

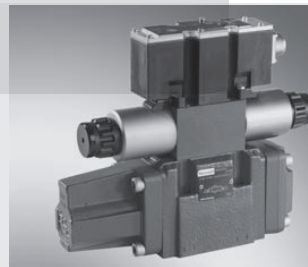
4/2, 4/3, and 5/2, 5/3 proportional directional valve, pilot operated, without electrical position feedback without/with integrated electronics (OBE)

RE 29115/08.13
Replaces: 10.05

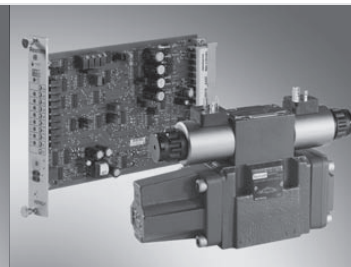
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Type .WRZ..., .WRZE... and .WRH...

Sizes 10 to 52
Component series 7X
Maximum operating pressure 350 bar
Maximum flow 2800 l/min



Type 4WRZE 10 ...-7X/...K31/...
with integrated electronics (OBE)



Type 4WRZE 10 ...-7X/...K4/...
with the corresponding control
electronics (separate order)

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Features

- Pilot operated, 2-stage proportional directional valve with integrated electronics (OBE) with type 4WRZE
- Control of flow direction and size
- Operation by means of proportional solenoids with central thread and detachable coil
- For subplate mounting:
Porting pattern according to ISO 4401
- Manual override, optional
- Spring-centered control spool
- Control electronics
 - Type .WRZE...
 - Integrated electronics (OBE) with voltage or current input (A1 and/or F1)
 - Type .WRZ...
 - Digital or analog amplifier in Euro-card format
 - Analog amplifier in modular design

Information on available spare parts:
www.boschrexroth.com/spc

Ordering codes (types 4WRZ and 4WRH; sizes 10 to 32 subplate mounting; size 52 flange connection)

4WR_						7X		/							
Hydraulic actuation	= H														
Electro-hydraulic actuation	= Z														
Type WRZ:															
For external electronics	= no code														
With integrated electronics	= E														
Size 10	= 10														
Size 16	= 16														
Size 25	= 25														
Size 32	= 32														
Size 52	= 52														
For control spool symbols , see page 3															
Rated flow in l/min at valve pressure differential $\Delta p = 10$ bar															
Size 10															
25 l/min	= 25														
50 l/min	= 50														
85 l/min	= 85														
Size 16															
100 l/min	= 100														
125 l/min	= 125														
150 l/min	= 150														
180 l/min	= 180														
Size 25															
220 l/min	= 220														
325 l/min	= 325														
Size 32															
360 l/min	= 360														
520 l/min	= 520														
Size 52															
1000 l/min	= 1000														
Component series 70 to 79 = 7X (70 to 79: Unchanged installation and connection dimensions)															
For subplate mounting = no code															
For flange connection (size 52 only) = F															
Pilot control valve size 6															
Proportional solenoid with detachable coil = 6E ¹⁾															
Supply voltage															
Direct voltage 24 V = G24 ¹⁾															
Without manual override = no code															
With concealed manual override = N9 ^{1, 2)}															
Without special type of protection = no code															
Seawater-resistant = J ³⁾															
Pilot oil supply and return															
External pilot oil supply, external pilot oil return = no code															
Internal pilot oil supply, external pilot oil return = E															
Internal pilot oil supply, internal pilot oil return = ET															
External pilot oil supply, internal pilot oil return = T															
(only possible without code for size 52 and type 4WRH)															

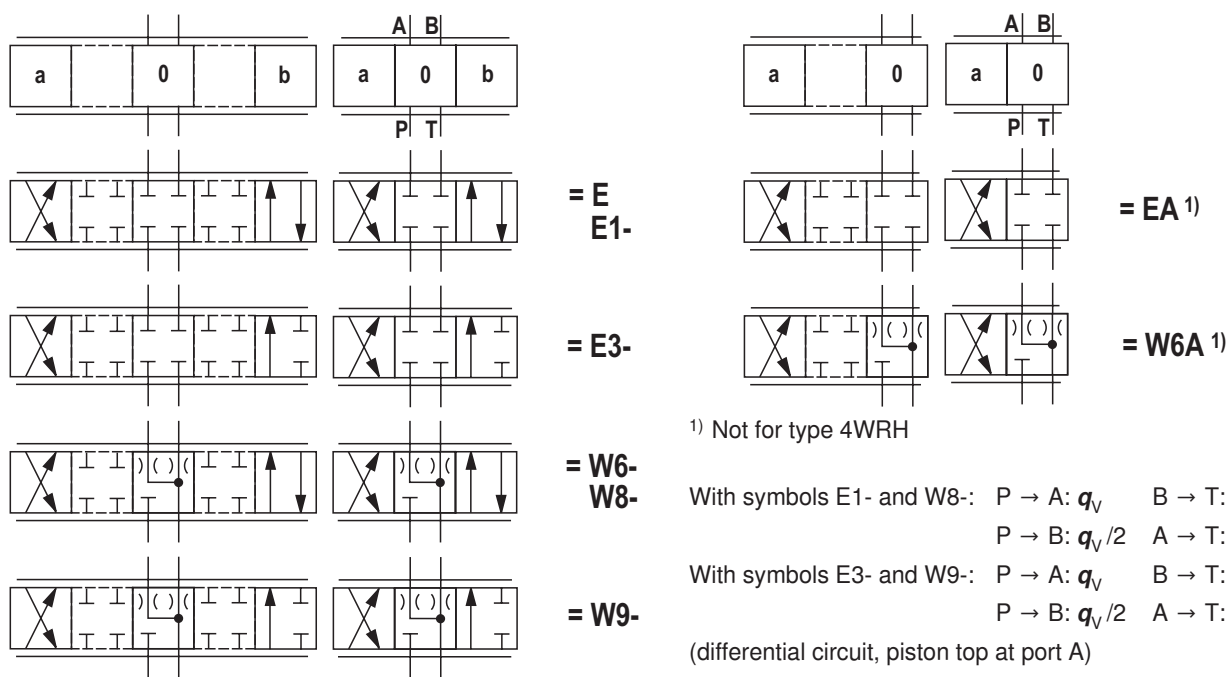
				*
For further details, see the plain text				
			M =	NBR seals
			V =	FKM seals
			no code =	Without pressure reducing valve
			D3 ¹⁾ =	With pressure reducing valve ZDR 6 DP0-4X/40YM-W80 (not adjustable)
		A1 =	Electronics interface	
		F1 =	Command value ±10 V	
		no code =	Command value 4 to 20 mA	
			For types WRZ and WRH	
		K4 ^{1, 4)} =	Electrical connection type WRZ:	
			Without mating connector, with connector according to DIN EN 175301-803	
			Mating connector, separate order, see page 27	
		K31 ^{1, 4)} =	Type WRZE:	
			Without mating connector, with connector according to DIN EN 175201-804	
			Mating connector, separate order, see page 27	

¹⁾ Not applicable with types 4WRH
²⁾ For version "J" → "N" instead of "N9"

³⁾ For information on the seawater-resistant version, see data sheet 29115-M
⁴⁾ For version "J" = seawater-resistant **only** "K31"

Electric special types of protection available on request.

Control spool symbols



¹⁾ Not for type 4WRH

With symbols E1- and W8-: P → A: q_V B → T: $q_V/2$
 P → B: $q_V/2$ A → T: q_V
 With symbols E3- and W9-: P → A: q_V B → T: Blocked
 P → B: $q_V/2$ A → T: q_V

(differential circuit, piston top at port A)

Notice: With symbols W6-, W8-, W9-, W6A, there is a connection from A → T and B → T with less than 2% of the respective nominal cross-section in switching position "0".

Ordering codes (types 4WRZ 52 and 4WRH 52; subplate mounting)

5WR_	52	1000	7X/									*
Hydraulic actuation	= H											
Electro-hydraulic actuation	= Z											
Type WRZ:												
For external electronics	= no code											
With integrated electronics	= E											
Size 52	= 52											
For control spool symbols , see page 5												
Rated flow in l/min at valve pressure differential $\Delta p = 10$ bar												
1000 l/min	= 1000											
Component series 70 to 79 (70 to 79: Unchanged installation and connection dimensions)												
	= 7X											
Pilot control valve size 6												
Proportional solenoid with detachable coil	= 6E ¹⁾											
Supply voltage												
Direct voltage 24 V	= G24 ¹⁾											
Without manual override	= no code											
With concealed manual override	= N9 ^{1, 2)}											
Without special type of protection	= no code											
Seawater-resistant	= J ³⁾											
Electrical connection type WRZ:												
Without mating connector, with connector according to DIN EN 175301-803	= K4 ^{1, 4)}											
Mating connector, separate order, see page 27												
Type WRZE:												
Without mating connector, with connector according to DIN EN 175201-804	= K31 ^{1, 4)}											
Mating connector, separate order, see page 27												
Electronics interface												
Command value ± 10 V	= A1											
Command value 4 to 20 mA	= F1											
For types WRZ and WRH	= no code											
Without pressure reducing valve	= no code											
With pressure reducing valve ZDR 6 DP0-4X/40YM-W80 (not adjustable)	= D3 ¹⁾											
NBR seals	= M											
FKM seals	= V											
For further details, see the plain text												

¹⁾ Not applicable with types 4WRH

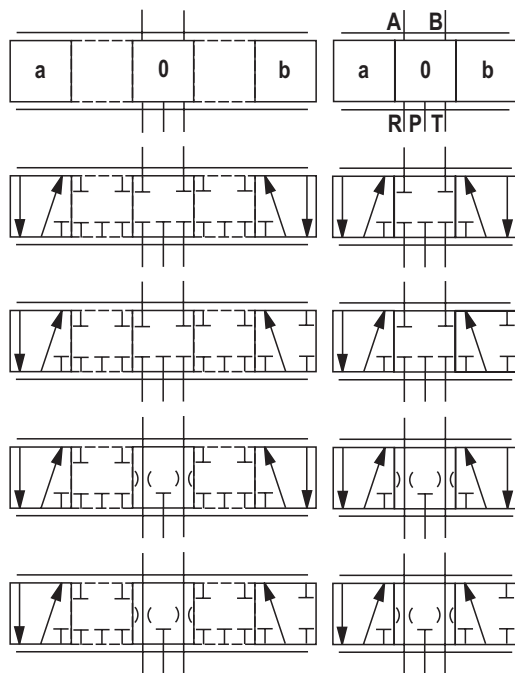
²⁾ For version "J" → "N" instead of "N9"

³⁾ For information on the seawater-resistant version, see data sheet 29115-M

⁴⁾ For version "J" = seawater-resistant **only** "K31"

Electric special types of protection available on request.

Control spool symbols

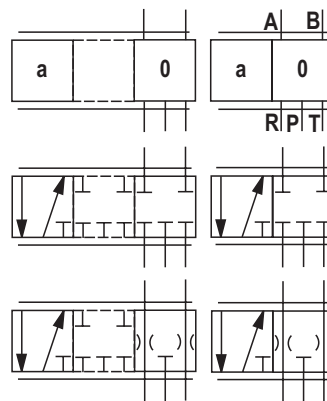


= E
E1-

= E3-

= W6-
W8-

= W9-



= EA ¹⁾

= W6A ¹⁾

¹⁾ Not for type 4WRH

With symbols E1- and W8-: P → A: q_V B → T: $q_V/2$

P → B: $q_V/2$ A → R: q_V

With symbols E3- and W9-: P → A: q_V B → T: Blocked

P → B: $q_V/2$ A → R: q_V

(differential circuit, piston top at port A)

Notice:

- Only external pilot oil supply and return possible
- With control spool W6-, W8-, W9-, W6A, there is a connection from A → R and B → T with less than 2% of the respective nominal cross-section in switching position "0".

Function, section

Pilot control valve type 3DREP 6...

The pilot control valve is a 3-way pressure reducing valve that is actuated by a proportional solenoid. It converts an electrical input signal into a proportional pressure output signal and is used for all valves of the type 4WRZ... and 5WRZ...

The proportional solenoids are controllable, wet-pin DC solenoids with a central thread and a detachable coil. The solenoids are controlled by external electronics (type .WRZ...).

Set-up:

The valve basically consists of:

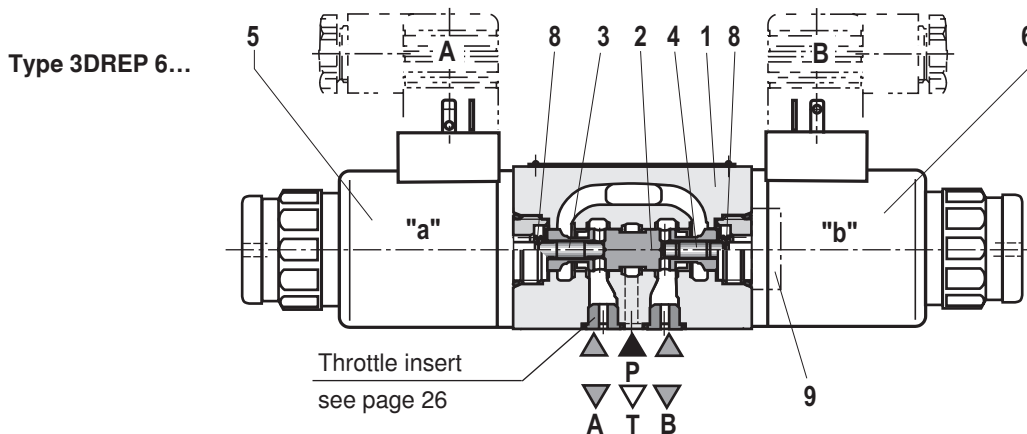
- Housing (1)
- Control spool (2) with pressure measuring spool (3 and 4)
- Solenoids (5 and 6) with central threads

Function:

The pressure in A or B is set by means of the proportional solenoids. The amount of the pressure depends on the current. With de-energized solenoids (5, 6), the control spool (2) is held in the central position by means of the pressure springs (8). Ports A and B are connected with T so that the hydraulic fluid can flow to the tank without obstructions.

By energizing a proportional solenoid, e.g. solenoid "a" (5), the pressure measuring spool (3) and with it the control spool (2) are moved to the right. This opens the connection from P to B and A to T via orifice-type cross-sections with progressive flow characteristic. With the surface of the pressure measuring spool (4) the pressure that builds up in channel B acts on the control spool and against the solenoid force. The pressure measuring spool (4) is supported by solenoid "b". If the pressure exceeds the value set at solenoid "a", the control spool (2) is pushed back against the solenoid force and connects B with T until the set pressure is reached again. The pressure is proportional to the solenoid current.

When the solenoid is switched off, the control spool (2) is returned into the central position by the compression springs (8).



Pilot control valve with two switching positions (type 3DREP 6...B...)

The operation of this valve version basically corresponds to the valve with 3 switching positions. However, this 2 spool position valve is only equipped with solenoid "a" (5). In the place of the second proportional solenoid there is a plug screw (9).

Information on type 3DREP 6:

Prevent the tank line from draining. If this is possible due to installation conditions, install a preload valve (with a preload pressure of approx. 2 bar).

Function, section

Pilot control valve type 3DREPE 6...

The pilot control valve is a 3-way pressure reducing valve that is actuated by a proportional solenoid. It converts an electrical input signal into a proportional pressure output signal and is used for all valves of the type 4WRZE... and 5WRZE...

The proportional solenoids are controllable, wet-pin DC solenoids with a central thread and a detachable coil. The solenoids are controlled by the integrated electronics (type .WRZE...).

Set-up:

The valve basically consists of:

- Housing (1)
- Control spool (2) with pressure measuring spool (3 and 4)
- Solenoids (5 and 6) with central threads
- Integrated electronics (7)

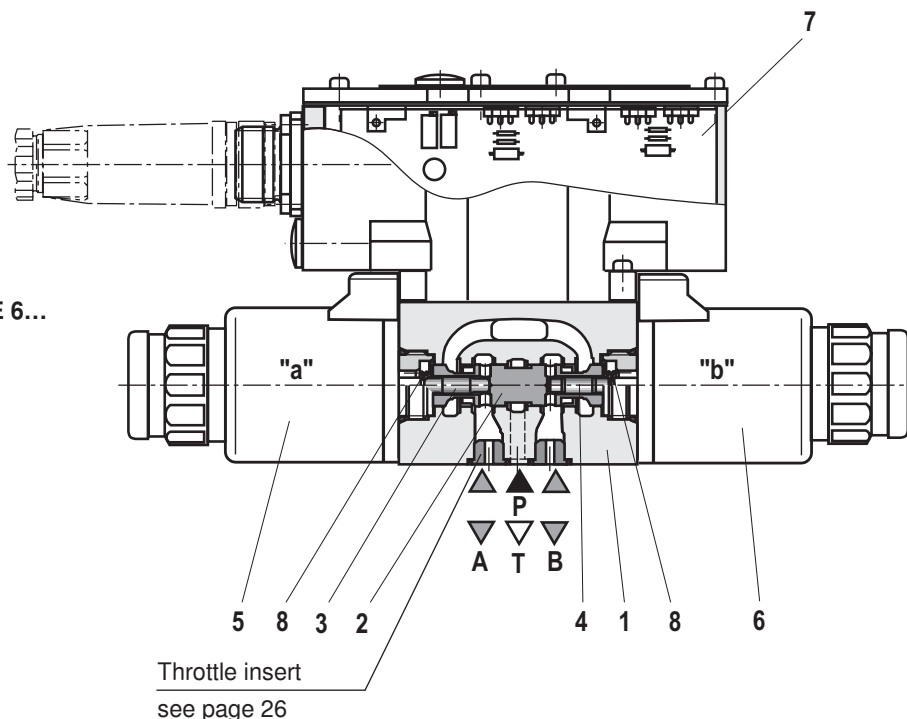
Function:

The pressure in A or B is set by means of the proportional solenoids. The amount of the pressure depends on the current. With de-energized solenoids (5, 6), the control spool (2) is held in the central position by means of the pressure springs (8). Ports A and B are connected with T so that the hydraulic fluid can flow to the tank without obstructions.

By energizing a proportional solenoid, e.g. solenoid "a" (5), the pressure measuring spool (3) and with it the control spool (2) are moved to the right. This opens the connection from P to B and A to T via orifice-type cross-sections with progressive flow characteristic. With the surface of the pressure measuring spool (4) the pressure that builds up in channel B acts on the control spool and against the solenoid force. The pressure measuring spool (4) is supported by solenoid "b". If the pressure exceeds the value set at solenoid "a", the control spool (2) is pushed back against the solenoid force and connects B with T until the set pressure is reached again. The pressure is proportional to the solenoid current.

When the solenoid is switched off, the control spool (2) is returned into the central position by the compression springs (8).

Type 3DREPE 6...



Function, section

Pilot operated proportional directional valves

Types 4WRZ... and 5WRZ.52...

Valves of type 4WRZ... are pilot operated 4-way directional valves that are actuated by proportional solenoids. They control the flow direction and size.

Valves of type 5WRZ... are equipped with an additional port "R" (only size 52).

Set-up:

The valve basically consists of:

- Pilot control valve (9) with proportional solenoids (5 and 6)
- Main valve (10) with main control spool (11) and centering spring (12)

Notice!

Due to the design principle, internal leakage is inherent to the valves, which may increase over the life cycle.

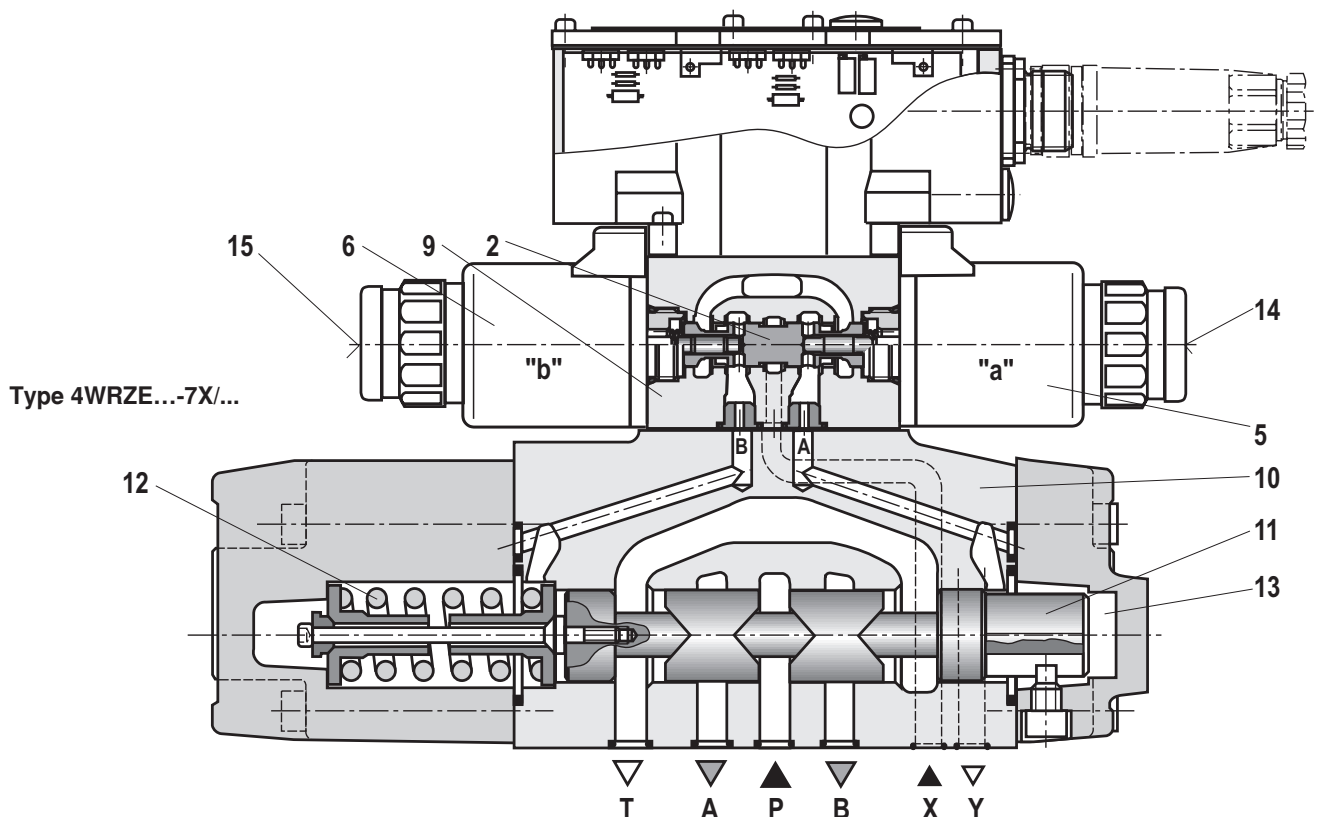
Function:

- With de-energized solenoids (5, 6), the main control spool (11) is held in the central position by means of the centering spring (12).
- The main control spool (11) is controlled by the pilot control valve (9); the main control spool is proportionally moved, e.g. by actuating solenoid "b" (6).
 - The control spool (2) is moved to the right, pilot oil enters the pressure chamber (13) via the pilot control valve (9) and deflects the main control spool (11) according to the electric input signal.
 - This opens the connection from P to B and A to T via orifice-type cross-sections with progressive flow characteristic.
- Pilot oil is internally supplied to the pilot control valve via port P or externally via port X.
- Switching the solenoid off (6)
 - The control spool (2) and main control spool (11) are moved back into the central position.
- Depending on the switching position, flow occurs from P to A and B to T or P to B and A to T (R).

An optional manual override (14 and 15) can be used to move the control spool (2) without solenoid energization.

Notice:

Inadvertent activation of the manual override may result in uncontrollable machine movements.



Function, section

Externally pilot operated proportional directional valves Types 4WRH... and 5WRH.52...

Valves of the type .WRH... are pilot operated proportional directional valves for external actuation via pressure control valves.

Set-up:

The valve basically consists of:

- Main valve (10) with main control spool (11) and centering spring (12)
- Diversion plate (16)

Notice!

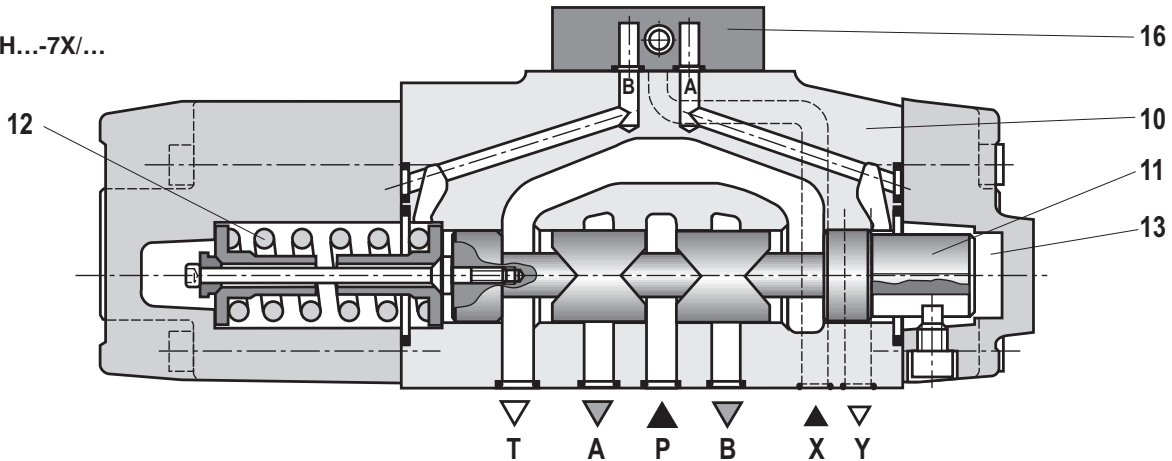
Due to the design principle, internal leakage is inherent to the valves, which may increase over the life cycle.

Function:

- The diversion plate (16) connects control port A that leads to the pressure chamber (13) with port Y and control port B with port X.
- If port X is pressurized, the main control spool (11) is moved to the right (P to B and A to T). If port Y is pressurized, the main control spool is moved to the left (P to A and B to T).

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

Type .WRH...-7X/...



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

general

Valve type			.WRZ	.WRZE	.WRH	
Installation position			Any, preferably horizontal (for commissioning information, see data sheet 07800)			
Storage temperature range	°C		-20 to +80			
Ambient temperature range	°C		-20 to +70	-20 to +50	-20 to +70	
Weight	- Subplate mounting	Size 10	kg	7.8	8.0	6.1
		Size 16	kg	11.9	12.1	9.7
		Size 25	kg	18.2	18.4	18.0
		Size 32	kg	42.2	42.2	41.5
		Size 52	kg	79.5	79.7	
	- Flange connection	Size 52	kg	77.5	77.7	
	- With "D3"		kg	+0.5 in addition		
Sine test according to DIN EN 60068-2-6:2008			10 cycles, 10...2000...10 Hz with logarithmic frequency changing speed of 1 oct./min., 5 to 57 Hz, amplitude 1.5 mm (p-p), 57 to 2000 Hz, amplitude 10 g, 3 axes			
Random test according to DIN EN 60068-2-64:2009			20...2000 Hz, amplitude 0.05 g ² /Hz (10 g _{RMS}) 3 axes, 30 min testing time per axis			
Shock test according to DIN EN 60068-2-27:2010			Half sine 15 g/11 ms, 3 times in positive/3 times in negative direction per axis, 3 axes			
Humid heat, cyclic according to DIN EN 60068-2-30:2006			Variant 2 +25 °C to +55 °C, 90% to 97% relative humidity, 2 cycles at 24 hours each			