RE 29 136/07.02

2- and 3-way cartridge closed loop control valve Type .WRCE.../S

Nominal sizes 32, 40 and 50

Series 2X

Maximum operating pressure 420 bar

Maximum flow 4500 L/min

HAD 6870/01

Type 2WRCE...-2X/S

HAD 6869/01

Type 3WRCE...-2X/S

Overview of contents

Features

- Suitable for closed loop, position, pressure, force and speed controls
- Pilot operated 3-stage closed loop control valve
- Pilot control valve:
  2-stage, with a mechanical feedback NS 6 or 10 servo valve, trimmed, closes on loss of power when the pilot pressure is being applied to the 2WRCE main stage opens the 3WRCE-main stage from A to T
- The main stage is closed loop position controlled
- Integrated control and closed loop control electronics
- Manifold mounting:
  Cavity to ISO/DIS 7368 for the 2WRCE
- Typical applications:
  - Presses
  - Dye casting machines
  - Nibbling axis

For further information see:

- Pilot control valves
  - Servo valve NS 6 — RE 29 564
  - Servo valve NS 10 — RE 29 583
- Note
  - Type WRCE with a proportional pilot control — RE 29 137 (is in preperation)

Ordering details

		WRCE				–2X/	S		K31/					*

2/2-directional valve = **2**
3/2-directional = **3**

Electrically operated closed loop cartridge with integrated control electronics = **WRCE**

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

Poppet spool (**only** with type 2WRCE) = **S**
Sliding spool, zero overlap (+0.5...+1.5%) **only** for type 3WRCE) = **V**
Sliding spool, with 10…13 % pos. overlap (only for type **3 WRCE**) = **E**

Nominal flow in L/min with a 5 bar valve pressure differential
2WRCE 32, 650 L/min linear **only** ...S650L... = **650**
2WRCE 32, 480 L/min with a fine control range **only** ...S480R... = **480**
2WRCE 40, 1000 L/min linear **only** ...S1000L... = **1000**
2WRCE 40, 700 L/min with a fine control range **only** ...S700R... = **700**
2WRCE 50, 1600 L/min linear **only** ...S1600L... = **1600**
2WRCE 50, 1100 L/min with a fine control range **only** ...S1100R... = **1100**
3WRCE 32, 290 L/min linear **only** ...V290L... = **290**
3WRCE 32, 250 L/min with a fine control range **only** ...E250P... = **250**
3WRCE 40, 460 L/min linear **only** ...V460L... = **460**
3WRCE 40, 410 L/min with a fine control range **only** ...E410P... = **410**
3WRCE 50, 720 L/min linear **only** ...V720L... = **720**
3WRCE 50, 620 L/min with a fine control range **only** ...E620P... = **620**

Characteristic curve form
Linear = **L**
Linear with a progressive fine control range = **R**
Linear with a linear fine control range = **P**

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

Pilot control valve
Servo valve = **S**

Supply voltage 24VDC = **G24**
Supply voltage ± 15VDC = **G15**

Electrical connections
Without plug-in connector with component plug to E DIN 43 563-AM6 = **K31**
(separate order, see page 11)

Interfaces
2WRCE: Command value 0 ...+10 V, actual valve 0.5 ...10 V = **A1**
Command value 0 ...10 mA, actual valve 0.5 ...10 mA = **C1**
3WRCE: Command value ± 10 V, actual valve ± 10 V = **A1**
Command value ± 10 mA, actual valve ± 10 mA = **C1**

Sandwich plate isolator valve
Without isolator valve = **No code**
With isolator valve
2WRCE:
A de-energised isolator valve actively closes the 2WRCE whilst the pressure is being applied = **WK15**
A de-energised isolator valve actively opens 2WRCE whilst the pressure is being applied = **WL15**
3WRCE:
A de-energised isolator valve actively opens the 3WRCE from A to T whilst a pilot pressure is being applied = **WK15**
A de-energised isolator valve actively opens the 3WRCE from P to A whilst a pilot pressure is being applied = **WL15**
24 VDC power supply, plug-in connector separate order, see page 11 (without circuitry)

Seals
NBR seals, suitable for mineral oils HL and HLP to DIN 51 524 = **M**
FKM seals = **V**

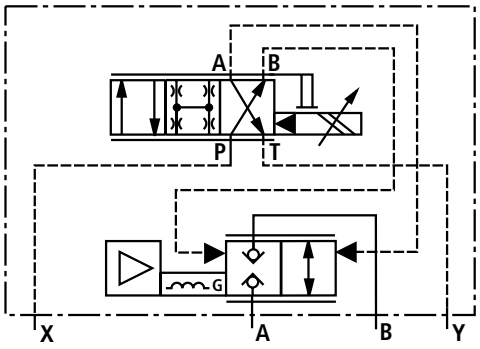
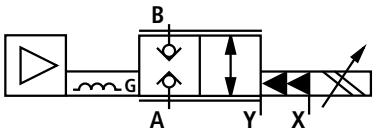
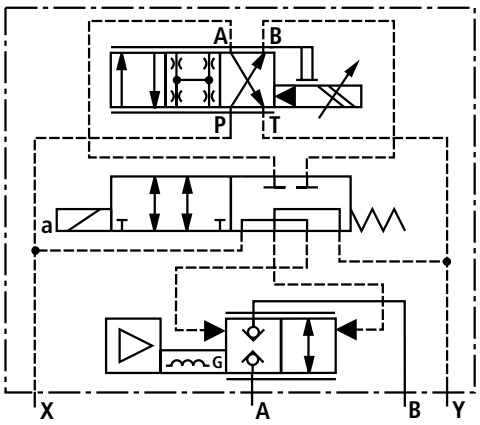
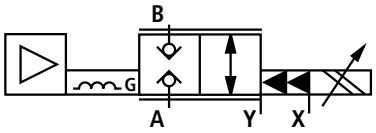
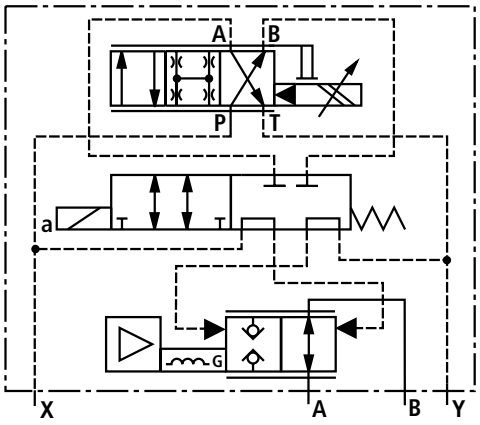
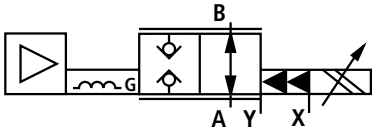
Further details in clear text

Preferred types (readily available)

Type 2WRCE	Material No.
2WRCE 32 S650L-2X/SG24K31/A1M	**00768408**
2WRCE 40 S1000L-2X/SG24K31/A1M	**00768412**
2WRCE 50 S1600L-2X/SG24K31/A1M	**00770094**

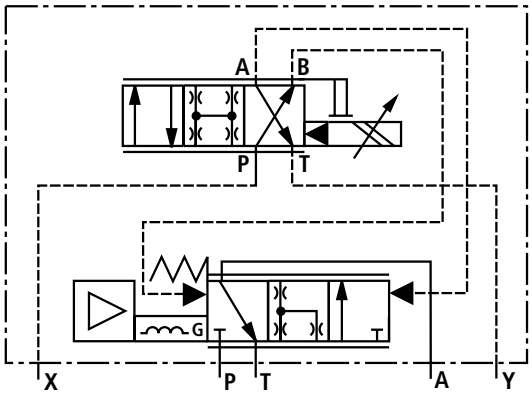
Type 3WRCE	Material No.
3WRCE 32 V290L-2X/SG24K31/A1M	**00768414**
3WRCE 40 V460L-2X/SG24K31/A1M	**00759110**
3WRCE 50 V720L-2X/SG24K31/A1M	**00768415**

Symbols: 2WRCE

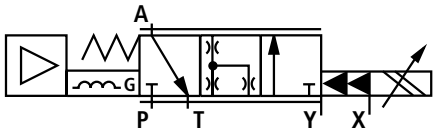
Detailed	Simplified
2WRCE..-2X/S...	**2WRCE..-2X/S...**
	
2WRCE..-2X/S...WK...	**2WRCE..-2X/S...WK...**
	
2WRCE..-2X/S...WL...	**2WRCE..-2X/S...WL...**
	

Symbols: 3WRCE

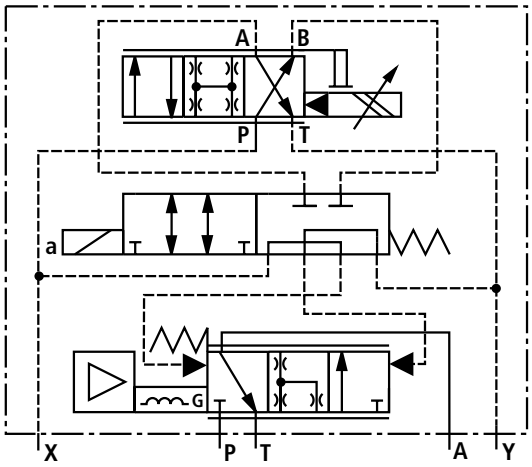
3WRCE..V...-2X/S...



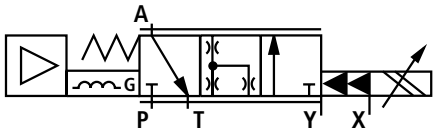
3WRCE..V...-2X/S...



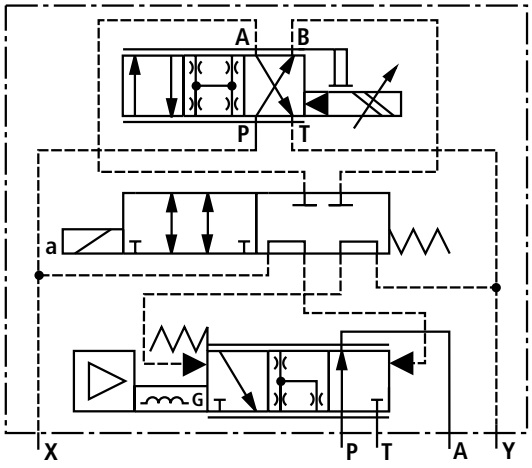
3WRCE..V...-2X/S...WK...



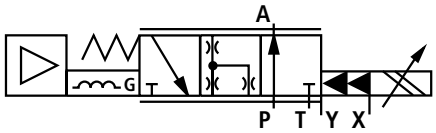
3WRCE..V...-2X/S...WK...



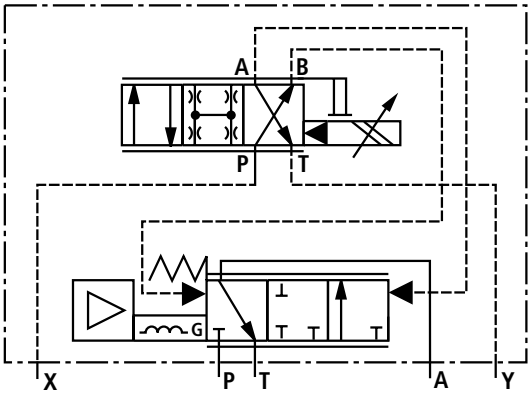
3WRCE..V...-2X/S...WL...



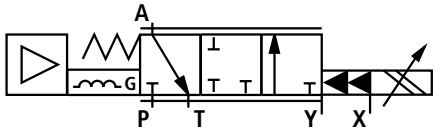
3WRCE..V...-2X/S...WL...



3WRCE..E...-2X/S...



3WRCE..E...-2X/S...



The type 2WRCE...-2X/S... valves are 3-stage closed loop 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:

– A 2-stage servo valve (1), as a pilot control valve
  • With a dry torque motor
  • A frictionless nossel and flapper amplifier
  • Mechanical feedback of the spool position
– A main control spool (2) for flow control
– An inductive position transducer (3) whose core (4) is fixed to the spool (5) of the third stage
– And integrated control electronics (6).

Function

Within the integrated control electronics the command and actual values are compared and the pilot valve torque motor is controlled via a current proportional to control deviation.

The pilot valve assumes a position to control the flow into or out of the control chambers A (7) and B (8) which, via the closed loop valve control, drives the main spool (5) untill the following error = 0.

The stroke of the main spool is therefore closed loop proportionally controlled in relation to the command value. It has to be taken into account that the flow is also dependent on the valve pressure differential.

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 %. With smaller command values the closed loop valve circuit tries to follow the spool, and presses it, with up to the full system pressure on to the seat and closes, leak-free, the connection.

The stated valve dynamics are only valid within the valves closed loop control range. For command value jumps from the seated position and small opening values, additional delay times occur.

The opening point of 5 % (= 0.5 V or 0.5 mA) is factory pre-set.

When the pilot valve or control electronics have been replaced the opening point can be calibrated via the zero matching potentiometer R316, which is accessible via a plug.

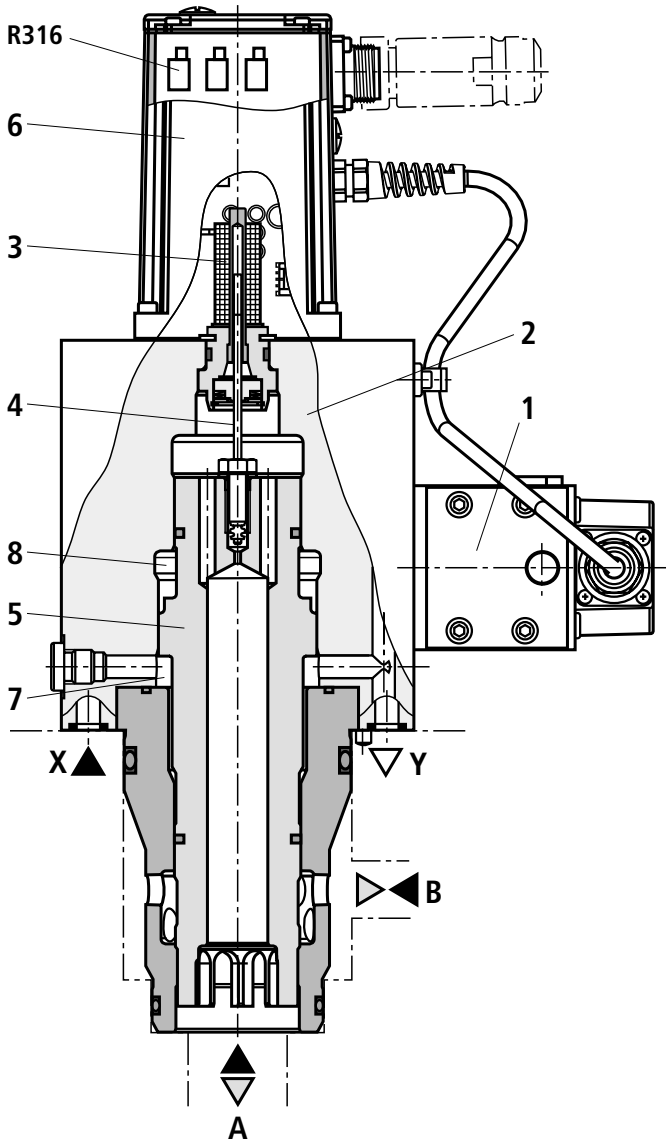
Other than the zero point adjustment no other adjustments may be carried out to the control electronics or pilot during the exchange.

Only the filter element can be replaced on the pilot control valve (see RE 29 564, NS 6 or RE 29 583, NS 10)

The pilot is so trimmed that in the case of a power failure the pilot pressure is connected with the control chamber B (8) and the main stage thereby closes

The control electronics have an offset which is used to balance out the pilot trimming.

Due to the diameter differences on the seat area, the spools are not statically pressure balanced. To compensate for the force differences 6 % of the system pressure, for spool types S...L and 22 % for spool types S...R are required as the pilot pressure. With reserves for the flow forces and dynamics this results in the recommended minimum control pressure.



Design, function and section: 3WRCE

The type 3WRCE...-2X/S... valves are 3-stage closed loop 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:

– A 2-stage servo valve (1), as a pilot control valve
  • With a dry torque motor
  • A frictionless nossel and flapper amplifier
  • Mechanical feedback of the spool position
– A main control spool (2) for flow control
– An inductive position transducer (3) whose core (4) is fixed to the spool (5) of the third stage
– And integrated control electronics (6).

Function

Within the integrated control electronics the command and actual values are compared and the pilot valve torque motor is controlled via a current proportional to control deviation.

The pilot valve assumes a position to control the flow into or out of the control chambers A (7) and B (8) which,via the closed loop valve control, drives the main spool (5) until the following error = 0.

The stroke of the main spool is therefore closed loop proportionally controlled in relation to the command value. It has to be taken into account that the flow is also dependent on the valve pressure differential.

Special valve features:

The opening point of 5 % (= 0.5 V or 0.5 mA) is factory pre-set. When the pilot valve or control electronics have been replaced the opening point can be calibrated via the zero matching potentiometer R316, which is accessible via a plug.

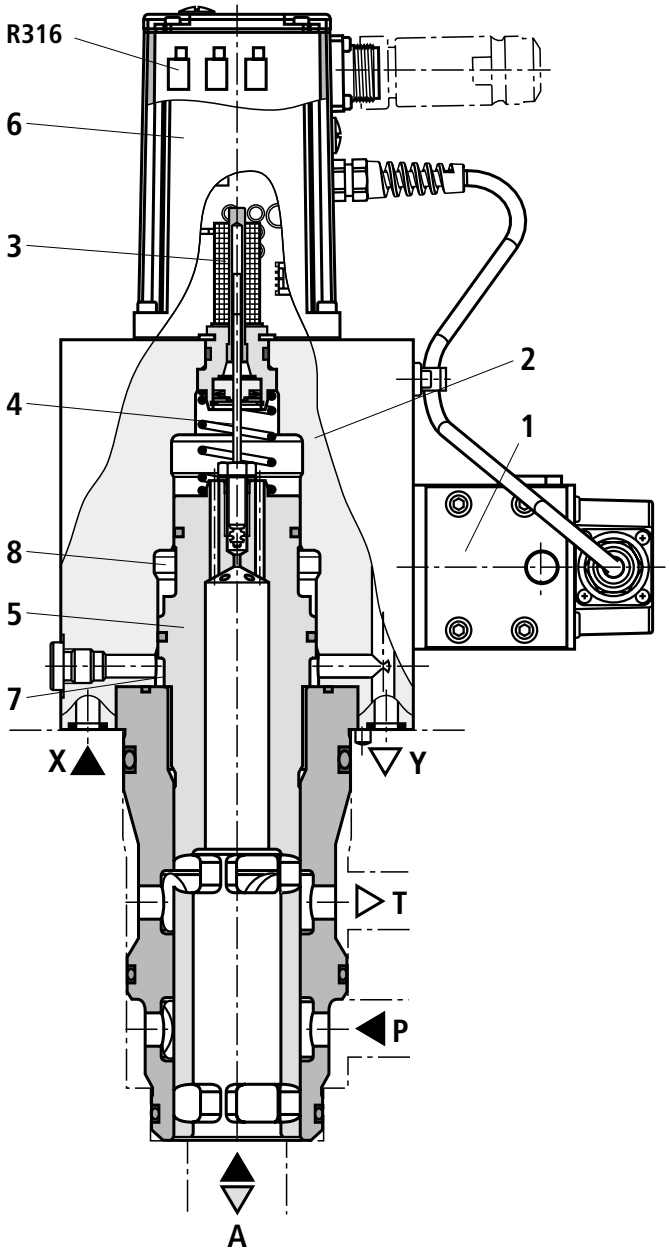
Other than the zero point adjustment no other adjustments may be carried out to the control electronics or pilot during the exchange.

Only the filter element can be replaced on the pilot control valve (see RE 29 564, NS 6 or RE 29 583, NS 10)

The valve is so trimmed that, in the case of a power failure, the control pressure is connected with the control chamber B (8), therefore the main stage opens from A to T or closes the connection from P to A.

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

The control electronics have an offset which is used to balance out the pilot trimming.



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

General		**NS 32**	**NS 40**	**NS 50**
Installation; commissioning		Optional, preferably horizontal; to RE 07 700		
Storage temperature range	°C	– 20 ... + 80		
Ambient temperature range	°C	– 20 ... + 60		
Weight	kg	11.2	21.1	28
Weight with isolator valves ...../...WK or .../...WL...	kg	12.4	24.8	31.7
Pilot valve nominal size	NS	6	10	10

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

Max. operating pressures				
Main stage, ports A, B	bar	420		
Pilot valve, port X	bar	315		
Pilot valve, port Y	bar	Pressure peaks <100, static <10		
Minimum control pressure in % of the system pressure				
For spool versions S...L	%	15		
For spool versions S...R	%	45		
Nominal flow q_{vnom} +10 % at Δp = 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 types ...S...L	L/min	1500	2200	3500
for spool types ...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	38	56	80
Zero flow of the servo pilot stage in relation to the pressure in X		2 WRCE 32 .../S	2 WRCE 40 .../S 2 WRCE 50 .../S	
	L/min	$\sqrt{\frac{p_x}{70\ bar}} \bullet 0{,}5$	$\sqrt{\frac{p_x}{70\ bar}} \bullet 1{,}2$	
Control oil flow	cm^3	4.52	8.48	17.3
Nominal stroke	mm	10	12	15
Pressure fluid		Mineral oil (HL, HLP) to DIN 51 524 Further 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		
Degree of contamination		Maximum permissible degree of contamintion of the pressure fluid is to NAS 1638.	A filter with a minimum retention rate of $\beta_x \geq 75$ is recommended	
Pilot valve		Class 7	x = 5	
Main valve		Class 9	x = 15	
Hysteresis	%	≤ 0.2		
Reversal span	%	≤ 0.1		
Response sensitivity	%	≤ 0.1		
Closing time with: Pilot trimming	ms	≤ 550		
(with control pressures of 40 to 315 bar) Isolator sandwich plates	ms	≤ 200		

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

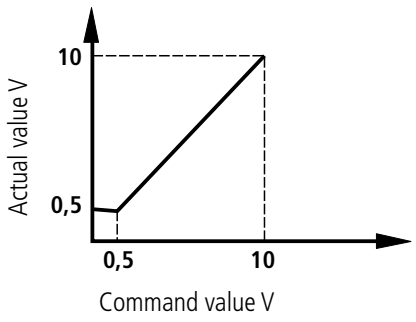
Electrical		**NS 32**	**NS 40**	**NS 50**
Valve protection to DIN 40 050		IP65 with fitted and locked plug-in connector		
Voltage type		DC		
Signal type		Analogue		
Opening point calibration	%	≤ 1		
Zero displacment with a change in:				
Pressure fluid temperature	%/10 K	≤ 0.3	≤ 0.3	≤ 0.3
Control pressure in X	%/100 bar	≤ 0.7	≤ 0.7	≤ 0.7
Return pressure in Y 0 to 10 % of p_x	%/bar	≤ 0.3	≤ 0.3	≤ 0.3

Note:
For details regarding the **environmental simulation test** covering EMC (electr-magnetic compatibility), climate and mechanical loading see RE 29 136-U (declaration regarding environmental compatibility).

Control electronics

Control electronics	VT 13037 (integrated into the valve)

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 0.5V.
With a slow command value change from 0.5 V to 10 V, the actual value follows the command value within ± 0.1 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: 3WRCE (for applications outside these parameters, please consult us!)

General		**NS 32**	**NS 40**	**NS 50**
Installation; commissioning		Optional, preferably horizontal; to RE 07 700		
Storage temperature range	°C	– 20 ... + 80		
Ambient temperature range	°C	– 20 ... + 60		
Weight	kg	11.5	18.9	29.2
Weight with isolator valves ...../...WK or .../...WL...	kg	12.7	20.1	32.9
Pilot valve nominal size	NG	6	6	10

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

Max. operating pressures				
Main stage, ports P, A, T	bar	315		
Pilot valve, port X	bar	315		
Pilot valve, port Y	bar	Pressue peaks <100, static <10		
Nominal flow q_{vnom} +10 % at Δp = 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	27	42	65
Max. zero flow of the main stage at P_p = 300 bar	L/min	4	6	8
Zero flow of the servo pilot stage in relation to the pressure in X		3 WRCE 32 .../S 3 WRCE 40 .../S		3 WRCE 50 .../S
	L/min	$\sqrt{\frac{p_x}{70\ bar}} \bullet 0{,}5$		$\sqrt{\frac{p_x}{70\ bar}} \bullet 1{,}2$
Control oil flow	cm^3	± 2.26	± 4.24	± 8.65
Nominal stroke	mm	± 5	± 6	± 7.5
Pressure fluid		Mineral oil (HL, HLP) to DIN 51 524		
Pressure fluid temperature range	°C	– 20 to + 80; preferably 40 to 50		
Viscosity range	mm^2/s	20 to 380; preferably 30 to 45		
Degree of contamination		Maximum permissible degree of contamintation of the pressure fluid is to NAS 1638.		A filter with a minimum retention rate of $\beta_x \geq 75$ is recommended
Pilot valve		Class 7		x = 5
Main valve		Class 9		x = 15
Hysteresis	%	≤ 0.2		
Reversal span	%	≤ 0.1		
Response sensitiviy	%	≤ 0.1		
Closing time, 100% open until zero flow with a trimmed pilot stage	ms	≤ 500		
Isolator sandwich plate (with control pressures from 40... 315 bar)	ms	≤ 200		

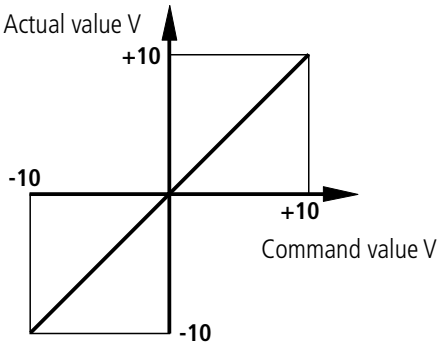
Technical data: 3WRCE (for applications outside these parameters, please consult us!)

Electrical		NS 32	NS 40	NS 50
Valve protection to DIN 40 050		IP65 with fitted and locked plug-in connector		
Voltage type		DC		
Signal type		Analogue		
Zero 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 (0 to 10 % of p_x)	%/bar	≤ 0.3	≤ 0.3	≤ 0.3

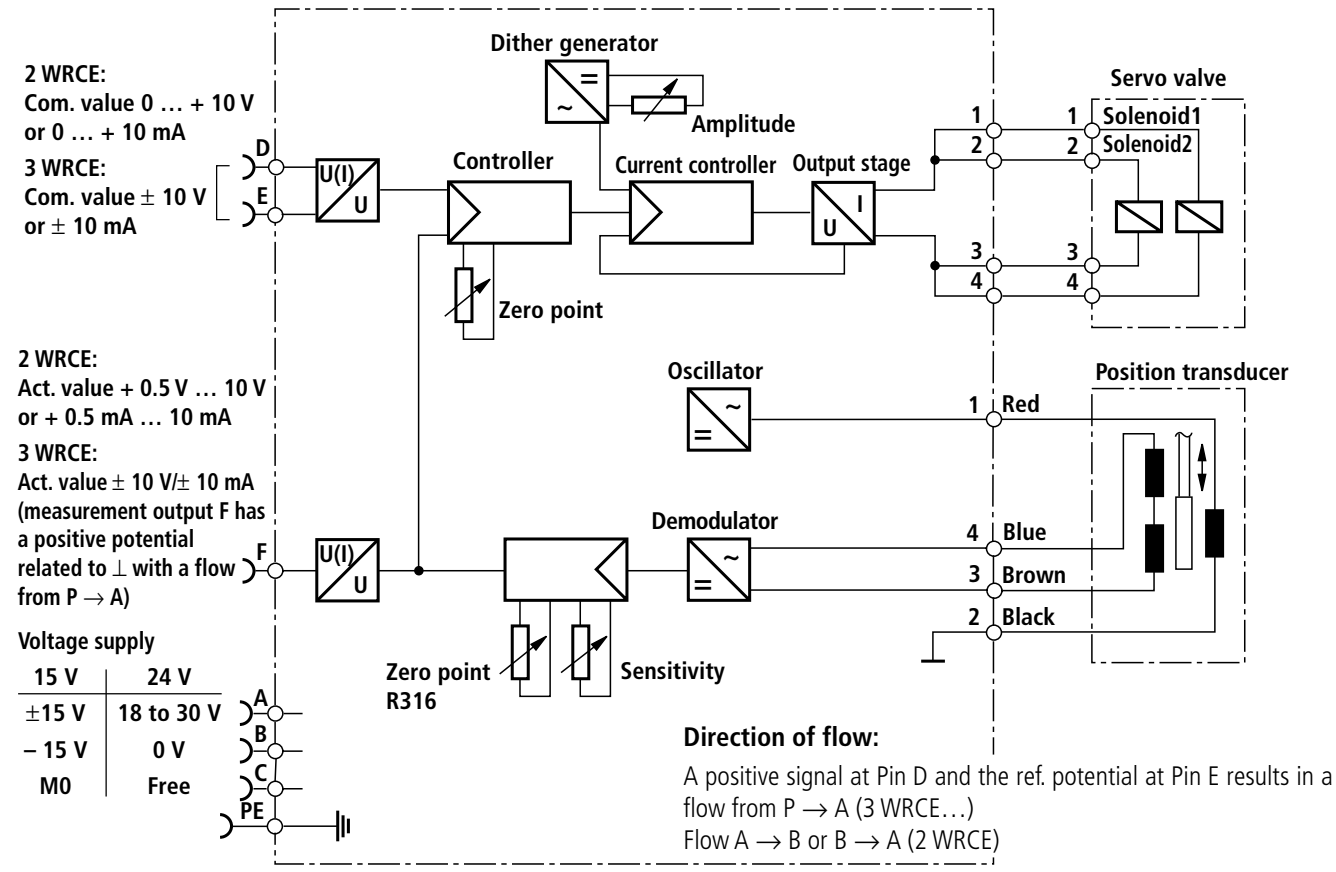
Control electronics

Control electronics	VT 13037 (integrated into the valve)

Nominal command 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 remains follows the command value within ± 0,1 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 reach values of approx. ± 10.5 V.



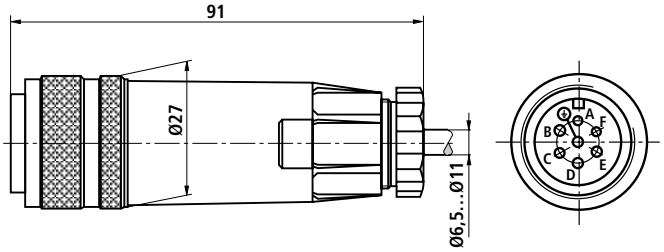
Block circuit diagram / connection allocation of the integrated control electronics, type VT13037



Electrical connections

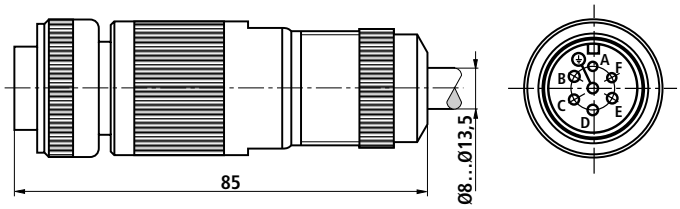
Plug-in connector

Plug-in connector to E DIN 43 563-BF6-3/Pg11
Separate order under Material No. **00021267**
(plastic version)



Plug-in connector

Plug-in connector to E DIN 43 563-BF6-3-Pg13,5
Separate order under Material No. **000223890**
(metal version)



Component plug allocation

	Contact	Interface A1 allocation (Supply voltage G15 in brackets)		Interface C1 allocation (Supply voltage G15 in brackets)	
		2WRCE	3WRCE	2 WRCE	3WRCE
Voltage supply	A	+ 24 VDC (+ 15 VDC)		+ 24 VDC (+ 15 VDC)	
	B	0 VDC (– 15 VDC)		0 VDC (– 15 VDC)	
Measurement zero at G15	C	Not allocated (ref. to A, B)		Not allocated (ref. to A, B)	
Differential command value input	D	0 ... + 10 V	0 ... ± 10 V	0 ... + 10 mA	0 ... ± 10 mA
	E				
Actual value Ref. is pin B at G24 Ref. is pin C at G15	F	+ 0,5 ... + 10 V	0 ... ± 10 V	+ 0,5 ... + 10 mA	0 ... ± 10 mA
Earth	PE	Connected to the valve housing		Connected to the valve housing	

Do not connect PE when the valve is earthed via the system.

Power supply: + 24 VDC ± 6 V; Full bridge rectifier with a smoothing capacitor 2200 µF = I_{max} = 230 mA
± 15 VDC ± 0.45 V; Stabilised and smoothed; I_{max} = 180 mA

Command value current: 0 … + 10 mA or ± 10 mA → input resistance 100 Ω

Actual value current: 0.5 mA … + 10 mA or ± 10 mA → max. load resistance 1 kΩ
The command and actual values have the same polarity

D positive in relation to E → the main spool for type 2WRCE moves in the opening direction

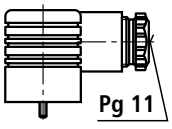
D positive in relation to E → the main spool for type 3WRCE moves in the direction of P to A open

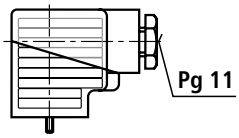
Note: Electrical signals (e.g. actual value) taken via valve electronics must not be used to switch off the machine safety functions!

(This is in accordance with the regualtions to the European Standard „Safety requirements of fluid technology systems and components – hydraulics", EN 982!)

Plug-in connectors for isolator valve to DIN EN 175 301-803 and ISO 4400 for component plug „K4"

For further plug-in connectors see RE 08 006

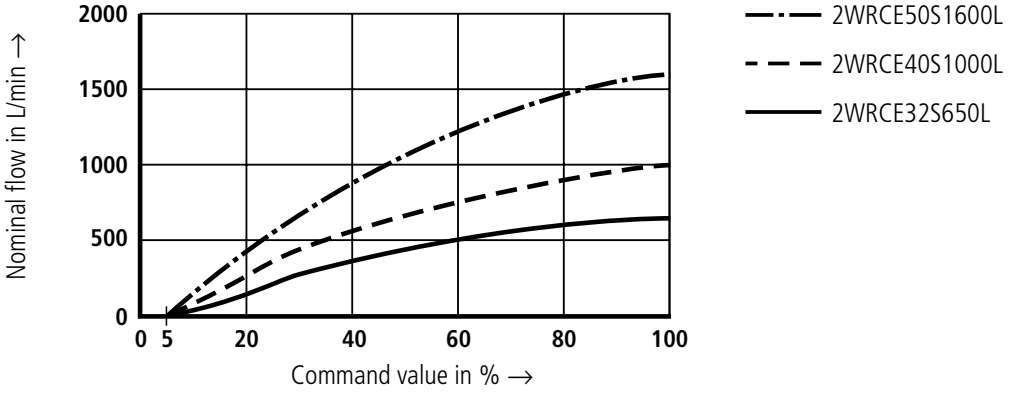




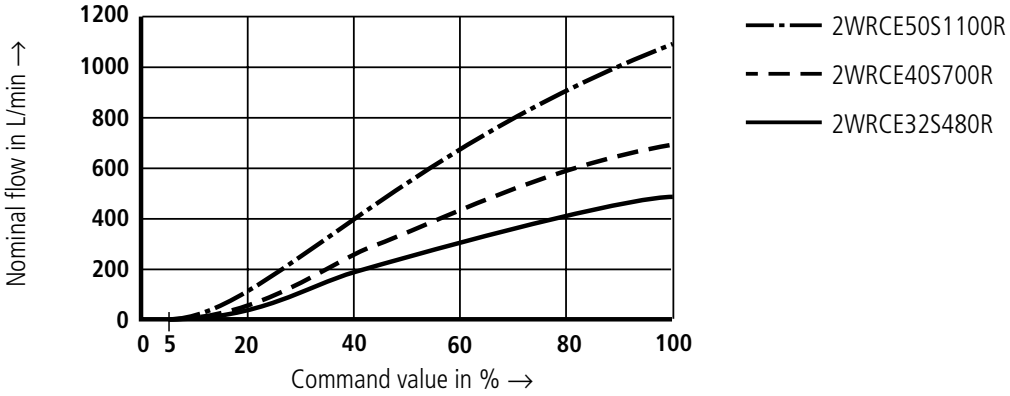
Valve side	Colour	Material-Nr. Without circuitry	With indicator light 12 … 240 V	With rectifier 12 … 240 V	With indicator light and Z-diode protective circuitry 24 V
a	Grey	**00074683**	–	–	–
a/b	Black	–	**00057292**	**0313933**	**00310995**

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

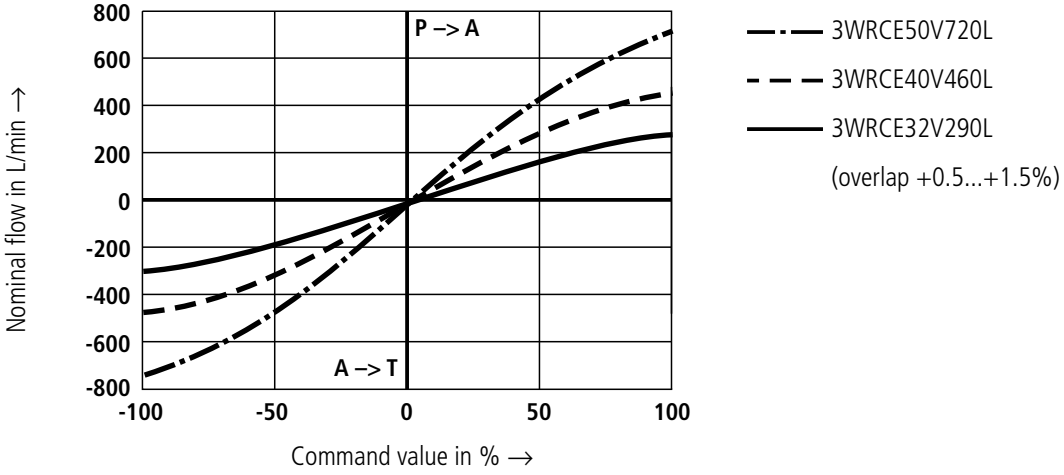
Nominal flow with a 5 bar valve pressure differential A → B = B → A



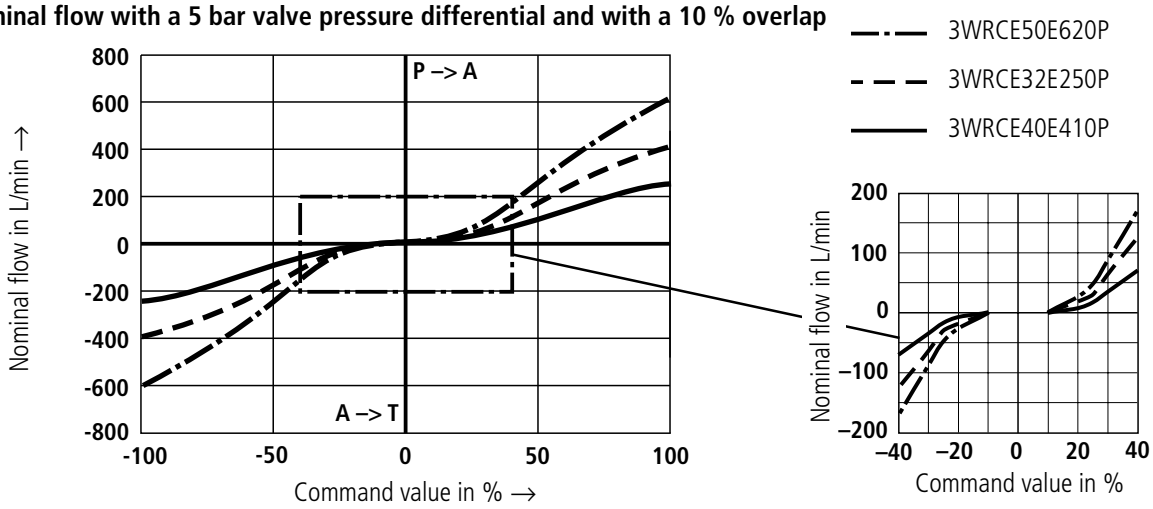
Nominal flow with a 5 bar valve pressure differential A → B = B → A



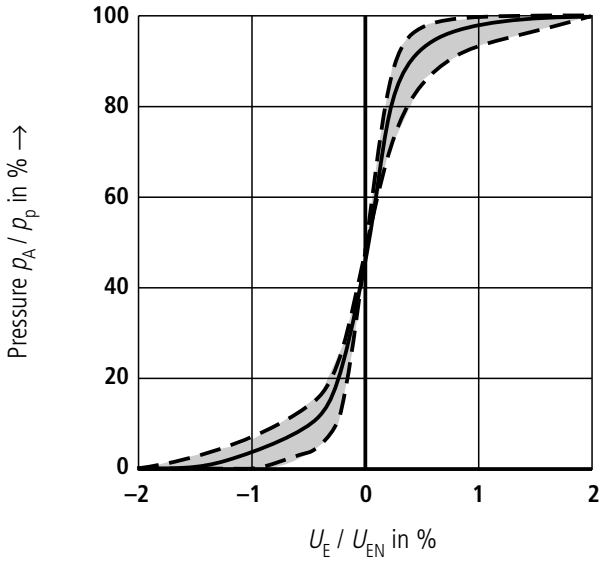
Nominal flow with a 5 bar valve pressure differential



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

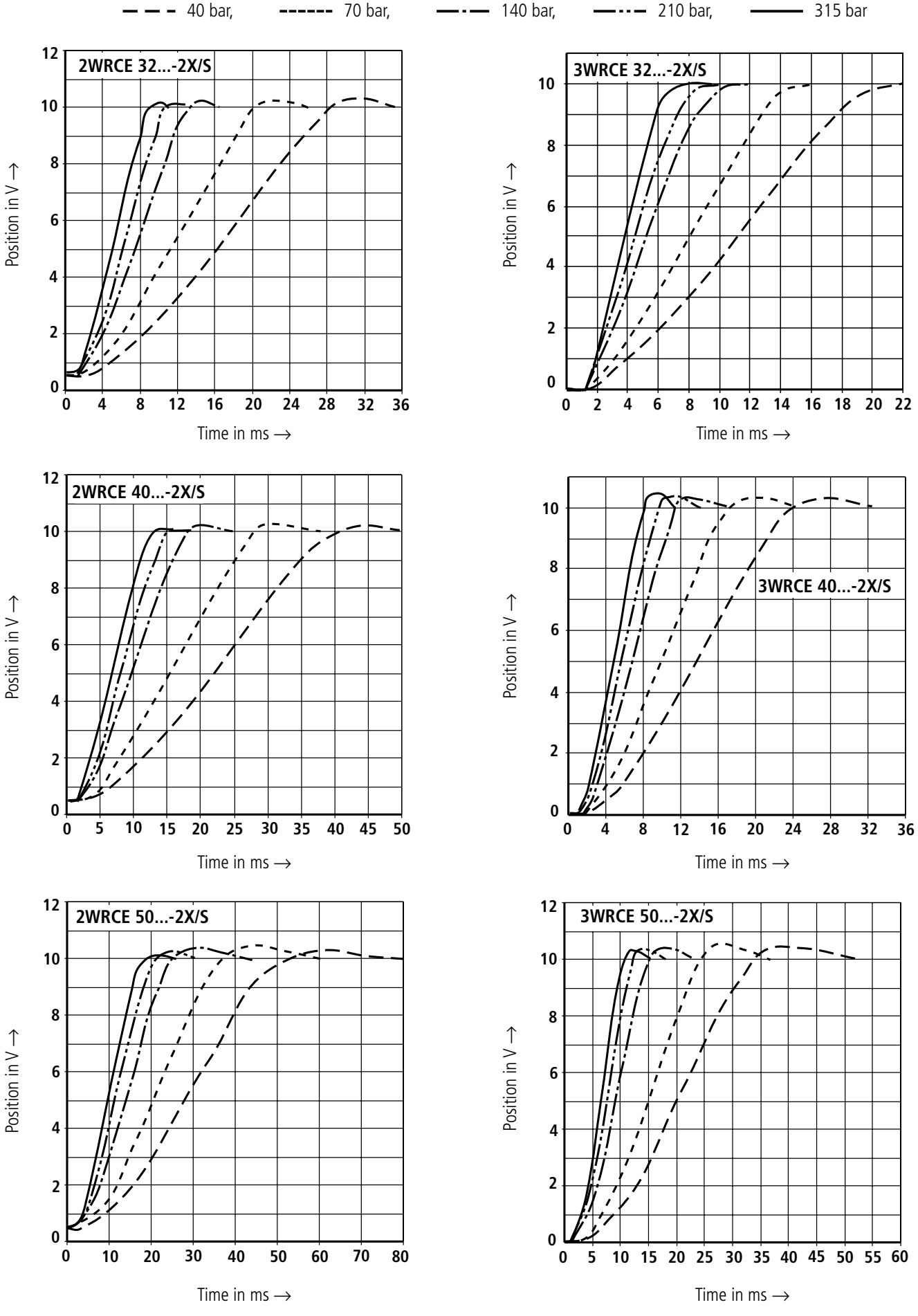


Pressure gain for the 3WRCE…V… limiting and average value characteristic curves



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

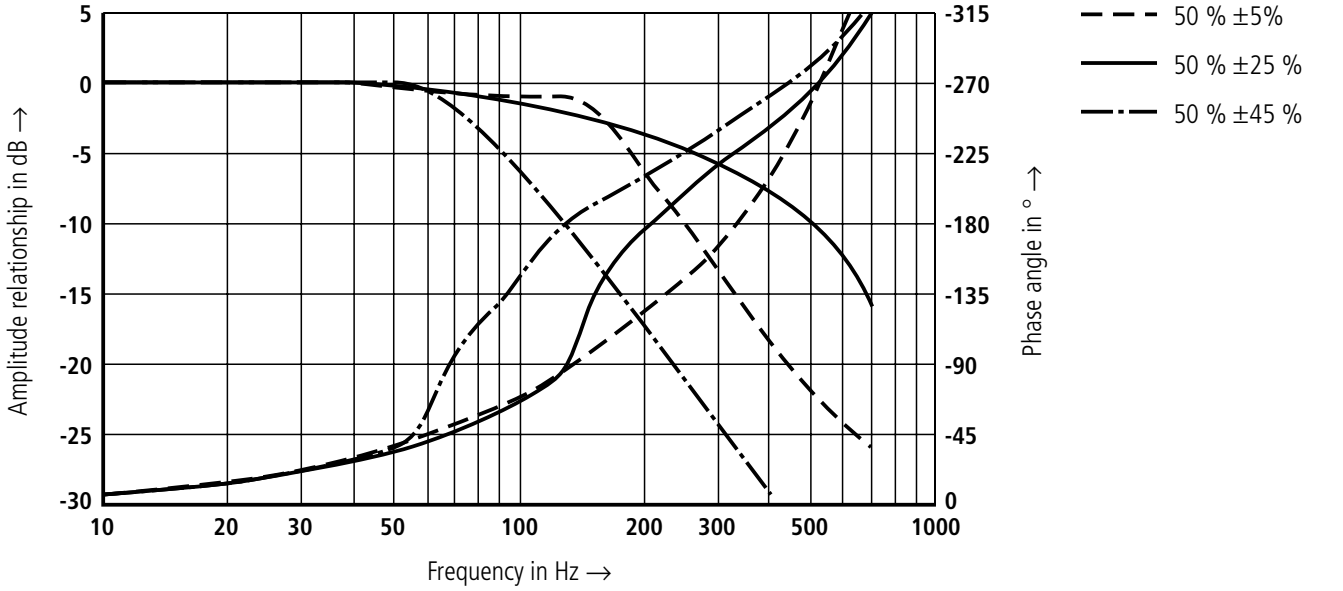
Step response



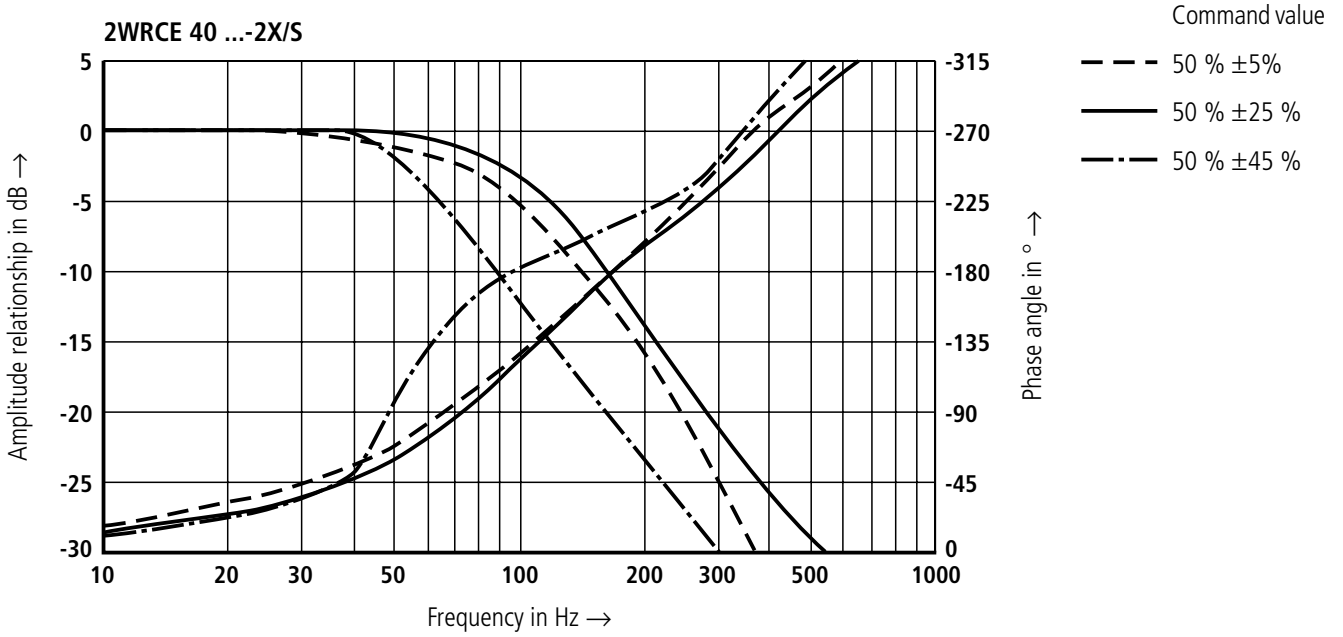
Characteristic curves (measured with HLP32, ϑ_{oil} = 40 °C ± 5 °C)

Frequency response at p_p = 315 bar

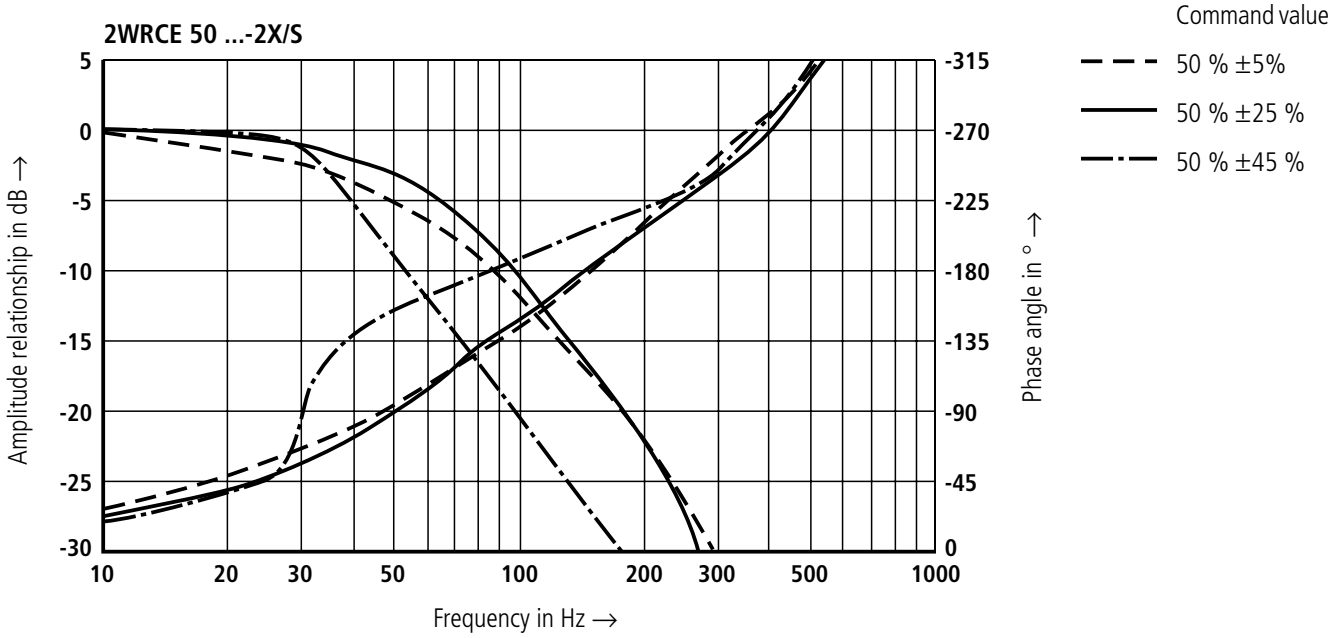
2WRCE 32 ...-2X/S



2WRCE 40 ...-2X/S



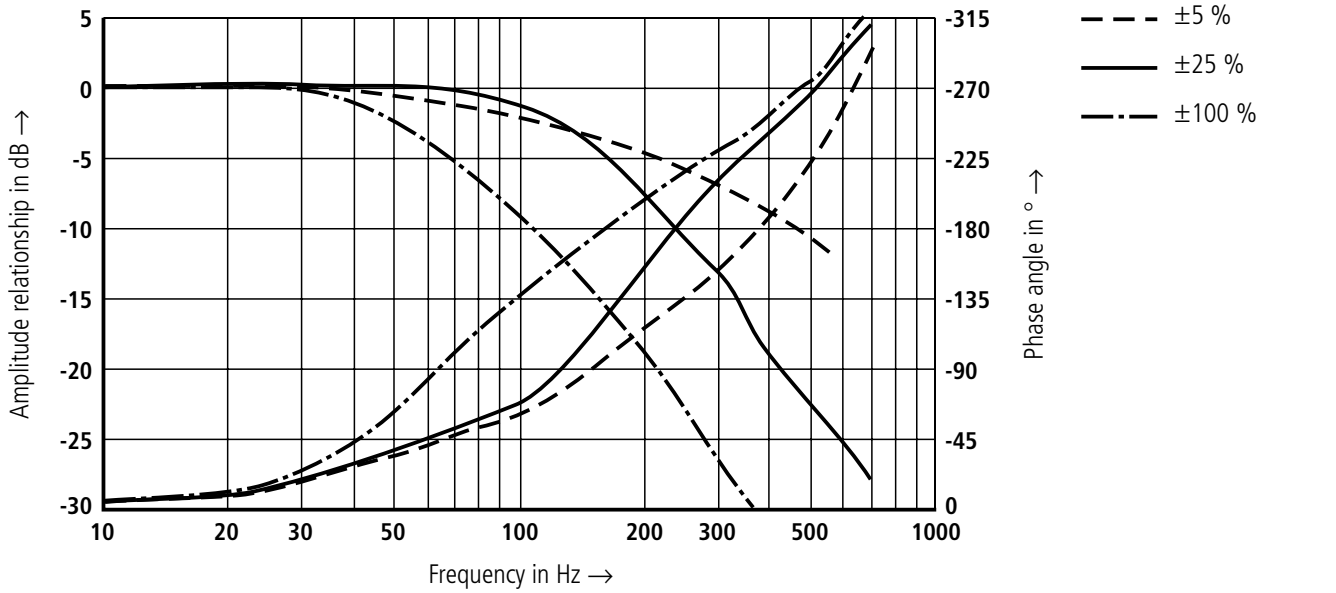
2WRCE 50 ...-2X/S



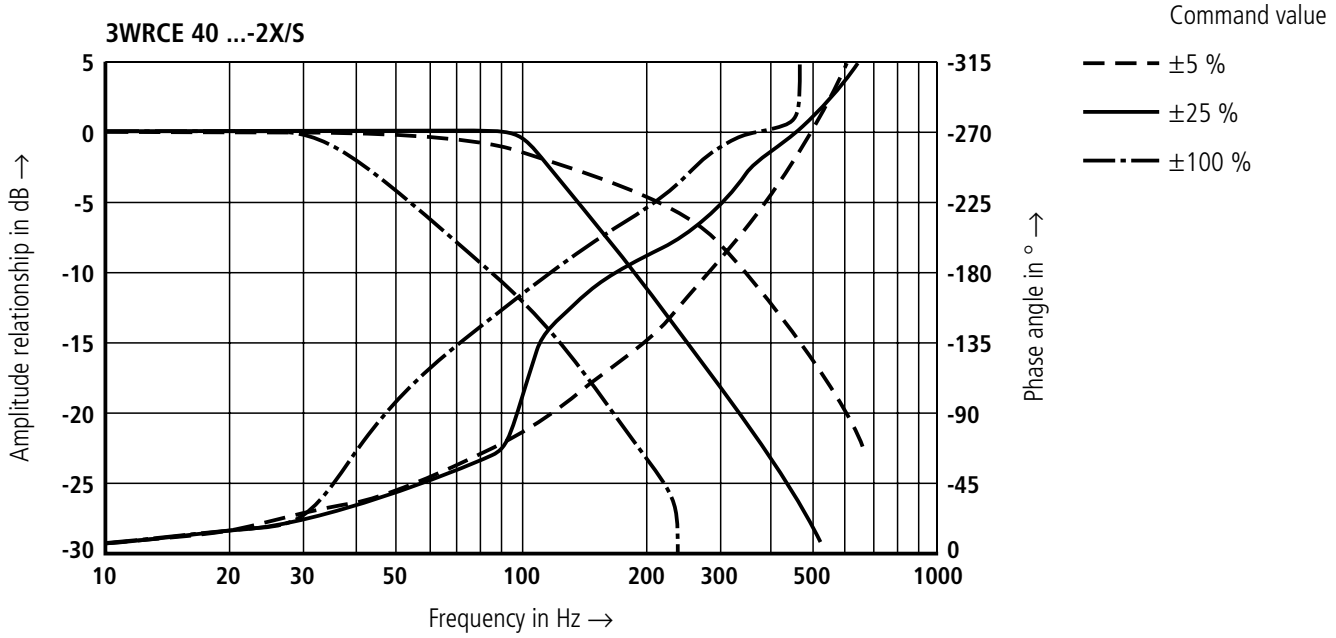
Characteristic curves (measured with HLP32, ϑ_{oil} = 40 °C ± 5 °C)

Frequency response at p_p = 315 bar

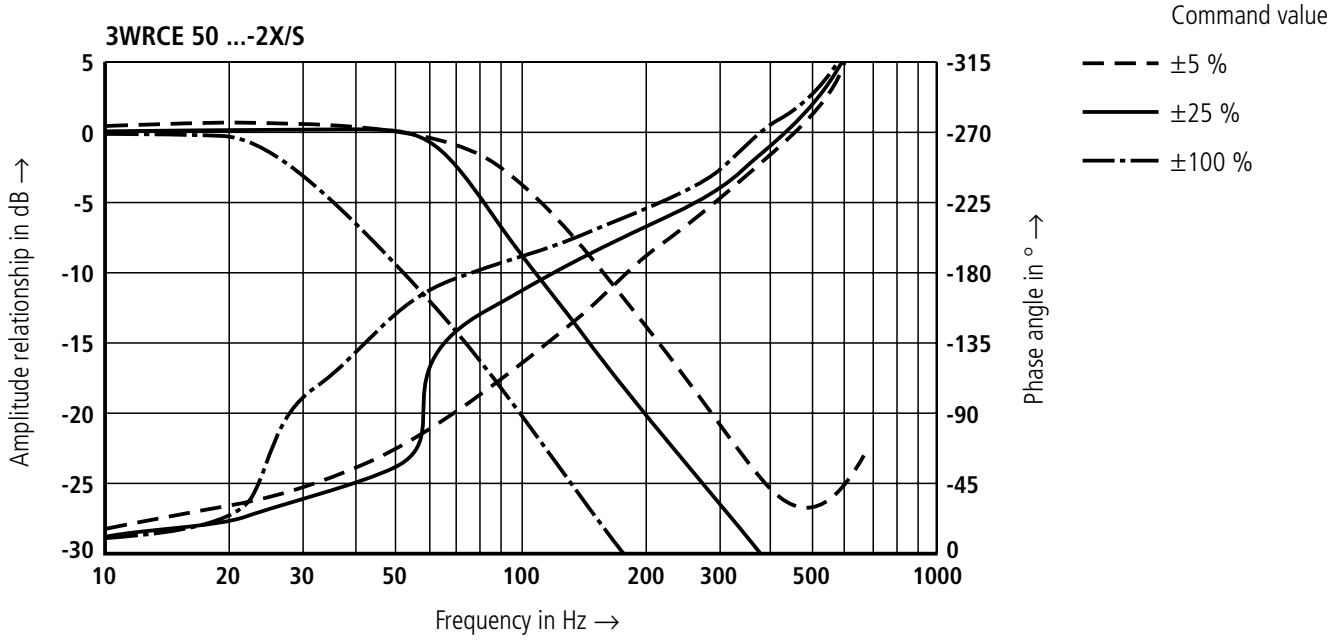
3WRCE 32 ...-2X/S



3WRCE 40 ...-2X/S



3WRCE 50 ...-2X/S



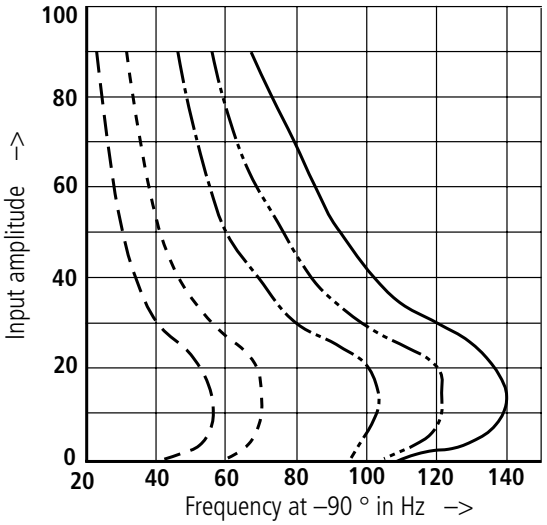
Characteristic curves (measured with HLP32, ϑ_{oil} = 40 °C ± 5 °C)

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

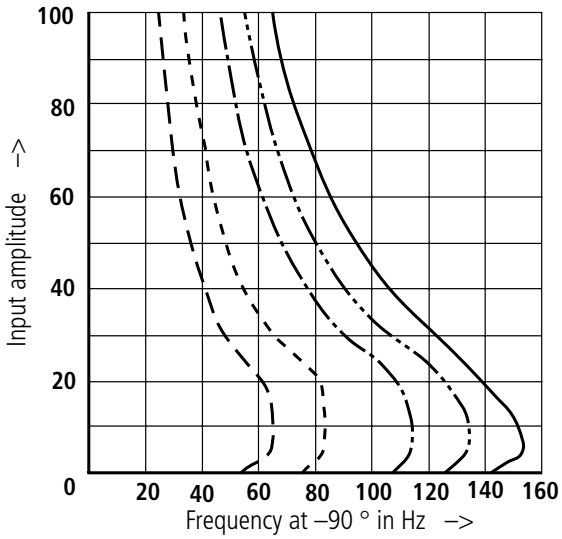
– – – p_{st} = 40 bar –·–·– p_{st} = 140 bar ——— p_{st} = 315 bar

– – – · p_{st} = 70 bar —·—·— p_{st} = 210 bar

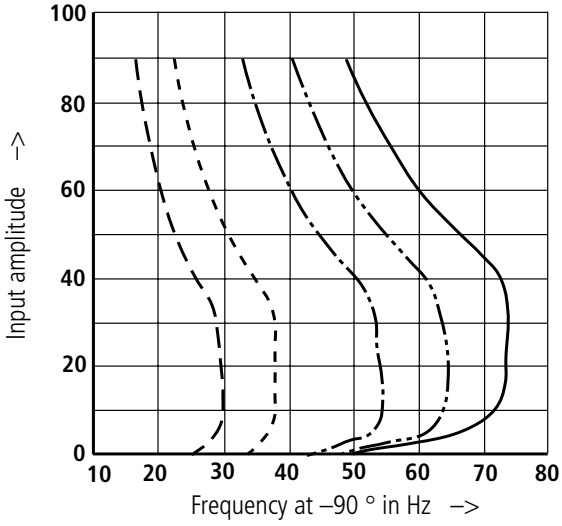
2WRCE 32-2X/S



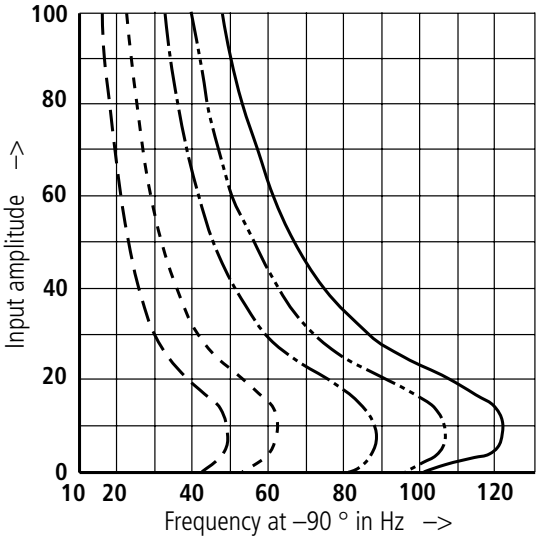
3WRCE 32-2X/S



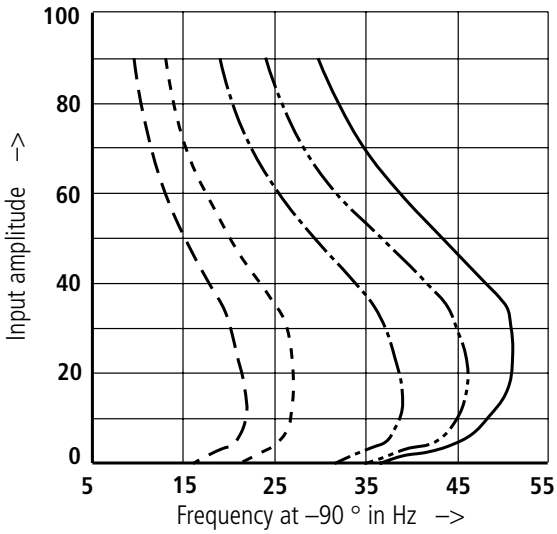
2WRCE 40-2X/S



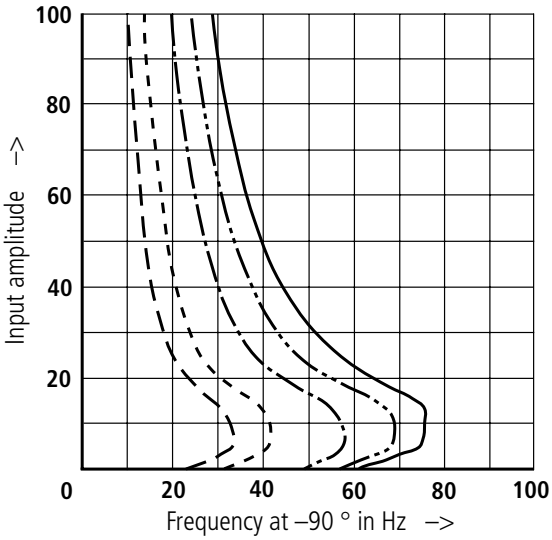
3WRCE 40-2X/S



2WRCE 50-2X/S

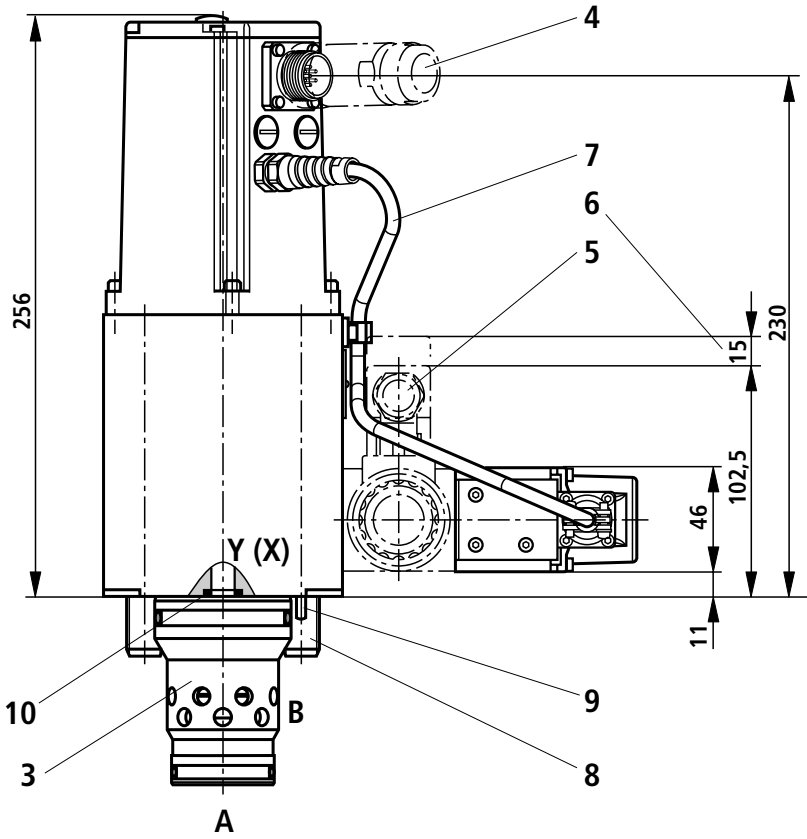


3WRCE 50-2X/S



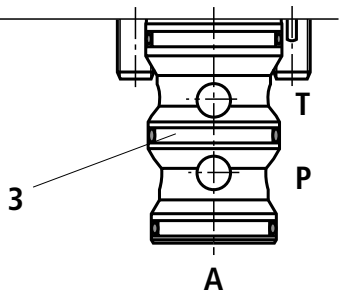
Unit dimensions: 2WRCE and 3WRCE, NS 32 (dimensions in mm)

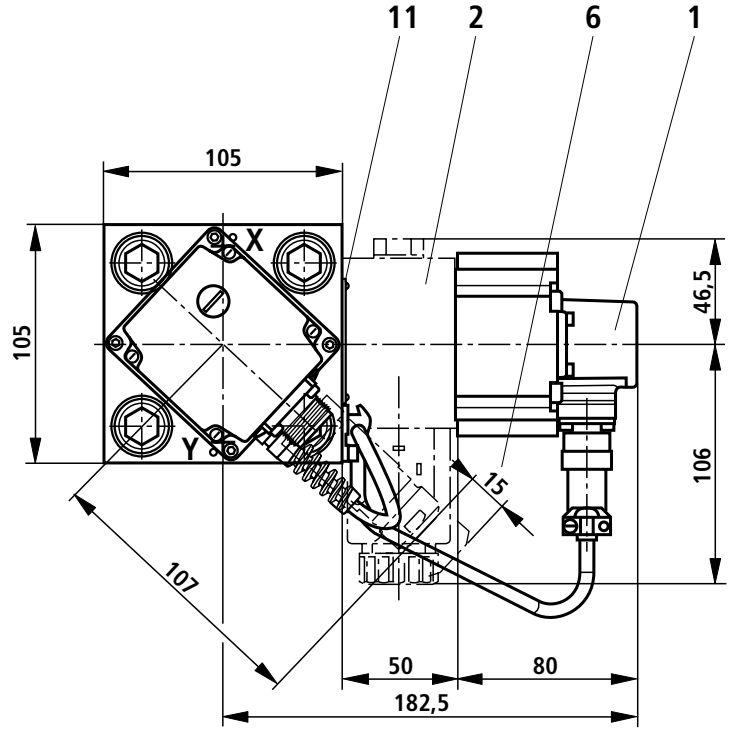
2WRCE 32



3WRCE 32...

(any missing dim. as type 2WRCE 32...)





1 Pilot control valve (servo valve NS 6)

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

3 Bush

4 Plug-in connector to E DIN 43 563-BF6-2/Pg11 (separate order, see page 11)

5 Plug-in connector to DIN EN 175 301-803 (separate order, see page 11)

6 Space required to remove the plug-in connector

7 Wiring

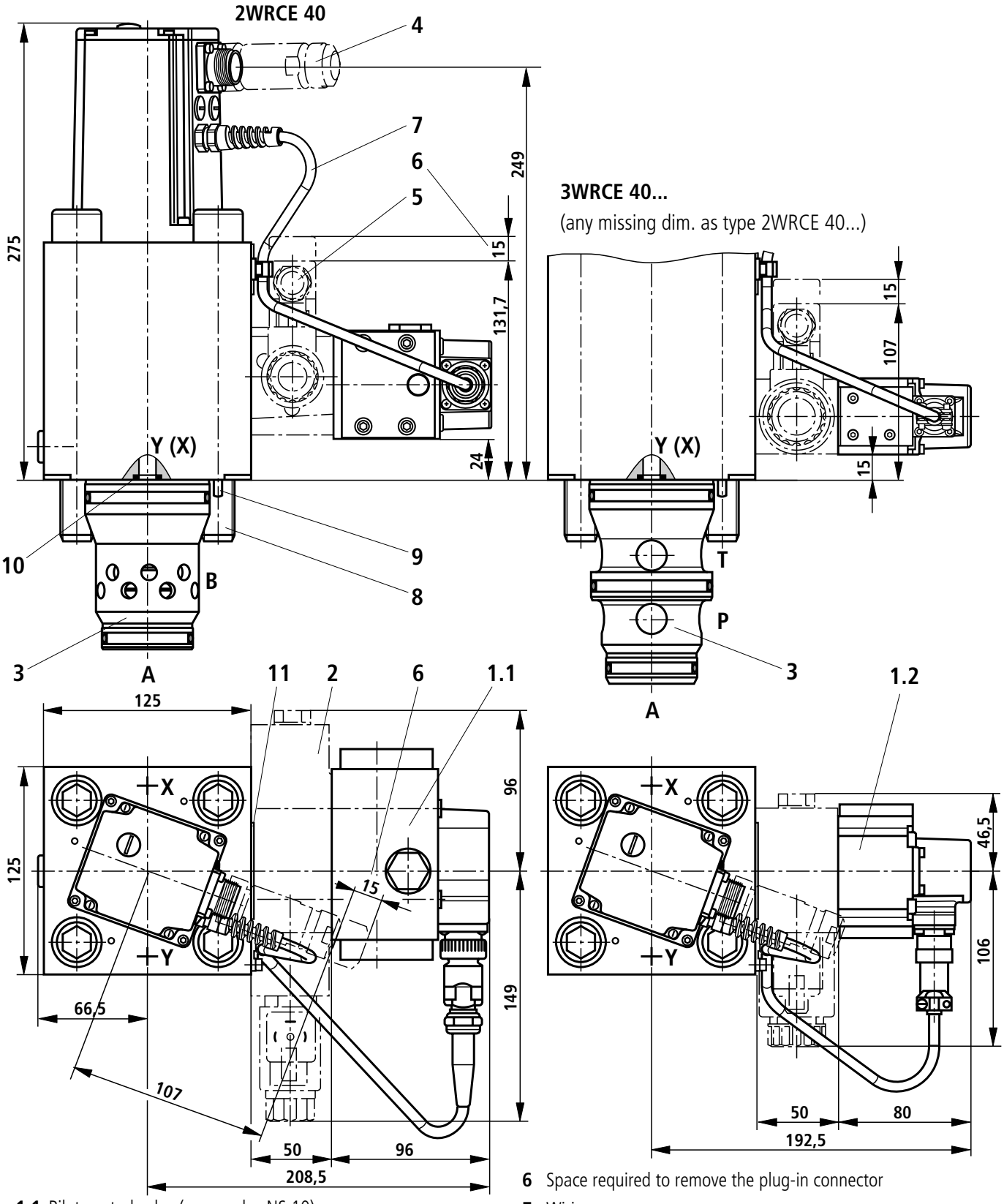
8 Valve fixing screws (are included within the scope of supply) 4 off M16 x 100-10.9 DIN 912; Tightening torque for a tightening factor of 1.6 : 280 Nm (display or signaling type of torque wrench)

9 Locating pin

10 Identical seal rings for ports X and Y (R-rings 9.81 x 1.5 x 1.78 or O-rings 9.25 x 1. 78)

11 Name plate

Unit dimensions: 2WRCE and 3WRCE, NS 40 (dimensions in mm)



1.1 Pilot control valve (servo valve NS 10)

1.2 Pilot control valve (servo valve NS 6)

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

3 Bush

4 Plug-in connector to E DIN 43 563-BF6-2/Pg11 (separate order, see page 11)

5 Plug-in connector to DIN EN 175301-803 (separate Border, see page 11)

6 Space required to remove the plug-in connector

7 Wiring

8 Valve fixing screws (are included within the scope of supply) 4 off M20 x 180-10.9 DIN 912; Tightening factor 1.6 : 560 Nm (display or signaling type of torque wrench)

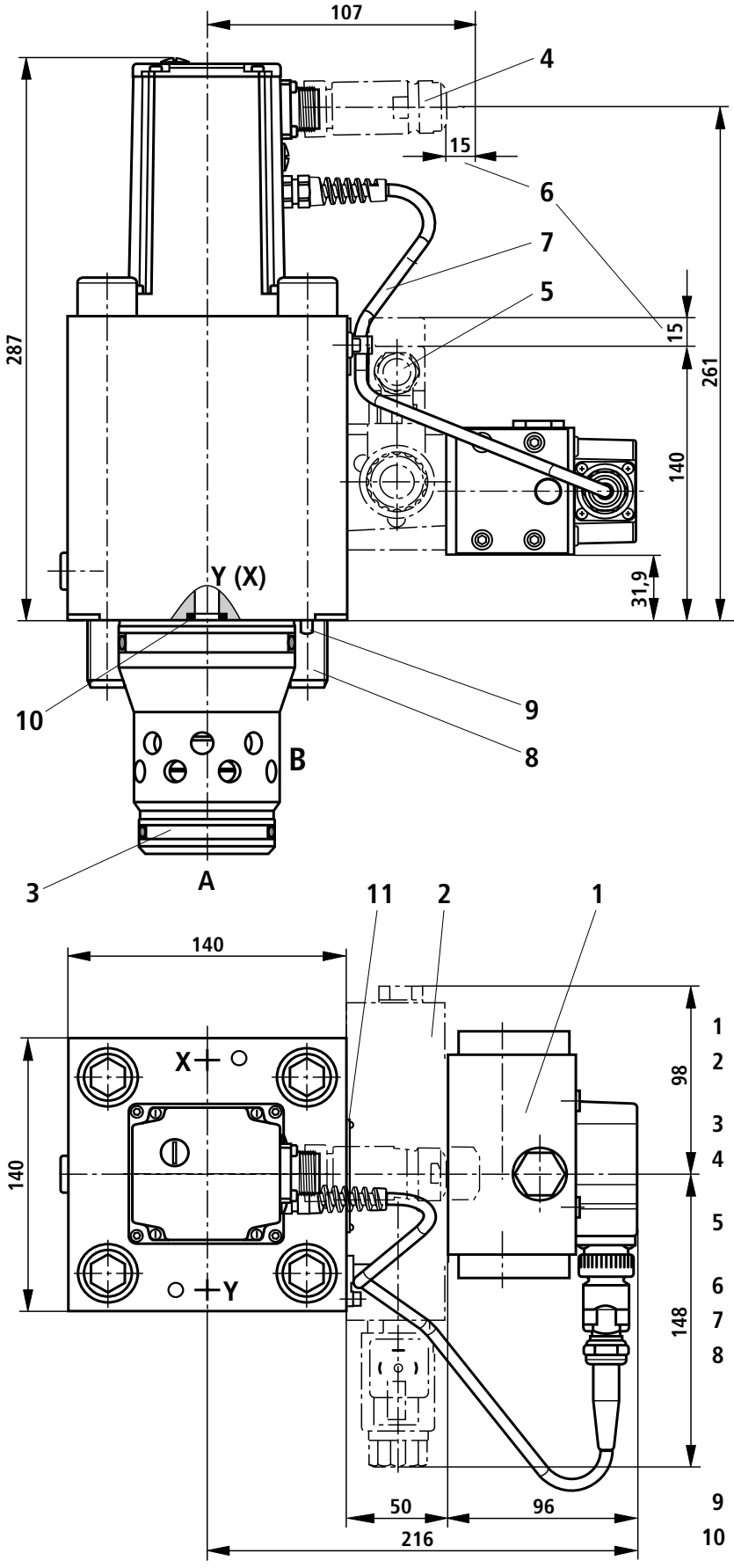
9 Locating pin

10 Identical seal rings for ports X and Y (R-rings 13 x 1.6 x 2 or O-rings 12 x 2)

11 Name plate

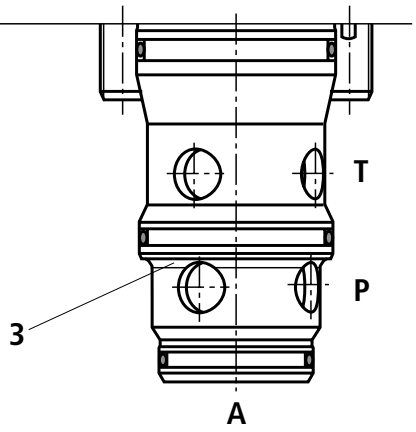
Unit dimensions: 2WRCE and 3WRCE, NS 50 (dimensions in mm)

2WRCE 50



3WRCE 50...

(any missing dim. as type 2WRCE 50...)



1 Pilot control valve (servo valve NS 10)

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

3 Bush

4 Plug-in connector to E DIN 43 563-BF6-2/Pg11 (separate order, see page 11)

5 Plug-in connector to DIN EN 175301-803 (separate order, see page 11)

6 Space required to remove the plug-in connector

7 Wiring

8 Valve fixing screws (are included within the scope of supply) 4 off M20 x 190-10.9 DIN 912; Tightening torque for a tightening factor of 1.6 : 560 Nm (display or signaling type of torque wrench)

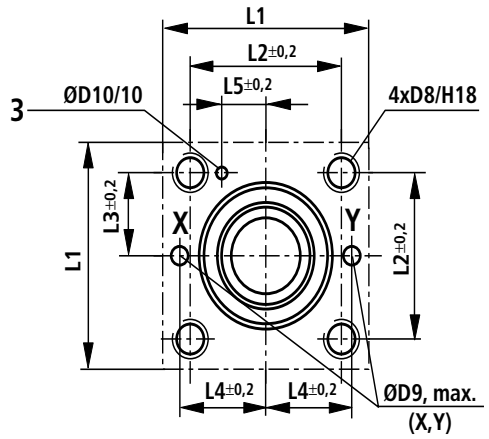
9 Locating pin

10 Identical seal rings for ports X and Y (R-rings 13 x 1.6 x 2 or O-rings 12 x 2)

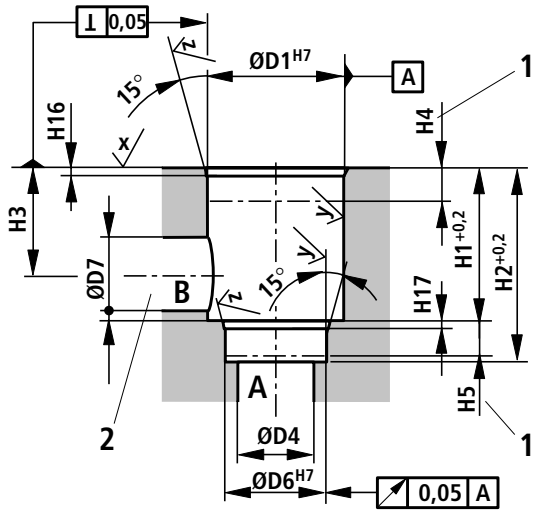
11 Name plate

Cavity to DIN ISO 7368 (dimensions in mm)

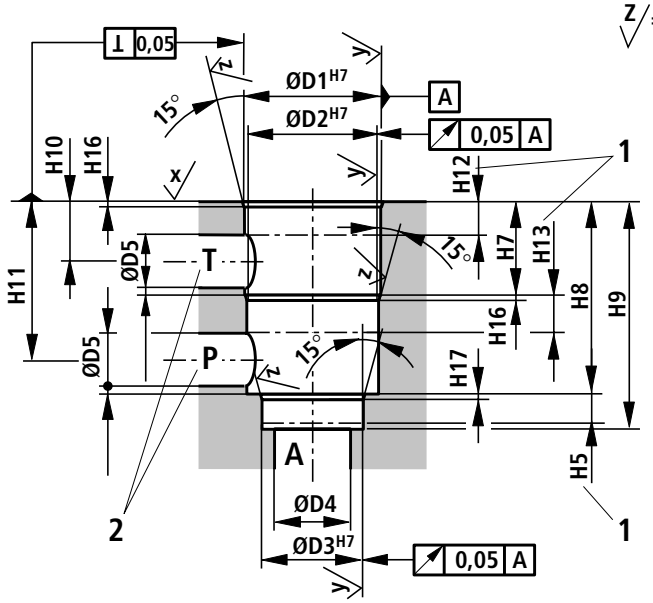
NS 32 … 50



Cavity for type 2 WRCE to DIN ISO 7368



Cavity for type 3 WRCE



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

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

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

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

1 Depth of fit, minimum dimension

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

General tolerances DIN ISO 2768 mK,
Tolerances to DIN 7167

Notes

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