

RE 23 178/03.02

Replaces: 04.01

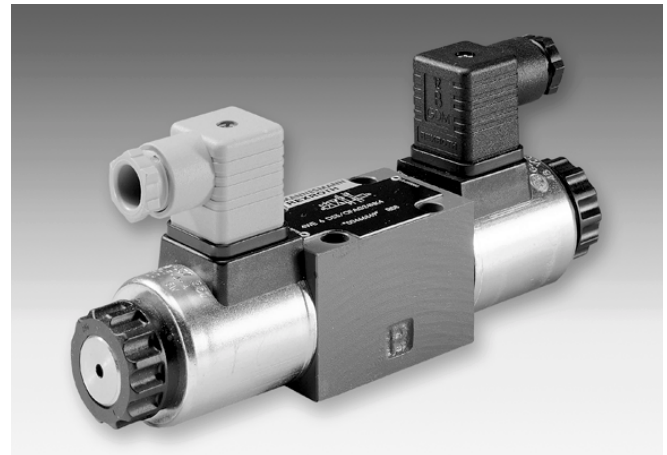
**4/3, 4/2 and 3/2 directional valves
with wet pin DC or AC solenoids,
Type WE 6 ../E**

Nominal size 6

Series 6X

Maximum operating pressure 350 bar

Maximum flow 80 L/min



HAD5909

Type 4WE 6 E6X/EG24N9K4 with plug-in connector (separate order)

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Features

- Direct solenoid operated directional spool valve, high performance version
- Porting pattern to DIN 24 340 form A, **without** locating pin hole (standard)
- Porting pattern to ISO 4401 and CETOP–RP 121 H, **with** locating pin hole, (ordering code .../60 at the end of the valve type code)
- For subplates see catalogue sheet RE 45 052 (separate order)
- Wet pin DC or AC solenoids with removable coil
- Solenoid coil can be rotated through 90°
- It is not necessary to open the pressure tight chamber when changing the coil
- Electrical connections either as individual or central connections
- Hand override, optional
- Soft switching version, see RE 23 183
- Inductive limit switch (contact or inductive), see RE 24 830

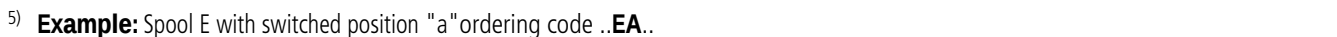


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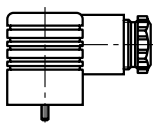
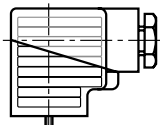
This document was prepared with the greatest of care, and all statements have been examined for correctness. This document is subject to alterations for reason of the continuing further developments of products. No liability can be accepted for any incorrect or incomplete statements.

AC supply voltage	Nominal voltage of DC	ng
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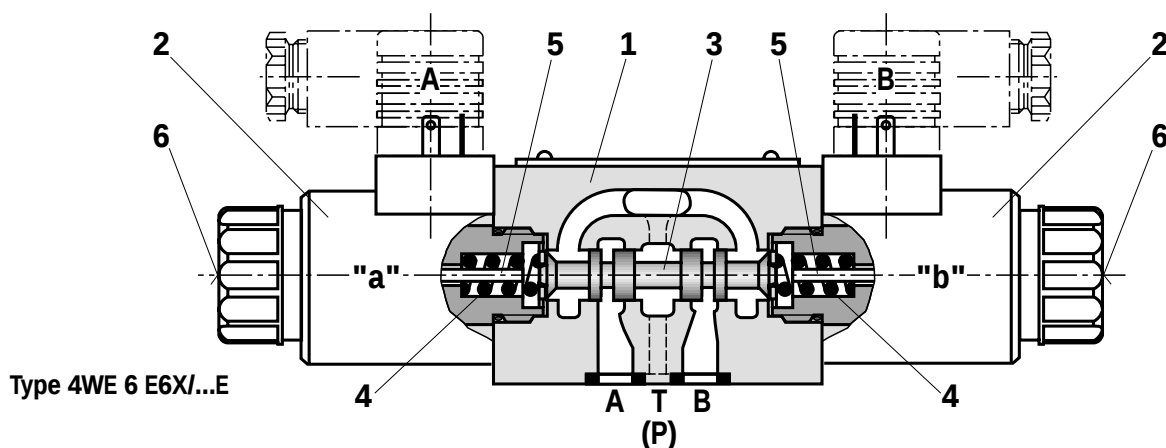


⁶⁾ Symbol E1-: P – A/B pre-opening, **Attention: Take pressure intensification with differential cylinders into account!**

Ordering details: plug-in connectors to DIN EN 175 301-803 and ISO 4400 for component plug "K4"

For further plug-in connectors see RE 08 006					
		Material No.			
		Without circuitry	With indicator light 12 ... 240 V	With rectifier 12 ... 240 V	With indicator light and Z-diode protective circuit 24 V
Valve side	Colour				
a	grey	00074683	–	–	–
b	black	00074684	–	–	–
a/b	black	–	00057292	00313933	00310995

Function, section



Type WE directional valves are solenoid operated directional spool valves. They control the start, stop and direction of flow.

Essentially the directional control valves consist of housing (1), one or two solenoids (2), the control spool (3), and one or two return springs (4).

In the de-energised condition the control spool (3) is held in the neutral or initial position by means of return springs (4) (except for impulse spools). The control spool (3) is operated via wet pin solenoids (2).

To guarantee satisfactory operation care should be taken to ensure that the solenoid pressure chamber is filled with oil.

The force of the solenoids (2) acts via the plunger (5) on the control spool (3) and pushes this from its neutral position into the required end position. This permits flow from P to A and B to T or P to B and A to T.

When solenoid (2) is de-energised, the control spool (3) is returned to its neutral position by means of the return springs (4).

An optional hand override (6), allows movement of the control spool (3) without energising the solenoid.

Type 4WE 6.. 6X/O... (only possible for symbols A, C and D)

This version is for directional control valves with two switched positions and two solenoids without detent. There is no definable switched position when the solenoids are de-energised.

Type 4WE 6.. 6X/OF... (impulse spool, only for symbols A, C and D)

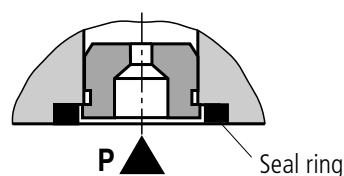
This version is for directional control valves with two switched positions, two solenoids and a detent. Both switched positions are thus fixed alternately and there is no need to continually energise the solenoid.

Note:

Pressure peaks in the tank line to two or more valves can, with valves with detents, lead to unintended spool movements! It is therefore, recommended that a separate tank line is used or that a check valve is fitted into the tank line.

Cartridge throttle (type 4WE 6..6X/.../B..)

If, due to particular operating conditions during the switching sequences, flows can occur which are larger than the valve performance curves allow, then it is necessary to fit a cartridge throttle. This is inserted in the P channel of the directional control valve.



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

General

Installation			Optional
Ambient temperature	°C		– 30 to + 50 (NBR seals) – 20 to + 50 (FKM seals)
Weight	Valve with 1 solenoid	kg	1.45
	Valve with 2 solenoids	kg	1.95

Hydraulic

Max. operating pressure	Ports A, B, P	bar	350
	Port T	bar	210 (=) ; 160 (~) With symbols A and B, port T must be used as a drain port if the operating pressure is above the permitted tank pressure.
Max. flow		L/min	80 (=); 60 (~)
Flow cross-section	For symbol Q	mm ²	Approx. 6 % of the nominal cross-section
(switched position 0)	For symbol W	mm ²	Approx. 3 % of the nominal cross-section
Pressure fluid			Mineral oil (HL, HLP) to DIN 51 524 ¹⁾ ; Fast bio-degradable pressure fluids to VDMA 24 568 (also see RE 90 221); HETG (rape seed oil) ¹⁾ ; HEPG (polyglycols) ²⁾ ; HEES (synthetic ester) ²⁾ ; Other pressure fluids on request
Pressure fluid temperature range		°C	– 30 to + 80 (NBR seals) – 20 to + 80 (FKM seals)
Viscosity range		mm ² /s	2.8 to 500
Degree of contamination			Maximum permissible degree of contamination of the pressure fluid is to NAS 1638 class 9. We therefore, recommend a filter with a minimum retention rate of $\beta_{10} \geq 75$.

Electrical

Voltage type			DC	AC 50/60 Hz
Available voltages ³⁾ (for ordering details of AC solenoids see below)	V		12, 24, 96, 205	110, 230
Voltage tolerance (nominal voltage)	%		±10	
Power consumption	W		30	–
Holding power	VA		–	50
Switch-on power	VA		–	220
Duty			Continuous	Continuous
Switching time to ISO 6403	ON	ms	25 to 45	10 to 20
	OFF	ms	10 to 25	15 to 40
Switching frequencies		Cycles/h	UP to 15000	UP to 7200
Protection to DIN 40 050 ⁴⁾			IP 65	IP 65
Max. coil temperature ⁵⁾		°C	150	180

¹⁾ Suitable for NBR **and** FKM seals

²⁾ **Only** suitable for FKM seals

³⁾ Other voltages on request

⁴⁾ With fitted and locked plug-in connector

⁵⁾ Due to the occurring surface temperatures of the solenoid coils, the European standards EN563 and EN982 must be taken into account!

Note:

AC solenoids may be used for 2 or 3 types of supply;
E.g. solenoid type **W110** for:
110 V, 50 Hz; 110 V, 60 Hz;
120 V, 60 Hz

Ordering details

W110	110 V, 50 Hz 110 V, 60 Hz 120 V, 60 Hz
W230	230 V, 50 Hz 230 V, 60 Hz

With electrical connections the protective conductor (PE $\frac{1}{2}$) must be connected according to the relevant regulations.

Performance limits (measured with HLP46, $\vartheta_{oil} = 40\text{ °C} \pm 5\text{ °C}$)

⚠ Attention!

The given switching power limits are for applications with two flow directions (e.g. from P to A and simultaneous return flow from B to T).

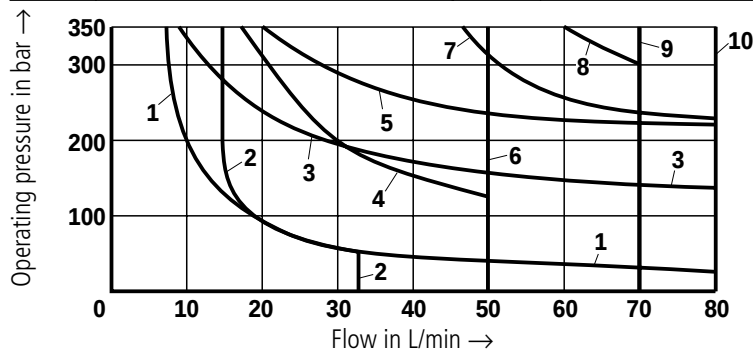
Due to the flow forces active within the valves the permissible switching power limit may be significantly less if there is only one

direction of flow (e.g. from P to A and port B blocked)!

(Please consult us for applications of this kind.)

The switching power limits were measured with the solenoids at operating temperature, 10% under voltage and without tank back pressure.

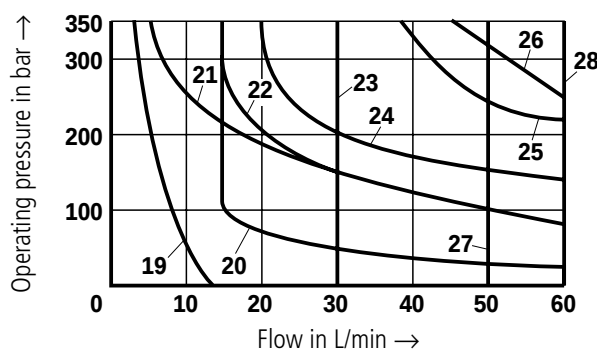
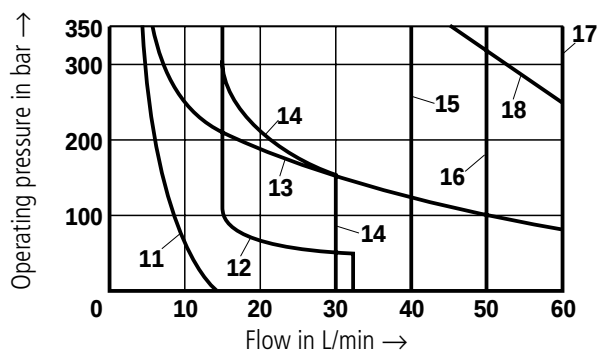
DC solenoid		AC solenoid – 50 Hz		AC solenoid – 60 Hz	
Char. curve	Symbol	Char. curve	Symbol	Char. curve	Symbol
1	A, B ¹⁾	11	A, B ¹⁾	19	A, B ¹⁾
2	V	12	V	20	V
3	A, B	13	A, B	21	A, B
4	F, P	14	F, P	22	F, P
5	J	15	G, T	23	G, T
6	G, H, T	16	H	24	J, L, U
7	A/O, A/OF, L, U	17	A/O, A/OF, C/O, C/OF	25	A/O, A/OF, Q, W
8	C, D, Y		D/O, D/OF, E, E1– ²⁾ , J, L	26	C, D, Y
9	M		M, Q, R ³⁾ , U, W	27	H
10	E, E1– ²⁾ , R ³⁾ , C/O, C/OF D/O, D/OF, Q, W	18	C, D, Y	28	C/O, C/OF, D/O, D/OF, E, E1– ²⁾ , M, R ³⁾



¹⁾ With hand override

²⁾ P – A/B pre-opening

³⁾ Return flow from actuator to tank



DC solenoid	
Char. curve	Solenoid voltage
1 to 10	12, 24, 48, 96, 125, 205 V

(for other voltages see pages 6 and 7)

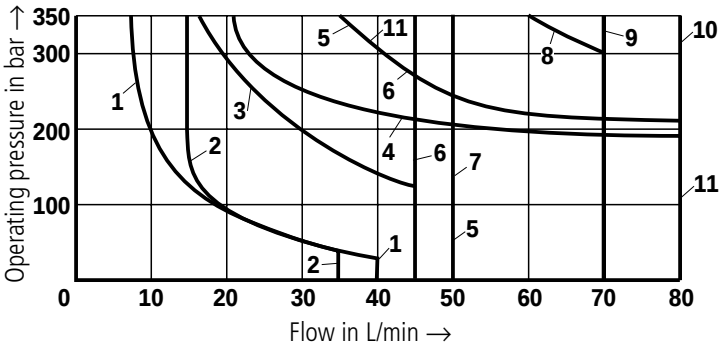
AC solenoid		
Char. curve	Solenoid voltage	
11 to 18	W110	110 V, 50 Hz
		120 V, 60 Hz
	W230	230 V, 50 Hz

(other voltages on request)

AC solenoid		
Char. curve	Solenoid voltage	
19 to 28	W110	110 V, 60 Hz
		230 V, 60 Hz
	W230	230 V, 60 Hz

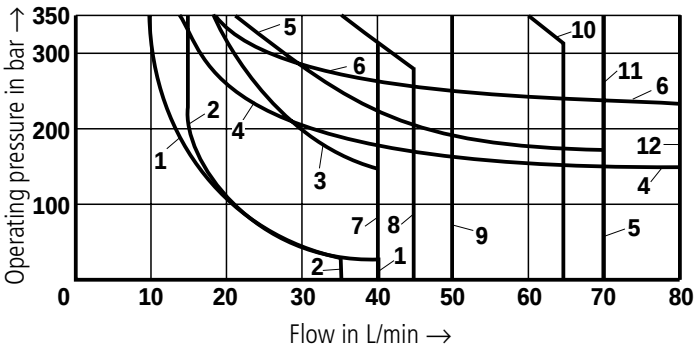
(other voltages on request)

Performance limits (measured with HLP46, $\vartheta_{oil} = 40\text{ °C} \pm 5\text{ °C}$)



DC solenoid	
Char. curve	Solenoid voltage
1 to 10	110; 180

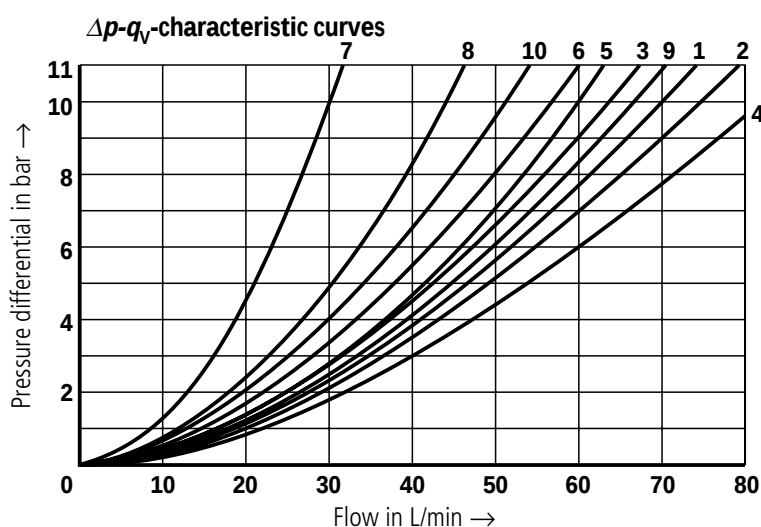
DC solenoid	
Char. curve	Symbol
1	A, B
2	V
3	F, P
4	J, L, U
5	G
6	T
7	H
8	D, C
9	M
10	C/O, C/OF, D/O, D/OF, E, E1, R, Q, W
11	A/O, A/OF



DC solenoid	
Char. curve	Solenoid voltage
1 to 12	42; 80; 220

DC solenoid	
Char. curve	Symbol
1	A, B
2	V
3	F, P
4	J, L, U
5	A/O, A/OF
6	E
7	T
8	G
9	H
10	D, C
11	M
12	C/O, C/OF, D/O, D/OF, E1, R, Q, W

Characteristic curves (measured with HLP46, $\vartheta_{oil} = 40\text{ °C} \pm 5\text{ °C}$)



- 7 Symbol "R" in switched position B – A
- 8 Symbol "G" and "T" in mid position P – T
- 9 Symbol "H" in mid position P – T

Symbols	Flow direction			
	P – A	P – B	A – T	B – T
A, B	3	3	–	–
C	1	1	3	1
D, Y	5	5	3	3
E	3	3	1	1
F	1	3	1	1
T	10	10	9	9
H	2	4	2	2
J, Q	1	1	2	1
L	3	3	4	9
M	2	4	3	3
P	3	1	1	1
R	5	5	4	–
V	1	2	1	1
W	1	1	2	2
U	3	3	9	4
G	6	6	9	9

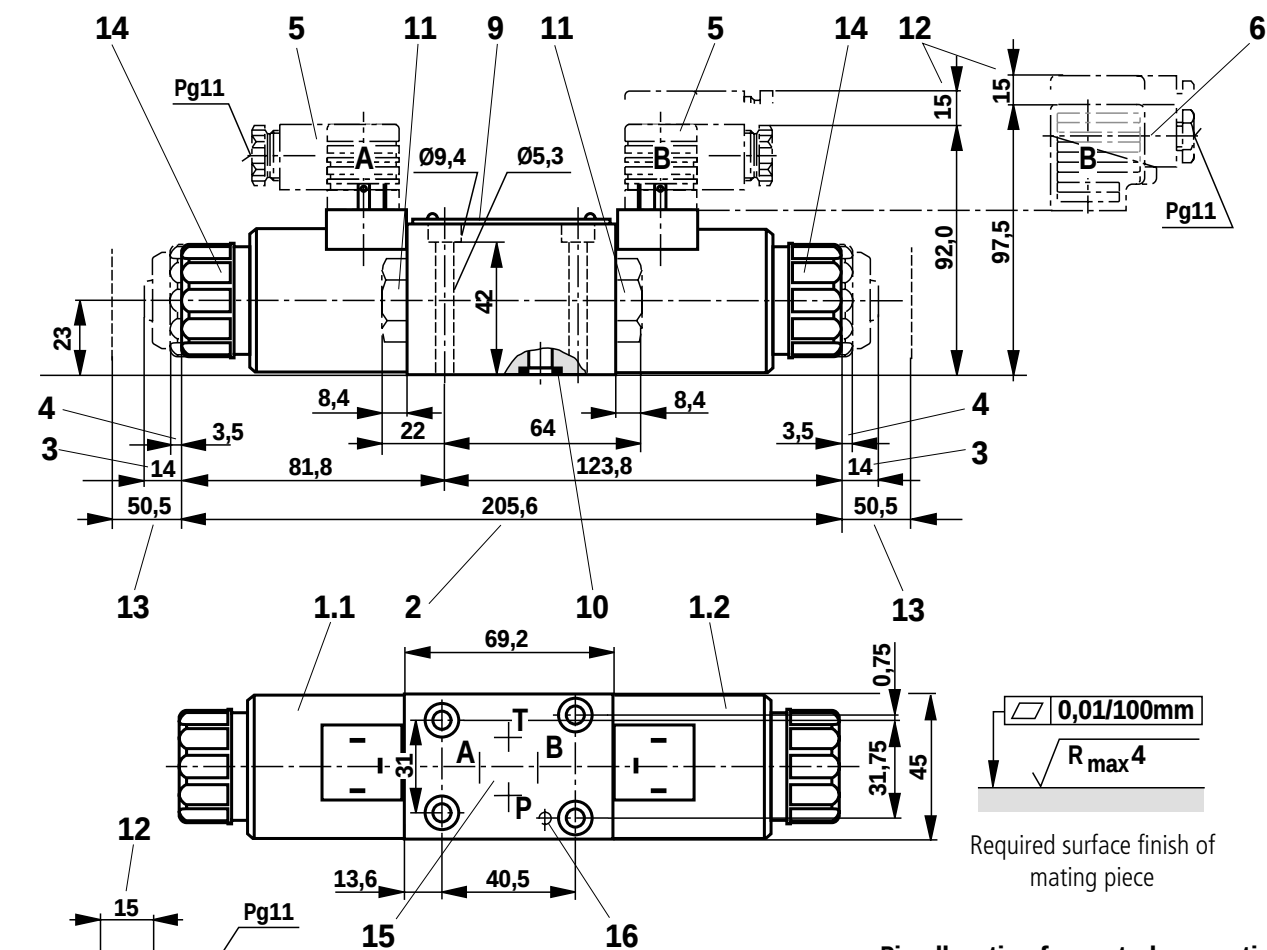
Preferred types (readily available)

Type	Material number
4WE 6 J6X/EG12N9K4	00567496
3WE 6 A6X/EG24N9K4	00561180
3WE 6 B6X/EG24N9K4	00561270
4WE 6 C6X/EG24N9K4	00561272
4WE 6 C6X/OFEG24N9K4	00564107
4WE 6 D6X/EG24N9K4	00561274
4WE 6 D6X/OFEG24N9K4	00567512
4WE 6 E6X/EG24N9K4	00561278
4WE 6 EA6X/EG24N9K4	00561280
4WE 6 EB6X/EG24N9K4	00561281
4WE 6 G6X/EG24N9K4	00561282
4WE 6 H6X/EG24N9K4	00561286
4WE 6 HA6X/EG24N9K4	00549534
4WE 6 J6X/EG24N9K4	00561288
4WE 6 M6X/EG24N9K4	00577475
4WE 6 Q6X/EG24N9K4	00561292
4WE 6 R6X/EG24N9K4	00571012
4WE 6 T6X/EG24N9K4	00934414
4WE 6 U6X/EG24N9K4	00572785
4WE 6 W6X/EG24N9K4	00568233
4WE 6 Y6X/EG24N9K4	00561276

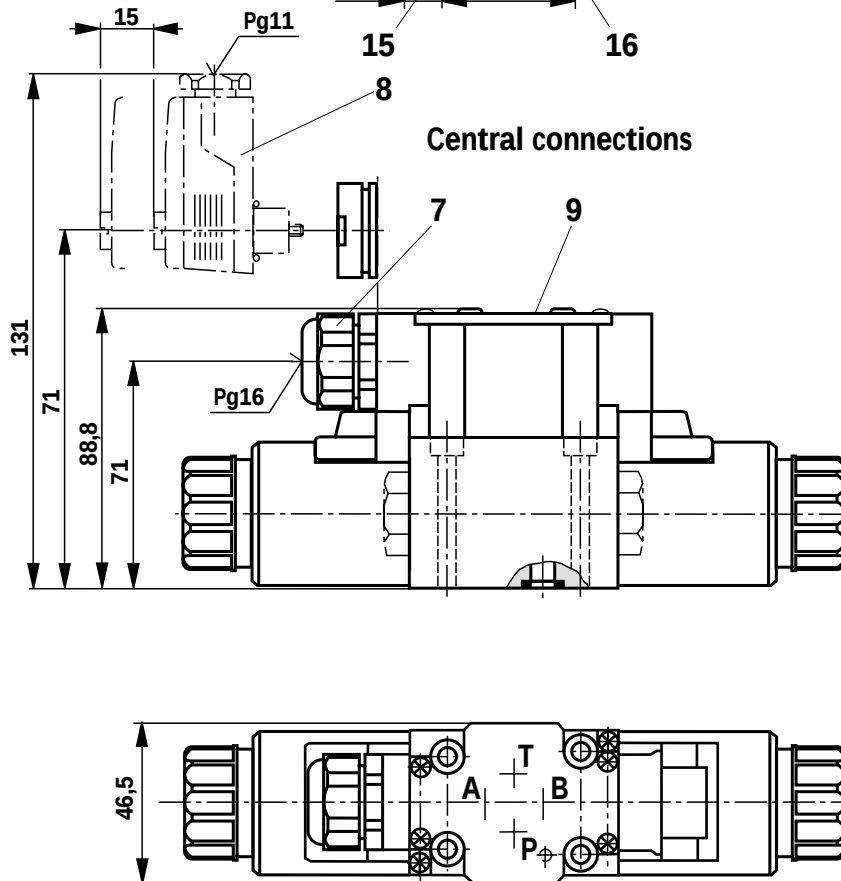
Type	Material number
4WE 6 D6X/EW110N9K4	00551704
4WE 6 D6X/OFEW110N9K4	00552321
4WE 6 E6X/EW110N9K4	00558641
4WE 6 J6X/EW110N9K4	00551703
3WE 6 A6X/EW230N9K4	00915672
4WE 6 C6X/EW230N9K4	00913132
4WE 6 D6X/EW230N9K4	00909559
4WE 6 D6X/OFEW230N9K4	00915095
4WE 6 E6X/EW230N9K4	00912492
4WE 6 H6X/EW230N9K4	00912494
4WE 6 J6X/EW230N9K4	00911762
4WE 6 Y6X/EW230N9K4	00909415

Further preferred types and standard components are shown in the EPS (standard price list).

Individual connections



Central connections



Pin allocation for central connections:

With 1 solenoid:

Solenoid always to terminals 1 and 2
Earth to terminal $\oplus$ PE

With 2 solenoids:

Solenoid "a" to terminals 1 and 2
solenoid "b" to terminals 3 and 4
Earth to terminal $\oplus$ PE

1.1 Solenoid "a" (plug-in connector colour grey)

1.2 Solenoid "b" (plug-in connector colour black)

2 Dim. for solenoid **with protected** hand override **"N9"** (standard)
– The hand override can only be actuated up to a tank pressure of approx. 50 bar.

Avoid damage to hand override pin bore!

3 Dim. for solenoid **with** hand override **"N"**

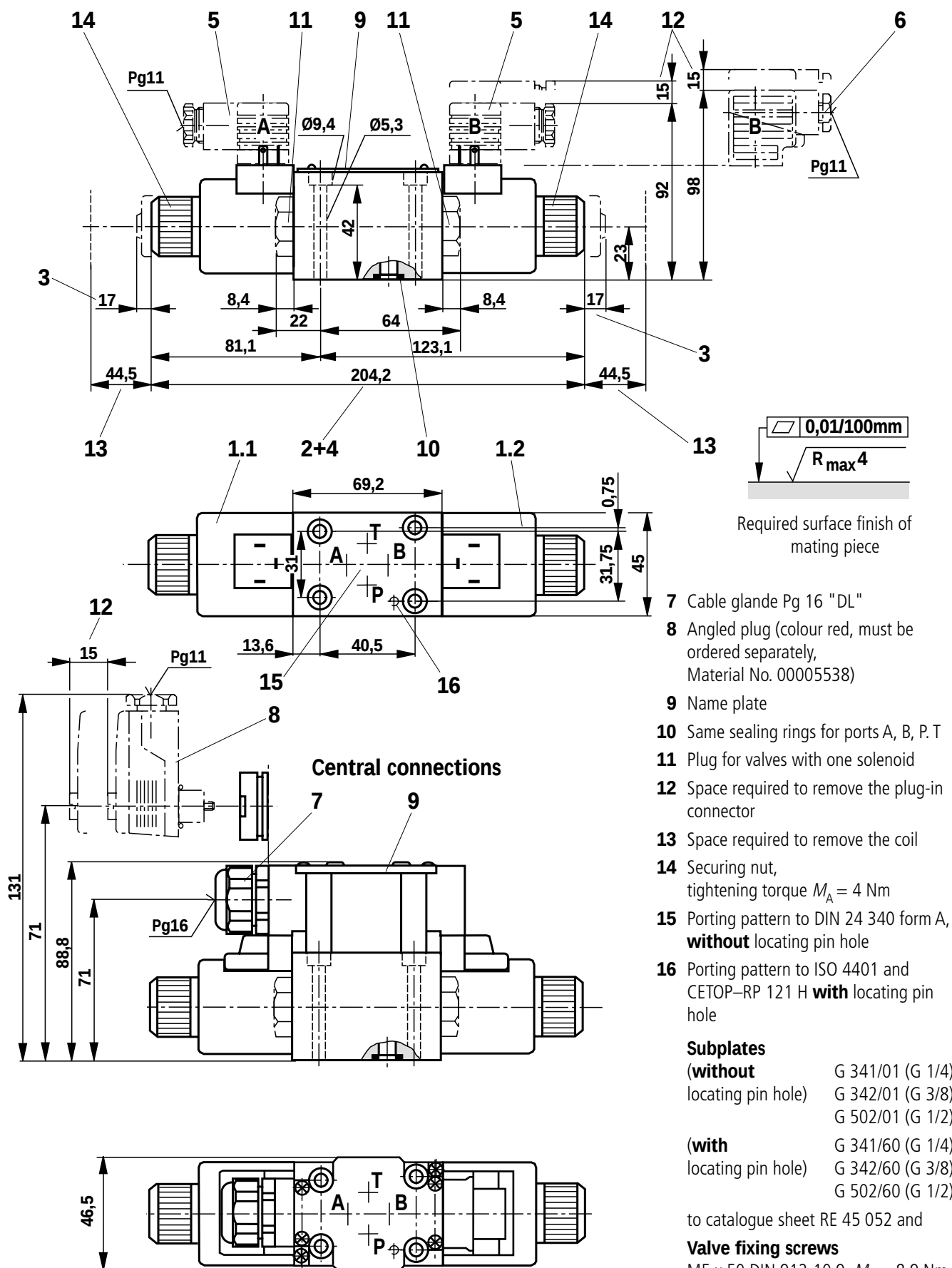
4 Dim. for solenoid **without** hand override

5 Plug-in connector **without** circuitry ¹⁾

6 Plug-in connector **with** circuitry ¹⁾

¹⁾ Must be ordered separately, see page 3

Individual connections



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