

**RE 22 371/02.03**

Replaces: 07.02

**4/3- and 4/2-way directional valves  
with hand lever  
Type WMM**

Nominal sizes 16 and 25

Series 7X

Maximum operating pressure 350 bar

Maximum flow 450 L/min



HAD5914/98

Type H-4WMM 16 E7X/...

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**Features**

- Direct operated directional spool valve with hand lever
- Porting pattern to DIN 24 340 Form A, ISO 4401 and CETOP-RP 121 H
- With spring return or detent, optional
- The mechanical actuator components are protected against contamination and ingress of moisture
- The end cap complete with the mechanical actuator components can be exchanged without having to disassemble the valve
- For further information:
 

For NS 16 subplates	RE 45 056
For NS 25 subplates	RE 45 058



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## Ordering details

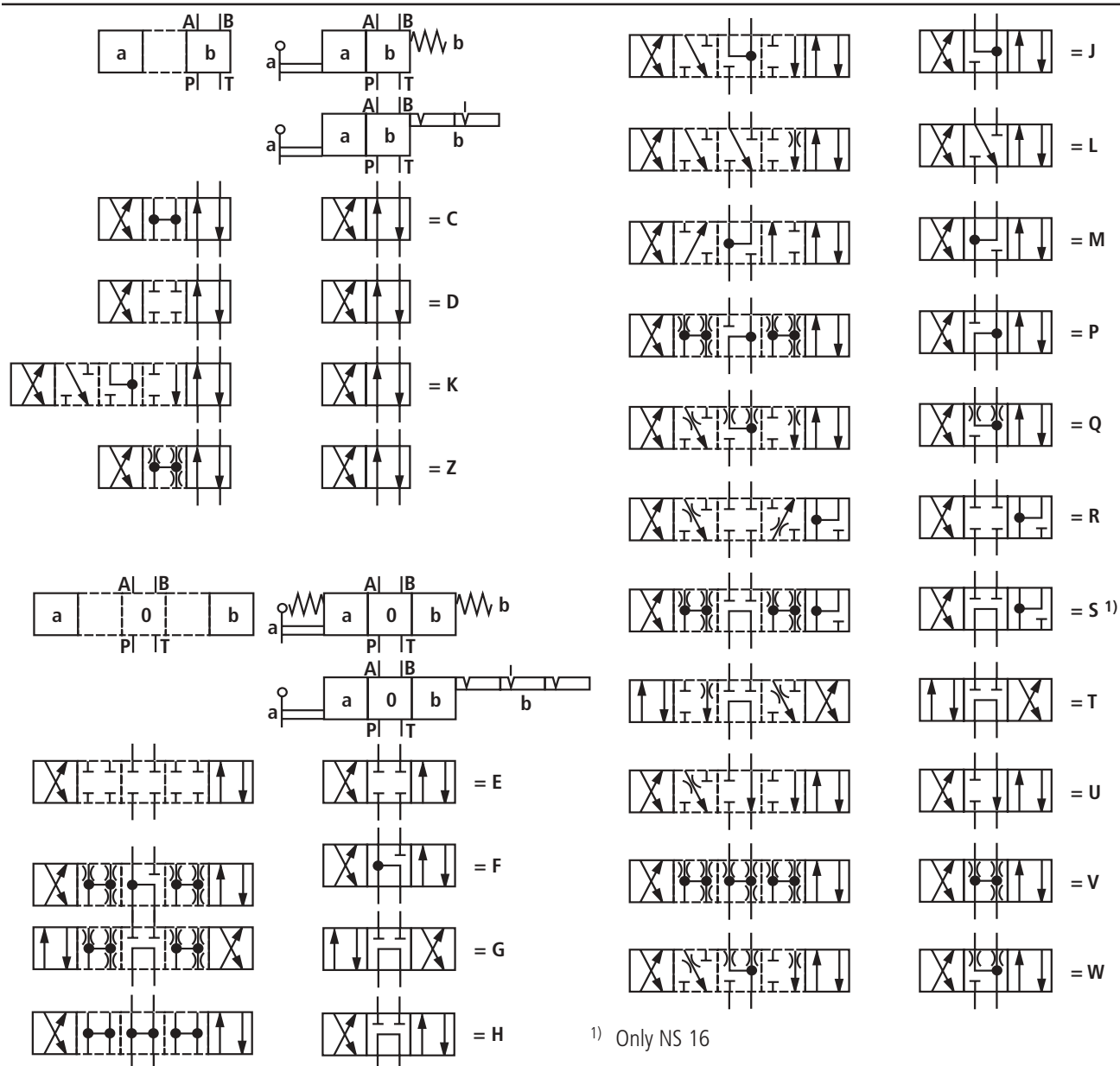
<b>H</b> – 4		<b>WMM</b>		<b>7X/</b>	<b>*</b>
Up to 350 bar	= H				Further details in clear text
4 actuator ports	= 4				
<b>Actuator type</b>					
Hand lever		= WMM			
Nominal size 16			= 16		
Nominal size 25			= 22		
<b>Symbols</b> , e.g. C, E, EA, EB etc.					
See below					
<b>No code =</b> NBR seals <b>V =</b> FKM seals (other seals on request)					
<b>Attention!</b> The compatibility of the seals and pressure fluid has to be taken into account!					
<b>No code =</b> With spring return <b>F =</b> With detent					
<b>7X =</b> Series 70 to 79 (70 to 79: unchanged installations and connection dimensions)					

### Preferred types (readily available)

Type	Material No
H-4WMM 16 D7X/F	R900927098
H-4WMM 16 E7X/	R900918059
H-4WMM 16 G7X/	R900924972
H-4WMM 16 J7X/	R900926212

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

## Symbols



## Function, section

The type WMM valves are hand lever operated directional spool valves. They control the start, stop and direction of a flow.

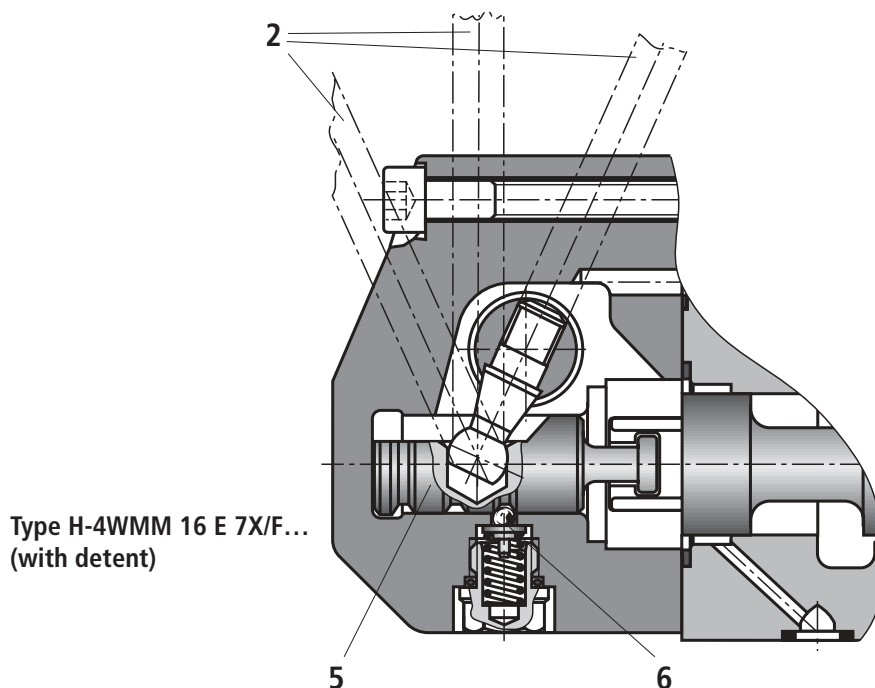
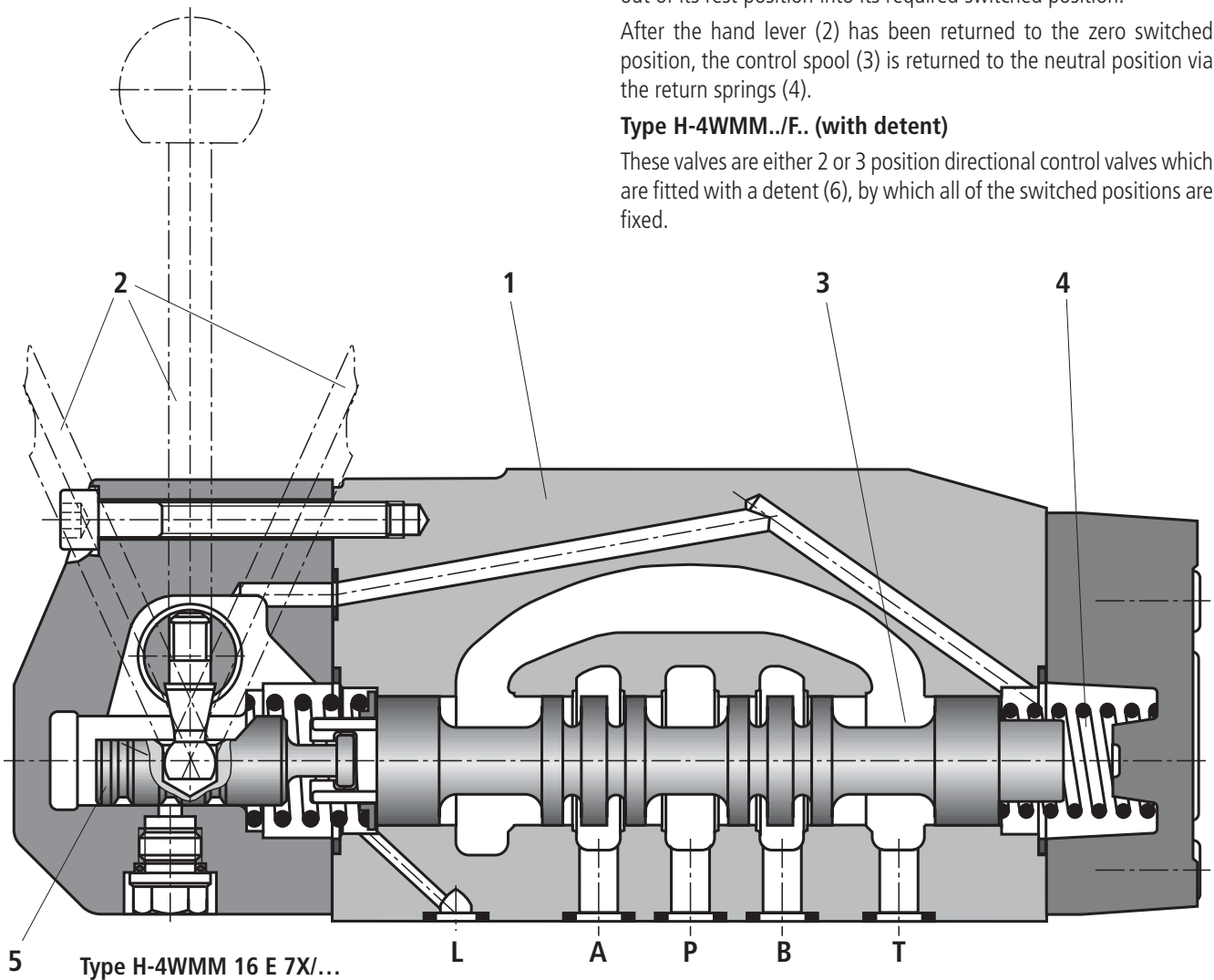
The directional valves basically comprises of the housing (1), hand lever (2), control spool (3), as well as one or two return springs (4).

In the de-energised condition the control spool (3) is held in the neutral or its initial position by the return springs (4). The control spool (3) is operated via the hand lever (2). This acts via a joint and pin (5) directly on the control spool (3). The spool is thereby moved out of its rest position into its required switched position.

After the hand lever (2) has been returned to the zero switched position, the control spool (3) is returned to the neutral position via the return springs (4).

### Type H-4WMM../F.. (with detent)

These valves are either 2 or 3 position directional control valves which are fitted with a detent (6), by which all of the switched positions are fixed.



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

Installation			Optional		
Ambient temperature range		°C	– 30 to + 80 (NBR seals)		
			– 20 to + 80 (FKM seals)		
Weight			NS16	NS25	
		kg	Approx. 8	Approx. 12.2	
Operating force	– With spring return	N	Max. 75	Max. 105	
	– With detent	N	Approx. 75	Approx. 105	
Operational angle about the centre position (see unit dimensions)			°	2 x 26	2 x 24.5

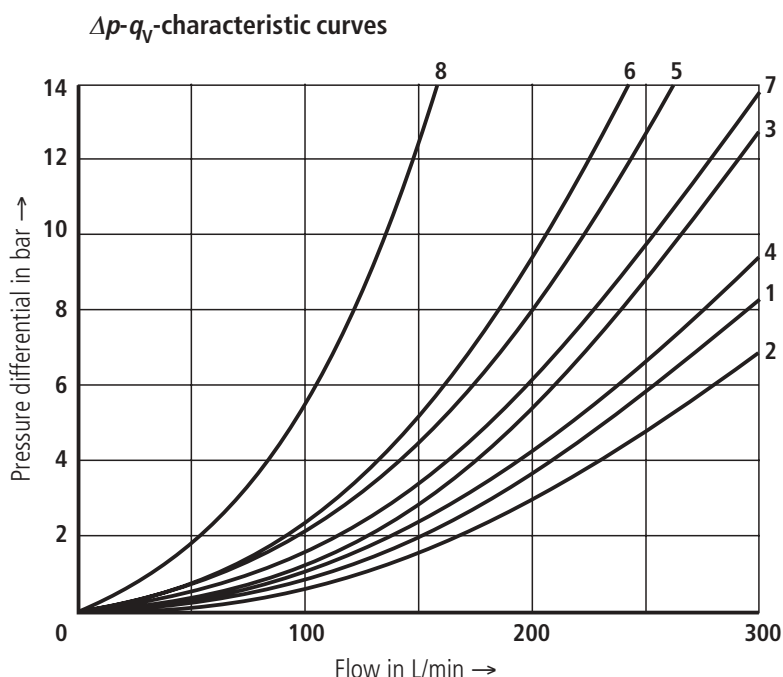
**Hydraulic**

Maximum operating pressure	– Ports A, B, P		bar	350
	– Port T		bar	250 For tank pressure > 160 bar the leakage oil must be drained away from port L (NS16) or port Y (NS25)!
Maximum flow		L/min	300	450
Pressure fluid			Mineral oil (HL, HLP) to DIN 51 524 <sup>1)</sup> ; Fast bio-degradable pressure fluid to VDMA 24 568 (also see RE 90 221); HETG (rape seed oil) <sup>1)</sup> ; HEPG (polyglycols) <sup>2)</sup> ; HEES (Synthetic ester) <sup>2)</sup> ; Other pressure fluids on request	
Pressure fluid temperature range		°C	– 30 to + 80 (NBR seals)	
			– 20 to + 80 (FKM seals)	
Viscosity range		mm <sup>2</sup> /s	2.8 to 380	
ISO code cleanliness class			Maximum permissible degree of contamination of the pressure fluid is to ISO 4406 (C) class 20/18/15 <sup>3)</sup>	
Flow cross-section	– Symbol Q (A/B → T)	mm <sup>2</sup>	32	78
	– Symbol V (A/B → T)	mm <sup>2</sup>	32	73
	(P → A/B)	mm <sup>2</sup>	32	84
	– Symbol W (A/B → T)	mm <sup>2</sup>	6	10

<sup>1)</sup> Suitable for NBR **and** FKM seals

<sup>2)</sup> **Only** suitable for FKM seals

<sup>3)</sup> 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.



Symbol	Flow direction				
	P – A	P – B	A – T	B – T	P – T
E, D, Y	1	1	1	3	–
F	2	2	3	3	–
G, T	5	1	3	7	6
H, C, Q	2	2	3	3	–
V, Z	2	2	3	3	–
J, K, L	1	1	3	3	–
M, W	2	2	4	3	–
R	2	2	4	–	–
U	1	1	4	7	–
S	4	4	4	–	8

**Performance limits:** nominal size 16 (measured with HLP46,  $\vartheta_{oil} = 40\text{ °C} \pm 5\text{ °C}$ )

**⚠ Attention!**

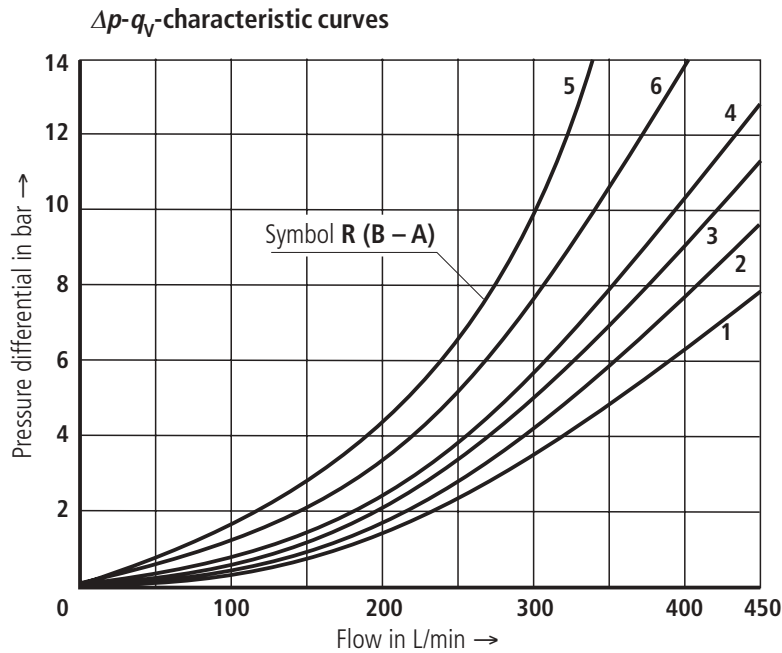
The switching function of the valve is, due to the sticking effect, dependent on the filtration. To obtain the stated permissible flow data, we recommend full flow filtration with a filter rating of 25  $\mu\text{m}$ . The flow forces acting within the valve also affects the flow performance limits.

For 4-way valves the stated flow data is valid for the normal application case of 2 directions of flow (e. g. from P to A and at the same time return flow from B to T) (see table). If there is only one direction of flow then the permissible flow can be considerably lower, (e.g. when using a 4-way directional valve as a 3-way directional valve with ports A or B plugged).

Permissible flow $q_v$ in L/min 2-position valves					
Symbol	Operating pressure $p_{max}$ in bar				
	70	140	210	280	350
• With spring return					
C	300	300	300	260	220
D	300	300	210	190	160
K	300	300	200	150	130
Z	300	240	190	170	150
• With detent					
C, D, K, Z	300	300	300	300	300

Permissible flow $q_v$ in L/min 3-position valves					
Symbol	Operating pressure $p_{max}$ in bar				
	70	140	210	280	350
• With spring return					
E, H, J, L, M, Q, R, U, W	300	300	300	300	300
F, P	300	300	210	190	170
G, S, T	300	300	220	210	180
V	300	260	200	180	170
• With detent					
E, H, J, L, M, Q, R, U, W	300	300	300	300	300
F, P	300	300	280	230	230
G, S, T	300	300	230	230	230
V	300	300	250	230	230

**Characteristic curves:** nominal size 25 (measured with HLP46,  $\vartheta_{oil} = 40\text{ °C} \pm 5\text{ °C}$ )



Symbol	Flow direction				
	P - A	P - B	A - T	B - T	P - T
E	2	2	1	4	—
F	1	2	1	2	4
G	2	2	2	4	6
H	2	2	1	3	2
J	2	2	1	3	—
L	2	2	1	2	—
M	2	2	1	4	—
P	2	2	1	4	6
Q	2	2	1	4	—
R	1	2	1	—	—
T	2	2	2	4	5
U	2	2	1	4	—
V	2	2	1	4	—
W	2	2	1	3	—

4 spool L neutral position A - T

6 spool U neutral position B - T

**Performance limits:** nominal size 25 (measured with HLP46,  $\vartheta_{oil} = 40\text{ °C} \pm 5\text{ °C}$ )

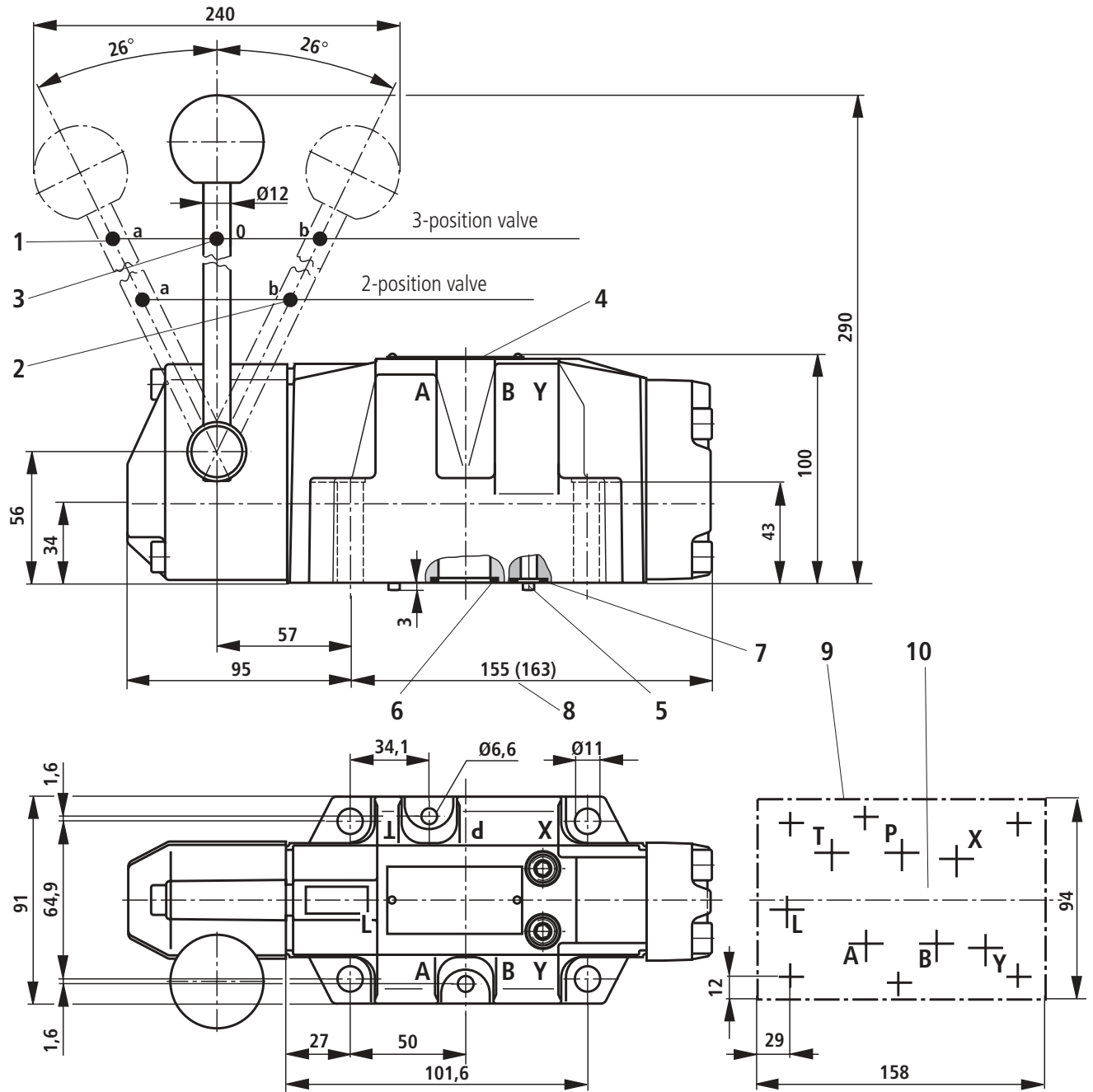
**⚠ Attention!**

The switching function of the valve is, due to the sticking effect, dependent on the filtration. To obtain the stated permissible flow data, we recommend full flow filtration with a filter rating of 25  $\mu\text{m}$ . The flow forces acting within the valve also affects the flow performance limits.

For 4-way valves the stated flow data is valid for the normal application case of 2 directions of flow (e. g. from P to A and at the same time return flow from B to T) (see table). If there is only one direction of flow then the permissible flow can be considerably lower (e.g. when using a 4-way directional valve as a 3-way directional valve with ports A or B plugged).

Permissible flow $q_v$ in L/min 2-position valves					
Symbol	Operating pressure $p_{max}$ in bar				
	70	140	210	280	350
• With spring return					
C	450	300	250	200	180
D	350	300	275	250	200
K	200	150	140	130	120
Z	300	270	240	220	200
• With detent					
C, D, K, Z	450	450	450	450	450

Permissible flow $q_v$ in L/min 3-position valves					
Symbol	Operating pressure $p_{max}$ in bar				
	70	140	210	280	350
• With spring return					
E, J, L, M, Q, R, U, W	450	450	450	450	450
F	450	250	200	135	110
G, T	450	330	290	230	180
H	450	450	400	400	350
P	450	310	240	215	150
V	450	310	280	270	200
• With detent					
E, F, G, H, J, L, M, P, Q, R, T, U, W	450	450	450	450	450
V	450	450	400	350	300



- 1 Switched position a
- 2 Switched position b
- 3 Switched position 0
- 4 Name plate
- 5 2 locating pins Ø3
- 6 Identical seal rings for ports A, B, P and T
- 7 Identical seal rings for ports L, X and Y
- 8 • 155 mm for 3-position valve  
• 163 mm for 2-position valve with spring return
- 9 Machined valve mounting surface

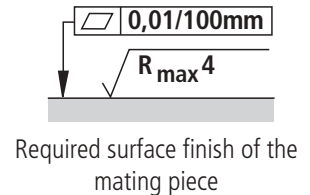
- 10 Porting pattern to DIN 24 340 Form A, ISO 4401 and CETOP-RP 121 H

**Subplates**

G 172/01 (G 3/4)  
G 174/01 (G 1)  
G 174/08 (flange)  
to catalogue sheet RE 45 056 and

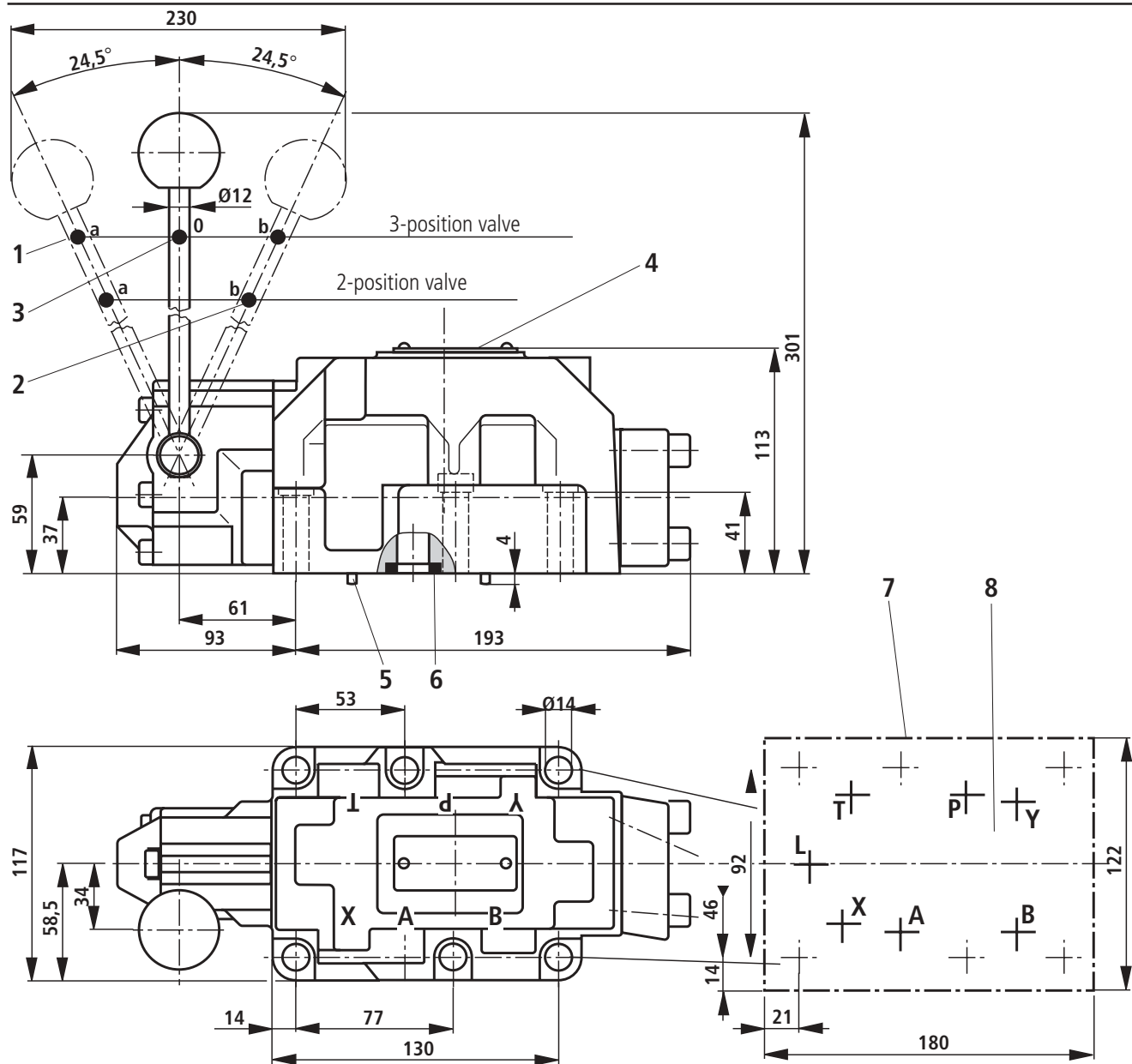
**Valve fixing screws**<sup>1)</sup>

4 off M10 x 60, DIN 912-10.9, tightening torque  $M_A = 75 \text{ Nm}$   
2 off M6 x 60, DIN 912-10.9, tightening torque  $M_A = 15.5 \text{ Nm}$ , must be ordered separately.



<sup>1)</sup> Phosphated and coated with Delta-Ton

**Unit dimensions:** nominal size 25 (dimensions in mm)



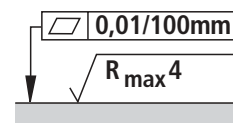
- 1 Switched position a
- 2 Switched position b
- 3 Switched position 0
- 4 Name plate
- 5 2 locating pins Ø6
- 6 Identical seal rings for ports A, B, P, T, X and Y
- 7 Machined valve mounting surface
- 8 Porting pattern to DIN 24 340 Form A, ISO 4401 and CETOP-RP 121 H

**Subplates**

G 150/01 (G 3/4)  
 G 151/01 (G 1)  
 G 154/01 (G 1 1/4)  
 G 156/01 (G 1 1/2)  
 to catalogue sheet RE 45 058 and

**Valve fixing screws** <sup>1)</sup>

6 off M12 x 60, DIN 912-10.9, tightening torque  $M_A = 130 \text{ Nm}$ , must be ordered separately.



Required surface finish of the mating piece

<sup>1)</sup> Phosphated and coated with Delta-Ton

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