NOP Coolant Unit YTH

Customer Service: [E-mail] vortex@nop-group.jp

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NOP-Coolant Unit YTH is sold as is a registered trademark in Japan, Taiwan and Hong Kong.
(Registration number(Japan): 5490356, Registration number(Taiwan): 01698716, and Registration number(Hong Kong): 302888506)

Notice related to safety:
For safe operation of our products, please peruse through the User’s Instruction Manual included with the product without fail.

Nippon Oil Pump Co., Ltd.
Tel: +81-3-5294-5801
Fax: +81-3-5294-5802
Tokyo Office: Uchi-Kanda 252 Bldg, 9th Floor
2-15-9 Uchi-Kanda, Chiyoda-ku, Tokyo 101-0047
Japan

Your dealer:

The catalog is valid through June, 2017.
YTH products are compliant with the RoHS Directive and Reach Regulation.

**E SERIES**

**EP**
- Pump: Plunger
- Motor: 2200~3700 W/AC
- Flow rate: 12~28.8 l/min
- Maximum Pressure: 7.0 MPa

**ET·ES**
- Pump: Trochoid™
- Motor: 750~1500 W/AC
- Flow rate: 12~28.8 l/min
- Maximum Pressure: 2.0 MPa

**C SERIES**

**CT**
- Pump: Trochoid™
- Motor: 750~1500 W/AC
- Flow rate: 12~28.8 l/min
- Maximum Pressure: 2.0 MPa

**CI**
- Pump: Impeller
- Motor: 1500~3700 W/AC
- Flow rate: 150~300 l/min
- Total pump head: 40~65 m

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**NOP Coolant Unit YTH**

All-in-one Coolant Unit

- **What is YTH?**
  - THE YTH STORY 3
- **E Series: for High-to-medium Pressure**
  - EP: Plunger-type All-in-one High-pressure Pump
    - Model Numbering System 13
    - Features of EP 15
    - Performance Curves 17
  - ET·ES: Trochoid™-type All-in-one Medium-pressure Pump
    - Model Numbering System 19
    - Features of ET·ES 21
    - Performance Curves 23
- **C Series: for Medium-to-low Pressure**
  - CT: Basic Model All-in-one Medium-pressure Pump
    - Model Numbering System 27
    - Features of CT 29
    - Performance Curves 31
  - CI: Large flow All-in-one Low-pressure coolant Pump
    - Model Numbering System 33
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- **TAZUNA™**
  - TAZUNA™ (A Fluid Control System that Cuts Annual Power Consumption by Up to 61%) 39
- **Specification Tables for All Series**
  - E and C Series 45

YTH products are compliant with the RoHS Directive and Reach Regulation.
Various components of the coolant unit are all combined in one. YTH greatly expands the working space and offers an easy-to-work and efficient environment.

**Existing Flow (Conventional coolant unit)**

1. Supply Pump
2. Cyclone Filter
3. Line Filter
4. Clean Tank
5. High to medium pressure Pump
6. Machining Center

**Proposal by YTH (except CI)**

1. NO supply pump
2. NO cyclone filter
3. NO line filter
4. NO clean tank
5. YTH
6. Machining Center

**Footprint of conventional coolant unit**

- Width: 1100 mm
- Height: 1270 mm
- Depth: 650 mm

**Dimensions of YTH-EP**

- Width: 269 mm
- Height: 753 mm
- Depth: 269 mm

**What is YTH?**

THE YTH STORY
The YTH will never be clogged, and require no maintenance — even in a coolant tank like this.

Our special Turbulence™ design generates turbulence. The combined action of the turbulence and centrifugal force washes away chips from the filter automatically. Filter maintenance is no longer required — no more cumbersome cleaning work. Of course, a clog-free filter ensures a constant flow rate. The coolant fluid is supplied to the machining center at a stable pressure.

On the left is a photograph of an actual YTH (after 10,000 hours of operation) installed in this tank. The filter remains clean.
Chip recovery is simple! — the YTH separates and ejects chips in lumps.

The YTH cleans the coolant, but that is not all. It also collects cumbersome chip. YTH ejects separated chips from the drain port to the bucket.

Chip recovery is incomparably simpler than the conventional system. The YTH can be used in combination with your existing chip conveyor system to collect and recycle chips.

**Bucket type**
- Chip recovery method: Bucket collects chips for recycling
- Compatible machine task: Machining centers, NC lathes
- Typical applications: For removal of chips and contaminant

**Chip conveyor type**
- Chip recovery method: A chip conveyor collects chips for recycling
- Compatible machine task: Machining centers, NC lathes
- Typical applications: For large applications where lump-size chips are produced in a good amount

**Magnet separator type**
- Chip recovery method: A magnet separator collects chips for recycling
- Compatible machine task: Machining centers, NC lathes
- Typical applications: For small-size chips are produced in a good amount

**Drum filter type**
- Chip recovery method: A drum filter collects chips for recycling while the dirty coolant is filtered by drum filter
- Compatible machine task: Machining centers, NC lathes
- Typical applications: For non-magnetic material such as aluminum, cast iron, and chips
“No more waste, extra labor or hassle! This has to be simple.” As a member of a manufacturing team, this was always in my mind.

Every day at work, I have been always thinking that coolant units incur too much waste, trouble and hassle. Coolant unit areas are no exactly the kind of areas I would love to step into. Yet, I must get in there to care for the system before the pressure drops and causes the machining center to stop.

It is extremely difficult to perform maintenance of a large coolant unit if located in such a manner that only limited space is available for maintenance work (e.g. at that back of a machine adjacent to walls). In addition, stopping a production line to perform maintenance reduces productivity.

Further, even though the line is stopped, pumps remain running at full speed, thus wasting electricity. Such a conventional manner never leads to saving of power consumption, let alone reducing CO₂ emission to combat global warming.

Yuji Kawano
Fellow
A Turbulence™ filter is built in

This is the High-Spec Series that washes chips away automatically
Plunger-type, All-in-one High-pressure Pump

**Turbulence™ filter**
Special turbulence cleans the filter automatically, rendering the filter clog free.

**Plunger pump/ 7.0 MPa ~ 3.0 MPa**
Piston action pushes fluid at high to medium pressure.

**Compatible with the TAZUNA™ fluid control system (software)**
TAZUNA reduces the electric power cost further by approximately 20%.
The pressure and flow rate are automatically adjusted.

### Model Numbering System

**TOP—YTH ① ② - ③ E VD ④ ⑤**

1. **Motor capacity**
   - 2200: 2.2 kW
   - 3700: 3.7 kW

2. **Motor type**
   - Standard motor
     - A3: AC 200/200/220/230 V 50/60/60/60 Hz 3 phase electric induction motor (IE3) with CE marking
     - E supplied by NOP Deutschland (Germany)
   - Local motor
     - A4: supplied by NOP Taiwan
     - A5: supplied by NOP Asia (China)
     - AK: supplied by NOP India

3. **Flow rate**
   - P008: Plunger pump, 8 cc/rev
   - P010: Plunger pump, 10 cc/rev
   - P014: Plunger pump, 14 cc/rev
   - P016: Plunger pump, 16 cc/rev

**Filtering method**
- E: Turbulence™ filter type
- VD: External return type

**Relief pressure setting**
- 7.0: 7.0 MPa
- 6.0: 6.0 MPa
- 3.5: 3.5 MPa
- 3.0: 3.0 MPa

**Filtering performance**
- C: 20 µm

*For further details about the local motor, please contact to our overseas branch or subsidiaries.

*Refer to page 45 for the compatible model for each relief pressure setting.

### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Item</th>
<th>Motor capacity (kW)</th>
<th>Flow rate (l/min) 50Hz / 60Hz</th>
<th>Maximum pressure (MPa) 50Hz / 60Hz</th>
<th>Approximate weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YTH2200A3-P008EVD+C</td>
<td></td>
<td>2.2</td>
<td>12.0 / 14.4</td>
<td>7.0 / 7.0</td>
<td>53</td>
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<tr>
<td>YTH2200A3-P010EVD+C</td>
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<td>15.0 / 18.0</td>
<td>7.0 / 6.0</td>
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<tr>
<td>YTH2200A3-P016EVD+C</td>
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<td></td>
<td>24.0 / 28.8</td>
<td>3.5 / 3.0</td>
<td></td>
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<tr>
<td>YTH3700A3-P014EVD+C</td>
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<td>3.7</td>
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<td>7.0 / 7.0</td>
<td>62</td>
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<tr>
<td>YTH3700A3-P016EVD+C</td>
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<td></td>
<td>24.0 / 28.8</td>
<td>7.0 / 6.0</td>
<td></td>
</tr>
</tbody>
</table>

**Dimensions in PDF**

Features of EP

An All-in-one, High-to-medium Pressure Coolant Pump

All components of a coolant system are consolidated into a single YTH unit. No line and suction filters are required. The use of YTH-EP reduces the required space to about 1/20th by volume of that occupied by a conventional coolant system. The saved space expands the available plant space, resulting in a higher production efficiency.

- Maximum operating pressure: 7.0 MPa
- Maximum flow rate: 28.8 liters/min
- No suction filter is required
- No line filter is required
- No clean tank is required
- No transfer pump is required on the coolant tank end
- No plumbing is required to interconnect various components

Automatic Self-cleaning Turbulence™ Filter

Our special Turbulence™ design generates turbulence. The combined action of the turbulence and centrifugal force washes away chips from the filter automatically. The result is a maintenance-free unit with a stable high pressure and large flow rate.

- Chips larger than 20µm in size is removed (when using water-soluble coolant fluid).
- Relief valve is built into the unit

Compatible types of chips

<table>
<thead>
<tr>
<th>Material</th>
<th>Iron</th>
<th>Casting</th>
<th>Aluminum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatibility</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

Filtering performance

- Suction strainer: 3mm (Solids larger than this must be removed in the tank)
- Filter: 20µm

High efficiency plunger pump

- Compatible types of fluid
  - Water-soluble coolant fluid
  - Not for lubricant oil or fuel oil
  - Not for clear water, purified water, aqueous solutions and viscous fluids without rust-preventive property, corrosive liquid, solvents, and oils

Huge Energy Saving Effect Reduces Utility Costs

The use of YTH-EP results in huge energy savings over the conventional centrifugal pumps. The electric power cost is greatly reduced.

- Operating cycle: total 80 seconds cycle
  - Unload (0MPa) 20 sec. → Coolant through (1.1 MPa) 20 sec. → Unload (0MPa) 20 sec. → Coolant through (1.1 MPa) 20 sec.

- The calculation is based on operation 8 hours/day, 365 days/year, and the electric power billed at ¥20/kWh.
- Results may differ according to the conventional pump specifications and the machining conditions (reference data).

Comparison of annual electric power costs

Up to 41% reduction in the electric power cost is possible.
Performance Curves

Water-soluble coolant (general performance)

Oil used: JIS K2241, Type A3 solution containing 2% water-soluble cutting fluid

50Hz

P-Q Curve

Required Power

60Hz

P-Q Curve

Required Power

The revolutionary transformation coolant pump
The all-in-one coolant unit

Less space required, less maintenance work, and less hassle even in tough conditions
Trochoid™-type, All-in-one Medium-pressure Pump

**Turbulence™ filter**
Special turbulence cleans the filter automatically, rendering the filter clog free.

**Trochoid™ pump/ 2.0 MPa, 1.5 MPa**
A rotor turning in a trochoidal curve generates pressure to suck and discharge fluid. This is an extremely efficient self-priming pump.

**Compatible with the TAZUNA™ fluid control system (software)**
TAZUNA reduces the electric power cost further by approximately 20%. The pressure and flow rate are automatically adjusted.

### Model Numbering System

**TOP—YTH**

<table>
<thead>
<tr>
<th>Motor capacity (kW)</th>
<th>Filtering method</th>
<th>Relief valve</th>
<th>Relief pressure setting*</th>
<th>Filtering performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>750: 0.75 kW</td>
<td>E: Turbulence™ filter type</td>
<td>VD: External return type</td>
<td>20 : 2.0 MPa</td>
<td>B: 50 µm (for spindle oil coolant)</td>
</tr>
<tr>
<td>1500: 1.5 kW</td>
<td></td>
<td></td>
<td>15 : 1.5 MPa</td>
<td>C: 20 µm</td>
</tr>
</tbody>
</table>

*1 For further details about the local motor, please contact to our overseas branch or subsidiaries.

**Motor type**

<table>
<thead>
<tr>
<th>Standard motor</th>
<th>Local motor</th>
</tr>
</thead>
<tbody>
<tr>
<td>A3: AC 200/220/230 V 50/60/60/60 Hz 3 phase electric induction motor (E3) with CE marking</td>
<td>AE: supplied by NOP Deutschland (Germany)</td>
</tr>
<tr>
<td>AF: supplied by NOP Taiwan</td>
<td>AJ: supplied by NOP Asia (China)</td>
</tr>
<tr>
<td>AK: supplied by NOP India</td>
<td></td>
</tr>
</tbody>
</table>

**Rotor capacity**

<table>
<thead>
<tr>
<th>T208: Trochoid™ pump, 8 cc/rev</th>
<th>T216: Trochoid™ pump, 16 cc/rev</th>
</tr>
</thead>
<tbody>
<tr>
<td>S208: Trochoid™ pump, 8 cc/rev</td>
<td>S216: Trochoid™ pump, 16 cc/rev</td>
</tr>
</tbody>
</table>

### Specifications

#### Model

<table>
<thead>
<tr>
<th>Model</th>
<th>Motor capacity (kW)</th>
<th>Flow rate (L/min) 50Hz / 60Hz</th>
<th>Maximum pressure (MPa)</th>
<th>Approximate weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YTH750A3-T208EVD**</td>
<td>0.75</td>
<td>12.0 / 14.4</td>
<td>2.0 / 2.0</td>
<td>34</td>
</tr>
<tr>
<td>YTH1500A3-T216EVD**</td>
<td>1.5</td>
<td>24.0 / 28.2</td>
<td>2.0 / 2.0</td>
<td>39</td>
</tr>
<tr>
<td>YTH750A3-S208EVD**</td>
<td>0.75</td>
<td>12.0 / 14.4</td>
<td>1.5 / 1.5</td>
<td>34</td>
</tr>
<tr>
<td>YTH1500A3-S216EVD**</td>
<td>1.5</td>
<td>24.0 / 28.2</td>
<td>2.0 / 2.0</td>
<td>39</td>
</tr>
</tbody>
</table>

*1 Relief pressure setting, *2 Filtering performance

**Dimensions**

<table>
<thead>
<tr>
<th>Model</th>
<th>L (mm)</th>
<th>B (mm)</th>
<th>C (mm)</th>
<th>W (mm)</th>
<th>Q (mm)</th>
<th>H (mm)</th>
<th>M (mm)</th>
<th>D (mm)</th>
<th>TB (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YTH750A3-T208EVD**</td>
<td>638.8</td>
<td>274.8</td>
<td>93.5</td>
<td>214.8</td>
<td>20</td>
<td>364</td>
<td>253.5</td>
<td>170</td>
<td>30</td>
</tr>
<tr>
<td>YTH1500A3-T216EVD**</td>
<td>678.3</td>
<td>294.8</td>
<td>113.5</td>
<td>234.8</td>
<td>40</td>
<td>383.5</td>
<td>273</td>
<td>202</td>
<td>45</td>
</tr>
<tr>
<td>YTH750A3-S208EVD**</td>
<td>638.8</td>
<td>274.8</td>
<td>93.5</td>
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<td>364</td>
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<td>40</td>
<td>383.5</td>
<td>273</td>
<td>202</td>
<td>45</td>
</tr>
</tbody>
</table>

Features of ET·ES

An All-in-one, Medium Pressure Coolant Pump

All components of a coolant system are consolidated into a single YTH unit. No line and suction filters are required. The use of YTH-ET reduces the required space to about 1/20th by volume of that occupied by a conventional coolant system. The saved space expands the available plant space, resulting in a higher production efficiency.

- Maximum operating pressure: 2.0 MPa
- Maximum flow rate: 28.8 liters/min
- No suction filter is required
- No line filter is required
- No clean tank is required
- No transfer pump is required on the coolant tank end
- No line and suction filters are required.

No plumbing is required to interconnect various components.

A sample configuration (Refer to page 8)

A foot print

YTH-ET

268 mm W x 678 mm H x 268 mm D

Foot print

Compatibles of chips

Material | Iron | Casting | Aluminum
---|---|---|---
Compatibility | Excellent | Excellent | Excellent

All components of a coolant system are consolidated into a single YTH unit.

Compatible types of chips

- Water-soluble coolant fluid
- Water-insoluble coolant fluid of 15 mm²/s or less viscosity
- Not for lubricant oil or fuel oil
- Not for clear water, purified water, aqueous solutions and viscous fluids without rust-preventive property, corrosive liquid, solvents, and oils
- Relief valve is built into the unit.

Filtering performance

- Suction strainer: 3mm (Solids larger than this must be removed in the tank)
- Filter: 20 µm 50 µm (for spindle oil coolant) (Must be specified at the time of purchase)

High efficiency Trochoid™ pump

- Trochoid™ pump
- High efficiency Trochoid™ pump
- Turbo-chord rotor
- Pump generates inner pressure to press the balance plate toward the Trochoid rotor side, which helps in reducing the clearance created due to wear and thereby minimize the pressure drop, ensuring desired performance for a longer time
- Shaft and bearing reinforcement
- Improved wear resistance by employing sprayed ceramic on shaft bearing area and usage of ceramic bearing
- Double seal & cartridge system
- Seal area is reinforced to prevent leakage and Cartridge System ensures ease of replacement.

Compatibility of fluid

- Water-soluble coolant fluid
- Water-insoluble coolant fluid of 15 mm²/s or less viscosity
- Not for lubricant oil or fuel oil
- Not for clear water, purified water, aqueous solutions and viscous fluids without rust-preventive property, corrosive liquid, solvents, and oils
- Relief valve is built into the unit.

Comparison of annual electric power costs

The use of YTH-ET results in huge energy savings over the conventional centrifugal pumps. The electric power cost is greatly reduced.

- Operating cycle: total 80 seconds cycle
  - Unload (0 MPa) 20 sec. → Coolant through (1.1 MPa) 20 sec. → Unload (0 MPa) 20 sec. → Coolant through (1.1 MPa) 20 sec.
  - The calculation is based on operation 8hours/day, 365days/year, and the electric power billed at ¥20/kWh.
- Results may differ according to the conventional pump specifications and the machining conditions (Reference data)

Comparison of power consumption during machining operation

- Reduces Utility Costs
- Huge Energy Saving Effect
- Reduces Utility Costs

For its special wear resistant structure, S type can be installed on coolant tanks of machines which are machining materials which generate hard and abrasive Chips.

- Balance plate
- Pump generates inner pressure to press the balance plate toward the Trochoid rotor side, which helps in reducing the clearance created due to wear and thereby minimize the pressure drop, ensuring desired performance for a longer time
- Shaft and bearing reinforcement
- Improved wear resistance by employing sprayed ceramic on shaft bearing area and usage of ceramic bearing
- Double seal & cartridge system
- Seal area is reinforced to prevent leakage and Cartridge System ensures ease of replacement.
**Performance Curves**

**Water-soluble coolant (general performance)**
Oil used: JIS K2241, Type A3 solution containing 2% water-soluble cutting fluid

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**Spindle Oil (general performance)**
Oil used: ISO VG2 equivalent

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**50Hz**

**P-Q Curve**

**Required Power**

---

**50Hz**

**P-Q Curve**

**Required Power**

---

**60Hz**

**P-Q Curve**

**Required Power**

---

**60Hz**

**P-Q Curve**

**Required Power**
The Cyclone Filter is Built In

This is a YTH Basic Series
CT
Cyclone-type, All-in-one Medium-pressure Pump

**Double-cyclone filter**
Two layers of double cyclones (one large cyclone and six small cyclones) remove chips from the coolant fluid.

**Trochoid™ pump/ 2.0 MPa, 1.5 MPa**
A rotor turning in a trochoidal curve generates pressure to suck and discharge fluid. This is an extremely efficient self-priming pump.

**Compatible with the TAZUNA™ fluid control system (software)**
TAZUNA™ reduces the electric power cost further by approximately 20%.

The pressure and flow rate are automatically adjusted.

### Model Numbering System

**TOP—YTH ① ② - ③ C VD ④**

<table>
<thead>
<tr>
<th>Item</th>
<th>Model</th>
<th>Motor capacity (kW)</th>
<th>Flow rate (/min)</th>
<th>Maximum pressure (MPa)</th>
<th>Approximate weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>① Motor capacity</td>
<td></td>
<td>750: 0.75 kW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1500: 1.5 kW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>② Motor type*</td>
<td>YTH750A3-T208CVD*</td>
<td>AE: supplied by NOP Deutschland (Germany)</td>
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<tr>
<td></td>
<td>YTH1500A3-T216CVD*</td>
<td>AF: supplied by NOP Taiwan</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>AJ: supplied by NOP Asia (China)</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>AK: supplied by NOP India</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

③ Rotor capacity
- T208: Trochoid™ pump, 8cc/rev
- T216: Trochoid™ pump, 16cc/rev

④ Relief pressure setting
- 20 : 2.0 MPa
- 15 : 1.5 MPa

⑤ Filtering method
- C: Double-cyclone type
- VD: External return type

⑥ Relief valve
- 2.0 MPa
- 1.5 MPa

* For further details about the local motor, please contact our overseas branch or subsidiaries.

### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Motor capacity (kW)</th>
<th>Flow rate (liters/min)</th>
<th>Maximum pressure (MPa)</th>
<th>Approximate weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>YTH750A3-T208CVD*</td>
<td>0.75</td>
<td>12.0 / 14.4</td>
<td>2.0</td>
<td>34</td>
</tr>
<tr>
<td>YTH1500A3-T216CVD*</td>
<td>1.5</td>
<td>24.0 / 28.8</td>
<td>2.0</td>
<td>39</td>
</tr>
</tbody>
</table>

For further details about the local motor, please contact to our overseas branch or subsidiaries.

**Dimensions (typical / Motor type: A3)**

Features of **CT**

**World's First — All-in-one, Medium-pressure Coolant Pump**

This is a basic YTH model consolidating a large coolant system into one unit. Simply replace a conventional medium-pressure pump with YTH-CT to reduce the occupied space to 1/20th by volume. The saved space expands the available plant space, resulting in a higher production efficiency.

- **Maximum operating pressure:** 2.0 MPa
- **Maximum flow rate:** 28.8 liters/min
- **No suction filter is required**
- **No clean tank is required**
- **Applicable only to continuous running (intermittent running is not applicable)**
- **No transfer pump is required on the coolant tank end**
- **No plumbing is required to interconnect various components**

**Double-cyclone Filter**

A proprietary double-cyclone system removes chips*. The first cyclone removes larger debris, while the second cyclones remove smaller particles. The line-filter cleaning cycle is extended by 24 times.

* Chips larger than 20µm in size is removed (when using water-soluble coolant fluid).

**High-efficiency Trochoid™ Pump**

YTH-CT uses a Trochoid™ pump which excels in fluid control efficiency. The double-cyclone system sorts out chips and enables direct connection to the coolant tank.

- **Compatible types of fluid**
  - Water-soluble coolant fluid
  - Not for water-insoluble coolant fluid, lubricant oil or fuel oil
  - Not for clear water, purified water, aqueous solutions and viscous fluids without rust-preventive property, corrosive liquid, solvents, and oils
- **Relief valve is built into the unit.**

**Comparison of power consumption during machining operation**

Conventional centrifugal pump

<table>
<thead>
<tr>
<th>Machining time (Sec)</th>
<th>Power consumption (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>600</td>
</tr>
<tr>
<td>20</td>
<td>1200</td>
</tr>
<tr>
<td>30</td>
<td>1800</td>
</tr>
<tr>
<td>40</td>
<td>2400</td>
</tr>
<tr>
<td>50</td>
<td>3000</td>
</tr>
<tr>
<td>60</td>
<td>3600</td>
</tr>
</tbody>
</table>

**Conventional centrifugal pump YTH-CT216**

- **Electric power cost (JPY)**
  - YTH-CT216: ¥27,160
  - YTH: ¥61,260

- **Up to 56% reduction in the electric power cost is possible.**

**Comparison of annual electric power costs**

Conventional centrifugal pump

<table>
<thead>
<tr>
<th>Machining time (Sec)</th>
<th>Power consumption (W)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>600</td>
</tr>
<tr>
<td>20</td>
<td>1200</td>
</tr>
<tr>
<td>30</td>
<td>1800</td>
</tr>
<tr>
<td>40</td>
<td>2400</td>
</tr>
<tr>
<td>50</td>
<td>3000</td>
</tr>
<tr>
<td>60</td>
<td>3600</td>
</tr>
</tbody>
</table>

**Huge Energy Saving Effect**

**Reduces Utility Costs**

The use of YTH-CT results in huge energy savings over the conventional centrifugal pumps. The electric power cost is greatly reduced.

- **Operating cycle:** total 80 seconds cycle
  - Unload (0 MPa) 20 sec. → Coolant through (1.1 MPa) 20 sec. → Unload (0 MPa) 20 sec. → Coolant through (1.1 MPa) 20 sec.
- **The calculation is based on operation 8 hours/day, 365 days/year, and the electric power billed at ¥20/kWh.**
- **Results may differ according to the conventional pump specifications and the machining conditions (reference data).**

**Filtering performance**

- **Suction strainer:**
  - 3mm (Solids larger than this must be removed in the tank)
- **Filter:**
  - 50µm: 95% (specific gravity 2.7)
  - 100µm: 99% (specific gravity 2.7)

- **Filtering performance is effective only to continuous running (ineffective results for intermittent running).**

**Compatible types of chips**

<table>
<thead>
<tr>
<th>Material</th>
<th>Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron</td>
<td>Excellent</td>
</tr>
<tr>
<td>Casting</td>
<td>Excellent</td>
</tr>
<tr>
<td>Aluminum</td>
<td>Good</td>
</tr>
<tr>
<td>Copper</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

- **No liquid containing abrasive stone/grain is allowed**
- **Please contact us for the use of High Silicon Aluminum**
- **Filtering performance is effective only to continuous running (ineffective results for intermittent running).**

**World's First — All-in-one, Medium-pressure Coolant Pump**

A sample configuration (Refer to page 8)

**Foot print**

YTH-CT

269 mm W x 639 mm H x 269 mm D

YTH

Daily 24 times Approx. 1 month* On the average

**Compatible types of chips**

<table>
<thead>
<tr>
<th>Material</th>
<th>Compatibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron</td>
<td>Excellent</td>
</tr>
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<td>Aluminum</td>
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</tr>
<tr>
<td>Copper</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

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*Please contact us for the use of High Silicon Aluminum

**Filtering performance**

- **Suction strainer:**
  - 3mm (Solids larger than this must be removed in the tank)
- **Filter:**
  - 50µm: 95% (specific gravity 2.7)
  - 100µm: 99% (specific gravity 2.7)

- **Filtering performance is effective only to continuous running (ineffective results for intermittent running).**
Performance Curves

Water-soluble coolant (general performance)
Oil used: JIS K2241, Type A3 solution containing 2% water-soluble cutting fluid

50Hz

P-Q Curve

Required Power

60Hz

P-Q Curve

Required Power

50Hz

P-Q Curve

Required Power

60Hz

P-Q Curve

Required Power

Spindle Oil (general performance)
Oil used: ISO VG2 equivalent
### CI

**Large flow**

All-in-one Low-pressure coolant pump

- **Cyclone filter**
  The cyclone system sorts out chips from the coolant fluid.

- **Impeller pump**
  Centrifugal mechanism generates pressure to supply a large flow coolant.
  This is a large flow transfer pump

### Model Numbering System

**TOP-YTH ① ② - ③ C**

<table>
<thead>
<tr>
<th>① Motor capacity</th>
<th>② Motor type</th>
<th>③ Flow rate*</th>
<th>Filtering method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1500: 1.5 kW</td>
<td>AC: AC 200/200/220/230 V</td>
<td>50 Hz</td>
<td>I155: Impeller pump (5 stages/150k)</td>
</tr>
<tr>
<td>3700: 3.7 kW</td>
<td>50/60/60/60 Hz</td>
<td>60 Hz</td>
<td>I152: Impeller pump (2 stages/200k)</td>
</tr>
<tr>
<td></td>
<td>3 phase electric induction motor (IE3) with CE marking</td>
<td>50 Hz</td>
<td>I305: Impeller pump (5 stages/300k)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>60 Hz</td>
<td>I302: Impeller pump (2 stages/300k)</td>
</tr>
</tbody>
</table>

* I155-I305 are not applicable to 60Hz

### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Item</th>
<th>Motor capacity (kW)</th>
<th>Flow rate (l/min)</th>
<th>Total pump head (m)</th>
<th>Approximate weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50Hz YTH1500AC-I155C</td>
<td></td>
<td>1.5</td>
<td>150</td>
<td>55</td>
<td>43</td>
</tr>
<tr>
<td>60Hz YTH1500AC-I152C</td>
<td></td>
<td>1.5</td>
<td>300</td>
<td>55</td>
<td>70</td>
</tr>
<tr>
<td>50Hz YTH3700AC-I305C</td>
<td></td>
<td>3.7</td>
<td>150</td>
<td>55</td>
<td>43</td>
</tr>
<tr>
<td>60Hz YTH3700AC-I302C</td>
<td></td>
<td>3.7</td>
<td>300</td>
<td>55</td>
<td>69</td>
</tr>
</tbody>
</table>

### Dimensional Drawing

(typical / Motor type : AC)

- **Direction of rotation**
- **Outlet port**
  - Rc 1 1/2
- **Drain port**
  - Rc 3/8
- **Inlet port**
  - (punched metal)
- **Contaminant drain port**
  - Rc 3/4

**NOTE**

- Drawings in PDF
Features of CI

Large flow All-in-one Low-pressure coolant pump

This is a YTH corresponding to large flow and low pressure with cyclone filter. YTH-CI enables operators to be free from troubles and filter maintenance around a coolant tank because of automatic clean-up system by cyclone filter.

- Total pump head: 40–65 m
- Maximum flow rate: CI 15+ C: 150 l /min
  CI 30+ C: 300 l /min
- No suction filter is required (continuous operation only)

Applications to various types of coolant tanks

Plan-A Application to coolant tank + isolated clean tank

YTH-CI transfers filtered coolant from a coolant tank to an isolated clean tank. Filtered coolant is supplied to machining centers by High-Medium pressure coolant supply pumps. Chips and contaminants are pushed out from YTH-CI and collected by magnet separator or sedimentation tank.

Plan-B Application to integrated coolant tank and clean tank

YTH-CI can totally clean up a coolant tank by circulation flow. At the same time, YTH-CI also automatically backwash plate strainers between a coolant tank and a clean tank by suction of dirty coolant, which reduces maintenance work for backwash plate dramatically.

Plan-C Application to single coolant tank (without clean tank)

YTH-CI supplies filtered coolant to nozzles in a machinery tool. When the machinery tool stops metal cutting operation, YTH-CI automatically switches to cleaning of a coolant tank by circulation flow.

[YTH-CI — the All in one coolant unit]

- Coolant supply: Filtered coolant is supplied to avoid clogging and damages to surface of work piece
- Chips and contaminants collection: Chips and contaminants in a coolant tank is automatically collected to reduce maintenance work dramatically
- Agitation of coolant: Making circulation flow in a coolant tank delays fermentation of coolant, which results in less odor around the coolant tank
**Cyclone filter**

Unique reversed cyclone system enables to separate clean coolant and contaminants. Contaminants are pushed up through side surface of cyclone filter by centrifugal force and discharged. Clean coolant are collected to center of cyclone filter and boosted up by multiple-stage impeller pump.

**Impeller Pump**

Multiple-stage impellers are used for YTH-CI to boost up and supply a large quantity of coolant.

- **Compatible types of fluid**
  - Water-soluble coolant fluid
  - Not for Water-insoluble coolant fluid, lubricant oil or fuel oil
  - Not for clear water, purified water, aqueous solutions and viscous fluids without rust-preventive property, corrosive liquid, solvents, and oils

- **Unique reversed cyclone system enables to separate clean coolant and contaminants. Contaminants are pushed up through side surface of cyclone filter by centrifugal force and discharged. Clean coolant are collected to center of cyclone filter and boosted up by multiple-stage impeller pump.**

- **Filtering performance**
  - **Suction strainer**: 3mm (Solids larger than this must be removed in the tank)
  - **Cyclone filter**: 50µm: 95% (specific gravity 2.7) 100µm: 99% (specific gravity 2.7)

---

**Performance Curves**

**Water-soluble coolant (general performance)**

Oil used: JIS K2241, Type A3 solution containing 2% water-soluble cutting fluid

- **50Hz**
- **60Hz**

---

**Compatible types of chips**

<table>
<thead>
<tr>
<th>Material</th>
<th>Iron</th>
<th>Casting</th>
<th>Aluminum</th>
<th>Copper</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatibility</td>
<td>Excellent</td>
<td>Excellent</td>
<td>Good</td>
<td>Excellent</td>
</tr>
</tbody>
</table>

- Please contact us for the use of High Silicon Aluminum
61% 

A Fluid Control System
It Reduces Annual Electric Power Cost by Up to 61%

YTH + TAZUNA
A Fluid Control System That Reduces Annual Electric Power Cost by Up to 61%

The use of YTH-EP cuts the annual electric power cost by about 41%. Additional savings of about 20% would be achieved, or a total of 61%, through the use of the TAZUNA™ fluid control system. Trimming the production costs is a way to improve your competitiveness. The saving impact will be greater in a plant with a multiple of machining center operating. Reduction in power consumption enables trimming of CO2 and is an effective measure against global warming.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric power cost (JPY)</td>
<td>¥23,900</td>
<td>¥36,140</td>
</tr>
<tr>
<td>Electric power cost (JPY)</td>
<td>¥36,140</td>
<td>¥61,260</td>
</tr>
</tbody>
</table>

Power Consumption Graph on a Test Operation
- Operating cycle: total 80 seconds cycle
  - Unload (0MPa) 20 sec.
  - Coolant through (1.1 MPa) 20 sec.
  - Unload (0MPa) 20 sec.
  - Coolant through (1.1 MPa) 20 sec.
- The energy-saving effect will vary due to the difference in machining pressures and drill diameters.
- The calculation is based on operation 8 hours/day, 365 days/year, and the electric power billed at ¥20/kWh.

Comparison of Annual Electric Power Bills

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric power cost (JPY)</td>
<td>¥23,900</td>
<td>¥36,140</td>
<td>¥61,260</td>
</tr>
<tr>
<td>Electric power cost (JPY)</td>
<td>¥36,140</td>
<td>¥61,260</td>
<td></td>
</tr>
</tbody>
</table>

TAZUNA™ Fluid Control System (Software)

TAZUNA™ is an automatic fluid control system (software) developed by NOP. The system uses a pressure sensor to identify the drill diameter being used by the machining center. It continuously controls the YTH, adjusting the pressure and flow rate instantaneously according to the drill movement. The absence of unneeded pressure means no extra pressure is wasted through the relief valve. The power consumption is greatly reduced while maintaining machining accuracy.

Features of TAZUNA™

- **Additional savings in energy**
  TAZUNA adjusts the motor within the YTH pump to an optimum speed for the drill diameter in use to achieve significant energy savings and CO2 reduction.

- **Improving machining accuracy**
  The system is compatible with any drill diameter. Automatic control of the pressure to an optimum value stabilizes the machining accuracy.

- **No initial settings required**
  An automatic drill identification system is pre-installed. The system is ready for use. No initial setting and other cumbersome programming (for different drills) are required on the machining end.

- **Warning function**
  Intelligent System alarms user in advance of upcoming Performance deterioration of the pump, so that corrective action can be taken and production-loss can be reduced.

- **Flexibly programmable**
  The system may be programmed to suit given specifications, allowing the user to customize the system to accomplish a variety of energy-saving control.

- **Compact and low cost**
  The circuit board is a compact and low-cost single card, complete with required interface.
Specifications for the Control Circuit Board

The board is equipped with assorted I/F, enabling control other than the automatic drill identification system.

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>General specifications</td>
<td></td>
</tr>
<tr>
<td>Ambient temperature</td>
<td>-10<del>40°C (when operating), -20</del>60°C (in storage)</td>
</tr>
<tr>
<td>Ambient humidity</td>
<td>10<del>85% (when operating), 10</del>90% (in storage) no condensation</td>
</tr>
<tr>
<td>Installed location</td>
<td>Indoors (free of corrosive gas or dust)</td>
</tr>
<tr>
<td>Input power</td>
<td>DC 24V±10%</td>
</tr>
<tr>
<td>Power consumption</td>
<td>10W</td>
</tr>
<tr>
<td>External dimensions</td>
<td>140mm (5.5”) W x 80mm (3.15”) D x 20mm (0.8”) H</td>
</tr>
<tr>
<td>Input specifications</td>
<td></td>
</tr>
<tr>
<td>Digital</td>
<td>Number of input ports: 8 ports</td>
</tr>
<tr>
<td>Input signal type</td>
<td>DC voltage-free contact input</td>
</tr>
<tr>
<td>On sync input</td>
<td>NPN open-collector transistor</td>
</tr>
<tr>
<td>On source input</td>
<td>PNP open-collector transistor</td>
</tr>
<tr>
<td>(Sink input/Source input are selectable at a jumper pin.)</td>
<td></td>
</tr>
<tr>
<td>Input operation indicator</td>
<td>An LED (red) is lit when input is on.</td>
</tr>
<tr>
<td>Analog</td>
<td>Number of input ports: 2 ports</td>
</tr>
<tr>
<td>Input range</td>
<td>DC 0<del>10V, DC 4</del>20mA</td>
</tr>
<tr>
<td>Resolution</td>
<td>16µA (in 1024 steps)</td>
</tr>
<tr>
<td>Output operation indicator</td>
<td>An LED (red) is lit when analog input is on.</td>
</tr>
<tr>
<td>SW</td>
<td>Number of input ports: 2-position switching: 8 ports (Rotary DI switch, 8-poles, on-off)</td>
</tr>
<tr>
<td></td>
<td>16-position switching: 4 ports (DP switch, 16-position)</td>
</tr>
<tr>
<td>Output specifications</td>
<td></td>
</tr>
<tr>
<td>Digital</td>
<td>Number of transistor output ports: 4 ports (with independent common)</td>
</tr>
<tr>
<td>Maximum load</td>
<td>Maximum load voltage DC 300V, resistive load, maximum 0.15A (per output port)</td>
</tr>
<tr>
<td>Output operation indicator</td>
<td>An LED (red) is lit when output is on.</td>
</tr>
<tr>
<td></td>
<td>Maximum response time: 85µs</td>
</tr>
<tr>
<td>Analog</td>
<td>Number of output ports: 2 ports</td>
</tr>
<tr>
<td>Output range</td>
<td>DC 4~20mA</td>
</tr>
<tr>
<td>Resolution</td>
<td>16µA (in 1024 steps)</td>
</tr>
<tr>
<td>CPU specifications</td>
<td>Processor: DSPIC33FJ128MC710A</td>
</tr>
<tr>
<td></td>
<td>Number of bits: 16-bit</td>
</tr>
<tr>
<td></td>
<td>Memory: RAM: 16kB, ROM: 128kB</td>
</tr>
<tr>
<td></td>
<td>Speed: 40MIPS</td>
</tr>
<tr>
<td>Non-volatile memory</td>
<td>EPROM: 8kB</td>
</tr>
<tr>
<td>Operation indicator specifications</td>
<td>On normal operation: RUN LED (green) is lit. On error: FAIL LED (red) is lit.</td>
</tr>
</tbody>
</table>

* MIPS is an abbreviation for “Million Instructions Per Second”, which is one of the indicators of a computer’s processor speed.
### E Series EP
(Specification: Turbulence™ filter + Plunger pump)

<table>
<thead>
<tr>
<th>Specifications for pump proper</th>
<th>E Series EP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump model</td>
<td>P008 50Hz / 60Hz, P010 50Hz / 60Hz, P014 50Hz / 60Hz, P016 50Hz / 60Hz</td>
</tr>
<tr>
<td>Flow rate (l/min)</td>
<td>12.0 / 14.4, 15.0 / 18.0, 21.0 / 25.2, 24.0 / 28.8</td>
</tr>
<tr>
<td>Compatible fluid</td>
<td>Water-soluble coolant fluid, Water-soluble coolant fluid / Water-insoluble coolant fluid</td>
</tr>
<tr>
<td>Maximum allowable viscosity (mm²/s) (Filtering performance)</td>
<td>15 (20μm), 32 (50μm)</td>
</tr>
<tr>
<td>Liquid temperature range (°C)</td>
<td>-5 to 60</td>
</tr>
<tr>
<td>Rotational speed (r/min)</td>
<td>1500 / 1800</td>
</tr>
<tr>
<td>Maximum pressure (MPa)</td>
<td>7.0, 2.0, 2.0, 2.0, 2.0</td>
</tr>
<tr>
<td>Total pump head (m)</td>
<td>2.0 / 2.0</td>
</tr>
</tbody>
</table>

### E Series ET-ES
(Specification: Turbulence™ filter + Trochoid™ pump)

<table>
<thead>
<tr>
<th>Specifications for pump proper</th>
<th>E Series ET-ES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump model</td>
<td>T208 50Hz / 60Hz, T216 50Hz / 60Hz</td>
</tr>
<tr>
<td>Flow rate (l/min)</td>
<td>12.0 / 14.4, 24.0 / 28.8</td>
</tr>
<tr>
<td>Maximum pressure (MPa)</td>
<td>2.0, 1.5, 1.5, 1.5, 1.5</td>
</tr>
<tr>
<td>Total pump head (m)</td>
<td>2.0 / 2.0</td>
</tr>
</tbody>
</table>

### Motor specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>2200A3</th>
<th>3700A3</th>
<th>2000x/3700A3</th>
<th>750A3</th>
<th>1500A3</th>
<th>750A3</th>
<th>1500A3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifications</td>
<td>Medium pressure, High pressure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Output (kW)</td>
<td>2.2, 3.7, 2.2, 3.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Voltage (V)</td>
<td>200/200/220/230</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency (Hz)</td>
<td>50/60/60/60</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rotational speed (r/min)</td>
<td>1460/1750/1780/1780</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficiency (%)</td>
<td>99.9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flow rate (l/min)</td>
<td>10.6/9.4/9.20/9.20</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of phases</td>
<td>4P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of poles</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Insulation class</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Approximate weight (kg)</td>
<td>33</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection rating</td>
<td>IP55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficiency class</td>
<td>IE3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compliance CE</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### CT Series C1
(Specification: Turbulence™ filter + Impeller pump)

<table>
<thead>
<tr>
<th>Specifications for pump proper</th>
<th>CT Series C1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pump model</td>
<td>T208 50Hz / 60Hz</td>
</tr>
<tr>
<td>Flow rate (l/min)</td>
<td>12.0 / 14.4</td>
</tr>
<tr>
<td>Maximum pressure (MPa)</td>
<td>2.0, 1.5, 1.5, 1.5</td>
</tr>
<tr>
<td>Total pump head (m)</td>
<td>2.0 / 2.0</td>
</tr>
</tbody>
</table>

### Motor specifications

<table>
<thead>
<tr>
<th>Model No.</th>
<th>750A3</th>
<th>1500A3</th>
<th>1500AC</th>
<th>3700AC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifications</td>
<td>Medium pressure, Basic Model</td>
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<td>Output (kW)</td>
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<td>Voltage (V)</td>
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<td>Frequency (Hz)</td>
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<td>Flow rate (l/min)</td>
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<td>✔</td>
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Please contact us if you need more information about motor specifications.

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