

**Water-cooled chillers
and water/water heat pumps
with hermetic scroll compressors**

42 ÷ 297 kW



SIGMA 2002

Water chiller

Unit frame

Self supporting frame, made of galvanized sheet steel with epoxy-polyester powder coating (RAL 7032) baked at 180°C to provide a durable weatherproof finish. Models 3.2 to 7.2 and model 14.4 are completely enclosed by painted steel panels fully lined with sound absorbing material. On models 8.2 to 13.2 only the upper compartment, which contains the compressors, is fully enclosed on all sides by painted steel panels fully lined with a sound absorbing material. On models 8.2 to 13.2 only the upper compartment, which contains the compressors, and the separator between this compartment and the lower part of the unit are enclosed by painted steel panels fully lined with sound absorbing material. Models 16.4 to 26.4 do not have panels.

Compressors

Hermetic scroll type with orbital motion, connected in tandem and equipped with oil level sight glass, oil equalisation line and Klixon internal thermal protection.

Evaporator and condenser

Brazed plate type in 316 AISI stainless steel. Thermal insulation of evaporator is provided by closed cell expanded material. Each evaporator is equipped with a low water temperature probe for antifreeze protection and each unit is equipped as standard with a mechanical flow switch.

Refrigerant circuit

Comprising: liquid line shut-off valve, charge connection, liquid sight-glass, filter dryer, thermostatic expansion valve with external pressure equalisation, high and low pressure switches for 2-compressor models. For 4-compressor

models high and low pressure values and relative condensing and evaporating temperatures are measured by pressure transducers which enable them to be read directly from the display. The high pressure side of the circuit is equipped with high pressure switches and safety valves.

Electrical panel

The electrical panel includes:

- main switch
- fuses for protecting power control circuits
- compressor contactors
- µchiller microprocessor for 2-compressor units and PCO2 for 4-compressor units.

Controls and safety devices

- high pressure switch with manual reset
- high pressure relief valve
- a low water temperature probe for antifreeze protection at the outlet of each evaporator
- mechanical flow switch supplied as standard with the unit.
- compressor thermal overload protection .

Testing

The units are factory-tested and supplied with refrigerant charge and oil.

SIGMA 2002 /HP

Reversible heat pump

The unit reverses the refrigerant flow. In addition to the components of version SIGMA 2002, this unit includes:

Refrigerant circuit

4-way reversing valve, second thermostatic expansion valve

ACCESSORY VERSIONS

SIGMA 2002/DC

Unit with heat recovery condenser and liquid receiver.

SIGMA 2002/DS

Unit with desuperheaters.

SIGMA 2002/LN

Low noise unit: the units are completely enclosed by painted steel panels lined with sound absorbing material having an intermediate layer of high acoustic impedance material.

MAIN ACCESSORIES

- Double set point
- Pressure control valve (with solenoid valve on heat pump)
- Condenser for well water
- Power factor correction $\cos \varnothing \geq 0,9$ at nominal operating conditions
- Serial interface
- Rubber antivibration mountings
- Timber crate packing.

SIGMA 2002 - R407C TECHNICAL DATA

| Unit size | | 3.2 | 4.2 | 5.2 | 6.2 | 7.2 | 8.2 |
|--------------------------------------|---------|-----------|-----------|-----------|-----------|-----------|-----------|
| Nominal cooling capacity (*) | kW | 42,4 | 51,2 | 59,8 | 68,9 | 78 | 89,9 |
| Nominal heating capacity (**) | kW | 51,2 | 61,7 | 71,9 | 83 | 94,1 | 108,7 |
| Compressor | | | | | | | |
| Quantity/Refrigerant circuits | n° | 2/1 | 2/1 | 2/1 | 2/1 | 2/1 | 2/1 |
| Cooling power input(*) | kW | 9,9 | 11,8 | 13,5 | 15,8 | 18 | 20,8 |
| Heating power input(**) | kW | 12,6 | 15,3 | 17,7 | 20,3 | 22,9 | 26,9 |
| Capacity steps | % | 0-50-100 | 0-50-100 | 0-50-100 | 0-50-100 | 0-50-100 | 0-50-100 |
| Evaporator characteristics | | | | | | | |
| Water flow rate | l/s | 2,025 | 2,445 | 2,857 | 3,292 | 3,727 | 4,296 |
| Water pressure drop | kPa | 49,9 | 45,5 | 39,6 | 36,2 | 35,4 | 35,0 |
| Condenser characteristics | | | | | | | |
| Water flow rate | l/s | 2,497 | 3,006 | 3,503 | 4,045 | 4,587 | 5,291 |
| Water pressure drop | kPa | 37,9 | 37,9 | 39,4 | 27,1 | 26,3 | 27,5 |
| Noise level (***) | | | | | | | |
| Basic unit | dB(A) | 55,0 | 55,2 | 55,3 | 55,8 | 56,2 | 59,5 |
| LN version | dB(A) | 53,6 | 53,8 | 53,7 | 54,3 | 54,7 | 56,1 |
| Power supply | V/ph/Hz | 400/3~/50 | 400/3~/50 | 400/3~/50 | 400/3~/50 | 400/3~/50 | 400/3~/50 |
| Dimensions and weight | | | | | | | |
| Width | mm | 1334 | 1334 | 1334 | 1334 | 1334 | 1356 |
| Depth | mm | 797 | 797 | 797 | 797 | 797 | 768 |
| Height | mm | 962 | 962 | 962 | 962 | 962 | 1700 |
| Operating weight | kg | 386 | 412 | 425 | 462 | 488 | 501 |

| Unit size | | 9.2 | 10.2 | 12.2 | 13.2 | 14.4 | 16.4 |
|--------------------------------------|---------|-----------|-----------|-----------|-----------|----------------|----------------|
| Nominal cooling capacity (*) | kW | 105,9 | 121,8 | 135,2 | 148,5 | 156 | 179,9 |
| Nominal heating capacity (**) | kW | 128,3 | 147,8 | 164,9 | 182 | 188,3 | 217,4 |
| Compressor | | | | | | | |
| Quantity/Refrigerant circuits | n° | 2/1 | 2/1 | 2/1 | 2/1 | 4/2 | 4/2 |
| Cooling power input(*) | kW | 24,6 | 28,5 | 31,5 | 34,5 | 36 | 41,6 |
| Heating power input(**) | kW | 31,7 | 36,5 | 40,6 | 44,7 | 45,8 | 53,7 |
| Capacity steps | % | 0-50-100 | 0-50-100 | 0-50-100 | 0-50-100 | 0-25-50-75-100 | 0-25-50-75-100 |
| Evaporator characteristics | | | | | | | |
| Water flow rate | l/s | 5,058 | 5,820 | 6,458 | 7,095 | 7,454 | 8,593 |
| Water pressure drop | kPa | 41,4 | 37,0 | 35,0 | 36,1 | 35,4 | 35,0 |
| Condenser characteristics | | | | | | | |
| Water flow rate | l/s | 6,236 | 7,180 | 7,962 | 8,743 | 9,174 | 10,582 |
| Water pressure drop | kPa | 27,7 | 30,0 | 31,9 | 28,5 | 26,3 | 27,5 |
| Noise level (***) | | | | | | | |
| Basic unit | dB(A) | 60,0 | 60,6 | 60,9 | 61,3 | 59,5 | 77,0 |
| LN version | dB(A) | 56,2 | 56,3 | 56,6 | 57,0 | 57,3 | 59,5 |
| Power supply | V/ph/Hz | 400/3~/50 | 400/3~/50 | 400/3~/50 | 400/3~/50 | 400/3~/50 | 400/3~/50 |
| Dimensions and weight | | | | | | | |
| Width | mm | 1356 | 1356 | 1356 | 1356 | 1426 | 2726 |
| Depth | mm | 768 | 768 | 768 | 768 | 801 | 945 |
| Height | mm | 1700 | 1700 | 1700 | 1700 | 1787 | 1700 |
| Operating weight | kg | 582 | 673 | 716 | 775 | 861 | 966 |

| Unit size | | 18.4 | 20.4 | 24.4 | 26.4 |
|--------------------------------------|---------|----------------|----------------|----------------|----------------|
| Nominal cooling capacity (*) | kW | 211,7 | 243,6 | 270,3 | 297 |
| Nominal heating capacity (**) | kW | 256,5 | 295,7 | 329,8 | 363,9 |
| Compressor | | | | | |
| Quantity/Refrigerant circuits | n° | 4/2 | 4/2 | 4/2 | 4/2 |
| Cooling power input(*) | kW | 49,3 | 56,9 | 63 | 69 |
| Heating power input(**) | kW | 63,4 | 73 | 81,2 | 89,3 |
| Capacity steps | % | 0-25-50-75-100 | 0-25-50-75-100 | 0-25-50-75-100 | 0-25-50-75-100 |
| Evaporator characteristics | | | | | |
| Water flow rate | l/s | 10,117 | 11,641 | 12,915 | 14,190 |
| Water pressure drop | kPa | 41,4 | 37,0 | 35,0 | 36,1 |
| Condenser characteristics | | | | | |
| Water flow rate | l/s | 12,471 | 14,361 | 15,924 | 17,487 |
| Water pressure drop | kPa | 27,7 | 30,0 | 31,9 | 28,5 |
| Noise level (***) | | | | | |
| Basic unit | dB(A) | 78,0 | 78,5 | 59,2 | 79,5 |
| LN version | dB(A) | 61,0 | 61,8 | 62,1 | 62,5 |
| Power supply | V/ph/Hz | 400/3~/50 | 400/3~/50 | 400/3~/50 | 400/3~/50 |
| Dimensions and weight | | | | | |
| Width | mm | 2726 | 2726 | 2726 | 2726 |
| Depth | mm | 945 | 945 | 945 | 945 |
| Height | mm | 1700 | 1700 | 1700 | 1700 |
| Operating weight | kg | 1116 | 1262 | 1286 | 1340 |

(*) Evaporator inlet/outlet water temperature 12-7°C; condenser inlet/outlet water temperature 30-35°C.

(**) Condenser inlet/outlet water temperature 40-45°C; evaporator inlet/outlet water temperature 10-15°C.

(***) Sound pressure levels measured in free field conditions at 1m from the unit, according to ISO 3746.

This datasheet gives the characteristic data of the basic and standard versions of the series; for details refer to the specific documentation