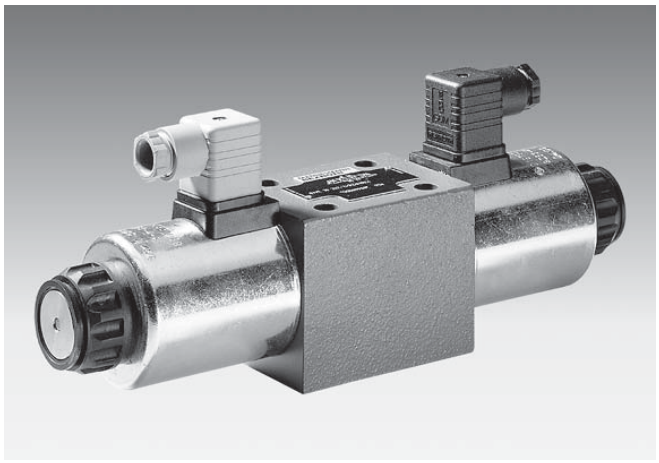
RE 23 327/02.03

Replaces: 07.02

4/3-, 4/2- and 3/2- way directional valves with wet pin DC or AC solenoids, Type .WE 10 ../.C

Nominal size 10
Series 3X (individual connections)
Series 4X (central connections)
Maximum operating pressure 315 bar
Maximum flow 120 L/min



HAD5958/98

Type 4WE 10 E3X/CG24N9K4 with plug-in connector

Overview of contents

Features

- Direct solenoid operated directional spool valve, standard version
- Porting pattern to DIN 24 340 form A, ISO 4401 and CETOP–RP 121 H, subplates to catalogue sheet RE 45 054 (separate order)
- Wet pin AC or DC solenoids with removable coil
- Solenoid coil can be rotated through 90°
- Coils may be replaced without opening the pressure tight chamber
- Electrical connections available as either individual connections or as a central connection
- Hand override, optional
- For soft switching version, see RE 23 183
- For inductive limit switch (contact and proximity), see RE 24 830

Ordering details

	WE	10		/	C				/		*

3 actuator ports = **3**
4 actuator ports = **4**

Nominal size 10 = **10**

Symbol e.g. C, E, EA, EB etc. – for possible versions see page 3

Series 30 to 39 – individual connection = **3X**
(30 to 39: unchanged installation and connection dimensions)

Series 40 to 49 – central connection = **4X**
(40 to 49: unchanged installation and connection dimensions)

With spring return = **No code**
Without spring return, with detent = **OF**
Without spring return = **O**

Wet pin solenoid (oil immersed) with removable coil = **C**

24 V DC = **G24**
230 V AC 50/60 Hz = **W230**
205 V DC = **G205** [1]
Ordering details for other voltages and frequencies see page 5.

With protected hand override **(standard)** = **N9**
Without hand override = **No code**
Hand override with protective cap = **N**

Types of electrical connections
Individual connection; with component plug DIN EN 175 301-803, without plug-in connector = **K4** [2]
Central connection; cable entry in cover with indicator lamp = **DL**
Central connection; central connection in cover with indicator light (without angled plug-in connector) = **DKL** [3]

Accessories
With inductive limit switch (for ordering details see catalogue sheet RE 24 830)
Without limit switch = **No code**

Without cartridge throttle = **No code**
Throttle Ø 0.8 mm = **B08**
Throttle Ø 1.0 mm = **B10**
Throttle Ø 1.2 mm = **B12**
Used where the flow > than the perforamce limit of the valves effective in P port

NBR seals = **No code**
FKM seals = **V**
(other seals on request) ⚠ **Attention!** The compatibility of the seals and pressure fluid has to be taken into account!

Further details in clear text

[1] When connecting to an AC supply a DC solenoid **must** be used which is controlled via a rectifier (see table below).
With an individual connection a large plug-in connector with built-in rectifier can be used (separate order, see page 3).

[2] Plug-in connectors must be ordered separately (see page 3).

[3] Plug-in connector (Material No. **R900005538**) must be ordered separately.

Preferred types, see page 10, are readily available

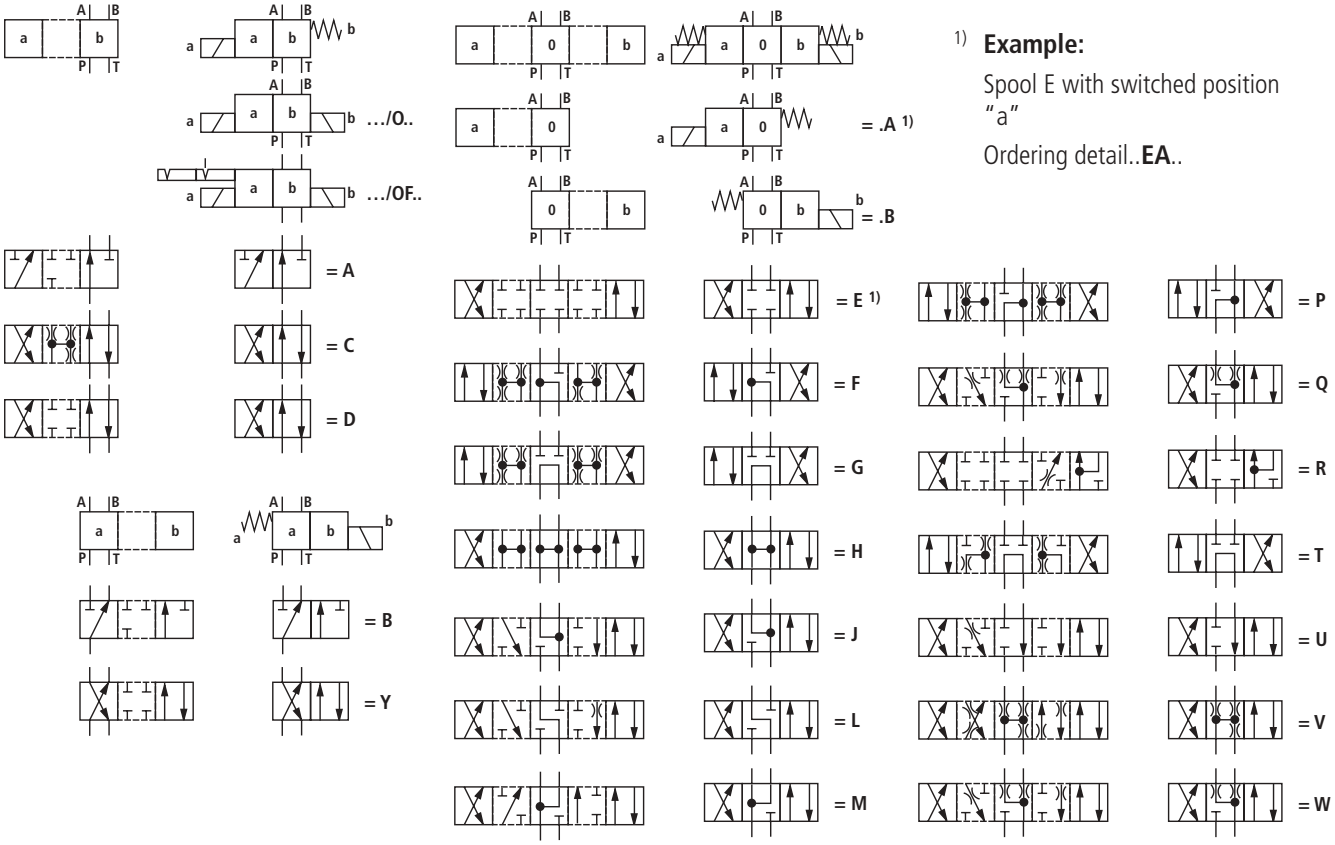
DC solenoids used with an AC supply

AC supply (permissible voltage tolerance ± 10%)	Nominal voltage of the DC solenoid when used with an AC supply via rectifier	Order detail
110 V - 50/60 Hz	96 V	**G96**
120 V - 60 Hz	110 V	**G110**
230 V - 50/60 Hz	205 V	**G205**

AC solenoids may be used for several types of supplies:

Supply	Ordering details
42 V, 50 Hz 42 V, 60 Hz	**W42**
110 V, 50 HZ 110 V, 60 Hz 120 V, 60 Hz	**W110**
230 V, 50 Hz 230 V, 60 Hz	**W230**

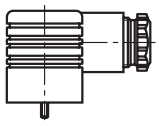
Symbols

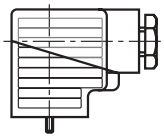


1) **Example:**
Spool E with switched position "a"
Ordering detail..**EA**..

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

Further plug-in connectors see RE 08 006





Valve side	Colour	Material No.			
		Without circuitry	With indicator lamp 12 … 240 V	With rectifier 12 … 240 V	With indicator lamp and Z-diode protective circuit 24 V
a	grey	**R900074683**	–	–	–
b	black	**R900074684**	–	–	–
a/b	black	–	**R900057292**	**R900313933**	**R900310995**

Function, section

Directional valves type WE are solenoid operated directional spool valves. They are used to control the start, stop and direction of a flow.

The directional valves basically comprise of the housing (1), one or two solenoids (2), a control spool (3), and one or two return springs (4).

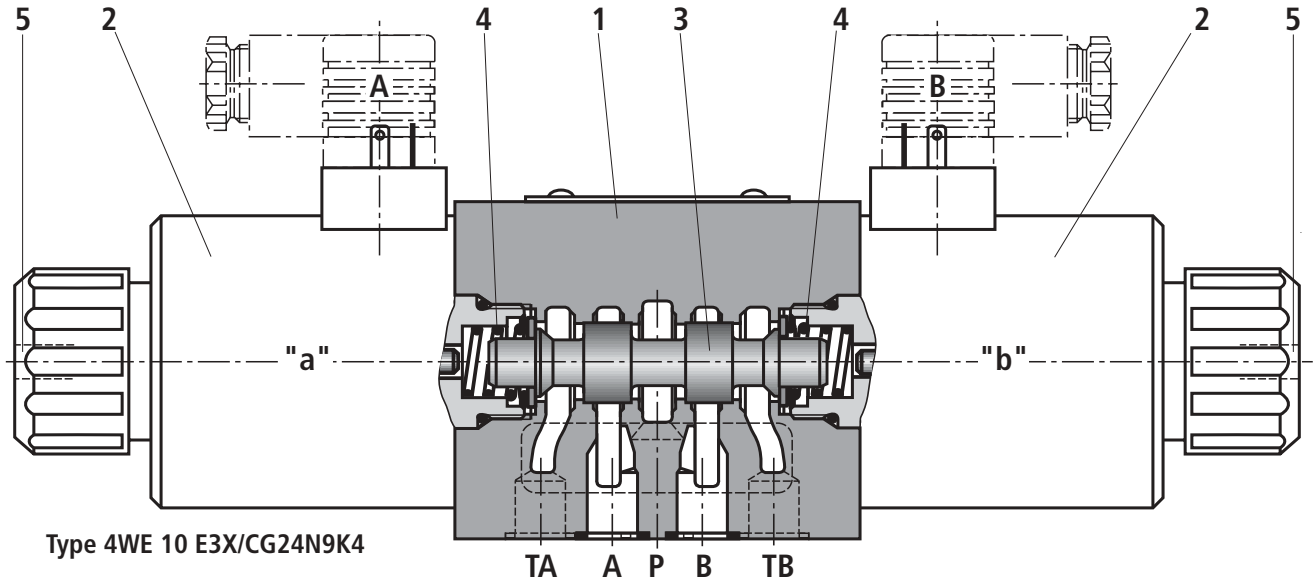
In the de-energised condition the control spool (3) is held in its central or initial position be means of the return springs (4) (with the exception of impulse spools). The control spool (3) is operated by the wet pin solenoids (2).

In order to ensure correct function care must be taken that the solenoid pressure chamber is filled with oil.

The force of solenoid (2) acts on the control spool (3) and moves it from its initial position to the desired end position. This permits free flow from P to A and B to T or P to B and A to T.

On de-energising the solenoid (2) the control spool (3) is returned to its initial position by the return spring (4).

The optional hand override (5) permits the control spool (3) to be moved without the solenoids being energised.



Type 4WE 10 E3X/CG24N9K4

Type .WE 10.3X/OC....

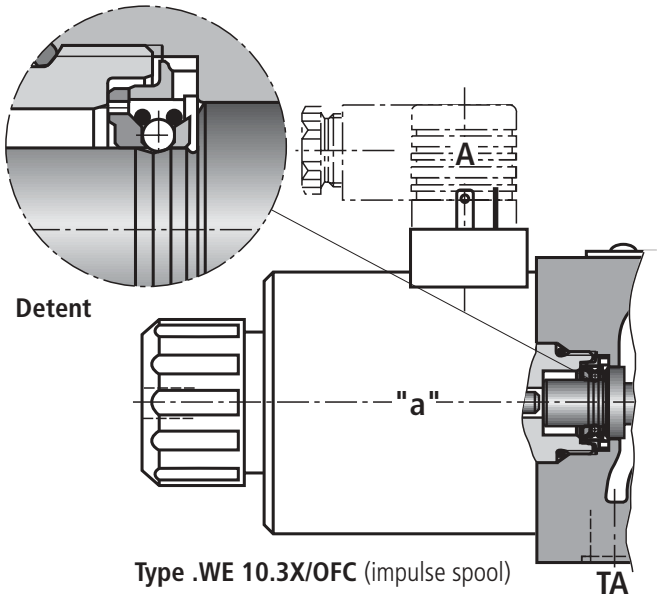
(only possible with symbols A, C and D)

This model is a 2-position directional valve with 2 solenoids without detents. The spool position, when the solenoids are de-energised, is **not** defined.

Type .WE 10.3X/OFC... (impulse spool), with detent

(only possible with symbols A, C and D)

This model is a 2-position directional valve with 2 solenoids and detents. Hence, when the solenoids are de-energised, the spool is held in the detented position and thus the solenoids do not need to be continuously energised.

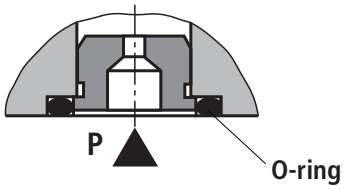


Type .WE 10.3X/OFC (impulse spool)

Cartridge throttle (type 4WE 10…/.../**B**..)

A cartridge throttle is required when, if due to the operating conditions, flows can occur during the switching procedure which are higher than the permitted performance limits of the valve.

The throttle is inserted into the P port of the directional valve.



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

General

Installation			Optional	
ambient temperature range		°C	–30 to +50 (NBR seals)	
			–20 to +50 (FKM seals)	
Weight			Central connection	Individual connection
	Valve with 1 solenoid	kg	4.4 (=); 3.6 (~)	4.3 (=); 3.5 (~)
	Valve with 2 solenoids	kg	6.0 (=); 4.4 (~)	5.9 (=); 4.3 (~)

Hydraulic

Max. operating pressure	Ports A, B, P	bar	315	
	Port T	bar	210 (=) ; 160 (~)	For symbols A and B port T must be used as a drain line, if the operating pressure is higher than the permissible tank pressure.
Max. flow		L/min	120	
Flow cross-section	For symbol V	mm^2	11 (A/B → T); 10.3 (P → A/B)	
(switched position 0)	For symbol W	mm^2	2.5 (A/B → T)	
	For symbol Q	mm^2	5.5 (A/B → T)	
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 (with NBR seals)	
			– 20 to + 80 (with FKM seals)	
Viscosity range		mm^2/s	2.8 to 500	
Cleanliness class to ISO code			Maximum permissible degree of contamination of the pressure fluid is to ISO 4406 (C) class 20/18/15 [3]	

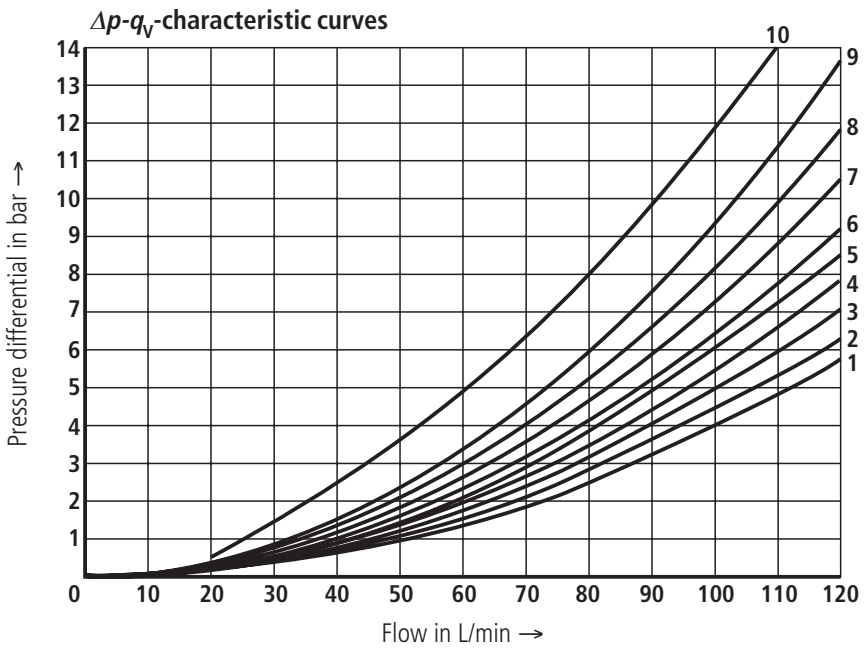
Electrical

Voltage type			DC	AC
Available voltages [4] (ordering details for AC solenoids see below)		V	12, 24, 42, 60, 96, 110, 180, 205, 220	42, 110, 230 50/60 Hz
Voltage tolerance (nominal voltage)		%	±10	
Power consumption		W	35	–
Holding power		VA	–	90
Switching power		VA	–	550
Duty			Continuous	
Switching time to ISO 6403	ON	ms	45 to 60	15 to 25
	OFF	ms	20 to 30	20 to 30
Switching frequency		cycles/h	Up to 15000	Up to 7200
Protection to DIN 40 050 [5]			IP 65	
Insulation class VDE 0580			F	H
Max. coil temperature [6]		°C	150	180

With electrical connections the protective conductor (PE ⏚) must be connected according to the relevant regulations.

1) Suitable for NBR **and** FKM seals
2) **Only** suitable for FKM seals
3) The cleanliness class stated for the components must be adhered too in hydraulic systems. Effective filtration prevents faults from occurring and at the same time increases the component service life.
   For the selection of filters see catalogue sheets RE 50 070, RE 50 076 and RE 50 081.
4) Special voltages on request
5) With assembled and locked plug-in connector
6) Due to the surface temperatures which occur on the solenoid coil, the European standards EN563 and EN982 have to be taken into account!

Characteristic curves (measured with HLP46, ϑ_{oil} = 40 °C ±5°C)



Symbols	Direction of flow			
	P – A	P – B	A – T	B – T
A, B	3	3	–	–
C	3	3	4	5
D, Y	5	5	6	6
E	1	1	4	4
F	2	3	7	4
G	3	3	6	7
H	1	1	6	7
J	1	1	3	3
L	2	2	3	5
M	1	1	4	5
P	4	2	5	7
Q	1	2	1	3
R	3	6	4	–
T	3	3	6	7
U, V	2	2	3	3
W	2	2	4	5

Op. pos.	P – A	B – A	A – T	P – T
R	–	9	–	–

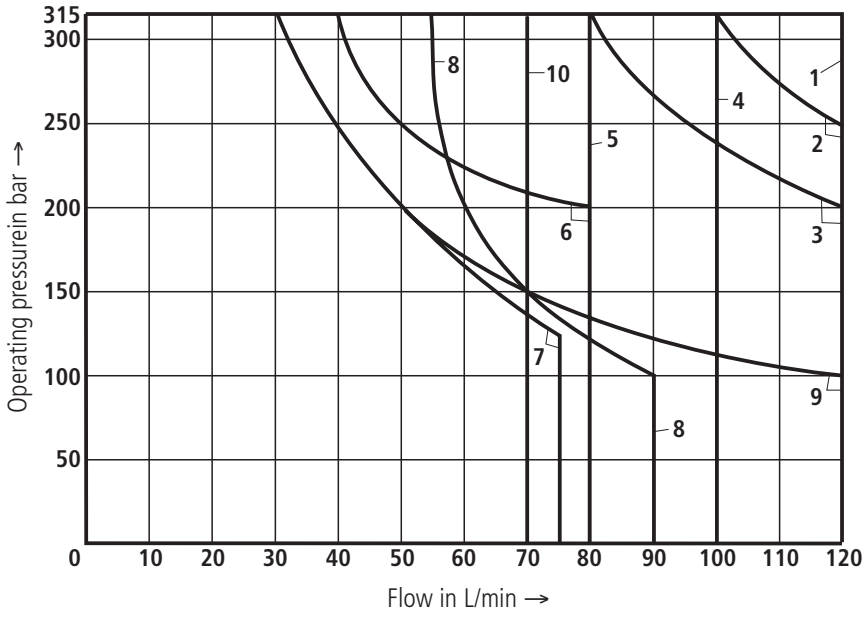
Centre pos.	P – A	P – B	B – T	A – T	P – T
F	4	–	–	9	9
P	–	5	8	–	10
G, T			–	–	9
H			–	–	3

Performance limits: DC (measured with HLP46, ϑ_{oil} = 40 °C ±5°C)

The performance limits shown are valid when the valve is used with two directions of flow (e.g. from P to A with simultaneous return flow from B to T).

Due to the flow forces occuring within the valves, the permissbile switching performance limits can be significantly lower with only one direction of flow (e.g. from P to A and port B blocked)! (For these applications, please consult us.)

The performance limit was determined with the solenoids at their operating temperature, 10 % under voltage and with no pre-loading of the tank.

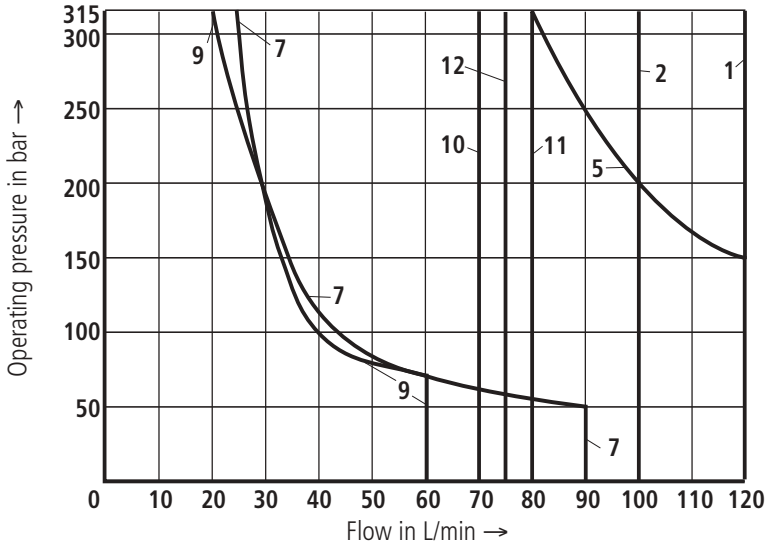


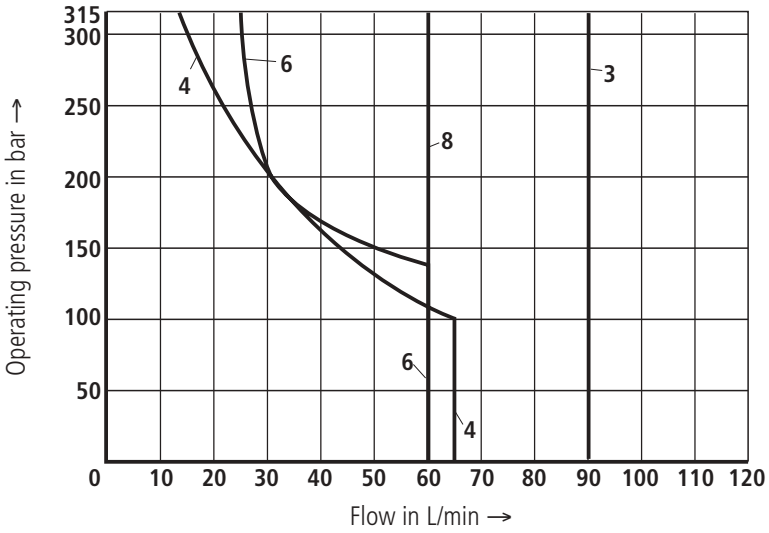
Char. curve	Symbols
1	C, C/O, C/OF D, D/O, D/OF Y, M
2	E
3	A/O, A/OF L, U, J, Q, W
4	H
5 [1]	R, L[2], U[2]
6	G
7	T
8	F, P
9	A, B
10	V

[1] Return flow
(independent of the area ratio)

[2] Only the centre position

Performance limits: AC (measured with HLP46, ϑ_{oil} = 40 °C ±5°C)

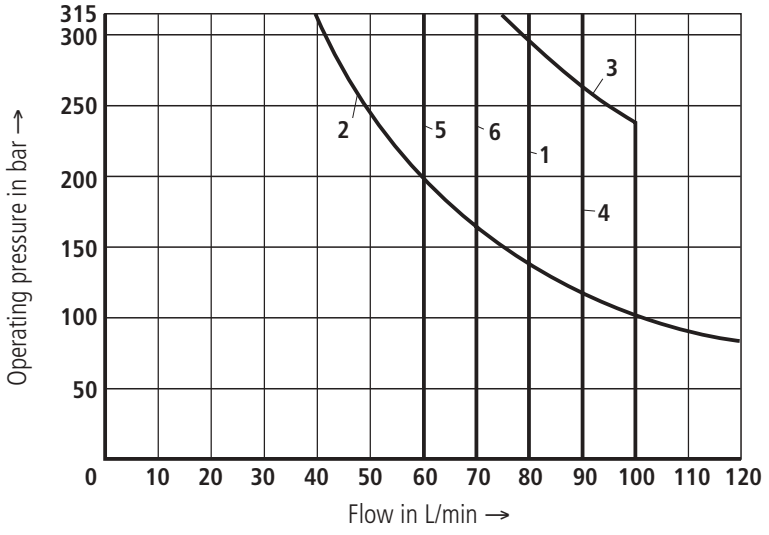




Char. curve	Symbols
1	C, C/O, C/OF D, D/O, D/OF Y
2	E, L, U, Q, W
3	M
4	A, B
5	A/O, A/OF, J
6	G
7	F, P
8	V
9	T
10	H
11	R
12 [1]	L, U

[1] Only the centre position

42 V, 50 Hz; 110 V, 50 Hz; 120 V, 60 Hz;
127 V, 50 Hz; 220 V, 50 Hz; 240 V, 60 Hz

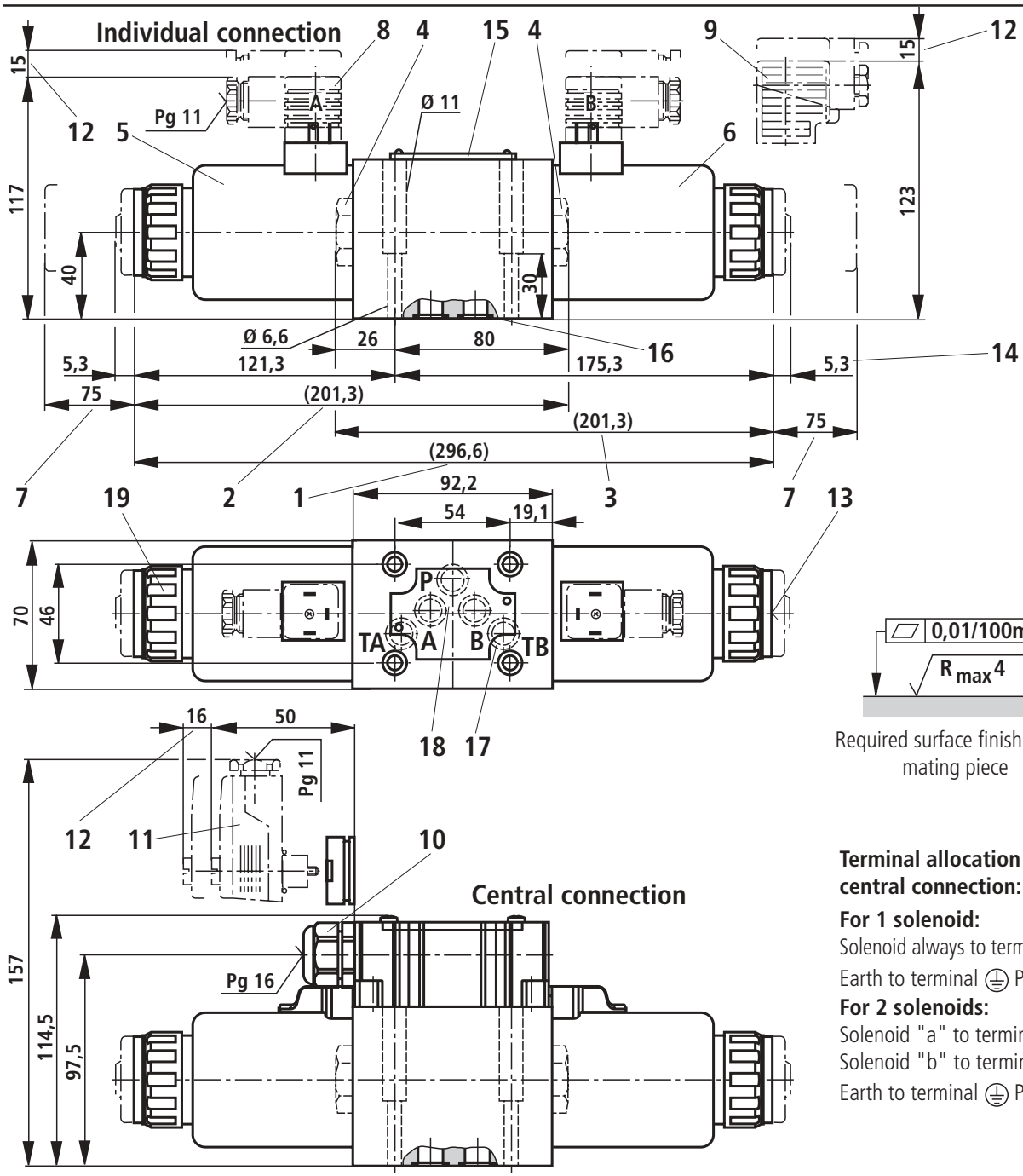


Char. curve	Symbols
1	C, C/O, C/OF D, D/O, D/OF Y
2	A/O, A/OF
3	E
4	M
5	V
6	H

42 V, 60 Hz; 110 V, 60 Hz;
127 V, 60 Hz; 220 V, 60 Hz

Performance limits for other spools on request!

Unit dimensions: DC (dimensions in mm)



Required surface finish of the mating piece

Terminal allocation for the central connection:

For 1 solenoid:
Solenoid always to terminal 1 and 2
Earth to terminal ⏚ PE

For 2 solenoids:
Solenoid "a" to terminals 1 and 2
Solenoid "b" to terminals 3 and 4
Earth to terminal ⏚ PE

1 3-position valve [1)]

2 2-position valve with 1 solenoid (A, C, D, EA...) [1)]

3 2-position valve with 1 solenoid (B, Y, EB...) [1)]

4 Cover for valve with 1 solenoid

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

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

7 Space required to remove the coil

8 Plug-in connector **without** circuitry to DIN EN 175 301-803 [2)]

9 Plug-in connector **with** circuitry to DIN EN 175 301-803 [2)]

10 Cable gland Pg 16 "DL"

11 Plug-in connector (plug-in connector colour red, must be ordered separately, Material No. **R900005538**)

12 Space required to remove the plug-in connector

13 Hand override "N9" (standard) – the hand override can only be operated up to a max. tank pressure of 50 bar – avoid damage to the hand override pin bore!

14 Dimension for hand override "N"

15 Name plate

16 Identical seal rings for ports A, B, P, TA, TB (for valves with cartridge throttle: O-ring in the P port)

17 Additional T connection (TB) can be used with manifolds where this connection is required.

18 Porting pattern to DIN 24 340 form A, ISO 4401 and CETOP–RP 121 H.

Subplates G 66/01 (G 3/8), G 67/01 (G 1/2), G 534/01 (G 3/4)

to catalogue sheet RE 45 054 and

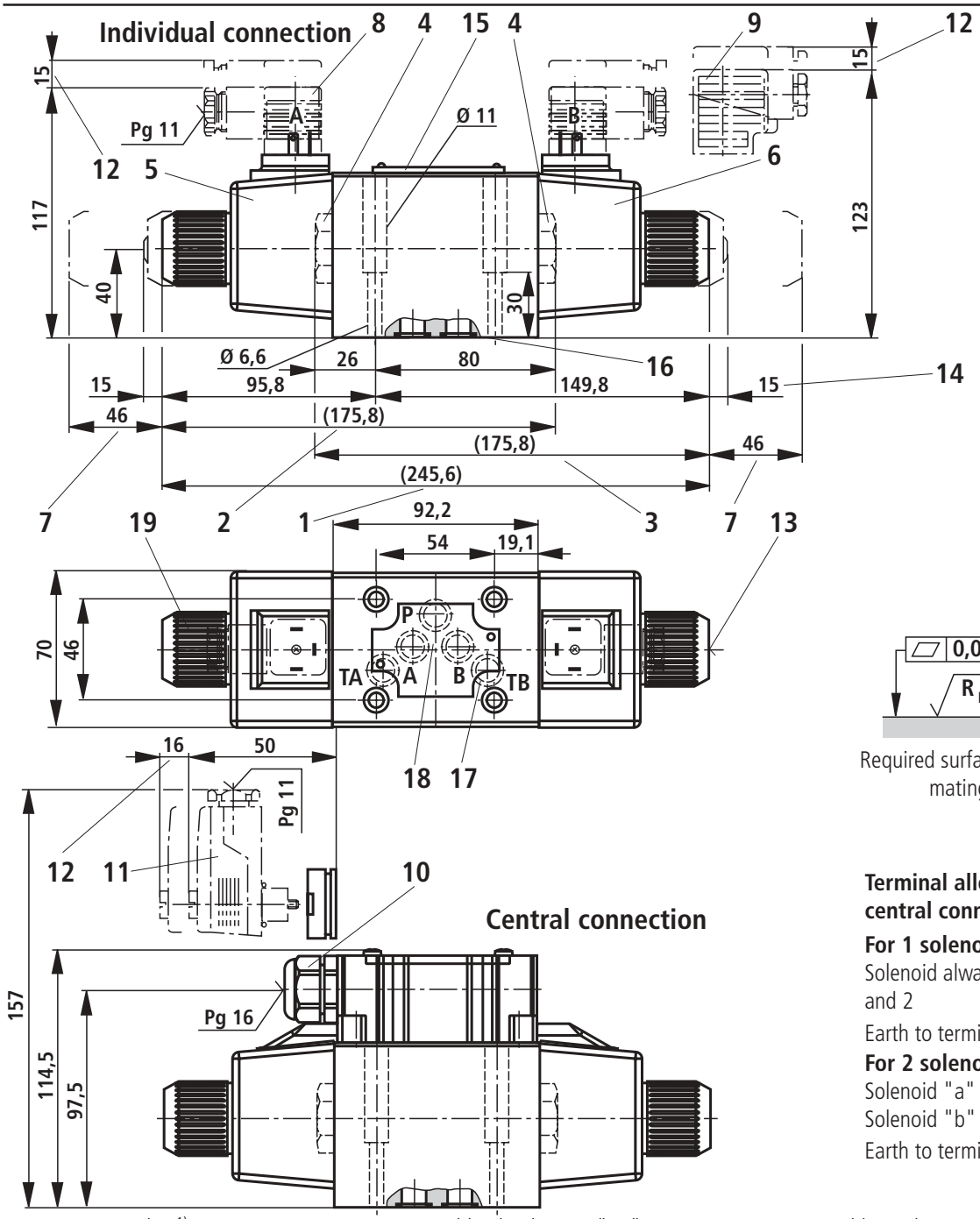
Valve fixing screws
M6 x 40 DIN 912-10.9, M_A = 15.5 Nm, must be ordered separately.

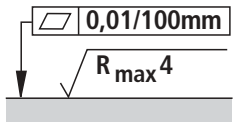
19 Tightening torque M_A = 6 + 2 Nm

[1)] Dim. without hand override and with protected hand override "N9"

[2)] Must be ordered separately, see page 3.

Unit dimensions: AC (dimensions in mm)





Required surface finish of the mating piece

Terminal allocation for the central connection:

For 1 solenoid:
Solenoid always to terminals 1 and 2
Earth to terminal ⏚ PE

For 2 solenoids:
Solenoid "a" to terminals 1 and 2
Solenoid "b" to terminals 3 and 4
Earth to terminal ⏚ PE

1 3-position valve [1)]

2 2-position valve with 1 solenoid (A, C, D, EA...) [1)]

3 2-position valve with 1 solenoid (B, Y, EB...) [1)]

4 Cover for valve with 1 solenoid

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

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

7 Space required to remove the coil

8 Plug-in connector **without** circuitry to DIN EN 175 301-803 [2)]

9 Plug-in connector **with** circuitry to DIN EN 175 301-803 [2)]

10 Cable gland Pg 16 "DL"

11 Plug-in connector (plug-in connector colour red, must be ordered separately, Material No. **R900005538**)

12 Space required to remove the plug-in connector

13 Hand override "N9" (standard) – the hand override can only be operated up to a max. tank pressure of 50 bar – avoid damage to the hand override pin bore!

14 Dimension for hand override "N"

15 Name plate

16 Identical seal rings for ports A, B, P, TA, TB (for valves with cartridge throttle: O-ring in P port)

17 Additional T connection (TB) can be used with manifolds where this connection is required.

18 Porting pattern to DIN 24 340 form A, ISO 4401 and CETOP–RP 121 H.

Subplates G 66/01 (G 3/8), G 67/01 (G 1/2), G 534/01 (G 3/4)
to catalogue sheet RE 45 054 and

Valve fixing screws
M6 x 40 DIN 912-10.9, M_A = 15.5 Nm, must be ordered separately.

19 Tightening torque M_A = 6 + 2 Nm

[1)] Dim. without hand override and with protected hand override "N9"

[2)] Must be ordered separately, see page 3.

Preferred types (readily available)

Type	Material number
3WE 10 A3X/CG24N9K4	R900592014
3WE 10 A3X/CW230N9K4	R900915675
3WE 10 B3X/CG24N9K4	R900594429
3WE 10 B3X/CW230N9K4	R900517341
4WE 10 C3X/CG24N9K4	R900593277
4WE 10 C3X/CW230N9K4	R900915651
4WE 10 D3X/CG24N9K4	R900589933
4WE 10 D3X/CW230N9K4	R900912496
4WE 10 E3X/CG24N9K4	R900588201
4WE 10 E3X/CW230N9K4	R900911869
4WE 10 F3X/CG24N9K4	R900529749
4WE 10 F3X/CW230N9K4	R900918361
4WE 10 G3X/CG24N9K4	R900594277
4WE 10 G3X/CW230N9K4	R900912497
4WE 10 H3X/CG24N9K4	R900597986
4WE 10 H3X/CW230N9K4	R900503425
4WE 10 J3X/CG24N9K4	R900589988
4WE 10 J3X/CW230N9K4	R900911868
4WE 10 L3X/CG24N9K4	R900599646
4WE 10 L3X/CW230N9K4	R900915669

Type	Material number
4WE 10 M3X/CG24N9K4	R900500932
4WE 10 M3X/CW230N9K4	R900916118
4WE 10 P3X/CG24N9K4	R900500716
4WE 10 Q3X/CG24N9K4	R900591325
4WE 10 Q3X/CW230N9K4	R900921465
4WE 10 R3X/CG24N9K4	R900598583
4WE 10 R3X/CW230N9K4	R900593804
4WE 10 T3X/CG24N9K4	R900503424
4WE 10 T3X/CW230N9K4	R900931784
4WE 10 U3X/CG24N9K4	R900592655
4WE 10 U3X/CW230N9K4	R900909906
4WE 10 V3X/CG24N9K4	R900921780
4WE 10 V3X/CW230N9K4	R900919553
4WE 10 W3X/CG24N9K4	R900588200
4WE 10 W3X/CW230N9K4	R900521281
4WE 10 Y3X/CG24N9K4	R900595531
4WE 10 Y3X/CW230N9K4	R900915670

Further preferred types and standard units can be found in the EPS (Standard Price List).

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