

## Directional spool valve bank type DL

Throttling directional spool valves are a type of directional valve. They continuously and manually meter the volumetric flow in hydraulic systems with single and double-acting consumers.

The throttling directional spool valve type DL influences the speed of the consumer by throttling the pump circulation via a parallel circuit (bypass control). The close fit of the spool in the throttling directional spool valve means that the leakage is limited to a minimum for lifting functions.

The throttling directional spool valve type DL is suitable for applications in material handling and for lifting equipment.

### Features and benefits:

- Compact design with up to 10 segments
- Various actuation variants for manual actuation
- Simple pressure reductions in downstream sections using intermediate plates
- Combinations possible for controlling lifting devices

### Intended applications:

- Material handling (industrial trucks, etc.)
- Machines for agricultural and forestry purposes
- Construction and construction materials machinery
- Road vehicle construction



<b>Nomenclature:</b>	Throttling directional spool valve
<b>Design:</b>	Valve bank, featuring integrated by-pass idle pump circulation
<b>Actuation:</b>	Manual: <ul style="list-style-type: none"> <li>▪ Return spring, detent</li> </ul>
<b>p<sub>max</sub>:</b>	250 ... 315 bar
<b>Q<sub>max</sub>:</b>	12 ... 90 lpm

### Design and order coding example

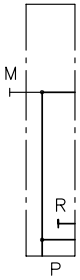
DL3 1 - 3 - GGD - B/E1 - 2 - 210

DL3	1	- 3	- GGD	- B/E1	- 2	- 210	
							Pressure specification [bar]
							End plate
							Actuation, mounting
							Valve sections
							<ul style="list-style-type: none"> <li>▪ Directional spool valve</li> <li>▪ Valve section options:                     <ul style="list-style-type: none"> <li>▪ Intermediate plate with pressure-limiting valve for all downstream valve sections</li> <li>▪ Additional functions on the consumer side in the ancillary block (e.g. double check valves, shock valves, load-holding valves etc.) (size 3)</li> </ul> </li> </ul>
							Port size
							G 1/4, G 3/8, G 1/2 (BSPP)
							Connection block
							<ul style="list-style-type: none"> <li>▪ With/without pressure limiting valve</li> <li>▪ With shock valve</li> </ul>
Basic type, size	Type DL, sizes 1 to 4						

## Function

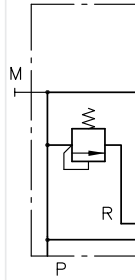
### Connection blocks:

DL .5



Without pressure-limiting valve

DL .1

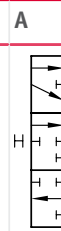
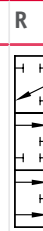
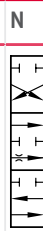
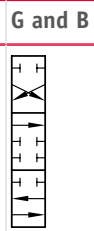
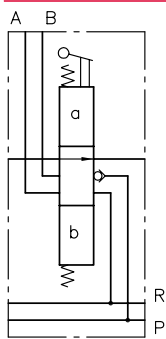


With pressure-limiting valve

### Valve sections:

Basic symbol

Symbol



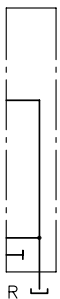
Reduced internal leakage due to reduced spool valve play

### Versions of valve sections:

- Additional function on the pump side (orifice, 2-way flow control valve)
- Valve sections for size 3 with consumer-side additional functions in ancillary block (e.g. double check valves, shock valves, load-holding valves etc.)
- Manual operation with return spring for switching position "a" and detent for switching position "b"
- Manual operation with detent in both switching positions
- Manual operation with combinations of contact switch, switch cam and switch carrier
- Manual operation with different mounting directions

### End plates:

2



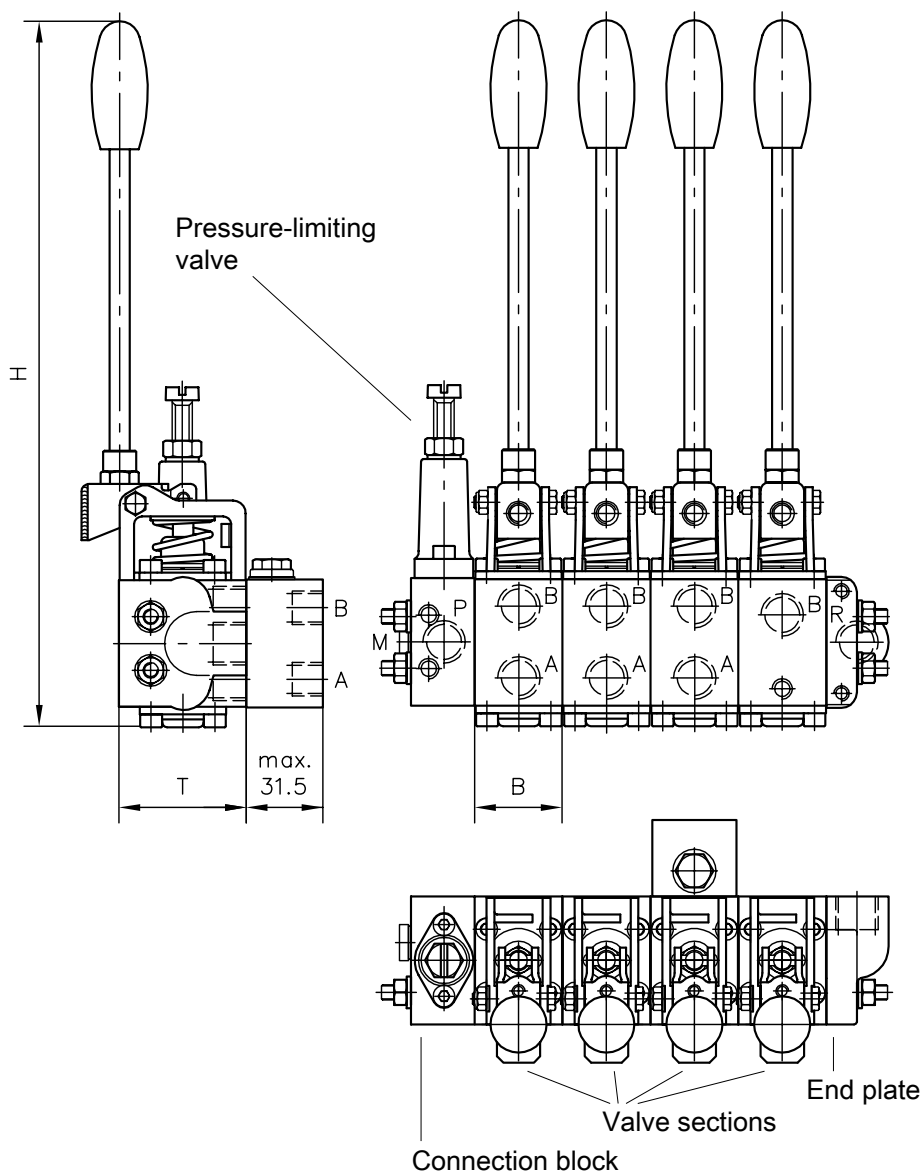
Standard end plate with port R

3



End plate for subsequent connection of a DL

## General parameters and dimensions



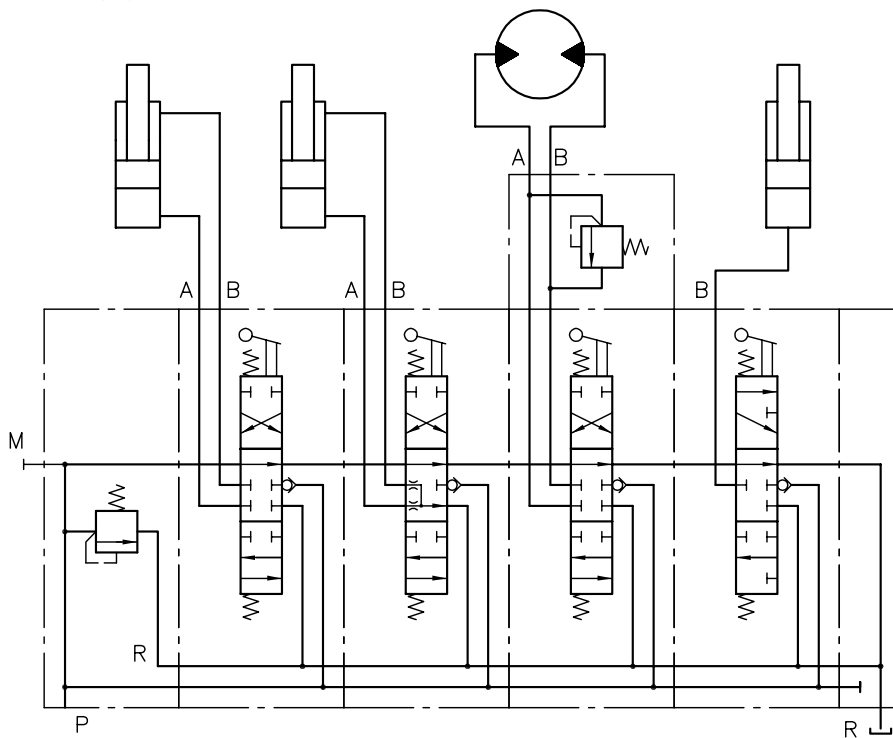
	$Q_{\text{max}}$ [lpm]	$p_{\text{max}}$ [bar]	Tapped ports			Dimensions [mm]			m [kg]
			Characteris- tic value	A, B	H, P, R	H	B	T	
<b>DL 1</b>	12 ... 16	315	1	G 1/4	G 1/4	approx. 192	31,5	45	0,5
<b>DL 2</b>	20 ... 30	315	1	G 1/4	G 3/8	approx. 278	34,5	50	0,85
			2	G 3/8	G 3/8				
<b>DL 3</b>	30 ... 60	250	2	G 3/8	G 1/2	approx. 351	39,5	60	1,4
			3	G 1/2	G 1/2				
<b>DL 4</b>	90	250	3	G 1/2	G 3/4	approx. 368	39,5	70	1,8

## Example circuit:

### DL 21-2-G D G71 N-B/E1-2-180

Size 2 DL directional spool valve with pressure-limiting valve (set to 180 bar), size 2 ports with G 3/8 tapped ports, symbols G, D, G, N; symbol G with pressure-limiting valve in port A (coding 71), valve sections with manual operation B (series with hand lever) and mounting type E1 (ports A, B are directed towards the front, valve spool is pushed into the housing for switching position "a"), valve bank with end plate 2 (coding 2)

## Switching symbol



### Associated technical data sheets:

- [Directional spool valve bank type DL: D 7260](#)