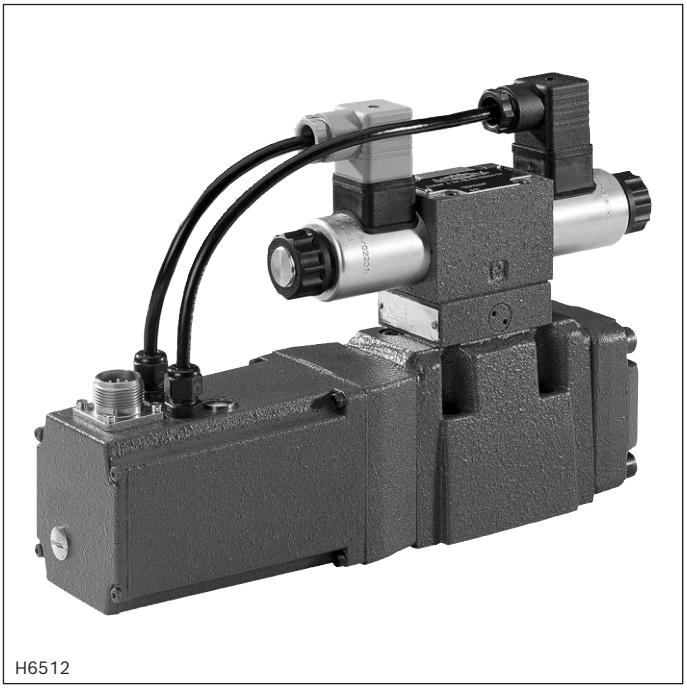
RE 29075
Edition: 2024-03
Replaces: 08.13

rexroth
A Bosch Company

Proportional directional control valves, pilot-operated, with electrical position feedback and integrated electronics (OBE)

Type 4WRKE


H6512

- Size 10 ... 35
- Component series 3X
- Maximum operating pressure 350 bar
- Maximum flow 3000 l/min

Features

- Operation by means of proportional solenoids
- Control of flow direction and size
- For subplate mounting
- Porting pattern according to ISO 4401
- Electrical position feedback
- Spring-centered main control spool
- Pilot control by means of proportional directional valve
- Main stage with position control

Contents

Ordering code

01	02	03	04	05	06	07		08		09	10	11	12		13	14	15	16
4	**WRK**	**E**					**–**	**3X**	**/**	**6E**	**G24**		**K31**	**/**		**D3**		*****

01	4 main ports	**4**
02	Proportional directional control valves, pilot-operated	**WRK**
03	With integrated electronics (OBE)	**E**
04	Size 10	**10**
	Size 16	**16**
	Size 25	**25**
	Size 27	**27**
	Size 32	**32**
	Size 35	**35**
05	Symbols; possible version see page 3	

Rated flow

06	**– Size 10**		
	25 l/min (only symbol E, E1-, W6-, W8- and EA as well as version "L")	**25**	
	50 l/min	**50**	
	100 l/min	**100**	◇
	– Size 16		
	150 l/min	**150**	
	220 l/min	**220**	◇
	– Size 25		
	220 l/min	**220**	
	350 l/min	**350**	◇
	– Size 27		
	500 l/min	**500**	◇
	– Size 32		
	400 l/min	**400**	
	600 l/min	**600**	◇
	– Size 35		
	1000 l/min	**1000**	◇

Flow characteristic

07	Linear	**L**	◇
	Linear with fine control range	**P**	
08	Component series 30 ... 39 (30 ... 39: unchanged installation and connection dimensions)	**3X**	
09	Proportional solenoid with detachable coil	**6E**	
10	Direct voltage 24 V	**G24**	

Pilot oil flow

11	External pilot oil supply, external pilot oil return	**No code**	◇
	Pilot oil supply internal, pilot oil return external	**E**	
	Internal pilot oil supply, internal pilot oil return	**ET**	◇
	External pilot oil supply, internal pilot oil return	**T**	

Electrical connection

12	Connector 7-pole (6 + PE) according to EN 175201-804	**K31** [1)]

Ordering code

01	02	03	04	05	06	07		08		09	10	11	12		13	14	15	16
4	**WRK**	**E**					**–**	**3X**	**/**	**6E**	**G24**		**K31**	**/**		**D3**		*****

Interfaces of the control electronics

13	Command value input ±10 V; actual value output ±10 V	**A1** [2]
	Command value input 4 ... 20 mA; actual value output 4 ... 20 mA	**F1** ◊
14	With pressure reducing valve type ZDR 6 DP0-4X/40YM-W80 (permanently set)	**D3**

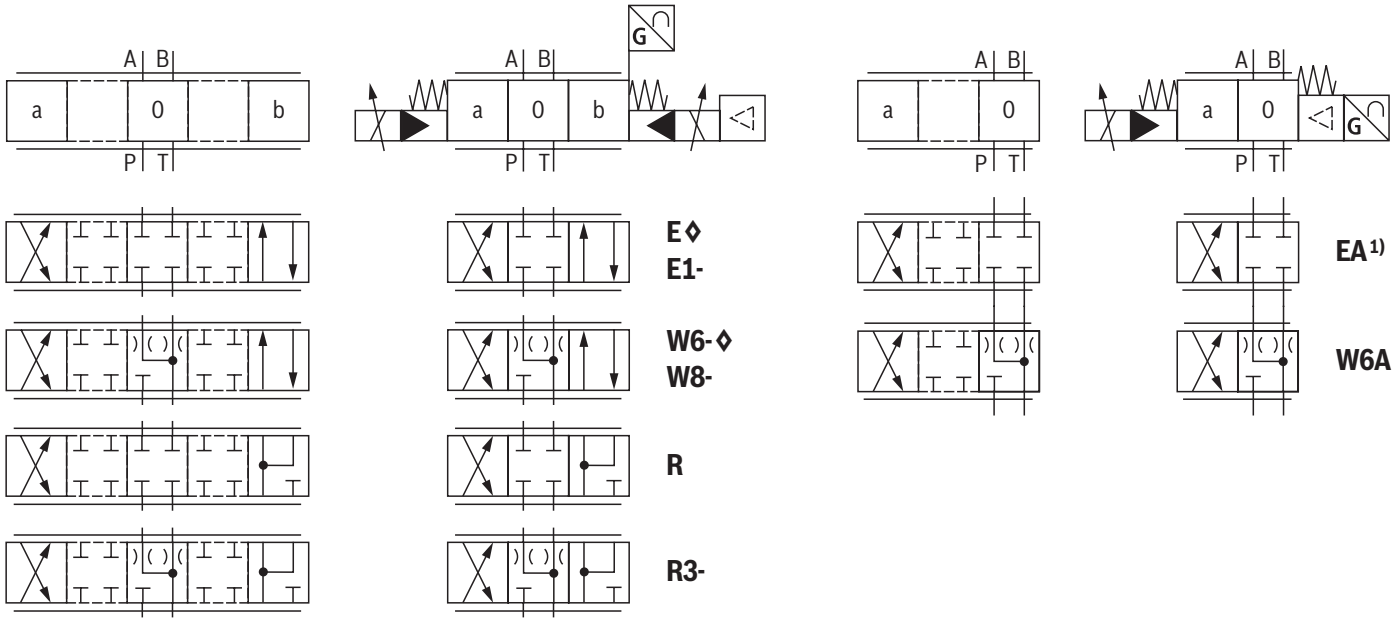
Seal material (observe compatibility of seals with hydraulic fluid used, see page 8)

15	NBR seals	**M** ◊
	FKM seals	**V**
16	Further details in the plain text	*****

[1] Mating connectors can be ordered separately, see page 27.
[2] See "Project planning information" page 27

☞ **Notice:** ◊ = Preferred type

Symbols



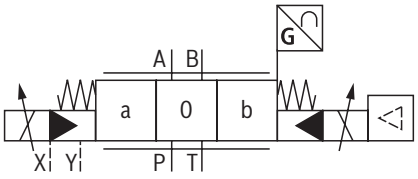
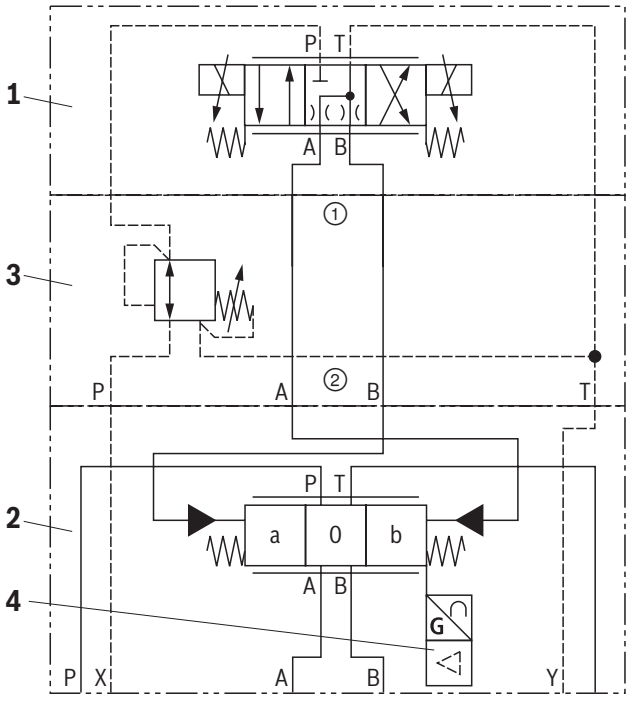
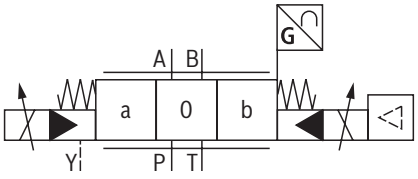
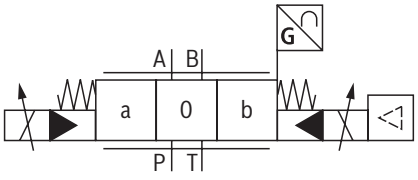
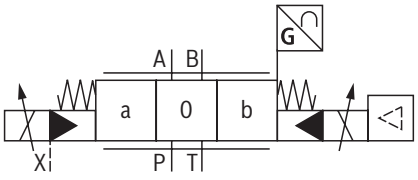
With symbols E1- and W8-:
P→A: ***q***V max B→T: ***q***V/2
P→B: ***q***V/2 A→T: ***q***V max

With symbols R and R3-:
P→A: ***q***V max B→P: ***q***V/2
P→B: ***q***V/2 A→T: ***q***V max

[1] Example:
Symbol E with spool position "a" ordering code ..**EA**..

☞ **Notice:**
- Representation according to ISO 1219-1. Hydraulic interim positions are shown by dashes.
- With symbols W6-, W8- and R3-, there is a connection from A→T and B→T with approx. 2% of the relevant nominal cross-section in zero position.

Symbols

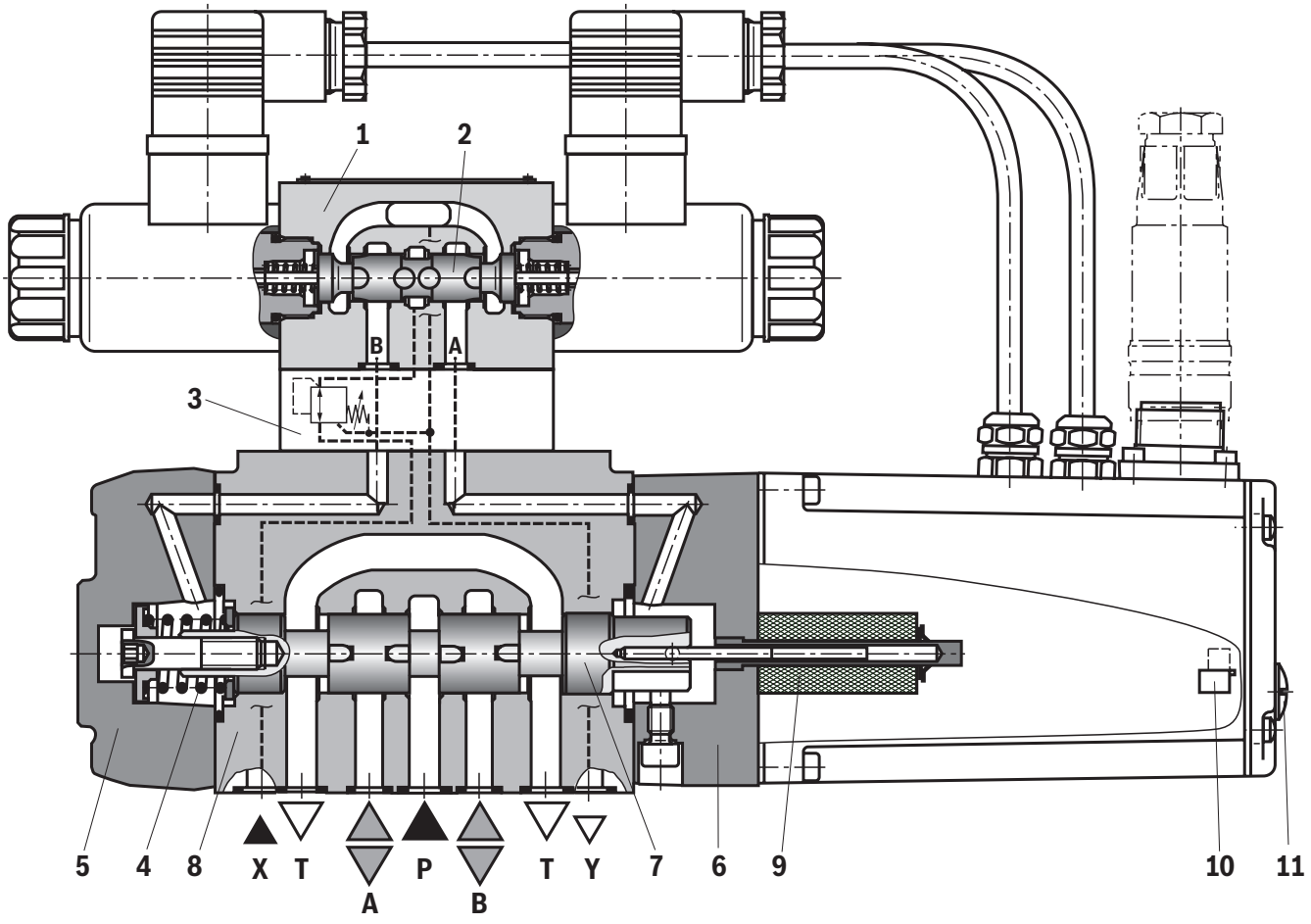
Version	Simple	Detailed
"no code"		
"E"		
"ET"		
"T"		

☞ **Notice:**
Representation according to ISO 1219-1.

1 Pilot control valve type 4WRAP 6...
2 Main valve
3 Pressure reducing valve type ZDR 6 DP0-4X/40YM-W80
4 Integrated electronics (OBE)

Function, section

Valves of type 4WRKE are 2-stage proportional directional control valves. They control the flow direction and size.
The main stage is position-controlled so that the control spool position is independent from flow forces also in the case of bigger flows.
The valves mainly consist of the pilot control valve (1), the housing (8), the main control spool (7), the covers (5 and 6), the centering spring (4), the inductive position transducer (9) and the pressure reducing valve (3).
If there is no input signal, the main control spool (7) will be kept in the central position by the centering spring (4).
Both control chambers in the covers (5 and 6) are connected to port T via the valve control spool (2).
The main control spool (7) is connected to suited control electronics via the inductive position transducer (9).
Both the position change of the main control spool (7) and the change of the command value at the junction summing of the amplifier create a voltage difference.
During the comparison of command value and actual value, a possible control deviation is determined via the electronics and the proportional solenoid of the pilot control valve (1) is supplied with current.
The current induces a force in the solenoid which operates the control spool via a plunger in a row.
The flow which is activated via the control cross-sections leads to an adjustment of the main control spool.
The main control spool (7) with the core of the inductive position transducer (9) attached to it is displaced until the actual value corresponds to the command value.
In controlled state, the main control spool (7) is force-balanced and kept in this controlled position.
The control spool stroke and the control opening change proportionally to the command value.
The control electronics is integrated in the valve.
By adjusting the valve and electronics, the deviation in series production of the devices is kept low.



Function, section

☞ **Notice:**

- The tank lines must not be allowed to run empty; with corresponding installation conditions, a preload valve (preload pressure approx. 2 bar) must be installed.
- The zero point adjustment at **"zero point main stage"** (10) is made at the factory and can be adjusted in a range of ± 30% of the nominal stroke via a potentiometer in the control electronics. Access with the integrated control electronics by removing a front-side plug screw (11) on the cover housing.
- When the pilot control valve or the control electronics are exchanged, they are to be re-adjusted. All adjustments may be implemented by instructed experts only.
- Changes in the zero point may result in damage to the system and may only be implemented by instructed specialists.

Technical data

(Please consult us for applications outside these values!)

General							
Size	NG	10	16	25	27	32	35
Type of connection		Subplate mounting					
Porting pattern		ISO 4401-05-05-0-05	ISO 4401-07-07-0-05	ISO 4401-08-08-0-05	ISO 4401-08-08-0-05	ISO 4401-10-09-0-05	ISO 4401-10-09-0-05
Weight	kg	9	11	18	19.5	37.5	75
Installation position		Any					
Ambient temperature range	°C	–20 ... +50					
Storage temperature range (with UV protection)	°C	+5 ... +40					
Maximum storage time	Years	1 (if the storage conditions are observed, refer to the operating instructions 07600-B)					
Maximum relative humidity (no condensation)	%	95					
Protection class according to EN 60529		IP65 (if suitable and correctly mounted mating connectors are used)					
Maximum surface temperature	°C	150					
$MTTF_D$ values according to EN ISO 13849	Years	75 (for further details see data sheet 08012)					
Sine test according to EN 60068-2-6		10 ... 2000 Hz / maximum of 10 g / 10 cycles / 3 axes					
Noise test according to EN 60068-2-64		20 ... 2000 Hz / 10 g_{RMS} / 30 g peak / 24 h / 3 axes					
Transport shock according to EN 60068-2-27		15 g / 11 ms / 3 shocks / 3 axes					
Conformity ▶ RoHS Directive		2011/65/EU [1]					

[1] The product fulfills the substance requirements of the RoHS Directive 2011/65/EU.

Technical data
(Please consult us for applications outside these values!)

Hydraulic									
Size			NG	10	16	25	27	32	35
Maximum operating pressure	▶ Ports A, B, P								
	– Pilot control valve	Pilot oil supply	bar	25 ... 350					
	– Main valve		bar	315	350	350	250	350	350
	▶ Port T	External pilot oil supply	bar	315	250	250	210	250	250
		Internal pilot oil supply	bar	Static < 10 (pilot control valve)					
	▶ Port Y		bar	Static < 10 (pilot control valve)					
Hydraulic fluid				See table page 8					
Hydraulic fluid temperature range			°C	–20 ... +80					
Viscosity range		▶ Recommended	mm^2/s	30 ... 45					
		▶ Maximum admissible	mm^2/s	20 ... 380					
Maximum admissible degree of contamination of the hydraulic fluid; cleanliness class according to ISO 4406 (c)		▶ Pilot control valve		Class 17/15/12 [2]					
		▶ Main valve		Class 20/18/15 [2]					
Nominal flow (***Δp*** = 5 bar per control edge; ±10%)				25 50 100	150 220	220 350	500	400 600	1000
Maximum flow			l/min	170	460	870	1000	1600	3000
Maximum leakage flow (inlet pressure 100 bar)	▶ Symbol E, E1-, R								
	– Main valve		l/min	0.09	0.22	0.26	0.26	0.32	1.11
	– Main valve + pilot control valve		l/min	0.39	0.52	0.56	0.56	0.53	1.41
	▶ Symbol W6-, W8-, R3-								
	– Main valve		l/min	0.18	0.44	0.52	0.52	0.47	2.22
	– Main valve + pilot control valve		l/min	0.48	0.74	0.82	0.82	0.77	2.52
Pilot flow (at port X and Y with stepped input signal from 0 ... 100%; 315 bar)			l/min	7	9	12	12	14	17

[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.

Technical data
(Please consult us for applications outside these values!)

Hydraulic fluid		Classification	Suitable sealing materials	Standards	Data sheet
Mineral oils		HL, HLP, HLPD, HVLP, HVLPD	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, Renosafe 500; Petrofer: Ultra Safe 620; Houghton: Safe 620; Union: Carbide HP5046)	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.
- ▶ **Bio-degradable and flame-resistant – containing water:**
  If components with galvanic zinc coating (e.g. version "J3" or "J5") or parts containing zinc are used, small amounts of dissolved zinc may get into the hydraulic system and cause accelerated aging of the hydraulic fluid. Zinc soap may form as a chemical reaction product, which may clog filters, nozzles and solenoid valves – particularly in connection with local heat input.
- ▶ **Flame-resistant – containing water:**
  - – Due to the increased cavitation tendency with HFC hydraulic fluids, the life cycle of the component may be reduced by up to 30% as compared to the use with mineral oil HLP. In order to reduce the cavitation effect, it is recommended – if possible specific to the installation – backing up the return flow pressure in ports T to approx. 20% of the pressure differential at the component.
  - – Dependent on the hydraulic fluid used, the maximum ambient and hydraulic fluid temperature must not exceed 50 °C. In order to reduce the heat input into the component, the command value profile is to be adjusted for proportional and high-response valves.

Static / dynamic		
Hysteresis	%	≤1
Range of inversion	%	≤0.5
Response sensitivity	%	≤0.5

Technical data
(Please consult us for applications outside these values!)

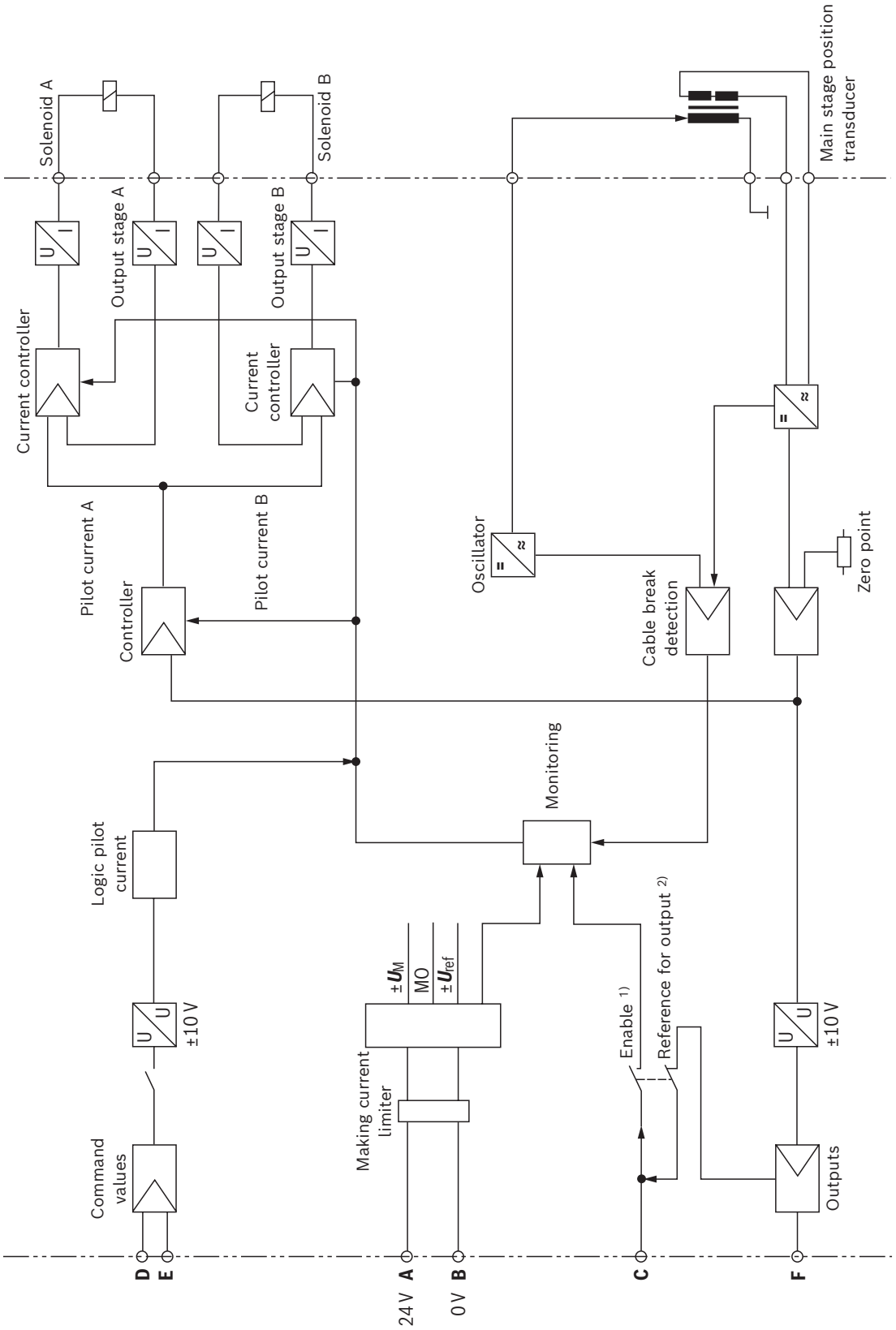
Electrical, integrated electronics (OBE) – interface "A1"				
Supply voltage	▶ Nominal value		VDC	24
	▶ Minimum		VDC	18
	▶ Maximum		VDC	36
	▶ Maximum residual ripple		Vpp	2.5
	▶ Maximum power consumption		VA	40
	▶ Current consumption	Maximum	A	<2
		Impulse current	A	3
	▶ Fuse protection, external		A_T	2.5 (time-lag)
Relative duty cycle time according to VDE 0580				S1 (continuous operation)
Functional ground and screening				See pin assignment page 13
Maximum voltage of the differential inputs against 0 V				D→B; E→B (max. 18 V)
Command value (differential amplifier)	▶ Measurement range		V	±10
	▶ Input resistance		kΩ	>100
Actual value (test signal)	▶ Output range		V	±10
	▶ Minimum load impedance		kΩ	>1

Electrical, integrated electronics (OBE) – interface "F1"				
Supply voltage	▶ Nominal value		VDC	24
	▶ Minimum		VDC	19
	▶ Maximum		VDC	36
	▶ Maximum residual ripple		Vpp	2.5
	▶ Maximum power consumption		VA	40
	▶ Current consumption	Maximum	A	<2
		Impulse current	A	3
	▶ Fuse protection, external		A_T	2.5 (time-lag)
Relative duty cycle time according to VDE 0580				S1 (continuous operation)
Functional ground and screening				See pin assignment page 13
Maximum voltage of the differential inputs against 0 V				D→B; E→B (max. 18 V)
Command value	▶ Input current range		mA	4 ... 20
	▶ Input resistance		Ω	200
Actual value (test signal)	▶ Output range		mA	4 ... 20
	▶ Maximum load		Ω	500

Technical data
(Please consult us for applications outside these values!)

Electrical, integrated electronics (OBE) – interface "A5"				
Supply voltage (U_B)	▶ Nominal value		VDC	24
	▶ Minimum		VDC	19
	▶ Maximum		VDC	36
	▶ Maximum residual ripple		Vpp	2.5
	▶ Maximum power consumption		VA	40
	▶ Current consumption	Maximum	A	<2
		Impulse current	A	3
	▶ Fuse protection, external		A_T	2.5 (time-lag)
Relative duty cycle time according to VDE 0580				S1 (continuous operation)
Functional ground and screening				See pin assignment page 13
Command value	▶ Input current range		mA	±10
	▶ Input resistance		Ω	>100
Actual value (test signal)	▶ Output range		mA	±10
	▶ Maximum load		Ω	>1
Enable	▶ Low level range		V	–3 ... 5
	▶ High level range		V	11 ... 36
	▶ Maximum current consumption at high level		mA	7.25 (U_B = 24 V) 11 ($U_{B\ max}$)

Block diagram/controller function block: Version "A1"

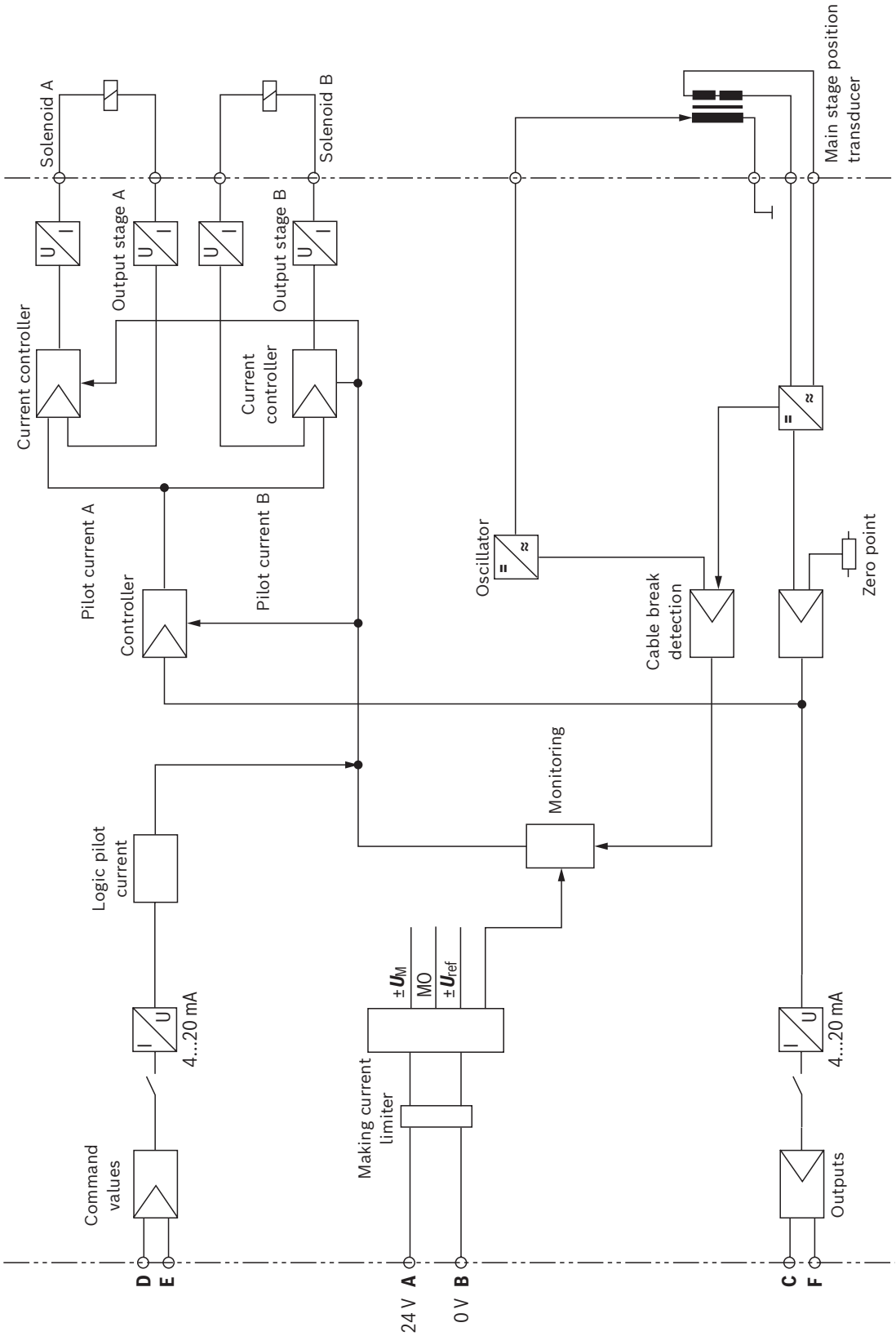


1) Only version "A5" (see "Project planning information" page 27)

2) Version "F1" only

☞ **Notice:**
Electrical signals provided via valve electronics (e.g. actual value) must not be used to switch off safety-relevant machine functions.

Block diagram/controller function block: Version "F1"



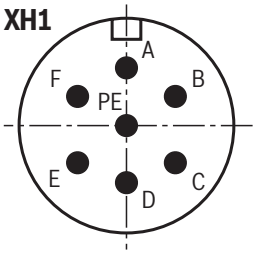
Notice:
Electrical signals provided via valve electronics (e.g. actual value) must not be used to switch off safety-relevant machine functions.

Electrical connections and assignment

Connector pin assignment "XH1", 6-pole + PE according to DIN 43563

Pin	Interface assignment	
	"A1"	**"F1"**
A	Supply voltage	Supply voltage
B	GND	GND
C	Reference potential actual value	Reference potential actual value
D	Command value	Command value
E	Reference potential command value	Reference potential command value
F	Actual value	Actual value
PE	Functional ground (directly connected to the valve housing)	

XH1



			Solenoid side	
			"a" and **"b"**	**"a"**
Command value	Positive	0 ... +10 V; 12 ... 20 mA	P→A; B→T	P→B; A→T
	Negative	0 ... −10 V; 12 ... 4 mA	P→B; A→T	–
Actual value	Positive	0 ... +10 V; 12 ... 20 mA	P→A; B→T	P→B; A→T
	Negative	0 ... −10 V; 12 ... 4 mA	P→B; A→T	–
Connection cable	▶ Up to 20 m cable length type LiYCY 7 x 0.75 mm²			
	▶ Up to 40 m cable length type LiYCY 7 x 1.0 mm²			
	▶ EMC-compliant installation: – Apply screening to both line ends – Use metal mating connector (see page 27) ▶ Alternatively up to 30 m cable length admissible – Apply screening on supply side – Plastic mating connector (see page 27) can be used			

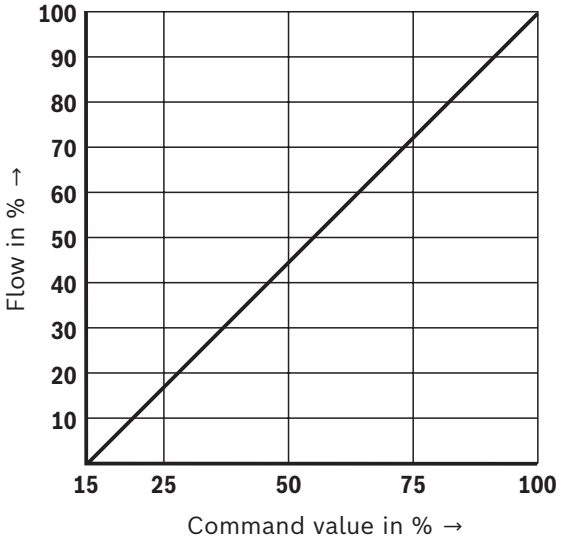
☞ **Notice:**
Mating connectors, separate order,
see page 27 and data sheet 08006.

☞ **Notice:**
- ▶ As a consequence of overvoltage at the inputs, the inputs will be overridden.
- ▶ Override of the inputs may lead to uncontrolled valve movements.
- ▶ Reference signals not correctly connected may cause overvoltage or override.

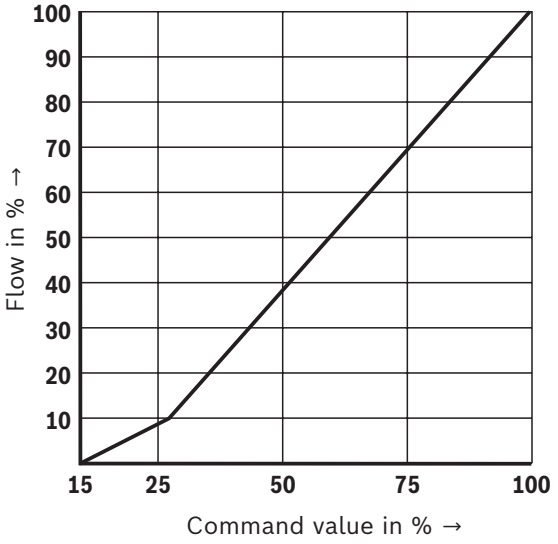
Characteristic curves
(measured with HLP46, ϑ_{oil} = 40±5 °C)

Flow command value function
(***Δp*** =10 bar (P→A / B→T) or ***Δp*** =5 bar per control edge (P→A / A→T))

Version "L"
Symbol E, W, and R



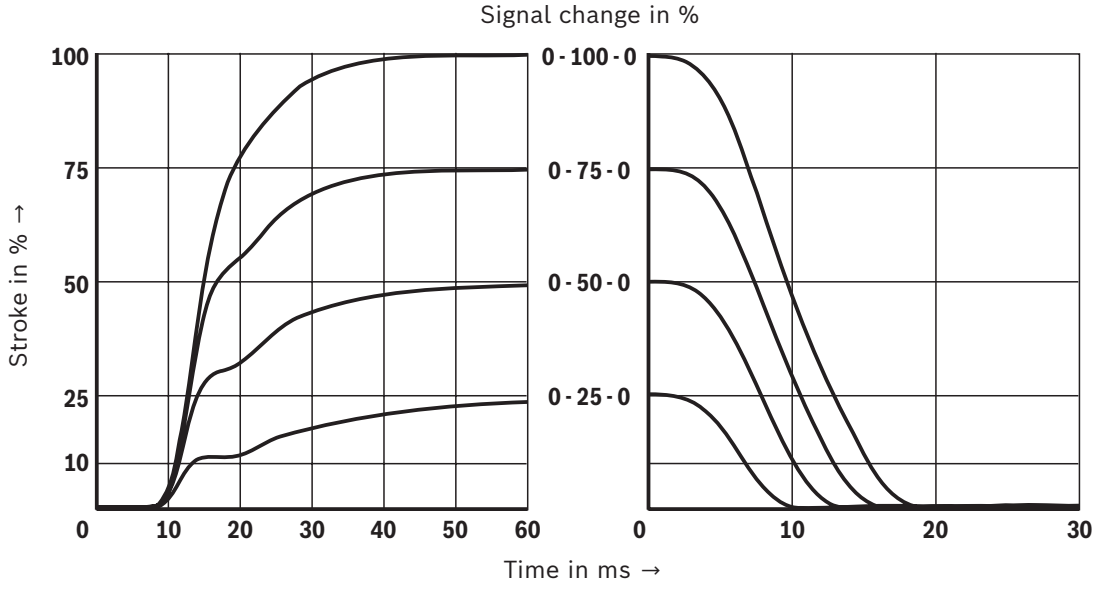
Version "P"
Symbol E, W, and R



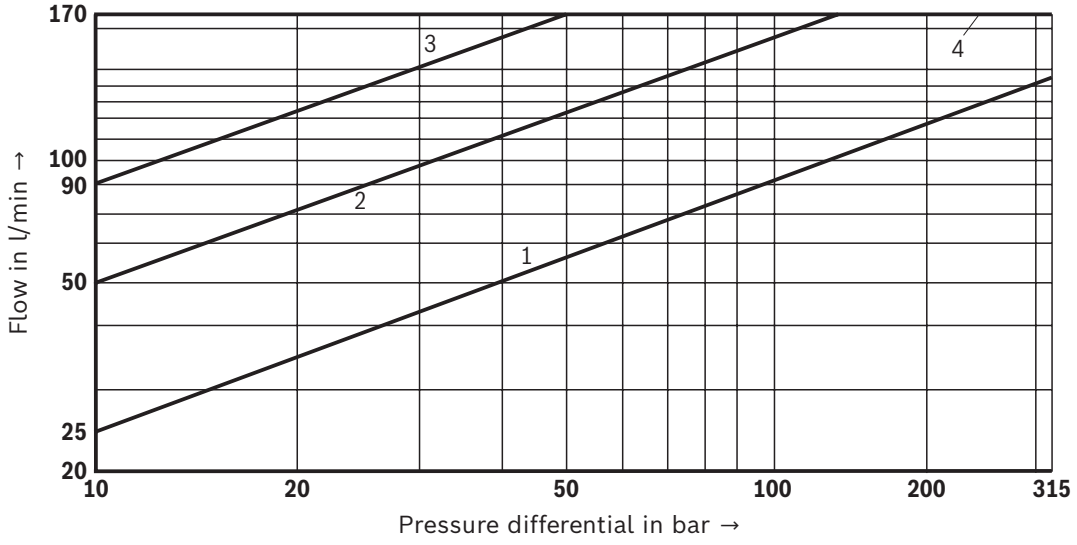
☞ **Notice:**
Typical characteristic curves which are subject to tolerance variations.

Characteristic curves: Size 10
(measured with HLP46, ϑ_{oil} = 40±5 °C)

Transition function with stepped electric input signals
(measured at a pilot pressure of 100 bar)



Flow/load function with maximum valve opening (tolerance ±10%)



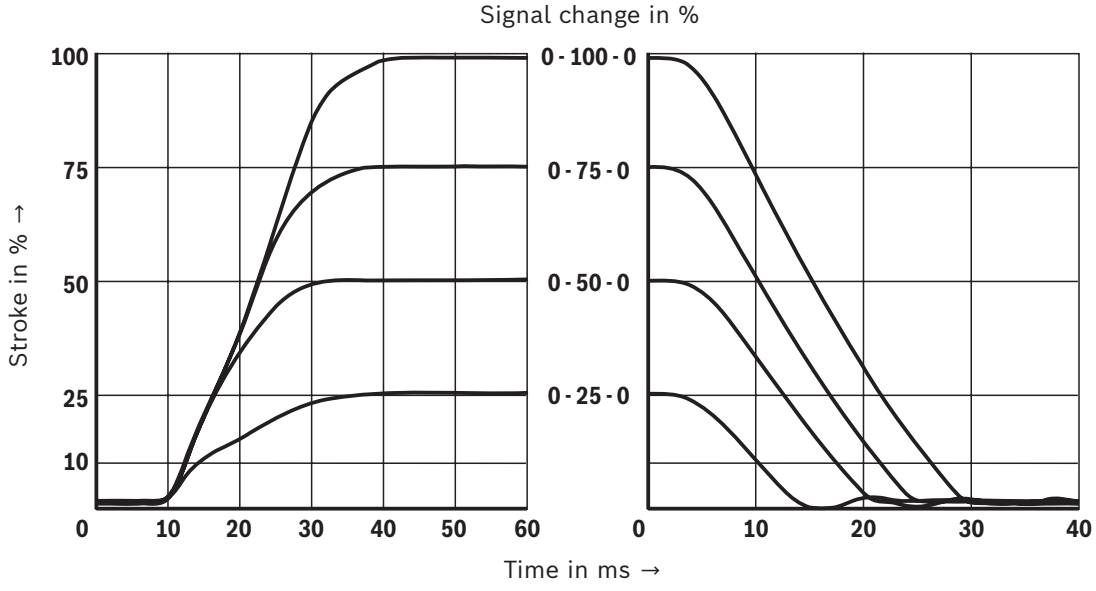
Rated flow

1 25 l/min
2 50 l/min
3 100 l/min
4 Recommended flow limitation (flow velocity 30 m/s)

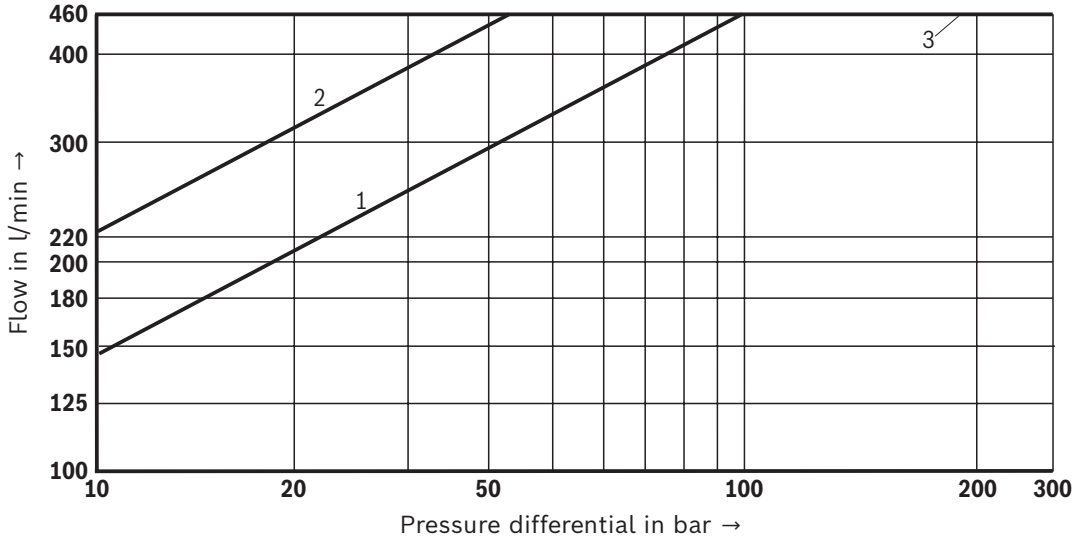
☞ **Notice:**
Typical characteristic curves which are subject to tolerance variations.

Characteristic curves: Size 16
(measured with HLP46, ϑ_{oil} = 40±5 °C)

Transition function with stepped electric input signals
(measured at a pilot pressure of 100 bar)



Flow/load function with maximum valve opening (tolerance ±10%)



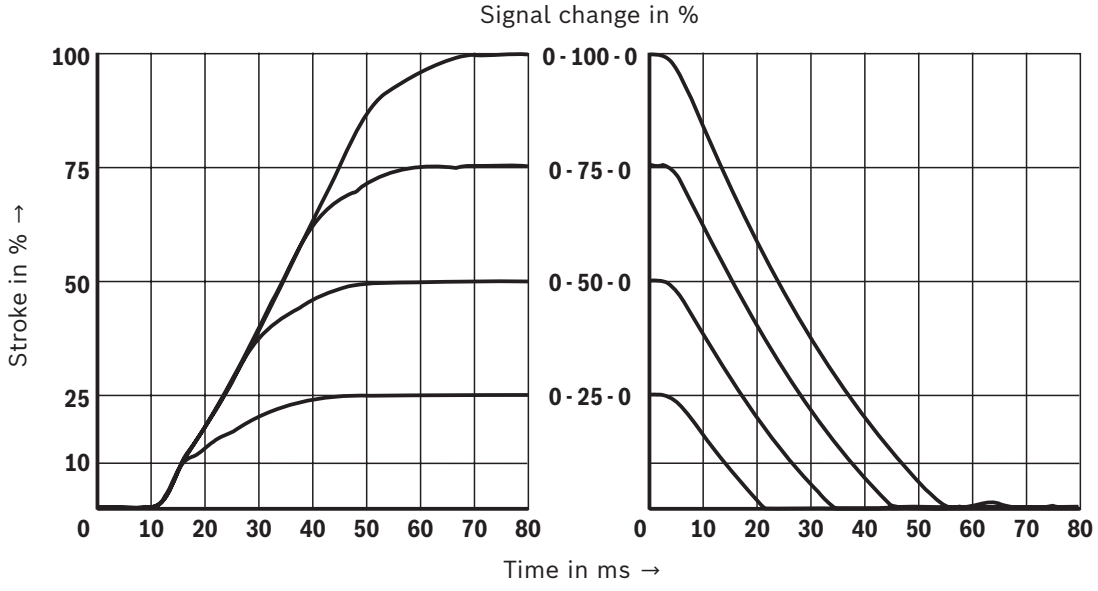
Rated flow

1 150 l/min
2 220 l/min
3 Recommended flow limitation (flow velocity 30 m/s)

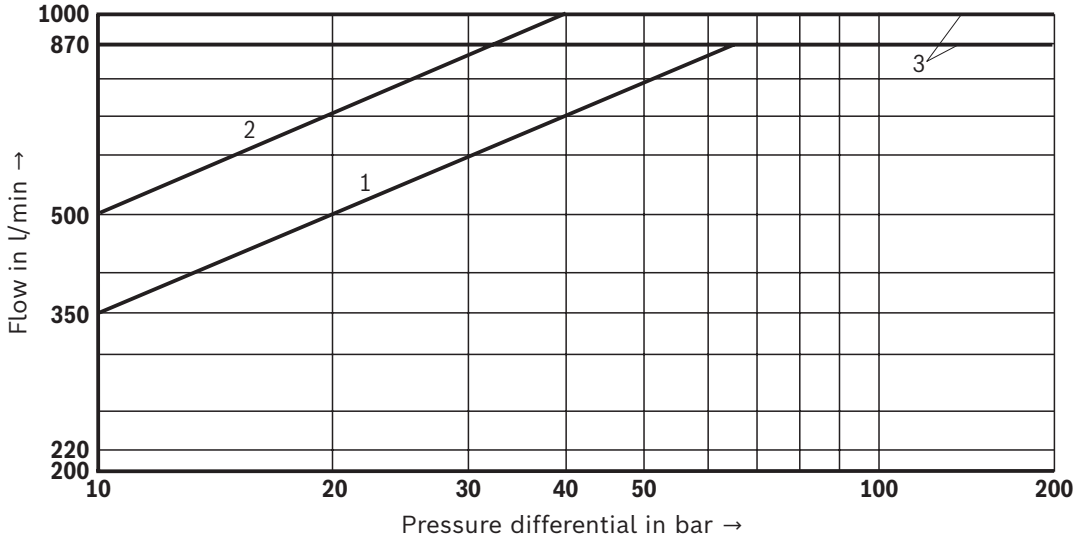
☞ **Notice:**
Typical characteristic curves which are subject to tolerance variations.

Characteristic curves: Sizes 25 and 27
(measured with HLP46, ϑ_{oil} = 40±5 °C)

Transition function with stepped electric input signals
(measured at a pilot pressure of 100 bar)



Flow/load function with maximum valve opening (tolerance ±10%)



Rated flow

1 350 l/min

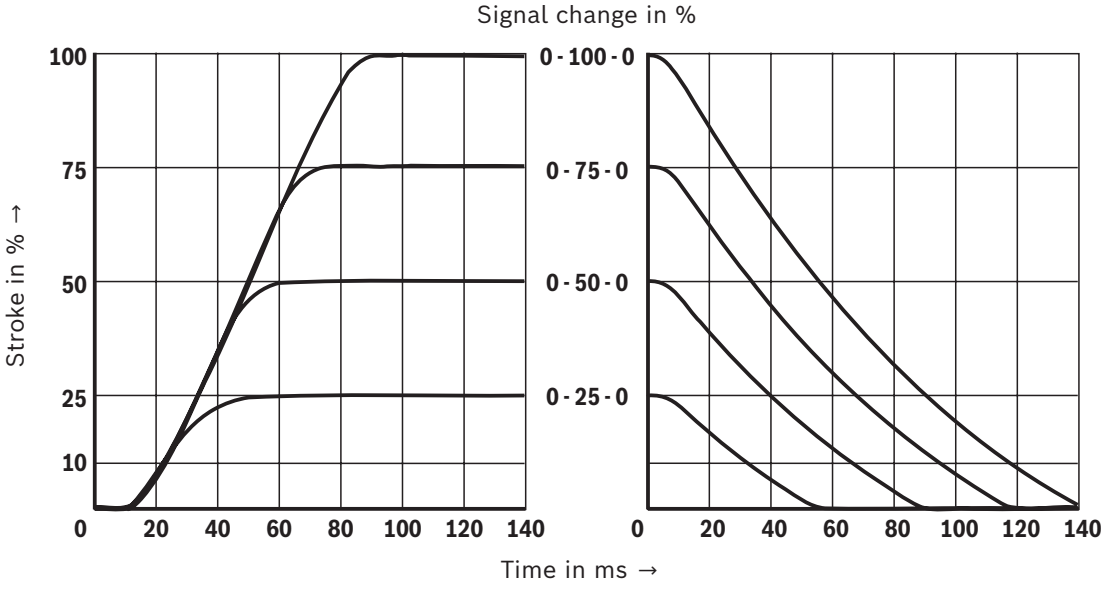
2 500 l/min

3 Recommended flow limitation (flow velocity 30 m/s)

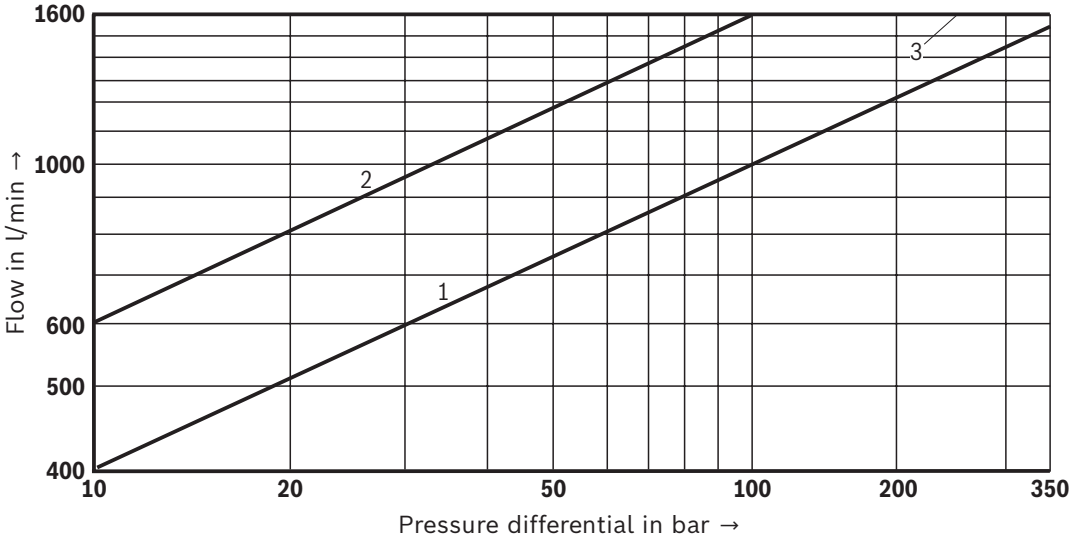
☞ **Notice:**
Typical characteristic curves which are subject to tolerance variations.

Characteristic curves: Size 32
(measured with HLP46, ϑ_{oil} = 40±5 °C)

Transition function with stepped electric input signals
(measured at a pilot pressure of 100 bar)



Flow/load function with maximum valve opening (tolerance ±10%)



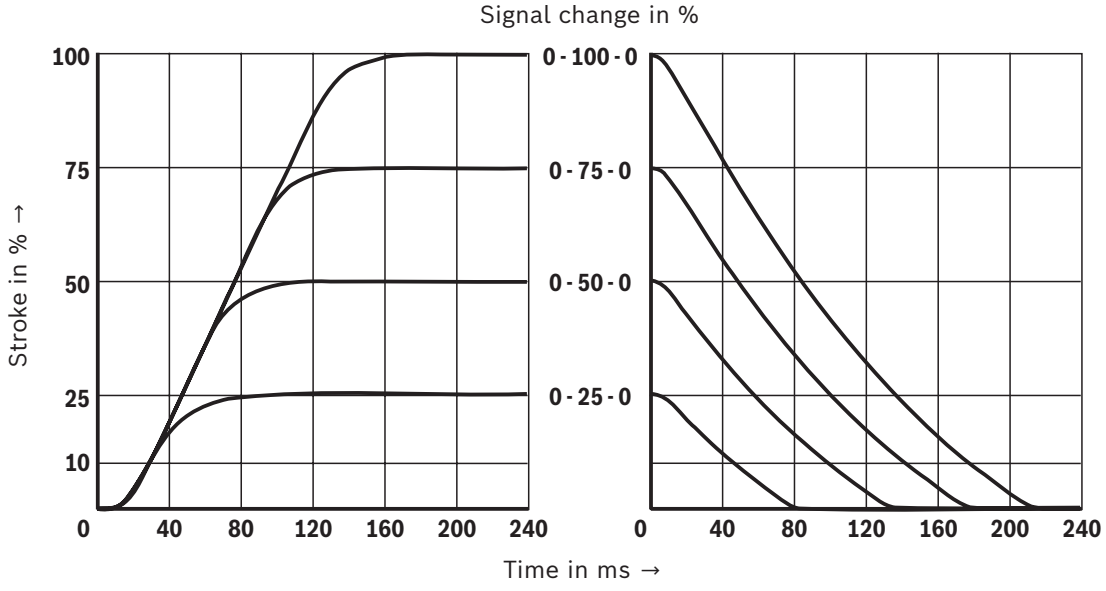
Rated flow

1 400 l/min
2 600 l/min
3 Recommended flow limitation (flow velocity 30 m/s)

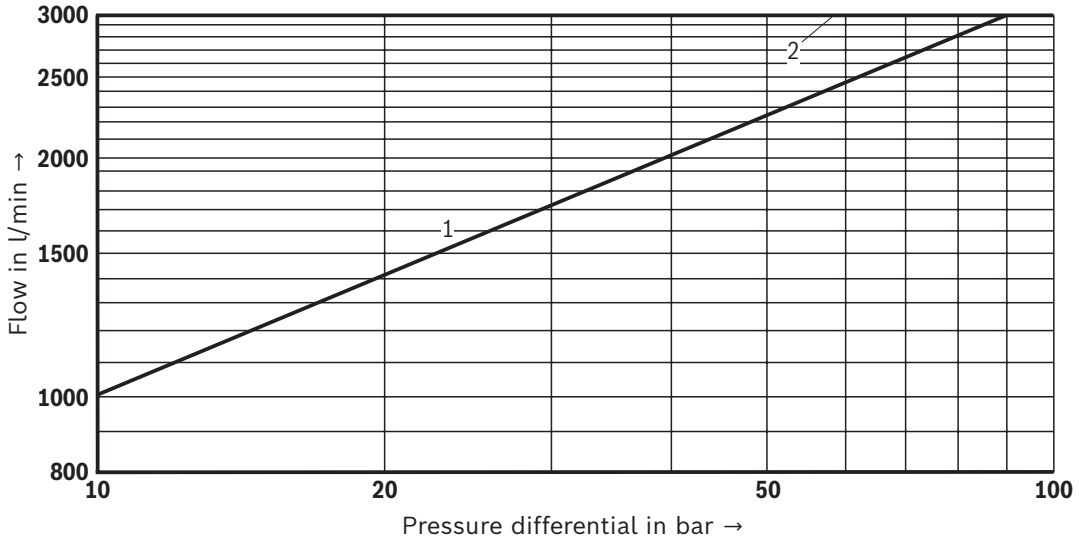
☞ **Notice:**
Typical characteristic curves which are subject to tolerance variations.

Characteristic curves: Size 35
(measured with HLP46, ϑ_{oil} = 40±5 °C)

Transition function with stepped electric input signals
(measured at a pilot pressure of 100 bar)



Flow/load function with maximum valve opening (tolerance ±10%)



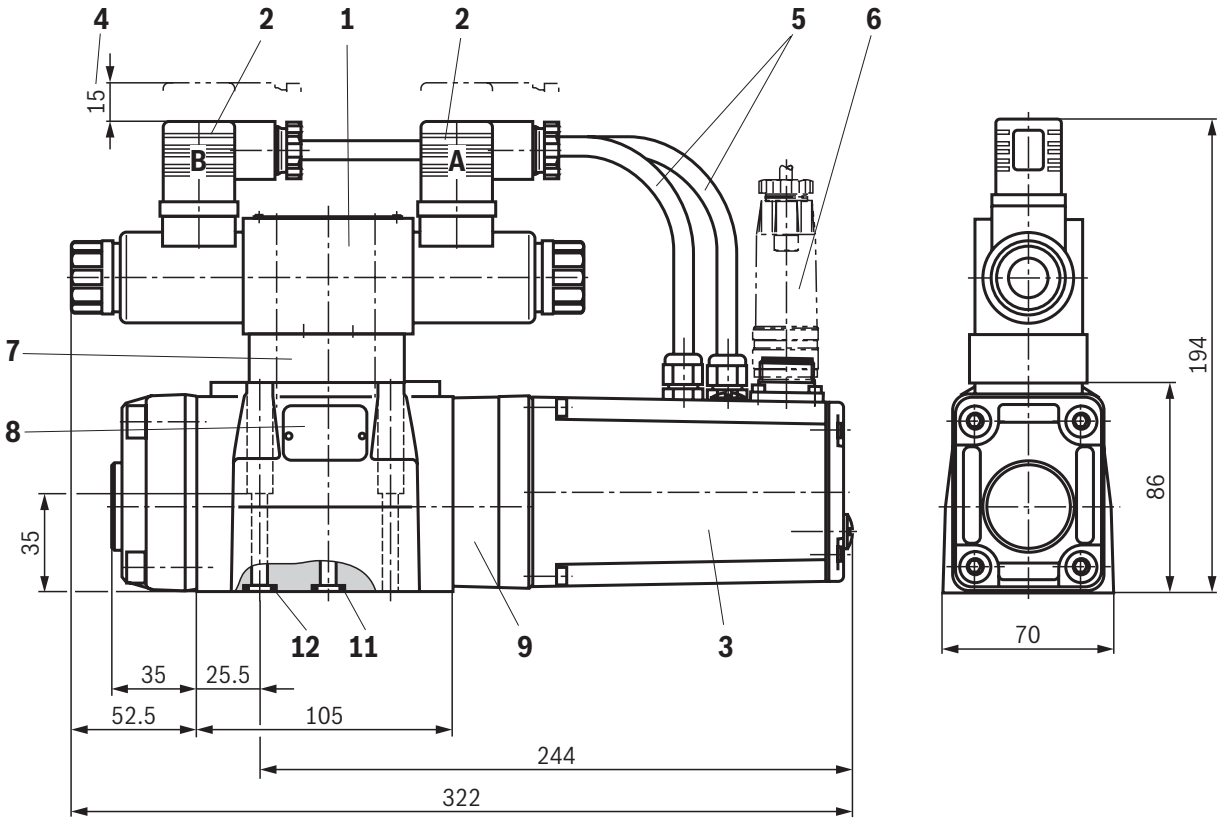
Rated flow

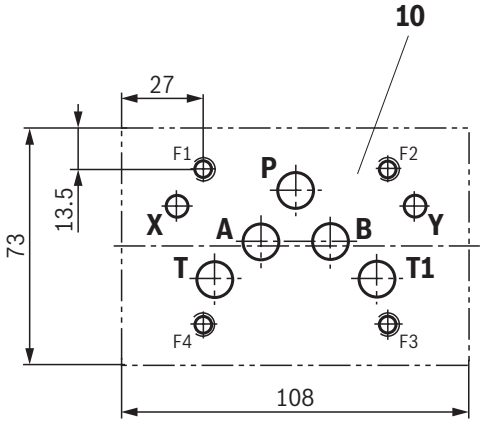
1 1000 l/min

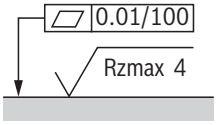
2 Recommended flow limitation (flow velocity 30 m/s)

☞ **Notice:**
Typical characteristic curves which are subject to tolerance variations.

Dimensions: Size 10
(dimensions in mm)







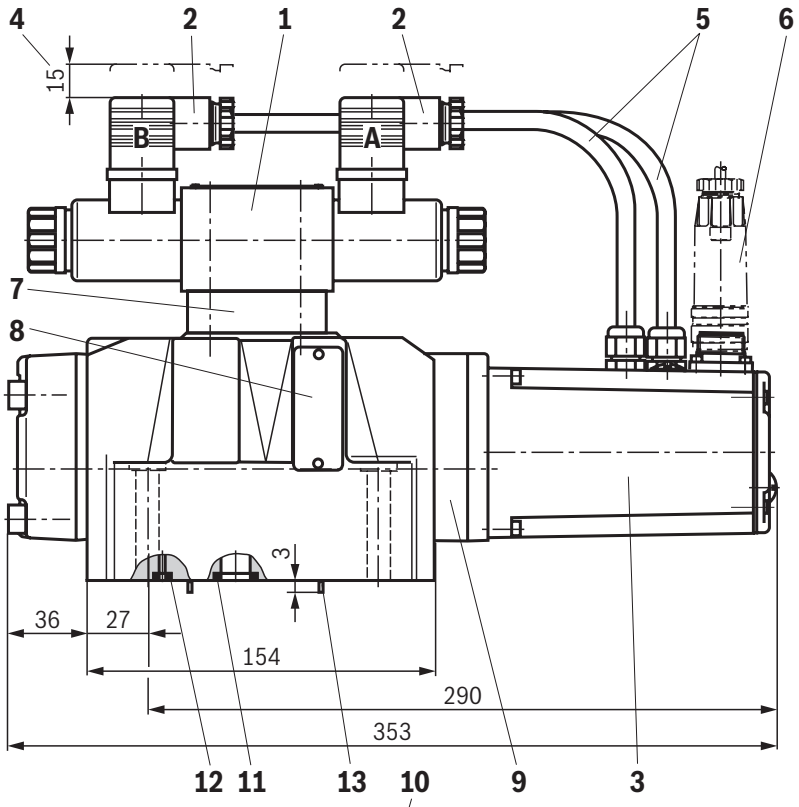
Required surface quality of the valve contact surface

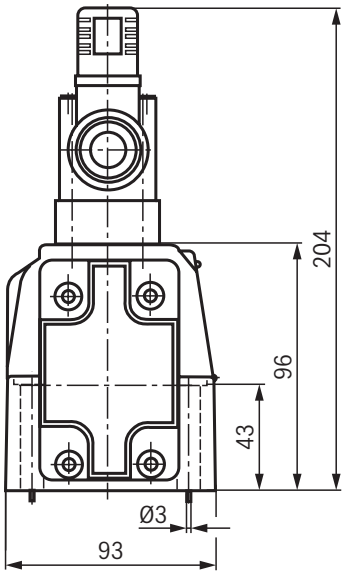
1 Pilot control valve
2 Mating connector (A gray; B black)
3 Integrated electronics (OBE)
4 Space required for connection cable and to remove the mating connector
5 Wiring
6 Mating connector for connector "K31" (separate order, see page 27 and data sheet 08006)
7 Pressure reducing valve
8 Name plate
9 Main valve
10 Machined valve contact surface, porting pattern according to ISO 4401-05-05-0-05 (port X, Y as required)
11 Identical seal rings for connection A, B, P, T
12 Identical seal rings for connection X, Y

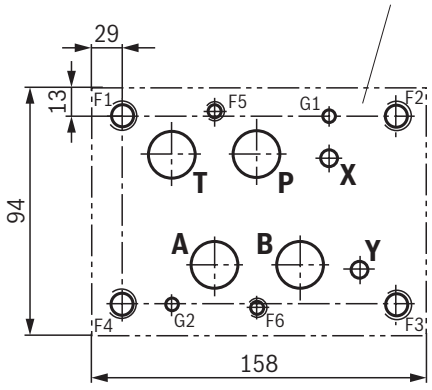
Valve mounting screws and **subplates**, see page 26.

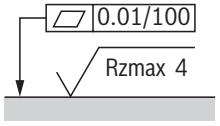
☞ **Notice:**
The dimensions are nominal dimensions which are subject to tolerances.

Dimensions: Size 16
(dimensions in mm)









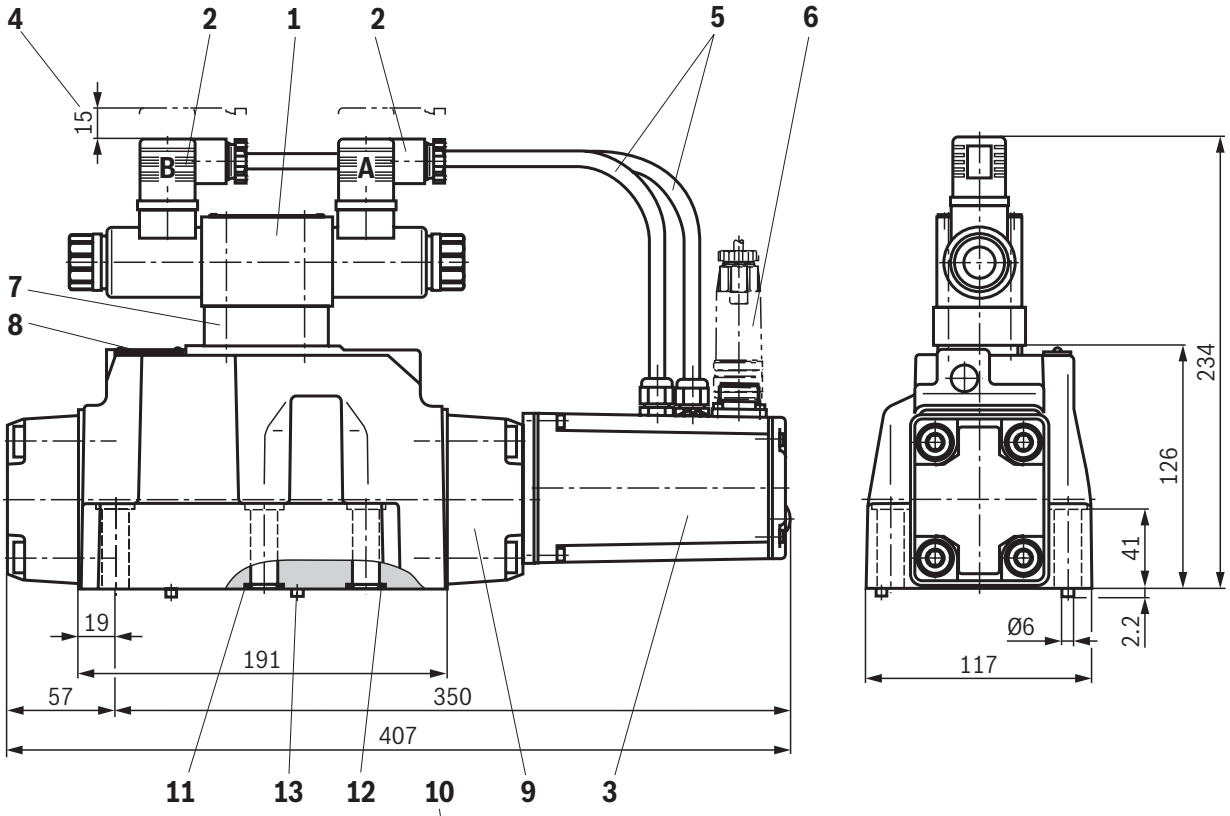
Required surface quality of the valve contact surface

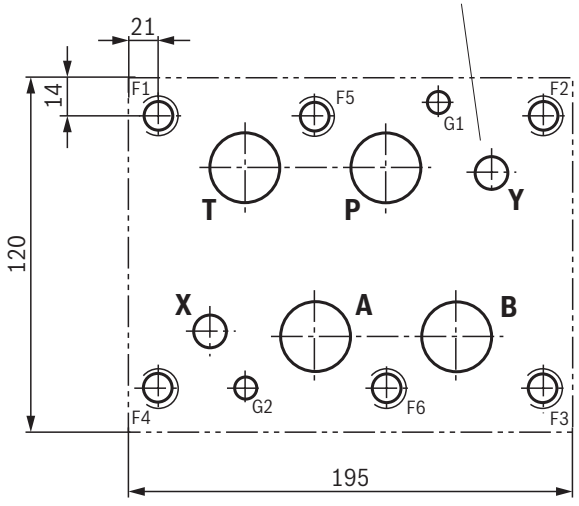
1 Pilot control valve
2 Mating connector (A gray; B black)
3 Integrated electronics (OBE)
4 Space required for connection cable and to remove the mating connector
5 Wiring
6 Mating connector for connector "K31" (separate order, see page 27 and data sheet 08006)
7 Pressure reducing valve
8 Name plate
9 Main valve
10 Machined valve contact surface; porting pattern according to ISO 4401-07-07-0-05 (ports X and Y as required), deviating from the standard: Ports A, B, T and P with Ø20 mm
11 Identical seal rings for connection A, B, P, T
12 Identical seal rings for connection X, Y
13 Locking pin

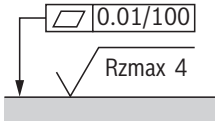
Valve mounting screws and **subplates**, see page 26.

☞ **Notice:**
The dimensions are nominal dimensions which are subject to tolerances.

Dimensions: Size 25
(dimensions in mm)







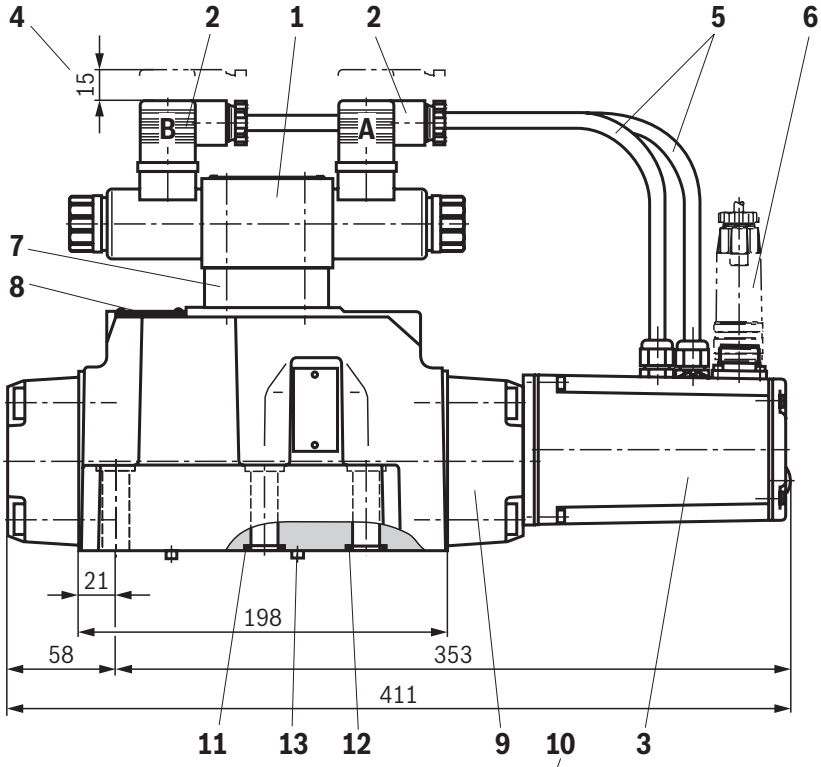
Required surface quality of the valve contact surface

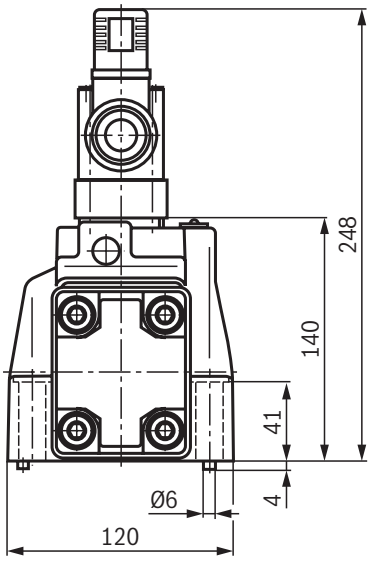
1 Pilot control valve
2 Mating connector (A gray; B black)
3 Integrated electronics (OBE)
4 Space required for connection cable and to remove the mating connector
5 Wiring
6 Mating connector for connector "K31" (separate order, see page 27 and data sheet 08006)
7 Pressure reducing valve
8 Name plate
9 Main valve
10 Machined valve contact surface, porting pattern according to ISO 4401-08-08-0-05 (port X, Y as required)
11 Identical seal rings for connection A, B, P, T
12 Identical seal rings for connection X, Y
13 Locking pin

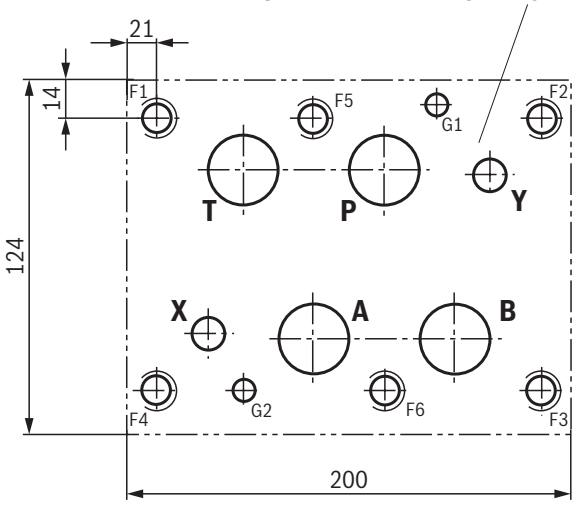
Valve mounting screws and **subplates**, see page 26.

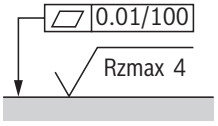
☞ **Notice:**
The dimensions are nominal dimensions which are subject to tolerances.

Dimensions: Size 27
(dimensions in mm)









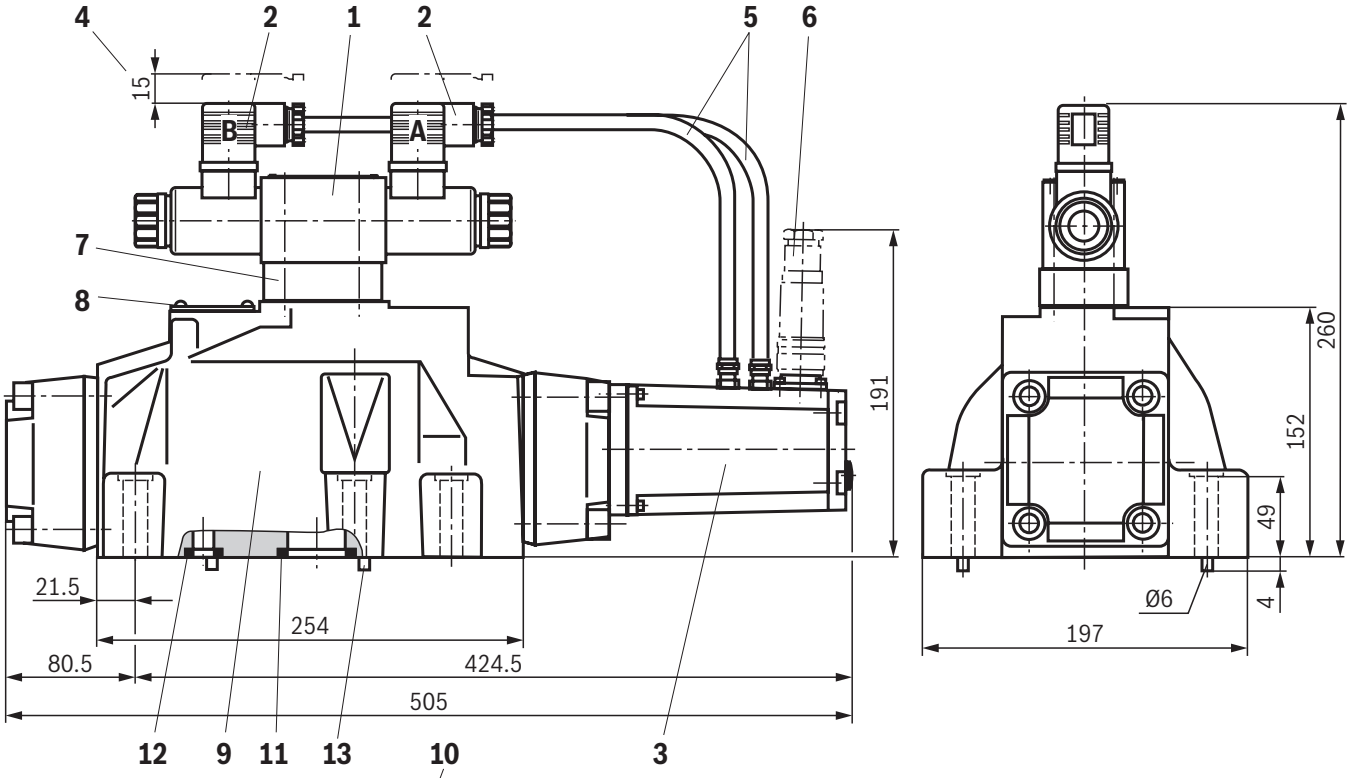
Required surface quality of the valve contact surface

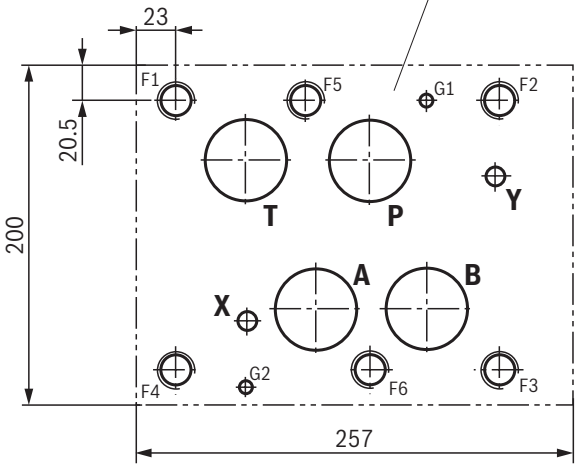
1 Pilot control valve
2 Mating connector (A gray; B black)
3 Integrated electronics (OBE)
4 Space required for connection cable and to remove the mating connector
5 Wiring
6 Mating connector for connector "K31" (separate order, see page 27 and data sheet 08006)
7 Pressure reducing valve
8 Name plate
9 Main valve
10 Machined valve contact surface; porting pattern according to ISO 4401-08-08-0-05 (ports X and Y as required), deviating from the standard: Ports A, B, T and P with Ø 32 mm
11 Identical seal rings for connection A, B, P, T
12 Identical seal rings for connection X, Y
13 Locking pin

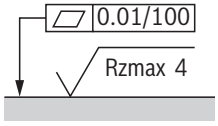
Valve mounting screws and **subplates**, see page 26.

☞ **Notice:**
The dimensions are nominal dimensions which are subject to tolerances.

Dimensions: Size 32
(dimensions in mm)







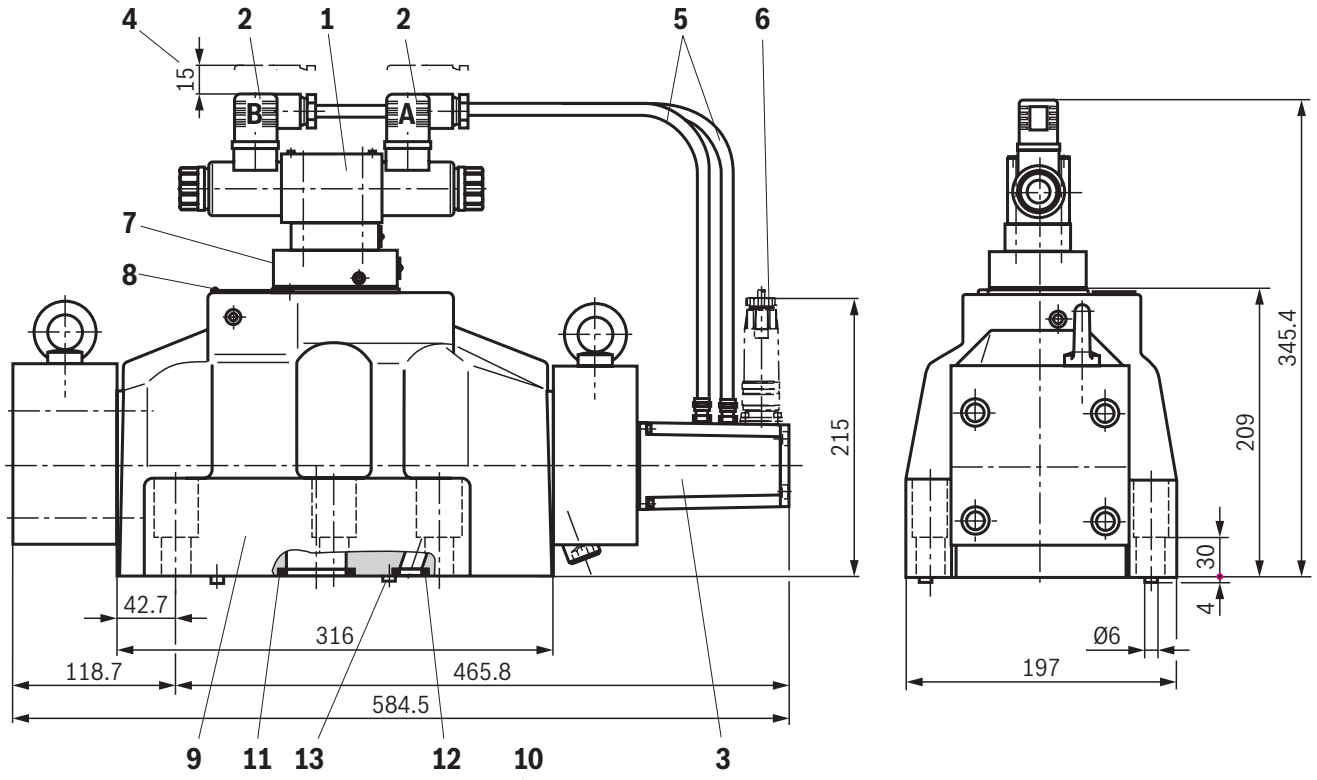
Required surface quality of the valve contact surface

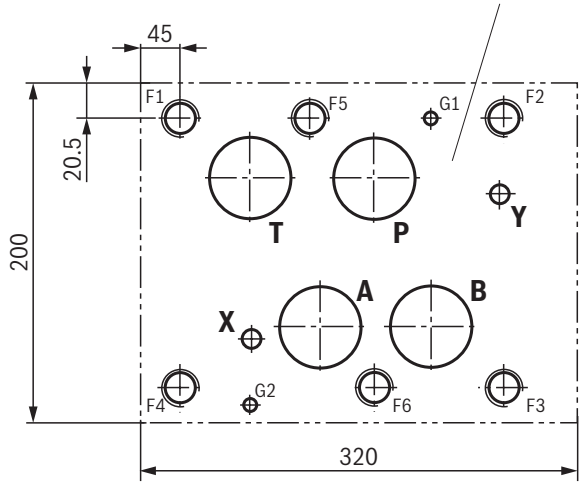
1 Pilot control valve
2 Mating connector (A gray; B black)
3 Integrated electronics (OBE)
4 Space required for connection cable and to remove the mating connector
5 Wiring
6 Mating connector for connector "K31" (separate order, see page 27 and data sheet 08006)
7 Pressure reducing valve
8 Name plate
9 Main valve
10 Machined valve contact surface; porting pattern according to ISO 4401-10-09-0-05 (ports X and Y as required), deviating from the standard: Ports A, B, T and P with Ø38 mm
11 Identical seal rings for connection A, B, P, T
12 Identical seal rings for connection X, Y
13 Locking pin

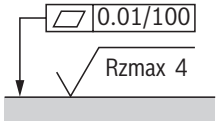
Valve mounting screws and **subplates**, see page 26.

☞ **Notice:**
The dimensions are nominal dimensions which are subject to tolerances.

Dimensions: Size 35
(dimensions in mm)







Required surface quality of the valve contact surface

1 Pilot control valve
2 Mating connector (A gray; B black)
3 Integrated electronics (OBE)
4 Space required for connection cable and to remove the mating connector
5 Wiring
6 Mating connector for connector "K31" (separate order, see page 27 and data sheet 08006)
7 Pressure reducing valve
8 Name plate
9 Main valve
10 Machined valve contact surface; porting pattern according to ISO 4401-10-09-0-05 (ports X and Y as required), deviating from the standard: Ports A, B, T and P with Ø50 mm
11 Identical seal rings for connection A, B, P, T
12 Identical seal rings for connection X, Y
13 Locking pin

Valve mounting screws and **subplates**, see page 26.

☞ **Notice:**
The dimensions are nominal dimensions which are subject to tolerances.

Dimensions

Valve mounting screws (separate order)

Size	Quantity	Hexagon socket head cap screws	Material number
10	4	**ISO 4762 - M6 x 45 - 10.9-CM-Fe-ZnNi-5-Cn-T0-H-B** Friction coefficient μ_{total} = 0.09 ... 0.14; tightening torque M_A = 13.5 Nm ±10%	**R913043777**
	or		
	4	**ISO 4762 - M6 x 45 - 10.9** Friction coefficient μ_{total} = 0.12 ... 0.17; tightening torque M_A = 15.5 Nm ±10%	Not included in the Rexroth delivery range
16	2	**ISO 4762 - M6 x 60 - 10.9-CM-Fe-ZnNi-5-Cn-T0-H-B** Friction coefficient μ_{total} = 0.09 ... 0.14; tightening torque M_A = 12.2 Nm ±10%	**R913043410**
	4	**ISO 4762 - M10 x 60 - 10.9-flZn/nc/480h/C** Friction coefficient μ_{total} = 0.09 ... 0.14; tightening torque M_A = 58 Nm ±20%	**R913014770**
	or		
	2	**ISO 4762 - M6 x 60 - 10.9** Friction coefficient μ_{total} = 0.12 ... 0.17; tightening torque M_A = 15.5 Nm ±10%	Not included in the Rexroth delivery range
	4	**ISO 4762 - M10 x 60 - 10.9** Friction coefficient μ_{total} = 0.12 ... 0.17; tightening torque M_A = 75 Nm ±10%	
25, 27	6	**ISO 4762 - M12 x 60 - 10.9-flZn/nc/480h/C** Friction coefficient μ_{total} = 0.09 ... 0.14; tightening torque M_A = 100 Nm ±20%	**R913015613**
	or		
	6	**ISO 4762 - M12 x 60** Friction coefficient μ_{total} = 0.12 ... 0.17; tightening torque M_A = 100 Nm ±10%	Not included in the Rexroth delivery range
32	6	**ISO 4762 - M20 x 80 - 10.9-flZn/nc/480h/C** Friction coefficient μ_{total} = 0.09 ... 0.14; tightening torque M_A = 340 Nm ±20%	**R913008472**
	or		
	6	**ISO 4762 - M20 x 80** Friction coefficient μ_{total} = 0.12 ... 0.17; tightening torque M_A = 430 Nm ±10%	Not included in the Rexroth delivery range
35	6	**ISO 4762 - M20 x 60 - 10.9-flZn/nc/480h/C** Friction coefficient μ_{total} = 0.09 ... 0.14; tightening torque M_A = 465 Nm ±20%	**R913014726**
	or		
	6	**ISO 4762 - M20 x 60 - 10.9** Friction coefficient μ_{total} = 0.12 ... 0.17; tightening torque M_A = 610 Nm ±10%	Not included in the Rexroth delivery range

☞ **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, see data sheet 45100.

Accessories (separate order)

Mating connectors

Pos. [1]	Designation	Version	Short designation	Material number	ZData sheet
6	Mating connector; for valves with round connector, 6-pole + PE	Straight, metal	7PZ31...M	**R900223890**	08006
		Straight, plastic	7PZ31...K	**R900021267**	
		Angled, plastic	–	**R900217845**	–
	Cable sets; for valves with round connector, 6-pole + PE	Plastic, 3.0 m	7P Z31 BF6	**R901420483**	08006
		Plastic, 5.0 m		**R901420491**	
		Plastic, 10.0 m		**R901420496**	
		Plastic, 20.0 m	–	**R901448068**	–

[1] See dimensions page 20 ... 25.

Test and service devices

	Material number	Data sheet
Service case with test device for continuous control valves with integrated electronics (OBE)	**R901049737**	29685

Project planning information

When replacing the component series 2X by component series 3X, the electronics interface is to be defined with "A5" (enable signal at pin C).

Pin	Interface assignment "A5"
A	Supply voltage
B	GND
C	Enable input
D	Command value
E	Reference potential command value
F	Actual value
PE	Functional ground (directly connected to the valve housing)

Further information

▶ Hydraulic valves for industrial applications	Data sheet 07600-B
▶ 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
▶ Hexagon socket head cap screw, metric/UNC	Data sheet 08936
▶ General product information on hydraulic products	Data sheet 07008
▶ Installation, commissioning and maintenance of servo valves and high-response valves	Data sheet 07700
▶ Assembly, commissioning and maintenance of hydraulic systems	Data sheet 07900
▶ Information on available spare parts	