
# Give yourself peace of mind

Circulating Fluid Temperature Controller Thermo-Chiller

Standard Type – HRS Series

Basic Type – HRSE Series

High-level Type – HRSH Series

Quick Overview

SMC®

## Give yourself peace of mind with SMC thermo-chillers

### Heat generation in industrial processes

Several industries, such as machine tooling, the printing industry and packaging, involve processes that include heat generating devices. Failure to properly control these can have serious consequences, including high rejection rates, poor product quality and lack of overall process reliability.

The use of a thermo-chiller makes it possible to **maintain the temperature of those heat generating devices within strict limits**. This proper temperature control increases the productivity, maximizes the machine performance, and improves the quality, reliability and service life of the equipment.

### Give yourself peace of mind with SMC thermo-chillers

The use of an SMC thermo-chiller will give you not only reliability and precision but also overall peace of mind. The HRS Series accurately monitors and controls the cooling system, so you can worry about something else.

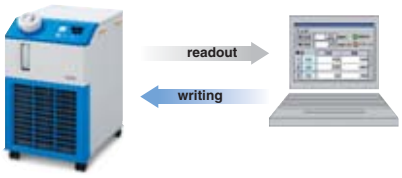
- Get a **smart solution that will give you proactive control**. Anticipate any changes via the remote control and manage anomalies and incidents in the cooling system.
- **Improve the performance and reliability of your machine** thanks to a superior temperature stability.
- **Ensure yourself worldwide support**. We have sales offices in 81 countries.
- **Streamline your suppliers** and profit from product order unification. Our portfolio consists of 12,000 basic models and over 700,000 variations.

### Whatever your cooling needs, we've got a solution for you

We have a range of standard, basic and high-level thermo-chillers that will adapt to your application needs.

## Main features

- **Serial communication – RS232-C and RS-485 – and contact I/Os.**




**Writing**
· Run/stop
· Circulating fluid temperature setting

**Readout**
· Circulating fluid present temperature
· Circulating fluid discharge pressure
· Status information
· Alarm occurrence information

Relevant process variables – such as pressure, flow and temperature – can be recorded, thus guaranteeing an **Industry 4.0 oriented thermo-chiller**.

- **Temperature stability:** ±0.1, ±0.5, ±1.0 or ±2.0 °C.
  (Depends on series and size)

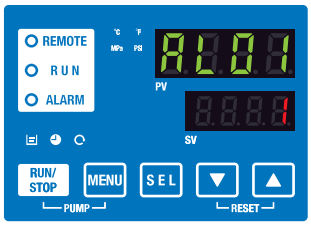
- **Heating function available even with no heater:** (Not for HRSE)
  - Circulating fluid can be heated by using the exhaust heat (hot gas) from the compressor circuit
  - Ideal for start-up in the mornings and cool environments
  - Temperature stability even in wintertime.

- **Cooling capacity:** from 1.1 to 28 KW.
  **Heating capacity:** from 0.58 to 7.5 kW.

- **Cooling methods:** air/water-cooled refrigeration.
  (HRSE and HRSH300 only air-cooled refrigeration)


For dimensions and other details refer to general catalogue HRS, HRSE or HRSH series in our website http://www.smc.eu

- **Self-diagnosis and large digital display** with extensive alarm monitoring and convenient functions that allow to detect abnormalities quickly before any real damage occurs.




Display of **up to 42 alarm codes**, such as:
- low level in tank
- circulating fluid return temperature sensor failure
- pump maintenance
- power stoppage.

**Convenient functions**, such as:
- timer operation function
- power failure auto-restart function
- anti-freezing operation function
- key-lock function
- function to output a signal for completion of preparation.

- **Compact and lightweight** – reduced machine dimensions.

- **Outdoor installation, splashproof type – IPX4**, for large type models.

- **Low-noise design** – as low as 57 dB(A). (Depends on series and size)

- **Dual frequency compatibility** – 50/60 Hz – in a wide range of power supplies available as standard.

- **Reduced power consumption with a triple inverter.**
(only HRSH series)
The triple inverter individually controls the compressor motor, the fan and the pump, thus optimizing control of the number of motor rotations depending on the load.


The inverter pump has a power reducing effect since there is no need of using, for different piping conditions, any bypass valve for adjustments.

- Optional facilities and accessories that ease the maintenance and provide better machine controllability (depends on series, type and size):
  - DI filter set
  - Piping conversion fitting
  - Electric conductivity control set
  - By-pass piping set
  - Particle filter set
  - Replacement type dustproof filter set
  - Anti-quake bracket
  - Caster adjuster foot-kit
  - Snow protection hood
  - Front access to electrical components
  - Optional fluid fill port in the upper tank
  - Easy check of the circulating fluid
  - Tool-less inspection and cleaning of air-cooled condenser
  - Concentration meter
  - Analogue gateway unit
  - Filter for circulating fluid fill port
  - Relief valve set.

# Thermo-Chiller
## HRS/HRSE/HRSH Series

## Thermo-Chiller Lineup

| | Cooling (heating) capacity [kW] [1) 2)] | Cooling method | Temperature stability [°C] | Set temperature range [°C] | Ambient temperature range [°C] |
|---|---|---|---|---|---|
| **Standard thermo-chiller, HRS Series** | | | | | |
| **HRS012/018/024**<br>**HRS030/050/060**  | HRS012: 1.1 (0.53)<br>HRS018: 1.7 (0.53)<br>HRS024: 2.1 (0.53)<br>HRS030: 2.6 (0.6)<br>HRS050: 4.7 (1.1)<br>HRS060: 4.9 (1.0) | Air/water-cooled refrigeration | ±0.1 | 5 to 40 | 5 to 40 |
| **HRS090**  | HRS090: 8.0 (1.7) | | ±0.5 | 5 to 35 | 5 to 45 |
| **HRS100/150**  | HRS100: 9.0 (1.7)<br>HRS150: 13.0 (2.5) | | ±1.0 | | -5 to 45 (air-cooled models)<br>2 to 45 (water-cooled models) |
| **Basic thermo-chiller, HRSE Series** | | | | | |
| **HRSE012/018/024**  | HRSE012: 1.0 (-)<br>HRSE018: 1.4 (-)<br>HRSE024: 1.9 (-) | Air-cooled refrigeration | ±2.0 | 10 to 30 | 5 to 40 |
| **High-level thermo-chiller, HRSH Series** | | | | | |
| **HRSH090**  | HRSH090: 9.5 (2.5) | Air/water-cooled refrigeration [3)] | ±0.1 | 5 to 40 | 5 to 45 |
| **HRSH100/150**<br>**HRSH200/250/300**  | HRSH100: 10.5 (2.5)<br>HRSH150: 15.7 (3.0)<br>HRSH200: 20.5 (5.5)<br>HRSH250: 25.0 (7.5)<br>HSRH300: 28.0 (7.5) | | | 5 to 35 | -20 to 45 (air-cooled models)<br>2 to 45 (water-cooled models) |

Note 1) Values for 50 Hz, air-cooled refrigeration
Note 2) Values for ambient temperature: 25 °C, circulating fluid temperature: 20 °C, circulating fluid: tap water
Note 3) HRSH300 only air-cooled refrigeration.

## Other Circulating Fluid Temperature Controllers

### Peltier-Type Chiller, Thermo-con, HEC Series

High-precision temperature control by using peltier elements

- Cooling/heating capacity: from 140/600 W to 1.2/2.2 kW
- Temperature stability: ± 0.01 to ±0.03 °C
- Set temperature range: 10 to 60 °C
- Refrigerant-free
- For environments with no cooling equipment
- Compact and low-vibration design
- Suitable for the manufacture of semiconductors, medical, pharmaceutical or special laser equipment.

### Thermo-con, Rack Mount Type, HECR Series

Air cooled peltier type chiller mounted in 19 inch rack

- Cooling/heating capacity: from 200/600 W to 1.0/2.0 kW.
- Temperature stability: ± 0.01 to 0.03 °C
- Set temperature range: 10 to 60 °C
- Refrigerant-free
- Easy start-up in 3 steps
- 14 alarm codes
- Low noise level: 55 dB or less
- Suitable for the manufacture of semiconductors, medical, pharmaceutical or special laser equipment.


For dimensions and other details refer to general catalogue HRS, HRSE or HRSH series in our website http://www.smc.eu

| Environment | Pump capacity [l/min] [2)] | Applicable fluid |
|---|---|---|
| Indoor use | 34 | Clear water, Ethylene glycol aqueous solution |
| Outdoor installation IPX4 | 55 | Clear water, Deionized water, Ethylene glycol aqueous solution |
| Indoor use | 15 (option T: 25) | Clear water, Ethylene glycol aqueous solution |
| Indoor use | 60 | Clear water, Deionized water, Ethylene glycol aqueous solution |
| Outdoor installation IPX4 | 180 | |

## Standard, options, accessories

| | HRS | HRS090 | HRS100/150 | HRSE | HRSH090 | HRSH |
|---|---|---|---|---|---|---|
| Heating function | ● | ● | ● | | ● | ● |
| Air-cooled condenser fan | ● | ● | ● | ● | ● | ● |
| PID control | ● | ● | ● | | ● | ● |
| Compressor ON/OFF | | | | ● | | |
| Self-diagnosis | ● | ● | ● | ● | ● | ● |
| RS-232C | ● | ● | ● | | ● | ● |
| RS-485 | ● | ● | ● | | ● | ● |
| Contact I/Os | ● | ● | ● | | ● | ● |
| Connector for external switch | ● | ● | ● | | ● | ● |
| Earth leakage breaker | ◆ | ◆ | ◆ | | ● | ● |
| Fluid fill port | ● | ● | ◆ | ● | ● | ◆ |
| Automatic water fluid fill function | ◆ | ◆ | ● | | ◆ | ● |
| Applicable to DI water piping | ◆ | ◆ | | | ◆ | |
| High-pressure pump | ◆ | ● | ● | ◆ | ● | ● |
| High ambient temp. (up to 45 °C) | ◆ | ● | ● | | ● | ● |
| DI filter set | ★ | | | | | |
| Piping conversion fitting | ◆/★ | ◆/★ | ◆/★ | | ◆/★ | ◆/★ |
| Electric conductivity control set | | ★ | ★ | | ★ | ★ |
| Electric conductivity sensor set | ★ | | | | | |
| By-pass piping set | ★ | ★ | ★ | ★ | ★ | ★ |
| Dustproof filter set | ★ | | | ★ | | |
| Particle filter set | ★ | ★ | ★ | ★ | ★ | ★ |
| Anti-quake bracket | ★ | | | ★ | | |
| Caster adjuster-foot kit | ● | ● | ◆/★ | ● | ● | ◆/★ |
| Snow protection hood | | | ★ | | | ★ |
| Analogue gateway unit | ★ | | | | | |
| Filter for circulating fluid fill port | ★ | ★ | | | ★ | |
| Relief valve set | | | ★ | | | |
| Power supply cable | ★ | | | ● | | |
| Drain pan set | ★ | | | | | |
| Connector cover | ★ | | | | | |
| Separately installed power transformer | ★ | | | | | |

● Standard
◆ Option
★ Accessory

## Thermo-chiller – Standard Type

### HRS Series


HRS012/018/024/030/050/060
Air/water-cooled Types


HRS090
Air-cooled Type


HRS090
Water-cooled Type


HRS100/150
Air-cooled Type


HRS100/150
Water-cooled Type

**Improve the performance & reliability of your machine**

- Temperature stability (depends on size): ±0.1, ±0.5, ±1.0 °C
- Control method: PID control
- Self-diagnosis: 35 alarms (41 for HRS090, 42 for HRS100/150).

| Part number [3] | Cooling method | Maximum cooling (heating) capacity (50/60 Hz) [kW] [2] | Power supply | Set temperature range [°C] | Temperature stability [°C] | Tank capacity [L] | Dimensions [mm] | Weight [kg] | Noise level (50 Hz) [dB(A)] [2] |
|---|---|---|---|---|---|---|---|---|---|
| **HRS012-AF-20** ● | Air-cooled refrigeration | 1.1/1.3 (0.53/0.65) | Single-phase 200-230 V AC (50/60 Hz) | 5 to 40 | ±0.1 | Approx. 5 | W377 x D500 x H615 | 43 | 60 |
| **HRS012-AF-20-T** ● | | | | | | | | | |
| **HRS012-AF-20-MT** ● | | | | | | | | | |
| **HRS018-AF-20** ● | | 1.7/1.9 (0.53/0.65) | | | | | | | |
| **HRS018-AF-20-T** ● | | | | | | | | | |
| **HRS018-AF-20-MT** ● | | | | | | | | | |
| **HRS024-AF-20** ● | | 2.1/2.4 (0.53/0.65) | | | | | | | |
| **HRS024-AF-20-T** ● | | | | | | | | | |
| **HRS024-AF-20-MT** ● | | | | | | | | | |
| **HRS030-AF-20** ● | | 2.6/3.2 (0.6/0.64) | | | | | W377 x D500 x H660 | 47 | 62 |
| **HRS050-AF-20** ● | | 4.7/5.1 (1.1/1.4) | | | | | W377 x D592 x H976 | 69 | 65 |
| **HRS060-AF-20** ● | | 4.9/5.9 (1.0/1.3) | | | | | | 73 | 66 |
| **HRS090-AF-40** ● | | 8.0/9.0 (1.7/2.2) | 3-phase 380-415 V AC (50/60 Hz) | 5 to 35 | ±0.5 | 18 | W377 x D970 x H1080 | 136 | 75 |
| **HRS100-AF-40** | | 9.0/9.5 (1.7/2.2) | | | ±1.0 | | W616 x D954 x H1434 | 171 | 70 |
| **HRS150-AF-40** | | 13.0/14.5 (2.5/3.0) | | | | | | 177 | 72 |
| **HRS012-WF-20** ● | Water-cooled refrigeration | 1.1/1.3 (0.53/0.65) | Single-phase 200-230 V AC (50/60 Hz) | 5 to 40 | ±0.1 | Approx. 5 | W377 x D500 x H615 | 43 | 60 |
| **HRS018-WF-20** ● | | 1.7/1.9 (0.53/0.65) | | | | | | | |
| **HRS024-WF-20** ● | | 2.1/2.4 (0.53/0.65) | | | | | | | |
| **HRS030-WF-20** | | 2.6/3.2 (0.4/0.6) | | | | | W377 x D500 x H660 | 46 | 62 |
| **HRS050-WF-20** ● | | 4.7/5.1 (1.0/1.3) | | | | | W377 x D592 x H976 | 67 | 65 |
| **HRS060-WF-20** | | 4.9/5.9 (1.0/1.3) | | | | | | | 66 |

● Stocked items.
Note 1) Pipe thread type: G.
Note 2) Values for ambient temperature: 25 °C, circulating fluid temperature: 20 °C, circulating fluid: tap water.
Note 3) HRS□-□-T: high pressure pump mounted; HRS□-□-MT: high pressure pump mounted and applicable to deionized water piping.


For dimensions and other details refer to general catalogue HRS, HRSE or HRSH series in our website http://www.smc.eu

## Thermo-chiller – Basic Type

### HRSE Series

HRSE012/018/024
Air-cooled Refrigeration

**Cool down your costs**

- Temperature stability: ±2.0 °C
- Control method: compressor ON/OFF
- Self-diagnosis: 12 alarms.

| Part number | Cooling method | Maximum cooling capacity (50/60 Hz) [kW] 2) | Power supply | Set temperature range [°C] | Temperature stability [°C] | Tank capacity [L] | Dimensions [mm] | Weight [kg] | Noise level (50 Hz) [dB(A)] 2) |
|---|---|---|---|---|---|---|---|---|---|
| **HRSE012-A-23** ● | Air-cooled refrigeration | 1.0/1.2 | Single-phase 230 V AC (56/60 Hz) | 10 to 30 | ±2.0 | Approx. 5 | W377 x D435 x H615 | 35 | 57 |
| **HRSE018-A-23** ● | | 1.4/1.6 | | | | | | | |
| **HRSE024-A-23** ● | | 1.9/2.2 | | | | | | | |

● Stocked items.
Note 1) Pipe thread type: Rc.
Note 2) Values for ambient temperature: 25 °C, circulating fluid temperature: 20 °C, circulating fluid: tap water.

## Thermo-chiller – High-level Type

### HRSH Series

HRSH090
Air-cooled Type

HRSH090
Water-cooled Type

HRSH100/150/200/250/300
Air-cooled Type

HRSH100/150/200/250/300
Water-cooled Type

**Triple savings at the right temperature**

- Temperature stability: ±0.1 °C
- Control method: PID control
- Self-diagnosis: 42 alarms (44 for HRSH090).

| Part number | Cooling method | Maximum cooling (heating) capacity [kW] 2) | Power supply | Set temperature range [°C] | Temperature stability [°C] | Tank capacity [L] | Dimensions [mm] | Weight [kg] | Noise level (50 Hz) [dB(A)] 2) |
|---|---|---|---|---|---|---|---|---|---|
| **HRSH090-AF-40** ● | Air-cooled refrigeration | 9.5 (2.5) | 3-phase 380-415 V AC (56/60 Hz) | 5 to 40 | ±0.1 | 18 | W377 x D970 x H1080 | 130 | 66 |
| **HRSH100-AF-40** ● | | 10.5 (2.5) | | 5 to 35 | | 25 | W715 x D954 x H1420 | 180 | 68 |
| **HRSH150-AF-40** ● | | 15.7 (3.0) | | | | 42 | | 215 | |
| **HRSH200-AF-40** ● | | 20.5 (5.5) | | | | | | | |
| **HRSH250-AF-40** ● | | 25.0 (7.5) | | | | 60 | W850 x D1035 x H1720 | 280 | |
| **HRSH300-AF-40** | | 28.0 (7.5) | | | | | | | |

● Stocked items.
Note 1) Pipe thread type: G.
Note 2) Values for ambient temperature: 25 °C, circulating fluid temperature: 20 °C, circulating fluid: tap water.

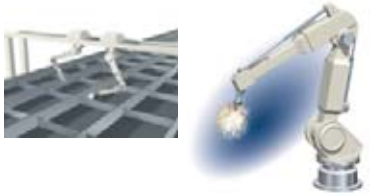
## Accessories

| Description | | Series/models | Part number |
|---|---|---|---|
| DI filter set, stainless steel type | | HRS012/018/024/030/050/060 | **HRS-DP001** |
| DI filter set, resin type | | | **HRS-DP002** |
| Electric conductivity control set<br>Refer to the Operation Manual for details about the models | | HRS090<br>HRSH090 | **HRS-DI007** |
| | | HRS100/150 | **HRS-DI010** |
| | | HRSH100/150/200/250/300 | **HRS-DI006** |
| Electrical resistance sensor set<br>Refer to the Operation Manual for details about the models | | HRS012/018/024/030/050/060 | **HRS-DI001**<br>**HRS-DI005** |
| | | HRS012/018/024/030 | **HRS-DI003**<br>**HRS-DI004** |
| Replacement type dustproof filter set | | HRS012/018/024<br>HRSE | **HRS-FL001** |
| Bypass piping set | | HRS012/018/024/030<br>HRSE | **HRS-BP001** |
| | | HRS050/060 | **HRS-BP004** |
| | | HRS090<br>HRSH | **HRS-BP005** |
| | | HRS100/150 | **HRS-BP007** |
| Particle filter set, for circulating fluid outlet, with handle, L=125 mm | Element (5 µm nominal filtration) | HRS012/018/024/030/050/060<br>HRSE | **HRS-PF001-W005-H** |
| | Element (75 µm nominal filtration) | | **HRS-PF001-W075-H** |
| Particle filter set, for circulating fluid outlet, with handle, L=250 mm | Element (5 µm nominal filtration) | HRS050/060 | **HRS-PF002-W005-H** |
| | Element (75 µm nominal filtration) | | **HRS-PF002-W075-H** |
| Particle filter set, for circulating fluid return port, with handle, L=125 mm | Element (5 µm nominal filtration) | HRS012/018/024/030/050/060 | **HRS-PF003-W005-H** |
| | Element (75 µm nominal filtration) | | **HRS-PF003-W075-H** |
| Particle filter set, for circulating fluid return port, with handle, L=250 mm | Element (5 µm nominal filtration) | HRS050/060 | **HRS-PF004-W005-H** |
| | Element (75 µm nominal filtration) | | **HRS-PF004-W075-H** |
| Particle filter set, with handle | | HRS090<br>HRSH090 | **HRS-PF005-H** |
| Anti-quake bracket | | HRS012/018/024/030 | **HRS-TK001** |
| | | HRS050/060 | **HRS-TK002** |
| | | HRSE | **HRS-TK003** |
| Caster adjuster-foot kit | | HRS100/150-A | **HRS-KS003** |
| | | HRS100/150-W<br>HRSH100/150/200-A<br>HRSH100/150/200/250-W | **HRS-KS002** |
| | | HRS250/300-A | **HRS-KS001** |
| Snow protection hood | | HRS100/150 | **HRS-BK005** |
| | | HRSH100/150/200 | **HRS-BK004** |
| | | HRSH250/300 | **HRS-BK003** |
| Filter for circulating fluid fill port | | HRS012/018/024/030/050/060<br>HRS090<br>HRSH090 | **HRS-PF007** |
| Relief valve set | | HRS100/150 | **HRS-BP008** |

Note) If more detailed information is required please check SMC´s online Digital Catalogue or contact your nearest SMC sales office

## Applications

Arc welding machine
Cooling of welding torches and power sources



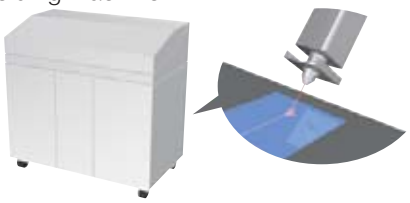
Packaging line
Sealing of film and paper package

Resistant welding machine (spot welding)
Cooling of the welding head electrodes, transformers and transistors (thyristors)

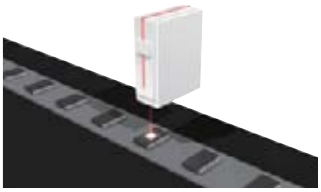
Injection moulding

Laser applications
Cooling of the laser oscillation part and power source, needing a very precise temperature control

- Laser welding machine



- Laser maker



Electronic microscope
Temperature control of the electron-beam irradiated part

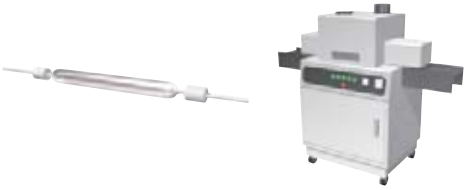
X-ray digital instrument – Medical Industry
Temperature control of x-ray tube and X-ray light sensing parts. The temperature stability enables to obtain clear pictures without fluctuation of digital signals

Cleaning machine
Temperature control of cleaning solution

High frequency induction heating equipment
Cooling of the heating coils, high frequency current transformers and around inverters

Printing machine
Temperature control of the ink roller, UV lamps

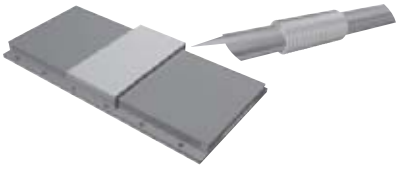
UV curing device



PET industry
Cooling of the moulds and oven

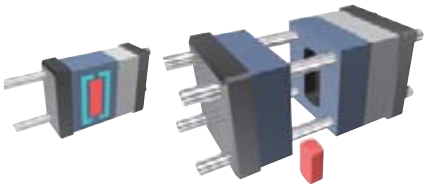
Concentrating equipment
Temperature control of concentrating fluid

Linear motor
Temperature control of moving coil



Atomising device (food, cosmetics)
Temperature control of samples and devices

Mould cooling



Temperature control of adhesive and paint material

Cooling of vacuum pump

Shrink fit machine
Cooling of workpieces

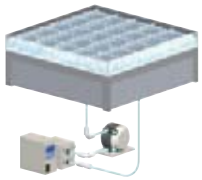
Ultra sonic wave inspection machine
Temperature control of ultra sonic wave laser part

Ozone applications
By using of water refrigeration it is possible to multiply by 5 the quantity of ozone generated

Gas cylinder cabinet
Temperature control inside the cabinet

Reagent cooling equipment
Temperature control of the reagents

Cleaning machine (hydrocarbon-based)

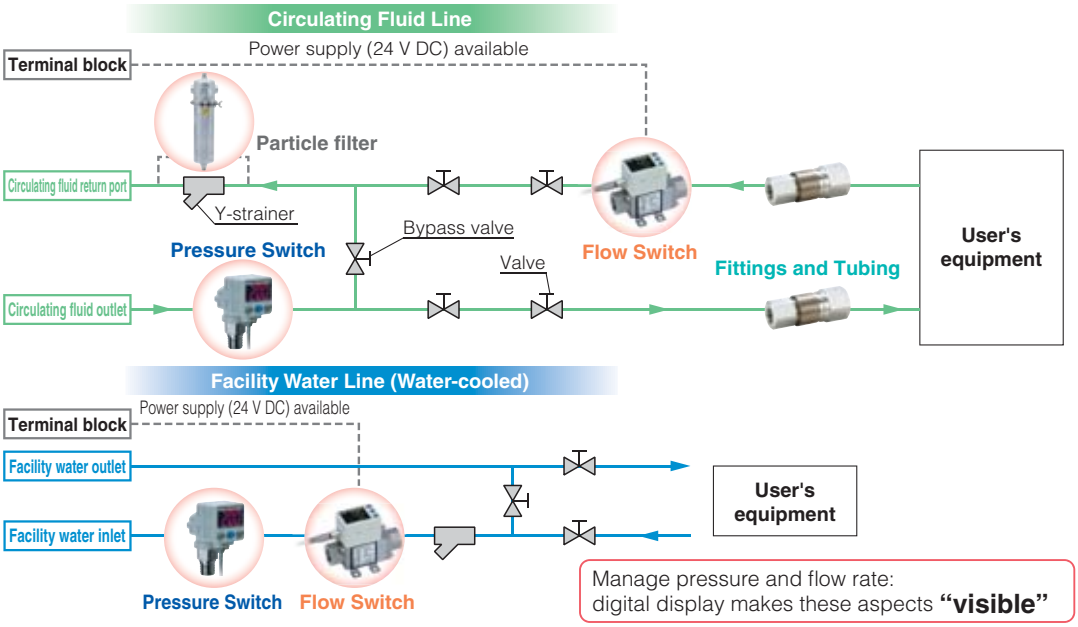


Machine tool (Spindle)



For dimensions and other details refer to general catalogue HRS, HRSE or HRSH series in our website http://www.smc.eu

## Related Product

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### Flow switch: monitors flow rate and temperature of the circulating fluid

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**4-Channel Flow Monitor**
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**Pressure Sensor for General Fluids**
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