



Powering Business Worldwide

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XCEL⁴⁵ Steering Unit



Steering Control Units

The Eaton® XCEL⁴⁵ steering control unit (SCU) is fully fluid linked. This means there is no mechanical connection between the steering unit, the pump and the steering cylinders. The unit consists of a manually operated directional control servo valve and feedback meter element in a single body. It is used principally for fluid linked power steering systems but it can be used for some servo-type applications or any

application where visual positioning is required. The close coupled, rotary action valve performs all necessary fluid directing functions with a small number of moving parts. The manually actuated valve is coupled with the mechanical drive to the meter gear. The control is lubricated and protected by the power fluid in the system and can operate in many environments.

XCEL⁴⁵

The XCEL⁴⁵ steering unit is an innovative steering platform that provides smooth and reliable steering.

The XCEL⁴⁵ is designed for mid-range flow applications.

The XCEL⁴⁵ is offered in several combinations including a variety of integral valve options, port sizes and multiple displacements.

Features

- Open Center or Load Sensing Neutral Circuit
- Robust housing design provides 190 bar max [2755 psi] system pressure capability for all models
- Six Integral Valves enable multiple configuration options:
 - Check Valves for Limited Manual Steering
 - Inlet Relief Valve
 - Inlet Check Valve
 - Cylinder Relief Valve
 - Load Sensing Relief Valve
 - Anti-cavitation Valve
- Innovative valving design provides optimized gain characteristics and reduced hydraulic noise level

Specification Data

Pressure:	bar	[psi]
Max. System Pressure	190	[2755]
Max. Back Pressure	21	[305]
Rated Flow:	lpm	[gpm]
50 - 125cc/r	7.5 - 15	[2-4]
160 - 250cc/r	15 - 30	[4-8]
320 - 500cc/r	30 - 45	[8-12]
Input Torque:	Nm	
Powered Standard	1.7 - 2.8	
Powered Low Torque	1.3 - 2.2	
Non-powered	136	
Max. Temperature:	C	[F]
Max. System Operating Temperature	93°	[200°]
Max. Differential Between Steering Unit and Other System Temperature	28°	[50°]
Fluid:	ATF Type A and Most Petroleum Based Fluids See Eaton Technical Bulletin 3-401	
Recommended Filtration:	ISO 18/13 cleanliness level	

Hydraulic Circuit Explanation

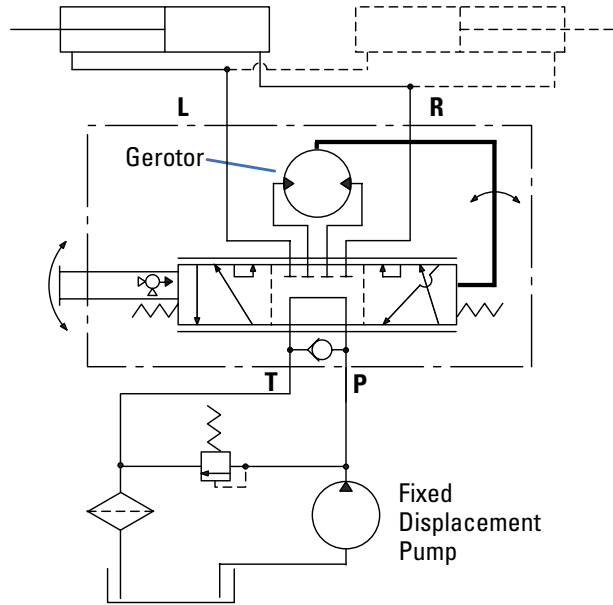
Neutral Circuits: Open Center

Open Center

- Simplest, most economical system
- Uses a fixed displacement pump
- In neutral position pump and tank are connected
- Most suitable on smaller type vehicles

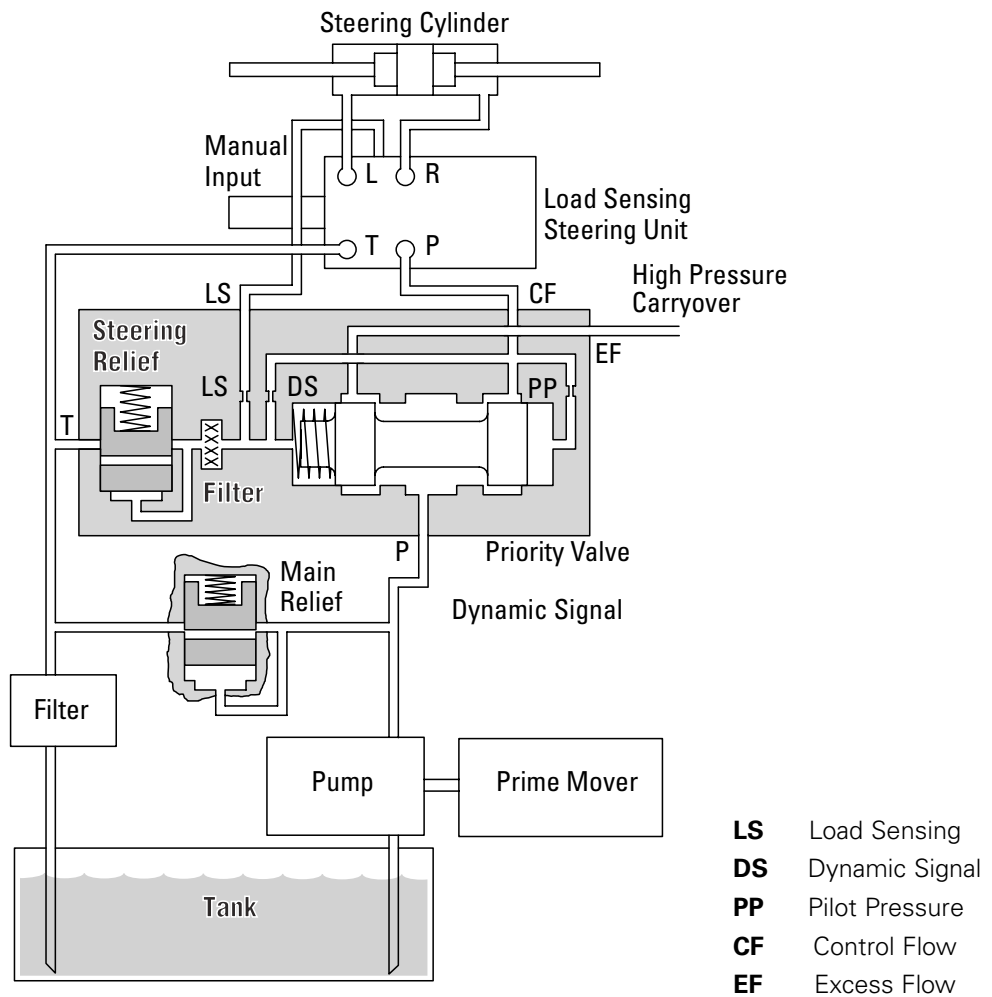
Applications

- Lawn and Garden Equipment
- Utility Vehicles



Hydraulic Circuit Explanation

Neutral Circuits: Load Sensing



Load Sensing Circuits

XCEL⁴⁵ load sensing power steering uses conventional or load sensing power supplies to achieve load sensing steering. The use of a load sensing steering unit and a priority valve in a normal power steering circuit offers the following advantages:

- Provides smooth pressure compensated steering because load variations in the steering circuit do not affect axle response or maximum steering rate.
- Provides true power beyond system capability by splitting the system into two independent circuits. Pressure transients are isolated in each circuit. Only the flow required by the steering maneuver goes to the steering circuit. Flow not required for steering is available for use in the auxiliary circuits.

- Provides reliable operation because the steering circuit always has flow and pressure priority.

XCEL⁴⁵ load sensing steering control units and priority valves can be used with open center, closed center or load sensing systems. Use in an open center system with a fixed displacement pump or a closed center system with a pressure compensated pump, offers many of the features of a load sensing system. Excess flow is available for auxiliary circuits.

Listed below are the components of a typical load sensing control circuit and a brief application description.

Pump—May be fixed displacement, pressure compensated, or flow and pressure compensated design.

Priority Valve—Sized for design pressure drop at maximum pump output flow rate and priority flow requirements. The minimum control pressure must assure adequate steering flow rate and must be matched with the steering control unit. A dynamic signal priority valve must be used with a dynamic signal steering control unit.

Steering Control Unit—Designed for specific rated flows and control pressures. It must be matched with a control pressure in the priority valve to obtain maximum steering rates. Higher flow rates require higher control pressures. Neutral internal bleed assures component temperature equalization.

LS Line—A LS line is always needed to sense pressure downstream from the variable control orifice in the steering control unit. This

is balanced by an internal passage to the opposite side of the priority control spool.

The total system performance depends on careful consideration of the control pressure chosen and pressure drop in the CF line.

Steering Relief Valve—Must be factory set at least 10 bar [145 PSI] above the maximum steering cylinder pressure requirement. Most of the flow will be directed to the auxiliary circuit (EF) when the relief setting is exceeded.

System Main Relief Valve

A pressure relief valve for the auxiliary circuit and/or a main safety valve for the protection of the pump is recommended and sized for the maximum pump output flow rate. If a main relief valve is used, it must be set above the priority circuit steering relief valve pressure setting.

Hydraulic Circuit Explanation

Neutral Circuits: Load Sensing

Load Sensing Circuits: Signal Systems

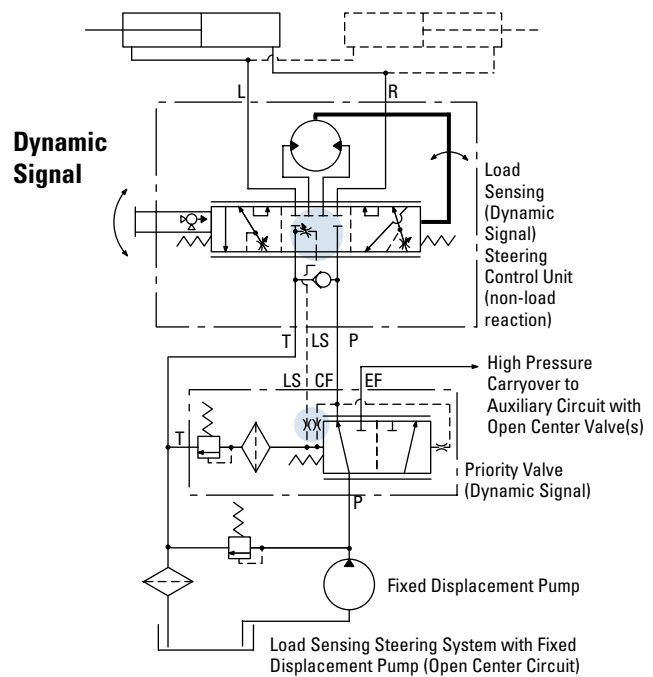
Two types of load sensing signal systems are available—Dynamic and Static.

Dynamic Signal

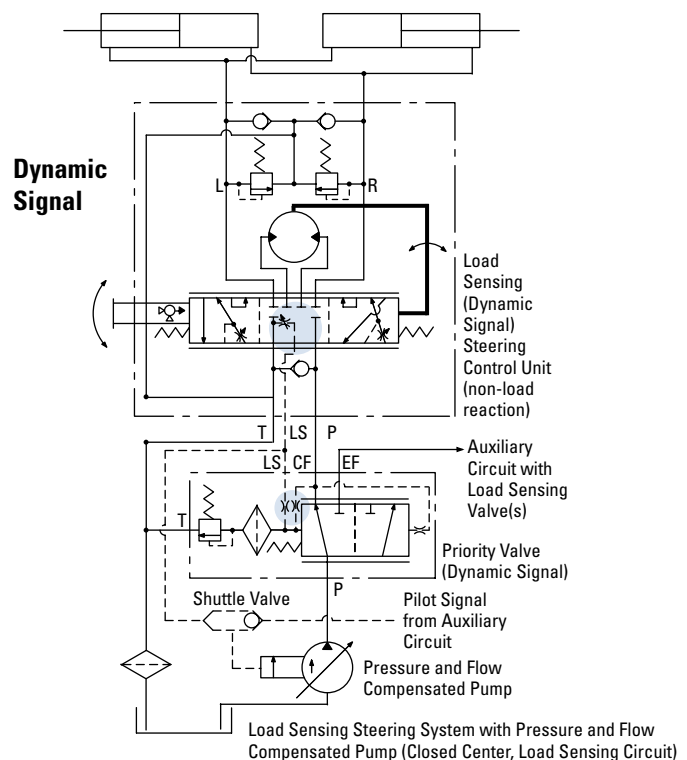
Used for more difficult applications. The dynamic signal systems offer the following benefits:

- Faster steering response.
- Improved cold weather start-up performance.
- Increased flexibility to solve problems related to system performance and stability.

Dynamic Signal— Open Center Pump



Dynamic Signal— Load Sensing Pump



Hydraulic Circuit Explanation

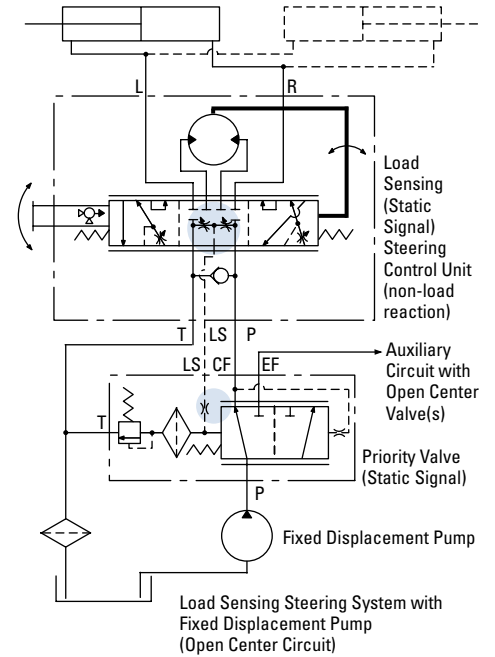
Neutral Circuits: Load Sensing

Static Signal— Open Center Pump

Static Signal

Used for conventional applications where response or circuit stability is not a problem. The load sensing pilot line should not exceed 2 meters [6 feet] in length.

Static Signal

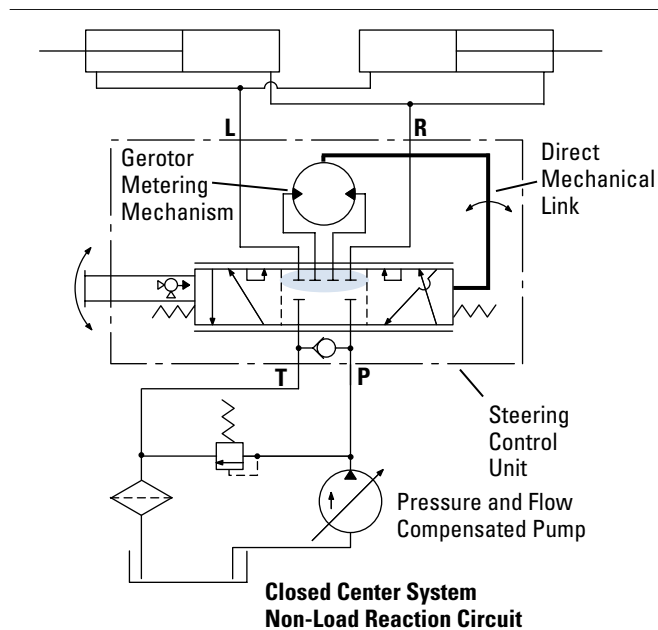


Hydraulic Circuit Explanation

Work Circuits: Non-Load Reaction and Load Reaction

Non-Load Reaction

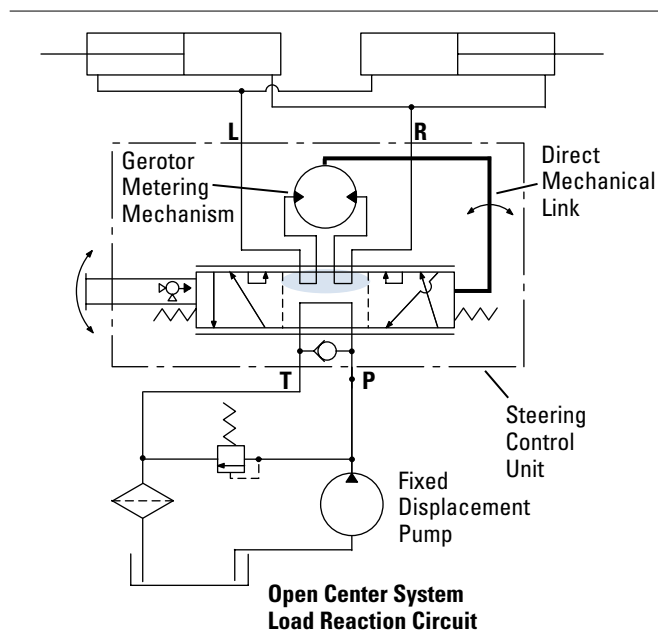
A non-load reaction steering unit blocks the cylinder ports in neutral, holding the axle position whenever the operator releases the steering wheel.



Load Reaction

A load reaction steering unit couples the cylinder ports internally (in the neutral position) with the meter gear set. Axle forces are then allowed to return the steering wheel to its approximate original position. Comparable to automobile steering, gradually releasing the wheel mid turn will allow the steering wheel to spin back as the vehicle straightens.

The cylinder system used with load reaction units **must have equal oil volume** displaced in both directions. The cylinders should be a parallel pair (as shown) or one double rod end unit. **Do not use with a single unequal area cylinder system.**



Steering Units with Integral Valves

Integral valves are available for the XCEL⁴⁵ steering control unit. Included are: Inlet Relief Valve, Cylinder Port Shock Valves, LS-Relief Valve, and Anti-Cavitation Valves for cylinder ports. In addition, a Manual Steering Check Valve for limited manual steering is included. The integral valves eliminate the need for a separate valve block, and provides versatility to meet any steering circuit standard.

Valve Description:

1 Anti-cavitation check valve for cylinder ports – (R & L) protects steering circuit against vacuum (cavitation) conditions.

2 Cylinder Port Relief Valves – (R & L) protects hoses against pressure surge created by ground forces on the steered axle.

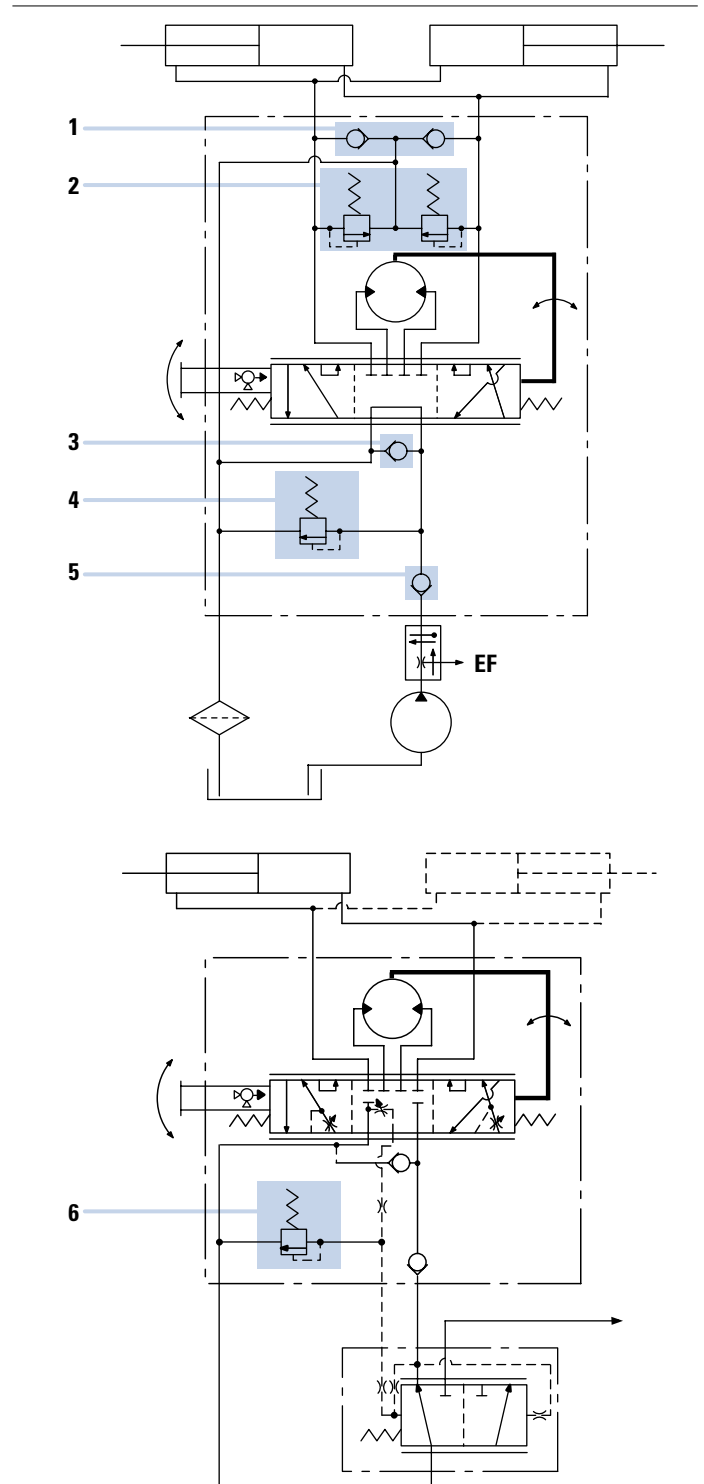
3 Manual Steering Check Valve – converts unit to a hand operated pump for limited manual steering. Included in all units except Series 20, 25, and 40.**

4 Inlet Relief Valve – limits maximum pressure drop across the steering unit protecting the steering circuit.

5 Inlet Check Valve – prevents oil from returning through the steering unit when pressure on the cylinder side is greater than pressure on the inlet side to prevent steering wheel kick.

6 LS-Relief Valve – Limits maximum pressure in the steering circuit (LS units only)

**Steering units with displacements larger than 185 cm³/r [11.3 in³/r] may require a separate power source for limited operation.



Special Features and Application

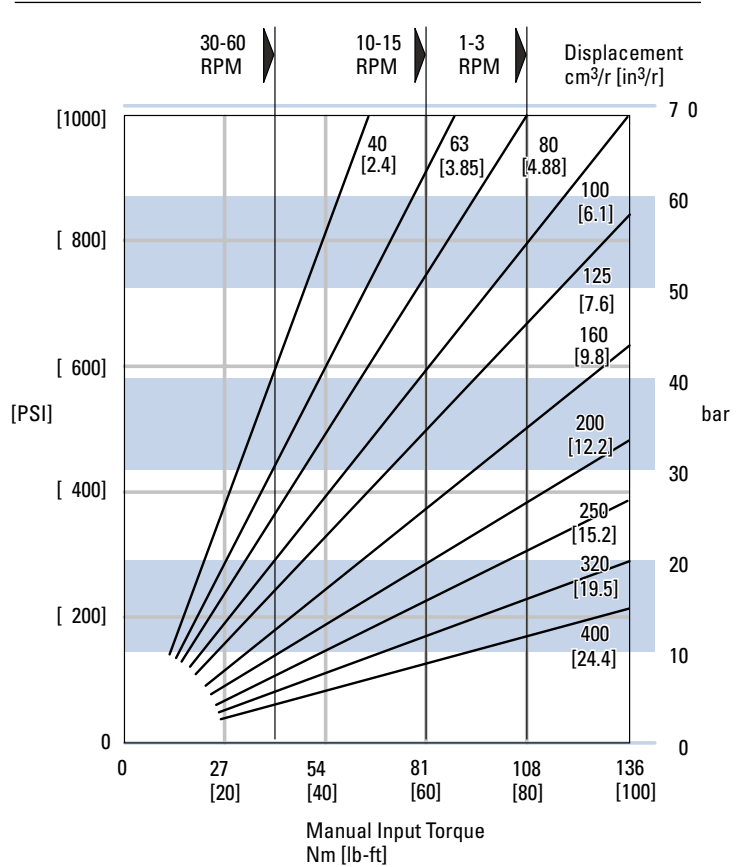
Manual Steering

Description

The steering control unit can provide steering flow when the pump or engine fails. It will pump oil through the meter (gerotor) as the operator applies input or torque to the steering wheel which provides limited manual steering.

Use of Graph

1. Determine steering work port pressure required to perform the desired steering maneuver from vehicle test data. This defines the approximate manual steering pressure level required. Find this value on the vertical axis and construct a horizontal line on the graph.
2. Find the input torque limit on the horizontal axis. Follow this vertically until it crosses the required pressure line of step 1.
3. The maximum steering unit displacement is identified by the first angled line to the left of this intersection.



1) Maximum flow less than 7,6 l/min [2 GPM].

2) Actual steering pressures required and manual steering capabilities must be verified with vehicle testing.

The above curves are intended as a design guide only.

Q-Amp Flow Amplification for Load Sensing Circuits

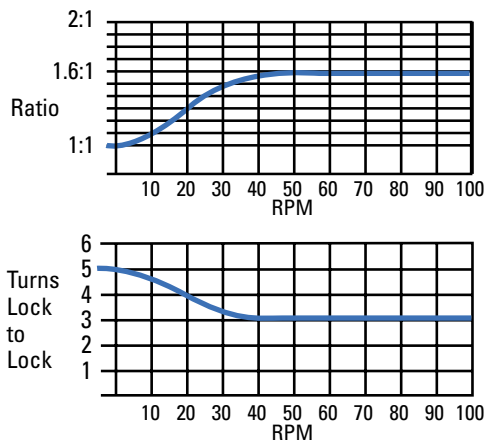
Description and Advantage

Q-Amp steering units have built in variable orifices that provide flow directly to the cylinder without going through the gerotor section. The orifices do not open until after the gerotor begins to rotate and then gradually open until the desired flow is achieved which is proportional to the flow going through the gerotor.

A typical Q-Amp unit has a ratio of 1.6:1 which means the flow of the cylinder is 1.6 times the flow going through the gerotor when turning the steering wheel at medium to fast speeds. (See model code for available ratios.)

Features

• Variable Ratio



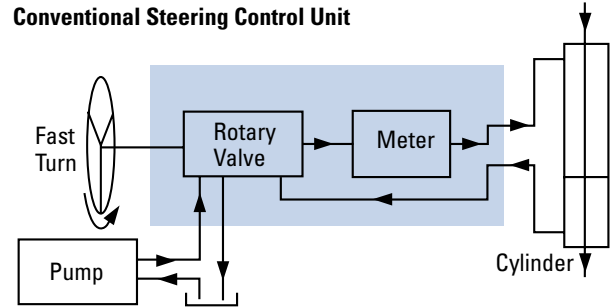
• Manual Steering

Steering a vehicle with loss of engine power may not be possible with a large displacement steering control unit (SCU). Q-Amp with manual feature has the smaller additional flow requirement of the larger displacement SCU for power steering.

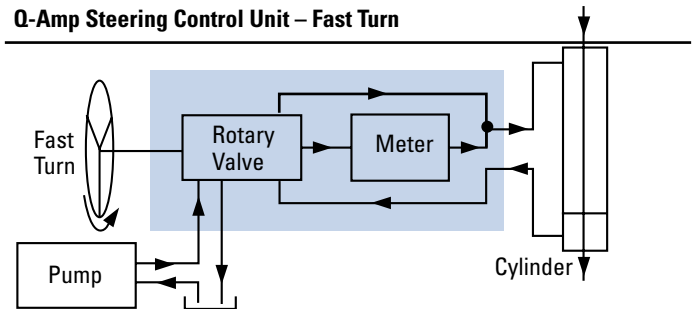
• Single Cylinder (Unequal area)

On vehicles with one single unequal area cylinder the steering wheel turns lock to lock are more in one direction than the other. When extending the rod one would get more turns than when retracting it. A different Q-Amp ratio while turning in one direction versus the other can be used to give an equal number of turns lock to lock in each direction.

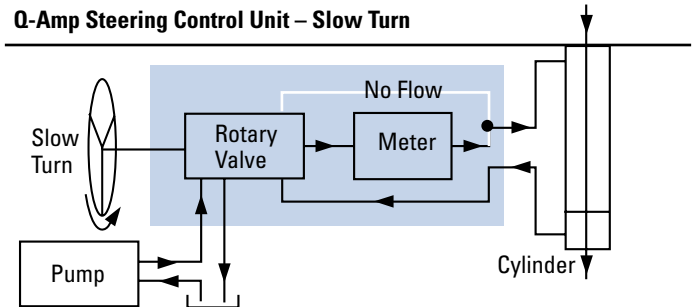
Conventional Steering Control Unit



Q-Amp Steering Control Unit – Fast Turn

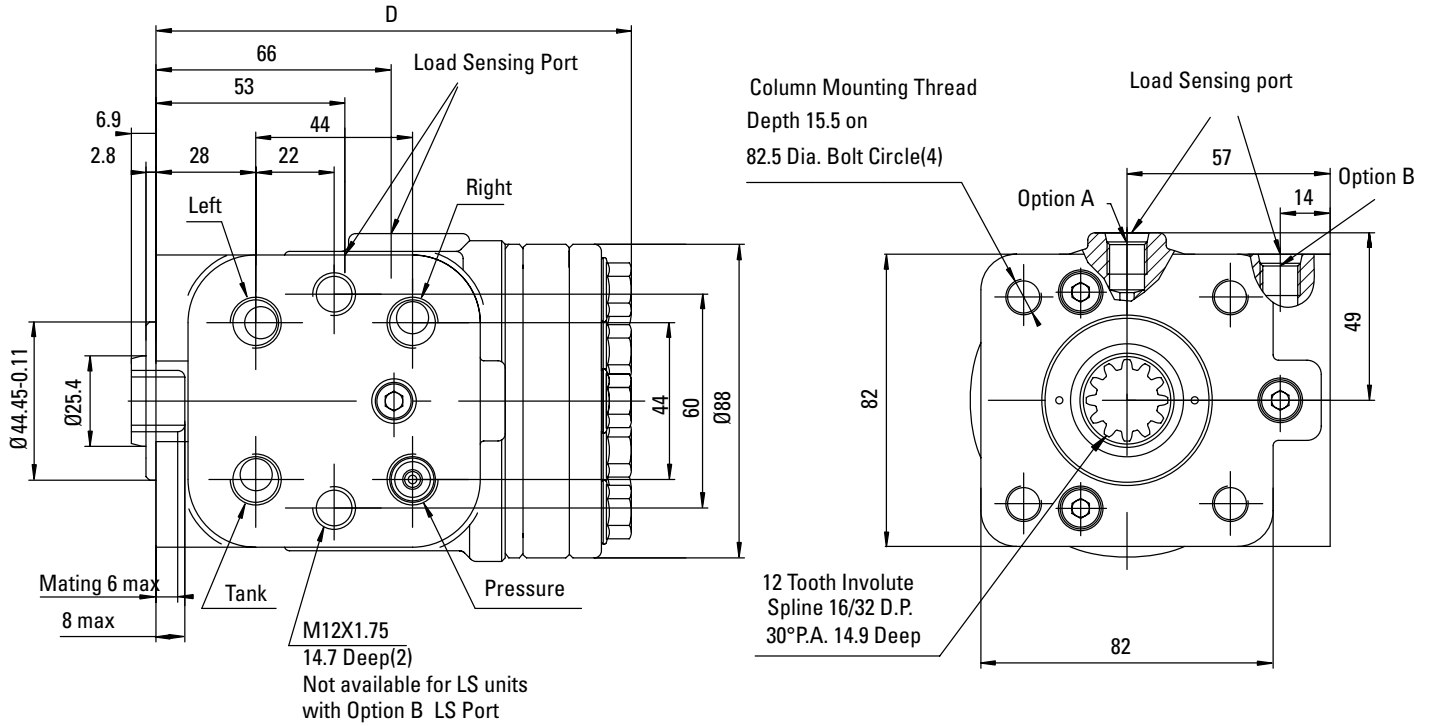


Q-Amp Steering Control Unit – Slow Turn



XCEL⁴⁵ Steering Unit

Dimensions



Load Sensing Port Options:

Option A—Only used for LS units with LS relief valve in priority valve

Option B—Only used for LS units with LS relief valve in steering unit

Port	Load Sensing Thread	Flange Thread	Displacement cc/r	Dimension B mm
M20X1.5	M12x1.5	M10x1.5	50	126.5
M20x1.5 O-ring	M12x1.5	M10x1.5	63	128
G-1/2 BSP	M12x1.5	M10x1.5	80	130.5
3/4-16 O-ring	7/16-20 O-ring	M10x1.5	100	133
9/16-18 O-ring	7/16-20 O-ring	M10x1.5	125	136
3/4-16 O-ring	7/16-20 O-ring	3/8-16	160	141
9/16-18 O-ring	7/16-20 O-ring	3/8-16	200	146
G-1/4 O-ring	G-1/4 O-ring	M10x1.25	250	152
			320	162
			400	172
			500	184

Dual Displacement



Description and Features

The dual displacement steering control unit allows off road vehicles to retain manual steering capability while reducing the number of components in their system. By using two displacements in one unit the dual displacement offers a better solution to manually steer a vehicle in an unpowered mode without the need of a back-up power system. This simplifies the design and provides a more economical machine.

The dual displacement steering units use two gerotors and a pressure controlled logic valve. The logic valve switches between one displacement for manual steering and the total of both displacements for powered operation. The logic valve is spring returned to the smaller manual displacement when inlet pressure falls below 8 bar [120 psi]. Above 8 bar [120 psi] the logic valve connects both gerotors to provide full powered displacement.

Manual steering capabilities in unpowered mode

- Eliminates the need for a back-up emergency system
- Engages the small displacement in an unpowered mode and allows manual steering
- Allows vehicles to meet ISO/TUV road regulations

Performance in powered mode

- Both gerotors are engaged to steer the vehicle
- Same performance as other Eaton steering units

Additional Features

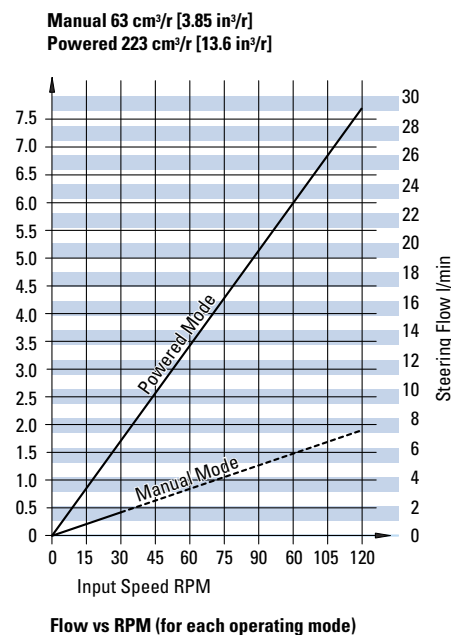
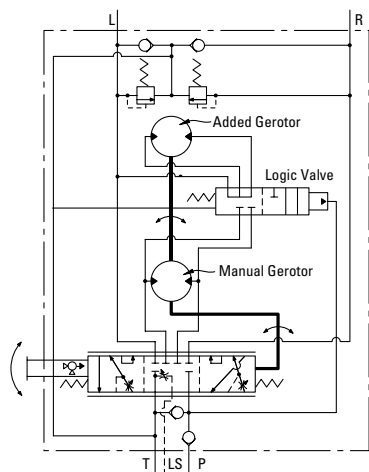
- Steering circuit available
 - Load Sensing
 - Open Center
- Max. system pressure: 190 bar [2755 psi]
- Valve options and other features: same as those available on other units
- Innovative low noise design

Displacement Chart

Gerotor 1 Manual displ.	Gerotor 1 and 2 Powered displ.	Gerotor 1 Manual displ.	Gerotor 1 and 2 Powered displ.
in ³ /rev	in ³ /rev	cm ³ /rev	cm ³ /rev
4.88	14.6	80	240
4.88	17.1	80	280
3.85	13.6	63	223

For any other displacement please see your Eaton Representative.

LS Circuit



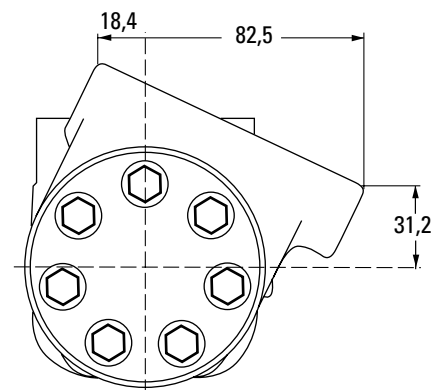
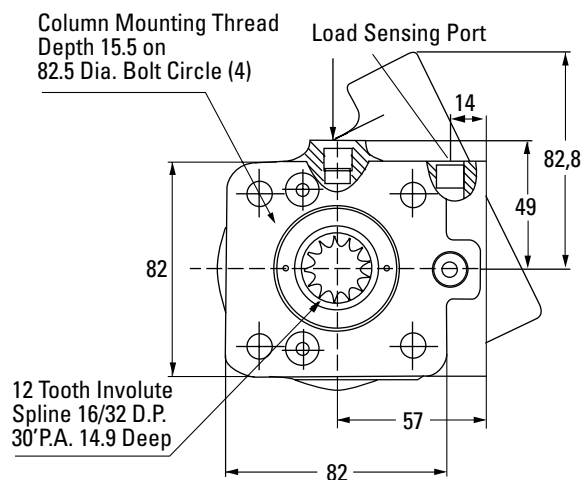
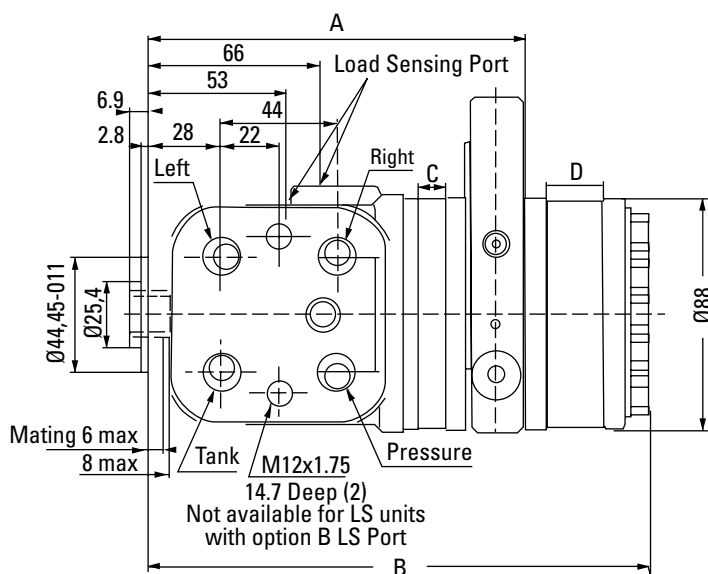
Dual Displacement

Installation Drawing

Port and Mounting Thread Combinations

Port	Column Mounting Thread	Load Sensing* Port	Port Mounting Thread
3/4-16 O-ring	M10x1.5-6H	7/16-20 O-ring	M12x1.75-6H
M18X1.5-6H (BSP)	M10x1.5-6H	M12x1.5 (BSP)	M12x1.75-6H
G1/2 (BSP)	M10x1.5-6H	G1/4 (BSP)	M12x1.75-6H

*Load Sensing Units only



Powered Gerotor 1 and 2

Displacement cm ³ /r	Dimension A mm	Dimension B mm
240	144.5	190.5
280	144.5	195.5
220	144.2	196.7

Manual Gerotor 1

Displacement cm ³ /r	Dimension C mm
80	10.5
80	10.5
60	10.2

Gerotor 2

Displacement cm ³ /r	Dimension D mm
160	21
200	26
160	27.5

Eaton Patented Technologies

STC Direct Porting

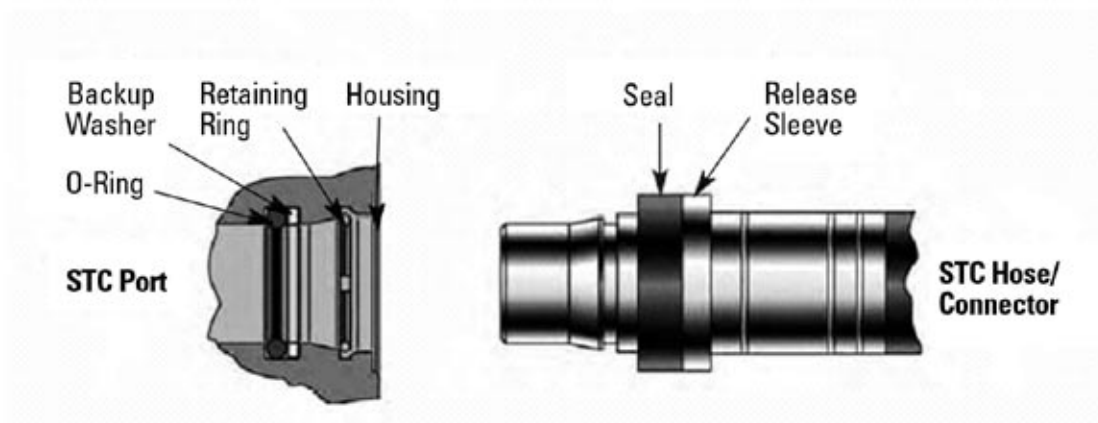
With the Snap-To-Connect (STC) Direct Porting option, the fitting profile is machined into the SCU housing, eliminating the need for extra STC fittings.

This revolutionary and patented porting technology provides leak-proof sealing and has operating pressure capability exceeding 4500 PSI (310 bar).

STC Direct Porting is available with XCEL⁴⁵ Steering Control Units.

Benefits

- STC Direct Ports provide a great opportunity for significant cost savings compared to threaded fittings
- Eliminates the need for assembly tools during installation
- Eliminates installation variability
- Improves ergonomics - reduces installer effort to connect
- Improves serviceability
- High quality, leak-proof seal
- Eliminates connector leakage
- Compact design and overall lighter weight

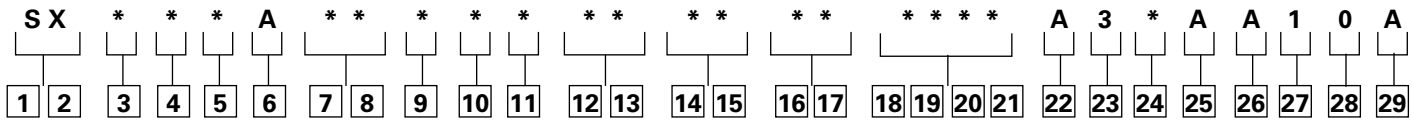


Model Code

Customer Order Information

The following 29-digit coding system has been developed to identify all of the configuration options for the XCEL⁴⁵ steering control units. Use this model code to specify a unit with the desired features. All 29-digit of the code must be present when ordering. You may want to photocopy the matrix below to ensure that each number is entered in the correct box.

This model code shows Preferred Products only. For a complete model code listing all available options, please contact your Eaton representative.



1, 2 Product Series
SX – Series XCEL⁴⁵ Steering Control Unit

3 Unit Type
A – Standard
B – Dual Displacement

4 Nominal Flow Rating
1 – 11.3 l/min (3 GPM)
2 – 22.7 l/min (6 GPM)
3 – 45 l/min (12 GPM)
4 – 37 l/min (10 GPM Q-amp)
5 – 75 l/min (20 GPM Q-amp)

5 Inlet Pressure Rating
1 – 190 bar (2755 PSI)

6 Return Pressure Rating
A – 21 bar (300 psi) MAX.
 – (standard rating*)

7, 8 Displacement cm³/r
 Dual Displacement
 Combined Manual
13 – 240/80
14 – 280/80
15 – 220/60
 Displacement cm³/r (in³/r)
01 – 40 (2.4)
02 – 50 (3.1)
03 – 63 (3.85)
04 – 80 (4.88)
05 – 100 (6.1)
06 – 125 (7.6)
07 – 160 (9.8)
08 – 200 (12.2)
09 – 250 (15.2)
10 – 320 (19.5)
11 – 400 (24.4)
12 – 500 (30.5)

9 Flow Amplification*
A – None (No Q-Amp)
B – 1.6:1.0 Ratio
C – 2.0:1.0 Ratio

10 Neutral Circuit
A – Open Center
B – Load Sensing, Static Signal
C – Load Sensing, Dynamic Signal

11 Load Circuit
A – Non-load Reaction
B – Load Reaction

12, 13 Valve Option
 MSC = Manual Steering Check
 ICV = Inlet Check Valve
 CRV = Cylinder Relief Valve
 ACV = Anti-Cavitation
 IRV = Inlet Relief Valve
01 – MSC
02 – MSC, ICV
03 – MSC, IRV
04 – MSC, ICV, IRV
05 – MSC, ICV, CRV, ACV
06 – MSC, CRV, ACV
07 – MSC, ICV, CRV, ACV, IRV
08 – MSC, CRV, ACV, IRV
09 – MSC, ICV, ACV, IRV

14, 15 Inlet Relief Valve – bar (psi)
00 – None
05 – 65 (940 psi)
06 – 85 (1230 psi)
07 – 115 (1670 psi)
08 – 60 (870 psi)

09 – 63 (915 psi)
10 – 70 (1015 psi)
11 – 80 (1160 psi)
12 – 90 (1305 psi)
13 – 95 (1377 psi)
14 – 100 (1450 psi)
15 – 105 (1522 psi)
16 – 110 (1595 psi)
17 – 117 (1696 psi)
18 – 125 (1812 psi)
19 – 130 (1885 psi)
20 – 140 (2030 psi)
21 – 150 (2175 psi)
24 – 165 (2392 psi)
25 – 175 (2537 psi)
28 – 190 (2755 psi)

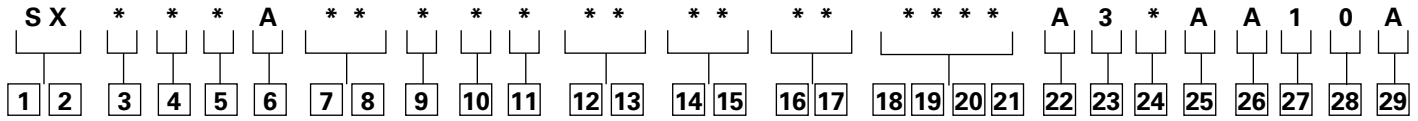
16, 17 Cylinder Relief Valve – bar (psi)
00 – None
07 – 115 (1670 psi)
14 – 100 (1450 psi)
15 – 105 (1522 psi)
16 – 110 (1595 psi)
17 – 120 (1740 psi)
18 – 125 (1812 psi)
20 – 140 (2030 psi)
22 – 150 (2175 psi)
23 – 160 (2320 psi)
25 – 175 (2537 psi)
27 – 185 (2682 psi)
28 – 190 (2755 psi)
29 – 200 (2900 psi)
30 – 210 (3045 psi)
31 – 220 (3190 psi)
34 – 235 (3407 psi)
35 – 240 (3480 psi)
36 – 250 (3625 psi)

18, 19, 20, 21 Port and Mounting
AAAA – 4-M18X1.5-6H Metric Ports
 None (No Additional port)
 4-M10X1.5 Mounting Threads
 Mounting Face
AABA – 4-M18X1.5-6H Metric Ports
 M12X1.5 Load Sensing Port
 4-M10X1.5 Mounting Threads
 Mounting Face
ABAA – 4-M18X1.5-6H Metric O-ring Ports
 None (No Additional Port)
 4-M10X1.5 Mounting Threads
 Mounting Face
ABBA – 4-M18X1.5H Metric O-ring Ports
 M12X1.5 O-ring Load Sensing Port
 4-M10X1.5 Mounting Threads
 Mounting Face
BAAA – 4-M20X1.5-6H Metric Ports
 None (No Additional Port)
 4-M10X1.5 Mounting Threads
 Mounting Face
BABA – 4-M20X1.5-6H Metric Ports
 M12X1.5 Load Sensing Port
 4-M10X1.5 Mounting Threads
 Mounting Face
BBAA – 4-M20X1.5-6H Metric O-ring Ports
 None (No Additional Port)
 4-M10X1.5 Mounting Threads
 Mounting Face

Model Code

Customer Order Information Continued

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BBBA – 4-M20X1.5-6H
Metric O-ring Ports
M12X1.5 O-ring
Load Sensing Port
4-M10X1.5
Mounting Threads
Mounting Face

CAAA – 4-G1/2(BSP) Straight
Thread ports
None (No Additional Port)
4-M10X1.5
Mounting Threads
Mounting Face

CABA – 4-G1/2(BSP) Straight
Thread ports
M12X1.5
Load Sensing Port
4-M10X1.5
Mounting Threads
Mounting Face

CADA – 4-G1/2(BSP) Straight
Thread ports
G1/4-19 Straight Thread
Load Sensing Port
4-M10X1.5
Mounting Threads
Mounting Face

DAAA – 4-G1/4-19 Straight
Thread ports
None (No Additional Port)
4-M10X1.5
Mounting Threads
Mounting Face

DADA – 4-G1/4-19 O-ring
Ports
G1/4-19 Straight Thread
Load Sensing Port
4-M10X1.5
Mounting Threads
Mounting Face

DBAC – 4-G1/4-19 O-ring
Ports
None (No Additional Port)
4-M10X1.25
Mounting Threads
Mounting Face

DBDC – 4-G1/4-19 O-ring
Ports
G1/4-19 O-ring Load
Sensing Port
4-M10X1.25
Mounting Threads
Mounting Face

EBAC – 4-G3/8-19 O-ring
Ports
None (No Additional Port)
4-M10X1.25
Mounting Threads
Mounting Face

EBEC – 4-G3/8-19 O-ring
Ports
G3/8-19 O-ring Load
Sensing Port
4-M10X1.25
Mounting Threads
Mounting Face

FBAA – 4-9/16-18 O-ring
Ports
None (No Additional Port)
4-M10X1.5
Mounting Threads
Mounting Face

FBAB – 4-9/16-18 O-ring
Ports
None (No Additional Port)
4-3/8-16
Mounting Threads
Mounting Face

FBCA – 4-9/16-18 O-ring
Ports 7/16-20 O-ring
Load Sensing Port
4-M10X1.5
Mounting Threads
Mounting Face

FBCB – 4-9/16-18 O-ring
Ports
7/16-20 O-ring Load
Sensing Port
4-3/8-16
Mounting Threads
Mounting Face

GBAA – 4-3/4-16 O-ring
Ports
None (No Additional Port)
4-M10X1.5
Mounting Threads
Mounting Face

GBAB – 4-3/4-16 O-ring
Ports
None (No Additional Port)
4-3/8-16
Mounting Threads
Mounting Face

GBCA – 4-3/4-16 O-ring
Ports
7/16-20 O-ring Load
Sensing Port
4-M10X1.5 Mounting
Threads
Mounting Face

GBCB – 4-3/4-16 O-ring
Ports
7/16-20 O-ring Load
Sensing Port
4-3/8-16 Mounting
Threads Mounting Face

22 Mechanical Interface

A – Internal Involute Spline,
12 tooth 16/32 DP30°
PA

23 Input Torque

1 – Low*
3 – Standard

24 Fluid Type

A – See Eaton Technical
Bulletin 3-401

25 Mounting Threads Port Face

A – 2-M12X1.75

26 Special Features

A – None
B – Low Noise Design
(Open Center)

27 Paints and Packaging

1 – Black

28 Identification

0 – Eaton Product Number
on Nameplate

29 Eaton Assigned

A – Assigned Design Code

* All low torque units need approval
from an Eaton Steering Engineering

NOTE: A dynamic signal steering unit must be used
together with a dynamic signal priority valve. Select
number from this table and take reference of the
connection dimensions.

Please always show your selected product number when
you place an order.

Bolt on VLC Priority Valve (BOPV)

Load sensing power steering uses conventional or load sensing power supplies to achieve load sensing steering. The use of a load sensing steering unit and a priority valve in a normal power steering circuit offers the following advantages:

- Provides true power beyond system capability by splitting the system into two independent circuits. Pressure transients are isolated in each circuit. Only the flow required by the steering maneuver goes to the steering circuit. Flow not required for steering is available for use in the auxiliary circuits.

- Provides reliable operation because the steering circuit always has flow and pressure priority.

The bolt on VLC priority valve is designed to be directly mounted onto the port face of a load sensing steering control unit. In line VLC and VLE priority valves are also available for integrated circuit applications. The load sensing steering control units and priority valves can be used with open center, closed center or load sensing systems. Use in an open center system with a fixed displacement pump or a closed center system with a pressure compensated pump, offers many of the features of a load sensing system. Excess flow is available for auxiliary.

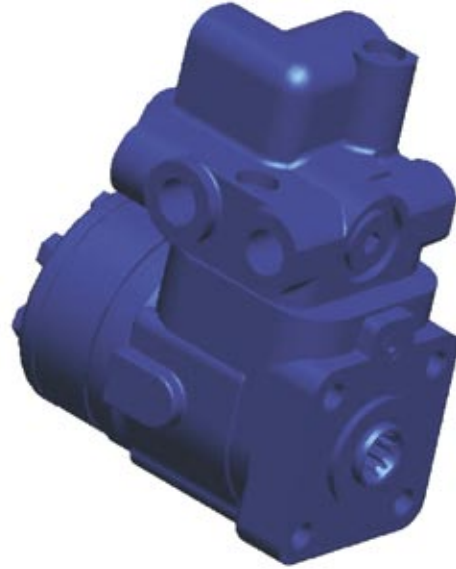
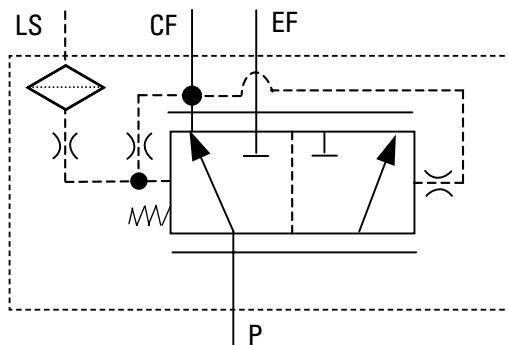


Illustration of BOPV installed on Xcel⁴⁵



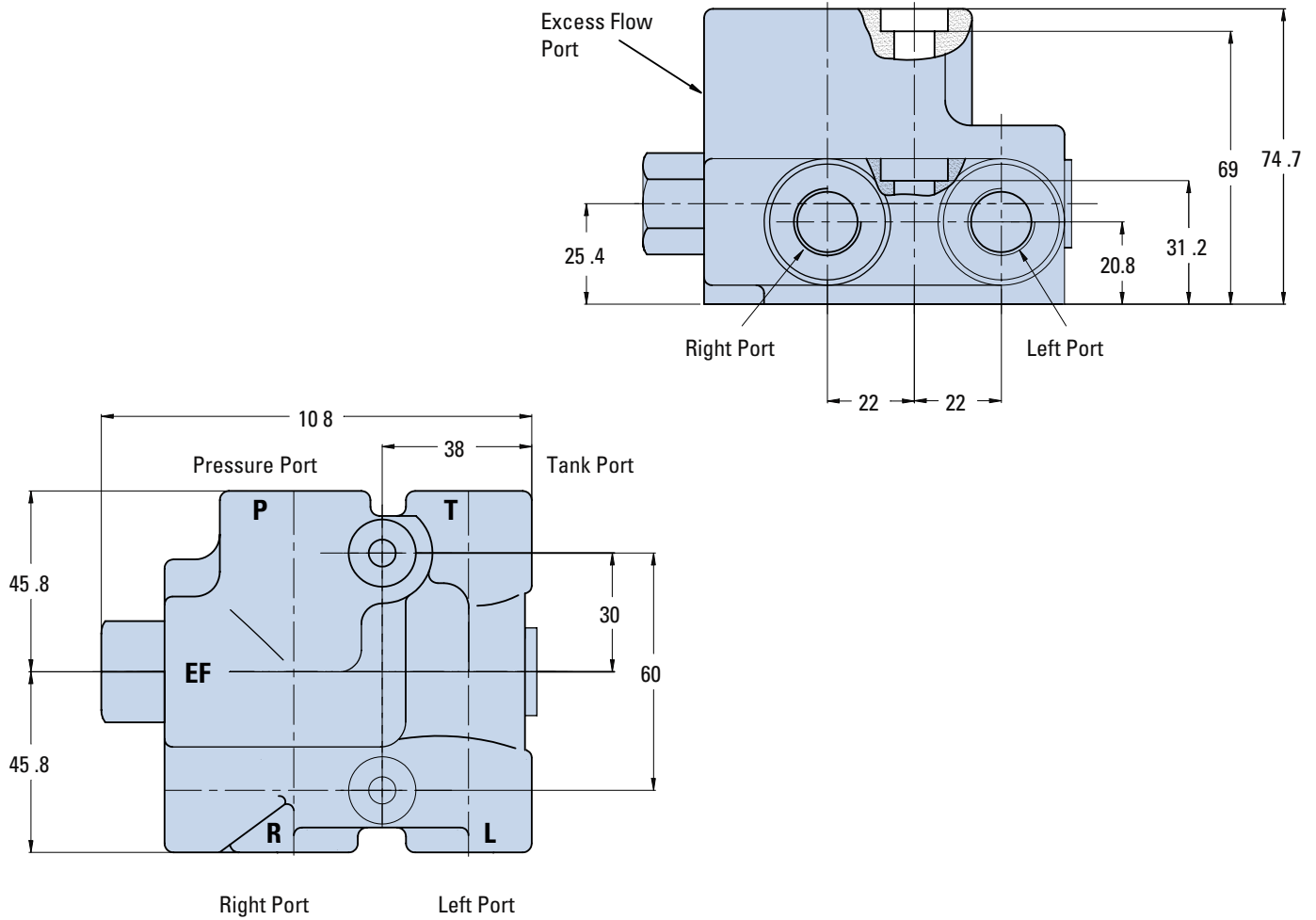
Symbol

Dynamic Signal



Bolt on VLC Priority Valve (BOPV)

Dimensions



Customer Order Information

VLC Priority Valve (BOPV)

The VLC priority valve (BOPV type) is ordered by a product serial number.

880 -1450

Product Number

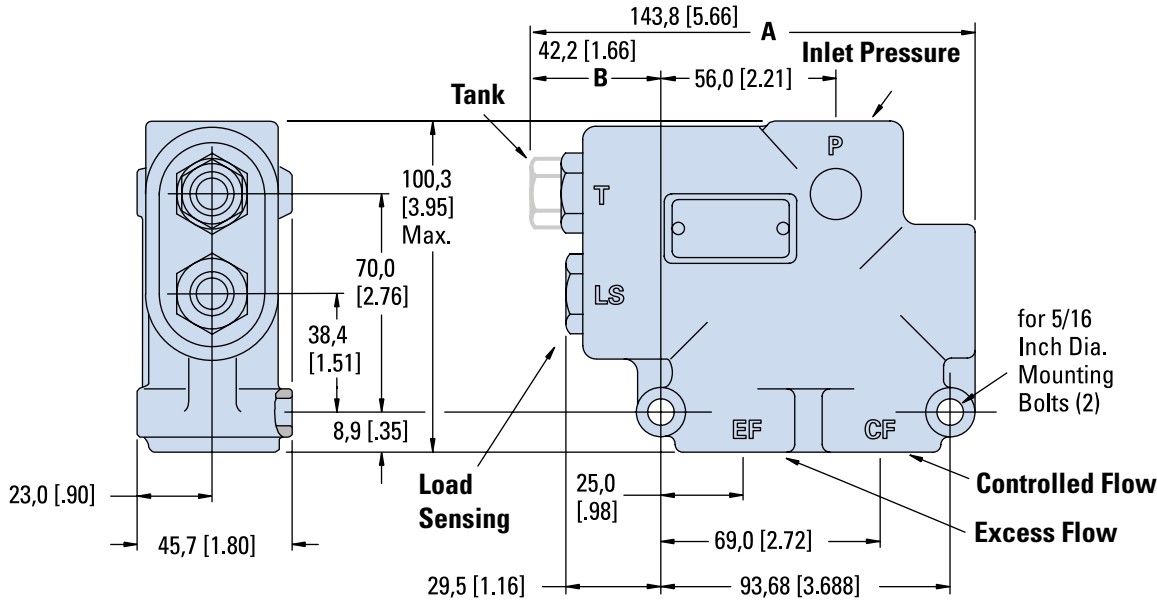
(Max. inlet flow capacity 60LPM)

Product Numbers

Port & Threads	Circuit	Control Pressure Bar		
		5.2	7.5	10
P & EF – G1/2 R & L & T – G3/8	Dynamic Signal	880-1450	880-1480	880-1490
P & EF – M20X1.5 R & L & T – M18X1.5	Dynamic Signal	880-1550	880-1580	880-1590
P & EF – G1/2 R & L & T – G1/2	Dynamic Signal	880-1750	880-1780	880-1790

VLC In-Line Priority Valves

Dimensions



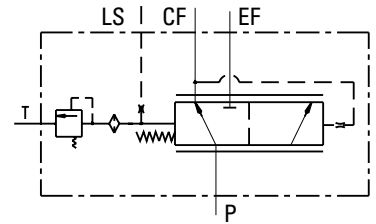
Specifications

Rated Input Flow: L/min	60
Rated Inlet Pressure: bar	241
Max. LS Relief Setting: bar	172

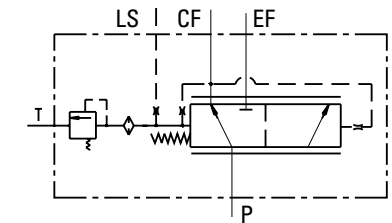
- A static signal priority valve must be used with a static signal load sensing steering unit
- A dynamic signal priority valve must be used with a dynamic signal load sensing steering unit

Hydraulic Symbols

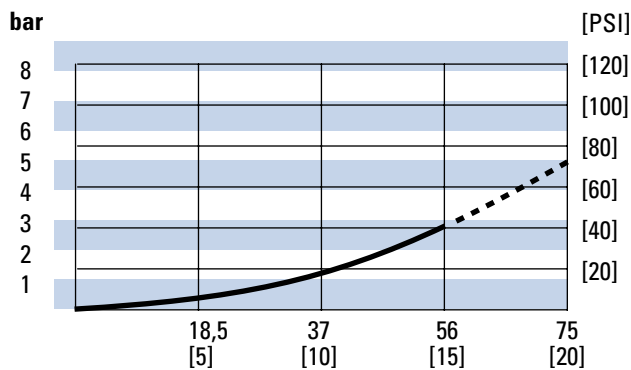
Static Signal



Dynamic Signal



VLC Series Pressure Drop Curve

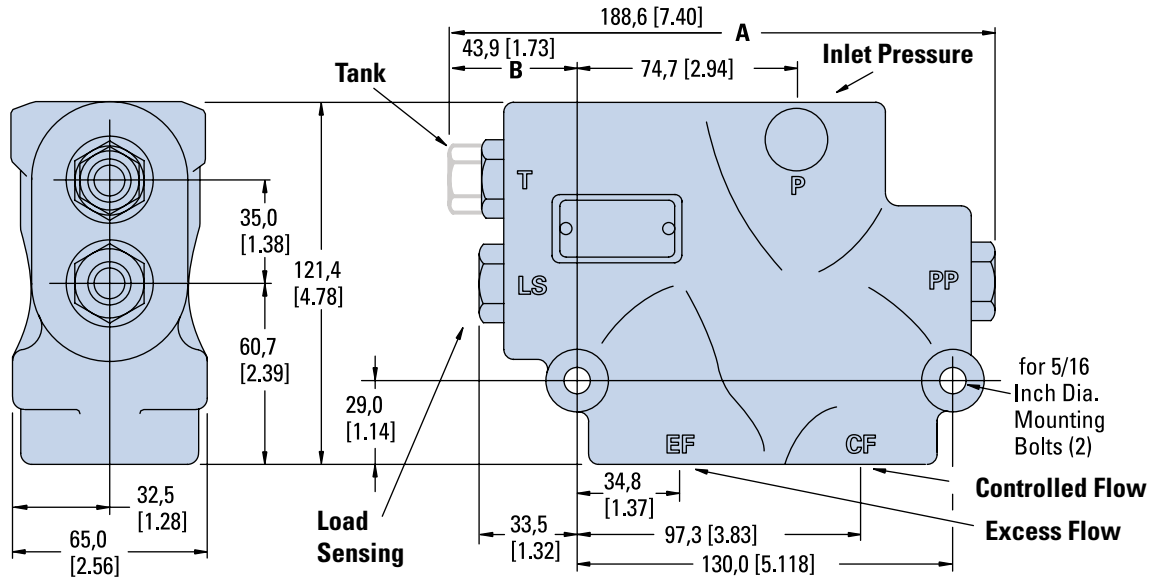


Maximum pressure drop depends on control pressure setting and pressure out EF port.

Minimum Pressure Drop P- EF
Oil Viscosity 25 cSt [120 SUS]

VLE In-Line Priority Valves

Dimensions



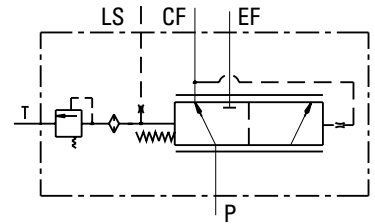
Specifications

Rated Input Flow: L/min	150
Rated Inlet Pressure: bar	241
Max. LS Relief Setting: bar	172

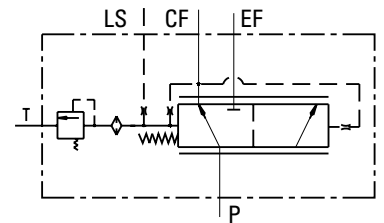
- A static signal priority valve must be used with a static signal load sensing steering unit
- A dynamic signal priority valve must be used with a dynamic signal load sensing steering unit

Hydraulic Symbols

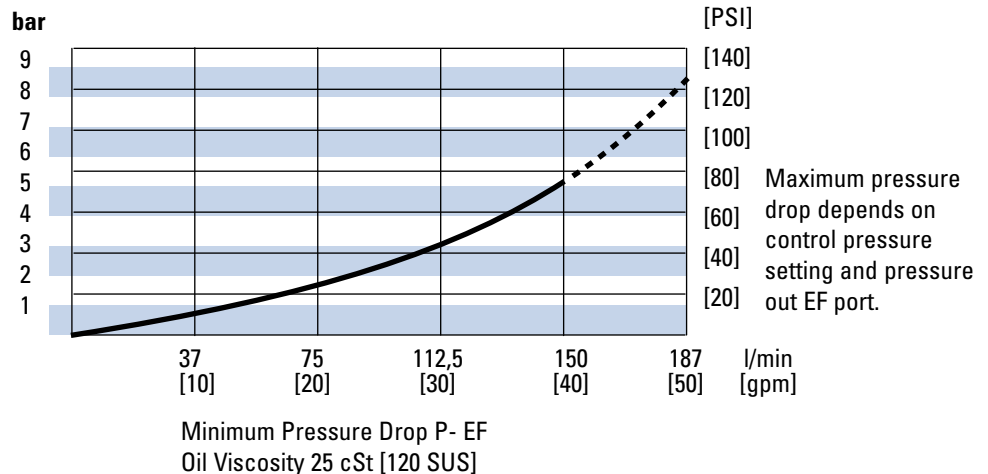
Static Signal



Dynamic Signal



VLE Series Pressure Drop Curve

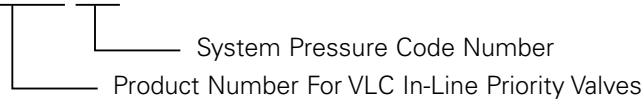


Customer Order Information

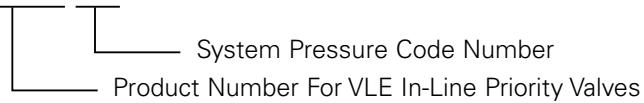
VLC or VLE In-Line Priority Valves

Ordering Information

881 -1001-012



882 -2001-030



System Pressure Code Number

Number	Bar	[psi]	Number	Bar	[psi]	Number	Bar	[psi]
009	64	925	031	102	1475	053	140	2025
010	66	950	032	103	1500	054	141	2050
011	67	975	033	105	1525	055	143	2075
012	69	1000	034	107	1550	056	145	2100
013	71	1025	035	109	1575	057	147	2125
014	72	1050	036	110	1600	058	148	2150
015	74	1075	037	112	1625	059	150	2175
016	76	1100	038	114	1650	060	152	2200
017	78	1125	039	115	1675	061	153	2225
018	79	1150	040	117	1700	062	155	2250
019	81	1175	041	119	1725	063	157	2275
020	83	1200	042	121	1750	064	159	2300
021	84	1225	043	122	1775	065	160	2325
022	86	1250	044	124	1800	066	162	2350
023	88	1275	045	126	1825	067	164	2375
024	90	1300	046	128	1850	068	165	2400
025	91	1325	047	129	1875	069	167	2425
026	93	1350	048	131	1900	070	169	2450
027	95	1375	049	133	1925	071	171	2475
028	97	1400	050	134	1950	072	172	2500
029	98	1425	051	136	1975			
030	100	1450	052	138	2000			

NOTE: If there is not a relief valve, the system pressure code number is 000. Select a pressure code from this table and include it in the product number you determined.

Please always show your selected product number when you place an order.

Customer Order Information

VLC or VLE In-Line Priority Valves

NOTE: A dynamic signal steering unit must be used together with a dynamic signal priority valve.

Please always show your selected product number when you place an order.

Select a number from this table and take reference of the connection dimensions on page 17.

VLC In-Line Priority Valves

Port Size	Signal Type & Control Pressure Bar [PSI]					
	Static 3.5 [50]	Dynamic 5.2 [75]	Static 5.2 [75]	Dynamic 76 [110]	Static 6.0 [100]	Dynamic 10.0 [145]
P & EF: 3/4-16 O-ring CF: 9/16-18 O-ring LS & T: 7/16-20 O-ring	881-1001	881-2001	881-1002	881-2002	881-1003	881-2003
P & EF: 7/8-14 O-ring CF: 3/4-16 O-ring LS & T: 7/16-20 O-ring	881-1101	881-2101	881-1102	881-2102	881-1103	881-2103
P & EF: M22X1.5 O-ring CF: M18X1.5 O-ring LS & T: M12X1.5 O-ring	881-1201	881-2201	881-1202	881-2202	881-1203	881-2203
P & EF: G1/2-14 CF: G1/2-14 LS & T: G1/4-19	881-1301	881-2301	881-1302	881-2302	881-1303	881-2303

VLE In-Line Priority Valves

Port Size	Signal Type & Control Pressure Bar [PSI]					
	Static 4.5 [65]	Dynamic 5.5 [80]	Static 6.9 [100]	Dynamic 8.6 [125]	Static 10.3 [150]	Dynamic 12.8 [185]
P & EF: 1-5/16 -12 O-ring CF: 7/8-14 O-ring LS & T: 7/16-20 O-ring	882-1001	882-2001	882-1002	882-2002	882-1003	882-2003
P & EF: 1-1/16-12 O-ring CF: 7/8-14 O-ring LS & T: 7/16-20 O-ring	882-1101	882-2101	882-1102	882-2102	882-1103	882-2103
P & EF: 7/8-14 O-ring CF: 3/4-16 O-ring LS & T: 7/16-20 O-ring	882-1201	882-2201	882-1202	882-2202	882-1203	882-2203
P & EF: 1-1/16-12 O-ring CF: 3/4-16 O-ring LS & T: 7/16-20 O-ring	882-1301	882-2301	882-1302	882-2302	882-1303	882-2303
P & EF: 1-5/16-12 O-ring CF: 1-5/16-12 O-ring LS & T: 7/16-20 O-ring	882-1401	882-2401	882-1402	882-2402	882-1403	882-2403
P & EF: 1-5/16-12 O-ring CF: 3/4-16 O-ring LS & T: 7/16-20 O-ring	882-1501	882-2501	882-1502	882-2502	882-1503	882-2503
P & EF: M27X2 O-ring CF: M18X1.5 O-ring LS & T: M12X1.5 O-ring	882-1601	882-2601	882-1602	882-2602	882-1603	882-2603
P & EF: G3/4-14 CF: G1/2-14 LS & T: G1/4-19	882-1701	882-2701	882-1702	882-2702	882-1703	882-2703

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