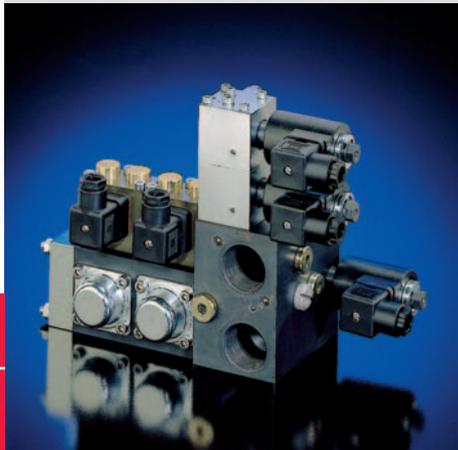


# Directional spool valves type HSR(L), HSF, and HSL

The directional spool valves are available as individual valve for pipe connection (type HSL), manifold mounting (type HSF) or as valve banks (type HSR). These valves are utilized to control the direction of movement of hydraulic consumers. All of them are indirectly electro-hydraulically actuated. The control fluid demand is either taken internally from the main circuit or fed externally from a separate control oil circuit.

These valves are equipped with adjustable thread type throttles (exception HSRL 3), prolonging the shifting operation, thereby preventing harsh shifting, which might cause pressure surges due to high pressure or consumer flow. The valve banks come with a connection block which optionally incorporates e.g. an idle circulation valve, a pressure limiting valve or a pressure reducing valve (control fluid supply for high primary pressure). Type HSRL 3 gives provision to select different pressure stages during operation.



**Nomenclature** Directional spool valve

**Design:** Individual valve for pipe connection or Manifold mounting Valve bank

**Actuation:** Electro-hydraulic Hydraulic

**$P_{max}$ :** 400 bar

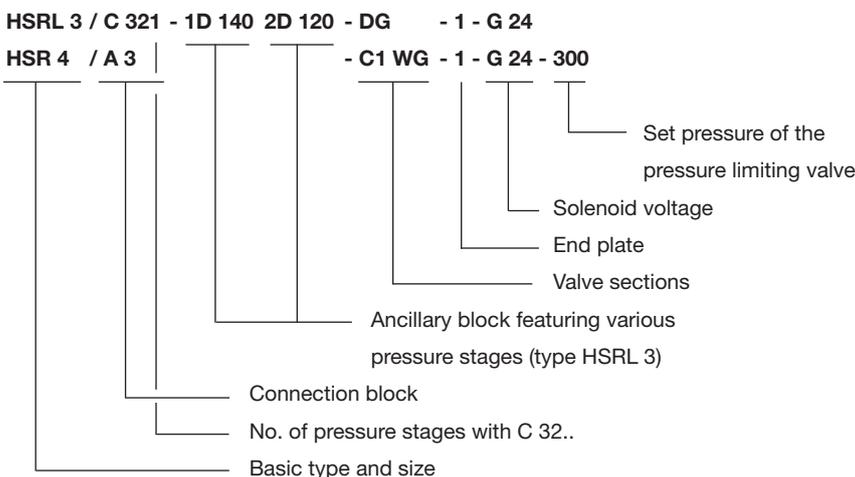
**$Q_{max}$ :** 80 ... 160 lpm

## Basic types and general parameters

Basic type and size			Flow	Oper. pressure	Control pressure	Tapped ports (BSPP)	
Individual valve for pipe connection	Manifold mounting valve	Valve bank	$Q_{max}$ (lpm)	$P_{max}$ (bar)	$P_{contr max}$ (bar)	A, B, P, R <sup>1)</sup>	M, X, Z
HSL 3	HSF 3	HSRL 3	80	400	160	G 1/2	G 1/4
HSL 4	HSF 4	HSR 4	160	400	160	G 3/4	G 1/4

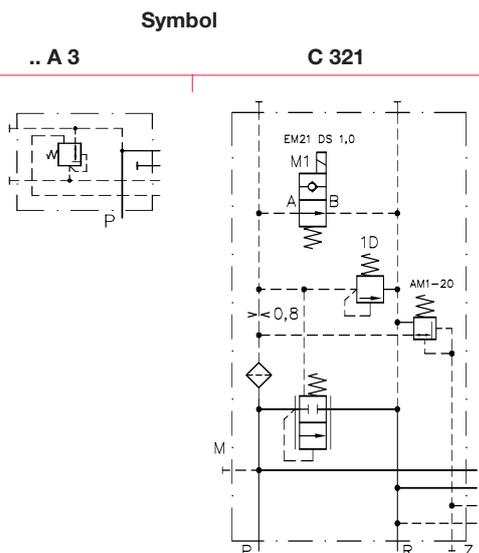
<sup>1)</sup> P, R = G 1 with HSRL 3/C 3.. /...

## Valve bank coding



**Connection blocks (HSR, HSRL)**

Basic type and size	Connection block	Brief description
HSRL 3 HSR 4	A 3	With internal control fluid supply picked up from gallery P, control pressure reduced to approx. 30 bar by pressure reducing valve
HSRL 3	C 321	With internal control fluid supply picked up from gallery P, idle circulation and pressure limiting valve, optional ancillary block featuring three additional pressure stages



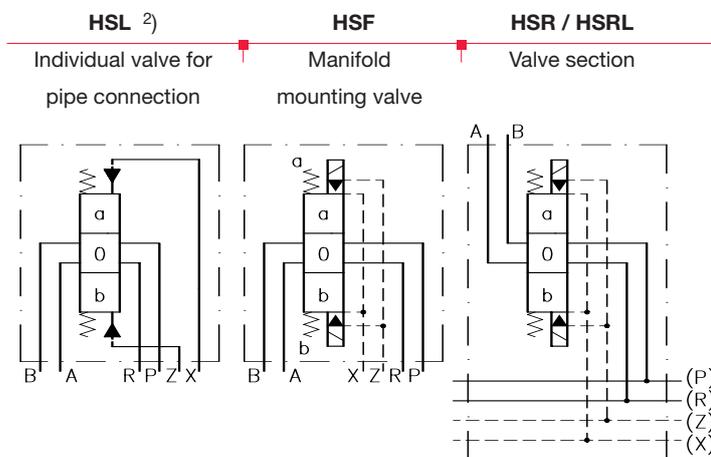
**Additional versions (connection blocks)**

- Connection blocks for external control fluid supply with/without pressure reducing valve
- Connection blocks with internal control fluid supply without pressure reducing valve for system pressure up to 160 bar

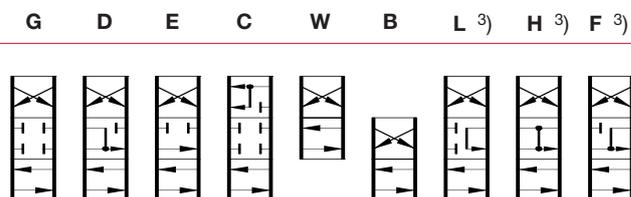
**Symbols**

max. 8 valve sections may be combined in a valve bank

**Basic symbol**



**Symbol**



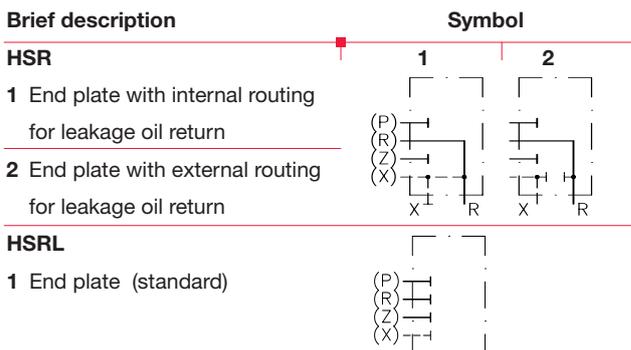
All flow pattern symbols also available with adjustable response time (not for type HSRL3)

2) Here illustrated with hydraulic actuation  
3) Not for type HSR..

**Solenoid voltage**

- 12V DC, 24V DC, 230V AC 50/60 Hz
- Other voltage on request
- Plugs with LED, improving EMC or with economy circuit (see also "Additional informations")
- Solenoid conforming ATEX (only type HSRL)

**End plate**



**Order examples**

**HSF 3 G1 - G24**

Indiv. manifold mounting valve, size 3, flow pattern G adjustable response time (coding 1) and solenoid voltage 24V DC

**HSR 4/A3 - D1E - 1 - G12**

Valve bank type HSR, size 4, connection block A 3 with internal control fluid supply and pressure reducing valve (approx. 30 bar control pressure), flow pattern D and E, D with adjustable response time (coding 1), end plate (coding 1) and solenoid voltage 12V DC

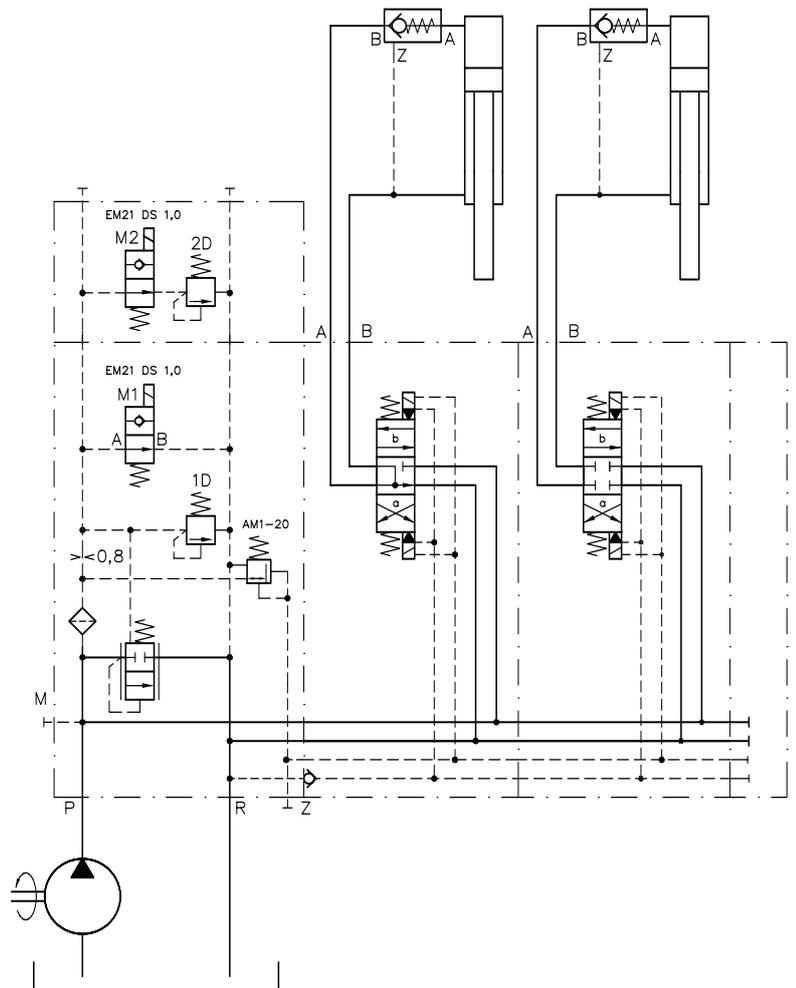
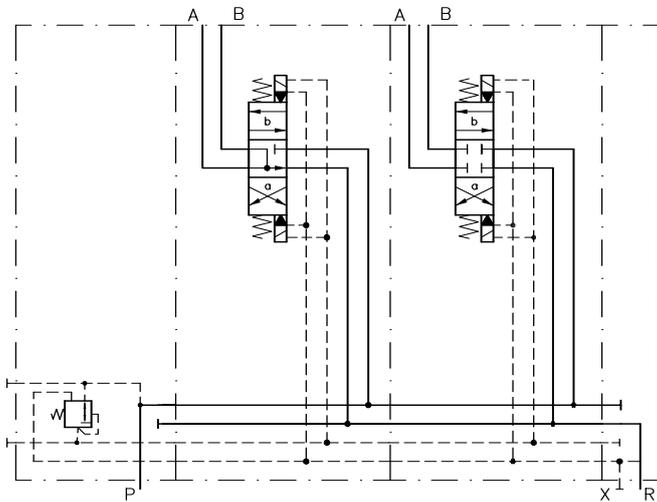
**HSRL 3/C322/1D200 2D100 - DG - 1 - G 24**

Valve bank type HSRL, size 3, connection block with integrated pressure reducing valve, idle circulation valve, piloted pressure limiting valve, main pressure limiting valve factory set for 200 bar, second pressure stage factory set for 100 bar, two valve sections flow pattern D and G and a standard end plate, solenoid voltage 24V DC

**Symbols**

Example type HSR

Example type HSRL 3

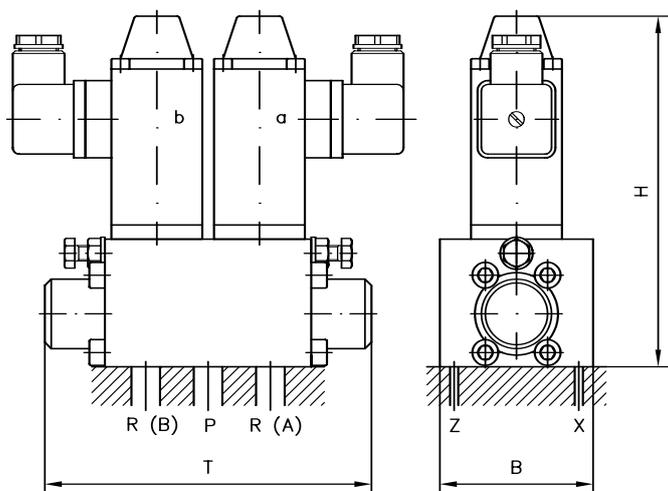


2  
1

**Dimensions**

**Indiv. directional spool valve type HSF ..**

(see order example)

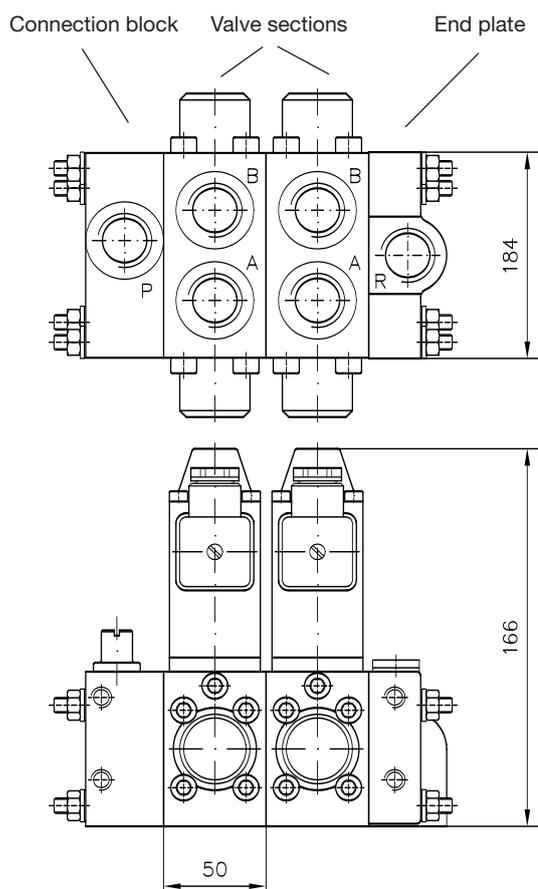


Basic type	H	B	T	m (kg)	
				Indiv. spool valve	or valve section
HSL 3	126	70	137	2 ... 2.5	
HSF 3	137	59	126		
HSL 4	136	80	182	3.7 ... 4.2	
HSF 4	157	70	184		

All dimensions in mm, subject to change without notice!

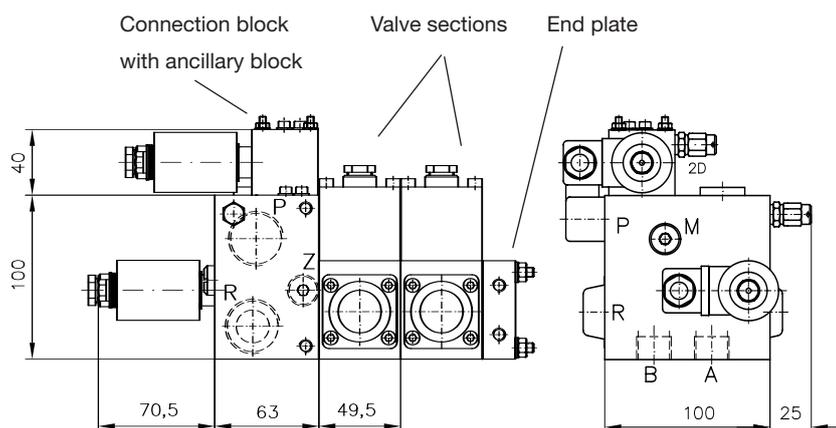
**Valve banks type HSR 4**

(see order example)



**Valve bank type HSRL 3**

(see order example)



Basic type	m (kg)	
	Connection block	Valve section
HSRL 3	1.7 ... 4.0	2.0
HSR 4	approx. 4.2	3.7

**Additional informations**

- Directional spool valve type HSF D 7493 E
- type HSR D 7493
- type HSRL Sk 7493 RL
- type HSL D 7493 L

- Plugs with LED etc. D 7163
- Plugs with economy circuit D 7813, D 7833

For page and section of the devices additionally listed, see type index