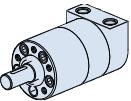
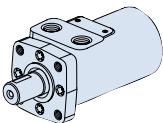
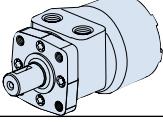
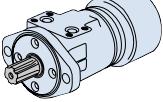
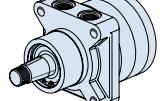
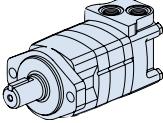
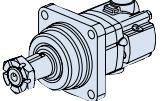
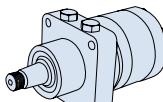
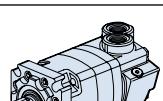
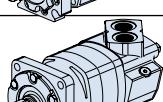
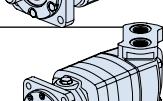
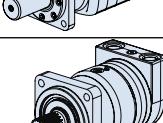
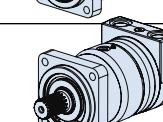
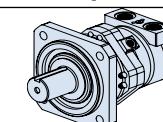


Low Speed, High Torque Motors

Spool Valve: J, H, S, T, and WV Series
Disc Valve: 2,000, 4,000 Compact, Delta,
4,000, 6,000, and 10,000 Series
VIS: VIS 30, VIS 40, and VIS 45 Series



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	J Series	(129-)	B-1-1
	H Series	(101-)	B-2-1
	S Series	(103-)	B-3-1
	T Series & "T" Series w/Parking Brake	(158-) (185-)	B-4-1
	W Series & W Series w/Parking Brake	(162-)	B-5-1
	2000 Series	(104-, 105-, 106-)	C-1-1
	4000 Compact Series	(167-,169-, 170-)	C-2-1
	Delta Series	(184-)	C-3-1
	4000 Series	(109-, 110-, 111-)	C-4-1
	6000 Series	(112-,113-,114-)	C-5-1
	10,000 Series	(119-, 120-, 121-)	C-6-1
	VIS 30 & VIS 30 w/Parking Brake	(159-,160-, 161-, 171-, 172-, 181-)	D-1-1
	VIS 40 & VIS 40 w/Parking Brake	(168-,176-, 177-, 178-, 180-, 183-)	D-2-1
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Char-Lynn, Hydraulic Motors

Introduction

For the past 45 years, the Char-Lynn®, brand has been recognized as the industry leader in low-speed, high-torque (LSHT) hydraulic motor technology. The name Char-Lynn was coined by one of the original pioneers in the hydraulic industry, the late Mr. Lynn Charlson. The hydraulic motor designs developed by Lynn Charlson and his team use what is termed as the Orbit principle. This principal is the center of the designs pioneered by the Char-Lynn team and is based on the fact that a gerotor or Geroler®, star orbits multiple times (typically 6 to 8 times depending on specific star and ring geometry) for each complete single revolution within the outer ring. This principle is what gives Char-Lynn motors their reliable high power density and extremely compact size. Only three primary moving components are needed to transmit torque through the motor: star, drive and output shaft. Shaft rotation can be instantly reversed by changing inlet / outlet flow while generating equal torque in either direction. A variety of displacement sizes are available in each motor family that provide a wide variety of speeds and torque ranges from any series of motors. The results are compact, modular, economical designs that can be easily customized to suit a wide variety of application needs.

Motor options include:

- Displacement size (cubic inches or cc's per revolution)
- Output shaft size and type
- Mounting flange type
- Porting interface
- A wide selection of special features such as integrated brakes, sensors, integrated cross-over relief valves, 2-speed capability, manifold valve packages, and environmental protection suited for corrosive environments.

Char-Lynn motors are extremely reliable, compact, and have tremendous power density. They provide a way to meet many needs for cost-effective power transmission requirements. Multiple motors can be driven by a single power source (pump) and controlled using a wide array of valves and variable displacement pump controls. Motors can even be configured with electronic sensors to provide digital feedback for sensing both motor direction and output speed.

The Char-Lynn motor range consists of three major types based on the type of valving used to distribute fluid through the Orbit gear set (geroler or gerotor). These three types are:

- **Spool Valve**
- **Disc Valve**
- **VIS (Valve-in-Star)**

Migration from one valve technology to the next enhances motor performance in terms of efficiency, pressure rating, displacements, and motor output torque capability.

To help guide you to proper product selection, a quick guide is provided below. In addition, you will find product highlights, summaries of motor option features and benefits, application formulas, and detailed specifications for each motor family.

MOTOR QUICK-GUIDE (BASED ON MAXIMUM CONTINUOUS RATINGS)

Type	Output Torque Nm [lb-in]	Pressure bar [psi]	Flow lpm [gpm]	Side Load kg [lbs]
Spool Valve	441 [3905]	165 [2400]	62 [18]	725 [1600]
Disc Valve	2700 [24000]	205 [3000]	170 [45]	4500 [10000]
VIS (valve-in-star)	4520 [40000]	345 [5000]	170 [45]	8640 [19000]

Circuits

Circuit Design Considerations

Hydraulic Circuit

Hydraulic drives can be divided into two basic types: 1) Traction Drives and 2) Non-Traction drives. Traction drives (also referred to as propel drives) are used to propel a wheeled or track-driven vehicle. Non-traction drives (also referred to as work drives) are used for some other vehicle function such as a winch, auger, conveyor or rotate function for a boom or crane.

These rotary drive systems can also be classified as either open loop or closed-loop circuits.

Open Loop Circuit

In an open loop circuit, oil is returned to a reservoir before returning to the motor. The motor/pump circuit is open to atmosphere. In an open loop circuit, the drive speed of a motor may be controlled by, varying the flow with a valve, changing pump input speed (engine or pump input speed), or varying flow using a variable displacement pump. Often these circuits use counter-balance valves to accomplish dynamic braking functions, and provide a flow (pressure) source to release a spring-applied, hydraulic release brake. It is common to use a shuttle valve for directing flow to release the spring-applied pressure-release brake. A shuttle valve is basically a double check valve that directs flow from the A or B side of the loop and is often the source of flow to create the pressure to release a brake.

Typical applications using open loop circuits include:

- Truck-Mounted Booms and cranes (boom – rotate function)
- Aerial Work Platforms (boom – rotate function)
- Winches
- Conveyors
- Grapples
- Others

Closed Loop Circuit

In a closed loop circuit, there is no reservoir between the inlet and outlet of the motor and pump. The pump outlet is connected directly to the motor inlet and the motor outlet is connected directly to the pump inlet. This circuit is, in theory, closed to atmosphere. Motor speed is typically controlled using a variable displacement pump. This pump can also control motor output shaft direction (CW or CCW rotation).

These systems provide dynamic control of flow through the closed loop of the motor/pump circuit. They are, however, subject to some inherent internal leakage that results in the inability of the loop to hold a load over time. This is why a static brake is typically found in such systems to mechanically hold the load. Brakes used include mechanical caliper, disc or ball-ramp type brakes. In addition, spring-applied, hydraulic release brakes are used. The T Series Motor w/Parking Brake meets this need.

Typical applications using closed loop circuits include:

- Vehicle traction drives (propel function)
- Conveyors
- Winches
- Others

Design Flexibility

Char-Lynn motors are truly built for high torque low speed. A lot of power is derived from this small package. This power advantage provides the designer with a product that can be used for overall compactness in addition to taking full advantage of the high pressure ratings typical of present day hydraulic components.

Char-Lynn hydraulic motors allow the designer to put the power where it is needed. Furthermore, the motors can be mounted directly on the driven device away from the original power source which eliminates the need for other mechanical linkages such as chains, sprockets, belts, pulleys, gears, rotating drive shafts, and universal joints. Several motors can be driven from the same power source and can be connected in series or parallel to each other.

Durability

The design and method of manufacture of three critical drive train components: valve drive, shaft drive, and output shaft, give these motors durability. Consequently, the motors stand up against high hydraulic pressures.

Performance Rating

Our method of rating these motors recognizes that at slower speeds and flow, higher pressures and torque are permitted. Hence, our performance data shows the complete flow range (down to 1 liter per minute or 1/4 gallon per minute) and speed range (down to one revolution per minute depending on application).

Controllable Speeds

Char-Lynn motors operate at low speeds that remain very near constant even when load varies. Shaft speed is varied smoothly, easily and economically using simple inexpensive controls. Also, these motors are reversible. Consequently, direction of shaft rotation can be changed instantly with equal output torque in either direction.

Dependable Performance

Highly precise manufacturing of parts provide consistent, dependable performance and long life even under varying conditions.

Reliability

Char-Lynn motors are self contained, with hydraulic fluid providing lubrication. These motors are completely sealed so they can operate safely and reliably in hostile environments such as dust, dirt, steam, water, and heat and provide reliable performance.

High Efficiencies

Char-Lynn motors efficiently convert the supplied hydraulic fluid's pressure and flow into a low speed high torque rotational output. This efficiency minimizes the rate of hydraulic system heat generation and maximizes shaft horsepower.

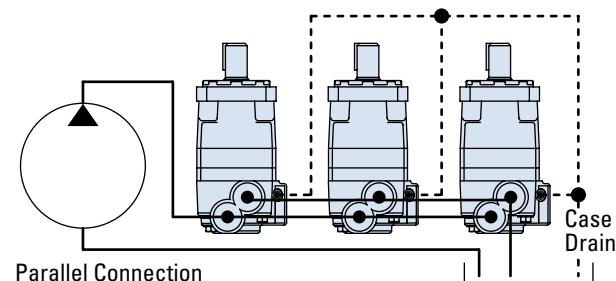
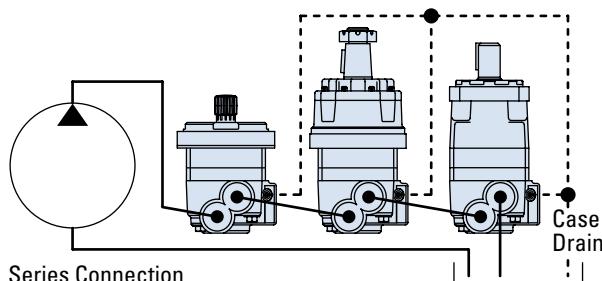
Case Drain and Shuttle Valve Options

Many hydraulic systems can benefit from the use of a system case drain. Char-Lynn motors provide this

feature built in. One of the advantages for case drain flow is that contamination is flushed from the system. This flushing also aids in cooling the system and lowering the case pressure

which will extend motor seal life. With a case drain line in place, oil pressure in the gear box (Bearingless motor applications) can also be controlled. In applications where more system cooling

and flushing is required, a shuttle valve option is available in VV series, 2000, 4000 Compact, 4000, 6000 series, VIS 30, VIS 40 and VIS 45 series motors.



Motor Application Information

Vehicle Drive Calculations

Step One — Calculate Motor Speed (RPM)

$$RPM = \frac{2.65 \times KPH \times G}{R_m} \quad RPM = \frac{168 \times MPH \times G}{R_i}$$

where KPH = vehicle speed (kilometers per hour)

where MPH = vehicle speed (miles per hour)

R_m = rolling radius of tires (meter)

R_i = rolling radius of tires (inch)

G = gear reduction ratio (if any) between motors and wheels. If no gear box or other gear reduction devices are used G = 1.

If vehicle speed is expressed in m/second, multiply by 3.6 to convert to KPH. If vehicle speed is expressed in ft./second, divide by 1.47 to convert to MPH.

Step Two — Determine Rolling Resistance

Rolling resistance (RR) is the force required to propel a vehicle over a particular surface. The values in Table 1 are typical of various surfaces per 1000 lb. of vehicle weight.

$$RR = GVW \times \rho \text{ (kg) (lb)}$$

where GVW = gross (loaded) vehicle weight lb/Kg

ρ = value from Table 1

TABLE 1- ROLLING RESISTANCE COEFFICIENTS FOR RUBBER TIRES ON VARIOUS SURFACES

Surface	ρ
Concrete, excellent	.010
Concrete, good	.015
Concrete, poor	.020
Asphalt, good	.012
Asphalt, fair	.017
Asphalt, poor	.022
Macadam, good	.015
Macadam, fair	.022
Macadam, poor	.037
Snow, 2 inch	.025
Snow, 4 inch	.037
Dirt, smooth	.025
Dirt, sandy	.040
Mud	.037 to .150
Sand, Gravel	.060 to .150
Sand, loose	.160 to .300

Step Three — Ttractive Effort to Ascend Grade

The largest grade a vehicle can ascend is called its "gradability." Grade is usually expressed as a percent rather than in degrees. A rise of one meter in ten meters or one footrise in ten feet of travel is a 1/10 or 10 percent grade.

$$GR = GVW (\sin \theta + \rho \cos \theta)$$

TABLE 2

Comparison Grade (%)	Table Slope (Degrees)
1%	0° 35'
2%	1° 9'
5%	2° 51'
6%	3° 26'
8%	4° 35'
10%	5° 43'
12%	6° 5'
15%	8° 31'
20%	11° 19'
25%	14° 3'
32%	18°
60%	31°

Step Four — Determine Acceleration Force (FA)

The force (FA) required to accelerate from stop to maximum speed (KPH) or (MPH) in time (t) seconds can be obtained from the following equation:

$$FA = \frac{KPH \times GVW(\text{kg})}{3.6 t}$$

FA = Acceleration Force (Newton)

t = Time (Seconds)

$$FA = \frac{\text{MPH} \times GVW \text{ (lb)}}{22 t}$$

FA = Acceleration Force (lb)

t = Time (Seconds)

Step Five — Determine Drawbar Pull

Drawbar Pull (DP) is total force available at the drawbar or "hitch" after the above forces have been subtracted from the total propelling force produced by the hydraulic motors. This value is established as either:

1. A goal or objective of the designer.
2. A force required to pull a trailer (Repeat steps two through four above using trailer weight and add the three forces together to obtain DP).

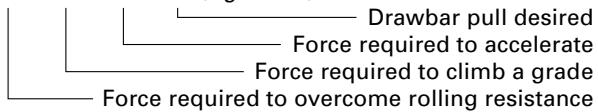
Motor Application Information

Vehicle Drive Calculations

Step Six — Total Tractive Effort

The tractive effort (TE) is the total force required to propel the vehicle and is the sum of the forces determined in Steps 2 through 5.

$$TE = RR + GR + FA + DP \text{ (Kg. or lb.)}$$



Wind resistance forces can usually be neglected. However, it may be wise to add 10% to the above total to allow for starting resistances caused by friction in bearings and other mechanical components.

Step Seven — Calculate Hydraulic Motor Torque (T)

$$T = \frac{TE \times R_m}{Nx Gx Eg} \text{ (Nm / Motor)}$$

$$T = \frac{TE \times R_l}{Nx Gx Eg} \text{ (lb - in/Motor)}$$

Where: N = number of driving motors

Eg = gear box mechanical efficiency

Step Eight—Wheel Slip

If the torque required to slip the wheel (TS) is less than the torque calculated in Step 7, the performance objectives cannot be achieved.

$$TS = \frac{W \times f \times R_m}{G \times Eg} \text{ (Nm / Motor)}$$

$$TS = \frac{W \times f \times R_l}{G \times Eg} \text{ (lb - in/Motor)}$$

Where: f = coefficient of friction

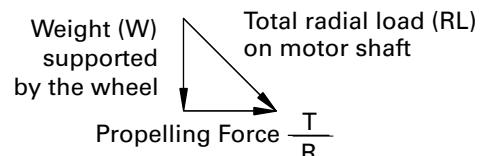
W = loaded vehicle weight over drive wheel

	Coefficient of friction (f)
Steel on steel	0.15 to 0.20
Rubber tire on dirt	0.5 to 0.7
Rubber tire on asphalt	0.8 to 1.0
Rubber tire on concrete	0.8 to 1.0
Rubber tire on grass	0.4

It may be desirable to allow the wheel to slip to prevent hydraulic system overheating when excessive loads are imposed should the vehicle stall. In this case TS should be just slightly larger than T.

Step Nine — Motor Radial Load Carrying Capacity

When a motor is used to drive a vehicle with the wheel mounted directly on the motor shaft or rotating hub, the Total Radial Load (RL) acting on the motor shaft is the vector summation of two forces acting at right angles to each other.



$$RL = \sqrt{W^2 + \left(\frac{T}{R}\right)^2}$$

Refer to radial load rating of each motor series.

Shaft Torque (T)

$$\frac{T = q \Delta P}{2 \pi} = \frac{\text{bar} \times \text{cm}^3/\text{rev}}{62.8} = \frac{\text{Psi} \times \text{in}^3/\text{rev}}{6.28} = \text{lb - in}$$

Shaft Speed (N)

$$N = \frac{\text{Flow}}{\text{Displacement}}$$

$$\text{RPM} = \frac{1000 \times \text{l/min}}{\text{cm}^3/\text{rev}} \quad \text{RPM} = \frac{231 \times \text{GPM}}{\text{in}^3/\text{rev}}$$

Power (into motor)

$$Kw = \frac{\text{bar} \times \text{l/min}}{600} \quad HP = \frac{\text{Psi} \times \text{GPM}}{1714}$$

Power (out of motor)

$$Kw = \frac{\text{Nm} \times \text{RPM}}{9549} \quad HP = \frac{\text{lb-in} \times \text{RPM}}{63,025}$$

where: Kw = Kilowatt

HP = Horsepower

LPM = Liters per Minute

GPM = Gallons per Minute

Nm = Newton Meters

Ib-in = Pound inch

Bar = 10 Newtons per Square Centimeter

PSI = Pounds per Square Inch

q = Displacement

Optional Features

OPTIONAL FEATURE	BENEFIT
2 Speed motors	Allows motor to have two displacements (higher speed has lower torque)
Seal Guard	Prevents physical damage to shaft seal from foreign debris
High pressure Shaft Seal	More robust shaft seal that can withstand high case pressure spikes
Environmental protection	Epoxy coating for demanding application in harsh environment
Nickel Plated Shaft	For highly corrosive environment or food/sanitary applications
Integrated Parking Brake	Spring applied hydraulic release brake
Mechanical Disc Brake	Bolt on caliper brake for wheel motor applications
Free running option	Improved mechanical efficiency at high-speed/high-flow conditions
Speed sensors	To collect speed and/or direction information from a motor and provide electric signal
Shuttle valve	Redirect some low pressure oil for increased cooling in closed loop applications
Case port	To increase lubrication and flushing of the motor and reduce case pressure , extend seal life
Internal check valves	Relieves the case pressure to the low pressure port
Low speed valving	For better efficiency and smooth running at low speed conditions (<200 RPM)
Vented Two-Stage seal	Extends shaft seal life
Viton seals	For higher temperature or chemical resistance applications
Integral cross over valving	Cost effective design that limits the differential pressure across the motor
Metric Shafts, Ports, & Mounts	EU specific threads
Reverse Rotation	Allows clockwise shaft rotation with B port pressurized

Optional Features

TYPICAL APPLICATIONS*

OPTIONAL FEATURES	WINCH	SWING DRIVES	SWEEPER BRUSH DRIVES	AUGER	INDUSTRIAL CONVEYOR	CAR WASH	TURF PROPEL	IRRIGATION REELS	MIXERS/GRINDERS	PLASTIC INJECTION MOLDING	TRACTION DRIVES	TRENCHER CHAIN DRIVES	SALT SAND SPREADER	MARINE WINCHES
2 Speed Motors	x			x				x			x			x
Seal Guard			x				x		x			x		
Viton Seals					x					x				
High Pressure Shaft Seal	x								x					
Environmental protection					x	x							x	x
Nickel Plated Shaft					x	x							x	
Integrated Parking Brake	x	x			x			x			x			x
Mechanical Disc Brake							x				x			
Free running option		x												
Speed sensors					x			x	x	x		x	x	
Shuttle valve							x		x		x	x		
Case port	x	x	x	x	x		x		x		x	x		
Internal check valves					x	x	x							
Low speed valving		x			x		x				x		x	
Vented Two-Stage seal					x	x	x				x			
Integral cross over valving	x	x		x										x
Metric Shafts, Ports, & Mounts	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Reverse Rotation					x									

* These features are not limited to these applications. Final configuration depends on individual application needs.

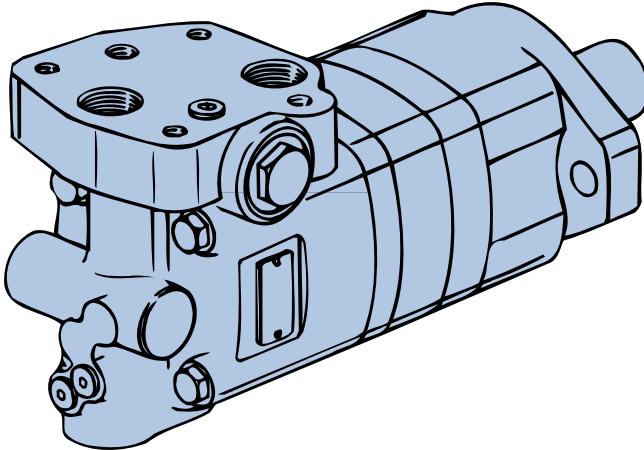
Optional Features

FEATURE DESCRIPTION	CATALOG PAGE NUMBER	SPOOL VALVE MOTORS					DISC VALVE MOTORS			VIS MOTORS				
		J Series	H Series	S Series	T Series	W series	2000 Series	4000 Compact Series	4000 Series	6000 Series	10000 Series	VIS 30	VIS 40	VIS 45
2 Speed motors	A-11	---	---	---	---	---	0	---	---	---	0	0	0	0
Seal Guard	A-12	---	0	0	0	---	0	0	0	0	0	0	0	0
Viton seals	A-12	0	0	0	0	0	0	0	0	0	0	0	0	0
High pressure Shaft Seal	A-13	---	0	0	0	---	0	0	---	---	---	---	---	---
Environmental protection	A-13	0	0	0	0	0	0	0	0	0	0	0	0	0
Integrated Parking Brake	A-14	---	---	---	0	0	---	---	---	---	---	0	0	0
Mechanical Disc Brake	A-14	---	---	---	---	0	0	0	---	---	---	---	---	---
Free running option	A-15	0	0	0	0	0	0	0	0	0	0	0	0	0
Speed sensors	A-16	0	0	0	0		0	0	0	0	0	0	0	0
Shuttle valve	A-17					0	0	0	0	0	---	0	0	0
Case port	A-18	0	0	0	0	0	S	S	S	S	S	S	S	S
Internal check valves	A-18	S	0	S	0	0	---	---	---	---	---	---	---	---
Low speed valving	A-19	---	0	0	0	S	---	---	---	---	---	---	---	---
Vented Two-Stage seal	A-20	---	0	0	0		---	---	---	---	---	---	---	---
Integral cross over valving	A-21	---	---	---	---		0	0	---	---	---	---	---	---
Metric Shafts, Ports, & Mounts	-	0	0	0	0	0	0	0	0	0	0	0	0	0
Reverse Rotation	-	0	0	0	0	0	0	0	0	0	0	0	0	0

O Optional
 S Standard
 — Not applicable

Two Speed Motors

This option is available on all 2000, 10,000, VIS 30, VIS 40 and VIS 45 motors.



Features:

This option gives the user the ability to switch the displacement of the motor thus providing a different speed at a different torque without changing the input flow or pressure. An external three way valve is required for shifting the pilot pressure port between signal pressure (HSLT) and low pressure (LSHT).

Two speed motors are available with a return line closed center shuttle for closed circuit applications.

Benefits:

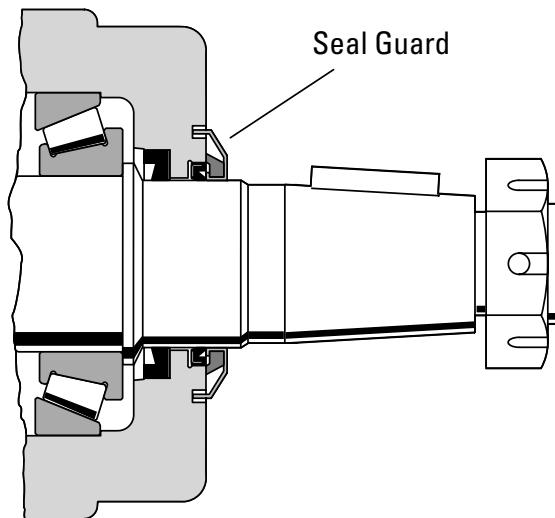
- Two operating speeds and torque levels with one motor
- Two selectable performance ranges in one motor package

Application:

- Conveyors
- Winches
- Traction drives
- Augers
- Irrigation/utility cable reels

Seal Guard

This option is available on H, S, T, 2000, 4000, 6000, 10,000, VIS 30, VIS 40 and VIS 45 series motors



Features:

This option consists of a metal shield that protects an internal wiper seal. The shield is interference-fit on the output shaft and moves with the output shaft. For added protection, the shield is recessed into a groove in the bearing housing face.

Benefits:

Centrifugal force causes foreign debris to be forced away from the high pressure shaft and dust seal area. The seal does not seal hydraulic fluid, instead it protects the standard seals from damage caused by foreign debris.

Applications:

- Street sweepers
- Industrial sweepers
- Lawn and turf equipment (ZTR)
- Harvesting machinery
- Mining equipment

Viton Seals

This option is available on all Char-Lynn motors.

Features:

Higher chemical compatibility and temperature tolerance make Viton the material of choice for demanding application in extremely corrosive and harsh environments.

Benefits:

- Longer seal life in chemically aggressive environment

Applications:

- Industrial conveyors
- Plastic injection molding

High Pressure Seals

This option is available on H, S, T and 2000 series motors.

Features:

Eaton has introduced a high-pressure shaft seal option for its H, S, T and 2000 series motors. The seal geometry is optimized for applications that operate under extreme conditions. The seal geometry increases the clamping force of the sealing lip against the output shaft to prevent seal leakage at extreme pressure conditions. Case pressure forces the lip of the seal to clamp more tightly against the output shaft. The result is a seal that handles high pressure spike conditions without failure. The seal is designed to withstand case pressures up to 200 bar [2900 PSI] at 150 rpm.

For reference, the standard seal can withstand case pressure up to:

- 100 bars (1500 PSI) for H, S, T motors
- 140 bars (2000PSI) for 2000 Series
- 100 bars (1500 PSI) for 4000 Series
- 70 bars (1000 PSI) for 6000 Series
- 20 bars (300 PSI) for the 10,000 Series
- 20 bars (300 PSI) for VIS 30, 40, 45

Benefits:

- Increases ability to handle high-pressure spike conditions.
- Eliminates the use of case port line in application with intermittent extreme operating conditions.
- Can be an effective alternative to additional case port plumbing.
- Any application with extreme intermittent operating conditions or where no case return line is available.

Applications:

- Harvesters
- Sweepers
- Turf Equipment
- Wood Chippers
- Stump Grinders
- Skid Steer Loader Attachments (often loaders have no case line available)
- Any application with extreme intermittent operating conditions or where no case return line is available.

Special Notes:

1. Intermittent* operation is defined as 10% of every minute.
2. The standard seal with case port option is preferred for maximum life – especially for continuous duty at high pressure conditions.
3. Seal kits are available to convert motors with the standard shaft seal to the high pressure shaft seal. (complete motor seal kits include high pressure shaft seal).

Part Numbers:

- H Series – Kit No. 60572-000
S Series – Kit No. 60578-000
T Series – Kit No. 60579-000
Shaft Seal –
Part No. 14778-001
2000 Series –
Kit No. 61329-000.
Shaft Seal – No. 14857-001

Environmental Protection (epoxy paint) (plated shafts)

This option is available on all Char-Lynn motors.

Features:

All motors are available with a corrosion resistant coating for use in hostile environments. The Char-Lynn line is also available with the output shaft plated, or with plated shaft and entire motor exterior coating.

Benefits:

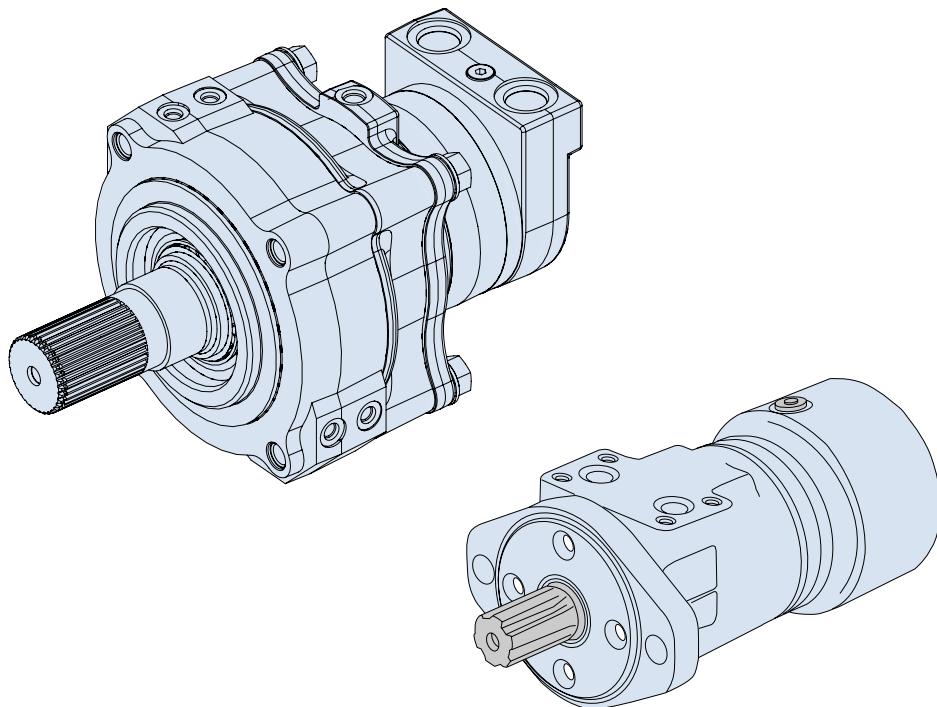
This coating protects the motor from salt water and various chemicals. Motor output shaft plating helps eliminate seal damage caused by caustic or acidic materials.

Applications:

- Marine
- Food processing,
- Cleansing
- Fishing and agricultural applications

Brake Solutions

Integrated brake options are available for all T, W, VIS 30, and VIS 40 series motors. Mechanical bolt-on packages are available for all W, 2000 and 4000 Compact series motors.



Features:

Eaton continues to develop and bring new brake solutions to market that are performance matched to each motor series. These include:

- T Series with Integrated Parking Brake
- W Series with Integrated Parking Brake
- VIS Series with Integrated Parking Brake

In addition, Eaton brake motors can be mated with bolt-on valve packages to provide dynamic braking hydraulically using state of the art counter-balance valve technology.

There are also a variety of bolt-on mechanical brake options including Hayes brake system. This compact brake package can be used on 2000 Series and W Series wheel motors.

Benefits:

- Complete compact system package
- Performance-matched brake / motor solution
- Increases design flexibility
- Reduces assembly costs and simplifies service requirements
- Streamlines inventory and order processing.
- Ability to direct port release pressure (eliminate brake release hose correction)

Applications:

- Aerial Work Platforms
- Boom Lifts
- Track Cranes
- Forestry Grapples
- Winches
- Traction Drives
- Anywhere load holding is a requirement in a LSHT motor application

For 2000 and 4000 Compact Series motors, a mechanical disc brake is available from Hayes Industrial Brake, Inc. They provide up to 1450 lb. of clamping force. These are mechanical parking/service brakes.

Contact:

Hayes Industrial Brake, Inc
5800 West Donges Bay Rd
Mequon, WI 57092
Phone: (262) 242-4300
Fax: (262) 242-0524

Free Running Geroler Sets/Gerotor Sets

This feature is available in all Char-Lynn motors.

Features:

The free running option is accomplished using a specially precision-machined gerotor/geroler assembly. This feature increases the clearance between the star and mating ring, allowing the motor to turn more freely with less mechanical drag. The increased clearance also improves lubrication across the wear surfaces of the gerotor star and ring and provides a greater pressure-relieving flow path reducing pressure spikes. Flow is by-passed internally across the star tips, reducing shock loads to the main drive components. This feature provides an effective method for reducing shock loads to the main drive components.

Benefits:

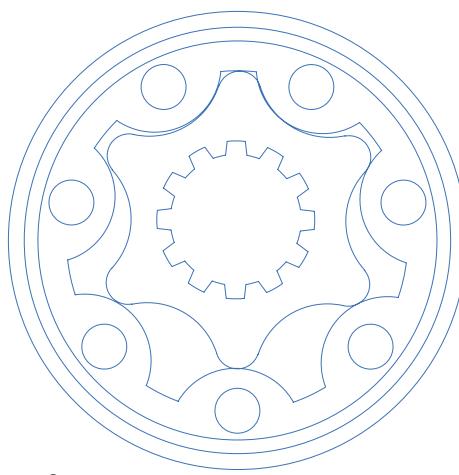
- Suited for applications with rapid stop/start or rapid reversals.
- Reduces starting pressure and increases starting torque efficiency.
- Reduces pressure spikes through the orbit gear set.

Applications:

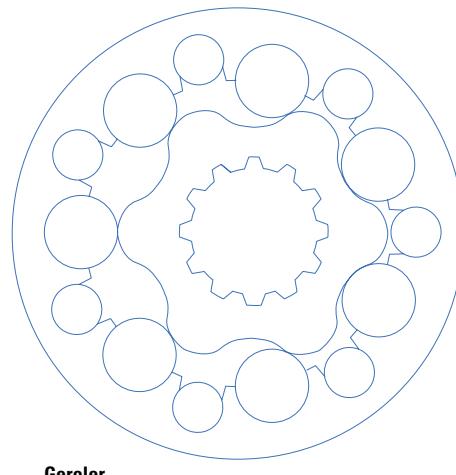
- Harvesters
- Stump Grinders
- Skid Steer Loader Attachments
- Machine Tools
- Especially suited for continuous high speed/high flow applications.
- Also suited for applications with high-pressure spikes from rapid reversals.

Special Notes:

Volumetric Efficiency will be reduced with the free-running option.



Gerotor



Geroler

Gerotor or Geroler?

The H series motor uses a Gerotor while the rest of the Char-Lynn motors use a Geroler. The difference is shown in the picture below:

Essentially a Geroler, has rolls added to the lobes of the outer ring of the Orbit gear set. These rolls act as a roller bearing and reduce friction, increase mechanical efficiency and reduce wear in systems with low fluid viscosity. In addition, the Geroler type typically provides smoother performance at low speed conditions. The basic formula and guideline to determine whether a gerotor or Geroler should be used is as follows:

20 x psi / RPM = SUS (use this formula to determine minimum fluid viscosity)

RPM = speed of output shaft in revolutions per minute

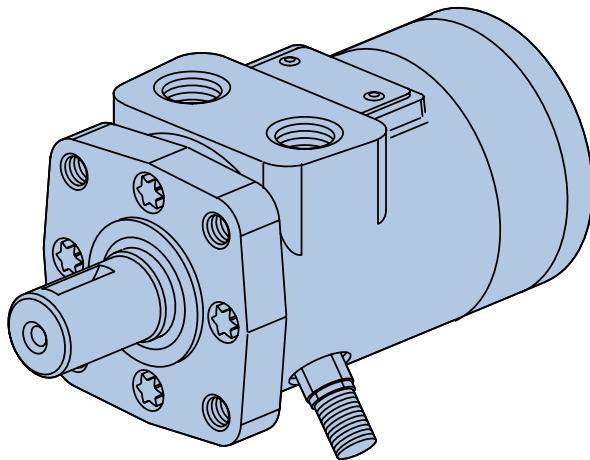
SUS = minimum viscosity measured in SUS.

The recommended viscosity limits are as follows:

- 1) A Gerotor Orbit gear set requires a minimum fluid viscosity of 100 SUS or the value calculated by the formula $20 \text{ psi}/\text{RPM} = \text{SUS}$.
- 2) A Geroler Orbit gear set requires a minimum fluid viscosity of 70 SUS.

In addition, applications running at less than 100 rpm should consider using a Geroler motor.

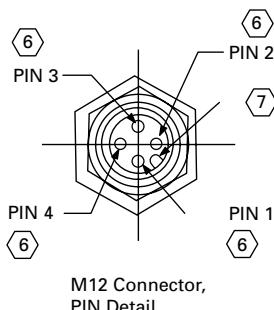
Speed Sensors



Note:

The speed sensor option does NOT include read-out display. Possible sources for read-out display include:

Eaton Corporation Durant Products 901 South 12 Street Watertown, WI 57094 — Phone 1-800-289-3866.



Features:

Eaton has developed speed sensors specifically designed for LSHT motors.

The single output speed sensor:

This design is rugged and fully protected against accidental reverse polarity or short circuit hook up. A built in pull up resistor simplifies installation with control systems. This sensor is fully compatible with the mobile vehicle electrical systems and gives a reliable digital on/off signal over a wide speed range and temperature range. The sensor is field-serviceable; no factory setting or shimming is required.

The dual output speed sensor:

This sensor provides both speed and direction information. Its design is based on the field proven technology of our standard sensor and is designed for off road environments. The new sensor is based on the principle of quadrature.

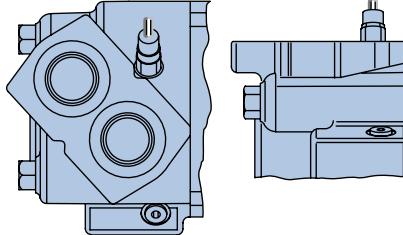
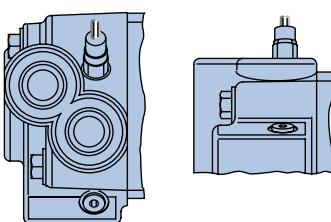
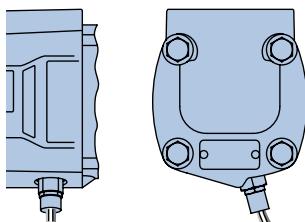
- The first version speed sensor has two output signals 90° out of phase. Each output provides one pulse per target.
- The second version has a speed signal that is twice the output pulses per revolution and it also has a direction signal. (Direction not available on spool motors)

Benefits:

These speed sensors provide vital information that can be collected and interpreted by a PLC or other device.

Applications:

- Salt/Sand Spreaders
- Irrigation Drives
- Machine Tools
- Mixers/Grinders
- Industrial Conveyors
- Food Processing Equipment
- Underground Boring Equipment



TECHNICAL INFORMATION

Motors	Speed Sensor Pulses Per Rev	Quadrature Pulses Per Rev
J,H,S,T,W	15	60
2000 series	30	60
4000 series	30	72
6000 series	30	80
10,000 series	30	60
VIS 30, 40, 45	30	60

Single and Two Outputs:

Supply Voltage: 8 to 24 VDC (compatible with 12V vehicle systems)

Supply Current: 20 mA max. (VS) (including internal pull-up resistor)

Output Voltage: Low < .5 Vdc @ 10 mA; output is open collector with 10kW pull-up resistor

M12 Connector (version 1)

Pin 1 = Power supply

Pin 2 = Output one

Pin 3 = Common

Pin 4 = Output two

M12 Connector (version 2)

Pin 1 = Power Supply

Pin 2 = Direction

Pin 3 = Common

Pin 4 = Speed signal

Shuttle Valve

Lubricating Shuttle

The shuttle valve option is available in W, 2000, 4000, 6000, and VIS series motors.

Features

Case Port allows for hydraulic oil to be flushed and cools the system. In applications where more system cooling and flushing is required.

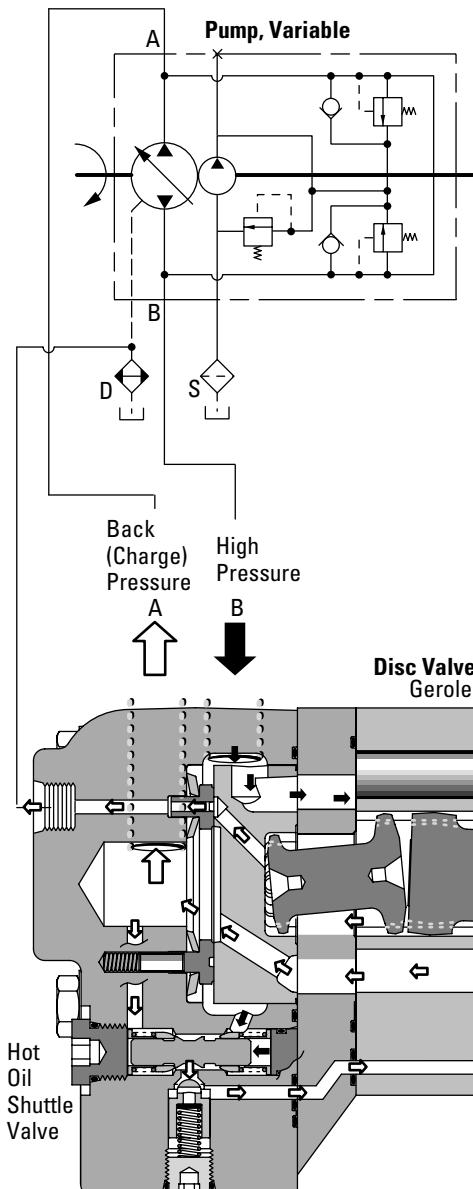
Benefits

- Flushing
- Cooling
- Longer system life

Applications

- Turf Propel
- Mixers/Grinders
- Traction drives
- Trencher chain drives

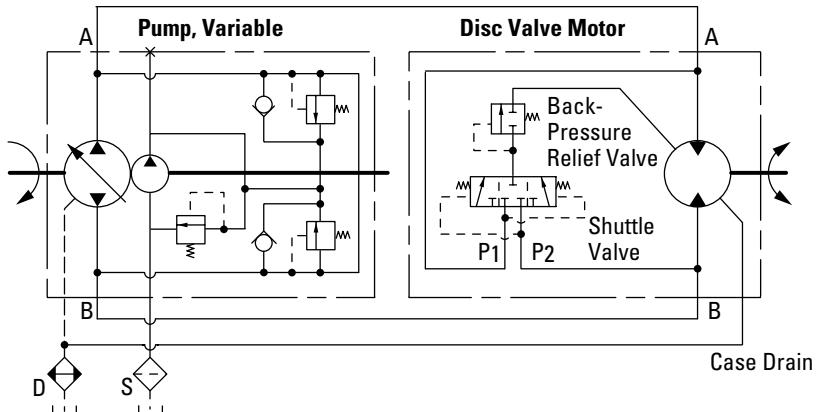
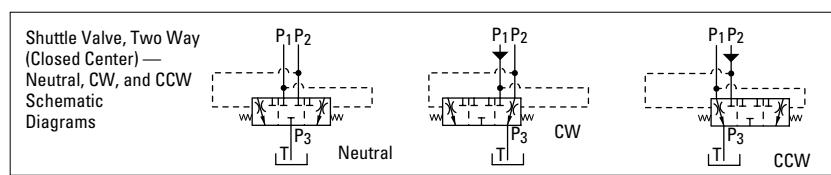
Closed Loop Circuit



Closed Loop Back-Pressure (Charge) Relief Valve

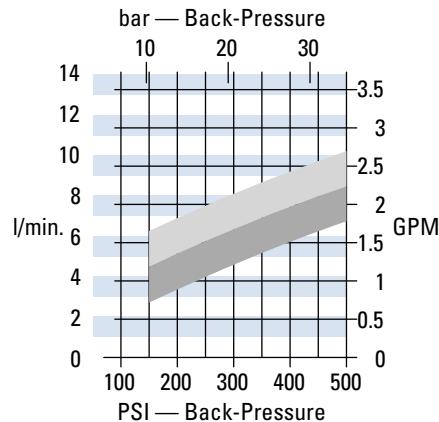
Motors with shuttle valve must have a case port to tank, without this port line the internal drive splines will not have adequate lubrication.

Low Speed High Torque Hydraulic Motors with Shuttle and Charge Pressure Relief Valve – Patent No. U.S. 4,645,438.



Typical Disc Valve Motor
Shuttle Flow with 4.5 bar [65 PSI]
Back-Pressure Relief Valve (Typical Data)

Due to Machining Tolerances, Flow May be More or Less

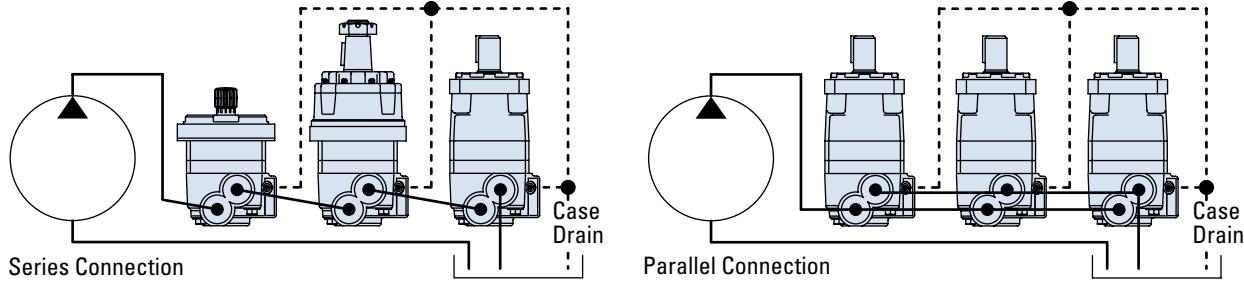


4000 Series and 6000 Series

2000 Series and 4000 Compact Series

Case Porting

This option is available on all Char-Lynn Motors.



Features:

This feature provides for connection of a port line connected to the motor case.

A port is located in the motor direct to motor case pressure that allows the case pressure to be returned directly to tank. Internal leakage to the motor case cavity can be drained directly which reduces case pressure and provides flushing of the system circuit.

Benefits:

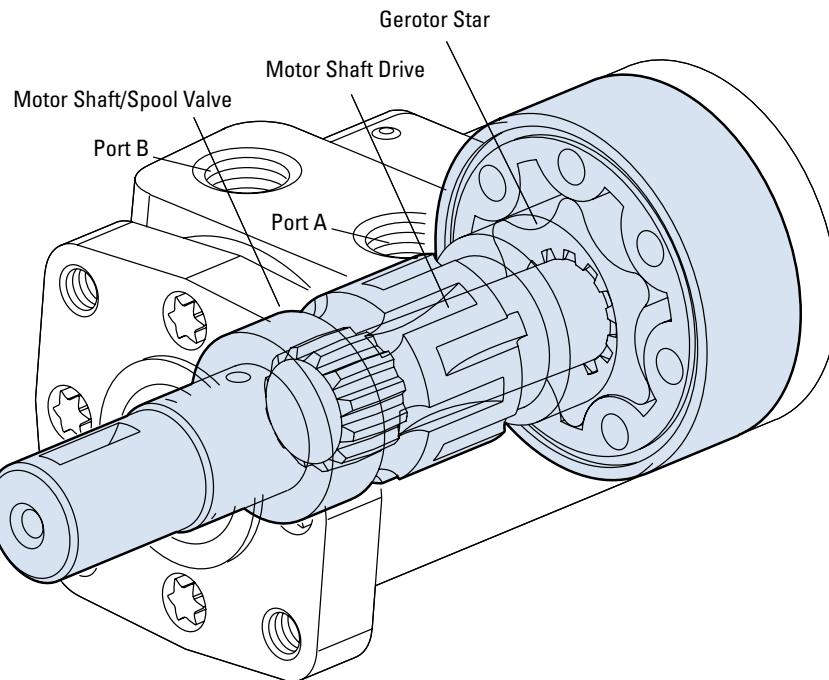
- Extends shaft seal life
- Extends thrust bearing life
- Reduces shaft seal leakage problems
- Improves flushing of the circuit to reduce system contaminates and cooling the system.

Applications:

- Especially suited for continuous running industrial applications and where motors are operating under high back pressure conditions (e.g. series circuit applications).
- Conveyers
- Car wash
- Harvesters
- Recommended for applications running with high case pressure conditions

Low Speed Valving

This option is available on H, S, T and W series motors.



Features:

This feature optimizes the motor for low-speed performance. It greatly improves smooth operation at speeds below 200 rpm. The valving is optimized with increased sealing and tighter clearances. Motors with this feature are designed to run continuously up to 200 rpm at standard rated pressures.

Benefits:

- Improves smoothness at low speed conditions (less than 200 rpm)
- Improves volumetric efficiency

Applications:

- Salt-sand spreaders
- Machine tools
- Irrigation drives
- Consider for applications running at low speed conditions below 200 rpm.

Notes:

Motors with this valving are not intended for low pressure applications (41 bar [600 psi minimum])

Vented Two-Stage Seal

This option is available on H, S and T series motors



Features:

- Patent-Pending design splits seal requirements into two stages
- Inboard (high-pressure) and outboard (low-pressure) seal designs are optimized for pressure conditions at each stage
- Combines latest low and high pressure sealing technologies into one design
- Vented port connection allows seal lube flow to be returned to system

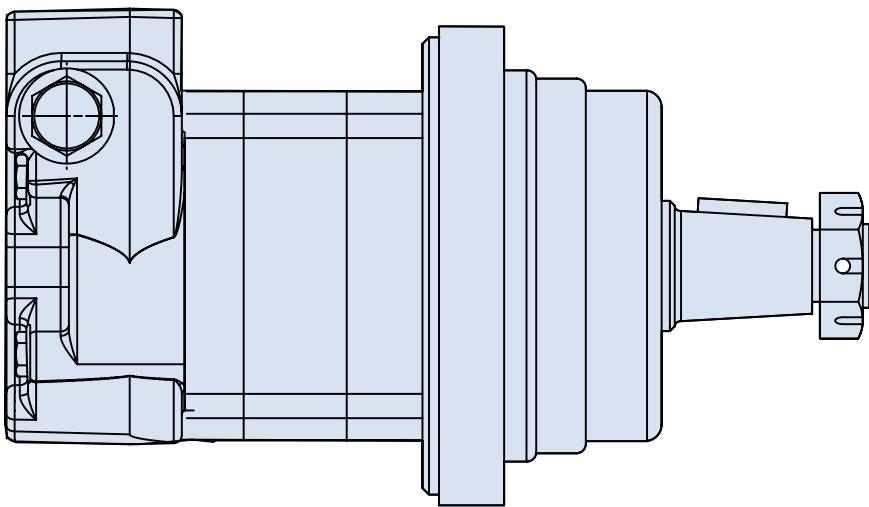
Benefits:

- Significantly increases seal life
- Higher case-pressure conditions increase motor performance
- Dependable leak free performance

Applications:

- Harvesters
- Car Washes
- Sweeper Brush drives
- Consider for applications running high case pressures for extending seal life and maximizing efficiency.

Integral Valves for 2000 Series



Features:

- Complete packaged system solution, single source for motors with relief valve capability
- Relief valves as close to Geroler as possible, providing added protection
- Eliminate leak points from in-line or bolt-on relief's
- Valves capable of full motor pressure
- Provides added flexibility to system design by allowing motors to have individual relief valve settings
- Simplifies assembly, purchasing and system design requirements

Benefits:

- This compact and efficient package offers increased value and cost effectiveness to designing Eaton into your applications.
- Minimizing the use of hoses, tubing and fittings will reduce production and assembly time significantly.

Applications:

- Skid-steer attachments
- Swing motors
- Brush cutters & Mowers
- Harvesting equipment
- Directional boring
- Winch
- Auger

Any place where pressure relief is optimal for system or motor performance and life

Replacement cartridges can be obtained by ordering the Item part number as listed below.

REPLACEMENT CARTRIDGES

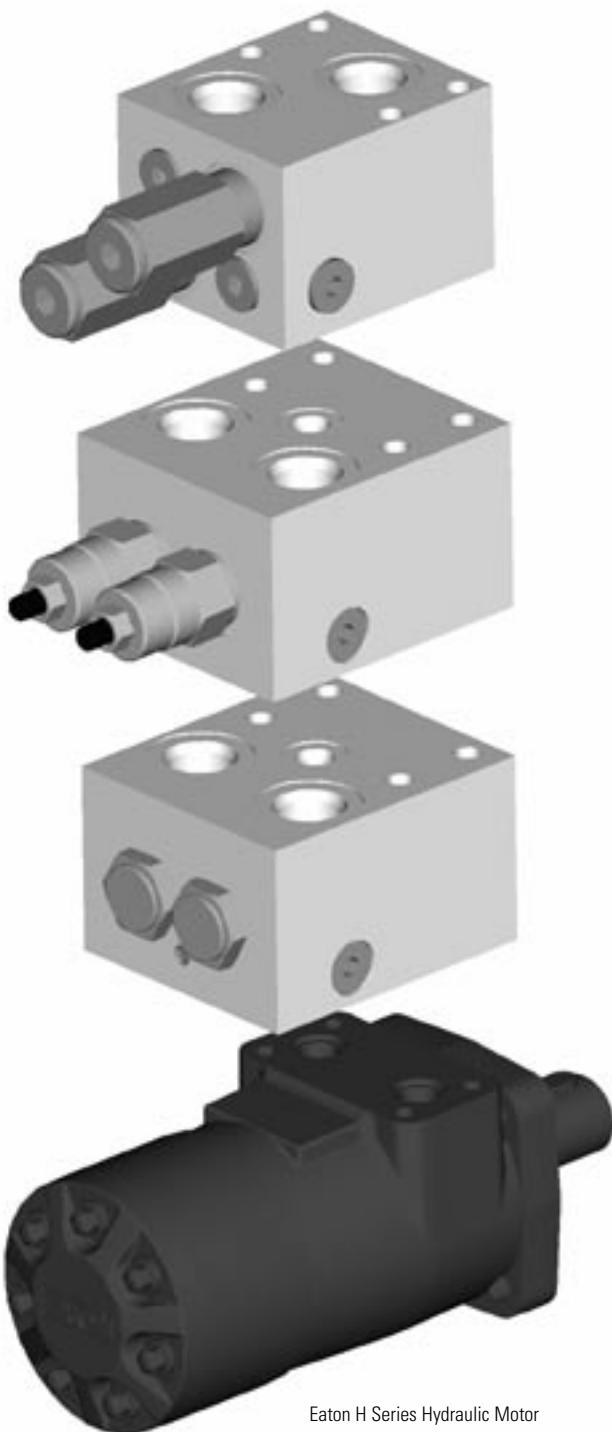
Item part #	Item desc.	Relief valve setting
02-199291	RV5A-10-F-0-35/15	1500 PSI
02-199292	RV5A-10-F-0-35/17.5	1750 PSI
02-199293	RV5A-10-F-0-35/20	2000 PSI
02-199295	RV5A-10-F-0-35/22.5	2250 PSI
02-198563	RV5A-10-F-0-35/25	2500 PSI
02-199294	RV5A-10-F-0-35/27.5	2750 PSI
02-199296	RV5A-10-F-0-35/30	3000 PSI

Special Housings Bolt on Solutions

Cartridge Valves &
Manifolds for Spool
& Disk Valve Motors

We Manufacture Solutions

Designing hydraulic systems with Eaton-Vickers Cartridge Valves & Manifolds is a cost effective way of bringing your design into production well within the most demanding of production schedules. Minimizing the use of hoses, tubing and fittings will reduce production and assembly time significantly.



Eaton H Series Hydraulic Motor

Features

- Compatible with Eaton H & T series spool valve motors, and most 2000 series disk valve motors
- Aluminum Manifolds Anodized Black
- Pre-set cartridges to your specifications
- 100% production tested assembly
- Wide range of settings available
- Intelligent model code
- Manifolds are available with or without cartridge valves, or pre-assembled and tested to your specifications
- Manifolds and motors can be supplied as a pre-assembled package
- Dual counterbalance valve (with integral shuttle valve), dual pilot operated check valve and dual cross port relief valve packages are available

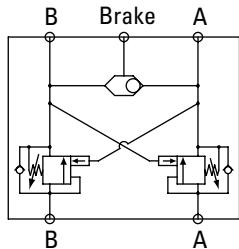
Dual CBV Package for H & T Series Motors

Cartridge valves & manifolds for spool valve motors

Dual Counterbalance Valve Assembly with Brake Release Shuttle

When the motor is in a stationary, unpowered mode, this assembly will prevent excessive drift in either direction of rotation. It will also prevent motor overspeed when exposed to an overrunning load, and will control motor deceleration to a stop. A shuttle within the assembly provides a pilot to release a parking or holding brake as either motor port is pressurized. Typical applications are swing drives, winch drives, and vehicle propulsion circuits. If the shuttle is not required the "Brake" port may be plugged.

Functional Symbol



How to Order

Complete pre-assembled packages are specified using the CBV*-10 model code, position 6 of the model code is "H". To order the manifold

sub-assembly, without the two CBV valves, but with integral shuttle valve order 4997072-001.

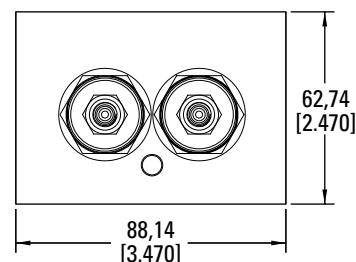
RATINGS AND SPECIFICATIONS

Rated flow	60L/min(15USgpm)
Rated pressure	210 bar (3000 psi)
Internal leakage (maximum)	5 drops/min max @ 77% of crack pressure
Pilot ratio	4:1 or 10:1
Manifold sub-assembly only	4997072-001
Installation kit (includes cap screws, washers and o-rings)	4997242-001

For detailed specifications refer to the CBV*-10 data sheet

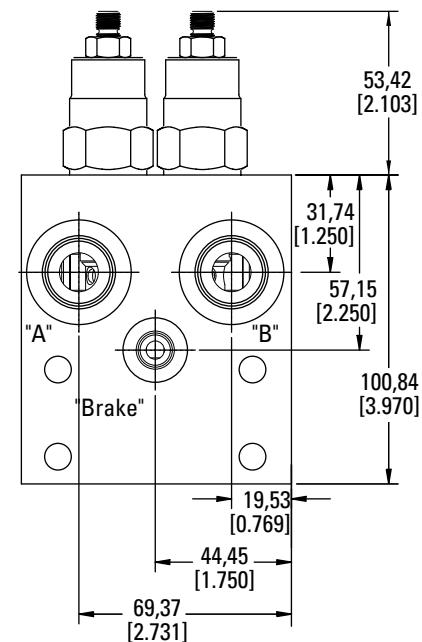
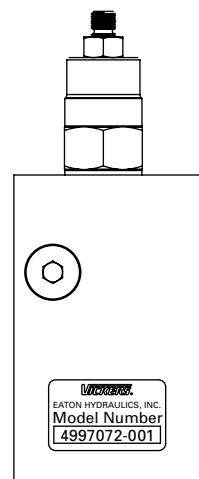
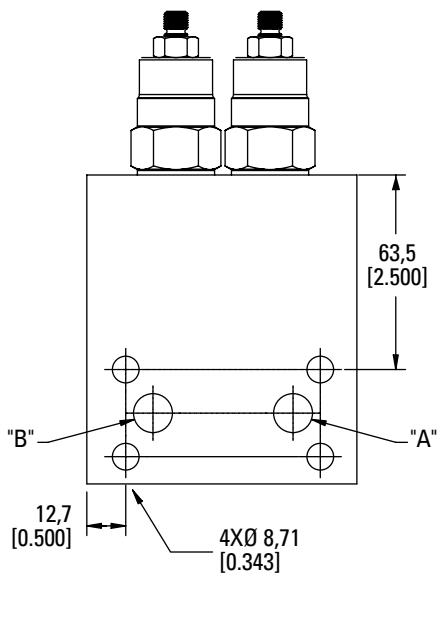
Dimensions

mm (inch)



Port Sizes

"A", "B" – SAE10
"Brake" – SAE4



Dual POC Package for H & T Series Motors

Cartridge valves and manifolds for spool valve motors

Dual Pilot Operated Check Valve Assembly

When the motor is in a stationary, unpowered mode, this assembly will prevent excessive drift in either direction of rotation. Although it is not designed to modulate the flow of oil to or from the motor, it will also prevent motor runaway if an overrunning load exists in the powered mode. A shuttle within the assembly provides a pilot to release a parking or holding brake as either motor port is pressurized. If the shuttle is not required the "Brake" port may be plugged.

How to Order

Complete pre-assembled packages are specified using the POC1-10 model code, position 6 of the model code is "H". To order the manifold

sub-assembly, without the two POC1 valves, but with integral shuttle valve order 4997072-001.

RATINGS AND SPECIFICATIONS

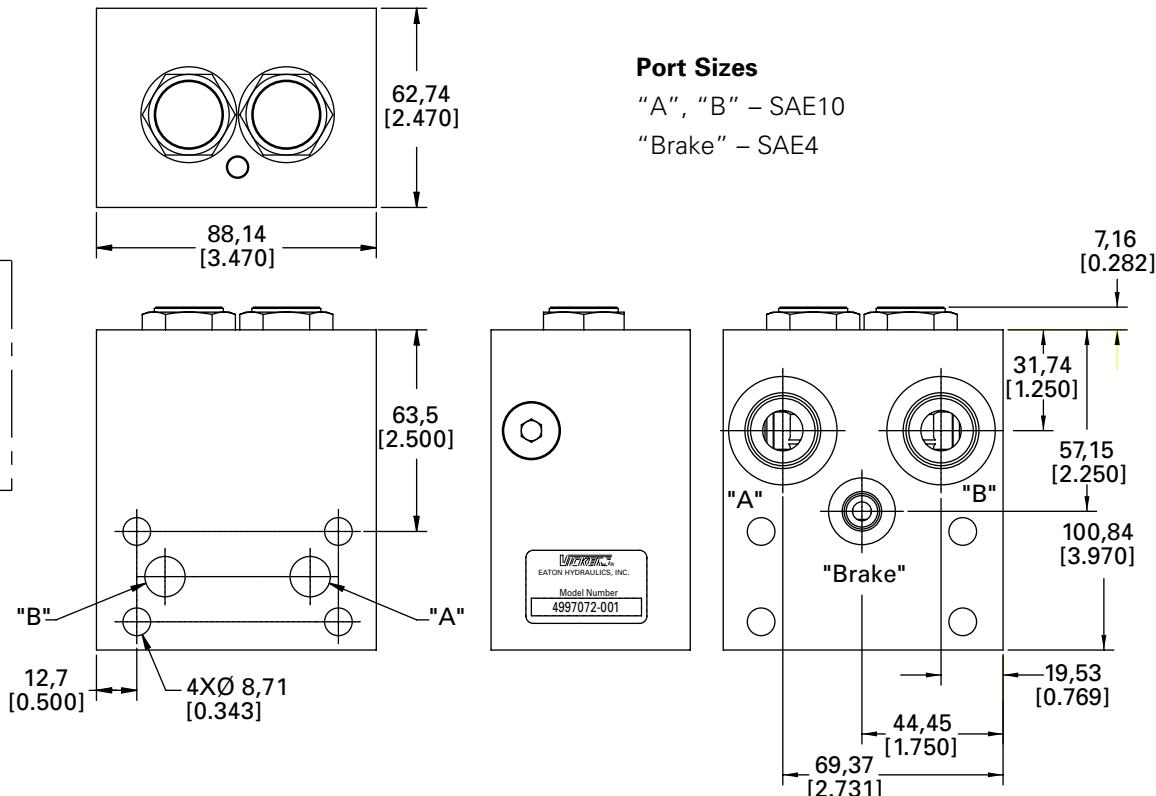
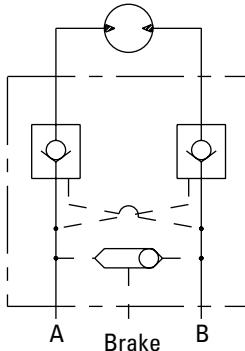
Rated flow	60L/min(15USgpm)
Rated pressure	210 bar(3000psi)
Internal leakage (maximum)	less than 5 drops/min @ 3000psi
Pilot ratio	3:1
Manifold sub-assembly	4997072-001
Installation kit (includes cap screws, washers and o-rings)	4997242-001

For detailed specifications refer to the POC1-10 data sheet

Dimensions

mm (inch)

Functional Symbol



Dual Cross-over Relief Package for H & T Series Motors

Cartridge valves & manifolds for spool valve motors

Dual Crossover Relief Valve Assembly

This valve assembly provides motor over-pressure protection in both directions of rotation, while supplying the return or lower pressure side of the motor with makeup oil. If closed center valving is used, an additional function is controlled braking.

Typical applications are vehicle propulsion and motor work circuits in which pressure limiting is required.

How to Order

Complete pre-assembled packages are specified using the RV3A-10 model code. Option "A" must be selected for the cage seals,

position 6 of the model code is "H". To order the manifold separately, without the two RV3A cartridges, order the part number 4997062-001.

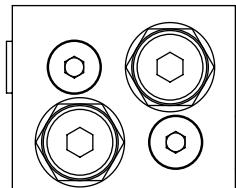
RATINGS AND SPECIFICATIONS

Rated flow	76 L/min(20USgpm)
Rated pressure	210 bar (3000psi)
Internal leakage (maximum)	less than 5 drops/min @ 85% of nominal setting
Manifold sub-assembly only	4997062-001
Installation kit (includes cap screws, washers and o-rings)	4997242-001

For detailed specifications refer to the RV3A-10 data sheet

Dimensions

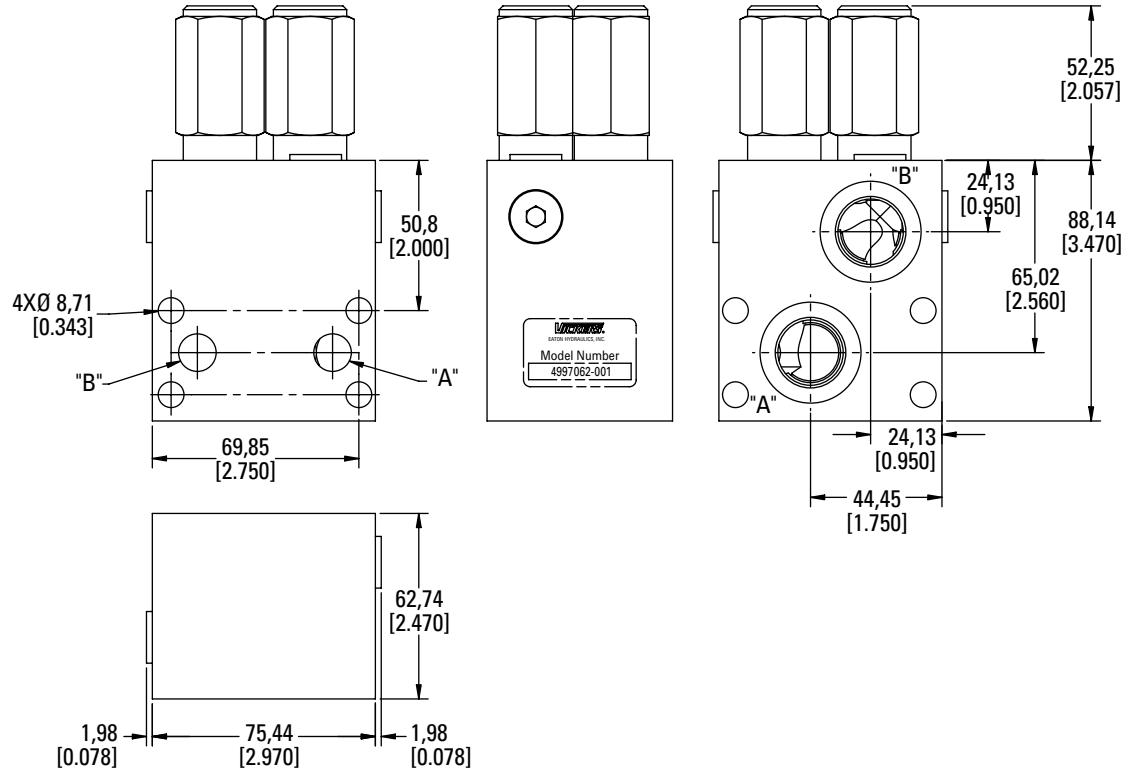
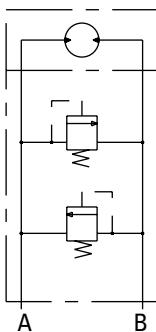
mm (inch)



Port Sizes

"A", "B" – SAE10
"Brake" – SAE4

Functional Symbol



Dual Cross-over Relief Package for 2000 Series Disc Valve Motors

Cartridge valves &
manifolds for disc
valve motors

Dual Crossover Relief Valve Assembly

This valve assembly provides motor over-pressure protection in both directions of rotation, while supplying the return or lower pressure side of the motor with makeup oil. If closed center valving is used, an additional function is controlled braking.

Typical applications are vehicle propulsion and motor work circuits in which pressure limiting is required.

How to Order

Complete pre-assembled packages are specified using the RV3A-10 model code. Option "A" must be selected for the cage seals, position 6 of the model code is

"2K". To order the manifold separately, without the two RV3A cartridges, order 4997060-001

RATINGS AND SPECIFICATIONS

Rated flow	76 L/min(20USgpm)
Rated pressure	210 bar (3000psi)
Internal leakage (maximum)	less than 5 drops/min @ 85% of nominal setting
Manifold sub-assembly only	4997060-001
Installation kit (includes cap screws, washers and o-rings)	02-372492

For detailed specifications refer to the RV3A-10 data sheet.

Dimensions

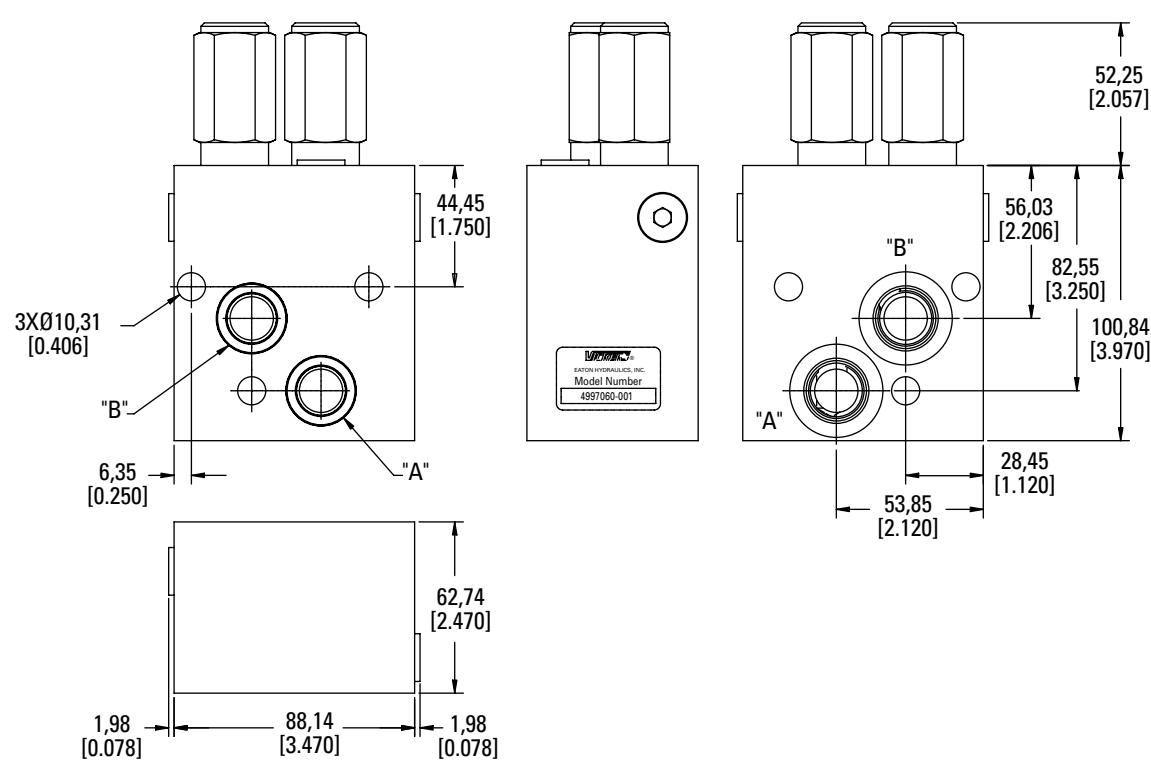
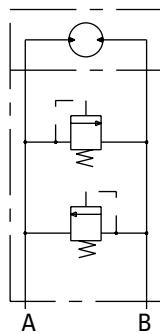
mm (inch)



Warning

This manifold package may not be suitable for application with all 2000 series motors - please check installation dimensions carefully.

Functional Symbol



Dual CBV Package for 2000 Series Disc Valve Motors

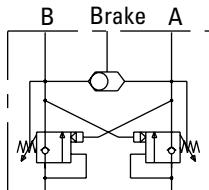
Cartridge valves &
manifolds for disc
valve motors

Dual Counterbalance Valve Assembly

When the motor is in a stationary, unpowered mode, this assembly will prevent excessive drift in either direction of rotation. It will also prevent motor overspeed when exposed to an overrunning load, and will control motor deceleration to a stop. A shuttle within the assembly provides a pilot to release a parking or holding brake as either motor port is pressurized.

Typical applications are swing drives, winch drives, and vehicle propulsion circuits. If the shuttle is not required the "Brake" port may be plugged.

Functional Symbol



How to Order

Complete pre-assembled packages are specified using the CBV*-10 model code, position 6 of the model code is "2K". To order the manifold

sub-assembly, without the two CBV valves, but with integral shuttle valve order 4997070-001.

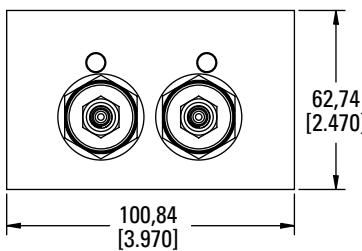
RATINGS AND SPECIFICATIONS

Rated flow	60L/min(15USgpm)
Rated pressure	210 bar (3000 psi)
Internal leakage (maximum)	5 drops/min max @ 77% of crack pressure
Pilot ratio	4:1 or 10:1
Manifold sub-assembly only	4997070-001
Installation kit (includes cap screws, washers and o-rings)	02-372492

For detailed specifications refer to the CBV*-10 data sheet.

Dimensions

mm (inch)



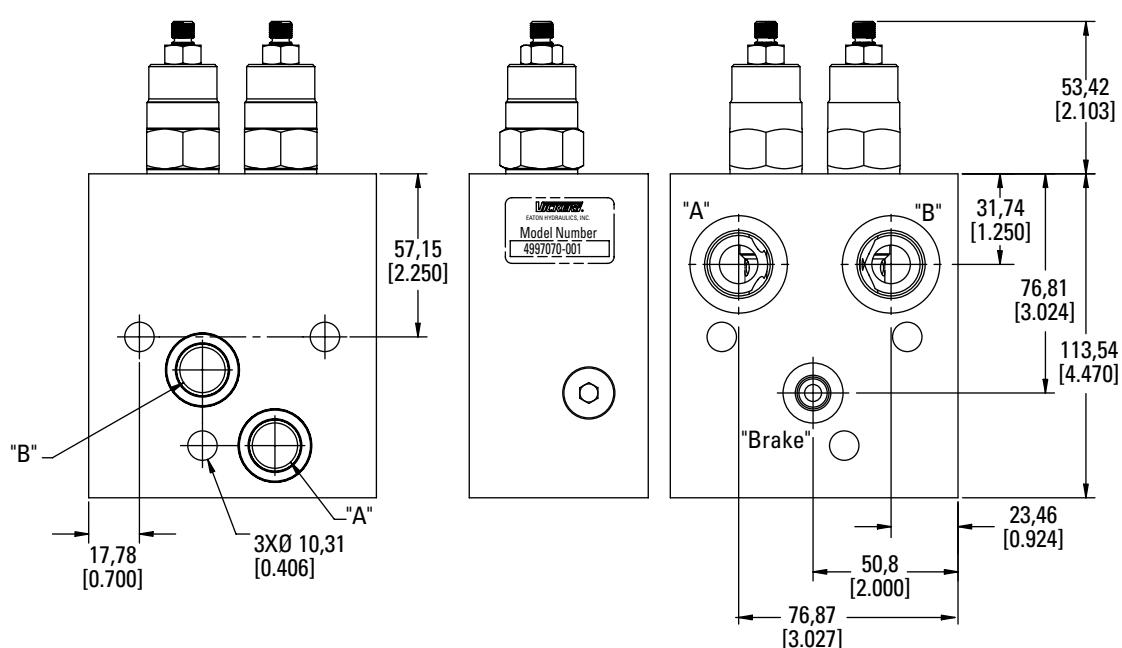
Port Sizes

"A", "B" – SAE10
"Brake" – SAE4



Warning

This manifold package may not be suitable for application with all 2000 series motors - please check installation dimensions carefully.



Dual POC Package for 2000 Series Disc Valve Motors

Cartridge valves & manifolds for disc valve motors

Dual Pilot Operated Check Valve Assembly

When the motor is in a stationary, unpowered mode, this assembly will prevent excessive drift in either direction of rotation. Although it is not designed to modulate the flow of oil to or from the motor, it will also prevent motor runaway if an overrunning load exists in the powered mode. A shuttle within the assembly provides a pilot to release a parking or holding brake as either motor port is pressurized. If the shuttle is not required the "Brake" port may be plugged.

How to Order

Complete pre-assembled packages are specified using the POC1-10 model code, position 6 of the model code is "2K". To order the manifold

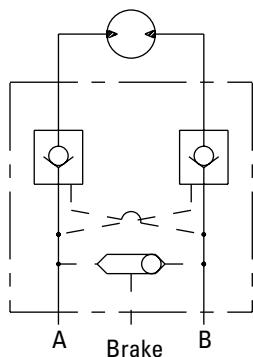
sub-assembly, without the two POC1 valves, but with integral shuttle valve order 4997070-001.

Ratings and Specifications

Rated flow	60L/min(15USgpm)
Rated pressure	210 bar(3000psi)
Internal leakage (maximum)	less than 5 drops/min @ 3000psi
Pilot ratio	3:1
Manifold sub-assembly only	4997070-001
Installation kit (includes cap screws, washers and o-rings)	02-372492

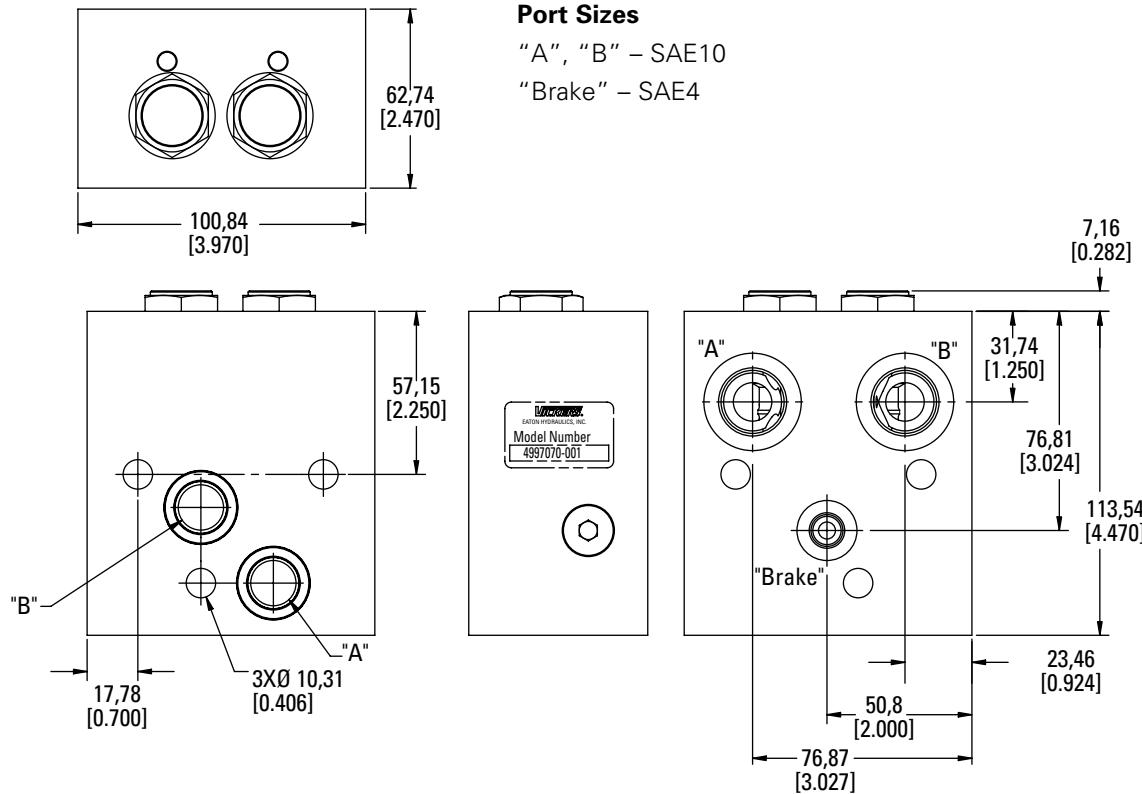
For detailed specifications refer to the POC1-10 data sheet

Functional Symbol



Dimensions

mm (inch)



Port Sizes

"A", "B" – SAE10
"Brake" – SAE4

Fluid Recommendations

Introduction

The ability of Eaton hydraulic components to provide the desired performance and life expectancy depends largely on the fluid used. The purpose of this section is to provide readers with the knowledge required to select the appropriate fluids for use in systems that employ Eaton hydraulic components.

One of the most important characteristic to consider when choosing a fluid to be used in a hydraulic system is viscosity. Viscosity choice is always a compromise; the fluid must be thin enough to flow easily but thick enough to seal and maintain a lubricating film between bearing and sealing surfaces. Viscosity requirements, see chart below.

Viscosity and Temperature

Fluid temperature affects viscosity. In general, as the fluid warms it gets thinner and its viscosity decreases. The opposite is true when fluid cools. When choosing a fluid, it is important to consider the start-up and operating temperatures of the hydraulic system.

Generally, the fluid is thick when the hydraulic system is started. With movement, the fluid warms to a point where a cooling system begins to operate.

From then on, the fluid is maintained at the temperature for which the hydraulic system was designed. In actual applications this sequence varies; hydraulic systems are used in many environments

from very cold to very hot. Cooling systems also vary from very elaborate to very simple, so ambient temperature may affect operating temperature. Equipment manufacturers who use Eaton hydraulic components in their products should anticipate temperature in their designs and make the appropriate fluid recommendations to their customers.

Cleanliness

Cleanliness of the fluid in a hydraulic system is extremely important. Eaton recommends that the fluid used in its hydraulic components be maintained at 20/18/13 per ISO Cleanliness Code 4406. This code allows a maximum of: 10,000 particles greater than 2 μm per mL fluid, 2500 particles greater than 5 μm per mL fluid, and 80 particles greater than 15 μm per mL fluid. Cleanliness requirements for specific products are given in the table below.

OEM's and distributors who use Eaton hydraulic components in their products should provide for these requirements in their designs. A reputable filter supplier can supply filter information.

Fluid Maintenance

Maintaining correct fluid viscosity and cleanliness level is essential for all hydraulic systems. Since Eaton hydraulic components are used in a wide variety of applications it is impossible for Eaton to publish a fluid maintenance schedule that

Product Line	Viscosity Minimum	Viscosity Best Range	ISO Cleanliness Requirements
J-2, S, W, T Series	70 SUS 13 cst	100-200 SUS 20-43 cst	20/18/13
H Series	100 SUS 20 cst	100-200 SUS 20-43 cst	20/18/13
Disc Valve Series	70 SUS 13 cst	100-200 SUS 20-43 cst	20/18/13
VIS Series	70 SUS 13 cst	100-200 SUS 20-43 cst	20/18/13

would cover every situation. Field testing and monitoring are the only ways to get accurate measurements of system cleanliness. OEM's and distributors who use Eaton hydraulic components should test and establish fluid maintenance schedules for their products. These maintenance schedules should be designed to meet the viscosity and cleanliness requirements laid out in this document.

Fluid Selection

Premium grade petroleum based hydraulic fluids will provide the best performance in Eaton hydraulic components. These fluids typically contain additives that are beneficial to hydraulic systems. Eaton recommends fluids that contain anti-wear agents, rust inhibitors, anti-foaming agents, and oxidation inhibitors. Premium grade petroleum based hydraulic fluids carry an ISO VG rating.

SAE grade crankcase oils may be used in systems that employ Eaton hydraulic components, but it should be noted that these oils may not contain all of the recommended additives. This means using crankcase oils may increase fluid maintenance requirements.

Hydraulic fluids that contain V.I. (viscosity index) improvers, sometimes called multi-viscosity oils, may be used in systems that employ Eaton hydraulic components. These V.I. improved fluids are known to "shear-down" with use. This means that their actual viscosity drops below the rated value.

Fluid maintenance must be increased if V.I. improved fluids are used. Automotive automatic transmission fluids contain V.I. improvers.

Synthetic fluids may be used in Eaton hydraulic components. A reputable fluid supplier can provide information on synthetic fluids. Review applications that require the use of synthetic fluids with your Eaton representative.

Additional Notes:

- Fluids too thick to flow in cold weather start-ups will cause pump cavitation and possible damage. Motor cavitation is not a problem during cold start-ups.
- When choosing a hydraulic fluid, all the components in the system must be considered and the best viscosity range adjusted accordingly. For example, when a medium duty piston pump is combined with a Geroler motor the best viscosity range becomes 100 - 150 SUS [20 - 32 cSt] and viscosity should never fall below 70 SUS [13 cSt].
- If the natural color of the fluid has become black it is possible that an overheating problem exists.
- If the fluid becomes milky a water contamination problem may exist.
- Take fluid level reading when the system is cold.
- Contact your Eaton representative if you have specific questions about the fluid requirements of Eaton hydraulic components.

Notes

Spool Valve Hydraulic Motors



Spool Valve motors incorporate the proven orbit motor principle to provide high torque at low speeds.

EATON
Powering Business Worldwide

Spool Valve Motors

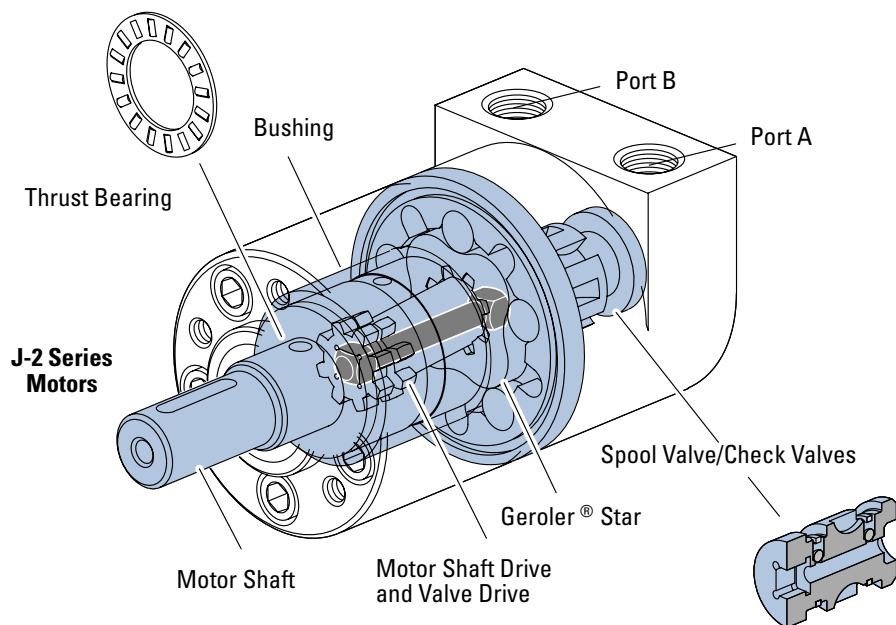
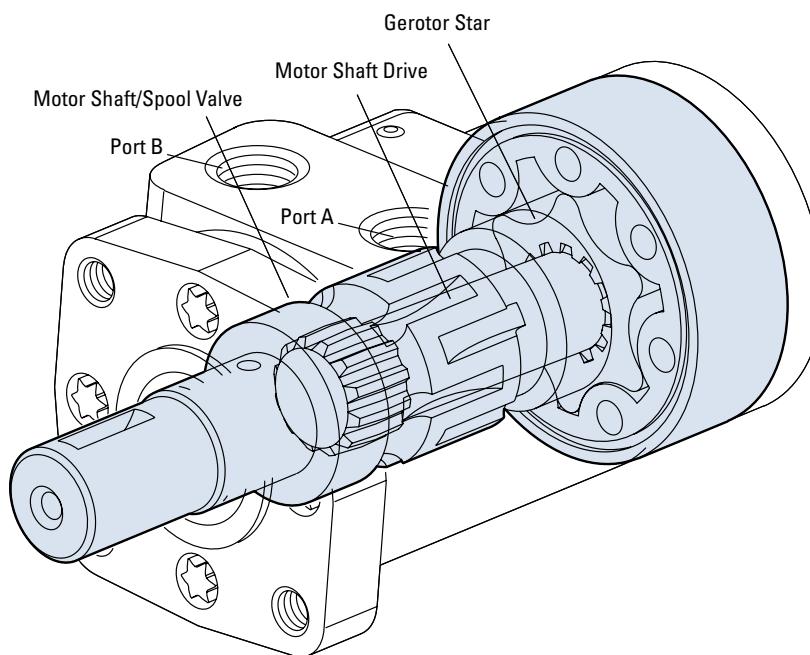
Highlights

Product Description

Char-Lynn spool valve motors distribute pressurized fluid into and out of the Orbit gear set (Gerotor or Geroler) via valve slots integrated into the output shaft. The spool valve motors incorporate both valving and hydrodynamic journal bearings into a common shaft design. The valve section (spool valve) can be optimized for low flow, low speed needs using a low speed spool option to enhance smooth running performance.

These motors incorporate the proven orbit motor principle to provide high torque at low speeds.

Motor shaft rotation can be instantly reversed by changing direction of input/output flow while generating equal torque in either direction. The displacements available provide a wide variety of speeds and torques from any spool valve motor series.



Features, Benefits, and Applications

Features

- Proven Orbit Motor Principle
- Hydrodynamic Journal Bearings
- Constant Clearance Geroler
- Three-Zone Pressure Design
- Reduced drive running-angle
- High-pressure seals
- Modular design

Benefits

- Compact, powerful package
- Infinite bearing life (at rated loads)
- High efficiency
- Increases shaft seal & bearing life
- Smooth operation, increases drive life
- Reduces leakage
- Design flexibility
- Economically tailored solutions

Applications

- Harvesters
- Augers
- Spreaders
- Machine tools
- Conveyors
- Winches
- Turf care equipment
- Food processing
- Aerial Work Platforms
- Anywhere a compact drive with high output torque is needed

Design Features

Spool valve technology is typically used where compact, economical solutions are most needed. Spool valve motors use a spool valve to precisely time and control flow through the orbit gear set (Gerotor or Geroler). Inlet flow is directed into and out of the orbit set via slots in the spool and passages through the motor housing. The result is a very cost-effective compact package suited to many application requirements. The three

primary components in the motor are the orbit star, drive and output shaft. H, S and T Series incorporate the spool valve and hydrodynamic bearings in the motor shaft. The W series is similar except a ball bearing is used for the front bearing for increased side-load capacity. Due to its compact size and high speed capability, the J Series is unique and utilizes a separate dedicated spool and spool valve drive. All motors utilize Eaton's

constant-clearance Geroler technology except the H Series, which continues to use the time-proven H motor gerotor set. These motors all use a three-zone pressure design consisting of three unique pressure areas: 1) inlet, 2) return, 3) case. This provides the capability to limit motor case pressure and allows the use of several case pressure options for extended shaft seal and thrust bearing life.

Below is a quick-guide to help select the proper motor for your application:

MOTOR QUICK-GUIDE (BASED ON MAXIMUM CONTINUOUS RATINGS)

Series	Output Torque Nm [lb-in]	Pressure bar [psi]	Flow lpm [gpm]	Side Load kg [lbs]
J Series	62 [550]	140 [2030]	21 [5.5]	196 [430]
H Series	407 [3607]	124 [1800]	57 [15]	635 [1400]
S Series	430 [3800]	135 [2000]	55 [15]	635 [1400]
T Series	450 [4000]	155 [2250]	55 [15]	635 [1400]
W Series	410 [3625]	165 [2400]	68 [18]	845 [1900]

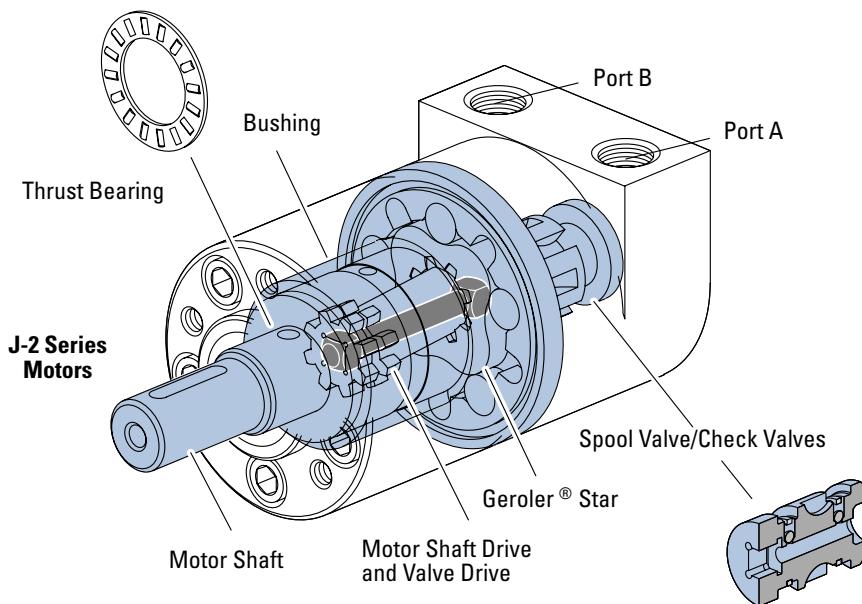
* The above are provided as guidelines only. Actual ratings vary depending on final motor configuration

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J Series (129-)

Highlights



Description

Char-Lynn J Series motors provide a lot of power from a very small package. Up to 5 kW [6 1/2 HP] of power. These motors are 61 mm [2.4 in] in diameter and 104 to 130 mm [4.1 to 5.1 in] in length.

The J Series motor shaft and seal allows high case pressure up to 76 bar [1100 PSI] return line pressure without case drain line. When a case drain line is used a 220 bar [3190 PSI] peak pressure is allowed in the return line.

Specifications

Geroler Element	5 Displacements
Flow l/min [GPM]	21 [5.5] Continuous*** 25 [6.5] Intermittent**
Speed	Up to 1992 RPM Cont. Up to 2458 RPM Inter.
Pressure bar [PSI]	140 [2030] Cont.*** 165 [2400] Inter.**
Torque Nm [lb-in]	62 [549] Cont.*** 84 [743] Inter.**

*** Continuous—(Cont.) Continuous rating, motor may be run continuously at these ratings.

** Intermittent—(Inter.) Intermittent operation, 10% of every minute.



Plastic Injection



Metal Forming



Food Processing

Features:

- Constant clearance Geroler set
- Integrated check valves
- Self-lubricating shaft bushing
- High-strength rigid components
- Increased valve seal lands
- High pressure seals
- Variety of displacements, shafts, mounts and special options

Benefits:

- High efficiency
- Extended leak-free performance
- Powerful compact package
- Design flexibility

Applications:

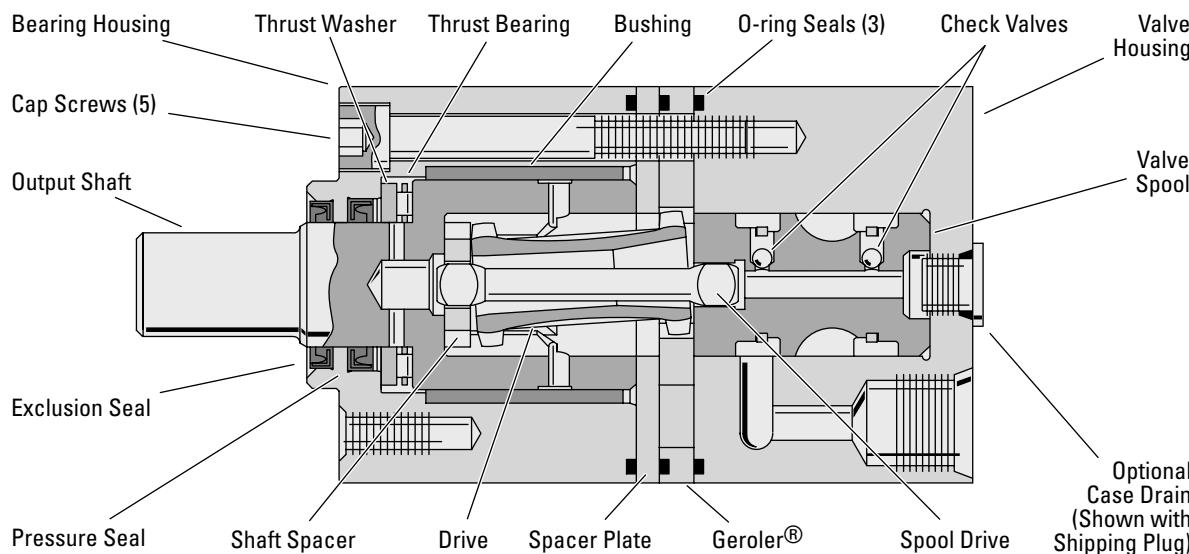
- Agricultural augers, harvesters, seeders
- Car wash tire spray wands and brushes
- Marine bow thrusters
- Food processing
- Railroad maintenance equipment
- Machine tools
- Conveyors
- Snow blower chute rotator
- Industrial sweepers and floor polishers
- Saw mill works
- Turf equipment reel drives
- Paint stripper
- Many more



Ship-Boat Building

J Series (129-)

Specifications



SPECIFICATION DATA — J MOTORS

Displ. cm ³ /r [in ³ /r]	8,2 [.50]	12,9 [.79]	19,8 [1.21]	31,6 [1.93]	50,0 [3.00]
Max. Speed (RPM) @ Continuous Flow	1992	1575	1043	650	393
Flow l/min [GPM]					
Continuous	17 [4.5]	21 [5.5]	21 [5.5]	21 [5.5]	21 [5.5]
Intermittent	21 [5.5]	25 [6.5]	25 [6.5]	25 [6.5]	25 [6.5]
Torque Nm [lb-in]					
Continuous	16 [141]	25 [225]	38 [333]	50 [446]	62 [549]
Intermittent	19 [164]	30 [263]	46 [405]	62 [546]	84 [743]
Peak	22 [193]	36 [321]	48 [425]	83 [733]	86 [765]
Pressure Δ bar [Δ PSI]					
Continuous	140 [2030]	140 [2030]	140 [2030]	121 [1750]	97 [1400]
Intermittent	165 [2400]	165 [2400]	165 [2400]	150 [2175]	140 [2030]
Peak	220 [3190]	220 [3190]	220 [3190]	190 [2756]	150 [2175]
Weight kg [lbs]	2 [4.4]	2,1 [4.6]	2,2 [4.8]	2,3 [5.0]	2,4 [5.4]

* Maximum pressure at motor inlet port is 220 Bar [3190 PSI] without regard to Δ bar [Δ PSI] and/or back pressure ratings or combination thereof.

Note:

To assure best motor life, run motor for approximately one hour at 30% of rated pressure before application to full load. Be sure motor is filled with fluid prior to any load applications.

Δ Pressure:

The true Δ bar [Δ PSI] difference between inlet port and outlet port.

See individual shafts for maximum torque recommendation. Splined shafts are recommended for those applications subject to frequent reversals.

Continuous Rating:

Motor may be run continuously at these ratings

Intermittent Operation:

10% of every minute

Peak Operation:

1% of every minute

Recommended Fluids:

Premium quality, anti-wear type hydraulic oil with a viscosity of not less than 70 SUS at operating temperature.

Recommended System Operating Temp.:

-34°C to 82°C
[-30°F to 180°F]

Recommended Filtration:

per ISO Cleanliness Code 4406, level 20/18/13

J Series (129-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from motor to motor in production.

8,2 cm ³ /r [.50 in ³ /r]												Max. Continuous	Max. Intermittent
△ Pressure Bar [PSI] Continuous													
	[200] 14	[400] 28	[500] 34	[600] 41	[700] 48	[800] 55	[1000] 69	[1400] 97	[1500] 103	[2000] 138	[2030] 140	[2400] 165	
Flow LPM [GPM]	[1] 3,8	[11] 1 456	[25] 3 444	[33] 4 437	[40] 5 429	[47] 5 422	[55] 6 412	[69] 8 394	[96] 11 347	[102] 12 332	[130] 15 250	[132] 15 239	[146] 16 170
	[2] 7,6	[9] 1 897	[24] 3 886	[31] 4 877	[38] 4 867	[46] 5 860	[53] 6 847	[68] 8 823	[97] 11 768	[105] 12 749	[139] 16 657	[141] 16 647	[163] 18 557
	[3] 11,4	[6] 1 1349	[20] 2 1331	[28] 3 1318	[35] 4 1309	[44] 5 1296	[51] 6 1285	[65] 7 1261	[94] 11 1198	[102] 12 1176	[137] 15 1070	[139] 16 1060	[164] 19 959
	[4.25] 16,0	[16] 2 1902	[23] 3 1885	[30] 3 1873	[36] 4 1858	[44] 5 1846	[60] 7 1817	[90] 10 1750	[97] 11 1721	[133] 15 1599	[135] 15 1585	[160] 18 1475	
	[4.5] 17,0	[16] 2 1992	[23] 3 1979	[29] 3 1964	[36] 4 1947	[44] 5 1929	[60] 7 1900	[89] 10 1833	[96] 11 1808	[131] 15 1684	[134] 15 1673	[160] 18 1553	
	Max. Continuous	[5.5]	[12] 1 2458	[18] 2 2437	[26] 3 2420	[33] 4 2405	[40] 5 2387	[54] 6 2353	[83] 9 2272	[92] 10 2255	[124] 14 2134	[129] 15 2115	[154] 17 1994
	Max. Intermittent	20,8											

 Continuous

 Intermittent

12,9 cm ³ /r [0.79 in ³ /r]												Max. Continuous	Max. Intermittent	
△ Pressure Bar [PSI] Continuous														
	[200] 14	[400] 28	[500] 34	[600] 41	[700] 48	[800] 55	[1000] 69	[1400] 97	[1450] 100	[1500] 103	[2000] 138	[2030] 140	[2400] 165	
Flow LPM [GPM]	[1] 3,8	[19] 2 290	[43] 5 285	[54] 6 281	[65] 7 277	[76] 9 273	[88] 10 268	[109] 12 260	[154] 17 237	[159] 18 234	[164] 19 230	[214] 24 194	[217] 25 189	[250] 28 151
	[2] 7,6	[16] 2 573	[39] 4 566	[51] 6 561	[63] 7 555	[74] 8 549	[86] 10 544	[109] 12 534	[155] 18 501	[160] 18 496	[165] 19 490	[221] 25 442	[225] 25 437	[263] 30 396
	[3] 11,4	[11] 1 859	[35] 4 849	[47] 5 843	[58] 7 838	[70] 8 832	[82] 9 825	[105] 12 810	[152] 17 777	[157] 18 771	[163] 18 763	[219] 25 708	[223] 25 701	[263] 30 652
	[4] 15,1	[6] 1 1153	[30] 3 1140	[41] 5 1135	[53] 6 1129	[64] 7 1124	[76] 9 1117	[99] 11 1101	[146] 16 1060	[152] 17 1051	[157] 18 1044	[214] 24 982	[217] 25 975	[260] 29 924
	[5.5] 20,8	[19] 2 1575	[30] 3 1566	[42] 5 1556	[54] 6 1547	[65] 7 1539	[89] 10 1521	[136] 15 1473	[142] 16 1466	[148] 17 1457	[205] 23 1396	[209] 24 1387	[251] 28 1330	
	Max. Intermittent	[6.5] 24,6	[11] 1 1859	[23] 3 1851	[35] 4 1842	[46] 5 1831	[56] 6 1820	[81] 9 1804	[130] 15 1755	[135] 15 1743	[140] 16 1734	[198] 22 1670	[202] 23 1663	[243] 27 1599

[42] Torque [lb-in]
5 } Nm
1556 Speed RPM

J Series (129-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from motor to motor in production.

19.8 cm ³ /r [1.21 in ³ /r]												Max. Continuous	Max. Intermittent
△ Pressure Bar [PSI] Continuous													
[200]	[400]	[500]	[600]	[700]	[800]	[1000]	[1400]	[1450]	[1500]	[2000]	[2030]	[2400]	
[1] 3.8	[32] 4 189	[67] 8 187	[85] 10 186	[102] 12 185	[119] 13 183	[136] 15 182	[170] 19 179	[236] 27 172	[244] 28 170	[253] 29 169	[321] 36 141	[325] 37 138	[374] 42 114
	[2] 7.6	[30] 3 379	[65] 7 375	[83] 9 373	[101] 11 370	[119] 13 368	[136] 15 366	[172] 19 361	[223] 25 351	[248] 28 349	[257] 29 347	[328] 37 312	[388] 44 285
	[3] 11.4	[21] 2 569	[57] 6 565	[75] 8 563	[93] 11 560	[111] 13 558	[128] 14 556	[163] 18 551	[231] 26 529	[240] 27 526	[248] 28 523	[325] 37 484	[405] 46 459
	[4] 15.1	[12] 1 761	[47] 5 758	[65] 7 754	[83] 9 751	[101] 11 749	[119] 13 746	[154] 17 741	[221] 25 717	[230] 26 711	[239] 27 707	[316] 36 660	[320] 36 656
	[5.5] 20.8	[31] 4 1043	[49] 6 1040	[67] 8 1035	[84] 9 1033	[101] 11 1028	[117] 15 1021	[202] 23 997	[211] 24 993	[218] 25 990	[295] 29 990	[299] 33 938	[329] 34 934
	[6.5] 24.6	[21] 2 1226	[38] 4 1222	[56] 6 1219	[74] 8 1215	[91] 10 1211	[126] 14 1204	[189] 21 1179	[196] 22 1174	[206] 23 1169	[278] 31 1121	[283] 32 1117	[347] 39 1079

Continuous

Intermittent

31.6 cm ³ /r [1.93 in ³ /r]												Max. Continuous	Max. Intermittent
△ Pressure Bar [PSI] Continuous													
[200]	[400]	[500]	[600]	[700]	[800]	[1000]	[1400]	[1450]	[1500]	[1750]	[2175]	[2175]	[150]
[1] 3.8	[51] 6 118	[106] 12 116	[133] 15 115	[160] 18 113	[187] 21 112	[213] 24 111	[265] 30 107	[362] 41 91	[372] 42 85	[383] 43 70	[439] 50 70	[546] 62 145	
	[2] 7.6	[46] 5 236	[103] 12 234	[132] 15 232	[159] 18 230	[187] 21 228	[214] 24 225	[269] 30 221	[362] 41 187	[374] 42 179	[387] 44 175	[446] 50 165	
	[3] 11.4	[36] 4 355	[94] 11 352	[122] 14 349	[149] 17 347	[177] 20 345	[205] 23 342	[259] 29 336	[351] 40 296	[364] 41 292	[377] 43 287	[440] 50 273	
	[4] 15.1	[24] 3 474	[79] 9 472	[107] 12 469	[135] 15 466	[162] 18 462	[190] 21 460	[246] 28 452	[337] 38 404	[349] 39 397	[362] 41 393	[425] 48 373	
	[5.5] 20.8	[55] 6 650	[83] 9 647	[111] 13 645	[139] 16 640	[167] 19 636	[221] 25 629	[307] 35 584	[320] 36 580	[334] 38 575	[400] 45 550	[505] 57 513	
	[6.5] 24.6	[35] 4 767	[64] 7 764	[93] 11 760	[121] 14 755	[150] 17 751	[204] 23 742	[279] 32 712	[294] 33 707	[308] 35 701	[378] 43 675	[485] 55 637	

50.0 cm ³ /r [3.00 in ³ /r]												Max. Continuous	Max. Intermittent
△ Pressure Bar [PSI] Continuous													
[200]	[400]	[500]	[600]	[700]	[800]	[1000]	[1100]	[1200]	[1300]	[1400]	[2030]	[2030]	[140]
[1] 3.8	[82] 9 75	[167] 19 72	[211] 24 72										
	[2] 7.6	[70] 8 149	[156] 18 147	[201] 23 145	[243] 28 144	[286] 32 143	[327] 37 142						
	[3] 11.4	[53] 6 221	[140] 16 220	[184] 21 218	[227] 26 217	[271] 31 215	[311] 35 213	[396] 45 209	[441] 50 205	[484] 55 201	[521] 59 200	[549] 62 191	
	[4] 15.1	[30] 3 296	[120] 14 292	[162] 18 289	[204] 23 286	[250] 28 284	[292] 33 282	[374] 42 273	[419] 47 270	[460] 52 265	[501] 57 263	[541] 61 259	
	[5.5] 20.8		[81] 9 393	[127] 14 392	[170] 19 389	[214] 24 387	[254] 29 383	[339] 38 377	[379] 43 372	[422] 48 369	[463] 52 364	[506] 57 358	
	[6.5] 24.6			[47] 5 465	[90] 10 462	[133] 15 460	[176] 20 458	[219] 25 455	[307] 35 448	[345] 39 445	[385] 43 440	[429] 48 435	[467] 53 430

[81]
9
393 Torque [lb-in]
Nm
Speed RPM

J Series (129-)

Dimensions

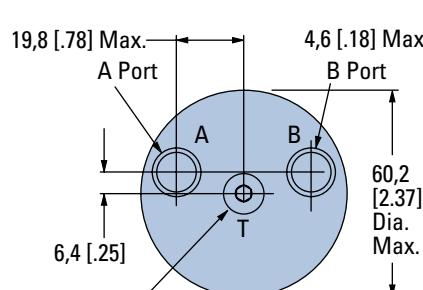
Standard Rotation Viewed from Shaft End

Port A Pressurized — CW

Port B Pressurized — CCW

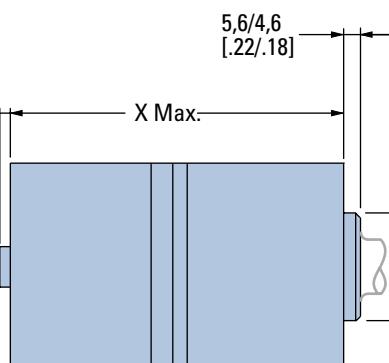
9/16 Inch End Port

9/16-18 UNF - 2B O-Ring Ports, M14 x 1,5 - 6H O-Ring Ports — Metric Motor or G 1/4 (BSP) Ports (2 Ports each)

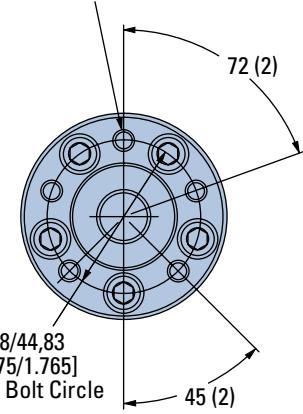


Optional External Case Drain Port
(to Tank)

3/8-24 UNF - 2B O-ring,
M10 x 1 - 6H O-ring — Metric Motor or
G 1/8 (BSP)



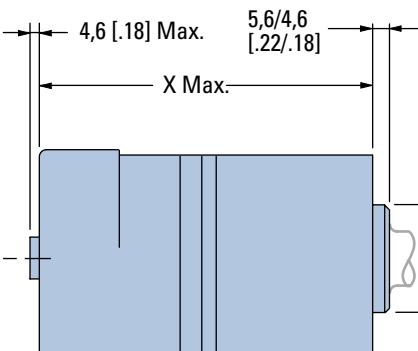
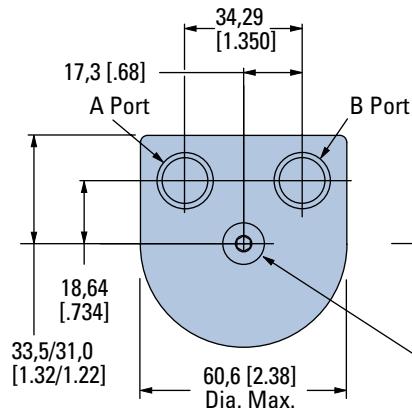
1/4-28 UNF - 2B or M6 x 1 - 6H
12.7 [.50] Min. Deep (5)



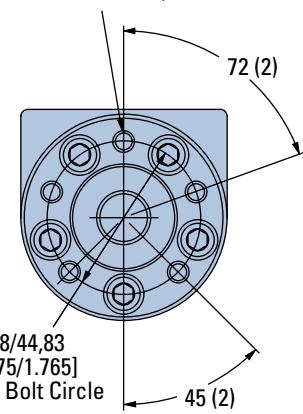
END PORT DIMENSIONS

Displacement cm ³ /r [in ³ /r]	X mm [inch]
8,2 [.50]	103,9 [4.09]
12,9 [.79]	106,9 [4.21]
19,8 [1.21]	112,5 [4.38]
31,6 [1.93]	118,9 [4.68]
50,0 [3.00]	130,3 [5.13]

3/8 Inch End Port



1/4-28 UNF - 2B or M6 x 1 - 6H
12.7 [.50] Min. Deep (5)



END PORT DIMENSIONS

Displacement cm ³ /r [in ³ /r]	X mm [inch]
8,2 [.50]	103,9 [4.09]
12,9 [.79]	106,9 [4.21]
19,8 [1.21]	112,5 [4.38]
31,6 [1.93]	118,9 [4.68]
50,0 [3.00]	130,0 [5.12]
160,5 [6.32]	132,3 [5.21]

J Series (129-)

Dimensions

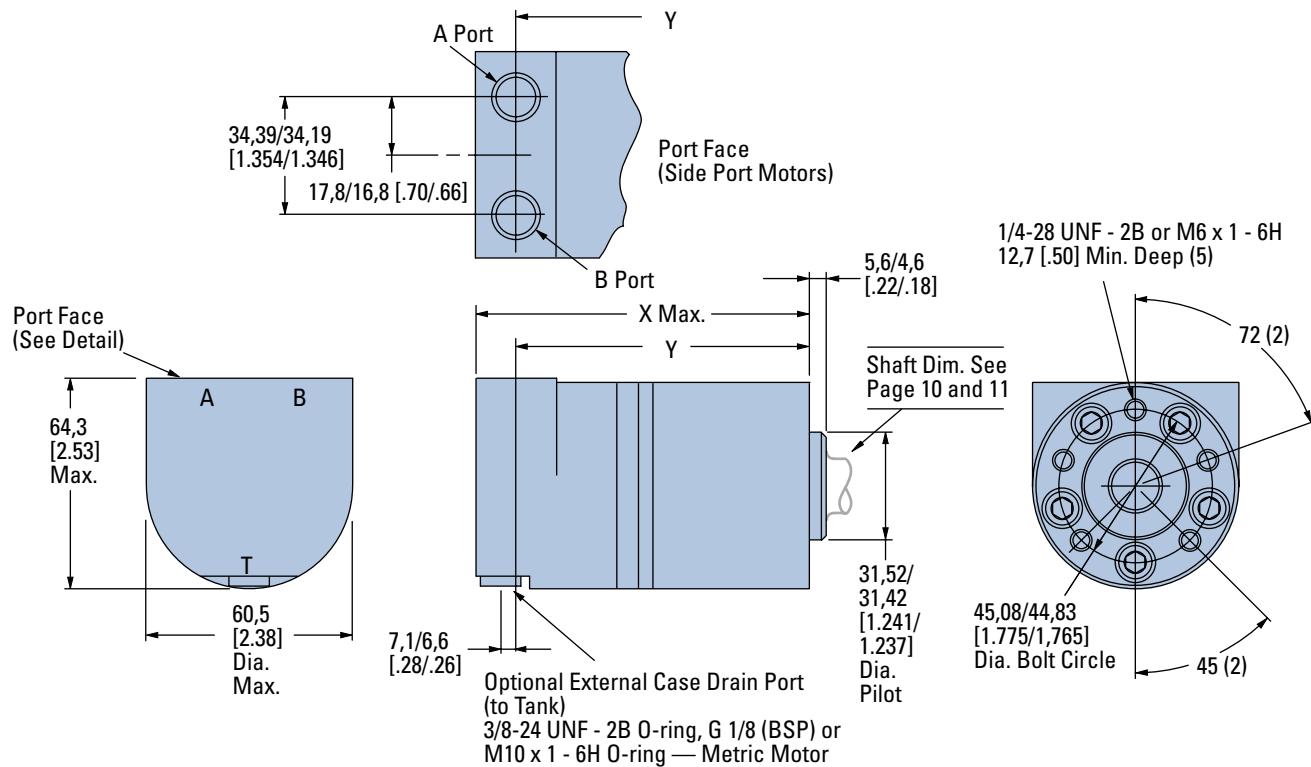
Ports

9/16 -18 UNF - 2B O-Ring Ports,
M14 x 1,5 -6H O-Ring Ports — Metric Motor,
G 3/8 or G 1/4 (BSP) Ports (2)

Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW

Side Port



SIDE PORT MOTORS

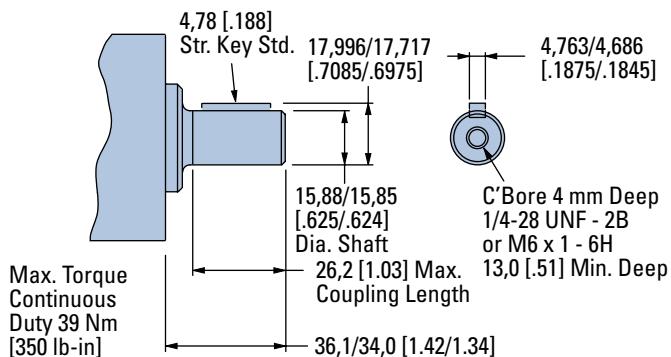
Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]
8,2 [.50]	103,9 [4.09]	89,4/ 87,4 [3.52/3.44]
12,9 [.79]	106,9 [4.21]	92,5/ 90,4 [3.64/3.56]
19,8 [1.21]	112,5 [4.38]	96,8/ 94,7 [3.81/3.73]
31,6 [1.93]	118,9 [4.68]	104,4/102,4 [4.11/4.03]
50,0 [3.00]	130,0 [5.12]	115,7/113,9 [4.56/4.48]

J Series (129-)

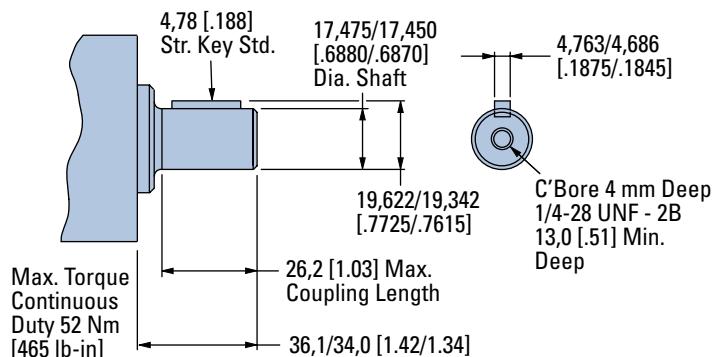
Dimensions

Shafts

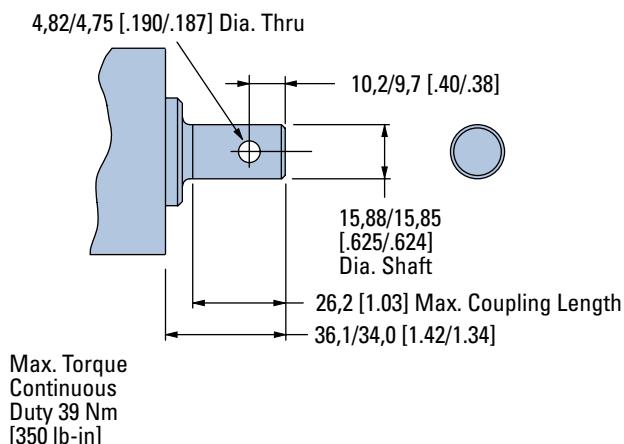
5/8 Inch Straight Keyed



11/16 Inch Straight Keyed



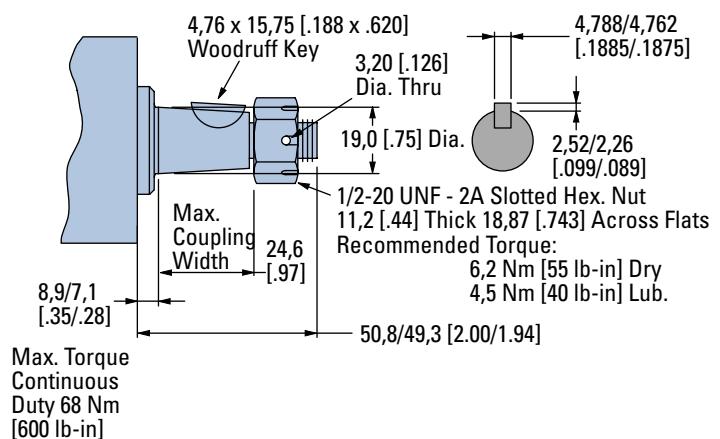
5/8 Inch Straight Keyed w/ Crosshole



3/4 Inch Tapered

(Tapered Shaft End Per SAE J744)

Except as Specified — 1.5 : 12 Ratio

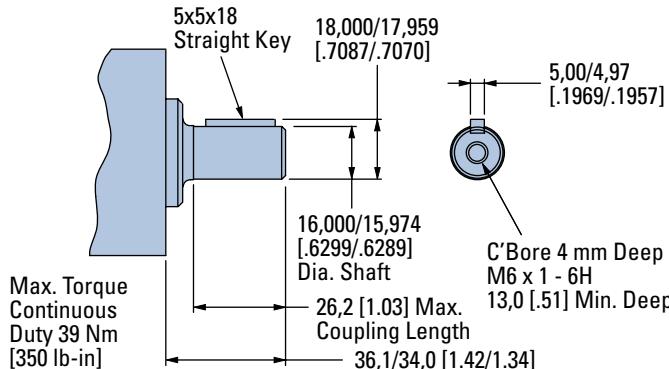


J Series (129-)

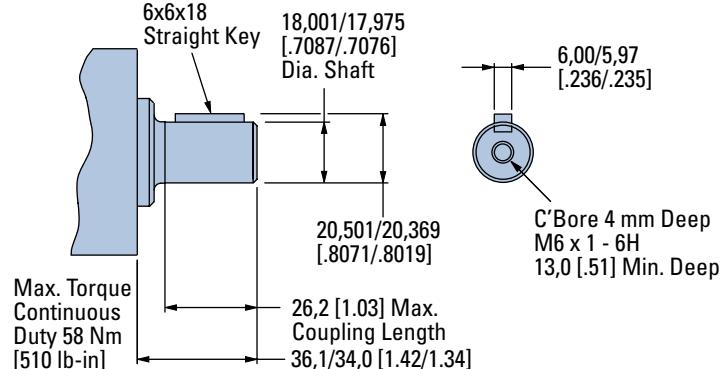
Dimensions

Shafts and Flange Kit

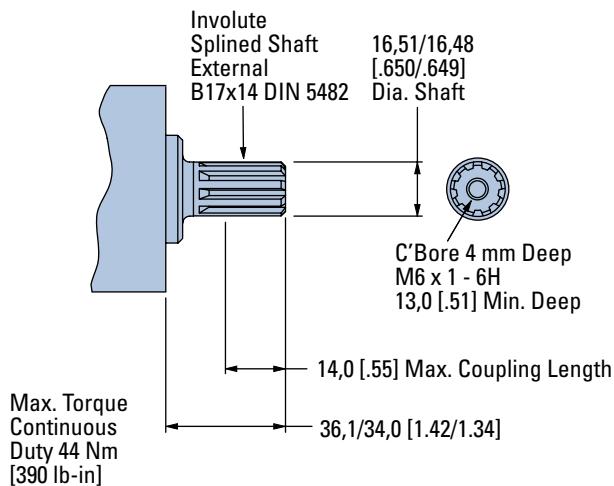
16 mm Straight Keyed



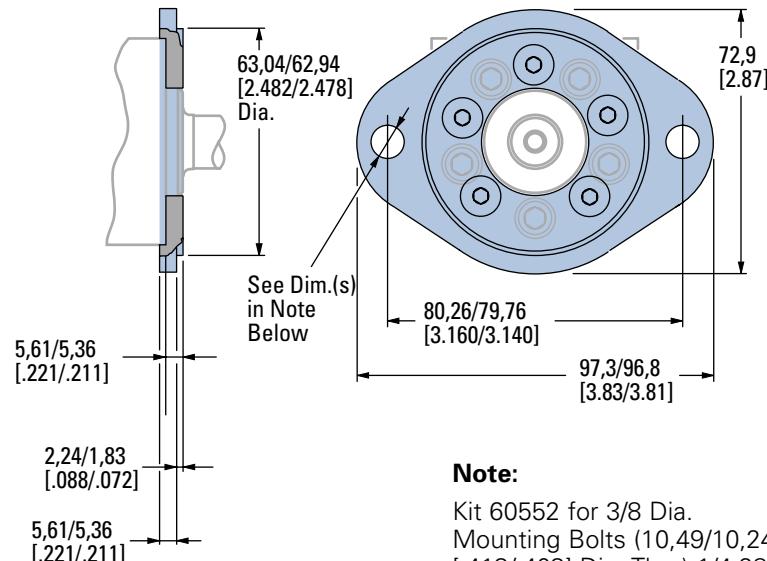
18 mm Straight Keyed



Involute 9T Splined — Metric



2 Bolt Flange Kits (2)



Note:

Kit 60552 for 3/8 Dia.
Mounting Bolts (10,49/10,24
[.413/.403] Dia. Thru) 1/4-28
UNF screws for attaching
flange to motor (5)

Kit 60553 for M8 Dia.
Mounting Bolts (9,12/8,86
[.359/.349] Dia. Thru) M6 x
1 - 6H screws for attaching
flange to motor (5)

J Series (129-)

Product Numbers

Use digit prefix —
129- plus four digit number
from charts for complete
product number—
Example 129-0479.

**Orders will not be
accepted without three
digit prefix.**

End Port

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER	31,6 [1.93]	50,0 [3.00]
1/4-28 UNF 2B	5/8 inch Straight		8,2 [.50] 129-0291 -0292 -0293 -0294 -0458		
	11/16 inch Straight	9/16 -18 UNF	129-0295 -0296 -0297 -0298 -0459		
	Splined — Metric	2B O-Ring (2)	129-0299 -0300 -0301 -0302 -0460		
	3/4 inch Tapered		129-0480		
M6 x 1 - 6H	16 mm Straight	M14 x 1,5 -	129-0303 -0304 -0305 -0306 -0461		
	18 mm Straight	6H O-Ring (2)	129-0307 -0308 -0309 -0310 -0462		
	Splined — Metric		129-0311 -0312 -0313 -0314 -0463		
	16 mm Straight		129-0315 -0316 -0317 -0318 -0464		
	18 mm Straight	G 1/4 (BSP) (2)	129-0319 -0320 -0321 -0322 -0465		
	Splined — Metric		129-0323 -0324 -0325 -0326 -0466		
	16 mm Straight		129-0327 -0328 -0329 -0330 -0467		
	18 mm Straight	G 3/8 (BSP) (2)*	129-0331 -0332 -0333 -0334 -0468		
	Splined — Metric		129-0335 -0336 -0337 -0338 -0469		

*Note: The Same Casting used for Side Ports is Required for G 3/8 (BSP) End Ports

129-0336

Side Port

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER	31,6 [1.93]	50,0 [3.00]
1/4-28 UNF 2B	5/8 inch Straight		8,2 [.50] 129-0339 -0340 -0341 -0342 -0470		
	11/16 inch Straight	9/16 -18 UNF	129-0343 -0344 -0345 -0346 -0471		
	Splined — Metric	2B O-Ring (2)	129-0347 -0348 -0349 -0350 -0472		
	3/4 inch Tapered		129-0481		
M6 x 1 - 6H	16 mm Straight	M14 x 1,5 -	129-0351 -0352 -0353 -0354 -0473		
	18 mm Straight	6H O-Ring (2)	129-0355 -0356 -0357 -0358 -0474		
	Splined — Metric		129-0359 -0360 -0361 -0362 -0475		
	16 mm Straight		129-0363 -0364 -0365 -0366 -0476		
	18 mm Straight	G 1/4 (BSP) (2)	129-0367 -0368 -0369 -0370 -0477		
	Splined — Metric		129-0371 -0372 -0373 -0374 -0403		
	16 mm Straight		129-0375 -0376 -0377 -0378 -0478		
	18 mm Straight	G 3/8 (BSP) (2)	129-0379 -0380 -0381 -0382 -0479		

Two Bolt Mounting Flange Kit (for 3/8 inch Mounting Bolts) — Kit Number 60552 (includes 5 screws — 1/4 -28 UNF-2B)

Two Bolt Mounting Flange Kit (for M8 Mounting Bolts) — Kit Number 60553 (includes 5 screws — M6 x 1-6H)

J Series (129-)

Shaft Side Load Capacity

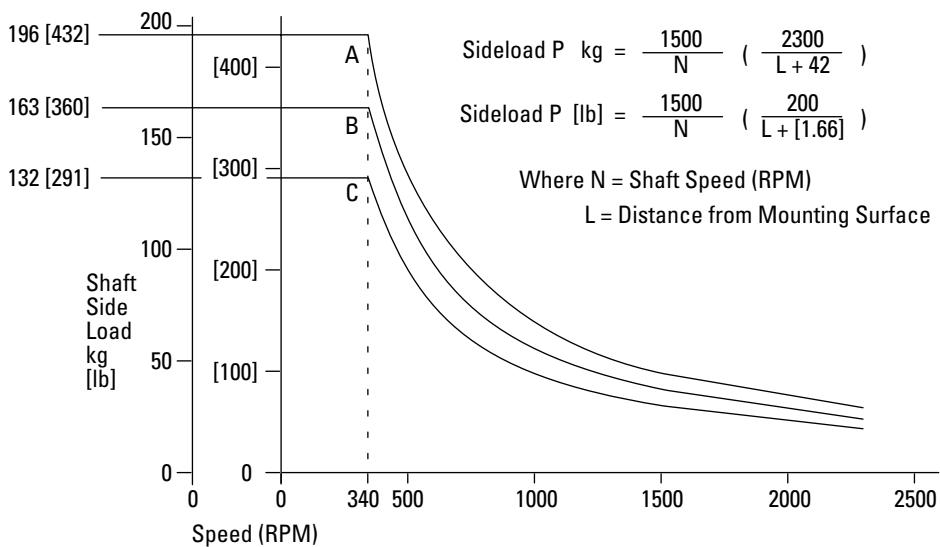
The hydrodynamic bearing has infinite life when shaft load ratings are not exceeded. Hence, the shaft side load capacity is more than adequate to handle most externally applied loads (such as belts, chains, etc.), providing the motor to shaft size is applied within its torque rating.

Allowable side load chart, shaft load location drawing (right) and load curves (below) are based on the side or radial loads being applied to shaft at locations A, B, and C, to determine the shaft side load capacity at locations other than those shown use the formula (shown below). For more information about shaft side loads on Char-Lynn motors contact your Eaton representative.

(below) are based on the side or radial loads being applied to shaft at locations A, B, and C, to determine the shaft side load capacity at locations other than those shown use the formula (shown below). For more information about shaft side loads on Char-Lynn motors contact your Eaton representative.

ALLOWABLE SIDE LOAD — KG [LB]

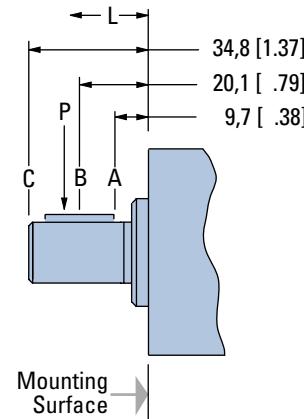
RPM	A	B	C
2300	29 [64]	24 [53]	20 [43]
1500	44 [98]	37 [82]	30 [66]
1250	54 [118]	44 [98]	36 [79]
1000	67 [147]	55 [122]	45 [99]
750	89 [196]	74 [163]	60 [132]
600	111 [245]	93 [204]	75 [165]
500	133 [294]	111 [245]	90 [198]
400	167 [368]	139 [306]	112 [248]
340	196 [432]	163 [360]	132 [291]



$$\text{Sideload } P \text{ kg} = \frac{1500}{N} \left(\frac{2300}{L + 42} \right)$$

$$\text{Sideload } P \text{ [lb]} = \frac{1500}{N} \left(\frac{200}{L + [1.66]} \right)$$

Where N = Shaft Speed (RPM)
L = Distance from Mounting Surface



J Series (129-)

Case Pressure and Case Drain

The J Series now offers check valves in the motor to make case pressure a standard feature. This addition reduces the case pressure in the motor to the return pressure of the system when the case drain is not used. For return pressures higher than the rated pressures (see chart) the external case drain can be connected. If the case drain line is needed, connect drain line to assure that the motor will always remain full of fluid.

Case Drain Advantage

In addition to providing lower case pressures for motors connected in series, there are advantages for adding an external case drain line to motors with normal case pressures as well. These advantages are:

Contamination Control — flushing the motor case.

Motor Cooler — exiting oil draws motor heat away.

Extend Motor Seal Life — maintain low case pressure with a preset restriction installed in the case drain line

Example:

A 14 Bar case pressure will cause a load of 40 kg, so the allowable thrust load will be 82 kg plus 40 = 120 kg kg pushing inward on shaft. Tension load is 82 kg under all case pressure conditions.

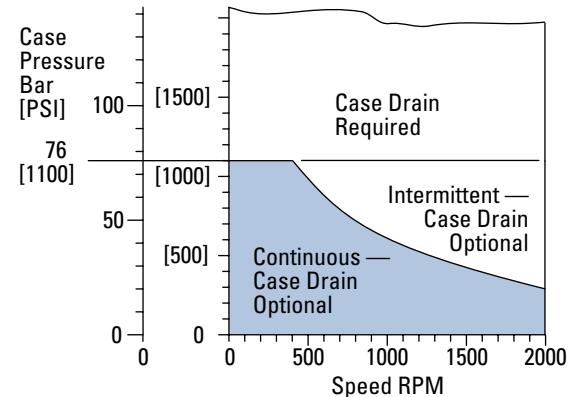
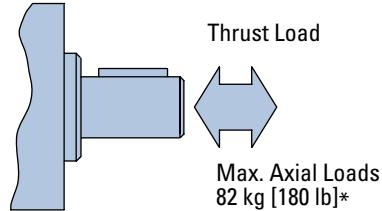
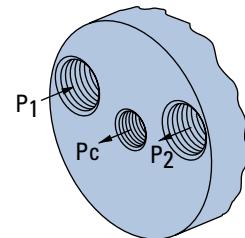
Example:

A 200 PSI case pressure will cause a load of 88 lbs, so the allowable thrust load will be 180 lbs plus 88 = 268 lbs pushing inward on shaft. Tension load is 180 lb under all case pressure conditions

Note:

J Series motors can be connected in parallel or in series.

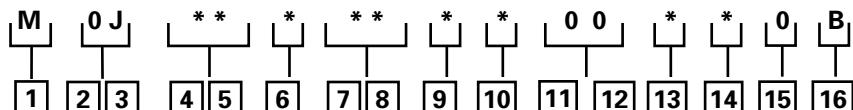
Case pressure will add to the allowable compressive thrust load. Case pressure will push outward on the shaft at 20 kg/7 Bar [44 lb/100 PSI].



J Series (129-)

Model Code

The following 16-digit coding system has been developed to identify all of the configuration options for the J motor. Use this model code to specify a motor with the desired features. All 16-digits of the code must be present when ordering. You may want to photocopy the matrix below to ensure that each number is entered in the correct box.



[1] Product

M – Motor

[2], [3] Series

0J – J Series

[4], [5] Displacement cm³/r [in³/r]

05 – 8,2 [.50]

08 – 12,9 [.79]

12 – 19,8 [1.21]

19 – 31,6 [1.93]

30 – 50,0 [3.00]

[6] Mounting Type

A – 5 Bolt: Dia. 31,47 [1.239] x 5,1 [.20] Pilot 1/4-28 UNF 2B Mounting Holes on 45 [1.77] Dia. Bolt Circle

B – 5 Bolt: Dia. 31,47 [1.239] x 5,1 [.20] Pilot M6 x 1- 6H Mounting Holes on 45 [1.77] Dia. Bolt Circle

C – 2 Bolt: Dia. 62,99 [2.480] x 2,0 [.08] Pilot 10,36[.408] Mounting Holes on 80,0 [3.150] Dia. Bolt Circle

D – 2 Bolt: Dia. 62,99 [2.480] x 2,0 [.08] Pilot 9,0 [.354] Mounting Holes on 80,0 [3.150] Dia. Bolt Circle

[7], [8] Output Shaft

01 – 5/8 inch Dia. Straight with 4,72 [.186] Square Key and 1/4-28 UNF - 2B Threaded Hole

02 – 16 mm Dia. Straight with 5,00 [.197] Square Key with M6 x 1 - 6H Threaded Hole

04 – 11/16 inch Dia. Straight with 4,72 [.186] Square Key and 1/4-28 UNF - 2B Threaded Hole

05 – 18 mm Dia. Straight with 5,92 [.233] Square Key with M6 x 1 - 6H Threaded Hole

06 – Involute Splined 9T— Metric 16,50 [.650] Dia. (B17 x 14 DIN 5482) M6 x 1 - 6H Threaded Hole

07 – 5/8 inch Dia. Straight with 4,75 [.187] Dia. Crosshole

08 – 3/4 inch Tapered with Woodruff Key and Nut

09 – 5/8 inch Dia. Straight with 4,72 [.186] Sq. Key with 1/4-28 UNF -2B Threaded Hole (Plated for Corrosion Protection)

14 – 16 mm Dia. Straight with 5,00 [.197] Sq. Key with M6 x 1 - 6H Threaded Hole (Plated for Corrosion Protection)

[9] Ports

A – 9/16-18 UNF - 2B O-Ring End Ported

B – G 1/4 (BSP) End Ported

C – M14 x 1,5 - 6H O-Ring Port, End Ported

D – 9/16-18 UNF - 2B O-Ring Side Ported

E – G 3/8 (BSP) Side Ported

F – G 1/4 (BSP) Side Ported

H – G 3/8 (BSP) End Ported

[10] Case Flow Options

0 – No Case Drain

1 – 3/8-24 UNF - 2B O-Ring

2 – G 1/8 (BSP)

3 – M10 x 1 - 6H O-Ring

[11], [12] Special Features (Hardware)

00 – None

[13] Special Features (Assembly)

0 – None

1 – Reverse Rotation

[14] Paint/Special Packaging

0 – No Paint, Individual Box

A – Painted Low Gloss Black, Individual Box

B – No Paint, Bulk Box Option

[15] Eaton Assigned Code when Applicable

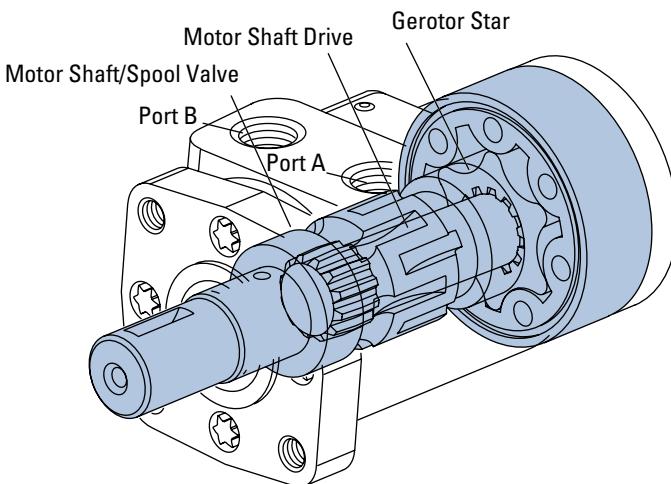
0 – Assigned Code

[16] Eaton Assigned Design Code

B – Assigned Design Code

H Series (101-)

Highlights



Description

Designed for medium duty applications, these motors use industry-proven spool valve technology combined with state-of-the-art gerotors. In addition, a wide variety of mounting flanges, shafts, Ports and valving options provide design flexibility. Direction of shaft rotation and shaft speed can be controlled easily and smoothly throughout the speed range of the motor, and equipment can be driven direct, eliminating costly mechanical components.

Specifications

Gerotor Element	13 Displacements
Flow l/min [GPM]	57 [15] Continuous*** 76 [20] Intermittent**
Speed	Up to 1100 RPM
Pressure bar [PSI]	125 [1800] Cont.*** 165 [2400] Inter.**
Torque Nm [lb-in]	407 [3604] Cont.*** 520 [4600] Inter.**

*** Continuous—(Cont.) Continuous rating, motor may be run continuously at these ratings.

** Intermittent—(Inter.) Intermittent operation, 10% of every minute.

Features:

- Time-tested Char-Lynn drive set
- Three moving components (gerotor-star, drive, and shaft)
- Optimized drive running angle
- Three-zone pressure design (inlet, return and case)
- Variety of displacements, shafts and mounts
- Special options to meet customer needs

Benefits:

- High efficiency
- Powerful compact package
- Design flexibility
- Extended leak-free performance

Applications:

- Agricultural augers, harvesters, seeders
- Car wash brushes
- Food processing
- Railroad maintenance equipment
- Machine tools
- Conveyors
- Industrial sweepers and floor polishers
- Saw mill works
- Turf equipment
- Concrete and asphalt equipment
- Skid steer attachments
- Many more



Conveyer



Combine



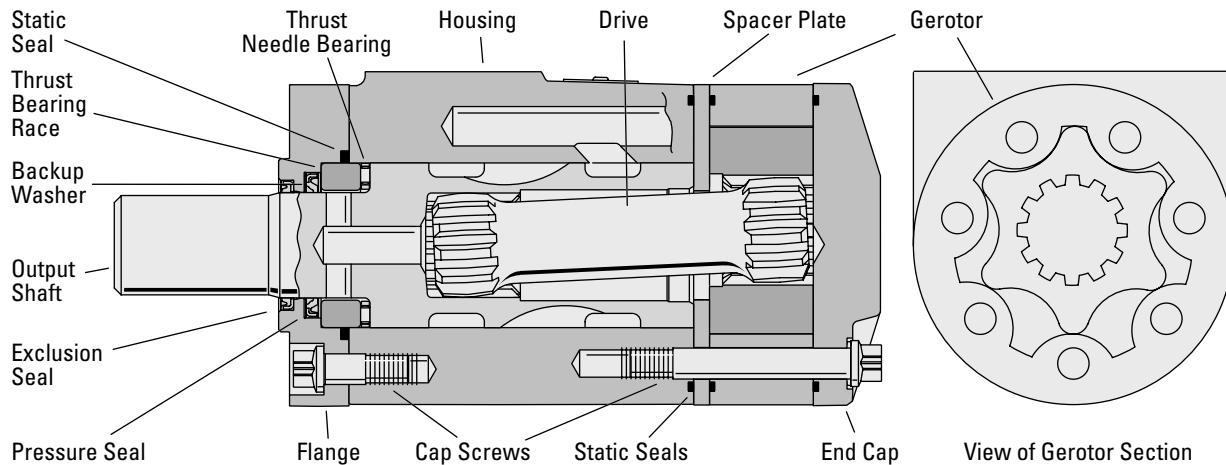
Sweeper



Salt and Sand Spreader

H Series (101-)

Specifications



SPECIFICATION DATA — H MOTORS

Displ. cm ³ /r [in ³ /r]	36 [2.2]	46 [2.8]	59 [3.6]	74 [4.5]	97 [5.9]	120 [7.3]	146 [8.9]	159 [9.7]	185 [11.3]	231 [14.1]	293 [17.9]	370 [22.6]	739 [45.1]
Max. Speed (RPM) @ Continuous Flow	1021	969	953	760	585	469	385	353	304	243	192	152	74
Flow LPM [GPM]	Continuous Intermittent	38 [10] 38 [10]	45 [12] 53 [14]	57 [15] 64 [17]	57 [15] 68 [18]	57 [15] 76 [20]							
Torque Nm Nm [lb-in]	Continuous Intermittent	56 [497] 75 [668]	73 [650] 99 [876]	91 [802] 122 [1044]	118 [1044] 158 [1368]	155 [1368] 207 [1699]	192 [1699] 257 [1954]	221 [1954] 300 [2059]	233 [2059] 319 [2343]	265 [2343] 356 [2669]	302 [2669] 415 [3110]	351 [3110] 466 [3604]	407 [3604] 484 [3440]
Min. Starting Torque Nm Nm [lb-in]	@ Cont. Pressure @ Int. Pressure	46 [410]	59 [520]	76 [670]	95 [840]	124 [1100]	154 [1100]	176 [1360]	186 [1560]	211 [1650]	238 [1870]	282 [2110]	330 [2500]
Pressure ΔBar [Δ PSI]	Continuous Intermittent	124 [1800]	124 [1800]	124 [1800]	124 [1800]	124 [1800]	117 [1800]	117 [1700]	114 [1700]	110 [1650]	100 [1600]	93 [1450]	86 [1350]
End Ported Units Only	Δ Bar [Δ PSI]	83 [1200]	83 [1200]	76 [1100]	76 [1100]	69 [1100]	69 [1000]	69 [1000]	62 [1000]	55 [900]	48 [800]	57 [700]	27 [825]
Weight kg [lb]	5,1 [11.2]	5,1 [11.2]	5,2 [11.5]	5,2 [11.5]	5,4 [11.8]	5,5 [12.1]	5,6 [12.4]	5,7 [12.4]	5,8 [12.5]	6,0 [12.8]	6,3 [13.3]	6,7 [14.0]	8,4 [18.6]

A simultaneous maximum torque and maximum speed NOT recommended.

Note:

To assure best motor life, run motor for approximately one hour at 30% of rated pressure before application to full load. Be sure motor is filled with fluid prior to any load applications.

Note:

Δ pressure is derated for end ported units.

Maximum Inlet Pressure:

172 Bar [2500 PSI] without regard to Δ Bar [Δ PSI] and/or back pressure ratings or combination thereof.

6B splined or Tapered shafts are recommended whenever operation above 282 NM [2500 lb-in] of torque, especially for those applications subject to frequent reversals.

Pressure:

The true Δ bar [Δ PSI] difference between inlet port and outlet port

Continuous Rating:

Motor may be run continuously at these ratings

Intermittent Operation:

10% of every minute

Recommended Fluids:

Recommended Fluids — Premium quality, anti-wear type hydraulic oil. Minimum oil viscosity (at operating temperature) should be the highest of the following:
100 SUS or

$$\left[\frac{300 \times \text{Bar}}{\text{RPM}} = \text{SUS} \right]$$

$$\left[\frac{20 \times \text{PSI}}{\text{RPM}} = \text{SUS} \right]$$

Recommended Maximum System Operating Temp.:

82°C [180°F]

Recommended Filtration:

per ISO Cleanliness Code 4406, level 20/18/13

H Series (101-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed, however for best motor life select a motor to run with a torque and speed range printed in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.

 Continuous

 Intermittent

36 cm ³ /r [2.2 in ³ /r]									
△ Pressure Bar [PSI]									
Continuous									
[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2400] 165
[2] 7,6	[49] 6 204	[103] 12 201	[162] 18 198	[189] 21 194	[270] 31 189	[325] 37 184	[379] 43 177	[432] 49 170	[489] 55 162
[4] 15,1	[47] 5 408	[106] 12 407	[160] 18 402	[191] 22 399	[274] 31 394	[327] 37 387	[384] 43 381	[439] 50 373	[495] 56 365
[6] 22,7	[44] 5 613	[102] 12 612	[158] 18 609	[188] 21 604	[272] 31 599	[328] 37 591	[383] 43 586	[440] 50 576	[496] 56 565
[8] 30,3	[40] 5 817	[97] 11 817	[153] 17 814	[184] 21 807	[270] 21 799	[326] 37 793	[383] 43 785	[440] 50 776	[497] 56 762
[10] 37,9	[36] 4 1021	[90] 10 1021	[148] 17 1015	[180] 20 1008	[265] 30 1001	[322] 36 991	[380] 43 981	[438] 49 969	[495] 56 959
Max. Intermittent									

[90] } Torque [lb-in]
10 Nm
1021 Speed RPM

46 cm ³ /r [2.8 in ³ /r]									
△ Pressure Bar [PSI]									
Continuous									
[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2400] 165
[2] 7,6	[64] 7 161	[136] 15 158	[212] 24 156	[284] 32 153	[355] 40 148	[426] 48 145	[497] 56 139	[567] 64 133	[641] 72 127
[4] 15,1	[61] 7 323	[139] 16 320	[209] 24 316	[286] 32 314	[359] 41 310	[429] 48 304	[503] 57 300	[576] 65 293	[649] 73 287
[6] 22,7	[58] 7 486	[134] 15 481	[207] 23 479	[282] 32 475	[356] 40 471	[430] 49 464	[502] 57 461	[577] 65 453	[650] 73 444
[8] 30,3	[52] 6 648	[128] 14 643	[200] 23 640	[276] 31 635	[354] 40 628	[428] 48 623	[502] 57 617	[577] 65 610	[651] 74 599
[10] 37,9	[47] 5 808	[118] 13 803	[194] 22 798	[269] 30 793	[347] 39 787	[423] 48 779	[498] 56 771	[575] 65 761	[649] 73 753
[12] 45,4	[36] 4 969	[109] 12 964	[188] 21 960	[260] 29 952	[340] 38 946	[417] 47 938	[492] 56 931	[567] 64 922	[643] 73 914
Max. Intermittent									
[14] 53,0	[25] 3 1127	[98] 11 1123	[175] 20 1115	[249] 28 1108	[327] 37 1100	[404] 46 1093	[484] 55 1086	[559] 63 1079	[634] 72 1068

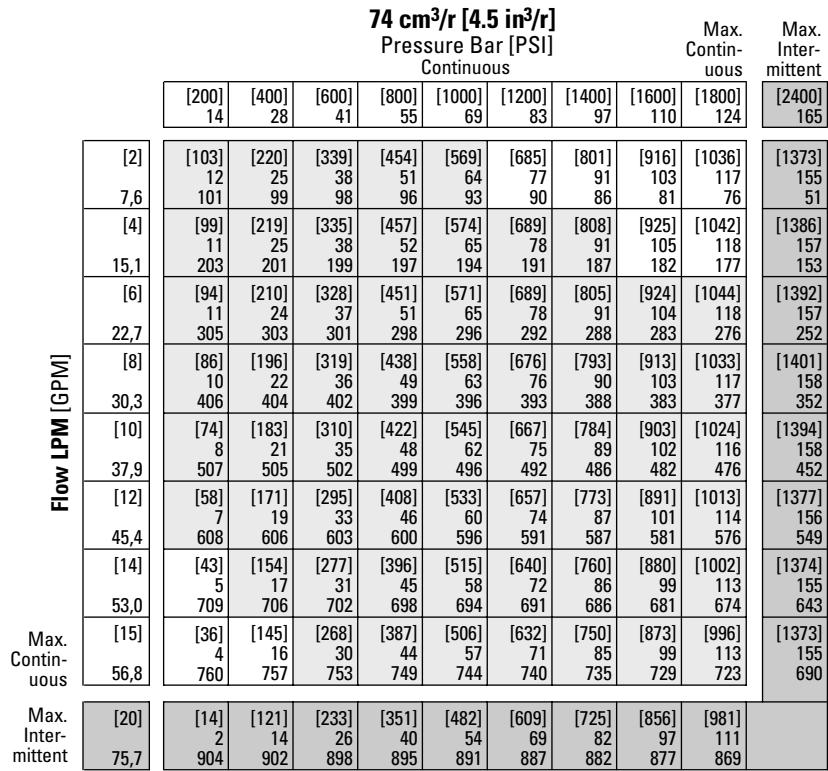
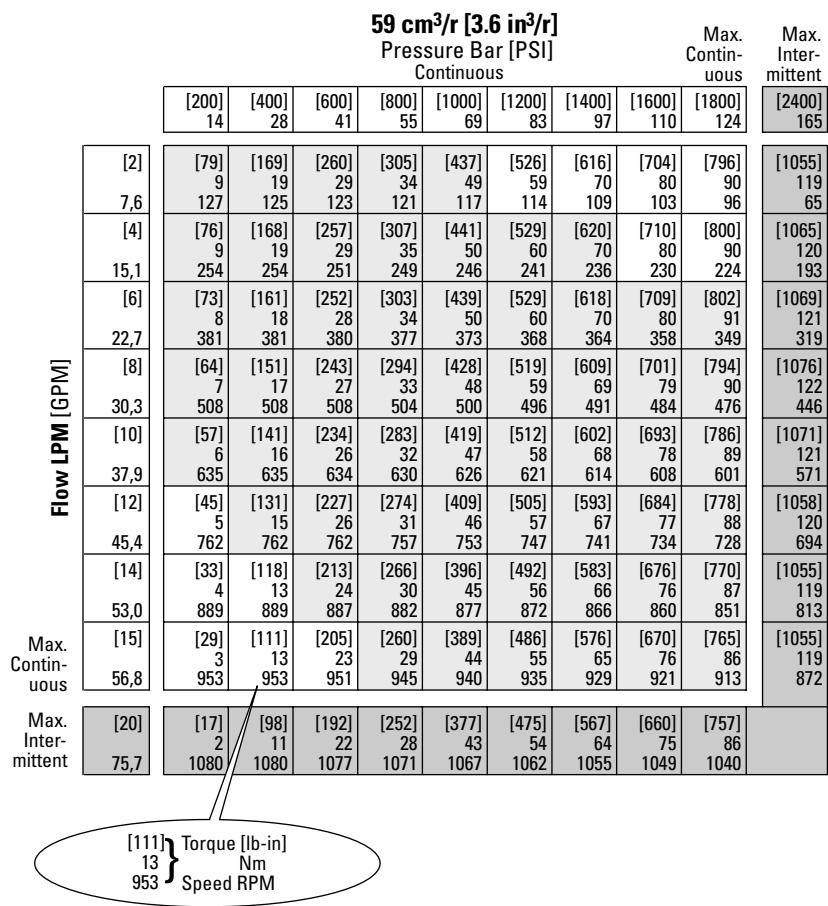
H Series (101-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed, however for best motor life select a motor to run with a torque and speed range printed in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.

- Continuous
- Intermittent



H Series (101-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed, however for best motor life select a motor to run with a torque and speed range printed in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.



Continuous



Intermittent

97 cm ³ /r [5.9 in ³ /r]										Max. Continuous	Max. Intermittent	
△ Pressure Bar [PSI]										Continuous		
[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2400] 165			
[2]	[134] 15	[292] 33	[442] 50	[593] 67	[746] 84	[899] 102	[1054] 119	[1209] 137	[1365] 154			
7,6	78	76	75	73	71	68	65	61	55			
[4]	[131] 15	[281] 32	[436] 49	[596] 67	[750] 85	[903] 102	[1059] 120	[1212] 137	[1367] 154			
15,1	156	155	153	151	149	147	143	139	134			
[6]	[126] 14	[269] 30	[425] 48	[588] 66	[747] 84	[900] 102	[1054] 119	[1206] 136	[1368] 155			
22,7	234	233	231	230	228	224	221	217	210			
[8]	[110] 12	[246] 28	[408] 46	[566] 64	[718] 81	[873] 99	[1023] 116	[1177] 133	[1339] 151			
30,3	312	311	310	308	305	303	300	295	291			
[10]	[96] 11	[231] 26	[392] 44	[539] 61	[699] 79	[859] 97	[1005] 114	[1156] 131	[1318] 149			
37,9	390	389	387	385	383	380	376	373	368			
[12]	[77] 9	[218] 25	[378] 43	[522] 59	[681] 77	[844] 95	[990] 112	[1142] 129	[1301] 147			
45,4	468	467	465	463	460	457	453	449	445			
[14]	[60] 7	[197] 22	[358] 40	[513] 58	[662] 75	[828] 94	[973] 110	[1131] 128	[1293] 146			
53,0	546	544	542	539	537	535	531	526	521			
[15]	[52] 6	[189] 21	[346] 39	[495] 56	[651] 74	[819] 93	[963] 109	[1126] 127	[1286] 145			
56,8	585	583	581	578	575	573	569	564	559			
Max. Intermittent	[20] 75,7	[25] 3 701	[157] 18 700	[311] 35 697	[455] 51 694	[625] 71 691	[790] 89 688	[941] 106 684	[1110] 125 681	[1272] 144 674		

[189]
21
583 } Torque [lb-in]
Nm
Speed RPM

120 cm ³ /r [7.3 in ³ /r]										Max. Continuous	Max. Intermittent	
△ Pressure Bar [PSI]										Continuous		
[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2400] 165			
[2]	[162] 18	[357] 40	[544] 61	[736] 83	[927] 105	[1116] 126	[1305] 147	[1498] 169	[1687] 191			
7,6	62	61	61	59	58	55	53	49	45			
[4]	[160] 18	[348] 39	[539] 61	[736] 83	[930] 105	[1119] 126	[1316] 149	[1506] 170	[1698] 192			
15,1	125	124	123	121	120	119	116	114	110			
[6]	[155] 18	[338] 38	[530] 60	[729] 82	[923] 104	[1116] 126	[1310] 148	[1500] 169	[1699] 192			
22,7	188	187	186	185	183	180	178	175	170			
[8]	[139] 16	[319] 36	[515] 58	[710] 80	[901] 102	[1094] 124	[1283] 145	[1476] 167	[1673] 189			
30,3	250	250	249	247	245	243	241	237	233			
[10]	[121] 14	[303] 34	[497] 56	[686] 78	[883] 100	[1081] 122	[1267] 143	[1460] 165	[1655] 187			
37,9	313	312	311	309	308	306	302	300	296			
[12]	[102] 12	[288] 33	[480] 54	[664] 75	[862] 97	[1060] 120	[1246] 141	[1440] 163	[1640] 185			
45,4	375	374	373	371	370	367	365	361	358			
[14]	[78] 9	[263] 30	[458] 52	[652] 74	[841] 95	[1041] 118	[1228] 139	[1420] 160	[1616] 183			
53,0	438	437	435	433	431	430	427	423	419			
[15]	[67] 8	[253] 29	[446] 50	[632] 71	[828] 94	[1030] 116	[1214] 137	[1411] 159	[1608] 182			
56,8	469	468	466	464	462	460	458	454	450			
Max. Intermittent	[20] 75,7	[20] 2 626	[202] 23 624	[384] 43 621	[581] 66 618	[778] 88 617	[971] 110 614	[1169] 132 611	[1356] 153 609	[1559] 176 606		

H Series (101-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed; however for best motor life select a motor to run with a torque and speed range printed in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.

- Continuous
- Intermittent

146 cm ³ /r [8.9 in ³ /r]										
△ Pressure Bar [PSI]										
Continuous										
[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1700] 117	[2300] 159	
[2] 7,6	[198] 22 51	[435] 49 50	[664] 75 50	[897] 101 49	[1130] 128 47	[1361] 154 45	[1591] 180 43	[1827] 206 40	[1942] 219 39	
[4] 15,1	[196] 22 103	[424] 48 102	[657] 74 101	[898] 101 99	[1133] 128 99	[1365] 154 97	[1604] 181 95	[1836] 207 93	[1954] 221 92	
[6] 22,7	[189] 21 154	[412] 47 153	[646] 73 152	[889] 100 151	[1125] 127 150	[1361] 154 148	[1598] 181 146	[1829] 207 143	[1951] 220 141	
[8] 30,3	[169] 19 205	[389] 44 205	[628] 71 204	[866] 98 203	[1098] 124 201	[1333] 151 200	[1564] 177 197	[1799] 203 195	[1919] 217 193	
[10] 37,9	[148] 17 257	[369] 42 256	[605] 68 255	[836] 94 253	[1076] 122 252	[1318] 149 251	[1544] 174 248	[1780] 201 246	[1899] 215 244	
[12] 45,4	[125] 14 308	[351] 40 307	[586] 66 306	[810] 92 305	[1051] 119 303	[1293] 146 301	[1519] 172 299	[1756] 198 296	[1878] 212 295	
[14] 53,0	[95] 11 359	[321] 36 358	[558] 63 357	[795] 90 355	[1026] 116 354	[1290] 146 352	[1497] 169 350	[1731] 196 347	[1851] 209 346	
[15] 56,8	[82] 9 85	[308] 35 384	[544] 61 383	[771] 87 381	[1010] 114 379	[1256] 142 378	[1480] 167 375	[1720] 194 373	[1840] 208 371	
Max. Intermittent	[20] 75,7	[24] 3 513	[246] 28 512	[468] 53 509	[708] 80 507	[948] 107 506	[1184] 134 504	[1425] 161 501	[1653] 187 499	[1780] 201 498

159 cm ³ /r [9.7 in ³ /r]									
△ Pressure Bar [PSI]									
Continuous									
[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1650] 134	[2250] 155
[2] 7,6	[209] 24 47	[465] 53 46	[715] 81 46	[973] 110 45	[1228] 139 44	[1478] 167 42	[1724] 195 40	[1981] 224 38	[2046] 231 37
[4] 15,1	[210] 24 94	[460] 52 94	[710] 80 93	[971] 110 91	[1229] 139 91	[1480] 167 90	[1745] 197 89	[1996] 226 87	[2059] 233 87
[6] 22,7	[205] 23 141	[454] 51 141	[704] 80 140	[965] 109 139	[1216] 137 138	[1477] 167 136	[1738] 196 134	[1991] 225 132	[2055] 232 132
[8] 30,3	[186] 21 188	[440] 50 188	[693] 78 187	[951] 107 186	[1205] 136 185	[1461] 165 183	[1716] 194 181	[1973] 223 179	[2038] 230 178
[10] 37,9	[164] 19 235	[422] 48 234	[671] 76 234	[930] 105 232	[1189] 134 232	[1451] 164 230	[1702] 192 228	[1965] 219 226	[2032] 230 225
[12] 45,4	[144] 16 282	[404] 46 281	[652] 74 281	[900] 102 279	[1163] 131 279	[1421] 161 277	[1674] 189 275	[1937] 219 273	[2004] 226 272
[14] 53,0	[109] 12 330	[374] 42 329	[623] 70 328	[883] 100 327	[1140] 129 325	[1396] 158 323	[1653] 187 322	[1900] 215 319	[1963] 222 319
Max. Intermittent	[15] 56,8	[359] 10 353	[612] 41 352	[861] 69 351	[1123] 97 350	[1381] 127 348	[1633] 156 347	[1886] 185 345	[1950] 213 343
Max. Intermittent	[20] 75,7	[26] 3 471	[268] 28 470	[510] 58 467	[772] 87 465	[1034] 117 464	[1290] 146 462	[1553] 175 460	[1802] 204 458

[359] { Torque [lb-in]
41 Nm
352 Speed RPM

H Series (101-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed, however for best motor life select a motor to run with a torque and speed range printed in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.

- Continuous
- Intermittent

185 cm³/r [11.3 in³/r]

△ Pressure Bar [PSI]
Continuous

Max.
Continuous
Max.
Intermittent

	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[2150] 148
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[2] 7,6	[257] 29 40	[554] 63 40	[847] 96 39	[1150] 130 38	[1447] 163 37	[1739] 196 36	[2035] 230 33	[2320] 262 29	[3103] 351 12
[4] 15,1	[254] 29 81	[546] 62 81	[845] 95 80	[1145] 129 79	[1448] 164 78	[1744] 197 77	[2049] 232 76	[2343] 265 74	[3147] 356 63
[6] 22,7	[246] 28 121	[540] 61 121	[834] 94 120	[1137] 128 120	[1434] 162 119	[1736] 196 117	[2036] 230 115	[2337] 264 112	[3151] 356 100
[8] 30,3	[224] 25 162	[520] 59 162	[820] 93 161	[1117] 126 160	[1414] 160 159	[1716] 194 157	[2014] 228 155	[2315] 262 152	[3133] 354 140
[10] 37,9	[202] 23 202	[499] 56 202	[793] 90 201	[1095] 124 201	[1394] 158 200	[1699] 192 198	[1997] 226 196	[2299] 260 193	[3112] 352 181
[12] 45,4	[176] 20 243	[475] 54 242	[767] 87 242	[1063] 120 241	[1368] 155 240	[1664] 188 238	[1969] 222 236	[2268] 256 234	[3088] 349 222
[14] 53,0	[140] 16 283	[443] 50 283	[735] 83 282	[1035] 117 281	[1340] 151 280	[1637] 185 279	[1936] 219 277	[2227] 252 274	[3051] 345 262
[15] 56,8	[120] 14 304	[425] 48 303	[719] 81 302	[1014] 115 301	[1320] 149 300	[1618] 183 299	[1914] 216 297	[2205] 249 294	[3023] 342 283
Max. Inter- mittent	[20] 3 405	[27] 36 404	[321] 69 402	[612] 103 401	[911] 137 400	[1211] 170 398	[1504] 170 397	[1795] 203	
Max. Inter- mittent	[75,7]								

231 cm³/r [14.1 in³/r]

△ Pressure Bar [PSI]
Continuous

Max.
Continuous
Max.
Intermittent

	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1450] 100	[2000] 138
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[2] 7,6	[338] 38 32	[707] 80 32	[1074] 121 31	[1456] 165 30	[1827] 206 30	[2192] 248 28	[2572] 291 26	[2657] 300 25	
[4] 15,1	[328] 37 65	[695] 79 65	[1076] 122 64	[1447] 163 63	[1827] 206 62	[2201] 249 62	[2577] 291 60	[2669] 302 60	[3671] 415 50
[6] 22,7	[317] 36 97	[687] 78 97	[1057] 119 97	[1434] 162 96	[1811] 205 95	[2186] 247 94	[2555] 289 92	[2650] 299 91	[3668] 414 80
[8] 30,3	[289] 33 130	[659] 74 130	[1038] 117 130	[1406] 159 129	[1777] 201 128	[2160] 244 127	[2531] 286 124	[2625] 297 124	[3644] 412 112
[10] 37,9	[265] 30 162	[631] 71 162	[1004] 113 162	[1381] 156 162	[1751] 198 160	[2131] 241 158	[2510] 284 156	[2602] 294 156	[3608] 408 145
[12] 45,4	[230] 26 195	[599] 68 195	[968] 109 194	[1345] 152 194	[1722] 195 193	[2088] 236 192	[2480] 280 189	[2571] 290 189	[3571] 403 178
[14] 53,0	[191] 22 227	[563] 64 227	[927] 105 227	[1299] 147 226	[1686] 190 226	[2058] 233 224	[2428] 274 222	[2519] 285 221	[3532] 399 212
Max. Continuous	[15] 56,8	[167] 19 243	[538] 61 243	[904] 102 243	[1279] 145 242	[1661] 188 242	[2030] 229 240	[2404] 272 238	[3488] 394 229
Max. Inter- mittent	[20] 75,7	[29] 3 324	[411] 46 324	[785] 89 323	[1152] 130 322	[1520] 172 322	[1877] 212 320	[2222] 251 319	[2318] 262 318

[538] } Torque [lb-in]
61 Nm
243 Speed RPM

H Series (101-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed; however for best motor life select a motor to run with a torque and speed range printed in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.

- Continuous
- Intermittent

293 cm ³ /r [17.9 in ³ /r]								
△ Pressure Bar [PSI]								
Continuous								
[2]	[427] 48 26	[893] 101 25	[1361] 154 25	[1829] 207 24	[2293] 259 22	[2672] 302 16	[2977] 336 13	
7,6								
[4]	[419] 47 51	[886] 100 51	[1362] 154 51	[1833] 207 50	[2305] 260 49	[2771] 313 47	[3110] 351 44	
15,1								
[6]	[402] 45 77	[872] 99 77	[1342] 152 76	[1819] 206 76	[2291] 259 74	[2757] 312 71	[3098] 350 68	
22,7								
[8]	[367] 41 102	[838] 95 102	[1316] 149 102	[1785] 202 101	[2252] 254 100	[2723] 308 98	[3070] 347 95	
30,3								
[10]	[332] 38 128	[803] 91 128	[1276] 144 128	[1749] 198 127	[2215] 250 126	[2684] 303 123	[3034] 343 120	
37,9								
[12]	[289] 33 153	[760] 86 153	[1230] 139 153	[1706] 193 153	[2177] 246 151	[2634] 298 149	[2989] 338 146	
45,4								
[14]	[241] 27 179	[712] 80 179	[1176] 133 179	[1650] 186 179	[2126] 240 177	[2592] 293 175	[2935] 332 172	
53,0								
[15]	[211] 24 192	[683] 77 192	[1149] 130 192	[1623] 183 191	[2096] 237 190	[2558] 289 188	[2905] 328 185	
56,8								
Max. Continuous	[20] 75,7	[43] 5 256	[527] 60 256	[1001] 113 255	[1463] 165 255	[1919] 217 254	[2375] 268 252	[2720] 307 249
Max. Intermittent								

370 cm ³ /r [22.6 in ³ /r]								
△ Pressure Bar [PSI]								
Continuous								
[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1250] 86	[1500] 103	
7,6	[537] 61 20	[1121] 127 20	[1715] 194 20	[2285] 258 19	[2862] 323 16			
15,1	[532] 60 40	[1123] 127 40	[1715] 194 40	[2308] 261 39	[2893] 327 38	[3467] 392 36	[3604] 407 35	
22,7	[508] 57 61	[1100] 124 61	[1693] 191 61	[2294] 259 60	[2884] 326 58	[3458] 391 55	[3598] 407 53	
30,3	[463] 52 81	[1060] 120 81	[1661] 188 81	[2255] 255 80	[2840] 321 79	[3414] 386 76	[3557] 402 74	
37,9	[414] 47 101	[1017] 115 101	[1613] 182 101	[2203] 249 101	[2788] 315 99	[3363] 380 96	[3506] 396 94	
45,4	[363] 41 121	[960] 108 121	[1553] 175 121	[2152] 243 121	[2737] 309 119	[3305] 373 116	[3446] 389 115	
53,0	[303] 34 142	[897] 101 142	[1484] 168 142	[2086] 236 142	[2667] 301 140	[3246] 367 137	[3386] 383 136	
56,8	[266] 30 152	[862] 97 152	[1452] 164 152	[2050] 232 152	[2630] 297 150	[3206] 362 148	[3347] 378 147	
Max. Continuous	[20] 75,7	[61] 7 202	[671] 76 202	[1269] 143 202	[1847] 209 202	[2410] 272 202	[2987] 337 199	[3119] 352 198
Max. Intermittent								
Max. Continuous	[20] 75,7	[43] 5 256	[527] 60 256	[1001] 113 255	[1463] 165 255	[1919] 217 254	[2375] 268 252	[2720] 307 249
Max. Intermittent								

[862] {
97 Nm
152 Speed RPM

H Series (101-)

Dimensions

(Refer to pages B-4-19 thru B-4-22 for shaft and port dimensions.)

Standard Rotation Viewed from Shaft End

Port A Pressurized — CW

Port B Pressurized — CCW

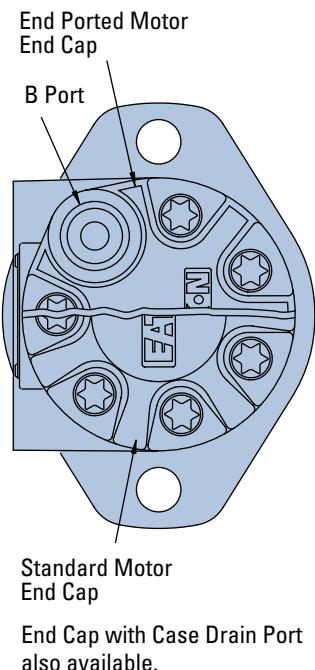
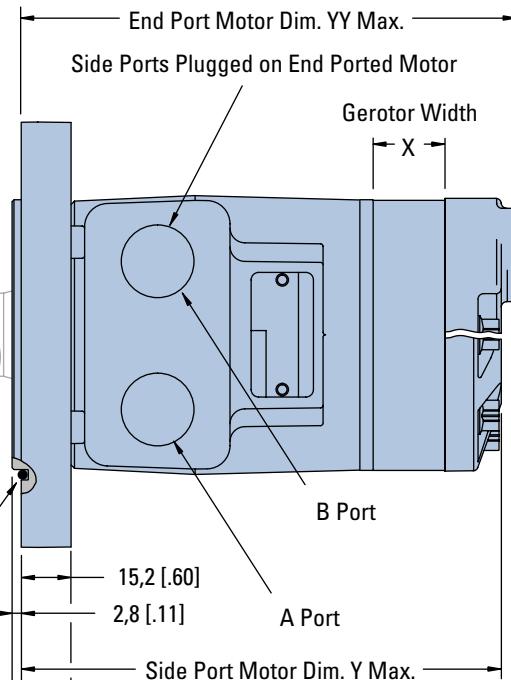
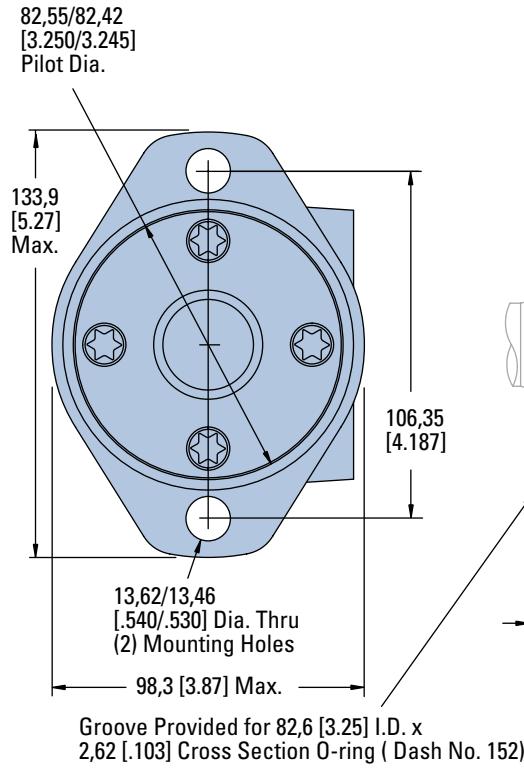
Note:

Mounting surface flatness requirement is ± 13 mm [.005 inch] Max.

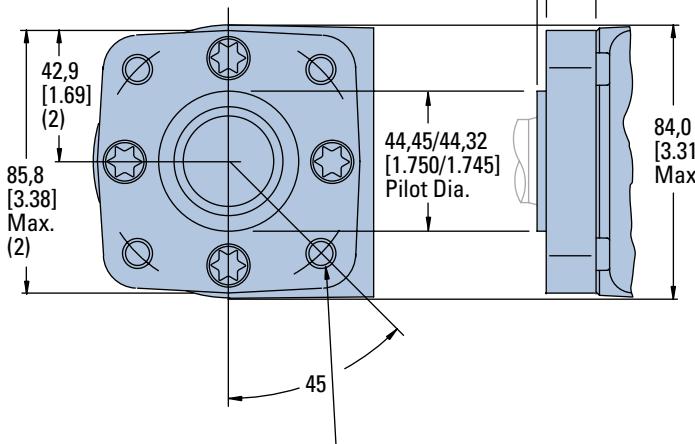
Note:

End ported motor pressure is derated. Reference page B-2-2 for ratings.

2 Bolt Flange



4 Bolt Flange



3/8-16 UNC (15,2 [.60] Max. Bolt Thread Engagement) Mounting Holes (4) Equally Spaced on 82,6 [3.25] Dia. Bolt Circle or M10 x 1,5 (15,2 [.60] Max. Bolt Thread Engagement) Mounting Holes (4) Equally Spaced on 82,6 [3.25] Dia. Bolt Circle

2 AND 4 BOLT FLANGE

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]	YY mm [inch]
36 [2.2]	6,4 [.25]	132,1 [5.20]	138,5 [5.45]
46 [2.8]	6,4 [.25]	132,1 [5.20]	138,5 [5.45]
59 [3.6]	10,2 [.40]	135,9 [5.35]	142,3 [5.60]
74 [4.5]	10,2 [.40]	135,9 [5.35]	142,3 [5.60]
97 [5.9]	13,2 [.52]	139,0 [5.47]	145,3 [5.72]
120 [7.3]	16,5 [.65]	142,3 [5.60]	148,6 [5.85]
146 [8.9]	20,1 [.79]	145,8 [5.74]	152,2 [5.99]
159 [9.7]	21,9 [.86]	147,6 [5.81]	154,0 [6.06]
185 [11.3]	25,4 [1.00]	151,2 [5.95]	157,5 [6.20]
231 [14.1]	31,8 [1.25]	157,5 [6.20]	
293 [17.9]	40,4 [1.59]	166,2 [6.54]	
370 [22.6]	50,8 [2.00]	176,6 [6.95]	
739 [45.1]	101,6 [4.00]	227,4 [8.95]	

H Series (101-)

Product Numbers

Use digit prefix —101- plus four digit number from charts for complete product number—Example 101-1001. Orders will not be accepted without three digit prefix.

2 Bolt Flange

SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER												
		36 [2.2]	46 [2.8]	59 [3.6]	74 [4.5]	97 [5.9]	120 [7.3]	146 [8.9]	159 [9.7]	185 [11.3]	231 [14.1]	293 [17.9]	370 [22.6]	740 [45.0]
1 in. Straight w/Woodruff key	7/8-14 O-Ring	101-1700	-1033	-1701	-1034	-1035	-1702	-1703	-1036	-1037	-1038	-1039	-1040	—
	1/2 NPTF	101-1704	-1025	-1705	-1026	-1027	-1706	-1707	-1028	-1029	-1030	-1031	-1032	—
	Manifold*	101-1708	-1041	-1709	-1042	-1043	-1710	-1711	-1044	-1045	-1046	-1047	-1048	—
1 in. SAE 6B Splined	7/8-14 O-Ring	101-1721	-1081	-1722	-1082	-1083	-1723	-1724	-1084	-1085	-1086	-1087	-1088	—
	1/2 NPTF	101-1725	-1073	-1726	-1074	-1075	-1727	-1728	-1076	-1077	-1078	-1079	-1080	—
	Manifold*	101-1729	-1089	-1730	-1090	-1091	-1731	-1732	-1092	-1093	-1094	-1095	-1096	—
1 in. Straight w/.31 Dia. Crosshole	7/8-14 O-Ring	101-1796	-1797	-1798	-1799	-1800	-1801	-1802	-1803	—	—	—	—	—
	1/2 NPTF	101-1804	-1805	-1806	-1807	-1808	-1870	-1809	-1810	—	—	—	—	—
	Manifold*	101-1811	-1812	-1813	-1814	-1815	-1816	-1817	-1818	—	—	—	—	—
1 in. Straight w/.40 Dia. Crosshole	7/8-14 O-Ring	101-1819	-1323	-1820	-1324	-1325	-1821	-1822	-1326	—	—	—	—	—
	1/2 NPTF	101-1823	-1319	-1824	-1320	-1825	-1826	-1827	-1828	—	—	—	—	—
	Manifold*	101-1829	-1463	-1830	-1831	-1832	-1833	-1834	-1871	—	—	—	—	—

101-1834

4 Bolt Flange

SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER												
		36 [2.2]	46 [2.8]	59 [3.6]	74 [4.5]	97 [5.9]	120 [7.3]	146 [8.9]	159 [9.7]	185 [11.3]	231 [14.1]	293 [17.9]	370 [22.6]	740 [45.0]
1 in. Straight w/Woodruff key	7/8-14 O-Ring	101-1749	-1009	-1750	-1010	-1011	-1751	-1752	-1012	-1013	-1014	-1015	-1016	—
	1/2 NPTF	101-1753	-1001	-1754	-1002	-1003	-1755	-1756	-1004	-1005	-1006	-1007	-1008	—
	Manifold*	101-1757	-1017	-1758	-1018	-1019	-1759	-1760	-1020	-1021	-1022	-1023	-1024	—
1 in. SAE 6B Splined	7/8-14 O-Ring	101-1761	-1057	-1762	-1058	-1059	-1872	-1763	-1060	-1061	-1062	-1063	-1064	—
	1/2 NPTF	101-1764	-1049	-1765	-1050	-1051	-1766	-1767	-1052	-1053	-1054	-1055	-1056	—
	Manifold*	101-1768	-1065	-1769	-1066	-1067	-1770	-1771	-1068	-1069	-1070	-1071	-1072	—
1 in. Straight w/.31 Dia. Crosshole	7/8-14 O-Ring	101-1835	-1836	-1837	-1838	-1839	-1840	-1841	-1842	—	—	—	—	—
	1/2 NPTF	101-1843	-1497	-1844	-1449	-1352	-1845	-1846	-1847	—	—	—	—	—
	Manifold*	101-1848	-1466	-1849	-1459	-1850	-1851	-1852	-1853	—	—	—	—	—
1 in. Straight w/.40 Dia. Crosshole	7/8-14 O-Ring	101-1854	-1311	-1855	-1856	-1857	-1858	-1859	-1860	—	—	—	—	—
	1/2 NPTF	101-1861	-1313	-1862	-1312	-1314	-1863	-1864	-1315	—	—	—	—	—
	Manifold*	101-1865	-1305	-1866	-1306	-1307	-1867	-1868	-1869	—	—	—	—	—

101-1868

4 Bolt Flange with Corrosion Protection

SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER												
		36 [2.2]	46 [2.8]	59 [3.6]	74 [4.5]	97 [5.9]	120 [7.3]	146 [8.9]	159 [9.7]	185 [11.3]	231 [14.1]	293 [17.9]	370 [22.6]	740 [45.0]
1 in. Straight w/Woodruff Key	1/2 NPTF	101-2032	-2014	-2093	-2027	-2013	-2094	-2095	-2015	-2028	-2029	-2030	-2031	—
	Manifold*			-2067						-2068	-2069			

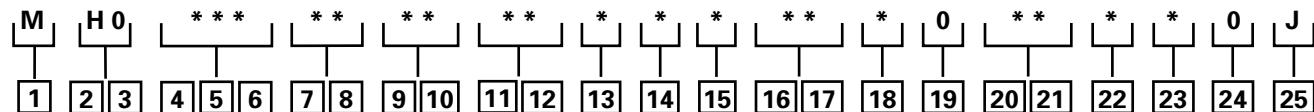
*Manifold product numbers shown are for motors with four 5/16-18 port face mounting threads. Manifold, manifold mounting O-Rings and bolts are NOT included.

For H Series Motors with a configuration Not Shown in the charts above: Use the model code system on page B-2-11 to specify the product in detail.

H Series (101-)

Model Code

The following 25-digit coding system has been developed to identify all of the configuration options for the H motor. Use this model code to specify a motor with the desired features. All 25-digits of the code must be present when ordering. You may want to photocopy the matrix below to ensure that each number is entered in the correct box.



[1] Product

M - Motor

[2], [3] Series

H0 - H Motor

[4], [5], [6] Displacement cm³/r [in³/r]

022 - 36 [2.2][†]

028 - 46 [2.8]

035 - 58 [3.5][†]

045 - 74 [4.5]

059 - 96 [5.9]

073 - 120 [7.3]

089 - 146 [8.9]

097 - 159 [9.7]

113 - 185 [11.3]

141 - 231 [14.1]

179 - 294 [17.9]

226 - 370 [22.6]

451 - 739 [45.1]

†The H Series motors with displacement code "022" or "035" must also specify free running gerotor (option "AA" in position 11,12).

[7], [8] Mounting Type

AA - 2 Bolt (Standard)

82.50 [3.248] Dia. x 3.05

[.120] Pilot, 13.59 [.535]

**Dia. Mounting Holes on
106.35 [4.187] Dia. B.C.**

BA - 4 Bolt (Standard)

44.40 [1.748] Dia. x 3.05

**[.120] Pilot, .375-16 UNC-
2B Mounting Holes on
82.55 [3.250] Dia. B.C.**

CA - 2 Bolt (Standard)

82.50 [3.248] Dia. x 6.10

[.240] Pilot, 10.41 [.410] Dia.

**Mounting Holes on 106.35
[4.187] Dia. B.C. (SAE A)**

**DD - 2 Bolt (Standard)
101.60 [4.000] Dia. x 6.10
[.240] Pilot, 14.35 [.565] Dia.
Mounting Holes on 146.05
[5.750] Dia. B.C. (SAE B)**

**FA - 4 Bolt (Standard)
44.40 [1.748] Dia. x 3.05
[.120] Pilot, M10 x 1.5-6H
Mounting Holes on 82.55
[3.250] Dia. B.C.**

**GA - 4 Bolt (Round) 82.50
[3.248] Dia. x 6.35 [.250]
Pilot, 19.05 [.750] Dia.
Mounting Holes on 109.48
[4.310] Dia. B.C.**

**[9], [10] Output Shaft
01 - 25.4 [1.00] Dia.
Straight, Woodruff Key,
.250-20 UNC-2B Hole in
Shaft End**

**02 - 25.4 [1.00] Dia. SAE 6B
Spline, .250-20 UNC-2B
Hole in Shaft End**

**07 - 25.4 [1.00] Dia. Straight,
8.03 [.316] Dia. Cross Hole
11.2 [.44] from End, 5.6 [.22]
Extra Length**

**08 - 25.4 [1.00] Dia.
Straight, 10.31 [.406] Dia.
Cross Hole 15.7 [.62] from
End, .250-20 UNC-2B Hole
in Shaft End**

**16 - 22.22 [.875] Dia. SAE
13 Tooth Spline (SAE B)**

**17 - 22.22 [.875] Dia.
Straight, 6.4 [.25] x 19.0 [.75]
Square Key (SAE B)**

**18 - 25.4 [1.00] Dia.
Tapered, Woodruff Key and
Nut, 34.92 [1.375] Taper
Length**

**24 - 25.00 [.984] Dia.
Straight, 8.00 [.315] KEY,
M8 x 1.25-6H Hole in
Shaft End**

[11], [12] Ports

**AA - .875-14 UNF-2B SAE
O-Ring Ports**

**AB - .500-14 NPTF Dry
Seal Pipe Thread Ports**

**AC - Manifold Ports (.3125-
18 UNC-2B Mounting
Holes)**

**AD - Manifold Ports (M8 x
1.25-6H Mounting Holes)**

**AF - G 1/2 BSP Straight
Thread Ports**

**EB† - End Ports: .750-16
UNF-2B SAE O-Ring Ports**

**EC† - End Ports: G 1/2
BSP Straight Thread Ports**

**† Note: End ported
motor pressure is derated.
Reference page B-2-2 for
ratings.**

[13] Case Flow Options

0 - None

**1 - .4375-20 UNF-2B SAE
O-Ring Port (End Cap)**

**2 - G 1/4 BSP Straight
THD Port (End Cap)**

A - Internal Check Valves

[14] Gerotor Options

0 - None

A - Free Running

[15] Shaft Options

0 - None

N - Electroless Nickel Plated

[16], [17] Seal Options

00 - Standard Seals

02 - Seal Guard

03 - Viton Seals

04 - Viton Shaft Seal

05 - Vented Two-Stage Seal

**07 - High Pressure
Shaft Seal**

[18] Speed Sensor Options

0 - None

**A - Digital Speed Pickup
(15 Pulse), No Lead Wire
with M12 Connector
(A=Power, B=Common,
C=Signal)**

**B - Magnetic Speed Pickup
(60 Pulse by Quadrature),
No Lead Wire with M12
Connector (A=Power,
B=Common, C=Signal)**

[19] Manifold Block Options

0 - None

*** - Contact your Eaton
Sales Representative
for available options.**

[20], [21] Special Features (Hardware)

00 - None

AB - Low Speed Valving

**SS - Stainless Steel
Flange Bolts**

[22] Special Features (Assembly)

0 - None

**1 - Reverse Rotation
2 - Flange Rotated 90°**

[23] Paint/ Special Packaging

0 - No Paint

**A - Painted Low Gloss
Black**

**D - Environmental Coated
Gloss White**

**F - Environmental
Coated Black**

[24] Eaton Assigned Code when Applicable

0 - Assigned Code

[25] Eaton Assigned Design Code

J - Nine (9)

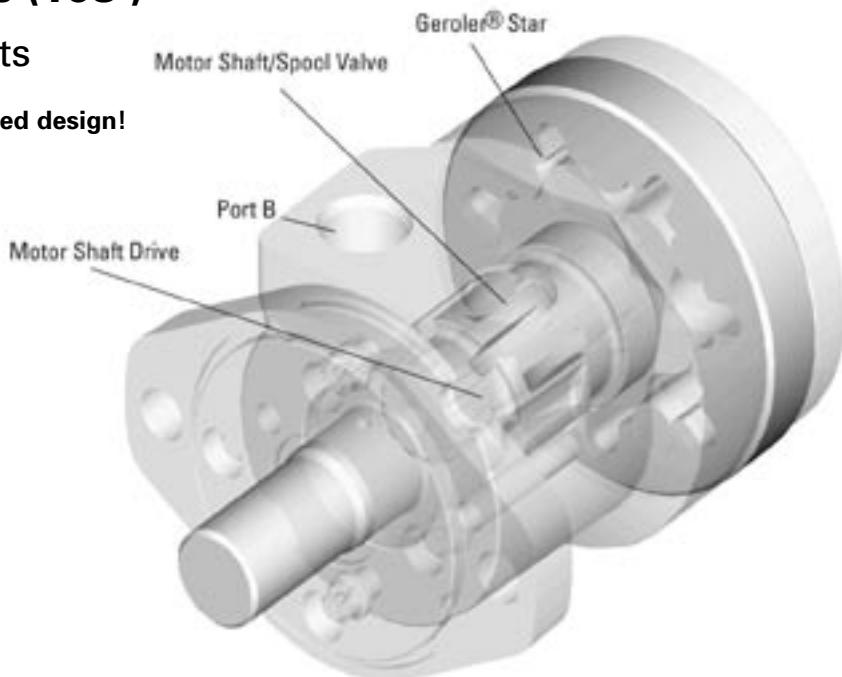
Feature in **bold are preferred and
allow for shorter lead time.**

Notes

S Series (103-)

Highlights

New, improved design!



Description

The new improved Char-Lynn S Series motors with optimized Geroler geometry offers enhanced performance with reduced drive-running angle while retaining the overall package size of the original S series. Design improvements include upgraded steel end cap, O-Ring section seals, and optimized Geroler set. The Geroler set has precision-machined rollers in the outer ring which provide support with rolling contact between the star and ring. This improves mechanical efficiency, especially at start-up and at low speed conditions. Improvements incorporated into the latest S Series motor provide reliable leak-free performance and smooth operation at start-up conditions.

Specifications

Geroler Element	10 Displacements
Flow l/min [GPM]	55 [15] Continuous*** 75 [20] Intermittent**
Speed	Up to 963 RPM
Pressure bar [PSI]	135 [2000] Cont.*** 170 [2500] Inter.**
Torque Nm [lb-in]	528 [4672] Cont.*** 587 [5190] Inter.**

*** Continuous—(Cont.) Continuous rating, motor may be run continuously at these ratings.

** Intermittent—(Inter.) Intermittent operation, 10% of every minute.

Features:

- Constant clearance Geroler, design
- Three moving components (gerotor, drive, shaft)
- Optimized drive running angle
- Three-zone pressure design (inlet, return and case)
- Variety of displacements, shafts and mounts
- Special options to meet customer needs!

Benefits:

- High efficiency
- Smooth low speed operation!
- Extended motor life
- Design flexibility
- Ability to optimize designs for your application needs
- Extended leak-free performance

Applications:

- Agricultural augers, harvesters, seeders
- Car wash brushes
- Food processing
- Railroad maintenance equipment
- Machine tools
- Conveyors
- Industrial sweepers and floor polishers
- Saw mill works
- Turf equipment
- Concrete and asphalt equipment
- Skid steer attachments
- Many more



Conveyor



Casting



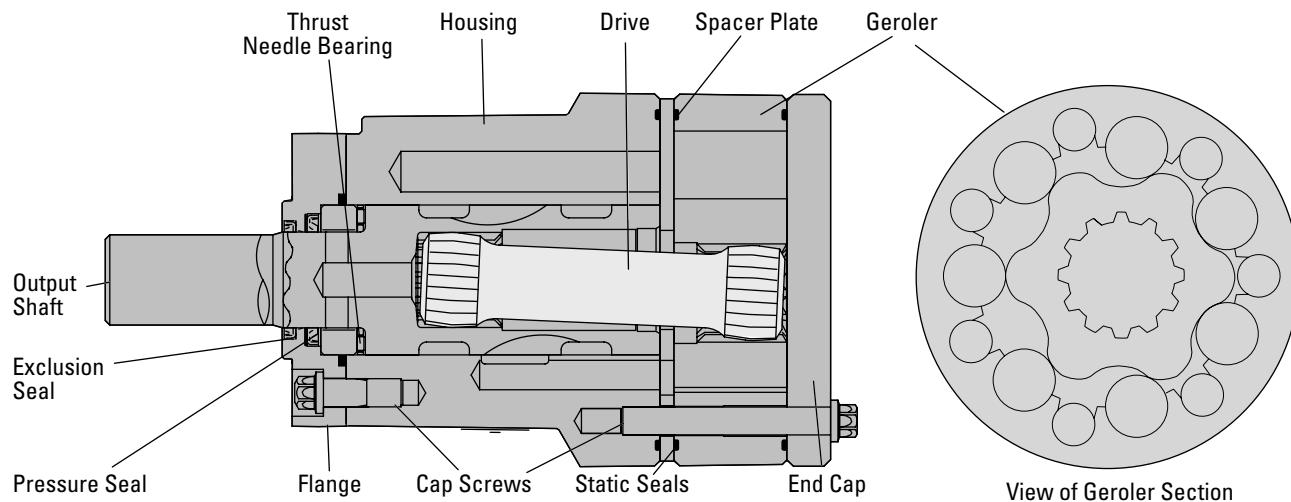
Amusement ride



Combine

S Series (103-)

Specifications



SPECIFICATION DATA — S MOTORS

Displ. cm ³ /r [in ³ /r]	59 [3.6]	75 [4.6]	97 [5.7]	120 [7.3]	144 [8.8]	166 [10.1]	187 [11.4]	225 [13.7]	298 [18.2]	372 [22.7]
Max. Speed (RPM) @ Continuous Flow	963	792	607	472	394	343	304	253	190	153
Flow LPM [GPM]	Continuous Intermittent	57 [15] 68 [18]	57 [15] 76 [20]							
Torque Nm [lb-in]	Continuous Intermittent	115 [1021] 144 [1271]	150 [1325] 186 [1649]	183 [1623] 225 [1992]	237 [2010] 292 [2582]	265 [2347] 324 [2870]	301 [2662] 360 [3191]	333 [2950] 399 [3533]	372 [3290] 434 [3843]	491 [4345] 505 [4467]
Min. Starting Torque Nm[lb-in]	@ Cont. Pressure @ Int. Pressure	90 [800] 116 [1030]	113 [1000] 146 [1290]	148 [1310] 190 [1680]	184 [1630] 236 [2090]	212 [2050] 271 [2400]	232 [2330] 289 [2560]	263 [2670] 329 [2910]	302 [2990] 374 [3310]	338 [3270] 417 [3690]
Pressure Bar [PSI]	Continuous Intermittent	138 [2000] 172 [2500]	138 [2000] 172 [2500]	138 [2000] 172 [2500]	131 [1900] 162 [2500]	131 [1900] 159 [2300]	128 [1850] 155 [2300]	117 [1700] 141 [2250]	103 [1500] 124 [2050]	90 [1300] 103 [1800]

A simultaneous maximum torque and maximum speed NOT recommended.

Note:

To assure best motor life, run motor for approximately one hour at 30% of rated pressure before application to full load. Be sure motor is filled with fluid prior to any load applications.

Maximum Inlet Pressure:

172 Bar [2500 PSI] without regard to Δ Bar [Δ PSI] and/or back pressure ratings or combination thereof.

6B Splined or Tapered shafts are recommended whenever operating above 282 NM [2500 lb-in] of torque, especially for those applications subject to frequent reversals.

Δ Pressure:

The true Δ bar [Δ PSI] between inlet port and outlet port

Continuous Rating:

Motor may be run continuously at these ratings

Intermittent Operation:

10% of every minute

Recommended Fluids:

Premium quality, anti-wear type hydraulic oil with a viscosity of not less than 70 SUS at operating temperature.

Recommended Maximum System Operating Temp.:

82°C [180°F]

Recommended Filtration:

per ISO Cleanliness Code 4406, level 20/18/13

S Series (103-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed, however for best motor life select a motor to run with a torque and speed range printed in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production



Continuous



Intermittent

S Motor 59 cm³/r [3.6 in³/r]

△ Pressure Bar [PSI]

	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2000] 138	[2500] 172
[2]	86 10	190 22	292 33	390 44	484 55	578 65	662 75	729 82	764 86	803 91	
7.6	126 115	121 107	115 97	107 85	107 85	107 75	107 75	107 63	107 45	107 24	
[4]	79 9	185 21	289 33	395 45	498 56	600 68	702 79	804 91	903 102	998 113	1156 131
15,1	256 250	243 235	243 224	235 224	235 212	235 199	235 199	235 183	235 166	235 147	235 89
[6]	71 8	177 20	280 32	387 44	495 56	602 68	704 80	808 91	909 103	1011 114	1257 142
22,7	383 377	369 360	369 349	369 336	369 320	369 320	369 302	369 302	369 284	369 266	369 207
[8]	62 7	166 19	274 31	379 43	488 55	594 67	699 79	806 91	907 102	1007 114	1264 143
30,3	514 508	500 490	500 477	500 464	500 448	500 430	500 430	500 409	500 390	500 333	
[10]	52 6	155 17	264 30	369 42	475 54	583 66	686 78	793 90	897 101	1000 113	1257 142
37,9	642 635	628 617	628 605	628 591	628 575	628 575	628 575	628 538	628 517	628 461	
[12]	38 4	141 16	248 28	354 40	462 52	568 64	674 76	777 88	884 100	987 100	1244 141
45,4	772 764	757 747	757 736	757 722	757 706	757 687	757 687	757 670	757 648	757 592	
[14]	21 2	125 14	231 26	337 38	445 50	551 62	658 74	763 86	868 98	972 110	1233 139
53,0	900 893	885 876	885 866	885 852	885 836	885 819	885 798	885 798	885 778	885 721	
[15]	8 1	116 13	223 25	328 37	434 49	543 67	648 73	756 85	862 97	965 109	1225 138
56,8	482 482	498 949	498 929	498 915	498 900	498 882	498 863	498 842	498 784		
[18]		86 10	191 22	296 33	403 46	511 58	617 70	726 82	831 94	935 106	1195 135
68,1		1151 1139	1128 1117	1128 1105	1128 1090	1128 1090	1128 1074	1128 1074	1128 1054	1128 1033	1128 977

S Motor 75 cm³/r [4.6 in³/r]

△ Pressure Bar [PSI]

	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2000] 138	[2500] 172
[2]	91 10	218 25	343 39	467 53	590 67	708 80	815 92	900 102	981 111	1086 123	
7.6	93 89	81 75	81 66	81 59	81 43	81 21	81 21	81 23	81 16		
[4]	87 10	217 25	352 40	484 55	616 70	748 85	874 99	1001 113	1123 127	1236 140	1472 166
15,1	193 188	181 173	181 163	181 150	181 139	181 125	181 125	181 125	181 107	181 89	181 37
[6]	82 9	219 25	355 40	492 56	627 71	763 86	898 101	1027 116	1155 131	1284 145	1590 180
22,7	292 286	277 269	277 258	277 244	277 228	277 214	277 214	277 214	277 202	277 186	277 140
[8]	69 8	202 23	341 38	481 53	619 70	761 86	896 101	1032 117	1165 132	1296 146	1618 183
30,3	390 384	375 364	375 355	375 342	375 326	375 309	375 295	375 276	375 230		
[10]	56 6	193 22	330 37	471 53	610 69	751 85	887 100	1025 116	1162 131	1297 147	1628 184
37,9	489 484	476 467	476 457	476 444	476 431	476 416	476 416	476 399	476 381	476 336	
[12]	39 4	175 20	315 36	453 51	595 67	736 83	873 99	1011 114	1148 130	1284 145	1617 183
45,4	587 582	573 564	573 552	573 540	573 526	573 510	573 510	573 510	573 494	573 476	573 427
[14]	12 1	153 17	290 33	431 49	571 65	716 81	856 97	993 112	1129 128	1265 143	1605 181
53,0	343 343	680 673	680 665	680 654	680 641	680 628	680 613	680 594	680 578	680 533	
[15]	9 1	143 16	281 32	424 48	567 64	708 80	846 96	985 111	1121 127	1259 142	1599 181
56,8	491 491	729 723	729 714	729 704	729 690	729 675	729 661	729 644	729 628	729 580	
[20]		82 9	220 25	362 41	505 57	645 73	784 89	922 104	1061 120	1200 136	1545 175
75,7		970 963	957 948	957 935	957 921	957 906	957 888	957 871	957 825		

[143] Torque [lb-in]
16 Nm
729 Speed RPM

S Series (103-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed, however for best motor life select a motor to run with a torque and speed range printed in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production



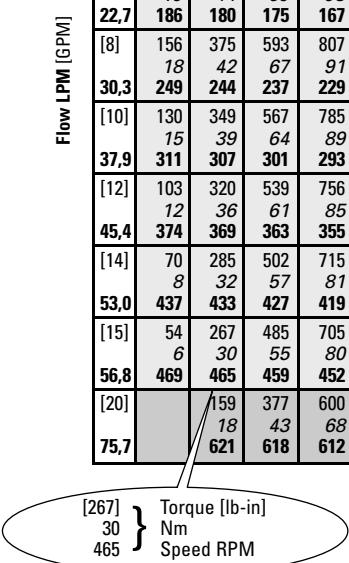
Continuous



Intermittent

S Motor 93 cm ³ /r [5.7 in ³ /r]												
△ Pressure Bar [PSI]												
	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2000] 138	[2500] 172	
[2]	146	308	466	620	771	913	1031	1086	1176	1281		
7,6	16 76	35 72	53 64	70 55	87 48	103 34	116 22	123 7	133 4	145 1		
[4]	136	301	466	633	797	959	1116	1275	1430	1570	1798	
15,1	15 158	34 153	53 146	72 138	90 126	108 115	126 103	144 90	162 77	177 59	203 17	
[6]	113	278	446	616	786	952	1116	1280	1444	1603	1971	
22,7	13 238	31 232	50 225	70 215	89 206	108 191	126 175	145 161	163 145	181 129	223 87	
[8]	98	262	431	604	777	947	1112	1279	1446	1610	2006	
30,3	11 319	30 313	49 306	68 296	88 284	107 270	126 255	144 240	163 224	182 208	227 165	
[10]	81	246	415	590	763	935	1100	1271	1439	1604	2012	
37,9	9 400	28 394	47 388	67 378	86 366	106 353	124 340	144 324	163 306	181 288	227 244	
[12]	65	232	401	574	746	916	1081	1255	1425	1591	2001	
45,4	7 481	26 476	45 469	65 460	84 448	103 435	122 423	142 408	161 394	180 374	226 326	
[14]	42	207	376	552	721	893	1064	1235	1405	1570	1983	
53,0	5 561	23 557	43 549	62 541	81 531	101 519	120 504	140 489	159 470	177 455	224 412	
[15]	31	196	364	538	708	881	1052	1223	1391	1560	1974	
56,8	4 602	22 597	41 591	61 582	80 571	100 559	119 546	138 530	157 514	176 498	223 453	
[20]		119	290	461	633	807	976	1145	1315	1485	1904	
75,7		13 799	33 792	52 785	72 775	91 762	110 748	129 734	149 717	168 702	215 660	

S Motor 120 cm ³ /r [7.3 in ³ /r]												
△ Pressure Bar [PSI]												
	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2000] 138	[2500] 172	
[2]	191	403	605	801	978	1146	1288	1440	1552	1679		
7,6	22 60	46 56	68 50	91 43	110 36	129 29	146 19	163 15	175 8	190 6		
[4]	188	403	617	829	1031	1236	1438	1632	1816	1990	1914	
15,1	21 122	46 118	70 112	94 106	117 98	140 87	162 78	184 67	205 56	225 49	216 16	
[6]	172	391	607	821	1030	1241	1449	1654	1858	2056	2522	
22,7	19 186	44 180	69 175	93 167	116 159	140 149	164 137	187 126	210 114	232 103	285 73	
[8]	156	375	593	807	1015	1229	1439	1648	1855	2059	2557	
30,3	18 249	42 244	67 237	91 229	115 220	139 210	163 199	186 185	210 174	233 162	289 128	
[10]	130	349	567	785	995	1210	1420	1630	1838	2045	2559	
37,9	15 311	39 307	64 301	89 293	112 286	137 275	160 264	184 252	208 239	231 227	289 193	
[12]	103	320	539	756	965	1175	1383	1593	1799	2003	2500	
45,4	12 374	36 369	61 363	85 355	109 346	133 336	156 327	180 314	203 303	226 288	282 253	
[14]	70	285	502	715	923	1131	1335	1540	1745	1948	2452	
53,0	8 437	32 433	57 427	81 419	104 411	128 402	151 391	174 379	197 369	220 355	277 322	
[15]	54 6	267 30	485 55	705 80	913 103	1122 127	1329 150	1540 174	1746 191	1947 200	2441 276	
56,8	469	465	459	452	444	433	423	411	400	386	349	
[20]		159 18 621	377 43 618	600 68 612	815 92 603	1026 116 594	1232 139 583	1444 163 571	1651 186 560	1859 186 549	2383 210 515	
75,7												



S Series (103-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed, however for best motor life select a motor to run with a torque and speed range printed in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production



Continuous



Intermittent

S Motor 144 cm³/r [8.8 in³/r]

△ Pressure Bar [PSI]

	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[1900] 138	[2350] 172
[2] 7,6	222 25 49	480 54 45	729 82 40	967 109 34	1190 134 29	1402 158 21	1591 180 17	1786 202 13	2031 229 14	2107 238 14	
	217 24 101	475 54 97	728 82 91	987 112 84	1237 140 77	1488 168 69	1727 195 61	1957 221 52	2181 246 45	2292 259 42	2310 261 22
	193 22 22,7	453 51 153	715 81 143	976 110 136	1234 139 128	1494 169 119	1746 197 110	1995 225 101	2239 253 91	2358 266 86	2867 324 66
[6] 30,3	173 20 205	434 49 202	699 79 195	961 109 187	1218 138 179	1479 167 170	1735 196 150	1984 224 139	2235 252 134	2358 266 134	2894 327 109
	144 16 37,9	407 46 259	673 76 247	940 106 240	1197 135 231	1459 165 221	1715 194 211	1967 222 202	2218 251 191	2344 265 185	2890 327 158
	118 13 45,4	380 43 312	644 73 307	907 102 301	1167 132 294	1429 161 286	1685 190 277	1941 219 267	2194 248 257	2319 262 246	2878 325 217
[10] 53,0	87 10 53,0	346 39 359	610 69 354	871 98 346	1131 128 339	1395 158 330	1651 187 319	1907 215 309	2163 244 299	2289 259 293	2851 322 266
	69 8 56,8	327 37 386	592 67 380	853 96 372	1113 126 364	1376 156 355	1633 185 344	1890 214 336	2146 242 323	2271 257 317	2835 320 289
	200 23 75,7	460 52 516	726 82 513	987 112 507	1251 141 499	1512 171 491	1770 200 480	2025 229 470	2153 243 459	2724 308 454	2724 308 427

S Motor 166 cm³/r [10.1 in³/r]

△ Pressure Bar [PSI]

	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[1900] 138	[2300] 172
[2] 7,6	267 30 43	563 64 39	841 95 35	1105 125 30	1364 154 27	1622 183 21	1852 209 16	2081 235 13	2288 259 13		
	247 28 15,1	544 61 89	838 95 80	1129 128 74	1418 160 68	1707 193 60	1988 225 53	2255 255 47	2514 284 41	2641 298 38	3116 352 28
	217 25 22,7	517 58 131	813 92 125	1108 125 120	1401 158 113	1700 192 105	1994 225 96	2281 258 88	2559 289 79	2692 304 75	3214 363 58
[6] 30,3	195 22 180	494 56 176	794 90 171	1089 123 164	1387 157 156	1687 191 147	1983 224 138	2269 256 128	2552 288 118	2691 304 114	3239 366 96
	176 20 37,9	477 54 222	776 88 217	1072 121 210	1371 155 203	1668 188 194	1960 221 185	2249 254 175	2537 287 165	2676 302 160	3228 365 136
	136 15 45,4	436 49 272	737 83 264	1037 117 258	1335 151 249	1636 185 241	1928 218 233	2217 251 223	2509 284 214	2651 300 208	3210 363 186
[10] 53,0	93 11 318	394 44 315	696 79 310	995 112 303	1296 146 296	1599 181 287	1890 214 279	2185 247 269	2475 280 259	2617 296 254	3178 359 230
	73 8 56,8	371 42 341	672 76 333	973 110 326	1272 144 319	1575 178 309	1867 211 300	2159 244 290	2453 277 280	2596 293 274	3158 357 253
	227 75,7	527 60 452	829 94 449	1128 127 435	1430 162 426	1724 195 417	2020 228 407	2313 261 396	2457 278 390	3030 342 366	

{ 371 } Torque [lb-in]
42 Nm
338 Speed RPM

S Series (103-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed, however for best motor life select a motor to run with a torque and speed range printed in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production



Continuous



Intermittent

S Motor 187 cm³/r [11.4 in³/r]

△ Pressure Bar [PSI]

	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[1850] 138	[2250] 172
[2] 7,6	298 34 37	627 71 34	944 107 31	1244 141 25	1532 173 22	1805 204 18	2030 229 10	2250 254 9	2478 280 7		
	[4] 15,1	298 34 78	640 72 75	969 109 70	1291 146 65	1607 182 60	1919 217 53	2219 251 47	2511 284 41	2799 316 35	2869 324 33
	[6] 22,7	279 32 119	621 70 115	953 108 110	1283 145 104	1608 182 97	1930 218 89	2243 253 82	2551 288 74	2850 322 66	2922 330 64
[8] 30,3	252 28 160	593 67 156	928 105 151	1257 142 144	1579 178 137	1905 215 129	2224 251 120	2542 287 110	2855 323 101	2932 331 99	3502 396 78
	[10] 37,9	211 24 201	555 63 198	888 100 193	1217 138 187	1546 175 180	1872 211 173	2193 248 164	2516 284 154	2831 320 143	2909 329 141
	[12] 45,4	162 18 243	502 57 240	835 94 235	1164 131 229	1490 168 222	1818 205 214	2139 242 206	2463 278 196	2780 314 184	2857 323 181
[14] 53,0	118 13 283	452 51 280	786 89 276	1117 126 270	1443 163 262	1772 200 254	2095 237 245	2417 273 235	2736 309 224	2814 318 221	3438 388 194
	[15] 56,8	91 10 304	425 48 301	759 86 296	1089 123 290	1418 160 283	1747 197 274	2068 234 265	2389 270 256	2708 306 243	2786 315 240
	[20] 75,7		259 29 403	590 67 400	925 105 394	1255 142 387	1585 179 379	1907 216 370	2229 252 359	2552 288 347	2633 297 344
											3265 369 319

S Motor 225 cm³/r [13.7 in³/r]

△ Pressure Bar [PSI]

	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1700] 124	[2050] 138	
[2] 7,6	358 40 32	765 86 29	1139 129 27	1498 169 23	1842 208 20	2163 244 16	2474 280 12	2738 309 10	2894 327 8		
	[4] 15,1	367 41 66	774 87 63	1177 133 60	1577 178 55	1956 221 50	2325 263 46	2680 303 40	3022 341 34	3191 361 31	
	[6] 22,7	348 39 99	758 86 96	1161 131 92	1567 177 88	1960 221 82	2344 265 76	2716 307 70	3083 348 63	3264 369 59	
[8] 30,3	313 35 133	721 81 132	1124 127 127	1529 173 123	1921 217 117	2312 261 111	2696 305 104	3073 347 96	3265 369 92	3894 440 76	
	[10] 37,9	262 30 167	669 76 165	1069 121 161	1473 166 157	1859 210 152	2247 254 146	2627 297 139	2997 339 130	3184 360 126	
	[12] 45,4	203 23 202	609 69 199	1006 114 196	1400 158 191	1782 201 186	2160 244 180	2531 286 173	2912 329 165	3098 350 160	
[14] 53,0	143 16 236	544 62 233	938 106 230	1324 150 225	1700 192 219	2079 235 214	2452 277 207	2824 319 199	3008 340 194	3639 411 177	
	[15] 56,8	106 12 253	504 57 251	897 101 248	1281 145 243	1653 187 237	2027 229 231	2393 270 224	2761 312 215	2944 333 211	3576 404 192
	[20] 75,7		303 34 336	697 79 334	1091 123 330	1477 167 325	1854 210 318	2214 250 312	2581 292 304	2765 312 298	3399 384 282

[504] Torque [lb-in]
57 Nm
251 Speed RPM

S Series (103-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed, however for best motor life select a motor to run with a torque and speed range printed in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production



Continuous



Intermittent

S Motor 298 cm³/r [18.2 in³/r]

△ Pressure Bar [PSI]

	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1500] 110	[1800] 124
[2]	487	1009	1509	1991	2460	2931	3360	3577	4113
	55	114	170	225	278	331	380	404	465
	24	22	20	18	17	14	11	10	8
[4]	498	1043	1576	2093	2597	3087	3567	3798	4500
	56	118	178	236	293	349	403	429	508
	49	47	45	41	38	34	31	29	25
[6]	470	1017	1552	2080	2594	3097	3594	3835	4536
	53	115	175	235	293	350	406	433	513
	22	74	72	69	66	57	52	49	42
[8]	423	967	1502	2031	2549	3062	3563	3807	4526
	48	109	170	229	288	346	403	430	511
	30,3	100	98	95	92	88	83	77	73
[10]	357	901	1433	1961	2477	2989	3486	3730	4456
	40	102	162	222	280	338	394	421	504
	37,9	126	124	121	118	113	108	101	87
[12]	287	826	1357	1884	2402	2917	3410	3652	4363
	32	93	153	213	271	330	385	413	493
	45,4	152	150	147	144	140	134	126	109
[14]	199	733	1261	1786	2303	2818	3316	3561	4276
	22	83	142	202	260	318	375	402	483
	53,0	177	176	173	170	165	160	152	134
[15]	154	688	1218	1742	2258	2771	3273	3518	4241
	17	78	138	197	255	313	370	398	479
	56,8	190	189	186	183	178	173	165	146
[20]		418	945	1471	1986	2502	3004	3253	3997
		47	107	166	224	283	339	368	452
	75,7	253	251	248	244	239	231	226	212

S Motor 372 cm³/r [22.7 in³/r]

△ Pressure Bar [PSI]

	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1500] 110
[2]	629	1287	1905	2501	3066	3624	3886	4370
	71	145	215	283	346	409	439	494
	19	18	16	14	13	11	9	7
[4]	628	1304	1962	2600	3206	3799	4082	4642
	71	147	222	294	362	429	461	525
	40	38	36	34	30	27	25	23
[6]	587	1261	1926	2578	3203	3813	4112	4687
	66	142	218	291	362	431	465	530
	60	59	56	54	50	45	43	38
[8]	529	1201	1867	2518	3148	3769	4072	4657
	60	136	211	285	356	426	460	526
	30,3	81	79	77	75	71	66	58
[10]	451	1124	1779	2429	3056	3678	3983	4583
	51	127	201	274	345	416	450	518
	37,9	102	100	98	96	92	86	78
[12]	359	1030	1688	2333	2963	3587	3889	4482
	41	116	191	264	335	405	439	506
	45,4	122	121	119	117	113	107	98
[14]	256	922	1577	2226	2864	3487	3787	4381
	29	104	178	252	324	394	428	495
	53,0	143	142	140	137	134	128	119
[15]	199	862	1514	2167	2797	3424	3727	4322
	22	97	171	245	316	387	421	488
	56,8	153	152	150	148	144	138	129
[20]		534	1187	1832	2470	3093	3402	4004
		60	134	207	279	349	384	452
	75,7	204	202	200	197	192	189	183

[862] } Torque [lb-in]
97 Nm
152 Speed RPM

S Series (103-)

Dimensions

(Refer to pages B-4-19 thru B-4-22 for shaft and port dimensions.)

Ports

7/8-14 SAE O-Ring

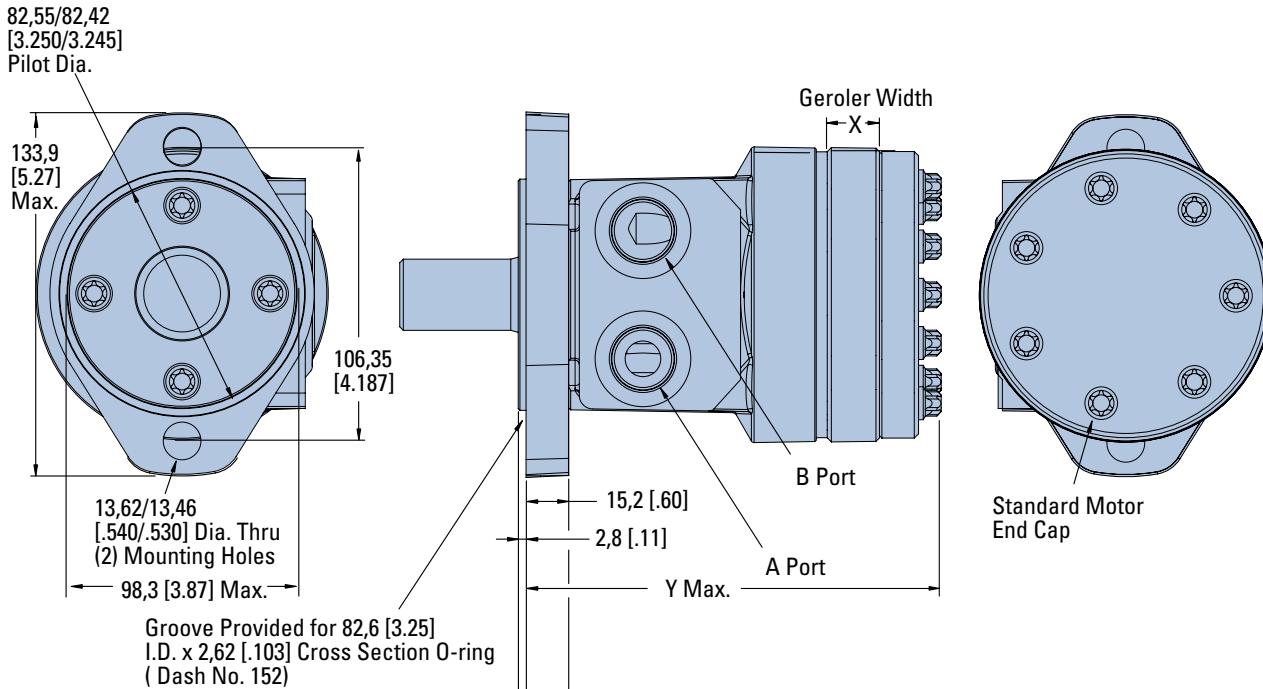
6-1/2 (BSP) Straight thread manifold

Standard Rotation Viewed from Shaft End

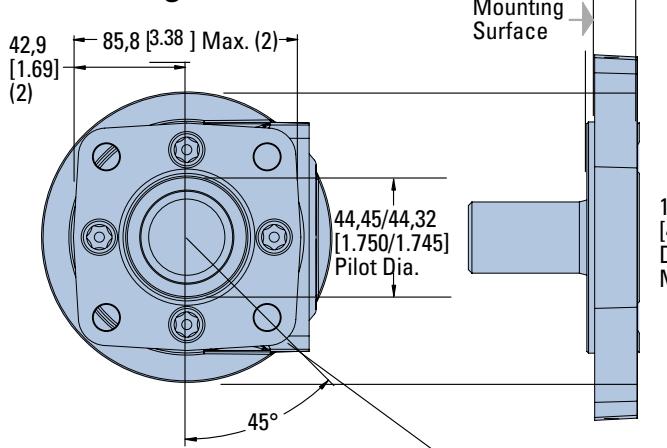
Port A Pressurized — CW

Port B Pressurized — CCW

2 Bolt Flange



4 Bolt Flange



Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]
58 [3.6]	7,5 [.30]	138,0 [5.43]
76 [4.6]	9,8 [.39]	140,3 [5.52]
93 [5.7]	12,0 [.47]	142,5 [5.61]
120 [7.3]	15,5 [.61]	146,0 [5.75]
144 [8.8]	18,6 [.73]	149,1 [5.87]
165 [10.1]	21,3 [.84]	151,8 [5.98]
186 [11.4]	24,0 [.94]	154,5 [6.08]
225 [13.7]	28,9 [1.14]	159,4 [6.28]
299 [18.2]	38,5 [1.52]	169,0 [6.66]
371 [22.7]	47,9 [1.88]	178,4 [7.02]

3/8-16 UNC (15,2 [.60] Max. Bolt Thread Engagement)
Mounting Holes (4) Equally Spaced on 82,6 [3.25] Dia. Bolt Circle
or
M10 x 1,5 (15,2 [.60] Max. Bolt Thread Engagement) Mounting
Holes (4) Equally Spaced on 82,6 [3.25] Dia. Bolt Circle

S Series (103-)

Product Numbers

Use three-digit prefix (103-) plus four-digit number from charts for complete product number (ex: 103-1093). Orders will not be accepted without the three-digit prefix.

2 Bolt Flange

SHAFT	PORt SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER									
		59 [3.6]	75 [4.6]	93 [5.7]	120 [7.3]	144 [8.8]	166 [10.1]	187 [11.4]	225 [13.7]	298 [18.2]	372 [22.7]
1 in. Straight w/Woodruff Key	7/8-14 O-Ring	103-1537	-1034	-1035	-1538	-1539	-1036	-1037	-1038	-1039	-1040
	1/2 NPTF	103-1540	-1026	-1027	-1541	-1542	-1028	-1029	-1030	-1031	-1032
	Manifold	103-1543	-1042	-1043	-1544	-1545	-1044	-1045	-1046	-1047	-1048
1 in. SAE 6B Splined	7/8-14 O-Ring	103-1552	-1082	-1083	-1553	-1554	-1084	-1085	-1086	-1087	-1088
	1/2 NPTF	103-1555	-1074	-1075	-1556	-1557	-1076	-1077	-1078	-1079	-1080
	Manifold	103-1558	-1090	-1091	-1559	-1560	-1092	-1093	-1094	-1095	-1096

103-1093

4 Bolt Flange

SHAFT	PORt SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER									
		59 [3.6]	75 [4.6]	93 [5.7]	120 [7.3]	144 [8.8]	166 [10.1]	187 [11.4]	225 [13.7]	298 [18.2]	372 [22.7]
1 in. Straight w/Woodruff Key	7/8-14 O-Ring	103-1570	-1010	-1011	-1571	-1572	-1012	-1013	-1014	-1015	-1016
	1/2 NPTF	103-1573	-1002	-1003	-1574	-1575	-1004	-1005	-1006	-1007	-1008
	Manifold	103-1576	-1018	-1019	-1577	-1578	-1020	-1021	-1022	-1023	-1024
1 in. SAE 6BSplined	7/8-14 O-Ring	103-1579	-1058	-1059	-1580	-1581	-1060	-1061	-1062	-1063	-1064
	1/2 NPTF	103-1582	-1050	-1051	-1583	-1584	-1052	-1053	-1054	-1055	-1056
	Manifold	103-1585	-1066	-1067	-1586	-1587	-1068	-1069	-1070	-1071	-1072

103-1069

S Series Motors with Corrosion Protection

SHAFT	MOUNTING	PORt SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER										
			59 [3.6]	75 [4.6]	93 [5.7]	120 [7.3]	144 [8.8]	166 [10.1]	187 [11.4]	225 [13.7]	298 [18.2]	372 [22.7]	
1 in. Straight w/Woodruff Key	2 Bolt Flange	7/8-14 O-Ring	103-1645	-	-	-	-	-	-	-	-1649	-	-1650
	4 Bolt Flange	1/2 NPTF	-	-	-	-	-	-	-	-	-1620	-	-1621

*Manifold product numbers shown are for motors with four 5/16 z-18 port face mounting threads. Manifold, manifold mounting O-Rings and bolts are NOT included.

For S Series Motors with a configuration Not Shown in the charts above: Use the model code number system on page B-3-11 to specify the product in detail.

S Series with Low Speed Valving

Product Number

Motors with the low speed valving option enable very smooth low speed operation while maintaining high torque.

Designed to run continuously at up to 200 RPM at standard rated pressures and reduced flows, this option provides smooth operation at low speeds. Furthermore, they resist slippage and have

more momentary load holding ability than the standard H and S Series motors. Motors with this valving are not intended for low pressure applications (41 Bar [600 PSI] Minimum). Shaft side / radial load ratings are not affected by this valving.

Use digit prefix—103—plus four digit number from charts for complete product number—Example: 103-2678.

Orders will not be accepted without the three-digit prefix.

2 Bolt Flange

SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER									
		59 [3.6]	75 [4.6]	93 [5.7]	120 [7.3]	144 [8.8]	166 [10.1]	187 [11.4]	225 [13.7]	298 [18.2]	372 [22.7]
1 in. Straight w/Woodruff Key	7/8 -14 O-Ring	103- —	-1427	-1428	—	—	-1429	-1430	-1431	-1432	-1433
	1/2 NPTF	103- —	-1419	-1420	—	—	-1421	-1422	-1423	-1424	-1425
	Manifold*	103- —	—	—	—	—	—	—	—	—	—
1 in. SAE 6B Splined	7/8 -14 O-Ring	103- —	-1525	—	—	-2692	—	—	-1675	—	—
	1/2 NPTF	103- —	—	-1634	—	—	—	—	—	—	—
	Manifold*	103- —	-1522	-2678	—	—	—	—	—	—	-1527

4 Bolt Flange

SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER									
		59 [3.6]	75 [4.6]	93 [5.7]	120 [7.3]	144 [8.8]	166 [10.1]	187 [11.4]	225 [13.7]	298 [18.2]	372 [22.7]
1 in. Straight w/Woodruff Key	7/8 -14 O-Ring	103-1625	-1410	-1411	-1626	-2531	-1412	-1413	-1414	-1415	-1416
	1/2 NPTF	103-1644	-1402	-1403	—	—	-1404	-1405	-1406	-1407	-1408

103-1404

103-1527

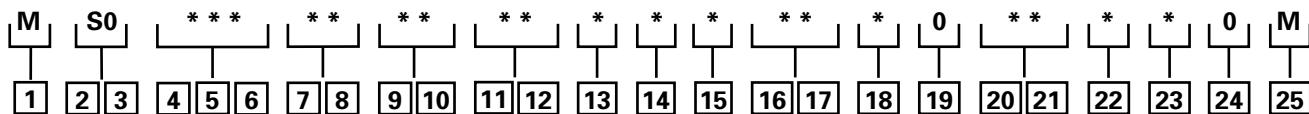
*Manifold product numbers shown are for motors with four 5/16 -18 port face mounting threads. Manifold, manifold mounting O-Rings and bolts are NOT included.

For S Series Motors with Low Speed Valving Not Shown in the chart above: Use the model code number system on page B-3-11 to specify the product in detail.

S Series (103-)

Model Code

The following 25-digit coding system has been developed to identify all of the configuration options for the S motor. Use this model code to specify a motor with the desired features. All 25-digits of the code must be present when ordering. You may want to photocopy the matrix below to ensure that each number is entered in the correct box.



[1] Product

M – Motor

[2], [3] Series

S0 – S Series Motor

[4], [5], [6] Displacement cm³/r [in³/r]

036 – 58 [3.6]

046 – 76 [4.6]

057 – 93 [5.7]

073 – 120 [7.3]

088 – 144 [8.8]

101 – 165 [10.1]

114 – 186 [11.4]

137 – 224 [13.7]

182 – 299 [18.2]

227 – 371 [22.7]

[7], [8] Mounting Type

AA – 2 Bolt Std: 82.50

[3.248] Dia. x 3.05 [.120]

Pilot, 13.59 [.535] Dia.

Mounting Holes on 106.35

[4.187] Dia. B.C.

BA – 4 Bolt Std: 44.40

[1.748] Dia. x 3.05 [.120]

Pilot, .375-16 UNC-2B

Mounting Holes on 82.55

[3.250] Dia. B.C.

CA – 2 Bolt Std: 82.50

[3.248] Dia. x 6.10 [.240]

Pilot, 10.41 [.410] Dia.

Mounting Holes on 106.35

[4.187] Dia. B.C. (SAE A)

DD – 2 Bolt Std: 101.60

[4.000] Dia. x 6.10 [.240]

Pilot, 14.35 [.565] Dia.

Mounting Holes on 146.05

[5.750] Dia. B.C. (SAE B)

(Ductile)

EA – 4 Bolt Magneto: 82.50

[3.248] Dia. x 3.05 [.120]

Pilot, 13.59 [.535] Dia.

Mounting Holes on 106.35

[4.187] Dia. B.C.

FA – 4 Bolt Std: 44.40

[1.748] Dia. x 3.05 [.120]

Pilot, M10 x 1.5-6h

Mounting Holes on 82.55

[3.250] Dia. B.C.

LA – 2 Bolt Std: 44.45

[1.750] Dia. x 3.05 [.120]

Pilot, 13.59 [.535] Dia.

Mounting Holes on 106.35

[4.187] Dia. B.C.

[9], [10] Output Shaft

01 – 25.4 [1.00] Dia.

Straight, Woodruff Key,

.250-20 UNC-2B Hole in

Shaft End

02 – 25.4 [1.00] Dia. SAE

6B Spline, .250-20 UNC-2B

Hole in Shaft End

07 – 25.4 [1.00] Dia.

Straight, 8.03 [.316] Dia.

Crosshole 11.2 [.44] From

End, 5.6 [.22] Extra Length

08 – 25.4 [1.00] Dia.

Straight, 10.31 [.406] Dia.

Crosshole 15.7 [.62] From

End, .250-20 UNC-2B Hole

in Shaft End

16 – 22.22 [.875] Dia. SAE

13 Tooth Spline (SAE B)

17 – 22.22 [.875] Dia.

Straight, 6.4 [.25] x 19.0

[.75] Square Key (SAE B)

18 – 25.4 [1.00] Dia.

Tapered, Woodruff Key and

Nut, 34.92 [1.375] Taper

Length

24 – 25.00 [.984] Dia.

Straight, 8.00 [.315] Key,

M8 x 1.25-6H Hole in

Shaft End

[11], [12] Port Type

AA – .875-14 UNF-2B SAE

O-Ring Ports

AB – .500-14 NPTF Dryseal

Pipe Thread Ports

AC – Manifold Ports

(.3125-18 UNC-2B

Mounting Holes)

AD – Manifold Ports (M8 x 1.25-6H Mounting Holes)

AF – G 1/2 BSP Straight Thread Ports

[19] Manifold Block Options

0 – None

* Contact your Eaton sales representative for available options.

[20], [21] Special Features (Hardware)

00 – None Specified

AB – Low Speed Valving

SS – Stainless Steel Flange Bolts

[22] Special Assembly Instructions

0 – None

1 – Reverse Rotation

2 – Flange Rotated 90°

3 – Reverse Rotation, Flange Rotated 90°

[23] Paint/Packaging Options

0 – No Paint

A – Painted Low Gloss Black

D – Environmental Coated Gloss White

F – Environmental Coated Black

[24] Eaton Assigned Code When Applicable

0 – Assigned Code

[25] Eaton Assigned Design Code

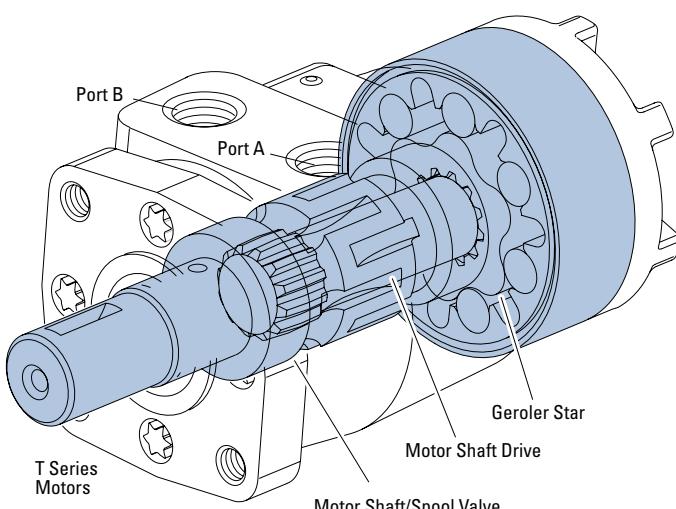
M – Twelve (12)

Feature in **bold** are preferred and allow for shorter lead time.

Notes

T Series (158-)

Highlights



Description

The newest Geroler motor, the "T Series, features the latest innovations in Geroler technology. These innovations include optimized Geroler geometry with lower drive running angle for improved life and improved low speed performance. In addition, the improved housing and smaller diameter end cap results in increased envelope rigidity which improves efficiency under high pressure loads. All of these innovations come together to make the T Series motor the highest performing motor in its class.

Specifications for T Series Motors

Geroler Element	11 Displacements
Flow l/min [GPM]	55 [15] Continuous***
	75 [20] Intermittent**
Speed	Up to 1021 RPM
Pressure bar [PSI]	155 [2250] Cont.***
	190 [2750] Inter.**
Torque Nm [lb-in]	441 [3905] Cont.***
	486 [4300] Inter.**

*** Continuous—(Cont.) Continuous rating, motor may be run continuously at these ratings.

** Intermittent—(Inter.) Intermittent operation, 10% of every minute.

Features:

- Constant clearance Geroler, geometry
- Optimized drive system with reduced running angle
- Three-pressure zone design (ability to reduce case pressure)
- Variety of displacements, shafts and mounts
- Special options to meet customer needs

Benefits:

- High efficiency
- Smooth low-speed operation
- Extended motor life (especially at low speed conditions)
- Design flexibility
- Ability to optimize designs for your application needs
- Extends leak-free performance

Applications:

- Agricultural augers, harvesters, seeders
- Car wash brushes
- Food processing
- Railroad maintenance equipment
- Machine tools
- Conveyors
- Industrial sweepers and floor polishers
- Saw mill works
- Turf equipment
- Concrete and asphalt equipment
- Skid steer attachments
- Many more



Crane (winch)



Paving



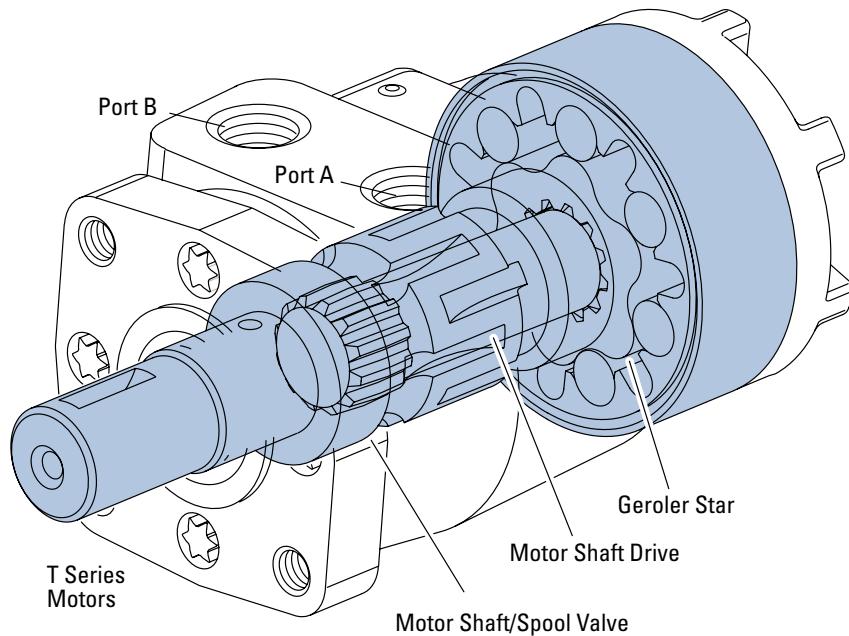
Harvester



Crane and winches

T Series (158-)

Specifications



SPECIFICATION DATA — T MOTORS

Displ. cm ³ /r [in ³ /r]	36 [2.2]	49 [3.0]	66 [4.0]	80 [4.9]	102 [6.2]	131 [8.0]	157 [9.6]	195 [11.9]	244 [14.9]	306 [18.7]	370 [22.6]	
Max. Speed (RPM) @ Continuous Flow	1021	906	849	694	550	426	355	287	229	183	152	
Flow LPM [GPM]	Continuous Intermittent	38 [10] 38 [10]	45 [12] 57 [15]	57 [15] 68 [18]	57 [15] 76 [20]							
Torque Nm Nm [lb-in]	Continuous Intermittent **	76 [672]	105 [928]	138 [1222]	174 [1541]	219 [1936]	251 [2226]	297 [2628]	359 [3178]	410 [3633]	441 [3905]	430 [3811]
Pressure Δ Bar Δ PSI	Continuous* Intermittent**	155 [2250]	155 [2250]	155 [2250]	155 [2250]	138 [2000]	138 [2000]	138 [2000]	127 [1850]	110 [1600]	90 [1300]	
		190 [2750]	190 [2750]	190 [2750]	190 [2750]	172 [2500]	172 [2500]	172 [2500]	155 [2250]	124 [1800]	103 [1500]	

A simultaneous maximum torque and maximum speed NOT recommended.

Note:

To assure best motor life, run motor for approximately one hour at 30% of rated pressure before application to full load. Be sure motor is filled with fluid prior to any load applications.

Maximum Inlet Pressure:

190 Bar [2750 PSI] without regard to Δ Bar [D PSI] and/or back pressure ratings or combination thereof.

6B splined or Tapered shafts are recommended whenever operation above 282 NM [2500 lb-in] of torque, especially for those applications subject to frequent reversals.

Δ Pressure:

The true Δ bar [Δ PSI] between inlet port and outlet port

Continuous Rating:

Motor may be run continuously at these ratings

Intermittent Operation:

10% of every minute

Recommended Fluids:

Premium quality, anti-wear type hydraulic oil with a viscosity of not less than 70 SUS at operating temperature.

Recommended Maximum System Operating Temp.:

82°C [180°F]

Recommended Filtration:

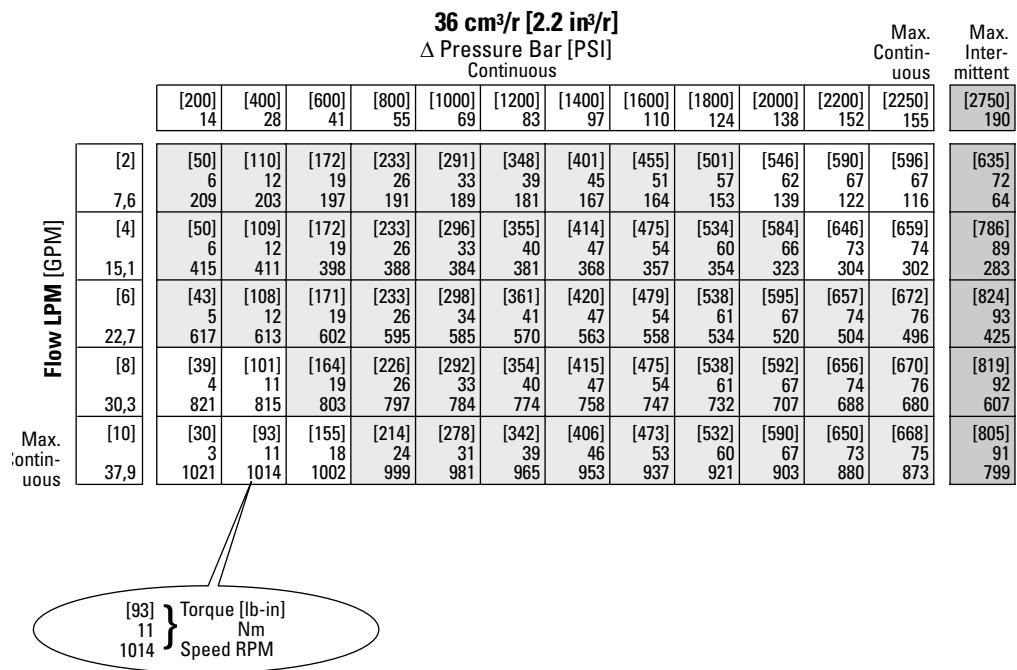
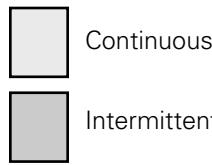
per ISO Cleanliness Code 4406, level 20/18/13

T Series (158-, 185-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.



T Series (158-, 185-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.

Continuous

Intermittent

66 cm ³ /r [4.0 in ³ /r] Pressure Bar [PSI] Continuous												Max. Continuous	Max. Intermittent
	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2000] 138	[2200] 152	[2250] 155	[2750] 190
[2] 7,6	[78] 9 114	[191] 22 111	[303] 34 110	[414] 47 107	[522] 59 105	[625] 71 101	[706] 80 96	[804] 91 92	[898] 101 87	[991] 112 81	[1081] 122 73	[1103] 125 72	[1318] 149 48
[4] 15,1	[97] 11 229	[209] 24 229	[325] 37 217	[441] 50 216	[548] 62 212	[657] 74 205	[766] 87 194	[873] 99 190	[972] 110 186	[1077] 122 183	[1181] 133 181	[1205] 136 178	[1437] 162 170
[6] 22,7	[79] 9 344	[192] 22 343	[309] 35 335	[426] 48 334	[534] 60 321	[649] 73 320	[760] 86 319	[874] 99 315	[984] 111 291	[1090] 123 288	[1190] 134 279	[1218] 138 276	[1488] 168 270
[8] 30,3	[75] 8 456	[191] 22 451	[304] 34 447	[419] 47 442	[532] 60 431	[645] 73 426	[759] 86 419	[871] 98 415	[982] 111 412	[1092] 123 401	[1197] 135 391	[1222] 138 386	[1458] 165 339
[10] 37,9	[49] 6 569	[163] 18 565	[283] 32 560	[398] 45 552	[509] 58 547	[623] 70 541	[742] 84 532	[856] 97 525	[971] 110 512	[1080] 122 504	[1186] 134 498	[1209] 137 496	[1425] 161 475
[12] 45,4	[24] 3 681	[156] 18 678	[270] 31 671	[385] 43 665	[502] 57 658	[614] 69 651	[729] 82 641	[845] 95 635	[963] 109 623	[1067] 121 612	[1182] 134 604	[1209] 137 601	[1472] 166 571
[14] 53,0	[19] 2 793	[143] 16 788	[261] 29 787	[370] 42 778	[485] 55 771	[602] 68 762	[718] 81 753	[837] 95 746	[948] 107 733	[1064] 120 723	[1175] 133 715	[1199] 135 711	[1436] 162 677
[15] 56,8	[13] 1 849	[120] 14 844	[236] 27 839	[352] 40 832	[471] 53 826	[590] 67 819	[707] 80 806	[823] 93 800	[939] 106 786	[1052] 119 779	[1165] 132 770	[1192] 135 766	[1462] 165 725
Max. Continuous	[18]		[107] 12 1006	[215] 24 1003	[326] 37 998	[442] 50 988	[555] 63 976	[669] 76 975	[786] 89 965	[900] 102 952	[1016] 115 940	[1123] 127 924	[1152] 130 919
Max. Intermittent	[18] 68,1												

80 cm ³ /r [4.9 in ³ /r] Pressure Bar [PSI] Continuous												Max. Continuous	Max. Intermittent
	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2000] 138	[2200] 152	[2250] 155	[2750] 190
[2] 7,6	[123] 14 93	[265] 30 90	[405] 46 86	[544] 61 83	[680] 77 80	[804] 91 75	[934] 106 70	[1052] 119 63	[1181] 133 57	[1079] 122 43	[937] 106 24	[895] 101 20	
[4] 15,1	[120] 14 187	[264] 30 185	[406] 46 183	[551] 62 179	[689] 78 175	[828] 94 171	[965] 109 166	[1101] 124 162	[1237] 140 156	[1369] 155 150	[1505] 170 142	[1537] 174 140	[1857] 210 121
[6] 22,7	[113] 13 279	[255] 29 275	[398] 45 271	[542] 61 267	[682] 77 265	[823] 93 258	[963] 109 253	[1101] 124 248	[1239] 140 240	[1373] 155 232	[1508] 170 223	[1541] 174 221	[1868] 211 198
[8] 30,3	[99] 11 372	[243] 27 367	[386] 44 364	[528] 60 359	[669] 76 354	[812] 92 351	[954] 108 343	[1094] 124 338	[1233] 139 333	[1368] 155 324	[1503] 170 315	[1537] 174 313	[1872] 212 289
[10] 37,9	[84] 9 463	[228] 26 463	[371] 42 456	[514] 58 450	[655] 74 446	[798] 90 441	[941] 106 435	[1080] 122 428	[1219] 138 420	[1357] 153 412	[1496] 169 403	[1530] 173 399	[1870] 211 368
[12] 45,4	[63] 7 557	[209] 24 552	[354] 40 547	[498] 56 543	[638] 72 537	[782] 88 530	[926] 105 523	[1067] 121 515	[1208] 136 509	[1346] 152 500	[1484] 168 489	[1520] 172 487	[1864] 211 470
[14] 53,0	[55] 6 649	[185] 21 646	[331] 37 642	[476] 54 635	[620] 70 630	[762] 86 622	[904] 102 616	[1046] 118 609	[1188] 134 599	[1327] 150 592	[1467] 166 581	[1502] 170 578	[1842] 208 550
[15] 56,8	[51] 6 694	[176] 20 694	[316] 36 687	[463] 52 680	[609] 69 673	[748] 85 668	[891] 101 660	[1037] 117 650	[1177] 133 642	[1316] 149 634	[1457] 165 622	[1491] 168 619	[1844] 208 598
Max. Continuous	[20] 75,7		[160] 18 916	[305] 34 910	[455] 51 893	[578] 65 893	[737] 83 875	[857] 97 866	[968] 109 877	[1144] 129 843	[1277] 144 833	[1412] 160 839	[1446] 163 836
Max. Intermittent													

[176]
20
691 } Torque [lb-in]
Nm
Speed RPM

T Series (158-, 185-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.



Continuous



Intermittent

102 cm ³ /r [6.2 in ³ /r]												Max. Continuous	Max. Intermittent	
Pressure Bar [PSI] Continuous														
	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2000] 138	[2200] 152	[2250] 155	[2750] 190	
Flow LPM [GPM]	[2] 7,6	[161] 18 73	[341] 39 71	[519] 59 68	[697] 79 66	[871] 98 63	[1030] 116 60	[1193] 135 56	[1349] 152 51	[1511] 171 46	[1496] 169 36	[1441] 163 23	[1421] 161 20	
	[4] 15,1	[157] 18 149	[340] 38 146	[520] 59 144	[702] 79 141	[879] 99 138	[1056] 119 135	[1229] 139 131	[1401] 158 128	[1567] 177 124	[1727] 195 118	[1889] 213 111	[1925] 217 109	
	[6] 22,7	[147] 17 221	[329] 37 217	[510] 58 214	[692] 78 211	[871] 98 208	[1050] 119 204	[1227] 139 199	[1401] 158 195	[1571] 178 190	[1731] 196 184	[1895] 214 176	[1936] 219 174	
	[8] 30,3	[132] 15 294	[315] 36 290	[497] 56 287	[675] 76 284	[857] 97 280	[1038] 117 277	[1216] 137 271	[1392] 157 267	[1564] 177 262	[1725] 195 255	[1891] 214 247	[1932] 218 245	
	[10] 37,9	[109] 12 367	[293] 33 363	[477] 54 360	[657] 74 355	[839] 95 351	[1018] 115 347	[1198] 135 343	[1374] 155 337	[1542] 174 332	[1711] 193 325	[1878] 212 318	[1918] 217 315	
	[12] 45,4	[84] 9 440	[271] 31 436	[457] 52 432	[638] 72 429	[818] 92 424	[999] 113 419	[1179] 133 414	[1354] 153 409	[1527] 173 402	[1697] 192 395	[1858] 210 386	[1901] 215 384	
	[14] 53,0	[59] 7 513	[242] 27 510	[428] 52 506	[611] 69 501	[794] 90 497	[974] 110 492	[1151] 130 487	[1328] 150 482	[1502] 170 475	[1674] 189 469	[1841] 208 458	[1883] 213 456	
	[15] 56,8	[39] 4 550	[227] 26 545	[411] 46 542	[595] 67 537	[780] 88 532	[957] 108 528	[1136] 128 522	[1314] 148 516	[1486] 168 510	[1658] 187 502	[1828] 207 492	[1869] 211 490	
	[20] 75,7				[154] 17 724	[328] 37 718	[515] 58 720	[710] 80 709	[874] 99 707	[1060] 120 696	[1243] 140 684	[1405] 159 683	[1579] 178 670	[1763] 199 659

131 cm ³ /r [8.0 in ³ /r]												Max. Continuous	Max. Intermittent		
Pressure Bar [PSI] Continuous															
	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2000] 138	[2500] 172				
Flow LPM [GPM]	[2] 7,6	[219] 25 57	[450] 51 55	[682] 77 53	[915] 103 51	[1144] 129 49	[1348] 152 47	[1561] 176 43	[1771] 200 40	[1979] 224 36	[2159] 244 30				
	[4] 15,1	[212] 24 115	[449] 51 113	[681] 77 110	[917] 104 109	[1148] 130 107	[1376] 155 105	[1600] 181 102	[1822] 206 99	[2025] 229 96	[2221] 251 91				
	[6] 22,7	[197] 22 171	[435] 49 168	[669] 76 166	[903] 102 163	[1139] 129 160	[1370] 155 157	[1600] 181 154	[1818] 205 150	[2032] 230 147	[2226] 252 142				
	[8] 30,3	[181] 20 227	[417] 47 225	[657] 74 222	[886] 100 219	[1122] 127 217	[1359] 154 213	[1589] 180 209	[1812] 205 206	[2022] 228 202	[2215] 250 196				
	[10] 37,9	[144] 16 284	[389] 44 281	[631] 71 278	[859] 97 275	[1098] 124 271	[1330] 150 267	[1562] 176 265	[1783] 201 261	[1993] 225 258	[2198] 248 252				
	[12] 45,4	[114] 13 341	[361] 41 338	[605] 68 334	[838] 95 332	[1075] 121 328	[1307] 148 325	[1532] 173 321	[1755] 198 318	[1965] 222 312	[2177] 246 307				
	[14] 53,0	[82] 9 397	[327] 37 394	[569] 64 391	[803] 91 387	[1042] 118 384	[1273] 144 361	[1498] 169 378	[1722] 195 374	[1935] 219 370	[2147] 243 365				
	[15] 56,8	[66] 7 426	[302] 34 423	[550] 62 422	[785] 89 415	[1025] 116 412	[1254] 142 409	[1480] 167 405	[1704] 193 402	[1915] 216 398	[2119] 239 392				
	Max. Intermittent	[20] 75,7			[177] 20 565	[429] 48 560	[678] 77 556	[908] 103 553	[1143] 129 549	[1375] 155 546	[1596] 180 541	[1811] 205 536	[2017] 228 527		

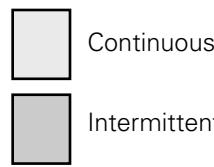
[302] } Torque [lb-in]
34 Nm
423 Speed RPM

T Series (158-, 185-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.



157 cm³/r [9.6 in³/r]											
△ Pressure Bar [PSI]											
Continuous											
[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2000] 138	[2500] 172	Max. Continuous
7,6	[264] 30 47	[541] 61 45	[819] 93 44	[1092] 123 42	[1357] 153 40	[1605] 181 37	[1847] 209 34	[2084] 235 30	[2311] 261 25	[1858] 210 16	Max. Intermittent
15,1	[259] 29 96	[541] 61 95	[822] 93 92	[1101] 124 91	[1373] 155 90	[1638] 185 88	[1890] 214 85	[2145] 242 82	[2383] 269 78	[2613] 295 73	[3063] 346 60
22,7	[241] 27 142	[526] 59 140	[808] 91 138	[1090] 123 136	[1368] 155 134	[1638] 185 132	[1900] 215 129	[2150] 243 125	[2399] 271 121	[2628] 297 114	[3169] 358 99
30,3	[219] 25 189	[506] 57 187	[789] 89 185	[1068] 121 183	[1348] 152 181	[1625] 184 178	[1885] 213 175	[2140] 242 172	[2388] 270 166	[2619] 296 159	[3178] 359 140
37,9	[180] 20 237	[472] 53 234	[759] 86 232	[1037] 117 230	[1319] 149 227	[1590] 180 224	[1853] 209 222	[2111] 239 218	[2355] 266 211	[2594] 293 203	[3170] 358 183
45,4	[141] 16 284	[436] 49 282	[728] 82 279	[1010] 114 277	[1292] 146 274	[1561] 176 272	[1821] 206 269	[2079] 235 265	[2331] 263 257	[2573] 291 248	[3162] 357 225
53,0	[101] 11 332	[397] 45 329	[687] 78 326	[969] 109 323	[1252] 141 321	[1519] 172 319	[1778] 201 316	[2040] 230 311	[2295] 259 305	[2539] 287 296	[3147] 356 274
56,8	[81] 9 355	[367] 41 353	[665] 75 350	[944] 107 347	[1231] 139 344	[1497] 169 342	[1755] 198 339	[2018] 228 334	[2273] 257 327	[2512] 284 318	[3136] 354 300
75,7	[20] 25 472		[221] 59 467	[519] 92 464	[814] 124 462	[1095] 155 459	[1368] 184 455	[1631] 214 450	[1891] 243 443	[2149] 271 433	

195 cm³/r [11.9 in³/r]											
△ Pressure Bar [PSI]											
Continuous											
[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1750] 121	[1800] 125	[2000] 138	Max. Continuous
7,6	[330] 37 38	[671] 76 36	[1016] 115 34	[1345] 152 33	[1654] 187 31	[1969] 222 28	[2242] 253 25	[2507] 283 20	[2689] 304 16	[2748] 310 14	[2973] 336 8
15,1	[328] 37 77	[675] 76 77	[1026] 116 75	[1366] 154 73	[1692] 191 73	[2010] 227 71	[2289] 259 68	[2586] 292 65	[2799] 316 62	[2867] 324 61	[3144] 355 55
22,7	[306] 35 115	[658] 74 113	[1011] 114 111	[1360] 154 110	[1698] 192 109	[2021] 228 107	[2324] 263 104	[2604] 294 100	[2829] 320 97	[2901] 328 95	[3178] 359 87
30,3	[272] 31 153	[634] 72 151	[980] 111 150	[1331] 150 148	[1675] 189 146	[2003] 226 144	[2300] 260 142	[2592] 293 139	[2815] 318 134	[2888] 326 132	[3174] 359 123
37,9	[238] 27 192	[596] 67 189	[945] 107 188	[1296] 146 186	[1637] 185 184	[1960] 221 183	[2255] 255 181	[2565] 290 176	[2786] 315 168	[2857] 323 166	[3140] 355 156
45,4	[181] 20 230	[545] 62 228	[908] 103 226	[1260] 142 224	[1607] 182 222	[1924] 217 221	[2223] 251 219	[2529] 286 213	[2759] 312 207	[2836] 320 204	[3121] 353 192
53,0	[154] 17 268	[500] 56 266	[860] 97 264	[1211] 137 261	[1556] 176 259	[1869] 211 259	[2175] 246 256	[2483] 281 251	[2713] 307 244	[2792] 315 242	[3080] 348 229
56,8	[140] 16 287	[465] 53 285	[832] 94 283	[1179] 133 281	[1525] 172 279	[1835] 207 278	[2144] 242 275	[2459] 278 269	[2693] 304 262	[2768] 313 260	[3061] 346 247
75,7	[20] 25 75,7		[291] 33 382	[653] 74 378	[1013] 114 375	[1366] 154 373	[1689] 191 372	[1987] 225 368	[2298] 260 363	[2540] 287 356	[2622] 296 353

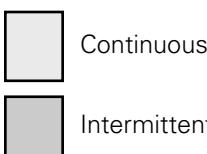
[465] } Torque [lb-in]
53 Nm
285 Speed RPM

T Series (158-, 185-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from unit to unit in production.



244 cm³/r [14.9 in³/r]

Pressure Bar [PSI]

Continuous

Max. Continuous
Max. Intermittent

	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1650] 114	[1800] 125	[1850] 127	[2250] 155
[2]	[406] 46	[833] 30	[1260] 29	[1655] 27	[2038] 26	[2403] 24	[2707] 22	[2597] 17	[2552] 12	[2373] 11	[2299] 7	
7,6												
[4]	[404] 46	[843] 62	[1277] 62	[1695] 60	[2083] 59	[2468] 59	[2820] 57	[3177] 55	[3261] 50	[3509] 49	[3589] 46	[4194] 44
15,1												
[6]	[382] 43	[823] 93	[1261] 91	[1687] 90	[2088] 89	[2477] 88	[2843] 86	[3196] 82	[3285] 78	[3547] 76	[3633] 72	[4290] 71
22,7												
[8]	[341] 39	[787] 89	[1120] 123	[1651] 122	[2059] 121	[2454] 120	[2820] 119	[3177] 116	[3265] 113	[3530] 108	[3615] 106	[4285] 99
30,3												
[10]	[297] 34	[744] 84	[1177] 133	[1611] 132	[2017] 128	[2412] 127	[2774] 126	[3151] 123	[3241] 121	[3504] 116	[3593] 106	[4269] 101
37,9												
[12]	[225] 25	[687] 78	[1132] 128	[1553] 175	[1967] 222	[2360] 226	[2734] 227	[3105] 222	[3194] 217	[3466] 209	[3554] 200	[4237] 153
45,4												
[14]	[154] 17	[628] 71	[1072] 121	[1498] 169	[1910] 216	[2298] 260	[2674] 302	[3052] 345	[3148] 356	[3419] 386	[3510] 397	[4226] 182
53,0												
[15]	[119] 13	[586] 66	[1035] 117	[1458] 165	[1872] 175	[2261] 222	[2637] 255	[3022] 298	[3116] 341	[3389] 352	[3488] 383	[4220] 394
Max. Continuous	56,8											
Max. Intermittent	[20] 75,7		[372] 42	[816] 92	[1251] 141	[1663] 188	[2067] 234	[2448] 277	[2832] 320	[2928] 331	[3214] 363	[3312] 374
			[305] 303	[301] 300	[300] 297	[297] 292	[292] 284	[284] 281	[281] 273	[273] 270		

306 cm³/r [18.7 in³/r]

Pressure Bar [PSI]

Continuous

Max. Continuous
Max. Intermittent

370 cm³/r [22.6 in³/r]

Pressure Bar [PSI]

Continuous

Max. Continuous
Max. Intermittent

	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1500] 103	[1600] 110	[1800] 124	[200] 14	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1300] 90	[1500] 103	
[2]	[499] 56	[1035] 117	[1560] 176	[2034] 230	[2501] 283	[2912] 329	[3239] 366	[3285] 323	[2400] 271		[590] 67	[1237] 140	[1858] 210	[2406] 272	[2953] 334	[3388] 383	[3586] 405		
7,6	24	23	22	21	19	16	11	8	5										
[4]	[497] 49	[1052] 119	[1590] 180	[2101] 237	[2561] 289	[3023] 342	[3464] 391	[3680] 416	[3866] 439		[588] 66	[1263] 143	[1906] 215	[2506] 283	[3029] 342	[3557] 402	[3811] 431	[4252] 36	
15,1											[580] 41	[1245] 41	[1899] 40	[2506] 40	[3029] 39	[3544] 38	[3788] 37	[4300] 54	
[6]	[480] 74	[1031] 74	[1578] 116	[2096] 178	[2564] 237	[3023] 290	[3464] 342	[3689] 391	[3905] 417		[514] 61	[164] 82	[1824] 81	[2452] 80	[2975] 79	[3518] 78	[3783] 77	[4284] 75	
22,7											[444] 102	[1119] 102	[1759] 101	[2391] 101	[2928] 101	[3479] 97	[3750] 96	[4275] 93	
[8]	[427] 99	[975] 98	[1520] 97	[2051] 97	[2525] 96	[2998] 94	[3448] 93	[3667] 89	[3881] 83		[337] 122	[1062] 121	[1690] 120	[2256] 191	[2813] 255	[3393] 318	[3685] 383	[4273] 112	
30,3											[231] 142	[958] 141	[1608] 140	[2201] 139	[2748] 137	[3319] 134	[3610] 129	[4198] 129	
[10]	[370] 123	[930] 122	[1467] 121	[2001] 120	[2477] 117	[2955] 117	[3406] 117	[3631] 112	[3852] 108		[178] 147	[896] 146	[1543] 145	[2147] 143	[2683] 149	[3272] 147	[3572] 146	[4187] 140	
37,9											[20] 152	[587] 152	[1228] 151	[1833] 150	[2331] 149	[2948] 147	[3273] 146		
[12]	[281] 147	[871] 146	[1410] 145	[1908] 145	[2400] 145	[2887] 142	[3352] 136	[3573] 131	[3790] 127		[337] 122	[1062] 121	[1690] 120	[2256] 191	[2813] 255	[3393] 318	[3685] 383	[4273] 112	
45,4	32	98	97	97	96	94	89	86	83		[231] 171	[958] 171	[1608] 170	[2201] 169	[2748] 168	[3319] 167	[3610] 166	[4198] 166	
[14]	[192] 171	[791] 171	[1338] 151	[1851] 209	[2338] 264	[2816] 318	[3281] 371	[3511] 397	[3743] 423		[178] 152	[896] 152	[1543] 151	[2147] 150	[2683] 149	[3272] 147	[3572] 146	[4187] 140	
53,0											[20] 183	[587] 183	[1228] 182	[1833] 181	[2331] 171	[2948] 165	[3273] 160		
[15]	[148] 183	[738] 183	[1288] 146	[1803] 204	[2287] 258	[2773] 313	[3243] 366	[3475] 393	[3705] 419		[4098] 146	[463] 146	[498] 146	[527] 146	[567] 146	[606] 146	[645] 146		
Max. Continuous	56,8																		
Max. Intermittent	[20] 75,7		[476] 54	[1020] 115	[1544] 174	[2010] 227	[2519] 285	[3010] 340	[3243] 366	[3495] 395									

{ Torque [lb-in]
83 Nm
183 Speed RPM

T Series (158-)

Dimensions

(Refer to pages B-4-19 thru B-4-22 for shaft and port dimensions.)

Ports

- 7/8 -14 INF O-Ring Ports (2)
- 1/2 -14 NPTF (2)
- G 1/2 BSP (2)
- Manifold Ports (5/16-18 mounting threads)

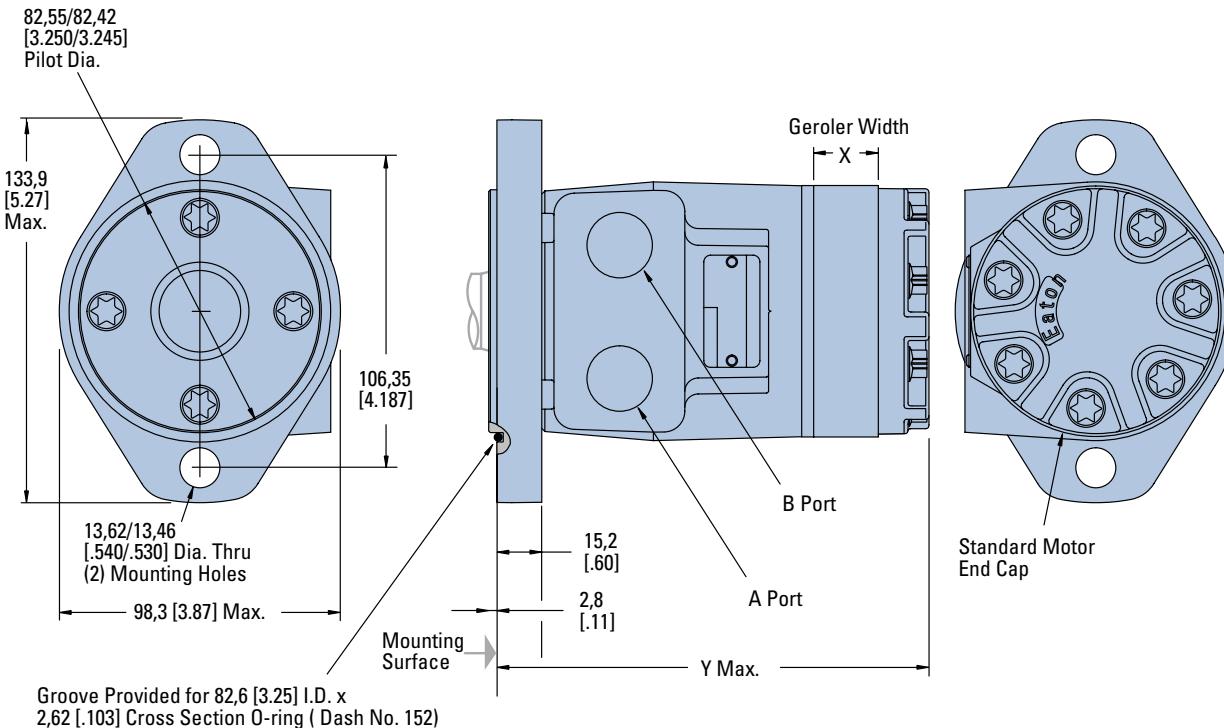
Note:

Mounting Surface Flatness Requirement is $\leq .13$ mm [.005 inch] Max.

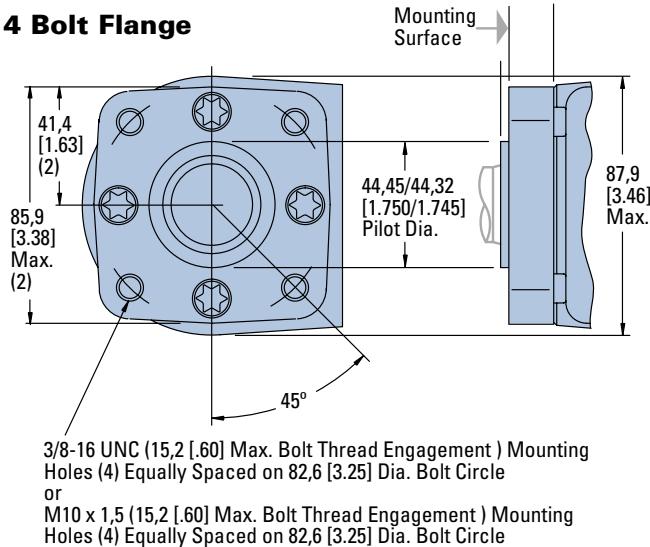
Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW

2 Bolt Flange



4 Bolt Flange



2 AND 4 BOLT FLANGE PORT DIMENSIONS

Displacement cm^3/r [in^3/r]	X mm [inch]	Y mm [inch]
36 [2.2]	6,6 [.26]	132,2 [5.21]
49 [3.0]	9,1 [.36]	134,6 [5.30]
66 [4.0]	12,2 [.48]	137,7 [5.42]
80 [4.9]	14,7 [.58]	140,3 [5.53]
102 [6.2]	18,5 [.73]	144,3 [5.68]
131 [8.0]	24,1 [.95]	149,6 [5.89]
157 [9.6]	29,0 [1.14]	154,5 [6.09]
195 [11.9]	35,6 [1.40]	161,3 [6.35]
244 [14.9]	44,7 [1.76]	170,3 [6.71]
306 [18.7]	56,1 [2.21]	181,6 [7.16]
370 [22.6]	72,1 [2.84]	197,9 [7.79]

T Series (158-)

Product Numbers

Use digit prefix—158- plus four digit number from charts for complete product number—
Example: 158-1067.

Orders will not be accepted without the three-digit prefix.

Standard

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER											
			36 [2.2]	49 [3.0]	66 [4.0]	80 [4.9]	102 [6.2]	131 [8.0]	157 [9.6]	195 [11.9]	244 [14.9]	306 [18.7]	370 [22.6]	
2 Bolt Flange	1 in. Straight w/Woodruff Key	7/8 -14 O-Ring	158-	—	—	-1537	-1034	-1035	-1538	-1036	-1037	-1038	-1039	-1040
		1/2 NPTF	158-	—	—	-1540	-1026	-1027	-1541	-1028	-1029	-1030	-1031	-1032
		Manifold*	158-	—	—	-1543	-1042	-1043	-1544	-1044	-1045	-1046	-1047	-1048
	1 in. SAE 6B Splined	7/8 -14 O-Ring	158-	—	—	-1552	-1082	-1083	-1553	-1084	-1085	-1086	-1087	-1088
		1/2 NPTF	158-	—	—	-1555	-1074	-1075	-1556	-1076	-1077	-1078	-1079	-1080
		Manifold*	158-	—	—	-1558	-1090	-1091	-1559	-1092	-1093	-1094	-1095	-1096
4 Bolt Flange	1 in. Straight w/Woodruff Key	7/8 -14 O-Ring	158-	—	—	-1570	-1010	-1011	-1571	-1012	-1013	-1014	-1015	-1016
		1/2 NPTF	158-	—	—	-1573	-1002	-1003	-1574	-1004	-1005	-1006	-1007	-1008
		Manifold*	158-	—	—	-1576	-1018	-1019	-1577	-1020	-1021	-1022	-1023	-1024
	1 in. SAE 6B Splined	7/8 -14 O-Ring	158-	—	—	-1579	-1058	-1059	-1580	-1060	-1061	-1062	-1063	-1064
		1/2 NPTF	158-	—	—	-1582	-1050	-1051	-1583	-1052	-1053	-1054	-1055	-1056
		Manifold*	158-	—	—	-1585	-1066	-1067	-1586	-1068	-1069	-1070	-1071	-1072

158-1067

T Series Motors with Corrosion Protection

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER										
			36 [2.2]	49 [3.0]	66 [4.0]	80 [4.9]	102 [6.2]	131 [8.0]	157 [9.6]	195 [11.9]	244 [14.9]	306 [18.7]	370 [22.6]
2 Bolt Flange	1 in. Straight w/ Woodruff Key	7/8 -14 O-Ring	158-	—	—	1645	—	—	—	—	-1649	—	-1650
		1/2 NPTF	158-	—	—	—	—	—	—	—	-1620	—	-1621

158-1620

T Series Motors with Low Speed Valving

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER										
			36 [2.2]	49 [3.0]	66 [4.0]	80 [4.9]	102 [6.2]	131 [8.0]	157 [9.6]	195 [11.9]	244 [14.9]	306 [18.7]	370 [22.6]
2 Bolt Flange	1 in. Straight w/Woodruff Key	7/8 -14 O-Ring	158-	—	—	-1427	-1428	—	—	-1430	-1431	-1432	-1433
		1/2 NPTF	158-	—	—	-1419	-1420	—	—	-1422	-1423	-1424	-1425
		Manifold*	158-	—	—	—	—	—	—	—	—	—	—
4 Bolt Flange	1 in. Straight w/ Woodruff Key	7/8 -14 O-Ring	158-	—	—	-1525	—	—	—	-1675	—	—	—
		1/2 NPTF	158-	—	—	—	-1634	—	—	—	—	—	—
		Manifold*	158-	—	—	-1522	-2678	—	—	—	—	—	-1527
2 Bolt Flange	1 in. Straight w/Woodruff Key	7/8 -14 O-Ring	158-	—	—	-1625	-1410	-1411	-1626	-1412	-1413	-1414	-1415
		1/2 NPTF	158-	—	—	-1644	-1402	-1403	—	-1404	-1405	-1406	-1407

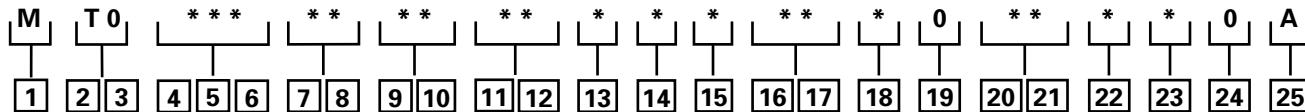
158-1403

*Manifold product numbers shown are for motors with four 5/16-18 port face mounting threads. Manifold, manifold mounting O-Rings and bolts are NOT included.

For T Series Motors with a configuration Not Shown in the charts above: Use the model code system on page B-4-10 to specify the product in detail.

T Series (158-)

Model Code



[1] Product

M – Motor

[2], [3] Product Series

T0 – T Series

[4], [5], [6] Displacement cm³/r [in³/r]

022 – 35 [2.2]

030 – 49 [3.0]

040 – 65 [4.0]

049 – 80 [4.9]

062 – 102 [6.2]

080 – 131 [8.0]

096 – 158 [9.6]

119 – 195 [11.9]

149 – 244 [14.9]

187 – 306 [18.7]

226 – 370 [22.6]

[7], [8] Mounting Type

AA – 2 Bolt (Standard)
82,6 [3.248] Dia. and 3,05
[.120] pilot, 13,59 [.535]
Dia. Mounting Holes
106,35 [4.187] Dia. B.C.

BA – 4 Bolt (Standard)
44,40 [1.748] Dia. x 3,05
[.120] pilot, .375-16 UNC-
2B Mounting Holes 82,55
[3.250] Dia. B.C.

CA – 2 Bolt (Standard)
82,50 [3.248] Dia. x 6,10
[.240] pilot, 10,41 [.410]
Dia. Mounting Holes 106,35
[4.187] Dia. B.C. (SAE A)

DD – 2 Bolt (Std.) 101,60
[4.000] Dia. x 6,10 [.240]
pilot, 14,35 [.565] Dia.
Mounting Holes 146,05
[5.750] Dia. B.C. (SAE B)
(Ductile)

EA – 4 Bolt Magneto 82,50
[3.248] Dia. x 3,05 [.120]
Pilot, 13,59 [.535] Dia.
Mounting Holes 106,35
[4.187] Dia. B.C.

FA – 4 Bolt (Standard)
44,40 [1.748] Dia. x 3,05
[.120] pilot, M10 x 1.5-6H
Mounting Holes on 82,55
[3.250] Dia. B.C.

[9], [10] Output Shaft Description

01 – 25,4 [1.00] Dia.
Straight, Woodruff Key,
.250-20 UNC-2B Hole in
Shaft End

02 – 25,4 [1.00] Dia. SAE
6B Spline, .25-20 UNC-2B
Hole in Shaft End

07 – 25,4 [1.00] Dia.
Straight, 8,03 [.316] Dia.
Crosshole 11,2 [.44] from
End, 5,6 [.22] Extra Length

08 – 25,4 [1.00] Dia.
Straight, 10,31 [.406] Dia.
Crosshole 15,7 [.62] from
End, .250-20 UNC-2B Hole
in Shaft End

16 – 22,22 [.875] Dia. SAE
13 Tooth Spline (SAE B)

17 – 22,22 [.875] Straight
Dia. 6,4 [2.5] x 19,0 [.75]
Square Key (SAE B)

18 – 25,4 [1.00] Dia.
Tapered, Woodruff Key
and Nut, 34,92 [1.375]
Taper Length

24 – 25.00 [.984] Dia.
Straight, 8,0 [.315] Key,
MB x 1.25-6H Hole in Shaft
End

The following 25-digit coding system has been developed to identify all of the configuration options for the T motor. Use this model code to specify a motor with the desired features. All 25-digits of the code must be present when ordering. You may want to photocopy the matrix below to ensure that each number is entered in the correct box.

[11], [12] Port Type

AA – .875-14 UNF-2B SAE
O-Ring Ports

AB – .500-14 NPTF Dryseal
Pipe Thread Ports

AC – Manifold (.3125-18
UNC-2B Mounting Holes)

AD – Manifold Ports (MB x
1.25-6H Mounting Holes)

AF – G 1/2 BSP Straight
Thread Ports

[13] Case Flow Options

0 – None Specified

1 – .4375-20 UNF-2B SAE
O-Ring Port (End Cap)

2 – G 1/4 BSP Straight
Thread Port (End Cap)

A – Internal Check Valves

[14] Geroler Options

0 – None

A – Free Running

[15] Shaft Options

0 – None

N – Electroless Nickel Plated

[16], [17] Seal Options

00 – Standard Seals

02 – Seal Guard

03 – Vitron Seals

04 – Vitron Shaft Seal

05 – Vented Two-Stage Seal

07 – High Pressure Shaft Seal

[18] Speed Sensor Options

0 – None

A – 12 mm Digital Speed
Pickup (15 Pulse) without
Lead Wire

B – Magnetic Speed Pickup
(60 Pulse by Quadrature),
No Lead Wire with M12
Connector

(A=Power, B=Common,
C=Signal)

[19] Valve Options

A – None

[20], [21] Special Features (Hardware)

00 – None Specified

AB – Low Speed Valving

SS – Stainless Steel Flange
Bolts

[22] Special Assembly Instructions

0 – None

A – Reverse Rotation
2 – Flange Rotation 90°

[23] Paint/Packaging Options

0 – No Paint

A – Painted Low Gloss
Black

D – Environmental Coated
Gloss White

[24] Customer ID/ Nameplate Options

A – None Specified

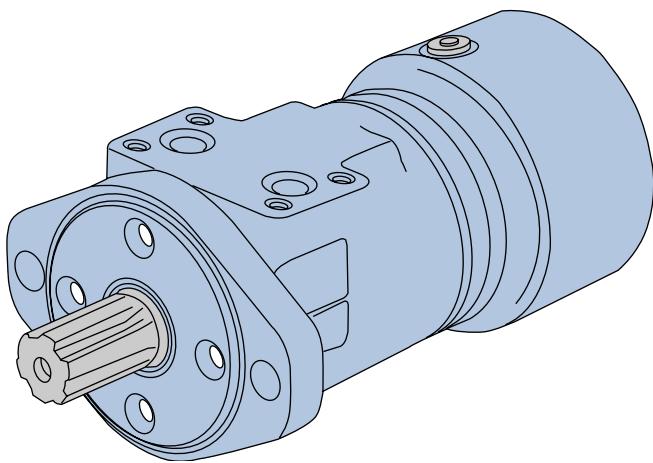
[25] Design Code

A – One (1)

Feature in **bold** are preferred and allow for shorter lead time.

T Series with Parking Brake (185-)

Highlights



Description

Eaton's latest offering in LSHT motor technology is the new T Series Motor with Parking Brake.

T Series Motor with Parking Brake utilizes brake pads that rotate at 6 times the speed of the output shaft, thereby giving the brake a 6-to-1 mechanical advantage. The T Series Motor with Parking Brake utilizes the same Geroler, and Spool Valve technologies as the standard Char-Lynn motors. Therefore, in addition to providing dependable load-holding capability, T Series Motor with Parking Brake provides the same smooth, reliable operation, with similar performance, as the T Series Motor.

Specifications

Geroler Element	11 Displacements
Flow l/min [GPM]	55 [15] Continuous*** 75 [20] Intermittent**
Speed	Up to 1055 RPM
Pressure bar [PSI]	155 [2250] Cont.*** 190 [2750] Inter.**
Torque Nm [lb-in]	441 [3905] Cont.*** 486 [4300] Inter.**

*** Continuous—(Cont.) Continuous rating, motor may be run continuously at these ratings.

** Intermittent—(Inter.) Intermittent operation, 10% of every minute.



Crane and winches



Boom Lift (Swing)



Maintenance Equipment

Features

- Integrated, Compact, Patented Design
- Capability of Combining 4 inventory items into a single assembly (motor, brake, counter-balance valve, brake release line)
- Rear-mounted integrated brake with 6:1 torque advantage
- Access port for manual brake release (for over-riding brake in the event of loss of release pressure.)

Benefits

- Cost-effective Packaged System Solution
- Simplifies ordering and inventory requirements
- Reduces assembly labor
- Design Flexibility
- Wet brake is environmentally protected and provides long life

Applications

- Truck-Mounted Equipment (boom rotate and winch)
- Conveyors – Positioners – Indexers
- Marine Cranes (boom rotate and winch)
- Fishing Winches
- Recycling and Refuse Equipment
- Vehicle Recovery Winches
- Mining Equipment
- Specialty Utility Vehicles/ Machines
- Forestry Grapples
- Agricultural Equipment
- Railroad Equipment
- Airport Support Vehicles
- Lawn & Turf Equipment
- Anywhere Load-Holding is Needed in a Low-Speed High-Torque Drive System

T Series with Parking Brake (185-)

Application Information

Principle of Operation

The wet brake is a spring-applied / pressure release design. Load-holding is applied by a mechanical spring and released by hydraulic pressure. The spring force holds the brake on when hydraulic pressure is absent.

Release Pressure

Release pressure is defined as the amount of pressure required to fully release the brake. The brake pressure cavity is common (shared) with the motor case. As a result, maximum release pressure is constrained by the motor case-pressure capability. The T Series Motor with Parking Brake incorporates a shaft seal capable up to 1500 psi (see page B-4-15). However, seal life is reduced at higher case pressure.

Residual Pressure

Residual pressure is the pressure trapped in the system by restrictions or long return lines.

Residual pressure in the motor case will lower the rated load holding torque of the brake.

Therefore, special attention needs to be given when applying this product. Keep in mind that long return lines create higher pressure that will reduce brake holding torque. In applications with high system pressures, the use of a pressure reducing valve to limit case and release pressure is recommended.

Holding Torque and Motor Output Torque

Holding torque is based on grade holding requirements for a vehicle or other load holding requirements in the application. System pressure and motor displacement are the factors in determining motor output torque. Motor displacement, measured in cubic centimeters or cubic inches, is the volume of fluid required to make one revolution. Motor output torque is the rotary force and is usually measured in inch pounds, newton meters or foot pounds. Maximum motor torque depends on pressure and motor displacement. Both output shaft size and shaft type can also affect motor torque. The T Series Motor with Parking Brake load holding capacity is factory set to match any limiting factor in each specific motor configuration (e.g. displacement, output shaft, etc).

Note:

Eaton Corporation does not approve any products for customer applications. It is the sole responsibility of the customer to qualify and verify the correct operation of products in their systems.

Note:

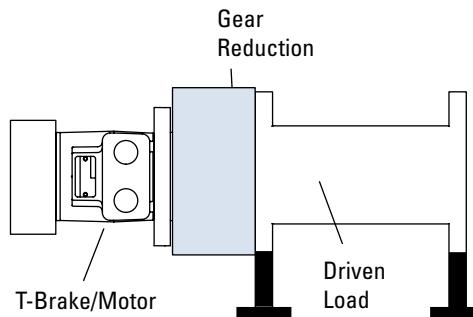
Special attention should be given to system back pressure. System back pressure directly affects brake release pressure and can cause the brake to release at undesired conditions.

Note:

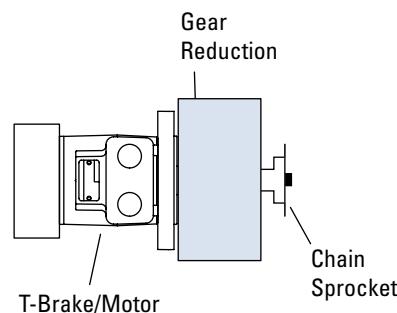
The T Series with parking brake is not compatible with water based fluids.

Typical Applications

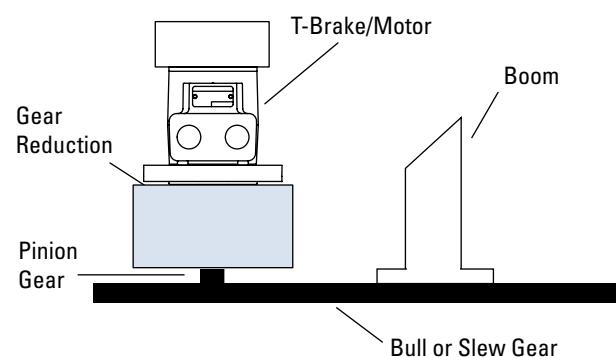
Winch



Machine Drive

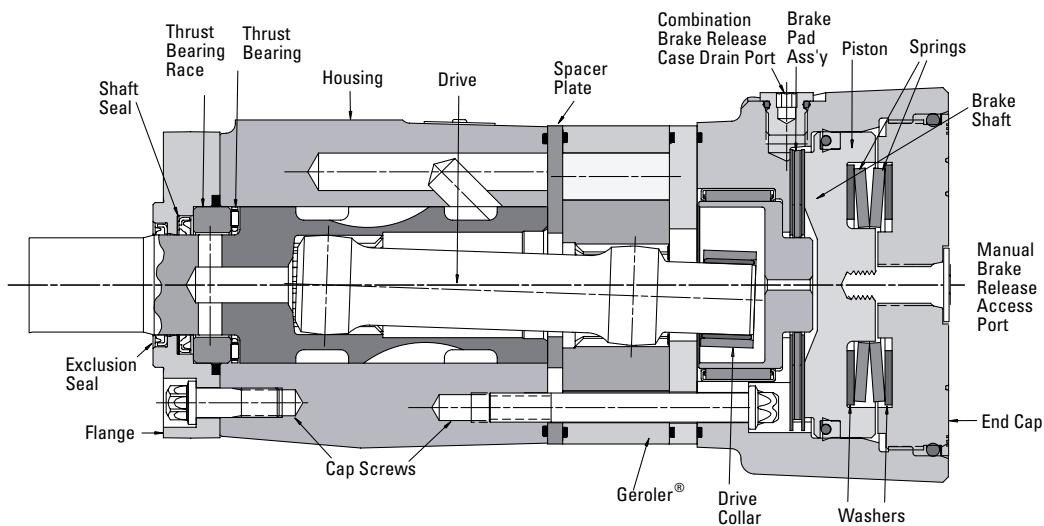


Swing Boom



T Series with Parking Brake (185-)

Specifications



SPECIFICATION DATA — T SERIES WITH PARKING BRAKE MOTORS

Displ. cm ³ /r [in ³ /r]	36 [2.2]	49 [3.0]	66 [4.0]	80 [4.9]	102 [6.2]	131 [8.0]	157 [9.6]	195 [11.9]	244 [14.9]	306 [18.7]	370 [22.6]
Max. Speed (RPM) @ Continuous Flow	1021	906	849	694	550	426	355	287	229	183	152
Flow LPM [GPM]	Continuous 38 [10] Intermittent 38 [10]	45 [12]	57 [15]	57 [15]	57 [15]	57 [15]	57 [15]	57 [15]	57 [15]	57 [15]	57 [15]
Torque Nm [lb-in]	Continuous 76 [672] Intermittent ** 93 [824]	105 [928]	138 [1222]	174 [1541]	219 [1936]	251 [2226]	297 [2628]	359 [3178]	410 [3633]	441 [3905]	430 [3811]
Pressure Δ Bar [Δ PSI]	Continuous * 155 [2250] Intermittent * *** 190 [2750]	155 [2250]	155 [2250]	155 [2250]	155 [2250]	138 [2000]	138 [2000]	138 [2000]	127 [1850]	110 [1600]	90 [1300]
	Limited Capacity 190 [2750]	118 [1131]	168 [1488]	212 [1872]	264 [2339]	307 [2718]	359 [3178]	437 [3864]	485 [4290]	483 [4275]	486 [4300]

Note:

See page B-4-2 for additional motor specification notes and definitions. The T Series with Parking Brake performance is similar to the standard T Series motor. High speed conditions may reduce performance on T Series with Parking Brake.

T SERIES BRAKE HOLDING TORQUE SETTINGS:

Shaft Code	Output Shaft Description	[in ³ /r]	2.2	3.0	4.0	4.9	6.2	8.0	9.6	11.9	14.9	18.7	22.6
18	1 Tapered w/key and nut		2,000	2,000	2,000	3,500	3,500	3,500	5,000	5,000	5,000	5,000	5,000
02	1 SAE 6B Splined		2,000	2,000	2,000	3,500	3,500	3,500	5,000	5,000	5,000	5,000	5,000
24	25mm Straight w/key		2,000	2,000	2,000	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
01	1 Straight w/key		2,000	2,000	2,000	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
07	1 Straight w/.31 dia. crosshole		2,000	2,000	2,000	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
08	1 Straight w/.40 dia. crosshole		2,000	2,000	2,000	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
16	7/8 SAE B 13T Splined		2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
17	7/8 SAE B Straight w/key		2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000

in-lbs Full Capacity Brake

in-lbs Limited Capacity Brake

Note:

The factory setting values are used for each motor based on motor displacement and shaft type.

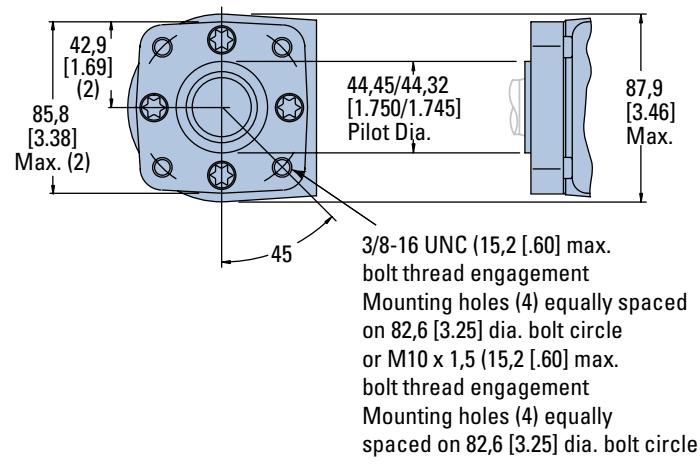
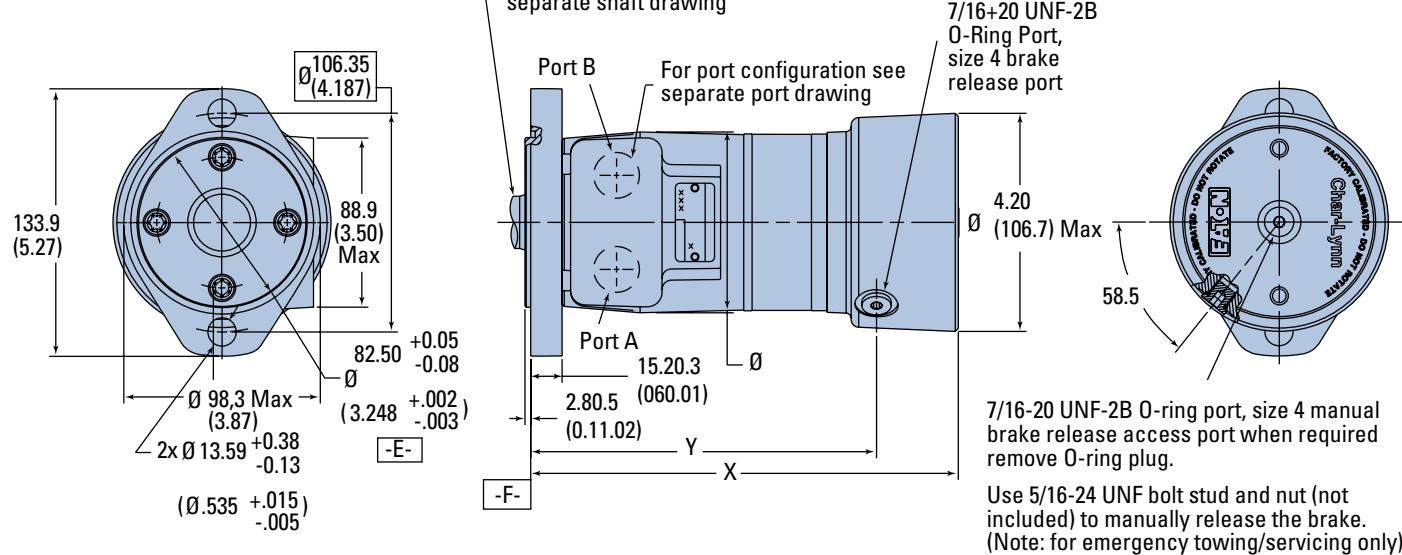
T Series with Parking Brake (185-)

Dimensions

(Refer to pages B-4-19 thru B-4-22 for shaft and port dimensions.)

Standard Rotation Viewed from Shaft End

Port A Pressurized — CW
Port B Pressurized — CCW



T-SERIES WITH PARKING BRAKE DIMENSIONS

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]
02	190.2 [7.49]	143.9 ± 0.9 [5.66 ± 0.3]
A2	190.8 [7.51]	144.5 ± 0.9 [5.69 ± 0.3]
03	192.5 [7.58]	146.3 ± 0.9 [5.76 ± 0.3]
A3	194.3 [7.65]	148.1 ± 0.9 [5.83 ± 0.3]
04	195.6 [7.70]	149.3 ± 0.9 [5.88 ± 0.3]
05	198.4 [7.81]	152.0 ± 0.9 [5.98 ± 0.3]
06	202.2 [7.96]	155.9 ± 0.9 [6.14 ± 0.3]
08	207.5 [8.17]	161.3 ± 0.9 [6.35 ± 0.3]
10	212.6 [8.37]	166.2 ± 0.9 [6.54 ± 0.3]
12	219.2 [8.63]	172.9 ± 0.9 [6.81 ± 0.3]
15	228.3 [8.99]	181.9 ± 0.9 [7.16 ± 0.3]
19	239.5 [9.43]	193.3 ± 0.9 [7.61 ± 0.3]
23	251.2 [9.89]	205.0 ± 0.9 [8.07 ± 0.3]

Note:

Standard Rotation

When facing shaft end of motor shaft to rotate clockwise when port "A" is pressurized, counterclockwise when port "B" is pressurized

Reverse Rotation

When facing shaft end of motor shaft will rotate clockwise when port "B" is pressurized, counterclockwise when port "A" is pressurized

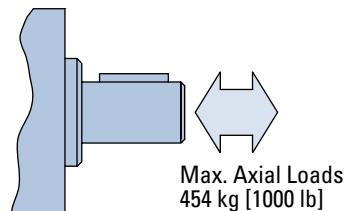
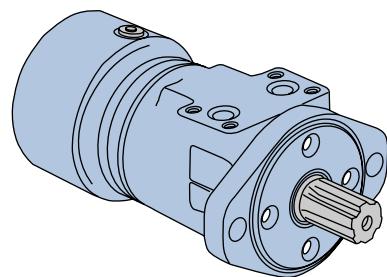
T Series with Parking Brake (185-)

Brake Release and Motor Case Pressure

The T Series Motor with Parking Brake is durable and has long life as long as the recommended case pressure is not exceeded. Allowable case pressure is highest at low shaft speeds.

Motor life will be shortened if case pressure exceeds recommended ratings (acceptability may vary with application).

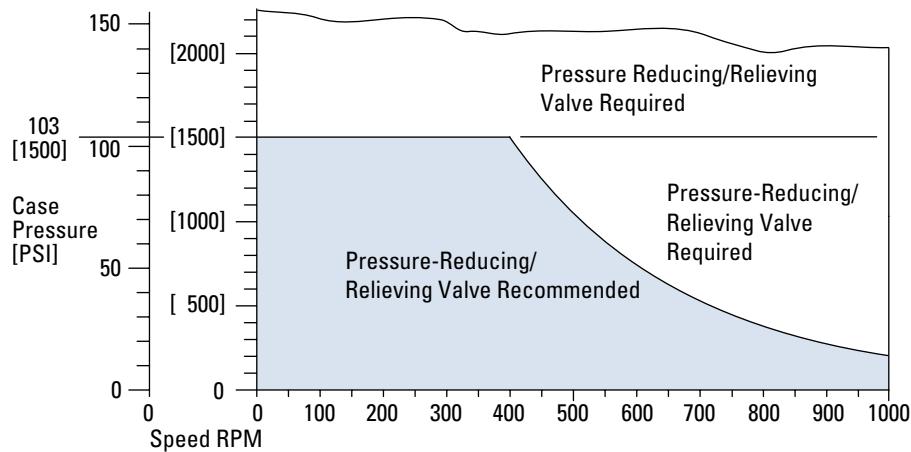
Refer to the Case Pressure/Shaft Seal chart below. This chart is based on case pressure and motor shaft speed. A minimum release pressure of 17 Bar [250 PSI] must be maintained to fully release the brake.



$$P_C \approx .6 DP + P_2$$

P_C = Case Pressure
P₁ = Inlet Line Pressure
P₂ = Back Pressure
DP = P₁ - P₂

Case Pressure/Shaft Seal



T Series with Parking Brake (185-)

Product Numbers

Use digit prefix —
185 plus four digit number
from charts for complete
product number —
Example 185-2068.

**Orders will not be
accepted without three
digit prefix.**

Standard Valving

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER									
			3.0	4.0	4.9	6.2	8.0	9.6	11.9	14.9	18.7	22.6
2-Bolt	1 Keyed	7/8-14 O-Ring Manifold	185-2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
			185-2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
	6B Splined	7/8-14 O-Ring Manifold	185-2020	2021	2022	2023	2024	2025	2026	2027	2028	2029
4-Bolt	13T Splined 16/32 pitch	7/8-14 O-Ring Manifold	185-2040	2041	2042	2043	2044	2045	2046	2047	2048	2049
			185-2050	2051	2052	2053	2054	2055	2056	2057	2058	2059
	1 Keyed	7/8-14 O-Ring Manifold	185-2060	2061	2062	2063	2064	2065	2066	2067	2068	2069
2-Bolt SAE B	6B Splined	7/8-14 O-Ring Manifold	185-2080	2081	2082	2083	2084	2085	2086	2087	2088	2089
			185-2090	2091	2092	2093	2094	2095	2096	2097	2098	2099
	13T Splined 16/32 pitch	7/8-14 O-Ring Manifold	185-2100	2101	2102	2103	2104	2105	2106	2107	2108	2109
2-Bolt SAE B	1 Keyed	7/8-14 O-Ring Manifold	185-2120	2121	2122	2123	2124	2125	2126	2127	2128	2129
			185-2130	2131	2132	2133	2134	2135	2136	2137	2138	2139
	6B Splined	7/8-14 O-Ring Manifold	185-2140	2141	2142	2143	2144	2145	2146	2147	2148	2149
2-Bolt SAE B	13T Splined 16/32 pitch	7/8-14 O-Ring Manifold	185-2160	2161	2162	2163	2164	2165	2166	2167	2168	2169
			185-2170	2171	2172	2173	2174	2175	2176	2177	2178	2179

Low Speed Valving

MOUNTING	SHAFT	PORT SIZE	DISPL. cm ³ /r [in ³ /r] / PRODUCT NUMBER									
			3.0	4.0	4.9	6.2	8.0	9.6	11.9	14.9	18.7	22.6
2-Bolt	1 Keyed	7/8-14 O-Ring Manifold	185-2180	2181	2182	2183	2184	2185	2186	2187	2188	2189
			185-2190	2191	2192	2193	2194	2195	2196	2197	2198	2199
	6B Splined	7/8-14 O-Ring Manifold	185-2200	2201	2202	2203	2204	2205	2206	2207	2208	2209
4-Bolt	13T Splined 16/32 pitch	7/8-14 O-Ring Manifold	185-2220	2221	2222	2223	2224	2225	2226	2227	2228	2229
			185-2230	2231	2232	2233	2234	2235	2236	2237	2238	223
	1 Keyed	7/8-14 O-Ring Manifold	185-2240	2241	2242	2243	2244	2245	2246	2247	2248	2249
2-Bolt SAE B	6B Splined	7/8-14 O-Ring Manifold	185-2260	2261	2262	2263	2264	2265	2266	2267	2268	2269
			185-2270	2271	2272	2273	2274	2275	2276	2277	2278	2279
	13T Splined 16/32 pitch	7/8-14 O-Ring Manifold	185-2280	2281	2282	2283	2284	2285	2286	2287	2288	2289
2-Bolt SAE B	1 Keyed	7/8-14 O-Ring Manifold	185-2300	2301	2302	2303	2304	2305	2306	2307	2308	2309
			185-2310	2311	2312	2313	2314	2315	2316	2317	2318	2319
	6B Splined	7/8-14 O-Ring Manifold	185-2320	2321	2322	2323	2324	2325	2326	2327	2328	2329
2-Bolt SAE B	13T Splined 16/32 pitch	7/8-14 O-Ring Manifold	185-2340	2341	2342	2343	2344	2345	2346	2347	2348	2349
			185-2350	2351	2352	2353	2354	2355	2356	2357	2358	2359

Motors with the low speed valving option enable very smooth low speed operation while maintaining high torque.

Designed to run continuously at up to 200 RPM at standard rated

pressures and reduced flows, this option provides smooth operation at low speeds. Furthermore, they resist slippage and have more momentary load holding ability than the standard motors.

Motors with this valving are not intended for low pressure applications (41 Bar [600 PSI] Minimum).

Shaft side / radial load ratings are not affected by this valving.

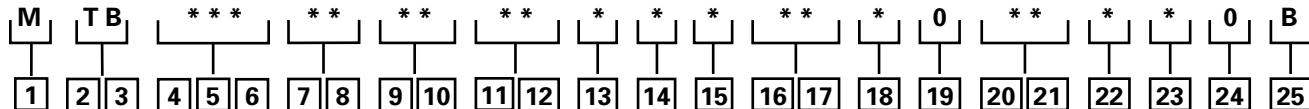
For a T Series motor with parking brake configuration not shown in the charts above use the model code system on page B-4-17 to specify the product in detail.

185-2357

T Series with Parking Brake (185-)

Model Code

The following 25-digit coding system has been developed to identify all of the configuration options for the T Series Motor with Parking Brake. Use this model code to specify a motor with the desired features. All 25-digits of the code must be present when ordering. You may want to photocopy the matrix below to ensure that each number is entered in the correct box.



[1] Product

M – Motor

[2], [3] Series

T B – T Series Motor with
Parking Brake

[4], [5], [6] Displacement cm³/r [in³/r]

022 – 36 [2.2]

030 – 49 [3.0]

040 – 66 [4.0]

049 – 80 [4.9]

062 – 102 [6.2]

080 – 131 [8.0]

096 – 157 [9.6]

119 – 195 [11.9]

149 – 244 [14.9]

187 – 306 [18.7]

226 – 370 [22.6]

[7], [8] Mounting Type

AA – 2 Bolt (Standard)
82,5 [3.248] Dia. and 3,05
[.120] pilot, 13,59 [.535]
Dia. Mounting Holes 106,35
[4.187] Dia. B.C.

BA – 4 Bolt (Standard)
44,40 [1.748] Dia. x 3,05
[.120] pilot, .375-16 UNC-
2B Mounting Holes 82,55
[3.250] Dia. B.C.

CA – 2 Bolt (Standard)
82,50 [3.248] Dia. x 6,10
[.240] pilot, 10,41 [.410]
Dia. Mounting Holes 106,35
[4.187] Dia. B.C. (SAE A)

DA – 2 Bolt (Std.) 101,60
[4.000] Dia. x 6.10 [.240]
pilot, 14,35 [.565] Dia.
Mounting Holes 146,05
[5.750] Dia. B.C. (SAE B)

EA – 4 Bolt Magneto 82,50
[3.248] Dia. x 3,05 [.120]
Pilot, 13,59 [.535] Dia.
Mounting Holes 106,35
[4.187] Dia. B.C.

FA – 4 Bolt (Standard)
44,40 [1.748] Dia. x 3,05
[.120] pilot, M10 x 1.5-6H
Mounting Holes on 82,55
[3.250] Dia. B.C.

[9], [10] Output Shaft Description

01 – 25,4 [1.00] Dia.
Straight, Woodruff Key,
.250-20 UNC-2B Hole in
Shaft End

02 – 25,4 [1.00] Dia. SAE 6B
Spline, .25-20 UNC-2B Hole in
Shaft End

16 – SAE 13 Tooth Spline,
16/32 Pitch, 21,74 (.856)
Dia. (SAE B)

18 – 25,4 [1.00] Dia.
Tapered, Woodruff Key
and Nut, 34,92 [1.375]
Taper Length

24 – 25.00 [.984] Dia.
Straight, 8.0 [.315] Key,
MB x 1.25-6H Hole in
Shaft End

[11], [12] Port Type

AA – .875-14 UNF-2B SAE
O-Ring Ports

AB – .500-14 NPTF Dryseal
Pipe Thread Ports

AC – Manifold (.3125-18
UNC-2B Mounting Holes)

AD – Manifold Ports (MB x
1.25-6H Mounting Holes)

[13] Case Flow Options

0 – None Specified

3 – Manifold Case Drain

[14] Geroler Options

A – Standard

B – Free Running

[15] Shaft Options

0 – None

N – Electroless Nickel Plated

[16], [17] Seal Options

00 – Standard Seals

03 – Vitron Seals

05 – Vented Two-Stage Seal

07 – High Pressure Shaft
Seal

[18] Speed Sensor Options

0 – None

A – 12 mm Digital Speed
Pickup (15 Pulse) without
Lead Wire

(A=Power, B=Common,
C=Signal)

[19] Valve Options

A – None

[20], [21] Special Features (Hardware)

00 – None Specified

AB – Low Speed Valving

[22] Special Assembly Instructions

0 – None

2 – Flange Rotation 90°

[23] Paint/Packaging Options

0 – No Paint

A – Painted Low Gloss
Black

[24] Customer ID/ Nameplate Options

0 – None Specified

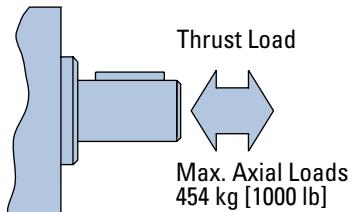
[25] Design Code

B – Two (2)

Case Pressure and Case Drain — H, S, and T Series

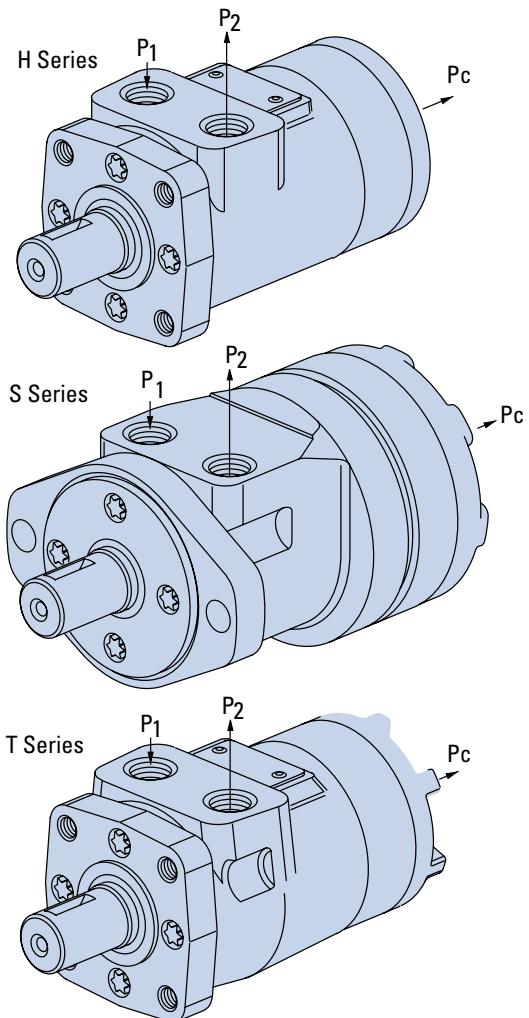
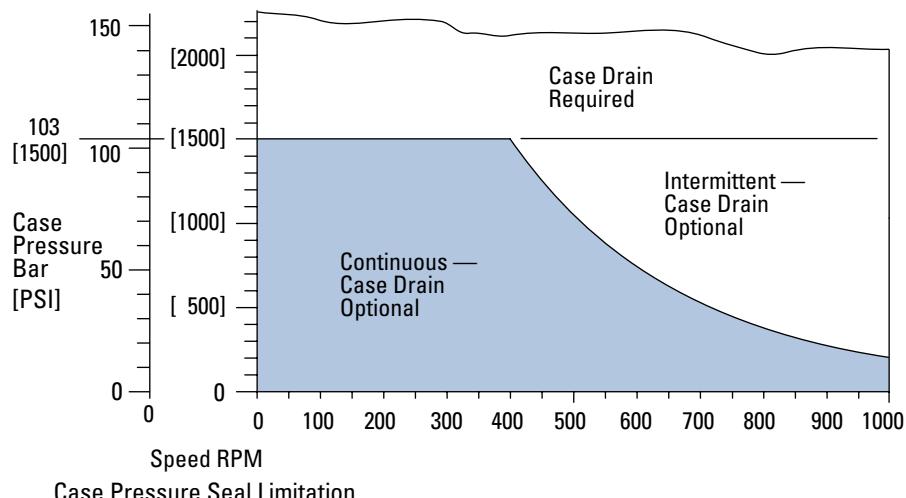
Char-Lynn H Series, S Series and T Series motors are durable and have long life as long as the recommended case pressure is not exceeded. Allowable case pressure is highest at low shaft speeds. Consequently, motor life will be shortened if case pressure exceeds these ratings (acceptability may vary with application). Determine if an external case drain is required.

from the case pressure seal limitation chart below — chart based on case pressure and shaft speed. If a case drain line is needed, connect drain line to assure that the motor will always remain full of fluid. A pressure restriction should be added to the case drain line, during which a motor case pressure of 3.5 Bar [50 PSI] is maintained.



$$P_C \approx .6 P + P_2$$

P_C = Case Pressure
 P_1 = Inlet Line Pressure
 P_2 = Back Pressure
 $\Delta P = P_1 - P_2$



H, S and T Series (101-, 103-, 158-, 185-)

Side Load Capacity

The hydrodynamic bearing has infinite life when shaft load ratings are not exceeded. Hence, the shaft side load capacity is more than adequate to handle most externally applied loads (such as belts, chains, etc.), providing the motor to shaft size is applied within its torque rating.

Allowable side load chart, shaft load location drawing and load curves (below) are based on the side / radial loads being applied to shaft at locations A, B, and C, to

determine the shaft side load capacity at locations other than those shown use the formula (shown below).

For more information about shaft side loads on Char-Lynn motors contact your Eaton representative.

Note:

When the speed sensor option is used, side load ratings are reduced 25%.

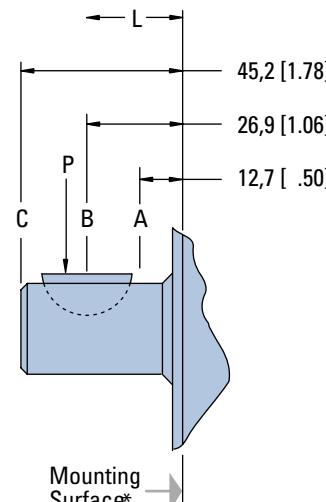
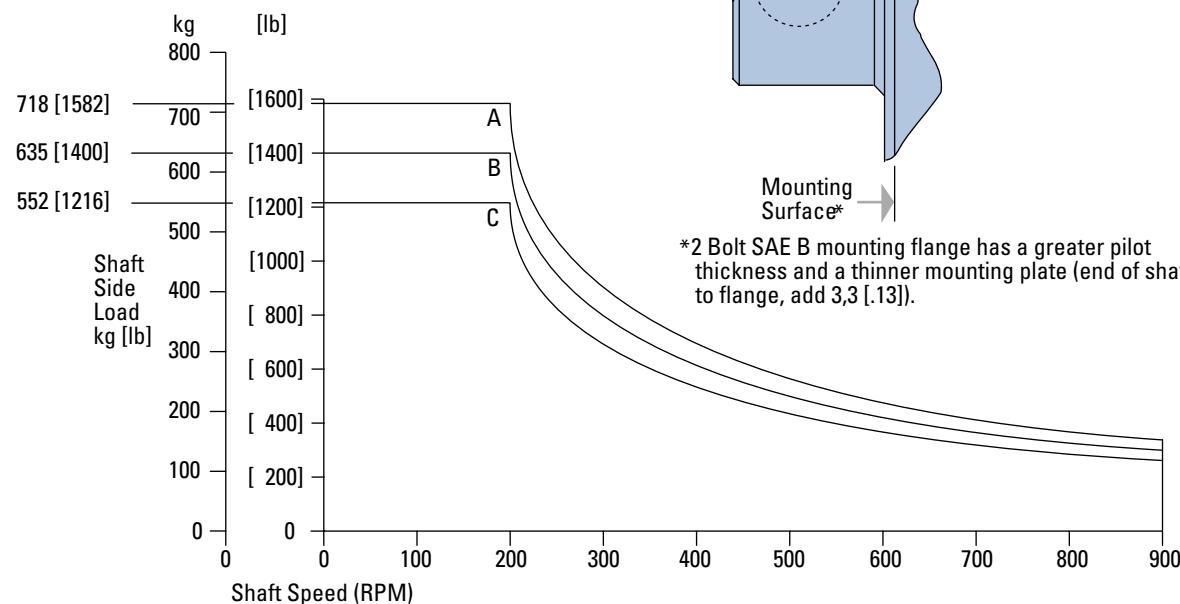
RPM	ALLOWABLE SHAFT SIDE LOAD — KG [LB]		
	A	B	C
900	154 [339]	136 [300]	118 [261]
625	205 [452]	181 [400]	158 [348]
500	256 [565]	227 [500]	197 [435]
400	307 [678]	272 [600]	237 [522]
300	410 [904]	363 [800]	316 [696]
200	718 [1582]	635 [1400]	552 [1216]

$$\text{Sideload } P \text{ kg} = \frac{900}{N} \left(\frac{16800}{L + 96.3} \right) \text{ for 200-900 RPM}$$

$$\text{Sideload } P [\text{lb}] = \frac{900}{N} \left(\frac{1460}{L + [3.79]} \right) \text{ for 200-900 RPM}$$

Where N = Shaft Speed (RPM)

L = Distance from Mounting Surface



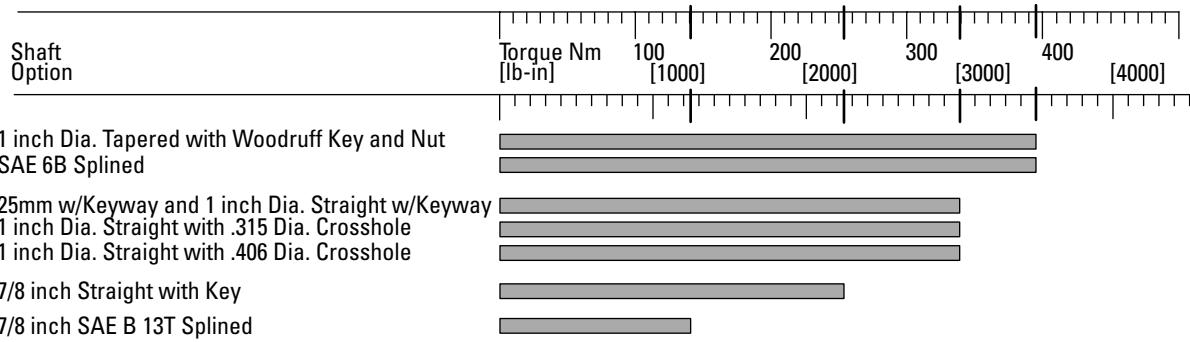
*2 Bolt SAE B mounting flange has a greater pilot thickness and a thinner mounting plate (end of shaft to flange, add 3.3 [.13]).

H, S and T Series (101, 103- 158, 185)

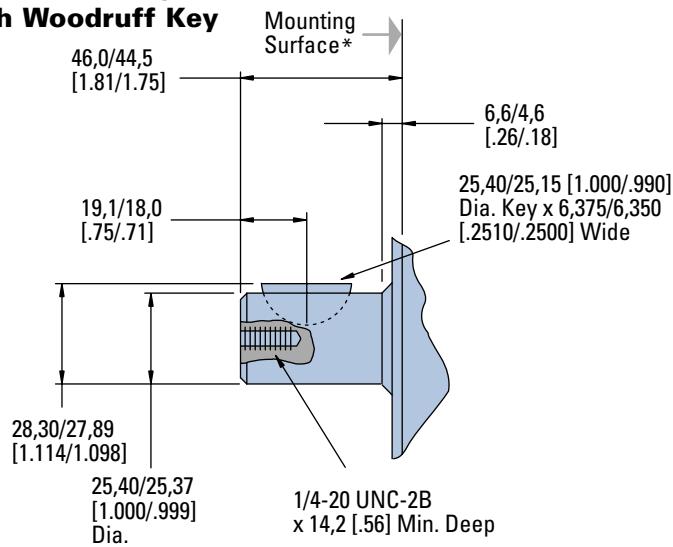
Dimensions

Shafts

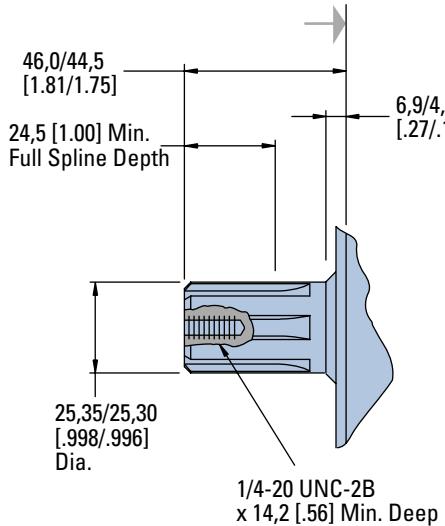
Shaft Size Motor Torque Combination Limit Guide



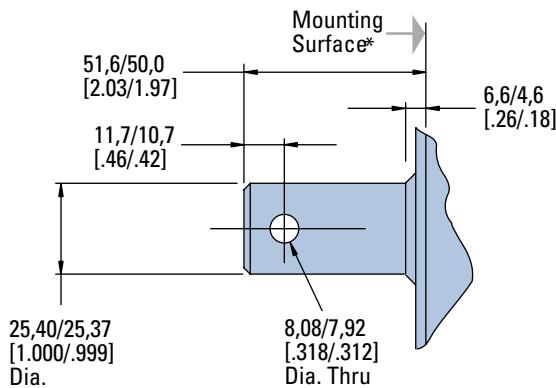
1 in. Dia. Straight with Woodruff Key



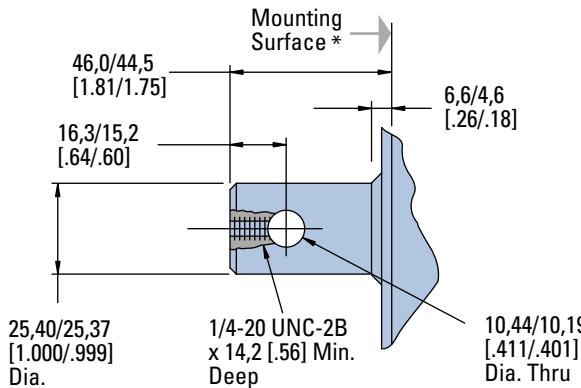
SAE 6B Splined Shaft



1 in. Dia. Straight Shaft with .315 Dia. Crosshole



1 in. Dia. Straight Shaft with .406 Dia. Crosshole



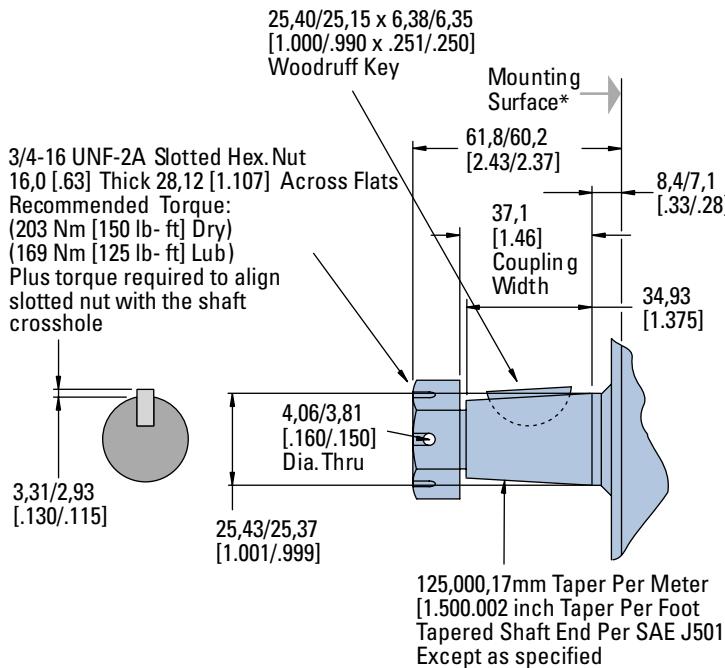
* 2 Bolt SAE B mounting flange has a greater pilot thickness and a thinner mounting plate (end of shaft to flange, add 3,3 [.13]).

H, S and T Series (101-, 103- 158-, 185-)

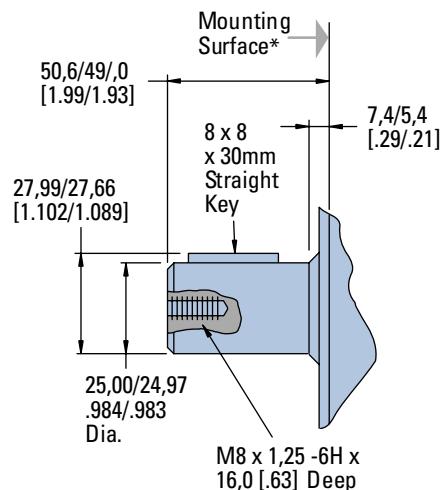
Dimensions

Shafts

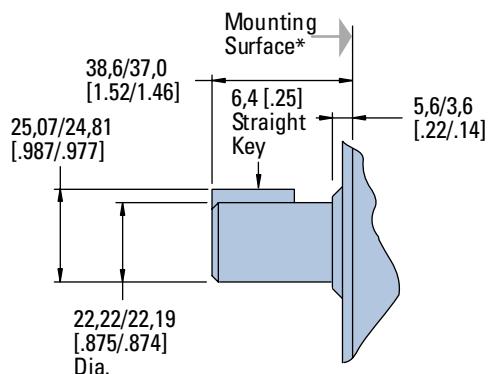
1 in. Dia. Tapered Shaft with Woodruff Key and Nut



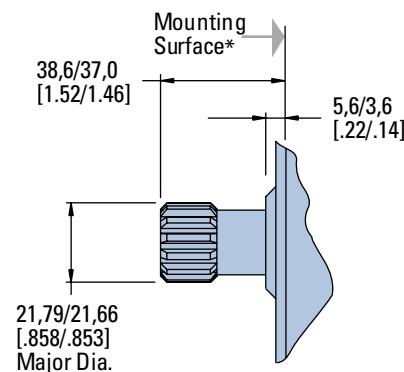
25mm Dia. Straight Shaft with 8mm Keyway



7/8 in. Dia. Straight Shaft with Key



7/8 in. Dia. SAE B Shaft 13 T Spline d

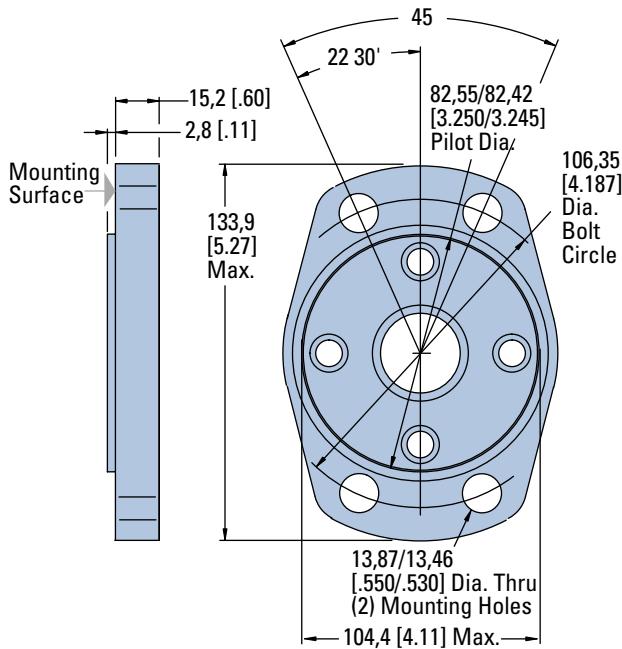


* 2 Bolt SAE B mounting flange has a greater pilot thickness and a thinner mounting plate (end of shaft to flange, add 3,3 [.13]).

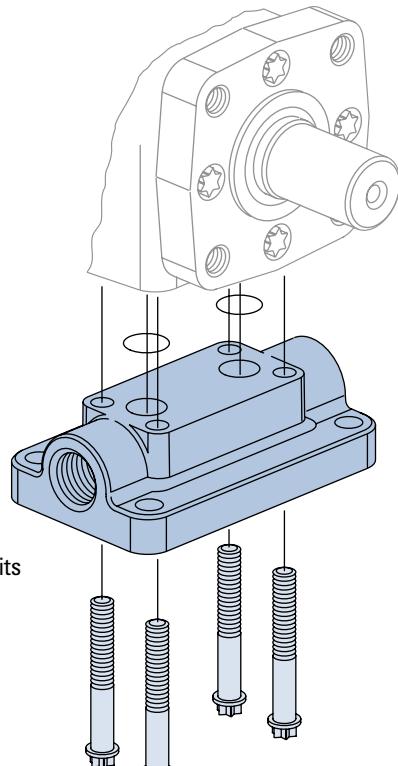
H, S and T Series (101-, 103- 158-, 185-)

Mounting Options

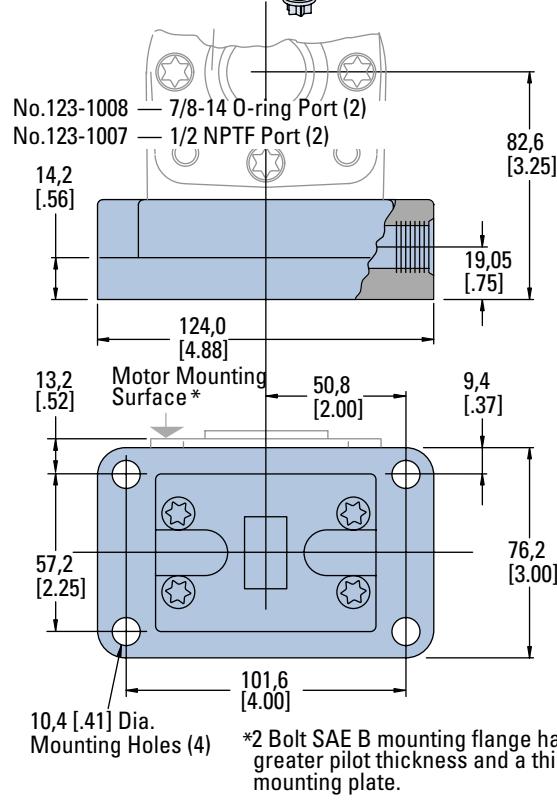
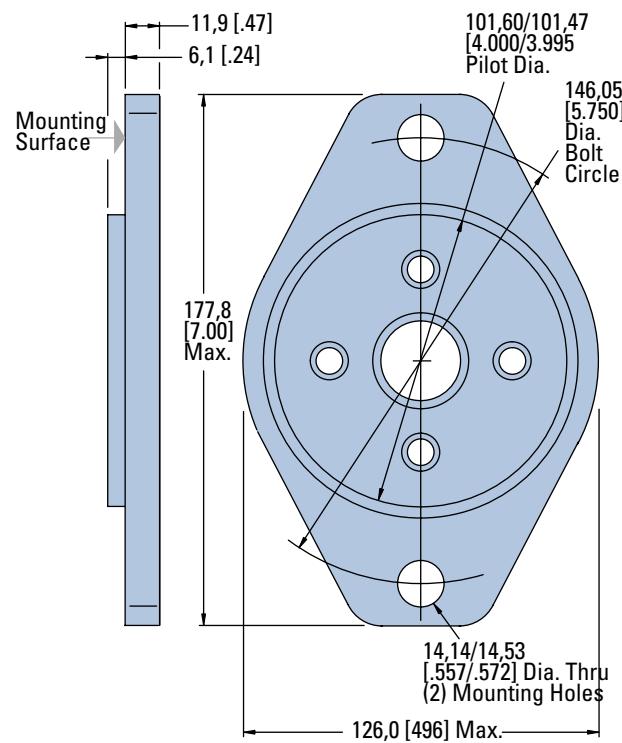
4 Bolt Magneto



Base Block Mounting Kits



2 Bolt SAE B



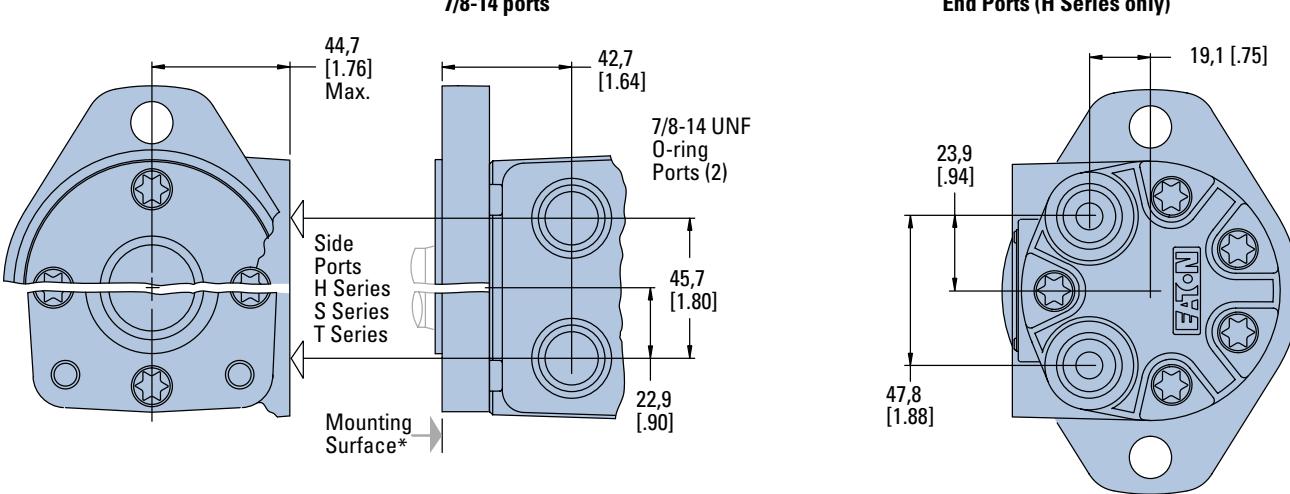
Note:

Mounting Surface Flatness Requirement is \leq , 13mm [.005 inch] Max.

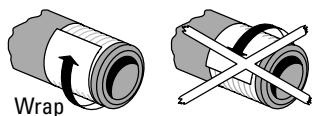
H, S and T Series (101-, 103-, 158-, 185-)

Dimensions

Ports



Use of Teflon Tape Sealant/
Lubricant (with 1/2 14 NPTF
Port Connectors only).



When using fittings with
Teflon tape, be careful
when taping and tightening.
Over tightening or
improperly taped fittings
can cause damage to
housing or leakage.

Use the following procedures:

- Wrap approx. 1 1/2 Turns
of 13 mm [1/2 in.] wide
Teflon Tape around fitting
threads — start tape 2
threads up from end of
fitting.
- Tighten threads to a
Maximum of 34 Nm
[25 lb-ft]. — Do Not
Tighten Further —
- If fittings leak when tight-
ened to maximum torque,
either retape, reseal, or
replace fittings.

Optional Case Drain
Port Location
(T-Series Only)

*2 Bolt SAE B mounting flange has a greater
pilot thickness and a thinner mounting plate.

Ports

End Ports — H Series only
G 1/2 (BSP) (2)
or 3/4-16 O-Ring (2)

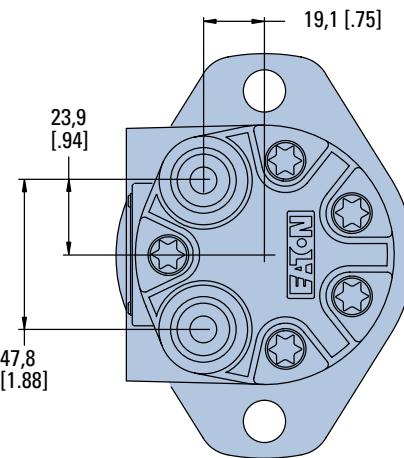
Standard Rotation Viewed from Drive End

Port A Pressurized — CW
Port B Pressurized — CCW

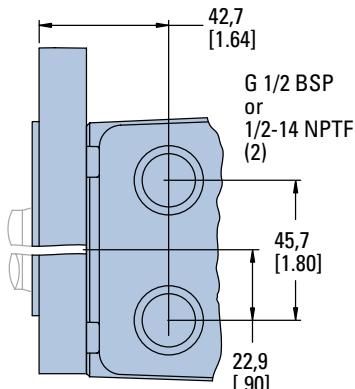
Note:

End ported motor pressure
is derated. Reference page
B-2-2 for ratings.

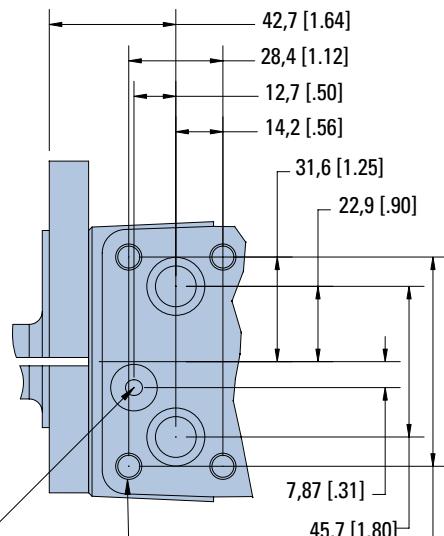
End Ports (H Series only)



6-1/2 or 1/2 NPTF ports

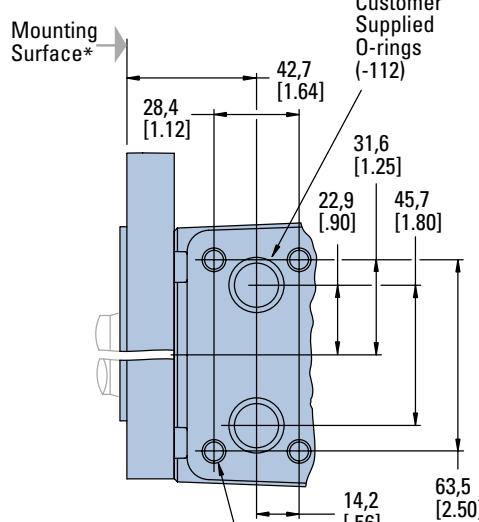


Manifold Ports w/manifold case port



5/16-18 UNC (12.7 [.50] Max. Screw
Thread Engagement) (4)
or
M8 x 1.25 (12.7 [.50] Max. Screw
Thread Engagement) (4)

Manifold Ports



5/16-18 UNC (12.7 [.50] Max. Screw
Thread Engagement) (4)
or
M8 x 1.25 (12.7 [.50] Max. Screw
Thread Engagement) (4)

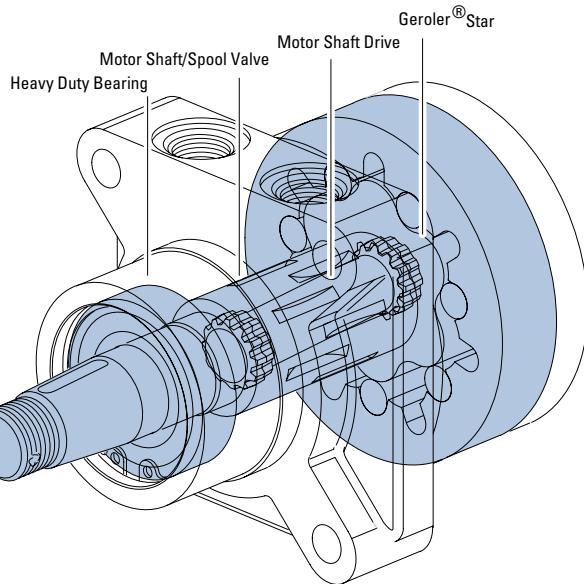
Note:

End ported motor option is
derated to 1400 continuous,
1700 psi intermittent.

Notes

W Series (162-)

Highlights



Description

Char-Lynn W Series motors with the Geroler displacement element offer the same low friction and long-life advantages as the S and T Series.

The W Series features the simplicity of Eaton's proven spool valve and a Geroler element that provides superior drive life and smooth performance. In addition, this motor has a rugged housing with an extra large capacity side load bearing.

W Series Motors

Geroler Element	7 Displacements
Flow l/min [GPM]	68 [18] Continuous*** 76 [20] Intermittent**
Speed	288 RPM
Pressure bar [PSI]	165 [2400] Cont.*** 179 [2600] Inter.**
Torque Nm [lb-in]	410 [3624] Cont.*** 562 [4970] Inter.**

*** Continuous—(Cont.) Continuous rating, motor may be run continuously at these ratings.

** Intermittent—(Inter.) Intermittent operation, 10% of every minute.

Features:

- Heavy duty bearing
- Wheel drive interface
- Three-pressure zone design (ability to reduce case pressure)
- Variety of displacements, shafts, mounts and special options
- Special options to meet customer needs

Benefits:

- High side-load capacity
- High shock load capability
- Wheel mount interface
- Compact powerful package
- High efficiency
- Smooth low-speed operation
- Extended leak-free performance

Applications:

- Scissors lifts
- Boom lifts
- Mid-size ZTR mowers
- Turf equipment
- Greens mowers
- Sand trap rakes
- Railroad maintenance equipment
- Industrial sweepers and floor polishers
- Skid steer attachments
- Many more



Scissor Lift



Sweeper



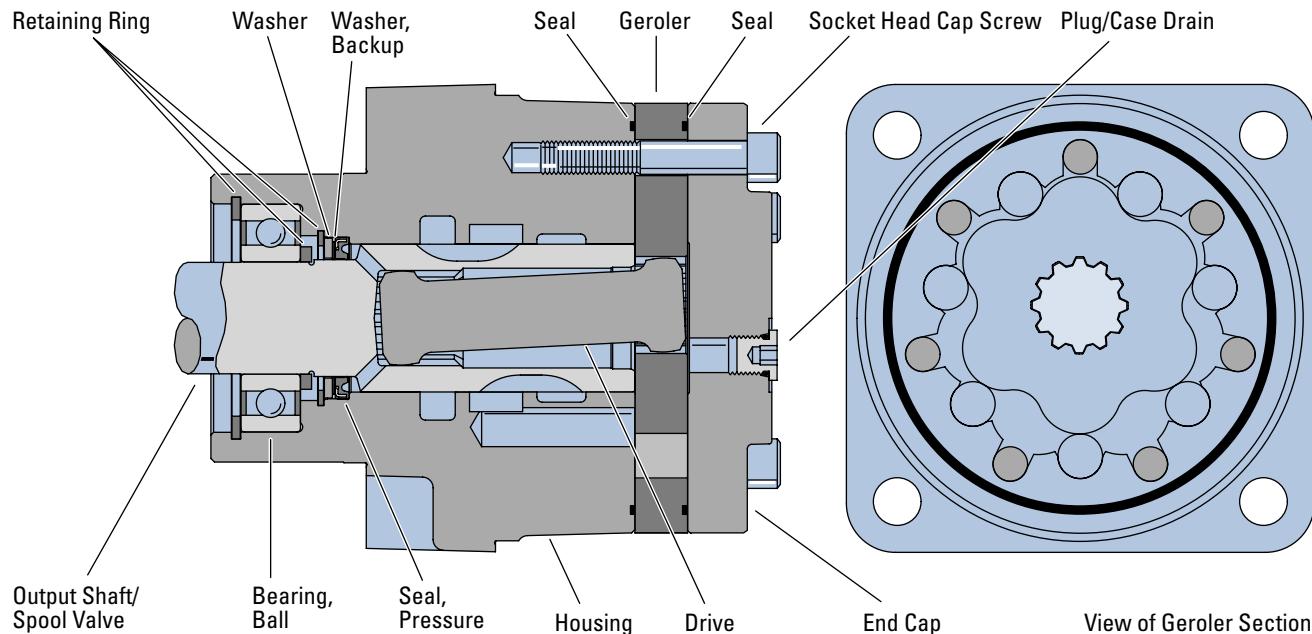
Trencher



Boom Lift

W Series (162-)

Specifications



SPECIFICATION DATA — W SERIES MOTORS

Displ. cm ³ /r [in ³ /r]	80 [4.9]	126 [7.7]	154 [9.4]	195 [11.9]	251 [15.3]	303 [18.5]	374 [22.8]
Max. Speed (RPM)	267	288	214	200	200	200	200
Flow l/min [GPM]	Continuous Intermittent	23 [6] 23 [6]	30 [8] 30 [8]	34 [9] 34 [9]	38 [10] 38 [10]	53 [14] 53 [14]	62 [16.5] 62 [16.5]
Theo. Torque Nm [lb-in]	Continuous Intermittent	176 [1555] 189 [1676]	279 [2470] 298 [2640]	318 [2813] 373 [3301]	318 [2816] 439 [3882]	375 [3319] 548 [4849]	387 [3429] 539 [4769]
Pressure Δbar [ΔPSI]	Continuous Intermittent	165 [2400] 179 [2600]	165 [2400] 179 [2600]	152 [2200] 179 [2600]	124 [1800] 179 [2600]	110 [1600] 165 [2400]	97 [1400] 138 [2000]

Note:

To assure best motor life, run motor for approximately one hour at 30% of rated pressure before application to full load. Be sure motor is filled with fluid prior to any load applications.

Maximum Inlet Pressure:

179 bar [2600 PSI]
Do Not Exceed Δ Pressure Rating (for displacement size see chart above).

Return Pressure (Back-Pressure):

Do not exceed Δ pressure rating (see chart above). Case drain required.

Note:

Optional version can be used without case drain.

Case Pressure:

Minimum – No Pressure
Maximum – 103 bar [1500 PSI] without case drain.

Note:

The case must be flooded when the motor is operating.

Δ Pressure:

The true Δ bar [Δ PSI] between inlet port and return port

Continuous Rating:

Motor may be run continuously at these ratings

Intermittent Operation:

10% of every minute

Recommended Fluids:

Premium quality, anti-wear type hydraulic oil with a viscosity of not less than 70 SUS at operating temperature.

Recommended Maximum System Operating Temp.:

82°C [180°F]

Recommended Filtration:

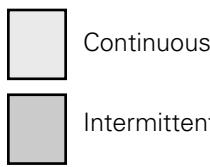
per ISO Cleanliness Code, level 20/18/13

W Series (162-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from motor to motor in production.



80 cm³/r [4.9 in³/r]												
△ Pressure bar [PSI] Continuous												
	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2000] 138	[2200] 152	[2400] 165	[2600] 179
[2]	[204] 23 93	[337] 38 89	[474] 54 88	[612] 69 84	[748] 85 83	[883] 79 73	[1019] 100 115	[1149] 115 130	[1281] 130 145	[1412] 145 160	[1540] 160 161	[1610] 174 182
7.6												
[4]	[223] 25 178	[357] 40 172	[489] 55 170	[627] 71 168	[769] 87 165	[902] 102 159	[1035] 117 157	[1169] 117 132	[1295] 146 154	[1424] 146 142	[1555] 161 131	[1676] 176 117
15.1												
[6]	[255] 29 267	[342] 39 265	[477] 54 262	[612] 69 258	[749] 85 257	[879] 99 252	[1014] 115 248	[1154] 130 241	[1286] 145 235	[1408] 159 229	[1533] 173 219	[1648] 186 206
22.7												

126 cm³/r [7.7 in³/r]												
△ Pressure bar [PSI] Continuous												
	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2000] 138	[2200] 152	[2400] 165	[2600] 179
[2]	[390] 44 58	[605] 68 56	[817] 92 55	[1032] 117 51	[1248] 141 49	[1448] 164 45	[1656] 187 43	[1871] 211 41	[2069] 234 33	[2243] 253 32	[2414] 273 26	[2513] 284 17
7.6												
[4]	[382] 43 113	[605] 68 106	[817] 92 104	[1036] 117 93	[1252] 141 97	[1463] 165 94	[1694] 191 94	[1908] 216 88	[2113] 239 82	[2306] 261 79	[2470] 279 74	[2640] 298 60
15.1												
[6]	[367] 41 172	[587] 66 167	[802] 91 164	[1017] 115 161	[1236] 140 156	[1444] 163 152	[1668] 188 147	[1882] 213 141	[2091] 236 134	[2284] 258 130	[2459] 278 120	[2637] 298 103
22.7												
[8]	[346] 39 228	[561] 63 225	[769] 87 220	[981] 111 216	[1203] 136 213	[1419] 160 208	[1634] 185 201	[1849] 209 195	[2039] 230 188	[2217] 250 174	[2432] 275 163	[2633] 297 149
30.3												

154 cm³/r [9.4 in³/r]												
△ Pressure bar [PSI] Continuous												
	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2000] 138	[2200] 152	[2400] 165	[2600] 179
[2]	[450] 51 47	[723] 82 47	[989] 112 46	[1249] 141 40	[1512] 171 39	[1769] 200 36	[2021] 228 33	[2269] 256 30	[2502] 283 30	[2714] 307 26	[2904] 328 19	[3019] 341 10
7.6												
[4]	[470] 53 94	[737] 83 93	[1009] 114 90	[1276] 144 89	[1540] 174 87	[1802] 204 84	[2064] 233 81	[2323] 262 78	[2570] 290 73	[2813] 318 67	[3019] 341 65	[3242] 366 52
15.1												
[6]	[435] 49 143	[715] 81 140	[984] 111 138	[1252] 141 137	[1513] 171 134	[1787] 202 131	[2020] 228 128	[2274] 257 124	[2521] 285 124	[2812] 318 117	[3042] 344 112	[3301] 373 103
22.7												
[8]	[407] 46 190	[677] 76 188	[945] 107 186	[1214] 137 184	[1477] 167 182	[1740] 197 179	[2005] 227 176	[2260] 255 171	[2503] 283 166	[2735] 309 158	[2964] 335 148	[3206] 362 137
30.3												
[9]	[380] 43 214	[648] 73 212	[914] 103 210	[1183] 134 207	[1452] 164 206	[1714] 194 202	[1981] 224 200	[2243] 253 196	[2499] 282 191	[2733] 309 182	[2964] 335 173	[3195] 361 162
34												

195 cm³/r [11.9 in³/r]												
△ Pressure bar [PSI] Continuous												
	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2000] 138	[2200] 152	[2400] 165	[2600] 179
[2]	[478] 54 38	[827] 93 38	[1171] 132 37	[1511] 171 36	[1839] 208 35	[2153] 243 34	[2452] 277 34	[2756] 311 30	[3027] 342 29	[3275] 370 26	[3513] 397 22	[3673] 415 16
7.6												
[4]	[515] 58 75	[872] 99 73	[1220] 138 73	[1558] 176 71	[1886] 213 70	[2206] 249 69	[2518] 284 66	[2816] 318 64	[3107] 351 62	[3382] 382 56	[3647] 412 52	[3882] 439 44
15.1												
[6]	[524] 59 114	[878] 99 111	[1214] 137 111	[1551] 175 110	[1875] 212 108	[2199] 248 106	[2518] 284 105	[2824] 319 103	[3113] 352 99	[3389] 383 95	[3666] 414 91	
22.7												
[8]	[518] 59 151	[856] 97 150	[1187] 134 150	[1524] 172 149	[1861] 210 147	[2187] 247 145	[2499] 282 144	[2782] 314 143	[3064] 346 141	[3334] 377 136		
30.3												
[10]	[462] 52 190	[797] 90 188	[1133] 128 187	[1468] 166 186	[1799] 203 184	[2118] 239 184	[2442] 276 182	[2739] 309 179	[3023] 342 176	[3281] 371 160		
38												

{ 3673 } Torque [lb-in
415 Nm
16 Speed RPM

W Series (162-)

Performance Data

Motors run with high efficiency in all areas designated with a number for torque and speed. For best motor life select a motor to run with a torque and speed range shown in the light shaded area.

Performance data is typical at 120 SUS. Actual data may vary slightly from motor to motor in production.



Continuous



Intermittent

251 cm ³ /r [15.3 in ³ /r]											
△ Pressure bar [PSI] Continuous											
	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2000] 140	[2200] 152	[2400] 165
[2]	[759] 86 30	[1194] 135 29	[1683] 190 29	[2122] 240 28	[2535] 286 27	[2928] 331 27	[3319] 375 25	[3634] 411 22	[3946] 446 17	[4242] 479 15	[4553] 514 14
7,6											
[4]	[806] 91 59	[1257] 142 58	[1691] 191 58	[2130] 241 56	[2563] 290 55	[2988] 338 55	[3381] 382 52	[3799] 429 48	[4147] 469 47	[4515] 510 41	[4849] 548 40
15,1											
[6]	[780] 88 90	[1219] 138 88	[1646] 186 87	[2084] 235 86	[2515] 284 85	[2933] 331 83	[3336] 377 83	[3716] 420 79			
22,7											
[8]	[720] 81 120	[1148] 130 118	[1590] 180 117	[2029] 229 117	[2449] 277 114	[2861] 323 112	[3236] 366 111	[3627] 410 108			
30,3											
[10]	[645] 73 148	[1080] 122 147	[1513] 171 147	[1947] 220 145	[2371] 268 145	[2779] 314 143	[3151] 356 141	[3515] 397 137			
37,9											
[12]	[557] 63 178	[992] 112 177	[1428] 161 176	[1864] 211 174	[2292] 259 174	[2697] 305 172	[3087] 349 169				
45,4											
[14]	[460] 52 208	[888] 100 206	[1330] 150 206	[1761] 199 203	[2191] 248 202	[2615] 295 202	[3035] 343 197				
53,0											

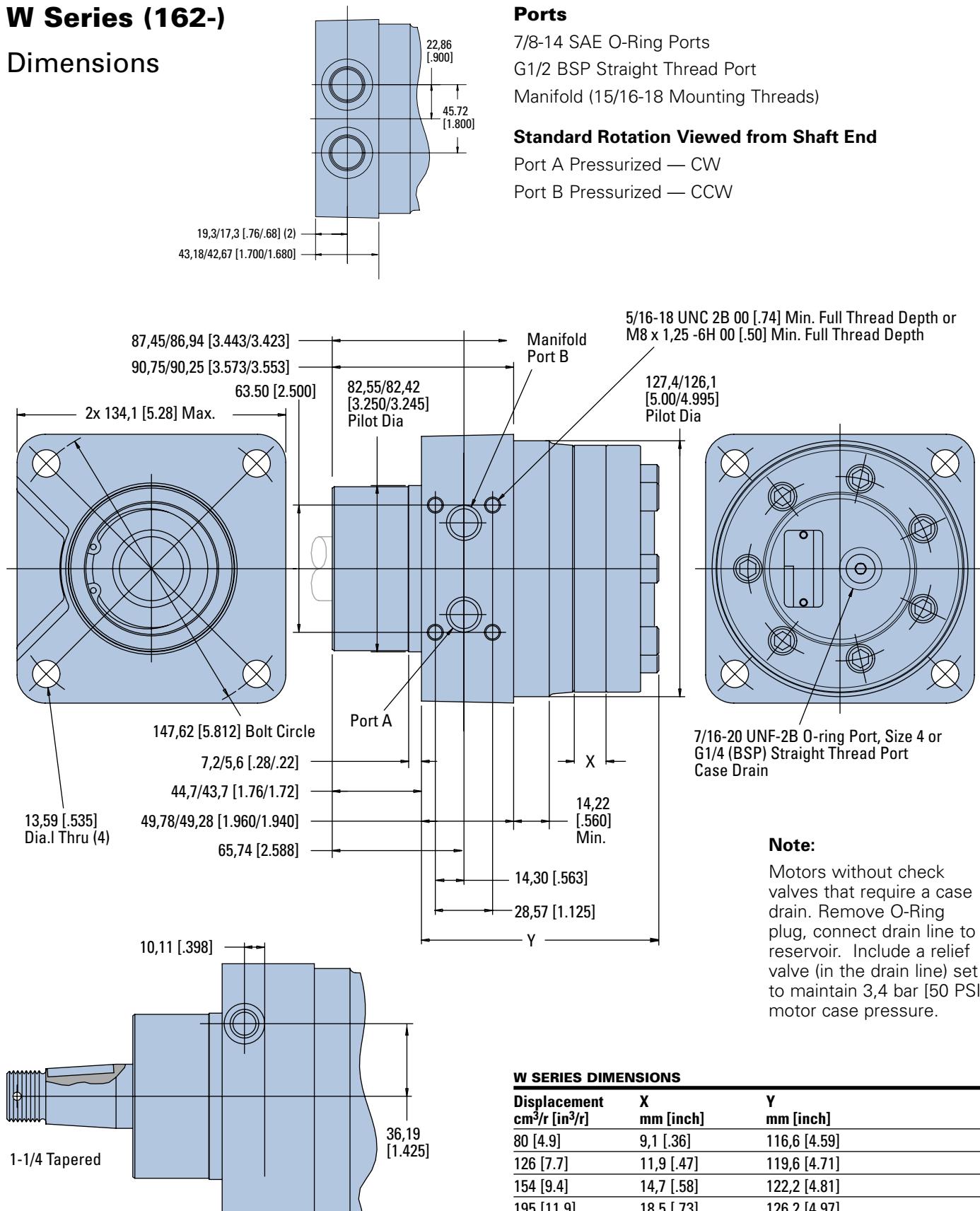
303 cm ³ /r [18.5 in ³ /r]											
△ Pressure bar [PSI] Continuous											
	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2000] 140	[2200] 152	[2400] 165
[2]	[920] 104 24	[1454] 164 24	[1974] 223 24	[2480] 280 23	[2969] 335 22	[3429] 387 22	[3859] 436 20	[4230] 478 18	[4583] 518 16		
7,6											
[4]	[960] 108 49	[1487] 168 49	[2007] 227 49	[2513] 284 47	[3006] 340 46	[3457] 391 45	[3905] 441 44	[4338] 490 41	[4769] 539 39		
15,1											
[6]	[911] 103 73	[1445] 163 73	[1961] 222 72	[2473] 279 72	[2952] 334 71	[3411] 385 69	[3842] 434 68	[4276] 483 66			
22,7											
[8]	[843] 95 99	[1375] 155 98	[1888] 213 97	[2393] 270 96	[2886] 326 95	[3350] 379 94	[3763] 425 93				
30,3											
[10]	[752] 85 123	[1274] 144 122	[1789] 202 122	[2303] 260 120	[2792] 316 119	[3274] 370 119	[3650] 412 118				
37,9											
[12]	[652] 74 148	[1170] 132 147	[1691] 191 146	[2199] 248 145	[2691] 304 145	[3123] 353 144					
45											
[14]	[526] 59 172	[1039] 117 172	[1560] 176 171	[2064] 233 170	[2548] 288 169	[2999] 339 168					
53											
[16.5]	[353] 40 203	[864] 98 203	[1367] 154 201	[1876] 212 200	[2369] 268 200						
62											

4583 }
518 }
16 }
Torque [lb-in]
Nm
Speed RPM

374 cm ³ /r [22.8 in ³ /r]											
△ Pressure bar [PSI] Continuous											
	[400] 28	[600] 41	[800] 55	[1000] 69	[1200] 83	[1400] 97	[1600] 110	[1800] 124	[2000] 140	[2200] 152	[2400] 165
[2]	[1086] 123 20	[1753] 198 19	[2365] 267 17	[2960] 334 16	[3533] 399 14	[4025] 455 12	[4484] 507 12	[4970] 562 11			
7,6											
[4]	[1152] 130 39	[1797] 203 39	[2431] 275 38	[3048] 344 36	[3624] 409 34	[4129] 467 33	[4599] 520 31				
15,1											
[6]	[1099] 124 60	[1749] 198 58	[2377] 269 57	[2996] 339 56	[3557] 402 54	[4077] 461 53					
22,7											
[8]	[1018] 115 80	[1662] 188 79	[2290] 259 78	[2894] 327 76	[3440] 389 75	[3952] 447 74					
30,3											
[10]	[940] 106 100	[1582] 179 99	[2210] 250 97	[2812] 318 96	[3346] 378 95	[3816] 431 95					
37,9											
[12]	[809] 91 120	[1454] 164 119	[2077] 235 117	[2677] 302 116	[3216] 363 115						
45,4											
[14]	[648] 73 141	[1284] 145 139	[1907] 215 138	[2506] 283 137	[3033] 343 137						
53,0											
[16]	[485] 55 160	[1107] 125 159	[1722] 195 157	[2315] 262 157	[2838] 321 157						
60,6											
[18]	[307] 35 180	[930] 105 179	[1543] 174 178	[2133] 241 178							
68,1											
[20]	[1111] 13 201	[730] 82 199	[1342] 152 198	[1939] 219 197							
75,7											

W Series (162-)

Dimensions



Note:

Motors without check valves that require a case drain. Remove O-Ring plug, connect drain line to reservoir. Include a relief valve (in the drain line) set to maintain 3,4 bar [50 PSI] motor case pressure.

W SERIES DIMENSIONS

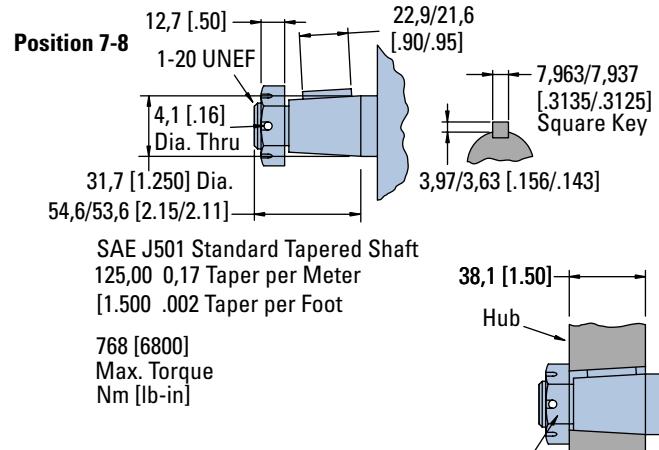
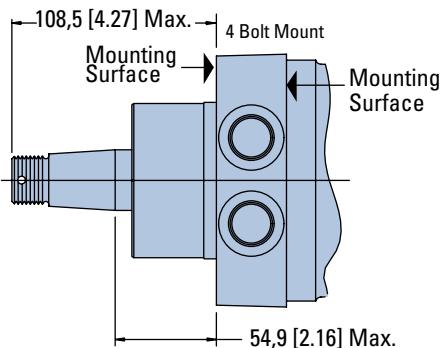
Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]
80 [4.9]	9,1 [.36]	116,6 [4.59]
126 [7.7]	11,9 [.47]	119,6 [4.71]
154 [9.4]	14,7 [.58]	122,2 [4.81]
195 [11.9]	18,5 [.73]	126,2 [4.97]
251 [15.3]	23,9 [.94]	131,6 [5.18]
303 [18.5]	29,0 [1.14]	136,4 [5.37]
374 [22.8]	35,6 [1.40]	143,3 [5.64]

W Series (162-)

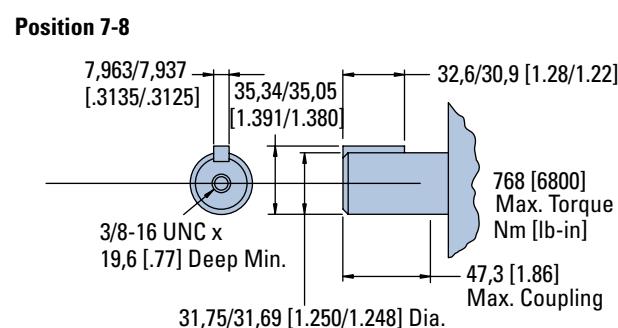
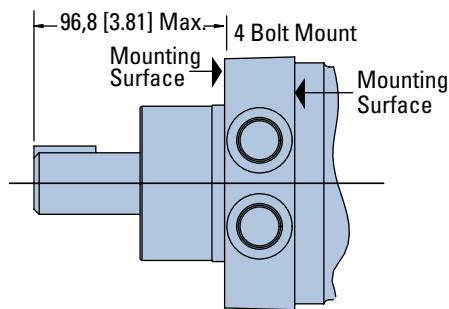
Dimensions

Shafts

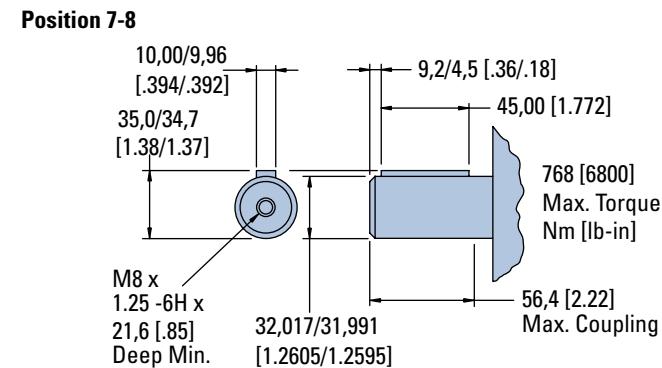
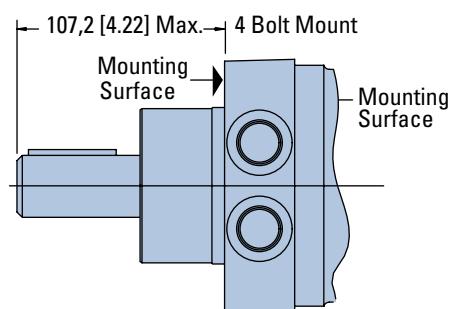
1 1/4 Tapered



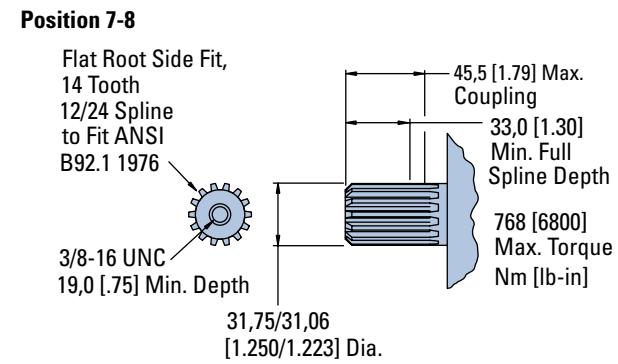
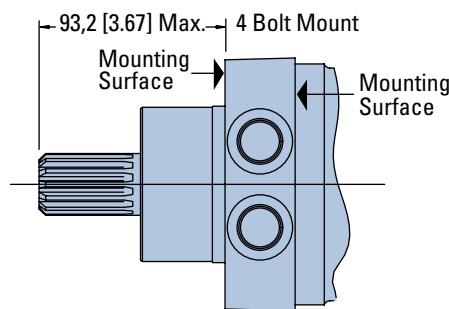
1 1/4 Inch Straight



32 mm Straight



1 1/4 14 Tooth Splined



Recommended Torque:
(373 Nm [275 lb-ft] Dry)
(305 Nm [225 lb-ft] Lub) Plus
Torque required to align the
slotted nut with the Shaft
Crosshole.

W Series (162-)

Shaft Side Load Capacity

1) Case pressure needs to be added to the outward axial thrust load and subtracted from inward axial thrustload – Case Pressure bar x 87, 1 [PSI] x 1.35]

2) Life values in Chart A can be adjusted for speeds up to 200 rpm.

$$\text{Life value} \times 100 \text{ rpm} \\ \text{application rpm}$$

3) Shaded areas are intermittent loading.

4) To convert application radial load at any load location to sideload at the center of keyway multiply load by the application factor from Chart B.

Example:

Side Load: 4849 N @ 120 mm [1090 lbf @ 4.75 inch] from flange.

Average Thrust Load: 890 N [200 lbf] inward (toward motor).

Case Pressure: 66 bar [960 PSI].

Average Speed: 150 rpm.

Expected Life Calculation: Adjust side load value (due to load variation): from Chart B look at 120mm [4.75 inch] read at angled curve for load adjustment factor of 1.38. Adjusted load is: (4849 N [1090 lbf]) x (1.38) = 6690 N [1504 lbf]

Thrust Load Value (due to case pressure): $(960 \text{ PSI}) \times (1.35) = 1296 \text{ lbf}$

$(66 \text{ bar}) \times (87.1) = 5750 \text{ N}$

Average thrust load found to be 890 N [200 lbf] inwards so subtract from thrust load due to case pressure:

$5750 \text{ N} - 890 \text{ N} = 4860 \text{ N}$ or
 $[1296 \text{ lbf}] - 200 \text{ lbf} = [1096 \text{ lbf}]$

Read Life Expectancy from Chart A: Value from chart reading across top to 6672 [1500] (6090 N [1504 lbf]) and down left side to 4895 [1100] (4875 N [1096 lbf])

Life = 1800 Hours

Speed Adjustment for over 100 rpm:

$$\frac{(1800 \text{ hrs}) \times (100 \text{ rpm})}{150 \text{ rpm}} = 1200 \text{ Hours}$$

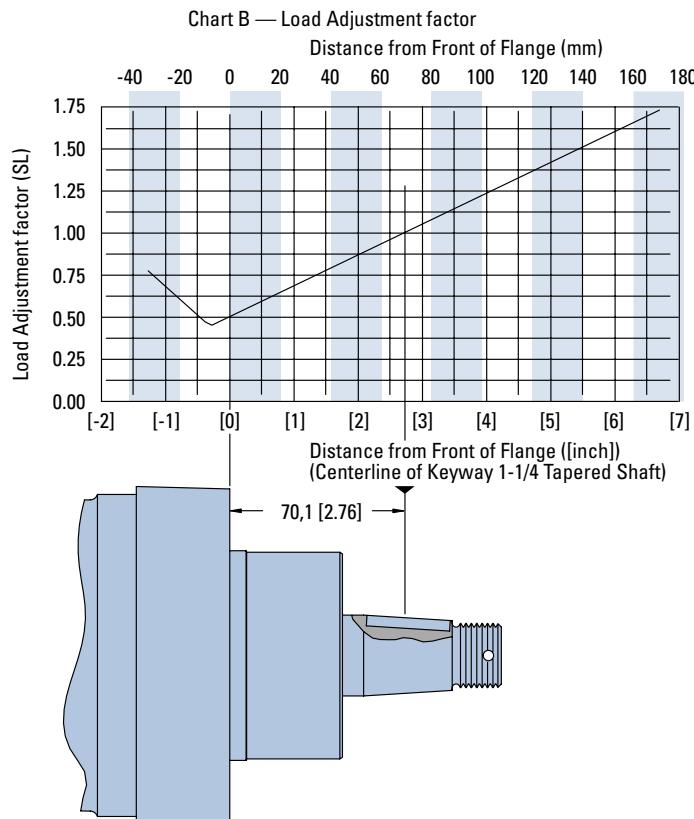


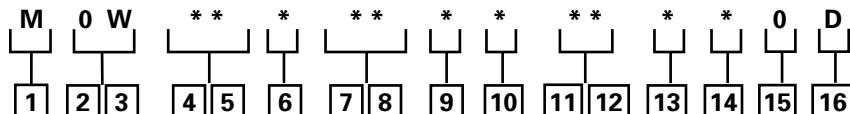
CHART A — EXPECTED B10 LIFE (HOURS) OF BEARING UNDER VARIOUS LOADS

Axial Thrust		Radial Load at Centerline of keyway at 100 RPM									
N	Ibf	1110 [250]	2225 [500]	3335 [750]	4450 [1000]	4560 [1250]	6670 [1500]	7785 [1750]	8895 [2000]	11120 N [2500lbf]	13345 N [3000lbf]
445	[100]	410 600	66 000	19 600	8 300	4 200	2 400	1 500	1 000	530	310
1335	[300]	92 700	40 900	19 600	8 300	4 200	2 400	1 500	1 000	530	310
2225	[500]	39 400	20 900	12 400	7 900	4 200	2 400	1 500	1 000	530	310
3115	[700]	21 400	12 600	8 100	5 500	3 900	2 400	1 500	1 000	530	310
4005	[900]	13 300	8 400	5 700	4 000	2 900	2 200	1 500	1 000	530	
4895	[1100]	9 000	6 000	4 200	3 100	2 300	1 800	1 400	1 000		
5785	[1300]	6 500	4 500	3 200	2 400	1 900	1 500	1 200	900		
6670	[1500]	4 800	3 500	2 600	2 000	1 500	1 200	1 000			
7560	[1700]	3 700	2 800	2 100	1 600	1 300					
8450	[1900]	3 000	2 200								
8895	[2000]	Max. Thrust									

W Series (162-)

Model Code

The following 16-digit coding system has been developed to identify all of the configuration options for the W Series motor. Use this model code to specify a motor with the desired features. All 16-digits of the code must be present when ordering. You may want to photocopy the matrix below to ensure that each number is entered in the correct box.



1 Product

M – Motor

2, 3 Series

0W – W Series

4, 5 Displacement cm³/r [in³/r]

05 – 30 [4.9]

08 – 126 [7.7]

09 – 154 [9.4]

12 – 195 [11.9]

15 – 251 [15.3]

19 – 303 [18.5]

23 – 374 [22.8]

6 Mounting Type

B – 4 Bolt (Wheel) 82,6
[3.25] Pilot Dia. and 13,59
.535 Dia. Mounting Holes
147,6 [5.81] Dia., B.C., 127,0
127,0 [5.00] rear pilot

7, 8 Output Shaft

02 – 1 1/4 inch Dia. Flat Root
Side Fit, 14 Tooth, 12/24 DP
30° Involute Spline with 3/8-
16 UNC-2B Thread in End,
33,0 [1.30] Min. Full Spline

03 – 1 1/4 inch Dia. .125:1
Tapered Shaft Per SAE
J501 with 1– 20 UNEF -2A
Threaded Shaft End and
Slotted Hex Nut, 7,938
[.3125] Square x 22,22 [.875]
Straight Key

04 – 32mm Dia. Straight
Shaft with M8 x 1, 25-6H
Thread in End, 9,982 [.3930]
Wide x 7,995 [.3132] High x
45,00 [1.772] Long Key

06 – 1 1/4 inch Dia. Straight
Shaft with 3/8 – 16 UNC 2B
Thread in End, 7,938 [.3125]
Square x 34,92 [1.375]
Straight Key

9 Ports

A – 7/8-14 UNF - 2B SAE
O-Ring Port

B – G 1/2 (BSP) Straight
Thread Port

10 Case Flow Options

A – 7/16 - 20 UNF - 2B SAE
O-Ring Port

B – G 1/4 (BSP) Straight
Thread Port

C – Internal Check Valve

11, 12 Special Features (Hardware)

00 – None

01 – Viton Seals

13 Special Features (Assembly)

0 – None

1 – Reverse Rotation

14 Paint/Special Packaging

0 – No Paint, Individual Box

A – Painted Low Gloss
Black, Bulk Box Option

15 Eaton Assigned Code when Applicable

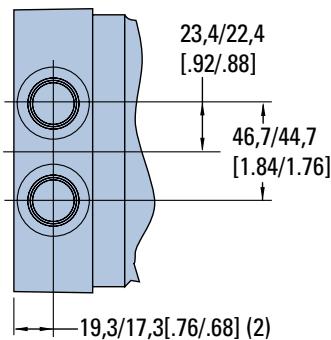
0 – Assigned Code

16 Eaton Assigned Design Code

D – Assigned Design Code

W Series with Parking Brake (162-)

Dimensions



Ports

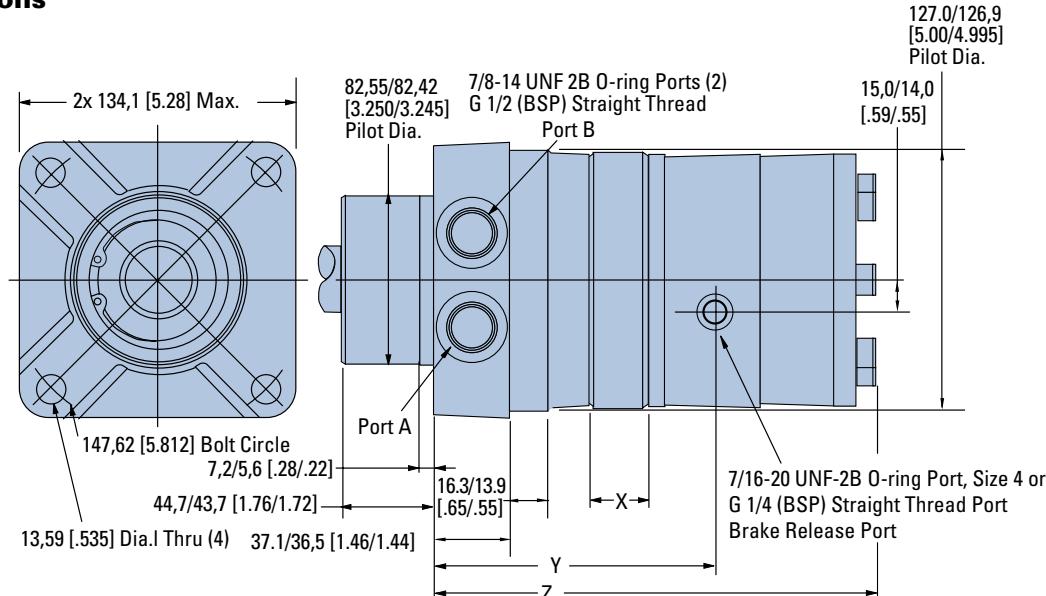
7/8 -14 UNF 2B SAE O-Ring Ports (2) or
G 1/2 (BSP) Straight Thread

Standard Rotation Viewed from Shaft End

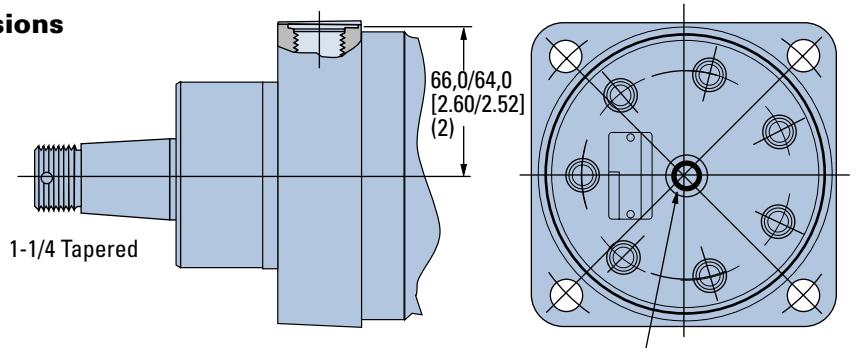
Port A Pressurized — CW

Port B Pressurized — CCW

Port Dimensions



Mounting Dimensions



7/16-20 UNF-2B O-ring Port, Size 4 or
G 1/4 (BSP) Straight Thread Port—
Manual Brake Release Access Port

PORTING AND MOUNTING DIMENSIONS

Displacement cm ³ /r [in ³ /r]	X mm [inch]	Y mm [inch]	Z mm [inch]
80 [4.9]	9,1 [0.36]	119,9 [4.72]	198,4 [7.81]
126 [7.7]	11,9 [0.47]	122,9 [4.84]	201,2 [7.92]
154 [9.4]	14,7 [0.58]	125,5 [4.94]	204,0 [8.03]
195 [11.9]	18,5 [0.73]	129,6 [5.10]	207,8 [8.18]
251 [15.3]	23,9 [0.94]	134,9 [5.31]	213,4 [8.40]
303 [18.5]	29,0 [1.14]	139,7 [5.50]	217,7 [8.59]
374 [22.8]	35,6 [1.40]	146,6 [5.77]	226,8 [8.85]

SPECIFICATIONS

Brake Release Pressure 205 bar [3000 PSI] Max.; 15 bar [250 PSI] Min.

W Series, W Series with Parking Brake (162-)

Product Numbers

Use digit prefix —
162 plus four digit number
from charts for complete
product number —
Example 162-1153.

**Orders will not be
accepted without three
digit prefix.**

Standard

SHAFT	DISPL. cm³/r [in³/r] / PRODUCT NUMBER	80 [4.9]	126 [7.7]	154 [9.4]	195 [11.9]	251 [15.3]	303 [18.5]	374 [22.8]
Standard	162-1016	-1017	-1018	-1019	-1020	-1021	-1022	
w/Case Drain	162-1023	-1024	-1025	-1009	-1008	-1026	-1027	

162-1009

W Series with Parking Brake

SHAFT	DISPL. cm³/r [in³/r] / PRODUCT NUMBER	80 [4.9]	126 [7.7]	154 [9.4]	195 [11.9]	251 [15.3]	303 [18.5]	374 [22.8]
Standard	162-1143	-1144	-1145	-1146	-1183	-1148	-1149	

162-1146

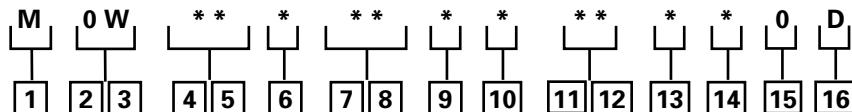
Note:

All above motors have
1-1/4 inch tapered output
shaft, 7/8 inch O-Ring Ports,
internal check valves.

For W Series Motors with
a configuration not shown
in the chart above: Use
the model code number
system to specify the
product in detail. (see page
B-5-8 and use the model
code supplement shown
on page B-5-11 for spring-
applied hydraulic-release
parking brake).

W Series with Parking Brake (162-)

Model Code



[1] Product

M – Motor

[2], [3] Series

0W – W Series with
Parking Brake

[4], [5] Displacement cm³/r [in³/r]

05 – 30 [4.9]

08 – 126 [7.7]

09 – 154 [9.4]

12 – 195 [11.9]

15 – 251 [15.3]

19 – 303 [18.5]

23 – 374 [22.8]

[6] Mounting Type

B – 4 Bolt (Wheel) 82,6
[3.25] Pilot Dia. and 13,59
[.535] Dia. Mounting Holes
147,6 [5.81] Dia., B.C., 127,0
127,0 [5.00] rear pilot

The following 16-digit coding system has been developed to identify all of the configuration options for the W motor. Use this model code to specify a motor with the desired features. All 16-digits of the code must be present when ordering. You may want to photocopy the matrix below to ensure that each number is entered in the correct box.

[7], [8] Output Shaft

02 – 1 1/4 inch Dia. Flat Root
Side Fit, 14 Tooth, 12/24 DP
30° Involute Spline with 3/8-
16 UNC-2B Thread in End,
33,0 [1.30] Min. Full Spline

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Square x 34,92 [1.375]
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Thread Port

[10] Case Flow Options

A – 7/16 - 20 UNF - 2B SAE
O-Ring Port

B – G 1/4 (BSP) Straight
Thread Port

C – Internal Check Valve

[11], [12] Special Features (Hardware)

00 – None

01 – Viton Seals

11 – Spring-applied
hydraulic-release brake

[13] Special Features (Assembly)

0 – None

1 – Reverse Rotation

[14] Paint/Special Packaging

0 – No Paint, Individual
Box

A – Painted Low Gloss
Black - Individual Box

[15] Eaton Assigned Code when Applicable

0 – Assigned Code

[16] Eaton Assigned Design Code

D – Assigned Design Code