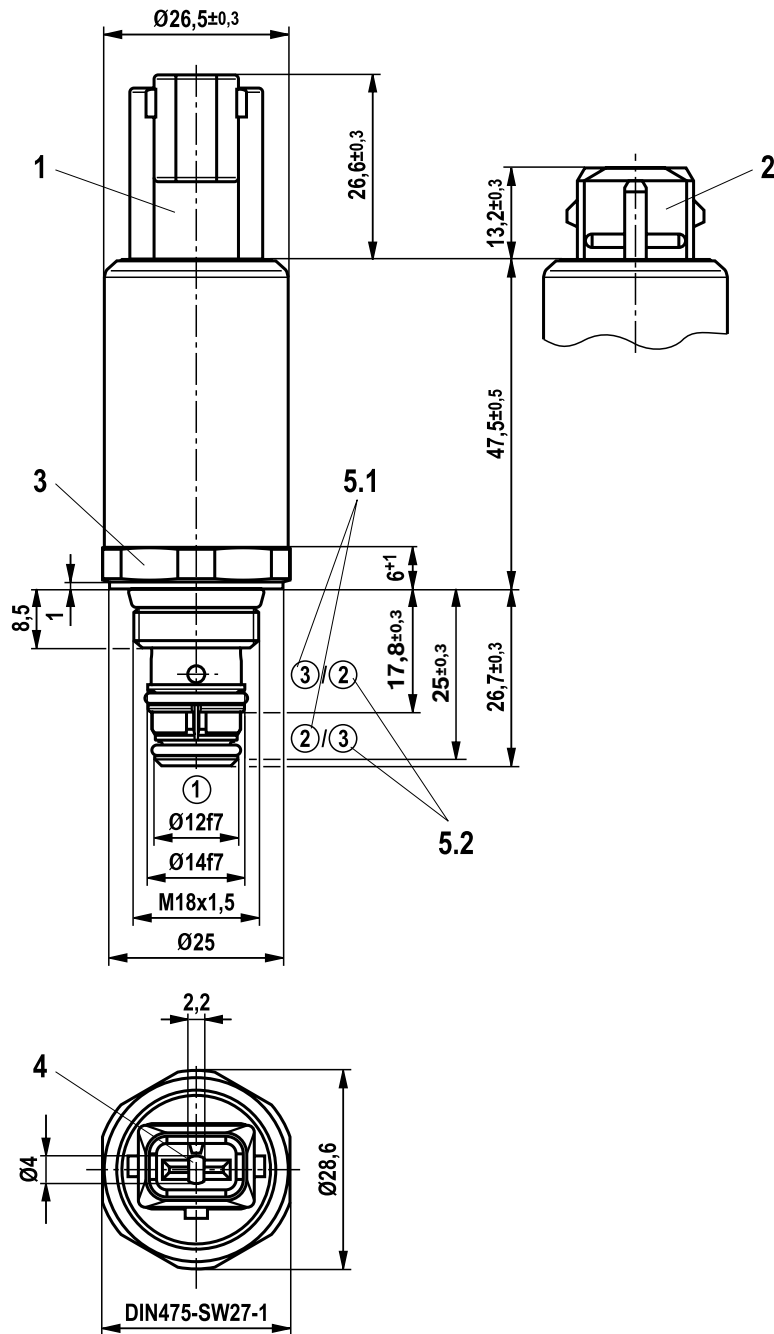


1 Main port ①(A) → ③(T)

2 Main port ②(P) → ①(A)

## Dimensions

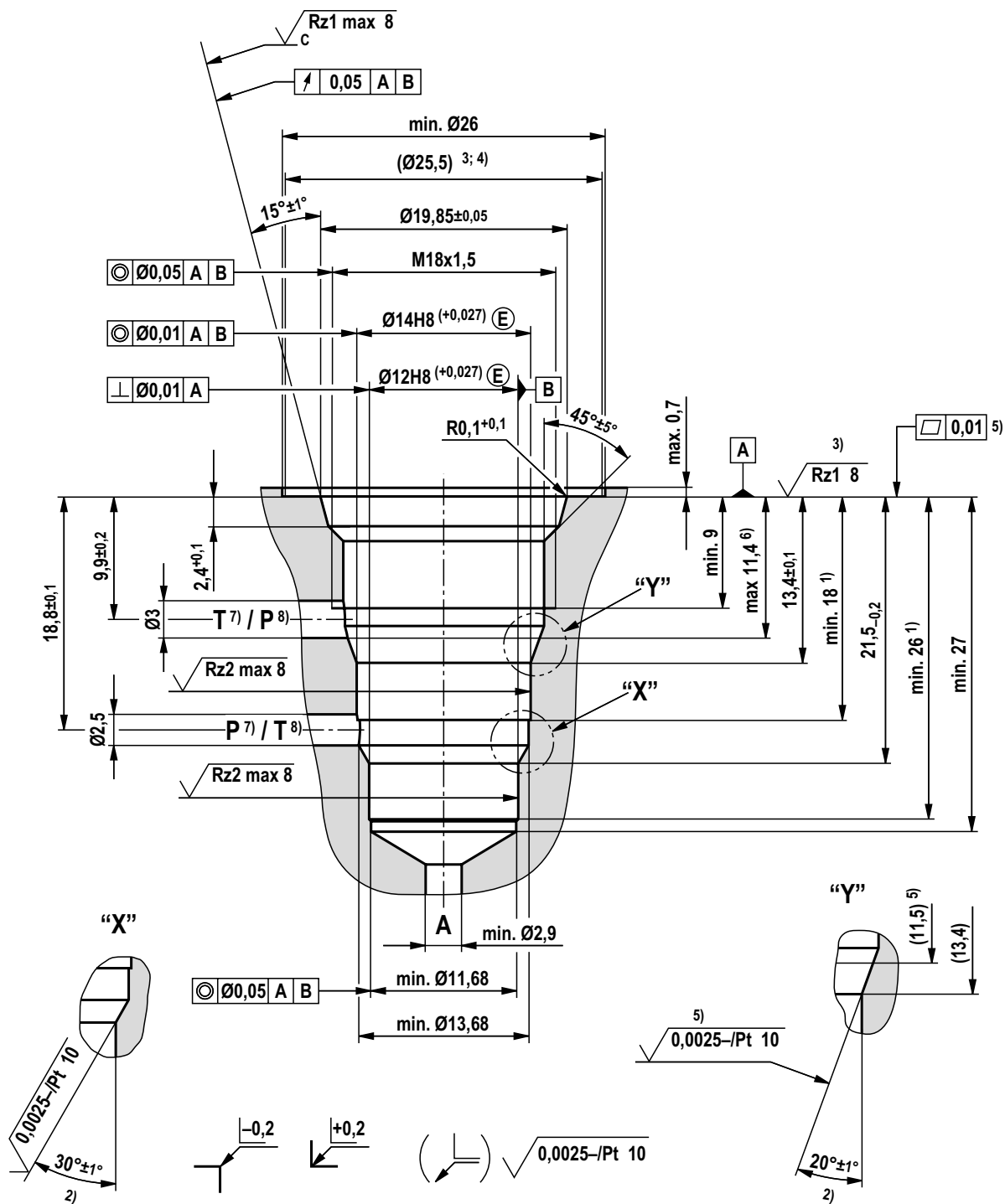
(dimensions in mm)



- ① = main port 1 (A)
- ② = main port 2 (P)
- ③ = main port 3 (T)

- 1 Mating connector for connector "K40" (separate order, see data sheet 08006)
- 2 Mating connector for connector "C4" (separate order, see data sheet 08006)
- 3 Wrench size 27;  $M_A = 10^{+5}$  Nm
- 4 Manual override: Actuated via pin tool (to actuate the manual override the connector must be removed (version "C4" and "K40"). Maximum number of plug-in processes 10 (specification AMP 108-18013)).
- 5.1 Symbol "C" (standard)
- 5.2 Symbol "U" (on request)

### Mounting cavity (dimensions in mm)

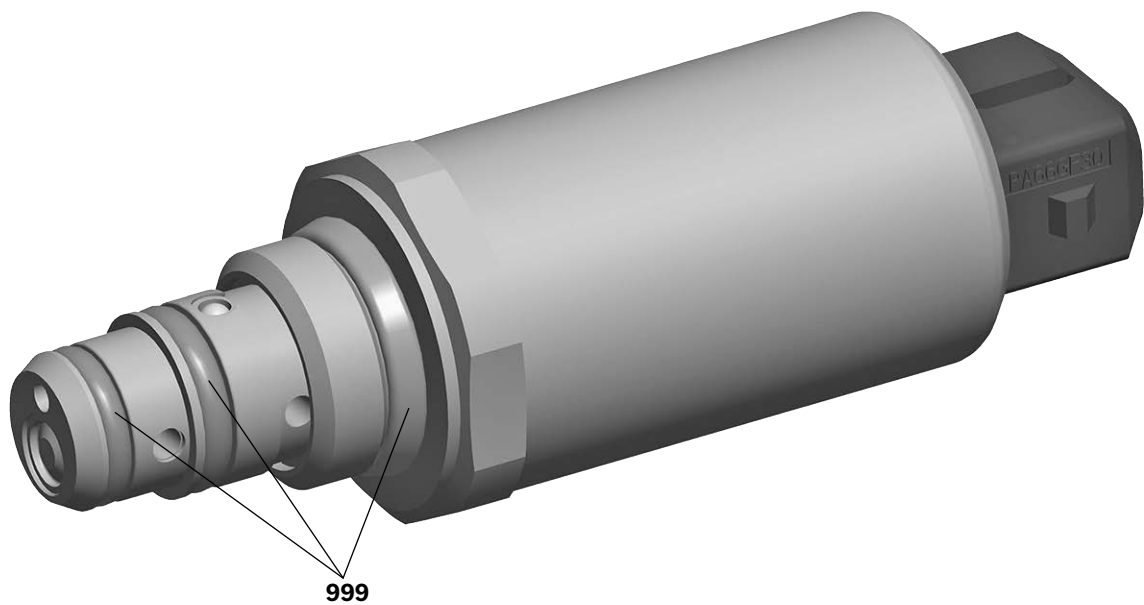


### Standards:

Workpiece edges	ISO 13715
Form and position tolerance	ISO 1101
General tolerance for metal-cutting procedures	ISO 2768 (mK)
Tolerance	ISO 8015
Surface condition	ISO 1302

- 1) Depth of fit
- 2) All seal ring insertion faces are rounded and free of burrs
- 3) Required roughness up to Ø 25.5 mm
- 4) Required evenness up to Ø 25.5 mm
- 5) Required roughness of 11.5 ... 13.4 mm
- 6) Step in chamfer possible
- 7) Symbol "C" (standard)
- 8) Symbol "U" (on request)

Available individual components



Item	Designation	Seal material	Material no.
999	Seal kit of the valve	FKM	R961007176

Seal kits with other seals on request.

More information

- Hydraulic valves for mobile applications
  - Mineral-oil-based hydraulic fluids
  - Filter range
- Data sheet 64020-B

Data sheet 90220

[www.boschrexroth.com/filter](http://www.boschrexroth.com/filter)

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