



MINI CHILLER

MUENR-H12

Data Book



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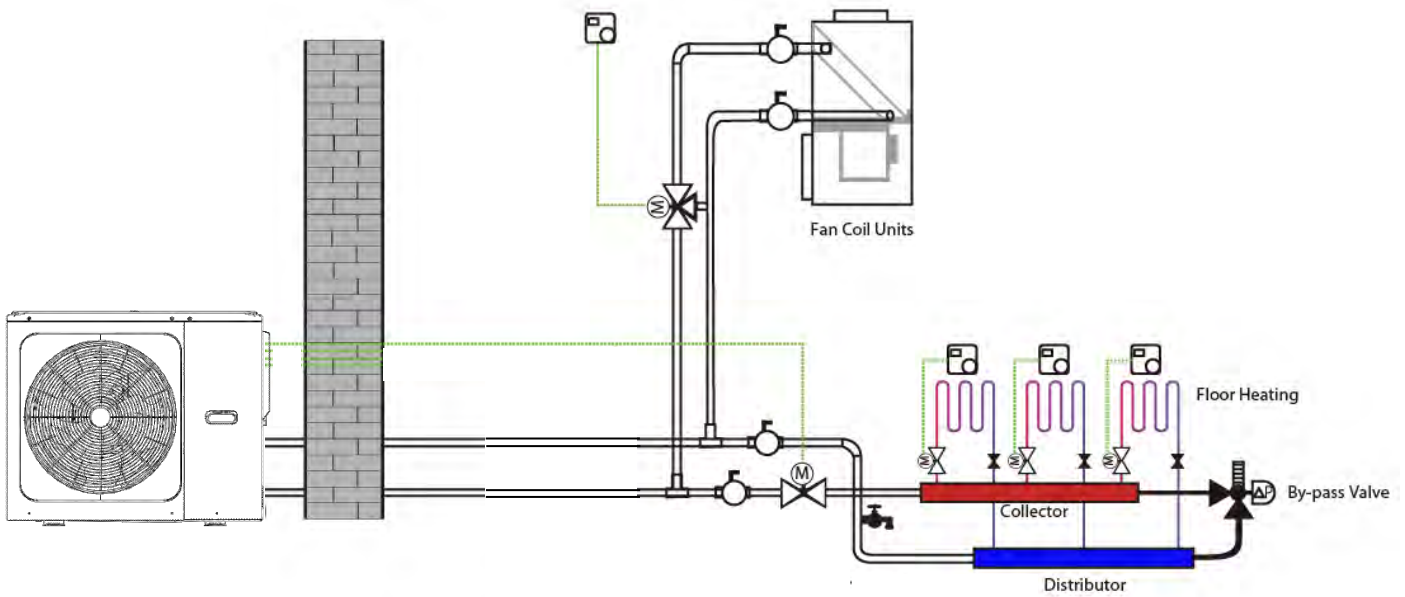
Part 1

General Information

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1 Heat pump system

1.1 System Schematic



Aqua Eco Mini Heat pump is an integrated air to water system which offers space heating and space cooling. The outdoor heat pump system extracts heat from the outdoor air and transfers this heat through refrigerant piping to the plate heat exchanger in the hydronic system. The heated water in the hydronic system circulates to low temperature heat emitters (floor heating loops or low temperature radiators) to provide space heating, and to the domestic hot water tank to provide domestic hot water. The 4-way valve in the outdoor unit can reverse the refrigerant cycle so that the hydronic system can provide chilled water for cooling using fan coil units.

The heating capacity of heat pumps decreases with ambient temperature dropping. External backup electric heater is optional to provide additional heating capacity for use during extremely cold weather when the heat pump capacity is insufficient. The backup electric heater also serves as a backup in case of heat pump malfunction and for anti-freeze protection of the outside water piping in winter.

1.2 System Configurations

Heat pump can be configured to run with the electric heater either enabled or disabled and can also be used in conjunction with an auxiliary heat source such as a boiler.

The chosen configuration affects the size of heat pump that is required. Three typical configurations are described below.

Configuration 1: Heat pump only

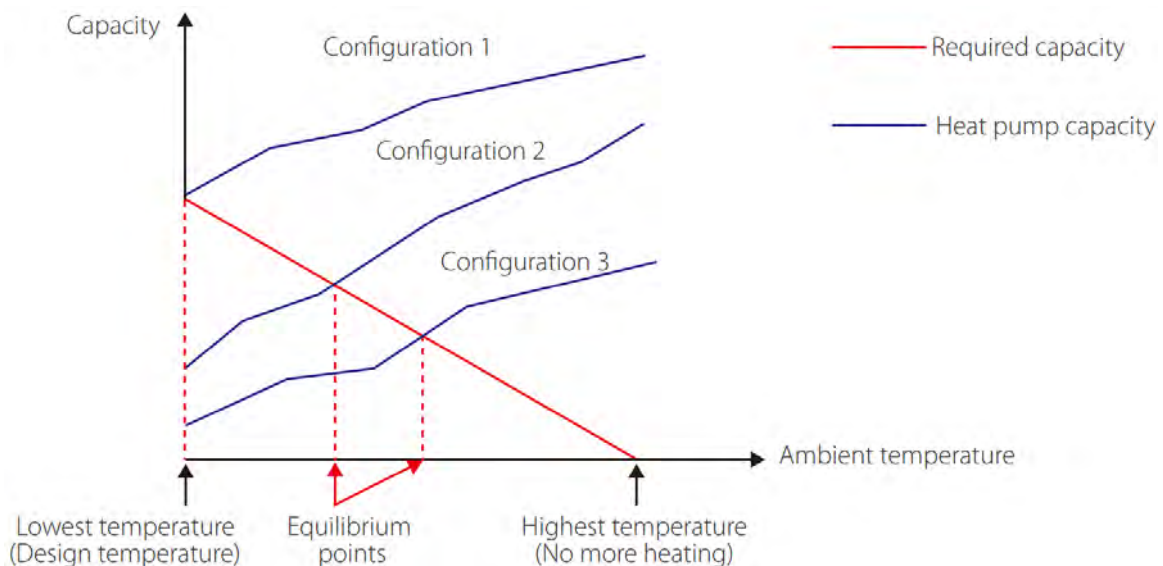
- The heat pump covers the required capacity and no extra heating capacity is necessary.
- Requires selection of larger capacity heat pump and implies higher initial investment.
- Ideal for new construction in projects where energy efficiency is paramount.

Configuration 2: Heat pump and backup electric heater


- Heat pump covers the required capacity until the ambient temperature drops below the point at which the heat pump is able to provide sufficient capacity. When the ambient temperature is below this equilibrium point, the backup electric heater supplies the required additional heating capacity.
- Best balance between initial investment and running costs, results in lowest lifecycle cost.
- Ideal for new construction.

Configuration 3: Heat pump with auxiliary heat source

- Heat pump covers the required capacity until the ambient temperature drops below the point at which the heat pump is able to provide sufficient capacity. When the ambient temperature is below this equilibrium point, depending on the system settings, either the auxiliary heat source supplies the required additional heating capacity or the heat pump does not run and the auxiliary heat source covers the required capacity.
- Enables selection of lower capacity heat pump.
- Ideal for refurbishments and upgrades.

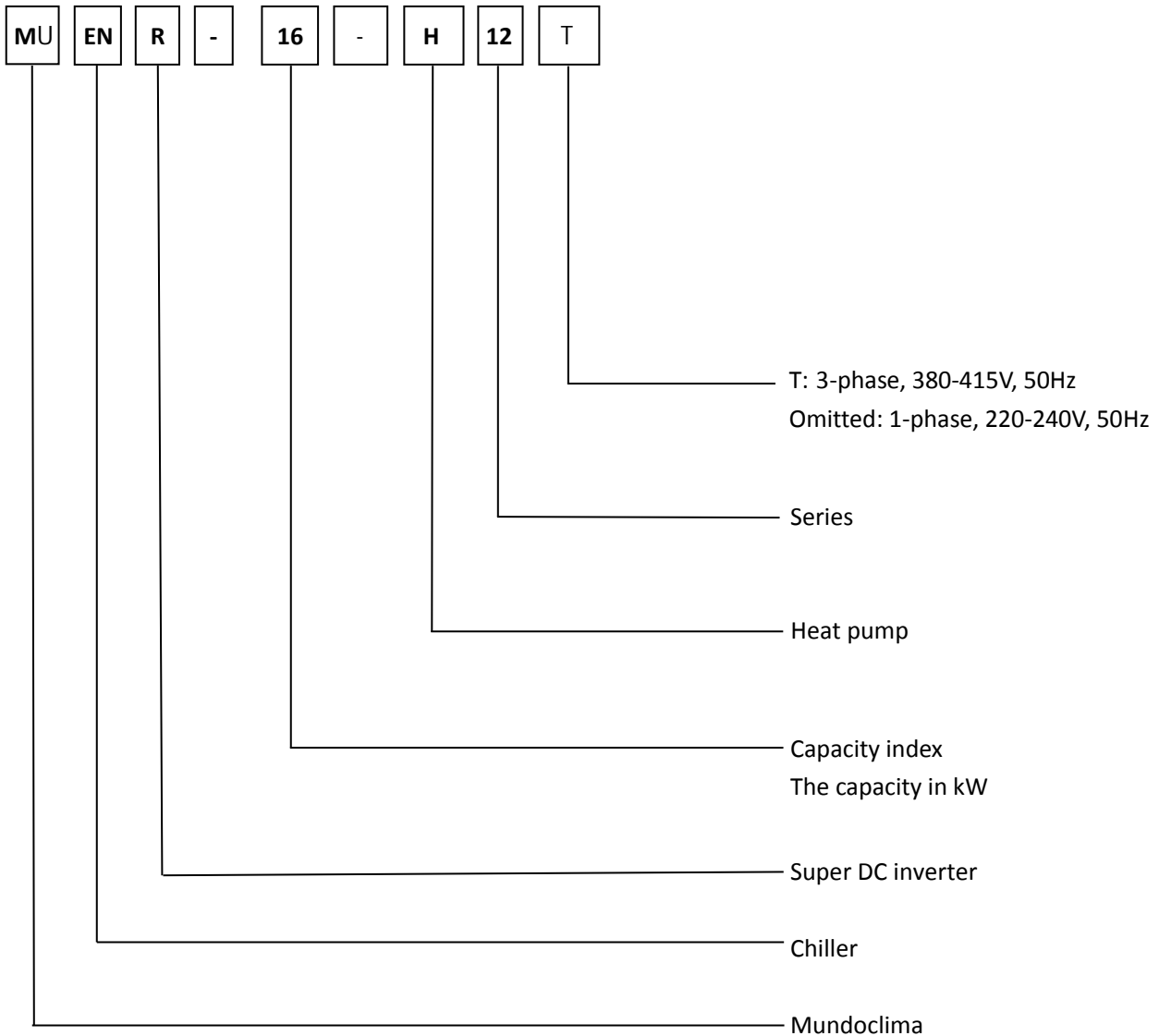


2 Product lineup

| Model | Power supply(V/Ph/Hz) | Refrigerant | Appearance |
|---------------|-----------------------|-------------|---|
| MUENR-05-H12 | 220-240/1 /50 | R32 |  |
| MUENR-07-H12 | 220-240/1 /50 | R32 | |
| MUENR-09-H12 | 220-240/1 /50 | R32 | |
| MUENR-12-H12 | 220-240/1 /50 | R32 | |
| MUENR-14-H12 | 220-240/1 /50 | R32 | |
| MUENR-16-H12 | 220-240/1 /50 | R32 | |
| MUENR-12-H12T | 380-415/3/50 | R32 | |
| MUENR-14-H12T | 380-415/3/50 | R32 | |
| MUENR-16-H12T | 380-415/3/50 | R32 | |

3 Nomenclature

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4 System Design and Unit Selection

4.1 Selection Procedure

Step 1: Total heat load calculation

Calculate conditioned surface area
Select the heat emitters (type, quantity, water temperature and heat load)

Step 2: System configuration

Decide whether to include AHS and set AHS's switching temperature
Decide whether backup electric heater is enabled or disabled

Step 3: Selection of outdoor units

Determine required total heat load on outdoor units
Set capacity safety factor
Select power supply

Provisionally select heat pump unit capacity based on nominal capacity

Correct capacity of the outdoor units for the following items:
Outdoor air temperature / Outdoor humidity / Water outlet temperature¹ /
Altitude / Anti-freeze fluid

Is corrected heat pump unit capacity \geq Required total heat load on outdoor units²

Yes

No

Heat pump system
selection is complete

Select a larger model or enable
backup electric heater operation

Notes:

1. If the required water temperatures of the heat emitters are not all the same, the heat pump's outlet water temperature setting should be set at the highest of the heat emitter required water temperatures. If the water outlet design temperature falls between two temperatures listed in the outdoor unit's capacity table, calculate the corrected capacity by interpolation.
2. If the outdoor unit selection is to be based on total heating load and total cooling load, select units which satisfy not only the total heating load requirements but also the total cooling load requirements.

4.2 Heat pump Leaving Water Temperature (LWT) Selection

The recommended design LWT ranges for different types of heat emitter are:

- For floor heating: 30 to 35°C
- For fan coil units: 30 to 45°C
- For low temperature radiators: 40 to 50°C

4.3 Optimizing System Design

To get the most comfort with the lowest energy consumption with heat pump, it is important to take account of the following considerations:

- Choose heat emitters that allow the heat pump system to operate at as low a hot water temperature as possible whilst still providing sufficient heating.
- Make sure the correct weather dependency curve is selected to match the installation environment (building structure, climate) as well as ender user's demands.
- Connecting room thermostats (field supplied) to the hydronic system helps prevent excessive space heating by stopping the outdoor unit and circulator pump when the room temperature is above the thermostat set point.

Part 2

Engineering Data

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1 Specifications

| Model | | | MUENR-05-H12 | MUENR-07-H12 | MUENR-09-H12 |
|--|----------------------|------|--------------|--------------|--------------|
| Power supply(V/Ph/Hz) | | | 220-240/1/50 | 220-240/1/50 | 220-240/1/50 |
| Heating A7W35 | Capacity | W | 6500 | 8400 | 10000 |
| | Rated input | W | 1226 | 1663 | 2128 |
| | COP | | | 5.30 | 5.05 |
| Heating A7W45 | Capacity | W | 6600 | 8500 | 10200 |
| | Rated input | W | 1650 | 2237 | 2795 |
| | COP | | | 4.00 | 3.80 |
| Heating A7W55 | Capacity | W | 6300 | 8200 | 9400 |
| | Rated input | W | 1969 | 2603 | 3032 |
| | COP | | | 3.20 | 3.15 |
| Heating A2W35 | Capacity | W | 5600 | 7100 | 8200 |
| | Rated input | W | 1333 | 1797 | 2158 |
| | COP | | | 4.20 | 3.95 |
| Heating A2W45 | Capacity | W | 6500 | 7500 | 8500 |
| | Rated input | W | 2063 | 2459 | 2881 |
| | COP | | | 3.15 | 3.05 |
| Heating A2W55 | Capacity | W | 6300 | 7600 | 8400 |
| | Rated input | W | 2250 | 2815 | 3170 |
| | COP | | | 2.80 | 2.70 |
| Heating A-7W35 | Capacity | W | 6200 | 7100 | 8000 |
| | Rated input | W | 1938 | 2254 | 2667 |
| | COP | | | 3.20 | 3.15 |
| Heating A-7W45 | Capacity | W | 6100 | 6800 | 7400 |
| | Rated input | W | 2346 | 2720 | 3083 |
| | COP | | | 2.60 | 2.50 |
| Heating A-7W55 | Capacity | W | 5700 | 6600 | 7200 |
| | Rated input | W | 2651 | 3143 | 3512 |
| | COP | | | 2.15 | 2.10 |
| Cooling A35W18 | Capacity | W | 6500 | 8300 | 10000 |
| | Rated input | W | 1275 | 1711 | 2326 |
| | COP | | | 5.10 | 4.85 |
| Cooling A35W7 | Capacity | W | 5500 | 7400 | 9000 |
| | Rated input | W | 1692 | 2349 | 3103 |
| | COP | | | 3.25 | 3.15 |
| Seasonal space heating energy efficiency class | Water outlet at 35°C | | A+++ | A+++ | A+++ |
| | Water outlet at 55°C | | A++ | A++ | A++ |
| SCOP | Warmer climate | 35°C | 6.78 | 6.94 | 7.05 |
| | | 55°C | 4.35 | 4.74 | 4.91 |
| | Average climate | 35°C | 5.12 | 5.18 | 5.12 |
| | | 55°C | 3.59 | 3.67 | 3.71 |
| | Colder climate | 35°C | 4.41 | 4.44 | 4.44 |
| | | 55°C | 2.90 | 3.02 | 3.14 |

| | | | | | |
|---------------------------------|--------------------------|-------------------|----------------------------|----------------|----------------|
| SEER | Water outlet at 35°C | | 5.09 | 5.19 | 5.08 |
| | Water outlet at 55°C | | 7.81 | 8.09 | 8.31 |
| Sound power level ² | Heating A7W35 | dB | 60 | 63 | 65 |
| | Heating max | dB | 64 | 66 | 68 |
| | Heating slince mode 1 | dB | 58 | 61 | 63 |
| | Heating slince mode 2 | dB | 56 | 58 | 60 |
| | Cooling A35W18 | dB | 60 | 63 | 65 |
| | Cooling max | dB | 64 | 66 | 68 |
| | Cooling slince mode1 | dB | 58 | 61 | 63 |
| | Cooling slince mode2 | dB | 56 | 58 | 60 |
| Compressor | Type | | DC twin rotary | DC twin rotary | DC twin rotary |
| Fan | Type | | DC motor | DC motor | DC motor |
| | Number | | 1 | 1 | 1 |
| | Air flow | m ³ /h | 3900 | 4500 | 4500 |
| Air side heat exchanger | Type | | Fin coil | Fin coil | Fin coil |
| Throttle | Type | | Electronic expansion valve | | |
| Refrigerant | Type | | R32 | R32 | R32 |
| | Charged volume | kg | 1.25 | 1.25 | 1.25 |
| Water side heat exchanger | Type | | Plate | Plate | Plate |
| Rated water flow | m ³ /h | | 1.12 | 1.44 | 1.72 |
| Water flow range | m ³ /h | | 0.40~1.25 | 0.40~1.65 | 0.40~2.10 |
| Water pump | Type | | DC | DC | DC |
| | Maximum pump head | m | 9 | 9 | 9 |
| Expansion vessel | Volume | L | 5 | 5 | 5 |
| | Maximum working pressure | bar | 8 | 8 | 8 |
| Safety valve | MPa | | 0.3 | 0.3 | 0.3 |
| Flow switch | m ³ /h | | 0.36 | 0.36 | 0.36 |
| Water side connection | | | G1"BSP | G1"BSP | G1"BSP |
| Unit dimension (W×H×D) | mm | | 865×1040×410 | 865×1040×410 | 865×1040×410 |
| Packing dimension (W×H×D) | mm | | 970×1190×560 | 970×1190×560 | 970×1190×560 |
| Net weight | kg | | 87 | 87 | 87 |
| Gross weight | kg | | 103 | 103 | 103 |
| Ambient temperature range | Cooling | °C | -5 ~ 43 | -5 ~ 43 | -5 ~ 43 |
| | Heating | °C | -25 ~ 35 | -25 ~ 35 | -25 ~ 35 |
| Water setting temperature range | Cooling | °C | 5~25 | 5~25 | 5~25 |
| | Heating | °C | 25~65 | 25~65 | 25~65 |

- Note:
1. The above data test reference standard EN14511; EN14825; EN50564; EN12102; (EU) No:811/2013; (EU)No:813/2013; OJ 2014/C 207/02.
 2. Sound power test condition: EN12102-1

| Model | | MUENR-12-H12 | MUENR-14-H12 | MUENR-16-H12 | |
|--|----------------------|--------------|--------------|--------------|-------|
| Power supply(V/Ph/Hz) | | 220-240/1/50 | 220-240/1/50 | 220-240/1/50 | |
| Heating A7W35 | Capacity | W | 12200 | 14100 | 16000 |
| | Rated input | W | 2490 | 3000 | 3556 |
| | COP | | 4.90 | 4.70 | 4.50 |
| Heating A7W45 | Capacity | W | 12500 | 14500 | 16200 |
| | Rated input | W | 3378 | 4085 | 4696 |
| | COP | | 3.70 | 3.55 | 3.45 |
| Heating A7W55 | Capacity | W | 12000 | 14000 | 16000 |
| | Rated input | W | 4000 | 4746 | 5614 |
| | COP | | 3.00 | 2.95 | 2.85 |
| Heating A2W35 | Capacity | W | 12300 | 13000 | 14500 |
| | Rated input | W | 3417 | 3714 | 4462 |
| | COP | | 3.60 | 3.50 | 3.25 |
| Heating A2W45 | Capacity | W | 12000 | 13000 | 14300 |
| | Rated input | W | 4138 | 4643 | 5296 |
| | COP | | 2.90 | 2.80 | 2.70 |
| Heating A2W55 | Capacity | W | 12000 | 13000 | 13500 |
| | Rated input | W | 5106 | 5603 | 5870 |
| | COP | | 2.35 | 2.32 | 2.30 |
| Heating A-7W35 | Capacity | W | 11600 | 12500 | 13500 |
| | Rated input | W | 4070 | 4464 | 5000 |
| | COP | | 2.85 | 2.80 | 2.70 |
| Heating A-7W45 | Capacity | W | 11500 | 12500 | 13500 |
| | Rated input | W | 4792 | 5435 | 6000 |
| | COP | | 2.40 | 2.30 | 2.25 |
| Heating A-7W55 | Capacity | W | 10800 | 11700 | 12800 |
| | Rated input | W | 5143 | 5625 | 6244 |
| | COP | | 2.10 | 2.08 | 2.05 |
| Cooling A35W18 | Capacity | W | 12200 | 13900 | 15400 |
| | Rated input | W | 2652 | 3159 | 3667 |
| | COP | | 4.60 | 4.40 | 4.20 |
| Cooling A35W7 | Capacity | W | 11600 | 13400 | 14000 |
| | Rated input | W | 3742 | 4573 | 4828 |
| | COP | | 3.10 | 2.93 | 2.90 |
| Seasonal space heating energy efficiency class | Water outlet at 35°C | | A+++ | A+++ | A+++ |
| | Water outlet at 55°C | | A++ | A++ | A++ |
| SCOP | Warmer climate | 35°C | 6.63 | 6.59 | 6.46 |
| | | 55°C | 4.55 | 4.63 | 4.72 |
| | Average climate | 35°C | 5.08 | 4.89 | 4.84 |
| | | 55°C | 3.62 | 3.62 | 3.59 |
| | Colder climate | 35°C | 4.30 | 4.36 | 4.35 |
| | | 55°C | 3.23 | 3.24 | 3.18 |
| SEER | Water outlet at 35°C | | 5.07 | 5.09 | 5.11 |
| | Water outlet at 55°C | | 7.79 | 7.59 | 7.49 |

| | | | | | |
|---------------------------------|--------------------------|-------------------|----------------------------|----------------|----------------|
| Sound power level ² | Heating A7W35 | dB | 70 | 72 | 72 |
| | Heating max | dB | 74 | 74 | 74 |
| | Heating slince mode 1 | dB | 66 | 67 | 67 |
| | Heating slince mode 2 | dB | 64 | 64 | 64 |
| | Cooling A35W18 | dB | 69 | 71 | 71 |
| | Cooling max | dB | 74 | 74 | 74 |
| | Cooling slince mode1 | dB | 66 | 67 | 67 |
| | Cooling slince mode2 | dB | 64 | 64 | 64 |
| Compressor | Type | | DC twin rotary | DC twin rotary | DC twin rotary |
| Fan | Type | | DC motor | DC motor | DC motor |
| | Number | | 1 | 1 | 1 |
| | Air flow | m ³ /h | 5200 | 5200 | 5200 |
| Air side heat exchanger | Type | | Fin coil | Fin coil | Fin coil |
| Throttle | Type | | Electronic expansion valve | | |
| Refrigerant | Type | | R32 | R32 | R32 |
| | Charged volume | kg | 1.8 | 1.8 | 1.8 |
| Water side heat exchanger | Type | | Plate | Plate | Plate |
| Rated water flow | m ³ /h | | 2.10 | 2.43 | 2.75 |
| Water flow range | m ³ /h | | 0.70~2.50 | 0.70~2.75 | 0.70~3.00 |
| Water pump | Type | | DC | DC | DC |
| | Maximum pump head | m | 9 | 9 | 9 |
| Expansion vessel | Volume | L | 5 | 5 | 5 |
| | Maximum working pressure | bar | 8 | 8 | 8 |
| Safety valve | MPa | | 0.3 | 0.3 | 0.3 |
| Flow switch | m ³ /h | | 0.6 | 0.6 | 0.6 |
| Water side connection | | | G5/4"BSP | G5/4"BSP | G5/4"BSP |
| Unit dimension (W×H×D) | | mm | 865×1040×410 | 865×1040×410 | 865×1040×410 |
| Packing dimension (W×H×D) | | mm | 970×1190×560 | 970×1190×560 | 970×1190×560 |
| Net weight | | kg | 106 | 106 | 106 |
| Gross weight | | kg | 122 | 122 | 122 |
| Ambient temperature range | Cooling | °C | -5 ~ 43 | -5 ~ 43 | -5 ~ 43 |
| | Heating | °C | -25 ~ 35 | -25 ~ 35 | -25 ~ 35 |
| Water setting temperature range | Cooling | °C | 5~25 | 5~25 | 5~25 |
| | Heating | °C | 25~65 | 25~65 | 25~65 |

Note:

1. The above data test reference standard EN14511; EN14825; EN50564; EN12102; (EU) No:811/2013; (EU)No:813/2013; OJ 2014/C 207/02.
2. Sound power test condition: EN12102-1

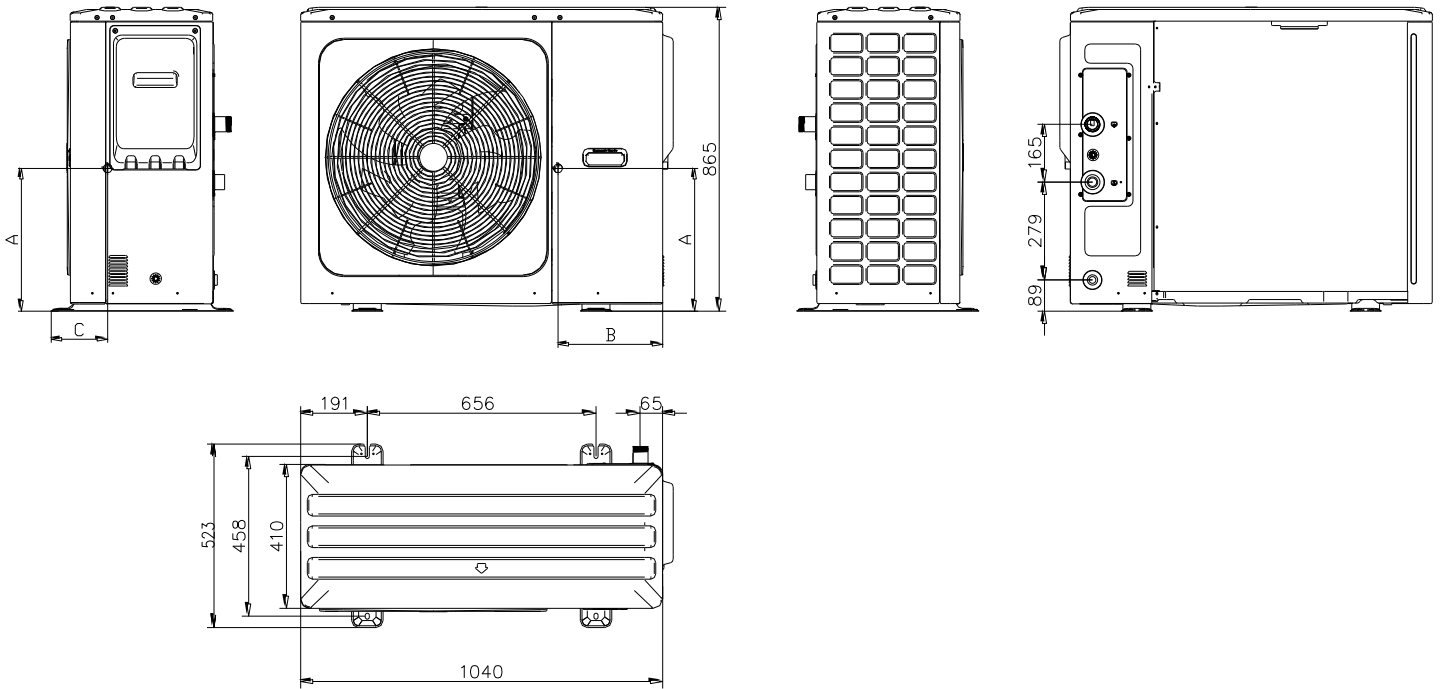
| Model | | | MUENR-12-H12T | MUENR-14-H12T | MUENR-16-H12T |
|--|----------------------|------|---------------|---------------|---------------|
| Power supply(V/Ph/Hz) | | | 380-415/3/50 | 380-415/3/50 | 380-415/3/50 |
| Heating A7W35 | Capacity | W | 12200 | 14100 | 16000 |
| | Rated input | W | 2490 | 3000 | 3556 |
| | COP | | 4.90 | 4.70 | 4.50 |
| Heating A7W45 | Capacity | W | 12500 | 14500 | 16200 |
| | Rated input | W | 3378 | 4085 | 4696 |
| | COP | | 3.70 | 3.55 | 3.45 |
| Heating A7W55 | Capacity | W | 12000 | 14000 | 16000 |
| | Rated input | W | 4000 | 4746 | 5614 |
| | COP | | 3.00 | 2.95 | 2.85 |
| Heating A2W35 | Capacity | W | 12300 | 13000 | 14500 |
| | Rated input | W | 3417 | 3714 | 4462 |
| | COP | | 3.60 | 3.50 | 3.25 |
| Heating A2W45 | Capacity | W | 12000 | 13000 | 14300 |
| | Rated input | W | 4138 | 4643 | 5296 |
| | COP | | 2.90 | 2.80 | 2.70 |
| Heating A2W55 | Capacity | W | 12000 | 13000 | 13500 |
| | Rated input | W | 5106 | 5603 | 5870 |
| | COP | | 2.35 | 2.32 | 2.30 |
| Heating A-7W35 | Capacity | W | 11600 | 12500 | 13500 |
| | Rated input | W | 4070 | 4464 | 5000 |
| | COP | | 2.85 | 2.80 | 2.70 |
| Heating A-7W45 | Capacity | W | 11500 | 12500 | 13500 |
| | Rated input | W | 4792 | 5435 | 6000 |
| | COP | | 2.40 | 2.30 | 2.25 |
| Heating A-7W55 | Capacity | W | 10800 | 11700 | 12800 |
| | Rated input | W | 5143 | 5625 | 6244 |
| | COP | | 2.10 | 2.08 | 2.05 |
| Cooling A35W18 | Capacity | W | 12200 | 13900 | 15400 |
| | Rated input | W | 2652 | 3159 | 3667 |
| | COP | | 4.60 | 4.40 | 4.20 |
| Cooling A35W7 | Capacity | W | 11600 | 13400 | 14000 |
| | Rated input | W | 3742 | 4573 | 4828 |
| | COP | | 3.10 | 2.93 | 2.90 |
| Seasonal space heating energy efficiency class | Water outlet at 35°C | | A+++ | A+++ | A+++ |
| | Water outlet at 55°C | | A++ | A++ | A++ |
| SCOP | Warmer climate | 35°C | 6.64 | 6.59 | 6.46 |
| | | 55°C | 4.55 | 4.64 | 4.72 |
| | Average climate | 35°C | 5.08 | 4.89 | 4.84 |
| | | 55°C | 3.62 | 3.62 | 3.59 |
| | Colder climate | 35°C | 4.30 | 4.36 | 4.35 |
| | | 55°C | 3.23 | 3.24 | 3.18 |
| SEER | Water outlet at 35°C | | 5.11 | 5.12 | 5.14 |
| | Water outlet at 55°C | | 7.86 | 7.65 | 7.54 |

| | | | | | | |
|---------------------------------|--------------------------|-------------------|----|----------------------------|----------------|----------------|
| Sound power level ² | Heating A7W35 | | dB | 70 | 72 | 72 |
| | Heating max | | dB | 74 | 74 | 74 |
| | Heating slince mode 1 | | dB | 66 | 67 | 67 |
| | Heating slince mode 2 | | dB | 64 | 64 | 64 |
| | Cooling A35W18 | | dB | 69 | 71 | 71 |
| | Cooling max | | dB | 74 | 74 | 74 |
| | Cooling slince mode1 | | dB | 66 | 67 | 67 |
| | Cooling slince mode2 | | dB | 64 | 64 | 64 |
| Compressor | Type | | | DC twin rotary | DC twin rotary | DC twin rotary |
| Fan | Type | | | DC motor | DC motor | DC motor |
| | Number | | | 1 | 1 | 1 |
| | Air flow | m ³ /h | | 5200 | 5200 | 5200 |
| Air side heat exchanger | Type | | | Fin coil | Fin coil | Fin coil |
| Throttle | Type | | | Electronic expansion valve | | |
| Refrigerant | Type | | | R32 | R32 | R32 |
| | Charged volume | kg | | 1.8 | 1.8 | 1.8 |
| Water side heat exchanger | Type | | | Plate | Plate | Plate |
| Rated water flow | m ³ /h | | | 2.10 | 2.43 | 2.75 |
| Water flow range | m ³ /h | | | 0.70~2.50 | 0.70~2.75 | 0.70~3.00 |
| Water pump | Type | | | DC | DC | DC |
| | Maximum pump head | m | | 9 | 9 | 9 |
| Expansion vessel | Volume | L | | 5 | 5 | 5 |
| | Maximum working pressure | bar | | 8 | 8 | 8 |
| Safety valve | MPa | | | 0.3 | 0.3 | 0.3 |
| Flow switch | m ³ /h | | | 0.6 | 0.6 | 0.6 |
| Water side connection | | | | G5/4"BSP | G5/4"BSP | G5/4"BSP |
| Unit dimension (W×H×D) | | mm | | 865×1040×410 | 865×1040×410 | 865×1040×410 |
| Packing dimension (W×H×D) | | mm | | 970×1190×560 | 970×1190×560 | 970×1190×560 |
| Net weight | | kg | | 120 | 120 | 120 |
| Gross weight | | kg | | 136 | 136 | 136 |
| Ambient temperature range | Cooling | °C | | -5 ~ 43 | -5 ~ 43 | -5 ~ 43 |
| | Heating | °C | | -25 ~ 35 | -25 ~ 35 | -25 ~ 35 |
| Water setting temperature range | Cooling | °C | | 5~25 | 5~25 | 5~25 |
| | Heating | °C | | 25~65 | 25~65 | 25~65 |

Note:

1. The above data test reference standard EN14511; EN14825; EN50564; EN12102; (EU) No:811/2013; (EU)No:813/2013; OJ 2014/C 207/02.
2. Sound power test condition: EN12102-1

2 Dimensions and Center of Gravity

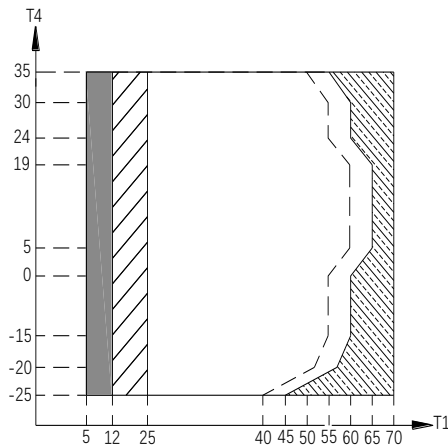


Unit: mm

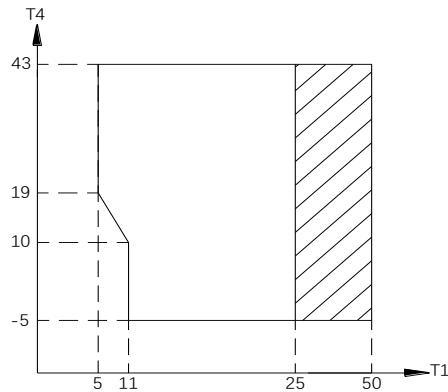
| Model | A | B | C |
|---------------|-----|-----|-----|
| MUENR-05-H12 | 350 | 355 | 285 |
| MUENR-07-H12 | | | |
| MUENR-09-H12 | | | |
| MUENR-12-H12 | 540 | 390 | 255 |
| MUENR-14-H12 | | | |
| MUENR-16-H12 | | | |
| MUENR-12-H12T | 500 | 400 | 275 |
| MUENR-14-H12T | | | |
| MUENR-16-H12T | | | |

3 Operating Limits

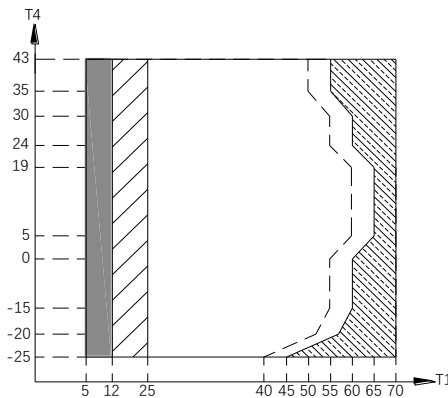
Heating operating limits



Cooling operating limits



Domestic hot water operating limits



Abbreviations:

T4: Outdoor temperature(°C)

T1: Leaving water temperature (°C)

IBH: Backup electric heater

AHS: Additional heat source

Notes:

■ If IBH/AHS setting is valid, only IBH/AHS turns on;

If IBH/AHS setting is invalid, only heat pump turns on, limitation and protection may occur.

▨ Heat pump turns off, only IBH/AHS turns on.

(IBH can heat the water temperature up to 65°C, AHS can heat the water temperature up to 70°C)

▨ Operation range by heat pump with possible limitation and protection

- - - Maximum inlet water temperature line for heat pump operation

4 Capacity Tables

4.1 Heating Capacity Tables (Test standard: EN14511)

Part load: Maximum

| MÜENR-05-H12 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| DB | LWT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 25 | | | 30 | | | 35 | | | 40 | | | 45 | | | 50 | | | 55 | | | 60 | | | 65 | | |
| | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP |
| -25 | 3.78 | 1.58 | 2.39 | 3.77 | 1.69 | 2.23 | 3.76 | 1.80 | 2.09 | 3.73 | 1.92 | 1.94 | 3.69 | 2.05 | 1.80 | / | / | / | / | / | / | / | / | / | / | | |
| -20 | 4.59 | 1.72 | 2.67 | 4.58 | 1.85 | 2.48 | 4.56 | 1.97 | 2.32 | 4.50 | 2.09 | 2.15 | 4.46 | 2.24 | 1.99 | 4.40 | 2.39 | 1.84 | 4.37 | 2.50 | 1.75 | / | / | / | / | | |
| -15 | 5.50 | 1.84 | 2.99 | 5.48 | 1.99 | 2.76 | 5.45 | 2.12 | 2.57 | 5.39 | 2.26 | 2.38 | 5.31 | 2.42 | 2.19 | 5.24 | 2.58 | 2.03 | 5.21 | 2.73 | 1.91 | 5.01 | 2.83 | 1.77 | / | / | |
| -10 | 6.53 | 1.94 | 3.37 | 6.50 | 2.10 | 3.10 | 6.46 | 2.25 | 2.87 | 6.38 | 2.43 | 2.63 | 6.28 | 2.60 | 2.42 | 6.17 | 2.78 | 2.22 | 6.02 | 2.87 | 2.10 | 5.66 | 2.92 | 1.94 | / | / | |
| -7 | 6.79 | 1.82 | 3.73 | 6.73 | 1.97 | 3.41 | 6.64 | 2.13 | 3.12 | 6.54 | 2.29 | 2.85 | 6.44 | 2.47 | 2.61 | 6.33 | 2.65 | 2.39 | 6.28 | 2.80 | 2.24 | 5.89 | 2.85 | 2.07 | / | / | |
| -5 | 7.01 | 1.79 | 3.92 | 6.95 | 1.95 | 3.56 | 6.85 | 2.11 | 3.24 | 6.75 | 2.28 | 2.96 | 6.65 | 2.46 | 2.70 | 6.51 | 2.64 | 2.47 | 6.32 | 2.72 | 2.32 | 5.76 | 2.68 | 2.15 | / | / | |
| -2 | 7.23 | 1.70 | 4.26 | 7.19 | 1.87 | 3.84 | 7.08 | 2.03 | 3.48 | 6.97 | 2.21 | 3.15 | 6.85 | 2.40 | 2.85 | 6.71 | 2.58 | 2.60 | 6.50 | 2.67 | 2.43 | 6.04 | 2.70 | 2.24 | / | / | |
| 0 | 7.42 | 1.64 | 4.52 | 7.38 | 1.82 | 4.05 | 7.28 | 2.00 | 3.64 | 7.16 | 2.18 | 3.28 | 7.03 | 2.37 | 2.97 | 6.88 | 2.56 | 2.69 | 6.67 | 2.66 | 2.51 | 6.18 | 2.66 | 2.32 | / | / | |
| 2 | 7.43 | 1.54 | 4.84 | 7.40 | 1.72 | 4.31 | 7.29 | 1.89 | 3.85 | 7.17 | 2.08 | 3.45 | 7.03 | 2.27 | 3.10 | 6.87 | 2.45 | 2.80 | 6.81 | 2.43 | 2.80 | 6.30 | 2.64 | 2.39 | / | / | |
| 5 | 8.13 | 1.44 | 5.65 | 8.06 | 1.62 | 4.97 | 7.97 | 1.81 | 4.41 | 7.91 | 2.00 | 3.96 | 7.82 | 2.20 | 3.56 | 7.72 | 2.40 | 3.21 | 7.65 | 2.58 | 2.97 | 7.25 | 2.69 | 2.70 | 6.64 | 2.70 | 2.46 |
| 7 | 8.48 | 1.37 | 6.20 | 8.44 | 1.56 | 5.41 | 8.47 | 1.69 | 5.00 | 8.31 | 1.96 | 4.25 | 8.14 | 2.11 | 3.85 | 7.94 | 2.35 | 3.38 | 7.87 | 2.46 | 3.20 | 7.23 | 2.56 | 2.82 | 6.79 | 2.66 | 2.55 |
| 10 | 9.00 | 1.24 | 7.28 | 8.86 | 1.43 | 6.20 | 8.71 | 1.63 | 5.36 | 8.54 | 1.82 | 4.68 | 8.35 | 2.03 | 4.12 | 8.14 | 2.23 | 3.65 | 8.07 | 2.42 | 3.24 | 7.35 | 2.44 | 3.01 | 6.40 | 2.36 | 2.71 |
| 12 | 9.25 | 1.16 | 8.00 | 9.09 | 1.35 | 6.73 | 8.94 | 1.55 | 5.75 | 8.76 | 1.76 | 4.99 | 8.56 | 1.96 | 4.36 | 8.34 | 2.17 | 3.85 | 8.23 | 2.35 | 3.50 | 7.48 | 2.38 | 3.14 | 6.73 | 2.40 | 2.81 |
| 15 | 9.29 | 1.00 | 9.30 | 9.14 | 1.19 | 7.65 | 8.97 | 1.40 | 6.43 | 8.78 | 1.60 | 5.50 | 8.57 | 1.80 | 4.76 | 8.35 | 2.01 | 4.16 | 8.28 | 2.21 | 3.75 | 7.47 | 2.23 | 3.35 | 7.22 | 2.42 | 2.98 |
| 20 | 8.77 | 0.81 | 10.8 | 8.62 | 0.95 | 9.08 | 8.44 | 1.16 | 7.28 | 8.25 | 1.32 | 6.23 | 8.05 | 1.43 | 5.64 | 7.82 | 1.62 | 4.83 | 7.74 | 1.81 | 4.28 | 7.49 | 2.05 | 3.65 | / | / | / |
| 25 | 9.51 | 0.82 | 11.6 | 9.33 | 0.88 | 10.6 | 9.14 | 1.13 | 8.12 | 8.92 | 1.28 | 6.99 | 8.70 | 1.44 | 6.03 | 8.44 | 1.59 | 5.30 | 8.34 | 1.81 | 4.61 | 8.06 | 2.10 | 3.83 | / | / | / |
| 30 | 9.80 | 0.79 | 12.5 | 9.61 | 0.84 | 11.4 | 9.40 | 1.05 | 8.96 | 9.17 | 1.19 | 7.71 | 8.93 | 1.34 | 6.66 | 8.65 | 1.51 | 5.72 | 8.53 | 1.77 | 4.83 | 8.23 | 2.08 | 3.95 | / | / | / |
| 35 | / | / | / | 10.7 | 0.88 | 12.1 | 10.4 | 1.05 | 9.89 | 10.2 | 1.21 | 8.43 | 9.90 | 1.40 | 7.08 | 9.60 | 1.61 | 5.95 | 9.54 | 1.87 | 5.10 | / | / | / | / | / | / |
| MÜENR-07-H12 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DB | LWT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 25 | | | 30 | | | 35 | | | 40 | | | 45 | | | 50 | | | 55 | | | 60 | | | 65 | | |
| | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP |
| -25 | 4.24 | 1.81 | 2.34 | 4.23 | 1.94 | 2.18 | 4.21 | 2.05 | 2.05 | 4.17 | 2.18 | 1.91 | 4.13 | 2.33 | 1.77 | / | / | / | / | / | / | / | / | / | / | / | / |
| -20 | 5.14 | 1.98 | 2.64 | 5.12 | 2.11 | 2.43 | 5.1 | 2.25 | 2.27 | 5.05 | 2.39 | 2.11 | 4.99 | 2.55 | 1.96 | 4.91 | 2.71 | 1.81 | 4.88 | 2.80 | 1.74 | / | / | / | / | / | / |
| -15 | 6.17 | 2.11 | 2.92 | 6.13 | 2.26 | 2.71 | 6.1 | 2.42 | 2.52 | 6.03 | 2.59 | 2.33 | 5.95 | 2.77 | 2.15 | 5.85 | 2.94 | 1.99 | 5.74 | 3.04 | 1.89 | 5.23 | 2.95 | 1.77 | / | / | / |
| -10 | 7.31 | 2.22 | 3.29 | 7.28 | 2.40 | 3.03 | 7.22 | 2.57 | 2.81 | 7.13 | 2.76 | 2.58 | 7.03 | 2.95 | 2.38 | 6.79 | 3.10 | 2.19 | 6.65 | 3.20 | 2.08 | 6.15 | 3.19 | 1.93 | / | / | / |
| -7 | 7.8 | 2.15 | 3.62 | 7.71 | 2.32 | 3.32 | 7.61 | 2.50 | 3.05 | 7.51 | 2.69 | 2.79 | 7.39 | 2.89 | 2.56 | 7.12 | 3.03 | 2.35 | 6.96 | 3.14 | 2.22 | 6.54 | 3.19 | 2.05 | / | / | / |
| -5 | 8.14 | 2.14 | 3.8 | 8.06 | 2.32 | 3.47 | 7.96 | 2.51 | 3.17 | 7.84 | 2.71 | 2.89 | 7.71 | 2.92 | 2.64 | 7.35 | 3.02 | 2.43 | 7.18 | 3.14 | 2.29 | 6.46 | 3.03 | 2.13 | / | / | / |
| -2 | 8.37 | 2.03 | 4.12 | 8.31 | 2.22 | 3.74 | 8.2 | 2.42 | 3.39 | 8.07 | 2.63 | 3.07 | 7.92 | 2.83 | 2.8 | 7.76 | 3.04 | 2.55 | 7.59 | 3.18 | 2.39 | 6.64 | 2.99 | 2.22 | / | / | / |
| 0 | 8.61 | 1.98 | 4.35 | 8.57 | 2.19 | 3.92 | 8.45 | 2.39 | 3.54 | 8.31 | 2.59 | 3.21 | 8.17 | 2.82 | 2.9 | 8 | 3.03 | 2.64 | 7.8 | 3.15 | 2.48 | 6.8 | 2.97 | 2.29 | / | / | / |
| 2 | 8.67 | 1.87 | 4.63 | 8.65 | 2.08 | 4.15 | 8.52 | 2.29 | 3.72 | 8.38 | 2.49 | 3.36 | 8.22 | 2.71 | 3.03 | 8.22 | 3.00 | 2.74 | 8 | 3.13 | 2.56 | 6.95 | 2.94 | 2.36 | / | / | / |
| 5 | 9.49 | 1.78 | 5.34 | 9.42 | 1.98 | 4.76 | 9.31 | 2.19 | 4.25 | 9.19 | 2.39 | 3.84 | 9.1 | 2.63 | 3.46 | 8.99 | 2.87 | 3.13 | 8.98 | 3.10 | 2.9 | 7.94 | 2.97 | 2.67 | 7.3 | 2.99 | 2.44 |
| 7 | 9.73 | 1.65 | 5.89 | 9.68 | 1.87 | 5.19 | 9.72 | 2.05 | 4.75 | 9.48 | 2.30 | 4.13 | 9.28 | 2.51 | 3.69 | 9.08 | 2.75 | 3.3 | 9.06 | 2.97 | 3.05 | 8.18 | 2.94 | 2.78 | 7.5 | 2.95 | 2.54 |
| 10 | 10.1 | 1.45 | 6.95 | 9.94 | 1.66 | 5.98 | 9.77 | 1.88 | 5.2 | 9.57 | 2.09 | 4.57 | 9.37 | 2.32 | 4.04 | 9.15 | 2.55 | 3.59 | 9.12 | 2.77 | 3.29 | 8.14 | 2.71 | 3 | 7.66 | 2.84 | 2.7 |
| 12 | 10.4 | 1.36 | 7.64 | 10.2 | 1.57 | 6.5 | 10.1 | 1.79 | 5.6 | 9.86 | 2.02 | 4.87 | 9.64 | 2.25 | 4.28 | 9.4 | 2.48 | 3.79 | 9.37 | 2.71 | 3.46 | 8.34 | 2.66 | 3.13 | 7.76 | 2.77 | 2.8 |
| 15 | 10.2 | 1.13 | 9.05 | 10.1 | 1.35 | 7.49 | 9.89 | 1.56 | 6.33 | 9.69 | 1.78 | 5.43 | 9.46 | 2.00 | 4.72 | 9.23 | 2.23 | 4.13 | 9.19 | 2.46 | 3.74 | 8.92 | 2.68 | 3.33 | 8.02 | 2.71 | 2.96 |
| 20 | 9.85 | 0.98 | 10.1 | 9.66 | 1.11 | 8.71 | 9.48 | 1.34 | 7.06 | 9.27 | 1.52 | 6.09 | 9.05 | 1.70 | 5.31 | 8.81 | 1.93 | 4.56 | 8.71 | 2.15 | 4.05 | 8.43 | 2.27 | 3.72 | / | / | / |
| 25 | 9.51 | 0.87 | 10.9 | 9.33 | 0.97 | 9.65 | 9.14 | 1.16 | 7.88 | 8.93 | 1.31 | 6.8 | 8.7 | 1.49 | 5.85 | 8.45 | 1.68 | 5.02 | 8.34 | 1.90 | 4.4 | 8.06 | 2.07 | 3.9 | / | / | / |
| 30 | 10.7 | 0.92 | 11.7 | 10.5 | 1.00 | 10.5 | 10.3 | 1.20 | 8.56 | 10.0 | 1.35 | 7.45 | 9.77 | 1.52 | 6.41 | 9.49 | 1.74 | 5.46 | 9.45 | 2.03 | 4.65 | 9.11 | 2.24 | 4.06 | / | / | / |
| 35 | / | / | / | 11.8 | 1.03 | 11.5 | 11.6 | 1.22 | 9.45 | 11.3 | 1.35 | 8.32 | 11.0 | 1.61 | 6.8 | 10.6 | 1.81 | 5.86 | 10.6 | 2.14 | 4.94 | / | / | / | / | / | / |
| MÜENR-09-H12 | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DB | LWT | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 25 | | | 30 | | | 35 | | | 40 | | | 45 | | | 50 | | | 55 | | | 60 | | | 65 | | |
| | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP |
| -25 | 4.36 | 1.89 | 2.31 | 4.35 | 2.00 | 2.17 | 4.38 | 2.16 | 2.03 | 4.35 | 2.30 | 1.89 | 4.3 | 2.44 | 1.76 | / | / | / | / | / | / | / | / | / | / | / | / |
| -20 | 5.29 | 2.06 | 2.57 | 5.27 | 2.19 | 2.41 | 5.31 | 2.38 | 2.23 | 5.26 | 2.53 | 2.08 | 5.19 | 2.69 | 1.93 | 5.12 | 2.86 | 1.79 | 4.95 | 2.88 | 1.72 | / | / | / | / | / | / |
| -15 | 6.54 | 2.29 | 2.85 | 6.51 | 2.45 | 2.66 | 6.45 | 2.62 | 2.46 | 6.38 | 2.80 | 2.28 | 6.29 | 2.98 | 2.11 | 6.2 | 3.16 | 1.96 | 6.09 | 3.27 | 1.86 | 5.28 | 3.00 | 1.76 | / | / | / |
| -10 | 7.76 | 2.42 | 3.21 | 7.72 | 2.59 | 2.98 | 7.63 | 2.77 | 2.75 | 7.54 | 2.99 | 2.52 | 7.43 | 3.19 | 2.33 | 7.26 | 3.39 | 2.14 | 7.06 | 3.46 | 2.04 | 6.45 | 3.38 | 1.91 | / | / | / |
| -7 | 8.48 | 2.51 | 3.38 | 8.41 | 2.60 | 3.23 | 8.32 | 2.80 | 2.97 | 8.2 | 3.01 | 2.72 | 8.08 | 3.23 | 2.5 | 7.81 | 3.40 | 2.3 | 7.53 | 3.45 | 2.18 | 6.91 | 3.39 | 2.04 | / | / | / |
| -5 | 8.66 | 2.41 | 3.59 | 8.72 | 2.58 | 3.38 | 8.61 | 2.79 | 3.09 | 8.42 | 2.96 | 2.84 | 8.29 | 3.20 | 2.59 | 7.87 | 3.28 | 2.4 | 7.63 | 3.38 | 2.26 | 6.99 | 3.33 | 2.1 | / | / | / |
| -2 | 9.2 | 2.35 | 3.91 | 9.18 | 2.54 | 3.62 | 9.06 | 2.75 | 3.29 | 8.85 | 2.94 | 3.01 | 8.78 | 3.22 | 2.73 | 8.24 | 3.27 | 2.52 | 7.98 | 3.35 | 2.38 | 7.21 | 3.29 | 2.19 | / | / | / |
| 0 | 9.49 | 2.29 | 4.15 | 9.49 | 2.50 | 3.8 | 9.35 | 2.72 | 3.44 | 9.13 | 2.92 | 3.13 | 9.05 | 3.19 | 2.84 | 8.48 | 3.25 | 2.61 | 8.21 | 3.35 | 2.45 | 7.38 | 3.27 | 2.26 | / | / | / |
| 2 | 9.79 | 2.21 | 4.43 | 9.78 | 2.45 | 4 | 9.64 | 2.67 | 3.61 | 9.4 | 2.87 | 3.27 | 9.31 | 3.16 | 2.95 | 8.8 | 3.26 | 2.7 | 8.42 | 3.33 | 2.53 | 7.54 | 3.24 | 2.33 | / | / | / |
| 5 | 10.9 | 2.15 | 5.08 | 10.8 | 2.38 | 4.56 | 10.7 | 2.61 | 4.11 | 10.7 | 2.86 | 3.72 | 10.6 | 3.13 | 3.37 | 10.3 | 3.34 | 3.07 | 9.82 | 3.43 | 2.86 | 8.78 | 3.34 | 2.63 | 7.93 | 3.29 | 2.41 |
| 7 | 11.3 | 2.03 | 5.56 | 11.2 | 2.27 | 4.94 | 11.1 | 2.51 | 4.43 | 11.0 | 2 | | | | | | | | | | | | | | | | |

Part load: Maximum

MUENR-12-H12 MUENR-12-H12T

| DB | LWT | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|--|
| | 25 | | | 30 | | | 35 | | | 40 | | | 45 | | | 50 | | | 55 | | | 60 | | | 65 | | |
| | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | | | |
| -25 | 6.83 | 3.13 | 2.18 | 6.93 | 3.34 | 2.07 | 7.04 | 3.58 | 1.97 | 7.14 | 3.84 | 1.86 | 5.69 | 3.08 | 1.85 | / | / | / | / | / | / | / | / | / | / | | |
| -20 | 8.18 | 3.38 | 2.42 | 8.30 | 3.63 | 2.29 | 8.42 | 3.89 | 2.16 | 8.53 | 4.17 | 2.05 | 8.63 | 4.47 | 1.93 | 8.73 | 4.79 | 1.82 | 6.87 | 3.85 | 1.79 | / | / | / | / | | |
| -15 | 9.70 | 3.62 | 2.68 | 9.83 | 3.88 | 2.53 | 9.96 | 4.18 | 2.39 | 10.1 | 4.49 | 2.25 | 10.2 | 4.82 | 2.11 | 10.3 | 5.17 | 1.99 | 9.82 | 5.27 | 1.87 | 6.06 | 3.38 | 1.79 | / | | |
| -10 | 11.4 | 3.81 | 2.99 | 11.6 | 4.11 | 2.81 | 11.7 | 4.43 | 2.64 | 11.8 | 4.79 | 2.47 | 11.9 | 5.14 | 2.32 | 12.0 | 5.54 | 2.17 | 11.0 | 5.35 | 2.05 | 10.8 | 5.54 | 1.95 | / | | |
| -7 | 10.6 | 3.49 | 3.03 | 10.9 | 3.78 | 2.88 | 11.2 | 4.11 | 2.73 | 11.5 | 4.48 | 2.56 | 11.5 | 4.80 | 2.39 | 11.7 | 5.19 | 2.25 | 11.7 | 5.40 | 2.17 | 10.9 | 5.45 | 2.00 | / | | |
| -5 | 10.8 | 3.35 | 3.21 | 11.1 | 3.66 | 3.04 | 11.4 | 3.98 | 2.87 | 11.7 | 4.35 | 2.69 | 11.5 | 4.64 | 2.49 | 11.7 | 5.03 | 2.33 | 11.9 | 5.22 | 2.27 | 10.6 | 5.15 | 2.05 | / | | |
| -2 | 10.9 | 3.10 | 3.51 | 11.3 | 3.41 | 3.30 | 11.6 | 3.74 | 3.10 | 11.8 | 4.09 | 2.89 | 11.9 | 4.46 | 2.67 | 12.1 | 4.85 | 2.50 | 12.7 | 5.31 | 2.39 | 11.0 | 5.11 | 2.15 | / | | |
| 0 | 11.3 | 3.02 | 3.75 | 11.6 | 3.32 | 3.51 | 12.0 | 3.66 | 3.28 | 12.2 | 4.01 | 3.04 | 12.3 | 4.36 | 2.81 | 12.1 | 4.85 | 2.50 | 12.9 | 5.23 | 2.47 | 11.4 | 5.10 | 2.23 | / | | |
| 2 | 11.7 | 2.92 | 4.01 | 12.1 | 3.23 | 3.73 | 12.4 | 3.56 | 3.48 | 12.6 | 3.93 | 3.21 | 12.7 | 4.27 | 2.96 | 12.8 | 4.69 | 2.74 | 13.1 | 5.13 | 2.56 | 11.9 | 5.10 | 2.32 | / | | |
| 5 | 13.1 | 2.86 | 4.58 | 13.4 | 3.19 | 4.21 | 13.8 | 3.52 | 3.92 | 14.1 | 3.95 | 3.57 | 14.6 | 4.32 | 3.37 | 14.5 | 4.71 | 3.09 | 14.4 | 4.99 | 2.88 | 14.0 | 5.31 | 2.63 | 8.56 | | |
| 7 | 13.8 | 2.66 | 5.17 | 14.1 | 3.00 | 4.71 | 14.4 | 3.31 | 4.35 | 14.4 | 3.66 | 3.93 | 14.5 | 4.03 | 3.60 | 14.5 | 4.42 | 3.28 | 14.4 | 4.70 | 3.06 | 14.4 | 5.23 | 2.75 | 8.87 | | |
| 10 | 14.9 | 2.40 | 6.19 | 14.9 | 2.74 | 5.44 | 14.9 | 3.06 | 4.87 | 14.8 | 3.41 | 4.35 | 14.8 | 3.78 | 3.91 | 14.7 | 4.15 | 3.53 | 14.6 | 4.46 | 3.27 | 14.2 | 4.87 | 2.92 | 8.57 | | |
| 12 | 15.3 | 2.28 | 6.73 | 15.3 | 2.61 | 5.87 | 15.3 | 2.94 | 5.21 | 15.2 | 3.28 | 4.62 | 15.1 | 3.65 | 4.13 | 15.0 | 4.03 | 3.71 | 14.9 | 4.36 | 3.42 | 14.8 | 4.85 | 3.04 | 8.92 | | |
| 15 | 14.5 | 1.84 | 7.87 | 14.4 | 2.16 | 6.66 | 14.3 | 2.49 | 5.73 | 14.1 | 2.82 | 5.01 | 14.0 | 3.17 | 4.42 | 13.8 | 3.52 | 3.93 | 13.5 | 3.82 | 3.54 | 13.2 | 4.18 | 3.16 | 9.07 | | |
| 20 | 14.8 | 1.39 | 10.7 | 14.6 | 1.71 | 8.57 | 14.5 | 2.04 | 7.10 | 14.4 | 2.39 | 6.02 | 14.2 | 2.72 | 5.20 | 13.9 | 3.07 | 4.54 | 13.2 | 3.30 | 3.98 | 9.26 | 2.72 | 3.41 | / | | |
| 25 | 14.4 | 0.93 | 15.4 | 14.7 | 1.23 | 11.9 | 14.1 | 1.57 | 9.00 | 13.9 | 1.90 | 7.32 | 13.7 | 2.22 | 6.14 | 13.5 | 2.56 | 5.25 | 13.3 | 2.88 | 4.61 | 10.2 | 2.64 | 3.85 | / | | |
| 30 | / | / | / | 15.7 | 0.96 | 16.4 | 15.5 | 1.31 | 11.9 | 15.3 | 1.66 | 9.22 | 15.1 | 2.03 | 7.45 | 14.8 | 2.38 | 6.21 | 14.3 | 2.74 | 5.22 | 11.5 | 2.61 | 4.40 | / | | |
| 35 | / | / | / | / | / | / | 17.6 | 1.05 | 16.7 | 17.2 | 1.43 | 12.1 | 17.0 | 1.82 | 9.30 | 16.6 | 2.22 | 7.49 | 15.5 | 2.68 | 5.77 | / | / | / | / | | |

MUENR-14-H12 MUENR-14-H12T

| DB | LWT | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|--|
| | 25 | | | 30 | | | 35 | | | 40 | | | 45 | | | 50 | | | 55 | | | 60 | | | 65 | | |
| | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | | | |
| -25 | 7.30 | 3.42 | 2.14 | 7.44 | 3.66 | 2.03 | 7.57 | 3.92 | 1.93 | 7.70 | 4.21 | 1.83 | 5.69 | 3.08 | 1.85 | / | / | / | / | / | / | / | / | / | / | | |
| -20 | 8.75 | 3.71 | 2.36 | 8.89 | 3.98 | 2.24 | 9.03 | 4.26 | 2.12 | 9.18 | 4.59 | 2.00 | 9.31 | 4.92 | 1.89 | 9.46 | 5.30 | 1.79 | 6.87 | 3.85 | 1.79 | / | / | / | / | | |
| -15 | 10.4 | 3.98 | 2.61 | 10.6 | 4.28 | 2.46 | 10.7 | 4.60 | 2.33 | 10.8 | 4.94 | 2.20 | 11.0 | 5.32 | 2.07 | 11.1 | 5.72 | 1.95 | 10.7 | 5.81 | 1.83 | 6.83 | 3.82 | 1.79 | / | | |
| -10 | 12.2 | 4.21 | 2.90 | 12.4 | 4.54 | 2.73 | 12.6 | 4.89 | 2.57 | 12.7 | 5.27 | 2.41 | 12.9 | 5.68 | 2.26 | 12.8 | 5.95 | 2.14 | 11.7 | 5.79 | 2.02 | 11.4 | 5.89 | 1.93 | / | | |
| -7 | 11.6 | 4.01 | 2.89 | 12.0 | 4.34 | 2.76 | 12.4 | 4.72 | 2.63 | 12.7 | 5.14 | 2.47 | 12.8 | 5.51 | 2.33 | 12.7 | 5.77 | 2.20 | 12.6 | 5.87 | 2.14 | 11.4 | 5.77 | 1.98 | / | | |
| -5 | 11.9 | 3.88 | 3.05 | 12.3 | 4.21 | 2.91 | 12.7 | 4.61 | 2.76 | 13.0 | 5.01 | 2.59 | 12.9 | 5.35 | 2.42 | 12.9 | 5.64 | 2.28 | 13.0 | 5.84 | 2.23 | 11.3 | 5.59 | 2.02 | / | | |
| -2 | 12.2 | 3.71 | 3.29 | 12.6 | 4.05 | 3.11 | 13.0 | 4.43 | 2.94 | 13.3 | 4.84 | 2.75 | 13.6 | 5.25 | 2.58 | 13.5 | 5.58 | 2.43 | 13.4 | 5.66 | 2.36 | 11.7 | 5.55 | 2.11 | / | | |
| 0 | 12.5 | 3.54 | 3.52 | 12.9 | 3.88 | 3.32 | 13.3 | 4.25 | 3.12 | 13.5 | 4.66 | 2.90 | 13.8 | 5.07 | 2.72 | 14.0 | 5.54 | 2.53 | 13.9 | 5.73 | 2.42 | 12.1 | 5.52 | 2.20 | / | | |
| 2 | 13.0 | 3.45 | 3.75 | 13.4 | 3.80 | 3.52 | 13.8 | 4.18 | 3.30 | 14.0 | 4.59 | 3.06 | 14.3 | 5.00 | 2.85 | 14.5 | 5.46 | 2.65 | 14.2 | 5.64 | 2.51 | 12.7 | 5.54 | 2.28 | / | | |
| 5 | 14.4 | 3.30 | 4.34 | 14.8 | 3.60 | 4.03 | 15.2 | 4.06 | 3.74 | 15.6 | 4.54 | 3.43 | 16.1 | 4.96 | 3.25 | 16.2 | 5.41 | 2.99 | 15.9 | 5.62 | 2.83 | 14.9 | 5.77 | 2.59 | 9.27 | | |
| 7 | 15.6 | 3.25 | 4.80 | 16.0 | 3.61 | 4.42 | 16.4 | 4.03 | 4.07 | 16.5 | 4.43 | 3.71 | 16.7 | 4.86 | 3.43 | 16.6 | 5.29 | 3.14 | 16.6 | 5.55 | 2.98 | 15.5 | 5.74 | 2.70 | 9.58 | | |
| 10 | 16.6 | 2.87 | 5.78 | 16.6 | 3.23 | 5.16 | 16.7 | 3.60 | 4.63 | 16.7 | 3.99 | 4.18 | 16.7 | 4.42 | 3.78 | 16.7 | 4.84 | 3.44 | 17.0 | 5.26 | 3.23 | 15.4 | 5.30 | 2.91 | 9.40 | | |
| 12 | 17.1 | 2.70 | 6.33 | 17.1 | 3.06 | 5.59 | 17.1 | 3.44 | 4.98 | 17.1 | 3.84 | 4.46 | 17.1 | 4.27 | 4.02 | 17.1 | 4.69 | 3.64 | 17.2 | 5.08 | 3.39 | 16.1 | 5.30 | 3.04 | 9.73 | | |
| 15 | 16.4 | 2.20 | 7.44 | 16.7 | 2.66 | 6.30 | 16.2 | 2.93 | 5.53 | 16.9 | 3.53 | 4.80 | 15.9 | 3.69 | 4.31 | 15.7 | 4.09 | 3.85 | 16.0 | 4.49 | 3.55 | 15.2 | 4.87 | 3.12 | 9.84 | | |
| 20 | 16.5 | 1.65 | 10.0 | 16.4 | 2.00 | 8.17 | 16.3 | 2.37 | 6.85 | 16.1 | 2.75 | 5.85 | 15.9 | 3.12 | 5.08 | 15.6 | 3.51 | 4.46 | 15.0 | 3.86 | 3.89 | 9.26 | 2.72 | 3.41 | / | | |
| 25 | 15.7 | 1.10 | 14.3 | 16.0 | 1.41 | 11.3 | 15.3 | 1.78 | 8.61 | 15.2 | 2.13 | 7.10 | 15.0 | 2.50 | 5.99 | 14.7 | 2.85 | 5.15 | 14.6 | 3.21 | 4.53 | 10.2 | 2.64 | 3.85 | / | | |
| 30 | / | / | / | 16.8 | 1.10 | 15.4 | 16.7 | 1.47 | 11.3 | 16.4 | 1.83 | 8.93 | 16.2 | 2.23 | 7.28 | 15.9 | 2.60 | 6.10 | 15.4 | 3.00 | 5.13 | 11.5 | 2.61 | 4.40 | / | | |
| 35 | / | / | / | / | / | / | 18.7 | 1.19 | 15.8 | 18.5 | 1.60 | 11.6 | 18.2 | 2.01 | 9.02 | 17.8 | 2.43 | 7.32 | 16.5 | 2.72 | 6.05 | / | / | / | / | | |

MUENR-16-H12 MUENR-16-H12T

| DB | LWT | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|--|
| | 25 | | | 30 | | | 35 | | | 40 | | | 45 | | | 50 | | | 55 | | | 60 | | | 65 | | |
| | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | | | |
| -25 | 7.89 | 3.83 | 2.06 | 8.04 | 4.10 | 1.96 | 8.20 | 4.41 | 1.86 | 8.24 | 4.64 | 1.78 | 5.69 | 3.08 | 1.85 | / | / | / | / | / | / | / | / | / | / | | |
| -20 | 9.45 | 4.19 | 2.26 | 9.62 | 4.49 | 2.14 | 9.80 | 4.83 | 2.03 | 9.81 | 5.06 | 1.94 | 10.1 | 5.56 | 1.82 | 10.2 | 5.85 | 1.74 | 6.87 | 3.85 | 1.79 | / | / | / | / | | |
| -15 | 11.2 | 4.50 | 2.49 | 11.4 | 4.85 | 2.35 | 11.6 | 5.21 | 2.22 | 11.8 | 5.61 | 2.10 | 12.0 | 6.03 | 1.98 | 11.9 | 6.27 | 1.89 | 11.0 | 6.05 | 1.81 | 7.13 | 4.00 | 1.78 | / | | |
| -10 | 13.2 | 4.78 | 2.76 | 13.4 | 5.16 | 2.60 | 13.6 | 5.55 | 2.45 | 13.8 | 6.00 | 2.30 | 13.7 | 6.23 | 2.19 | 13.2 | 6.26 | 2.11 | 12.2 | 6.09 | 2.00 | 11.9 | 6.20 | 1.92 | / | | |
| -7 | 12.4 | 4.49 | 2.76 | 12.9 | 4.88 | 2.64 | 13.3 | 5.31 | 2.51 | 13.7 | 5.76 | 2.37 | 13.6 | 6.08 | 2.24 | 13.3 | 6.13 | 2.16 | 12.8 | 6.24 | 2.05 | 12.0 | 6.10 | 1.96 | / | | |
| -5 | 12.7 | 4.34 | 2.92 | 13.1 | 4.72 | 2.79 | 13.6 | 5.15 | 2.65 | 14.0 | 5.60 | 2.49 | 13.5 | 5.71 | 2.36 | 13.4 | 5.97 | 2.24 | 13.6 | 6.16 | 2.20 | 11.7 | 5.81 | 2.01 | / | | |
| -2 | 13.1 | 4.15 | 3.15 | 13.6 | 4.52 | 3.00 | 14.1 | 4.95 | 2.84 | 14.5 | 5.48 | 2.64 | 14.3 | 5.67 | 2.53 | 14.1 | 5.89 | 2.39 | 14.3 | 6.14 | 2.32 | 12.1 | 5.76 | 2.10 | / | | |
| 0 | 13.7 | 4.07 | 3.36 | 14.1 | 4.45 | 3.18 | 14.6 | 4.87 | 3.00 | 15.0 | 5.34 | 2.80 | 15.0 | 5.67 | 2.64 | 14.7 | 5.89 | 2.49 | 14.5 | 6.07 | 2.40 | 12.6 | 5.75 | 2.18 | / | | |
| 2 | 14.2 | 3.99 | 3.57 | 14.7 | 4.38 | 3.37 | 15.2 | 4.81 | 3.17 | 15.6 | 5.27 | 2.95 | 15.5 | 5.63 | 2.76 | 14.9 | 5.69 | 2.62 | 14.9 | 5.98 | 2.48 | 13.1 | 5.77 | 2.27 | / | | |
| 5 | 16.4 | 4.08 | 4.01 | 16.9 | 4.50 | 3.75 | 17.4 | 4.96 | 3.51 | 17.9 | 5.53 | 3.24 | 18.8 | 6.05 | 3.11 | 17.6 | 6.03 | 2.92 | 17.1 | 6.17 | 2.78 | 15.3 | 5.95 | 2.57 | 9.42 | | |
| 7 | 17.6 | 3.94 | 4.47 | 18.1 | 4.36 | 4.16 | 18.6 | 4.82 | 3.86 | 18.8 | 5.30 | 3.54 | 19.1 | 5.81 | 3.28 | 18.3 | 6.00 | 3.06 | 17.7 | 6.08 | 2.91 | 16.0 | 5.98 | 2.67 | 9.86 | | |
| 10 | 19.0 | 3.58 | 5.30 | 19.1 | 4.00 | 4.78 | 19.2 | 4.44 | 4.33 | 19.3 | 4.90 | 3.94 | 19.4 | 5.39 | 3.59 | 18.6 | 5.58 | 3.33 | 17.9 | 5.64 | 3.17 | 16.1 | 5.56 | 2.89 | 9.72 | | |
| 12 | 19.2 | 3.30 | 5.83 | | | | | | | | | | | | | | | | | | | | | | | | |

4.2 Cooling Capacity Tables (Test standard: EN14511)

Part load: Maximum

| MUENR-05-H12 | | | | | | | | | | | | | | | | | | | | | | |
|--------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-------|------|------|-------|------|------|--|
| DB | LWT | | | | | | | | | | | | | | | | | | | | | |
| | 5 | | | 7 | | | 10 | | | 15 | | | 18 | | | 20 | | | 25 | | | |
| | CC | PI | EER | CC | PI | EER | CC | PI | EER | CC | PI | EER | CC | PI | EER | CC | PI | EER | CC | PI | EER | |
| -5 | / | / | / | / | / | / | / | / | / | 4.56 | 0.56 | 8.21 | 4.79 | 0.57 | 8.41 | 4.96 | 0.58 | 8.60 | 5.47 | 0.60 | 9.04 | |
| 0 | / | / | / | / | / | / | / | / | / | 4.56 | 0.56 | 8.21 | 4.79 | 0.57 | 8.41 | 4.96 | 0.58 | 8.60 | 5.47 | 0.60 | 9.04 | |
| 5 | / | / | / | / | / | / | / | / | / | 4.67 | 0.58 | 8.13 | 4.92 | 0.59 | 8.31 | 5.04 | 0.59 | 8.51 | 5.57 | 0.62 | 8.91 | |
| 10 | / | / | / | / | / | / | / | / | / | 4.98 | 0.63 | 7.84 | 5.21 | 0.65 | 8.02 | 5.34 | 0.65 | 8.20 | 5.87 | 0.68 | 8.57 | |
| 15 | / | / | / | / | / | / | / | / | / | 6.34 | 0.80 | 7.97 | 7.01 | 0.93 | 7.55 | 7.54 | 1.01 | 7.48 | 7.61 | 0.95 | 8.02 | |
| 20 | 6.33 | 1.19 | 5.32 | 6.69 | 1.19 | 5.64 | 7.26 | 1.18 | 6.17 | 7.40 | 1.07 | 6.95 | 7.39 | 1.11 | 6.66 | 7.40 | 0.99 | 7.49 | 7.48 | 0.93 | 8.03 | |
| 25 | 7.03 | 1.61 | 4.38 | 7.43 | 1.61 | 4.60 | 8.03 | 1.62 | 4.97 | 9.10 | 1.62 | 5.64 | 9.78 | 1.61 | 6.07 | 10.23 | 1.60 | 6.38 | 11.39 | 1.58 | 7.19 | |
| 30 | 7.57 | 2.11 | 3.59 | 7.98 | 2.13 | 3.75 | 8.61 | 2.16 | 3.99 | 9.72 | 2.20 | 4.42 | 9.65 | 1.94 | 4.97 | 10.09 | 1.94 | 5.19 | 11.20 | 1.95 | 5.75 | |
| 35 | 7.13 | 2.39 | 2.98 | 6.92 | 2.23 | 3.11 | 8.45 | 2.48 | 3.40 | 9.52 | 2.56 | 3.72 | 9.27 | 2.17 | 4.27 | 9.66 | 2.20 | 4.40 | 10.72 | 2.22 | 4.83 | |
| 40 | 5.95 | 2.14 | 2.78 | 6.03 | 2.06 | 2.93 | 7.49 | 2.41 | 3.11 | 8.26 | 2.38 | 3.46 | 8.85 | 2.42 | 3.66 | 9.01 | 2.33 | 3.87 | 10.02 | 2.36 | 4.24 | |
| 43 | 5.14 | 1.92 | 2.68 | 5.35 | 1.92 | 2.79 | 6.48 | 2.17 | 2.99 | 7.36 | 2.22 | 3.31 | 7.90 | 2.25 | 3.51 | 8.27 | 2.26 | 3.65 | 9.24 | 2.31 | 4.01 | |

| MUENR-07-H12 | | | | | | | | | | | | | | | | | | | | | | |
|--------------|------|------|------|------|------|------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|--|
| DB | LWT | | | | | | | | | | | | | | | | | | | | | |
| | 5 | | | 7 | | | 10 | | | 15 | | | 18 | | | 20 | | | 25 | | | |
| | CC | PI | EER | CC | PI | EER | CC | PI | EER | CC | PI | EER | CC | PI | EER | CC | PI | EER | CC | PI | EER | |
| -5 | / | / | / | / | / | / | / | / | / | 4.84 | 0.59 | 8.15 | 5.09 | 0.61 | 8.35 | 5.27 | 0.62 | 8.55 | 5.81 | 0.65 | 8.98 | |
| 0 | / | / | / | / | / | / | / | / | / | 4.84 | 0.59 | 8.15 | 5.09 | 0.61 | 8.35 | 5.27 | 0.62 | 8.55 | 5.81 | 0.65 | 8.98 | |
| 5 | / | / | / | / | / | / | / | / | / | 4.97 | 0.62 | 8.07 | 5.23 | 0.63 | 8.26 | 5.35 | 0.63 | 8.45 | 5.92 | 0.67 | 8.86 | |
| 10 | / | / | / | / | / | / | / | / | / | 5.27 | 0.68 | 7.79 | 5.51 | 0.69 | 7.97 | 5.66 | 0.69 | 8.15 | 6.21 | 0.73 | 8.53 | |
| 15 | / | / | / | / | / | / | / | / | / | 6.96 | 0.87 | 8.04 | 7.71 | 1.05 | 7.38 | 8.29 | 1.13 | 7.32 | 8.67 | 1.13 | 7.65 | |
| 20 | 7.06 | 1.35 | 5.22 | 7.47 | 1.35 | 5.52 | 8.08 | 1.34 | 6.03 | 8.94 | 1.35 | 6.63 | 9.10 | 1.44 | 6.34 | 9.11 | 1.28 | 7.10 | 9.42 | 1.20 | 7.87 | |
| 25 | 7.72 | 1.80 | 4.30 | 8.18 | 1.81 | 4.51 | 8.80 | 1.80 | 4.88 | 9.99 | 1.81 | 5.51 | 10.70 | 1.80 | 5.94 | 11.20 | 1.80 | 6.22 | 11.67 | 1.68 | 6.96 | |
| 30 | 8.26 | 2.36 | 3.50 | 8.70 | 2.38 | 3.65 | 10.35 | 2.85 | 3.63 | 10.36 | 2.35 | 4.40 | 10.86 | 2.27 | 4.78 | 11.11 | 2.18 | 5.10 | 11.49 | 1.91 | 6.01 | |
| 35 | 8.27 | 2.76 | 2.99 | 8.72 | 2.80 | 3.11 | 9.40 | 2.85 | 3.29 | 9.93 | 2.62 | 3.79 | 10.41 | 2.55 | 4.09 | 10.64 | 2.45 | 4.34 | 11.03 | 2.14 | 5.14 | |
| 40 | 7.04 | 2.53 | 2.78 | 7.42 | 2.56 | 2.90 | 8.02 | 2.61 | 3.08 | 9.04 | 2.66 | 3.40 | 9.70 | 2.70 | 3.60 | 10.13 | 2.72 | 3.73 | 10.55 | 2.43 | 4.34 | |
| 43 | 6.31 | 2.39 | 2.64 | 6.66 | 2.42 | 2.76 | 7.23 | 2.46 | 2.93 | 8.17 | 2.51 | 3.25 | 8.77 | 2.54 | 3.45 | 9.20 | 2.56 | 3.59 | 9.98 | 2.49 | 4.02 | |

| MUENR-09-H12 | | | | | | | | | | | | | | | | | | | | | | |
|--------------|------|------|------|------|------|------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|--|
| DB | LWT | | | | | | | | | | | | | | | | | | | | | |
| | 5 | | | 7 | | | 10 | | | 15 | | | 18 | | | 20 | | | 25 | | | |
| | CC | PI | EER | CC | PI | EER | CC | PI | EER | CC | PI | EER | CC | PI | EER | CC | PI | EER | CC | PI | EER | |
| -5 | / | / | / | / | / | / | / | / | / | 5.13 | 0.63 | 8.10 | 5.39 | 0.65 | 8.30 | 5.58 | 0.66 | 8.50 | 6.15 | 0.69 | 8.92 | |
| 0 | / | / | / | / | / | / | / | / | / | 5.13 | 0.63 | 8.10 | 5.39 | 0.65 | 8.30 | 5.58 | 0.66 | 8.50 | 6.15 | 0.69 | 8.92 | |
| 5 | / | / | / | / | / | / | / | / | / | 5.26 | 0.66 | 8.02 | 5.54 | 0.68 | 8.20 | 5.67 | 0.67 | 8.40 | 6.27 | 0.71 | 8.80 | |
| 10 | / | / | / | / | / | / | / | / | / | 5.86 | 0.76 | 7.75 | 6.13 | 0.77 | 7.93 | 6.29 | 0.78 | 8.11 | 6.91 | 0.81 | 8.48 | |
| 15 | / | / | / | / | / | / | / | / | / | 8.05 | 1.18 | 6.81 | 9.12 | 1.27 | 7.19 | 9.80 | 1.37 | 7.13 | 10.24 | 1.37 | 7.46 | |
| 20 | 7.81 | 1.53 | 5.10 | 8.25 | 1.53 | 5.40 | 8.92 | 1.51 | 5.90 | 10.08 | 1.48 | 6.83 | 10.83 | 1.76 | 6.14 | 11.36 | 1.69 | 6.72 | 12.34 | 1.71 | 7.23 | |
| 25 | 8.54 | 2.12 | 4.04 | 9.00 | 2.13 | 4.22 | 9.74 | 2.16 | 4.50 | 10.71 | 2.08 | 5.14 | 11.20 | 1.99 | 5.63 | 11.46 | 1.93 | 5.95 | 11.95 | 1.82 | 6.56 | |
| 30 | 9.17 | 2.78 | 3.30 | 9.65 | 2.82 | 3.43 | 10.00 | 2.69 | 3.73 | 10.34 | 2.35 | 4.41 | 10.83 | 2.26 | 4.79 | 11.09 | 2.17 | 5.11 | 11.49 | 1.85 | 6.20 | |
| 35 | 9.12 | 3.21 | 2.84 | 9.58 | 3.26 | 2.94 | 9.58 | 2.95 | 3.25 | 9.94 | 2.62 | 3.79 | 10.38 | 2.53 | 4.10 | 10.62 | 2.44 | 4.35 | 11.02 | 2.14 | 5.15 | |
| 40 | 7.04 | 2.53 | 2.78 | 7.42 | 2.59 | 2.86 | 8.02 | 2.61 | 3.08 | 9.07 | 2.67 | 3.39 | 9.70 | 2.70 | 3.60 | 10.15 | 2.72 | 3.73 | 10.52 | 2.42 | 4.35 | |
| 43 | 6.31 | 2.39 | 2.64 | 6.66 | 2.42 | 2.76 | 7.20 | 2.45 | 2.94 | 8.17 | 2.51 | 3.25 | 8.78 | 2.54 | 3.45 | 9.18 | 2.56 | 3.59 | 10.21 | 2.58 | 3.95 | |

Abbreviations:

LWT: Leaving water temperature (°C)

DB: Dry-bulb temperature for Outdoor air temperature (°C)

CC: Total cooling capacity (kW)

PI: Power input (kW)

Part load: Maximum

| MUENR-12-H12 MUENR-12-H12T | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------|-------|------|------|-------|------|------|-------|------|------|-------|------|-------|-------|------|-------|-------|------|-------|-------|------|-------|------|------|
| DB | LWT | | | | | | | | | | | | | | | | | | | | | | |
| | 5 | | | 7 | | | 10 | | | 15 | | | 18 | | | 20 | | | 25 | | | | |
| | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | | |
| -5 | / | / | / | / | / | / | / | / | / | / | / | 10.28 | 1.47 | 7.00 | 10.92 | 1.55 | 7.04 | 11.60 | 1.49 | 7.77 | 12.49 | 1.79 | 6.99 |
| 0 | / | / | / | / | / | / | / | / | / | / | / | 10.53 | 1.30 | 8.08 | 10.92 | 1.55 | 7.04 | 11.70 | 1.44 | 8.15 | 12.49 | 1.79 | 6.97 |
| 5 | / | / | / | / | / | / | / | / | / | / | / | 10.53 | 1.31 | 8.03 | 11.11 | 1.44 | 7.69 | 11.60 | 1.51 | 7.70 | 12.61 | 1.73 | 7.29 |
| 10 | / | / | / | / | / | / | / | / | / | / | / | 11.16 | 1.47 | 7.59 | 11.89 | 1.48 | 8.02 | 12.29 | 1.61 | 7.64 | 13.33 | 1.94 | 6.87 |
| 15 | / | / | / | / | / | / | / | / | / | / | / | 11.49 | 1.55 | 7.43 | 12.88 | 1.77 | 7.27 | 13.63 | 1.91 | 7.12 | 14.34 | 1.93 | 7.44 |
| 20 | 11.70 | 2.31 | 5.07 | 12.37 | 2.31 | 5.36 | 13.43 | 2.31 | 5.81 | 14.36 | 2.76 | 5.20 | 16.22 | 2.24 | 7.25 | 16.06 | 2.99 | 5.38 | 17.78 | 3.01 | 5.91 | | |
| 25 | 13.00 | 3.17 | 4.11 | 13.58 | 3.14 | 4.32 | 14.71 | 3.19 | 4.62 | 15.55 | 3.93 | 3.95 | 18.10 | 3.48 | 5.20 | 18.38 | 3.32 | 5.54 | 20.33 | 3.61 | 5.63 | | |
| 30 | 13.93 | 4.14 | 3.36 | 14.70 | 4.22 | 3.48 | 15.86 | 4.33 | 3.67 | 17.83 | 4.50 | 3.96 | 17.57 | 3.88 | 4.53 | 18.38 | 3.94 | 4.67 | 20.28 | 4.03 | 5.04 | | |
| 35 | 13.79 | 4.78 | 2.88 | 14.35 | 4.78 | 3.01 | 15.45 | 4.91 | 3.15 | 17.31 | 5.12 | 3.38 | 16.81 | 4.32 | 3.89 | 17.58 | 4.40 | 4.00 | 18.68 | 4.19 | 4.46 | | |
| 40 | 12.74 | 4.93 | 2.58 | 13.17 | 4.87 | 2.70 | 13.19 | 4.45 | 2.96 | 13.22 | 3.86 | 3.43 | 13.22 | 3.52 | 3.76 | 13.22 | 3.30 | 4.01 | 13.62 | 2.91 | 4.68 | | |
| 43 | 10.16 | 3.93 | 2.59 | 10.18 | 3.73 | 2.73 | 10.19 | 3.44 | 2.96 | 10.21 | 2.98 | 3.43 | 10.21 | 2.72 | 3.76 | 10.21 | 2.54 | 4.01 | 10.57 | 2.24 | 4.72 | | |

| MUENR-14-H12 MUENR-14-H12T | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------|-------|------|------|-------|------|------|-------|------|------|-------|------|-------|-------|------|-------|-------|------|-------|-------|------|-------|------|------|
| DB | LWT | | | | | | | | | | | | | | | | | | | | | | |
| | 5 | | | 7 | | | 10 | | | 15 | | | 18 | | | 20 | | | 25 | | | | |
| | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | | |
| -5 | / | / | / | / | / | / | / | / | / | / | / | 10.76 | 1.61 | 6.66 | 11.51 | 1.72 | 6.68 | 12.08 | 1.73 | 6.99 | 13.20 | 2.00 | 6.60 |
| 0 | / | / | / | / | / | / | / | / | / | / | / | 11.02 | 1.44 | 7.64 | 11.51 | 1.73 | 6.66 | 12.29 | 1.60 | 7.68 | 13.20 | 2.01 | 6.58 |
| 5 | / | / | / | / | / | / | / | / | / | / | / | 11.02 | 1.45 | 7.60 | 11.70 | 1.61 | 7.27 | 12.29 | 1.61 | 7.64 | 13.33 | 1.94 | 6.87 |
| 10 | / | / | / | / | / | / | / | / | / | / | / | 11.63 | 1.62 | 7.19 | 12.49 | 1.65 | 7.57 | 12.97 | 1.71 | 7.58 | 13.84 | 2.13 | 6.50 |
| 15 | / | / | / | / | / | / | / | / | / | / | / | 12.48 | 1.79 | 6.97 | 14.44 | 1.82 | 7.94 | 14.92 | 2.07 | 7.22 | 15.83 | 2.11 | 7.52 |
| 20 | 13.01 | 2.70 | 4.82 | 13.67 | 2.69 | 5.08 | 14.95 | 2.76 | 5.41 | 16.71 | 2.73 | 6.12 | 17.92 | 2.75 | 6.53 | 17.31 | 3.68 | 4.70 | 18.87 | 3.40 | 5.55 | | |
| 25 | 14.06 | 3.56 | 3.95 | 14.99 | 3.68 | 4.07 | 16.09 | 3.71 | 4.33 | 17.81 | 3.81 | 4.68 | 18.10 | 3.48 | 5.20 | 18.88 | 3.51 | 5.37 | 20.13 | 3.72 | 5.41 | | |
| 30 | 15.08 | 4.77 | 3.16 | 15.84 | 4.84 | 3.27 | 16.98 | 4.95 | 3.43 | 18.91 | 5.12 | 3.69 | 17.57 | 3.88 | 4.53 | 18.38 | 3.94 | 4.67 | 20.28 | 4.03 | 5.04 | | |
| 35 | 14.98 | 5.53 | 2.71 | 15.69 | 5.62 | 2.79 | 16.61 | 5.64 | 2.94 | 18.08 | 5.62 | 3.22 | 16.81 | 4.32 | 3.89 | 17.58 | 4.40 | 4.00 | 18.68 | 4.19 | 4.46 | | |
| 40 | 12.84 | 5.00 | 2.57 | 13.17 | 4.87 | 2.70 | 13.19 | 4.45 | 2.96 | 13.22 | 3.86 | 3.43 | 13.22 | 3.52 | 3.76 | 13.22 | 3.30 | 4.01 | 13.62 | 2.91 | 4.68 | | |
| 43 | 10.16 | 3.93 | 2.59 | 10.18 | 3.73 | 2.73 | 10.19 | 3.44 | 2.96 | 10.21 | 2.98 | 3.43 | 10.21 | 2.72 | 3.76 | 10.21 | 2.54 | 4.01 | 10.57 | 2.24 | 4.72 | | |

| MUENR-16-H12 MUENR-16-H12T | | | | | | | | | | | | | | | | | | | | | | | |
|----------------------------|-------|------|------|-------|------|------|-------|------|------|-------|------|-------|-------|------|-------|-------|------|-------|-------|------|-------|------|------|
| DB | LWT | | | | | | | | | | | | | | | | | | | | | | |
| | 5 | | | 7 | | | 10 | | | 15 | | | 18 | | | 20 | | | 25 | | | | |
| | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | HC | PI | COP | | |
| -5 | / | / | / | / | / | / | / | / | / | / | / | 11.45 | 1.73 | 6.62 | 12.19 | 1.84 | 6.63 | 12.64 | 1.91 | 6.63 | 13.71 | 2.19 | 6.25 |
| 0 | / | / | / | / | / | / | / | / | / | / | / | 11.63 | 1.61 | 7.23 | 12.19 | 1.84 | 6.62 | 12.75 | 1.84 | 6.92 | 13.71 | 2.20 | 6.23 |
| 5 | / | / | / | / | / | / | / | / | / | / | / | 11.63 | 1.62 | 7.19 | 12.39 | 1.72 | 7.22 | 12.86 | 1.78 | 7.22 | 13.84 | 2.13 | 6.50 |
| 10 | / | / | / | / | / | / | / | / | / | / | / | 12.24 | 1.79 | 6.83 | 13.08 | 1.83 | 7.16 | 13.54 | 1.89 | 7.16 | 14.60 | 2.27 | 6.43 |
| 15 | / | / | / | / | / | / | / | / | / | / | / | 13.14 | 1.96 | 6.70 | 14.95 | 1.95 | 7.65 | 15.49 | 2.26 | 6.84 | 16.11 | 2.37 | 6.80 |
| 20 | 13.33 | 2.80 | 4.76 | 13.99 | 2.79 | 5.01 | 15.27 | 2.86 | 5.33 | 17.19 | 2.88 | 5.96 | 18.22 | 2.84 | 6.41 | 18.79 | 3.07 | 6.12 | 20.01 | 3.53 | 5.67 | | |
| 25 | 14.97 | 3.99 | 3.75 | 15.59 | 3.97 | 3.93 | 16.80 | 4.05 | 4.15 | 18.65 | 4.24 | 4.40 | 18.10 | 3.48 | 5.20 | 18.88 | 3.51 | 5.37 | 20.01 | 3.53 | 5.67 | | |
| 30 | 15.65 | 5.09 | 3.07 | 16.40 | 5.17 | 3.17 | 17.52 | 5.27 | 3.32 | 19.43 | 5.45 | 3.57 | 17.57 | 3.88 | 4.53 | 18.38 | 3.94 | 4.67 | 20.28 | 4.03 | 5.04 | | |
| 35 | 15.62 | 5.96 | 2.62 | 16.22 | 5.98 | 2.71 | 17.13 | 5.99 | 2.86 | 18.57 | 5.96 | 3.11 | 16.81 | 4.32 | 3.89 | 17.58 | 4.40 | 4.00 | 18.68 | 4.19 | 4.46 | | |
| 40 | 12.84 | 5.00 | 2.57 | 13.17 | 4.87 | 2.70 | 13.19 | 4.45 | 2.96 | 13.22 | 3.86 | 3.43 | 13.22 | 3.52 | 3.76 | 13.22 | 3.30 | 4.01 | 13.62 | 2.91 | 4.68 | | |
| 43 | 10.16 | 3.93 | 2.59 | 10.18 | 3.73 | 2.73 | 10.19 | 3.44 | 2.96 | 10.21 | 2.98 | 3.43 | 10.21 | 2.72 | 3.76 | 10.21 | 2.54 | 4.01 | 10.57 | 2.24 | 4.72 | | |

Abbreviations:

LWT: Leaving water temperature (°C)

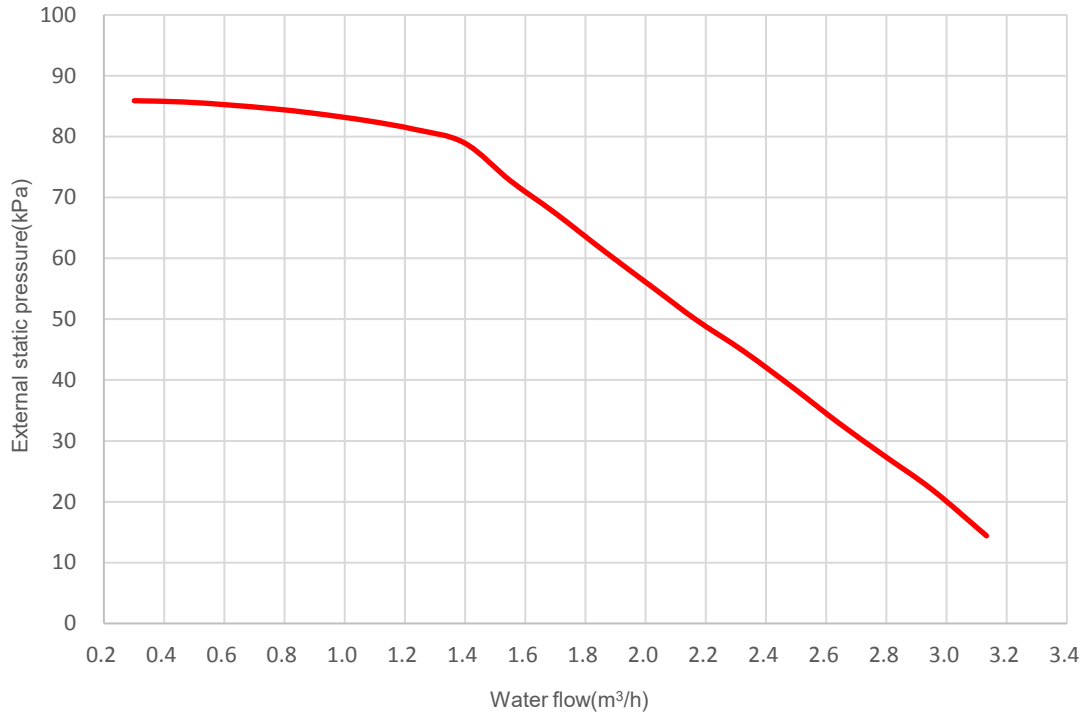
DB: Dry-bulb temperature for Outdoor air temperature (°C)

CC: Total cooling capacity (kW)

PI: Power input (kW)

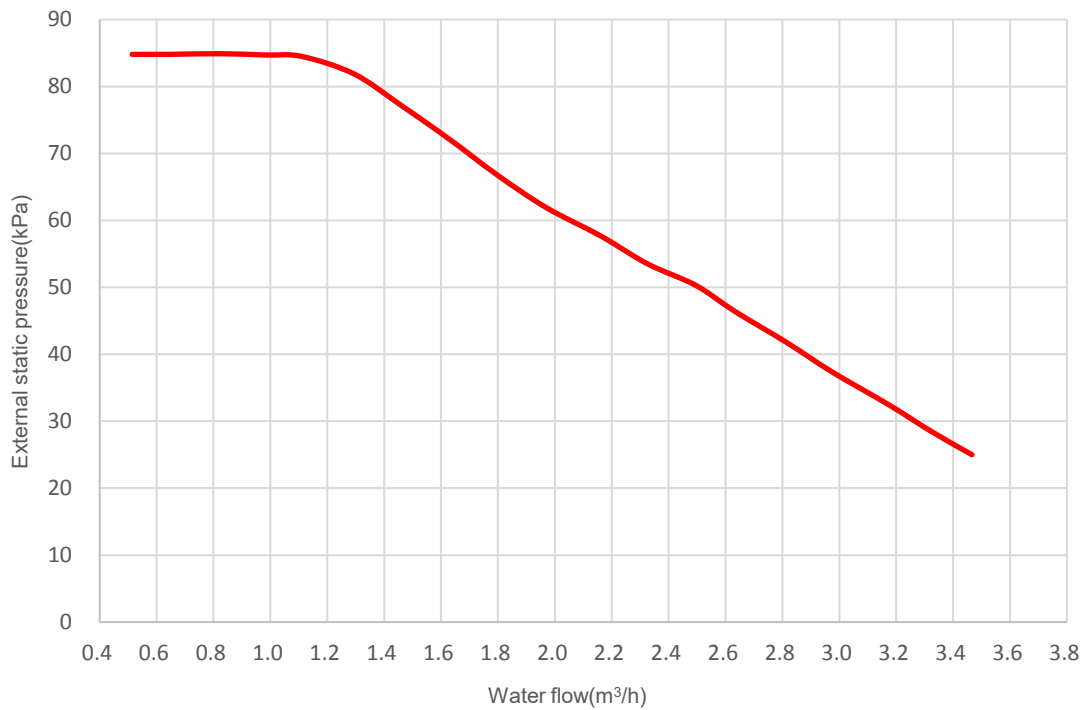
5 Hydronic Performance

MUENR-05-H12 / MUENR-07-H12 / MUENR-09-H12



MUENR-12-H12 / MUENR-14-H12 / MUENR-16-H12

MUENR-12-H12T / MUENR-14-H12T / MUENR-16-H12T



6 Sound Levels

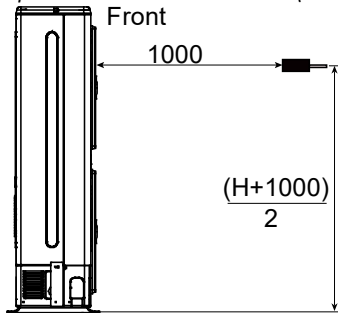
6.1 Overall

| Model name | dB(A) ² |
|---------------|--------------------|
| MUENR-05-H12 | 48 |
| MUENR-07-H12 | 51 |
| MUENR-09-H12 | 53 |
| MUENR-12-H12 | 56 |
| MUENR-14-H12 | 58 |
| MUENR-16-H12 | 58 |
| MUENR-12-H12T | 57 |
| MUENR-14-H12T | 59 |
| MUENR-16-H12T | 59 |

Notes:

1. Sound pressure level is measured at a position 1m in front of the unit and $(1+H)/2$ m (where H is the height of the unit) above the floor in a semi-anechoic chamber. During in-situ operation, sound pressure levels may be higher as a result of ambient noise.

Sound pressure level measurement (unit: mm)

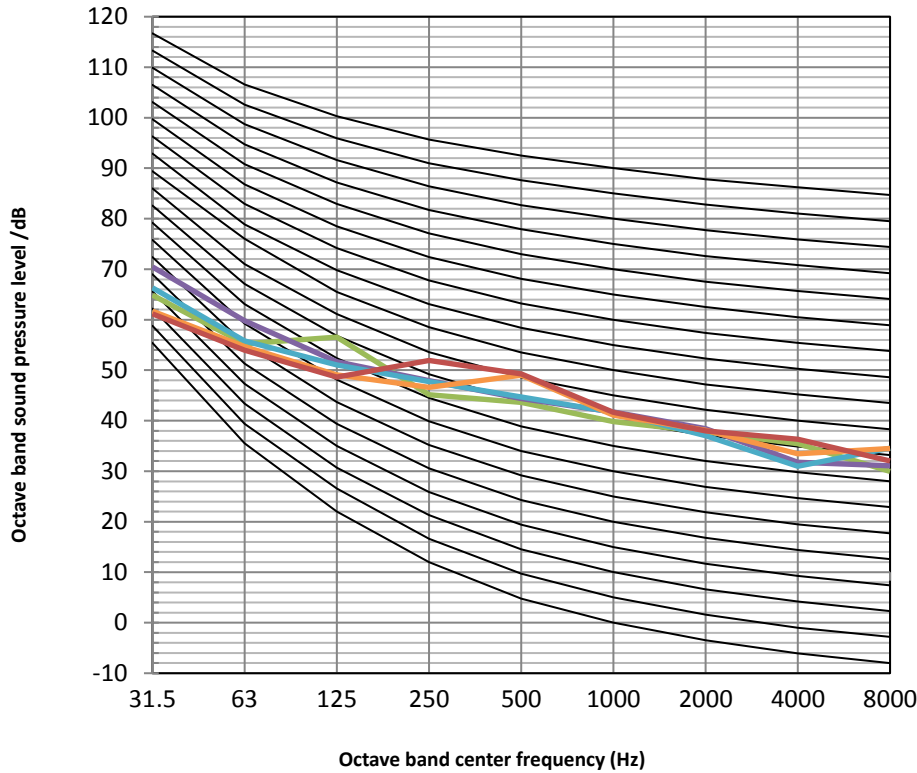


2. dB(A) is the maximum value tested under the conditions below:
 Outdoor air temperature 7°C DB, 6°C WB; EWT 30°C, LWT 35°C. Free compressor frequency.
 Outdoor air temperature 7°C DB, 6°C WB; EWT 47°C, LWT 55°C. Free compressor frequency.

Mini Chiller Serie H12

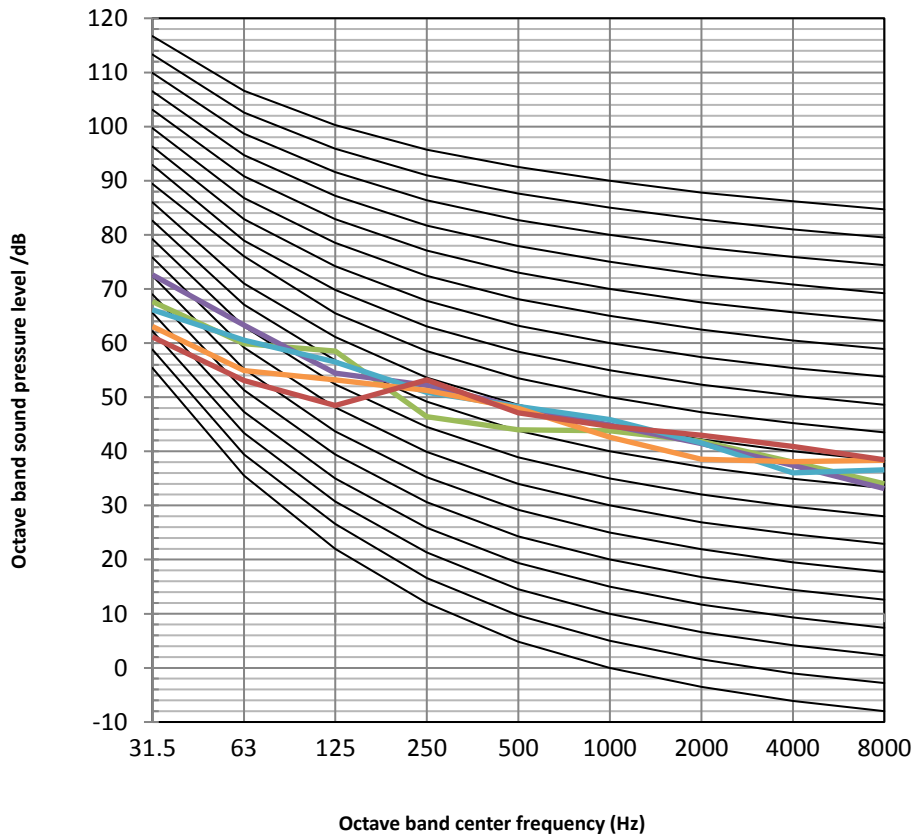
6.2 Octave Band Levels(NR)

MUENR-05-H12 octave band levels



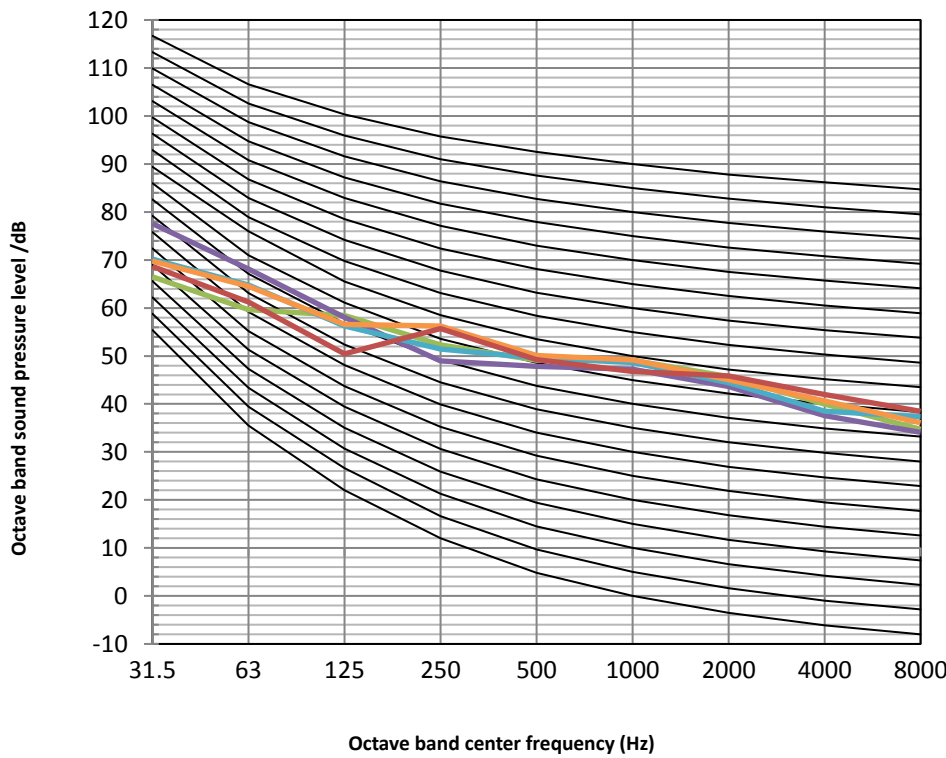
- Cooling in rated frequency
Outdoor air temperature 35°C DB; EWT 12°C, LWT 7°C
- NR-90 — Cooling in rated frequency
Outdoor air temperature 35°C DB; EWT 23°C, LWT 18°C
- NR-80 — Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C.
- NR-70 — Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 40°C, LWT 45°C.
- NR-60 — Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 47°C, LWT 55°C.
- NR-50
- NR-40
- NR-30
- NR-20
- NR-10
- NR-0

MUENR-07-H12 octave band levels



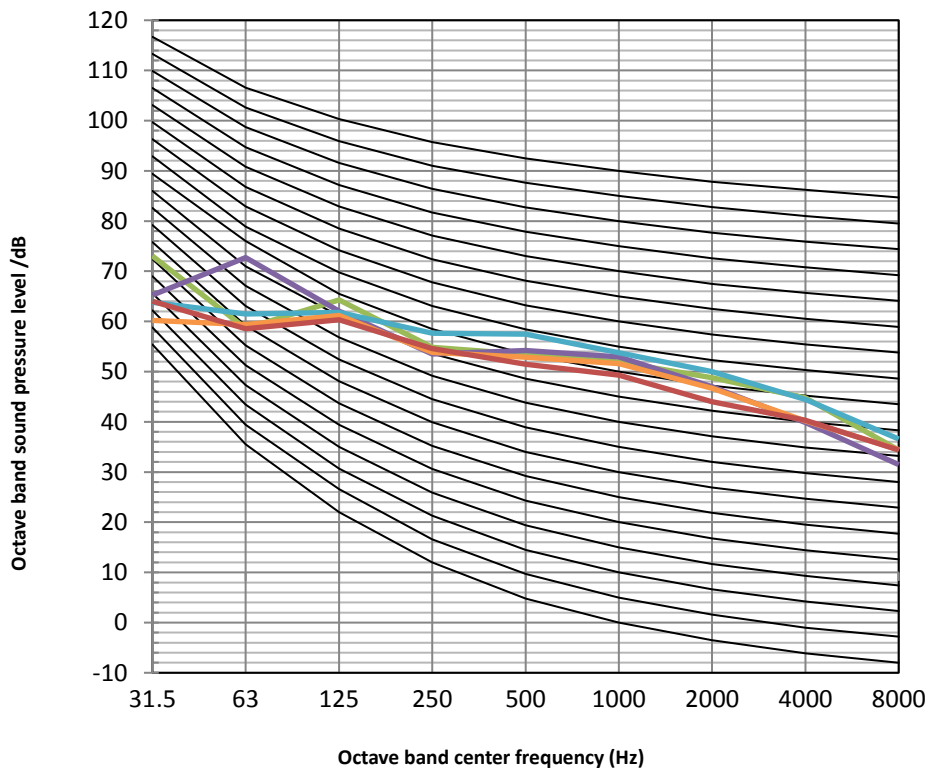
- Cooling in rated frequency
Outdoor air temperature 35°C DB; EWT 12°C, LWT 7°C
- NR-90 — Cooling in rated frequency
Outdoor air temperature 35°C DB; EWT 23°C, LWT 18°C
- NR-80 — Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C.
- NR-70 — Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 40°C, LWT 45°C.
- NR-60 — Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 47°C, LWT 55°C.
- NR-50
- NR-40
- NR-30
- NR-20
- NR-10
- NR-0

MUENR-09-H12 octave band levels



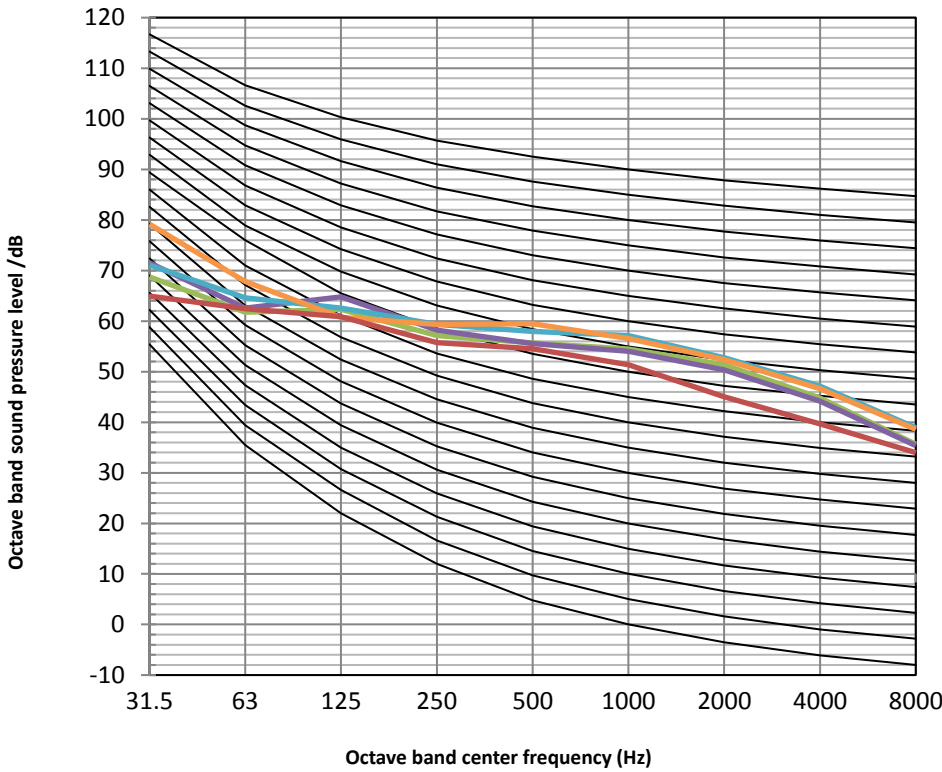
- Cooling in rated frequency
Outdoor air temperature 35°C
DB; EWT 12°C, LWT 7°C
- NR-90 Cooling in rated frequency
- NR-80 Outdoor air temperature 35°C
DB; EWT 23°C, LWT 18°C
- NR-70
- NR-60 Heating in rated frequency
- NR-50 Outdoor air temperature 7°C DB,
85% R.H.; EWT 30°C, LWT 35°C.
- NR-40
- NR-30 Heating in rated frequency
- NR-20 Outdoor air temperature 7°C DB,
85% R.H.; EWT 40°C, LWT 45°C.
- NR-10
- NR-0 Heating in rated frequency
Outdoor air temperature 7°C DB,
85% R.H.; EWT 47°C, LWT 55°C.

MUENR-12-H12 octave band levels



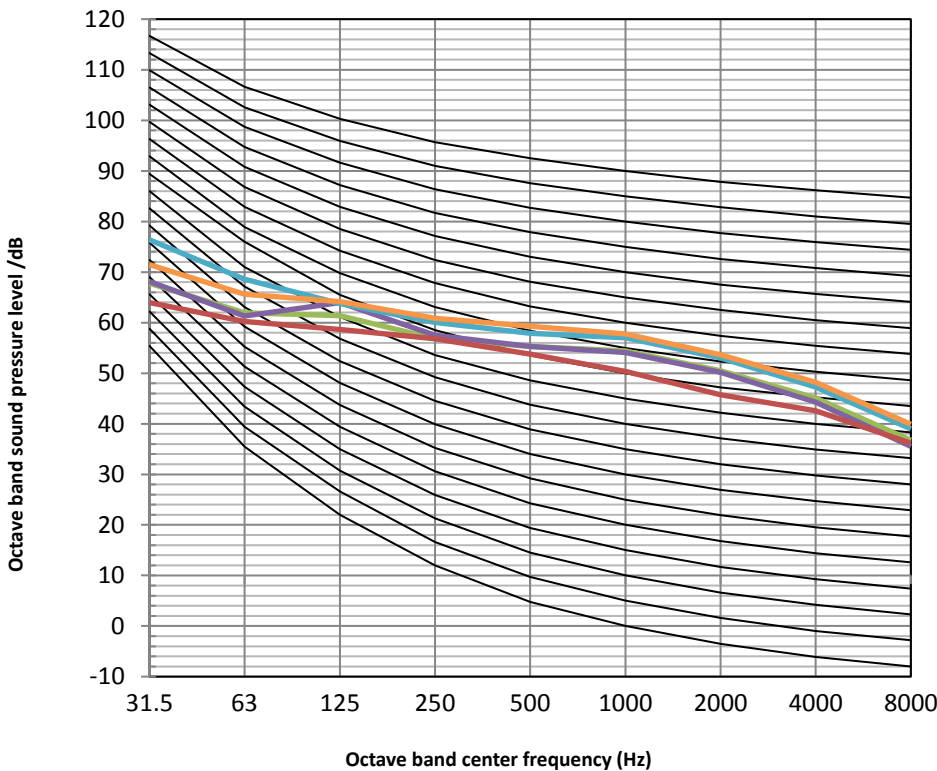
- Cooling in rated frequency
Outdoor air temperature 35°C
DB; EWT 12°C, LWT 7°C
- NR-90
- NR-80 Cooling in rated frequency
- NR-80 Outdoor air temperature 35°C
DB; EWT 23°C, LWT 18°C
- NR-70
- NR-60 Heating in rated frequency
- NR-50 Outdoor air temperature 7°C DB,
85% R.H.; EWT 30°C, LWT 35°C.
- NR-40
- NR-30 Heating in rated frequency
- NR-20 Outdoor air temperature 7°C DB,
85% R.H.; EWT 40°C, LWT 45°C.
- NR-10
- NR-0 Heating in rated frequency
Outdoor air temperature 7°C DB,
85% R.H.; EWT 47°C, LWT 55°C.

MUENR-12-H12 octave band levels



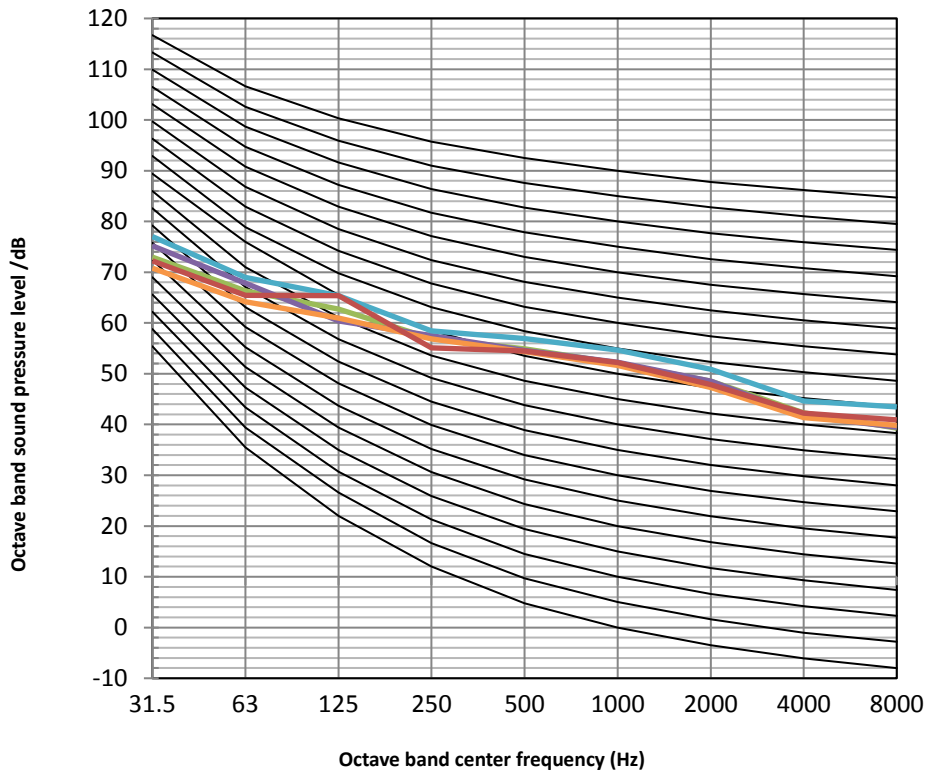
- Cooling in rated frequency
Outdoor air temperature 35°C DB;
EWT 12°C, LWT 7°C
- NR-90 Cooling in rated frequency
- NR-80 Outdoor air temperature 35°C DB;
- NR-70 EWT 23°C, LWT 18°C
- NR-60 Heating in rated frequency
- NR-50 Outdoor air temperature 7°C DB,
- NR-40 85% R.H.; EWT 30°C, LWT 35°C.
- NR-30 Heating in rated frequency
- NR-20 Outdoor air temperature 7°C DB,
- NR-10 85% R.H.; EWT 40°C, LWT 45°C.
- NR-0 Heating in rated frequency
- Outdoor air temperature 7°C DB,
- 85% R.H.; EWT 47°C, LWT 55°C.

MUENR-16-H12 octave band levels



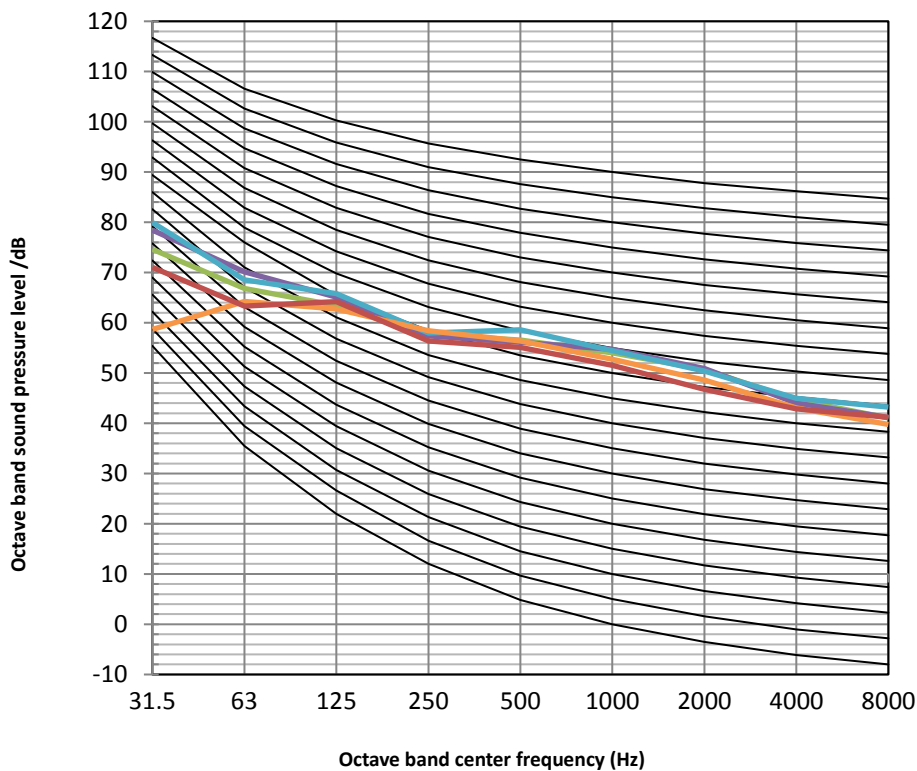
- Cooling in rated frequency
Outdoor air temperature 35°C DB;
EWT 12°C, LWT 7°C
- NR-90 Cooling in rated frequency
- NR-80 Outdoor air temperature 35°C DB;
- NR-70 EWT 23°C, LWT 18°C
- NR-60 Heating in rated frequency
- NR-50 Outdoor air temperature 7°C DB,
- NR-40 85% R.H.; EWT 30°C, LWT 35°C.
- NR-30 Heating in rated frequency
- NR-20 Outdoor air temperature 7°C DB,
- NR-10 85% R.H.; EWT 40°C, LWT 45°C.
- NR-0 Heating in rated frequency
- Outdoor air temperature 7°C DB,
- 85% R.H.; EWT 47°C, LWT 55°C.

MUENR-12-H12T octave band levels



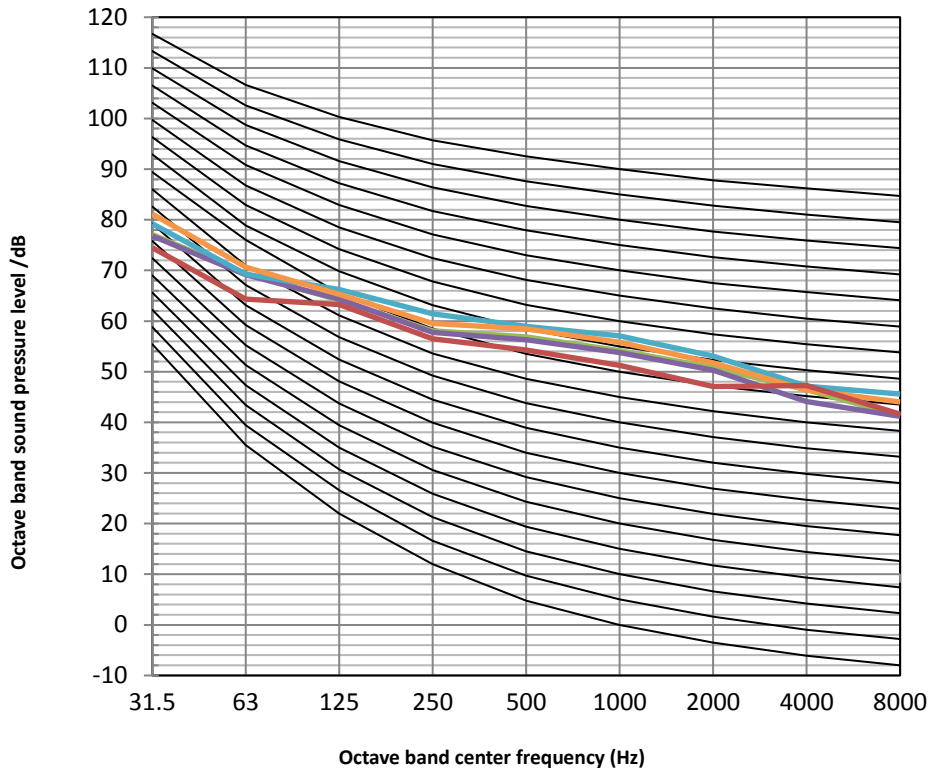
- NR-90 Cooling in rated frequency
Outdoor air temperature 35°C DB; EWT 12°C, LWT 7°C
- NR-80 Cooling in rated frequency
Outdoor air temperature 35°C DB; EWT 23°C, LWT 18°C
- NR-70 Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C.
- NR-60 Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 40°C, LWT 45°C.
- NR-50 Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 47°C, LWT 55°C.
- NR-40
- NR-30
- NR-20
- NR-10
- NR-0

MUENR-14-H12T octave band levels



- NR-90 Cooling in rated frequency
Outdoor air temperature 35°C DB; EWT 12°C, LWT 7°C
- NR-80 Cooling in rated frequency
Outdoor air temperature 35°C DB; EWT 23°C, LWT 18°C
- NR-70 Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C.
- NR-60 Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 40°C, LWT 45°C.
- NR-50 Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 47°C, LWT 55°C.
- NR-40
- NR-30
- NR-20
- NR-10
- NR-0

MUENR-12-H12T octave band levels



- NR-90** Cooling in rated frequency
Outdoor air temperature 35°C DB; EWT 12°C, LWT 7°C
- NR-80** Cooling in rated frequency
Outdoor air temperature 35°C DB; EWT 23°C, LWT 18°C
- NR-70** Cooling in rated frequency
Outdoor air temperature 35°C DB; EWT 23°C, LWT 18°C
- NR-60** Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C.
- NR-50** Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C.
- NR-40** Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C.
- NR-30** Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C.
- NR-20** Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C.
- NR-10** Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 30°C, LWT 35°C.
- NR-0** Heating in rated frequency
Outdoor air temperature 7°C DB, 85% R.H.; EWT 47°C, LWT 55°C.

7 Climate Related Curves

The climate related curves can be selected in the user interface, **MENU > PRESET TEMPERATURE > WEATHER TEMP. SET.**

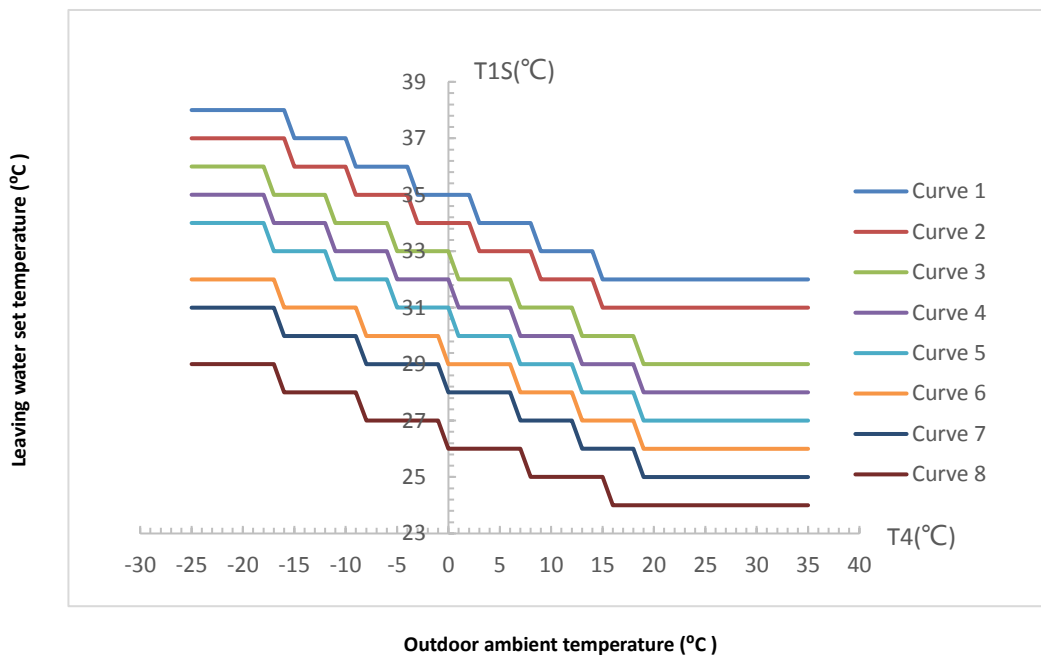
If WEATHER TEMP. SET is active, the leaving water set temperature (T1s) will automatically change as outdoor ambient temperature (T4) changes. Totally 32 weather temperature curves are already set by experienced engineer and one personalized curve is available, which meets the diversified requirements of temperature.

The relationship between outdoor ambient temperature (T4) and leaving water set temperature (T1s) is described as below.

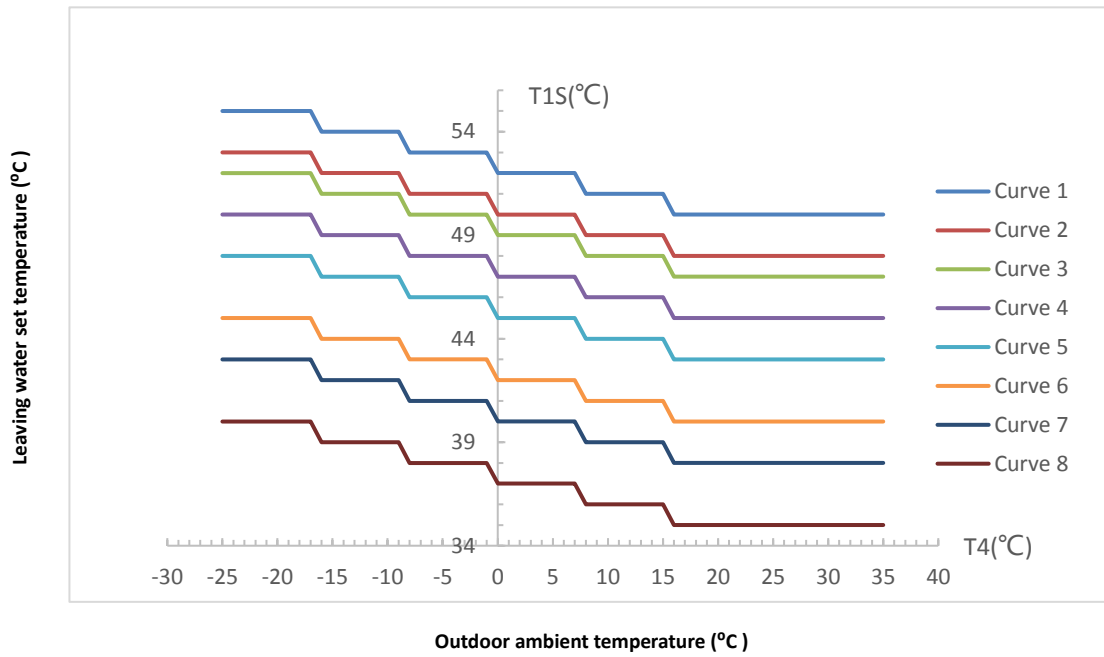
WEATHER TEMP. SET menu

| PRESET TEMPERATURE | | |
|--|-------------------------------------|-------------------------------------|
| PRESET TEMP. | WEATHER TEMP.SET | ECO MODE |
| ZONE1 C-MODE LOWTEMP. | <input checked="" type="checkbox"/> | OFF |
| ZONE1 H-MODE LOWTEMP. | <input type="checkbox"/> | OFF |
| ZONE2 C-MODE LOWTEMP. | <input type="checkbox"/> | OFF |
| ZONE2 H-MODE LOWTEMP. | <input type="checkbox"/> | OFF |
| <input checked="" type="checkbox"/> ON/OFF | | <input checked="" type="checkbox"/> |

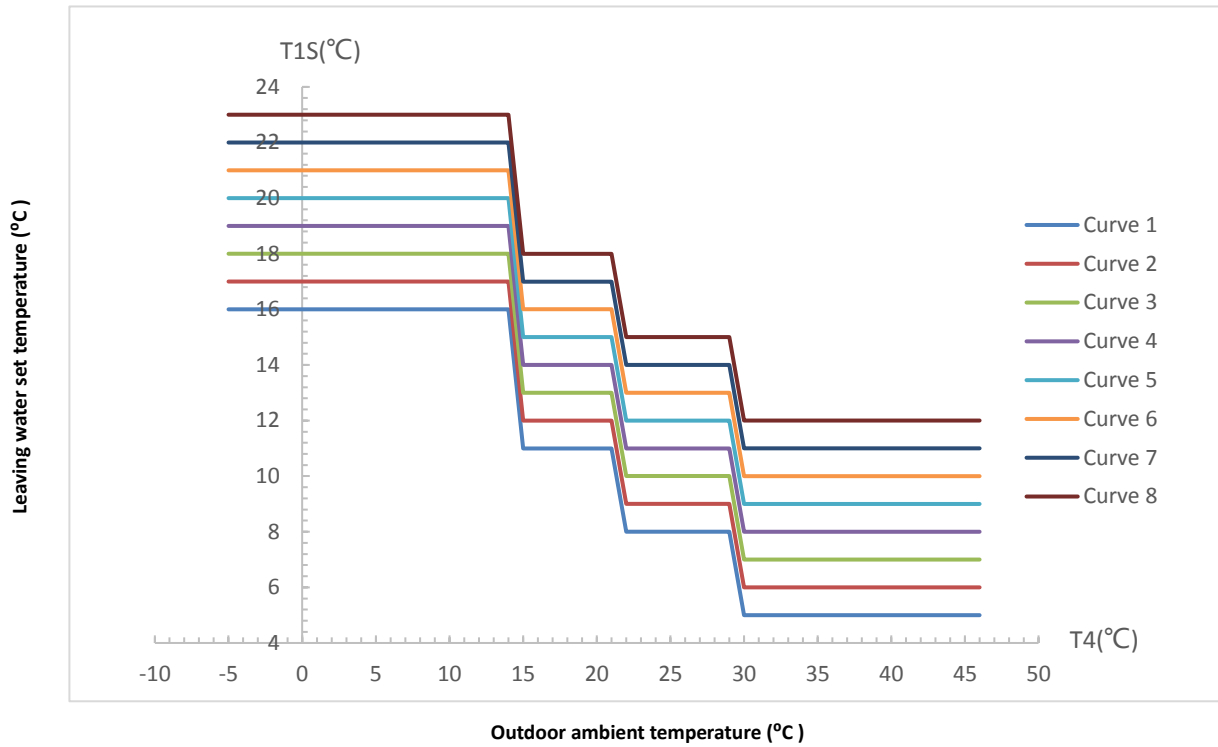
Low temperature curves for heating mode¹



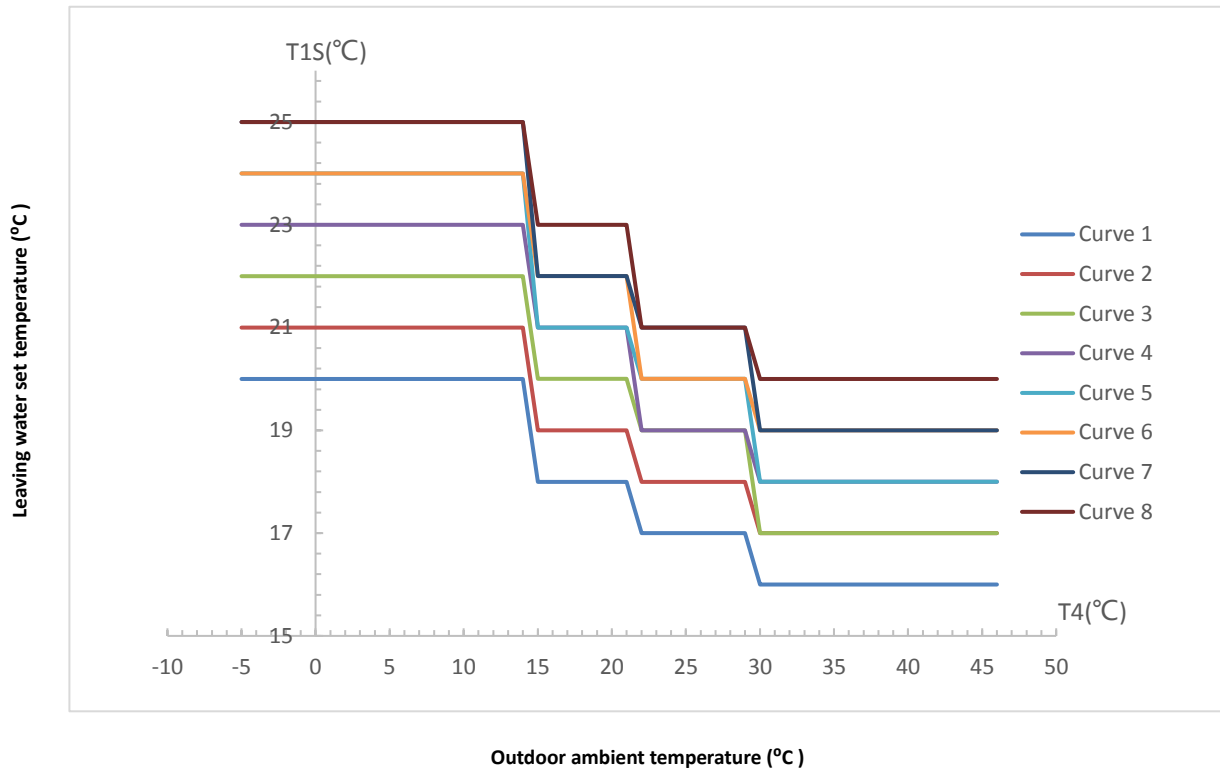
High temperature curves for heating mode¹



Low temperature curves for cooling mode¹

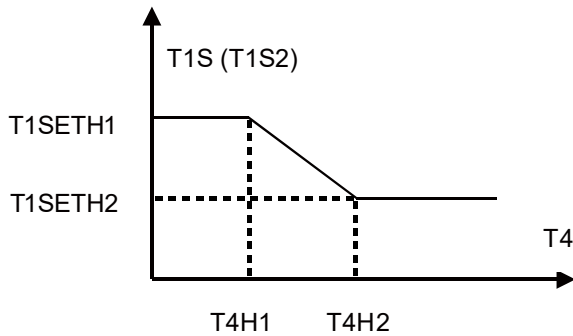


High temperature curves for cooling mode¹

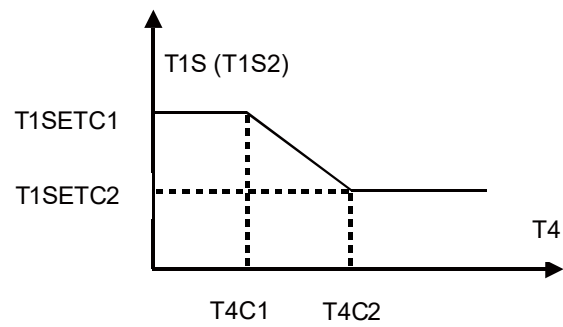


The automatic setting curves are the ninth curve for cooling and heating mode.

Automatic setting curve for heating mode



Automatic setting curve for cooling mode



Part 3

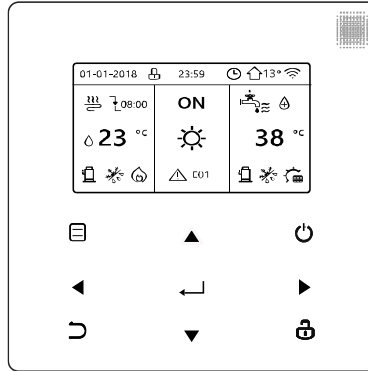
Installation and Field Settings

| | |
|---------------------------------------|----|
| 1 User Interface Field Settings | 62 |
| 2 Operation parameter..... | 77 |

1 User Interface Field Settings

1.1 Introduction

During installation, the settings and parameters should be configured by the installer to suit the installation configuration, climate conditions and end-user preferences. The relevant settings are accessible and programmable through the **FOR SERVICEMAN** menu on the user interface. The user interface menus and settings can be navigated using the user interface’s touch-sensitive keys, as shown below:



| Keys | Function |
|------|--|
| ☰ | Go to the menu structure(on the home page) |
| ▲ | Navigate the cursor on the display |
| ◀ ▶ | Navigate in the menu structure |
| ▼ | Adjust settings |
| ⏻ | Turn on/off the space heating/cooling operation or DHW mode Turn on/off functions in the menu structure |
| ↶ | Come back to the up level |
| 🔒 | Long press for unlock/lock the controller Unlock /lock some functions such as “DHW temperature adjusting” |
| ↵ | Go to the next step when programming a schedule in the menu structure and confirm a selection to enter in the submenu of the menu structure. |

1.2 Menu Structure

- FOR SERVICEMAN
- 1 DHW MODE SETTING
- 2 COOL MODE SETTING
- 3 HEAT MODE SETTING
- 4 AUTO MODE SETTING
- 5 TEMP. TYPE SETTING
- 6 ROOM THERMOSTAT
- 7 OTHER HEATING SOURCE
- 8 HOLIDAY AWAY SETTING
- 9 SERVICE CALL
- 10 RESTORE FACTORY SETTINGS
- 11 TEST RUN
- 12 SPECIAL FUNCTION
- 13 AUTO RESTART
- 14 POWER INPUT LIMITATION
- 15 INPUT DEFINE
- 16 CASCADE SET
- 17 HMI ADDRESS SET
- 18 COMMON SET

- 2 COOL MODE SETTING
 - 2.1 COOL MODE
 - 2.2 t_T4_FRESH_C
 - 2.3 T4CMAX
 - 2.4 T4CMIN
 - 2.5 dT1SC
 - 2.6 dTSC
 - 2.7 t_INTERVAL_C
 - 2.8 T1SetC1
 - 2.9 T1SetC2
 - 2.10 T4C1
 - 2.11 T4C2
 - 2.12 ZONE1 C-EMISSION
 - 2.13 ZONE2 C-EMISSION

- 3 HEAT MODE SETTING
 - 3.1 HEAT MODE
 - 3.2 t_T4_FRESH_H
 - 3.3 T4HMAX
 - 3.4 T4HMIN
 - 3.5 dT1SH
 - 3.6 dTSH
 - 3.7 t_INTERVAL_H
 - 3.8 T1SetH1
 - 3.9 T1SetH2
 - 3.10 T4H1
 - 3.11 T4H2
 - 3.12 ZONE1 H-EMISSION
 - 3.13 ZONE2 H-EMISSION
 - 3.14 FORCE DEFROST

- 4 AUTO MODE SETTING
 - 4.1 T4AUTOCMIN
 - 4.2 T4AUTOHMAX

- 5 TEMP. TYPE SETTING
 - 5.1 WATER FLOW TEMP.
 - 5.2 ROOM TEMP.
 - 5.3 DOUBLE ZONE

- 6 ROOM THERMOSTAT
 - 6.1 ROOM THERMOSTAT
 - 6.2 MODE SET PRIORITY

- 7 OTHER HEATING SOURCE
 - 7.1 IBH FUNCTION
 - 7.2 IBH LOCATE
 - 7.3 dT1_IBH_ON
 - 7.4 t_IBH_DELAY
 - 7.5 T4_IBH_ON
 - 7.6 P_IBH1
 - 7.7 P_IBH2
 - 7.8 AHS FUNCTION
 - 7.9 AHS_PUMPI CONTROL
 - 7.10 dT1_AHS_ON
 - 7.11 t_AHS_DELAY
 - 7.12 T4_AHS_ON
 - 7.13 EnSWITCHPDC
 - 7.14 GAS_COST
 - 7.15 ELE_COST
 - 7.16 MAX_SETHEATER
 - 7.17 MIN_SETHEATER
 - 7.18 MAX_SIGHEATER
 - 7.19 MIN_SIGHEATER

- 8 HOLIDAY AWAY SETTING
 - 8.1 T1S_H.A._H

- 9 SERVICE CALL
 - PHONE NO.
 - MOBILE NO.

- 10 RESTORE FACTORY SETTINGS

- 11 TEST RUN

- 12 SPECIAL FUNCTION

- 13 AUTO RESTART
 - 13.1 COOL/HEAT MODE

- 14 POWER INPUT LIMITATION
 - 14.1 POWER INPUT LIMITATION

- 15 INPUT DEFINE
 - 15.1 M1M2
 - 15.2 SMART GRID
 - 15.3 T1T2
 - 15.4 Tbt
 - 15.5 P_X PORT

- 16 CASCADE SET
 - 16.1 PER_START
 - 16.2 TIME_ADJUST
 - 16.3 ADDRESS RESET

- 17 HMI ADDRESS SET
 - 17.1 HMI SET
 - 17.2 HMI ADDRESS FOR BMS
 - 17.3 STOP BIT

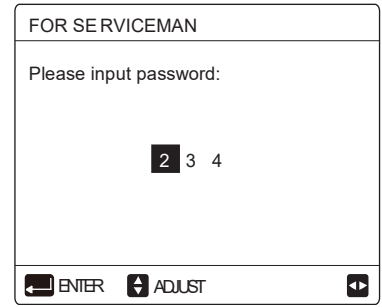
- 18 COMMON SET
 - 18.1 t_DELAY PUMP
 - 18.2 t1_ANTILOCK PUMP
 - 18.3 t2_ANTILOCK PUMP RUN
 - 18.4 t1_ANTILOCK SV
 - 18.5 t2_ANTILOCK SV RUN
 - 18.6 Ta_adj.
 - 18.7 F-PIPE LENGTH
 - 18.8 PUMP_I SILENT OUTPUT

1.3 FOR SERVICEMAN Menu

FOR SERVICEMAN allows installers to input the system configuration and set the system parameters. To enter **FOR SERVICEMAN**, go to **MENU > FOR SERVICEMAN**.

Enter the password, using ◀ ▶ to navigate between digits and using ▼ ▲ to adjust the numerical values. The password is 234.

Then the following pages will be displayed after putting the password.



FOR SERVICEMAN menu

| | | |
|--|--|---|
| <p>FOR SERVICEMAN 1/3</p> <p>1. DHW MODE SETTING</p> <p>2. COOL MODE SETTING</p> <p>3. HEAT MODE SETTING</p> <p>4. AUTO MODE SETTING</p> <p>5. TEMP.TYPE SETTING</p> <p>6. ROOM THERMOSTAT</p> <p>ENTER ADJUST</p> | <p>FOR SERVICEMAN 2/3</p> <p>7. OTHER HEATING SOURCE</p> <p>8. HOLIDAY AWAY SETTING</p> <p>9. SERVICE CALL SETTING</p> <p>10. RESTORE FACTORY SETTINGS</p> <p>11. TEST RUN</p> <p>12. SPECIAL FUNCTION</p> <p>ENTER ADJUST</p> | <p>FOR SERVICEMAN 3/3</p> <p>13. AUTO RESTART</p> <p>14. POWER INPUT LIMITATION</p> <p>15. INPUT DEFINE</p> <p>16. CASCADE SET</p> <p>17. HMI ADDRESS SET</p> <p>18. COMMON SET</p> <p>ENTER ADJUST</p> |
|--|--|---|

1.4 DHW MODE SETTING Menu

Because Aqua Eco Mini Heat Pump has no DHW function, so this menu can not be set.

1.5 COOL MODE SETTING Menu

MENU > FOR SERVICEMAN > COOL MODE SETTING

COOL MODE SETTING menu

| | | |
|--|---|--|
| <p>2 COOL MODE SETTING 1/3</p> <p>2.1 COOL MODE YES</p> <p>2.2 t_T4_FRESH_C 2.0Hrs</p> <p>2.3 T4CMAX 43°C</p> <p>2.4 T4CMIN 20°C</p> <p>2.5 dT1SC 5°C</p> <p>ADJUST</p> | <p>2 COOL MODE SETTING 2/3</p> <p>2.6 dTSC 2C</p> <p>2.7 t_INTERVAL_C 5MIN</p> <p>2.8 T1SetC1 10°C</p> <p>2.9 T1SetC2 16°C</p> <p>2.10 T4C1 35°C</p> <p>ADJUST</p> | <p>2 COOL MODE SETTING 3/3</p> <p>2.11 T4C2 25C</p> <p>2.12 ZONE1 C-EMISSION FCU</p> <p>2.13 ZONE2 C-EMISSION FHL</p> <p>ADJUST</p> |
|--|---|--|

COOL MODE enables or disables cooling mode. For installations with space cooling terminals, select **YES** to enable cooling mode. For installations without space cooling terminals, select **NON** to disable cooling mode.

t_T4_FRESH_C sets the refresh time of cooling mode climate temperature curve.

T4CMAX sets the ambient temperature above which the heat pump will operate in cooling mode with lowest compressor frequency.

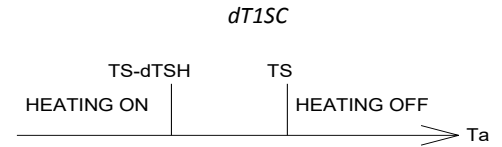
T4CMIN sets the ambient temperature below which the heat pump will not operate in cooling mode.

T4CMAX, T4CMIN



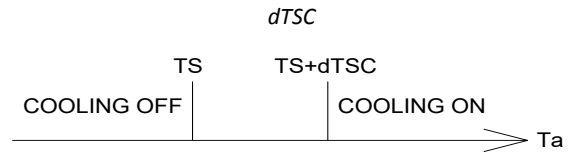
Abreviations:
T4: Outdoor ambient temperature

dT1SC sets the minimum temperature difference between the heat pump leaving water temperature (T1) and the heat pump leaving water set temperature (T1S) at which the heat pump provides chilled water to the space cooling terminals. When $T1 - T1S \geq dT1SC$ the heat pump provides chilled water to the space cooling terminals and when $T1 \leq T1S$ the heat pump does not provide chilled water to the space cooling terminals.



Abbreviations:
 T1: Heat pump leaving water temperature
 T1S: Heat pump leaving water set temperature

dTSC sets the temperature difference between the actual room temperature (Ta) and set room temperature (TS) above which the heat pump provides chilled water to the space cooling terminals. When $Ta - TS \geq dTSC$ the heat pump provides chilled water to the space cooling terminals and when $Ta \leq TS$ the heat pump does not provide chilled water to the space cooling terminals. **dTSC** is only applicable if **YES** is selected for **ROOM TEMP** in the **5 TEMP. TYPE SETTING** menu.



t_INTERVAL_C sets the cooling mode compressor re-start delay. When the compressor stops running, it will not re-start until at least **t_INTERVAL_C** minutes have elapsed.

T1SetC1 sets the water temperature 1 of personalized setting curve for cooling mode.

T1SetC2 sets the water temperature 2 of personalized setting curve for cooling mode.

T4C1 sets the ambient temperature 1 of personalized setting curve for cooling mode.

T4C2 sets the ambient temperature 2 of personalized setting curve for cooling mode.

ZONE1 C-EMISSION sets the emission type of zone1 for cooling mode. (FCU: Fan coil unit; FHL: Floor heating loop; RAD.: Radiator)

ZONE2 C-EMISSION sets the emission type of zone2 for cooling mode. (FCU: Fan coil unit; FHL: Floor heating loop; RAD.: Radiator)

1.6 HEAT MODE SETTING Menu

MENU > FOR SERVICEMAN > HEAT MODE SETTING

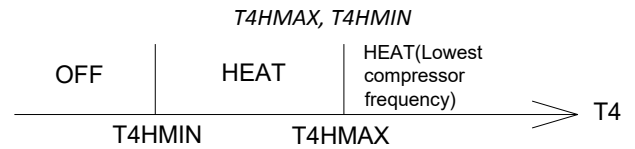
HEAT MODE SETTING menu

| 3 HEAT MODE SETTING 1/3 | | 3 HEAT MODE SETTING 2/3 | | 3 HEAT MODE SETTING 3/3 | |
|-------------------------|--------|-------------------------|------|-------------------------|------|
| 3.1 HEAT MODE | YES | 3.6 dTSH | 2C | 3.11 T4H2 | 7C |
| 3.2 t_T4_FRESH_H | 2.0Hrs | 3.7 t_INTERVAL_H | 5MIN | 3.12 ZONE1 H-EMISSION | RAD. |
| 3.3 T4HMAX | 16°C | 3.8 T1SetH1 | 35°C | 3.13 ZONE2 H-EMISSION | FHL |
| 3.4 T4HMIN | -15°C | 3.9 T1SetH2 | 28°C | 3.14 FORCE DEFROST | NON |
| 3.5 dT1SH | 5°C | 3.10 T4H1 | -5°C | | |
| ADJUST | | ADJUST | | ADJUST | |

HEAT MODE enables or disables heating mode.

t_T4_FRESH_H sets the refresh time of heating mode climate temperature curve.

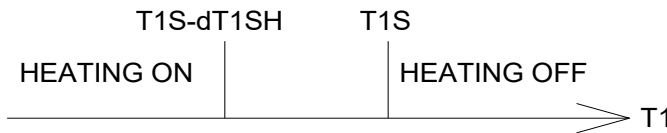
T4HMAX sets the ambient temperature above which the heat pump will operate heating mode with lowest compressor frequency.



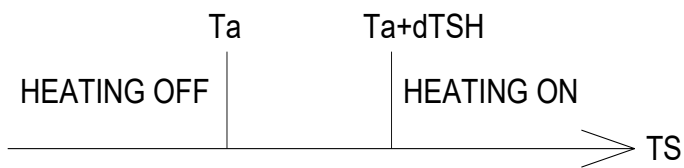
T4HMIN sets the ambient temperature below which the heat pump will not operate in heating mode.

Abbreviations:
T4: Outdoor ambient temperature

dT1SH sets the temperature difference between the heat pump leaving water temperature (T1) and the heat pump leaving water set temperature (T1S) above which the heat pump provides hot water to the space heating terminals.



dTSH sets the temperature difference between the actual room temperature (Ta) and set room temperature (TS) above which the heat pump provides hot water to the space heating terminals. When $TS - Ta \geq dTSH$ the heat pump provides hot water to the space heating terminals and when $Ta \geq TS$ the heat pump does not provide hot water to the space heating terminals. **dTSH** is only relevant if **YES** is selected for **ROOM TEMP** in the 5 **TEMP. TYPE SETTING** menu.



t_INTERVAL_H sets the heating mode compressor re-start delay. When the compressor stops running, it will not re-start until at least **t_INTERVAL_H** minutes have elapsed.

T1SetH1 sets the water temperature 1 of automatic setting curve for heating mode.

T1SetH2 sets the water temperature 2 of automatic setting curve for heating mode.

T4H1 sets the ambient temperature 1 of automatic setting curve for heating mode.

T4H2 sets the ambient temperature 2 of automatic setting curve for heating mode.

ZONE1 H-EMISSION sets the emission type for heating mode. (FCU: Fan coil unit; FHL: Floor heating loop; RAD.: Radiator)

ZONE2 H-EMISSION sets the emission type for heating mode. (FCU: Fan coil unit; FHL: Floor heating loop; RAD.: Radiator)

FORCE DEFROST enable heat pump enters defrost mode by manual operation when heat pump runs for 10min and air side heat exchanger outlet temperature $T3 < 0^\circ\text{C}$ lasts for more than 6min.

1.7 AUTO MODE SETTING Menu

MENU > FOR SERVICEMAN > AUTO MODE SETTING

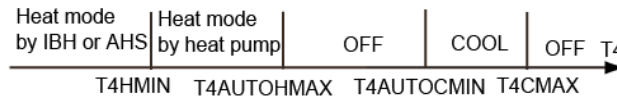
T4AUTOCMIN sets the ambient temperature below which the heat pump will not provide chilled water for space cooling in auto mode.

T4AUTOHMAX sets the ambient temperature above which the heat pump will not provide hot water for space heating in auto mode.

AUTO MODE SETTING menu

| | |
|----------------------|------|
| 4 AUTO. MODE SETTING | |
| 4.1 T4AUTOCMIN | 25°C |
| 4.2 T4AUTOHMAX | 17°C |
| | |
| | |
| | |
| ADJUST | |

T4AUTOHMAX, T4AUTOCMIN



Abbreviations:

AHS: Additional heating source

IBH: Backup electric heater

T4CMAX: The ambient temperature above which the heat pump will not operate in cooling mode.

T4HMIN: The ambient temperature below which the heat pump will not operate in heating mode.

1.8 TEMP. TYPE SETTING Menu

MENU > FOR SERVICEMAN > TEMP. TYPE SETTING

The TEMP. TYPE SETTING is used for selecting whether the water flow temperature or room temperature is used to control the ON/OFF of the heat pump.

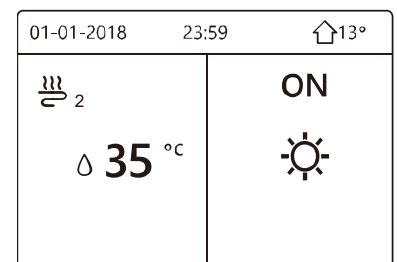
When ROOM TEMP. is enabled, the target water flow temperature will be calculated from climate curves.

For installations without room thermostats, space heating and cooling modes can be controlled in one of two different ways:

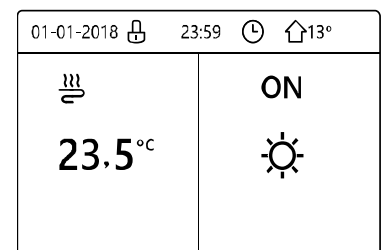
TEMP. TYPE SETTING menu

| | |
|----------------------|-----|
| 5 TEMP. TYPE SETTING | |
| 5.1 WATER FLOW TEMP. | YES |
| 5.2 ROOM TEMP. | NON |
| 5.3 DOUBLE ZONE | NON |
| | |
| | |
| ADJUST | |

- **WATER FLOW TEMP.** sets whether space heating/cooling modes are controlled according to the leaving water temperature. If **YES** is selected, the user is able to set the leaving water temperature on the user interface's main screen.



- **ROOM TEMP.** sets whether space heating/cooling modes are controlled according to the room temperature detected by the temperature sensor inside the wired controller. If **YES** is selected, the user is able to set the room temperature on the user interface's main screen, no matter what is the setting of **WATER FLOW TEMP.**



DOUBLE ZONE sets whether there are two zones.

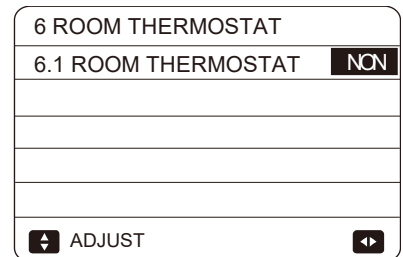
| WATER FLOW TEMP. | | ROOM TEMP. | DOUBLE ZONE | | Double zones control |
|------------------|----|------------|-------------|----|--|
| YES | | YES | YES | NO | Zone 1: Water temperature control Zone 2: Climate curve control |
| YES | NO | NO | YES | | Zone 1: Water temperature control Zone 2: Water temperature control |
| YES | NO | YES | YES | | Zone 1: Water temperature control Zone 2: Climate curve control |

1.9 ROOM THERMOSTAT Menu

MENU > FOR SERVICEMAN > ROOM THERMOSTAT

ROOM THERMOSTAT menu

As an alternative to control space heating/cooling modes according to the leaving water temperature and/or the room temperature detected by the temperature sensor inside the user interface, separate room thermostat can be installed and used to control space heating/cooling modes.



ROOM THERMOSTAT sets whether or not room thermostats are installed:

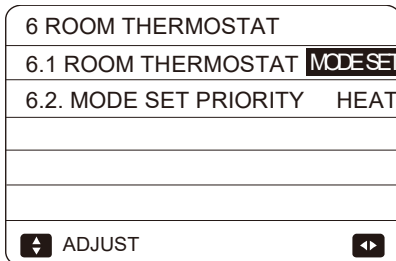
ROOM THERMOSTAT = NON: No room thermostat.

ROOM THERMOSTAT=ONE ZONE: Room thermostat provides the switch signal to unit.

ROOM THERMOSTAT=DOUBLE ZONE: Indoor unit is connected with two room thermostat.

ROOM THERMOSTAT = MODE SET: Room thermostat can control heating and cooling individually.

If **ROOM THERMOSTAT** is set as **MODE SET**, the interface appears:



MODE SET PRIORITY sets whether cooling mode or heating mode takes priority. When CL port and HL port close at the same time, heat pump will run corresponding to the **MODE SET PRIORITY** setting.

1.10 OTHER HEATING SOURCE Menu

1.10.1 OTHER HEATING SOURCE menu overview

MENU > FOR SERVICEMAN > OTHER HEATING SOURCE

OTHER HEATING SOURCE menu

| 7 OTHER HEATING SOURCE 1/6 | | 7 OTHER HEATING SOURCE 2/6 | | 7 OTHER HEATING SOURCE 3/6 | |
|----------------------------|-----------|----------------------------|-------|----------------------------|-------|
| 7.1 IBH FUNCTION | HEAT | 7.6 P_IBH1 | 0.0kW | 7.11 t_AHS_DELAY | 30MIN |
| 7.2 IBH LOCATE | PIPE LOOP | 7.7 P_IBH2 | 0.0kW | 7.12 T4_AHS_ON | -5°C |
| 7.3 dT1_IBH_ON | 5°C | 7.8 AHS FUNCTION | NON | 7.13 EnSWITCHPDC | NON |
| 7.4 t_IBH_DELAY | 30MIN | 7.9 AHS_PUMPI CONTROL | RUN | 7.14 GAS_COST | 0.85 |
| 7.5 T4_IBH_ON | -5°C | 7.10 dT1_AHS_ON | 5°C | 7.15 ELE_COST | 0.20 |
| ADJUST | | ADJUST | | ADJUST | |

| | |
|----------------------------|------|
| 7 OTHER HEATING SOURCE 4/6 | |
| 7.16 MAX_SETHEATER | 80°C |
| 7.17 MIN_SETHEATER | 30°C |
| 7.18 MAX_SIGHEATER | 10V |
| 7.19 MIN_SIGHEATER | 3V |
| ADJUST | |

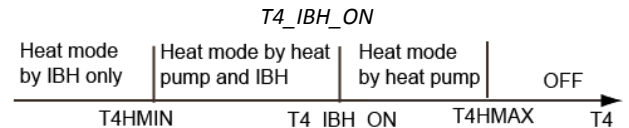
IBH FUNCTION set IBH runs for heat mode.

IBH LOCATE means IBH is installed for pipe heating. (Default setting: PIPE LOOP)

dT1_IBH_ON sets the temperature difference between the heat pump leaving water set temperature (T1S) and the heat pump leaving water temperature (T1) above which the backup electric heater is on. When $T1S - T1 \geq dT1_IBH_ON$ the backup electric heater is on.

t_IBH_DELAY sets the delay time for the electric heater to turn on after the compressor starts.

T4_IBH_ON sets the ambient temperature below which the backup electric heater is on.



Abbreviations:
 T4: Outdoor ambient temperature
 IBH: Backup electric heater

P_IBH1 sets heating capacity of IBH1, which is used for energy consumption statistics.

P_IBH2 sets heating capacity of IBH2, which is used for energy consumption statistics.

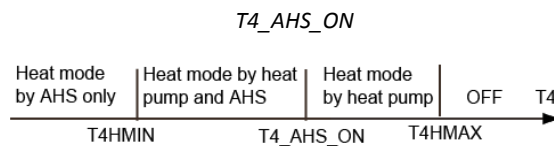
AHS FUNCTION sets enable or disable the additional heating source function.

AHS_PUMPI CONTROL select the pump operating status when only AHS runs

dT1_ASH_ON sets the temperature difference between the heat pump leaving water set temperature (T1S) and the heat pump leaving water temperature (T1) above which the additional heating source is on. When $T1S - T1 \geq dT1_ASH_ON$ the additional heating source is on.

t_ASH_DELAY sets the delay time for the AHS to turn on after the compressor starts.

T4_AHS_ON sets the ambient temperature below which the additional heating source is on.



Abbreviations:
 AHS: Additional heating source
 T4: Outdoor ambient temperature

EnSWITCHPDC enable or disable the function that heat pump and additional heating source switch automatically based on running cost

GAS_COST set the price of gas

ELE_COST set the price of electricity

MAX_SETHEATER sets the maximum temperature of additional heating source.

MIN_SETHEATER sets the minimum temperature of additional heating source.

1.11 HOLIDAY AWAY SETTING Menu

MENU > FOR SERVICEMAN > HOLIDAY AWAY SETTING

The **HOLIDAY AWAY SETTING** menu settings are used to set the outlet water temperature to prevent water pipes freezing when away from home in cold weather seasons.

T1S_H.A._H sets the heat pump leaving water set temperature for space heating mode when in holiday away mode.

T5S_H.M._DHW sets the heat pump leaving water set temperature for DHW mode when in holiday away mode.

HOLIDAY AWAY SETTING menu

| | |
|------------------------|------|
| 8 HOLIDAY AWAY SETTING | |
| 8.1 T1S_H.A._H | 20°C |
| 8.2 T5S_H.A._DHW | 20°C |
| | |
| | |
| | |
| ⏪ ADJUST | ⏩ |

1.12 SERVICE CALL Menu

MENU > FOR SERVICEMAN > SERVICE CALL

PHONE NO. and **MOBILE NO.** can be used to set after-sales service contact numbers. Use ▼ ▲ to adjust the numerical values. The maximum length of the phone numbers is 13 digits.

SERVICE CALL menu

| | |
|------------------------|---------------|
| 9 SERVICE CALL SETTING | |
| PHONE NO. | 0000000000000 |
| MOBILE NO. | 0000000000000 |
| | |
| | |
| | |
| ⏪ CONFIRM | ⏪ ADJUST ⏩ |

1.13 RESTORE FACTORY SETTINGS

MENU > FOR SERVICEMAN > RESTORE FACTORY SETTINGS

RESTORE FACTORY SETTINGS is used to restore all the parameters set in the user interface to factory defaults.

On selecting **YES**, the process of restoring all settings to factory defaults begins and progress is displayed as a percentage.

RESTORE FACTORY SETTINGS screens

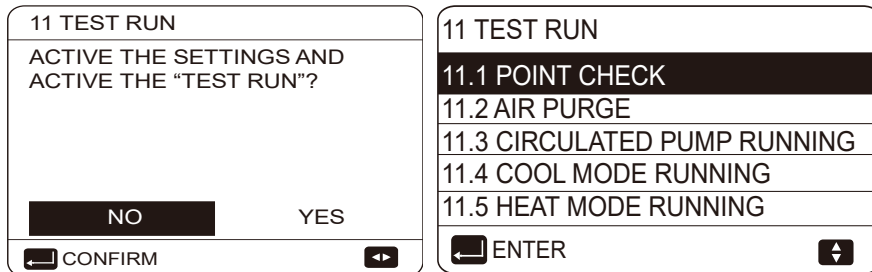
| | |
|---|--|
| <p>10 RESTORE FACTORY SETTINGS</p> <p>ALL THE SETTINGS WILL COME BACK TO FACTORY DEFAULT. DO YOU WANT TO RESTORE FACTORY SETTINGS?</p> <p>NO YES</p> <p>⏪ CONFIRM ⏩</p> | <p>10 RESTORE FACTORY SETTINGS</p> <p>PLEASE WAIT...</p> <p style="text-align: center;">5%</p> |
|---|--|

1.14 TEST RUN

MENU > FOR SERVICEMAN > TEST RUN

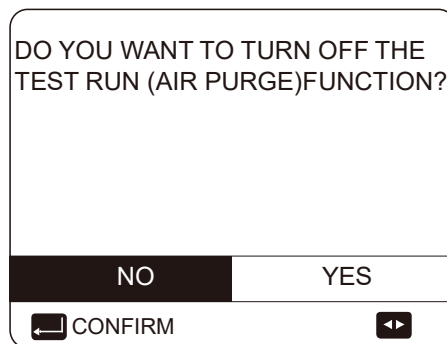
TEST RUN is used to do the point check and check that air purge function, circulation pump, space cooling mode, space heating mode are all operating correctly.

TEST RUN start screen and TEST RUN menu



During test run, all buttons except are invalid. If you want to turn off the test run, please press ENTER. For example, when the unit is in air purge mode, after you press ENTER, the following page will be displayed:

Exit air purge screen

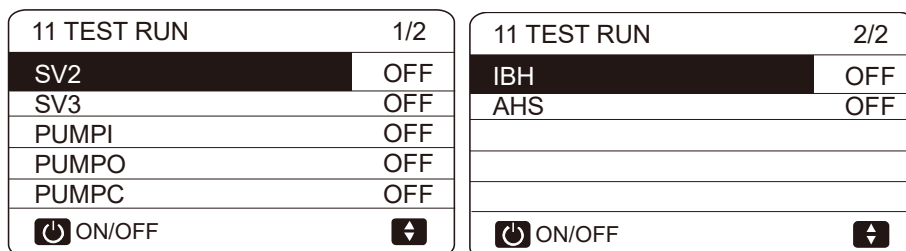


If any error code is displayed during the test run operation, the cause should be investigated.

1.14.1 POINT CHECK

The POINT CHECK menu is used to check the operation of individual components. Use to scroll to the components you want to check and press CONFIRM to toggle the on/off state of the component. If a valve does not turn on/off when its on/off state is toggled or if a pump/heater does not operate when turned on, check the component's connection to the hydronic system main PCB.

POINT CHECK menu



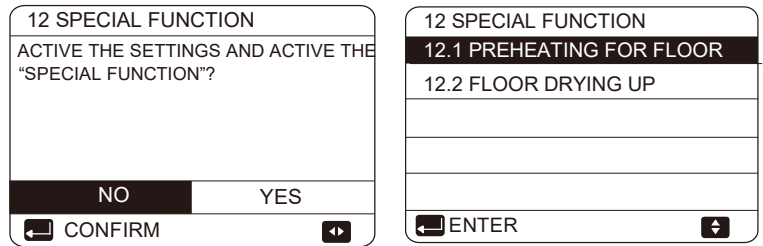
1.15 SPECIAL FUNCTION

1.15.1 SPECIAL FUNCTION menu overview

MENU > FOR SERVICEMAN > SPECIAL FUNCTION

SPECIAL FUNCTION is used to pre-heating floor and drying up floor once installation is complete or the first time start up the unit or restart the unit after a long time stop.

Special functions menu



1.15.2 PREHEATING FOR FLOOR

MENU > FOR SERVICEMAN > SPECIAL FUNCTION > PREHEATING FOR FLOOR

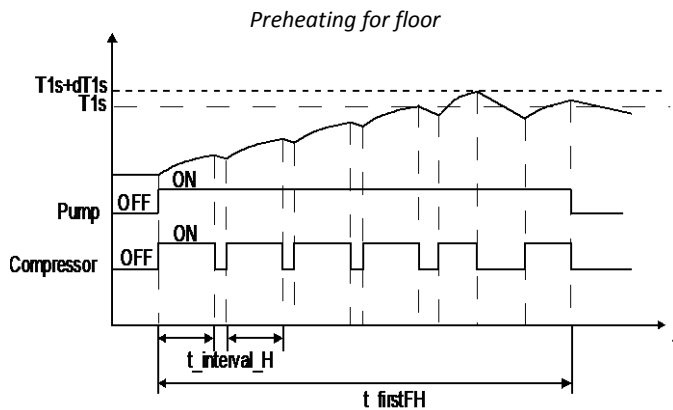
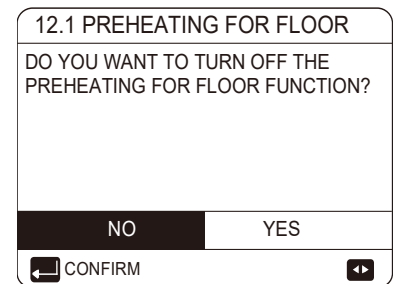
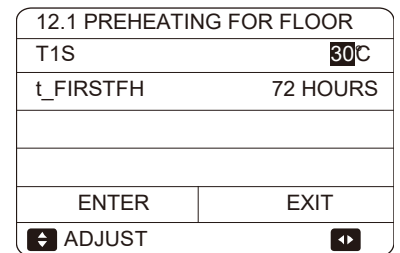
Before floor heating, if a large amount of water remains on the floor, the floor may be warped or even rupture during floor heating operation, in order to protect the floor, floor drying is necessary, during which the temperature of the floor should be increased gradually.

During first operation of the unit, air may remain in the water system which can cause malfunctions during operation. It is necessary to run the air purge function to release the air (make sure the air purge valve is open).

T1S sets the heat pump leaving water set temperature in preheating for floor mode.

t_FIRSTFH sets the duration of preheating for floor mode.

Preheating for floor menu



Abbreviations:
 t_interval_H: Compressor re-start delay in space heating mode.

Whilst the preheating for floor operation is running, the number of minutes that it has been running for and the heat pump leaving water temperature are displayed on the user interface. During the preheating for floor operation all buttons except \leftarrow are inactivated. To exit the preheating for floor operation, press \leftarrow and then select **YES** when prompted.

Mini Chiller Serie H12

1.15.3 FLOOR DRYING UP

MENU > FOR SERVICEMAN > SPECIAL FUNCTION > FLOOR DRYING UP

FLOOR DRYING UP menu

| | | | |
|------------------------|--------|-------------------|------------|
| 12.2 INPUT DEFINE | 1/2 | 12.2 INPUT DEFINE | 2/2 |
| WARM UP TIME(t_DRYUP) | 8 DAYS | START DATE | 21-10-2021 |
| KEEP TIME(t_HIGHPEAK) | 5 DAYS | | |
| TEMP.DOWN TIME(t_DRYD) | 5 DAYS | | |
| PEAK TEMP.(t_DRYPEAK) | 45°C | | |
| START TIME | 21:00 | ENTER | EXIT |
| ADJUST | | ENTER | |

For newly-installed under-floor heating systems, floor drying up mode can be used to remove moisture from the floor slab and subfloor to prevent warping or rupture of the floor during floor heating operation. There are three phases to the floor drying up operation:

- Phase 1: gradual temperature increase from a starting point of 25°C to the peak temperature
- Phase 2: maintain peak temperature
- Phase 3: gradual temperature decrease from the peak temperature to 45°C

WARM UP TIME(t_DRYUP) sets the duration of Phase 1.

KEEP TIME(t_HIGHPEAK) sets the duration of Phase 2.

TEMP. DOWN TIME(t_DRYD) sets the duration of Phase 3.

PEAK TEMP.(T_DRYPEAK) sets the heat pump leaving water set temperature for Phase 2.

START TIME sets the floor drying up operation start time.

START DATE sets the floor drying up operation start date.

During the floor drying up operation all buttons except **OK** are inactivated. To exit the floor drying up operation, press **OK** and then select **YES** when prompted.

Note: In the event of a heat pump malfunction, floor drying up mode will continue if a backup electric heater and/or additional heating source is available and configured to support space heating mode.

1.16 AUTO RESTART

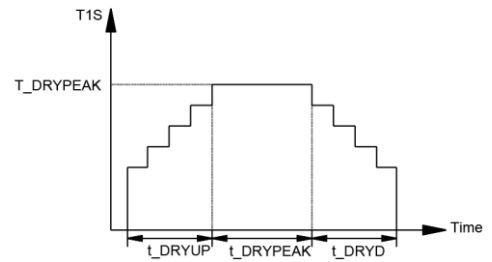
MENU > FOR SERVICEMAN > AUTO RESTART

AUTO RESTART sets whether or not the unit re-applies the user interface settings when the power returns following a power failure. Select **YES** to enable auto restart or **NON** to disable auto restart.

AUTO RESTART menu

| | |
|---------------------|-----|
| 13 AUTO RESTART | |
| 13.1 COOL/HEAT MODE | YES |
| | |
| | |
| | |
| ADJUST | |

FLOOR DRYING UP settings



1.17 POWER INPUT LIMITATION

MENU > FOR SERVICEMAN > POWER INPUT LIMITATION

POWER INPUT LIMITATION sets the type of power input limitation and the setting range is 1-8. If the unit will operate at larger power input, 1 should be selected. If the unit will operate at a lower power input, 2-8 should be selected and the power input and capacity will decrease.

Limitation value (unit:A)

| Model \ No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|----------------|----|----|----|----|----|----|----|----|
| 5/7/9kW | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 |
| 12/14/16kW(1N) | 28 | 26 | 24 | 22 | 20 | 18 | 16 | 14 |
| 12/14/16kW(3N) | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 5 |

1.18 INPUT DEFINE

MENU > FOR SERVICEMAN > INPUT DEFINE

INPUT DEFINE sets sensors and functions to fulfill with installation.

M1M2 sets the remote control function of M1M2 for ON/OFF of heat pump
SMART GRID sets whether SMART GRID control signal is connected to hydronic PCB.
T1T2 sets control options of Port T1T2 (0: NON; 1: RT/Ta_PCB)
Tbt set whether balance tank temperature sensors are installed in the balance tank.
P_X PORT is set DEFORST by default. When P_X PORT is set ALARM, it represents the fault signal output of the unit. (0: DEFORST; 1: ALARM)

1.19 CASCADE SET

MENU > FOR SERVICEMAN > CASCADE SET

CASCADE SET

| 16 CASCADE SET | |
|--------------------|-------|
| 16.1 PER_START | 10% |
| 16.2 TIME_ADJUST | 5 MIN |
| 16.3 ADDRESS RESET | FF |
| ADJUST | |

PER_START sets the start-up percentage of multiple units for the first time start-up after power on. For example:

| Total units | PER_START | Starting units |
|-------------|-----------|----------------|
| 6 | 50% | 3 |
| 6 | 30% | 2 |

TIME_ADJUST sets the judgment period of adding and subtracting units

ADDRESS RESET resets the address code of unit. ("FF" is an invalid address code.) Normally, program will set the address for each unit automatically, only when unit lost address and Hd error code appears then we need to use this function. After setting the address, you need to press the "UNLOCK" key to confirm.

POWER INPUT LIMITATION

| 14 POWER INPUT LIMITATION | |
|-----------------------------|---|
| 14.1 POWER INPUT LIMITATION | 0 |
| ADJUST | |

INPUT DEFINE

| 15 INPUT DEFINE | |
|-----------------|---------------|
| 15.1 M1M2 | REMOTE ON/OFF |
| 15.2 SMART GRID | NON |
| 15.3 T1T2 | NON |
| 15.4 Tbt | NON |
| 15.5 P_X PORT | DEFROST |
| ADJUST | |

1.20 HMI ADDRESS SET

MENU > FOR SERVICEMAN > HMI ADDRESS SET

HMI ADDRESS SET

| | |
|--------------------------|--------|
| 17 HMI ADDRESS SET | |
| 17.1 HMI SET | MASTER |
| 17.2 HMI ADDRESS FOR BMS | 1 |
| 17.3 STOP BIT | 1 |
| | |
| ADJUST | |

HMI SET sets the wired controller is master or slave. (0=MASTER, 1=SLAVE)

When HMI SET is set to SLAVE, the controller can only switch the operation mode, turn on or off, set the temperature, and cannot set other parameters and functions.

HMI ADDRESS FOR BMS sets the HMI address code for BMS.(only valid for master controller)

STOP BIT set upper computer stop bit(1: STOP BIT1; 2:STOP BIT2)

1.21 COMMON SET

MENU > FOR SERVICEMAN > COMMON SET

| | | | |
|---------------------------|--------|---------------------------|------|
| 18 COMMON SET 1/2 | | 18 COMMON SET 2/2 | |
| 18.1 t_DELAY_PUMP | 2.0MIN | 18.6 Ta_adj. | -2C |
| 18.2 t1_ANTILOCK PUMP | 24h | 18.7 F-PIPE LENGTH | <10m |
| 18.3 t2_ANTILOCK PUMP RUN | 60s | 18.8 PUMP_I_SILENT OUTPUT | 100% |
| 18.4 t1_ANTILOCK SV | 24h | | |
| 18.5 t2_ANTILOCK SV RUN | 30s | | |
| ADJUST | | ADJUST | |

t_DELAY PUMP sets the delay time for the pump to turn off after the compressor stops.

t1_ANTILOCK PUMP sets the interval time that the pump runs in order to antilock

t2_ANTILOCK PUMP RUN sets the running time for pump antilock operation

t1_ANTILOCK SV sets the interval time that the valve works in order to antilock

t2_ANTILOCK SV RUN sets the running time for valve antilock operation

Ta-adj is an correction value for Ta which is inside the wired controller.

F-PIPE LENGTH select the total length in the liquid pipe (0=F-PIPE LENGTH<10m, 1=F-PIPE LENGTH>=10m)

PUMP_I_SLIENT OUTPUT can decrease water pump maximum output in order to decrease the noise of heat pump.

2 Operation parameter

MENU > OPERATION PARAMETER

This menu is for installer or service engineer reviewing the operation parameters.

Operation parameter

| | |
|------------------------|-------|
| OPERATION PARAMETER | #00 |
| ONLINE UNITS NUMBER | 1 |
| ODU MODEL | 16 kW |
| OPERATION MODE | COOL |
| FREQUENCY ORDER | ON |
| FREQUENCY LIMITED TYPE | 0 |
| COMP. RUN TIME | 1 MIN |
| ADDRESS | 1/10 |

| | |
|---------------------------|-----------|
| OPERATION PARAMETER | #00 |
| COMP. FREQUENCY | 37 Hz |
| FAN SPEED | 810 R/MIN |
| EXPAN VALVE | 280 P |
| Tp COMP. DISCHARGE TEMP. | 60 °C |
| Th COMP. SUCTION TEMP. | 23 °C |
| T3 OUTDOOR EXCHANGE TEMP. | 42°C |
| ADDRESS | 2/10 |

| | |
|----------------------|----------|
| OPERATION PARAMETER | #00 |
| T4 OUTDOOR AIR TEMP. | 32°C |
| TF MODULE TEMP. | 50°C |
| P1 COMP. PRESSURE | 2970 kPa |
| P2 COMP. PRESSURE | 1380 kPa |
| T2B PLATE F-IN TEMP. | 21 °C |
| T2 PLATE F-OUT TEMP. | 19°C |
| ADDRESS | 3/10 |

| | |
|---------------------------|-------|
| OPERATION PARAMETER | #00 |
| TW_I PLATE W-INLET TEMP. | 23 °C |
| TW_O PLATE W-OUTLET TEMP. | 20°C |
| T1 LEAVING WATER TEMP. | -- °C |
| TW2 CIRCUIT2 WATER TEMP. | -- °C |
| Ta ROOM TEMP. | -- °C |
| RH ROOM HUMIDITY | -- % |
| ADDRESS | 4/10 |

| | |
|---------------------------|-------|
| OPERATION PARAMETER | #00 |
| T5 WATER TANK TEMP. | -- °C |
| T5_2 WATER TANK TEMP. | -- °C |
| Tbt BUFFER TANK TEMP. | 0 °C |
| Tsolar | 0 °C |
| T1S' C1 CLI. CURVE TEMP. | 0 °C |
| T1S2' C1 CLI. CURVE TEMP. | 0 °C |
| ADDRESS | 5/10 |

| | |
|-----------------------|-----------|
| OPERATION PARAMETER | #00 |
| WATER PRESSURE | -- bar |
| WATER FLOW | 2.65 M3/H |
| HEAT PUMP CAPACITY | 0.00 kW |
| ODU CURRENT | 3 A |
| ODU VOLTAGE | 232 V |
| DC GENERATRIX VOLTAGE | 490 V |
| ADDRESS | 6/10 |

| | |
|-----------------------|--------|
| OPERATION PARAMETER | #00 |
| DC GENERATRIX CURRENT | 9 A |
| POWER CONSUM | 53 kWh |
| SV1 | OFF |
| SV2 | OFF |
| SV3 | OFF |
| PUMP_I | ON |
| ADDRESS | 7/10 |

| | |
|---------------------|------|
| OPERATION PARAMETER | #00 |
| PUMP_O | ON |
| PUMP_C | OFF |
| PUMP_S | OFF |
| PUMP_D | OFF |
| IBH1 | OFF |
| IBH2 | OFF |
| ADDRESS | 8/10 |

| | |
|----------------------|-------|
| OPERATION PARAMETER | #00 |
| TBH | OFF |
| AHS | OFF |
| COM. TOTAL RUN TIME | 8 Hrs |
| FAN TOTAL RUN TIME | 8 Hrs |
| PUMPI TOTAL RUN TIME | 8 Hrs |
| IBH1 TOTAL RUN TIME | 0 Hrs |
| ADDRESS | 9/10 |

| | |
|---------------------|---------------|
| OPERATION PARAMETER | #00 |
| IHB2 TOTAL RUN TIME | 0 Hrs |
| THB TOTAL RUN TIME | -- Hrs |
| AHS TOTAL RUN TIME | 0 Hrs |
| IDU SOFTWARE | 29-09-2021V15 |
| ODU SOFTWARE | 28-09-2021V25 |
| HMI SOFTWARE | 16-10-2021V19 |
| ADDRESS | 10/10 |

The following parameter ranges are used to roughly determine whether the system is running properly:

| Discharge temperature(Tp) for heating mode | |
|--|----------------------------------|
| $T4 < -10^{\circ}\text{C}$ | $Tw_{out}+15 < Tp < Tw_{out}+40$ |
| $-10^{\circ}\text{C} \leq T4 < 10^{\circ}\text{C}$ | $Tw_{out}+10 < Tp < Tw_{out}+35$ |
| $10^{\circ}\text{C} \leq T4 < 25^{\circ}\text{C}$ | $Tw_{out}+10 < Tp < Tw_{out}+30$ |
| $T4 \geq 25^{\circ}\text{C}$ | $Tw_{out}+10 < Tp < Tw_{out}+28$ |

Note:
T4 means ambient temperature
Tw_out means leaving water temperature.

| Discharge pressure(P1) for heating mode | | | | | | | | | |
|---|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| Tw_out(°C) | 25 | 30 | 35 | 40 | 45 | 50 | 55 | 60 | 65 |
| P1 (kPa) | 1750±1 50 | 2000±1 50 | 2270±1 50 | 2560±1 50 | 2890±1 50 | 3250±1 50 | 3630±1 50 | 3900±1 50 | 4200±1 50 |

Note: P1 is absolute pressure.

| Discharge temperature(Tp) for cooling mode | | | | |
|--|-----------|------------------|------------------|-----------|
| Tp | Fx < 44Hz | 44Hz ≤ Fx < 62Hz | 62Hz ≤ Fx < 72Hz | Fx ≥ 72Hz |
| T4 < 25°C | 52±10 | 56±10 | 58±10 | 62±10 |
| 25°C ≤ T4 < 30°C | 56±10 | 62±10 | 68±10 | 74±10 |
| 30°C ≤ T4 < 35°C | 65±10 | 70±10 | 75±10 | 80±10 |
| 35°C ≤ T4 < 40°C | 70±10 | 75±10 | 80±10 | 85±10 |
| 40°C ≤ T4 < 46°C | 75±10 | 80±10 | 85±10 | 90±10 |
| T4 ≥ 46°C | 78±10 | 80±10 | 85±10 | 90±10 |

Note: Fx means compressor operating frequency.

| Suction pressure(P1) for cooling mode | | | | | | | |
|---------------------------------------|---------|---------|----------|----------|----------|----------|----------|
| Tw_out(°C) | 5~7 | 8~10 | 11~13 | 14~16 | 17~19 | 20~22 | 23~25 |
| P1 (kPa) | 880±100 | 955±100 | 1050±100 | 1150±100 | 1250±100 | 1360±100 | 1500±100 |

Note: P1 is absolute pressure.

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