

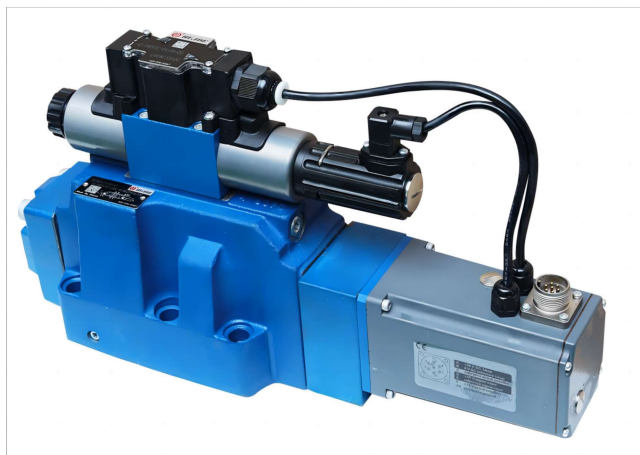
HD-4WRTE...-4X/...

High frequency response proportional directional valve

Size 10 to 35
Component series 4X
Maximum operating pressure 35MPa
Maximum flow 1000L/min

Features:

- ▶ Design to enhance reliability and security
 1. Automatic pressure compensation in the control chambers of the main stage by the pilot control valve
 2. Control spool of the main stage in the spring centered central position and/or in the offset position
 3. Optionally with spool position monitoring
- ▶ Flexible - suitable for position, speed and pressure control
- ▶ Precise - high response sensitivity and little hysteresis



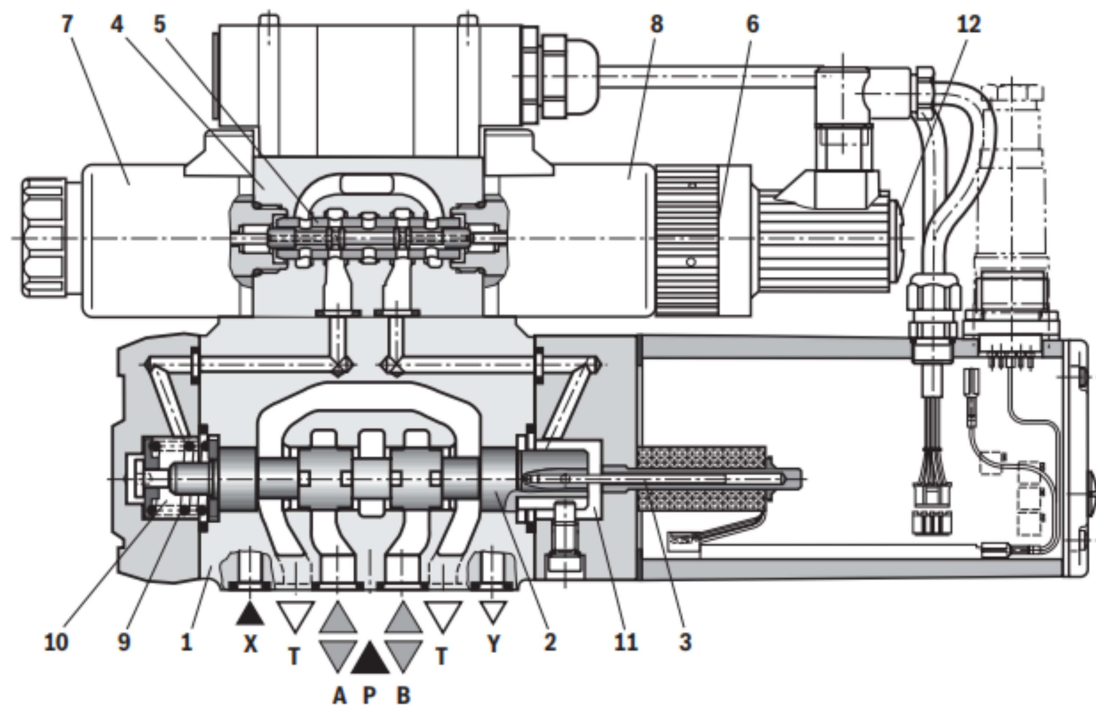
Function and valve particularities

Valves of type 4WRTE are pilot-operated directional control valves with electrical position feedback, integrated electronics (OBE) and optional spool position monitoring.

The valve basically consists of 3 main assemblies:

1. Housing (1) with main stage control spool (2) and optional spool position monitoring (13).
2. Integrated electronics (optionally with electronics protection membrane (14)) with inductive position transducer (3) of the main stage.
3. Pilot control valve (4) with control spool/socket unit (5), inductive position transducer (6) and pressure feed back for central position of the main stage control spool (2).

With de-energized proportional solenoids (7; 8) central position of the main stage control spool (2) due to centering spring (9) and pressure feed back. Control of the main stage control spool (2) via the pilot control valve (4) → the main stage control spool (2) is positioned in a regulated manner. Controlling the control spool of the pilot control valve (4) by changing the solenoid force of the proportional solenoids (7; 8). Connection of the command and actual values in the integrated electronics. Pilot oil supply to the pilot control valve internally via port P or externally via port X. Pilot oil return internally via port T or externally via Y to the tank. With a command value of 0 V, the electronics control the main stage control spool (2) in central position.



Ordering code

Spool position monitoring:

The spool positions of the main stage control spool (2) are detected by the inductive position switch (13) and displayed via two switching outputs with a preset logic. If the fixedly set switching points are exceeded, the deviation from the zero position is monitored within the control spool overlap (see page 27). The switching signals can be used in a superior control for monitoring functions. The electrical connection is implemented separately via a 4-pole connector M12x1 with two pins for signal output and two pins for voltage supply.

Area of application:

The valve can be used in safety-related two-channel applications (category 3, PL d and category 4, PL e according to EN 13849-1) as switch-off element for one channel. The valve meets the requirements of a secure start inhibitor according to EN 60204, stop category 0. If safety requirements are needed, the supply voltage of the valve must be safely disconnected based on the required safety level (category PL).

Depending on the application and the requirements of work equipment-specific standards according to EN 13849-1, the user must provide appropriate monitoring/plausibility checks which comply with the required diagnostic coverage DCavg using a superior control.

Electronics protection membrane "-967":

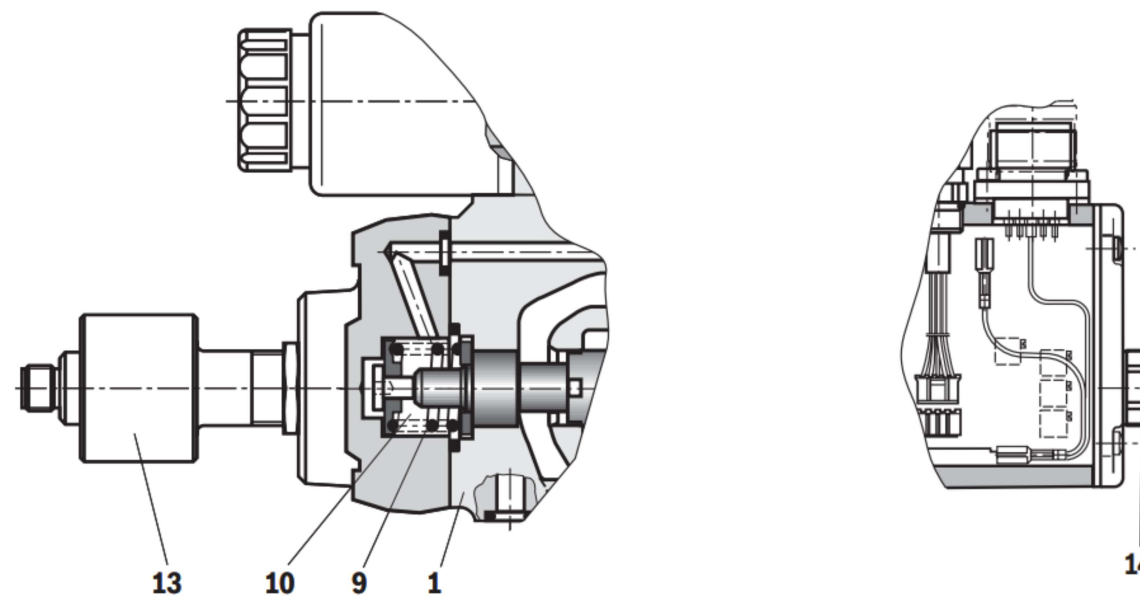
To prevent condensate formation in the housing of the integrated electronics (OBE), an electronics protection membrane (14) can be used. Recommended for use outside industry-standard conditions with high ambient air humidity and significant cyclic temperature changes (e. g. outdoors).

Failure of supply voltage:

1. Integrated electronics de-energize the solenoid in case of supply voltage failure or cable break
2. Automatic pressure control on the same level in the control chambers (10 and 11) by the pilot control valve
3. In case of pressure supply failure, centering of the main stage control spool by centering spring (9)
4. Central position of the main stage control spool (2)

Notices:

1. Failure of the supply voltage will lead to an abrupt standstill of the control axis. The acceleration forces occurring in this connection may cause machine damage. With control spool symbols E, E1-, W6- and W8-, the centering spring (9) sets the main stage control spool (2) in central position, control spools V- and V1 are switched to the preferred direction P to B and A to T in a tolerance range of 1% to a maximum of 11% of the control spool stroke.
2. The PG fitting (12) must not be opened. Mechanical adjustment of the adjustment nut located below is prohibited and damages the valve.
3. The zero point has been adjusted at the factory. Changes in the zero point may result in damage to the system and may only be implemented by instructed specialists.
4. If the pilot control valve or the electronics are exchanged, the zero point has to be adjusted once again by instructed specialists.



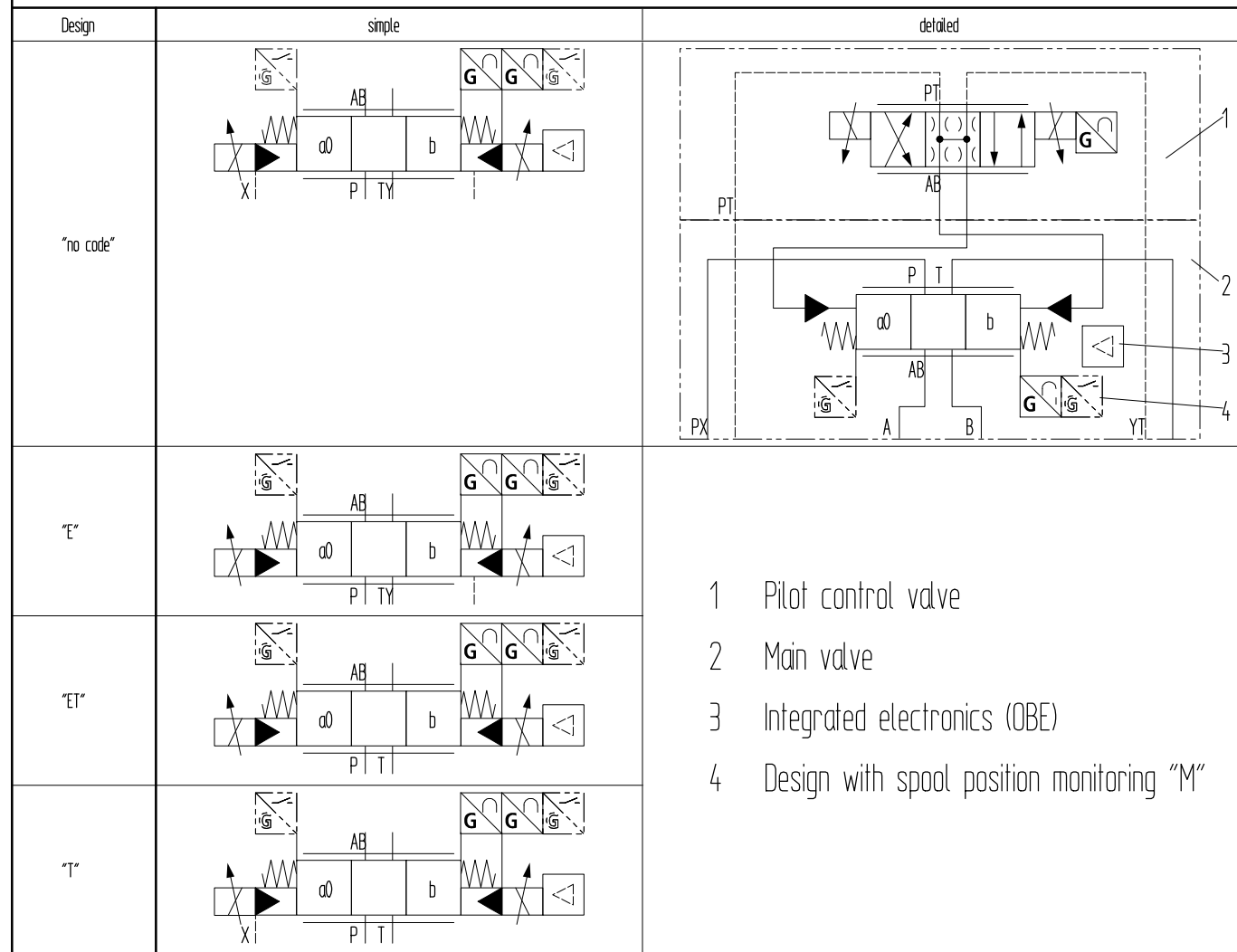
Ordering code

01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
4	WRT	E						- 4X	/ 6E	G24		K31	/			*
01	4 main parts															4
02	Directional control valve, pilot-operated															WRT
03	With integrated electronics															E
04	Without spool position monitoring															no code
	With spool position monitoring (NG16 G16 ... NG35 only)															M
05	Size 10															10
	Size 16															16
	Size 25															25
	Size 27															27
	Size 32															32
	Size 35															35
06	Symbols e. g. E, E1-, W6- etc.; possible version see page 3															
Rated flow ($\Delta p = 5 \text{ bar/control edge}$)																
07	- Size 10															
	25 l/min (symbol E, W6-, W8- and V only with flow characteristic "L")															25
	50 l/min (symbol E1-, W8- and V1 only with flow characteristic "L")															50
	90 l/min															100
	- Size 16															
	150 l/min (symbol V1 only with flow characteristic "L")															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																
08	Linear															L
	Linear with fine control range															P
09	Component series 40..49; unchanged installation and mounting dimensions)															4X
Pilot control valve																
10	Proportional solenoid with detachable coil (NG6)															6E
11	Direct voltage 24 V															G24
Pilot oil flow																
12	External pilot oil supply, external pilot oil return															no code
	Internal pilot oil supply, external pilot oil return															E
	External pilot oil supply, internal pilot oil return															T
	Internal pilot oil supply, internal pilot oil return															ET
Electrical connection																
13	Without mating connector; connector DIN EN 175201-804															K31 ¹⁾

Ordering code

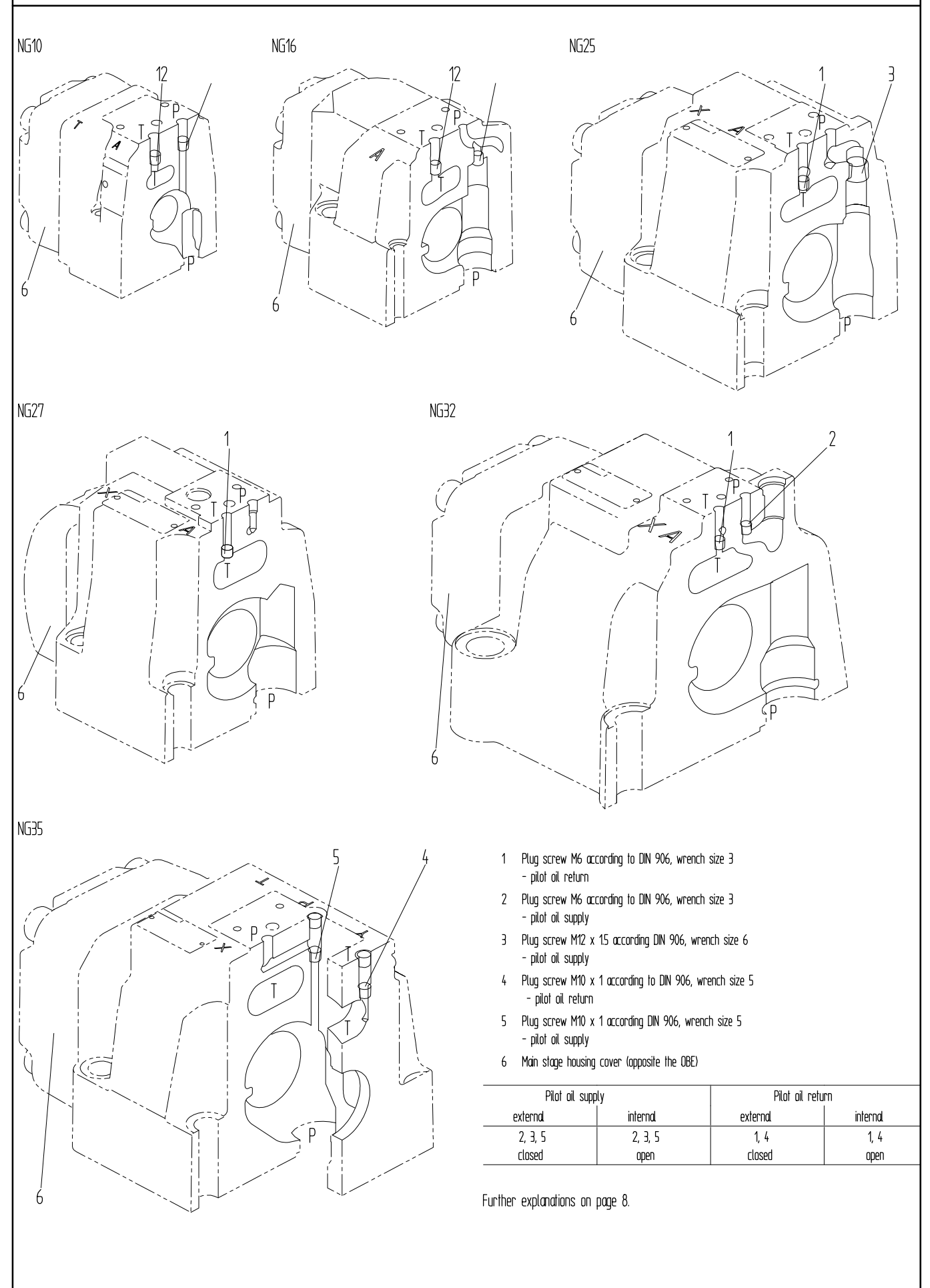
01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
4	WRT	E						- 4X	/ 6E	G24		K31	/			*
Interfaces of the control electronics																
14	Command value/actual value $\pm 10 \text{ V}$															A1
	Command value/actual value 4 ... 20 mA															F1
	Command value/actual value $\pm 10 \text{ V}$, enable signal (pin C)															A5 ²⁾
Seal material																
15	NBR seals															M
	FKM seals															V
Observe compatibility of seals with hydraulic fluid used.																
16	Without electronics protection membrane															no code
	With electronics protection membrane															-967
17	Further details in the plain text															*
<p>¹⁾ Mating connectors, separate order, see page 28 and data sheet 08006.</p> <p>²⁾ When replacing the component series 3X by component series 4X, the electronics interface is to be defined with A5 (enable signal of pin C).</p>																
Symbols																
<p>The symbols show various valve configurations: <ul style="list-style-type: none"> Symbol 1: A 3-position valve with positions 'aa', '00', and 'bb'. The '00' position is centered, and 'aa' and 'bb' are to the left and right respectively. Below it are labels 'P T I'. Symbol 2: A 3-position valve with a spring return to the '00' position. Below it are labels 'P T I'. Symbol 3: A 3-position valve with a spring return to the '00' position and a G symbol in a square above it. Below it are labels 'P T I'. Symbol 4: A 3-position valve with a spring return to the '00' position and a G symbol in a square above it. Below it are labels 'P T I'. Symbol 5: A 3-position valve with a spring return to the '00' position and a G symbol in a square above it. Below it are labels 'P T I'. Symbol 6: A 3-position valve with a spring return to the '00' position and a G symbol in a square above it. Below it are labels 'P T I'. Symbol 7: A 3-position valve with a spring return to the '00' position and a G symbol in a square above it. Below it are labels 'P T I'. Symbol 8: A 3-position valve with a spring return to the '00' position and a G symbol in a square above it. Below it are labels 'P T I'. Symbol 9: A 3-position valve with a spring return to the '00' position and a G symbol in a square above it. Below it are labels 'P T I'. Symbol 10: A 3-position valve with a spring return to the '00' position and a G symbol in a square above it. Below it are labels 'P T I'. </p> <p>Legend for symbols:</p> <ul style="list-style-type: none"> = E = E1- = W6- = W8- = V = V1- <p>With symbol E1-, V1- and W8-:</p> <ul style="list-style-type: none"> P → A: $q_{V \max}$ B → T: $q_{V/2}$ P → B: $q_{V/2}$ A → T: $q_{V \max}$ <p>Notices:</p> <ul style="list-style-type: none"> Representation according to DIN ISO 1219-1 Hydraulic interim positions are shown by dashes. 																

Symbols



- 1 Pilot control valve
- 2 Main valve
- 3 Integrated electronics (OBE)
- 4 Design with spool position monitoring "M"

Pilot oil supply (schematic illustration)



Pilot oil supply

"No code" version
 External pilot oil supply
 External pilot oil return
 In this version, the pilot oil is supplied from a separate control circuit (externally).
 The pilot oil return is not directed into channel T of the main valve, but is separately directed to the tank via port Y (externally).

Version "E"
 Internal pilot oil supply
 External pilot oil return
 With this version, the pilot oil is supplied from channel P of the main valve (internally).
 The pilot oil return is not directed into channel T of the main valve, but is separately directed to the tank via port Y (externally).
 In the subplate, port X is to be closed.

Version "ET"
 Internal pilot oil supply
 Internal pilot oil return
 With this version, the pilot oil is supplied from channel P of the main valve (internally).
 The pilot oil is directly returned to channel T of the main valve (internally).
 In the subplate, ports X and Y are to be closed.

Version "T"
 External pilot oil supply
 Internal pilot oil return
 In this version, the pilot oil is supplied from a separate control circuit (externally).
 The pilot oil is directly returned to channel T of the main valve (internally).
 In the subplate, port Y is to be closed.

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

general							
Sizes	NG	10	16	25	27	32	35
Weight	kg	8.7	112	16.8	17	315	34
Installation position and commissioning information		Preferably horizontal					
Ambient temperature range		°C -20...+50					
Maximum storage time		Years 1 * (if the storage conditions are observed; refer to the operating instructions 07600-B)					
MTTF _d values according to EN ISO 13849		Years 150 ¹ (for more information see data sheet 08012)					
Sine test according to DIN EN 60068-2-6		10 ... 2000 Hz / maximum of 10 g / 10 cycles / 3 axes					
Noise test according to DIN EN 60068-2-64		20 ... 2000 Hz / 10 g rms / 30 g peak / 30 min. / 3 axes					
Transport shock according to DIN EN 60068-2-27		15 g / 11 ms / 3 shocks / 3 axes					
Damp heat, cyclic, according to DIN EN 60068-2-30		Variant 2 +25 °C ... +55 °C, 90% ... 97% relative humidity, 2 cycles of 24 hours					

¹ With symbol E, E1, W6 and W8: in longitudinal control spool direction, there is sufficient positive overlap without shock/vibration load; observe the installation orientation with regard to the main direction of acceleration.

Technical data

hydraulic		NG	10	16	25	27	32	35
Sizes								
Maximum operating pressure	▶ Pilot control valve ▶ Main valve	Pilot oil supply ²⁾ Part P, A, B	bar 255 ... 315					
Maximum return flow pressure	▶ Part T	Internal pilot oil return	bar Static < 10					
	▶ Part Y	External pilot oil return	bar 315	250	250	210	250	250
Rated flow with $\Delta p = 5 \text{ bar/control edge}$	$q_{v \text{ nom}} \pm 10\%$ ³⁾		l/min 25	150	-	-	-	-
			50	-	220	-	400	-
			100	220	350	500	600	1000
Maximum flow (recommended)			l/min 170	460	870	1000	1600	3000
Pilot oil flow at part X or Y with stepped input signal from 0 to 100% (315 bar)			l/min 7	14	20	20	27	29
Pilot oil volume @ 100% ... 100%			cm ³ 11	2.9	6.8	6.8	17.7	33.9
Hydraulic fluid	See table below							
Hydraulic fluid temperature range (at the valve working parts)	°C	-20 ... +80; preferably +40...+80						
Viscosity range	mm ² /s	20 ... 380; preferably 30 ... 45						
Maximum admissible degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c)		Class 18/16/13 ⁴⁾						
Hysteresis	%	≤ 0.1						
Response sensitivity	%	≤ 0.05						
Zero point calibration (ex works)	%	≤ 1						
Temperature drift	%/10 °C	Zero shift < 0.3						

Hydraulic fluid	Classification	Suitable sealing materials	Standards	Data sheet
Mineral oils	HL, HLP, HLPD, HVL, HVLPD	NBR, FKM	DIN 51524	90220
Bio-degradable	▶ Insoluble in water	HETG HEES	ISO 15380	90221
	▶ Soluble in water	HEPG	ISO 15380	
Flame-resistant	▶ Water-free	HFDU, HFDR	ISO 12922	90222
	▶ Containing water	HFC (Fuchs Hydrotherm 46M, Petroler Ultra Safe 620)	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 40 K higher than the maximum solenoid surface temperature.

▶ Flame-resistant - containing water:
 -- Maximum operating pressure 210 bar
 -- Maximum pressure differential per control edge 175 bar
 -- Pressure pre-loading at the tank port >20% of the pressure differential, otherwise increased cavitation erosion
 -- Life cycle as compared to operation with mineral oil HL, HLP 50...100%
 -- Maximum hydraulic fluid temperature 50 °C

²⁾ For perfect system behavior, we recommend an external pilot oil supply for pressures above 210 bar.

³⁾ Flow for deviating Δp (valve pressure differential):

$$q_x = q_{v \text{ nom}} \times \sqrt{\frac{\Delta p_x}{5}}$$

⁴⁾ The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and simultaneously increases the life cycle of the components.
 For the selection of the filters see www.boschrexroth.com/filter

⁵⁾ Related to the pressure-signal characteristic curve (symbol V)

Notice:
 Technical data (hydraulic) measured with HLP46,
 $\theta_{\text{amb}} = 40 \text{ °C} \pm 5 \text{ °C}$

Technical data

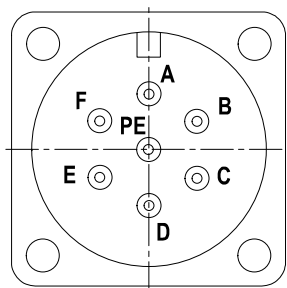
electrical, integrated electronics (OBE)			
Relative duty cycle	%	100 (continuous operation)	
Protection class according to EN 60529		IP 65 with mounted and locked plug-in connectors	
Supply voltage	▶ Nominal voltage	VDC	24
	▶ Lower limit value	VDC	18
	▶ Upper limit value	VDC	35
Maximum admissible residual ripple	Vpp	25 (Comply with absolute supply voltage limit value)	
Current consumption	▶ Maximum	A	16
	▶ Impulse current	A	27
Maximum power consumption	VA	72 (average 24)	
Required fuse protection, external	A _T	4 (time-lag)	
Voltage input "A1" (differential input)	▶ Measurement range	VDC	-1.0 ... +1.0
	▶ Input resistance	kΩ	100
Current input "F1"	▶ Input current	mA	4 ... (12) ... 20
	▶ Input resistance	Ω	100
Enable input "A5"	▶ Low level	VDC	0 ... 2
	▶ High level	VDC	1.1 ... U _B
Maximum coil temperature ⁶⁾	°C	150	

⁶⁾ Due to the temperatures occurring at the surfaces of the solenoid coils, the European standards ISO 13732-1 and EN ISO 4413 need to be adhered to.

Electrical connections and assignment

Connector pin assignment

Pin	Signal	Interface A1	Interface F1	Interface A5
A	Supply voltage	24 V DC		
B		0 V		
C	Reference potential (actual value)/enable signal	Reference potential for actual value (pin F)		Enable signal 11 ... U _B V DC
D	Differential amplifier input (command value)	±10 V	4 ... 20 mA	±10 V
E		0 V reference potential (pin D)		
F	Measuring output (actual value)	±10 V	4 ... 20 mA	±10 V
PE	Functional ground (directly connected to the valve housing)			

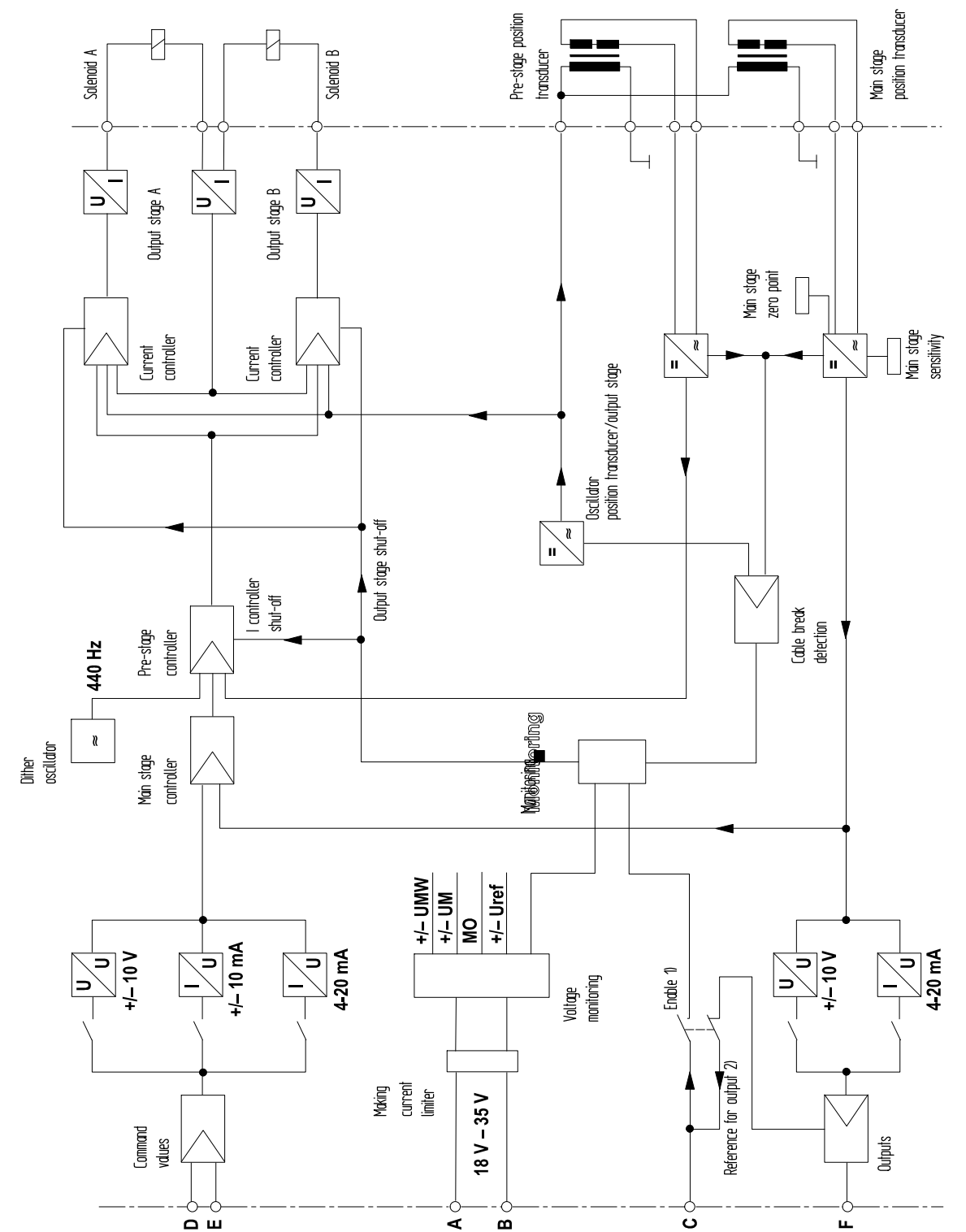


Command value:	▶ Reference potential at E and positive command value at D result in flow from P → A and B → T.
	▶ Reference potential at E and negative command value at D result in flow from P → B and A → T.
Connection cable (recommendation):	▶ Up to 25 m cable length type LiCY 7 x 0.75 mm ²
	▶ Up to 50 m cable length type LiCY 7 x 1.0 mm ²
	▶ Connect shield on PE only on the supply side

Notices:

- ▶ Electrical signals provided via valve electronics (e.g. actual value) must not be used to switch off safety-relevant machine functions.
- ▶ Mating connectors, separate order, see page 28 and data sheet 08006.

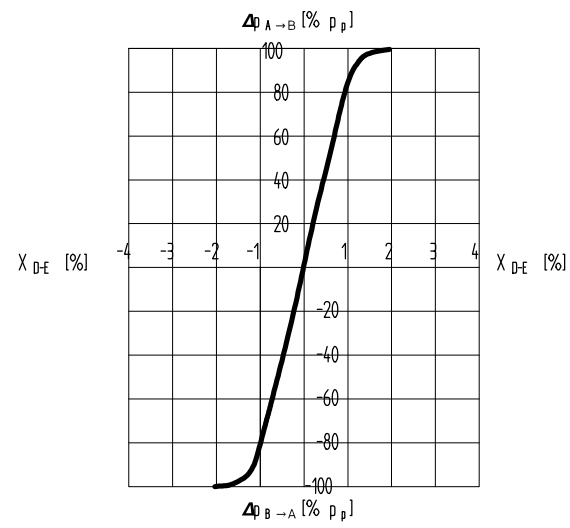
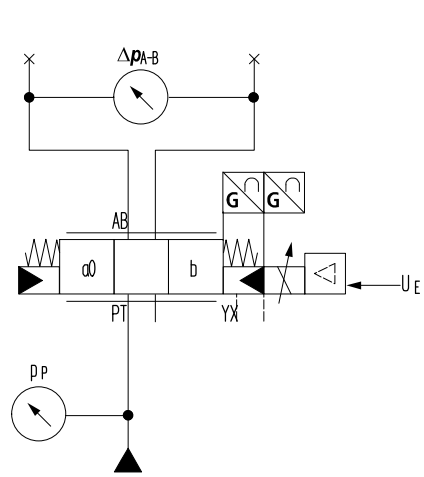
Block diagram: Integrated electronics (OBE)



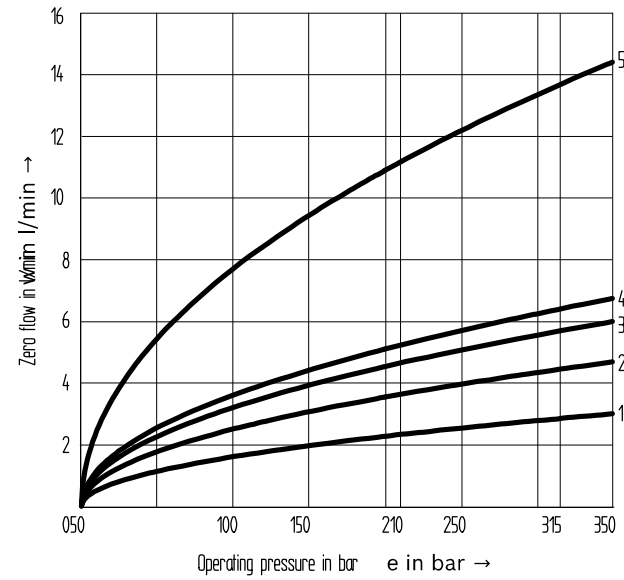
- ¹ Only with electronics interface "A5"
- ² Only with electronics interfaces "A1" and "F1"

Characteristic curves : (measured with HLP46,oil temperature = 40 °C ±5 °C)

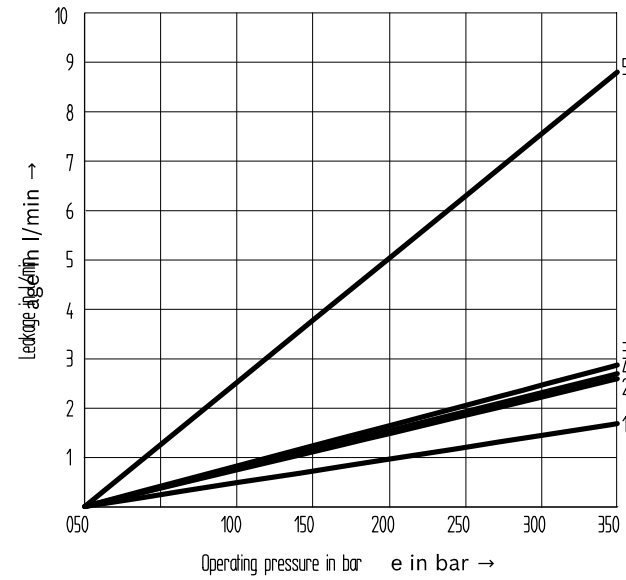
Pressure amplification



Maximum zero flow of the main stage (symbol V) with pilot control valve



Maximum internal leakage of the main stage (symbol W) with pilot control valve

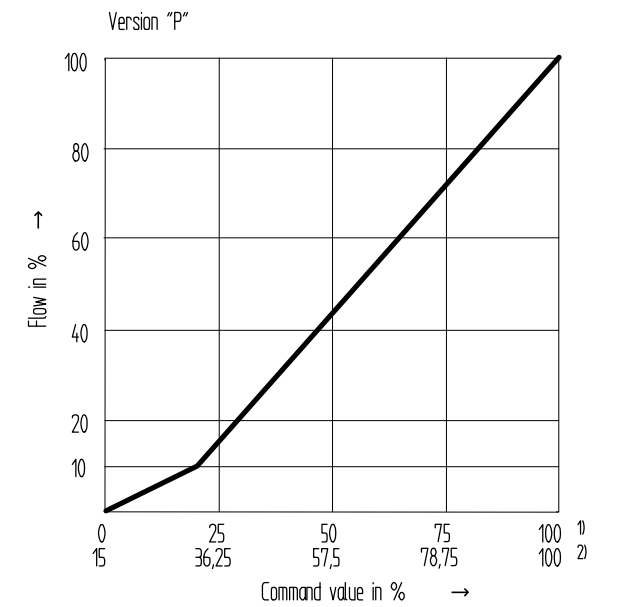
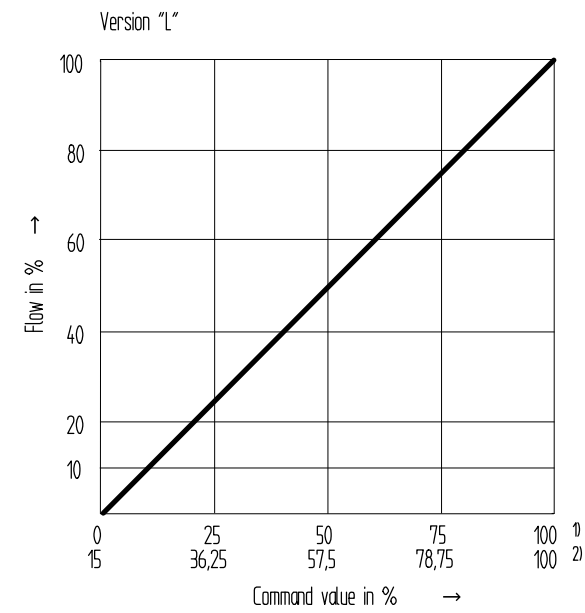


- 1 Size 10
- 2 Size 16
- 3 Sizes 25, 27
- 4 Size 32
- 5 Size 35

Characteristic curves : (measured with HLP46,oil temperature = 40 °C ±5 °C)

Flow command value function
($\Delta p = 5 \text{ bar/control edge}$)

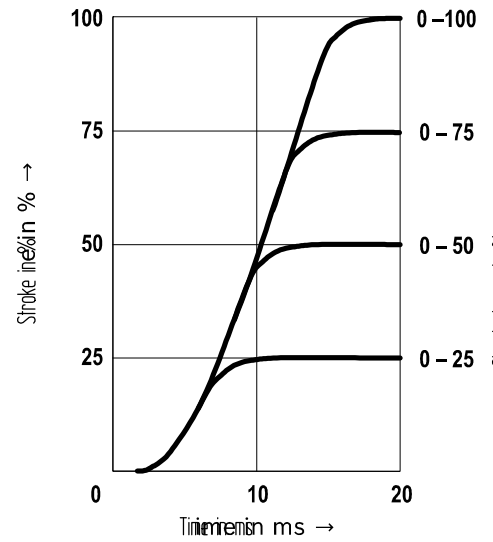
Symbol E, W, and V



- 1 Positive overlap 0 ... 0.5% at symbol V
- 2 Positive overlap 15% at symbol E and W

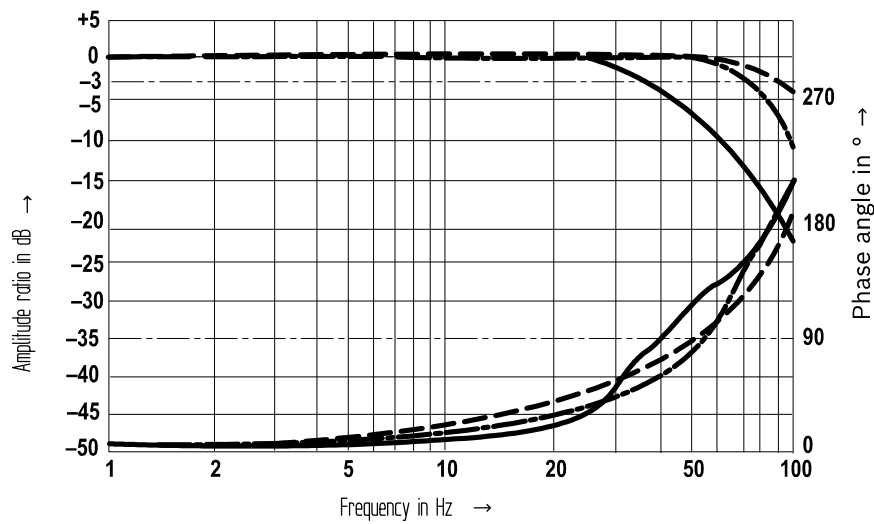
Characteristic curves: Size 10 (measured with HLP46,oil temperature = 40 °C ±5 °C)

Transition function with stepped electric input signals

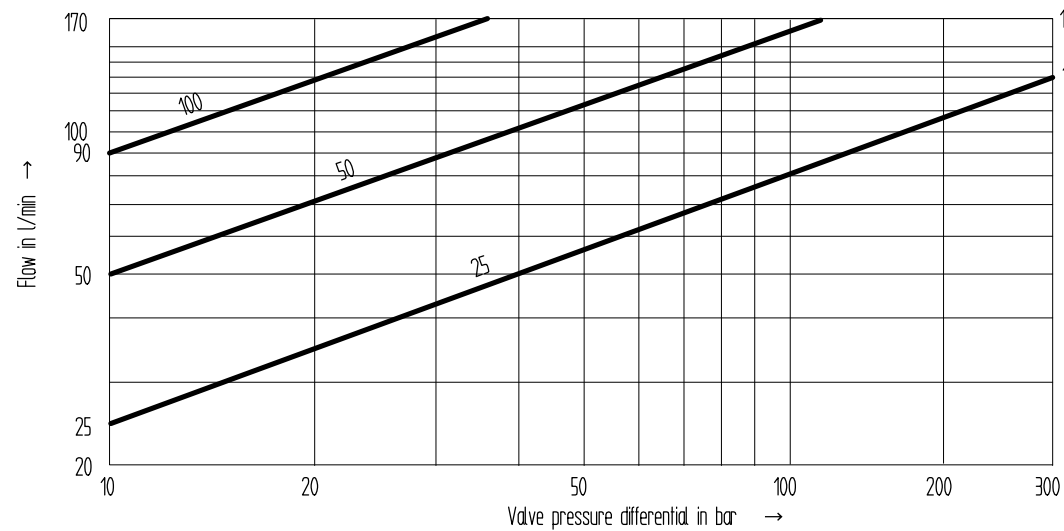


Measured with:
 ▶ Pilot control valve: Part X = 100 bar
 ▶ Main stage: Part P = 10 bar

Frequency response characteristic curves

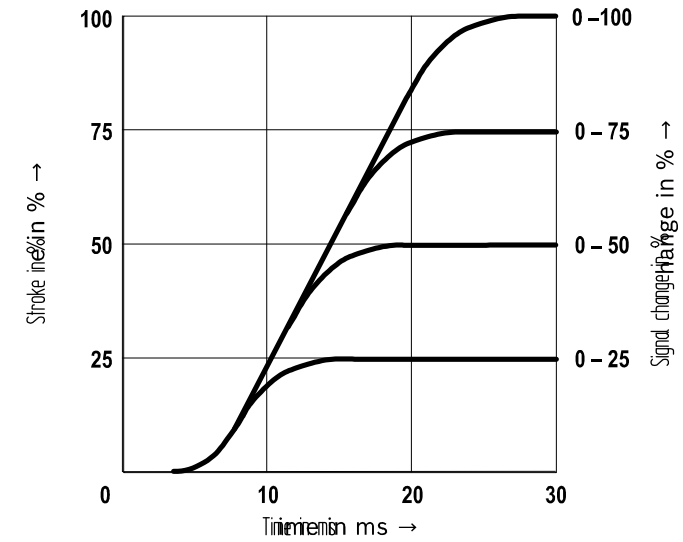


Flow/load function with maximum valve opening (tolerance $\pm 10\%$)



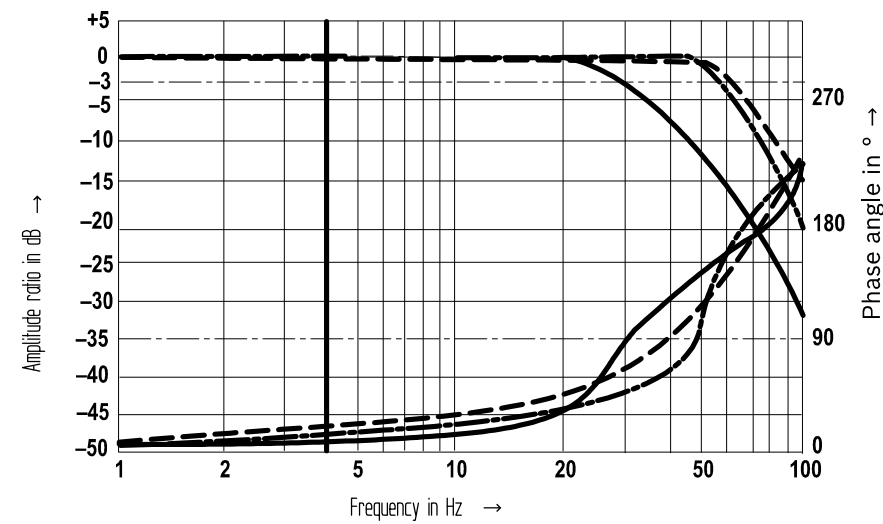
Characteristic curves: Size 16 (measured with HLP46,oil temperature = 40 °C ±5 °C)

Transition function with stepped electric input signals

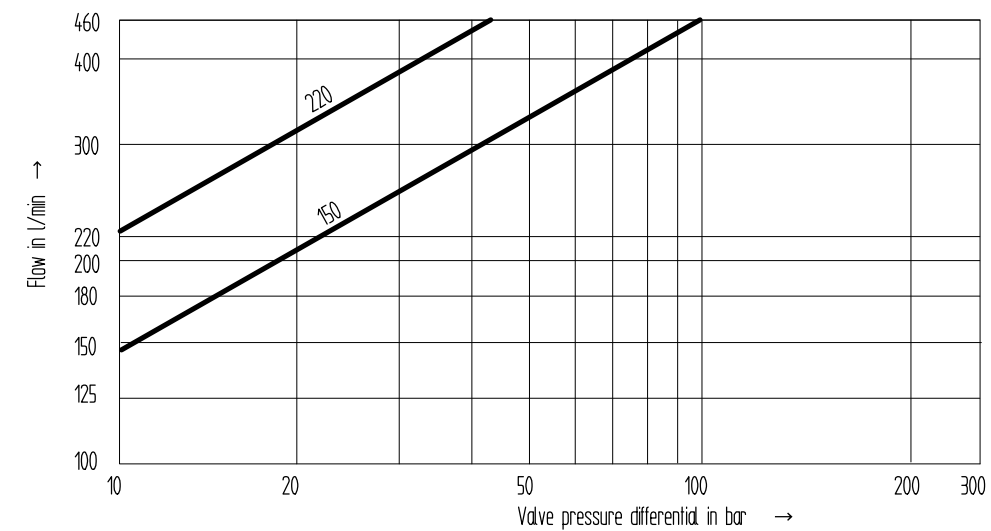


Measured with:
 ▶ Pilot control valve: Part X = 100 bar
 ▶ Main stage: Part P = 10 bar

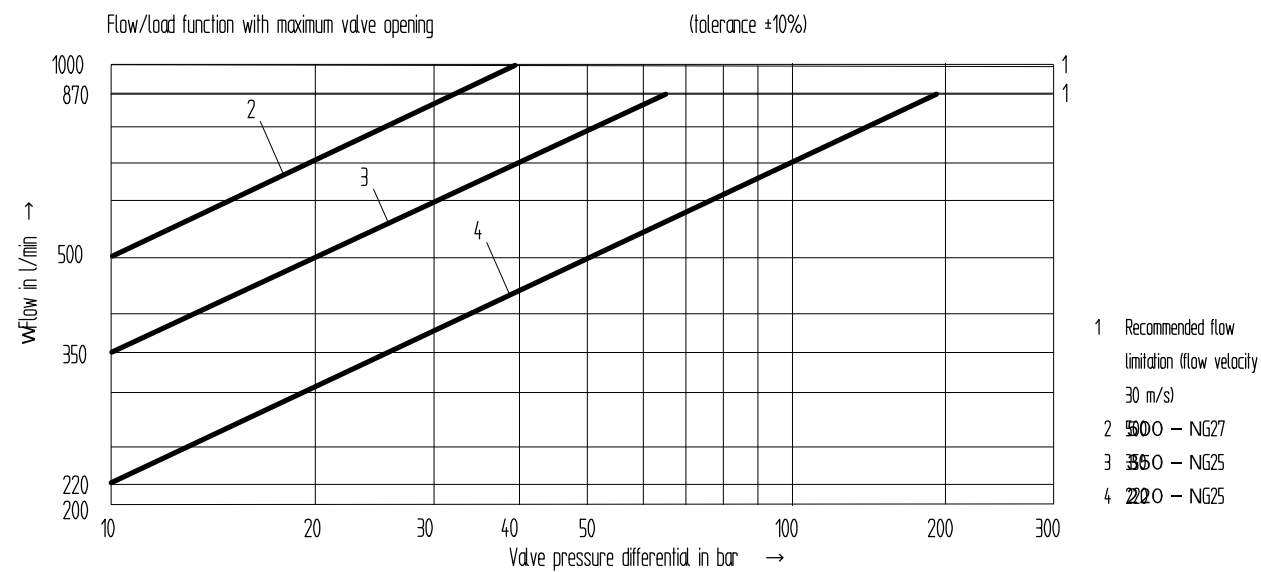
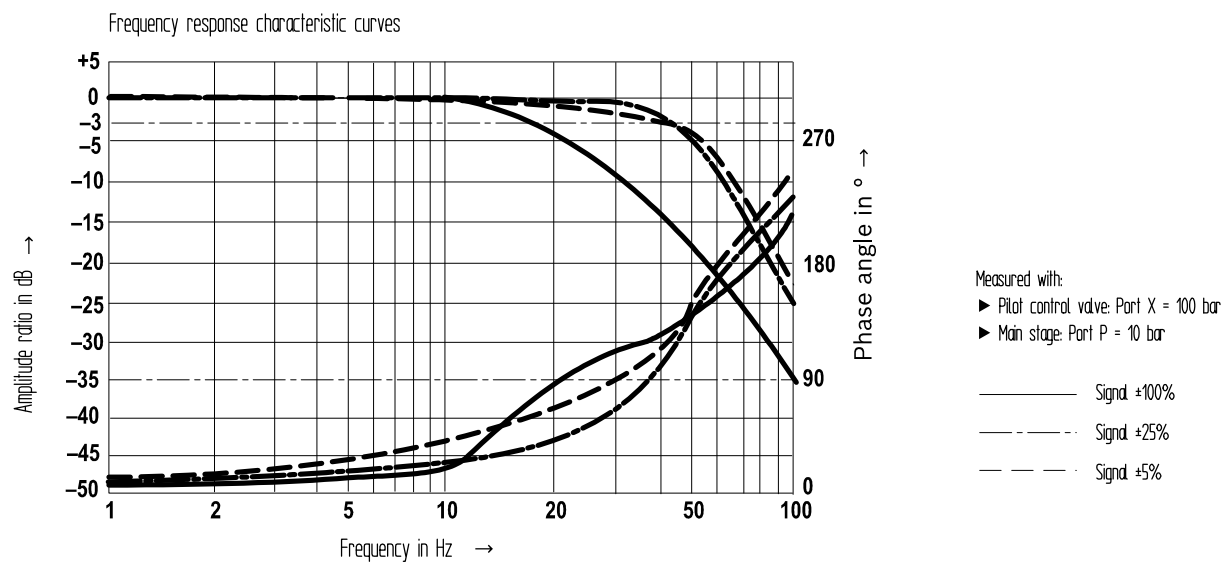
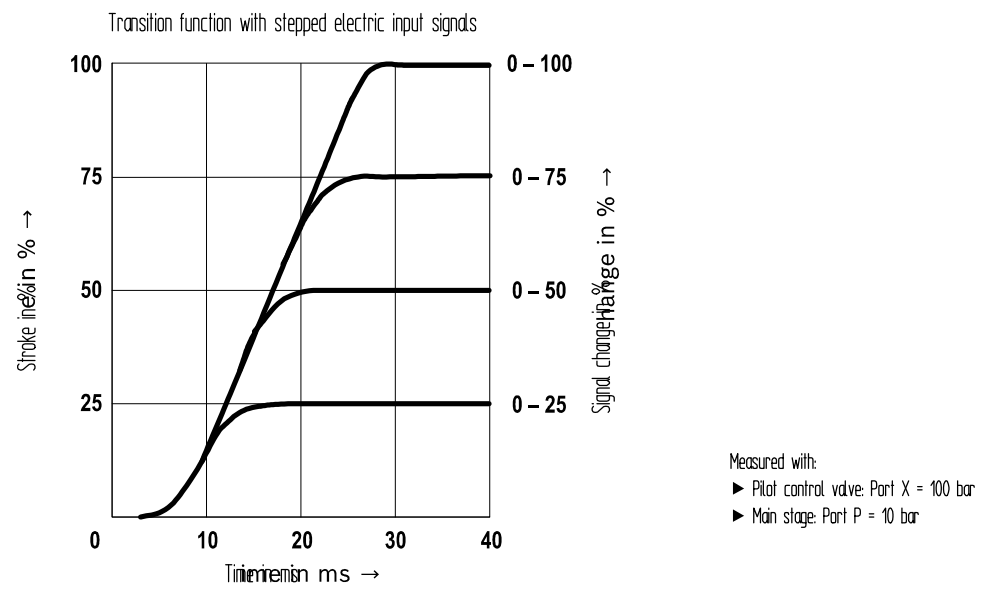
Frequency response characteristic curves



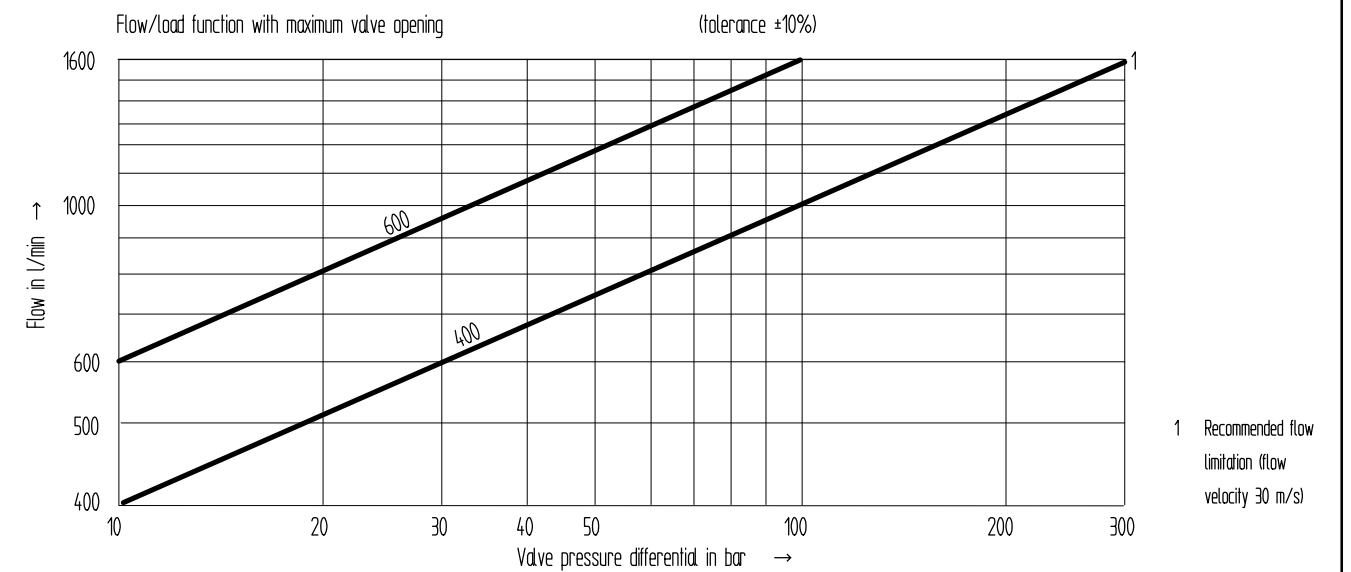
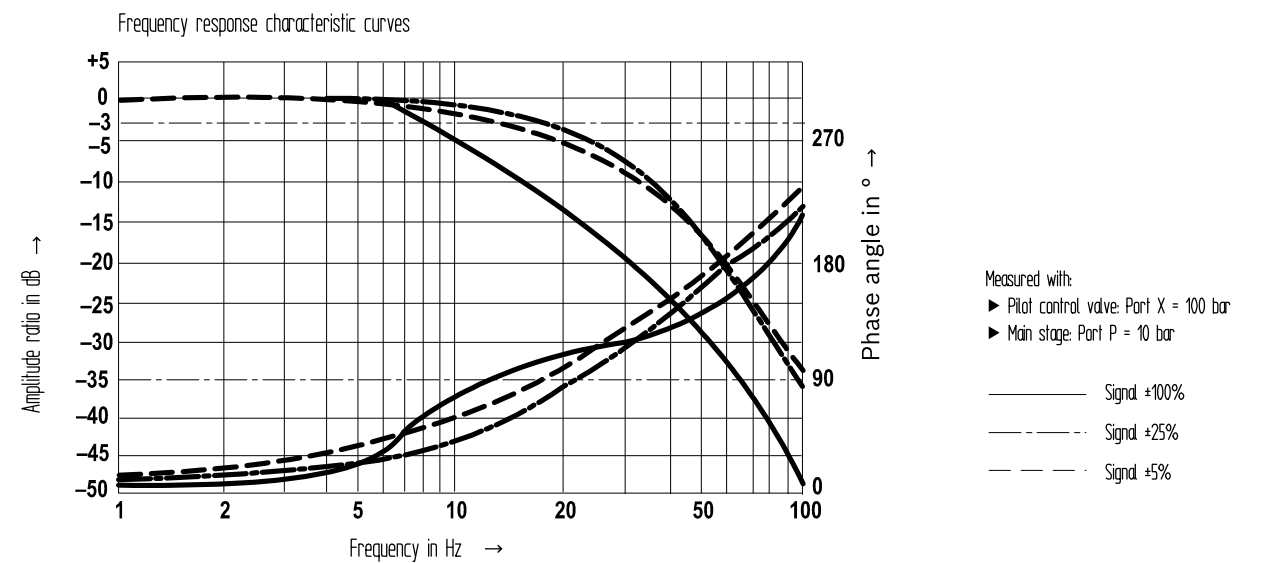
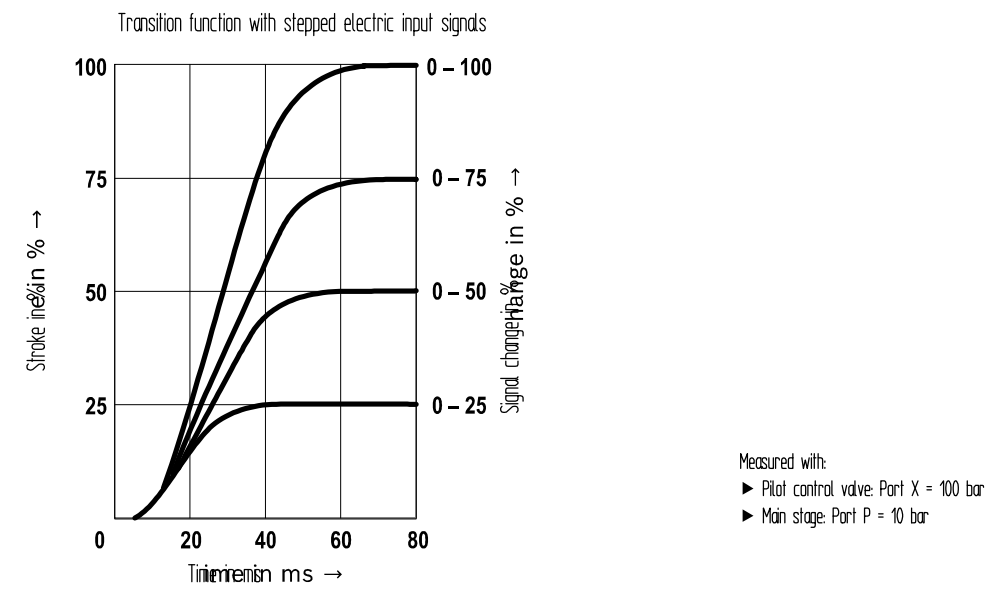
Flow/load function with maximum valve opening (tolerance $\pm 10\%$)



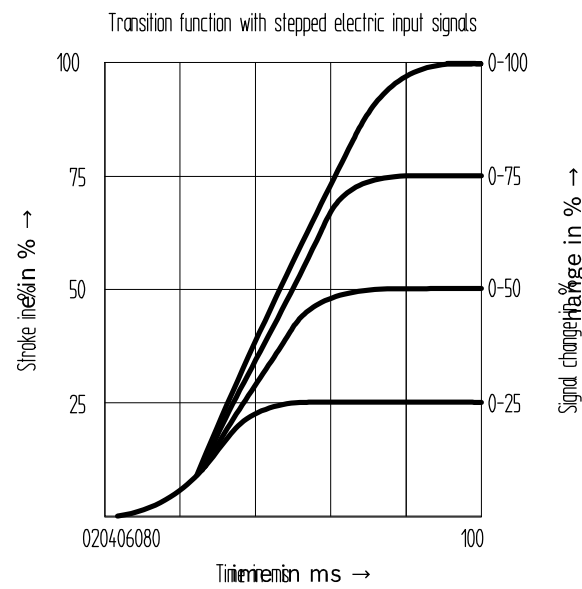
Characteristic curves : Size 25 (measured with HLP46,oil temperature = 40 °C ±5 °C)



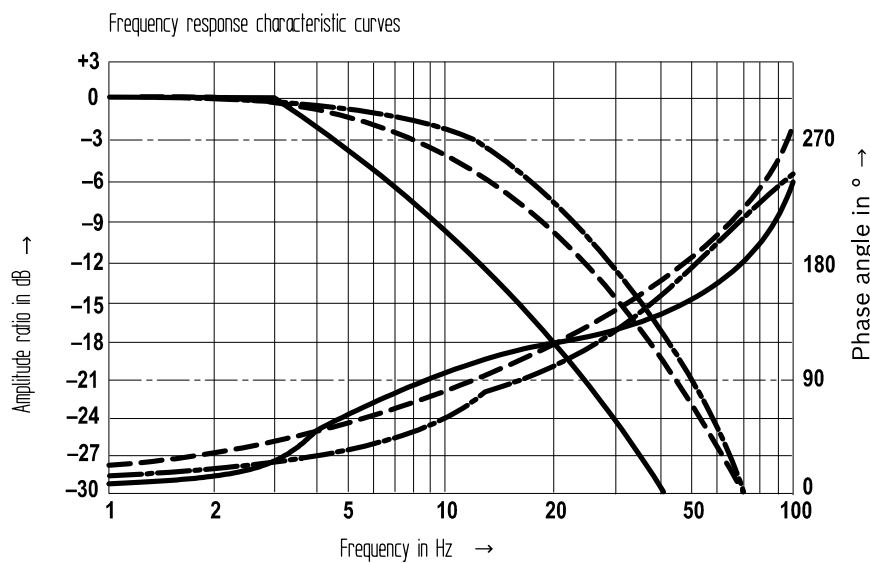
Characteristic curves : Size 32 (measured with HLP46,oil temperature = 40 °C ±5 °C)



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



Measured with:
 ▶ Pilot control valve: Part X = 100 bar
 ▶ Main stage: Part P = 10 bar



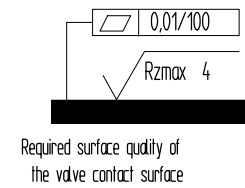
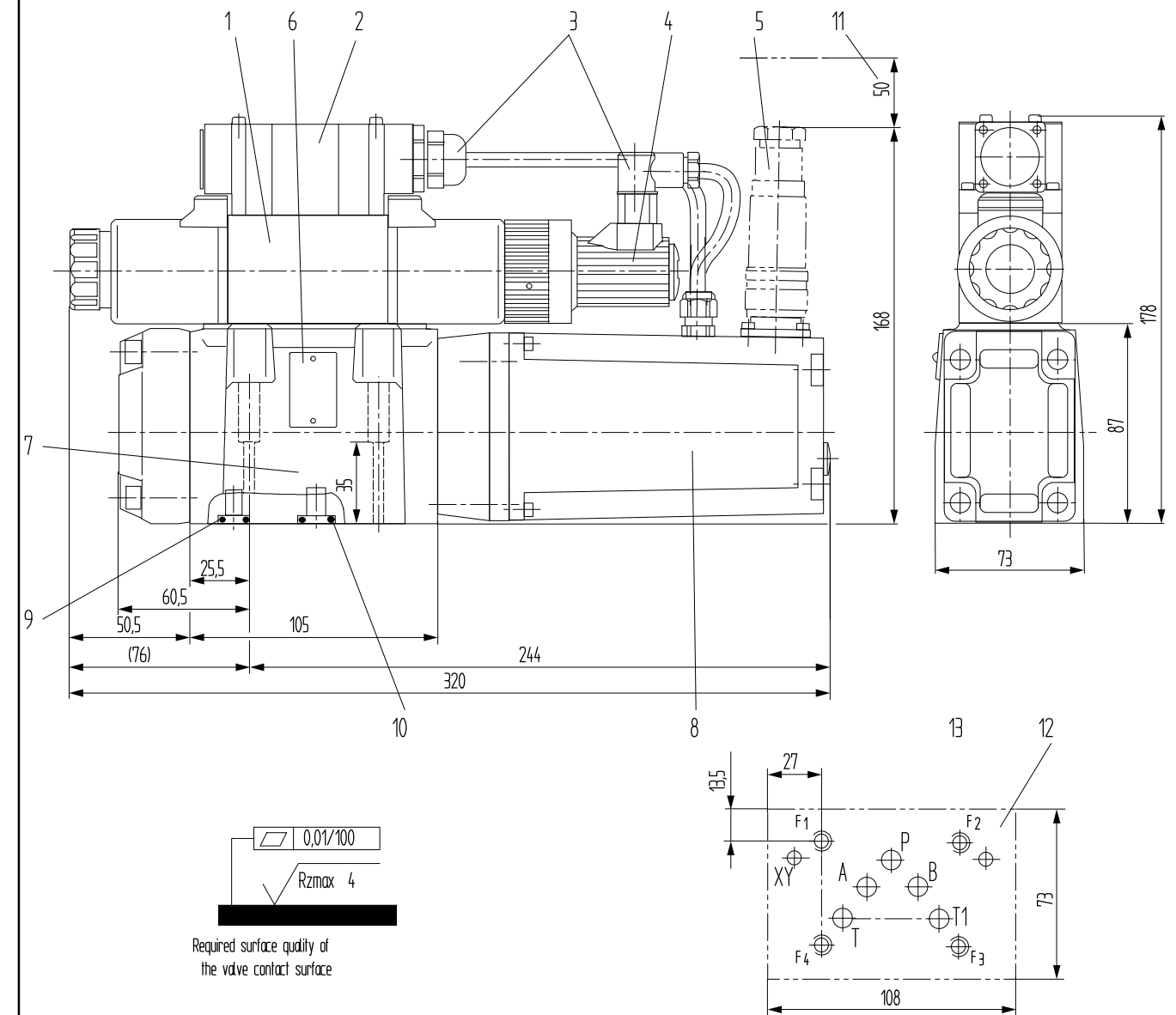
Measured with:
 ▶ Pilot control valve: Part X = 100 bar
 ▶ Main stage: Part P = 10 bar

— Signal +100%
 - - - Signal +25%
 - · - · Signal +5%



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

Dimensions: Size 10 (dimensions in mm)



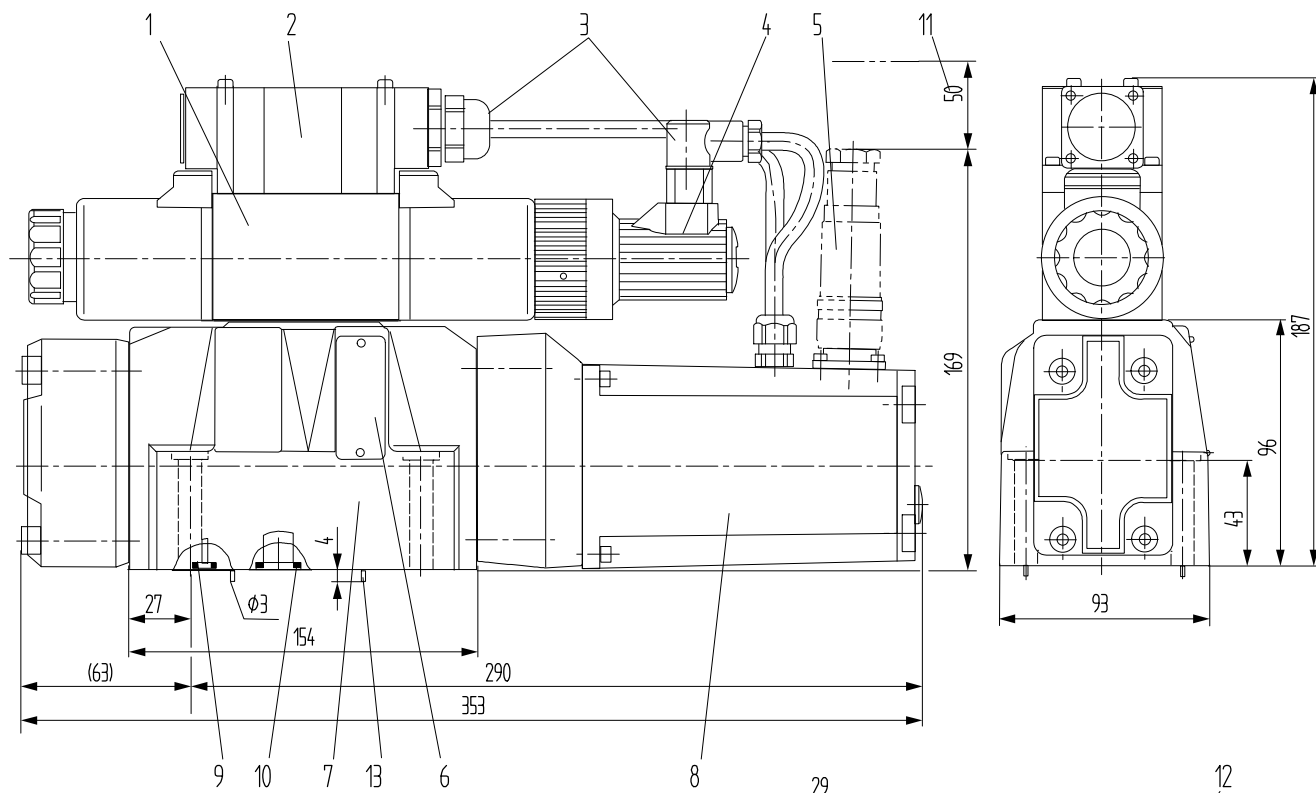
- 1 Pilot control valve
- 2 Electrical connection
- 3 Wiring and mating connector
- 4 Inductive position transducer (pilot control valve)
- 5 Mating connector 6-pole + PE (separate order, see page 28 and data sheet 08006)
- 6 Name plate
- 7 Main valve
- 8 Integrated electronics (OBE) and inductive position transducer (main valve)
- 9 Identical seal rings for parts X, Y
- 10 Identical seal rings for parts A, B, P, T, T1
- 11 Space required for connection cable and to remove the mating connector
- 12 Machined valve contact surface, porting pattern according to ISO 4401-05-05-0-05 (parts X, Y as required)

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

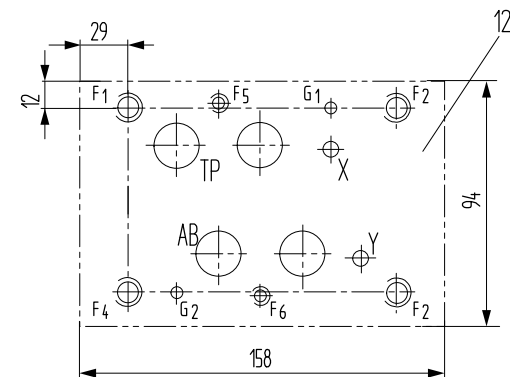
Notice:
 The dimensions are nominal dimensions which are subject to tolerances.

Dimensions for electronics protection membrane "967" see page 25
 Valve mounting screws see page 26.

Dimensions: Size 16 (dimensions in mm)



Required surface quality of the valve contact surface
 $Rz_{max} 4$



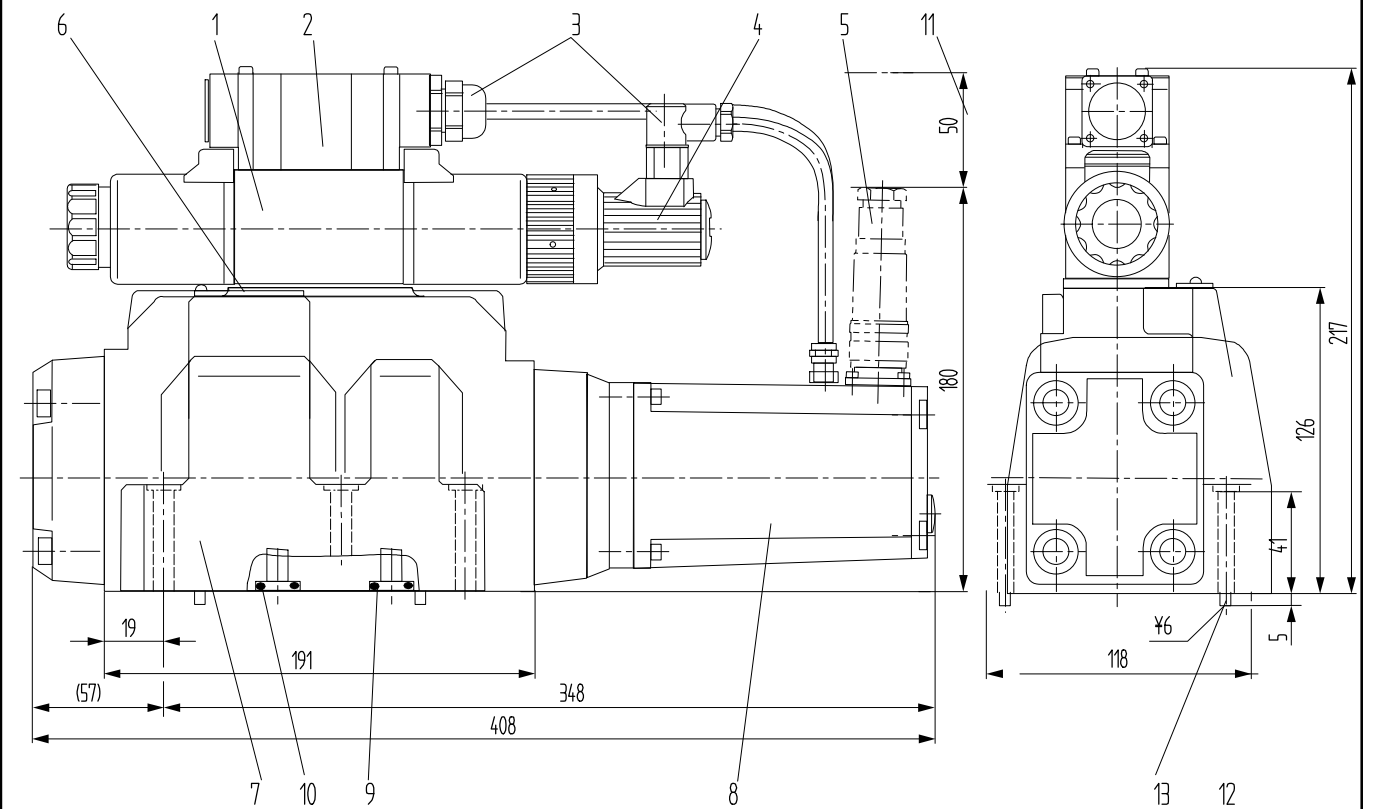
Subplates (separate order) with parting pattern according to ISO 4401-07-07-0-05 see data sheet 45100.

Notice:
The dimensions are nominal dimensions which are subject to

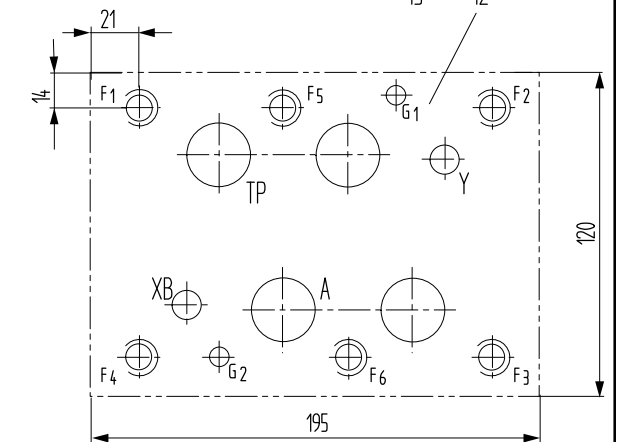
Dimensions for electronics protection membrane "967" and spool position monitoring "M" see page 25
 Valve mounting screws see page 26.

- 1 Pilot control valve
- 2 Electrical connection
- 3 Wiring and mating connector
- 4 Inductive position transducer (pilot control valve)
- 5 Mating connector 6-pole + PE (separate order, see page 28 and data sheet 08006)
- 6 Name plate
- 7 Main valve
- 8 Integrated electronics (IBE) and inductive position transducer (main valve)
- 9 Identical seal rings for parts X, Y
- 10 Identical seal rings for parts A, B, P, T
- 11 Space required for connection cable and to remove the mating connector
- 12 Machined valve contact surface; parting pattern according to ISO 4401-07-07-0-05 (parts X, Y as required)
Deviating from the standard: parts A, B, P, T = ± 20 mm
- 13 Locking pin

Dimensions: Size 25 (dimensions in mm)



Required surface quality of the valve contact surface
 $Rz_{max} 4$



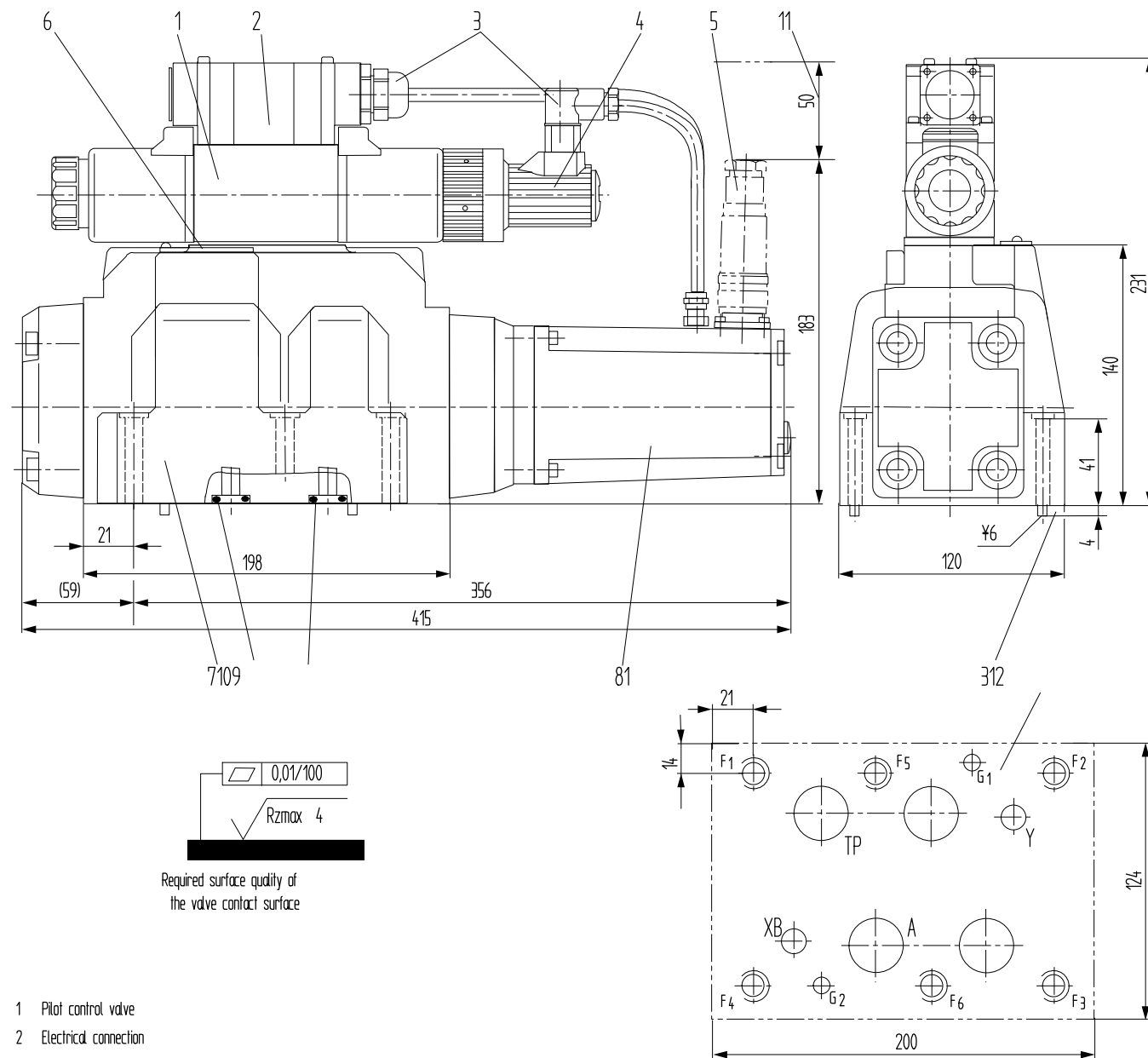
Subplates (separate order) with parting pattern according to ISO 4401-08-08-0-05 see data sheet 45100.

The dimensions are nominal dimensions which are subject to

Dimensions for electronics protection membrane "967" and spool position monitoring "M" see page 25
 Valve mounting screws see page 26.

- 1 Pilot control valve
- 2 Electrical connection
- 3 Wiring and mating connector
- 4 Inductive position transducer (pilot control valve)
- 5 Mating connector 6-pole + PE (separate order, see page 28 and data sheet 08006)
- 6 Name plate
- 7 Main valve
- 8 Integrated electronics (IBE) and inductive position transducer (main valve)
- 9 Identical seal rings for parts X, Y
- 10 Identical seal rings for parts A, B, P, T
- 11 Space required for connection cable and to remove the mating connector
- 12 Machined valve contact surface; parting pattern according to ISO 4401-08-08-0-05 (parts X, Y as required)
- 13 Locking pin

Dimensions: Size 27 (dimensions in mm)



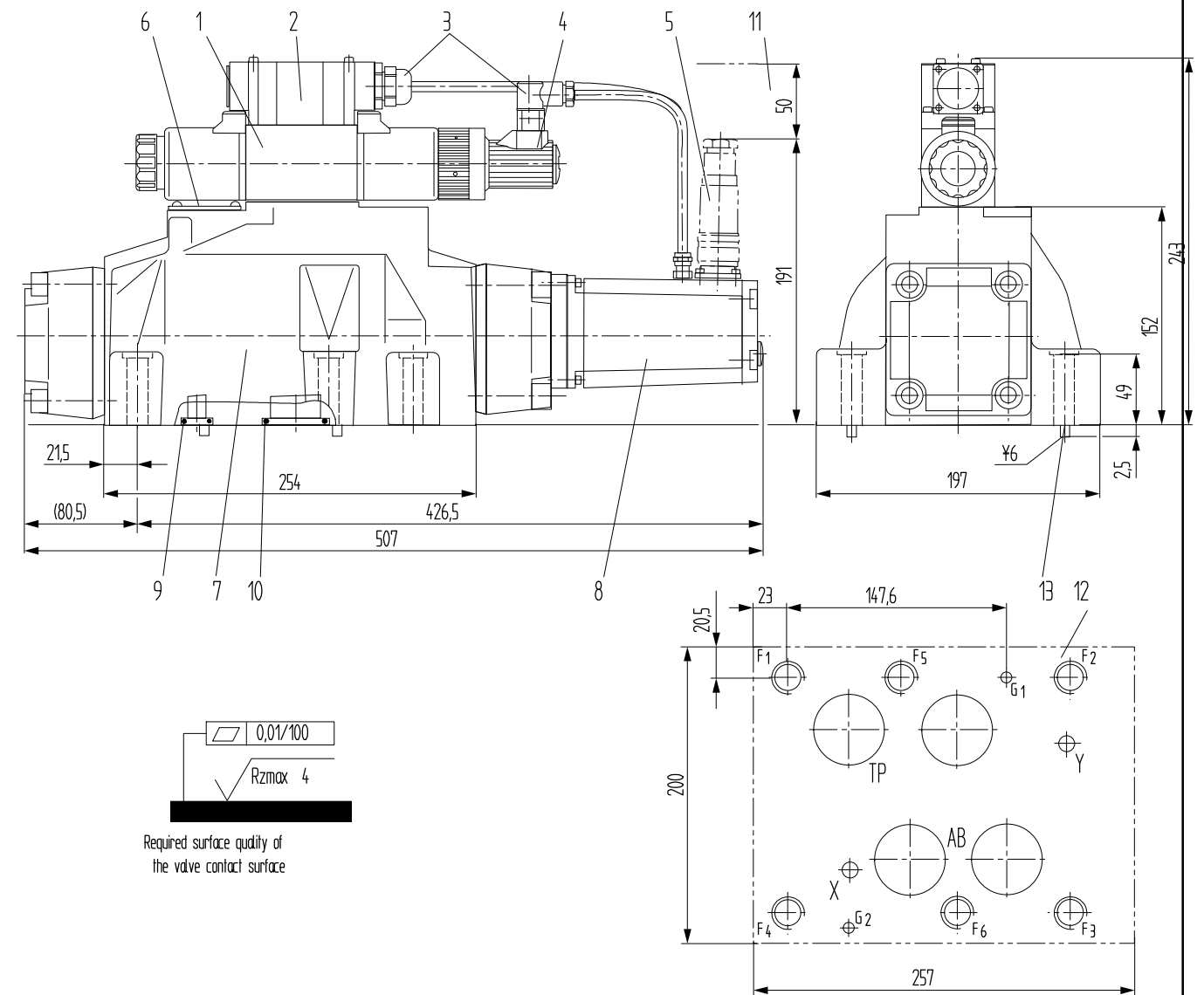
- 1 Pilot control valve
- 2 Electrical connection
- 3 Wiring and mating connector
- 4 Inductive position transducer (pilot control valve)
- 5 Mating connector 6-pole + PE (separate order, see page 28 and data sheet 08006)
- 6 Name plate
- 7 Main valve
- 8 Integrated electronics (OBE) and inductive position transducer (main valve)
- 9 Identical seal rings for parts X, Y
- 10 Identical seal rings for parts A, B, P, T
- 11 Space required for connection cable and to remove the mating connector
- 12 Machined valve contact surface; porting pattern according to ISO 4401-08-08-0-05 (parts X, Y as required)
Deviating from the standard: parts A, B, P, T - \varnothing 32 mm
- 13 Locking pin

Subplates (separate order) with porting pattern according to ISO 4401-08-08-0-05 see data sheet 45100.

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

Dimensions for electronics protection membrane "-967" and spool position monitoring "M" see page 25
Valve mounting screws see page 26.

Dimensions: Size 32 (dimensions in mm)



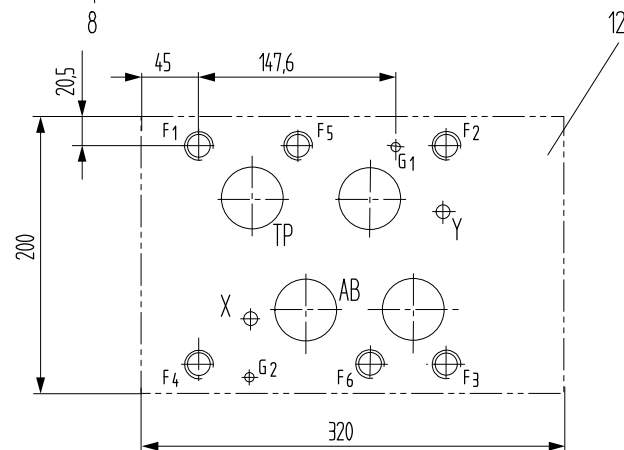
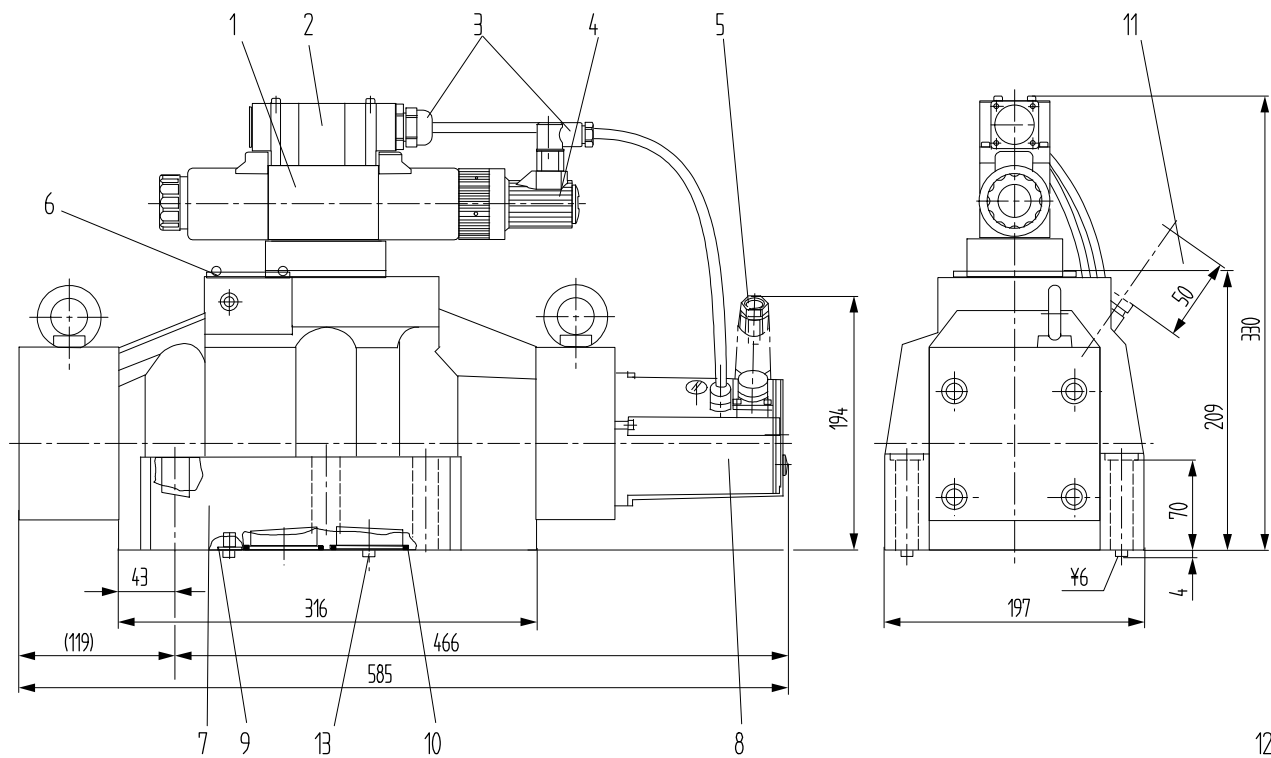
- 1 Pilot control valve
- 2 Electrical connection
- 3 Wiring and mating connector
- 4 Inductive position transducer (pilot control valve)
- 5 Mating connector 6-pole + PE (separate order, see page 28 and data sheet 08006)
- 6 Name plate
- 7 Main valve
- 8 Integrated electronics (OBE) and inductive position transducer (main valve)
- 9 Identical seal rings for parts X, Y
- 10 Identical seal rings for parts A, B, P, T
- 11 Space required for connection cable and to remove the mating connector
- 12 Machined valve contact surface; porting pattern according to ISO 4401-10-09-0-05 (parts X, Y as required)
Deviating from the standard:
▶ Parts A, B, P, T - \varnothing 38 mm
▶ Dimension G₁ according to DIN 24340 Form A
- 13 Locking pin

Subplates (separate order) with porting pattern according to ISO 4401-10-09-0-05 see data sheet 45100.

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

Dimensions for electronics protection membrane "-967" and spool position monitoring "M" see page 25
Valve mounting screws see page 26.

Dimensions: Size 35 (dimensions in mm)



0,01/100
Rzmax 4
Required surface quality of the valve contact surface

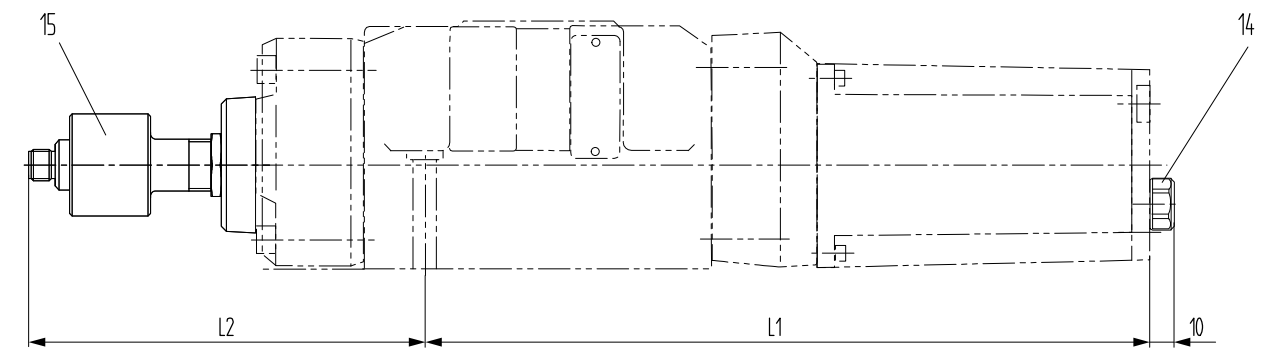
- 1 Pilot control valve
- 2 Electrical connection
- 3 Wiring and mating connector
- 4 Inductive position transducer (pilot control valve)
- 5 Mating connector 6-pole + PE (separate order, see page 28 and data sheet 08006)
- 6 Name plate
- 7 Main valve
- 8 Integrated electronics (OBE) and inductive position transducer (main valve)
- 9 Identical seal rings for parts X, Y
- 10 Identical seal rings for parts A, B, P, T
- 11 Space required for connection cable and to remove the mating connector
- 12 Machined valve contact surface; parting pattern according to ISO 4401-10-09-0-05 (parts X, Y as required)
Deviating from the standard:
▶ Ports A, B, P, T - ± 50 mm
▶ Dimension G according to DIN 24340 Form A
- 13 Locking pin

Subplates (separate order) with parting pattern according to ISO 4401-10-09-0-05 see data sheet 45100.

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

Dimensions for electronics protection membrane "-967" and spool position monitoring "M" see page 25
Valve mounting screws see page 26.

Dimensions: Spool position monitoring "M" and electronics protection membrane "-967" (dimensions in mm)



NG	L1	L2
10	240	-
16	286	151
25	347	143
27	353	144
32	422	168
35	463	201

- 14 Electronics protection membrane "-967"
- 15 Spool position monitoring "M", optional

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-EM-Fe-ZnNi-5-Cr-Ti-H-B tightening torque $M_A = 13.5 \text{ Nm} \pm 10\%$	R913043777
	4	ISO 4762 - M6 x 45 - 10.9 tightening torque $M_A = 15.5 \text{ Nm} \pm 10\%$	Not included in the Rexroth delivery range
16	2	ISO 4762 - M6 x 60 - 10.9-EM-Fe-ZnNi-5-Cr-Ti-H-B tightening torque $M_A = 12.2 \text{ Nm} \pm 10\%$	R913043410
	4	ISO 4762 - M10 x 60 - 10.9-flZn/nc/480h/C tightening torque $M_A = 58 \text{ Nm} \pm 20\%$	R913014770
	2	ISO 4762 - M6 x 60 - 10.9 tightening torque $M_A = 15.5 \text{ Nm} \pm 10\%$	Not included in the Rexroth delivery range
	4	ISO 4762 - M10 x 60 - 10.9 tightening torque $M_A = 75 \text{ Nm} \pm 20\%$	
25, 27	6	ISO 4762 - M12 x 60 - 10.9-flZn/nc/480h/C tightening torque $M_A = 100 \text{ Nm} \pm 20\%$	R913015613
	6	ISO 4762 - M12 x 60 tightening torque $M_A = 130 \text{ Nm} \pm 20\%$	Not included in the Rexroth delivery range
32	6	ISO 4762 - M20 x 80 - 10.9-flZn/nc/480h/C tightening torque $M_A = 340 \text{ Nm} \pm 20\%$	R913008472
	6	ISO 4762 - M20 x 80 - 10.9 tightening torque $M_A = 430 \text{ Nm} \pm 20\%$	Not included in the Rexroth delivery range
35	6	ISO 4762 - M20 x 100 - 10.9-flZn/nc/480h/C tightening torque $M_A = 465 \text{ Nm} \pm 20\%$	R913015670
	6	ISO 4762 - M20 x 100 - 10.9 tightening torque $M_A = 610 \text{ Nm} \pm 20\%$	Not included in the Rexroth delivery range

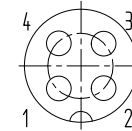
Notice:
The tightening torque of the hexagon socket head cap screws refers to maximum operating pressure.

Inductive position switch:

Electrical connection

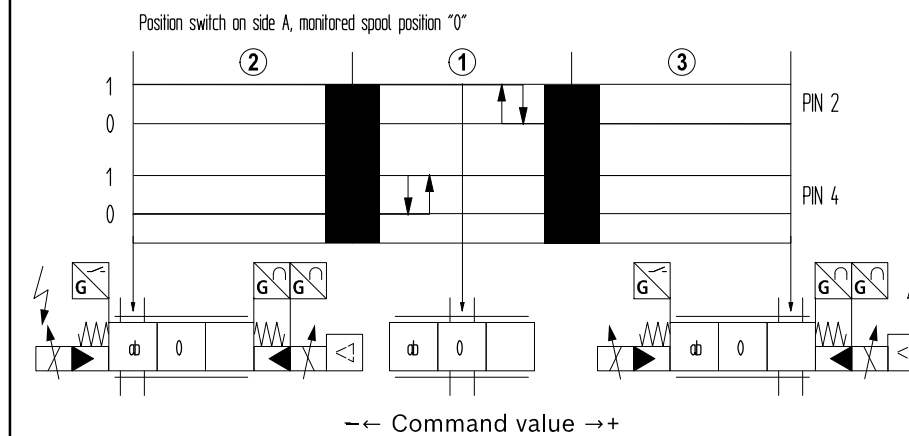
The electrical connection is realized via a 4-pole mating connector (separate order, see page 28) with connection thread M12 x 1.

Switching point	Within positive valve overlap
Supply voltage	20...32 V DC
Admissible residual ripple	$\leq 10\%$
Current consumption	approx. 25 mA (no load)
Outputs	2
Output function	PNP
Low level "0"	$< 0.5 \text{ V DC}$
High level "1"	$U_B - 2 \text{ V DC}$
Current carrying capacity	$\leq 400 \text{ mA}$
Signal delay time	$\leq 15 \text{ ms}$ (electrical, without switching time of valve)
Reference potential	GND
Pinout:	
	1 +24 V
	2 Switching output: 400 mA (valve opening P e opening P→A)
	3 0 V, GND
	4 Switching output: 400 mA (valve opening P e opening P→B)



Inductive position switch:

Switching logics



- ① Central position (mechanical control spool overlap)
- ② Valve opening P to B
- ③ Valve opening P to A

Accessories:

Mating connectors and cable sets (separate order)

Valve with integrated electronics

Mating connectors 6-pole + PE	Design	Design
For the connection of valves with integrated electronics, round connector 6+PE, line cross-section 0.5 ... 1.5 mm ²	straight	Metal
	straight	Plastic
	angled	Plastic

Cable sets 6-pole + PE	Length in m
For the connection of valves with integrated electronics, round connector 6+PE, straight connector, shielded, potted-in mating connector, line cross-section 0.75 mm ²	3.0
	5.0
	10.0
	20.0

Sensors

Mating connectors 4-pole	Design	Line fitting
For the connection of sensors with connector "K24", "K35" and "K72", line cross-section 0.75 mm ²	straight	PG7
	straight	PG9
	angled	PG7
	angled	PG9

Cable sets 4-pole	Design	Screening	Length in m
For the connection of sensors with connector "K24", "K35" and "K72", line cross-section 0.34 mm ²	straight	yes	2.0
	straight	no	3.0
	straight	yes	5.0
	straight	no	10.0
	angled	yes	2.0
	angled	yes	5.0
	angled	no	10.0