

## 2.1 Directional spool valve type SG and SP

Directional spool valves are a type of directional valve. They control the direction of movement and the velocity of single and double-acting hydraulic consumers.

The directional spool valve type SG is available as a single valve for pipe connection. Type SP is available as a valve for manifold mounting. Due to the robust design the directional spool valve type SG and SP reaches operating pressures up to 400 bar. It is of versatile use due to different types of actuation.

Intended applications include mobile hydraulics, in particular in special vehicles, in municipal trucks and in shipbuilding.

### Features and benefits:

- Sturdy design
- Suited for maritime applications
- Various actuation variants

### Intended applications:

- Mining machinery
- Cranes and lifting equipment
- Ship building
- Road vehicle



<b>Nomenclature:</b>	Directional spool valve
<b>Design:</b>	Single valve for pipe connection Individual valve for manifold mounting
<b>Actuation:</b>	Solenoid Manual <ul style="list-style-type: none"> <li>▪ With automatic spring return</li> <li>▪ With detent</li> </ul> Mechanical <ul style="list-style-type: none"> <li>▪ Roller head</li> <li>▪ Pin head</li> </ul> Pressure-actuated <ul style="list-style-type: none"> <li>▪ (Individual and combined with manual operation)</li> <li>▪ Hydraulic</li> <li>▪ Pneumatic</li> </ul>
<b>p<sub>max</sub>:</b>	400 bar
<b>Q<sub>max</sub>:</b>	100 l/min

## Design and order coding example

SP 1	D	- A	
SG 3	E	3E	- MD 3/24 - 120

Pressure setting pressure limiting valve [bar]

Actuation mode

Pressure limiting valve

- Function**
- Parallel- or series connection
  - Directional spool valves either with positive (blocked between switching positions) or negative (slightly floating position) overlap
  - SP 1 with/without check valve insert

**Basic type and size** Directional spool valve SG 0 to 5, SP 1, SP 3, SP 5  
Directional spool valves type SP for manifold mounting, sizes 1, 3, 5

## Function

### Basic symbol


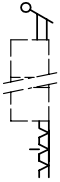
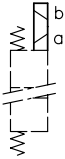
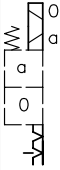
SG	SP
Individual valve for pipe connection	Individual valve for manifold mounting
With pressure-limiting valve	

### Circuit symbol




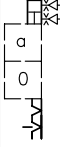

G	C	D	E	N	W	R	V	Z	U
L	F	H	Y	S	X				

- Circuit symbol Z, U, X: only for size 2, 3 and 5

**Actuations:**

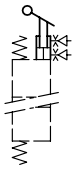
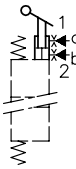
Manual		Solenoid	
A, AK	C, CK	ME, MD	MU
Return spring	Detent	Solenoid voltage: 12V DC, 24V DC, 110V AC, 230V AC	
			

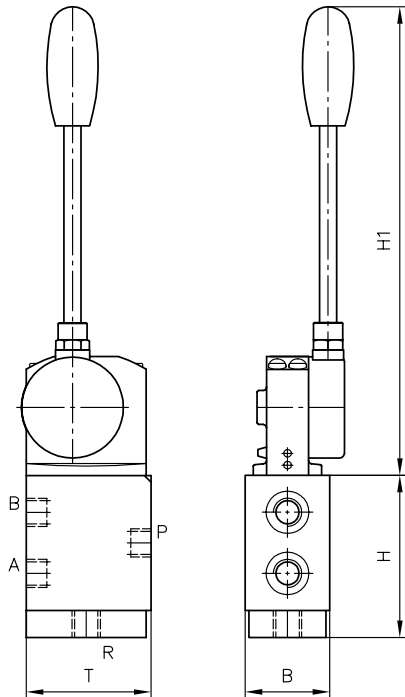
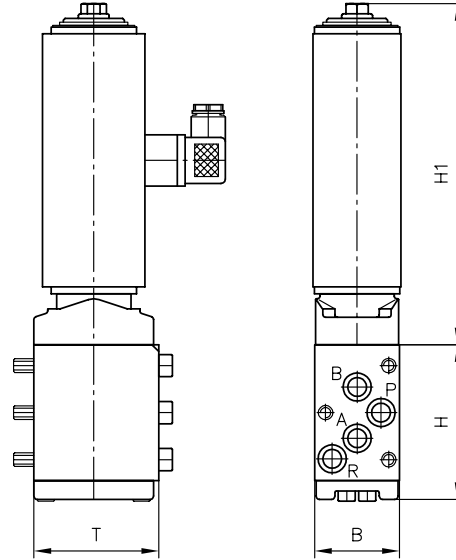
**Actuations:**

Mechanical		Pressure		
RE, RD	BE, BD	NE, ND	NU	NM
Roller head	Pin head	Pneumatic		Hydraulic
				
Actuation forces: 90 - 280 N (according to size)		Control pressures: pneumatic 5 - 10 bar hydraulic 12 - 20 bar		

**Actuations:**

**Double acting**

KD	KM
Pneumatic / manual	Hydraulic / manual
	
Control pressure: Pneumatic 5 ... 10 bar Hydraulic 12 ... 20 bar	

**General parameters and dimensions**
**SG with manual actuation**

**SP with solenoid actuation**


	$Q_{\max}$ [lpm]	Operating pressure $p_{\max}$ [bar] for actuation			Ports	Dimensions [mm]				$m_{\max}$ [kg]
		Solenoid	Mechanical	Manual/ pressure		H	H1	B	T	
<b>SG 0</b>	12	200	400	400	G 1/4, G 3/8	59.5	151	39.5	51	0.8 ... 1.0
<b>SG 1</b>	20	200	400	400	G 3/8	59.5	151	39.5	51	0.8 ... 1.0
<b>SG 2</b>	30	315	400	400	G 3/8	100.5	342	49.5	73	2.5 ... 5.7
<b>SG 3</b>	50	315	400	400	G 1/2	100.5	342	49.5	73	2.5 ... 5.7
<b>SG 5</b>	100	200	315	400	G 1	110	342	50	80	2.9 ... 6.1
<b>SP 1</b>	20	200	400	400	-	59.5	151	40	51	0.8 ... 1.0
<b>SP 3</b>	50	315	400	400	-	94.5	342	49.5	73	2.5 ... 5.7

**Associated technical data sheets:**

- [Directional spool valve type SG and SP: D 5650/1](#)
- Actuations:
  - [Manual operation for directional spool valves, type S: D 6511/1](#)
  - [Electrical operation for directional spool valves type S: D 7055](#)
  - [Mechanical operation for directional spool valves, type S: D 5870](#)
  - [Pressure actuation for directional spool valves: D 6250](#)

**Male connectors:**

- [Line connector type MSD and others: D 7163](#)
- With economy circuit: [D 7813](#), [D 7833](#)