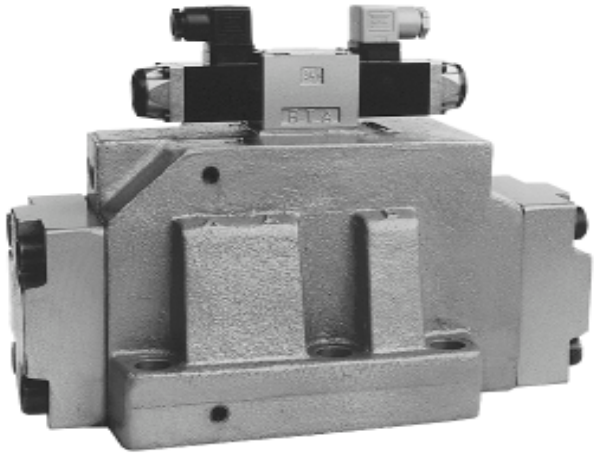
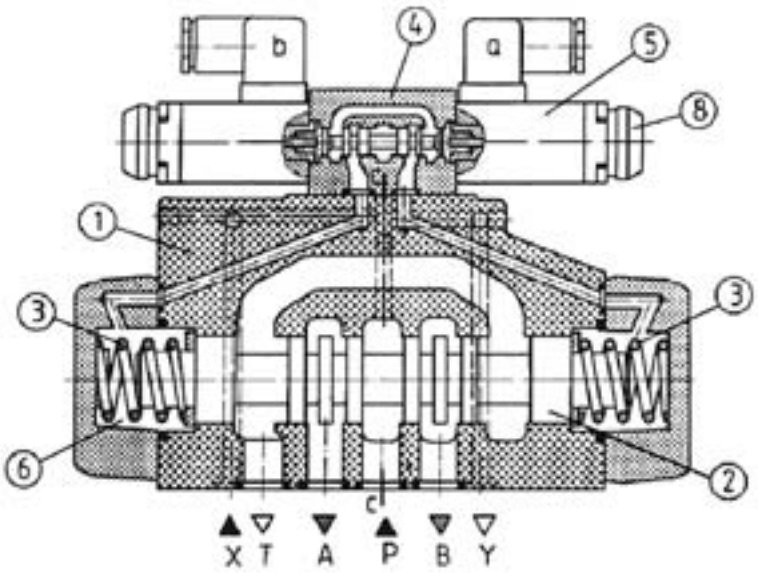
PONAR wadowice	Directional spool valve type WEH 32 electro-hydraulically operated			WK 460 580
	Size 32	28/35 MPa	1100 dm³/min	04.2001r.



Directional spool valves are used to conrol the start, stop and direction of fluid flow and thus the direction of movement or holding position (cylinder or hydraulic motor) is determind. The valves can be installed in hydraulic circuit in any position together with a subplate.
The connecting surfaces are sealed with O-rings that are included with the valve.

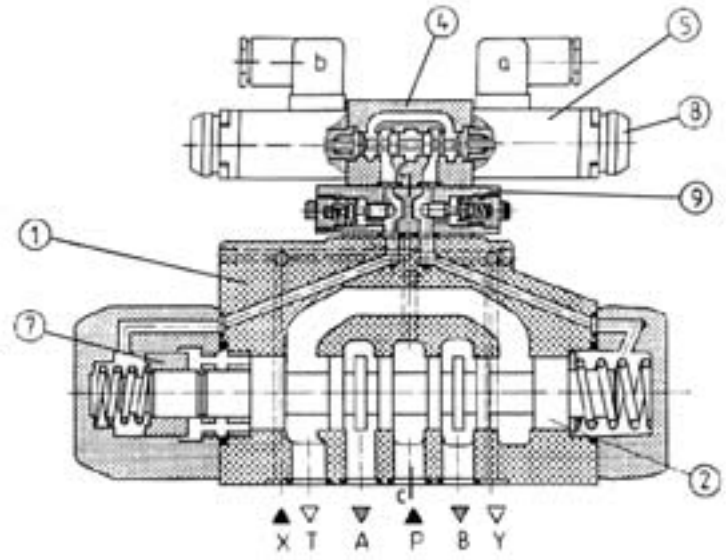
DESCRIPTION OF OPERATION



Type 4WEH32...

The directional valve is switched by changing position of the control spool 2 which moving along its axis separates or connects ports A, B, P or T in the housing 1.
Pressure supplied to one spring chamber 6 via the pilot valve 4 acts on the main spool surface and thus the main spool is shifted from its neutral position.
The main control spool is held in centre position by the spring 4 or hydraulically that is by fluid pressure affecting (via the pilot valve) the both spool surfaces.

Centering sleeve 7 serves centering function.
The pilot valve is electrically operated by the solenoids 5, which may be equipped with the emergency button 8. The optional emergency button allows the operation of the pilot valve without energisation subject to the pilot fluid pressure being at disposal.
The directional valve may be provided with the pilot choke adjustment 9.



Type 4 WEH 32H...

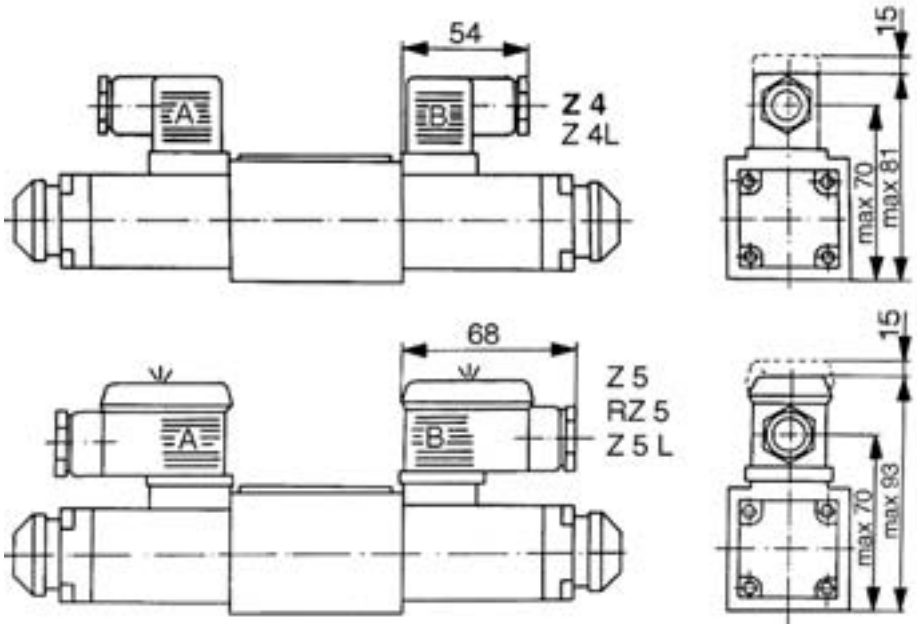
TECHNICAL DATA

Hydraulic fluid	Mineral oil, phosphate ester
Required filtration	up to 16 μm (recommended 10 μm)
Nominal fluid viscosity	37 mm^2 at temp. of 328 K
Viscosity range	2.8 to 380 mm^2/s
Optimum working temperature (fluid in a tank)	313 - 328 K
Fluid temperature range	243 - 343 K
Weight	max. 51 kg
Maximum operating pressure - in ports A, B, P - in port T pilot fluid return Y = external pilot fluid return Y = internal (3-position valve spring centered, 2-position valve) internal pilot fluid return (3-position valve hydraulically centered)	 35 MPa for H-4WEH 32, 28 MPa for 4WEH 32 25 MPa 16 MPa no
Minimum pilot pressure pilot fluid supply X = external pilot fluid supply X = internal three-position directional valve two-position directional valve spring centered two-position directional valve hydraulically centered pilot fluid supply X = internal for spool types G, H, F, S, T (via pre-load valve or by suitable high flow rate)	 pst = 0.8 MPa pst = 1.0 MPa pst = 0.5 MPa pst = 0.45 MPa
Maximum pilot pressure	25 MPa

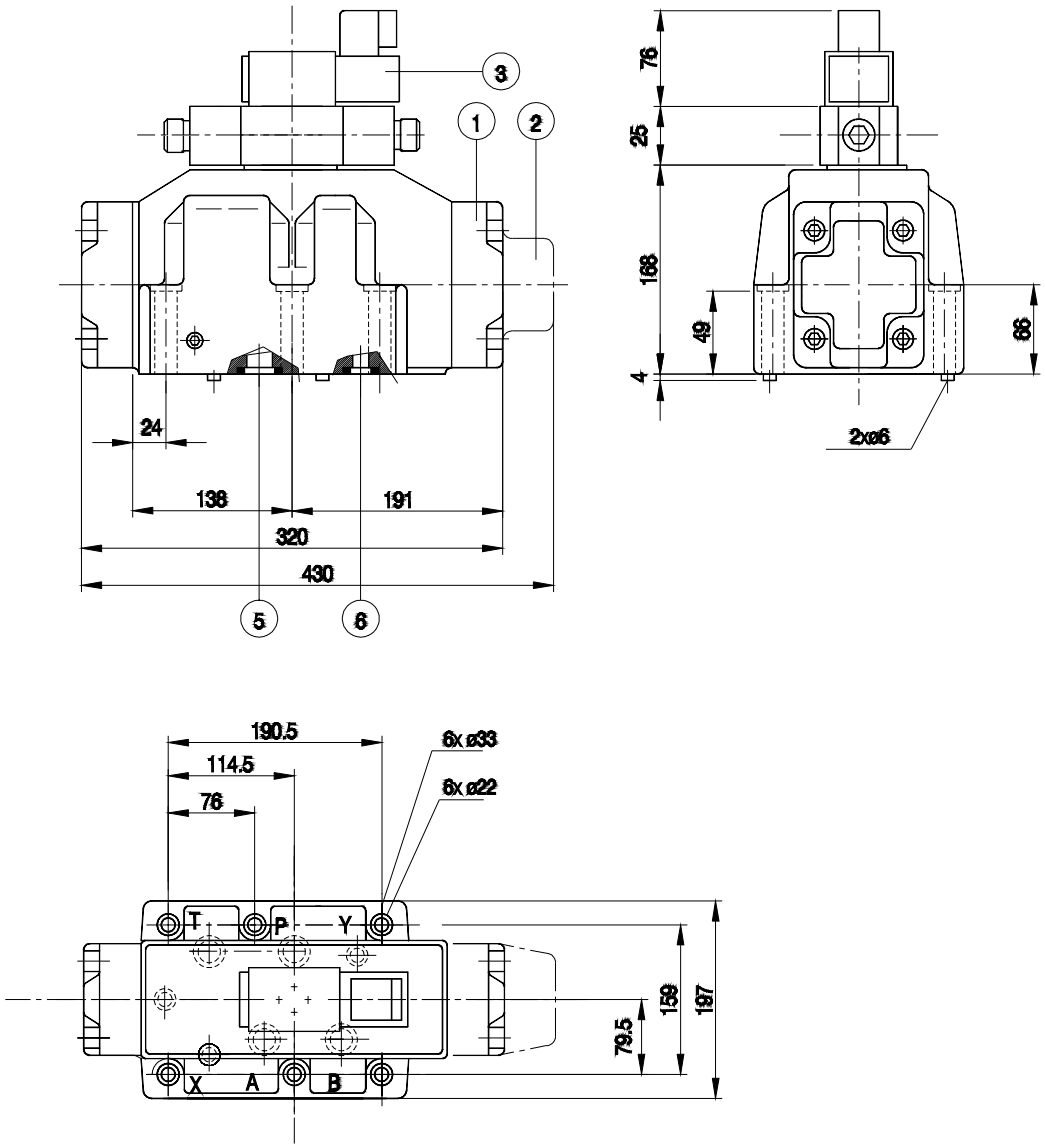
TECHNICAL DATA

Pilot fluid volume for valve operation - three-position directional valve spring centered - two-position directional valve Three-position directional valve hydraulically centered - from neutral to operated position '' a '' - from operated position '' a '' to neutral - from neutral to operated position '' b '' - from operated position '' b '' to neutral	 35,35 cm^3 70,70 cm^3 17,25 cm^3 35,35 cm^3 18,10 cm^3 17,25 cm^3
Total operating time of valve from neutral position to operated position at pilot pressure 5 MPa, 15 MPa,25 MPa three-position valve spring centered two-position valve three-position valve hydraulically centered : - solenoid ''a'' operation - solenoid ''b'' operation	 60 ms for pst = 5 MPa 45 ms for pst = 15 MPa 35 ms for pst = 25 MPa 105 ms for pst = 5 MPa 85 ms for pst = 15 MPa 75 ms for pst = 25 MPa 55 ms for pst = 5 MPa 40 ms for pst = 15 MPa 35 ms for pst = 25 MPa 65 ms for pst = 5 MPa 50 ms for pst = 15 MPa 45 ms for pst = 25 MPa
Total operating time from neutral to operated position increases for DC supply by	30 ms
Total operating time from operated to neutral position at pilot pressure 5MPa, 15 MPa, 25 MPa three-position valve spring centered two-position valve three-position valve hydraulically centered : - solenoid ''a'' operation - solenoid ''b'' operation	 95 ms 105 ms for pst = 5 MPa 85 ms for pst = 15 MPa 75 ms for pst = 25 MPa 65 ms for pst = 5 MPa 60ms for pst = 15 MPa 60 ms for pst = 25 MPa 70 ms for pst = 5 MPa 60 ms for pst = 15 MPa 60 ms for pst = 25 MPa
Direct solenoid operated valve WE 6 is used as a pilot valve. The spool is shifted by means of DC or AC solenoids. Version A - power input 26 W for AC - holding current 46 VA for DC - in-rush current 130 VA for DC - duty rating 100 % ED - nominal voltage 24 V, 110 V for DC 220 V - 50 HZ, 110 V - 50 HZ for AC - insulation to 40050 DIN : IP 65 - central connections : with 1 solenoid - solenoid to terminal 1 and 2, earth conductor to terminal 5 with 2 solenoids - solenoid ,,a'' to terminals1 and 2, solenoid ,,b'' to terminals 3 and 4, earth conductor to terminal 5	The control spool is held in neutral position by springs and in operated position by solenoid or detent. Version C - power input 30 W for AC - holding current 59 VA for DC - in-rush current 200 VA for DC - duty rating 100 % ED For the particular types of a main directional valve the following spool types of a pilot valve are designed : - scheme J for three-position directional valve spring cen tered - scheme D/O or D/OF for two-position directional valve - scheme M for three-position directional valve hydraulically centered - scheme D for two-position directional valve

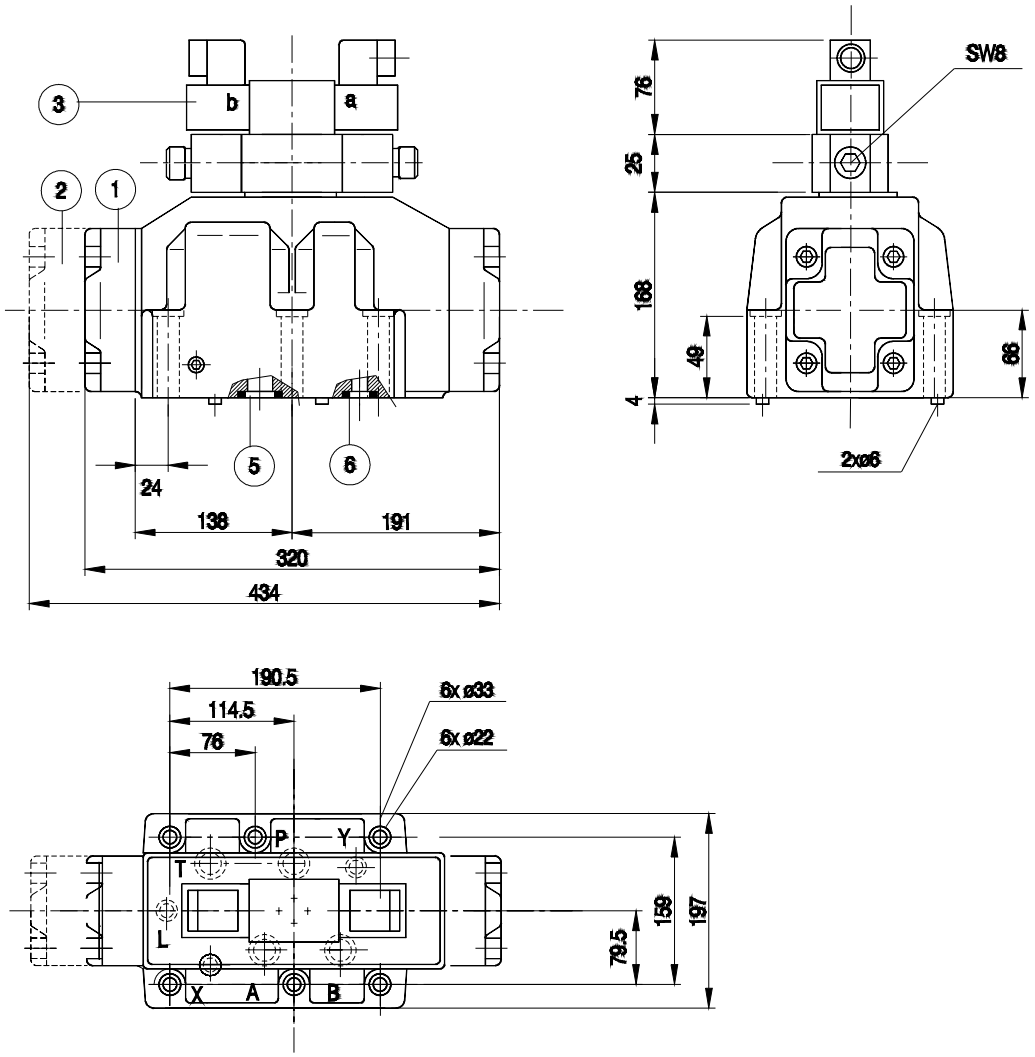
Electrical connections :



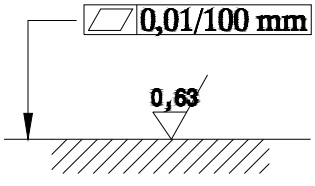
OVERALL DIMENSIONS



item 1 - two-position valve hydraulically centered
item 2 - two-position valve spring centered
item 3 - solenoid
item 5 - O-ring 42 × 3 - 4 pcs (P, A, B, T)
item 6 - O-ring 19.2 × 3 - 3 pcs (X, Y, L)



item 1 - three-position valve spring centered or two-position valve hydraulically centered
item 2 - three-position valve hydraulically centered
item 3 - solenoid
item 4 - O-ring 42 × 3 - 4 pcs (P, A, B, T)
item 5 - O-ring 19,2 × 3 - 3 pcs (X, Y, L)

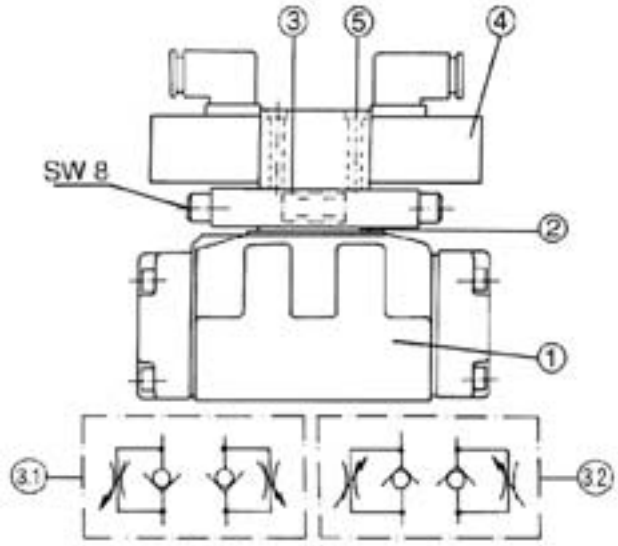


Admissible surface roughness and flatness deviation for a subplate face

Installation method for pilot choke adjustment

Rotation of the adjusting screw SW 6 to the right increases and to the left decreases switching time of the main valve. The pilot choke adjustment is fixed by means of 4 bolts M5 × 80 - 10.9 (DIN 912) with tightening torque 5 Nm.
The change of adjustment on inlet for adjustment on outlet is by rotating the pilot choke adjustment round its longitudinal axis.

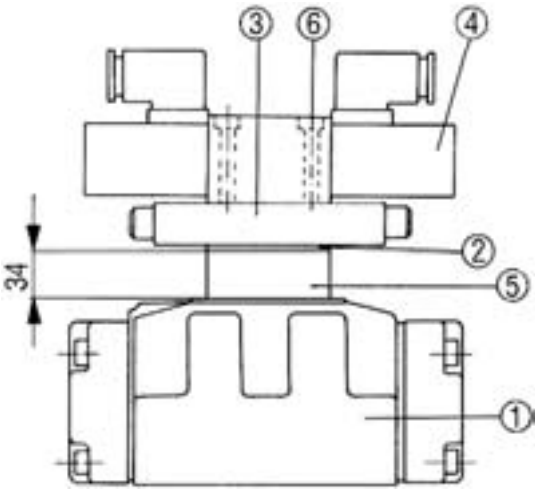
item 1 - main valve
item 2 - intermediate plate with sockets for o-rings.
item 3 - pilot choke adjustment
adjustment on inlet - scheme 3.1
adjustment on outlet - scheme 3.2
item 4 - pilot valve
item 7 - fixing screws



Installation method for pressure ratio valve

When pilot pressure exceeds 25 MPa, the pressure ratio valve must be used. It causes reducing the pilot pressure in the ratio 1 : 0.66 to the main pressure. In this case the main pilot pressure must be increased by the factor 1 : 0.66 = 1.515. The pressure ratio valve is mounted by means of 4 bolts M5 × 100 - 10.9 (DIN 912) with tightening torque 5 Nm

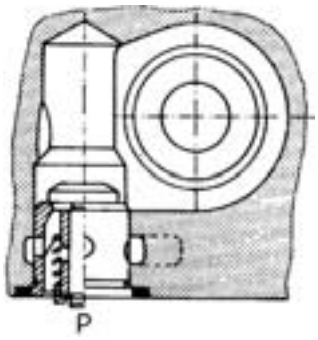
item 1 - pressure ratio valve
item 2 - main directional valve
item 3 - pilot valve
item 4 - pilot choke adjustment
item 5 - fixing screws



Installation method for pre-load valve

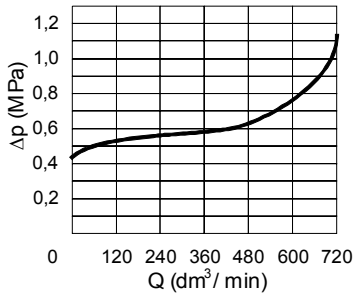
In valves with a low pressure bypass and internal pilot fluid feed the pre-load valve must be fixed in port P to obtain minimum pilot pressure.
When using the pressure ratio valve D1 the valve P7 should be installed.

Cracking pressure - from 0.45 MPa or 0.7 MPa



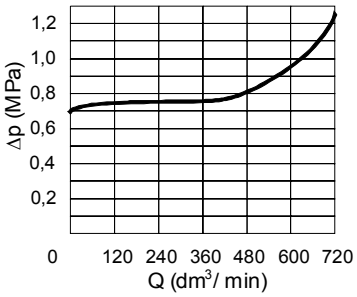
Operating curve for valve P 4.5

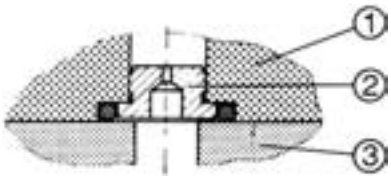
measured at ν = 41mm²/s and T = 323 K.



Operating curve for valve P 7

measured at ν = 41mm²/s and T = 323 K.



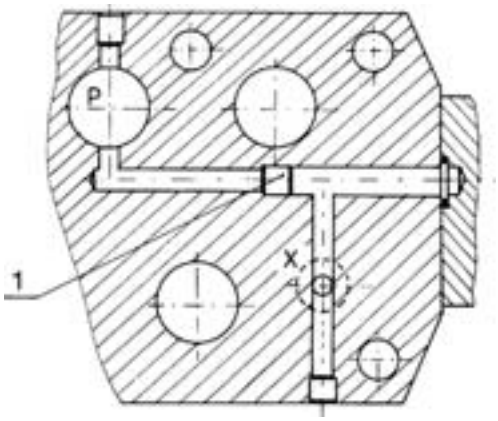


Mounting method for throttle insert

item 1 - pilot valve
item 2 - throttle insert
item 3 - main valve

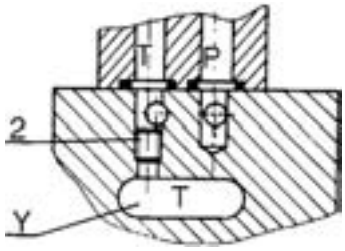
Pilot fluid return
change internal/external

''a'' pilot fluid return internal - plug 2 screwed out
''b'' pilot fluid return external - plug 2 screwed in

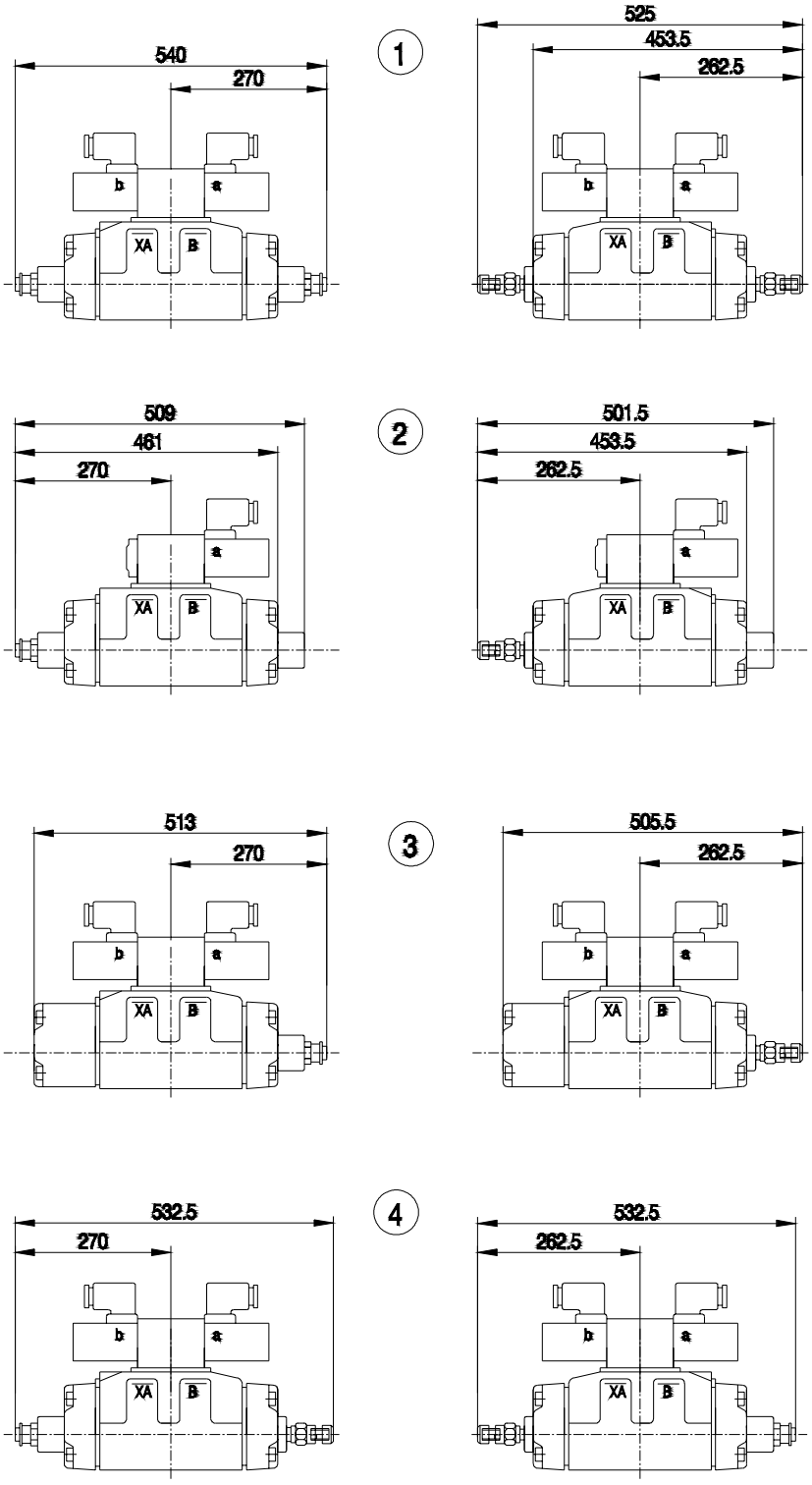


Pilot fluid feed
change internal/external

''a'' pilot fluid feed internal - plug 1 screwed out
''b'' pilot fluid feed external - plug 1 screwed in



OVERALL DIMENSIONS FOR DIRECTIONAL VALVE WITH ACCESSORIES



Optional accessories

item 1 - 2-position valve hydraulically centered and 3-position valve spring centered, optional accessories 10, 11, 12,

item 2 - 2-position valve (spool schemes C - D - K - Z), optional accessory 11,

item 3 - 3-position valve, hydraulically centered, optional accessory 12,

item 4 - 2-position valve, hydraulically centered and 3-position valve spring centered, optional accessory 16

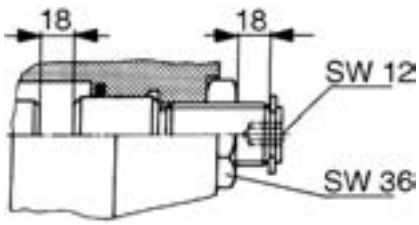
item 5 - 2-position valve, hydraulically centered and 3-position valve spring centered, optional accessories 13, 14, 15,

item 6 - 2-position valve (spool schemes C - D- K - Z), optional accessory 14,

item 7 - 3-position valve, hydrauliacally centered, optional accessory 12,

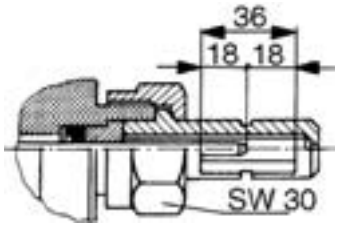
item 8 - 2-position valve, hydraulically centered and 3-position valve spring centered, optional accessory 17.

Main spool stroke adjustment



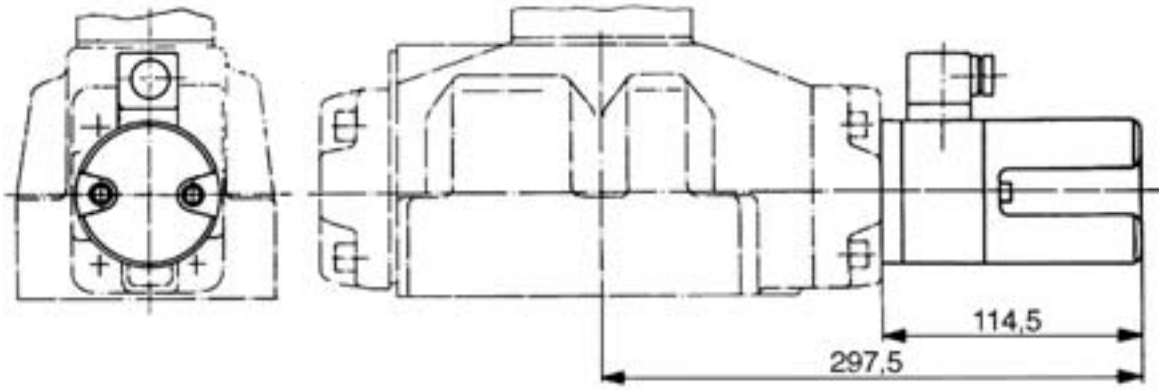
Adjustment of a stroke of the main spool is by loosining the locknut SW 36 and rotating the pin SW 12. Rotating to the right reduces the stroke of the spool (1 turn = 1.5 mm).
While adjusting the stroke the control chamber must be at 0 pressure.

Limit switch



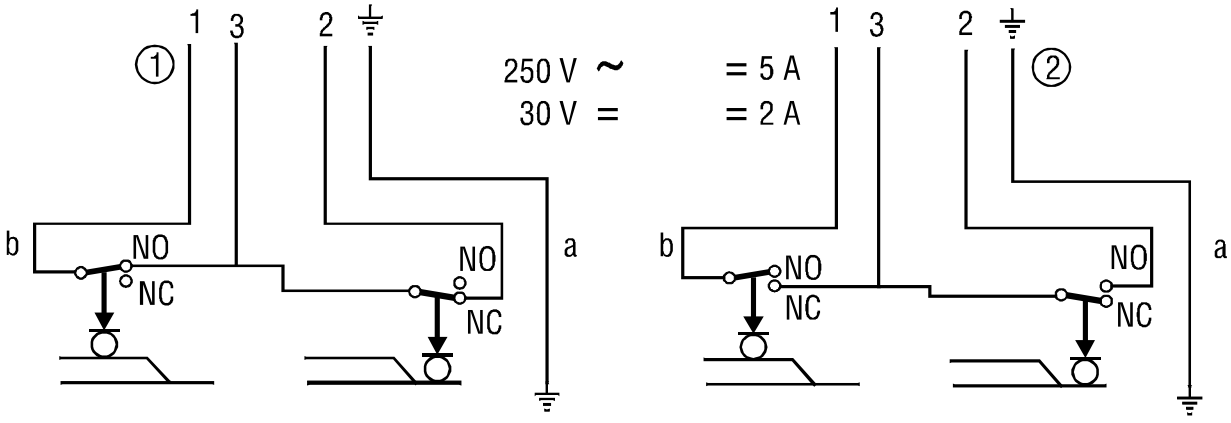
By loosing the clamp nut SW 30, the sleeve with viewing window may be rotated through 360° and set up in any position.
While loosing the nut, the control chamber must be at 0 pressure.

End position monitor



Installation of limit switch, optional (accessory)

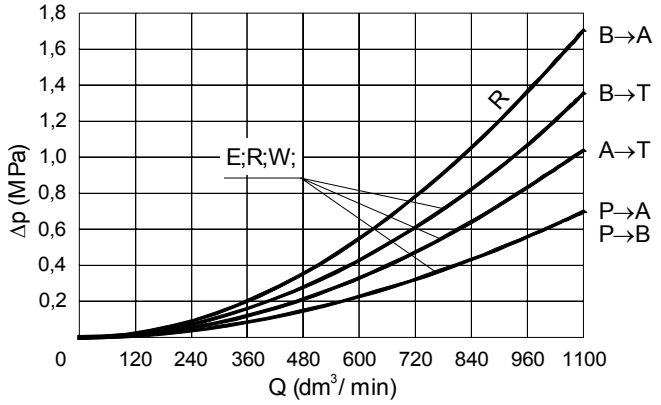
- 2-position valve and 3-position valve, spring centered, optional limit switcg 18, 22
- 2-position valve, hydraulically centered and 3-position valve, optional limit switch 19, 23
- 2-position valve, hydraulically centered and 3-position valve,
  spring centered, optional limit switch 20, 21, 24, 25,

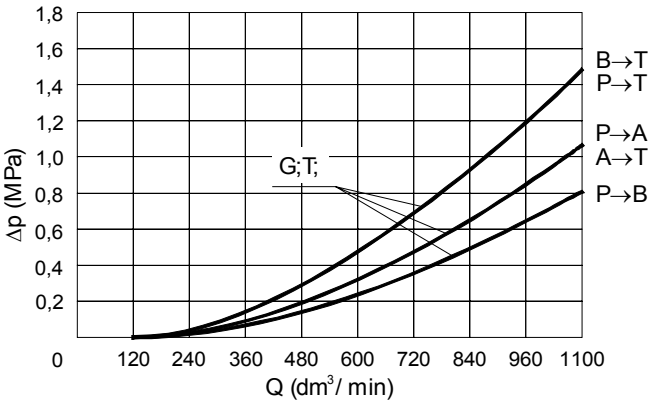


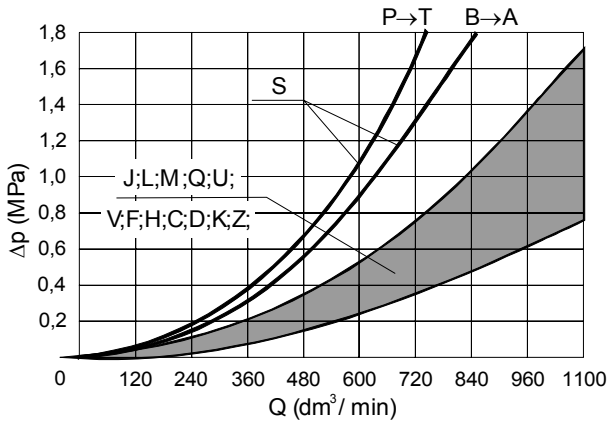
Electrical scheme for limit switch
item 1 - scheme for limit switch, normally closed
item 2 - scheme for limit switch, normally open

PERFORMANCE CURVES measured at ν = 41 mm²/s and T = 323 K

Flow curves





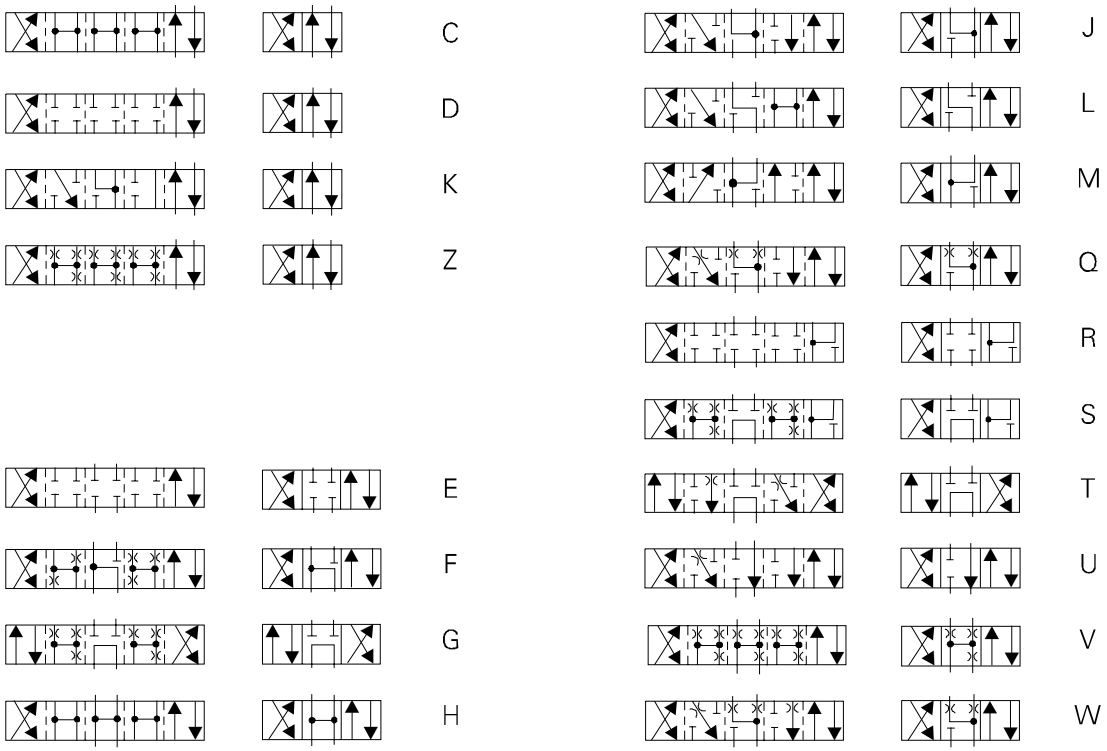


2- and 3-position valves spring centered					
Flow dm²/min for spools	Pressure MPa				
	7	14	210	280	350
E, J, L, M, Q, R, U, V, W, C, D, K, Z	110	105	860	750	680
F, G, H, S, T	820	630	510	450	400

Note:
The flow limits referto 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 considetably lower.

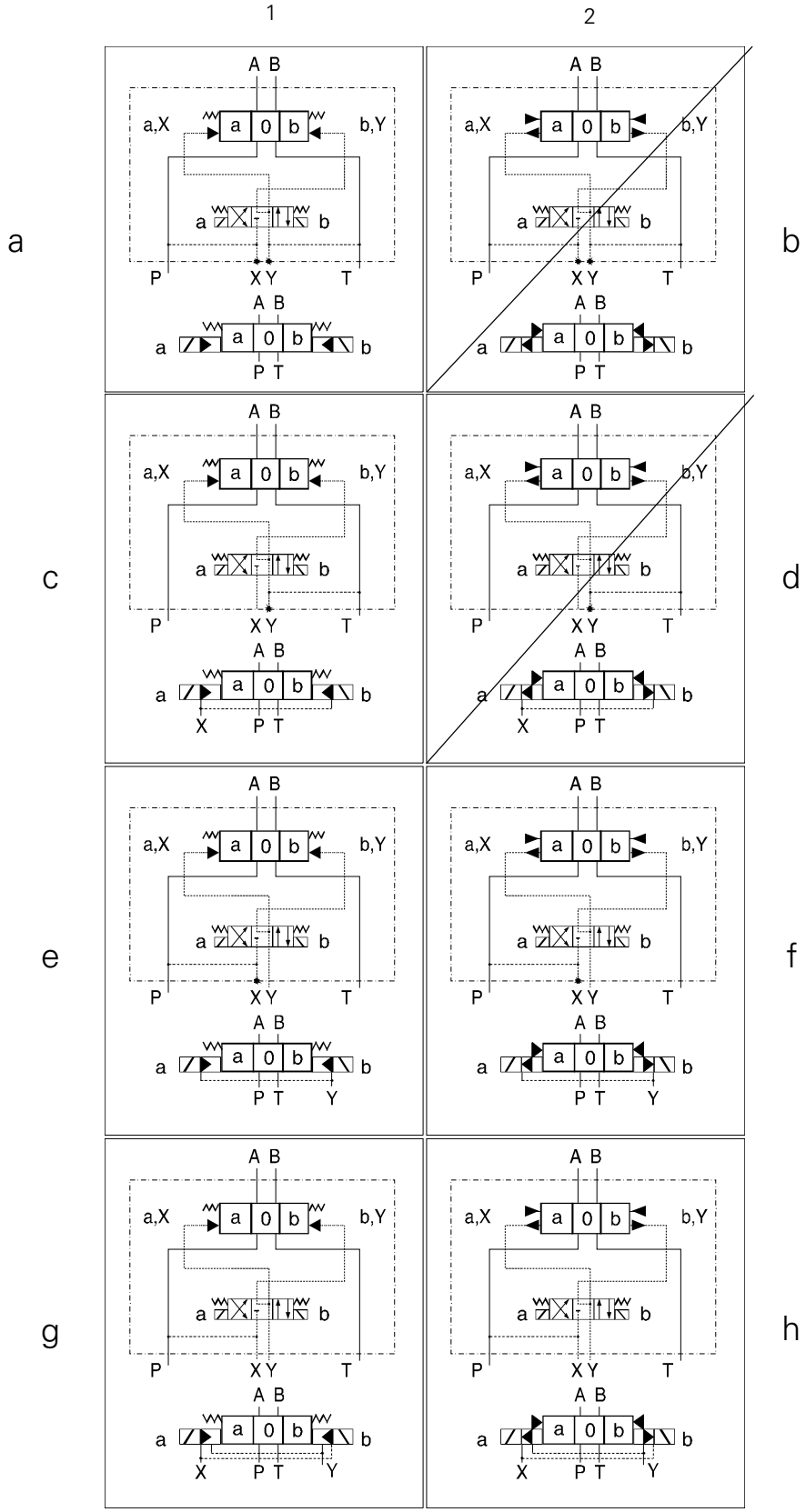
SCHEMES

Spool schemes



Flow section in position ,,0'' for spool type W - 3%, Q, V - 16%

Detailed and simplified diagrams for directional valves

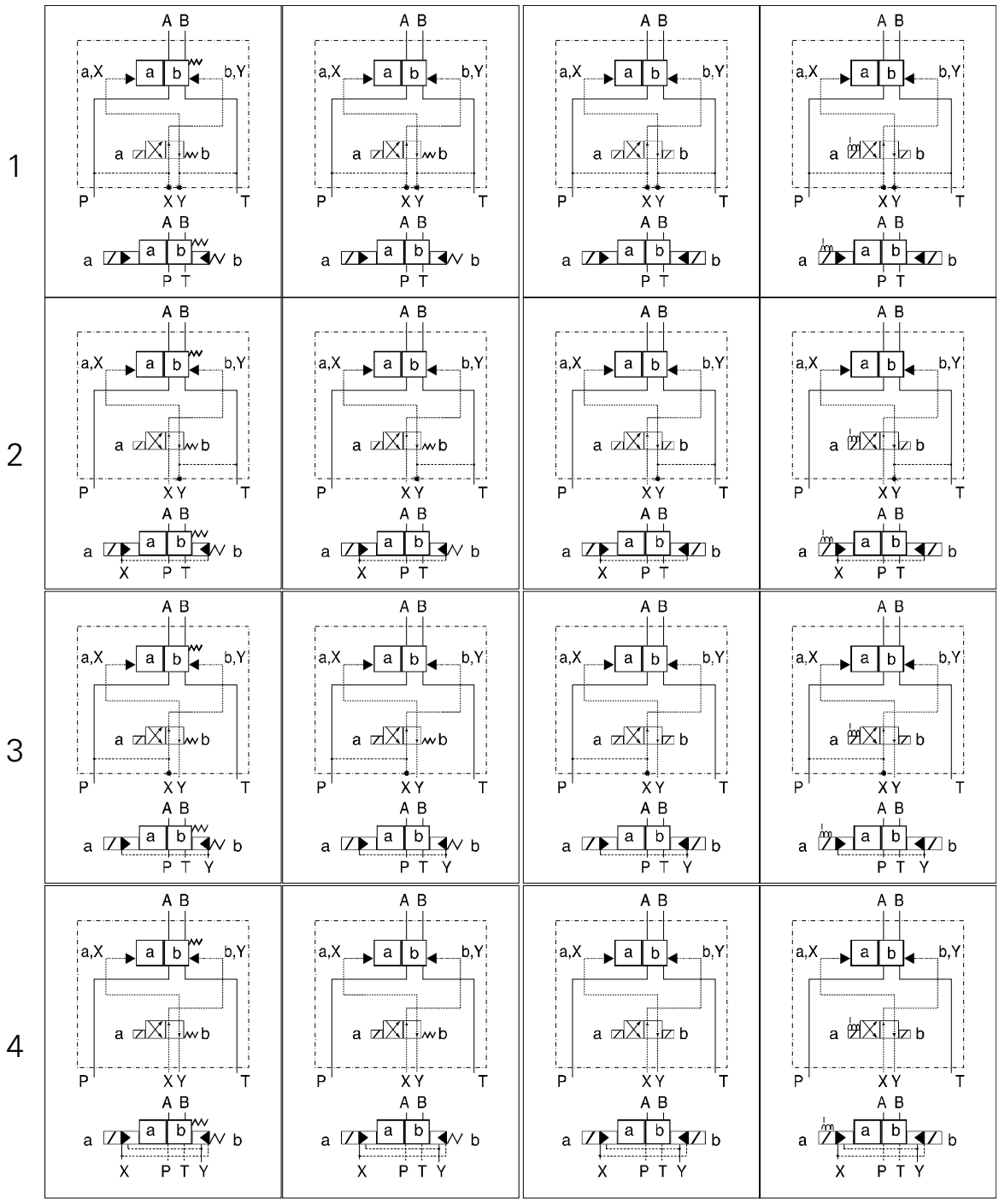


Schemes for 3-position valves

1. Valves spring centered

2. Valves hydraulically centered

a, b - X = internal feed Y = internal return
c, d - X = external feed Y = internal return
e, f - X = internal feed Y = external return
g, h - X = external feed Y = external return
b, d - impossible



Schemes for 2-position valve

1. X = internal feed Y = internal return
Type : ... 4WEH ..../.... ET
Type : ... 4WEH ....H/.... ET
Type : ... 4WEH ....H./.O.. ET
Type : ... 4WEH ....H./.OF.. ET

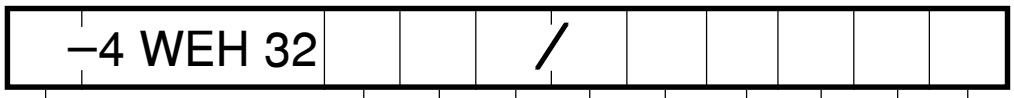
2. X = external feed Y = internal return
Type : ... 4WEH ..../.... T
Type : ... 4WEH ....H../...T
Type : ... 4WEH ....H./.O...T
Type : ... 4WEH ....H./..OF...T

3. X = internal feed Y = external return
Type : ... 4WEH ..../.... E
Type : ... 4WEH ...H./... E
Type : ... 4WEH ...H./..O... E
Type : ... 4WEH ...H/.. OF... E

4. X = external feed Y = external return
Type : ... 4WEH ..../....
Type : ... 4WEH ....H../....
Type : ... 4WEH ....H./..O...
Type : ... 4WEH ..../... OF ...

HOW TO ORDER

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



Version
High pressure up to 35 MPa = H
Normal pressure up to 28 MPa = no code

Spool positioning
Spring centering = with no designation
Hydraulic off-set = H

Control spool type
See spool schemes

Series number
11 = 11
(10 - 19) - installation and connection dimensions unchanged

Spool positioning (applicable to 2-position spools hydraulically centered HC, HD, HK, HZ only)
Without return spring = O
Without return spring with detent (detent in pilot valve only) = OF
Spring return = with no code

Pilot valve type
Directional spool valve size 6 with wet solenoids ∅ 35 or ⍁ 35 = 6A
* Directional spool valve size 6 with wet solenoids ∅ 44 or ⍁ 44 = 6C *

Power supply (for pilot valve)
DC 24 V = G 24
DC 110 V = G 110
AC 110 V, 50 Hz = W 110-50
AC 220 V, 50 Hz = W 220-50

Emergency operation for solenoids
Without emergency button = with no code
With emergency button = N

Pilot fluid feed
External pilot fluid feed, external pilot fluid return = with no code
Internal pilot fluid feed, external pilot fluid return = E
Internal pilot fluid feed, internal pilot fluid return = ET
External pilot fluid feed, internal pilot fluid return = T

Pilot choke adjustment
Without pilot choke adjustment = no designation
Adjustment, meter-in = S
Adjustment, meter-out = S2

* Recommended for use when pilot pressure exceeds 20 MPa

Coding example : 4WEH 32 E 50/ 6 AG 24 NET Z4

*						*

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

Sealing

For fluids on mineral oil base	= with no designation
For fluids on phosphate ester base	= V

Pressure ratio valve

Without pressure ratio valve	= with no designation
With pressure ratio valve	= D1

Pre - load valve

Without pre - load valve	= with no designation
Pre - load valve with cracking pressure 0.45 MPa	= P 4.5

Throttle insert

Without throttle insert	= with no designation
Throttle insert ∅ 0.8 mm	= B 08
Throttle insert ∅ 1.0 mm	= B10
Throttle insert ∅ 1.2 mm	= B12

Accessories

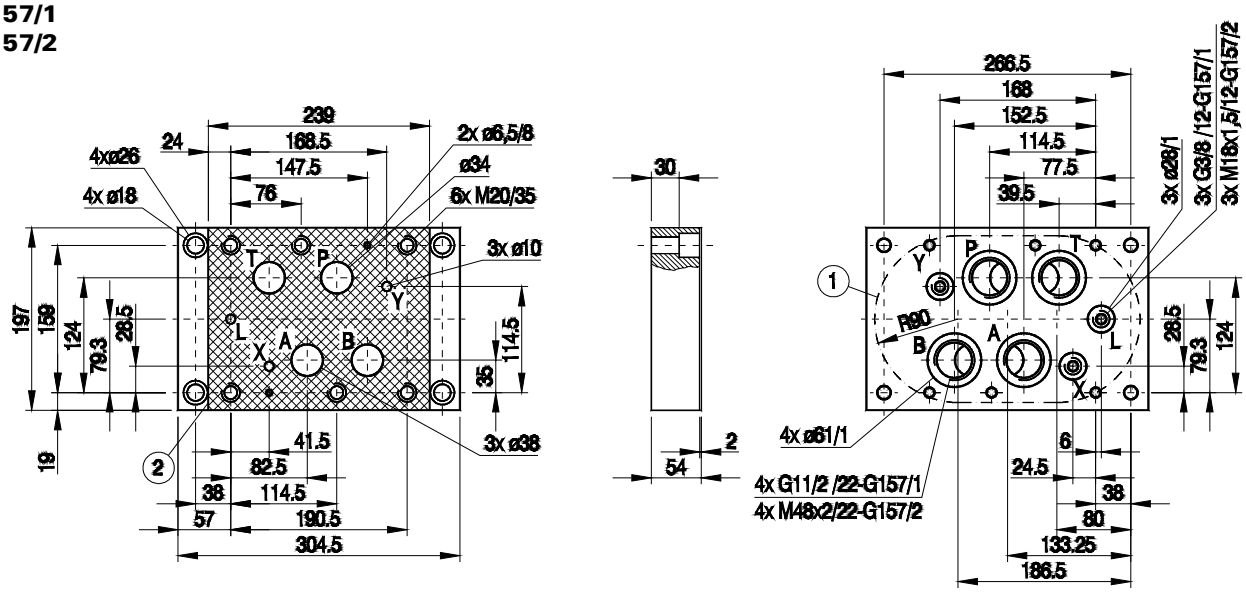
Without accessories	= with no designation
Stroke limiter on valve ends A and B	= 10
Stroke limiter on valve end A	= 11
Stroke limiter on valve end B	= 12
End position monitor on valve ends A and B	= 13
End position monitor on valve end A	= 14
End position monitor on valve end B	= 15
Stroke limiter on valve end A and end position monitor	= 16
Stroke limiter on valve end B and end position monitor on valve end A	= 17
Limit switch on end A normally closed	= 18
Limit switch on end B normally closed	= 19
Stroke limiter on valve end A, limit switch on valve end B normally closed	= 20
Stroke limiter on valve end B, limit switch on valve end A normally closed	= 21
Limit switch on valve end A normally open	= 22
Limit switch on valve end B normally open	= 23
Stroke limiter on valve end A, limit switch on valve end B normally open	= 24
Stroke limiter on valve end B, limit switch on valve end A normally open	= 25

Electrical connections

see schemes on page 4

MOUNTING DIMENSIONS FOR SUBPLATE

G 157/1
G 157/2



1 - Recess in subplate face
2 - Mounting face of directional valve

Port L for directional valve with hydraulic off-set only.
Mounting bolts and subplate must be ordered separately.

Bolts fixing directional valve
6 pcs M20 × 80 - 10.9 per PN 87/M - 82302 (DIN 912 - 10.9)
Subplate weight - about 20 kg

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