Canned Sealless Centrifugal

- Capacities to 2100 GPM
- Heads to over 410 Feet
- Temperatures from -95°F to 750°F
Canned Sealless Centrifugal Pumps

**Materials**

<table>
<thead>
<tr>
<th>Part</th>
<th>304 Stainless Steel</th>
<th>316 Stainless Steel</th>
<th>316L Stainless Steel</th>
<th>Alloy 20</th>
<th>Hastelloy® C</th>
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</thead>
<tbody>
<tr>
<td>Pump Casing</td>
<td>304 SS</td>
<td>316 SS</td>
<td>316L SS</td>
<td>Alloy 20</td>
<td>Hastelloy® C</td>
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<tr>
<td>Impeller</td>
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<td>316 SS</td>
<td>316L SS</td>
<td>Alloy 20</td>
<td>Hastelloy® C</td>
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<tr>
<td>Shaft</td>
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<td>316L SS</td>
<td>Alloy 20</td>
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<tr>
<td>Liner</td>
<td>316L SS</td>
<td>316L SS</td>
<td>316L SS</td>
<td>Hastelloy® C</td>
<td>Hastelloy® C</td>
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<tr>
<td>Sleeves / Thrust Washers</td>
<td>304 SS w/M16C* Coating</td>
<td>316 SS w/M16C* Coating</td>
<td>316L SS w/M16C* Coating</td>
<td>Alloy 20 w/ST#1** Coating</td>
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<td>Compressed Fiber Sheet</td>
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<td>Teflon®</td>
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</table>

Note: Individual component materials are often changed to suit the individual application requirements and provide the most reliable and economical operating life.

* M16C is a Nickel / Chromium flame sprayed hard coating
** ST#1 is Stellite® 1 which is a Cobalt / Chromium / Tungsten flame sprayed hard coating

**Limitations**

- **Discharge Pressure**: 425 PSI
- **Speed (Max)**: 3600 RPM
- **Min. Viscosity**: 0.2 CP
- **Max. Viscosity**: 100 CP
- **Temperature**
  - HCM & HHP Series: -95°F to 750°F
  - All other H Series: -95°F to 265°F
- **Horsepower (Max. by Series*)**
  - HBT: 75HP
  - HCM: 150HP
  - HHP: 20HP
  - HHJ: 40HP
  - HSS/HSJ: 50HP
  - HRC: 25HP
  - HAS: 10HP
  - HAR: 4HP
  - HSP: 15HP

*Consult Factory for Higher Horsepower

**No External Lubrication**
Sealless Canned Motor Pumps do not contaminate atmosphere sensitive fluids by absorbing moisture from the air through external lubrication ports. Lubrication is provided by the pumping fluid during normal operation.

**Compact Design**
Since Sealless Canned Motor Pumps integrate the motor and pump in one housing, the size is very compact, often half that of other pumps. Savings in both installation costs and floor space are achievable with these units.

**Easy Maintenance**
Sealless Canned Motor Pumps require very little maintenance. Simply change the bearings during annual maintenance checks or when the bearing monitor indicates. These units are easily maintained with relatively unskilled labor.

**Low Noise & Vibration**
Because these units have no motor fans or ball bearings, and the shaft is completely enclosed, Sealless Canned Motor Pumps have a very low noise output (below 60dBA) and very little vibration.

**Bearing Monitor Features**
MTH Bearing Monitors take the guess work out of operating a canned motor pump. They continuously monitor the direction of rotation and critical running clearances between the stator and the rotor.

This bearing monitor system not only monitors the running clearance but also indicates bearing condition. This allows the operator to plan in advance for pump maintenance.

The bearing monitor operates on the principle of induced voltage. A magnetic field is created in the monitor coils by the current flowing through the stator winding. When the rotor is perfectly centered in the stator, the magnetic fields are essentially concentric and balanced. When bearing wear or unequal running clearance occurs, and the rotor drifts off center, the flux created by the imbalance in the magnetic fields induces a voltage in the monitor coils. This voltage is converted and displayed on the monitor’s meter as an indication of bearing condition.

Each MTH H Series pump is equipped with a bearing monitor. The meter is mounted on the pump’s terminal box as standard, but is also available in a remote panel mount package by customer request.

Bearing wear indicator and rotation detector
HBT Series
These basic type pumps are designed to prevent any leakage or contamination during chemical or sanitary processes.

Applications include: solvents pumping, oil refineries, reactors, plating systems, and medical plants.

HCM Series
These high temperature chilled motor pumps utilize a tight shaft restriction, an auxiliary impeller, and a water cooled heat exchanger jacket to isolate the high temperature process fluid from the chilled motor end. Secondary cooling water supply required.

Applications include: Process temperatures from 265° - 750°F for medium heating oil, petroleum, heat transfer oils, petrochemical synthesis process, and polymerization process.

HHP Series
High temperature heat proof pumps are designed to save energy by using a thermally resistant, inorganic substance as a motor winding insulator. With this additional insulation, the motor windings do not require a secondary cooling system and can operate safely at the process fluid temperature.

Applications include: Process temperatures from 265° to 750°F for heat transfer oils, petrochemical synthesis process, polymerization process.

HHJ Series
These pumps are designed to prevent the danger of solidification which is normally found during the transfer of high melting point liquids. This model helps retain the necessary fluid temperature to maintain pumping action by incorporating a high temperature heating jacket through which steam or hot water is circulated.

Applications include: caprolactam, carboxylic acid, fatty oils, caustic soda
HSP Series

These self-priming pumps are designed for the transfer of liquids which are below the level of the pump. The casing has a specially structured chamber to separate the air from the fluid that is being drawn from the suction pipe. The suction lifts liquids with a specific gravity of 1.0 up to 20 feet.

Applications include: solvent, toluene, benzene, and EG+waste water.

HSS · HSJ Series

Vertical slurry pumps are designed to prevent bearing damage due to slurries in the liquid. A mechanical seal installed between the pump and the motor provides physical separation between the slurry and the motor bearings, while an auxiliary cooling system keeps the motor cool. The HSJ Series pumps can also be used to transfer high melting point liquids with the addition of an optional pump end heating jacket.

Applications include: CEG, TEG+slurry, H₂O+TiO₂, Lactam+TiO₂, and TiO₂+EG.

HAS · HAR Series

Low NPSH characteristics are required for absorption chiller/heater pumps since the refrigerator operates under a high vacuum state while circulating both absorption solution (HAS Series) and absorption refrigeration medium (HAR Series). A low acceleration inducer is used to minimize NPSH requirements.

Applications include: LiBr, H₂O

HRC Series

Reverse circulation pumps are designed to minimize the cavitation effects which occur during the transfer of saturated vapor pressure liquids, such as liquefied gasses by the pressurization of the inner structure. Vapor build-up in the pump and motor is flushed by circulating a small constant stream of process fluid through the motor in a reverse direction back to the source tank.

Applications include: ammonia, freon, LPG, and LNG.
Primary Metallurgy
304, 316, and 316L Stainless Steel are stock materials with Hastelloy® B or C, Monel® and Alloy 20 available by special order. Consult factory for availability of other materials.

Bearing Materials
Carbon graphite sleeve bearings are standard with Antimony Impregnated Carbon Graphite for high temperature resistance, Silicon Carbide for abrasive fluids, and Glass-filled Teflon® for enhanced chemical resistance to highly corrosive fluids.

Gasket Materials
Compressed fiber sheet gaskets are standard, with Teflon® as an option for high corrosives, and a vortex spiral wound metal gasket for high temperature applications over 400° F.

Low NPSH Inducer
Many pump casings are available in an optional low acceleration screw inducer design to lower NPSH requirements for pumping fluids in a low vapor pressure state (near boiling or prone to flashing to a gaseous state easily).

Reverse Circulation Degassing Line
An optional reverse circulation motor degassing line is available in the HRC Series to flush gasses that may build up in the pump or motor during operation or at cycle off times. This reverse circulation line is invaluable in keeping the bearings well lubricated when pumping low vapor pressure or high gas content fluids.

Heating/Cooling Jacket
For materials that require constant heating above ambient temperatures to maintain a liquid state, a heating jacket can be provided around the motor and pump casing to run steam, hot water, or heat transfer fluids to maintain a liquid state suitable for efficient pumping. This option is found in the HHJ and HSJ Series. Likewise, a motor cooling jacket with heat exchanger, recirculation impeller, and temperature isolation adapter may be added to chill the canned motor to its optimal operating temperature and isolate it from pumpage which may exceed the normal 265° F maximum of the H Series, up to 750° F. This option is found in the HCM Series.

Slurry Barrier
When pumping slurries, additional isolation is required to protect the sleeve bearings found in the H Series canned pumps. In the case of the HSS and HSJ Series, a special mechanical seal provides a slurry barrier that prevents contamination of the clean motor cooling and bearing lubrication fluid. An external temperature controlled fluid system is required to maintain motor winding temperature below its design maximum of 265° F.

Self-Priming Casings
For high suction lifts up to 20 feet from trenches and sumps, some H Series casings come in an optional self-priming chamber design with an integral check valve. Please consult the factory for more information on the HSP Self-Priming Series and available casings.

Flanged Ports
Pump casings are fitted with ANSI Raised Face flanges through 900 Lbs. as standard with a number of alternative flange designs available upon request.

Custom Design
Special combinations of the listed options, or custom designed features and capabilities are available by request. Please consult the factory for all special applications and feature

### H Series

#### Optional Features

**HBT Series**

**Basic Assembly**

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<tr>
<th>No.</th>
<th>Description</th>
<th>No.</th>
<th>Description</th>
<th>No.</th>
<th>Description</th>
<th>No.</th>
<th>Description</th>
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<td>Set Screw</td>
<td>18</td>
<td>Drain Plug</td>
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</table>
**PUMP MODEL**

1. **PUMP SERIES**
   - HBT: Basic Type
   - HHP: High Temperature Heat-Proof
   - HRC: Reverse Circulation Series
   - HHJ: High Melting Point Heating Jacket Series
   - HCM: High Temperature Cooling Jacketed Motor
   - HSS: Slurry Separate Series
   - HSJ: Slurry Separate with Steam Jacket Series
   - HSP: Self-Priming Series
   - HAS: Absorption Solution Series
   - HAR: Absorption Refrigeration Series
   - HSD: Special Design

2. **PUMP CASING NO.**
   (See the listing on the next page)
   - 403
   - 501
   - 601

3. **OPTIONS**
   - 3. **PUMP CASING FLANGE TYPE**
     - A1: ANSI 150# RF Flange
     - A3: ANSI 300# RF Flange
     - A4: ANSI 400# RF Flange
     - A6: ANSI 600# RF Flange
     - A9: ANSI 900# RF Flange
     - ALPHABET: Special Types

4. **CONSTRUCTION (WETTED PARTS)**
   (Primary Material)
   - S4: Stainless Steel 304
   - S6: Stainless Steel 316
   - SL: Stainless Steel 316L
   - CS: Carbon Steel
   - MO: Monel
   - HB: Hastelloy B
   - HC: Hastelloy C

5. **MOUNTING STYLE**
   - H: Horizontal
   - V: Vertical In Line

6. **MOTOR**
   - 6. **MOTOR OUTPUT (HP): ##
   - 7. **MOTOR INSULATION CLASS**
     - E: E class
     - F: F class
     - H: H class
     - C: C class
     - Z: Z class (HHP Series)
   - 8. **MOTOR POLES**
     - 2: 2 - pole - 3500RPM @ 60Hz
     - 4: 4 - pole - 1750RPM @ 60Hz
     - 6: 6 - pole - 1150RPM @ 60Hz
     - 8: 8 - pole - 875RPM @ 60Hz
   - 9. **ENCLOSURE**
     - T: TELC - Totally Enclosed Liquid Cooled

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**EXAMPLE**

HBT 601 - A3 SL H - 02 H 2 T

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**Engineering Specification**

The contractor shall furnish an MTH H Series (horizontal) (vertical base mount) sealless canned centrifugal type pump model _____ of (STAINLESS STEEL 304) (STAINLESS STEEL 316) (STAINLESS STEEL 316L) (CARBON STEEL) (MONEL) (HASTELLOY - B) (HASTELLOY - C) construction.

The pump shall be of dual containment design to prevent pumpage from leaking to the environment in the event of a liner breach. The pump shall be mounted to a ____ HP 3 phase ____ Hertz ____ volt ____ RPM, sealless canned motor; equipped with a (remote) (integral) mounted electrically controlled bearing monitor that detects both the motor's rotation direction and radial bearing wear. Each pump shall have a capacity of _____GPM (1.5 to 2,100 GPM) when operating at a total head of _____feet (up to 410 ft.) and a suction pressure of ___ feet for _____________ (fluid) with a ___ specific gravity and a ___ viscosity at the nominal process temperature of ___degrees F. The unit will be tested to the equivalent water performance prior to shipment. The pump (will) (will not) be equipped with an inducer and will have an NPSH requirement of ____ feet or less. The motor shall be sized to prevent overloading at (the highest flow condition listed in this specification) (the end-of-curve condition indicated on the performance curve).
## Pump Casing Dimensions

<table>
<thead>
<tr>
<th>Casing Number</th>
<th>Pump Size</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E*</th>
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<tr>
<td></td>
<td>(Suction X Discharge X Max. Imp.)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>200</td>
<td>3/4&quot; 1/2&quot; 5 3/4&quot;</td>
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Note: Dimension "E*" is the horizontal distance from the center of the suction to the center of the discharge. Zero indicates top centerline discharge.

## Motor Dimensions

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<th>T</th>
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Note: Motor dimensions are for HBT series basic units only. Other series motor dimensions may vary. Consult factory for specific motor series dimensions. All dimensions in inches.
Note: Pump curves are for 60Hz 2-Pole operation and are generally applicable to HBT, HCM, HHJ, HRC, HHP, HSP, HSS, and HSJ Series, but some casings may not be available due to maximum HP restrictions of certain series or other limitations. All of these products are engineered to customer specifications in consideration of the particular application. Refer to the HRCHASHEAR brochure for specific performance data for those series.