

Proportional pressure reducing valve

Type FTDRE2K

RE 58032

Edition: 2014-04

Replaces: 04.99



H7981

- ▶ Frame size 2
- ▶ Component series 3X
- ▶ Maximum control pressure 18, 24 bar
- ▶ Maximum operating pressure 100 bar
- ▶ Maximum flow 2 l/min (at $\Delta p = 7$ bar)

Features

- ▶ Direct operated proportional pressure reducing valve for reducing a system pressure
- ▶ Cartridge valve
- ▶ Suitable for mobile and industrial applications
- ▶ Operation by means of proportional solenoid
- ▶ In case of power failure, the minimum pressure is set
- ▶ Recommended control electronics:
Mobile amplifier type RA and RC

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Ordering code (valve without coil) ¹⁾

01	02	03	04	05	06	07	08	09	10	11
FTDRE	2	K	3X	/	A			V	-8	*

01	Proportional pressure reducing valve, non-standardized design, electrical operation	FTDRE
02	Size 2	2
03	Screw-in cartridge valve	K
04	Component series 30 to 39 (30 to 39; unchanged installation and connection dimensions)	3X
05	Maximum control pressure 18 bar	18
	Maximum control pressure 24 bar	24
06	Proportional solenoid, wet-pin	A

Supply voltage

07	Control electronics 12 V DC	G12
	Control electronics 24 V DC	G24
08	With manual override	no code
	Without manual override	N0

Electrical connection ¹⁾

09	Without mating connector, with DT 04-2P connector (Deutsch plug)	K40
	Without mating connector, with AMP Junior-Timer connector	C4

Seal material

10	FKM seals	V
	Observe compatibility of seals with hydraulic fluid used! (Other seals upon request)	
11	Further details in the plain text	*

¹⁾ Mating connectors, separate order, see data sheet 08006.

Notice:

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

Valve types

Type	Material no.
FTDRE 2 K3X/18AG12C4V-8	R900726604
FTDRE 2 K3X/18AG12K40V-8	R901047323
FTDRE 2 K3X/18AG24C4V-8	R900701407
FTDRE 2 K3X/18AG24K40V-8	R901023204

Type	Material no.
FTDRE 2 K3X/18AG12N0C4V-8	R901377809
FTDRE 2 K3X/18AG12N0K40V-8	R901377815
FTDRE 2 K3X/18AG24N0C4V-8	R901377808
FTDRE 2 K3X/18AG24N0K40V-8	R901377814

Function, section, symbols

General

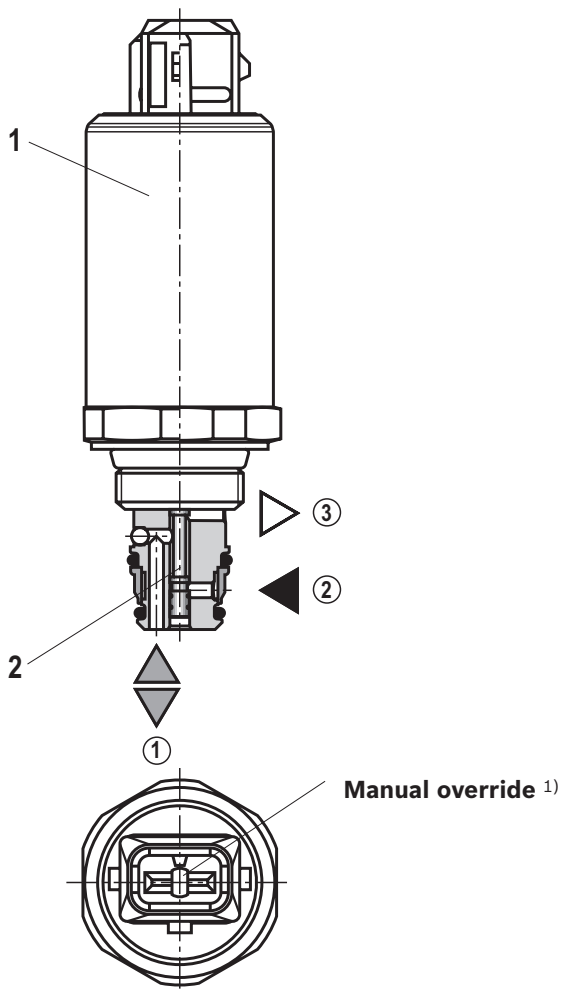
The proportional pressure reducing valve type FTDRE 2 K is a direct operated screw-in cartridge valve in 3-way version. It reduces the control pressure (main port ①) proportionally to the solenoid current and functions largely independently from the inlet pressure (main port ②). With a command value of 0 or in case of power failure, the minimum pressure is set. Operation is effected by means of a proportional solenoid. The solenoid's interior is connected to the main port ③ and filled with hydraulic fluid. Depending on the electric command value, these valves can be used to reduce the system pressure continuously. The valve is suitable for controlling couplings, pumps and directional valves as well as for use in proportional pilot controls (particularly in the mobile area, however also for industrial applications).

Basic principle

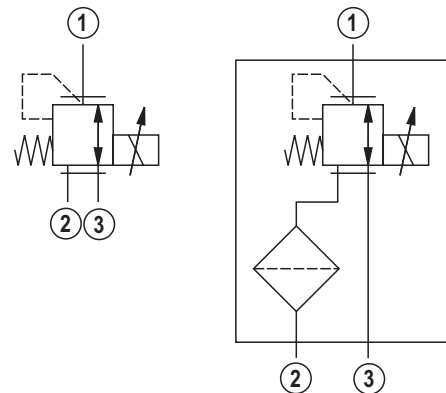
The valve controls the pressure in the main port ① proportionally to the current at the solenoid. The proportional solenoid (1) converts the electric current into a mechanical force that acts on the control spool (2) via the armature. The control spool controls the connection between the main ports.

Notices:

- ▶ Occurring tank pressure (main port ③) is added up to the control pressure (main port ①).
- ▶ If the valve is not installed or installed in a system that is not completely bled, the valve must not be energized as otherwise, the entering air has a very negative effect on the valve's dynamic behavior.



Type FTDRE 2 K3X/..C4..



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

¹⁾ Not contained in "N0" version. Operation by pin tool (to operate the manual override, the connector must be disconnected ("C4" and "K40" version). Maximum number of plug-in processes 10 (specification AMP 108-18013).

Technical data

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

general			
Weight		kg	Approx. 0.16
Installation position	Any; preferably with electrical connection hanging down (for horizontal position of valve or electrical connection standing up, a minimum counter pressure must be generated to ensure the valve remains filled with oil).		
Ambient temperature range	▶ Version "18"	°C	-30 ... +120
	▶ Version "24"	°C	-30 ... +80
Salt spray test according to ISO 9227		h	600 (NSS test)
Surface protection Solenoid	Coating according to DIN 50962-Fe//ZnNi with thick film passivation		

hydraulic			
Maximum control pressure	▶ Main port ① (A)	bar	18, 24
Maximum inlet pressure	▶ Main port ② (P)	bar	100
Maximum counter pressure	▶ Main port ③ (T)	bar	Depressurized (maximum admissible 30) Counter pressure increases set pressure, even for current $I = 0$
Flow ($\Delta p = 7 \text{ bar}$) ¹⁾		l/min	≥ 2 (maximum admissible 7.5)
Maximum leakage flow	▶ Main port ③ (T)	cm ³ /min	≤ 60 ($p_p = 50 \text{ bar}$ and control current $I = 0$)
Maximum pilot flow		cm ³ /min	≤ 500 ($p_p = 50 \text{ bar}$, $q_{VA} = 0$ and control current $I = I_{\text{max}}$)
Hydraulic fluid	See table page 5		
Hydraulic fluid temperature range		°C	-30 ... +80
Viscosity range		mm ² /s	10 ... 380
Maximum admissible degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c)	Class 20/18/15 ¹⁾		
Load cycles	5 million ¹⁾		
Maximum step response in case of control current change (see characteristic curve below)	▶ t_{on}	ms	25
	▶ t_{off}	ms	20
Mesh size strainer element at the main port ②		μm	160

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

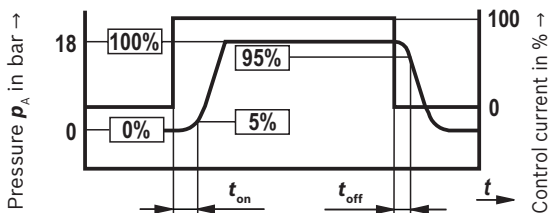
2) The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and at the same time increases the life cycle of the components.

For the selection of the filters see www.boschrexroth.com/filter.

We recommend using a filter with a minimum retention rate of $\beta_{10} \geq 75$.

Notice:

- ▶ The following documentation must be observed: 64020-B1 Hydraulic valves for mobile applications
- ▶ When exchanging screw-in cartridge valves, provide for the correct tightening torque!

Maximum step response

Technical data

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

Hydraulic fluid	Classification	Suitable sealing materials	Standards
Mineral oils	HL, HLP	FKM	DIN 51524
Bio-degradable	– insoluble in water	FKM	VDMA 24568
	– soluble in water	HEPG	

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, life cycle, maintenance intervals, etc.)!

- ▶ The flash point of the hydraulic fluid used must be 40 K higher than the maximum solenoid surface temperature.
- ▶ **Bio-degradable:** If bio-degradable hydraulic fluids are used that are also zinc-solvent, there may be an accumulation of zinc.

electric			
Voltage type		Direct voltage	
Supply voltages	V	12 DC	24 DC
Maximum solenoid current ³⁾	▶ Version "18"	mA	1800
	▶ Version "24"	mA	2200
Coil resistance (cold value at 20 °C)	Ω	2.4	12
Duty cycle	%	100 See characteristic curves on page 7 and 8	
Maximum coil temperature ⁴⁾	°C	150	
Protection class according to VDE 0470-1 (DIN EN 60529) DIN 40050-9	▶ Version "C4"	IP 65 with mating connector mounted and locked	
	▶ Version "K40"	IP 67 and IP 69K with Rexroth mating connector (material no. R901022127)	
Control electronics (separate order)		Analog amplifier type RA... (data sheet 95230)	
		BODAS control unit type RC... (data sheet 95200)	
Recommended dither frequency (PMW) Chopper frequency (recommended) ⁵⁾	Hz	150	
Design according to VDE 0580			

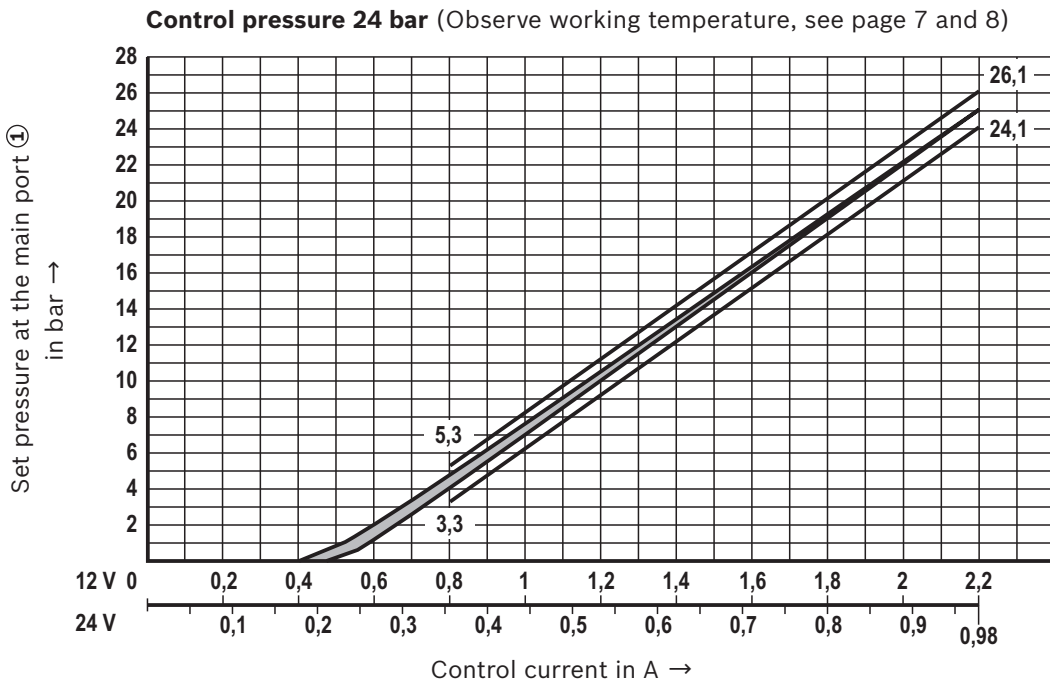
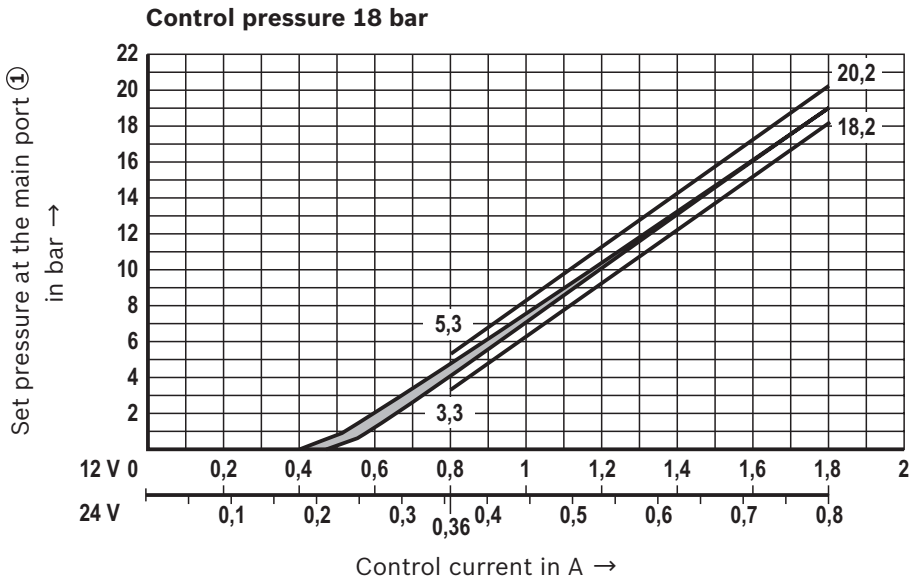
³⁾ With version "24", observe working temperature, see page 7 and 8

⁴⁾ Due to the surface temperatures of the solenoid coils, the standards ISO 13732-1 and ISO 4413 need to be adhered to!

⁵⁾ The chopper frequency is to be optimized depending on the application.
In this regard, observe the working temperature range of the application.

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

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



Measuring conditions

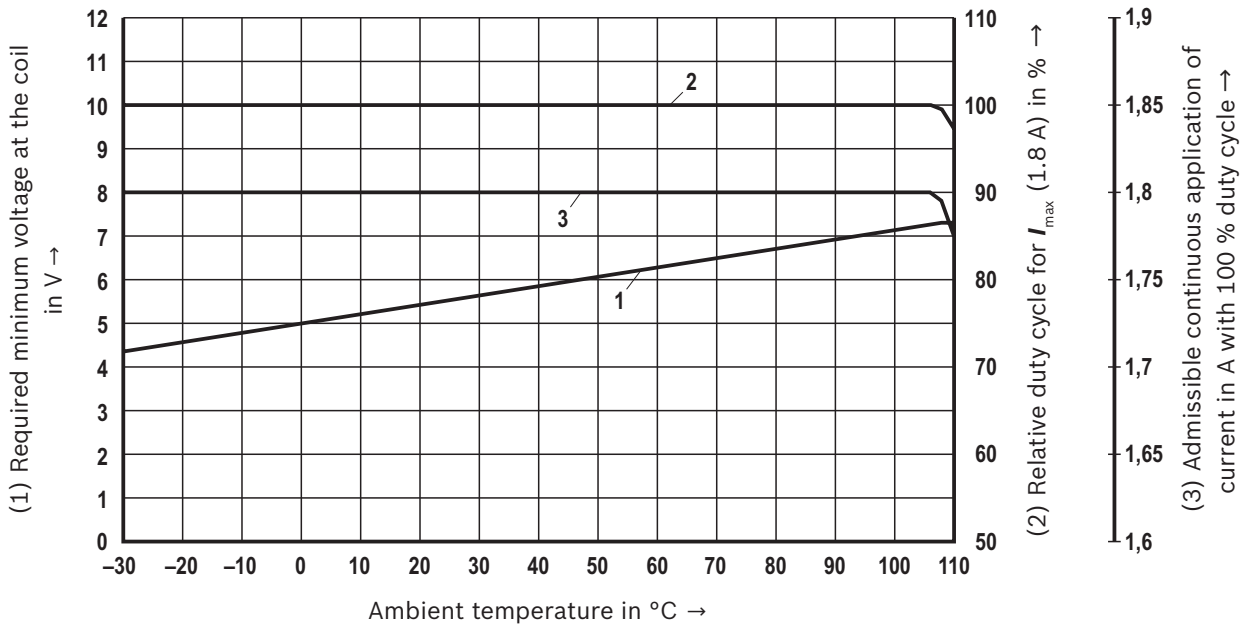
Amplifier	Analog amplifier RA (data sheet 95230)	
Chopper frequency	Hz	150
Inlet pressure	bar	50
Dead volume at the main port ①	ml	135

Admissible working range: Version "G12"

Minimum terminal voltage at the coil and relative duty cycle

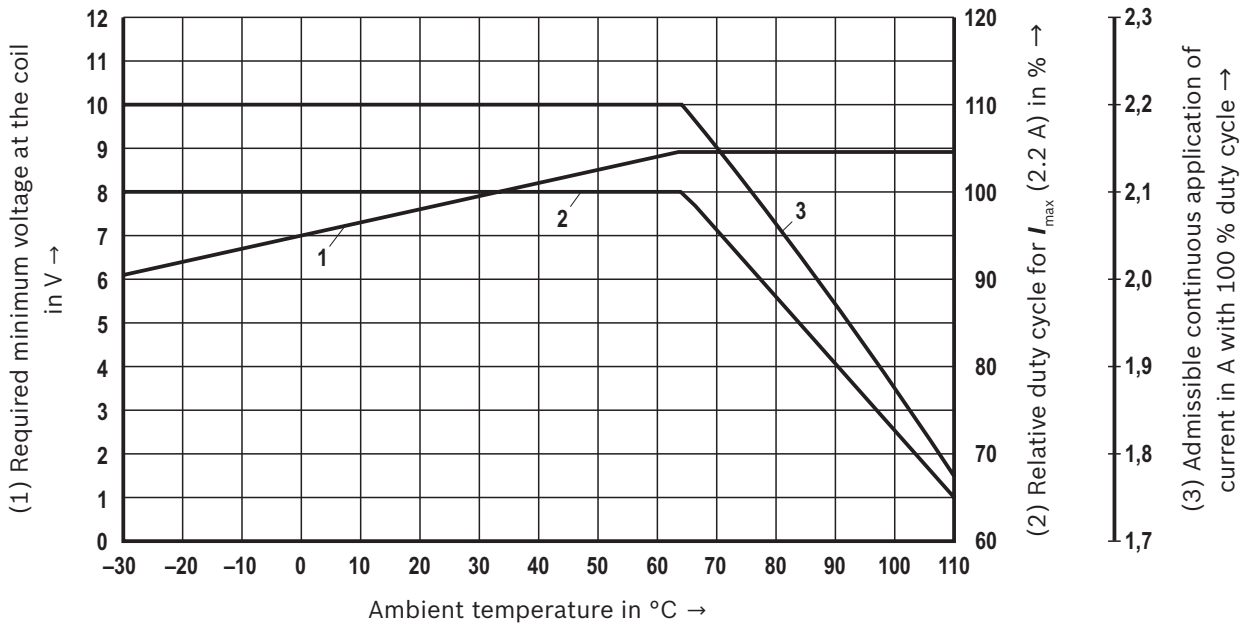
Admissible working range against the ambient temperature

Version "18" (2.4 Ω - 12 V - 1.8 A)



Admissible working range against the ambient temperature

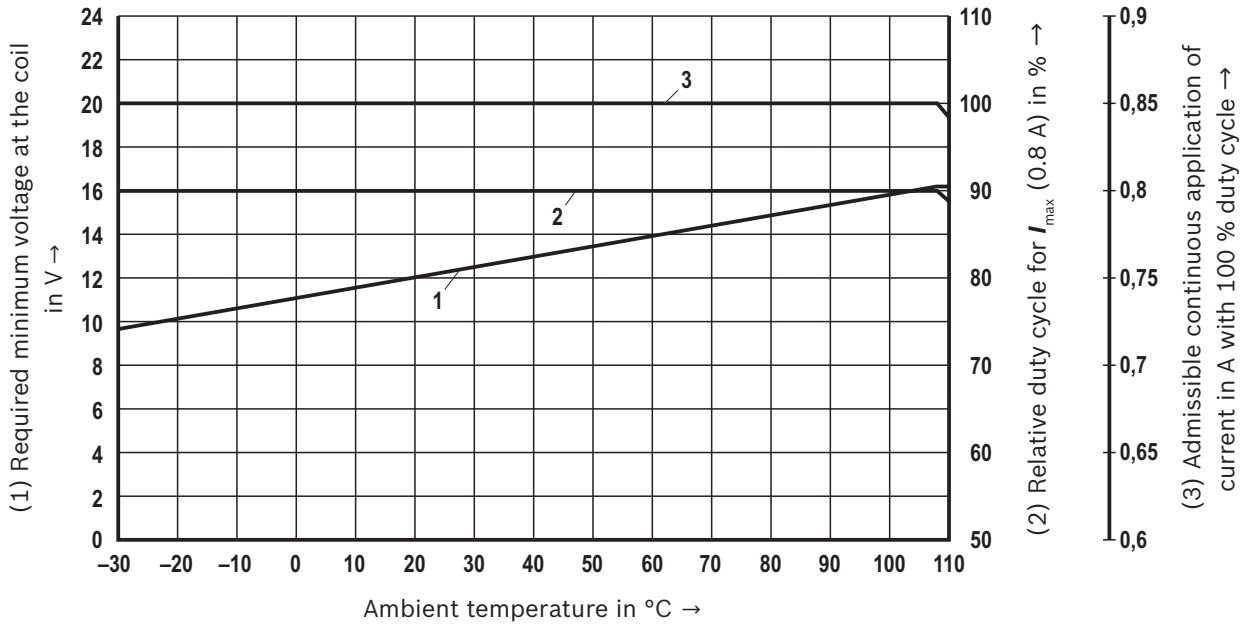
Version "24" (2.4 Ω - 12 V - 2.2 A)



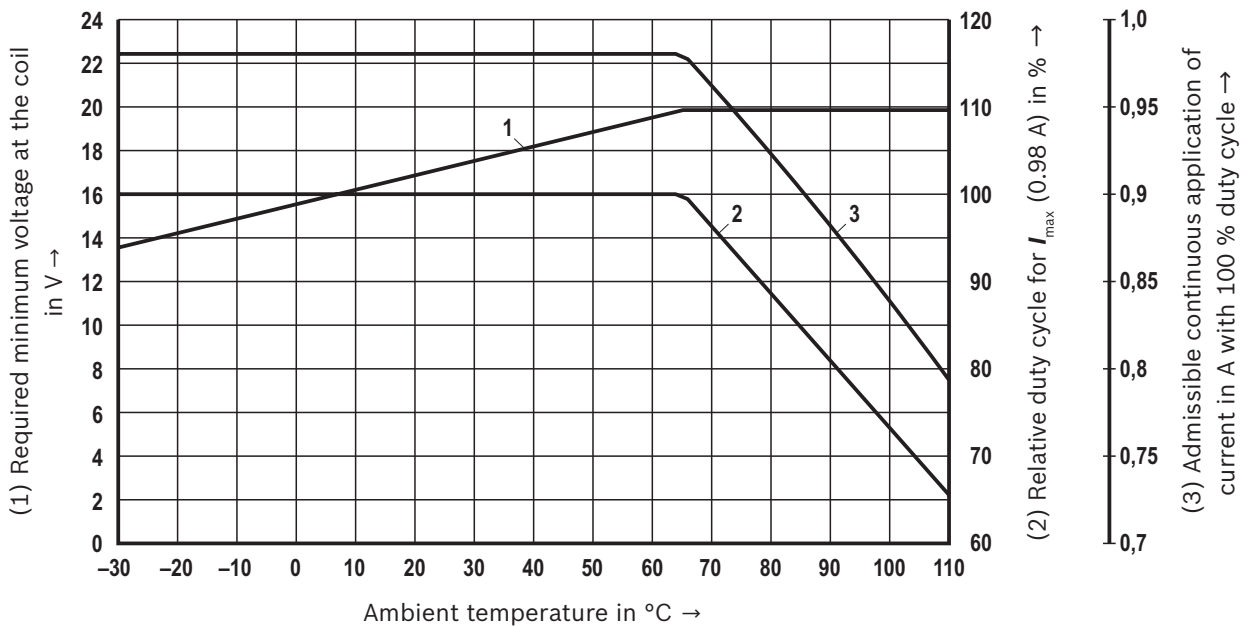
Admissible working range: Version "G24"

Minimum terminal voltage at the coil and relative duty cycle

Admissible working range against the ambient temperature
Version "18" (12 Ω - 24 V - 0.8 A)

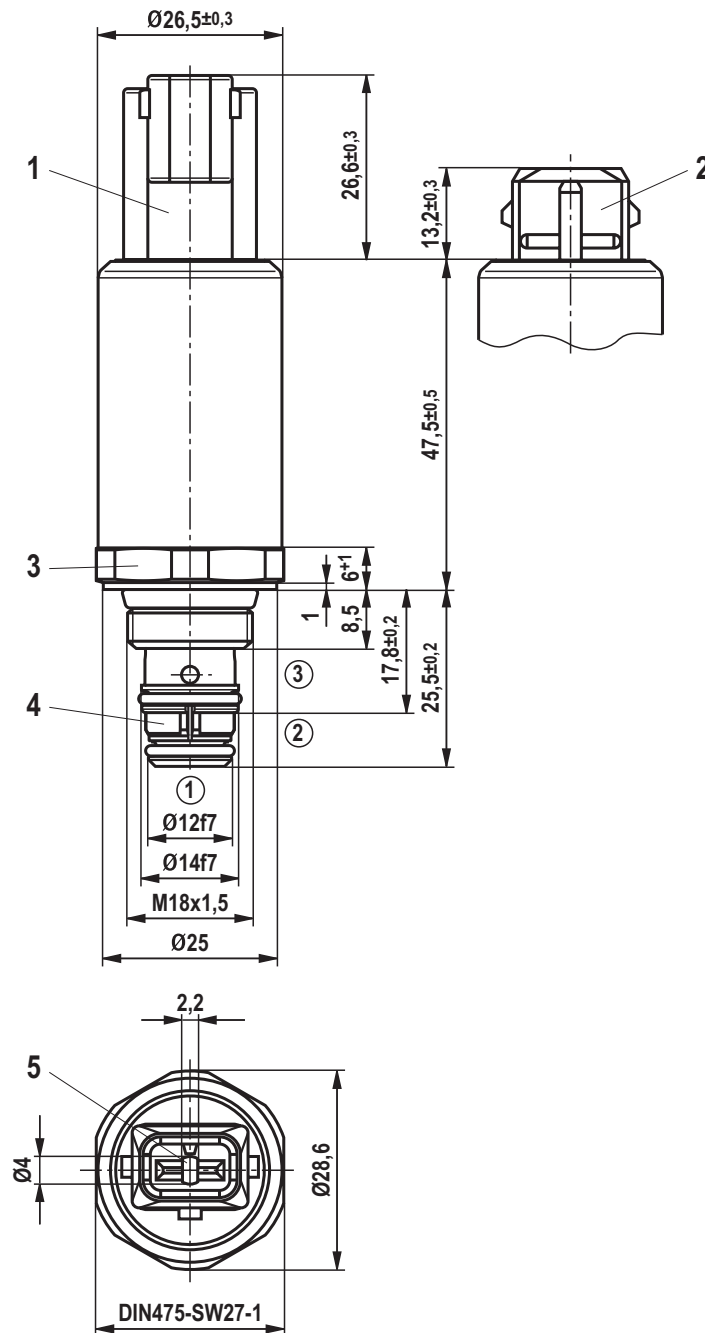


Admissible working range against the ambient temperature
Version "24" (12 Ω - 24 V - 0.98 A)



Dimensions

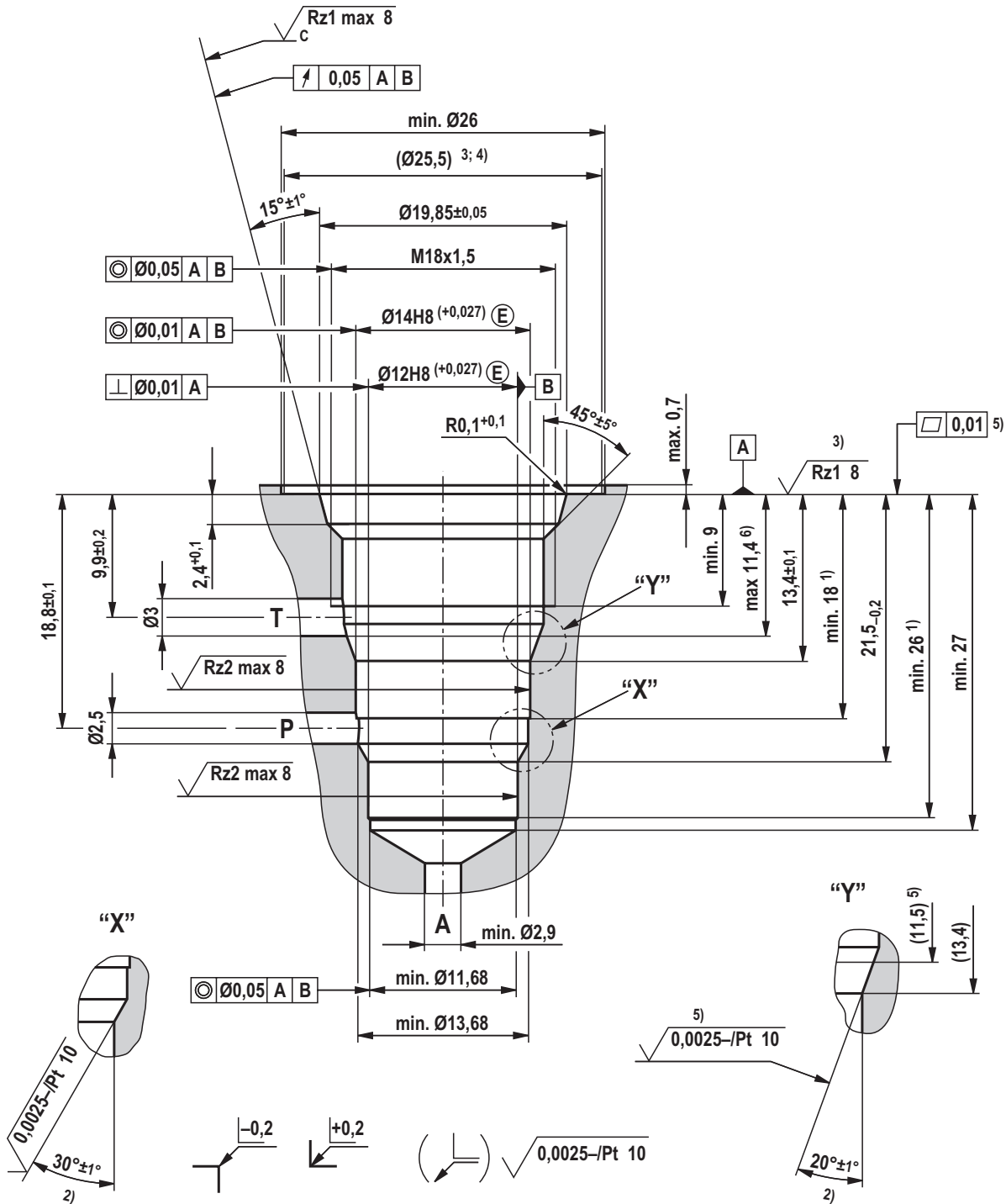
(dimensions in mm)



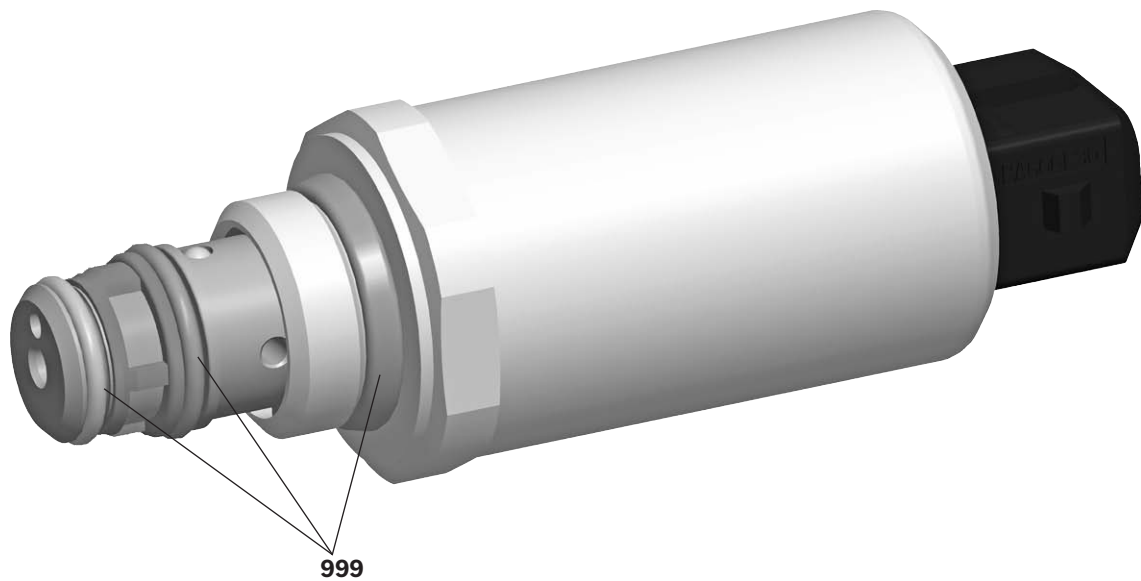
- ① = Main port 1 (A)
- ② = Main port 2 (P)
- ③ = Main port 3 (T)

- 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 SW27; $M_A = 10^{+5}$ Nm
- 4 Strainer 160 μm
- 5 Not contained in "N0" version. Operation by pin tool (to operate the manual override, the connector must be disconnected ("C4" and "K40" version). Maximum number of plug-in processes 10 (specification AMP 108-18013).

Mounting cavity
(dimensions in mm)



Available individual components



Item	Denomination	Seal material	Material no.
999	Seal kit of the valve	FKM	R961007179

Seal kits with other seals upon request.

More information

- ▶ Control electronics:
 - Analog amplifier type RA...
 - BODAS control unit type RC...
- ▶ Hydraulic valves for mobile applications
- ▶ Hydraulic fluids on mineral oil basis
- ▶ Selection of the filters

Data sheet 95230

Data sheet 95200

Data sheet 64020-B1

Data sheet 90220

www.boschrexroth.com/filter

Notes

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