Hot Water Navigator
Hot Water Navigator System

Yoshitake's Hot Water System can produce hot water only with steam and water. It can be used in wide range of fields, from production process such as cleaning or sterilization to handwashing or shower.

- Appliance cleaning
- SIP (Sterilize in Place)
- Handwashing, shower
- Floor cleaning
- Equipment cleaning
- CIP (Cleaning in Place)

Effective Utilization and Benefit of Hot Water System

Time reduction
Hot water system can produce hot water instantly, hence waiting time for start of production can be shortened remarkably.

- Manufacturing process at food factory
  - Collecting water
    - Approximate 35 minutes
  - Collecting water at 80 degrees C
    - Approximate 35 minutes
  - Steam is provided to the needer. Warming up the water from 20 degrees C to 80 degrees C.
  - Approximate 30 minutes
  - Able to start the production with half time of previous time!

Disposal loss reduction of waste water
Bacteria risk reduction
Large effect of energy saving and CO₂ reduction can be obtained in the process of wasting residual water of previous day for bacteria risk reduction.

- Comparison between disposal loss of residual water in equipment and storage tank
  - Heat energy reduction: Approx. 1,356 GJ/year
  - Steam amount: Approx. 616 t/year
  - Reduction amount: Approx. 3,064,000 JPY/year

* This is a comparison in case that warming up the 7,000L of water from 20 degrees C to 80°C and collecting 80°C of hot water, 7,000L by using Hot Water Navigator.

* Comparison between 18 m³ of Storage tank and hot water navigator. In case that warming up 20°C of water to 80°C by saturated steam 0.1 MPa (steam unit price 4000 JPY/t), disposal of waste water 300 times/year, diversion of water unit price 200 JPY/m³.
**Hot water storage tank is unnecessary**

**Propagation prevention of Legionella**
It is said that Legionella can be easily propagated in a tank where there is backwater in flow, such as hot water storage tank.
Hot water system do not require the use of the tank, so reliability of sanitary as a system is increased.

**Space saving/Easy and short construction period**
Since it does not require to keep hot water in tank, larger three-dimensional space saving can be obtained, compared with storage tank system.
Due to easy construction only connecting steam and water, construction period is very short and it can be used soon.

- Occupied area becomes approx. 1/3
- 3 dimension area becomes approx. 1/6.

*Comparison of 18 m³ storage tank and Hot water navigator.*

**Energy saving**
It is designed as energy saving to use low steam pressure including high latent heat below 0.1 MPa.
In case of indirect heating system, because it uses latent heat of steam, system using low steam pressure including much latent heat is effective.

**Increased reliability of sanitary**
Due to indirect heating, water quality of steam does not affect hot water.

**Safety design**

**Fail Safety**
Due to water amount control by differential pressure control of water pressure, even if diaphragm is broken, the passage to heat exchanger is shut down and water temperature decreases.

**No requirement of notification or inspection.**
Since it is low pressure & compact design, notification as pressure vessel class 1 and every year regular inspection is not required.
Made-to-Order Product

HN-300M

Adoption of digital three-way valve control system
High-accuracy temperature control can be made due to PID control based on feed-forward control.

High-temperature/High flow rate type
It can be used in wide range of usage such as from washing at 50-60 degrees C, handwashing, shower to sterilization at 80-90 degrees C.

Maximum and minimum temperature alarm can be set
(Warning Buzzar, Emergency shut down of steam supply, emergency shut down of line pump.)
It is possible to customize control panel.
Since external input/output is possible, warning buzzar, emergency shutdown of steam supply, and line pump shutdown can be set according to request.

Easy change by digital temperature setting
Since it is possible to change set temperature easily, the changing the temperature for all application had been efficiency.

Stainless steel shell & tube
Due to adoption of colgate tube, heat transfer area is large and heat exchange capability is excellent.

Fluid temperature customize
Regarding fluid temperature customize, we can make customization according to customers usage condition and situation.

HN-300M series is made to order product. We produce product appropriate for customer’s usage with proposal.

<table>
<thead>
<tr>
<th>Model</th>
<th>HN-300M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluid</td>
<td>Heating Steam</td>
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<tr>
<td></td>
<td>Heated Water</td>
</tr>
<tr>
<td>Steam supply pressure</td>
<td>0.6-1.0 MPa</td>
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<td>Steam pressure inside unit</td>
<td>0.15 MPa</td>
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<tr>
<td>Water supply pressure</td>
<td>0.2-0.7 MPa</td>
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<tr>
<td>Temperature adjustment range</td>
<td>30-93 degrees C</td>
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<tr>
<td>Minimum temperature difference</td>
<td>15 degrees C</td>
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<tr>
<td>Maximum water supply pressure loss</td>
<td>0.07 MPa</td>
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<tr>
<td>Material</td>
<td>Three way valve body Stainless steel</td>
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<td></td>
<td>Shell Stainless steel</td>
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<td>Tube Stainless steel (SUS316L)</td>
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### HN-300M Hot Water Navigator Temperature Regulation Test Data

<table>
<thead>
<tr>
<th>Setting condition</th>
<th>CH-1 Hot water Temp</th>
<th>CH-2 Supply water Temp</th>
<th>CH-3 High hot water Temp</th>
<th>CH-4 Flow rate (L/min)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setting 1:</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Setting 2:</td>
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<td>Setting 3:</td>
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<td>Setting 4:</td>
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Supply water: 18 degrees C  Setting of hot water temperature: ① 90 degrees C, ② 60 degrees C, ③ 30 degrees C, ④ 90 degrees C
High hot water temperature: 120 degrees C  Setting of hot water flow rate: At the stage of 1, fixing 100 L/min by manual valve

Setting 1: Hot water temperature is set to 90 degrees C, keeping hot water flow rate 100 L/min for 10 minutes (temperature rises to 90 degrees C within 4 minutes, regulated within ± 1.5 degrees C).

Setting 2: Hot water temperature is set to 60 degrees C, keeping hot water flow rate 100 L/min for 10 minutes (temperature rises to 60 degrees C within 5 minutes, regulated within ± 1.5 degrees C).

Setting 3: Hot water temperature is set to 30 degrees C, keeping hot water flow rate 100 L/min for 10 minutes (temperature rises to 30 degrees C within 5 minutes, regulated within ± 1.5 degrees C).

Setting 4: Hot water temperature is set to 90 degrees C, keeping hot water flow rate 100 L/min for 10 minutes (temperature rises to 90 degrees C within 5 minutes, regulated within ± 1.5 degrees C).