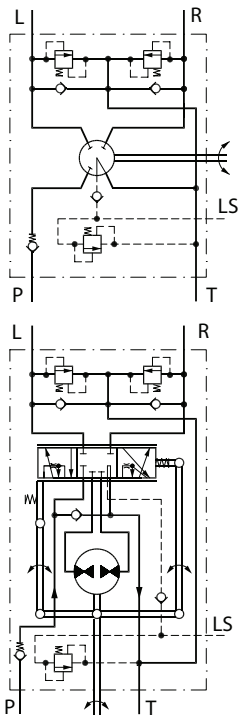
Versions

F300614

F300724

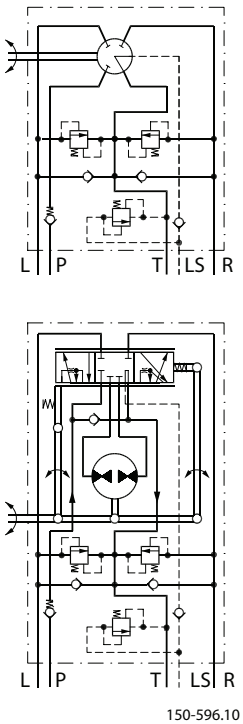
OSPC LS: Steering unit load sensing with integrated valve functions for in line priority valve OLS



150-595.11

OSPC LS (OLS)
Load sensing dynamic non-reaction

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

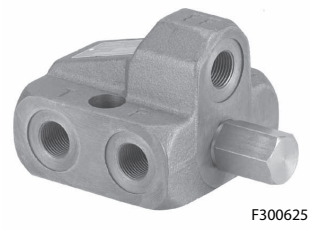
Sauer-Danfoss priority valves are used in steering systems with load sensing steering units. In such systems steering always has first priority

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.

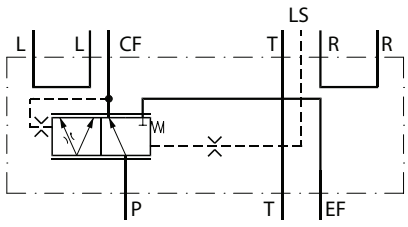
Load sensing dynamic priority valves
Load sensing dynamic steering units require load sensing dynamic priority valves. Load sensing dynamic steering systems have a constant oil flow in the LS connection from the priority valve to the steering unit even when the steering unit is in neutral position.

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



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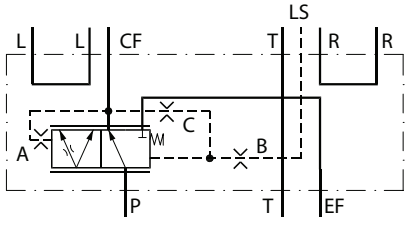
OLSA dynamic



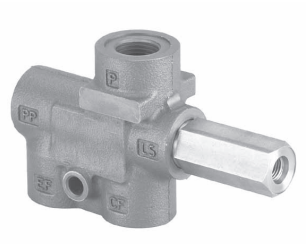
152B170.11

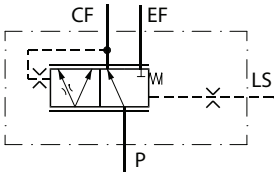
A: PP-damping orifice
B: LS-orifice
C: Dynamic-orifice

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.

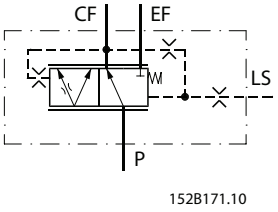
OLS 40/80





OLS static

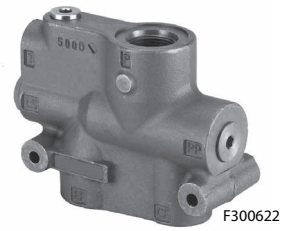
OLS 120

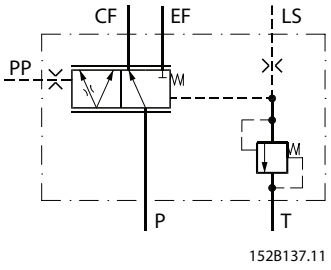


OLS dynamic

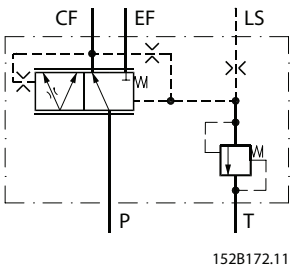
The OLS 160 "in line" priority valve is used in load sensing steering systems together with OSPB LS, OSPC LS, OSPF LS, OSPD LS, OSPQ LS and OSPL LS steering units.

OLS 160





OLS static



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	Weight
	Connections			
	European version T,R,L: G 3/8 P, EF: G 1/2	US version T, R, L: 9/16 - 18 UNF P, EF: 7/8 - 14 UNF	bar [psi]	kg [lb]
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	Weight
	Connections			
	European version LS: G 1/4 P, EF, CF: G 1/2	US version LS: 7/16 - 20 UNF CF: 3/4 - 16 UNF P, EF: 7/8 - 14 UNF	bar [psi]	kg [lb]
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 statics steering units

OLS 120 static

Priority valve	Code Numbers: Connections: European version LS: G 1/4 CF: G 1/2 P, EF: G 3/4	Code Numbers: Connections: US version LS: 7/16 -20 UNF CF: 3/4 - 16 UNF P, EF: 1 1/16 - 12 UNF	Control spring pressure bar [psi]	Weight kg [lb]
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: Connections: European version LS, PP, T: G 1/4 CF: G 1/2 P, EF: G 3/4	Code Numbers: Connections: US version LS, PP, T: 7/16 -20 UNF CF: 3/4 - 16 UNF P, EF: 1 1/16 - 12 UNF	Control spring pressure bar [psi]	Pilot pressure relief valve bar [psi]	Weight kg [lb]
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: Connections: European version T,R,L: G 3/8 P/EF: G 1/2	Code Numbers: Connections: US version T,R,L: 9/16 - 18 UNF P/EF: 7/8 - 14 UNF	Control spring pressure bar [psi]	Weight kg [lb]
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: G½ - S** T, L, R: G3/8 - S**	Metric 1: P, EF, T, L, R: M18 • 1.5 -O*** +S**	Metric 2: P, EF: M22 • 1.5 - O*** +S** T, L, R: M18 • 1.5 - O*** +S**	UNF: P, EF: 7/8 - 14 UNF - O*** T, L, R : 9/16 - 18 UNF - O***
Ports, OLS 40/80	G: P, CF, EF: G½ - S** LS: G½ - S**	Metric: P, EF: M22 • 1.5 - O*** +S** CF: M18 • 1.5 - O*** +S** LS: M12 • 1.5 - O*** +S**	UNF: P, EF: 7/8 - 14 UNF - O*** CF: 3/4 - 16 UNF - O*** LS: 7/16 - 20 UNF - O***	
Ports, OLS 120	G: P, EF: G¾ - S** CF: G½ - S** LS, PP: G¼ - S**	Metric: P, EF: M27 • 2 - O*** +S** CF: M18 • 1.5 - O*** +S** LS: M12 • 1.5 - O*** +S**	UNF: P, EF: 11/16 - 14 UNF - O*** CF: 3/4 - 16 UNF - O*** LS: 7/16 - 20 UNF - O***	
Ports, OLS 160	G 1: P, EF: G¾ - S** CF: G½ - S** LS, PP, T: G¼ - S**	G 2: P, EF: G1 - S** CF: G¾ - S** LS, PP, T: G¼ - S**	UNF 1: P, EF: 11/16 - 12 UN - O*** CF: 3/4 - 16 UNF - O*** LS, PP, T: 7/16 - 20 UNF - O***	UNF 2: P, EF:15/16 - 12 UN - O*** CF: 7/8 - 14 UNF - O*** LS, PP, T: 7/16 - 20 UNF - O***
Ports, OLSP 80 (P: square flange 35)	G: EF: G½ - S** CF: G3/8 - S** LS: G¼ - S**	Metric: EF: M22 • 1.5 - O*** +S** CF: M18 • 1.5 - O*** +S** LS: M12 • 1.5 - O*** +S**	UNF: EF: 7/8 - 14 UNF - O*** CF: 3/4 - 16 UNF - O*** LS : 7/16 - 20 UNF - O***	
Ports, OLS 320 in-line	G: P, EF: G1 - S** CF: G½ - S** LS, PP: G¼ - S**	UNF 1: P, EF: 1 5/16 - 12 UN - O*** CF: 3/4 - 16 UNF - O*** LS, PP, T: 7/16 - 20 UNF - O***	UNF 2: P, EF: 1 5/16 - 12 UN - O*** CF: 1 1/16 - 12 UNF - O*** 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
											bar	

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 vlave (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]

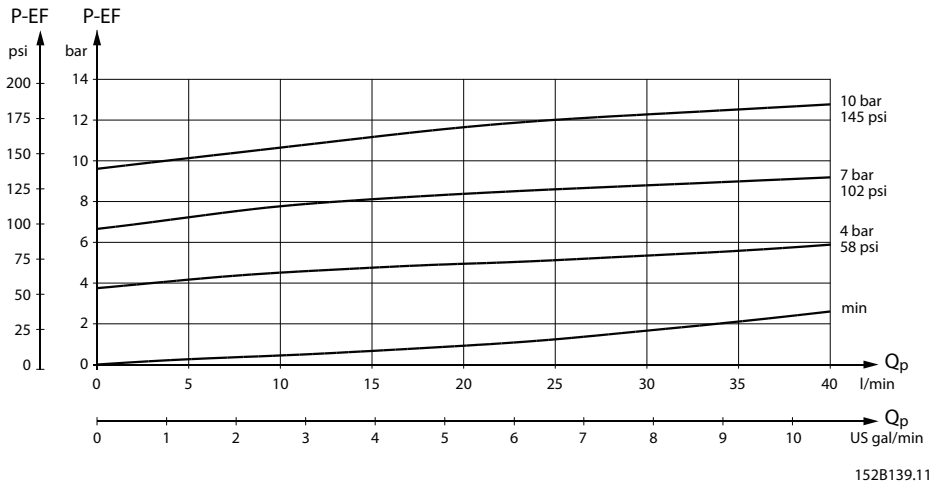
Pressure Drop in Priority Valves

Pressure drop in priority valves

This data comes from measurements on a representative sample of priority valves from production. Oil with viscosity of 21 mm²/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



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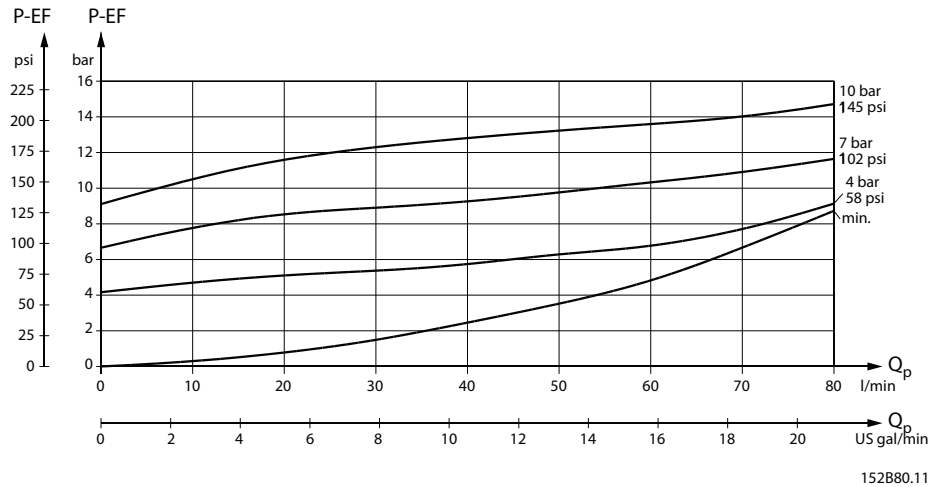
OLSA/OLS 80



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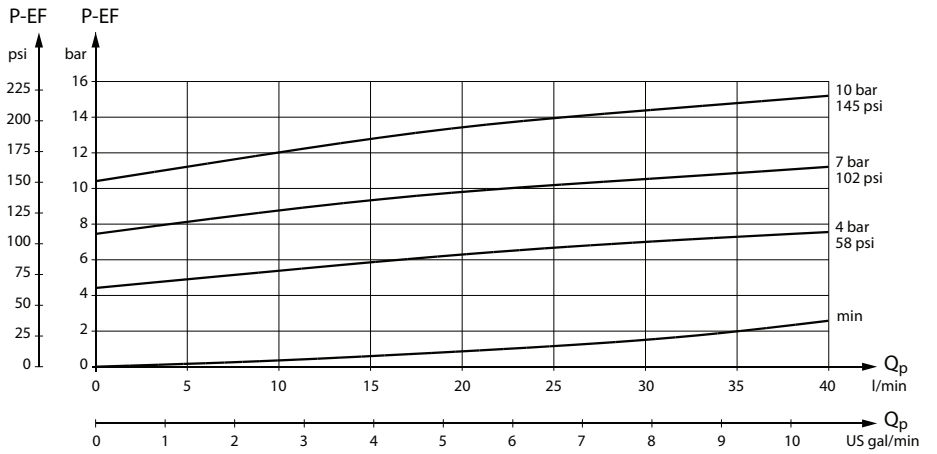
Technical Data (continued)

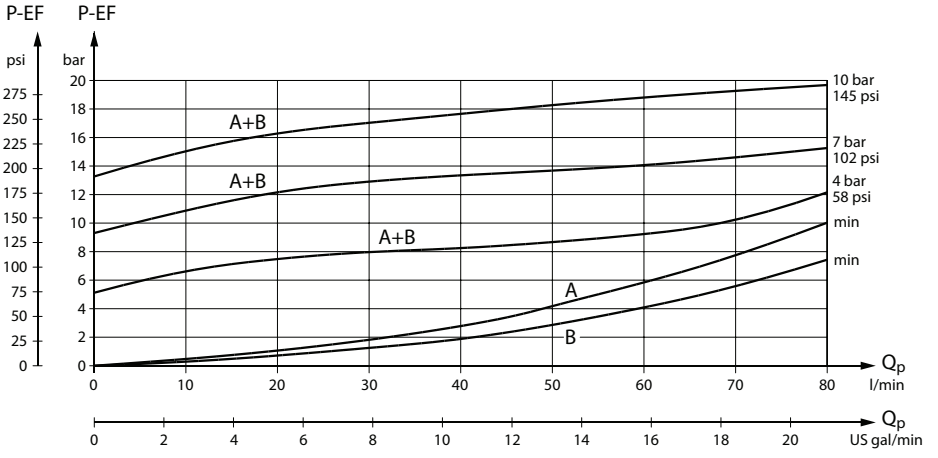
Pressure drop P-EF for dynamic priority valves

OLSA/OLS 40



152B174.10

OLSA/OLS 80



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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

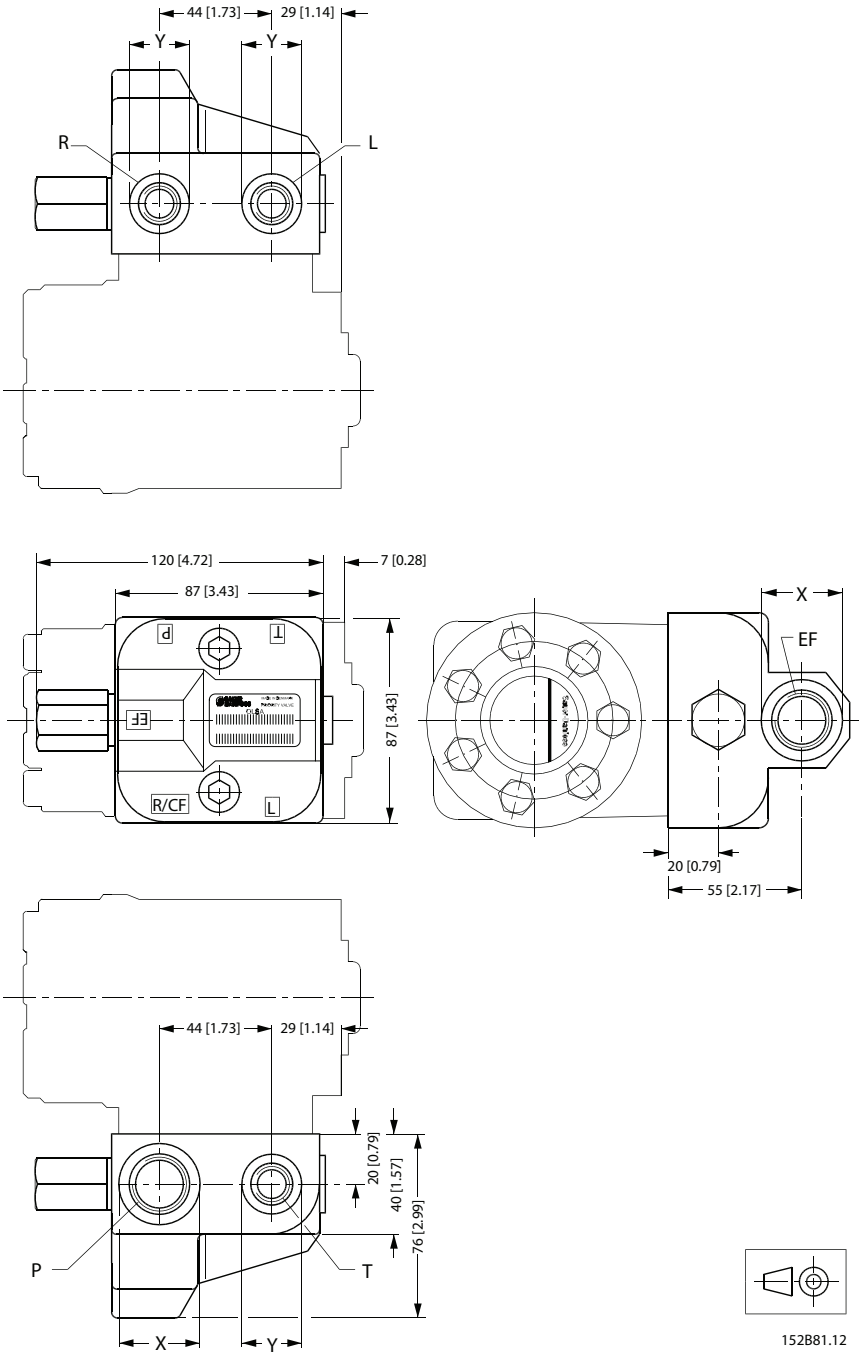
OLSA

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 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:
- 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



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

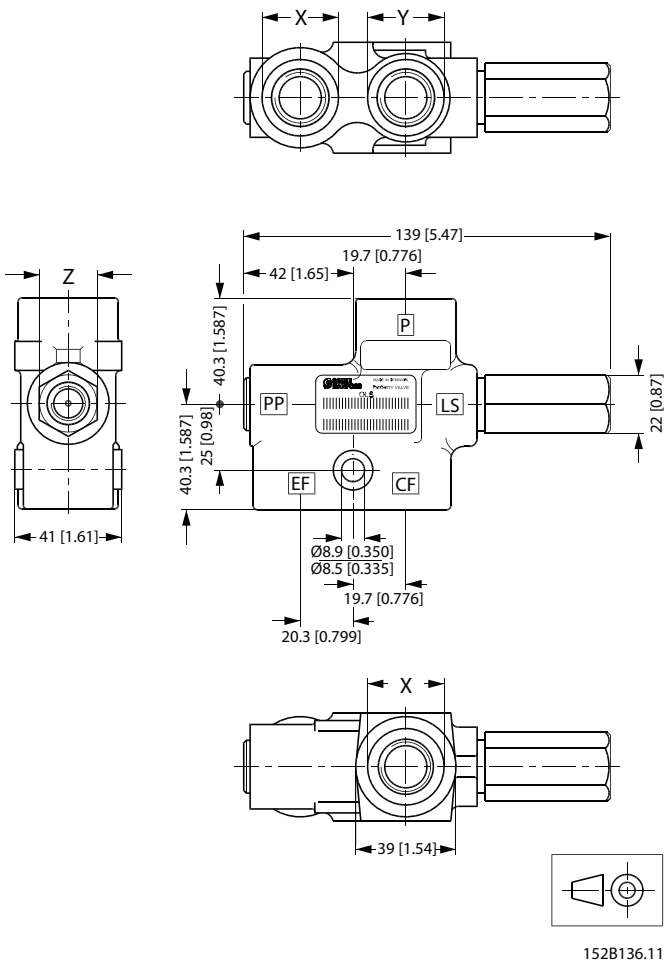
LS:
- G ¼ w. spot face
  12.5 mm [0.49 in] deep
  z = 21mm [0.83 in],
  max. 1 mm [0.04 in] deep
  or M12 x 1,5 ISO 6149
  12,5 mm [0.49 in] deep,
  z = 22 mm [0.86 in]
  0 mm deep

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:
- 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



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