RA10553
Edition: 2021-11

High Torque Vane Motor – MV125 Series Technical Data Sheet

- Maximum operating pressure:
  - 3000 psi (207 bar)
    - Code 61
  - 4500 psi (310 bar)
    - Code 62

Features

Use: Medium speed, high torque applications requiring reliability in demanding mobile equipment applications. Small size, high torque at start and stall, and through-hole are important features.

- Six fixed displacement rotating groups ranging from 60 in^3 to 125 in^3 (983 cm^3/rev to 2048 cm^3/rev)
- Double stack motors using two ports with displacement from 120 in^3 to 250 in^3 (1966 cm^3/rev to 4097 cm^3/rev)
- 4-port motors from 120 in^3 to 250 in^3 (1966 cm^3/rev to 4097 cm^3/rev) capable of two-speed or three-speed operation with external valving
- Starting and stall torques up to 92% of theoretical torque
- Speed to 300 RPM continuous
- Up to 788 HP (588 kW)
- Customizable for direct drive applications
- High power to weight ratio
- High reliability in demanding applications
- Long service life

Overview of contents

Ordering code

01		02		03		04		05		06		07	08	09		10	
MV125	**–**	**A2**	**–**	**1S**	**–**	**098**	**–**	**30**	**–**	**B1**	**–**	**T**	**B**	**B**	**–**	**000**	

01	**Motor Series**	**MV125**

Port Options – Rear port orientation can be specified. Consult factory.

02	***Code 61***	
	1-1/2" 4 – bolt flange, 2-port	**A2**
	1-1/2" 4 – bolt flange, 4-port	**A4**
	SAE 24	
	O-ring boss, 2-port	**C2**
	O-ring boss, 4-port	**C4**
	Code 62	
	1-1/2" 4 – bolt flange, 2-port	**H2**
	1-1/2" 4 – bolt flange, 4-port	**H4**

Rotary Group Designation

03	Code 61 – standard speed	**1S**
	Code 62 – standard speed	**2S**

Displacement Options

04	***Single rotating group***	
	60 in^3 (983 cc)/rev.	**060**
	68 in^3 (1114 cc)/rev.	**068**
	82 in^3 (1344 cc)/rev.	**082**
	98 in^3 (1606 cc)/rev.	**098**
	113 in^3 (1852 cc)/rev.	**113**
	125 in^3 (2048 cc)/rev.	**125**
	2-port double stack	
	Same displacement possible in double stack as four ports	
	4-port	
	120 in^3 (1966 cc)/rev. – 60/60 suitable for series/parallel circuit	**120**
	128 in^3 (2098 cc)/rev. – 60/68 requires logic circuit for operation as a two speed	**128**
	136 in^3 (2229 cc)/rev. – 68/68 suitable for series/parallel circuit	**136**
	142 in^3 (2327 cc)/rev. – 60/82 requires logic circuit for operation as a two speed	**142**
	150 in^3 (2458 cc)/rev. – 68/82 requires logic circuit for operation as a two speed	**150**
	158 in^3 (2589 cc)/rev. – 60/98 requires logic circuit for operation as a two speed	**158**
	164 in^3 (2687 cc)/rev. – 82/82 suitable for series/parallel circuit	**164**
	166 in^3 (2720 cc)/rev. – 68/98 requires logic circuit for operation as a two speed	**166**
	173 in^3 (2835 cc)/rev. – 60/113 requires logic circuit for operation as a two speed	**173**
	180 in^3 (2950 cc)/rev. – 82/98 requires logic circuit for operation as a two speed	**180**
	181 in^3 (2966 cc)/rev. – 68/113 requires logic circuit for operation as a two speed	**181**
	185 in^3 (3032 cc)/rev. – 60/125 requires logic circuit for operation as a two speed	**185**
	193 in^3 (3163 cc)/rev. – 68/125 requires logic circuit for operation as a two speed	**193**
	195 in^3 (3195 cc)/rev. – 82/113 requires logic circuit for operation as a two speed	**195**
	196 in^3 (3212 cc)/rev. – 98/98 suitable for series/parallel circuit	**196**

Ordering code

01		02		03		04		05		06		07	08	09		10	
MV125	**–**	**A2**	**–**	**1S**	**–**	**098**	**–**	**30**	**–**	**B1**	**–**	**T**	**B**	**B**	**–**	**000**	

Displacement Options (continued)

04	207 in^3 (3392 cc)/rev. – 82/125 requires logic circuit for operation as a two speed	**207**
	211 in^3 (3458 cc)/rev. – 98/113 requires logic circuit for operation as a two speed	**211**
	223 in^3 (3654 cc)/rev. – 98/125 requires logic circuit for operation as a two speed	**223**
	226 in^3 (3703 cc)/rev. – 113/113 suitable for series/parallel circuit	**226**
	238 in^3 (3900 cc)/rev. – 113/125 requires logic circuit for operation as a two speed	**238**
	250 in^3 (4097 cc)/rev. – 125/125 suitable for series/parallel circuit	**250**

Motors assembled with largest displacement rotating group closest to front housing

Shaft Selection

05	Keyed	**30**
	Splined	**31**
	Direct mount (shaftless with enlarged bearing and seal ID)	**33**
	Keyed shaft out front & rear	**34**
	Shaft with internal key	**35**
	Shaft with internal spline	**36**
	Shaftless (no bearings or seals)	**37**
	Splined shaft out front & rear	**40**
	Keyed front with rear shaft – configured to customer specifications	**42**
	Splined front with rear shaft – configured to customer specifications	**43**
	Hollow shaft with API NC26 (2-7/8") internal flush threads	**53**

Bearing Selection

06	*See Code 61 & 62 shaft and bearing combinations for availability (Page 4)*	

Shaft Seal (see page 9)

07	TCN (radial lip seal)	**T**
	PolyPak (O-ring loaded U-cup seal)	**P**
	Disogrin (U-cup seal)	**D**
	No shaft seal	**0**

Main Body O-rings (see page 8 for seal material specifications)

08	NBR (Buna) – not available in Code 62	**B**
	FKM (Viton) – Code 61 optional, Code 62 only	**V**

Pedestal O-rings (see page 8 for seal material specifications)

09	NBR (Buna) – Code 61 standard, not available in Code 62	**B**
	FKM (Viton) – Code 61 optional, not available in Code 62	**V**
	Disogrin – Code 62 only	**D**

Special Index Number

10	Standard design – special features are designated with a three-digit code (consult factory)	**000**

Ordering code

Shaft and bearing combinations

Code 61

	30	31	33	34	35	36	37	40	42	53
00	—	—	—	—	—	—	●	—	—	—
B1	●	●	—	●	—	—	—	○	●	—
B2	—	—	●	—	●	●	—	—	—	—
T1	●	●	—	—	—	—	—	—	—	●

Code 62

	30	31	36	37	53
00	—	—	—	●	—
B1	—	●	—	—	—
T1	●	●	—	—	—
T2	—	—	—	—	●
T3	—	—	—	—	●
T4	—	—	●	—	—

● = available ○ = upon request – = not available

Note: Other shaft and bearing combinations may be available. Consult factory.

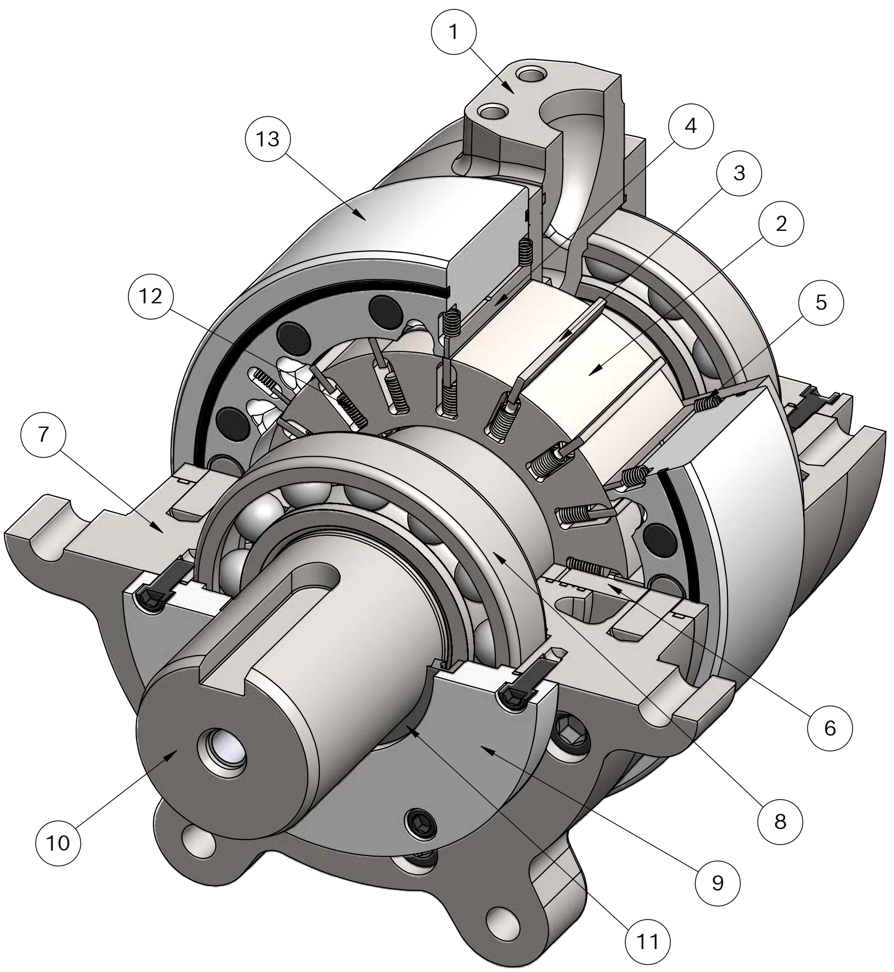
Weights

Type of motor	lbs.	kg
Code 61, 2-port	225	102.2
Code 61, 2-port, 34 shaft	235	106.7
Code 61, 2-port, 35 & 36 shaft	200	90.8
Code 61, 2-port, double stack	300	136.2
Code 61, 4-port	380	172.5
Code 62, 2-port	257	116.7
Code 62, 2-port, 53 shaft	242	109.9
Code 62, 2-port, double stack	343	155.7
Code 62, 4-port	449	204.3
Code 62, 4-port, 53 shaft	449	204.3

Technical data

The MV125 series motors are hydraulically balanced internally and therefore no significant radial loads are induced on the motor bearings which contribute to long service life. The motor can be configured with various bearing options to accommodate external radial and axial loading. This data sheet details standard motors (see Figure 1); technically feasible, custom solutions may be offered. Please consult factory.

Oil supply lines are connected to ports A and B on 2-port and double stack motor configurations and to A1, A2, B1 and B2 on 4-port configurations. Case drain lines can be installed on the C1 port. Reference motor unit drawings on page 6 for additional case line locations and Case Drain section on page 37 for details. Using the "A" port as the inlet will provide clockwise shaft rotation as seen from the front of the shaft. Using the "B" port will provide counter-clockwise shaft rotation also seen from the front of the shaft (see Figure 2 & Figure 3). The 4-port configuration has the front housing port designated "A1," the center housing ports have been designated "A2" and "B1," and the rear housing port is designated as "B2." This configuration can be used as a two speed motor with appropriate external valving. Like the motor with the single rotating group when inlet flow is provided to the "A1 and A2" ports the motor shaft rotation will be clockwise as seen from the front of the shaft, and when inlet flow is provided to the "B1 and B2" ports the motor shaft rotation will be counter-clockwise as seen from the front of the shaft (see Figure 4).



Item No.	Description
1	Rear Housing
2	Rotor
3	Rotor Vane
4	Stator Vane
5	Stator Vane Spring
6	Timing Plate
7	Front Housing
8	Bearing
9	Seal Plate
10	Shaft
11	Shaft Seal
12	Rotor Vane Springs
13	Stator

Figure 1. Basic parts list

Technical data

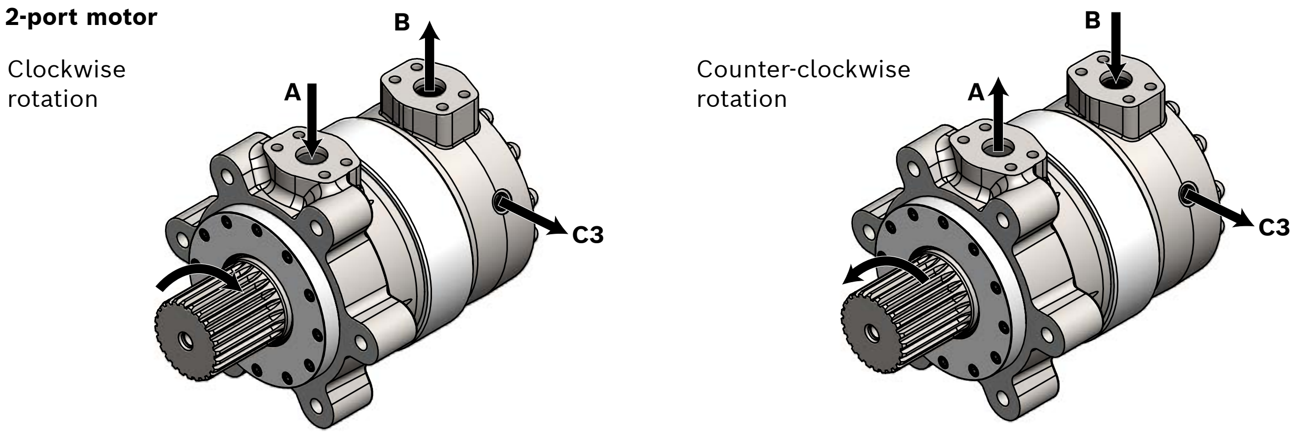


Figure 2. Oil flow direction to establish clockwise and counter-clockwise rotation on 2-port configuration motors.

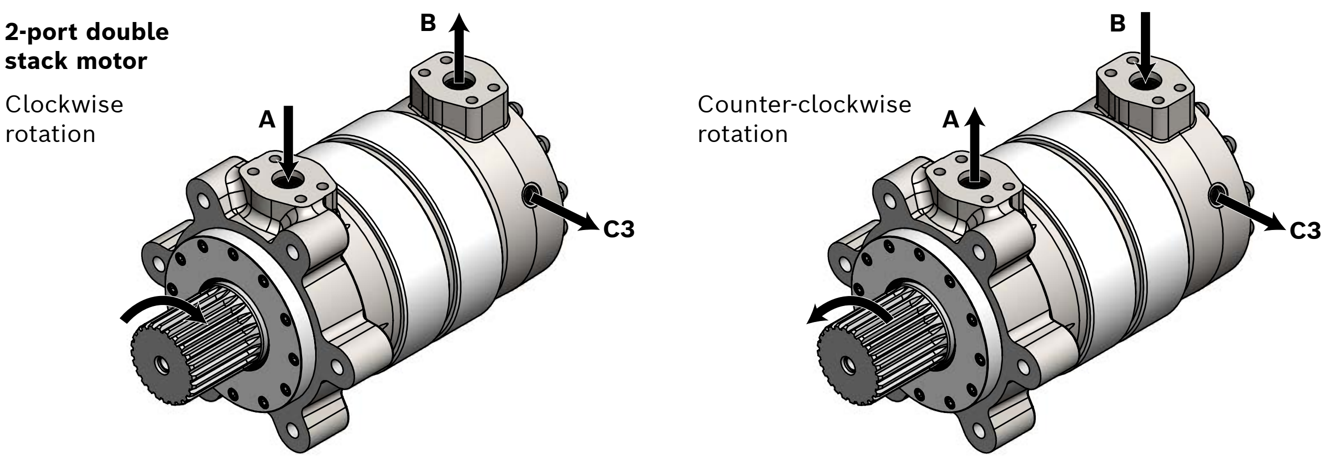


Figure 3. Oil flow direction to establish clockwise and counter-clockwise rotation on 2-port configuration motors.

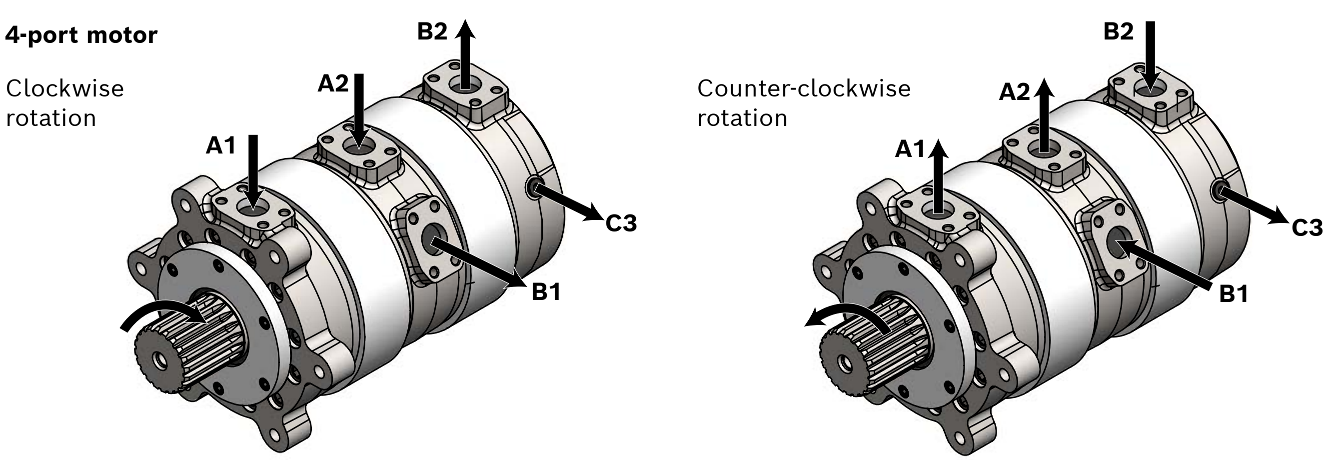


Figure 4. Oil flow direction to establish clockwise and counter-clockwise rotation on 4-port configuration motors.

Technical Data

Motor specifications

Standard Series Code 61	Displacement		Pressure				Speed		Torque @ 3000 psid (207 bar)*	
			Continuous		Intermittent		Continuous	Intermittent	Continuous	
	(in³/rev)	(cm³/rev)	(psid)	(bar)	(psid)	(bar)	(rpm)	(rpm)	(lb-ft)	(Nm)
MV125-A,C	60	983	3000	207	3500	241	350	400	2188	2967
	68	1114					350	400	2507	3399
	82	1344					300	350	3024	4100
	98	1606					300	350	3589	4866
	113	1852					300	350	4130	5600
	125	2048					300	350	4602	6239

High Performance Series Code 62	Displacement		Pressure				Speed		Torque @ 4500 psid (310 bar)*	
			Continuous		Intermittent		Continuous	Intermittent	Continuous	
	(in³/rev)	(cm³/rev)	(psid)	(bar)	(psid)	(bar)	(rpm)	(rpm)	(lb-ft)	(Nm)
MV125-H	60	983	4500	310	5000	345	350	400	3282	4450
	68	1114					350	400	3761	5099
	82	1344					300	400	4536	6150
	98	1606					300	400	5383	7298
	113	1852					300	400	6194	8398
	125	2048					300	400	6903	9359

* Torque values are average performance data measured at maximum speeds with 100 SUS (98 cSt) and standard rotating group.

Note:

1. When considering 2-port double stack or 4-port motors, any two displacements can be combined. The resultant torque is the sum of the two (2) displacements.
2. Maximum speed is limited by the highest displacement selected.
3. Intermittent duty cycle is six (6) seconds per minute.
4. Higher speeds or pressure may be permissible under certain conditions. Consult factory.

Technical data

Choice of hydraulic fluid

Bosch Rexroth Rineer high torque vane motors are primarily designed to operate on conventional petroleum based hydraulic oils. The hydraulic oil can be chosen in consultation with the oil supplier or your local sales office, bearing the following requirements in mind:

General

The oil shall have FZG (90) fail stage minimum 11 described in IP 334 (DIN 51354). The oil must also contain inhibitors to prevent oxidation, corrosion and foaming. The viscosity of mineral oil is highly dependent on the temperature. The final choice of oil must depend on the operating temperature that can be expected at the motor or that has been established in the system and not in the hydraulic tank.

High temperatures in the system greatly reduce the service life of oil and rubber seals, as well as resulting in low viscosity, which in turn provides poor lubrication. Content of water shall be less than 0.1%.

Oil used in the system should be filtered by a minimum of 25 micron filter.

Fluid Cleanliness

System Pressure	
< 3000 psi / 207 bar	> = 3000 psi / 207 bar
19/17/14*	18/16/13

* ISO 4406 Standard

Viscosity

Minimum Operating Viscosity	100 SSU / 20 cSt
Maximum Operating Viscosity	250 SSU / 54 cSt

Minimum operating viscosities must be met even at maximum temperature. Operating below 20 cSt will result in reduced life expectancy.

Maximum fluid temperature should not exceed 180 °F (82 °C).

Please consult with a Bosch Rexroth Rineer Applications Engineer when using fire resistant fluid, water glycols, biodegradable fluids, or viscosities outside above recommendations.

Seals

Buna N (NBR)

Temperature Range:
−65 °F to +250 °F (−54 °C to +121 °C)

Buna N is a copolymer of butadiene and acrylonitrile with excellent compatibility with petroleum products. For exposure in low temperatures it is necessary to sacrifice some high temperature resistance. The product is superior in compression set, cold flow, tear, and abrasion resistance. Inferior in resistance to ozone, sunlight or weather. It is generally recommended for petroleum, water, diester, and water-glycol. Not recommended for use with halogenated hydrocarbons, phosphate ester, ketones, acids, and brake fluids.

Fluorocarbon (FKM) (Viton)

Temperature Range:
−20 °F to +350 °F (−29 °C to +177 °C)

Viton is a linear copolymer of vinylidene fluoride and hexafluoro propylene which offers the widest temperature range and chemical resistance. The product is compatible and recommended for use with most fluids and gases such as petroleum, silicate ester, diester, halogenated hydrocarbons, and most phosphate esters. Viton has very good ozone, weather and aging resistance. It is not recommended for ketones, glycol based brake fluids, superheated steam, formic and acetic acids.

Disogrin (TODI/Polyurethane)

Temperature Range:
−54 °F to +230 °F (−48 °C to +110 °C)

Disogrin is a high performance polyurethane. This compound is primarily used on O-rings for heavy duty applications and possesses extremely high mechanical properties, offering outstanding resistance to abrasion, tear and extrusion over a large range of temperatures. It has high temperature stability resulting in very low compression set required for sealing ensuring maximum service life. It is suitable for use with petroleum based fluids and some biodegradable (synthetic and natural Ester) fluids.

Technical data

Bosch Rexroth Rineer offers three types of rotary seals for MV125 motors. Standard radial seals are loaded with a garter spring and have dual lips. The additional excluder/ dust lip provides increased protection for the primary pressure lip. PolyPak seals are O-ring loaded U-cups. Radial lip, and PolyPak seals are offered in both NBR and FKM materials. Also offered are Disogrin material U-cup seals.

Radial lip seals accommodate higher external radial loads and shaft speeds than U-cup designs. Both designs will accommodate axial loading on the shaft. Disogrin U-cup seals are mainly used in harsh environments with high contamination, such as drilling. PolyPak and Disogrin seal motors are generally paired with a secondary excluder/ wiper seal to extend seal life.

Heat failure of the material is the most common failure mode for a rotary seal. Reducing the friction at the shaft / seal interface is the most effective method of reducing heat buildup on the seal. The higher the pressure to be sealed combined with high shaft speeds results in increased friction (heat buildup), decreasing seal life. Properly performing rotary seals offer unique challenges. Our seals operate with an oil film under the seal / shaft contact area that separates the two surfaces reducing surface wear and providing cooling to the contact area. Slippage oil which by-passes the vanes, rotor and timing plate interface accumulates in the case and lubricates the bearings and seals.

Shaft seal options

Seal Type	Maximum Case Pressure	External Loading
Radial Lip Seal	35 psig (2.4 bar)	Radial / Axial
PolyPak	100 psig (6.9 bar)	Low Radial / Axial
Disogrin	100 psig (6.9 bar)	Low Radial / Axial
No Shaft Seal	500 psig (35 bar)	N/A

When the motor is mated to a gearbox, bearing box, or overhung load adapter, it is possible to specify the motor to have no shaft seal which would allow motor case flow to flush the companion component. In this instance, the driven component must have a case connection to allow flow back to tank at a pressure low enough for the rating of its shaft seal.

Technical data

Selecting / Sizing a Motor

Motor selection is dependent on the application and generally the required horsepower, motor speed range, and available supply pressure are to be defined. Alternatively desired output torque and speed for a given application can be used. Motor speed (shaft speed) is a function of flow delivered to the motor and displacement. Torque output is a function of differential pressure and motor displacement. The charts illustrated are based on actual performance data and account for losses in a given motor.

For example:
An application requirement is 136 hp (101.4 kW) at 200 rpm with an available supply pressure of 3200 psi (221 bar) and a return line pressure of 200 psi (14 bar). The pressure differential is 3000 psi (207 bar).

Calculations:

Theoretical torque (ideal no losses):

Metric:

$$T = \frac{P \text{ x } 9549.09}{n} = \frac{101.4 \text{ x } 9549.09}{200} = 4841 \text{ N-m}$$

U.S.:

$$T = \frac{P \text{ x } 5252}{n} = \frac{136 \text{ x } 5252}{200} = 3571 \text{ lb-ft}$$

Theoretical displacement (ideal no losses):
for condition T = 4841 N-m (T = 3571 lb-ft)

Metric:

$$d = \frac{T \text{ x } 62.81}{p} = \frac{4841 \text{ x } 62.81}{207} = \text{~}1469 \text{ cc}$$

U.S.:

$$d = \frac{T \text{ x } 75.4}{p} = \frac{3571 \text{ x } 75.4}{3000} = 89 \text{ cir}$$

Referencing the chart *“Torque 98 cir (1606 cc)”*
A 98 cir (1606 cc) displacement motor at a pressure 3000 psid (207 bar) will develop torque of approximately 3589 lb-ft (4866 N-m).

Referencing the chart *“Total Required Flow 98 cir (1606 cc)”*
A 98 cir (1606 cc) displacement motor at a pressure of 3000 psid (207 bar) operating at 200 rpm will require a total flow of approximately 97 gpm (367 lpm).

Nomenclature

Symbol	Measureable Quantity	U.S.	Metric
d	Displacement	cir or $\frac{in^3}{rev}$	cc or $\frac{cm^3}{rev}$
Q	Flow	gpm or $\frac{gal}{min}$	lpm or $\frac{liters}{min}$
n	Shaft Speed	rpm or $\frac{revolutions}{min}$	rpm or $\frac{revolutions}{min}$
P	Power	hp	kW
Δ*p*	Differential pressure	psid	bar
T	Torque	lb-ft	N-m

Calculation Fundamentals

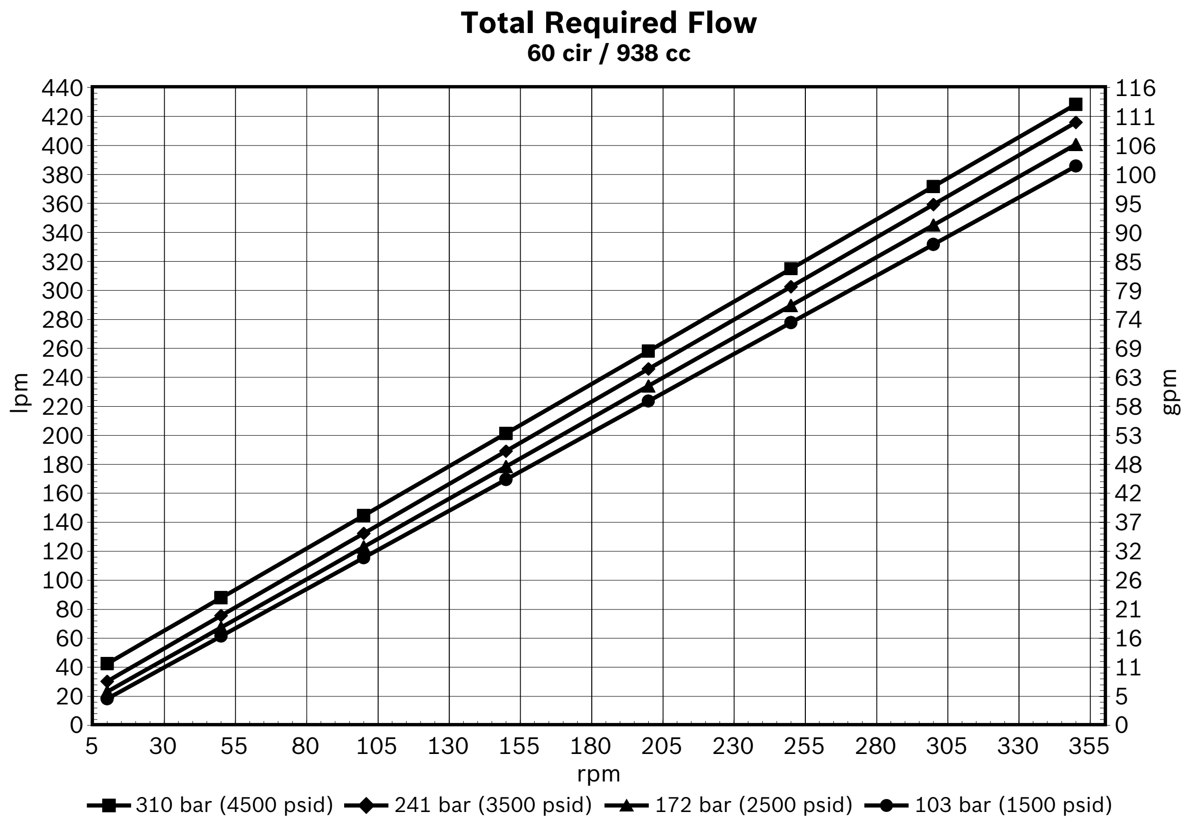
U.S.	Metric
$T = \frac{P \text{ x } 5252}{n}$	$T = \frac{P \text{ x } 9549.09}{n}$
$T = \frac{d \text{ x } \Delta p}{75.4}$	$T = \frac{d \text{ x } \Delta p}{62.81}$
$P_{shaft} = \frac{T \text{ x } n}{5252}$	$P_{shaft} = \frac{T \text{ x } n}{9549.09}$
$P_{shaft} = \frac{Q \text{ x } \Delta p}{1714}$	$P_{shaft} = \frac{Q \text{ x } \Delta p}{599.29}$
$Q = \frac{d \text{ x } n}{231}$	$Q = \frac{d \text{ x } n}{1000}$
$n = \frac{P \text{ x } 5252}{T}$	$n = \frac{P \text{ x } 9549.09}{T}$
$d = \frac{T \text{ x } 75.4}{\Delta p}$	$d = \frac{T \text{ x } 62.81}{\Delta p}$

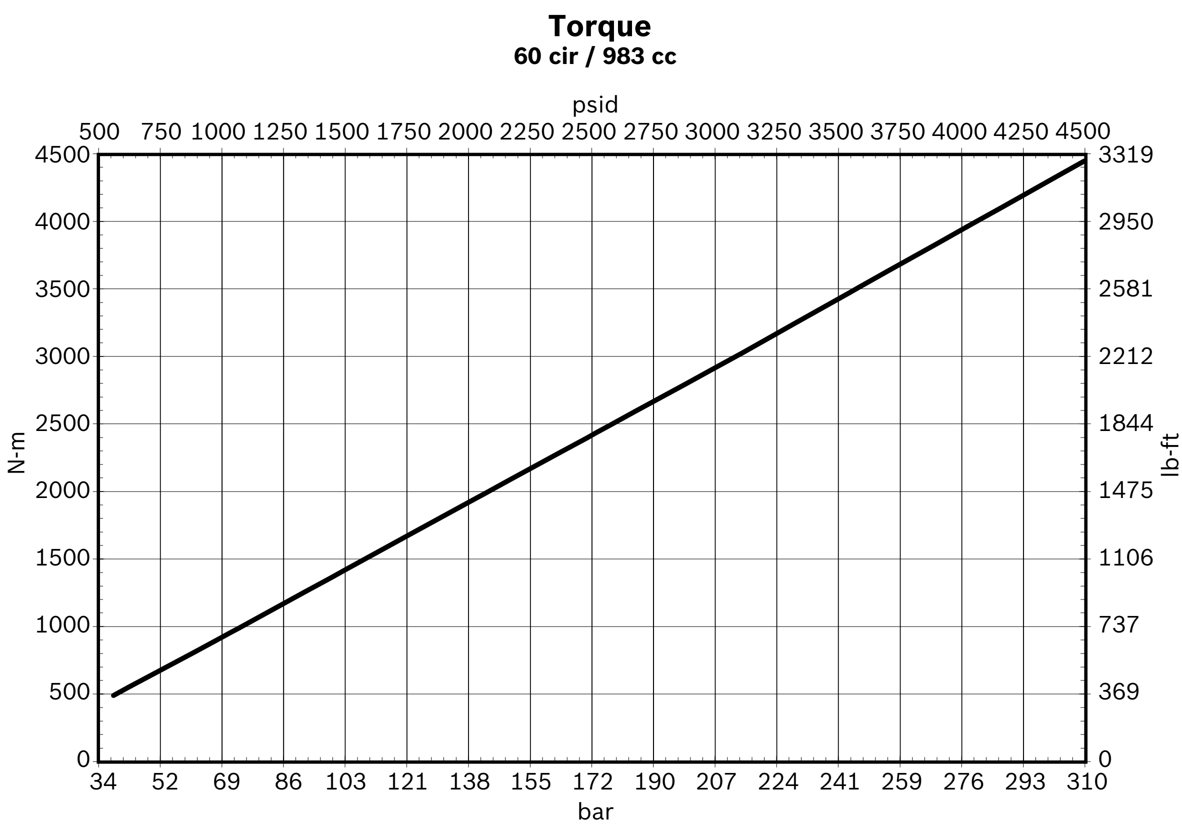
Unit Conversions

Quantity	Symbol	Metric	Convert	U.S.
Torque	*T*	N-m	÷ 1.356	lb-ft
Power	*P*	kW	x 1.341	hp
Displacement	*d*	cm^3/rev	÷ 16.385	in^3/rev
Flow Rate	*Q*	lpm	÷ 3.78	gpm
Rotational Speed	*n*	rpm	=	rpm
Pressure	*p*	bar	x 14.504	psi

Technical data

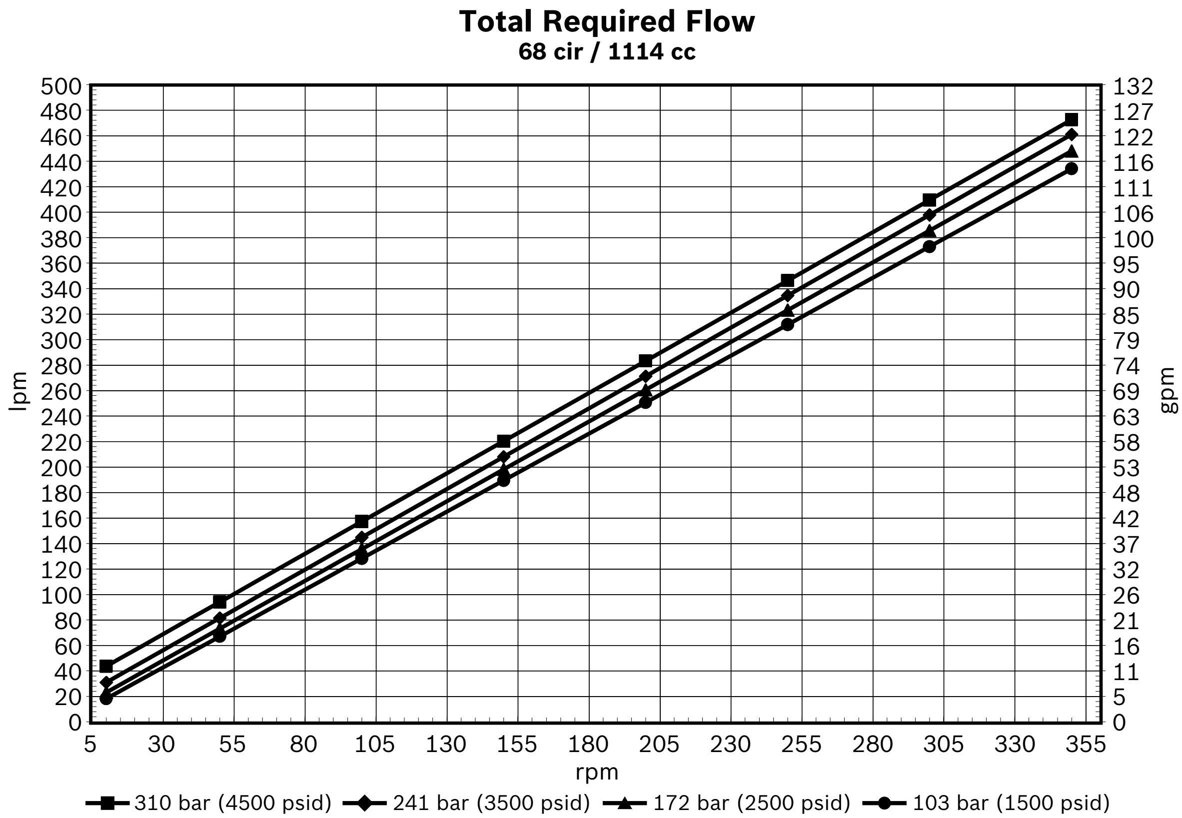
Flow & output torque – 60 cir

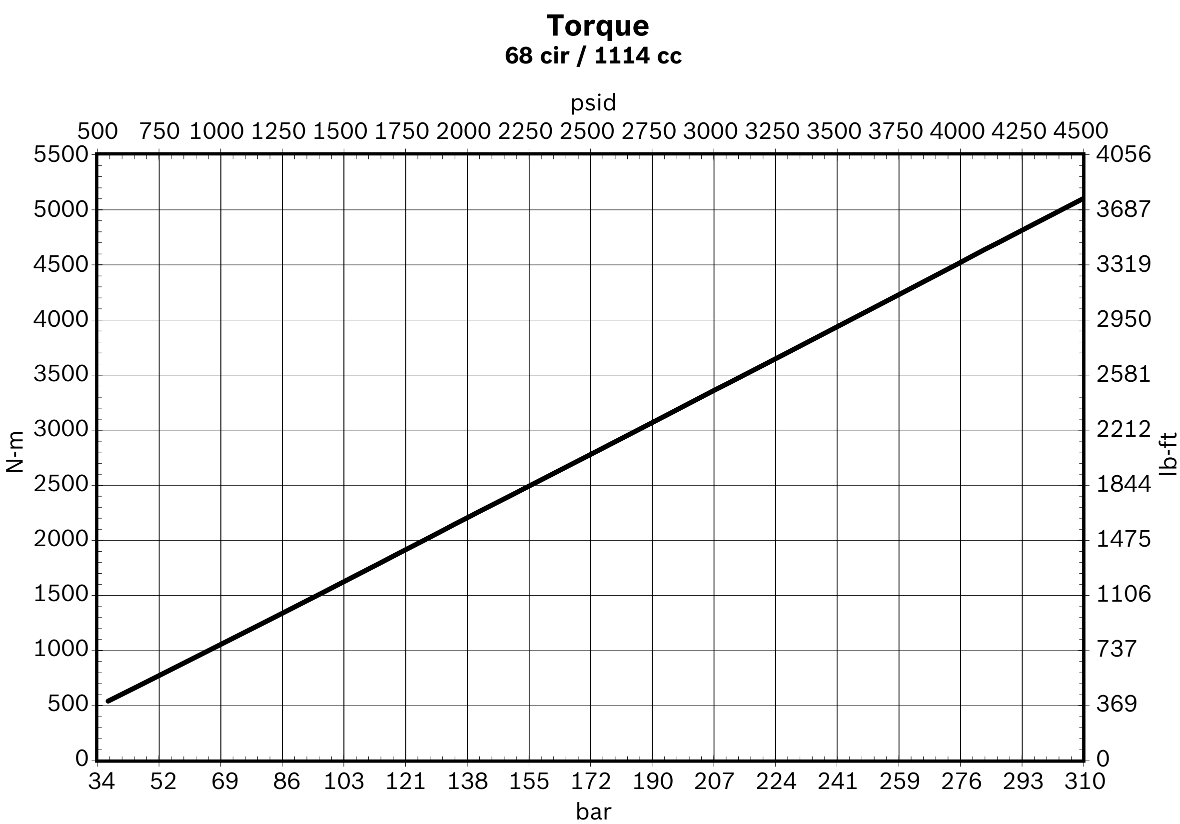




Technical data

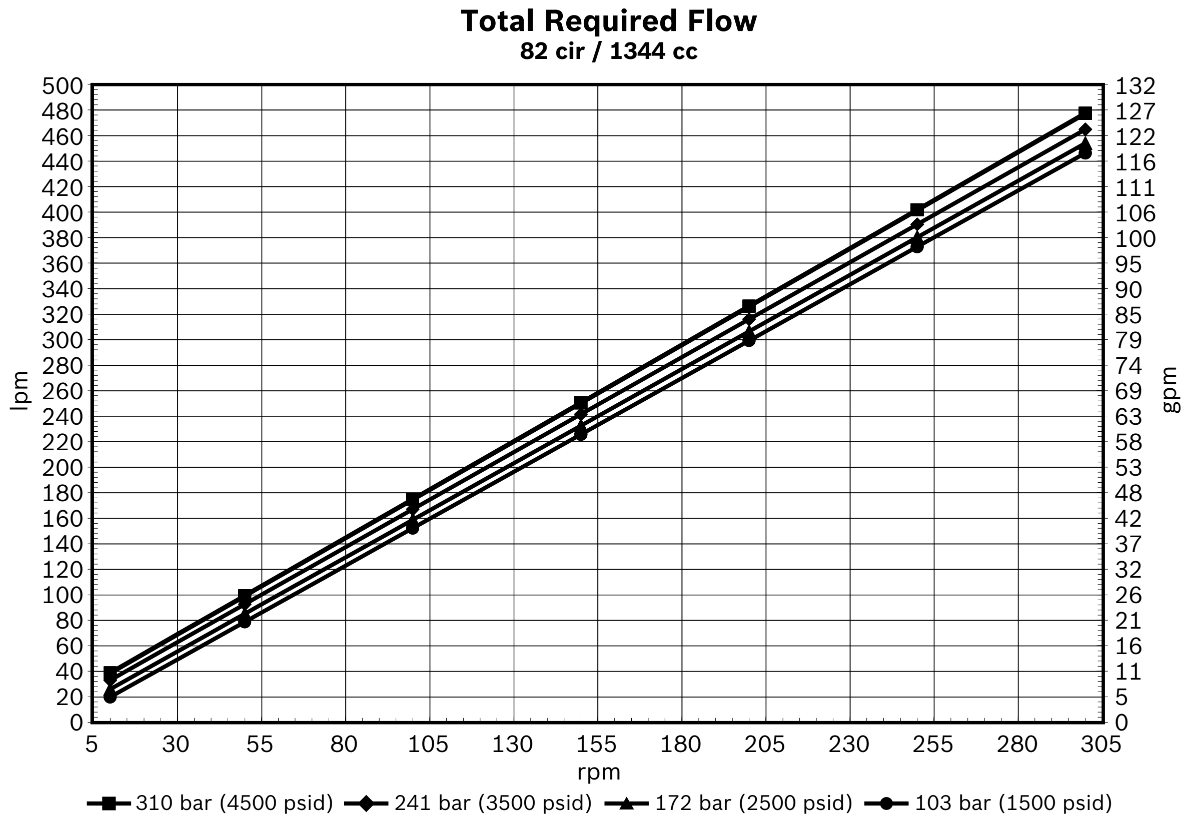
Flow & output torque – 68 cir

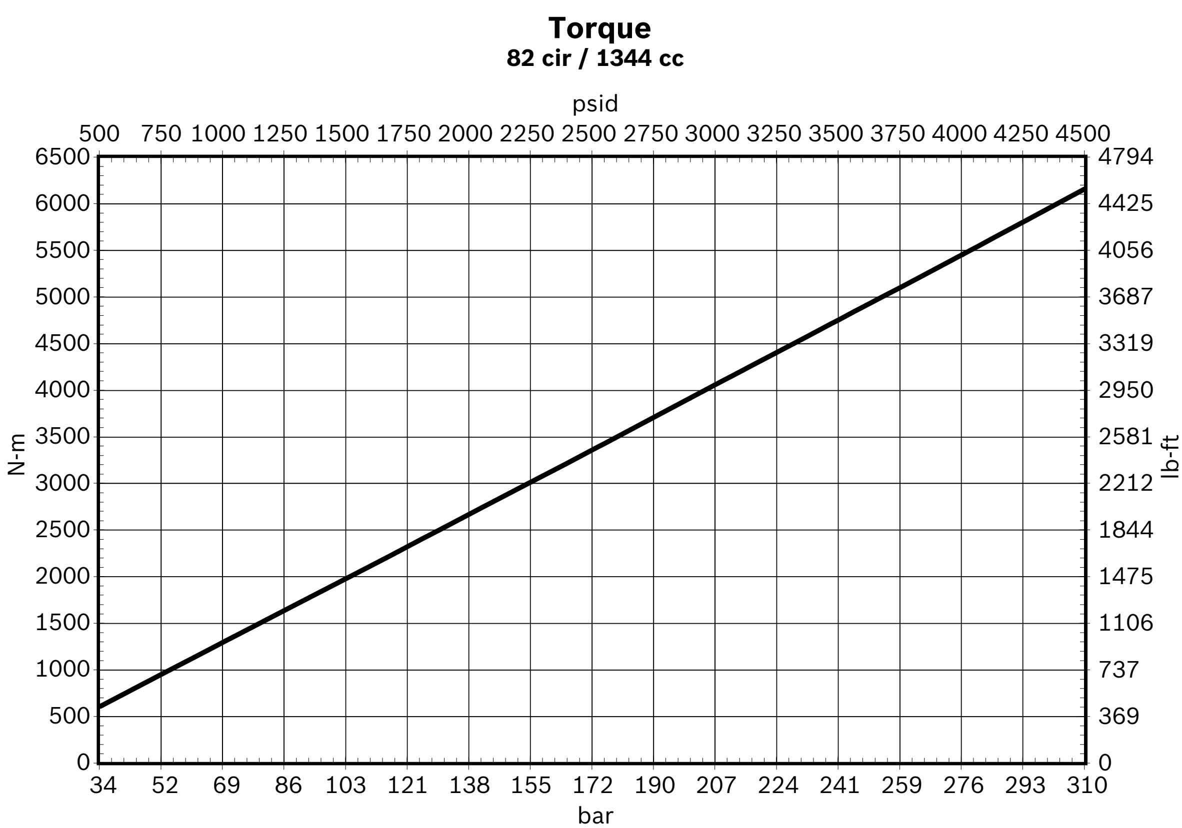




Technical data

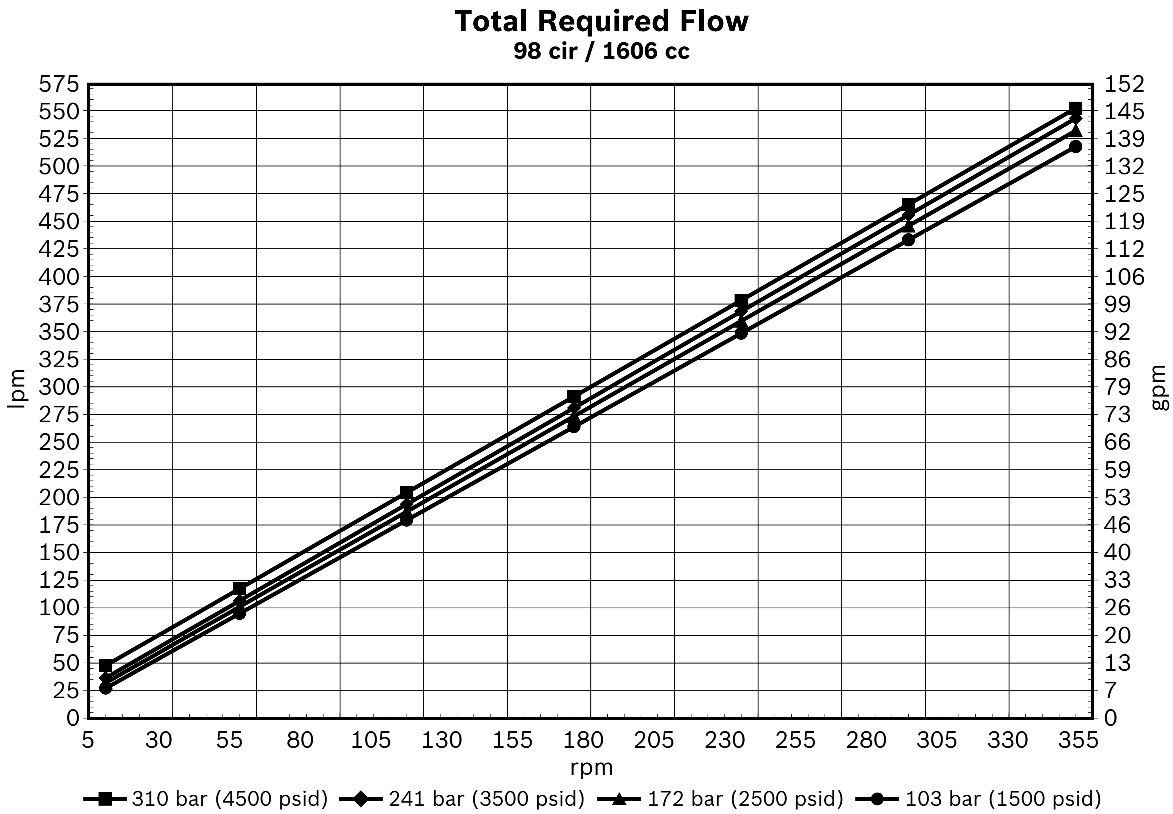
Flow & output torque – 82 cir

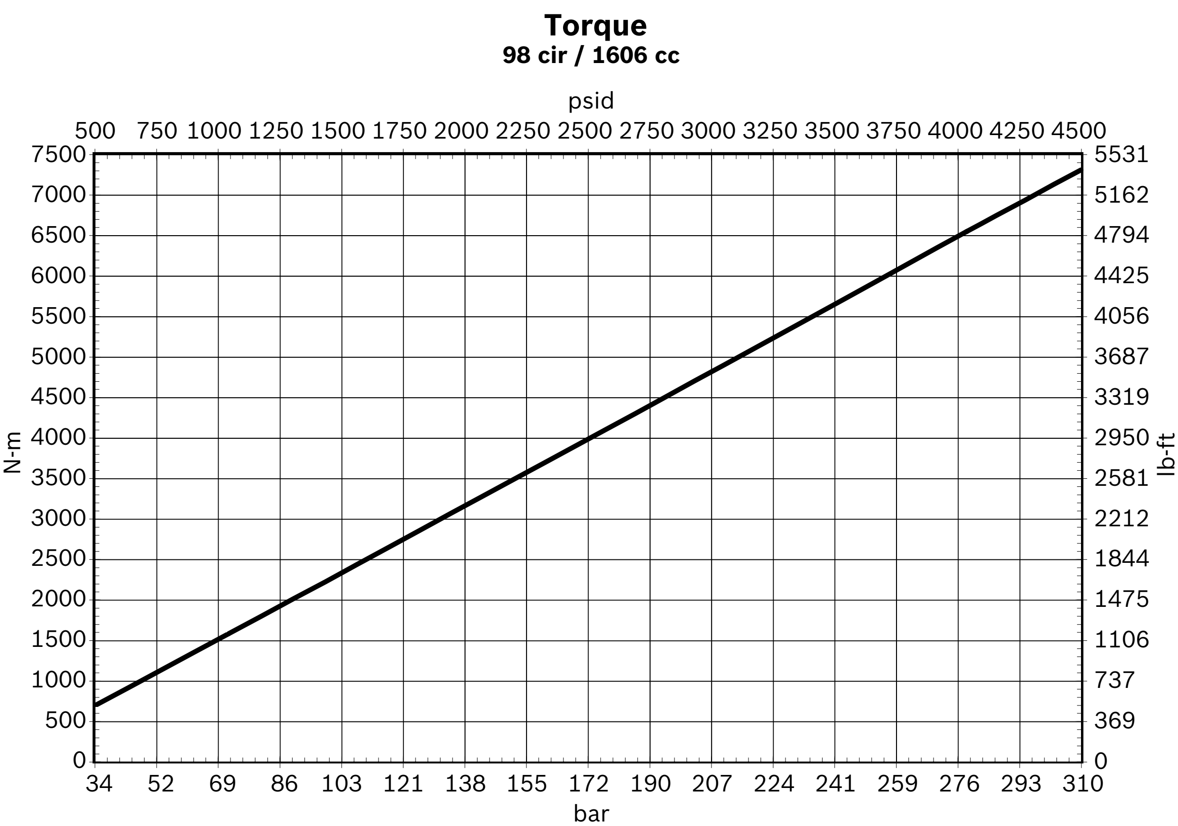




Technical data

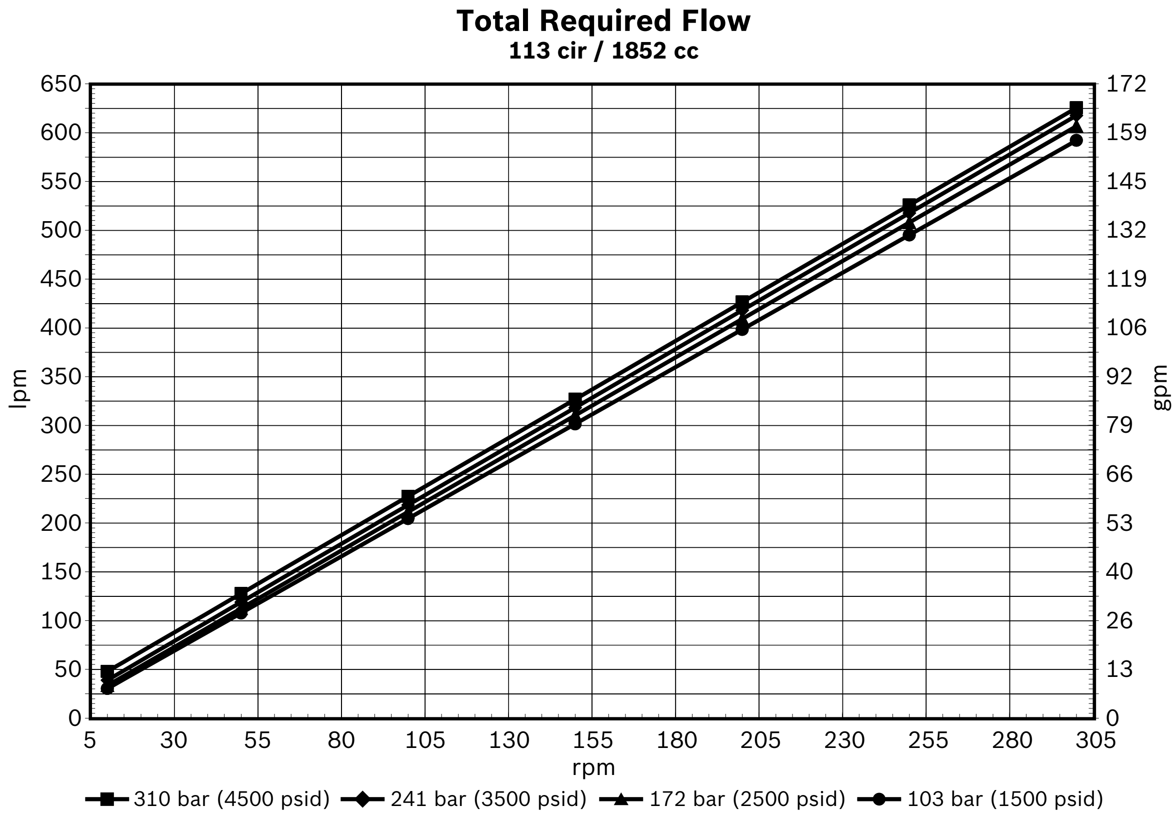
Flow & output torque – 98 cir

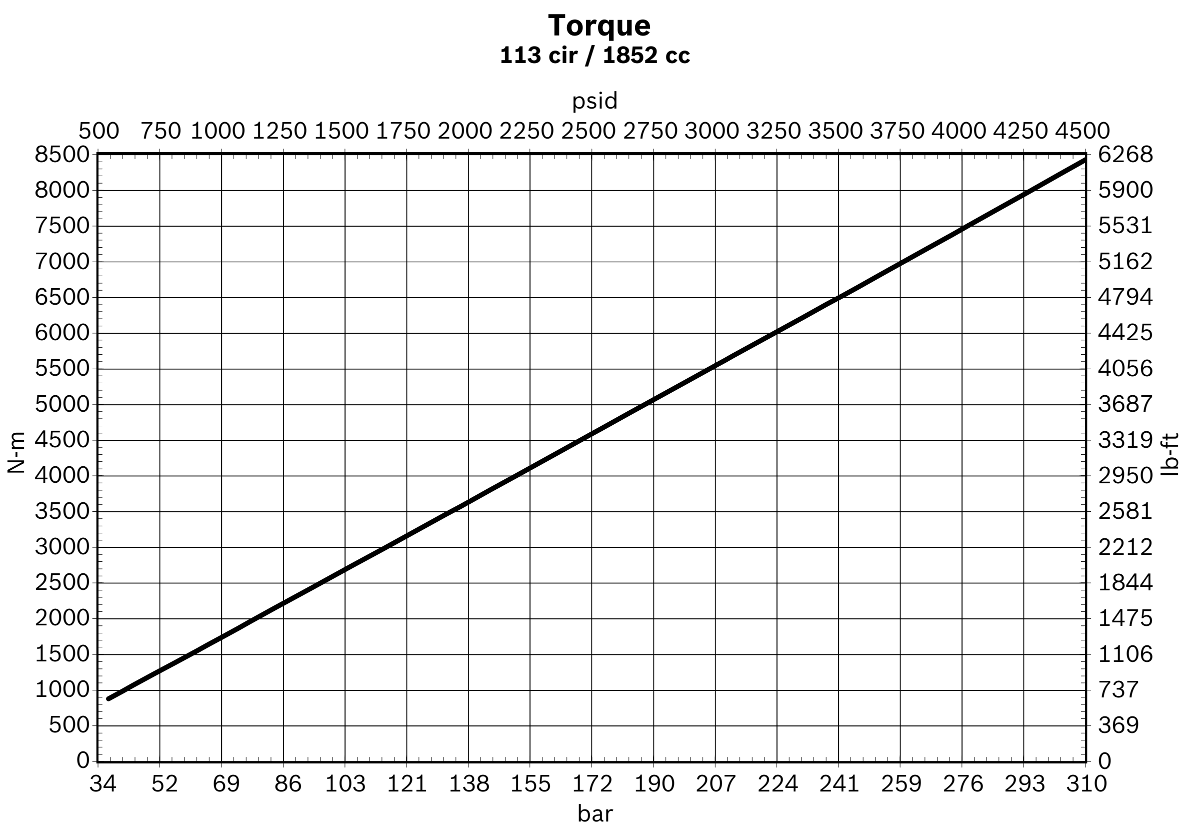




Technical data

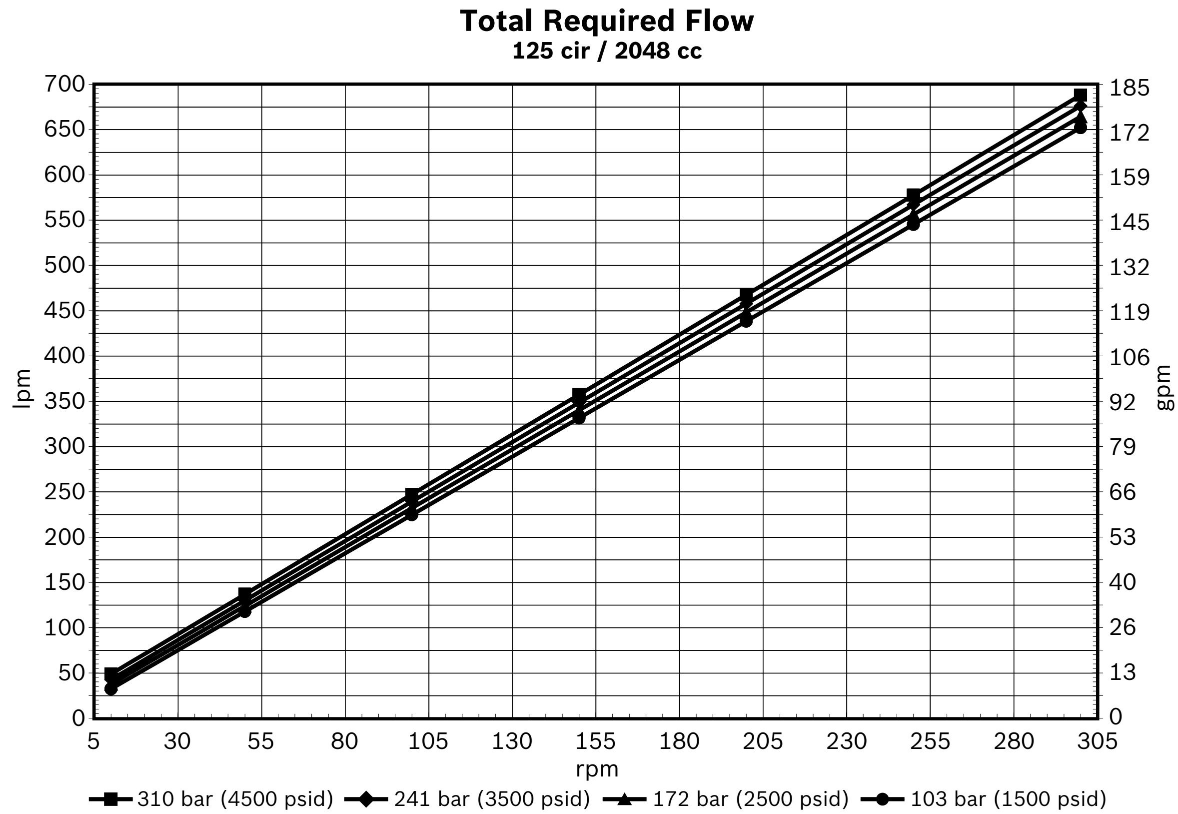
Flow & output torque – 113 cir

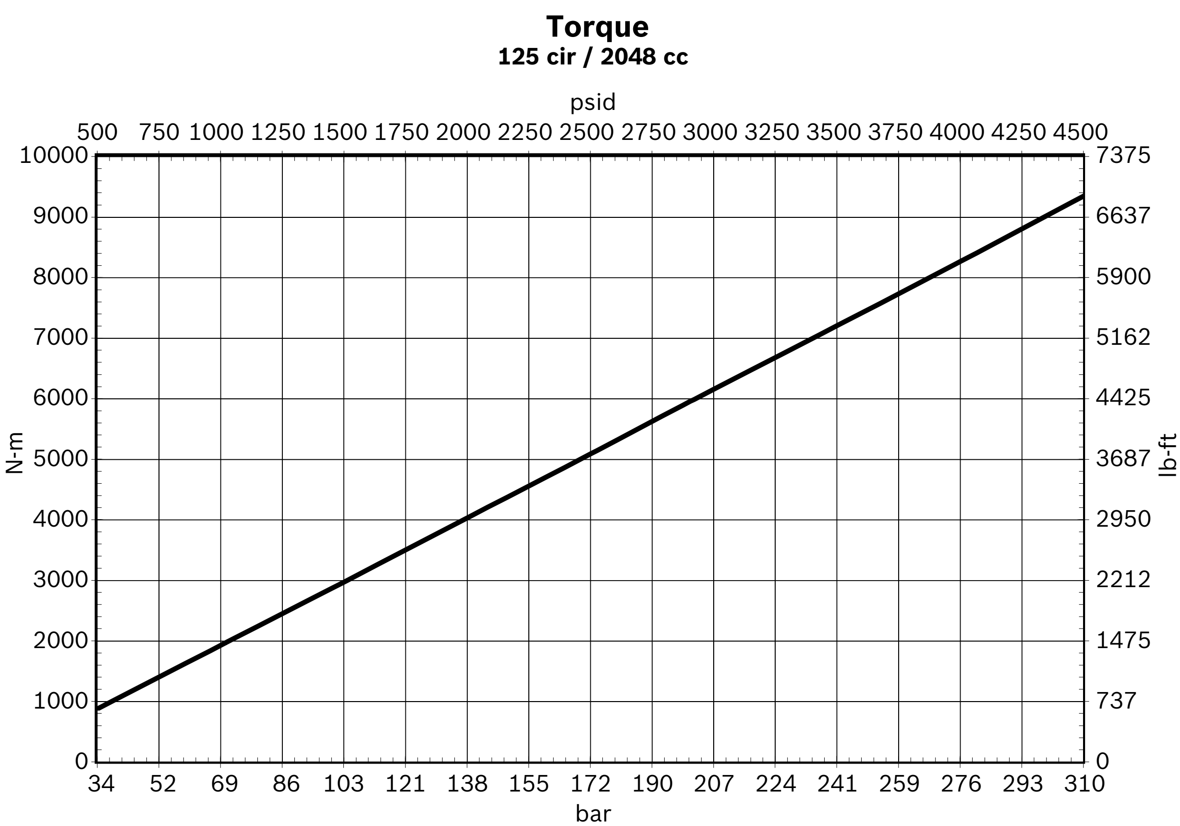




Technical data

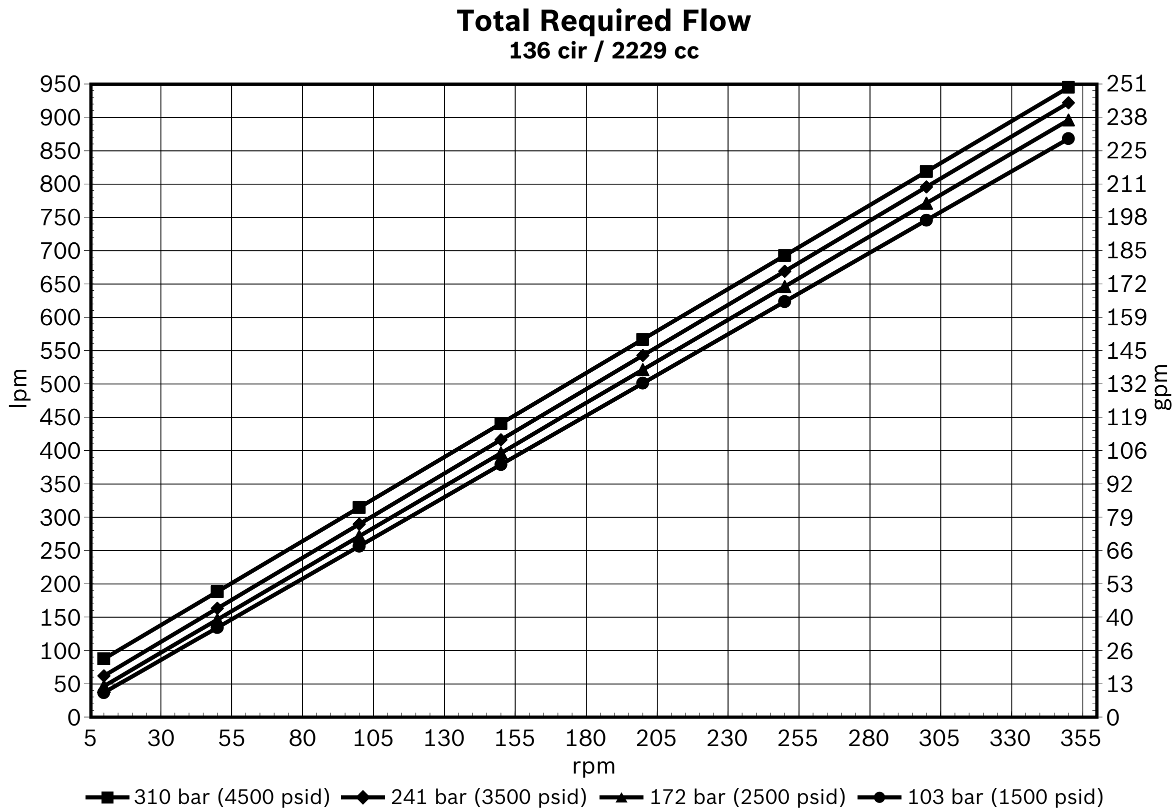
Flow & output torque – 125 cir

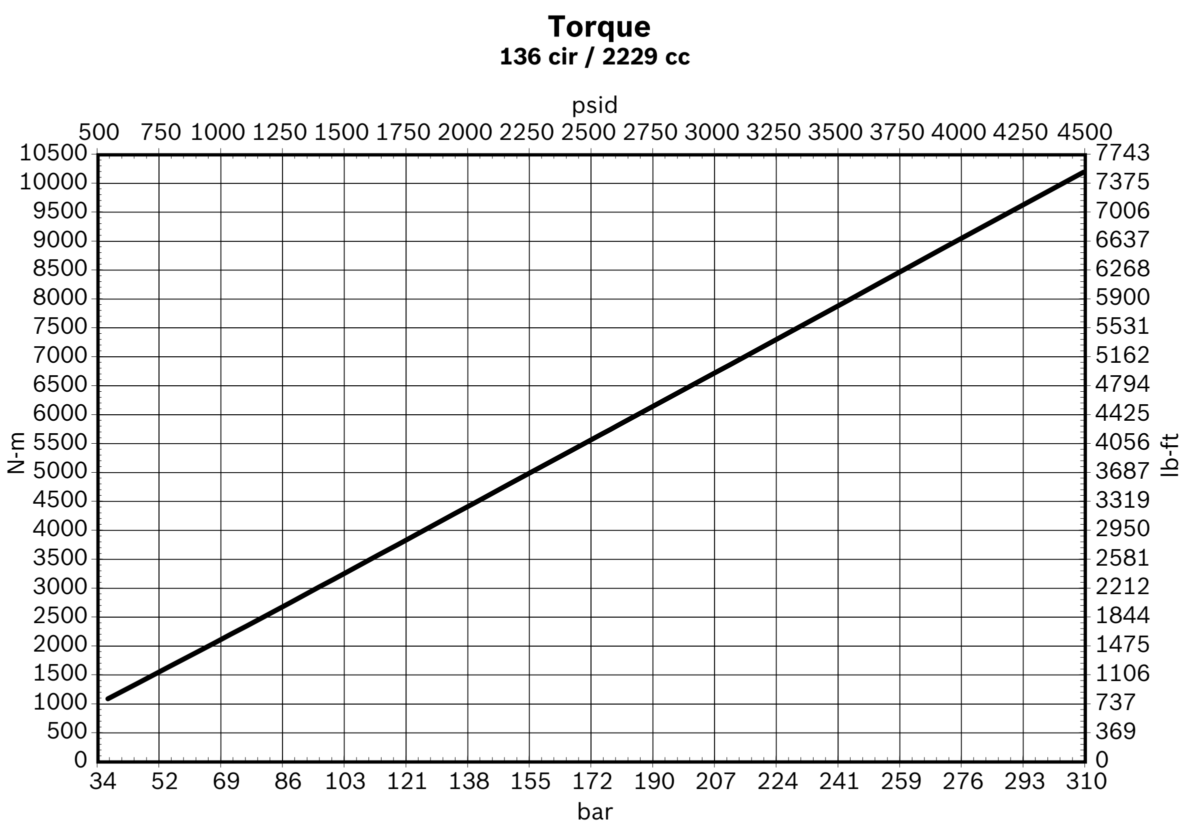




Technical data

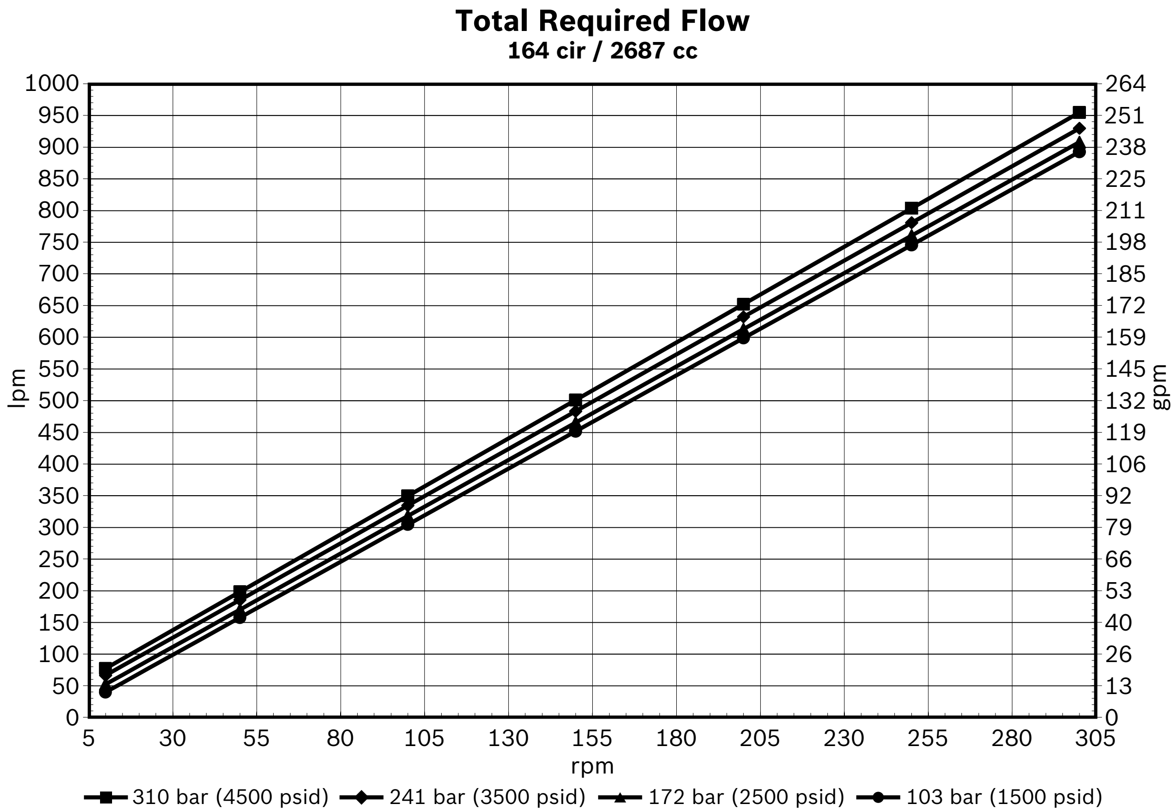
Flow & output torque – 136 cir

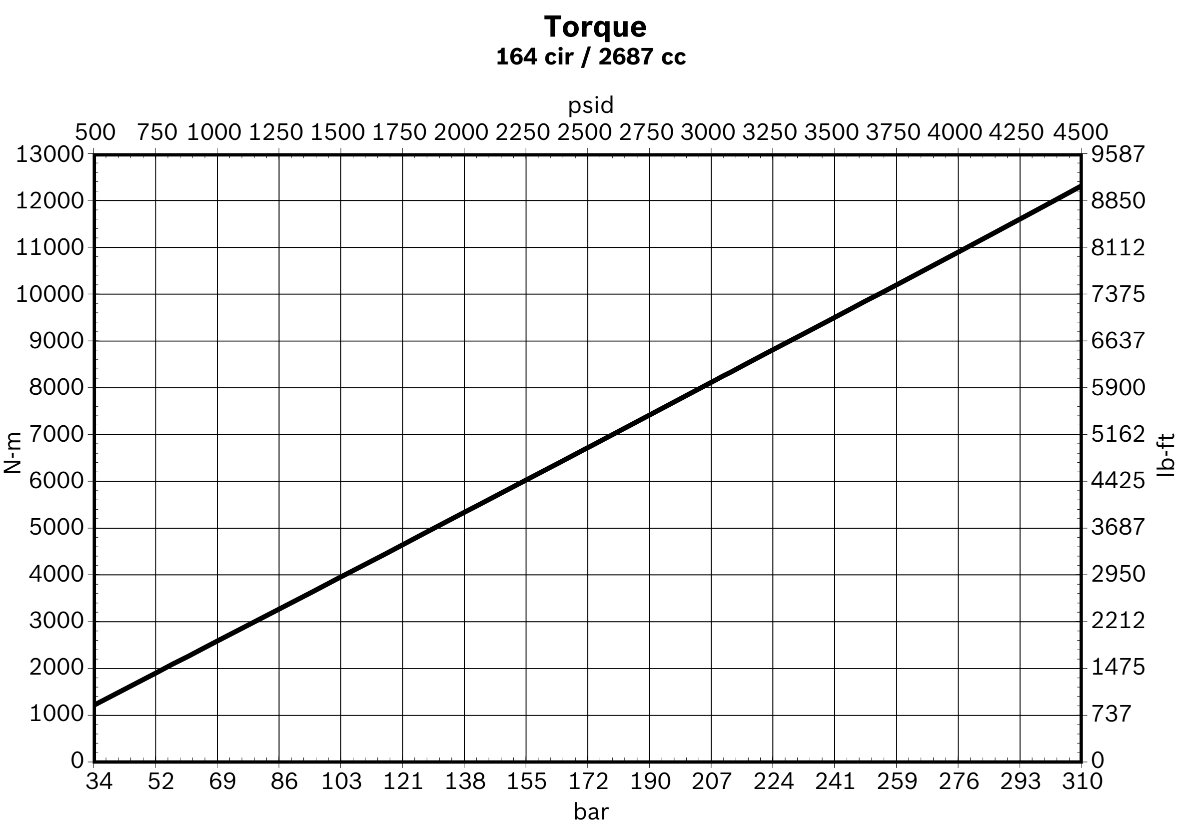




Technical data

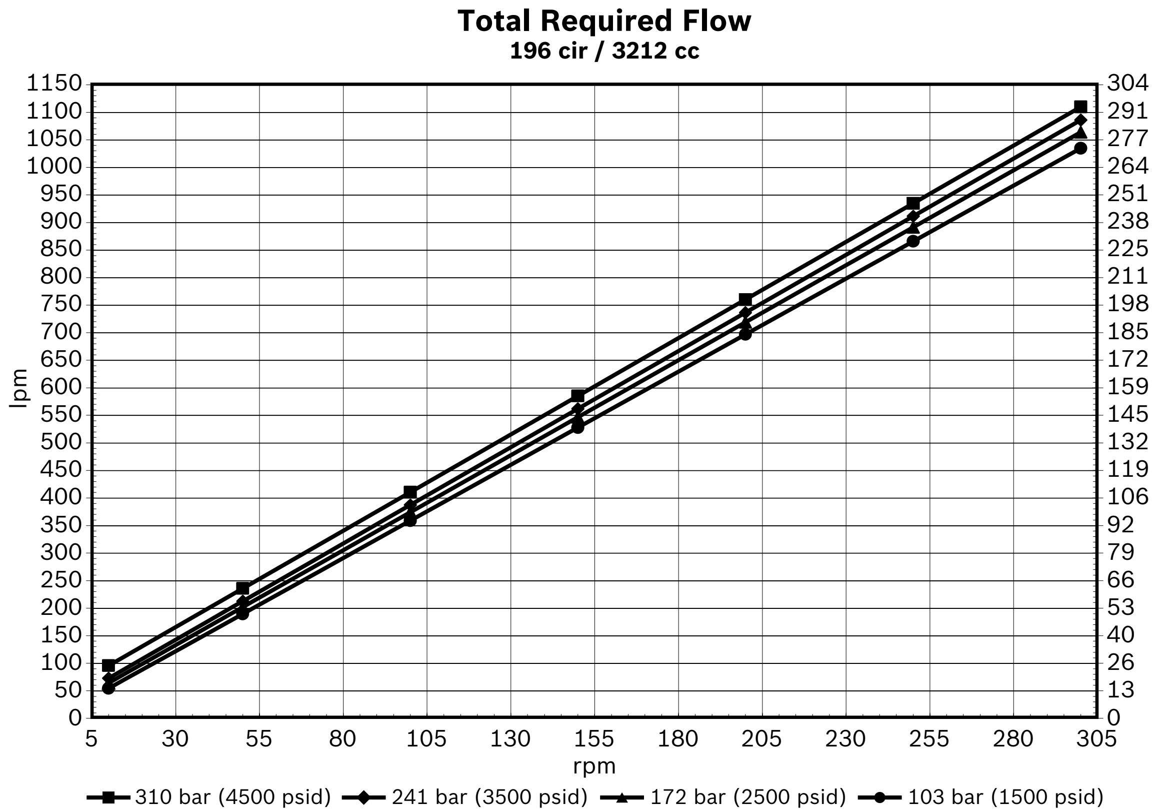
Flow & output torque – 164 cir

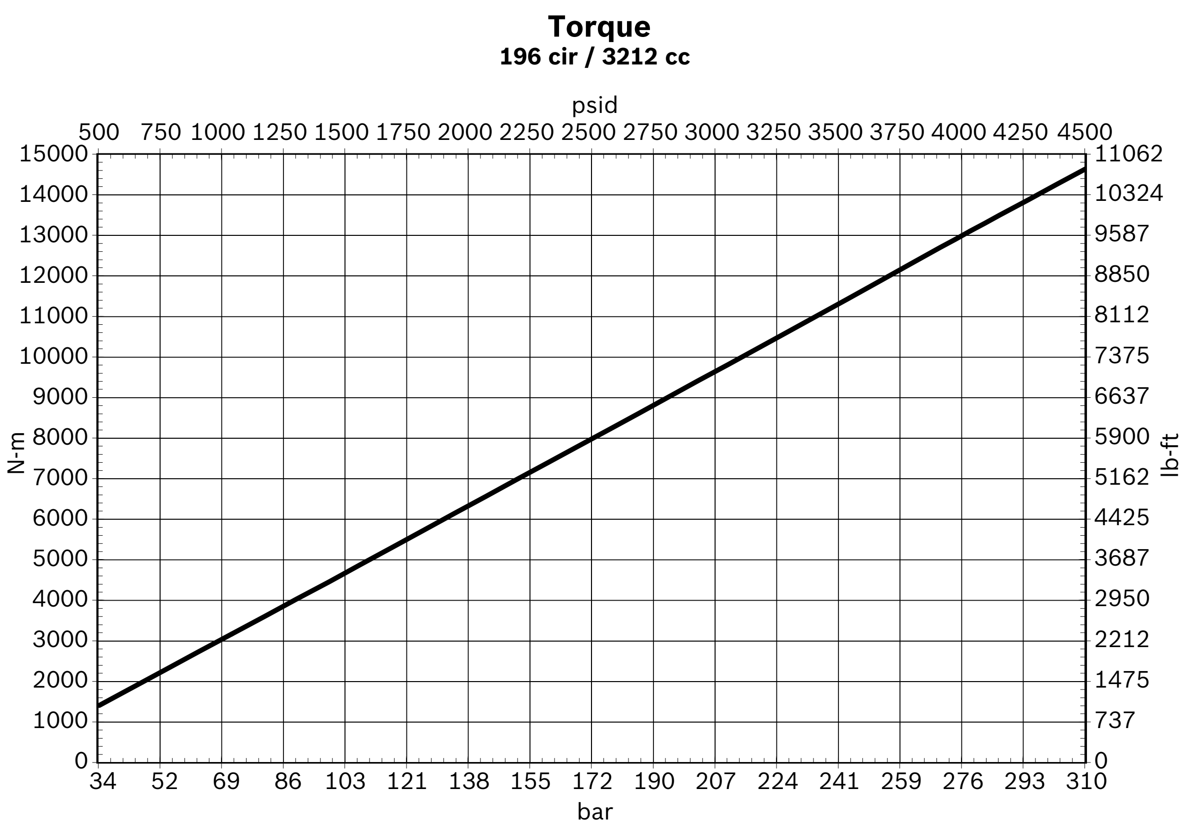




Technical data

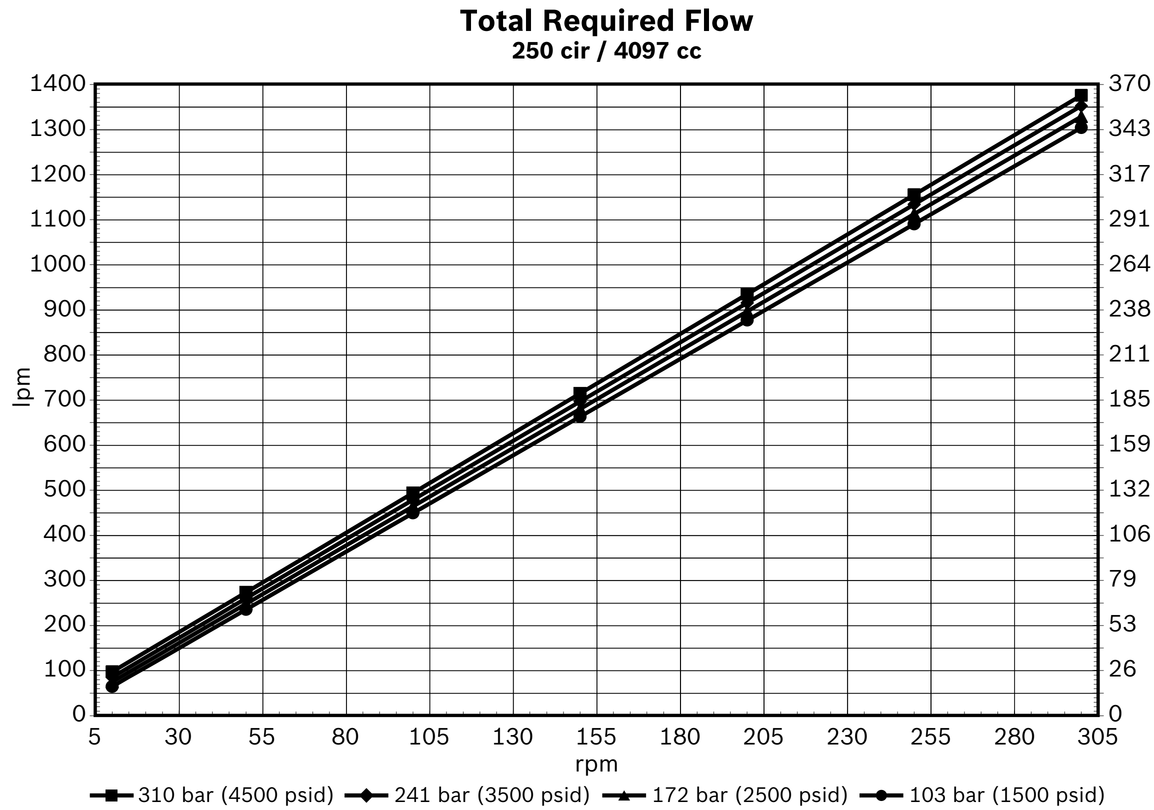
Flow & output torque – 196 cir

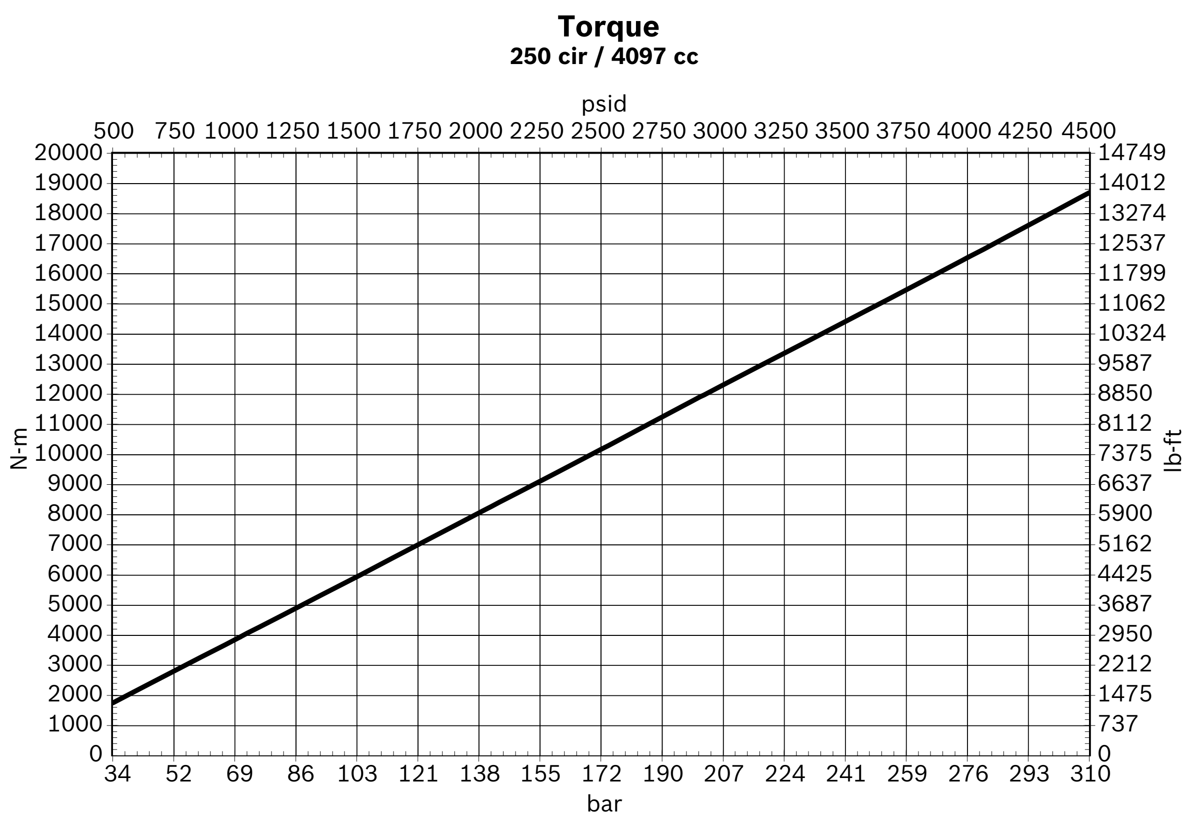




Technical data

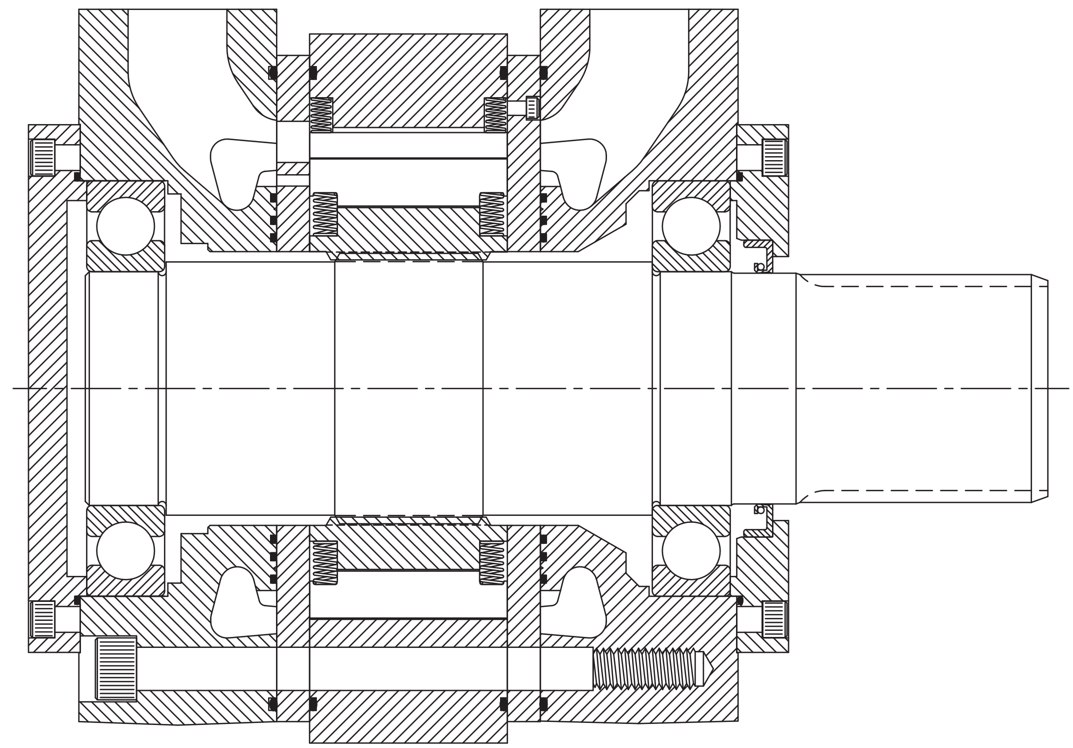
Flow & output torque – 250 cir

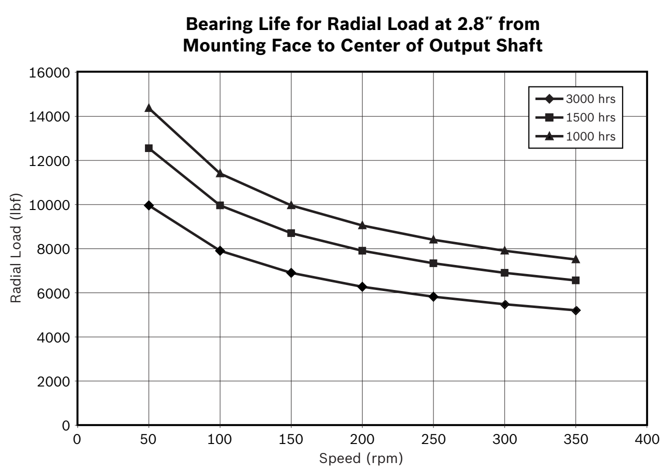


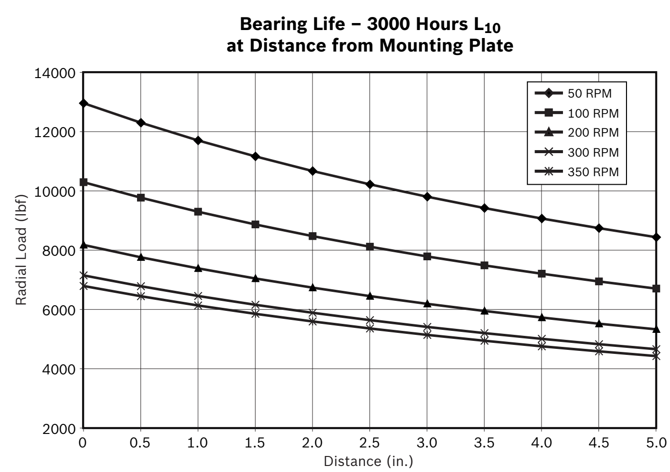


Technical data

Bearing data – Code 61 standard motor (B1 bearing)





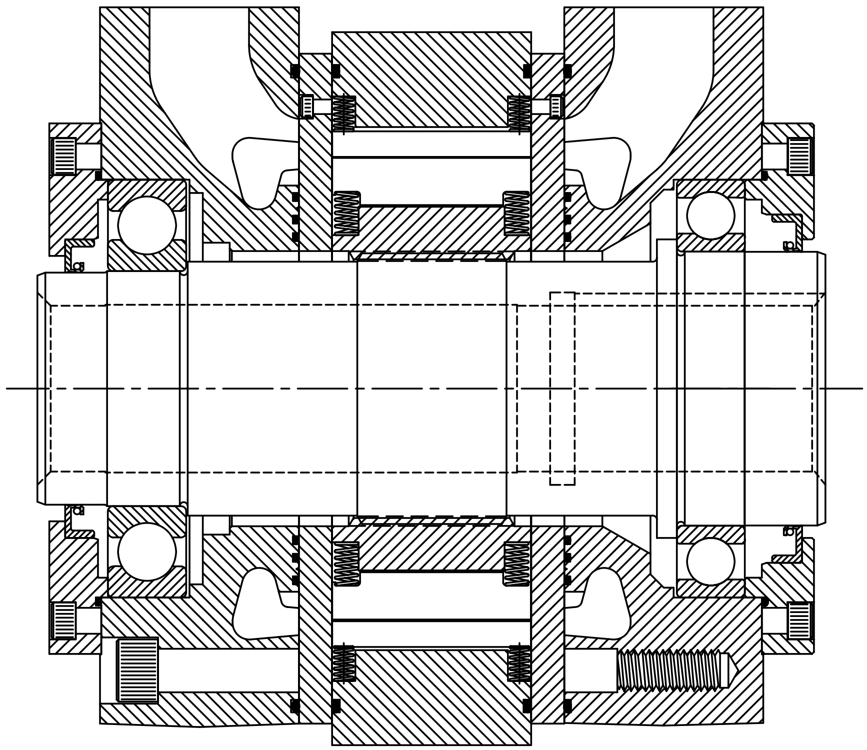


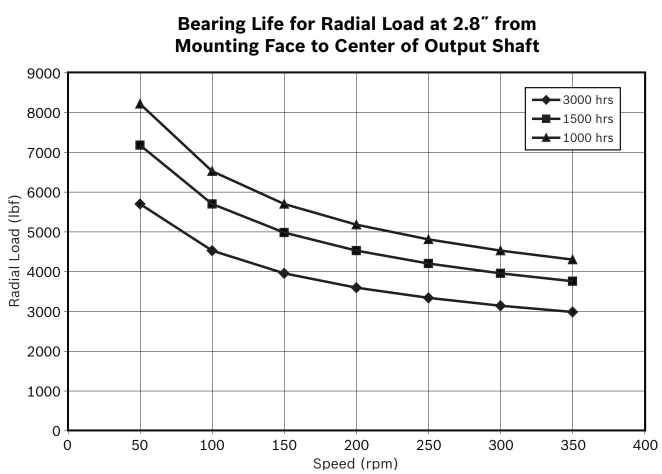
Bearing loading

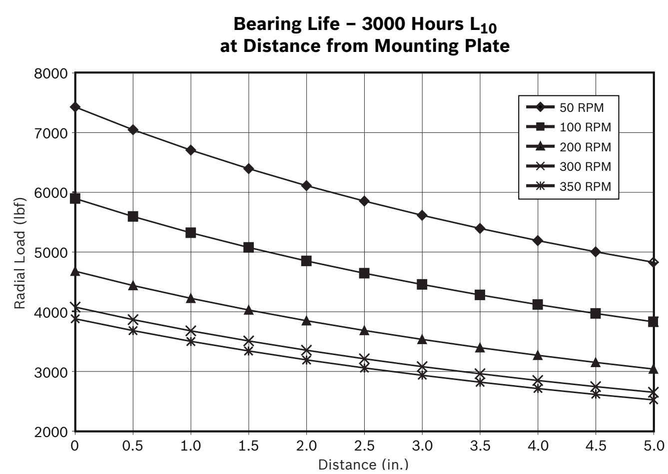
The bearings in the 125 Series can accept radial load per the radial capacity charts above. Thrust loading is not recommended for the standard motor. For thrust-type applications, see the thrust capable motor bearing chart.

Technical data

Bearing data – Code 61 standard motor (B2 bearing)

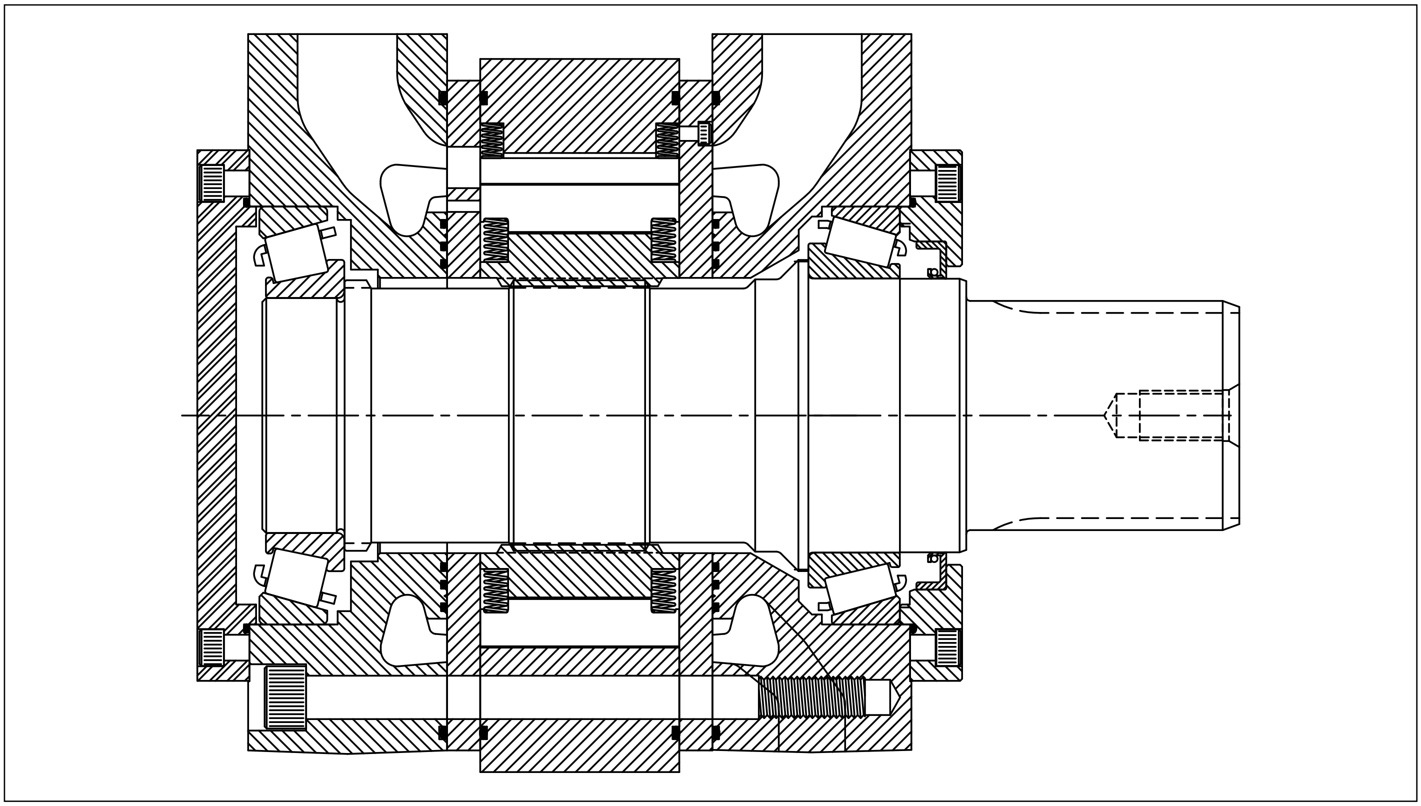


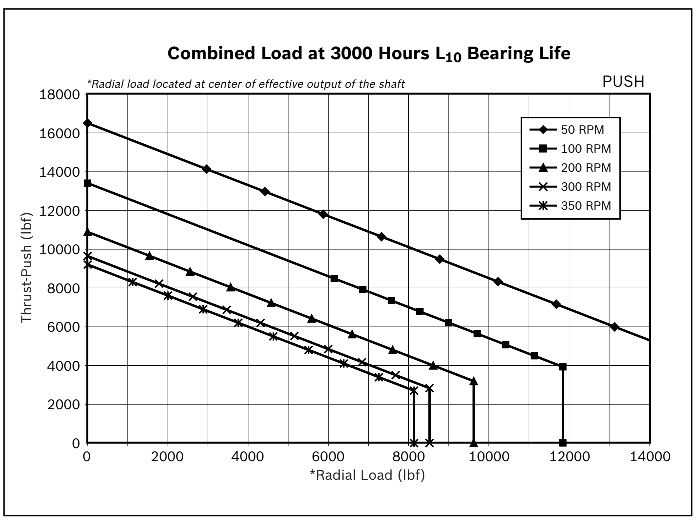


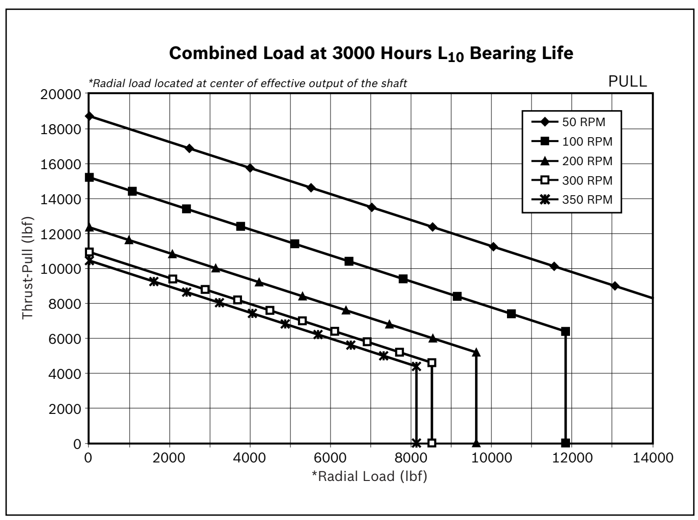


Technical data

Bearing data – Code 61 (T1 bearing)

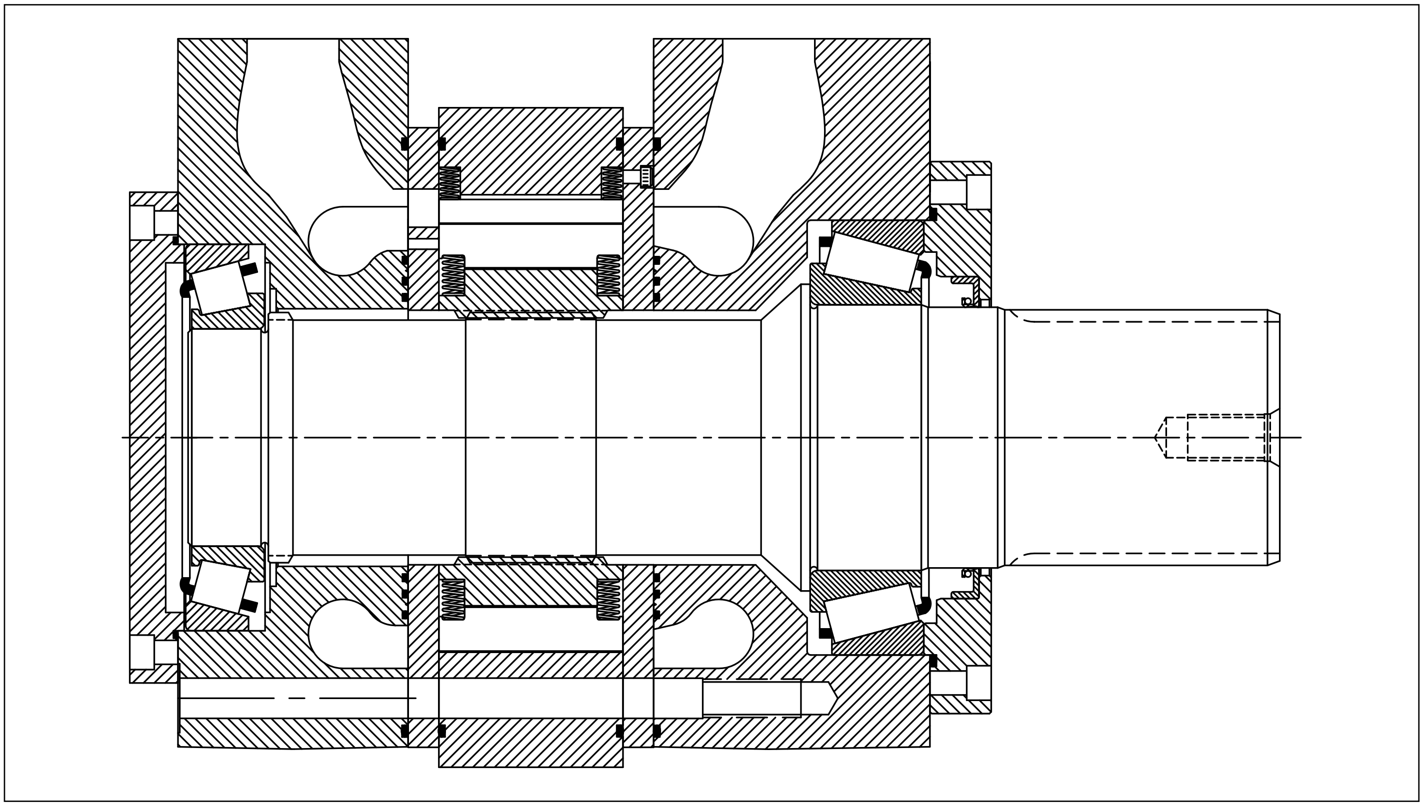


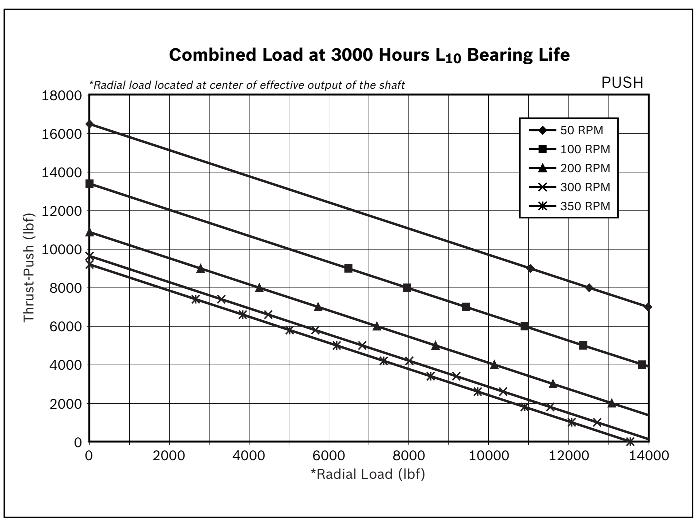


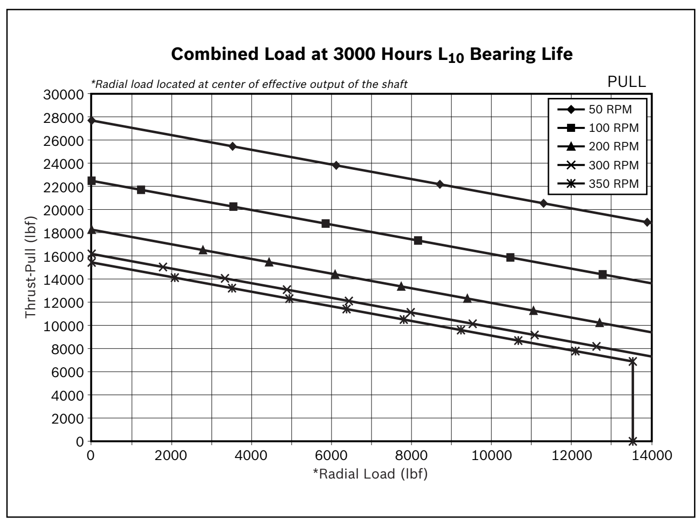


Technical data

Bearing data – Code 62 standard motor (T1 bearing)

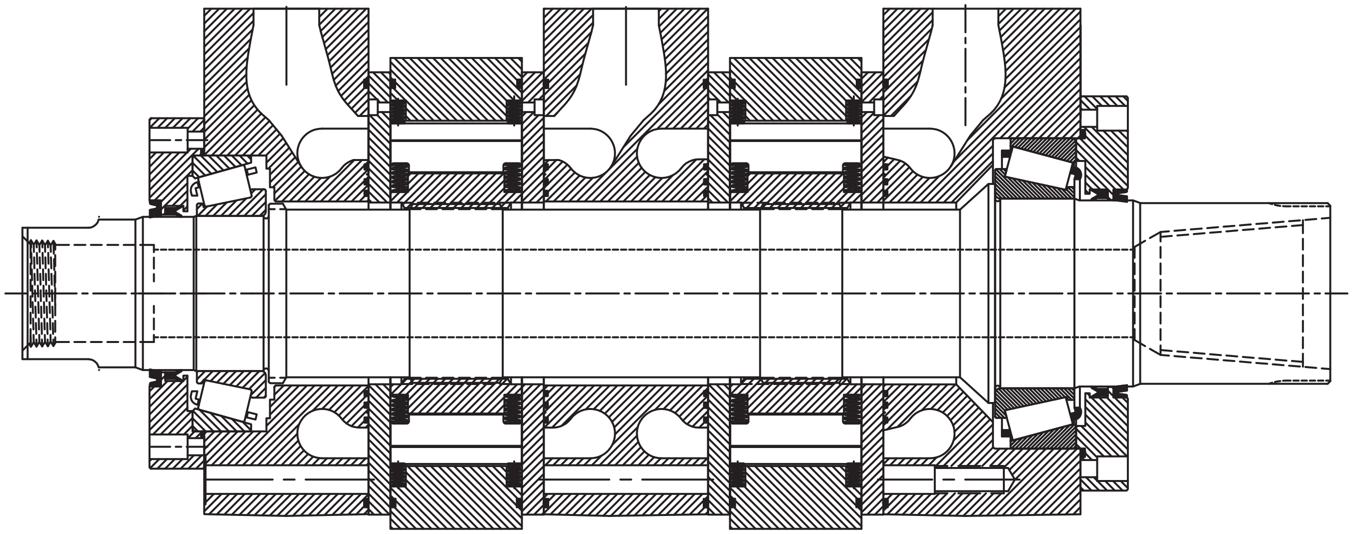


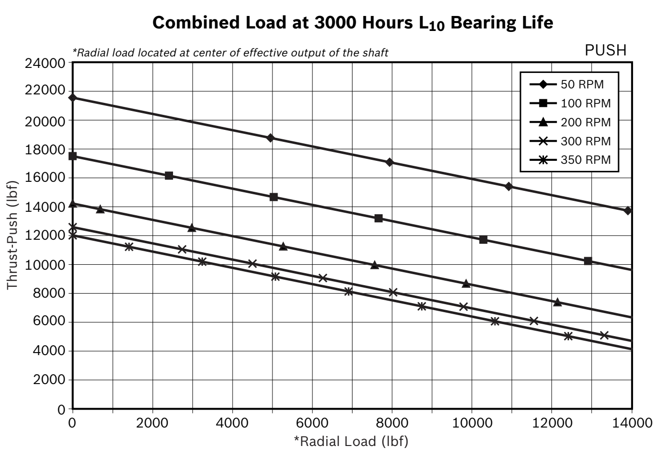


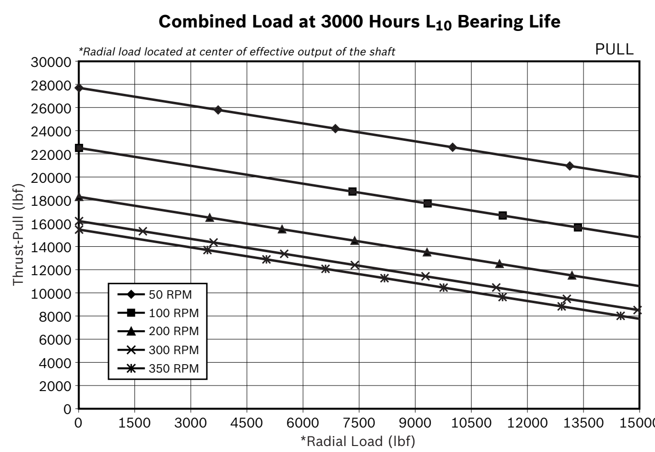


Technical data

Bearing data – Code 62 (T2 bearing)



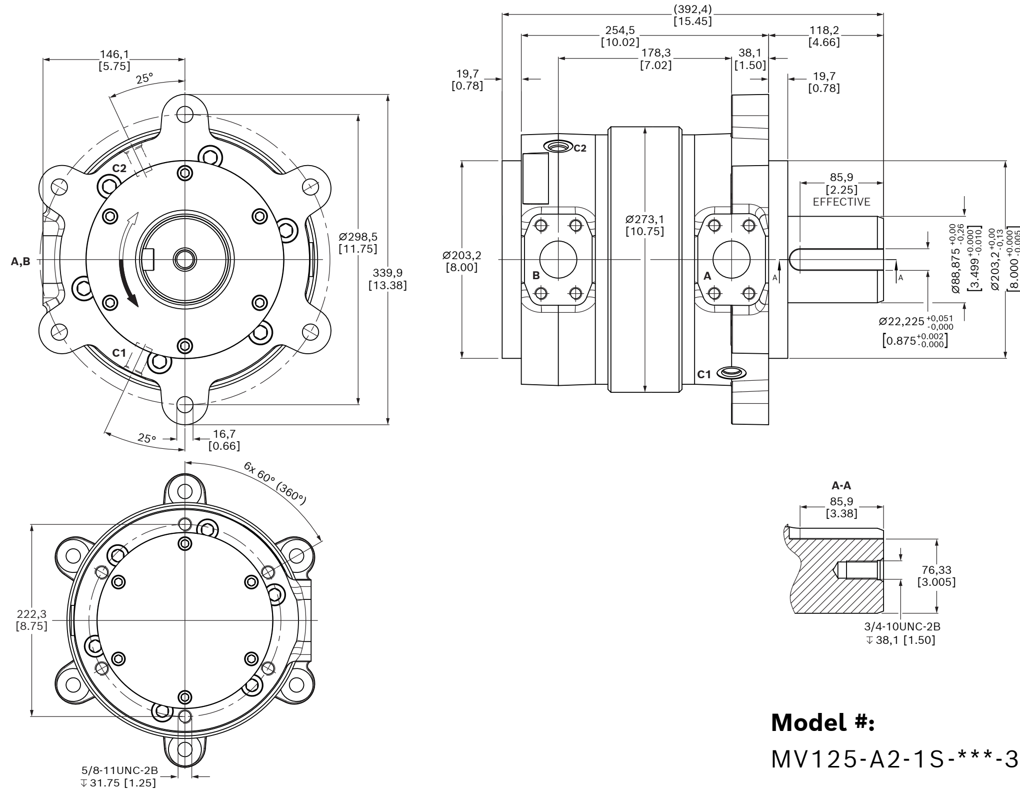




The drawings on the following pages represent basic motor configurations.

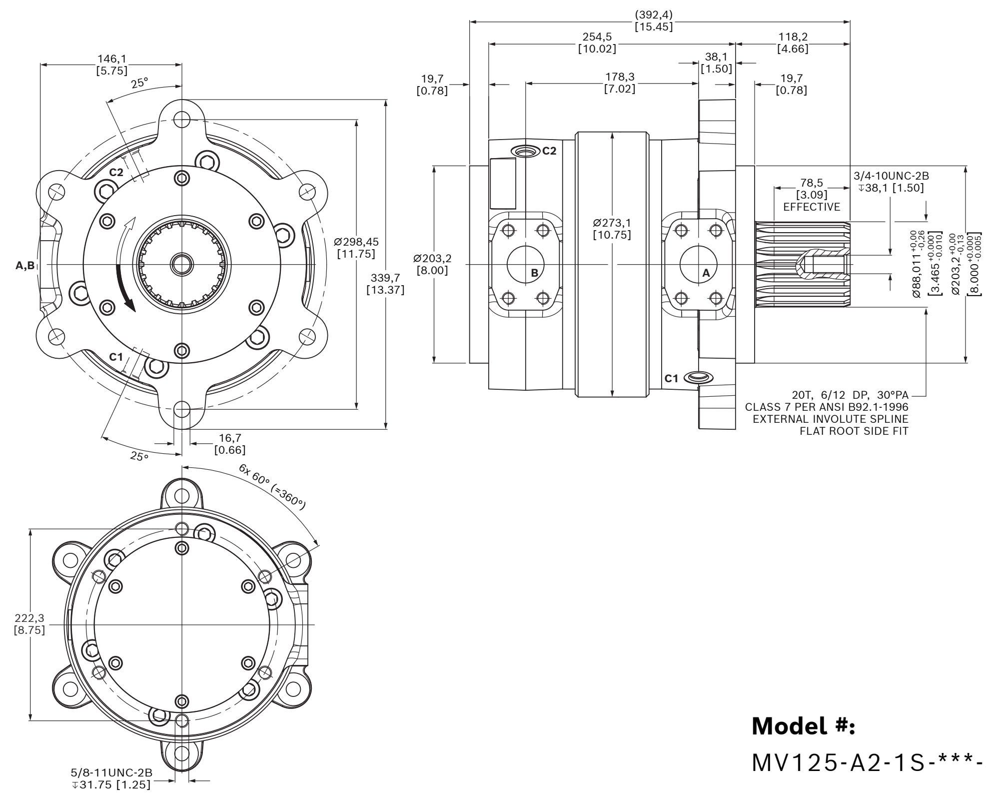
Unit dimensions

Code 61 (B1 bearing)



Model #:

MV125-A2-1S-***-30-B1-***-000

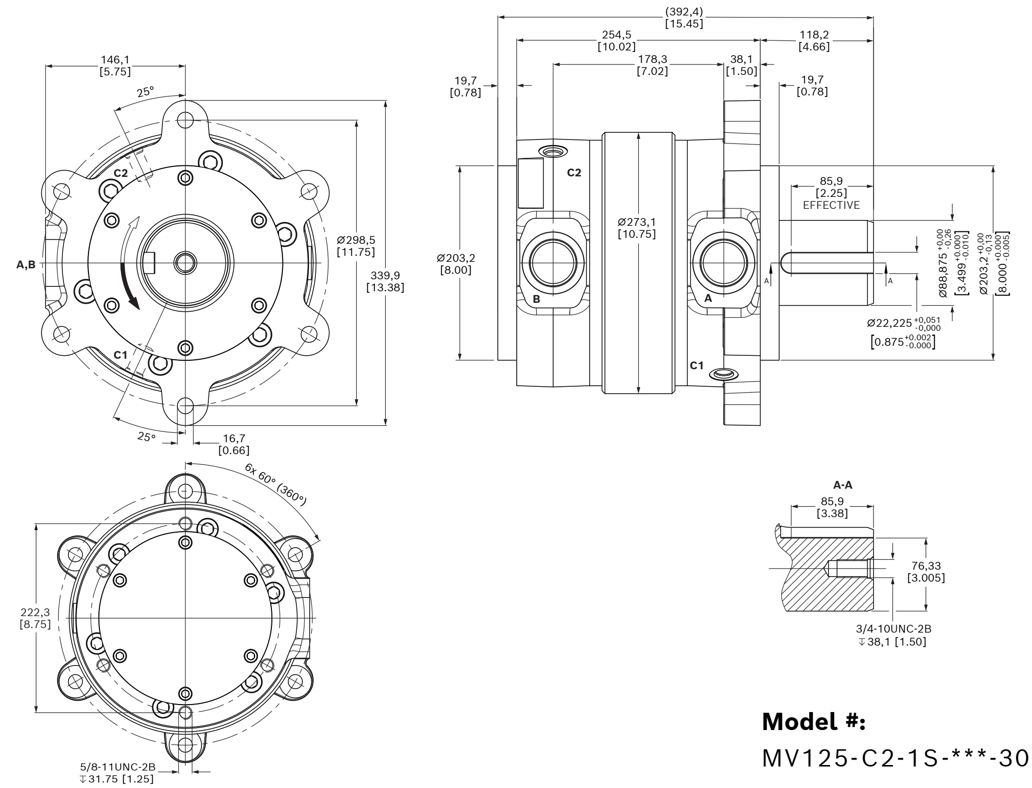


Model #:

MV125-A2-1S-***-31-B1-***-000

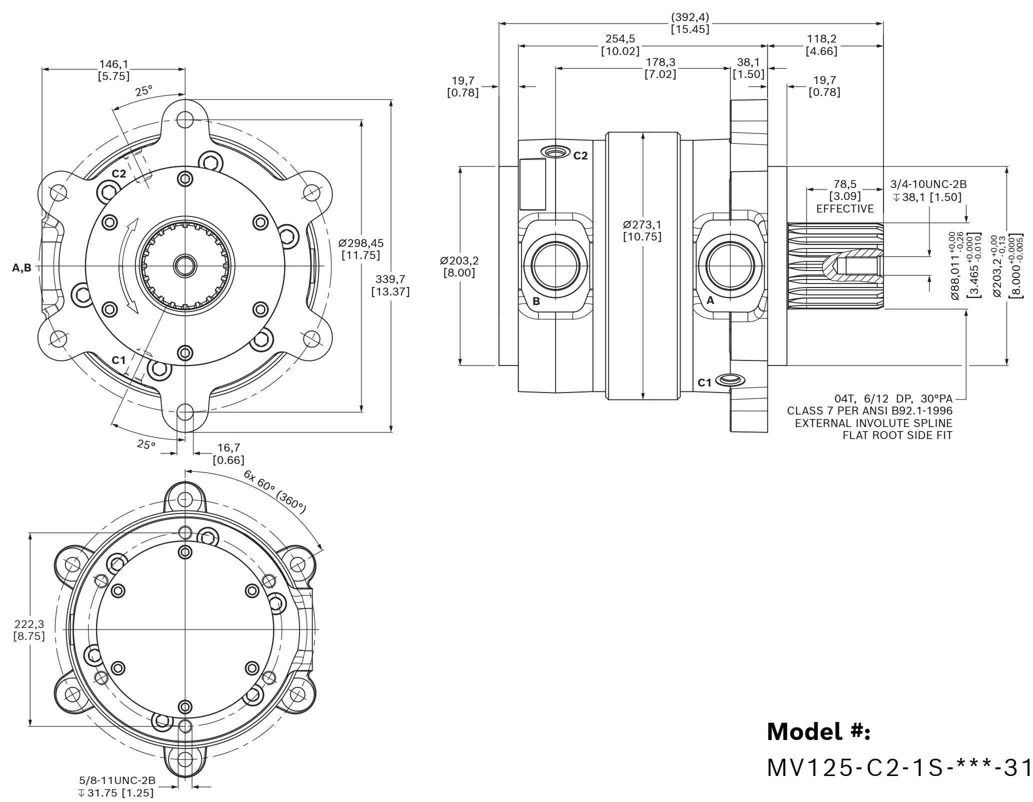
Unit dimensions

Code 61 (B1 bearing) – continued



Model #:

MV125-C2-1S-***-30-B1-***-000

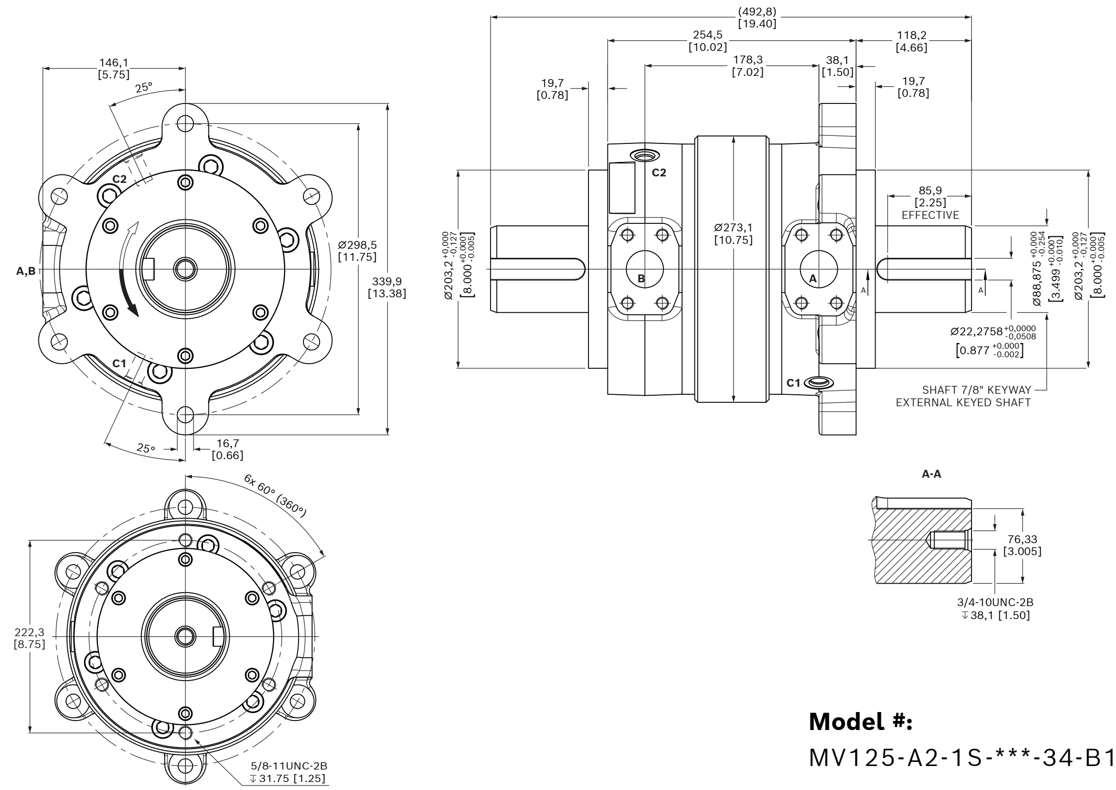


Model #:

MV125-C2-1S-***-31-B1-***-000

Unit dimensions

Code 61 (B1 bearing) – continued

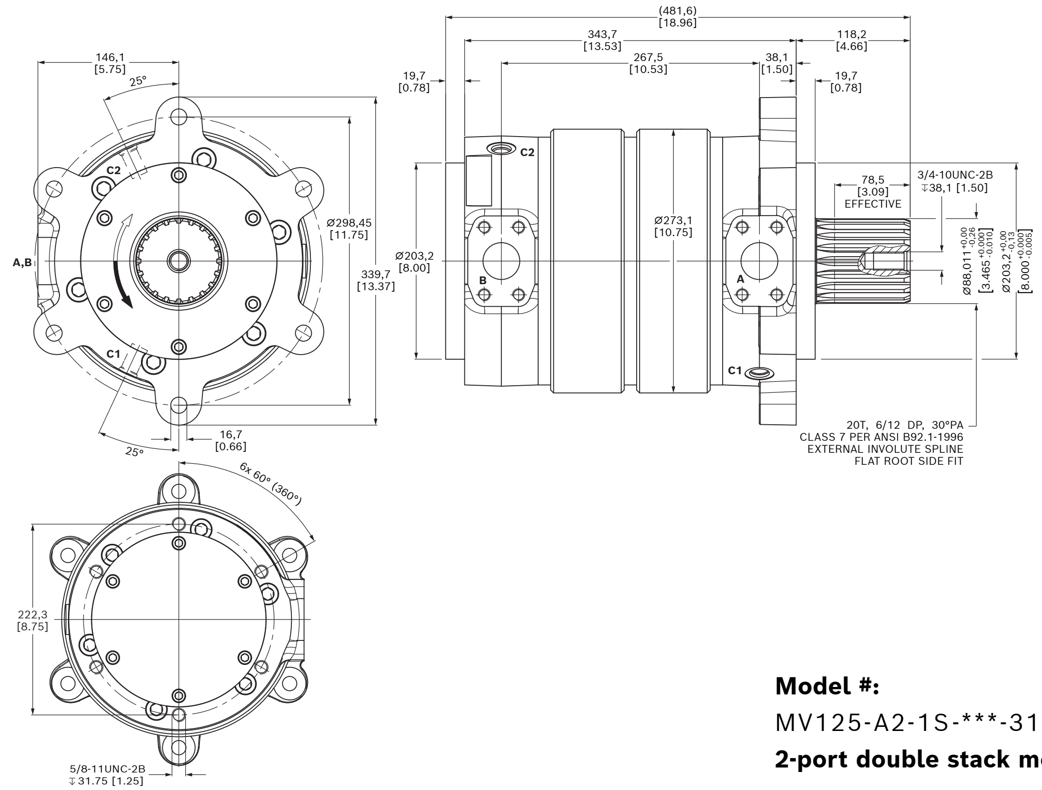


Model #:

MV125-A2-1S-***-34-B1-***-000

Unit dimensions

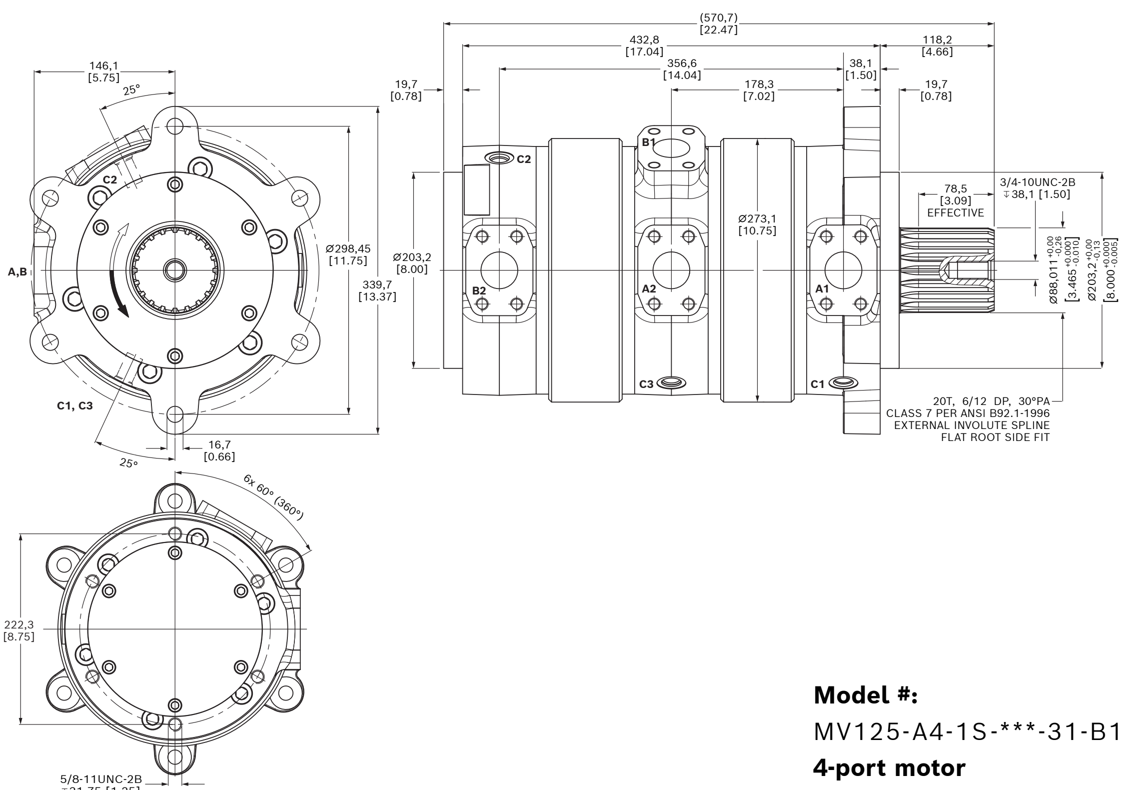
Code 61 (B1 bearing) – continued



Model #:

MV125-A2-1S-***-31-B1-***-000

2-port double stack motor



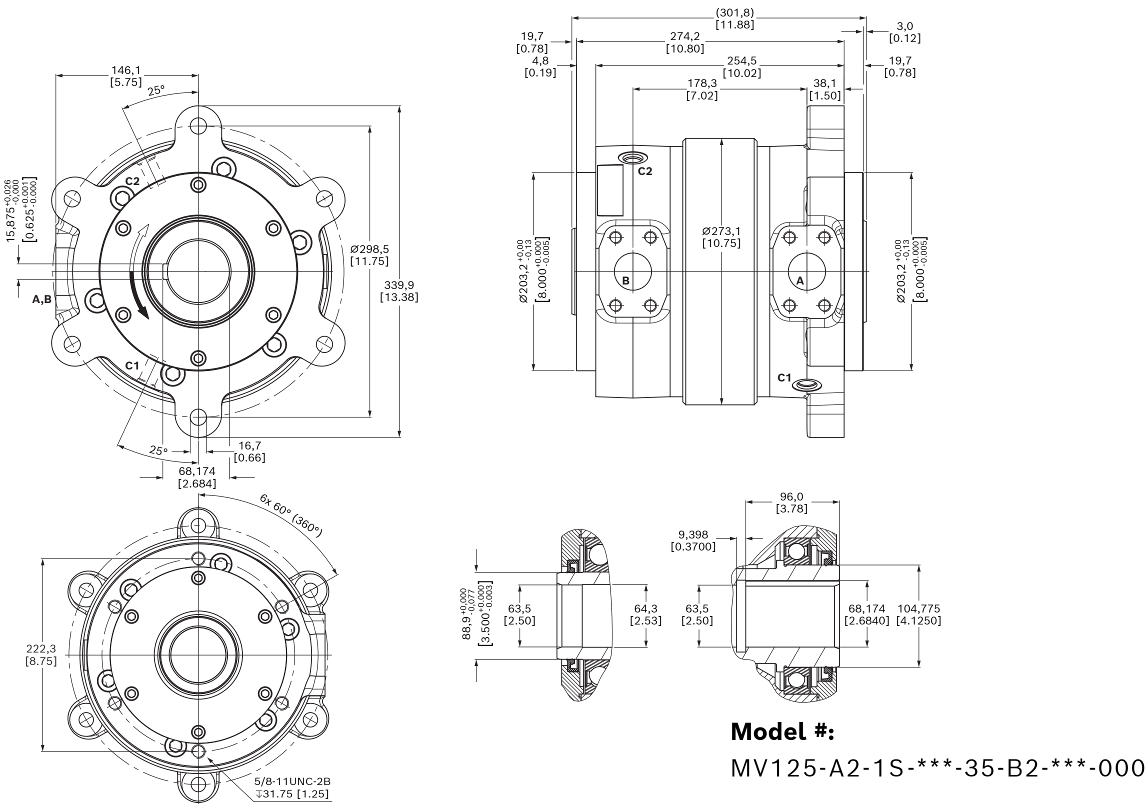
Model #:

MV125-A4-1S-***-31-B1-***-000

4-port motor

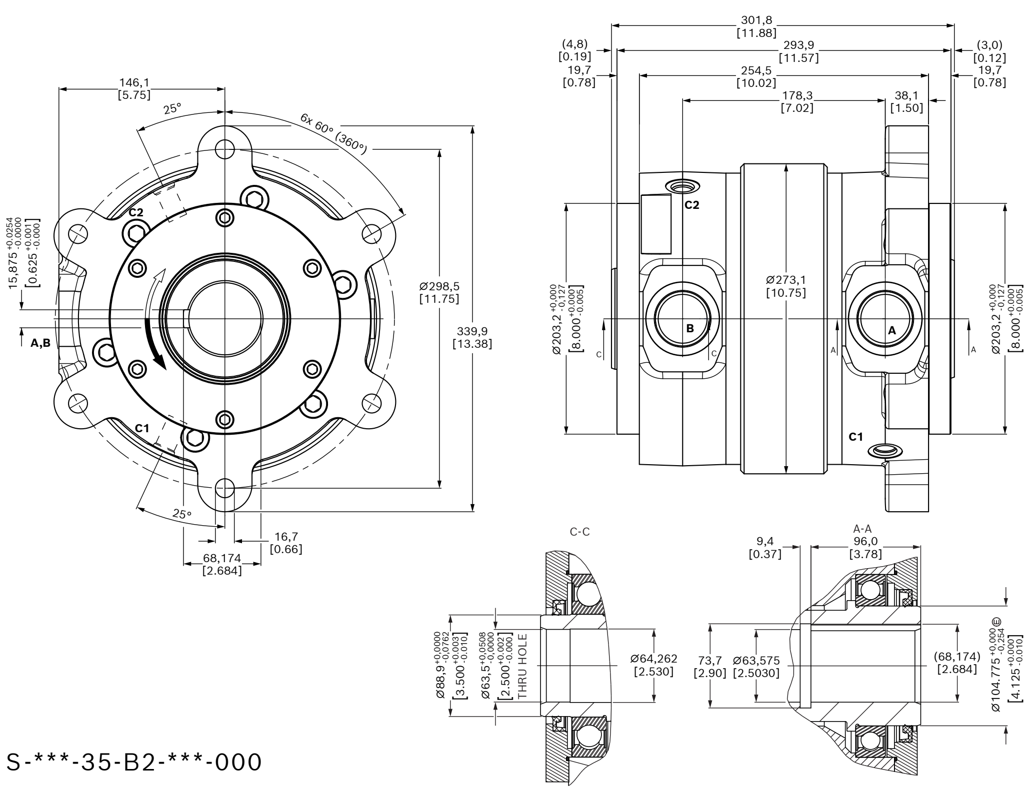
Unit dimensions

Code 61 (B2 bearing)



Model #:

MV125-A2-1S-***-35-B2-***-000

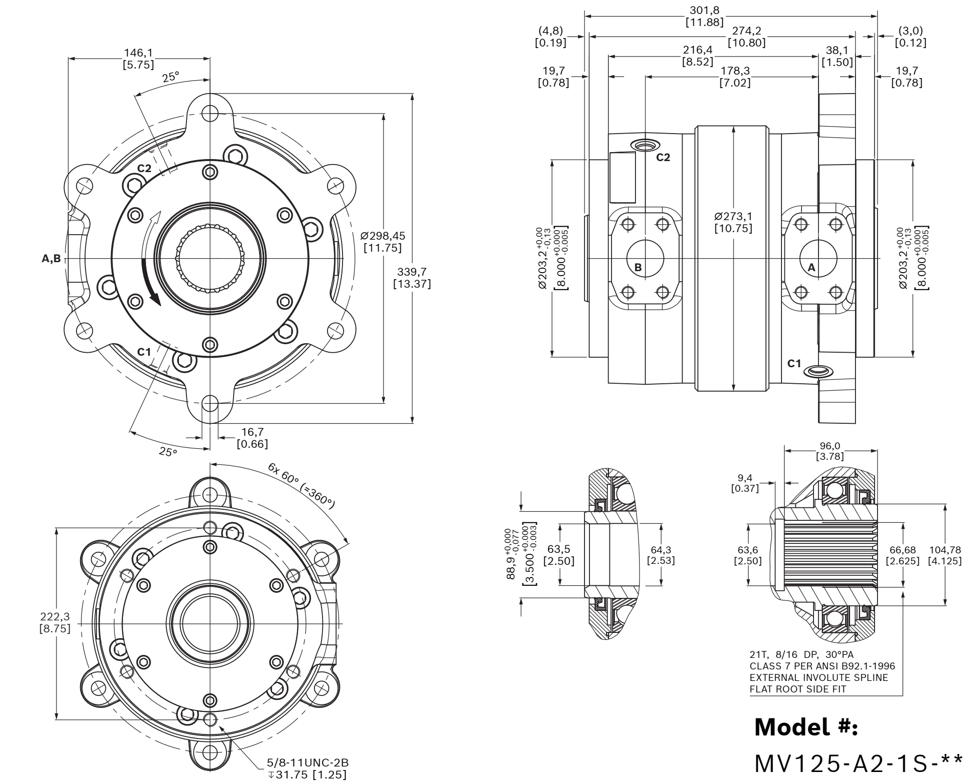


Model #:

MV125-C2-1S-***-35-B2-***-000

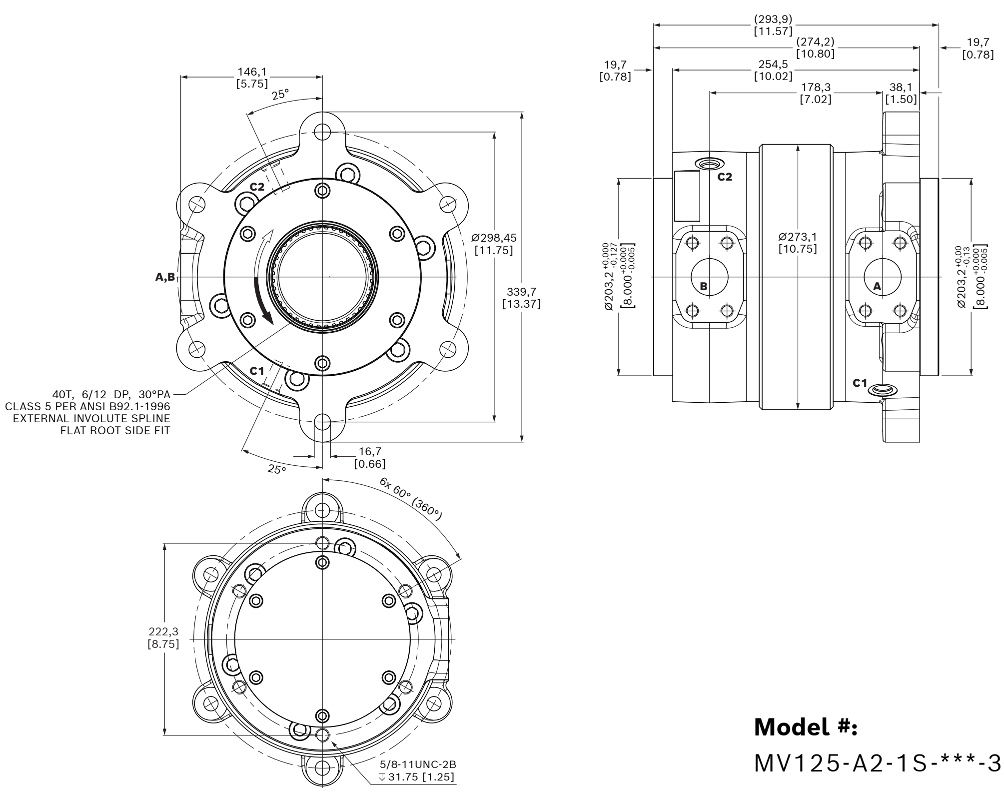
Unit dimensions

Code 61 (B2 bearing) – continued



Model #:

MV125-A2-1S-***-36-B2-***-000

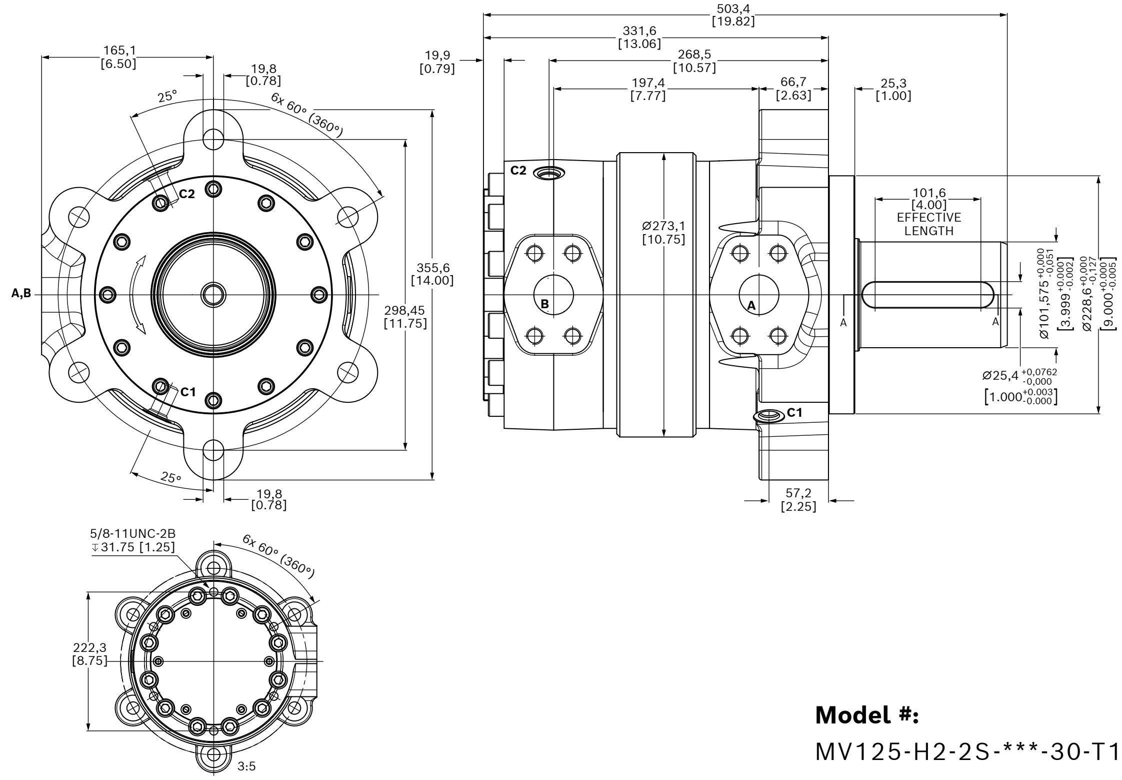


Model #:

MV125-A2-1S-***-33-B2-***-000

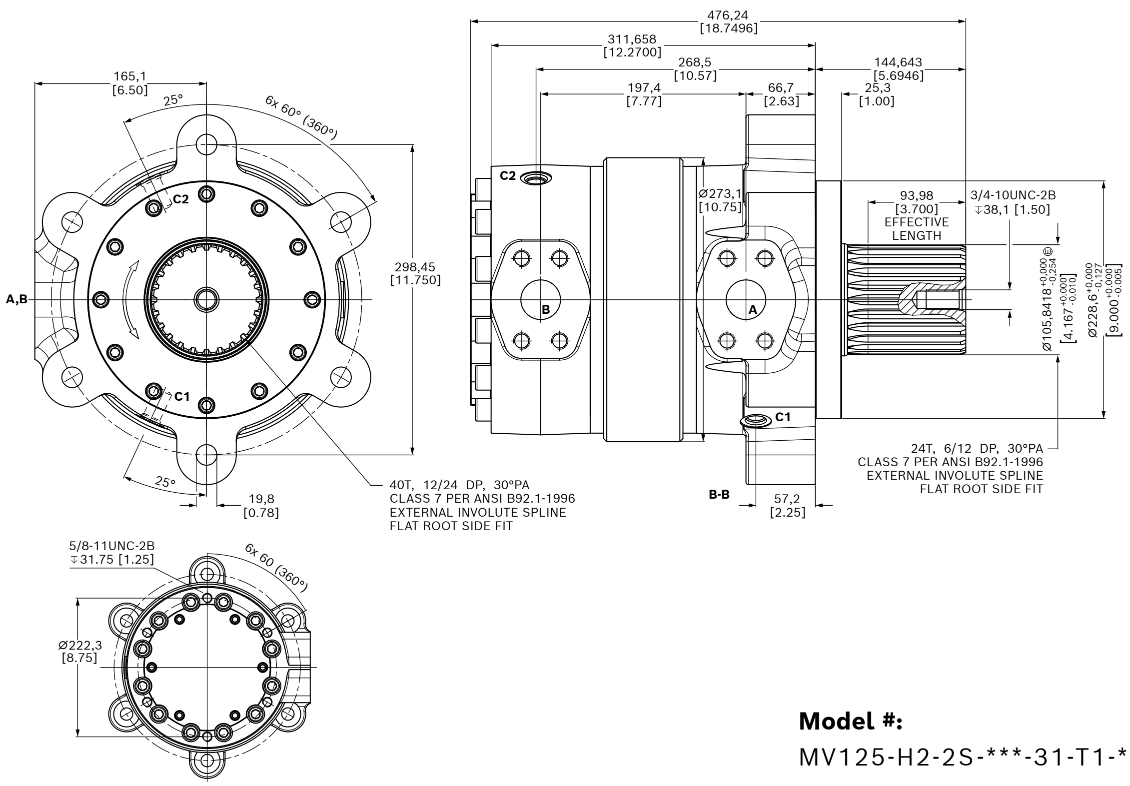
Unit dimensions

Code 62 (T1 bearing)



Model #:

MV125-H2-2S-***-30-T1-***-000

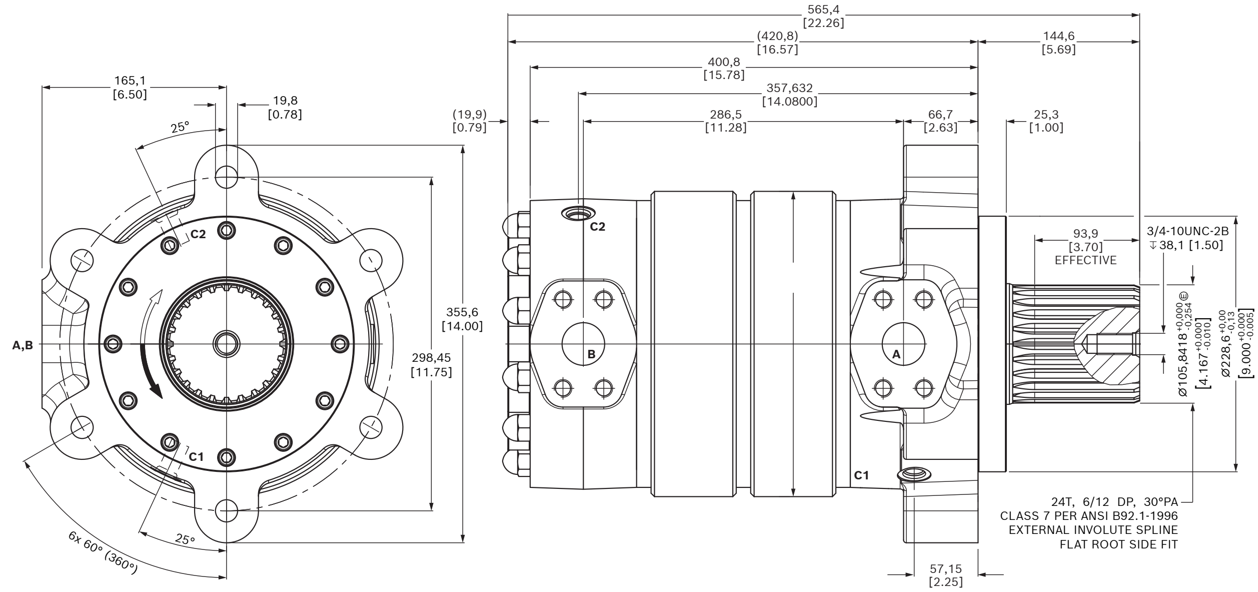


Model #:

MV125-H2-2S-***-31-T1-***-000

Unit dimensions

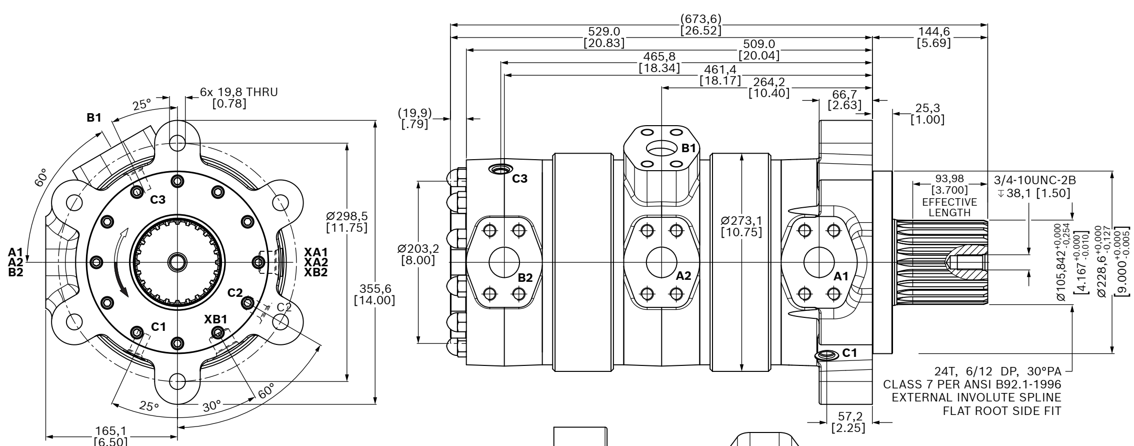
Code 62 (T1 bearing) – continued

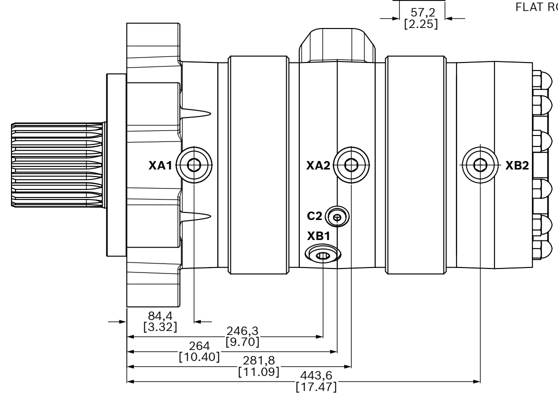


Model #:

MV125-H2-2S-***-31-T1-***-000

2-port double stack motor





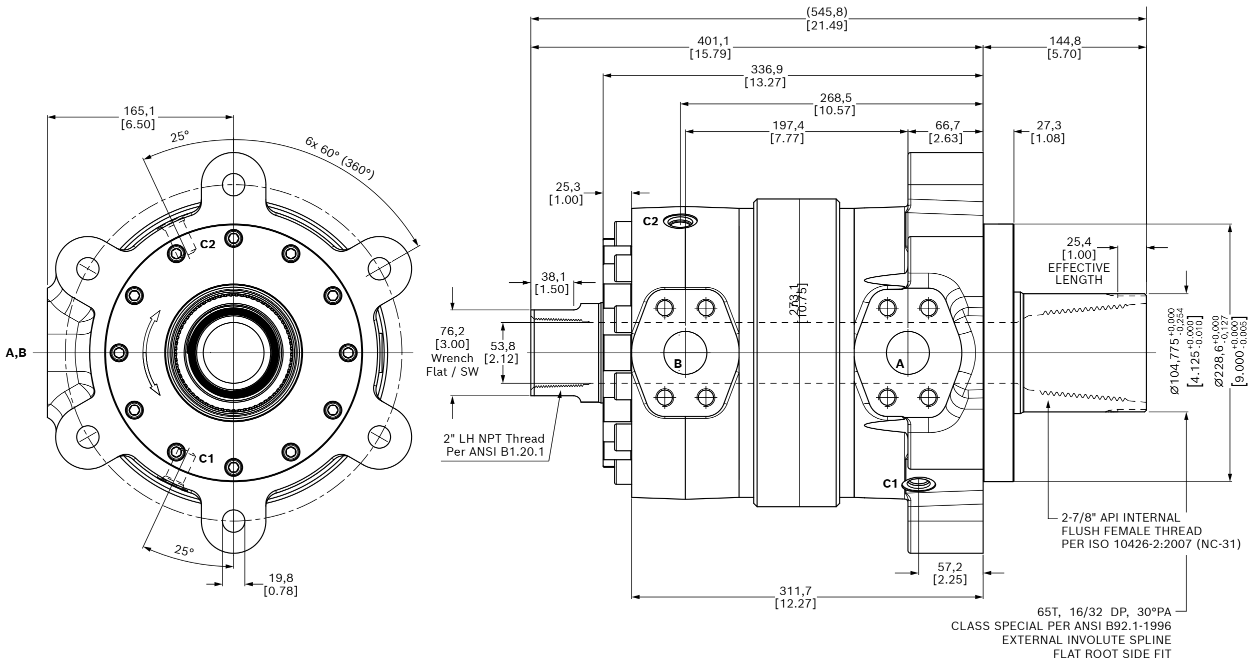
Model #:

MV125-H4-2S-***-31-T1-***-000

4-port motor

Unit dimensions

Code 62 (T1 bearing)

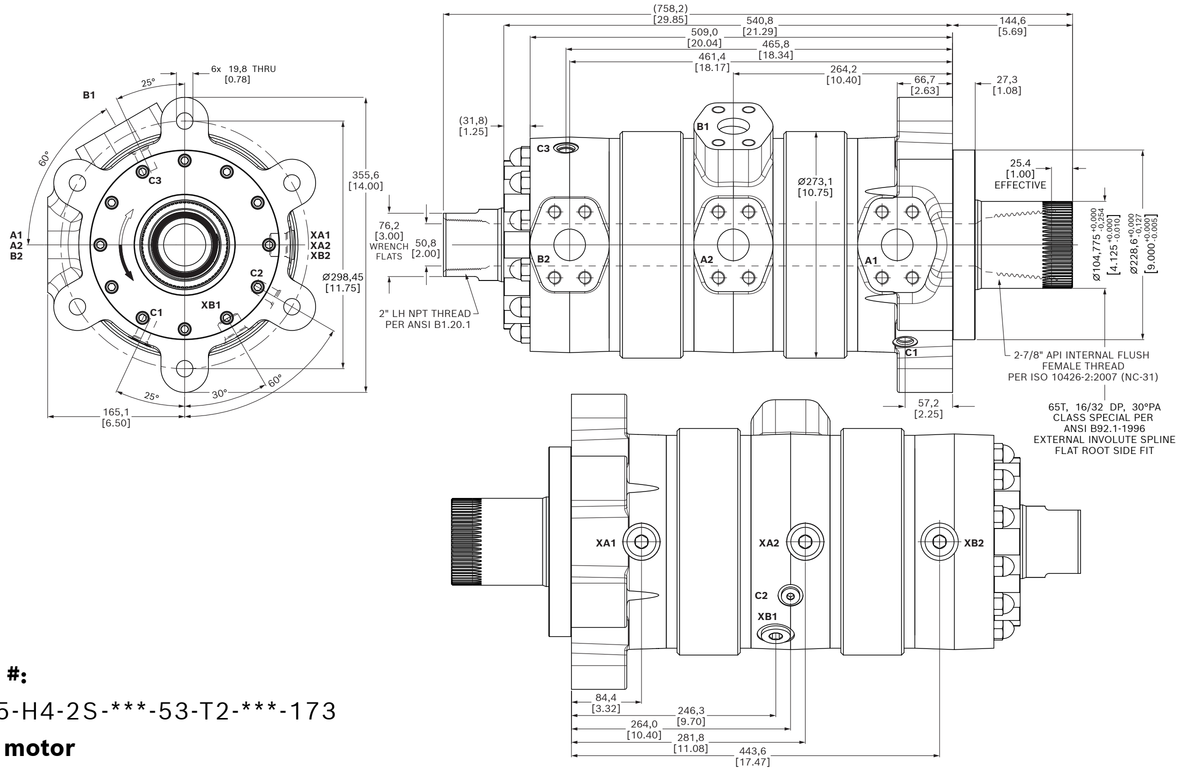


Model #:

MV125-H2-2S-***-53-T1-***-164

Unit dimensions

Code 62 (T2 bearing)



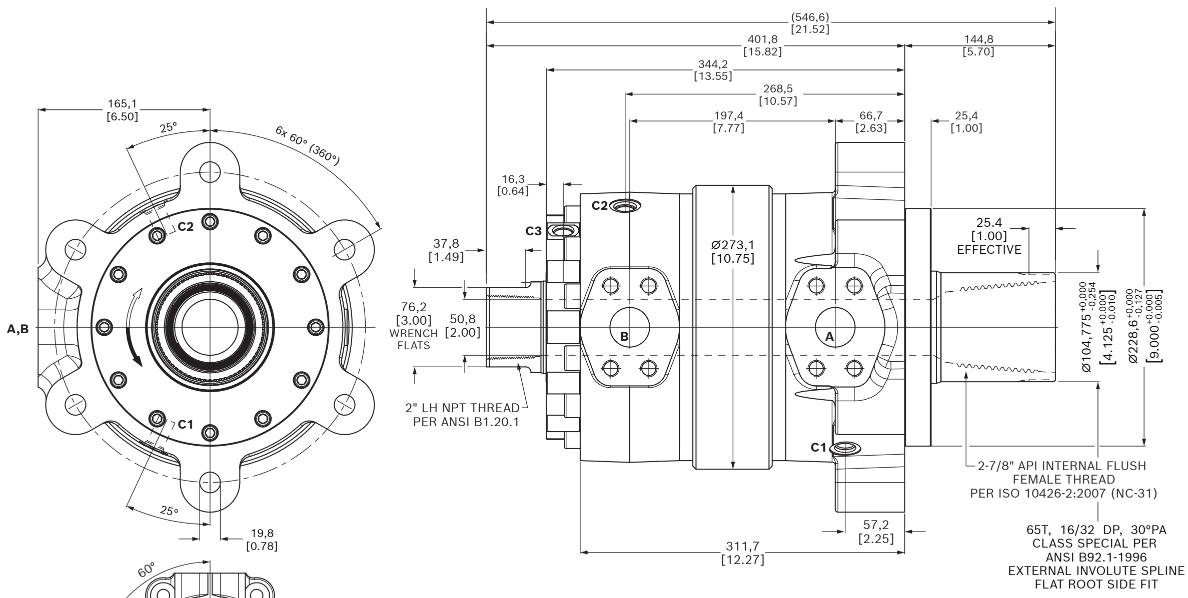
Model #:

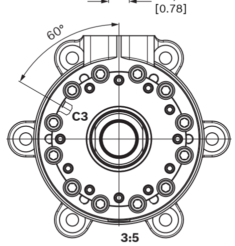
MV125-H4-2S-***-53-T2-***-173

4-port motor

Unit dimensions

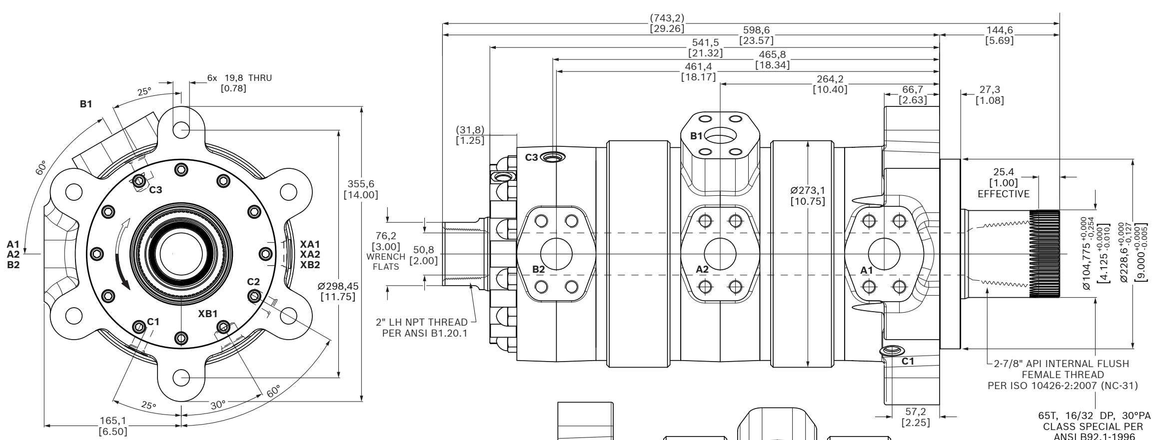
Code 62 (T3 bearing)

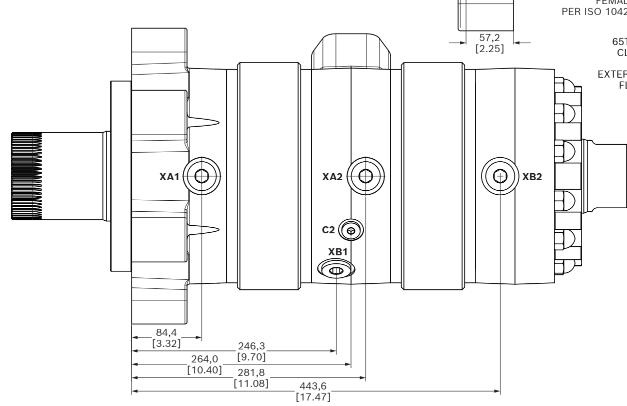




Model #:

MV125-H2-2S-***-53-T3-***-000





Model #:

MV125-H4-2S-***-53-T3-***-000

4-port motor

Engineering guidelines

Case Drain

The 125 Series motors **REQUIRE** an external case drain of sufficient size to prevent back pressure in excess of 35 psi (2.4 bar) for radial lip seals or 100 psi (6.9 bar) for Disogrin and PolyPak seals. A case drain line must be run to the reservoir with minimum restriction as to not exceed the rated capacity of the seals; any unused case drain ports must be plugged. Never plug all case drain ports as this will cause build up of pressure in the motor case and blow out the shaft seal. The case drain line should return directly to the reservoir below the surface of the oil, and as far away as possible from the pump suction line. Refer to the unit drawings for case drain port locations. Use of the case drain port at the highest elevation is recommended.

Thermal Shock

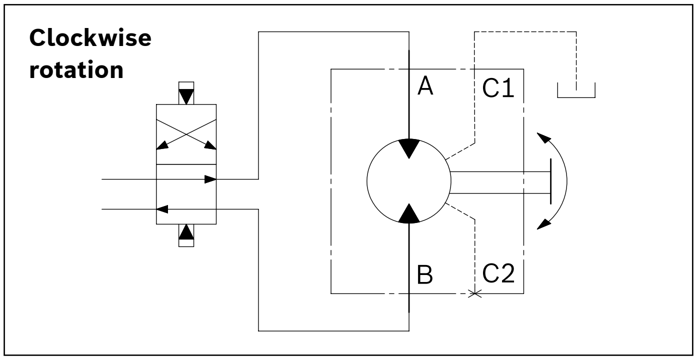
Consideration to cold temperature environments must be provided in the event that a temperature differential exists between the motor and the system in excess of 50 °F (28 °C). Contact a Bosch Rexroth Rineer representative if this is a possibility. In cold temperature environments it may be necessary to warm up the oil in the hydraulic system before the system is used. Typically the warm up is limited to the oil, the pump and directional control valve; leaving other components in the circuit such as the motor cold. When a directional control valve is shifted, the warm oil in the hydraulic system flows through a cold motor resulting in a non-uniform expansion of the internal parts of the motor which may lead to galling and component failure. Low pressure oil can be circulated through the motor case at a maximum flow rate of 3 gpm (11 lpm) or idled at low speed of 20 rpm maximum until the motor temperature is within 50 °F (28 °C) or less than system oil temperature.

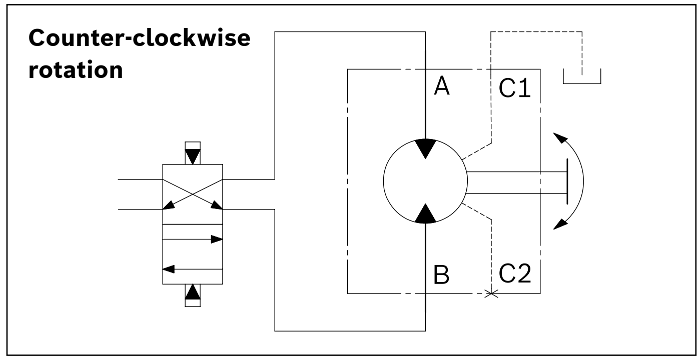
Engineering guidelines

Circuit design

2-port motor circuit

When fluid flow is provided to the “A” port, the rotation of the shaft as seen from its end will be clockwise. The “B” port will be return line flow. Using the “B” port for inlet flow will simply reverse the direction of rotation of the shaft and the “A” port will become the return line port.



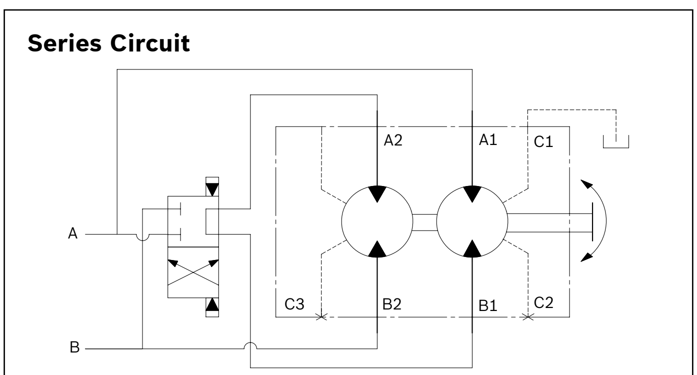


4-port motor circuit

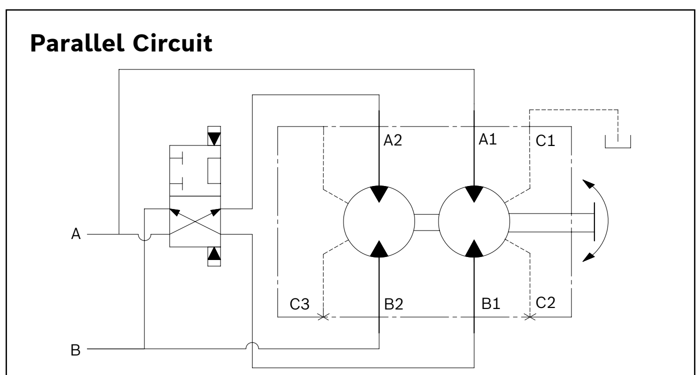
The front housing has a port designated “A1.” The center housing has 2 each ports designated “A2” and “B1”. Port “A2” is on the same plane as port “A1”. Port “B1” is offset from “A2” by 60 degrees. The rear housing has a port designated “B2” and is located on the same plane as “A1” and “A2.” The 4-ported motor is capable of single speed and with external valving, two speed operation. Two-speed operation with the 4-port motor can be accomplished using either series/parallel or logic circuits.

Series/parallel circuit

When using a series/parallel circuit with the 4-port motor, equal displacement rotating groups must be used. See the circuit diagram below for reference only.



Note: Circuit between A2 and B2 port must be rated for full system pressure.



Note: Circuit between A2 and B2 port must be rated for full system pressure.

Notes

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