OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL
Load sensing
Steering units
OLS Priority valves
OSQ Flow amplifiers

Technical Information
Sauer-Danfoss is the largest producer in the world of steering components for hydrostatic steering systems on off-road vehicles. Sauer-Danfoss offers steering solutions both at component and system levels. Our product range makes it possible to cover applications of all types - ranging from ordinary 2-wheel steering (also known as Ackermann steering) to articulated steering, complicated 4-wheel steering, automatic steering (e.g. by sensor) and remote controlled steering via satellite.

We can offer more than 1000 different steering units, 150 different priority valves and 300 different steering columns categorised in types, variants and sizes.

For hydrostatic steering systems Sauer-Danfoss offers:

- Mini steering units with displacements from 32 to 100 cm³/rev [1.95 to 6.10 in³/rev], flow up to 20 l/min [5.28 US gal/min], steering pressure up to 125 bar [1813 psi].
- Steering units with displacements from 40 to 1000 cm³/rev [2.44 to 61.0 in³/rev], flow up to 100 l/min [26.4 US gal/min], steering pressure up to 210 bar [3045 psi].
- Priority valves for rated flows at 40, 80, 120 and 160 l/min [10.6, 21.1, 31.7 and 42.3 US gal/min], pressure up to 350 bar [5076 psi].
- Pilot operated flow-amplifiers with amplification factors of 4, 5, 8, 10 or 20 for rated oil flows of 240 and 400 l/min [63.4 and 105.7 US gal/min], steering pressure up to 210 bar [3045 psi].
- Pilot operated steering valve with steering flow up to 100 l/min [26.4 US gal/min], steering pressure up to 250 bar [3625 psi] and with integrated priority valve for pump flow up to 150 l/min [39.6 US gal/min].
A WIDE RANGE OF STEERING COMPONENTS (CONTINUED)

For electro-hydraulic steering systems Sauer-Danfoss offers:
- Pilot operated steering valve (pilot operated by hydrostatic steering unit or by electrical signal) with steering flow up to 100 l/min [26.4 US gal/min], steering pressure up to 250 bar [3625 psi] and with integrated priority valve for pump flow up to 150 l/min [39.6 US gal/min]

For hydromechanical steering systems Sauer-Danfoss offers:
- Torque amplifiers for output torques of 80 and 120 Nm [708 and 1062 lbf·in]

For steering units and torque amplifiers Sauer-Danfoss offers:
- Steering columns: fixed, tiltable and/or telescopic with or without horn switch and sensor for start/stop of pump, with length, from 45 to 1200 mm [1.77 to 47.2 in]

Characteristic features of steering units:
- Low steering torque: From 0.5 Nm to 3 Nm [4.42 to 26.6 lbf·in] in normal steering situations
- Low noise level
- Low pressure drop
- Many types available: Open center Non reaction, Open center Reaction, Closed center Non reaction, Load Sensing, Load Sensing Reaction, Power Beyond
- One or more built-in valve functions: relief valve, shock and suction valves in L- and R-line, non return valve in P-line and in LS-line
- Optional port connections (according to ISO, SAE or DIN standards)

Characteristic features of electro-hydraulic steering system:
- High steering pressure requiring smaller cylinders and flow
- Low noise emission in the cab because of low pilot pressure
- The possibility of emergency steering even on very heavy vehicles
- Minimization of side acceleration with articulated steering
- With microcontroller: No steering wheel drift and the possibility of variable steering ratio
- Analogue and CAN-bus interface
- Electro-hydraulic steering valve EHPS can be combined with Sauer-Danfoss PVG 32 proportional valve
- The system is approved by TÜV and have a controller with safety critical steering software

CONVERSION FACTORS

1 Nm = 8.851 lbf·in
1 N = 0.225 lbf
1 bar = 14.50 psi
1 °F = 1.8 × °C + 32
1 cm³ = 0.061 in³
1 litre = 0.264 US gal
1 mm = 0.0394 in
## Contents and technical literature survey

**A wide range of steering components**

- Conversion factors ................................................................................................................................. 2

**Survey of literature with technical data on Sauer-Danfoss steering components**

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Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
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<td>68</td>
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<tr>
<td>OSQB/OLSQ</td>
<td>69</td>
</tr>
</tbody>
</table>
Detailed data on all Sauer-Danfoss steering components and accessories can be found in our steering component catalogues, which is divided in 6 individual subcatalogues:

- General information
  Steering components
  DKMH.PK.200.A1.02  520L0468

- Technical data on mini steering units and steering columns for mini steering units:
  OSPM and OTPM
  DKMH.PN.210.PC.02  520L0438

- Technical data on open center and closed center steering units and on torque amplifiers:
  OSPB, OSPC, OSPR, OSPD and TAD
  DKMH.PK.210.A1.02  520L0502

- Technical data on load sensing steering units, priority valves and flow-amplifiers:
  OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL, OSPBX, OSPCX, OSPLX, OLS and OSQ
  DKMH.PN.210.B1.02  520L0520

- Technical data on hydraulic and electro-hydraulic pilot operated steering valve, appropriate steering units and electrical actuation module as well as sensors for electro-hydraulic steering systems
  EHPS and OSPCX
  PVE and PVED for EHPS and sensors for steering systems with EHPS
  DKMH.PN.270.B1.02  520L0521

- Technical data on valve blocks and steering columns
  OVP, OVPL, OVR and OTPB
  DKMH.PN.230.A1.02  520L0522

The most important data on all Sauer-Danfoss steering components is highlighted in a general survey brochure.

For technical information on individual variants, please contact the Sauer-Danfoss Sales Organization.
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL

**VERSIONS**

*Load sensing*

In load sensing steering systems both the steering system and the working hydraulics can be supplied with oil from the same pump, using a load sensing pump, also delivers the potential for energy saving.

Load sensing steering units have an extra connection for load sensing (LS), so that a load pressure signal can be directed via the steering unit to a Sauer-Danfoss priority valve and/or an LS pump. The load sensing signal controls the oil flow from the priority valve (and/or the LS pump) to the steering unit. The LS connection is open to tank when the steering unit is in the neutral position.

*Load sensing static*

Load sensing static steering units require load sensing static priority valves and/or load sensing static variable displacement pumps. Load sensing static steering systems have no oil flow in the LS connection when the steering unit is in neutral position.

*Load sensing dynamic*

Load sensing dynamic steering units require load sensing dynamic priority valves and/or load sensing dynamic variable displacement pumps. Load sensing dynamic steering systems have a constant oil flow in the LS connection in the direction of the steering unit even when the steering unit is in neutral position.

*Reaction*

With reaction steering units any external forces acting on the steered wheels result in a corresponding movement of the steering wheel when the driver is not steering the vehicle.

*Non-reaction*

With non-reaction steering units there is no corresponding movement of the steering wheel when the driver is not steering the vehicle.

**OSPB LS: Steering unit with no valve functions**

![Diagram of OSPB LS steering unit](image-url)
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL

**VERSIONS**

**OSPC LS (OLS)**
Load sensing static non-reaction and load sensing dynamic non-reaction

**OSPC LS (OLSA)**
Load sensing static non-reaction and load sensing dynamic non-reaction
Load Sensing Steering units, Priority valves and Flow amplifiers

Technical Information

LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL

VERSIONS

OSPC LSR: Steering unit load sensing dynamic with integrated valve functions

OSPF LS: Steering unit full drain load sensing dynamic and with integrated valve functions

OSPC LSR (OLS)
Load sensing dynamic reaction

OSPF LS (OLS)
Load sensing dynamic non-reaction
Load Sensing Steering units, Priority valves and Flow amplifiers

Technical Information

LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL

**VERSION**

**OSPD LS:** Steering unit load sensing dynamic with 2 rotary meters and with integrated valve functions

The OSPD has 2 rotary meters (gear wheel sets). Should the pump supply be lost, only one rotary meter is active for emergency steering. In normal steering situations both rotary meters are active.

**OSPQ LS:** Steering unit load sensing dynamic with flow amplification and with integrated valve functions

The OSPQ has incorporated amplification valve. Should pump supply fail or the steering wheel speed be less than approximate 10 rev/min only the rotary meter determines the displacement. In normal steering situations or at higher steering wheel speed, oil is also led to the steering cylinder via the built in amplification valve.

OSPL LS (OLS)
Load sensing static non-reaction

OSPL LS (OLS)
Load sensing dynamic non-reaction
**Load Sensing Steering units, Priority valves and Flow amplifiers**

**Technical Information**

LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL

**VERSIONS**

OSPBX LS, OSPCX LS and OSPLX LS: Steering units load sensing for flow amplifiers.

OSPBX LS, OSPCX LS and OSPX LS are load sensing steering units with the L and the R connections open to tank when in neutral position. OSPBX LS, OSPCX LS and OSPX LS can only be used with Sauer-Danfoss flow-amplifiers OSQA or OSQB. OSPBX LS, OSPCX LS and OSPX LS steering units must not be connected directly to the steering cylinder. OSPCX LS is for OSQ dynamic without pilot pressure relief valve.

OSPBX LS, OSPLX LS

Load sensing static

OSPFX LS

Load sensing dynamic
**CODE NUMBERS AND WEIGHTS**

**OSPB load sensing static non-reaction steering units**

OSPB LS Static steering units have no valve functions.
OSPB LS in the table below have all standard neutral setting springs, see page 24

<table>
<thead>
<tr>
<th>Steering unit</th>
<th>Code Numbers</th>
<th>Connections</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSPB 50 LS</td>
<td>-</td>
<td>G ½</td>
<td>5.2 kg [11.46 lb]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>G ¾ - S**</td>
<td></td>
</tr>
<tr>
<td>OSPB 80 LS</td>
<td>-</td>
<td>150G6085</td>
<td>5.3 kg [11.68 lb]</td>
</tr>
<tr>
<td>OSPB 100 LS</td>
<td>-</td>
<td>150G6086</td>
<td>5.4 kg [11.90 lb]</td>
</tr>
<tr>
<td>OSPB 125 LS</td>
<td>-</td>
<td>150G6087</td>
<td>5.5 kg [12.13 lb]</td>
</tr>
<tr>
<td>OSPB 160 LS</td>
<td>-</td>
<td>150G6088</td>
<td>5.6 kg [12.35 lb]</td>
</tr>
<tr>
<td>OSPB 200 LS</td>
<td>150-0103</td>
<td>150G6090</td>
<td>5.8 kg [12.79 lb]</td>
</tr>
<tr>
<td>OSPC 315 LS</td>
<td>150-0104</td>
<td>150-0116</td>
<td>6.2 kg [13.67 lb]</td>
</tr>
<tr>
<td>OSPB 400 LS</td>
<td>150-0105</td>
<td>150-0117</td>
<td>7.0 kg [15.43 lb]</td>
</tr>
</tbody>
</table>

O*: O-ring chamfer on port connections
S**: Spot face around port connection

Valve blocks OVP and OVR can be mounted on all of the OSPB steering units from the above table.
**CODE NUMBERS AND WEIGHS**

**OSPB Load sensing dynamic non-reaction steering units**

OSPB LS Dynamic steering units have no valve functions. OSPB LS in the table below have all standard neutral setting springs, see page 24

<table>
<thead>
<tr>
<th>Steering unit</th>
<th>Code Numbers</th>
<th>Connections</th>
<th>Weight kg [lb]</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSPB 50 LS</td>
<td>150-8204</td>
<td>3/4-16 UNF - O*</td>
<td>5.2 [11.46]</td>
</tr>
<tr>
<td>OSPB 80 LS</td>
<td>150-8205</td>
<td>7/16-20 UNF - O* + S**</td>
<td>5.3 [11.68]</td>
</tr>
<tr>
<td>OSPB 100 LS</td>
<td>150-8206</td>
<td></td>
<td>5.4 [11.90]</td>
</tr>
<tr>
<td>OSPB 125 LS</td>
<td>150-8207</td>
<td></td>
<td>5.5 [12.13]</td>
</tr>
<tr>
<td>OSPB 160 LS</td>
<td>150-8208</td>
<td></td>
<td>5.6 [12.35]</td>
</tr>
<tr>
<td>OSPB 200 LS</td>
<td>150-8209</td>
<td></td>
<td>5.8 [12.79]</td>
</tr>
<tr>
<td>OSPB 315 LS</td>
<td>150-8210</td>
<td></td>
<td>6.2 [13.67]</td>
</tr>
<tr>
<td>OSPB 400 LS</td>
<td>150-8211</td>
<td></td>
<td>7.0 [15.43]</td>
</tr>
</tbody>
</table>

O*: O-ring chamfer on port connections
S**: Spot face around port connection

Valve blocks OVP and OVR can be mounted on all of the OSPB steering units from the above table.
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL

**CODE NUMBERS AND WEIGHTS**

**OSPC load sensing static non-reaction steering unit**

OSPC LS Static steering units in the table below incorporate all the following valve functions:
- check valve in P-port
- pilot pressure relief valve
- shock valves
- suction valves

OSPC LS in the table below have all standard neutral setting springs, see page 24

<table>
<thead>
<tr>
<th>Steering unit</th>
<th>Code Numbers</th>
<th>Valve settings</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>European for OLS</td>
<td>Connections</td>
<td>US version for OLS</td>
</tr>
<tr>
<td></td>
<td>G ½</td>
<td>G ¼ - S**</td>
<td>European and US version for OLSA</td>
</tr>
<tr>
<td>OSPC 80 LS</td>
<td>150-1230</td>
<td>150-1188</td>
<td>150-1222</td>
</tr>
<tr>
<td>OSPC 100 LS</td>
<td>150-1231</td>
<td>150-1189</td>
<td>150-1221</td>
</tr>
<tr>
<td>OSPC 125 LS</td>
<td>150-1232</td>
<td>150-1190</td>
<td>150-1220</td>
</tr>
<tr>
<td>OSPC 160 LS</td>
<td>150-1233</td>
<td>150-1191</td>
<td>150-1219</td>
</tr>
<tr>
<td>OSPC 200 LS</td>
<td>150-1234</td>
<td>150-1192</td>
<td>150-1218</td>
</tr>
<tr>
<td>OSPC 315 LS</td>
<td>150-1235</td>
<td>-</td>
<td>150G6091</td>
</tr>
<tr>
<td>OSPC 400 LS</td>
<td>150-1240</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

O*: O-ring chamfer on port connections
S**: Spot face around port connections

If you require other port connections, valve combinations and/or other valve settings or other displacements, please fill in the order form on page 24 and contact the Sauer-Danfoss Sales Organization.
**OSPC load sensing dynamic non-reaction steering units**

OSPC LS Dynamic steering units in the table below incorporate all the following valve functions:
- check valve in P-port
- pilot pressure relief valve
- shock valves
- suction valves
- check valve in LS-line for all OSPC LS Dynamic up to and including 200 cm³/rev

OSPC LS in the table below have all standard neutral setting springs, see page 24.

If you require other port connections, valve combinations and/or other valve settings or other displacements please fill in the order form on page 24 and contact the Sauer-Danfoss Sales Organization.

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>OSPC 50 LS</td>
<td>150-8233</td>
<td>140 (2030)</td>
<td>G (\frac{1}{2}) - S**</td>
<td>150-8215</td>
<td></td>
<td>5.2 (11.46)</td>
</tr>
<tr>
<td>OSPC 80 LS</td>
<td>150-8234</td>
<td>170 (2465)</td>
<td>G (\frac{3}{4}) - S**</td>
<td>150-8216</td>
<td>200 (2900)</td>
<td>5.3 (11.68)</td>
</tr>
<tr>
<td>OSPC 100 LS</td>
<td>150-8235</td>
<td>225 (3263)</td>
<td>G (\frac{1}{2}) - S**</td>
<td>150-8217</td>
<td></td>
<td>5.4 (11.90)</td>
</tr>
<tr>
<td>OSPC 125 LS</td>
<td>150-8236</td>
<td></td>
<td>G (\frac{3}{4}) - S**</td>
<td>150-8218</td>
<td></td>
<td>5.5 (12.13)</td>
</tr>
<tr>
<td>OSPC 160 LS</td>
<td>150-8237</td>
<td></td>
<td>G (\frac{3}{4}) - S**</td>
<td>150-8219</td>
<td></td>
<td>5.6 (12.35)</td>
</tr>
<tr>
<td>OSPC 200 LS</td>
<td>150-8238</td>
<td></td>
<td>G (\frac{3}{4}) - S**</td>
<td>150-8220</td>
<td></td>
<td>5.8 (12.79)</td>
</tr>
<tr>
<td>OSPC 315 LS</td>
<td>150-8239</td>
<td></td>
<td></td>
<td>150-8221</td>
<td></td>
<td>6.2 (13.67)</td>
</tr>
<tr>
<td>OSPC 400 LS</td>
<td>150-8240</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.0 (15.43)</td>
</tr>
</tbody>
</table>

**Notes:**
- O*: O-ring chamfer on port connections
- S**: Spot face around port connections

---

**CODE NUMBERS AND WEIGHTS**

**OSPC load sensing dynamic non-reaction steering units**

OSPC LS Dynamic steering units in the table below incorporate all the following valve functions:
- check valve in P-port
- pilot pressure relief valve
- shock valves
- suction valves
- check valve in LS-line for all OSPC LS Dynamic up to and including 200 cm³/rev

OSPC LS in the table below have all standard neutral setting springs, see page 24.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>OSPC 50 LS</td>
<td>150-8233</td>
<td>140 (2030)</td>
<td>G (\frac{1}{2}) - S**</td>
<td>150-8215</td>
<td></td>
<td>5.2 (11.46)</td>
</tr>
<tr>
<td>OSPC 80 LS</td>
<td>150-8234</td>
<td>170 (2465)</td>
<td>G (\frac{3}{4}) - S**</td>
<td>150-8216</td>
<td>200 (2900)</td>
<td>5.3 (11.68)</td>
</tr>
<tr>
<td>OSPC 100 LS</td>
<td>150-8235</td>
<td>225 (3263)</td>
<td>G (\frac{1}{2}) - S**</td>
<td>150-8217</td>
<td></td>
<td>5.4 (11.90)</td>
</tr>
<tr>
<td>OSPC 125 LS</td>
<td>150-8236</td>
<td></td>
<td>G (\frac{3}{4}) - S**</td>
<td>150-8218</td>
<td></td>
<td>5.5 (12.13)</td>
</tr>
<tr>
<td>OSPC 160 LS</td>
<td>150-8237</td>
<td></td>
<td>G (\frac{3}{4}) - S**</td>
<td>150-8219</td>
<td></td>
<td>5.6 (12.35)</td>
</tr>
<tr>
<td>OSPC 200 LS</td>
<td>150-8238</td>
<td></td>
<td>G (\frac{3}{4}) - S**</td>
<td>150-8220</td>
<td></td>
<td>5.8 (12.79)</td>
</tr>
<tr>
<td>OSPC 315 LS</td>
<td>150-8239</td>
<td></td>
<td></td>
<td>150-8221</td>
<td></td>
<td>6.2 (13.67)</td>
</tr>
<tr>
<td>OSPC 400 LS</td>
<td>150-8240</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>7.0 (15.43)</td>
</tr>
</tbody>
</table>

**Notes:**
- O*: O-ring chamfer on port connections
- S**: Spot face around port connections

---

If you require other port connections, valve combinations and/or other valve settings or other displacements please fill in the order form on page 24 and contact the Sauer-Danfoss Sales Organization.
**OSPC load sensing dynamic reaction steering units**

OSPC LSR Dynamic steering units in the table below incorporate all the following valve functions:
- Check valve in P-port
- Pilot pressure relief valve
- Shock valves
- Suction valves
- Check valve in LS-line

OSPC LSR in the table below have all standard neutral setting springs, see page 24.

<table>
<thead>
<tr>
<th>Steering unit</th>
<th>Code Numbers</th>
<th>Valve settings</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Connections</td>
<td>Relief valve</td>
<td></td>
</tr>
<tr>
<td></td>
<td>European version for OLS</td>
<td>bar [psi]</td>
<td>bar [psi]</td>
</tr>
<tr>
<td></td>
<td>G ½ - S**</td>
<td>170 [2465]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>G ¼ - S**</td>
<td>225 [3263]</td>
<td></td>
</tr>
<tr>
<td>OSPC 80 LSR</td>
<td>150-8241</td>
<td></td>
<td>5.3</td>
</tr>
<tr>
<td>OSPC 200 LSR</td>
<td>150-8242</td>
<td></td>
<td>5.8</td>
</tr>
</tbody>
</table>

O*: O-ring chamfer on port connections  
S**: Spot face around port connections (can not be used in connection with OVR angular block)

If you require other port connections, valve combinations, valve settings and/or other displacements, please fill in the order form on page 24 and contact the Sauer-Danfoss Sales Organization.
**CODE NUMBERS AND WEIGHTS**

**OSPF load sensing dynamic non-reaction steering units**

OSPF LS Dynamic steering units in the table below incorporate all the following valve functions:
- check valve in P-port
- pilot pressure relief valve
- shock valves
- suction valves

OSPF LS in the table below have all soft neutral setting springs, see page 24

<table>
<thead>
<tr>
<th>Steering unit</th>
<th>Code Numbers</th>
<th>Valve settings</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Connections</td>
<td>Relief valve</td>
<td></td>
</tr>
<tr>
<td></td>
<td>European version for OLS</td>
<td>bar [psi]</td>
<td>Shock valve</td>
</tr>
<tr>
<td>OSPF 80 LS</td>
<td>150G5079</td>
<td>170 [2465]</td>
<td>5.3 [11.68]</td>
</tr>
<tr>
<td>OSPF 100 LS</td>
<td>150G5080</td>
<td>225 [3263]</td>
<td>5.4 [11.90]</td>
</tr>
<tr>
<td>OSPF 125 LS</td>
<td>150G5081</td>
<td></td>
<td>5.5 [12.13]</td>
</tr>
<tr>
<td>OSPF 160 LS</td>
<td>150G5082</td>
<td></td>
<td>5.6 [12.35]</td>
</tr>
<tr>
<td>OSPF 200 LS</td>
<td>150G5083</td>
<td></td>
<td>5.8 [12.79]</td>
</tr>
<tr>
<td>OSPF 315 LS</td>
<td>150G5084</td>
<td></td>
<td>6.2 [13.67]</td>
</tr>
<tr>
<td>OSPF 400 LS</td>
<td>150G5085</td>
<td></td>
<td>7.0 [15.43]</td>
</tr>
</tbody>
</table>

O*: O-ring chamfer on port connections
S**: Spot face around port connections (can not be used in connection with OVR angular block)

If you require other port connections, valve combinations, valve settings and/or other displacements, please fill in the order form on page 24 and contact the Sauer-Danfoss Sales Organization.
**CODE NUMBERS AND WEIGHTS**

**OSPD load sensing non-reaction steering units**

OSPD LS Dynamic steering units in the table below incorporate all the following valve functions:
- check valve in P-port
- pilot pressure relief valve
- shock valves
- suction valves
- check valve in LS-line

OSPD LS in the table below have all standard neutral setting springs, see page 24

<table>
<thead>
<tr>
<th>Steering unit</th>
<th>Code Numbers</th>
<th>Valve settings</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Relief valve</td>
<td>Shock valve</td>
</tr>
<tr>
<td></td>
<td></td>
<td>bar [psi]</td>
<td>bar [psi]</td>
</tr>
<tr>
<td>OSPD 70/230 LS</td>
<td>150G8112</td>
<td>170 [2465]</td>
<td>225 [3263]</td>
</tr>
<tr>
<td>OSPD 70/270 LS</td>
<td>150G8113</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSPD 70/385 LS</td>
<td>150G8114</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSPD 125/325 LS</td>
<td>150G8128</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSPD 125/440 LS</td>
<td>150G8129</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**S**: Spot face around port connections (can not be used in connection with OVR angular block)

If you require other port connections, valve combinations, valve settings and/or other displacements, please fill in the order form on page 24 and contact the Sauer-Danfoss Sales Organization.
CODE NUMBERS AND WEIGHTS

OSPQ load sensing dynamic non-reaction steering units
OSPQ LS Dynamic steering units in the table below incorporate all the following valve functions:
• check valve in amplification valve, act as check valve in P-port
• pilot pressure relief valve
• shock valves
• suction valves
• check valve in LS-line
OSPQ LS in the table below have all standard neutral setting springs, see page 24

<table>
<thead>
<tr>
<th>Steering unit</th>
<th>Code Numbers</th>
<th>Valve settings</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Relief valve</td>
<td>Shock valve</td>
</tr>
<tr>
<td></td>
<td></td>
<td>bar [psi]</td>
<td>bar [psi]</td>
</tr>
<tr>
<td>OSPQ 80/125 LS</td>
<td>150G8012</td>
<td>170 [2465]</td>
<td>225 [3263]</td>
</tr>
<tr>
<td>OSPQ 125/250 LS</td>
<td>150G8011</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSPQ 160/320 LS</td>
<td>150G8030</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

O*: O-ring chamfer on port connections
S**: Spot face around port connections (can not be used in connection with OVR angular block)

If you require other valve combinations, valve settings and/or other displacements, please fill in the order form on page 24 and contact the Sauer-Danfoss Sales Organization.
OSPL load sensing static non-reaction steering units
OSPL LS Static steering units have no valve functions.
OSPL LS in the three tables below have all strong neutral setting springs, see page 24

<table>
<thead>
<tr>
<th>Steering unit</th>
<th>Code Numbers</th>
<th>Connections</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSPL 520 LS</td>
<td>150-7169</td>
<td>150-7167</td>
<td>8.1 [17.86]</td>
</tr>
<tr>
<td>OSPL 630 LS</td>
<td>150-7107</td>
<td>150-7164</td>
<td>8.4 [18.52]</td>
</tr>
<tr>
<td>OSPL 800 LS</td>
<td>150-7108</td>
<td>150-7165</td>
<td>8.8 [19.40]</td>
</tr>
<tr>
<td>OSPL 1000 LS</td>
<td>150-7110</td>
<td>150-7166</td>
<td>10.0 [22.05]</td>
</tr>
</tbody>
</table>

O*: O-ring chamfer on port connections  S**: Spot face around port connection

OSPL load sensing dynamic non-reaction steering units
OSPL LS Dynamic steering units in the table below have no valve functions.

<table>
<thead>
<tr>
<th>Steering unit</th>
<th>Code Numbers</th>
<th>Connections</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSPL 520 LS</td>
<td>150-8244</td>
<td>150-8214</td>
<td>8.1 [17.86]</td>
</tr>
<tr>
<td>OSPL 630 LS</td>
<td>150-8212</td>
<td></td>
<td>8.4 [18.52]</td>
</tr>
<tr>
<td>OSPL 800 LS</td>
<td>150-8213</td>
<td></td>
<td>8.8 [19.40]</td>
</tr>
<tr>
<td>OSPL 1000 LS</td>
<td>150-8214</td>
<td></td>
<td>10.0 [22.05]</td>
</tr>
</tbody>
</table>

O*: O-ring chamfer on port connections  S**: Spot face around port connection

OSPL LS Dynamic steering units in the table below incorporate all the following valve function:
- pilot pressure relief valve

If you require other displacements or other valve setting, please fill in the order form on page 24 and contact the Sauer-Danfoss Sales Organization.
### CODE NUMBERS AND WEIGHTS

**OSPBX and OSPLX load sensing static steering units for OSQ static**

OSPBX LS and OSPLX LS Static steering units in the table below have no valve functions. OSPBX LS in the table below have all standard neutral setting springs, see page 24. OSPLX LS in the table below have all strong neutral setting springs, see page 24.

<table>
<thead>
<tr>
<th>Steering unit</th>
<th>Code Numbers</th>
<th>Connections</th>
<th>Weight [kg] [lb]</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSPBX 160 LS</td>
<td>150-1082</td>
<td>G ½ - S**</td>
<td>5.6 [12.35]</td>
</tr>
<tr>
<td>OSPBX 200 LS</td>
<td>150-1083</td>
<td>G ½ - S**</td>
<td>5.8 [12.79]</td>
</tr>
<tr>
<td>OSPBX 315 LS</td>
<td>150-1084</td>
<td>G ½ - S**</td>
<td>6.2 [13.67]</td>
</tr>
<tr>
<td>OSPBX 400 LS</td>
<td>150-1085</td>
<td>G ½ - S**</td>
<td>7.0 [15.43]</td>
</tr>
<tr>
<td>OSPLX 520 LS</td>
<td>150-7170</td>
<td>G ½ - S**</td>
<td>8.1 [17.86]</td>
</tr>
<tr>
<td>OSPLX 630 LS</td>
<td>150-7171</td>
<td>G ½ - S**</td>
<td>8.4 [18.52]</td>
</tr>
<tr>
<td>OSPLX 800 LS</td>
<td>150-7172</td>
<td>G ½ - S**</td>
<td>8.8 [19.40]</td>
</tr>
</tbody>
</table>

O*: O-ring chamfer on port connections
S**: Spot face around port connection

If you require other port connections for the OSPLX, please fill in the order form on page 24 and contact the Sauer-Danfoss Sales Organization.

**OSPCX load sensing dynamic steering units for OSQ dynamic**

OSPCX LS Dynamic steering unit in the table below incorporates the following valve function:
- pilot pressure relief valve

OSPCX LS in the table below has standard neutral setting springs, see page 24.

<table>
<thead>
<tr>
<th>Steering unit</th>
<th>Code Numbers</th>
<th>Valve settings</th>
<th>Weight [kg] [lb]</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSPCX LS 160</td>
<td>150-8188</td>
<td>200 [2900]</td>
<td>5.6 [12.35]</td>
</tr>
</tbody>
</table>

S**: Spot face around port connection

If you require other displacements or other valve setting, please fill in the order form on page 24 and contact the Sauer-Danfoss Sales Organization.
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL

SPECIFICATION TABLE FOR NON CATALOGUE NUMBERS OF LS STEERING UNITS

Fill in your company data and place x's in the table where appropriate, then send to your Sauer-Danfoss Sales Organisation.

<table>
<thead>
<tr>
<th>Your company</th>
<th>Name</th>
<th>Vehicle</th>
<th>Potential pcs/year</th>
<th>Completed by</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steering unit type</td>
<td>OSPC</td>
<td>OSPF</td>
<td>OSPD</td>
<td>OSPQ</td>
<td>OSPL</td>
</tr>
<tr>
<td>Reaction type</td>
<td>LS (Non-reaction)</td>
<td>LSR (Reaction: only OSPC, OSPD, OSPQ)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load Sensing type</td>
<td>Static (Only OSPC, OSPL, OSPLX, OSPCX)</td>
<td>Dynamic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DP, cm³/rev OSPC LS</td>
<td>40</td>
<td>50</td>
<td>60</td>
<td>70</td>
<td>80</td>
</tr>
<tr>
<td>OSPF LS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSPD LS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSPQ LS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSPL LS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSPLX LS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSPC LSR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSPF LSR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSPD LSR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSPQ LSR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSPL, OSPLX</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relief valve*** bar</td>
<td>70</td>
<td>80</td>
<td>90</td>
<td>100</td>
<td>110</td>
</tr>
<tr>
<td>Shock valves**** bar</td>
<td>160</td>
<td>180</td>
<td>200</td>
<td>225</td>
<td>240</td>
</tr>
<tr>
<td>Suction**** valves</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Check valve in LS</td>
<td>Yes (Only for OSPC dynamic, OSPD and OSPQ)</td>
<td>No (Only for OSPC, OSPF and OSPL)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neutral setting springs</td>
<td>Soft: 0.5 - 1.8 Nm in normal steering situations</td>
<td>Standard: 0.8 - 3 Nm in normal steering situations</td>
<td>Strong: 1.5 - 4 Nm in normal steering situations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unit black painted</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL

DP = Displacement, RV = Pilot pressure relief valve.
O*: O-ring chamfer on port connections
S**: Spot face around port connections (can not be used in connection with OVR angular block)
RV*** see "Technical data" page 29-30 for limitation in maximum pressure depending on displacements
Shock and suction valves****: not available in OSPL
Port and valve combinations possible: see tables page 26 - 28.
Types not mentioned with port connections in the table above, are only available in the version(s) stated in
the code number tables.

An alternative way to specify a variant is to state an existing code number and add the
modifications, you would like to have implemented in the basic steering unit.

Code number of basic steering unit: ____________________________

Requested modifications: ______________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________

__________________________________________________________
### Load Sensing Steering units, Priority valves and Flow amplifiers

#### Technical Information

**LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL**

#### PORT THREAD VERSIONS AND VALVE COMBINATIONS

The following combinations of port threads and valves are available for OSPC LS/LSR:


<table>
<thead>
<tr>
<th>Threads</th>
<th>Valves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main ports (P, T, L, R)</td>
<td>LS-port</td>
</tr>
<tr>
<td>DIN 3852-2 G ½</td>
<td>DIN 3852-2 G ¼ w. spot face</td>
</tr>
<tr>
<td>DIN 3852-2 G ½ w. spot face</td>
<td>DIN 3852-2 G ¼ w. spot face</td>
</tr>
<tr>
<td>ISO 6149-1 M18 x 1,5, w. O-ring chamfer and spot face</td>
<td>ISO 6149-1 M12 x 1,5, w. O-ring chamfer and spot face</td>
</tr>
<tr>
<td>ISO 11926-1 ¼ - 16 UNF, O-ring boss port</td>
<td>ISO 11926-1 ⅛ - 20 UNF O-ring boss port and spot face</td>
</tr>
<tr>
<td>ISO 11926-1 ¼ - 16 UNF, O-ring boss port</td>
<td>ISO 11926-1 ⅛ - 20 UNF O-ring boss port and spot face</td>
</tr>
<tr>
<td>For OLSA</td>
<td>For OLSA</td>
</tr>
</tbody>
</table>

Housings with spot face around port connections on main ports cannot be used in connection with OVR angular block.

The following combinations of port threads and valves are available for OSPC LS/LSR:

- **Housings for high flow:** 250 - 400 cm³/rev [15.25 - 24.4 in³/rev] gear wheel set.

<table>
<thead>
<tr>
<th>Threads</th>
<th>Valves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main ports (P, T, L, R)</td>
<td>LS-port</td>
</tr>
<tr>
<td>DIN 3852-2 G ½</td>
<td>DIN 3852-2 G ¼ w. spot face</td>
</tr>
<tr>
<td>DIN 3852-2 G ½ w. spot face</td>
<td>DIN 3852-2 G ¼ w. spot face</td>
</tr>
<tr>
<td>ISO 11926-1 ¼ - 16 UNF, O-ring boss port</td>
<td>ISO 11926-1 ⅛ - 20 UNF O-ring boss port and spot face</td>
</tr>
<tr>
<td>ISO 11926-1 ¼ - 16 UNF, O-ring boss port</td>
<td>ISO 11926-1 ⅛ - 20 UNF O-ring boss port and spot face</td>
</tr>
<tr>
<td>For OLSA</td>
<td>For OLSA</td>
</tr>
</tbody>
</table>
The following combinations of port threads and valves are available for OSPF LS:

<table>
<thead>
<tr>
<th>Threads</th>
<th>Valves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main ports (P, T, L, R)</td>
<td>LS-port</td>
</tr>
<tr>
<td>DIN 3852-2 G ½</td>
<td>DIN 3852-2 G ¼ w. spot face</td>
</tr>
<tr>
<td>DIN 3852-2 G ½ w. spot face</td>
<td>DIN 3852-2 G ¼ w. spot face</td>
</tr>
<tr>
<td>ISO 6149-1 M18 x 1,5, w. O-ring chamfer and spot face</td>
<td>ISO 6149-1 M12 x 1,5, w. O-ring chamfer and spot face</td>
</tr>
<tr>
<td>ISO 11926-1 ⅛ - 16 UNC, O-ring boss port</td>
<td>ISO 11926-1 ¼ - 20 UNF O-ring boss port and spot face</td>
</tr>
<tr>
<td>ISO 11926-1 ¼ - 16 UNC, O-ring boss port</td>
<td>ISO 11926-1 ¼ - 20 UNF O-ring boss port and spot face</td>
</tr>
</tbody>
</table>

The following combinations of port threads and valves are available for OSPD LS/LSR:

<table>
<thead>
<tr>
<th>Threads</th>
<th>Valves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main ports (P, T, L, R)</td>
<td>LS-port</td>
</tr>
<tr>
<td>DIN 3852-2 G ½ w. spot face</td>
<td>DIN 3852-2 G ¼ w. spot face</td>
</tr>
<tr>
<td>ISO 6149-1 M18 x 1,5, w. O-ring chamfer and spot face</td>
<td>ISO 6149-1 M12 x 1,5, w. O-ring chamfer and spot face</td>
</tr>
<tr>
<td>ISO 11926-1 ⅛ - 16 UNC, O-ring boss port</td>
<td>ISO 11926-1 ½ - 20 UNF O-ring boss port and spot face</td>
</tr>
<tr>
<td>ISO 11926-1 ¼ - 16 UNC, O-ring boss port</td>
<td>ISO 11926-1 ¼ - 20 UNF O-ring boss port and spot face</td>
</tr>
</tbody>
</table>
PORT THREAD VERSIONS AND VALVE COMBINATIONS
(CONTINUED)

The following combinations of port threads and valves are available for OSPQ LS/LSR:

<table>
<thead>
<tr>
<th>Threads</th>
<th>Valves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main ports (P, T, L, R)</td>
<td>LS-port</td>
</tr>
<tr>
<td>ISO 6149-1 M18 x 1.5, w. O-ring chamfer and spot face</td>
<td>ISO 6149-1 M12 x 1.5, w. O-ring chamfer and spot face</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Housings with spot face around port connections on main ports cannot be used in connection with OVR angular block. For OSPL, OSPBX, OSPCX and OSPLX only the versions listed in the tables with code numbers are available.
### TECHNICAL DATA

**Displacement, flow and pressure:** OSPB LS, OSPC LS, OSPC LSR  
Common data: Look in sub catalogue: "General Steering Components "

<table>
<thead>
<tr>
<th>Steering unit</th>
<th>Displacement cm³/rev</th>
<th>*Rated oil flow L/min</th>
<th>Max. pressure on connections P bar</th>
<th>T bar [psi]</th>
<th>L. R bar [psi]</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSPC 40 LS Static</td>
<td>40 [2.44]</td>
<td>4 [1.06]</td>
<td></td>
<td></td>
<td></td>
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*Rated flow at 100 rpm*
### TECHNICAL DATA

**Displacement, flow and pressure: OSPF LS**

Common data: Look in sub catalogue: “General Steering Components“

<table>
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<tr>
<th>Steering unit</th>
<th>Displacement cm³/rev</th>
<th>*Rated oil flow l/min</th>
<th>Max. pressure on connections</th>
<th>P bar [psi]</th>
<th>T bar [psi]</th>
<th>L. R bar [psi]</th>
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</table>

*Rated flow at 100 rpm
### TECHNICAL DATA

#### Displacement, flow and pressure: OSPD LS, OSPQ LS

OSPD and OSPQ steering units in the table below are all Load Sensing Dynamic type.

Common data: Look in sub catalogue: “General Steering Components”

#### Displacement and flow

<table>
<thead>
<tr>
<th>Steering unit</th>
<th>Displacement manual steer mode</th>
<th>Displacement *normal steer mode</th>
<th>Rated oil flow**</th>
<th>Max. pressure on connections</th>
</tr>
</thead>
</table>

* normal steer mode: OSPQ: at a steering wheel speed higher than approximately 20 rpm, the amplification is fully active, and the displacements in the table are valid.

** Rated flow at 100 rpm
## Technical Data

### Load Sensing Steering units, Priority valves and Flow amplifiers

#### Technical Information

**LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL**

**Displacement, flow and pressure:** OSPL LS, OSPBX LS, OSPCX LS, OSPLX LS

*Common data: Look in sub catalogue: “General Steering Components”* 

|------------------|--------------------------------|------------------------------------|-----------------------------------------|------------|---------------|

* Rated flow at 100 rpm

** Please contact Sauer-Danfoss Sales Organization for flow higher then 70l/min [18.49 US gal/min]: 70l/min [18.49 US gal/min] results in lower max. speed than 100 rpm on steering wheel for OSPL 800 and OSPL 1000:

OSPL 800 max. speed at 70l/min [18.49 US gal/min] 87 rpm
OSPL 1000 max speed at 70l/min [18.49 US gal/min] 70 rpm

Please contact the Sauer-Danfoss Sales Organization regarding steering units with code numbers not
Load Sensing Steering units, Priority valves and Flow amplifiers

Technical Information

LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL

TECHNICAL DATA

Valve functions in OSPC, OSPF, OSPD, OSPQ and OSPL LS steering units

Pilot pressure relief valve; \((P - T, Q_p)\) characteristic

The pilot pressure relief valve protects the steering unit against excessive pressure. The pilot pressure relief valve in the OSPC LS, OSPF LS, OSPD LS, OSPQ LS and OSPL LS steering unit together with the priority valve limit the maximum steering pressure \(P - T\). The pilot pressure relief valve is set at an oil flow to the priority valve of 25 l/min [6.60 US gal/min].

For OSPC, OSPD, OSPQ and OSPL load sensing dynamic steering units, the setting values are valid at a dynamic flow of 0.6 l/min [0.16 US gal/min].

For OSPF load sensing dynamic steering units, the setting values are valid at a dynamic flow of 1 l/min [0.26 US gal/min].

Setting tolerance:

\(< 170\) bar: rated value +5 bar [72.5 psi].

\(> 170\) bar: rated value +10 bar [145 psi].

Shock valves

The shock valves protect the steering unit and limit maximum external forces on the steering cylinder. The shock valves in the steering unit limit the maximum pressure drop from \(L\) to \(T\) and from \(R\) to \(T\). The shock valves are set at 1 l/min [0.264 US gal/min].

At higher flow pressure peaks may occur.

The shock valves are of the direct acting type, so they react very quickly.

Setting tolerance: rated value +20 bar [290 psi].
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL

TECHNICAL DATA

Suction valves
The suction valves allow oil suction to avoid cavitation in the steering cylinder. To provide correct suction, a back pressure valve must be fitted in the tank line from the steering unit. Generally Sauer-Danfoss recommend a back pressure of 2 bar, but on vehicles with strong self straightening tendencies and on articulated steered vehicles, we recommend 5-10 bar [72.5 - 145 psi]. For further advice, please contact the Sauer-Danfoss Sales Organisation.

Note: A connection which incorporates a check valve must be established to allow oil flow to by-pass the back pressure valve (and filter) from the tank to steering unit. See diagramme examples in sub catalogue “General Steering Components” page 37 - 39.

Check valves
The check valve in the P connection of the steering unit protects the driver against steering wheel jerks. The check valve prevents oil from flowing backwards into the pump line when steering against a high pressure on the cylinder side. The pressure drop across the check valve is indicated on the following graph, which assumes the use of port adaptors with 11 mm [0.43 in] minimum bore.

The check valve in the LS line of OSPC LS, OSPD LS and OSPQ LS dynamic steering units also protects the driver against steering wheel jerks. The check valve prevents oil from flowing backwards into the LS line to the priority valve when steering against a high pressure on the cylinder side.

In OSPF LS oil cannot flow backwards into the LS line, look in sub catalogue: “General Steering Components” page 26.
PORT THREAD VERSIONS
FOR
OSPB LS,
OSPC LS/LSR,
OSPF LS,
OSPD LS/LSR,
OSPQ LS/LSR,
OSPL LS,
OSPBX LS,
OSPCX LS,
OSPLX LS

A: G port w. spot face
   (LS in OSPB and OSPL with no valves)
K: DIN 3852-2 - G ¼

B: G port w. spot face
   (LS in OSPC/F/D/Q and OSPL with valves)
L: DIN 3852-2 - G ¼

C: G ports (P, T, L, R)
M: DIN 3852-2 - G ½

D: G ports w. spot face
   (P, T, L, R)
N: DIN 3852-2 - G ½

E: Metric port w. spot face and O-ring chamfer (LS)
O: ISO 6149-1 - M12 x 1.5

F: Metric ports w. spot face and O-ring chamfer (LS)
P: ISO 6149-1 - M18 x 1.5

G: UNF port w. O-ring chamfer
   (LS in OSPB and OSPL with no valves)
Q: ISO 11926-1 - 7/16-20 UNF
   O-ring boss port

H: UNF ports w. O-ring chamfer
   (LS in OSPC/F/D and OSPL with valves)
R: ISO 11926-1 - 7/16-16 UNF
   O-ring boss port

I: UNF ports w. O-ring chamfer (P, T, L, R)
S: ISO 11926-1 - ¾-16 UNF
   O-ring boss port

SAUER DANFOSS
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL

### DIMENSIONS

**OSPB LS for OLS, OSPBX LS for OSQ:**

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<tr>
<th>Type</th>
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<th>L₂ [mm]</th>
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<td>[4.96]</td>
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<td>[0.51]</td>
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<td>[0.64]</td>
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<td>[0.82]</td>
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<td>[1.02]</td>
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<tr>
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<tr>
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<td>[6.73]</td>
<td>[2.05]</td>
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</tbody>
</table>

**European version:**
- A: G ½; 15 mm [0.59 in] deep
- B: M10 × 1.5, 16 mm [0.63 in] deep
- LS: G ¾ with spot face, 11 mm [0.43 in] deep

**US version:**
- A: ¾ - 16 UNF O-ring boss; 15 mm [0.59 in] deep
- B: ½” - 16 UNC, 16 mm [0.63 in] deep
- LS: G ⅜ - 20 UNF O-ring boss, 11.5 mm [0.45 in] deep
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL

DIMENSIONS

<table>
<thead>
<tr>
<th>Type</th>
<th>L₁ [mm]</th>
<th>L₁ [in]</th>
<th>L₂ [mm]</th>
<th>L₂ [in]</th>
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<td>171</td>
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</table>

European version:
A: G ½ or G ½ w. spot face
   or M18 x 1.5 ISO 6149,
   15 mm [0.59 in] deep
B: M10 x 1.5, 16 mm [0.63 in] deep
LS: G ¼ w. spot face
   or M12 x 1.5 ISO 6149,
   11.5 mm [0.45 in] deep

US version:
A: ¾-16 UNF O-ring boss,
   15 mm [0.59 in] deep
B: ⅜ - 16 UNC or M10 x 1.5,
   16 mm [0.63 in] deep
LS: 7/16 - 20 UNF O-ring boss,
   11.5 mm [0.45 in] deep

OSPC LS/LSR for OLSA:
B: M10 x 1.5,
   16 mm [0.63 in] deep
**Load Sensing Steering units, Priority valves and Flow amplifiers**

**Technical Information**

**LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL**

### DIMENSIONS

**OSPD LS/LSR for OLS:**

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<th>Type</th>
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<th>L₂ [mm]</th>
<th>L₃ [mm]</th>
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<td>L</td>
<td>222</td>
<td>16.2</td>
<td>40.9</td>
</tr>
<tr>
<td></td>
<td>L₁</td>
<td>[8.74]</td>
<td>[0.64]</td>
<td>[1.61]</td>
</tr>
</tbody>
</table>

**European version:**

- **A:** G ½ w. spot-face or M18 x 1.5 ISO 6149
  - 15 mm [0.59 in] deep
- **B:** M10 x 1.5, 16 mm [0.63 in] deep
- **LS:** G ¼ w. spot face or M 12 x 1.5 ISO 6149
  - 11.5 mm [0.45 in] deep

**US version:**

- **A:** ¾ - 16 UNF O-ring boss;
  - 15 mm [0.59 in] deep
- **B:** M 10 x 1.5, 16 mm [0.63 in] deep,
- **LS:** 7/16 - 20 UNF o-ring boss,
  - 11.5 mm [0.45 in] deep
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information

LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL

DIMENSIONS

OSPQ LS/LSR for OLS:

<table>
<thead>
<tr>
<th>Type</th>
<th>L1 [mm]</th>
<th>L1 [in]</th>
<th>L2 [mm]</th>
<th>L2 [in]</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSPQ 80/125</td>
<td>129</td>
<td>5.08</td>
<td>10,4</td>
<td>0.41</td>
</tr>
<tr>
<td>OSPQ 80/140</td>
<td>129</td>
<td>5.08</td>
<td>10,4</td>
<td>0.41</td>
</tr>
<tr>
<td>OSPQ 80/160</td>
<td>129</td>
<td>5.08</td>
<td>10,4</td>
<td>0.41</td>
</tr>
<tr>
<td>OSPQ 100/160</td>
<td>132</td>
<td>5.20</td>
<td>13,0</td>
<td>0.51</td>
</tr>
<tr>
<td>OSPQ 100/180</td>
<td>132</td>
<td>5.20</td>
<td>13,0</td>
<td>0.51</td>
</tr>
<tr>
<td>OSPQ 100/200</td>
<td>132</td>
<td>5.20</td>
<td>13,0</td>
<td>0.51</td>
</tr>
<tr>
<td>OSPQ 125/200</td>
<td>135</td>
<td>5.31</td>
<td>16,2</td>
<td>0.64</td>
</tr>
<tr>
<td>OSPQ 125/250</td>
<td>135</td>
<td>5.31</td>
<td>16,2</td>
<td>0.64</td>
</tr>
<tr>
<td>OSPQ 160/250</td>
<td>140</td>
<td>5.51</td>
<td>20,8</td>
<td>0.82</td>
</tr>
<tr>
<td>OSPQ 160/320</td>
<td>140</td>
<td>5.51</td>
<td>20,8</td>
<td>0.82</td>
</tr>
</tbody>
</table>

European version:
A: M18 x 1.5 ISO 6149, 15 mm [0.59 in] deep
B: M10 x 1.5, 16 mm [0.63 in] deep
LS: M12 x 1.5 ISO 6149, 11.5 mm [0.45 in] deep
Load Sensing Steering units, Priority valves and Flow amplifiers

Technical Information

LS Steering units OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL

**DIMENSIONS**

<table>
<thead>
<tr>
<th>Type</th>
<th>L₁ [in]</th>
<th>L₂ [in]</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSPL/OSPLX 520</td>
<td>194 [7.64]</td>
<td>65.0 [2.56]</td>
</tr>
<tr>
<td>OSPL/OSPLX 630</td>
<td>211 [8.31]</td>
<td>82.0 [3.23]</td>
</tr>
<tr>
<td>OSPL/OSPLX 800</td>
<td>233 [9.17]</td>
<td>104.0 [4.09]</td>
</tr>
<tr>
<td>OSPL 1000</td>
<td>263 [10.35]</td>
<td>134.0 [5.27]</td>
</tr>
</tbody>
</table>

European version:
A: G 1/2; 15 mm (0.59 in) deep
B: M10 x 1.5, 16 mm deep
LS: G 1/4 w. spot face,
11.5 mm [0.45 in] deep

US version:
A: 3/4-16 UNF O-ring boss,
15 mm (0.59 in) deep
or for OVPL
B: M10 x 1.5, 16 mm deep
LS: 7/16-20 UNF O-ring boss,
11.5 mm [0.45 in] deep

OSPL LS with pilot pressure relief valve:

European version:
A: for OVPL
B: M10 x 1.5, 16 mm deep
LS: G 1/4 w. spot face,
11.5 mm [0.45 in] deep

OSPL LS with relief valve
**Load Sensing Steering units, Priority valves and Flow amplifiers**

**Technical Information**

**Priority valves OLSA and OLS**

**Sauer-Danfoss priority valves are used in steering systems with load sensing steering units. In such systems steering always has first priority.**

**VERSIONS**

**Load sensing static priority valves**

Load sensing static steering units require load sensing static priority valves. Load sensing static steering systems have no oil flow in the LS connection when the steering unit is in neutral position.

**Load sensing dynamic priority valves**

Load sensing dynamic steering units require load sensing dynamic priority valves. Load sensing dynamic steering systems have a constant oil flow in the LS connection from the priority valve to the steering unit even when the steering unit is in neutral position.

**Ports:**

- P = pump,
- CF = controlled flow (priority oil flow),
- EF = excess flow,
- L = left,
- R = right,
- T = tank,
- LS = load sensing,
- PP = pilot pressure

**OLSA 40/80**

The OLSA 40 and OLSA 80 “flange on” priority valves are used in load sensing steering systems, built onto OSPC LS (OLSA) steering units.

![OLSA 40/80 diagram](image)

**OLSA static**

**OLSA dynamic**

**Legend:**

- A: PP-damping orifice
- B: LS-orifice
- C: Dynamic-orifice
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
Priority valves OLSA and OLS

VERSIONS

The OLS 40, OLS 80 and OLS 120 "in line" priority valves are used in load sensing steering systems together with OSPB LS, OSPC LS, OSPF LS, OSPD LS, OSPQ LS and OSPL LS steering units.

**OLS 40/80**

**OLS 120**

The OLS 160 "in line" priority valve is used in load sensing steering systems together with OSPB LS, OSPC LS, OSPF LS, OSPD LS, OSPQ LS and OSPL LS steering units.

**OLS 160**

OLS 160 is also available without pilot pressure relief valve.
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
Priority valves OLSA and OLS

SYSTEM SIZING

The steering system pump is sized so that satisfactory performance is achieved for both steering and working hydraulics - even at idle.
Before selecting a priority valve, consider
- the type of steering unit (LS static, LS dynamic or OSPF LS dynamic)
- the displacement of the steering unit
- the pump flow
- the application's requirement for energy optimization, initial steering response time and stability, as these all govern the selection for control spring pressure
- whether the priority valve should have internal PP (Pilot Pressure) or external PP-connection depends on the pressure drop in the pump line between the priority valve’s CF-port (Controlled Flow) and the steering unit’s P-port. With normal hose and tube dimensions and less than 5 m distance between priority valve and steering unit, the immediate choice is normally a priority valve with internal PP.

The following survey lists the code numbers of the priority valves that are the most frequently used in connection with the above Sauer-Danfoss steering unit types. All priority valves in the code number tables, except OLS 160 static, have internal PP connection. OLS 160 static in the code number table all have external PP connection.

<table>
<thead>
<tr>
<th>Priority valve</th>
<th>Code Numbers</th>
<th>Connections</th>
<th>Control spring pressure bar [psi]</th>
<th>Weight kg [lb]</th>
</tr>
</thead>
<tbody>
<tr>
<td>OLSA 40</td>
<td>152B0001</td>
<td>T, R, L: G 3/8, P, EF: G 1/2</td>
<td>4 [58]</td>
<td>2,1 [4.63]</td>
</tr>
<tr>
<td>OLSA 40</td>
<td>152B0002</td>
<td>15280122</td>
<td>7 [101.5]</td>
<td>2,1 [4.63]</td>
</tr>
<tr>
<td>OLSA 40</td>
<td>152B0003</td>
<td>15280124</td>
<td>10 [145]</td>
<td>2,1 [4.63]</td>
</tr>
<tr>
<td>OLSA 80</td>
<td>152B0016</td>
<td>15280019</td>
<td>4 [58]</td>
<td>2,1 [4.63]</td>
</tr>
<tr>
<td>OLSA 80</td>
<td>152B0017</td>
<td>15280020</td>
<td>7 [101.5]</td>
<td>2,1 [4.63]</td>
</tr>
<tr>
<td>OLSA 80</td>
<td>152B0015</td>
<td>15280125</td>
<td>10 [145]</td>
<td>2,1 [4.63]</td>
</tr>
</tbody>
</table>

OLS/OLSA static priority valves for load sensing static steering units

<table>
<thead>
<tr>
<th>Priority valve</th>
<th>Code Numbers</th>
<th>Connections</th>
<th>Control spring pressure bar [psi]</th>
<th>Weight kg [lb]</th>
</tr>
</thead>
<tbody>
<tr>
<td>OLS 40</td>
<td>152B0231</td>
<td>LS: G 3/4, P, EF, CF: G 1/2</td>
<td>4 [58]</td>
<td>1,0 [2.2]</td>
</tr>
<tr>
<td>OLS 40</td>
<td>152B0232</td>
<td>15280237</td>
<td>7 [101.5]</td>
<td>1,0 [2.2]</td>
</tr>
<tr>
<td>OLS 40</td>
<td>152B0233</td>
<td>15280238</td>
<td>10 [145]</td>
<td>1,0 [2.2]</td>
</tr>
<tr>
<td>OLS 80</td>
<td>152B0261</td>
<td>15280267</td>
<td>4 [58]</td>
<td>1,0 [2.2]</td>
</tr>
<tr>
<td>OLS 80</td>
<td>152B0262</td>
<td>15280268</td>
<td>7 [101.5]</td>
<td>1,0 [2.2]</td>
</tr>
<tr>
<td>OLS 80</td>
<td>152B0263</td>
<td>15280280</td>
<td>10 [145]</td>
<td>1,0 [2.2]</td>
</tr>
</tbody>
</table>
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
Priority valves OLSA and OLS

### CODE NUMBERS AND WEIGHTS

**OLS/OLSA static priority valves for load sensing statics steering units**

**OLS 120 static**

<table>
<thead>
<tr>
<th>Priority valve</th>
<th>Code Numbers</th>
<th>Connections</th>
<th>Control spring pressure</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>European version</td>
<td>US version</td>
<td>bar [psi]</td>
</tr>
<tr>
<td>OLS 120</td>
<td>152B2232</td>
<td>LS: G 1⁄4</td>
<td>LS: 7⁄16 -20 UNF</td>
<td>7 [101.5]</td>
</tr>
<tr>
<td></td>
<td>152B2233</td>
<td>P, EF: G 3⁄4</td>
<td>P, EF: 1 1⁄16 - 12 UNF</td>
<td>10 [145]</td>
</tr>
</tbody>
</table>

**OLS 160 static**

<table>
<thead>
<tr>
<th>Priority valve</th>
<th>Code Numbers</th>
<th>Connections</th>
<th>Control spring pressure</th>
<th>Pilot pressure relief valve</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>European version</td>
<td>US version</td>
<td>bar [psi]</td>
<td>bar [psi]</td>
</tr>
</tbody>
</table>

**OLS/OLSA dynamic priority valves for load sensing dynamic steering units**

**OLSA 40 dynamic and OLSA 80 dynamic for OSPC LS dynamic**

<table>
<thead>
<tr>
<th>Priority valve</th>
<th>Code Numbers</th>
<th>Connections</th>
<th>Control spring pressure</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>European version</td>
<td>US version</td>
<td>bar [psi]</td>
</tr>
<tr>
<td>OLSA 40</td>
<td>15288001</td>
<td>P, EF: G 3⁄8</td>
<td>T, R, L: 3⁄8 -18 UNF</td>
<td>4 [58]</td>
</tr>
<tr>
<td>OLSA 40</td>
<td>15288041</td>
<td>P, EF: G 1⁄2</td>
<td>T, R, L: 3⁄8 -14 UNF</td>
<td>7 [101.5]</td>
</tr>
<tr>
<td>OLSA 40</td>
<td>15288046</td>
<td>P, EF: G 1⁄2</td>
<td>T, R, L: 3⁄8 -14 UNF</td>
<td>10 [145]</td>
</tr>
<tr>
<td>OLSA 80</td>
<td>15288047</td>
<td>P, EF: G 3⁄8</td>
<td>T, R, L: 3⁄8 -18 UNF</td>
<td>4 [58]</td>
</tr>
<tr>
<td>OLSA 80</td>
<td>15288048</td>
<td>P, EF: G 1⁄2</td>
<td>T, R, L: 3⁄8 -14 UNF</td>
<td>7 [101.5]</td>
</tr>
<tr>
<td>OLSA 80</td>
<td>15288049</td>
<td>P, EF: G 1⁄2</td>
<td>T, R, L: 3⁄8 -14 UNF</td>
<td>10 [145]</td>
</tr>
</tbody>
</table>
### CODE NUMBERS AND WEIGHTS

#### OLS/OLSA dynamic priority valves for load sensing dynamic steering units

**OLS 40 dynamic and OLS 80 dynamic for OSPB, OSPC, OSPD, OSPQ and OSPL LS dynamic**

<table>
<thead>
<tr>
<th>Priority valve</th>
<th>Code Numbers</th>
<th>Connections</th>
<th>Control spring pressure</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>OLS 40</td>
<td>152B8231</td>
<td>LS: G ¼</td>
<td>4 [58]</td>
<td>1.0 [2.2]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CF: G ½</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OLS 80</td>
<td>152B8257</td>
<td>LS: G ¼</td>
<td>10 [145]</td>
<td>1.0 [2.2]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CF: G ½</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**OLS 80 dynamic with low pressure drop (P-EF) spool for OSPB, OSPC, OSPD, OSPQ and OSPL LS dynamic**

<table>
<thead>
<tr>
<th>Priority valve</th>
<th>Code Numbers</th>
<th>Connections</th>
<th>Control spring pressure</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>OLS 80</td>
<td>152B8259</td>
<td>LS: G ¼</td>
<td>7 [101.5]</td>
<td>1.0 [2.2]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CF: G ½</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**OLS 120 dynamic for OSPB, OSPC, OSPD, OSPQ and OSPL LS dynamic**

<table>
<thead>
<tr>
<th>Priority valve</th>
<th>Code Numbers</th>
<th>Connections</th>
<th>Control spring pressure</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>OLS 120</td>
<td>152B8132</td>
<td>LS: G ¼</td>
<td>7 [101.5]</td>
<td>2.1 [4.63]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CF: G ½</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**OLS 160 dynamic for OSPB, OSPC, OSPD, OSPQ and OSPL LS dynamic**

<table>
<thead>
<tr>
<th>Priority valve</th>
<th>Code Numbers</th>
<th>Connections</th>
<th>Control spring pressure</th>
<th>Pilot pressure relief valve</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>CF: G ½</td>
<td></td>
<td>170 [2465]</td>
<td></td>
</tr>
</tbody>
</table>

---

**Priority valves OLSA and OLS**

- Load Sensing Steering units, Priority valves and Flow amplifiers
- Technical Information
- OLS/OLSA dynamic priority valves for load sensing dynamic steering units
**Load Sensing Steering units, Priority valves and Flow amplifiers**

**Technical Information**

**Priority valves OLSA and OLS**

### CODE NUMBERS AND WEIGHTS

#### OLS dynamic priority valves for OSPF LS dynamic steering units

**OLS 40 dynamic and OLS 80 dynamic**

<table>
<thead>
<tr>
<th>Priority valve</th>
<th>Code Numbers</th>
<th>Control spring pressure</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>bar [psi] kg [lb]</td>
<td></td>
</tr>
<tr>
<td>OLS 40</td>
<td>152B8031</td>
<td>10 [145] 1.0 [2.20]</td>
<td></td>
</tr>
<tr>
<td>OLS 80</td>
<td>152B8258</td>
<td>7 [101.5] 1.0 [2.20]</td>
<td></td>
</tr>
</tbody>
</table>

#### OLS 120 dynamic

<table>
<thead>
<tr>
<th>Priority valve</th>
<th>Code Numbers</th>
<th>Control spring pressure</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>bar [psi] kg [lb]</td>
<td></td>
</tr>
<tr>
<td>OLS 120</td>
<td>152B8147</td>
<td>7 [101.5] 2.1 [4.63]</td>
<td></td>
</tr>
</tbody>
</table>

#### OLS 160 dynamic

<table>
<thead>
<tr>
<th>Priority valve</th>
<th>Code Numbers</th>
<th>Control spring pressure</th>
<th>Pilot pressure relief valve</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>bar [psi] kg [lb]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OLS 160</td>
<td>152B8158</td>
<td>7 [101.5] none</td>
<td></td>
<td>4.4 [9.7]</td>
</tr>
<tr>
<td>OLS 160</td>
<td>152B8113</td>
<td>10 [145] none</td>
<td></td>
<td>4.4 [9.7]</td>
</tr>
</tbody>
</table>

If you require other port connections, other control spring pressure and/or other PP connection, go to the survey on page 47, and tick off the desired specifications, then consult the Sauer-Danfoss Sales Organization.
### Load Sensing Steering units, Priority valves and Flow amplifiers

#### Technical Information

#### Priority valves OLSA and OLS

**SPECIFICATION TABLE FOR NON CATALOGUE NUMBERS OF SAUER-DANFOSS PRIORITY VALVES**

Fill in your company data and place x’s in the table where appropriate, then send to your Sauer-Danfoss Sales Organization.

<table>
<thead>
<tr>
<th>Your company</th>
<th>Name</th>
<th>Vehicle</th>
<th>Potential pcs/year</th>
<th>Completed by</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Your application**

- Pump flow to OLS/OLSA at idle, l/min [US gal/min]
- Pump flow to OLS/OLSA at max engine speed, l/min [US gal/min]

**Priority valve type**

- OLSA 40
- OLSA 80
- OLS 40
- OLS 80
- OLS 120
- OLS 160

**Load Sensing type**

- Static
- Dynamic
- Dynamic for OSPF steering unit

**Spool type**

- Standard
- Low pressure drop, P-EF (only OLS/OLSA 80 dynamic)

**Control spring bar**

- 4
- 5.5 (only OLS/OLSA 40/80)
- 7
- 10
- 12 (only OLS 160)

**PP-connection**

- Internal
- External

**Ports**

**OLSA**

- G:
  - P, EF: G ½ - S**
  - T, L, R: G 1/8 - S**
- Metric 1:
  - P, EF, T, L, R: M 18 x 1.5 - O* + S**
- Metric 2:
  - P, EF: M 22 x 1.5 - O* + S**
- UNF:
  - T, L: T, R: M 18 x 1.5 - O* - S**
  - G:
  - Metric:
  - UNF:

**OLSA 40/80**

- G:
  - P, CF, EF: G ½ - S**
  - LS: G ¼ - S**
- Metric:
  - P, EF: M 22 x 1.5 - O* + S**
  - CF: M 18 x 1.5 - O* + S**
  - LS: M 12 x 1.5 - O* + S**
- UNF:
  - P, EF: 7/8 - 14 UNF - O*
  - LS:

**OLSA 120**

- G:
  - P, CF, EF: G ¼ - S**
  - LS: G ¼ - S**
  - LS, PP: G ¼ - S**
- Metric:
  - P, EF: M 27 x 2 - O* + S**
  - CF: M 18 x 1.5 - O* + S**
  - LS, PP: M 12 x 1.5 - O* + S**
- UNF:
  - P, EF: 11/16 - 12 UNF - O*
  - LS, PP, T: 11/16 - 20 UNF - O*

**OLSA 160**

- G 1:
  - P, EF: G ½ - S**
  - CF: G ½ - S**
  - LS, PP, T: G ¼ - S**
- G 2:
  - P, EF: G 1 - S**
  - CF: G ½ - S**
  - LS, PP, T: G ¼ - S**
- UNF 1:
  - P, EF: 1 1/16 - 12 UNF - O*
  - CF: 3/4 - 16 UNF - O*
  - LS, PP, T: 7/16 - 20 UNF - O*
- UNF 2:
  - P, EF: 1 1/16 - 12 UNF - O*
  - CF: 7/8 - 14 UNF - O*
  - LS, PP, T: 7/16 - 20 UNF - O*

**Ports**

- PP port only exists when external PP connection is used.
- Ports OLS 160: T port only exists with integrated pilot pressure relief valve (RV)
- O*: O-ring chamfer on port connections
- S**: Spot face around port connections

An alternative way to specify a variant is to state an existing code number and add the modifications, you would like to have implemented in the basic priority valve.

- Code number of basic priority valve: __________________________
- Requested modifications:

<table>
<thead>
<tr>
<th>RV, OLS 160 bar</th>
<th>70</th>
<th>80</th>
<th>90</th>
<th>100</th>
<th>110</th>
<th>120</th>
<th>140</th>
<th>170</th>
<th>190</th>
<th>200</th>
<th>210</th>
<th>no relief valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit black painted</td>
<td>Yes</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>----------------</td>
</tr>
</tbody>
</table>

Ports: PP port only exists when external PP connection is used. Ports OLS 160: T port only exists with integrated pilot pressure relief valve (RV)

O*: O-ring chamfer on port connections
S**: Spot face around port connections
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
Priority valves OLSA and OLS

### TECHNICAL DATA

#### Max. pressure on connections

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>OLS 120</td>
<td>120 [31.70]</td>
<td>250 [3025]</td>
<td>210 [3045]</td>
<td></td>
<td>210 [3045]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Pressure drop in priority valves

This data comes from measurements on a representative sample of priority valves from production. Oil with viscosity of 21 mm$^2$/s at 50 °C [102 SUS at 122 °F] was used during measuring. Measurement made when pressure on the LS connection is zero (steering unit in neutral position). The minimum curves apply when the pressure on the EF connection is higher than the actual control spring pressure. The curves for control spring pressure of 4, 7, 10 or 12 bar [58, 101, 145 or 174 psi] apply when pressure on the EF connection is zero.

Pressure drop P-EF for static priority valves

**OLSA/OLS 40**

**OLSA/OLS 80**
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
Priority valves OLSA and OLS

TECHNICAL DATA

Pressure drop P-EF for static priority valves
OLS 120

OL S 160

1528185,11

15281188,11
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
Priority valves OLSA and OLS

TECHNICAL DATA

Pressure drop P-EF for dynamic priority valves

OLSA/OLS 40

![Graph of OLSA/OLS 40](image1)

OLSA/OLS 80

![Graph of OLSA/OLS 80](image2)

A: OLSA/OLS 80 Dynamic for OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL LS Dynamic
B: OLSA/OLS 80 Dynamic with low pressure drop (P-EF) spool for OSPB, OSPC, OSPD, OSPQ, OSPL LS Dynamic
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
Priority valves OLSA and OLS

TECHNICAL DATA

Pressure drop P-EF for dynamic priority valves

OLS 120

A: OLS 120 Dynamic for OSPB, OSPC, OSPD, OSPQ, OSPL LS Dynamic
B: OLS 120 Dynamic for OSPF LS Dynamic

OLS 160

A: OLS 160 Dynamic for OSPB, OSPC, OSPD, OSPQ, OSPL LS Dynamic
B: OLS 160 Dynamic for OSPF LS Dynamic
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
Priority valves OLSA and OLS

TECHNICAL DATA

**OLS 160, pilot pressure relief valve (P - T, Qp) characteristic**

OLS 160 with pilot pressure relief valve is used in connection with Sauer-Danfoss steering units without pilot pressure relief valve, normally steering unit type OSPL.

The pilot pressure relief valve protects the steering unit against excessive pressure. The pilot pressure relief valve in OLS 160 operates with the priority valve spool in the OLS 160 to limit the maximum steering pressure P-T measured across the steering unit ports.

The pilot pressure relief valve is set when an oil flow of 80 l/min[21 US gal/min] is supplied to OLS 160.

Setting tolerance:

- \( \leq 170 \text{ bar } [2466 \text{ psi}] \): rated value +5 bar [72.5 psi]
- > 170 bar [2466 psi]: rated value +10 bar [145 psi]

![Graph showing the characteristic of OLS 160, pilot pressure relief valve (P - T, Qp).](image-url)

-Qp = Pump flow
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
Priority valves OLSA and OLS

DIMENSIONS

European version:
P, EF:
G 1/4 w. spot face
14 mm [0.55 in] deep
x = 34 mm [1.34 in],
max. 1.5 mm [0.06 in] deep
or M18 x 1.5 ISO 6149
14.5 mm [0.57 in] deep
x = 29 mm [1.14 in],
max. 1.5 mm [0.06 in] deep
or M22 x 1.5 ISO 6149,
15,5 mm [0.61 in] deep
x = 34 mm [1.34 in],
max. 1.5 mm [0.06 in] deep

T, L, R:
G 3/8 w. spot face
12 mm [0.47 in] deep
y = 34 mm [1.34 in],
max. 1.5 mm [0.06 in] deep
or M18 x 1.5 ISO 6149,
15 mm [0.59 in] deep
y = 29 mm [1.14 in],
max. 1.5 mm [0.06 in] deep

US version:
P, EF:
7/8-14 UNF O-ring boss
16.7 mm [0.66 in] deep
x = 34 mm [1.34 in],
max. 1.5 mm [0.06 in] deep

T, L, R:
7/16 - 18 UNF O-ring boss
12.7 mm [0.50 in] deep
y = 25 mm [0.98 in],
max. 1.5 mm [0.06 in] deep
Load Sensing Steering units, Priority valves and Flow amplifiers

Technical Information

Priority valves OLSA and OLS

**DIMENSIONS**

**OLS 40, OLS 80**

European version:

P, EF:
- G ½ w. spot face
  - 15 mm [0.59 in] deep
  - x = 29 mm [1.14 in],
  - max. 1.5 mm [0.06 in] deep
  - or M22 x 1.5 ISO 6149
  - 15 mm [0.59 in] deep,
  - x = 34 mm [1.34 in],
  - max. 1 mm [0.04 in] deep

CF:
- G ½ w. spot face
  - 14 mm [0.55 in] deep
  - y = 29 mm [1.14 in],
  - max. 1.5 mm [0.06 in] deep
  - or M18 x 1.5 ISO 6149
  - 12 mm [0.47 in] deep,
  - y = 29 mm [1.14 in],
  - max. 1 mm [0.04 in] deep

LS:
- G ¼ w. spot face
  - 12.5 mm [0.49 in] deep
  - z = 21 mm [0.83 in],
  - max. 1 mm [0.04 in] deep
  - or M12 x 1.5 ISO 6149
  - 12.5 mm [0.49 in] deep,
  - z = 22 mm [0.86 in]
  - 0 mm deep

US version:

P, EF:
- 7/8 - 14 UNF O-ring boss
  - 15 mm [0.59 in] deep
  - x = 34 mm [1.14 in],
  - max. 1.3 [0.05] deep

CF:
- ¾-16 UNF O-ring boss
  - 14.3 mm [0.56 in] deep
  - y = 30 mm [1.18 in],
  - max. 1.3 mm [0.05 in] deep

LS:
- ½-20 UNF O-ring boss
  - 12.5 mm [0.49 in] deep
  - z = 21 mm [0.83 in],
  - max. 1 mm [0.04 in] deep
DIMENSIONS

OLS 120

European version:

P, EF:
- G ¼ w. spot face
  x = 42 mm [1.65 in],
  max. 2.5 mm [0.10 in] deep
  or M27 x 2 ISO 6149
  x = 40 mm [1.57 in],
  max. 2.5 mm [0.10 in] deep

CF:
- G ½ w. spot face
  y = 34 mm [1.34 in],
  max. 2.5 mm [0.10 in] deep
  or M18 x 1.5 ISO 6149
  y = 29 mm [1.14 in],
  max. 2 mm [0.08 in] deep

LS, PP:
- G ¼ w. spot face
  12 mm [0.47 in] deep
  z = 19 mm [0.75 in]
  0 mm deep
  or M12 x 1.5 ISO 6149
  11.5 mm [0.45 in] deep,
  z = 19 mm [0.75 in]
  0 mm deep

US version:

P, EF:
- 1/16 - 12 UN O-ring boss
  x = 41 mm [1.61 in],
  max. 2.4 mm [0.09 in] deep

CF:
- ¼ - 16 UNF O-ring boss
  y = 30 mm [1.18 in],
  max. 2 mm [0.08 in] deep

LS, PP:
- 7/16 - 20 UNF O-ring boss
  11.5 mm [0.45 in] deep
  z = 19 mm [0.75 in], 0 mm deep
Load Sensing Steering units, Priority valves and Flow amplifiers

Technical Information

Priority valves OLSA and OLS

**DIMENSIONS**

**OLS 160**

**European version:**

**P, EF:**
- G ¼ w. spot face
  - x = 42 mm [1.65 in], max. 2.5 mm [0.10 in] deep
  - or G 1 w. spot face
  - x = 47 mm [1.85 in], max. 2.5 mm [0.10 in] deep

**CF:**
- G ½ w. spot face
  - y = 34 mm [1.34 in], max. 2.5 mm [0.10 in] deep
  - or G ¾ w. spot face
  - y = 38 mm [1.50 in], max. 2.5 mm [0.10 in] deep

**LS, PP, T:**
- G ¼ w. spot face
  - 12 mm [0.47 in] deep
  - z = 22.8 mm [0.89 in], max. 1 mm [0.04 in] deep
  - u = 25 mm [0.98 in], max. 1.5 mm [0.06 in] deep

**US version:**

**P, EF:**
- 1 ⅛/16-12 UNF O-ring boss
  - x = 41 mm [1.61 in], max. 2.5 mm [0.10 in] deep
  - or 1 ½/16 - 12 UNF O-ring boss
  - x = 49 mm [1.93 in], max. 2.5 mm [0.10 in] deep

**CF:**
- ¾-16 UNF O-ring boss
  - y = 32 mm [1.26 in], max. 2.5 mm [0.10 in] deep
  - ⅝ - 14 UNF O-ring boss
  - y = 34 mm [1.34 in], max. 2.5 mm [0.10 in] deep

**LS, PP, T:**
- ⅛ - 20 UNF O-ring boss
  - 11.5 mm [0.45 in] deep
  - z = 22.8 mm [0.89 in], max. 1.5 mm [0.06 in] deep
  - u = 21 mm [0.83 in], max. 1.6 mm [0.06 in] deep
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
Flow amplifiers OSQA, OSQB and OSQB/OLSQ

**VERSIONS**

**OSQA and OSQB static**
Flow amplifier OSQ is used in steering systems of large vehicles and vessels that need high oil flow for their steering. A steering system of this nature consists of a steering unit and a flow amplifier.

**OSQA static**

**OSQB static**

F300630
VERSIONS

OSQB dynamic with OLSQ priority valve for emergency steering

Flow amplifiers OSQA, OSQB and OSQB/OLSQ
Load Sensing Steering units, Priority valves and Flow amplifiers

Technical Information

Flow amplifiers OSQA, OSQB and OSQB/OLSQ

**CODE NUMBERS AND WEIGHTS**

**OSQA and OSQB static flow amplifiers for load sensing static steering units**

These flow amplifiers have to be used in connection with steering units type OSPBX LS or OSPLX LS:

<table>
<thead>
<tr>
<th>Flow amplifier</th>
<th>Code Numbers</th>
<th>Setting pressures</th>
<th>Control spring pressure</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>European</td>
<td>US version</td>
<td>Pilot pressure</td>
<td></td>
</tr>
<tr>
<td></td>
<td>version</td>
<td></td>
<td>valve</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSQA 5</td>
<td>150F0041</td>
<td>150F0044</td>
<td>170 bar [2465]</td>
<td>230 bar [3335]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSQB 5</td>
<td>150F0031</td>
<td>150F0054</td>
<td>170 bar [2465]</td>
<td>230 bar [3335]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSQB 8</td>
<td>150F0032</td>
<td>150F0055</td>
<td>170 bar [2465]</td>
<td>230 bar [3335]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**OSQB/OLSQ dynamic flow amplifier for load sensing dynamics steering units.**

OSQB with OLSQ has no pilot pressure relief valve.

This flow amplifier has to be used in connection with steering unit type OSPCX LS, which has incorporated pilot pressure relief valve:

<table>
<thead>
<tr>
<th>Flow amplifier</th>
<th>Code Numbers</th>
<th>Setting pressures</th>
<th>Control spring pressure</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>European</td>
<td>Shock valves</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OSQB 8/OLSQ</td>
<td>152B8010</td>
<td>260 bar [3770 psi]</td>
<td>7 [101.5]</td>
<td>32 [70.6]</td>
</tr>
</tbody>
</table>

If you require other amplification factors, other valve settings or other control spring pressures, please fill in the order form on page 61 and contact the Sauer-Danfoss Sales Organization.
**SPECIFICATION TABLE FOR NON CATALOGUE NUMBERS OF SAUER-DANFOSS FLOW AMPLIFIERS**

Fill in your company data and place x’s in the table where appropriate, then send to your Sauer-Danfoss Sales Organization.

<table>
<thead>
<tr>
<th>Your company</th>
<th>Name</th>
<th>Vehicle</th>
<th>Potential pcs/year</th>
<th>Completed by</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Your application

Flow amplifier type | OSQA | OSQB | OSQB/OLSQ

Amplification factor | 4 | 5 | 8 | 9.1 | 16.5

Load sensing type | Static | Dynamic |

Control spring bar | 7 [101] | 10 [145] | 16 [232] |

PP-connection | Internal | External |

Ports, OSQA

G: European version
HP, EF, HT, CL, CL: G ¼
P, T, L, R: G ½
PP, LS: G ¼

UNF: US version
HP, EF, HT, CL, CR: 1 ¼ - 12 UN
P, T, L, R: ¾ - 16 UNF
PP, LS: ½ - 20 UNF

Ports, OSQB

G: European version
HP, EF: 1 ¼ in SAE flange
HT, CL, CR: 1 in SAE flange
P, T, L, R: G ½
PP, LS: G ¼

UNF: US version
HP, EF: 1 ¼ in SAE flange
HT, CL, CR: 1 in SAE flange
P, T, L, R: ¾ - 16 UNF
PP, LS: ½ - 20 UNF

Ports, OSQB/OLSQ

G: (European version)
HP, EF: 1 ¼ in SAE flange
HT, CL, CR: 1 in SAE flange
P_{OSQ}, P_{OLSQ}, T, L, R: G ½
PP, LS: G ¼

Pilot pressure relief valve bar (psi)

100 [1450] | 120 [1740] | 140 [2030] | 170 [2465] | 210 [3045] | No relief valve (only OSQB/OLSQ)

Shock valves, bar (psi)


Back pressure valve

Yes (Only OSQB) | No

Unit black painted

Yes | No

An alternative way to specify a variant is to state an existing code number and add the modifications, you would like to have implemented in the basic flow amplifier.

Code number of basic flow amplifier: __________________________

Requested modifications: ______________________________________

________________________________________________________________________________________________________________________________________________________
Technical Information
Flow amplifiers OSQA, OSQB and OSQB/OLSQ

TECHNICAL DATA

Flow and pressure

<table>
<thead>
<tr>
<th>Flow amplifier</th>
<th>Rated flow to HP-connection l/min [US gal/min]</th>
<th>Max. pressure on connections to HP, EF, CL CR, CF, LS, PP, HT, T bar [psi]</th>
</tr>
</thead>
</table>

Total displacement of steering system

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>OSQA 8</td>
<td>8</td>
<td>1280 [78] 1600 [98]</td>
<td></td>
</tr>
<tr>
<td>OSQA 10</td>
<td>9.1</td>
<td>1456 [89]</td>
<td></td>
</tr>
<tr>
<td>OSQB 4</td>
<td>4</td>
<td>2080 [127]</td>
<td></td>
</tr>
<tr>
<td>OSQB 5</td>
<td>5</td>
<td>2000 [122]</td>
<td></td>
</tr>
<tr>
<td>OSQB 8</td>
<td>8</td>
<td>2520 [154]</td>
<td></td>
</tr>
<tr>
<td>OSQB 10</td>
<td>9.1</td>
<td>2865 [175]</td>
<td></td>
</tr>
<tr>
<td>OSQB 20</td>
<td>16.5</td>
<td>2640 [161]</td>
<td></td>
</tr>
</tbody>
</table>

Installation
The flow amplifier has to be mounted on a flat surface.

Mounting screw

<table>
<thead>
<tr>
<th>Mounting screw</th>
<th>Tightening torque, Nm [lbf-in]</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 10 x 1.5</td>
<td>30 +/- 5 [265 +/- 44]</td>
</tr>
<tr>
<td>1/8 - 16 UNC</td>
<td>40 +/- 5 [354 +/- 44]</td>
</tr>
<tr>
<td>7/16 - 14 UNC</td>
<td>55 +/- 5 [487 +/- 44]</td>
</tr>
</tbody>
</table>

Tightening torque for fittings: Look in sub catalogue "General Steering Components" page 36.
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
Flow amplifiers OSQA, OSQB and OSQB/OLSQ

TECHNICAL DATA

Valve functions in the flow amplifiers
The data below come from measurements on a representative sample of flow amplifiers from production. Oil with viscosity of 21 mm²/s [102 SUS] at 50 °C [122 °C] was used during measuring.

Priority valve
The priority valve is used in load sensing systems where the same pump supplies oil to both the steering system and working hydraulics. The steering system always has first priority. Measurements were made when the pressure on the LS connection is zero. (steering unit is in neutral position). The minimum curves apply when the pressure on the EF connection is higher than the actual control spring pressure. The curves for control spring pressure of 7 bar [101.5 psi] apply when the pressure on the EF connection is zero.

OSQA

OSQB
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
Flow amplifiers OSQA, OSQB and OSQB/OLSQ

TECHNICAL DATA

**OSQ pilot pressure relief valve (HP - HT, Qp) characteristic**
The pilot pressure relief valve protects the steering unit against excessive pressure. The pilot pressure relief valve together with the priority valve limit the maximum steering pressure HP-HT.
The pilot pressure relief valve in OSQA is set with an oil flow of 140 l/min [37 US gal/min] supplied to the HP connection.
The pilot pressure relief valve in OSQB is set with an oil flow of 240 l/min [63.4 US gal/min] supplied to the HP connection.
Setting tolerance: rated value +10 bar [+145 psi]. The curves below are valid for rated settings 170 bar [2466 psi].

**OSQA**

![Graph OSQA]

**OSQB**

![Graph OSQB]
**TECHNICAL DATA**

**Back pressure valve**
The back pressure valve in (OSQB only) increases the capacity of the suction valves. The pressure drop shown applies to the back pressure valve only.

![Graph showing Δp vs. Q_d](image)

**Shock valves**
The shock valves protect the flow amplifier against shock from external forces on the steering cylinders. The shock valves in OSQA and OSQB limit the maximum pressure drop from CL to HT and from CR to HT. The shock valves are set at 10 l/min [2.64 US gal/min]. Setting tolerance: rated value +20 bar [290 psi].

**Suction valves**
The suction valves ensure oil suction on the side of the steering cylinder pistons where in unfavorable conditions cavitation might occur. The capacity of the suction valves is increased in OSQB by the built-in back pressure valve.

![Graph showing HT-CR, HT-CL](image)
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
Flow amplifiers OSQA, OSQB and OSQB/OLSQ

TECHNICAL DATA

Priority valve OLSQ for emergency circuit in OSQB/OLSQ
When under normal steering conditions the stand-by pressure in the main circuit (minimum 7 bar [101.5 psi] priority valve spring in OSQ) overrules the spring pressure in OLSQ (4 bar [58 psi] spring), OLSQ's priority valve will pass oil from the emergency steering pump across OLSQ's P-connection to the flow amplifier's HT tank connection.
If the oil supply from the main pump should fail, the stand-by pressure of OSQ's priority valve in the main pump circuit disappears and relocates the spool in OLSQ to enable the oil from the emergency steering pump to enter the pump circuit in the OSQ.
The curve shows the pressure drop from OLSQ's P-connection to OSQ's HT-connection with an active main pump and neutral positioned steering. The curve solely applies to OSQs without any back pressure valve in the tank line.
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
Flow amplifiers OSQA, OSQB and OSQB/OLSQ

DIMENSIONS  OSQA

European version:
HP, EF, HT, CL, CR:  G 3/4
P, T, L, R:  G 1/2
PP, LS:  G 1/4

A: M10 x 1.5, 21 mm [0.83 in] deep
B: M10 x 1.5, 16 mm [0.63 in] deep

US version:
HP, EF, HT, CL, CR:  1 1/16 - 12 UN
P, T, L, R:  1/4 - 16 UNF
PP, LS:  7/16 - 20 UNF

A:  7/16 - 14 UNC, 21 mm [0.83 in] deep
B:  7/16 - 14 UNC, 16 mm [0.63 in] deep
Load Sensing Steering units, Priority valves and Flow amplifiers
Technical Information
Flow amplifiers OSQA, OSQB and OSQB/OLSQ

DIMENSIONS OSQB

European version:
HP, EF:
1 ¼ in SAE flange
7/16 - 14 UNC
18 mm [0.71 in] deep (8)

HT, CL, CR:
1 in SAE flange
7/8 - 16 UNC
18 mm [0.71 in] deep (12)

P, T, L, R: G ½
PP, LS: G ¼

A: M10 x 1.5, 21 mm [0.83 in] deep
B: M10 x 1.5, 16 mm [0.63 in] deep

US version:
HP, EF:
1 ¼ in SAE flange
7/16 - 14 UNC
18 mm [0.71 in] deep (8)

HT, CL, CR:
1 in SAE flange
7/8 - 16 UNC
18 mm [0.71 in] deep (12)

P, T, L, R: ¾ - 16 UNF
PP, LS: 7/16 - 20 UNF

A: 7/16 - 14 UNC, 21 mm [0.83 in] deep
B: 7/16 - 14 UNC, 16 mm [0.63 in] deep
Load Sensing Steering units, Priority valves and Flow amplifiers

Technical Information

Flow amplifiers OSQA, OSQB and OSQB/OLSQ

**DIMENSIONS**

**OSQB WITH OLSQ**

European version

- **HP, EF:**
  - 1 ¼ in SAE flange
  - 7/16 - 14 UNC
  - 18 mm [0.71 in] deep (8)

- **HT, CL, CR:**
  - 1 in SAE flange
  - 7/8 - 16 UNC
  - 18 mm [0.71 in] deep (12)

- **P<sub>OSQ</sub>**
  - T, L, R: G ½

- **PP, LS, P<sub>OLSQ</sub>**
  - G ¼

- **A:**
  - M10 x 1.5, 21 mm [0.83 in] deep

- **B:**
  - M10 x 1.5, 16 mm [0.63 in] deep
Sauer-Danfoss is a comprehensive supplier providing complete systems to the global mobile market.

Sauer-Danfoss serves markets such as agriculture, construction, road building, material handling, municipal, forestry, turf care, and many others.

We offer our customers optimum solutions for their needs and develop new products and systems in close cooperation and partnership with them.

Sauer-Danfoss specializes in integrating a full range of system components to provide vehicle designers with the most advanced total system design.

Sauer-Danfoss provides comprehensive worldwide service for its products through an extensive network of Authorized Service Centers strategically located in all parts of the world.

OUR PRODUCTS

Hydrostatic transmissions
Hydraulic power steering
Electro-hydraulic power steering
Electric power steering
Closed and open circuit axial piston pumps and motors
Electric motors
Gear pumps and motors
Bent axis motors
Radial piston motors
Orbital motors
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Planetary compact gears
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