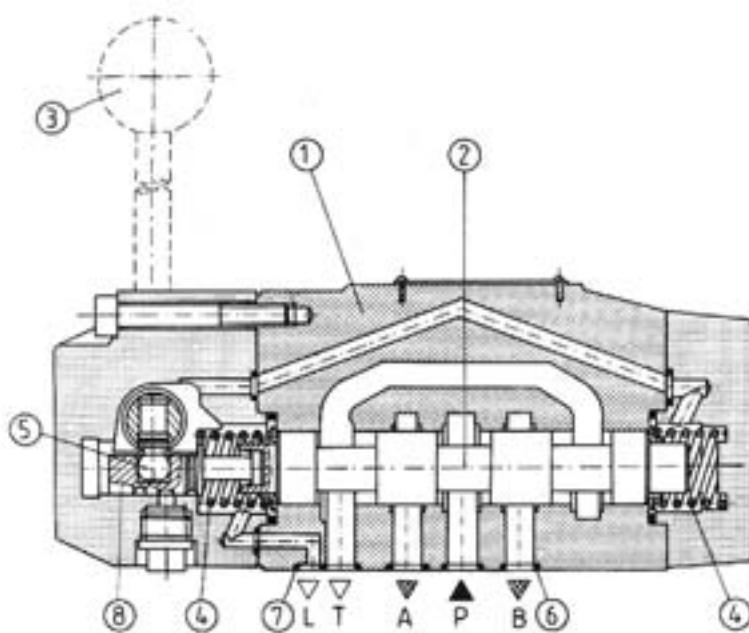


Directional spool valves are used to control the direction of fluid flow and thus the direction of movement or holding position of a user ( cylinder or hydraulic motor ).



### DESCRIPTION OF OPERATION



Annular ports are made around the longitudinal bore in the housing 1. The annular ports cut through the longitudinal bore forming control lands in the housing. The moveable control spool 2 is placed in the main port. If the spool is shifted, it connects or separates the ports in the housing. Various control functions result directly from shape of the control spool. Movement of the control spool is caused by a change

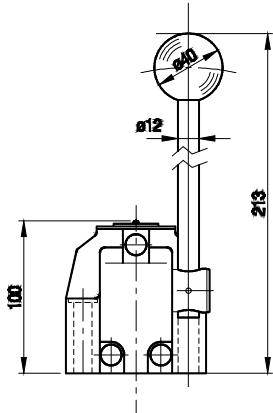
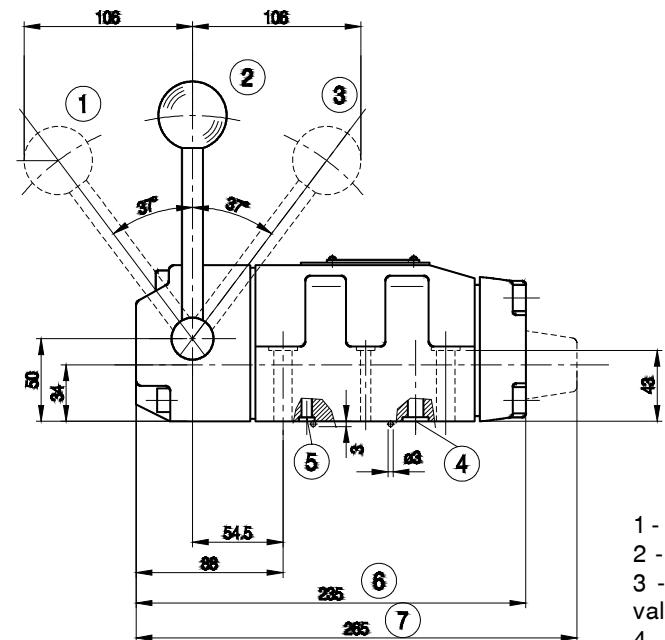
in position of the hand lever 3 with aid of the pins 5 and 8. The control spool together with the control elements are returned to their rest position by the centering spring 4 - in version with return springs.

The sealing rings 6 and 7 are installed between the valve and a subplate to prevent leakage.

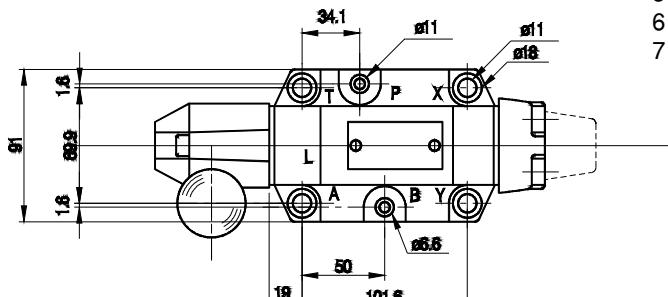
## TECHNICAL DATA

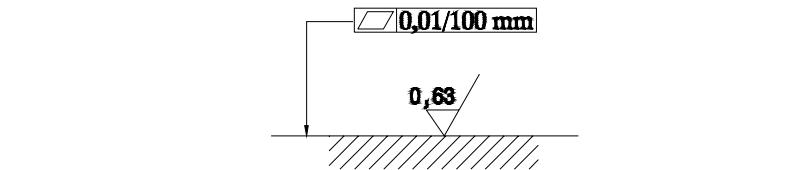
Hydraulic fluid	Mineral oil, phosphate ester				
Required filtration	up to 16 µm				
Recommended filtration	up to 10 µm				
Nominal fluid viscosity	37 mm <sup>2</sup> at temp. of 328 K				
Viscosity range	2.8 to 380 mm <sup>2</sup> /s				
Optimum working temperature ( fluid in a tank )	313 - 328 K				
Fluid temperature range	243 - 343 K				
Maximum admissible operating pressure	Ports P, A, B		Port T		
	35 MPa		25 MPa		
Flow section in position „0”	Spool type Q	Spool type V			Spool type W
	16 % of nominal section	16 % of nominal section			3 % of nominal section
Operating force	With detent		With return springs		
	approx. 40 N		max 70 N		
Weight	7.5 kg				

## OVERALL AND MOUNTING DIMENSIONS

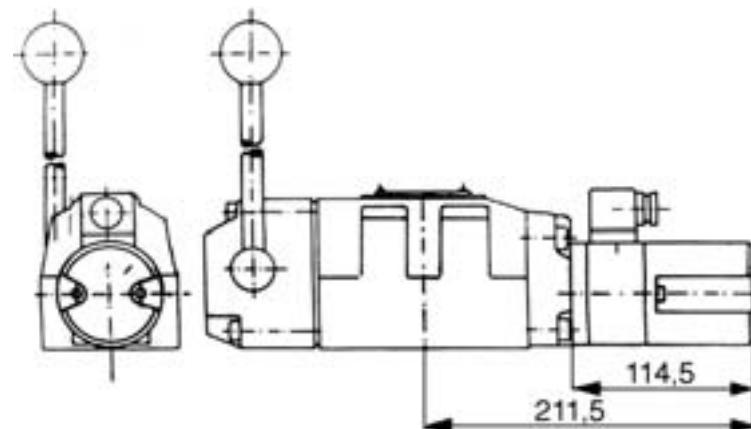


- 1 - Position „a” for two- and three-position directional valves
- 2 - Position „0” for three-position directional valves
- 3 - Position „b” for three- and two- position directional valves
- 4 - O-ring  $22.3 \times 2.4$  - 4 pieces
- 5 - O-ring  $10 \times 2$  - 3 pieces
- 6 - Dimension for three-position valve
- 7 - Dimension for two-position valve

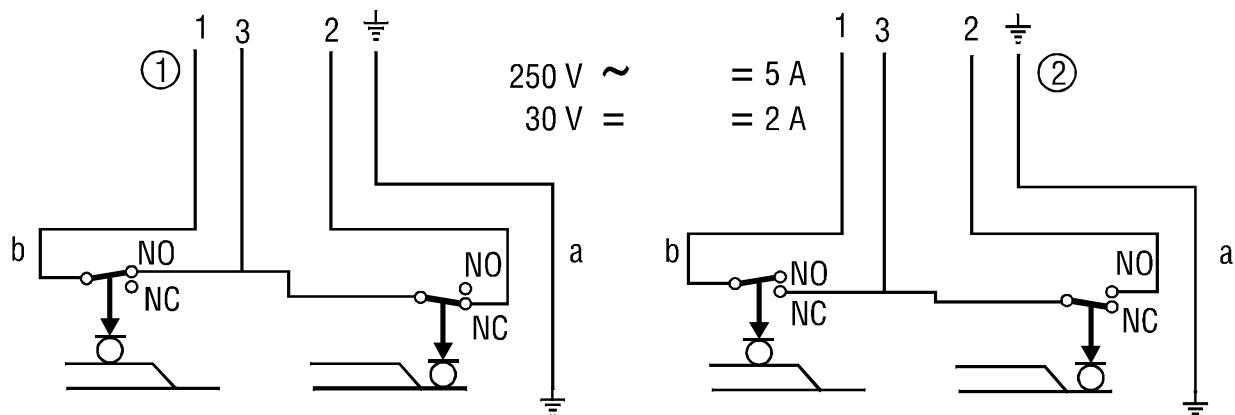




Admissible surface roughness and flatness deviation for a subplate face.



Limit switch - overall dimensions

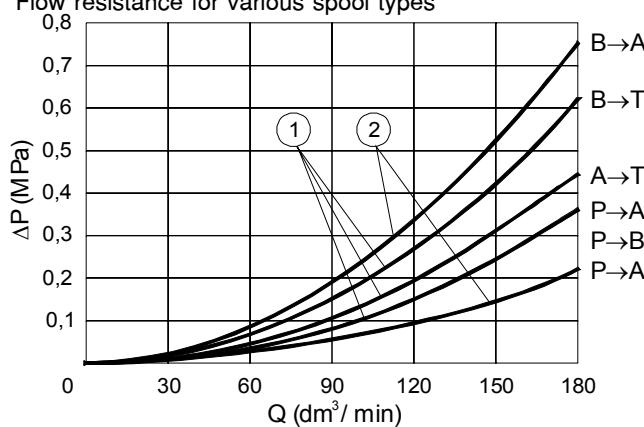


Electrical scheme for limit switch

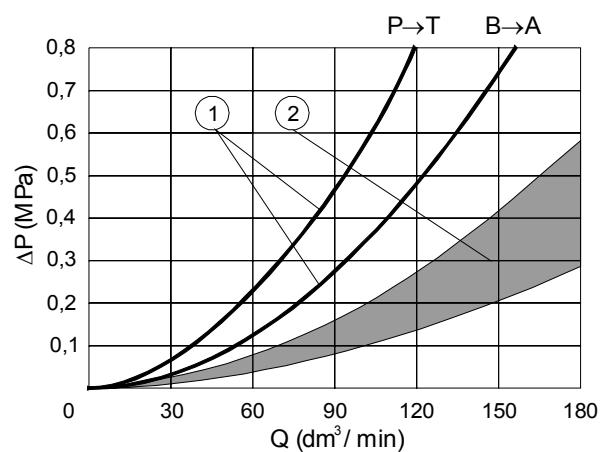
1 - Scheme for limit switch normally closed 19  
 2 - Scheme for limit switch normally open 23

## PERFORMANCE CURVES : measured at $v = 41 \text{ mm}^2/\text{s}$ and $T = 323 \text{ K}$

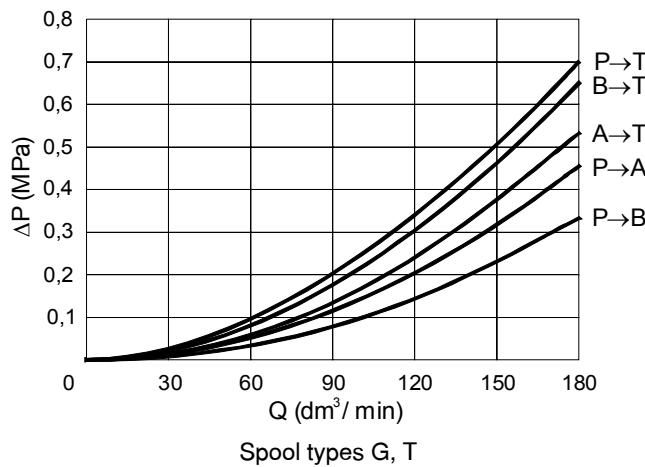
Flow resistance for various spool types



1 - Spool types E, R  
 2 - Spool type R (P to A and B to A)



1 - Spool type S  
 2 - Other spool types



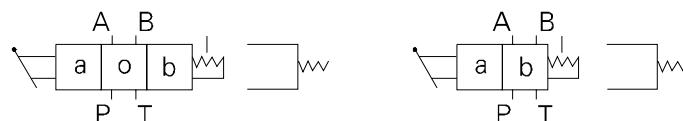
### Flow limits

2 and 3-position valves, spring centered					
Spool types	Pressure ( MPa )				
	7	14	21	28	35
E, J, L, M, Q, R, U, V, W, C, D, K, Z	180	180	180	180	170
F	125	100	80	70	65
G, H, S, T	125	115	90	80	70
2 and 3-position valves with detent					
All spool types	180	180	180	180	180

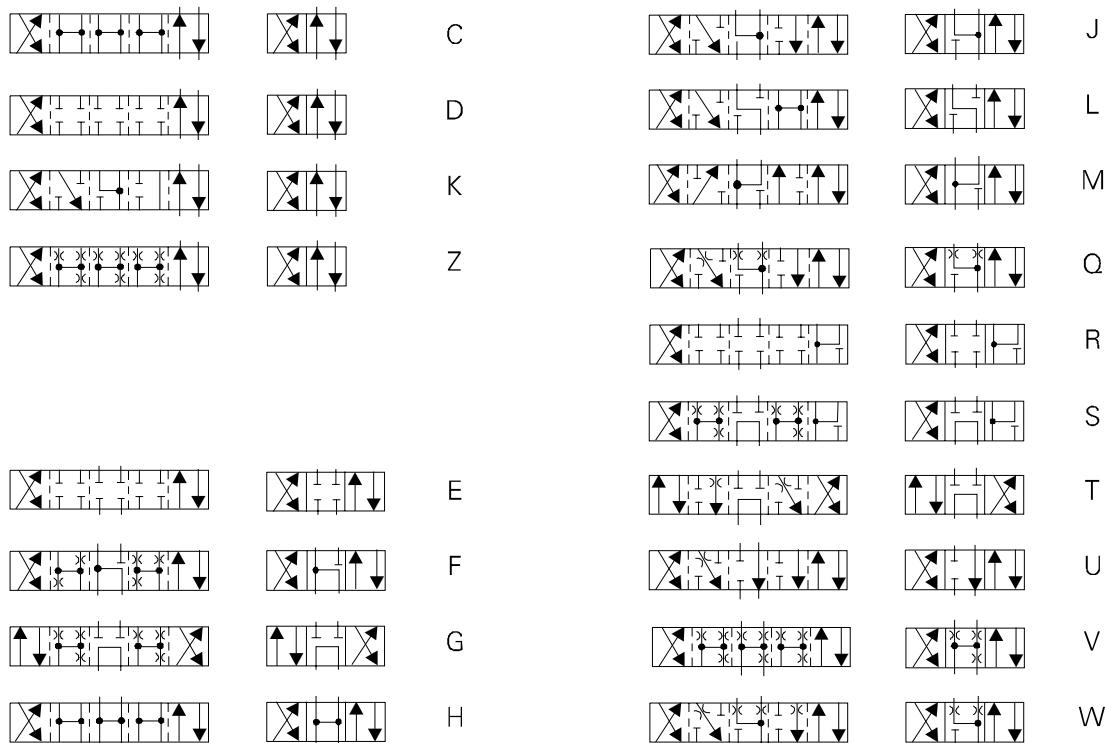
### Note:

The flow limits refer to typical application of 4-way directional control valve i.e. with using two lines e.g. P to A and B to T at the same time. In case of using 4-way directional control valve with one flow line e.g. P to A ( B plugged ) or A to T ( B plugged ) actual flow limits are considerably lower.

### SCHEMES



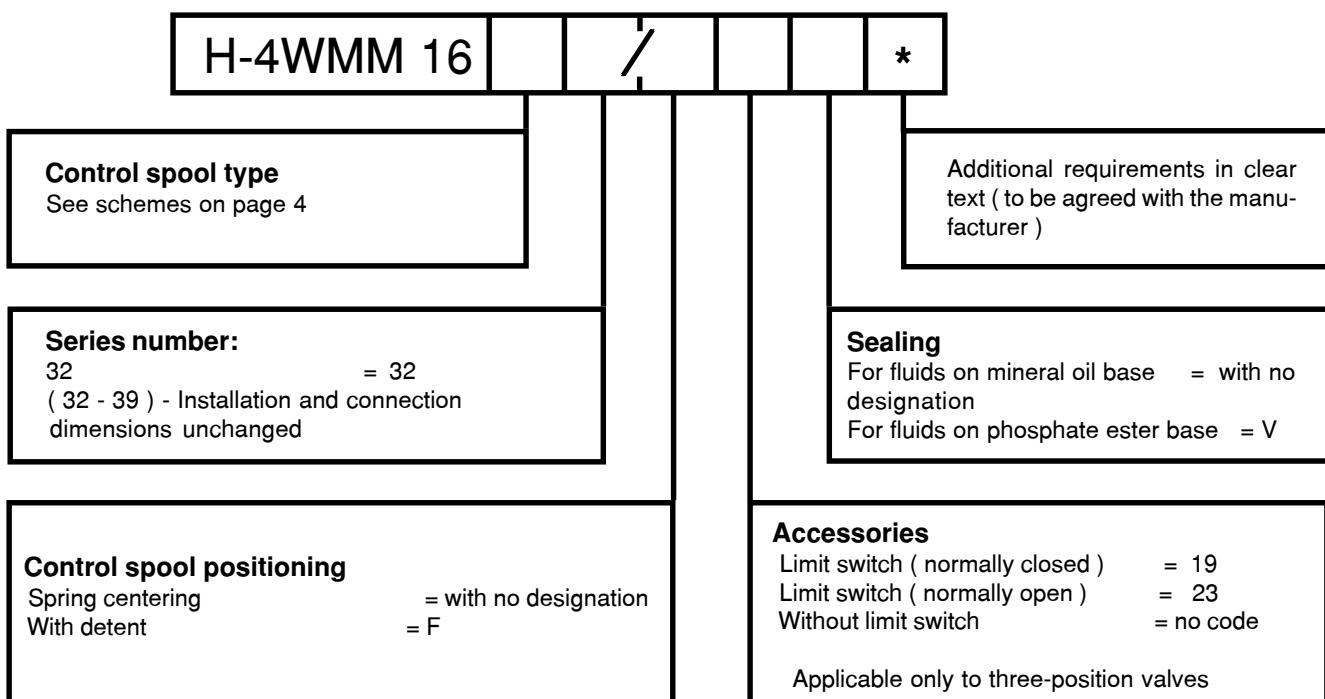
Hydraulic scheme



Schemes for control spools

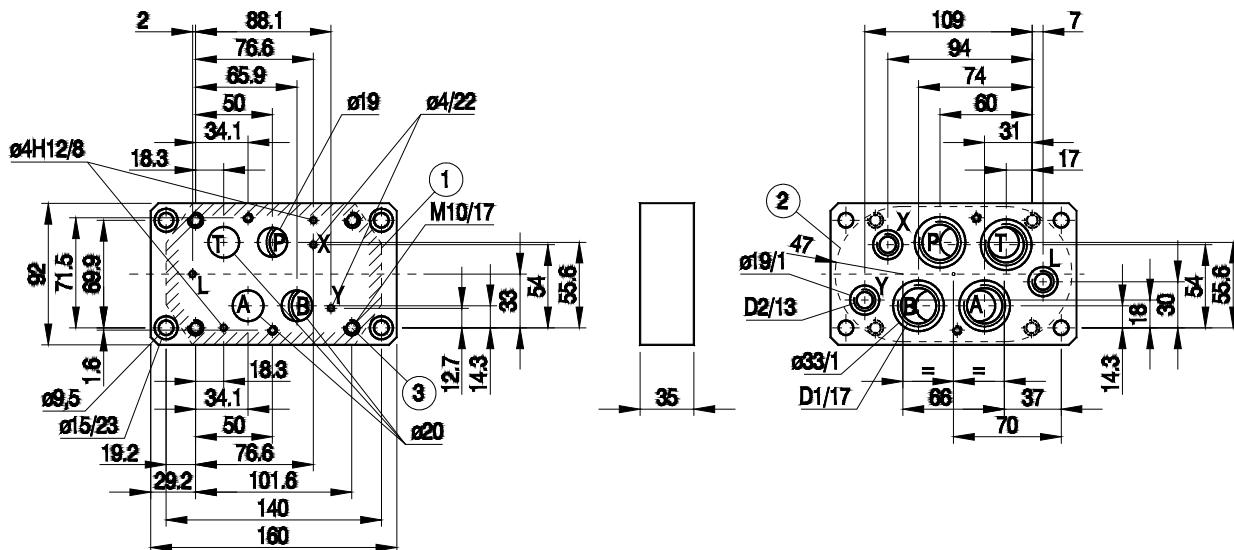
## HOW TO ORDER

Orders coded in the way showed below should be forwarded to the manufacturer.



**Coding example : H-4 WMM 16E30/F**

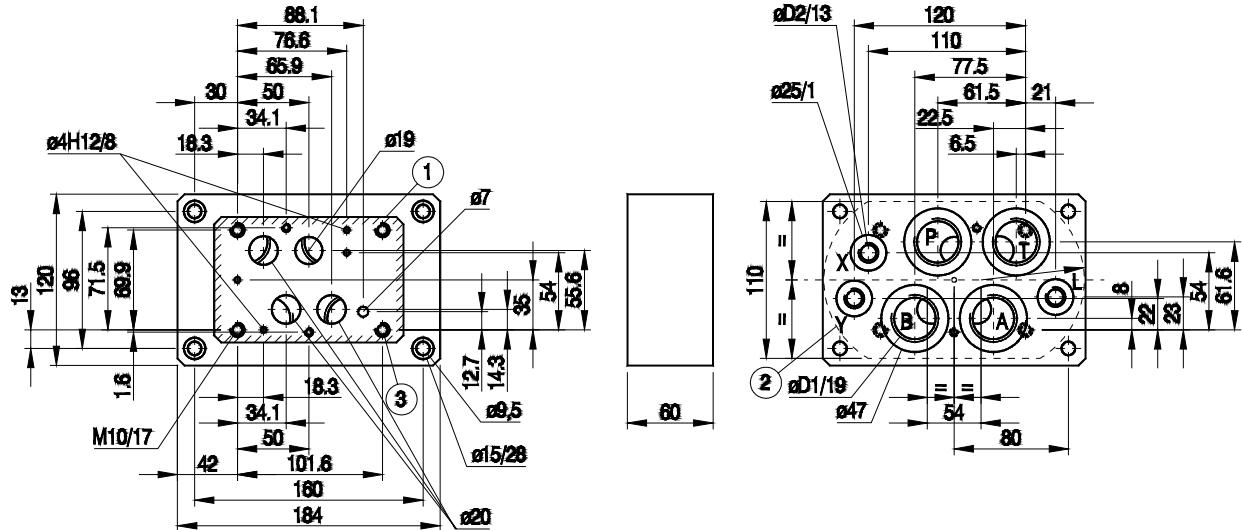
## MOUNTING DIMENSIONS FOR SUBPLATE



- 1 - Mounting face
- 2 - Recess in subplate face
- 3 - Threads fixing valve

Subplate type	$\varnothing$ D1	$\varnothing$ D2
G 172/01	G3/4	G1/4
G 172/02	M27 x 2	M14 x 1.5

Weight approx. 2.8 kg



1 - Mounting face  
 2 - Recess in subplate face  
 3 - Threads fixing valve

Subplate type	$\varnothing$ D1	$\varnothing$ D2
G 174/01	G1	G1/4
G 174/02	M33 x 2	M14 x 1.5

Weight approx. 5.5 kg

Bolts mounting the valve to subplate

Quantity	Size	Standard	Mechanical properties	M ( Nm )
4	M10 x 60	PN-87/ M-82302 (DIN 912)	10.9	62
2	M6 x 60			12.5

Note : Subplate and mounting bolts must be ordered separately

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