

2.1 Directional spool valve bank type DL

Throttling directional spool valves are a type of directional valve. They continuously and manually meter the flow rate 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



Nomenclature:	Throttling directional spool valve
Design:	Valve bank design with integrated bypass pump circulation control
Actuation:	Manual <ul style="list-style-type: none"> ▪ Return spring, detent
p_{max}:	315
Q_{max}:	90

Design and order coding example

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

Pressure specification [bar]

End plate

Actuation, mounting

Valve sections

- Directional spool valve
- Valve section options:
 - Intermediate plate with pressure-limiting valve for all downstream valve sections
 - Additional functions on the consumer side in the ancillary block (e.g. double check valves, shock valves, load-holding valves etc.) (size 3)

Port size G 1/4, G 3/8, G 1/2 (BSPP)

Connection block

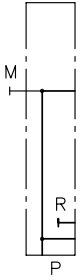
- With/without pressure limiting valve
- With shock valve

Basic type, size Type DL, sizes 1 to 4

Function

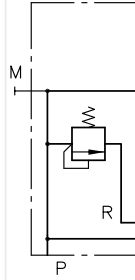
Connection blocks:

DL .5



Without pressure-limiting valve

DL .1

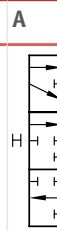
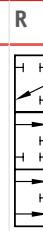
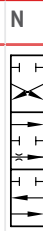
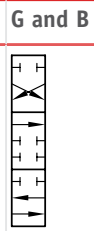
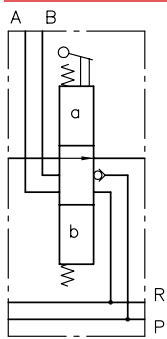


With pressure-limiting valve

Valve sections:

Basic symbol

Symbol



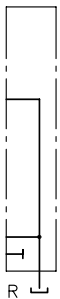
Reduced internal leakage due to reduced spool valve play

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



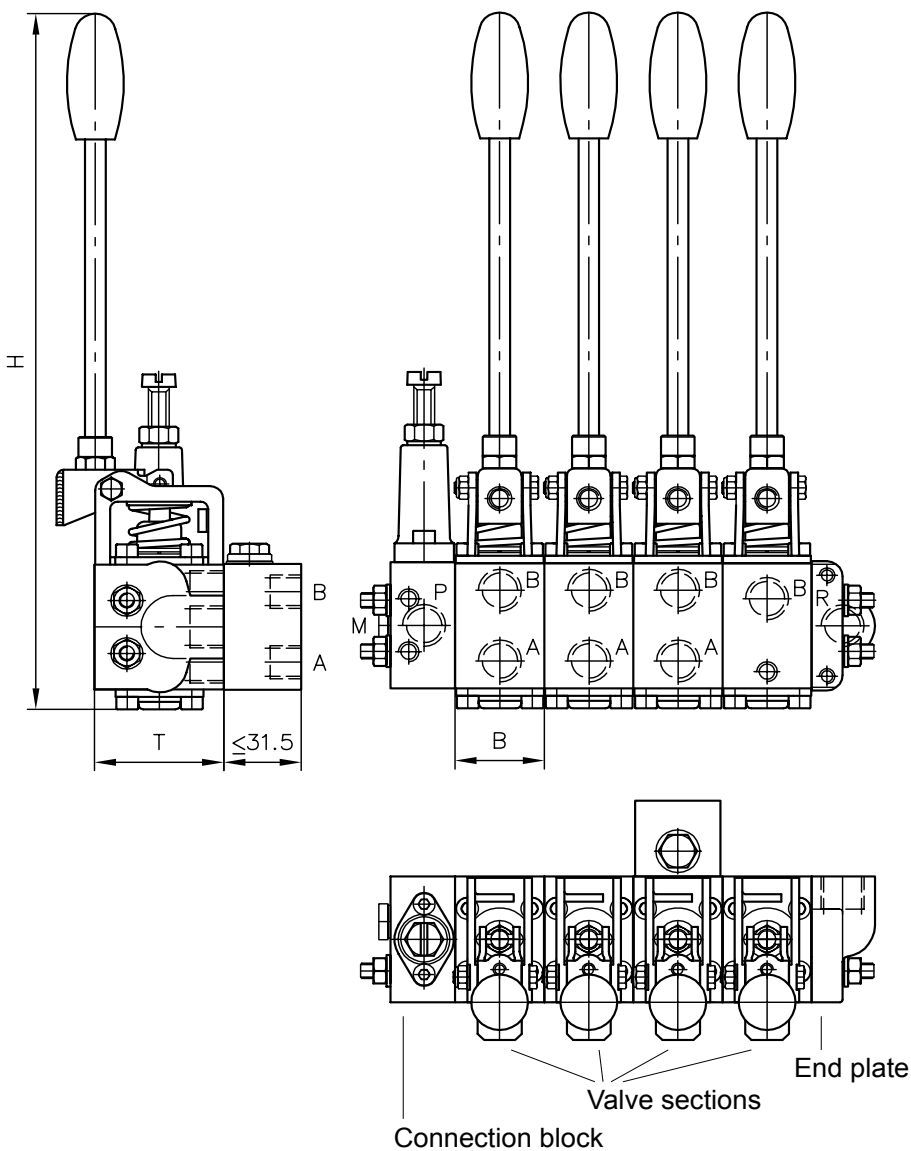
Standard end plate with port R

3



End plate for subsequent connection of a DL

General parameters and dimensions

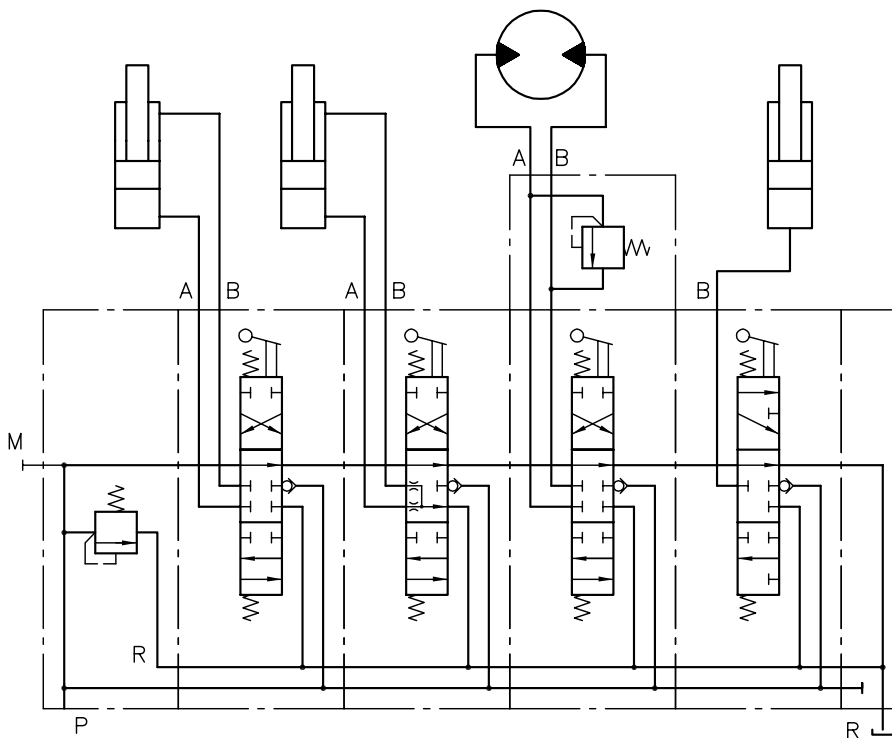


- 1 Connection block
- 2 Valve section
- 3 End plate

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

Circuit example:
DL 21-2-G D G71 N-B/E1-2-180

Directional spool valve DL, size 2 with pressure-limiting valve (set to 180 bar), port size 2 with G 3/8 threaded connections, circuit symbols G, D, G, N; circuit 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)


Associated technical data sheets:

- [Directional spool valve bank type DL: D 7260](#)
- [Directional spool valve bank type DL 4: D 7510](#)