Directional high-response cartridge valve, pilot-operated, with integrated electronics (OBE)

Type WRCE

RE 29137
Edition: 2019-04
Replaces: 08.13



H6871+6872

- Size 32 ... 50
- Component series 2X
- Maximum operating pressure 420 bar
- Maximum flow 4500 l/min

Features

- 2/2- oder 3/3-way directional cartridge valve
- Pilot control valve: Proportional directional valve
- Main stage: position-controlled
- Normalized:
  - Installation dimensions according to ISO 7368 (“2WRCE”)
- Flexible:
  - Suitable for position, pressure, force and velocity control
- Typical applications:
  - Presses
  - Die casting machines
  - Punching axes

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Ordering code: “2WRCE”

01	02	03	04	05	06		07		08	09	10		11	12	13	14
2	**WRCE**		**S**			**–**	**2X**	**/**	**P**	**G24**	**K31**	**/**				*****

01	2 main ports	**2**
02	Directional high-response cartridge valve, pilot-operated, with integrated electronics (OBE)	**WRCE**
03	Size 32	**32**
	Size 40	**40**
	Size 50	**50**
04	Control spool in seat design	**S**

Rated flow at 5 bar pressure differential

05	**– Size 32**	
	480 l/min (only version “R”)	**480**
	650 l/min (only version “L”)	**650**
	– Size 40	
	700 l/min (only version “R”)	**700**
	1000 l/min (only version “L”)	**1000**
	– Size 50	
	1100 l/min (only version “R”)	**1100**
	1600 l/min (only version “L”)	**1600**

Flow characteristic

06	Linear	**L**
	Linear with progressive fine control range	**R**
07	Component series 20 ... 29 (20 ... 29: unchanged installation and connection dimensions)	**2X**

Pilot control valve

08	Proportional directional valve	**P**

Supply voltage

09	Direct voltage 24 V	**G24**

Electrical connection

10	Without mating connector; connector according to DIN EN 175201-804	**K31** [1]

Electrical interface

11	Command value 0 ... 10 V, actual value 0.5 ... 10 V	**A1**
	Command value 0 ... 10 mA, actual value 0.5 ... 10 mA	**C1**

Sandwich plate shut-off valve

12	**Without** shut-off valve	**no code**
	With shut-off valve [1]	
	Shut-off valve switched to de-energized actively **closes** "2WRCE" with applied pilot pressure	**WK15**
	Shut-off valve switched to de-energized actively **opens** "2WRCE" with applied pilot pressure	**WL15**

Seal material(observe compatibility of seals with hydraulic fluid used, see page 10)

13	NBR seals	**M**
	FKM seals	**V**
14	Further details in the plain text	

[1] Mating connectors, separate order, see page 28 and data sheet 08006.

Ordering code: “3WRCE”

01	02	03	04	05	06		07		08	09	10		11	12	13	14
3	**WRCE**					**–**	**2X**	**/**	**P**	**G24**	**K31**	**/**				*****

01	3 main ports	**3**
02	Directional high-response cartridge valve, pilot-operated, with integrated electronics (OBE)	**WRCE**
03	Size 32	**32**
	Size 40	**40**
	Size 50	**50**
04	Control spool in spool design – zero overlap (+0.5 ... +1.5%)	**V**
	Control spool in spool design – positive overlap 10 ... 13%	**E**

Rated flow at 5 bar pressure differential

05	**– Size 32**	
	250 l/min (only versions “E” and “P”)	**250**
	290 l/min (only versions “V” and “L”)	**290**
	– Size 40	
	410 l/min (only versions “E” and “P”)	**410**
	460 l/min (only versions “V” and “L”)	**460**
	– Size 50	
	620 l/min (only versions “E” and “P”)	**620**
	720 l/min (only versions “V” and “L”)	**720**

Flow characteristic

06	Linear	**L**
	Linear with progressive fine control range	**P**
07	Component series 20 ... 29 (20 ... 29: unchanged installation and connection dimensions)	**2X**

Pilot control valve

08	Proportional directional valve	**P**

Supply voltage

09	Direct voltage 24 V	**G24**

Electrical connection

10	Without mating connector; connector according to DIN EN 175201-804	**K31** [1]

Electrical interface

11	Command value ±10 V, actual value ±10 V	**A1**
	Command value ±10 mA, actual value ±10 mA	**C1**

Sandwich plate shut-off valve

12	**Without** shut-off valve	**no code**
	With shut-off valve [1]	
	Shut-off valve switched to de-energized actively **closes** “3WRCE” with applied pilot pressure	**WK15**
	Shut-off valve switched to de-energized actively **opens** “3WRCE” with applied pilot pressure	**WL15**

Seal material(observe compatibility of seals with hydraulic fluid used, see page 10)

13	NBR seals	**M**
	FKM seals	**V**
14	Further details in the plain text	

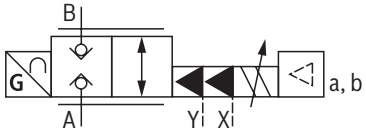
[1] Mating connectors, separate order, see page 28 and data sheet 08006.

☞ **Notice:**
Version “3WRCE” is not recommended for new applications, see page 7.

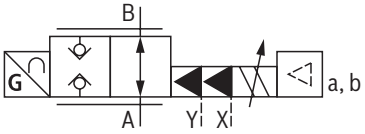
Symbols: “2WRCE”

Simplified

“No code” and **“WK15” version**

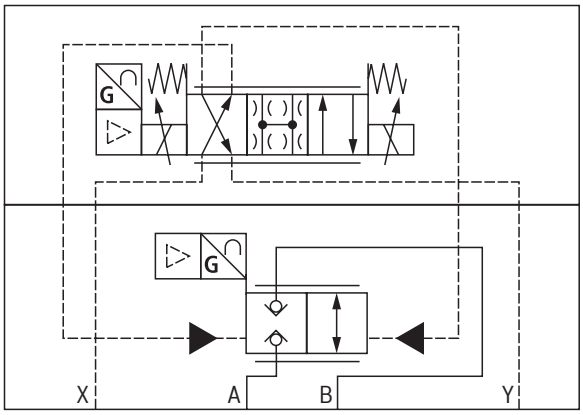


Version "WL15"

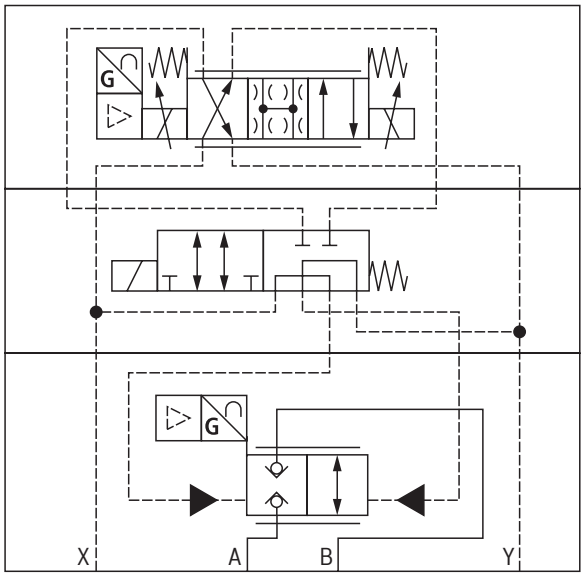


Detailed

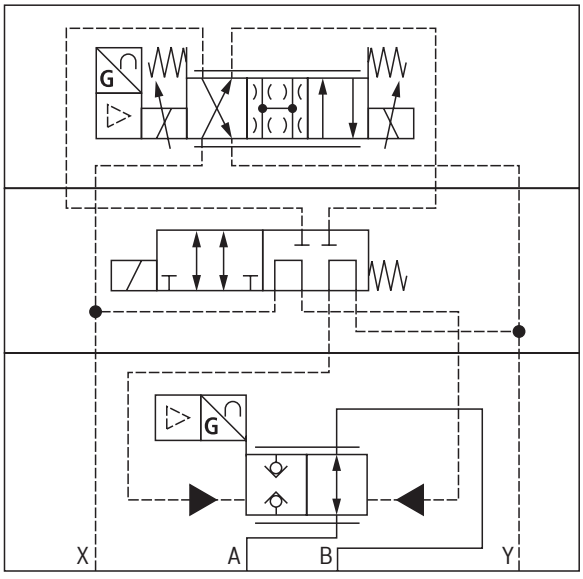
"No code" version



Version "WK15"



Version "WL15"

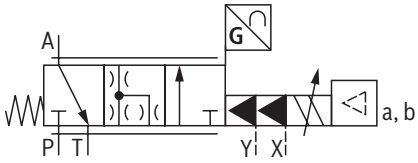


☞ **Notice:** Representation according to DIN ISO 1219-1.

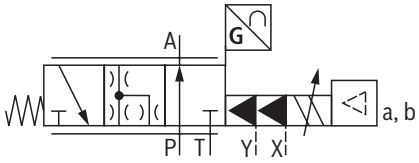
Symbols: “3WRCE”

Simplified

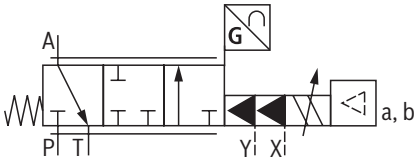
Version “V…no code” and **“V…WK15”**



Version “V…WL15”

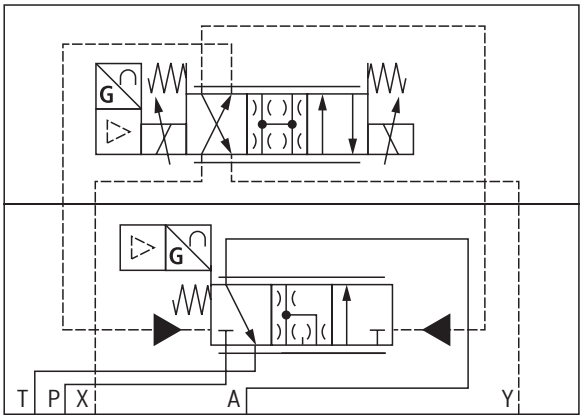


Version “E…no code”

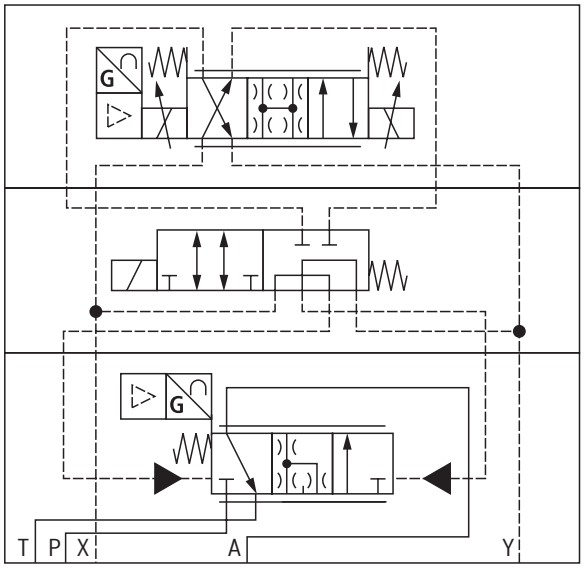


Detailed

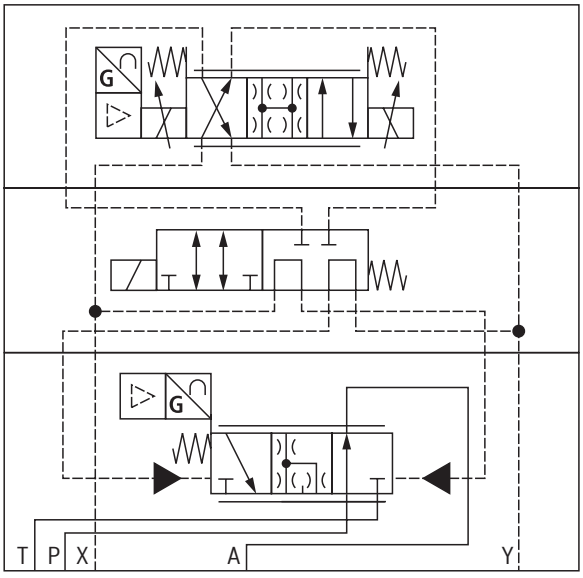
Version “V…no code”



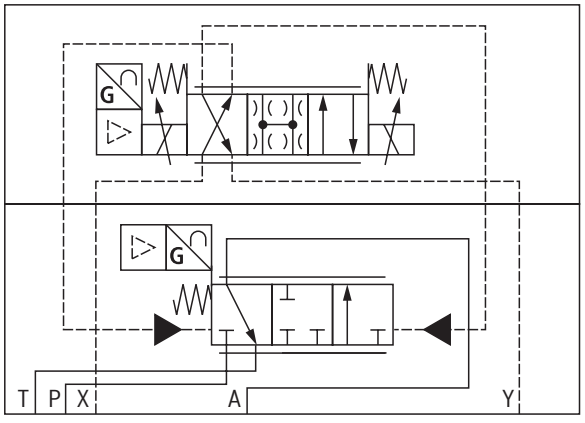
Version “V…WK15”



Version “V…WL15”



Version “E…no code”



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

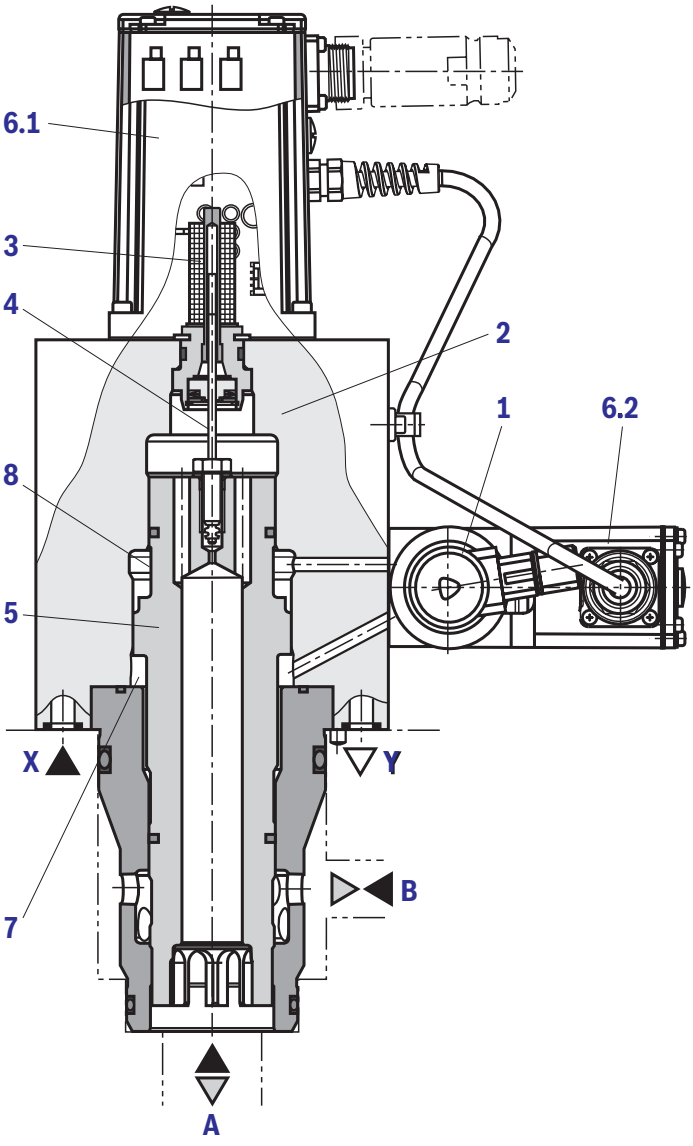
Function, section: “2WRCE”

Valves of type 2WRCE are pilot-operated, 2-stage directional high-response cartridge valves. They control the quantity and direction of a flow and are mainly used in control loops.

Set-up

The valves consist of the following assemblies:

- 1-stage pilot control valve (1)
  - with two solenoids as electro-mechanical converters and a control spool that is connected to the integrated pilot electronics (6.2) via electrical feedback
- Second stage (2) for flow control
- An inductive position transducer (3) the core (4) of which is attached to the main control spool (5) of the second stage
- Integrated electronics (OBE) (6.1).



Function

The integrated electronics (OBE) compares command and actual values and the solenoids of the pilot control valve (1) are actuated with a proportional current according to the control deviation.
The pilot control valve (1) takes a proportionally controlled position and controls the flow in and out of the control chambers A (7) and B (8) that actuate the main control spool (5) through the closed valve control loop up to 0 control deviation.
This means that the stroke of the main control spool (5) is regulated proportionally to the command value. It must be noted that the flow also depends on the valve pressure drop.

Valve features

The flow can pass through the valve from A to B or from B to A.
The control spool (seat design) closes or opens at 5% of the command value. At lower command values, the valve control loop attempts to guide the control spool, thus presses it onto the seat at full pilot pressure and blocks the connection in a leakage-free way.
The specified valve dynamics only apply to the control area of the valve. At command value steps from the seat to lower opening values, additional delay times occur.
The opening point of 5% (= 0.5 V or 0.5 mA) is set at the factory.
Due to the internal setting of the pilot control valve, the pilot pressure is connected to control chamber B (8) in case of a power failure, i.e. the main stage is closed.
The control electronics feature an offset setting to compensate pilot trimming.
Due to differences in diameter in the seat range, the control spools are statically not pressure-compensated. To compensate the force differential, 6% of the system pressure is required for version “L” and 22% of the system pressure is required for version “R” as pilot pressure. With reserves for flow force and dynamics, this defines the recommended minimum pilot pressure.

☞ **Notice:**
Preferably, port B is to be connected to the actuator.

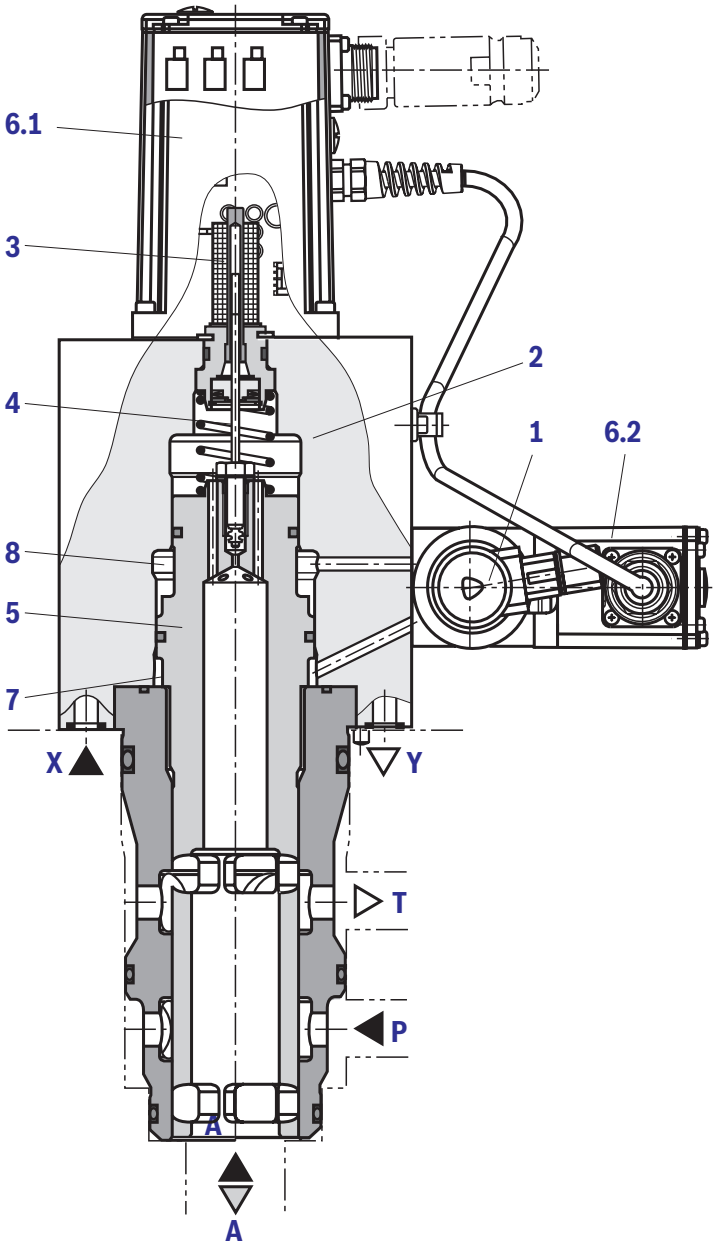
Function, section: “3WRCE”

Valves of type 3WRCE are pilot-operated, 3-stage directional high-response cartridge valves. They control the quantity and direction of a flow and are mainly used in control loops.

Set-up

The valves consist of the following assemblies:

- 1-stage pilot control valve (1)
  - with two solenoids as electro-mechanical converters and a control spool that is connected to the integrated pilot electronics (6.2) via electrical feedback
- Second stage (2) for flow control
- Inductive position transducer (3) the core (4) of which is attached to the main control spool (5) of the second stage
- Integrated electronics (OBE) (6.1).



Function

The integrated electronics (OBE) compares command and actual values and the solenoids of the pilot control valve (1) are actuated with a proportional current according to the control deviation.

The pilot control valve (1) takes a proportionally controlled position and controls the flow in and out of the control chambers A (7) and B (8) that actuate the main control spool (5) through the closed valve control loop up to 0 control deviation.

This means that the stroke of the main control spool (5) is regulated proportionally to the command value. It must be noted that the flow also depends on the valve pressure drop.

Valve features

The opening point of 0% (symbol V) is set at the factory.

Due to the internal setting of the pilot control valve, the pilot pressure is connected to control chamber B (8) in case of a power failure, i.e. the main stage is opened from A to T or the connection P to A is closed.

The spring behind the main control spool moves the control spool only into position so that P to A is closed if no pressure is applied (e.g. prior to installation, before the pressures are reapplied after tool change).

The integrated control electronics (OBE) feature an offset setting to compensate pilot trimming.

Notice:
Version “3WRCE” is not recommended for new applications.
If version “3WRCE” is used, ports A and P have to be exchanged. Upon request.

Technical data: “2WRCE”
(for applications outside these values, please consult us!)

General					
Sizes		NG	32	40	50
Installation position; commissioning			any, preferably horizontal		
Storage temperature range		°C	–20 ... +80		
Ambient temperature range		°C	–20 ... +50		
Weight	▶ Without shut-off valve (“no code”)	kg	12.5	19.9	26.8
	▶ With shut-off valve (“WK15”, “WL15”)	kg	13.7	21.1	28
Size of the pilot control valve		NG	6		
Sine test according to DIN EN 60068-2-6			5 ... 2000 Hz / maximum 10 g / 10 cycles		
Noise test according to DIN EN 60068-2-64			20 ... 2000 Hz / 10 g_{RMS} / 30 min		
Shock test according to DIN EN 60068-2-27			15 g / 11 ms		

Hydraulic					
Maximum operating pressure	▶ Main stage				
	– Ports A, B	bar	420		
	▶ Pilot control valve				
	– Port X	bar	315		
	– Port Y	bar	210		
Minimum pilot pressure (in % of the system pressure)	▶ Version “L”	%	15		
	▶ Version "R"	%	45		
Rated flow (q_{Vnom} +10%; Δp = 5 bar)	▶ Version “L”	l/min	650	1000	1600
	▶ Version "R"	l/min	480	700	1100
Maximum flow	▶ Version “L”	l/min	1500	2200	3500
	▶ Version "R"	l/min	2000	3000	4500
Pilot flow [1]		l/min	37	45	60
Zero flow (pre-stage)			see characteristic curves page 13		
Pilot oil volume		cm^3	4.52	8.48	17.3
Hydraulic fluid			see table page 10		
Hydraulic fluid temperature range	▶ Recommended	°C	+40 ... +50		
	▶ Maximum admissible		–20 ... +80		
Viscosity range	▶ Recommended	mm^2/s	30 ... 45		
	▶ Maximum admissible		20 ... 380		
Maximum admissible degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c)			Class 20/18/15 [2]		
Hysteresis		%	≤ 0.2		
Range of inversion		%	≤ 0.1		
Response sensitivity		%	≤ 0.1		
Closing time [3]	▶ Pilot control valve	ms	≤ 200		
	▶ With shut-off valve	ms	≤ 200		

1) Stepped input signal (from 0 to 100%, pilot pressure 315 bar)

2) 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.
Available filters can be found at www.boschrexroth.com/filter.

3) Pilot pressure 40 ... 315 bar

Technical data: “3WRCE”
(for applications outside these values, please consult us!)

General					
Sizes		NG	32	40	50
Installation position; commissioning			any, preferably horizontal		
Storage temperature range		°C	–20 ... +80		
Ambient temperature range		°C	–20 ... +50		
Weight	▶ Without shut-off valve (“no code”)	kg	12.8	20.2	28
	▶ With shut-off valve (“WK15”, “WL15”)	kg	14	21.4	29.2
Size of the pilot control valve		NG	6		
Sine test according to DIN EN 60068-2-6			5 ... 2000 Hz / maximum 10 g / 10 cycles		
Noise test according to DIN EN 60068-2-64			20 ... 2000 Hz / 10 g_{RMS} / 30 min		
Shock test according to DIN EN 60068-2-27			15 g / 11 ms		

Hydraulic					
Maximum operating pressure	▶ Main stage				
	– Ports A, B, T	bar	315		
	▶ Pilot control valve				
	– Port X	bar	315		
	– Port Y	bar	210		
Rated flow (q_{Vnom} +10%; Δp = 5 bar)		l/min	290	460	720
Maximum flow		l/min	900	1400	2200
Pilot flow [1]		l/min	20	35	55
Maximum zero flow (main stage; p_P = 300 bar)		l/min	4	6	8
Zero flow (pre-stage)			see characteristic curves page 13		
Pilot oil volume		cm^3	±2.26	±4.24	±8.65
Hydraulic fluid			see table page 10		
Hydraulic fluid temperature range	▶ Recommended	°C	+40 ... +50		
	▶ Maximum admissible		–20 ... +80		
Viscosity range	▶ Recommended	mm^2/s	30 ... 45		
	▶ Maximum admissible		20 ... 380		
Maximum admissible degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c)			Class 20/18/15 [2]		
Hysteresis		%	≤ 0.2		
Range of inversion		%	≤ 0.1		
Response sensitivity		%	≤ 0.1		
Closing time [3]	▶ Pilot control valve	ms	≤ 200		
	▶ With shut-off valve	ms	≤ 200		

1) Stepped input signal (from 0 to 100%, pilot pressure 315 bar)

2) 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.
Available filters can be found at www.boschrexroth.com/filter.

3) Pilot pressure 40 ... 315 bar

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	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 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 - to back 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.

Electric			
Protection class of the valve according to EN 60529			IP65 with mating connector mounted and locked
Voltage type			Direct voltage
Type of signal			analog
Zero compensation		%	≤ 1
Zero shift upon change of:	▶ Hydraulic fluid temperature	%/10 K	≤ 0.3
	▶ Pilot pressure in X	%/100 bar	≤ 0.7
	▶ Return flow pressure in Y	%/bar	≤ 0.3

☞ **Notice:**
For information on the environment simulation testing for the areas EMC (electromagnetic compatibility), climate and mechanical
load see data sheet 29137-U (declarations on environmental compatibility).

Electrical connections and assignment

Connector pin assignment

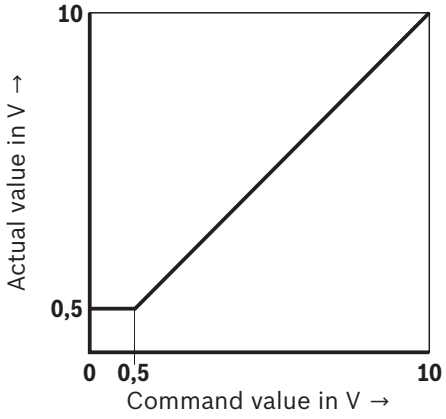
Pin	Signal	Interface assignment			
		„A1“		“C1”	
		“2WRCE”	“3WRCE”	“2WRCE”	“3WRCE”
A	Supply voltage	24 VDC nominal (18 ... 30 V; $I_{average}$ = 1 A, I_{peak} = 3 A)			
B		0 VDC			
C	Measurement zero	Reference to pin F			
D	Differential command value input	0 to +10 V Input resistance > 100 kΩ		0 ... +10 mA Load 100 Ω	
E					
F	Actual value Reference with pin C	+0.5 to +10 V maximum 10 mA	0 ... ±10 V maximum 10 mA	+0.5 to +10 mA Maximum load 1 kΩ	0 ... ±10 mA Maximum load 1 kΩ
PE	Protective ground	Functional ground (directly connected to the valve housing)			

☞ **Notes:**
- ▶ Do not connect PE if the valve has already been grounded via the system.
- ▶ Command value and actual value have the same polarity. In case of failure of the fuse “1A fast”, the actual value may temporarily also be measured between F and B.
- ▶ Electrical signals provided via control 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.

Nominal command value range

Version “2WRCE”

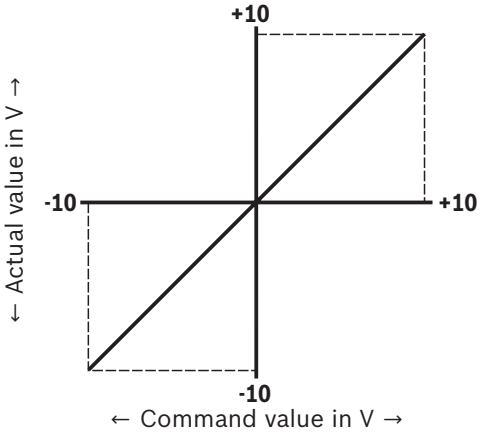
▶ 0 ... +10 V; 0 ... +10 mA (0 ... 100%)



- ▶ In case of a slow command value modification from +0.5 V to +10 V, the actual value follows the command value within ±0.15 V.
- ▶ For command values over +10 V, the actual value follows up to approx. +12 V.
- ▶ In the command value range of 0 ... +0.5 V, the actual value remains constant at 0.5 V.
- ▶ At a command value step to +10 V, the actual value can temporarily reach values of up to approx. +10.5 V.

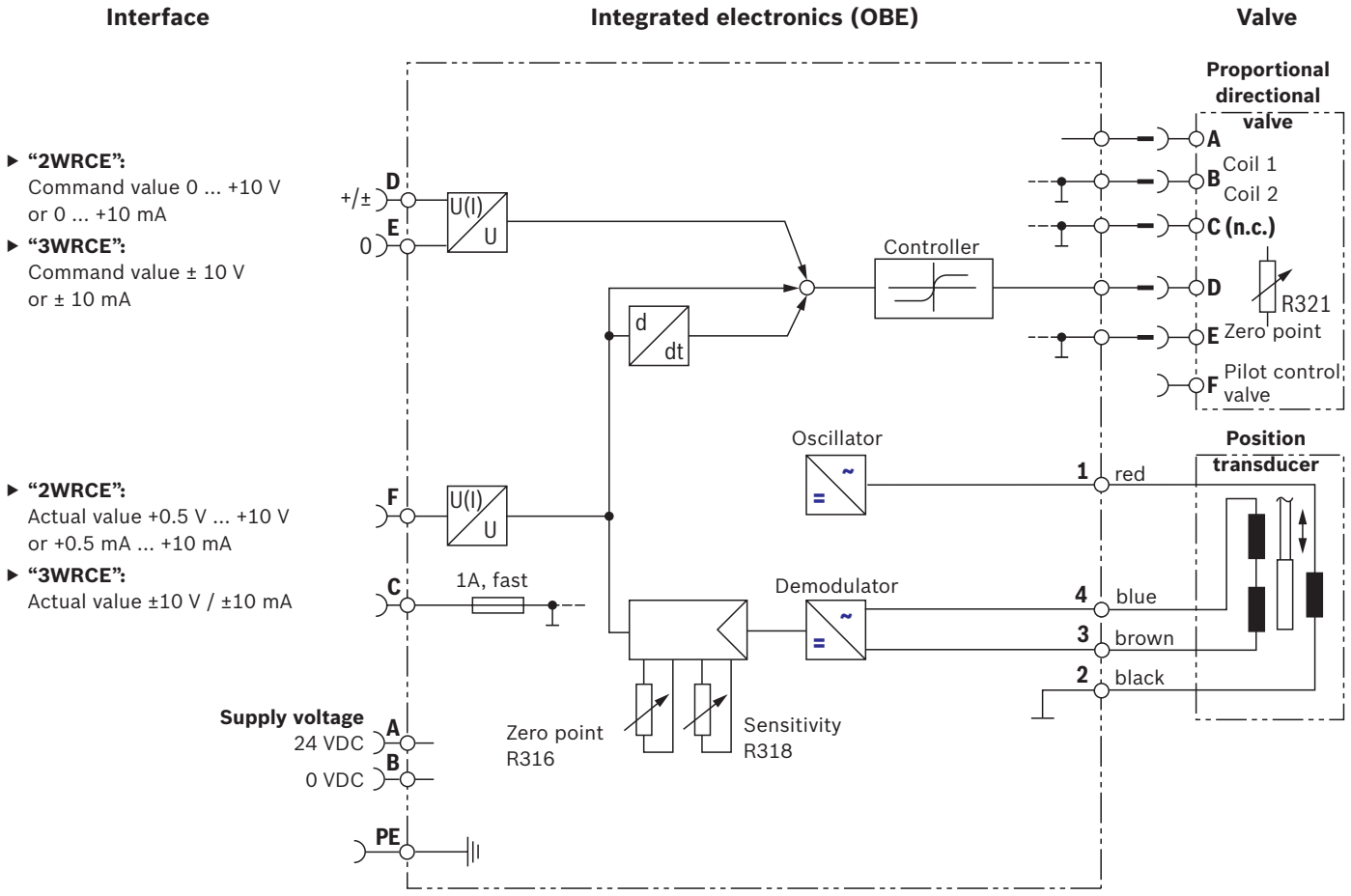
Version “3WRCE”

▶ 0 ... ±10 V; 0 ... ±10 mA (0 ... ±100%)



- ▶ In case of a slow command value modification from +0 V ... ±10 V, the actual value follows the command value within ±0.15 V.
- ▶ For command values over 10 V, the actual value follows up to approx. ±13 V.
- ▶ At a command value step to +10 V, the actual value can temporarily reach values of up to approx. +10.5 V.

Block diagram/controller function block: Integrated electronics (OBE)



Effect of the control:

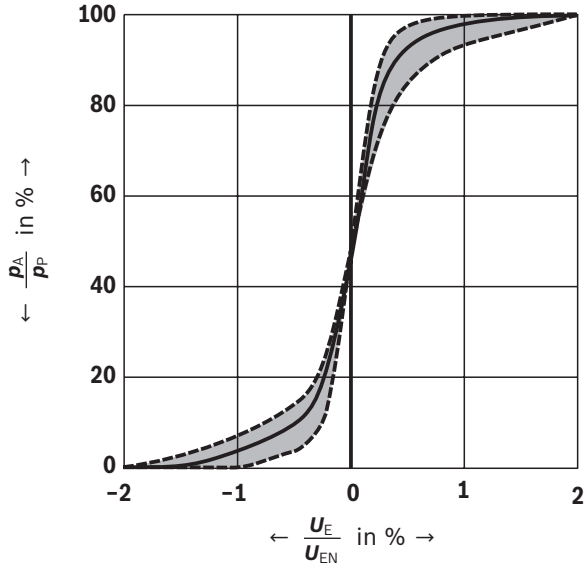
- A positive signal at pin D and a reference potential at pin E results in
  - "2WRCE": Flow A → B or B → A
  - "3WRCE": Flow P → A
- A positive signal at pin F and a reference potential at pin C results in
  - "2WRCE": Flow A → B or B → A
  - "3WRCE": Flow P → A

Characteristic curves

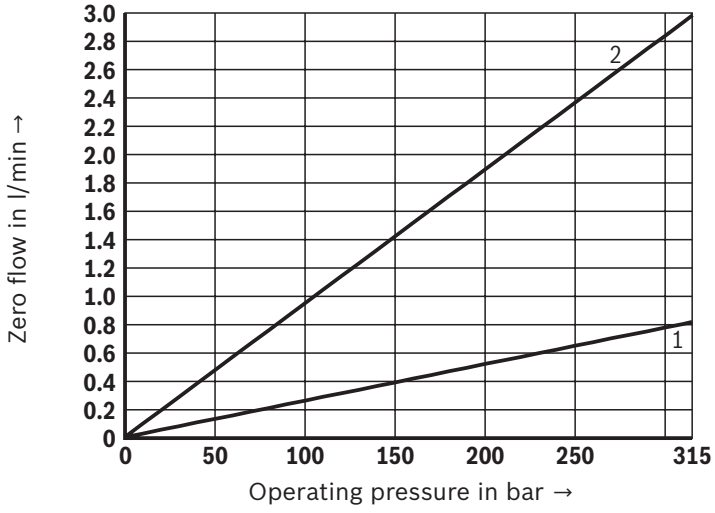
(measured with HLP32, ϑ_{oil} = 40 ±5 °C)

Pressure-signal function

("3WRCE...V"; limit and average characteristic curves)



Zero flow at the pilot control valve



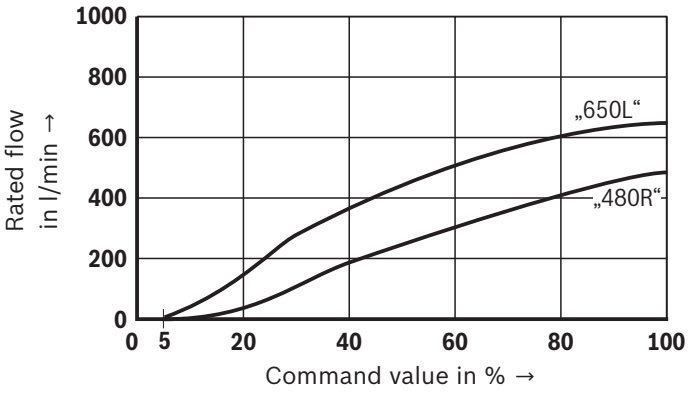
1 Minimum zero flow

2 Maximum zero flow

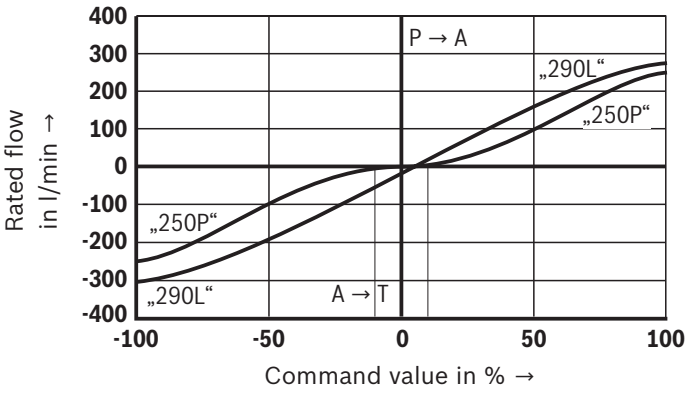
Characteristic curves: Size 32
(measured with HLP32, ϑ_{oil} = 40 ±5 °C)

Rated flow

"2WRCE" (***Δp*** = 5 bar; A → B, B → A)



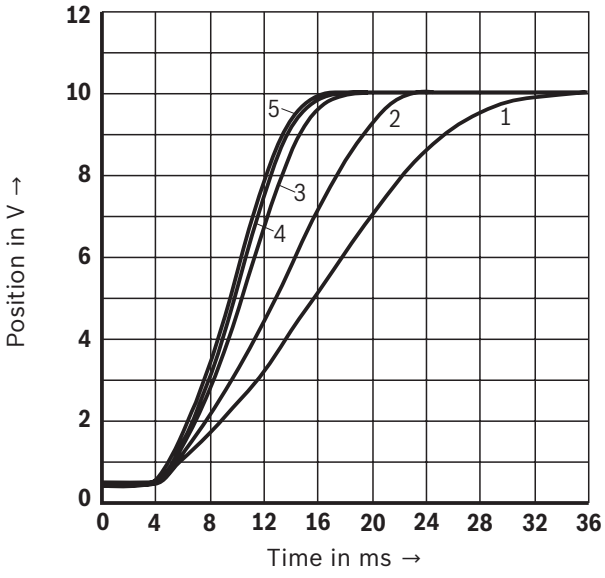
"3WRCE" (***Δp*** = 5 bar)



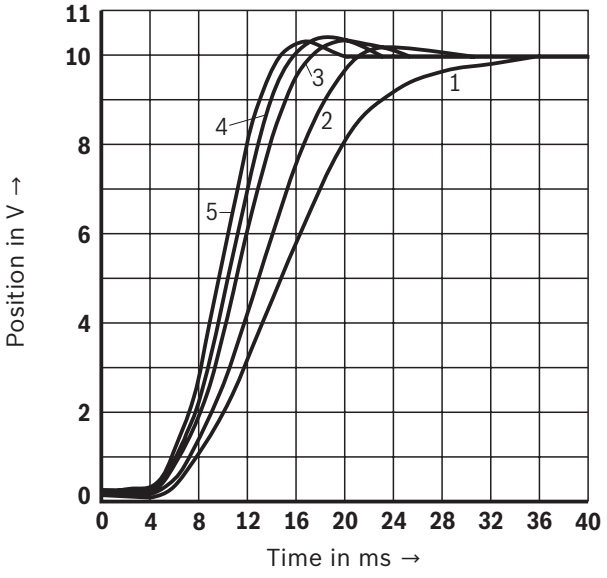
"E250P" 10% overlap
"V290L" 0.5 ... 1.5% overlap

Transition function

"2WRCE"



"3WRCE"

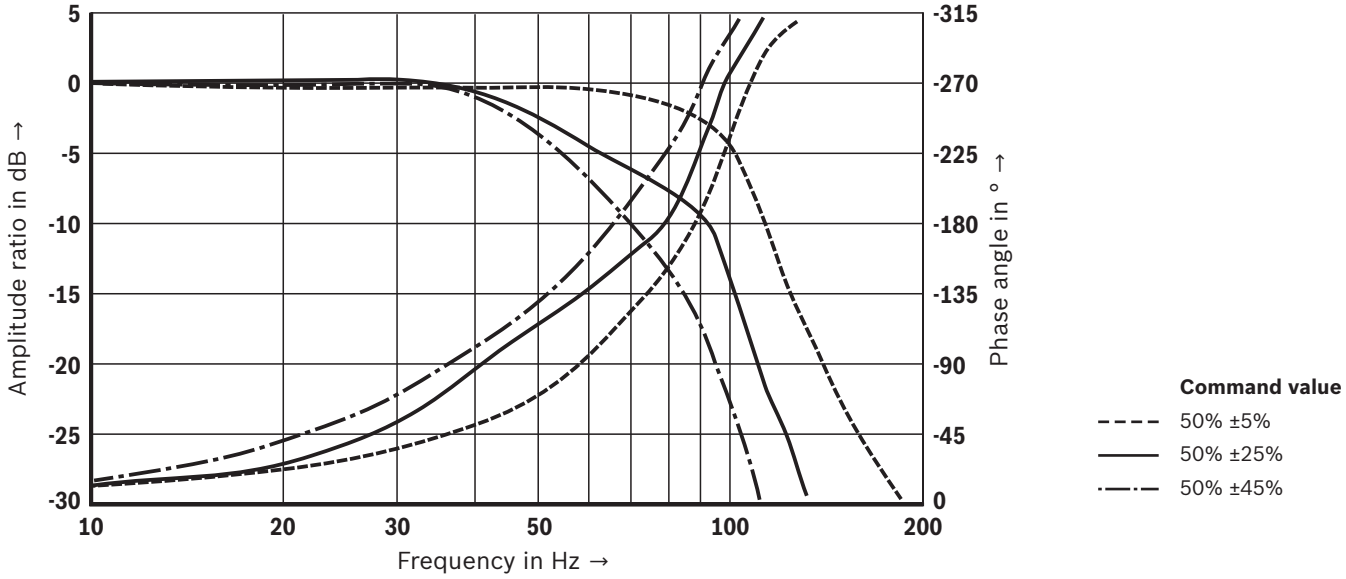


1 40 bar
2 70 bar
3 140 bar
4 210 bar
5 315 bar

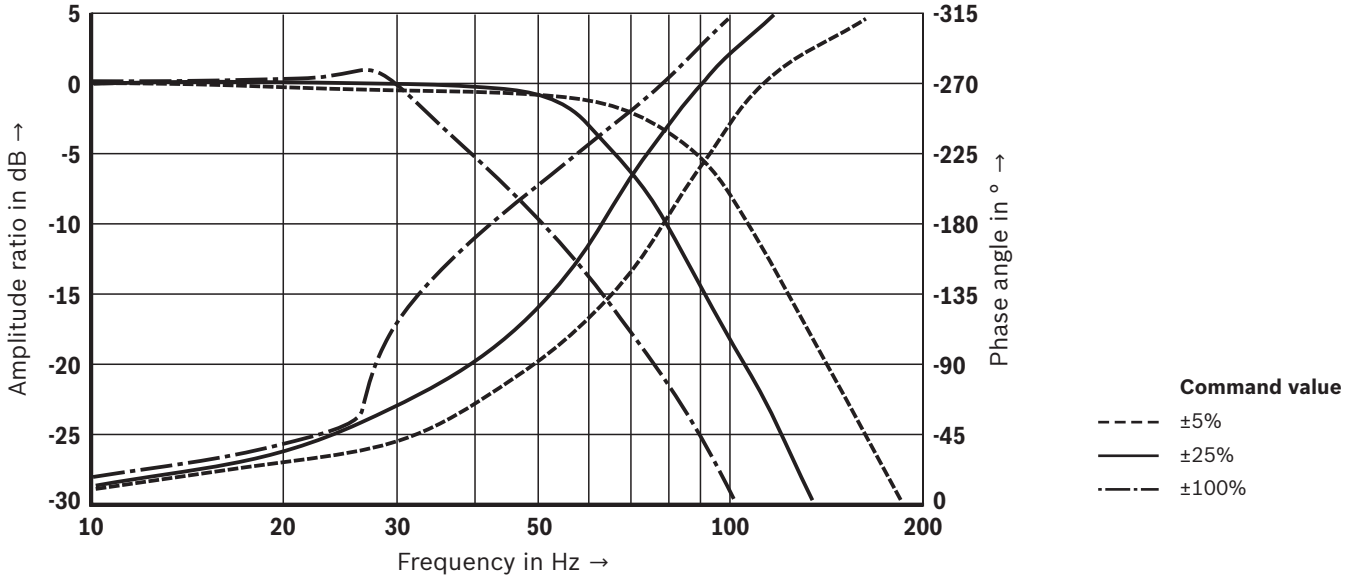
Characteristic curves: Size 32
(measured with HLP32, ϑ_{oil} = 40 ±5 °C)

Frequency response (p_P = 315 bar)

“2WRCE”



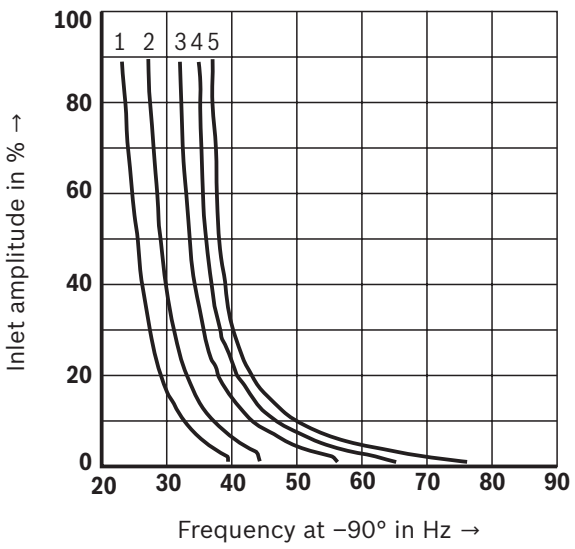
“3WRCE”



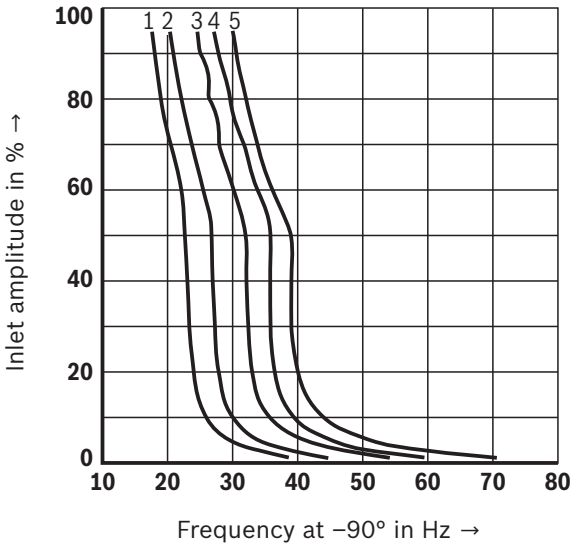
Characteristic curves: Size 32
(measured with HLP32, ϑ_{oil} = 40 ±5 °C)

Frequency *f* dependent on operating pressure and inlet amplitude

“2WRCE”



“3WRCE”

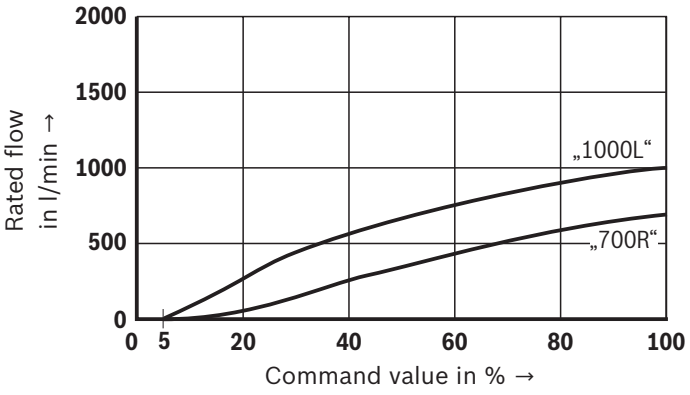


1 40 bar
2 70 bar
3 140 bar
4 210 bar
5 315 bar

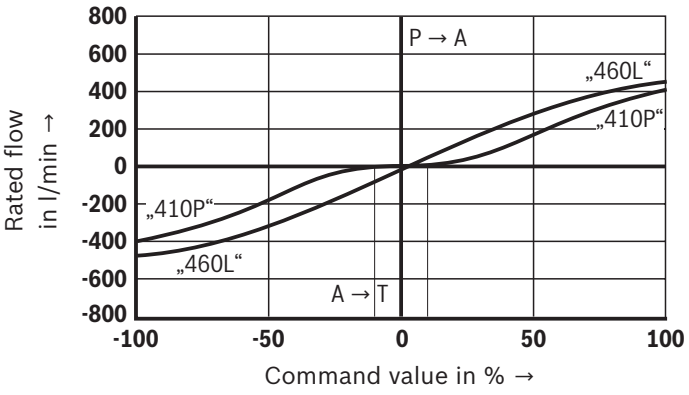
Characteristic curves: Size 40
(measured with HLP32, ϑ_{oil} = 40 ±5 °C)

Rated flow

“2WRCE” (***Δp*** = 5 bar; A → B, B → A)



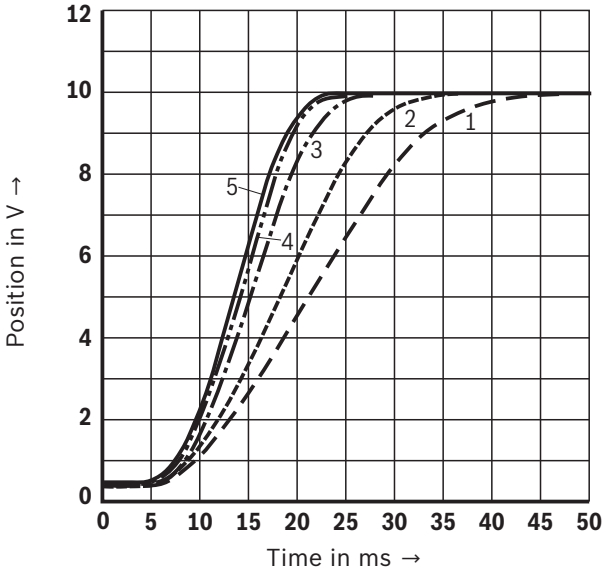
“3WRCE” (***Δp*** = 5 bar)



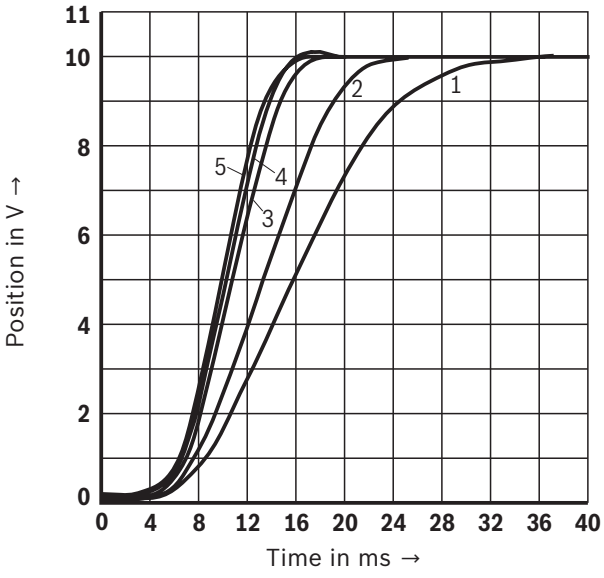
“E410P” 10% overlap
“V460L” 0.5 ... 1.5% overlap

Transition function

“2WRCE”



“3WRCE”

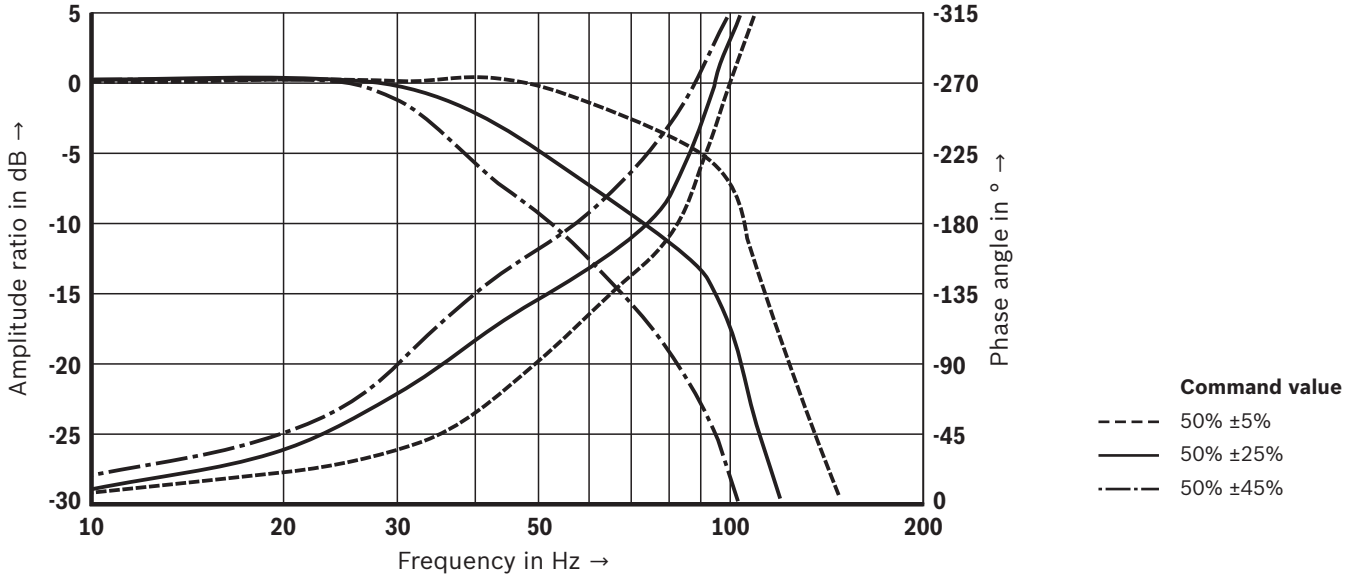


1 40 bar
2 70 bar
3 140 bar
4 210 bar
5 315 bar

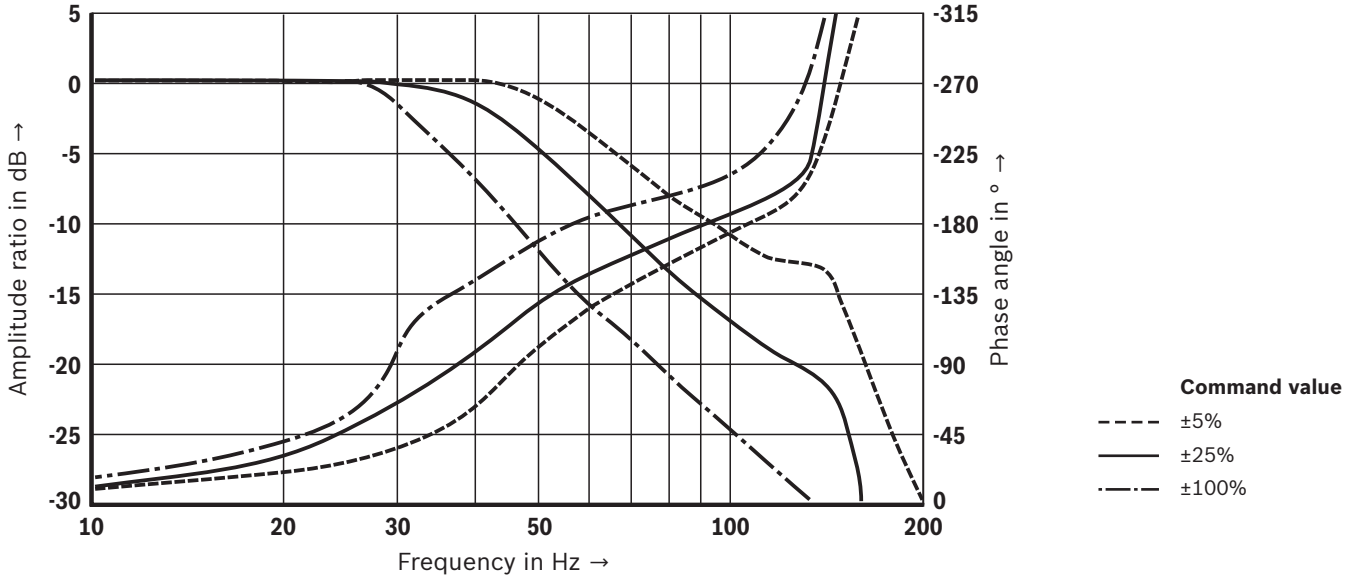
Characteristic curves: Size 40
(measured with HLP32, ϑ_{oil} = 40 ±5 °C)

Frequency response (p_P = 315 bar)

“2WRCE”



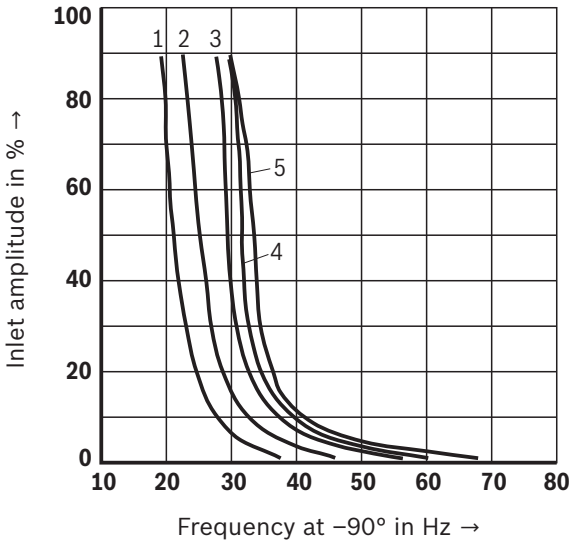
“3WRCE”



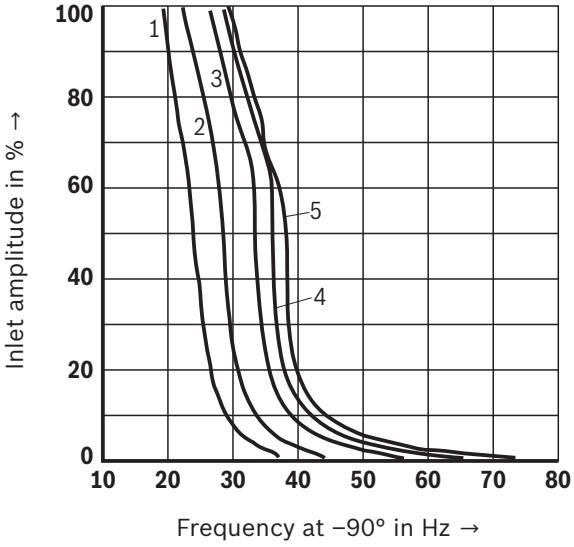
Characteristic curves: Size 40
(measured with HLP32, ϑ_{oil} = 40 ±5 °C)

Frequency *f* dependent on operating pressure and inlet amplitude

“2WRCE”



“3WRCE”

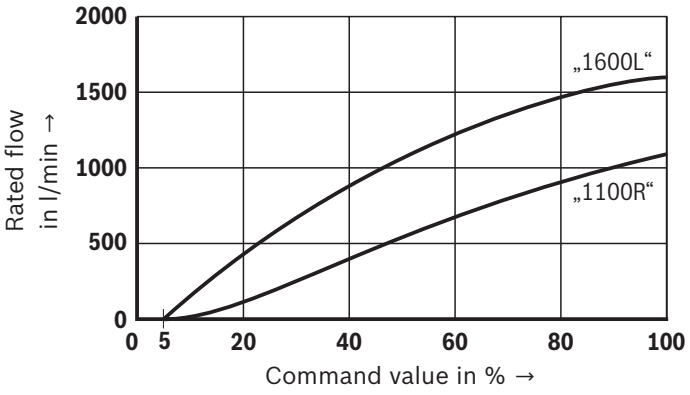


1 40 bar
2 70 bar
3 140 bar
4 210 bar
5 315 bar

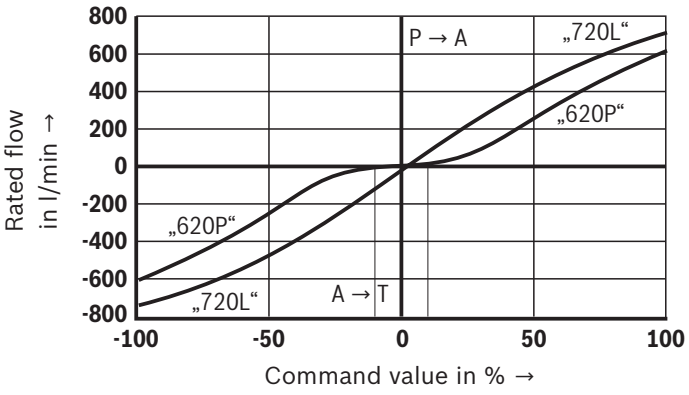
Characteristic curves: Size 50
(measured with HLP32, ϑ_{oil} = 40 ±5 °C)

Rated flow

"2WRCE" (***Δp*** = 5 bar; A → B, B → A)



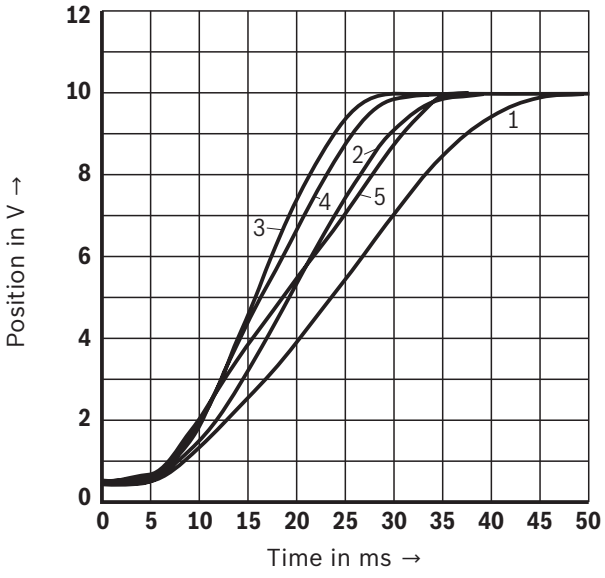
"3WRCE" (***Δp*** = 5 bar)



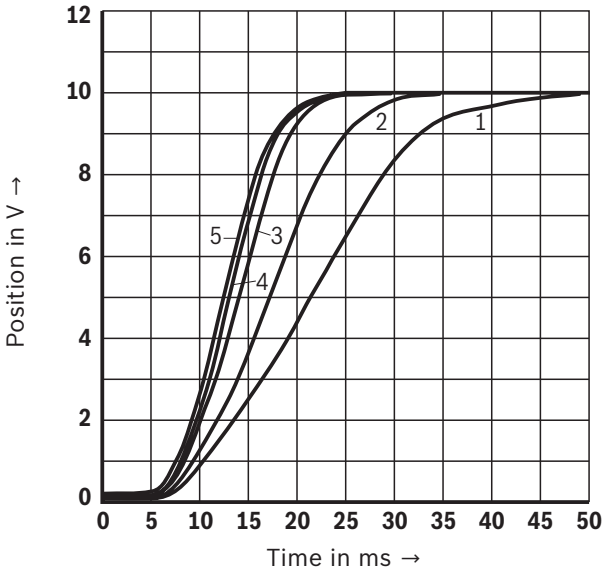
"E620P" 10% overlap
"V720L" 0.5 ... 1.5% overlap

Transition function

"2WRCE"



"3WRCE"

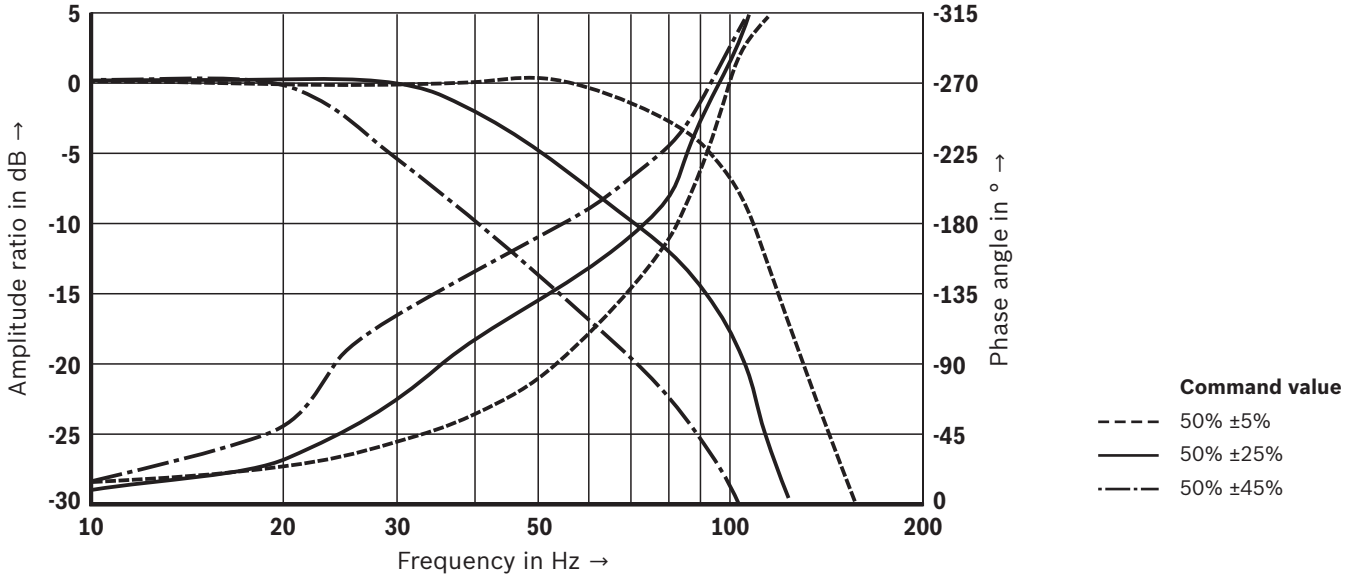


1 40 bar
2 70 bar
3 140 bar
4 210 bar
5 315 bar

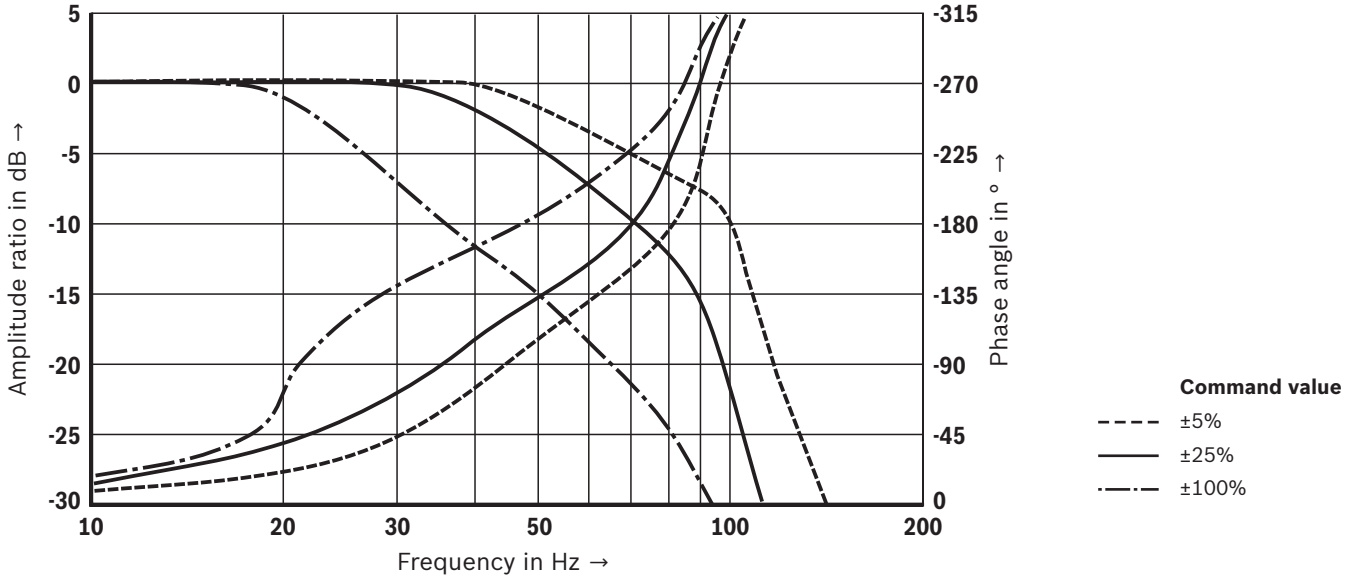
Characteristic curves: Size 50
(measured with HLP32, ϑ_{oil} = 40 ±5 °C)

Frequency response (p_P = 315 bar)

“2WRCE”



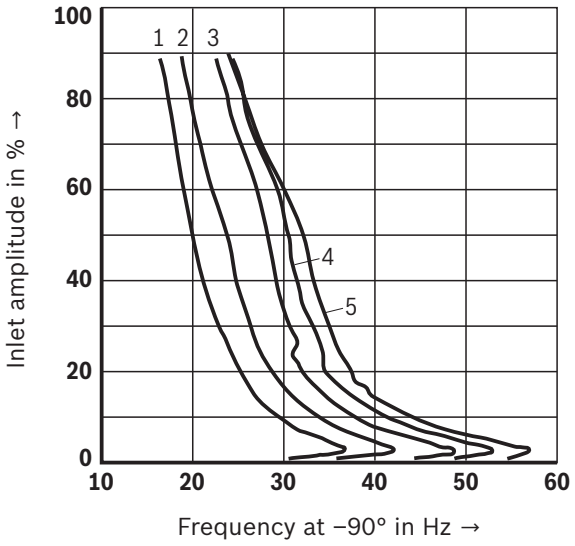
“3WRCE”



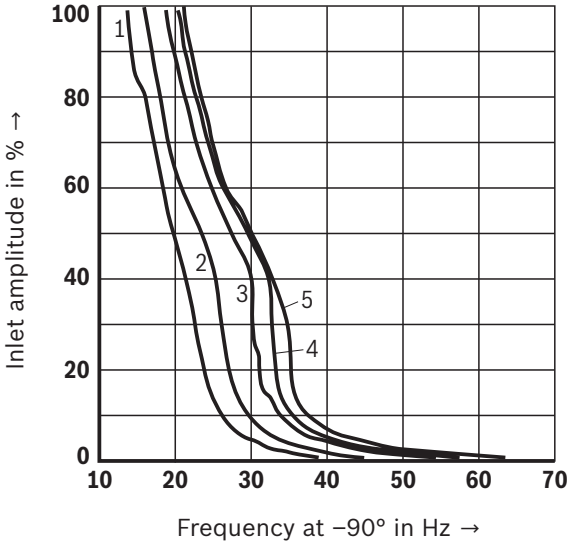
Characteristic curves: Size 50
(measured with HLP32, ϑ_{oil} = 40 ±5 °C)

Frequency *f* dependent on operating pressure and inlet amplitude

“2WRCE”

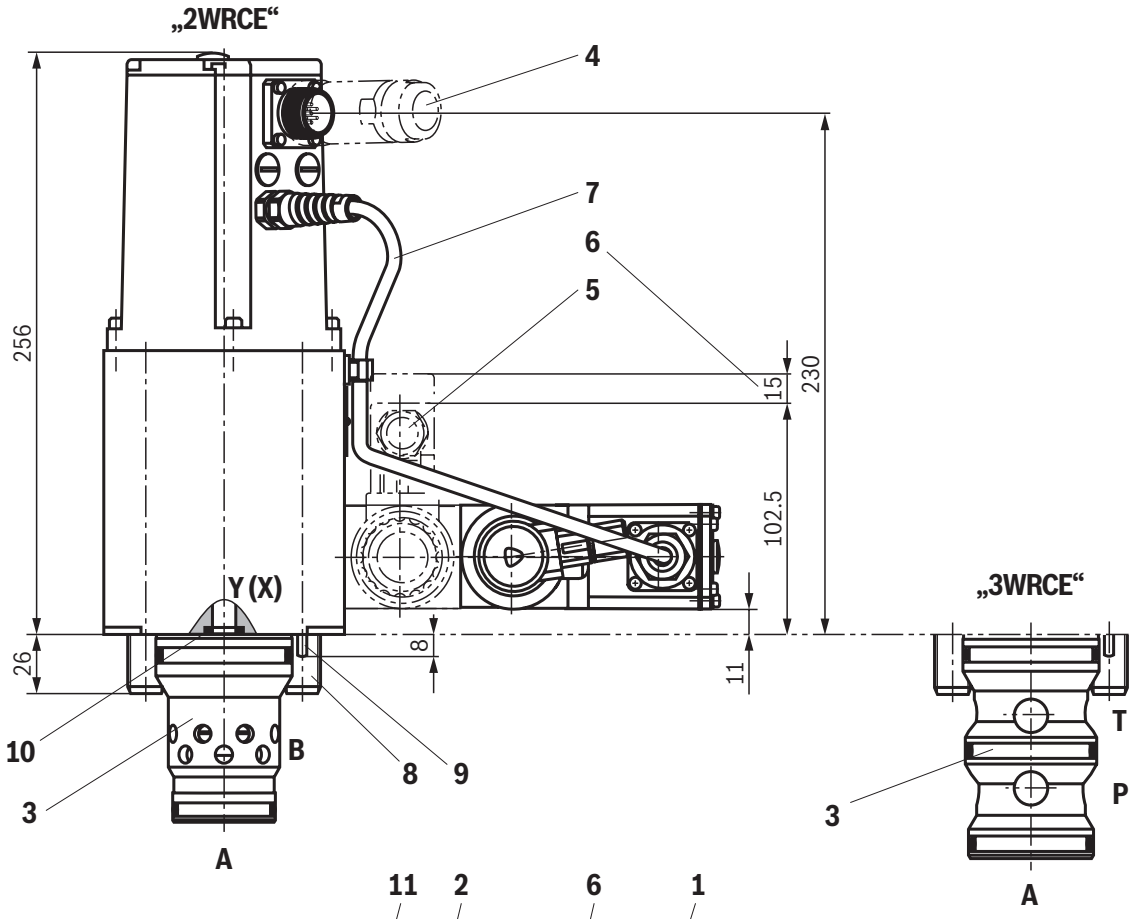


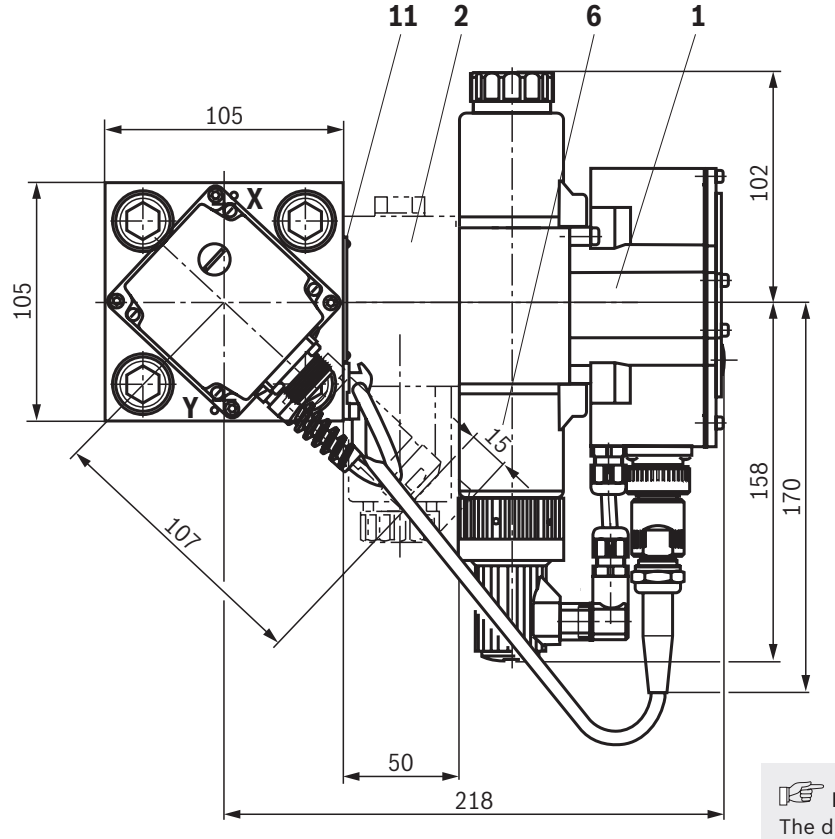
“3WRCE”



1 40 bar
2 70 bar
3 140 bar
4 210 bar
5 315 bar

Dimensions: Size 32
(dimensions in mm)

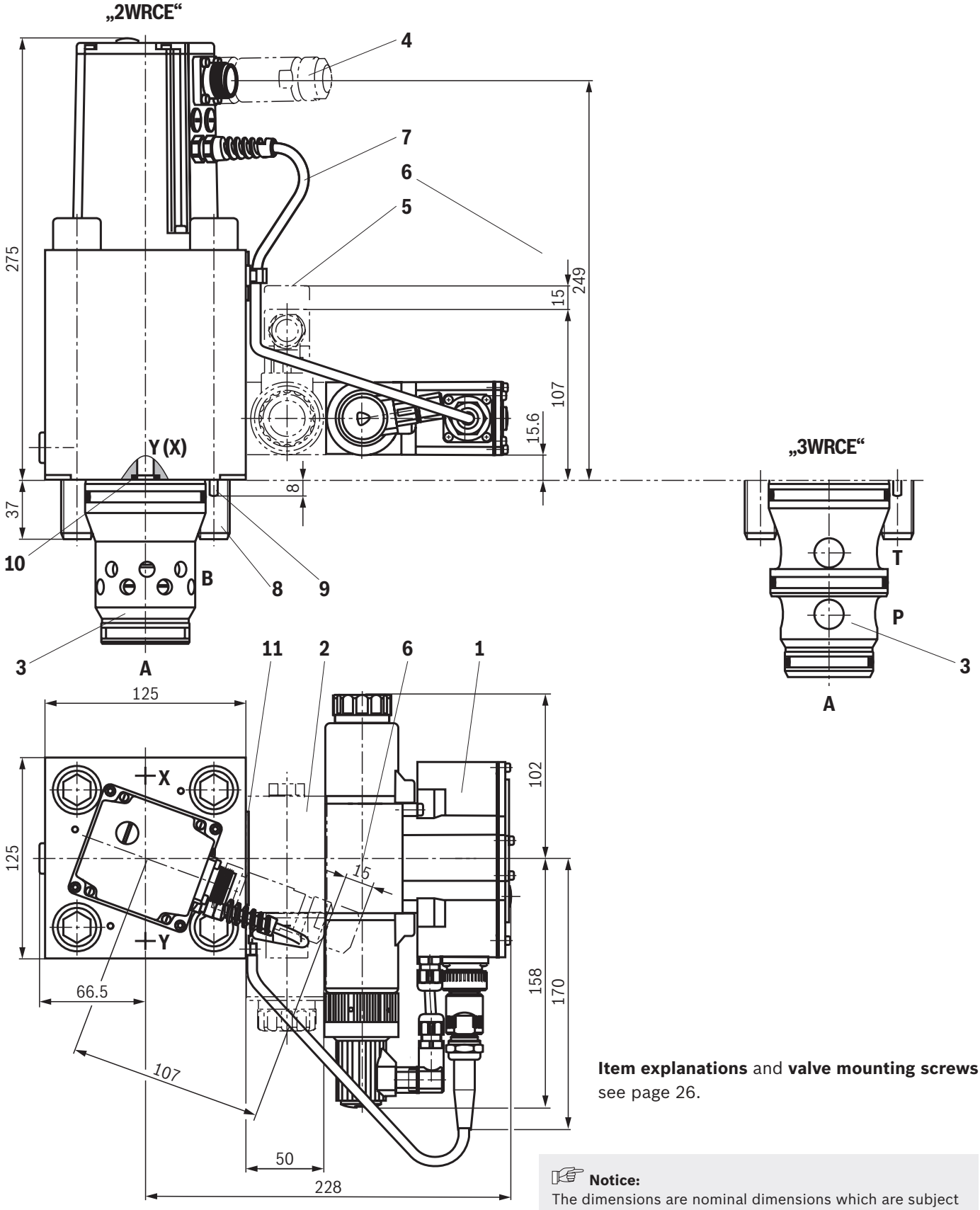




Item explanations and **valve mounting screws** see page 26.

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

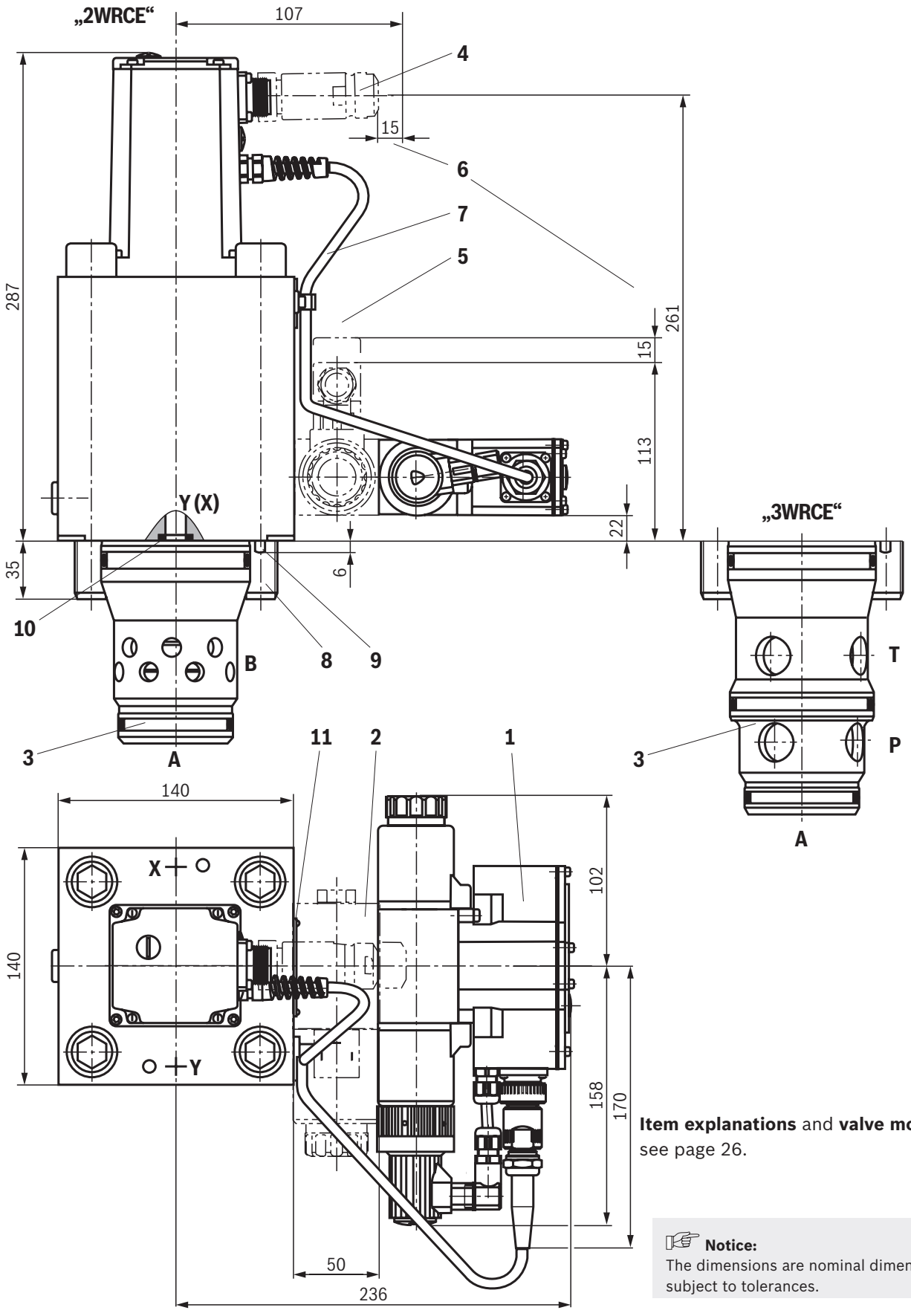
Dimensions: Size 40
(dimensions in mm)



Item explanations and **valve mounting screws** see page 26.

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

Dimensions: Size 50
(dimensions in mm)



Item explanations and **valve mounting screws** see page 26.

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

Dimensions

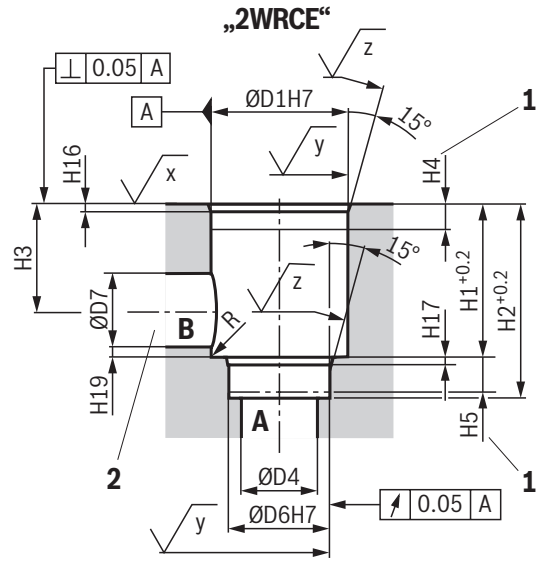
1 Pilot control valve (proportional directional valve)
2 Sandwich plate shut-off valve (version “WK15” and “WL15”)
3 Bushing
4 Mating connectors for valves with round connector, 6-pole + PE (separate order, see page 28 and data sheet 08006)
5 Mating connectors for valves with connector “K4” (separate order, see page 28 and data sheet 08006)
6 Space required for removing the mating connector
7 Cabling
8 Valve mounting screws (included in the scope of delivery), see below
9 Locating pin
10 Identical seal rings for ports X and Y
11 Name plate

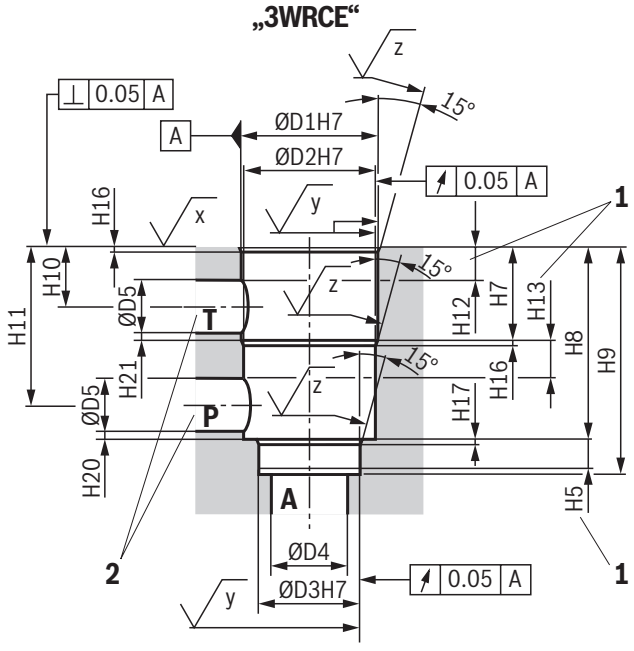
Valve mounting screws (included in the scope of delivery)

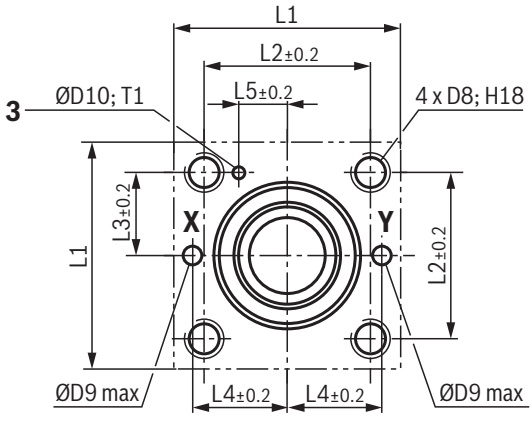
Size	Quantity	Hexagon socket head cap screws
32	4	**ISO 4762 - M16 x 100 -10.9-flZn/nc/480h/C** Tightening torque M_A = 250 Nm ±10%
40	4	**ISO 4762 - M20 x 180 -10.9** Tightening torque M_A = 590 Nm ±10%
50	4	**ISO 4762 - M20 x 190 -10.9** Tightening torque M_A = 590 Nm ±10%

☞ **Notice:**
For tightening, a manual torque wrench with a tolerance of ≤10% is to be used.

Installation bore
(dimensions in mm)







Installation dimensions according to DIN ISO 7368

NG	32	40	50
ØD1H7	60	75	90
ØD2H7	58	73	87
ØD3H7	55	55	68
ØD4	32	40	50
ØD5	24	30	35
ØD6H7	45	55	68
ØD7	32	40	50
D8	M16	M20	M20
ØD9 max	8	10	10
ØD10	6	6	8
H1	70	87	100
H2	85	105	122
H3	52	64	72
H4	30	30	35
H5	13	15	17
H7	43.5	54	87
H8	85	105	143
H9	100	125	165
H10	30	36	66
H11	70.5	87	122
H12	18	21	48
H13	15	18	18
H16	2.5	3	4
H17	2.5	3	3
H18	35	45	45
H19	2	3	3
H20	2.5	3	3.5
H21	1.5	3	3.5
L1	105	125	140
L2	70	85	100
L3	35	42.5	50
L4	41	50	58
L5	17	23	30
T1	10	10	10

1 Depth of fit, minimum dimension

2 The ports P, T and B can be positioned around the central axis of port A. However, it must be observed that the mounting bores and the control bores are not damaged.

3 Bore for locating pin

Tolerances according to: General tolerances ISO 2768-mK

Valve mounting screws see page 28.

√x = √Rzmax 4 √z = √Rz 10

√y = √Rzmax 8

Accessories (separate order)

Mating connectors and cable sets

Item [1]	Designation	Version	Short designation	Material number	Data sheet
4	Mating connector; for valves with round connector, 6-pole + PE	straight, metal	7PZ31...M	**R900223890**	08006
		straight, plastic	7PZ31...K	**R900021267**	
5	Mating connector; for valves with "K4" connector, 2-pole + PE, design A	Without circuitry, 12 ... 240 V	Z4	**R901017010**	08006
		With indicator light, 12 ... 240 V	Z5L	**R901017022**	
		With rectifier, 12 ... 240 V	RZ5	**R901017025**	
		Z-diode-suppressor 24 V	Z5L1	**R901017026**	

[1] See dimensions on page 23 of 25.

Further information

▶ Directional high-response cartridge valve, pilot-operated, with integrated electronics (OBE)	Data sheet 29136
▶ Hydraulic valves for industrial applications	Operating instructions 07600-B
▶ Hydraulic fluids on mineral oil basis	Data sheet 90220
▶ Environmentally compatible hydraulic fluids	Data sheet 90221
▶ Flame-resistant, water-free hydraulic fluids	Data sheet 90222
▶ Flame-resistant hydraulic fluids - containing water (HFAE, HFAS, HFB, HFC)	Data sheet 90223
▶ Selection of filters	www.boschrexroth.com/filter
▶ Information on available spare parts	www.boschrexroth.com/spc

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