

**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**RE
29 113/09.95**

Replaces: 07.93

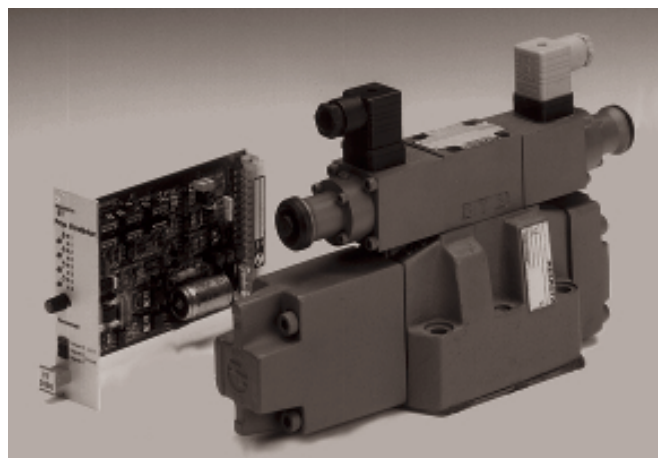
Size 10 to 52

up to 350 bar

up to 2800 L/min

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 centring
- 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)

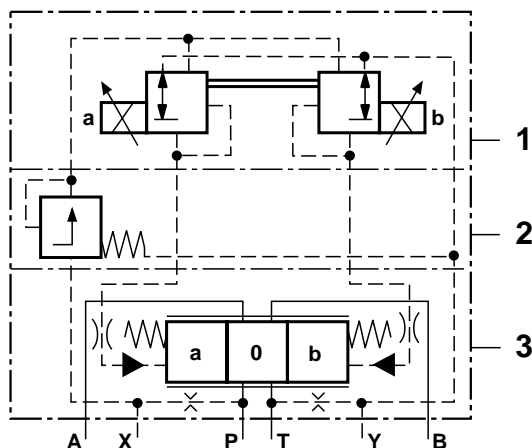
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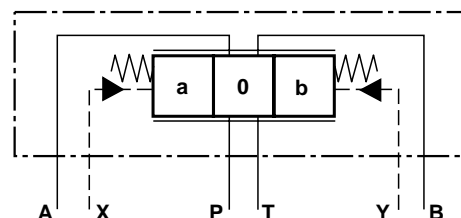
Symbols (detailed)

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.

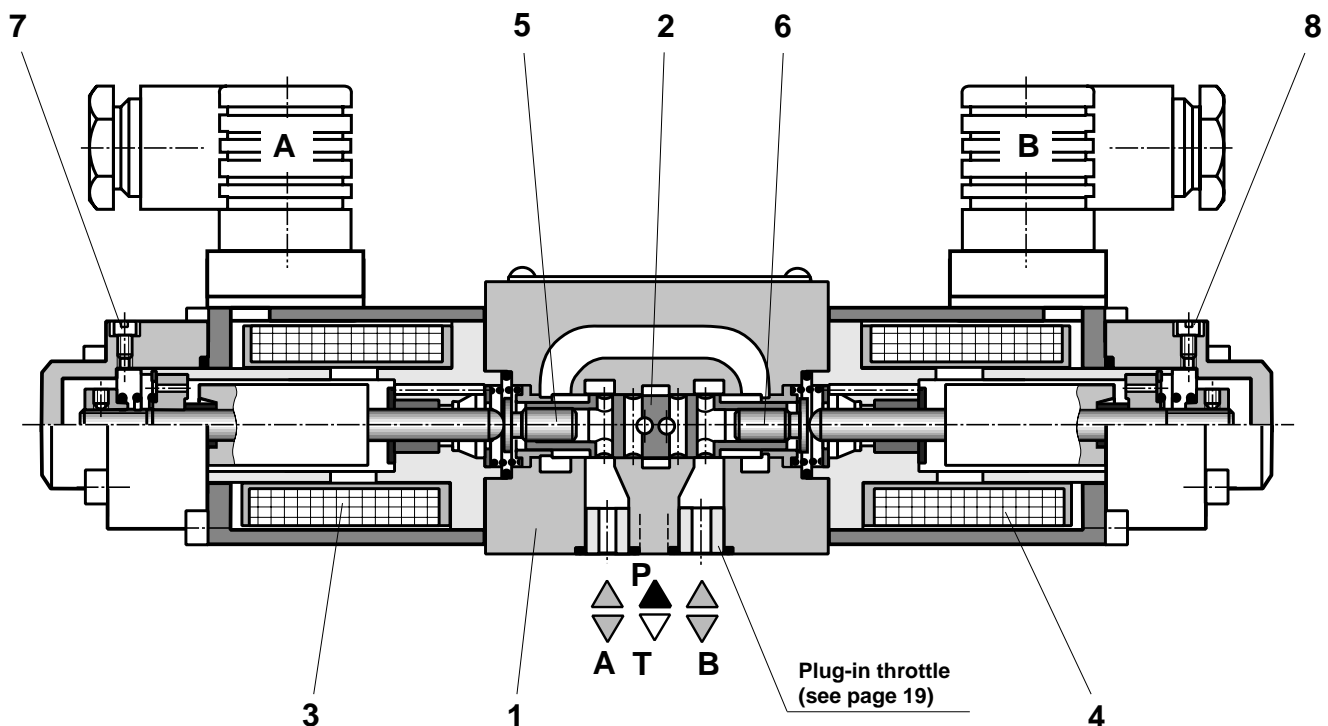
The pressure fluid can flow via the connection from B to T and the pressure reduces accordingly.

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.

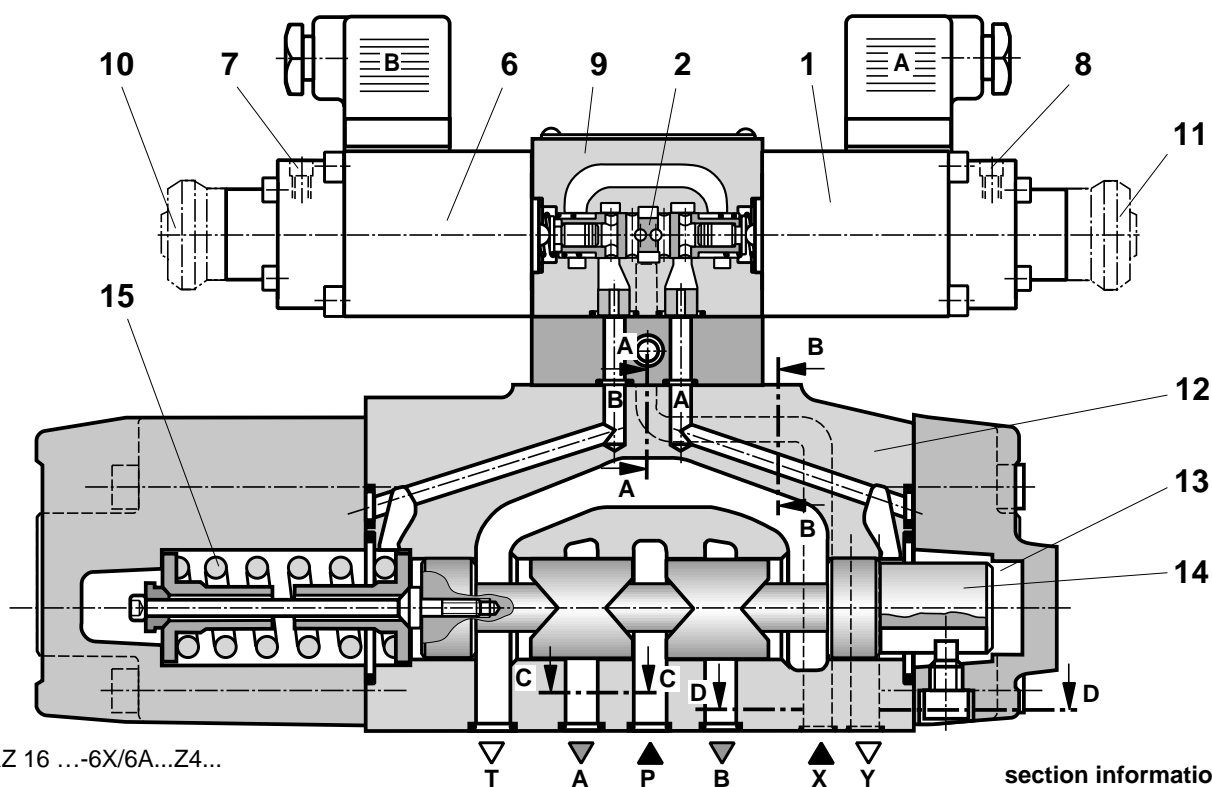
Size 52 sub-plate mounting 5-way valves are fitted with an additional "R" port. Depending on the spool position, fluid flows from P to A and B to T or P to B and A to R.

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...

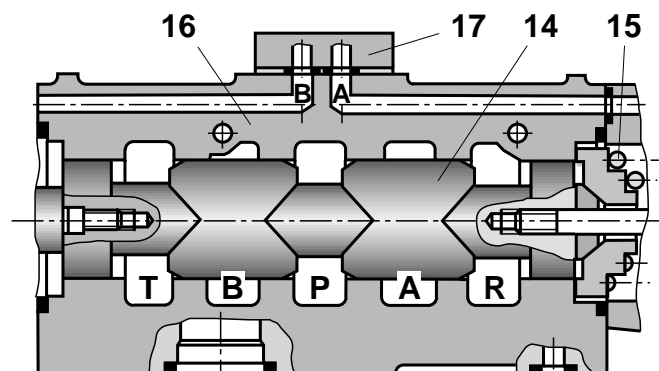
Proportional directional valves with external pilot operation Types 4WRH... and 5WRH...

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)!

section information
see page 19



Type 5WRH 52 ...-5X/...

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

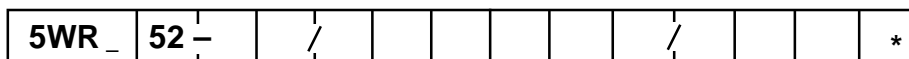
4WR _		-	/	/	*																				
Hydraulic operation = H Electro-hydraulic operation = Z Size 10 = 10 Size 16 = 16 Size 25 = 25 Size 32 = 32 Size 52 = 52	Symbols 																								
Further details in clear text No code = O-Ring ⁵⁾ R = R-Ring M = NBR seals, suitable for mineral oil (HL, HLP) to DIN 51 524 V = FPM seals, suitable for phosphate ester (HFD-R) No code = without pressure reducing valve D3 = with reducing valve type ZDR 6DP0-4X/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)																									
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																									
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10%;">5X =</td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;"></td> <td style="width: 10%;">series 50 to 59 (sizes 10, 25, 32, 52) (50 to 59: externally interchangeable)</td> </tr> <tr> <td>6X =</td> <td></td> <td></td> <td></td> <td></td> <td>series 60 to 69 (size 16 only) (60 to 69: externally interchangeable)</td> </tr> </table>						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)								
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Nominal flow in L/min with a 10 bar valve pressure drop <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 15%;">25 =</td> <td style="width: 15%;">50 =</td> <td style="width: 15%;">85 = ¹⁾</td> <td style="width: 55%;">for size 10</td> </tr> <tr> <td></td> <td>100 =</td> <td>150 = ¹⁾</td> <td>for size 16</td> </tr> <tr> <td></td> <td>220 =</td> <td>325 = ¹⁾</td> <td>for size 25</td> </tr> <tr> <td></td> <td>360 =</td> <td>520 = ¹⁾</td> <td>for size 32</td> </tr> <tr> <td></td> <td></td> <td>1000 = ¹⁾</td> <td>for size 52</td> </tr> </table> <p style="text-align: right;">¹⁾ E2- and W2- possible only with max. flow $q_{V \max}$</p>						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
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																						

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!

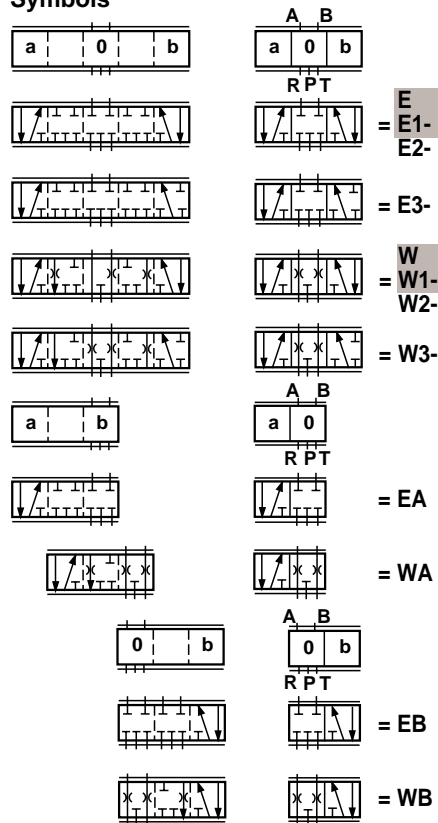
Valve types which are marked in grey are readily available!

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



Hydraulic operation = H
 Electro-hydraulic operation = Z
 Size 52 = 52

Symbols



With symbols E1- and W1-:
 P to A: $q_v = 1000 \text{ L/min}$ B to T: $q_v = 500 \text{ L/min}$
 P to B: $q_v = 500 \text{ L/min}$ A to R: $q_v = 1000 \text{ L/min}$

With symbols E2- and W2-:
 P to A: $q_v = 500 \text{ L/min}$ B to T: $q_v = 1000 \text{ L/min}$
 P to B: $q_v = 1000 \text{ L/min}$ A to R: $q_v = 500 \text{ L/min}$

With symbols E3- and W3-:
 P to A: $q_v = 1000 \text{ L/min}$ B to T: closed
 P to B: $q_v = 500 \text{ L/min}$ A to R: $q_v = 1000 \text{ L/min}$
 (Regenerative circuit, base of spool at port A)

Note:
 – Pilot oil feed and discharge only possible externally
 – 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.

Valve types which are marked in grey are readily available!

Further details in clear text

No code = O-Ring
 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 pressure reducing valve type ZDR 6 DP0-4X/40YM-W80 ¹⁾ (fixed setting)

Electrical connection
Z4 = angled plug to DIN 43 650 ^{1,2)}
K4 = without angled plug

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)}

Electronic control supply voltage
12 = 12 volt DC (on request) ¹⁾
24 = 24 volt DC (standard design) ¹⁾

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

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

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

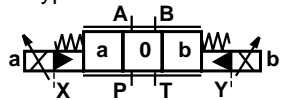
1) Omitted on 5WRH and 5WRZ without pilot valve.
 2) Cannot be supplied in seawater resistant design "J".
 3) **Note:** Accidental activation of the emergency operator may result in uncontrolled machine movements.

Special electrical insulation on request!

Technical data (For applications outside these parameters, please consult us!)						
General						
Installation position			optional, preferably horizontal (for commissioning 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 $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ °C}$)						
Operating pressure			Size 10	Size 16	Size 25	Size 32
– Pilot valve, Pilot oil feed external			30 to 100			20 to 100
Pilot oil feed internal						–
– Main valve			100 to 315 only with "D3"			
			up to 315	up to 350	up to 350	up to 350
Return line pressure – Port T (port R) (Pilot oil drain external)			up to 315	up to 250	up to 250	up to 150
– Port T (Pilot oil drain internal)			up to 30	up to 30	up to 30	up to 30
– Port Y			up to 30	up to 30	up to 30	up to 30
Pilot oil volume for spool movement 0 → 100 %			cm ³ 1,7	4,6	10	26,5
Pilot oil flow at ports X and Y at stepped input signals 0 → 100 %			L/min 3,5	5,5	7	15,9
Flow through main valve			L/min up to 170	up to 460	up to 870	up to 1600
Degree of fluid contamination			Maximum 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 $\beta_{5} \geq 75$ for the pilot stage; and $\beta_{15} \geq 75$ for the main stage			
Hydraulic fluid			Mineral oil (HL, HLP) to DIN 51 524 Phosphate ester (HFD-R)			
Hydraulic fluid temperature range			°C – 20 to +70			
Viscosity range			mm ² /s 20 to 380			
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)			

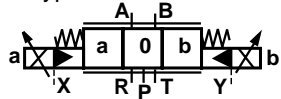
Symbols (simplified)

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



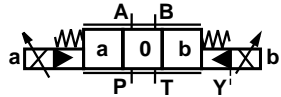
X = external
Y = external

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



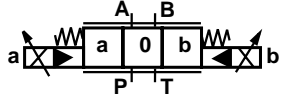
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Type 4WRZ...-.../...E..



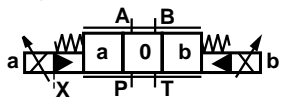
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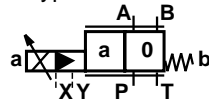
X = internal
Y = internal

Type 4WRZ...-.../...T..

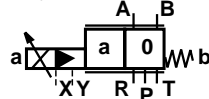


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Y = internal

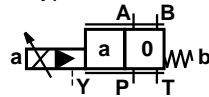
Type 4WRZ..A-.../... and
Type 4WRZ 52 A-...-...F/...



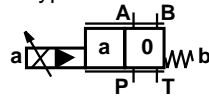
Type 5WRZ 52 A-...-.../...



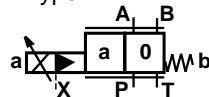
Type 4WRZ.A-...-.../...E..



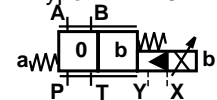
Type 4WRZ.A-...-.../...ET..



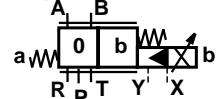
Type 4WRZ.A-...-.../...T..



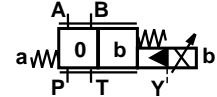
Type 4WRZ ..B-.../... and
Type 4WRZ 52 B-...-...F/...



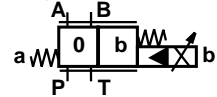
Type 5WRZ 52 B-...-.../...



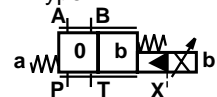
Type 4WRZ.A-...-.../...E..



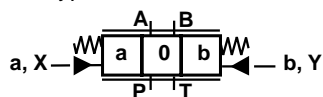
Type 4WRZ.B-...-.../...ET..



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

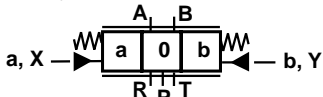


Type 4WRH ...-.../... and
Type 4WRH 52 ...-...F/...



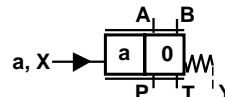
X = external
Y = external

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

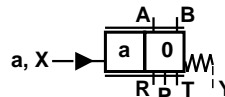


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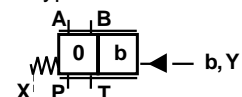
Type 4WRH ..A-...-.../... and
Type 4WRH 52 A-...-...F/...



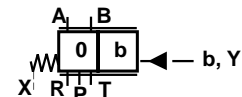
Type 5WRH 52 A-...-.../...



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

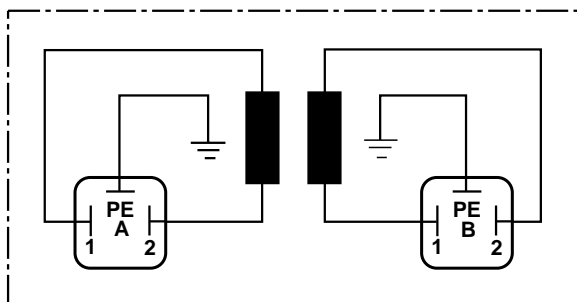


Type 5WRH 52 B-...-.../...

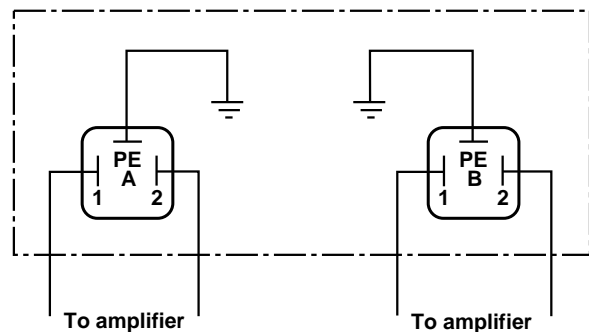


Electrical connections

Coil connection

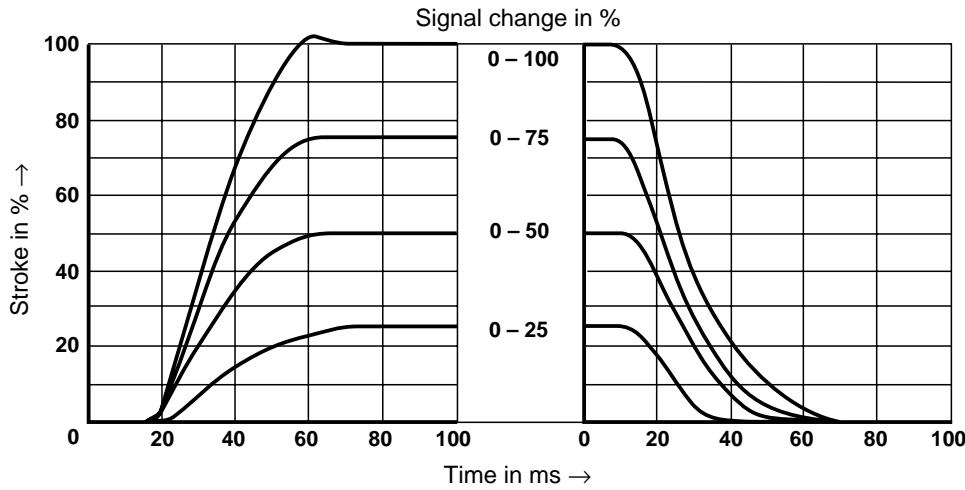


Plug connection

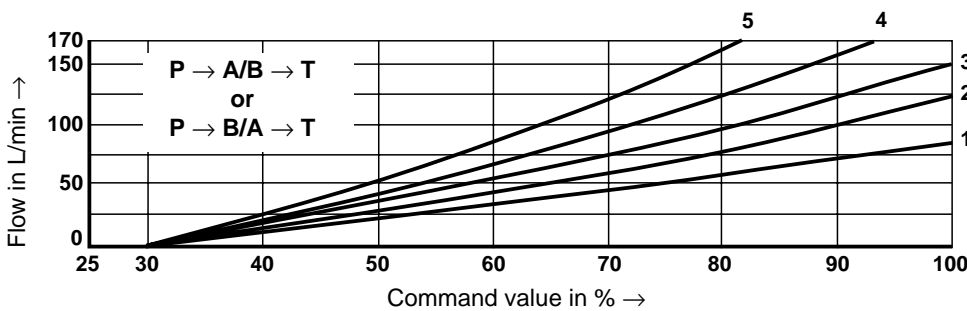
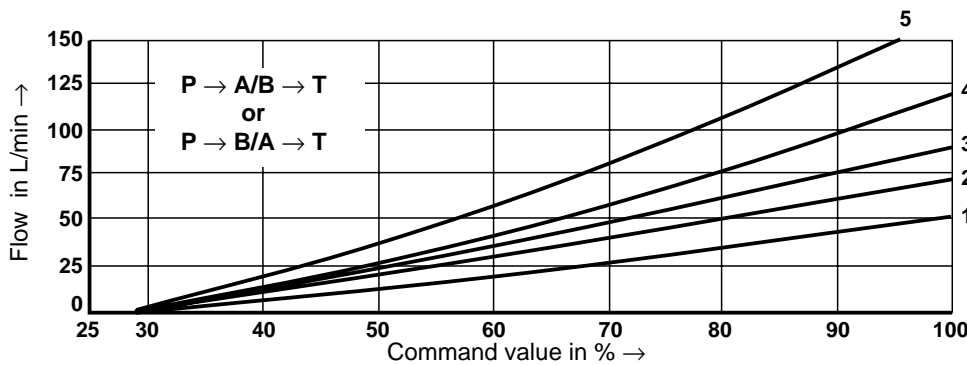
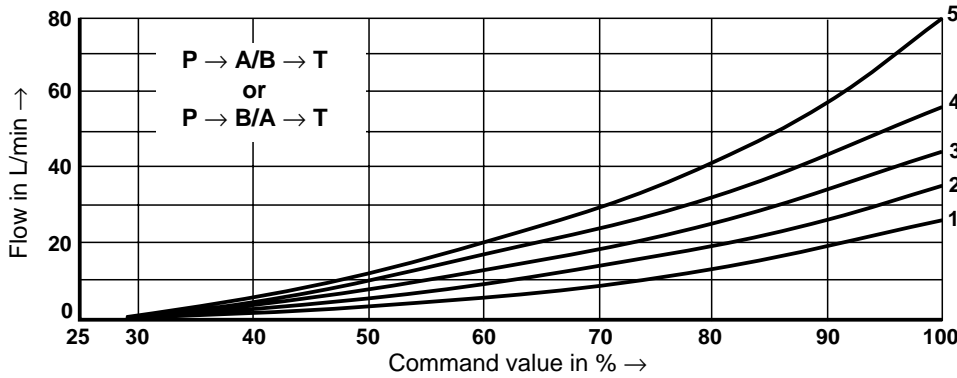


Transient function with stepped electrical input signals

Size 10



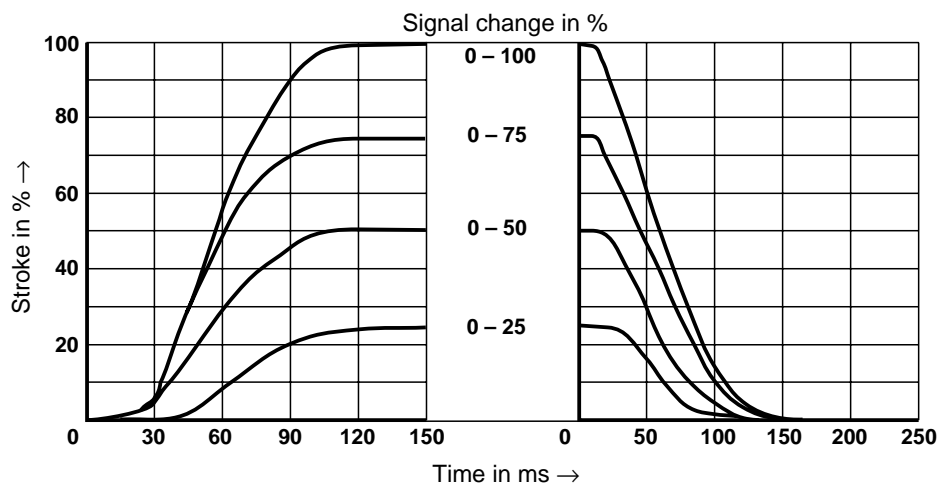
Technical Data (measured with spools "E, W, EA, WA, EB, WB" at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$) **Size 10**



$\Delta p =$ Valve pressure differential to DIN 24311 (Input pressure minus load pressure and return line pressure)

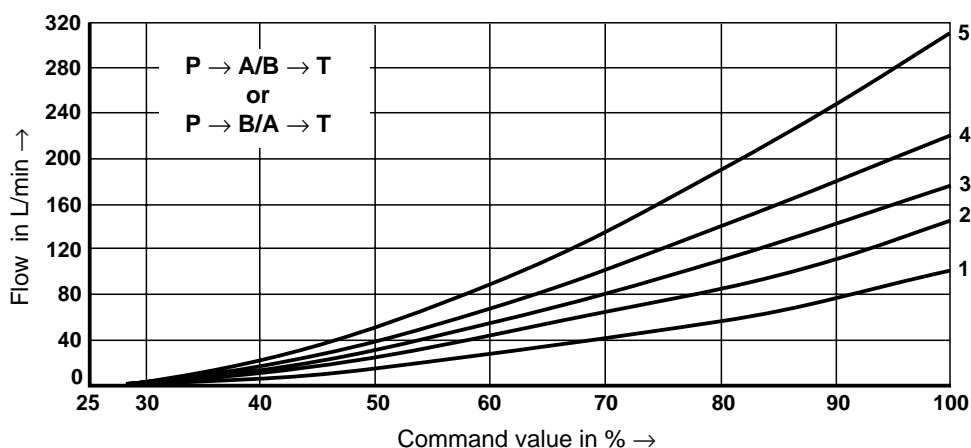
Transient function with stepped electrical input signals

Size 16



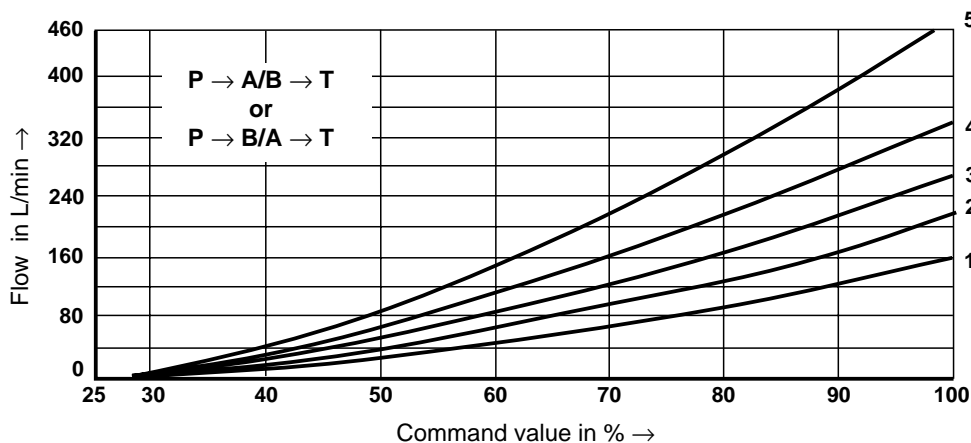
Pilot pressure $p = 50$ bar

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



100 L/min flow at 10 bar valve pressure differential

- 1 $\Delta p = 10$ bar constant
- 2 $\Delta p = 20$ bar constant
- 3 $\Delta p = 30$ bar constant
- 4 $\Delta p = 50$ bar constant
- 5 $\Delta p = 100$ bar constant



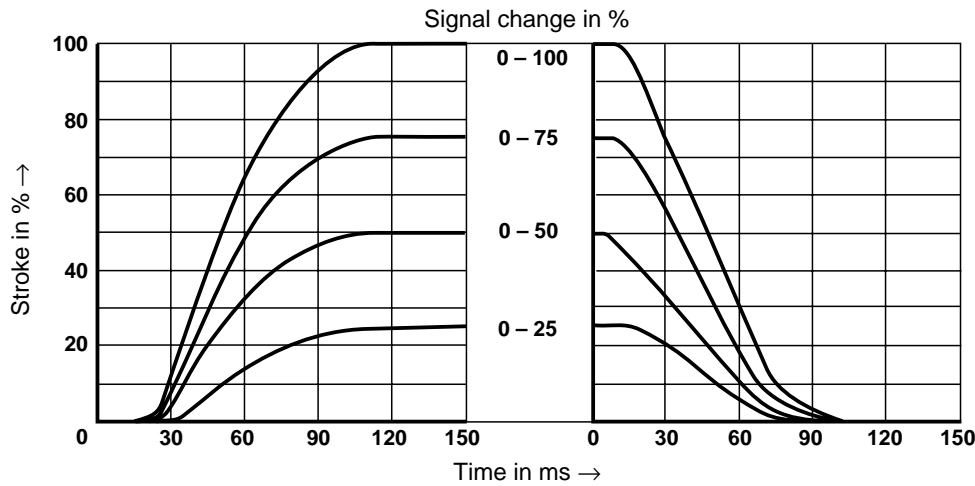
150 L/min flow at 10 bar valve pressure differential

- 1 $\Delta p = 10$ bar constant
- 2 $\Delta p = 20$ bar constant
- 3 $\Delta p = 30$ bar constant
- 4 $\Delta p = 50$ bar constant
- 5 $\Delta p = 100$ bar constant

$\Delta p =$ Valve pressure differential to DIN 24311 (Input pressure minus load pressure and return line pressure)

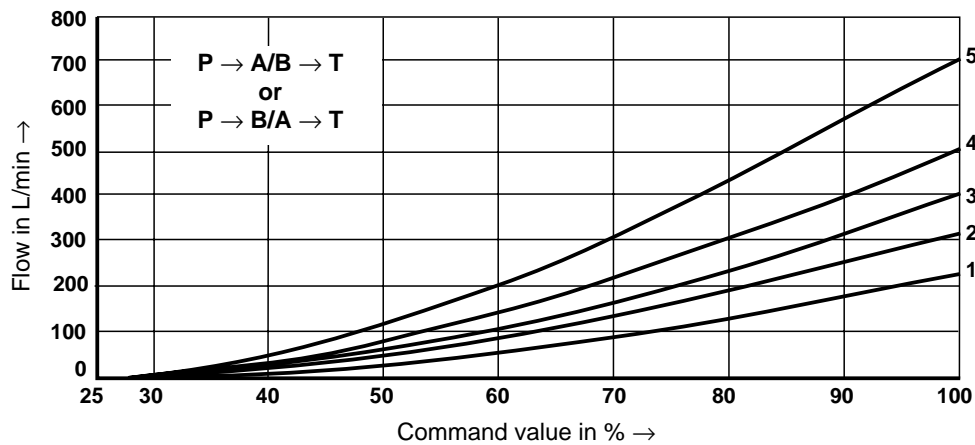
Transient function with stepped electrical input signals

Size 25



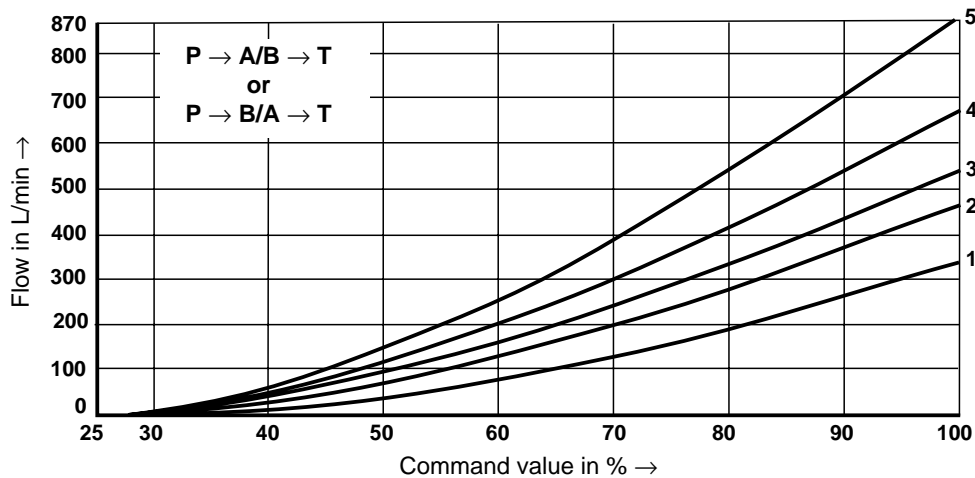
Pilot pressure $p = 50$ bar

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



220 L/min flow at 10 bar valve pressure differential

- 1 $\Delta p = 10$ bar constant
- 2 $\Delta p = 20$ bar constant
- 3 $\Delta p = 30$ bar constant
- 4 $\Delta p = 50$ bar constant
- 5 $\Delta p = 100$ bar constant



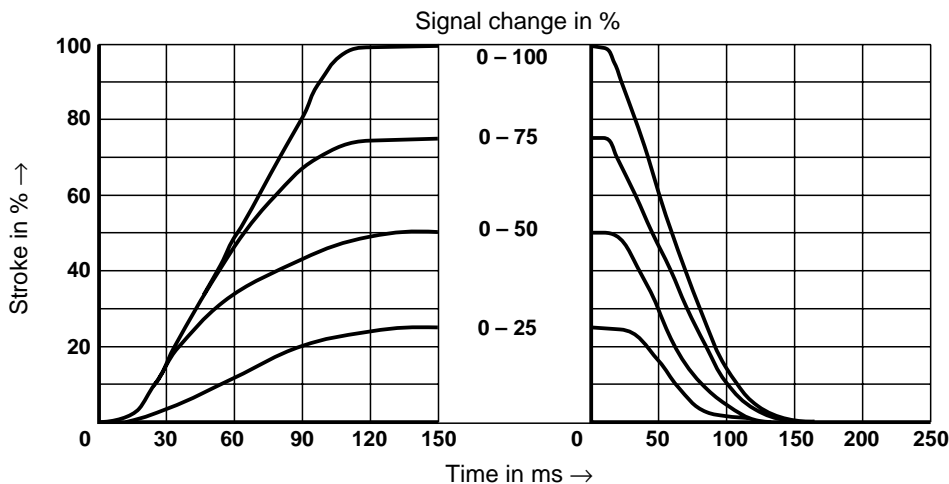
325 L/min flow at 10 bar valve pressure differential

- 1 $\Delta p = 10$ bar constant
- 2 $\Delta p = 20$ bar constant
- 3 $\Delta p = 30$ bar constant
- 4 $\Delta p = 50$ bar constant
- 5 $\Delta p = 100$ bar constant

$\Delta p =$ Valve pressure differential to DIN 24311 (Input pressure minus load pressure and return line pressure)

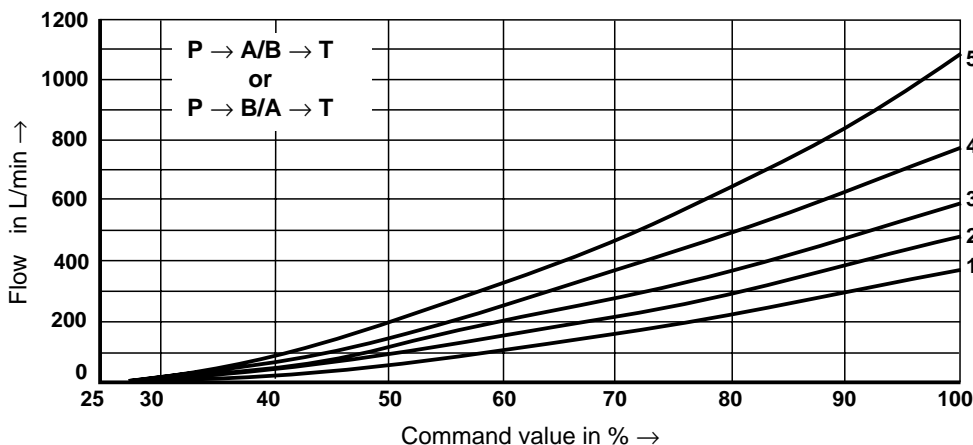
Transient function with stepped electrical input signals

Size 32



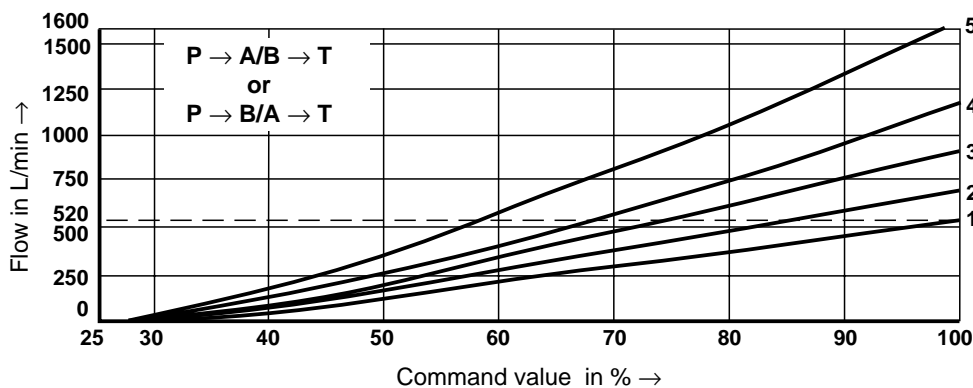
Pilot pressure $p = 50$ bar

Technical data (measured with spools "E, W, EA, WA, EB, WB" at $v = 41 \text{ mm}^2/\text{s}$ and $t = 50 \text{ }^\circ\text{C}$) **Size 32**



360 L/min flow at 10 bar valve pressure differential

- 1 $\Delta p = 10$ bar constant
- 2 $\Delta p = 20$ bar constant
- 3 $\Delta p = 30$ bar constant
- 4 $\Delta p = 50$ bar constant
- 5 $\Delta p = 100$ bar constant



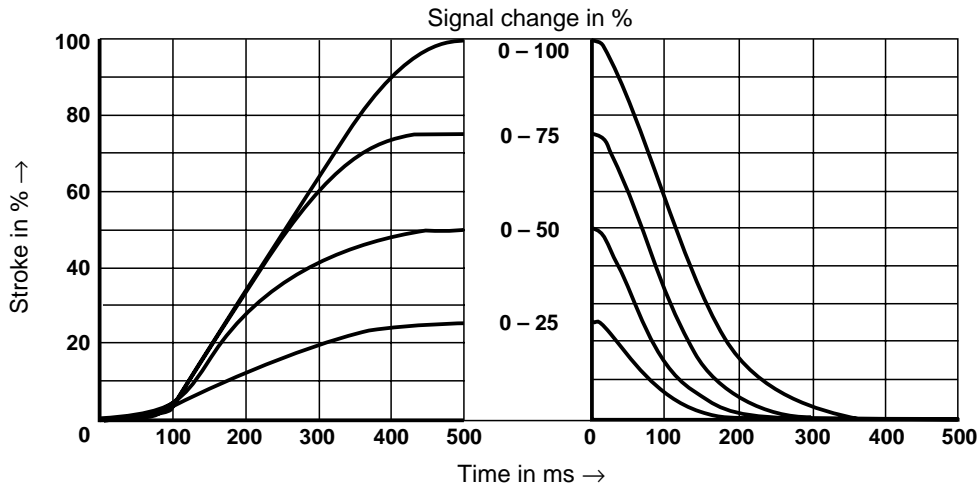
520 L/min flow at 10 bar valve pressure differential

- 1 $\Delta p = 10$ bar constant
- 2 $\Delta p = 20$ bar constant
- 3 $\Delta p = 30$ bar constant
- 4 $\Delta p = 50$ bar constant
- 5 $\Delta p = 100$ bar constant

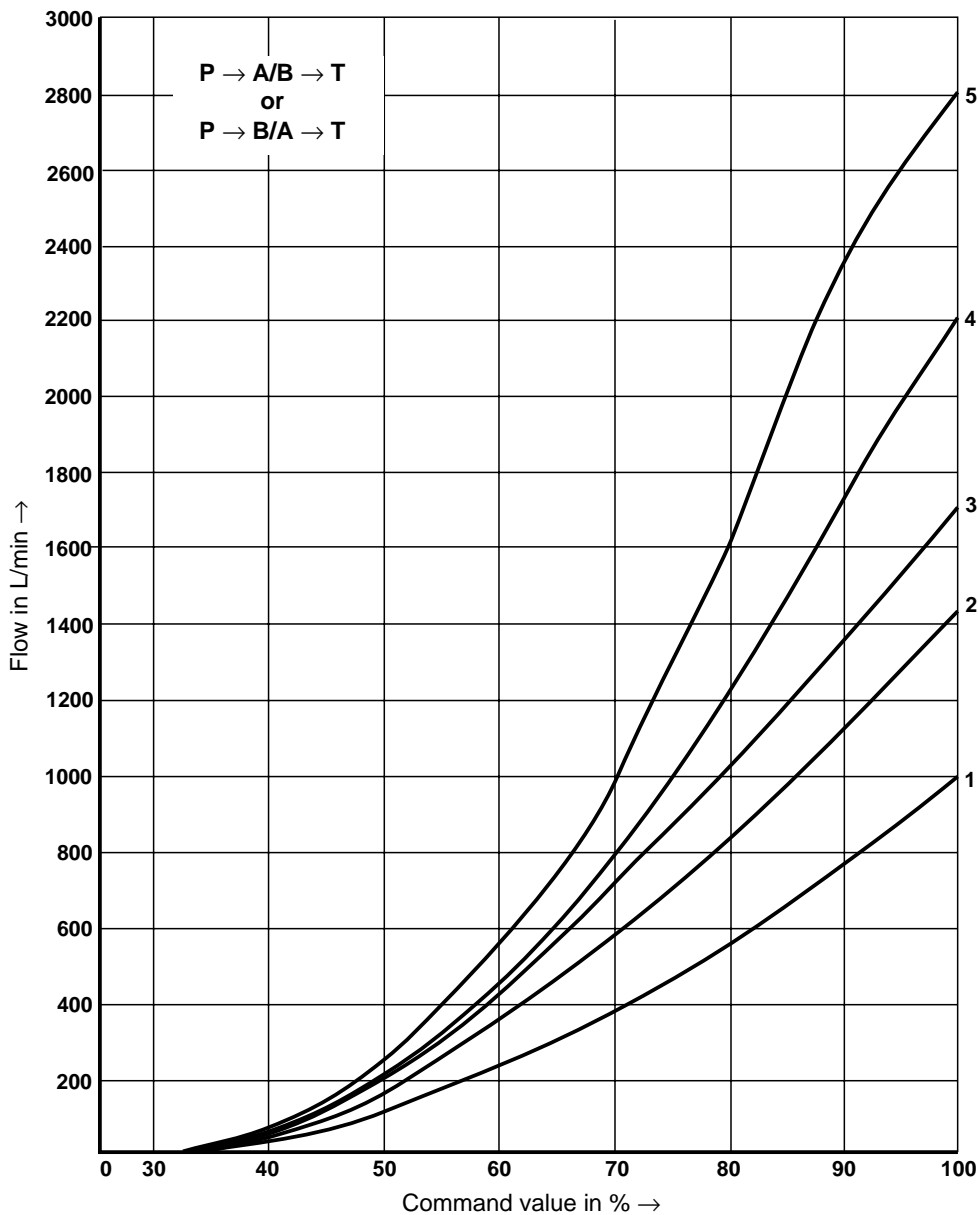
$\Delta p =$ Valve pressure differential to DIN 24311 (Input pressure minus load pressure and return line pressure)

Transient function with stepped electrical input signals

Size 52



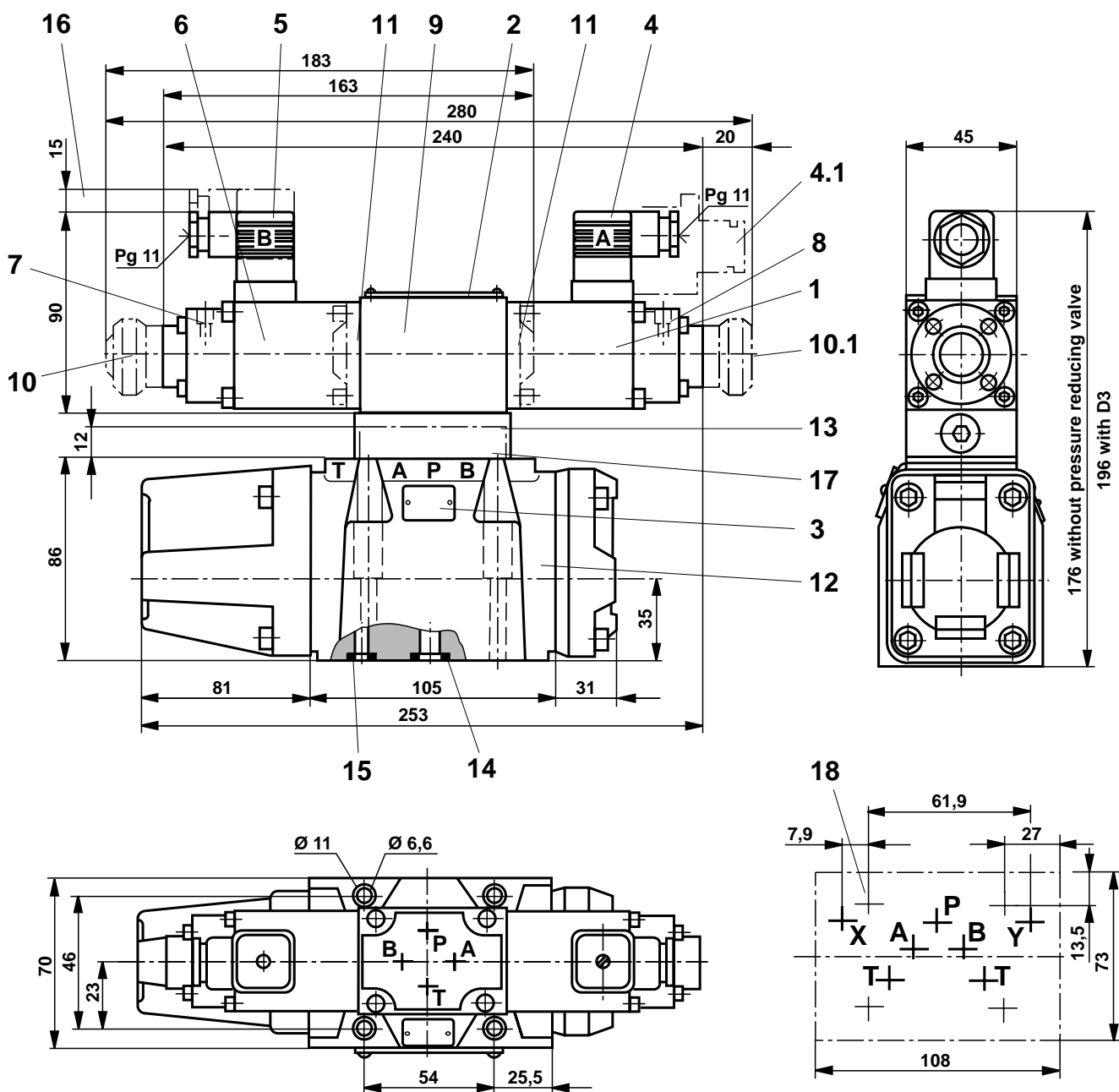
Technical data (measured with spools "E, W, EA, WA, EB, WB" at $v = 41$ mm²/s and $t = 50$ °C) **Size 52**



$\Delta p =$ Valve pressure differential to DIN 24 311 (Input pressure minus load pressure and return line pressure)

Unit dimensions Size 10

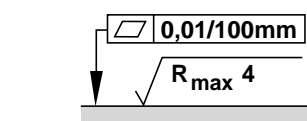
(Dimensions in mm)



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; $M_A = 15,5 \text{ Nm}$

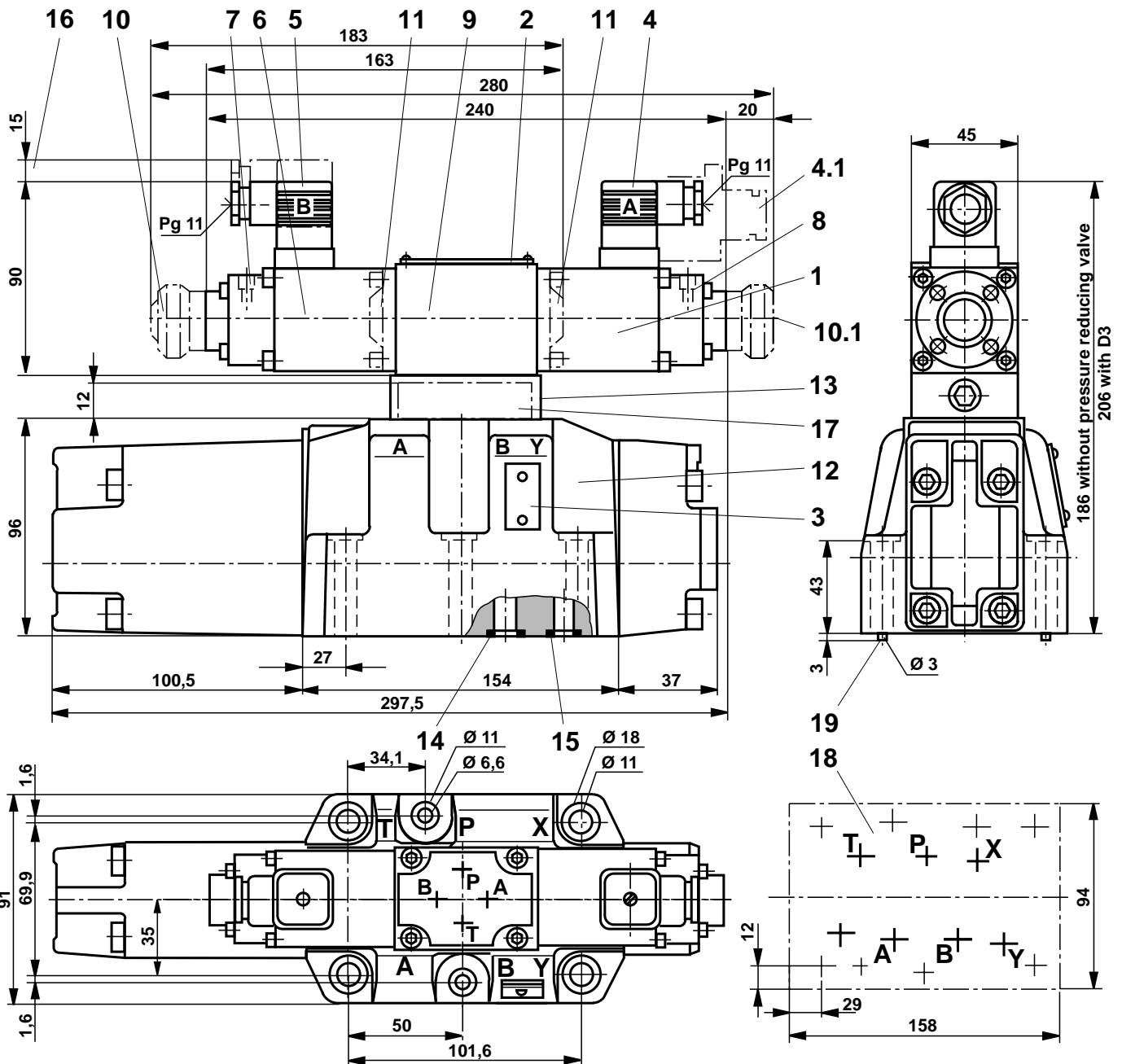


Required surface finish of mating piece

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

Unit dimensions Size 16

(Dimensions in mm)



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

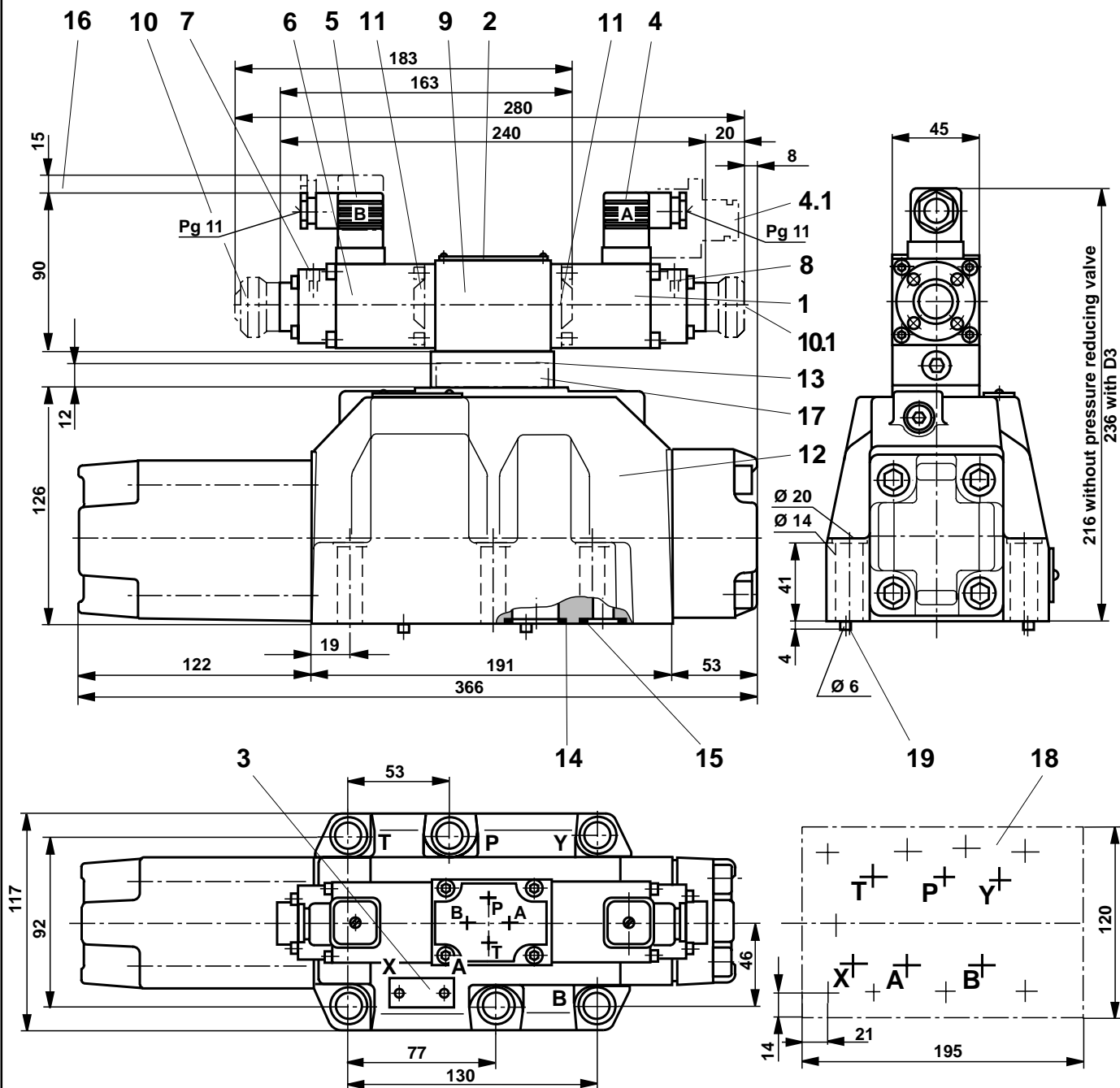
Subplates: G 172/01 (G 3/4), G 172/02 (M27 x 2)
 G 174/01 (G 1) G 174/02 (M33 x 2)
 G 174/08 (Flange)

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

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

Unit dimensions Size 25

(Dimensions in mm)

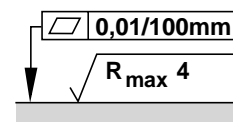


Subplates to data sheet RE 45 058 and valve fixing screws must be ordered separately.

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; $M_A = 130 \text{ Nm}$

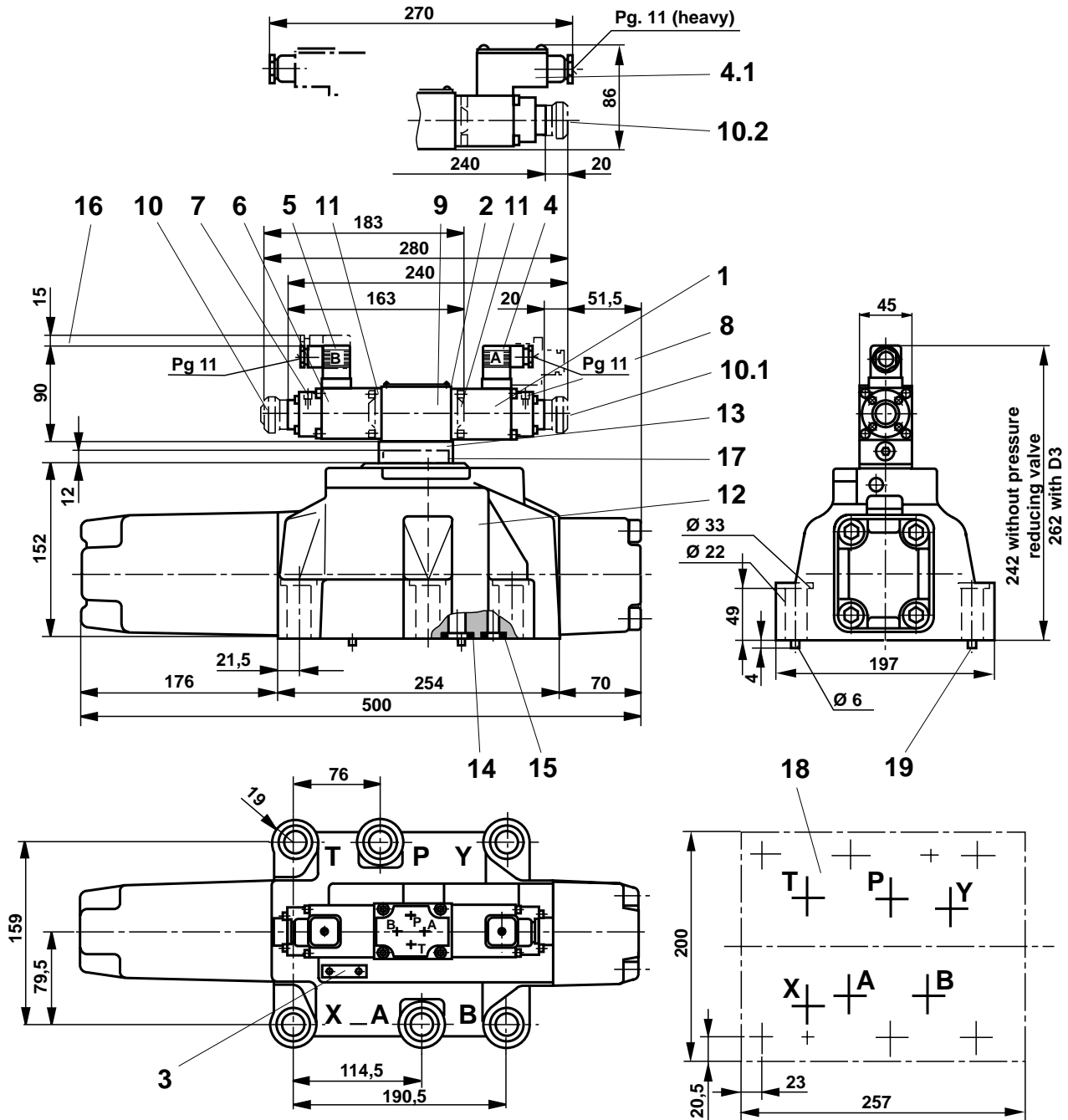
- | | | | | | |
|-----|---|------|--|----|---|
| 1 | Proportional solenoid "a" | 8 | Bleed screw, solenoid "a" | 15 | R-ring 19 x 3 x 3 (O-ring 19 x 3); Ports X, Y |
| 2 | Name plate for pilot valve | 9 | Pilot valve | 16 | Space required to remove plug |
| 3 | Name plate for overall valve | 10 | Emergency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



Required surface finish of mating piece

Unit dimensions Size 32

(Dimensions in mm)

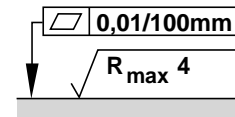


Subplates to data sheet RE 45 060 and valve fixing screws must be ordered separately.

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

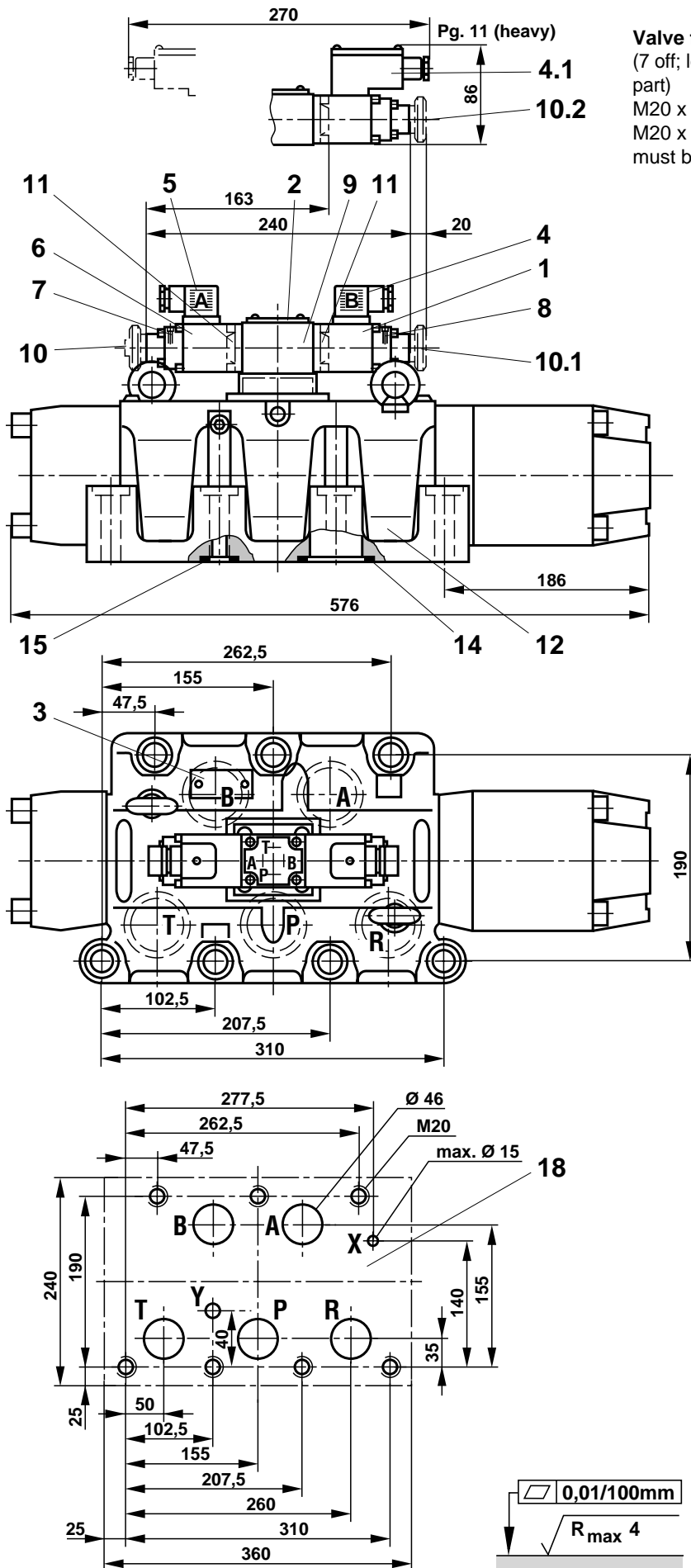
- | | | | | | |
|-----|---|------|---|----|--|
| 1 | Proportional solenoid "a" | 9 | Pilot valve | 15 | R-ring 19 x 3 x 3 (O-ring 19 x 3); Ports X, Y |
| 2 | Name plate for pilot valve | 10 | Emergency operator "N" | 16 | Space required to remove plug |
| 3 | Name plate for overall valve | 10.1 | Emergency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



Required surface finish of mating piece

Unit dimensions Size 52 (subplate mounting)

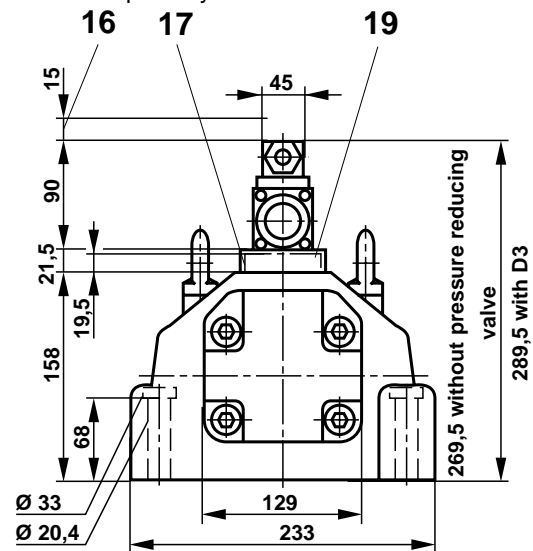
(Dimensions in mm)



Valve fixing screws

(7 off; length is dependant on the material of the adjoining part)

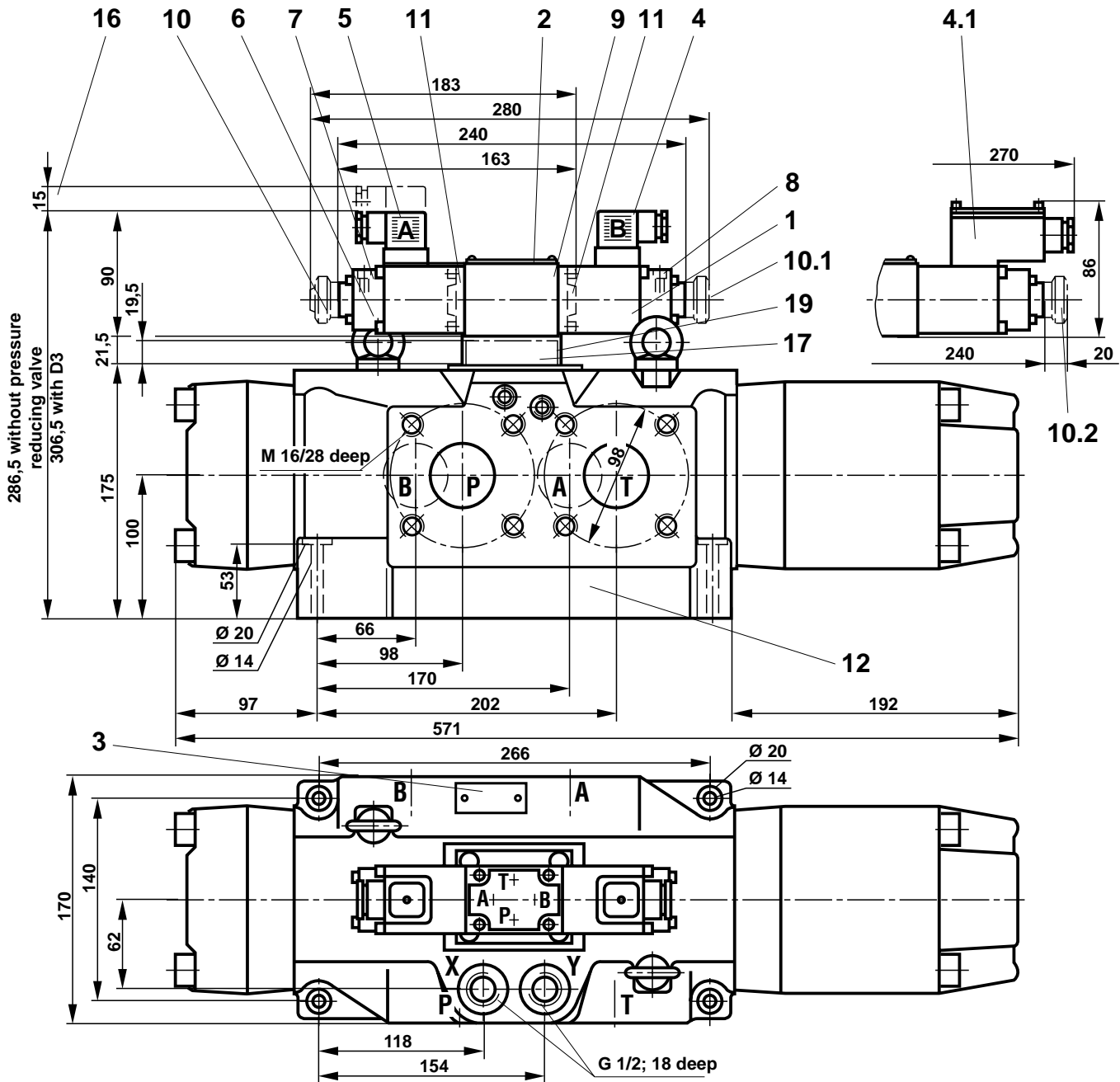
M20 x 90 DIN 912-10.9; $M_A = 610$ Nm (for steel) or M20 x 100 DIN 912-10.9; $M_A = 610$ Nm (for cast iron) must be ordered separately.



- 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; $M_A = 130 \text{ Nm}$
must be ordered separately.

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

Pilot oil supply

Type 4WRZ...-../... and Type 4WRH...-../...

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).

Pilot oil feed external Pilot oil drain external

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

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.

Pilot oil feed internal Pilot oil drain internal

Type 4WRZ...-../...E...

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.

Pilot oil feed internal Pilot oil drain external

Type 4WRZ...-../...T...

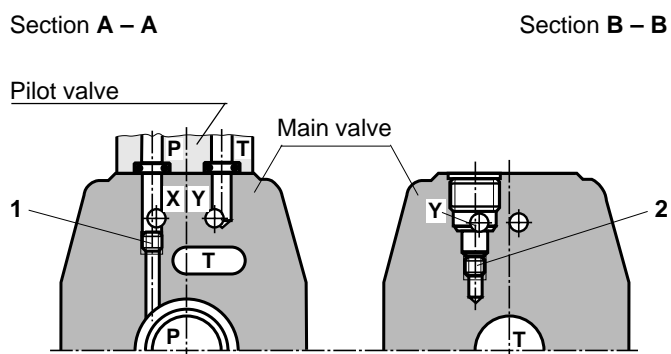
On this model pilot oil feed is from a separate control circuit (external). Pilot oil discharge is directly into the T line on the main valve (internal). Port Y is closed on the subplate.

Pilot oil feed external Pilot oil drain internal

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

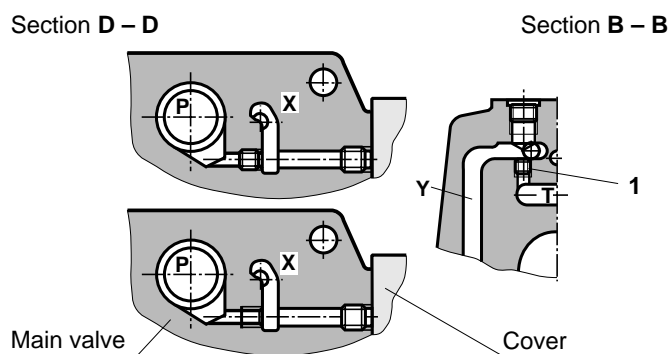
For section see page 3

Size 10



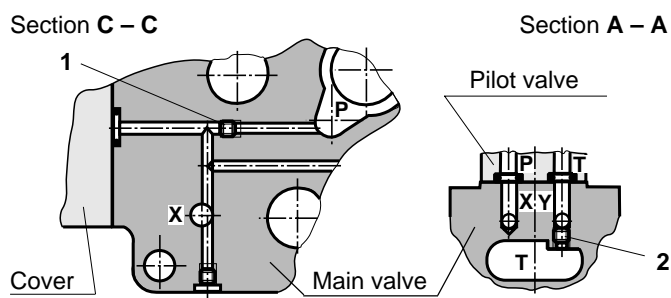
Pilot oil feed	external: 1 closed
	internal: 1 open
Pilot oil drain	external: 2 closed
	internal: 2 open

Size 16



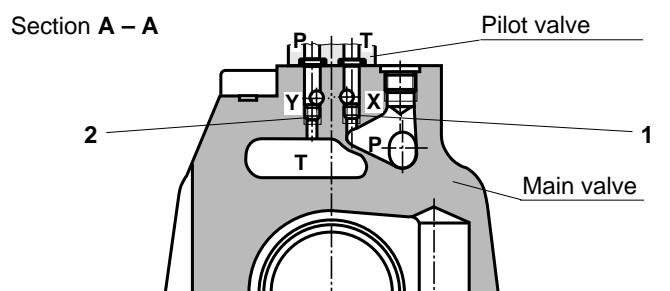
Pilot oil feed	external: P closed
	internal: P open
Pilot oil drain	external: 1 closed
	internal: 1 open

Size 25



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

Size 32



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

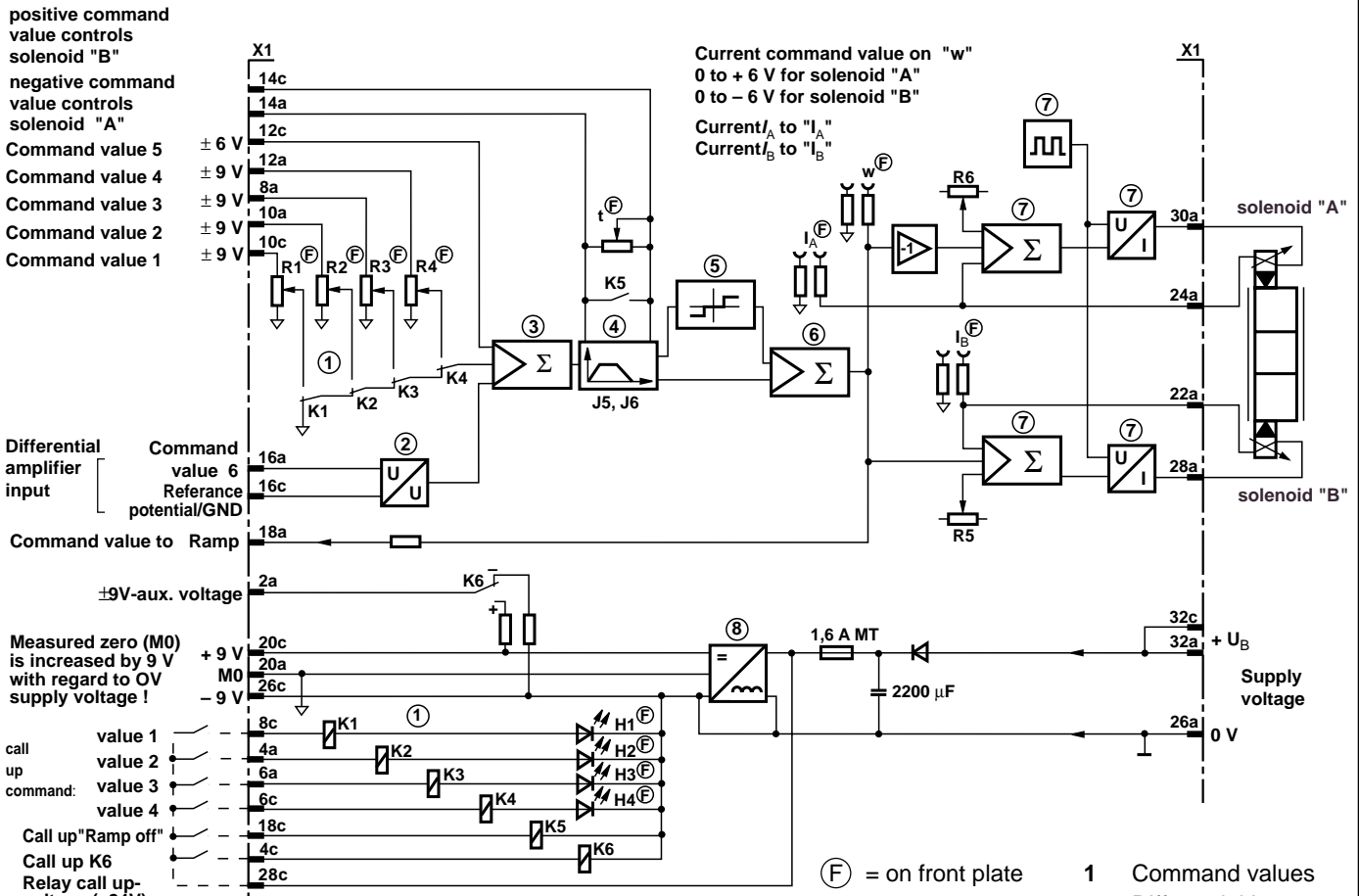
Card dimensions: Eurocard 100 x 160 mm
 DIN 41 494

Front plate dimensions
 - Height: 3 HE (128,4 mm)
 - Width conductor side: 1 TE (5,08 mm)
 - Width component side: 7 TE

For applications outside these parameters, please consult us!

Detailed information: Data sheet RE 29 935

Block diagram/Terminal connections



- 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
- (F) = on front plate
- 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

Further details in clear text

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

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