

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 7600ff) 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:

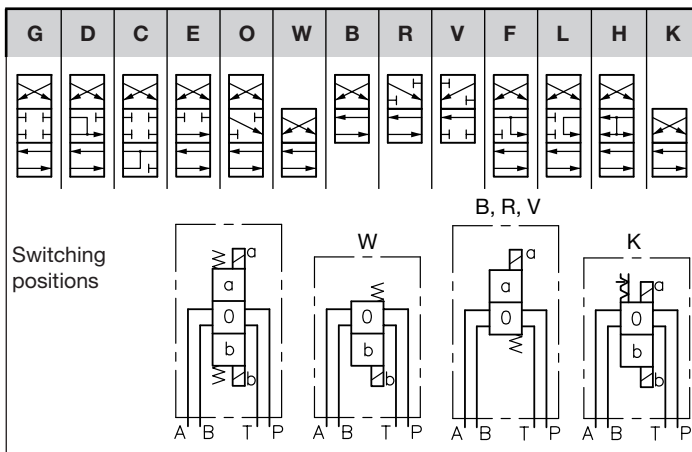
SWPN 2 - G - G 24

Basic type	Port size	Max. pressure (bar)		Max. flow (lpm)
		P, A, B	T	
SWPN 2	Nom. size 6	350	210	60
SWPN 8	Nom. size 10	350		150

Actuation solenoid

Without plug	Nominal voltage
X 12	12V DC
X 24	24V DC
X 98	98V DC
X 205	205V DC
---	110V AC 50 /
---	230V AC 60Hz

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

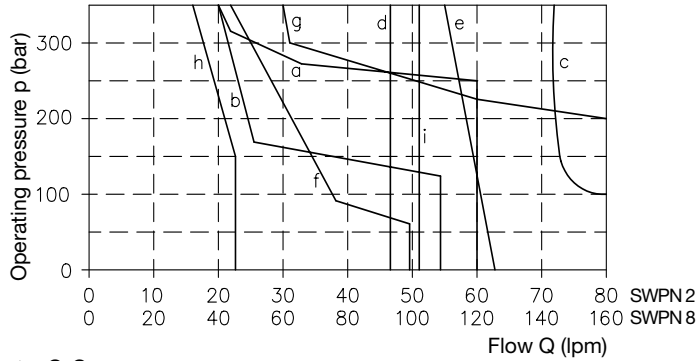
3.1 General and hydraulic data

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.
Over lapping	zero
Operation pressure	see above
Max. flow	see above
Mass (weight)	Attention: Consumers with unequal area ratio may cause an increased return rate on the piston side (see also page 2)! SWPN 2 - G (D, C, E, O, F, L, H, K) = approx. 2.1 kg SWPN 2 - B (W, R, V) = 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 mm²/s
 Also suitable are biologically degradable pressure fluids of the type HPEG (Polyalkylenglycol) and HEES (synthetic ESTER) at operation temperatures up to approx. + 70°

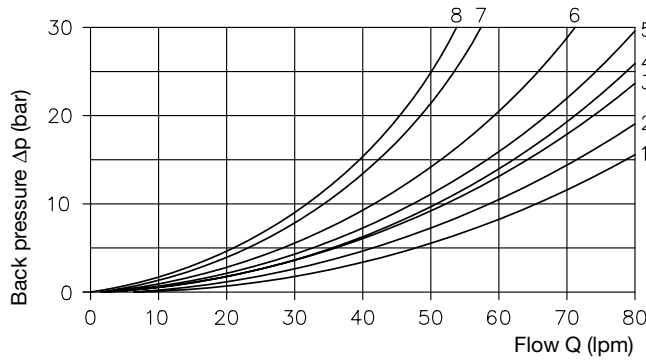
Temperatures Ambient: approx. -25 ... +50°C
 Oil: -25 ... +70°C; pay attention to the viscosity range!
 Biological degradable pressure fluids: Pay attention to manufacturer's information!

Curves
 Switchable flows (guide line)
 These figures may be significantly lower when the flow is only one-sided.



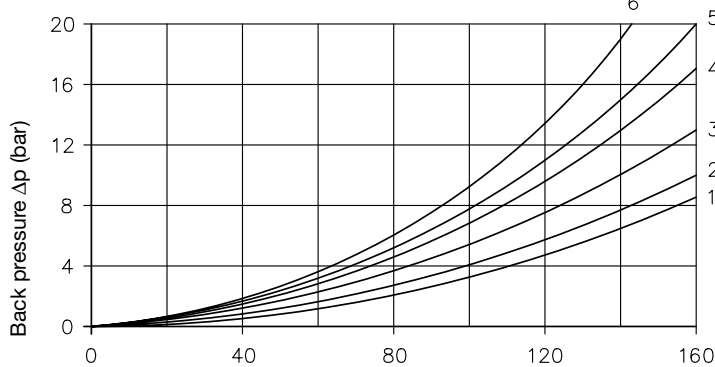
Curve	Coding (flow pattern symbol)
a	G
b	D
c	C
d	E, O, R
e	H
f	F
g	B, W
h	V
i	L

Δp-Q-Curves
 Type SWPN 2

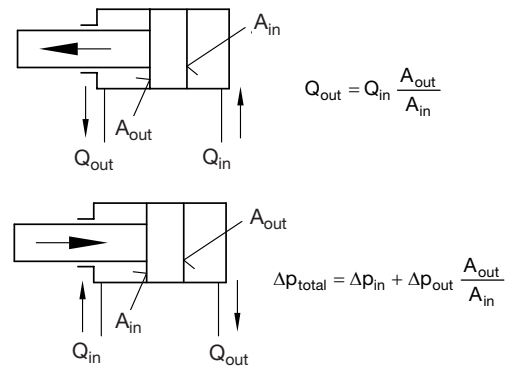


The characteristics apply only to the specified flow direction. The total back pressure (Δp_{total}) with 4/3- or 4/2-way directional valves is taken at P. It consists of an inflow share (Δp_{in}) and an outflow share (Δp_{out}). Important: Consumers with unequal area ratio (e.g. differential cylinders) 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!

Type SWPN 8



Viscosity during the measuring approx. 60 mm²/s



Coding (Symbol)	Switching position 0						Switching pos. a		Switching pos. b	
	P→A	P→B	A→T	B→T	P→T	A→B	P→B	A→T	P→A	B→T
G							3/4	1/3	3/4	1/3
D			6/13	6/13		8/6	3/4	2/2	3/4	2/2
C	8/5	8/4				8/6	4/3	1/3	4/5	1/4
E				7/4			3/4	1/3	3/5	2/2
O			7/4				3/5	2/2	3/4	1/3
B							4/4	1/3	4/4	1/3
W							4/4	1/3	4/4	1/3
R			7/4				3/5	2/2	3/4	1/3
V							5/4		5/4	
F	4		1		6		1/5	3/1	2/4	4/3
L					7/6		2/4	2/3	2/4	2/3
H	3/3	3/3	1/1	1/1	5/5	1/1	4/4	2/1	4/4	2/1

Back pressure each control edge type SWPN 2 / SWPN 8

3.2 Electrical data

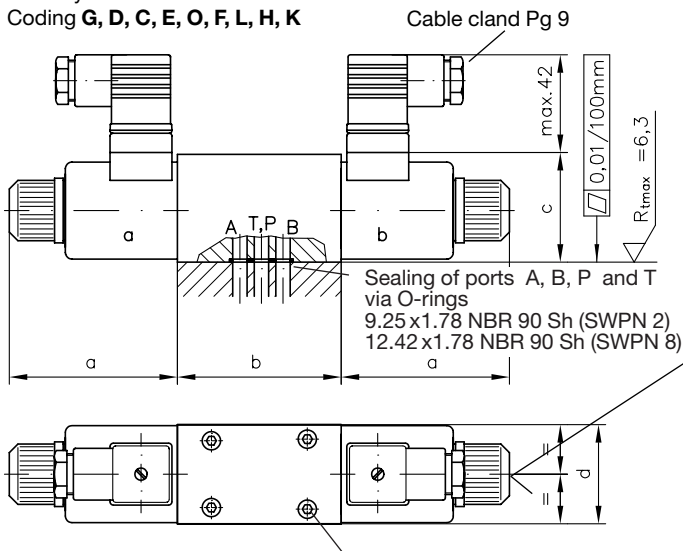
Solenoid	Wet armature solenoid, manufactured and tested conforming VDE 0580						1) These solenoids are intended to be connected via a customer furnished bridge rectifier to mains 50/60 Hz: X 98 for mains 110V AC or X 205 for mains 230V AC
Coding conf. position 2	G 12 X 12	G 24 X 24	X 98	X 205	WG 110	WG 230	
Nom. voltage U_N (V)	DC-voltage				AC-voltage 50 and 60 Hz		
Nom. power P_N (W) SWPN2 / SWPN8	30/36	30/36	30/36	30/36	30/36	30/36	
Nom. current I_{20} (A) SWPN2 / SWPN8	2.5/3.0	1.25/1.5	0.37/0.37	0.12/0.18	0.37/0.37	0.18/0.18	
Switch-off energy	≤ 0.3 Ws						
Circuitry (valid for solenoid a and b)	DC-voltage Coding G		AC-voltage Coding G				
Plug DIN 43650	Coding G (...V DC) is available with grey or black plug Coding WG (...V AC) is available only with black plug containing a rectifier circuit (see also D 7163)				Grey plug	Black plug	
Relative duty cycle	100% ED, stamping on the solenoid						
Switching times (Bg. 2)	Coding G.. = on: approx. 30 ms off: approx. 40 ms; Coding WG.. = approx. 2 ... 3 x longer						
Switching times (Bg. 8)	Coding G.. = on: approx. 110 ms off: approx. 85 ms; Coding WG.. = approx. 2 ... 3 x longer						
Switching operations	approx. 10 000 switchings /h						
Protection class DIN 40050	IP 65 acc. to DIN VDE EN 60529 / IEC 60529 (plug properly mounted)						
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.						

4. Unit dimensions

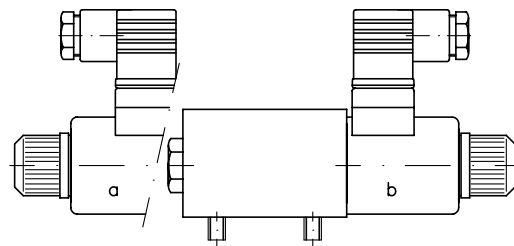
All dimensions in mm, subject to change without notice!

Basic type	a	b	c	d
SWPN 2	80	84	54	48
SWPN 8	101	98	86	70 (84.5 +1.5)

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



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



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

Man. emergency actuation (approx. 35 N)

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

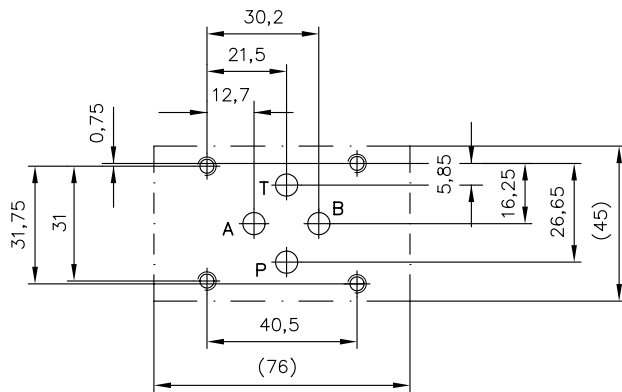
Type SWPN2: M5 x 30-12.9
Starting torque 8 Nm ±10%

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

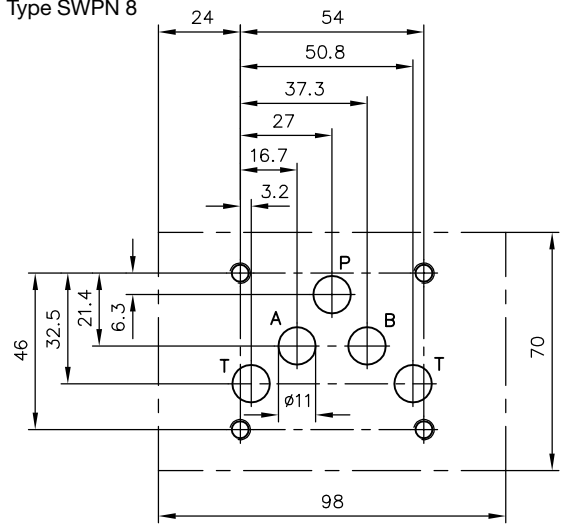
Hole pattern for manifold

(top view)

Type SWPN 2



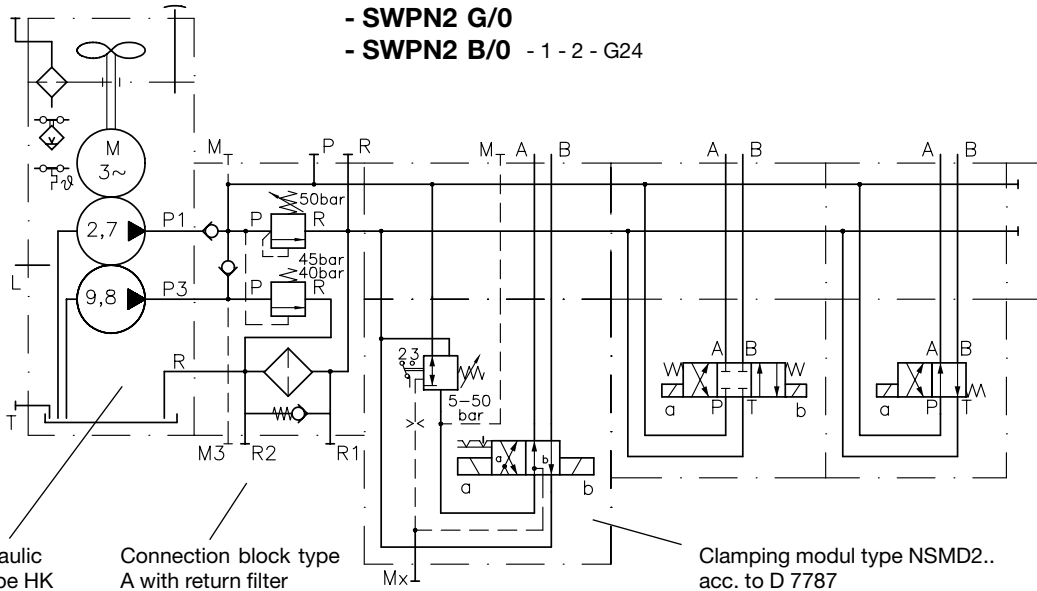
Type SWPN 8



\varnothing A, B, P, T max. 6.3 mm

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 - G24



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

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

Clamping modul type NSMD2.. acc. to D 7787

