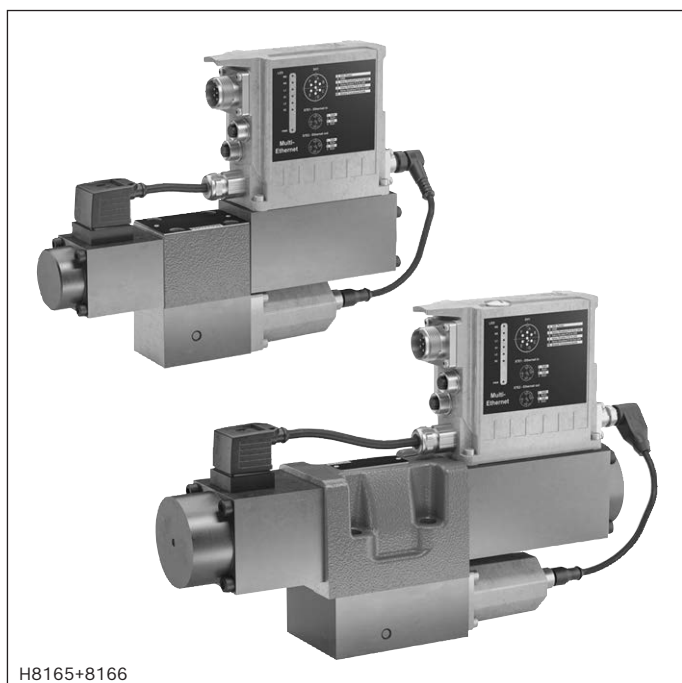


Directional control valves, direct operated, with electrical position feedback and integrated flow control (IFB Multi-Ethernet)

Type 4WRPQ



- ▶ Sizes 6 and 10
- ▶ Component series 3X
- ▶ Maximum operating pressure 280 bar
- ▶ Rated flow 32, 80 l/min ($\Delta p = 5$ bar)



Features

- ▶ Open
 - Integrated, digital flow controller (IFB Multi-Ethernet)
 - Bus connection/service interface (Sercos, Ether-CAT, EtherNet/IP, PROFINET RT, VARAN)
- ▶ Safe
 - Internal safety function (can be used up to category 4/PL e according to EN 13849-1)
 - CE conformity according to EMC Directive 2014/30/EU

Contents

| | |
|---|-----------|
| Features | 1 |
| Ordering code | 2 |
| Symbols | 3 |
| Function | 4, 5 |
| Technical data | 6 ... 8 |
| Block diagram/controller function block | 9 |
| Electrical connections, assignment | 10 |
| LED displays | 11 |
| Characteristic curves | 12 ... 21 |
| Dimensions | 22 ... 24 |
| Accessories | 25 |
| Project planning and maintenance instructions | 26 |
| Further information | 26 |

Ordering code

| | | | | | | | | | | | | | | | | | | |
|----------|------------|----------|----|----|----|----------|----------|-----------|----------|----|----------|----------|----------|-----------|----|-----------|----------|----------|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | | |
| 4 | WRP | Q | | | | S | - | 3X | / | | G | F | / | 24 | | D9 | 0 | * |

| | | |
|----|--|------------|
| 01 | 4 main ports | 4 |
| 02 | Directional control valve, direct operated | WRP |
| 03 | With integrated digital flow controller | Q |
| 04 | Size 6 | 6 |
| | Size 10 | 10 |
| 05 | Symbols; possible version see page 3 | |

Rated flow ($\Delta p = 5$ bar/control edge)

| | | |
|----|---------------------|-----------|
| 06 | 32l/min (only NG6L) | 32 |
| | 80l/min (only NG10) | 80 |

Flow characteristic

| | | |
|----|--|-----------|
| 07 | Progressive | S |
| 08 | Component series 30 ... 39 (30 ... 39: unchanged installation and connection dimensions) | 3X |

Seal material (observe compatibility of seals with hydraulic fluid used, see page 7)

| | | |
|----|-----------|--------------------------------|
| 09 | NBR seals | M \diamond |
| | FKM seals | V |

Pressure sensor (pressure rating)

| | | |
|----|-------------------------|----------|
| 10 | Pressure rating 280 bar | G |
|----|-------------------------|----------|

Internal pressure sensor (position)

| | | |
|----|---------------------|-----------|
| 11 | In port A, B and P | F |
| 12 | Supply voltage 24 V | 24 |

Ethernet interface

| | | |
|----|----------------------------|----------|
| 13 | EtherNET/IP | E |
| | PROFINET RT | N |
| | Sercos | S |
| | EtherCAT (CANopen profile) | T |
| | VARAN | V |

Connector

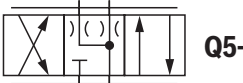
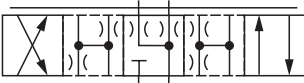
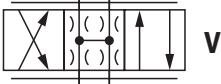
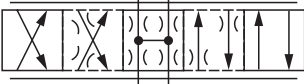
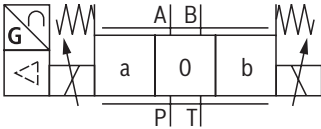
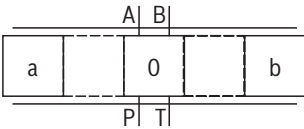
| | | |
|----|---------------------------------------|-----------|
| 14 | Voltage supply, enable acknowledgment | D9 |
|----|---------------------------------------|-----------|

Pressure sensor interface

| | | |
|----|-----------------------------------|----------|
| 15 | Without interface | 0 |
| 16 | Further details in the plain text | * |

 **Notice:** \diamond = Preferred type

Symbols



Notice:

Representation according to DIN ISO 1219-1.
 Hydraulic interim positions are shown by dashes.

Function

General

The **IFB Multi-Ethernet** valve (Integrated **F**ield**b**us) is a digital directional control valve with integrated flow controller, load-independent.

The following operating modes are possible:

- ▶ Valve direct control
- ▶ Flow control
- ▶ Pressure/force control
- ▶ Pressure control/flow alternating
- ▶ Torque/force control/flow
- ▶ Pressure control/valve direct control alternating
- ▶ Alternating control (flow – pressure/force);
pQ function (flow-controlled)

Communication is done via the digital Multi-Ethernet interface (X7E1 or X7E2) only. The following data may be exchanged:

- ▶ Command values
- ▶ Actual values

- ▶ Configuration and setting of the system control parameters
- ▶ Status messages, faults or warnings

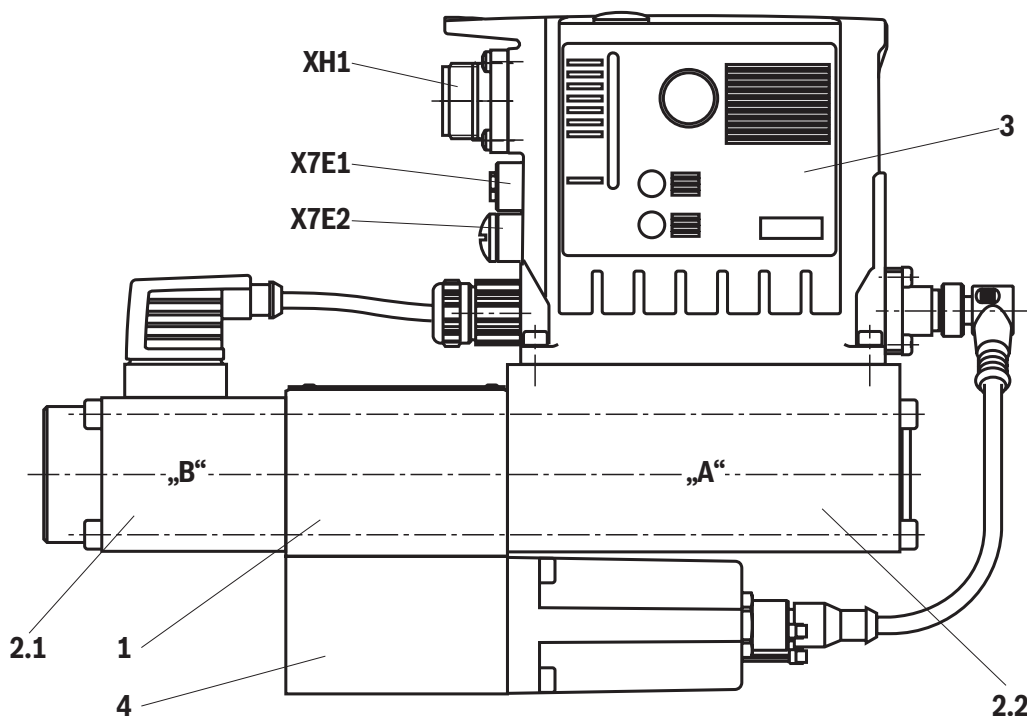
Set-up

The directional control valve with IFB Multi-Ethernet electronics mainly consists of:

- ▶ Main housing with control spool (1)
- ▶ Control electronics with integrated fieldbus (3)
 - Connector, voltage supply, safety shut-down (XH1)
 - Ethernet interfaces (X7E1, X7E2)
- ▶ Pressure sensor sandwich plate (4)
- ▶ Stroke solenoid (2.1)
- ▶ Control solenoid with electrical position feedback (2.2)

Notice:

With version "V32", the control spool may rotate in case of single-sided flow through the supply flow edges (P–A or P–B) causing damage to or failure of the valve. This can be solved by reduction of the pressure differential over the supply flow edge to a maximum of 80 bar or by simultaneous use of both control edges (P–A/B–T or P–B/A–T).



Function (flow control)

The integrated electronics (OBE) enables load-independent control of the flow at positive command value by means of the two integrated pressure sensors in ports P and A. At negative command value, the flow is controlled from P to B.

Safety function (only symbol Q5-)

The integrated electronics (OBE) of the valve enable additional shut-off of a channel according to EN 13849-1 in both directions (depending on the symbol, the valve can be considered as safely switched off).

When using symbol V, the valve cannot be used in a safety-relevant manner according to EN 13849-1 while enable acknowledgment always remains 0.

Thanks to the two control solenoids (enable pin D and E, low signal) at the connector (XH1), direction-dependent shut-off is enabled. The control spool of the valve is in spring-centered central position for this purpose (fail-safe position).

Enable acknowledgment pin C for solenoid A and pin F for solenoid B are "high". By connecting both control solenoids (enable pin D and E, high signal), the valve can be controlled by a command value presetting (command value positive, solenoid B or command value negative, solenoid A).

Enable acknowledgment pin C for solenoid A and pin F for solenoid B are "low".

Separate shut-off of solenoid A or solenoid B will moreover allow for the direction-dependent activation or shut-off of the drive.

The integrated electronics (OBE) of the valve enable additional shut-off of a channel according to EN 13849-1 in both directions (depending on the symbol, the valve can be considered as safely switched off). For this purpose, a suitable control system must be provided to perform the plausibility check between the direction-dependent valve signals "enable input" and "enable acknowledgment" (diagnosis signal fed back by the valve) and react in an error case.

When using symbol V, the valve cannot be used in a safety-relevant manner according to EN 13849-1.

Monitoring

The digital control electronics enable comprehensive monitoring functions/error detection including:

- ▶ Undervoltage
- ▶ Communication error
- ▶ Cable break for analog sensor inputs
- ▶ Monitoring of the microcontroller (watchdog)
- ▶ Temperature of the integrated electronics

IndraWorks DS PC program

To implement the project planning task and to parameterize the valve, the user may use the IndraWorks DS engineering tool (see accessories):

- ▶ Project planning
- ▶ Parameterization
- ▶ Commissioning
- ▶ Diagnosis
- ▶ Comfortable administration of all data on a PC
- ▶ PC operating systems: Windows 10

Notes:

- ▶ When using symbol V, the enable inputs (enable pin D and E) may only be activated and deactivated together.
- ▶ For all other symbols, a unilateral shut-off will cause reduced performance data.
- ▶ 4/3 directional control valves do not have a leakage-free basic locking when deactivated. Leakage must be considered when designing the drive.
- ▶ Valve type 4WRPQ (symbol Q5-) can be used as shut-off element cat. 3 or 4 (up to PL e according to EN 13849-1). For both categories, an additional shut-off element is required to achieve a two-channel shut-off. For further information on the safety application, see operating instructions 29391-B.
- ▶ At a flow command value of 0, the specified flow control tolerance also applies.

Technical data

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

| General | | | |
|--|---|---|---------------------|
| Size | NG | 6 | 10 |
| Type of connection | Subplate mounting | | |
| Porting pattern | ISO 4401-03-02-0-05 | | ISO 4401-05-04-0-05 |
| Weight | kg | 4.7 | 9.8 |
| Installation position | any | | |
| Ambient temperature range | °C | -20 ... +60 | |
| Storage temperature range (with UV protection) | °C | +10 ... +40 | |
| Transport temperature range | °C | -30 ... +80 | |
| Maximum storage time | years | 1 (if the storage conditions are observed, refer to the operating instructions 07600-B) | |
| Maximum relative humidity (no condensation) | % | 95 | |
| Maximum solenoid surface temperature | °C | 150 (individual operation) | |
| MTTF _d value according to EN ISO 13849 | years | 150 (for further details see data sheet 08012) | |
| Can be used up to category according to EN ISO 13849-1 | 3 or 4 (up to PL e); as shut-off element (not symbol V) | | |
| Vibration resistance | ▶ 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 | |
| Conformity | ▶ CE according to EMC directive 2014/30/EU, tested according to | EN 61000-6-2 and EN 61000-6-3 | |
| | ▶ RoHS directive | 2011/65/EU ¹⁾ | |
| Protection class according to EN 60529 | IP65 (if suitable and correctly mounted mating connectors are used) | | |

| Hydraulic | | | |
|--|------------------------------|--------------------|------------|
| Maximum operating pressure | ▶ Ports A, B, P | bar | 280 |
| | ▶ Port T | bar | 200 |
| Hydraulic fluid | see table page 7 | | |
| Hydraulic fluid temperature range (flown-through) | °C | -20 ... +70 | |
| Viscosity range | ▶ recommended | mm ² /s | 20 ... 100 |
| | ▶ maximum admissible | mm ² /s | 10 ... 800 |
| Maximum admissible degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c) | Class 18/16/13 ³⁾ | | |
| Rated flow ($\Delta p = 5$ bar/control edge ²⁾) | l/min | 32 | 80 |

1) The product fulfills the substance requirements of the RoHS directive 2011/65/EU.

2) Flow for deviating Δp (per control edge):

$$q_x = q_{Vnom} \cdot \sqrt{\frac{\Delta p_x}{5}}$$

3) 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.

Notice:

The specified technical data were measured with HLP46 and $\vartheta_{oil} = 40 \pm 5$ °C.

Technical data

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

| 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 | ISO 15380 | 90221 |
| | | HEES | | |
| | ▶ Soluble in water | HEPG | ISO 15380 | |
| Flame-resistant | ▶ Water-free | HFDU (glycol base) | ISO 12922 | 90222 |
| | | HFDU (ester base) | | |
| | | HFDR | | |
| | ▶ Containing water | HFC (Fuchs: Hydrotherm 46M, Renosafe 500; Petrofer: Ultra Safe 620; Houghton: Safe 620; Union: Carbide HP5046) | 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 (valve direct control)

| | | |
|---|-----------|-------------------|
| Hysteresis | % | < 0.25 |
| Range of inversion | % | < 0.05 |
| Response sensitivity | % | < 0.05 |
| Manufacturing tolerance q_{Vmax} | % | < 10 |
| Temperature drift (temperature range 20 °C ... 80 °C) | %/10 K | Zero shift < 0.25 |
| Pressure drift | %/100 bar | Zero shift < 0.2 |
| Zero compensation | | ex plant ±1% |

Static /dynamic (flow control)

| | | | |
|-----------------------------|-------|------|-------|
| Size | NG | 6 | 10 |
| Flow accuracy ⁴⁾ | l/min | 80±4 | 180±9 |

⁴⁾ Accuracy tolerance of regulated flow/recommended maximum flow

Technical data

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

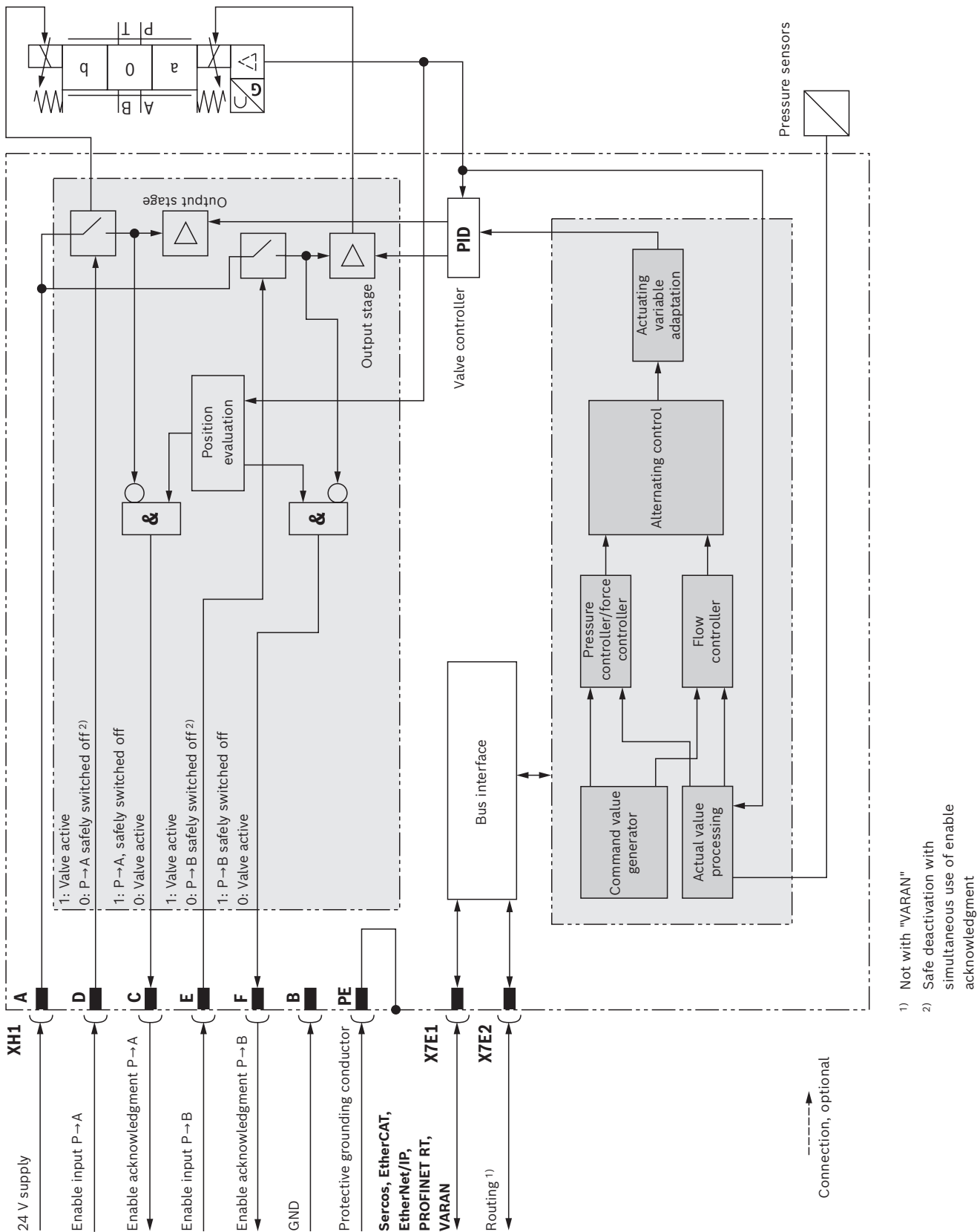
| Electrical, integrated electronics (OBE) | | | |
|--|--|-----------------|---|
| Size | | NG | 6 10 |
| Supply voltage ⁵⁾ | ▶ Nominal voltage | VDC | 24 |
| | ▶ Minimum | VDC | 18 |
| | ▶ Maximum | VDC | 36 |
| | ▶ Maximum residual ripple | V _{pp} | 2.5 (comply with the absolute supply voltage limit values) |
| Current consumption (at nominal voltage) | ▶ Maximum ⁶⁾ | A | 2.5 2.8 |
| | ▶ Impulse current | A | 4 4 |
| Maximum power consumption | | W | 40 65 |
| Relative duty cycle | | % | 100 (continuous operation) |
| Fuse protection, external | | A | 4, time-lag |
| Functional ground and screening | | | see connector pin assignment (CE-compliant installation) page 10 |
| Booting time | | s | <15 |
| Switching input Enable XH1 | ▶ Quantity | | 2 |
| | ▶ Low level | V | -3 ... 5 |
| | ▶ High level | V | 15 ... U_B |
| | ▶ Maximum current consumption at high level | mA | <15 |
| Switching output Enable acknowledgment XH1 ⁷⁾ | ▶ Quantity | | 2 |
| | ▶ Low level | V | 0 ... 3 |
| | ▶ High level | V | 15 ... U_B |
| | ▶ Current carrying capacity | mA | 50 (short-circuit-proof) |

⁵⁾ Voltage limit values must be observed directly at the connector of the valve (observe line length and cable cross-section!)

⁶⁾ The maximum current consumption will increase when using the sensor inputs or the switching output according to the external load

⁷⁾ The enable acknowledgment outputs must always be loaded with current-consuming switching inputs.

Block diagram/controller function block



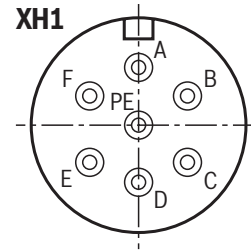
Electrical connections, assignment

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

| Pin | Assignment of interface D9 |
|-----|---|
| A | 24 VDC supply voltage ¹⁾ |
| B | GND (reference for pin A, C, D, E, F) |
| C | Enable acknowledgment 24 VDC ($I_{\max} = 50 \text{ mA}$) ²⁾ (high $\geq 15 \text{ V}$; low $< 2 \text{ V}$); Flow from P→A |
| D | Enable input 24 VDC (high $\geq 15 \text{ V}$; low $< 2 \text{ V}$); Flow from P→A |
| E | Enable input 24 VDC (high $\geq 15 \text{ V}$; low $< 2 \text{ V}$); Flow from P→B |
| F | Enable acknowledgment 24 VDC ($I_{\max} = 50 \text{ mA}$) ²⁾ (high $> 15 \text{ V}$; low $< 2 \text{ V}$); Flow from P→B |
| PE | Functional ground (connected directly to metal housing) |

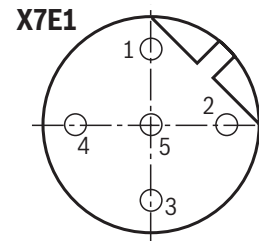
¹⁾ A load increases the current consumption on pin A

²⁾ Enable acknowledgment is issued only if the valve has safely switched off according to EN 13849-1, see operating instructions 29391-B.



Connector pin assignment for Ethernet interfaces "X7E1" and "X7E2" (coding D), M12, 4-pole, socket

| Pin | Assignment |
|-----|------------|
| 1 | TxD + |
| 2 | RxD + |
| 3 | TxD - |
| 4 | RxD - |
| 5 | Not used |

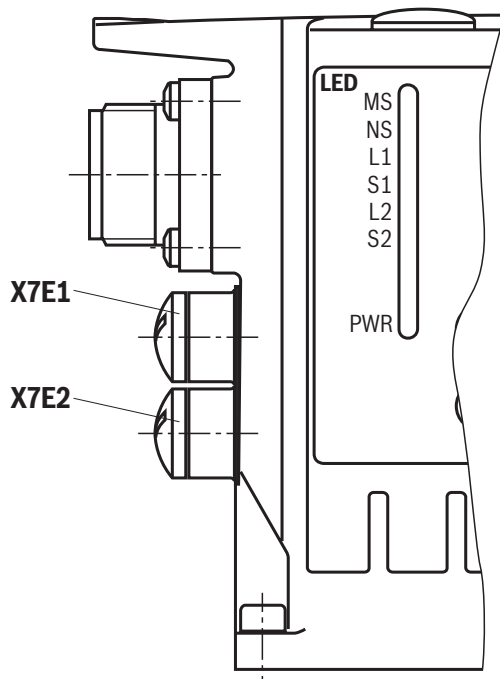


Notes:

- ▶ Reference potential for all signals: GND
- ▶ We recommend connecting the shields on both sides via the metal housings of the plug-in connectors.
- ▶ Using connector pins will affect the effectiveness of the shielding effect. Internal screens are not required.

LED displays

| LED | Interface | Sercos | EtherNET/IP | EtherCAT | PROFINET RT | VARAN |
|-----|--------------------|---------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| MS | Electronics module | Module status | Module status | Module status | Module status | Module status |
| NS | | S | Network status and others | Network status and others | Network status and others | Network status and others |
| L1 | X7E1 | Link and others | Link and others | Link/activity | Link and others | Link and others |
| S1 | | Activity and others | Activity and others | not used | Activity and others | Active and others |
| L2 | X7E2 | Link and others | Link and others | Link/activity | Link and others | not used |
| S2 | | Activity and others | Activity and others | not used | Activity and others | not used |
| PWR | XH1 | Power | Power | Power | Power | Power |



Displays of the status LEDs

| Power LED (LED PWR) | Display status |
|---------------------|-------------------|
| Off | No voltage supply |
| Green | Operation |

| Module status LED (LED MS) | Display status |
|----------------------------|---------------------------|
| Off | No voltage supply |
| Green-red, flashing | Initialization |
| Green, flashing | Drive ready for operation |
| Green | Drive active |
| Orange, flashing | Warning |
| Red, flashing | Error |
| Green, rapidly flashing | Firmware must be loaded |

| Link LED (LED L1) | Display status |
|-------------------|--|
| Permanently lit | Cable plugged in, connection established |

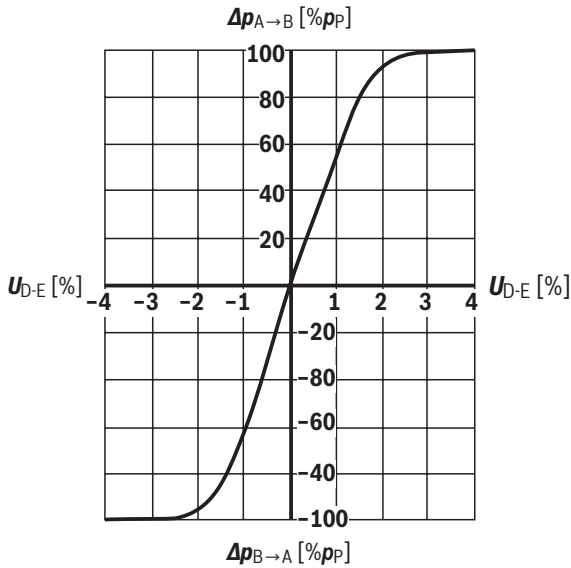
| Activity LED (LED S1) | Display status |
|-----------------------|--------------------|
| Flashing | Data sent/received |

Notes:

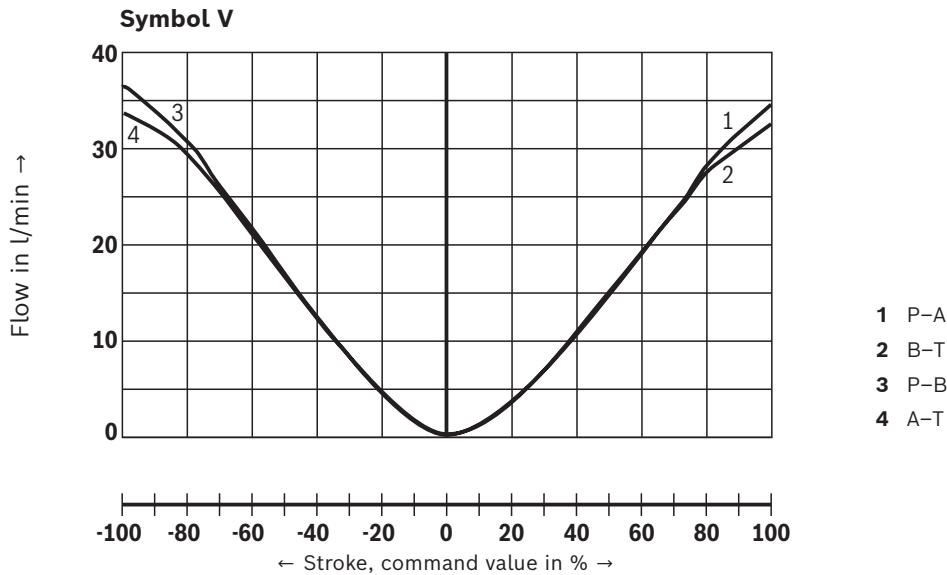
- ▶ For the connection to the M12 sockets, we recommend using self-locking mating connectors
- ▶ The MS module status LED relates to the electronics module
- ▶ The NS network status LED indicates the status of the control communication, see application description 30338-FK
- ▶ LEDs L1, S1, L2 and S2 relate to interfaces "X7E1" and "X7E2"
- ▶ For a detailed description of the diagnosis LEDs, please refer to the functional description Rexroth HydraulicDrive HDx.
- ▶ Function is only available after start-up of the electronics.

Characteristic curves: Size 6 – Valve direct control
(measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ } ^\circ\text{C}$)

Pressure/signal characteristic curve (symbol V)



Flow/signal function (rated flow 32 l/min with $\Delta p = 5 \text{ bar}$ /control edge)

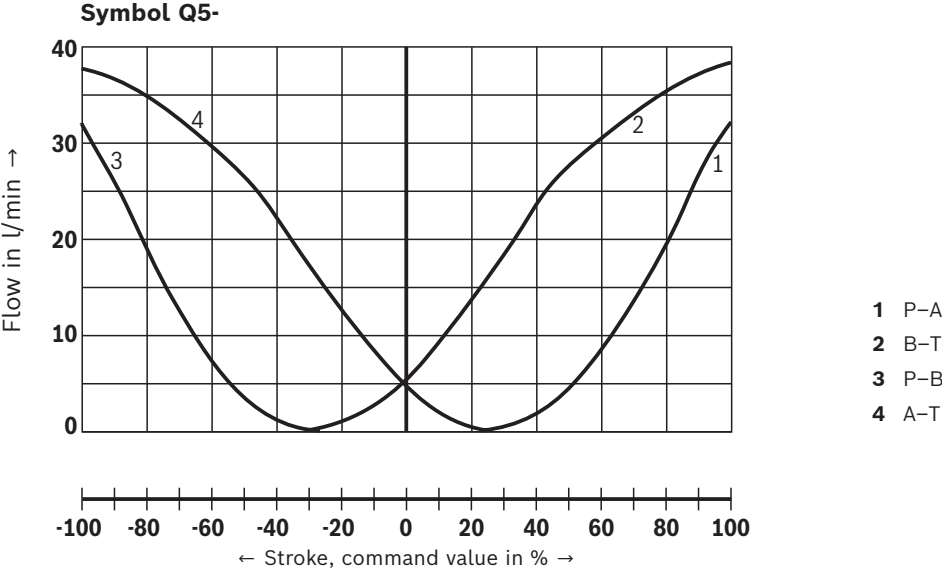


Notice:

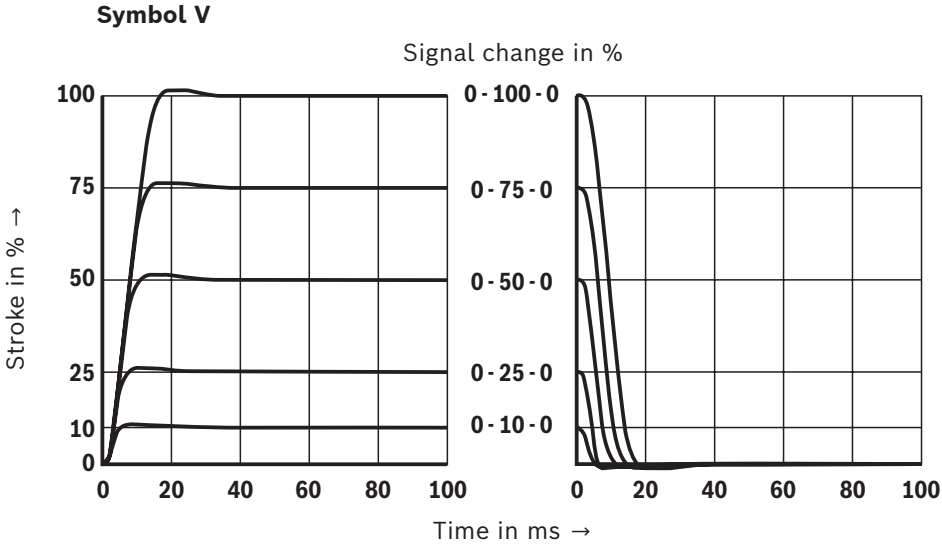
Typical characteristic curves which are subject to tolerance variations.

Characteristic curves: Size 6 – Valve direct control
(measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$)

Flow/signal function (rated flow 32 l/min with $\Delta p = 5 \text{ bar/control edge}$)



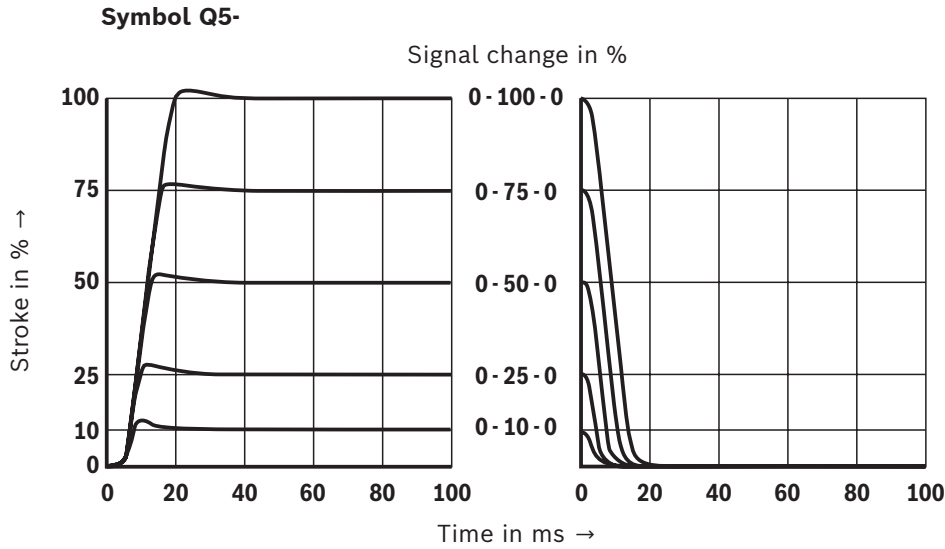
Transition function with stepped electric input signals



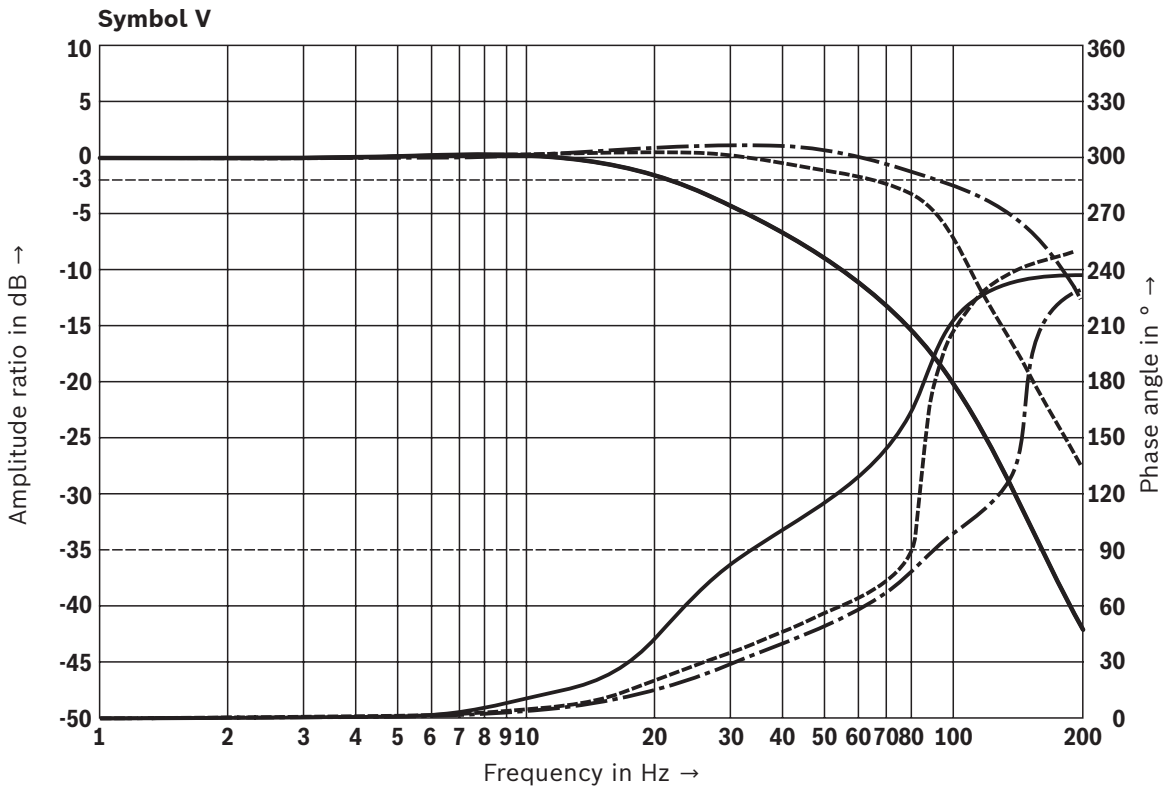
Notice:
Typical characteristic curves which are subject to tolerance variations.

Characteristic curves: Size 6 – Valve direct control
(measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ } ^\circ\text{C}$)

Transition function with stepped electric input signals



Frequency response



- Signal $\pm 5\%$
- - - Signal $\pm 25\%$
- Signal $\pm 100\%$

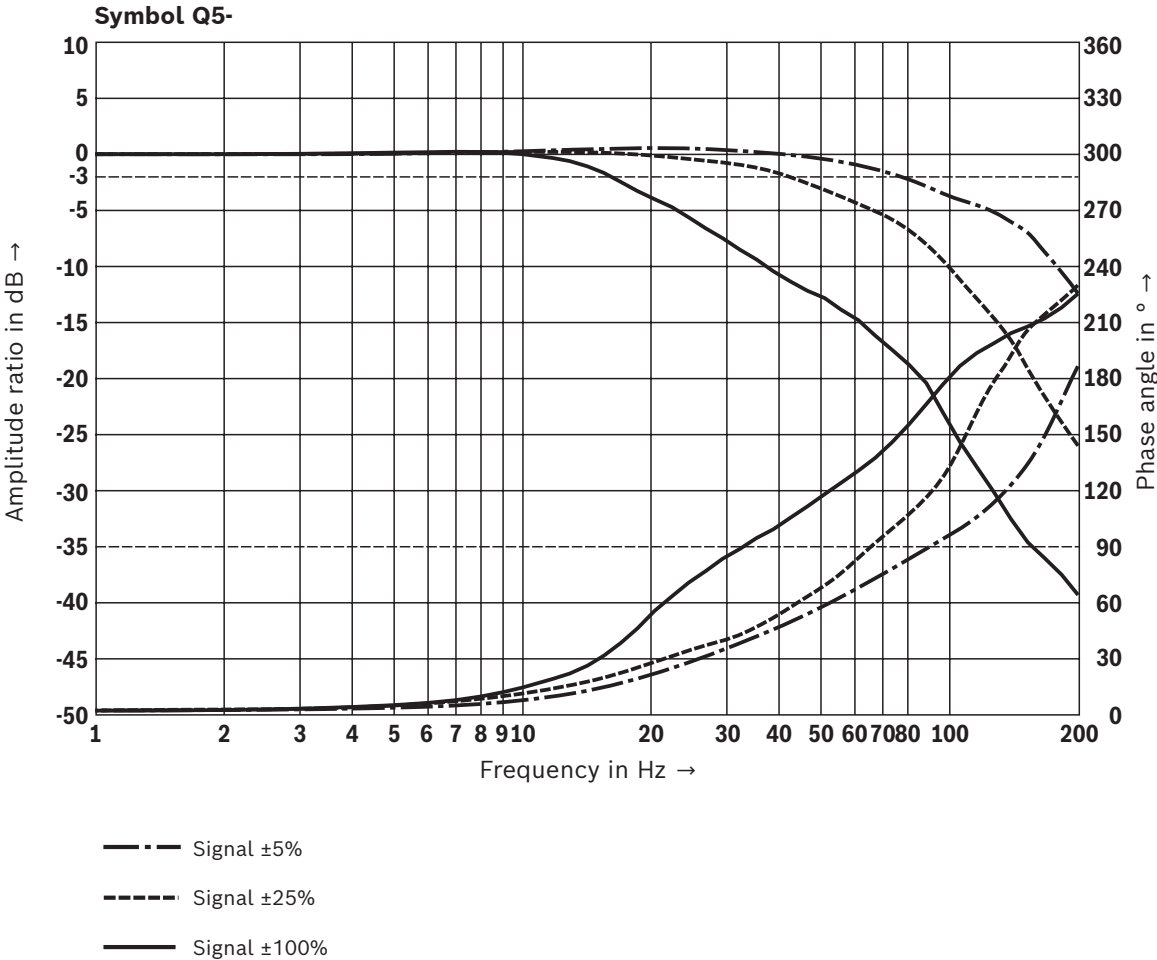


Notice:

Typical characteristic curves which are subject to tolerance variations.

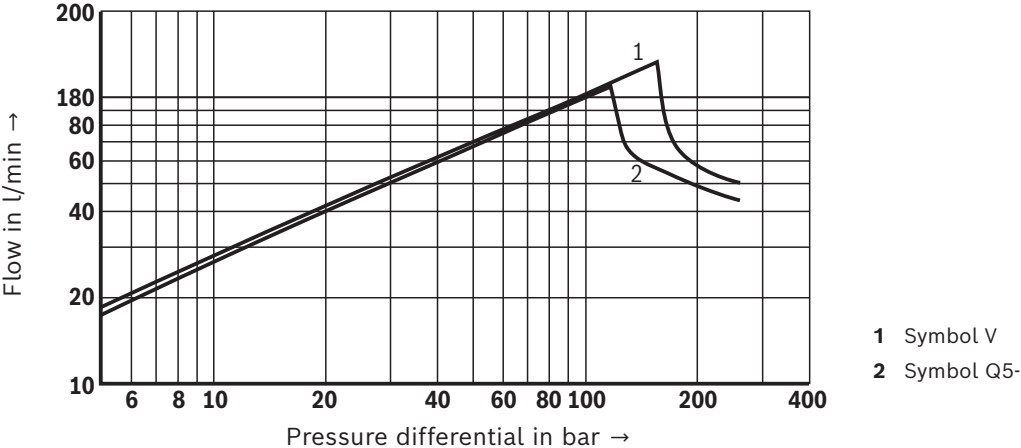
Characteristic curves: Size 6 – Valve direct control
(measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$)

Frequency response



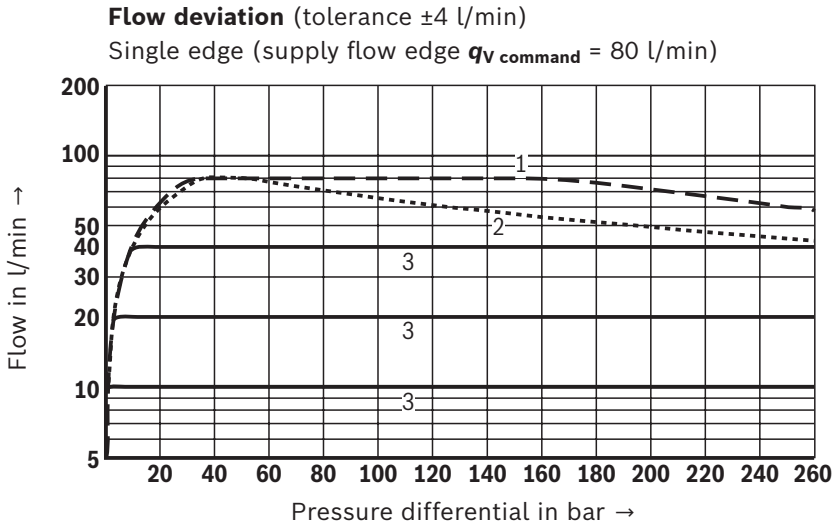
Flow/load function with maximum valve opening (tolerance ±10%)

Rated flow 32 l/min

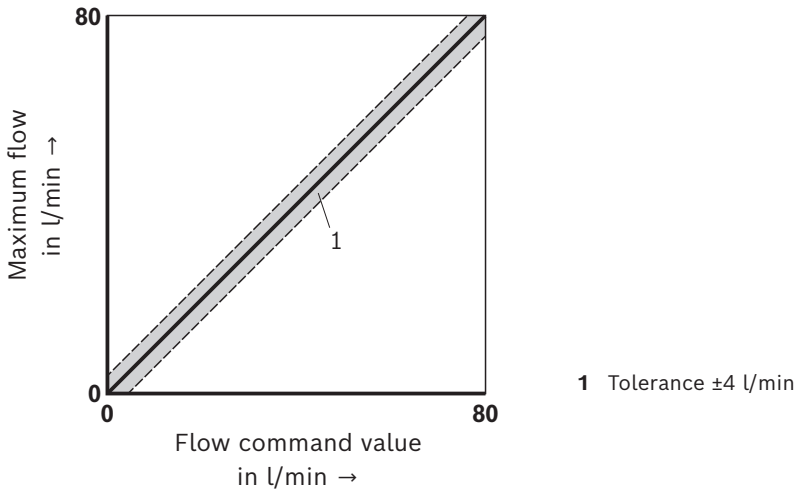


Notice:
Typical characteristic curves which are subject to tolerance variations.

Characteristic curves: Size 6 – Flow control
(measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$)



Tolerance of regulated flow / recommended maximum flow
(Default value 80 l/min)

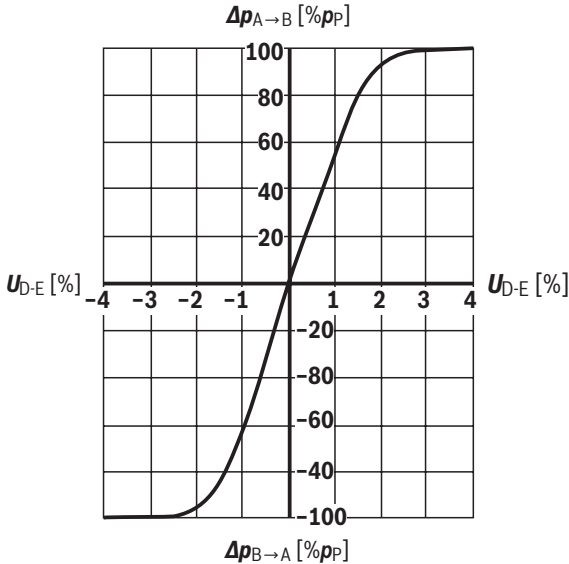


Notice:

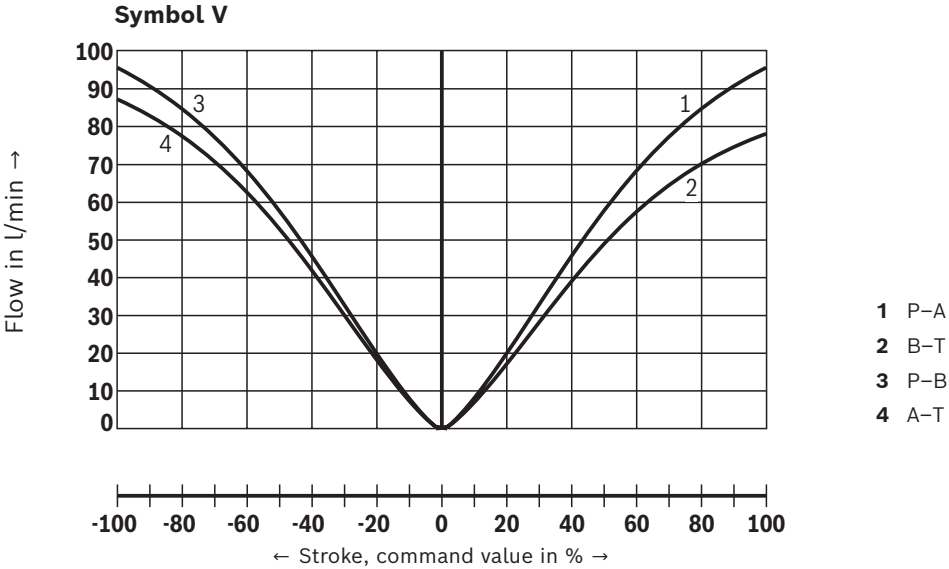
- ▶ The maximum possible flow is specified in parameter "maximum flow" (P-0-2875.0.3). The default value is defined by the performance data of the valve (see parameter description 30330-PA).
- ▶ Observe the limitations of use of the valve under "Flow/load function with maximum valve opening".

Characteristic curves: Size 10 – Valve direct control
(measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$)

Pressure/signal characteristic curve (symbol V)



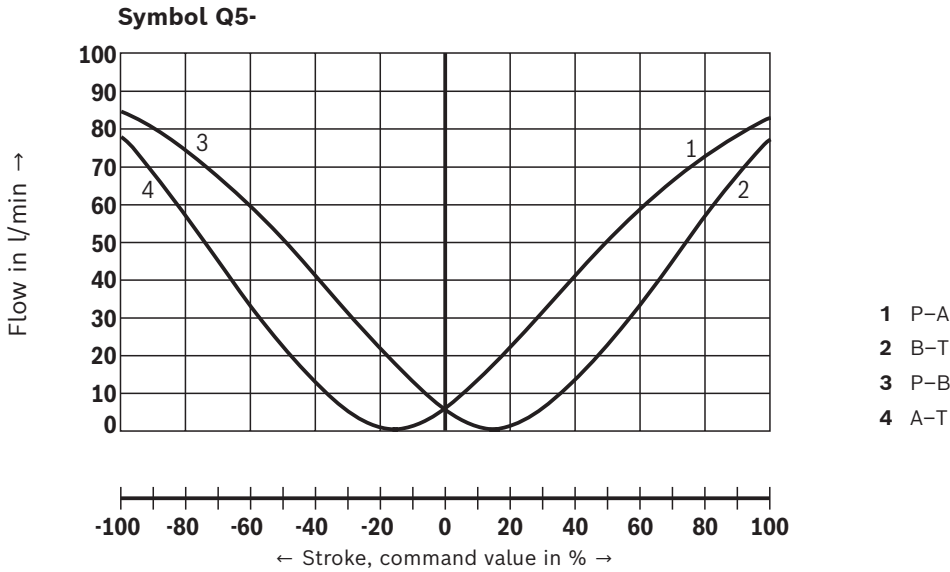
Flow/signal function (rated flow 80 l/min with $\Delta p = 5 \text{ bar}$ /control edge)



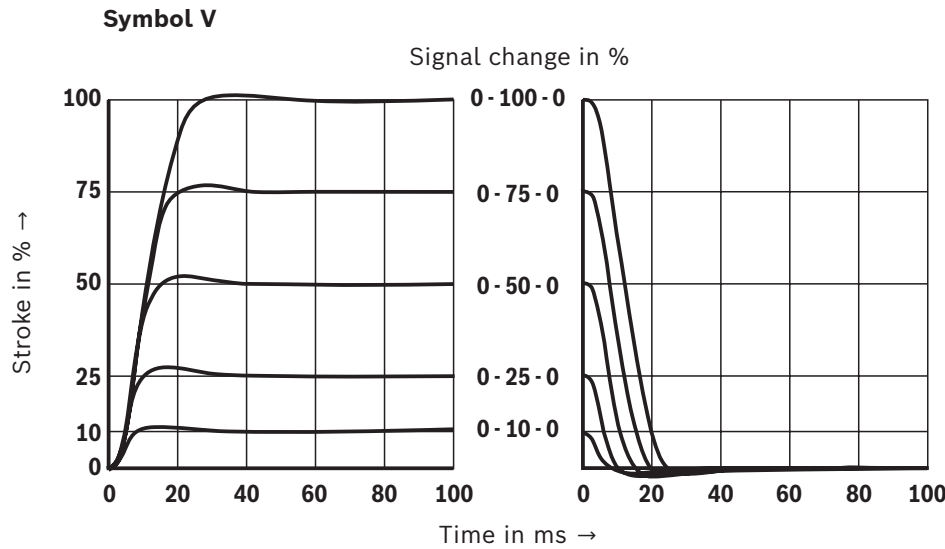
Notice:
Typical characteristic curves which are subject to tolerance variations.

Characteristic curves: Size 10 – Valve direct control
(measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$)

Flow/signal function (rated flow 80 l/min with $\Delta p = 5 \text{ bar/control edge}$)



Transition function with stepped electric input signals



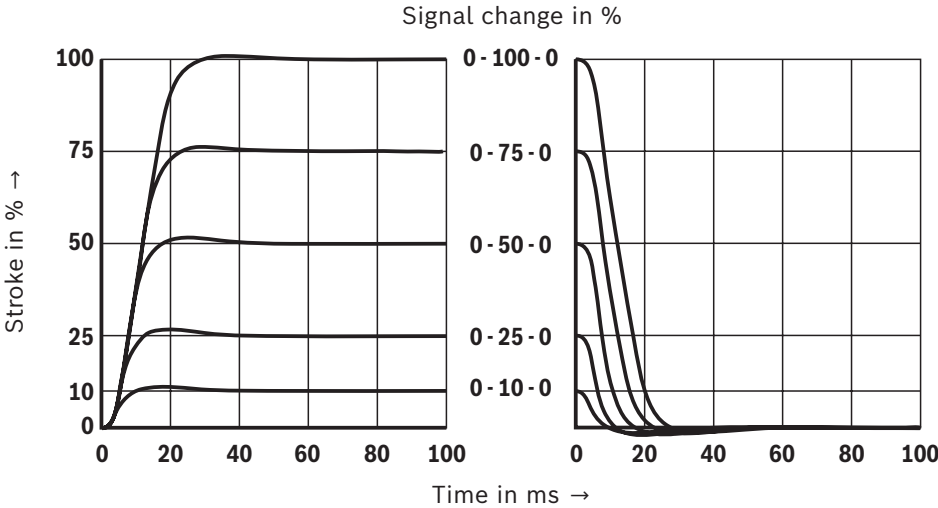
Notice:

Typical characteristic curves which are subject to tolerance variations.

Characteristic curves: Size 10 – Valve direct control
(measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ } ^\circ\text{C}$)

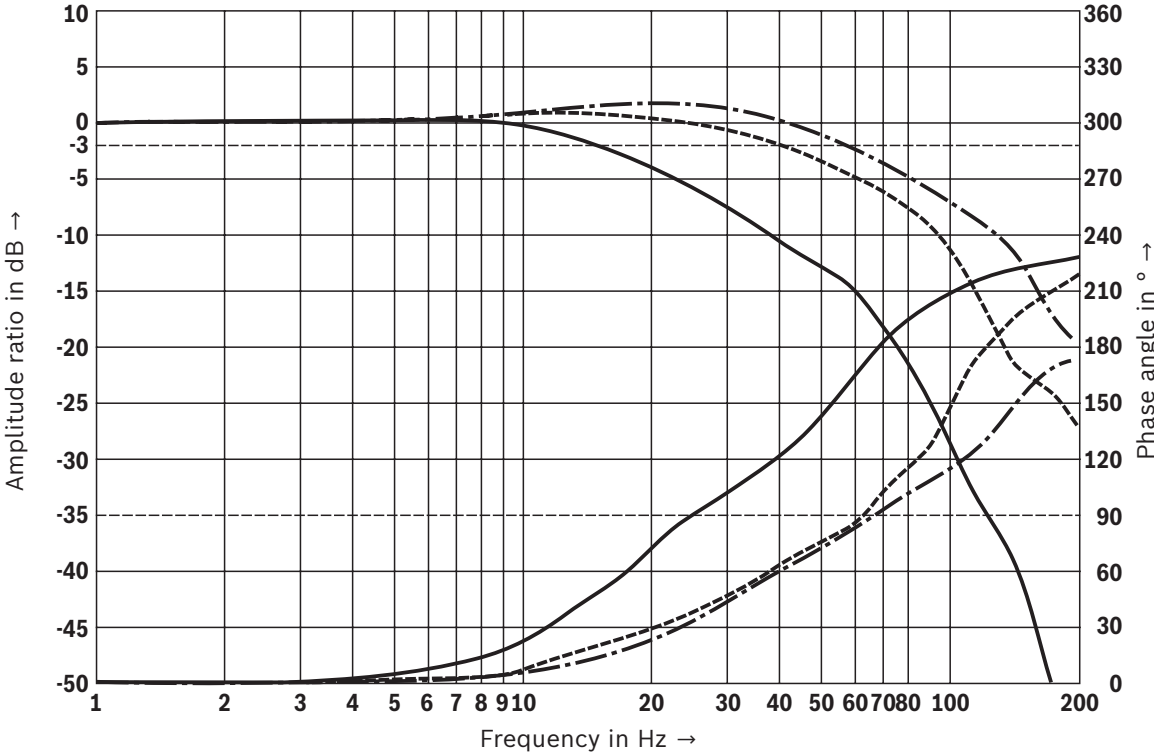
Transition function with stepped electric input signals

Symbol Q5-



Frequency response

Symbol V

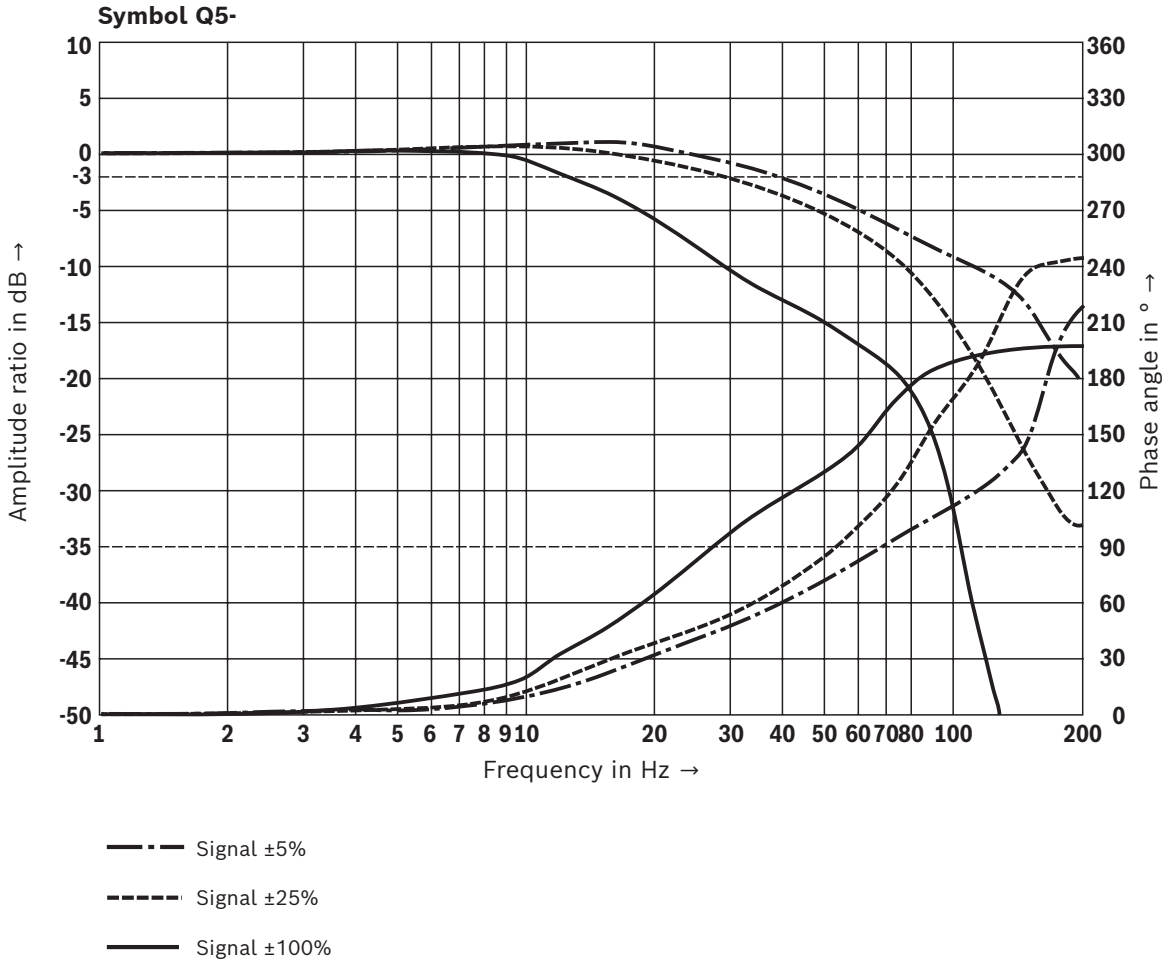


- Signal $\pm 5\%$
- - - Signal $\pm 25\%$
- Signal $\pm 100\%$

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

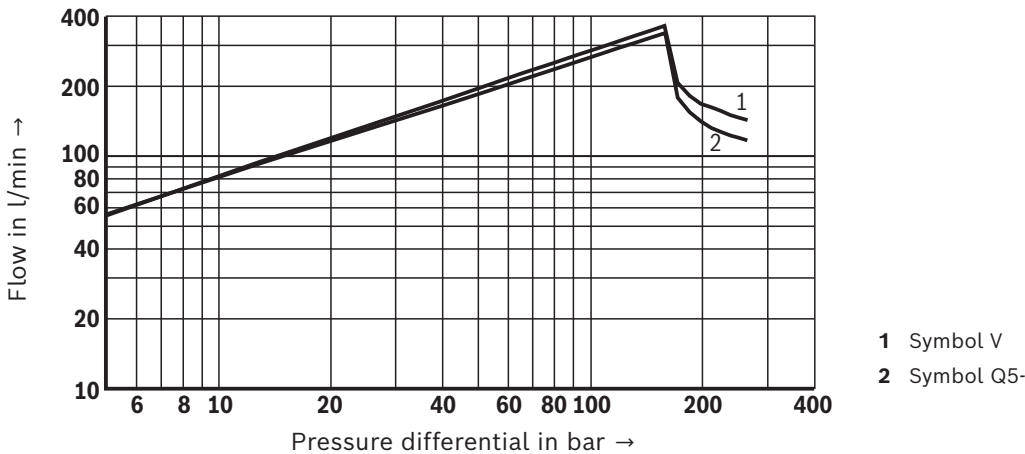
Characteristic curves: Size 10 – Valve direct control
(measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ }^\circ\text{C}$)

Frequency response



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

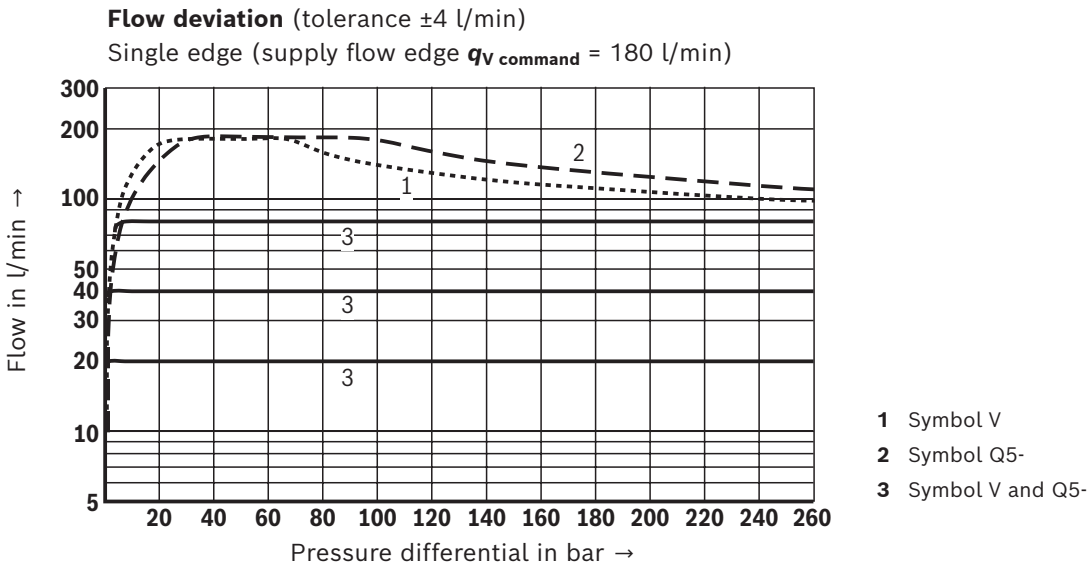
Rated flow 80 l/min



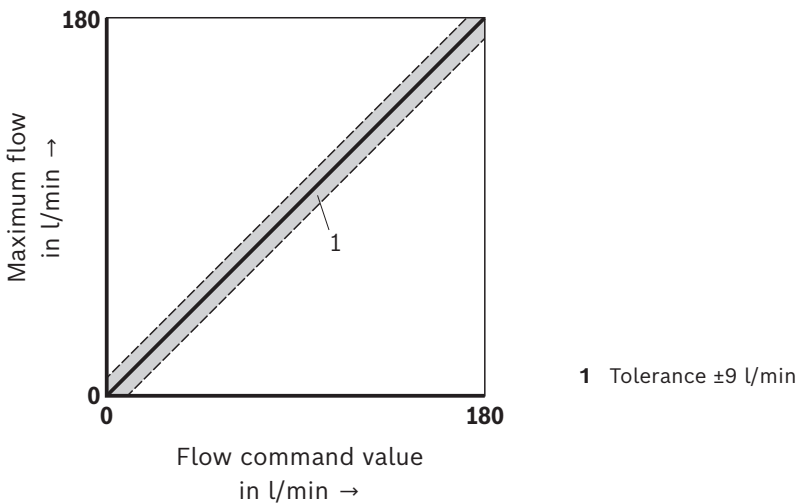
Notice:

Typical characteristic curves which are subject to tolerance variations.

Characteristic curves: Size 10 – Flow control
 (measured with HLP46, $\vartheta_{oil} = 40 \pm 5 \text{ } ^\circ\text{C}$)



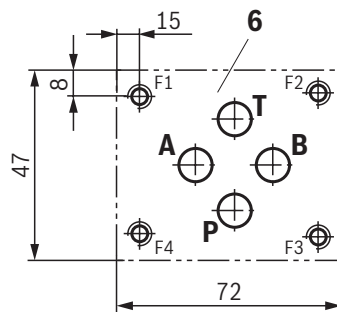
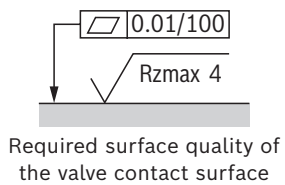
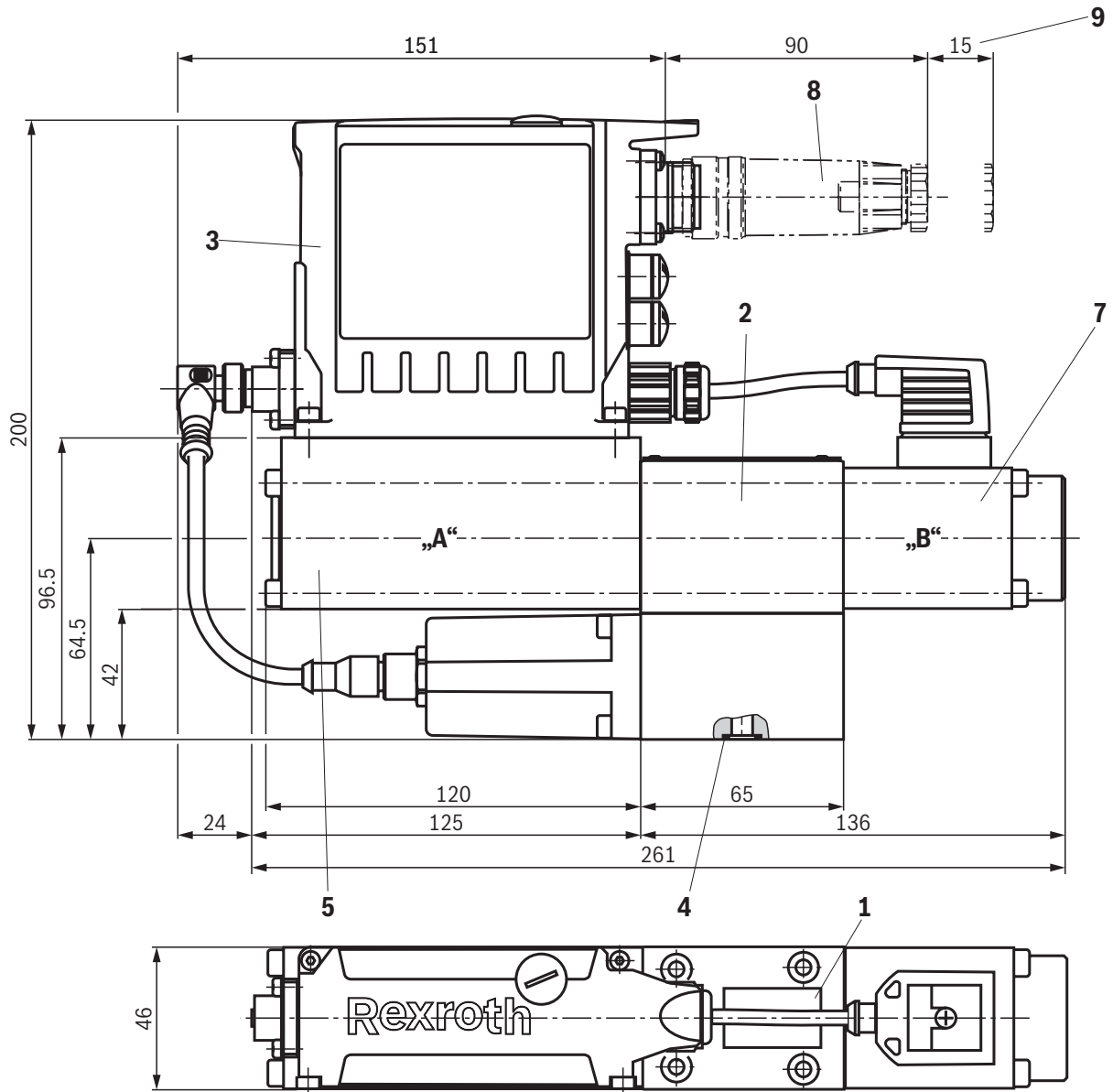
Tolerance of regulated flow / recommended maximum flow
 (Default value 180 l/min)



Notice:

- ▶ The maximum possible flow is specified in parameter "maximum flow" (P-0-2875.0.3). The default value is defined by the performance data of the valve (see parameter description 30330-PA).
- ▶ Observe the limitations of use of the valve under "Flow/load function with maximum valve opening".

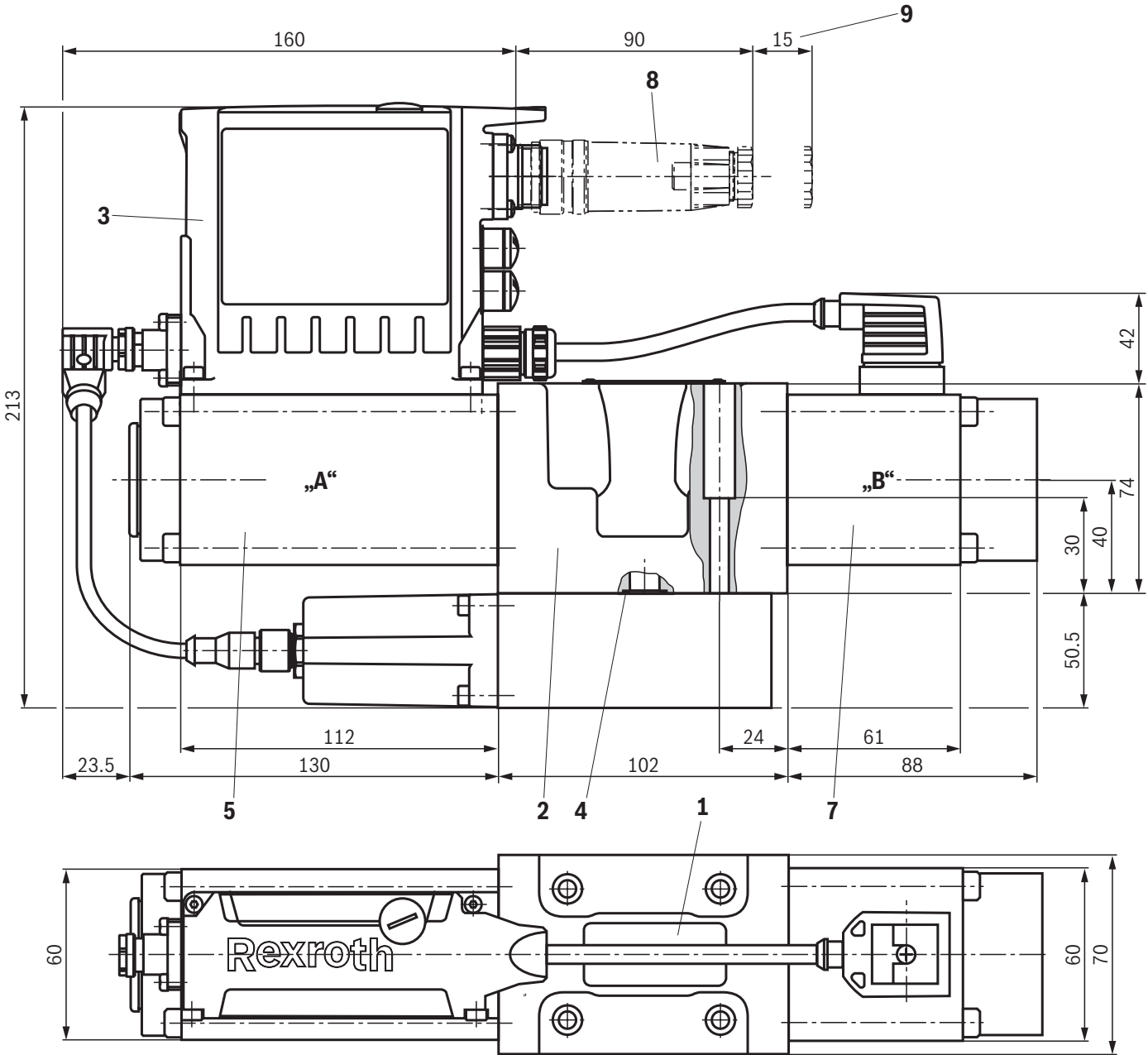
Dimensions: Size 6
(dimensions in mm)



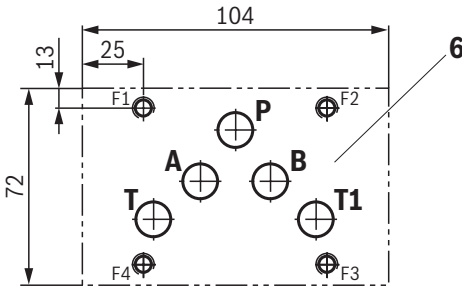
For item explanations, valve mounting screws and subplates, see page 24.

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

Dimensions: Size 10
(dimensions in mm)



0.01/100
 Rzmax 4
 Required surface quality of the valve contact surface



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

For item explanations, valve mounting screws and subplates, see page 24.

Dimensions

- 1 Name plate
- 2 Valve housing
- 3 Integrated digital control electronics
- 4 Identical seal rings for ports A, B, P, T
- 5 Control solenoid with position transducer
- 6 Machined valve contact surface, porting pattern according to ISO 4401-03-02-0-05 (NG6) and ISO 4401-05-04-0-05 (NG10)
- 7 Stroke solenoid
- 8 Mating connectors, separate order, see page 25 and data sheet 08006.
- 9 Space required for removing the mating connector
- 10 Multi Ethernet interface X7E1
- 11 Multi Ethernet interface X7E2

Valve mounting screws (separate order)

| Size | Quantity | Hexagon socket head cap screws | Material number |
|------|----------|--|--|
| 6 | 4 | ISO 4762 - M5 x 70 - 10.9-CM-Fe-ZnNi-5-Cn-T0-H-B Friction coefficient $\mu_{\text{total}} = 0.09 \dots 0.14$; tightening torque $M_A = 8.9 \text{ Nm} \pm 10\%$ | R913043762 |
| | or | | |
| | 4 | ISO 4762 - M5 x 70 - 10.9 Tightening torque $M_A = 8.9 \text{ Nm} \pm 10\%$ | Not included in the Rexroth delivery range |
| 10 | 4 | ISO 4762 - M6 x 80 - 10.9-CM-Fe-ZnNi-5-Cn-T0-H-B Friction coefficient $\mu_{\text{total}} = 0.09 \dots 0.14$; tightening torque $M_A = 13 \text{ Nm} \pm 10\%$ | R913049927 |
| | or | | |
| | 4 | ISO 4762 - M6 x 80 - 10.9 Tightening torque $M_A = 13 \text{ Nm} \pm 10\%$ | 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 4401-03-02-0-05 (NG6) and ISO 4401-05-04-0-05 (NG10) see data sheet 45100.

Accessories (separate order)

Mating connectors and cable sets

| Port | Designation | Version | Short designation | Material number | Data sheet |
|-----------------|--|---|-------------------|---------------------------------|------------|
| XH1 | 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 | – | |
| X7E1, X7E2 | Cable set; shielded, 4-pole, D coding | Straight connector M12, on straight connector M12, line cross-section 0.25 mm ² , CAT 5e, length freely selectable (= xx.x) | – | R911172111 ¹⁾ | – |
| | Cable set; shielded, 4-pole | Straight connector M12, on straight connector RJ45, line cross-section 0.25 mm ² , CAT 5e, length freely selectable (= xx.x) | – | R911172135 ²⁾ | – |


1) Additional indication of type designation RKB0040/xx.x

2) Additional indication of type designation RKB0044/xx.x

Notes:

- ▶ Tighten the M12 connector with a manual torque wrench by 1 Nm.
- ▶ Self-locking M12 cables must be used.
- ▶ It must be ensured that cables are secured without radial force.
- ▶ All cables connected to "XH1", "X7E1" and "X7E2" must be bundled in a wire harness after 20 cm the latest. The wire harness must be fixed after further 20 ... 30 cm. Make sure that there is no relative motion between the fixation and the valve.
- ▶ Before the fixation point, there must not be any cable loops.
- ▶ In general, the information on installation provided by the cable manufacturers must be observed.
- ▶ For further information, see operating instructions 29391-B

Protective cap

| Protective cap M12 | Version | Material number |
|--------------------|---|-------------------|
| |  | R901075563 |

Parameterization

| The following is required for the parameterization with PC | | Material number/download |
|--|---|--|
| 1 Commissioning software | IndraWorks, Indraworks D, Indraworks DS | www.boschrexroth.com/IFB |
| 2 Connection cable, 3 m | Shielded, M12 on RJ45, length can be freely selected (= xx.x) | R911172135 (additional indication of type designation RKB0044/xx.x) |

Project planning and maintenance instructions

- ▶ The supply voltage must be permanently connected; otherwise, bus communication is not possible.
- ▶ If electro-magnetic interference is to be expected, take appropriate measures for ensuring the function (depending on the application, e.g. shielding, filtration).
- ▶ The devices have been tested in the plant and are supplied with default settings.
- ▶ Only complete devices can be repaired. Repaired devices are returned with default settings. User-specific settings will not be applied. The machine end-user will have to retransfer the corresponding user parameters.

Further information

- | | |
|--|--|
| ▶ High-response/proportional valve with Multi-Ethernet interface | Operating instructions 29391-B |
| ▶ Operation fieldbus electronics (xx = software version): | |
| – Functional description Rexroth HydraulicDrive HDx-20 | 30338-FK |
| – Parameter description Rexroth HydraulicDrive HDS-16, HDx-17 ... 20 | 30330-PA |
| – Description of diagnosis Rexroth HydraulicDrive HDS-16, HDx-17 ... 20 | 30330-WA |
| ▶ 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 | Data sheet 90223 |
| ▶ Reliability characteristics according to EN ISO 13849 | Data sheet 08012 |
| ▶ Hexagon socket head cap screw, metric/UNC | Data sheet 08936 |
| ▶ Installation, commissioning and maintenance of servo valves and high-response valves | Data sheet 07700 |
| ▶ General product information on hydraulic products | Data sheet 07008 |
| ▶ Hydraulic valves for industrial applications | Data sheet 07600-B |
| ▶ Assembly, commissioning and maintenance of hydraulic systems | Data sheet 07900 |
| ▶ Information on available spare parts | www.boschrexroth.com/spc |
| ▶ "IFB" hydraulic field bus valves | www.boschrexroth.com/ifb |

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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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