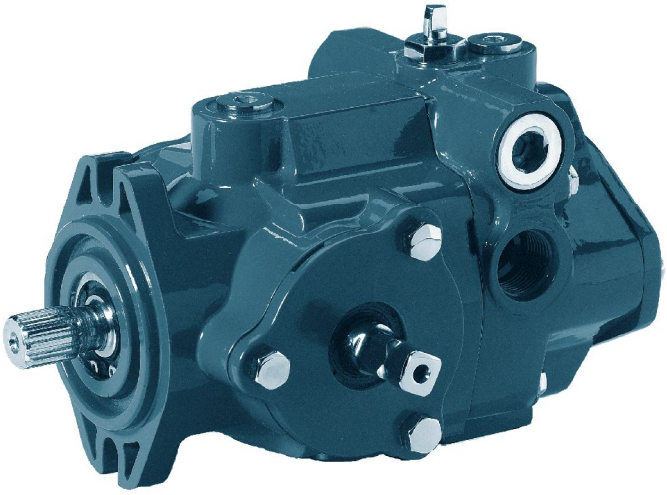
Model 70160 Specifications



Model 70160
Specifications - Piston Pump

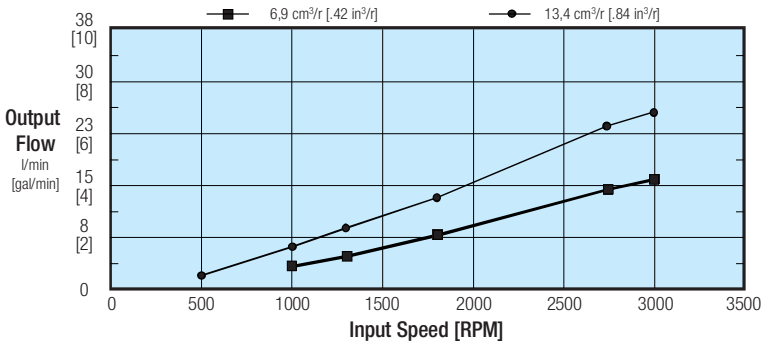
Maximum Displacement	20,3 cm^3/r [1.24 in^3/r]	23,6 cm^3/r [1.44 in^3/r]
Input Mounting Flange	SAE "A"	SAE "A"
Flow @ Rated Speed & PSI	64,3 l/min [17 gal/min]	75,7 l/min [20 gal/min]
Maximum Rated Speed	3600 RPM	3600 RPM
Continuous Rated Pressure	210 bar [3000 PSI]	210 bar [3000 PSI]
Maximum Intermittent Pressure	345 bar [5000 PSI]	345 bar [5000 PSI]
Continuous Allowable Case Pressure	2 bar [25 PSI]	2 bar [25 PSI]
Maximum Case Drain Temperature	107° C [225° F]	107° C [225° F]
Weight Per Single Pump	9,5 kg [21 lbs]	9,5 kg [21 lbs]

Specifications - Integral Gerotor Charge Pump
Displacement Options
- 6,9 cm^3/r [.42 in^3/r]
- 13,8 cm^3/r [.84 in^3/r]

Operating Pressure Range (std.) ..... 7 to 10 bar [100 to 150 PSI]
Maximum Charge Inlet Vacuum ..... 0,80 bar Abs. [11.6 PSI Abs.]

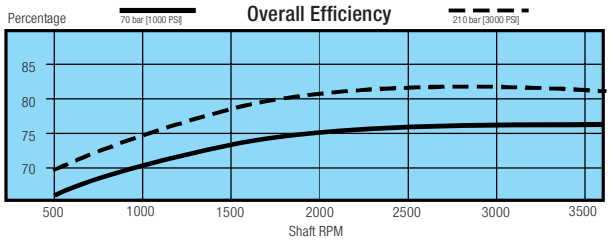
Charge Pump Performance - Flow vs Speed

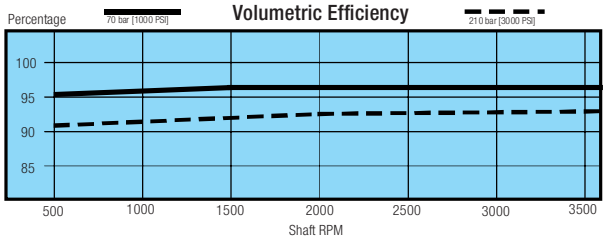
The chart at right is representative of a 6,9 cm^3/r [.42 in^3/r] cm^3/r and 13,4 [.84 in^3/r] displacement charge pumps. The test was run at an oil temperature of 60°C [150°F] with viscosity 13 cSt [65 SUS].

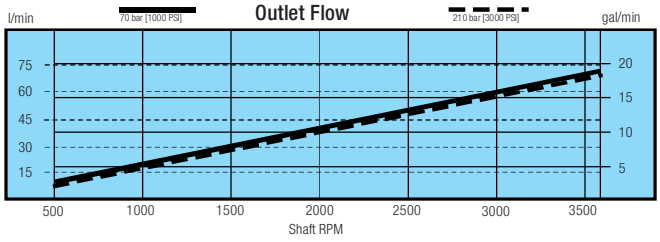


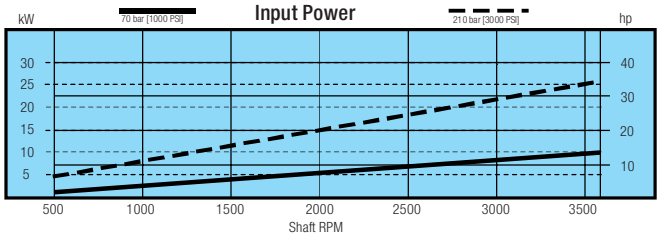
Model 70160 Performance Data

The charts below are representative of a **20,3 cm³/r [1.24 in³/r]** Variable Displacement Piston Pump. The tests were run at an oil temperature of 82°C [180°F] with viscosity 7 - 9 cSt [50 - 54 SUS] and the pump at maximum displacement.

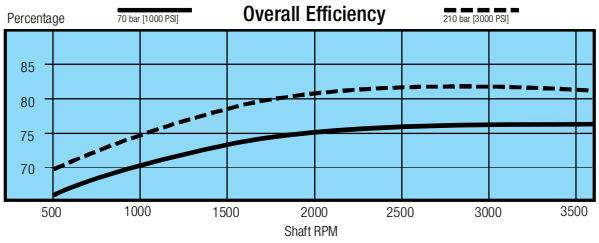


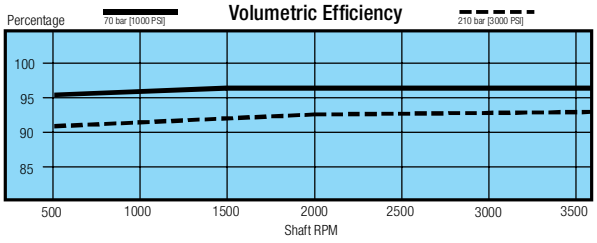


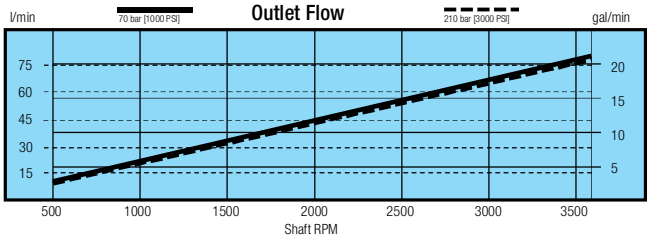


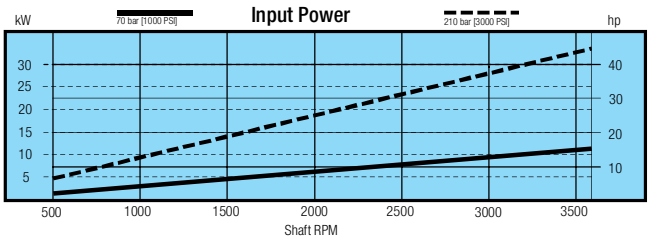


The charts below are representative of a **23,6 cm³/r [1.44 in³/r]** Variable Displacement Piston Pump. The tests were run at an oil temperature of 82°C [180°F] with viscosity 7 - 9 cSt [50 - 54 SUS] and the pump at maximum displacement.









Model 70160 Code

The Model 70160 Variable Displacement Piston Pumps are specified by the following model code. Once a pump is built from the model code, a product number will be assigned to that configuration. Make sure all positions are selected within the 32 digit code for each pump.

Code Example:	ADB	12	R	1	A	B	D	1	1	T	T	1	A	0	A	AA	3	1	1	A	0	0	00	0A	0	C
Position -	1, 2, 3	4, 5	6	7	8	9	10	11	12	13	14	15	16	17	18	19, 20	21	22	23	24	25	26	27,28	29,30	31	32
	ADB			1			D		1					0												C

Position 1, 2, 3 - **Code Title**

ADB = Series 160 Manually Variable Displacement Axial Piston Pump with SAE J744 Flange 82-2 (2 Bolt A)

All left (CCW) or right (CW) directions given are viewed from the input shaft end of the pump.

	Code	Single Unit	Tandem Unit Front	Tandem Unit Rear
Positions 4, 5 - Displacement				
12 = 20,3 cm³/r [1.24 in³/r]	**12**	Std.	Std.	Std.
14 = 23,6 cm³/r [1.44 in³/r]	**14**	Std.	Std.	Std.
Position 6 - Input Shaft Rotation				
R = Righthand Rotation (CW)	**R**	Std.	Std.	Std.
L = Lefthand Rotation (CCW)	**L**	Std.	Std.	Std.
Position 7 - Valve Plate				
1 = Type 1	**1**	Std.	Std.	Std.
Position 8 - Input Shaft (see page 16 for details)				
A = 13 Tooth 16/32 Pitch Spline, Shaft Extension 41,1 [1.62]	**A**	Std.	Std.	NA
C = 35 Tooth 48/96 Pitch Spline, Shaft Extension 32,0 [1.26]	**C**	NA	NA	Std.
F = Straight Shaft Dia. 22,2 [.875], Keyway 6,35 [.25] x 25,9 [1.02], Shaft Extension 41,1 [1.62] (Key Included)	**F**	Opt.	NA	NA
Position 9 - Control Shaft and Location				
L = Left Side	**L**	Std.	Std.	Std.
R = Right Side	**R**	Std.	Std.	Std.
Position 10 - Control Shaft				
D = with 15.7 [.62] square arm, with bolt groove; 113 [4.45] from unit centerline to control shaft end.	**D**	Std.	Std.	Std.
Position 11 - Main Ports (A and B) Location (see page 14 for port location)				
1 = Opposite Sides	**1**	Std.	Std.	Std.
2 = Same Side (without internal charge pump)	**2**	Opt.	Opt.	Opt.
Position 12 - Main Ports (A and B) Size				
1 = 1- 1/16 -12 UN-2B Port, SAE Straight Thread O-ring Ports	**1**	Std.	Std.	Std.
Positions 13, 14 - Relief Valve Setting for Main Ports				
(Select a setting for port "A" in position 10 and port "B" in position 11.)				
0 = No Relief, Check Valve Assembly Only	**0**	Opt.	Opt.	Opt.
B = 138 bar [2000 PSI]	**B**	Opt.	Opt.	Opt.
E = 173 bar [2500 PSI]	**E**	Opt.	Opt.	Opt.
H = 207 bar [3000 PSI]	**H**	Opt.	Opt.	Opt.
L = 241 bar [3500 PSI]	**L**	Opt.	Opt.	Opt.
N = 276 bar [4000 PSI]	**N**	Opt.	Opt.	Opt.
Q = 310 bar [4500 PSI]	**Q**	Opt.	Opt.	Opt.
T = 344 bar [5000 PSI]	**T**	Std.	Std.	Std.
Position 15 - Charge Displacement, Suction Port (S) (see page 17 for port location)				
0 = No Charge	**0**	Opt.	Std.	Opt.
1 = 6,9 cm³/r [.42 in³/r]; 3/4 - 16 UNF-2B SAE o-ring port for suction inlet (right side CCW, Left side CW)	**1**	Std.	NA	NA
3 = 13,8 cm³/r [.84 in³/r]; 3/4 -16 UNF-2B SAE o-ring port for suction inlet (right side CCW, Left side CW)	**3**	Opt.	NA	Std.
Position 16 - Charge Relief Setting and Routing				
0 = No (requires external relief set between 6,89 bar [100 lbf/in²] and 20,68 bar [300 lbf/in²])	**0**	Opt.	Std.	Opt.
A = 6,89-10,34 bar [100-150 PSI]; Relieved to case	**A**	Std.	NA	Std.
B = 10,34-13,79 bar [150-200 PSI]; Relieved to case	**B**	Opt.	NA	Opt.
C = 13,79-17,24 bar [200-250 PSI]; Relieved to case	**C**	Opt.	NA	Opt.
D = 17,24-20,68 bar [250-300 PSI]; Relieved to case	**D**	Opt.	NA	Opt.
E = 20,68-24,13 bar [300-350 PSI]; Relieved to case	**E**	Opt.	NA	Opt.
F = 6,89-10,34 bar [100-150 PSI]; Recirculated	**F**	Std.	NA	Std.
G = 10,34-13,79 bar [150-200 PSI]; Recirculated	**G**	Opt.	NA	Opt.
H = 13,79-17,24 bar [200-250 PSI]; Recirculated	**H**	Opt.	NA	Opt.
J = 17,24-20,68 bar [250-300 PSI]; Recirculated	**J**	Opt.	NA	Opt.
K = 20,68-24,13 bar [300-350 PSI]; Recirculated	**K**	Opt.	NA	Opt.

Dimensions are in mm [in] unless noted otherwise.

Model 70160 Code (continued)

Position 17 - **Charge Special Feature**

0 = No Special Feature	**0**	Std.	Std.	Std.

Position 18 - **Auxiliary Rear Mount and Output Shaft** (see page 15 for details)

A = With Integral Charge: Horizontal 2-Bolt "A" SAE J744 Flange 82-2; Accepts 9 tooth internal 16/32 pitch spline with 31,7 [1.25] shaft extention	**A**	Std.	NA	Std.
B = No Integral Charge: Horizontal or Vertical 2-Bolt "A" SAE J744 Flange 82-2; Accepts 11 tooth external 16/32 pitch spline with 31,7 [1.25] shaft extention (Coupler required)	**B**	Opt.	NA	Opt.
C = No Integral Charge: Horizontal or Vertical 2-Bolt "A" SAE J744 Flange 82-2; Accepts 9 tooth external 16/32 pitch spline with 31,7 [1.25] shaft extention (Coupler required)	**C**	Opt.	NA	Opt.
D = No Integral Charge: Horizontal or Vertical 2-Bolt "A" SAE J744 Flange 82-2; Accepts 35 tooth external 48/96 pitch spline with 32 [1.26] shaft extention (Coupler required)	**D**	Opt.	Std.	Opt.
E = No Integral Charge: Horizontal or Vertical 2-Bolt "A" SAE J744 Flange 82-2; Accepts 9 tooth external 20/40 pitch spline with 31,7 [1.25] shaft extention (Coupler required)	**E**	Opt.	NA	Opt.

Position 19, 20 - **Special Features Auxiliary Mounting**

00 = No Special Features	**00**	Std.	Std.	Std.
AA = Supply Cover Plate for 2-Bolt "A" SAE J744 Flange 82-2	**AA**	Opt.	Opt.	Opt.
AB = Supply Shaft Coupler 9 tooth 16/32 pitch	**AB**	Opt.	Opt.	Opt.
AC = Supply Shaft Coupler 9 tooth 20/40 pitch	**AC**	Opt.	Opt.	Opt.
AD = Supply Shaft Coupler 11 tooth 16/32 pitch	**AD**	Opt.	Opt.	Opt.
AE = Supply Shaft Coupler 35 tooth 48/96 pitch	**AE**	Opt.	Opt.	Opt.
AF = Bottom Mounting Bracket (632), Square Shaped	**AF**	Opt.	Opt.	Opt.
AG = Bottom Mounting Bracket (709), V Shaped	**AG**	Opt.	Opt.	Opt.
AH = Auxiliary Mounting Holes, 2 holes .375-16 UNC-2B thread, 15 [.59] min full thread, both sides	**AH**	Opt.	Opt.	Opt.
AJ = Auxiliary Mounting Holes, 2 holes .375-16 UNC-2B thread, 15 [.59] min full thread, both sides (9T coupler and Mounting Holes)	**AJ**	Opt.		

Position 21 - **Auxiliary Port Top-Front (C1) or Bypass Valve** (see page 17 for port location)

0 = None	**0**	Std.	Std.	Std.
1 = 3/4 -16 UNF-2B SAE o-ring port	**1**	Opt.	Opt.	Opt.
2 = 3/4 -16 UNF-2B SAE o-ring port plugged	**2**	Opt.	Opt.	Opt.
3 = Bypass Valve Installed	**3**	Opt.	Opt.	Opt.

Position 22 - **Auxiliary Port Top-Rear (C2)** (see page 17 for port location)

1 = 3/4 -16 UNF-2B SAE o-ring port	**1**	Std.	Std.	Std.
2 = 3/4 -16 UNF-2B SAE o-ring port plugged	**2**	Opt.	Opt.	Opt.

Position 23 - **Auxiliary Port Side (C4 or C5)** (Integral Charge Only) (see page 17 for port location)

0 = None	**0**	Opt.	NA	Opt.
1 = 3/4 -16 UNF-2B SAE o-ring port (right side CW, left side CCW)	**1**	Opt.	NA	Opt.

Position 24 - **Case Drain (D1 and D2)** (see page 17 for port location)

A = 3/4 -16 UNF-2B SAE o-ring port D1-top (D2-bottom plugged)	**A**	Std.	Opt.	Std.
B = 3/4 -16 UNF-2B SAE o-ring port D2-bottom (D1-top plugged)	**B**	Opt.	Opt.	Opt.
C = 3/4 -16 UNF-2B SAE o-ring port (D1-top plugged and D2-bottom plugged)	**C**	Opt.	Opt.	Opt.
D = 3/4 -16 UNF-2B SAE o-ring port (D1-top and D2-bottom open)	**D**	Opt.	Opt.	Opt.

Position 25 - **Thru Drain (D3 and D4)** (see page 17 for port location)

0 = None	**0**	Opt.	Opt.	Opt.
A = .365 Dia. D3-rear	**A**	Opt.	Std.	Opt.
B = .376 Dia. D4-front	**B**	Opt.	Opt.	Std.
C = .365 Dia. D3-rear and .376 Dia. D4-front	**C**	Opt.	Opt.	Opt.

Position 26 - **Additional Functions**

0 = None	**0**	Std.	Std.	Std.

Position 27, 28 - **Special Features**

00 = None	**00**	Std.	Std.	Std.
0A = Flourocarbon rubber drive shaft seal	**0A**	Opt.	Opt.	Opt.

Position 29, 30 - **Paint**

0A = Primer, Red Oxide	**0A**	Std.	Std.	Std.
0B = Black	**0B**	Opt.	Opt.	Opt.
CD = Primer, Blue	**CD**	Opt.	Opt.	Opt.

Position 31 - **Identification**

0 = Standard: Nameplate	**0**	Std.	Std.	Std.

Position 32 - **Design Code**

C = C	**C**	Std.	Std.	Std.

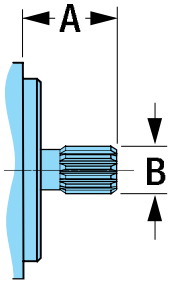
Model 70160
Input Shafts

Code Position 8

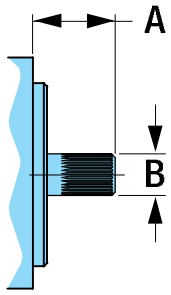
Dimensions are in mm [in]
unless noted otherwise.

	Input Shafts		
Code	A	C	F
Type	13 Tooth	35 Tooth	Straight Keyed
A Dimension	41,1 [1.62]	32,0 [1.26]	41,1 [1.62]
B Dimension	21,810 [.8585]	19,0 [.75]	22,23 +0,00/-0,03 [.875 +.000/ -.001] Dia.
Maximum Input Torque	209,3 N•m [1852 lbf•in]	Used for tandem connection only	209,3 N•m [1852 lbf•in]
Shaft Specifications	16/32 Pitch 30 Degree Involute Flat Root, Class 1 Side Fit Spline, SAE J498b	48/96 Pitch 45 Degree Involute Fillet Root, Class 1 Side Fit Spline, SAE J498b	

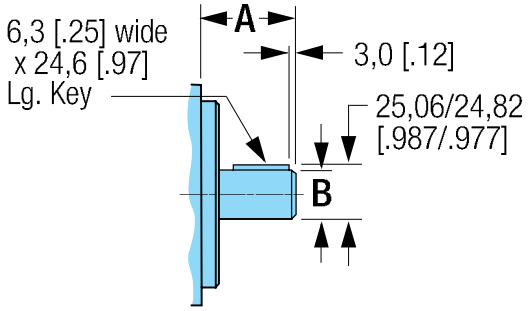
Torque Note:
The combined torque required for multiple pumps must not exceed the torque rating of the input drive shaft of the front piston pump.
Consult an Eaton representative and/or Eaton engineering on side load recommendations.



Input Shaft A
13 Tooth



Input Shaft C
35 Tooth



Input Shaft F
Straight Keyed

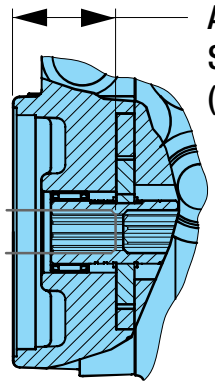
Model 70160
Auxiliary Rear Mounts & Output Shafts

Code Position 18

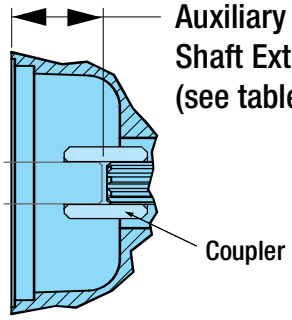
Dimensions are in mm [in] unless noted otherwise.

	Output Shafts				
Code	A	B	C	D	E
Type	9 Tooth	11 Tooth	9 Tooth	35 Tooth	9 Tooth
Shaft Outside Diameter	15,88 [.6250]	19,33 [.761]	15,88 [.6250]	19 [.75]	15,88 [.6250]
Shaft Diametrical Pitch	16/32 Pitch Int.	16/32 Pitch Ext.	16/32 Pitch Int.	48/96 Pitch Ext.	20/40 Pitch Ext.
Auxiliary Mount SAE "A" 2 Bolt	SAE J744	SAE J744	SAE J744	SAE J744	SAE J744
Auxiliary Pump Shaft Extension	31,7 [1.25]	31,7 [1.25]	31,7 [1.25]	32,0 [1.26]	31,7 [1.25]
Charge Pump	Yes	No	No	No	No
Maximum Torque	54 N•m [480 lbf•in]	119 N•m [1050 lbf•in]	76 N•m [672 lbf•in]	Used for tandem connection only	76 N•m [672 lbf•in]
Coupler Required; In code Postion 19, 20 select...	No	Yes, Code "AD"	Yes, Code "AB"	Yes, Code "AE"	Yes, Code "AC"

Auxiliary "A" Mount with Charge Pump



Auxiliary "A" Mount without Charge Pump

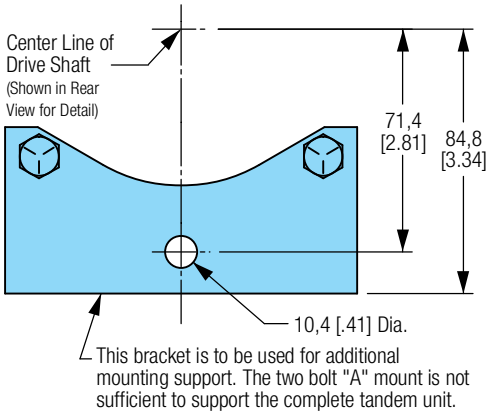


		Type	Diameter	Length
Code Position 12 and 20	AB	9T	28,45 [1.12] Dia.	39,12 [1.540]
	AC	9T	28,45 [1.12] Dia.	34,29 [1.35]
	AD	11T	31,8 [1.25] Dia.	38,9 [1.531]
	AE	35T	28,45 [1.12] Dia.	37,9 [1.49]

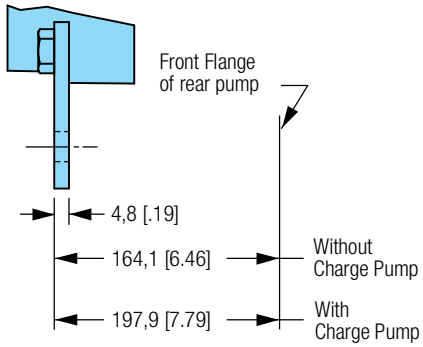
Model 70160
Bracket and Cover Plate

Code Position 19, 20 Bracket

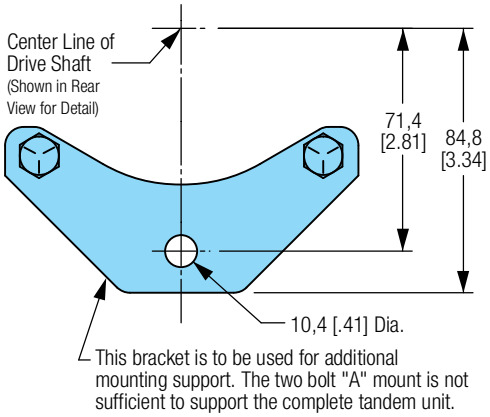
Code "AF" Bracket

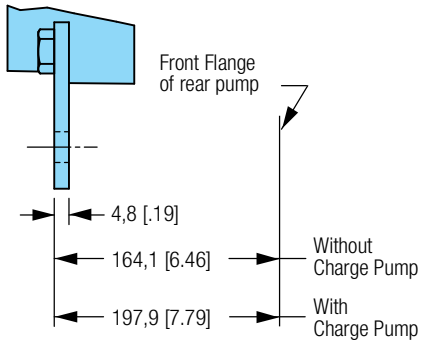


For Units with Integral Charge Pump Only



Code "AG" Bracket





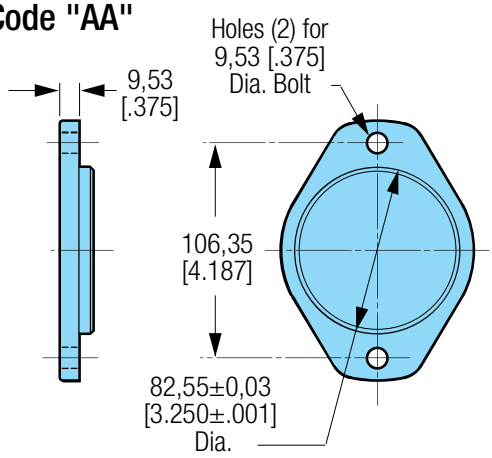
Cover Plate

Code Position 19, 20

Fits SAE "A" auxiliary mounting flange in place of auxiliary pump.

Cover Plate Kit #70142-915 includes cover plate, cap screws (2) and o-ring.

Code "AA"

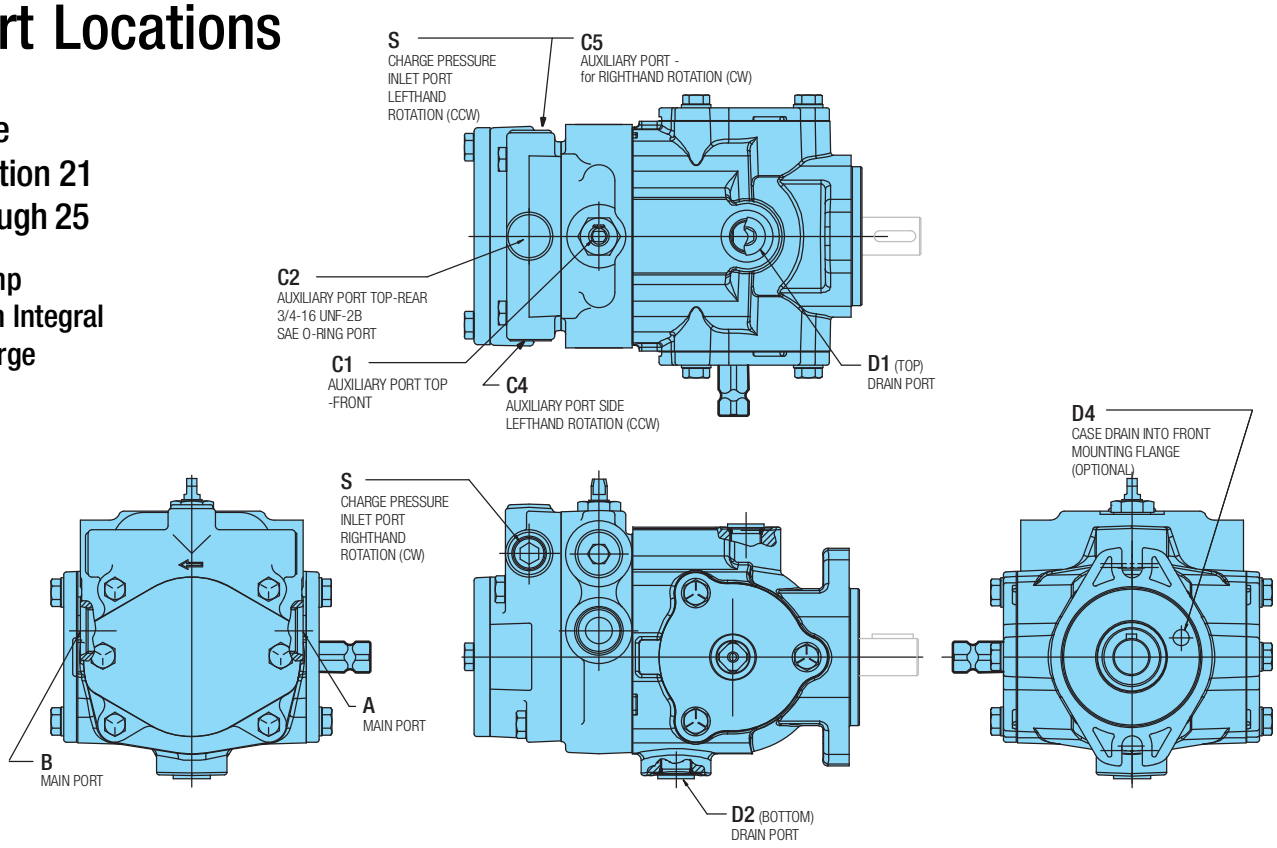


Dimensions are in mm [in] unless noted otherwise.

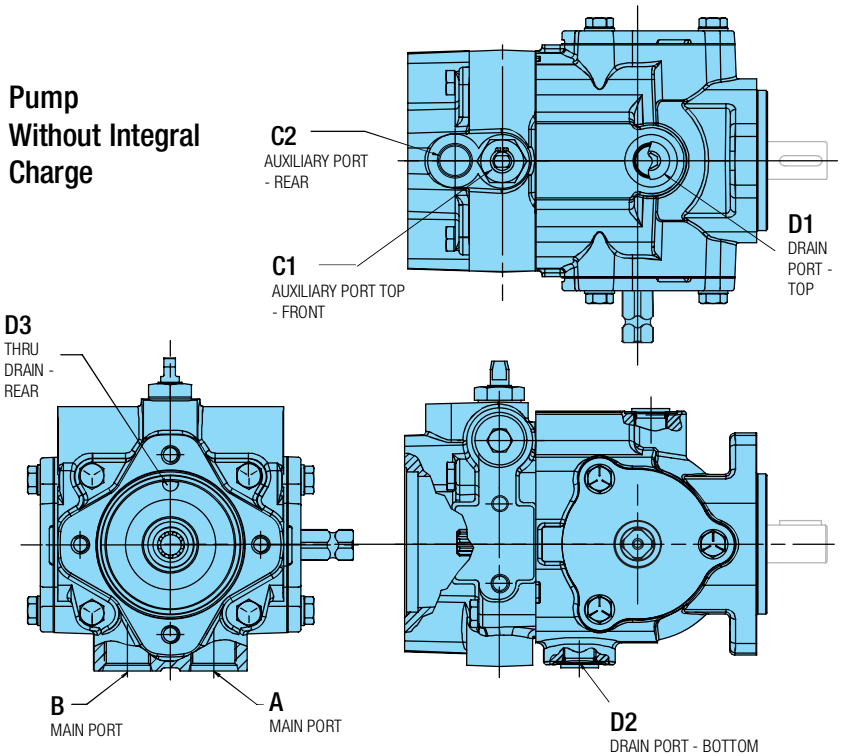
Model 70160 Port Locations

Code Position 21 through 25

Pump With Integral Charge

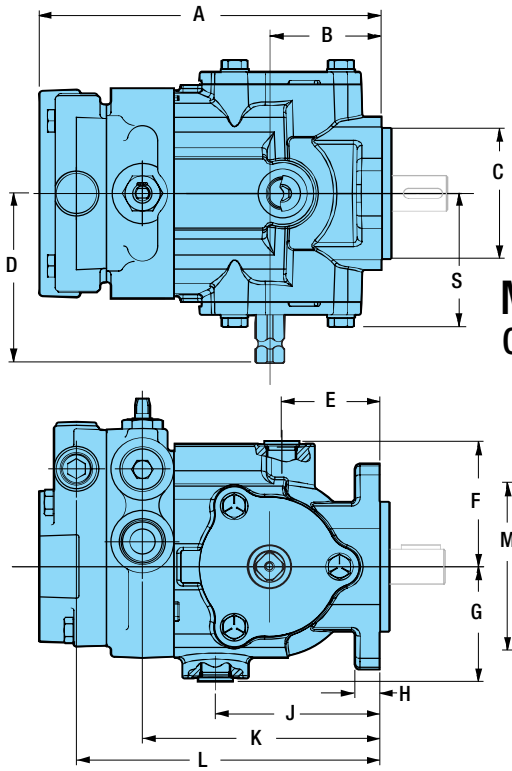


Pump Without Integral Charge

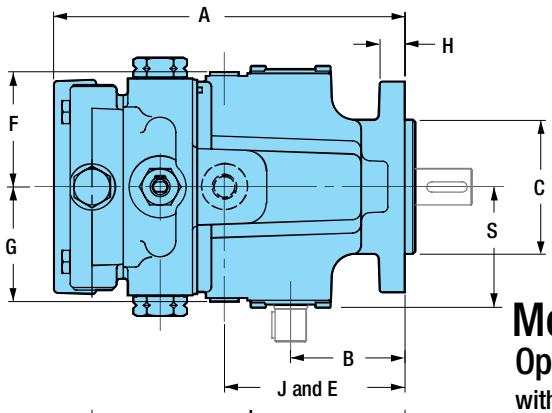


Port ID	Type of Port	Size and Description
A	Main Port	1- 1/16 - 12 UN-2B SAE O-ring
B	Main Port	1- 1/16 - 12 UN-2B SAE O-ring
C1	Auxiliary Port Top - Front or Bypass Valve	3/4 - 16 UNF-2B SAE O-ring
C2	Auxiliary Port Top - Rear	3/4 - 16 UNF-2B SAE O-ring
C4	Auxiliary Port Side - Left Side	3/4 - 16 UNF-2B SAE O-ring
C5	Auxiliary Port Side - Right Side	3/4 - 16 UNF-2B SAE O-ring
D1	Drain Port - Top	3/4 - 16 UNF-2B SAE O-ring
D2	Drain Port - Bottom	3/4 - 16 UNF-2B SAE O-ring
D3	Thru Drain - Rear	9,27 [.365] Dia.
D4	Thru Drain - Front	9,27 [.365] Dia.
S	Charge Suction Port	3/4 - 16 UNF-2B SAE O-ring

Model 70160 and 70142 Dimension Comparison



Model 70160
Opposite Side Porting, with integral Charge



Model 70142
Opposite Side Porting,
with integral Charge

	Model 70160	Model 70142
A	214,8 [8.46]	214,8 [8.46]
B	69,8 [2.75]	69,8 [2.75]
C	82,52 [3.249]	82,52 [3.249]
D	113,0 [4.45]	95,2 [3.75]
E	62,0 [2.44]	110,5 [4.35]
F	79,8 [3.14]	70,6 [2.75]
G	72,9 [2.87]	70,6 [2.75]
H	15,7 [.62]	15,2 [.60]
J	103,9 [4.09]	110,5 [4.35]
K	149,8 [5.90]	149,6 [5.89]
L	191,4 [7.54]	191,4 [7.54]
M	106,6 [4.19]	106,6 [4.19]
N	53,2 [2.09]	53,2 [2.09]
P	106,2 [4.18]	106,6 [4.20]
R	11,2 [.44] ∅ Bolt Slot	9,5 [.375] ∅ Bolt Slot
S	84,1 [3.31]	74,7 [2.94]