SLSE
SECTIONAL PROPORTIONAL DIRECTIONAL VALVE FOR LOAD SENSING
315 bar  45 l/min
INTRODUCTION

The SLSE is a sectional directional control valve with load sensing feature. It can be assembled with up to 8 working sections (proportional and solenoid valves together).

Each module is equipped with a meter-in compensator that keeps the flow constant, independently from load changes.

Sections with pressure compensator are not influenced by other operated functions, provided that sufficient pump capacity is available. To work correctly, the sum of the flows used at the same time must not overcome the 90% of the inlet flow.

A and B working ports are threaded 1/2" BSP. P1, P2 and T1 ports of the inlet section are threaded 3/4" BSP.

The manual lever override is available as option.

FLUIDS

Use mineral oil-based hydraulic fluids HL or HM type, or fluids HFDR type (phosphate esters). For the use of other kinds of fluid such as HFA, HFB, HFC, please consult our technical department.

Using fluids at temperatures higher than 80 °C (180 °F) causes the accelerated degradation of seals as well as the fluid physical and chemical properties.

OPERATING PARAMETERS

<table>
<thead>
<tr>
<th>OPERATING PARAMETERS</th>
<th>A - B ports</th>
<th>P1 and P2 ports</th>
<th>T1 port</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAXIMUM OPERATING PRESSURE</td>
<td>315 bar</td>
<td>315 bar</td>
<td>20 bar</td>
</tr>
<tr>
<td></td>
<td>4570 psi</td>
<td>4570 psi</td>
<td>290 psi</td>
</tr>
<tr>
<td>FLOW CAPACITY WITH Δp 10 BAR (145 PSI)</td>
<td>45 l/min</td>
<td>100 l/min</td>
<td>120 l/min</td>
</tr>
<tr>
<td></td>
<td>12 gpm</td>
<td>26 gpm</td>
<td>32 gpm</td>
</tr>
<tr>
<td>STEP RESPONSE</td>
<td>0 → 100%</td>
<td>50 ms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>100 → 0%</td>
<td>40 ms</td>
<td></td>
</tr>
<tr>
<td>HYSTERESIS</td>
<td>% of Q max</td>
<td>&lt; 6%</td>
<td></td>
</tr>
<tr>
<td>REPEATABILITY</td>
<td>% of Q max</td>
<td>&lt; ± 2%</td>
<td></td>
</tr>
<tr>
<td>VOLTAGE</td>
<td>12V DC</td>
<td>24V DC</td>
<td></td>
</tr>
<tr>
<td>COIL CONNECTION</td>
<td>DIN 43650</td>
<td>DT04-2P</td>
<td></td>
</tr>
<tr>
<td>WEIGHT</td>
<td>working section</td>
<td>4.5 kg</td>
<td>10 lbs</td>
</tr>
</tbody>
</table>

| RANGE TEMPERATURES: | ambient -20 to +60 °C | -4 to +140 °F |
|                      | fluid -20 to +82 °C | -4 to +180 °F |
| FLUID VISCOITY | range 10 - 400 cSt | 60 - 1900 SUS |
|                  | recommended 25 cSt | 120 SUS |
| FLUID CONTAMINATION | ISO 4406:1999 class 18/16/13 |
SECTIONAL DIRECTIONAL CONTROL VALVE
SLSE - Model Number - Working section

SLSE - [ ] [ ] [ ] [ ] - 1

NOMINAL FLOW
with Δp P-T 4 bar (58 psi)
- 05 5 l/min (1.3 gpm)
- 15 15 l/min (4 gpm)
- 30 30 l/min (7.9 gpm)
- 45 45 l/min (12 gpm)
- 15-10 15/10 l/min asymmetrical
- 30-20 30/20 l/min asymmetrical

with Δp P-T 8 bar (116 psi)
- 09 9 l/min (2.4 gpm)
- 25 25 l/min (6.5 gpm)
- 60* 60 l/min (15.9 gpm)
- 25-15 25/15 l/min asymmetrical
- 45-30 45/30 l/min asymmetrical
* D1 and D9 spools only

VOLTAGE
- D12 12 V DC solenoid
- D24 24 V DC solenoid

SEAL
- V Viton

MANUAL OVERRIDE
- M built-in with the tube, pin (standard)
- B built-in with the tube, boot protected
- K knob, turning
- L hand lever

COIL
- K1 DIN 43650
- K2 AMP Junior
- K7 DT04-2P ‘deutsch’
- WK1 DIN 43650 zinc-nickel plated
- WK7 DT04-2P ‘deutsch’ zinc-nickel plated

SPOOLS
<table>
<thead>
<tr>
<th>SYMBOL</th>
<th>DESCRIPTION</th>
<th>APPLICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>closed centre</td>
<td>meter in / meter out</td>
</tr>
<tr>
<td>A</td>
<td>open centre</td>
<td></td>
</tr>
<tr>
<td>PA</td>
<td>line A</td>
<td>single flow function type D, flows 35 and 40 only</td>
</tr>
<tr>
<td>PB</td>
<td>line B</td>
<td></td>
</tr>
<tr>
<td>D1</td>
<td>closed centre, on-off</td>
<td>function type D, flows 60, 45, 15, 25-15 only</td>
</tr>
<tr>
<td>D9</td>
<td>open centre, on-off</td>
<td></td>
</tr>
</tbody>
</table>

FUNCTION
- D double solenoid
  3 position - spring centred
- A single solenoid at side A
  2 position - spring return
- B single solenoid at side B
  2 position - spring return

CODE EXAMPLE:
SLSE - D25C - D12K7 - VM - 1
SLSE - D25-15D1 - D12K7 - VM-1
SLSX - B3S - V - 1

PORTS SIZE
B3 3/4" BSPP

SEAL
V Viton

FUNCTION
F for fixed pump
V for variable pump

RELIEF VALVE
0 no relief valve
210 12 to 210 bar
315 15 to 315 bar

RELIEF VALVE
0 no relief valve

PORTS SIZE
B3 3/4" BSPP

SEAL
V Viton

BLANKING SECTION
04 Blanking section with load sensing port

SEAL
V Viton
Typical constant flowrate obtained through the embedded compensator, and current with 12V solenoid type (for D24 version the maximum current is 860 mA).

**PRESSURE DROPS $\Delta p$-$Q$ - SYMMETRICAL SPOOLS TYPE C, A**

![Graph showing pressure drops for symmetrical spools]

**PRESSURE DROPS $\Delta p$-$Q$ - ASYMMETRICAL SPOOLS TYPE C, A**

![Graph showing pressure drops for asymmetrical spools]

**FLOWRATE BY PRESSURE**

![Graph showing flowrate by pressure]

**PRESSURE DROPS $\Delta p$-$Q$ OF INLET SECTIONS F AND V**

![Graph showing pressure drops of inlet sections]
The proportional solenoid consists of tube and coil. The coil is mounted on the tube and fastened to it by a ring retainer.

The coils can be indexed to any position allowing for convenient location of the connector.

<table>
<thead>
<tr>
<th>DUTY CYCLE</th>
<th>100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELECTROMAGNETIC</td>
<td></td>
</tr>
<tr>
<td>COMPATIBILITY (EMC)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>PROTECTION</td>
<td></td>
</tr>
<tr>
<td>CLASS FOR IN insulation</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>copper wire</td>
<td>class H (180 °C)</td>
</tr>
<tr>
<td>coil</td>
<td>class F (155 °C)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nominal voltage [V]</th>
<th>Resistance at 20 °C [Ω]</th>
<th>Current at 20 °C [A]</th>
<th>K1</th>
<th>K2</th>
<th>K7</th>
<th>WK1</th>
<th>WK7</th>
</tr>
</thead>
<tbody>
<tr>
<td>D12</td>
<td>12</td>
<td>4.4</td>
<td>1003080</td>
<td>1003081</td>
<td>1003082</td>
<td>1903080</td>
<td>1903081</td>
</tr>
<tr>
<td>D24</td>
<td>24</td>
<td>18.6</td>
<td>1003081</td>
<td>1003082</td>
<td>1003083</td>
<td>1903081</td>
<td>1903082</td>
</tr>
</tbody>
</table>
Declared IP degrees are intended according to EMC 2014/30/EU, only for both valve and connectors of an equivalent IP degree, installed properly.

WK1 and WK7 coils reach a better IP degree than standard coils thanks to the zinc-nickel plating and to some constructive measures. The valves with these coils have a salt spray resistance up to 600 hours (test performed according to UNI EN ISO 9227 and assessment test performed according to UNI EN ISO 10289).

**WK1**

- DIN connector always included
- DIN 43650 (EN 175301-803)
  - IP degree of electrical connection: IP66
  - IP degree of whole valve: IP66

**WK7**

- DIN connector always included
- DIN 43650 (EN 175301-803)
  - Zinc-nickel plated coil.
  - IP degree of electrical connection: IP65
  - IP degree of whole valve: IP65
  - The pin for manual override is boot-protected (code B).

**K1**

- DIN connector always included
- DIN 43650 (EN 175301-803)
  - IP degree of electrical connection: IP65
  - IP degree of whole valve: IP65

**K2**

- AMP Junior
  - IP degree of electrical connection: IP65/IP67
  - IP degree of whole valve: IP65

**K7**

- DEUTSCH DT04 MALE
  - Zinc-nickel plated coil.
  - IP degree of electrical connection: IP65/IP67
  - IP degree of whole valve: IP65
  - The pin for manual override is boot-protected (code B).
SLSE WORKING SECTION - DOUBLE SOLENOID (K7 COIL)

- Asymmetrical overall dimensions of the inlet section.
- Dimensions in mm [in]:
  - Mounting surface with sealing rings: 4 OR 2056 90 shore A
  - No. 6 holes M6x10

SLSE WORKING SECTION - SINGLE SOLENOID SIDE B (K7 COIL)

- Solenoid position for A function.
- Dimensions in mm [in]:
  - A and B working ports: 1/2" BSP

Manual override integrated in the solenoid tube (code M).
The standard valve has override pins integrated in the tube (code M). The operation of this control must be executed with a suitable tool, carefully not to damage the sliding surface.

Further manual overrides are available, entering the proper code in the model number.

**OVERRIDE PINS INTEGRATED THE TUBE, BOOT PROTECTED**

Code B

**KNOB, TURNING**

Code K

Valves with ‘WK’ coils are equipped with the boot for solenoid tube protection.
**BASIC INLET SECTION SLSX - B3S - V - 1**

Dimensions in mm [in]

- **P1, P2, T1 ports:**
  - 3/4” BSP

- **Ls load sensing port:**
  - 1/4” BSP

- **Pressure gauge port:**
  - 1/4” BSP

- **Orifice ‘Ls’ underneath mounting surface with sealing rings:**
  - 4 OR 2056
  - 90 shore A

**SLSX-B3S-V-1**
INLET SECTION WITH COMPENSATOR SLSX-****-B3S - V - 1

Pressure relief valve ‘D’
For SLSX-*0 only:
3/4”-16 UNF plug
Orifice seat “A” underneath

mounting surface with sealing rings:
4 OR 2056
90 shore A

Socket hex adj. screw:
Hex key 4.

Locking nut: spanner 13
Tightening torque: 12-17 Nm

dimensions in mm [in]

P1, P2, T1 ports:
3/4” BSP
T2 port: 1/2” BSP
Ls load sensing port:
1/4” BSP
OUTLET SECTION SLSX - 04S - V - 1

dimensions in mm [in]

mounting surface with no sealing rings
90 shore A

M8-6H for eyebolt

no. 2 fixing holes M8x13

Load sensing port

Ls load sensing port:
1/4” BSP
dimensions in mm [in]

NOTE: Please consider this dimension 10 mm shorter for SLSX-B3S-V-1.

ASSEMBLY KIT
The assembly kit includes
no. 3 studs,
no. 3 self locking nuts
no. 3 washers
All parts zinc-coated.
Please use these codes to order the kit:

<table>
<thead>
<tr>
<th>Sectional valves</th>
<th>A (NOTE)</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>212</td>
<td>132.5</td>
</tr>
<tr>
<td>3</td>
<td>262</td>
<td>182.5</td>
</tr>
<tr>
<td>4</td>
<td>312</td>
<td>232.5</td>
</tr>
<tr>
<td>5</td>
<td>362</td>
<td>282.5</td>
</tr>
<tr>
<td>6</td>
<td>412</td>
<td>332.5</td>
</tr>
<tr>
<td>7</td>
<td>462</td>
<td>382.5</td>
</tr>
<tr>
<td>8</td>
<td>512</td>
<td>432.5</td>
</tr>
</tbody>
</table>

NOTE: Please consider this dimension 10 mm shorter for SLSX-B3S-V-1.

Tightening torque: 25 Nm
CIRCUIT EXAMPLES

SLSE sectional assembly with pressure relief valve for variable displacement pumps.

Two SLSE sectional assemblies linked together by parallel connection for the pump and by serial connection for LS port.
IP DEGREE TIPS

The technical reference standard for IP degree is IEC 60529, which classifies and rates the degree of protection provided by equipments and electrical enclosures against intrusions.

The first digit (6) concerns the protection from solid particles (body parts to dust).

The second digit of the IP rating concerns the liquid ingress protection. It indicates three different types of atmospheric agents from which protection is provided:

Values from 1 to 6 → water jets.
Values 7 and 8 → immersion.
Value 9 → high pressure and high temperature water jets.

This means that IP66 covers all the lower steps, rating IP68 covers IP67 but not IP66 and lower. Instead, IP69 does not cover any of them. Whether a device meets two types of protection requirements it must be indicated by listing both separated by a slash. (E.g. a marking of an equipment covered both by temporary immersion and water jets is IP66/IP68).

INSTALLATION

These valves can be installed in any position without impairing correct operation.

Ensure that there is no air in the hydraulic circuit.