

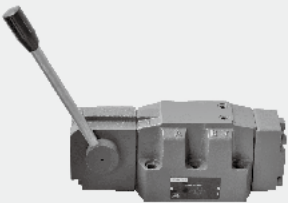


4/3, and 4/2 directional valve with mechanical, manual operation

2.5

Type WMM16, 25 and 32

Size 16 , 25 and 32
Up to 315bar
Up to 1100L/min



Contents

Function and configurations	02
Ordering code	03
Technical data	03
Symbols	04-05
Characteristic curves	06-07
Unit dimensions	08-10

Features

- Direct operating directional spool valves with mechanical,manual operation
- For sub-plates mounting
- Hand lever
- Porting pattern confirms to DIN 24 340 form A, and ISO 4401

Function and configurations

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

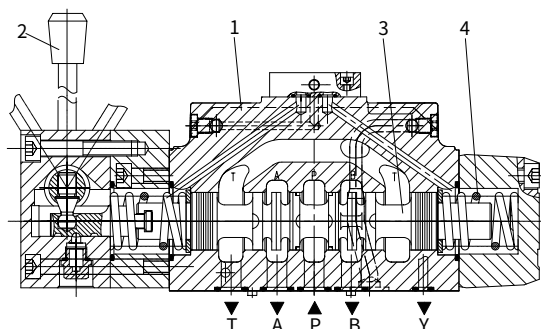
The directional valves basically comprise of a housing (1), hand lever (2), control spool (3), as well as one or two return springs (4).

In the unoperated condition the control spool (3) is held in the neutral or its initial position by the return springs (4). The control spool (3) is actuated by the hand lever (2) via a joint and a pin. The spool is thereby moved out of its initial position into switched position.

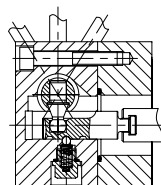
After the hand lever(2) has been returned to the zero switched position , the spool (3) is returned to the neutral position via the return springs (4).

4WMM.../F... (With the detent)

The directional valves with one detect , 2 or 3 switched position , can be orientated at any switched position.



Type 4WMM...L7X



Type 4WMM...L7X/F
(with detent)

Ordering code

4

WMM

L7X

*

4 ways

= 4

Nominal size 16

=16

Nominal size 25

=25

Nominal size 32

=32

Symbols e.g. C, E etc.

see below

Further details in clear text

No code =

V

=

NBR seals

FKM seals

No code =

F

=

Return spring

With detent

L7X =

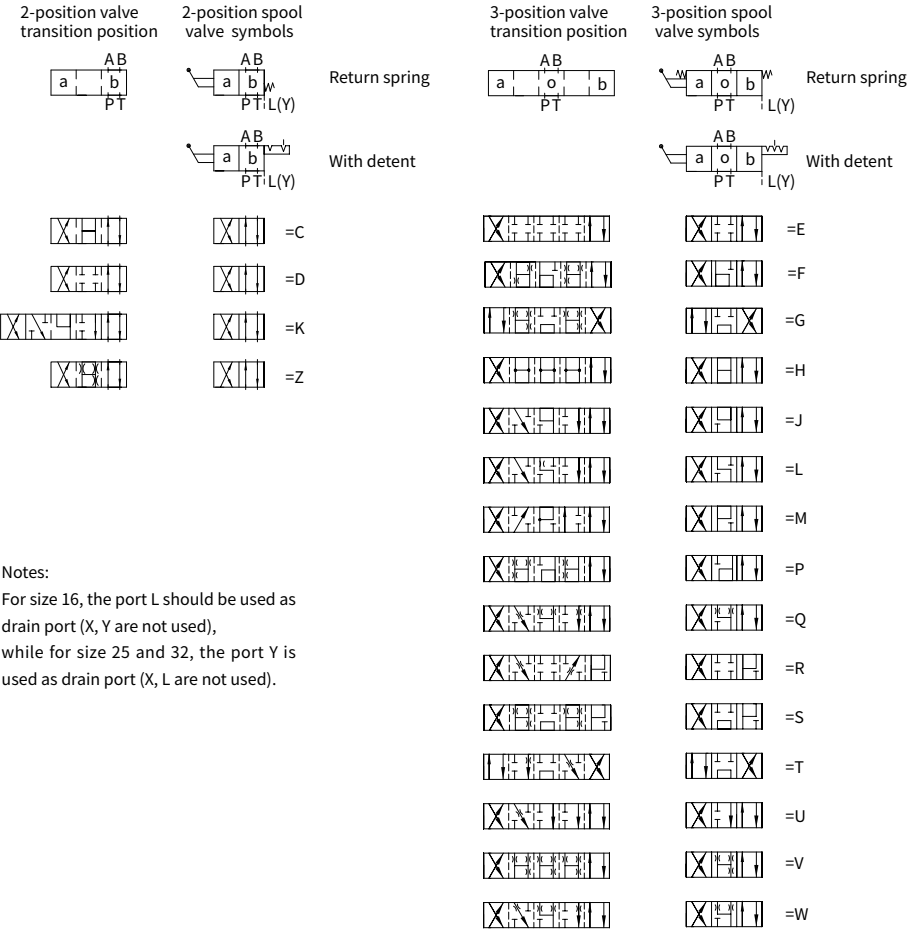
(L70 to L79: unchanged installation and connection dimensions)

Series L70 to L79

Technical data

Nominal size		16	25	32
Weight	kg	Approx.8	Approx.12.2	Approx.49
Actuation force –with spring return	N	Approx.75	Approx.105	Approx.170
–with detent	N	Approx.75	Approx.105	Approx.170
Actuation angle about the neutral postion	°	2×26°	2×32°	2×30°
Max.operating pressure port A,B,P	bar	315		
Port T	bar	250		
Fluid		Mineral oil suitable for NBR and FKM seal		
		Phosphate ester for FKM seal		
Fluid temperature range	°C	-30 to +80 (NBR seal)		
		-20 to +80 (FKM seal)		
Viscosity range	mm ² /s	2.8 to 380		
Degree of contamination		Maximum permissible degree of fluid contamination: Class 9. NAS 1638 or 20/18/15, ISO4406		

Symbols



Notes:

For size 16, the port L should be used as drain port (X, Y are not used), while for size 25 and 32, the port Y is used as drain port (X, L are not used).

Example:

Three-position E-type can derive two-position EA and EB.

Symbols

Three-position can derive two-position(*A/*B)
Return spring and with detent

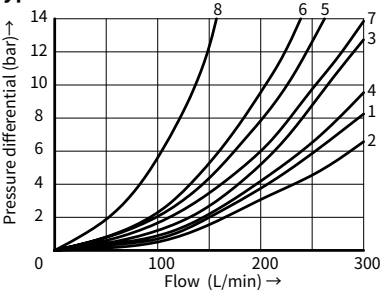
Transition position	Spool valve symbols		Transition position	Spool valve symbols	
		Return spring			Return spring
		With detent			With detent
		=EA			=EB
		=FA			=FB
		=GA			=GB
		=HA			=HB
		=JA			=JB
		=LA			=LB
		=MA			=MB
		=PA			=PB
		=QA			=QB
		=RA			=RB
		=SA			=SB
		=TA			=TB
		=UA			=UB
		=VA			=VB
		=WA			=WB

Notes:

For size 16, the port L should be used as drain port (X, Y are not used),
while for size 25 and 32, the port Y is used as drain port (X, L are not used).

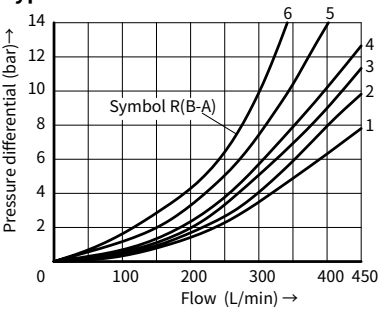
Characteristic curves (Measured at $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$, using HLP46)

Type 4MM16...



Spool symbol	Flow direction				
	P to A	P to B	A to T	B to T	P to T
E, Y, D	1	1	1	3	-
F	2	2	3	3	-
G, F	5	1	3	7	6
H, C, Q	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

Type 4MM25...

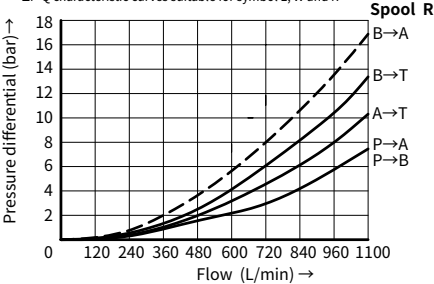


Spool symbol	Flow direction				
	P to A	P to B	A to T	B to T	P to T
E	2	2	1	4	-
F	1	2	1	2	4
G	2	2	2	4	6
H	2	2	1	3	2
J	2	2	1	3	-
L	2	2	1	2	-
M	2	2	1	4	-
P	2	2	1	4	6
Q	2	2	1	4	-
R	1	2	1	-	-
T	2	2	2	4	5
U	2	2	1	4	-
V	2	2	1	4	-
W	2	2	1	3	-

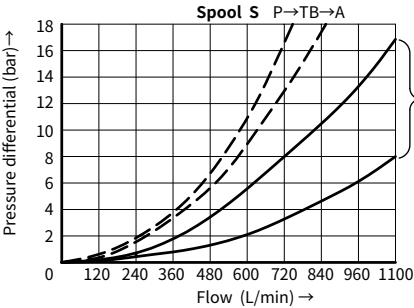
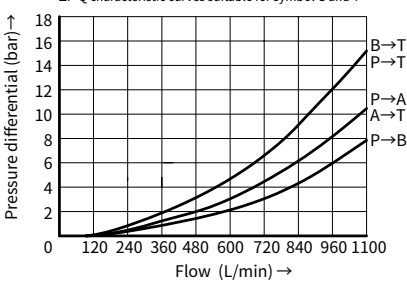
4 spools L neutral position A - T
6 spools U neutral position B - T

Type 4MM32...

ΔP-Q characteristic curves suitable for symbol E, W and R



ΔP-Q characteristic curves suitable for symbol G and T



Others symbols' characteristic curve

Characteristic curves (Measured at $\vartheta_{oil}=40^{\circ}\text{C} \pm 5^{\circ}\text{C}$, using HLP46)

The switching performance of the valves depends on the filtration. To achieve the specified admissible flow values, we recommend full flow filtration with 25 μm . The flow forces acting within the valves also affect the flow performance. With 4 way valves the specified flow data thus apply to normal operation with 2 volume flow directions (e.g. from P to A and at the same time return flow from B to T) (see table). If only one flow direction is available, in certain cases, the admissible flow can be significantly smaller (e.g. when using a 4 way valve as 3 way valve, due to blocked connection A or B).

Nominal size 16

Allowing flow qv L/min, 2-position valve						Allowing flow qv L/min, 3-position valve					
Symbol	Operating pressure P bar					Symbol	Operating pressure P bar				
	70	140	210	280	315		70	140	210	280	315
Return spring						Return spring					
C	300	300	300	260	220	E,H,J,L,M,Q,R,U,W	300	300	300	300	300
D	300	300	210	190	160	F,P	300	300	210	190	170
K	300	300	200	150	130	G,S,T	300	300	220	210	180
Z	300	240	190	170	150	V	300	260	200	180	170
With detent						With detent					
C,D,K,Z	300	300	300	300	300	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

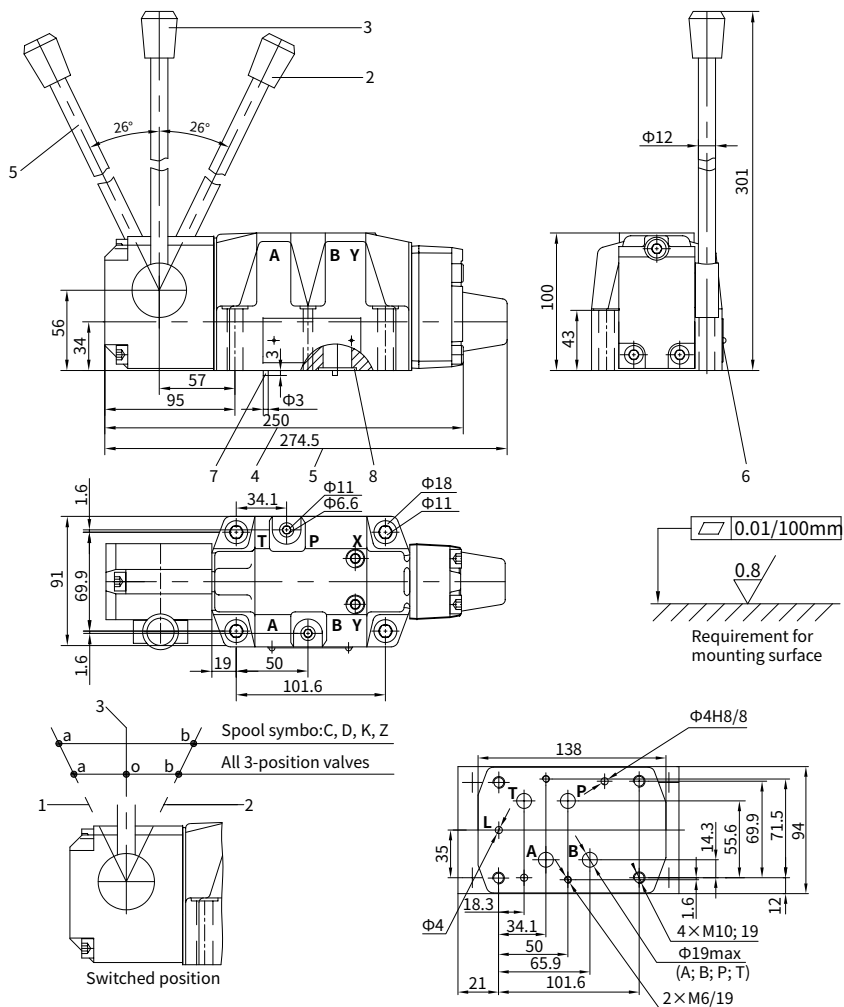
Nominal size 25

Allowing flow qv L/min, 2-position valve						Allowing flow qv L/min, 3-position valve					
Symbol	Operating pressure P bar					Symbol	Operating pressure P bar				
	70	140	210	280	315		70	140	210	280	315
Return spring						Return spring					
C	450	300	250	200	180	E,J,L,M,Q,R,U,W	450	450	450	450	450
D	350	300	275	250	200	F	450	250	200	135	110
K	200	150	140	130	120	G,T	450	330	290	230	180
Z	300	270	240	220	200	H	450	450	400	400	350
						P	450	310	240	215	150
						V	450	310	280	270	200
With detent						With detent					
C, D, K, Z	450	450	450	450	450	E, F, G, H, J, L, M, P, Q, R, T, U, W	450	450	450	450	450
						V	450	450	400	350	300

Nominal size 32

2-position and 3-position valves with spring return					
Flow L/min	When...(bar)				
Spool symbol	70	140	210	280	315
E,J,L,M,Q,R,V,U,W	1100	1050	860	750	680
F,G,H,S,T C,D,K,Z	650	450	370	320	280
2-position and 3-position valves with detent					
All symbols	1100	1050	860	750	680

Unit dimensions: nominal size 16



- 1 Switched position a
2 Switched position b
3 Switched position 0
(a and b for 2-position valve)
4 2-position and
3-position valves
with detent, 3-position
valve with spring centered

- 5 2-position valve with
return spring
6 Nameplate
7 2 locating pins 3x8
8 O-ring 22x2.5
(ports A, B, P and T)
O-ring 10x2 (port L)

It must be ordered separately, if connection plate is needed.

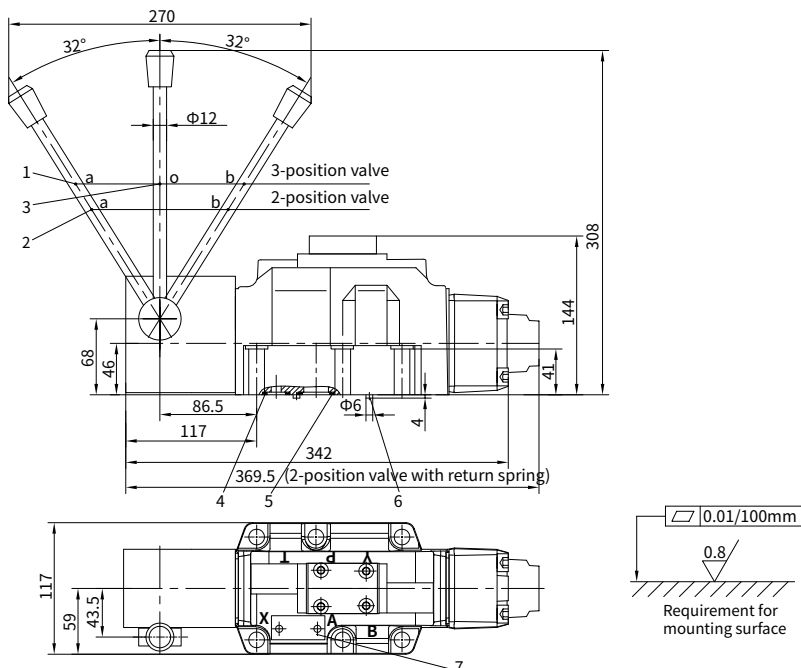
Type :

G172/01, G172/02, G174/01 G174/02, G174/08
(Port X and Y unavailable, returning directly by port L)

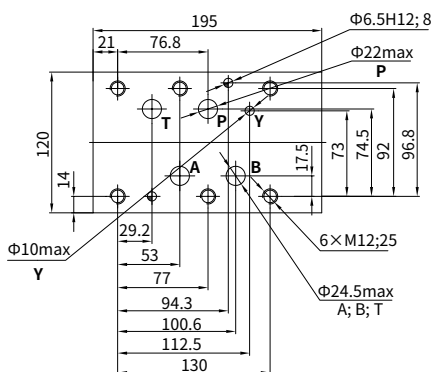
Valve fixing screws:

Internal hexagon screw, GB/T 70.1-10.9,
4-M10x60 Tightening torque $M_A = 75 \text{ Nm}$
2-M6x55 Tightening torque $M_A = 15.5 \text{ Nm}$
must be ordered separately

Unit dimensions: nominal size 25



Port X and L unavailable, port Y is used as drain port



- 1 Switched position a
- 2 Switched position b
- 3 Switched position 0
- 4 O-ring 19×3 (ports X and Y)
- 5 O-ring 27×3 (ports A, B, P and T)
- 6 2 locating pins 6×12
- 7 Nameplate

Valve fixing screws:

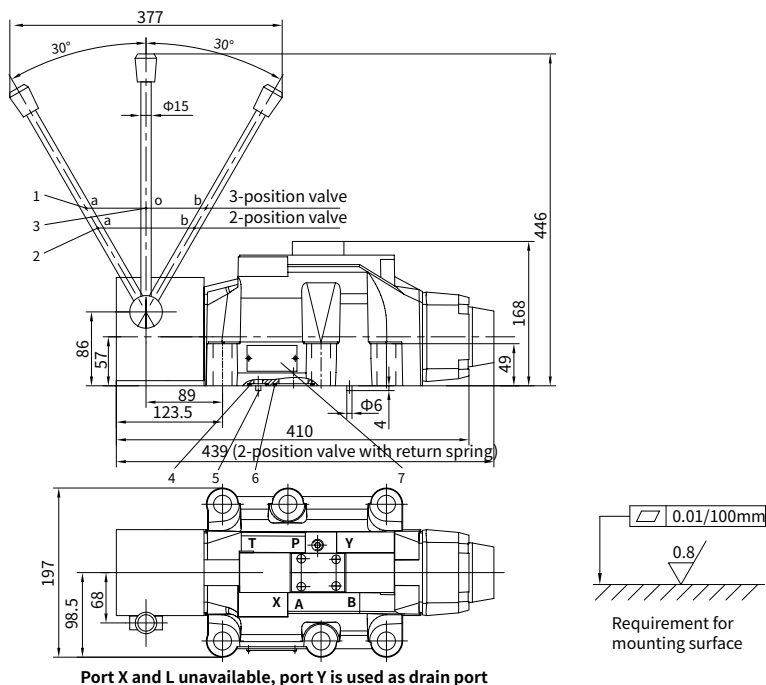
Internal hexagon screw
GB/T 70.1-10.9, 6-M12×60
Tightening torque $M_A=130\text{Nm}$
must be ordered separately

It must be ordered separately if connection plate is needed.

Type: G151/01(G1), G151/02 (M33×2)
G154/01(G1 ¼), G154/02 (M42×2)

G156/01(G1½), G156/02(M48×2)
G154/08(Flange connection)

Unit dimensions: nominal size 32



- 1 Switched position a
- 2 Switched position b
- 3 Switched position 0
- 4 O-ring 19×3 (ports X and Y)
- 5 2 locating pins 6×12
- 6 O-ring 42×3 ports A, B, P and T)
- 7 Nameplate

It must be ordered separately if connection plate is needed.

Type:

G157/01(G1 1/2), G157/02 (M48×2)

G158/10 (Flange connection)

Valve fixing screws:

Internal hexagon screw

GB/T 70.1-10.9,

6-M20×80 Tightening torque $M_A=430$ Nm must be order separately

