2- and 3-way high response cartridge valve

RE 29137/10.05 1/24
Replaces: 08.03

Type .WRCE…/P

Type 3WRCE…-2X/P

Type 2WRCE…-2X/P

Nominal sizes 32, 40 and 50
Component series 2X
Maximum operating pressure 420 bar
Maximum flow 4500 L/min

Overview of contents

[1)] Not for new applications!

For information regarding the available spare parts see:
www.boschrexroth.com/spc

Features

- Pilot operated 2-stage valve, of cartridge design
- Suitable for closed loop, position, pressure, force and speed
- Pilot control valve (pilot):
  Direct operated proportional valve NS6 with electrical feedback, trimmed, closes the 2WRCE main stage in the event of a power failure and when pilot pressure is applied, opens the 3WRCE main stage from A to T
- Main stage: closed loop position controlled
- Integrated control and closed loop control electronics (OBE)
- Manifold mounting:
  Cavity to DIN ISO 7368 for 2WRCE
- Typical applications:
  • Presses
  • Dye casting machines
  • Nibbling axis

For further information see:
- Pilot control valve, similar
  • Type 4WREE 6 to RE 29061

Note
For further variants of type .WRCE…/S with servo pilot control see RE 29136

Ordering details: type 2WRCE

2	WRCE		S		–2X/	P	G24	K31/			*

2/2-way directional valve = **2**

Electrically operated high response cartrdige valve
With integrated electronics (OBE) = **WRCE**

Nominal size 32 = **32**
Nominal size 40 = **40**
Nominal size 50 = **50**

Poppet spool = **S**

Nominal flow in l/min with a 5 bar valve pressure differential

NS32:	650 l/min linear	= **650**
	480 l/min with a fine control range **only** ...S480R...	= **480**
NS40:	1000 l/min linear **only** ...S1000L...	= **1000**
	700 l/min with a fine control range **only** ...S700R...	= **700**
NG50:	1600 l/min linear **only** ...S1600L...	= **1600**
	1100 l/min with a fine control range **only** ...S1100R...	= **1100**

Characteristic curve form

Linear = **L**
Linear with a progressive fine control range = **R**

Component series 20 to 29 = **2X**
(20 to 29 unchanged installation and connection dimensions)

Pilot control valve (pilot)

Proportional valve = **P**

Supply voltage 24 VDC = **G24**

Electrically connections

Without plug-in connection, with component plug to DIN EN 175201-804 = **K31**
(separate order, see page 12)

Electronic interfaces

Command value 0 ...+10 V, actual value +0.5 ...+10 V = **A1**
Command value 0 ...+10 mA, actual valve +0.5 ...+10 mA = **C1**

Sandwich plate isolator valve

Without isolator valve = **No code**
With isolator valve:
A de-energised isolator valve actively closes the 2WRCE using the applied pilot pressure = **WK15**
A de-energised isolator valve actively opens the 2WRCE using the applied pilot pressure = **WL15**

Seal material

NBR seals, suitable for mineral oil HL and HLP to DIN 51524 = **M**
FKM seals = **V**

Further details in clear text

Ordering details: type 3WRCE – not for new applications!

3	WRCE				–2X/	P	G24	K31/			*

3/2-way directional valve = 3

Electrically operated high response control valve for manifold mounting
With integrated electronics (OBE) = WRCE

Nominal size 32 = 32
Nominal size 40 = 40
Nominal size 50 = 50

Sliding spool, zero overlap (+0.5...+1.5 %) = V
Sliding spool, with 10…13 % positive overlap = E

Nominal flow in l/min with a 5 bar valve pressure differential

NS32: 290 l/min linear **only** ...V290L... = 290
250 l/min with a fine control range **only** ...E250P... = 250

NS40: 460 l/min linear **only** ...V460L... = 460
410 l/min with a fine control range **only** ...E410P... = 410

NS50: 720 l/min linear **only** ...V720L... = 720
620 l/min with a fine control range **only** ...E620P... = 620

Characteristic curve form

Linear = L
Linear with a linear fine control range = P

Component series 20 to 29 = 2X
(20 to 29 unchanged installation and connection dimensions)

Pilot control valve (pilot)

Proportional valve = P

Supply voltage 24 VDC = G24

Electrical connections

Without plug-in connector, with component plug to DIN EN 175201-804 = K31
(separate order, see page 12)

Electronic interfaces

Command value ± 10 V, actual value ± 10 V = A1
Command value ± 10 mA, actual value ± 10 mA = C1

Sandwich plate isolator valve

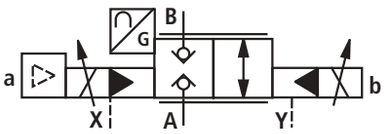
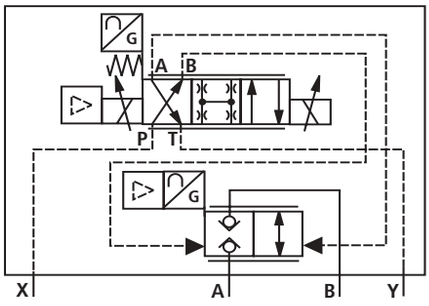
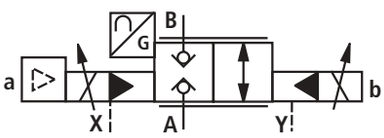
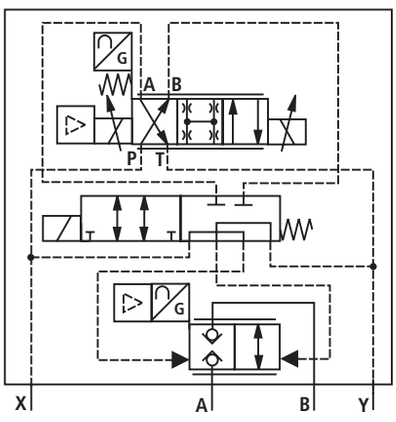
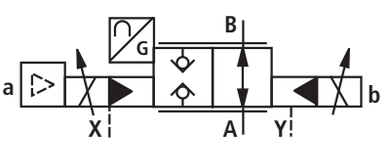
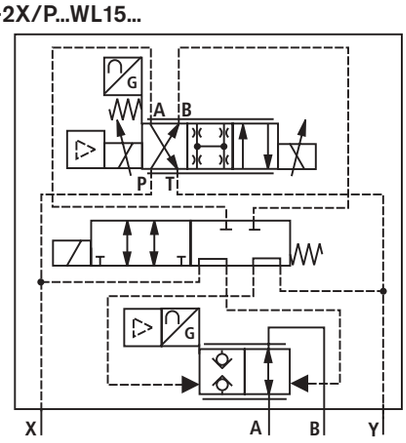
Without isolator valve = No code
With isolator valve:
A de-energised isolator valve actively opens the 3WRCE, using the applied pilot pressures from A to T = WK15
A de-energised isolator valve actively opens the 3WRCE, using the applied pilot pressures from P to A = WL15
24 VDC power supply, plug-in connector separate order, see page 12 (without circuitry)

Seal material

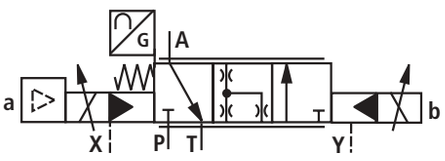
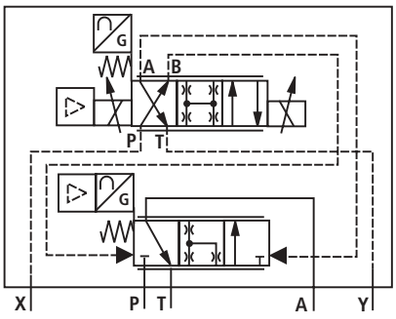
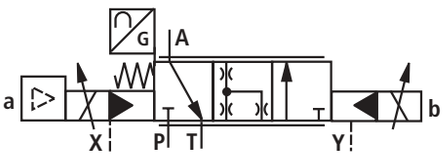
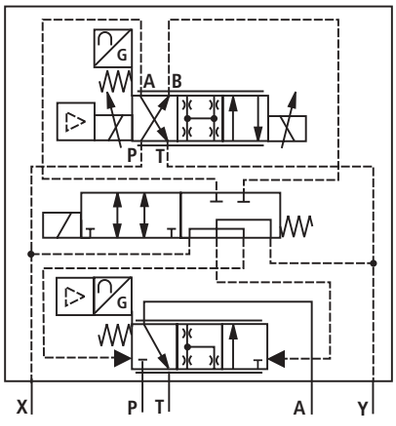
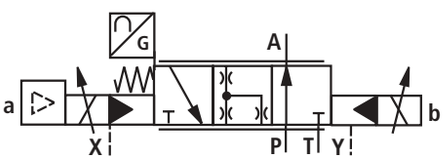
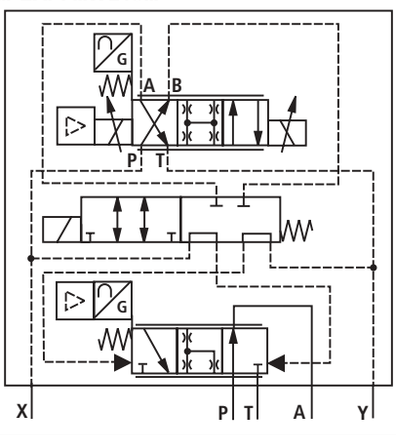
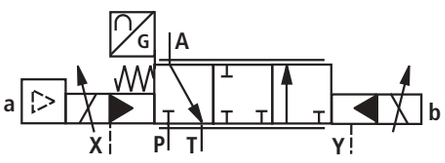
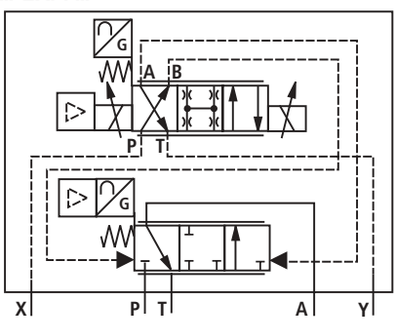
NBR seals, suitable for mineral oil HL and HLP to DIN 51524 = M
FKM seals = V

Further details in clear text

Symbols: type 2WRCE

Simplified	Detailed
2WRCE..-2X/P...	**2WRCE..-2X/P...**
	
2WRCE..-2X/P...WK15...	**2WRCE..-2X/P...WK15...**
	
2WRCE..-2X/P...WL15...	**2WRCE..-2X/P...WL15...**
	

Symbols: type 3WRCE – not for new applications!

Simplified	Detailed
3WRCE..V...-2X/P...	3WRCE..V...-2X/P...
	
3WRCE..V...-2X/P...WK15...	3WRCE..V...-2X/P...WK15...
	
3WRCE..V...-2X/P...WL15...	3WRCE..V...-2X/P...WL15...
	
3WRCE..E...-2X/P...	3WRCE..E...-2X/P...
	

Design, function and section: type 2WRCE

The type 2WRCE...-2X/P... valves are 2-stage high response control valves.

They control the size and direction of a flow and are mainly used in closed loop control circuits.

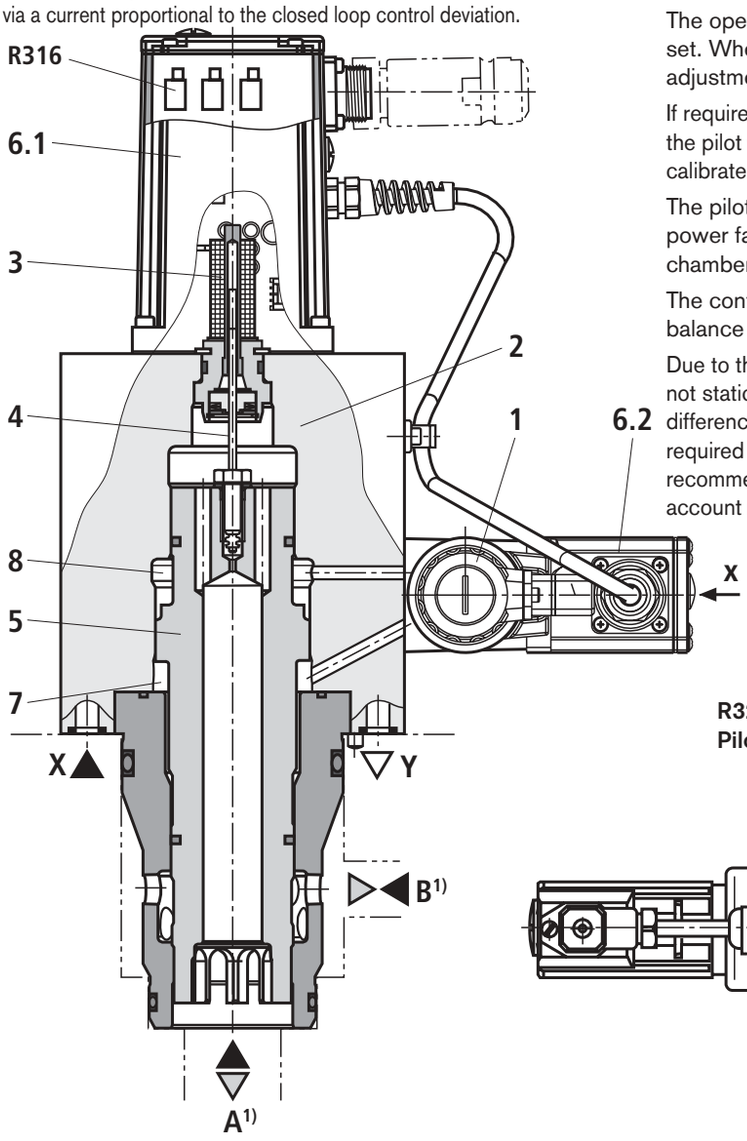
Design

They comprise of the following assemblies:

- The single stage proportional pilot control valve (1), (pilot), with two solenoids as electro-mechanical converters and a spool that is connected to the integrated pilot electronics (6.2) via an electrical feedback
- The second stage (2) for flow control
- An inductive position transducer (3) whose core (4) is fixed to the spool (5) of the third stage
- And integrated closed loop control electronics (6.1).

Function

Within the integrated control electronics (OBE) the command and actual values are compared and the pilot control valve solenoids are controlled via a current proportional to the closed loop control deviation.



1) Preferably port B should be connected to the actuator.

The pilot control valve assumes a proportional control position and controls the flows into or from control chambers A (7) and B (8) that actuate the main spool (5) by means of the closed loop valve control until the system deviation is 0.

The stroke of the main spool is thus controlled in proportion to the command value. It must be noted here that the flow also depends on the valve pressure drop.

Special valve features

Flow can pass through the valve from A to B or from B to A.

The poppet opens or closes at a command value of 5 %. In the case of smaller command values, the closed loop valve control tries to correct the spool position, thus pressing it onto the seat up at a pressure to the maximum pilot pressure and closing the connection leak-free.

The stated valve dynamics are only valid within the closed loop control range of the valve. In the case of command value step changes from the seated position to small opening values additional time delays occur.

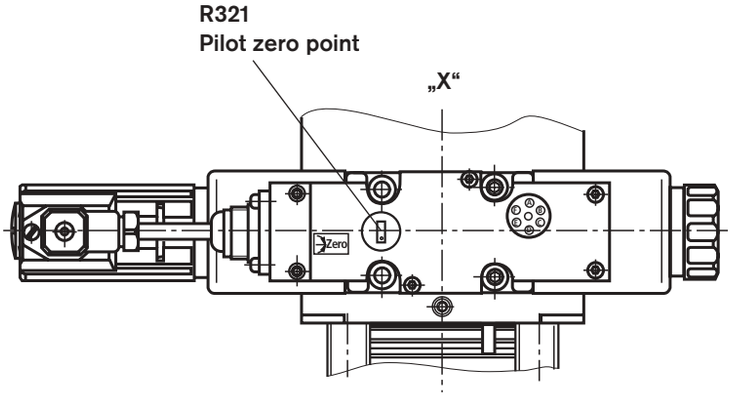
The opening point of 5 % (= 0.5 V or 0.5 mA) is factory preset. When the pilot valve or the controller are replaced, adjustments are usually not required.

If required, the pilot zero point can be adjusted via the R321 after the pilot was replaced, or the zero point of the entire valve calibrated via the R316 after the controller was replaced.

The pilot valve has an internal setting so that in the case of a power failure the pilot pressure is connected to control chamber B (8), i.e. the main stage closes.

The control electronics have an offset setting in order to balance out the pilot trimming.

Due to the diameter differences of the seat area, the spools are not statically pressure compensated. In order to balance the force difference, with spool type S...L 6 % of the system pressure is required as pilot pressure, with spool type S...R 22 %. The recommended minimum pilot pressure is obtained by taking into account reserves required for the flow forces and dynamics.



Design, function and section: type 3WRCE – not for new applicatons!

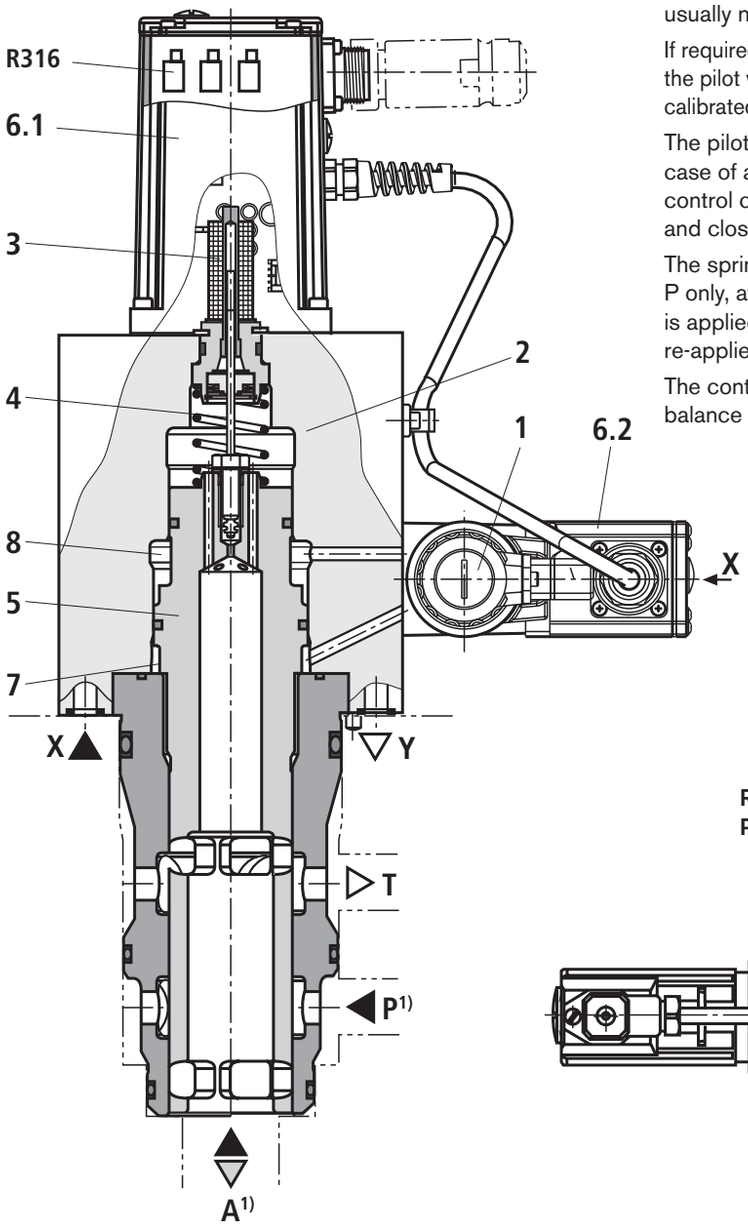
The type 3WRCE...-2X/P... valves are 2-stage high response control valves.

They control the size and direction of a flow and are mainly used in closed loop control circuits.

Design

They comprise of the following assemblies:

- The single stage proportional pilot control valve (1), (pilot), with two solenoids as electro-mechanical converters and a spool that is connected to the integrated pilot electronics (6.2) via an electrical feedback
- The second stage (2) for flow control
- An inductive position transducer (3) whose core (4) is fixed to the spool (5) of the second stage
- And integrated control electronics (6.1).



Function

Within the integrated control electronics (OBE) the command and actual values are compared and the pilot control valve solenoids are controlled via a current proportional to the closed loop control deviation.

The pilot control valve assumes a proportional control position and controls the flows into or from control chambers A (7) and B (8) that actuate the main spool (5) by means of the closed loop valve control until the system deviation is 0.

The stroke of the main spool is thus controlled in proportion to the command value. It must be noted here that the flow also depends on the valve pressure drop.

Special valve features

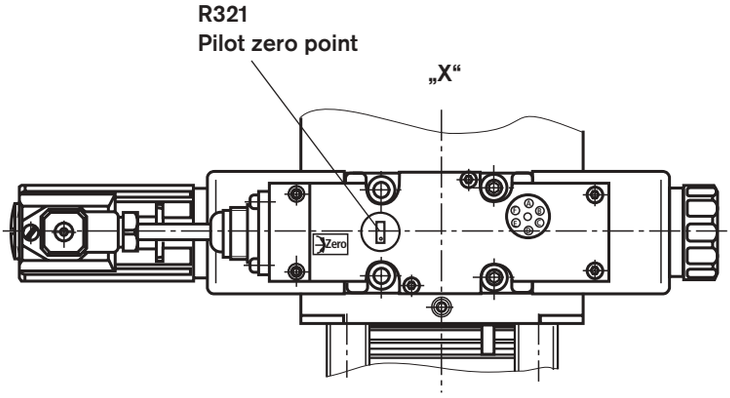
The opening point of 0 % (V spools) is factory pre-set. When the pilot valve or the controller are replaced, adjustments are usually not required.

If required, the pilot zero point can be adjusted via the R321 after the pilot was replaced, or the zero point of the entire valve calibrated via the R316 after the controller was replaced.

The pilot control valve has an internal setting so that in the case of a power failure the pilot pressure is connected to control chamber B (8), i.e. the main stage opens from A to T, and closes the connection from P to A.

The spring behind the main spool moves the spool to position P only, after the connection to A is closed, when no pressure is applied (e.g. before installation or when the pressures are re-applied after a tool change).

The control electronics have an offset setting in order to balance out the pilot trimming.



1) Please use the variant with P and A exchanged. Please consult us!

Technical data: type 2WRCE (for applications outside these parameters, please consult us!)

General

Nominal size	NS	**32**	**40**	**50**
Weight	kg	12.5	19.9	26.8
Weight with isolator valves ...../...WK or .../...WL...	kg	13.7	21.1	28
Pilot control valve nominal size (pilot)	NS	6	6	6
Installation; commissioning		Optional, preferably horizontal; to RE 07700		
Storage temperature range	°C	–20 to +80		
Ambient temperature range	°C	–20 to +50		

Hydraulic (measured with HLP32, $\vartheta_{oil} = 40\ °C \pm 5\ °C$)

Nominal size	NS	**32**	**40**	**50**
Max. operating pressures				
– Main stage, ports A, B	bar	420		
– Pilot control valve, port X	bar	315		
– Pilot control valve, port Y	bar	210		
Minimum control pressure in % of the system pressure				
– For spool version S...L	%	15		
– For spool version S...R	%	45		
Nominal flow q_{Vnom} +10 % at $\Delta p = 5$ bar				
– Version ...S...L (linear)	l/min	650	1000	1600
– Version ...S...R (linear with a progressive fine control range)	l/min	480	700	1100
Max. flow – For spool ...S...L	l/min	1500	2200	3500
Max. flow – For spool ...S...R	l/min	2000	3000	4500
Control oil flow at X and Y with a stepped form of input signal from 0 to 100 % (315 bar)	l/min	37	45	60
Zero flow of the proportional pilot stage in relation to the pressure in pipe X	l/min	$q_{Lmin} = 0{,}0026 \frac{L}{min\ bar} \cdot p_x\ [bar]$ $q_{Lmax} = 0{,}0095 \frac{L}{min\ bar} \cdot p_x\ [bar]$		
Control oil flow	cm^3	4.52	8.48	17.3
Pressure fluid		Mineral oil (HL, HLP) to DIN 51524, other pressure fluids on request		
Pressure fluid temperature range	°C	–20 to +80; preferably +40 to +50		
Viscosity range	mm^2/s	20 to 380; preferably 30 to 45		
Max. permissible degree of pressure fluid contamination Cleanliness class to ISO 4406 (c) – Pilot control valve + main valve		Class 20/18/15 [1]		
Hysteresis	%	≤ 0.2		
Reversal span	%	≤ 0.1		
Response sensitivity	%	≤ 0.1		
Closing time with: – Pilot control valve	ms	≤ 200		
(with control pressure of 40 to 315 bar) – Sandwich plate isolator valve	ms	≤ 200		

[1] The cleanliness class stated for the components must be adhered to in hydraulic systems. Effective filtration prevents faults from occurring and at the same time increases the component service life. For the selection of filters see data sheets:
RE 50070, RE 50076, RE 50081; RE 50086 and RE 50088

Technical data: type 2WRCE (for applications outside these parameters, please consult us!)

Electrical

Nominal size	NS	32	40	50
Voltage type		DC		
Signal type		Analogue		
Opening point calibration	%	≤ 1		
Zero displacement with a change in:				
– Pressure fluid temperature	%/10 K	≤ 0.3	≤ 0.3	≤ 0.3
– Control pressure in X	%/100 bar	≤ 0.7	≤ 0.7	≤ 0.7
– Return pressure in Y	%/bar	≤ 0.3	≤ 0.3	≤ 0.3
Valve protection to EN 60529		IP65 with mounted and fixed plug-in connector		

☞ **Note!**

for details regarding the enviromental siumulation test covering EMC (electro-magnetic compatibility), climate and mechanical loading see RE 29137-U (declaration regarding environmental compatibility).

Integrated electronics (OBE) type VT 13037

Block circuit diagram, see page 11

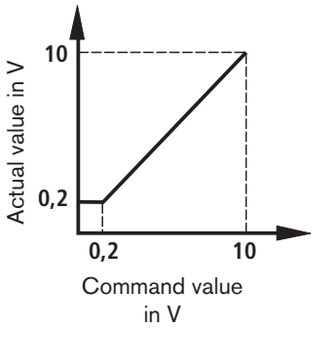
Nominal command value range for the 2WRCE:
0 to +10 V (mA) ≙ 0 to 100 %

Within the command value range of 0 to +0.5 V, the actual value remains constant at 0.5 V.

With a slow command value change from +0.5 V to +10 V, the actual value follows the command value within ±0.15 V.

With command values over +10 V, the command value follows up to approx. +12 V.

With a command value jump to +10 V, the actual value can briefly reach values of approx. +10.5 V.



Technical data: type 3WRCE [1] (for applications outside these parameters, please consult us!)

General

Nominal size	NS	**32**	**40**	**50**
Weight	kg	12.8	20.2	28
Weight with isolator valves ...../...WK or .../...WL...	kg	14	21 .4	29.2
Pilot control valve nominal size (pilot)	NS	6	6	6
Installation; commissioning		Optional, preferably horizontal; to RE 07700		
Storage temperature range	°C	–20 to +80		
Ambient temperature range	°C	–20 to +50		

Hydraulic (measured with HLP32, $\vartheta_{oil} = 40$ °C ± 5 °C)

Nominal size	NS	**32**	**40**	**50**
Max. operating pressures				
– Main stage, ports A, B, T	bar	315		
– Pilot control valve, port X	bar	315		
– Pilot control valve, port Y	bar	210		
Nominal flow q_{Vnom} +10 % at $\Delta p = 5$ bar – Version ...V...L (linear)	l/min	290	460	720
Max. flow	l/min	900	1400	2200
Control oil flow at X and Y with a stepped form of input signal from 0 to 100 % (315 bar)	l/min	20	35	55
Max. zero flow of the main stage at $p_p = 300$ bar	l/min	4	6	8
Zero flow of the proportional pilot stage in relation to the pressure in pipe X	l/min	$q_{Lmin} = 0{,}0026 \frac{L}{min\ bar} \cdot p_x$ [bar] $q_{Lmax} = 0{,}0095 \frac{L}{min\ bar} \cdot p_x$ [bar]		
Control oil flow	cm^3	± 2.26	± 4.24	± 8.65
Pressure fluid		Mineral oil (HL, HLP) to DIN 51524, other pressure fluids on request		
Pressure fluid temperature range	°C	–20 to +80; preferably +40 … +50		
Viscosity range	mm^2/s	20 to 380; preferably 30 to 45		
Max. permissible degree of pressure fluid contamination Cleanliness class to ISO 4406 (c) – Pilot control valve + main valve		Class 20/18/15 [2]		
Hysteresis	%	≤ 0,2		
Reversal span	%	≤ 0,1		
Response sensitivity	%	≤ 0,1		
Closing time with: – Pilot control valve	ms	≤ 200		
(for control pressures from 40 to 315 bar) – Sandwich plate isolator valve	ms	≤ 200		

[1] Not for new applications!

[2] The cleanliness class stated for the components must be adhered to in hydraulic systems. Effective filtration prevents faults from occurring and at the same time increases the component service life. for the selection of filters see data sheets:
RE 50070, RE 50076, RE 50081; RE 50086 and RE 50088

Technical data: type 3WRCE [1] (for applications outside these parameters, please consult us!)

Electrical

Nominal size	NS	32	40	50
Voltage type		DC		
Signal type		Analogue		
Opening point calibration	%	≤ 1		
Zero displacement with a change in:				
– Pressure fluid temperature	%/10 K	≤ 0.3	≤ 0.3	≤ 0.3
– Control pressure in X	%/100 bar	≤ 0.7	≤ 0.7	≤ 0.7
– Return pressure in Y	%/bar	≤ 0.3	≤ 0.3	≤ 0.3
Valve protection to EN 60529		IP65 with mounted and fixed plug-in connector		

[1] Not for new applications!

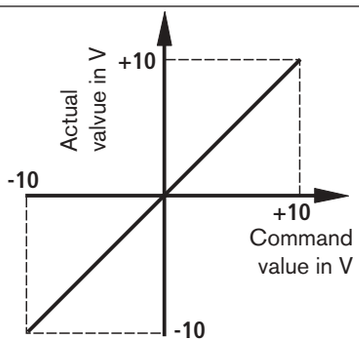
Integrated electronics (OBE) type VT 13037

Nominal current value range for the 3WRCE:
0 to ±10 V (mA) ≙ 0 to ±100 %

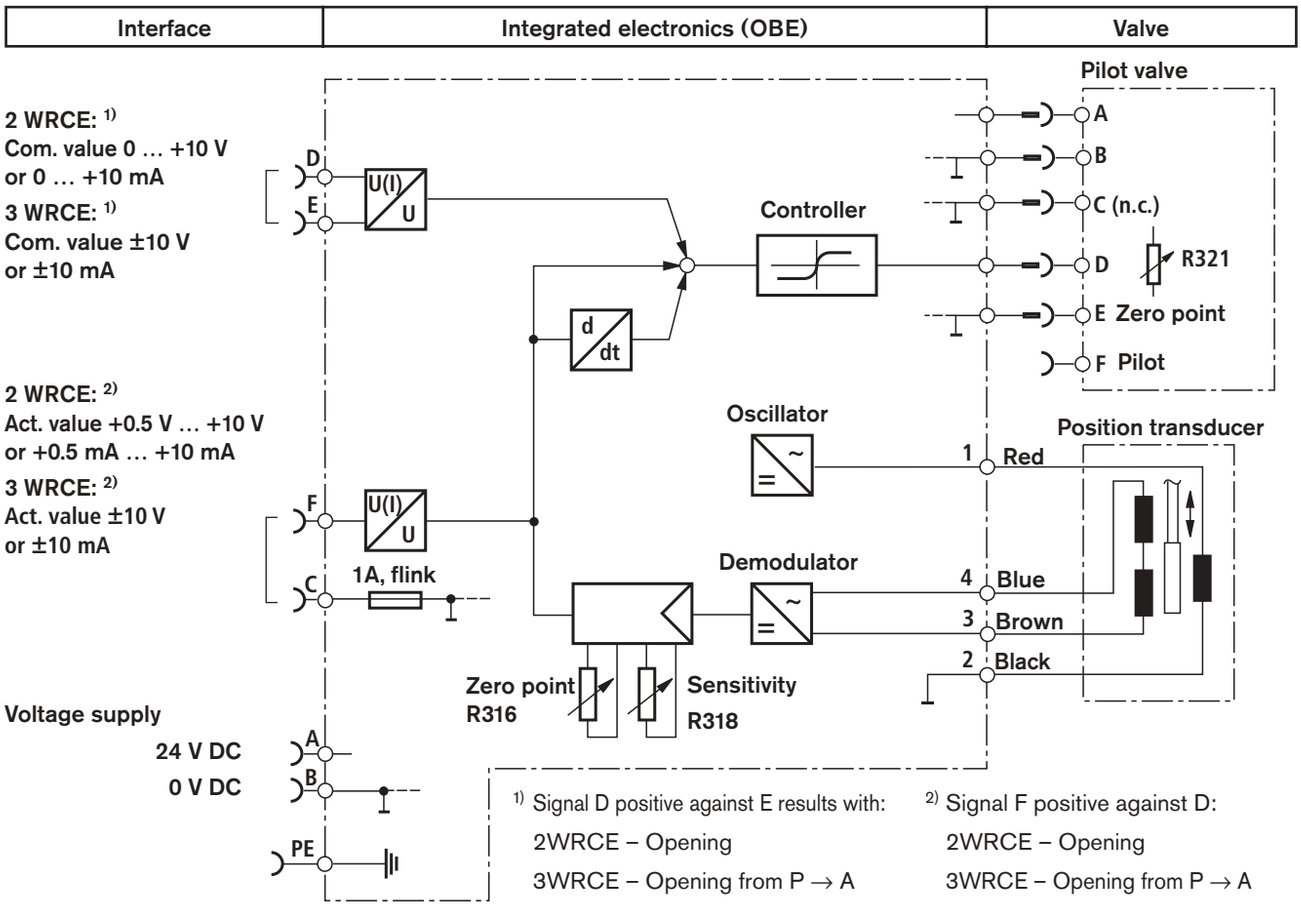
With a slow command value change from 0 V to ±10 V, the actual value follows the command value within ±0,15 V.

With command values over ±10 V, the command value follows up to approx. ±13 V.

With a command value jump to ±10 V, the actual value can briefly each values of approx. ±10,5 V.



Block circuit diagram (OBE) type VT13037



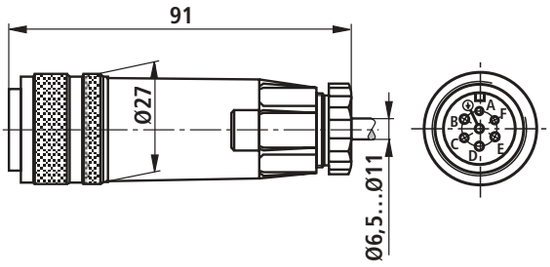
[1] Signal D positive against E results with:
2WRCE – Opening
3WRCE – Opening from P → A

[2] Signal F positive against D:
2WRCE – Opening
3WRCE – Opening from P → A

Electrical connections, plug-in connectors

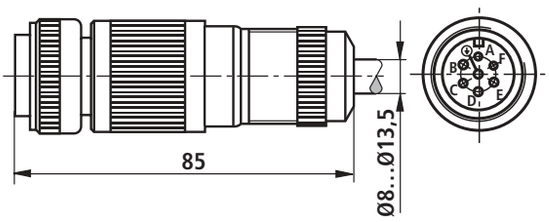
Plug-in connector

Plug-in connector to DIN EN 175201-804
Separate order under Material No. **R900021267**
(plastic version)



Plug-in connector

Plug-in connector to DIN EN 175201-804
Separate order under Material No. **R9000223890**
(metal version)



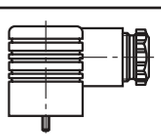
Component plug allocation	Pin	Electronic interface A1 allocation		Electronic interface C1 allocation	
		2WRCE	3WRCE	2 WRCE	3WRCE
Voltage supply	A	24 VDC nominal (18 ... 30 V; $I_{average}$ = 1 A, I_{peak} = 3 A)			
	B	0 VDC			
Measurement zero	C	Reference to in F			
Differential command value input	D	0 ... +10 V	0 ... ±10 V	0 ... +10 mA	0 ... ±10 mA
	E	Input resistance >100 kΩ	Input resistance >100 kΩ	Load 100 Ω	Load 100 Ω
Actual valve Reference is contact C [1)]	F	+0,5 ... +10 V Max. 10 mA	0 ... ±10 V Max. 10 mA	+0,5 ... +10 mA Load max. 1 kΩ	0 ... ±10 mA Load max. 1 kΩ
Earth	PE	Connected to the valve housing Do not connect when the valve is already earthed via the system			

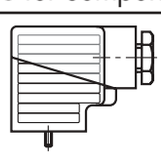
[1)] The command and acutal values have the same polarity. If fuse „1A flink“ fails, then the actual value can also be measured between F and B.

Note: **Electrical signals (e.g. actual value) taken via valve electronics must not be used to switch off the machine safety functions!**
(Also see the European Standard „Safety requirement for fluid power systems and components – Hydraulics“, EN 982!)

Plug-in connectors for isolator valves to DIN EN 175301-803 for component plug „K4“

Further plug-in connectors see RE 08006

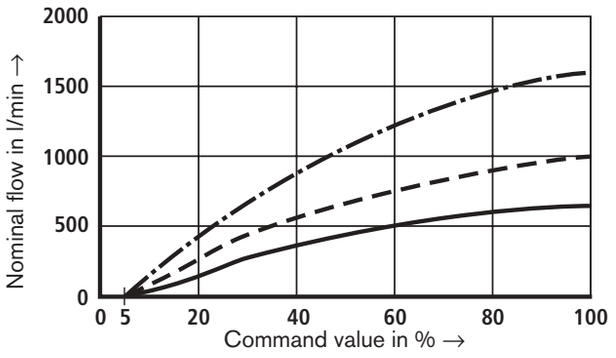




Valve side	Colour	Material No. Without circuitry	With indicator light 12 … 240 V	With rectifier 12 … 240 V	With indicator light and Z-diode protective circuitry 24 V
a	Grey	**R901017010**	–	–	–
a/b	Black	–	**R901017022**	**R901017025**	**R901017026**

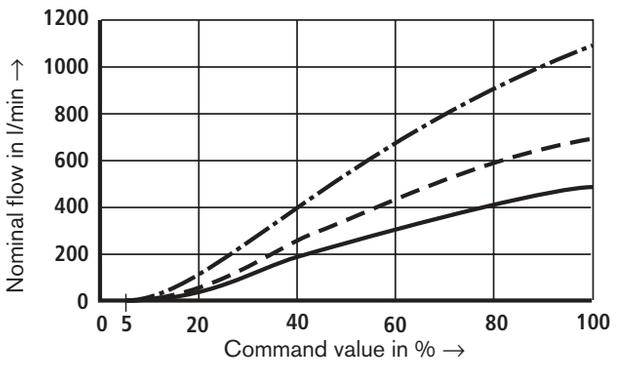
Characteristic curves (measured with HLP32, ϑ_{oil} = 40 °C ± 5 °C)

Nominal flow with a 5 bar valve pressure differential A → B = B → A



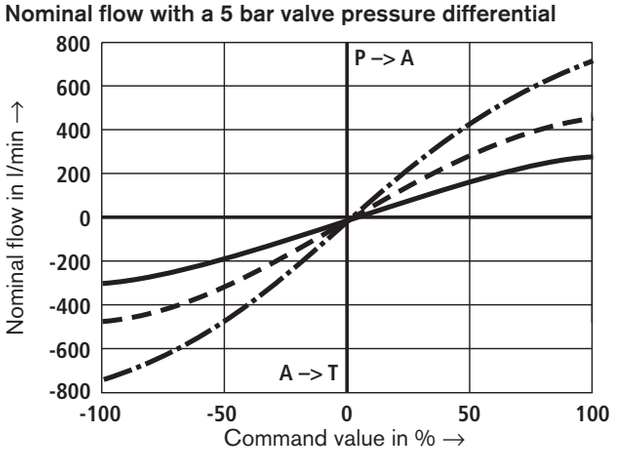
2WRCE 50 S1600L
2WRCE 40 S1000L
2WRCE 32 S650L

Nominal flow with a 5 bar valve pressure differential A → B = B → A



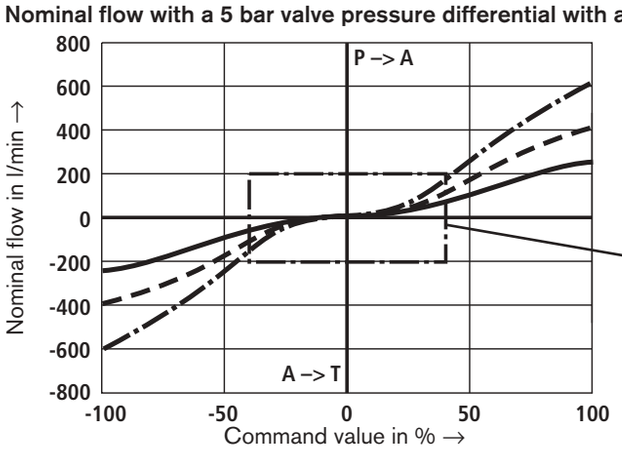
2WRCE 50 S1100R
2WRCE 40 S700R
2WRCE 32 S480R

Nominal flow with a 5 bar valve pressure differential

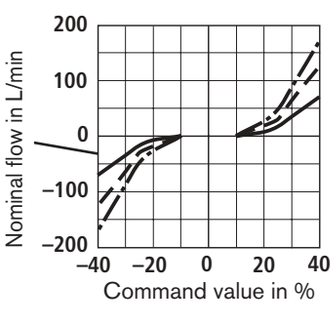


3WRCE 50 V720L
3WRCE 40 V460L
3WRCE 32 V290L
(Überdeckung +0,5...+1,5 %)

Nominal flow with a 5 bar valve pressure differential with a 10% overlap

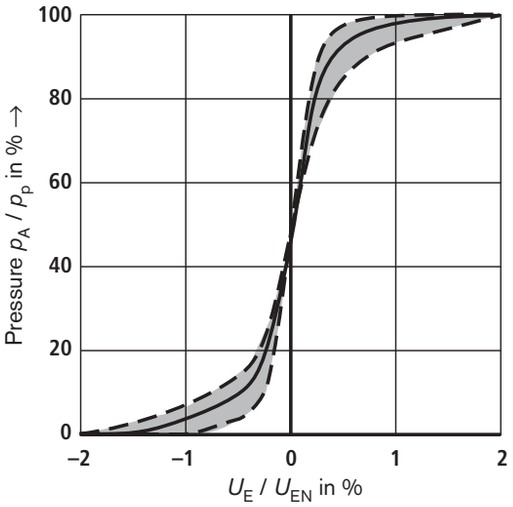


3WRCE 50 E620P
3WRCE 40 E410P
3WRCE 32 E250P



Characteristic curves (measured with HLP32, $\vartheta_{oil} = 40\ °C \pm 5\ °C$)

Pressure-signal function for the 3WRCE...V... limiting and average value characteristic curves

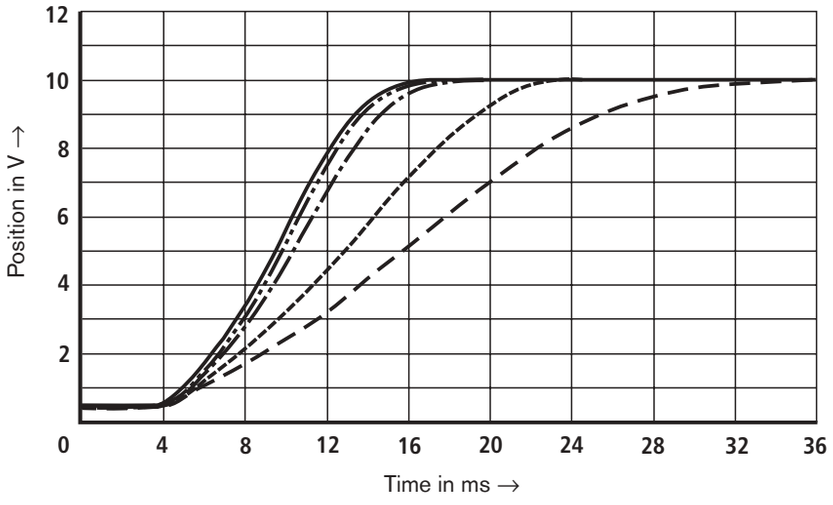


Characteristic curves (measured with HLP32, ϑ_{oil} = 40 °C ± 5 °C)

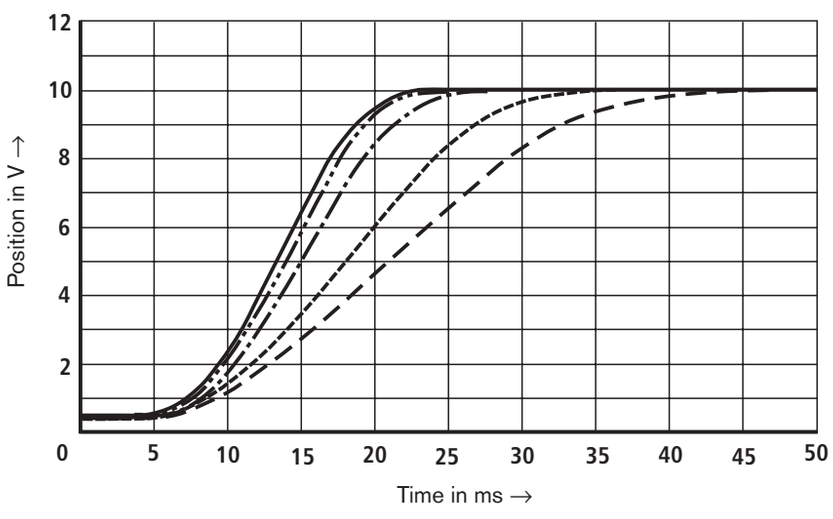
Transient function

40 bar, 70 bar, 140 bar, 210 bar, 315 bar

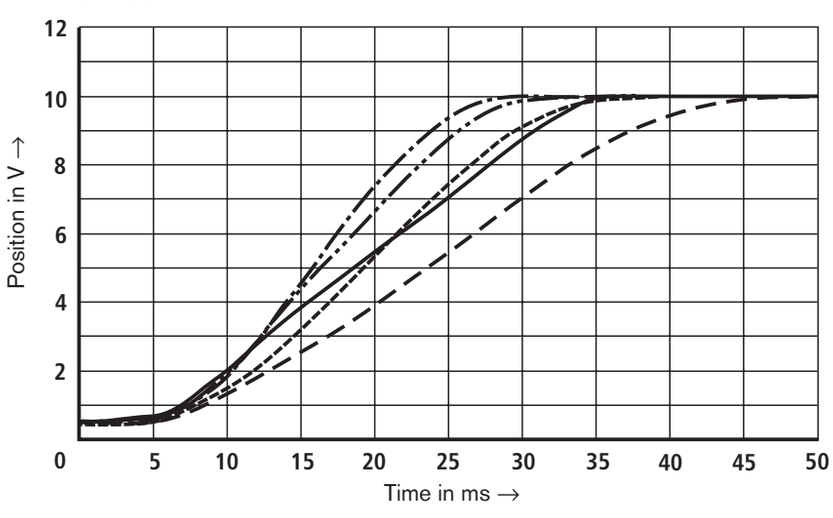
2WRCE 32...



2WRCE 40...



2WRCE 50...

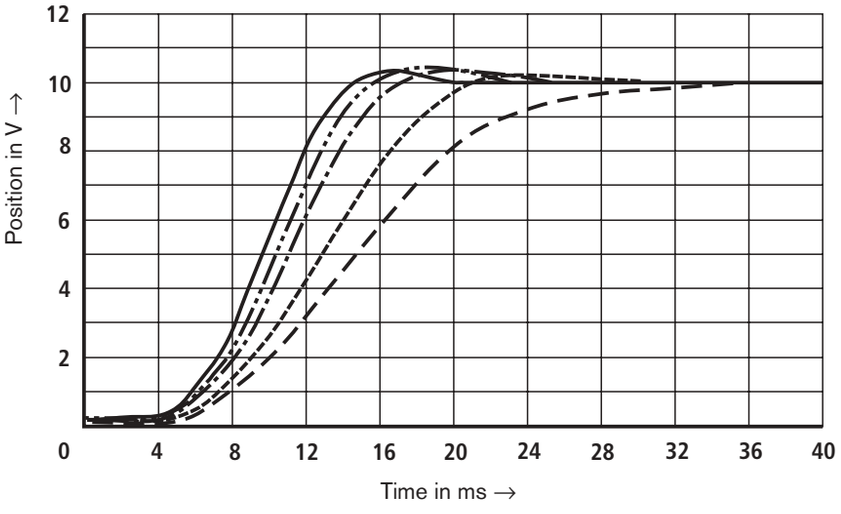


Characteristic curves (measured with HLP32, ϑ_{oil} = 40 °C ± 5 °C)

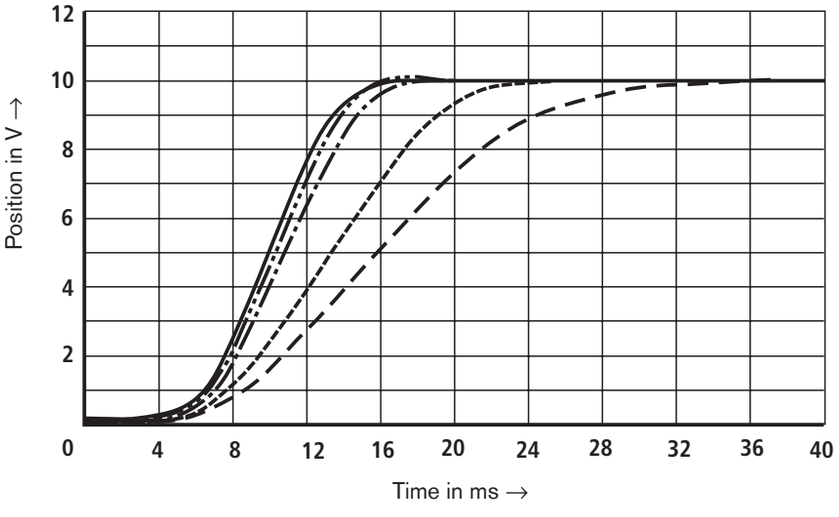
Transient function

— — — 40 bar, ------ 70 bar, —·— 140 bar, —··— 210 bar, ——— 315 bar

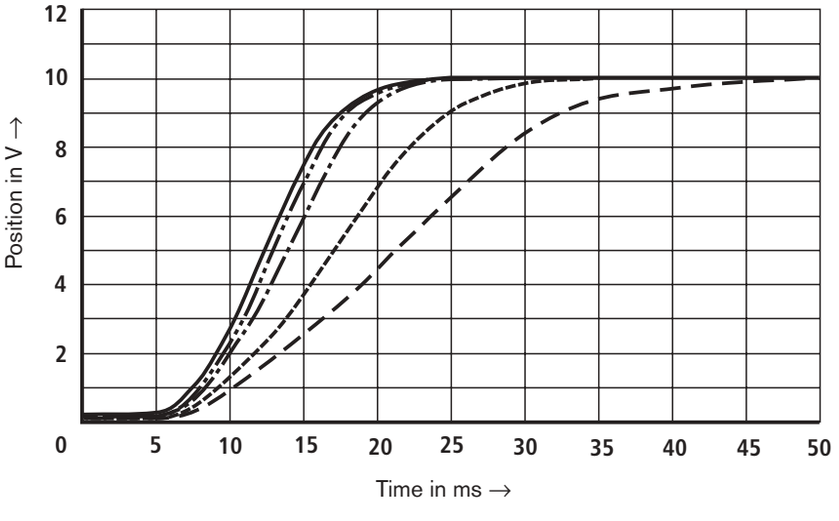
3WRCE 32…



3WRCE 40…



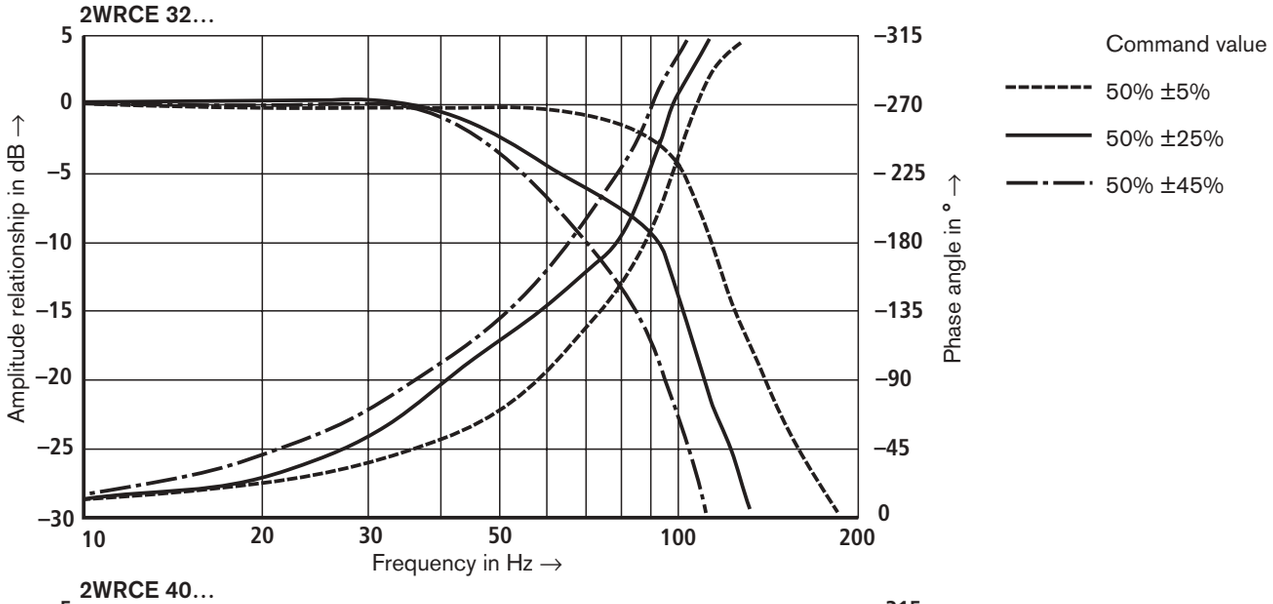
3WRCE 50…



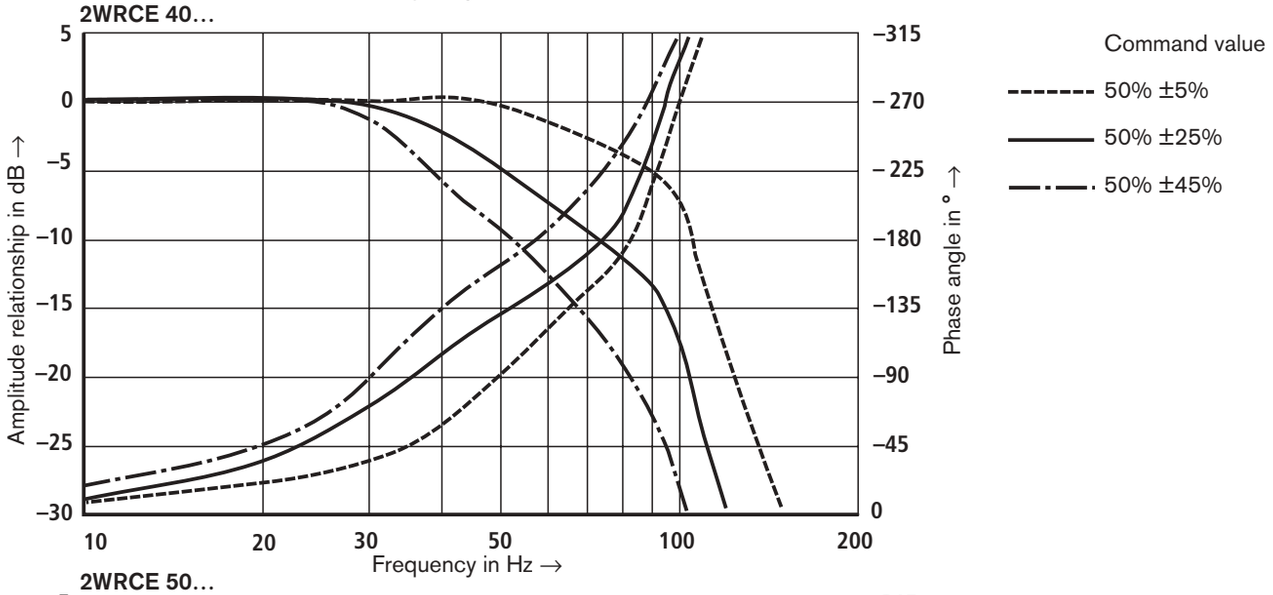
Characteristic curves (measured with HLP32, $\vartheta_{oil} = 40\ °C \pm 5\ °C$)

Frequency response at $p_{st} = 315$ bar

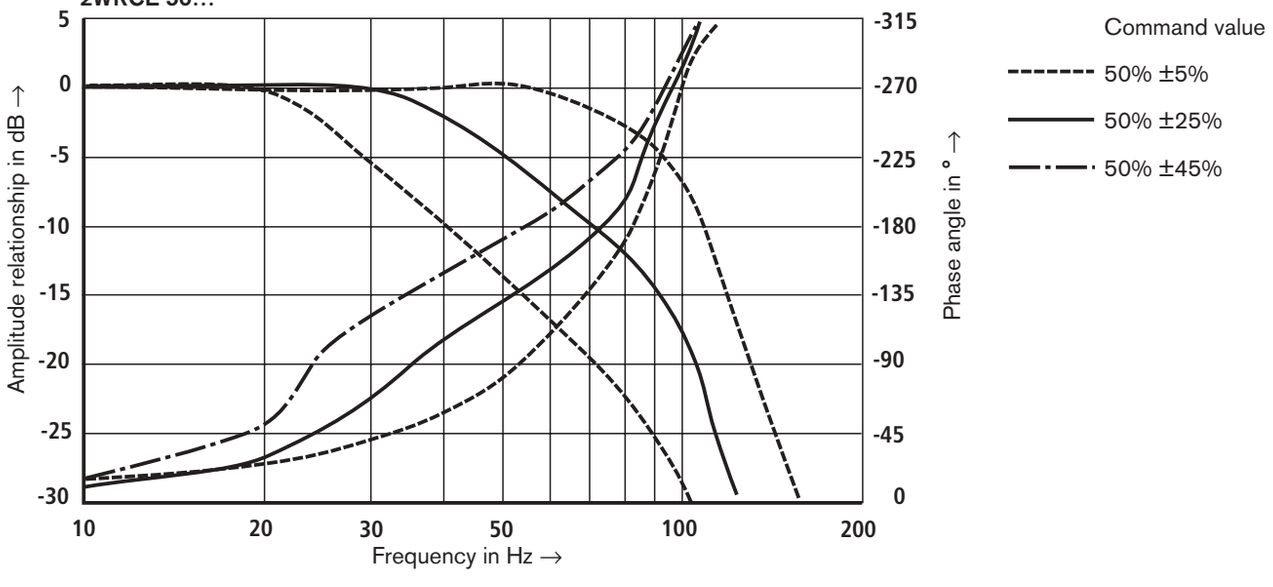
2WRCE 32...



2WRCE 40...



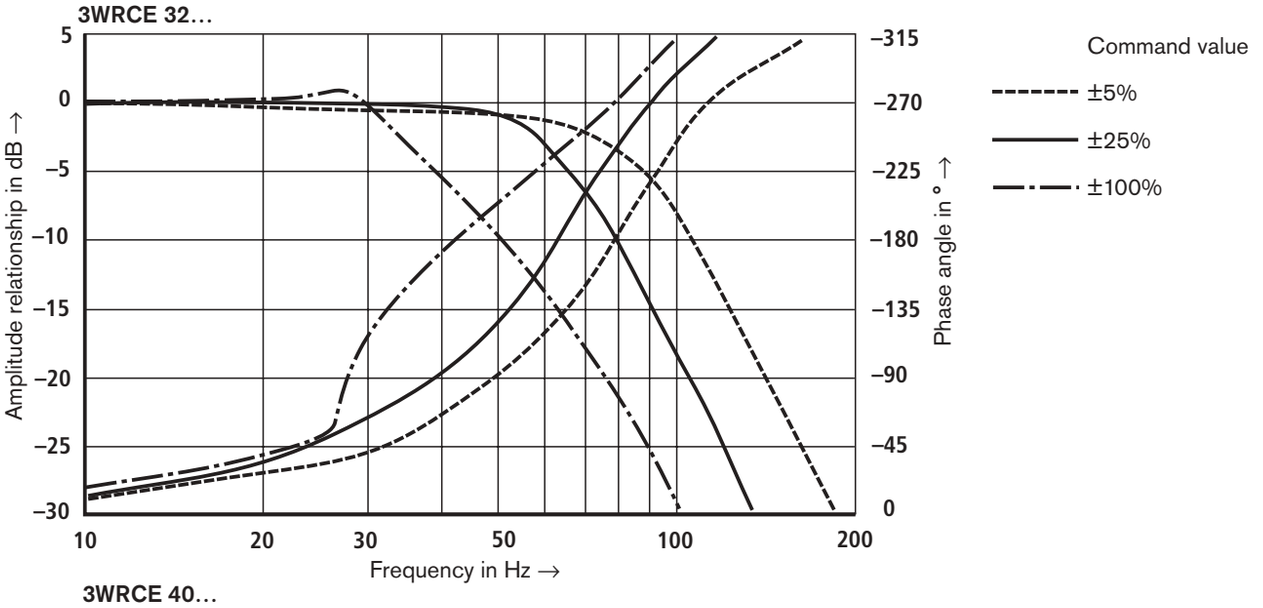
2WRCE 50...



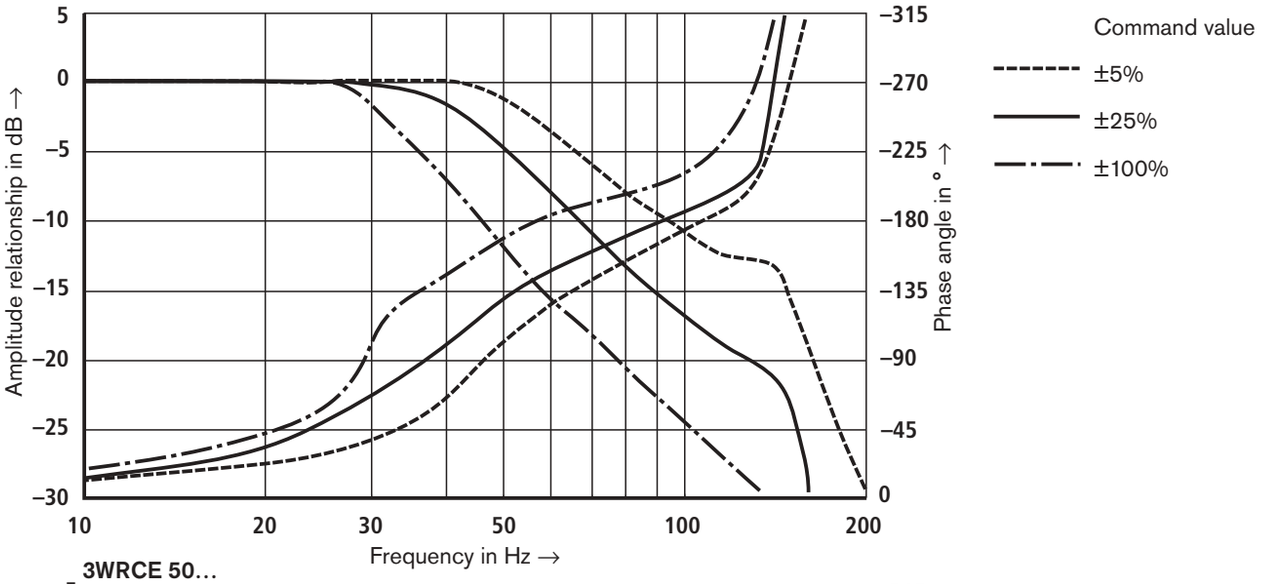
Characteristic curves (measured with HLP32, ϑ_{oil} = 40 °C ± 5 °C)

Frequency response at p_{st} = 315 bar

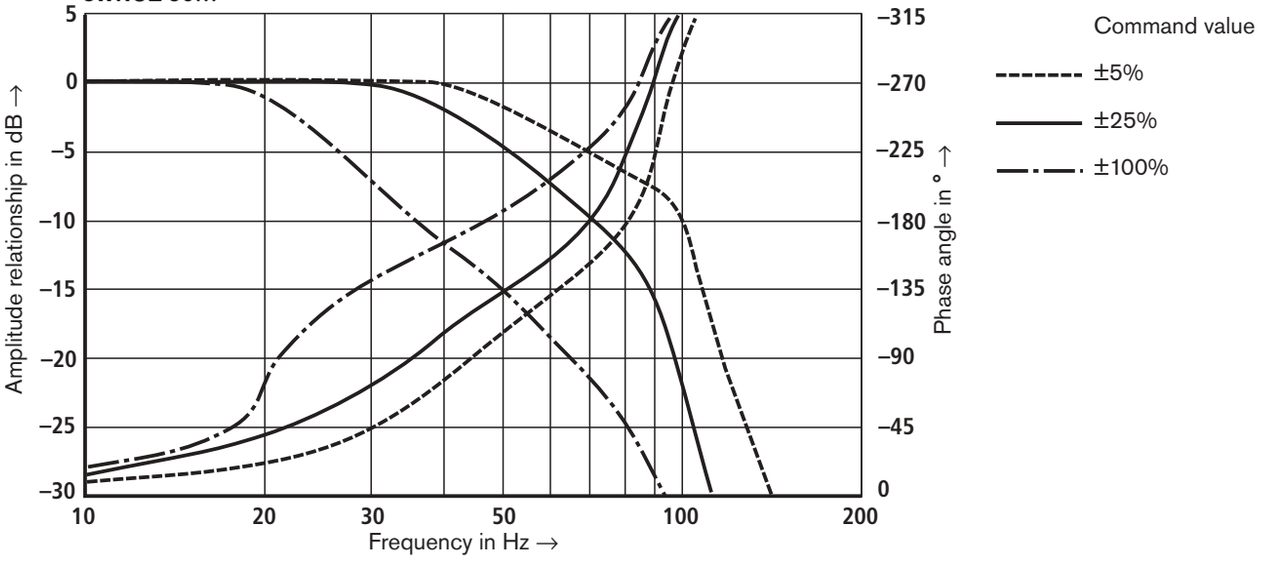
3WRCE 32...



3WRCE 40...

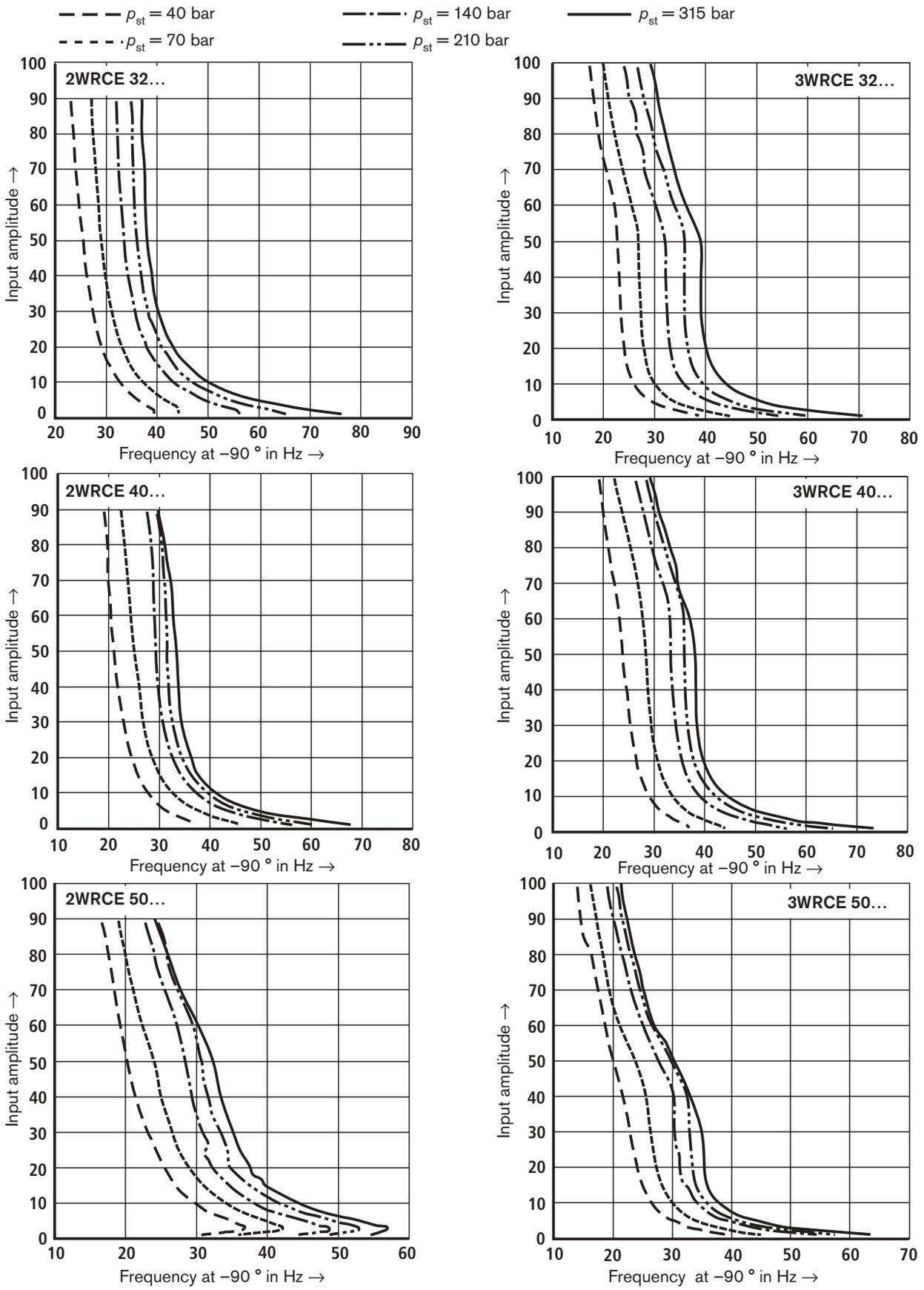


3WRCE 50...



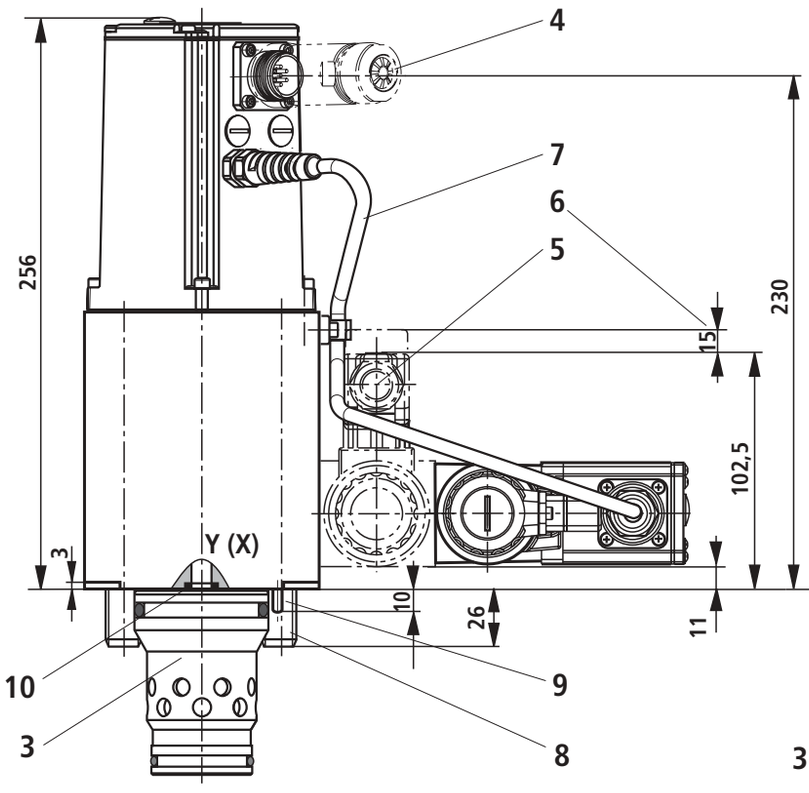
Characteristic curves (measured with HLP32, $\vartheta_{oil} = 40\ °C \pm 5\ °C$)

The relationship of the frequency *f* at −90° of the operating pressure and the input amplitude



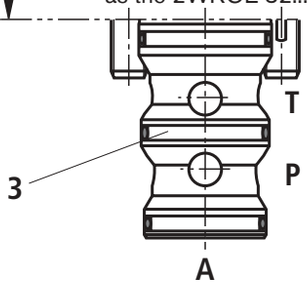
Unit dimensions: types 2WRCE and 3WRCE [1], NS32 (nominal dimensions in mm)

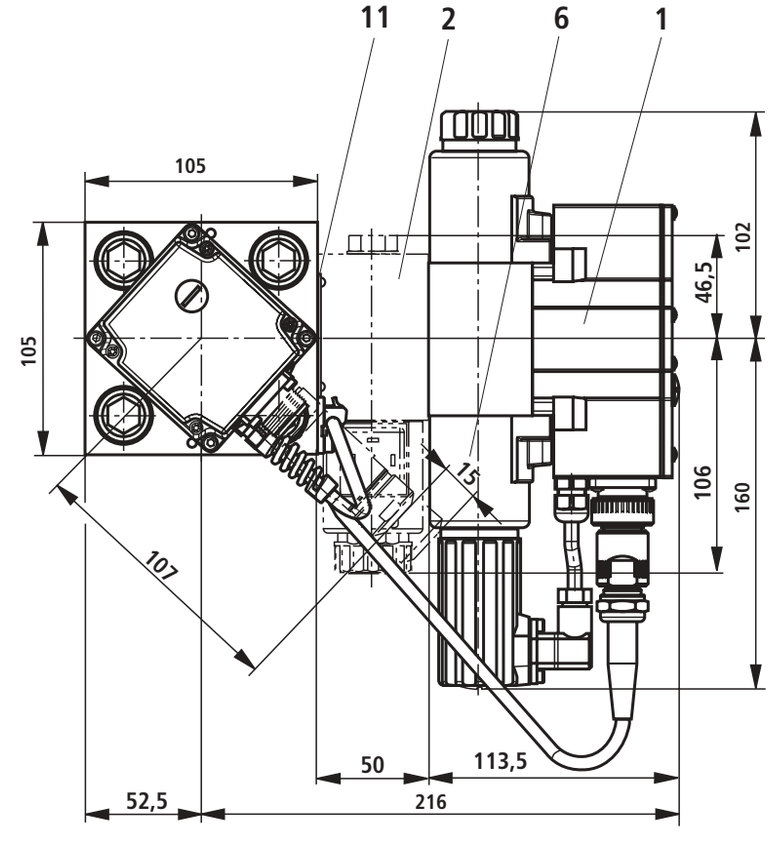
2WRCE 32



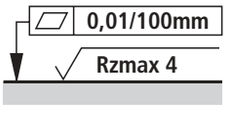
3WRCE 32... [1]

(the missing dimensions are the same as the 2WRCE 32...)





Required surface finish of the valve mounting surface



1 Pilot control valve (proportional valve NS6)

2 Sandwich plate isolator valve (only with versions „WK15“ and „WL15“)

3 Bush

4 Plug-in connector to DIN EN 175201-804 (separate order, see page 12)

5 Plug-in connector to DIN EN 175301-803 (separate order, see page 12)

6 Space required to remove the plug-in connector

7 Cabling

8 Valve fixing screws (are included within the scope of supply) 4 S.H.C.S. ISO 4762 - M16 x 100-10.9 (friction co-efficient μ_{total} = 0.09 to 0.14 Tightening torque for a tightening factor of: 1.6 : 280 Nm (display or signaling type of torque wrench)

9 Locating pin hole

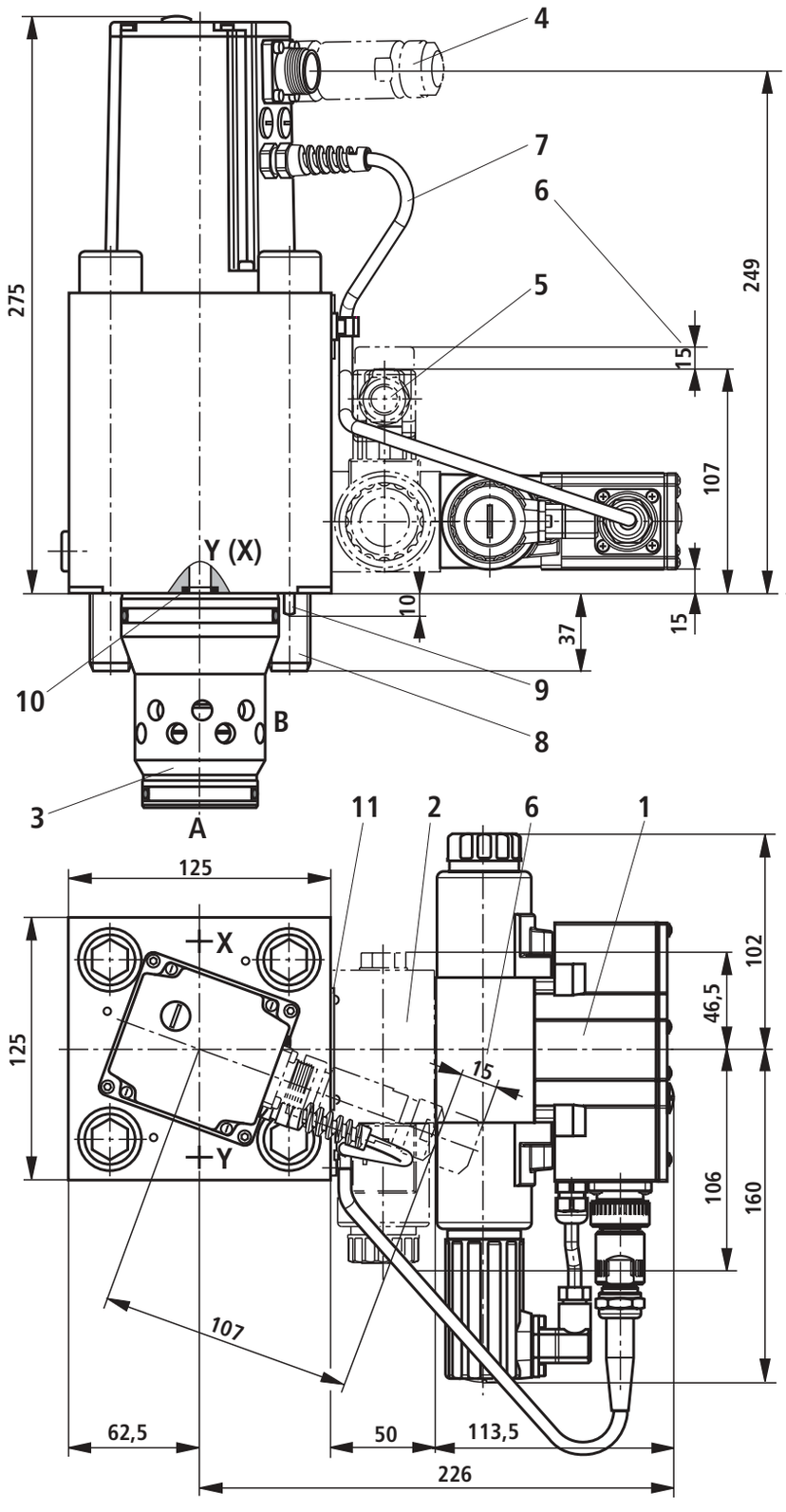
10 Identical seal rings for ports X and Y

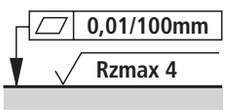
11 Name plate

[1] Not for new applications!

Unit dimensions: types 2WRCE and 3WRCE [1], NS40 (nominal dimensions in mm)

2WRCE 40

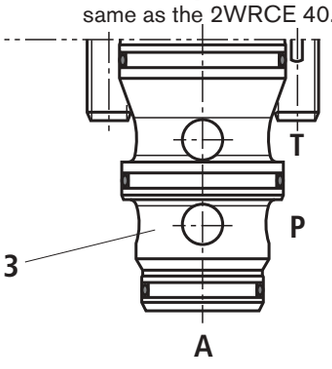




Required surface finish of the valve mounting surface

3WRCE 40... [1]

(the missing dimensions are the same as the 2WRCE 40...)



1 Pilot control valve (proportional valve NS6)

2 Sandwich plate isolator valve (only with versions „WK15“ and „WL15“)

3 Bush

4 Plug-in connector to DIN EN 175201-804 (separate order, see page 12)

5 Plug-in connector to DIN EN 175301-803 (separate order, see page 12)

6 Space required to remove the plug-in connector

7 Cabling

8 Valve fixing screws (are included within the scope of supply) 4 S.H.C.S. ISO 4762 - M20 x 180-10.9 (friction co-efficient μ_{total} = 0.09 to 0.14 Tightening torque for a tightening factor of: 1.6 : 560 Nm (display or signaling type of torque wrench)

9 Locating pin hole

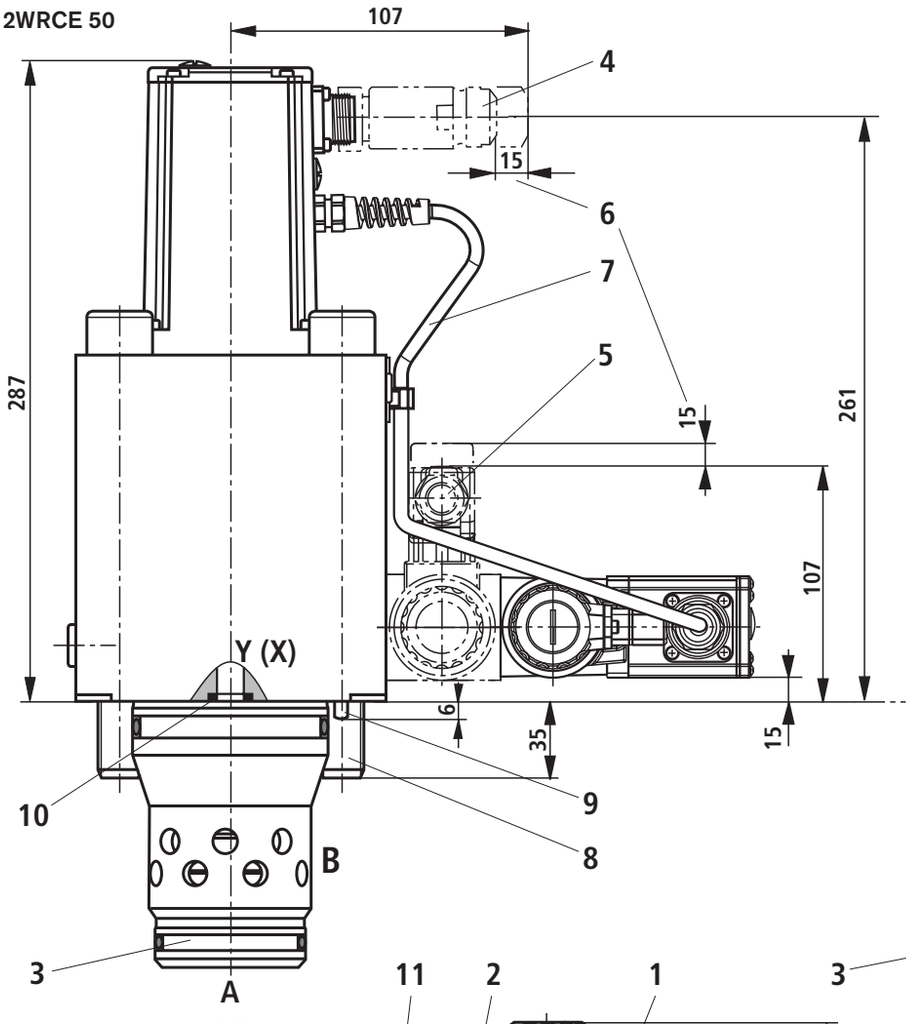
10 Identical seal rings for ports X and Y

11 Name plate

[1] Not for new applications!

Unit dimensions: types 2WRCE and 3WRCE [1], NS50 (nominal dimensions in mm)

2WRCE 50

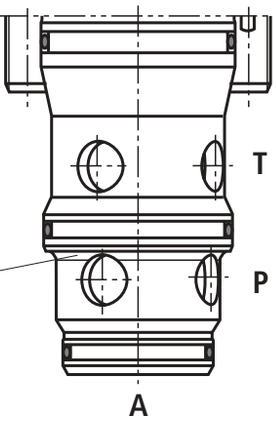


Required surface finish of the valve mounting surface

3WRCE 50... [1]

(the missing dimensions are the same as the 2WRCE 50...)

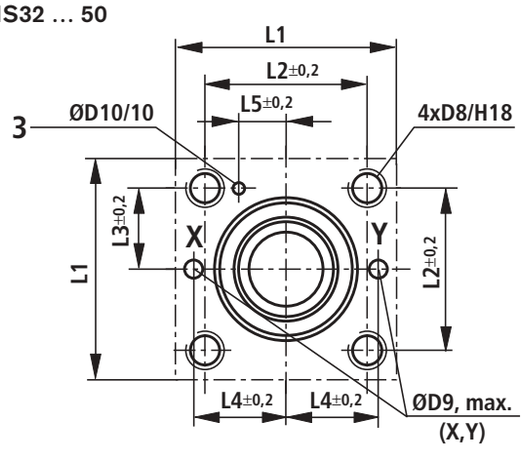
[1] Not for new applications!



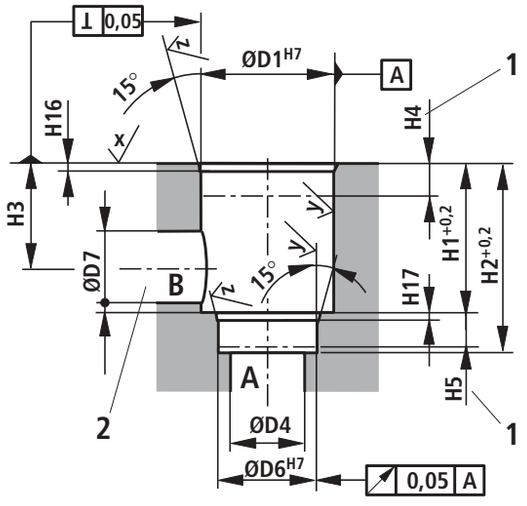
1 Pilot control valve (proportional valve NS6)
2 Sandwich plate isolator valve (only with versions WK15 and WL15)
3 Bush
4 Plug-in connectors to DIN EN 175201-804 (separate order, see page 12)
5 Plug-in connectors to DIN EN 175301-803 (separate order, see page 12)
6 Space required to remove the plug-in connector
7 Cabling
8 Valve fixing screws (are included within the scope of supply) 4 S.H.C.S. ISO 4762 - M20 x 190-10.9 (friction co-efficient μ_{total} = 0.09 to 0.14 tightening torque for a tightening factor of: 1.6 : 560 Nm (display or signaling type of torque wrench)
9 Locating pin hole
10 Identical seal rings for ports X and Y
11 Name plate

Installation dimensions to DIN ISO 7368 (nominal dimensions in mm)

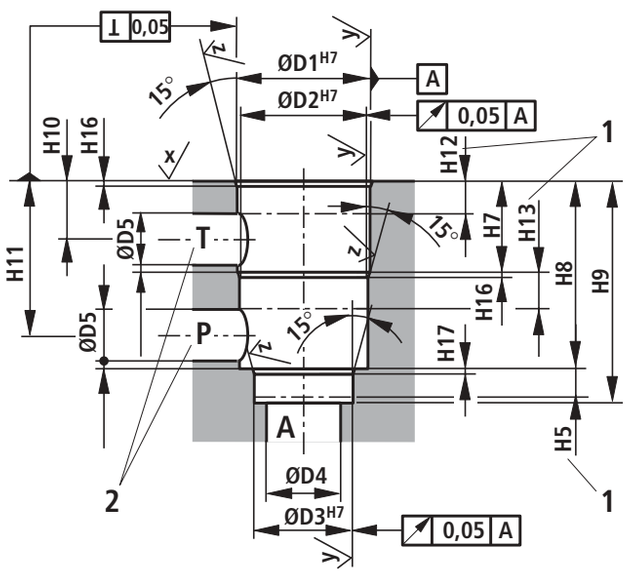
NS32 ... 50



Cavity for type 2WRCE to DIN ISO 7368



Cavity for type 3WRCE



NS	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
max. ØD9	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
L1	105	125	140
L2	70	85	100
L3	35	42,5	50
L4	41	50	58
L5	17	23	30

$\sqrt{X} = \sqrt{R_{max}\ 4}$

$\sqrt{Y} = \sqrt{R_{max}\ 8}$

$\sqrt{Z} = \sqrt{R_z\ 10}$

Tolerances to: – General tolerances ISO 2768-mK

1 Depth of fit, min. dim.

2 Ports P, T or B may be moved about the central axis of port A. However adequate spacing in relation to the fixing holes and control oil holes must be taken into account.

3 Locating pin hole

Notes

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