

Directional spool valve type SWPN

Nom. size 6 or 10 conforming DIN 24 340

Max. pressure = 350 bar
Max. flow = 150 lpm

1. General

The valves illustrated here are directly actuated directional spool valves with connection hole pattern conforming DIN 24 340-A6 or A10. The valves type SWPN 2 may be combined as valve banks via the sub-plate system type BA 2 acc. to D 7788. This enables direct mounting onto hydraulic power packs type HC (D 7900), HCG (D 7900 G), MP (D 7200 H), and HK (D 7600 ++) or combination with directional seated valve banks type BWN(H) 1 + 2 (D 7470 B/1), BVZP 1 (D 7785 B) and VB 01, 11 and 21 (D 7302).

2. Port size, main data

Order example:

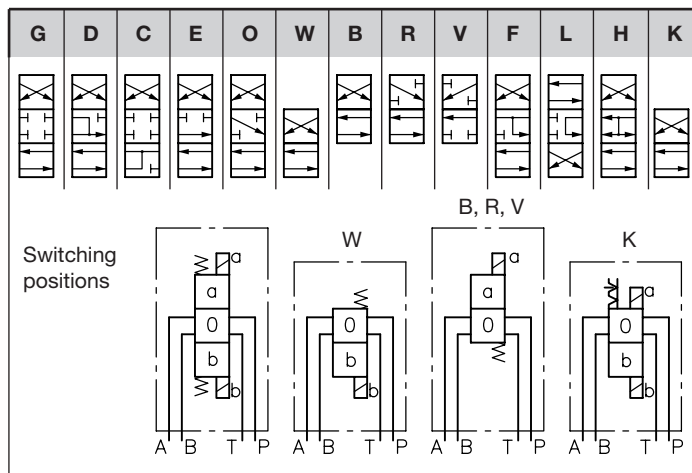
SWPN 2 - G - X 24

Actuation solenoid

Basic type	Port size	Max. pressure (bar)		Max. flow (lpm)
		P, A, B	T	
SWPN 2	Nom. size 6	350	210	80
SWPN 8	Nom. size 10	350		150

Without plug	Nominal voltage
X 12	12V DC
X 24	24V DC
X 98	98V DC
X 205	205V DC

Symbols



Plugs have to be ordered separately, when required

DC-voltage:

- Part No. 6217 0002-00 (black)
- Part No. 6217 0003-00 (grey)

AC-voltage (50/60 Hz):

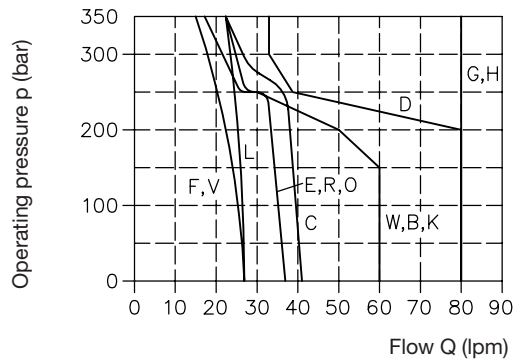
- Part No. 6217 6002-00

3. Further parameters

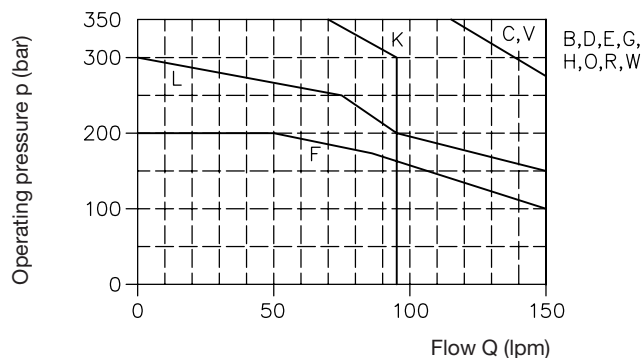
3.1 General and hydraulic data

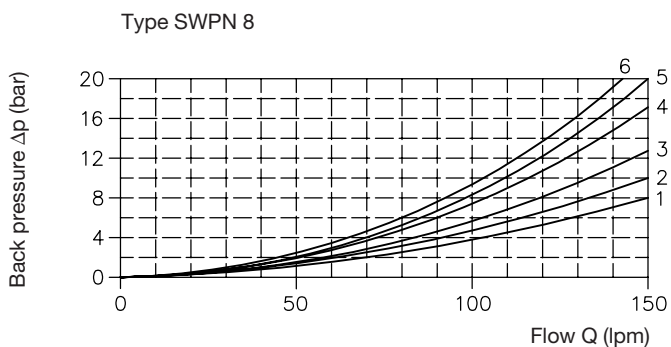
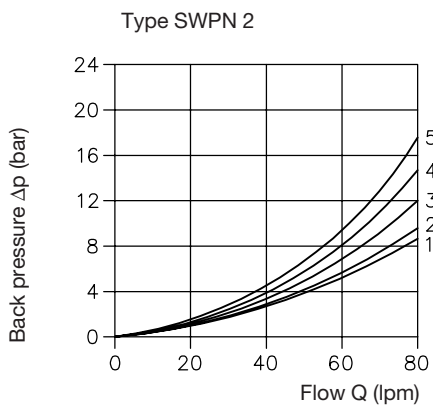
Nomenclature and design	4/3- and 4/2-way directional valve, directly actuated spool valve
Type coding	SWPN
Installed position	Any, preferably horizontal; fixture 4x M5x30 (SWPN 2), 4x 6x 40 (SWPN 8)
Pipe connection	Type SWPN 2, connection hole pattern conforming DIN 24 340-A6 (ISO 4401- AB-03-4-A) Type SWPN 8, connection hole pattern conforming DIN 24 340-A10 (ISO 4401- AC-05-4-A)
Port coding	P = Inlet (pump) A, B = Consumer T = Return, tank
Flow direction	In accordance with arrow direction in the flow pattern symbol: It is not permissible to reverse the flow direction!
Recommended contamination rating	18/14 ISO 4406 or NAS 1638 class 7..9, 10..20 μm absolute.
Operation pressure	see above
Max. flow	see above
Leakage at $\Delta p = 50$ bar	up to 20 ml/min per flow path, depending on spool Attention: Consumers with unequal area ratio may cause an increased return rate on the piston side (see also page 2)!
Mass (weight)	SWPN 2 - G (D, C, E, O, F, L, H, K) = approx. 2.1 kg SWPN 2 - B (W, V, R) = approx. 1.5 kg SWPN 8 - G (D, C, E, O, F, L, H, K) = approx. 6.3 kg SWPN 8 - B (W, R, V) = approx. 4.8 kg
Hydraulic fluid	Fluids acc. to DIN 51524 table 1 to 3; ISO VG 10 to 68 acc. to DIN 51519 Viscosity range: min. approx. 2.8; max. approx. 400 mm^2/s Also suitable are biologically degradable pressure fluids of the type HPEG (Polyalkylenglycol) and HEES (synthetic ESTER) at operation temperatures up to approx. $+70^\circ$
Temperatures	Ambient: approx. $-25 \dots +50^\circ\text{C}$ Oil: $-25 \dots +70^\circ\text{C}$; pay attention to the viscosity range! Biological degradable pressure fluids: Pay attention to manufacturer's information!
Δp -Q-curves type SWPN	The shift limits can be considerably lower at unbalanced flow conditions.

Switchable flows (guide line) for SWPN 2



Switchable flows (guide line) for SWPN 8



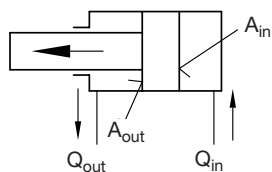


Viscosity during the measuring approx. 60 mm²/s

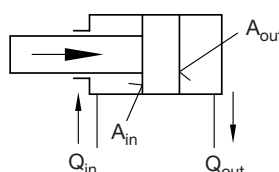
Coding (Symbol)	Switching position 0						Switching position a		Switching position b	
	P→A	P→B	A→T	B→T	P→T	A→B	P→B	A→T	P→A	B→T
G							3/4	3/3	3/4	3/3
H	-/3	-/3	-/1	-/1	2/5	-/1	1/4	4/1	1/4	4/1
O, R			-/4				-/5	-/2	-/4	-/3
D			-/3	-/3		-/5	3/4	5/2	3/4	5/2
F	-/4		-/2		-/6		-/5	-/1	-/4	-/3
E				-/4			-/4	-/3	-/5	-/2
B, K, W							-/4	-/3	-/4	-/3
V							-/4		-/4	
L					-/6		-/4	-/3	-/4	-/3

Back pressure each control edge type SWPN 2 / SWPN 8

The characteristics apply only to the specified flow direction. The total back pressure (Δp_{total}) with 4/3- or 4/2-way directional valves is taken at P. It consists of an inflow share (Δp_{in}) and an outflow share (Δp_{out}). Important: Consumers with unequal area ration (e.g. differential cylinders) show uneven flow at the consumers flow at the consumer ports, i.e. also (Δp_{in}) and (Δp_{out}) won't be equal regardless of the direction of movement!



$$Q_{out} = Q_{in} \frac{A_{out}}{A_{in}}$$



$$\Delta p_{total} = \Delta p_{in} + \Delta p_{out} \frac{A_{out}}{A_{in}}$$

3.2 Electrical data

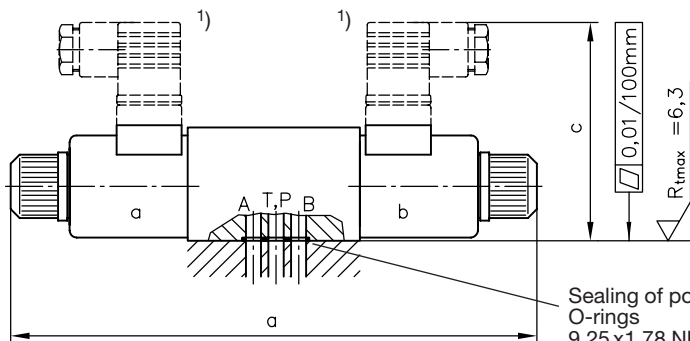
Coding conf. position 2	X 12	X 24	X 98 ¹⁾	X 205 ¹⁾
Nom. voltage (V)	12 V =	24 V =	98 V =	205 V =
Tolerance supply voltage (%)	± 10	± 10	± 10	± 10
Nom. current (A)	2.58	1.29	0.32	0.15
Nom. power (W)	31	31	31	31
Switch-off energy	≤ 0.3 Ws			
Electical connection	Plug conf. DIN EN 175 301-803			
Relative dute cycle	100% ED, stamping on the solenoid			
Switching times (Bg. 2) Switching times (Bg. 8)	Coding G.. = on: approx. 30 ms off: approx. 40 ms; Coding WG.. = approx. 2 ... 3 x longer Coding G.. = on: approx. 110 ms off: approx. 85 ms; Coding WG.. = approx. 2 ... 3 x longer			
Switching operations (Bg. 2) (Bg. 8)	approx. 15 000 switchings / h approx. 10 000 switchings / h			
Protection class DIN 40050	IP 65 (plug properly mounted), IEC 60529			
Insulation material class	F			
Surface temperature	approx. 85 ... 150°C at 20°C ambient temperature			
Mounting	The solenoid can be simply removed after loosening the mounting nut, easing replacement in case of an electrical defect.			

¹⁾ These solenoids are intended to be connected via a customer furnished bridge rectifier to mains 50/60 Hz:
X 98 for mains 110V AC or
X 205 for mains 230V AC

4. Unit dimensions

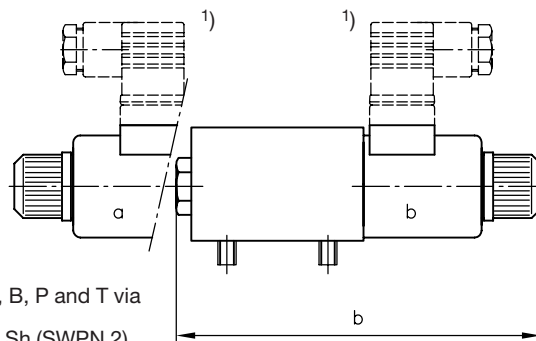
All dimensions in mm, subject to change without notice!

4/3-way directional valve
Coding **G, D, C, E, O, F, L, H, K**



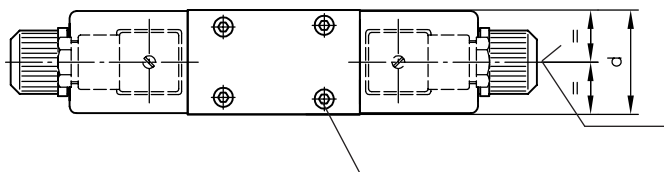
4/2-way directional valve
Coding **B and V**

4/2-way directional valve
Coding **W and R**



Sealing of ports A, B, P and T via
O-rings
9.25 x 1.78 NBR 90 Sh (SWPN 2)
12.42 x 1.78 NBR 90 Sh (SWPN 8)

1) Plugs are not scope of delivery



Man. emergency actuation
(approx. 35 N)

Skt.-head screws ISO 4762 zinc plated,
not scope of delivery.

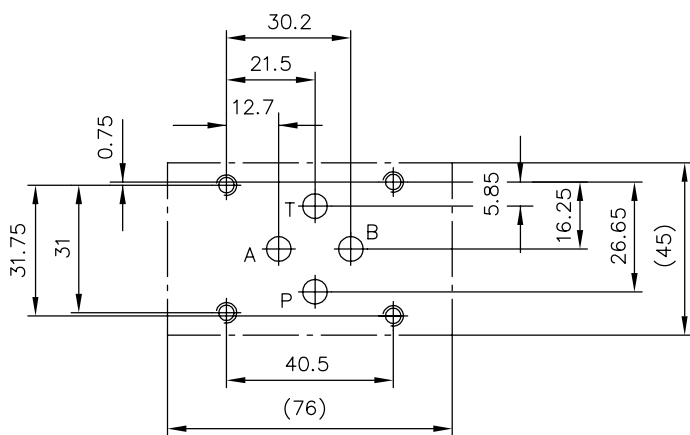
Type SWPN2: M5 x 30-12.9
Starting torque: 8 Nm ±10%

Type SWPN8: M6 x 40-12.9
Starting torque: 14 Nm ±10%

Basic type	a	b	c	d
SWPN 2	226	162	93	46
SWPN 8	300	209	114	70 (84.5 +1.5)

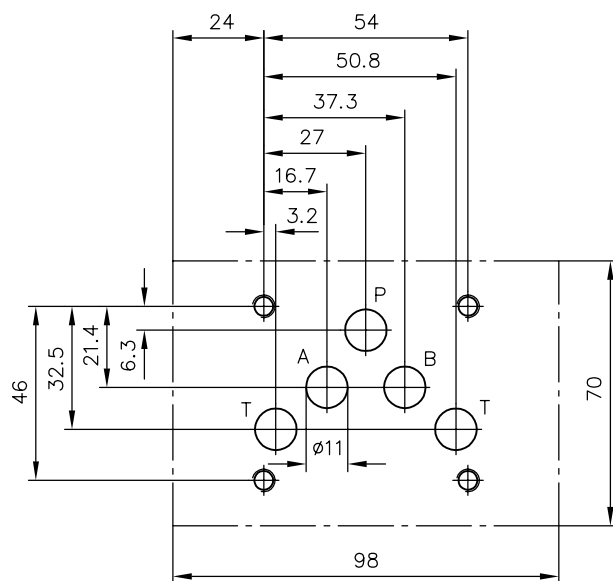
Hole pattern for manifold
(top view)

Type SWPN 2



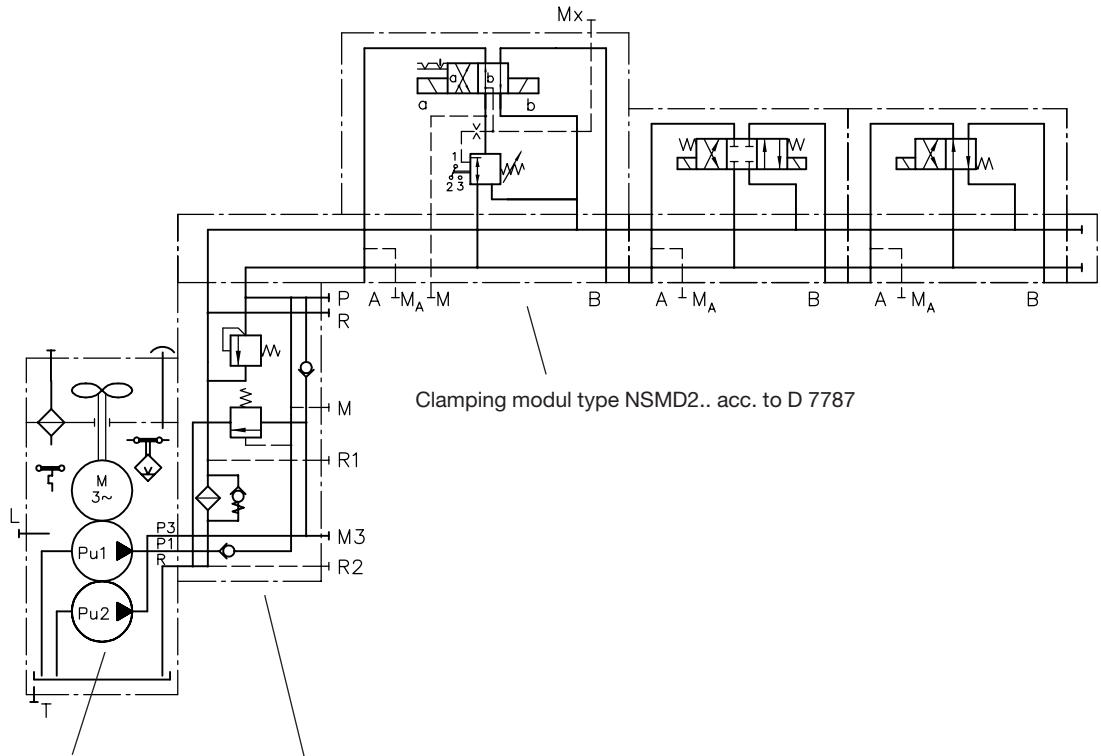
∅ A, B, P, T max. 6.3 mm

Type SWPN 8



5. Example circuits

Example 1: HK 43LDT/1M -Z Z2,7/9,8 - AN21F2 - D45 - F50
 - BA2 - NSMD2K/GRK/0
 - **SWPN2 G/0**
 - **SWPN2 B/0** - 1 - 2 - G 24



Clamping modul type NSMD2.. acc. to D 7787

Compact-hydraulic power pack type HK acc. to D 7600-4 ($Q_{pu} \approx 2.7 / 9.8 \text{ lpm}$)

Connection block type A with return filter acc. to D 6905 AF/1 ($p_{max} \approx 45/50 \text{ bar}$)

