Rexroth
Bosch Group

2- and 3-way high response cartridge valves

RE 29135/10.05 1/20
Replaces: 05.03

Types .WRC…/S; .WRCE…/S

Type 2WRCE…-1X/S

Type 3WRCE…-1X/S

Nominal sizes 63 to 160
Component series 1X
Maximum operating pressure 420 bar
Maximum flow 50000 L/min

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Features

- High response control valve of cartridge design
- Controlled by means of a servo directional valve
- Feedback of the control spool position by means of an inductive positional transducer
- 2-way control element of poppet design
- 3-way control element of spool design
- Typical applications,
  Open or closed loop control of large flows, e.g.:
  • Forging manipulators
  • Press cylinders
  • Pressure casting machines
- Control electronics:
  Integrated or to component type separate order,
  see page 11

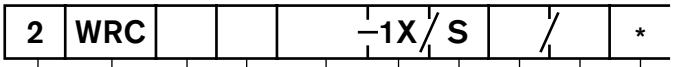
[1)] Not for new applications!

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

For further information regarding pilot operated valves and external control electronics see:

- Servo directional valves NS6 RE 29564
- Servo directional valves NS10 RE 29583
- Servo directional valves NS16 RE 29591
- Amplifier type VT-SR… RE 29931

Ordering details: type 2WRC(E)



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

Electrically operated high response cartridge valve **= WRC**

For external control electronics **= No code**
With integrated electonics (OBE) **= E**

Nominal size 63 **= 63**
Nominal size 80 **= 80**
Nominal size 100 **= 100**
Nominal size 125 **= 125**
Nominal size 160 **= 160**

Designation of the spool characteristic curves
2-way function
Spool with:
– Standard poppet seat (linear) **= K001**
– Dual gain flow (linear fine control range) **= D001**
– Control window (progressive fine control range) **= S001**

Further details in clear text

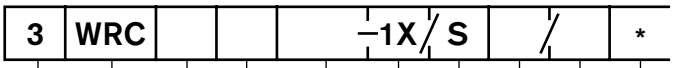
Seal material
M = NBR seal (suitable for mineral oil HL and HLP to DIN 51524)
V = FKM seals

Supply voltage
No code = For .WRC (external control electronics)
For .WRCE:
G24 = Supply voltage +24 VDC
G15 = Supply voltage +15 VDC

Pilot valve
S = Servo directional valve

1X = Component series 10 to 19 (10 to 19 unchanged installation and connection dimensions)

Ordering details: type 3WRC(E) – Not for new applications!



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

Electrically operated high response control valve for manifold mounting **= WRC**

For external control electronics **= No code**
With integrated electronics (OBE) **= E**

Nominal size 63 **= 63**
Nominal size 80 **= 80**
Nominal size 100 **= 100**
Nominal size 125 **= 125**
Nominal size 160 **= 160**

Designation of the spool characteristic curves
3-way function
Spools with:
– 0 to 0.5% positive overlap (linear) **= L006**
– 0 to 0.5% negative overlap (linear fine control range) **= V001**
– 10% positive overlap (linear fine control range) **= E001**

Further details in clear text

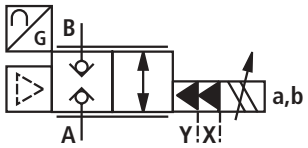
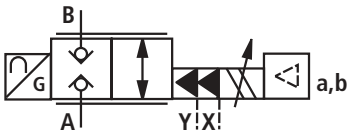
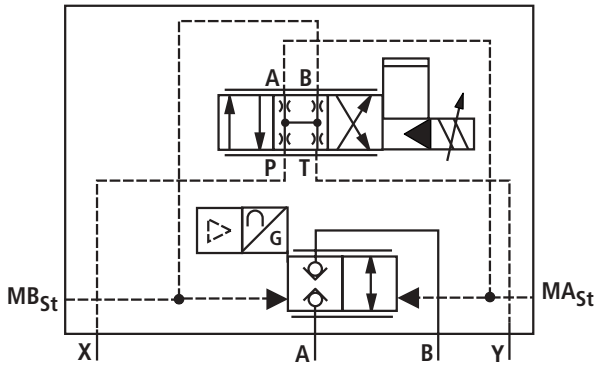
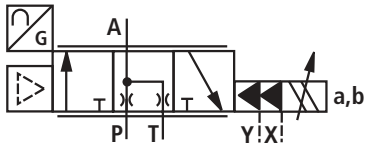
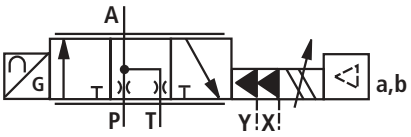
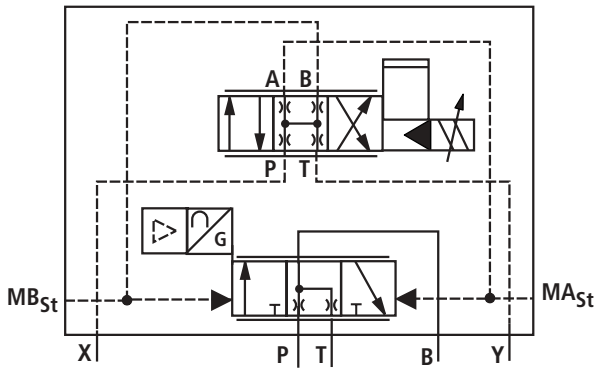
Seal material
M = NBR seals (suitable for mineral oil HL and HLP to DIN 51524)
V = FKM seals

Supply voltage
No code = For .WRC (external control electronics)
For .WRCE:
G24 = Supply voltage +24 VDC
G15 = Supply voltage +15 VDC

Pilot valve
S = Servo directional valve

1X = Component series 10 to 19 (10 to 19 unchanged installation and connection dimensions)

Symbols

Simplified: main stage with pilot control valve	Detailed: main stage with pilot control valve
2-way function **2WRC** 	
2WRCE – with integrated electronics (OBE) 	**2WRCE** – with integrated electronics (OBE) 
3-way function (spool overlap L and V) **3WRC** 	
3WRCE – with integrated electronics (OBE) 	**3WRCE** – with integrated electronics (OBE) 

Design, function and section: type 2WRC(E)

The valve types 2WRC(E) are 3-stage high response valves.

They control the rate and direction of a flow and are primarily used in closed loop control circuits.

Design

They comprise of the following sub-assemblies:

- A pilot control valve (1) as a 2-stage servo directional valve (pilot)
  - With a dry torque motor
  - Low friction jet / flapper amplifier and
  - Mechanical feedback of the spool position
- A main control spool (2) for flow control
- An inductive position transducer (3) whose core (4) is attached to the spool (2) of the third stage
- And integrated control electronics (5) for 2WRCE or separate electronics for the 2WRC version.

Function

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

The pilot control valve asumes a proportional control position and controls the flows into or from control chambers A (6) and B (7), that actuate the main spool (2) by means of the closed loop control valve 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 herethat the flow also depends on the valve pressure drop.

Valve features

Flow can be passed through the valve from A to B or from B to A.

The poppet spool closes or opens with a command value of approx. 2 %. With smaller command values the valve's closed loop control circuit trys to correct the spool position and thereby presses the spool, with up to the full system pressure, onto its seat and closes the connection leak-free.

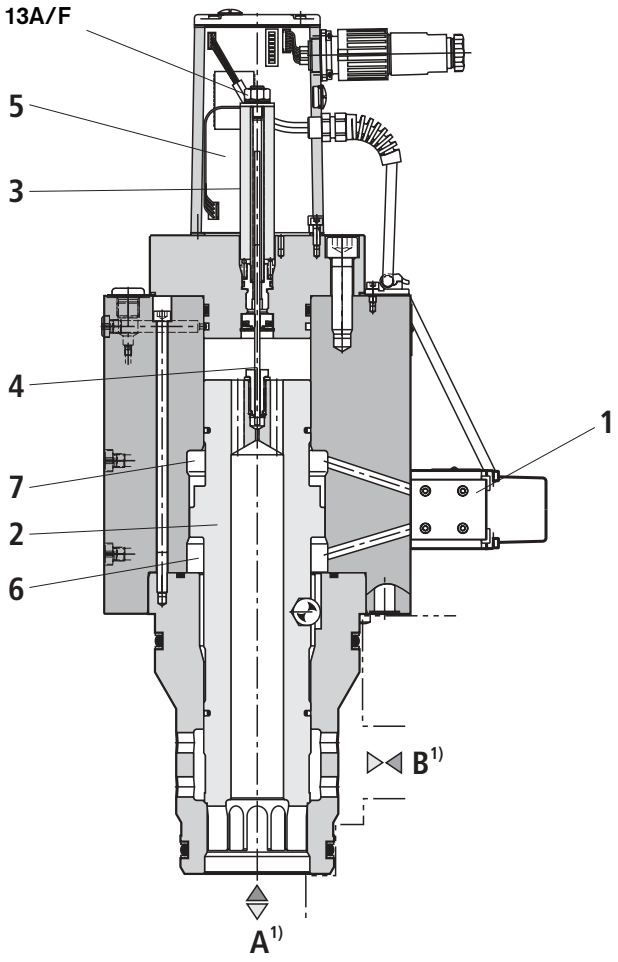
The stated switching times are only valid for the closed loop control range of the valve. With command value jumps from the seat to small opening values, additional delay times occur.

The 2 % opening point (= 0.2 V) is factory pre-set. When replacing the pilot control valve or control electronics the opening point can be calibrated by adjusting the position transducer (3) by using the 13A/F nut.

When carrying out an exchange **no** adjustments to the control electronics and pilot control valve (= closed loop controller, controller or control electronics), other than the zero calibration at the position controller may be carried out.

Only the filter element can be replaced on the pilot control valve (see data sheet „Servo directional valve")

Due to the diameter differences in the seat area, the spools are not pressure balanced. To compensate for the force differences for spool „K001" 6 %, and for spools „D001" and „S001" 22 % of the system pressure is required as the control pressure, and then by adding reserves for flow forces and dynamics, the recommended minimum control pressure can be obtained (see technical data).



⚠ **Attention:** A loss of power at the pilot control valve results in the spool being in an undefined position (2). For preventive measures see RE 29135-1 „Preferred settings on the 2WRCE"

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

Design, function and section: type 3WRC(E) [1)]

The valve types 3WRC(E) are 3-stage 3-way high response valves.

They control the rate and direction of a flow and are primarily used in closed loop control circuits.

Design

They comprise of the following sub-assemblies:

- A pilot control valve (1) as a 2-stage servo directional valve (pilot)
  - With a dry torque motor
  - Low friction jet / flapper amplifier and
  - Mechanical feedback of the spool position
- A main control spool (2) for flow control
- An inductive position transducer (3) whose core (4) is attached to the spool (2) of the third stage
- And integrated control electronics (5) for 3WRCE or separate electronics for the 3WRC version.

Function

Within the integrated or external electronics, the command and actual values are compared, and accordingly the associated control deviation controls, the pilot valve torque motor via a proportional current.

The pilot control valve assumes a proprtional control position and controls the pilot control flows in/out of the control chambers A (6) and B (7), that controls the main spool (2) via the closed loop circuit until the control deviation is 0.

The stroke of the main spool is thereby closed loop controlled in proportion to the command value. It has, however to be taken into account that the flow is also dependent on the pressure drop.

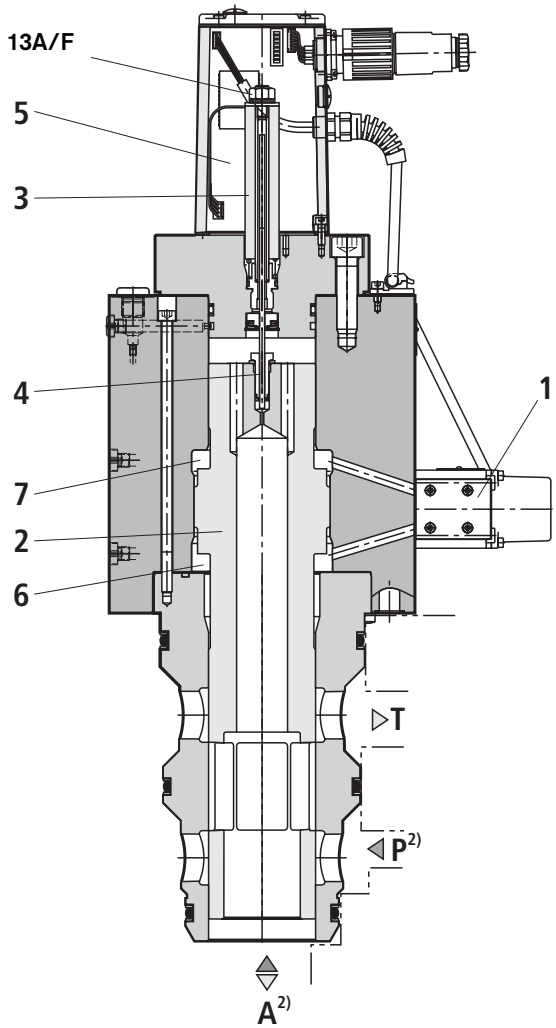
⚠ **Attention:** A loss of power at the pilot control valve results in the spool being in an undefined position (2). for preventative measures see RE 29135-1 „Preferred setting on the 3WRCE“

Valve features

The 0 % opening point (L006 and V001 spools) is factory pre-set. When replacing the pilot control valve or the control electronics the opening point can be calibrated by adjusting the position transducer (3) by using the 13A/F nut.

When carrying out an exchange **no** adjustments to the control electronics and pilot control valve (= closed loop controller, controller or control electronics) may be carried out other than the zero calibration at the position controller.

Only the filter element can be replaced on the pilot control valve (see data sheet „Servo directional valves“).



1) Not for new applications!

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

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

General

Nominal size	NS	**63**	**80**	**100**	**125**	**160**
Weight	kg	56	114	198	357	635
Pilot control valve nominal size (pilot)	NS	6	10	10	16	16
Installation; commissioning guidelines		Optional, preferably horizontal; to data sheet RE 07700				
Storage temperature range		–20 to +80				
Ambient temperature range	°C	–20 to +60 for WRCE –20 to +70 for WRC				

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

Nominal size	NS	**63**	**80**	**100**	**125**	**160**
Max. operating pressure						
– Main stage, ports A, B	bar	420				
– Pilot control valve, port X	bar	315				
– Pilot control valve, port Y	bar	Pressure peaks <100, static <10				
Min. control pressure in % of the system pressure						
– For spool „K001“	%	15				
– For spools „D001“ and „S001“	%	45				
Nominal flow q_{Vnom} –10 % at $\Delta p = 5$ bar						
– For spool „K001“	l/min	2600	4100	6300	10100	17000
– For spool „D001“	l/min	2300	3600	5800	9200	15000
– For spool „S001“	l/min	1800	3000	5200	7800	13300
Max. flow						
– For spools „K001“ and „D001“	l/min	5500	9000	14000	22000	35000
– For spool „S001“	l/min	8000	13000	20000	30000	50000
Switching time at 200 bar (315 bar)						
– Stroke 50%	ms	37(30)	32(25)	45(35)	50(40)	70(60)
– Stroke 100%	ms	70(60)	50(40)	75(60)	90(70)	120(100)
Pilot oil flow at X and Y with a stepped form of input signal from 0 to 100 % (315 bar)	l/min	42	135	165	320	430
Zero flow of the servo pilot stage in relationship to pressure in line X		$\sqrt{\frac{p_x}{70\ bar}} \cdot 0{,}5$	$\sqrt{\frac{p_x}{70\ bar}} \cdot 1{,}5$		$\sqrt{\frac{p_x}{70\ bar}} \cdot 3{,}5$	
Control flow	cm^3	36,3	67,9	132,5	313,4	565,5

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

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

Nominal size		NS	63	80	100	125	160
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		Class 18/16/13 [1]				
	– Main valve		Class 20/18/15 [1]				
Hysteresis		%	≤ 0.5				
Reversal error		%	≤ 0.2				
Response sensitivity		%	≤ 0.2				

Electrical

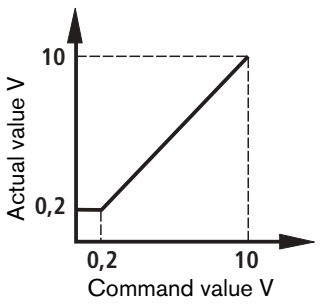
Voltage type			DC
Signal type			Analogue
Opening point calibration, see page 8		%	≤ 1
Zero point drift with a change in:			
	– Pressure fluid temperature	%/10 K	≤ 0.3
	– Control pressure in X	%/100 bar	≤ 0.7
	– Return pressure in Y 0 to 10 % from p_x	%/bar	≤ 0.3
Valve protection to EN 60529			IP65 with mounted and fixed plug-in connector

[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

Control electronics

Control electronics		
	– 2WRCE	Integrated in the valve, see page 11
	– 2WRC	External control electronics, see RE 29931

Nominal command value range for 2WRCE:
0 to +10 V ≙ 0 to 100 %
In the command value range 0 to 0.2 V
the actual value stays constant at 0.2 V.
With a slow command value change from 0.2 V to 10 V,
the actual value follows the command value within ± 0.1 V.
With command value jumps greater than 10 V, then the actual value can briefly reach valves of approx. 10.5 V.



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

General

Nominal size	NS	**63**	**80**	**100**	**125**	**160**
Weight	kg	57	116	200	360	640
Pilot control valve nominal size (pilot)	NS	6	10	10	16	16
Installation; commissioning guidelines		Optional, preferably horizontal; to data sheet RE 07700				
Storage temperature range		–20 to +80				
Ambient temperature range	°C	–20 to +60 to WRCE –20 to +70 to WRC				

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

Nominal size	NS	**63**	**80**	**100**	**125**	**160**
Max. operating pressure						
– Main stage, ports P, A, T	bar	315				
– Pilot control valve, port X	bar	315				
– Pilot control valve, port Y	bar	Pressure peaks <100, static <10				
Nominal flow q_{Vnom} +10 % at $\Delta p = 5$ bar						
– For spool „L006“	l/min	1200	1850	2800	4500	7300
– For spool „V001“	l/min	1250	1900	2700	4550	7350
– For spool „E001“	l/min	1180	1820	2750	4330	6900
Max. flow						
– For spool L…, V…, E…,	l/min	3500	5600	8500	13000	21000
Switching time at 200 bar (315 bar)						
– Stroke 50%	ms	20(17)	18(13)	25(20)	40(33)	50(40)
– Stroke 100%	ms	37(30)	32(25)	40(35)	55(47)	80(60)
Pilot oil flow at X and Y with a stepped form of input signal from 0 to 100 % (315 bar)	l/min	42	130	170	330	430
Zero flow of the servo pilot stage in relationship to pressure in line X		$\sqrt{\frac{p_x}{70\ bar}} \cdot 0{,}5$	$\sqrt{\frac{p_x}{70\ bar}} \cdot 1{,}5$		$\sqrt{\frac{p_x}{70\ bar}} \cdot 3{,}5$	
Control flow	cm^3	±18,1	±33,9	±66,2	±156,7	±282,7
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		Class 18/16/13 [2]				
Cleanliness class to ISO 4406 (c) – Main valve		Class 20/18/15 [2]				
Hysteresis	%	≤ 0.5				
Reversal error	%	≤ 0.2				
Response sensitivity	%	≤ 0.2				

[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 3WRC(E)[1] (for applications outside these parameters, please consult us!)

Electrical

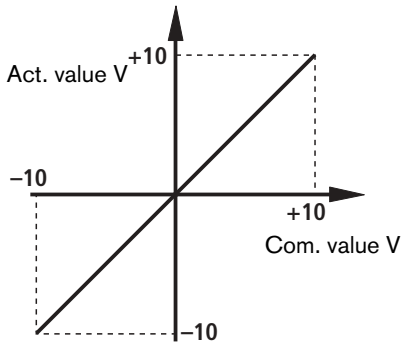
Voltage type		DC
Signal type		Analogue
Zero calibration	%	≤ 1
Zero point drift with change in:		
– Pressure fluid temperature	%/10 K	≤ 0.3
– Control pressure in X	%/100 bar	≤ 0.7
– Return pressure in Y 0 to 10 % from p_x	%/bar	≤ 0.3
Valve protection to EN 60529		IP65 with mounted and fixed plug-in connector

Control electronics

Control electronics	– 3WRCE	Integrated in the valve, see page 11
	– 3WRC	External control electronics, see RE 29931

[1] Not for new applications!

Nominal command value range for 3WRCE:
0 to ±10 V ≙ 0 to ± 100 %
With a slow command value change from 0 V to ± 10 V, the actual value follows the command value within ± 0.1 V.
With command value greater than ± 10 V, then the actual value can briefly reach values of approx. ± 10.5 V.



Electrical connections

The plug-in connectors are included within the scope of supply.

Component plug allocation with integrated electronics (OBE)

Component plug allocation	Pin	Allocation with a G24 supply voltage		Allocation with a G15 supply voltage	
		2WRCE	3WRCE	2WRCE	3WRCE
Supply voltage	A	+ 24 VDC		+ 15 VDC	
	B	0 VDC		– 15 VDC	
	C	Enable (+ 24 V) [2]		Reference to A, B	
Differential com. value input	D	0 ... + 10 V	0 ... ± 10 V	0 ... + 10 V	0 ... ± 10 V
	E	R_e = >100 kΩ	R_e = >100 kΩ	R_e = >100 kΩ	R_e = >100 kΩ
Actual valve	F	+ 0,2 ... + 10 V	0 ... ± 10 V	+ 0,2 ... + 10 V	0 ... ± 10 V
		Reference is pin B	Reference is pin B	Reference is pin C	Reference is pin C
Earth	PE	Connected with the valve housing		Connected with the valve housing	

[2] Without enable = SO37 (–37 attached to the type code)

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

Supply voltage: + 24 VDC ± 6 V; full bridge rectification with a smoothing capaciter 2200 µF; I_{max} = 230 mA
± 15 VDC ± 0,45 V; stabilised and smoothed; I_{max} = 180 mA

The command and actual values have the same polarity

D positive against E → main spool for the 2WRCE opens

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

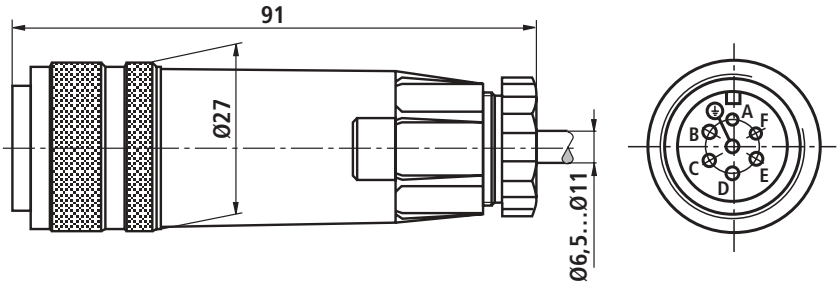
Note: Electrical signals generated via control electronics (e.g. actual valve) must not be used for switching safety-relevant machine functions!

(Also see the European Standard „Safety requirement for fluid power systems and components – Hydraulics“, EN 982!)

Electrical connection, plug-in connector for the integrated electronics or main stage of the external control electronics

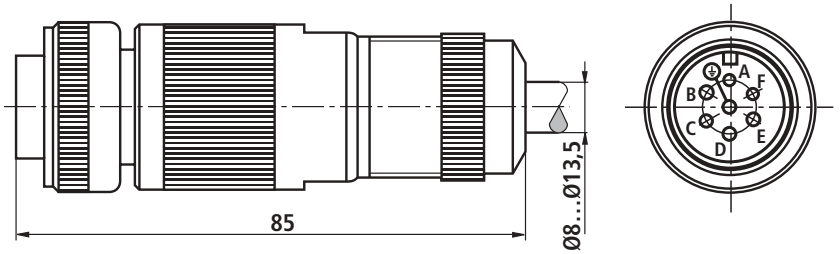
Plug-in connector (within the scope of supply)

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



Plug-in connector (separat order)

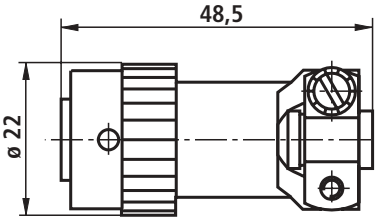
Plug-in connector to DIN EN 175201-804
Separate order under Material No. **R9000223890**
(metal version)



Plug-in connector for pilot control valve NS6 (NS63)

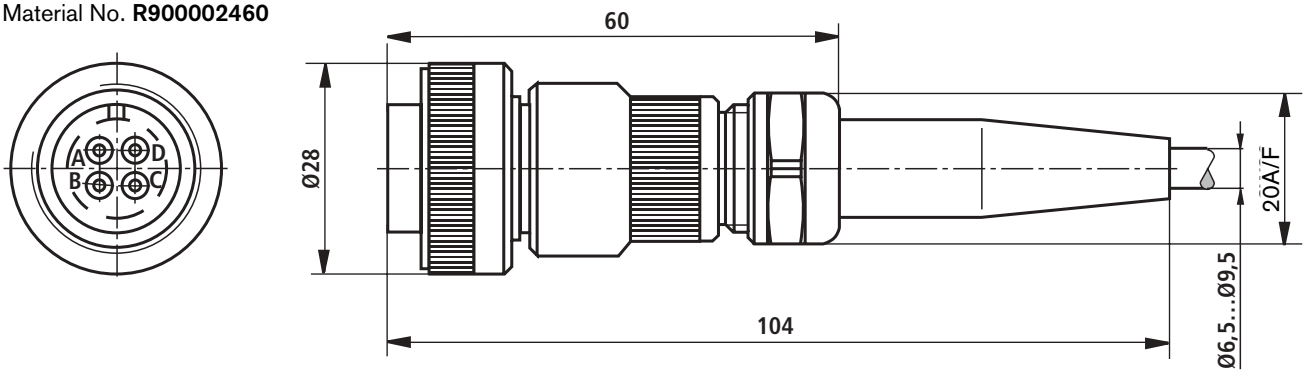
Plug-in connector to VG 95 328
Separate order under Material No. **R900005414**

Connection cable: 4 or 6 core, 0,75 mm^2, screened
(e.g. cable type LiYCY 4 or 6 x 0.75 mm^2),
to DIN VDE 0812
Outer diameter 5 to 8.5 mm



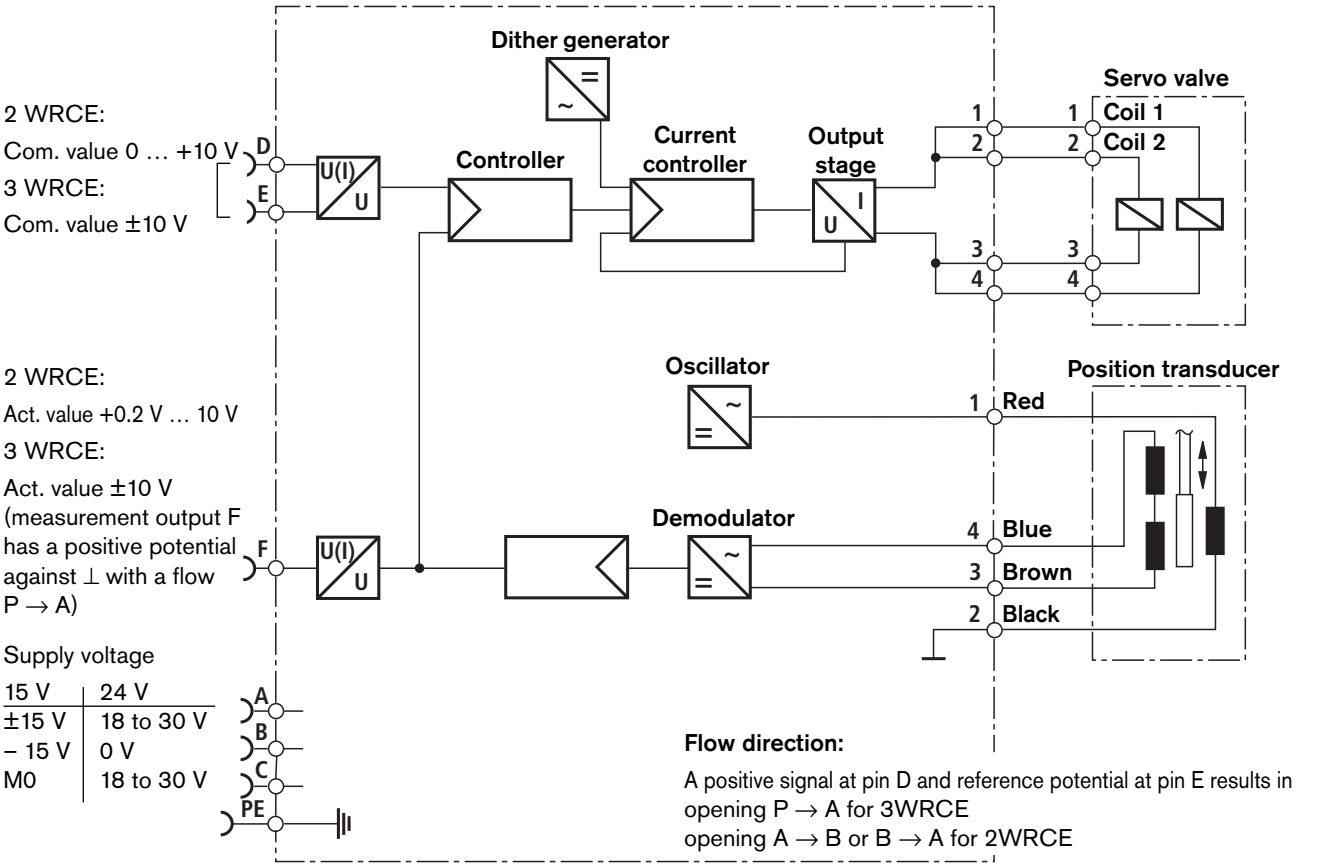
Plug-in connector for pilot control valves NS10 and 16 (NS80, 100, 125, 150)

Plug-in connector version **K8** (external control electronics)
to VG 095 342 – separate order under
Material No. **R900002460**



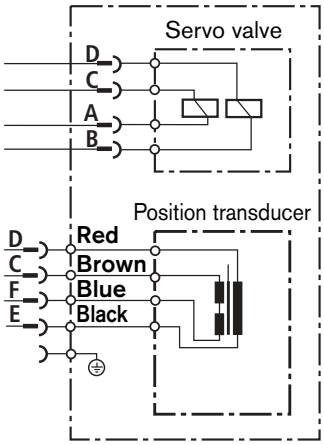
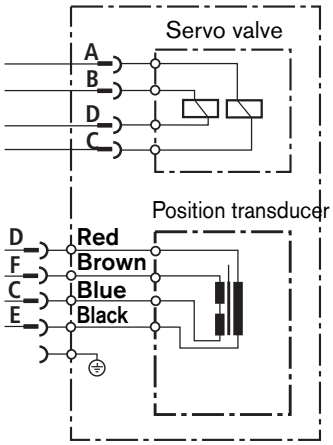
Integrated electronics (OBE) type VT13037 for valve type .WRCE

Block circuit diagram / pin allocation



External control electronics

Pin alloction

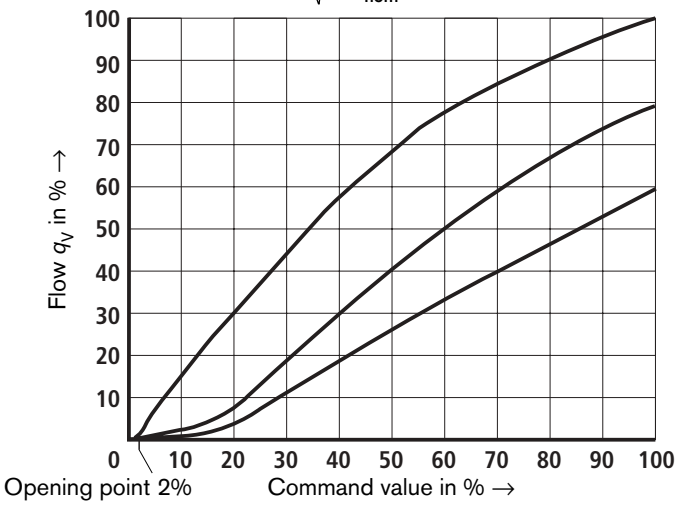
2WRC	3WRC
	

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

A $\Delta p = 5$ bar relates to a 100% flow value of the nominal flow of the associated table.

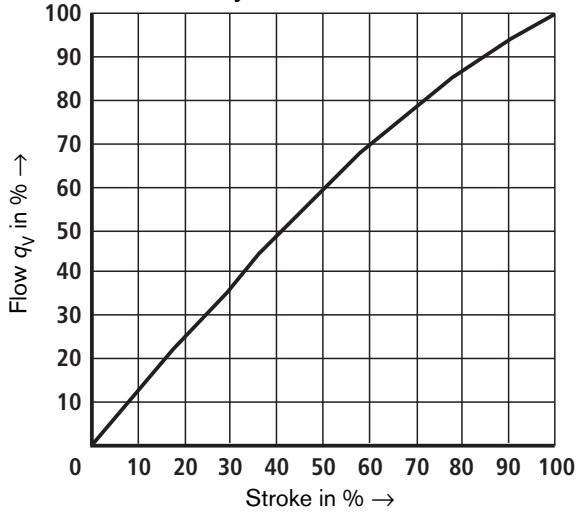
For other valve pressure differentials, the following applies: $q = q_{vnom} \cdot \sqrt{\frac{\Delta p}{\Delta p_{nom}}}$

Type 2 WRC…/…
(2/2-way function)

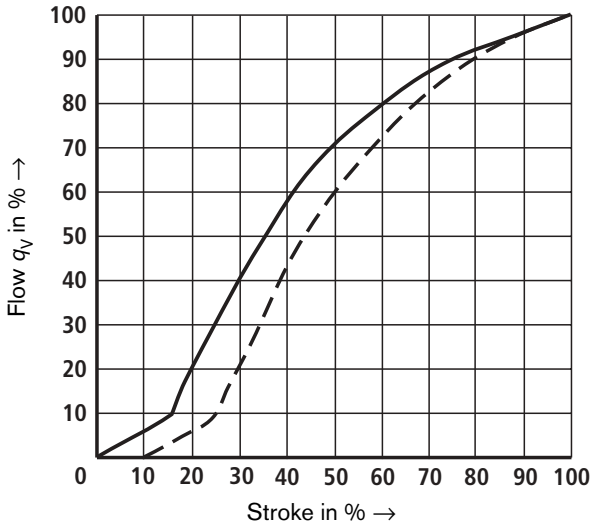


Version "K001"
(spool with standard poppet seat)
Version "D001"
(spool with dual gain flow)
Version "S001"
(spool with control window)

Type 3 WRC…/… (3/2-way function)

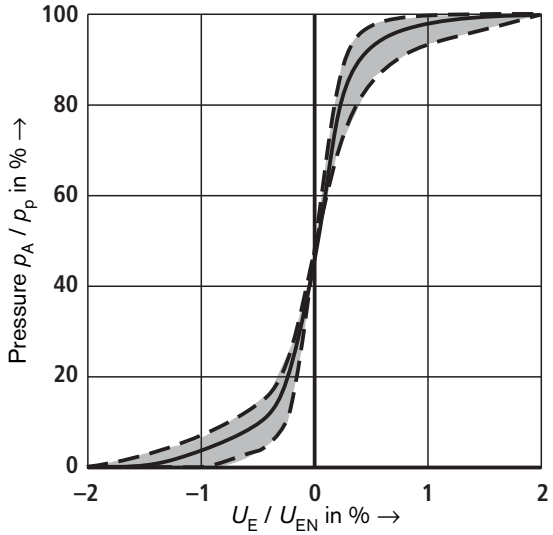


Version "L006"



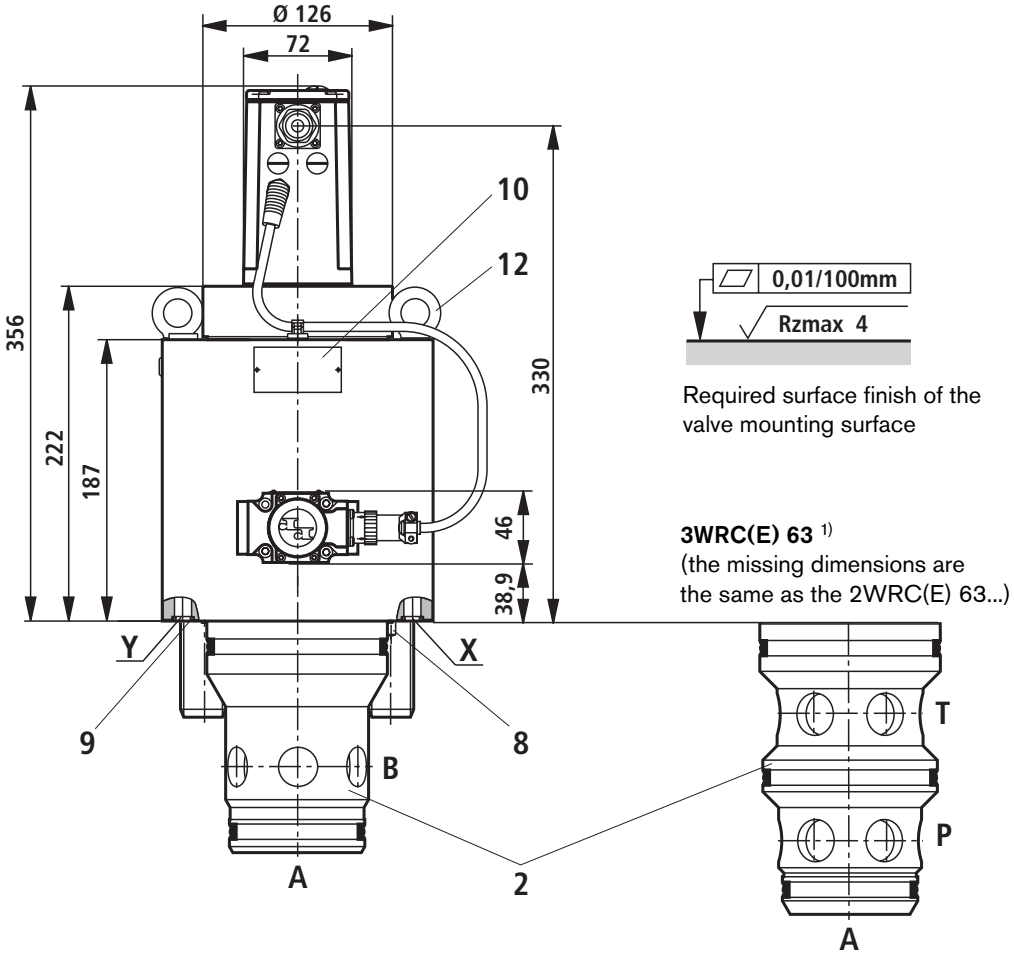
Version "V001"
Version "E001"

Pressure-signal function for 3WRC(E)…V and L…- limiting and average value characteristic curves



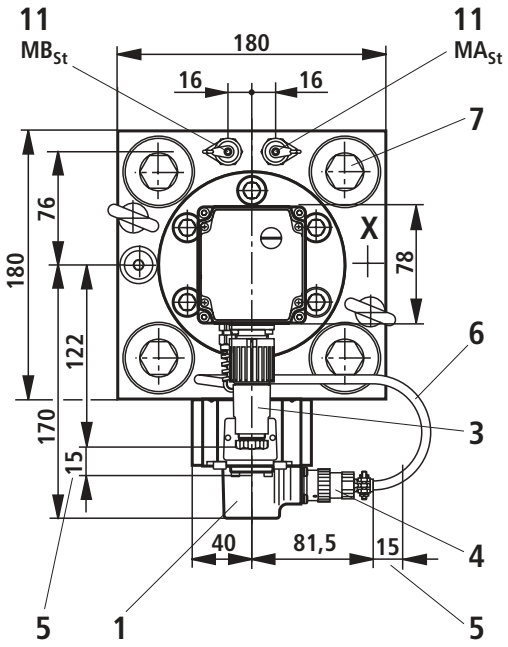
Unit dimensions: 2WRC(E) and 3WRC(E) [1], NS63 (nominal dimensions in mm)

2WRC(E) 63



Required surface finish of the valve mounting surface

3WRC(E) 63 [1]
(the missing dimensions are the same as the 2WRC(E) 63...)

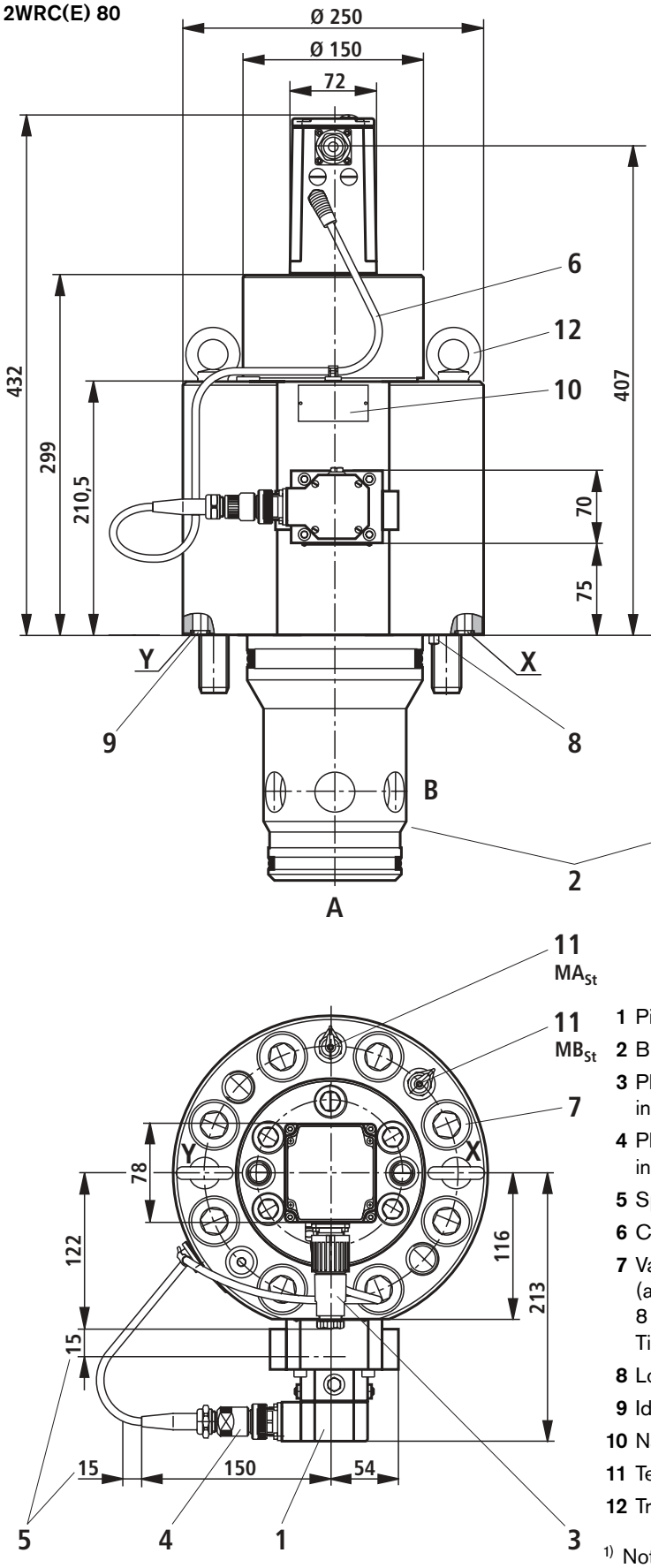


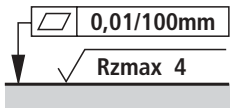
1 Pilot control valve (servo directional valve NS6)
2 Bush
3 Plug-in connector (Material No. **R900021267**) included within the scope of supply
4 Plug-in connector (Material No. **R900005414**) included within the scope of supply
5 Space required to remove the plug-in connector
6 Cabling (only for WRCE)
7 Valve fixing screws
(are included within the scope of supply)
4 S.H.C.S. ISO 4762 – M30 x 220-10.9;
Tightening torque for a tightening factor of 1.6 : 1900 Nm
8 Locating pin hole
9 Identical seal rings for ports X and Y
10 Name plate
11 Test points for control pressures, screwed coupling G1/4
12 Transport aid

[1] Not for new applications!

Unit dimensions: 2WRC(E) and 3WRC(E) [1], NS80 (nominal dimensions in mm)

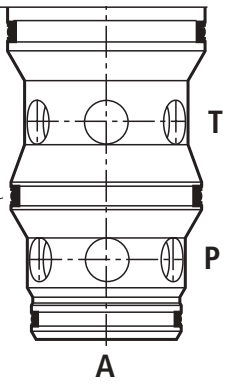
2WRC(E) 80





Required surface finish of the valve mounting surface

3WRC(E) 80 [1]
(the missing dimensions are the same as the 2WRC(E) 80...)

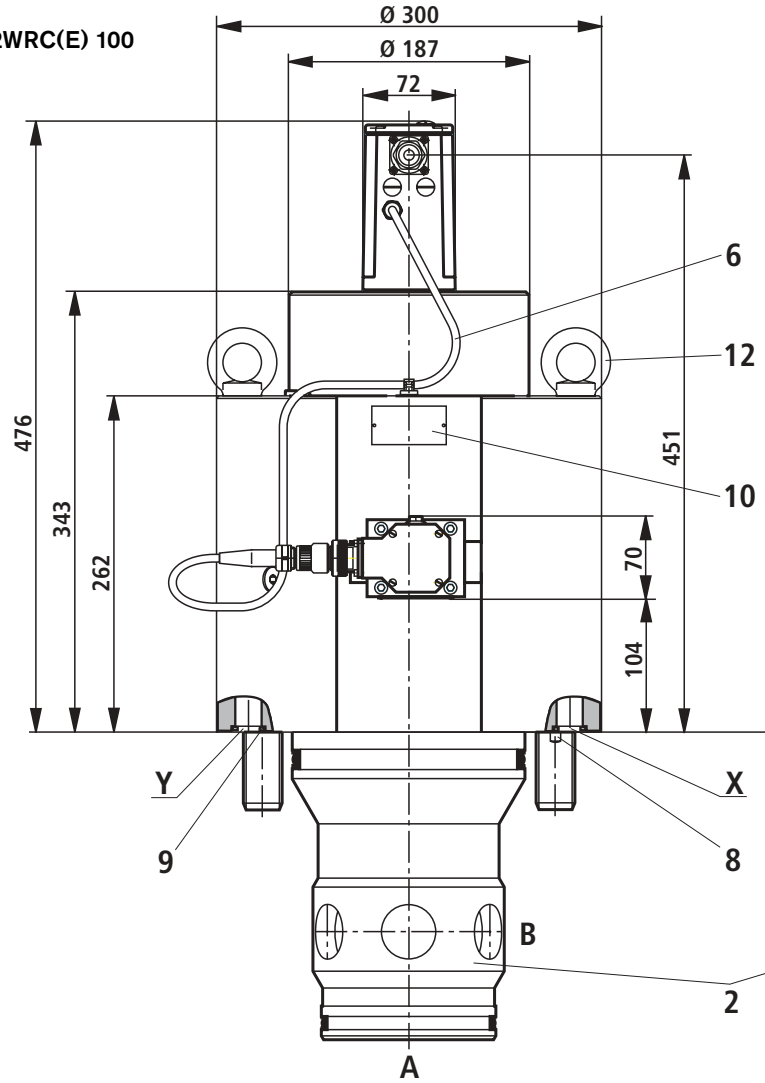


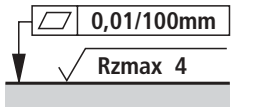
1 Pilot control valve (servo directional valve NS10)
2 Bush
3 Plug-in connector (Material No. **R900021267**) included within the scope of supply
4 Plug-in connector (Material No. **R900002460**) included within the scope of supply
5 Space required to remove the plug-in connector
6 Cabling (only for WRCE)
7 Valve fixing screws
(are included within the scope of supply)
8 S.H.C.S. ISO 4762 – M24 x 220-10.9;
Tightening torque for a tightening factor of 1.6 : 960 Nm
8 Locating pin hole
9 Identical seal rings for ports X and Y
10 Name plate
11 Test points for control pressure, G1/4 screwed coupling
12 Transport aid

[1] Not for new applications!

Unit dimensions: 2WRC(E) and 3WRC(E) [1], NS100 (nominal dimensions in mm)

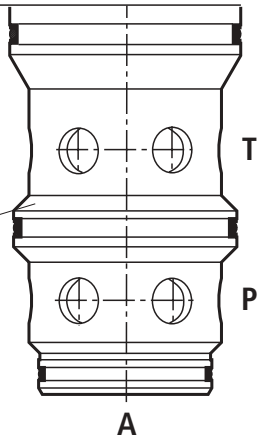
2WRC(E) 100

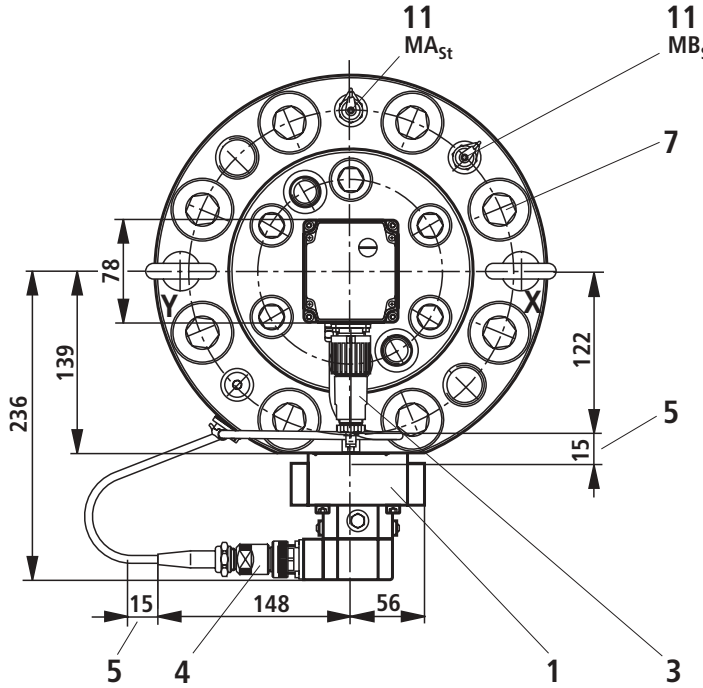




Required surface finish of the valve mounting surface

3WRC(E) 100 [1]
(the missing dimensions are the same as for 2WRC(E) 100...)



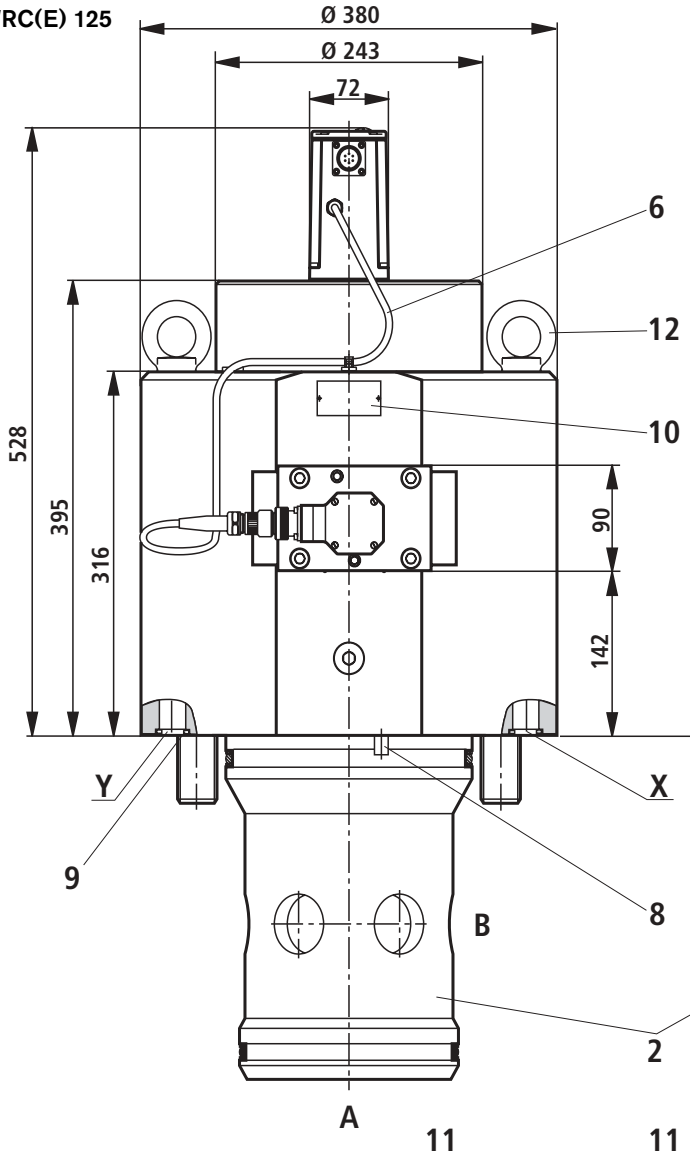


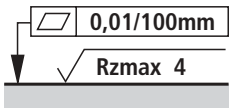
1 Pilot control valve (servo directional valve NS10)
2 Bush
3 Plug-in connector (Material No. **R900021267**) included within the scope of supply
4 Plug-in connector (Material No. **R900002460**) included within the scope of supply
5 Space required to remove the plug-in connector
6 Cabling (only for WRCE)
7 Valve fixing scews
(are included within the scope of supply)
8 S.H.C.S. ISO 4762 – M30 x 280-10.9;
Tightening torque for a tightening factor of 1.6 : 1900 Nm
8 Locating pin hole
9 Identical seal rings for ports X and Y
10 Name plate
11 Test points for control pressures, G1/4 screwed coupling
12 Transport aid

[1] Not for new applications!

Unit dimensions: 2WRC(E) and 3WRC(E) [1], NS125 (nominal dimensions in mm)

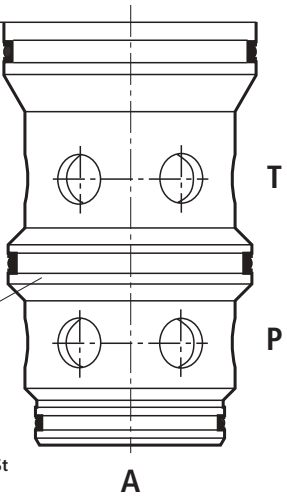
2WRC(E) 125

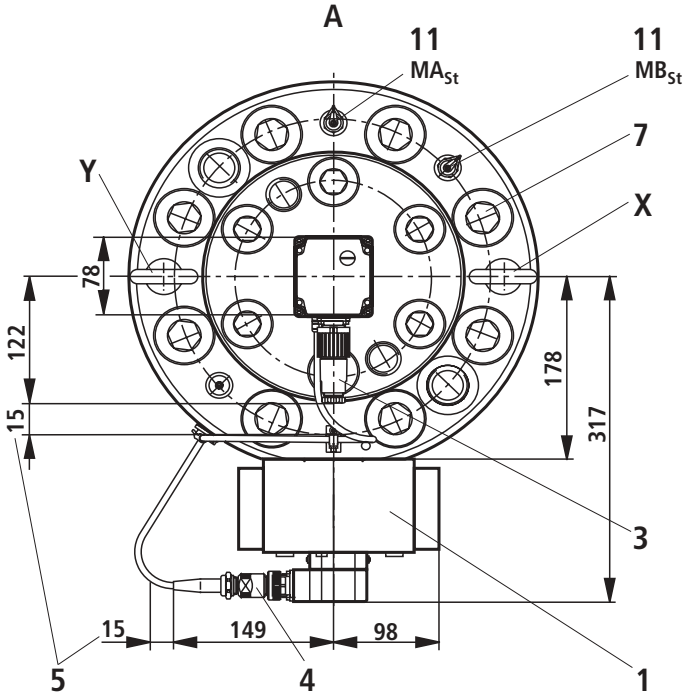




Required surface finish of the valve mounting surface

3WRC(E) 125 [1]
(the missing dimensions are the same as the 2WRC(E) 125...)

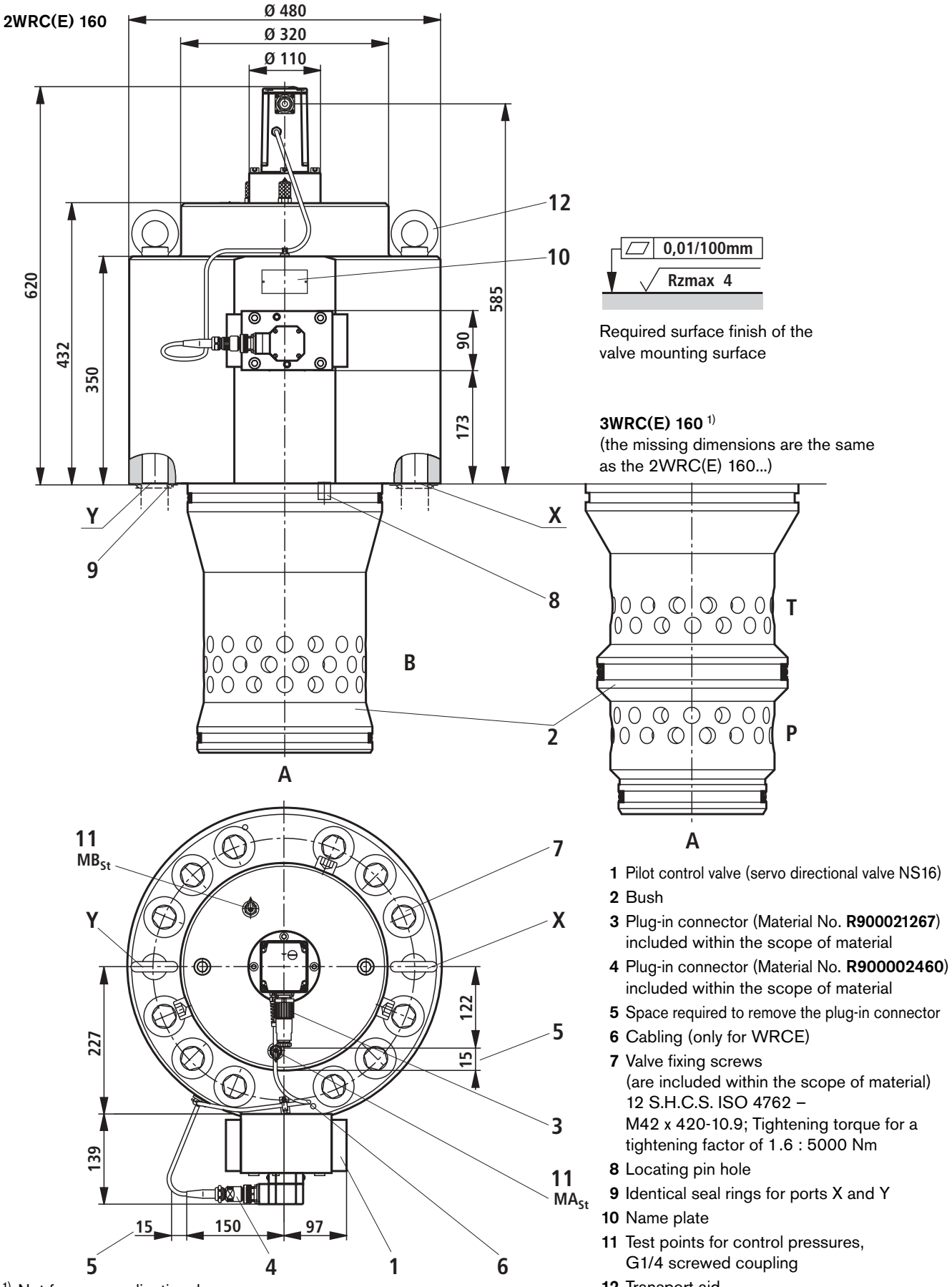




1 Pilot control valve (servo directional valve NS16)
2 Bush
3 Plug-in connector (Material No. **R900021267**) included within the scope of supply
4 Plug-in connector (Material No. **R900002460**) included within the scope of supply
5 Space required to remove the plug-in connector
6 Cabling (only for WRCE)
7 Valve fixing screws (are included within the scope of supply)
8 S.H.C.S. ISO 4762 – M36 x 300-10.9;
Tightening torque for a tightening factor of 1.6 : 3300 Nm
8 Locating pin hole
9 Identical seal rings for ports X and Y
10 Name plate
11 Test points for control pressures, G1/4 screwed coupling
12 Transport aid

[1] Not for new applications!

Unit dimensions: 2WRC(E) and 3WRC(E) [1], NS160 (nominal dimensions in mm)

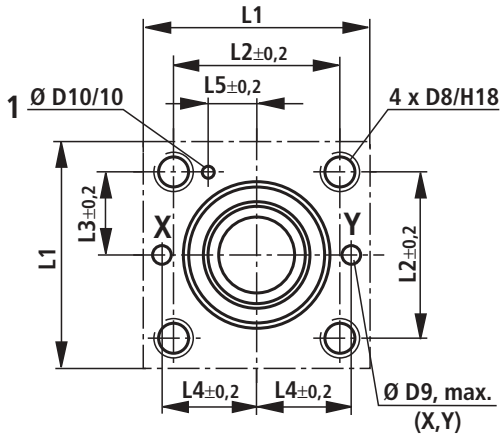


1) Not for new applications!

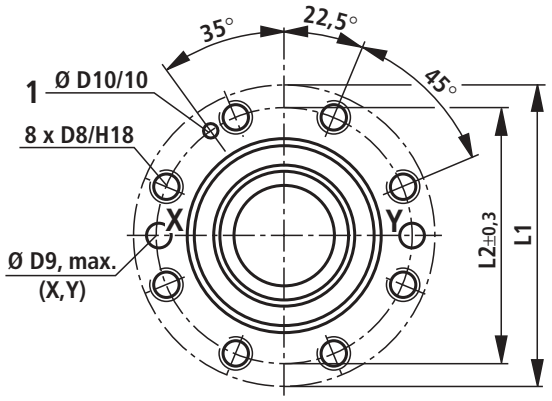
1 Pilot control valve (servo directional valve NS16)
2 Bush
3 Plug-in connector (Material No. **R900021267**) included within the scope of material
4 Plug-in connector (Material No. **R900002460**) included within the scope of material
5 Space required to remove the plug-in connector
6 Cabling (only for WRCE)
7 Valve fixing screws (are included within the scope of material) 12 S.H.C.S. ISO 4762 – M42 x 420-10.9; Tightening torque for a tightening factor of 1.6 : 5000 Nm
8 Locating pin hole
9 Identical seal rings for ports X and Y
10 Name plate
11 Test points for control pressures, G1/4 screwed coupling
12 Transport aid

Installation dimensions to DIN ISO 7368 – except for NS125 and 160 (nom. dimensions in mm)

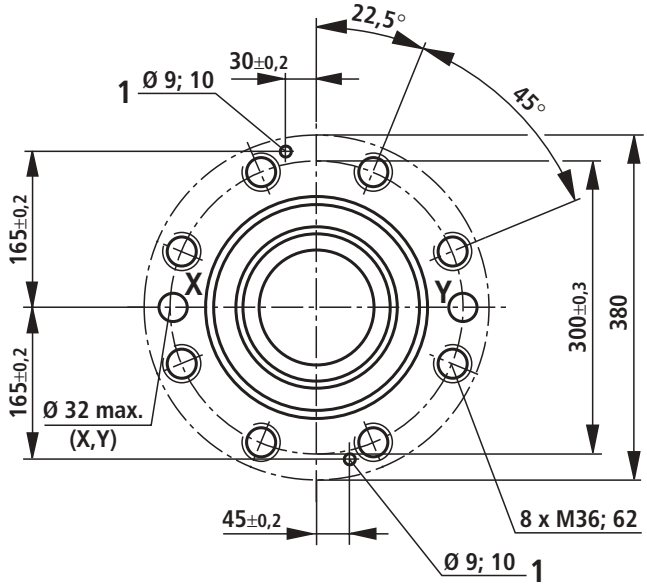
NS63



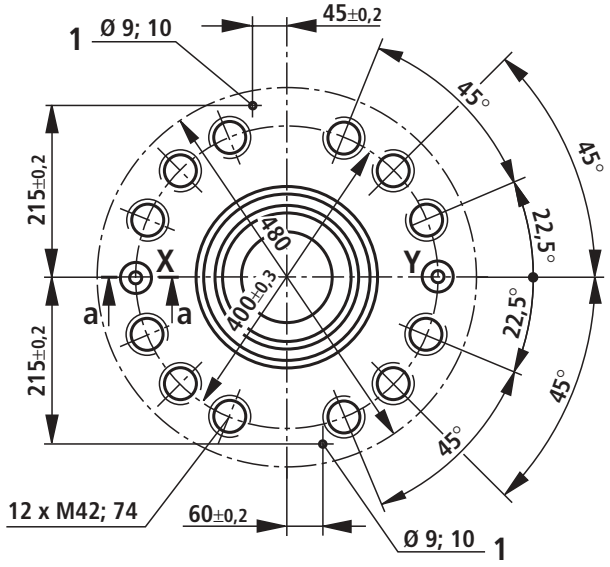
NS80, 100



NS125



NS160

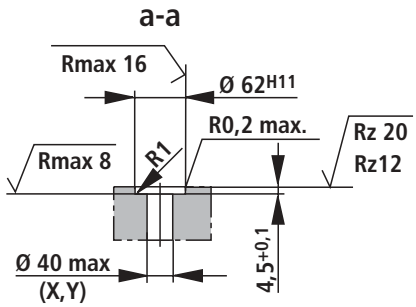


1 Locating pin hole

Tolerances to:
– General tolerances ISO 2768-mK

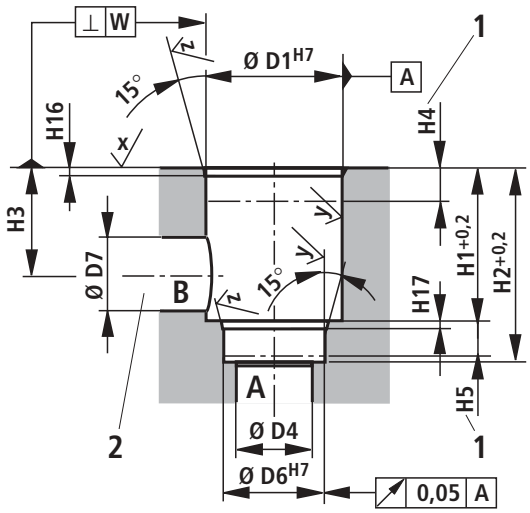
NS	63	80	100
D8	M30	M24	M30
max. ØD9	12	16	20
ØD10	8	10	10
L1	180	250	300
L2	125	200	245
L3	62,5	–	–
L4	75	–	–
L5	38	–	–

Counterbore for ports X and Y in the manifold, only for NS160

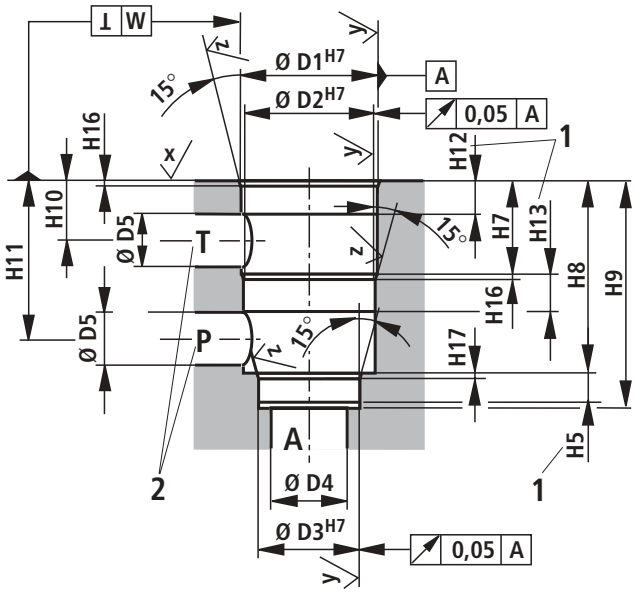


Installation dimensions to DIN ISO 7368 – except for NS125 and 160 (nom. dimensions in mm)

Cavity for type 2WRC…
to DIN ISO 7368



Cavity for type 3WRC…



$\sqrt[x]{} = \sqrt{Rmax\ 4}$

$\sqrt[y]{} = \sqrt{Rmax\ 8}$

$\sqrt[z]{} = \sqrt{Rz\ 10}$

1 Depth of fit, minimum dimensions

2 Ports P, T or B can be arranged about the centre axis of port A. However care must be taken to ensure that the fixing and control bores are not damaged.

Tolerances to:
– General tolerances ISO 2768-mK

NS	63	80	100	125	160
ØD1H7	120	145	180	225	300
ØD2H7	116	140	174	220	290
ØD3H7	90	110	135	200	270
ØD4	63	80	100	max.150	max.200
ØD5	48	60	75	95	120
ØD6H7	90	110	135	200	270
ØD7	63	80	100	125	200
H1	130	175	210	257	370
H2	155	205	245	300	425
H3	95	130	155	192	268
H4	40	40	50	40	50
H5	20	25	29	31	45
H7	85	125	155	195	245
H8	165	215	270	335	420
H9	195	245	305	380	480
H10	57	90	112	140	175
H11	137	180	225	280	350
H12	33	60	75	93	115
H13	28	25	32	37	45
H16	4	5	5	5,5	5,5
H17	4	5	5	7	8
H18	65	50	63	–	–
W	0,05	0,1	0,2	0,2	0,2

Notes

Bosch Rexroth AG
Hydraulics
Zum Eisengießer 1
97816 Lohr am Main, Germany
Telefon +49 (0) 93 52 / 18-0
Telefax +49 (0) 93 52 / 18-23 58
documentation@boschrexroth.de
www.boschrexroth.de