COMPACT MECHANICAL PUMP FOR CONDENSATE REMOVAL AND RECOVERY

Features

Pump with a linear inlet/outlet and low filling head. Ideal for low flow condensate removal from vented receivers situated at a low level in open systems.

1. Handles high-temperature condensate without cavitation.
2. No electric power or additional level controls required, hence INTRINSICALLY SAFE.
3. Pump will operate with an extremely low filling head (min. 155 mm).
4. Linear inlet/outlet greatly reduces installation time.
5. Easy, inline access to internal parts simplifies cleaning and reduces maintenance costs.
6. High-quality stainless steel internals and hardened working surfaces ensure reliability.
7. Compact design permits installation in a limited space.

Specifications

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Material</th>
<th>JIS</th>
<th>ASTM/AISI*</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Body</td>
<td>Cast Iron</td>
<td>FC250</td>
<td>A126 Cl.B</td>
</tr>
<tr>
<td>2</td>
<td>Cover</td>
<td>Cast Stainless Steel</td>
<td>A351 Gr.CF8M</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Cover Gasket</td>
<td>Fluorine Resin</td>
<td>PTFE</td>
<td>—</td>
</tr>
<tr>
<td>4</td>
<td>Float</td>
<td>Stainless Steel</td>
<td>SUS316L</td>
<td>AISI316L</td>
</tr>
<tr>
<td>5</td>
<td>Snap-action Unit</td>
<td>Stainless Steel</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>6</td>
<td>** Snap-action Spring**</td>
<td>Stainless Steel</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>7</td>
<td>Intake-Exhaust Valve Unit</td>
<td>Stainless Steel</td>
<td>SUS440C</td>
<td>AISI440C</td>
</tr>
<tr>
<td>8</td>
<td>Outlet Check Valve Unit</td>
<td>Stainless Steel</td>
<td>SUS304</td>
<td>AISI304</td>
</tr>
<tr>
<td>9</td>
<td>Inlet Check Valve Unit</td>
<td>Stainless Steel</td>
<td>SUS304</td>
<td>AISI304</td>
</tr>
<tr>
<td>10</td>
<td>Seal Set</td>
<td>Stainless Steel</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

* Screwed-in flange ** Do not use with toxic, flammable or otherwise hazardous fluids. ** Do not use for fluids with specific gravities under 0.85 or over 1, or for toxic, flammable or otherwise hazardous fluids.

PRESSURE SHELL DESIGN CONDITIONS (NOT OPERATING CONDITIONS):

- Maximum Allowable Pressure (MPaG) PMA: 1.0
- Maximum Allowable Temperature (°C) TMA: 220

To avoid abnormal operation, accidents or serious injury, DO NOT use this product outside of the specification range. Local regulations may restrict the use of this product to below the conditions quoted.

1 MPa = 10.197 kg/cm²

1 MPa = 10.197 kg/cm²

Pumped Medium Inlet & Outlet

Motive Medium & Pump Exhaust

Motive Medium Pressure Range (MPaG)

0.03 - 0.3

Maximum Allowable Back Pressure

0.05 MPa less than motive medium pressure used

Volume of Each Discharge Cycle (l)

Approximately 1.5

Motive Medium***

Saturated Steam, Compressed Air, Nitrogen

Steam Condensate, Water

COMPACT MECHANICAL PUMP FOR CONDENSATE REMOVAL AND RECOVERY

Patented
Dimensions

![Diagram of Dimensions]

Note: All Plug Holes are:
For Rc(PT) screw connection model: Rc(PT) ½
For ASME screw connection model: NPT ½
() is for Stainless Steel

Discharge Capacity

<table>
<thead>
<tr>
<th>System Back Pressure (kg/cm²G)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
<tr>
<td>--------------------------------</td>
</tr>
<tr>
<td>300</td>
</tr>
<tr>
<td>250</td>
</tr>
<tr>
<td>200</td>
</tr>
<tr>
<td>150</td>
</tr>
<tr>
<td>100</td>
</tr>
<tr>
<td>50</td>
</tr>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

Motive Medium: Saturated Steam
Motive Steam Pressure: MPaG
Condensate Temperature: 90 °C

- **Correction Factor**
  For GP5C installed with filling head other than 300 mm
  (minimum filling head: 155 mm)

![Graph of Discharge Capacity vs System Back Pressure]

Other standards available, but length and weight may vary.

- **ASME Class 150 RF**
- **Flanged** (Screwed-in flange)
- **Screwed**

Connection: Screwed/Flanged
Inlet size: 25 mm
Outlet size: 25 mm
Check Valve:
  Inlet (built-in)
  Outlet (built-in)
Filling Head: 300 mm

- **Screwed***
  Exhaust Outlet
  Rc(PT) ½
  Condensate Inlet
  Rc(PT) 1
  Motive Medium Inlet
  Rc(PT) ½
  Condensate Outlet
  Rc(PT) 1
  Weight (kg): 20 (18)
  * Rc(PT), other standards available

- **Flanged**
  Exhaust Outlet
  NPT ½
  Condensate Inlet
  25 mm ASME Class 150 RF
  Motive Medium Inlet
  NPT ½
  Condensate Outlet
  25 mm ASME Class 150 RF
  Weight (kg): 23 (21)

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**NOTE:**
- GP5C should be used in an open system in which the receiver is open to the atmosphere.
- Motive medium pressure minus back pressure must be greater than 0.05 MPa.
- The motive medium supply pipe diameter should be at least 15 mm, and the motive medium supply pipe/tube and its fittings/valves should have an inner diameter of at least 8 mm.
- A 40 mesh or finer strainer must be installed at the motive medium and pumped medium inlets.

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**Table of Receiver Sizing**

<table>
<thead>
<tr>
<th>Discharge Capacity (kg/h)</th>
<th>System Back Pressure (MPaG)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>0.2</td>
<td>0.2</td>
</tr>
<tr>
<td>0.3</td>
<td>0.3</td>
</tr>
<tr>
<td>0.4</td>
<td>0.4</td>
</tr>
<tr>
<td>0.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>

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**Reciprocating Steam Traps**

- **Flanged**
- Inlet (built-in)
- Outlet (built-in)
- Check Valve:
  Inlet (built-in)
  Outlet (built-in)
- Filling Head: 300 mm

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**Connection:** Screwed/Flanged
**Outlet size:** 25 mm
**Check Valve:**
- Inlet (built-in)
- Outlet (built-in)
**Filling Head:** 300 mm

---

**Weights:**
- Screwed: 20 kg (18 kg)
- Flanged: 23 kg (21 kg)

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**Pressure Drop Standards:**
- ASME Class 150 RF
- Other standards available, but length and weight may vary.
NOTE:
- GP5C should be used in an open system in which the receiver is open to the atmosphere.
- Motive medium pressure minus back pressure must be greater than 0.05 MPa.
- The motive medium supply pipe diameter should be at least 15 mm, and the motive medium supply pipe/tube and its fittings/valves should have an inner diameter of at least 8 mm.
- A 40 mesh or finer strainer must be installed at the motive medium and pumped medium inlets.

The discharge capacity is determined by the motive medium, motive medium pressure (Pm) and back pressure (P2).

Make sure that:
Discharge Capacity × Correction Factor > Required Flow Rate

Receiver Sizing Table

The receiver must have a capacity sufficient to store the condensate produced during the PowerTrap operation and discharge. A receiver that must handle the condensate both as a liquid and as flash steam will generally be larger than a receiver that handles condensate only as a liquid, and should separate one from the other so that only condensate is sent to the PowerTrap. When supercooled condensate is pumped, there may be cases in which hardly any flash steam is produced.

1. Size of Receiver; flash steam is involved
(Length: 1 m)

<table>
<thead>
<tr>
<th>Flash steam up to (kg/h)</th>
<th>Receiver diameter (mm)</th>
<th>Vent pipe diameter (mm)</th>
<th>Overflow pipe diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>25</td>
<td>80</td>
<td>25</td>
<td>Overflow pipe diameter should be equal to or greater than the condensate inlet pipe diameter.</td>
</tr>
<tr>
<td>50</td>
<td>100</td>
<td>50</td>
<td>Diaeter for receiver must be equal to or more than 3 x the overflow pipe diameter.</td>
</tr>
<tr>
<td>75</td>
<td>125</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>100</td>
<td>150</td>
<td>80</td>
<td></td>
</tr>
</tbody>
</table>

- Receiver length can be reduced by 50% when the motive medium pressure (Pm) divided by back pressure (P2) equals 2 or greater (when Pm ÷ P2 \(\leq 2\)).

2. Size of Receiver; flash steam is not involved
(Length: 1 m)

<table>
<thead>
<tr>
<th>Amount of condensate (kg/h)</th>
<th>Receiver diameter (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 or less</td>
<td>25</td>
</tr>
<tr>
<td>100</td>
<td>40</td>
</tr>
<tr>
<td>200</td>
<td>40</td>
</tr>
<tr>
<td>300</td>
<td>50</td>
</tr>
<tr>
<td>400</td>
<td>65</td>
</tr>
<tr>
<td>500</td>
<td>80</td>
</tr>
</tbody>
</table>

* Rc(PT), other standards available
* Units: mm
* Note: All Plug Holes are:
  - For Rc(PT) screw connection model: Rc(PT)
  - For ASME screw connection model: NPT
  ( ) is for Stainless Steel
  - \(\approx\) ASME Class 150 RF. Other standards available, but length and weight may vary.

Connection: Screwed/Flanged
Inlet size: 25 mm
Outlet size: 25 mm
Check Valve: Inlet (built-in) Outlet (built-in)
Filling Head: 300 mm

For explanation purposes only, not intended as an installation design.
Memo:


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