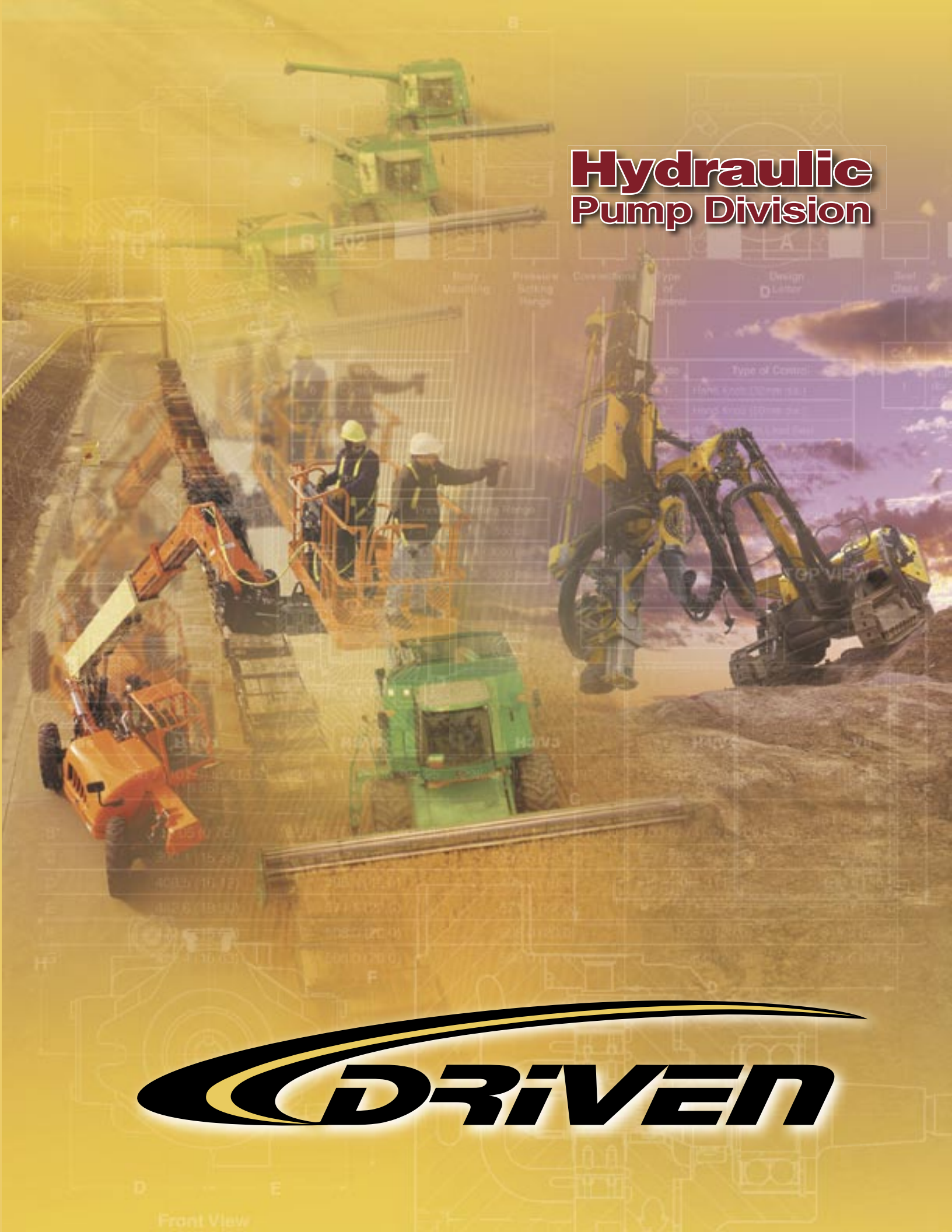
Parker

Hydraulic Pump Division

Solutions for Mobile Applications

DRIVEN



Hydraulic
Pump Division

DRIVEN

Parker Hannifin Corporation

Parker is the leading global manufacturer of components and systems designed to control motion, flow and pressure in all types of machinery.

Parker Hannifin is a Fortune 300 corporation listed on the New York Stock Exchange as PH.

anything Parker Possible.™

Parker's newly formed Hydraulic Pump Division has manufacturing locations in Otsego, Michigan and Marysville, Ohio. At these locations, the industry's best teams of application, engineering and manufacturing people focus on piston pumps and motors.

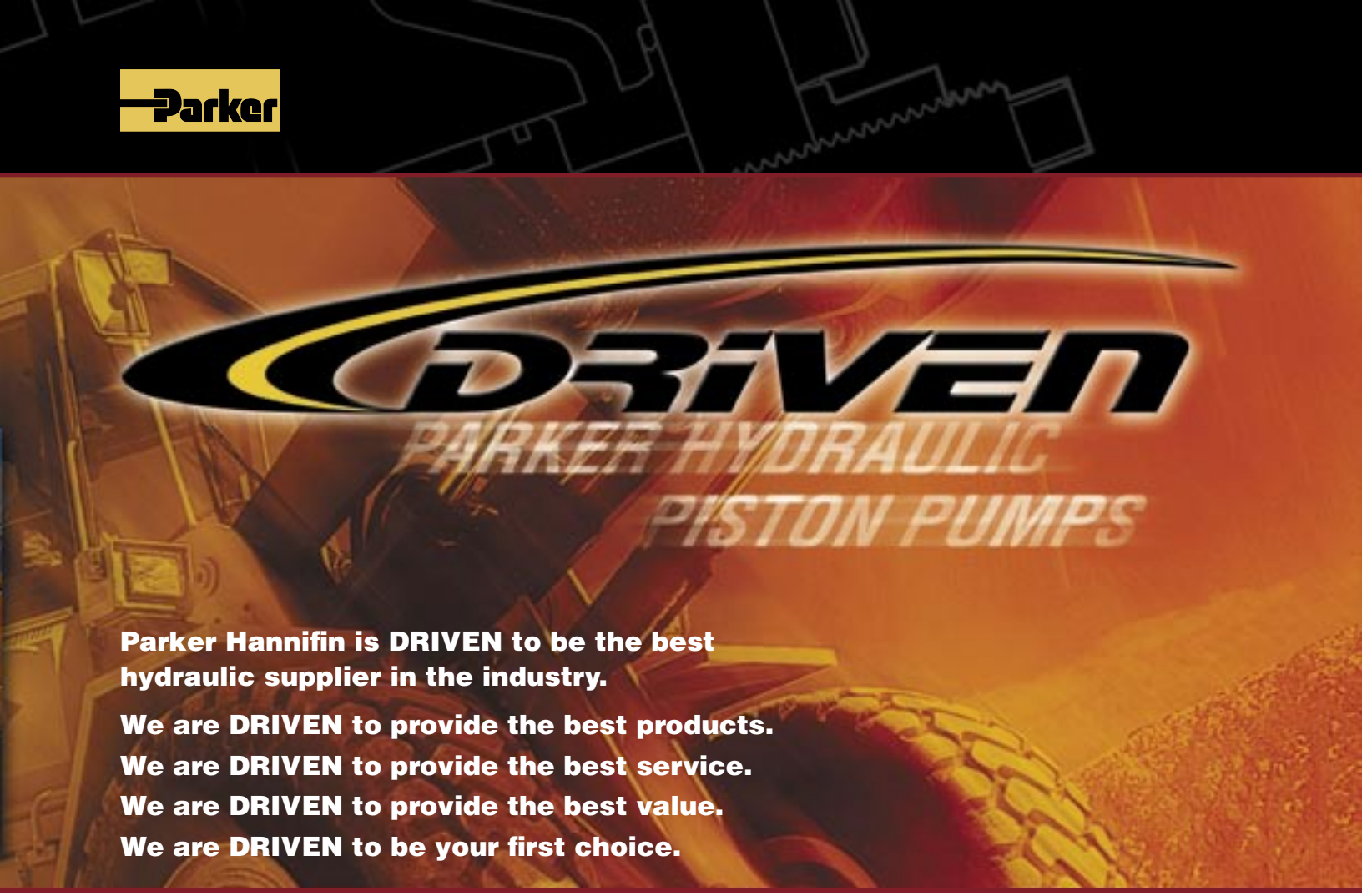
The Hydraulic Pump Division successfully competes in mobile, industrial and truck markets with product offerings designed and manufactured to meet the demanding requirements that are associated with hydraulic applications. The world's largest motion and control company, with field sales, technical support and distribution located throughout the world, support Hydraulic Pump Division's products.

Most recently, Parker introduced the industry's first totally redesigned and re-engineered piston pump produced in the last 15 years. Parker responded to customer demands for greater speed, improved performance, less noise and more flexibility.

Using advanced processes and extensive data mining, Parker gathered a team of application and engineering experts from around the world and challenged them to develop the next quantum leap in piston pump technology. Parker's P2/P3/PE piston pump line is the result of the team's efforts and represents the new standard in piston pumps, providing improved performance, on-time delivery and zero defects.

Again with the P1 we have increased the breadth of our product offering with a new Medium Duty Pump designed from the ground up.

The success of the P2/P3/PE program clearly demonstrates the results attainable when an organization is "Driven" to provide the best products and services to its customers. At Parker Hydraulic Pump Division, *DRIVEN* has become the foundation of a new order. From product design, engineering, application, manufacturing and now, the *DRIVEN* Options Program.



Parker Hannifin is DRIVEN to be the best hydraulic supplier in the industry.

We are DRIVEN to provide the best products.
We are DRIVEN to provide the best service.
We are DRIVEN to provide the best value.
We are DRIVEN to be your first choice.

DRIVEN Options Program

Traditionally, piston pumps and motors are configurable products. A model ordering code that allows customers to specify individual product features generates part numbers. The combinations are extensive, but can be matched to meet any specification. Unfortunately, because of the countless configurations, lead times and price are often the trade-offs.

After extensive research, Parker determined that a large number of configurations were common to a growing number of requested products. This led to the development of the *DRIVEN* Options Program. Here, Parker has taken its leading product series and identified, using *DRIVEN* 1, 2 or 3, the most popular configurations.

DRIVEN Models Equal *DRIVEN* Value

Orders using the specific *DRIVEN* Model Codes will benefit with faster delivery, shorter lead times and better prices.

The *DRIVEN* models have unique, easy to remember, ordering codes. The *DRIVEN* code is specified on the order and is used to identify the product on the nameplate. A handy cross reference to the equivalent, complete model description is included in this brochure.

Example of *DRIVEN* Model Code:

P2060 R-DRIVEN3

Pump Series
Direction of Rotation
DRIVEN Configuration
3-SAE Splined Shaft, Load Sense and Pressure Limiter Control

Remember, if the Options Program does not meet your specific needs, Parker's full pump motor line is available for your consideration. Full line catalogs with model ordering codes are available on the CD-ROM that accompanies this brochure.

Parker's *DRIVEN* Options Program is the latest example of the value programming that you have come to expect from Parker. To learn more about this program, or to obtain additional information on any Piston Pump or Motor product, call 937-642-3639 or visit us online at www.parker.com/hydraulicsgroup.

⚠ WARNING

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS 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 and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure, and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Offer of Sale

The items described in this document are hereby offered for sale by Parker Hannifin Corporation, its subsidiaries or its authorized distributors. This offer and its acceptance are governed by the provisions stated in the full “Offer of Sale”.

Piston Pumps

Contents

P1

- Variable displacement, axial piston pump for open-circuit applications
- Medium pressure, continuous operation at pressures up to 280 bar
- Compact, quiet and efficient control
- Wide temperature range suitable for mobile applications

Pump Performance Data

Model Series	Displacement	Max. Outlet Pressure	Rated Drive Speed	Flow	Input Horsepower
P1075	75 cc/r	4000 PSI	2300 RPM	42 GPM	114 HP
P1100	100 cc/r	4000 PSI	2100 RPM	54 GPM	142 HP
P1140	140 cc/r	4000 PSI	2000 RPM	71 GPM	188 HP

DRIVEN Model Selection

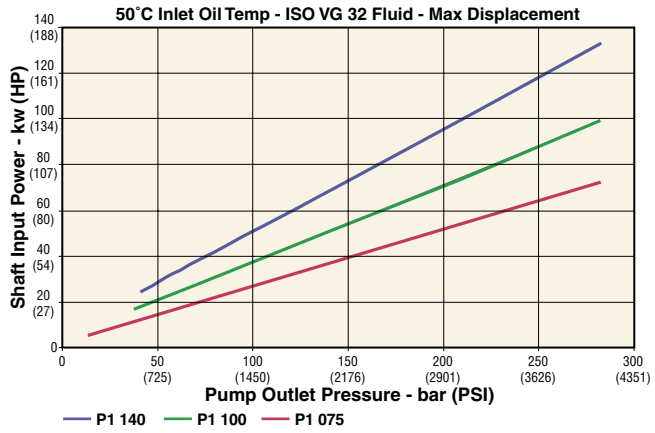
Driven Model Selection	Rotation	Mounting	Shaft	Ports	Thru-Drive	Pump Control
P1075L-DRIVEN3	CCW	SAE C 4 Bolt	C Spline	Side	–	Load Sense & Pressure Limiter
P1075R-DRIVEN3	CW	SAE C 4 Bolt	C Spline	Side	–	Load Sense & Pressure Limiter
P1075LTC-DRIVEN3	CCW	SAE C 4 Bolt	C Spline	Side	SAE C	Load Sense & Pressure Limiter
P1075RTC-DRIVEN3	CW	SAE C 4 Bolt	C Spline	Side	SAE C	Load Sense & Pressure Limiter
P1100L-DRIVEN3	CCW	SAE C 4 Bolt	C-C Spline	Side	–	Load Sense & Pressure Limiter
P1100R-DRIVEN3	CW	SAE C 4 Bolt	C-C Spline	Side	–	Load Sense & Pressure Limiter
P1100LTC-DRIVEN3	CCW	SAE C 4 Bolt	C-C Spline	Side	SAE C	Load Sense & Pressure Limiter
P1100RTC-DRIVEN3	CW	SAE C 4 Bolt	C-C Spline	Side	SAE C	Load Sense & Pressure Limiter
P1140L-DRIVEN3	CCW	SAE D 4 Bolt	D Spline	Side	–	Load Sense & Pressure Limiter
P1140R-DRIVEN3	CW	SAE D 4 Bolt	D Spline	Side	–	Load Sense & Pressure Limiter
P1140LTD-DRIVEN3	CCW	SAE D 4 Bolt	D Spline	Side	SAE D	Load Sense & Pressure Limiter
P1104RTD-DRIVEN3	CW	SAE D 4 Bolt	D Spline	Side	SAE D	Load Sense & Pressure Limiter

P1
Performance Characteristics

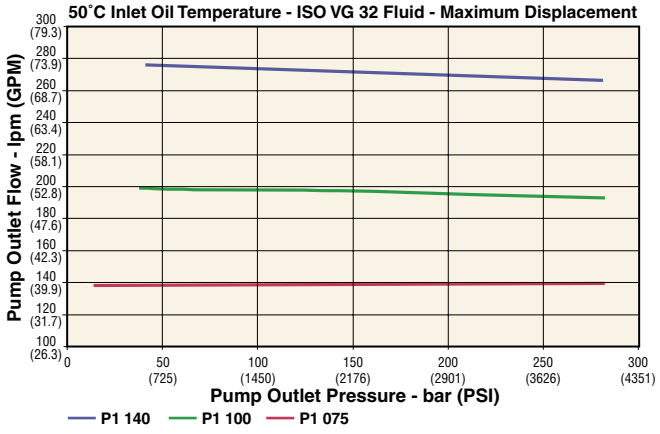
Features/Benefits

- Compact overall package size
- Quiet operation
- Low flow ripple to further reduce noise
- Elastomer seals that eliminate gaskets and external leakage
- High operating efficiency for lower power consumption and reduced heat generation
- Simple hydraulic controls with “no-leak” adjustments
- SAE and ISO standard mounting flanges and ports
- Long life, tapered-roller shaft bearings
- Long life, low friction, hydrostatically balanced cam bearings
- Full power through-drive capability
- End or side inlet and outlet ports
- Case drain ports for horizontal or vertical, shaft-up mounting
- Optional minimum and maximum displacement adjustments
- Optional case-to-inlet check valve to extend shaft seal life
- Easy to service

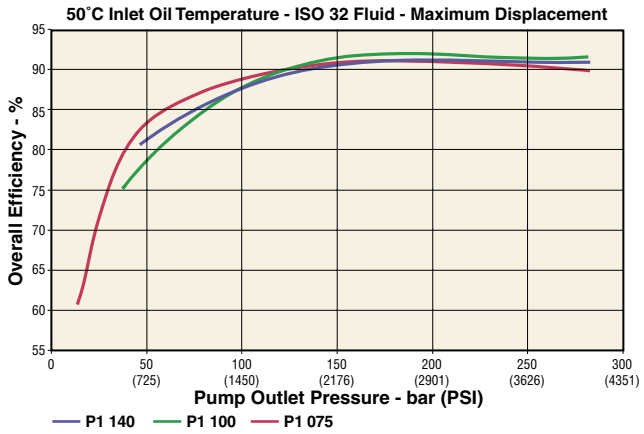
P1 Series Shaft Input Power - 2000 RPM



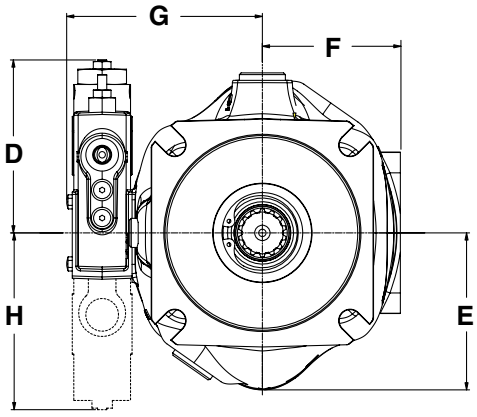
P1 Series Pump Outlet Flow - 2000 RPM

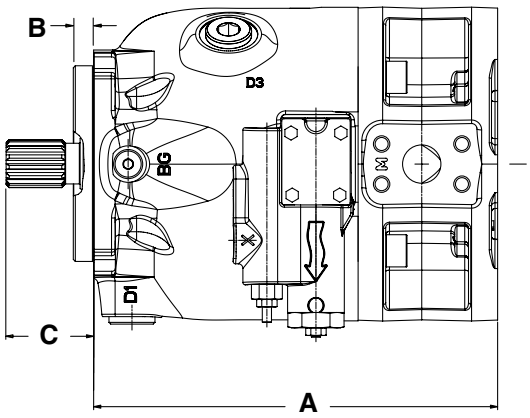


P1 Series Overall Efficiency - 2000 RPM



P1





Dimensions, mm (inch)

Series	A	B	C max	D	E	F	G	H
P1075	263.5 (10.37)	12.7 (0.50)	55.6 (2.19)	120 (4.72)	103.8 (4.09)	90 (3.54)	128.6 (5.06)	120 (4.72)
P1100	339.6 (13.37)	12.7 (0.50)	62.0 (2.44)	120 (4.72)	117.1 (4.61)	101 (3.98)	143.7 (5.66)	122 (4.80)
P1140	364.3 (14.34)	12.7 (0.50)	75.6 (2.98)	120 (4.72)	133 (5.24)	113 (4.45)	155.7 (6.13)	122 (4.80)

Filtration and auxiliary function pump suggestions

Pump

Model Code	Flow @1800 RPM	Pressure
T7DS-B14-3R00-A100	21 GPM	3600

Thru Drive Kits for Driven Options

Pump Series	Kit #	Rear Mount
P1075	*	SAE C
P1100	*	SAE C

* P1 Thru Drive mounting dedicated by model code

P1																		
Pump Series	Displacement	Type	Mounting & Ports	Shaft Options	Shaft Seal	Shaft Rotation	Application	Seal Material	Design Level	Control Options	Additional Control Options	Port Orientation	Mechanical Displacement Adjustment	Case-to-Inlet Check Valve	Thru-Drive Mounting Pad & Coupling	Paint	Special Features

Code	Type
P	Open circuit, variable displacement

Code	Displacement
075	75 cc/rev (4.58 in³/rev)
100	100 cc/rev (6.41 in³/rev)
140	140 cc/rev (8.85 in³/rev)

Code	Shaft Rotation
R	Clockwise
L	Counterclockwise

Code	Shaft Seal
S	Single Shaft Seal

Code	Shaft Options*
01	SAE Spline
03	ISO/DIN Spline

* Consult factory for keyed shaft.

Code	Mounting/Ports
S	SAE - Inch Mount & Ports
A	SAE - Inch Mount, Metric Flange Threads, BSPP Threaded Ports
M	ISO - Metric Mount & Metric Ports
B	ISO - Metric Mount & BSPP Ports

Code	Application
M	Mobile

Code	Seal Material
5	Fluorocarbon Viton

Code	Design Level
A	Current Design Series

Code	Paint
00	No Paint
PB	Black Paint

Code	Special Features
00	No Special Features
M2	Special Modification

Code	Thru-Drive Mounting Pad/Coupling
0	None (only valid for end or side ported)
A*	SAE 82-2 (A) & 16 (A) Coupling
H*	SAE 82-2 (A) & 19 (--) Coupling
B*	SAE 101-2 (B) & 22 (B) Coupling
Q*	SAE 101-2 (B) & 25 (B-B) Coupling
C*	SAE 127-4 (C) & 32 (C) Coupling
N**	SAE 127-4 (C) & 38 (C-C) Coupling
D***	SAE 152-4 (D) & 44 (D&E) Coupling
R*	ISO 80A2 & K20N Coupling
S*	ISO 100A2 & K20N Coupling
T*	ISO 100A2 & K25N Coupling
V*	ISO 125B4 & K32N Coupling
W**	ISO 125B4 & K40N Coupling
X***	ISO 180B4 & K50N Coupling

* Available on 075 thru 140 models.
** Available on 100 thru 140 models.
*** Available on 140 models.

Code	Additional Control Options
0	None

Code	Port Orientation
E	End Ports
S	Side Ports
T	Side Ports with Thru-Drive

Code	Case-to-Inlet Check Valve
0	No
1	Yes

Code	Control Options
C0	Pressure Limiter, 80-280 bar Adjustment Range
C1	Pressure Limiter, 20-80 bar Adjustment Range
L0	Load sensing, 10-30 bar ΔP and Pressure Limiter 80-280 bar
L1	Load sensing, 10-30 bar ΔP and Pressure Limiter 20-80 bar
RN	Pilot Operated Control with ISO-4401 (NG 6) Interface and Shipping Cover
RH	Pilot Operated Control with Vent Port
RM	Pilot Operated Pressure Limiter Control with Mechanical Adjustment and Vent Port
RE	Pilot Operated Pressure Limiter Control with Proportional Electronic Adjustment

Code	Mechanical Displacement Adjustment
0	None
1*	Adjustable Maximum Displacement
2*	Adjustable Minimum Displacement
3*	Adjustable Maximum & Minimum Displacement

* Displacement adjustment not available on thru-drive.

See previous page for information and examples.

P2

The newly developed variable displacement piston pumps from Parker Hannifin, designated “P2”, are intended for mobile applications, featuring a very compact design, low noise level and low pressure ripple.

Stable and quick to respond to system demands in many different types of mobile machinery, the P2 is designed for cost effective installation within the limited space available on modern mobile machines.

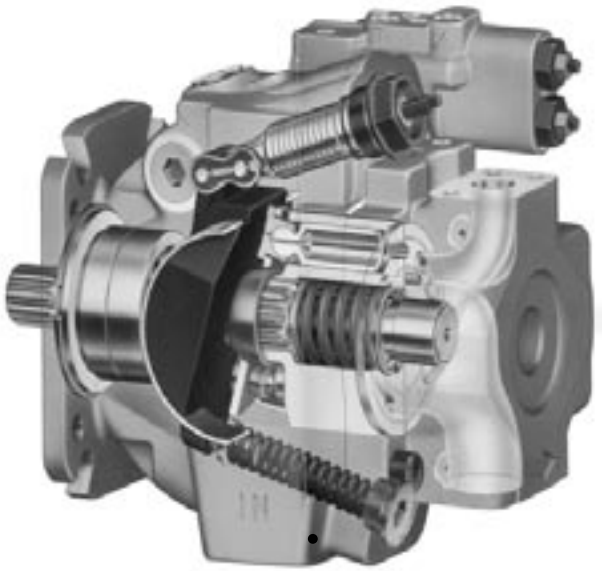
Pump Performance Data

Model Series	Displacement	Max. Outlet Pressure	Rated Drive Speed	Flow	Input Horsepower
P2060	60 cc/r	4600 PSI	2800 RPM	42 GPM	96 HP
P2075	75 cc/r	4600 PSI	2500 RPM	48 GPM	145 HP
P2105	105 cc/r	4600 PSI	2300 RPM	61 GPM	185 HP
P2145	145 cc/r	4600 PSI	2200 RPM	78 GPM	240 HP

DRIVEN Model Selection

Driven Model Selection	Rotation	Mounting	Shaft	Ports	Thru-Drive w/cover	Control Type
P2060L-DRIVEN3	CCW	SAE C 4 Bolt	SAE C Spline	Side, Flange	—	Load Sense & Pressure Limiter
P2060R-DRIVEN3	CW	SAE C 4 Bolt	SAE C Spline	Side, Flange	—	Load Sense & Pressure Limiter
P2060LT-DRIVEN3	CCW	SAE C 4 Bolt	SAE C Spline	Side, Flange	✓	Load Sense & Pressure Limiter
P2060RT-DRIVEN3	CW	SAE C 4 Bolt	SAE C Spline	Side, Flange	✓	Load Sense & Pressure Limiter
P2075L-DRIVEN3	CCW	SAE C 2/4 Bolt	SAE C Spline	Side, Flange	—	Load Sense & Pressure Limiter
P2075R-DRIVEN3	CW	SAE C 2/4 Bolt	SAE C Spline	Side, Flange	—	Load Sense & Pressure Limiter
P2075LT-DRIVEN3	CCW	SAE C 2/4 Bolt	SAE C Spline	Side, Flange	✓	Load Sense & Pressure Limiter
P2075RT-DRIVEN3	CW	SAE C 2/4 Bolt	SAE C Spline	Side, Flange	✓	Load Sense & Pressure Limiter
P2105L-DRIVEN3	CCW	SAE C 2/4 Bolt	SAE C Spline	Side, Flange	—	Load Sense & Pressure Limiter
P2105R-DRIVEN3	CW	SAE C 2/4 Bolt	SAE C Spline	Side, Flange	—	Load Sense & Pressure Limiter
P2105LT-DRIVEN3	CCW	SAE C 2/4 Bolt	SAE C Spline	Side, Flange	✓	Load Sense & Pressure Limiter
P2105RT-DRIVEN3	CW	SAE C 2/4 Bolt	SAE C Spline	Side, Flange	✓	Load Sense & Pressure Limiter
P2145L-DRIVEN3	CCW	SAE D 4 Bolt	SAE D Spline	Side, Flange	—	Load Sense & Pressure Limiter
P2145R-DRIVEN3	CW	SAE D 4 Bolt	SAE D Spline	Side, Flange	—	Load Sense & Pressure Limiter
P2145LT-DRIVEN3	CCW	SAE D 4 Bolt	SAE D Spline	Side, Flange	✓	Load Sense & Pressure Limiter
P2145RT-DRIVEN3	CW	SAE D 4 Bolt	SAE D Spline	Side, Flange	✓	Load Sense & Pressure Limiter

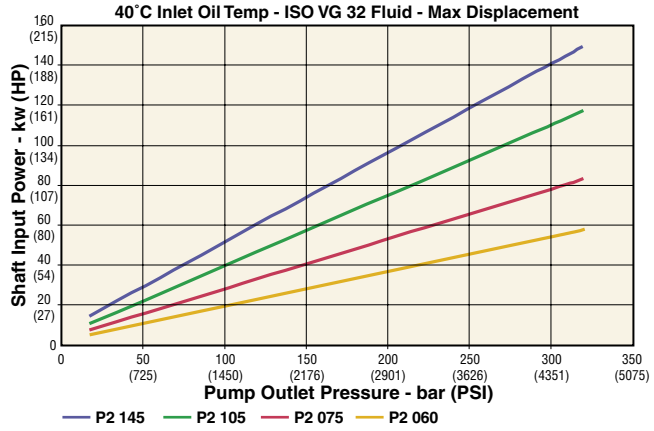
P2
Performance Characteristics



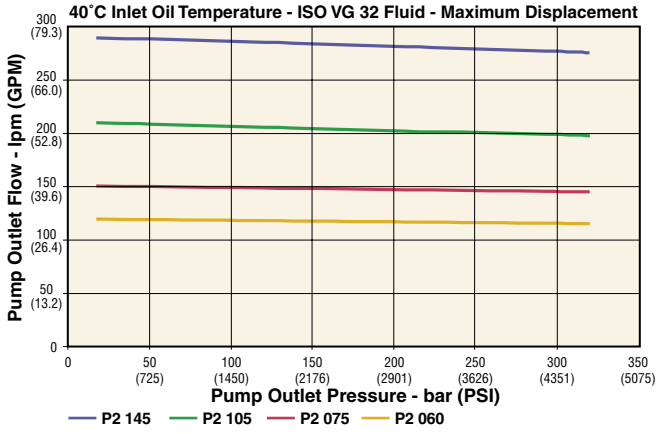
Features/Benefits

- Compact
- Low noise level
- Sealed shaft bearing
- Service friendly
- Reliable
- Long-lasting
- Flexible
- Easy to install
- High self-priming speed

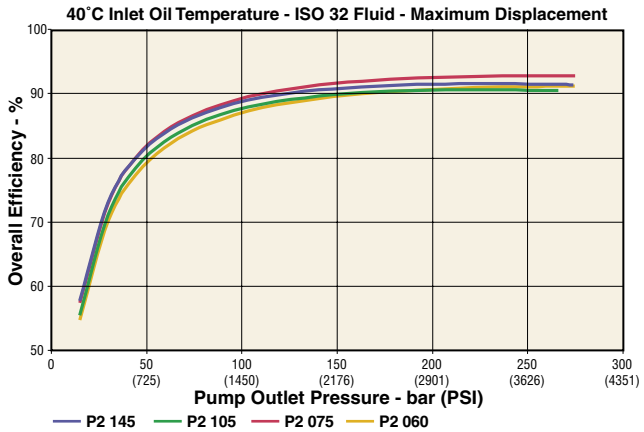
P2 Series Input Drive Power - 2000 RPM



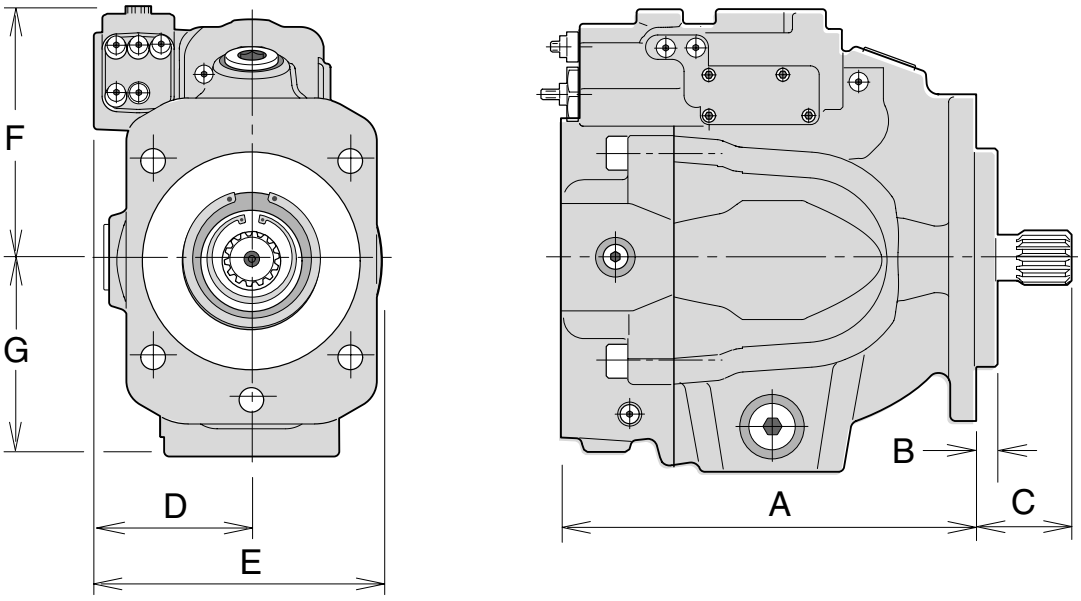
P2 Series Pump Outlet Flow - 2000 RPM



P2 Series Overall Efficiency - 2000 RPM



P2



Dimensions, mm (inch)

Series	A Max*	B Max.	C Max.	D	E Max.	F	G
P2060	299 (11.8)	12.5 (0.49)	55.6 (2.19)	92 (3.62)	171.3 (6.74)	141 (5.55)	114 (4.49)
P2075	327.5 (12.9)	12.5 (0.49)	62.0 (2.44)	112 (4.41)	193.8 (7.63)	145 (5.71)	123 (4.84)
P2105	358 (14.1)	12.5 (0.49)	75.7 (2.98)	112 (4.41)	212.0 (8.35)	175 (6.89)	—
P2145	375 (14.7)	12.7 (0.50)	75.7 (2.98)	118 (4.65)	225.0 (8.86)	181 (7.13)	164 (6.46)

* With thru-shaft option

Filtration and auxiliary function pump suggestions

Pump

Model Code	Flow @ 1800 RPM	Pressure
T67B-B02-3R00-A100	3 GPM	4000
T67B-B04-3R00-A100	6 GPM	4000
T67B-B07-3R00-A100	10 GPM	4000

Thru Drive Kits for P2 Series (Nitrile Seals, UNC Threads, Couplings)

Thru Drive Mounting	P2060 Kit #	P2075 Kit #	P2105 Kit #	P2145 Kit #
SAE A with 9 tooth spline	P2-060-0215-01N	P2-075-0215-01N	P2-105-0215-01N	P2-145-0215-01N
SAE B with 13 tooth spline	P2-060-0216-01N	P2-075-0216-01N	P2-105-0216-01N	P2-145-0216-01N
SAE B with 15 tooth spline	P2-060-0217-01N	P2-075-0217-01N	P2-105-0217-01N	P2-145-0217-01N
SAE C with 14 tooth spline	P2-060-0218-01N	P2-075-0218-01N	P2-105-0218-01N	P2-145-0218-01N
SAE D with 13 tooth spline	Not Available	Not Available	Not Available	P2-145-0220-01N

P2														
Pump Series	Displacement	Rotation	Percent of Max Displacement	Shaft	Mounting Flange	Pressure Setting	Controls	Differential Pressure Setting	Seals	Torque Control Setting	Thru-Drive	Port Location	Multiple Pumps	Paint Option

Code	Displacement, cm^3/rev (in^3/rev)
060	60 (3.7)
075	75 (4.6)
105	105 (6.4)
145	145 (8.8)

Code	Rotation*
R	Right (CW)
L	Left (CCW)

* Viewed from shaft end.

Code	Percent of Max. Displacement
00	100% Stroke, standard factory setting
XX	Range is 70-99 (70% to 99%)

Code	Shaft Option				
	Type	060	075	105	145
B1	SAE B Spline(1)	x			
B2	SAE BB Spline	x			
C1	SAE C Spline	x	x	x	x
C2	SAE CC Spline(2)		x	x	
C3	SAE C Spline(2)		x	x	x
C5	SAE C Key	x	x	x	x
C6	SAE CC Key(2)		x	x	x
D1	SAE D Spline			x	x
D3	SAE D Key				x

(1) 060 non thru drive only (2) 075 thru drive version only

Code	Mounting Flange			
	060	075	105	145
B	SAE B 2-Bolt			
C	SAE C 4-Bolt	SAE C 2/4-Bolt	SAE C 2/4-Bolt	SAE C 2-Bolt
D				SAE D 4-Bolt

Code	Pressure Compensator Setting
XX	Factory set in bar times 10; Range 100-320

For example, 32 = 320 bar setting

Code	Seal Type
N	Nitrile, single shaft seal
D	Nitrile, double shaft seal – "wet flange"
V	Fluorocarbon, single shaft seal
T	Fluorocarbon, double shaft seal – "wet flange"

Code	Paint Option
P	Parker Black
U	No Paint

Code	Multiple Pump Option
1	Single Pump
2	Front Pump of Multiple Pumps
3	Middle Pump of Multiple Pumps
4	Rear Pump of Multiple Pumps

Code	Port Location
A	Side Flanges, UNC
B	Side Flanges, ISO 6149 (Metric)
G*	Rear Flanges, UNC
H*	Rear Flanges, ISO 6149 (Metric)

* Available on P2060 only.

Code	Thru Drive
S1	No Thru Drive
T1	Thru Drive with Cover
A1	SAE A – 2-Bolt with SAE A Spline
B1	SAE B – 2-Bolt with SAE B Spline
B2	SAE B – 2-Bolt with SAE BB Spline
C2	SAE C – 2-Bolt with SAE CC Spline (145 only)
C3	SAE C – 4-Bolt with SAE C Spline
C4	SAE C – 4-Bolt with SAE CC Spline (145 only)
D3	SAE D – 4-Bolt with SAE D Spline (145 only)

Code	Torque Control Setting (%)
00	For Non-torque Control Pumps
XX	20-90% of Max. Rated Torque(3)

(3) See table below at left for information and example.

Code	Differential Pressure Setting
20	Recommended Initial Factory Setting
00	Use with PA Control only
XX	Factory set in bar – Range 10-35

Code	Controls
PA	Std. max pressure control (Pmax), 100-320 bar (1450-4600 PSI)
LA	Load sensing (2 spool)/Pmax without bleed orifice
LB	Load sensing (2 spool)/Pmax with bleed orifice
TA(3)	Torque/LS/Pmax without bleed orifice, Torque range 20-60% of max
TB(3)	Torque/LS/Pmax with bleed orifice, Torque range 20-60% of max
TC(3)	Torque/LS/Pmax without bleed orifice, Torque range 50-90% of max
TD(3)	Torque/LS/Pmax with bleed orifice, Torque range 50-90% of max

(3) See table at left for information and example.
(4) For Remote Pressure Compensator, order the "PA" model and remove plug from "X" port.

P2 Torque Control Options TA, TB, TC, TD Ordering Guide

Model	Maximum Rated Torque		TA/TB Adj. Range 20%-60% of Max Torque		TC/TD Adj. Range, 50%-90% of Max Torque	
	Nm	lb-in	Nm	lb-in	Nm	lb-in
P2060	339	3004	68-204	600-1802	170-306	1502-2703
P2075	424	3755	85-254	751-2253	212-382	1877-3379
P2105	594	5257	119-356	1051-3154	297-535	2628-4731
P2145	820	7259	164-492	1451-4355	410-738	3629-6533

The input torque limit is factory set at a percentage of the maximum rated input torque. The percentage needs to be specified in Torque Control Setting (%) box of the ordering code. For example, for a P2075-TC pump with an input torque limit setting required of 300 Nm, divide 300 into 424, which equals 71%, so 71 is specified in Torque Control Setting (%) box.

= Not Available

P3

P3 Piston Pumps are ideal for mobile applications with high self priming speed and operating pressure up to 4600 PSI. These high performance pumps are suited for mobile applications where inlet fill characteristics are not ideal; i.e. high altitudes, long inlet lines, cold weather and high pump drive speeds.

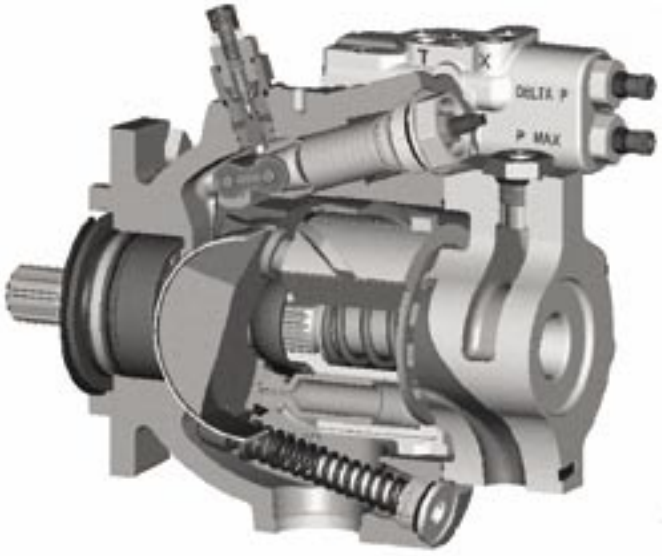
Pump Performance Data

Model Series	Displacement	Max. Outlet Pressure	Rated Drive Speed	Flow	Input Horsepower
P3075	75 cc/r	4600 PSI	3000 RPM	57 GPM	173 HP
P3105	105 cc/r	4600 PSI	2600 RPM	67 GPM	210 HP
P3145	145 cc/r	4600 PSI	2500 RPM	90 GPM	270 HP

DRIVEN Model Selection

Driven Model Selection	Rotation	Mounting	Shaft	Ports	Thru-Drive w/cover	Control Type
P3075L-DRIVEN3	CCW	SAE C 2/4 Bolt	SAE C Spline	Side, Flange	—	Load Sense & Pressure Control
P3075R-DRIVEN3	CW	SAE C 2/4 Bolt	SAE C Spline	Side, Flange	—	Load Sense & Pressure Control
P3075LT-DRIVEN3	CCW	SAE C 2/4 Bolt	SAE C Spline	Side, Flange	✓	Load Sense & Pressure Control
P3075RT-DRIVEN3	CW	SAE C 2/4 Bolt	SAE C Spline	Side, Flange	✓	Load Sense & Pressure Control
P3105L-DRIVEN3	CCW	SAE C 2/4 Bolt	SAE C Spline	Side, Flange	—	Load Sense & Pressure Control
P3105R-DRIVEN3	CW	SAE C 2/4 Bolt	SAE C Spline	Side, Flange	—	Load Sense & Pressure Control
P3105LT-DRIVEN3	CCW	SAE C 2/4 Bolt	SAE C Spline	Side, Flange	✓	Load Sense & Pressure Control
P3105RT-DRIVEN3	CW	SAE C 2/4 Bolt	SAE C Spline	Side, Flange	✓	Load Sense & Pressure Control
P3145L-DRIVEN3	CCW	SAE D 4 Bolt	SAE D Spline	Side, Flange	—	Load Sense & Pressure Control
P3145R-DRIVEN3	CW	SAE D 4 Bolt	SAE D Spline	Side, Flange	—	Load Sense & Pressure Control
P3145LT-DRIVEN3	CCW	SAE D 4 Bolt	SAE D Spline	Side, Flange	✓	Load Sense & Pressure Control
P3145RT-DRIVEN3	CW	SAE D 4 Bolt	SAE D Spline	Side, Flange	✓	Load Sense & Pressure Control

P3
Performance Characteristics

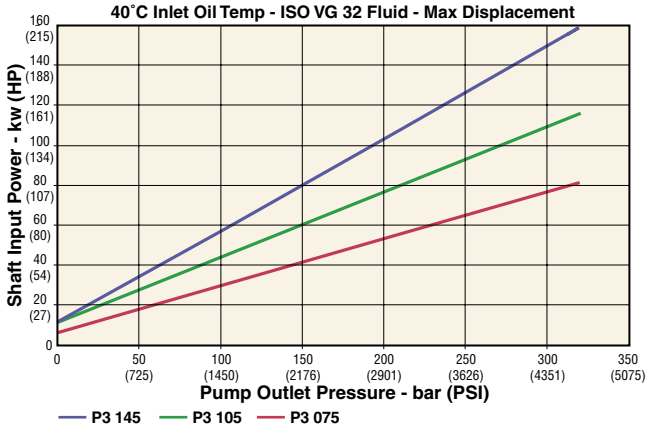


Features/Benefits

- Compact
- Low noise level
- Sealed shaft bearing
- Service friendly
- Reliable
- Long-lasting
- Flexible
- Easy to install
- High self-priming speed

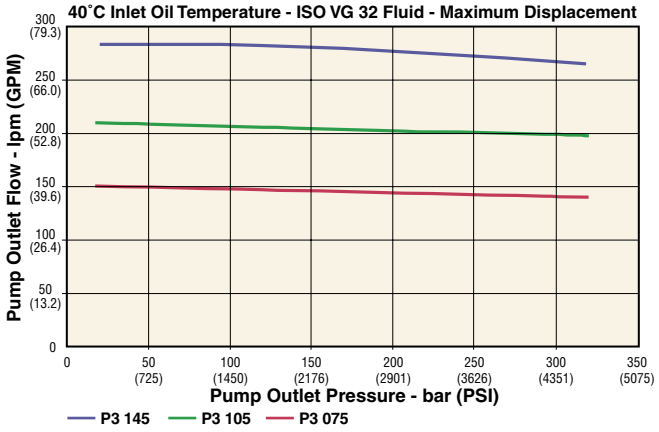
P3 Series Input Drive Power - 2000 RPM

40˚C Inlet Oil Temp - ISO VG 32 Fluid - Max Displacement



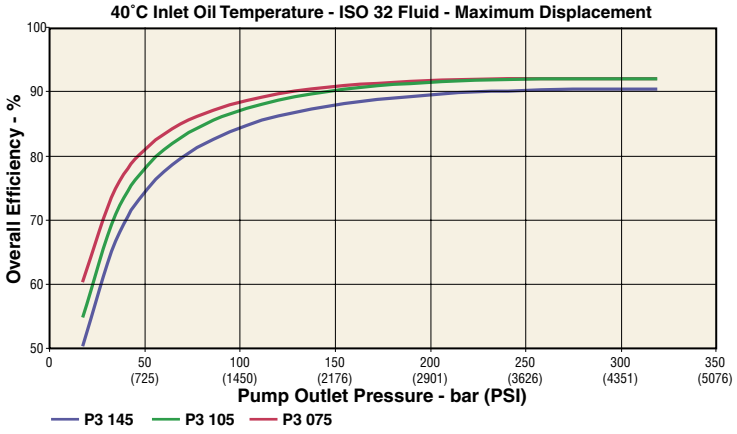
P3 Series Pump Outlet Flow - 2000 RPM

40˚C Inlet Oil Temperature - ISO VG 32 Fluid - Maximum Displacement

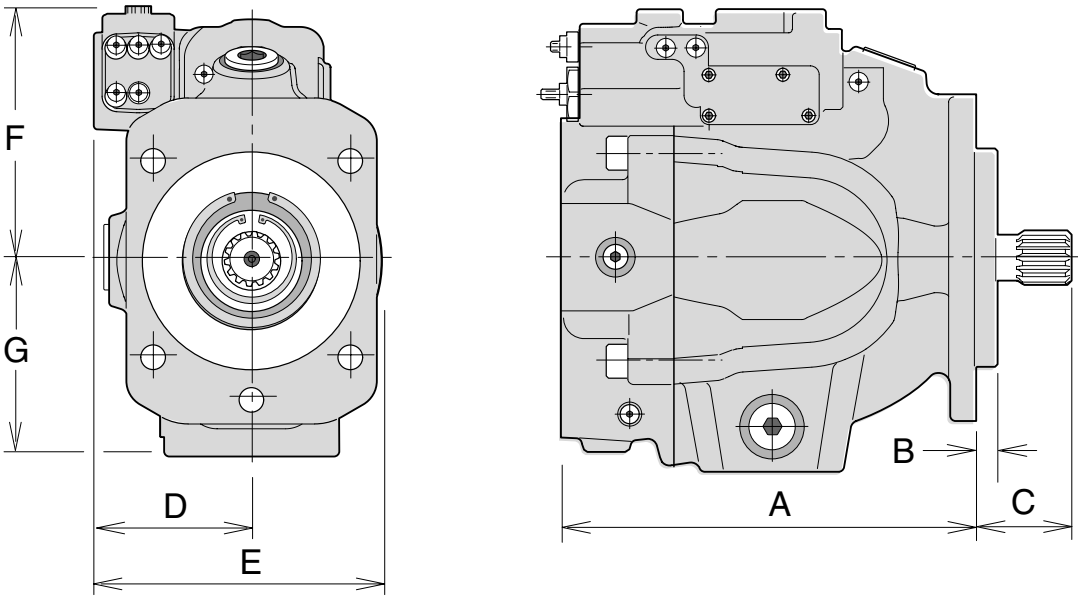


P3 Series Overall Efficiency - 2000 RPM

40˚C Inlet Oil Temperature - ISO 32 Fluid - Maximum Displacement



P3



Dimensions, mm (inch)

Series	A Max*	B Max.	C Max.	D	E Max.	F	G
P3075	327.5 (12.89)	—	62 (2.44)	112 (4.41)	176 (6.86)	145 (5.71)	120 (4.72)
P3105	327.5 (12.89)	12.5 (0.49)	75.6 (2.98)	112 (4.41)	210 (8.26)	182 (7.17)	150 (5.87)
P3145	375.0 (14.76)	12.7 (0.50)	75.6 (2.98)	114 (4.49)	228 (8.98)	181 (7.13)	161 (6.34)

Filtration and auxiliary function pump suggestions

Pump

Model Code	Flow @1800 RPM	Pressure
T67B-B02-3R00-A100	3 GPM	4000
T67B-B04-3R00-A100	6 GPM	4000
T67B-B07-3R00-A100	10 GPM	4000

Thru Drive Kits for P2 Series (Nitrile Seals, UNC Threads, Couplings)

Thru Drive Mounting	P3075 Kit #	P3105 Kit #	P3145 Kit #
SAE A with 9 tooth spline	P2-075-0215-01N	P2-105-0215-01N	P2-145-0215-01N
SAE B with 13 tooth spline	P2-075-0216-03N	P2-105-0216-03N	P2-145-0216-03N
SAE B with 15 tooth spline	P2-075-0217-03N	P2-105-0217-03N	P2-145-0217-03N
SAE C with 14 tooth spline	P2-075-0218-03N	P2-105-0218-03N	P2-145-0218-03N
SAE D with 13 tooth spline	Not Available	Not Available	P2-145-0220-03N

P3														
Pump Series	Displacement	Rotation	Percent of Max Displacement	Shaft	Mounting Flange	Pressure Setting	Controls	Differential Pressure Setting	Seals	Torque Control Setting	Thru-Drive	Port Location	Multiple Pumps	Paint Option

Code	Displacement, cm³/rev (in³/rev)
075	75 (4.6)
105	105 (6.4)
145	145 (8.8)

Code	Rotation*
R	Right (CW)
L	Left (CCW)

* Viewed from shaft end.

Code	Percent of Max. Displacement
00	100% Stroke, standard factory setting
XX	Range is 70-99 (70% to 99%)

Code	Shaft Option			
	Type	075	105	145
C1	SAE C Spline	x	x	x
C2	SAE CC Spline(2)	x	x	
C3	SAE C Spline(2)	x	x	x
C5	SAE C Key	x	x	x
C6	SAE CC Key(2)	x	x	x
D1	SAE D Spline		x	x
D3	SAE D Key			x

(2) 075 thru drive version only

Code	Mounting Flange		
	075	105	145
C	SAE C 2/4-Bolt	SAE C 2/4-Bolt	SAE C 2-Bolt
D			SAE D 4-Bolt

Code	Pressure Compensator Setting
XX	Factory set in bar times 10; Range 100-320

For example, 32 = 320 bar setting

Code	Seal Type
N	Nitrile, single shaft seal
D	Nitrile, double shaft seal – "wet flange"
V	Fluorocarbon, single shaft seal
T	Fluorocarbon, double shaft seal – "wet flange"

Code	Paint Option
P	Parker Black
U	No Paint

Code	Multiple Pump Option
1	Single Pump
2	Front Pump of Multiple Pumps
3	Middle Pump of Multiple Pumps
4	Rear Pump of Multiple Pumps

Code	Port Location
A	Side Flanges, UNC
B	Side Flanges, ISO 6149 (Metric)

Code	Thru Drive
S1	No Thru Drive
T1	Thru Drive with Cover
A1	SAE A – 2-Bolt with SAE A Spline
B1	SAE B – 2-Bolt with SAE B Spline
B2	SAE B – 2-Bolt with SAE BB Spline
C2	SAE C – 2-Bolt with SAE CC Spline (145 only)
C3	SAE C – 4-Bolt with SAE C Spline
C4	SAE C – 4-Bolt with SAE CC Spline (145 only)
D3	SAE D – 4-Bolt with SAE D Spline (145 only)

Code	Torque Control Setting (%)
00	For Non-torque Control Pumps
XX	20-90% of Max. Rated Torque(3)

(3) See table at bottom left for information and example.

Code	Differential Pressure Setting
20	Recommended Initial Factory Setting
00	Use with PA Control only
XX	Factory set in bar – Range 10-35

P3 Torque Control Options TA, TB, TC, TD Ordering Guide

Model	Maximum Rated Torque		TA/TB Adj. Range 20%-60% of Max Torque		TC/TD Adj. Range, 50%-90% of Max Torque	
	Nm	lb-in	Nm	lb-in	Nm	lb-in
P3075	424	3755	85-254	751-2253	212-382	1877-3379
P3105	594	5257	119-356	1051-3154	297-535	2628-4731
P3145	820	7259	164-492	1451-4355	410-738	3629-6533

The input torque limit is factory set at a percentage of the maximum rated input torque. The percentage needs to be specified in Torque Control Setting (%) box of the ordering code. For example, for a P3075-TC pump with an input torque limit setting required of 300 Nm, divide 300 into 424, which equals 71%, so 71 is specified in Torque Control Setting (%) box.

Code	Controls
PA(4)	Std. max pressure control (Pmax), 100-320 bar (1450-4600 PSI)
LA	Load sensing (2 spool)/Pmax without bleed orifice
LB	Load sensing (2 spool)/Pmax with bleed orifice
TA(3)	Torque/LS/Pmax without bleed orifice, Torque range 20-60% of max
TB(3)	Torque/LS/Pmax with bleed orifice, Torque range 20-60% of max
TC(3)	Torque/LS/Pmax without bleed orifice, Torque range 50-90% of max
TD(3)	Torque/LS/Pmax with bleed orifice, Torque range 50-90% of max

(3) See table at left for information and example.
(4) For Remote Pressure Compensator, order the "PA" model and remove plug from "X" port.

= Not Available

PAVC

PAVC piston pumps are ideal for many mobile applications with operating pressure up to 3000 PSI. These compact pumps feature convenient cartridge style controls and carry a full pressure rating on most water glycol fluids.

- High strength cast-iron housing
- Built-in supercharger
- High speed capability - 3000 RPM (2600 RPM PAVC100)
- Sealed shaft bearing
- Two piece design for ease of service
- Cartridge bronze clad port plate
- Airbleed standard for quick priming
- Hydrodynamic cylinder barrel bearing
- Thru-shaft (PAVC100 only)
- Full pressure rating on water glycol fluids
- Pump case and shaft seal - see inlet pressure only
- Filter and/or cool drain line (100 PSI Max.)

Pump Performance Data

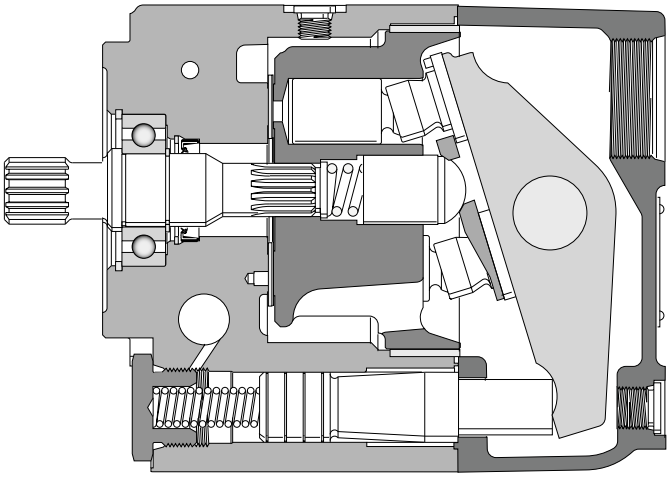
Model Series	Maximum Displacement	Rated Outlet Pressure	Drive Speed	At 1800 RPM and 3000 PSI Flow	Input Horsepower
PAVC33	33 cc/r	3000 PSI	3000 RPM	25 GPM	50 HP
PAVC38	38 cc/r	3000 PSI	3000 RPM	28 GPM	55 HP
PAVC65	65 cc/r	3000 PSI	3000 RPM	52 GPM	96 HP
PAVC100	100 cc/r	3000 PSI	2600 RPM	69 GPM	140 HP

DRIVEN Model Selection

Driven Model Selection	Rotation	Mounting	Shaft	Inlet Ports	Thru-shaft	Control
PAVC33R-DRIVEN1	CW	SAE B 2-Bolt	SAE B keyed	Rear, Straight Thread	N/A	Pressure Limiter
PAVC33BL-DRIVEN3	CCW	SAE B 2-Bolt	SAE B spline	Rear, Straight Thread	N/A	Load Sensing
PAVC33BR-DRIVEN3	CW	SAE B 2-Bolt	SAE B spline	Rear, Straight Thread	N/A	Load Sensing
PAVC339BL-DRIVEN3	CCW	SAE B 2-Bolt	SAE B spline	Rear, Straight Thread	N/A	Load Sensing
PAVC339BR-DRIVEN3	CW	SAE B 2-Bolt	SAE B spline	Rear, Straight Thread	N/A	Load Sensing
PAVC38R-DRIVEN1	CW	SAE B 2-Bolt	SAE B spline	Rear, Straight Thread	N/A	Pressure Limiter
PAVC38BL-DRIVEN3	CCW	SAE B 2-Bolt	SAE B spline	Rear, Straight Thread	N/A	Load Sensing
PAVC38BR-DRIVEN3	CW	SAE B 2-Bolt	SAE B spline	Rear, Straight Thread	N/A	Load Sensing
PAVC389BL-DRIVEN3	CCW	SAE B 2-Bolt	SAE B spline	Rear, Straight Thread	N/A	Load Sensing
PAVC389BR-DRIVEN3	CW	SAE B 2-Bolt	SAE B spline	Rear, Straight Thread	N/A	Load Sensing
PAVC65R-DRIVEN1	CW	SAE C 2-Bolt	SAE C keyed	Rear, Straight Thread	N/A	Pressure Limiter
PAVC65BL-DRIVEN3	CCW	SAE C 2-Bolt	SAE C spline	Rear, Straight Thread	N/A	Load Sensing
PAVC65BR-DRIVEN3	CW	SAE C 2-Bolt	SAE C spline	Rear, Straight Thread	N/A	Load Sensing
PAVC659BL-DRIVEN3	CCW	SAE C 2-Bolt	SAE C spline	Rear, Straight Thread	N/A	Load Sensing
PAVC659BR-DRIVEN3	CW	SAE C 2-Bolt	SAE C spline	Rear, Straight Thread	N/A	Load Sensing
PAVC100R-DRIVEN1	CW	SAE C 2-Bolt	SAE C spline	Rear, Straight Thread	N/A	Pressure Limiter
PAVC100RB3-DRIVEN1	CW	SAE C 2-Bolt	SAE C keyed	Top, Straight Thread	SAE B	Pressure Limiter
PAVC1009BL-DRIVEN3	CCW	SAE C 2-Bolt	SAE C spline	Rear, Straight Thread	N/A	Load Sensing
PAVC1009BR-DRIVEN3	CW	SAE C 2-Bolt	SAE C spline	Rear, Straight Thread	N/A	Load Sensing
PAVC100BLB3-DRIVEN3	CCW	SAE C 2-Bolt	SAE C spline	Top, Straight Thread	SAE B	Load Sensing
PAVC100BRB3-DRIVEN3	CW	SAE C 2-Bolt	SAE C spline	Top, Straight Thread	SAE B	Load Sensing

Note: All PAVC Driven pumps have adjustable differential.

PAVC
Performance Characteristics



Features/Benefits

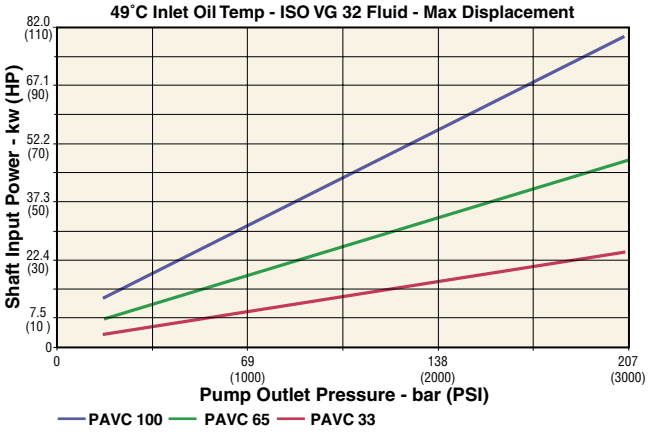
- High Strength Cast-Iron Housing
- Built-In Supercharger Ensures High Speed Capability - 3000 RPM (2600 RPM PAVC100)
- Sealed Shaft Bearing
- Two Piece Design for Ease of Service
- Cartridge Type Controls Field Changeable
- Replaceable Bronze Clad Port Plate
- Airbleed Standard for Quick Priming
- Hydrodynamic Cylinder Barrel Bearing
- Thru-Shaft (PAVC100 Only)
- Full Pressure Rating on Most Water Glycol Fluids
- Pump Case and Shaft Seal are Subjected to Inlet Pressure Only
- Filter and/or Cool Drain Line 7 bar (100 PSI) Maximum

Controls

- Pressure Compensation
- Load Sensing
- Power (Torque) Limiting
- Power and Load Sensing
- Remote Pressure Compensation
- Adjustable Maximum Volume Stop
- Electrohydraulic Flow and Pressure
- Low Pressure Standby

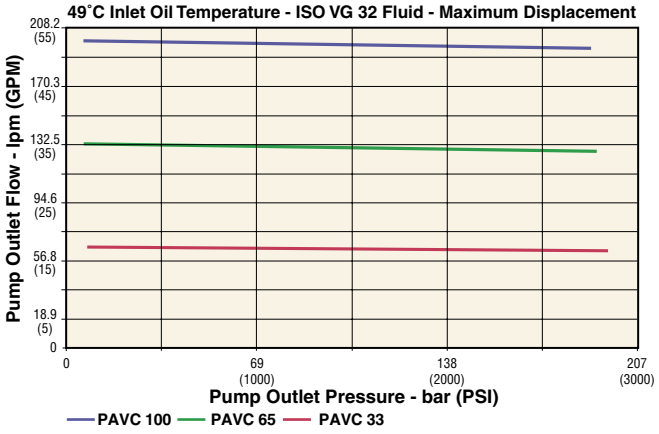
PAVC Series Shaft Input Power - 2000 RPM

49˚C Inlet Oil Temp - ISO VG 32 Fluid - Max Displacement



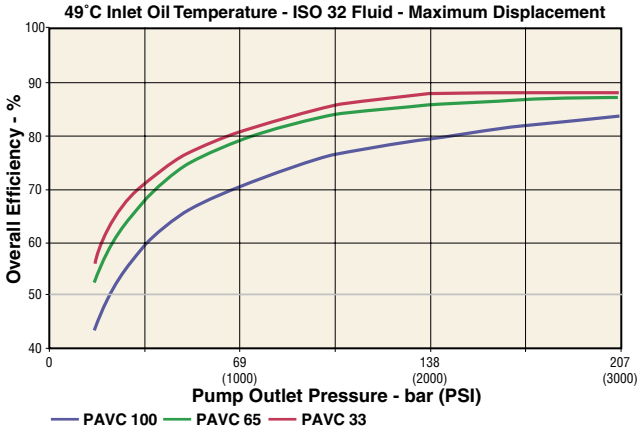
PAVC Series Pump Outlet Flow - 2000 RPM

49˚C Inlet Oil Temperature - ISO VG 32 Fluid - Maximum Displacement



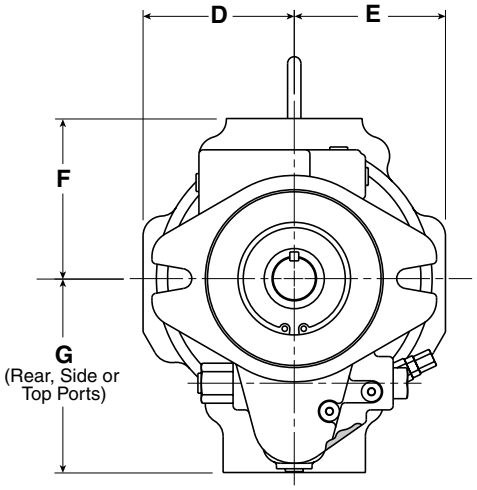
PAVC Series Overall Efficiency - 2000 RPM

49˚C Inlet Oil Temperature - ISO 32 Fluid - Maximum Displacement

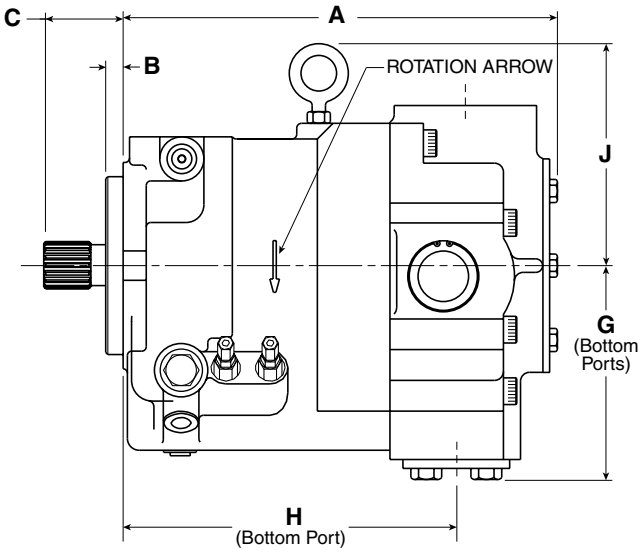


PAVC

Front View



Side View



Dimensions, mm (inch)

Dim.	PAVC33/38		PAVC65		PAVC100	
	Rear Ported	Side Ported	Rear Ported	Top Ported	Rear Ported	Top/Bottom Ported
A	184.15 (7.25)	185.93 (7.32)	224.03 (8.82)	224.02 (8.82)	303.53 (11.95)	310.13 (12.21)
B	9.39 (0.37)	9.37 (0.37)	12.45 (0.49)	12.44 (0.49)	12.44 (0.49)	12.44 (0.49)
C	58.67 (2.31)	58.67 (2.31)	55.63 (2.19)	55.62 (2.19)	55.62 (2.19)	55.62 (2.19)
D	84.07 (3.31)	105.92 (4.17)	101.60 (4.00)	101.60 (4.00)	107.95 (4.25)	107.94 (4.25)
E	84.07 (3.31)	89.66 (3.53)	101.60 (4.00)	101.60 (4.00)	107.95 (4.25)	107.94 (4.25)
F	63.50 (2.50)	63.50 (2.50)	88.90 (3.50)	85.85 (3.38)	117.34 (4.62)	114.30 (4.50)
G	96.77 (3.81)	104.65 (4.12)	115.82 (4.56)	115.82 (4.56)	141.47 (5.57)	159.25 (6.25)
H	—	—	—	—	—	237.99 (9.37)
J	—	—	—	—	158.49 (6.24)	159.49 (6.24)

Filtration and auxiliary function pump suggestions

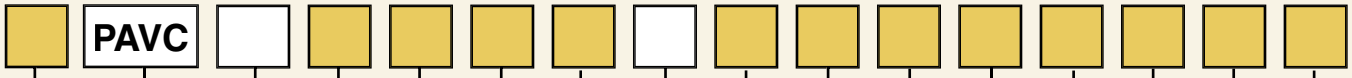
Pump

Model Code	Flow @1800 RPM	Pressure
T67B-B02-3R00-A100	3 GPM	4000
T67B-B04-3R00-A100	6 GPM	4000
T67B-B07-3R00-A100	10 GPM	4000

PAVC100 SAE B, SAE BB and SAE C Thru Drive Kits

Pump Series	Mount	Spline	Kit #
PAVC 100...6B3	SAE B	SAE B	787076
PAVC 100...6B4	SAE B	SAE BB	787077
PAVC 100...6C3	SAE C	SAE C	787076

Note: Pumps can be converted from/to SAE B, BB or SAE C thru drives by using the kits listed.



Code	Multiple Pumps
Omit	Single Pump
—	Factory Mounted to Rear of Another Pump

Code	cm³/rev (in³/rev)
33	33 (2.0)
38	38 (2.3)
65	65 (4.0)
100	100 (6.1)

Code	Bearing Option
Omit	Single Piece Shaft
9*	Dual Bearing

* For applications where side loading may be experienced. Max. side load = 113.4 kg (250 lbs).

Typical Applications:
Belt/chain drive
Universal joint drive
Massive couplings
Foot mount installations

Code	Shaft Option	
	Size 33/38	Size 65/100
Omit	7/8" Keyed SAE B	1¼" Keyed SAE C
B	13T Spline SAE B	14T Spline SAE C
C*	—	1½" Keyed SAE CC
D*	—	17T Spline SAE CC
S**	7/8" Keyed, Short Shaft SAE B	—

* Size 100 only ** Not available with Bearing Option 9.

Code	Port		
	Outlet	Location	Type
Omit	Str. Thread	Top	SAE/Inch
3*	Flange	Top	SAE/Inch

* Size 100 only

Code	Port			
	33/38 Inlet	65 Inlet	100 Inlet	Type
Omit	Str. Thd., Rear	Str. Thd., Rear	Flange, Rear	SAE/Inch Threads
2	Flange, Side	Flange, Top	Flange, Top/Bottom	SAE/Inch Threads
8	Flange, Side	Flange, Top	Flange, Top/Bottom	ISO 6149/Metric

Code	Rotation*
R	Right CW
L	Left CCW

* Viewed from shaft end.

Code	Differential Options
4	Adjustable Differential

Code	Volume Stop Options
Omit	Volume Stop Plugged
2	Maximum Volume Stop
5*	Max. Volume Stop with O-ring

* Not available with Thru-Shaft option on Size 100.

Code	Thru-Shaft Threads*
Omit	No Thru-Shaft
6	UNC
9**	Metric

* Available on Size 100 only.
** Must be used with "8" porting option.

Code	Control Option
Omit	Standard Pressure Compensated Setting Pressure 41-207 bar (600-3000 PSI)
A	Pressure & Flow (Load Sensing)
*C	Pressure, Flow & Power
*H	Pressure Comp. & Power
**†M	Remote Pressure
**†ME	Remote Pressure
†AM	Remote Pressure & Flow
*†CM	Remote Pressure, Flow & Power
*†HM	Remote Pressure & Power

* Power controlled pumps (H, C, HM or CM) must have maximum input power limit specifications at a particular drive speed (RPM) and compensator pressure setting (PSI) included with order. Power controlled pumps that do not have input power limit specifications, will be set at default setting (22.5 HP @ 1800 RPM and 3000 PSI) "H" & "C" (60 HP @ 1800 RPM and 3000 PSI) "HM" & "CM"
** "M" may be remotely controlled; "ME" requires external pilot
† Pumps with M, ME, AM, CM or HM controls will be set to compensate at 207 bar (3000 PSI) unless Chart #1 specifies otherwise.

Code	Thru-Shaft Variations
Omit	No Thru-Shaft Option
A3	Thru-Shaft, SAE AA Pilot, 9 Tooth 20/40 Pitch Spline Shaft
A4	Thru-Shaft, SAE A Pilot, 9 Tooth 16/32 Pitch Spline Shaft
*B3	Thru-Shaft, SAE B Pilot, 13 Tooth 16/32 Pitch Spline Shaft
*B4	Thru-Shaft, SAE B Pilot, 15 Tooth 16/32 Pitch Spline Shaft
*C3	Thru-Shaft, SAE C Pilot, 14 Tooth 12/24 Pitch Spline Shaft

Inlet port option "2" or "8" (top/bottom) must be used with all Thru-Shaft pumps.
* Use SAE C-C shaft on thru-shaft pump variation when combined input torque of front and rear pumps exceeds 565 N•m (5000 In-Lbs).

Code	Painting
Omit	No Paint
P	Paint

Code	Seals
Omit	Nitrile (Standard)

Code	Multiple Pumps
Omit	Single Pump
—	Pump Factory Mounted on Rear

Chart #1

Item	Setting
RPM	
PSI	
HP	
GPM	

Ordering Notes

Unless otherwise specified, pump is shipped at maximum GPM (1800 RPM) and set to 69 bar (1000 PSI) [See † Exceptions].

When factory settings are required, the items shown in Chart #1 must be included with order.

= Omit if not required or to select standard option coded "omit".

PVP

PVP piston pumps are ideal for medium duty applications with operating pressure up to 3600 PSI. These service friendly pumps are quiet and respond quickly to flow demand changes.

- High strength cast-iron housing
- Optional inlet/outlet locations
- Replaceable bronze port plate
- Replaceable piston slipper plate
- Low noise levels
- Fast response times
- Metric pilot, shaft and ports available

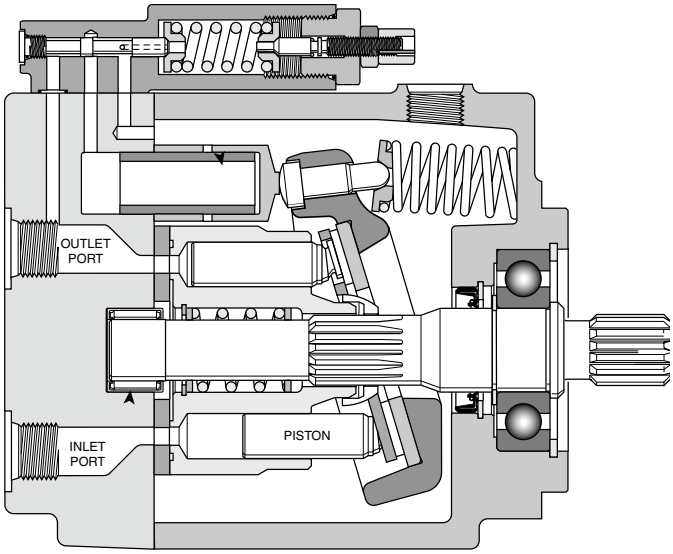
Pump Performance Data

Model Series	Displacement	Maximum Outlet Pressure	Rated Drive Speed	At 1800 RPM & 3600 PSI Flow	Input Horsepower
PVP16	16 cc/r	3600 PSI	3000 RPM	13 GPM	28 HP
PVP23	23 cc/r	3600 PSI	3000 RPM	19 GPM	45 HP
PVP33	33 cc/r	3600 PSI	3000 RPM	25 GPM	62 HP
PVP41	41 cc/r	3600 PSI	2800 RPM	31 GPM	68 HP
PVP48	48 cc/r	3600 PSI	2400 RPM	33 GPM	70 HP

DRIVEN Model Selection

Driven Model Selection	Rotation	Mounting	Shaft	Ports	Thru-shaft	Control
PVP16L-DRIVEN3	CCW	SAE A	SAE A spline	Rear, Str Thd	N/A	Load Sense
PVP16R-DRIVEN3	CW	SAE A	SAE A spline	Rear, Str Thd	N/A	Load Sense
PVP16RA4-DRIVEN1	CW	SAE A	SAE A keyed	Side, Str Thd	SAE A	Remote Pressure
PVP23R-DRIVEN1	CW	SAE B	SAE B keyed	Rear, Str Thd	N/A	Remote Pressure
PVP23RA4-DRIVEN1	CW	SAE B	SAE B keyed	Side, Str Thd	SAE A	Remote Pressure
PVP33R-DRIVEN1	CW	SAE B	SAE B keyed	Rear, Str Thd	N/A	Remote Pressure
PVP33RA4-DRIVEN1	CW	SAE B	SAE B keyed	Side, Str Thd	SAE A	Remote Pressure
PVP41R-DRIVEN1	CW	SAE B	SAE B keyed	Rear, Str Thd	N/A	Remote Pressure
PVP41RA4-DRIVEN1	CW	SAE B	SAE BB keyed	Side, Str Thd	SAE A	Remote Pressure
PVP48R-DRIVEN1	CW	SAE B	SAE B keyed	Rear, Str Thd	N/A	Remote Pressure
PVP48RA4-DRIVEN1	CW	SAE B	SAE BB keyed	Side, Str Thd	SAE A	Remote Pressure

PVP
Performance Characteristics



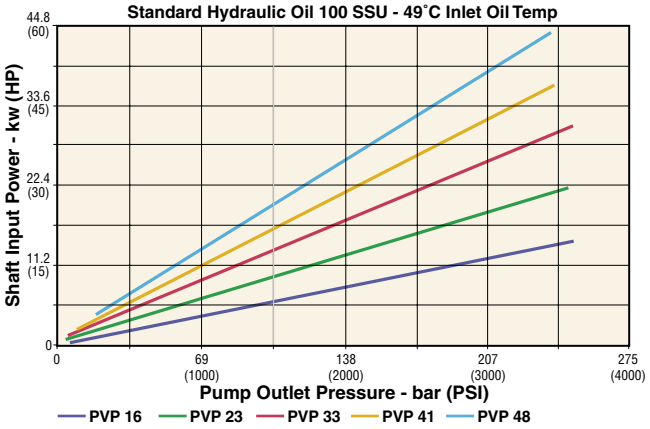
Features/Benefits

- High Strength Cast-Iron Housing
- Fast Response Times
- Two Piece Housing For Ease of Service
- Metric Pilot, Shaft and Ports Available
- Replaceable Bronze Clad Port Plate
- Thru-Shaft Capability
- Low Noise Levels
- Replaceable Piston Slipper Plate

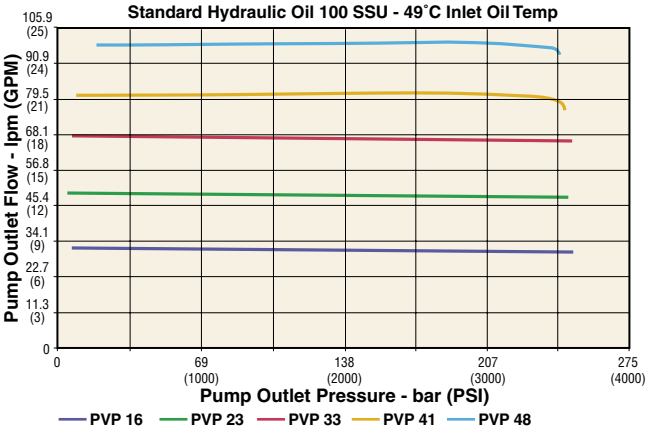
Controls

- Pressure Compensation
- Load Sensing
- Horsepower Limiting
- Horsepower and Load Sensing
- Remote Pressure Compensation
- Adjustable Maximum Volume Stop

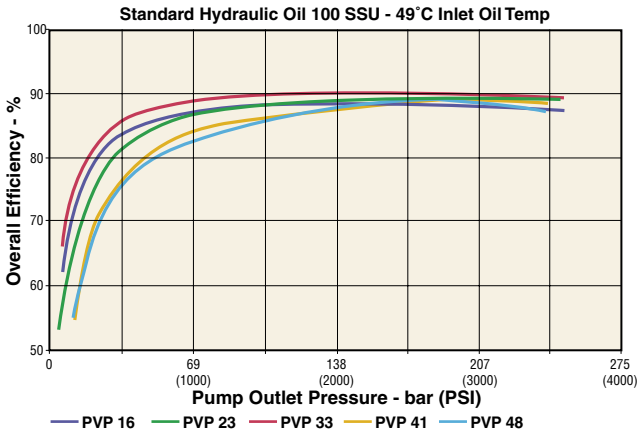
PVP Series Shaft Input Power - 2000 RPM



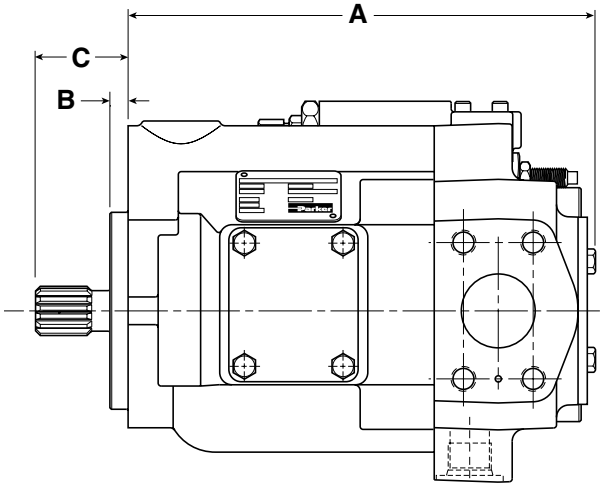
PVP Series Output Flow - 2000 RPM



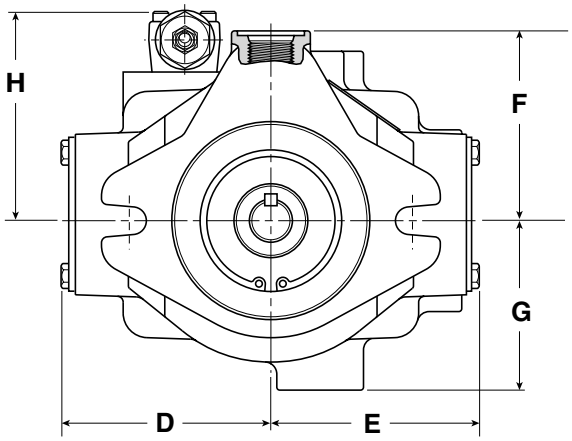
PVP Series Overall Efficiency - 2000 RPM



PVP



Side View



Front View

Dimensions, mm (inch)

Series	A	B*	C	D	E	F	G	H
PVP16	175.75 (6.91)	6.10 (0.24)	44.45 (1.75)	89.92 (3.54)	89.92 (3.54)	91.95 (3.62)	61.47 (2.42)	94.23 (3.71)
PVP23/33	216.65 (8.49)	9.40 (0.37)	58.67 (2.31)	107.19 (4.22)	107.19 (4.22)	82.55 (3.25)	79.50 (3.13)	102.62 (4.04)
PVP41/48	240.79 (9.48)	9.40 (0.37)	58.67 (2.31)	107.69 (4.24)	107.69 (4.24)	97.79 (3.86)	87.38 (3.44)	107.44 (4.23)

*For dimension with “K” shaft, see catalog.

Filtration and auxiliary function pump suggestions

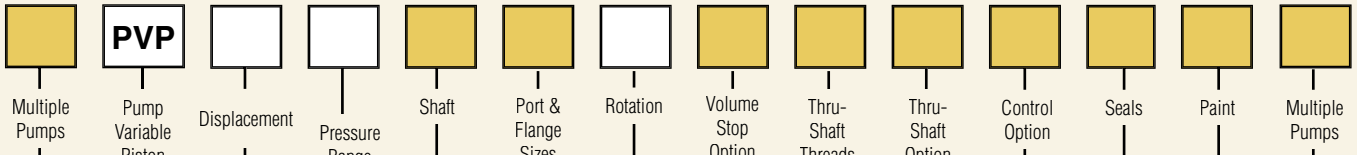
Pump

Model Code	Flow @1800 RPM	Pressure
TB003-4R00-A100*	**6 GPM**	**2000**
TB006-4R00-A100*	**12 GPM**	**2000**
T67B-B02-3R00-A100	3 GPM	4000
T67B-B04-3R00-A100	6 GPM	4000
T67B-B07-3R00-A100	10 GPM	4000

***PVP16 only**

Thru Drive Kits for P3 Series (Nitrile Seals, UNC Threads, Couplings)

Thru Drive Mounting	PVP16 Kit #	PVP23/33 Kit #	PVP41/48 Kit #
SAE A with 9 tooth spline	787244	787236	787236
SAE B with 13 tooth spline	N/A	787239	787239
SAE B with 15 tooth spline	N/A	787240	787240



Code	Displacement, cm³/rev (in³/rev)
16	16.4 (1.0)
23	23 (1.4)
33	33 (2.0)
41	41 (2.5)
48	48 (2.9)

Code	Rotation*
R	CW
L	CCW

* Viewed from shaft end.

Code	Painting
Omit	No Paint
P	Paint

Code	Seals
Omit	Nitrile
V	Fluoroelastomer*

* "Fluoroelastomers are available under various registered trademarks, including FLUOROCARBON (a registered trademark of DuPont) and FLUOREL (a registered trademark of 3M)."

Code	Multiple Pumps
Omit	Single Pump
—	Factory Mounted to Rear of Another Pump

Code	Multiple Pumps
Omit	Single Pump
—	Pump Factory Mounted on Rear

Code	Pressure Range*
10	17-69 bar (250-1000 PSI)
20	17-138 bar (250-2000 PSI)
30	17-207 bar (250-3000 PSI)
36	17-248 bar (250-3600 PSI)

* Minimum value of pressure range only applies on control option "omit" code.

Code	Thru-Shaft Threads
Omit	No Thru-Shaft
6*	UNC
9**	Metric

* Available with 2 or 3 port option only.
** Available with 8 or 9 port option only.

Code	Volume Stop Options
Omit	No Volume Stop
2	Adj. Maximum Volume Stop

Code	Port Options	
	Type	Location
Omit	SAE	Rear – Straight Thread
2	SAE	Side – Flange (Inch)
3	SAE	Side – Straight Thread
5*	SAE	Rear – Straight Thread (Vickers)
8	ISO 6149	Side – Flange (Metric Threads)
9	BSPP	Side – Flange (Metric Threads)

* Available on Size 16 only.

Code	Size 16	
	Shaft	Pilot
Omit*	3/4" Keyed SAE A	SAE A
B *	9T Spline SAE A	SAE A
C	11 Tooth Spline	SAE A
K†	18mm Keyed	Metric
Code	**Sizes 23/33 & 41/48**	
	Shaft	**Pilot**
Omit*	7/8" Keyed SAE B	SAE B
B*	13T Spline SAE B	SAE B
C	1" Keyed SAE B	SAE B
D	15T Spline SAE BB	SAE B
K†	25mm Keyed	Metric

* For size 16, total input torque not to exceed 58.2 Nm (517 In-Lbs). Max. input torque for all other sizes is 208.1 Nm (1850 In-Lbs).
† Available with 8 or 9 port option only.

Code	Thru-Shaft Option
Omit	No Thru-Drive
A4	SAE A Pilot / SAE A 9T Spline
A5†	SAE A Pilot / 11T Spline
B3†	SAE B Pilot / SAE B 13T Spline
B4†	SAE B Pilot / SAE BB 15T Spline
T**	Thru with Cover

** Available on Size 16 only.
† Available on Sizes 23/33 and 41/48 only.

Code	Control Options
Omit	Pressure Compensated
**M	Remote Pressure (Int.)
**ME	Remote Pressure (Ext.)
A	Pressure and Flow
C	Pressure, Flow and Power
H*	Pressure and Power
HLM*†	Remote Pressure and Hi/Lo Power
HLA*†	Pressure, Flow and Hi/Lo Power

† Available on Sizes 41/48 only.
* Specify HP, RPM & comp setting when ordering or will get default.
** "M" (May be remotely controlled)
"ME" (Requires external pilot)

= Omit if not required or to select standard option coded "omit".

VP1

The VP1 is the world's first variable displacement pump for truck applications. It can be close-coupled to a gearbox PTO (power take-off) or to a coupling independent PTO (e.g. an engine PTO) which meets ISO standard 7653-1985.

- Variable displacement
- Low noise level
- High power-to-weight ratio
- Compact and lightweight
- Highly efficient
- Sturdy design
- Withstands low temperatures
- Can be close coupled and tandem mounted

Pump Performance Data

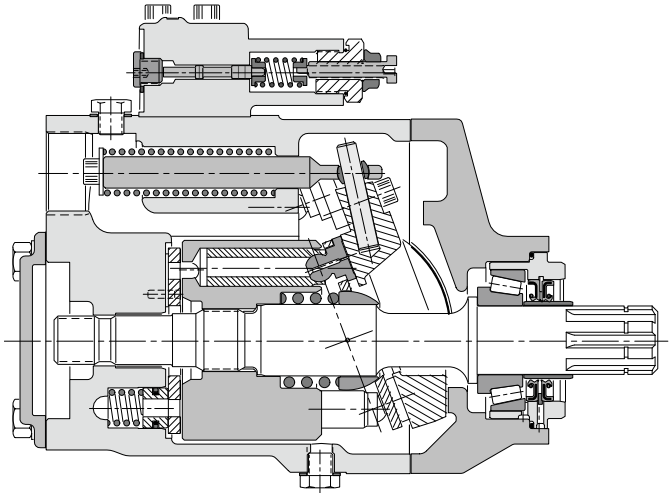
Model Series	Maximum Displacement	Outlet Pressure	Drive Speed	Flow @ Rated RPM	Maximum Horsepower
VP1-45	45 cc/rev	4350 PSI	2400 RPM	26 GPM	80 HP
VP1-75	75 cc/rev	4350 PSI	2100 RPM	39 GPM	120 HP
VP1-120	120 cc/rev	4350 PSI	1800 RPM	53 GPM	165 HP

DRIVEN Model Selection

DRIVEN Model	Rotation	Mounting	Shaft	Ports
VP1075R-DRIVEN1	CW	DIN 4 Bolt	DIN Spline	Rear BSP

Note: Complete Mounting and Fitting kit available as part number 3785286. Contains BSP to JIC fittings for suction, pressure, load sense and drain lines along with studs for rear support and optional PTO shim plate with extra gasket.

VP1
Performance Characteristics



Features

- Thru drive capability on VP1-045 and VP1-075
- Higher self-priming speeds
- Operating pressures to 400 bar
- New frame sizes to meet market requirements
- Higher overall efficiency
- Increased reliability
- Reduced noise level
- Smaller installation dimensions

Control

- Load sense and pressure limiter

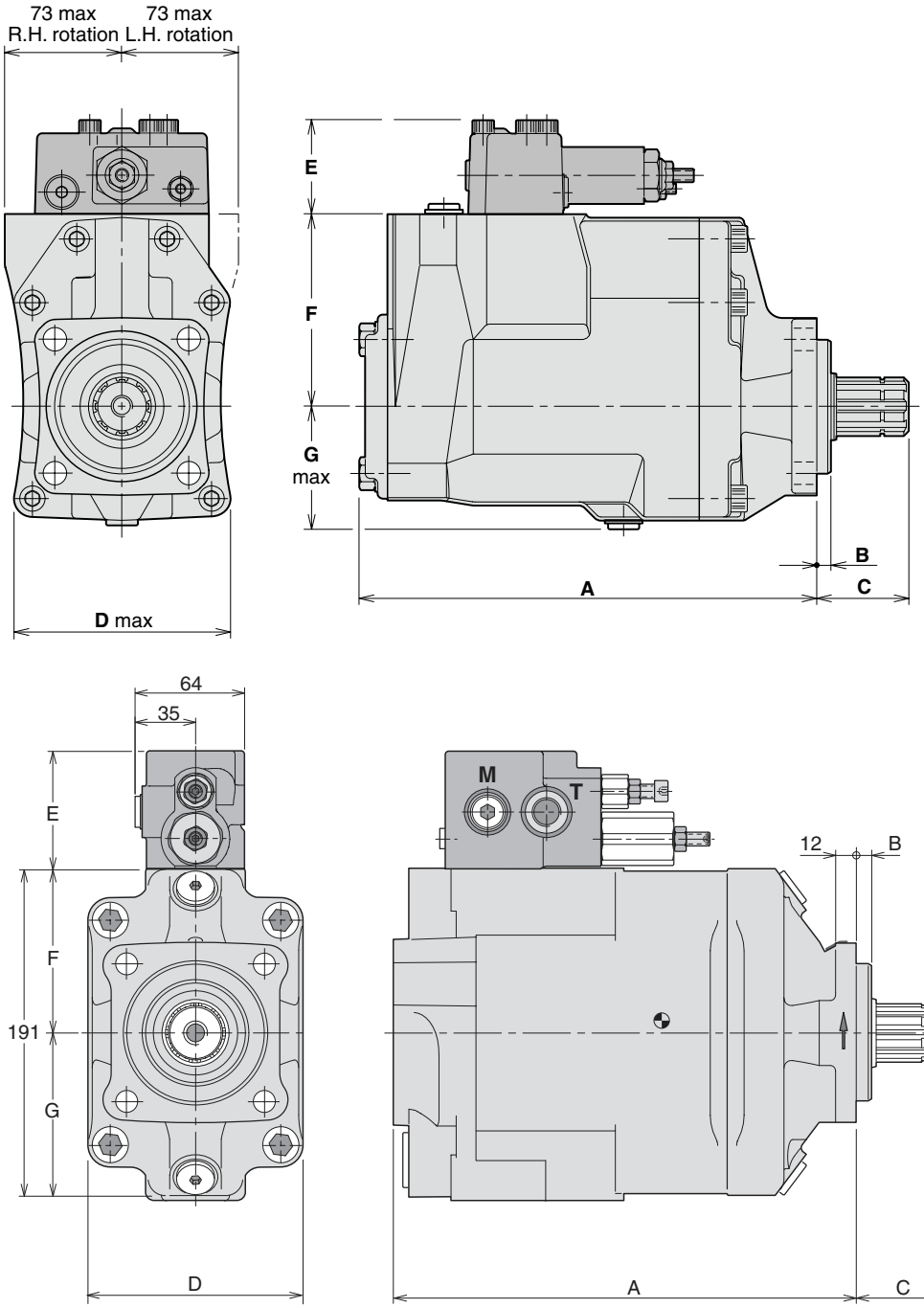
Control Performance

- Data on response

Thru Drive

- Fitting Kit 3797795 will accommodate mounting a DIN 5462 pump to the rear of the VP1. Check the factory for torque limitations on rear mount.

VP1



IMPORTANT!
The control is not drained through the pump case. An external line must be installed between the control drain port 'T' and the reservoir.

Dimensions, mm (inch)

Series	A max	B	C	D max	E	F	G max	H max
VP1-045 VP1-075	276.5 (10.89)	8.5 (0.33)	55 (2.17)	132 (5.20)	56 (2.20)	115 (4.53)	71 (2.80)	73 (2.87)
VP1-120	269 (10.59)	9 (0.35)	55 (2.17)	125 (4.92)	68 (2.68)	96 (3.78)	95 (3.74)	–

VP1 – [ ] – [ ]

- **VP1**: Variable Displacenent Pump
- [ ]: Frame Size

Code	Size
045	45 cc/rev
075	75 cc/rev
120	120 cc/rev

- [ ]: Rotation

Code	Rotation
L	Left Hand (CCW)
R	Right Hand (CW)

NOTES:
1. Pressure port on 25, 41, 51 and 61 sizes is 3/4". Pressure port on 81 and 101 sizes is 1".
2. Suction fitting must be ordered separately.
3. Use seven digit number when placing order.

Ordering Code	Ordering No.
VP1-045-R	378 0334
VP1-045-L	378 0335
VP1-075-R	378 0336
VP1-075-L	378 0337
VP1-120-R	378 3182
VP1-120-L	378 3183

4. Fitting Kit 378 5286 provides adapter fittings for inlet /outlet, load sense and drain ports to JIC connections, along with the mounting gasket and support studs for installation.

Fitting Kits

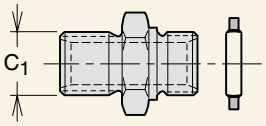
Each kit consists of a pressure fitting, a suction fitting and corresponding seal washers.

Kits with straight suction fitting

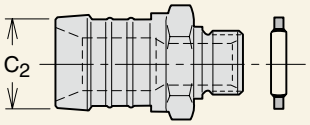
Ordering no.	C_1	C_2 dia.
370 4936	BSP ¾"	2"
370 7220*	BSP 1"	2"

* Above 100 l/min

Pressure fitting



Straight suction fitting

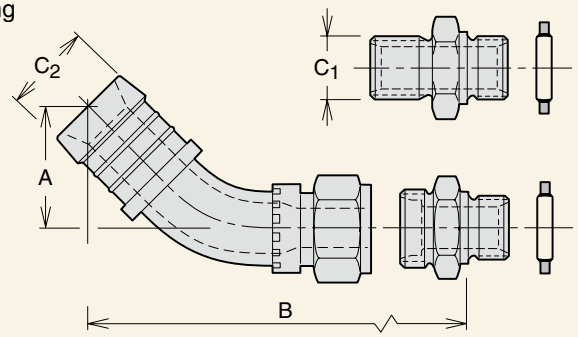


Kits with 45° suction fitting

Ordering no.	A mm	B mm	C_1	C_2 dia.
379 9563	71	154	BSP ¾"	2"
379 9562*	64	147	BSP 1"	2½"

* Above 100 l/min

Pressure fitting

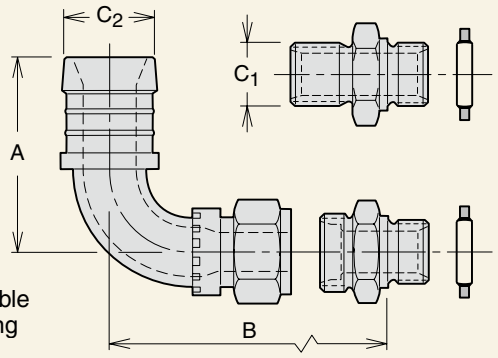


45° adjustable suction fitting

Kits with 90° suction fitting

Ordering no.	A mm	B mm	C_1	C_2 dia.
379 9918	144	128	BSP 1"	2"

Pressure fitting



90° adjustable suction fitting

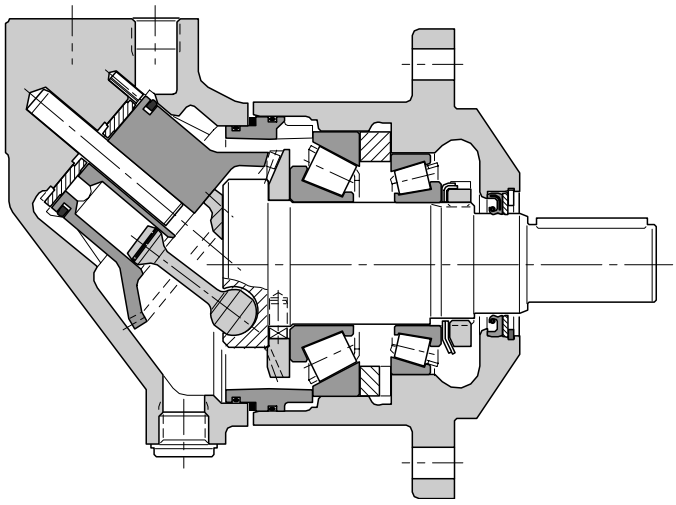
F11

F11 is a well proven bent axis, fixed displacement heavy-duty pump series. They can be used in numerous applications where high efficiency , high drive speeds, high pressure and indirect drives are desired. The F11 will provide high output flows in a very compact package.

Pump Performance Data

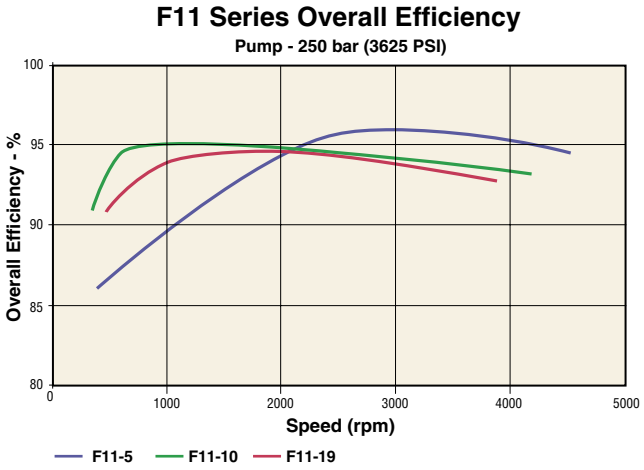
Model Series	Displacement	Continuous Pressure	Rated Speed	Flow @ Rated RPM
F11005	4.9 cc/r	5000 PSI	4600 RPM	5.5 GPM
F11010	9.8 cc/r	5000 PSI	4200 RPM	10 GPM
F11012		Coming Soon		
F11014	14.3 cc/r	5000 PSI	3900 RPM	14 GPM
F11019	19.0 cc.r	5000 PSI	3500 RPM	17 GPM
F11150	150.0 cc/r	5000 PSI	1700 RPM	63 GPM
F11250	242.0 cc/r	5000 PSI	1500 RPM	90 GPM

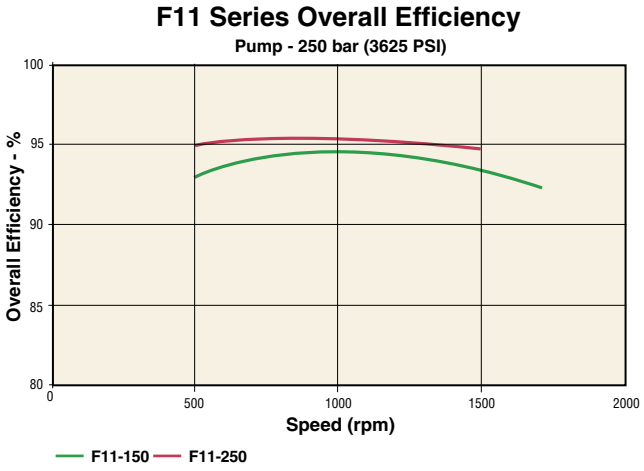
F11
Performance Characteristics



Features

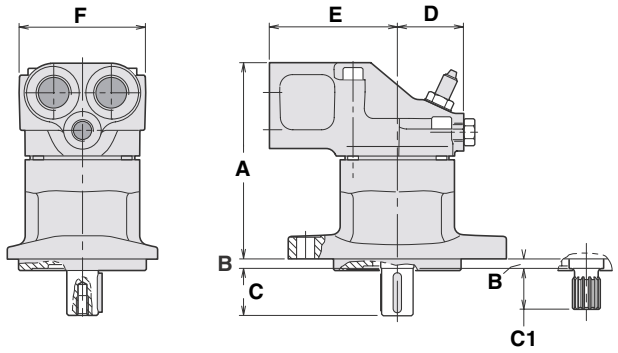
- F11 fixed pumps can be used at unusually high shaft speeds
- Intermittent operating pressures to 6000 PSI
- Compact, lightweight pump, high power to weight ratio
- Laminated piston ring provides low internal leakage and thermal shock resistance
- F11 Series have very few moving parts providing long life and service friendly design
- Heavy duty roller bearings for indirect drive

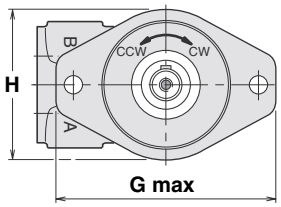




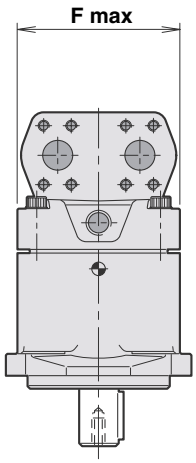
F11

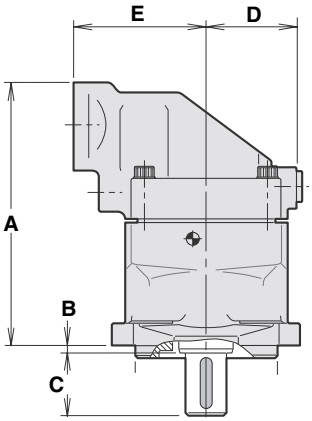
F11-14
(SAE versions)

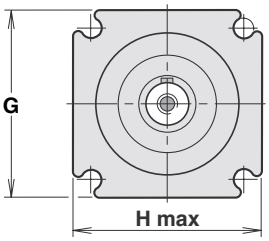


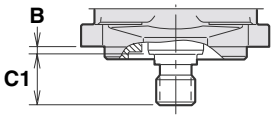


F11-150
(SAE version)









Dimensions, mm (inch)

Series	A max	B	C	C1	D	E	F	G max	H
F11-10 F11-14	175.7 (6.21)	7.9 (0.31)	38.1 (1.50)	33.0 (1.30)	53.1 (2.09)	102.1 (4.02)	101.1 (3.98)	174.0 (6.85)	119.9 (4.72)
F11-19	181.1 (7.13)	7.9 (0.31)	38.1 (1.50)	33.0 (1.30)	63.0 (2.48)	87.9 (3.46)	114.0 (4.49)	176.0 (6.93)	122.9 (4.84)
F11-150	355.1 (13.98)	7.9 (0.31)	66.8 (2.63)	66.8 (2.63)	118.1 (4.65)	172.0 (6.77)	222.0 (8.74)	214.1 (8.43)	192.0 (7.56)
F11-250	395.0 (15.55)	7.9 (0.31)	82.0 (3.23)	66.8 (2.63)	118.1 (4.65)	197.1 (7.76)	231.9 (9.13)	206.0 (8.11)	206.0 (8.11)

F11 – [ ] – [ ] [ ] – [ ] [ ] – [ ] – [ ] – [ ] – [ ]

Bent Axis Pump | Frame Size | Function | Main Ports | Mounting Flange | Shaft Seal | Shaft | Version Number | Option | Speed Sensor Option

Code	Displacement (cm^3/rev)
005*	4.9 cc/r
010*	9.8 cc/r
012*	Coming Soon
014	14.3
019	19.0
150	150.0
250	242.0

* ISO or CETOP mounting options, see catalog on CD

Code	Option
	None (see page 36 of catalog on CD)

Code	Speed Sensor	014	019	150	250
S	With Speed Sensor	x	x	–	–
P	Prepared for Speed Sensor	x	x	–	–

Code	Version Number
	Assigned by factory for special versions

Code	Function	014	019	150	250
R	Pump, CW Rotation	x	x	x	x
L	Pump, CCW Rotation	x	x	x	x

Code	Main Ports	014	019	150	250
U	SAE, UN Threads	x	x	–	–
B	BSP Threads	–	x	–	–
F	SAE 6000 PSI Flange*	–	–	x	x
R	CW Rotation, with Anti-cavitation Valve**	x	x	–	–
L	CCW Rotation, with Anti-cavitation Valve**	x	x	–	–

* Metric threads

Code	Shaft	014	019	150	250
T	SAE Key	x	x	x	–
S	SAE Spline	x	x	x	x
K	Metric Key	–	–	–	x
F	SAE Spline	–	–	–	x

Code	Mounting Flange
S	SAE Flange

NOTE: CETOP and ISO mounting also available. See catalog on CD.

Code	Shaft Seal	014	019	150	250
N	NBR*, Low Pressure	–	x	x	x
H	NBR*, High Pressure	–	x	x	x
E	FPM**, Low Pressure, High Temperature	x	x	x	x
V	FPM**, High Pressure, High Temperature	x	x	–	–

* NBR - Nitrile rubber
** FPM - Fluorocarbon rubber

x: Available –: Not Available

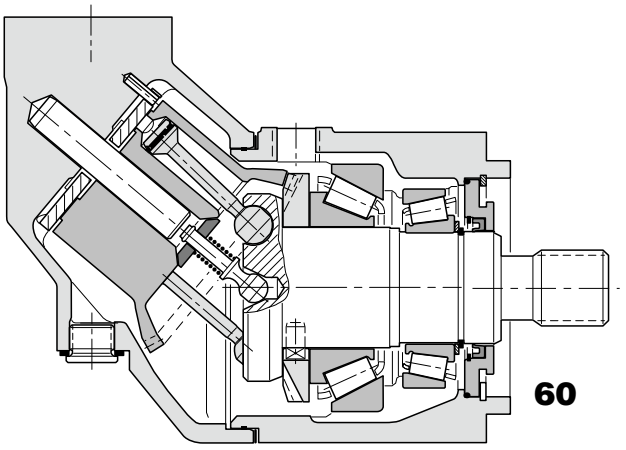
F12

F12 is a high performance, bent axis, fixed displacement heavy-duty pump series. They can be used in numerous applications where high efficiency , high drive speeds, high pressure and indirect drives are desired. The F12 will provide high output flows in a very compact package.

Pump Performance Data

Model Series	Displacement	Continuous Pressure	Rated Speed	Flow
F12030	30.0 cc/r	6000 PSI	3150 RPM	23 GPM
F12040	40.0 cc/r	6000 PSI	2870 RPM	28 GPM
F12060	59.6 cc/r	6000 PSI	2500 RPM	37 GPM
F12080	80.4 cc/r	6000 PSI	2300 RPM	46 GPM
F12090	93.0 cc/r	6000 PSI	2300 RPM	53.5 GPM
F12110	110.1 cc/r	6000 PSI	2290 RPM	63 GPM
F12125	125.0 cc/r	6000 PSI	2290 RPM	72 GPM

F12
Performance Characteristics



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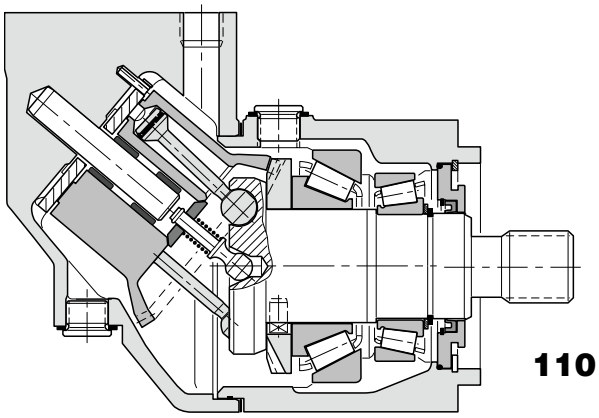

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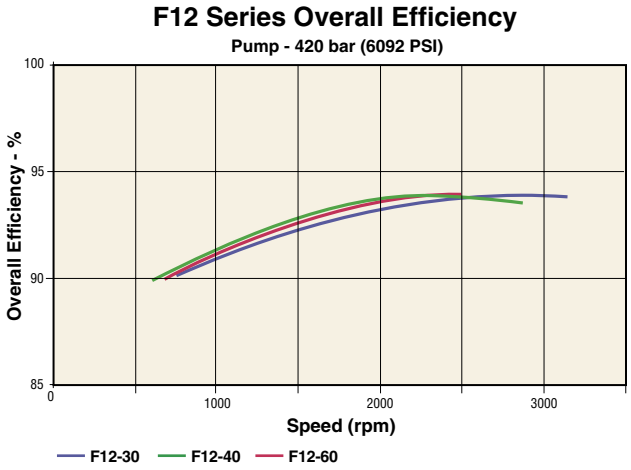
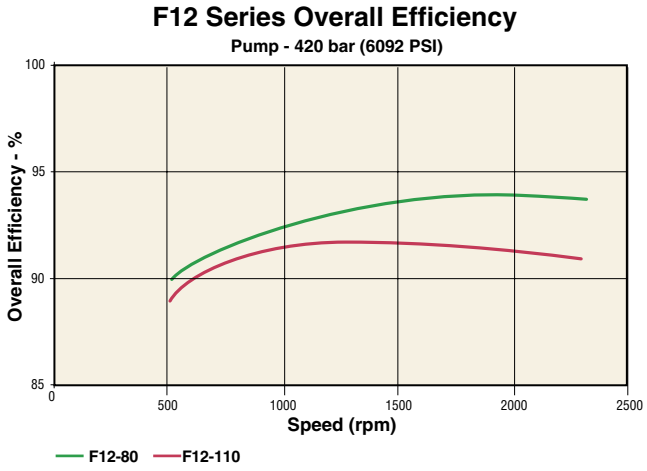


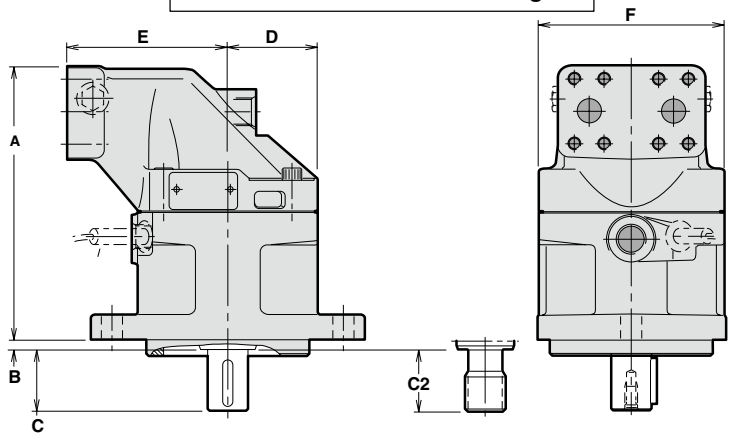


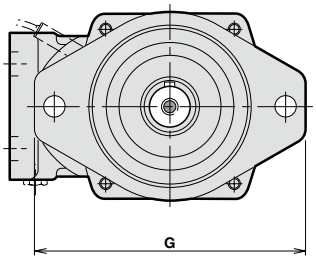
Features

- Intermittent operating pressures to 7000 PSI
- Compact, lightweight pump with high power to weight ratio
- Laminated piston ring provides low internal leakage and thermal shock resistance
- F12 Series have very few moving parts providing long life and service friendly design
- Heavy duty roller bearings provides indirect drive capability

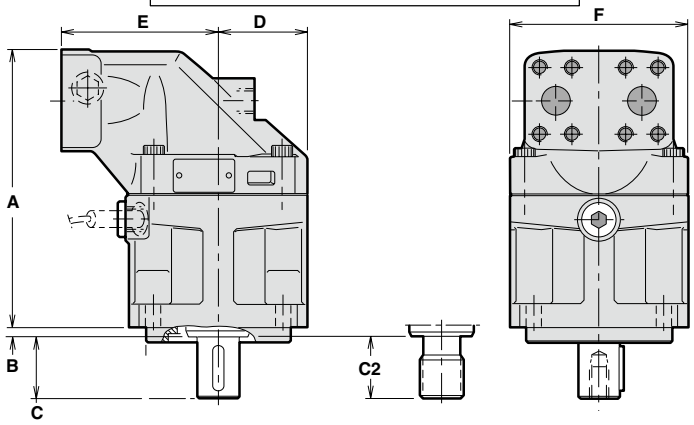
F12

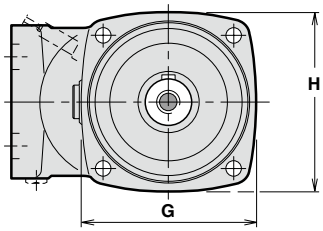
Shown: F12-60 with 2-bolt flange





Shown: F12-80 with 4-Bolt Flange





Dimensions, mm (inch)

Series 2-BOLT	A	B	C	C2	D	E	F	G
F12-30	189.5 (7.46)	7.9 (0.31)	38.1 (1.5)	33.0 (1.3)	58.9 (2.32)	100.1 (3.94)	121.9 (4.80)	176.0 (6.93)
F12-40	197.1 (7.76)	7.9 (0.31)	48.0 (1.89)	48.0 (1.89)	64.0 (2.56)	110.0 (4.33)	134.1 (5.28)	214.9 (8.46)
F12-60	214.1 (8.43)	7.9 (0.31)	48.0 (1.89)	48.0 (1.89)	70.1 (2.76)	125.0 (4.92)	144.0 (5.67)	214.9 (8.46)

Series 4-BOLT	A	B	C	C2	D	E	F	G	H
F12-30	189.5 (7.46)	7.9 (0.31)	38.1 (1.50)	33.0 (1.30)	58.9 (2.32)	100.1 (3.94)	121.9 (4.80)	118.1 (4.65)	118.1 (4.65)
F12-40	197.1 (7.76)	7.9 (0.31)	48.0 (1.89)	48.0 (1.89)	65.0 (2.56)	110.0 (4.33)	134.1 (5.28)	148.1 (5.83)	144.0 (5.67)
F12-60	214.1 (8.43)	7.9 (0.31)	48.0 (1.89)	48.0 (1.89)	70.1 (2.76)	125.0 (4.92)	144.0 (5.67)	148.1 (5.83)	144.0 (5.67)
F12-80	240.0 (9.45)	7.9 (0.31)	54.1 (2.13)	54.1 (2.13)	77.5 (3.05)	134.9 (5.31)	154.9 (6.10)	154.9 (6.10)	154.9 (6.10)
F12-110	263.9 (10.39)	7.9 (0.31)	67.1 (2.64)	66.8 (2.63)	85.1 (3.35)	145.0 (5.71)	169.9 (6.69)	204.0 (8.03)	199.9 (7.87)

F12 – [ ] – [ ] [ ] – [ ] [ ] – [ ] – [ ] – [ ] – [ ]

Bent Axis Pump | Frame Size | Function | Main Ports | Mounting Flange | Shaft Seal | Shaft | Version Number | Option | Speed Sensor Option

Code	Displacement (cm^3/rev)
30	30.0
40	40.0
60	59.8
80	80.4
90	93.0
110	110.1
125	125.0

Code	Function
R	Pump, CW Rotation
L	Pump, CCW Rotation

Code	Main Ports	30	40	60	80	90	110	125
S	SAE Flange	x	x	x	x	x	x	x
U	SAE, UN Threads	x	x	x	–	–	x	x

Code	Mounting Flange	30	40	60	80	90	110	125
S	SAE 4 bolt	x	x	x	x	x	x	x
T	SAE 2 bolt	x	x	x	–	–	x	x
X	SAE D 4 bolt	–	–	–	x	x	–	–

NOTE: ISO and cartidge mounting also available. See catalog on CD.

Code	Shaft Seal	30	40	60	80	90	110	125
N	NBR*, Low Pressure	x	x	x	x	x	x	x
H	NBR*, High Pressure	x	x	x	x	x	x	x
V	FPM**, High Pressure, High Temperature	x	x	x	x	x	x	x

* NBR - Nitrile rubber
** FPM - Fluorocarbon rubber

Code	Shaft	30	40	60	80	90	110	125
S	SAE Spline (std)	x	x	x	x	x	x	x
U	SAE Spline (opt.)	–	–	–	x	x	–	–
T	SAE Key (std)	x	x	x	x	x	x	x

Code	Shaft	30	40	60	80	90	110	125
L01	Integr. Flushing Valve	x	x	x	x	x	–*	–*

* F12-110 accessory valve block. See page 36 of catalog on CD.

Code	Version Number
	Assigned by factory for special versions

Code	Speed Sensor
S	With Speed Sensor
P	Prepared for Speed Sensor

x: Available –: Not Available

F1

F1 Fixed Displacement Piston Pumps are widely used on truck applications with operating pressure up to 5000 PSI. These lightweight, efficient pumps were designed specifically for truck applications including cargo cranes, hook loaders, forest cranes and concrete mixer trucks.

(For T1 pump version see catalog on CD)

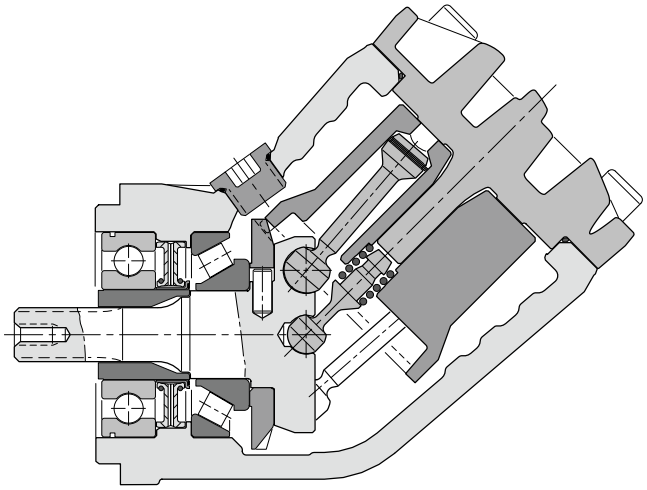
Pump Performance Data

Model Series	Displacement	Maximum Outlet Pressure	Rated Drive Speed	Theoretical Max Flow	Maximum Input Horsepower
F01-25	25.6 cc/r	5000 PSI	2600 RPM	16 GPM	39 HP
F01-41	40.9 cc/r	5000 PSI	2400 RPM	24 GPM	57 HP
F01-51	51.1 cc/r	5000 PSI	2200 RPM	28 GPM	67 HP
F01-61	59.5 cc/r	5000 PSI	2200 RPM	35 GPM	84 HP
F01-81	81.6 cc/r	5000 PSI	2000 RPM	43 GPM	102 HP
F01-101	102.9 cc/r	5000 PSI	1800 RPM	49 GPM	115 HP

DRIVEN Model Selection

DRIVEN Model	Rotation	Mounting	Shaft	Ports
F0125R-DRIVEN1	CW	DIN 4 Bolt	DIN Spline	Side, Flange
F0141R-DRIVEN1	CW	DIN 4 Bolt	DIN Spline	Side, Flange
F0151R-DRIVEN1	CW	DIN 4 Bolt	DIN Spline	Side, Flange
F0161R-DRIVEN1	CW	DIN 4 Bolt	DIN Spline	Side, Flange
F0181R-DRIVEN1	CW	DIN 4 Bolt	DIN Spline	Side, Flange
F01101R-DRIVEN1	CW	DIN 4 Bolt	DIN Spline	Side, Flange

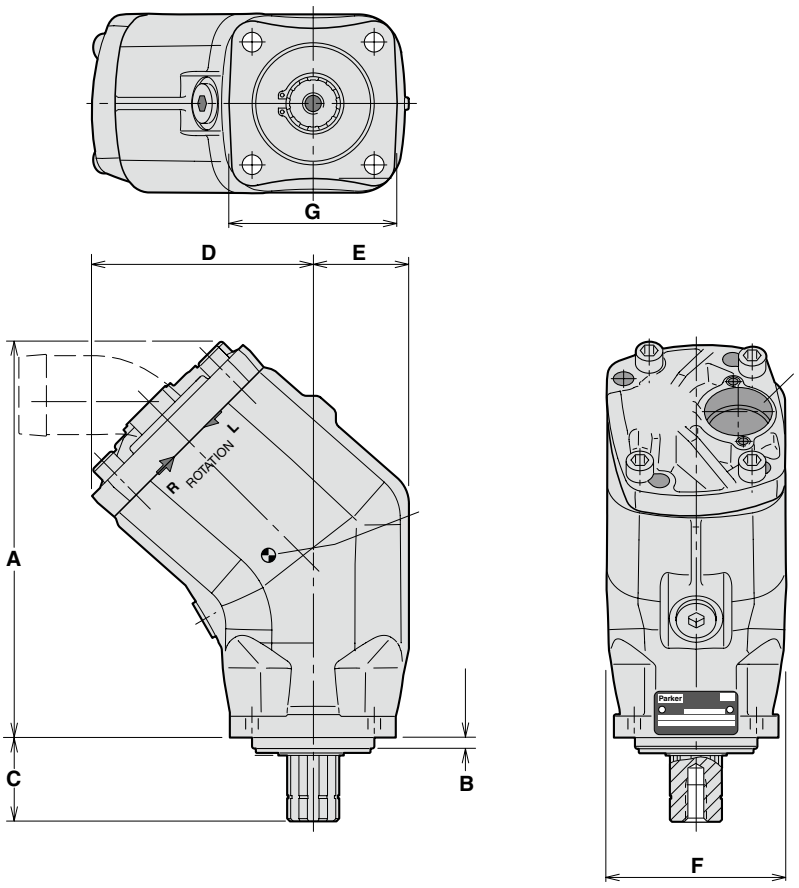
F1
Performance Characteristics



Features

- Higher selfpriming speeds
- Operating pressures to 400 bar
- New frame sizes to meet market requirements
- Higher overall efficiency
- Increased reliability
- Reduced noise level
- Smaller installation dimensions

F1



Dimensions, mm (inch)

Series	A	B	C	D	E	F	G
F1-25 F1-41 F1-51 F1-61	205 (8.07)	7 (0.27)	55 (2.17)	129.5 (5.10)	56.5 (2.22)	108 (4.25)	109 (4.29)
F1-81 F1-101	259 (10.20)	7 (0.27)	55 (2.17)	144 (5.67)	63 (2.48)	118 (4.65)	110 (4.33)

F1 – [ ] – [ ]

F1 – Fixed Displacenent Bent Axis Pump

Frame Size

Code	Size
25	25.6 cc/rev
41	40.9 cc/rev
51	51.1 cc/rev
61	59.5 cc/rev
81	81.6 cc/rev
101	102.9 cc/rev

Rotation

Code	Rotation
L	Left Hand (CCW)
R	Right Hand (CW)

NOTES:
1. Pressure port on 25, 41, 51 and 61 sizes is 3/4". Pressure port on 81 and 101 sizes is 1".
2. Suction fitting must be ordered separately.
3. Use seven digit number when placing order.

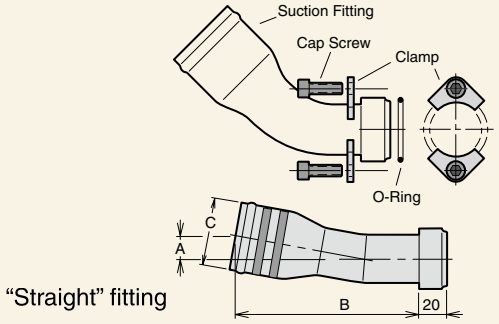
ISO/DIN mounting:

Ordering Code	Ordering No.
F1-25-R	378 1024
F1-25-L	378 1025
F1-41-R	378 1040
F1-41-L	378 1041
F1-51-R	378 1050
F1-51-L	378 1051
F1-61-R	378 1060
F1-61-L	378 1061
F1-81-R	378 1080
F1-81-L	378 1081
F1-101-R	378 1100
F1-101-L	378 1101

See CD for SAE mount versions

Suction Fittings

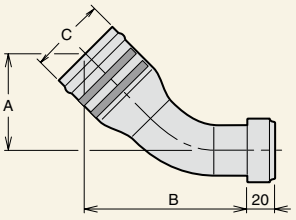
A suction fitting consists of a straight, 45°, 90° or 135° suction fitting, 2 clamps, 2 cap screws and an O-ring.



"Straight" fitting

Straight Suction Fittings

Ordering no.	A mm	B mm	C dia. mm (in.)
378 0635	0	85	38 *(1½")*
378 0636	17	136	50 *(2")*
378 0637	25	145	63 *(2½")*
378 0973	17	136	45
378 0974	17	136	48

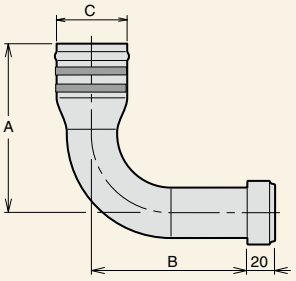


45° fitting

45° Suction Fittings

Ordering no.	A mm	B mm	C dia. mm (in.)
378 1234[1)]	60	104	32 *(1¼")*
378 0633[1)]	60	104	38 *(1½")*
378 0364[2)]	67	110	50 *(2")*
378 0634	75	117	63 *(2½")*
378 1062	67	110	40
378 0975	67	110	45
378 0965	67	110	48

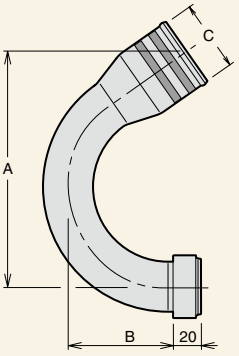
1) Suitable for frame size F1-25.
2) Suitable for pump sizes F1-41,-51,-61,-81 and -110.



90° fitting

90° Suction Fittings

Ordering no.	A mm	B mm	C dia. mm (in.)
378 0978	126	83	38 *(1½")*
378 0979	135	83	50 *(2")*
378 0976	135	83	45
378 0977	135	83	48
378 1980	147	103	63 *(2½")*



135° fitting

135° Suction Fitting

Ordering no.	A mm	B mm	C dia. mm (in.)
378 1867	166	73	50 *(2")*

F2

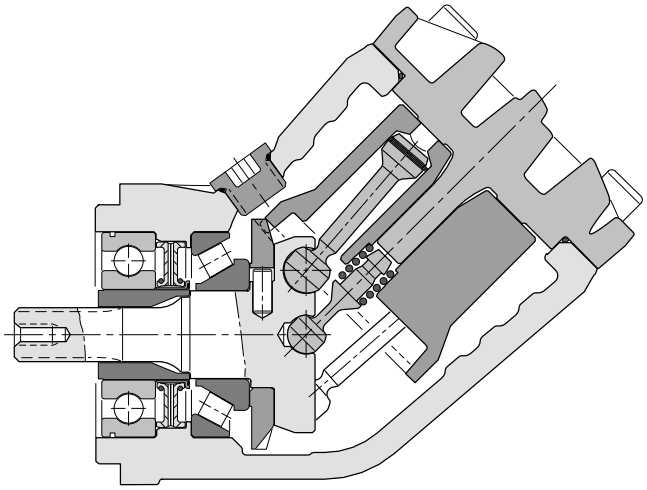
F2 Fixed Displacement Piston Pumps are widely used on truck applications with operating pressure up to 5000 PSI. These twin flow pumps provide two independent output flows with a single inlet in a compact package. These lightweight,efficient pumps were designed specifically for truck applications including cargo cranes, hook loaders, forest cranes and concrete mixer trucks.

Pump Performance Data

Model Series	Maximum Displacement	Outlet Pressure	Drive Speed	Flow** @ 1800 RPM Port A	Port B
F2-53/53	54/52 cc/rev*	5000 PSI	1800 RPM	25.5 GPM	24.8 GPM
F2-55/28	55/28 cc/rev*	5000 PSI	1800 RPM	26.1 GPM	13.3 GPM
F2-70/35	69/36 cc/rev*	5000 PSI	1800 RPM	32.7 GPM	17.2 GPM

*Port A/Port B
** Port A + Port B

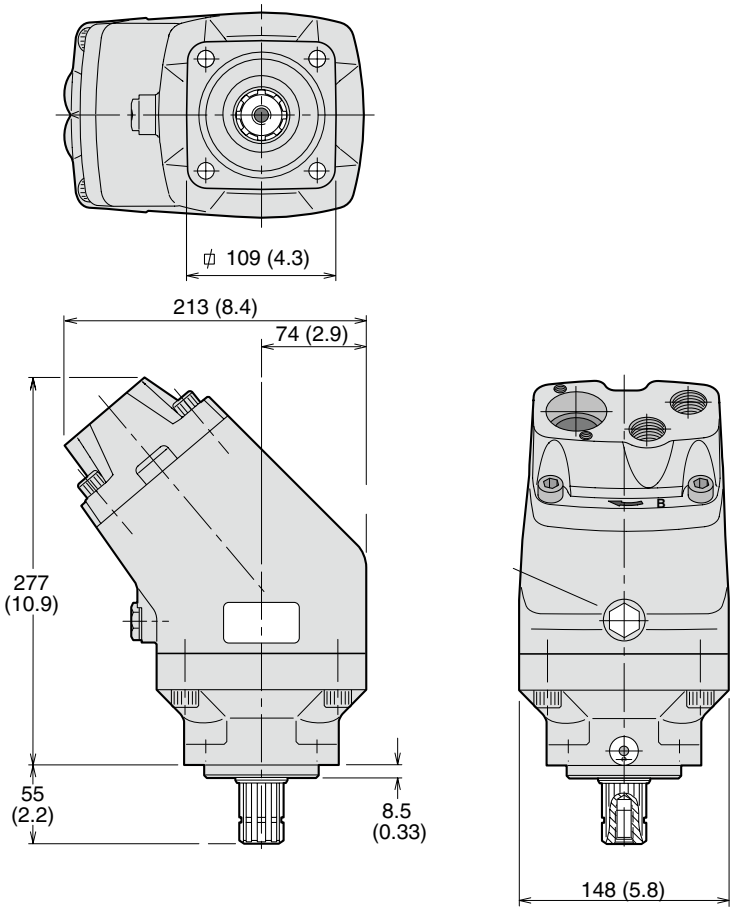
F2
Performance Characteristics



Features

- Two separate outlet flows with a single inlet
- Operating pressures to 6000 PSI intermittent
- Higher overall efficiency
- Increased reliability
- Low noise level
- Compact package that only weighs 42 lbs.

F2



F2 – [ ] – [ ]

- **F2**: Twin Flow Bent Axis Pump
- Frame Size:

Code
53/53
70/35
55/28

- Rotation:

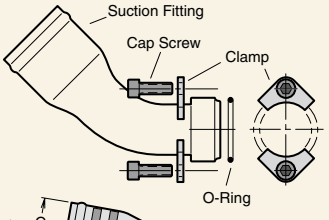
Code	Rotation
L	Left Hand (CCW)
R	Right Hand (CW)

NOTES:
1. Pressure port on 25, 41, 51 and 61 sizes is 3/4". Pressure port on 81 and 101 sizes is 1".
2. Suction fitting must be ordered separately.
3. Use seven digit number when placing order.

Ordering Code	Ordering No.
F2-53/53-R	378 1453
F2-53/53-L	378 1454
F2-70/35-R	378 1470
F2-70/35-L	378 1471
F2-55/28-R	378 4128
F2-55/28-L	378 4129

Suction Fittings

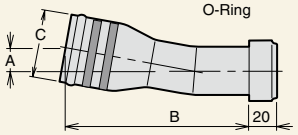
A suction fitting consists of a straight, 45°, 90° or 135° suction fitting, 2 clamps, 2 cap screws and an O-ring.



Straight Suction Fittings

Ordering no.	A mm	B mm	C dia. mm (in.)
378 0635	0	85	38 *(1½")*
378 0636	17	136	50 *(2")*
378 0637	25	145	63 *(2½")*
378 0973	17	136	45
378 0974	17	136	48

"Straight" fitting

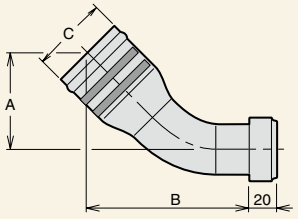


45° Suction Fittings

Ordering no.	A mm	B mm	C dia. mm (in.)
378 1234[1)]	60	104	32 *(1¼")*
378 0633[1)]	60	104	38 *(1½")*
378 0364[2)]	67	110	50 *(2")*
378 0634	75	117	63 *(2½")*
378 1062	67	110	40
378 0975	67	110	45
378 0965	67	110	48

1) Suitable for frame size F1-25.
2) Suitable for pump sizes F1-41,-51,-61,-81 and -110.

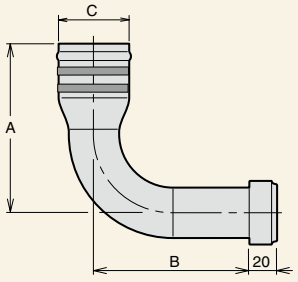
45° fitting



90° Suction Fittings

Ordering no.	A mm	B mm	C dia. mm (in.)
378 0978	126	83	38 *(1½")*
378 0979	135	83	50 *(2")*
378 0976	135	83	45
378 0977	135	83	48
378 1980	147	103	63 *(2½")*

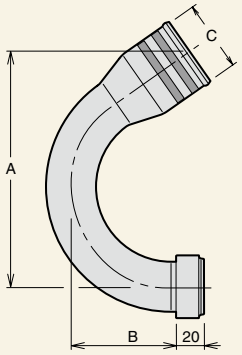
90° fitting



135° Suction Fitting

Ordering no.	A mm	B mm	C dia. mm (in.)
378 1867	166	73	50 *(2")*

135° fitting



Vane Pumps

Contents

Code	Size
25	25.6 cc/rev
41	40.9 cc/rev
51	51.1 cc/rev
61	59.5 cc/rev
81	81.6 cc/rev
101	102.9 cc/rev

Code	Rotation
L	Left Hand (CCW)
R	Right Hand (CW)

NOTES:
1. Pressure port on 25, 41, 51 and 61 sizes is 3/4". Pressure port on 81 and 101 sizes is 1".
2. Suction fitting must be

SDV Single

The SDV series are a fixed displacement vane pump ideal for low to mid pressure applications. Their compact design and low noise features make them well suited for filter carts, test stands and remote pilot pumps.

Pump Performance Data

Series SDV10	-1	-2	-3	-4	-5	-6	-7
Displacement (cm3/rev) (in3/rev)	3.3 0.2	6.6 0.4	9.8 0.6	13.1 0.8	16.4 1.0	19.5 1.2	22.8 1.4
Max. continuous pressure (bar) (PSI)	175 2500	175 2500	175 2500	175 2500	175 2500	150 2200	140 2000
Max. speed (rpm)	1800	1800	1800	1800	1800	1800	1800

Series SDV20	-6	-7	-8	-9	-11	-12	-13
Displacement (cm3/rev) (in3/rev)	19.5 1.2	22.8 1.4	26.5 1.6	29.7 1.8	36.4 2.2	39.0 2.4	42.4 2.6
Max. continuous pressure (bar) (PSI)	175 2500	175 2500	175 2500	175 2500	175 2500	150 2200	150 2200
Max. speed (rpm)	1800	1800	1800	1800	1800	1800	1800

DRIVEN Model Selection

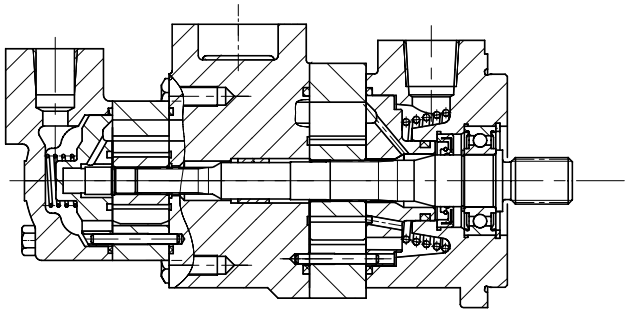
DRIVEN Order Code	Mounting	Ports	Rotation	Shaft
SDV-10410-1/A	SAE A 2-Bolt Flange	NPTF Thread	CW	Straight Keyed
SDV-10610-1/A	SAE A 2-Bolt Flange	NPTF Thread	CW	Straight Keyed
SDV-20310-1/A	SAE A 2-Bolt Flange	NPTF Thread	CW	Straight Keyed

SDV Single Performance Characteristics

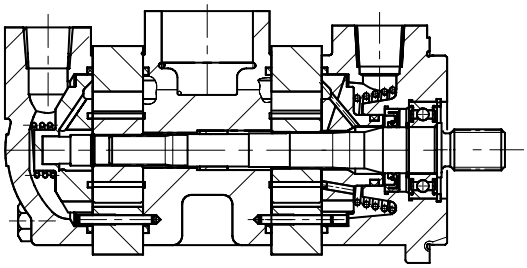
Features/Benefits

- Two compact frame sizes to choose from
- Low noise
- 100% tested
- Easy to convert or repair

SDV10



SDV20

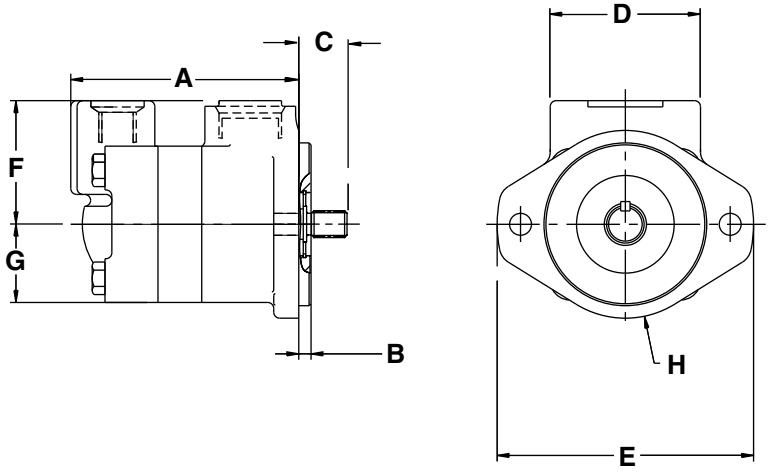


SDV10	Output Flow (l/min)		Output Flow (GPM)		Input Power (kW)		Input Power (HP)	
Size	0 bar	150 bar	0 PSI	2000 PSI	7 bar	150 bar	80 PSI	2500 PSI
1	6.1	3.8	1.6	1.0	0.1	1.4	0.14	1.93
2	11.7	9.8	3.1	2.6	0.2	3.6	0.28	4.83
3	17.8	15.5	4.7	4.1	0.3	5.7	0.41	7.65
4	23.5	20.1	6.2	5.3	0.4	7.4	0.55	9.87
5	29.5	98.8	7.8	26.1	0.5	9.5	0.69	12.77
6	35.2	31.0	9.3	8.2	0.6	11.3	0.82	15.11
7	40.9	36.7	10.8	9.7	0.7	13.4	0.96	18.01

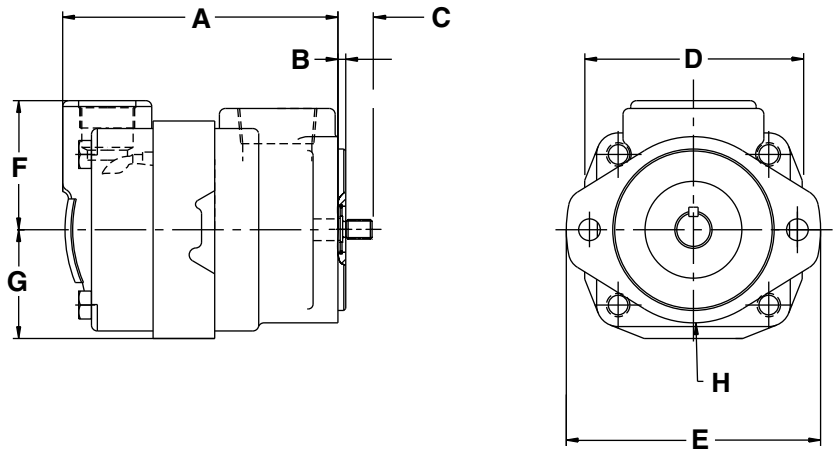
SDV20	Output Flow (l/min)		Output Flow (GPM)		Input Power (kW)		Input Power (HP)	
Size	0 bar	150 bar	0 PSI	2000 PSI	7 bar	150 bar	80 PSI	2500 PSI
6	35.1	31.5	9.27	8.32	0.5	10.8	0.7	14.5
7	41.0	35.7	10.84	9.42	0.7	12.2	0.9	16.4
8	47.7	42.3	12.60	11.18	0.7	14.5	1.0	19.5
9	53.4	48.1	14.12	12.70	0.8	16.5	1.1	22.1
11	65.5	62.1	17.31	16.41	1.0	21.3	1.4	28.6
12	70.2	66.0	18.55	17.44	1.1	22.7	1.5	30.4
13	76.3	72.1	20.16	19.05	0.9	24.8	1.2	33.2

SDV Single

SDV10



SDV20



Dimensions, mm (inch)

Ring Size	A*	B	C Max	D	ØE	F	G	ØH
SDV10	115.6 (4.55) to 127.0 (5.00)	6.35 (0.250)	44.4 (1.75)	76.2 (3.00)	130.00 (5.12)	62.7 (2.47)	38.1 (1.50)	95.2 (3.75)
SDV20	125.2 (4.93) to 140.2 (5.52)	4.4 (0.173)	67.6 (2.66)	111.2 (4.38)	130.00 (5.12)	66.0 (2.60)	55.6 (2.19)	95.2 (3.75)

* Depending on ring size

SDV		–						–				
Light Duty Vane Pump	Series		Mounting	Inlet Port	Ring Size	Outlet Port		Shaft	Position of Outlet Port	Rotation

Code	Series
10	Size 10, 1-7 GPM
20	Size 20, 6-13 GPM

Code	Mounting
1	2 Bolt Flange, 3-1/4 Pilot SAE A

Code	Inlet Port Connection	
	SDV10	SDV20
P	1" NPTF Thread	1 1/4" NPTF Thread
S	1 5/16"-12 UNF-2B Thread	1 5/8"-12 UNF-2B Thread
B	G1" (BSPP)	G1¼" (BSPP)

Code	Ring Size ***
1*	1 GPM
2*	2 GPM
3*	3 GPM
4*	4 GPM
5*	5 GPM
6	6 GPM
7	7 GPM
8**	8 GPM
9**	9 GPM
10**	10 GPM
11**	11 GPM
12**	12 GPM
13**	13 GPM

* SDV10 only
** SDV20 only
*** Delivery at 1200 RPM and 100 PSI

Code	Shaft
1	Straight Keyed
11	Splined
38	11 Teeth - 3/4" OD
62*	Splined

* SDV20 only

Code	Rotation*
Omit	CW
L	CCW

* As viewed from shaft end.

Code	Position of Outlet Port*
A	Opposite Inlet Port
B	90° CCW from Inlet
C	In Line with Inlet
D	90° CW from Inlet

* Viewed from cover end of pump

Code	Outlet Port Connection	
	SDV10	SDV20
P	1/2" NPTF Thread	3/4" NPTF Thread
S	3/4"-16 UNF-2B Thread	1 1/16"-12 UNF-2B Thread
B	G1/2" (BSPP)	G3/4" (BSPP)

SDV Double

The SDV series are a fixed displacement vane pump, ideal for low to mid pressure applications. The double pump provides the flexibility of two different displacements within one housing. The compact design and low noise features make them well suited for filter carts, test stands, remote pilot pumps, and for hi/lo circuits.

Pump Performance Data

Series SDV2010	-7	-8	-9	-11	-12	-13
Displacement* (cm3/rev) (in3/rev)	26.1 - 45.6 1.6 - 2.8	29.8 - 49.3 1.8 - 3.0	33.0 - 52.5 2.0 - 3.2	39.7 - 59.2 2.4 - 3.6	42.3 - 61.8 2.6 - 3.8	45.7 - 65.2 2.8 - 4.0
Max. continuous pressure (bar) (PSI)	175 2500	175 2500	175 2500	175 2500	150 2200	150 2200
Max. speed (rpm)	1800	1800	1800	1800	1800	1800

* Range calculated by adding displacement for SDV20 to range of displacements for SDV10.

Series SDV2020	-7	-8	-9	-11	-12	-13
Displacement* (cm3/rev) (in3/rev)	42.3 - 52.5 2.6 - 3.2	46.0 - 56.2 2.8 - 3.4	49.2 - 59.4 3.0 - 3.6	55.9 - 72.8 3.4 - 4.4	58.5 - 75.4 3.6 - 4.6	61.9 - 78.8 3.8 - 4.8
Max. continuous pressure (bar) (PSI)	175 2500	175 2500	175 2500	175 2500	150 2200	150 2200
Max. speed (rpm)	1800	1800	1800	1800	1800	1800

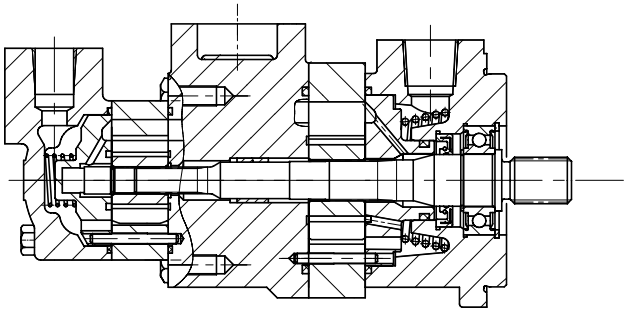
* Range calculated by adding displacement for SDV20 (shaft end) to range of SDV20 (cover end).

SDV Double Performance Characteristics

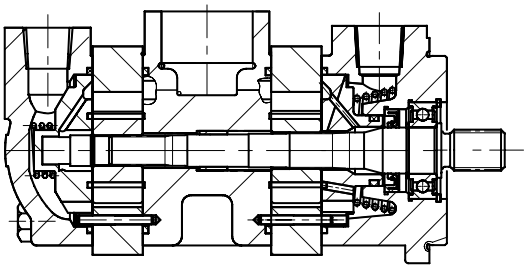
Features/Benefits

- Two compact frame sizes to choose from
- Low noise
- 100% tested
- Easy to convert or repair

SDV2010



SDV2020

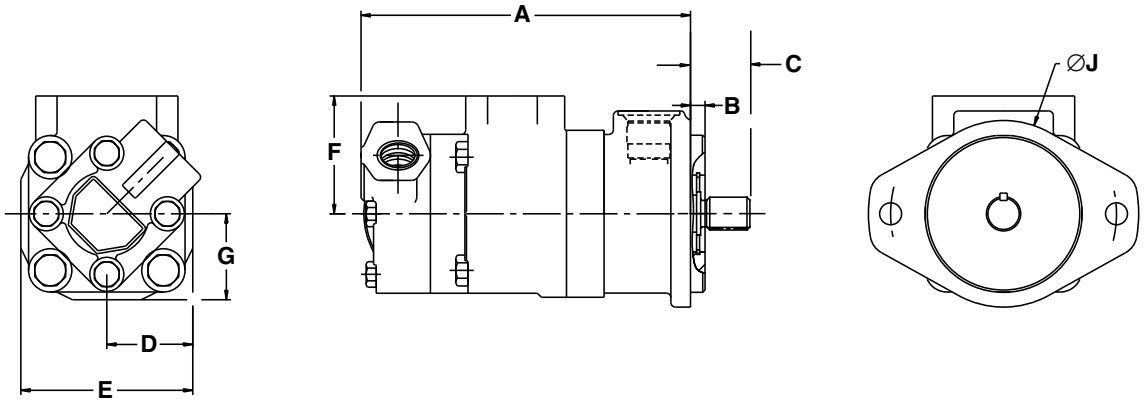


SDV10	Output Flow (l/min)		Output Flow (GPM)		Input Power (kW)		Input Power (HP)	
Size	0 bar	150 bar	0 PSI	2000 PSI	7 bar	150 bar	80 PSI	2500 PSI
1	5.9	3.9	1.6	1.0	0.10	1.44	0.14	1.93
2	11.9	9.9	3.1	2.6	0.21	3.60	0.28	4.83
3	17.6	15.6	4.7	4.1	0.31	5.70	0.41	7.65
4	23.6	20.2	6.2	5.3	0.41	7.36	0.55	9.87
5	29.5	26.1	7.8	26.1	0.51	9.52	0.69	12.77
6	35.1	30.9	9.3	8.2	0.61	11.27	0.82	15.11
7	41.0	36.8	10.8	9.7	0.71	13.43	0.96	18.01

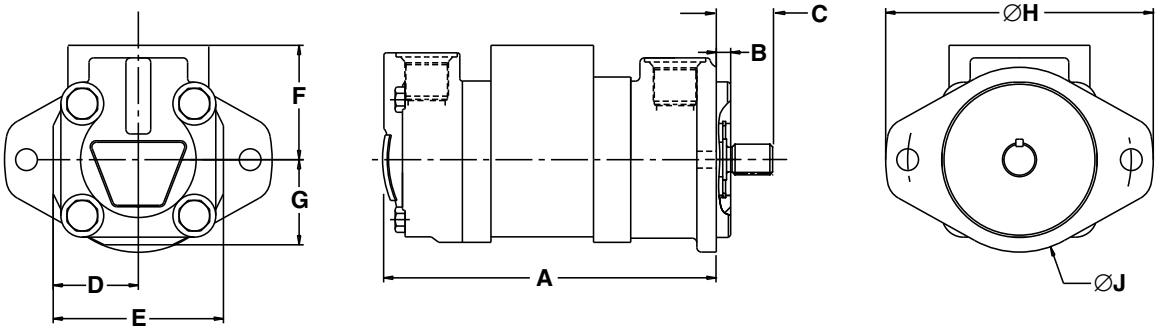
SDV20	Output Flow (l/min)		Output Flow (GPM)		Input Power (kW)		Input Power (HP)	
Size	0 bar	150 bar	0 PSI	2000 PSI	7 bar	150 bar	80 PSI	2500 PSI
6	35.1	31.5	9.27	8.32	0.50	10.80	0.7	14.5
7	41.0	35.6	10.84	9.42	0.60	12.20	0.9	16.4
8	47.7	42.3	12.60	11.18	0.70	14.50	1.0	19.5
9	53.5	48.1	14.12	12.70	0.80	16.50	1.1	22.1
11	65.5	62.1	17.31	16.41	1.00	21.30	1.4	28.6
12	70.2	66.0	18.55	17.44	1.10	22.60	1.5	30.4
13	76.3	72.1	20.16	19.05	1.20	24.70	1.2	33.2

SDV Double

SDV2010



SDV2020



Dimensions, mm (inch)

Ring Size	A*	B	C	D	E	F	G	ØH	ØJ
SDV2010	213.1 (8.39) to 232.9 (9.17)	9.4 (0.37)	58.7 (2.31)	55.6 (2.19)	111.2 (4.38)	76.2 (3.00)	55.6 (2.19)	174.8 (8.88)	120.7 (4.75)
SDV2020	213.6 (8.41) to 233.4 (9.19)	9.4 (0.37)	58.7 (2.31)	55.6 (2.19)	111.2 (4.38)	74.7 (2.94)	55.6 (2.19)	174.8 (8.88)	120.7 (4.75)

* Depending on ring size

SDV		–										–	
Light Duty Vane Pump	Series		Mounting	Inlet Port	Shaft End Pump Ring Size	No. 1 Outlet Port (Shaft End)	Cover End Pump Ring Size	No. 2 Outlet Port (Cover End)	Shaft	Position of Outlet Ports			Rotation

Code	Series
2010	SDV20/SDV10 Combination
2020	SDV20/SDV20 Combination

Code	Mounting
1	2 Bolt Flange, 4" Pilot (Standard)
6*	2 Bolt Flange, 3¼" Pilot

* Available on SDV2020 only.

Code	Inlet Port Connection	
	SDV2010	SDV2020
F	4 Bolt Flange 1½" Dia.	4 Bolt Flange 2" Dia.

Code	Shaft End Pump Ring Size*
7	7 GPM
8	8 GPM
9	9 GPM
11	11 GPM
12	12 GPM
13	13 GPM

* Delivery at 1200 RPM and 100 PSI.

Code	Shaft End Pump Outlet Port
S	1 1/16"-12 UNF-2B Thread
B	G3/4" BSPP

Code	Ring Size ***
1*	1 GPM
2*	2 GPM
3*	3 GPM
4*	4 GPM
5*	5 GPM
6	6 GPM
7	7 GPM
8**	8 GPM
9**	9 GPM
11**	11 GPM

* SDV2010 only
** SDV2020 only
*** Delivery at 1200 RPM and 100 PSI

Code	Cover End Pump Outlet Port	
	SDV2010	SDV2020
S	3/4"-16 UNF-2B Thread	1 1/16"-12 UNF-2B Thread
B	G1/2" (BSPP)	G3/4" (BSPP)

Code	Shaft
1	Straight Keyed
11	Splined

Code	Position of Outlet Port No. 1*
A	Opposite Inlet Port
B	90° CCW from Inlet
C	In Line with Inlet
D	90° CW from Inlet

* Viewed from cover end of pump

Code	Position of Outlet Port No. 2*
A	135° CCW from Inlet
B	45° CCW from Inlet
C	45° CW from Inlet
D	135° CW from Inlet

* Viewed from cover end of pump

Code	Rotation*
Omit	CW
L	CCW

* As viewed from shaft end.

T Series Single

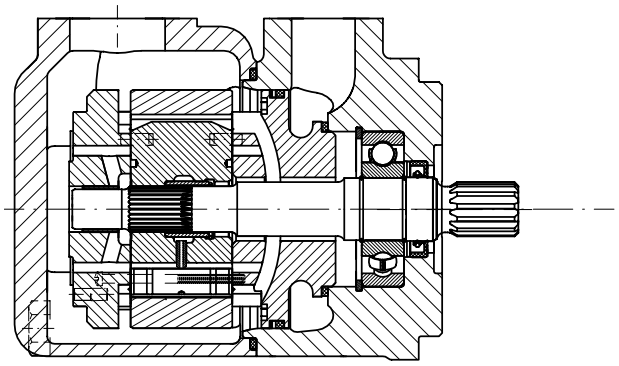
The T series fixed displacement vane pump is the highest performance pump of its kind. The balanced design and double lip vane technology are key features in providing a contamination resistant and reliable pump. High pressure and speed capabilities, extremely low noise, and a cartridge designed to prime in cold weather conditions, make this fluid power source ideal for Mobile applications.

Pump Performance Data

Single Pump Model Series	Displacement, cc/rev*	Max. Outlet Pressure**	Rated Drive Speed**	Flow @1800 RPM and 0 PSI*	Input Horsepower @ 1800 RPM and 2000 PSI*
T6CM	10.8 - 100	4000 PSI	2800 RPM	5.14 - 47.56 GPM	8.45 - 57.95 HP
T6DM	47.5 - 158	3500 PSI	2500 RPM	22.64 - 75.14 GPM	29.31 - 90.58 HP
T6EM	132.3 - 227	3500 PSI	2200 RPM	62.92 - 108.00 GPM	78.44 - 129.09 HP

* Available range based on various combinations of displacements

**Lower for larger displacements. See catalog.



Features/Benefits

- Mobile cartridge designed for cold start-ups
- Wide range of displacements
- Low noise provides machine operator safety
- Speed range from 400 to 2800 rpm
- Large flow within a small envelope
- Double shaft seal option allows direct mounting to gearboxes

T Series Single Performance Characteristics

T6CM/CP	Output Flow (lpm) @ 1800 RPM			Output Flow (GPM) @ 1800 RPM			Input Power (kW)			Input Power (HP)		
Size**	0 bar	140 bar	280 bar	0 PSI	2000 PSI	3500 PSI	7 bar	140 bar	280 bar	100 PSI	2000 PSI	3500 PSI
B03	19.3	13.6	#VALUE	5.1	3.6	–	1.6	6.3	#VALUE	2.1	8.5	–
B05	31.0	25.0	21.2	8.2	6.6	5.6	1.7	8.9	14.6	2.3	12.0	19.6
B06	38.2	32.6	28.4	10.1	8.6	7.5	1.8	10.7	17.6	2.4	14.3	23.6
B08	47.3	41.6	37.5	12.5	11.0	9.9	1.9	12.8	21.3	2.5	17.1	28.5
B10	61.3	55.6	51.5	16.2	14.7	13.6	2.1	16.0	26.8	2.8	21.4	36.0
B12	66.6	60.9	56.8	17.6	16.1	15.0	2.1	17.2	29.0	2.8	23.1	38.9
B14	82.9	76.8	73.1	21.9	20.3	19.3	2.3	20.9	35.5	3.1	28.0	47.6
B17	104.8	99.2	95.0	27.7	26.2	25.1	2.5	26.0	44.4	3.4	34.8	59.5
B20	114.7	109.0	103.7	30.3	28.8	27.4	2.7	28.3	48.4	3.6	37.9	64.9
B22	126.4	120.7	116.6	33.4	31.9	30.8	2.8	30.9	53.1	3.8	41.5	71.2
B25	142.7	137.0	132.9	37.7	36.2	35.1	3.0	34.7	59.6	4.0	46.5	79.9
B28	159.8	154.1	151.0	42.23	40.7	39.9	3.2	38.6	57.2	4.3	51.7	76.7
B31	180.0	174.1	171.5	47.56	46.0	45.3	3.4	43.3	64.2	4.6	58.0	86.1

** T6CP not available in sizes B03 through B12

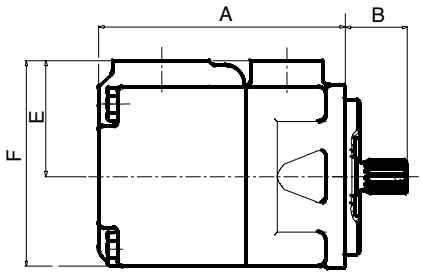
T6DM	Output Flow (lpm) @ 1800 RPM			Output Flow (GPM) @ 1800 RPM			Input Power (kW)			Input Power (HP)		
Size	0 bar	140 bar	300 bar	0 PSI	2000 PSI	3500 PSI	7 bar	140 bar	300 bar	100 PSI	2000 PSI	3500 PSI
B14	85.5	77.2	71.2	22.6	20.4	18.8	3.0	21.9	36.8	4.0	29.3	49.3
B17	104.8	96.5	90.5	27.7	25.5	23.9	3.2	26.2	44.4	4.3	35.2	59.6
B20	118.9	110.5	104.5	31.4	29.2	27.6	3.4	29.5	50.1	4.5	39.5	67.2
B24	143.1	134.7	128.7	37.8	35.6	34.0	3.7	35.0	59.9	4.9	47.0	80.3
B28	161.6	153.3	146.9	42.7	40.5	38.8	3.9	39.3	67.3	5.2	52.7	90.2
B31	176.8	168.8	162.4	46.7	44.6	42.9	4.0	42.8	73.5	5.4	57.4	98.6
B35	199.8	191.5	185.5	52.8	50.6	49.0	4.3	48.1	82.7	5.8	64.5	110.9
B38	216.5	208.2	202.1	57.2	55.0	53.4	4.5	52.0	89.4	6.0	69.7	119.9
B42	244.9	236.6	230.5	64.7	62.5	60.9	4.8	58.5	100.8	6.5	78.4	135.2
B45	262.3	254.0	247.9	69.3	67.1	65.5	5.0	62.4	107.8	6.7	83.7	144.6
B50	284.3	276.3	271.8	75.1	73.0	71.8	5.3	67.6	100.3	7.1	90.6	134.5

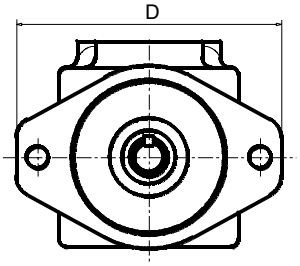
T6EM	Output Flow (lpm) @ 1800 RPM			Output Flow (GPM) @ 1800 RPM			Input Power (kW)			Input Power (HP)		
Size	0 bar	140 bar	240 bar	0 PSI	2000 PSI	3500 PSI	7 bar	140 bar	300 bar	100 PSI	2000 PSI	3500 PSI
042	238.1	228.6	221.4	62.9	60.4	58.5	6.0	58.5	84.9	8.1	78.4	113.8
045	256.2	246.8	239.6	67.7	65.2	63.3	5.1	61.2	105.5	6.9	82.1	141.5
050	285.4	275.5	268.7	75.4	72.8	71.0	5.4	67.9	117.2	7.3	91.0	157.2
052	296.7	286.9	280.1	78.4	75.8	74.0	5.6	70.5	121.8	7.5	94.5	163.3
062	353.9	344.4	337.2	93.5	91.0	89.1	6.3	83.7	144.9	8.4	112.2	194.3
066	383.8	374.3	367.1	101.4	98.9	97.0	6.6	90.5	156.9	8.8	121.4	210.4
072	408.8	399.3	392.1	108.0	105.5	103.6	6.9	96.3	166.9	9.2	129.1	223.8

Note: See catalog on CD for additional cartridge options and specific displacement operating parameters.

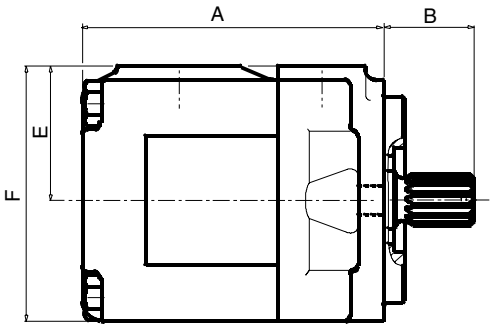
T Series Single

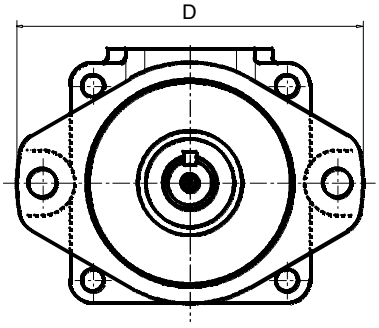
T6CM



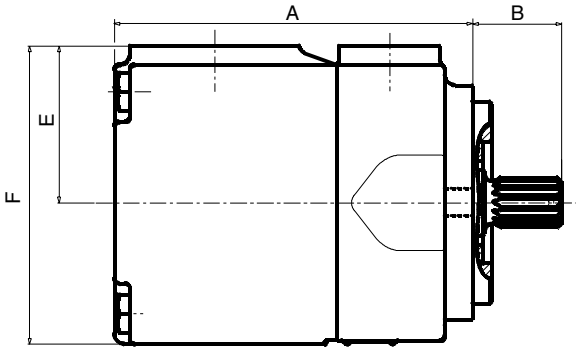


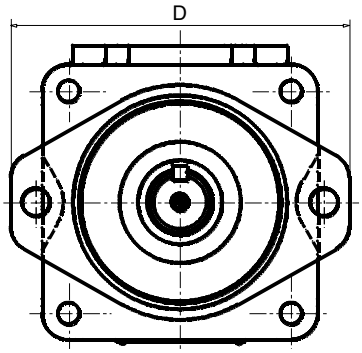
T6DM





T6EM





Dimensions, mm (inch)

Series	A	B	D	E	F	weight, kg (lb)
T6CM	161.5 (6.36)	71.4 (2.81)	174.5 (6.87)	76.2 (3.00)	134.9 (5.31)	15.5 (34.0)
T6DM	184.9 (7.28)	83.6 (3.29)	212.3 (8.36)	82.6 (3.25)	156.7 (6.17)	24.0 (53.0)
T6EM	225.3 (8.87)	90.9 (3.58)	213.1 (8.39)	98.6 (3.88)	187.5 (7.38)	43.4 (95.4)

T		–		–				–			
High Performance Vane Pump	Series		Delivery		Shaft	Rotation	Porting		Design Level	Seal Class	Modifications (Code entered at factory)

Code	Description
6CM	Size C, Mobile 1 Shaft Seal
6CP	Size C, Mobile 2 Shaft Seals
6DM	Size D, Mobile 1 Shaft Seal
6DP	Size D, Mobile 2 Shaft Seals
6EM	Size E, Mobile 1 Shaft Seal
6EP	Size E, Mobile 2 Shaft Seals

Code	Rotation*
R	CW
L	CCW

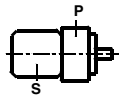
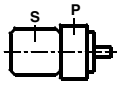
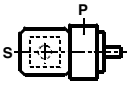
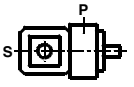
* As viewed from shaft end.

Code	Seal Class
1	S1 (Buna N)
4	S4 (EPDM)
5	S5 (VITON)

Code	Design Level
A	T6CP only
B	T6EM, T6EP
C	All Others

Code	Shaft Type			
	6CM	6CP	6DM, 6DP	6EM, 6EP
1	Keyed SAE B		Keyed SAE C	Keyed SAE CC
2	Keyed (non SAE)	Keyed (non SAE)	Keyed (non SAE)	Keyed (non SAE)
3	Splined SAE B	Splined SAE C	Splined***	Splined***
4	Splined SAE BB		Splined (non SAE)	Splined SAE CC
T			Splined SAE J718c	Splined SAE J718c

* SAE C for 6*M, non SAE for 6*P

Code	Porting Combinations*
00	
01	
02	
03	

* P = Pressure Port; S = Suction Port

6C Codes	Deivery** (GPM)	6D Codes	Delivery ** (GPM)	6E Codes	Delivery** (GPM)
B03*	3.42	B14	15.09	042	41.94
B05*	5.45	B17	18.45	045	46.15
B06*	6376	B20	20.93	050	50.25
B08*	8.36	B24	25.20	052	52.25
B10*	10.81	B28	28.44	062	62.36
B12*	11.76	B31	31.16	066	67.62
B14	14.58	B35	35.19	072	72.00
B17	18.48	B38	38.14		
B20	20.23	B42	43.12		
B22	22.28	B45	46.19		
B25	25.14	B50	50.09		
B28	27.90				
B31	31.70				

* Not available on T6CP
** At 0 PSI and 1200 RPM

Pumps are also available in thru-drive version. See Catalog on CD.

= Not Available

T Series Double

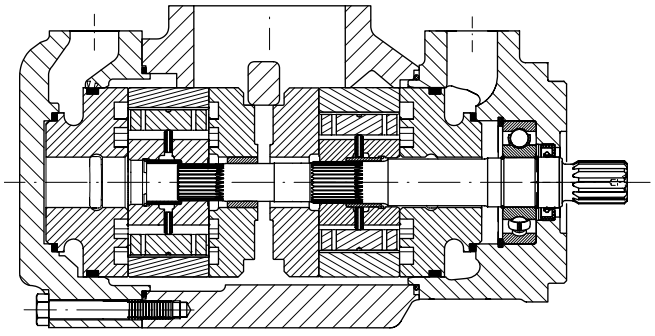
The high performance T Series fixed displacement vane pumps have been specially designed to provide high flows within a small envelope. The balanced design and double lip vane technology are key features in providing a contamination resistant and reliable pump. High pressure and speed capabilities, extremely low noise, and a cartridge designed to prime in cold weather conditions, make this fluid power source ideal for Mobile applications.

Pump Performance Data

Double Pump Model Series	Displacement, cc/rev*	Max. Outlet Pressure**	Rated Drive Speed	Flow @1800 RPM and 0 PSI*	Input Horsepower @ 1800 RPM and 2000 PSI*
T6CCM	21.6 - 200	4000 PSI	2800 RPM	10.3 - 95.1 GPM	16.9 - 115.9 HP
T6DCM	58.3 - 258	4000 PSI	2500 RPM	27.8 - 122.7 GPM	37.8 - 148.5 HP
T6ECM	143.1 - 327	4000 PSI	2200 RPM	68.1 - 155.6 GPM	86.9 - 187.0 HP
T6EDM	179.7 - 385	3500 PSI	2200 RPM	85.5 - 183.1 GPM	107.7 - 219.7 HP

* Available range based on various combinations of displacements
**Lower for larger displacements. See catalog.

T Series Double Performance Characteristics

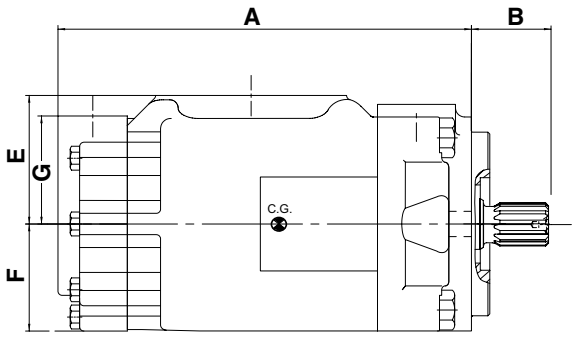


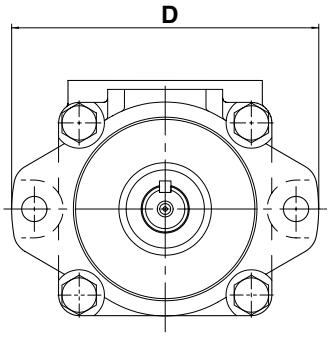
Features/Benefits

- Low noise
- SAE or ISO standards
- One-piece shaft (no internal torque limitations)
- One inlet
- 32 porting orientations available
- Wide displacement possibility
- High power to weight ratio
- Wide range of options for shafts, threads and pilots
- Mobile cartridge design for cold start conditions

Refer back to tables on pages 56

T Series Double
Performance Characteristics





Dimensions, mm (inch)

Series	A	B max	D	E	F	weight, kg (lb)
T6CCM	265.7 (10.46)	71.4 (2.81)	174.5 (6.87)	84.1 (3.31)	73.2 (2.88)	26.0 (57.3)
T6DCM	286.0 (11.26)	83.6 (3.29)	212.3 (8.36)	88.9 (3.50)	74.2 (2.92)	36.7 (80.7)
T6ECM	331.7 (13.06)	90.9 (3.58)	213.1 (8.39)	102.4 (4.03)	88.9 (3.50)	55.0 (121.0)
T6EDM	361.2 (14.22)	90.9 (3.58)	213.1 (8.39)	102.4 (4.03)	88.9 (3.50)	66.1 (145.5)

Vane Pumps
Model Ordering Code

T				–		–		–				–			–		
High Performance Vane Pump	Size	Shaft Seal	Severe Duty Shaft		Delivery (P1)		Delivery (P2)		Shaft	Rotation	Porting		Design Level	Seal Class		Mounting w/Connection Variables (T6CC only)	Modifications (Code entered at factory)

Code
6CC
6DC
6EC
6ED

Code	Severe Duty
Omit	Standard
W*	Severe Duty

* Available on T6CCM and T6DCM only.

Code	Shaft Seal
M	Mobile 1 Seal
P	Mobile 2 Seals

Code	Porting Combinations*
00	Standard

* Many other combinations are available. See catalog on CD.

Code	Rotation*
R	CW
L	CCW

* As viewed from shaft end.

Code	Seal Class
1	S1 (Buna N)
4	S4 (EPDM)
5	S5 (VITON)

Code	Design Level
D	T6CC only
C	All Others

Size	Delivery (See Table Below)	
	P1	P2
6CC	Use Codes for 6C	Use Codes for 6C
6DC	Use Codes for 6D	Use Codes for 6C
6EC	Use Codes for 6E	Use Codes for 6C
6ED	Use Codes for 6E	Use Codes for 6D

Code	Shaft (See catalog on CD for severe duty options)				
	6CCM	6CCP	6DCM	6DCP 6ECP, 6EDP	6ECM 6EDM
1	Keyed (non SAE)		Keyed SAE C		Keyed SAE CC
2			Keyed (non SAE)		Keyed (non SAE)
3	Splined SAE BB	Splined (non SAE)	Splined SAE C	Splined (non SAE)	Splined SAE C
4		Splined SAE BB	Splined (non SAE)		Splined SAE CC
5	Splined SAE B				
6		Splined (non SAE)			
T					Splined SAE J718c

Delivery

6C Codes	Deivery* (GPM)	6D Codes	Delivery * (GPM)	6E Codes	Delivery* (GPM)
B03	3.42	B14	15.09	042	41.94
B05	5.45	B17	18.45	045	46.15
B06	6376	B20	20.93	050	50.25
B08	8.36	B24	25.20	052	52.25
B10	10.81	B28	28.44	062	62.36
B12	11.76	B31	31.16	066	67.62
B14	14.58	B35	35.19	072	72.00
B17	18.48	B38	38.14		
B20	20.23	B42	43.12		
B22	22.28	B45	46.19		
B25	25.14	B50	50.09		
B28	27.90				
B31	31.70				

* At 0 PSI and 1200 RPM

Code	Connection Variables T6CC		
	P1	P2	S
00	1"	1"	3"
01	1"	3/4"	3"
10	1"	1"	2 1/2"
11	1"	3/4"	2 1/2"

P = Pressure Port; S = Suction Port

= Not Available

T Series Triple

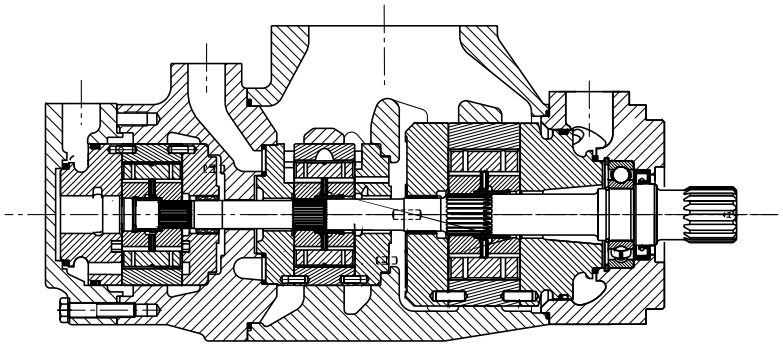
The high performance T Series fixed displacement vane pumps have been specially designed to provide high flows within a small envelope. The balanced design and double lip vane technology are key features in providing a contamination resistant and reliable pump. High pressure and speed capabilities, extremely low noise, and a cartridge designed to prime in cold weather conditions, make this fluid power source ideal for Mobile applications.

Pump Performance Data

Triple Pump Model Series	Displacement, cc/rev*	Max. Outlet Pressure**	Rated Drive Speed	Flow @1800 RPM and 0 PSI*	Input Horsepower @ 1800 RPM and 2000 PSI*
T6DCCM	69.1 - 358	4000 PSI	2500 RPM	32.9 - 170.3 GPM	46.2 - 206.5 HP
T6EDCM/S	190.5 - 485	4000 PSI	2200 RPM	90.7 - 230.7 GPM	116.2 - 277.6 HP

* Available range based on various combinations of displacements
** Lower for larger displacements. See catalog

T Series Triple Performance Characteristics

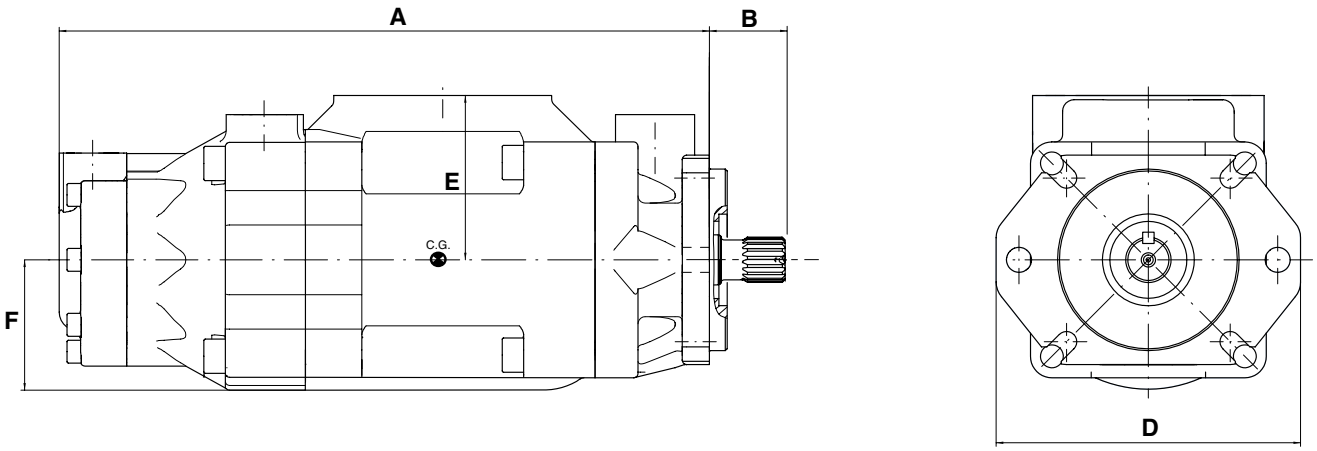


Refer back to tables on pages 56

Features/Benefits

- Low Noise
- SAE or ISO standards
- One-piece shaft (no internal torque limitations)
- One inlet
- 128 porting orientations available
- Many displacement combinations per stage
- High power to weight ratio
- Wide range of options for shafts, threads and pilots
- Mobile cartridge design for cold start conditions

T Series Triple



Dimensions, mm (inch)

Series	A	B max	D	E	F	weight, kg (lb)
T6DCC	403.9 (15.90)	89.7 (3.53)	212.3 (8.36)	127.0 (5.00)	85.1 (3.35)	61.1 (134.5)
T6EDC	467.9 (18.42)	100.1 (3.94)	273.1 (10.75)	–	–	100.2 (220.4)

T		–		–		–		–				–			–		–	
High Performance Vane Pump	Size		Delivery (P1)		Delivery (P2)		Delivery (P3)		Shaft	Rotation	Porting		Design Level	Seal Class		Mounting with Connection Variable		Modifications (Code entered at factory)

Code
6DCCM
6EDCS
6EDCM

Note: T6EDCS (SAE pilot)
T6EDCM (ISO pilot)

Code	Porting Combinations*
00	Standard

* Many other combinations are available. See catalog on CD.

Code	Seal Class
1	S1 (Buna N)
4	S4 (EPDM)
5	S5 (VITON)

Code	Rotation*
R	CW
L	CCW

* As viewed from shaft end.

Code	Design Level
A	6EDC
B	6DCC

Size	Delivery (See Table Below)		
	P1	P2	P3
6DCCM	Use Codes for 6D	Use Codes for 6C	Use Codes for 6C
6EDCS 6EDCM	Use Codes for 6E	Use Codes for 6D	Use Codes for 6C

Code	Shaft		
	6DCCM	6EDCM	6EDCS
1	Keyed (non SAE)	Keyed ISO G45N - 3019-2	
2	Keyed SAE CC		Keyed SAE D&E
3	Splined SAE C	Splined SAE D&E	Splined SAE D&E
4	Splined SAE CC		
6	Splined (non SAE)		

Code	Connection Variables
Code	6DCCM
M0	P3 = 1" Metric
M1	P3 = 3/4" Metric
00	P3 = 1" UNC
01	P3 = 3/4" UNC
Code	6EDC/S/M
F0*	P3 = 1" SAE
F1*	P3 = 3/4" SAE
P0**	P3 = 1" SAE
P1**	P3 = 3/4" SAE

* "F" is standard
** "P" 4 holes for external support

Delivery

6C Codes	Deivery* (GPM)	6D Codes	Delivery * (GPM)	6E Codes	Delivery* (GPM)
B03	3.42	B14	15.09	042	41.94
B05	5.45	B17	18.45	045	46.15
B06	6376	B20	20.93	050	50.25
B08	8.36	B24	25.20	052	52.25
B10	10.81	B28	28.44	062	62.36
B12	11.76	B31	31.16	066	67.62
B14	14.58	B35	35.19	072	72.00
B17	18.48	B38	38.14		
B20	20.23	B42	43.12		
B22	22.28	B45	46.19		
B25	25.14	B50	50.09		
B28	27.90				
B31	31.70				

* At 0 PSI and 1200 RPM

= Not Available

T6H Series Hybrid

The hybrid pump is a combination of fixed displacement vane pump B, C, D cartridges combined with a variable cartridge of PV20 or PV29 piston pump. The cartridges are driven by a common shaft without coupling in between they have a large common suction port and two or three independent outlet ports: One for the piston, one or two for the vane pump.

Pump Performance Data

Single Pump Model Series	Displacement, cc/rev*	Max. Outlet Pressure**	Rated Drive Speed**	Flow @1800 RPM and 0 PSI*	Input Horsepower @ 1800 RPM and 2000 PSI*
T6H20B	5.7 - 92.9	3500 PSI	2600	23.76 - 44.78	31.5 - 56.1
T6H20C	10.8 - 142.9	3500 PSI	2600	26.14 - 68.56	36 - 85.5
T6H29B	5.7 - 111.9	3000 PSI	2400	31.76 - 52.78	41 - 65.5
T6H29C	10.8 - 161.9	3000 PSI	2400	34.14 - 76.56	45.5 - 95
T6H29D	47.5 - 219.9	3000 PSI	2400	51.64 - 104.14	66.3 - 127.6
T6H29DB	53.2 - 269.9	3000 PSI	2400	56.78 - 151.7	70.3 - 156.1

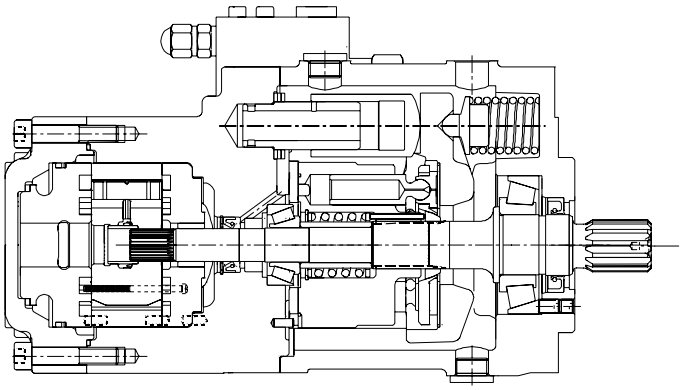
T6H Series Hybrid Performance Characteristics

Tables show data by cam ring size for vane portion only (does not include piston portion)

T6H**B	Output Flow (lpm) @ 1800 RPM			Output Flow (GPM) @ 1800 RPM			Input Power (kW) @ 1800 RPM			Input Power (HP) @ 1800 RPM		
Size	0 bar	140 bar	320 bar	0 PSI	2000 PSI	4350 PSI	7 bar	140 bar	320 bar	100 PSI	2000 PSI	4350 PSI
B02	10.4	8.8	6.8	2.76	2.33	1.8	0.6	3.0	6.0	0.74	4.02	8.1
B03	17.6	16.0	14.0	4.66	4.23	3.7	0.6	4.7	9.6	0.85	6.24	12.93
B04	23.1	21.4	19.4	6.09	5.66	5.13	0.7	5.9	12.3	0.94	7.9	16.55
B05	28.6	27.0	25.0	7.56	7.13	6.6	0.8	7.2	15.1	1.02	9.62	20.29
B06	35.7	34.0	32.0	9.42	8.99	8.46	0.8	8.8	18.6	1.13	11.79	25
B07	40.5	38.9	36.9	10.7	10.27	9.74	0.9	9.9	21.1	1.2	13.29	28.26
B08	44.8	43.2	41.2	11.84	11.41	10.88	0.9	10.9	23.2	1.27	14.62	31.15
B10	57.2	55.6	53.6	15.12	14.69	14.16	1.1	13.8	29.4	1.46	18.45	39.48
B12	73.8	72.2	70.2	19.5	19.07	18.54	1.3	17.6	37.7	1.72	23.55	50.58
B15	90.0	88.4	86.6	23.78	23.35	22.88	1.5	21.3	42.8	1.97	28.55	57.35

*at 280 bar (4060 PSI)

T6H Series Hybrid Performance Characteristics



Features/Benefits

- Very compact
- High pressure ratings
- Low noise
- Independent outlets for fixed and variable flow allow simultaneous cycles
- Internal or external drain
- Choice of controls
- Wide range of acceptable fluids

Tables show data by cam ring size for vane portion only (does not include piston portion)

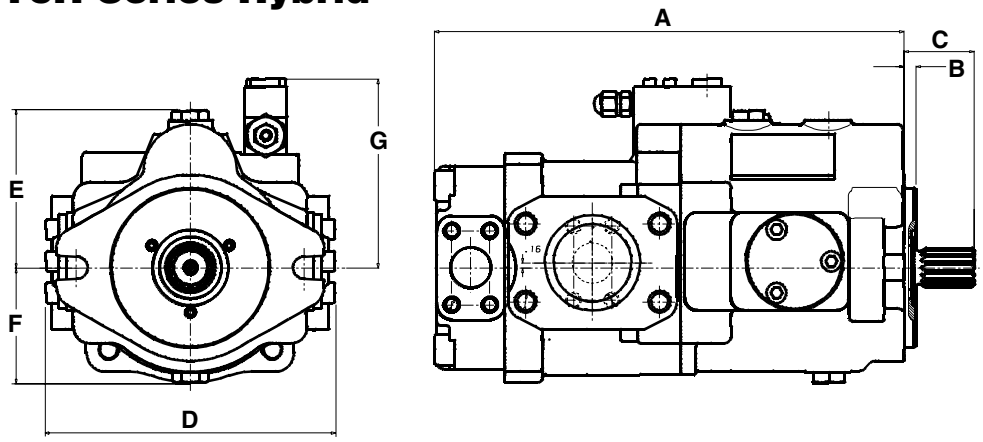
T6H**C	Output Flow (lpm) @ 1800 RPM			Output Flow (GPM) @ 1800 RPM			Input Power (kW) @ 1800 RPM			Input Power (HP) @ 1800 RPM		
Size	0 bar	140 bar	320 bar	0 PSI	2000 PSI	3500 PSI	7 bar	140 bar	320 bar	100 PSI	2000 PSI	3500 PSI
*03	19.5	13.7	#VALUE	5.14	3.61	—	1.6	6.3	10.0	2.11	8.45	13.38
*05	31.0	25.2	21.0	8.18	6.65	5.56	1.7	8.9	14.6	2.29	12	19.59
*06	38.3	32.6	28.4	10.13	8.6	7.51	1.8	10.6	17.6	2.4	14.28	23.57
*08	47.5	41.7	37.6	12.55	11.02	9.93	1.9	12.8	21.3	2.54	17.11	28.53
*10	61.4	55.6	51.5	16.22	14.69	13.6	2.1	15.9	26.8	2.76	21.38	36
*12	66.8	61.0	56.9	17.64	16.11	15.02	2.1	17.2	29.0	2.84	23.05	38.92
*14	82.8	77.0	72.9	21.88	20.35	19.26	2.3	20.9	35.5	3.09	27.99	47.56
*17	105.0	99.2	95.0	27.73	26.2	25.11	2.6	26.0	44.4	3.43	34.81	59.51
*20	114.8	109.0	103.8	30.34	28.81	27.42	2.7	28.2	48.4	3.58	37.86	64.85
*22	126.5	120.7	116.6	33.43	31.9	30.81	2.8	30.9	53.1	3.76	41.47	71.16
*25	142.7	136.9	132.8	37.71	36.18	35.09	3.0	34.6	59.6	4.01	46.46	79.9
*28	159.8	154.1	151.2	42.23	40.7	39.94	3.2	38.6	57.2	4.27	51.74	76.73
*31	180.0	174.2	171.3	47.56	46.03	45.27	3.4	43.2	64.2	4.58	57.95	86.06

* at 210 bar (3000 PSI)

T6H29D	Output Flow (lpm) @ 1800 RPM			Output Flow (GPM) @ 1800 RPM			Input Power (kW) @ 1800 RPM			Input Power (HP) @ 1800 RPM		
Size	0 bar	140 bar	320 bar	0 PSI	2000 PSI	3500 PSI	7 bar	140 bar	320 bar	100 PSI	2000 PSI	3500 PSI
014	85.7	77.4	71.2	22.64	20.46	18.82	3.0	21.9	36.8	4.02	29.31	49.34
017	104.8	96.5	90.3	27.68	25.50	23.86	3.2	26.2	44.5	4.31	35.20	59.64
020	118.8	110.6	104.4	31.39	29.21	27.57	3.4	29.5	50.1	4.53	39.52	67.21
024	143.1	134.9	128.7	37.81	35.63	33.99	3.7	35.1	59.9	4.91	47.02	80.32
028	161.5	153.2	147.0	42.66	40.48	38.84	3.9	39.3	67.3	5.19	52.68	90.23
031	176.9	168.7	162.5	46.75	44.57	42.93	4.1	42.8	73.5	5.43	57.45	98.58
035	199.8	191.6	185.4	52.79	50.61	48.97	4.3	48.1	82.7	5.78	64.50	110.91
038	216.5	208.3	202.1	57.21	55.03	53.39	4.5	51.9	89.4	6.04	69.66	119.94
042	244.8	236.6	230.4	64.68	62.5	60.86	4.8	58.4	100.8	6.47	78.37	135.19
045	262.3	254.0	247.8	69.29	67.11	65.47	5.0	62.5	107.8	6.74	83.75	144.61
050	284.4	276.2	271.7	75.14	72.96	71.78	5.3	67.5	100.3	7.08	90.58	134.54

* at 3000 PSI

T6H Series Hybrid



Dimensions, mm (inch)

Series	A	B max	C Max.	D Max	E	F	G Max.	Weight, kg (lb)
T6H20B/C	321.1 (12.64)	7.9 (0.31)	69.8 (2.75)	225.0 (8.86)	115.3 (4.54)	81.0 (3.19)	172.0 (6.77)	37.1 (81.6)
T6H29B/C	337.1 (13.27)	9.5 (0.375)	84.1 (3.31)	230.0 (9.056)	124.7 (4.91)	91.2 (3.59)	149.9 (5.9)	49.1 (108.0)
T6H29D	373.4 (14.70)	9.5 (0.375)	84.1 (3.31)	230.1 (9.06)	125.0 (4.92)	91.2 (3.59)	149.9 (5.9)	60.1 (132.2)
T6H29DB	490.2 (19.30)	9.5 (0.375)	84.1 (3.31)	230.1 (9.06)	125.7 (4.95)	91.2 (3.59)	149.9 (5.9)	72.1 (158.7)

T6H		–		–		–					–					–		–	
Hybrid Pump	Series & P1 Size (P1)		Cam Ring (P2)		Cam Ring (P3)		Shaft	Rotation	Seal Class	Design Level		Connection	Control	Control Accessories	Variable Flanges	Variable Ports		Porting Combinations		Modifications (Code entered at factory)

Code	P1 Size
20B 20C	2.62 in³/rev
29B 29C 29D 29DB	3.78 in³/rev

Size	P2 & P3 Cam Ring Size (See Table Below)	
	P2	P3*
T6H20B	Use B Codes	
T6H20C	Use C Codes	
T6H29B	Use B Codes	
T6H29C	Use C Codes	
T6H29D	Use D Codes	
T6H29DB	Use D Codes	Use B Codes

* P3 required for double pumps (DB) only. Omit for single pumps.

Code	Design Level
C	T6H20C
B	All Other Sizes

Code	Seal Class
1	S1 (Buna N)
5	S5 (VITON)

Code	Rotation*
R	CW
L	CCW

* As viewed from shaft end.

Code	Shaft	
	T6H20	T6H29
1	Keyed SAE BB	Keyed SAE C
3	Splined SAE C	Splined SAE C
4	Splined SAE BB	
5	Keyed SAE C	

Code	Control Accessories
0	Maximum Flow
9	90% Max Flow
8	80% Max Flow
7	70% Max Flow
6	60% Max Flow
5	50% Max Flow

Code	Control
C	Compensator
F	RC Pilot Operated Compensator
L	RC Pilot Operated Compensator, Load Sensing
X*	RC Pilot Operated Compensator with Vent Valve 24 VDC

* Use with external drain only.

Code	Connection (Drain + Vent.)
0	Ext. Drain + UNF Thread
2	Ext. Drain + BSPP Thread
3	Int. Drain + UNF Thread
4	Int. Drain + BSPP Thread

Code	Variable Flange Connection
0	SAE 4 Bolt Flange (J518c), UNC Thread
M	SAE 4 Bolt Flange (J518c), Metric Thread

Code	Variable Port		
	B & C P2	D P2	DB P3
0	1"	1¼"	1"
1	3/4"		3/4"

Porting Combinations
Several combinations are available. See Catalog on CD.

Cam Ring Codes

B Codes	Delivery (GPM)	C Codes	Delivery (GPM)	D Codes	Delivery (GPM)
B02	1.84	*03	3.42	014	15.09
B03	3.11	*05	5.45	017	18.45
B04	4.06	*06	6.75	020	20.93
B05	5.04	*08	8.37	024	25.20
B06	6.28	*10	10.81	028	28.44
B07	7.13	*12	11.76	031	31.16
B08	7.89	*14	14.58	035	35.19
B10	10.08	*17	18.48	038	38.14
B12	13.00	*20	20.23	042	43.12
B15	15.85	*22	22.29	045	46.19
		*25	25.14	050	50.09
		*28	28.15		
		*31	31.70		

* 0 = uni-rotational; B = bi-rotational

Motors

Contents

F11

F11 is the well proven bent axis, fixed displacement heavy-duty motor series. They can be used in numerous applications on both open and closed loop circuits where high speed and extreme shaft loads are required.

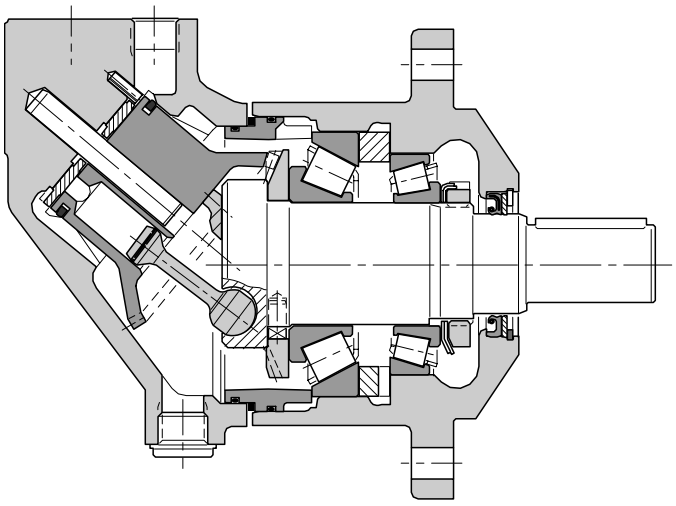
Motor Performance Data

Model Series	Displacement	Outlet Pressure	Drive Speed	Flow @ Rated RPM
F11005	4.9 cc/r	5000 PSI	12800 RPM	14 GPM
F11010	9.8 cc/r	5000 PSI	10200 RPM	26 GPM
F11012	Coming Soon			
F11014	14.3 cc/r	5000 PSI	9000 RPM	34 GPM
F11019	19.0 cc.r	5000 PSI	8100 RPM	40 GPM
F11150	150.0 cc/r	5000 PSI	3200 RPM	103 GPM
F11250	242.0 cc/r	5000 PSI	2700 RPM	154 GPM

DRIVEN Model Selection

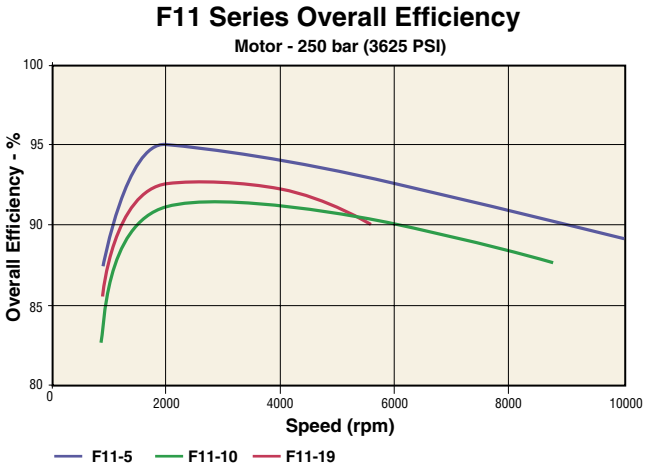
DRIVEN Model	Rotation	Mounting	Shaft	Ports
F11005-DRIVEN1	Both	CETOP 2-Bolt	Metric Keyed	SAE Str Thrd
F11010-DRIVEN2	Both	SAE B 2-Bolt	SAE Spline	SAE Str Thrd
F11014-DRIVEN1	Both	SAE B 2-Bolt	SAE Keyed	SAE Str Thrd
F11019-DRIVEN1	Both	SAE B 2-Bolt	SAE Keyed	SAE Str Thrd
F11150-DRIVEN1	Both	SAE D 4-Bolt	SAE Spline	Flange
F11250-DRIVEN1	Both	SAE D 4-Bolt	SAE Spline	Flange

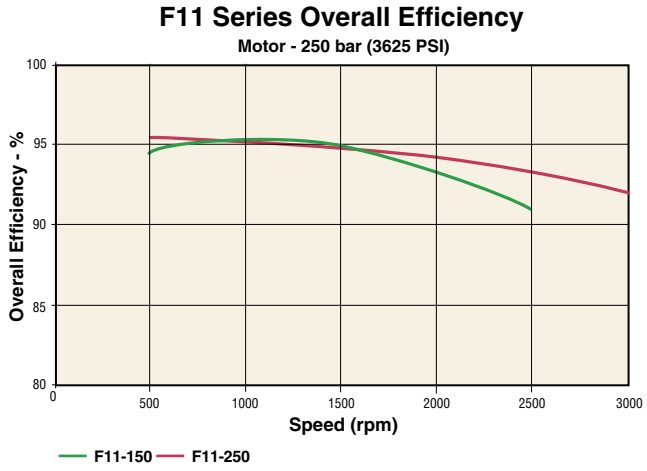
F11
Performance Characteristics



Features

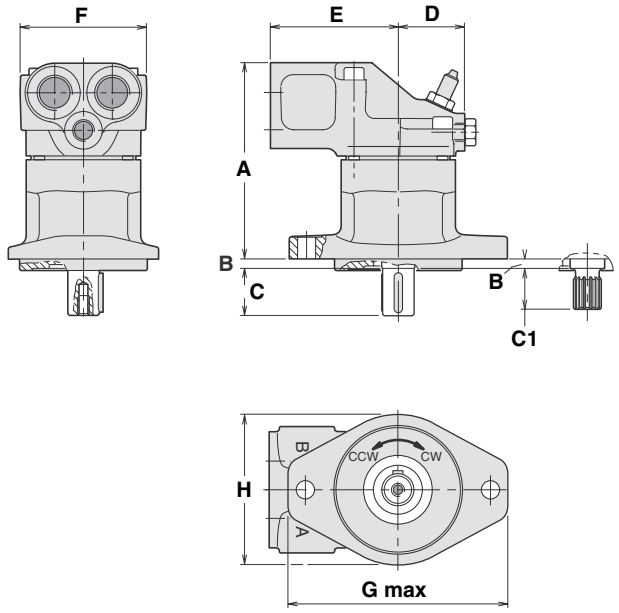
- F11 motors can be used at unusually high shaft speeds
- Operating pressures to 420 bar
- Compact, lightweight motor and pump
- Laminated piston ring provides low internal leakage and thermal shock resistance
- F11 Series have very few moving parts
- Heavy duty roller bearings



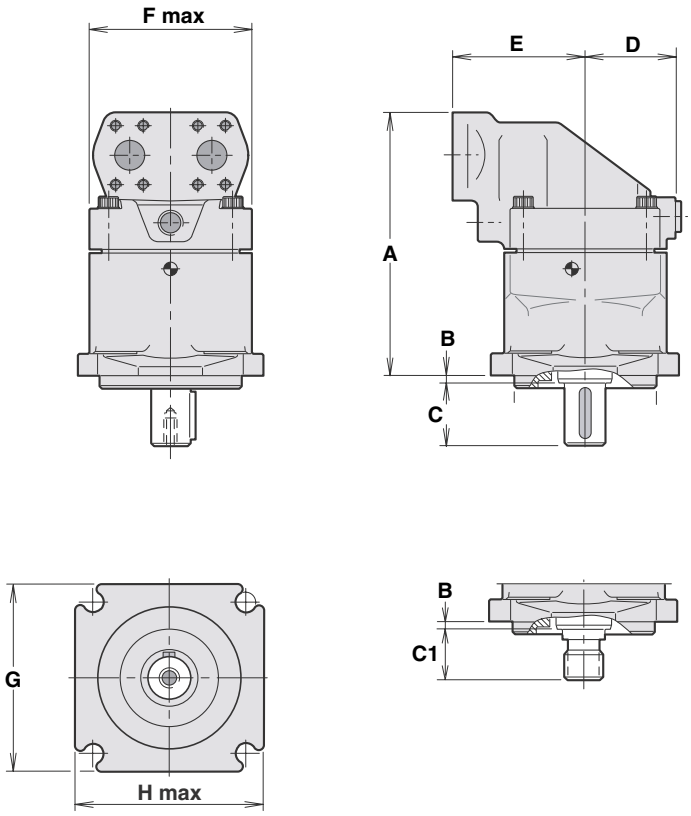


F11

F11-14
(SAE versions)



F11-150
(SAE version)



Dimensions, mm (inch)

Series	A max	B	C	C1	D	E	F	G max	H
F11-10 F11-14	175.7 (6.21)	7.9 (0.31)	38.1 (1.50)	33.0 (1.30)	53.1 (2.09)	102.1 (4.02)	101.1 (3.98)	174.0 (6.85)	119.9 (4.72)
F11-19	181.1 (7.13)	7.9 (0.31)	38.1 (1.50)	33.0 (1.30)	63.0 (2.48)	87.9 (3.46)	114.0 (4.49)	176.0 (6.93)	122.9 (4.84)
F11-150	355.1 (13.98)	7.9 (0.31)	66.8 (2.63)	66.8 (2.63)	118.1 (4.65)	172.0 (6.77)	222.0 (8.74)	214.1 (8.43)	192.0 (7.56)
F11-250	395.0 (15.55)	7.9 (0.31)	82.0 (3.23)	66.8 (2.63)	118.1 (4.65)	197.1 (7.76)	231.9 (9.13)	206.0 (8.11)	206.0 (8.11)

F11	–		–			–				–		–		–		–	
Bent Axis Motor		Frame Size		Function	Main Ports		Mounting Flange	Shaft Seal		Shaft		Version Number		Option		Speed Sensor Option	

Code	Displacement (cm^3/rev)
005*	4.9 cc/r
010*	9.8 cc/r
012*	Coming Soon
014	14.3
019	19.0
150	150.0
250	242.0

* ISO or CETOP mounting options, see catalog on CD

Code	Function	010	014	019	150	250
M	Motor	x	–	x	x	–
H	Motor, High Pressure	–	x	x	x	–
Q	Motot, Silent	–	–	x	x	x
J	Motor, CW Rotation*	–	–	x	x	–
G	Motor, CCW Rotation*	–	–	x	x	–

* Internal drain

Code	Main Ports	010	014	019	150	250
U	SAE, UN Threads	x	x	x	–	–
B	BSP Threads	–	–	x	–	–
F	SAE 6000 psi Flange*	–	–	–	x	x
R	Anti-cav Valve**	–	x	x	–	–
L	Anti-cav Valve**	–	x	x	–	–

* Metric threads
** UNF threads

Code	Mounting Flange
S	SAE Flange

NOTE: CETOP and ISO mounting also available. See catalog on CD.

Code	Shaft Seal	010	014	019	150	250
N	NBR*, Low Pressure	–	–	x	x	x
H	NBR*, High Pressure	–	–	x	x	x
E	FPM**, Low Pressure, High Temperature	–	x	x	x	x
V	FPM**, High Pressure, High Temperature	x	x	x	–	–

* NBR - Nitrile rubber
** FPM - Fluorocarbon rubber

Code	Shaft	010	014	019	150	250
T	SAE Key	–	x	x	x	–
S	SAE Spline	x	x	x	x	x
K	Metric Key	–	–	–	–	x
F	SAE Spline	–	–	–	–	x

Code	Version Number
	Assigned by factory for special versions

Code	Option
	None (see page 36 of catalog on CD)

Code	Speed Sensor	010	014	019	150	250
S	With Speed Sensor	–	x	x	–	–
P	Prepared for Speed Sensor	–	x	x	–	–

x: Available –: Not Available

F12

Series F12 is the high performance bent axis, fixed displacement heavy-duty motor series. They can be used in numerous applications in both at unusually high shaft speeds.

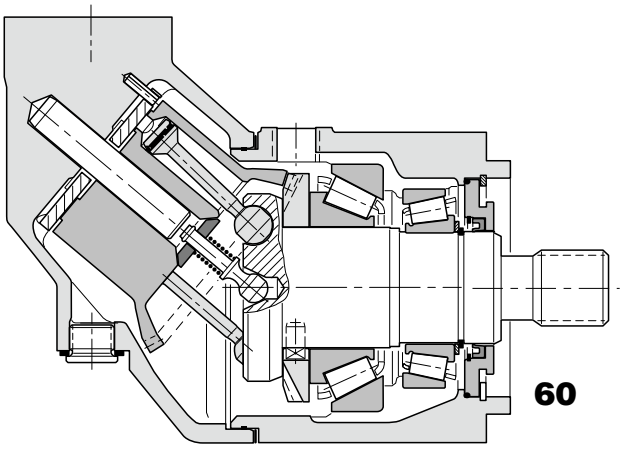
Motor Performance Data

Model Series	Displacement	Maximum Outlet Pressure	Rated Drive Speed	Flow
F12030	30.0 cc/r	6000 PSI	6700 RPM	44 GPM
F12040	40.0 cc/r	6000 PSI	6100 RPM	53 GPM
F12060	59.6 cc/r	6000 PSI	5300 RPM	68 GPM
F12080	80.4 cc/r	6000 PSI	4800 RPM	85 GPM
F12090	93.0 cc/r	6000 PSI	4600 RPM	—
F12110	110.1 cc/r	6000 PSI	4400 RPM	105 GPM
F12125	125.0 cc/r	6000 PSI	4200 RPM	—

DRIVEN Model Selection

DRIVEN Model Selection	Rotation	Mounting	Shaft	Ports	Anti-Cavitation Check
F12030-DRIVEN2	Both	SAE B 2-Bolt	SAE B Spline	Flange	No
F12030-DRIVEN3	Both	SAE B 4-Bolt	SAE B-B Key	Flange	No
F12030-DRIVEN4	Both	SAE B 2-Bolt	SAE B-B Key	Flange	No
F12040-DRIVEN1	Both	SAE C 4-Bolt	SAE C Spline	Flange	No
F12040-DRIVEN3	Both	SAE C 4-Bolt	SAE C Key	Flange	No
F12060-DRIVEN1	Both	SAE C 4-Bolt	SAE C Spline	Flange	No
F12060-DRIVEN2	Both	SAE C 2-Bolt	SAE C Spline	Flange	No
F12080-DRIVEN1	Both	SAE C 4-Bolt	SAE CC Spline	Flange	No
F12090-DRIVEN1	Both	SAE C 4-Bolt	SAE CC Spline	Flange	No
F12110-DRIVEN1	Both	SAE D 4-Bolt	SAE D Spline	Flange	No
F12125-DRIVEN1	Both	SAE D 4-Bolt	SAE D Spline	Flange	No

F12
Performance Characteristics



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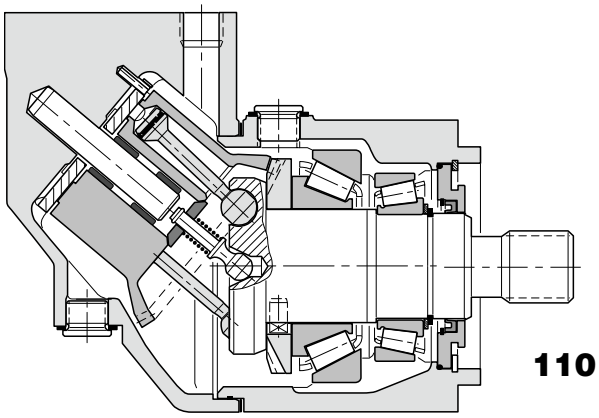

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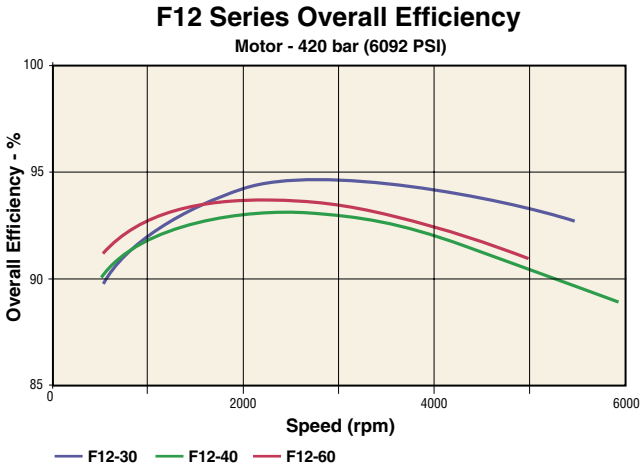
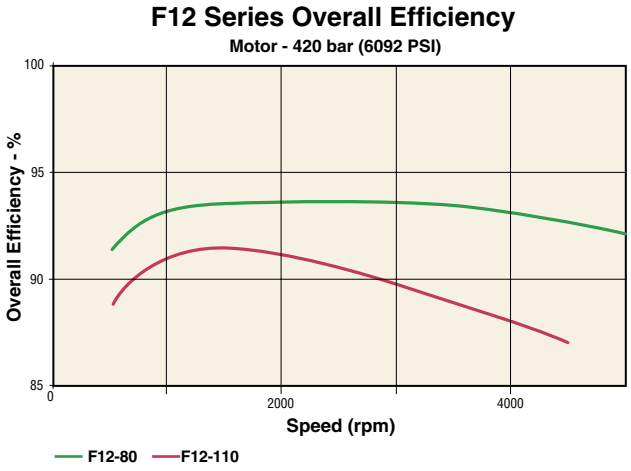


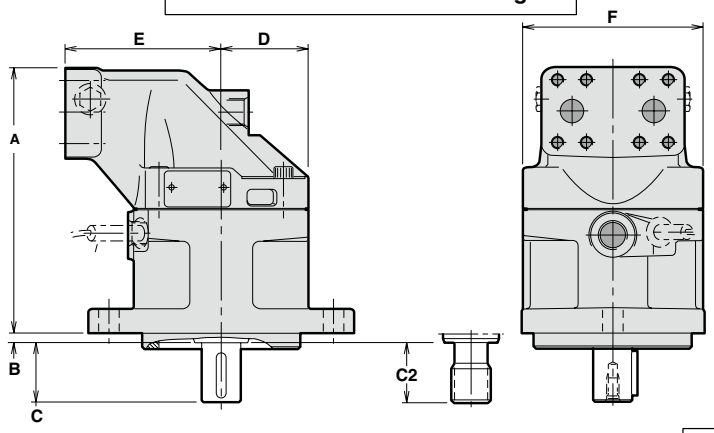


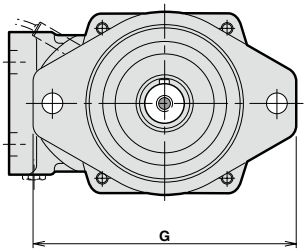
Features

- Operating pressures to 480 bar
- Compact, lightweight motor and pump
- Laminated piston ring provides low internal leakage and thermal shock resistance
- F12 Series have very few moving parts
- Heavy duty roller bearings

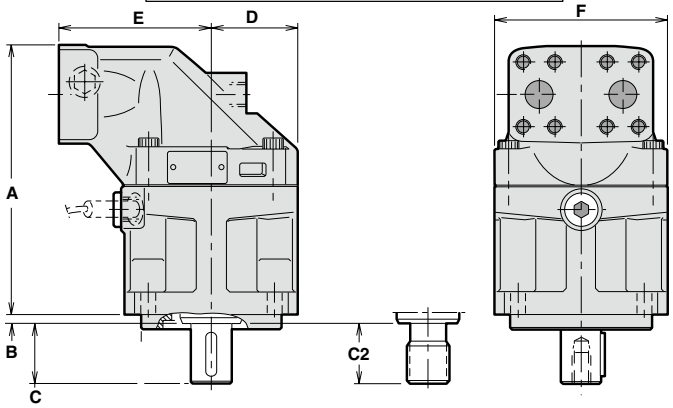
F12

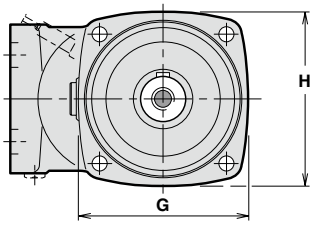
Shown: F12-60 with 2-bolt flange





Shown: F12-80 with 4-Bolt Flange





Dimensions, mm (inch)

Series 2-BOLT	A	B	C	C2	D	E	F	G
F12-30	189.5 (7.46)	7.9 (0.31)	38.1 (1.5)	33.0 (1.3)	58.9 (2.32)	100.1 (3.94)	121.9 (4.80)	176.0 (6.93)
F12-40	197.1 (7.76)	7.9 (0.31)	48.0 (1.89)	48.0 (1.89)	64.0 (2.56)	110.0 (4.33)	134.1 (5.28)	214.9 (8.46)
F12-60	214.1 (8.43)	7.9 (0.31)	48.0 (1.89)	48.0 (1.89)	70.1 (2.76)	125.0 (4.92)	144.0 (5.67)	214.9 (8.46)

Series 4-BOLT	A	B	C	C2	D	E	F	G	H
F12-30	189.5 (7.46)	7.9 (0.31)	38.1 (1.50)	33.0 (1.30)	58.9 (2.32)	100.1 (3.94)	121.9 (4.80)	118.1 (4.65)	118.1 (4.65)
F12-40	197.1 (7.76)	7.9 (0.31)	48.0 (1.89)	48.0 (1.89)	65.0 (2.56)	110.0 (4.33)	134.1 (5.28)	148.1 (5.83)	144.0 (5.67)
F12-60	214.1 (8.43)	7.9 (0.31)	48.0 (1.89)	48.0 (1.89)	70.1 (2.76)	125.0 (4.92)	144.0 (5.67)	148.1 (5.83)	144.0 (5.67)
F12-80	240.0 (9.45)	7.9 (0.31)	54.1 (2.13)	54.1 (2.13)	77.5 (3.05)	134.9 (5.31)	154.9 (6.10)	154.9 (6.10)	154.9 (6.10)
F12-90	240.0 (9.45)	7.9 (0.31)	54.1 (2.13)	54.1 (2.13)	77.5 (3.05)	134.9 (5.31)	154.9 (6.10)	154.9 (6.10)	154.9 (6.10)
F12-110	263.9 (10.39)	7.9 (0.31)	67.1 (2.64)	66.8 (2.63)	85.1 (3.35)	145.0 (5.71)	169.9 (6.69)	204.0 (8.03)	199.9 (7.87)
F12-125	263.9 (10.39)	7.9 (0.31)	67.1 (2.64)	66.8 (2.63)	85.1 (3.35)	145.0 (5.71)	169.9 (6.69)	204.0 (8.03)	199.9 (7.87)

F12	–		–			–			–		–		–		–	
Axial Piston Motor		Frame Size		Function	Main Ports		Mounting Flange	Shaft Seal		Shaft		Version Number		Option		Speed Sensor Option

Code	Displacement (cm^3/rev)
30	30.0
40	40.0
60	59.8
80	80.4
90	90.3
110	110.1
125	125.0

Code	Version Number
	Assigned by factory for special versions

Code	Speed Sensor
S	With Speed Sensor
P	Prepared for Speed Sensor

Code	Function
M	Motor

Code	Shaft	30	40	60	80	90	110	125
L01	Integr. Flushing Valve	x	x	x	x	x	–*	–

* F12-110 accessory valve block. See page 36 of catalog on CD.

Code	Main Ports	30	40	60	80	90	110	125
S	SAE Flange	x	x	x	x	x	x	x
U	SAE, UN Threads	x	x	x	–	–	x	x

Code	Shaft	30	40	60	80	90	110	125
S	SAE Spline (std)	x	x	x	x	x	x	x
U	SAE Spline (opt.)	–	–	–	x	x	–	–
T	SAE Key (std)	x	x	x	x	x	x	x

Code	Mounting Flange	30	40	60	80	90	110	125
S	SAE 4 bolt	x	x	x	x	x	x	x
T	SAE 2 bolt	x	x	x	–	–	–	–
X	SAE D 4 bolt	–	–	–	x	x	–	–

NOTE: ISO and cartidge mounting also available. See catalog on CD.

Code	Shaft Seal	30	40	60	80	90	110	125
N	NBR*, Low Pressure	x	x	x	x	x	x	x
H	NBR*, High Pressure	x	x	x	x	x	x	x
V	FPM**, High Pressure, High Temperature	x	x	x	x	x	x	x

* NBR - Nitrile rubber
** FPM - Fluorocarbon rubber

x: Available –: Not Available

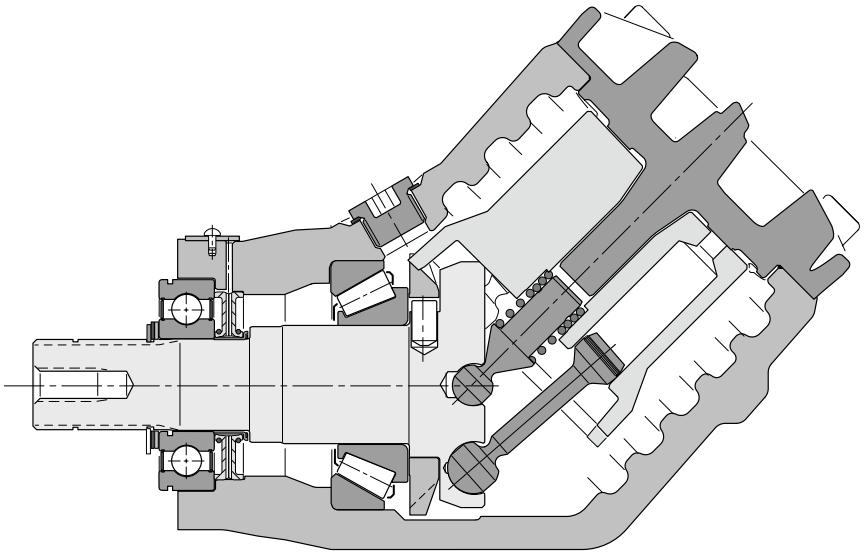
F1

F1 Motors are used on applications that do not require high shaft side-loading. Their light weight ,compact size and efficient design make them the first choice on many mobile applications including winches, augers and spreaders.

Motor Performance Data

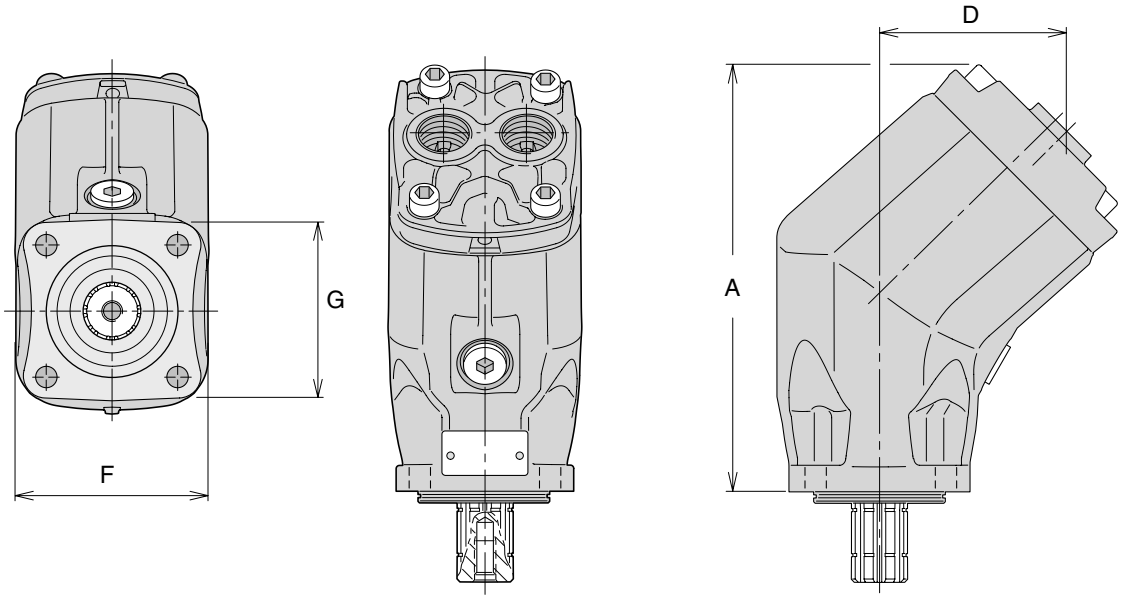
Model Series	Displacement	Maximum Cont. Pressure	Rated Drive Speed	Max. Theoretical Torque	Maximum Output Power @ Rated Speed
F1-25-M	25.6 cc/r	3600 PSI	2300 RPM	719 in-lb	27 HP
F1-41-M	40.9 cc/r	3600 PSI	2000 RPM	1154 in-lb	36 HP
F1-51-M	51.1 cc/r	3600 PSI	1800 RPM	1439 in-lb	41 HP
F1-61-M	59.5 cc/r	3600 PSI	1700 RPM	1678 in-lb	45 HP
F1-81-M	81.6 cc/r	3600 PSI	1500 RPM	2300 in-lb	55 HP
F1-101-M	102.9 cc/r	3600 PSI	1400 RPM	2904 in-lb	64 HP

F1
Performance Characteristics



Features

- Higher selfpriming speeds
- Operating pressures to 400 bar
- New frame sizes to meet market requirements
- Higher overall efficiency
- Increased reliability
- Reduced noise level
- Smaller installation dimensions



Dimensions, mm (inch)

Series	A	B	C	D	E	F	G
F1-25 F1-41 F1-51 F1-61	205 (8.07)	7 (0.27)	55 (2.17)	129.5 (5.10)	56.5 (2.22)	108 (4.25)	109 (4.29)
F1-81 F1-101	259 (10.20)	7 (0.27)	55 (2.17)	144 (5.67)	63 (2.48)	118 (4.65)	110 (4.33)

F1 – [ ] – **M**

Fixed Displacenent Bent Axis Motor

Frame Size

Code	Size
25	25.6 cc/rev
41	40.9 cc/rev
51	51.1 cc/rev
61	59.5 cc/rev
81	81.6 cc/rev
101	102.9 cc/rev

NOTES:
1. Pressure port on 25, 41, 51 and 61 sizes is 3/4". Pressure port on 81 and 101 sizes is 1".
2. Suction fitting must be ordered separately.
3. Use seven digit number when placing order.

Ordering Code	Ordering No.
F1-25-M	378 1724
F1-41-M	378 1740
F1-51-M	378 1750
F1-61-M	378 1760
F1-81-M	378 1780
F1-101-M	378-1800

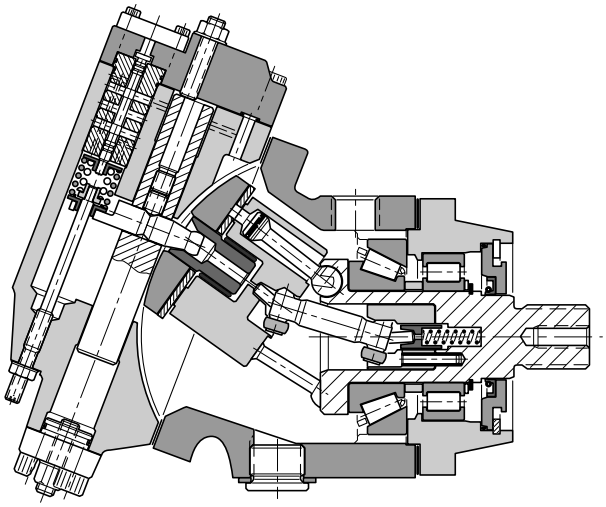
V12

Series V12 is a bent-axis, variable displacement motor. It is intended for both open and closed circuits, mainly in mobile applications, but the V12 can also be utilized in a wide variety of other applications.

Motor Performance Data

Model Series	Displacement	Outlet Pressure	Drive Speed	Flow @ Rated RPM
V12-60	60 cc/r	6000 psi	5600 RPM	57 GPM
V12-80	80 cc/r	6000 psi	5000 RPM	66 GPM

V12
Performance Characteristics

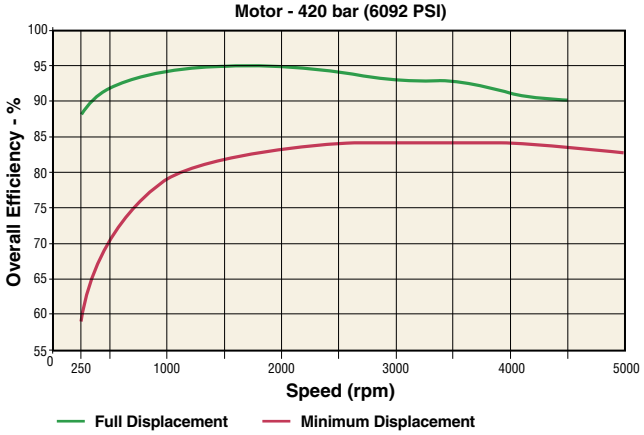


Features

- Tolerates very high speeds due to low weight pistons with laminated piston rings and a compact design of the rotating parts
- High output power; the overall efficiency remains high throughout the entire displacement range
- The 9-piston design provides high start-up torque and smooth motor operation
- Wide displacement ratio (5:1)
- Broad range of controls and accessory valves for most applications
- Small envelop size and a high power-to-weight ratio
- ISO, cartridge and SAE versions
- Low noise levels due to a very compact and sturdy design with smooth fluid passages
- Positive piston locking, strong synchronizing shaft, heavy-duty bearings and small number of parts add up to a compact and robust motor with long service life and proven reliability.

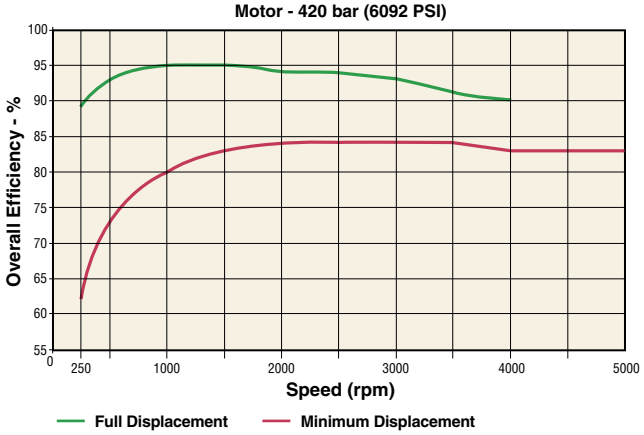
V12-60 Series Overall Efficiency

Motor - 420 bar (6092 PSI)

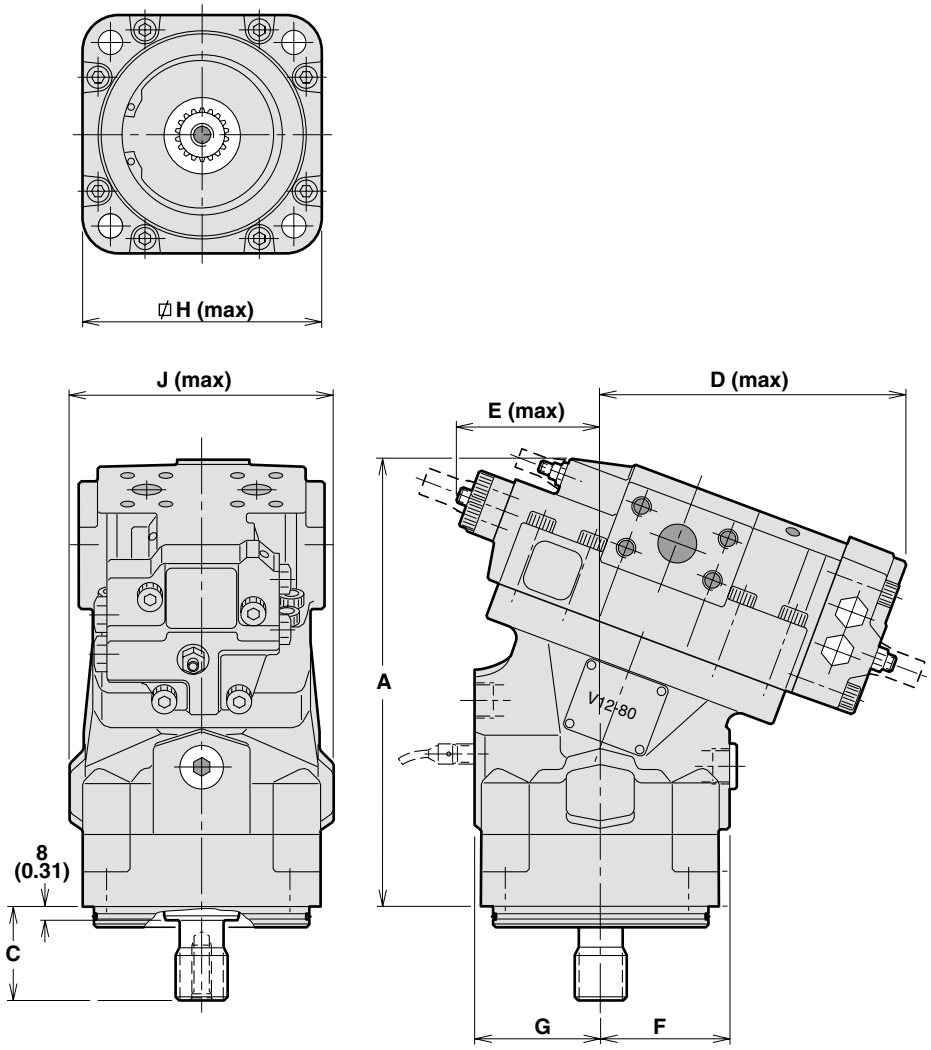


V12-80 Series Overall Efficiency

Motor - 420 bar (6092 PSI)

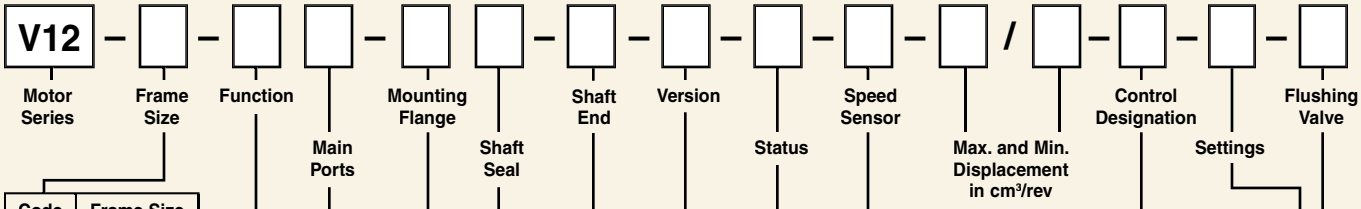


V12



Dimensions, mm (inch)

Series	A	C max	D max	E max	F	G	H max	J max
V12-60	267 (10.51)	55.6 (2.19)	188 (7.40)	87 (3.43)	77 (3.03)	76 (2.99)	149 (5.87)	159 (6.26)
V12-80	280 (11.02)	55.6 (2.19)	193 (7.60)	90 (3.54)	80 (3.15)	78 (3.07)	149 (5.87)	165 (6.50)



Code	Frame Size
60	60 cm³/rev
80	80 cm³/rev

Code	Function
M	Motor; normal end cap position (EO, EP, HO & HP only)
T	Motor; normal end cap position (AC & AH only)

Code	Main Ports*
S	SAE Flange; UN Threads, Side Ports
U	SAE Flange; UN Threads, Rear Ports

Code	Mounting Flange**
S	SAE Flange

Code	Shaft Seal	60	80
H	NBR (Nitrile)	x	x
V	FPM (High Temperature Fluorocarbon)	(x)	(x)

Code	Shaft End***	60	80
S	Spline (SAE J498b)	(x)	(x)

Version
Factory issued for special versions

Code	Status
D	Control pressure setting; max and min displacement screws sealed

Code	Speed Sensor
0	No Sensor
S	Speed Sensor (not installed)
P	Prepared for Speed Snesor

x = standard; (x) = option

* Main ports also available with metric threads. See CD.
** Cartridge and ISO options available. See CD.
*** DIN shaft ends also available. See CD.

Code	Control	60	80
AC I 01 I	Pressure Compensator, internal pilot pressure, internal servo supply	x	x
AC E 01 I	Pressure Compensator, external pilot pressure, internal servo supply	(x)	(x)
AH I 01 I	Pressure Compensator, hydraulic override internal pilot pressure, internal servo supply	x	x
AH E 01 I	Pressure compensator, hydraulic override, external pilot pressure, internal servo supply	(x)	(x)
EOL 01 I	Electrohydraulic, two-position, 12 VDC, internal servo supply	x	x
EOL 01 E	Electrohydraulic, two-position, 12 VDC, external servo supply	(x)	(x)
EOH 01 I	Electrohydraulic, two-position, 24 VDC, internal servo supply	x	x
EPL 01 I	Electrohydraulic, proportional, 12 VDC, internal servo supply	x	x
EPL 01 E	Electrohydraulic, proportional, 12 VDC, external servo supply	(x)	(x)
EPH 01 I	Electrohydraulic, proportional, 24 VDC, internal servo supply	x	x
EPH 01 E	Electrohydraulic, proportional, 24 VDC, external servo supply	(x)	(x)
HOS 01 I	Hydraulic, two-position, standard version, internal servo supply	x	x
HOS 01 E	Hydraulic, two-position, standard version, external servo supply	(x)	(x)
HPS 01 I	Hydraulic, proportional, standard version, internal servo supply	x	x
HPS 01 E	Hydraulic, proportional, standard version, external servo supply	(x)	(x)

Settings
AC, AH: Threshold Pressure: **150**, **200** or **250** bar Modulating Pressure: **015**, **025** or **050** bar
EO, EP: Threshold Current: **400** mA (12 VDC), **200** mA (24 VDC) Modulating Current: **000** (EO), **600** mA (EP 12 VDC), **300** mA (EP 24 VDC)
HO, HP: Threshold Pressure: **010** bar Modulating Pressure: **000** (HO), **015** or **025** bar (HP)

Code	Flushing Valve
L 01	Integrated flushing valve with standard nozzle. See CD for options.

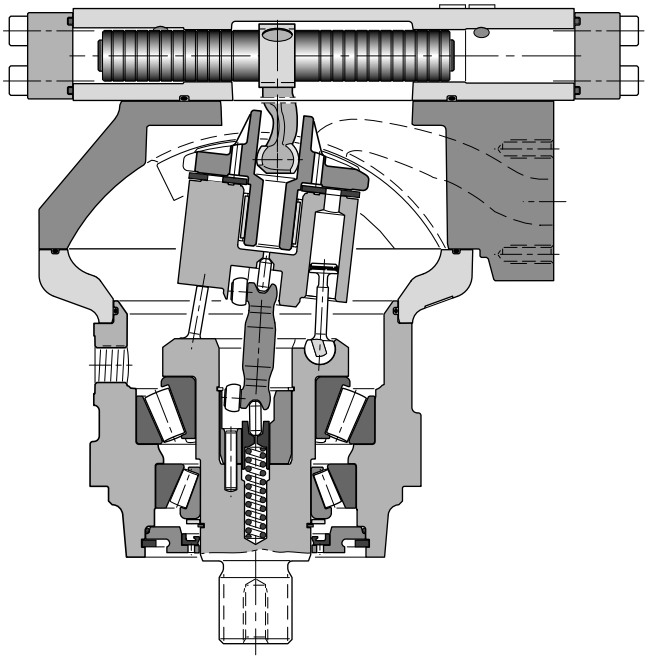
V14

Series V14 is a new generation of variable displacement, bent-axis motors, a further development of our well known V12 motor. It is designed for both open and closed circuit transmissions with focus on high performance machines

Motor Performance Data

Model Series	Displacement	Outlet Pressure	Drive Speed	Flow
V14-110	110 cc/r	6000 PSI	5700 RPM	99 GPM
V14-160	160 cc/r	6000 PSI	5000 RPM	127 GPM

V14
Performance Characteristics



Applications

- Excavators
- Forestry machines
- Mining and drilling machines
- Wheel loaders
- Winch drives

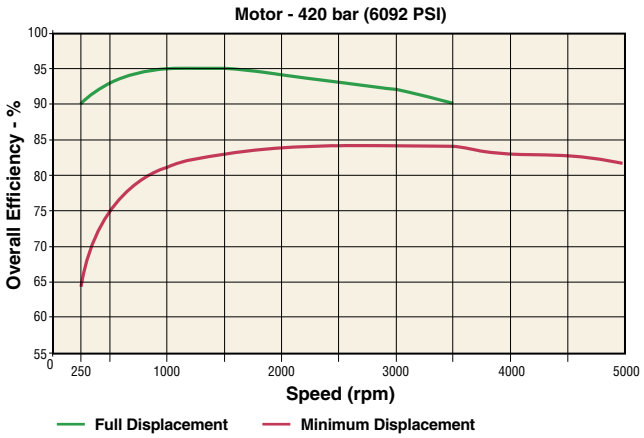
Optional equipment

- Integrated sensors for speed and displacement
- Integrated flushing and pressure relief valves

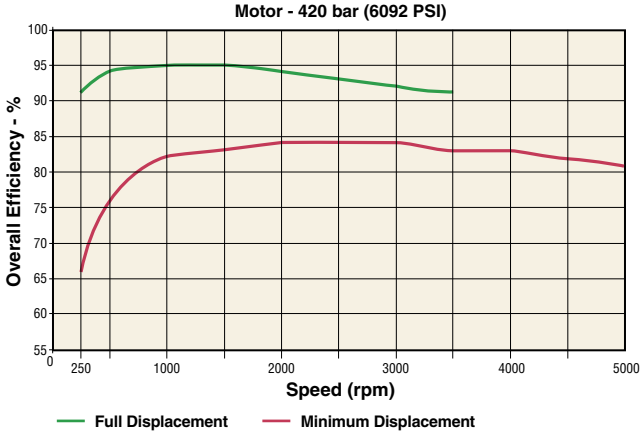
Additional benefits

- Improved speed capability
- Improved control performance
- Reduced number of parts
- Stronger shaft bearing support.

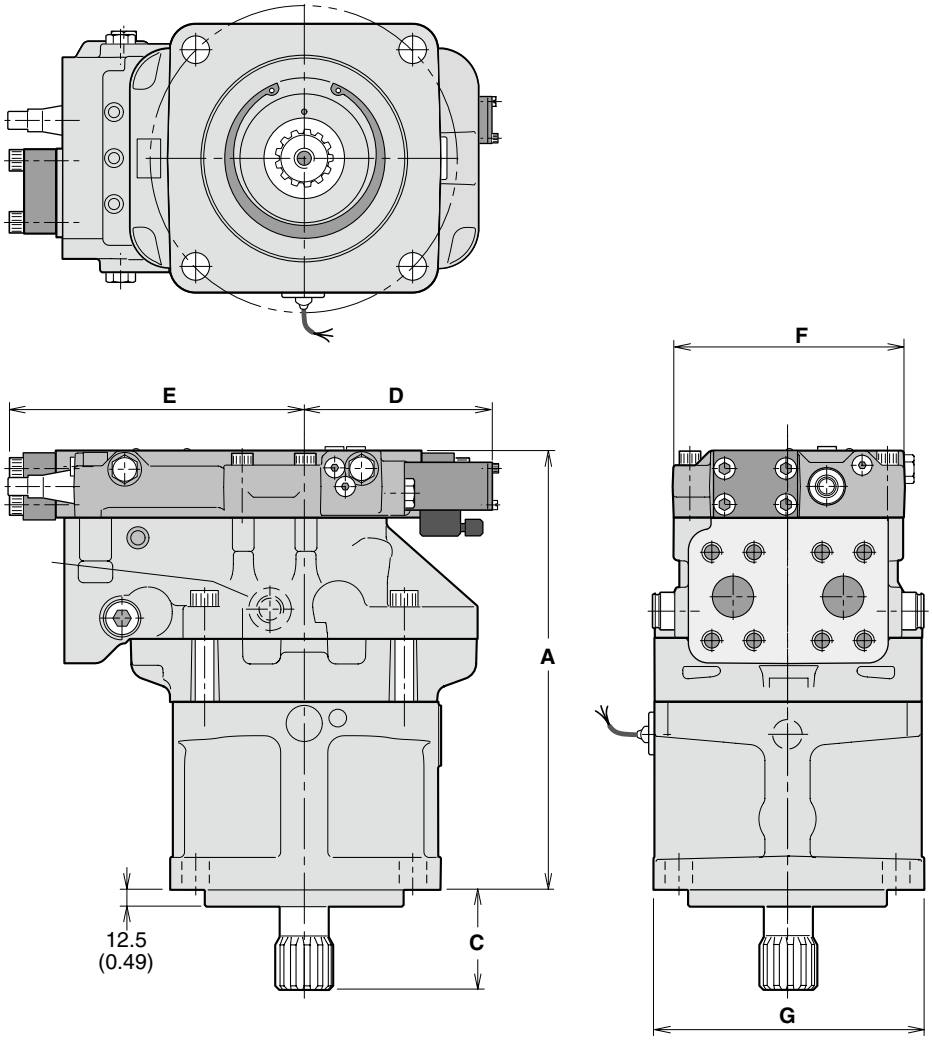
V14-110 Series Overall Efficiency



V14-160 Series Overall Efficiency

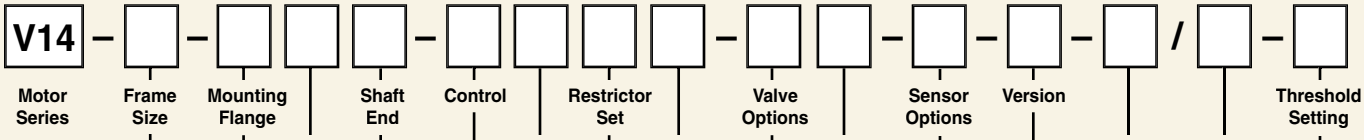


V14



Dimensions, mm (inch)

Series	A	C	D	E	F	G
V14-110	293 (11.54)	74.5 (2.93)	150 (5.91)	208 (8.19)	174 (6.85)	204 (8.03)
V14-160	328 (12.91)	75 (2.95)	139 (5.47)	219 (8.62)	174 (6.85)	200 (7.87)



Code	Frame Size
110	110 cm³/rev
160	160 cm³/rev

Code	Mounting Flange
S	SAE version
I	ISO version
C*	Cartridge version

* 110 only

Code	Shaft Seal
H	NBR (Nitrile)
V	FPM (High Temperature Fluorocarbon)

Code	Shaft End
S	SAE (SAE Version)
C	DIN (ISO Version)
D	DIN (ISO Version)

Code	Control
AC	Presure Compensator
AD	Press. Compensator with electrohydraulic override and brake defeat valve
AH	Pressure Compensator with hydraulic override
EO	Electrohydraulic, two-position
EP	Electrohydraulic, proportional
HO	Hydraulic, two-position
HP	Hydraulic, proportional

Code	Control Signal
E	External Pressure (HO, HP)
I	Internal Pressure (AC, AD, AH)
H	24 VDC (EO, EP)
L	12 VDC (EO, EP)

Code	Control Restrictor Set (orifice dia. in mm)
1	0.7
2	0.8
3	1.0 (standard)
4	1.2

Code	Control Modulating Pressure/Current
N	AC: 0 bar EP: Non-selectable current
A	15 bar (AC, HP)
B	25 bar (AC, HP)
C	50 bar (AC)

Code	Valve Options
N	None
L	Flushing Valve
P	Pressure Relief Valve

Valve Operating Pressure
Pressure Relief Valve opening pressure (bar) Alternately: Flushing Valve restrictor

Code	Sensor Options
N	None
C	Prepared for Setting Piston Position and Shaft Speed Sensors (EP, HP)
D	Setting Piston Position and Shaft Speed Sensors (EP, HP)
L	Setting Piston Position Sensor (EP, HP)
P	Prepared for Speed Sensor
S	Speed Sensor
T	Prepared for Setting Piston Position Sensor

Version
Factory issued for special versions

Min. and Max. Displacement
Min. and max. displacement in cm³/rev

Code	Threshold Setting
***	Select pressure between 100 and 350 bar (AC, AD, AH only)
400	400 mA - 12 VDC (EO, EP only)
200	200 mA - 24 VDC (EO, EP only)
10	10 bar (HO, HP only)

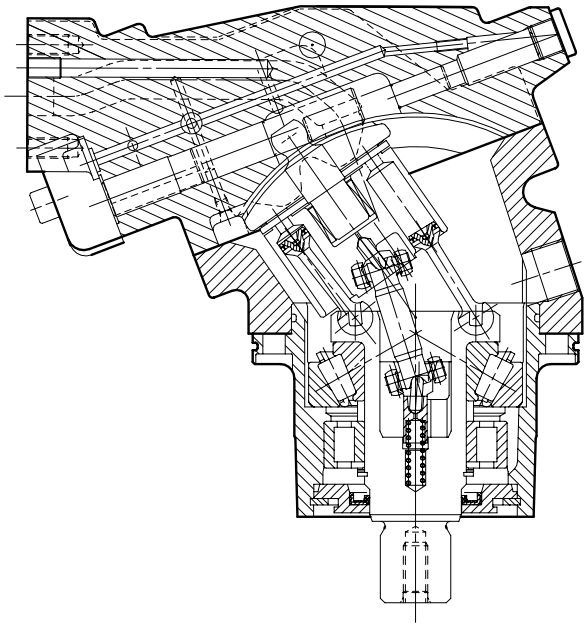
T12

The T12 two-displacement motor is tailor-made for track drives. It allows a high ratio between high and low speed and installs as easily as a fixed displacement motor. Max speed ratio is 3.33-to-1. The T12 is a cartridge motor based on the well proven V12 series. The specially designed end cap with dual side ports permits a very short installation. A simple setting device moves the cylinder barrel to the maximum or minimum displacement position. The setting is controlled by an external hydraulic pilot signal. A brake valve can be fitted without increasing the axial length of the motor. The twin ports have the same mounting pattern as those of the F12 and V12 motors. The F12/V12 accessory valve program also fits the T12 motor. As an option, integrated pressure relief valves can be included.

Motor Performance Data

Model Series	Displacement	Outlet Pressure	Drive Speed	Flow @ Rated RPM
T12-60	60 cc/r	6000 PSI	5600 RPM	57 GPM
T12-80	80 cc/r	6000 PSI	5000 RPM	66 GPM

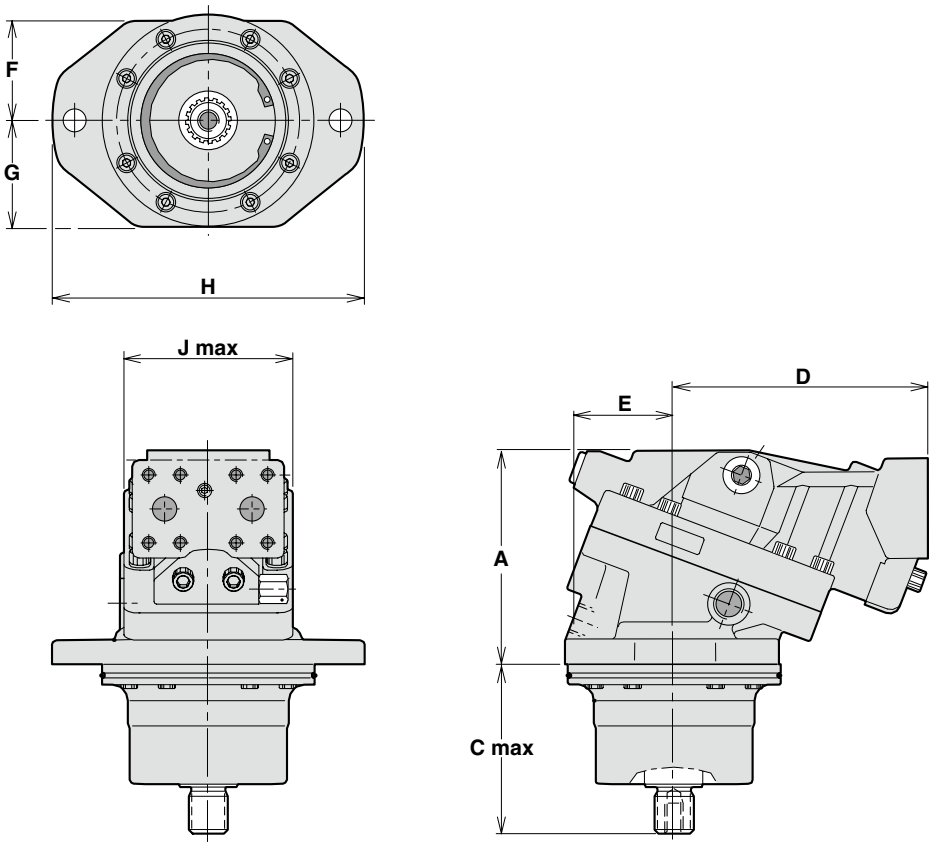
T12
Performance Characteristics



Features/Benefits

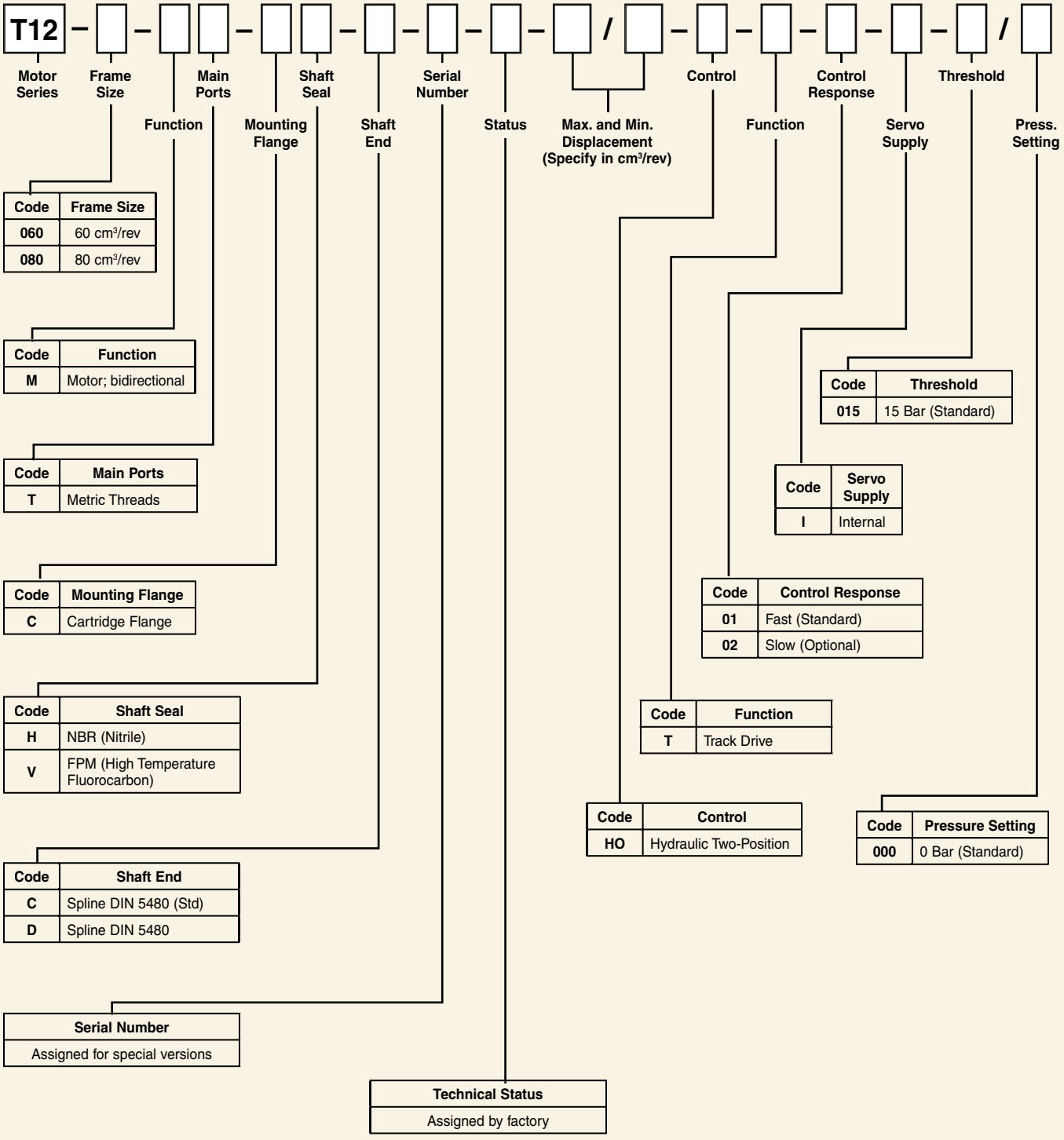
- Designed for Track drive applications the 3.33 to 1 speed ratio provides versatility
- Cartridge mount allows very short installation dimension
- Optional valve blocks do not add to length F12/V12 accessory valves will fit T12 motor

T12



Dimensions, mm (inch)

Series	A	C max	D	E	F	G	ØH	J max
T12-60	164 (6.46)	132 (5.20)	191 (7.52)	–	78.5 (3.09)	83.5 (3.29)	231 (9.09)	127 (5.00)
T12-80	160 (6.30)	155.5 (6.12)	205 (8.07)	78 (3.07)	89.5 (3.52)	99.5 (3.92)	263 (10.35)	136 (5.35)


T12 – – – – – – – – – / – – – – – – / –
Motor Series
Frame Size
Function
Main Ports
Mounting Flange
Shaft Seal
Shaft End
Serial Number
Status
Max. and Min. Displacement (Specify in cm³/rev)
Control
Function
Control Response
Servo Supply
Threshold
Press. Setting
Code | Frame Size
060 | 60 cm³/rev
080 | 80 cm³/rev
Code | Function
M | Motor; bidirectional
Code | Main Ports
T | Metric Threads
Code | Mounting Flange
C | Cartridge Flange
Code | Shaft Seal
H | NBR (Nitrile)
V | FPM (High Temperature Fluorocarbon)
Code | Shaft End
C | Spline DIN 5480 (Std)
D | Spline DIN 5480
Serial Number
Assigned for special versions
Technical Status
Assigned by factory
Code | Control
HO | Hydraulic Two-Position
Code | Function
T | Track Drive
Code | Control Response
01 | Fast (Standard)
02 | Slow (Optional)
Code | Servo Supply
I | Internal
Code | Threshold
015 | 15 Bar (Standard)
Code | Pressure Setting
000 | 0 Bar (Standard)

M3-M4 Fixed Displacement

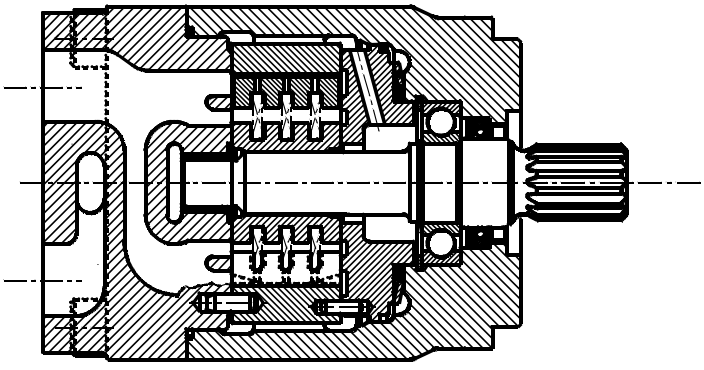
The M3 and M4 Series vane motors are fixed displacement and designed especially for severe duty applications. The balance vane cartridge concept provides high volumetric efficiency, longer life, lower noise, and a high starting torque efficiency. The double motor is ideal for applications to obtain three speed operation.

Motor Performance Data

Single Pump Model Series	Displacement, cc/rev	Max. Outlet Pressure*	Rated Drive Speed*	Torque (in-lb/PSI)
M3B	9.2 - 37.1	3000 PSI	4000 RPM	0.08 - 0.38
M4C	24.4 - 80.1	2535 PSI	4000 RPM	0.24 - 0.78
M4SC	24.4 - 80.1	3335 PSI	4000 RPM	0.24 - 0.78
M4D	65.1 - 144.4	2535 PSI	4000 RPM	0.63 - 1.40
M4SD	65.1 - 144.4	3335 PSI	4000 RPM	0.63 - 1.40
M4E	158.8 - 222	2535 PSI	3600 RPM	1.54 - 2.16
M4SE	158.8 - 222	2795 PSI	3600 RPM	1.54 - 2.16

Double Pump Model Series	Displacement, cc/rev	Max. Outlet Pressure*	Rated Drive Speed*	Torque @2000 RPM and 2500 PSI
M4DC	89.5 - 224.5	2535 PSI	4000 RPM	0.87 - 2.18
M4SDC	89.5 - 224.5	3335 PSI	4000 RPM	0.87 - 2.18

M3-M4 Fixed Displacement Performance Characteristics

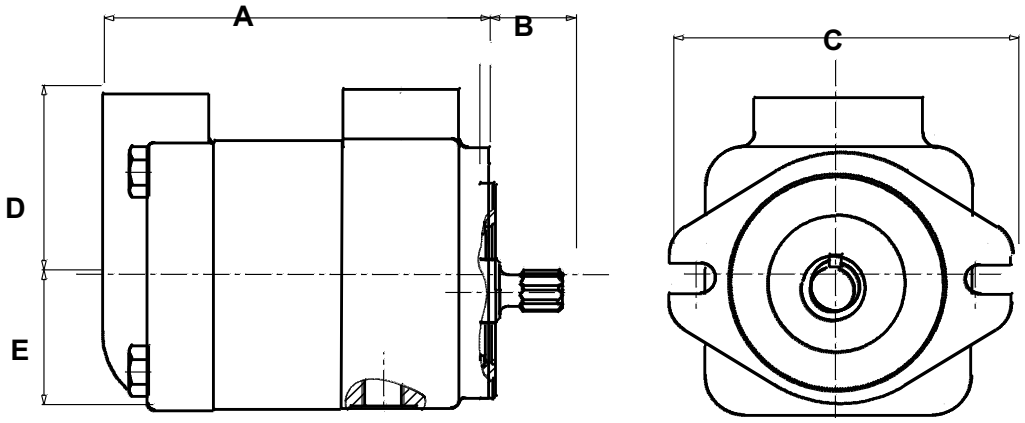


Features/Benefits

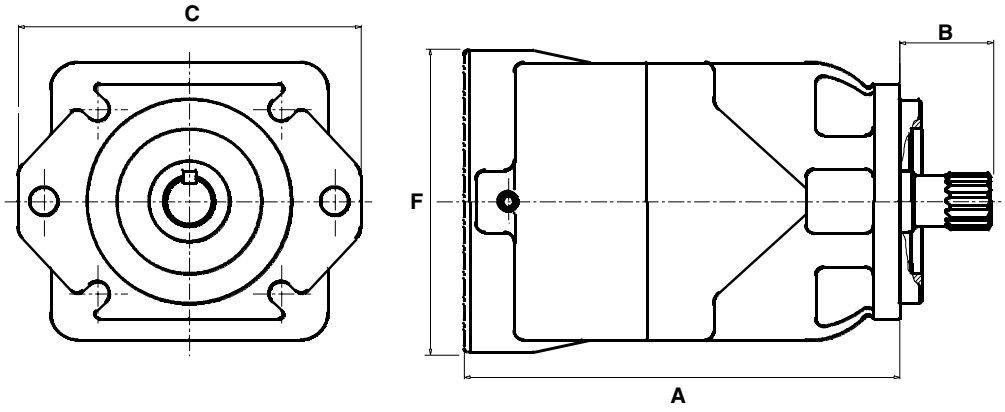
- Low ripple torque
- Low starting torque
- Low noise
- Bi-rotational technology
- Various pilot, threaded port and porting configurations
- External/internal drain option
- Many displacement combinations for double motor

M3-M4 Fixed Displacement

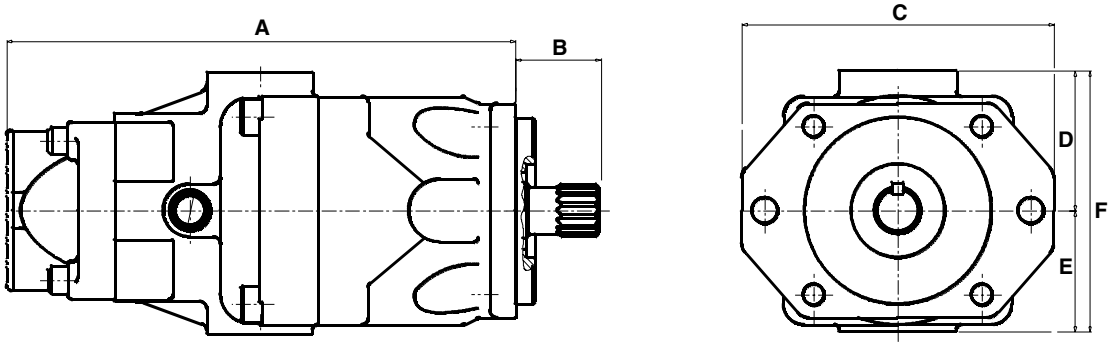
M3



M4 Single



M4 Double



Dimensions, mm (inch)

Series	A	B	C	D	E	F	Weight, lb (kg)
M3B	145.8 (5.74)	55.6 (2.19)	130.0 (5.12)	–	–	120.7 (4.75)	8.0 (17.6)
M4C	183.6 (7.23)	71.4 (2.81)	176.0 (6.93)	–	–	120.7 (4.75)	15.5 (34.0)
M4D	203.5 (8.01)	55.6 (2.19)	212.3 (8.36)	–	–	–	27.0 (59.5)
M4E	270.8 (10.66)	84.1 (3.31)	212.9 (8.38)	–	–	–	45.0 (99.0)
M4DC	346.2 (13.63)	55.6 (2.19)	212.3 (8.36)	95.3 (3.75)	82.6 (3.25)	177.8 (7.0)	40.0 (88.0)

M			–		–		–				–				00	
Series	Service	Drain		Torque		Torque (M4DC only)		Shaft	Rotation	Porting		Design Level	Seal Class	Port Connection		Modifications (Code entered at factory)

Code
M3B
M4C
M4D
M4E
M4DC

Code	Service
Omit	Standard
S*	Severe Duty

* Not available on M3B

Code	Drain
Omit	External
1	Internal

Code	Rotation
N	Bi-directional

Code	Porting Combinations*
00	Standard

* Other combinations available. See catalog on CD.

Code	Seal Class
1*	S1 Buna N
4**	S4 EPDM
5 †	S5 Fluorocarbon

* Not available on M4E.
** Available on M3B only.
† Must be ordered for severe duty motors.

Code	Design Level
A	M4C only
B	M3B, M4D, M4E, M4DC

Code	Shaft Type			
	3B	4C/4CS	4D/4DS, 4DC	4E/4ES
1	Keyed (non SAE)	Keyed SAE B	Keyed SAE C	Keyed SAE C
2		Keyed (non SAE)		
3	Splined SAE A	Splined SAE B	Splined SAE C	Splined SAE C
4	Splined SAE B			

Series	Torque Codes (See Table Below)		
	Single Pumps	Double Pumps A1 - B1	Double Pump A2 - B2
M3B	Use M3B Codes		
M4C	Use M4C Codes		
M4D	Use M4D Codes		
M4E	Use M4E Codes		
M4DC		Use M4D Codes	Use M4C Codes

Code	Port Connection	
	M3B	M4C/M4D/M4E M4DC
00	SAE Threaded Port SAE Drain	
01	SAE 4 Bolt Flange BSPP Drain	SAE Threaded Port SAE Drain
02	BSPP Threaded Port BSPP Drain	SAE 4 Bolt Flange UNC Threaded SAE Drain
04		SAE 4 Bolt Flange UNC Threaded BSPP Drain
M4*		SAE 4-Bolt Flange Metric Thread BSPP Drain

* Not available on M4DC.

Torques

M3B Codes	Torque, in-lb/PSI	M4C Codes	Torque, in-lb/PSI	M4D Codes	Torque, in-lb/PSI	M4E Codes	Torque, in-lb/PSI
009	0.08	024	0.24	062	0.63	153	1.54
012	0.11	027	0.28	074	0.75	185	1.86
018	0.19	031	0.33	088	0.88	214	2.16
027	0.30	043	0.45	102	0.96		
036	0.38	055	0.57	113	1.13		
		067	0.69	128	1.28		
		075	0.78	138	1.40		

= Omit if not required
= Not Available

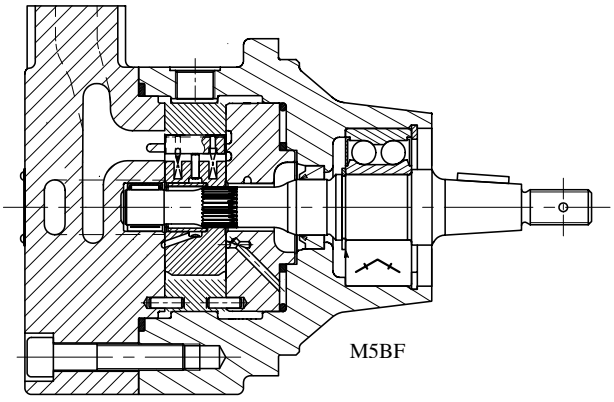
M5 Fixed Displacement Motors

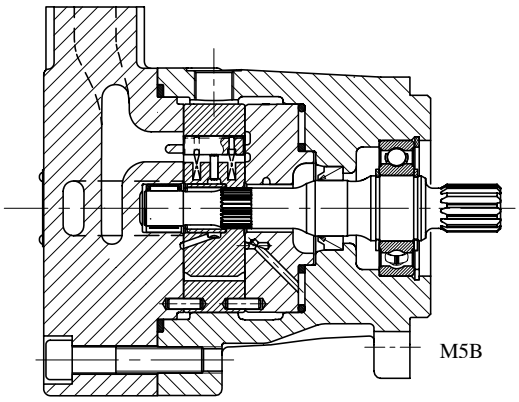
Keep the M5 fixed displacement vane motors in mind when your application requires radial and/or axial shaft loads. The fan-drive version comes equipped with a rugged double row bearing that can eliminate the need for external supports. An integrated proportional valve option provides speed control for fan circuits. Both fan-drive and standard versions use the same high performance cartridge, giving repeatable speed at specified flows.

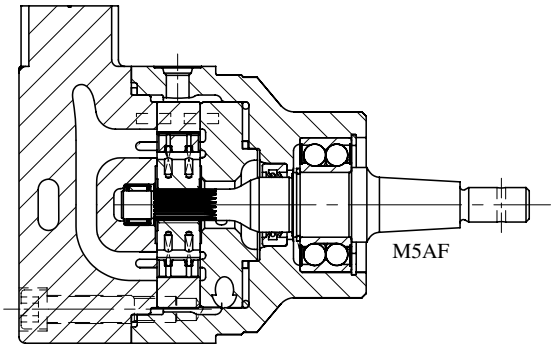
Motor Performance Data

Single Pump Model Series	Displacement, cc/rev	Max. Outlet Pressure*	Rated Drive Speed*	Torque (in-lb/PSI)
M5AF	6.3 - 25	4350 PSI	6000 RPM	0.060 - 0.242
M5B/S	12 - 45	4650 PSI	6000 RPM	0.116 - 0.437
M5BF	12 - 45	4650 PSI	6000 RPM	0.116 - 0.437

M5 Fixed Displacement Motors Performance Characteristics





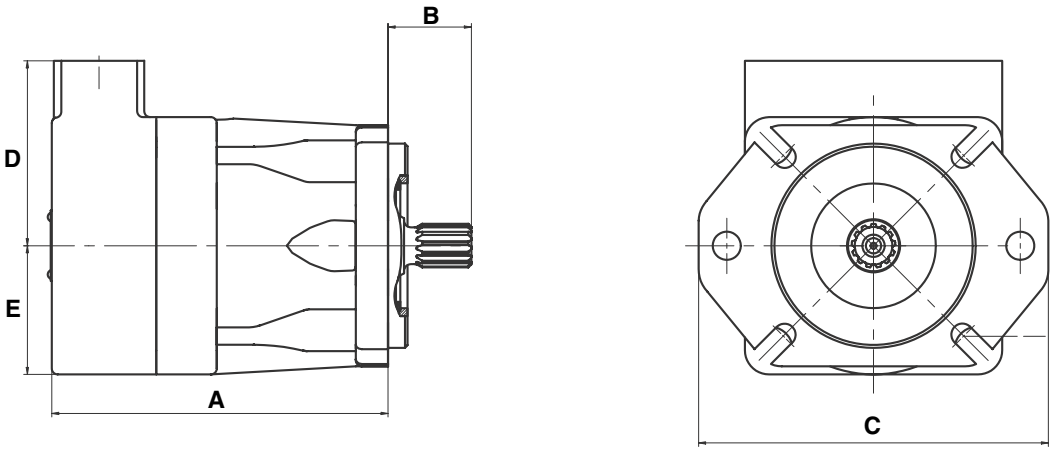


Features/Benefits

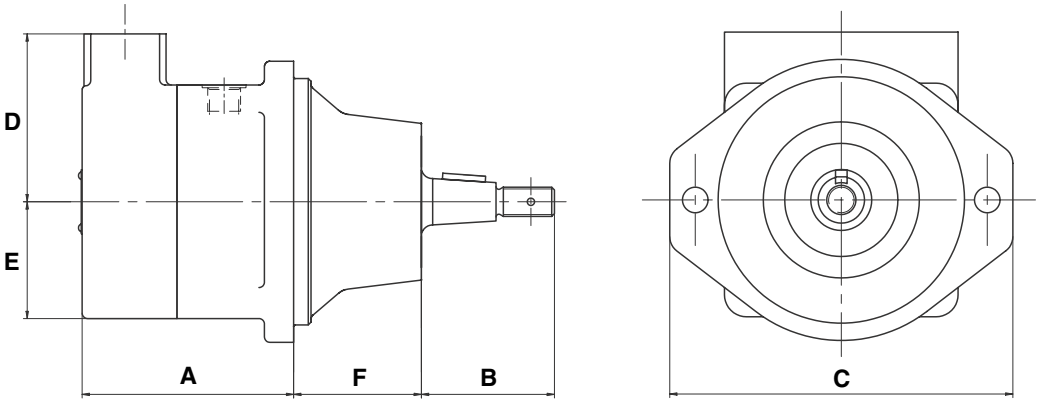
- Low noise
- Designed for severe duty applications
- High efficiency
- High starting torque
- Low torque ripple
- Long life
- Interchangeable rotating groups
- Cross port check valve on M5BF/1

M5 Fixed Displacement Motors

M5B



M5AF, M5BF



Dimensions, mm (inch)

Series	A	B	C	D	E	F	Weight, lb (kg)
M5AF	90.9 (3.58)	75.4 (2.97)	–	91.9 (3.62)	64.1 (2.52)*	69.6 (2.74)	15.0 (33.0)
M5B	167.4 (6.59)	69.8 (2.75)	174.0 (6.85)	91.9 (3.62)	64.1 (2.52)	–	18.5 (40.8)
M5BF	115.8 (4.56)	72.9 (2.87)	188.0 (7.40)	91.9 (3.62)	64.1 (2.52)	69.8 (2.75)	18.5 (40.8)

* For relief valve option, add 2.66" (67.6 mm) max.

M5	–		–				–	A				–	
Series		Displacement		Shaft	Rotation	Porting		Design Level	Seal Class	Port/ End Cap Variable	Drain Variable		Modifications (Code entered at factory)

Code	Description
M5AF	Fan Motor, External Drain
M5AF1	Fan Motor, Internal Drain
M5B	ISO Flange
M5BS	SAE Flange
M5BF	Fan Motor, External Drain
M4BF1	Fan Motor, Internal Drain

Code	Porting Combinations
Several combinations available. See catalog on CD	

Code	Seal Class
1	S1 Buna N
5	S5 Fluorocarbon

Code	Rotation
N*	Bi-directional
R**	CW
L**	CCW

* Not available on M5AF1, M5BF1.
** Viewed from shaft end; not available on M5B, M5BS.

Code	Shaft Type		
	M5AF/1	M5B/S	M5BF/1
1	Taper (non SAE)	Keyed SAE B J744	Keyed Taper (non SAE)
2	Keyed (non SAE)	Keyed ISO E25M - 3019-2	Keyed SAE C J744c
3		Splined SAE B J498	
4		Splined SAE BB J498	
W			Keyed ISO G32N

Code	Variables	
	M5AF End Cap Variables**	M5B/S, M5BF/1 Port Variables
0	4 Bolt SAE Flange (J518) UNC Thread	3/4" SAE 4 Bolt Flange (J518c), UNC Thread†
M	4 Bolt SAE Flange (J518) Metric Thread	3/4" SAE 4 Bolt Flange (J518c), Metric Thread
Y	Metric Threaded Ports (ISO 6149) M22x1.5	
W	SAE Str. Threaded Ports 1-1/6"-12 UNF-2B	
A*	4 Bolt SAE Flange (J518) Metric Thread, 210 bar	
B*	4 Bolt SAE Flange (J518) Metric Thread, 140 bar	
C*	4 Bolt SAE Flange (J518) Metric Thread, 70 bar	

* Motors with proportional pressure relief valve only (external drain and uni-rotational only)
** All uni-rotational motors have an internal check valve included.
† Not available on M5BF1.

M5AF Codes	Displacement (in^3/rev)	M5B/ M5BF Codes	Displacement (in^3/rev)
006	0.38	012	0.73
010	0.61	018	1.10
012	0.76	023	1.40
016	0.98	028	1.71
018	1.10	036	2.20
025	1.52	045	2.75

Code	Drain Variables				
	M5AF	M5AF1	M5B/S	M5BF	M5BF1
2	9/16" SAE		9/16" SAE	9/16" SAE	
3	M12x1.5 Metric		M18 x .06 Metric	M18 x .06 Metric	
X		No Drain			No Drain

= Not Available

Calzoni Motors

The outstanding performance of this robust product is the result of our original, patented design. Used widely in the Injection molding, mining, off shore drilling, oil field, and marine markets; the Parker Calzoni motor is produced in sizes from 32cc up to 6 gallons per revolution. The efficiency of our design allows for a smaller installed product for the same displacement vs our competitors. Since there are no internal connecting rods we have greatly reduced frictional drag as well as most thrust loading. By creating a static balance on the shaft we have extended the expected lifetime as well.

Calzoni MR-MRE

Calzoni MRT-MRTE-MRTF

Calzoni MRD-MRDE, MRV-MRVE

Motor Performance Data

Series	Displacement, cc/rev	Max. Pressure	Max. Speed	Torque (in-lb/PSI)
MR	32.1 - 6967.2	4350 PSI	1400 RPM	0.025 - 5.665
MRE	332.4 - 8226.4	3626 PSI	750 RPM	0.270 - 6.657
MRT	7100 - 19508	4350 PSI	150 RPM	5.75 - 15.79
MRTE/MRTF	7808 - 23034	3626 PSI	130 RPM	6.32 - 18.64

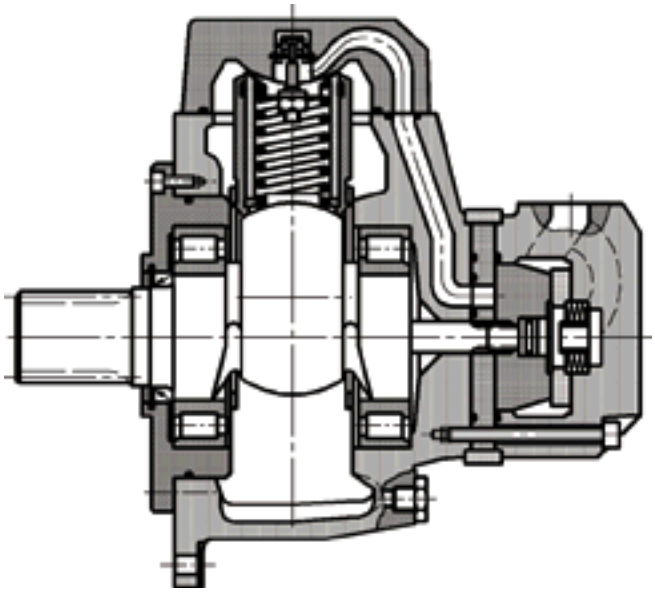
Series	Displacement, cc/rev	Max. Pressure	Max. Speed	Min. Torque (in-lb/PSI)	Max. Torque (in-lb/PSI)
MRD/MRV	304.1 - 6867	4350 PSI	1100 RPM	0.123 - 1.823	0.244 - 3.646
MRDE/MRVE	332.4 - 8226	3626 PSI	1000 RPM	0.135 - 2.187	0.270 - 4.374

Calzoni MRD-MRDE, MRV-MRVE

Motor Performance Data

Series	Displacement	Max. Pressure	Max. Speed	Torque (in-lb/PSI)
MR33	32.1 cc/rev	4350 PSI	1800 RPM	0.025
MR57	56.4 cc/rev	4350 PSI	1600 RPM	0.046
MR73	72.6 cc/rev	4350 PSI	1200 RPM	0.061
MR93	92.6 cc/rev	4350 PSI	1150 RPM	0.076
MR110	109.0 cc/rev	4350 PSI	1100 RPM	0.087
MR125	124.7 cc/rev	4350 PSI	900 RPM	0.102
MR160	159.7 cc/rev	4350 PSI	900 RPM	0.129
MR190	191.6 cc/rev	4350 PSI	850 RPM	0.155
MR200	199.2 cc/rev	4350 PSI	800 RPM	0.163
MR250	250.9 cc/rev	4350 PSI	800 RPM	0.203
MR300	304.4 cc/rev	4350 PSI	750 RPM	0.244
MR350	349.5 cc/rev	4350 PSI	640 RPM	0.283
MR450	451.6 cc/rev	4350 PSI	600 RPM	0.366
MR600	607.9 cc/rev	4350 PSI	520 RPM	0.493
MR700	706.9 cc/rev	4350 PSI	500 RPM	0.575
MR1100	1125.8 cc/rev	4350 PSI	330 RPM	0.910
MR1600	1598.4 cc/rev	4350 PSI	260 RPM	1.292
MR1800	1809.6 cc/rev	4350 PSI	250 RPM	1.465
MR2400	2393.1 cc/rev	4350 PSI	220 RPM	1.937
MR2800	2792.0 cc/rev	4350 PSI	215 RPM	2.263
MR3600	3636.8 cc/rev	4350 PSI	180 RPM	2.944
MR4500	4502.7 cc/rev	4350 PSI	170 RPM	3.346
MR6500	6460.5 cc/rev	4350 PSI	130 RPM	5.267
MR7000	6967.2 cc/rev	4350 PSI	130 RPM	5.665
MRE330	332.4 cc/rev	3626 PSI	750 RPM	0.270
MRE500	497.9 cc/rev	3626 PSI	600 RPM	0.403
MRE800	804.2 cc/rev	3626 PSI	450 RPM	0.651
MRE1400	1369.5 cc/rev	3626 PSI	280 RPM	1.109
MRE2100	2091.2 cc/rev	3626 PSI	250 RPM	1.693
MRE3100	3103.7 cc/rev	3626 PSI	215 RPM	2.512
MRE5400	5401.2 cc/rev	3626 PSI	160 RPM	4.374
MRE8200	8226.4 cc/rev	3626 PSI	130 RPM	6.657

Calzoni MR-MRE Performance Characteristics

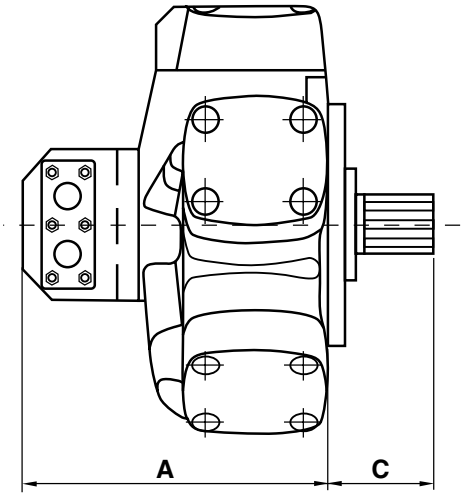


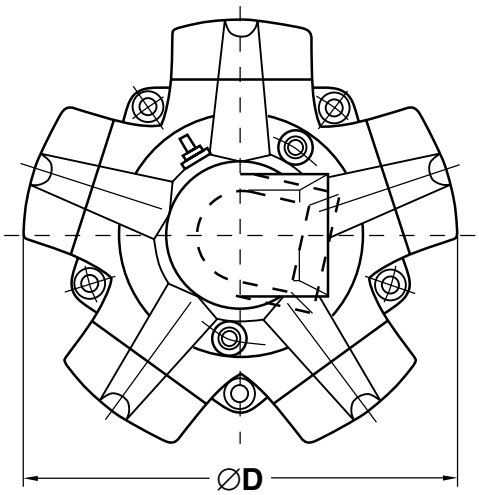
Features/Benefits

- 5-piston design
- Wide range of displacements
- Starting torque from 90-95% theoretical
- Total efficiency up to 96%
- Resistance to thermal shocks $\Delta T = 176°F$
- Speed feedback accessories optional

Dimensions, mm (inch)

Series	A	C Max.	D
MR33 MR57	196.1 (7.72)	57.2 (2.25)	235.5 (9.27)
MR73 MR93 MR110	228.6 (9.0)	68.6 (2.70)	249.9 (9.84)
MR125 MR160 MR190	242.1 (9.53)	67.1 (2.64)	313.2 (12.33)
MR200 MR250 MR300 MRE330	242.1 (9.53	81.0 (3.19)	327.9 (12.91)
MR350 MR450 MRE500	178.9 (10.98)	97.0 (3.82)	368.0 (14.49)
MR600 MR700 MRE800	299.0 (11.77)	101.1 (3.98)	405.1 (15.95)
MR1100 MRE1400	341.1 (13.43)	117.1 (4.61)	469.9 (18.5)
MR1600 MR1800 MRE2100	373.9 (14.72)	132.1 (5.20)	558.0 (21.97)
MR2400 MR2800 MRE3100	466.1 (18.35)	152.9 (6.02)	642.1 (25.28)
MR3600 MR4500 MRE5400	489.5 (19.27)	210.1 (8.27)]	766.1 (30.16)
MR6500 MR7000 MRE8200	565.9 (22.28)	230.1 (9.06)	864.1 (34.02)





MR		–							
Motor Series	Size & Displacement		Shaft	Speed Sensor Option	Seals	Connection Flange	Rotation	Special

Code	Series
MR	Standard 3626 PSI Max. Continuous
MRE	Expanded 3026 PSI Max. Continuous

Code	Displacement cm³ (in³)	MR	MRE
33A	32.1 (1.96)	x	
57A	56.4 (3.44)	x	
73B	72.6 (4.43)	x	
93B	92.6 (5.65)	x	
110B	109.0 (6.65)	x	
125C	124.7 (7.61)	x	
160C	159.8 (9.75)	x	
190C	191.6 (11.69)	x	
200D	199.3 (12.16)	x	
250D	250.9 (15.31)	x	
300D	304.5 (18.56)	x	
330D	332.3 (20.28)		x
350E	349.5 (21.33)	x	
450E	451.6 (27.56)	x	
500E	497.8 (30.38)		x
600F	608.0 (37.10)	x	
700F	706.1 (43.09)	x	
800F	804.3 (49.08)		x
1100G	1126 (68.7)	x	
1400G	1370 (83.6)		x
1600H	1598 (97.5)	x	
1800H	1809 (110.4)	x	
2100H	2091 (127.6)		x
2400I	2292 (139.9)	x	
2800I	2792 (170.4)	x	
2100I	3104 (189.4)		x
3600L	3636 (221.9)	x	
4500L	4503 (274.8)	x	
5400L	5401 (329.6)		x
6500M	6460 (394.2)	x	
7000M	6697 (408.7)	x	
8200M	8226 (502.0)		x

Code	Special
	Entered by Factory

Code	Rotation
N	Standard Rotation (CW: Inlet in A; CCW: Inlet in B)
S	Reversed Rotation (CW: Inlet in B; CCW: Inlet in A)

Code	Connection Flange
N1	None
C1	Standard DENISON Calzoni
S1	Standard SAE Metric
T1	Standard SAE UNC
G1	SAE 6000 PSI Metric
L1	SAE 6000 PSI UNC

Code	Seals
N1	NBR Mineral Oil
F1	NBR, 218 PSI Shaft Seal
V1	Fluorocarbon
U1	No Shaft Seal (for Brake)

Code	Speed Sensor Option
N1	None
Q1	Encoder Drive
C1	Mechanized Tachometer Drive
T1	Tachometer Drive
M1	Incremental Elcis Encoder, Uni-directional*
B1	Incremental Elcis Encoder, Bi-directional*

* 500 pulse/rev

Code	Shaft
N1	Spline Ex DIN 5463
D1	Spline DIN 5480
F1	Female Spline DIN 5480
P1	Shaft with Key
B1	Spline B.S. 3550

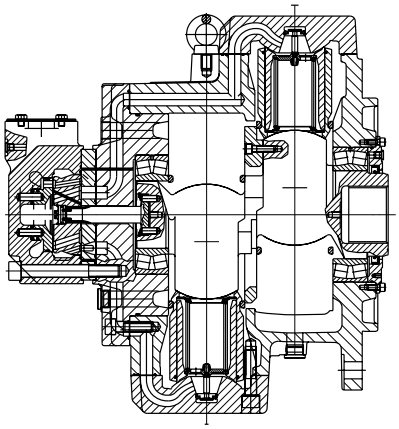
Calzoni MRT-MRTE-MRTF Performance Characteristics

Motor Performance Data

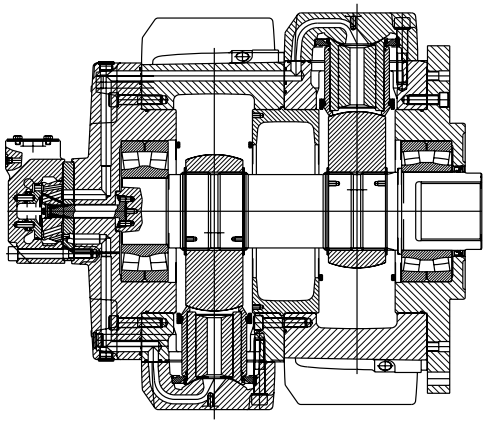
Series	Displacement	Max. Pressure	Max. Speed	Torque (in-lb/PSI)
MRT7100	7100.4 cc/rev	4350 PSI	150 RPM	5.75
MRTF7800	7808.4 cc/rev	3626 PSI	130 RPM	6.32
MRTE8500	8517.3 cc/rev	3626 PSI	120 RPM	6.90
MRT9000	9005.4 cc/rev	4350 PSI	130 RPM	7.29
MRTF9900	9903.9 cc/rev	3626 PSI	120 RPM	8.02
MRTE10800	10802.4 cc/rev	3626 PSI	110 RPM	8.75
MRT14000	14010 cc/rev	4350 PSI	80 RPM	11.34
MRTF15500	15276 cc/rev	3626 PSI	75 RPM	12.36
MRTE16500	16542 cc/rev	3626 PSI	70 RPM	13.39
MRT17000	16759 cc/rev	4350 PSI	70 RPM	14.58
MRTF18000	18025 cc/rev	3626 PSI	65 RPM	14.59
MRT19500	19508 cc/rev	4350 PSI	60 RPM	15.79
MRTE20000	19788 cc/rev	3626 PSI	60 RPM	16.01
MRTF21500	21271 cc/rev	3626 PSI	55 RPM	17.21
MRTE23000	23034 cc/rev	3626 PSI	50 RPM	18.64

Features/Benefits

- Hydraulically balanced 10 & 14-piston twin row design
- Wide range of displacements
- Starting torque from 91% theoretical
- Total efficiency up to 96%
- Speed feedback accessories optional

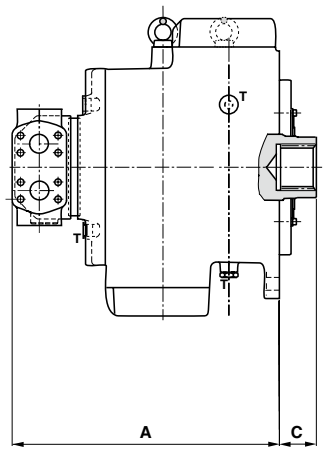


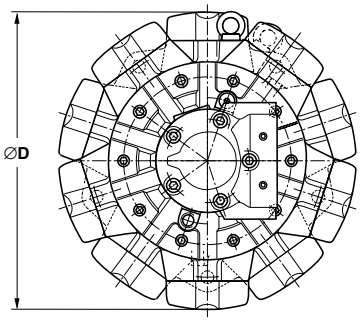
10-Piston Design

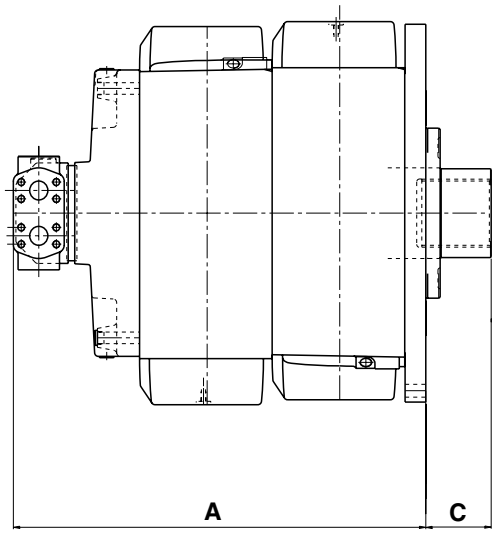


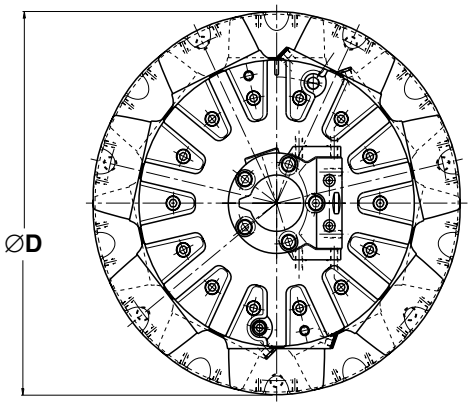
14-Piston Design

Calzoni MRT-MRTE-MRTF









Dimensions, mm (inch)

Series			A	C Max.	D
MRT7100 MRT9000	MRTE8500 MRTE 10800	MRTF7800 MRTF9900	688.5 (27.106)	50.0 (1.969)	766.0 (30.157)
MRT1400 MRT17000 MRT19500	MRTE16500 MRTE20000 MRTE23000	MRTF1550 MRTF18000 MRTF21500	1135.5 (44.705)	80.0 (3.15)	1014.0 (39.921)

MRT		–						
Motor Series	Size & Displacement		Shaft	Speed Sensor Option	Seals	Connection Flange	Rotation	Special

Code	Series
MRT	Standard 3626 PSI Max. Continuous
MRTE MRTF	Expanded 3026 PSI Max. Continuous

Code	Displacement cm³ (in³)	MRT	MRTE	MRTF
7100P	7103 (433.3)	x		
7800P	7808 (476.5)			x
8500P	8518 (529.8)		x	
9000P	9005 (549.5)	x		
9800P	9904 (604.4)			x
10800P	10802 (659.2)		x	
14000Q	14009 (854.9)	x		
15500Q	15278 (832,3)			x
16500Q	16543 (1009.5)		x	
17000Q	16759 (1022.7)	x		
18000Q	18026 (1100.0)			x
19500Q	19509 (1190.5)	x		
20000Q	19787 (1207.5)		x	
21500Q	21270 (1298.0)			x
23000Q	23034 (1405.6)		x	

Code	Special
	Entered by Factory

Code	Rotation
N	Standard Rotation (CW: Inlet in A; CCW: Inlet in B)
S	Reversed Rotation (CW: Inlet in B; CCW: Inlet in A)

Code	Connection Flange
S1	Standard SAE Metric
G1	SAE 6000 PSI Metric
M1	SAE 6000 PSI Metric Special Timing

Code	Seals
N1	NBR Mineral Oil
F1	NBR, 218 PSI Shaft Seal
V1	Fluorocarbon
U1	No Shaft Seal (for Brake)

Code	Speed Sensor Option
N1	None
Q1	Encoder Drive
C1	Mechanized Tachometer Drive
T1	Tachometer Drive
M1	Incremental Elcis Encoder, Uni-directional*
B1	Incremental Elcis Encoder, Bi-directional*

* 500 pulse/rev

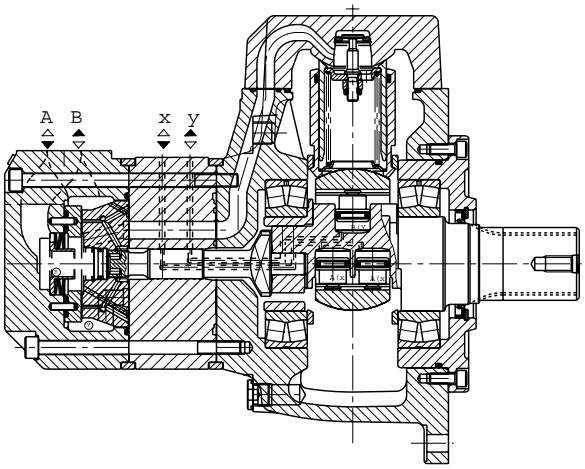
Code	Shaft
D1	Spline DIN 5480
F1	Female Spline DIN 5480

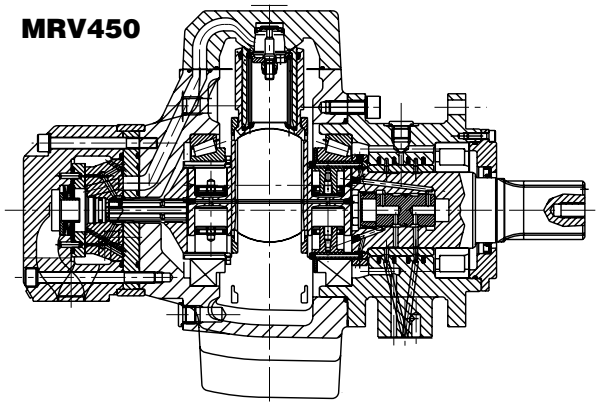
Calzoni MRD-MRDE, MRV-MRVE

Motor Performance Data

Series		Displacement	Max. Pressure	Max. Speed	Min-Max Torque (in-lb/PSI)
MRD300		304.1 cc/rev	4350 PSI	1100 RPM	0.123 0.244
MRD450		451.6 cc/rev	4350 PSI	850 RPM	0.183 0.366
	MRV450	451.6 cc/rev	4350 PSI	850 RPM	0.107 0.366
MRD700	MRV700	706.9 cc/rev	4350 PSI	700 RPM	0.275 0.575
MRD1100	MRV1100	1125.8 cc/rev	4350 PSI	580 RPM	0.412 0.910
MRD1800	MRV1800	1809.6 cc/rev	4350 PSI	400 RPM	0.733 1.465
MRD2800	MRV2800	2792.0 cc/rev	4350 PSI	280 RPM	1.130 2.263
MRD4500	MRV4500	4502.7 cc/rev	4350 PSI	250 RPM	1.823 3.646
MRDE330		332.4 cc/rev	3626 PSI	1000 RPM	0.135 0.270
MRDE500		497.9 cc/rev	3626 PSI	800 RPM	0.201 0.403
MRDE800	MRVE800	804.2 cc/rev	3626 PSI	650 RPM	0.313 0.651
MRDE1400	MRVE1400	1369.5 cc/rev	3626 PSI	550 RPM	0.501 1.109
MRDE2100	MRVE2100	2091.2 cc/rev	3626 PSI	370 RPM	0.847 1.693
MRDE3100	MRVE3100	3103.7 cc/rev	3626 PSI	280 RPM	1.257 2.512
MRDE5400	MRVE5400	5401.2 cc/rev	3626 PSI	210 RPM	2.187 4.374

Calzoni MRD-MRDE, MRV-MRVE Performance Characteristics

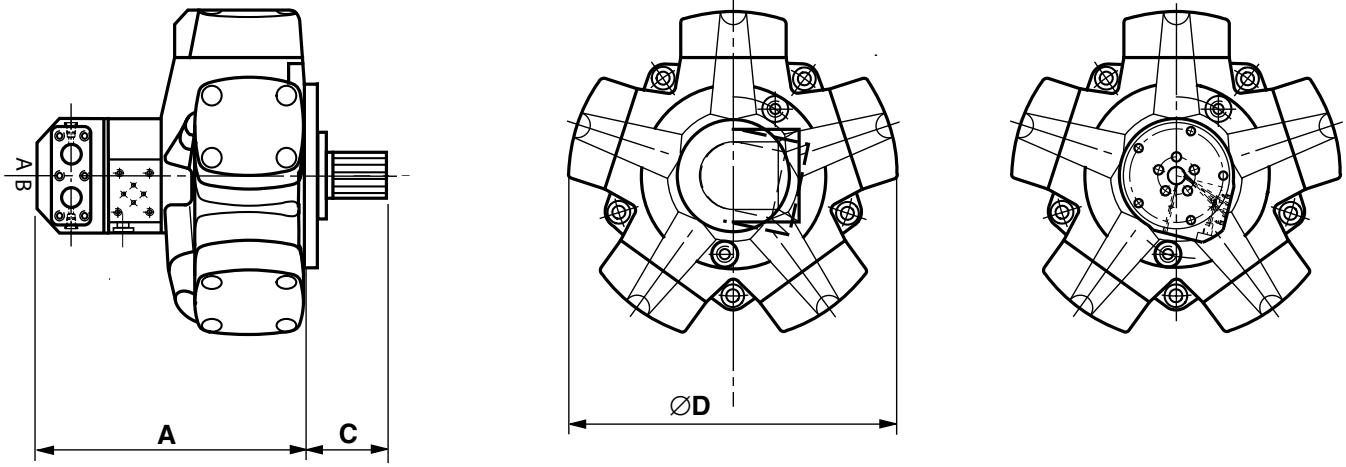




Features/Benefits

- 5-piston design
- Displacement ratios of 1:2 or 1:3
- Starting torque from 90-95% theoretical
- Total efficiency up to 96%
- Resistance to thermal shocks
  $\Delta T = 176°F$
- Speed feedback accessories optional

Calzoni MRD-MRDE, MRV-MRVE



Dimensions, mm (inch)

Series	A	C Max.	D
MRD300 MRDE330	281.9 (11.10)	81.0 (3.19)	327.9 (12.91)
MRD450 MRDE500	328.9 (12.95)	97.0 (3.82)	368.0 (14.49)
MRV450	407.9 (16.06)	110.0 (4.33)	368.0 (14.49)
MR*700 MR*E800	349.0 (13.74)	101.1 (3.98)	404.9 (15.94)
MR*1100 MR*E1400	401.1 (15.79)	117.1 (4.61)	469.9 (18.50)
MR*1800 MR*E2100	434.1 (17.09)	132.1 (5.20)	558.0 (21.97)
MR*2800 MR*E3100	526.0 (20.71)	152.9 (6.02)	642.1 (25.28)
MR*4500 MR*E5400	526.0 (20.71)	210.1 (8.27)	766.1 (30.16)

* MRD and MRV

MRD		–						
Motor Series	Size & Displacement		Shaft	Speed Sensor Option	Seals	Connection Flange	Rotation	Special

Code	Series
MRD	Dual, Standard 3626 PSI Max. Continuous
MRDE	Dual, Expanded 3026 PSI Max. Continuous
MRV	Variable, Standard 3626 PSI Max. Continuous
MRVE	Variable, Expanded 3026 PSI Max. Continuous

Code	Displacement (cc/rev)	MRD	MRDE	MRV	MRVE
300 D 150	304.1 / 152.1	x			
330 D 165	332.4 / 166.2		x		
450 E 133	451.6 / 133			x	
450 E 225	451.6 / 225.8	x			
500 E 250	497.9 / 248.9		x		
700 F 235	706.9 / 235.6	x		x	
800 F 270	804.2 / 268.1		x		x
1100 G 375	1125.8 / 375.3	x		x	
1400 G 450	1369.5 / 456.5		x		x
1800 H 600	1809.6 / 603.2	x		x	
2100 H 700	2091.2 / 697.1		x		x
2800 I 930	2792.0 / 930.7	x		x	
3100 I 1035	3103.7 / 1034.6		x		x
4500 L 1500	4502.7 / 1500.9	x		x	
5400 L 1800	5401.2 / 1800.4		x		x
7000 M 2300	6967 / 2322.4	x		x	
8200 M 2750	8226 / 2742.1		x		x

Code	Special
	Entered by Factory

Code	Rotation
N	Standard Rotation (CW: Inlet in A; CCW: Inlet in B)
S	Reversed Rotation (CW: Inlet in B; CCW: Inlet in A)

Code	Connection Flange
N1	None
C1	Standard Denison Calzoni
S1	Standard SAE Metric
T1	Standard SAE UNC
G1	SAE 6000 PSI Metric
L1	SAE 6000 PSI UNC

Code	Seals
N1	NBR Mineral Oil
F1	NBR, 218 PSI Shaft Seal
V1	Fluorocarbon
U1	No Shaft Seal (for Brake)

Code	Speed Sensor Option
N1	None
Q1	Encoder Drive
C1	Mechanized Tachometer Drive
T1	Tachometer Drive
M1	Incremental Elcis Encoder, Uni-directional*
B1	Incremental Elcis Encoder, Bi-directional*

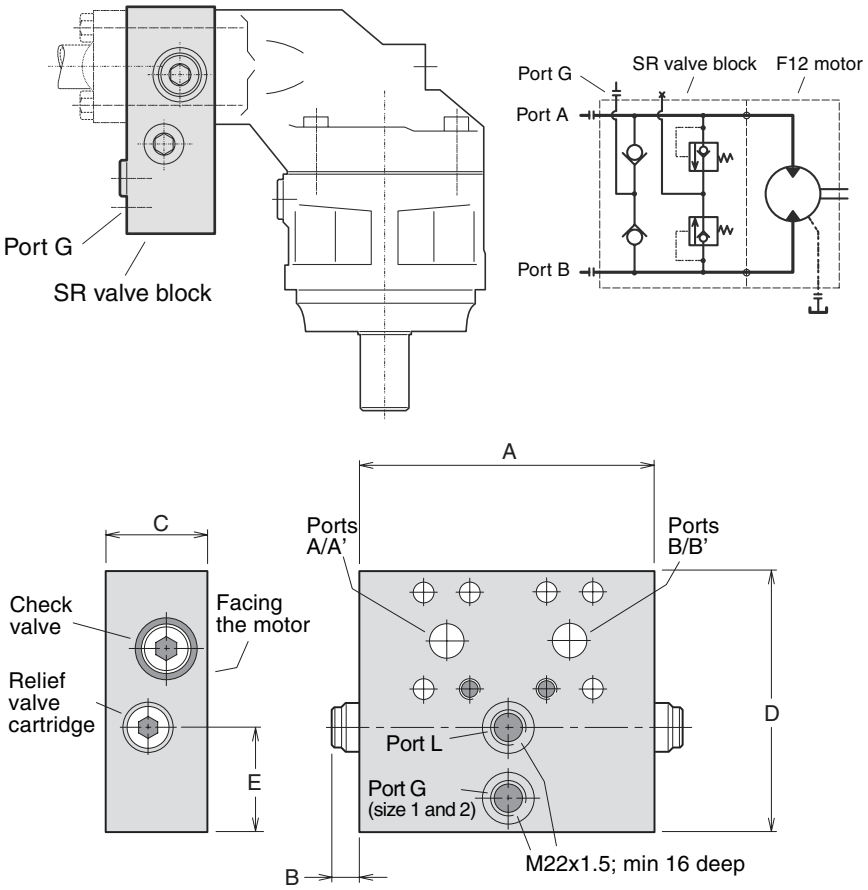
*500 pulse/rev

Code	Shaft
N1	Spline Ex DIN 5463
D1	Spline DIN 5480
F1	Female Spline DIN 5480
P1	Shaft with Key
B1	Spline B.S. 3550

Auxiliary Valves

Contents

SR Valve



The SR pressure relief/make-up valve block for series F12 and V12 motors is designed to protect the motor and the main hydraulic lines from short duration pressure spikes. The valve block also provides an excellent make-up function.

- Installs directly on the motor port flange.
- Consists of a housing containing two high pressure relief cartridges and two separate check valves for make-up.
- Non-adjustable pressure settings.
- A make-up port (G) is also provided.
- Low pressure drop through the main ports (A–A' or B–B'): 0.45 bar (6.5 PSI) at 175 l/min (45 GPM) for size 1, 0.7 bar (10 PSI) at 250 l/min (65 GPM) for size 2.

NOTE: The valve block includes main port O-rings (facing the motor) but no mounting screws.

See CD for installation dimensions.

Dimensions, mm (inch)

Series	A	B	C	D	E
SR11	157 (6.18)	16 (0.63)	55 (2.17)	140 (5.51)	55 (2.17)
SR12	160 (6.30)	16 (0.63)	57 (2.24)	150 (5.91)	55 (2.17)
SR13	160 (6.30)	16 (0.63)	57 (2.24)	135 (5.31)	25 (0.98)

SR – **1** **2** – **350/350** – **00** – **H** **F** – **A**

- **SR** — Pressure Relief/ Make-Up Valve Block
- **1** — Version
- **2** — Port Size

Code	Size	Use With
1	¾"	F12-30, -40, -60; V12-60, -80
2	1"	F12-80, V12-110
3	1¼"	F12-110, V12-160

- **350/350** — Pressure Settings

Code	Pressure Settings A/B Ports
280	280 bar (4000 PSI)
300	300 bar (4350 PSI)
330	330 bar (4800 PSI)
350	350 bar (5000 PSI)
380	380 bar (5500 PSI)
400	400 bar (5800 PSI)
420	420 bar (6100 PSI)

- **00** — Serial Number
- **H** — Seals

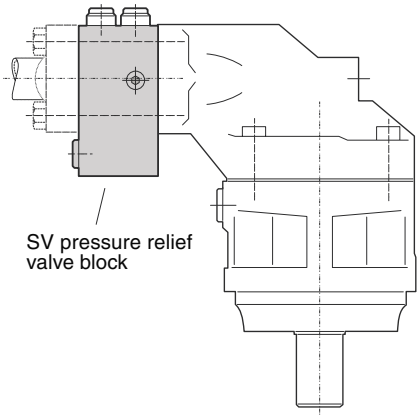
Code	Seals
H	Nitrile

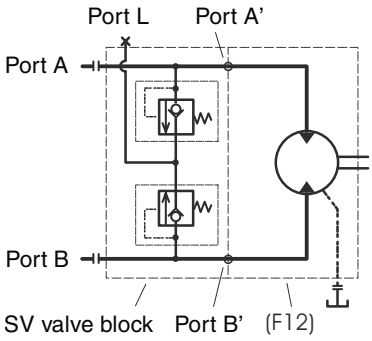
- **F** — Port Threads

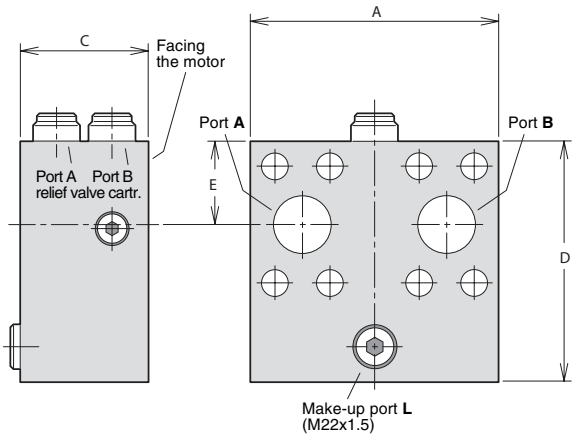
Code	Port Threads
F	Metric

- **A** — Design Level

SV Valve







The SV pressure relief valve block for series F12, V12 and T12 motors is designed to protect the motor and adjacent hydraulic components from short duration pressure peaks.

- Installs directly on the motor port flange.
- Consists of a housing containing two high pressure relief cartridges with anti-cavitation function.
- Non-adjustable pressure settings.
- A make-up port (L) is also provided.
- Low pressure drop through the main ports (A–A' or B–B'): 0.45 bar (6.5 PSI) at 175 l/min (45 GPM) for ¾", 0.7 bar (10 PSI) at 250 l/min (65 GPM) for 1" size.

NOTE: The valve block includes main port O-rings (facing the motor) but no mounting screws.

See CD for installation dimensions.

Dimensions, mm (inch)

Series	A	C	D	E
SV11	130 (5.12)	71 (2.80)	99 (3.90)	36 (1.42)
SV12	127 (5.00)	73 (2.87)	109 (4.29)	41 (1.61)
SV13	142 (5.59)	73 (2.87)	135 (5.31)	47 (1.85)

SV	1	2	–	350/350	–	00	–	H	F	–	A
Pressure Relief Valve Block	Version	Port Size		Pressure Settings		Serial Number		Seals	Port Threads		Design Level

Code	Size	Use With
1	¾"	F12-30, -40, -60; T12-60; V12-60, -80
2	1"	F12-80, T12-80, V12-110
3	1¼"	F12-110, V12-160

Code	Pressure Settings A/B Ports
280	280 bar (4000 PSI)
300	300 bar (4350 PSI)
330	330 bar (4800 PSI)
350	350 bar (5000 PSI)
380	380 bar (5500 PSI)
400	400 bar (5800 PSI)
420	420 bar (6100 PSI)

Code	Seals
H	Nitrile

Code	Port Threads
F	Metric

C5V

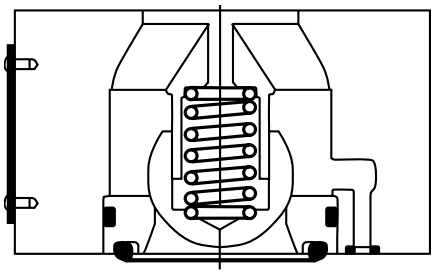
The C5V flange mounted check valves are ideal for pump outlet ports, cylinder ports, manifolds, or any Code 61 or 62 four bolt flange. These valves provide a compact, leak-free solution for any hydraulic circuit. Unloader circuits can also be easily configured using the C5V/R5U combination, with the built-in downstream sensing line passage located in the flange face.

Valve Performance Data

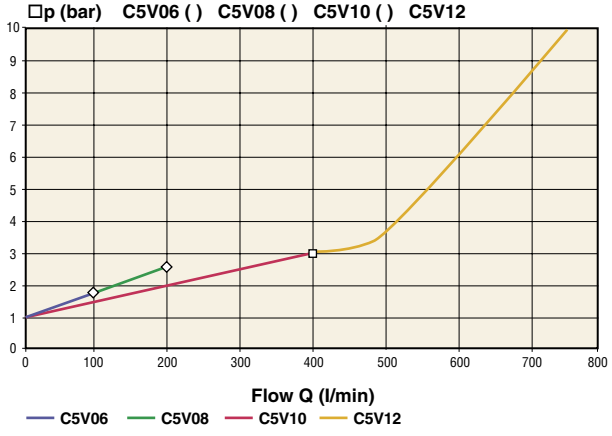
			Max Pressure	
Series	**Ports**	**Max. Flow**	**SAE 61 Flange**	**SAE 62 Flange**
C5V06	3/4"	26.4 GPM	5000 PSI	6000 PSI
C5V08	1"	52.8 GPM	5000 PSI	6000 PSI
C5V10	1¼"	105.7 GPM	4000 PSI	6000 PSI
C5V12	1½"	198.1 GPM	3000 PSI	6000 PSI

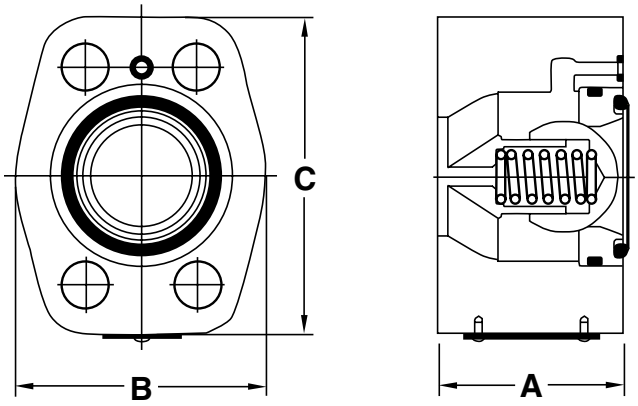
Features/Benefits

- Bolts directly to pumps and motors
- Flange mounting eliminates costly piping
- Three different springs for range of cracking pressures
- Capsulated spring chamber
- Increase range of other flange mounted valves



C5V Series (B-design) □p-Q Characteristics (1 bar spring)





Dimensions, mm (inch)

Series	A	B	C
C5V06	45 (1.78)	48 (1.89)	64 (2.52)
C5V08	45 (1.78)	60 (2.36)	74 (2.91)
C5V10	50 (1.97)	68 (2.68)	85 (3.35)
C5V12	50 (1.97)	80 (3.15)	104 (4.09)

C5V [ ] – [ ] [ ] [ ] – **B** [ ] [ ]

Check Valve | Size | Flange | Body Seals | Cracking Pressure | Design Letter | Seal Class | Modification

Code	Size
06	3/4"
08	1"
10	1¼"
12	1½"

Code	Flange
3	SAE 61
4	SAE 62

Code	Body Seals
1	Sealing for Port A
2	Sealing for Ports A & X (for SAE 61 only)
3	Without Sealing

Code	Cracking Pressure
0	0.5 bar
1	1 bar (Standard)
2	2 bar

Design Letter
Determined by Factory

Code	Seal Class
1	NBR (Buna N) Standard
4	EPDM
5	Fluorocarbon

Code	Modification
019	C5V10 for M14 Mounting Screws (SAE 62 only)

R1E02

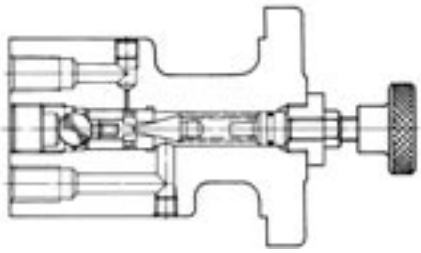
The R1E02 is a direct operated pressure relief valve. These reliable seat type valves are designed to control system pressure and set with the manual adjusting device. Typical applications would be for remote pilot control of two-stage relief valves or pump compensators. Panel mount versions are ideal for installation on industrial equipment.

Valve Performance Data

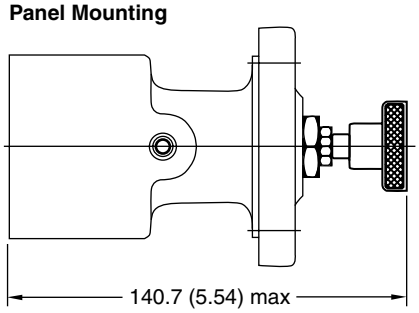
Series	Ports	Max. Flow	Max. Op. Pressure
R1E02	¼" NPTF or G¼"	1 GPM	5000 PSI

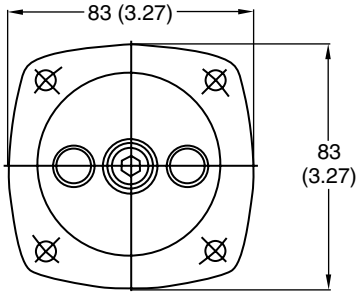
Features/Benefits

- Four different mounting types
  Stable pressure function
- Three different control types
- Usable as remote control valve for all pilot operated pressure control valves

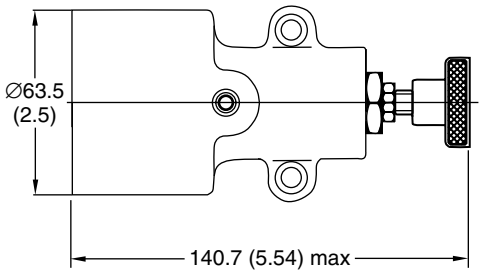


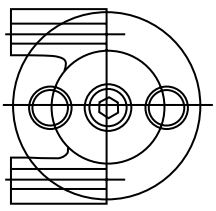
Panel Mounting



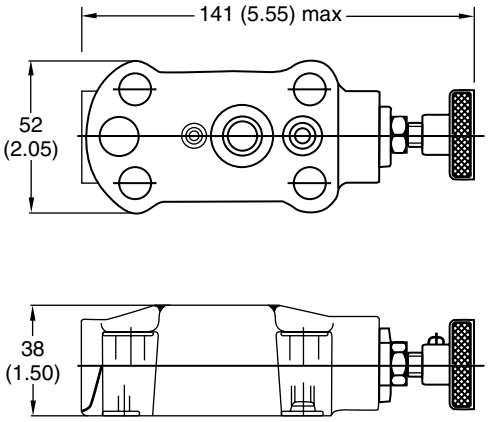


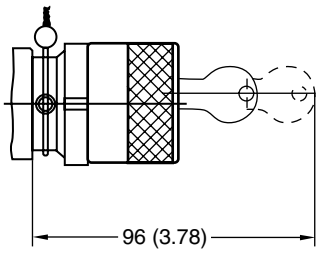
Foot Mounting



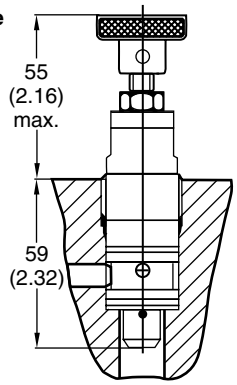


Subplate Mounting





Cartridge Type



R1E02	–					–	A	–		–	
Pressure Relief Valves		Body Mounting	Pressure Setting Range	Connections	Type of Control		Design Letter		Seal Class		Modification

Code	Body Mounting
0	Cartridge
1	Foot Mounting
2	Panel Mounting
3	Subplate Mounting

Code	Pressure Setting Range
1	7 - 105 bar (58 - 1500 PSI)
3	7 - 210 bar (58 - 3000 PSI)
5	7 - 350 bar (58 - 5000 PSI)

Code	Size
0	Without (Only for Cartridge)
1	1/4" NPTF
2	G 1/4"

Code	Type of Control
1	Hand Knob (32 mm Dia.)
2*	Hand Knob (50 mm Dia.)
3	Acorn Nut with Lead Seal
4*	Adjusting Device with Key Lock (key order # 700-70619)

* On bodies for subplate mounting, use adapter plate S16-64188 if necessary.

This requires the following 4 mounting screws: M10 x 55 DIN 912; 12.9
Order # 700-71447-8

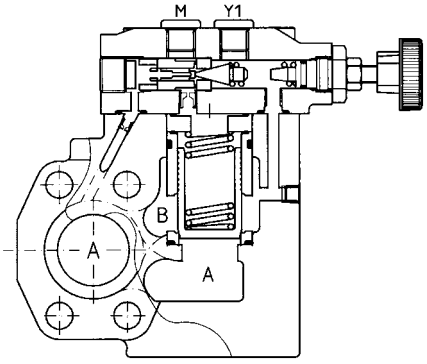
Code	Seal Class
1	Standard (for special fluids, consult factory)

R5 2-Port

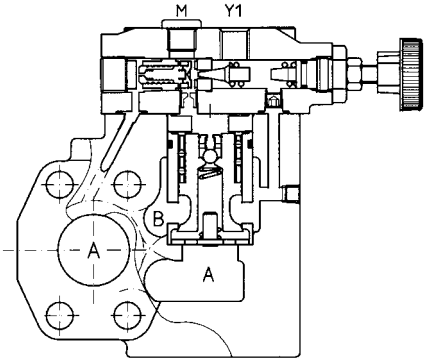
R5 Series 2-port pressure valves are pilot operated controls consisting of two or three valve sections. The electric vent and proportional control section are standard options that suit well for on/off hydraulic functions and precise variable pressure control.

Valve Performance Data

Series	Ports	Max Flow	Max Inlet Pressure
R5*06	¾"	23.7 GPM	5000 PSI
R5*08	1"	79.3 GPM	5000 PSI
R5*10	1¼"	159.5 GPM	4000 PSI
R5*12	1½"	159.5 GPM	3000 PSI w/SAE 61 Flange, 5000 PSI w/SAE 62 Flange



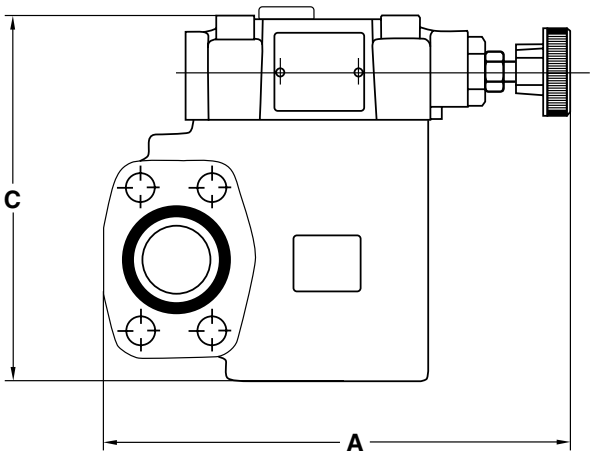
Example: R5V10
Internal Drain



Example: R5R10
Only external Drain

Features/Benefits

- Direct mounting to SAE pump outlet flange ensures maximum pump protection against peak pressure and eliminates costly piping
- Minimum pressure overshoot and cracking flow
- Extremely precise pressure setting
- Fast response, high accuracy and quiet, flutter-free control
- Wide range of control options and accessories



Dimensions, mm (inch)

Series	A max	B	C
R5*06	152 (5.98)	60 (2.36)	128 (5.04)
R5*08	171 (6.73)	60 (2.36)	134 (5.28)
R5*10	179 (7.05)	75 (2.95)	147 (5.79)

R5*		–					–						–		–		–	
Series	Size		Max. Pressure	Body Mounting	Pressure Setting Range (Nominal)	Type of Control		Pilot Connection		3-Way Vent Valve (VV01)	Electronic Pressure Control	Solenoid Voltage and Current		Design Letter	Seal Class		Modifi-cations

Code	Series
R5V	Pressure Relief Valve
R5S	Sequence Valve
R5R	Pressure Reducing Valve

Code	Size
06	3/4"
08	1"
10	1¼"

Code	Max. Pressure
4	280 bar (Size 10)
5	350 bar (Sizes 06/08)
C	With Built-in Return Flow Check (Max. 210 bar)

Code	Body Mounting
2	Annular Entry for R5R [M, Y1, Ports SAE-4 (7/16"-20 UNF)]
5	Seat Entry for R5V/R5S [M, Y1, Ports SAE-4 (7/16"-20 UNF)]
7	Seat Entry for R5V/R5S (M, Y1, Ports G 1/4")
8	Annular Entry for R5R (M, Y1, Ports G1/4")

Code	Pressure Setting Range
1	7-105 bar (58-1500 PSI)
3	7-210 bar (58-3000 PSI)
5	7-350 bar (58-5000 PSI)

Code	Type of Control
1	Hand Knob, 32mm Dia.
2*	Hand Knob, 50mm Dia.
3	Acorn Nut with Lead Seal
4	Adjusting Device with Key Lock (Key order # 700-70619-8)

* Not for version with vent valve VV01 or P2.

Code	Pilot Connection
2	Internal PP, Internal PD (R5V)
6	Internal PP, External PD (R5V, R5S, R5R)

Code	3-Way Vent Valve VV01
09	With Manual Override (1)
10	Without Manual Override (1)
11	With Manual Override (2)
12	Without Manual Override (2)

(1) Solenoid de-energized, open to tank; solenoid energized, vent line blocked
(2) Solenoid de-energized, vent line blocked; solenoid energized, open to tank

Code	Electric Proportional Pressure Control
P2	12 VDC only (R5V & R5R only)

Code	Solenoid Voltage and Current
W01*	115 VAC/60 Hz
W02*	230 VAC/60 Hz
W06*	115 VAC/50 Hz
W07*	230 VAC/50 Hz
G0R	12 VDC
G0Q*	24 VDC
G0H*	48 VDC

* Not available for models with P2 option.

Code	Seal Class
1	NBR (Standard)
4	EPDM
5	Fluorocarbon

= Omit for version without VV01 & without P2

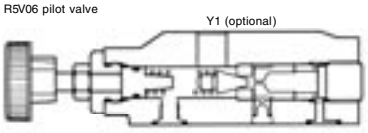
R5 3-Port

R5 Series 3-port pressure valves are pilot operated controls consisting of two or three valve sections. The electric vent and proportional control section are standard options that suit well for on/off hydraulic functions and precise variable pressure control.

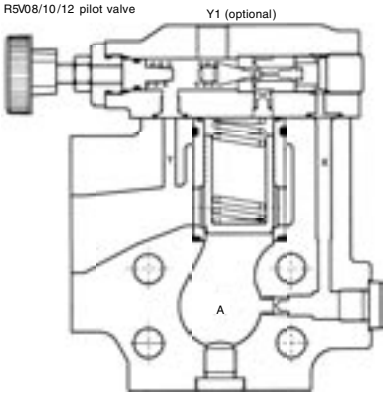
Valve Performance Data

Series	Ports	Max Flow	Max Inlet Pressure
R5*06	¾"	23.7 GPM	5000 PSI
R5*08	1"	79.3 GPM	5000 PSI
R5*10	1¼"	159.5 GPM	4000 PSI
R5*12	1½"	159.5 GPM	3000 PSI w/SAE 61 Flange, 5000 PSI w/SAE 62 Flange

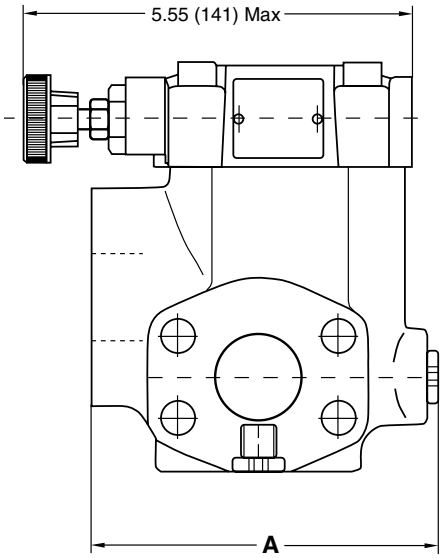
R5V06 pilot valve

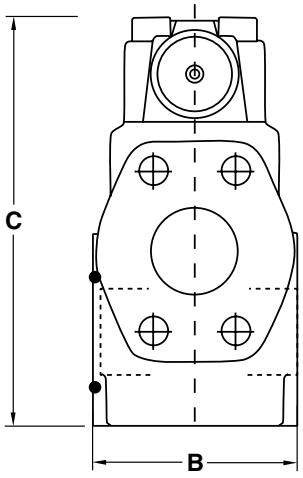


R5V08/10/12 pilot valve



Example: R5V Pressure Relief Valve





Dimensions, mm (inch)

Series	A	B	C
R5*06	123 (4.84)	60 (2.36)	119.2 (4.70)
R5*08	127 (5.0)	60 (2.36)	140.6 (5.53)
R5*10	127 (5.0)	75 (2.95)	149.1 (5.87)
R5*12	151.7 (5.97)	80 (3.15)	177.6 (6.99)

R5*		–				–			–			–		–	A		–	
Series	Size		Max. Pressure	Body Porting	Pressure Setting Range (Nominal)		Type of Control	Pilot Connection		3-Way Vent Valve (VV01)	Electronic Pressure Control		Solenoid Voltage and Current		Design Letter	Seal Class		Modifi-cations

Code	Series
R5V	Pressure Relief Valve
R5U	Pressure Unloading Valve
R5S	Sequence Valve

Code	Size
06	3/4"
08	1"
10	1¼"
12	1½" (R5V, R5U only)

Code	Max. Pressure
3	210 bar – SAE 61 Flange (R5V/R5U12)
4	280 bar – SAE 61 Flange (R5*10)
5	350 bar – SAE 61 Flange (R5*06/08)
6	350 bar – SAE 62 Flange (R5V12 only)

Code	Body Porting*
3	SAE-4 (7/16"-20 UNF)
9	G 1/4"

* Port Y1 is only available at external PD (codes 4 & 6) from the pilot head. Ports X1 and M closed when supplied.

Code	Pressure Setting Range
1	To 105 bar (1500 PSI) – R5U Pressure Differential 28%
3	To 210 bar (3000 PSI) – R5U Pressure Differential 28%
5	To 350 bar (5000 PSI) – R5U Pressure Differential 15%

Code	Type of Control
1	Hand Knob, 32mm Dia.
2*	Hand Knob, 50mm Dia.
3	Acorn Nut with Lead Seal
4	Adjusting Device with Key Lock (Key order # 700-70619-8)

* Not for version with vent valve VV01 or P2.

Code	Pilot Connection
2	Internal PD, Internal PP (R5V)
4	External PD, External PP* (R5U)
5	Internal PD, External PP* (R5U)
6	External PD, Internal PP (R5V, R5S)

* External pilot pressure connection on flange face (port X2)

Code	3-Way Vent Valve VV01
09	With Manual Override (1)
10	Without Manual Override (1)
11	With Manual Override (2)
12	Without Manual Override (2)

(1) Solenoid de-energized, open to tank; solenoid energized, vent line blocked
(2) Solenoid de-energized, vent line blocked; solenoid energized, open to tank

Code	Electric Proportional Pressure Control
P2	12 VDC (R5V only)

Code	Solenoid Voltage and Current
W01*	115 VAC/60 Hz
W02*	230 VAC/60 Hz
W06*	115 VAC/50 Hz
W07*	230 VAC/50 Hz
G0R	12 VDC
G0Q*	24 VDC
G0H*	48 VDC

* Not available for models with P2 option.

Code	Seal Class
1	NBR (Standard)
4	EPDM
5	Fluorocarbon

= Omit for version without VV01 & without P2

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2. Payment: Payment shall be made by Buyer net 30 days from the date of delivery of the items purchased hereunder. Amounts not timely paid shall bear interest at the maximum rate permitted by law for each month or portion thereof that the Buyer is late in making payment. Any claims by Buyer for omissions or shortages in a shipment shall be waived unless Seller receives notice thereof within 30 days after Buyer's receipt of the shipment.

3. Delivery: Unless otherwise provided on the face hereof, delivery shall be made F.O.B. Seller's plant. Regardless of the method of delivery, however, risk of loss shall pass to Buyer upon Seller's delivery to a carrier. Any delivery dates shown are approximate only and Seller shall have no liability for any delays in delivery.

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5. Limitation Of Remedy: SELLER'S LIABILITY ARISING FROM OR IN ANY WAY CONNECTED WITH THE ITEMS SOLD OR THIS CONTRACT SHALL BE LIMITED EXCLUSIVELY TO REPAIR OR REPLACEMENT OF THE ITEMS SOLD OR REFUND OF THE PURCHASE PRICE PAID BY BUYER, AT SELLER'S SOLE OPTION. IN NO EVENT SHALL SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES OF ANY KIND OR NATURE WHATSOEVER, INCLUDING BUT NOT LIMITED TO LOST PROFITS ARISING FROM OR IN ANY WAY CONNECTED WITH THIS AGREEMENT OR ITEMS SOLD HEREUNDER, WHETHER ALLEGED TO ARISE FROM BREACH OF CONTRACT, EXPRESS OR IMPLIED WARRANTY, OR IN TORT, INCLUDING WITHOUT LIMITATION, NEGLIGENCE, FAILURE TO WARN OR STRICT LIABILITY.

6. Changes, Reschedules and Cancellations: Buyer may request to modify the designs or specifications for the items sold hereunder as well as the quantities and delivery dates thereof, or may request to cancel all or part of this order, however, no such requested modification or cancellation shall become part of the contract between Buyer and Seller unless accepted by Seller in a written amendment to this Agreement. Acceptance of any such requested modification or cancellation shall be at Seller's discretion, and shall be upon such terms and conditions as Seller may require.

7. Special Tooling: A tooling charge may be imposed for any special tooling, including without limitation, dies, fixtures, molds and patterns, acquired to manufacture items sold pursuant to this contract. Such special tooling shall be and remain Seller's property notwithstanding payment of any charges by Buyer. In no event will Buyer acquire any interest in apparatus belonging to Seller which is utilized in the manufacture of the items sold hereunder, even if such apparatus has been specially converted or adapted for such manufacture and notwithstanding any charges paid by Buyer. Unless otherwise agreed, Seller shall have the right to alter, discard or otherwise dispose of any special tooling or other property in its sole discretion at any time.

8. Buyer's Property: Any designs, tools, patterns, materials, drawings, confidential information or equipment furnished by Buyer or any other items which become Buyer's property, may be considered obsolete and may be destroyed by Seller after two (2) consecutive years have elapsed without Buyer placing an order for the items which are manufactured using such property, Seller shall not be responsible for any loss or damage to such property while it is in Seller's possession or control.

9. Taxes: Unless otherwise indicated on the face hereof, all prices and charges are exclusive of excise, sales, use, property, occupational or like taxes which may be imposed by any taxing authority upon the manufacture, sale or delivery of the items sold hereunder. If any such taxes must be paid by Seller or if Seller is liable for the collection of such tax, the amount thereof shall be in addition to the amounts for the items sold. Buyer agrees to pay all such taxes or to reimburse Seller therefore upon receipt of its invoice. If Buyer claims exemption from any sales, use or other tax imposed by any taxing authority, Buyer shall save Seller harmless from and against any such tax, together with any interest or penalties thereon which may be assessed if the items are held to be taxable.

10. Indemnity For Infringement of Intellectual Property Rights: Seller shall have no liability for infringement of any patents, trademarks, copyrights, trade dress, trade secrets or similar rights except as provided in this Part 10. Seller will defend and indemnify Buyer against allegations of infringement of U.S. Patents, U.S. Trademarks, copyrights, trade dress and trade secrets (hereinafter 'Intellectual Property Rights'). Seller will defend at its expense and will pay the cost of any settlement or damages awarded in an action brought against Buyer based on an allegation that an item sold pursuant to this contract infringes the Intellectual Property Rights of a third party. Seller's obligation to defend and indemnify Buyer is contingent on Buyer notifying Seller within ten (10) days after Buyer becomes aware of such allegations of infringement, and Seller having sole control over the defense of any allegations or actions including all negotiations for settlement or compromise. If an item sold hereunder is subject to a claim that it infringes the Intellectual Property Rights of a third party, Seller may, at its sole expense and option, procure for Buyer the right to continue using said item, replace or modify said item so as to make it noninfringing, or offer to accept return of said item and return the purchase price less a reasonable allowance for depreciation. Notwithstanding the foregoing, Seller shall have no liability for claims of infringement based on information provided by Buyer, or directed to items delivered hereunder for which the designs are specified in whole or part by Buyer, or infringements resulting from the modification, combination or use in a system of any item sold hereunder. The foregoing provisions of this Part 10 shall constitute Seller's sole and exclusive liability and Buyer's sole and exclusive remedy for infringement of Intellectual Property Rights.

If a claim is based on information provided by Buyer or if the design for an item delivered hereunder is specified in whole or in part by Buyer, Buyer shall defend and indemnify Seller for all costs, expenses or judgments resulting from any claim that such item infringes any patent, trademark, copyright, trade dress, trade secret or any similar right.

11. Force Majeure: Seller does not assume the risk of and shall not be liable for delay or failure to perform any of Seller's obligations by reason of circumstances beyond the reasonable control of Seller (hereinafter 'Events of Force Majeure'). Events of Force Majeure shall include without limitation, accidents, acts of God, strikes or labor disputes, acts, laws, rules or regulations of any government or government agency, fires, floods, delays or failures in delivery of carriers or suppliers, shortages of materials and any other cause beyond Seller's control.

12. Entire Agreement/Governing Law: The terms and conditions set forth herein, together with any amendments, modifications and any different terms or conditions expressly accepted by Seller in writing, shall constitute the entire Agreement concerning the items sold, and there are no oral or other representations or agreements which pertain thereto. This Agreement shall be governed in all respects by the law of the State of Ohio. No actions arising out of the sale of the items sold hereunder or this Agreement may be brought by either party more than two (2) years after the cause of action accrues.

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DRIVEN

anything Parker Possible™

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