RE 29133
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rexroth
A Bosch Company

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

Type 4WRPQ

H8165+8166

- Sizes 6 and 10
- Component series 3X
- Maximum operating pressure 280 bar
- Rated flow 32, 80 l/min (***Δp*** = 5 bar)

CE

Features

- Open
  - Integrated, digital flow controller (IFB Multi-Ethernet)
  - Bus connection/service interface (Sercos, Ether-CAT, EtherNet/IP, PROFINET RT, EtherNET)
  - Analog interface (NG6)
- 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 ... 9
Block diagram/controller function block	10, 11
Electrical connections, assignment	12, 13
LED displays	14
Characteristic curves	15 ... 24
Dimensions	25 ... 27
Accessories	28, 29
Project planning information	29
Further information	30

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**			**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	

Nominal flow (***Δp*** = 5 bar per control edge)

06	32 l/min (only NG6)	**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** ◇
	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**
	EtherNET (version "D6" only)	**B**

Electrical interface

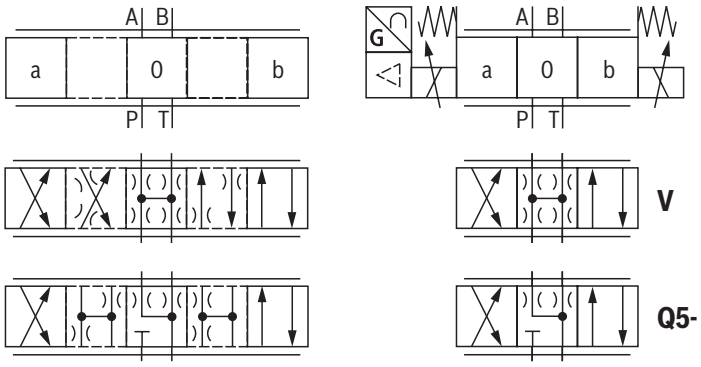
14	Digital, voltage supply, enable, enable acknowledgment	**D9**
	Analog, voltage supply, enable, enable acknowledgment (version "B" only)	**D6**

Pressure sensor interface

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

☞ **Notice:** ◇ = Preferred type

Symbols



☞ **Notice:**
Representation according to ISO 1219-1.
Hydraulic interim positions are shown by dashes.

Function

General

The **IFB Multi-Ethernet** valve (**I**ntegrated **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 via the digital multi-Ethernet interface (X7E1, X7E2) or the analog command value presetting (XH2). The following data may be exchanged:

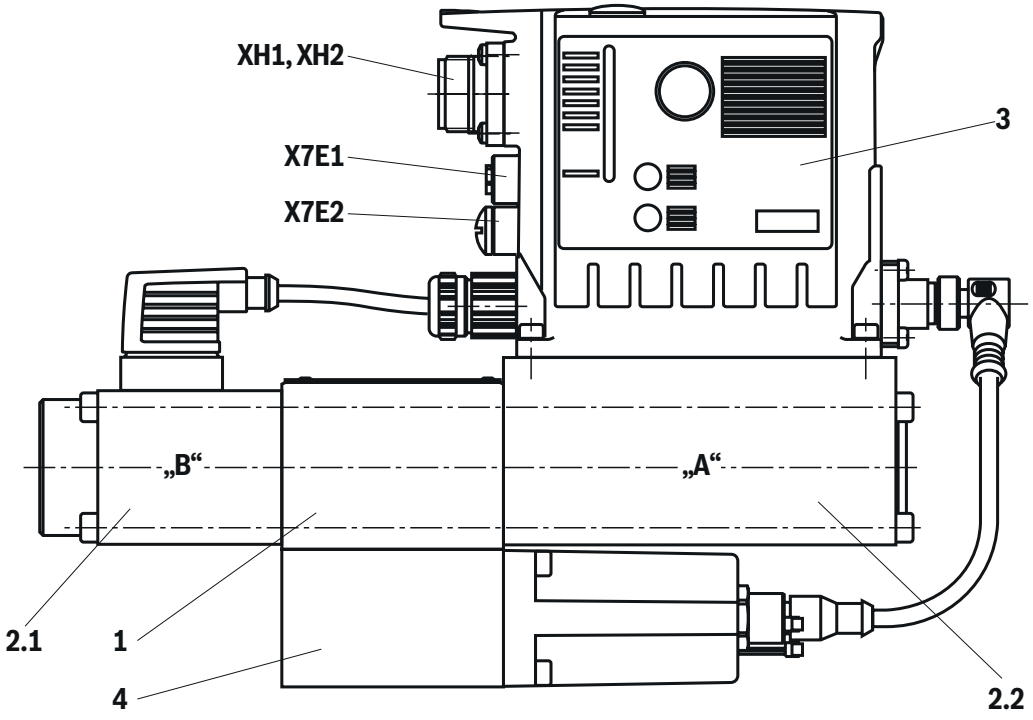
- Command values
- Actual values
- Configuration and setting of the system control parameters
- Status messages, faults or warnings

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, XH2)
  - 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 remedied 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 on-board 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. When the command value is negative, the flow is regulated by P→B.

Safety function (only symbol Q5-)
The on-board electronics (OBE) of the valve enables the 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 shut-off).
When using symbol V, the valve cannot be used in a safety-relevant manner according to EN 13849-1, enable acknowledgment always remains 0.
Thanks to the two control solenoids (enable pin D and E, "D9"; pin 3 and 10 ("D6"), low signal) at the connector (XH1), direction-dependent shut-off is enabled. The control spool of the valve is in the spring-centered central position for this purpose (fail-safe position).
The enable acknowledgment for solenoid A (pin C ("D9"); pin 8 ("D6")) and for solenoid B (pin F ("D9"); pin 9 ("D6")) are on high signal. By connecting the two control solenoids (enable pins D and E ("D9"); pins 3 and 10 ("D6"), low signal), the valve can be controlled by a command value presetting (positive command value, solenoid B or negative command value, solenoid A).
The enable acknowledgments for solenoid A (pin C ("D9"); pin 8 ("D6")) and for solenoid B (pin F ("D9"); pin 9 ("D6")) are on low signal.
Separate shut-off of solenoid A or solenoid B will moreover allow for the direction-dependent activation or shut-off of the drive.

The on-board electronics (OBE) of the valve enables the 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 shut-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 to 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 on-board 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

☞ **Notice:**
- When using symbol V, the enable inputs (enable pins D and E ("D9"); pins 3 and 10 ("D6")) may only be switched on and off 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 of 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 parameters, 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	
Protection class according to EN 60529			IP65 (if suitable and correctly mounted mating connectors are used)	
Maximum 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)	
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 / 30 min / 3 axes	
Transport shock according to 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]	

Hydraulic				
Maximum operating pressure	▶ Ports A, B, P	bar	280	
	▶ Port T	bar	200	
Hydraulic fluid			See table on page 7	
Hydraulic fluid temperature range (flowed-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 (Δp = 5 bar per 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 ϑ_{oil} = 40±5 °C.

Technical data
(For applications outside these parameters, 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	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 an increased cavitation tendency with the use of HFC hydraulic fluids, the life cycle of the component may be reduced by up to 30% as compared to use with HLP mineral oil. 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 ... 80 °C)	%/10 K	Zero shift < 0.25
Pressure drift	%/100 bar	Zero shift < 0.2
Zero point calibration		±1 (ex works)

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 parameters, please consult us!)

Electrical, on-board electronics (OBE) – interface "D9"					
Size			NG	6	10
Supply voltage [5]	▶ Nominal value		VDC	24	
	▶ Minimum		VDC	18	
	▶ Maximum		VDC	36	
	▶ Maximum residual ripple		Vpp	2.5 (comply with the absolute supply voltage limit values)	
	▶ Maximum power consumption		VA	40	65
	▶ Current consumption during operation [6]	Rated current	A_{eff}	2.5	2.8
		Impulse current	A	4	
	▶ Fuse protection, external		A_T	4 (time-lag)	
Charging capacity (externally effective)			µF	<1000	
Relative duty cycle time according to VDE 0580			%	S1 (continuous operation)	
Functional ground and screening				See pin assignment, page 12	
Digital inputs (enable) XH1	▶ Quantity			2	
	▶ Low level range		V	–3 ... 5	
	▶ High level range		V	15 ... 36	
	▶ Maximum current consumption at high level		mA	<15	
Digital outputs (enable acknowledgment) XH1 [7]	▶ Quantity			2	
	▶ Low level range		V	0 ... 3	
	▶ High level range		V	15 ... 36	
	▶ Current carrying capacity		mA	50 (short-circuit-proof)	
	▶ Inductive load admissible			no	

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

[6] The making current peak is usually higher (depending on power supply unit, supply line, and capacities).

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

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

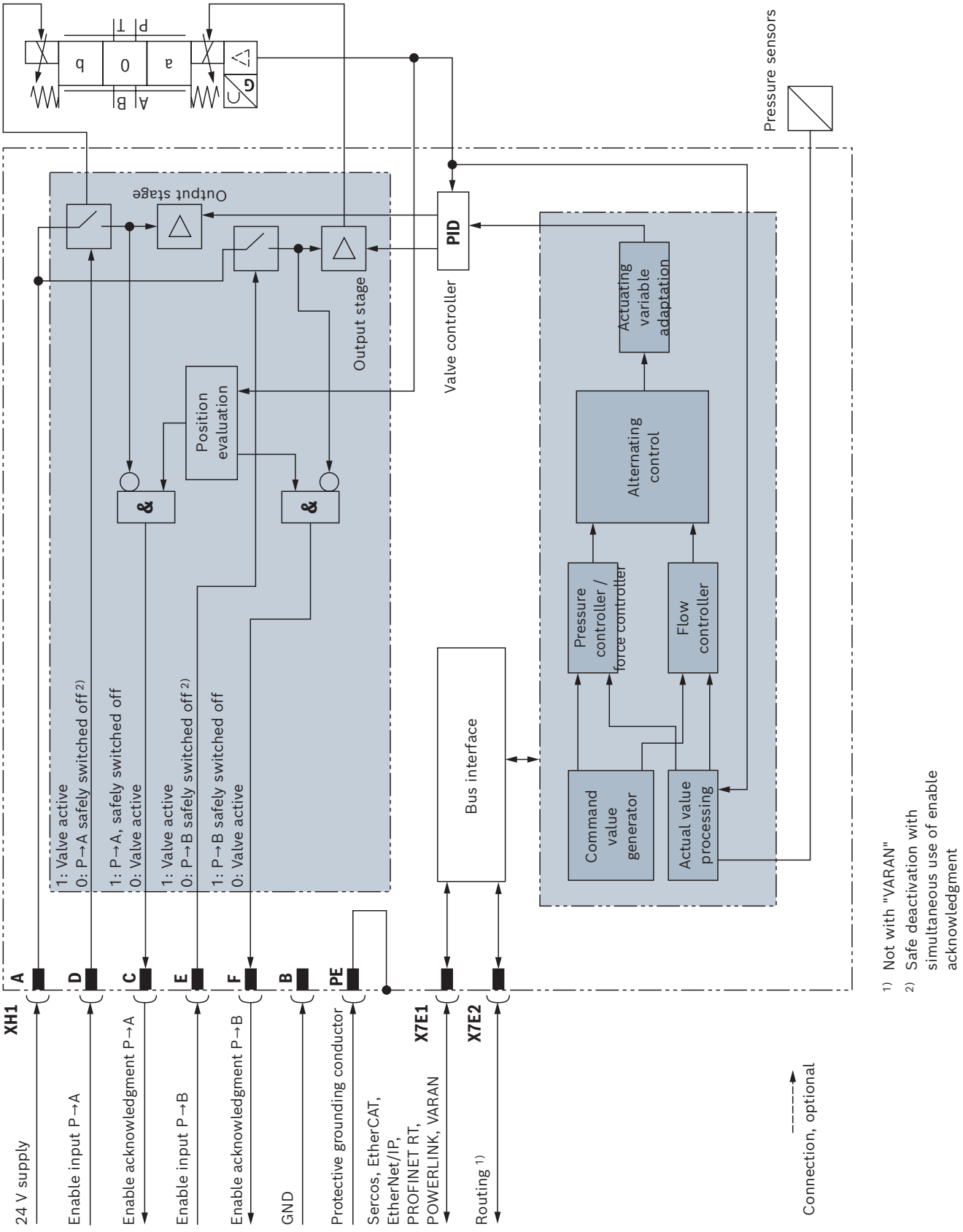
Electrical, on-board electronics (OBE) – interface "D6"					
Size			NG	6	10
Supply voltage [5]	▶ Nominal value		VDC	24	
	▶ Minimum		VDC	18	
	▶ Maximum		VDC	36	
	▶ Maximum residual ripple		Vpp	2.5 (comply with the absolute supply voltage limit values)	
	▶ Maximum power consumption		VA	40	65
	▶ Current consumption during operation [6]	Rated current	A_{eff}	2.5	2.8
		Impulse current	A	4	
	▶ Fuse protection, external		A_T	4 (time-lag)	
Charging capacity (externally effective)			µF	<1000	
Relative duty cycle time according to VDE 0580			%	S1 (continuous operation)	
Functional ground and screening				See pin assignment, page 12	
Maximum voltage of the differential inputs against 0 V				4→2; 5→2 (max. 18 V)	
Command value XH2	▶ Quantity			2	
	▶ Measurement range		V	±10	
	▶ Input resistance		kΩ	≥50	
Actual value XH2	▶ Quantity			1	
	▶ Output range		V	±10	
	▶ Minimum load impedance		kΩ	10	
Enable	▶ Quantity			2	
	▶ Low level range		V	–3 ... 5	
	▶ High level range		V	15 ... 36	
	▶ Maximum current consumption at high level		mA	<15	
Valve ready for operation (output) [7]	▶ Quantity		V	3	
	▶ Low level range		V	0 ... 3	
	▶ High level range		V	15 ... 36	
	▶ Current carrying capacity		mA	50 (short-circuit-proof)	
	▶ Inductive load admissible			no	

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

[6] The making current peak is usually higher (depending on power supply unit, supply line, and capacities).

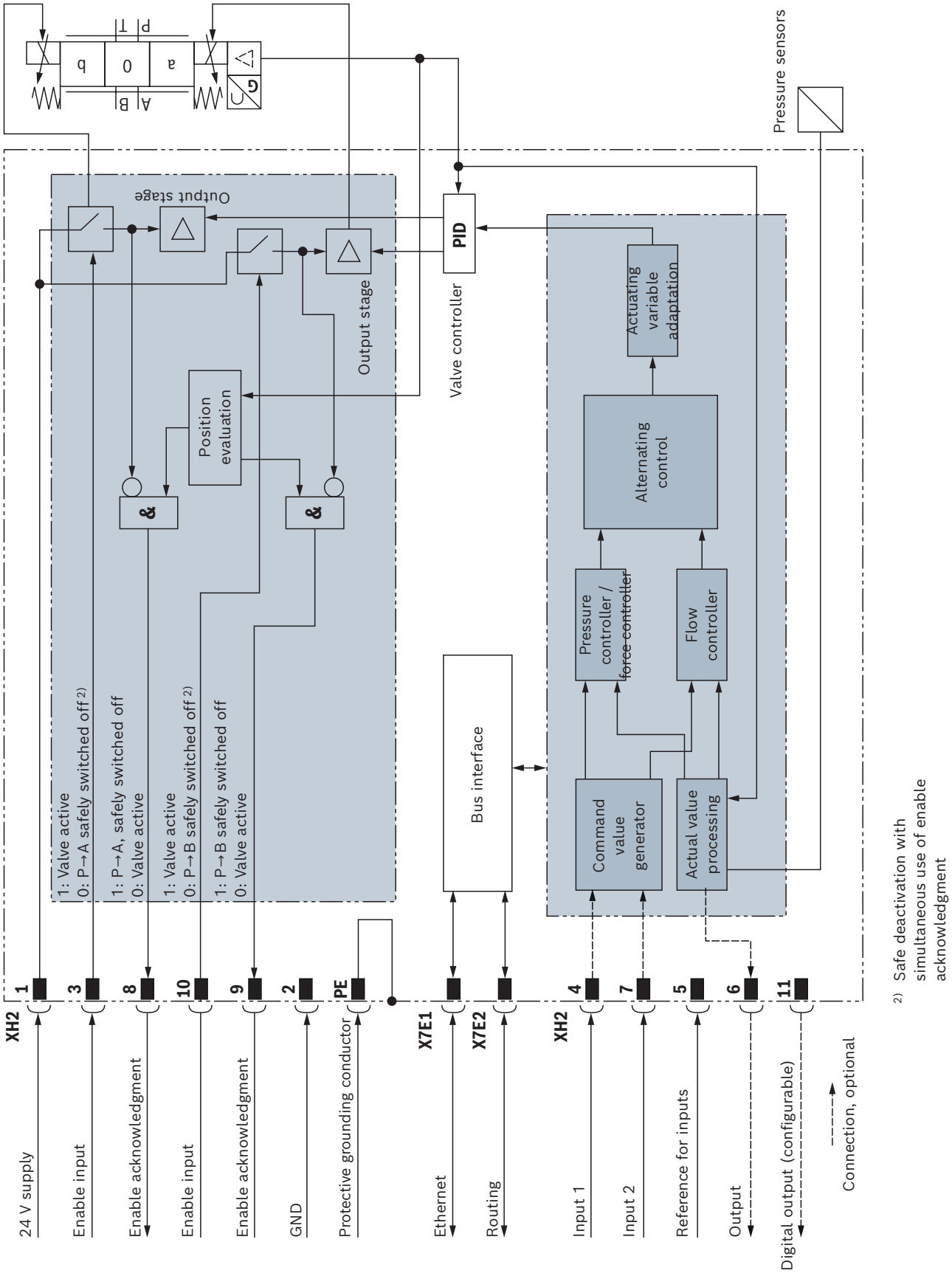
[7] The enable acknowledgment outputs must always be loaded with current-consuming switching inputs.

Block diagram/controller function block: Version "D9"



1) Not with "VARAN"
2) Safe deactivation with simultaneous use of enable acknowledgment

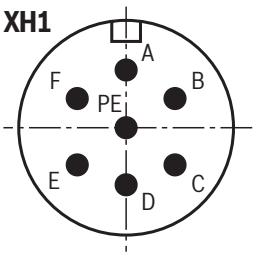
Block diagram/controller function block: Version "D6"



Electrical connections, assignment

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

Pin	Assignment interface "D9"
A	Supply voltage [1]
B	GND
C	Enable acknowledgment (P→A) [2]
D	Enable input (P→A)
E	Enable input (P→B)
F	Enable acknowledgment (P→B)
PE	Functional ground (connected directly to metal housing)

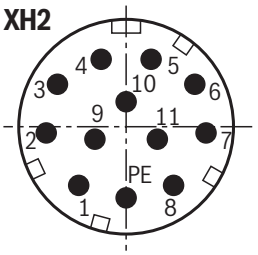


1) A load increases the current consumption at pin A
2) Enable acknowledgment is issued only if the valve has safely switched off according to EN 13849-1, see operating instructions 29391-B.

Connector pin assignment "XH2", 11-pole + PE according to EN 175201-804

Pin	Core marking		Allocation interface "D6"
	Cable, one-part [1]	Cable, split [2]	
1	1	1	Supply voltage
2	2	2	GND
3	3	White	Enable input (P→A)
4	4	Yellow	Command value 1 [3]
5	5	Green	Reference potential command values
6	6	Violet	Actual value [3; 4]
7	7	Pink	Command value 2 [3]
8	8	Red	Enable acknowledgment (P→A) [5]
9	9	Brown	Enable acknowledgment (P→B)
10	10	Black	Enable input (P→B)
11	11	Blue	Switching output – fault-free operation
PE	Green-yellow	Green-yellow	Functional ground (connected directly to metal housing)

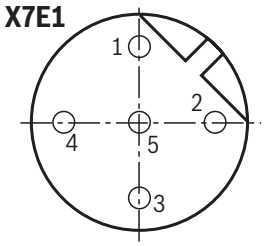
1) Core marking of the connection lines for mating connector with cable set (see accessories, page 28, material numbers R901268000, R901272854, R901272852)
2) Core marking of the connection lines for mating connector with cable set (see accessories page 28, material numbers R900884671, R900032356, R900860399)
3) Selection via commissioning software
4) For diagnosis purposes, precise actual value response via Ethernet interface
5) A load increases the current consumption at pin 1



Electrical connections, assignment

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

Pin	Assignment
1	TxD +
2	RxD +
3	TxD –
4	RxD –
5	Not assigned

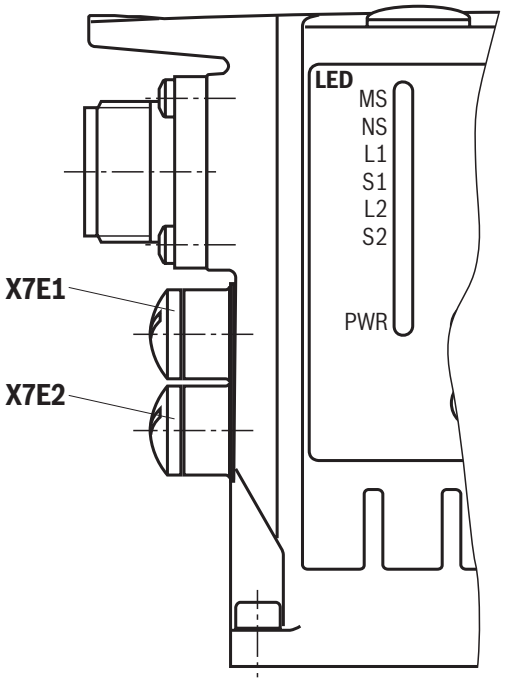


☞ **Notice:**

- 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	Ethernet
MS	**Electronics module**	Module status	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	No function
L1	**X7E1**	Link and others	Link and others	Link/activity	Link and others	Link and others	Link and others
S1		Activity and others	Activity and others	not used	Activity and others	Active and others	Activity and others
L2	**X7E2**	Link and others	Link and others	Link/activity	Link and others	not used	Link and others
S2		Activity and others	Activity and others	not used	Activity and others	not used	Activity and others
PWR	**XH1, XH2**	Power	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

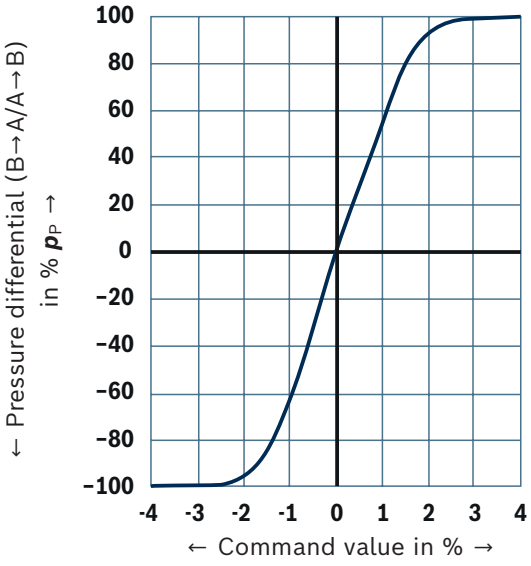
Link LED (LED L1)	Display status
Permanently lit	Cable plugged in, connection established

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

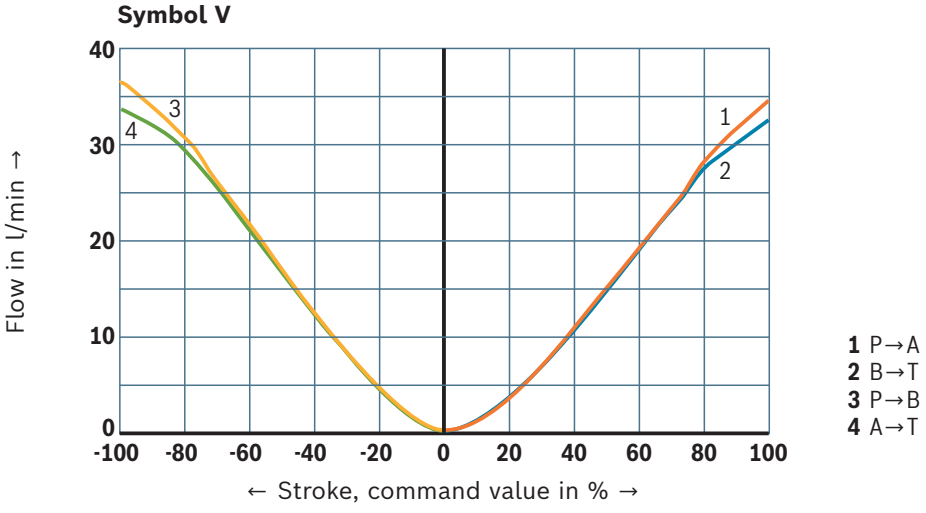
☞ **Notice:**
- For the connection to the M12 bushes, we recommend using self-locking mating connectors
- The MS module status LED relates to the electronics module
- The NS network status LED indicates the status of the control communication, see application description 30338-FK
- LEDs L1, S1, L2 and 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, ϑ_{oil} = 40±5 °C)

Pressure/signal characteristic curve (symbol V)



Flow/signal function (rated flow **32** l/min at Δp = 5 bar per control edge)



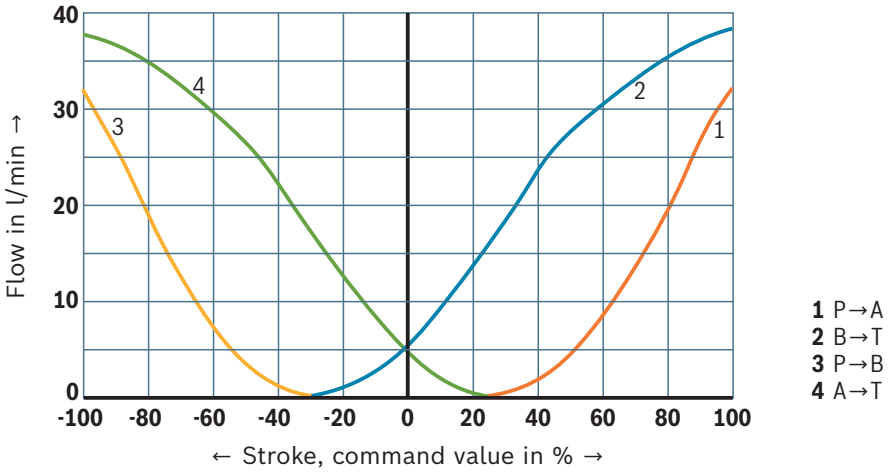
1 P→A
2 B→T
3 P→B
4 A→T

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

Characteristic curves: Size 6 – valve direct control (measured with HLP46, ϑ_{oil} = 40±5 °C)

Flow/signal function (rated flow **32** l/min with Δp = 5 bar per control edge)

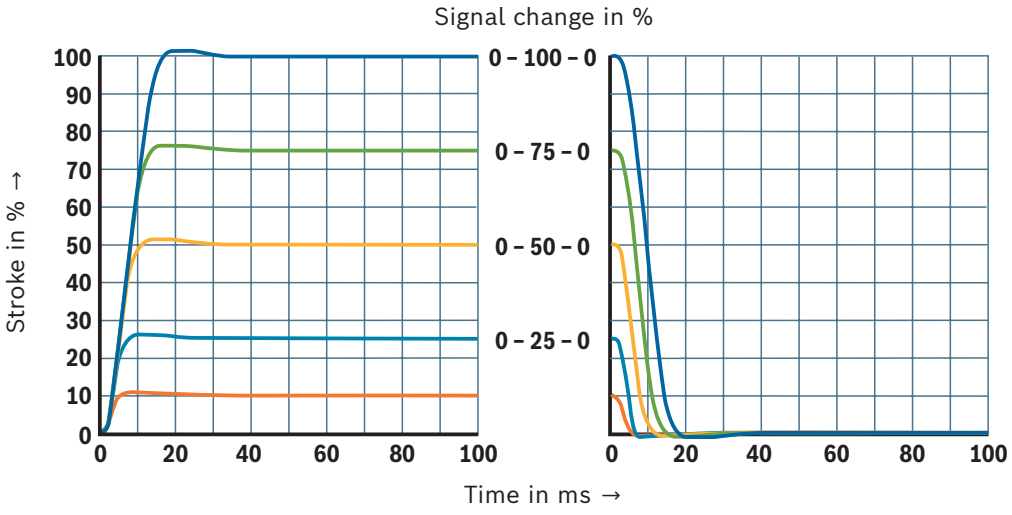
Symbol Q5-



1 P→A
2 B→T
3 P→B
4 A→T

Transition function with stepped electric input signals

Symbol V

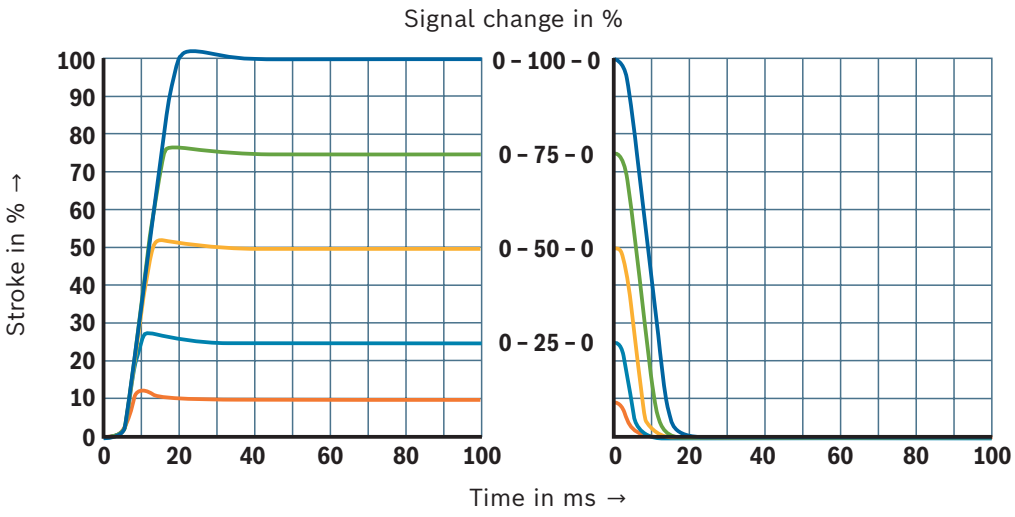


☞ **Notice:**
Typical characteristic curves which are subject to tolerance variations.

Characteristic curves: Size 6 – valve direct control (measured with HLP46, ϑ_{oil} = 40±5 °C)

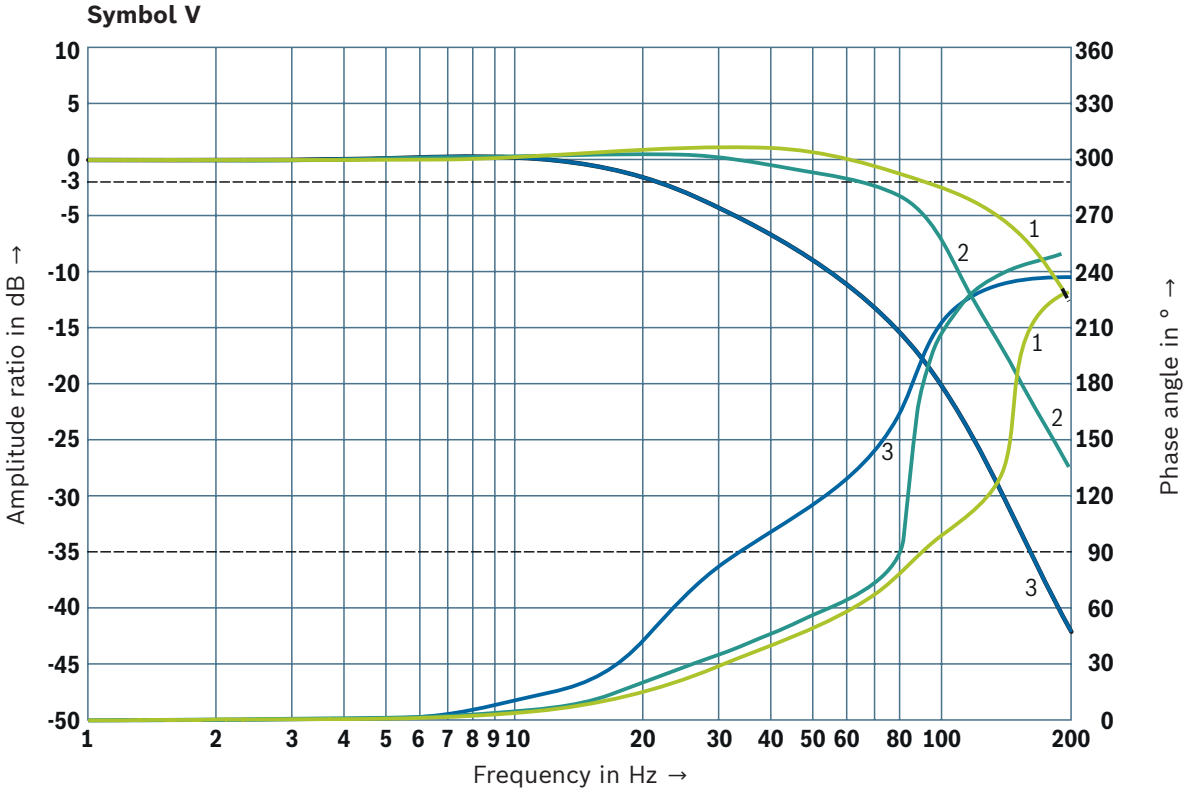
Transition function with stepped electric input signals

Symbol Q5-



Frequency response

Symbol V



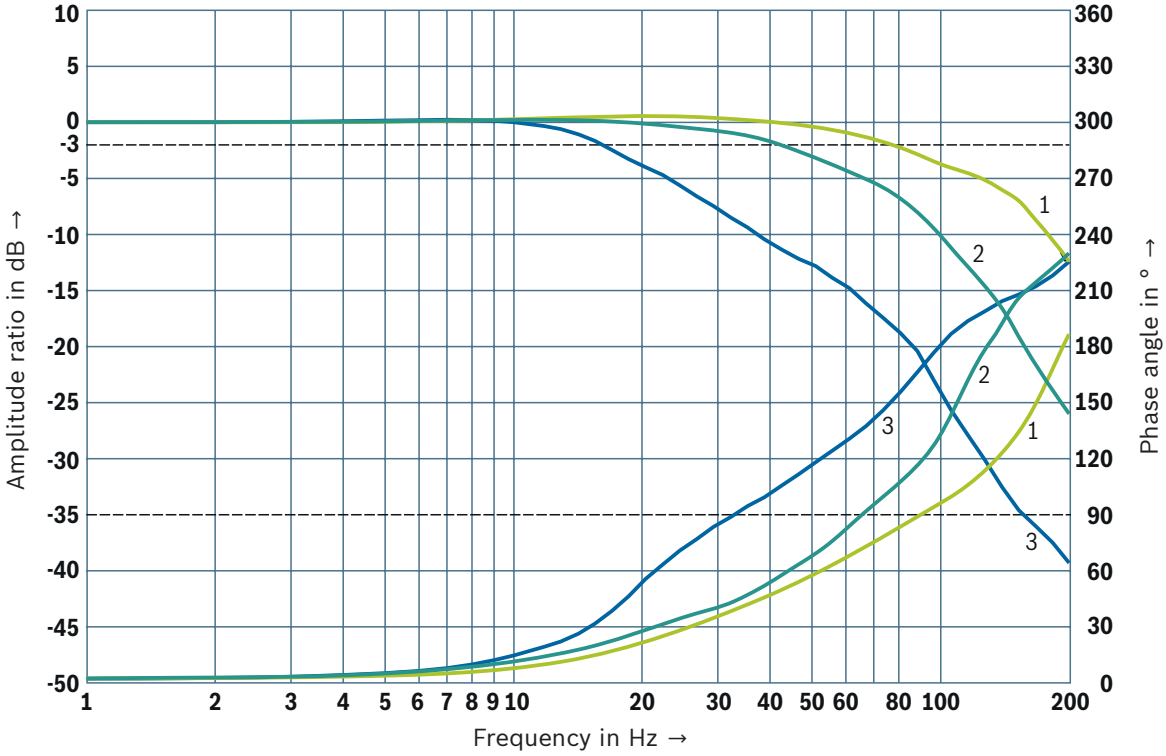
1 Signal ±5 %
2 Signal ±25 %
3 Signal ±100 %

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

Characteristic curves: Size 6 – valve direct control (measured with HLP46, ϑ_{oil} = 40±5 °C)

Frequency response

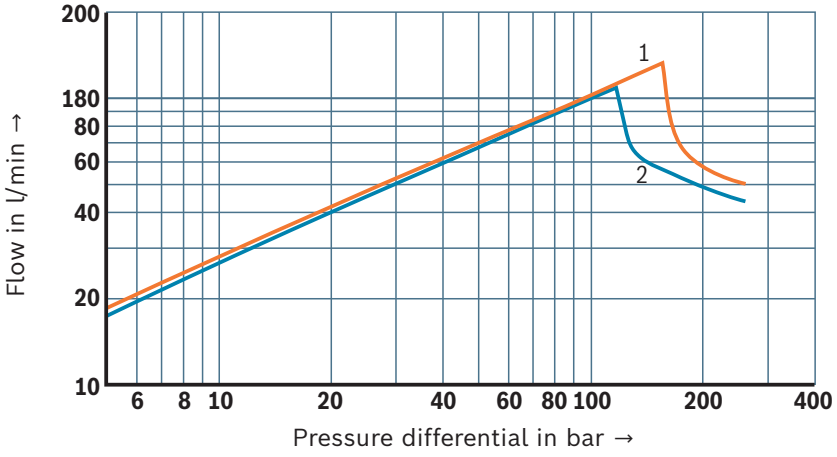
Symbol Q5-



1 Signal ±5 %
2 Signal ±25 %
3 Signal ±100 %

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

Rated flow 32 l/min

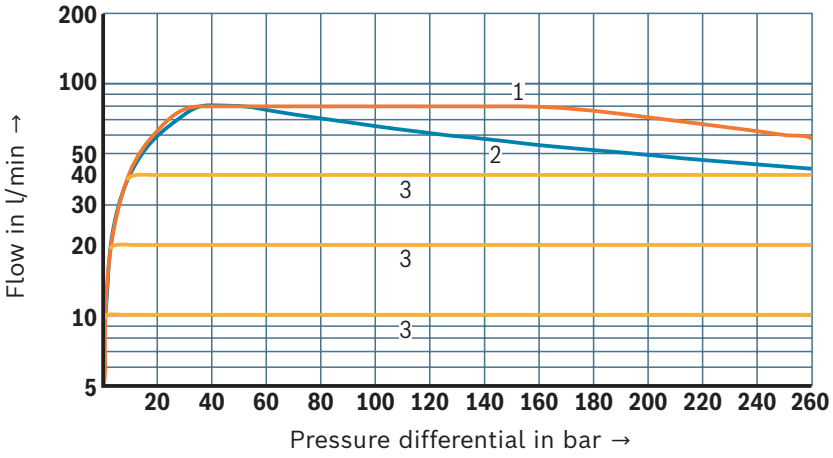


1 Symbol V
2 Symbol Q5-

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

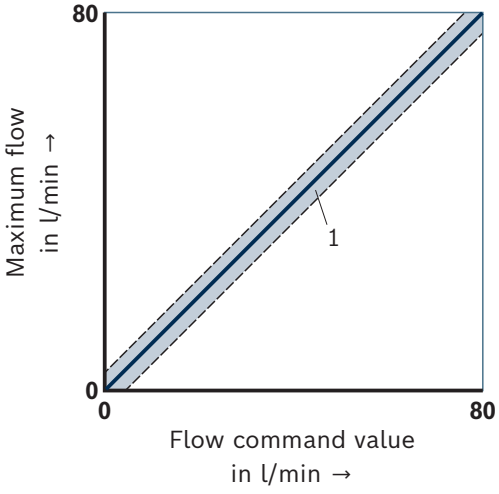
Characteristic curves: Size 6 – flow control (measured with HLP46, ϑ_{oil} = 40±5 °C)

Flow deviation (tolerance ±4 l/min)
Single edge (supply flow edge $q_{V\ command}$ = 80 l/min)



1 Symbol V
2 Symbol Q5-
3 Symbols V and Q5-

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

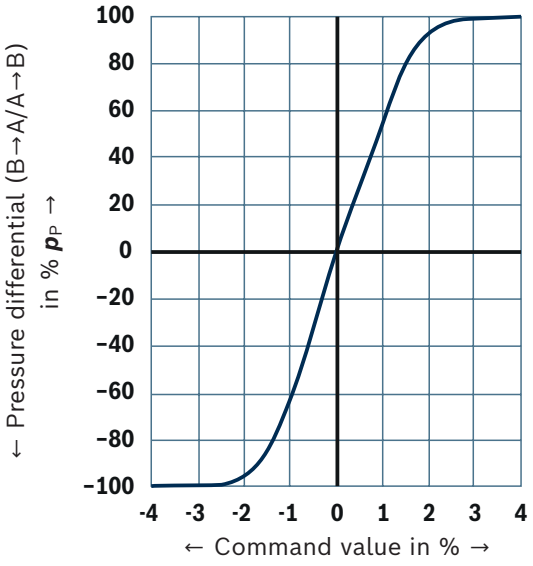


1 Tolerance ±4 l/min

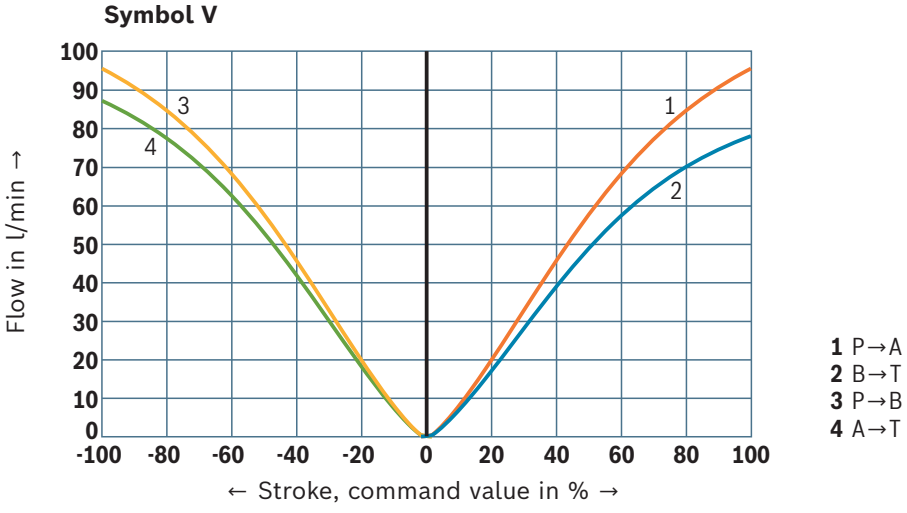
☞ **Notice:**
- The maximum possible flow is specified in the "maximum flow" parameter (P-0-2875.0.3). The default value is defined by the performance data of the valve (see parameter description 30330-PA).
- Observe the limitations of use of the valve under "Flow/load function with maximum valve opening".

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

Pressure/signal characteristic curve (symbol V)



Flow/signal function (rated flow **80** l/min with Δp = 5 bar/control edge)



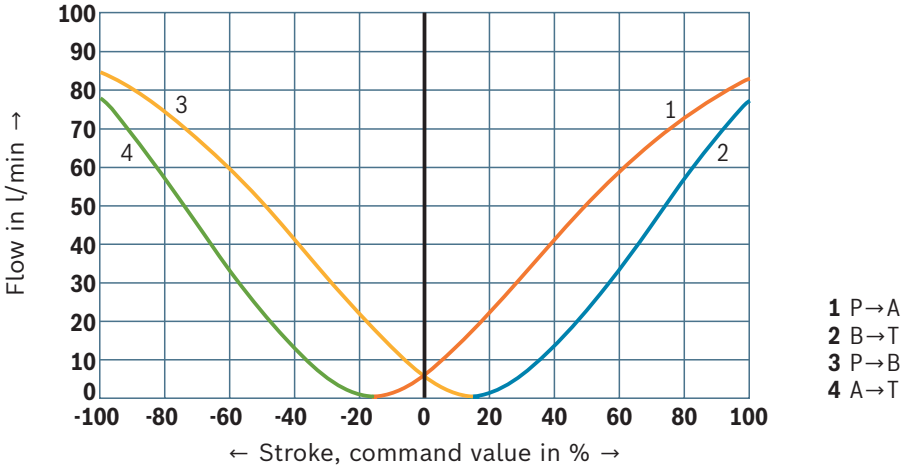
1 P→A
2 B→T
3 P→B
4 A→T

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

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

Flow/signal function (rated flow 80 l/min with Δp = 5 bar/control edge)

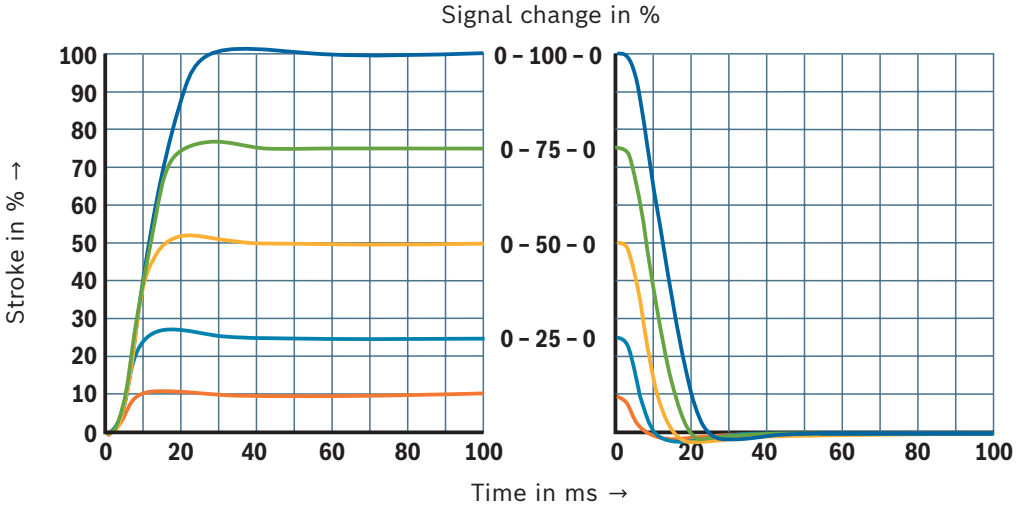
Symbol Q5-



1 P→A
2 B→T
3 P→B
4 A→T

Transition function with stepped electric input signals

Symbol V

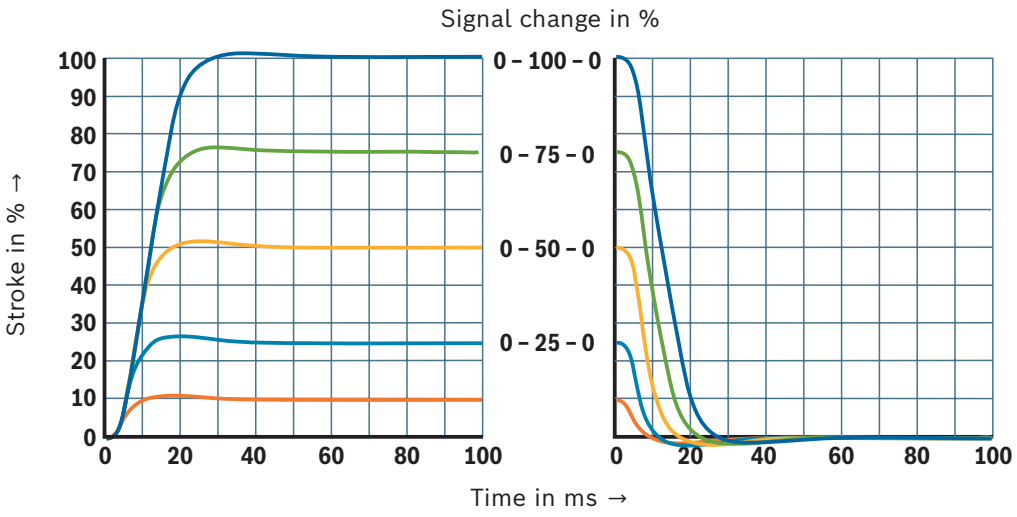


☞ **Notice:**
Typical characteristic curves which are subject to tolerance variations.

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

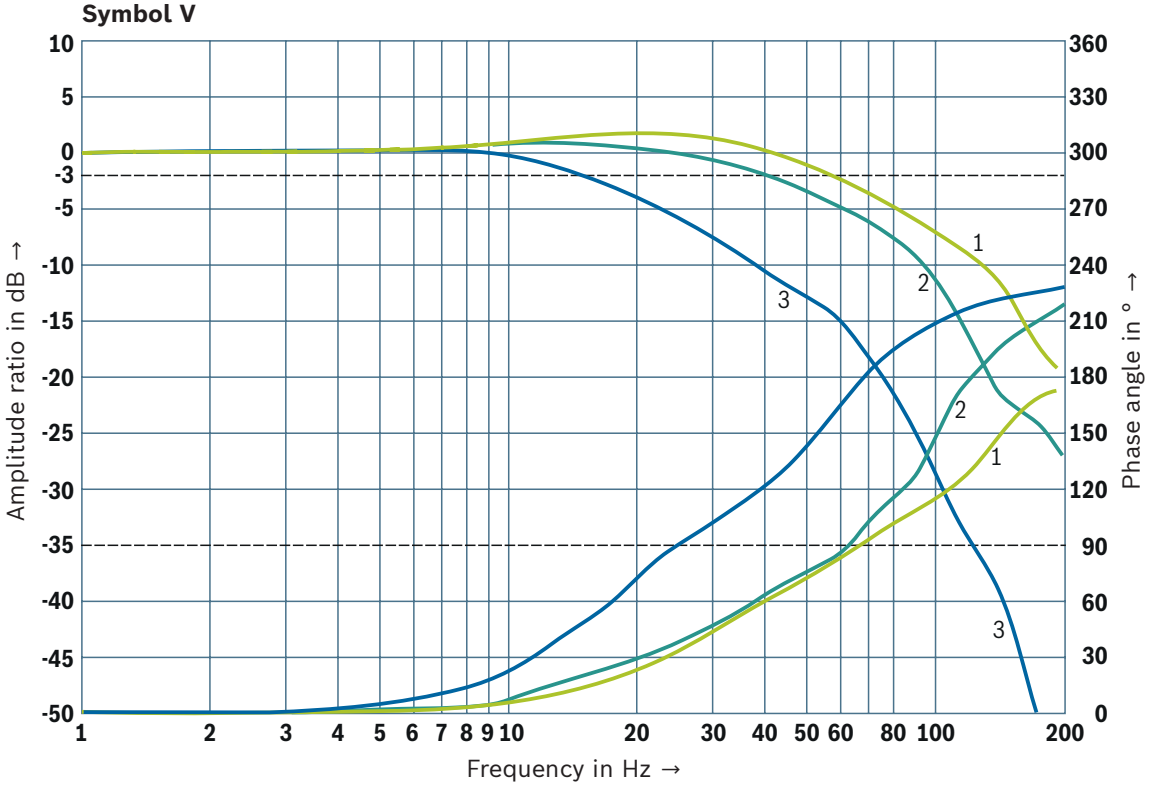
Transition function with stepped electric input signals

Symbol Q5-



Frequency response

Symbol V



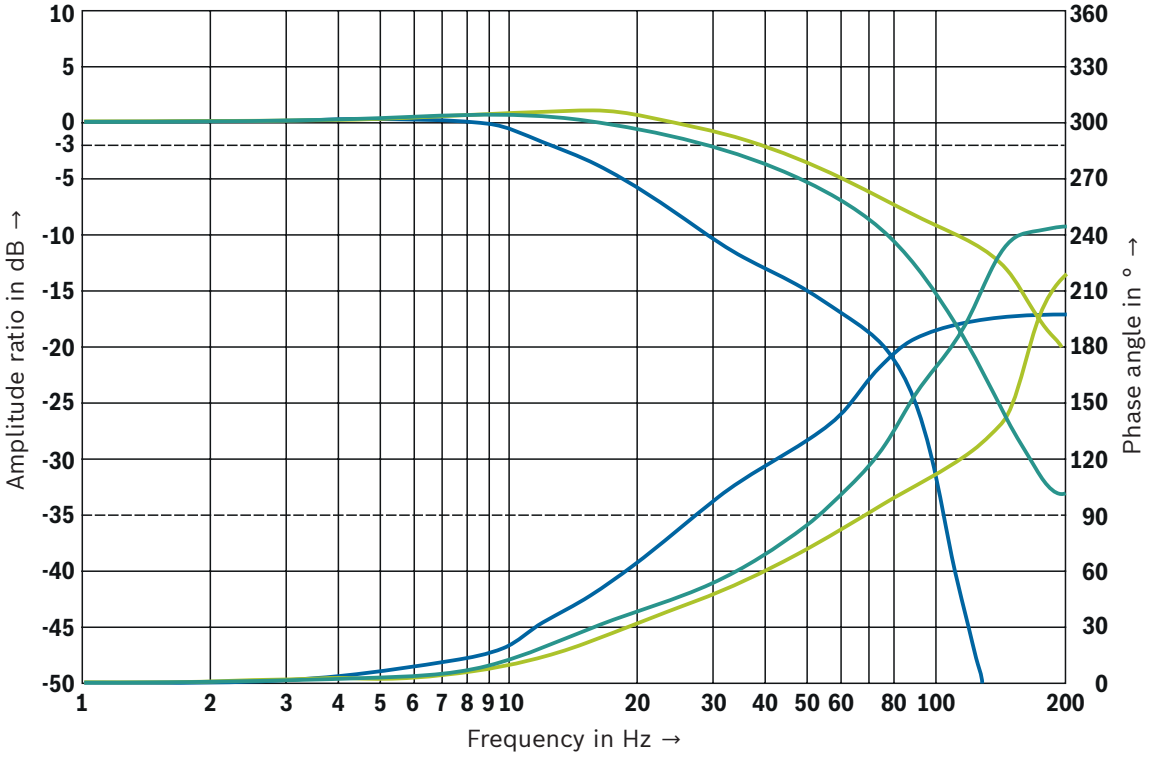
1 Signal ±5 %
2 Signal ±25 %
3 Signal ±100 %

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

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

Frequency response

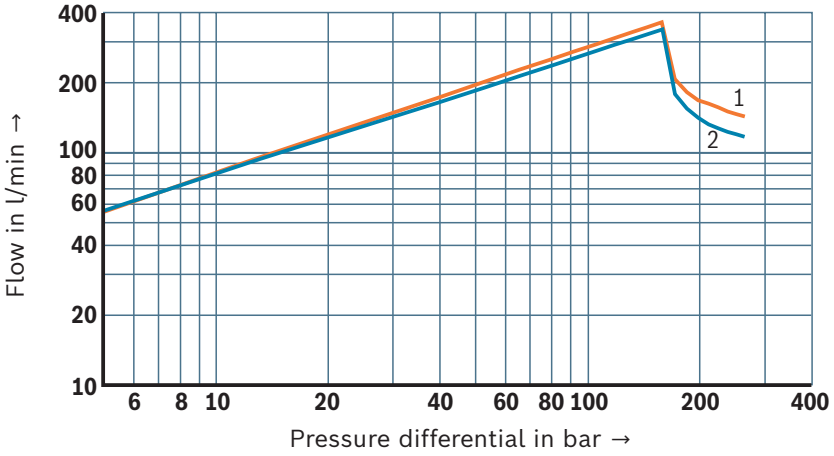
Symbol Q5-



1 Signal ±5 %
2 Signal ±25 %
3 Signal ±100 %

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

Rated flow 80 l/min

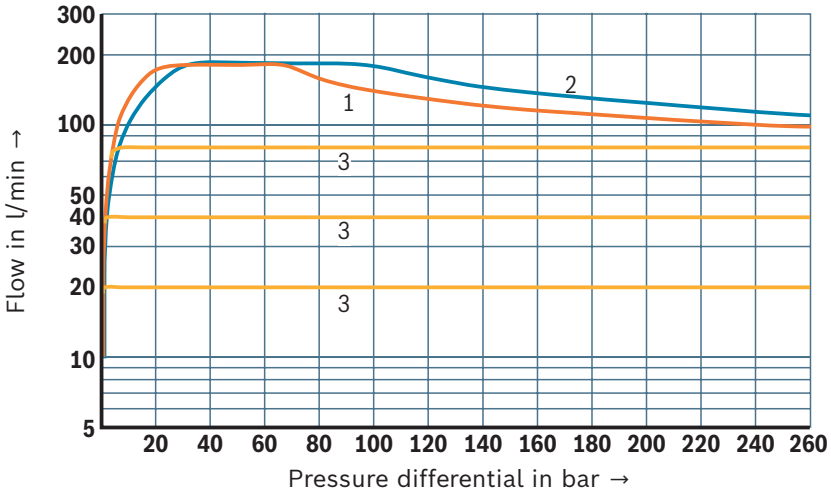


1 Symbol V
2 Symbol Q5-

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

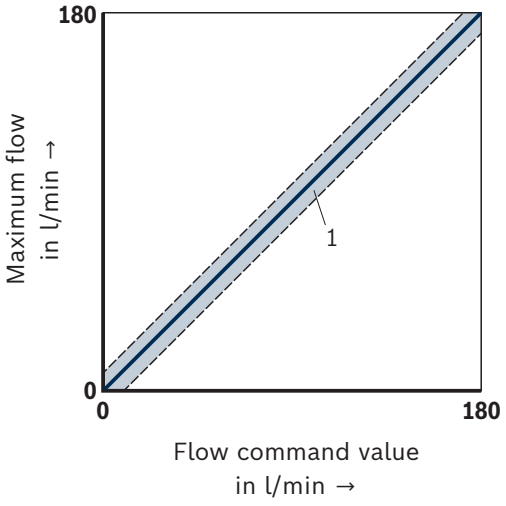
Characteristic curves: Size 10 – flow control (measured with HLP46, ϑ_{oil} = 40±5 °C)

Flow deviation (tolerance ±4 l/min)
Single edge (supply flow edge $q_{V\ command}$ = 180 l/min)



1 Symbol V
2 Symbol Q5-
3 Symbols V and Q5-

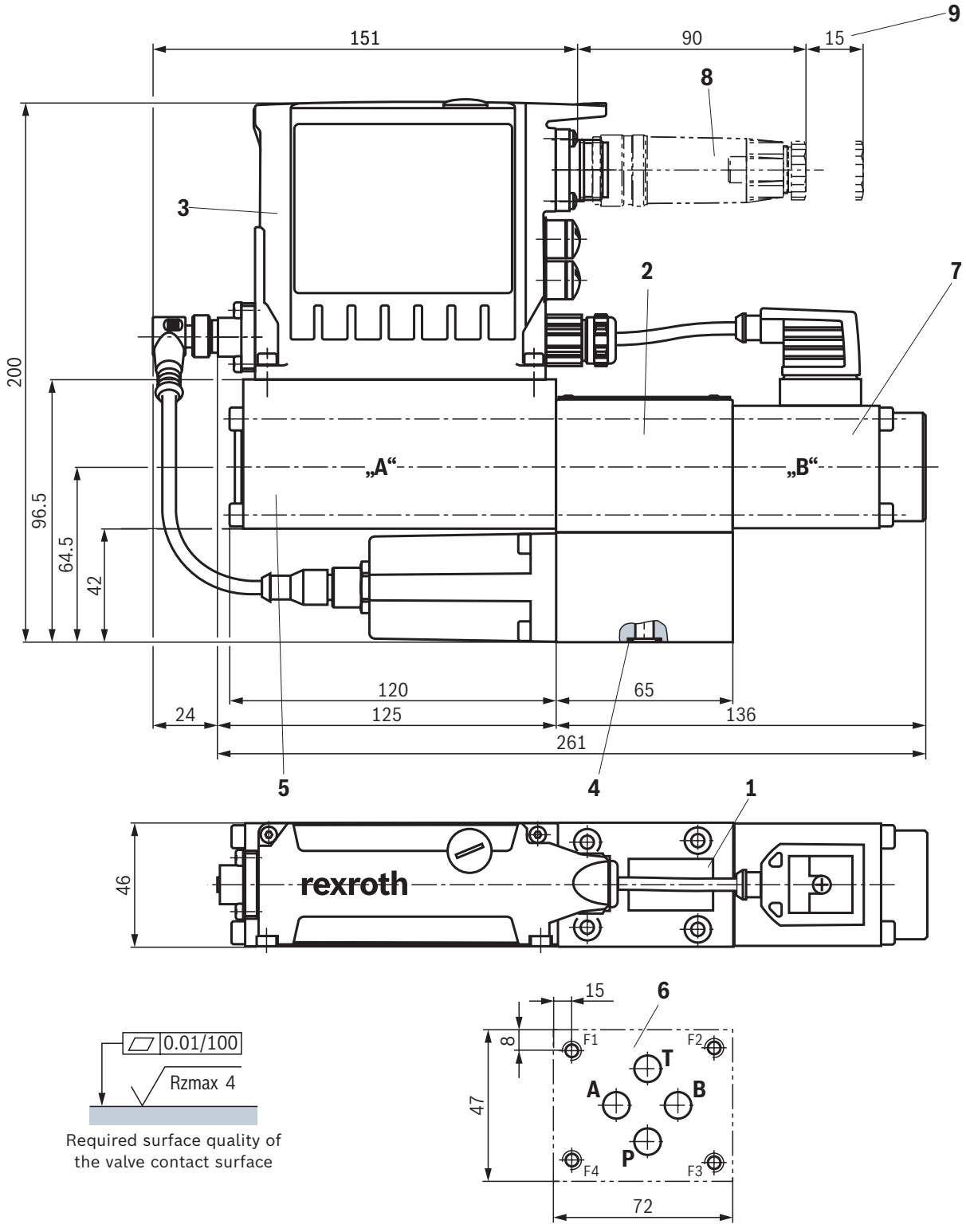
Tolerance of regulated flow / recommended maximum flow
(Default value 180 l/min)



1 Tolerance ±9 l/min

Notice:
- The maximum possible flow is specified in the "maximum flow" parameter (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)

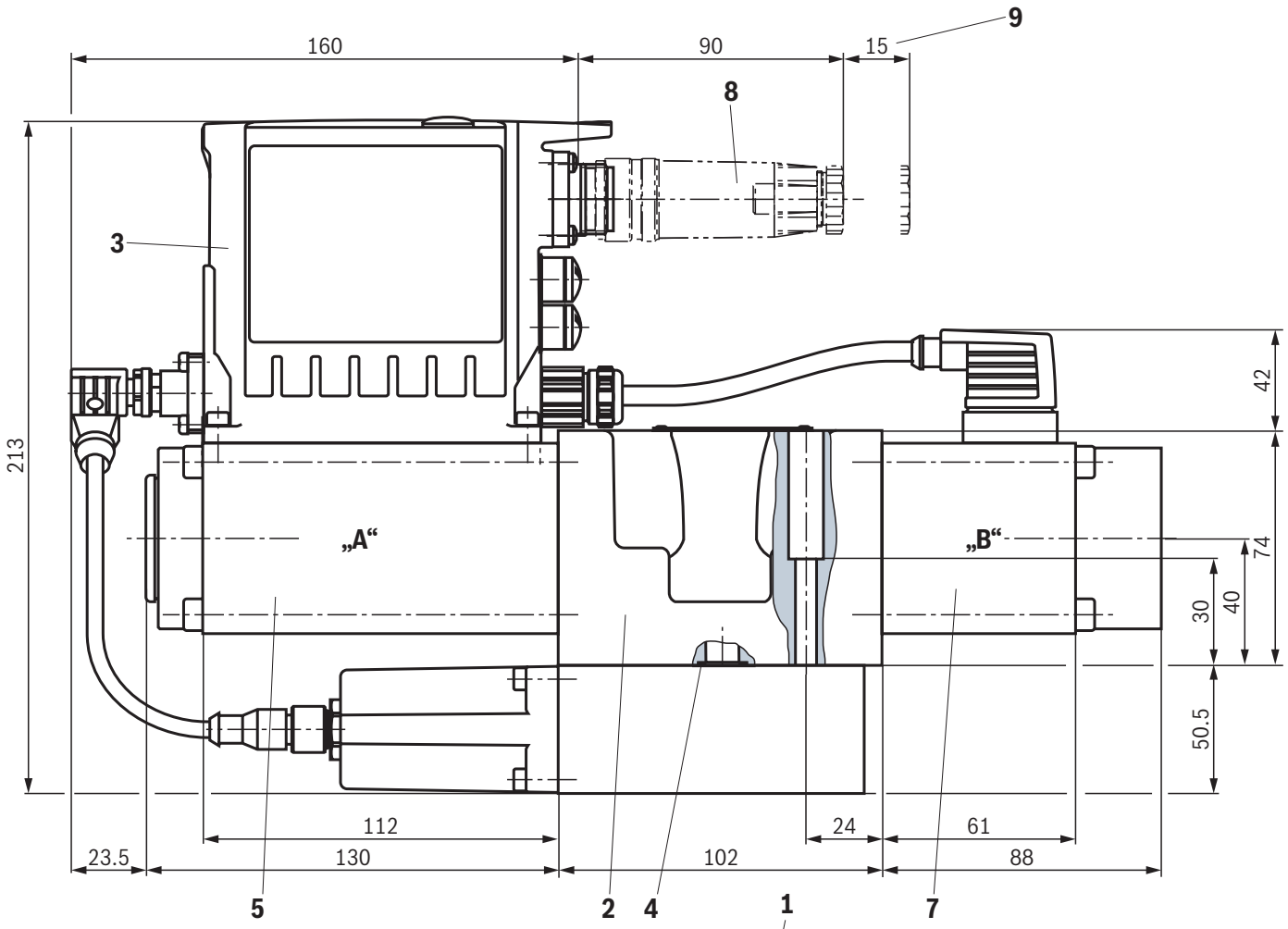


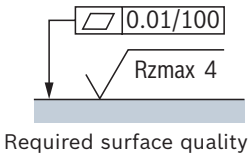
Required surface quality of the valve contact surface

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

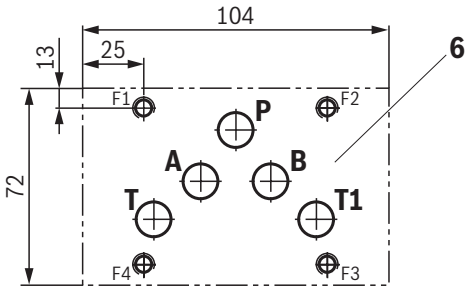
For **item explanations, valve mounting screws** and **subplates,** see page 27.

Dimensions: Size 10
(dimensions in mm)





Required surface quality of the valve contact surface



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

For **item explanations, valve mounting screws** and **subplates,** see page 27.

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 28 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** Tightening torque M_A = 8.9 Nm ±10%	**R913043762**
	or		
	4	**ISO 4762 - M5 x 70 - 10.9** Tightening torque M_A = 8.9 Nm ±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** Tightening torque M_A = 13 Nm ±10%	**R913049927**
	or		
	4	**ISO 4762 - M6 x 80 - 10.9** Tightening torque M_A = 13 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 4401-03-02-0-05 (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, PG11	7PZ31...M	**R900223890**	08006
		Straight, plastic, PG11	7PZ31...K	**R900021267**	
		Angled, plastic, PG11	7PZ31...K	**R900217845**	
	Cable sets; for valves with round connector, 6-pole + PE	Plastic, 3.0 m	7PZ31 BF6	**R901420483**	
		Plastic, 5.0 m		**R901420491**	
		Plastic, 10.0 m		**R901420496**	
		Plastic, 20.0 m		**R901448068**	
XH2	Mating connector; for valves with round connector, 11-pole + PE	Metal, shielded, PG13.5	12PN11... EMC	**R901268000**	08006
		Plastic, two cable outlets, PG16	2PN11...2XD8	**R900884671**	
	Cable sets; for valves with round connector, 11-pole + PE	Metal, shielded, 5 m	12PN11REFS EMC...BG	**R901272854**	
		Metal, shielded, 20 m		**R901272852**	
		Plastic, shielded, 5 m	12PN11REFF 2X	**R900032356**	
		Plastic, shielded, 20 m		**R900860399**	
X7E1, X7E2	Cable set; shielded, 4-pole, D coding	Straight connector M12, on straight connector M12, line cross-section 0.25 mm², 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 mm², 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

☞ **Notice:**

- Tighten the M12 connector with a manual torque wrench to 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 a 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.

Accessories (separate order)

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 information

- 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
▶ 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 fieldbus valves	www.boschrexroth.com/ifb

Notes

Notes

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