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Find the *Bosch Rexroth 4WRZ10W85-51/6A24NTK4/M* at our website: *Click HERE*

MANNESMANN REXROTH

4/3-and 5/3-Way-Proportional-Directional Valves

Pilot operated type .WRZ, external pilot operation type .WRH
Sizes 10, 25, 32, 52 Series 5X; Size 16 Series 6X

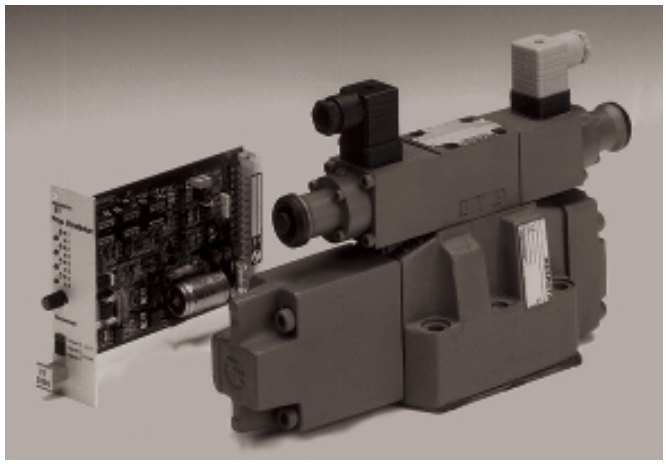
Size 10 to 52	up to 350 bar	up to 2800 L/min

RE 29 113/09.95

Replaces: 07.93

Characteristics:

- Pilot operated 2-stage proportional directional valve
- Valve for controlling both flow direction and volume
- Proportional solenoid operation
- For sub-plate mounting:
  Porting pattern to DIN 24 340 Form A,
  ISO 4401 and CETOP-RP121H
  For subplates see data sheets RE 45 054 to RE 45 060
  (subject to separate order), see pages 13 to 16
- Emergency operator, optional
- Spring centreing
- Control unit:
  Electrical amplifier (subject to separate order)
  see pages 6 and 20



H/A 1200/87

Type 4WRZ 16 ...6X/6A..NZ4...
with associated electronic control (to be ordered separately)

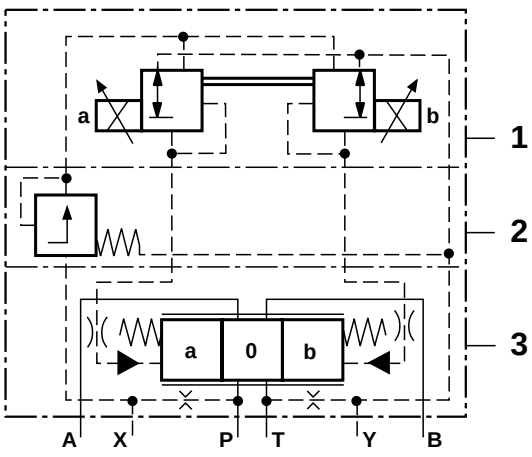
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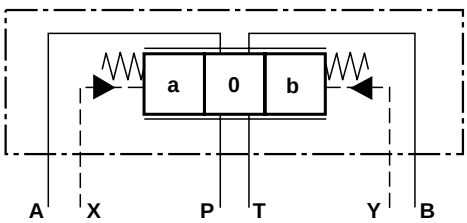
Symbols (detailed)

Example: 4WRZ ...

1 Pilot valve
2 Pressure reducing valve D3 (optional)
3 Main valve



Example: 4WRH 52 ...



Functional description, section

Pilot valve type 3DREP 6 ...

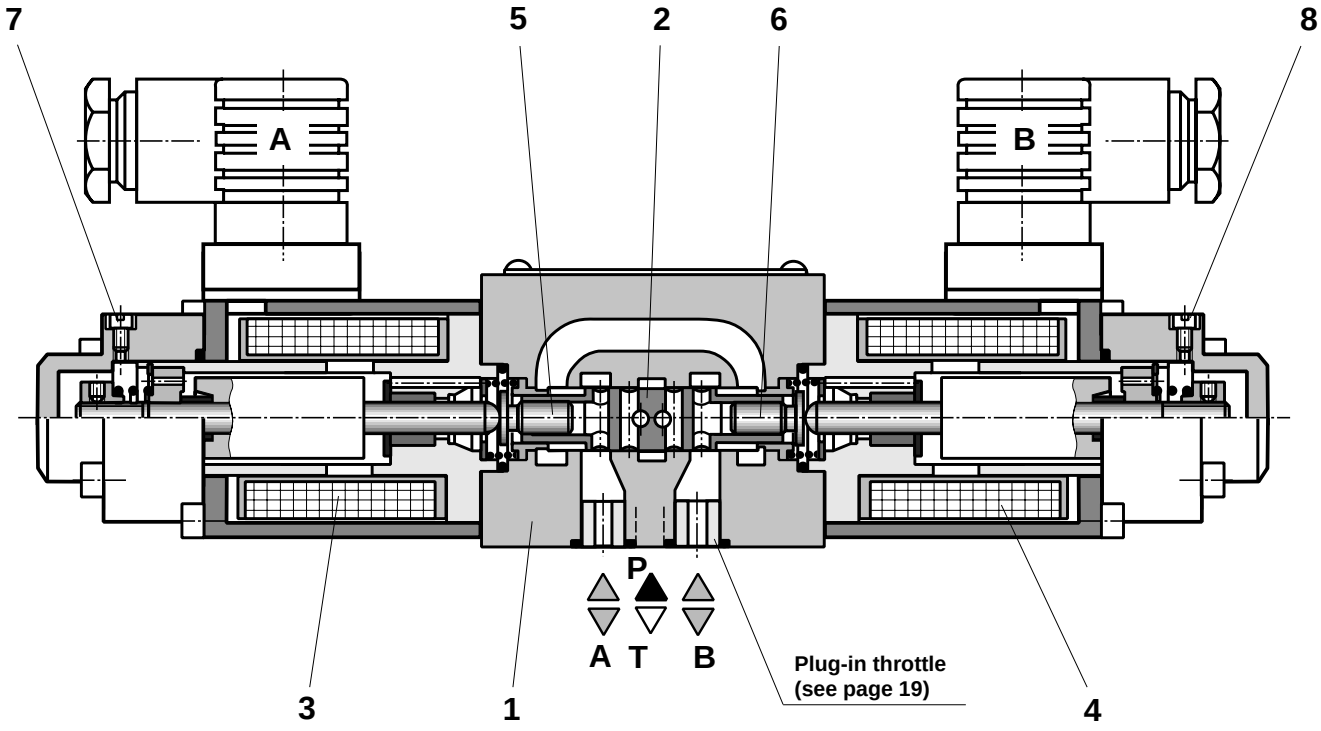
The pilot valve is a proportional solenoid operated 3-way pressure control valve. It is used to convert an electrical input signal into a proportional pressure output signal and is used on all 4WRZ... and 5WRZ... type valves.

The proportional solenoids are controllable DC wet pin solenoids. They convert an electrical current proportionally into mechanical force. Increasing the current intensity causes a corresponding increase in their solenoid force. The set solenoid force remains constant over the entire control stroke.

The pilot valve consists basically of housing (1), two pressure measuring spools (5; 6) and two proportional solenoids (3; 4).
In the de-energised condition the control spool (2) is held in the centre position by the return springs. The control spool (2) is directly operated by the proportional solenoids (3 or 4). If solenoid “a” (3) is energised, its force acts via the pressure measuring spool (5) on the control spool (2) and pushes it to the right, thereby allowing pressure fluid to flow from P to B. The pressure which is building up in port B acts via the radial drillings in the control spool (2) on the pressure measuring spools (6).

The resulting pressure force acts against the solenoid and pushes the control spool (2) towards its closing position until the two forces are again in balance.The pressure measuring spool (6) supports itself on the pin of solenoid “b” (4).
At this point the connection from P to B is closed, the pressure in service port B is held constant. A reduction in the solenoid force leads to an excess in force on the control spool (2). This causes the spool to move to the left.
The pressure fluid can flow via the connection from B to T and the pressure reduces accordingly.
Again, force balancing means holding the pressure constant, however, now at the lower level.
In the neutral position - proportional solenoids de-energised - the connections A and T are open, allowing the pressure fluid to flow unhindered back to the reservoir.
At the same time the connection P to A and P to B is closed.

Note on bleeding the valves (Bleed screws at Pos. 7 and 8) see page 3.



Type 3DREP 6 C1X/...

Functional description, section

Pilot operated proportional directional valve Types 4WRZ and 5WRZ...

Valve types WRZ... are pilot operated 4-way valves operated by means of proportional solenoids. They control the direction and flow rate of hydraulic fluid.

These valves consist basically of the pilot valve (9) with its two proportional solenoids (1 and 6), the main valve (12) together with the main spool (14) and centering spring (15).

In the non-operated condition the centering spring (15) holds the main spool (14) in the centre position. If "b" (6) is energised, it moves the control spool (2) to the right. Pilot oil is then either fed "internally" from line P or "externally" via port X into the pressure chamber (13) via the pilot valve (9) and moves the main spool (14) a distance proportional to the strength of the electric current. The throttling grooves in the main spool (14) open progressively with increasing current, thus controlling the flow of hydraulic fluid to the actuator ports.

When the solenoid current is switched off the control spool (2) and also the main spool (14) are returned to their neutral position, regardless of the control pressure. An emergency hand operator (10 and 11, optional) permits movement of the pilot spool (2) without energising the solenoid.

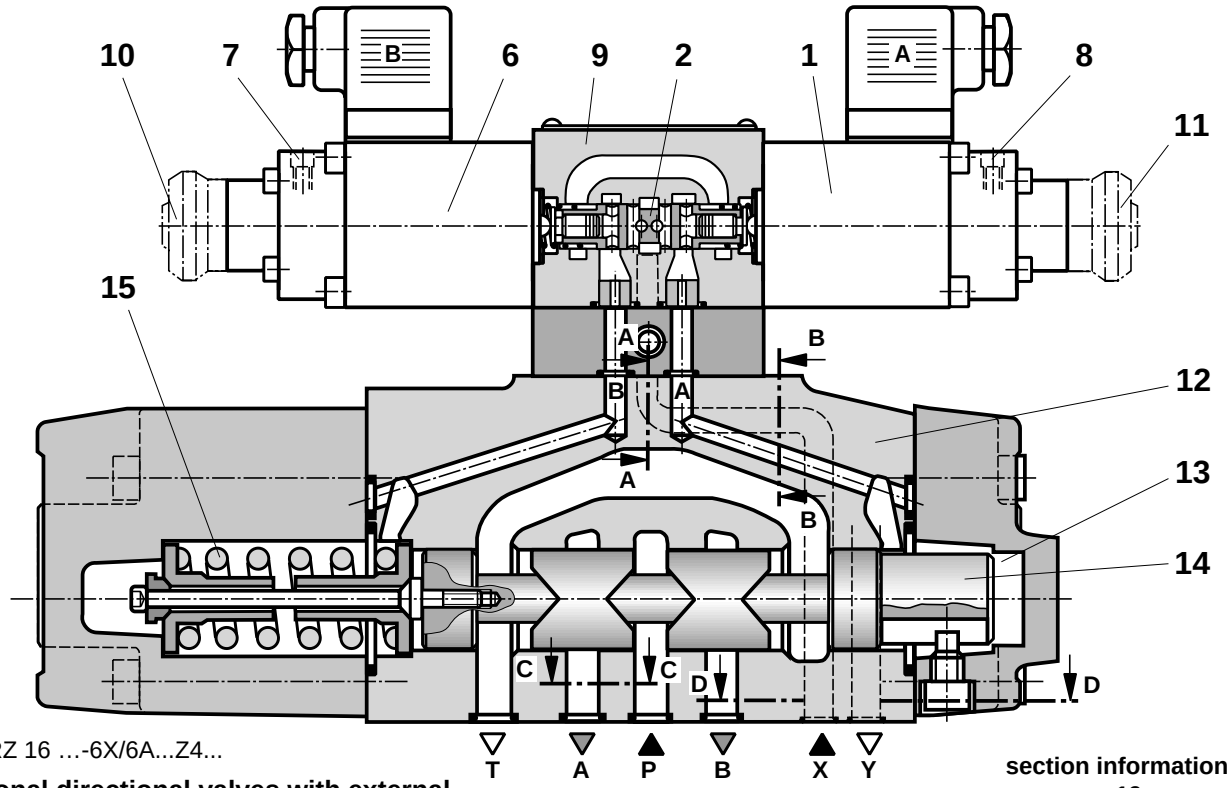
Size 52 sub-plate mounting 5-way valves are fitted with an additional "R" port. Depending on the spool position, fluid flows from P to A and B to T or P to B and A to R.

Note!

In order to achieve the optimum functioning of the valve, the valve must be bled at the commissioning stage:

- Supply pressure to valve,
- remove screws at 7 and 8, and top up with hydraulic fluid as required,
- when no further bubbles exit screw in items 7 and 8.

In order to prevent the tank line from emptying under adverse conditions, a back pressure valve should be fitted. (back pressure approx. 2 bar).



Type 4WRZ 16 …-6X/6A...Z4...

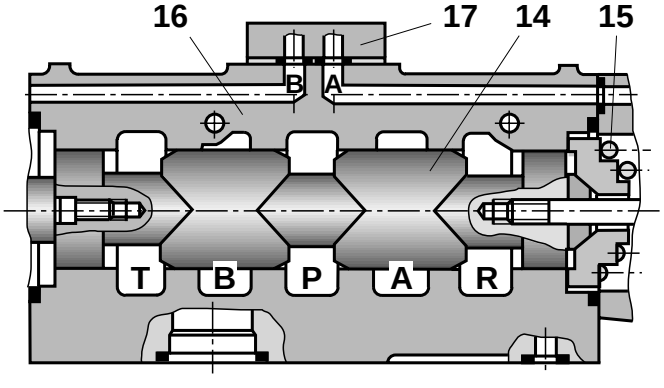
section information see page 19

Proportional directional valves with external pilot operation Types 4WRH... and 5WRH...

Type WRH... are pilot operated proportional directional valves for external operation via pressure control valves. Proportional directional valves type WRH... (Fig. 3) consist basically of a housing (16) with spool (14) centering spring (15), together with an interconnecting plate (17). The interconnecting plate (17) connects pilot connection A with port T(Y) and pilot connection B with port P(X).

The application of pilot pressure at port X moves the spool (14) into switching position P to B, A to T (R). The movement of the main spool (14) and thus the opening of the control ports is proportional to the pilot pressure present. The pilot pressure at port Y moves the spool (14) into switching positions P to A and B to T.

The pilot pressure at the main stage must not exceed 25 bar (16 bar for size 52)!



Type 5WRH 52 …-5X/...

Ordering codes for 4WRZ and 4WRH; size 10 up to 32 subplate mounting; size 52 flange connections

4WR _ | | | – | / | | | | | / | | | *

Further details in clear text

No code = O-Ring [5])
R = R-Ring

M = NBR seals, suitable for mineral oil (HL, HLP)to DIN 51 524

V = FPM seals, suitable for phosphate ester (HFD-R)

No code = **without** pressure reducing valve

D3 = **with** reducing valve type ZDR 6 DP0-4X/40YM-W80 [2]) (fixed setting)

Electrical connection

Z4= angled plug to DIN 43 650 [2,3])
K4= without angled plug

Pilot oil feed and discharge

No code = pilot oil feed external, pilot oil drain external

E = pilot oil feed internal, pilot oil drain external

ET = pilot oil feed internal, pilot oil drain internal

T = pilot oil feed external, pilot oil drain internal

(size 52 and type 4WRH only possible without code)

No code = without special insulation
J = seawater resistant

No code = without emergency operator
N = with emergency operator [2, 4])
N9 = with concealed emergency operator [2, 3])

Electronic control supply voltage

12 = 12 volt DC (on request) [2])
24 = 24 volt DC (standard design) [2])

6A = pilot valve size 6 [2]) with wet pin DC solenoids

No code = for subplate mounting
F = for flange mounting (size 52 only)

5X = series 50 to 59 (sizes 10, 25, 32, 52) (50 to 59: externally interchangeable)

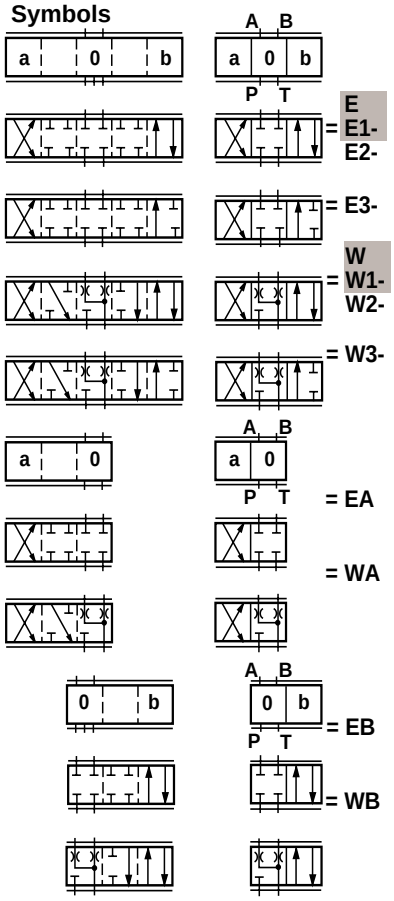
6X = series 60 to 69 (size 16 only) (60 to 69: externally interchangeable)

Nominal flow in L/min with a10 bar valve pressure drop

25 =	**50 =**	**85 =** [1])	for size 10
	100 =	**150 =** [1])	for size 16
	220 =	**325 =** [1])	for size 25
	360 =	**520 =** [1])	for size 32
		1000 = [1])	for size 52

[1]) E2- and W2- possible only with max. flow $q_{V\,max}$

Symbols



With symbols E1- and W1-:

P to A: $q_{V\,max}$ B to T: $q_V/2$

P to B: $q_V/2$ A to T: $q_{V\,max}$

With symbols E2- and W2-:

P to A: $q_V/2$ B to T: $q_{V\,max}$

P to B: $q_{V\,max}$ A to T: $q_V/2$

With symbols E3- and W3-:

P to A: $q_{V\,max}$ B to T: closed

P to B: $q_V/2$ A to T: $q_{V\,max}$

(Regenerative circuit, base of spool at port A)

Note: With spools W, W1, W2-, W3-, WA, and WB in their neutral position, there is a connection from A to T and B to T with an opening of less than 3% of the relevant cross section

[2]) Omitted for 4WRH and 4WRZ without pilot valve.

[3]) Cannot be supplied in seawater resistant design "J".

[4]) **Note:** Accidental activation of the emergency operator can result in uncontrolled machine movements.

[5]) Size 16 is only available with R-rings.

Special electrical insulation on request!

Valve types which are marked in grey are readily available!

Order codes 5WRZ 52 and 5WRH 52; subplate mounting

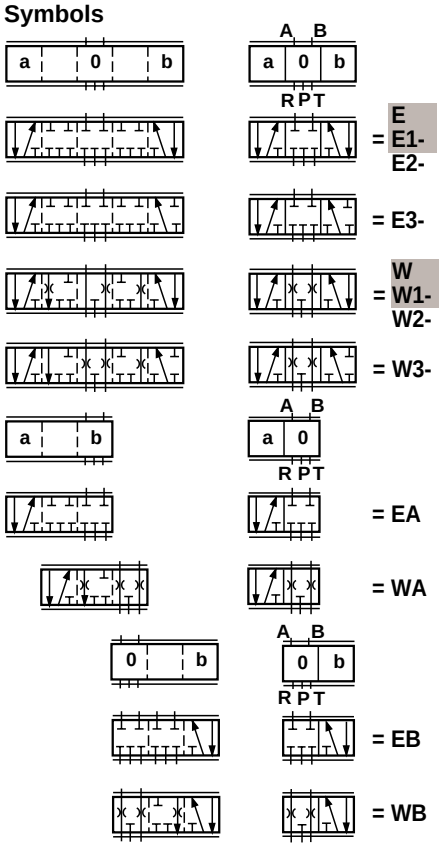
5WR _	52 –	/					/			*

Hydraulic operation = H

Electro-hydraulic operation = Z

Size 52 = 52

Symbols



1000 = Flow at 10 bar valve pressure drop 1000 L/min

5X = series 50 to 59 (50 to 59: externally interchangeable)

6A = pilot valve size 6 [1]) with wet pin DC solenoid

Electronic control supply voltage

12 = 12 volt DC (on request) [1])

24 = 24 volt DC (standard design) [1])

No code = without special insulation

J = seawater resistant

No code = without emergency operator

N = with emergency operator [1,3])

N9 = with concealed emergency operator [1,2])

Electrical connection

Z4 = angled plug to DIN 43 650 [1,2])

K4= without angled plug

No code = **without** pressure reducing valve

D3 = **with** pressure reducing valve type ZDR 6 DP0-4X/40YM-W80 [1]) (fixed setting)

V = FPM seals, suitable for phosphate ester (HFD-R)

M = NBR seals, suitable for mineral oil (HL, HLP) to DIN 51 524

No code = O-Ring

R = R-Ring

Further details in clear text

With symbols E1- and W1-:

P to A: q_V = 1000 L/min B to T: q_V = 500 L/min

P to B: q_V = 500 L/min A to R: q_V = 1000 L/min

With symbols E2- and W2-:

P to A: q_V = 500 L/min B to T: q_V = 1000 L/min

P to B: q_V = 1000 L/min A to R: q_V = 500 L/min

With symbols E3- and W3-:

P to A: q_V = 1000 L/min B to T: closed

P to B: q_V = 500 L/min A to R: q_V = 1000 L/min

(Regenerative circuit, base of spool at port A)

Note:

– Pilot oil feed and discharge only possible enternally

– With spools W, W1, W2-, W3-, WA, and WB in their neutral position, there is a connection from A to T and B to T with an opening of less than 3% of the relevant cross section.

[1]) Omitted on 5WRH and 5WRZ without pilot valve.

[2]) Cannot be supplied in seawater resistant design "J".

[3]) **Note:** Accidental activation of the emergency operator may result in uncontrolled machine movements.

Special electrical insulation on request!

Valve types which are marked in grey are readily available!

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

General

Installation position				optional, preferably horizontal (for comissioning guidelines see RE 07 800)			
Ambient temperature			°C	– 20 to + 50			
Weight		Spool symbol		E, E1-, E2-, E3-, W, W1-, W2-, W3-			EA, WA, EB, WB
		Size 10	kg	7,8			7,4
		Size 16	kg	13,4			12,7
		Size 25	kg	18,2			17,5
		Size 32	kg	42,2			41,8
		Size 52	kg	79,5			78,5
	for flange connection	Size 52	kg	77,5			76,5

Hydraulic (measured at v = 41 mm²/s and t = 50 °C)

			Size 10	Size 16	Size 25	Size 32	Size 52
Operating pressure							
– Pilot valve,	Pilot oil feed external	bar	30 to 100				20 to 100
	Pilot oil feed internal	bar					–
		bar	100 to 315 only with "D3"				
– Main valve		bar	up to 315	up to 350	up to 350	up to 350	up to 350
Return line pressure	– Port T (port R) (Pilot oil drain external)	bar	up to 315	up to 250	up to 250	up to 150	up to 250
	– Port T (Pilot oil drain internal)	bar	up to 30	up to 30	up to 30	up to 30	–
	– Port Y	bar	up to 30	up to 30	up to 30	up to 30	up to 30
Pilot oil volume for spool movement 0 → 100 %		cm³	1,7	4,6	10	26,5	54,3
Pilot oil flow at ports X and Y at stepped input signals 0 → 100 %		L/min	3,5	5,5	7	15,9	7
Flow through main valve		L/min	up to 170	up to 460	up to 870	up to 1600	up to 2800

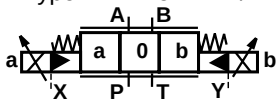
Degree of fluid contamination	Maxiumum permissible degree of contamination of the fluid is to NAS 1638, class 7 (pilot stage) and class 9 (main stage) We, therefore, recommend a filter with a minimum retention rate of $ß_5 \geq 75$ for the pilot stage; *and* $ß_{15} \geq 75$ for the main stage
Hydraulic fluid	Mineral oil (HL, HLP) to DIN 51 524 Phosphate ester (HFD-R)
Hydraulic fluid temperature range	– 20 to +70 °C
Viscosity range	20 to 380 mm²/s
Hysteresis	≤ 6 %
Repetitive accuracy	≤ 3 %

Electrical

Type of voltage			DC	
Nominal current,	– at 12 V	mA	1300	
per proportional solenoid	– at 24 V	mA	700	
Pilot current		mA	≤ 20	
Coil resistance	– value when cold at 20 °C	Ω	19,5 (24 V)	5,4 (12 V)
	– max. value when hot	Ω	28,8 (24 V)	7,9 (12 V)
Coil temperature		°C	to + 150	
Duty			Continuous	
Electrical connection			Plug connection to DIN 43 650/2-pin. + PE/Pg11	
Type of insulation to DIN 40 050			IP 65	
Electronic control (to separate order)	– Amplifier in Eurocard format		VT 3000 (see page 20 and data sheet RE 29 935) VT 3006 (see data sheet RE 29 926) VT 3024 (see data sheet RE 29 934)	
	– Amplifier in modular design		VT 11 013 (see data sheet RE 29 738)	

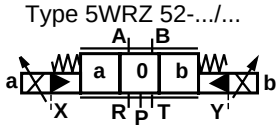
Symbols (simplified)

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Type 4WRZ 52 ..-..F/...



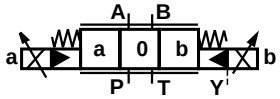
X = external
Y = external

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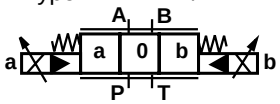
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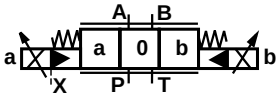
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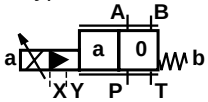
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Y = internal

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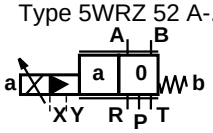


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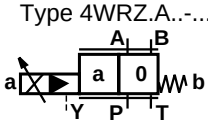
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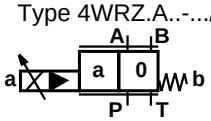
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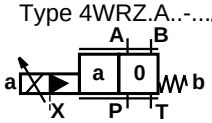
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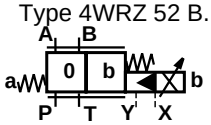
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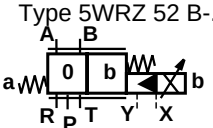
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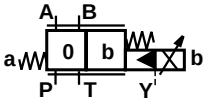
Type 4WRZ ..B-.../... and
Type 4WRZ 52 B..-..F/...



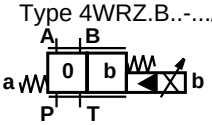
Type 5WRZ 52 B-.../...



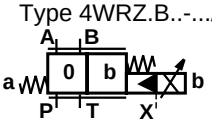
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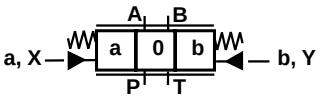
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Type 4WRZ.B..-.../..ET..

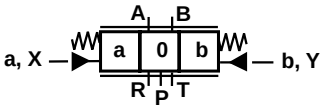


Type 4WRH ..-.../... and
Type 4WRH 52 ..-..F/...



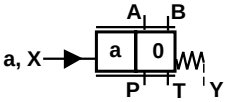
X = external
Y = external

Type 5WRH 52 ..-...

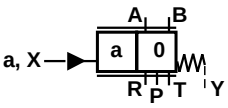


X = external
Y = external

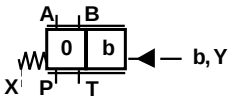
Type 4WRH ..A..-.../... and
Type 4WRH 52 ..-..F/...



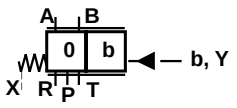
Type 5WRH 52 A..-.../...



Type 4WRH ..B..-.../... and
Type 4WRH 52 B..-..F/...

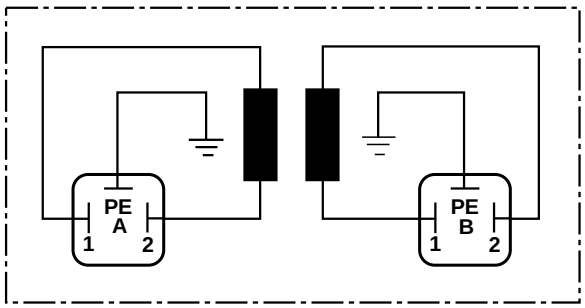


Type 5WRH 52 B..-.../...

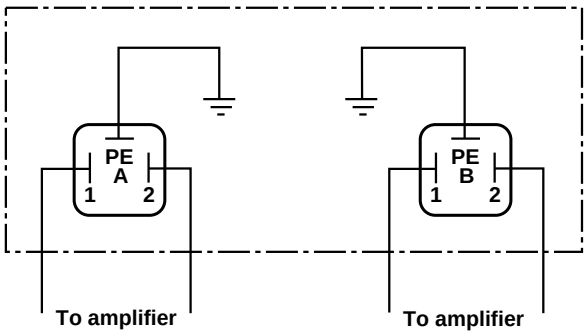


Electrical connections

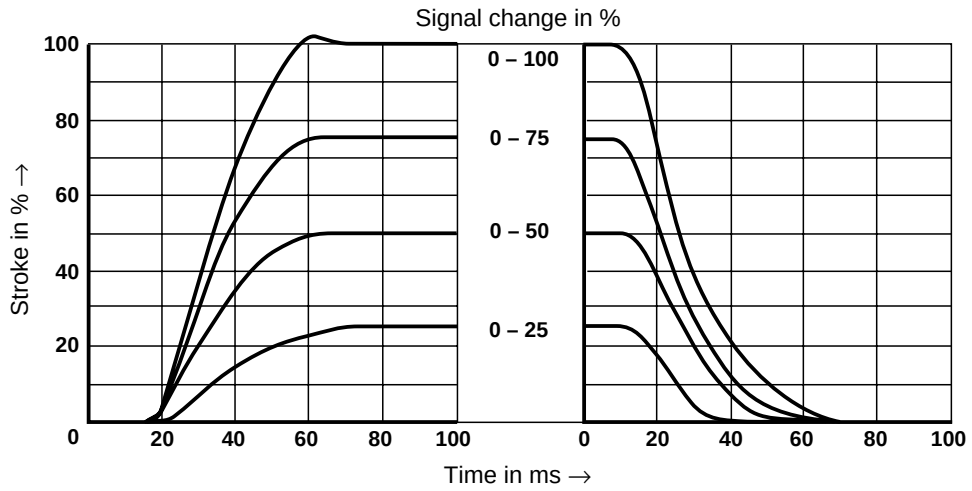
Coil connection



Plug connection

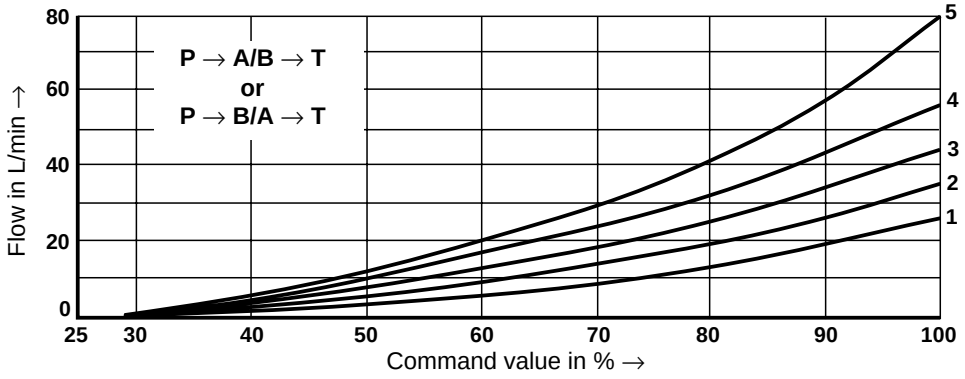


Transient function with stepped electrical input signals — Size 10



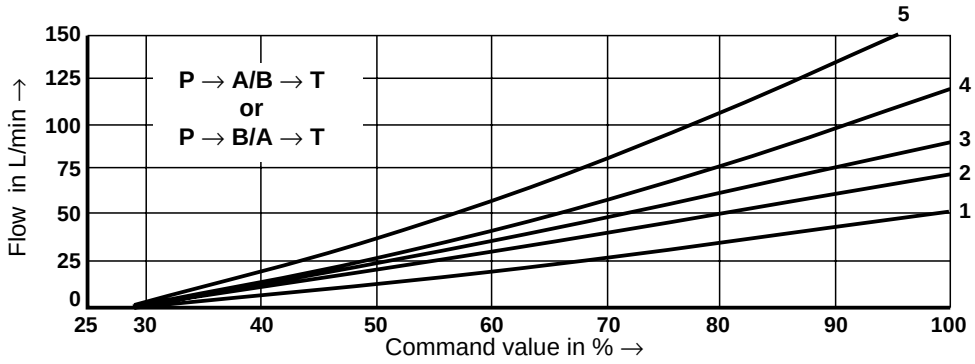
Pilot pressure p = 50 bar

Technical Data (measured with spools "E, W, EA, WA, EB, WB" at ν = 41 mm²/s and t = 50 °C) Size 10



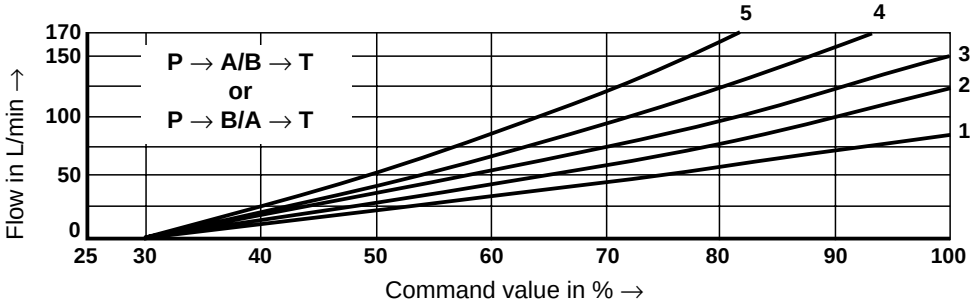
25 L/min flow at 10 bar valve pressure differential

1 Δp = 10 bar constant
2 Δp = 20 bar constant
3 Δp = 30 bar constant
4 Δp = 50 bar constant
5 Δp = 100 bar constant



50 L/min flow at 10 bar valve pressure differential

1 Δp = 10 bar constant
2 Δp = 20 bar constant
3 Δp = 30 bar constant
4 Δp = 50 bar constant
5 Δp = 100 bar constant

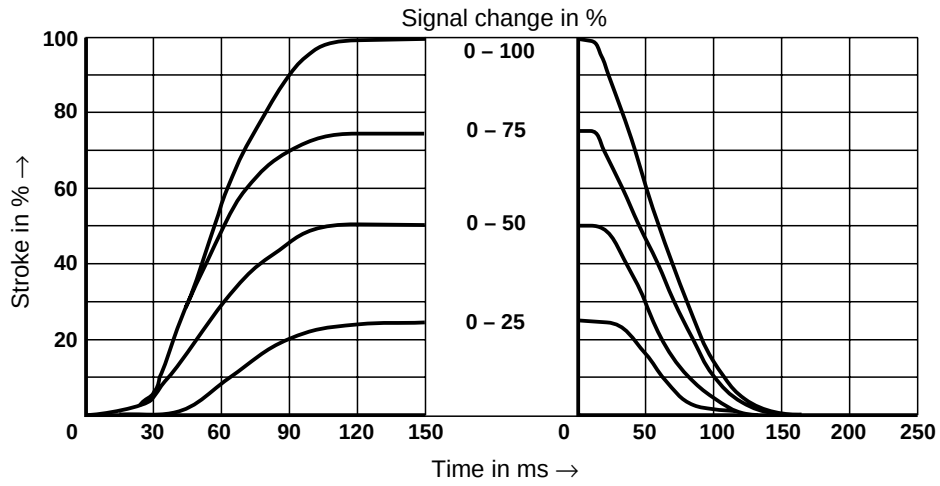


85 L/min flow at 10 bar valve pressure differential

1 Δp = 10 bar constant
2 Δp = 20 bar constant
3 Δp = 30 bar constant
4 Δp = 50 bar constant
5 Δp = 100 bar constant

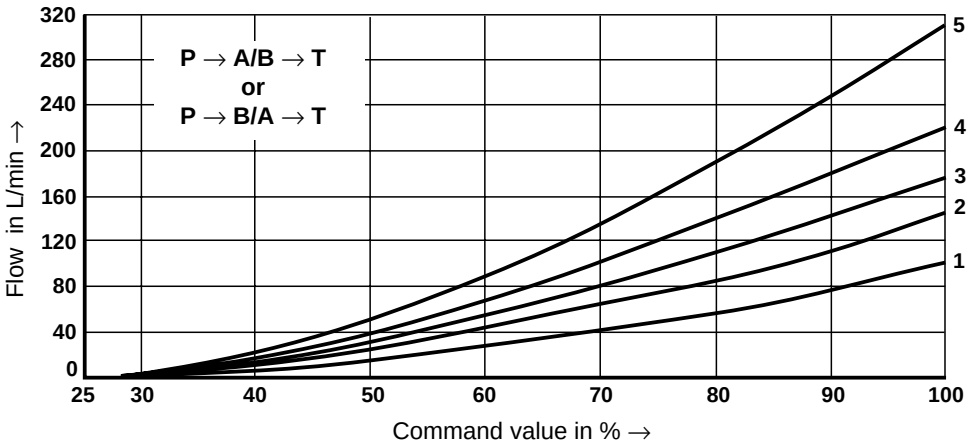
Δp = Valve pressure differential to DIN 24 311(Input pressure minus load pressure and return line pressure)

Transient function with stepped electrical input signals — Size 16



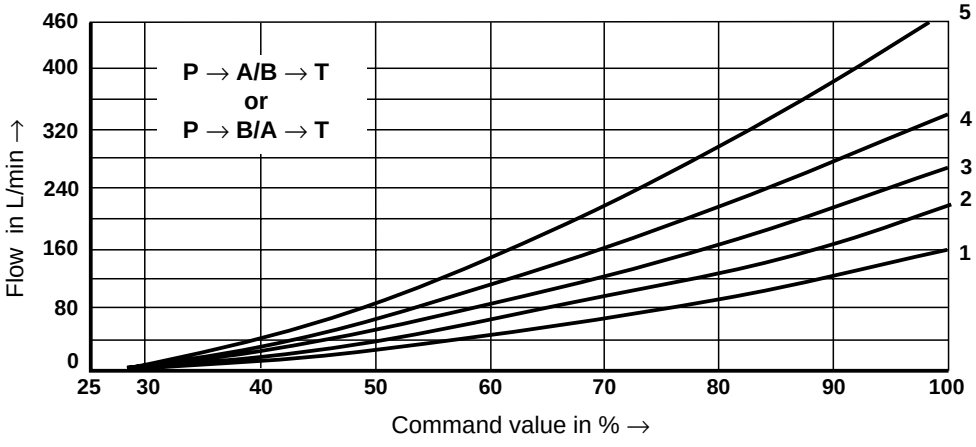
Pilot pressure p = 50 bar

Technical data (measured with spools "E, W, EA, WA, EB, WB" at ν = 41 mm²/s and t = 50 °C) — Size 16



100 L/min flow at 10 bar valve pressure differential

1 Δp = 10 bar constant
2 Δp = 20 bar constant
3 Δp = 30 bar constant
4 Δp = 50 bar constant
5 Δp = 100 bar constant

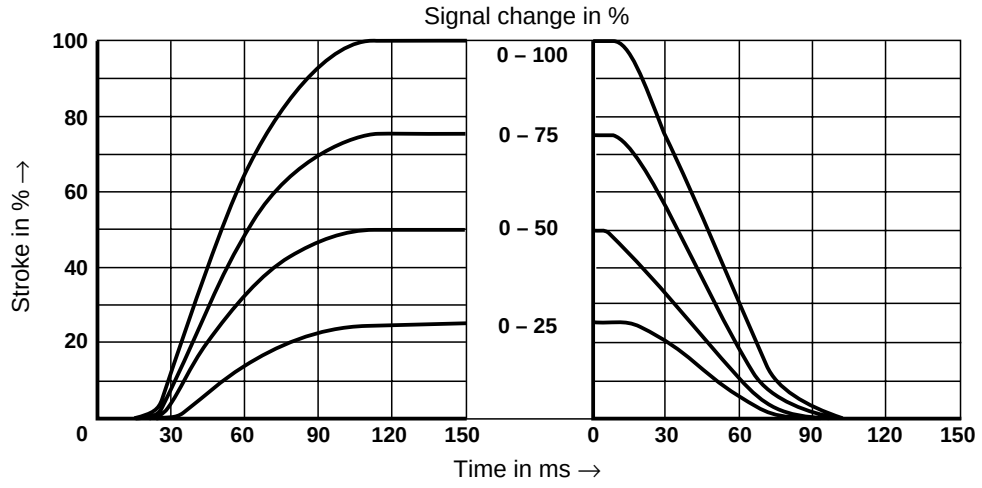


150 L/min flow at 10 bar valve pressure differential

1 Δp = 10 bar constant
2 Δp = 20 bar constant
3 Δp = 30 bar constant
4 Δp = 50 bar constant
5 Δp = 100 bar constant

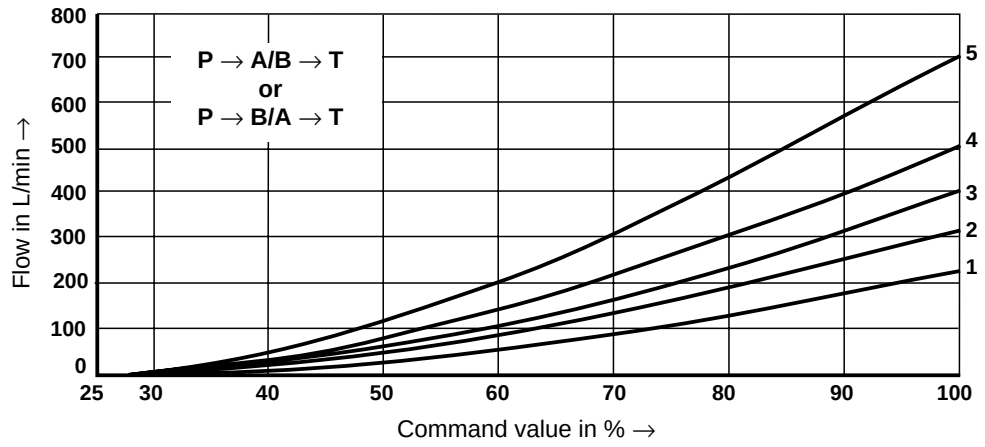
Δp = Valve pressure differential to DIN 24 311(Input pressure minus load pressure and return line pressure)

Transient function with stepped electrical input signals — Size 25



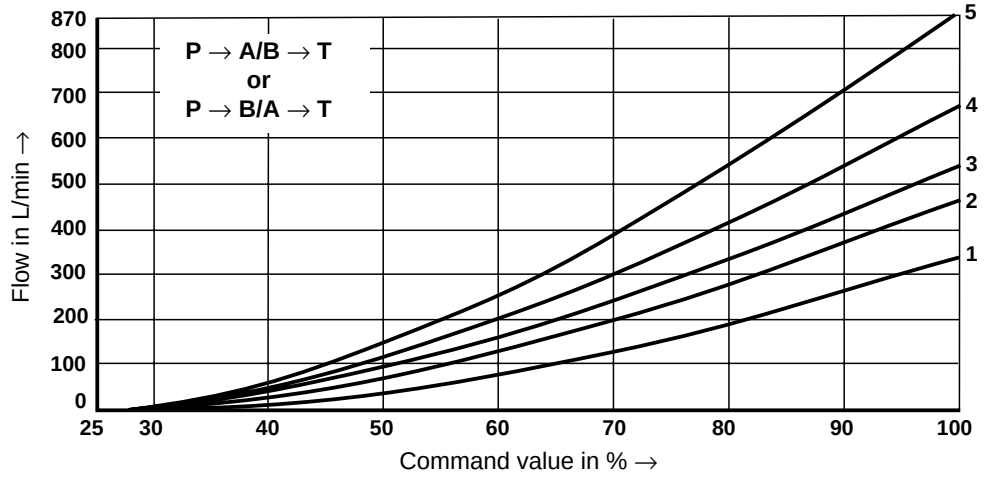
Pilot pressure p = 50 bar

Technical data (measured with spools "E, W, EA, WA, EB, WB" at ν = 41 mm²/s and t = 50 °C) — Size 25



220 L/min flow at 10 bar valve pressure differential

1 Δp = 10 bar constant
2 Δp = 20 bar constant
3 Δp = 30 bar constant
4 Δp = 50 bar constant
5 Δp = 100 bar constant

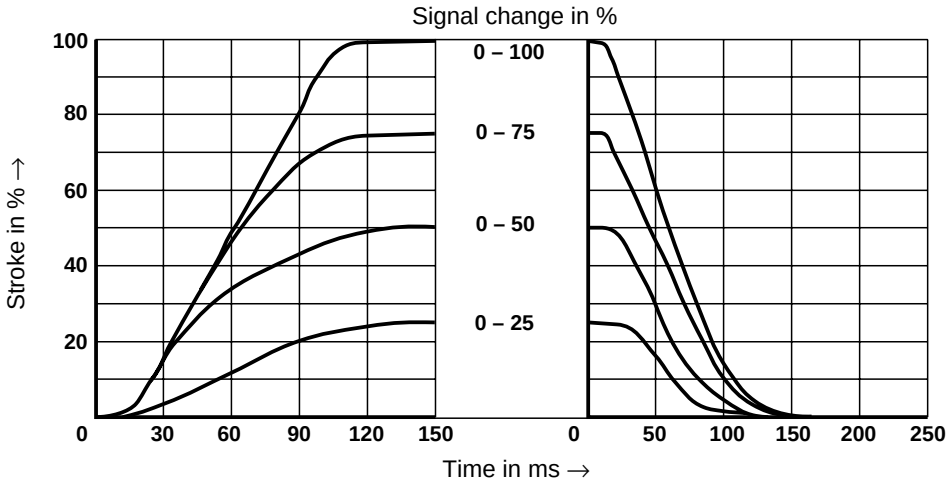


325 L/min flow at 10 bar valve pressure differential

1 Δp = 10 bar constant
2 Δp = 20 bar constant
3 Δp = 30 bar constant
4 Δp = 50 bar constant
5 Δp = 100 bar constant

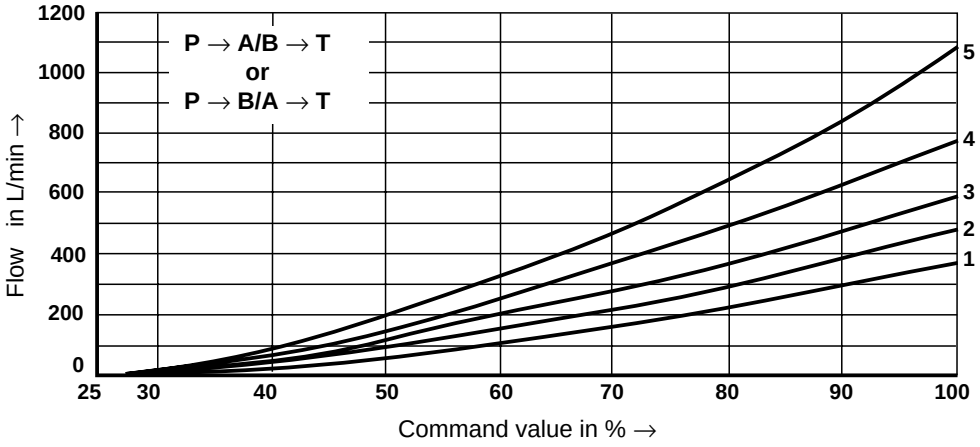
Δp = Valve pressure differential to DIN 24 311(Input pressure minus load pressure and return line pressure)

Transient function with stepped electrical input signals — Size 32



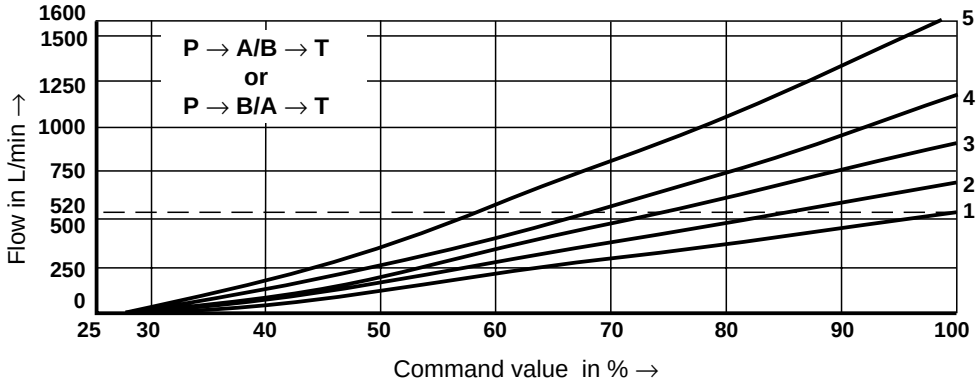
Pilot pressure p = 50 bar

Technical data (measured with spools "E, W, EA, WA, EB, WB" at ν = 41 mm²/s and t = 50 °C) — Size 32



360 L/min flow at 10 bar valve pressure differential

1 Δp = 10 bar constant
2 Δp = 20 bar constant
3 Δp = 30 bar constant
4 Δp = 50 bar constant
5 Δp = 100 bar constant

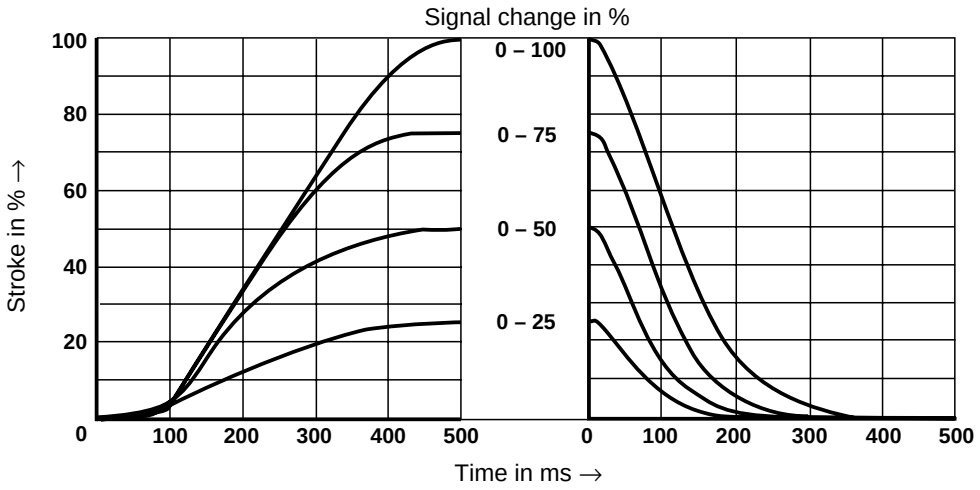


520 L/min flow at 10 bar valve pressure differential

1 Δp = 10 bar constant
2 Δp = 20 bar constant
3 Δp = 30 bar constant
4 Δp = 50 bar constant
5 Δp = 100 bar constant

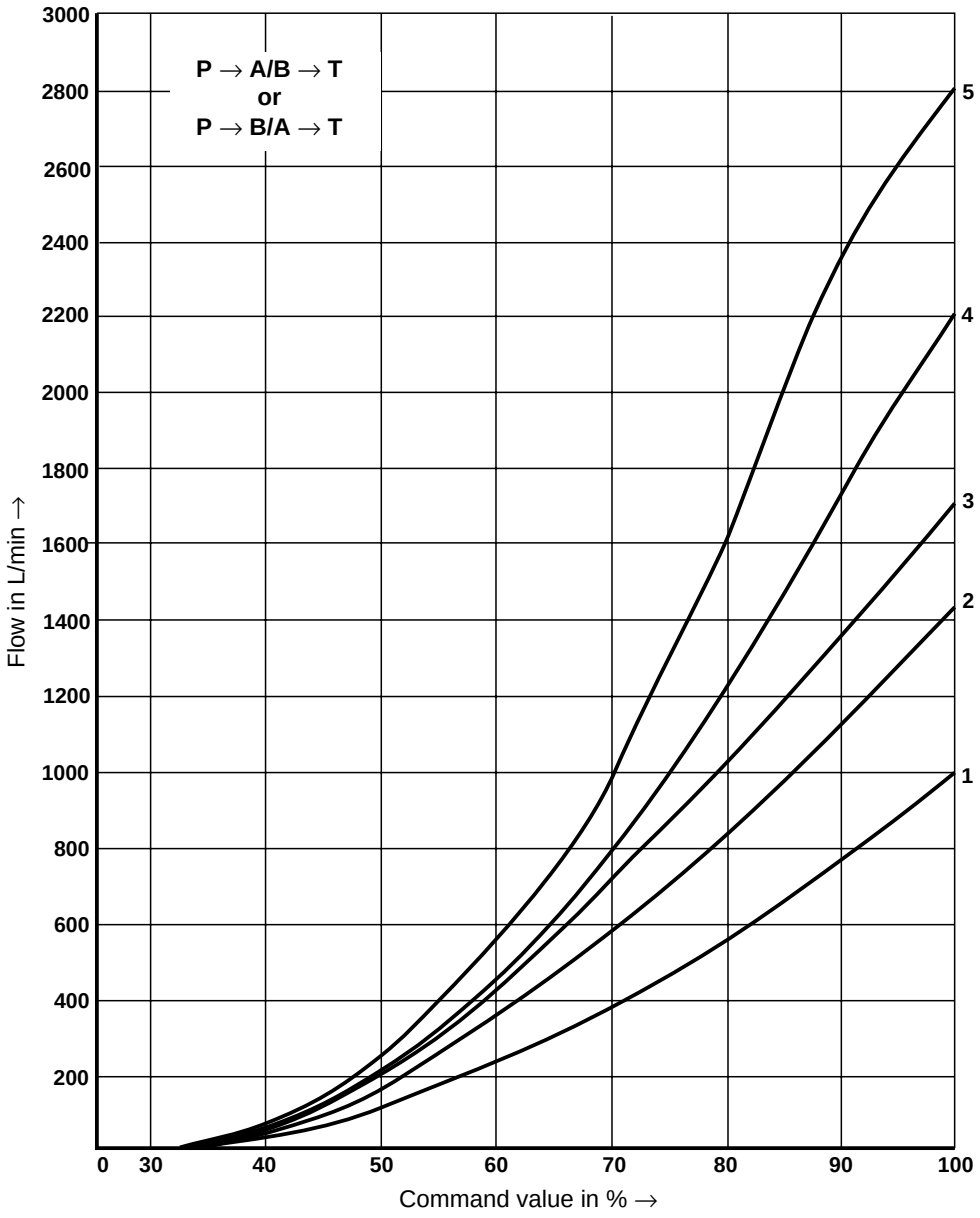
Δp = Valve pressure differential to DIN 24 311(Input pressure minus load pressure and return line pressure)

Transient function with stepped electrical input signals — Size 52



Pilot pressure p = 50 bar

Technical data (measured with spools "E, W, EA, WA, EB, WB" at ν = 41 mm²/s and t = 50 °C) — Size 52



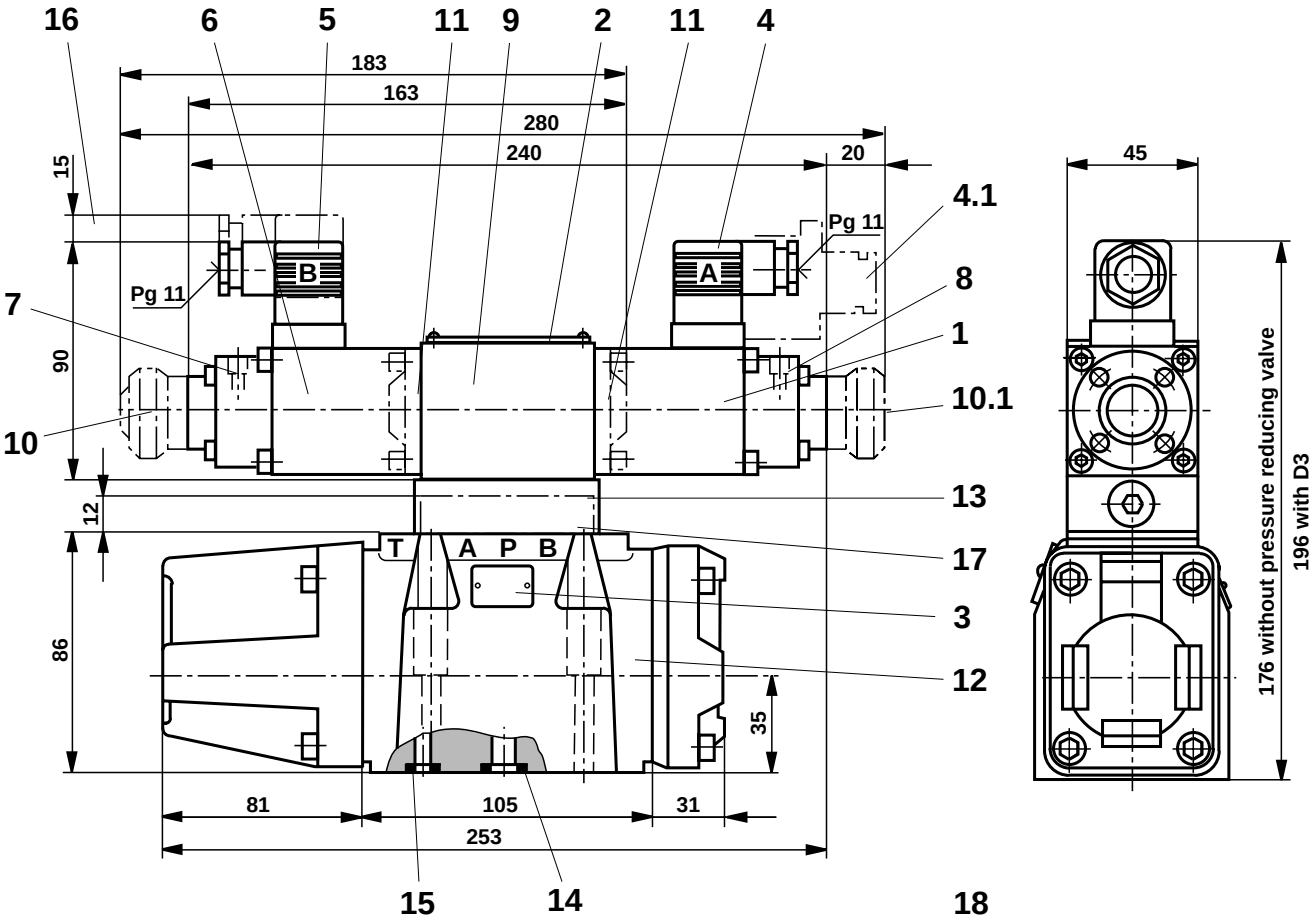
1000 L/min flow at 10 bar valve pressure differential

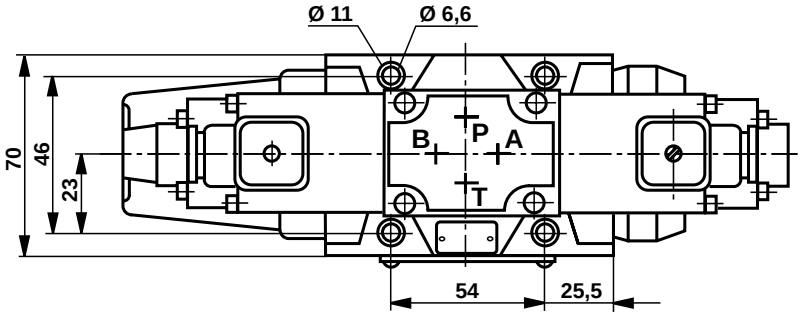
1 Δp = 10 bar constant
2 Δp = 20 bar constant
3 Δp = 30 bar constant
4 Δp = 50 bar constant
5 Δp = 100 bar constant

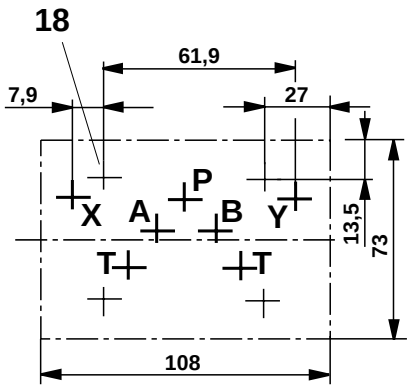
Δp = Valve prressue differential to DIN 24 311 (Input pressure minus load pressure and return line pressure)

Unit dimensions Size 10

(Dimensions in mm)



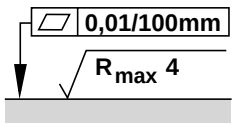




Subplates to data sheet RE 45 054 and valve fixing screws to be ordered separately.

Subplates: G 534/01 (G 3/4) **without** ports X and Y
G 535/01 (G 3/4) **with** ports X and Y
G 536/01 (G 1) **with** ports X and Y

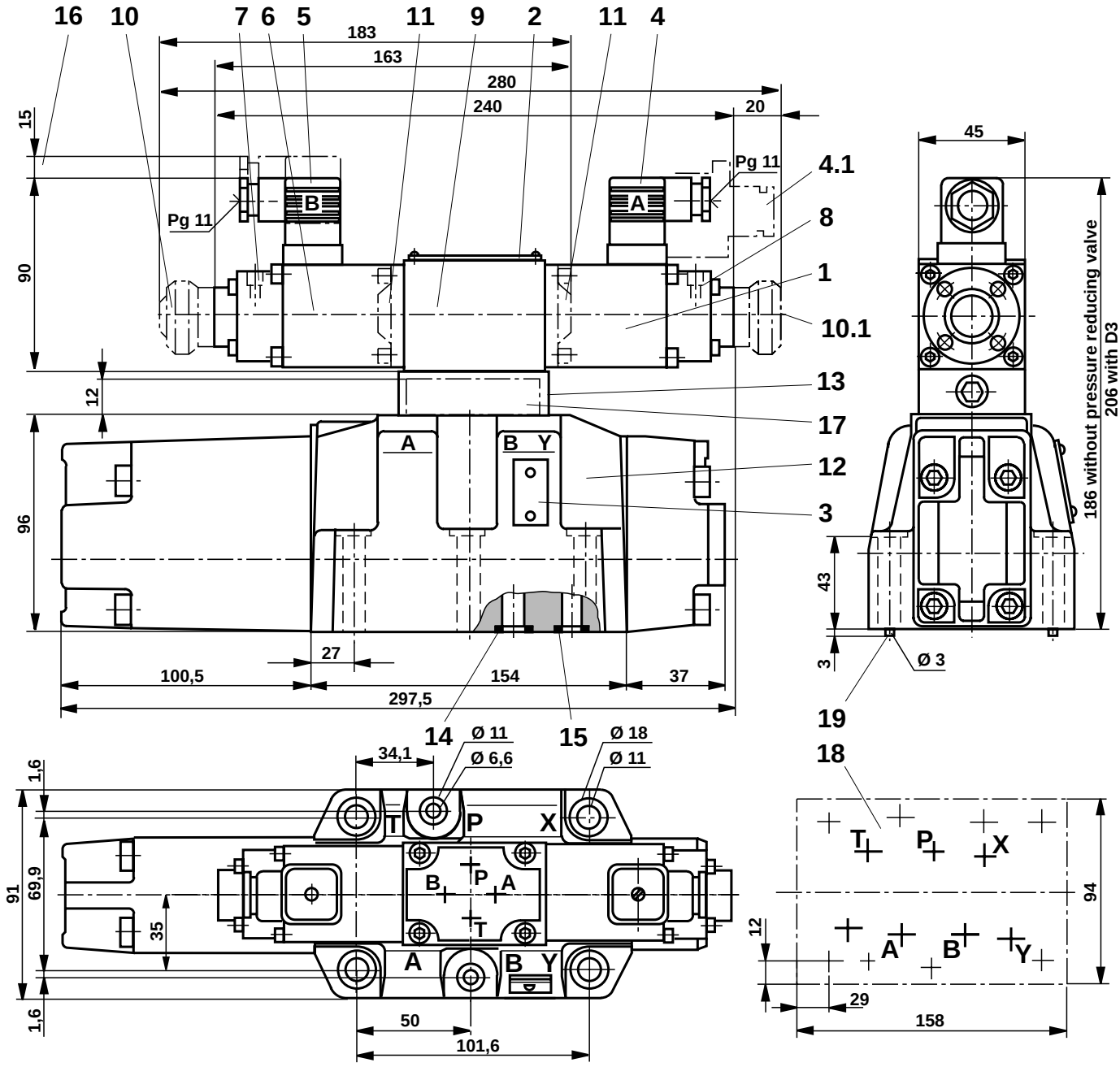
Valve fixing screws:
4 off M6 x 45 DIN 912-10.9; M_A = 15,5 Nm



Required surface finish of mating piece

1 Proportional solenoid "a"
2 Name plate for pilot valve
3 Name plate for overall valve
4 Plug "A", colour grey
Order No.: 008 908
4.1 Plug "A",
sea water resistant type
(dimensions see page 17)
5 Plug "B", colour black
Order No.: 008 909
6 Proportional solenoid "b"
7 Bleed screw, solenoid "b"
8 Bleed screw, solenoid "a"
9 Pilot valve
10 Emergency operator "N"
10.1 Emergency operator "N9"
(concealed type)
11 Cover for single solenoid valves
(types "A" or "B")
12 Main valve
13 Pressure reducing valve
14 R-ring 13 x 1,6 x 2 (O-ring 12 x 2);
Ports A, B, P, T
15 R-ring 11,18 x 1,6 x 1,78
(O-ring 10,82 x 1,78);
Ports X, Y
16 Space required to remove plug
17 Interconnecting plate
(type 4WRH...)
18 Machined valve mounting surface,
position of ports to
DIN 24 340 form A, ISO 4401 and
CETOP-RP121H
(X, Y as required)

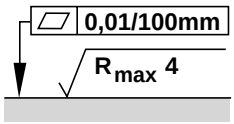
Unit dimensions Size 16 (Dimensions in mm)



Subplates to data sheet RE 45 056 and and valve fixing screws must be ordered separately.

Subplates: G 172/01 (G 3/4), G 172/02 (M27 x 2)
G 174/01 (G 1) G 174/02 (M33 x 2)
G 174/08 (Flange)

Valve fixing screws:
2 off M6 x 60 DIN 912-10.9; M_A = 15,5 Nm
4 off M10 x 60 DIN 912-10.9; M_A = 75 Nm

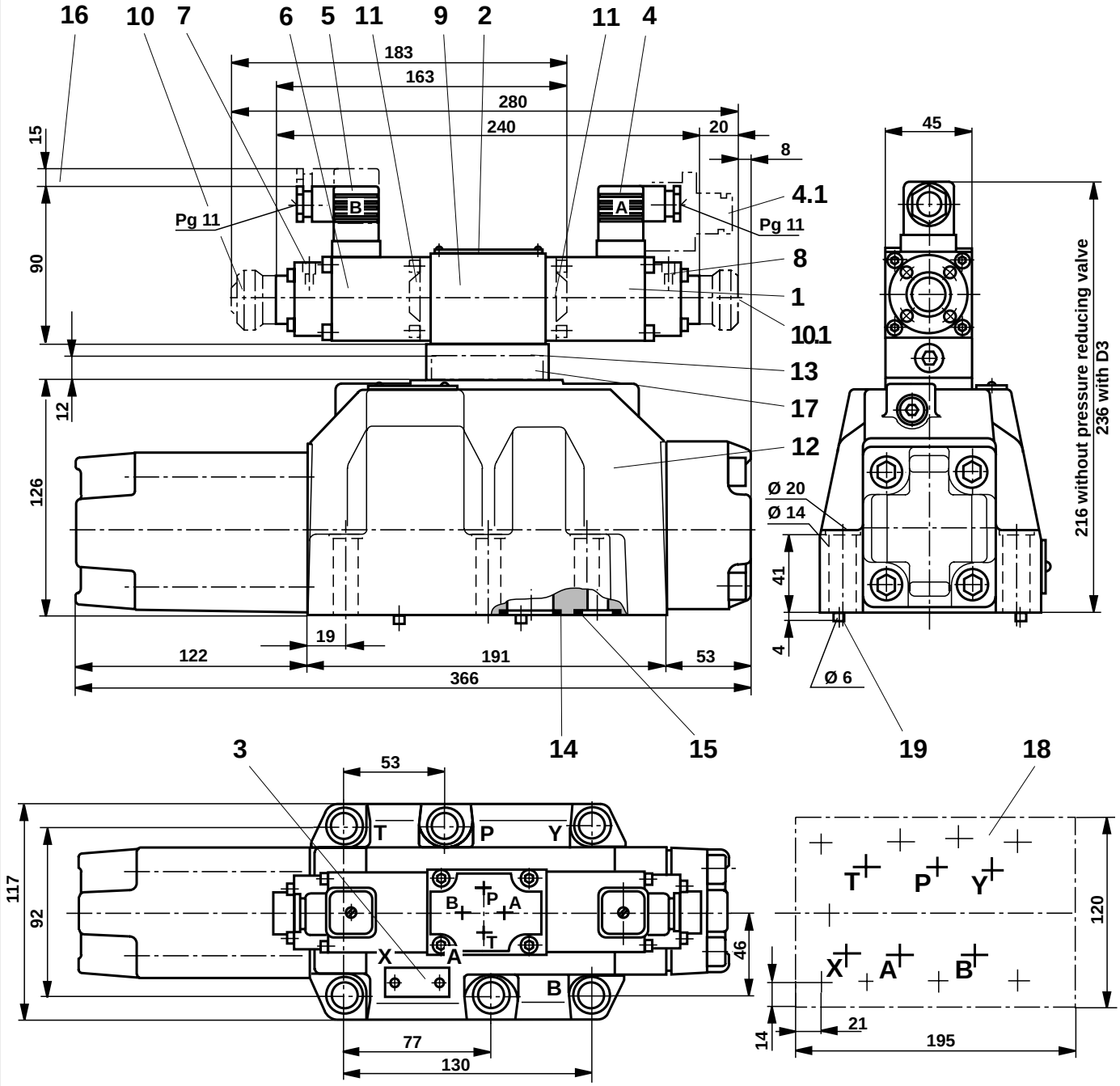


Required surface finish of mating piece

1 Proportional solenoid "a"
2 Name plate for pilot valve
3 Name plate for overall valve
4 Plug "A", colour grey
Order No.: 008 908
4.1 Plug "A",
sea water resistant type
(dimensions see page 17)
5 Plug "B", colour black
Order No.: 008 909
6 Proportional solenoid "b"
7 Bleed screw, solenoid "b"
8 Bleed screw, solenoid "a"
9 Pilot valve
10 Emergency operator "N"
10.1 Emergency operator "N9"
(concealed type)
11 Cover for single solenoid valves
(types "A" oder "B")
12 Main valve
13 Pressure reducing valve
14 R-ring 22,53 x 2,3 x 2,62;
Ports A, B, P, T
15 R-ring 10 x 2 x 2; Ports X, Y
16 Space required to remove plug
17 Interconnecting plate
(type 4WRH...)
18 Machined valve mounting surface,
position of ports to
DIN 24 340 form A, ISO 4401 and
CETOP-RP121H
19 Locating pin

Unit dimensions Size 25

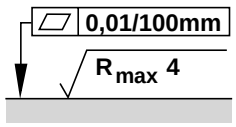
(Dimensions in mm)



Subplates to data sheet RE 45 058 and valve fixing screws must be ordered separately.

Subplates: G 151/01 (G 1)
G 154/01 (G 1 1/4); G 154/08 (Flange)
G 156/01 (G 1 1/2)

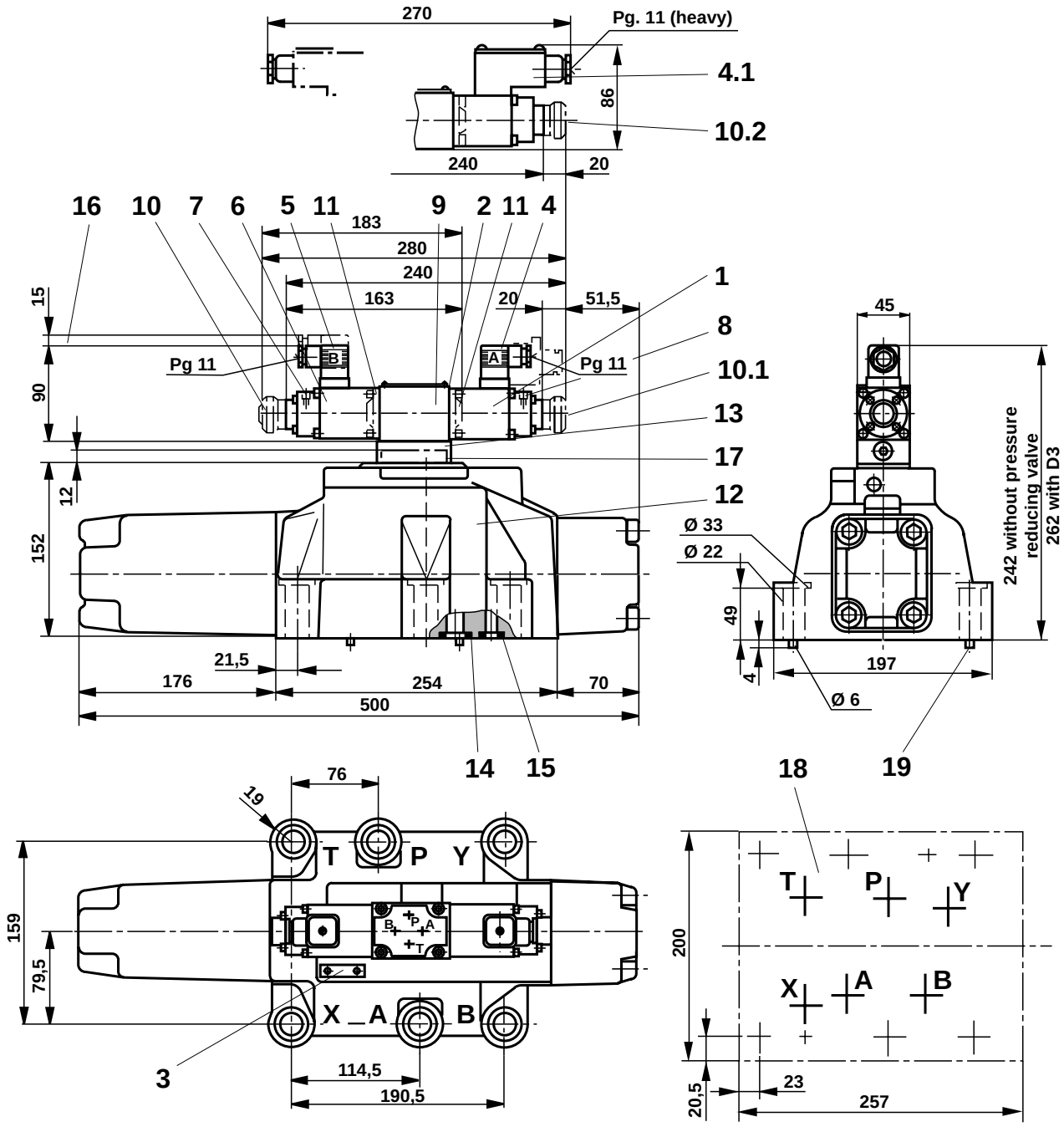
Valve fixing screws:
6 off M12 x 60 DIN 912-10.9; M_A = 130 Nm



Required surface finish of mating piece

1 Proportional solenoid "a"
2 Name plate for pilot valve
3 Name plate for overall valve
4 Plug "A", colour grey
Order No.: 008 908
4.1 Plug "A",
Sea water resistant type
(dimensions see page 17)
5 Plug "B", colour black
Order No.: 008 909
6 Proportional solenoid "b"
7 Bleed screw, solenoid "b"
8 Bleed screw, solenoid "a"
9 Pilot valve
10 Emergency operator "N"
10.1 Emergency operator "N9"
(concealed type)
11 Cover for single solenoid valves
(types "A" or "B")
12 Main valve
13 Pressure reducing valve
14 R-ring 27,8 x 2,6 x 3 (O-Ring 27 x 3);
Ports A, B, P, T
15 R-ring 19 x 3 x 3 (O-ring 19 x 3);
Ports X, Y
16 Space required to remove plug
17 Interconnecting plate
(type 4WRH...)
18 Machined valve mounting surface,
position of ports to
DIN 24 340 form A, ISO 4401 and
CETOP-RP121H
19 Locating pin

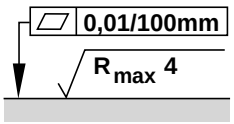
Unit dimensions Size 32 (Dimensions in mm)



Subplates to data sheet RE 45 060 and valve fixing screws must be ordered separately.

Subplates: G 157/01 (G 1 1/2)
G 157/02 (M48 x 2)
G 158/10 (G 1 1/2) (Flange)

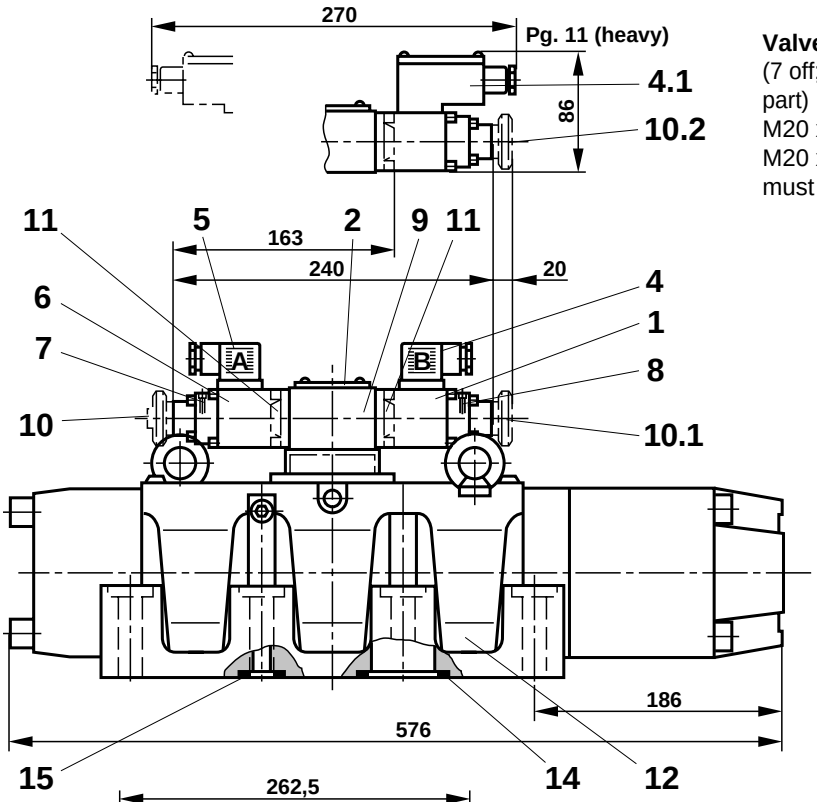
Valve fixing screws:
6 off M20 x 80 DIN 912-10.9; M_A = 430 Nm



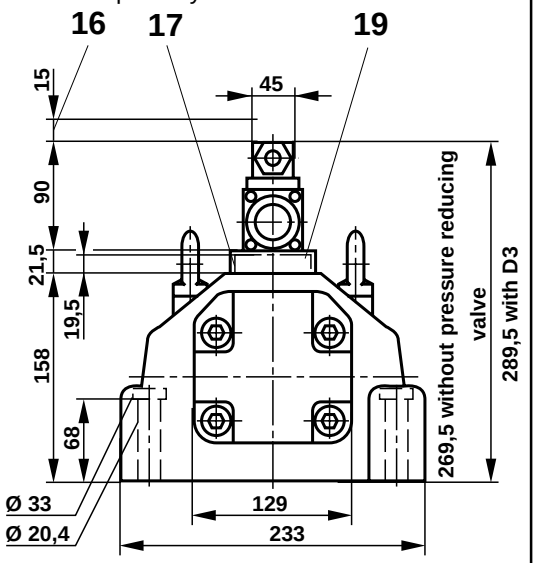
Required surface finish of mating piece

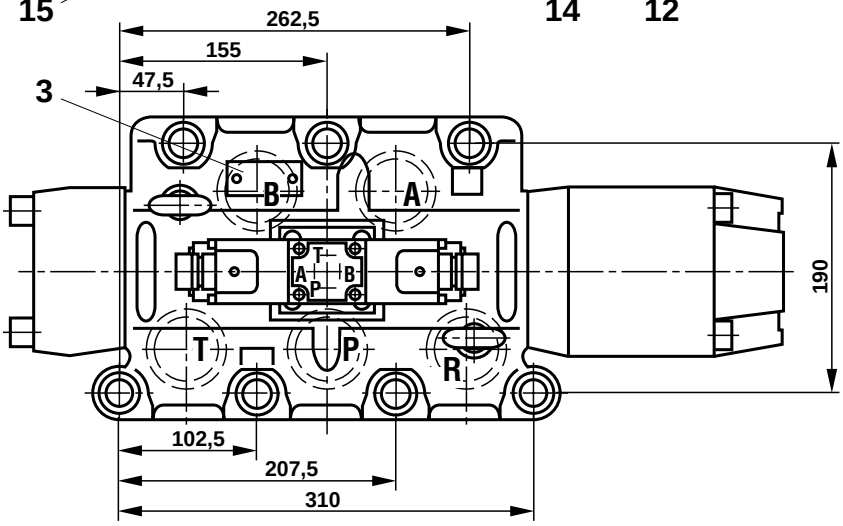
1 Proportional solenoid "a"
2 Name plate for pilot valve
3 Name plate for overall valve
4 Plug "A", colour grey
Order No.: 008 908
4.1 Plug "A",
Sea water resistant type
(dimensions see page 17)
5 Plug "B", colour black
Order No.: 008 909
6 Proportional solenoid "b"
7 Bleed screw, solenoid "b"
8 Bleed screw, solenoid "a"
9 Pilot valve
10 Emergency operator "N"
10.1 Emergency operator "N9"
(concealed type)
10.2 Emergency operator "N"
(sea water resistant type)
11 Cover of singe solenoid valves
(types "A" or "B")
12 Main valve
13 Pressure reducing valve
14 R-ring 42,5 x 3 x 3 (O-ring 42 x 3);
Ports A, B, P, T
15 R-ring 19 x 3 x 3 (O-ring 19 x 3);
Ports X, Y
16 Space required to remove plug
17 Interconnecting plate
(type 4WRH...)
18 Machined valve mounting plate,
position of ports to
DIN 24 340 form A, ISO 4401 and
CETOP-RP121H
19 Locating pin

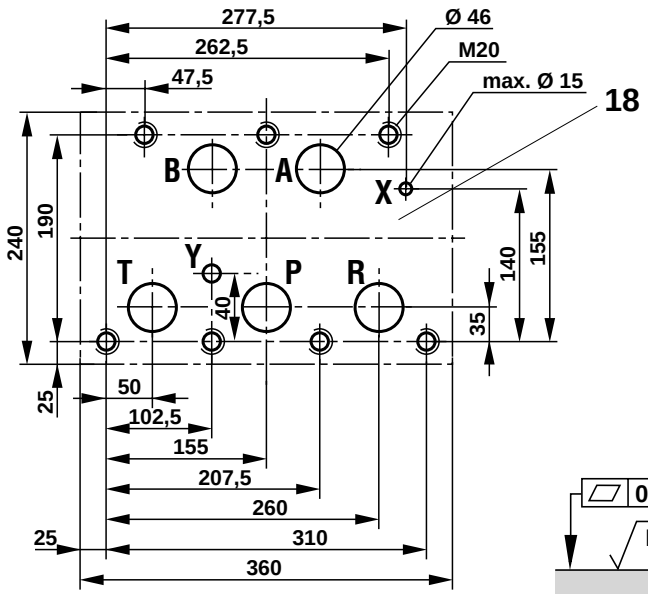
Unit dimensions Size 52 (subplate mounting) (Dimensions in mm)

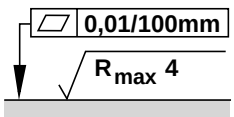


Valve fixing screws
(7 off; length is dependant on the material of the adjoining part)
M20 x 90 DIN 912-10.9; M_A = 610 Nm (for steel) **or**
M20 x 100 DIN 912-10.9; M_A = 610 Nm (for cast iron)
must be ordered separately.





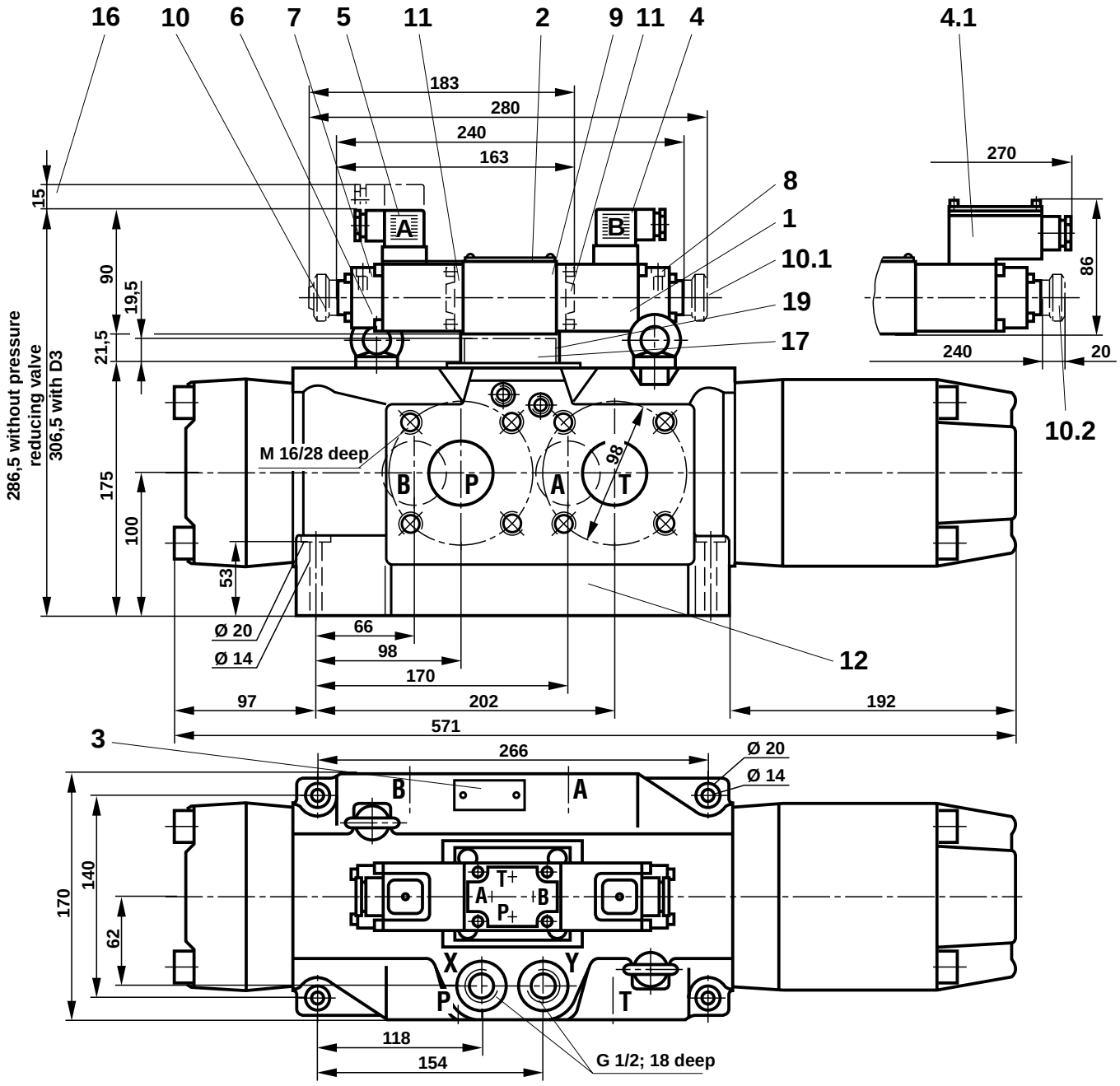




Required surface finish of mating piece

1 Proportional solenoid "b"
2 Name plate for pilot valve
3 Name plate for overall valve
4 Plug "B", colour black
Order No.: 008 909
4.1 Electrical connection "B",
(sea water resistant type)
5 Plug "A", colour grey
Order No.: 008 908
6 Proportional solenoid "a"
7 Bleed screw, solenoid "a"
8 Bleed screw, solenoid "b"
9 Pilot valve
10 Emergency operator "N"
10.1 Emergency operator "N9"
(concealed type)
10.2 Emergency operator "N"
(sea water resistant type)
11 Cover for single solenoid valves
(types "A" or "B")
12 Main valve
14 R-ring 54,5 x 3,53 x 3,53
(O-ring 53,57 x 3,53);
Ports A, B, P, T,R
15 R-ring 18,64 x 3,53 x 3,53
(O-ring 18,66 x 3,53);
Ports X, Y, L
16 Space required to remove plug
17 Interconnecting plate
(type 4WRH...)
18 Machined valve mounting surface,
position of ports to DIN 24 340
form A, ISO 4401 and
CETOP-RP 121 H
19 Adaptor plate

Unit dimensions Size 52 (Flange connection) (Dimensions in mm)



Mounting flanges to data sheet RE 45 501 and
Valve fixing screws
4 off M12 x 70 DIN 912-10.9; M_A =130 Nm
must be ordered separately.

1 Proportional solenoid "b"
2 Name plate for pilot valve
3 Name plate for overall valve
4 Plug "B",colour black
Order No.: 008 909
4.1 Plug "B",
sea water resistant type
(dimensions see page 17)
5 Page "A", colour grey
Order No.: 008 908
6 Proportional solenoid "a"
7 Bleed screw, solenoid "a"
8 Bleed screw, solenoid "b"
9 Pilot valve
10 Emergency operator "N"
10.1 Emergency operator "N9"
(concealed type)
10.2 Emergency operator "N"
(sea water resistant type)
11 Cover for single solenoid valves
(types "A" or "B")
12 Main valve
16 Space required to remove plugs
17 Interconnecting plate
(type 4WRH...)
19 Adaptor plate

Pilot oil supply

Type 4WRZ…-../… and **Pilot oil feed external**
Type 4WRH…-../… **Pilot oil drain external**

With this model pilot oil feed is from a separate control circuit (external).
Pilot oil discharge is not via the T line on the main valve, but is routed separately into the tank via port Y (external).

Type 4WRZ…-../…E… **Pilot oil feed internal**
Pilot oil drain external

With this model pilot oil feed is from the P line on the main valve (internal).
Pilot oil discharge is not via the T line on the main valve, but is routed separately into the tank via port Y (external).
Port X should be closed on the subplate.

Type 4WRZ…-../…ET… **Pilot oil feed internal**
Pilot oil drain internal

On this model pilot oil feed is from the P line on the main valve (internal).
The pilot oil discharge is direct into the T line on the main valve (internal).
Ports X and Y should be closed on the subplate.

Type 4WRZ…-../…T… **Pilot oil feed external**
Pilot oil drain internal

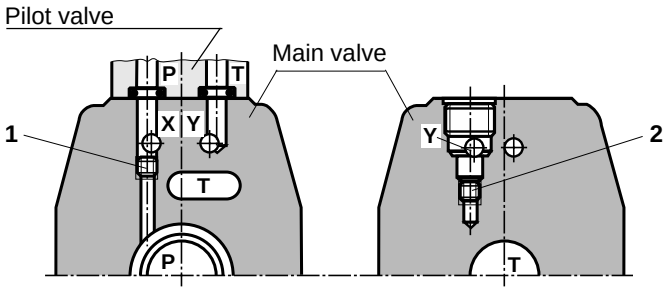
On this model pilot oil feed is from a separate control circuit (external).
Pilot oil discharge is directly into the T line on the main valve (internal).
Port Y is closed on the subplate.

Items **1** and **2**: Plug M6 DIN 906-8.8 A/F 3

For section see page 3

Size 10

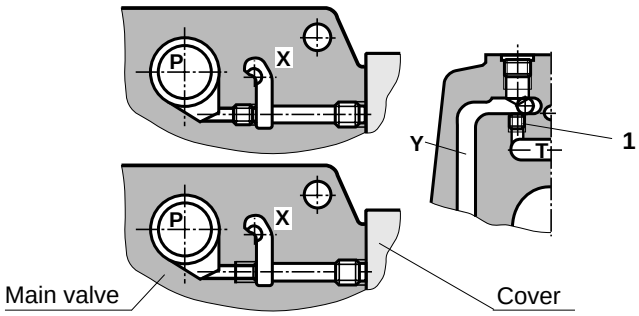
Section **A – A** Section **B – B**



Pilot oil feed	external:	1	closed
	internal:	1	open
Pilot oil drain	external:	2	closed
	internal:	2	open

Size 16

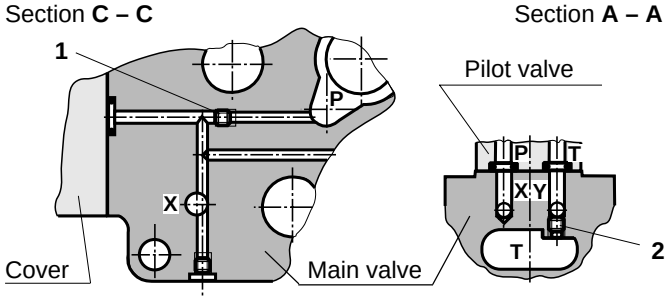
Section **D – D** Section **B – B**



Pilot oil feed	external:	P	closed
	internal:	P	open
Pilot oil drain	external:	1	closed
	internal:	1	open

Size 25

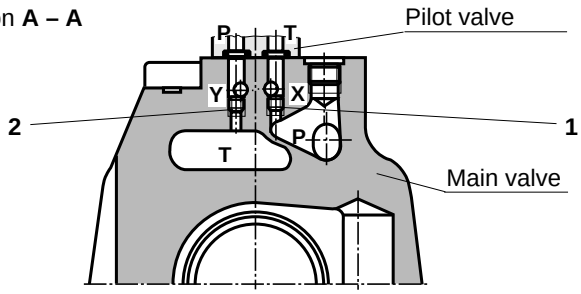
Section **C – C** Section **A – A**



Pilot oil feed	external:	1	closed
	internal:	1	open
Pilot oil drain	external:	2	closed
	internal:	2	open

Size 32

Section **A – A**



Pilot oil feed	external:	1	closed
	internal:	1	open
Pilot oil drain	external:	2	closed
	internal:	2	open

Plug-in throttle valves

When using a proportional directional valve type 4 WRZ... the following plug-in throttle valves should be used in lines A and B:

Size	10	16	25	32	52
Ø in mm	2,0	2,0	2,8	–	–
Part No.	158 547	158 547	157 948	–	–

Electronic control: electrical amplifier type VT 3000, Series 3X (separate order)

Technical data

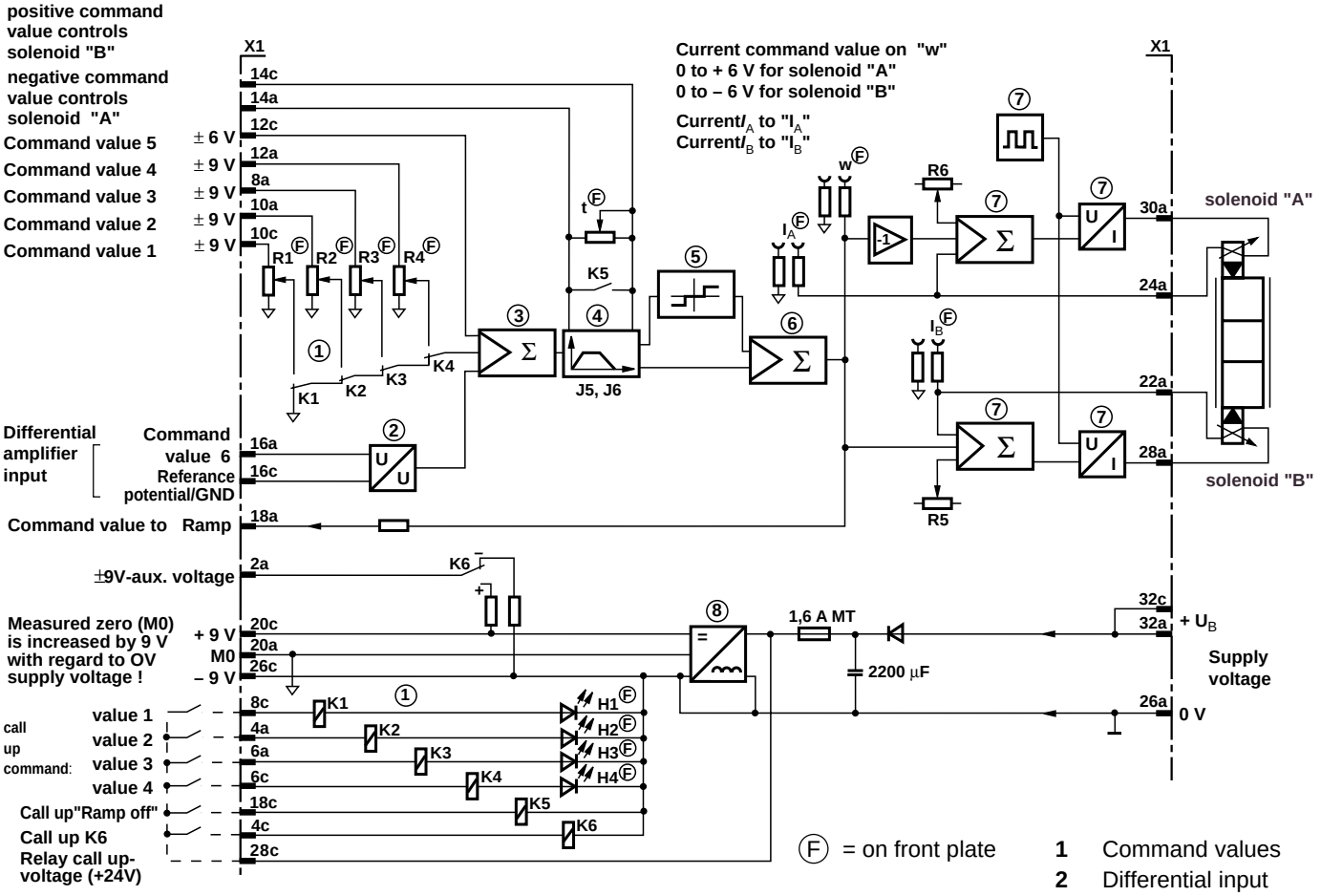
Supply voltage	U_B:	24 VDC; + 60 %; – 5 %
– upper limiting value	$u_B(t)_{max}$:	39 V
– lower limiting value	$u_B(t)_{min}$:	22 V
Pilot current	I:	20 mA ± 25 %
Max. output current	I_{max}:	800 mA

Card dimensions:	Eurocard 100 x 160 mm DIN 41 494
Front plate dimensions	
– Height:	3 HE (128,4 mm)
– Width conductor side:	1 TE (5,08 mm)
– Width conponent side:	7 TE

For applications outside these parameters, please consult us!

Detailed information: Data sheet RE 29 935

Block diagram/Terminal connections



Ⓕ = on front plate

H1 to **H4** = LED display for selecting command value

K1 to **K6** = Call-up relay

R1 to **R4** = Command values

R5 = Pilot current solenoid "B"

R6 = Pilot current solenoid "A"

t = Ramp time

1 Command values
2 Differential input
3; **6** Summator
4 Ramp generator
5 Step function
7 Current amplifier with pulse generator
8 Power supply

Order codes

VT 3000 – 3X/ *

Amplifier for proportional valves without positional feed back

Series 30 to 39 **= 3X**
(Series 30 to 39: unchanged technical data and connection definitions)

Further details in clear text

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