

4/3 and 4/2 directional valve  
with hand lever actuation

RE 22371/01.08    1/12  
Replaces: 10.05

Type WMM

Sizes 16 to 32  
Component series 5X; 7X  
Maximum operating pressure 350 bar  
Maximum flow 450 l/min



H5914

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Features

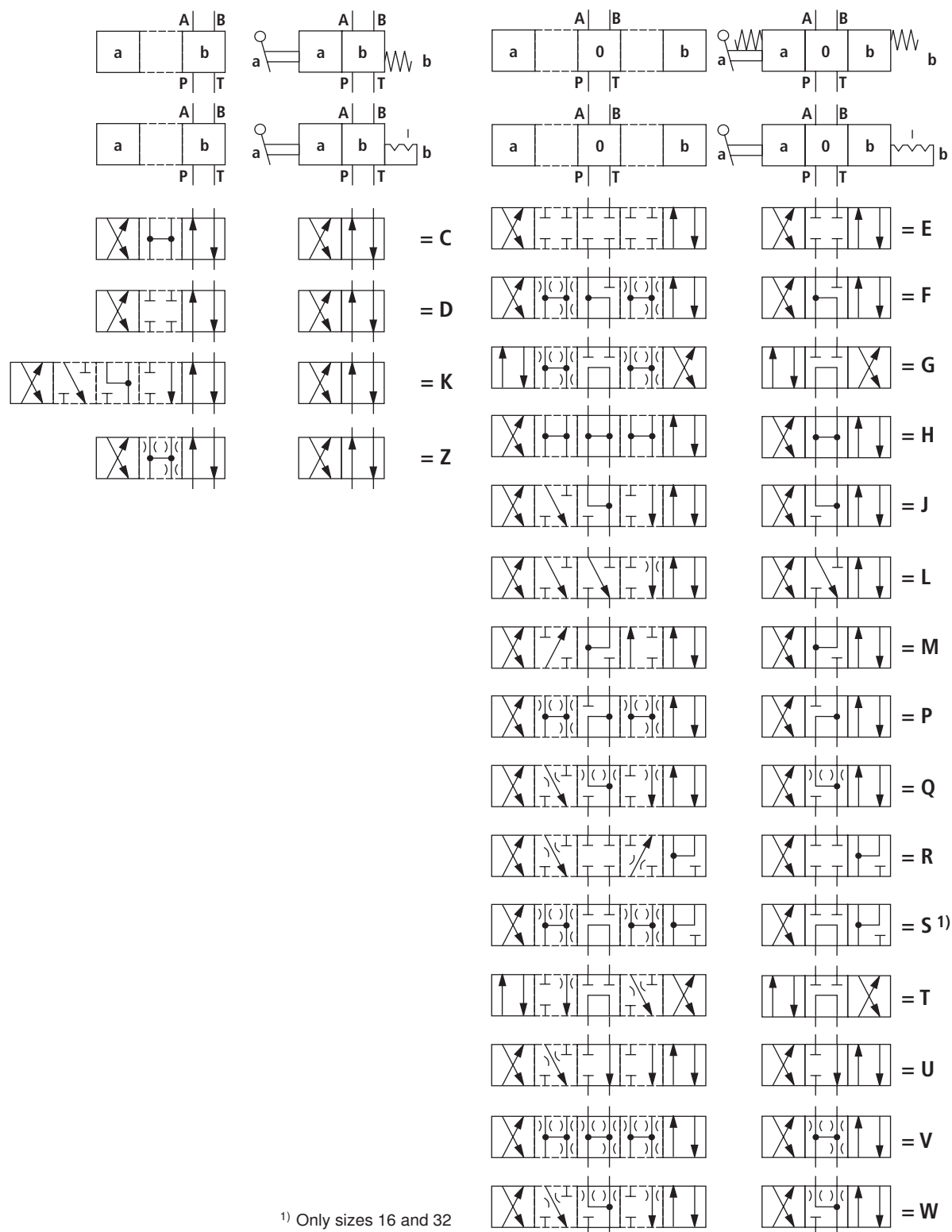
- Direct operated directional spool valve with hand lever actuation
- Porting pattern to DIN 24340 Form A and ISO 4401
- With spring return or detent, optionally
- Actuating mechanism is protected against contamination and ingress of humidity
- Head piece with actuating mechanism can be replaced without having to disassemble the valve
- Inductive position switches and proximity sensors (contact-free and floating), see RE 24830 (only sizes 16 and 25)
- Further information:
  - Subplates size 16: RE 45056
  - Subplates size 25: RE 45058
  - Subplates size 32: RE 45060

## Ordering code

H		4		WMM												*	
Maximum operating pressure 350 bar	= H																Further details in clear text
4 main ports	= 4																<b>Seal material</b>
<b>Actuation</b>																	<b>No code =</b> NBR seals
Hand lever	= WMM																V = FKM seals
																	(other seals on request)
Size 16																	<b>⚠ Attention!</b>
Size 25																	Observe compatibility of seals with hydraulic fluid used!
Size 32																	
Spool symbols, e.g. C, E, etc., see page 3																	<b>Spool position monitoring</b> (only sizes 16 and 25)
Sizes 16 and 25 – component series 70 to 79 (70 to 79: unchanged installation and connection dimensions)																	<b>No code =</b> Without position switch
Sizes 32 – Component series 30 to 39 (30 to 39: unchanged installation and connection dimensions)																	<b>QMAG24 =</b> Monitored spool position “a”
																	<b>QMBG24 =</b> Monitored spool position “b”
																	<b>QM0G24 =</b> Monitored rest position
																	<b>No code =</b> With spring return
																	<b>F =</b> With detent

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

## Spool symbols



## Function, sections

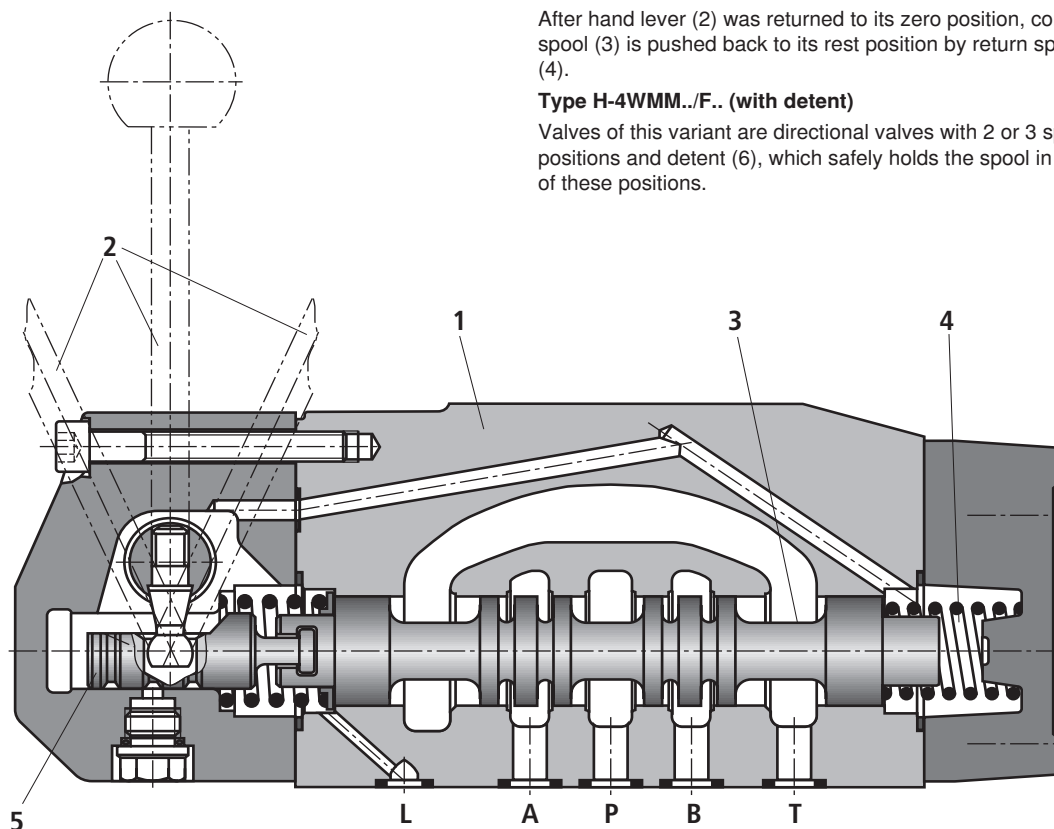
Valves of type WMM are hand lever-actuated directional spool valves. They control the start, stop and direction of a flow and basically consist of housing (1), hand lever (2), control spool (3), and one or two return springs (4).

In the non-operated condition, control spool (3) is held by return springs (4) in the central or starting position. Control spool (3) is actuated by hand lever (2), which acts via a joint and pin (5) directly onto control spool (3), which is thereby moved from its rest position to the desired end position.

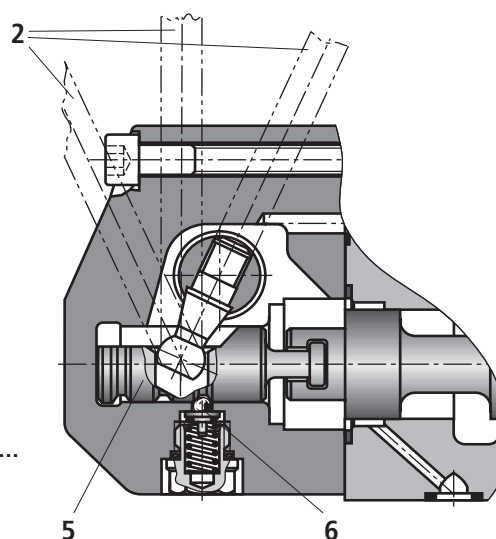
After hand lever (2) was returned to its zero position, control spool (3) is pushed back to its rest position by return spring (4).

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

Valves of this variant are directional valves with 2 or 3 spool positions and detent (6), which safely holds the spool in any of these positions.



Type H-4WMM 16 E 7X/...



Type H-4WMM 16 E 7X/F...  
(with detent)

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

### General

Sizes		Size 16	Size 25	Size 32
Weight	kg	ca. 8	ca. 12.2	ca. 49
Installation position		Optional		
Ambient temperature range	°C	-30 to +80 (NBR seals) -20 to +80 (FKM seals)		
Actuating force	- with spring return	N	max 75	max 105
	- with detent	N	ca. 75	ca. 105
Actuating angle from central position (see Unit dimensions on pages 9 to 11)	°	2 x 26	2 x 24.5	2 x 25

### Hydraulic

Maximum operating pressure	- Ports A, B, P	bar	350		
	- Part T	bar	250 At tank pressure > 160 bar the leakage oil must be drained via port L (size 16) or port Y (sizes 25 and 32)!		
Maximum flow			300	450	1100
Hydraulic fluid			Mineral oil (HL, HLP) to DIN 51524 <sup>1)</sup> ; fast bio-degradable hydraulic fluids to VDMA 24568 (see also RE 90221); HETG (rape seed oil) <sup>1)</sup> ; HEPG (polyglycols) <sup>2)</sup> ; HEES (synthetic esters) <sup>2)</sup> ; other hydraulic fluids on request		
Hydraulic 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		
Permissible max. degree of contamination of the hydraulic fluid - cleanliness class 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	116
	- Symbol V (A/B → T)	mm <sup>2</sup>	32	73	136
	(P → A/B)	mm <sup>2</sup>	32	84	120
	- Symbol W (A/B → T)	mm <sup>2</sup>	6	10	20

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

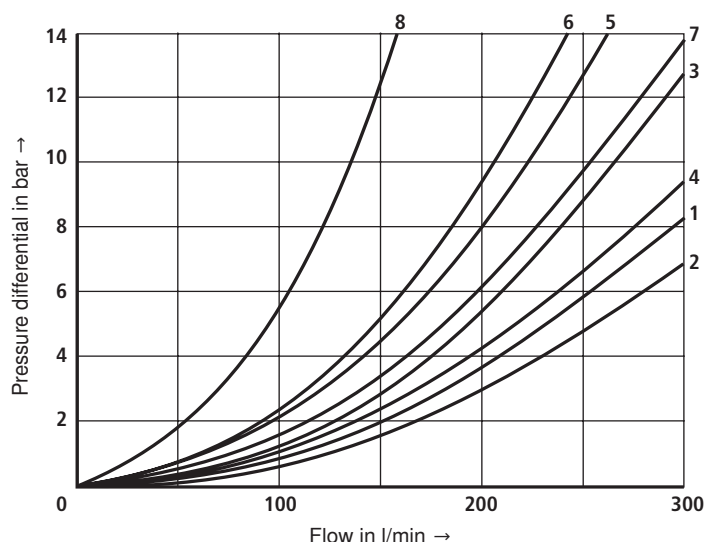
<sup>2)</sup> Suitable only for FKM seals

<sup>3)</sup> The cleanliness classes specified for components must be adhered to in hydraulic systems. Effective filtration prevents malfunction and, at the same time, prolongs the service life of components.

For the selection of filters, see data sheets RE 50070, RE 50076, RE 50081, RE 50086, RE 50087 and RE 50088.

## Characteristic curves: Size 16 (measured with HLP46, $\vartheta_{oil} = 40 \text{ }^{\circ}\text{C} \pm 5 \text{ }^{\circ}\text{C}$ )

$\Delta p$ - $q_v$  characteristic curves



Spool symbol	Direction of flow				
	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: Size 16 (measured with HLP46, $\vartheta_{oil} = 40 \text{ }^{\circ}\text{C} \pm 5 \text{ }^{\circ}\text{C}$ )

### ⚠ Attention!

Due to the sticking effect, the switching function of the valves depends on filtration. To achieve the specified permissible flows, full-flow filtration with  $25 \mu\text{m}$  is recommended. The flow forces acting within the valves also have an effect on the flow performance.

For 4-way directional valves, the specified flows are therefore valid for normal operation with 2 directions of flow (e.g. from P to A and simultaneous return flow from B to T) (see table). In the case of only one direction of flow, the permissible flow can be significantly smaller (e.g. when using a 4-way directional valve as 3-way directional valve with port A or B plugged).

### 2-position valves – $q_{V \max}$ in l/min

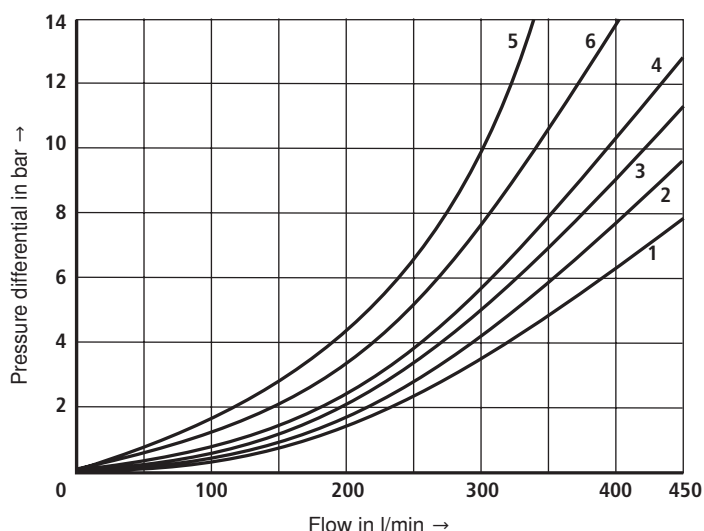
Spool symbol	Operating pressure $p_{\max}$ in bar				
	70	140	210	280	350
– With spring return					
C	300	300	300	260	220
D	300	300	210	190	160
K	300	300	200	150	130
Z	300	240	190	170	150
– With detent					
C, D, K, Z	300	300	300	300	300

### 3-position valves – $q_{V \max}$ in l/min

Spool 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: Size 25 (measured with HLP46, $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$ )

$\Delta p$ - $q_v$  characteristic curves



Spool symbol	Direction of flow					
	P - A	P - B	A - T	B - T	P - T	B - A
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	-	-	5
T	2	2	2	4	5	-
U	2	2	1	4	-	-
V	2	2	1	4	-	-
W	2	2	1	3	-	-

4 Spool symbol L Central position A - T

6 Spool symbol U Central position B - T

## Performance limits: Size 25 (measured with HLP46, $\vartheta_{oil} = 40^\circ\text{C} \pm 5^\circ\text{C}$ )

### ⚠ Attention!

Due to the sticking effect, the switching function of the valves depends on filtration. To achieve the specified permissible flows, full-flow filtration with  $25\ \mu\text{m}$  is recommended. The flow forces acting within the valves also have an effect on the flow performance.

For 4-way directional valves, the specified flows are therefore valid for normal operation with 2 directions of flow (e.g. from P to A and simultaneous return flow from B to T) (see table). In the case of only one direction of flow, the permissible flow can be significantly smaller (e.g. when using a 4-way directional valve as 3-way directional valve with port A or B plugged).

### 2-position valves – $q_{v\max}$ in l/min

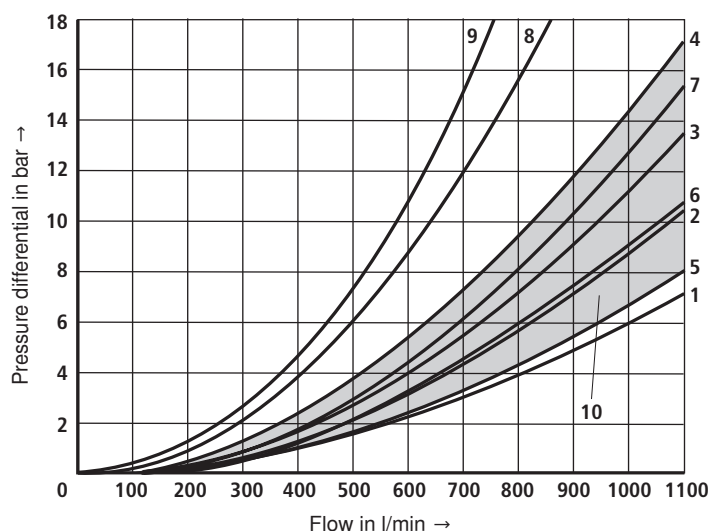
Spool symbol	Operating pressure $p_{\max}$ in bar				
	70	140	210	280	350
– With spring return					
C	450	300	250	200	180
D	350	300	275	250	200
K	200	150	140	130	120
Z	300	270	240	220	200
– With detent					
C, D, K, Z	450	450	450	450	450

### 3-position valves – $q_{v\max}$ in l/min

Spool 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

## Characteristic curves: Size 32 (measured with HLP46, $\vartheta_{oil} = 40 \text{ }^{\circ}\text{C} \pm 5 \text{ }^{\circ}\text{C}$ )

$\Delta p$ - $q_v$  characteristic curves



Spool symbol	Direction of flow					
	P - A	P - B	A - T	B - T	P - T	B - A
E	1	1	2	3	-	-
G	6	5	6	7	7	-
R	1	1	2	-	-	4
S	-	-	-	-	9	8
T	6	5	6	7	7	-
W	1	1	2	3	-	4

10 All other spool symbols

## Performance limits: Size 32 (measured with HLP46, $\vartheta_{oil} = 40 \text{ }^{\circ}\text{C} \pm 5 \text{ }^{\circ}\text{C}$ )

### ⚠ Attention!

Due to the sticking effect, the switching function of the valves depends on filtration. To achieve the specified permissible flows, full-flow filtration with  $25 \mu\text{m}$  is recommended. The flow forces acting within the valves also have an effect on the flow performance.

For 4-way directional valves, the specified flows are therefore valid for normal operation with 2 directions of flow (e.g. from P to A and simultaneous return flow from B to T) (see table). In the case of only one direction of flow, the permissible flow can be significantly smaller (e.g. when using a 4-way directional valve as 3-way directional valve with port A or B plugged).

### 2-position valves – $q_{V \max}$ in l/min

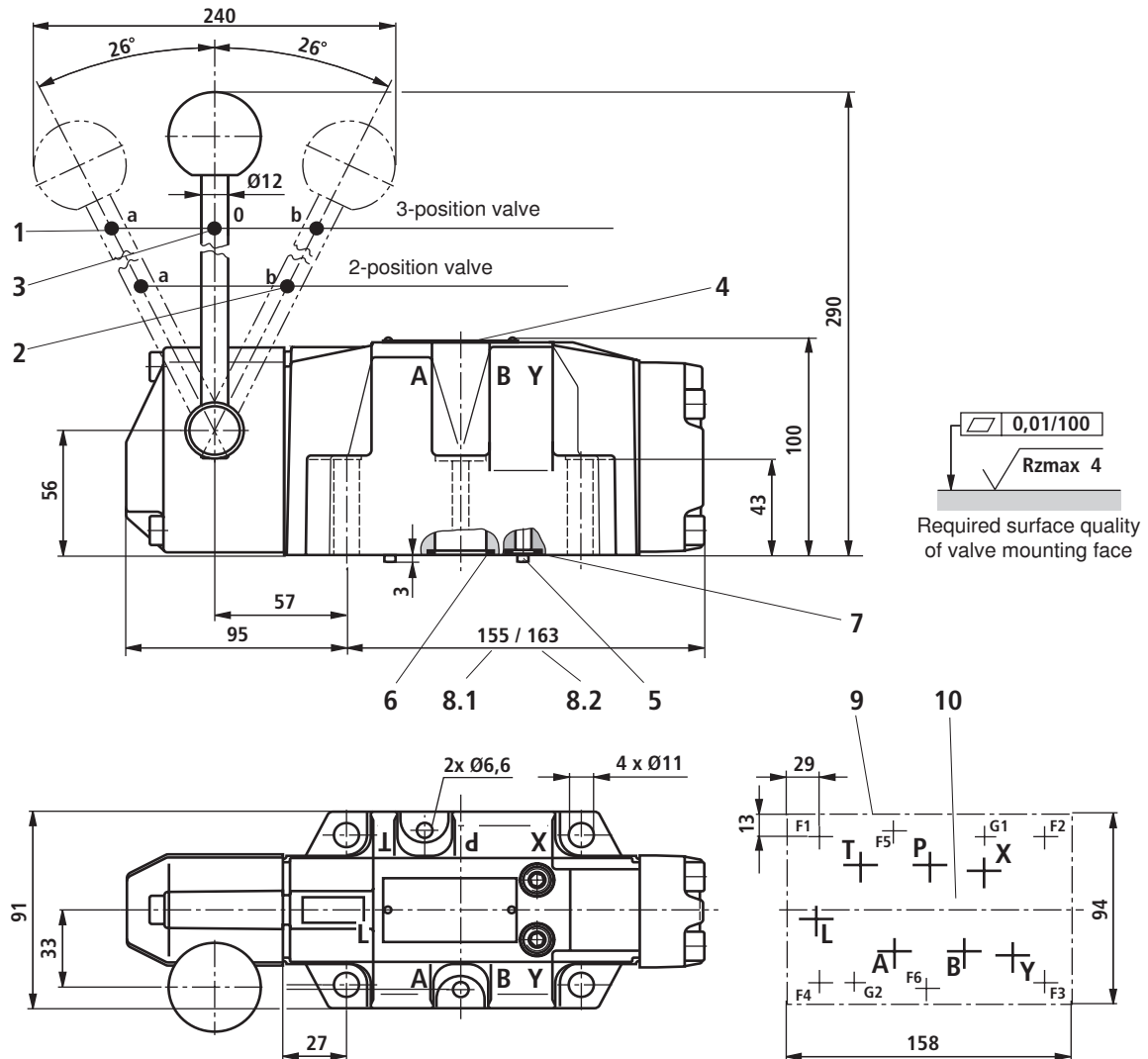
Spool symbol	Operating pressure $p_{\max}$ in bar				
	70	140	210	280	350
– With spring return					
C	1100	1040	860	800	700
D	1100	1040	540	480	420
K	1100	1040	860	500	450
Z	1100	1040	860	700	650
– With detent					
C, D, K, Z	1100	1040	860	750	680

### 3-position valves – $q_{V \max}$ in l/min

Spool symbol	Operating pressure $p_{\max}$ in bar				
	70	140	210	280	350
– With spring return					
E, J, L, M, Q, R, U, W	1100	1040	860	750	680
F, G, S, T, H, P	900	900	800	650	450
V	1100	1000	680	500	450
– With detent					
E, F, G, H, J, L, M, P, Q, R, S, T, U, V, W	1100	1040	860	750	680



## Unit dimensions: Size 16 (dimensions in mm)



- 1 Spool position a
- 2 Spool position b
- 3 Spool position 0
- 4 Nameplate
- 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
- 8.1 Dimension for 3-position valve
- 8.2 Dimension for 2-position valve with spring return
- 9 Machined valve mounting face
- 10 Porting pattern to DIN 24340 form A16 and ISO 4401-07-07-0-05

**Subplates according** to data sheet RE 45056 (separate order)

G 172/01 (G3/4)  
G 174/01 (G1)  
G 174/08 (flange)

**Valve mounting screws** (separate order)

**4 hexagon socket head cap screws**  
ISO 4762 - M10 x 60 - 10.9-f1Zn-240h-L

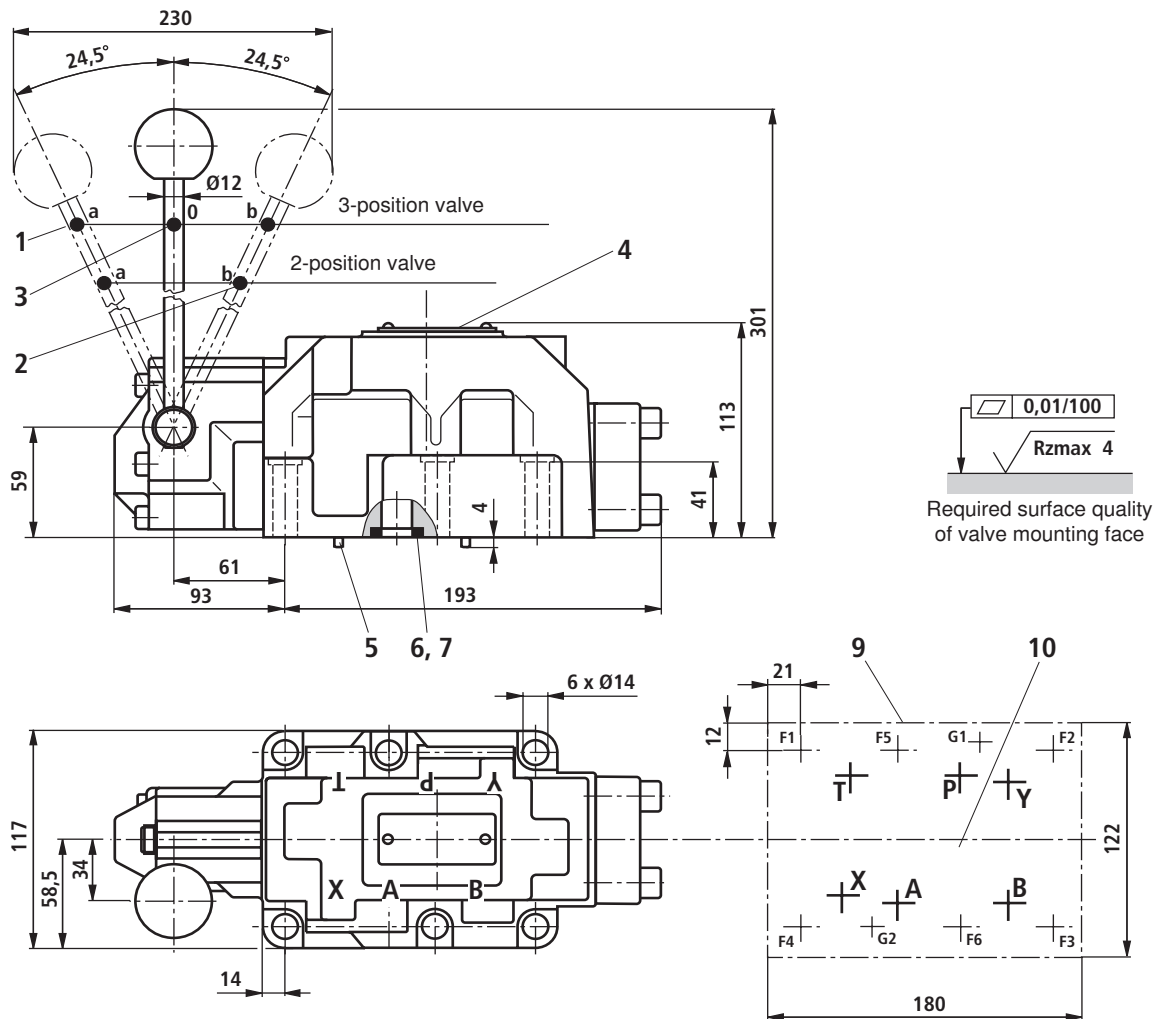
Friction coefficient  $\mu_{\text{total}} = 0.09$  to  $0.14$ ,  
tightening torque  $M_T = 75$  Nm,  
Material no. **R913000116**

**2 hexagon socket head cap screws** ISO 4762 - M6 x 60 - 10.9,

Friction coefficient  $\mu_{\text{total}} = 0.09$  to  $0.14$ ,  
tightening torque  $M_T = 12.5$  Nm

Material no. **R913000115**

## Unit dimensions: Size 25 (dimensions in mm)



- 1 Spool position a
- 2 Spool position b
- 3 Spool position 0
- 4 Nameplate
- 5 2 locating pins  $\varnothing 6$
- 6 Identical seal rings for ports A, B, P and T
- 7 Identical seal rings for ports X and Y
- 9 Machined valve mounting face
- 10 Porting pattern to DIN 24340 form A25 and ISO 4401-08-08-0-05

**Subplates according** to data sheet RE 45058, 45059 (separate order)

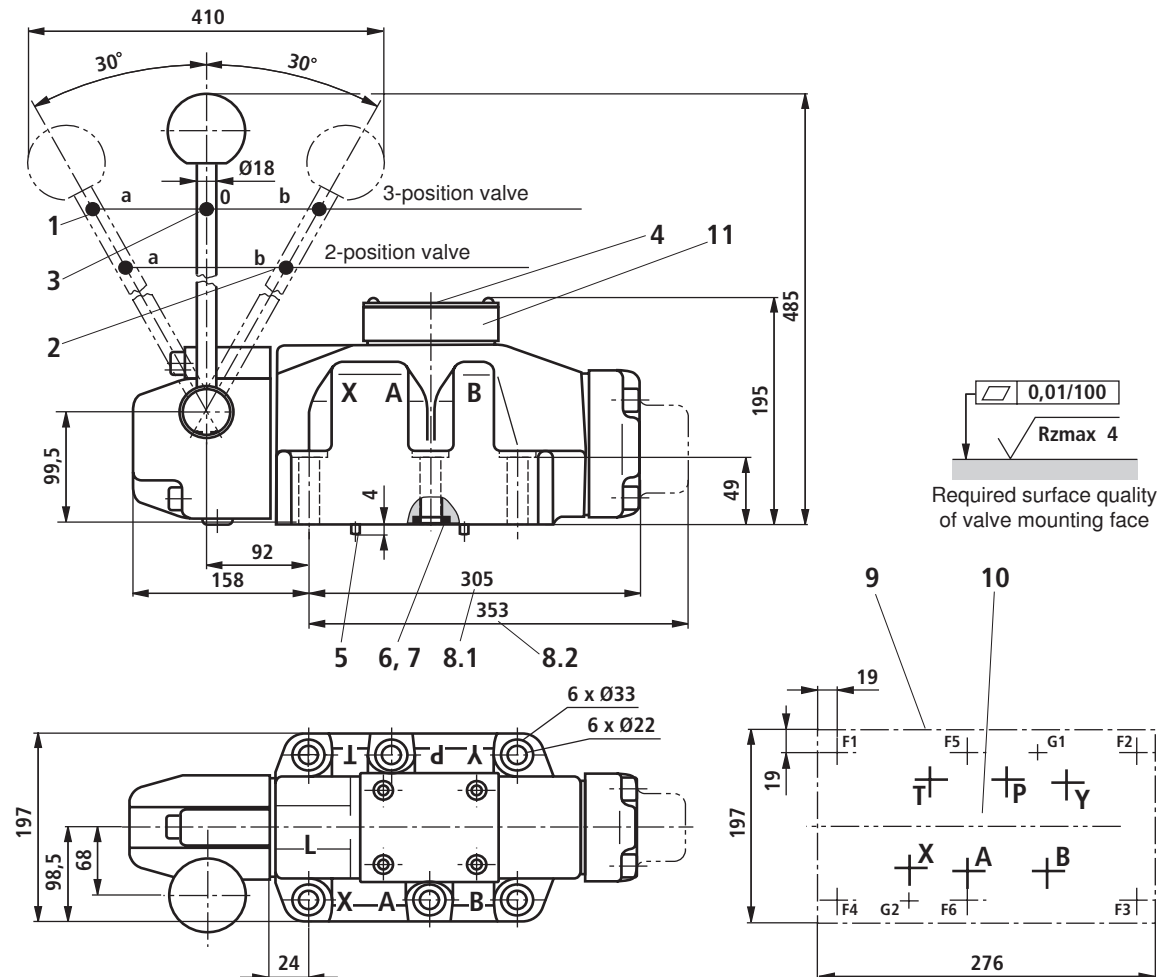
G 150/01 (G3/4)  
G 151/01 (G1)  
G 154/01 (G1 1/4)  
G 156/01 (G1 1/2)

**Valve mounting screws** (separate order)

**6 hexagon socket head cap screws**  
ISO 4762 - M12 x 60 - 10.9-f1Zn-240h-L

Friction coefficient  $\mu_{\text{total}} = 0.09$  to  $0.14$ ,  
tightening torque  $M_T = 130$  Nm,  
Material no. **R913000121**

## Unit dimensions: Size 32 (dimensions in mm)



- 1 Spool position a
- 2 Spool position b
- 3 Spool position 0
- 4 Nameplate
- 5 2 locating pins Ø6
- 6 Identical seal rings for ports A, B, P and T
- 7 Identical seal rings for ports X and Y
- 8.1 Dimension for 2- and 3-position valve with detent and 3-position valve with spring return
- 8.2 Dimension for 2-position valve with spring return
- 9 Machined valve mounting face
- 10 Porting pattern to DIN 24340 form A32 and ISO 4401-10-09-0-05
- 11 Diversion plate

**Subplates according** to data sheet RE 45060 (separate order)

G 157/01 (G1 1/2)  
G 157/02 (M48 x 2)  
G 158/10 (flange)

**Valve mounting screws** (separate order)

**6 hexagon socket head cap screws**  
ISO 4762 - M20 x 80 - 10.9-fZn-240h-L

Friction coefficient  $\mu_{\text{total}} = 0.09$  to  $0.14$ ,  
tightening torque  $M_T = 160$  Nm,  
Material no. **R901035246**