

# HTO 300 INSTALLATION AND SERVICE INSTRUCTIONS

This bulletin must be read completely before installing, operating, or servicing the pump.

## WARNING:

If any of the items listed below are violated, serious injury or death from burns caused by hot oil may occur.

- **DO NOT** perform service or maintenance when the pumping system is pressurized or hot - serious injury or death from burns caused by hot oil may occur.
- **DO NOT** operate the pump in a manner that it was not intended to be used.
- **DO NOT** install for use in an open environment where people are present.
- **DO NOT** install in a rigid piping system that does not allow the pipe to expand and cause the pump to be strained.
- **DO NOT** continue to operate the pumping system when a known leak exists or the system continues to smoke.
- **DO NOT** continue to operate the pump when unusual noise or vibration occurs.
- **DO NOT** install or use near water where the pumping system may come into contact with water or is splashed by water.
- **DO NOT** operate beyond the pressure or temperature limits stated in the product literature, see form 9001.
- **DO NOT** allow severe temperature changes to occur in a short time period within the pumping system.
- **DO NOT** mix different types or grades of oil within the oil system.
- **DO NOT** use an oil that is not a recommended heat transfer oil by the manufacturer.
- **DO NOT** exceed the maximum oil temperature rated by the oil manufacturer at the hottest point in the pumping system.
- **DO NOT** mount the pump such that high piping loads exist on the pump flanges.



34800 BENNETT • FRASER, MI 48026-1686  
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**FORM 3065-B**

## OPERATION AND MAINTENANCE

Thermal oil vapors leaking from a system can be highly flammable.

Any system leak should be repaired immediately.

Do not insulate the pump or system piping with porous flammable insulation. Fluid may wick, decompose and spontaneously ignite.

Ideal mechanical seal life is 20,000 hours. Reduced seal life may be experienced from extreme conditions.

Recommended spare parts and service parts to rebuild the HTO-120 are:

PART NO.	DESCRIPTION	QTY.	PART NO.	DESCRIPTION	QTY.
29822	DRIVE SLEEVE	1	34933	SEAL ASSEMBLY	1
26744	GASKET	1	29825	GASKET	3
30842	ISOLATOR	2	30841	O-RNG	1

At disassembly, check the impeller and other wear items for unusual wear. Replace if necessary.

When servicing the pump, care should be taken that the pump has cooled to a sufficient temperature to permit disassembly. The product should be drained from the pump housing and disposed in accordance with the fluid manufacturer's recommendations. Operating personnel should be warned to exercise care and utilize eye and skin protection when servicing the pump.

## HTO 300 ASSEMBLY INSTRUCTIONS

1. Press the seal seat (part of #5) into the seal housing #4.
2. Set the drive sleeve #7 standing up on the workbench with the threaded end up. Place the seal housing #4 on the sleeve with the seal seat facing up.
3. Lubricate the seal head's o-ring (part of #5) and slide it over the sleeve.
4. Install snap ring #6 into the groove on the sleeve.
5. Install the pipe plug into the seal housing. Use sealant on the threads.
6. Install the three gaskets #8, two graphite isolators #9, and o-ring #10 over the drive sleeve onto the seal housing.
7. Place the seal housing assembly from step 6 into the adapter #13 and install 3 capscrews #3 through the seal housing and into the adapter. Torque the capscrews to 20 ft-lbs. in 5 ft-lbs. increments.
8. Apply Loctite onto the drive sleeve threads and install the impeller #14 by threading it onto the sleeve. Make sure that the impeller shoulders against the sleeve.
9. Position the gasket #15 onto the adapter and install the housing #16 to the adapter using eight capscrews #11 and lockwashers #12.
10. Slide the fan clamp #2 onto the sleeve with fan blades closest to the seal housing. The pump end assembly (Pumpak) is complete.
11. Pumpak assembly to the motor as follows:
  1. Place 5/16x5/16x.5 key into the key slot of the motor shaft.
  2. Slide the Pumpak onto the motor with the shaft/key indexed to lineup with a slot in the pump sleeve.
  3. Install and tighten (4) 1/2"-13 capscrews onto the motor flange with 40 ft-lbs. torque.
  4. Reaching through the inlet of the pump push the impeller back towards the motor until it stops up against the carbon isolators.
  5. While holding the impeller in this position, tighten the fasteners of the fan clamp with 15 ft-lbs. torque.
  6. Rotate impeller to check for contact with stationary parts.
  7. Install piping.
  8. After wiring the motor, check rotation by momentarily applying power and viewing the rotation of the fan clamp. Viewed from the motor end, the clamp should rotate in a clockwise direction.

# APPLICATION AND INSTALLATION INSTRUCTIONS

**Application assistance and technical information can be obtained by calling MP PUMPS at 586-293-8240.**

The HTO Pump is designed for pumping high temperature fluids that are non-corrosive, non-volatile and have good lubricating qualities.

The primary application for use is with heat transfer oils.

It is the users' responsibility to determine the pump and product compatibility with the materials of construction.

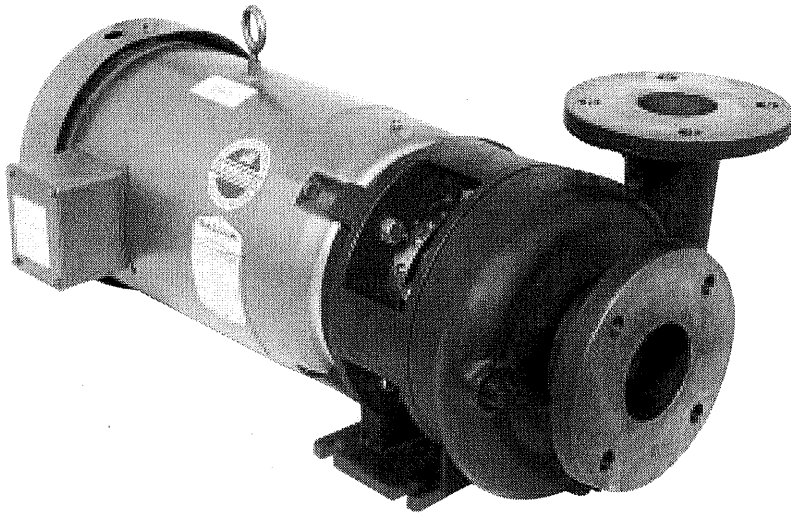
## INSTALLATION AND START-UP

### INSTALLATION

1. The pump must be installed in a horizontal shaft position.
2. The housing may be rotated to a horizontal or vertical discharge to fit the particular piping installation.
3. Rigid and supported piping must be used that will not strain the pump housing when temperature changes are made during the use of the pump.
4. The piping system must be free of foreign material and moisture before start-up.
5. Pipe thread sealing compound must be used on the NPT flanges that is compatible with the fluid being pumped and is rated for the temperature requirements.
6. The installation should permit adequate circulation of air to provide proper cooling of the motor and pump seal housing.
7. Do not install in a sealed enclosure or insulate the pump adapter and motor. The motor and/or pump seal may fail from excessive heat.
8. A good installation will have an enclosure that provides adequate air flow of ambient air to the motor of the pump.

### START-UP

1. Follow all requirements and recommendations from the heat transfer fluid manufacturer for fill, start-up and use.
2. Check for leaks before insulating the piping system.
3. Check for proper shaft rotation by jogging the power and observing the fan clamp. Rotation arrows are provided on pump housing.
4. The seal cavity inside the pump will internally vent during fill and start-up.
5. A small amount of oil may leak from the seal cavity at the shaft; this is normal for a new installation and will stop after approximately one hour.
6. Do not allow the pump to run dry, or continue to operate the pump when it is noisy, vibrating, or leaks are observed. These noticeable signs give a warning that something is wrong with the equipment and must be investigated to avoid possible damage or injury from burns caused by hot oil.



# HTO 300

3" x 2 1/2"  
Centrifugal  
Pump

The HTO 300 is a unique centrifugal pump (patented) designed for high temperature applications without requiring external flushes or jacket cooling. Capacities to 500 GPM ... heads to 190 FT TDH. Temperatures to 650°F.

3, 5, 7 1/2, 10,  
15, & 20 HP

FLOWS UP TO 500 GPM  
PRESSURES UP TO 190 FEET HEAD



## WARNING

Consult factory for applications approval and usage. Serious injury or death caused by burns from hot oil may occur.

*Available in:*

Ductile Iron  
Construction



**MP PUMPS, INC.**

**TECUMSEH PRODUCTS COMPANY**  
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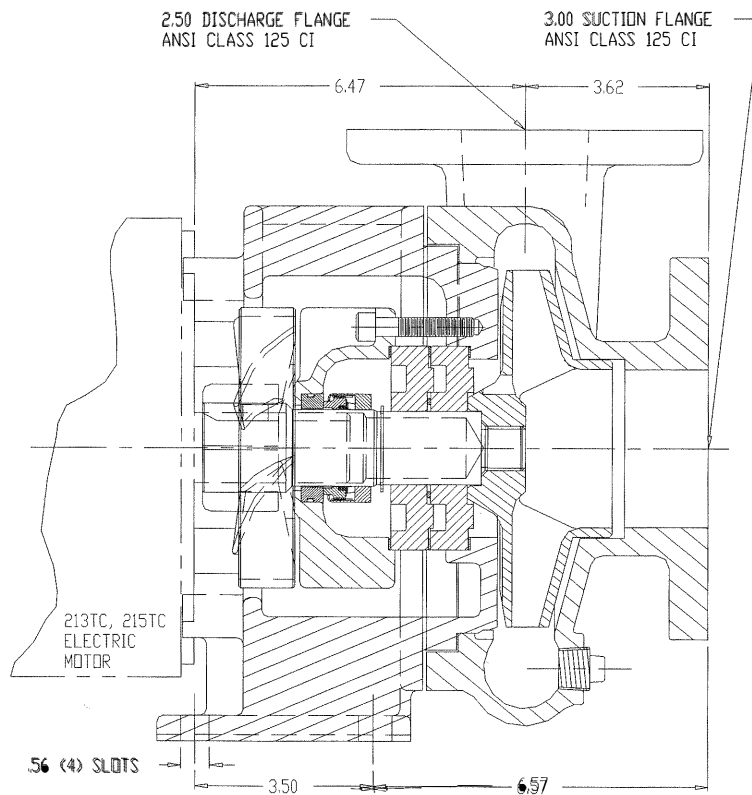
# HTO 300

For application in the plastics, chemical, food, and processing industries which require pumping of high temperature fluids.

The HTO 300 utilizes an isolated seal chamber, effectively cooled by a fan clamp which couples the unit to the shaft of a standard 213TC and 215TC motor.

- Standard carbon/ceramic mechanical seal with viton elastomers, stainless steel fitted.
- Carbon graphite isolator bushing separates mechanical seal from high temperature fluids.
- Stainless steel drive sleeve and ductile iron drive clamp couples pump unit to motor.
- Vertical or horizontal discharge.
- With or without electric motor.

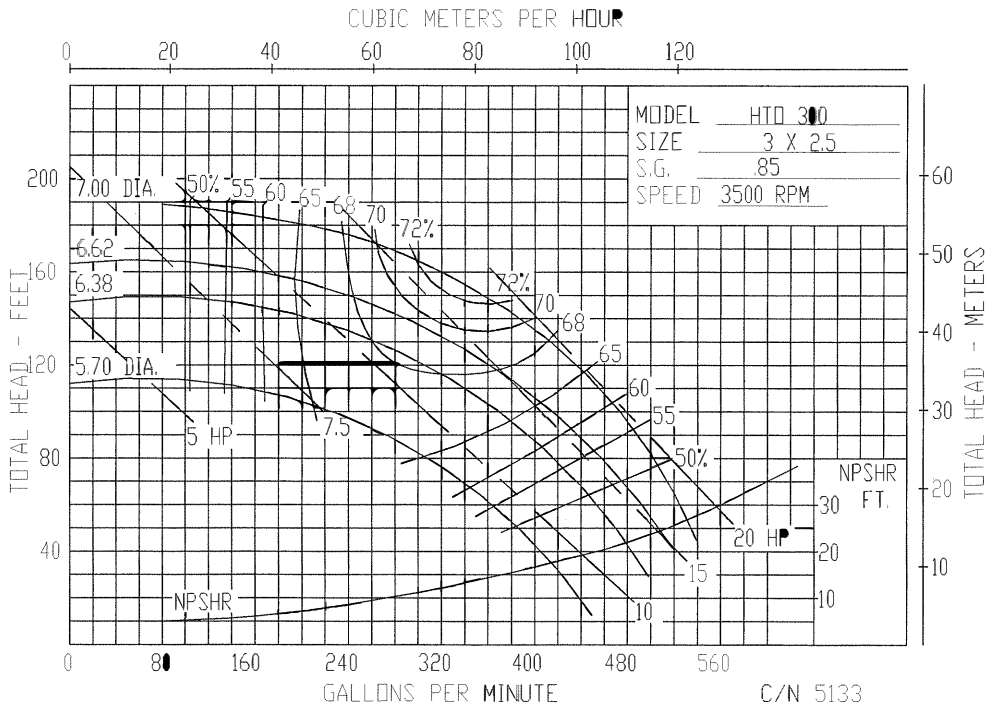
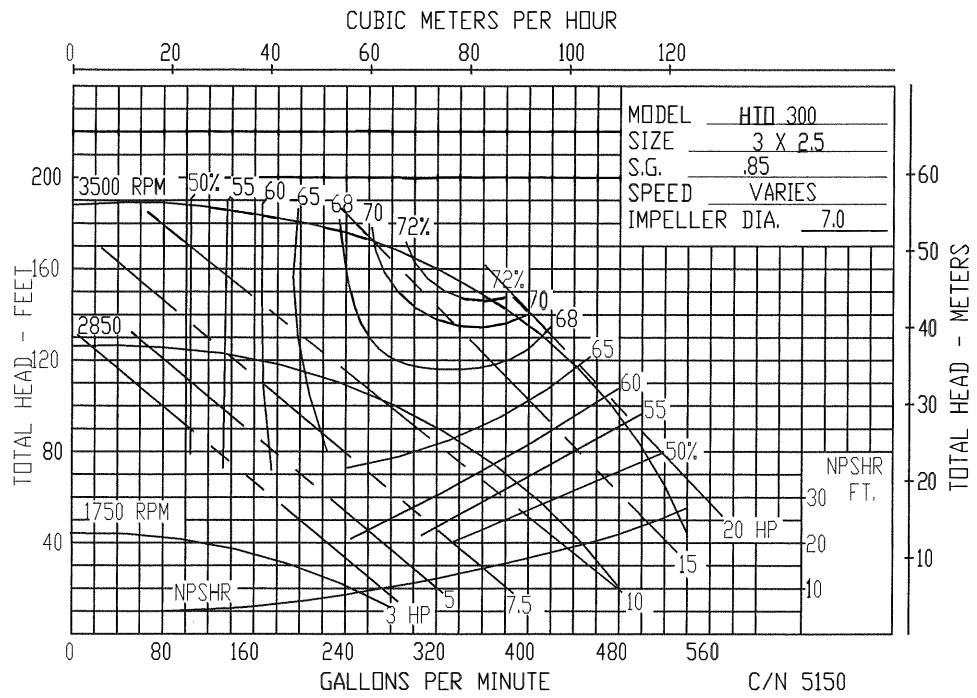
## HTO 300 PUMP CROSS-SECTION AND DETAIL



DET.	DESCRIPTION
1	IMPELLER - CAST IRON
2	SEAL ASSEMBLY
3	HEX JAM NUT - S.S.
4	COOLING FAN CLAMP
5	CAPSCREW
6	GASKET
7	CAPSCREW
8	O-RING
9	ADAPTER - DUCTILE IRON
10	ISOLATOR - CARBON GRAPHITE
11	DRIVE SLEEVE - STAINLESS STEEL
12	SEAL HOUSING - DUCTILE IRON
13	LIP SEAL
14	HOUSING - DUCTILE IRON
15	GASKET
16	PIPE PLUG S.S.
17	LOCKWASHER S.S.
18	CAPSCREW CPS

The HTO 300 provides a self-aligning compact installation with an integral air-cooled seal chamber. Precautions must be exercised in the installation to assure safe operation.

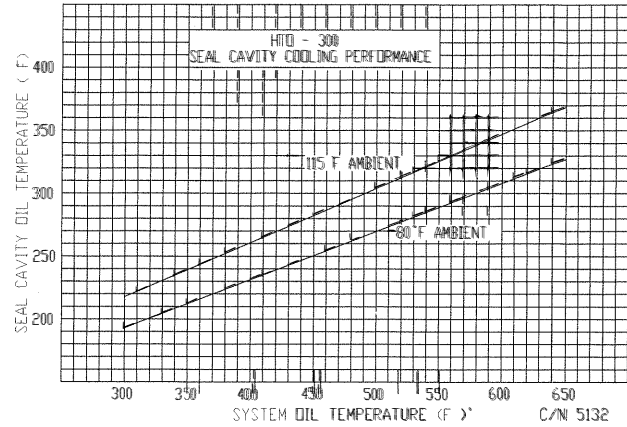
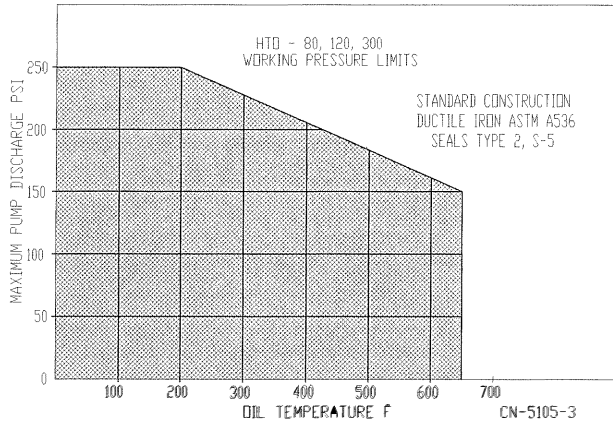
# HTO 300 PERFORMANCE CHARACTERISTICS



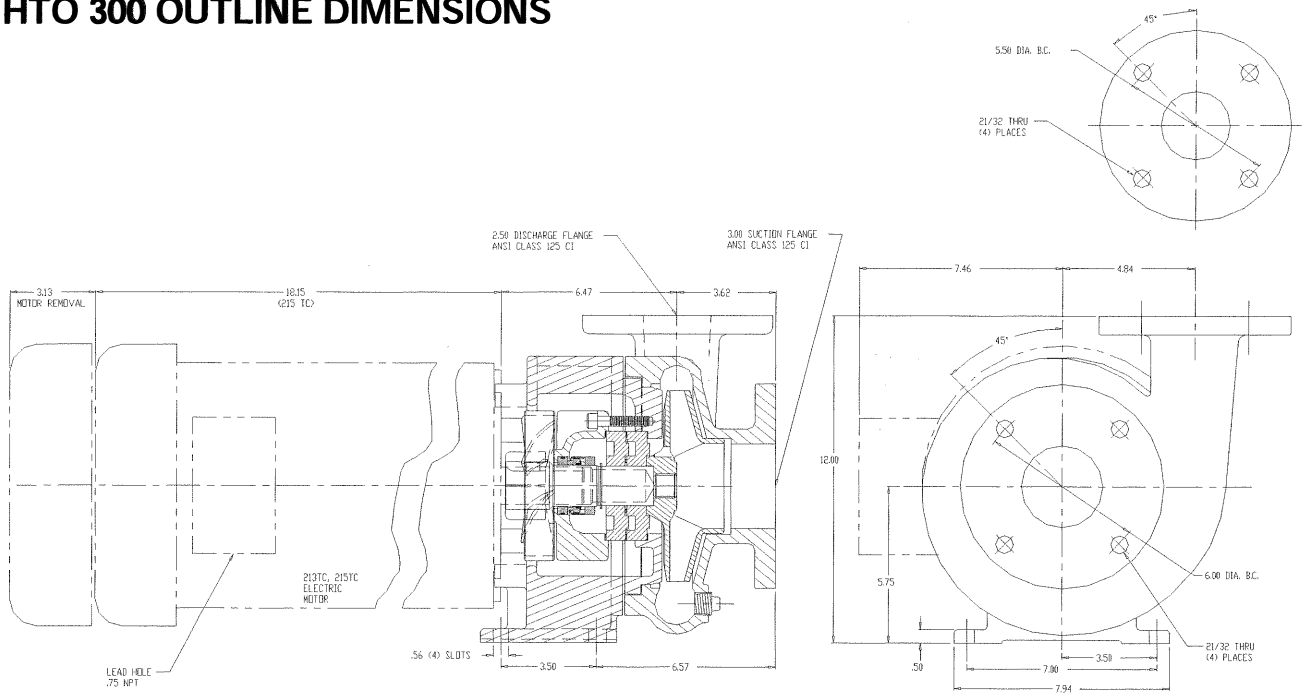
Horsepower requirements based upon 0.85 specific gravity.  
 Calculations can be applied for fluids of other specific gravities.

Maximum operating temperature is 650°F.  
 Maximum working pressure is 150 PSI.

# HTO 300



## HTO 300 OUTLINE DIMENSIONS



Pump dimensions certifiable for construction purposes. Motor dimensions dependent upon motor manufacturer.

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FORM 9060-A (12/98)

CONSULT FACTORY FOR CHEMICAL COMPATIBILITY.

LITHO IN U.S.A.

# MP PUMPS HTO SERIES

## APPLICATION AND INSTALLATION INSTRUCTIONS

**Application assistance and technical information can be obtained by calling MP PUMPS at 810-293-8240.**

The HTO pump is designed for pumping high temperature fluids that are non-corrosive, non-volatile and have good lubricating qualities.

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## INSTALLATION AND START-UP

### INSTALLATION

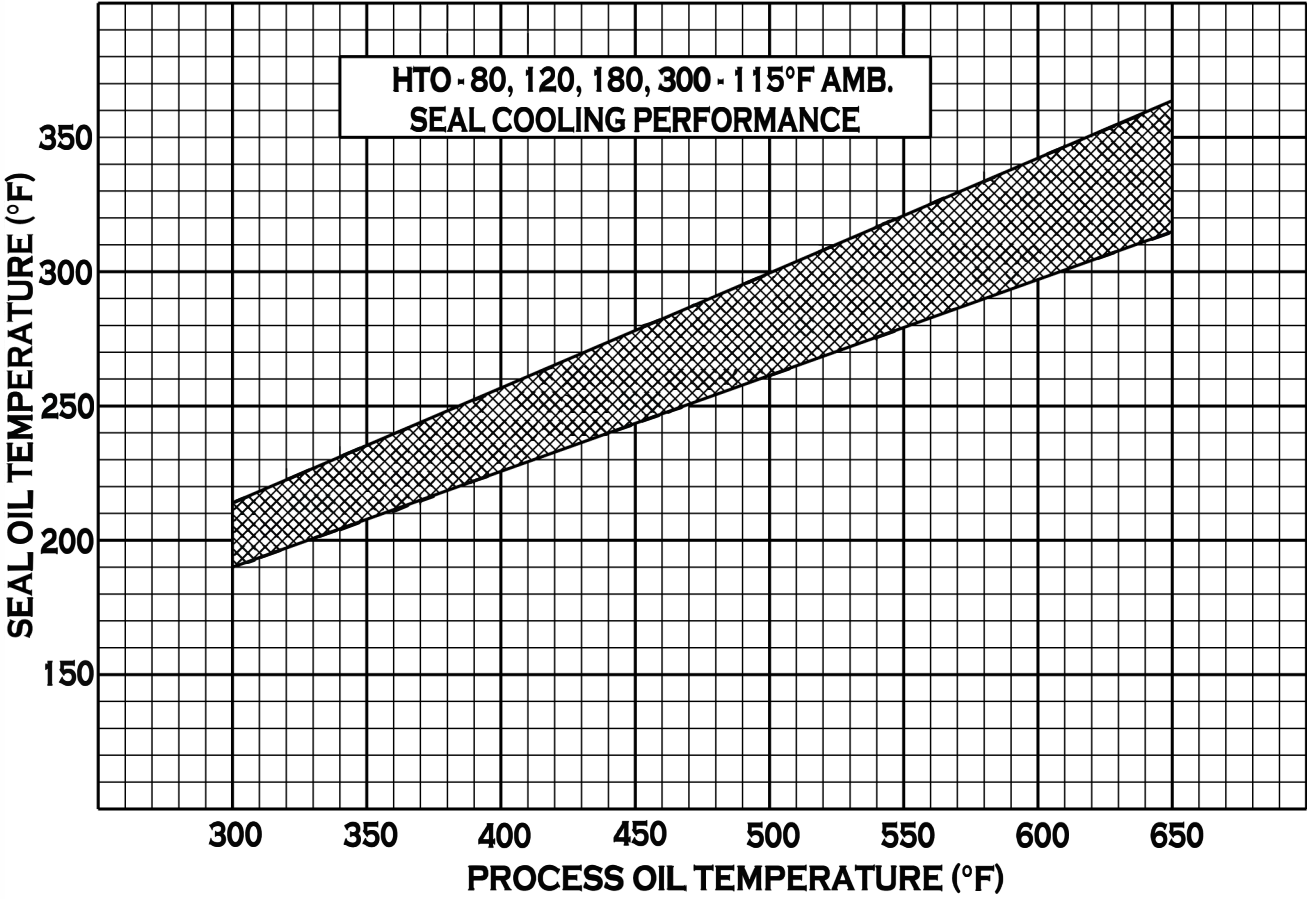
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4. The piping system must be free of foreign material and moisture before start-up.
5. Pipe thread sealing compound must be used on the NPT flanges that is compatible with the fluid being pumped and is rated for the temperature requirements.
6. The installation should permit adequate circulation of air to provide proper cooling of the motor and pump seal housing.
7. Do not install in a sealed enclosure or insulate the pump adapter and motor. The motor and/or pump seal may fail from excessive heat.
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### START-UP

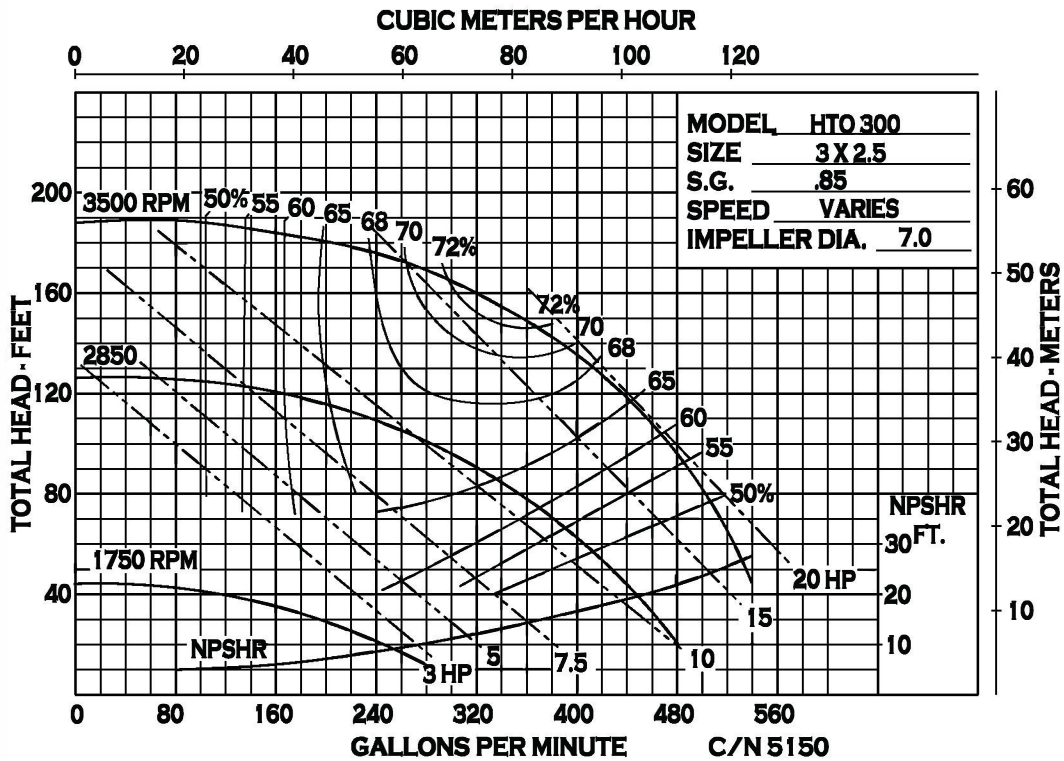
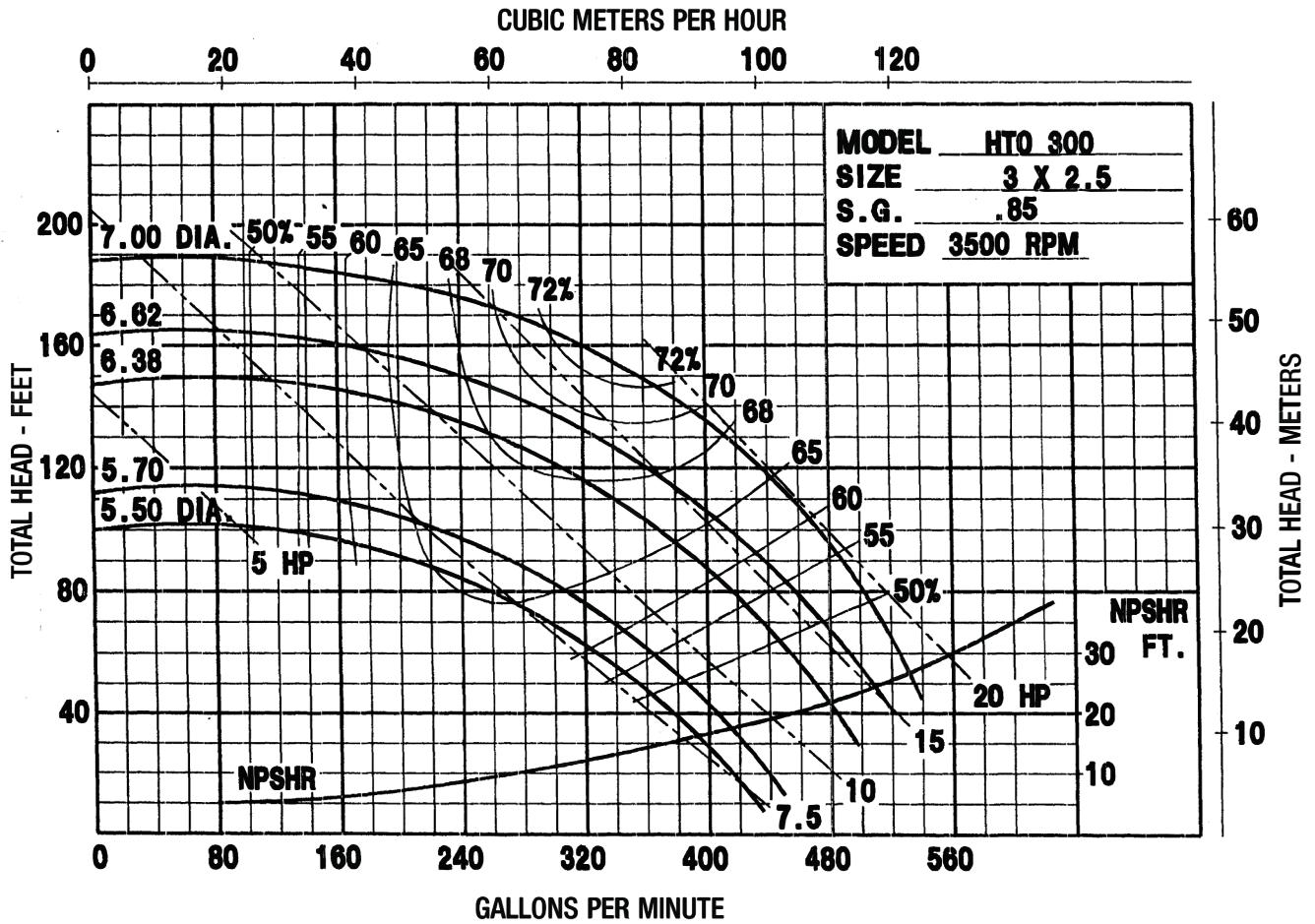
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2. Check for leaks before insulating the piping system.
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4. The seal cavity inside the pump will internally vent during fill and start-up.
5. A small amount of oil may leak from the seal cavity at the shaft; this is normal for a new installation and will stop after approximately one hour.
6. Do not allow the pump to run dry, or continue to operate the pump when it is noisy, vibrating, or leaks are observed. These noticeable signs give a warning that something is wrong with the equipment and must be investigated to avoid possible damage or injury from burns caused by hot oil.





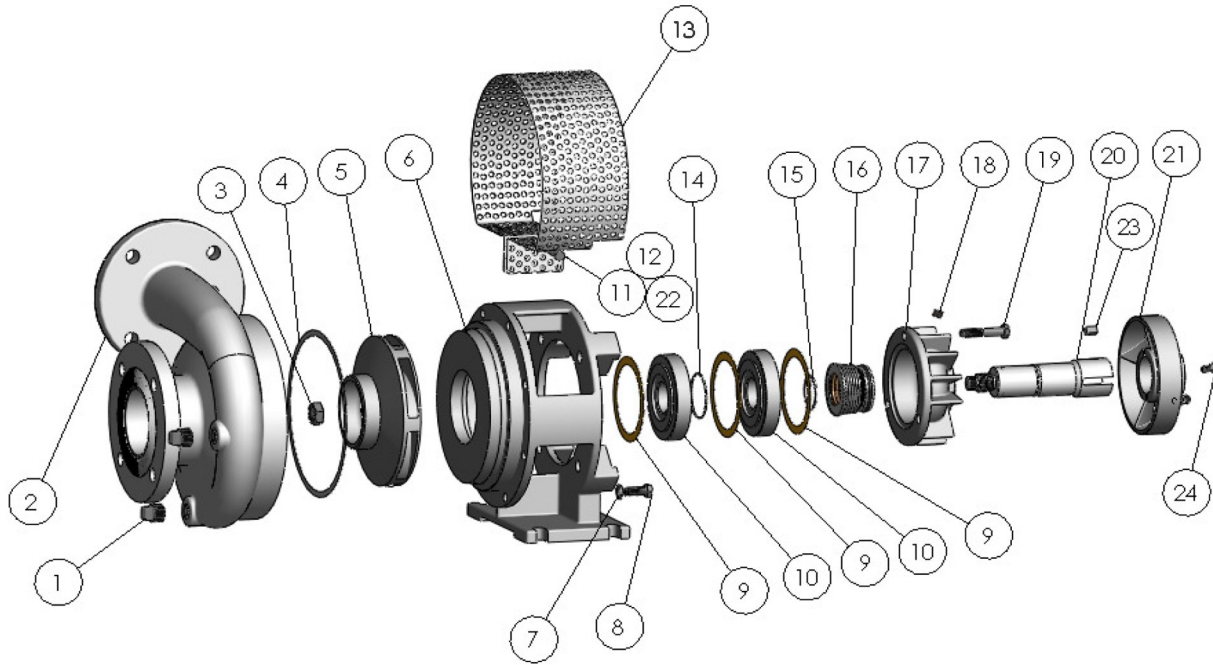


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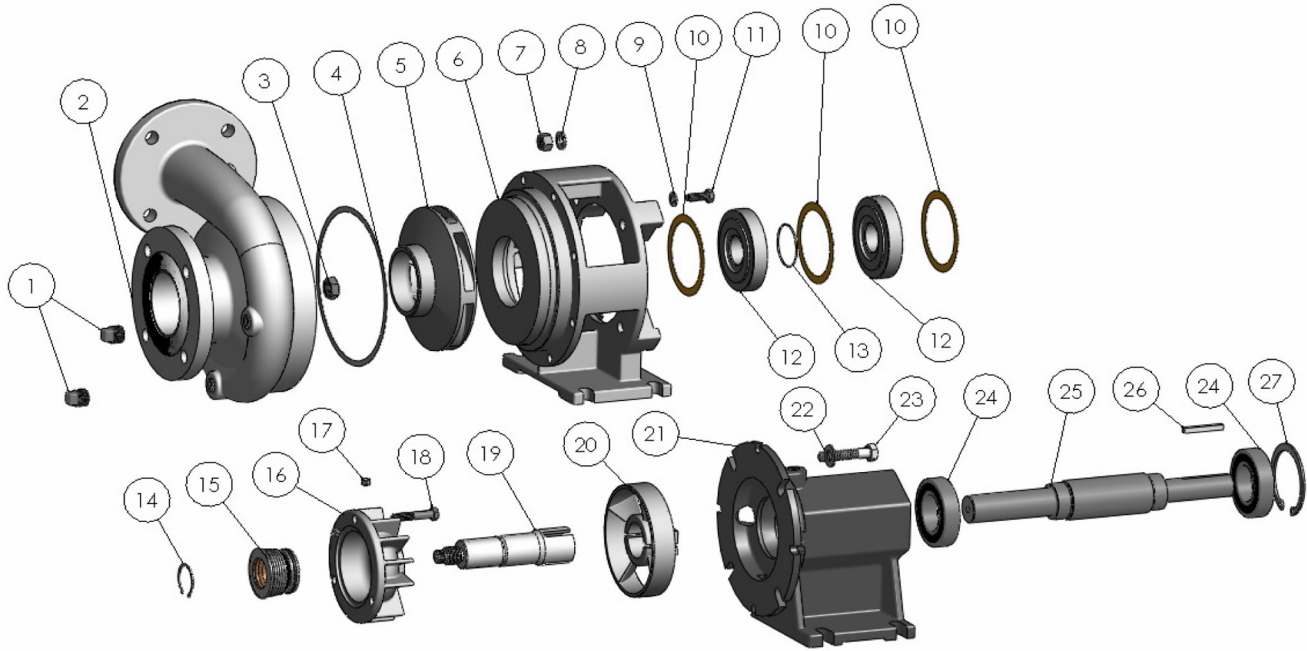
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ITEM NO.	PART NO.	DESCRIPTION	QTY.		ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	41479	1/2" NPT PIPE PLUG PLATED STL	2		11	33810	CAPSCREW ZPS - 1/4-20 X 1.75	1
2	26733	HOUSING FLAT FLANGE	1		12	21241	HEX NUT S.S. - 1/4-20	1
3	25168	HEX JAM NUT S.S.- 5/8-18	1		13	33274	SHIELD ZPS	1
* 4	31519	GASKET: 7.8X7.27X.03 GARLOCK 9850	1	*	14	30841	O RING - VITON	1
5	29823	IMPELLER C MACH: HTO-300 Ø7.0	1		15	29826	SNAP RING STL: 1.387X.05	1
6	29828	ADAPTER D MACH: HTO 300	1		16	34933	SEAL ASSY. T-2	1
7	30626	LOCK WASHER SS 3/8 X 1/8	8		17	29830	SEAL HSG D - HTO-300	1
8	41256	CAPSCREW STL: HH 3/8-16X1.0 GR.5	8		18	30824	PIPE PLUG STL. - 1/8" NPT	1
* 9	29825	GASKET: 3.98X3.23X.03 GARLOCK	3		19	21277	CAPSCREW SS:HH 3/8-16 X 2	3
* 10	30842	ISOLATER	2		20	29822	DRIVE SLEEVE SS 215TC	1
					21	29833	CLAMP FAN	1
					22	27261	WASHER STL.	2
					23	29831	KEY STL. - 5/16 X .50	1
					24	30264	CAPSCREW STL. - 5/16-18 X 1.25	2

\*RECOMMENDED REPLACEMENT PARTS



ITEM NO.	PART NO.	DESCRIPTION	QTY.	ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	41479	1/2" NPT PIPE PLUG PLATED STL	2	14	29826	SNAP RING STL: 1.387X.05	1
2	26733	HOUSING FLAT FLANGE	1	15	34933	SEAL ASSY. T-2	1
3	25168	HEX JAM NUT S.S.- 5/8-18	1	16	29830	SEAL HSG D - HTO-300	1
* 4	31519	GASKET: 7.8X7.27X.03 GARLOCK 9850	1	17	30824	PIPE PLUG STL. - 1/8" NPT	1
5	29823	IMPELLER C MACH: HTO-300 Ø7.0	1	18	21277	CAPSCREW SS:HH 3/8-16 X 2	3
6	29828	ADAPTER D MACH: HTO 300	1	19	29822	DRIVE SLEEVE S.S.	1
7	41553	HEXNUT STL. - 1/2-13	4	20	29833	CLAMP FAN ASSY.	1
8	41387	L'WASHER ZPS - 1/2"	4	21	34889	BEARING HOUSING C	1
9	30626	LOCK WASHER S.S. 3/8 X 1/8	8	22	34350	WASHER FLAT S.S. - .50	4
* 10	29825	GASKET: 3.98X3.23X.03 GARLOCK	3	23	34890	CAPSCREW STL.- 1/3-13 X 2.5 GRADE 5	4
11	41256	CAPSCREW STL: HH 3/8-16X1.0 GR.5	8	24	31804	BALL BEARING SEALED	2
* 12	30842	ISOLATER	2	25	34891	SHAFT S.S.	1
* 13	30841	O RING - VITON	1	26	33232	SQ KEY: 1/4 X 1/4 X 2.00	1
				27	31803	SNAP RING STL.- N5000-334	1

\*RECOMMENDED REPLACEMENT PARTS