Directional spool valves
hand lever operated type WMM6
rotary knob operated type WMD6
roller operated type WMR6
hydraulically operated type WH6

WK 421 180

NS6 | **up to 31,5 MPa** | **up to 80 dm³/min** | 11.2015

DATA SHEET - OPERATION MANUAL

APPLICATION

Directional spool valves are intended for change in direction of fluid flow in a hydraulic system and thus it allows to change direction of movement of a receiver - mostly piston rod of a cylinder or hydraulic motor as well to use functions: *on* and *off*.
Directional spool valves can be made in differently operated design versions:

- hand lever operated type WMM6
- rotary knob operated type WMD6/WMDA6
- roller operated type WMR6/WMU6
- hydraulically operated type WH6

These directional valves are intended for subplate mounting in any position in hydraulic system.

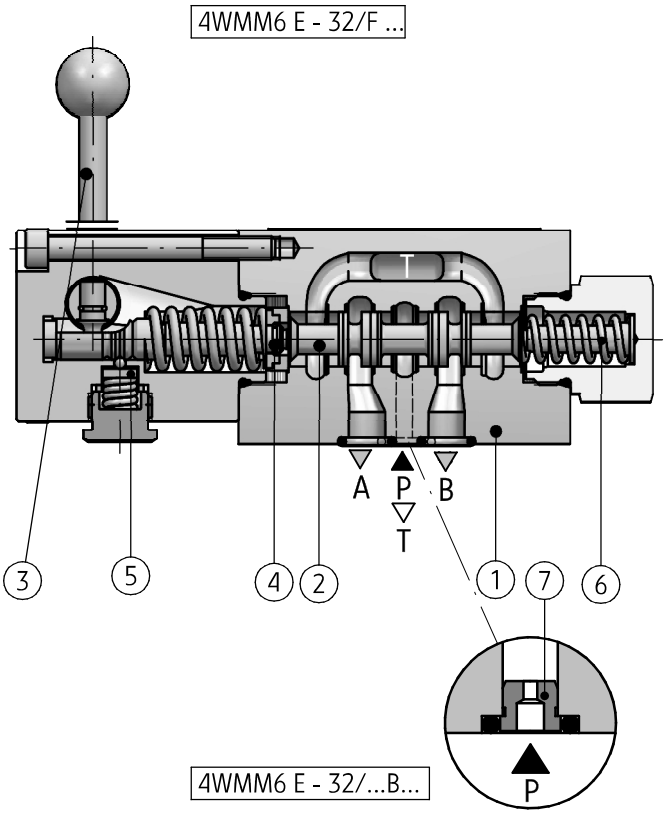
DESCRIPTION OF OPERATION

General information

Main bore and annular ports P, T, A, B are made in the housing (1) and are connected to its subplate connection.
Directional valve is switched by shifting the spool (2) into one end position. Various control functions are dependent on shape of the spool (2), which affects the change in configuration of connections among ports P, T, A, B in the housing (1).

Directional spool valve - hand lever operated type WMM6

The spool (2) is shifted as a result of changing position of the hand lever (3), by means of pin (4). The spool return (2) to its rest is secured by springs (6) - version …WMM6…/**...** or the spool (2) is positioned by means of the detent (5) - versions …WMM6…/F. Directional spool valve may be equipped with throttle insert (7) placed in port P - version WMM6…/…B.



TECHNICAL DATA

Hydraulic fluid	mineral oil							
Required fluid cleanliness class	ISO 4406 class 20/18/15							
Nominal fluid viscosity	37 mm ^{2}/s at temperature 55 ^{o}C							
Viscosity range	2,8 up to 380 mm ^{2}/s							
Fluid temperature range (in a tank)	recommended	40^{o}C up to 55^{o}C						
	max	-20^{o}C up to +70^{o}C						
Ambient temperature range	- 20^{o}C up to +70^{o}C							
Features	type WMM6		type WMD6/WMDA6		type WMR6/WMU6		type WH6	
Max operating pressure	ports		ports		ports		ports	
	P, A, B	T	P, A, B	T	P, A, B	T	P, A, B	T
	31,5 MPa	16 MPa	31,5 MPa	16 MPa	31,5 MPa	6 MPa	31,5 MPa	16 MPa
Control pressure	—		—		—		min 0,6 - 1 MPa max 20 MPa	
Switching force	pressure in port T		—		100 - 200 N		—	
	0 MPa	15 MPa						
	~ 20 N	~ 30 N						
Tightening torque of rotary knob	—		150 Ncm		—		—	
Max angle of control cam	—		—		30^{o}		—	
Weight	1,4 kg		1,4 kg		1,4 kg		version with 2 control ports 1,8 kg version with 1 control port 1,3 kg	
Flow section in *0* (central) position	spool Q - 6 % nominal section spool W - 3 % nominal section							

INSTALLATION AND OPERATION REQUIREMENTS

1. Only fully functional and operational valve must be used.
2. During the period of operation must be kept fluid viscosity acc. to requirements defined in this Data Sheet - Operation Manual
3. In order to ensure failure free and safe operation the following must be checked:
   - proper working of the valve
   - cleanliness of the hydraulic fluid
4. Due to heating of valve body to high temp., the valve shall be placed in such way to eliminate the risk of accidental contact with the valve body during operation or to apply suitable covers acc. to PN - EN ISO 13732 - 1 and PN - EN 4413
5. In order to ensure tightness of the directional valve block, one should take care of dimension of sealing rings and valve operation parameters given in this Data Sheet - Operation Manual
6. A person that operates the valve must be thoroughly familiar with this Data Sheet - Operation Manual.

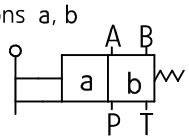
DIAGRAMS

Directional spool valve – hand lever operated
type ...WMM6...-3X/...

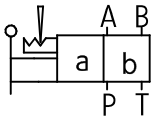
Graphic symbols of 2-position
directional spool valves

versions with positions a, b

WMM6...-3X/...

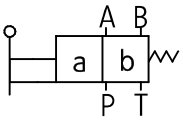


WMM6...-3X/F...

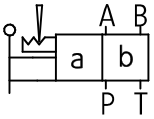


versions with positions a, b

WMM6...-3X/...

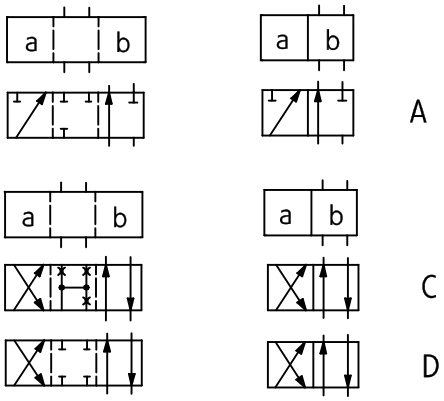


WMM6...-3X/F...

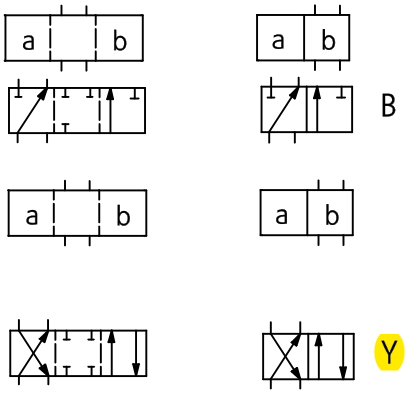


Graphic symbols of spools

working and indirect positions / working positions



working and indirect positions / working positions

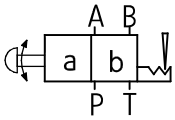


Directional spool valve – rotary knob operated
type ... WMD6...-3X/... ; ...WMDA6...-3X/...

Graphic symbols of 2-position
directional spool valves

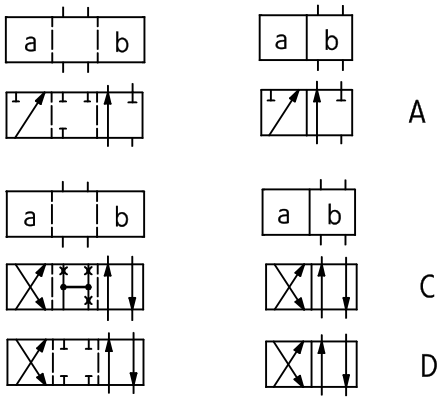
versions with positions a, b

WMD6...-3X/F...
WMDA6...-3X/F...



Graphic symbols of spools

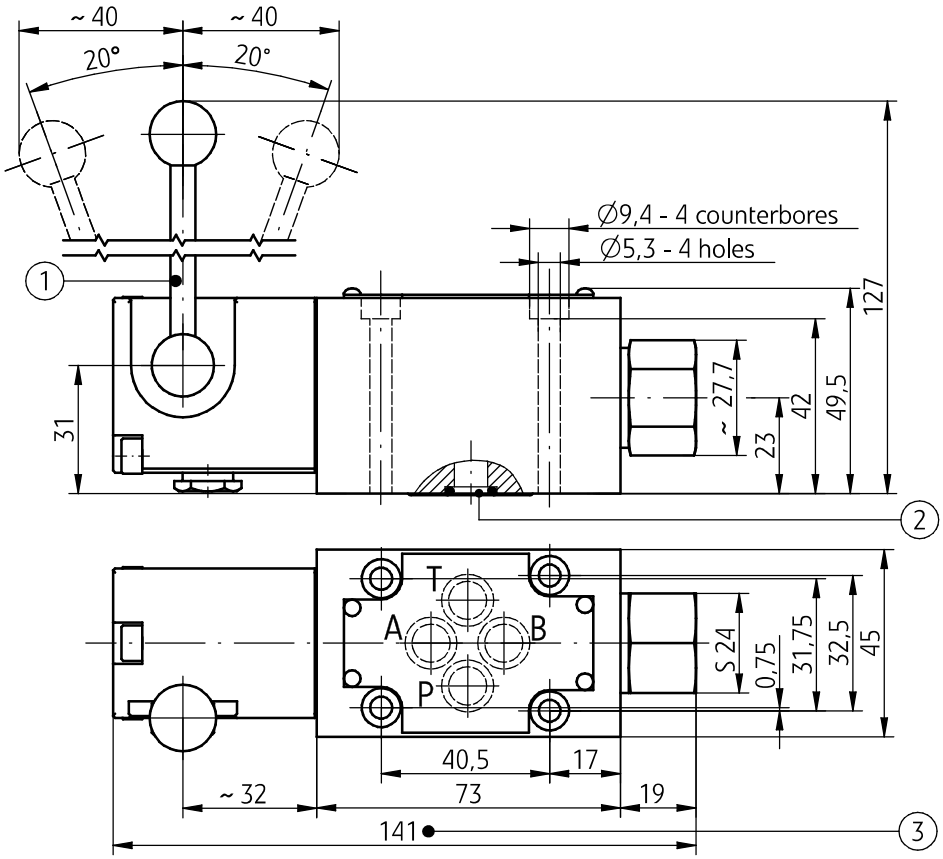
working and indirect positions / working positions

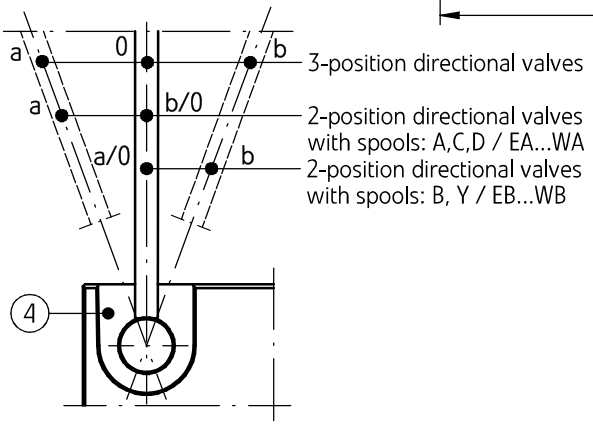


OVERALL AND CONNECTION DIMENSIONS

Directional spool valve - hand lever operated

type ...WMM6...-3X/...

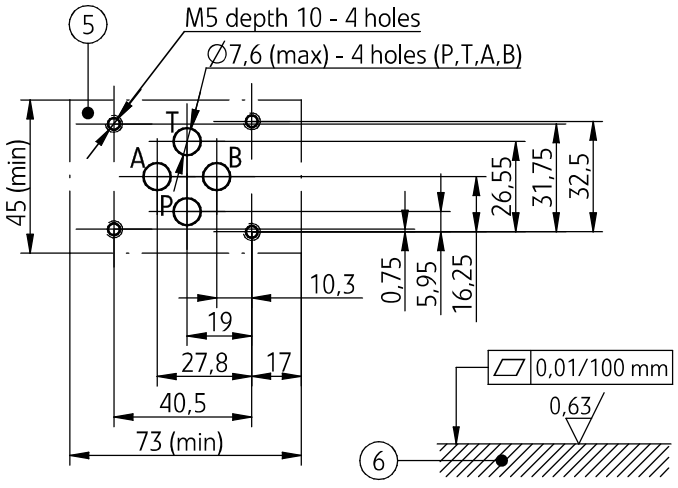




3-position directional valves

2-position directional valves with spools: A,C,D / EA...WA

2-position directional valves with spools: B, Y / EB...WB



1 - Hand lever

2 - Sealing o-ring 9,2 x 1,8 - 4 pcs/set (P,T,A,B)

3 - Overall dimension of directional spool valve:

- 3-position directional spool valve springs centered
- 3-position directional spool valve positioned with detent (spool diagrams: E,F,G,H,J,L,M,Q,R,T,U,V,W - according to page 4)
- 2-position directional spool valve positioned with return spring
- 2-position directional spool valve positioned with detent (positions a, 0 - spool diagrams: EA,FA,GA,HA,JA,LA, MA,PA,QA,RA,TA,UA,VA,WA - according to page 4) (positions 0, b - spool diagrams: EB,FB,GB,HB,JB,LB, MB,PB,QB,RB,TB,UB,VB,WB - according to page 4) (positions a, b - spool diagrams: A,C,D,B,Y- according to page 5)

4 - Positions of hand lever for different versions of directional spool valves

5 - Porting pattern - configuration of connection holes in subplate in accordance with the standard ISO 4401 designation ISO 4401-03-02-0-94 (CETOP 03) fixing screws M5 x 50 -10.9 in accordance with PN - EN ISO 4762 - 4 pcs/set - must be ordered separatel; tightening; torque Md = 9 Nm

6 - Subplate surface required

HOW TO ORDER

4	WMM	6	J	-32	/				★

Number of service ports

3-way - for spools A, B	= **3**
4-way - for the other spools	= **4**

Type of operation

hand lever operated	= **WMM**
rotary knob operated	= **WMD**
lockable rotary knob operated	= **WMDA**
roller operated (roller positioning according to page12)	= **WMR**
roller operated (roller positioning according to page12)	= **WMU**
hydraulically operated	= **WH**

Nominal size (NS)

NS6	= **6**

Spool type

spool diagrams for directional spool valve:

type **WMM**	- according to page **4**, **5**
type **WMD/WMDA**	- according to page **5**, **6**
type **WMR/ WMU**	- according to page **7**
type **WH**	- according to page **8**, **9**

Series number

(30-39) - connection and installation dimensions unchanged	= 3X
series 32	= **32**

Spool positioning

spring centering - possible for directional spool valves type: **WMM, WMR/WMU, WH**	= **no designation**
with detent - possible for directional spool valves type: **WMM, WMD/WMDA**	= **F**
without return springs, without detent - possible for directional spool valves type WH	= O
without return springs, with detent - possible for directional spool valves type WH	= OF

Throttle insert (in port P)

without throttle insert	= **no designation**
throttle insert ϕ 0,8	= B 08
throttle insert ϕ 1,0	= B 10
throttle insert ϕ 1,2	= B 12

Sealing

NBR (for fluids on mineral oil base)	= **no designation**
FKM (for fluids on phosphate ester base)	= V

Further requirements in clear text (to be agreed with the manufacturer)

Directional spool valve should be ordered according to the above coding.
The symbols in bold are preferred versions in short delivery time.
Coding examples: 4WMM6 E -32/B08; 4WMD6 E -32/F B08; 4WMR6 E -32/B08; 4WH6 E -32/B08