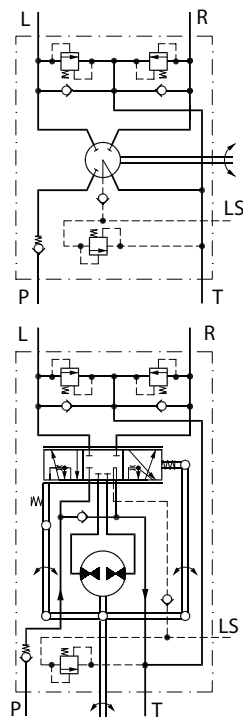


Versions



F300614

**OSPC LS: Steering unit load sensing with integrated valve functions for in line priority valve OLS**



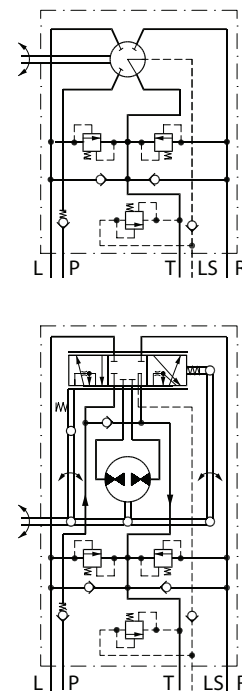
150-595.11

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



F300724

**OSPC LS: Steering unit load sensing with integrated valve functions for flange on priority valve OLSA**



150-596.10

**OSPC LS (OLSA)**  
 Load sensing dynamic non-reaction

**Versions**

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

*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

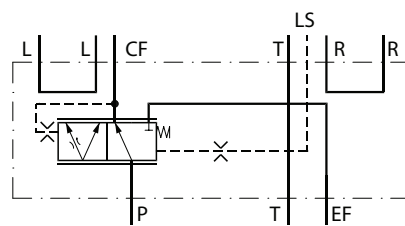
**OLSA 40/80**

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



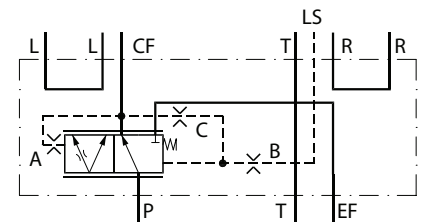
F300625

**OLSA static**



152B135.11

**OLSA dynamic**



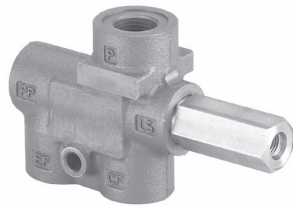
152B170.11

- A: PP-damping orifice
- B: LS-orifice
- C: Dynamic-orifice

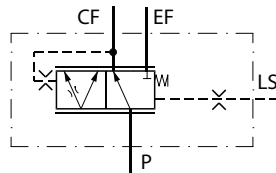
**Versions**

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**



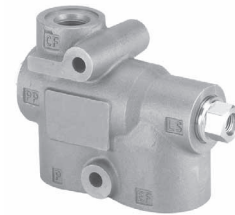
F300624



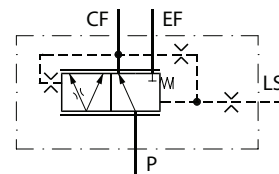
152B134.10

*OLS static*

**OLS 120**



F300623

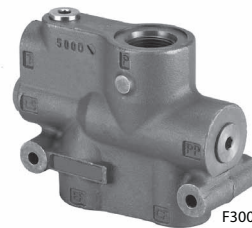


152B171.10

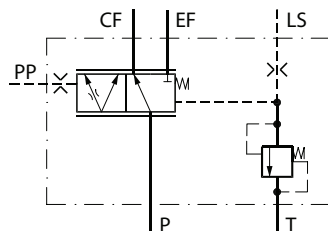
*OLS dynamic*

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**

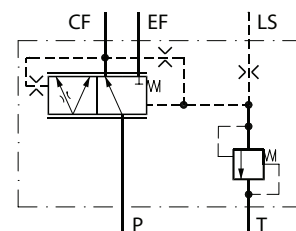


F300622



152B137.11

*OLS static*



152B172.11

*OLS dynamic*

OLS 160 is also available without pilot pressure relief valve.

### 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.

### Code Numbers and Weights

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

*OLSA 40 static and OLSA 80 static*

| Priority valve | Code Numbers                                     |   | Control spring pressure<br>bar [psi] | Weight<br>kg [lb] |
|----------------|--|---|--------------------------------------|-------------------|
|                | European version<br>T,R,L: G 3/8<br>P, EF: G 1/2 | US version<br>T, R, L: 9/16 - 18 UNF<br>P, EF: 7/8 - 14 UNF |                                      |                   |
| OLSA 40        | 152B0001   | -   | 4 [58]                               | 2.1 [4.63]        |
| OLSA 40        | 152B0002   | 152B0122  | 7 [101.5]                            | 2.1 [4.63]        |
| OLSA 40        | 152B0003   | 152B0124  | 10 [145]                             | 2.1 [4.63]        |
| OLSA 80        | 152B0016   | 152B0019  | 4 [58]                               | 2.1 [4.63]        |
| OLSA 80        | 152B0017   | 152B0020  | 7 [101.5]                            | 2.1 [4.63]        |
| OLSA80         | 152B0015   | 152B0125  | 10 [145]                             | 2.1 [4.63]        |

*OLS 40 static and OLS 80 static*

| Priority valve | Code Numbers                                      |  | Control spring pressure<br>bar [psi] | Weight<br>kg [lb] |
|----------------|---|--|--------------------------------------|-------------------|
|                | European version<br>LS: G 1/4<br>P, EF, CF: G 1/2 | US version<br>LS: 7/16 - 20 UNF<br>CF: 3/4 - 16 UNF<br>P, EF: 7/8 - 14 UNF |                                      |                   |
| OLS 40         | 152B0231  | 152B0237   | 4 [58]                               | 1.0 [2.2]         |
| OLS 40         | 152B0232  | 152B0238   | 7 [101.5]                            | 1.0 [2.2]         |
| OLS 40         | 152B0233  | 152B0253   | 10 [145]                             | 1.0 [2.2]         |
| OLS 80         | 152B0261  | 152B0267   | 4 [58]                               | 1.0 [2.2]         |
| OLS 80         | 152B0262  | 152B0268   | 7 [101.5]                            | 1.0 [2.2]         |
| OLS 80         | 152B0263  | 152B0280   | 10 [145]                             | 1.0 [2.2]         |

**Code Numbers and Weights (continued)**

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

*OLS 120 static*

| Priority valve | Code Numbers   |  | Control spring pressure<br>bar [psi] | Weight<br>kg [lb] |
|----------------|--|--|--------------------------------------|-------------------|
|                | Connections  |  |                                      |                   |
|                | European version<br>LS: G 1/4<br>CF: G 1/2<br>P, EF: G 3/4 | US version<br>LS: 7/16 -20 UNF<br>CF: 3/4 - 16 UNF<br>P, EF: 1 1/16 - 12 UNF |                                      |                   |
| OLS 120        | 152B2232   | 152B2238   | 7 [101.5]                            | 2.1 [4.63]        |
| OLS 120        | 152B2233   | 152B2239   | 10 [145]                             | 2.1 [4.63]        |

*OLS 160 static*

| Priority valve | Code Numbers  |   | Control spring pressure<br>bar [psi] | Pilot pressure relief valve<br>bar [psi] | Weight<br>kg [lb] |
|----------------|---|---|--------------------------------------|--|-------------------|
|                | Connections   |   |                                      |  |                   |
|                | European version<br>LS, PP, T: G 1/4<br>CF: G 1/2<br>P, EF: G 3/4 | US version<br>LS, PP, T: 7/16 -20 UNF<br>CF: 3/4 - 16 UNF<br>P, EF: 1 1/16 - 12 UNF |                                      |  |                   |
| OLS 160        | 152B1005  | 152B1085  | 7 [101.5]                            | 170 [2465]                               | 4.4 [9.7]         |
| OLS 160        | 152B1006  | 152B1086  | 10 [145]                             | 170 [2465]                               | 4.4 [9.7]         |

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

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

| Priority valve | Code Numbers                                    |  | Control spring pressure<br>bar [psi] | Weight<br>kg [lb] |
|----------------|---|--|--------------------------------------|-------------------|
|                | Connections                                     |  |                                      |                   |
|                | European version<br>T,R,L: G 3/8<br>P/EF: G 1/2 | US version<br>T,R,L: 9/16 - 18 UNF<br>P/EF: 7/8 - 14 UNF |                                      |                   |
| OLSA 40        | 152B8001  | -  | 4 [58]                               | 2.1 [4.63]        |
| OLSA 40        | 152B8041  | 152B8042   | 7 [101.5]                            | 2.1 [4.63]        |
| OLSA 40        | 152B8046  | 152B8043   | 10 [145]                             | 2.1 [4.63]        |
| OLSA 80        | 152B8047  | -  | 4 [58]                               | 2.1 [4.63]        |
| OLSA 80        | 152B8048  | 152B8044   | 7 [101.5]                            | 2.1 [4.63]        |
| OLSA 80        | 152B8049  | 152B8045   | 10 [145]                             | 2.1 [4.63]        |

**Specification Table for Non Catalogue Numbers of Sauer-Danfoss Priority Valves**

| Your company                         | Name   |         | Vehicle   |   |  |         | Potential, pcs/year  |                 |  |                   | Completed by   |  | Date            |  |
|--------------------------------------|--|---------|---|---|--|---------|--|-----------------|--|-------------------|----------------|--|-----------------|--|
| Your application                     | Pump flow to OLS/OLSA at idle, l/min [USgal/min]   |         |   |   |  |         | Pump flow to OLS/OLSA at max. engine speed, l/min [USgal/min]  |                 |  |                   |                |  |                 |  |
| Priority valve type                  | OLSA 40  | OLSA 80 | OLS 40  | OLS 80  | OLS 120  | OLS 160 | OLSP 80  | OLS 320 in-line |  |                   |                |  |                 |  |
| Load sensing type                    | Static   |         | Dynamic   |   |  |         | Dynamic for OSPF steering unit   |                 |  |                   |                |  |                 |  |
| Spool type                           | Standard   |         | Low pressure drop, P-EF (only OLS/OLSA 80 dynamic)                                    |   |  |         | No CF cut-off (only for OLS 320 for flanging on EHPs)  |                 |  |                   |                |  |                 |  |
| Control spring, bar                  | 4 (only OLS 80, 120, 160, OLSP 80)   |         |   | 5.5 (only OLS/OLSA 40/80)   |  |         | 7  | 10              | 12 (only OLS 160)  | 16 (only OLS 160) |                |  |                 |  |
| PP connection                        | Internal   |         |   |   |  |         | External (not OLSP)  |                 |  |                   |                |  |                 |  |
| Ports, OLSA                          | G: P, EF: G $\frac{1}{2}$ - S**<br>T, L, R: G $\frac{3}{8}$ - S**                                  |         | Metric 1: P, EF, T, L, R:<br>M18 • 1.5 - O*** + S**                                   |   |  |         | Metric 2: P, EF: M22 • 1.5 - O*** + S**<br>T, L, R: M18 • 1.5 - O*** + S**                           |                 | UNF: P, EF: 7/8 - 14 UNF - O***<br>T, L, R: 9/16 - 18 UNF - O*** |                   |                |  |                 |  |
| Ports, OLS 40/80                     | G: P, CF, EF: G $\frac{1}{2}$ - S**<br>LS: G $\frac{1}{2}$ - S**                                   |         |   | Metric: P, EF: M22 • 1.5 - O*** + S**<br>CF: M18 • 1.5 - O*** + S**<br>LS: M12 • 1.5 - O*** + S** |  |         | UNF: P, EF: 7/8 - 14 UNF - O***<br>CF: 3/4 - 16 UNF - O***<br>LS: 7/16 - 20 UNF - O***               |                 |  |                   |                |  |                 |  |
| Ports, OLS 120                       | G: P, EF: G $\frac{3}{4}$ - S**<br>CF: G $\frac{1}{2}$ - S**<br>LS, PP: G $\frac{1}{4}$ - S**      |         |   | Metric: P, EF: M27 • 2 - O*** + S**<br>CF: M18 • 1.5 - O*** + S**<br>LS: M12 • 1.5 - O*** + S**   |  |         | UNF: P, EF: 11/16 - 14 UNF - O***<br>CF: 3/4 - 16 UNF - O***<br>LS: 7/16 - 20 UNF - O***             |                 |  |                   |                |  |                 |  |
| Ports, OLS 160                       | G 1: P, EF: G $\frac{3}{4}$ - S**<br>CF: G $\frac{1}{2}$ - S**<br>LS, PP, T: G $\frac{1}{4}$ - S** |         | P, EF: G1 - S**<br>G 2: CF: G $\frac{3}{4}$ - S**<br>LS, PP, T: G $\frac{1}{4}$ - S** |   | UNF 1: P, EF: 11/16 - 12 UN - O***<br>CF: 3/4 - 16 UNF - O***<br>LS, PP, T: 7/16 - 20 UNF - O*** |         | UNF 2: P, EF: 15/16 - 12 UN - O***<br>CF: 7/8 - 14 UNF - O***<br>LS, PP, T: 7/16 - 20 UNF - O***     |                 |  |                   |                |  |                 |  |
| Ports, OLSP 80 (P: square flange 35) | G: EF: G $\frac{1}{2}$ - S**<br>CF: G $\frac{3}{8}$ - S**<br>LS: G $\frac{1}{4}$ - S**             |         |   | Metric: EF: M22 • 1.5 - O*** + S**<br>CF: M18 • 1.5 - O*** + S**<br>LS: M12 • 1.5 - O*** + S**    |  |         | UNF: EF: 7/8 - 14 UNF - O***<br>CF: 3/4 - 16 UNF - O***<br>LS: 7/16 - 20 UNF - O***                  |                 |  |                   |                |  |                 |  |
| Ports, OLS 320 in-line               | G: P, EF: G1 - S**<br>CF: G $\frac{1}{2}$ - S**<br>LS, PP: G $\frac{1}{4}$ - S**                   |         |   | UNF 1: P, EF: 1 5/16 - 12 UN - O***<br>CF: 3/4 - 16 UNF - O***<br>LS, PP, T: 7/16 - 20 UNF - O*** |  |         | UNF 2: P, EF: 1 5/16 - 12 UN - O***<br>CF: 1 1/16 - 12 UNF - O***<br>LS, PP, T: 7/16 - 20 UNF - O*** |                 |  |                   |                |  |                 |  |
| RV-bar OLS 160 OLS 320               | 80   | 90      | 100   | 110   | 120  | 140     | 170  | 190             | 200  | 210               | Other settings |  | No relief valve |  |
| Unit black painted                   | Yes  |         |   |   |  |         | No   |                 |  |                   |                |  |                 |  |

**Specification Table for  
 Non Catalogue Numbers  
 of Sauer-Danfoss Priority  
 Valves  
 (continued)**

Ports: PP-port only exists when external PP connection is used. T-port only exists for OLS 160 and OLS 320 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 steering unit.

Code number of basic steering unit: \_\_\_\_\_

Requested modifications: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Technical Data**

**Max. Pressure on Connections**

| Priority valve | Rated flow to P-connection |              | Max. pressure on connections |        |     |        |      |        |     |        |     |       |     |        |
|----------------|----------------------------|--------------|------------------------------|--------|-----|--------|------|--------|-----|--------|-----|-------|-----|--------|
|                |                            |              | P, EF                        |        | CF  |        | L, R |        | LS  |        | T   |       | PP  |        |
|                | l/min                      | [US gal/min] | bar                          | [psi]  | bar | [psi]  | bar  | [psi]  | bar | [psi]  | bar | [psi] | bar | [psi]  |
| OLSA 40        | 40                         | [10.57]      | 250                          | [3625] | 210 | [3045] | 280  | [4061] | 210 | [3045] | 20  | [290] |     |        |
| OLSA 80        | 80                         | [21.13]      | 250                          | [3625] | 210 | [3045] | 280  | [4061] | 210 | [3045] | 20  | [290] |     |        |
| OLS 40         | 40                         | [10.57]      | 250                          | [3625] | 210 | [3045] |      |        | 210 | [3045] |     |       | 210 | [3045] |
| OLS 80         | 80                         | [21.13]      | 250                          | [3625] | 210 | [3045] |      |        | 210 | [3045] |     |       | 210 | [3045] |
| OLS 120        | 120                        | [31.70]      | 250                          | [3625] | 210 | [3045] |      |        | 210 | [3045] |     |       | 210 | [3045] |
| OLS 160        | 160                        | [42.27]      | 350                          | [5076] | 210 | [3045] |      |        | 210 | [3045] | 15  | [217] | 210 | [3045] |
| OLSP 80        | 80                         | [21.13]      | 250                          | [3625] | 210 | [3045] |      |        | 210 | [3045] |     |       |     |        |
| OLS 320        | 320                        | [84.54]      | 300                          | [4351] | 280 | [4061] |      |        | 280 | [4061] | 40  | [580] | 280 | [4061] |

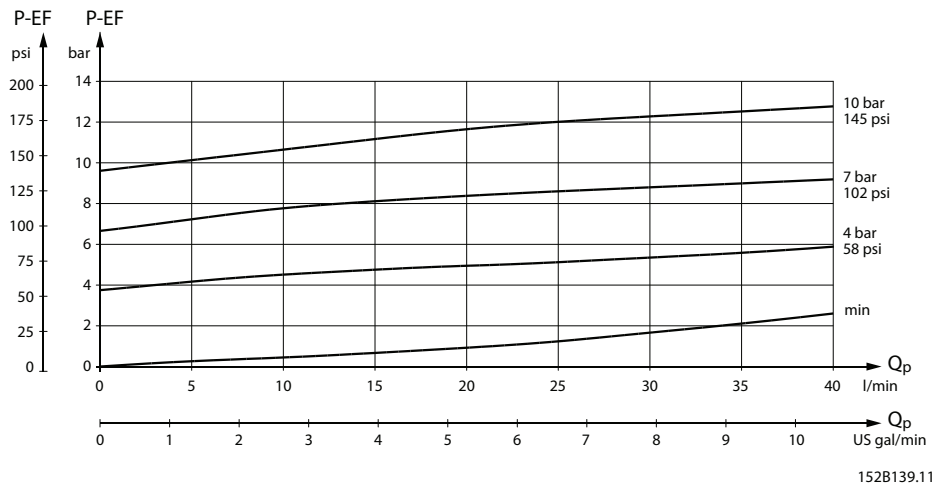
**Pressure Drop in Priority Valves**

**Pressure drop in priority valves**

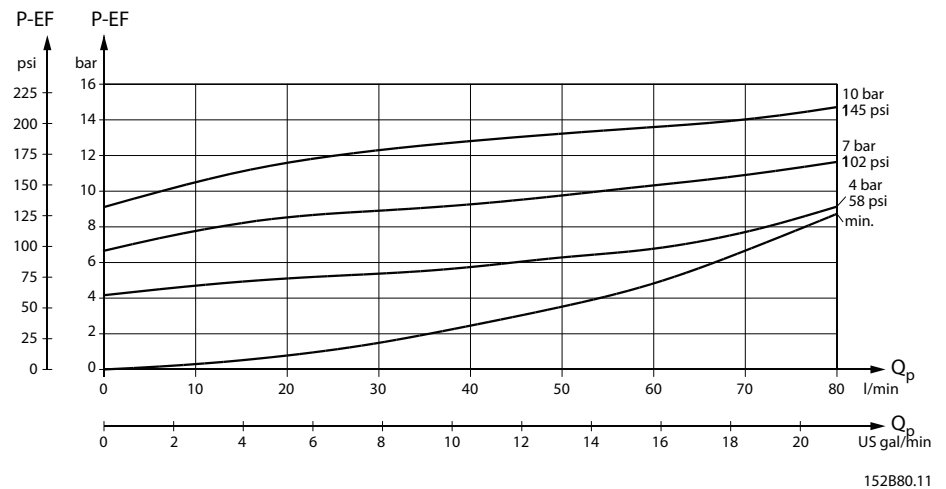
This data comes from measurements on a representative sample of priority valves from production. Oil with viscosity of 21 mm<sup>2</sup>/s at 50 °C [102 SUS at 122 °F] was used during measuring. Measurement made when pressure on the LS connection is zero (steering unit in neutral position). The minimum 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**

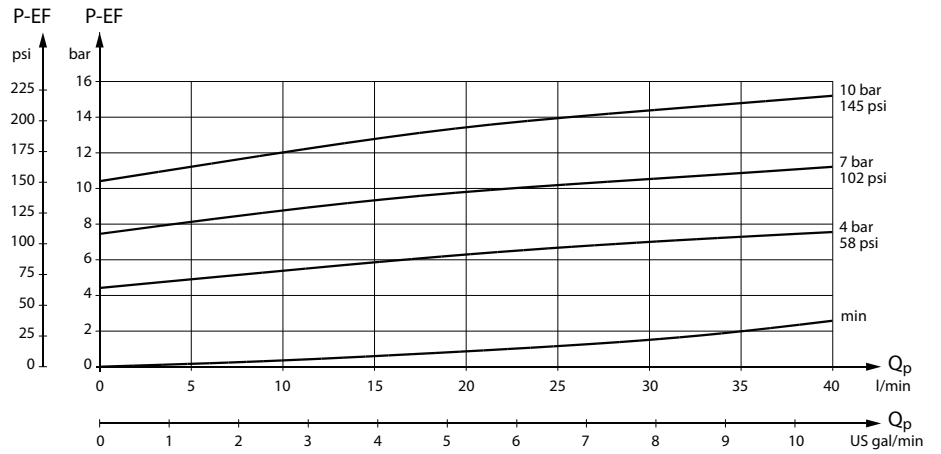




Technical Data  
 (continued)

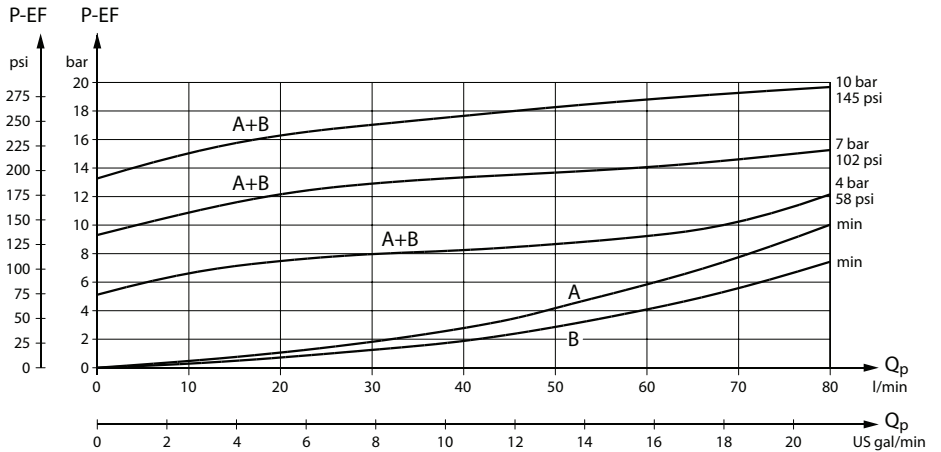
Pressure drop P-EF for dynamic priority valves

OLSA/OLS 40



152B174.10

OLSA/OLS 80



152B175.10

A: OLS/OLSA 80 Dynamic for OSPB, OSPC, OSPF, OSPD, OSPQ, OSPL LS Dynamic

B: OLS/OLSA 80 Dynamic with low pressure drop (P-EF) spool for OSPB, OSPC, OSPD, OSPQ, OSPL LS Dynamic

**Dimensions**

**OLSA**

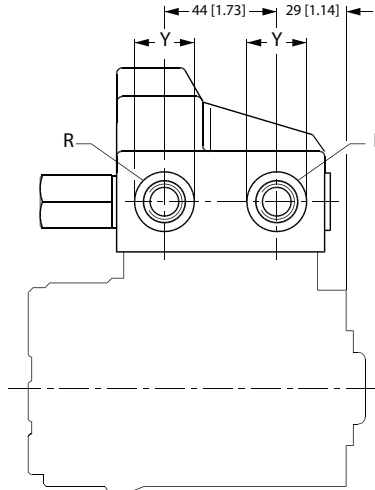
European version:

P, EF:

- G ½ 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 ¾ 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



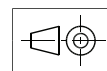
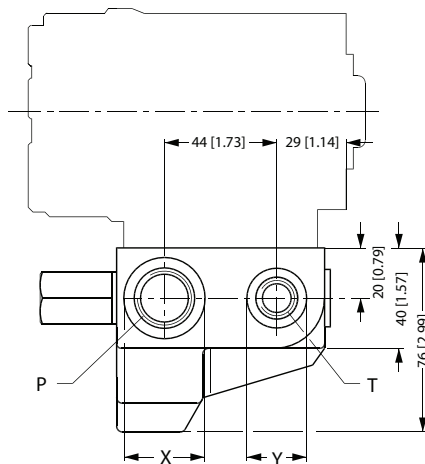
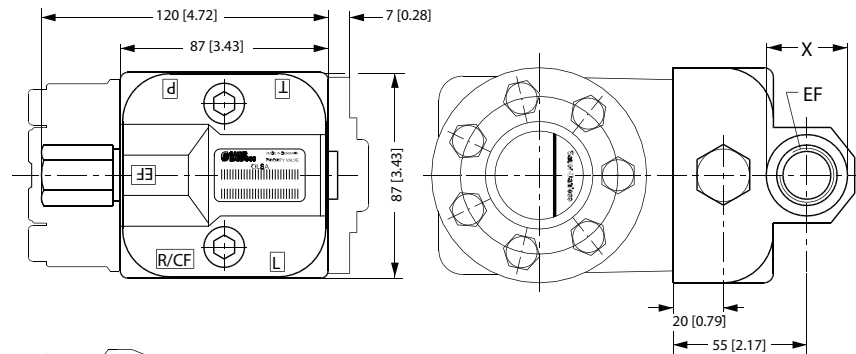
US version:

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:

- 9/16 - 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



152881.12

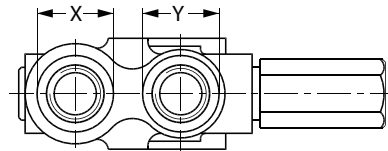
**Dimensions**

**OLS 40, OLS 80**

European version:

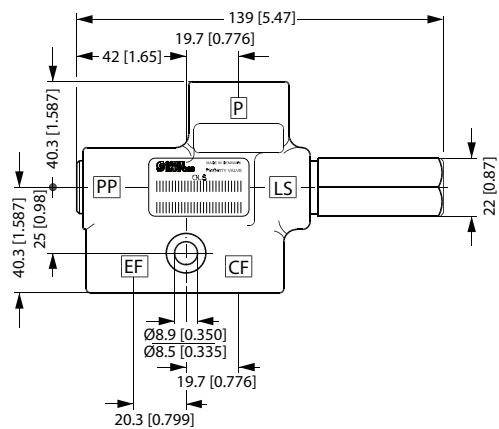
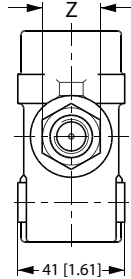
P, EF:

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



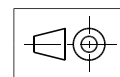
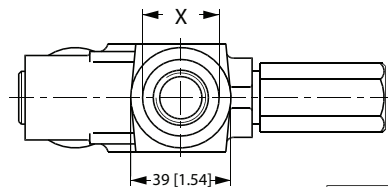
CF:

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



152B136.11

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:

7/16-20 UNF O-ring boss  
 12.5 mm [0.49 in] deep  
 z = 21 mm [0.83 in],  
 max. 1 mm [0.04 in] deep