

Proportional pressure relief valve,  
direct operated

Type DBET

**RE 29170**

Edition: 2018-06



H8136

- ▶ Size 6
- ▶ Component series 1X
- ▶ Maximum operating pressure 350 bar
- ▶ Maximum flow 2 l/min

**Features**

- ▶ For subplate mounting
- ▶ Porting pattern according to ISO 4401-03-02-0-05
- ▶ Operation by means of proportional solenoid
- ▶ Proportional solenoid with central thread and detachable coil
- ▶ External control electronics:
  - Amplifier in modular design or as plug-in amplifier
  - Individually adjustable upwards and downwards ramp
  - Fine adjustment of the command value pressure characteristic curve possible

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Ordering code

01	02	03	04	05	06	07	08	09	
DBET	—	1X	/		H	G24	-8	K4	*

01	Proportional pressure relief valve	DBET
02	Component series 10 ... 19 (10 ... 19: unchanged installation and connection dimensions)	1X

Maximum pressure rating

03	50 bar	50
	180 bar	180
	315 bar	315
04	Standard solenoid	H
05	Direct voltage 24 V	G24
06	800 mA coil	-8

Electrical connection

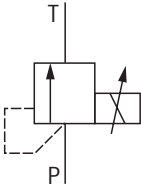
07	Connector 3-pole (2 + PE) according to DIN EN 175301-803	K4 <sup>1)</sup>
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Seal material

08	NBR seals	M
	FKM seals	V
	Observe compatibility of seals with hydraulic fluid used. (Other seals upon request)	
09	Further details in the plain text	

1) Mating connectors, separate order, see page 9 and data sheet 08006.

Symbols



## Function, section

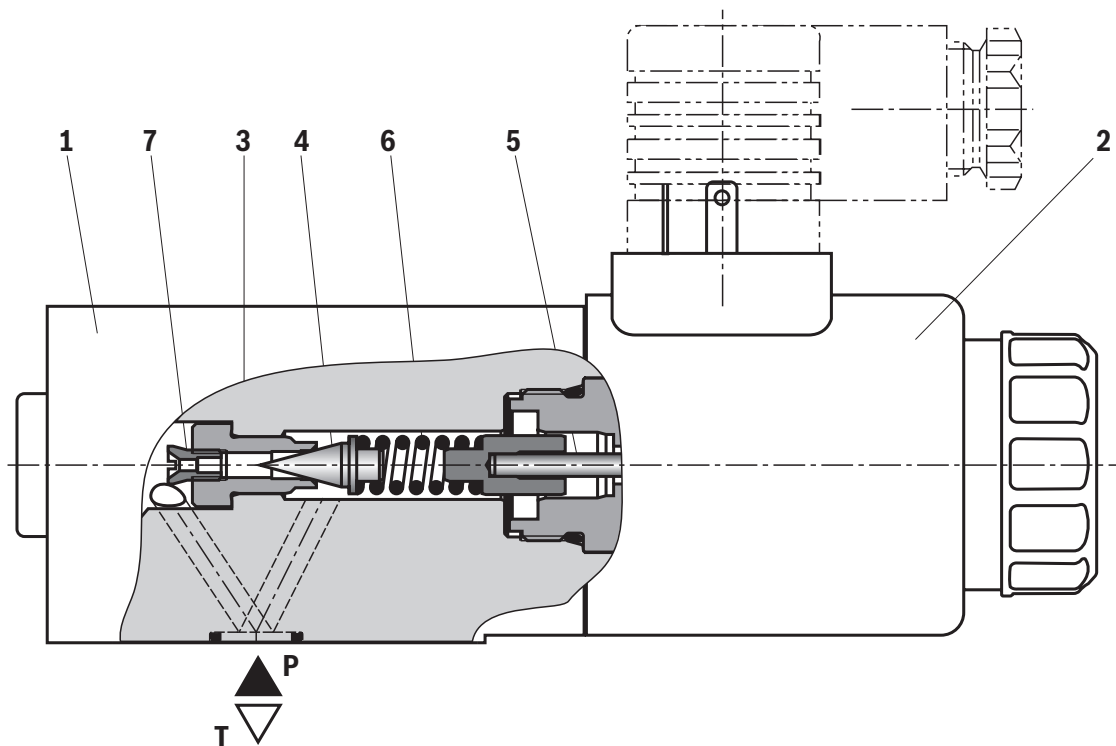
### General information

Proportional pressure relief valves of type DBET are remote control valves with seat design and are used for system pressure limitation. Operation by means of a proportional solenoid with central thread and detachable coil. The interior of the solenoid is connected to port T and is filled with the hydraulic fluid. Dependent on the electric command value, these valves can be used to steplessly set the system pressure to be limited.

The valves basically consist of housing (1), proportional solenoid (2), valve seat (3), valve poppet (4), compression spring (6) and nozzle (7).

### Basic principle

For the setting of the system pressure, a command value is specified at the external control electronics. Dependent on the command value, the electronics actuate the solenoid coil with electric current. The proportional solenoid converts the electric current into mechanical force that acts on the valve poppet (4) via the armature plunger (5) and the compression spring (6). The valve poppet (4) pushes onto the valve seat (3) and blocks the connection between port P and T. If the hydraulic force which acts on the valve poppet (4) is equal to the solenoid force, the valve regulates the set pressure by lifting the valve poppet (4) from the valve seat (3) and thereby letting hydraulic fluid flow from port P to T or Y. If the command value is zero, the external control electronics only apply the minimum control current to the proportional solenoid (2) and the minimum set pressure is set.



**Technical data**

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

<b>general</b>			
Weight	kg	1.57	
Installation position		any	
Ambient temperature range	°C	-20 ... +70	
MTTF <sub>D</sub> values according to EN ISO 13849	Years	150	
<b>hydraulic</b>			
Maximum operating pressure ▶ Port P	bar	350	
Maximum set pressure	bar	50; 180; 315	
Minimum set pressure (with 0 mA)	bar	see characteristic curves page 7	
Return flow pressure ▶ Port T	bar	separately at zero pressure to the tank	
Maximum flow	l/min	2 <sup>1)</sup>	
Hydraulic fluid		see table below	
Hydraulic fluid temperature range	°C	-20 ... +80	
Viscosity range	mm <sup>2</sup> /s	20 ... 380, preferably 30 ... 46	
Maximum admissible degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c)		Class 20/18/15 <sup>2)</sup>	
Hysteresis	%	< 7 of the maximum set pressure	
Range of inversion	%	< 0.5 of the maximum set pressure	
Response sensitivity	%	< 0.5 of the maximum set pressure	
Linearity (flow 0.8 l/min)	%	±3.5 of the maximum set pressure	
Manufacturing tolerance of the command value pressure characteristic curve	%	+20 of the maximum set pressure <sup>3)</sup>	
Step response ( $T_u + T_g$ ) 10 → 90% and/or 90 → 10% line volume < 20 cm <sup>3</sup> ; $q_v = 0.8$ l/min	ms	90 (depending on the system)	

<b>Hydraulic fluid</b>		<b>Classification</b>	<b>Suitable sealing materials</b>	<b>Standards</b>	<b>Data sheet</b>
Mineral oils		HL, HLP	NBR, FKM	DIN 51524	90220
Bio-degradable	▶ Insoluble in water	HETG	FKM	ISO 15380	90221
		HEES	FKM		
	▶ Soluble in water	HEPG	FKM	ISO 15380	
Flame-resistant	▶ Water-free	HFDU (glycol base)	FKM	ISO 12922	90222
		HFDU (ester base)	FKM		
		HFDR	FKM		
	▶ Containing water	HFC (Fuchs Hydrotherm 46M, Petrofer Ultra Safe 620)	NBR	ISO 12922	90223

**Important information on hydraulic fluids:**

- ▶ For further information and data on the use of other hydraulic fluids, please refer to the data sheets above or contact us.
- ▶ There may be limitations regarding the technical valve data (temperature, pressure range, life cycle, maintenance intervals, etc.).
- ▶ The ignition temperature of the hydraulic fluid used must be 50 K higher than the maximum surface temperature.

**▶ Flame-resistant – containing water:**

- Maximum pressure differential 210 bar, otherwise, increased cavitation erosion
- Life cycle as compared to operation with mineral oil HL, HLP 30 ... 100%
- Maximum hydraulic fluid temperature 60 °C

- ▶ **Bio-degradable and flame-resistant:** If this hydraulic fluid is used, small amounts of dissolved zinc may get into the hydraulic system.

<sup>1)</sup> Observe flow limitation for version “315” (see page 6).


<sup>2)</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 life cycle of the components.

For the selection of filters, see [www.boschrexroth.com/filter](http://www.boschrexroth.com/filter).

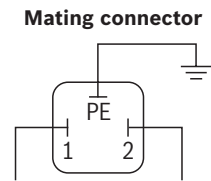
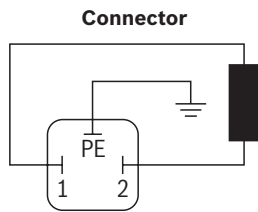
<sup>3)</sup> Related to 0.8 l/min and command value 100%; pressure increasing. Possible comparison of the external control electronics.


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

electric			
Minimum solenoid current	mA	0	
Maximum solenoid current	mA	800	
Solenoid coil resistance	– Cold value at 20 °C	Ω	19.25
	– Maximum hot value	Ω	32
Duty cycle (ED)	%	100	

 **Notice:**  
Information on climate and mechanical load see data sheet 29162-U (environmental compatibility statement)

**Electrical connection**

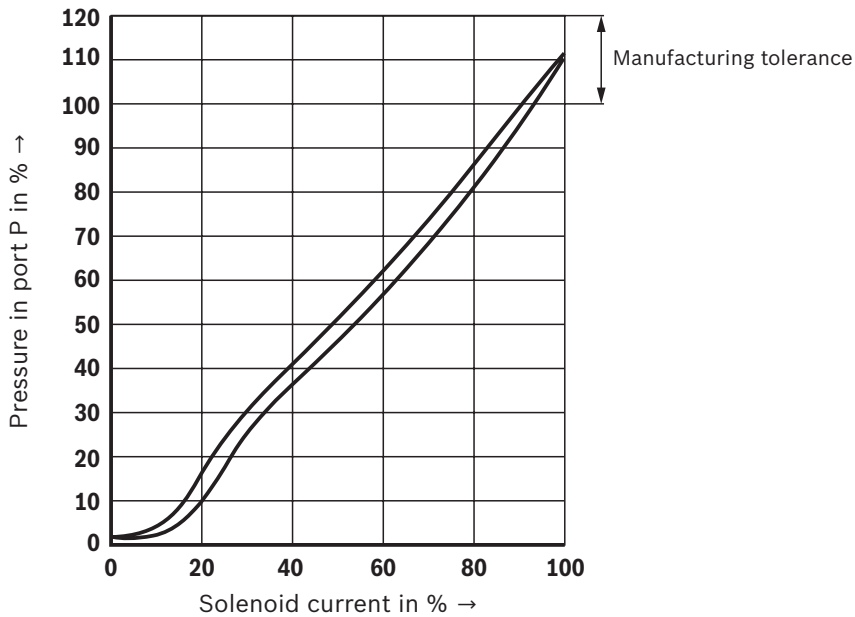


 **Notice:**  
Mating connectors, separate order, see page 9 and data sheet 08006.

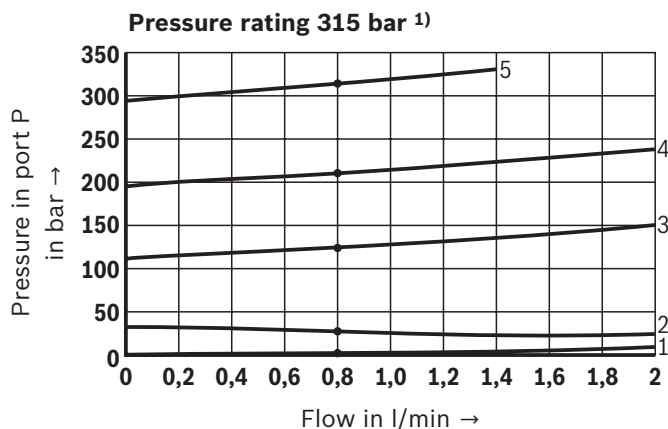
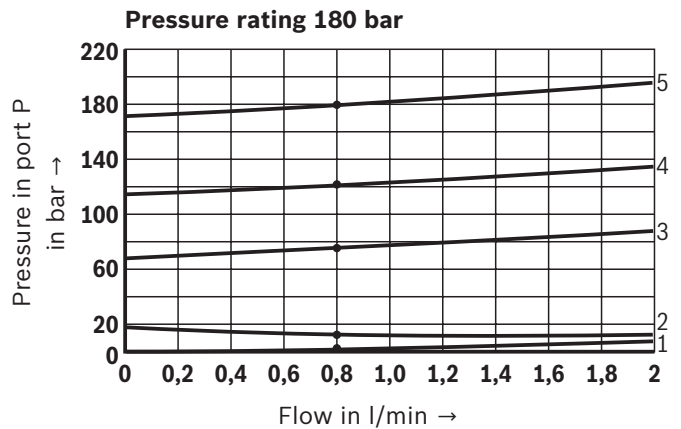
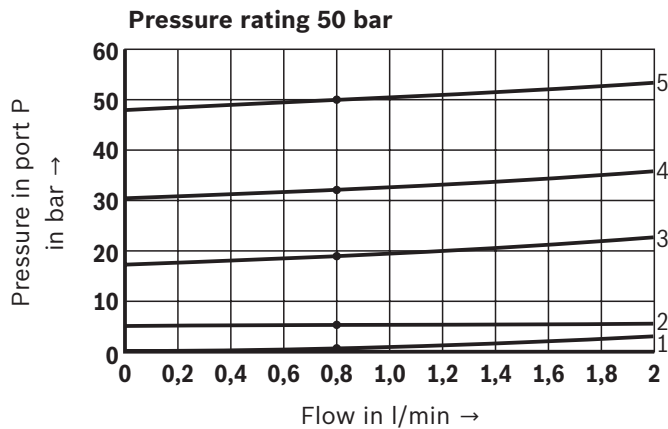
## Characteristic curves

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

**Pressure in port P dependent on the command value** (rated flow 0.8 l/min)



**Pressure in port P dependent on the flow**



- 1 Command value 0%
- 2 Command value 25%
- 3 Command value 50%
- 4 Command value 75%
- 5 Command value 100% <sup>1)</sup>

<sup>1)</sup> The command value must not exceed the maximum flow of 1.4 l/min.



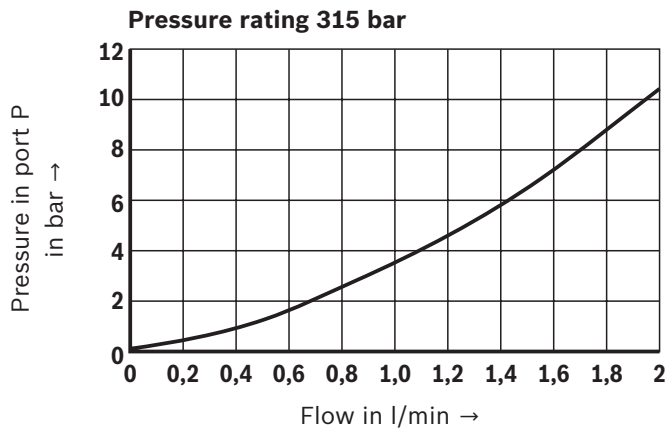
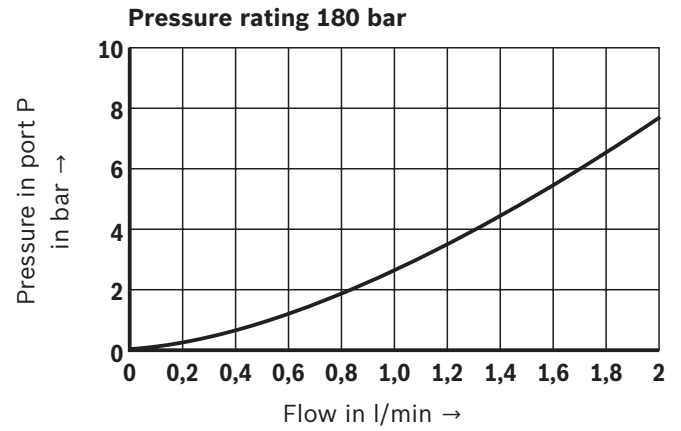
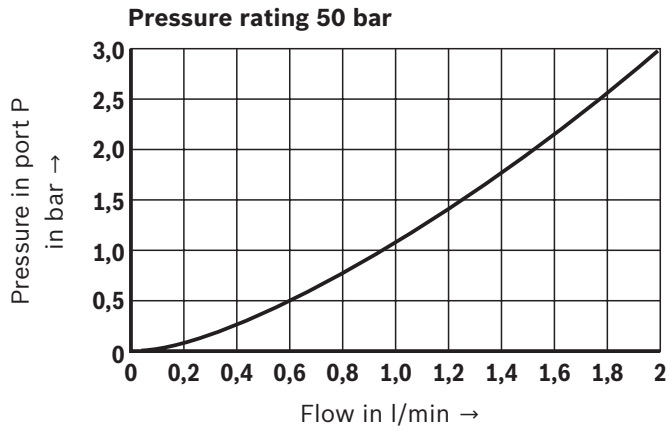
### Notice:

The characteristic curves apply for output pressure  $p_T = 0 \text{ bar}$  in the entire flow range.

## Characteristic curves

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

**Minimum set pressure in port P dependent on the flow** (command value 0 mA)

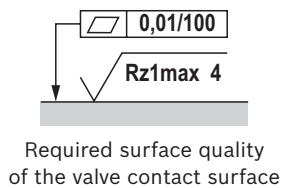
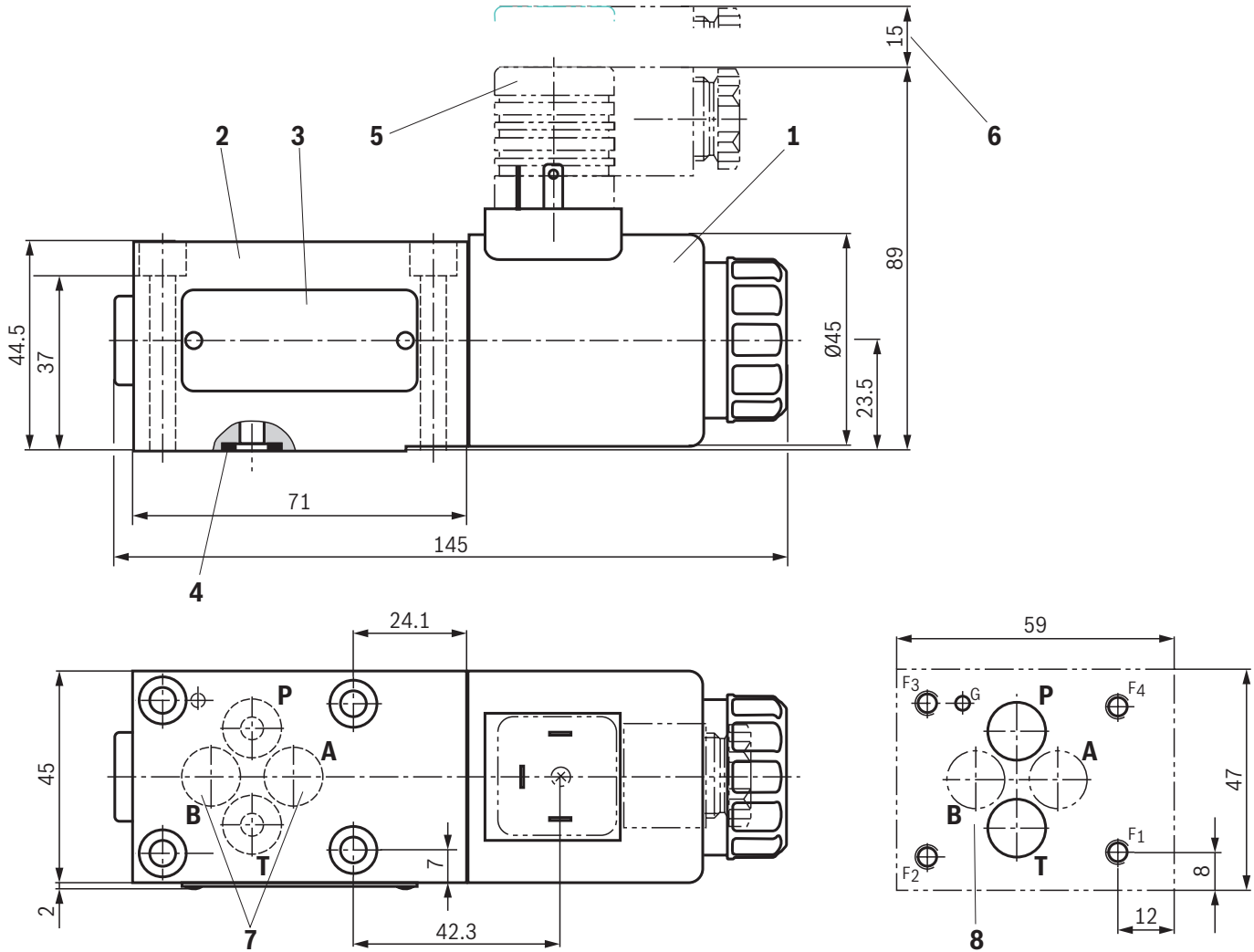


### Notice:

The characteristic curves apply for output pressure  $p_T = 0 \text{ bar}$  in the entire flow range.

## Dimensions

(dimensions in mm)



- 1 Proportional solenoid
- 2 Valve housing
- 3 Name plate
- 4 Identical seal rings for ports P, T, A and B
- 5 Mating connectors, separate order, see page 9 and data sheet 08006.
- 6 Space required for removing the mating connector
- 7 Blind counterbores A and B
- 8 Machined valve contact surface; porting pattern according to ISO 4401-03-02-0-05  
Deviating from the standard: Ports A and B not bored

**Valve mounting screws and subplates, see page 9.**



## Dimensions

### Valve mounting screws (separate order)

Size	Quantity	Hexagon socket head cap screws	Material number
6	4	ISO 4762 - M5 x 45 - 10.9-CM-Fe-ZnNi-5-Cn-T0-H-B tightening torque $M_A = 7 \text{ Nm} \pm 10\%$	R913048087



#### Notice:

The tightening torque of the hexagon socket head cap screws refers to the maximum operating pressure.

**Subplates** (separate order) with porting pattern according to ISO 4401-03-02-0-05 see data sheet 45100.

## Accessories (separate order)

### Mating connectors and cable sets

Item <sup>1)</sup>	Designation	Version	Short designation	Material number	Data sheet
5	Mating connector; for valves with "K4" connector, 2-pole + PE, design A	Without circuitry, 12 ... 240 V, "b"	Z4	R901017011	08006

<sup>1)</sup> See dimensions page 8.

### External control electronics

	Designation	Material no.	Data sheet
Valve amplifier	VT-SSPA1-1		30116
	VT-SSPA1-150-11V/V0/0-24 (preferred)	R901104644	
	VT-SSPA1-150-1X/V0/0-24/K24 (preferred)	R901263782	
Modular design	VT-MSPA1-2X		30232

## Further information

▶ Subplates	Data sheet 45100
▶ Hydraulic fluids on mineral oil basis	Data sheet 90220
▶ Environmentally compatible hydraulic fluids	Data sheet 90221
▶ Flame-resistant, water-free hydraulic fluids	Data sheet 90222
▶ Flame-resistant hydraulic fluids - containing water (HFAE, HFAS, HFB, HFC)	Data sheet 90223
▶ Reliability characteristics according to EN ISO 13849	Data sheet 08012
▶ Mating connectors and cable sets for valves and sensors	Data sheet 08006
▶ Valve amplifier for proportional valves	Data sheet 30116
▶ Valve amplifier for proportional valves without electrical position feedback	Data sheet 30232
▶ Hydraulic valves for industrial applications	Operating instructions 07600-B
▶ Selection of filters	<a href="http://www.boschrexroth.com/filter">www.boschrexroth.com/filter</a>
▶ Information on available spare parts	<a href="http://www.boschrexroth.com/spc">www.boschrexroth.com/spc</a>

Bosch Rexroth AG  
Industrial Hydraulics  
Zum Eisengießer 1  
97816 Lohr am Main, Germany  
Phone +49 (0) 93 52/ 40 30 20  
[my.support@boschrexroth.de](mailto:my.support@boschrexroth.de)  
[www.boschrexroth.de](http://www.boschrexroth.de)

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It must be remembered that our products are subject to a natural process of wear and aging.

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Bosch Rexroth AG  
Industrial Hydraulics  
Zum Eisengießer 1  
97816 Lohr am Main, Germany  
Phone +49 (0) 93 52 / 40 30 20  
[my.support@boschrexroth.de](mailto:my.support@boschrexroth.de)  
[www.boschrexroth.de](http://www.boschrexroth.de)

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Industrial Hydraulics  
Zum Eisengießer 1  
97816 Lohr am Main, Germany  
Phone +49 (0) 93 52/ 40 30 20  
my.support@boschrexroth.de  
www.boschrexroth.de

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