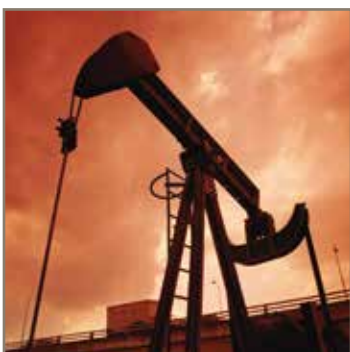




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C Series Variable Displacement Axial Piston Pumps For Closed-Circuit Applications

HY28-2686-01/C/US Revised September 2014



ENGINEERING YOUR SUCCESS.

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⚠ WARNING - USER RESPONSIBILITY

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

This document and other information from Parker-Hannifin Corporation, its subsidiaries and authorized distributors provide product or system options for further investigation by users having technical expertise. The user, through its own analysis and testing, is solely responsible for making the final selection of the system and components and assuring that all performance, endurance, maintenance, safety and warning requirements of the application are met. The user must analyze all aspects of the application, follow applicable industry standards, and follow the information concerning the product in the current product catalog and in any other materials provided from Parker or its subsidiaries or authorized distributors. To the extent that Parker or its subsidiaries or authorized distributors provide component or system options based upon data or specifications provided by the user, the user is responsible for determining that such data and specifications are suitable and sufficient for all applications and reasonably foreseeable uses of the components or systems.

Offer of Sale

The items described in this document are hereby offered for sale by Parker-Hannifin Corporation, its subsidiaries or its authorized distributor. This offer and its acceptance are governed by the provisions stated in the detailed "Offer of Sale" elsewhere in this document.



General Information

The C Series variable displacement piston pumps have been designed for use in closed circuit hydrostatic applications. The flow direction is controlled by a rugged swashplate and bearing design. Units are rated to operate at pressure up to 420 bar (6090 PSI).

Parker C Series offers a full range of controls:

- **Manual lever with feedback (with or without neutral position switch)**
- **Hydraulic proportional with or without feedback**
- **Electric proportional with or without feedback**
- **Electric on-off**
- **Electric proportional with hydraulic override**
- **Automotive**

With two cross port relief valves, C Series pumps are protected from pressure overloads. The charge pump circuit features a gerotor pump with three displacement options, while the pump design performs with a variety of accessories, including:

- **Hydraulic pressure compensator**
- **Electric cut-off valve**
- **Combination hydraulic pressure/electric cut-off**
- **Flushing valve**
- **Charge pressure filter with electric or mechanical clogging sensor**

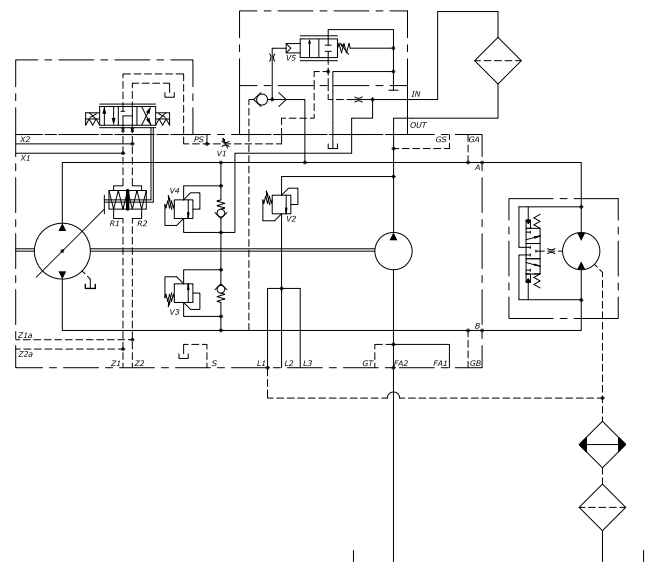


Basic Closed Circuit

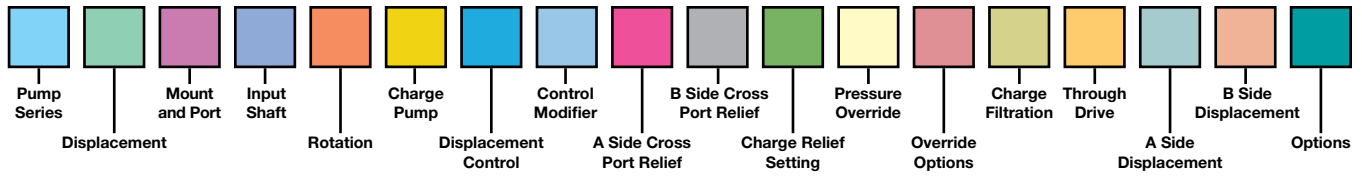
In a closed circuit transmission, both work ports of the hydraulic pump are connected to the hydraulic actuator, typically a hydraulic motor. In a closed circuit transmission, fluid can flow out of either port of the pump to the actuator and return via the opposite port. The position of the swash plate in the pump determines flow direction in the circuit.

The closed circuit pump and actuator will (normally) have case drains which will allow for hot oil to be removed from the circuit for cooling and filtering. Fluid removed from the circuit is replaced by the fluid supplied by the charge pump. The charge pump is a fixed displacement pump, typically a gerotor unit, that's primary purposes are to supply oil into the closed circuit to make up for losses and to provide control flow to the pump displacement controls.

Typical C081 and An F12-060 with Integrated Flushing Valve Option L01



Model Codes



Pump Series	
C	C Series closed circuit pump

Displacement	
081	081 cc/rev (4.94 CIR)
136	136 cc/rev (8.3 CIR)

Mount and Port Options	
C	SAE C 2/4 bolt mount with SAE ports (C081 only)
D	SAE D 2/4 bolt mount with SAE ports (C136 only)
G	SAE C 2/4 bolt mount with ISO ports (C081 only)
H	SAE D 2/4 bolt mount with ISO ports (C136 only)

Input Shaft		081	136
1	SAE C 14T 12/24 DP 1 1/4" OD ANSI B92.1a-1976	X	—
2	21T 16/32 DP 1 3/8" OD ANSI B92.1a-1976	X	—
3	SAE D-E 13T 8/16 DP 1 3/4" OD ANSI B92.1a-1976	—	X
4	SAE F 15T 8/16 DP 2" OD ANSI B92.1a-1976	—	X
5	23T 16/32 DP 1 1/2" OD ANSI B92.1a-1976	—	X
6	27T 16/32 DP 1 3/4" OD ANSI B92.1a-1976	—	X
7	W40x2x30x18 DIN 5480	—	X
8	W45x2x30x21 DIN 5480	—	X

X = Available
— = Not available

Rotation	
R	CW
L	CCW

As viewed looking at the shaft

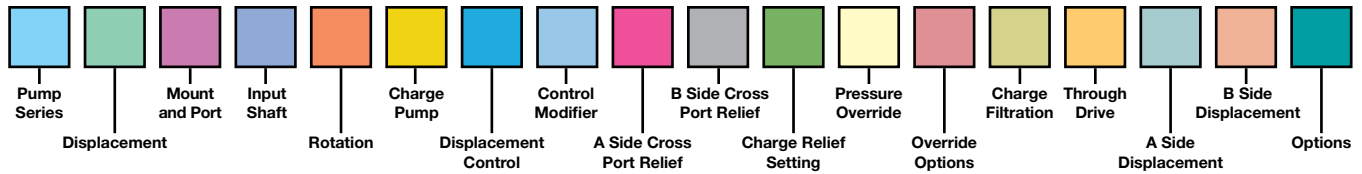
Charge Pump		081	136
A	18 cc/rev (1.1 CIR)	#	—
B	23.1 cc/rev (1.41 CIR)	X	X
C	27.3 cc/rev (1.65 CIR)	X	#
X	No Charge pump	X	X

= Standard option
X = Available
— = Not available

Displacement Control	
A	Manual lever
B	Manual lever with neutral switch
C	Hydraulic proportional control with internal feedback
D	Hydraulic proportional control without internal feedback
E	Electric non proportional
F	Electric proportional with internal feedback
G	Electric proportional without internal feedback
H	Electric proportional with internal feedback and hydraulic override
J	Automotive control electrical
K	Automotive control hydraulic



Model Codes



Displacement Control										Control Modifier							
A	B	C	D	E	F	G	H	J	K	Pump control selection determines what modifier is used							
#	#	-	A	-	-	-	-	-	-	<>	0	0	0	No control orifices			
-	-	-	X	-	-	-	-	-	-	<>	0	0	5	0.5 mm (.019 in) control orifice			
-	-	X	-	-	-	-	-	-	-	<>	0	0	6	0.6 mm (.024 in) control orifice			
-	-	X	C	-	-	-	-	-	-	<>	0	0	7	0.7 mm (.027 in) control orifice			
-	-	#	B	-	-	-	-	-	-	<>	0	0	8	0.8 mm (.031 in) control orifice			
-	-	X	#	-	-	-	-	-	-	<>	0	0	9	0.9 mm (.035 in) control orifice			
-	-	X	-	-	-	-	-	-	-	<>	0	1	2	1.2 mm (.047 in) control orifice			
-	-	-	-	-	X	-	-	-	-	<>	2	0	0	12 VDC, No control orifice			
-	-	-	-	-	X	-	-	-	-	<>	2	0	6	12 VDC, 0.6 mm (.024 in) control orifice			
-	-	-	-	-	X	-	-	-	-	<>	2	0	7	12 VDC, 0.7 mm (.027 in) control orifice			
-	-	-	-	-	#	X	X	-	-	<>	2	0	8	12 VDC, 0.8 mm (.031 in) control orifice			
-	-	-	-	X	-	-	-	-	-	<>	2	1	2	12 VDC, 1.2 mm (.047 in) control orifice			
-	-	-	-	-	A	-	-	-	-	<>	2	2	0	12 VDC, 2.0 mm (.079 in) control orifice			
-	-	-	-	-	X	-	-	-	-	<>	4	0	0	24 VDC, No control orifice			
-	-	-	-	-	X	-	-	-	-	<>	4	0	6	24 VDC, 0.6 mm (.024 in) control orifice			
-	-	-	-	-	X	-	-	-	-	<>	4	0	7	24 VDC, 0.7 mm (.027 in) control orifice			
-	-	-	-	-	#	#	#	-	-	<>	4	0	8	24 VDC, 0.8 mm (.031 in) control orifice			
-	-	-	-	X	-	-	-	-	-	<>	4	1	2	24 VDC, 1.2 mm (.047 in) control orifice			
-	-	-	-	-	A	-	-	-	-	<>	4	2	0	24 VDC, 2.0 mm (.079 in) control orifice			
-	-	-	-	-	-	-	-	X	-	<>	D			No Inching valve, 12 VDC coils, J control only			
-	-	-	-	-	-	-	-	X	-	<>	E			Hydraulic Inching valve, 12 VDC coils, J control only			
-	-	-	-	-	-	-	-	X	-	<>	F			No Inching valve, 24 VDC coils, J control only			
-	-	-	-	-	-	-	-	X	-	<>	G			Hydraulic Inching valve, 24 VDC coils, J control only			
-	-	-	-	-	-	-	-	X	<>	H				Hydraulic Inching valve, K control only			
-	-	-	-	-	-	-	-	X	<>	X				No Inching valve, K control only			
-	-	-	-	-	-	-	-	X	X	<>	2			1.2 mm (.047 in) control orifice			
-	-	-	-	-	-	-	-	X	X	<>	5			1.5 mm (.059 in) control orifice			
-	-	-	-	-	-	-	-	X	X	<>	P			Prepared for flushing valve			
-	-	-	-	-	-	-	-	X	X	<>	1			Flushing valve installed with 1.5 mm orifice			
-	-	-	-	-	-	-	-	X	X	<>	2			Flushing valve installed with 2.0 mm orifice			
-	-	-	-	-	-	-	-	X	X	<>	3			Flushing valve installed with 2.5 mm orifice			
# = Standard option X = Available all displacements - = Not available A = 136cc unit only B = 81cc units only C = With pressure override 81cc unit only										Example modifier with J/K control <table border="1"> <tr> <td>G</td> <td>5</td> <td>P</td> <td>Hydraulic inching valve, 24VDC coils with a 1.5 mm control orifice and prepared for flushing</td> </tr> </table> When ordering J/K control specify starting input RPM, input RPM at rated torque and rated input torque (NM)				G	5	P	Hydraulic inching valve, 24VDC coils with a 1.5 mm control orifice and prepared for flushing
G	5	P	Hydraulic inching valve, 24VDC coils with a 1.5 mm control orifice and prepared for flushing														

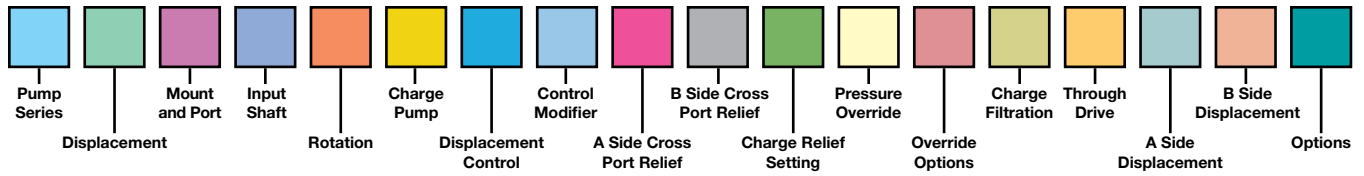
A Side Cross Port Relief	
A	250 Bar (3625 PSI)
B	350 Bar (5075 PSI)
C	420 Bar (6090 PSI)
D	450 Bar (6525 PSI)

B Side Cross Port Relief	
A	250 Bar (3625 PSI)
B	350 Bar (5075 PSI)
C	420 Bar (6090 PSI)
D	450 Bar (6525 PSI)

Charge Relief Setting		
A	20 Bar (290 PSI)	X -
B	22 Bar (319 PSI)	# #
C	25 Bar (362 PSI)	X X

= Standard option
X = Available all displacements
- = Not available

Model Codes



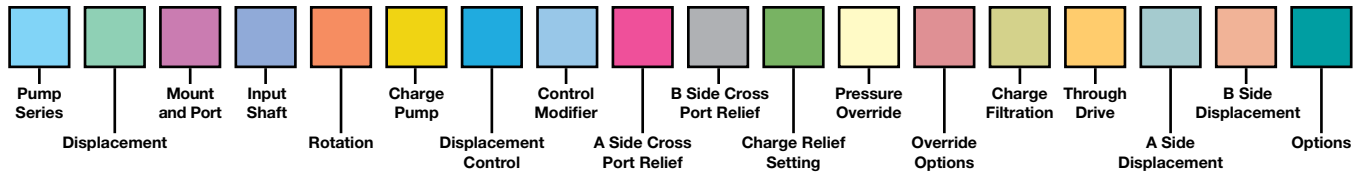
Pressure Override	
X	No pressure override
P	Hydraulic internal pressure override
E	Electrical override
C	Electrical override and hydraulic internal pressure override
<i>Override not available on J/K control Pressure override should be set 20-30 bar below cross port relief settings. See page 28 for more information.</i>	

Pressure Override					Override Options		
X	P	E	C		Pressure override selection determines override option		
X	—	—	—	<>	X	X	No pressure override
—	X	—	—	<>	0	A	Locked
—	X	—	—	<>	0	B	100 Bar (1450 PSI)
—	X	—	—	<>	0	C	150 Bar (2175 PSI)
—	X	—	—	<>	0	D	200 Bar (2900 PSI)
—	X	—	—	<>	0	E	250 Bar (3625 PSI)
—	A	—	—	<>	0	F	280 Bar (4060 PSI)
—	X	—	—	<>	0	G	300 Bar (4350 PSI)
—	B	—	—	<>	0	H	320 Bar (4712 PSI)
—	X	—	—	<>	0	J	330 Bar (4785 PSI)
—	X	—	—	<>	0	K	350 Bar (5075 PSI)
—	X	—	—	<>	0	M	380 Bar (5510 PSI)
—	X	—	—	<>	0	N	400 Bar (5800 PSI)
—	—	X	—	<>	1	2	12 VDC coil
—	—	X	—	<>	2	4	24 VDC coil
—	—	—	X	<>	2	A	12VDC coil locked override
—	—	—	X	<>	2	B	12VDC coil, 100 Bar (1450 PSI) override
—	—	—	X	<>	2	C	12VDC coil, 150 Bar (2175 PSI) override
—	—	—	X	<>	2	D	12VDC coil, 200 Bar (2900 PSI) override
—	—	—	X	<>	2	E	12VDC coil, 250 Bar (3625 PSI) override
—	—	—	X	<>	2	G	12VDC coil, 300 Bar (4350 PSI) override
—	—	—	X	<>	2	K	12VDC coil, 350 Bar (5075 PSI) override
—	—	—	X	<>	2	M	12VDC coil, 380 Bar (5510 PSI) override
—	—	—	X	<>	2	N	12VDC coil, 400 Bar (5800 PSI) override
—	—	—	X	<>	4	A	24 VDC coil locked override
—	—	—	X	<>	4	B	24 VDC coil, 100 Bar (1450 PSI) override
—	—	—	X	<>	4	C	24 VDC coil, 150 Bar (2175 PSI) override
—	—	—	X	<>	4	D	24 VDC coil, 200 Bar (2900 PSI) override
—	—	—	X	<>	4	E	24 VDC coil, 250 Bar (3625 PSI) override
—	—	—	X	<>	4	G	24 VDC coil, 300 Bar (4350 PSI) override
—	—	—	X	<>	4	K	24 VDC coil, 350 Bar (5075 PSI) override
—	—	—	X	<>	4	M	24 VDC coil, 380 Bar (5510 PSI) override
—	—	—	X	<>	4	N	24 VDC coil, 400 Bar (5800 PSI) override

X = Available all displacements
 — = Not available
 A = 136 cc unit only
 B = 81 cc units only



Model Codes



Charge Filtration		081	136
X	No charge filter	X	X
N	Charge filter with 8 Bar (116 PSI) mechanical bypass indicator	X	X
G	Charge filter with 8 Bar (116 PSI) electrical bypass indicator	X	X
R	Prepared for remote charge pressure filtration	X	X
X = Available - = Not available			
Charge filter and remote filter block not available on J/K control			

A Side Displacement	
00-99	Set displacement of A side between 0-99%
XX	XX = 100% displacement

B Side Displacement	
00-99	Set displacement of B side between 0-99%
XX	XX = 100% displacement

Options		081	136
X	No paint, no bypass valve	#	#
Y	No paint with bypass valve	X	-
P	Paint Black, no bypass valve	X	X
D	Paint Black with bypass valve	X	-
M	Special modification contact technical support		
# = Standard option X = Available all displacements - = Not available			

Through Drive		081	136
X	No through drive	#	#
A	SAE A mount, 9T spline shaft	X	X
B	SAE B mount, 13T spline shaft	X	X
G	SAE B mount, 15T spline shaft	X	X
C	SAE C mount, 14T spline shaft	X	X
H	SAE C mount, 17T spline shaft	X	X
D	SAE D mount, 13T spline shaft	-	X
E	SAE C mount, 14T spline shaft for multiple pump: 2nd pump 81 cc/r mounted	X	X
F	SAE D mount, 13T spline shaft for multiple pump: 2nd pump 136 cc/r mounted	-	X
L	SAE D mount, 23T spline shaft for multiple pump: 2nd pump 136 cc/r mounted	-	X
# = Standard option X = Available - = Not available			

Example Model Code

C081C1RAF208BBBP0HRAXXXP

- C081** = 81cc frame
- C** = SAE C 2/4 bolt mount with SAE ports
- 1** = SAE C 14T 12/24 DP 1-1/4" OD ANSI B92.1A-1976
- R** = CW rotation (looking at the shaft)
- A** = 81cc frame 18cc/rev (1.1 CIR) charge pump
- F** = Electric proportional with internal feedback displacement control
- 208** = 12 VDC, 0.8mm (.031 in) control orifice
- B** = A side cross port relief set to 350 bar (5075 PSI)
- B** = B side cross port relief set to 350 bar (5075 PSI)
- B** = Charge relief set to 22 bar (319 PSI)
- P** = Hydraulic internal pressure override
- 0H** = Pressure override set to 320 bar (4712 PSI)
- R** = Prepared for remote charge pressure filtration
- A** = SAE A mount through drive with 9T spline shaft coupling
- XX** = A side displacement set to 100%
- XX** = B side displacement set to 100%
- P** = Paint black, no bypass valve

Technical Data

Technical Data

Fluids

Only fluids with mineral oil basis and anticorrosive, antioxidant and wear-preventing agents (HL or HM) should be used. Viscosity range at operating temperature must be between 15 and 40 cSt. For short periods and low starting temperatures, a maximum viscosity of 800 cSt is allowed. Viscosities less than 10 cSt are not permitted. In extreme operating conditions, a viscosity range of 10 to 15 cSt is allowed for short periods.

Operating Temperature

The oil's operating temperature must be between -13°F and 194°F (-25°C and 90°C). Running the unit outside of these temperature ranges is not recommended, and could negatively impact performance.

Filtration

The C Series pump is available with a built-in charge filter. Units also can be shipped with a block to permit a remote-mounted filter. Parker suggests a remote pressure filter with an element rating of 10 micron absolute and a minimum beta ratio of 200. A visual or electromechanical indicator is also suggested.

Correct filtration helps extend unit life. The maximum permissible contamination class is 20/18/15 per ISO 4406:1999. Suction filters are not suggested. If needed, a 100-mesh (149-micron) strainer is the finest mesh recommended.

Suction Pressure

The charge pump suction performs at a minimum absolute pressure of 0.8 bar (11.6 psi). For short periods and low starting temperatures, an absolute pressure of 0.5 bar (7.25 psi) is allowed. Inlet pressure may never be lower.

Operating Pressure

Main pump: The maximum permissible continuous pressure is 420 bar (6,090 psi).

Charge pump: Nominal pressure is 25 bar (360 psi). Maximum admissible pressure is 40 bar (580 psi).

Case Drain Pressure

Maximum case drain pressure is 4 bar (58 psi). For short periods and low starting temperatures, a pressure of 6 bar (86 psi) is allowed. Higher pressures can damage the input shaft seal, reducing its life.

Seals

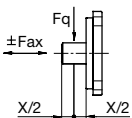
Parker C Series pumps use standard FKM (Viton®) seals. In case of special fluids, contact your Parker distributor.

Displacement Limiting

An externally adjustable mechanical device limits displacement by utilizing two setting screws to limit to the control piston stroke.

Input Shaft: Radial and Axial Loads

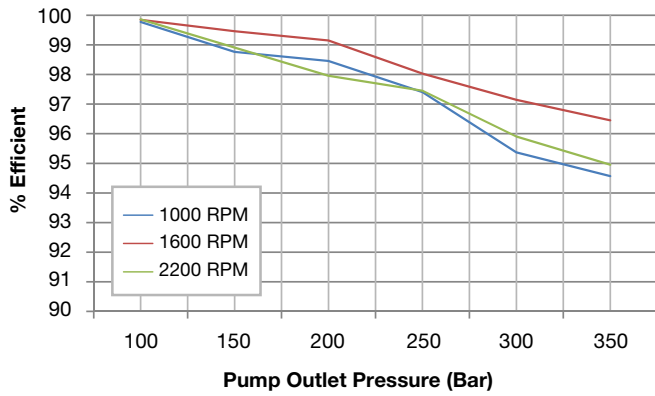
The input shaft can stand both radial and axial loads. Maximum permissible loads in the following table are calculated to guarantee a service life of at least 80% of that of bearings to which no load has been applied.

Displacement				081	136
	Radial Load	F _q max	lbf	540	1035
	Axial Load	F _{ax} max	lbf	428	967

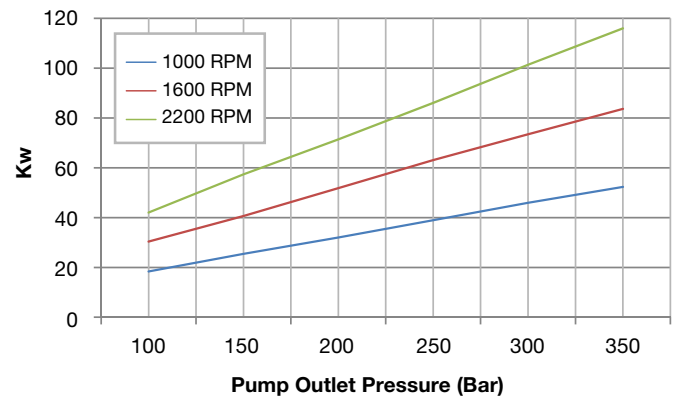
C Series Technical Specifications		
Frame	C081	C136
Displacement CC/Rev (CIR)	81 (4.94)	136 (8.3)
Input Speed (RPM)		
Continuous	3400	2850
Intermittent	3600	3250
Minimum	500	500
System Pressure Bar (PSI)		
Continuous	420 (6090)	
Peak*	450 (6525)*	
Charge Inlet Pressure Bar (PSI) Absolute		
Minimum	.8 (11.6)	
Cold startup	.5 (7.25)	
Case Pressure Bar (PSI)		
Maximum Continuous	4 (58)	
Cold startup	6 (86)	
Fluid Viscosity cSt		
Operating	15 to 40	
Minimum	10	
Cold startup	800	
Fluid Operating Temperature °F (°C)	-13 to 194°F (-25 to 90°C)	
Maximum Permissible Fluid Cleanliness Per ISO 4406:1999	20/18/15	
Power Consumption kW (HP)		
Continuous	170 (228)	259 (347)
Intermittent	203 (272)	343 (459)
Maximum Torque at Maximum Displacement Nm (lb-ft)		
Continuous	478 (352)	858 (632)
Peak	537 (396)	980 (722)
Moment of Intertia Kg-m² (lb-ft²)	.014 (.34)	.040 (.96)
Approximate Weight kg (lb)	51 (113)	86 (190)

*Peak is defined as no longer than 1% of every minute. For long life design system to not run at maximum flow and pressure continuously.

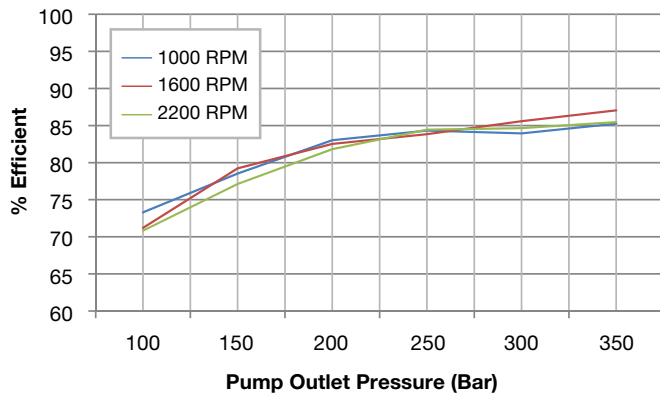
C081 Volumetric Efficiency



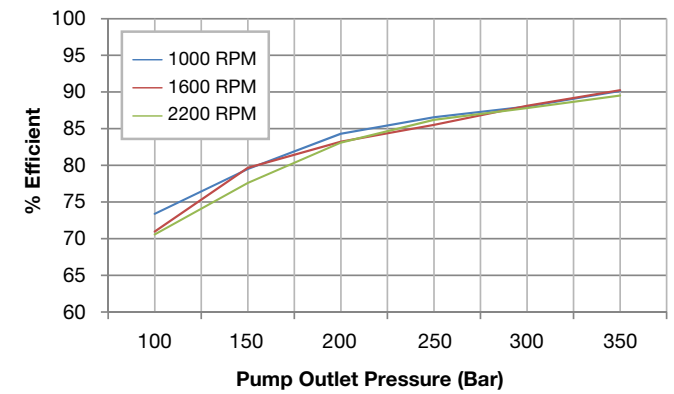
C081 Input Power



C081 Overall Efficiency



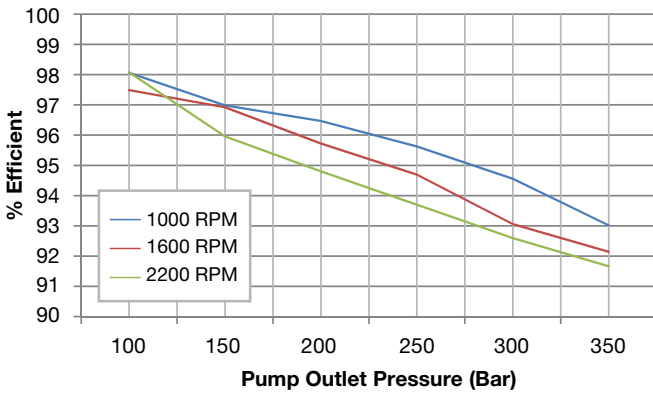
C081 Mechanical Efficiency



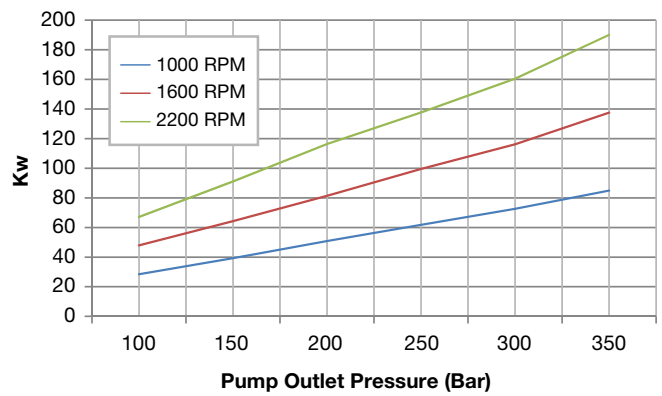
Testing completed using ISO VG68 fluid at 90°C 18 cc charge pump with 22 bar pressure setting



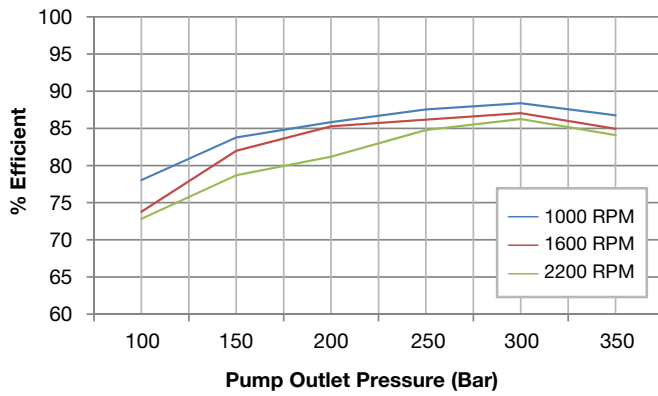
C136 Volumetric Efficiency



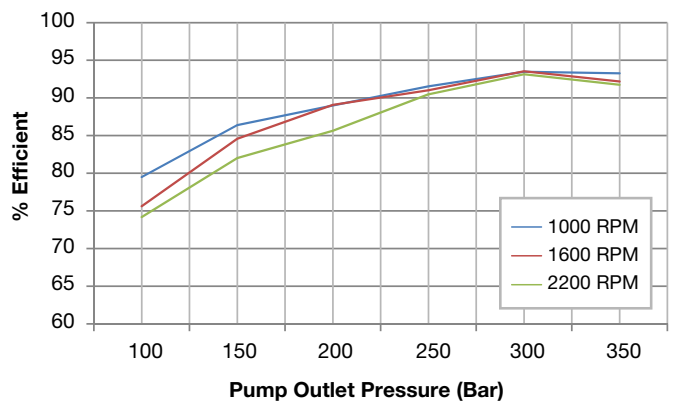
C136 Input Power



C136 Overall Efficiency



C136 Mechanical Efficiency

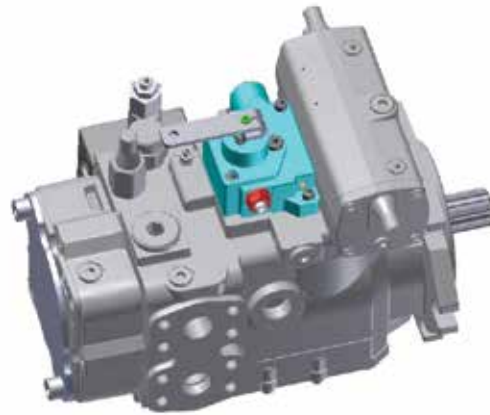


Testing completed using ISO VG68 fluid at 90°C 23 cc charge pump with 22 bar pressure setting

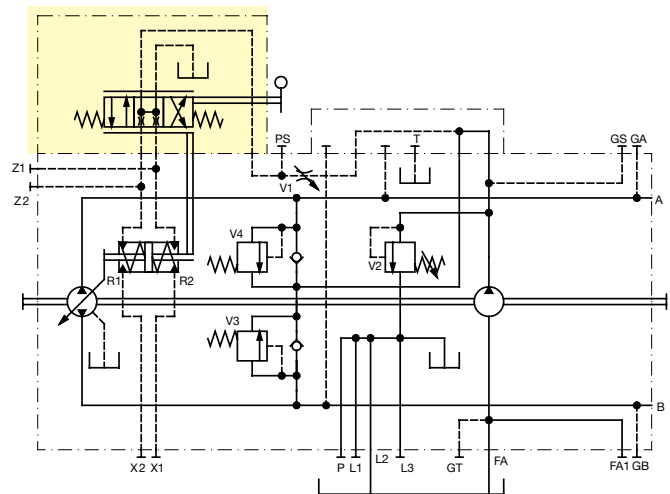
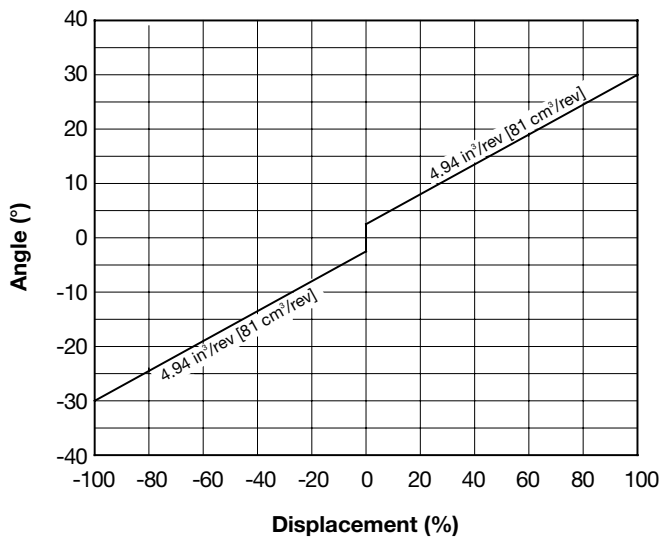
Controls

Manual Lever Control With Feedback – A

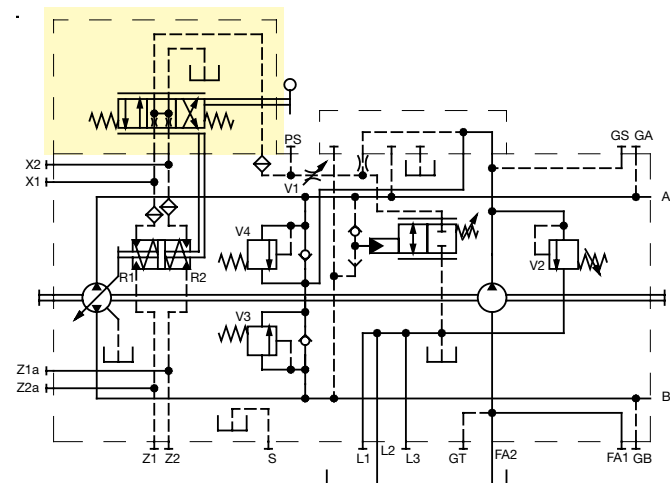
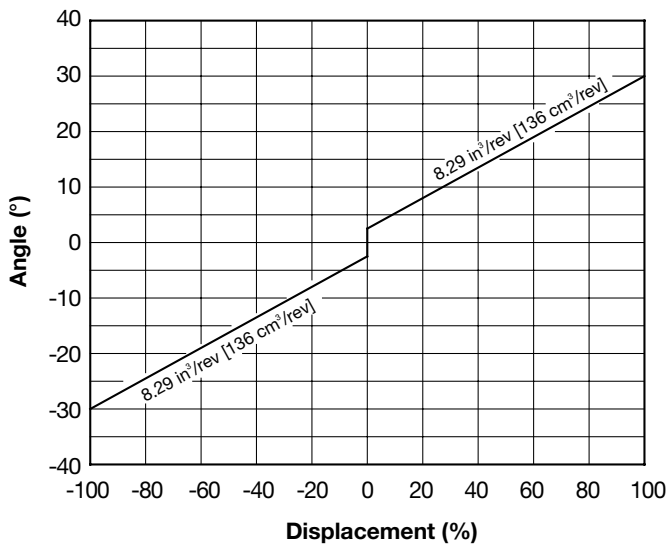
Pump displacement is directly proportional to the lever's rotation angle. Based on swash-plate position, the feedback system works automatically to compensate for positioning errors. Refer to diagrams for relationship between angle and displacement.



Lever Angle vs. Displacement: C081

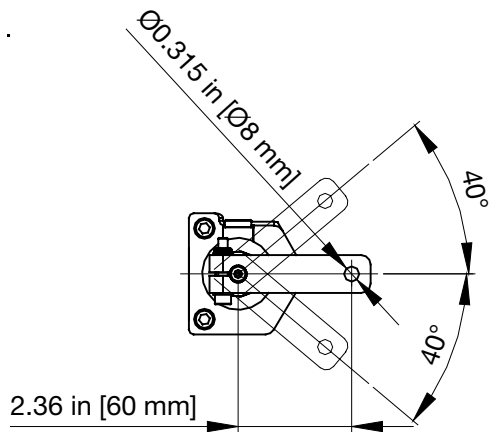


Lever Angle vs. Displacement: C136



Controls

Lever Detail

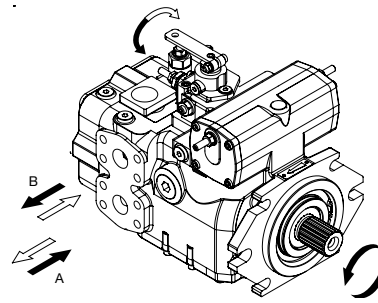


Lever width = .75 in [20 mm]
 Lever thickness = .16 in [4 mm]
 The torque necessary at the control lever is between 1 and 2.45 Nm [0.737 and 1.80 lbf-ft].

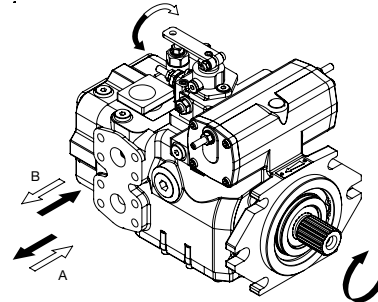
Note:

The spring return feature in the control unit is not a safety device. Internal contamination (contaminated hydraulic fluid, abrasion or residual contamination from system components) can cause the spool valve inside the control unit to get stuck in an undefined position. As a result, the axial piston unit will no longer supply the specified flow. Check which remedial measures should be taken on your machine in order to bring the driver consumer into a safe position (e.g. immediate stop).

Direction of Rotation



L (CCW) Rotation

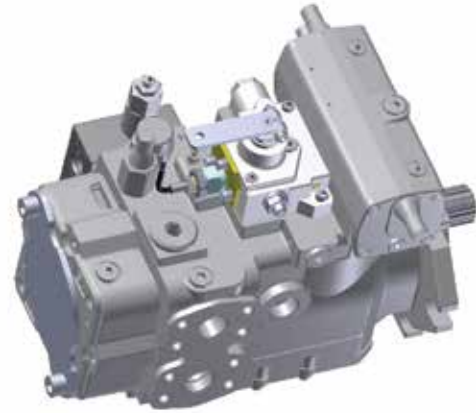


R (CW) Rotation

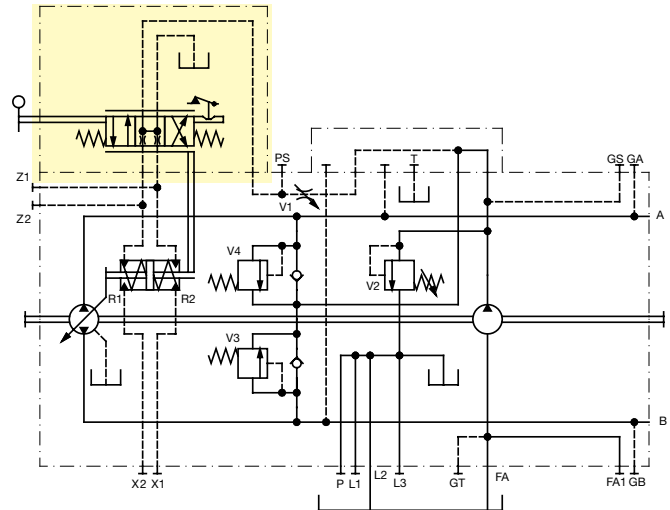
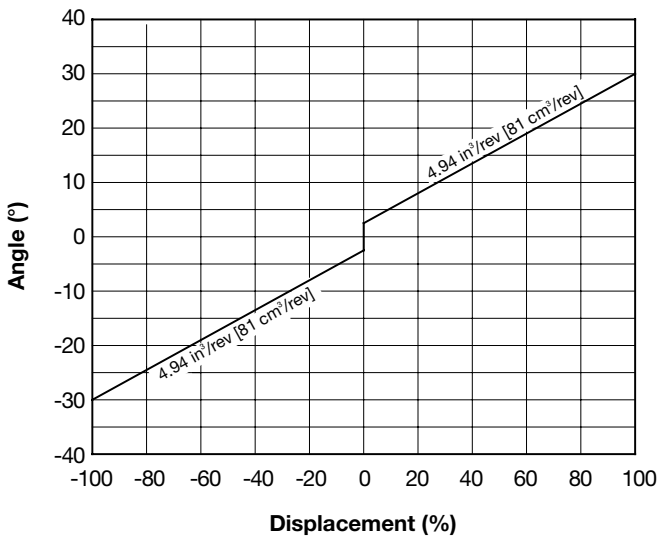
Correlation between direction of rotation (shaft view) control and direction of flow.

**Manual Lever Control with Feedback and
 Neutral Position Micro Switch – B**

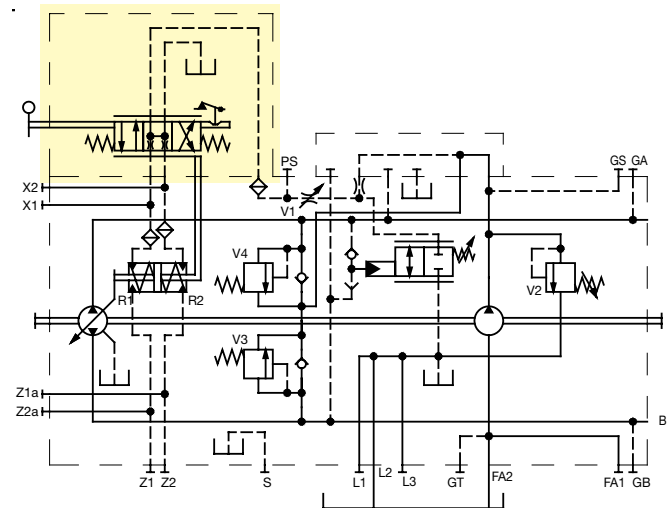
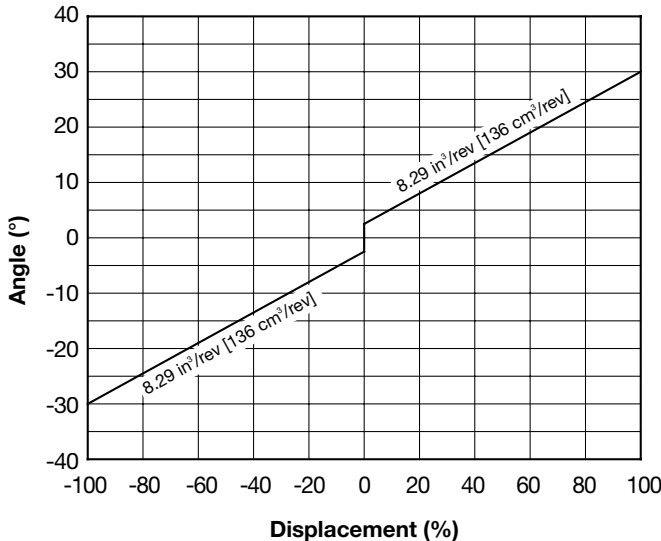
Pump displacement is directly proportional to lever angle. Based on swash-plate position, the feedback system works automatically to compensate for positioning errors. Built as PNP, the sensor is in low voltage when the lever is in the neutral position. Any lever movement brings the sensor to high voltage. Refer to diagrams for relationship between angle and displacement.



C081 Lever Angle vs. Displacement

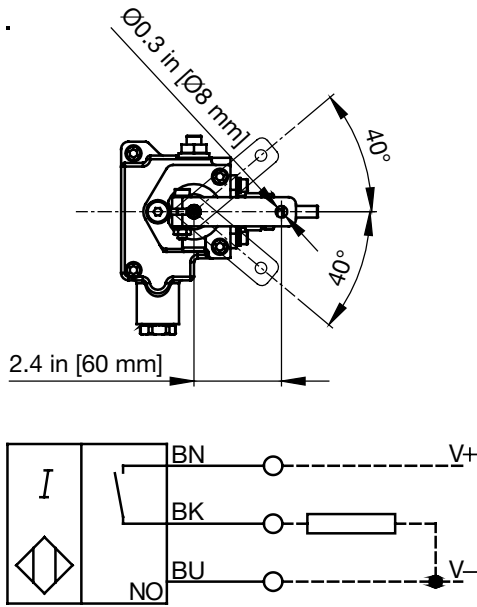


C136 Lever Angle vs. Displacement



Controls

Lever Detail



Lever width = .75 in [20 mm]
 Lever thickness = .16 in [4 mm]
 The torque necessary at the control lever is between 1 and 2.45 Nm [0.737 and 1.80 lbf-ft].

Note:

The spring return feature in the control unit is not a safety device. Internal contamination (contaminated hydraulic fluid, abrasion or residual contamination from system components) can cause the spool valve inside the control unit to get stuck in an undefined position. As a result, the axial piston unit will no longer supply the specified flow. Check which remedial measures should be taken on your machine in order to bring the driver consumer into a safe position (e.g. immediate stop).

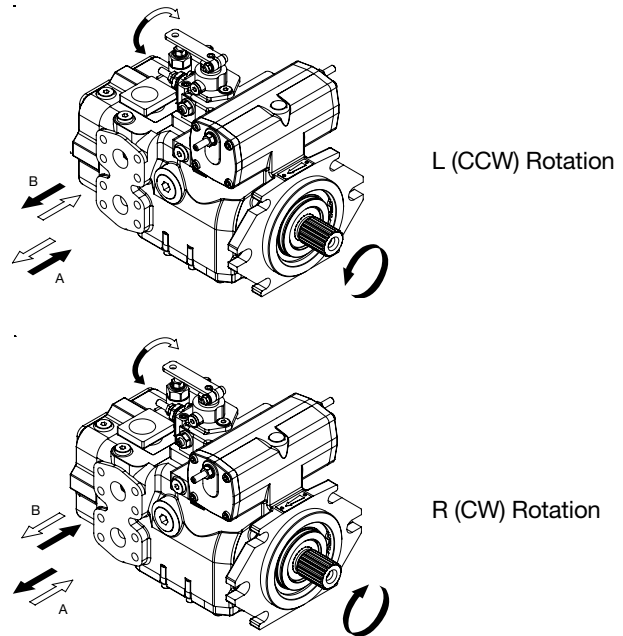
Electronic Sensor Technical Features:

- Inductive principle
- Output current PNP
- Voltage 10÷34 V
- Current in neutral $I_o \leq 10$
- Nominal working current I_e 200 mA
- Temperature range -13°F to +185°F (-25°C +85°)
- Enclosure IP67

Output Signal:

$V_{high} > V \text{ d.c. } -2V$
 $V_{low} < 2V$

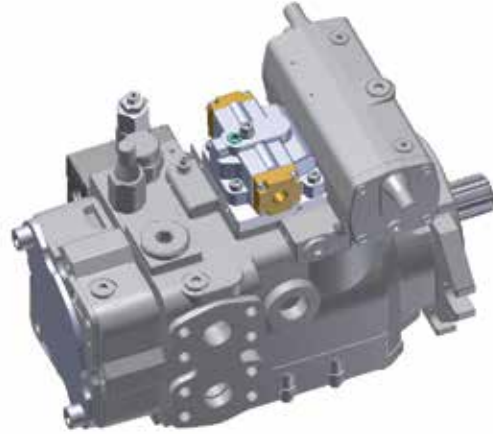
Direction of Rotation



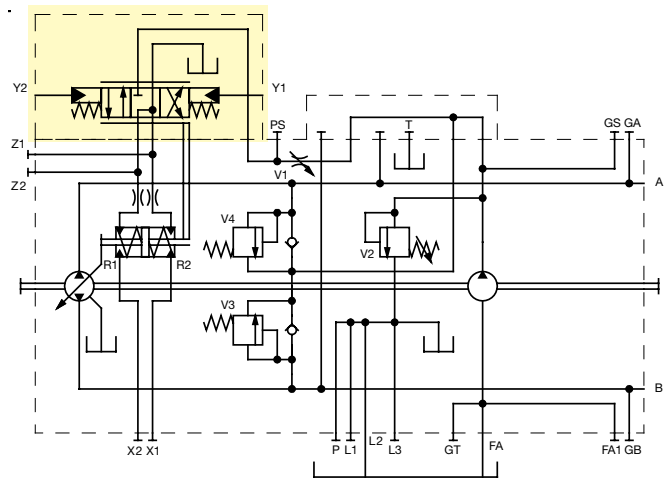
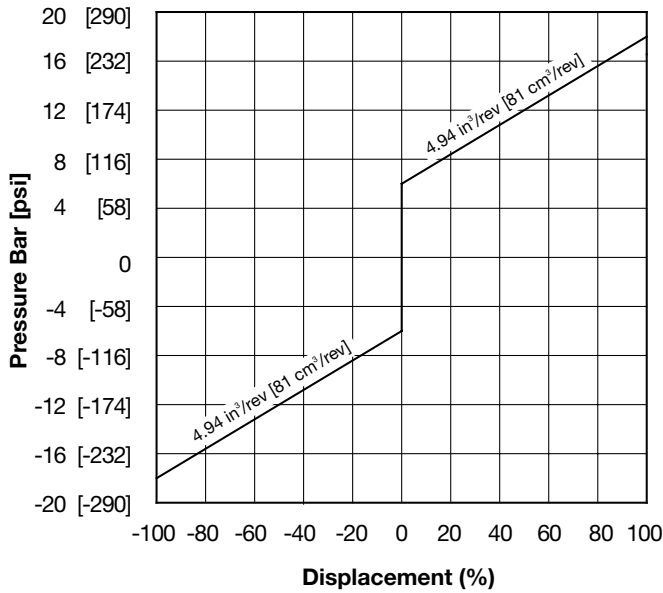
Correlation between direction of rotation (shaft view) control and direction of flow.

**Hydraulic Proportional Control
 With Feedback – C**

Pump displacement and flow direction are proportional to the pilot pressure on Y1 or Y2 ports. Based on swash-plate position, the feedback system works automatically to compensate for positioning errors. Piloting can be provided by boost pressure from the GS port. The piloting pressure must then be controlled by a joystick or pressure-reducing valve (not supplied).

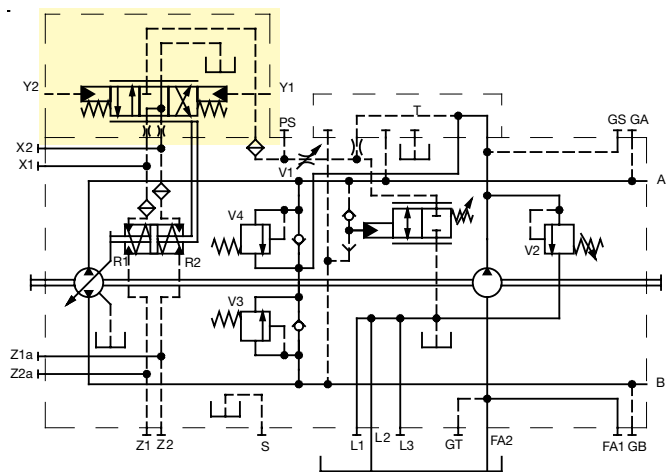
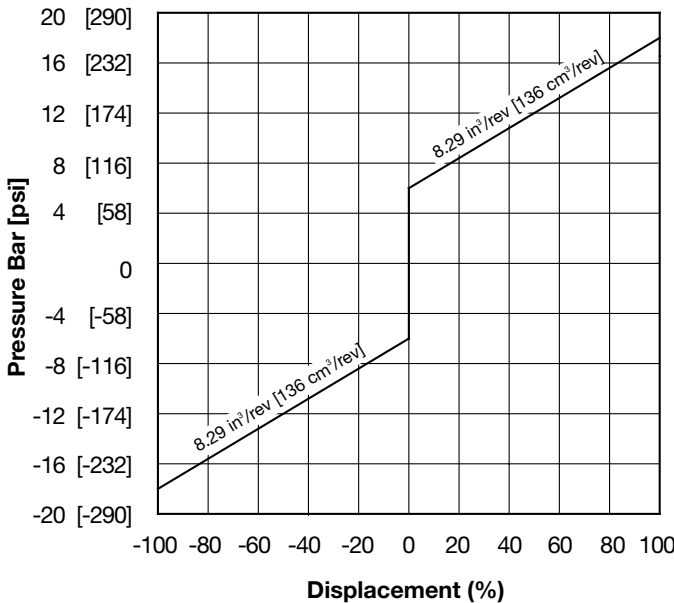


C081 Pilot Pressure vs. Displacement



Pilot pressure = 6 ÷ 18 bar [87 ÷ 261 psi] (at ports Y1, Y2)
 Start of control = 6 bar [87 psi]
 End of control = 18 bar [261 psi] (Max displacement)

C136 Pilot Pressure vs. Displacement



Controls

Note:

The tolerance on piloting pressure is $\pm 10\%$ of maximum value.

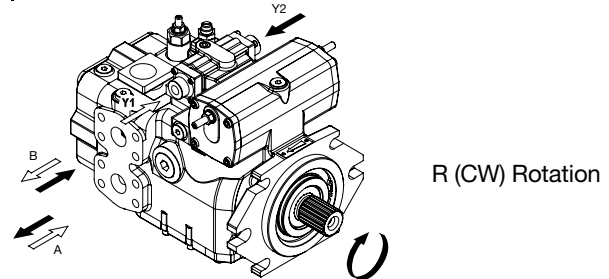
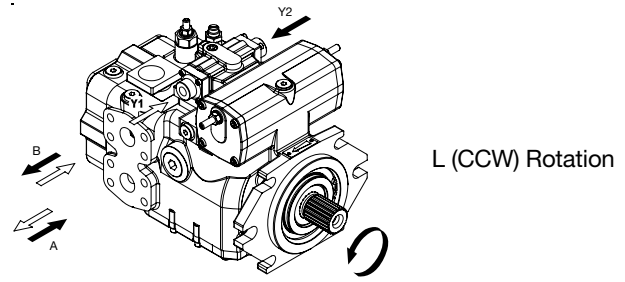
The spring return feature in the control unit is not a safety device. Internal contamination (contaminated hydraulic fluid, abrasion or residual contamination from system components) can cause the spool valve inside the control unit to get stuck in an undefined position. As a result, the axial piston unit will no longer supply the specified flow. Check which remedial measures should be taken on your machine in order to bring the driver consumer into a safe position (e.g. immediate stop).

Control Response Time		
Orifice dimension	Vg min→Vg max 300 bar [4350 psi]	Vg max→Vg min 300 bar [4350 psi]
Ø 0.5 mm [Ø 0.019 in]	3.6 sec.	6.5 sec.
Ø 0.7 mm (*) [Ø 0.027 in] (*)	2 sec.	3.1 sec.
Ø 0.8 mm (**) [Ø 0.031 in] (**)	1.7 sec.	2.7 sec.
Ø 0.9 mm [Ø 0.035 in]	1.6 sec.	2.2 sec.
Values obtained with oil temperature 45°±47° C and pump temperature of 50°± 55° C - oil ISO Vg 46.		

(*) STANDARD with override valves

(**) STANDARD without override valves, Note: Used on C081 only

Direction of Rotation

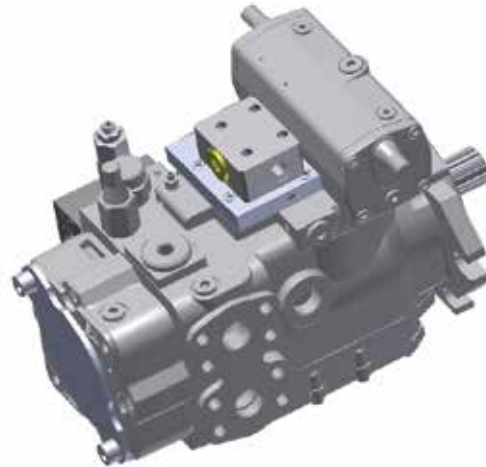


Correlation between direction of rotation (shaft view) control and direction of flow.

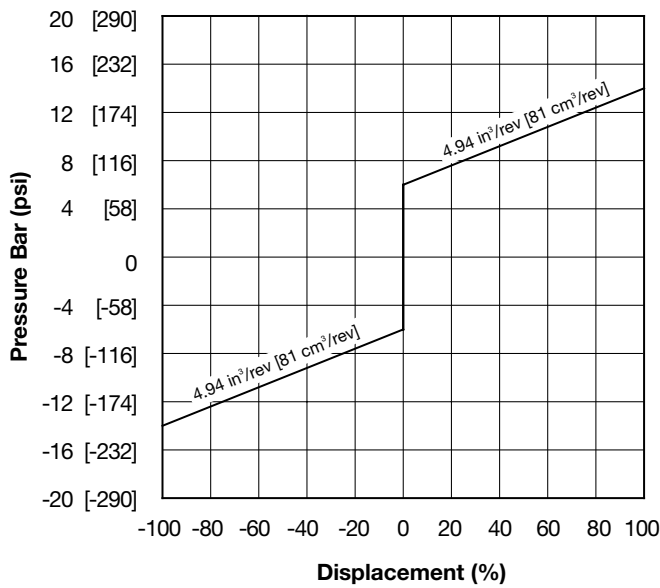
Controls

Hydraulic Proportional Control Without Feedback – D

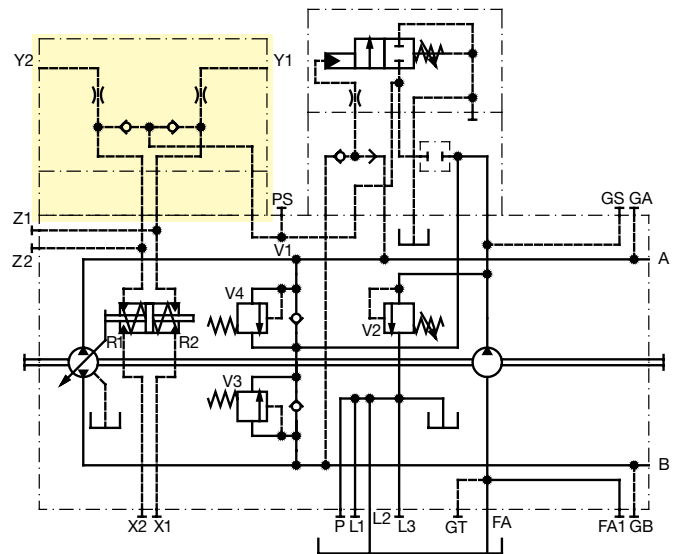
Pump displacement and flow direction are proportional to the pilot pressure on Y1 or Y2 ports. Working pressure and rotation speed also influence flow. With a given input signal (piloting pressure), the pump can vary displacement and flow when working pressure or rotating speed change. Feeding pressure to the control joystick can be provided by charge pressure from the GS port. The piloting pressure must then be controlled by said joystick or by a pressure-reducing valve (not supplied). The orifice dimensions must correlate with required response times. See next page for table.



C081 Pilot Pressure vs. Displacement



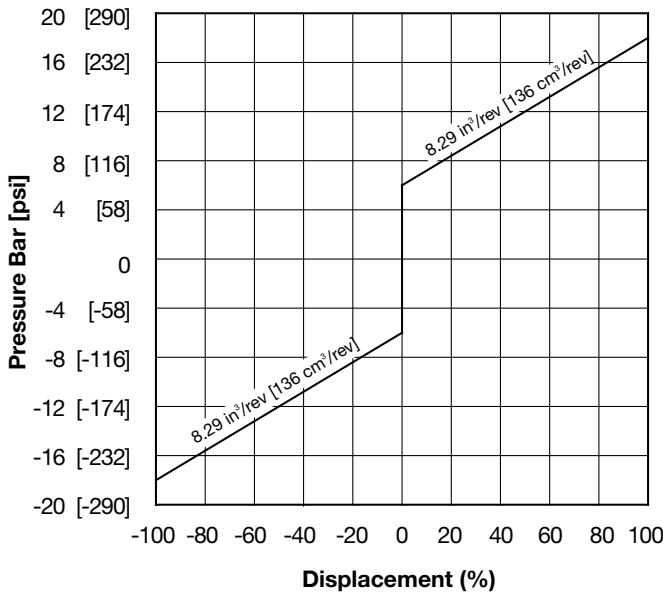
Nominal output shown. Actual output will vary depending on input speed and system pressures.



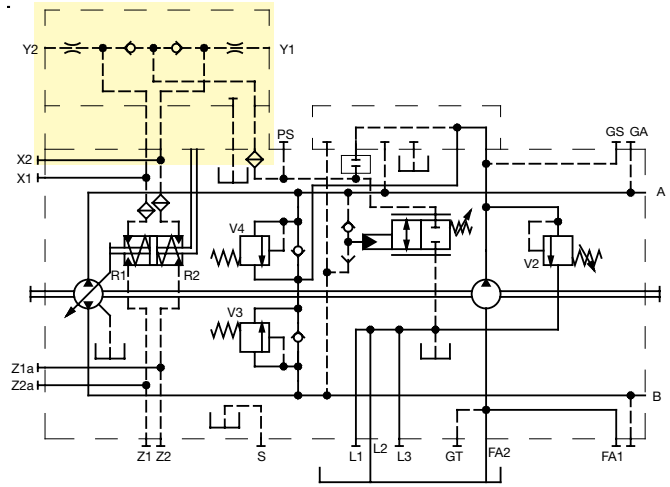
Pilot pressure = 6÷14 bar [87÷203 psi] (at ports Y1, Y2)
 Maximum pilot pressure = 30 bar [435 psi]
 Start of control = 6 bar [87 psi]
 End of control = 14 bar [203 psi] (Max displacement)

Controls

C136 Pilot Pressure vs. Displacement



Nominal output shown. Actual output will vary depending on input speed and system pressures.



Pilot pressure = 6÷14 bar [87÷203 psi] (at ports Y1, Y2)
 Maximum pilot pressure = 30 bar [435 psi]
 Start of control = 6 bar [87 psi]
 End of control = 14 bar [203 psi] (Max displacement)

Control Response Time		
Orifice dimension	Vg min→Vg max 300 bar [4350 psi]	Vg max→Vg min 300 bar [4350 psi]
Ø 0.5 mm [Ø 0.019 in]	3.6 sec.	6.5 sec.
Ø 0.7 mm (*) [Ø 0.027 in] (*)	2 sec.	3.1 sec.
Ø 0.8 mm (**) [Ø 0.031 in] (**)	1.7 sec.	2.7 sec.
Ø 0.9 mm [Ø 0.035 in]	1.6 sec.	2.2 sec.

Values obtained with oil temperature 45°±47° C and pump temperature of 50°±55° C - oil ISO Vg 46.

(*) STANDARD with override valves

(**) STANDARD without override valves, Note: Used on C081 only

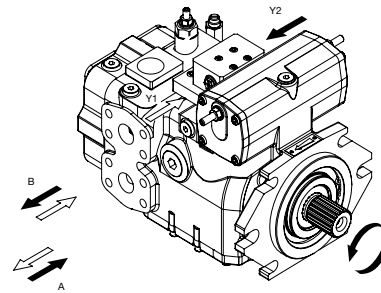
Note:

The tolerance on piloting pressure is ± 10% of maximum value.

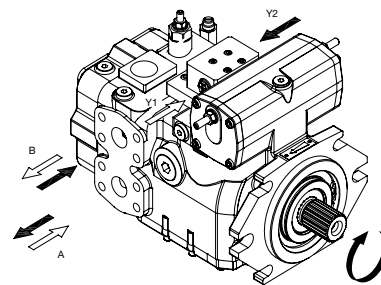
Warning:

Use of the D control can require a review of the motor engine and vehicle parameters to ensure that the pump is set up correctly. We recommend that applications be reviewed by a Parker technician.

Direction of Rotation



L (CCW) Rotation

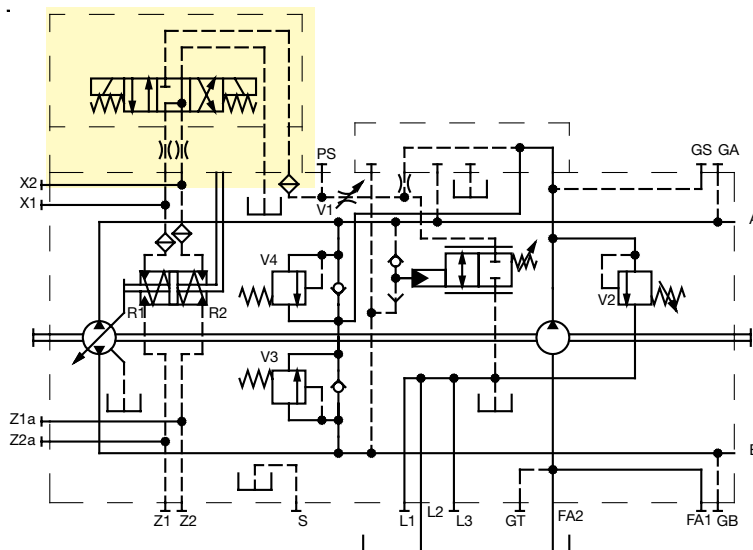
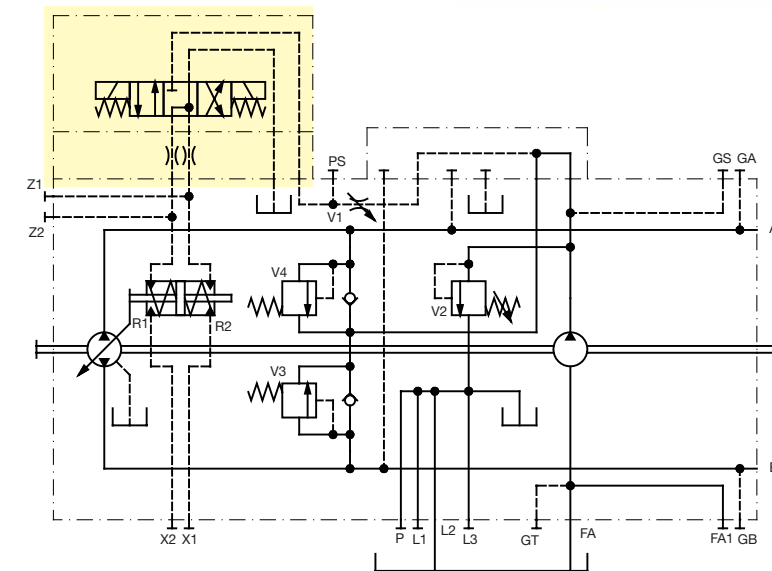


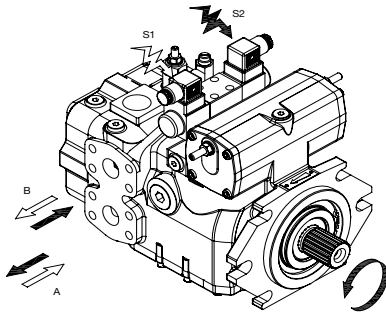
R (CW) Rotation

Correlation between direction of rotation (shaft view) control and direction of flow.

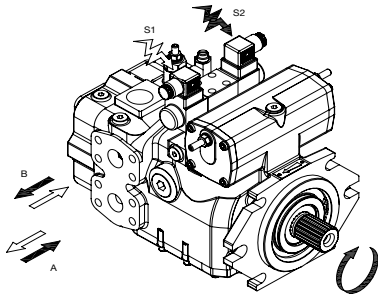
Electric Non-Proportional – E

By turning on one of the on-off solenoids (standard 24V d.c. optional 12V d.c.), the pump swivels to maximum displacement in the corresponding output flow direction. Turning off the solenoid results in swiveling the pump back to zero displacement position.



Controls**Direction of Rotation**

L (CCW) Rotation



R (CW) Rotation

Correlation between direction of rotation (shaft view) control and direction of flow.

Note:

The tolerance on control coil amperage is $\pm 10\%$ of maximum value.

30 Watt coils

12VDC coil resistance of 4.8 ohms

24 VDC coil resistance of 18.8 ohms

The spring return feature in the control unit is not a safety device. Internal contamination (contaminated hydraulic fluid, abrasion or residual contamination from system components) can cause the spool valve inside the control unit to get stuck in an undefined position. As a result, the axial piston unit will no longer supply the specified flow. Check which remedial measures should be taken on your machine in order to bring the driver consumer into a safe position (e.g. immediate stop).

Controls

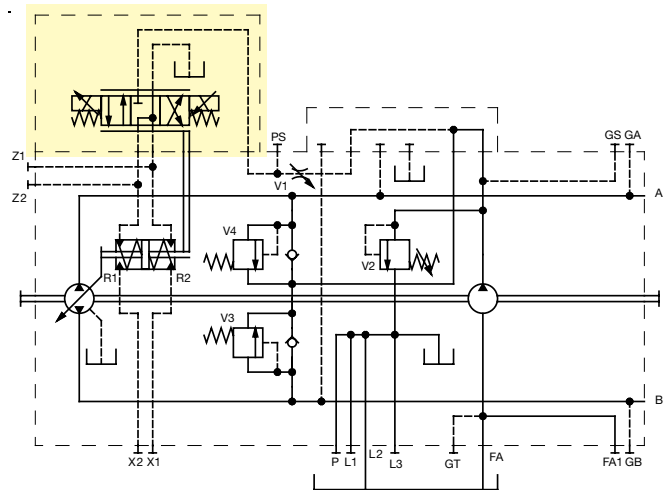
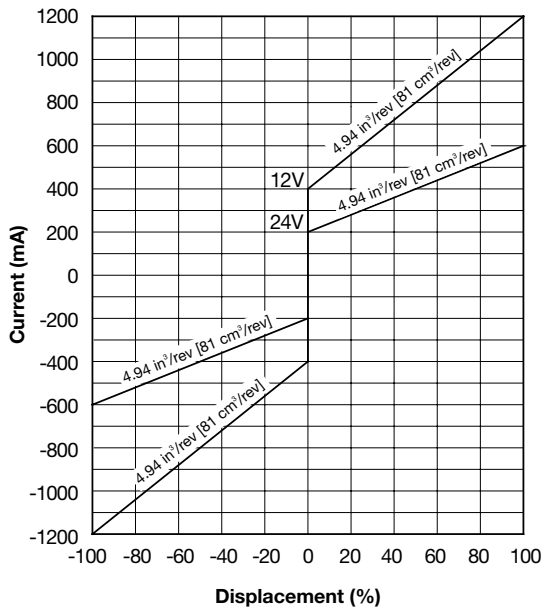
Electric Proportional Control With Feedback – F

Pump displacement is directly proportional to the input current of one of the two proportional solenoids. Based on swash-plate position, the feedback system works automatically to compensate for positioning errors. The input current of the two proportional solenoids must be controlled by an external amplifier card. The Parker IQAN family of controllers is suggested for use.

Flow direction depends on which solenoid is energized. Standard solenoids are proportional at 24V d.c. max. current 1A. (Optional solenoids 12V d.c. max. current 2A). However, for emergency operation only, it is possible to control solenoids directly with 24V d.c. voltage (or 12V d.c.), bypassing the amplifier.



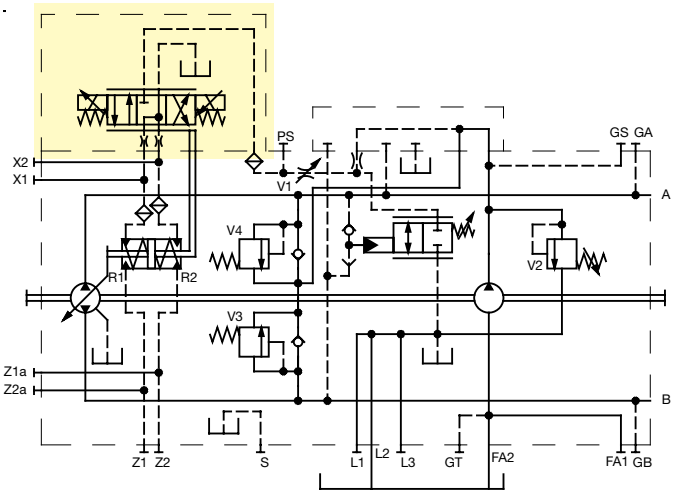
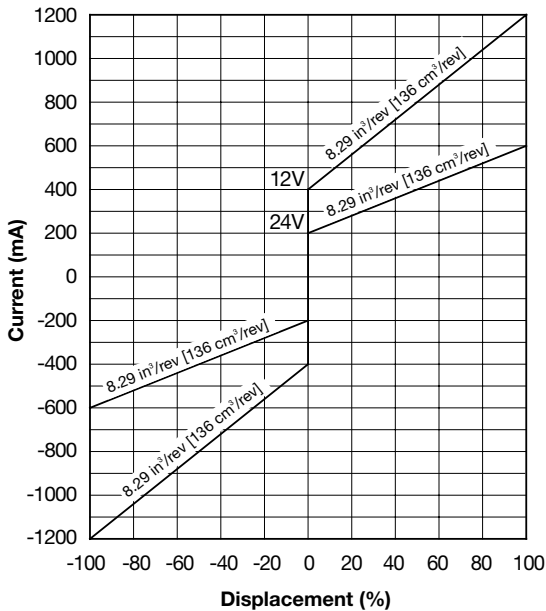
C081 Amperage vs. Displacement



Solenoid 24V:
Current min. 200 mA max 600 mA
Solenoid 12V:
Current min. 400 mA max 1200 mA
PWM frequency: 110 Hz

Controls

C136 Amperage vs. Displacement



Solenoid 24V:
Current min. 200 mA max 600 mA
Solenoid 12V:
Current min. 400 mA max 1200 mA
PWM frequency: 110 Hz

C081 Step Response Chart					
Orifice size	0.6 mm	0.7 mm	0.8* mm	1.2 mm	None
0 to full flow	5.87	4.48	4.27	3.09	2.88
Full to 0 flow	3.52	2.99	2.56	1.17	0.96

C136 Step Response Chart					
Orifice size	0.6 mm	0.7 mm	0.8* mm	1.2 mm	None
0 to full flow	8.22	6.40	5.44	3.63	3.20
Full to 0 flow	4.69	3.63	2.88	1.60	1.07

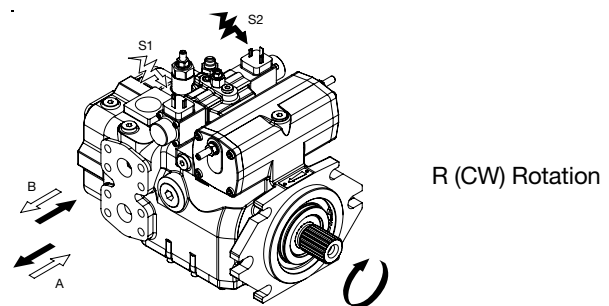
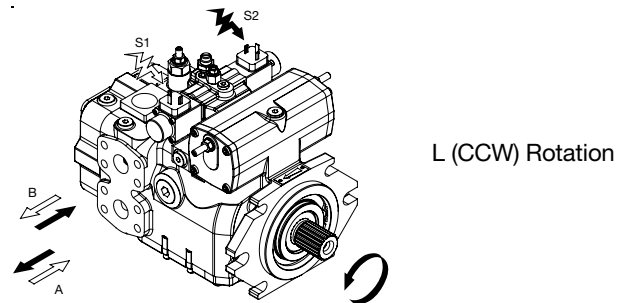
Time in seconds
*Standard orifice
Fluid viscosity = 50 cSt
Input speed = 1500
250 bar (3600 PSI) working pressure
22 bar (320 PSI) charge pressure

Note:

The tolerance on control coil amperage is $\pm 10\%$ of maximum value.

The spring return feature in the control unit is not a safety device. Internal contamination (contaminated hydraulic fluid, abrasion or residual contamination from system components) can cause the spool valve inside the control unit to get stuck in an undefined position. As a result, the axial piston unit will no longer supply the specified flow. Check which remedial measures should taken on your machine in order to bring the driver consumer into a safe position (e.g. immediate stop).

Direction of Rotation



Correlation between direction of rotation (shaft view) control and direction of flow.

Controls

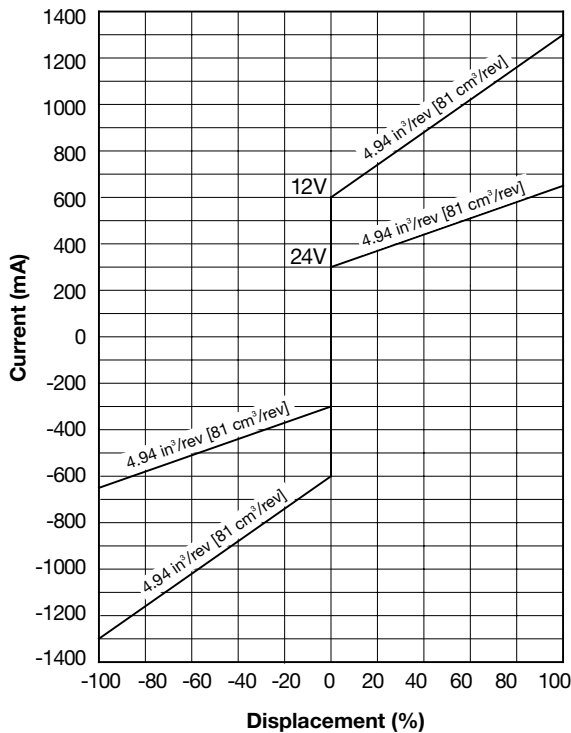
Electric Proportional Control Without Feedback – G

Pump displacement is directly proportional to the input current of the two proportional solenoids. Flow is also influenced by the working pressure and rotation speed of the pump. With a given input signal (piloting current), the pump can vary the displacement and flow when working pressure or rotating speed change. The input current of the two proportional solenoids must be controlled by an external amplifier card. The Parker IQAN family of controllers is suggested for use.

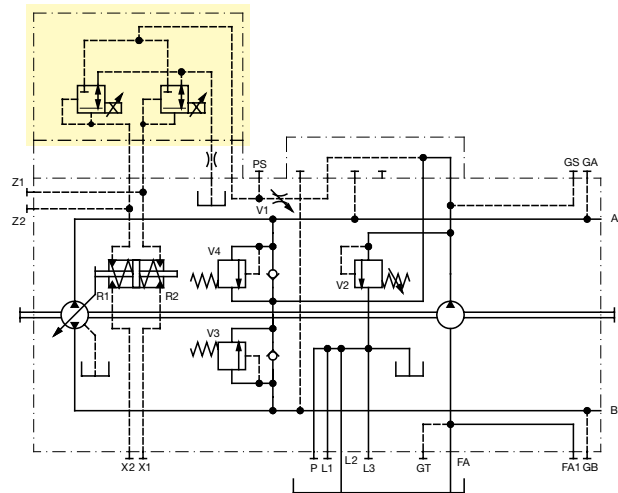


Flow direction depends on which solenoid is energized. Standard solenoids are proportional 24V d.c. max. current 1A. (Optional solenoids 12V d.c. max. current 2A). However, for emergency operation only, it is possible to control solenoids directly with 24V d.c.voltage (or 12V d.c.), bypassing the amplifier.

C081 Amperage vs. Displacement



Nominal output shown. Actual output will vary depending on input speed and system pressures.

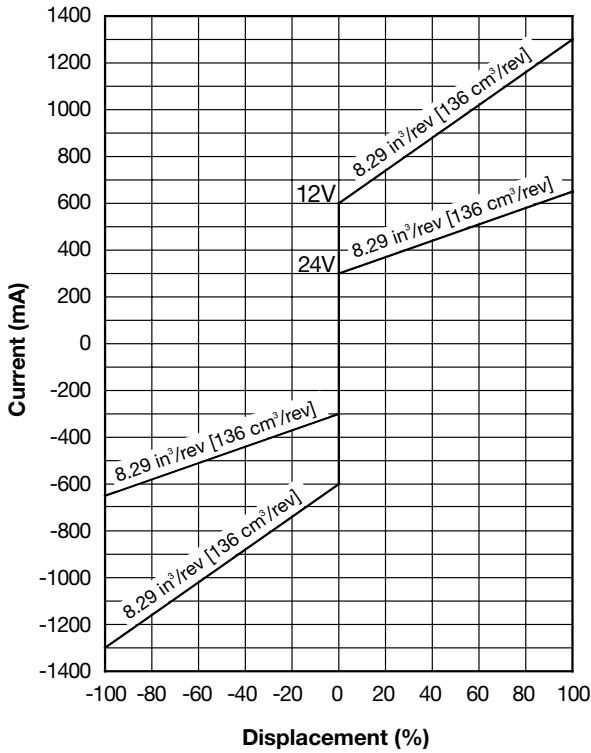


Solenoid 24V:
Current min. 300 mA max 650 mA
Solenoid 12V:
Current min. 600 mA max 1300 mA
PWM frequency: 110 Hz



Controls

C136 Amperage vs. Displacement



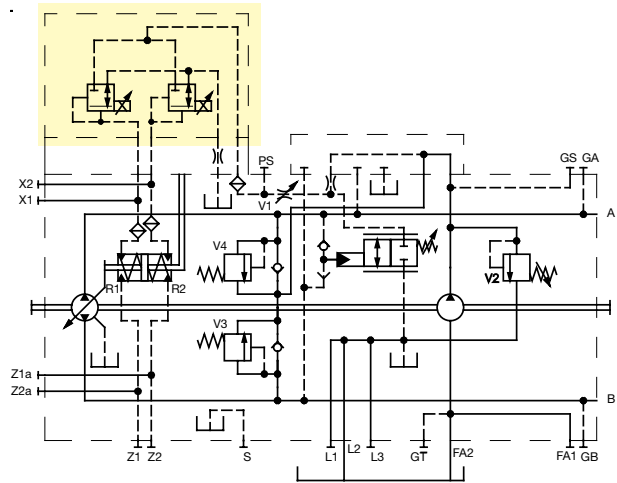
Nominal output shown. Actual output will vary depending on input speed and system pressures.

Note:

The tolerance on control coil amperage is $\pm 10\%$ of maximum value.

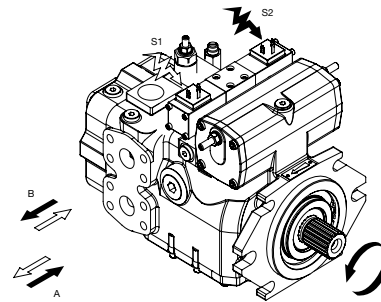
Warning:

Use of the G control can require a review of the engine and vehicle parameters to ensure that the pump is set up correctly. We recommend that applications be reviewed by a Parker technician.

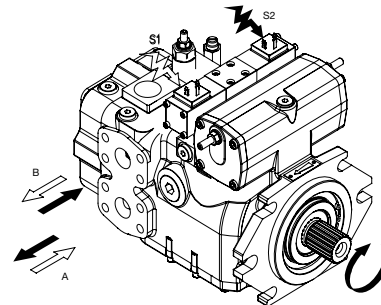


Solenoid 24V:
Current min. 300 mA max 650 mA
Solenoid 12V:
Current min. 600 mA max 1300 mA
PWM frequency: 110 Hz

Direction of Rotation



L (CCW) Rotation



R (CW) Rotation

Correlation between direction of rotation (shaft view) control and direction of flow.

Controls

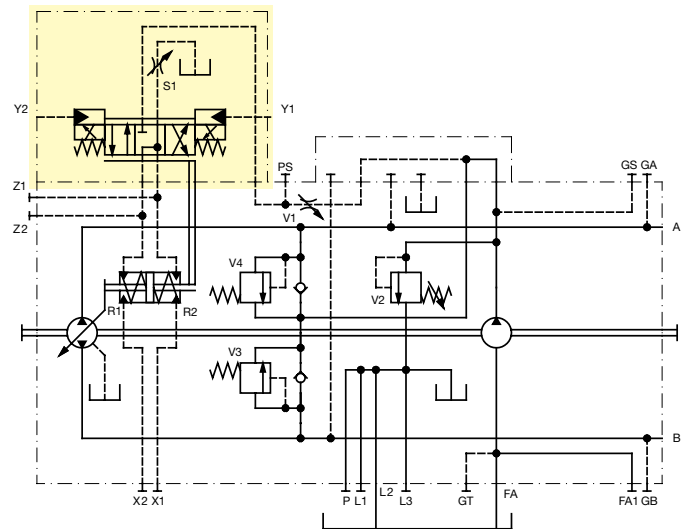
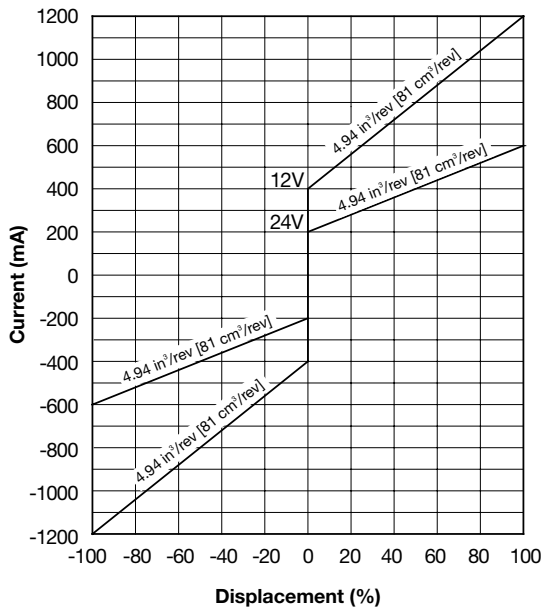
Electric Proportional Control With Hydraulic Override – H

This control has the same electric proportional features as the F control, as well as emergency hydraulic proportional control capability for pilot pressure on Y1 and Y2 ports. The input current of the two proportional solenoids must be controlled by an external amplifier card. The Parker IQAN family of controls is suggested for use.

Hydraulic operation of the H control is designed to be an emergency device to control displacement of the pump in case of a breakdown of the electric circuit it is not intended as the primary control of pump displacement. A pilot pressure of 22 bar (319 psi) is required to swivel the pump to maximum displacement in emergency operation.

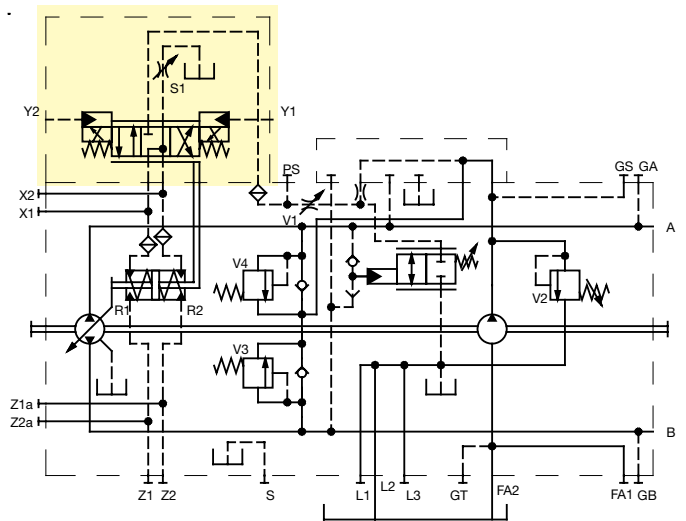
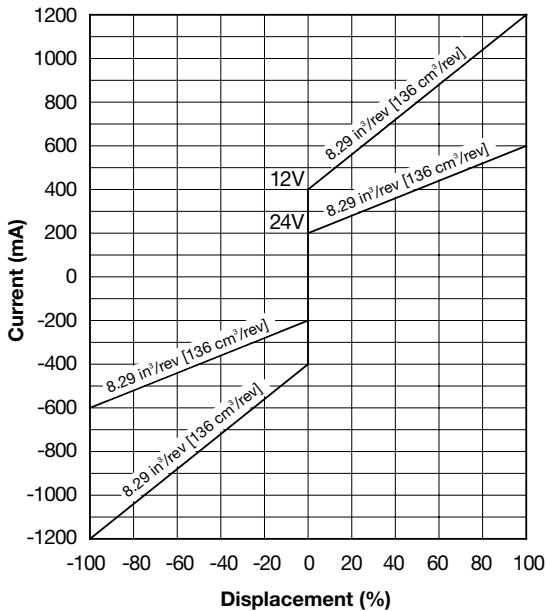


C081 Amperage vs. Displacement



Controls

C136 Amperage vs. Displacement



C081 Step Response Chart					
Orifice size	0.6 mm	0.7 mm	0.8* mm	1.2 mm	None
0 to full flow	5.87	4.48	4.27	3.09	2.88
Full to 0 flow	3.52	2.99	2.56	1.17	0.96

C136 Step Response Chart					
Orifice size	0.6 mm	0.7 mm	0.8* mm	1.2 mm	None
0 to full flow	8.22	6.40	5.44	3.63	3.20
Full to 0 flow	4.69	3.63	2.88	1.60	1.07

Time in seconds
 *Standard orifice
 Fluid viscosity = 50 cSt
 Input speed = 1500
 250 bar (3600 PSI) working pressure
 22 bar (320 PSI) charge pressure

Note:

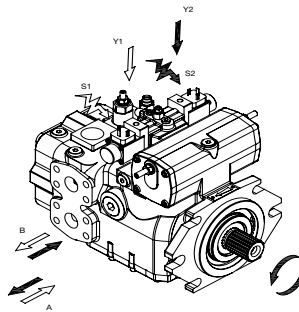
The tolerance on control coil amperage is $\pm 10\%$ of maximum value.

The spring return feature in the control unit is not a safety device. Internal contamination (contaminated hydraulic fluid, abrasion or residual contamination from system components) can cause the spool valve inside the control unit to get stuck in an undefined position. As a result, the axial piston unit will no longer supply the specified flow. Check which remedial measures should be taken on your machine in order to bring the driver consumer into a safe position (e.g. immediate stop).

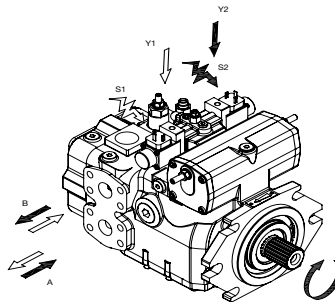
Warning:

Y1 and Y2 ports must not have any back pressure during normal electric control operation (vented to tank).

Direction of Rotation



L (CCW) Rotation



R (CW) Rotation

Correlation between direction of rotation (shaft view) control and direction of flow.

Controls

Automotive – J/K

The automotive control is primarily used in propel applications where a transmission needs to act similar to automotive vehicles with automatic transmissions where an operator selects direction of travel and then controls the prime mover rpm to control vehicle travel speed.

Output flow direction is determined by a directional control valve command either an electrical (J) or hydraulic (K) signal. Pump displacement is controlled by an internal pilot signal which will increase or decrease depending on input RPM and generate output flow into the circuit in the direction commanded by the directional control valve.

System flow will be affected by increases or decreases in system pressure in addition to any change in input RPM.

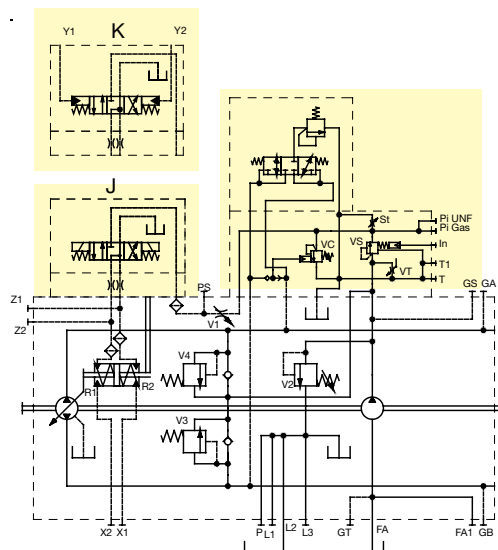
Control is also available with a hydraulic inching valve which will act to keep the pump from producing flow when the inching valve is activated. This valve will allow for high engine speeds and ensure that the pump does not produce any system flow if an auxiliary function requires more input speed. Minimum Pressure for the inching valve to function is 12 bar (175 PSI).

Units with this control also have the option for having a flushing valve mounted onto the pump.

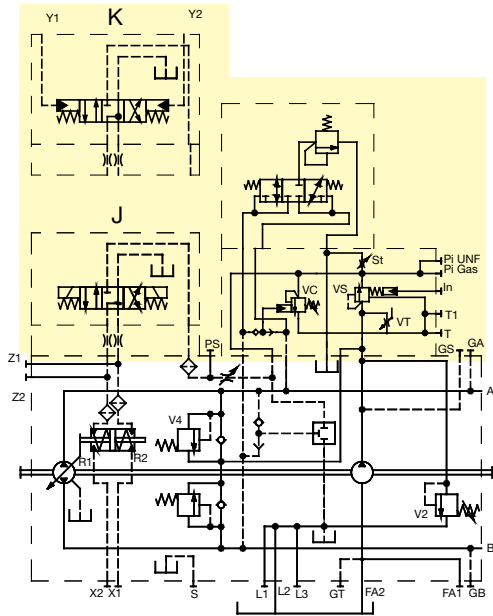
This control is naturally speed and torque sensitive so your Parker representative will need to know more information on the prime mover driving the pump to ensure it is properly applied.



C081 Electric (J) / Hydraulic (K) Automotive With Hydraulic Inching + Flushing Valve



**C136 Electric (J) / Hydraulic (K) Automotive
With Hydraulic Inching + Flushing Valve**



Note:

The tolerance on control coil amperage is $\pm 10\%$ of maximum value.

J Coil Information:

30 Watt coils

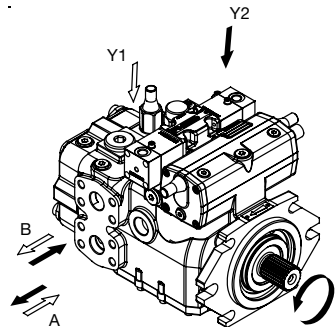
12VDC coil resistance of 4.8 ohms

24 VDC coil resistance of 18.8 ohms

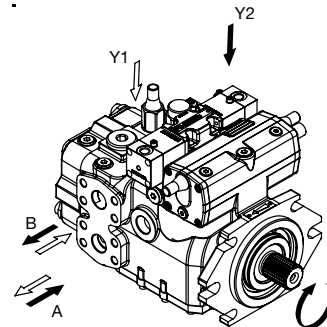
The spring return feature in the control unit is not a safety device. Internal contamination (contaminated hydraulic fluid, abrasion or residual contamination from system components) can cause the spool valve inside the control unit to get stuck in an undefined position. As a result, the axial piston unit will no longer supply the specified flow. Check which remedial measures should be taken on your machine in order to bring the driver consumer into a safe position (e.g. immediate stop).

K control requires a pilot pressure of 22 Bar (319 PSI) to shift spool.

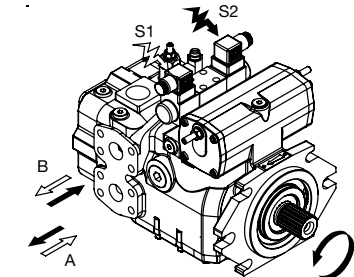
Direction of Rotation (J/K)



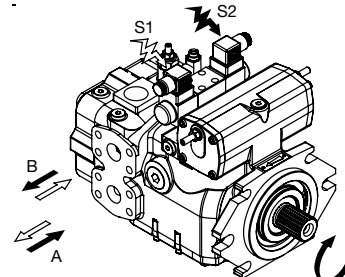
L (CCW) Rotation



R (CW) Rotation



L (CCW) Rotation



R (CW) Rotation

Correlation between direction of rotation (shaft view) control and direction of flow.

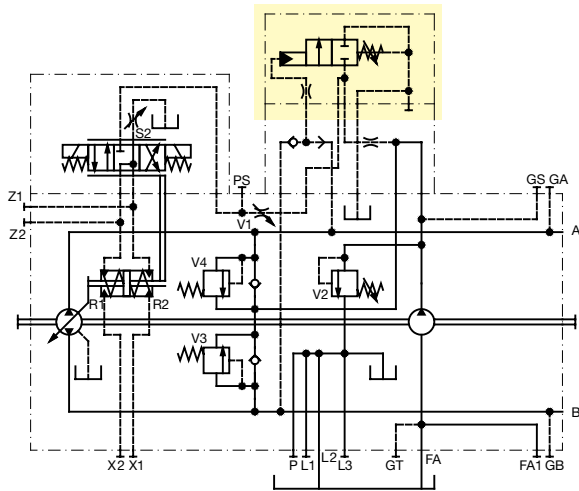
Pressure Override Options

Pressure Override – P

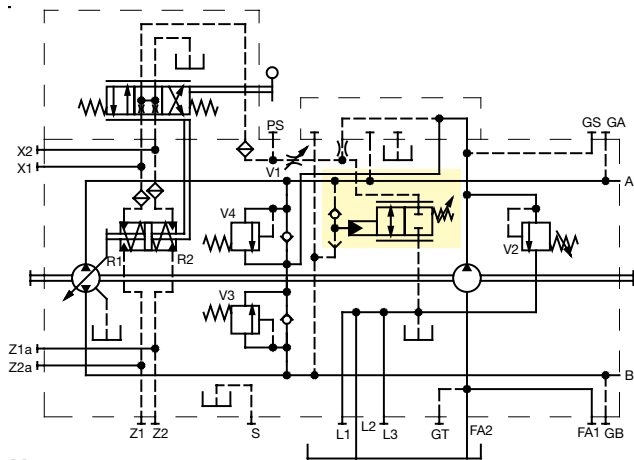
The pressure override valve is designed to avoid opening relief valves. When working pressure reaches the P valve setting, the swash plate swivels back and reduces flow. The valve maintains a constant pressure in the circuit at the setting value. It is advisable to fit the cut-off valve to all systems where pressure peaks

close to the relief valve’s setting, or in hydraulic systems engineered to maximum pump pressure. The pressure override should be set 20 – 30 bar (290 – 435 psi) lower than the cross port relief valve setting. Setting range: 100 – 420 bar (1,450 – 6,090 psi)

C081 With Type P Pressure Override



C136 With Type P Pressure Override



Note:

The electric override valve can be assembled on standard C pumps and combined with pressure override valves.

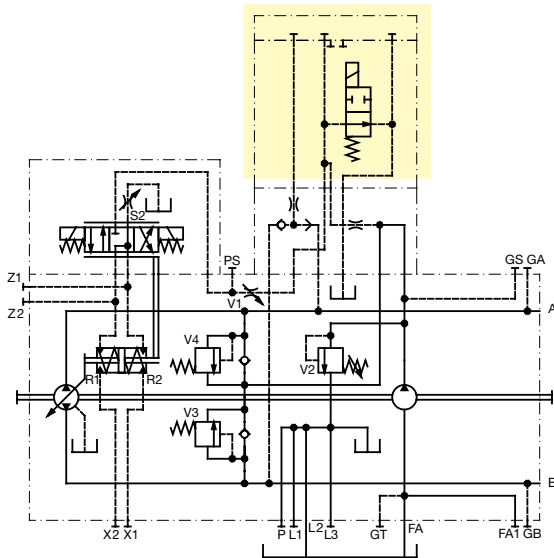


Electric Cut-Off Valve – E

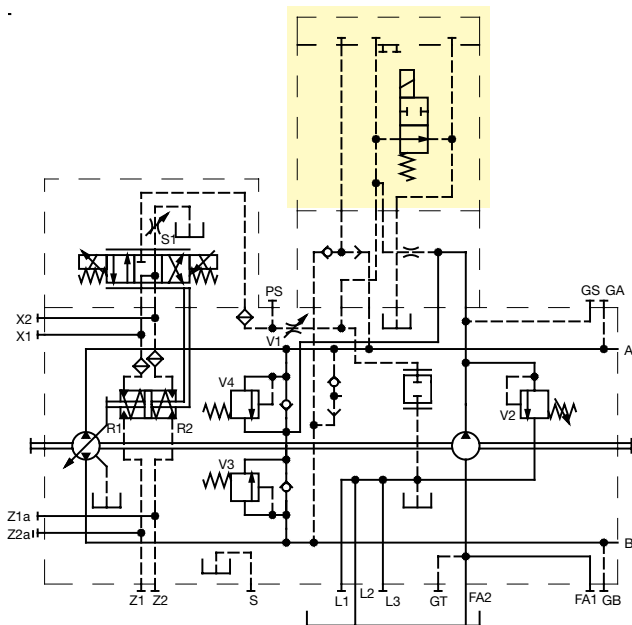
The electric cut-off valve, directly connected to the C pump housing, swivels pump flow back to zero when power supply to the on/off solenoid is cut off.

This valve is designed for applications subject to safety regulations, which require stopping the machine in case of no electric signal. Feed voltage is 24V d.c. (optional 12V d.c.).

C081 With Type E Override



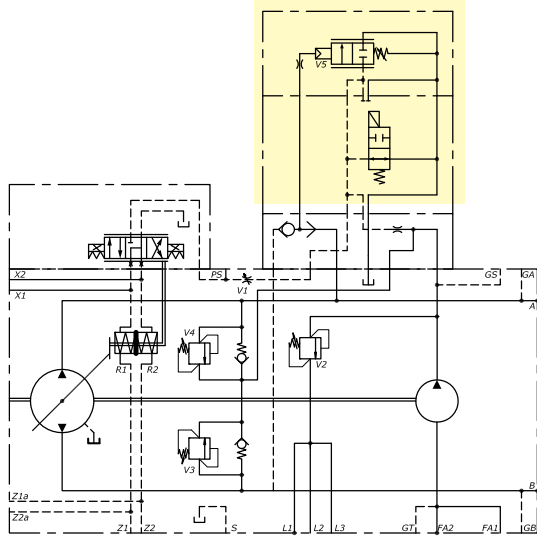
C136 With Type E Override



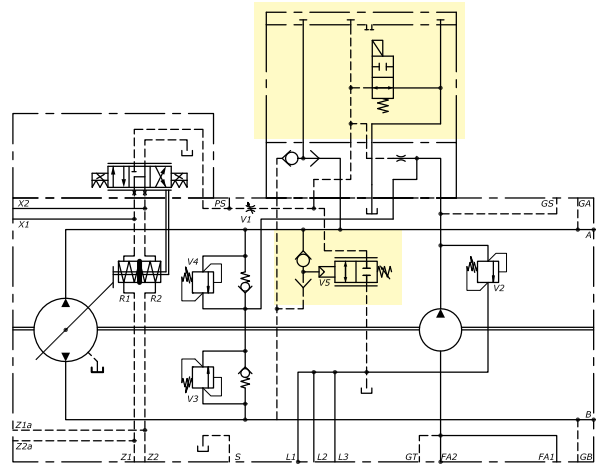
Electrical Cut-Off Valve and Pressure

The C option override is a combination of the P and E override options. P and E override option details for operation information.

C081 With Type C Override



C136 With Type C Override

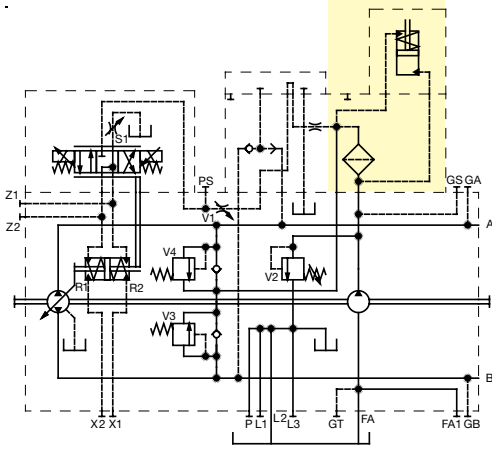


Charge Filtration Options

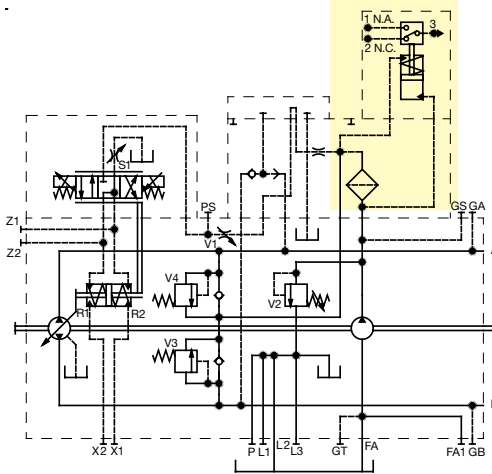
To guarantee an optimum fluid contamination level in the closed loop, the C pump can be equipped with a filter. It is positioned on the delivery outlet of the charge pump, The filter contains a composite-fiber

filtering element. Electrical (connector DIN 43650) and mechanical filter clogging sensors (standard 8 bar/116 psi) are available. It's possible to combine the filter with cut-off valves.

C081 With Charge Filter Option

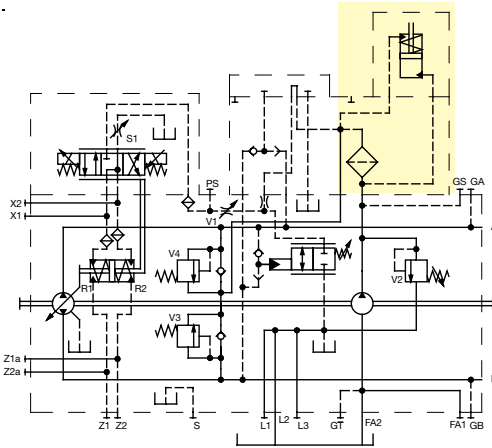


Mechanical Sensor

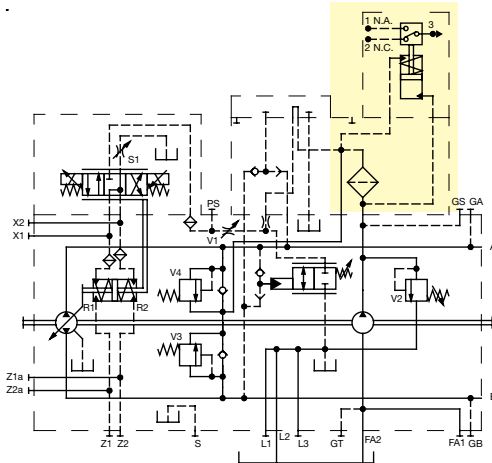


Electrical Sensor

C136 With Charge Filter Option



Mechanical Sensor



Electrical Sensor

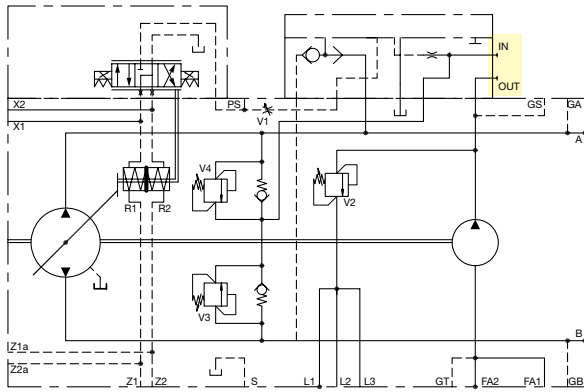
SPDT	Max Resistive Load	Max Inductive Load
C.A.\A.C. 125-250 V	1 A	1 A
C.C.\D.C. 30 V	2 A	2 A
C.C.\D.C. 50 V	0,5 A	0,5 A
C.C.\D.C. 75 V	0,25 A	0,25 A
C.C.\D.C. 125 V	0,2 A	0,03 A

Remote Charge Filtration

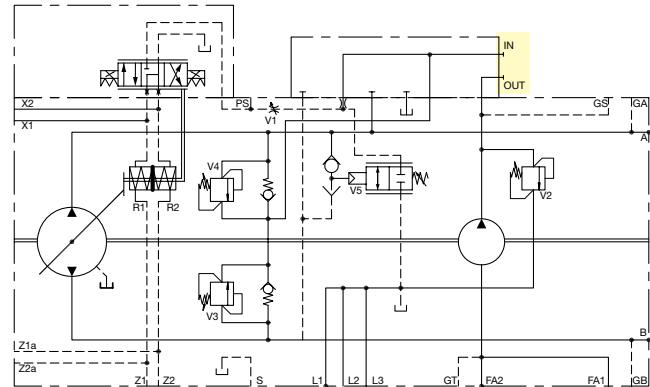
Remote Charge Filtration - R

Valve block supplied on the pumps with ports for connecting a customer supplied remotely mounted hydraulic filter.

C081 With Remote Charge Filtration



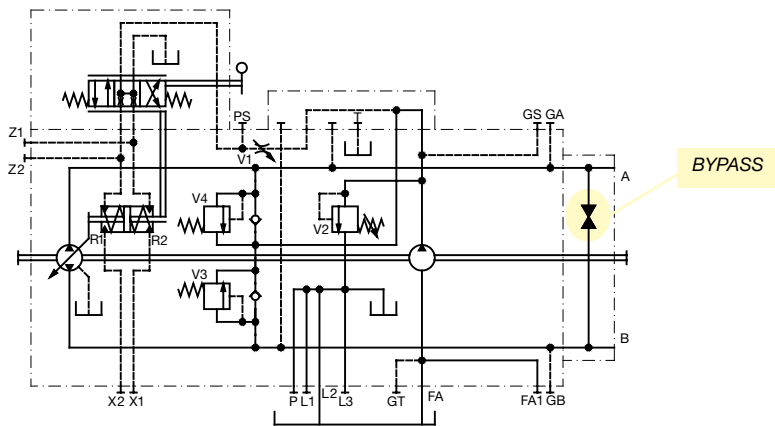
C136 With Remote Charge Filtration



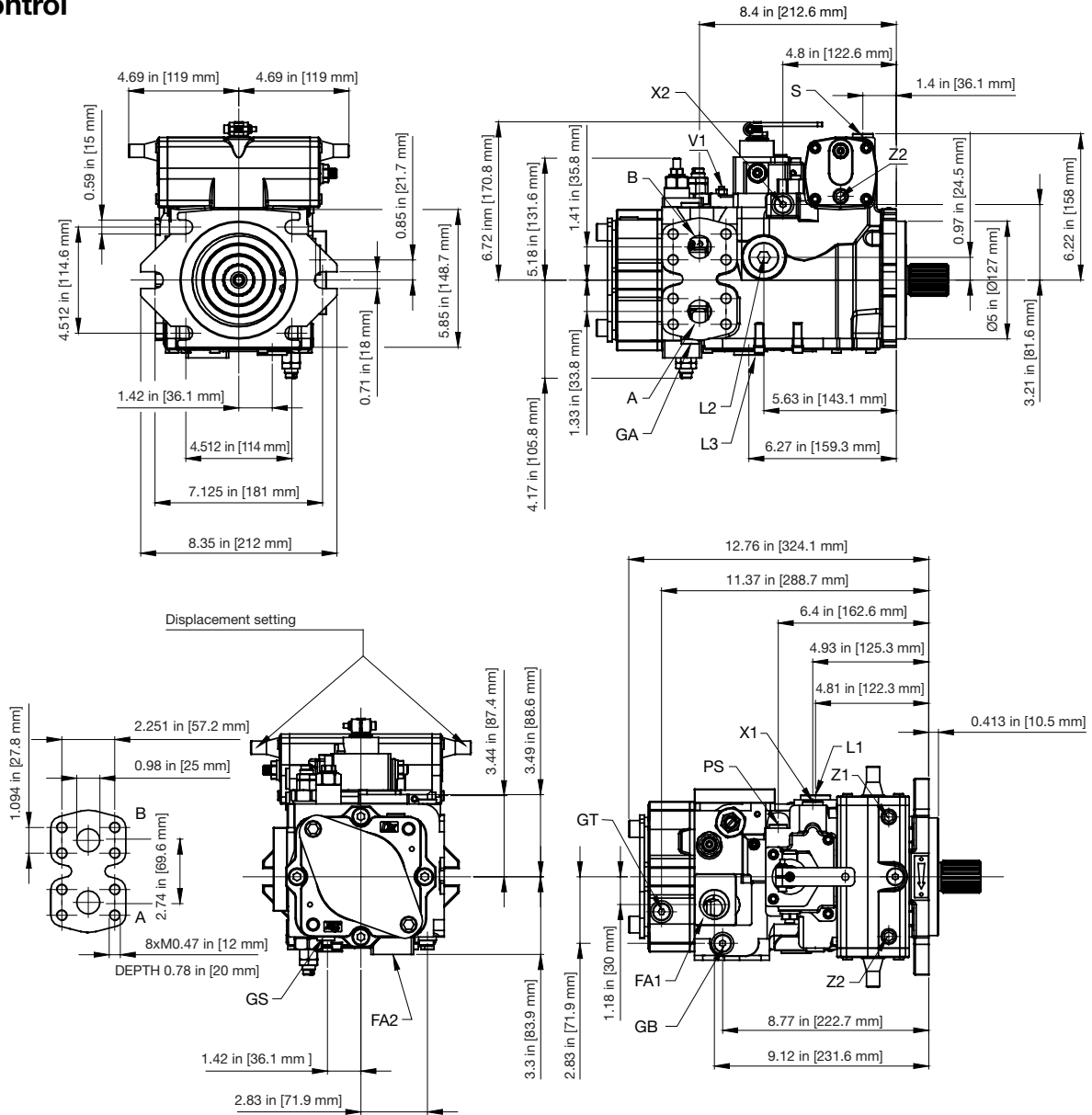
Do not operate units without filter connected to IN and OUT ports

Bypass Valve (C081 Only)

The bypass valve allows the connection of pressure port lines A and B. To open the valve, unlock the locking nut and turn the screw six turns counterclockwise. The bypass valve is intended for use at low vehicle speeds. Moving at high speeds may cause damage to transmission components and cause an excess of heat generation.



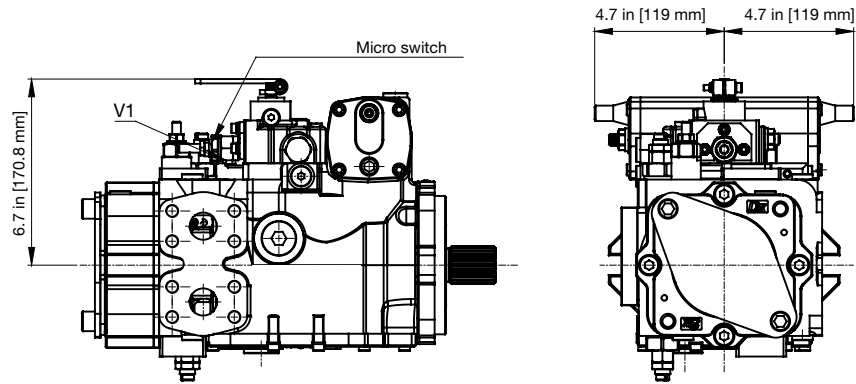
A Control



C081 Port Chart		
Port	Mount C	Mount G
A	1" SAE CODE 62	1" SAE CODE 62
B	1" SAE CODE 62	1" SAE CODE 62
L1	-12 SAE ORB	3/4" G
L2	-12 SAE ORB	3/4" G
FA1	-16 SAE ORB	1" G
FA2	-16 SAE ORB	1" G
GA	-4 SAE ORB	1/4" G
GB	-4 SAE ORB	1/4" G
GS	-4 SAE ORB	1/4" G

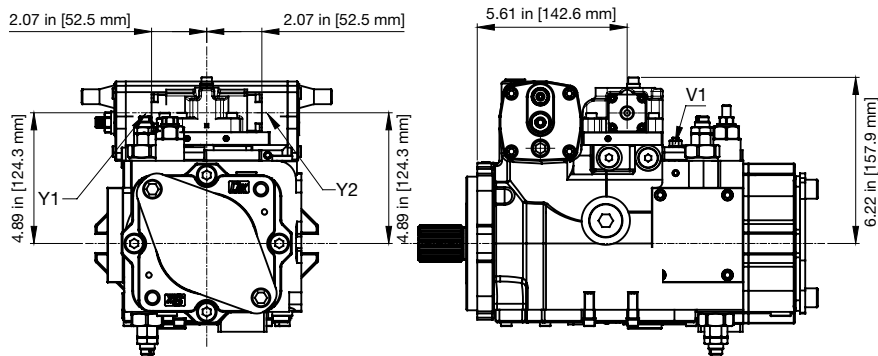
Port	Mount C	Mount G
PS	-4 SAE ORB	1/4" G
Z1	-4 SAE ORB	1/8" G
Z2	-4 SAE ORB	1/8" G
X1	-4 SAE ORB	1/4" G
X2	-4 SAE ORB	1/4" G
Y1	-4 SAE ORB	1/4" G
Y2	-4 SAE ORB	1/4" G
S	-4 SAE ORB	1/4" G
GT	-4 SAE ORB	1/4" G

B Control



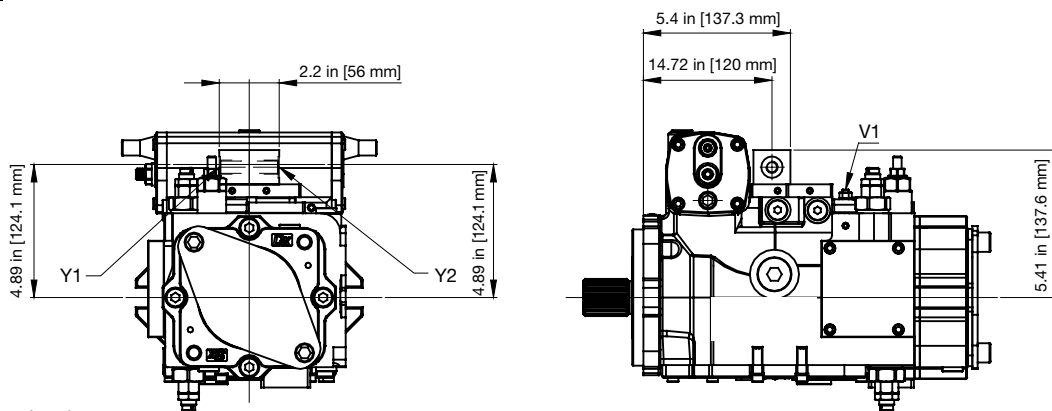
V1: Adjustable throttle valve

C Control



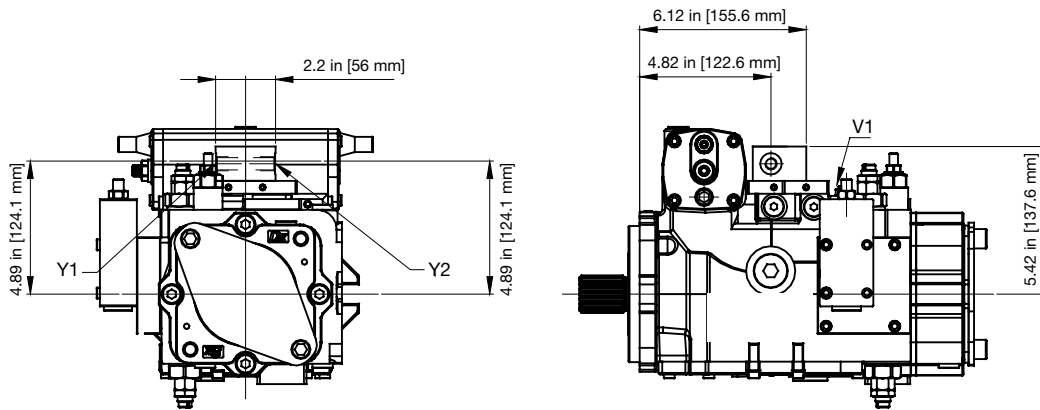
Y1-Y2: Control piloting pressure ports - 1/4 G (BSPP)
 S1-V1: Adjustable throttle valve

D Control



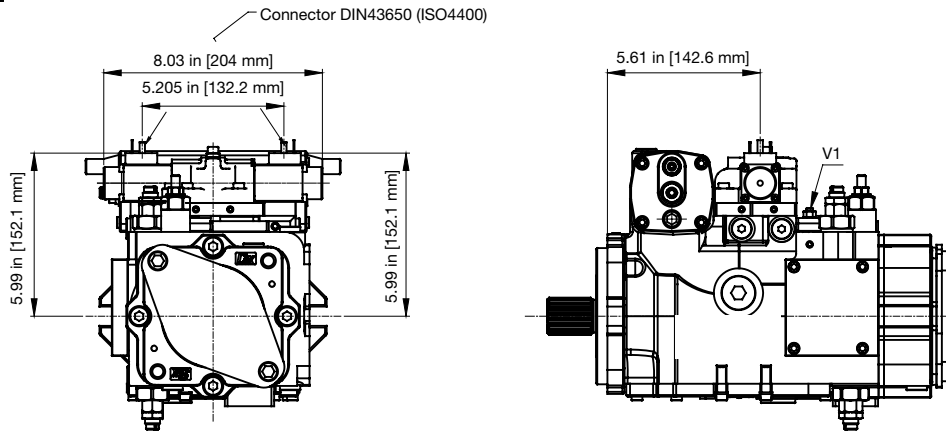
V1: Adjustable throttle valve

D Control With Cut-Off Valves



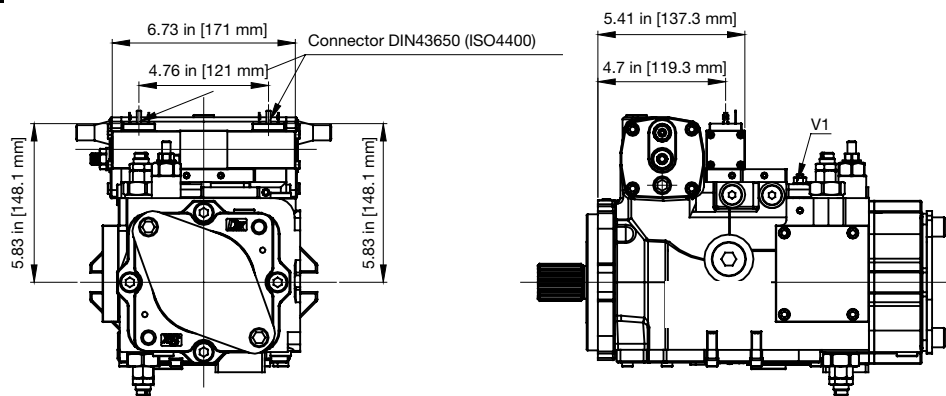
Y1-Y2: Control piloting pressure ports - 1/4 G (BSPP)
 S1-V1: Adjustable throttle valve

F Control



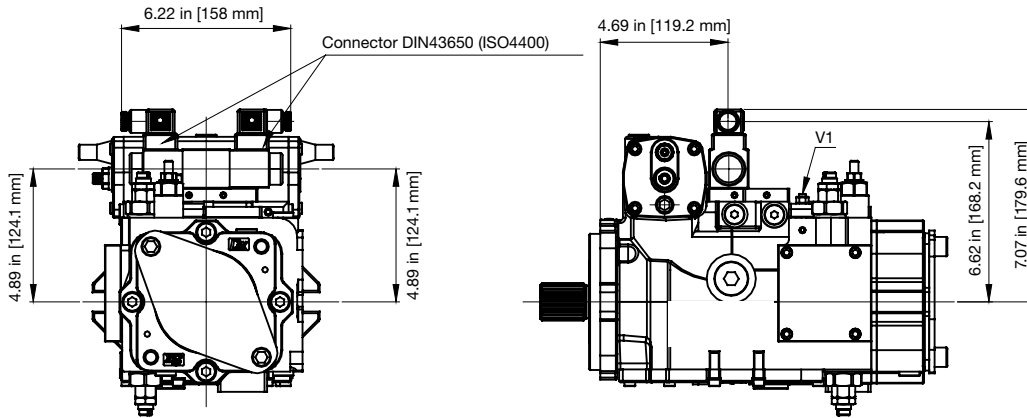
V1: Adjustable throttle valve

G Control



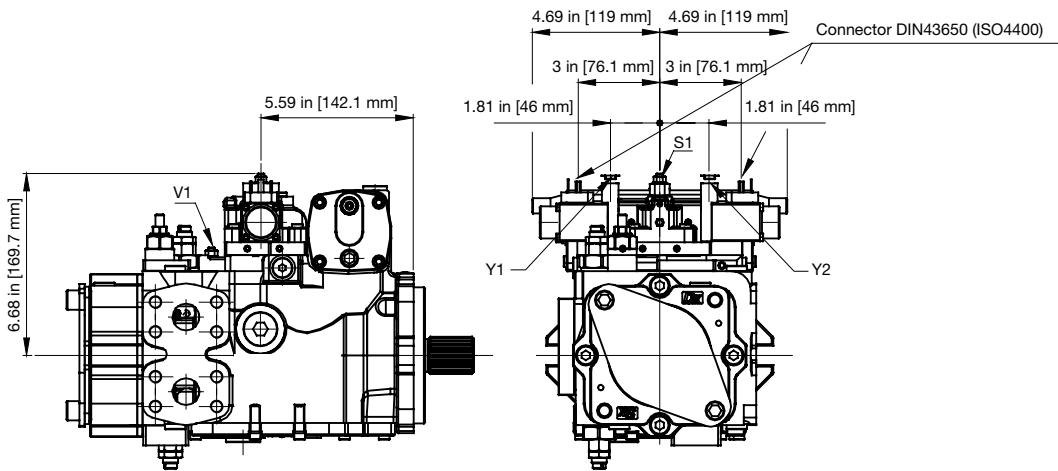
V1: Adjustable throttle valve

E Control



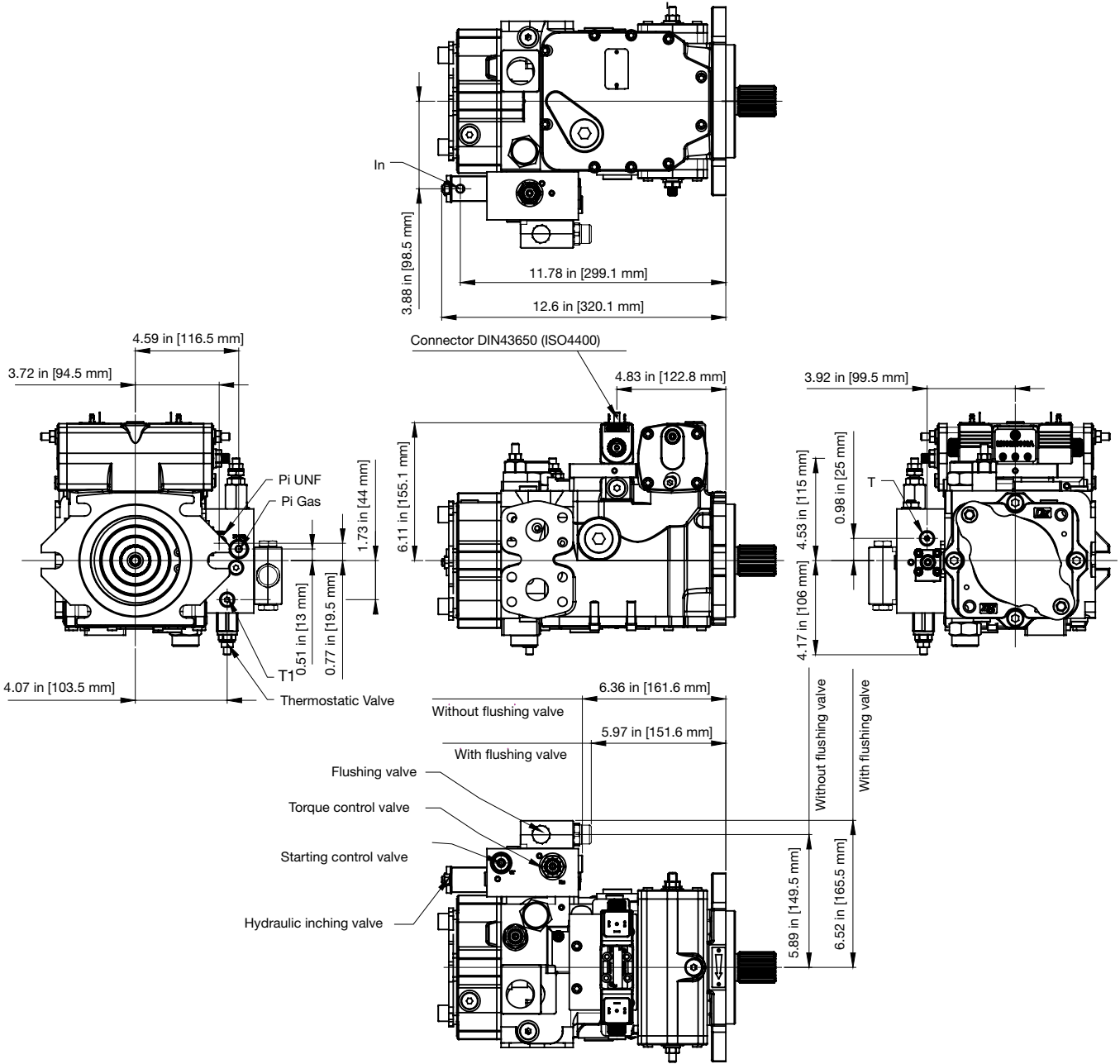
V1: Adjustable throttle valve

H Control

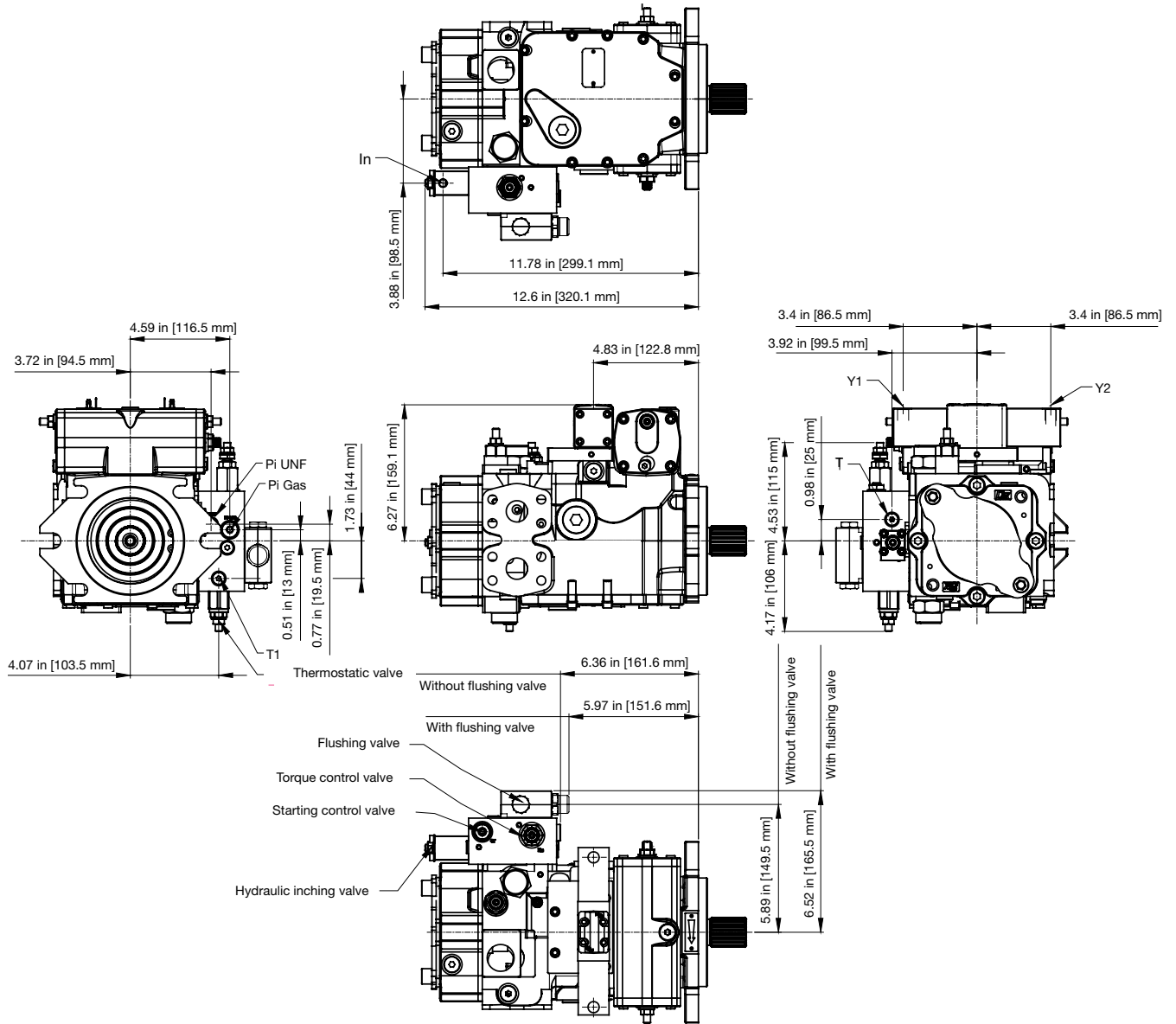


V1: Adjustable throttle valve

Automotive J With Hydraulic Inching



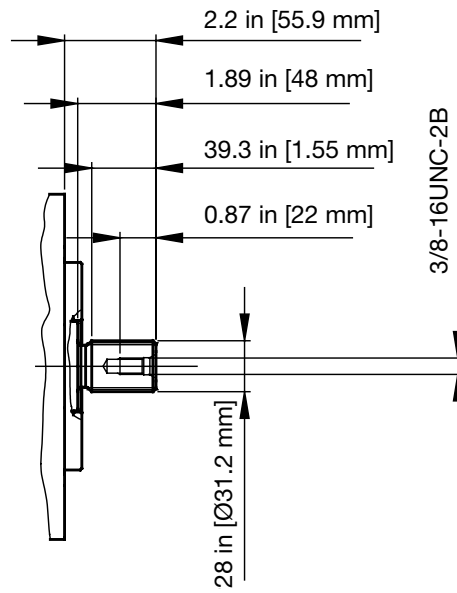
Automotive K With Hydraulic Inching



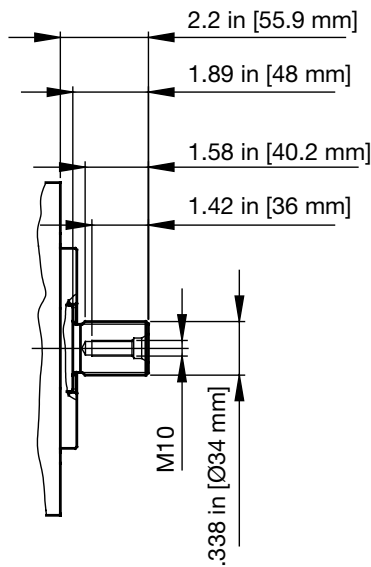
Pi Gas: Piloting pressure gauge port - 1/4 G (BSPP)
 Pi UNF: Piloting pressure gauge port - 7/16" - 20 UNF
 In: Piloting Pressure inching port - 1/8 G (BSPP)
 T1: Drainage Pressure gauge port - 1/8 G (BSPP)
 T: Drainage Pressure gauge port - 1/4 G (BSPP)

Shaft

1: Splined SAE 1 - 1/4" 14T 12/24 Dp – Flat Root Class 5 ANSI B92.1a – 1976

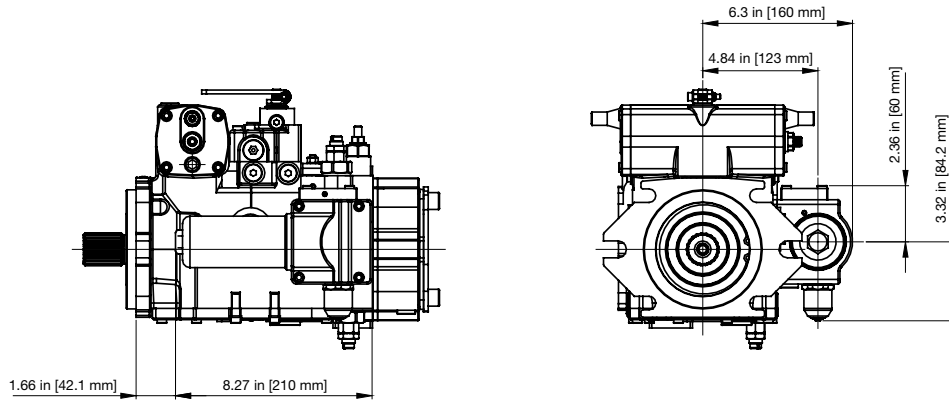


2: Splined SAE 1 - 3/8" 21T 16/32 Dp – Flat Root Class 5 ANSI B92.1a – 1976



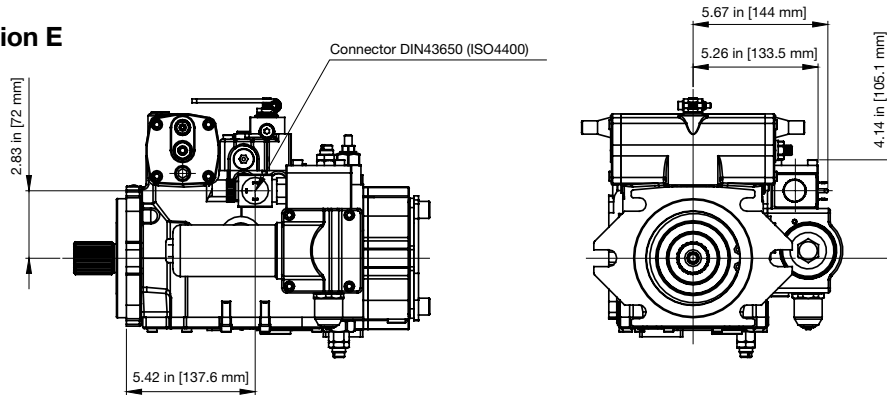
Pump and Accessories

Filter



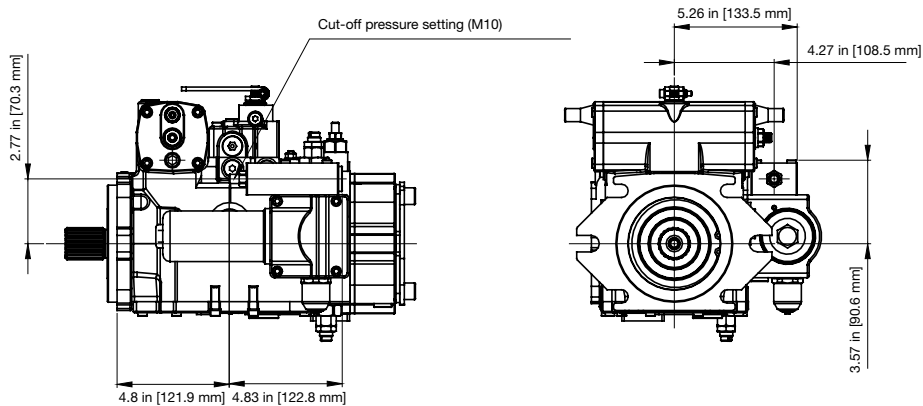
Electric clogging indicator: Connector DIN 43650

Filter and Override Option E



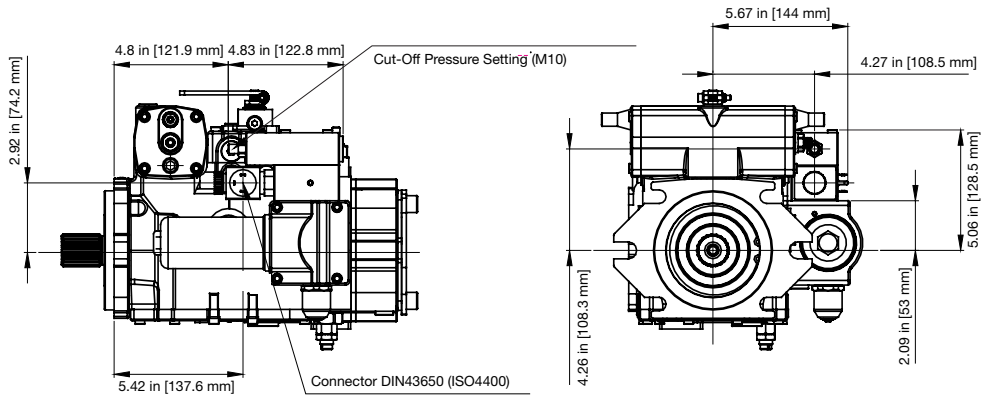
Electric clogging indicator: Connector DIN 43650

Filter and Override Option P



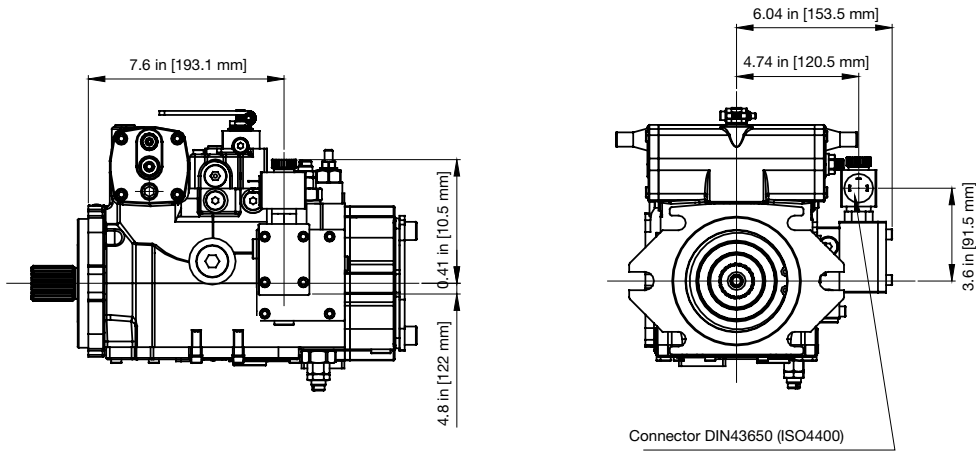
Electric clogging indicator: Connector DIN 43650

Filter and Override Option C

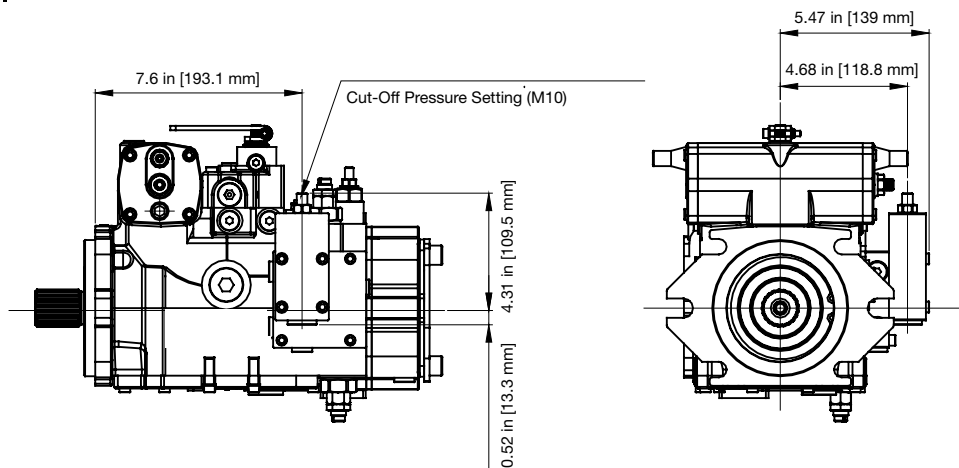


Electric clogging indicator: Connector DIN 43650

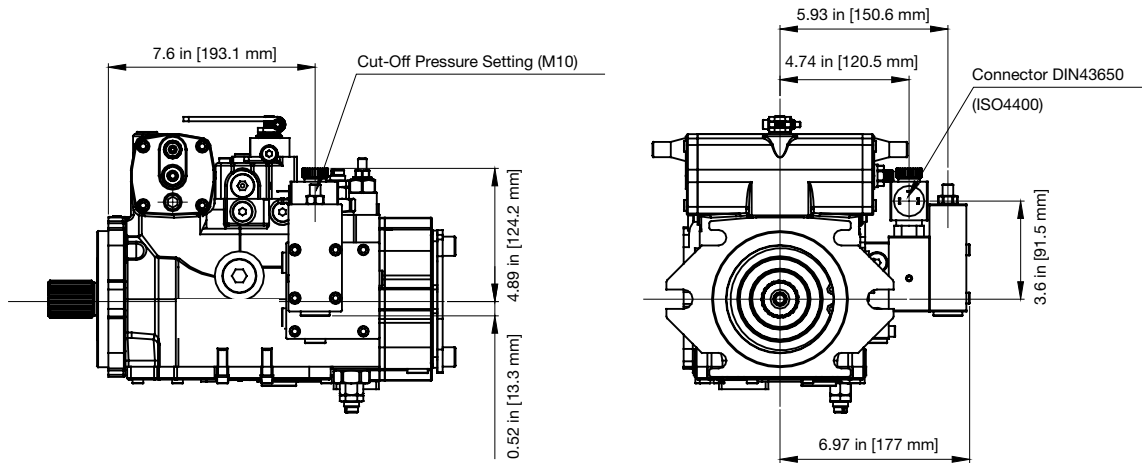
Override Option E



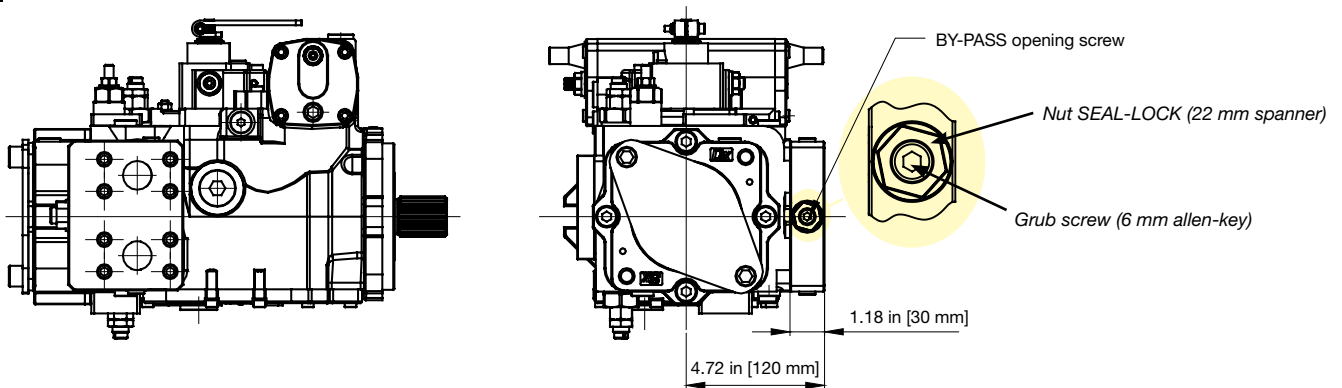
Override Option P



Filter and Override Option C



By-Pass (01)



Through Drives

The C pump can be supplied with a through drive, which can operate in tandem with a second pump. Available flanges include SAE A, SAE B, SAE C, SAE B-B and SAE C-C flanges.

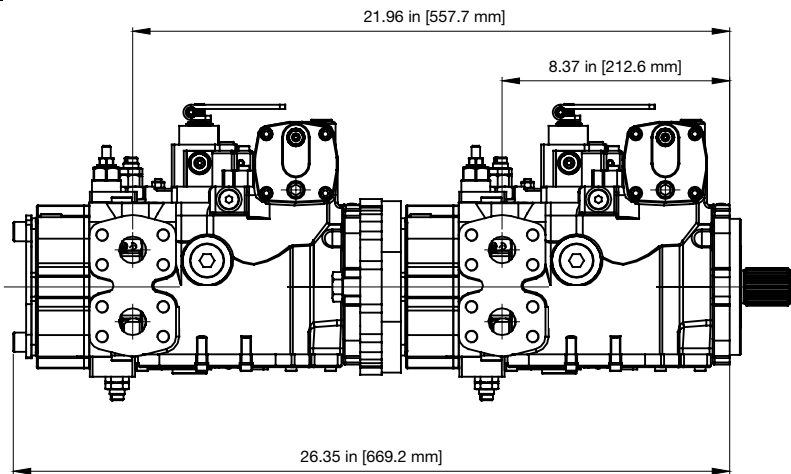
Maximum permissible drive-shaft torques for the first pump, as well as maximum through drive torques are listed in the table below.

Warning:

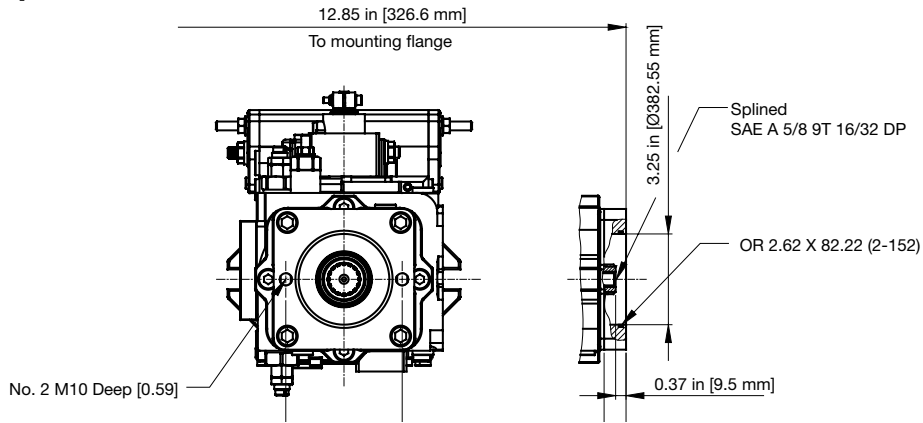
The effective torque value on the shaft of first pump is given by the sum of the torques required from each pump making the system.

Size		081	
		2 Z21 16/32 DP	1 Z14 12/24 DP
Drive shaft max torque	Nm [lbf-ft]	950 (700)	620 (457)
Through drive max torque	Nm [lbf-ft]	665 (490)	620 (457)

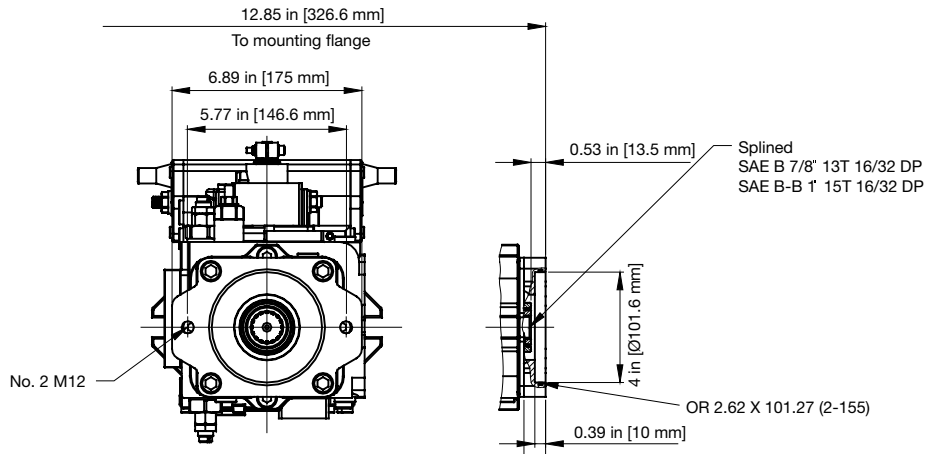
C081 Tandem for Reference



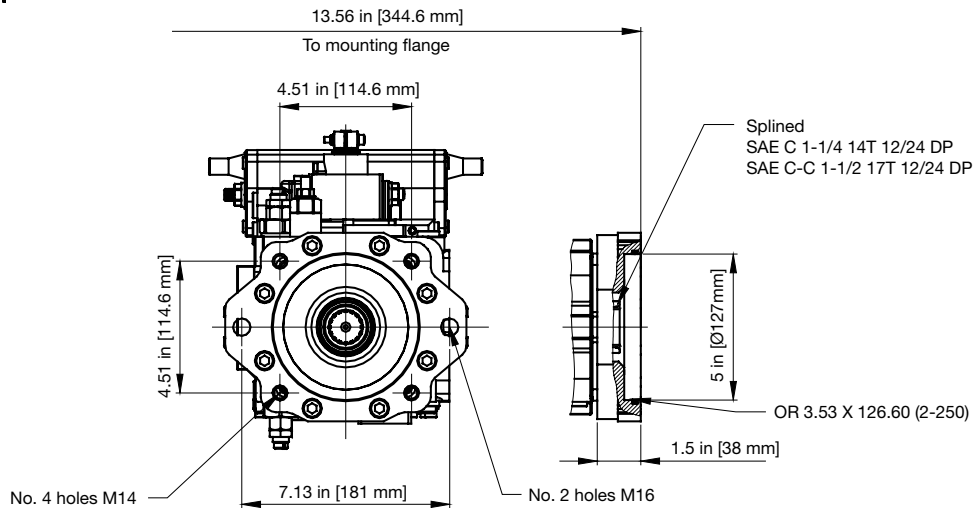
Through Drive Option A



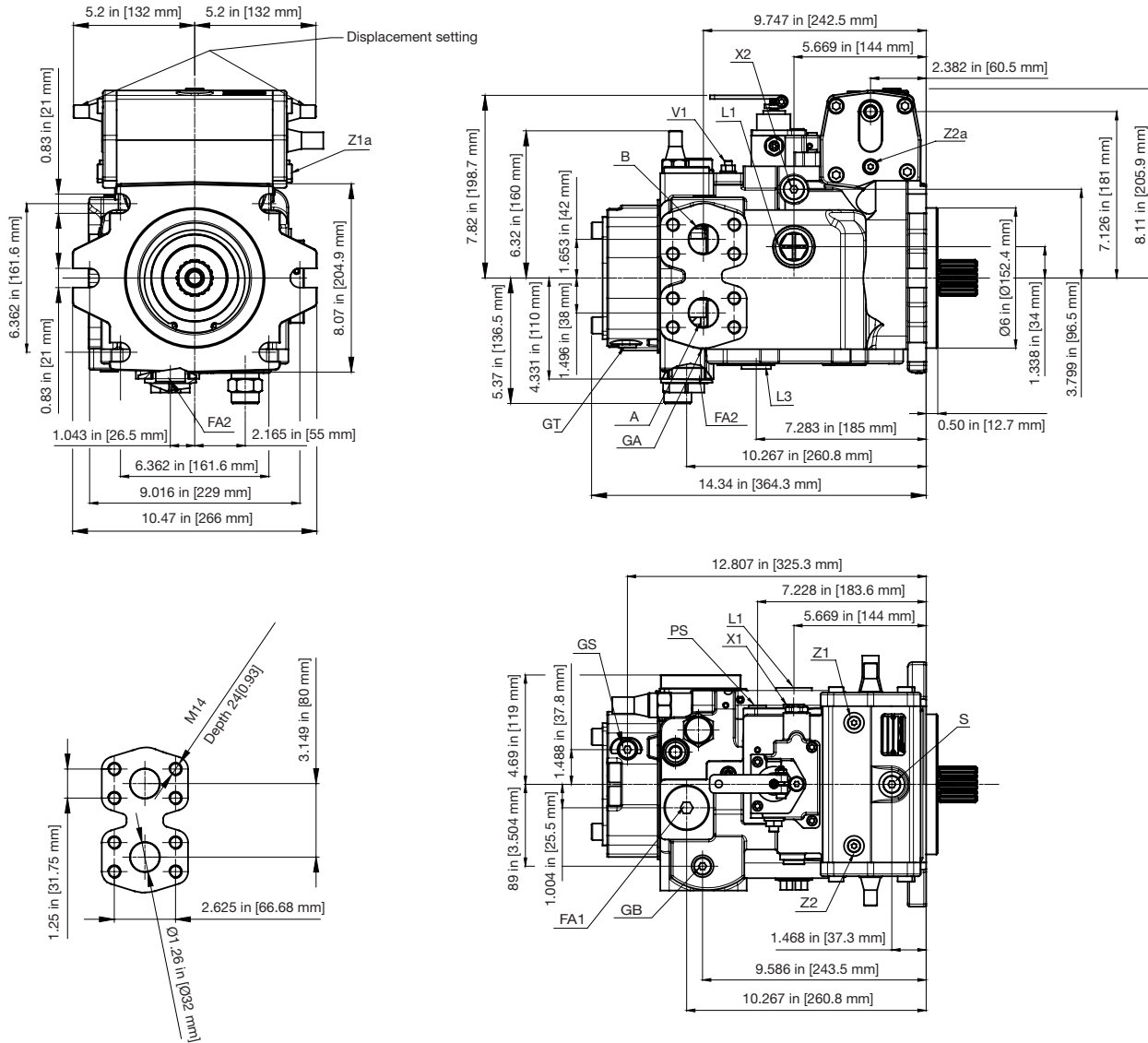
Through Drive Option B and G



Through Drive Option C and H



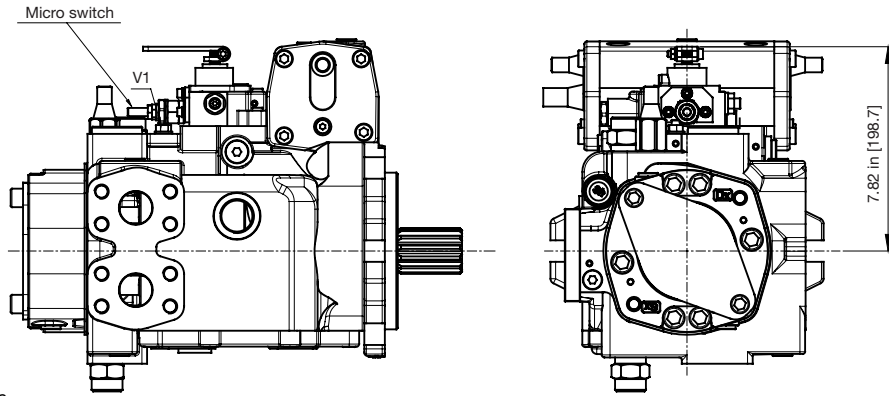
A Control



C136 Port Chart		
Port	Mount C	Mount G
A	1-1/4" SAE CODE 62	1-1/4" SAE CODE 62
B	1-1/4" SAE CODE 62	1-1/4" SAE CODE 62
L1	-16 SAE ORB	1" G
L2	-16 SAE ORB	1" G
L3	-12 SAE ORB	3/4" G
FA1	-20 SAE ORB	1-1/4" G
FA2	-20 SAE ORB	1-1/4" G
GA	-4 SAE ORB	1/4" G
GB	-4 SAE ORB	1/4" G

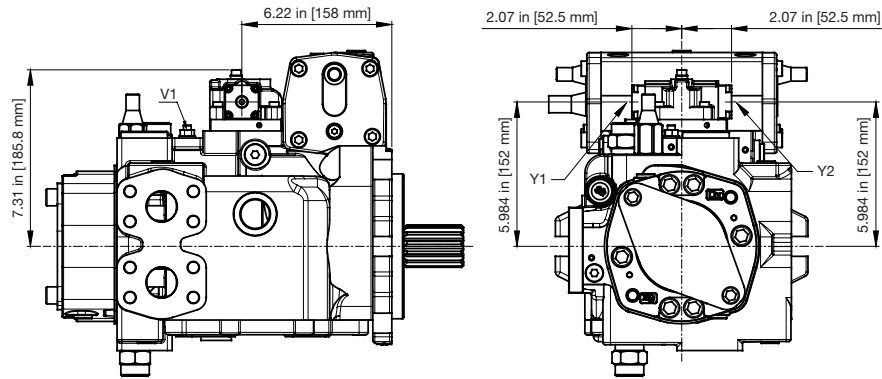
Port	Mount C	Mount G
GS	-4 SAE ORB	1/4" G
PS	-4 SAE ORB	1/4" G
Z1 (a)	-4 SAE ORB	1/8" G
Z2 (a)	-4 SAE ORB	1/8" G
X1	-6 SAE ORB	3/8" G
X2	-6 SAE ORB	3/8" G
Y1	4 SAE ORB	1/4" G
Y2	-4 SAE ORB	1/4" G
GT	-4 SAE ORB	1/4" G

B Control



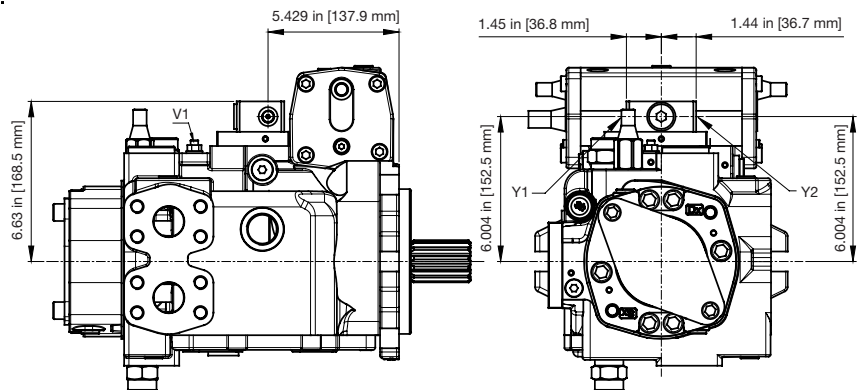
V1: Adjustable throttle valve

C Control



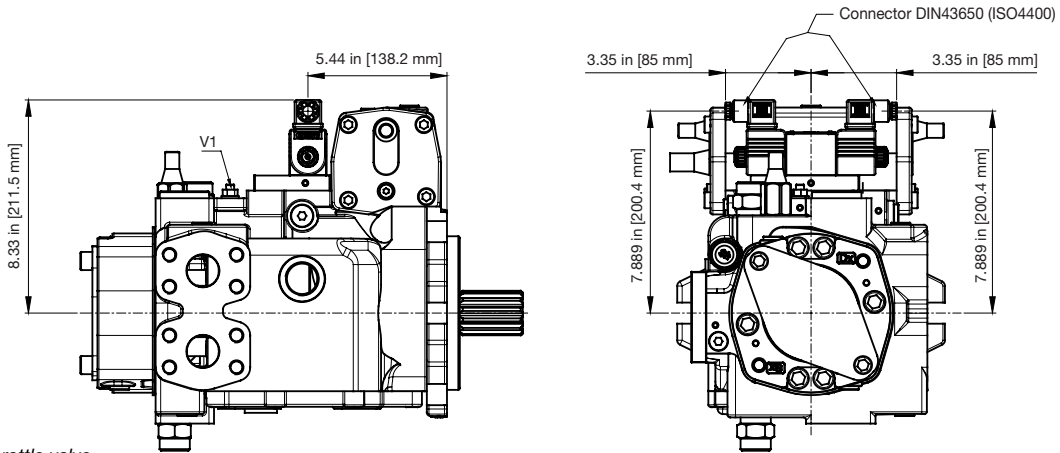
Y1-Y2: Control piloting pressure ports - 1/4 G (BSP)
 S1-V1: Adjustable throttle valve

D Control



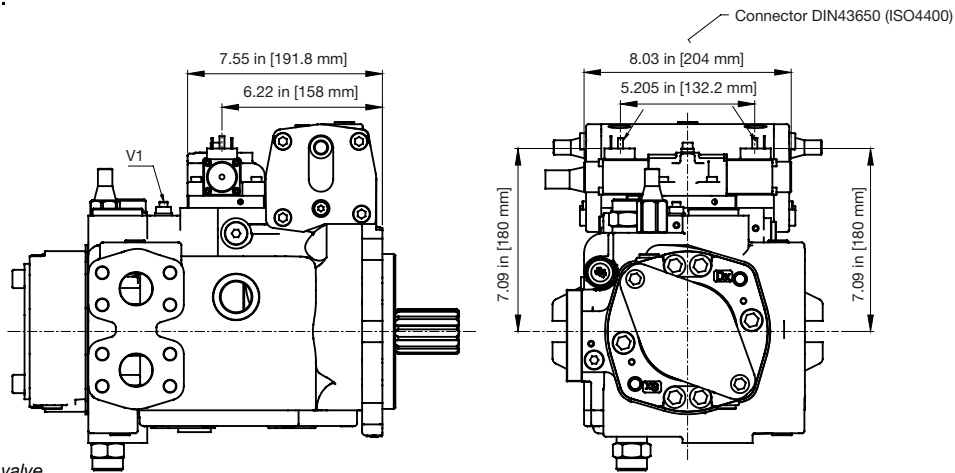
V1: Adjustable throttle valve

E Control



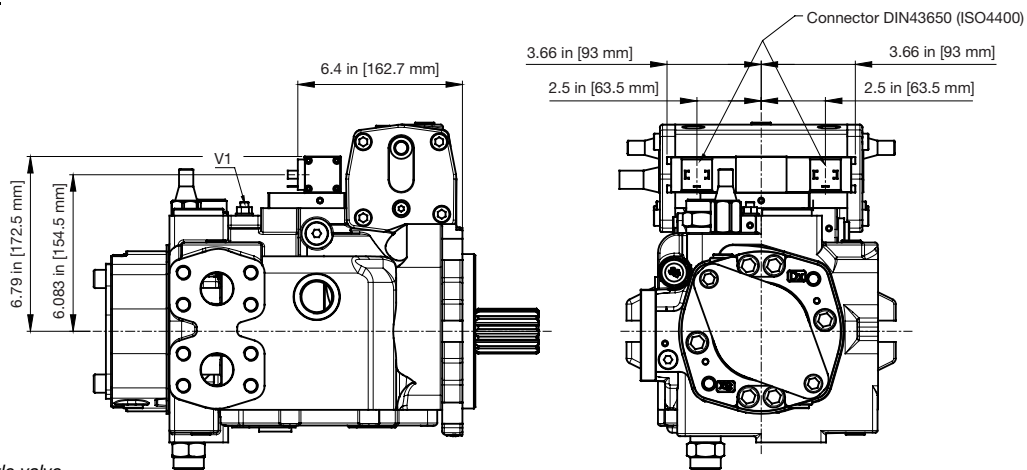
V1: Adjustable throttle valve

F Control



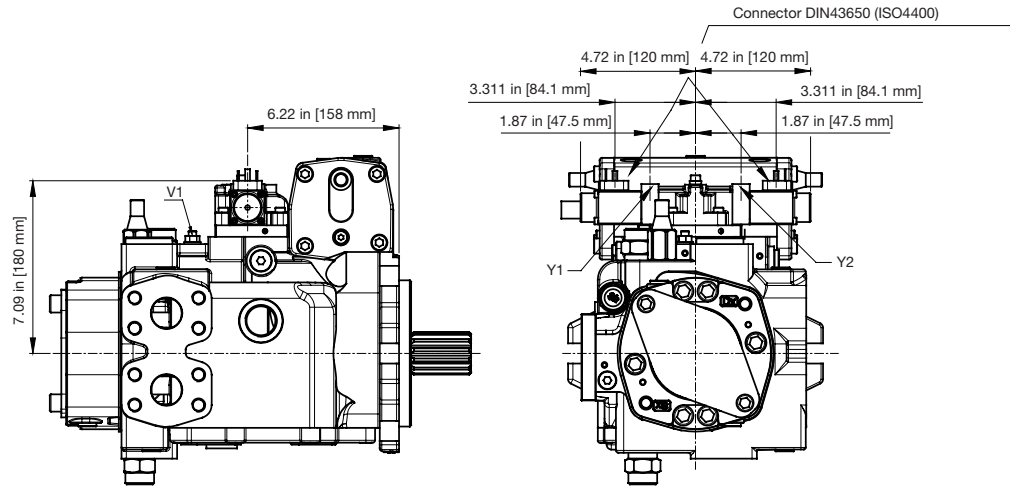
V1: Adjustable throttle valve

G Control



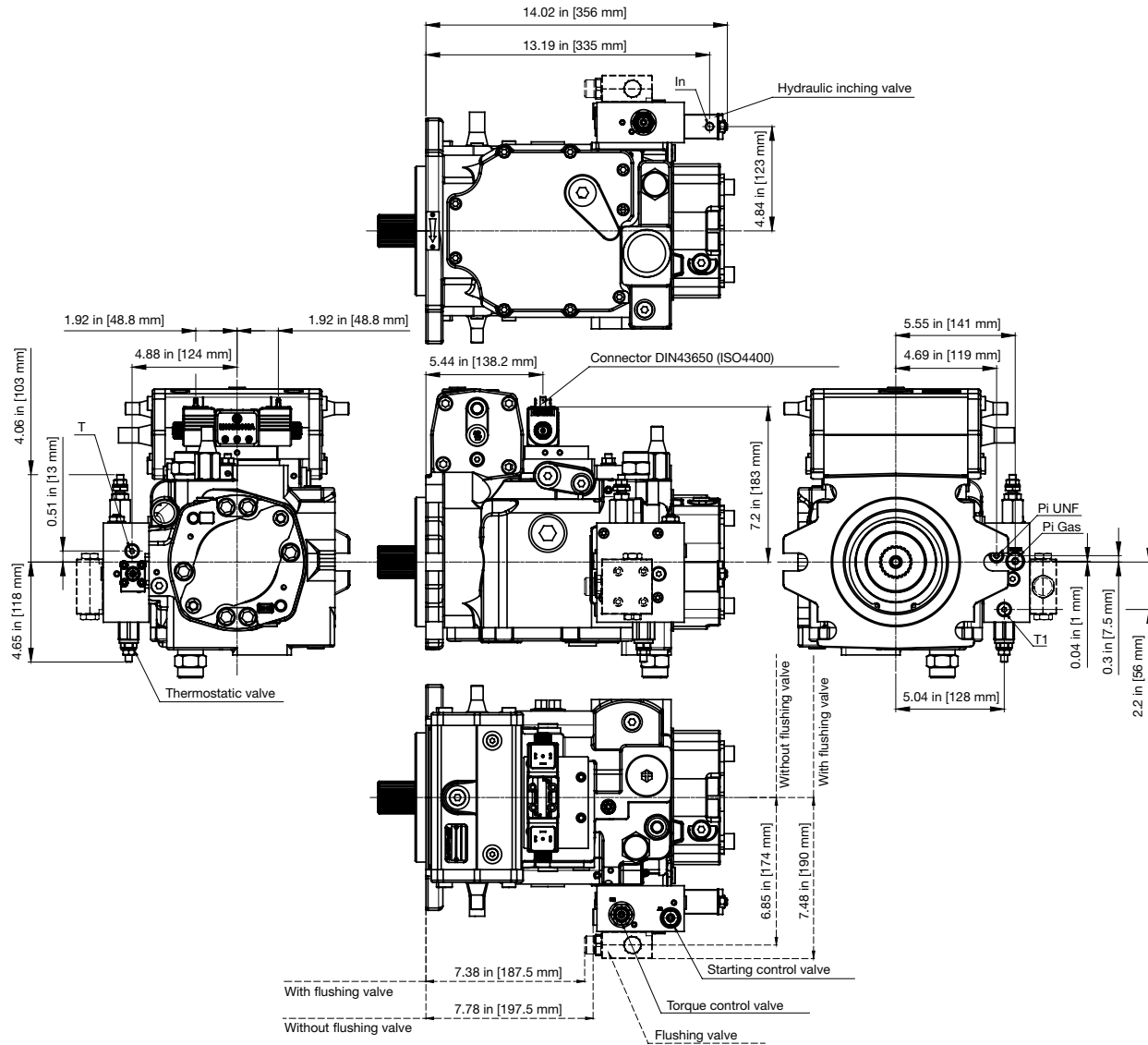
V1: Adjustable throttle valve

H Control



Y1-Y2: Control piloting pressure ports – 1/4G (BSPP)
V1: Adjustable throttle valve

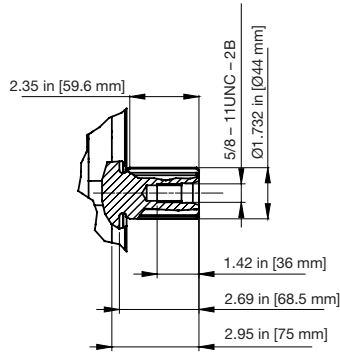
Automotive J With Hydraulic Inching



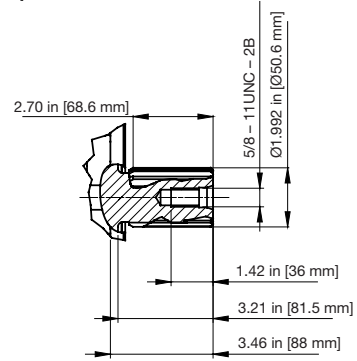
Pi Gas: Piloting pressure gauge port - 1/4 G (BSPP)
 Pi UNF: Piloting pressure gauge port - 7/16" - 20 UNF
 In: Piloting pressure inching port - 1/8 G (BSPP)
 T1: Drainage pressure gauge port - 1/8 G (BSPP)
 T: Drainage pressure gauge port - 1/4 G (BSPP)

Shaft

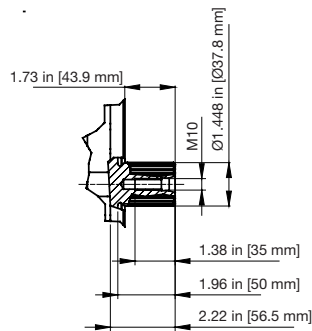
**3: Splined 13T 8/16 Dp ANSI B92.1a
 1976 Flat Root**



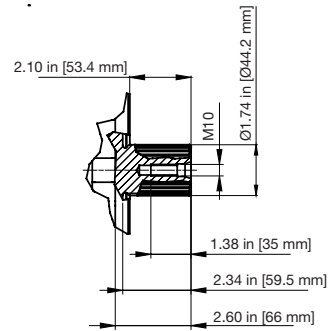
**4: Splined 15T 8/16 Dp ANSI B92.1a
 1976 Flat Root**



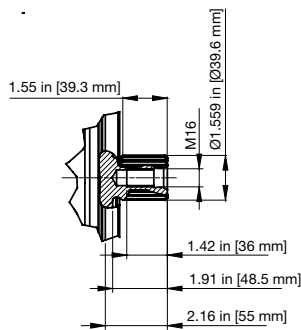
**5: Splined 23T 16/32 Dp ANSI B92.1a
 1976 Flat Root**



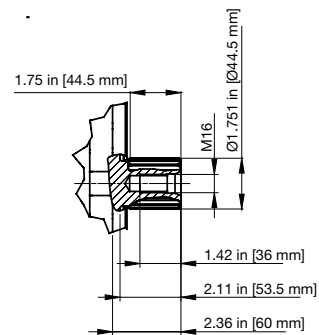
**6: Splined 27T 16/32 Dp ANSI B92.1a
 1976 Flat Root**



G: Splined W40x2x30x18 DIN 5480

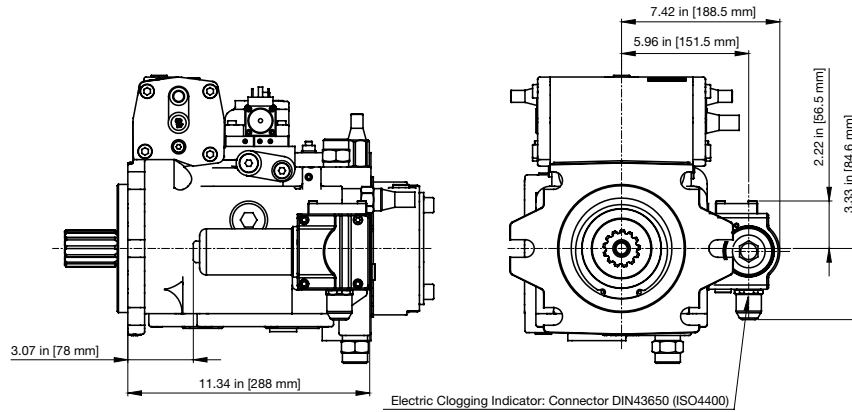


H: Splined W45x2x30x21 DIN 5480

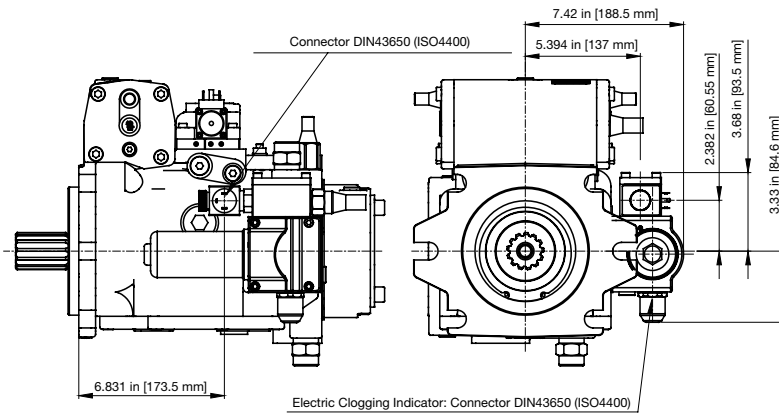


Pump and Accessories

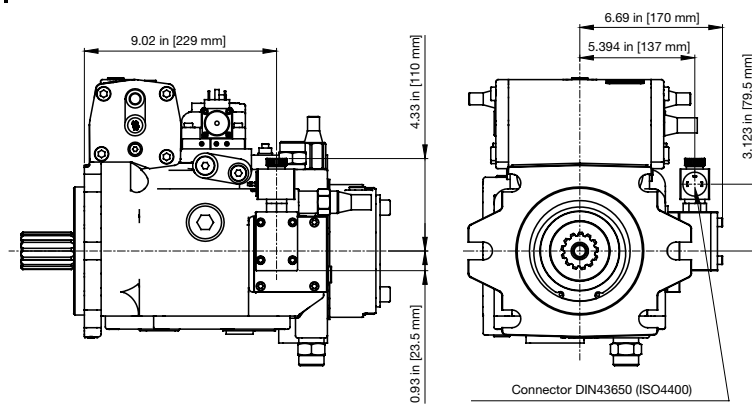
Filter



Filter and Override Option E



Filter and Override Option P



Through Drives

The C pump can be supplied with a through drive, which can operate in tandem with a second pump. Available flanges include SAE A, SAE B, SAE C, SAE B-B, SAE C-C and SAE-D flanges.

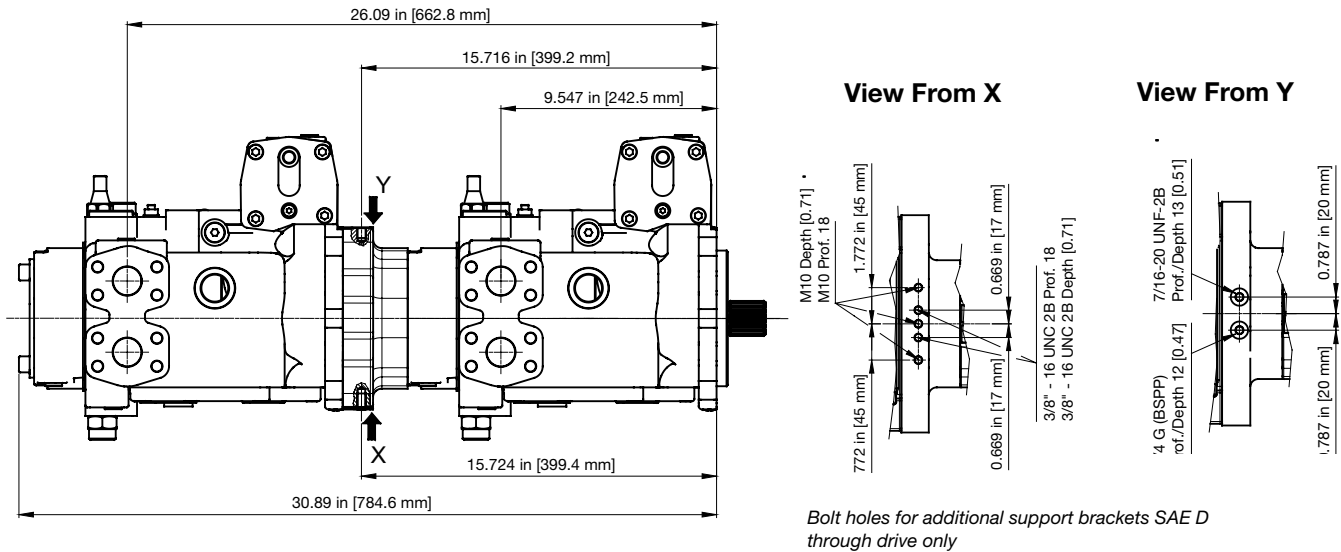
Maximum permissible drive-shaft torques for the first pump, as well as maximum through drive torques are listed in the table below.

Warning:

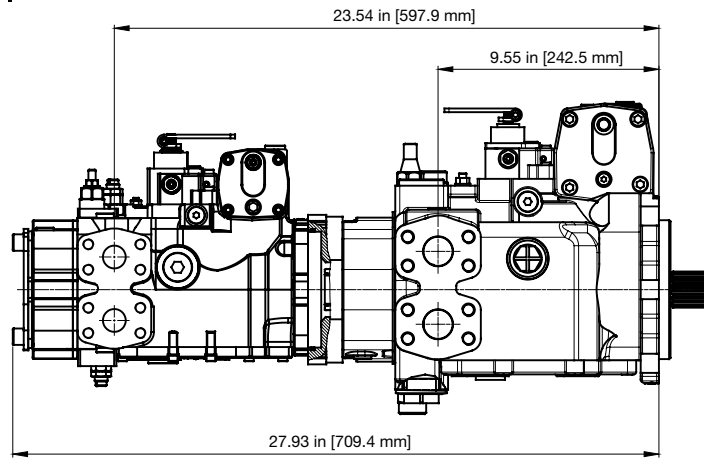
The effective torque value on the shaft of first pump is given by the sum of the torques required from each pump making the system.

Size		136					
Drive shaft		3	4	5	6	7	8
		Z13 8/16 DP	Z15 8/16 DP	Z23 16/32 DP	Z27 16/32 DP	W40x2x30x18	W45x2x30x21
Drive shaft max torque	Nm [lbf-ft]	1640 (1208)	2670 (1967)	1250 (921)	1900 (1400)	1460 (1076)	2190 (1614)
Through drive max torque	Nm [lbf-ft]	1000 (737)	1000 (737)	1000 (737)	1000 (737)	1000 (737)	1000 (737)

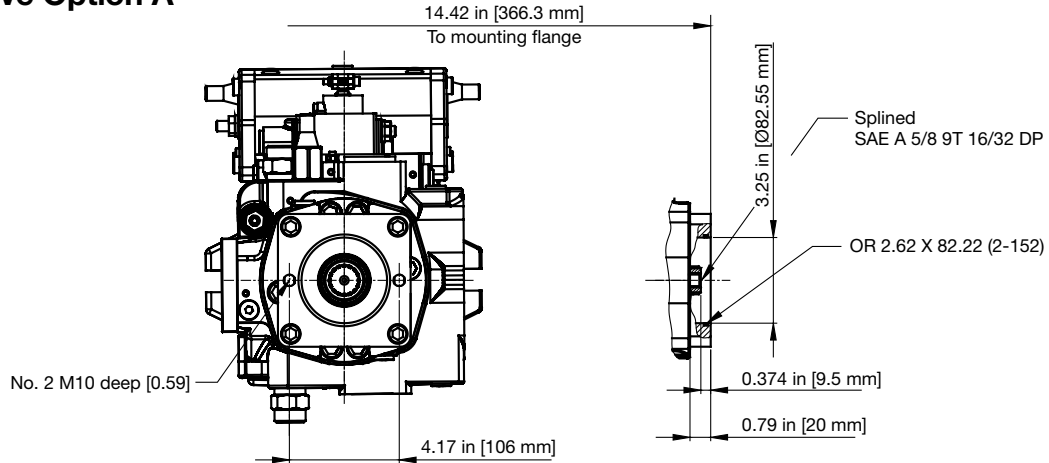
C136 Tandem for Reference



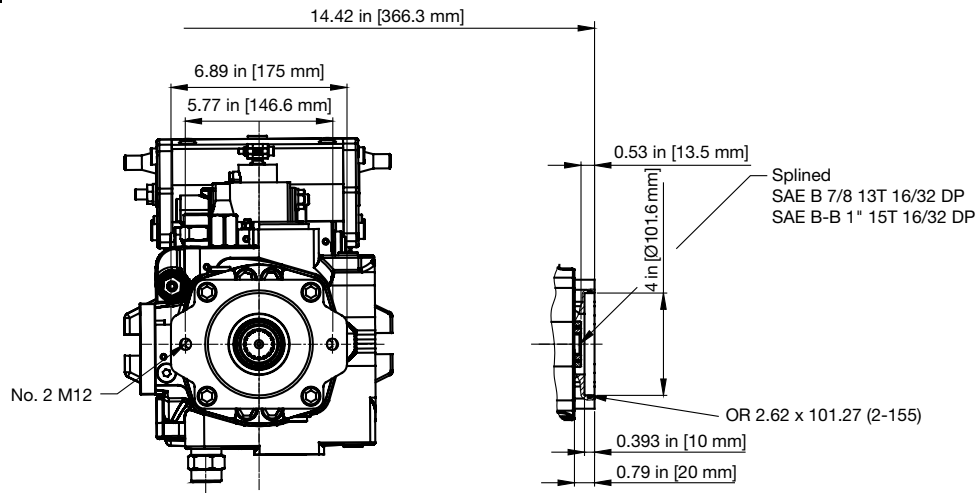
Tandem Combination C136 + C081



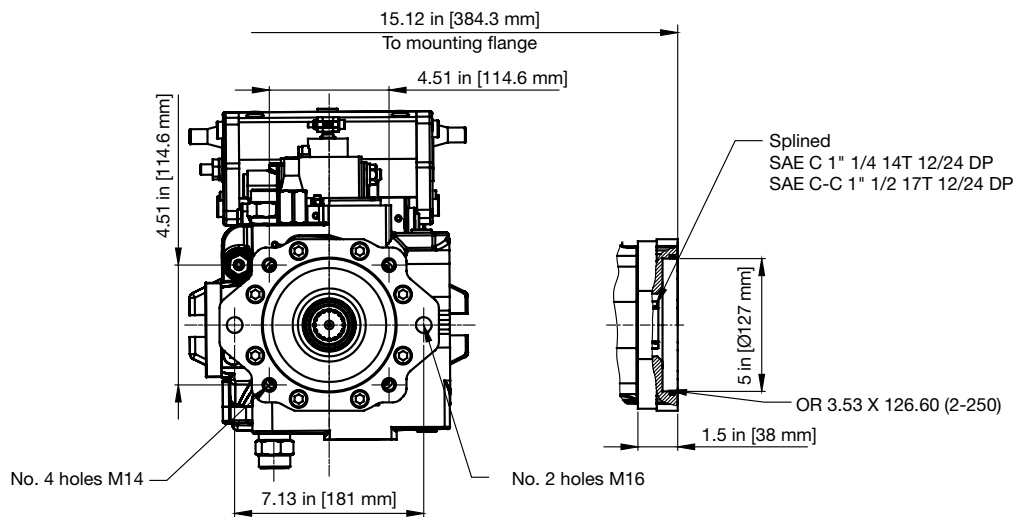
Through Drive Option A



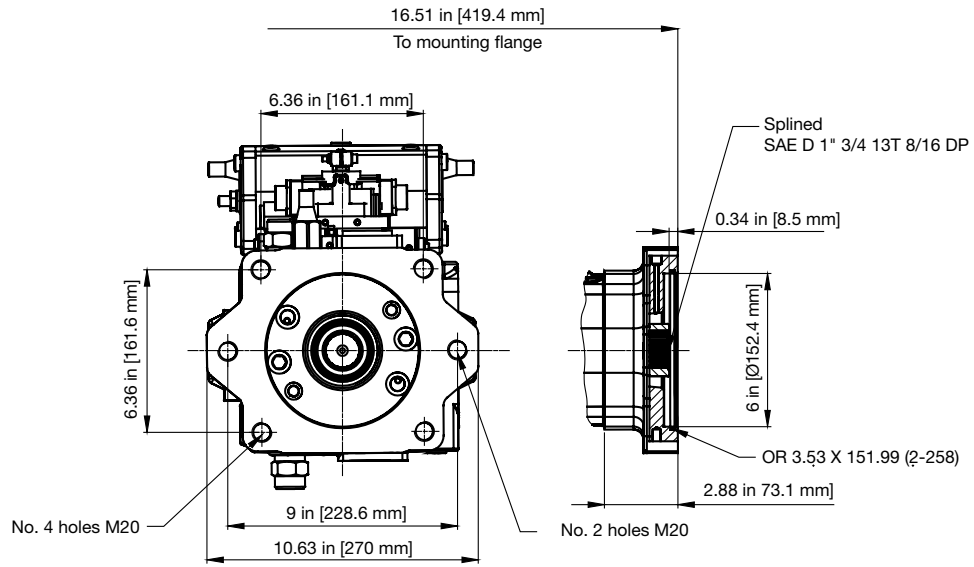
Through Drive Option B and G



Through Drive Option C and H



Through Drive Option D



General Installation Information

Installation Guidelines

Pump case should be filled prior to start up and plumbed to ensure it remains filled with fluid under all conditions. Pump case pressure should not exceed 4 bar (58 PSI) continuous pressure, 6 bar (87 PSI) on cold start up.

Care should be taken to ensure line velocities are not above standard design specifications as noted in table 1. Raised line velocities will cause an increase in pressure loss in the hoses and cause premature failure under certain conditions. Pressure in the suction line of the pump should never be below .8 bar (11.6 PSI) absolute. Maximum suction pressure is 4 bar (58 psi) continuous and 6 bar (87 psi) on cold startup.

Long line lengths and sharp turns in the fluid conveyance will add additional pressure loss or restriction to the system. It is recommended to keep the line lengths as short as possible and to avoid as many fluid direction changes in the system as possible.

Table 1

Function	Fluid Velocity m/sec (Ft/sec)
Suction	0.6-1.2 (2-4)
Case drain	1.5-3 (5-10)
Pressure	3-6 (10-20)

Installation Orientation

The C Series pump can be installed in many different orientations; see figure 1 for examples. If you are wanting to mount the unit in an orientation not shown please contact technical support.

It is suggested that the pump be mounted so that it is level or below minimum fluid level in the hydraulic reservoir. The pump can be mounted above fluid level but ensure the case remains filled at all times and proper suction pressure is maintained when mounting in this manner.

Regardless of installation orientation the highest case drain port (L1, L2 or L3) should always be used and should return below fluid level. See figure 2 for drain port suggestions and suggested air bleed port.

Air bleed port should only be used while filling the case of the unit to ensure the unit is completely filled with fluid. Once unit is filled the air bleed port should be closed via a port plug or shut off valve.

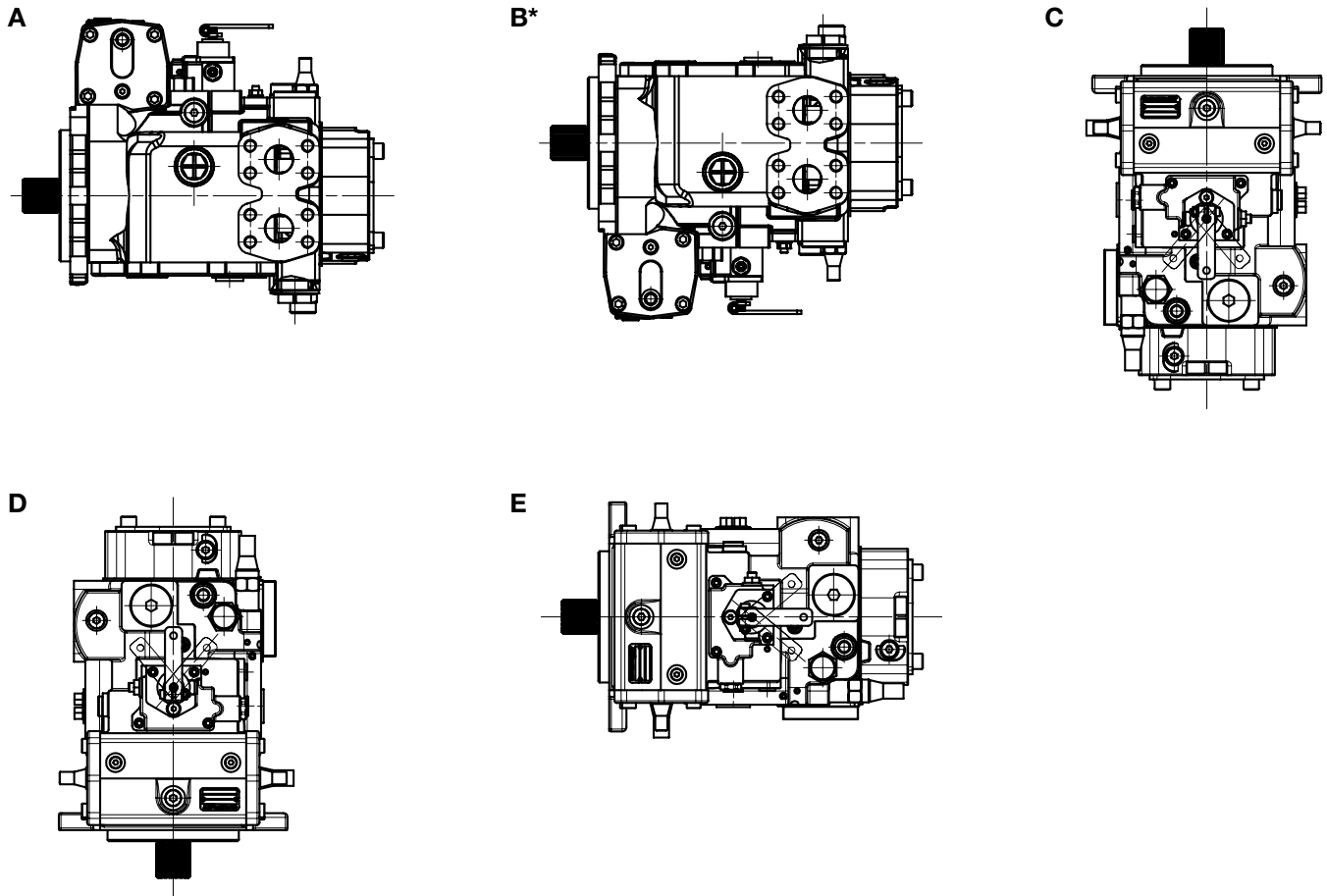
Fluid

Parker recommends using a fluid with a petroleum base and contains agents which provide oxidation inhibition and anti-rust, anti-foam and detiaerating properties as described in Parker standard HF-1. Where anti-wear additive fluids are specified see Parker standard HF-0.

Use fluids with a minimum Viscosity index of 90. Higher viscosity index extend the range of operating temperatures but may reduce the service life of the fluid.

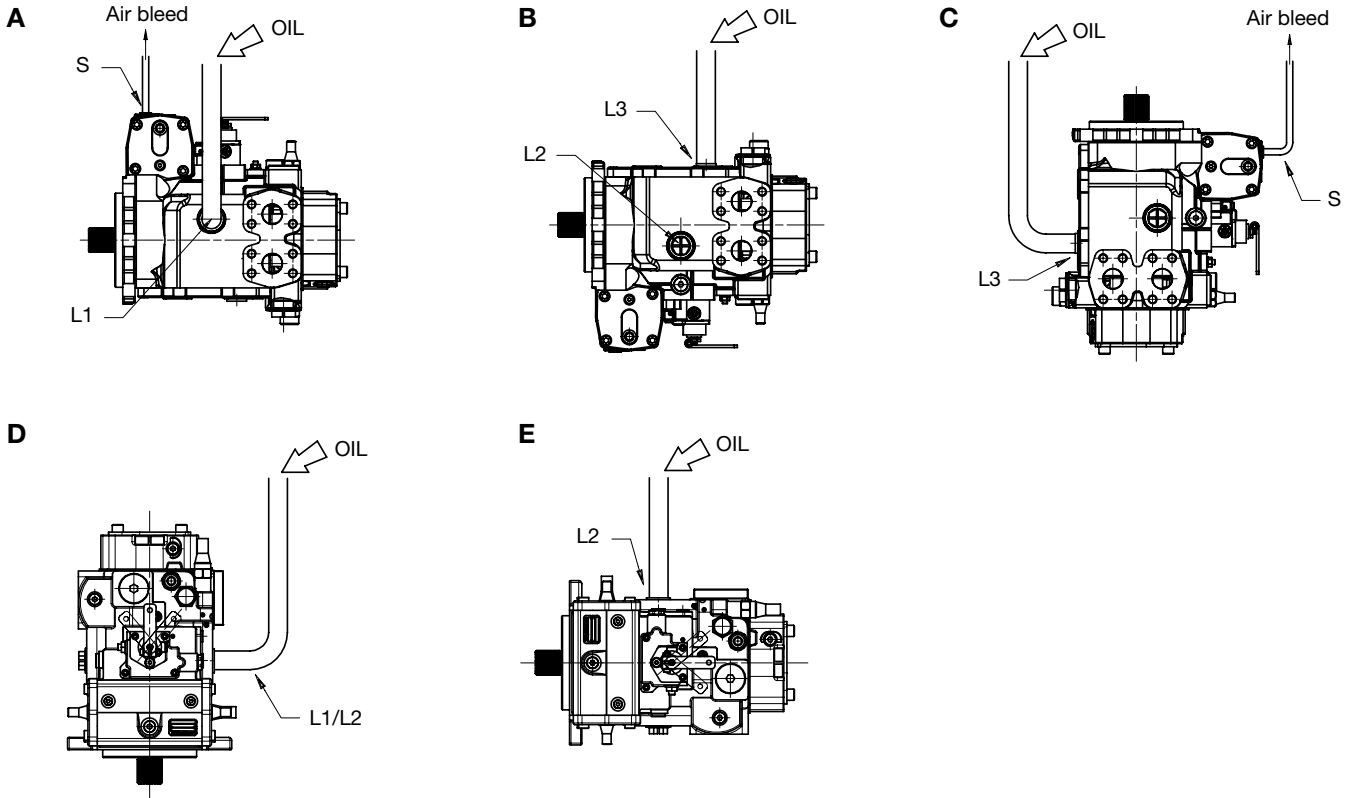
It is recommended that the reservoir, hydraulic fluid and fluid conveyance items be cleaned prior to use. Filtration of the fluid is recommended before and during use. Maximum fluid contamination level is 20/18/15 per ISO 4406:1999. Better cleanliness levels will increase the life of the system.

Figure 1: Optional Mounting Orientations



**Contamination can cause issues when mounting in this orientation. Ensure system is clean when this orientation is used.*

Figure 2: Case Drain and Air Bleed Recommendations



Customer must verify adequate cooling flow through pump case in their application.

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