



Compliant with Regulation (EU) No.
327/2011

Fan Coil Unit
Cassette SkyStar
SK
SK-ECM
SK-Jumbo-ECM
TECHNICAL MANUAL



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Sabiana take part to the Eurovent program of fan coil performance certification. The official figures are published in the web site www.eurovent-certification.com. The tested performances are:

Total cooling emission at the following conditions:

| | | |
|---------------------|--------------|---------------|
| • water temperature | +7 °C E.W.T. | +12 °C L.W.T. |
| • air temperature | +27 °C d.b. | +19 °C w.b. |

Heating emission (2 pipe units) at the following conditions:

| | | |
|---------------------|---------------|---------------|
| • water temperature | +45 °C E.W.T. | +40 °C L.W.T. |
| • air temperature | +20 °C | |

Static pressure Fan absorption

Sensible cooling emission at the following conditions:

| | | |
|---------------------|--------------|---------------|
| • water temperature | +7 °C E.W.T. | +12 °C L.W.T. |
| • air temperature | +27 °C d.b. | +19 °C w.b. |

Heating emission (4 pipe units) at the following conditions:

| | | |
|---------------------|---------------|---------------|
| • water temperature | +65 °C E.W.T. | +55 °C L.W.T. |
| • air temperature | +20 °C | |

Water side pressure drop Sound power

INTRODUCTION

The Cassette fan coil units **SkyStar** serie (7 sizes), **SkyStar ECM** serie (5 sizes) and **SkyStar Jumbo ECM** (2 sizes) are the result of an extended technical and design development aimed at achieving the highest level in terms of performance, silent operation and control possibility.

The full SkyStar range has an innovative and beautiful design, high control flexibility and extremely easy maintenance, all this achieving the highest level in terms of performance suited to all dimension environments.

The air diffuser has an highly attractive aesthetical appearance, very innovative, and is also able to offer the best air distribution performance thanks to long computer studies and laboratory tests.

The standard colour is RAL 9003, other colours available on request.

All the models allow the best outcome in terms of quietness and of price/performance ratio.

Every unit can be supplied with 1 coil (2 pipe system) and a possible electric heater or with 2 coils (4 pipe system).

The Cassette is fitted with inlets for fresh air to be mixed with return air inside the unit.

The float switch centrifugal pump is particularly silent, with 650 mm of maximum head.

In addition to temperature and speed standard controls, automatic speed selection is also available. More than one unit can be connected to a single control.

All the units can be supplied in **MB** version. This version includes a wide range of controls, including the infra-red remote control, which allows managing one single unit or one or more groups of units by using the Modbus RTU - RS 485 communication protocol. The units can be connected to the most common automatic building management systems.

With the SkyStar Jumbo ECM MB version serie it is possible to control at the same time the (motorized) outlet louvers with the remote-control or with the T-MB2 wall control.

The outlet louvers position themselves automatically according to the selected operation (summer-winter) and can be managed with the swing mode, that guarantees a complete air distribution in the environment.

ECM version

The **SkyStar ECM** and **SkyStar Jumbo ECM** series use an innovative brushless synchronous permanent

magnet electric motor controlled by an inverter board that is directly installed on the unit.

The air flow can be varied continuously with a 1-10 V signal from Sabiana controls or by independent controllers (programmable controllers with a 1-10 V output).

The extreme efficiency, also at a low speed, makes possible a great reduction in electric consumption (more than 75% less in comparison to a traditional motor) with absorption values, under normal operating conditions, that are no greater than a 10 Watt for **SkyStar ECM** serie and than 20 Watt for **SkyStar Jumbo ECM** serie.

The brushless motor is characterised by a constant synchronous speed, independently of the applied load, that depends only on the motor power supply frequency, which is modulated by the inverter.

It consumes less because:

- the motor always works at its point of maximum efficiency
- in the brushless motor, the rotor's permanent magnets generate the magnetising power autonomously
- the motor always operates at the synchronous speed, as a result there are no induced currents that reduce efficiency.

The main advantages are:

- large reduction in energy consumption, thanks to an optimal response to the thermal load of the environment during every moment of the day
- operating silence at all rotation speeds
- ability to operate at any rotation speed.

MAIN COMPONENTS



Air diffuser

Intake grids, frame and adjustable air distribution louvers on each side, made from ABS.

- **HTA** version: white ABS, RAL 9003.
- **HTB** version: with intake grid, frame and louvers, choice of one colour only.
- **HTC** version: with intake grid and louvers, choice of one colour, plus white ABS frame RAL 9003.
- **HTD** version: with louvers, choice of one colour, while the grid and frame are made from ABS, RAL 9003.
- **MD-600 / MD-800** version: metal diffuser painted in RAL 9003 white colour, with 600x600 / 800x800 dimension, to perfectly fit into the false ceiling standard modules without overlapping parts.

Inner casing

It is made of galvanized steel with internal thermal insulation with polyolefin (PO) foam (B-s2-d0 EN 13501-01) and external anti-condensate lining.

Control panel

Made of an external box with the control electronic board with an easily accessible terminal board.

Fan assembly

The fan assembly, which is mounted on anti-vibrating supports, is extremely silent.

The radial fan has been designed to optimise performance, using wing profile blades with a shape that reduces turbulence, increasing efficiency and reducing noise.

The motor is single phase 230 V / 50 Hz supply, class B insulation and integrated Klixon thermal contact for motor protection.

The units are supplied with 3 standard speeds connected and it is possible to change them on site if necessary.

Coil

Made of copper tubes with bonded aluminium fins for maximum transfer contact.

1, 2 or 3 row coil for 2 pipe models and 2+1 row coil for 4 pipe models (the heating row is on the inside part of the coil).

For 4 pipe systems two versions are available: the SK 04, SK 14, SK 24, SK 34, SK 44, SK 54, SK 64 serie supply an higher heating emission; and the SK 26, SK 36, SK 56, SK 66 serie supply an higher cooling emission.

The coil is not suitable for use in corrosive atmosphere or in environments where aluminium may be subject to corrosion.

Condensate collection tray

High density ABS polystyrene foam condensate tray, shaped in order to optimize the air diffusion.

Fire retardant rating B1 to DIN 4102.

Filter

Synthetic washable filter, easily removable.

Condensate pump

Float switch centrifugal pump with 650 mm of maximum head, integral to the unit and wired to the control panel on the outside of the casing.

The version with available pressure 1000 mm can be supplied on demand.

Valve set

Two or three way valves for ON/OFF operation, with pipe mounting kit and lockshields.

EUROVENT CERTIFICATION



2 pipe system

The following standard rating conditions are used:

COOLING

Entering air temperature: + 27 °C d.b. + 19 °C w.b.
 Water temperature: +7 °C E.W.T. +12 °C L.W.T.

HEATING

Entering air temperature: + 20 °C
 Water temperature: +45 °C E.W.T. +40 °C L.W.T.

| MODEL | Speed | SK 02 | | | SK 12 | | | SK 22 | | | SK 32 | | |
|--|-------------------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|
| | | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| Eurovent certified performances. | | MIN | MED | MAX | MIN | MED | MAX | MIN | MED | MAX | MIN | MED | MAX |
| | | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) |
| Air flow | m ³ /h | 310 | 420 | 610 | 310 | 420 | 520 | 320 | 500 | 710 | 430 | 610 | 880 |
| Cooling total emission (E) | kW | 1,25 | 1,60 | 1,92 | 1,82 | 2,31 | 2,64 | 2,23 | 3,30 | 4,26 | 2,91 | 3,82 | 4,93 |
| Cooling sensible emission (E) | kW | 0,99 | 1,29 | 1,58 | 1,33 | 1,72 | 2,00 | 1,55 | 2,35 | 3,11 | 2,05 | 2,75 | 3,65 |
| Heating emission (E) | kW | 1,38 | 1,80 | 2,24 | 1,85 | 2,42 | 2,80 | 2,12 | 3,28 | 4,37 | 2,85 | 3,85 | 5,15 |
| Dp Cooling (E) | kPa | 4,5 | 7,0 | 10,0 | 4,9 | 7,6 | 9,7 | 6,4 | 13,0 | 20,9 | 7,5 | 12,4 | 19,7 |
| Dp Heating (E) | kPa | 4,4 | 7,2 | 10,7 | 4,3 | 6,9 | 9,0 | 2,8 | 6,1 | 10,2 | 6,2 | 10,6 | 17,8 |
| Sound power (Lw) (E) | dB(A) | 33 | 40 | 49 | 33 | 40 | 45 | 33 | 45 | 53 | 41 | 49 | 59 |
| Sound pressure (Lp) ⁽¹⁾ | dB(A) | 24 | 31 | 40 | 24 | 31 | 36 | 24 | 36 | 44 | 32 | 40 | 50 |
| Fan (E) | W | 25 | 32 | 57 | 25 | 32 | 44 | 25 | 44 | 68 | 32 | 57 | 90 |
| Current absorbed | A | 0,11 | 0,15 | 0,27 | 0,11 | 0,15 | 0,20 | 0,11 | 0,20 | 0,32 | 0,15 | 0,27 | 0,45 |
| Condensate drain pump power absorption | W | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Water content | l | 0,8 | 0,8 | 0,8 | 1,4 | 1,4 | 1,4 | 2,1 | 2,1 | 2,1 | 2,1 | 2,1 | 2,1 |
| Length | mm | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 |
| Depth | mm | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 |
| Height | mm | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 |

| MODEL | Speed | SK 42 | | | SK 52 | | | SK 62 | | |
|--|-------------------|-------|------|------|-------|------|------|-------|------|-------|
| | | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| Eurovent certified performances. | | MIN | MED | MAX | MIN | MED | MAX | MIN | MED | MAX |
| | | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) |
| Air flow | m ³ /h | 630 | 820 | 1140 | 710 | 970 | 1500 | 710 | 1280 | 1820 |
| Cooling total emission (E) | kW | 4,18 | 4,86 | 6,08 | 5,27 | 6,72 | 9,39 | 5,27 | 8,36 | 10,93 |
| Cooling sensible emission (E) | kW | 3,00 | 3,53 | 4,51 | 3,42 | 4,42 | 6,36 | 3,67 | 6,00 | 8,08 |
| Heating emission (E) | kW | 4,27 | 5,03 | 6,50 | 4,92 | 6,40 | 9,23 | 5,12 | 8,55 | 11,72 |
| Dp Cooling (E) | kPa | 10,9 | 14,3 | 21,6 | 9,4 | 14,7 | 26,9 | 9,4 | 21,8 | 35,6 |
| Dp Heating (E) | kPa | 7,0 | 9,4 | 15,0 | 7,1 | 11,4 | 22,0 | 7,6 | 19,2 | 33,8 |
| Sound power (Lw) (E) | dB(A) | 33 | 40 | 48 | 34 | 40 | 53 | 34 | 48 | 58 |
| Sound pressure (Lp) ⁽¹⁾ | dB(A) | 24 | 31 | 39 | 25 | 31 | 44 | 25 | 39 | 49 |
| Fan (E) | W | 33 | 48 | 77 | 42 | 63 | 120 | 42 | 95 | 170 |
| Current absorbed | A | 0,15 | 0,23 | 0,36 | 0,18 | 0,28 | 0,53 | 0,18 | 0,42 | 0,74 |
| Condensate drain pump power absorption | W | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Water content | l | 3,0 | 3,0 | 3,0 | 4,0 | 4,0 | 4,0 | 4,0 | 4,0 | 4,0 |
| Length | mm | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 |
| Depth | mm | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 |
| Height | mm | 303 | 303 | 303 | 303 | 303 | 303 | 303 | 303 | 303 |

(E) Eurovent certified performance.

(1) The sound pressure levels are 9 dB (A) lower than the sound power levels, apply to the reverberant field of a 100 m³ room and a reverberation time of 0.5 sec.

4 pipe system



The following standard rating conditions are used:

COOLING

Entering air temperature: + 27 °C d.b. + 19 °C w.b.

Water temperature: +7 °C E.W.T. +12 °C L.W.T.

HEATING

Entering air temperature: + 20 °C

Water temperature: +65 °C E.W.T. +55 °C L.W.T.

| MODEL | Speed | SK 04 | | | SK 14 | | | SK 24 | | | SK 26 | | | SK 34 | | | SK 36 | | |
|--|-------------------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|
| | | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| | | MIN | MED | MAX | MIN | MED | MAX | MIN | MED | MAX | MIN | MED | MAX | MIN | MED | MAX | MIN | MED | MAX |
| Eurovent certified performances. | | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) |
| Air flow | m ³ /h | 310 | 420 | 610 | 310 | 420 | 520 | 320 | 500 | 710 | 320 | 500 | 710 | 430 | 610 | 880 | 430 | 610 | 880 |
| Cooling total emission (E) | kW | 1,49 | 1,93 | 2,27 | 1,83 | 2,33 | 2,66 | 1,83 | 2,61 | 3,27 | 2,07 | 3,02 | 3,86 | 2,33 | 2,96 | 3,72 | 2,69 | 3,47 | 4,44 |
| Cooling sensible emission (E) | kW | 1,13 | 1,52 | 1,84 | 1,32 | 1,68 | 1,94 | 1,32 | 1,94 | 2,49 | 1,47 | 2,20 | 2,88 | 1,72 | 2,23 | 2,88 | 1,94 | 2,56 | 3,37 |
| Heating emission (E) | kW | 1,72 | 2,23 | 2,66 | 2,13 | 2,66 | 3,04 | 2,13 | 3,04 | 3,86 | 1,73 | 2,71 | 2,91 | 2,61 | 3,33 | 4,19 | 2,14 | 2,66 | 3,29 |
| Dp Cooling (E) | kPa | 6,0 | 10,0 | 13,5 | 4,6 | 6,9 | 8,8 | 4,6 | 8,8 | 13,4 | 4,0 | 7,0 | 10,5 | 7,2 | 11,2 | 17,0 | 6,0 | 9,0 | 14,0 |
| Dp Heating (E) | kPa | 5,2 | 8,3 | 11,4 | 4,6 | 6,8 | 8,7 | 4,6 | 8,7 | 13,3 | 2,6 | 4,6 | 6,7 | 6,4 | 9,9 | 15,0 | 3,9 | 5,7 | 8,4 |
| Sound power (Lw) (E) | dB(A) | 33 | 40 | 49 | 33 | 40 | 45 | 33 | 45 | 53 | 33 | 45 | 53 | 41 | 49 | 59 | 41 | 49 | 59 |
| Sound pressure (Lp) ⁽¹⁾ | dB(A) | 24 | 31 | 40 | 24 | 31 | 36 | 24 | 36 | 44 | 24 | 36 | 44 | 32 | 40 | 50 | 32 | 40 | 50 |
| Fan (E) | W | 25 | 32 | 57 | 25 | 32 | 44 | 25 | 44 | 68 | 25 | 44 | 68 | 32 | 57 | 90 | 32 | 57 | 90 |
| Current absorbed | A | 0,11 | 0,15 | 0,27 | 0,11 | 0,15 | 0,20 | 0,11 | 0,20 | 0,32 | 0,11 | 0,20 | 0,32 | 0,15 | 0,27 | 0,45 | 0,15 | 0,27 | 0,45 |
| Condensate drain pump power absorption | W | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Cooling water content | l | 1,0 | 1,0 | 1,0 | 1,4 | 1,4 | 1,4 | 1,4 | 1,4 | 1,4 | 1,7 | 1,7 | 1,7 | 1,4 | 1,4 | 1,4 | 1,7 | 1,7 | 1,7 |
| Heating water content | l | 0,6 | 0,6 | 0,6 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,5 | 0,5 | 0,5 | 0,7 | 0,7 | 0,7 | 0,5 | 0,5 | 0,5 |
| Length | mm | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 |
| Depth | mm | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 |
| Height | mm | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 |

| MODEL | Speed | SK 44 | | | SK 54 | | | SK 56 | | | SK 64 | | | SK 66 | | |
|--|-------------------|-------|------|------|-------|------|------|-------|------|------|-------|------|-------|-------|------|-------|
| | | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| | | MIN | MED | MAX | MIN | MED | MAX | MIN | MED | MAX | MIN | MED | MAX | MIN | MED | MAX |
| Eurovent certified performances. | | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) | (E) |
| Air flow | m ³ /h | 630 | 820 | 1140 | 710 | 970 | 1500 | 710 | 970 | 1500 | 710 | 1280 | 1820 | 710 | 1280 | 1820 |
| Cooling total emission (E) | kW | 4,11 | 4,98 | 6,26 | 4,48 | 5,60 | 7,59 | 4,95 | 6,27 | 8,65 | 4,48 | 6,84 | 8,72 | 4,95 | 7,75 | 10,03 |
| Cooling sensible emission (E) | kW | 2,93 | 3,60 | 4,61 | 3,21 | 4,09 | 5,71 | 3,49 | 4,49 | 6,37 | 3,21 | 5,09 | 6,67 | 3,49 | 5,64 | 7,51 |
| Heating emission (E) | kW | 5,21 | 6,33 | 8,02 | 5,69 | 7,15 | 9,66 | 4,59 | 5,63 | 7,50 | 5,69 | 8,80 | 11,16 | 4,59 | 6,78 | 8,58 |
| Dp Cooling (E) | kPa | 8,8 | 12,5 | 18,9 | 10,3 | 15,4 | 26,9 | 9,0 | 14,0 | 25,0 | 10,3 | 22,1 | 34,7 | 9,0 | 20,0 | 32,0 |
| Dp Heating (E) | kPa | 7,9 | 11,2 | 17,2 | 9,3 | 14,0 | 24,0 | 4,9 | 7,0 | 11,8 | 9,3 | 20,3 | 31,2 | 4,9 | 9,9 | 15,0 |
| Sound power (Lw) (E) | dB(A) | 33 | 40 | 48 | 34 | 40 | 53 | 34 | 40 | 53 | 34 | 48 | 58 | 34 | 48 | 58 |
| Sound pressure (Lp) ⁽¹⁾ | dB(A) | 24 | 31 | 39 | 25 | 31 | 44 | 25 | 31 | 44 | 25 | 39 | 49 | 25 | 39 | 49 |
| Fan (E) | W | 33 | 48 | 77 | 42 | 63 | 120 | 42 | 63 | 120 | 42 | 95 | 170 | 42 | 95 | 170 |
| Current absorbed | A | 0,15 | 0,23 | 0,36 | 0,18 | 0,28 | 0,53 | 0,18 | 0,28 | 0,53 | 0,18 | 0,42 | 0,74 | 0,18 | 0,42 | 0,74 |
| Condensate drain pump power absorption | W | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Cooling water content | l | 3,0 | 3,0 | 3,0 | 3,0 | 3,0 | 3,0 | 3,6 | 3,6 | 3,6 | 3,0 | 3,0 | 3,0 | 3,6 | 3,6 | 3,6 |
| Heating water content | l | 1,4 | 1,4 | 1,4 | 1,4 | 1,4 | 1,4 | 1,0 | 1,0 | 1,0 | 1,4 | 1,4 | 1,4 | 1,1 | 1,1 | 1,1 |
| Length | mm | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 |
| Depth | mm | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 |
| Height | mm | 303 | 303 | 303 | 303 | 303 | 303 | 303 | 303 | 303 | 303 | 303 | 303 | 303 | 303 | 303 |

(E) Eurovent certified performance.

(1) The sound pressure levels are 9 dB (A) lower than the sound power levels, apply to the reverberant field of a 100 m³ room and a reverberation time of 0.5 sec.

COOLING EMISSION

Models with single coil (2 pipe installations)

Entering air temperature: +27 °C d.b. – +19 °C w.b.

| Model | Vn | Qv m ³ /h | WT: 7 / 12 °C | | | WT: 8 / 13 °C | | | WT: 9 / 14 °C | | | WT: 12 / 17 °C | | | |
|-------|----|-------------------------|---------------|----------|-----------|---------------|----------|-----------|---------------|----------|-----------|----------------|----------|-----------|------|
| | | | Pc kW | Ps kW | Qw l/h | Pc kW | Ps kW | Qw l/h | Pc kW | Ps kW | Qw l/h | Pc kW | Ps kW | Qw l/h | |
| SK 02 | 3 | MAX | 610 | 1,92 | 1,58 | 340 | 1,75 | 1,50 | 310 | 1,41 | 1,39 | 254 | 1,10 | 1,10 | 199 |
| | 2 | MED | 420 | 1,60 | 1,29 | 280 | 1,42 | 1,19 | 250 | 1,22 | 1,16 | 210 | 0,90 | 0,90 | 160 |
| | 1 | MIN | 310 | 1,25 | 0,99 | 219 | 1,09 | 0,88 | 191 | 0,96 | 0,89 | 165 | 0,69 | 0,69 | 123 |
| SK 12 | 3 | MAX | 520 | 2,64 | 2,00 | 462 | 2,34 | 1,82 | 409 | 2,10 | 1,75 | 362 | 1,43 | 1,43 | 252 |
| | 2 | MED | 420 | 2,31 | 1,72 | 403 | 2,05 | 1,58 | 358 | 1,84 | 1,50 | 317 | 1,25 | 1,25 | 220 |
| | 1 | MIN | 310 | 1,82 | 1,30 | 317 | 1,62 | 1,22 | 282 | 1,61 | 1,29 | 276 | 1,07 | 1,07 | 188 |
| SK 22 | 3 | MAX | 710 | 4,26 | 3,11 | 745 | 3,81 | 2,87 | 668 | 3,59 | 2,87 | 617 | 2,37 | 2,37 | 420 |
| | 2 | MED | 500 | 3,30 | 2,35 | 575 | 2,97 | 2,18 | 518 | 2,81 | 2,18 | 483 | 1,82 | 1,82 | 319 |
| | 1 | MIN | 320 | 2,23 | 1,55 | 387 | 2,01 | 1,43 | 350 | 2,03 | 1,53 | 349 | 1,29 | 1,29 | 225 |
| SK 32 | 3 | MAX | 880 | 4,93 | 3,65 | 863 | 4,38 | 3,35 | 769 | 4,03 | 3,29 | 694 | 2,70 | 2,70 | 479 |
| | 2 | MED | 610 | 3,82 | 2,75 | 667 | 3,44 | 2,55 | 601 | 3,25 | 2,57 | 559 | 2,13 | 2,13 | 376 |
| | 1 | MIN | 430 | 2,91 | 2,05 | 506 | 2,62 | 1,90 | 456 | 2,50 | 1,92 | 430 | 1,62 | 1,62 | 283 |
| SK 42 | 3 | MAX | 1140 | 6,08 | 4,40 | 1060 | 5,39 | 4,14 | 940 | 4,88 | 3,95 | 840 | 3,25 | 3,25 | 573 |
| | 2 | MED | 820 | 4,86 | 3,45 | 845 | 4,33 | 3,25 | 753 | 3,92 | 3,09 | 674 | 2,58 | 2,58 | 453 |
| | 1 | MIN | 630 | 4,18 | 2,94 | 722 | 3,73 | 2,76 | 647 | 3,37 | 2,62 | 580 | 2,20 | 2,20 | 384 |
| SK 52 | 3 | MAX | 1500 | 9,39 | 6,36 | 1635 | 8,48 | 6,33 | 1480 | 7,57 | 5,99 | 1301 | 5,00 | 5,00 | 880 |
| | 2 | MED | 970 | 6,72 | 4,42 | 1166 | 6,10 | 4,41 | 1060 | 5,46 | 4,15 | 939 | 3,50 | 3,50 | 612 |
| | 1 | MIN | 710 | 5,27 | 3,42 | 913 | 4,79 | 3,40 | 830 | 4,30 | 3,20 | 740 | 2,48 | 2,48 | 434 |
| SK 62 | 3 | MAX | 1820 | 10,93 | 7,90 | 1909 | 9,83 | 7,48 | 1721 | 8,78 | 7,11 | 1511 | 5,90 | 5,90 | 1044 |
| | 2 | MED | 1280 | 8,36 | 5,89 | 1454 | 7,59 | 5,59 | 1321 | 6,75 | 5,27 | 1162 | 4,42 | 4,42 | 775 |
| | 1 | MIN | 710 | 5,27 | 3,60 | 913 | 4,79 | 3,40 | 830 | 4,30 | 3,20 | 740 | 2,48 | 2,48 | 434 |

WT: Water temperature
Vn: Nominal speeds
Qv: Air flow
Pc: Cooling total emission
Ps: Cooling sensible emission
Qw: Water flow rate

Models with double coil (4 pipe installations)

Note: the SK 26-36-56-66 versions are equipped with an extra cold battery.

Entering air temperature: +27 °C d.b. – +19 °C w.b.

| Model | Vn | Qv m ³ /h | WT: 7 / 12 °C | | | WT: 8 / 13 °C | | | WT: 9 / 14 °C | | | WT: 12 / 17 °C | | | |
|-------|----|-------------------------|---------------|----------|-----------|---------------|----------|-----------|---------------|----------|-----------|----------------|----------|-----------|-----|
| | | | Pc kW | Ps kW | Qw l/h | Pc kW | Ps kW | Qw l/h | Pc kW | Ps kW | Qw l/h | Pc kW | Ps kW | Qw l/h | |
| SK 04 | 3 | MAX | 610 | 2,27 | 1,84 | 401 | 2,04 | 1,73 | 361 | 1,78 | 1,69 | 307 | 1,33 | 1,33 | 239 |
| | 2 | MED | 420 | 1,93 | 1,52 | 337 | 1,73 | 1,43 | 303 | 1,51 | 1,37 | 260 | 1,11 | 1,11 | 196 |
| | 1 | MIN | 310 | 1,49 | 1,13 | 260 | 1,34 | 1,06 | 234 | 1,17 | 1,02 | 201 | 0,84 | 0,84 | 148 |
| SK 14 | 3 | MAX | 520 | 2,66 | 1,94 | 465 | 2,36 | 1,82 | 413 | 2,18 | 1,79 | 374 | 1,47 | 1,47 | 260 |
| | 2 | MED | 420 | 2,33 | 1,68 | 405 | 2,06 | 1,57 | 360 | 1,80 | 1,44 | 309 | 1,19 | 1,19 | 210 |
| | 1 | MIN | 310 | 1,83 | 1,32 | 318 | 1,63 | 1,21 | 284 | 1,55 | 1,22 | 267 | 1,01 | 1,01 | 177 |
| SK 24 | 3 | MAX | 710 | 3,27 | 2,49 | 574 | 2,88 | 2,28 | 507 | 2,72 | 2,30 | 467 | 1,85 | 1,85 | 330 |
| | 2 | MED | 500 | 2,61 | 1,94 | 455 | 2,30 | 1,78 | 404 | 2,18 | 1,79 | 374 | 1,47 | 1,47 | 260 |
| | 1 | MIN | 320 | 1,83 | 1,32 | 318 | 1,63 | 1,21 | 284 | 1,55 | 1,22 | 267 | 1,01 | 1,01 | 177 |
| SK 26 | 3 | MAX | 710 | 3,86 | 2,88 | 664 | 3,49 | 2,70 | 613 | 3,00 | 2,53 | 528 | 2,13 | 2,13 | 378 |
| | 2 | MED | 500 | 3,02 | 2,20 | 519 | 2,75 | 2,06 | 480 | 2,37 | 1,93 | 415 | 1,63 | 1,63 | 288 |
| | 1 | MIN | 320 | 2,07 | 1,47 | 355 | 1,89 | 1,37 | 329 | 1,65 | 1,29 | 287 | 1,10 | 1,10 | 192 |
| SK 34 | 3 | MAX | 880 | 3,72 | 2,88 | 656 | 3,25 | 2,62 | 574 | 2,98 | 2,56 | 512 | 2,04 | 2,04 | 366 |
| | 2 | MED | 610 | 2,96 | 2,23 | 520 | 2,62 | 2,05 | 461 | 2,40 | 2,00 | 413 | 1,61 | 1,61 | 288 |
| | 1 | MIN | 430 | 2,33 | 1,72 | 405 | 2,06 | 1,57 | 360 | 1,96 | 1,59 | 337 | 1,32 | 1,32 | 231 |
| SK 36 | 3 | MAX | 880 | 4,44 | 3,37 | 764 | 3,99 | 3,14 | 702 | 3,43 | 2,96 | 606 | 2,48 | 2,48 | 442 |
| | 2 | MED | 610 | 3,47 | 2,56 | 597 | 3,16 | 2,41 | 554 | 2,71 | 2,25 | 477 | 1,90 | 1,90 | 337 |
| | 1 | MIN | 430 | 2,69 | 1,94 | 462 | 2,45 | 1,82 | 427 | 2,12 | 1,70 | 370 | 1,46 | 1,46 | 256 |
| SK 44 | 3 | MAX | 1140 | 6,26 | 4,50 | 1090 | 5,58 | 4,25 | 973 | 5,02 | 4,04 | 864 | 3,33 | 3,33 | 586 |
| | 2 | MED | 820 | 4,98 | 3,52 | 866 | 4,46 | 3,32 | 776 | 4,02 | 3,15 | 691 | 2,63 | 2,63 | 462 |
| | 1 | MIN | 630 | 4,11 | 2,87 | 713 | 3,69 | 2,71 | 640 | 3,33 | 2,56 | 572 | 2,14 | 2,14 | 374 |
| SK 54 | 3 | MAX | 1500 | 7,59 | 5,57 | 1327 | 6,71 | 5,23 | 1175 | 6,08 | 5,02 | 1046 | 4,10 | 4,10 | 726 |
| | 2 | MED | 970 | 5,60 | 4,00 | 974 | 5,00 | 3,77 | 871 | 4,50 | 3,57 | 775 | 2,99 | 2,99 | 524 |
| | 1 | MIN | 710 | 4,48 | 3,15 | 778 | 4,01 | 2,97 | 698 | 3,62 | 2,81 | 623 | 2,35 | 2,35 | 411 |
| SK 56 | 3 | MAX | 1500 | 8,65 | 6,37 | 1488 | 8,05 | 6,05 | 1405 | 6,79 | 5,60 | 1189 | 4,74 | 4,74 | 836 |
| | 2 | MED | 970 | 6,27 | 4,49 | 1078 | 5,86 | 4,27 | 1018 | 4,98 | 3,94 | 867 | 3,35 | 3,35 | 587 |
| | 1 | MIN | 710 | 4,95 | 3,49 | 851 | 4,62 | 3,31 | 802 | 3,96 | 3,06 | 689 | 2,63 | 2,63 | 459 |
| SK 64 | 3 | MAX | 1820 | 8,72 | 6,49 | 1529 | 7,64 | 6,07 | 1344 | 6,97 | 5,98 | 1199 | 4,77 | 4,77 | 849 |
| | 2 | MED | 1280 | 6,84 | 4,96 | 1191 | 6,08 | 4,67 | 1062 | 5,48 | 4,46 | 942 | 3,66 | 3,66 | 646 |
| | 1 | MIN | 710 | 4,48 | 3,15 | 778 | 4,01 | 2,97 | 698 | 3,62 | 2,81 | 623 | 2,35 | 2,35 | 411 |
| SK 66 | 3 | MAX | 1820 | 10,03 | 7,51 | 1725 | 9,28 | 7,11 | 1625 | 7,82 | 6,60 | 1375 | 5,57 | 5,57 | 987 |
| | 2 | MED | 1280 | 7,75 | 5,64 | 1332 | 7,24 | 5,37 | 1261 | 6,11 | 4,96 | 1066 | 4,21 | 4,21 | 739 |
| | 1 | MIN | 710 | 4,95 | 3,49 | 851 | 4,62 | 3,31 | 802 | 3,96 | 3,06 | 689 | 2,63 | 2,63 | 459 |

WT: Water temperature
 Vn: Nominal speeds
 Qv: Air flow
 Pc: Cooling total emission
 Ps: Cooling sensible emission
 Qw: Water flow rate

HEATING EMISSION

Models with single coil (2 pipe installations)

Entering air temperature: +20 °C

| Model | Vn | Qv m ³ /h | WT: 80 / 70 °C | | WT: 70 / 60 °C | | WT: 60 / 50 °C | | WT: 50 / 40 °C | | WT: 45 / 40 °C | |
|-------|-------|-------------------------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|
| | | | Ph kW | Qw l/h | Ph kW | Qw l/h | Ph kW | Qw l/h | Ph kW | Qw l/h | Ph kW | Qw l/h |
| SK 02 | 3 MAX | 610 | 5,67 | 488 | 4,56 | 393 | 3,46 | 298 | 2,37 | 203 | 2,24 | 386 |
| | 2 MED | 420 | 4,55 | 391 | 3,66 | 315 | 2,78 | 239 | 1,91 | 164 | 1,80 | 310 |
| | 1 MIN | 310 | 3,47 | 298 | 2,80 | 240 | 2,13 | 183 | 1,46 | 126 | 1,38 | 237 |
| SK 12 | 3 MAX | 520 | 6,97 | 599 | 5,68 | 488 | 4,39 | 377 | 3,10 | 266 | 2,80 | 482 |
| | 2 MED | 420 | 5,96 | 513 | 4,91 | 422 | 3,80 | 327 | 2,69 | 232 | 2,42 | 417 |
| | 1 MIN | 310 | 5,12 | 441 | 4,19 | 360 | 3,25 | 279 | 2,31 | 198 | 2,07 | 356 |
| SK 22 | 3 MAX | 710 | 11,30 | 972 | 9,25 | 795 | 7,19 | 619 | 5,12 | 440 | 4,57 | 787 |
| | 2 MED | 500 | 8,48 | 730 | 6,96 | 598 | 5,43 | 467 | 3,89 | 334 | 3,45 | 593 |
| | 1 MIN | 320 | 5,87 | 505 | 4,83 | 415 | 3,79 | 326 | 2,73 | 235 | 2,39 | 412 |
| SK 32 | 3 MAX | 880 | 13,00 | 1118 | 10,63 | 914 | 8,25 | 709 | 5,86 | 504 | 5,25 | 903 |
| | 2 MED | 610 | 10,07 | 866 | 8,25 | 709 | 6,42 | 552 | 4,58 | 394 | 4,08 | 702 |
| | 1 MIN | 430 | 7,43 | 639 | 6,10 | 524 | 4,77 | 410 | 3,42 | 294 | 3,02 | 520 |
| SK 42 | 3 MAX | 1140 | 16,08 | 1383 | 13,14 | 1130 | 10,21 | 878 | 7,26 | 624 | 6,50 | 1118 |
| | 2 MED | 820 | 12,41 | 1067 | 10,16 | 874 | 7,92 | 681 | 5,65 | 486 | 5,03 | 865 |
| | 1 MIN | 630 | 10,50 | 903 | 8,61 | 741 | 6,72 | 578 | 4,82 | 415 | 4,27 | 734 |
| SK 52 | 3 MAX | 1500 | 24,08 | 2071 | 19,76 | 1699 | 15,43 | 1327 | 11,06 | 951 | 9,78 | 1683 |
| | 2 MED | 970 | 16,32 | 1403 | 13,43 | 1155 | 10,54 | 906 | 7,62 | 655 | 6,67 | 1146 |
| | 1 MIN | 710 | 12,42 | 1068 | 10,25 | 882 | 8,07 | 694 | 5,87 | 505 | 5,09 | 876 |
| SK 62 | 3 MAX | 1820 | 28,91 | 2486 | 23,68 | 2037 | 18,45 | 1586 | 13,17 | 1132 | 11,72 | 2015 |
| | 2 MED | 1280 | 21,01 | 1807 | 17,26 | 1484 | 13,50 | 1161 | 9,70 | 834 | 8,55 | 1471 |
| | 1 MIN | 710 | 12,42 | 1068 | 10,25 | 882 | 8,07 | 694 | 5,87 | 505 | 5,09 | 876 |

WT: Water temperature
 Vn: Nominal speeds
 Qv: Air flow
 Ph: Heating emission
 Qw: Water flow rate

Models with double coil (4 pipe installations)

Note: the SK 26-36-56-66 versions are equipped with an extra cold battery.

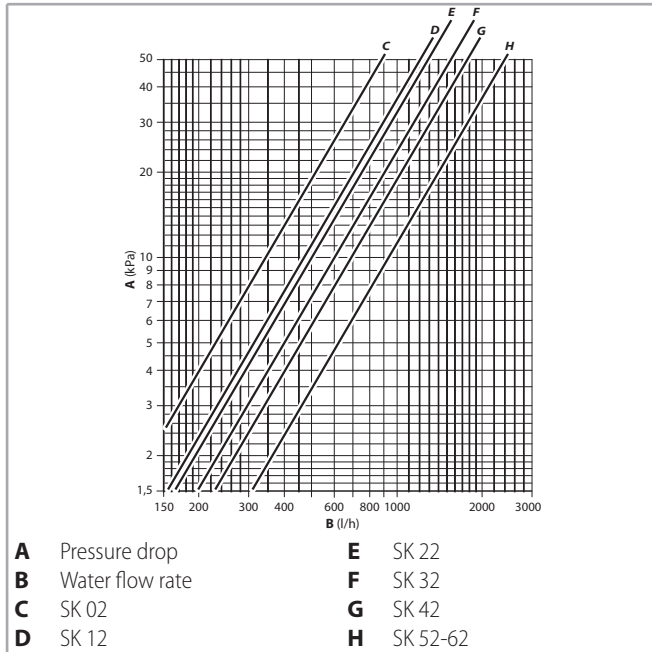
Entering air temperature: +20 °C

| Model | Vn | Qv m ³ /h | WT: 80 / 70 °C | | WT: 70 / 60 °C | | WT: 60 / 50 °C | | WT: 50 / 40 °C | | WT: 45 / 40 °C | | |
|-------|----|-------------------------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------|
| | | | Ph kW | Qw l/h | Ph kW | Qw l/h | Ph kW | Qw l/h | Ph kW | Qw l/h | Ph kW | Qw l/h | Ph kW |
| SK 04 | 3 | MAX | 610 | 3,78 | 325 | 3,03 | 261 | 2,29 | 197 | 1,56 | 134 | 1,49 | 256 |
| | 2 | MED | 420 | 3,17 | 272 | 2,54 | 219 | 1,93 | 166 | 1,31 | 113 | 1,25 | 215 |
| | 1 | MIN | 310 | 2,44 | 210 | 1,96 | 169 | 1,49 | 128 | 1,01 | 87 | 0,96 | 166 |
| SK 14 | 3 | MAX | 520 | 4,17 | 358 | 3,46 | 298 | 2,54 | 218 | 1,73 | 149 | 1,65 | 283 |
| | 2 | MED | 420 | 3,63 | 312 | 3,02 | 260 | 2,22 | 191 | 1,51 | 130 | 1,44 | 247 |
| | 1 | MIN | 310 | 2,87 | 247 | 2,43 | 209 | 1,76 | 151 | 1,20 | 103 | 1,14 | 196 |
| SK 24 | 3 | MAX | 710 | 5,17 | 444 | 4,40 | 378 | 3,14 | 270 | 2,14 | 184 | 2,04 | 351 |
| | 2 | MED | 500 | 4,07 | 350 | 3,46 | 298 | 2,48 | 214 | 1,69 | 146 | 1,61 | 277 |
| | 1 | MIN | 320 | 2,87 | 247 | 2,43 | 209 | 1,76 | 151 | 1,20 | 103 | 1,14 | 196 |
| SK 26 | 3 | MAX | 710 | 4,22 | 363 | 3,35 | 288 | 2,48 | 213 | 1,61 | 139 | 1,62 | 279 |
| | 2 | MED | 500 | 3,42 | 294 | 2,71 | 233 | 2,01 | 173 | 1,32 | 113 | 1,32 | 226 |
| | 1 | MIN | 320 | 2,49 | 214 | 1,98 | 170 | 1,47 | 127 | 0,97 | 83 | 0,96 | 165 |
| SK 34 | 3 | MAX | 880 | 5,93 | 510 | 4,95 | 426 | 3,60 | 310 | 2,45 | 211 | 2,34 | 402 |
| | 2 | MED | 610 | 4,67 | 401 | 3,97 | 341 | 2,84 | 244 | 1,94 | 166 | 1,84 | 317 |
| | 1 | MIN | 430 | 3,63 | 312 | 3,10 | 267 | 2,22 | 191 | 1,51 | 130 | 1,44 | 247 |
| SK 36 | 3 | MAX | 880 | 4,78 | 411 | 3,79 | 326 | 2,80 | 241 | 1,82 | 156 | 1,83 | 315 |
| | 2 | MED | 610 | 3,86 | 332 | 3,06 | 263 | 2,27 | 195 | 1,48 | 127 | 1,48 | 255 |
| | 1 | MIN | 430 | 3,10 | 266 | 2,46 | 212 | 1,83 | 157 | 1,20 | 103 | 1,19 | 205 |
| SK 44 | 3 | MAX | 1140 | 11,28 | 970 | 9,10 | 783 | 6,93 | 596 | 4,76 | 410 | 4,48 | 771 |
| | 2 | MED | 820 | 8,90 | 766 | 7,19 | 618 | 5,48 | 471 | 3,77 | 324 | 3,54 | 609 |
| | 1 | MIN | 630 | 7,31 | 629 | 5,91 | 508 | 4,51 | 388 | 3,11 | 267 | 2,91 | 501 |
| SK 54 | 3 | MAX | 1500 | 13,60 | 1170 | 11,00 | 946 | 8,34 | 718 | 5,73 | 493 | 5,40 | 929 |
| | 2 | MED | 970 | 10,04 | 864 | 8,10 | 697 | 6,17 | 531 | 4,25 | 365 | 3,99 | 686 |
| | 1 | MIN | 710 | 7,98 | 686 | 6,45 | 555 | 4,92 | 423 | 3,39 | 291 | 3,18 | 547 |
| SK 56 | 3 | MAX | 1500 | 10,69 | 919 | 8,56 | 736 | 6,44 | 554 | 4,33 | 493 | 4,18 | 720 |
| | 2 | MED | 970 | 8,01 | 689 | 6,42 | 552 | 4,84 | 416 | 3,27 | 365 | 3,14 | 541 |
| | 1 | MIN | 710 | 6,52 | 561 | 5,23 | 450 | 3,95 | 340 | 2,67 | 291 | 2,56 | 441 |
| SK 64 | 3 | MAX | 1820 | 15,74 | 1353 | 12,70 | 1092 | 9,64 | 829 | 6,61 | 569 | 6,24 | 1074 |
| | 2 | MED | 1280 | 12,37 | 1064 | 9,98 | 858 | 7,60 | 653 | 5,22 | 449 | 4,91 | 845 |
| | 1 | MIN | 710 | 7,98 | 686 | 6,45 | 555 | 4,92 | 423 | 3,39 | 291 | 3,18 | 547 |
| SK 66 | 3 | MAX | 1820 | 12,24 | 1053 | 9,80 | 843 | 7,36 | 633 | 6,61 | 569 | 4,79 | 824 |
| | 2 | MED | 1280 | 9,66 | 831 | 7,74 | 666 | 5,83 | 501 | 5,22 | 449 | 3,79 | 651 |
| | 1 | MIN | 710 | 6,52 | 561 | 5,23 | 450 | 3,95 | 340 | 3,39 | 291 | 2,56 | 441 |

WT: Water temperature
 Vn: Nominal speeds
 Qv: Air flow
 Ph: Heating emission
 Qw: Water flow rate

WATER SIDE PRESSURE DROP

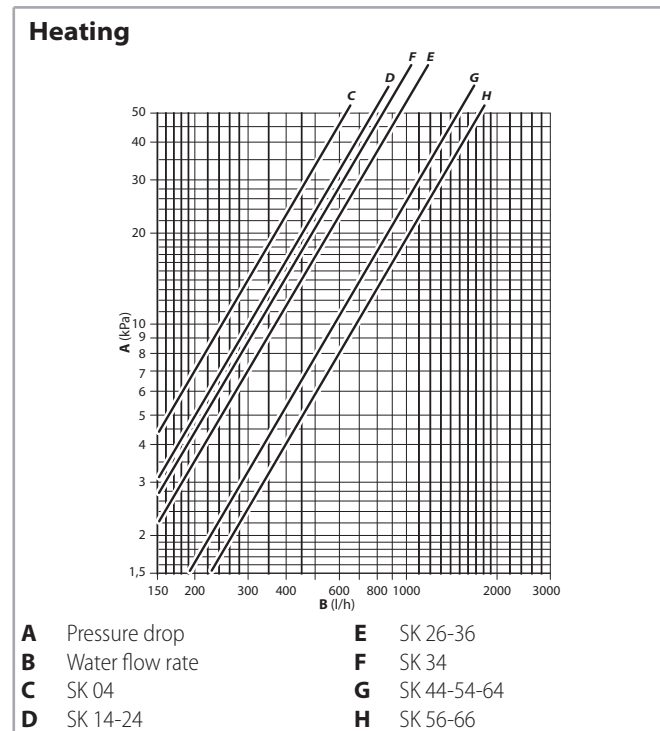
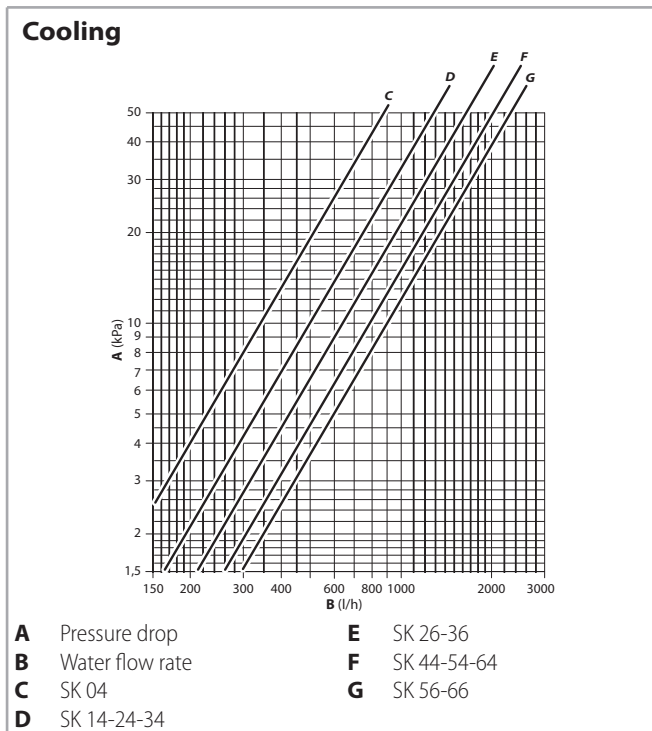
2 pipe system



The water pressure drop figures refer to a mean water temperature of 10 °C; for different temperatures, multiply the pressure drop figures by the correction factors K.

| | Mean water temperature (°C) | | | | | | |
|---------------------|-----------------------------|------|------|------|------|------|------|
| | 20 | 30 | 40 | 50 | 60 | 70 | 80 |
| K correction factor | 0,94 | 0,90 | 0,86 | 0,82 | 0,78 | 0,74 | 0,70 |

4 pipe system



The water pressure drop figures refer to a mean water temperature of 10 °C; for different temperatures, multiply the pressure drop figures by the correction factors K.

| | Mean water temperature (°C) | | | | | | |
|---------------------|-----------------------------|------|------|------|------|------|------|
| | 20 | 30 | 40 | 50 | 60 | 70 | 80 |
| K correction factor | 0,94 | 0,90 | 0,86 | 0,82 | 0,78 | 0,74 | 0,70 |

The water pressure drop figures refer to a mean water temperature of 60 °C; for different temperatures, multiply the pressure drop figures by the correction factors K.

| | Mean water temperature (°C) | | | |
|---------------------|-----------------------------|------|------|------|
| | 40 | 50 | 70 | 80 |
| K correction factor | 1,12 | 1,06 | 0,94 | 0,88 |

OPERATION LIMITS

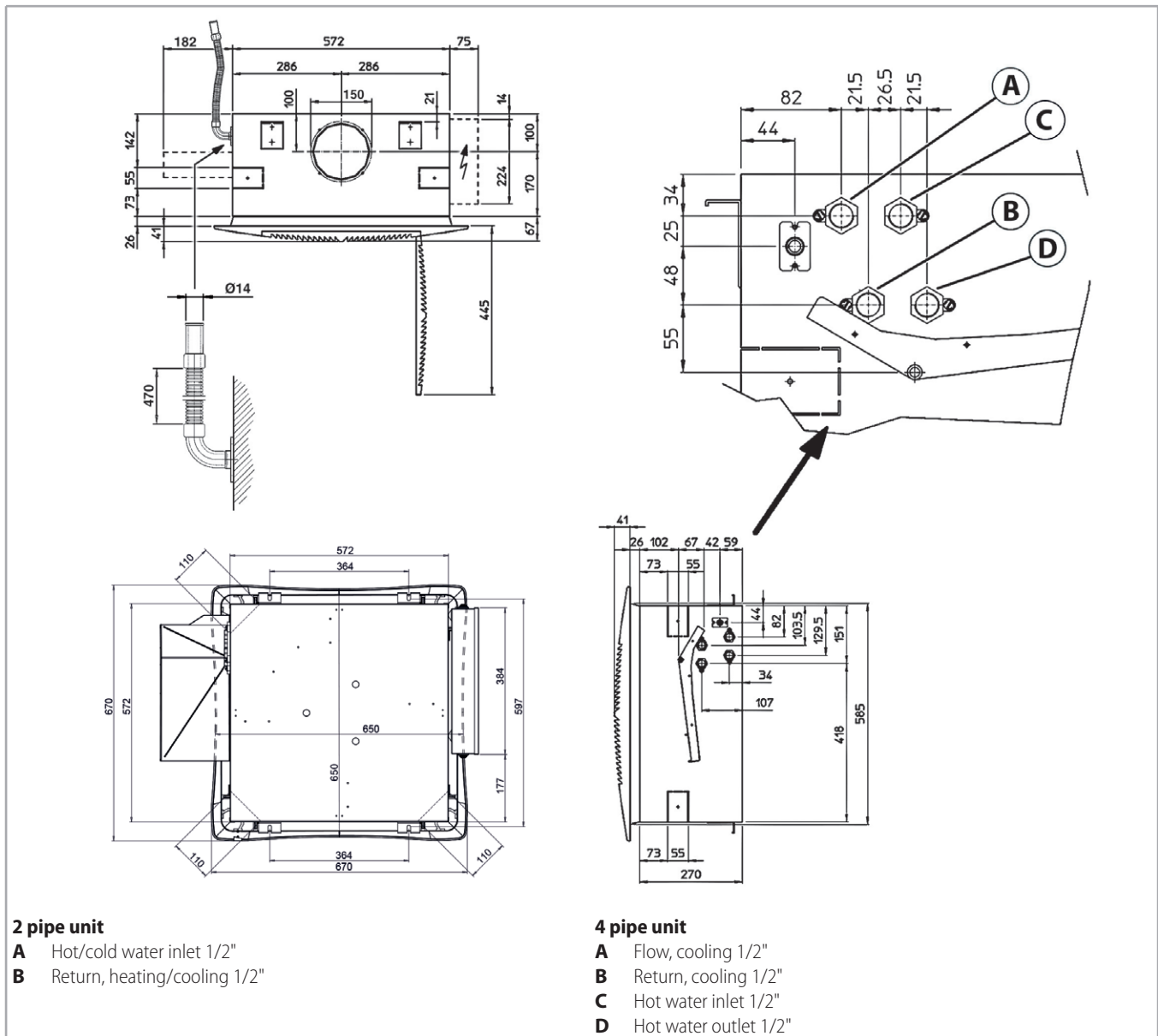
| Description | | UoM | Value |
|--------------|--------------------------------------|------|--------|
| Water flow | Coil maximum working pressure | bars | 10 |
| | | kPa | 1000 |
| | Lowest water inlet temperature | °C | +6 |
| | Highest water inlet temperature | °C | +80 |
| Power supply | Single-phase rated operating voltage | V/Hz | 230/50 |

For maximum installation height, see p. 17.

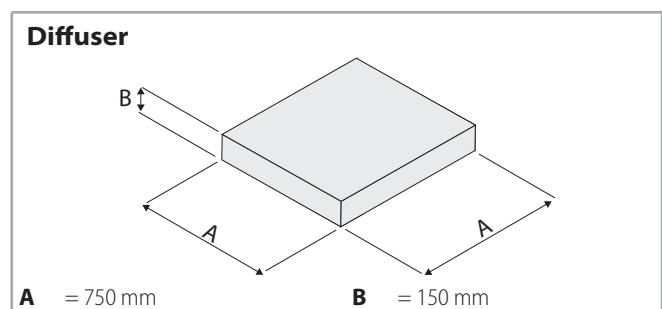
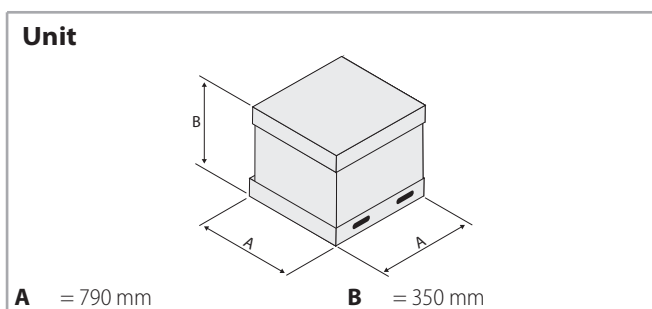


DIMENSION AND WEIGHT

SK 02-04 / SK 12-14 / SK 22-24-26 / SK 32-34-36 (600 x 600 version)



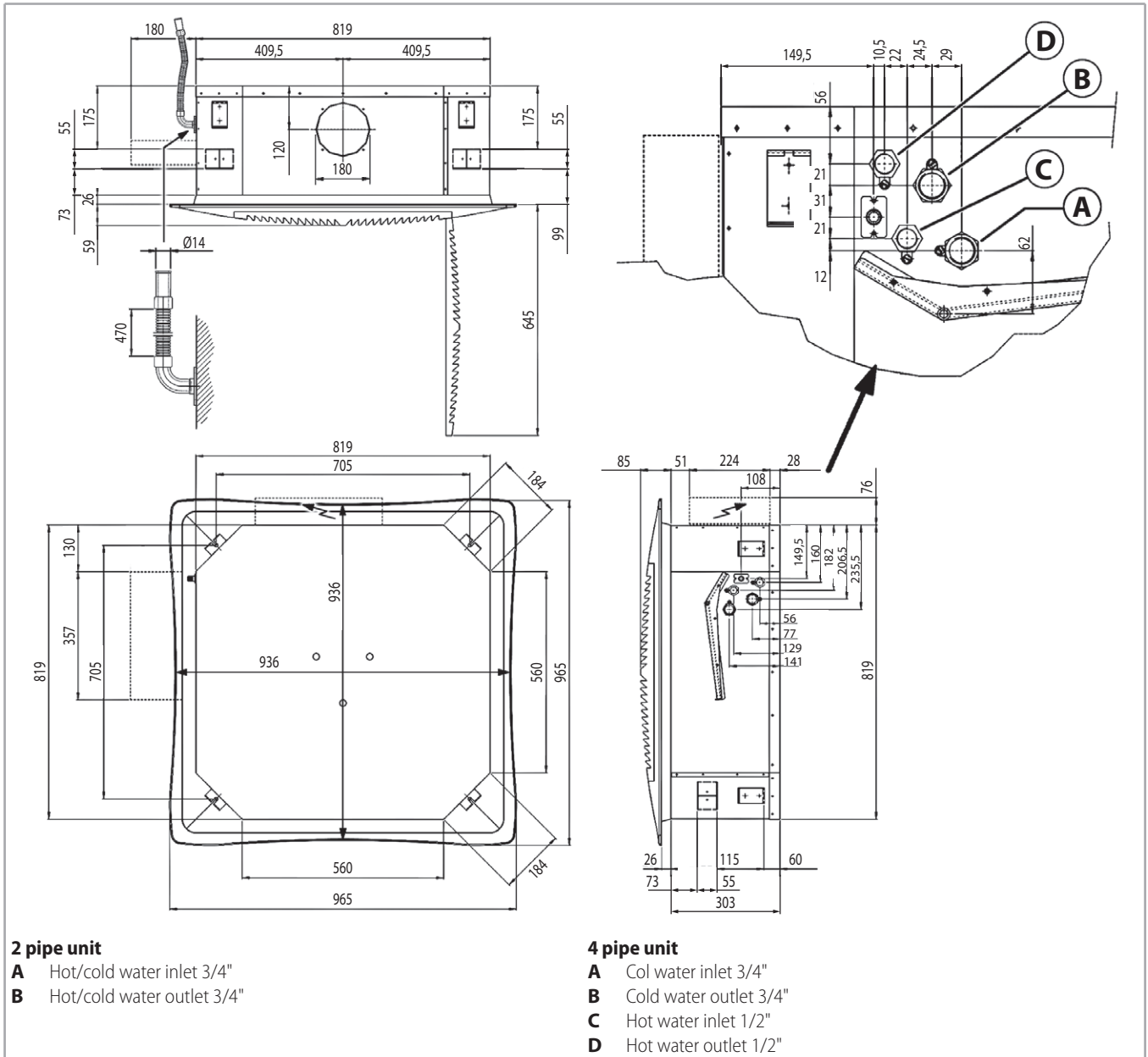
Packed unit



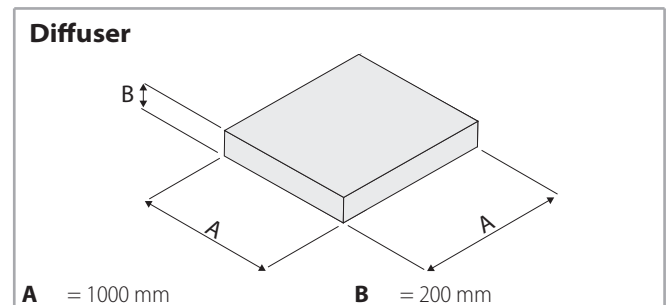
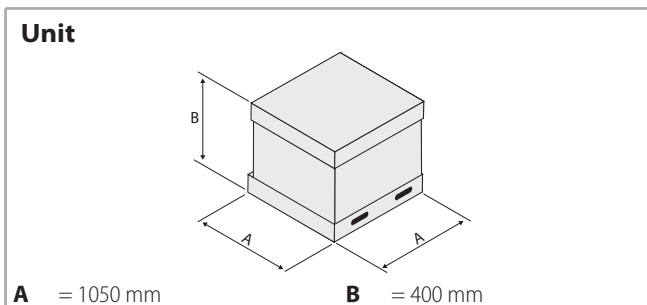
| Weight/Model | | 02-12 | 04-14 | 22-24-26 | 32-34-36 |
|-------------------|----|-------|-------|----------|----------|
| With packaging | kg | 21,0 | 22,5 | | 22,0 |
| Without packaging | kg | 18,0 | 19,5 | | 19,0 |

| Weight/Model | | 02-12 | 04-14 | 22-24-26 | 32-34-36 |
|-------------------|----|-------|-------|----------|----------|
| With packaging | kg | | | 3,5 | |
| Without packaging | kg | | | 2,5 | |

SK 42-44 / SK 52-54-56 / SK 62-64-66 (800 x 800 version)



Packed unit



| Weight/Model | | 42 | 44 | 52-54-56 | 62-64-66 |
|-------------------|----|----|----|----------|----------|
| With packaging | kg | 40 | | 44 | |
| Without packaging | kg | 35 | | 39 | |

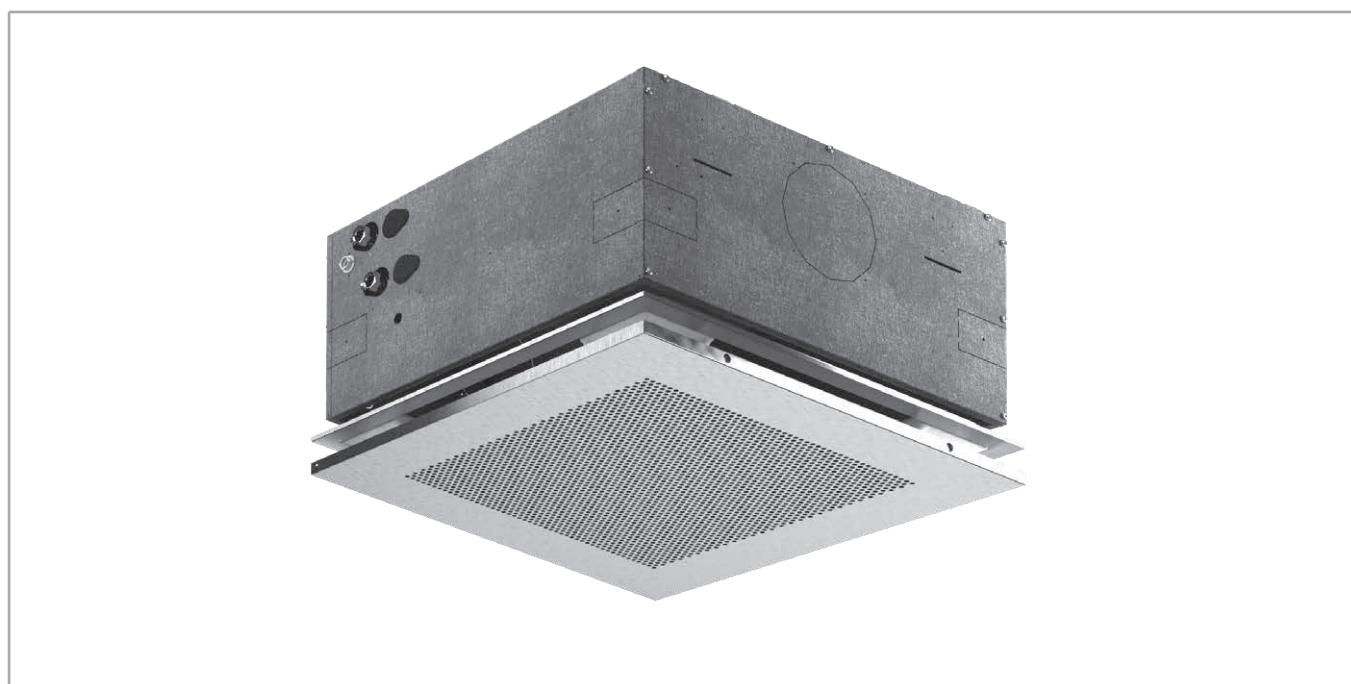
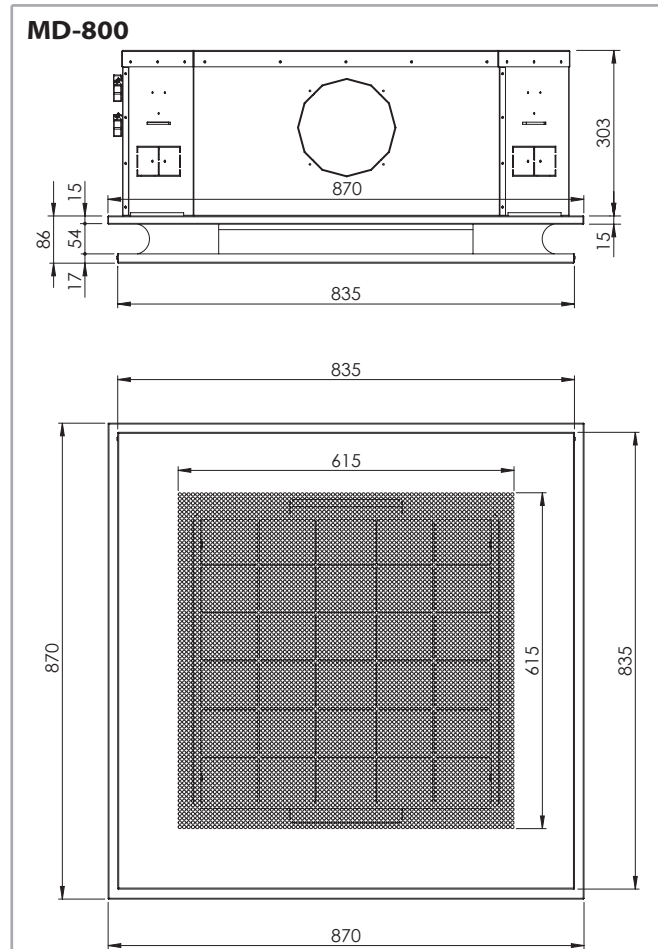
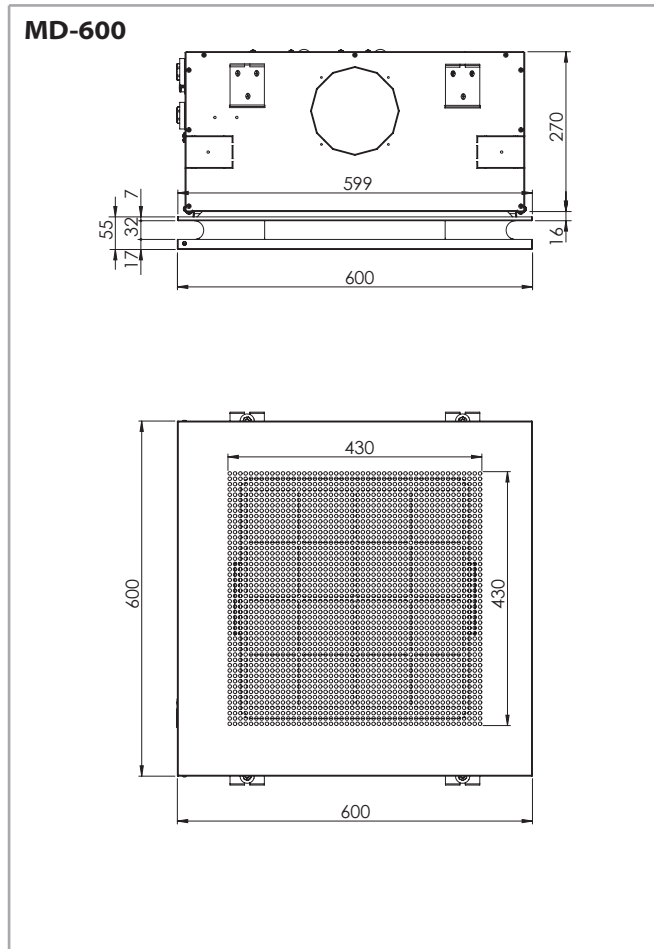
| Weight/Model | | 42 | 44 | 52-54-56 | 62-64-66 |
|-------------------|----|----|----|----------|----------|
| With packaging | kg | | | 7,0 | |
| Without packaging | kg | | | 5,5 | |

Metal air inlet grid MD 600 / MD 800

(RS receiver, Code 9066338, for metal diffuser for MB units)

Not suitable with Crystall electronic electrostatic filter.

| Model | Code |
|--------|---------|
| MD-600 | 9079420 |
| MD-800 | 9079417 |



AIR THROW

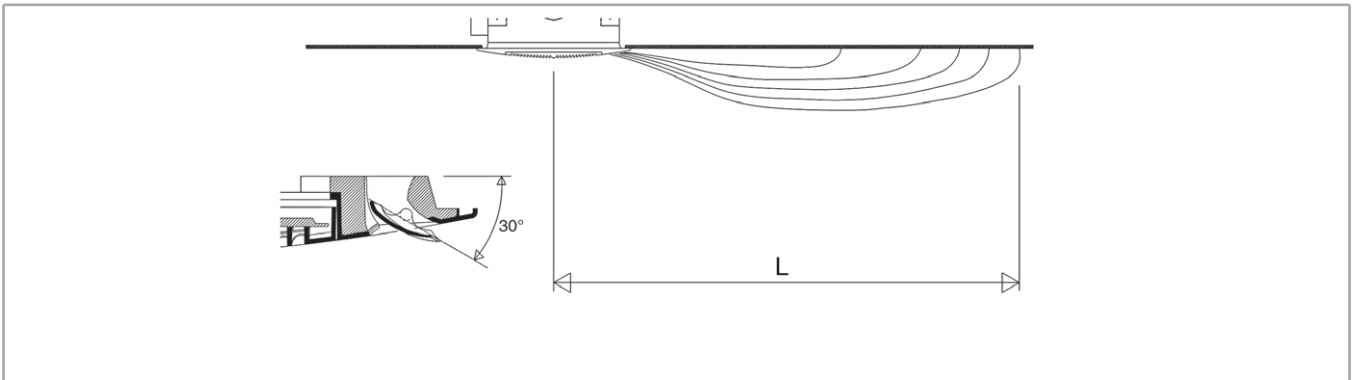
The air throw indicated in the tables must only be considered the maximum value, as it may change significantly in relation to the dimensions of the room in which the appliance is installed and the positioning of the furniture in the room.

The useful throw L refers to the distance between the unit and the point where the air speed is 0.2 m/sec; if the louver has a gradient of 30° (recommended in cooling mode), the so-called "coanda" effect will occur,

illustrated in the first figure, while at a gradient of 45° (recommended in heating mode), there will be a downwards throw, as illustrated in the second figure.

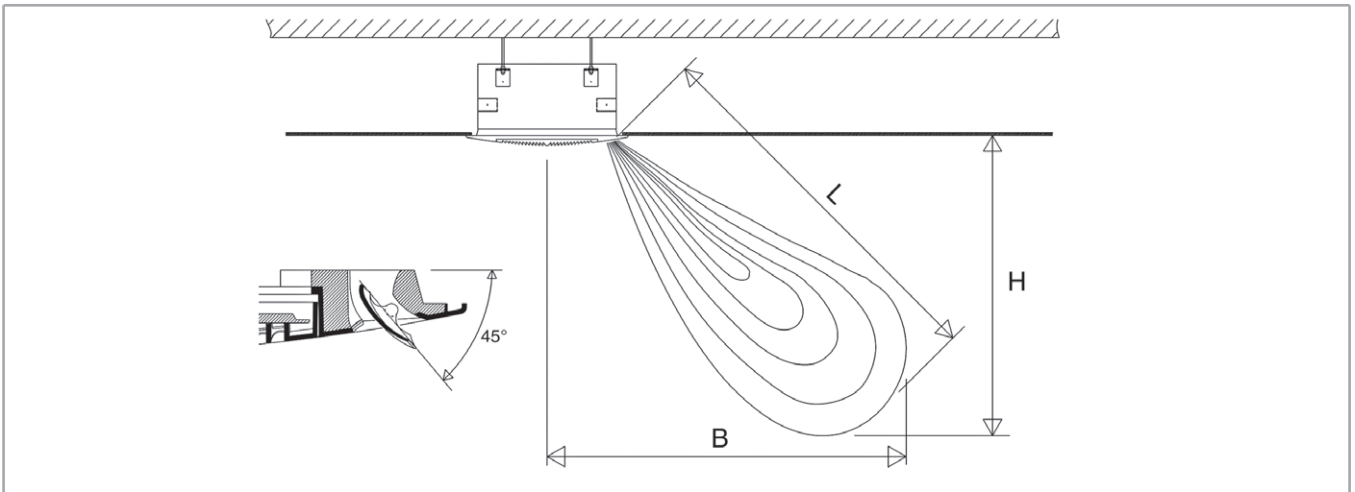
Note: on heating it must be paid attention to rooms where the floor temperature is particularly low (for example less than 5 °C). In this situation the floor can cool the lower layer of air to a level that stops the uniform diffusion of the hot air coming from the unit, decreasing the throw figures shown in the table.

With adjustable air diffusion louvers at 30°



| Model | SK 02-04-12-14 | | | SK 22-24-26 | | | SK 32-34-36 | | | SK 42-44 | | | SK 52-54-56 | | | SK 62-64-66 | | | |
|-------|----------------|-----|-----|-------------|-----|-----|-------------|-----|-----|----------|-----|-----|-------------|-----|-----|-------------|-----|-----|-----|
| | Speed | Min | Med | Max | Min | Med | Max | Min | Med | Max | Min | Med | Max | Min | Med | Max | Min | Med | Max |
| L | m | 3,0 | 3,5 | 3,8 | 3,0 | 3,8 | 4,5 | 3,5 | 4,2 | 5,0 | 3,2 | 3,7 | 4,3 | 3,4 | 4,0 | 5,0 | 3,4 | 4,6 | 5,5 |

With adjustable air diffusion louvers at 45°



| Model | SK 02-04-12-14 | | | SK 22-24-26 | | | SK 32-34-36 | | | SK 42-44 | | | SK 52-54-56 | | | SK 62-64-66 | | | |
|-------|----------------|-----|-----|-------------|-----|-----|-------------|-----|-----|----------|-----|-----|-------------|-----|-----|-------------|-----|-----|-----|
| | Speed | Min | Med | Max | Min | Med | Max | Min | Med | Max | Min | Med | Max | Min | Med | Max | Min | Med | Max |
| L | m | 3,3 | 3,9 | 4,2 | 3,3 | 4,2 | 4,8 | 3,9 | 4,5 | 5,2 | 3,5 | 4,1 | 4,8 | 3,8 | 4,6 | 5,4 | 3,8 | 5,1 | 5,8 |
| H | m | 2,2 | 2,6 | 2,8 | 2,2 | 2,8 | 3,2 | 2,6 | 3,0 | 3,4 | 2,2 | 2,6 | 3,0 | 2,4 | 2,8 | 3,4 | 2,4 | 3,1 | 3,6 |
| B | m | 2,5 | 2,9 | 3,1 | 2,5 | 3,1 | 3,6 | 2,9 | 3,4 | 3,9 | 2,7 | 3,2 | 3,8 | 3,0 | 3,6 | 4,2 | 3,0 | 4,0 | 4,6 |

CONTROLS FOR SK UNITS

All the **SkyStar SK** units can be supplied with a wide range of electronic wall controls that allows managing one single unit or several units (by using Dip-Switches or the power units).

The options range from the basic **WM-3V**, only for 3-speed control, to the highly sophisticated **WM-T**, **WM-TQR** and **T2T** electronic room thermostats, that regulate the room temperature precisely and are suitable when the user wants to set the fan speed.

The most evolved **WM-AU**, **T-MB2** and **WM-503-AC-EC** versions allow both the manual and the automatic speed switch.

Note: all the controls are described in detail in the "Fan Coil Control Range literature".

WM-3V control



230 V 50 Hz

WM-T control



230 V 50-60 Hz

WM-TQR control



230 V 50-60 Hz

WM-AU control (*)



230 V 50-60 Hz

T-MB2 control (*)



230 V 50-60 Hz

WM-503-AC-EC control (**)



230 V 50 Hz

T2T control



230 V 50-60 Hz

(*) To be used with UPM-AU or UP-AU.

(**) To be used with UP-503-AC-EC only

Control systems

See from p. 50 for:

- the MB electronic board (to be fitted on the MB version)
- the MB controls and units
- the KNX Bus System

SK-E VERSION

The 2 pipe model Cassette units are available with electric heater.

The electric heater is controlled in place of the hot water valve and not as integration to it.

The electric heaters are hermetically sealed and supplied inside the coil pipes and therefore can be only factory mounted.

The electric resistances of the units are for single phase 230V supply.

The Cassette fan coil unit includes no. 2 safety thermostats which intervene in case of internal over-heating, opening an auxiliary power relay (included in the electrical panel) which stops the power supply to the electric heaters.

Note: the cooling emission of the units is 95% of the emission in the tables of p. 8.

Constructional features of the electric heater

| Model | | SK 12 | SK 22 | SK 32 | SK 42 | SK 52 | SK 62 |
|---|---------------------|----------|-------|-------|---------|-------|-------|
| Nominal installed power | W | 1500 | | 2500 | | 3000 | |
| Single-phase rated operating voltage | Vac/Ph/Hz | 230/1/50 | | | | | |
| Connecting wires | n x mm ² | 3 x 1,5 | | | 3 x 2,5 | | |
| Maximum current absorbed | A | 7,0 | | 11,0 | | 13,5 | |
| Recommended fuse ⁽¹⁾ | A | 8 | | 12 | | 16 | |
| Max. ambient temperature ⁽²⁾ | °C | 25 | | | | | |

(1) for the overload protection; gG type

(2) with electric heater in heating mode

CONTROLS FOR SK-E UNITS

WM-T control



230 V 50-60 Hz

WM-AU control (*)



230 V 50-60 Hz

WM-TQR control



230 V 50-60 Hz

T-MB2 control (*)



230 V 50-60 Hz

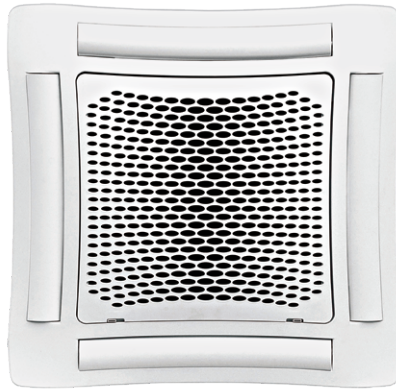
(*) To be used with UPM-AU or UP-AU.

AIR DIFFUSER

Version

White ABS, RAL 9003.

HTA



Version

In ABS painted in one color to choose.

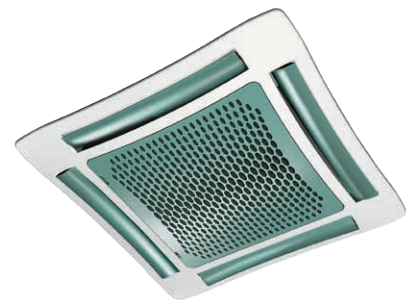
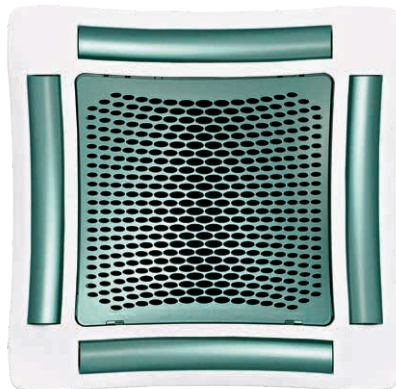
HTB



Version

Louvers and intake grid painted choice of one colour, frame in white ABS, RAL 9003.

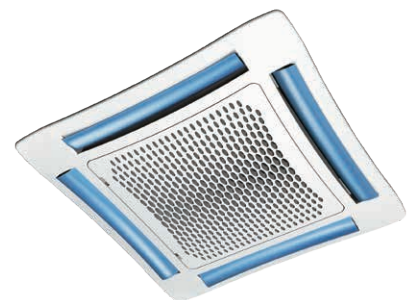
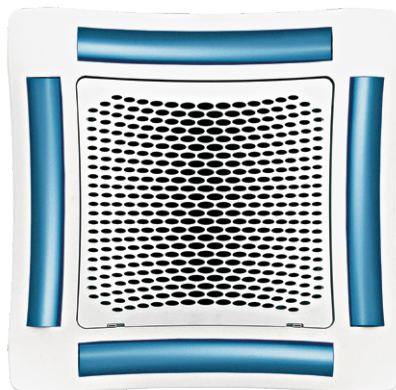
HTC



Version

Louvers painted in one color to choose, intake grid and frame in white ABS, RAL 9003.

HTD



MAIN COMPONENTS



Air diffuser

Intake grids, frame and adjustable air distribution louvers on each side, made from ABS.

- **HTA** version: white ABS, RAL 9003.
- **HTB** version: with intake grid, frame and louvers, choice of one colour only.
- **HTC** version: with intake grid and louvers, choice of one colour, plus white ABS frame RAL 9003.
- **HTD** version: with louvers, choice of one colour, while the grid and frame are made from ABS, RAL 9003.
- **MD-600 / MD-800** version: metal diffuser painted in RAL 9003 white colour, with 600x600 / 800x800 dimension, to perfectly fit into the false ceiling standard modules without overlapping parts.

Inner casing

It is made of galvanized steel with internal thermal insulation with polyolefin (PO) foam (B-s2-d0 EN 13501-01) and external anti-condensate lining.

Control panel

- **SK-ECM** version

It consists of the pump control circuit board and the inverter circuit board.

- **SK-ECM-MB** version

It consists of the MB electronic board (that integrates pump control) and the inverter board.

Fan assembly

The fan assembly, which is mounted on anti-vibrating supports, is extremely silent.

The radial fan has been designed to optimise performance, using wing profile blades with a shape that reduces turbulence, increasing efficiency and reducing noise.

The fans are connected to a three phase permanent magnet brushless electronic motor that is controlled with reconstructed current according to a BLAC sinusoidal wave.

The inverter board that controls the motor operation is powered by 230 Volt, single-phase and, with a switching system, it generates a three-phase frequency modulated, wave form power supply.

The power supply of the unit is single phase 230-240 Vac 50/60 Hz.

Coil

Made of copper tubes with bonded aluminium fins for maximum transfer contact.

2 or 3 row coil for 2 pipe models and 2+1 row coil for 4 pipe models (the heating row is on the inside part of the coil).

For 4 pipe systems two versions are available: the SK 14 and SK 44 serie supply an higher heating emission; and the SK 26, SK 36, SK 56 serie supply an higher cooling emission.

The coil is not suitable for use in corrosive atmosphere or in environments where aluminium may be subject to corrosion.

Condensate collection tray

High density ABS polystyrene foam condensate tray, shaped in order to optimize the air diffusion.

Fire retardant rating B1 to DIN 4102.

Filter

Synthetic washable filter, easily removable.

Condensate pump

Float switch centrifugal pump with 650 mm of maximum head, integral to the unit and wired to the control panel on the outside of the casing.

The version with available pressure 1000 mm can be supplied on demand.

Valve set

Two or three way valves for ON/OFF operation, with pipe mounting kit and lockshields.

EUROVENT CERTIFICATION



2 pipe system

The following standard rating conditions are used:

COOLING

Entering air temperature: + 27 °C d.b. + 19 °C w.b.
Water temperature: +7 °C E.W.T. +12 °C L.W.T.

HEATING

Entering air temperature: + 20 °C
Water temperature: +45 °C E.W.T. +40 °C L.W.T.

| MODEL | Inverter power | SK-ECM 12 | | | | | SK-ECM 22 | | | | | SK-ECM 32 | | | | |
|--|-------------------|-----------|------|------|------|------|-----------|------|------|------|------|-----------|------|------|------|------|
| | | 1 | 3 | 5 | 7,5 | 10 | 1 | 3 | 5 | 7,5 | 10 | 1 | 3 | 5 | 7,5 | 10 |
| Eurovent certified performances. | | MIN | - | MED | - | MAX | MIN | - | MED | - | MAX | MIN | - | MED | - | MAX |
| | | (E) | - | (E) | - | (E) | (E) | - | (E) | - | (E) | (E) | - | (E) | - | (E) |
| Air flow | m ³ /h | 310 | 345 | 380 | 457 | 535 | 310 | 377 | 445 | 577 | 710 | 360 | 485 | 610 | 745 | 880 |
| Cooling total emission (E) | kW | 1,84 | 2,01 | 2,16 | 2,47 | 2,73 | 2,24 | 2,65 | 3,04 | 3,71 | 4,30 | 2,55 | 3,25 | 3,85 | 4,45 | 4,96 |
| Cooling sensible emission (E) | kW | 1,35 | 1,47 | 1,60 | 1,84 | 2,07 | 1,57 | 1,87 | 2,16 | 2,67 | 3,15 | 1,80 | 2,31 | 2,79 | 3,25 | 3,68 |
| Heating emission (E) | kW | 1,85 | 2,04 | 2,22 | 2,55 | 2,87 | 2,12 | 2,56 | 2,98 | 3,68 | 4,36 | 2,46 | 3,17 | 3,85 | 4,52 | 5,15 |
| Dp Cooling (E) | kPa | 4,9 | 5,8 | 6,6 | 8,4 | 10,1 | 4,6 | 6,3 | 9,4 | 11,6 | 15,1 | 5,9 | 9,1 | 12,4 | 16,2 | 19,7 |
| Dp Heating (E) | kPa | 4,3 | 5,1 | 5,9 | 7,6 | 9,4 | 3,6 | 5,1 | 6,6 | 9,7 | 13,2 | 4,7 | 7,5 | 10,6 | 14,1 | 17,8 |
| Sound power (Lw) (E) | dB(A) | 33,0 | 36,0 | 39,0 | 43,0 | 47,0 | 33,0 | 38,0 | 43,0 | 48,5 | 54,0 | 37,0 | 43,5 | 50,0 | 55,0 | 60,0 |
| Sound pressure (Lp) ⁽¹⁾ | dB(A) | 24,0 | 27,0 | 30,0 | 34,0 | 38,0 | 24,0 | 29,0 | 34,0 | 39,5 | 45,0 | 28,0 | 34,5 | 41,0 | 46,0 | 51,0 |
| Fan (E) | W | 5,0 | 6,5 | 8,0 | 12,0 | 16,0 | 5,0 | 8,0 | 11,0 | 21,0 | 31,0 | 7,0 | 14,0 | 21,0 | 41,5 | 62,0 |
| Condensate drain pump power absorption | W | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Water content | l | 1,4 | 1,4 | 1,4 | 1,4 | 1,4 | 2,1 | 2,1 | 2,1 | 2,1 | 2,1 | 2,1 | 2,1 | 2,1 | 2,1 | 2,1 |
| Length | mm | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 |
| Depth | mm | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 |
| Height | mm | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 |

| MODEL | Inverter power | SK-ECM 42 | | | | | SK-ECM 52 | | | | |
|--|-------------------|-----------|------|------|------|------|-----------|------|------|------|-------|
| | | 1 | 3 | 5 | 7,5 | 10 | 1 | 3 | 5 | 7,5 | 10 |
| Eurovent certified performances. | | MIN | - | MED | - | MAX | MIN | - | MED | - | MAX |
| | | (E) | - | (E) | - | (E) | (E) | - | (E) | - | (E) |
| Air flow | m ³ /h | 630 | 750 | 870 | 1017 | 1165 | 710 | 920 | 1130 | 1450 | 1770 |
| Cooling total emission (E) | kW | 4,20 | 4,70 | 5,13 | 5,76 | 6,30 | 5,28 | 6,54 | 7,69 | 9,28 | 10,69 |
| Cooling sensible emission (E) | kW | 3,02 | 3,39 | 3,75 | 4,23 | 4,69 | 3,68 | 4,62 | 5,50 | 6,71 | 7,83 |
| Heating emission (E) | kW | 4,27 | 4,78 | 5,30 | 6,02 | 6,70 | 4,90 | 6,18 | 7,34 | 9,00 | 10,56 |
| Dp Cooling (E) | kPa | 10,9 | 13,3 | 15,6 | 19,3 | 22,7 | 9,4 | 13,8 | 18,5 | 26,1 | 33,0 |
| Dp Heating (E) | kPa | 9,6 | 11,8 | 14,2 | 17,9 | 21,6 | 7,0 | 10,7 | 14,6 | 21,1 | 28,1 |
| Sound power (Lw) (E) | dB(A) | 33,0 | 36,0 | 39,0 | 43,5 | 48,0 | 34,0 | 40,5 | 47,0 | 52,0 | 57,0 |
| Sound pressure (Lp) ⁽¹⁾ | dB(A) | 24,0 | 27,0 | 30,0 | 34,5 | 39,0 | 25,0 | 31,5 | 38,0 | 43,0 | 48,0 |
| Fan (E) | W | 10,0 | 13,5 | 17,0 | 25,0 | 33,0 | 10,0 | 21,0 | 32,0 | 70,0 | 108,0 |
| Condensate drain pump power absorption | W | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Water content | l | 3,0 | 3,0 | 3,0 | 3,0 | 3,0 | 4,0 | 4,0 | 4,0 | 4,0 | 4,0 |
| Length | mm | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 |
| Depth | mm | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 |
| Height | mm | 303 | 303 | 303 | 303 | 303 | 303 | 303 | 303 | 303 | 303 |

(E) Eurovent certified performance.

(1) The sound pressure levels are 9 dB (A) lower than the sound power levels, apply to the reverberant field of a 100 m³ room and a reverberation time of 0.5 sec.

4 pipe system



The following standard rating conditions are used:

COOLING

Entering air temperature: + 27 °C d.b. + 19 °C w.b.

Water temperature: +7 °C E.W.T. +12 °C L.W.T.

HEATING

Entering air temperature: + 20 °C

Water temperature: +65 °C E.W.T. +55 °C L.W.T.

| MODEL | | SK-ECM 14 | | | | | SK-ECM 26 | | | | | SK-ECM 36 | | | | |
|--|-------------------|-----------|------|------|------|------|-----------|------|------|------|------|-----------|------|------|------|------|
| | | 1 | 3 | 5 | 7,5 | 10 | 1 | 3 | 5 | 7,5 | 10 | 1 | 3 | 5 | 7,5 | 10 |
| Inverter power | | MIN | | MED | | MAX | MIN | | MED | | MAX | MIN | | MED | | MAX |
| Eurovent certified performances. | | (E) | - | (E) | - | (E) | (E) | - | (E) | - | (E) | (E) | - | (E) | - | (E) |
| Air flow | m ³ /h | 310 | 345 | 380 | 457 | 535 | 310 | 377 | 445 | 577 | 710 | 360 | 485 | 610 | 745 | 880 |
| Cooling total emission (E) | kW | 1,85 | 2,02 | 2,17 | 2,48 | 2,75 | 2,09 | 2,46 | 2,81 | 3,39 | 3,90 | 2,37 | 2,99 | 3,51 | 4,03 | 4,47 |
| Cooling sensible emission (E) | kW | 1,34 | 1,31 | 1,59 | 1,64 | 2,06 | 1,49 | 1,76 | 2,03 | 2,49 | 2,92 | 1,70 | 2,17 | 2,60 | 3,01 | 3,40 |
| Heating emission (E) | kW | 2,13 | 2,32 | 2,51 | 2,85 | 3,18 | 1,73 | 1,97 | 2,20 | 2,57 | 2,91 | 1,92 | 2,31 | 2,66 | 2,99 | 3,29 |
| Dp Cooling (E) | kPa | 4,6 | 5,4 | 6,2 | 7,9 | 9,5 | 3,3 | 4,4 | 5,6 | 7,9 | 10,3 | 4,1 | 6,3 | 8,4 | 10,9 | 13,1 |
| Dp Heating (E) | kPa | 4,6 | 5,3 | 6,1 | 7,7 | 9,4 | 2,6 | 3,3 | 4,1 | 5,4 | 6,7 | 3,2 | 4,4 | 5,7 | 7,1 | 8,4 |
| Sound power (Lw) (E) | dB(A) | 33,0 | 36,0 | 39,0 | 43,0 | 47,0 | 33,0 | 38,0 | 43,0 | 48,5 | 54,0 | 37,0 | 43,5 | 50,0 | 55,0 | 60,0 |
| Sound pressure (Lp) ⁽¹⁾ | dB(A) | 24,0 | 27,0 | 30,0 | 34,0 | 38,0 | 24,0 | 29,0 | 34,0 | 39,5 | 45,0 | 28,0 | 34,5 | 41,0 | 46,0 | 51,0 |
| Fan (E) | W | 5,0 | 6,5 | 8,0 | 12,0 | 16,0 | 5,0 | 8,0 | 11,0 | 21,0 | 31,0 | 7,0 | 14,0 | 21,0 | 41,5 | 62,0 |
| Condensate drain pump power absorption | W | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Cooling water content | l | 1,4 | 1,4 | 1,4 | 1,4 | 1,4 | 1,7 | 1,7 | 1,7 | 1,7 | 1,7 | 1,7 | 1,7 | 1,7 | 1,7 | 1,7 |
| Heating water content | l | 0,7 | 0,7 | 0,7 | 0,7 | 0,7 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 | 0,5 |
| Length | mm | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 |
| Depth | mm | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 | 575 |
| Height | mm | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 | 275 |

| MODEL | | SK-ECM 44 | | | | | SK-ECM 56 | | | | |
|--|-------------------|-----------|------|------|------|------|-----------|------|------|------|-------|
| | | 1 | 3 | 5 | 7,5 | 10 | 1 | 3 | 5 | 7,5 | 10 |
| Inverter power | | MIN | | MED | | MAX | MIN | | MED | | MAX |
| Eurovent certified performances. | | (E) | - | (E) | - | (E) | (E) | - | (E) | - | (E) |
| Air flow | m ³ /h | 630 | 750 | 870 | 1017 | 1165 | 710 | 920 | 1130 | 1450 | 1770 |
| Cooling total emission (E) | kW | 4,29 | 4,81 | 5,29 | 5,92 | 6,48 | 4,97 | 6,13 | 7,14 | 8,56 | 9,76 |
| Cooling sensible emission (E) | kW | 3,07 | 3,46 | 3,82 | 4,32 | 4,80 | 3,51 | 4,37 | 5,17 | 6,27 | 7,29 |
| Heating emission (E) | kW | 5,41 | 6,04 | 6,65 | 7,46 | 8,24 | 4,58 | 5,47 | 6,27 | 7,36 | 8,33 |
| Dp Cooling (E) | kPa | 9,4 | 11,6 | 13,6 | 16,8 | 19,8 | 8,8 | 12,9 | 17,0 | 23,7 | 30,1 |
| Dp Heating (E) | kPa | 8,5 | 10,3 | 12,3 | 15,1 | 18,1 | 4,9 | 6,7 | 8,6 | 11,4 | 14,3 |
| Sound power (Lw) (E) | dB(A) | 33,0 | 36,0 | 39,0 | 43,5 | 48,0 | 34,0 | 40,5 | 47,0 | 52,0 | 57,0 |
| Sound pressure (Lp) ⁽¹⁾ | dB(A) | 24,0 | 27,0 | 30,0 | 34,5 | 39,0 | 25,0 | 31,5 | 38,0 | 43,0 | 48,0 |
| Fan (E) | W | 10,0 | 13,5 | 17,0 | 25,0 | 33,0 | 10,0 | 21,0 | 32,0 | 70,0 | 108,0 |
| Condensate drain pump power absorption | W | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Cooling water content | l | 3,0 | 3,0 | 3,0 | 3,0 | 3,0 | 3,6 | 3,6 | 3,6 | 3,6 | 3,6 |
| Heating water content | l | 1,4 | 1,4 | 1,4 | 1,4 | 1,4 | 1,1 | 1,1 | 1,1 | 1,1 | 1,1 |
| Length | mm | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 |
| Depth | mm | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 | 820 |
| Height | mm | 303 | 303 | 303 | 303 | 303 | 303 | 303 | 303 | 303 | 303 |

(E) Eurovent certified performance.

(1) The sound pressure levels are 9 dB (A) lower than the sound power levels, apply to the reverberant field of a 100 m³ room and a reverberation time of 0.5 sec.

COOLING EMISSION

Models with single coil (2 pipe installations)

Entering air temperature: 27 °C – R.H.: 50%

| Model | Vdc | Qv m ³ /h | WT: 7 / 12 °C | | | WT: 8 / 13 °C | | | WT: 10 / 15 °C | | | WT: 12 / 17 °C | | |
|-----------|-----|-------------------------|---------------|----------|-----------|---------------|----------|-----------|----------------|----------|-----------|----------------|----------|-----------|
| | | | Pc kW | Ps kW | Qw l/h | Pc kW | Ps kW | Qw l/h | Pc kW | Ps kW | Qw l/h | Pc kW | Ps kW | Qw l/h |
| SK-ECM 12 | 10 | 535 | 2,94 | 2,06 | 506 | 2,64 | 1,94 | 455 | 1,78 | 1,78 | 307 | 1,53 | 1,53 | 263 |
| | 7,5 | 457 | 2,64 | 1,84 | 455 | 2,38 | 1,73 | 409 | 1,88 | 1,52 | 323 | 1,36 | 1,36 | 234 |
| | 5 | 380 | 2,32 | 1,60 | 399 | 2,09 | 1,50 | 360 | 1,65 | 1,32 | 284 | 1,20 | 1,20 | 206 |
| | 3 | 345 | 2,15 | 1,47 | 370 | 1,94 | 1,38 | 334 | 1,54 | 1,22 | 264 | 1,10 | 1,10 | 190 |
| | 1 | 310 | 1,97 | 1,34 | 339 | 1,78 | 1,26 | 307 | 1,41 | 1,11 | 242 | 1,00 | 1,00 | 173 |
| SK-ECM 22 | 10 | 710 | 4,61 | 3,14 | 792 | 4,16 | 2,95 | 716 | 3,29 | 2,60 | 566 | 2,35 | 2,35 | 404 |
| | 7,5 | 577 | 3,96 | 2,67 | 681 | 3,59 | 2,51 | 617 | 2,85 | 2,20 | 490 | 2,20 | 1,93 | 379 |
| | 5 | 445 | 3,25 | 2,16 | 559 | 2,95 | 2,03 | 508 | 2,35 | 1,78 | 403 | 1,81 | 1,56 | 312 |
| | 3 | 377 | 2,83 | 1,87 | 487 | 2,57 | 1,76 | 442 | 2,06 | 1,54 | 354 | 1,59 | 1,35 | 274 |
| | 1 | 310 | 2,39 | 1,56 | 410 | 2,17 | 1,47 | 373 | 1,75 | 1,29 | 300 | 1,35 | 1,13 | 232 |
| SK-ECM 32 | 10 | 880 | 5,32 | 3,67 | 916 | 4,80 | 3,45 | 825 | 3,80 | 3,04 | 653 | 2,74 | 2,74 | 471 |
| | 7,5 | 745 | 4,75 | 3,24 | 817 | 4,29 | 3,05 | 738 | 3,40 | 2,69 | 585 | 2,43 | 2,43 | 417 |
| | 5 | 610 | 4,13 | 2,79 | 710 | 3,74 | 2,62 | 643 | 2,97 | 2,31 | 510 | 2,29 | 2,02 | 394 |
| | 3 | 485 | 3,46 | 2,31 | 596 | 3,14 | 2,17 | 541 | 2,49 | 1,91 | 429 | 1,93 | 1,67 | 332 |
| | 1 | 360 | 2,73 | 1,80 | 470 | 2,48 | 1,69 | 426 | 1,99 | 1,49 | 342 | 1,54 | 1,30 | 264 |
| SK-ECM 42 | 10 | 1165 | 6,76 | 4,67 | 1162 | 6,10 | 4,40 | 1049 | 4,80 | 3,88 | 826 | 3,48 | 3,48 | 599 |
| | 7,5 | 1017 | 6,15 | 4,22 | 1057 | 5,55 | 3,97 | 955 | 4,39 | 3,49 | 755 | 3,14 | 3,14 | 541 |
| | 5 | 870 | 5,50 | 3,74 | 945 | 4,97 | 3,52 | 856 | 3,93 | 3,10 | 675 | 2,79 | 2,79 | 480 |
| | 3 | 750 | 5,01 | 3,39 | 861 | 4,54 | 3,19 | 780 | 3,60 | 2,80 | 619 | 2,55 | 2,55 | 438 |
| | 1 | 630 | 4,49 | 3,02 | 772 | 4,07 | 2,84 | 426 | 3,23 | 2,49 | 556 | 2,50 | 2,18 | 430 |
| SK-ECM 52 | 10 | 1770 | 11,41 | 7,81 | 1962 | 10,30 | 7,35 | 1772 | 8,20 | 6,48 | 1410 | 5,89 | 5,89 | 1012 |
| | 7,5 | 1450 | 9,90 | 6,70 | 1702 | 8,96 | 6,29 | 1541 | 7,14 | 5,55 | 1227 | 5,53 | 4,87 | 951 |
| | 5 | 1130 | 8,22 | 5,49 | 1415 | 7,45 | 5,17 | 1281 | 5,96 | 4,54 | 1026 | 4,60 | 3,98 | 791 |
| | 3 | 920 | 6,98 | 4,61 | 1200 | 6,34 | 4,34 | 1090 | 5,09 | 3,81 | 875 | 3,92 | 3,33 | 675 |
| | 1 | 710 | 5,63 | 3,68 | 968 | 5,12 | 3,46 | 881 | 4,13 | 3,04 | 710 | 3,20 | 2,66 | 550 |

WT: Water temperature
Vdc: Inverter power
Qv: Air flow
Pc: Cooling total emission
Ps: Cooling sensible emission
Qw: Water flow rate

Models with double coil (4 pipe installations)

Entering air temperature: 27 °C – R.H.: 50%

| Model | Vdc | WT: 7 / 12 °C | | | WT: 8 / 13 °C | | | WT: 10 / 15 °C | | | WT: 12 / 17 °C | | | |
|-----------|-----|---------------|----------|----------|---------------|----------|----------|----------------|----------|----------|----------------|----------|----------|-----------|
| | | Qv m³/h | Pc kW | Ps kW | Qw l/h | Pc kW | Ps kW | Qw l/h | Pc kW | Ps kW | Qw l/h | Pc kW | Ps kW | Qw l/h |
| SK-ECM 14 | 10 | 535 | 2,95 | 2,05 | 508 | 2,66 | 1,93 | 458 | 1,77 | 1,77 | 305 | 1,52 | 1,52 | 261 |
| | 7,5 | 457 | 2,65 | 1,83 | 456 | 2,39 | 1,72 | 412 | 1,89 | 1,52 | 325 | 1,37 | 1,37 | 235 |
| | 5 | 380 | 2,33 | 1,59 | 401 | 2,10 | 1,50 | 362 | 1,66 | 1,32 | 286 | 1,19 | 1,19 | 204 |
| | 3 | 345 | 2,16 | 1,47 | 371 | 1,95 | 1,38 | 336 | 1,54 | 1,21 | 265 | 1,09 | 1,09 | 188 |
| | 1 | 310 | 1,98 | 1,33 | 340 | 1,79 | 1,26 | 308 | 1,41 | 1,10 | 242 | 0,99 | 0,99 | 171 |
| SK-ECM 26 | 10 | 710 | 4,19 | 2,91 | 720 | 3,77 | 2,73 | 648 | 2,98 | 2,41 | 513 | 2,16 | 2,16 | 372 |
| | 7,5 | 577 | 3,62 | 2,49 | 623 | 3,27 | 2,34 | 562 | 2,59 | 2,06 | 446 | 1,85 | 1,85 | 319 |
| | 5 | 445 | 3,00 | 2,03 | 516 | 2,71 | 1,91 | 467 | 2,15 | 1,68 | 369 | 1,52 | 1,52 | 261 |
| | 3 | 377 | 2,63 | 1,76 | 452 | 2,38 | 1,66 | 409 | 1,90 | 1,46 | 326 | 1,46 | 1,28 | 251 |
| | 1 | 310 | 2,23 | 1,48 | 383 | 2,02 | 1,39 | 347 | 1,61 | 1,22 | 277 | 1,24 | 1,07 | 214 |
| SK-ECM 36 | 10 | 880 | 4,80 | 3,38 | 826 | 4,31 | 3,18 | 742 | 3,41 | 2,81 | 586 | 2,51 | 2,51 | 431 |
| | 7,5 | 745 | 4,31 | 3,00 | 742 | 3,88 | 2,82 | 667 | 3,06 | 2,49 | 527 | 2,23 | 2,23 | 384 |
| | 5 | 610 | 3,77 | 2,60 | 649 | 3,40 | 2,44 | 585 | 2,69 | 2,15 | 462 | 1,94 | 1,94 | 333 |
| | 3 | 485 | 3,19 | 2,17 | 548 | 2,88 | 2,04 | 496 | 2,28 | 1,79 | 393 | 1,62 | 1,62 | 278 |
| | 1 | 360 | 2,54 | 1,70 | 436 | 2,30 | 1,60 | 395 | 1,83 | 1,40 | 314 | 1,41 | 1,23 | 243 |
| SK-ECM 44 | 10 | 1165 | 6,95 | 4,79 | 1196 | 6,28 | 4,50 | 1080 | 4,95 | 3,96 | 851 | 3,56 | 3,56 | 613 |
| | 7,5 | 1017 | 6,31 | 4,31 | 1086 | 5,71 | 4,06 | 982 | 4,51 | 3,57 | 775 | 3,21 | 3,21 | 553 |
| | 5 | 870 | 5,64 | 3,82 | 969 | 5,10 | 3,59 | 878 | 4,05 | 3,16 | 697 | 2,88 | 2,88 | 495 |
| | 3 | 750 | 5,13 | 3,45 | 882 | 4,65 | 3,25 | 800 | 3,69 | 2,86 | 634 | 2,60 | 2,60 | 447 |
| | 1 | 630 | 4,59 | 3,07 | 790 | 4,17 | 2,89 | 717 | 3,30 | 2,54 | 567 | 2,55 | 2,22 | 439 |
| SK-ECM 56 | 10 | 1770 | 10,47 | 7,26 | 1801 | 9,44 | 6,83 | 1623 | 7,48 | 6,03 | 1286 | 5,42 | 5,42 | 933 |
| | 7,5 | 1450 | 9,14 | 6,25 | 1571 | 8,25 | 5,88 | 1419 | 6,53 | 5,18 | 1123 | 4,68 | 4,68 | 805 |
| | 5 | 1130 | 7,65 | 5,17 | 1315 | 6,93 | 4,86 | 1191 | 5,48 | 4,27 | 942 | 4,25 | 3,74 | 731 |
| | 3 | 920 | 6,53 | 4,36 | 1123 | 5,93 | 4,10 | 1019 | 4,71 | 3,60 | 810 | 3,63 | 3,16 | 625 |
| | 1 | 710 | 5,31 | 3,51 | 913 | 4,83 | 3,30 | 831 | 3,86 | 2,90 | 664 | 2,99 | 2,53 | 514 |

WT: Water temperature
Vdc: Inverter power
Qv: Air flow
Pc: Cooling total emission
Ps: Cooling sensible emission
Qw: Water flow rate

HEATING EMISSION

Models with single coil (2 pipe installations)

Entering air temperature: +20 °C

| Model | Vdc | Qv m ³ /h | WT: 70 / 60 °C | | WT: 60 / 50 °C | | WT: 55 / 45 °C | | WT: 50 / 40 °C | | WT: 45 / 40 °C | |
|-----------|-----|-------------------------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|
| | | | Ph kW | Qw l/h | Ph kW | Qw l/h | Ph kW | Qw l/h | Ph kW | Qw l/h | Ph kW | Qw l/h |
| SK-ECM 12 | 10 | 535 | 5,82 | 500 | 4,49 | 387 | 3,83 | 330 | 3,17 | 272 | 2,87 | 247 |
| | 7,5 | 457 | 5,16 | 444 | 3,99 | 343 | 3,41 | 293 | 2,82 | 243 | 2,55 | 219 |
| | 5 | 380 | 4,51 | 387 | 3,49 | 300 | 2,99 | 257 | 2,48 | 213 | 2,22 | 191 |
| | 3 | 345 | 4,13 | 355 | 3,21 | 276 | 2,74 | 236 | 2,28 | 196 | 2,04 | 176 |
| | 1 | 310 | 3,75 | 322 | 2,91 | 250 | 2,49 | 214 | 2,07 | 178 | 1,85 | 159 |
| SK-ECM 22 | 10 | 710 | 8,81 | 758 | 6,85 | 589 | 5,87 | 505 | 4,89 | 420 | 4,36 | 375 |
| | 7,5 | 577 | 7,44 | 640 | 5,80 | 499 | 4,97 | 428 | 4,15 | 357 | 3,68 | 317 |
| | 5 | 445 | 6,01 | 517 | 4,70 | 404 | 4,04 | 347 | 3,38 | 290 | 2,98 | 256 |
| | 3 | 377 | 5,16 | 444 | 4,05 | 348 | 3,48 | 300 | 2,92 | 251 | 2,56 | 220 |
| | 1 | 310 | 4,28 | 368 | 3,36 | 289 | 2,90 | 249 | 2,43 | 209 | 2,12 | 183 |
| SK-ECM 32 | 10 | 880 | 10,42 | 896 | 8,09 | 696 | 6,92 | 595 | 5,75 | 494 | 5,15 | 443 |
| | 7,5 | 745 | 9,14 | 786 | 7,11 | 611 | 6,09 | 524 | 5,06 | 435 | 4,52 | 389 |
| | 5 | 610 | 7,79 | 670 | 6,07 | 522 | 5,20 | 448 | 4,34 | 373 | 3,85 | 331 |
| | 3 | 485 | 6,41 | 551 | 5,01 | 430 | 4,30 | 370 | 3,59 | 309 | 3,17 | 273 |
| | 1 | 360 | 4,96 | 427 | 3,89 | 335 | 3,35 | 288 | 2,81 | 241 | 2,46 | 212 |
| SK-ECM 42 | 10 | 1165 | 13,54 | 1165 | 10,51 | 904 | 9,00 | 774 | 7,47 | 642 | 6,70 | 576 |
| | 7,5 | 1017 | 12,16 | 1046 | 9,46 | 813 | 8,10 | 696 | 6,73 | 579 | 6,02 | 517 |
| | 5 | 870 | 10,72 | 922 | 8,34 | 717 | 7,15 | 615 | 5,95 | 512 | 5,30 | 456 |
| | 3 | 750 | 9,65 | 830 | 7,52 | 647 | 6,45 | 555 | 5,38 | 463 | 4,78 | 411 |
| | 1 | 630 | 8,61 | 741 | 6,72 | 578 | 5,78 | 497 | 4,82 | 415 | 4,27 | 367 |
| SK-ECM 52 | 10 | 1770 | 21,37 | 1837 | 16,60 | 1428 | 14,21 | 1222 | 11,81 | 1015 | 10,56 | 908 |
| | 7,5 | 1450 | 18,20 | 1565 | 14,17 | 1219 | 12,15 | 1045 | 10,11 | 870 | 9,00 | 774 |
| | 5 | 1130 | 14,82 | 1274 | 11,56 | 994 | 9,93 | 854 | 8,29 | 713 | 7,34 | 631 |
| | 3 | 920 | 12,47 | 1073 | 9,76 | 839 | 8,40 | 722 | 7,02 | 604 | 6,18 | 532 |
| | 1 | 710 | 9,87 | 849 | 7,74 | 666 | 6,67 | 574 | 5,60 | 481 | 4,90 | 421 |

WT: Water temperature
Vdc: Inverter power
Qv: Air flow
Ph: Heating emission
Qw: Water flow rate

Models with double coil (4 pipe installations)

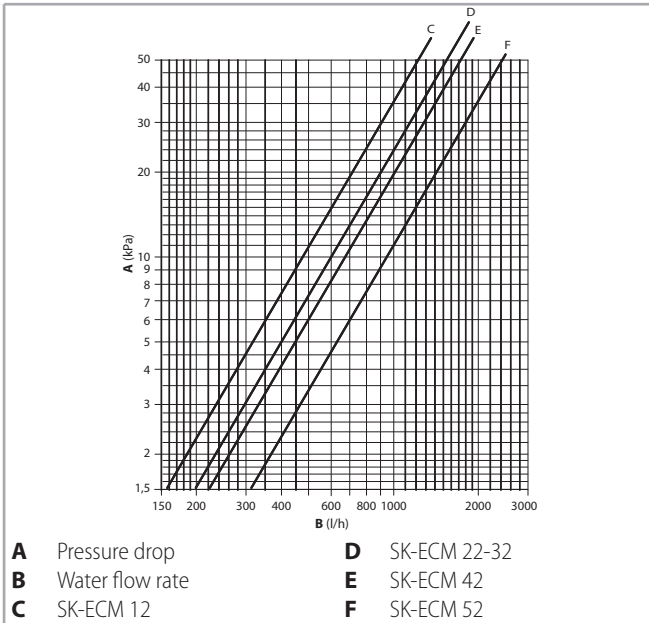
Entering air temperature: +20 °C

| Model | Vdc | Qv m ³ /h | WT: 70 / 60 °C | | WT: 60 / 50 °C | | WT: 55 / 45 °C | | WT: 50 / 40 °C | | WT: 45 / 40 °C | |
|-----------|-----|-------------------------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|----------------|-----------|
| | | | Ph kW | Qw l/h | Ph kW | Qw l/h | Ph kW | Qw l/h | Ph kW | Qw l/h | Ph kW | Qw l/h |
| SK-ECM 14 | 10 | 535 | 3,62 | 311 | 2,74 | 236 | 2,30 | 198 | 1,87 | 161 | 1,78 | 305 |
| | 7,5 | 457 | 3,24 | 279 | 2,46 | 212 | 2,07 | 178 | 1,68 | 144 | 1,59 | 274 |
| | 5 | 380 | 2,85 | 245 | 2,16 | 186 | 1,82 | 156 | 1,48 | 127 | 1,40 | 241 |
| | 3 | 345 | 2,64 | 227 | 2,01 | 172 | 1,69 | 145 | 1,37 | 118 | 1,30 | 223 |
| | 1 | 310 | 2,43 | 209 | 1,84 | 158 | 1,55 | 133 | 1,26 | 108 | 1,19 | 205 |
| SK-ECM 26 | 10 | 710 | 3,35 | 288 | 2,48 | 213 | 2,04 | 176 | 1,61 | 139 | 1,62 | 279 |
| | 7,5 | 577 | 2,96 | 254 | 2,19 | 189 | 1,81 | 156 | 1,43 | 123 | 1,43 | 247 |
| | 5 | 445 | 2,53 | 217 | 1,87 | 161 | 1,55 | 133 | 1,23 | 106 | 1,23 | 211 |
| | 3 | 377 | 2,27 | 195 | 1,68 | 145 | 1,39 | 120 | 1,11 | 95 | 1,10 | 189 |
| | 1 | 310 | 1,98 | 170 | 1,47 | 127 | 1,22 | 105 | 0,97 | 83 | 0,96 | 165 |
| SK-ECM 36 | 10 | 880 | 3,79 | 326 | 2,80 | 241 | 2,31 | 198 | 1,82 | 156 | 1,83 | 315 |
| | 7,5 | 745 | 3,44 | 296 | 2,54 | 219 | 2,10 | 181 | 1,66 | 142 | 1,67 | 286 |
| | 5 | 610 | 3,06 | 263 | 2,27 | 195 | 1,87 | 161 | 1,48 | 127 | 1,48 | 255 |
| | 3 | 485 | 2,66 | 229 | 1,97 | 170 | 1,63 | 140 | 1,29 | 111 | 1,29 | 222 |
| | 1 | 360 | 2,20 | 189 | 1,64 | 141 | 1,36 | 117 | 1,08 | 93 | 1,07 | 184 |
| SK-ECM 44 | 10 | 1165 | 9,36 | 805 | 7,13 | 613 | 6,01 | 517 | 4,90 | 421 | 4,61 | 793 |
| | 7,5 | 1017 | 8,48 | 729 | 6,46 | 555 | 5,45 | 468 | 4,44 | 382 | 4,17 | 718 |
| | 5 | 870 | 7,54 | 649 | 5,75 | 494 | 4,85 | 417 | 3,96 | 340 | 3,72 | 639 |
| | 3 | 750 | 6,86 | 590 | 5,23 | 450 | 4,41 | 380 | 3,60 | 310 | 3,38 | 581 |
| | 1 | 630 | 6,14 | 528 | 4,68 | 403 | 3,96 | 340 | 3,23 | 278 | 3,03 | 521 |
| SK-ECM 56 | 10 | 1770 | 9,51 | 818 | 7,15 | 615 | 5,97 | 514 | 4,80 | 413 | 4,65 | 800 |
| | 7,5 | 1450 | 8,40 | 722 | 6,32 | 543 | 5,28 | 454 | 4,25 | 365 | 4,11 | 706 |
| | 5 | 1130 | 7,16 | 616 | 5,39 | 464 | 4,51 | 388 | 3,63 | 312 | 3,50 | 603 |
| | 3 | 920 | 6,24 | 537 | 4,70 | 405 | 3,94 | 339 | 3,18 | 273 | 3,06 | 526 |
| | 1 | 710 | 5,22 | 449 | 3,94 | 339 | 3,30 | 284 | 2,67 | 229 | 2,56 | 440 |

WT: Water temperature
Vdc: Inverter power
Qv: Air flow
Ph: Heating emission
Qw: Water flow rate

WATER SIDE PRESSURE DROP

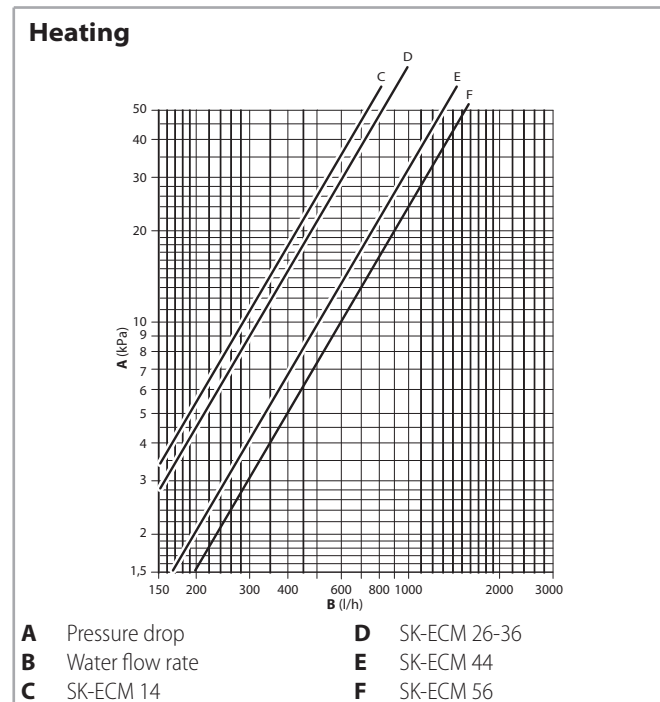
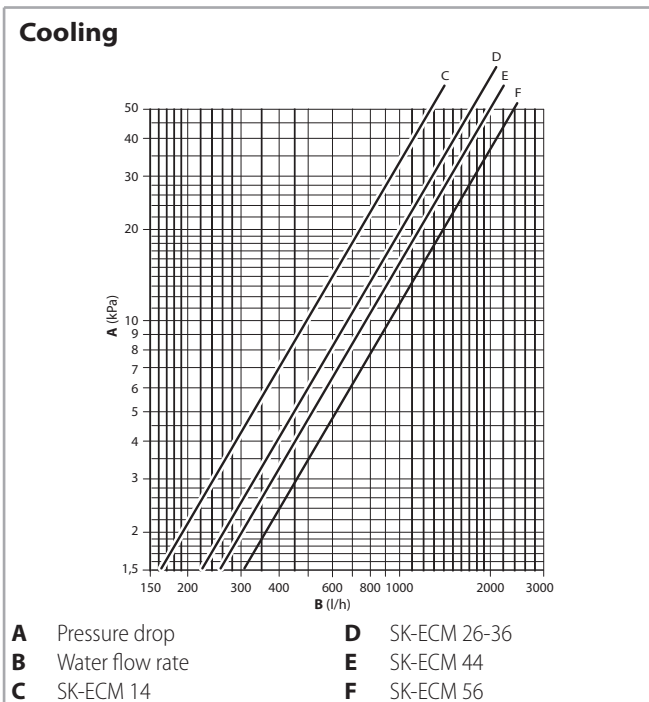
2 pipe system



The water pressure drop figures refer to a mean water temperature of 10 °C; for different temperatures, multiply the pressure drop figures by the correction factors K.

| K correction factor | Mean water temperature (°C) | | | | | | |
|---------------------|-----------------------------|------|------|------|------|------|------|
| | 20 | 30 | 40 | 50 | 60 | 70 | 80 |
| | 0,94 | 0,90 | 0,86 | 0,82 | 0,78 | 0,74 | 0,70 |

4 pipe system



The water pressure drop figures refer to a mean water temperature of 10 °C; for different temperatures, multiply the pressure drop figures by the correction factors K.

| K correction factor | Mean water temperature (°C) | | | | | | |
|---------------------|-----------------------------|------|------|------|------|------|------|
| | 20 | 30 | 40 | 50 | 60 | 70 | 80 |
| | 0,94 | 0,90 | 0,86 | 0,82 | 0,78 | 0,74 | 0,70 |

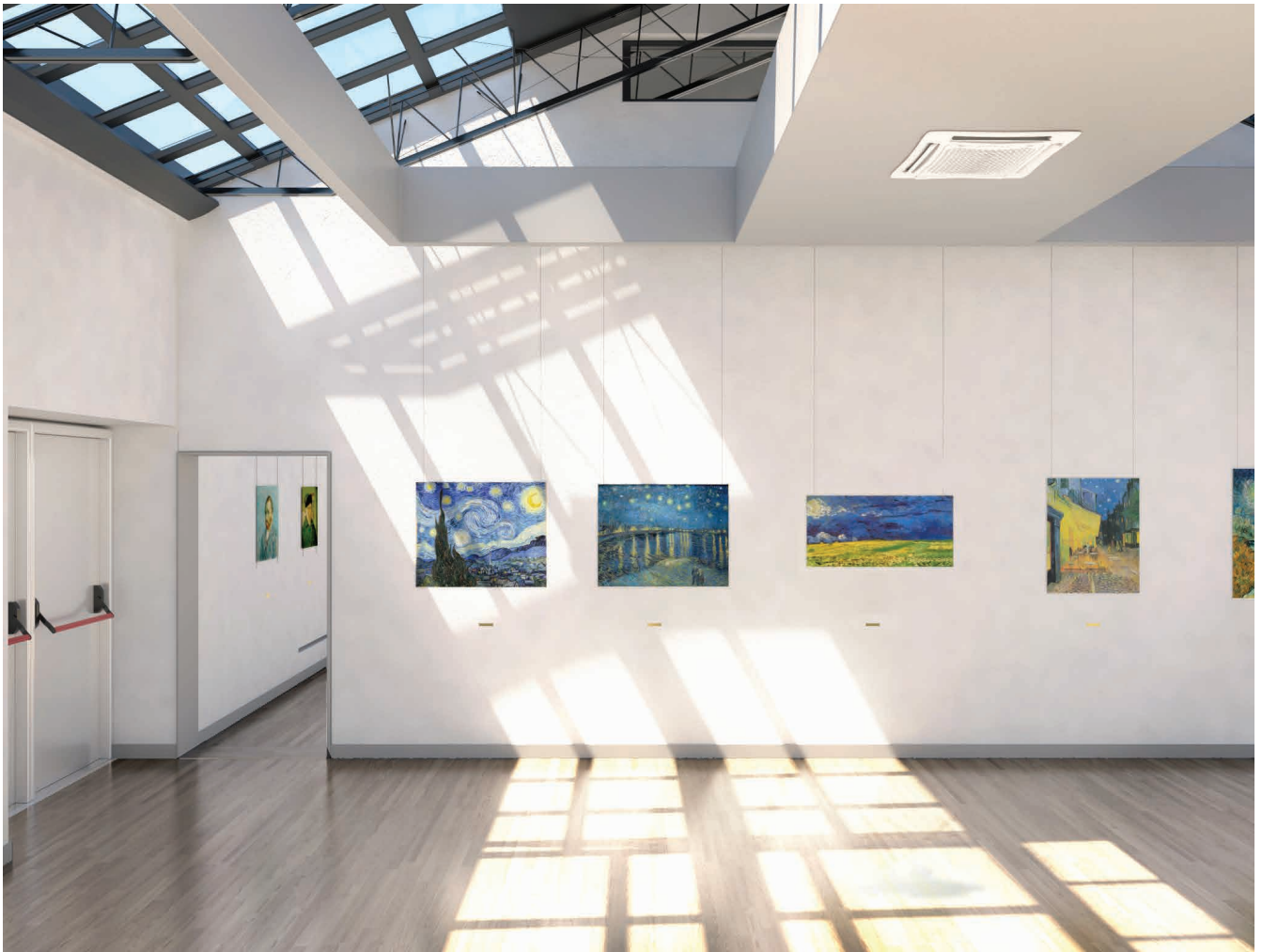
The water pressure drop figures refer to a mean water temperature of 60 °C; for different temperatures, multiply the pressure drop figures by the correction factors K.

| K correction factor | Mean water temperature (°C) | | | |
|---------------------|-----------------------------|------|------|------|
| | 40 | 50 | 70 | 80 |
| | 1,12 | 1,06 | 0,94 | 0,88 |

OPERATION LIMITS

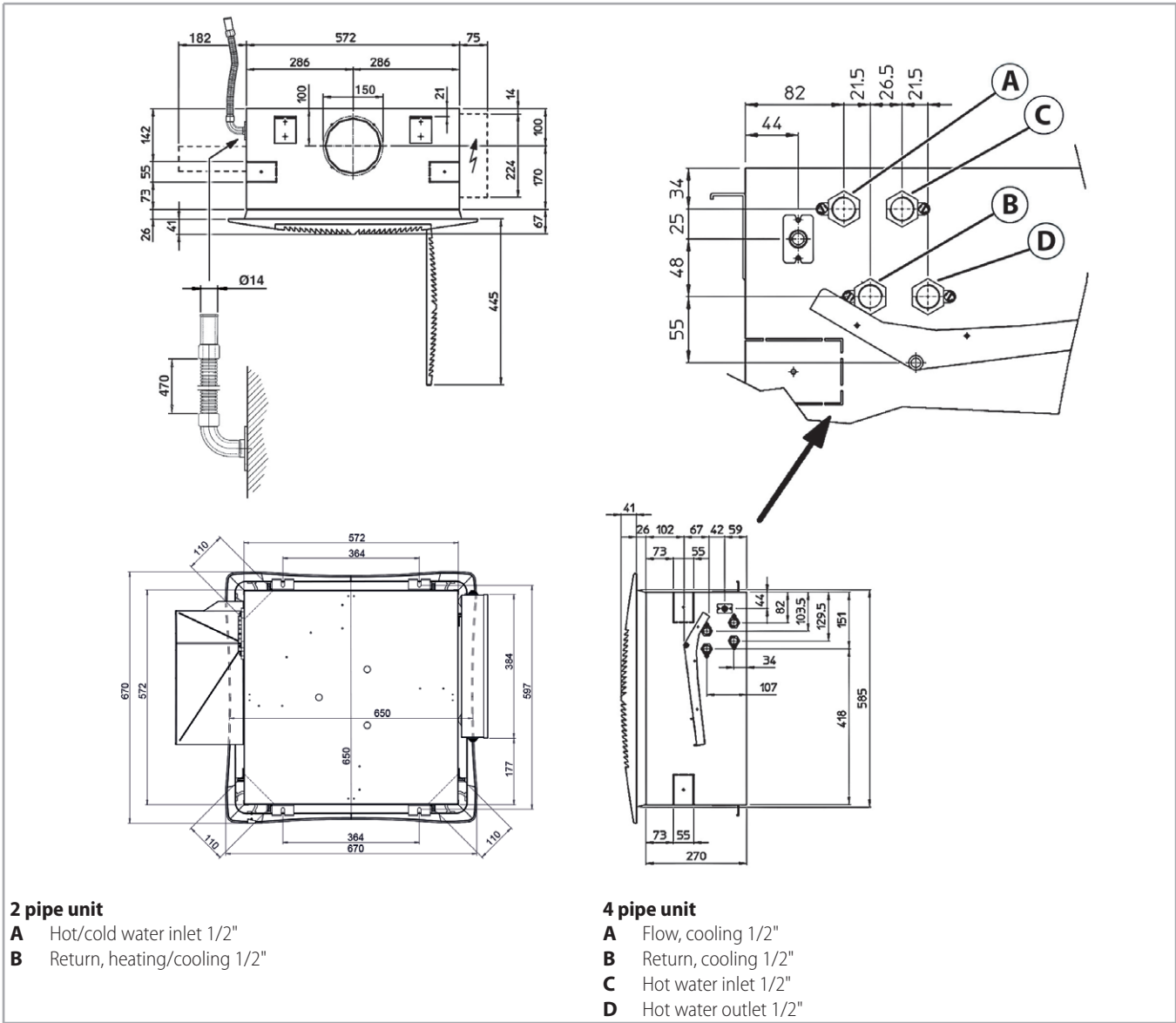
| Description | | UoM | Value |
|--------------|--------------------------------------|------|--------|
| Water flow | Coil maximum working pressure | bars | 10 |
| | | kPa | 1000 |
| | Lowest water inlet temperature | °C | +6 |
| | Highest water inlet temperature | °C | +80 |
| Power supply | Single-phase rated operating voltage | V/Hz | 230/50 |

For maximum installation height, see p. 33.

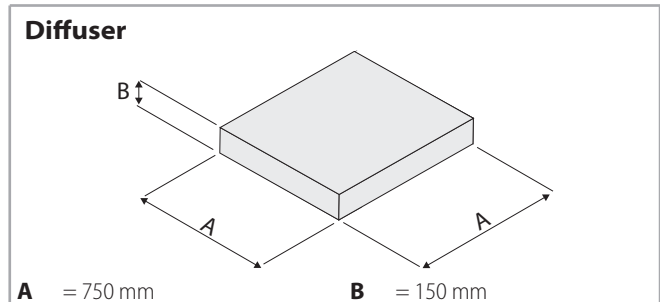
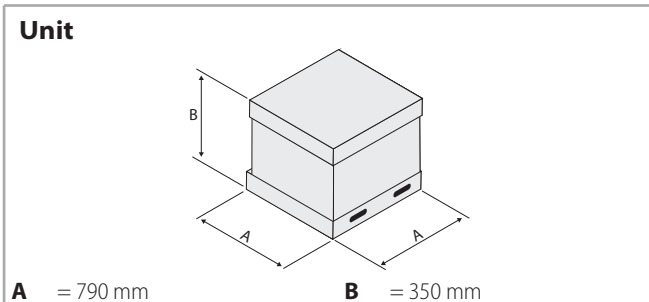


DIMENSION AND WEIGHT

SK-ECM 12-14 / SK-ECM 22-26 / SK-ECM 32-36 (600 x 600 version)



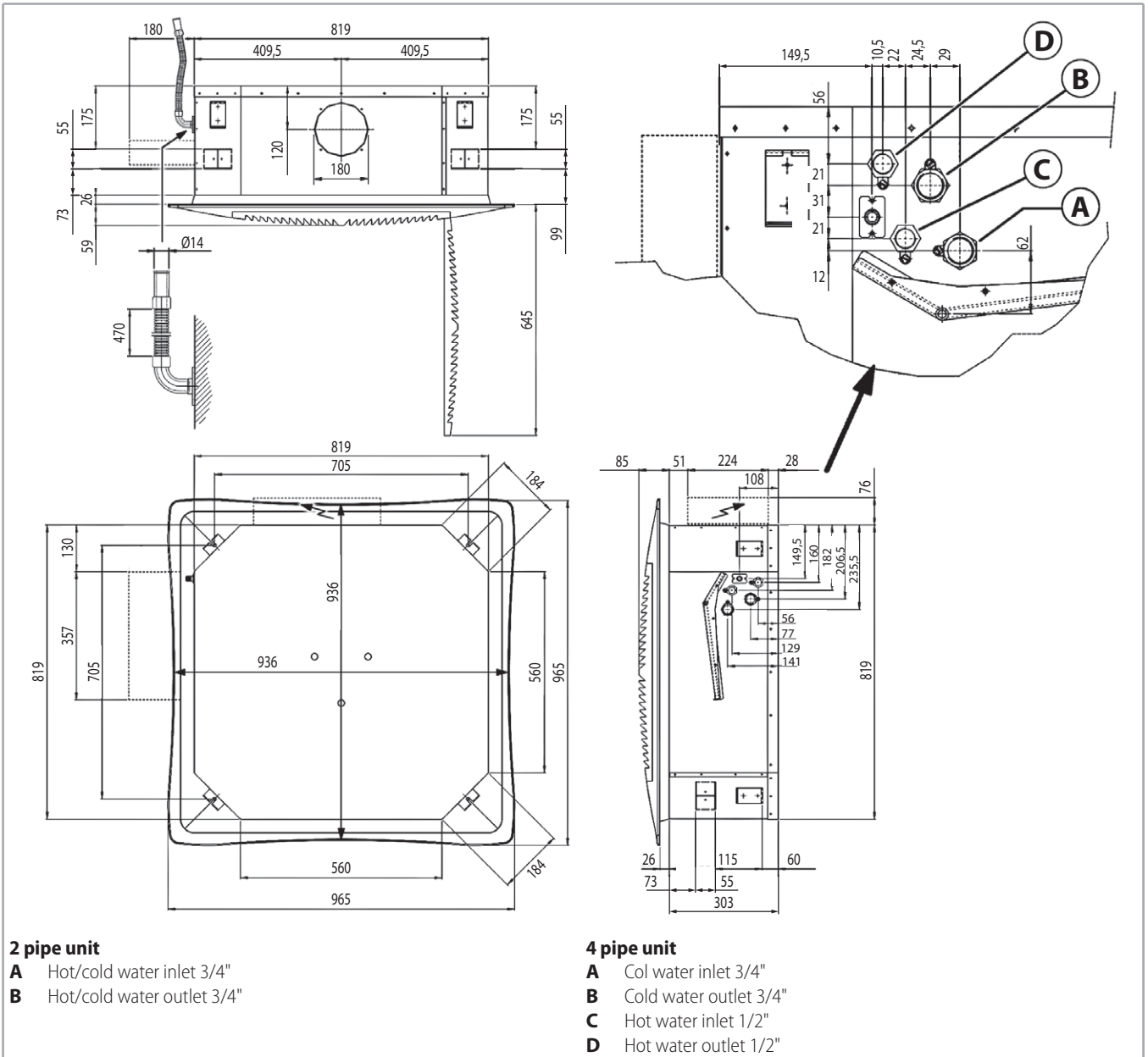
Packed unit



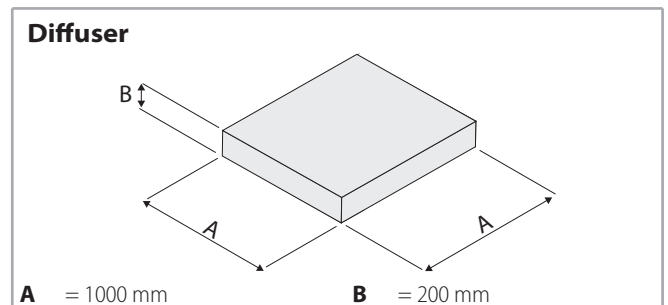
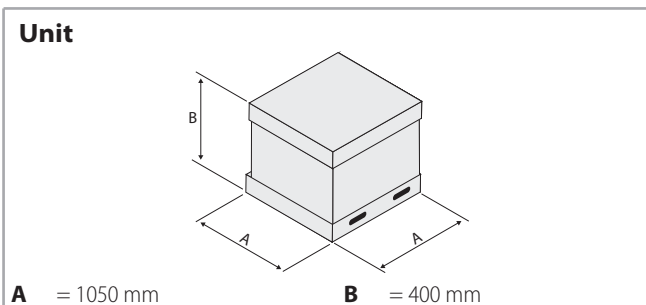
| Weight/Model | | 12 | 14 | 22-26 | 32-36 |
|-------------------|----|------|------|-------|-------|
| With packaging | kg | 20,0 | 22,0 | 21,5 | 21,0 |
| Without packaging | kg | 17,0 | 19,0 | 18,5 | 18,0 |

| Weight/Model | | 12 | 14 | 22-26 | 32-36 |
|-------------------|----|----|----|-------|-------|
| With packaging | kg | | | 3,5 | |
| Without packaging | kg | | | 2,5 | |

SK-ECM 42-44 / SK-ECM 52-56 (800 x 800 version)



Packed unit



| Weight/Model | | 42 | 44 | 52-56 |
|-------------------|----|----|----|-------|
| With packaging | kg | 35 | | 40 |
| Without packaging | kg | 31 | | 35 |

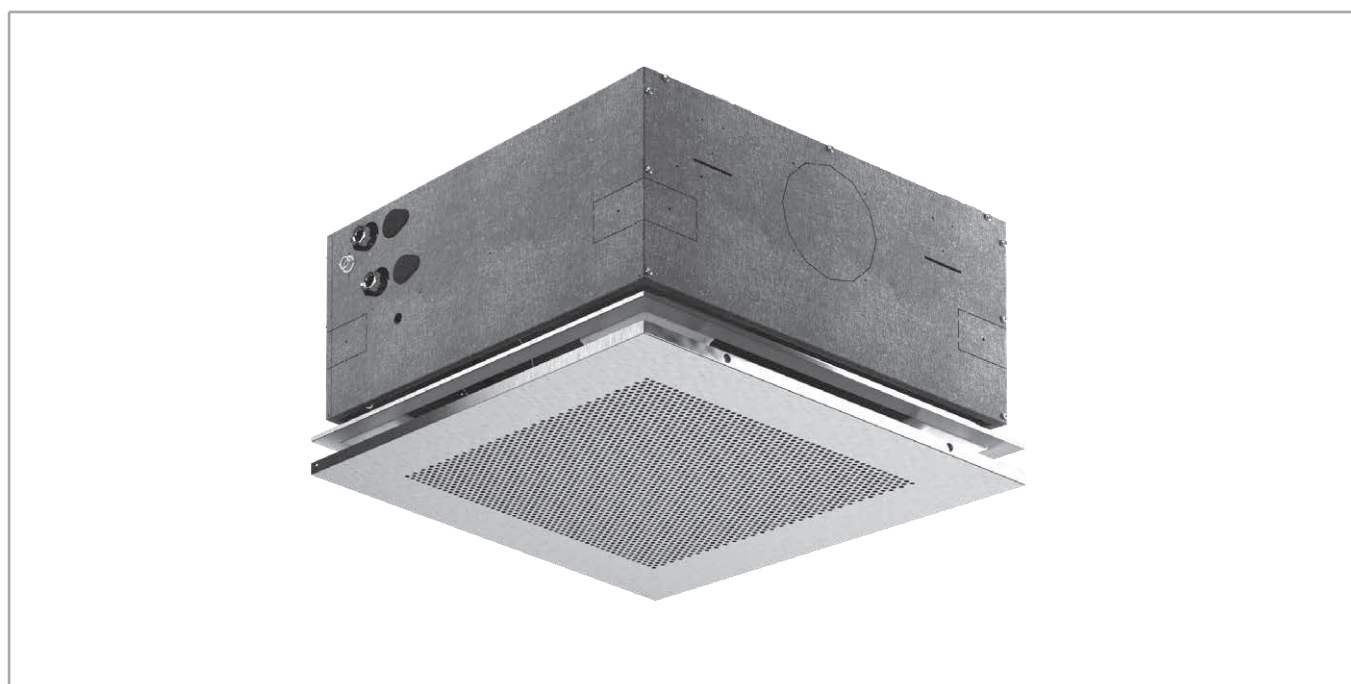
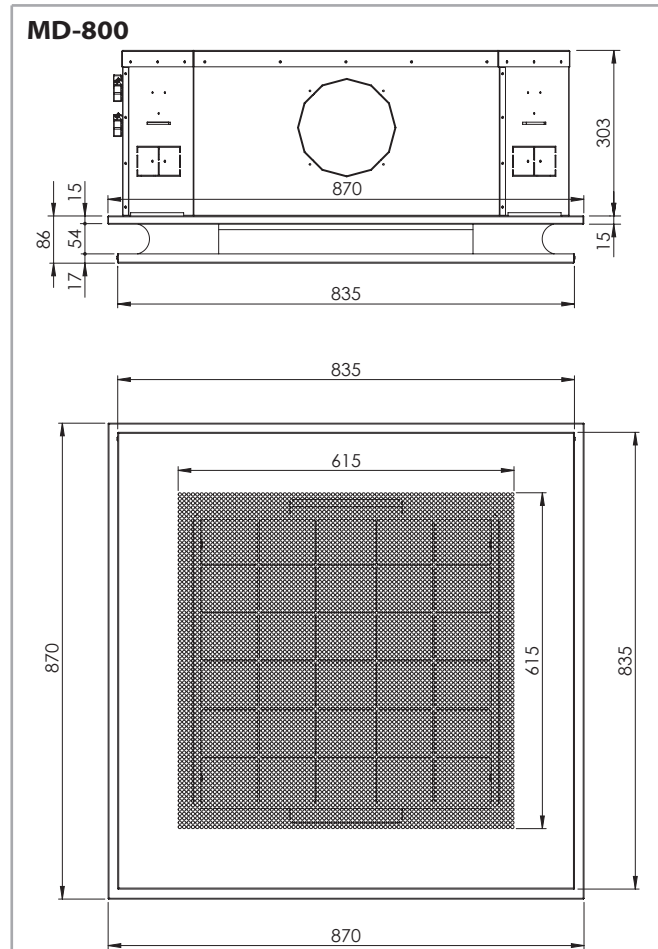
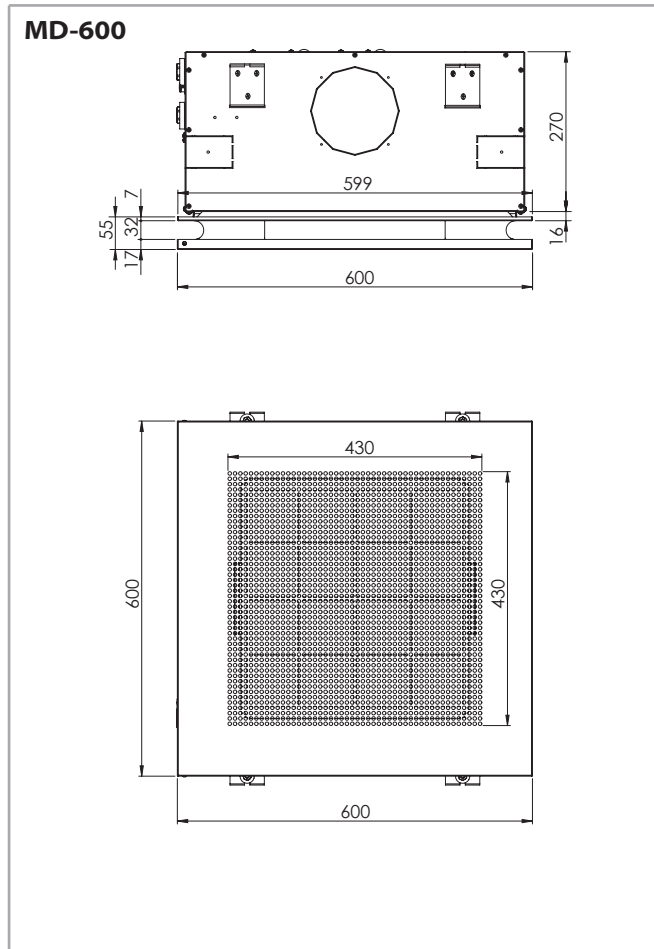
| Weight/Model | | 42 | 44 | 52-56 |
|-------------------|----|----|----|-------|
| With packaging | kg | | | 7,0 |
| Without packaging | kg | | | 5,5 |

Metal air inlet grid MD 600 / MD 800

(RS receiver, Code 9066338, for metal diffuser for MB units)

Not suitable with Crystall electronic electrostatic filter.

| Model | Code |
|--------|---------|
| MD-600 | 9079420 |
| MD-800 | 9079417 |



AIR THROW

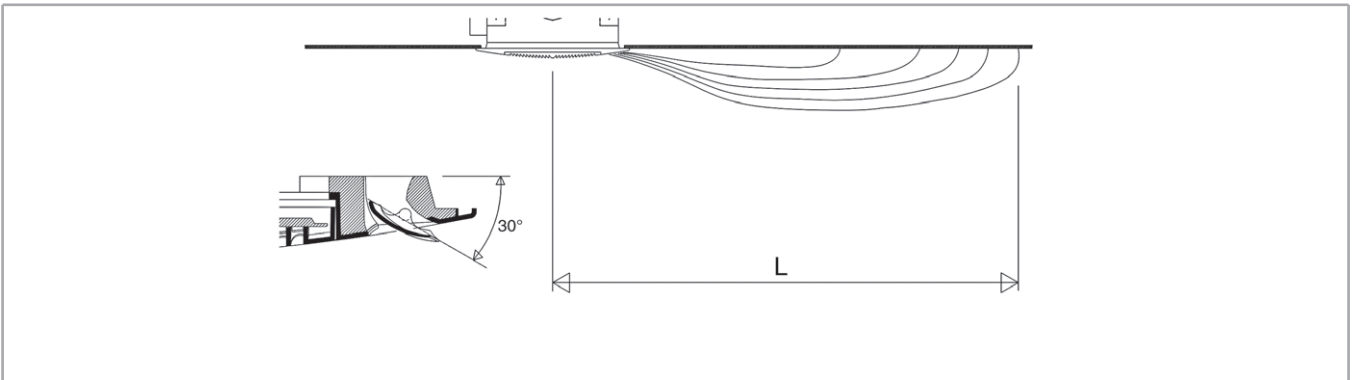
The air throw indicated in the tables must only be considered the maximum value, as it may change significantly in relation to the dimensions of the room in which the appliance is installed and the positioning of the furniture in the room.

The useful throw L refers to the distance between the unit and the point where the air speed is 0.2 m/sec; if the louver has a gradient of 30° (recommended in cooling mode), the so-called "coanda" effect will occur,

illustrated in the first figure, while at a gradient of 45° (recommended in heating mode), there will be a downwards throw, as illustrated in the second figure.

Note: on heating it must be paid attention to rooms where the floor temperature is particularly low (for example less than 5 °C). In this situation the floor can cool the lower layer of air to a level that stops the uniform diffusion of the hot air coming from the unit, decreasing the throw figures shown in the table.

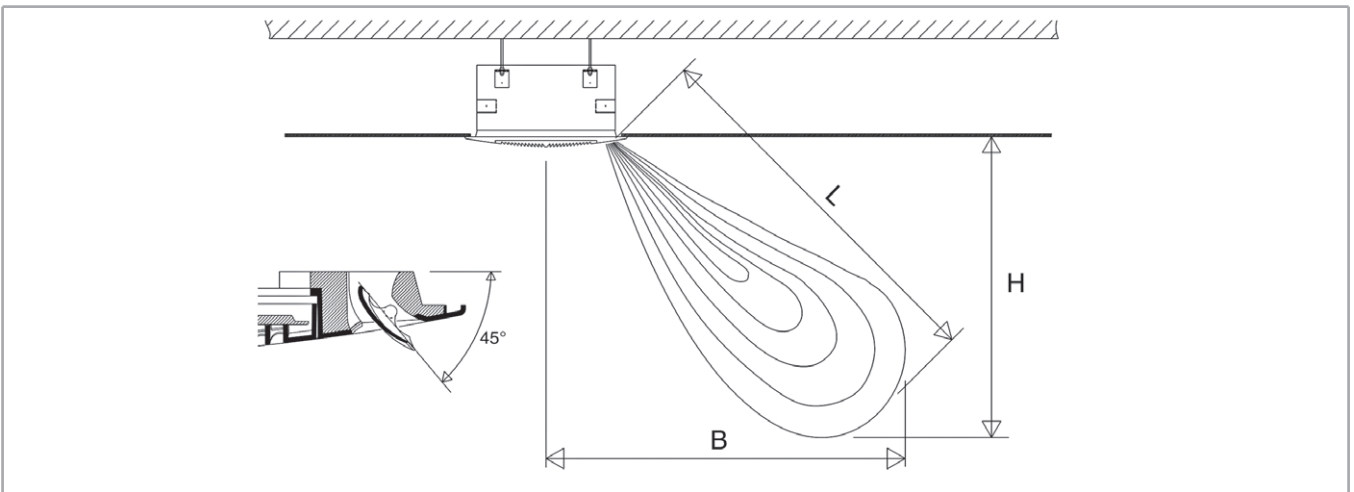
With adjustable air diffusion louvers at 30°



| Model | SK-ECM 12-14 | | | SK-ECM 22-26 | | | SK-ECM 32-36 | | | SK-ECM 42-44 | | | SK-ECM 52-56 | | | |
|-------|--------------|-----|-----|--------------|-----|-----|--------------|-----|-----|--------------|-----|-----|--------------|-----|-----|-----|
| | Vdc | 1 | 5 | 10 | 1 | 5 | 10 | 1 | 5 | 10 | 1 | 5 | 10 | 1 | 5 | 10 |
| L | m | 3,0 | 3,5 | 3,8 | 3,0 | 3,8 | 4,5 | 3,5 | 4,2 | 5,0 | 3,2 | 3,7 | 4,3 | 3,4 | 4,0 | 5,0 |

Vdc = Inverter power

With adjustable air diffusion louvers at 45°



| Model | SK-ECM 12-14 | | | SK-ECM 22-26 | | | SK-ECM 32-36 | | | SK-ECM 42-44 | | | SK-ECM 52-56 | | | |
|-------|--------------|-----|-----|--------------|-----|-----|--------------|-----|-----|--------------|-----|-----|--------------|-----|-----|-----|
| | Vdc | 1 | 5 | 10 | 1 | 5 | 10 | 1 | 5 | 10 | 1 | 5 | 10 | 1 | 5 | 10 |
| L | m | 3,3 | 3,9 | 4,2 | 3,3 | 4,2 | 4,8 | 3,9 | 4,5 | 5,2 | 3,5 | 4,1 | 4,8 | 3,8 | 4,6 | 5,4 |
| H | m | 2,2 | 2,6 | 2,8 | 2,2 | 2,8 | 3,2 | 2,6 | 3,0 | 3,4 | 2,2 | 2,6 | 3,0 | 2,4 | 2,8 | 3,4 |
| B | m | 2,5 | 2,9 | 3,1 | 2,5 | 3,1 | 3,6 | 2,9 | 3,4 | 3,9 | 2,7 | 3,2 | 3,8 | 3,0 | 3,6 | 4,2 |

Vdc = Inverter power

CONTROLS FOR SK-ECM UNITS

SK-ECM version

For this Cassette configuration, the 1-10 Vdc signal, which controls the inverter, must be supplied by a controller with the following signal specifications:

Fan coil control signal

- Fan OFF = 0 Vdc
- Fan ON > 1 Vdc
- Max. speed = 10 Vdc

ECM Blac inverter board

- 0÷10 Vdc Circuit Input Impedance Value = 68 kOhm

Power supply

230 Vac 1 Ph 50-60 Hz

Controls

All the units of the **SkyStar SK-ECM** range can be supplied with a wide range of controls that allows managing one single unit or several units (with the use of the power units).

The room temperature can be controlled through wall electronic room thermostats, with different solutions according to every ambient conditions.

The **WM-AU**, **T-MB2**, **WM-503-AC-EC** and **WM-S-ECM** electronic thermostats regulate the room temperature precisely and are suitable when the user wants to set the fan speed.

Note: all the controls are described in detail in the "Fan Coil Control Range literature".

WM-AU control (*)



230 V 50-60 Hz

T-MB2 control (*)



230 V 50-60 Hz

WM-S-ECM control



230 V 50 Hz

WM-503-AC-EC control (**)



230 V 50 Hz

(*) To be used with UPM-AU or UP-AU.

(**) To be used with UP-503-AC-EC only

Control systems

See from p. 50 for:

- the MB electronic board (to be fitted on the MB version)
- the MB controls and units
- the KNX Bus System

SK-ECM-E VERSION

The 2 pipe model Cassette units are available with electric heater.

The electric heater is controlled in place of the hot water valve and not as integration to it.

The electric heaters are hermetically sealed and supplied inside the coil pipes and therefore can be only factory mounted.

The electric resistances of the units are for single phase 230V supply.

The Cassette fan coil unit includes no. 2 safety thermostats which intervene in case of internal over-heating, opening an auxiliary power relay (included in the electrical panel) which stops the power supply to the electric heaters.

Note: the cooling emission of the units is 95% of the emission in the tables of p. 24.

Constructional features of the electric heater

| Model | | SK-ECM 12 | SK-ECM 22 | SK-ECM 32 | SK-ECM 42 | SK-ECM 52 |
|---|---------------------|-----------|-----------|-----------|-----------|-----------|
| Nominal installed power | W | 1500 | 2500 | | 3000 | |
| Single-phase rated operating voltage | Vac/Ph/Hz | 230/1/50 | | | | |
| Connecting wires | n x mm ² | 3 x 1,5 | 3 x 2,5 | | | |
| Maximum current absorbed | A | 7,0 | 11,0 | | 13,5 | |
| Recommended fuse ⁽¹⁾ | A | 8 | 12 | | 16 | |
| Max. ambient temperature ⁽²⁾ | °C | 25 | | | | |

(1) for the overload protection; gG type

(2) with electric heater in heating mode

CONTROLS FOR SK-ECM-E UNITS

WM-AU control (*)



230 V 50-60 Hz

T-MB2 control (*)



230 V 50-60 Hz

(*) To be used with UPM-AU or UP-AU.

SkyStar Jumbo SK-ECM | MAIN COMPONENTS

MAIN COMPONENTS

HTA version



HTB version





Air diffuser

Intake grids, frame and adjustable air distribution louvers on each side, made of ABS. In the **SK-ECM-MB** version the outlet louvers are adjustable with infra-red remote control or with T-MB2 wall control (for the **SK-ECM** version manually only).

The intake and air distribution grids are available with both, the G0 filter and the **ePM₁ 55% - F7 filter**.

- **HTA** version: white ABS, RAL 9003.
- **HTB** version: in ABS one single color to choose.

Inner casing

It is made of galvanized steel with internal thermal insulation with polyolefin (PO) foam (B-s2-d0 EN 13501-01) and external anti-condensate lining.

Control panel

- **SK-ECM / SK-ECM-E** version

It consists of the pump control circuit board and the inverter circuit board.

- **SK-ECM-MB / SK-ECM-MB-E** version

It consists of the MB electronic board (that integrates pump control) and the inverter board.

The diffusion louvers are adjustable with the infra-red remote control or with T-MB2 wall control.

Fan assembly

The fan assembly, which is mounted on anti-vibrating supports, is extremely silent.

The radial fan has been designed to optimise performance, using wing profile blades with a shape that reduces turbulence, increasing efficiency and reducing noise.

The fans are connected to a three phase permanent magnet brushless electronic motor that is controlled with reconstructed current according to a BLAC sinusoidal wave.

The inverter board that controls the motor operation is powered by 230 Volt, single-phase and, with a switching system, it generates a three-phase frequency modulated, wave form power supply.

The electric power supply required for the machine is therefore single-phase with voltage of 230 - 240 V and frequency of 50 - 60 Hz.

Coil

Made of copper tubes with bonded aluminium fins for maximum transfer contact.

3 row coil for 2 pipe models and 2,5 + 1/2 row coil for 4 pipe models (the heating row is on the inside part of the coil).

The coil is not suitable for use in corrosive atmosphere or in environments where aluminium may be subject to corrosion.

Condensate collection tray

High density polystyrene foam condensate tray, shaped in order to optimize the air diffusion.

Fire retardant rating B1 to DIN 4102.

Filter

Easy access to the filter that is available in both versions, in the G0 (synthetic regenerable washable) and in the ePM₁ 55% - F7 one (to change at the end of its life-cycle).

Condensate pump

Float switch centrifugal pump with 650 mm of maximum head, integral to the unit and wired to the control panel on the outside of the casing.

The version with available pressure 1000 mm can be supplied on demand.

Valve set

Two or three way valves for ON/OFF operation, with pipe mounting kit and ball valves.

EUROVENT CERTIFICATION



2 pipe system

The following standard rating conditions are used:

COOLING

Entering air temperature: + 27 °C d.b. + 19 °C w.b.
Water temperature: +7 °C E.W.T. +12 °C L.W.T.

HEATING

Entering air temperature: + 20 °C
Water temperature: +45 °C E.W.T. +40 °C L.W.T.

| MODEL | | SK-ECM 72 | | | | | SK-ECM 82 | | | | |
|--|-------------------|-----------|------|------|-------|-------|-----------|------|-------|-------|-------|
| | | 1 | 3 | 5 | 7,5 | 10 | 1 | 3 | 5 | 7,5 | 10 |
| Inverter power | | MIN | | MED | | MAX | MIN | | MED | | MAX |
| Eurovent certified performances. | | (E) | - | (E) | - | (E) | (E) | - | (E) | - | (E) |
| Air flow | m ³ /h | 790 | 1040 | 1290 | 1600 | 1905 | 1025 | 1340 | 1650 | 2060 | 2480 |
| Cooling total emission (E) | kW | 6,36 | 7,95 | 9,43 | 11,10 | 12,60 | 7,86 | 9,72 | 11,38 | 13,35 | 15,13 |
| Cooling sensible emission (E) | kW | 4,45 | 5,65 | 6,77 | 8,09 | 9,31 | 5,58 | 7,00 | 8,30 | 9,88 | 11,41 |
| Heating emission (E) | kW | 6,18 | 7,93 | 9,59 | 11,55 | 13,39 | 8,72 | 9,91 | 11,86 | 14,29 | 16,40 |
| Dp Cooling (E) | kPa | 6,6 | 9,8 | 13,4 | 18,0 | 22,7 | 9,6 | 14,1 | 18,8 | 25,2 | 31,8 |
| Dp Heating (E) | kPa | 5,4 | 8,4 | 11,8 | 16,5 | 21,5 | 8,2 | 12,5 | 17,3 | 24,2 | 31,0 |
| Sound power (Lw) (E) | dB(A) | 38 | 44 | 49 | 54 | 58 | 47 | 50 | 55 | 60 | 64 |
| Sound pressure (Lp) ⁽¹⁾ | dB(A) | 29 | 35 | 40 | 45 | 49 | 38 | 41 | 46 | 51 | 55 |
| Fan (E) | W | 13 | 22 | 35 | 59 | 93 | 21 | 38 | 64 | 113 | 183 |
| Condensate drain pump power absorption | W | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Water content | l | 4,6 | 4,6 | 4,6 | 4,6 | 4,6 | 4,6 | 4,6 | 4,6 | 4,6 | 4,6 |
| Length | mm | 869 | 869 | 869 | 869 | 869 | 869 | 869 | 869 | 869 | 869 |
| Depth | mm | 869 | 869 | 869 | 869 | 869 | 869 | 869 | 869 | 869 | 869 |
| Height | mm | 304 | 304 | 304 | 304 | 304 | 304 | 304 | 304 | 304 | 304 |

(E) Eurovent certified performance.

(1) The sound pressure levels are 9 dB (A) lower than the sound power levels, apply to the reverberant field of a 100 m³ room and a reverberation time of 0.5 sec.

4 pipe system

The following standard rating conditions are used:

COOLING

Entering air temperature: + 27 °C d.b. + 19 °C w.b.
Water temperature: +7 °C E.W.T. +12 °C L.W.T.

HEATING

Entering air temperature: + 20 °C
Water temperature: +65 °C E.W.T. +55 °C L.W.T.

| MODEL | | SK-ECM 76 | | | | | SK-ECM 86 | | | | |
|--|-------------------|-----------|------|------|-------|-------|-----------|------|-------|-------|-------|
| | | 1 | 3 | 5 | 7,5 | 10 | 1 | 3 | 5 | 7,5 | 10 |
| Inverter power | | MIN | | MED | | MAX | MIN | | MED | | MAX |
| Eurovent certified performances. | | (E) | - | (E) | - | (E) | (E) | - | (E) | - | (E) |
| Air flow | m ³ /h | 790 | 1040 | 1290 | 1600 | 1905 | 1025 | 1340 | 1650 | 2060 | 2480 |
| Cooling total emission (E) | kW | 6,07 | 7,53 | 8,86 | 10,35 | 11,61 | 7,45 | 9,10 | 10,59 | 12,30 | 13,59 |
| Cooling sensible emission (E) | kW | 4,33 | 5,46 | 6,53 | 7,74 | 8,87 | 5,40 | 6,73 | 7,96 | 9,44 | 10,68 |
| Heating emission (E) | kW | 6,01 | 7,27 | 8,40 | 9,63 | 10,55 | 7,19 | 8,62 | 9,80 | 11,05 | 12,17 |
| Dp Cooling (E) | kPa | 7,0 | 10,3 | 13,8 | 18,3 | 22,6 | 10,1 | 14,5 | 19,1 | 25,2 | 30,4 |
| Dp Heating (E) | kPa | 7,2 | 10,2 | 13,2 | 16,9 | 19,9 | 10,0 | 13,8 | 17,4 | 21,6 | 25,7 |
| Sound power (Lw) (E) | dB(A) | 38 | 44 | 49 | 54 | 58 | 47 | 50 | 55 | 60 | 64 |
| Sound pressure (Lp) ⁽¹⁾ | dB(A) | 29 | 35 | 40 | 45 | 49 | 38 | 41 | 46 | 51 | 55 |
| Fan (E) | W | 13 | 22 | 35 | 59 | 93 | 21 | 38 | 64 | 113 | 183 |
| Condensate drain pump power absorption | W | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Cooling water content | l | 3,6 | 3,6 | 3,6 | 3,6 | 3,6 | 3,6 | 3,6 | 3,6 | 3,6 | 3,6 |
| Heating water content | l | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 | 1,2 |
| Length | mm | 869 | 869 | 869 | 869 | 869 | 869 | 869 | 869 | 869 | 869 |
| Depth | mm | 869 | 869 | 869 | 869 | 869 | 869 | 869 | 869 | 869 | 869 |
| Height | mm | 304 | 304 | 304 | 304 | 304 | 304 | 304 | 304 | 304 | 304 |

(E) Eurovent certified performance.

(1) The sound pressure levels are 9 dB (A) lower than the sound power levels, apply to the reverberant field of a 100 m³ room and a reverberation time of 0.5 sec.

COOLING EMISSION

Entering air temperature: 27 °C – R.H.: 50%

| Model | Vdc | WT: 7 / 12 °C | | | | | WT: 8 / 13 °C | | | | | WT: 10 / 15 °C | | | | | WT: 12 / 17 °C | | | | |
|-----------|-----|-------------------------|----------|----------|-----------|--------------|---------------|----------|-----------|--------------|----------|----------------|-----------|--------------|----------|----------|----------------|--------------|--|--|--|
| | | Qv m ³ /h | Pc kW | Ps kW | Qw l/h | Dp(c) kPa | Pc kW | Ps kW | Qw l/h | Dp(c) kPa | Pc kW | Ps kW | Qw l/h | Dp(c) kPa | Pc kW | Ps kW | Qw l/h | Dp(c) kPa | | | |
| SK-ECM 72 | 10 | 1905 | 13,52 | 9,25 | 2341 | 25,7 | 12,21 | 8,73 | 2116 | 21,3 | 9,70 | 7,68 | 1684 | 14,0 | 6,96 | 6,96 | 1213 | 7,7 | | | |
| | 7,5 | 1600 | 11,90 | 8,07 | 2058 | 20,4 | 10,77 | 7,59 | 1862 | 16,9 | 8,58 | 6,69 | 1486 | 11,2 | 6,63 | 5,86 | 1150 | 7,0 | | | |
| | 5 | 1290 | 10,11 | 6,77 | 1744 | 15,1 | 9,14 | 6,36 | 1577 | 12,6 | 7,31 | 5,60 | 1264 | 8,3 | 5,65 | 4,90 | 978 | 5,2 | | | |
| | 3 | 1040 | 8,52 | 5,65 | 1470 | 11,1 | 7,74 | 5,32 | 1335 | 9,3 | 6,19 | 4,66 | 1068 | 6,2 | 4,77 | 4,08 | 825 | 3,8 | | | |
| | 1 | 790 | 6,80 | 4,45 | 1172 | 7,4 | 6,19 | 4,19 | 1067 | 6,2 | 4,99 | 3,68 | 860 | 4,2 | 3,85 | 3,22 | 665 | 2,6 | | | |
| SK-ECM 82 | 10 | 2480 | 16,21 | 11,31 | 2819 | 35,9 | 14,60 | 10,67 | 2543 | 29,7 | 11,59 | 9,41 | 2025 | 19,5 | 8,49 | 8,49 | 1491 | 11,1 | | | |
| | 7,5 | 2060 | 14,28 | 9,84 | 2476 | 28,5 | 12,92 | 9,28 | 2242 | 23,6 | 10,23 | 8,17 | 1779 | 15,4 | 7,39 | 7,39 | 1291 | 8,6 | | | |
| | 5 | 1650 | 12,18 | 8,27 | 2106 | 21,3 | 11,03 | 7,79 | 1907 | 17,7 | 8,74 | 6,85 | 1515 | 11,5 | 6,78 | 6,01 | 1177 | 7,2 | | | |
| | 3 | 1340 | 10,41 | 6,98 | 1797 | 16,0 | 9,43 | 6,57 | 1628 | 13,3 | 7,51 | 5,77 | 1299 | 8,8 | 5,81 | 5,06 | 1005 | 5,5 | | | |
| | 1 | 1025 | 8,42 | 5,58 | 1453 | 10,9 | 7,64 | 5,25 | 1318 | 9,1 | 6,13 | 4,61 | 1057 | 6,0 | 4,73 | 4,03 | 816 | 3,8 | | | |
| SK-ECM 76 | 10 | 1905 | 12,40 | 8,78 | 2149 | 25,5 | 11,20 | 8,31 | 1942 | 21,1 | 8,93 | 7,36 | 1553 | 13,9 | 6,65 | 6,65 | 1160 | 8,2 | | | |
| | 7,5 | 1600 | 11,03 | 7,69 | 1908 | 20,6 | 10,01 | 7,28 | 1731 | 17,2 | 7,97 | 6,43 | 1381 | 11,3 | 5,83 | 5,83 | 1013 | 6,4 | | | |
| | 5 | 1290 | 9,47 | 6,49 | 1635 | 15,6 | 8,57 | 6,11 | 1480 | 12,9 | 6,84 | 5,40 | 1183 | 8,6 | 5,32 | 4,75 | 921 | 5,4 | | | |
| | 3 | 1040 | 8,07 | 5,44 | 1391 | 11,6 | 7,30 | 5,13 | 1259 | 9,7 | 5,82 | 4,51 | 1005 | 6,4 | 4,53 | 3,97 | 782 | 4,0 | | | |
| | 1 | 790 | 6,50 | 4,32 | 1121 | 7,9 | 5,88 | 4,06 | 1014 | 6,6 | 4,73 | 3,57 | 816 | 4,4 | 3,67 | 3,14 | 634 | 2,8 | | | |
| SK-ECM 86 | 10 | 2480 | 14,48 | 10,52 | 2522 | 34,0 | 13,08 | 9,98 | 2281 | 28,2 | 10,41 | 8,85 | 1822 | 18,6 | 7,94 | 7,94 | 1396 | 11,4 | | | |
| | 7,5 | 2060 | 13,05 | 9,31 | 2264 | 28,0 | 11,81 | 8,82 | 2051 | 23,3 | 9,40 | 7,81 | 1635 | 15,3 | 7,04 | 7,04 | 1231 | 9,1 | | | |
| | 5 | 1650 | 11,27 | 7,87 | 1949 | 21,4 | 10,22 | 7,45 | 1768 | 17,8 | 8,13 | 6,58 | 1409 | 11,7 | 5,97 | 5,97 | 1038 | 6,7 | | | |
| | 3 | 1340 | 9,74 | 6,69 | 1681 | 16,4 | 8,82 | 6,30 | 1524 | 13,6 | 7,04 | 5,57 | 1217 | 9,0 | 5,47 | 4,90 | 947 | 5,7 | | | |
| | 1 | 1025 | 7,98 | 5,38 | 1376 | 11,4 | 7,22 | 5,07 | 1246 | 9,5 | 5,79 | 4,47 | 1000 | 6,3 | 4,48 | 3,92 | 774 | 3,9 | | | |

WT: Water temperature
Vdc: Inverter power
Qv: Air flow
Pc: Cooling total emission
Ps: Cooling sensible emission
Qw: Water flow rate
Dp(c): Dp Cooling

Entering air temperature 26 °C – R.H.: 50%

| Model | Vdc | WT: 7 / 12 °C | | | | | WT: 8 / 13 °C | | | | WT: 10 / 15 °C | | | | WT: 12 / 17 °C | | | |
|-----------|-----|-------------------------|----------|----------|-----------|--------------|---------------|----------|-----------|--------------|----------------|----------|-----------|--------------|----------------|----------|-----------|--------------|
| | | Qv m ³ /h | Pc kW | Ps kW | Qw l/h | Dp(c) kPa | Pc kW | Ps kW | Qw l/h | Dp(c) kPa | Pc kW | Ps kW | Qw l/h | Dp(c) kPa | Pc kW | Ps kW | Qw l/h | Dp(c) kPa |
| SK-ECM 72 | 10 | 1905 | 12,13 | 8,75 | 2102 | 21,2 | 10,85 | 8,19 | 1883 | 17,3 | 8,55 | 7,21 | 1487 | 11,2 | 6,39 | 6,39 | 1116 | 6,6 |
| | 7,5 | 1600 | 10,67 | 7,61 | 1846 | 16,8 | 9,56 | 7,13 | 1655 | 13,7 | 7,57 | 6,28 | 1311 | 8,9 | 5,58 | 5,58 | 971 | 5,1 |
| | 5 | 1290 | 9,07 | 6,38 | 1565 | 12,5 | 8,16 | 5,98 | 1410 | 10,3 | 6,45 | 5,25 | 1115 | 6,6 | 4,70 | 4,70 | 814 | 3,7 |
| | 3 | 1040 | 7,67 | 5,33 | 1322 | 9,2 | 6,90 | 4,99 | 1190 | 7,6 | 5,46 | 4,38 | 943 | 4,9 | 4,17 | 3,82 | 721 | 3,0 |
| | 1 | 790 | 6,13 | 4,21 | 1056 | 6,1 | 5,53 | 3,94 | 954 | 5,1 | 4,39 | 3,45 | 757 | 3,3 | 3,36 | 3,01 | 580 | 2,0 |
| SK-ECM 82 | 10 | 2480 | 14,49 | 10,67 | 2523 | 29,4 | 12,94 | 10,03 | 2257 | 23,9 | 10,26 | 8,85 | 1797 | 15,7 | 7,78 | 7,78 | 1370 | 9,5 |
| | 7,5 | 2060 | 12,78 | 9,30 | 2218 | 23,3 | 11,44 | 8,72 | 1988 | 19,0 | 9,04 | 7,68 | 1574 | 12,4 | 6,79 | 6,79 | 1187 | 7,4 |
| | 5 | 1650 | 10,93 | 7,80 | 1891 | 17,5 | 9,78 | 7,31 | 1694 | 14,3 | 7,72 | 6,43 | 1338 | 9,2 | 5,72 | 5,72 | 995 | 5,4 |
| | 3 | 1340 | 9,35 | 6,59 | 1615 | 13,2 | 8,40 | 6,17 | 1451 | 10,8 | 6,63 | 5,42 | 1147 | 7,0 | 4,84 | 4,84 | 840 | 3,9 |
| | 1 | 1025 | 7,58 | 5,27 | 1307 | 9,0 | 6,82 | 4,94 | 1176 | 7,4 | 5,40 | 4,32 | 932 | 4,8 | 4,12 | 3,77 | 713 | 2,9 |
| SK-ECM 76 | 10 | 1905 | 11,14 | 8,33 | 1932 | 21,0 | 9,94 | 7,83 | 1725 | 17,0 | 7,93 | 6,93 | 1380 | 11,3 | 6,10 | 6,10 | 1065 | 7,0 |
| | 7,5 | 1600 | 9,95 | 7,30 | 1721 | 17,1 | 8,88 | 6,84 | 1538 | 13,9 | 7,04 | 6,04 | 1221 | 9,0 | 5,35 | 5,35 | 931 | 5,5 |
| | 5 | 1290 | 8,52 | 6,13 | 1471 | 12,9 | 7,62 | 5,76 | 1317 | 10,5 | 6,03 | 5,07 | 1043 | 6,8 | 4,53 | 4,53 | 785 | 4,0 |
| | 3 | 1040 | 7,25 | 5,15 | 1251 | 9,6 | 6,51 | 4,82 | 1124 | 7,9 | 5,15 | 4,24 | 889 | 5,1 | 3,80 | 3,80 | 658 | 2,9 |
| | 1 | 790 | 5,85 | 4,08 | 1009 | 6,5 | 5,27 | 3,83 | 909 | 5,4 | 4,18 | 3,36 | 722 | 3,5 | 3,21 | 2,94 | 555 | 2,2 |
| SK-ECM 86 | 10 | 2480 | 13,03 | 10,00 | 2272 | 28,1 | 11,64 | 9,41 | 2033 | 22,9 | 8,61 | 8,61 | 1512 | 13,3 | 7,26 | 7,26 | 1280 | 9,7 |
| | 7,5 | 2060 | 11,76 | 8,85 | 2042 | 23,2 | 10,50 | 8,31 | 1825 | 18,9 | 8,33 | 7,35 | 1452 | 12,4 | 6,45 | 6,45 | 1129 | 7,8 |
| | 5 | 1650 | 10,16 | 7,47 | 1758 | 17,7 | 9,07 | 7,00 | 1571 | 14,4 | 7,17 | 6,19 | 1244 | 9,4 | 5,48 | 5,48 | 954 | 5,7 |
| | 3 | 1340 | 8,77 | 6,34 | 1514 | 13,6 | 7,83 | 5,94 | 1353 | 11,0 | 6,19 | 5,23 | 1071 | 7,1 | 4,67 | 4,67 | 809 | 4,3 |
| | 1 | 1025 | 7,17 | 5,08 | 1237 | 9,4 | 6,45 | 4,76 | 1112 | 7,7 | 5,11 | 4,20 | 882 | 5,0 | 3,76 | 3,76 | 650 | 2,9 |

WT: Water temperature
 Vdc: Inverter power
 Qv: Air flow
 Pc: Cooling total emission
 Ps: Cooling sensible emission
 Qw: Water flow rate
 Dp(c): Dp Cooling

Entering air temperature: 25 °C – R.H.: 50%

| Model | Vdc | WT: 7 / 12 °C | | | | | WT: 8 / 13 °C | | | | | WT: 10 / 15 °C | | | | | WT: 12 / 17 °C | | | | |
|-----------|-----|-------------------------|----------|----------|-----------|--------------|---------------|----------|-----------|--------------|----------|----------------|-----------|--------------|----------|----------|----------------|--------------|--|--|--|
| | | Qv m ³ /h | Pc kW | Ps kW | Qw l/h | Dp(c) kPa | Pc kW | Ps kW | Qw l/h | Dp(c) kPa | Pc kW | Ps kW | Qw l/h | Dp(c) kPa | Pc kW | Ps kW | Qw l/h | Dp(c) kPa | | | |
| SK-ECM 72 | 10 | 1905 | 10,80 | 8,21 | 1874 | 17,2 | 9,64 | 7,70 | 1674 | 14,0 | 7,53 | 6,75 | 1310 | 8,9 | 5,82 | 5,82 | 1018 | 5,6 | | | |
| | 7,5 | 1600 | 9,51 | 7,15 | 1646 | 13,6 | 8,52 | 6,72 | 1476 | 11,1 | 6,63 | 5,87 | 1151 | 7,0 | 5,09 | 5,09 | 886 | 4,4 | | | |
| | 5 | 1290 | 8,11 | 6,00 | 1401 | 10,2 | 7,25 | 5,62 | 1254 | 8,3 | 5,65 | 4,92 | 977 | 5,2 | 4,29 | 4,29 | 744 | 3,2 | | | |
| | 3 | 1040 | 6,86 | 5,01 | 1184 | 7,5 | 6,13 | 4,69 | 1059 | 6,1 | 4,79 | 4,10 | 827 | 3,9 | 3,59 | 3,59 | 622 | 2,3 | | | |
| | 1 | 790 | 5,50 | 3,96 | 948 | 5,1 | 4,93 | 3,70 | 851 | 4,1 | 3,85 | 3,23 | 665 | 2,6 | 2,86 | 2,86 | 495 | 1,5 | | | |
| SK-ECM 82 | 10 | 2480 | 12,91 | 10,07 | 2251 | 24,0 | 11,54 | 9,45 | 2016 | 19,5 | 8,49 | 8,49 | 1492 | 11,2 | 7,07 | 7,07 | 1247 | 8,0 | | | |
| | 7,5 | 2060 | 11,41 | 8,73 | 1981 | 19,0 | 10,17 | 8,21 | 1769 | 15,4 | 7,40 | 7,40 | 1292 | 8,7 | 6,18 | 6,18 | 1082 | 6,2 | | | |
| | 5 | 1650 | 9,75 | 7,33 | 1688 | 14,3 | 8,70 | 6,88 | 1508 | 11,6 | 6,78 | 6,02 | 1177 | 7,3 | 5,22 | 5,22 | 908 | 4,5 | | | |
| | 3 | 1340 | 8,35 | 6,19 | 1442 | 10,8 | 7,46 | 5,80 | 1290 | 8,7 | 5,81 | 5,07 | 1006 | 5,5 | 4,43 | 4,43 | 768 | 3,4 | | | |
| | 1 | 1025 | 6,79 | 4,95 | 1171 | 7,4 | 6,08 | 4,64 | 1050 | 6,0 | 4,73 | 4,05 | 818 | 3,8 | 3,55 | 3,55 | 615 | 2,3 | | | |
| SK-ECM 76 | 10 | 1905 | 9,94 | 7,84 | 1726 | 17,2 | 8,89 | 7,38 | 1545 | 14,0 | 6,65 | 6,65 | 1160 | 8,3 | 5,54 | 5,54 | 969 | 5,9 | | | |
| | 7,5 | 1600 | 8,82 | 6,86 | 1528 | 13,8 | 7,91 | 6,44 | 1370 | 11,3 | 5,84 | 5,84 | 1014 | 6,5 | 4,87 | 4,87 | 848 | 4,6 | | | |
| | 5 | 1290 | 7,59 | 5,77 | 1311 | 10,5 | 6,81 | 5,42 | 1177 | 8,6 | 5,32 | 4,76 | 921 | 5,4 | 4,13 | 4,13 | 716 | 3,4 | | | |
| | 3 | 1040 | 6,49 | 4,84 | 1119 | 7,9 | 5,78 | 4,54 | 999 | 6,4 | 4,53 | 3,98 | 782 | 4,1 | 3,47 | 3,47 | 601 | 2,5 | | | |
| | 1 | 790 | 5,24 | 3,84 | 903 | 5,3 | 4,69 | 3,59 | 809 | 4,4 | 3,68 | 3,15 | 635 | 2,8 | 2,78 | 2,78 | 481 | 1,7 | | | |
| SK-ECM 86 | 10 | 2480 | 11,61 | 9,42 | 2028 | 22,9 | 10,38 | 8,87 | 1816 | 18,7 | 7,93 | 7,93 | 1396 | 11,5 | 6,58 | 6,58 | 1163 | 8,2 | | | |
| | 7,5 | 2060 | 10,47 | 8,31 | 1821 | 18,9 | 9,36 | 7,83 | 1629 | 15,4 | 7,05 | 7,05 | 1231 | 9,2 | 5,86 | 5,86 | 1027 | 6,6 | | | |
| | 5 | 1650 | 9,03 | 7,01 | 1564 | 14,4 | 8,07 | 6,59 | 1399 | 11,7 | 5,97 | 5,97 | 1039 | 6,8 | 4,99 | 4,99 | 869 | 4,8 | | | |
| | 3 | 1340 | 7,79 | 5,95 | 1347 | 11,0 | 6,99 | 5,59 | 1209 | 9,0 | 5,48 | 4,91 | 948 | 5,7 | 4,25 | 4,25 | 738 | 3,6 | | | |
| | 1 | 1025 | 6,41 | 4,78 | 1106 | 7,7 | 5,72 | 4,48 | 988 | 6,2 | 4,48 | 3,93 | 774 | 4,0 | 3,43 | 3,43 | 594 | 2,4 | | | |

WT: Water temperature
Vdc: Inverter power
Qv: Air flow
Pc: Cooling total emission
Ps: Cooling sensible emission
Qw: Water flow rate
Dp(c): Dp Cooling

HEATING EMISSION

Entering air temperature: 20 °C

| Model | Vdc | WT: 65 / 55 °C | | | | WT: 60 / 50 °C | | | WT: 50 / 40 °C | | | WT: 50 / 45 °C | | | WT: 45 / 40 °C | | |
|-----------|-----|-------------------------|----------|-----------|--------------|----------------|-----------|--------------|----------------|-----------|--------------|----------------|-----------|--------------|----------------|-----------|--------------|
| | | Qv m ³ /h | Ph kW | Qw l/h | Dp(h) kPa | Ph kW | Qw l/h | Dp(h) kPa | Ph kW | Qw l/h | Dp(h) kPa | Ph kW | Qw l/h | Dp(h) kPa | Ph kW | Qw l/h | Dp(h) kPa |
| SK-ECM 72 | 10 | 1905 | 24,08 | 2070 | 17,0 | 21,08 | 1813 | 13,5 | 15,06 | 1295 | 7,6 | 16,34 | 2810 | 30,4 | 13,39 | 2302 | 21,5 |
| | 7,5 | 1600 | 20,78 | 1787 | 13,0 | 18,21 | 1566 | 10,4 | 13,05 | 1122 | 5,9 | 14,08 | 2421 | 23,2 | 11,55 | 1987 | 16,5 |
| | 5 | 1290 | 17,25 | 1483 | 9,3 | 15,14 | 1302 | 7,5 | 10,90 | 937 | 4,2 | 11,67 | 2007 | 16,6 | 9,59 | 1649 | 11,8 |
| | 3 | 1040 | 14,26 | 1226 | 6,6 | 12,54 | 1078 | 5,3 | 9,06 | 779 | 3,0 | 9,63 | 1656 | 11,7 | 7,93 | 1363 | 8,4 |
| | 1 | 790 | 11,12 | 956 | 4,2 | 9,79 | 842 | 3,4 | 7,11 | 611 | 2,0 | 7,49 | 1289 | 7,5 | 6,18 | 1063 | 5,4 |
| SK-ECM 82 | 10 | 2480 | 29,49 | 2536 | 24,4 | 25,79 | 2218 | 19,4 | 18,33 | 1577 | 10,8 | 20,06 | 3450 | 43,9 | 16,40 | 2821 | 31,0 |
| | 7,5 | 2060 | 25,69 | 2210 | 19,1 | 22,49 | 1934 | 15,2 | 16,04 | 1379 | 8,5 | 17,45 | 3001 | 34,2 | 14,29 | 2457 | 24,2 |
| | 5 | 1650 | 21,33 | 1834 | 13,6 | 18,69 | 1608 | 10,9 | 13,39 | 1151 | 6,1 | 14,45 | 2486 | 24,4 | 11,86 | 2039 | 17,3 |
| | 3 | 1340 | 17,83 | 1533 | 9,9 | 15,65 | 1346 | 7,9 | 11,25 | 968 | 4,5 | 12,06 | 2075 | 17,6 | 9,91 | 1705 | 12,5 |
| | 1 | 1025 | 14,08 | 1211 | 6,5 | 12,38 | 1064 | 5,2 | 8,94 | 769 | 3,0 | 9,50 | 1635 | 11,5 | 7,82 | 1346 | 8,2 |

WT: Water temperature
 Vdc: Inverter power
 Qv: Air flow
 Ph: Heating emission
 Qw: Water flow rate
 Dp(h): Dp Heating

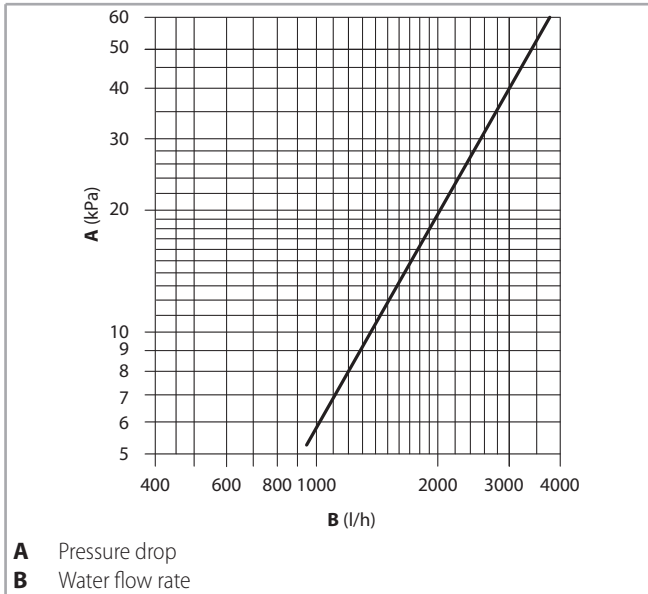
Entering air temperature: 20 °C

| Model | Vdc | WT: 70 / 60 °C | | | | WT: 60 / 50 °C | | | WT: 50 / 40 °C | | | WT: 50 / 45 °C | | | WT: 45 / 40 °C | | |
|-----------|-----|-------------------------|----------|-----------|--------------|----------------|-----------|--------------|----------------|-----------|--------------|----------------|-----------|--------------|----------------|-----------|--------------|
| | | Qv m ³ /h | Ph kW | Qw l/h | Dp(h) kPa | Ph kW | Qw l/h | Dp(h) kPa | Ph kW | Qw l/h | Dp(h) kPa | Ph kW | Qw l/h | Dp(h) kPa | Ph kW | Qw l/h | Dp(h) kPa |
| SK-ECM 76 | 10 | 1905 | 12,04 | 1036 | 24,9 | 9,07 | 780 | 15,3 | 6,10 | 525 | 7,7 | 7,36 | 1266 | 37,4 | 5,89 | 1014 | 25,5 |
| | 7,5 | 1600 | 10,98 | 944 | 21,1 | 8,28 | 712 | 13,0 | 5,58 | 480 | 6,6 | 6,71 | 1155 | 31,7 | 5,38 | 925 | 21,6 |
| | 5 | 1290 | 9,58 | 824 | 16,5 | 7,23 | 621 | 10,2 | 4,88 | 420 | 5,2 | 5,85 | 1007 | 24,8 | 4,69 | 807 | 16,9 |
| | 3 | 1040 | 8,28 | 712 | 12,7 | 6,25 | 538 | 7,9 | 4,23 | 364 | 4,0 | 5,06 | 870 | 19,1 | 4,06 | 698 | 13,0 |
| | 1 | 790 | 6,84 | 588 | 9,0 | 5,17 | 445 | 5,6 | 3,51 | 301 | 2,9 | 4,18 | 719 | 13,5 | 3,35 | 577 | 9,2 |
| SK-ECM 86 | 10 | 2480 | 13,89 | 1195 | 32,3 | 10,45 | 899 | 19,8 | 7,02 | 604 | 10,0 | 8,50 | 1461 | 48,5 | 6,80 | 1169 | 32,9 |
| | 7,5 | 2060 | 12,61 | 1085 | 27,1 | 9,49 | 817 | 16,7 | 6,39 | 549 | 8,4 | 7,71 | 1326 | 40,7 | 6,17 | 1062 | 27,7 |
| | 5 | 1650 | 11,18 | 961 | 21,8 | 8,42 | 724 | 13,4 | 5,68 | 488 | 6,8 | 6,83 | 1176 | 32,8 | 5,48 | 942 | 22,3 |
| | 3 | 1340 | 9,83 | 845 | 17,3 | 7,41 | 637 | 10,7 | 5,00 | 430 | 5,4 | 6,00 | 1033 | 25,9 | 4,81 | 828 | 17,7 |
| | 1 | 1025 | 8,20 | 705 | 12,5 | 6,19 | 532 | 7,7 | 4,19 | 360 | 3,9 | 5,01 | 862 | 18,7 | 4,02 | 691 | 12,8 |

WT: Water temperature
 Vdc: Inverter power
 Qv: Air flow
 Ph: Heating emission
 Qw: Water flow rate
 Dp(h): Dp Heating

WATER SIDE PRESSURE DROP

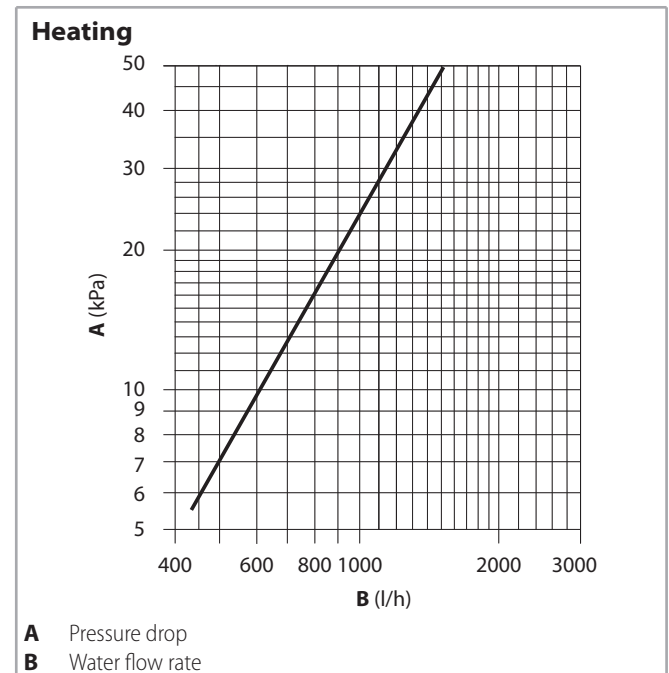
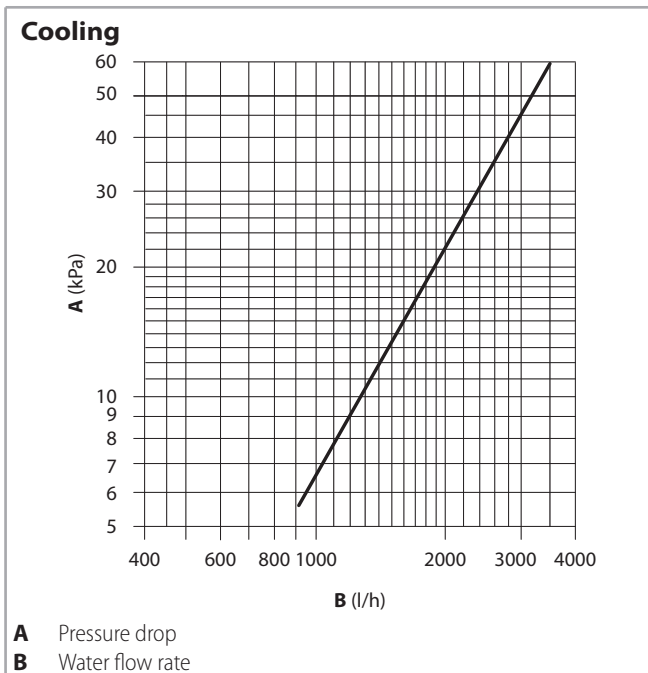
2 pipe system



The water pressure drop figures refer to a mean water temperature of 10 °C; for different temperatures, multiply the pressure drop figures by the correction factors K.

| K correction factor | Mean water temperature (°C) | | | | | | |
|---------------------|-----------------------------|------|------|------|------|------|------|
| | 20 | 30 | 40 | 50 | 60 | 70 | 80 |
| | 0,94 | 0,90 | 0,86 | 0,82 | 0,78 | 0,74 | 0,70 |

4 pipe system



The water pressure drop figures refer to a mean water temperature of 10 °C; for different temperatures, multiply the pressure drop figures by the correction factors K.

| K correction factor | Mean water temperature (°C) | | | | | | |
|---------------------|-----------------------------|------|------|------|------|------|------|
| | 20 | 30 | 40 | 50 | 60 | 70 | 80 |
| | 0,94 | 0,90 | 0,86 | 0,82 | 0,78 | 0,74 | 0,70 |

The water pressure drop figures refer to a mean water temperature of 60 °C; for different temperatures, multiply the pressure drop figures by the correction factors K.

| K correction factor | Mean water temperature (°C) | | | |
|---------------------|-----------------------------|------|------|------|
| | 40 | 50 | 70 | 80 |
| | 1,12 | 1,06 | 0,94 | 0,88 |

OPERATION LIMITS

| Description | UoM | Value |
|--------------|--|-----------|
| Water flow | Coil maximum working pressure | bars |
| | | kPa |
| | Lowest water inlet temperature | °C |
| | Highest water inlet temperature mod. 72-82 | °C |
| | | +6 |
| | | +65 |
| | | +80 |
| Power supply | Single-phase rated operating voltage | V/Hz |
| | | 230/50-60 |

For maximum installation height, see p. 46.

Filter

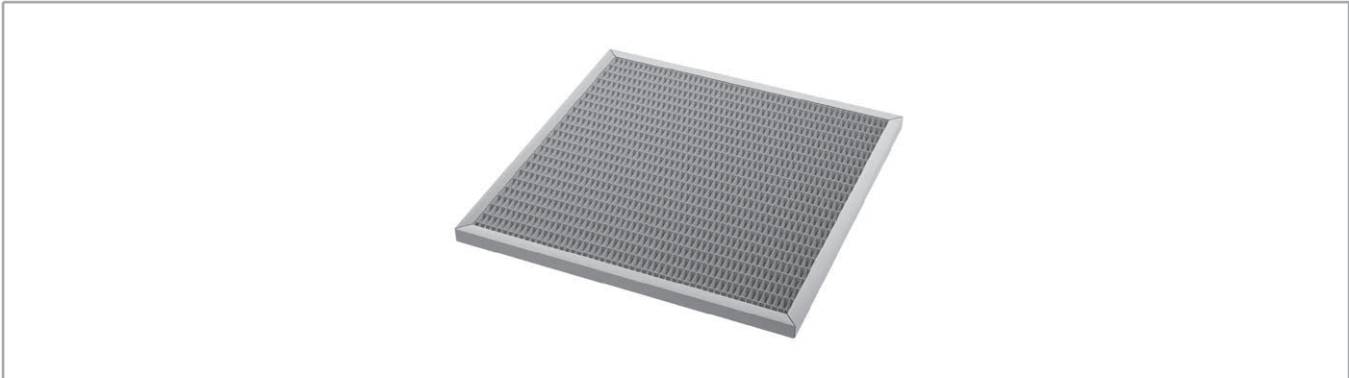
ePM₁ 55% - F7 filter

Micro-pleated synthetic filter dimension 578x578x24 mm.

surface increases the emissions and reduces the pressure drops.

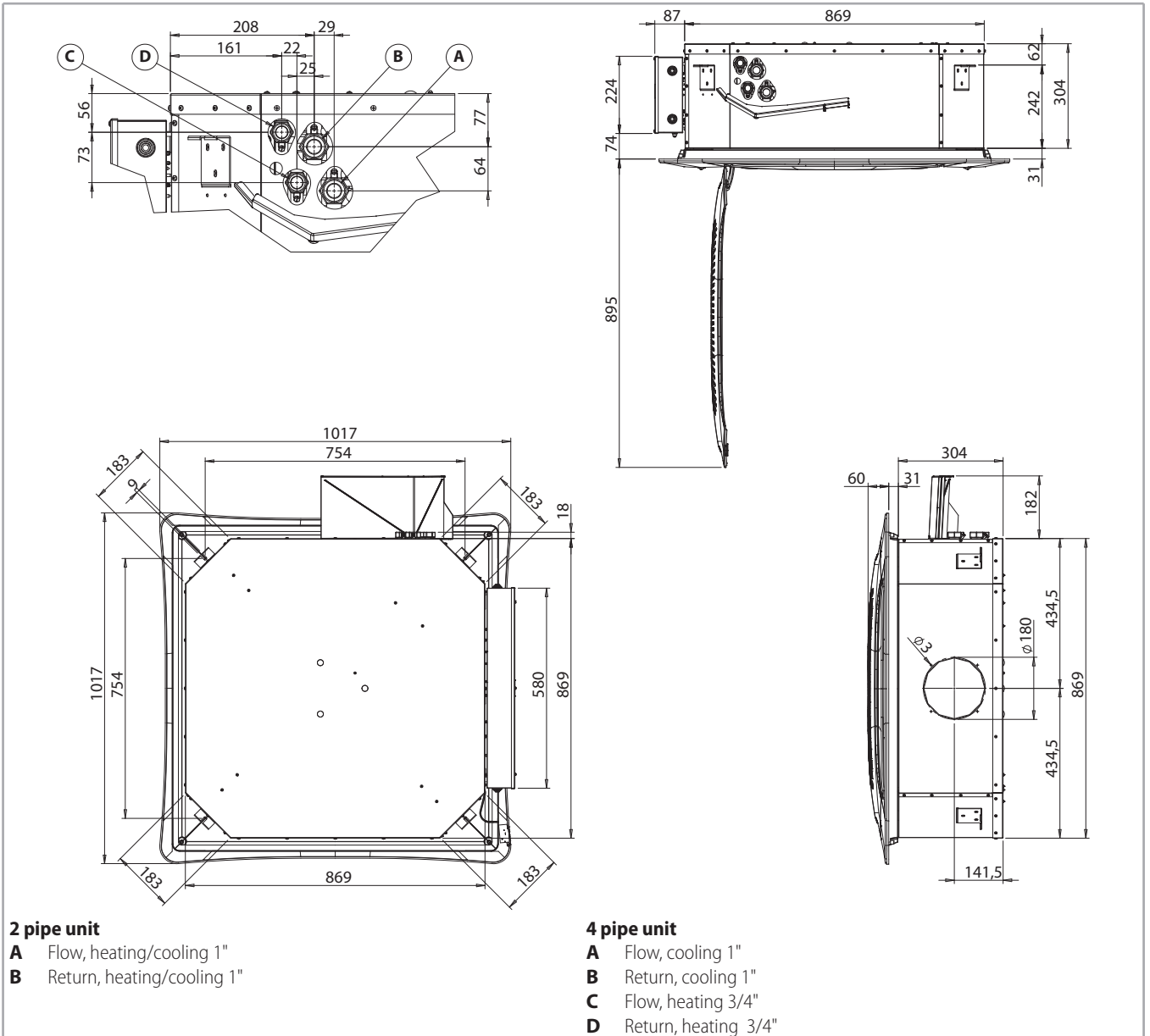
The filtering media is made of (PP+PS) polystyrene and polypropilene. The very big micro-pleated filtering

| | | | | | | |
|---------------------------------|-----|------|------|------|------|------|
| Air flow Qv (m ³ /h) | 700 | 1000 | 1300 | 1600 | 1900 | 2200 |
| Efficiency | 70% | 70% | 65% | 65% | 55% | 55% |

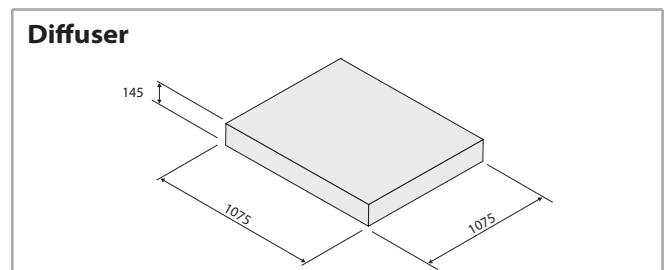
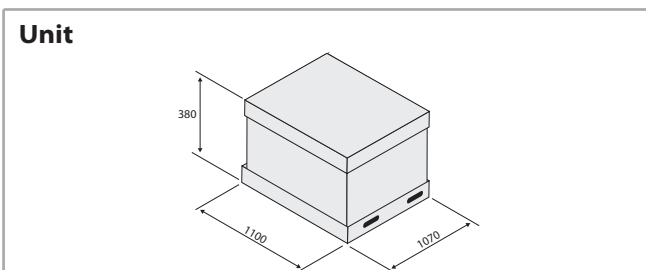


DIMENSION AND WEIGHT

SK-ECM 72-76 / SK-ECM 82-86



Packed unit



| Weight/Model | | 72 | 76 | 82 | 86 |
|-------------------|----|----|----|----|----|
| With packaging | kg | | | 52 | |
| Without packaging | kg | | | 42 | |

| Weight/Model | | 72 | 76 | 82 | 86 |
|-------------------|----|----|----|-----|----|
| With packaging | kg | | | 9,4 | |
| Without packaging | kg | | | 7,5 | |

AIR THROW

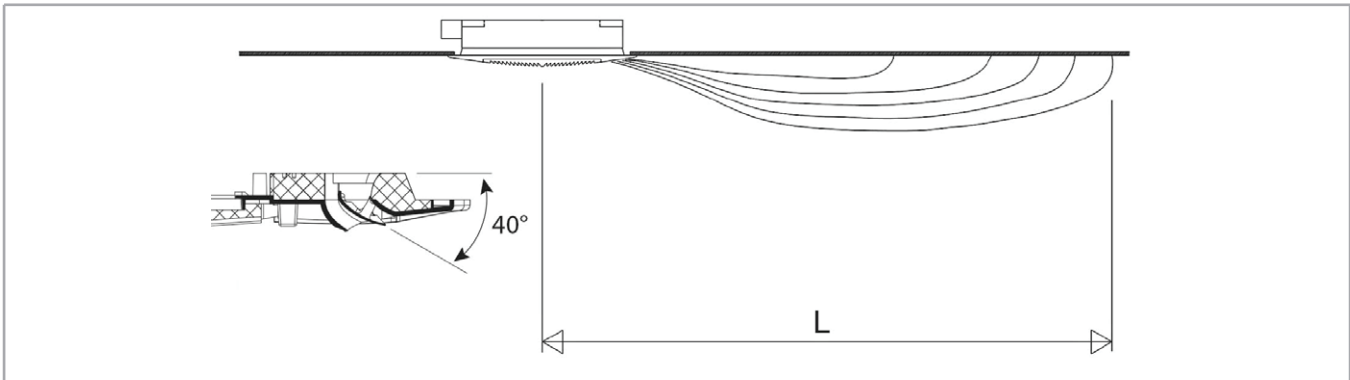
The air throw indicated in the tables must only be considered the maximum value, as it may change significantly in relation to the dimensions of the room in which the appliance is installed and the positioning of the furniture in the room.

The useful throw L refers to the distance between the unit and the point where the air speed is 0.2 m/sec; if the louver has a gradient of 40° (recommended in cooling mode), the so-called "coanda" effect will occur,

illustrated in the first figure, while at a gradient of 60° (recommended in heating mode), there will be a downwards throw, as illustrated in the second figure.

Note: on heating it must be paid attention to rooms where the floor temperature is particularly low (for example less than 5 °C). In this situation the floor can cool the lower layer of air to a level that stops the uniform diffusion of the hot air coming from the unit, decreasing the throw figures shown in the table.

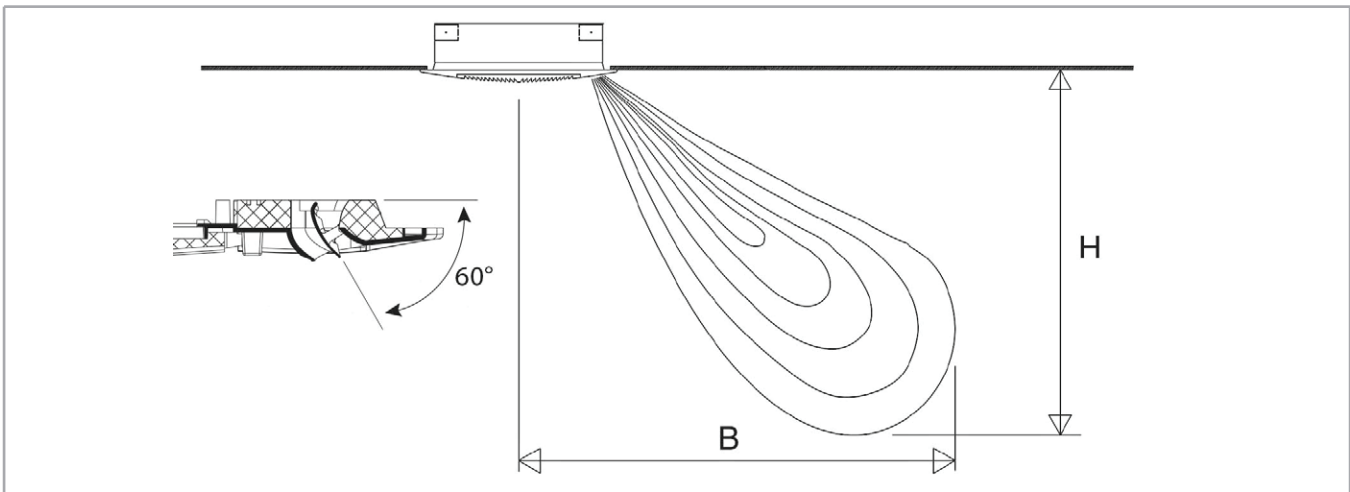
With adjustable air diffusion louvers at 40°



| Model | SK-ECM 72-76 | | | SK-ECM 82-86 | | | |
|-------|--------------|-----|-----|--------------|-----|-----|-----|
| Vdc | 1 | 5 | 10 | 1 | 5 | 10 | |
| L | m | 3,5 | 5,0 | 6,5 | 4,0 | 6,0 | 7,5 |

Vdc = Inverter power

With adjustable air diffusion louvers at 60°



| Model | SK-ECM 72-76 | | | SK-ECM 82-86 | | | |
|-------|--------------|-----|-----|--------------|-----|-----|-----|
| Vdc | 1 | 5 | 10 | 1 | 5 | 10 | |
| H | m | 3,1 | 3,6 | 4,1 | 3,5 | 4,0 | 4,7 |
| B | m | 3,5 | 4,5 | 5,5 | 4,0 | 5,0 | 6,5 |

Vdc = Inverter power

CONTROLS FOR SK-ECM UNITS

SK-ECM version

For this Cassette configuration, the 1-10 Vdc signal, which controls the inverter, must be supplied by a controller with the following signal specifications:

Fan coil control signal

- Fan OFF = 0 Vdc
- Fan ON > 1 Vdc
- Max. speed = 10 Vdc

ECM Blac inverter board

- 0÷10 Vdc Circuit Input Impedance Value = 96 kOhm

Power supply

230Vac 1Ph 50-60Hz

Controls

All the units of the **SkyStar Jumbo ECM** range can be supplied with a wide range of controls that allows managing one single unit or several units (with the use of the power units).

The room temperature can be controlled through wall electronic room thermostats, with different solutions according to every ambient conditions.

The **WM-AU**, **T-MB2**, **WM-503-AC-EC** and **WM-S-ECM** electronic thermostats regulate the room temperature precisely and are suitable when the user wants to set the fan speed.

Note: all the controls are described in detail in the "Fan Coil Control Range literature".

T-MB2 control (*)



230 V 50-60 Hz

WM-503-AC-EC control (**)

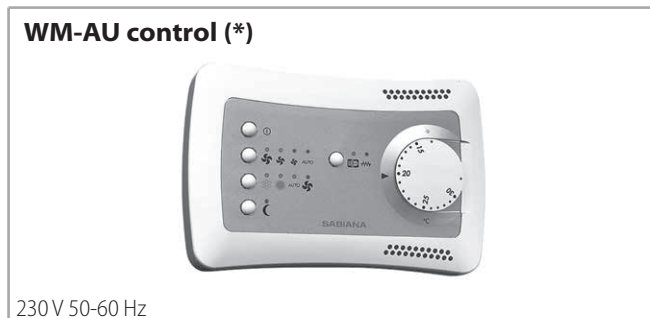


230 V 50 Hz

WM-S-ECM control



230 V 50 Hz



(*) To be used with UPM-AU or UP-AU.

(**) To be used with UP-503-AC-EC only

Control systems

See from p. 50 for:

- the MB electronic board (to be fitted on the MB version)
- the MB controls and units

NTC probe with receiver for infra-red remote control

| ID | Code |
|--------|---------|
| WM-NTC | 9079885 |

The WM-NTC probe to be used only with the MB board for SkyStar Jumbo SK-ECM-MB unit, is a control for concealed installation (box interaxle spacing 60 mm) for room temperature control.

This control with fitted NTC probe lets the prevention from stratification problems.



Technical specifications

- On/off switch for the fan coil unit
- Manual and automatic 3 speed switch
- Internal probe for room temperature detection
- Receiver for infra-red remote control

With the dip-switches it is possible to select the following operating functions:

- Room temperature cut-out thermostat only
- ON/OFF switch
- ON/OFF and speed change switches
- Operating mode with receiver for infra-red remote control for RT03 / RR03 infra-red remote control

The WM-NTC probe can be used as stand-alone or master/slave.

SK-ECM-E VERSION

The 2 pipe model Cassette units are available with electric heater.

The electric heater is controlled in place of the hot water valve and not as integration to it.

The electric heaters are hermetically sealed and supplied inside the coil pipes and therefore can be only factory mounted.

The electric heaters of the unit can be for 230Vac 1Ph 50-60Hz or 400Vac 3Ph 50-60Hz supply.

The Cassette fan coil unit includes no. 2 safety thermostats which intervene in case of internal over-heating, opening an auxiliary power relay (included in the electrical panel) which stops the power supply to the electric heaters.

Note: the cooling emission of the units is 95% of the emission in the tables of p. 39.

| Model | | SK-ECM 72 | SK-ECM 76 | SK-ECM 82 | SK-ECM 86 |
|--|---------------------|-----------|-----------|-----------|-----------|
| Nominal installed power | W | | | | 3000 |
| Single-phase rated operating voltage | Vac/Ph/Hz | | | | 230/1/50 |
| Rated three phase connection | Vac/Ph/Hz | | | | 400/3/50 |
| Connecting wires | n x mm ² | | | | 3 x 2,5 |
| Maximum single-phase current absorbed | A | | | | 13,5 |
| Maximum three-phase current absorbed | A | | | | 4,5 |
| Single-phase advised fuse ⁽¹⁾ | A | | | | 16 |
| Three-phase advised fuse ⁽¹⁾ | A | | | | 6 |
| Max. ambient temperature ⁽²⁾ | °C | | | | 25 |

(1) for the overload protection; gG type

(2) with electric heater in heating mode

Controls for SK-ECM-E units

WM-AU control (*)



230 V 50-60 Hz

T-MB2 control (*)



230 V 50-60 Hz

(*) To be used with UPM-AU or UP-AU.

CONTROLS

MB electronic board

The MB electronic board, to be mounted on the **SK-MB**, **SK-ECM-MB** and **SK-ECM-MB-E** versions, is set to carry out different functions and adjustment modes, in order to meet the installation requirements.

The Dip Switches on the board have to be set to carry out different functions:

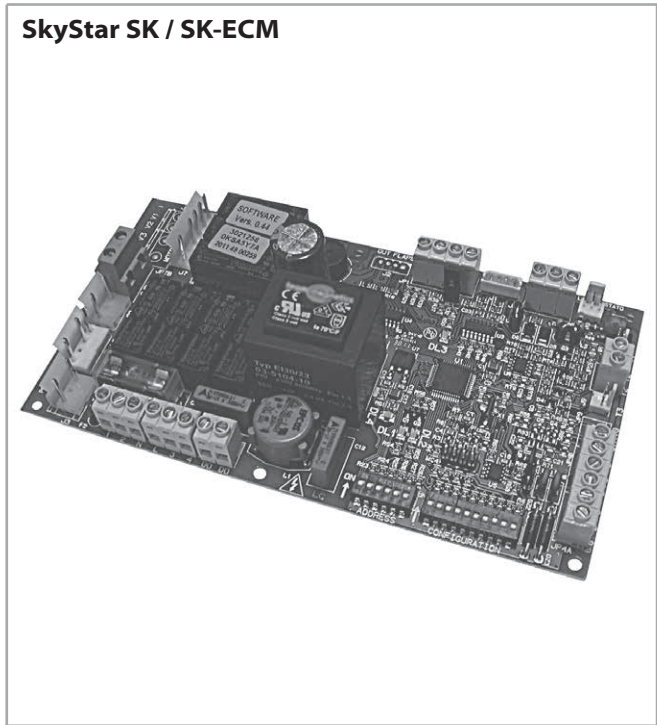
- 2/4 pipe unit
- electronic room thermostat or automatic fan speed modulation for fan control (ON-OFF)
- electronic room thermostat for valve control (ON-OFF) (the fan keeps working)
- simultaneous thermostatic control of the valves and fan
- fan operation control depending on the coil temperature (cut-out T3 probe fitted), which can be activated only in heating mode or heating and cooling mode
- automatic switch of the operating mode by means of T2 water probe (optional) applied on the 2 pipe system
- seasonal switch by means of remote contact
- ON/OFF of the fan coil by means of the remote contact (window or clock contact)
- electric heater control

By activating the cut-out T3 probe function, the fan is stopped in winter when the coil temperature is lower than 32 °C and started when the temperature reaches 36 °C. In summer mode, the fan stops when inside the coil exceeds 22 °C and starts when it drops below 18 °C.

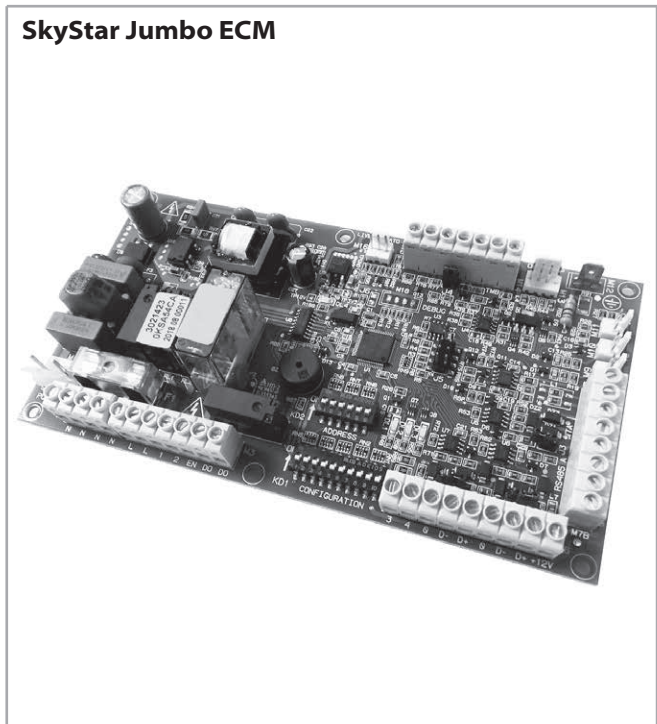
The following connections are located on the power board:

- receiver for infra-red remote control
- T-MB2 wall control
- serial connection to manage several fan coil units in Master/Slave configuration or to create a supervisory network.

SkyStar SK / SK-ECM



SkyStar Jumbo ECM



MB controls and units

All the units **SkyStar SK**, **SkyStar ECM** and **SkyStar Jumbo ECM** can be supplied in **MB** version. This version includes a wide range of controls, including the infra-red remote control, which allows managing one single unit or one or more groups of units by using the Modbus RTU - RS 485 communication protocol. Units can be managed according to the Master/Slave logic (up to 20 units) or by supervisory components. The system includes a single MB power board and a range of technical devices to be used with:

- the **T-MB2** wall control and the **RT03 / RR03 infra-red remote control** to manage single units;
- the **PSM-DI** multifunctional panel, the **Sabianet** supervisory system, the **T-DI Touch screen multifunction control panel** and the **SabWeb** Web gateway for Sabiana Cloud, to manage one single unit or several units.

Note: all the controls are described in detail in the "Fan Coil Control Range literature".

T-MB2 control

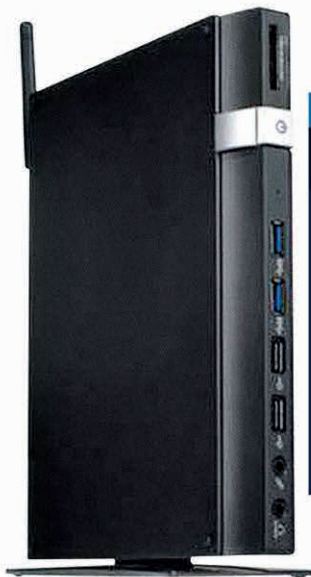


230 V 50-60 Hz

RT03 / RR03 remote control



PC and Sabianet screenshot



230 V 50-60 Hz

T-DI Touch screen multifunction control panel

The T-DI multifunction control panel lets supervise and control more units with MB or SIOS boards; the panel is equipped with a 7 inches touch screen display and a serie of graphical pages that allows an easy reading of the data sent by the fan coils and the management of up to 60 units (max. 60 units: SIOS + MB).

With the multifunction control panel T-DI it is also possible to control the units remotely with the specific Sabiana Cloud App for Android and iOS.

The Sabiana Cloud application is simple to use and lets have complete control of all the connected units.



Web gateway for Cloud

With the Web gateway for "Sabiana Cloud" it is possible to control at a distance up to 60 units, equipped with MB or SIOS boards (max. 60 units: SIOS + MB), with the specific APP for Android and iOS.

The "Sabiana Cloud" APP is simple to use and lets have complete control of all the connected units.



PSM-DI Multifunction control panel

With the PSM-DI multifunction control panel it is possible to manage up to 60 units that are equipped with MB electronic board or SIOS (max. 60 units: SIOS + MB).

The PSM-DI multifunction control panel supervises via Bus network all the connected units.

The remote connection (stand-alone) is not possible.



230 V 50-60 Hz

KNX Bus System

(Not for SkyStar Jumbo ECM)

The KNX bus system is a building automation standard for controlling, managing and monitoring a wide range of products for:

- Heating, cooling, ventilation.
- Lighting.
- Alarm systems.
- Audio and video systems.
- Electricity and gas.

Since 2016, Sabiana is a certified member of the KNX association and the certified products can be added to this system in compliance with the tests carried out at KNX laboratories.

KNX devices

The Sabiana WM-KNX room thermostat controls and adjusts the temperature of a room or area in a building. In combination with one or several UP-KNX power units, the thermostat is able to control the operation of terminal units such as fan coils. The appliance consists of an



LCD display with adjustable backlight and a sensor for measuring the room temperature.

WM-KNX is suitable for installation in a wall recessed box (to be used with UP-KNX and with PL mounting plate only).

Note: all the controls are described in detail in the "Fan Coil Control Range literature".

Recessed thermostat WM-KNX



Power unit UP-KNX



WM-KNX with rectangular plate



WM-KNX with square plate



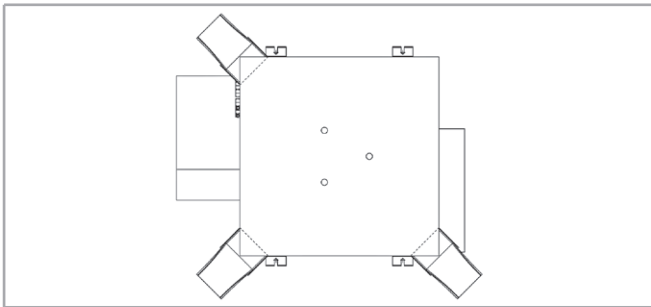
FRESH AIR AND CAP ACCESSORY

Fresh air

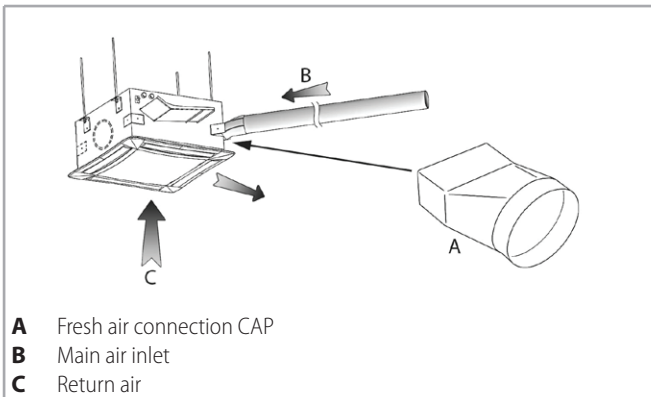
To be used with SK 0-1-2-3 models only.

The SkyStar Fan Coil Cassette units are fitted with inlets for fresh air to be mixed with return air inside the units. The fresh air flow is limited to 20% of the total fan coil air flow at medium speed and 100 m³/h for each treated air inlet.

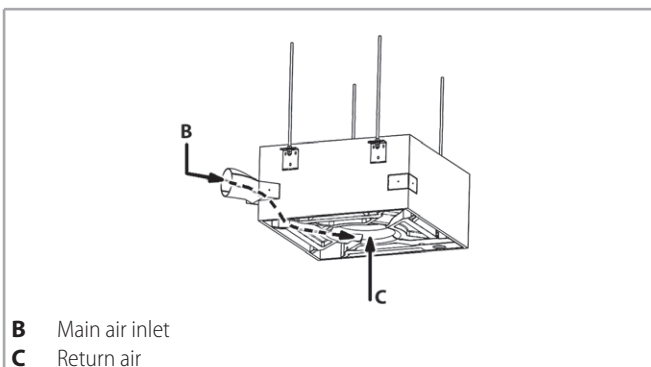
The units feature fresh air inlets on three corners (no inlets on the fourth corner because of the condensate pump inside the unit).



The fresh air inlets are designed for the insertion of standard 110x55 mm rectangular ducts or for the circular ducts fresh air connection CAP below illustrated.



The fresh air is conveyed into the radial fan and mixed to the return air.

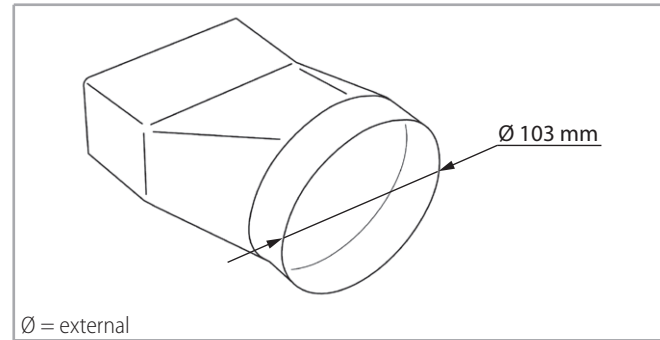


Note: the fresh air must be filtered.

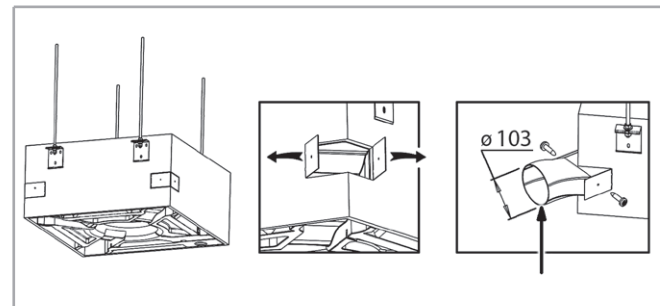
Fresh air connection

Not suitable for MCT models with outer casing.

| Model | ID | Code |
|---------|-----|---------|
| 0-1-2-3 | CAP | 6078005 |



The air duct is connected quickly and easily. After removing the blank and the insulation inside the unit, the mounting plate is rolled back and the air duct with its V-shaped section must be pushed into the unit. The duct is then fixed to the mounting plate.



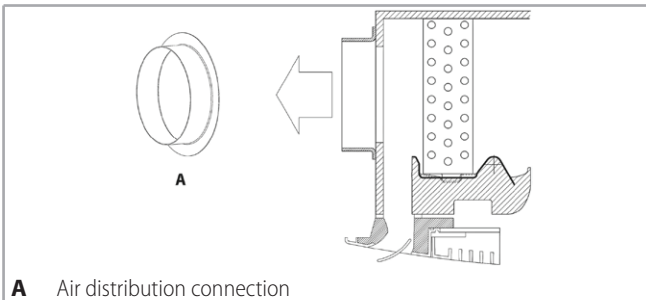
ACCESSORIES

Air distribution connection

Not suitable for MCT models with outer casing.

| Model | ID | Code |
|-----------|---------|---------|
| 0-1-2-3 | CDA 600 | 9079232 |
| 4-5-6-7-8 | CDA 800 | 9079233 |

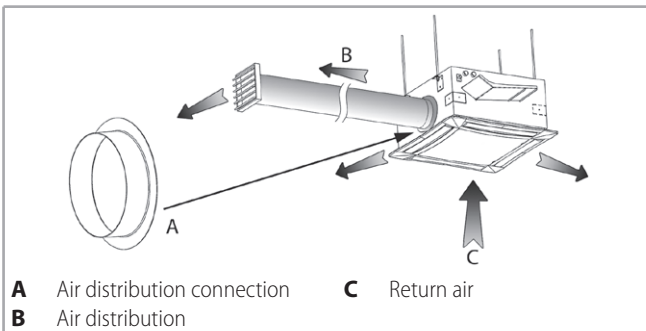
On Cassette fan coils two air outlets are provided on the side of the unit for connection to separate supply air outlets. The total air flow does not change.



A Air distribution connection

The air distribution connection diameters are:

| Model | 0-1-2-3 | 4-5-6-7-8 | |
|-----------|---------|-----------|-----|
| ∅ fitting | mm | 150 | 180 |



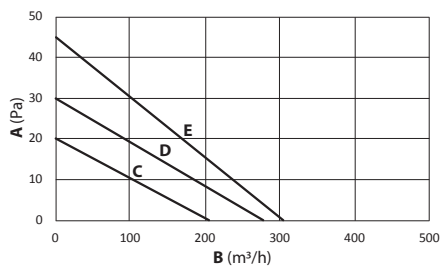
A Air distribution connection
B Air distribution
C Return air

The air flow at high speed depending on the air duct pressure drop is shown in the tables below.

Note: all air ducts must be insulated in order to avoid condensation.

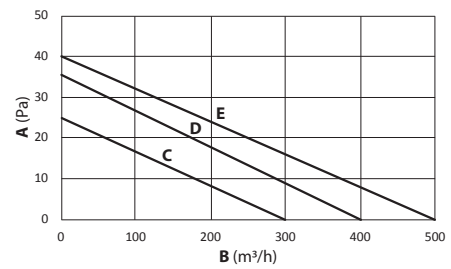
Air distribution connection pressure drop

0-1-2-3 models with outlets used n. = 1



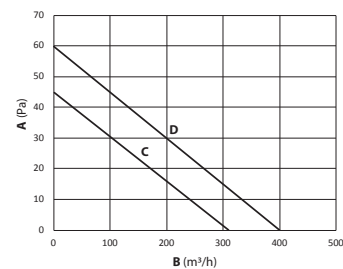
A Pressure drop
B Air flow
C 02-04-12-14
D 22-24-26
E 32-34-36

4-5-6 models with outlets used n. = 1



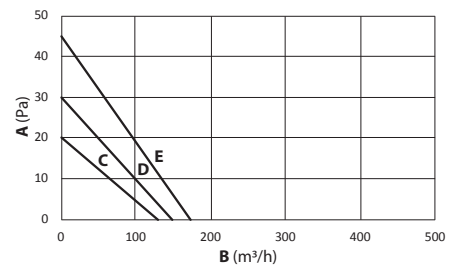
A Pressure drop
B Air flow
C 42-44
D 52-54-56
E 62-64-66

7-8 models with outlets used n. = 1



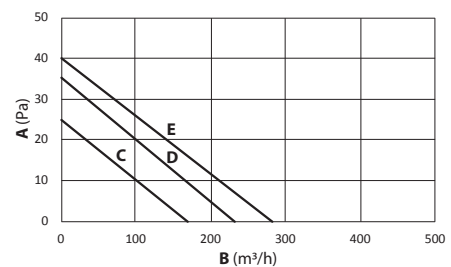
A Pressure drop
B Flow rate
C 72-76
D 82-86

0-1-2-3 models with outlets used n. = 2



A Pressure drop
B Air flow
C 02-04-12-14
D 22-24-26
E 32-34-36

4-5-6 models with outlets used n. = 2



A Pressure drop
B Air flow
C 42-44
D 52-54-56
E 62-64-66

Fresh air kit

Not suitable for MCT models with outer casing.

| Model | ID | Code |
|---------|---------|---------|
| 0-1-2-3 | PRT 600 | 9079230 |
| 4-5-6 | PRT 800 | 9079231 |
| 7-8 | PRT 900 | 9079235 |

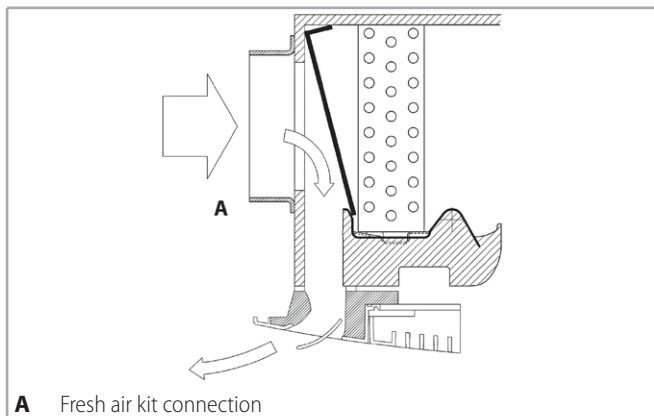
This is used to introduce fresh air into the environment directly through the diffuser.

The kit includes a flow separator to be fitted inside the Cassette, and a circular fitting for connection to the flexible system ducting.

The flow of air is sent directly to just one of the outlet louvers, without passing through the coil. The air flow of fresh air introduced into the environment depends on the inlet static pressure.

The fresh air kit diameters are:

| Model | | 0-1-2-3 | 4-5-6-7-8 |
|-----------|----|---------|-----------|
| ∅ fitting | mm | 150 | 180 |



Correlation between flow-rate / Static pressure

Models 0-1-2-3

| | | | | | | |
|-----------------|-------------------|----|-----|-----|-----|-----|
| Flow rate | m ³ /h | 80 | 120 | 160 | 200 | 240 |
| Static pressure | Pa | 3 | 8 | 15 | 25 | 36 |

Models 4-5-6-7-8

| | | | | | | |
|-----------------|-------------------|-----|-----|-----|-----|-----|
| Flow rate | m ³ /h | 160 | 200 | 300 | 400 | 500 |
| Static pressure | Pa | 3 | 8 | 15 | 25 | 36 |

Units with remote electric board

Factory mounted on standard units **SkyStar SK** without MB electronic board.

It can not be fitted on ECM versions.

| Model | ID | Code |
|---------------|-----|------------|
| 0-1-2-3-4-5-6 | RUS | on request |

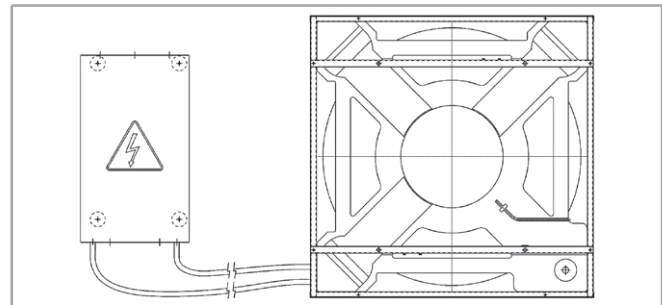
On request the **SkyStar SK** Cassette are available with electric control panel reachable from below and with the electric board that can be placed in a remote position.

In this case the units are supplied with an electronic connecting control panel, fitted to the bottom side on the 4 smallest sizes and to the lateral side on the 3 biggest sizes.

The electronic control panel is connected to the fan motor, to the condensate pump and to the condensate level control.

A 6 m wire is also supplied with integral plug-in connections to connect the unit with the remote electric board that can be installed in a suitable and comfortable position, where the power and system connections can be made easily.

This feature is not available for units with electric heater or infrared remote control.



Unit with condensate pump with higher pressure head

Factory mounted on all models SkyStar.

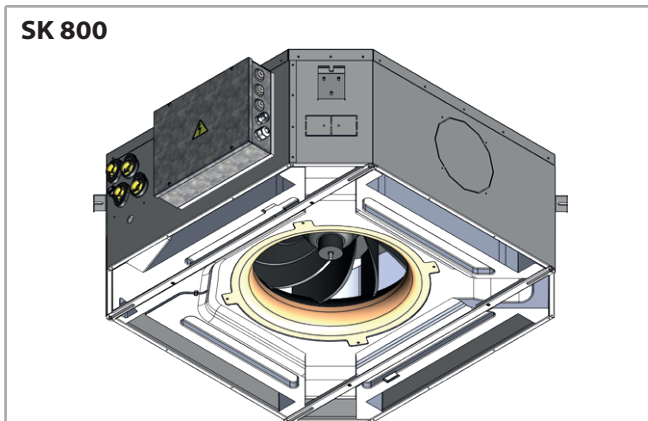
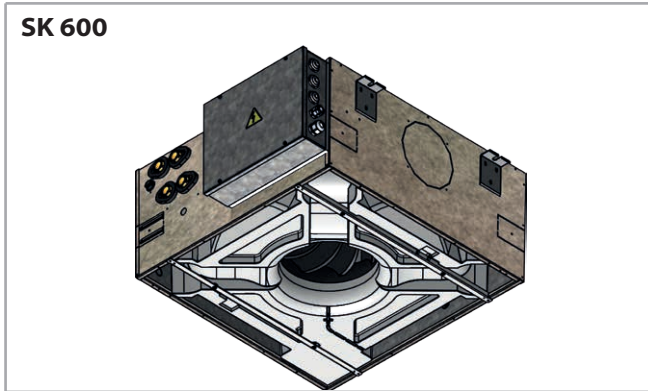
| Model | ID | Code |
|---------|-----------|---------|
| 0-1-2-3 | PM-SK-600 | 9079160 |
| 4-5-6 | PM-SK-800 | 9079162 |
| 7-8 | PM-SK-900 | 9079164 |

On demand it is possible to order each fan coil Cassette SkyStar with condensate pump with available pressure 1000 mm.

Hydraulic and electrical connection on the same side kit

Not applicable for:

- versions with electric heater
- unit with Crystall filter
- SkyStar Jumbo-ECM version



The kit is supplied only fitted on the unit in the factory.

The kit can not be used with valve standard kits from p. 58.

Hydraulic and electrical connection on the same side kit for SK version

SkyStar version without MB board

| Model | ID | Code |
|-------|----------|---------|
| SK 0 | KAL-SK 0 | 9K79050 |
| SK 1 | KAL-SK 1 | 9K79051 |
| SK 2 | KAL-SK 2 | 9K79052 |
| SK 3 | KAL-SK 3 | 9K79053 |
| SK 4 | KAL-SK 4 | 9K79054 |
| SK 5 | KAL-SK 5 | 9K79055 |
| SK 6 | KAL-SK 6 | 9K79056 |

SkyStar version with MB board

| Model | ID | Code |
|---------|-------------|---------|
| SK-MB 0 | KAL-SK-MB 0 | 9K79060 |
| SK-MB 1 | KAL-SK-MB 1 | 9K79061 |
| SK-MB 2 | KAL-SK-MB 2 | 9K79062 |
| SK-MB 3 | KAL-SK-MB 3 | 9K79063 |
| SK-MB 4 | KAL-SK-MB 4 | 9K79064 |
| SK-MB 5 | KAL-SK-MB 5 | 9K79065 |
| SK-MB 6 | KAL-SK-MB 6 | 9K79066 |

SkyStar version with UP-AU board fitted on the unit

| Model | ID | Code |
|-----------------|-------------|---------|
| SK 0 con UP-AU | KAL-SK-UP 0 | 9K79070 |
| SK 1 with UP-AU | KAL-SK-UP 1 | 9K79071 |
| SK 2 with UP-AU | KAL-SK-UP 2 | 9K79072 |
| SK 3 with UP-AU | KAL-SK-UP 3 | 9K79073 |
| SK 4 with UP-AU | KAL-SK-UP 4 | 9K79074 |
| SK 5 with UP-AU | KAL-SK-UP 5 | 9K79075 |
| SK 6 with UP-AU | KAL-SK-UP 6 | 9K79076 |

Hydraulic and electrical connection on the same side kit for SK-ECM version (not to be used with SkyStar Jumbo)

SkyStar ECM version without MB board

| Model | ID | Code |
|------------|----------------|---------|
| SK-ECM 1÷3 | KAL-SK-ECM 1-3 | 9K79081 |
| SK-ECM 4-5 | KAL-SK-ECM 4-5 | 9K79084 |

SkyStar ECM version with MB board

| Model | ID | Code |
|---------------|-------------------|---------|
| SK-ECM MB 1÷3 | KAL-SK-ECM-MB 1-3 | 9K79091 |
| SK-ECM MB 4-5 | KAL-SK-ECM-MB 4-5 | 9K79094 |

SkyStar version with UP-AU board fitted on the unit

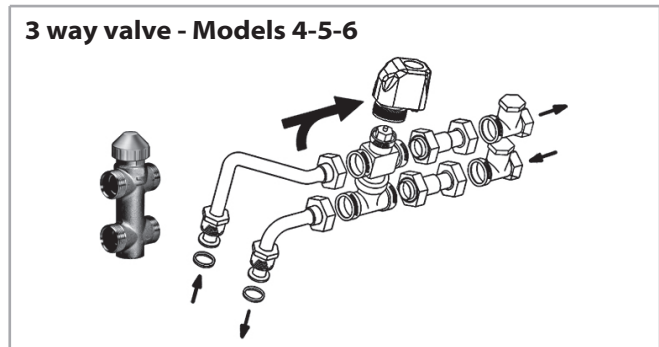
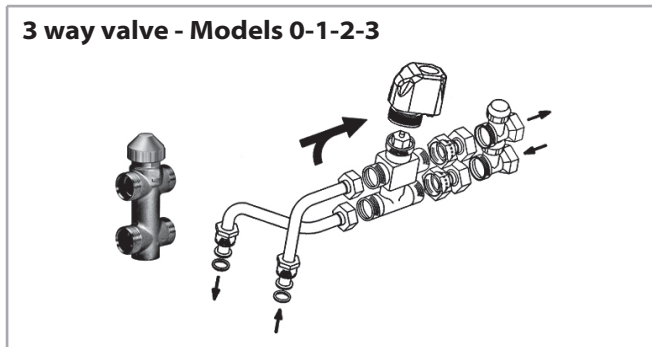
| Model | ID | Code |
|------------|-------------------|---------|
| SK-ECM 1÷3 | KAL-SK-ECM-UP 1-3 | 9K79101 |
| SK-ECM 4-5 | KAL-SK-ECM-UP 4-5 | 9K79104 |

3 ways ON-OFF valves with actuator with interception valve

Valve set with 3 ways ON-OFF valves and with thermoelectric actuator; the set includes connection pipes.

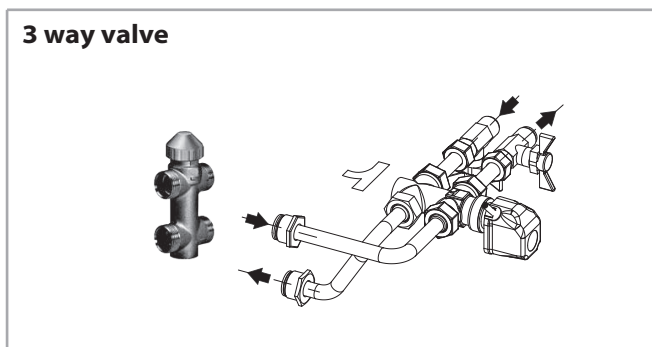
3 ways valves + micrometric lockshield valve connection kit - SkyStar SK and SkyStar SK-ECM

| Model | Valve fitted on the unit | | Valve not fitted on the unit | | Coil | Micrometric lockshield valve connections ø (female) | Kvs m ³ /h | Dp max kPa* |
|-------------------|--------------------------|---------|------------------------------|---------|-----------|--|--------------------------|----------------|
| | ID | Code | ID | Code | | | | |
| 02-12-22-32 | 3V2T1-3-M | 9079510 | 3V2T1-3 | 9079500 | main | 1/2" | 2,5 | 50 |
| 42-52-62 | 3V2T4-6-M | 9079511 | 3V2T4-6 | 9079501 | main | 3/4" | 4,5 | 50 |
| 04-14-24-26-34-36 | 3V4T1-3-M | 9079512 | 3V4T1-3 | 9079502 | main | 1/2" | 2,5 | 50 |
| | | | | | secondary | 1/2" | 2,5 | 50 |
| 44-54-56-64-66 | 3V4T4-6-M | 9079513 | 3V4T4-6 | 9079503 | main | 3/4" | 4,5 | 50 |
| | | | | | secondary | 1/2" | 2,5 | 50 |



3 ways valves + ball valves connection kit - SkyStar SK Jumbo ECM

| Model | Valve fitted on the unit | | Valve not fitted on the unit | | Coil | Ball valve connections ø (female) | Kvs m ³ /h | Dp max kPa* |
|-------|--------------------------|----------|------------------------------|----------|-----------|--------------------------------------|--------------------------|----------------|
| | ID | Code | ID | Code | | | | |
| 72-82 | 3V2T7-8-M | 9079923W | 3V2T7-8 | 9079922W | main | 1" | 4,5 | 50 |
| 76-86 | 3V4T7-8-M | 9079933W | 3V4T7-8 | 9079932W | main | 1" | 4,5 | 50 |
| | | | | | secondary | 3/4" | 2,5 | 50 |



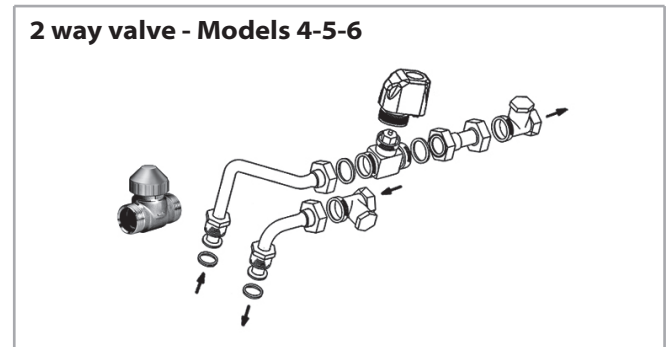
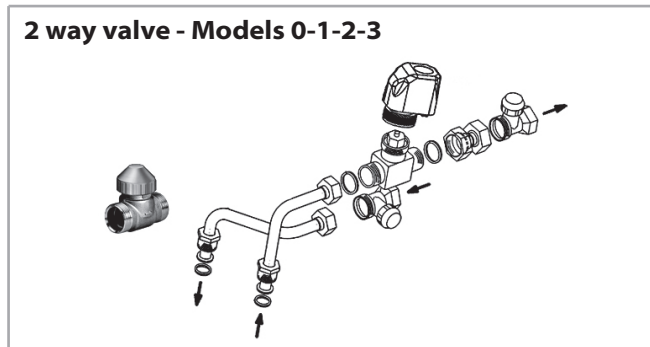
For technical data, operation limits and valves pressure drop, see p. 62

2 ways ON-OFF valves with actuator with interception valve

Valve set with 2 ways ON-OFF valves and with thermoelectric actuator; the set includes connection pipes.

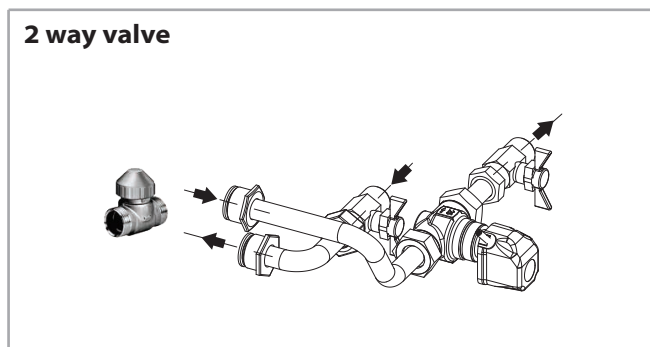
2 ways valves + micrometric lockshield valve connection kit - SkyStar SK and SkyStar SK-ECM

| Model | Valve fitted on the unit | | Valve not fitted on the unit | | Coil | Micrometric lockshield valve connections ø (female) | Kvs m ³ /h | Dp max kPa* |
|-------------------|--------------------------|---------|------------------------------|---------|-----------|--|--------------------------|----------------|
| | ID | Code | ID | Code | | | | |
| 02-12-22-32 | 2V2T1-3-M | 9079515 | 2V2T-1-3 | 9079505 | main | 1/2" | 2,8 | 50 |
| 42-52-62 | 2V2T4-6-M | 9079516 | 2V2T4-6 | 9079506 | main | 3/4" | 4,5 | 60 |
| 04-14-24-26-34-36 | 2V4T1-3-M | 9079517 | 2V4T1-3 | 9079507 | main | 1/2" | 2,8 | 50 |
| | | | | | secondary | 1/2" | 2,8 | 50 |
| 44-54-56-64-66 | 2V4T4-6-M | 9079518 | 2V4T4-6 | 9079508 | main | 3/4" | 4,5 | 60 |
| | | | | | secondary | 1/2" | 2,8 | 50 |



2 ways valves + ball valves connection kit - SkyStar SK Jumbo ECM

| Model | Valve fitted on the unit | | Valve not fitted on the unit | | Coil | Ball valve connections ø (female) | Kvs m ³ /h | Dp max kPa* |
|-------|--------------------------|----------|------------------------------|----------|-----------|--------------------------------------|--------------------------|----------------|
| | ID | Code | ID | Code | | | | |
| 72-82 | 2V2T7-8-M | 9079921W | 2V2T7-8 | 9079920W | main | 1" | 4,5 | 60 |
| 76-86 | 2V4T7-8-M | 9079931W | 2V4T7-8 | 9079930W | main | 1" | 4,5 | 60 |
| | | | | | secondary | 3/4" | 2,8 | 50 |



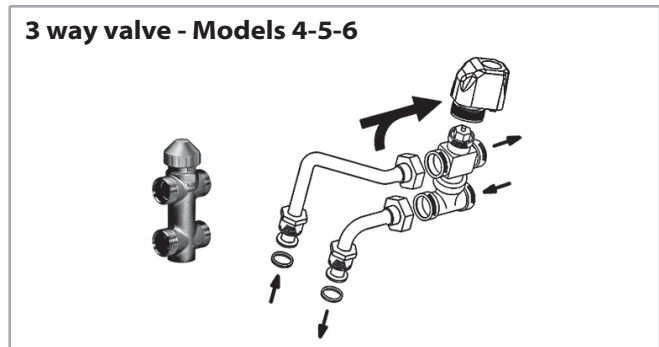
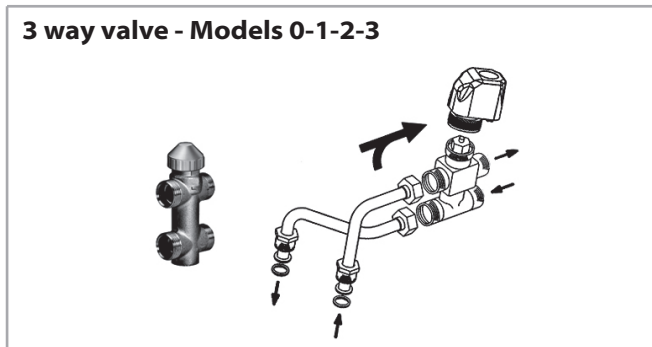
For technical data, operation limits and valves pressure drop, see p. 62

3 ways ON-OFF valves with actuator, without interception valve

Valve set with 3 ways ON-OFF valves and with thermoelectric actuator; the set includes connection pipes.

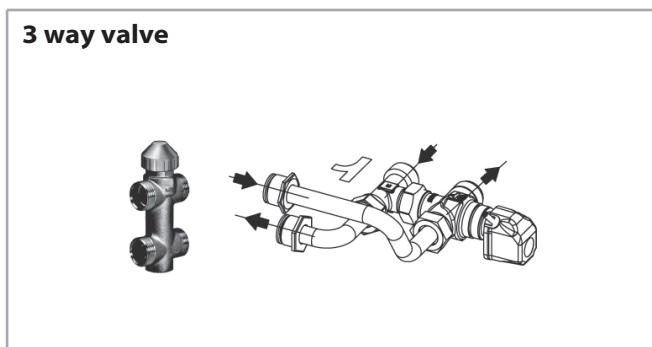
3 ways valves + simplified connection kit - SkyStar SK e SkyStar SK-ECM

| Model | Valve fitted on the unit | | Valve not fitted on the unit | | Coil | Valve connection ø (male) | Kvs m ³ /h | Dp max kPa* |
|-------------------|--------------------------|---------|------------------------------|---------|-----------|------------------------------|--------------------------|----------------|
| | ID | Code | ID | Code | | | | |
| 02-12-22-32 | 3VS2T1-3-M | 9079530 | 3VS2T1-3 | 9079520 | main | 3/4" | 2,5 | 50 |
| 42-52-62 | 3VS2T4-6-M | 9079531 | 3VS2T4-6 | 9079521 | main | 1" | 4,5 | 50 |
| 04-14-24-26-34-36 | 3VS4T1-3-M | 9079532 | 3VS4T1-3 | 9079522 | main | 3/4" | 2,5 | 50 |
| | | | | | secondary | 3/4" | 2,5 | 50 |
| 44-54-56-64-66 | 3VS4T4-6-M | 9079533 | 3VS4T4-6 | 9079523 | main | 1" | 4,5 | 50 |
| | | | | | secondary | 3/4" | 2,5 | 50 |



3 ways valves + simplified connection kit - SkyStar SK Jumbo ECM

| Model | Valve fitted on the unit | | Valve not fitted on the unit | | Coil | Valve connection ø (male) | Kvs m ³ /h | Dp max kPa* |
|-------|--------------------------|----------|------------------------------|----------|-----------|------------------------------|--------------------------|----------------|
| | ID | Code | ID | Code | | | | |
| 72-82 | 3VS2T7-8-M | 9079928W | 3VS4T7-8 | 9079927W | main | 1" | 4,5 | 50 |
| 76-86 | 3VS4T7-8-M | 9079938W | 3VS4T7-8 | 9079937W | main | 1" | 4,5 | 50 |
| | | | | | secondary | 3/4" | 2,5 | 50 |



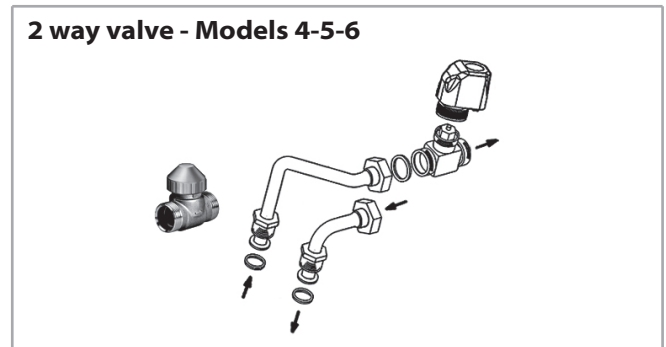
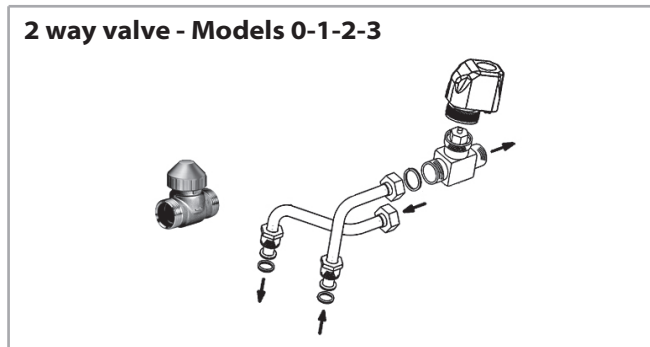
For technical data, operation limits and valves pressure drop, see p. 62

2 ways ON-OFF valves with actuator, without interception valve

Valve set with 2 ways ON-OFF valves and with thermoelectric actuator; the set includes connection pipes.

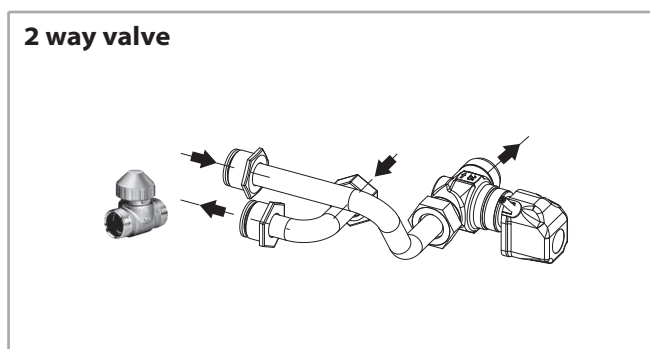
2 ways valves + simplified connection kit - SkyStar SK e SkyStar SK-ECM

| Model | Valve fitted on the unit | | Valve not fitted on the unit | | Coil | Valve connection ø (male) | Kvs m ³ /h | Dp max kPa* |
|-------------------|--------------------------|---------|------------------------------|---------|-----------|------------------------------|--------------------------|----------------|
| | ID | Code | ID | Code | | | | |
| 02-12-22-32 | 2VS2T1-3-M | 9079535 | 2VS2T1-3 | 9079525 | main | 3/4" | 2,8 | 50 |
| 42-52-62 | 2VS2T4-6-M | 9079536 | 2VS2T4-6 | 9079526 | main | 1" | 4,5 | 60 |
| 04-14-24-26-34-36 | 2VS4T1-3-M | 9079537 | 2VS4T1-3 | 9079527 | main | 3/4" | 2,8 | 50 |
| | | | | | secondary | 3/4" | 2,8 | 50 |
| 44-54-56-64-66 | 2VS4T4-6-M | 9079538 | 2VS4T4-6 | 9079528 | main | 1" | 4,5 | 60 |
| | | | | | secondary | 3/4" | 2,8 | 50 |



2 ways valves + simplified connection kit - SkyStar SK Jumbo ECM

| Model | Valve fitted on the unit | | Valve not fitted on the unit | | Coil | Valve connection ø (male) | Kvs m ³ /h | Dp max kPa* |
|-------|--------------------------|----------|------------------------------|----------|-----------|------------------------------|--------------------------|----------------|
| | ID | Code | ID | Code | | | | |
| 72-82 | 2VS2T7-8-M | 9079926W | 2VS2T7-8 | 9079925W | main | 1" | 4,5 | 60 |
| 76-86 | 2VS4T7-8-M | 9079936W | 2VS4T7-8 | 9079935W | main | 1" | 4,5 | 60 |
| | | | | | secondary | 3/4" | 2,8 | 50 |



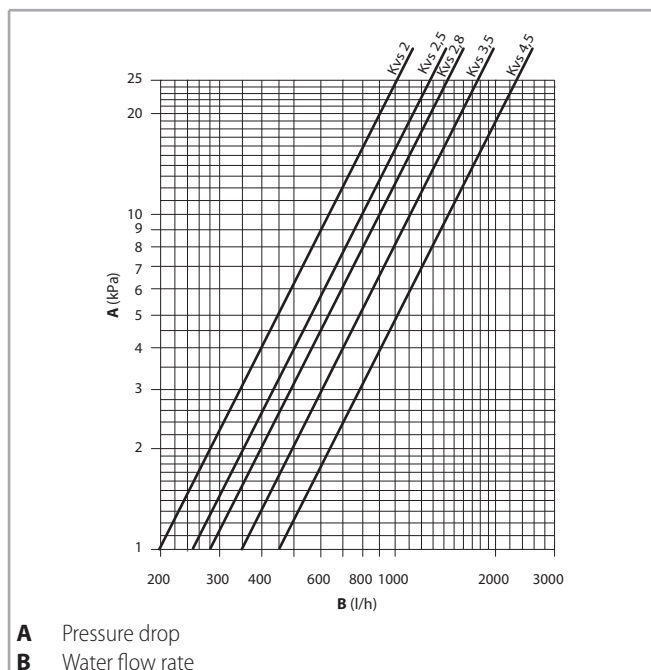
For technical data, operation limits and valves pressure drop, see p. 62

Valves technical data and operation limits

| Description | UoM | Value |
|------------------------------|------|-----------|
| Max. working pressure | bars | 16 |
| Max. ambient temperature | °C | 50 |
| Max. water temperature | °C | 110 |
| Power supply | V-Hz | 230-50/60 |
| Rating | VA | 2,5 |
| Protection | | IP 44 |
| Travel time | min | ca. 3 |
| Max. glycol content of water | % | 50 |

Note: The maximum pressure drop across the fully open valve should not exceed 25 kPa for cooling operation and 15 kPa for heating operation.

Valves pressure drop



Balance valve with actuator

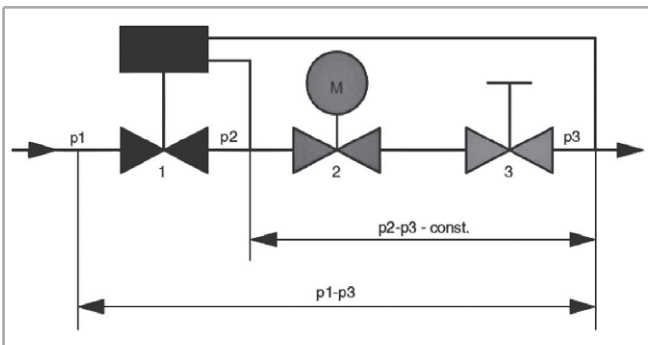
SkyStar Jumbo ECM excluded.

Balancing valves independent from the system pressure.

- The balancing valve and a combined 2 way valve allow the regulation of the water flow value autonomously, regardless of the system pressure, and the control of the flow by using an ON/OFF electro-thermal actuator.
- The balancing valve allows you to balance the hydraulic system by supplying the required water flow, for each fan-coil, and to maintain it even under partial load conditions.
- A graduated ring nut allows you to set the flow rate value and also allows direct reading of the set value.

Valve operation logic

- "p1" the valve inlet pressure.
- "p3" the outlet pressure.
- "p2" the diaphragm activation pressure, which allows differential pressure "p2" – "p3" to be maintained at a constant value, in order to guarantee the water to flow at the set value.



The minimum differential pressure "p1" – "p3", required to guarantee the correct value of the set water flow rate, is indicated in the diagrams and in the related tables. This is an essential factor to size the system pressure drop and pump pressure head. The flow rate is kept at a constant value only if the valve pressure drop is higher than the indicated value.

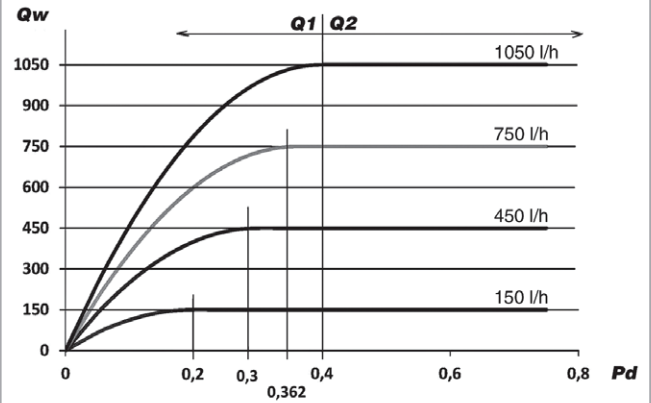
Minimum operating differential pressure

The minimum differential pressure and the balancing valve pressure drop must be considered to size the system pumps.

Flow rate is constant if the pressure drop is higher than that indicated in the diagrams and into the related tables.

The following diagram shows an example of the flow rate trend according to the pressure drop and calibration required.

Example



Qw = Water flow rate

Pd = Min. differential pressure "p1" - "p3" (bar)

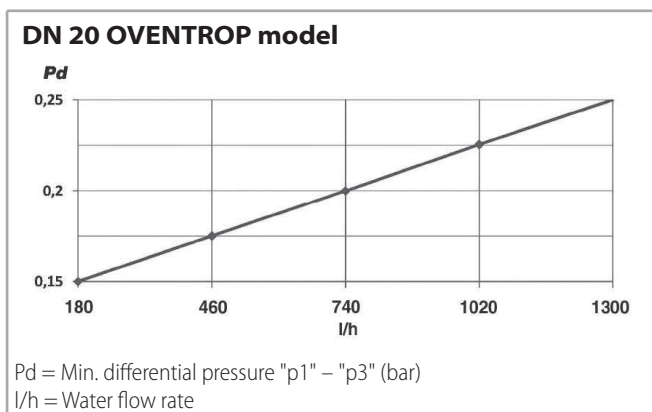
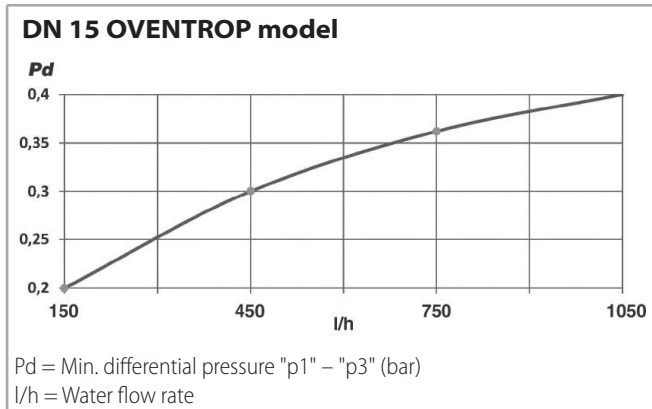
Q1 = Area with inconstant water flow

Q2 = Area with constant water flow

Kit with OVENTROP valve

SkyStar Jumbo ECM excluded.

In case of Oventrop valves, the valve upstream-downstream minimum differential pressure ("p1" - "p3"), which depends on the valve calibration value, must be exceeded to access the constant flow rate field.



E.g., when sizing the system pump, in which the DN 15 valves will be installed and in which 450 l/h are constantly required for each device, consider a useful pressure of 0.3 bar (to compensate the pressure drop of the valve) for each balancing valve. Therefore, the pressure drop values produced by the system balancing valves must be summed and the pump must be sized to produce a pressure equal to or greater than the value obtained previously.

Benefits

- Reduced dimensions.
- Easy installation on 2 or 4 pipe devices.
- Easy visualization of the nominal set value.
- Guarantee of constant flow rate set even with partial loads.
- Pre-regulation can be blocked and leaded with the locking ring.

OVENTROP technical characteristics

| DN model | Flow rate range (l/h) | Kvs |
|----------|-----------------------|-----|
| DN 15 | 150 - 1050 | 1,8 |
| DN 20 | 180 - 1300 | 2,5 |

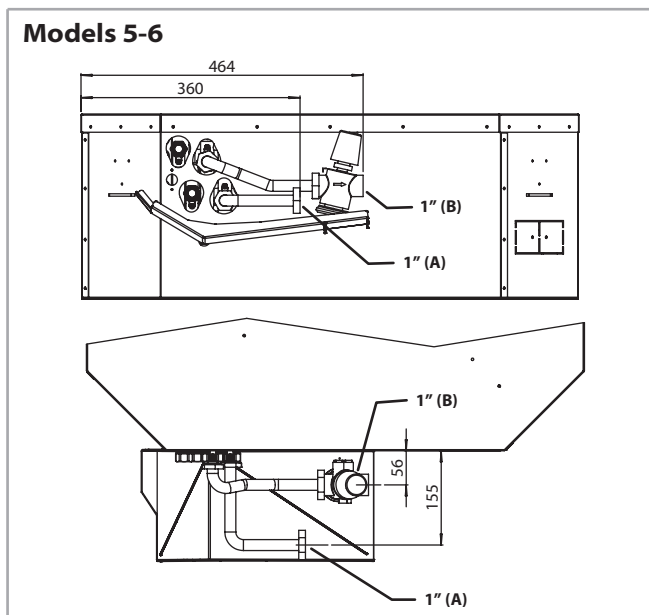
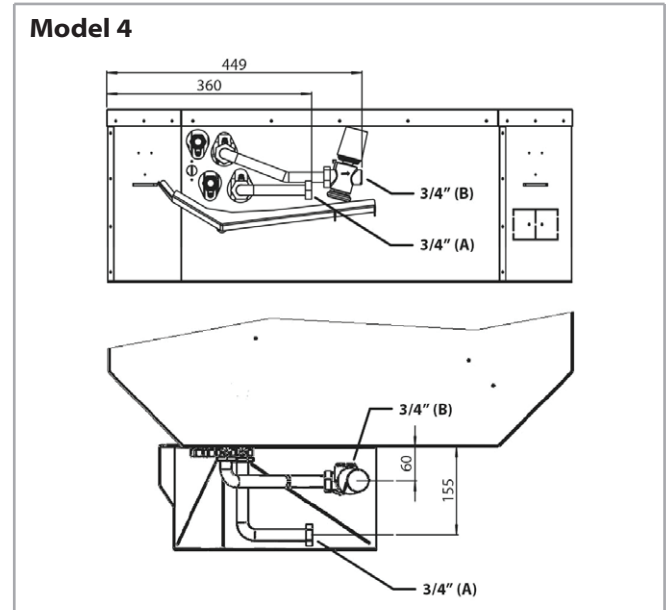
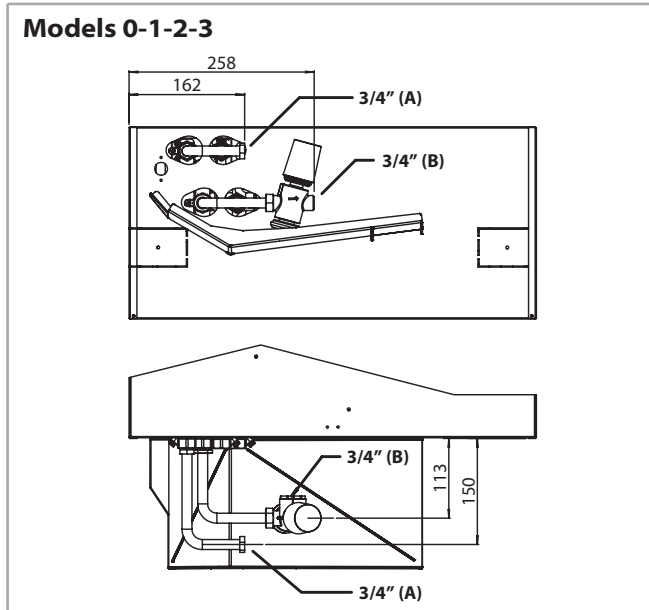
Operation limits of the OVENTROP balancing valves

- Maximum operating temperature: 120 °C
- Highest working pressure: 16 bar
- Maximum % of water/glycol mixture: 50%
- Minimum operating temperature: -10 °C
- Maximum differential pressure: 4 bar

Balancing valves for OVENTROP main coil

2 way valve for main coil and assembly kit.

The valve is supplied equipped with 230 Volt electro-thermal actuator for the ON/OFF control.



(A) = Water inlet - Female connection

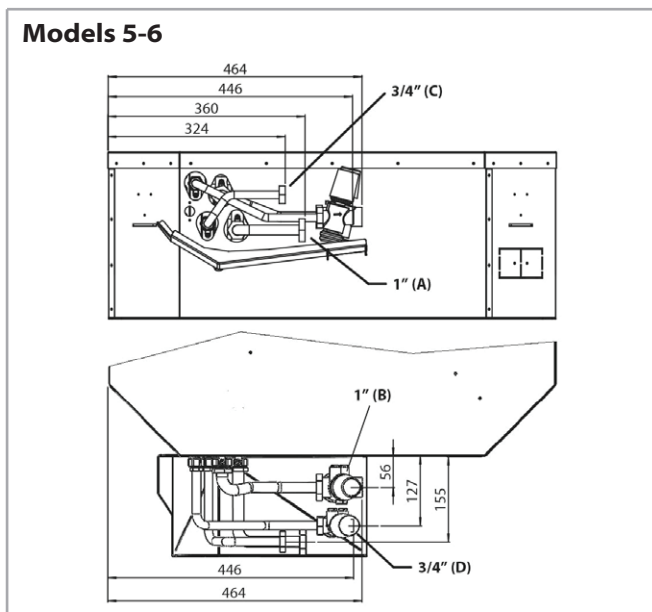
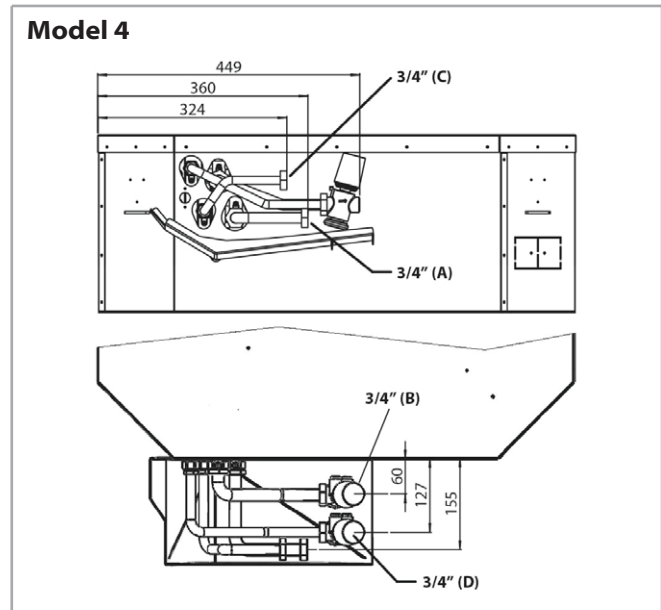
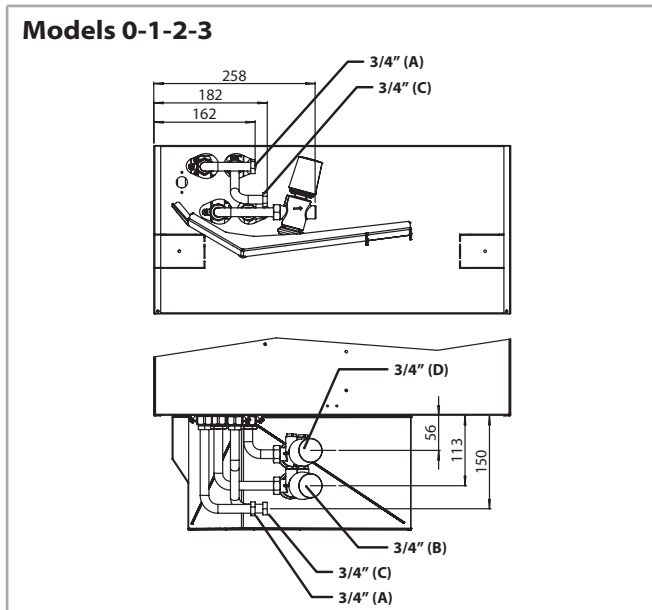
(B) = Water outlet - Male connection

| Model | Valve fitted on the unit | | Valve not fitted on the unit | | DN | (Ø) | Qwr |
|---------|--------------------------|---------|------------------------------|---------|----|------|----------|
| | ID | Code | ID | Code | | | |
| 0-1-2-3 | V20VSK6BPM 150-1050 | 9079771 | V20VSK6BPS 150-1050 | 9079761 | 15 | 3/4" | 150-1050 |
| 4 | V20VSK8BPM 150-1050 | 9079791 | V20VSK8BPS 150-1050 | 9079781 | | | |
| 5-6 | V20VSK8BPM 180-1300 | 9079792 | V20VSK8BPS 180-1300 | 9079782 | 20 | 1" | 180-1300 |

Balancing valves for OVENTROP main and additional coil

2 way valve for main and additional coil and assembly kit.

The valve is supplied equipped with 230 Volt electro-thermal actuator for the ON/OFF control.



(A) = Water inlet (main coil) - Female connection

(B) = Water outlet (main coil) - Male connection

(C) = Water inlet (additional coil) - Female connection

(D) = Water outlet (additional coil) - Male connection

| Model | Valve fitted on the unit | | Valve not fitted on the unit | | DN | (Ø) | Qwr |
|---------|--------------------------|---------|------------------------------|---------|----|------|----------|
| | ID | Code | ID | Code | | | |
| 0-1-2-3 | V20VSK6BPM 150-1050 | 9079771 | V20VSK6BPS 150-1050 | 9079761 | 15 | 3/4" | 150-1050 |
| 4 | V20VSK8BPM 150-1050 | 9079791 | V20VSK8BPS 150-1050 | 9079781 | | | |
| 5-6 | V20VSK8BPM 180-1300 | 9079792 | V20VSK8BPS 180-1300 | 9079782 | 20 | 1" | 180-1300 |

| Model | Valve fitted on the unit | | Valve not fitted on the unit | | DN | (Ø) | Qwr |
|---------|--------------------------|---------|------------------------------|---------|----|------|----------|
| | ID | Code | ID | Code | | | |
| 0-1-2-3 | V20VSK6BAM 150-1050 | 9079773 | V20VSK6BAS 150-1050 | 9079763 | 15 | 3/4" | 150-1050 |
| 4-5-6 | V20VSK8BAM 150-1050 | 9079793 | V20VSK8BAS 150-1050 | 9079783 | | | |

Kit with DANFOSS valve

SkyStar Jumbo ECM excluded.

The flow rate can be calculated without any special tools. In order to modify the presetting (the factory value is 100%), go ahead as follow :

1. Remove the blue protective cover or the actuator fitted on the unit
2. Lift up the indicator (DN 25-32)
3. Turn (clockwise to decrease) on the new value
4. Set off the grey indicator again into the closed position (DN 25-32)

The presetting range shows flow rate values between 10-0 (DN 15-20). The clockwise rotation reduces the requested flow rate value whereas the counterclockwise rotation increases it.



DANFOSS technical characteristics

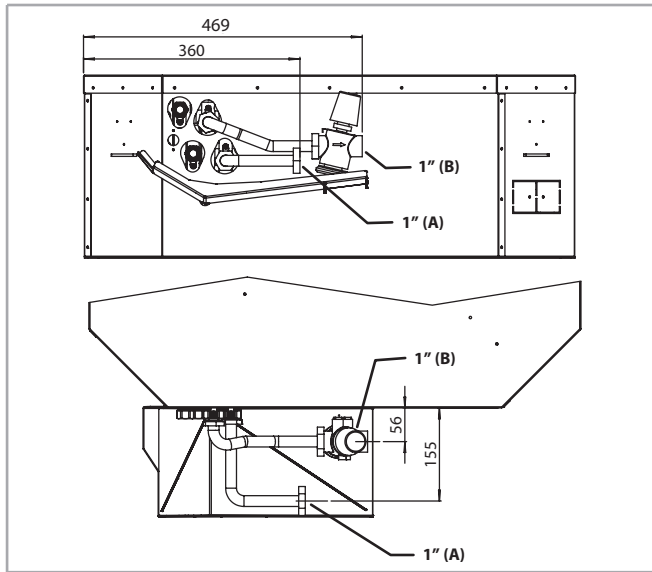
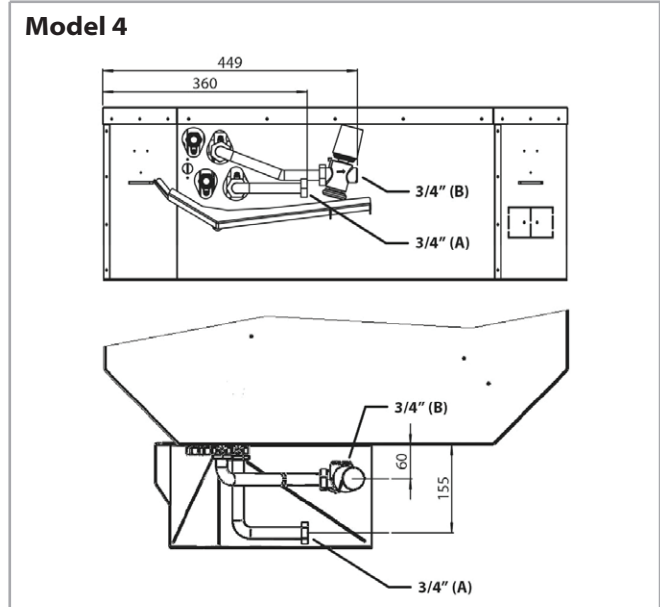
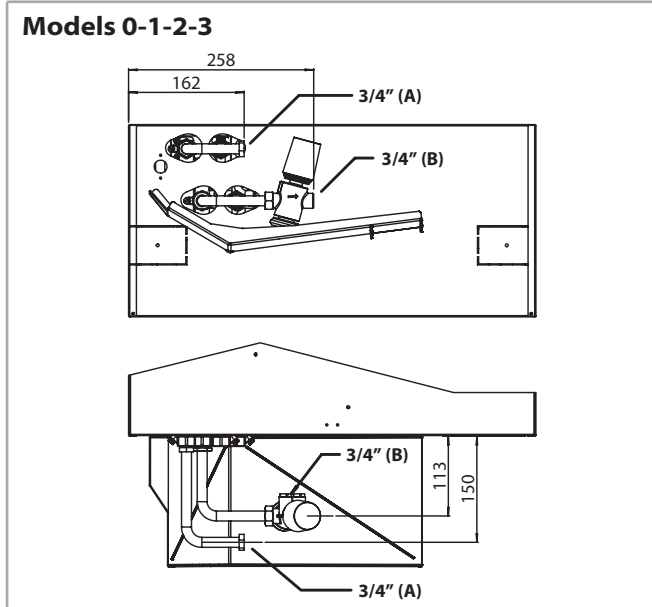
| Nominal diameter | DN | 15 | 15HF |
|-----------------------|---------|--------|----------|
| Type | - | 90-450 | 150-1050 |
| Flow rate range | l/h | 650 | 1200 |
| Adjustment range | % | 10-100 | |
| Differential pressure | Dp min. | 16 | 25 |
| | Dp max. | 600 | |
| Nominal pressure | PN | 25 | |

Operation limits of the DANFOSS balancing valves

- Maximum operating temperature: 120 °C
- Maximum % of water/glycol mixture: 50%
- Minimum operating temperature: -10 °C

Balancing valves for DANFOSS main coil

The valve is supplied equipped with 230 Volt electro-thermal actuator for the ON/OFF control.



(A) = Water inlet - Female connection

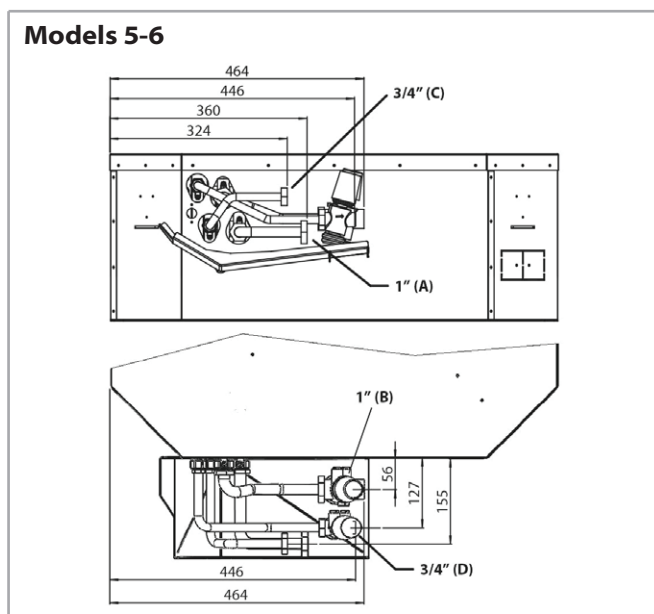
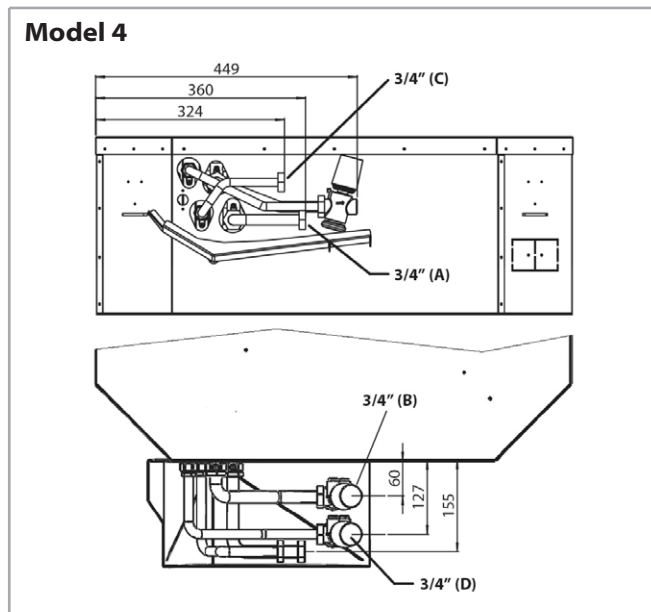
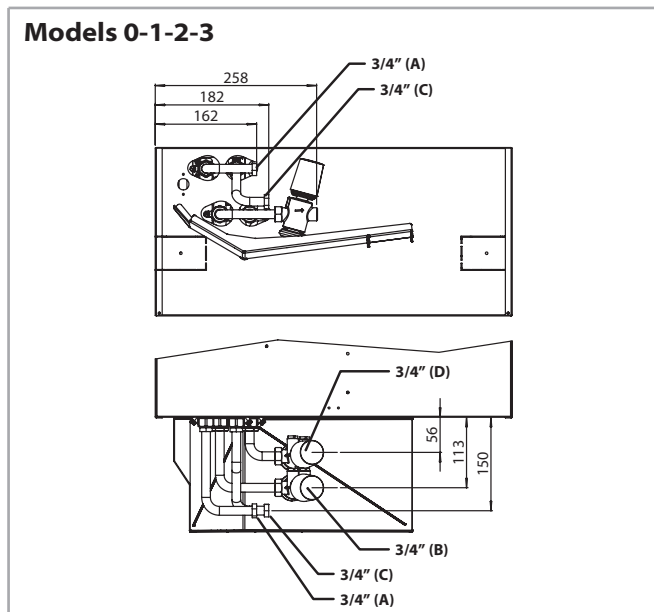
(B) = Water outlet - Male connection

| Model | Fitted | | Not mounted | | DN | (Ø) | Range (l/h) |
|-------|---------|--------------------|-------------|--------------------|----|------|-------------|
| | Code | ID | Code | ID | | | |
| 0-3 | 9079774 | V2DFSK6BPM150-1050 | 9079784 | V2DFSK6BPS150-1050 | 15 | 3/4" | 150-1050 |
| 4 | 9079775 | V2DFSK8BPM150-1050 | 9079785 | V2DFSK8BPS150-1050 | 15 | 3/4" | 150-1050 |
| 5-6 | 9079776 | V2DFSK8BPM190-1300 | 9079786 | V2DFSK8BPS190-1300 | 20 | 1" | 190-1300 |

Balancing valves for DANFOSS main and additional coil

2 way valve for main and additional coil and assembly kit.

The valve is supplied equipped with 230 Volt electro-thermal actuator for the ON/OFF control.



(A) = Water inlet (main coil) - Female connection

(B) = Water outlet (main coil) - Male connection

(C) = Water inlet (additional coil) - Female connection

(D) = Water outlet (additional coil) - Male connection

| Model | Fitted | | Not mounted | | DN | (Ø) | Range (l/h) |
|-------|---------|--------------------|-------------|--------------------|----|------|-------------|
| | Code | ID | Code | ID | | | |
| 0-3 | 9079774 | V2DFSK6BPM150-1050 | 9079784 | V2DFSK6BPS150-1050 | 15 | 3/4" | 150-1050 |
| 4 | 9079775 | V2DFSK8BPM150-1050 | 9079785 | V2DFSK8BPS150-1050 | 15 | 3/4" | 150-1050 |
| 5-6 | 9079776 | V2DFSK8BPM190-1300 | 9079786 | V2DFSK8BPS190-1300 | 20 | 1" | 190-1300 |

| Model | Fitted | | Not mounted | | DN | (Ø) | Range (l/h) |
|-------|---------|--------------------|-------------|--------------------|----|------|-------------|
| | Code | ID | Code | ID | | | |
| 0-3 | 9079777 | V2DFSK6BAM150-1050 | 9079787 | V2DFSK6BAS150-1050 | 15 | 3/4" | 150-1050 |
| 4-5 | 9079778 | V2DFSK8BAM150-1050 | 9079788 | V2DFSK8BAS150-1050 | 15 | 3/4" | 150-1050 |

MCT casing

| Model | ID | Code |
|---------|---------|---------|
| 0-1-2-3 | MCT 600 | 9079240 |
| 4-5-6 | MCT 800 | 9079250 |
| 7-8 | MCT 900 | 9079886 |

The MCT version has been designed for all environments where false ceilings are not featured or cannot be constructed.

The casing fits perfectly to the air intake and outlet diffuser, maintaining the appealing design that defines the SkyStar series.

The water fittings can be turned to point upwards.

The MCT series includes 9 models, with an installation height of up to 5 m, thanks to the highly flexible adjustment of the air distribution louvers.

All the technical specifications described on the previous pages remain the same, while keeping in mind that:

- the MCT series features one coil only (2 pipe systems)
- there is no possibility of fresh air intake
- there is no possibility of additional electric heater

The MCT version features a special casing, in COOL GREY 1C colour, delivered in separate packaging; this must only be fitted after having installed the SkyStar unit and completed the water and electrical connections.

Warning: the electrical and water connections must enter the unit from above and must not interfere with the casing.

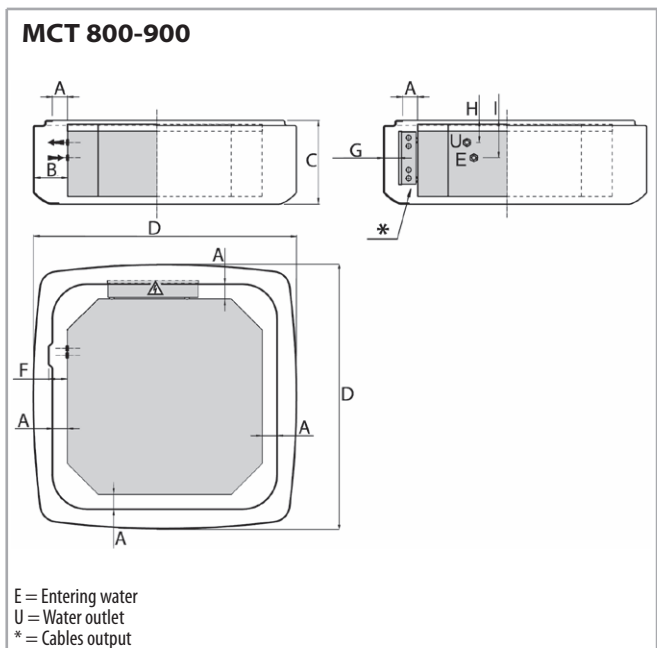
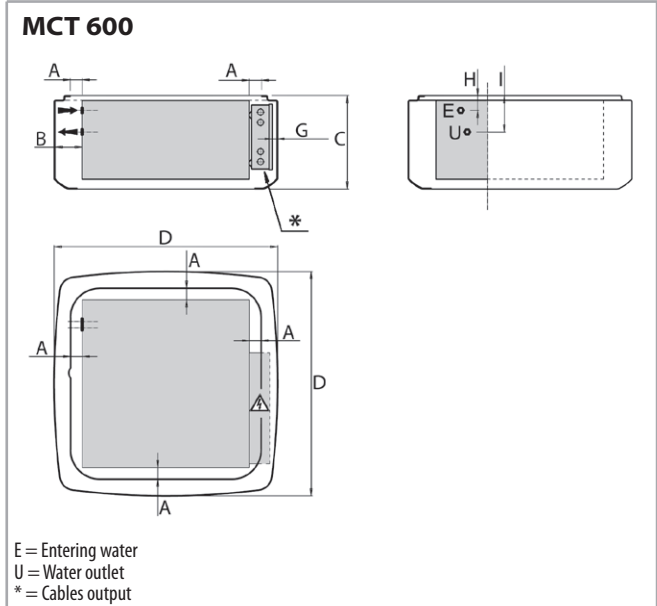
Models 02-12-22-32-42-52-62



Models 72-82

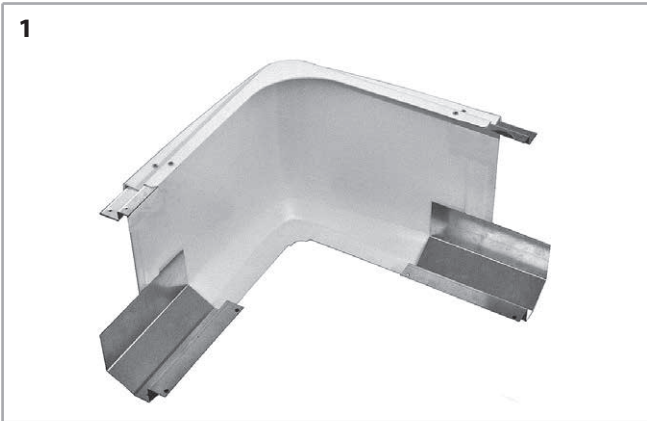


Dimension and weight



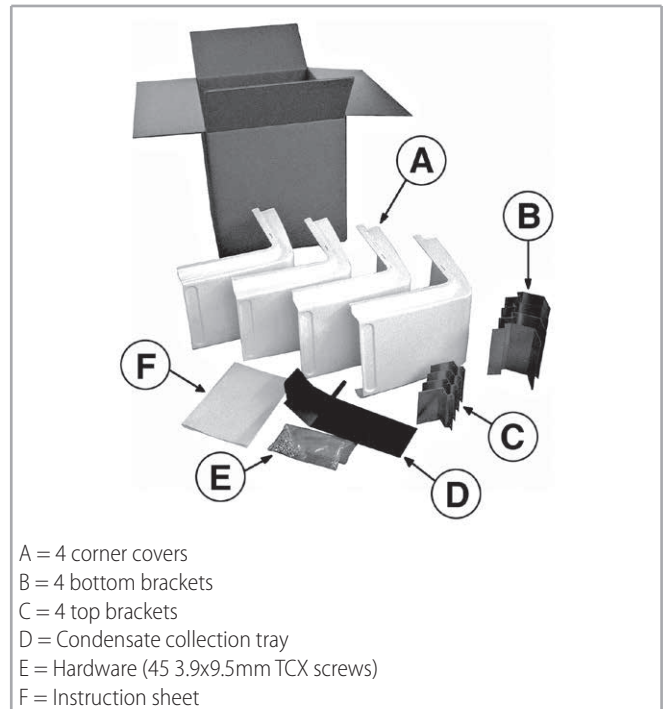
| Model | | MCT 600 | MCT 800 | MCT 900 |
|--------------------------|----|---------|---------|---------|
| A | mm | 40 | 62 | 53 |
| B | mm | 93 | 140 | 126 |
| C | mm | 320 | 350 | 350 |
| D | mm | 768 | 1089 | 1125 |
| F | mm | - | 78 | 69 |
| G | mm | 15 max | 65 max | 33 max |
| H | mm | 51 | 94 | 94 |
| I | mm | 125 | 158 | 158 |
| Weight with packaging | kg | 5 | 10,5 | 11 |
| Weight without packaging | kg | 7,5 | 13,5 | 14 |

Assembly diagram



Components of the casing

The casing includes the following elements:

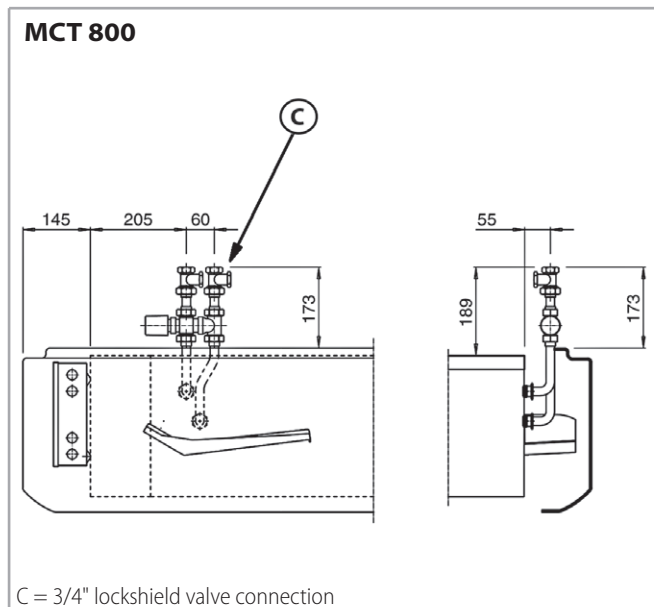
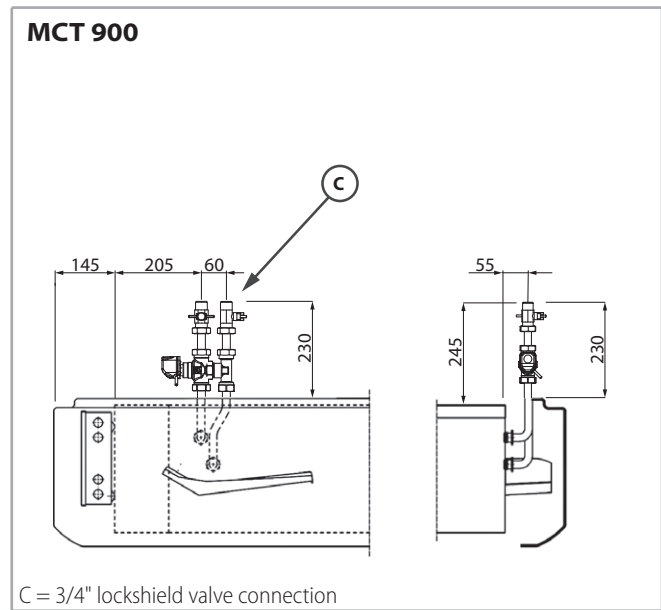
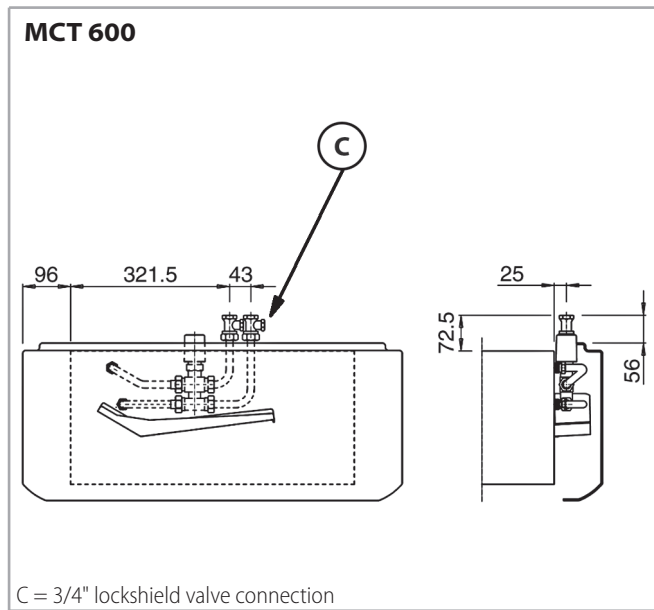


Valves kit

| Model | ID | Code | Kvs m ³ /h | Dp max kPa * | Micrometric lockshield valve connections (female) | Ball valve connections (female) |
|---------|------------|----------|--------------------------|-----------------|--|------------------------------------|
| | | | | | Ø | Ø |
| MCT 600 | 3V2T1-3MCT | 9079155 | 2,5 | 50 | 3/4" | - |
| MCT 800 | 3V2T4-6MCT | 9079221 | 4,5 | | 3/4" | |
| MCT 900 | 3V2T7-8MCT | 9079945W | | | 3/4" | |

* maximum pressure difference for valve to close

The valve fittings allow the water pipes to be connected from above.



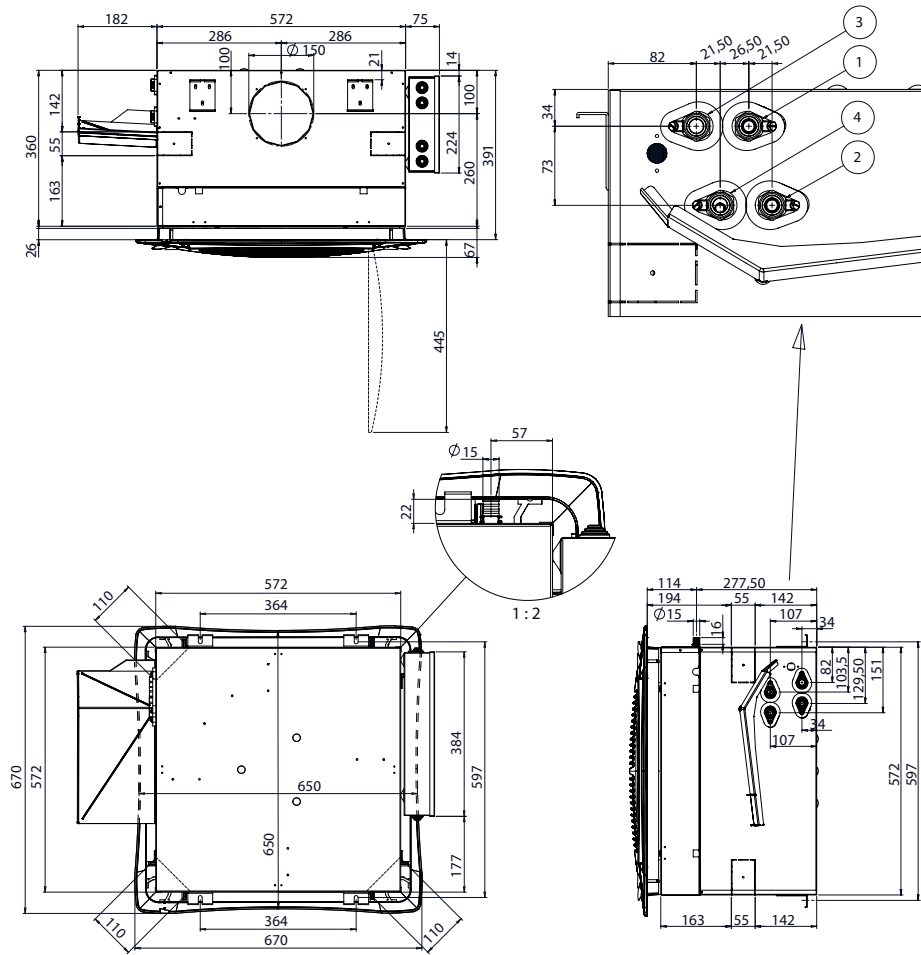
RSP / RSP-ECM VERSION

The unit is not supplied with a pump to discharge condensation; condensation must be evacuated by gravity by correctly sloping the drain pipe.

These units are higher than the standard version.

With RSP / RSP-ECM versions the following accessories are not applicable:

- the MCT casing
- the condensate pump with higher pressure head
- The Crystall active plate type electrostatic filter



2 pipe unit

- 3 - Hot/cold water inlet 1/2"
- 4 - Return, heating/cooling 1/2"

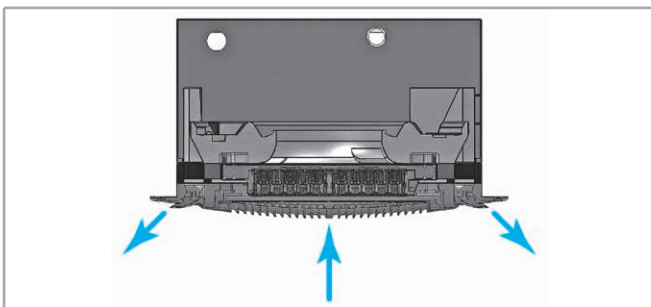
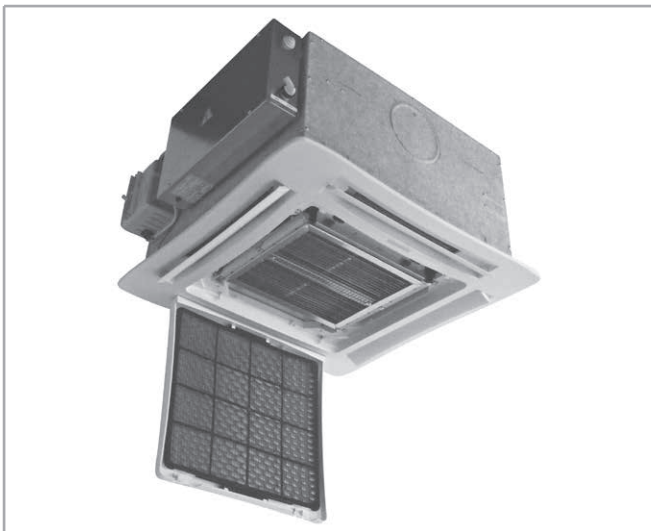
4 pipe unit

- 1 - Hot water inlet 1/2"
- 2 - Hot water outlet 1/2"
- 3 - Flow, cooling 1/2"
- 4 - Return, cooling 1/2"

CRYSTALL

SkyStar Jumbo ECM excluded.

The fan coil Cassette SkyStar, **SK** and **SK-ECM** range (except for SkyStar Jumbo ECM), can be equipped with the innovative plate type electrostatic filter Crystall, combining air treatment and purifying in a single product. The electronic filter is patented and certified according to Standard EN ISO 16890 Class A+ (Eurovent).



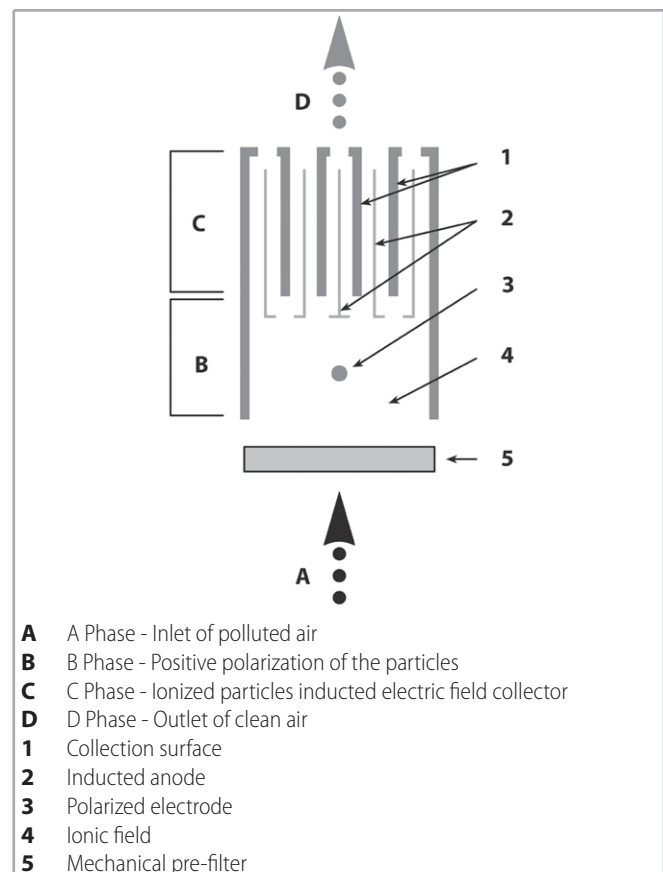
Operating principle of the electrostatic filter

When the polluted air goes through the mechanical pre-filter the particles $> 50 \mu\text{m}$ are eliminated (powder, insects, etc).

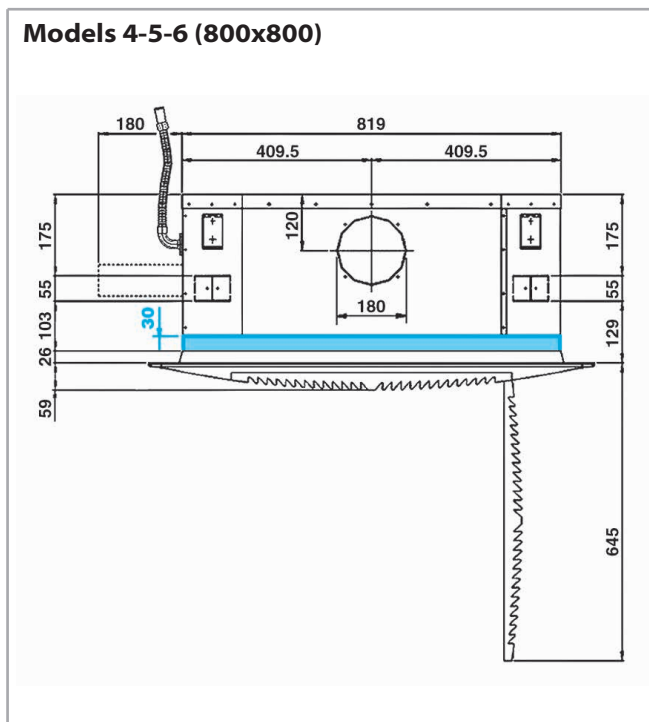
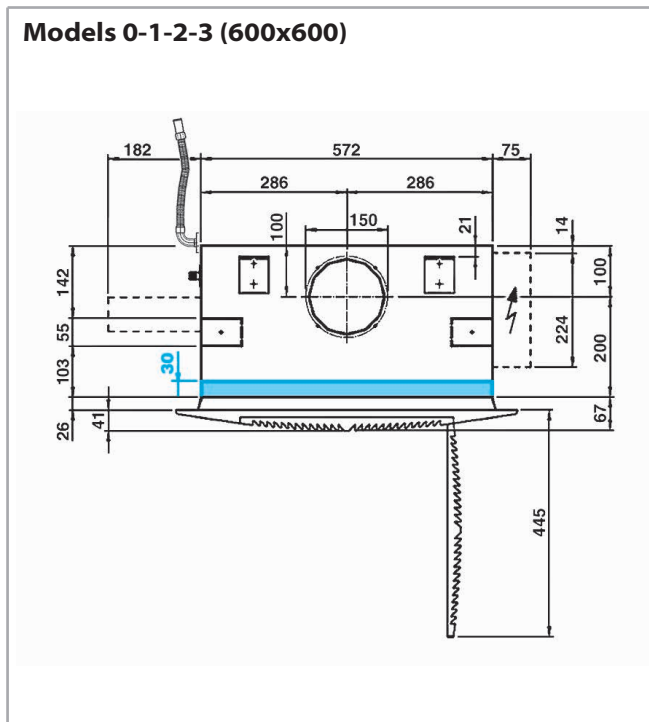
Then the smallest particles ($50 \div 0.01 \mu\text{m}$) are exposed to an intensive ionizing field and are polarized (B - B Phase).

The charged particles passing through the second filter section, are pushed back by the anode and attracted to the collection surfaces by a strong, induced magnetic field (C - C Phase).

The air which leaves the unit is free from polluting particles.



Dimensions



Indoor air quality (IAQ)

The expression Indoor Air Quality (IAQ) covers all the procedures and methodologies used to improve the quality of the air we breathe in the places where we live and work, from all points of view, from temperature to cleanliness, to relative humidity, etc. (EN 16798-1 / 3). Thanks to its new certified and patented electronic filter, the Crystall unit totally eliminates the pollutants

present in the air, including tobacco smoke, dust (PM10, PM2.5, PM1), fibres, microbiological substances such as bacteria, fungi, viruses etc., which are harmful to human health (source: WHO 2009).

Purifying the air means not only greater well-being, but also energy saving, as the fresh air changes are significantly reduced (indeed it is enough to supply just the quantity of air required to reduce the gaseous pollutants).

Moreover, according to the new EN 16798, the recirculated air of the Crystall unit can be considered as fresh air, because it is filtered with the same efficiency (ePMx), to be added to the minimum requirements (0,5 ls/m² or 4 lt/pers. in accordance with WHO).

The positioning of the electronic filter allows simple and effective maintenance and, as it is easy to wash, its working life is practically unlimited.

The modularity of the filter components and their ease of mounting make the system extremely competitive in terms of cost and energy consumption (A+ class) if compared with other types of filters present on the market.

In spring and autumn, if air conditioning/heating is not required, the appliance acts simply as an air purifier.

Standards and legislation

The ambient condition is acceptable when:

- Microclimatic parameters are normal
- 80% of people are satisfied by the quality of air
- Specific internal contaminants are not in harmful concentrations

The method for obtaining the air quality required in confined areas and thus succeeding in ensuring that the contaminants present are in concentrations less than those considered dangerous to health are:

- **Prescriptive approach:** ventilation of the internal area using only properly filtered fresh air (SUPx), in the quantity and quality needed to dilute the internal contaminants in order to reach the required maximum acceptable concentration values (see WHO limits).
- **Performant approach:** ventilation with fresh air and recirculated air from the same area, both properly filtered, in the quantity and quality needed to dilute the internal contaminants in order to reach the required maximum acceptable concentration values (see WHO limits).

The quantity and quality of recirculated air and fresh air to supply is better specified in the prescriptive approach of EN 16798-1 (annex A national legislative) and EN 16798-3.

The flow rate derives from a binomial equation that joins a proportion per surface (qp.s) (L/sec/m²), that can change according to the internal emission of the contaminants (3 classes: very low polluting, low polluting, non low polluting) and a proportion per person (qp.p) (L/sec/pers).

Tot. flow rate = (qp.s x m²) + (qp.p x N°pers.)

The table here below shows partially an example of the values:

Prescriptive Method

| Ambients Category | EN 16798-1 (annex A national legislative) | | | | | | | | | | | |
|----------------------|---|-------|------|---|------|------|--|------|------|--|------|------|
| | Flow rate per person (l/sec/pers.) | | | Flow rate per surface (l/sec/m ²) Very low polluting | | | Flow rate per surface (l/sec/m ²) Low polluting | | | Flow rate per surface (l/sec/m ²) Non low polluting | | |
| | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 | 1 | 2 | 3 |
| Offices | 8,50 | 7,50 | 5,50 | 0,25 | 0,20 | 0,15 | 0,50 | 0,40 | 0,30 | 1,00 | 0,80 | 0,60 |
| Hospital room | 11,50 | 10,00 | 8,70 | 0,25 | 0,20 | 0,15 | 0,50 | 0,40 | 0,30 | 1,00 | 0,80 | 0,60 |
| Restaurants | 8,75 | 7,00 | 5,25 | 0,63 | 0,50 | 0,38 | 1,25 | 1,00 | 0,75 | 3,00 | 2,00 | 1,50 |
| Shops | 8,75 | 7,00 | 5,25 | 0,50 | 0,40 | 0,30 | 1,00 | 0,80 | 0,60 | 2,00 | 1,60 | 1,20 |
| Schools | 7,50 | 6,00 | 4,50 | 0,32 | 0,25 | 0,19 | 0,63 | 0,50 | 0,38 | 1,26 | 1,00 | 0,76 |

Performant Method

| EN 16798-1 Identification and quantification of the reference pollutant (PM or gas) | | |
|--|-------------------------------|--|
| Concentration Limit | Minimum fresh air l.s. person | Quantity of recirculated air provided that it is filtered like fresh air |
| WHO publicized values and legislative acts expressed in μg/m ³ , PPM, ecc. | 5 - 6 | The volume of air to be considered is based on the internal production and the imposed concentration limits in the confined area |

| EN 16798-3 Identification and quantification of the reference pollutant (PMx) | | |
|---|---|--|
| Concentration Limit | Minimum fresh air l.s. person | Quantity of recirculated air provided that it is filtered like fresh air |
| WHO publicized values and legislative acts expressed in μg/m ³ , PPM, ecc. | The minimum volume of air input varies based on the intended use of the confined area | The volume of air to be considered is based on the internal production and the imposed concentration limits in the confined area |

Fresh air flow rates according to the performant approach

EN 16798-1 and EN 16798-3 Standards

The example reproduced at the bottom of the page shows how, with adequate air filtering, it is possible to decrease considerably the quantity of fresh air to be brought into the environment (up to 3-4 times less): the thermal energy dissipated due to ventilation is in fact in direct proportion to the number of air changes, as indicated in the following equation:

Qv = ΔT · (R / 3600) · D · C · Vol.

Qv = Thermal energy lost for ventilation - Watt

ΔT = Indoor-Outdoor difference (T) - °C

R = A.C.H.

D = Air density - Kg/m³

C = Specific air heat - J/Kg-°C

Vol = Room size - m³

Note: www.tecnicabontempi.it for the simplified "IAQ software" performance rating

Main components

The Crystall electrostatic filtering system consists of two parts: the first is a plate type electronic active filter and is fitted in the return air section of the cassette, while the second is an electronic control and regulation board, fixed on the structure.

All electrical connections are made during production. The installation of the Cassette SkyStar Sabiana cassette fan coil unit incorporating the Crystall electronic filter is therefore similar to that of a normal unit: the only difference is the installation height, for which the filter dimensions must be taken into account (30 mm).

The Crystall filters can not be used with the electric heater.

Active plate type electronic filter

The filtering element consists of two sections: the first consists of electrodes and insulating elements, forming a self-supporting ionising frame, while the second consists of special light aluminium fins (collector).

The two sections are installed above the return air grille to make the extraction and maintenance of the filter easier.

Accessibility to sections to be cleaned is ensured by easy-open plastic closures.

The collector can be cleaned by washing with water and ordinary detergents or steam jets (please consult the maintenance manual for further details).

PCB (electronic board)

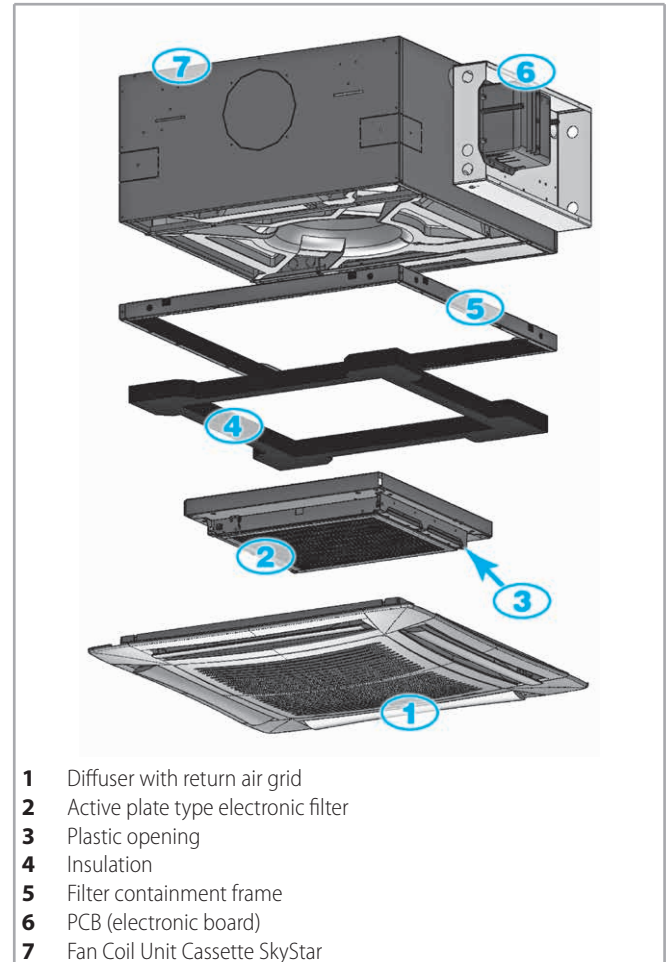
Controls and regulates all functions of the electrostatic filter.

It is appropriately protected against any operating defects of the electrostatic filter.

It supplies a constant voltage to the electrodes when the mains supply voltage varies ($\pm 15\%$).

The supply transformer is constructed with its primary and secondary coils physically separated and wound onto separate cores.

The energy consumption of the filter group is 25 W (to which the electrical consumption of the Cassette SkyStar must be added).





THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

CISQ/ICIM SPA has issued an IQNet recognized certificate that the organization:

SABIANA S.p.A.

Head Office and Operative Unit
Via Piave, 53 - I-20011 Corbetta (MI)
Operative Units
Via Virgilio, 2 - I-20013 Magenta (MI)
Via Zanella, 27 - I-20011 Corbetta (MI)

has implemented and maintains a
Quality Management System

for the following scope:

Design, production and service of heating and air conditioning equipment (unit heaters, radiant panels, fan coil units and air handling units) and chimneys.

which fulfils the requirements of the following standard:

ISO 9001:2015

Issued on: 2022-05-13
First issued on: 1996-06-10
Expires on: 2024-04-09

This attestation is directly linked to the IQNet Partner's original certificate and shall not be used as a stand-alone document.

Registration Number: IT-4000

Alex Stoichitoiu
President of IQNet

Ing. Mario Romersi
President of ICISQ

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Il presente documento annulla e sostituisce il certificato di pari numero emesso in data 06/05/2022.



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CERTIFICATO N. 0545/8
 CERTIFICATE No. _____

SI CERTIFICA CHE IL SISTEMA DI GESTIONE PER LA QUALITÀ DI
 WE HEREBY CERTIFY THAT THE QUALITY MANAGEMENT SYSTEM OPERATED BY

SABIANA S.P.A.

Sede e Unità Operativa

Via Piave, 53 - 20011 Corbetta (MI) - Italia

Processi direzionali, primari e di supporto relativamente a Progettazione, produzione e assistenza di apparecchiature per il riscaldamento e il condizionamento dell'aria (aerotermi, termostrisce radianti, ventilconvettori e unità trattamento aria) e canne fumarie.

Unità Operative

Via Virgilio, 2 - 20013 Magenta (MI) - Italia

Produzione di ventilconvettori. Magazzino Logistica.

(Presente solo reparto produttivo, magazzino componenti e logistica: Magazzino P.F. e spedizione).

Via Zanella, 27 - 20011 Corbetta (MI) - Italia

Assemblaggio unità trattamento aria, lavorazioni meccaniche, saldatura, magazzino, assemblaggio recuperatori.

È CONFORME ALLA NORMA / IS IN COMPLIANCE WITH THE STANDARD

UNI EN ISO 9001:2015

Sistema di Gestione per la Qualità / Quality Management System

PER LE SEGUENTI ATTIVITÀ / FOR THE FOLLOWING ACTIVITIES

EA: 18

Progettazione, produzione e assistenza di apparecchiature per il riscaldamento e il condizionamento dell'aria (aerotermi, termostrisce radianti, ventilconvettori e unità trattamento aria) e canne fumarie.

Design, production and service of heating and air conditioning equipment (unit heaters, radiant panels, fan coil units and air handling units) and chimneys.

Riferirsi alla documentazione del Sistema di Gestione per la Qualità aziendale per l'applicabilità dei requisiti della norma di riferimento.
 Refer to the documentation of the Quality Management System for details of application to reference standard requirements.

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 The use and the validity of this certificate shall satisfy the requirements of the ICIM document "Rules for the certification of company management systems" and specific Scheme.

Per informazioni puntuali e aggiornate circa eventuali variazioni intervenute nello stato della certificazione di cui al presente certificato, si prega di contattare il n° telefonico +39 02 725341 o indirizzo e-mail info@icim.it.
 For timely and updated information about any changes in the certification status referred to in this certificate, please contact the number +39 02 725341 or email address info@icim.it.

DATA EMISSIONE
 FIRST ISSUE
 10/06/1996

EMISSIONE CORRENTE
 CURRENT ISSUE
 13/05/2022

DATA DI SCADENZA
 EXPIRING DATE
 09/04/2024

Vincenzo Delacqua
 Rappresentante Direzione / Management Representative
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Cert. n. 050153

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