

# Servo solenoid valves with electrical position feedback (LvdT AC/AC)

**RE 29030/01.05**  
Replaces: 09.03

1/8

## Type 4WRPH 6

Size 6  
Unit series 1X  
Maximum working pressure 250 bar  
Nominal flow rate 4...40 l/min ( $\Delta p$  70 bar)



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## Features

- Directly operated servo solenoid valve NG6, with control piston and sleeve in servo quality
- Actuated on one side, 4/4 fail-safe position when switched off
- Control solenoid with passive position feedback (LvdT (AC/AC))
- Suitable for steering axles, systems in the iron and steel industry and in tougher ambient conditions
- For subplate attachment, mounting hole configuration to ISO 4401-03-02-0-94
- Subplates as per catalogue section RE 45053 (order separately)
- Line sockets to DIN 43650-AM2  
Solenoid 2P+PE/M16 x 1.5, position transducer 3P/Pg7 in scope of delivery, see catalogue section RE 08008
- External trigger electronics (order separately)
  - Electric amplifier for standard curve “L”  
0 811 405 148 and 0 811 405 123,  
see catalogue section RE 30042

**Ordering data and scope of delivery**



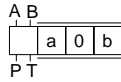
For external trigger electronics = no desig.

Control piston/sleeve = H

Size 6 = 6

**Symbols**

4/4-way version

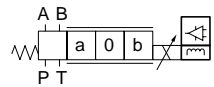


= C3



= C4

**Side of inductive position transducer**



(Standard) = B

Further information in plain text

M = NBR seals, suitable for mineral oils (HL, HLP) to DIN 51524

**Electrical connection**

Z4 = with line socket, with plug to DIN 43650-AM2  
Line socket included in scope of delivery

**Voltage supply of trigger electronics**

G24 = +24 V DC

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

**Flow characteristic**

Linear

**Nominal flow rate at 70 bar valve pressure difference (35 bar/metering notch)**

**Size 6**

- 04 = 4 l/min
- 12 = 12 l/min
- 24 = 24 l/min
- 40 = 40 l/min

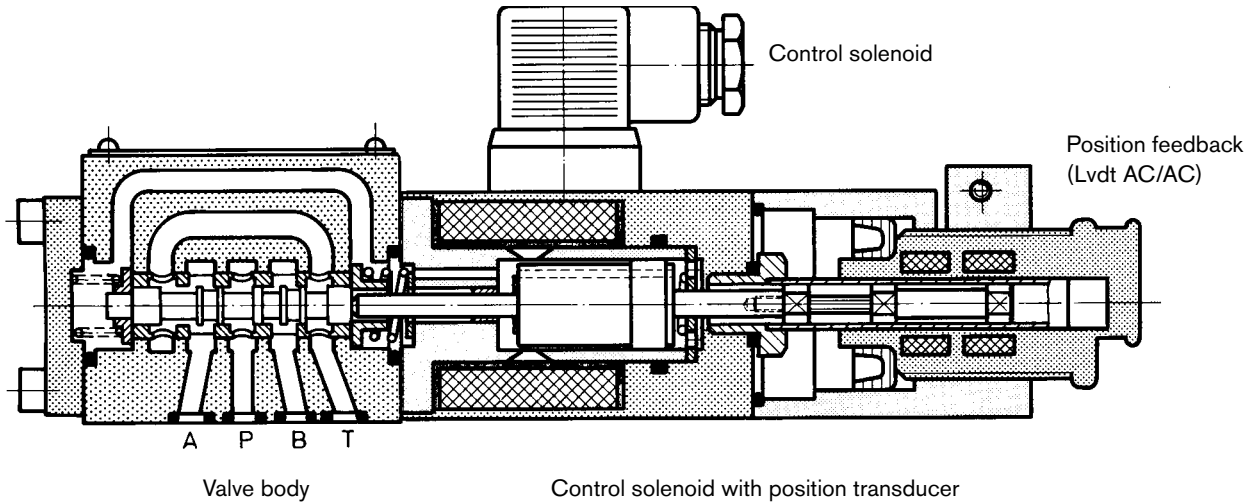
**Preferred types (available at short notice)**

Type 4WRPH 6	Material No.
<b>C3</b>	
4WRPH 6 C3B04L -1X/G24Z4 /M	<b>0 811 404 122</b>
4WRPH 6 C3B12L -1X/G24Z4 /M	<b>0 811 404 111</b>
4WRPH 6 C3B24L -1X/G24Z4 /M	<b>0 811 404 106</b>
4WRPH 6 C3B40L -1X/G24Z4 /M	<b>0 811 404 113</b>

Type 4WRPH 6	Material No.
<b>C4</b>	
4WRPH 6 C4B12L -1X/G24Z4 /M	<b>0 811 404 112</b>
4WRPH 6 C4B24L -1X/G24Z4 /M	<b>0 811 404 118</b>

**Function, sectional diagram**

**Servo solenoid valve 4WRPH6**



**Symbols**

	<p>Linear</p>
<p><b>C3</b></p>	
<p><b>C4</b></p>	
<p>C3, C4</p>	

**Accessories, not included in scope of delivery**

<p>(4 x)  M5x30 DIN 912-10.9</p>	<p>Fastening screws</p>	<p><b>2910 151 166</b></p>
	<p>VT-VRRA1-527-10/V0/RV, see RE 30042 VT-VRRA1-527-10/V0, see RE 30042</p>	<p><b>0811 405 148</b> <b>0811 405 123</b></p>
	<p>Line sockets 2P+PE (M16 x 1.5) and 3P (Pg7) included in scope of delivery, see also RE 08008</p>	


**Testing and service equipment**

- Test box type VT-PE-TB1, see RE 30063.
- Test adapter type VT-PA-3, see RE 30070.

**Technical data****General**

Construction	Spool type valve, operated directly, with steel sleeve		
Actuation	Proportional solenoid with position control, external amplifier		
Type of mounting	Subplate, mounting hole configuration NG6 (ISO 4401-03-02-0-94)		
Installation position	Optional		
Ambient temperature range	°C	-20 ... +50	
Weight	kg	2.2	
Vibration resistance, test condition	Max. 25 g, shaken in 3 dimensions (24 h)		

**Hydraulic** (measured with HLP 46,  $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$ )

Pressure fluid	Hydraulic oil to DIN 51524 ... 535, other fluids after prior consultation				
Viscosity range	recommended	mm <sup>2</sup> /s	20 ... 100		
	max. permitted	mm <sup>2</sup> /s	10 ... 800		
Pressure fluid temperature range	°C	-20 ... +80			
Maximum permissible degree of contamination of pressure fluid Purity class to ISO 4406 (c)	Class 18/16/13 <sup>1)</sup>				
Flow direction	See symbol				
Nominal flow at $\Delta p = 35$ bar per notch <sup>2)</sup>	l/min	4	12	24	40
Max. working pressure	bar	Port P, A, B: 250			
Max. pressure	bar	Port T: 250			
Operating limits at $\Delta p$	bar	250	200	120	70
Pressure drop at valve					
Leakage at 100 bar	 cm <sup>3</sup> /min	<180	<350	<700	<1,000

**Electrical**

Cyclic duration factor	%	100
Power supply	24 V <sub>nom</sub> (external amplifier)	
Degree of protection	IP 65 to DIN 40050	
Solenoid connector	Connector DIN 43650/ISO 4400 M16 x 1.5 (2P+PE)	
Position transducer connector	Special connector Pg7 (3P)	
Max. solenoid current	A	2.7
Coil resistance $R_{20}$	$\Omega$	2.5
Max. power consumption at 100% load and operational temperature	VA	35
Position transducer AC/AC technology	$U_{osc.} \sim 10 V_{eff}/7$ kHz	

**Static/Dynamic**

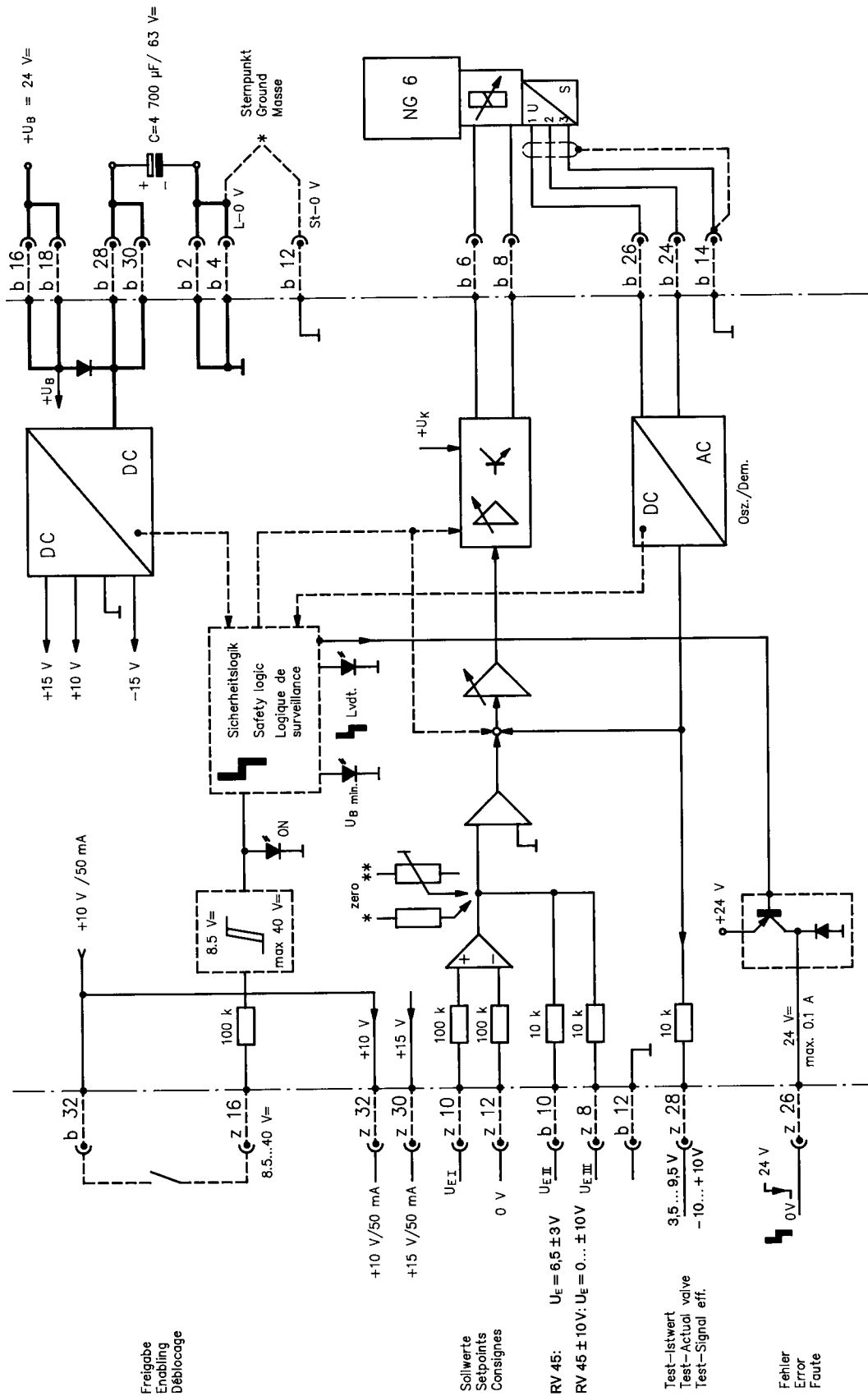
Hysteresis	%	$\leq 0.5$
Manufacturing tolerance for $q_{max.}$	%	< 10
Response time for signal change 0 ... 100%	ms	< 12
Thermal drift	Zero point displacement <1% at $\Delta T = 40^\circ\text{C}$	

<sup>1)</sup> The purity classes stated for the components must be complied with in hydraulic systems.  
Effective filtration prevents problems and also extends the service life of components.  
For a selection of filters, see catalogue sections RE 50070, RE 50076 and RE 50081.

<sup>2)</sup> Flow rate at a different  $\Delta p$   $q_x = q_{nom} \cdot \sqrt{\frac{\Delta p_x}{35}}$

Valve with external trigger electronics (standard linear curve: L)

Block diagram/pin assignment



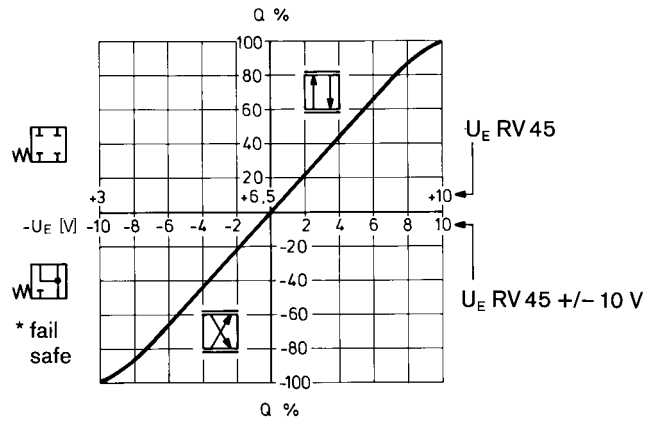
\* 0811 405 148 Signal: unipolar  $6.5 \pm 3.5 V$

\*\* 0811 405 123 Signal: bipolar  $\pm 10 V$

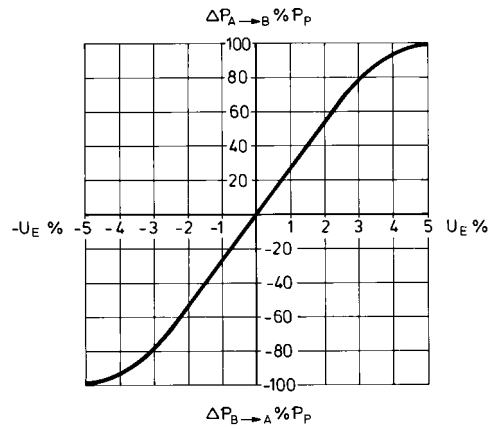
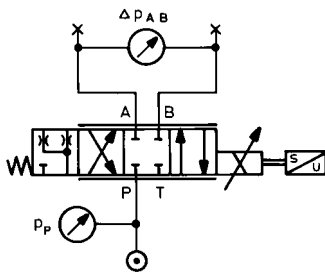
**Performance curves** (measured with HLP 46,  $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$ )

Flow rate/Signal function  $Q = f(U_E)$

\* Fail-safe: when enabling is not released



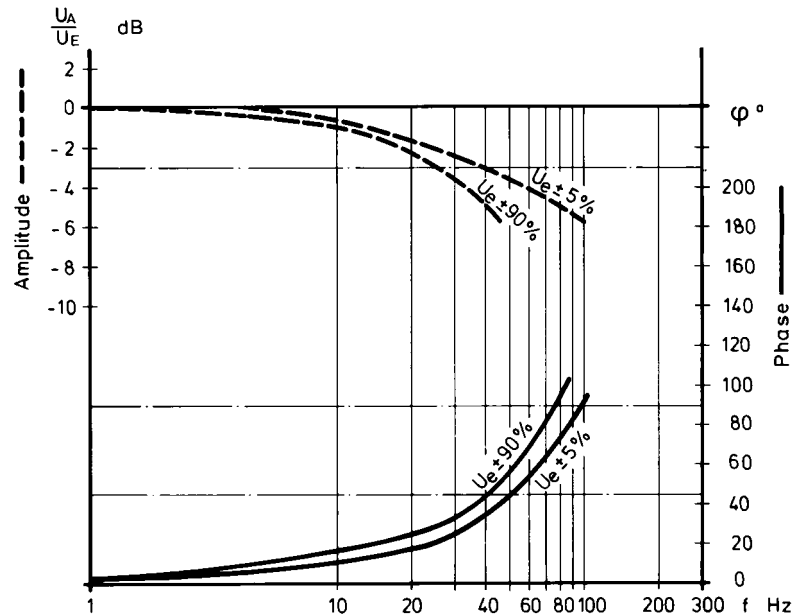
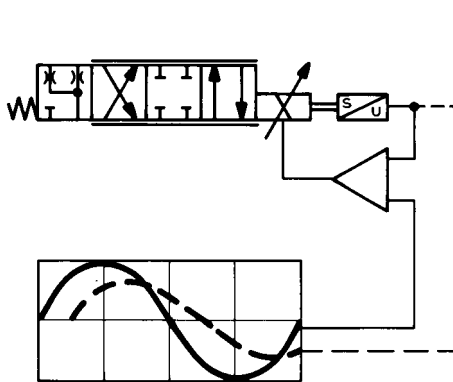
**Pressure gain**



Fail-safe position					
	Leakage at	100 bar	P-A	50 cm <sup>3</sup> /min	
			P-B	70 cm <sup>3</sup> /min	
	Flow at	$\Delta p = 35$ bar	A-T	10 ... 20 l/min	
			B-T	7 ... 20 l/min	
	Leakage at	100 bar	P-A	50 cm <sup>3</sup> /min	
			P-B	70 cm <sup>3</sup> /min	
			A-T	70 cm <sup>3</sup> /min	
			B-T	50 cm <sup>3</sup> /min	
	Fail-safe	$p = 0$ bar $\rightarrow$ 7 ms	Enable off		
		$p = 100$ bar $\rightarrow$ 10 ms			

## Performance curves (measured with HLP46, $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$ )

### Bode diagram

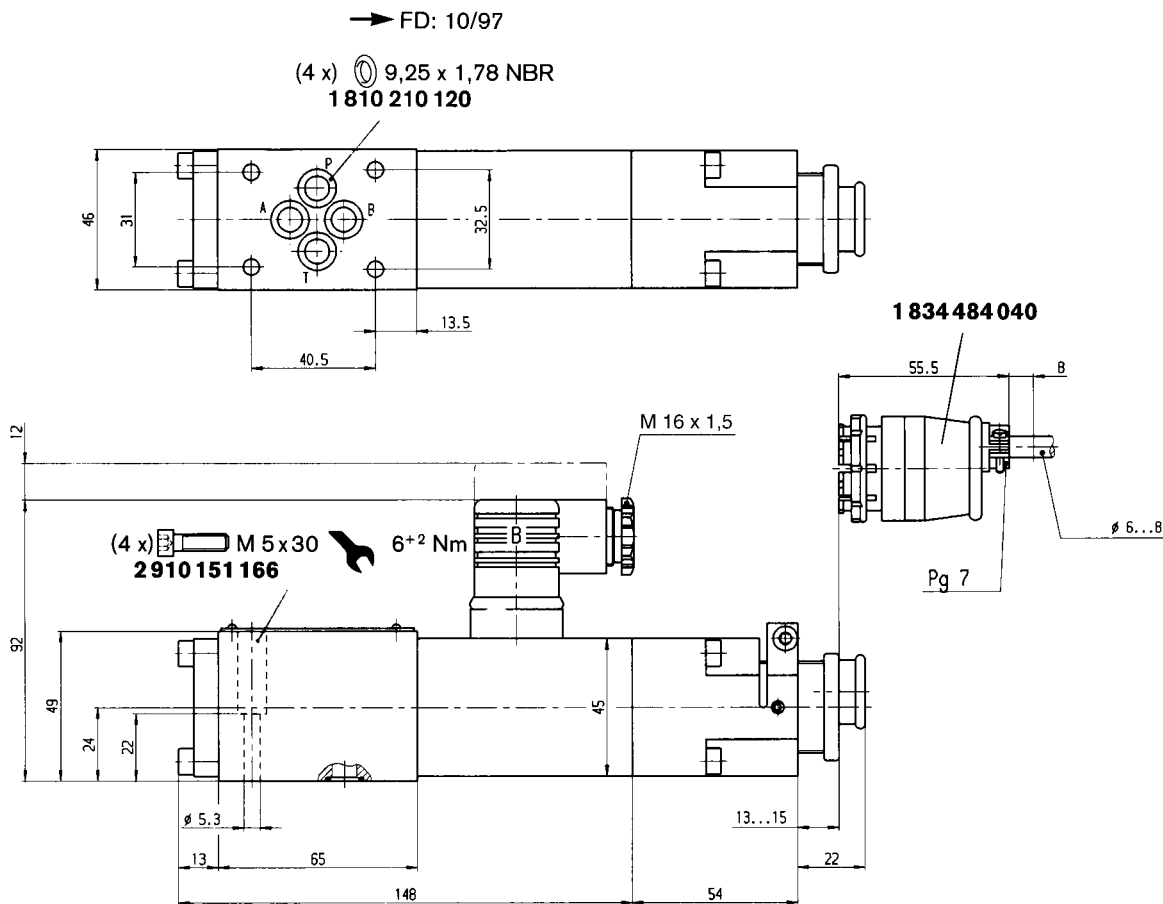


### Important

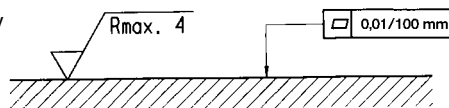
Servo solenoid valves type 4WRPH6 are equivalent to NG6 proportional valves with AC/AC position transducer in terms of their solenoid and position transducer technology, and represent a sturdy alternative.

For more demanding requirements where dynamics are concerned (Bode diagram), we recommend NG6 servo solenoid valves type 4WRP(E)H 6 with integral position transducer.

**Unit dimensions** (nominal dimensions in mm)

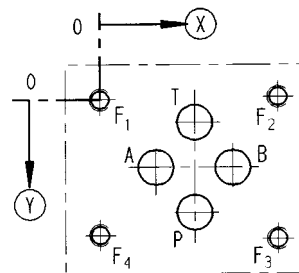


Required surface quality of mating component



**Mounting hole configuration: NG6** (ISO 4401-03-02-0-94)  
For subplates, see catalogue section RE 45053

- 1) Deviates from standard
- 2) Thread depth:  
Ferrous metal 1.5x $\phi$ ,  
Non-ferrous 2 x $\phi$



	P	A	T	B	F <sub>1</sub>	F <sub>2</sub>	F <sub>3</sub>	F <sub>4</sub>
$\text{\textcircled{X}}$	21.5	12.5	21.5	30.2	0	40.5	40.5	0
$\text{\textcircled{Y}}$	25.9	15.5	5.1	15.5	0	-0.75	31.75	31
$\text{\textcircled{Z}}$	8 <sup>1)</sup>	8 <sup>1)</sup>	8 <sup>1)</sup>	8 <sup>1)</sup>	M5 <sup>2)</sup>	M5 <sup>2)</sup>	M5 <sup>2)</sup>	M5 <sup>2)</sup>