

Liebert
HIROSS



High Performance Air Conditioning

Hisp

SE + SC

Product Documentation

Split Air Conditioner for:

Cooling

Heating

Air Filtration

Indoor Ventilation

Freecooling with Outdoor Fresh Air

Emergency Cooling

English

code 272069 – rev. 13.10.2000

Issued by TDS

INDEX

1 – The series	1
1.1– Main features	1
1.2– Accessibility	1
1.3– Installation	1
1.4– Metal cabinet	2
1.5– Refrigeration circuit	2
1.6– Evaporating section	2
1.6.1– Heat transfer coil	2
1.6.2– Fan features	4
1.7– Motor–condensing section	4
1.7.1– Heat transfer coil	4
1.7.2– Fan features (condensing temperature control with Variex, variable fan speed)	4
1.8– Air filter section	4
1.9– Electric board	4
1.10–Electronic control	5
1.10.1– Microface control	5
1.10.2– Microface xontrol plus Hiromatic Grafic (optional)	5
1.11–Freecooling (optional)	6
1.12–Electric heating (optional)	6
1.13–Emergency cooling (optional)	6
1.14–Noise level	7
1.15–Installation accessories	8
1.16–Packing	8
1.17–Tests and reference norms	8
2 – Technical data and performances	9
2.1– Performances	12
2.2– Electric data	27
2.2.1– Standard features	27
2.2.2– Optional features	28
2.2.3– Differential current protection switch and cable size, AC supply	28
2.2.4– Main disconnecter switch and cable size, DC supply	28
2.3– Application ranges	29
Overall dimensions	30
Examples of installation	36
Electrical connections	39
Refrigeration connections	39

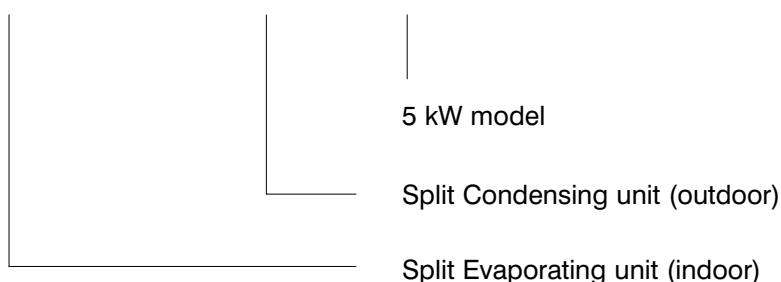
1 – The series

Subject

SE+SC04; SE+SC05; SE+SC06; SE+SC08: SE+SC10; SE+SC14

- split air conditioners
- direct expansion units with capillary (SE+SC04; SE+SC05; SE+SC06) or thermostatic valve (SE+SC08; SE+SC10; SE+SC14)
- microprocessor control
- flexible installation

SE + SC05



1.1 – Main features

Functions

Split units composed by an evaporating indoor unit for ceiling or wall installation and a motor–condensing outdoor unit, mainly for electronic equipped shelters, process centres, telecommunications sites from 4 to 14 kW of nominal cooling capacity.

The system provides air filtration, indoor ventilation, cooling, heating, freecooling with outdoor fresh air to assure the useful climate in the site. The unit can accept emergency power supply of 48 Vdc or 24 Vdc, assuring indoor ventilation and freecooling.

1.2 – Accessibility

Easy Servicing

In the evaporating unit the accessibility is granted from the bottom side; removing three screwed panels and the air discharge grille, it's possible to operate the ordinary and the extraordinary maintenance of the following components: air filter, coil, fan, electrical panel, heaters (opt.), freecooling module (opt.). In the motor–condensing unit, a dedicated panel is covering the compressor, the cooling circuit and the electrical board; a frontal panel has to be used for the extraordinary maintenance of the axial fan. All the outdoor fixing screws are anti–vandalism and weather–proof type (special rubber gasket as standard), requiring a special tool to be removed (supplied with the unit).

1.3 – Installation

Flexibility

Thanks to its special design, the evaporating unit is available for ceiling (standard factory configuration) or wall installation (an easy setting, always possible on site, is needed) according to the specific needs. With vertical installation, the air discharge is upflow.

1.4 – Metal cabinet

Compactness

Hisp frame consists of riveted steel panels, treated with powder coating colour as standard (RAL7035). The motor–condensing unit is designed to be installed outdoor and resist to worst weather conditions. The screws are hermetic (special rubber gasket as standard) and antivandalism (they can be removed only with specific tools) and allow the opening from the front.

The evaporating unit SE has to be placed indoor, to supply the conditioned air inside the room or shelter: it's available in basic version (without Freecooling option) with smaller footprint, and in Freecooling version, inclusive of the additional module for the fresh air modulating management. The air inlet is located in the rear panel (basic version, without Freecooling option), and the air supply is done from the front section, through an integrated grille, complete with double row of orientable fins (horizontal and vertical set) as standard.

The thermo–acoustic insulation of the panels is 10 mm thick, density 70 kg/m³ and of the type mineral wool.

The motor–condensing unit SC takes the external air from the rear, to discharge it on the front section: a frontal metal safety grid prevents contact with the fan, and a special design of the front panel avoids damaging of the fan motor.

The compressor is located in the left side of the motor–condensing unit, separated from the air flow.

1.5 – Refrigeration circuit

Efficiency

There is a single refrigeration circuit with a hermetic compressor (rotary on SC04, 05, 06 models; scroll on SC08, 10, 14).

An internal thermal protection against overheating of the motor is provided as standard.

The circuit, for SE+SC04, SE+SC05 and SE+SC06, incorporates a capillary tube which controls the refrigerant flow to the evaporator (SE unit); a filter dryer is provided in the liquid line to eliminate all moisture for maximum efficiency and an increased working life.

On SE+SC08; SE+SC10 and SE+SC14 the circuit is equipped with thermostatic valve and sight glass. The compressor is equipped with two pressure switches for protection against high condensing (HP) and low evaporating (LP) pressures. The low pressure switch features automatic reset and a delay for winter operation, whilst to avoid compressor cycling at high discharge pressures. The high pressure switch is equipped with manual reset for safety reasons.

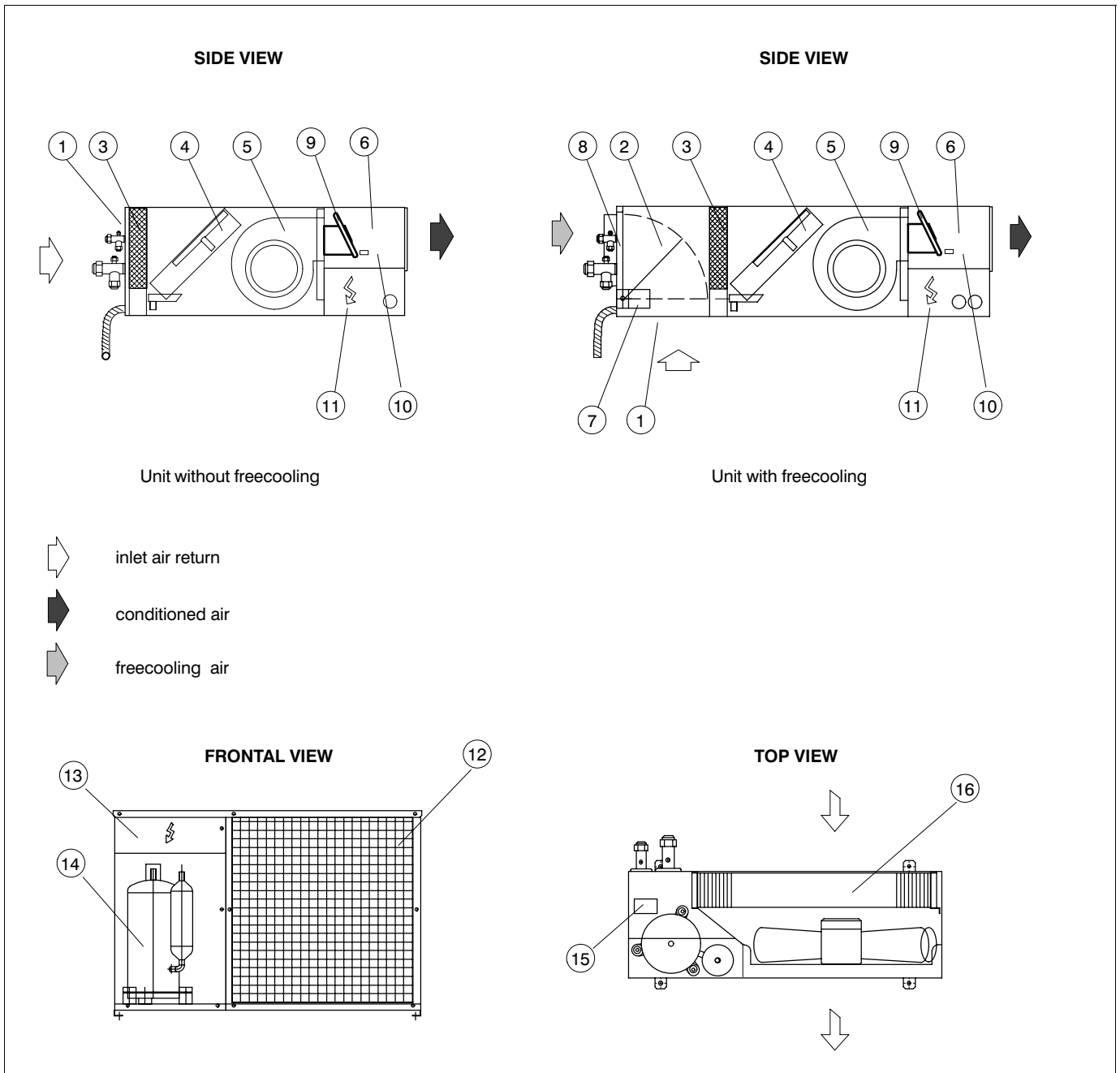
1.6 – Evaporating section

Cooling capacity

1.6.1 – Heat transfer coil

This consists of a slab coil in copper tubes with aluminium waved fins and with a large face area so as to increase the SHR (Sensible Heat Ratio) and optimise the EER (Energy Efficiency Ratio); this is achieved by reducing the air pressure drop and turbulence and increasing the evaporating temperature, thus the efficiency, of the compressor. A galvanized steel basin is provided for the drainage water: its special design allows safe operations indifferently in horizontal or vertical position.

Operation diagram:



POS.	DESCRIPTION	POS.	DESCRIPTION
1	Air return grille	9	Electric heaters (optional)
2	Freecooling damper (Freecooling version only)	10	Heater safety thermostat (heating version only)
3	Air filter	11	Electrical panel evaporating unit
4	Evaporator coil	12	Condenser fan
5	Evaporator unit fan	13	Electrical panel condensing unit
6	Air discharge duct	14	Refrigeration compressor
7	Damper motor (Freecooling version only)	15	Variex
8	Air suction grille (Freecooling version only)	16	Condenser coil

1.6.2 – Fan features

The standard SE units are equipped with two centrifugal fans with forwardly bladed impellers and housing in deep galvanized steel plate. One electrical motor is directly coupled on the motor shaft, with internal thermal protection. The impellers are statically and dynamically balanced with lifetime lubricated bearings for quiet, vibration-free operation.

The motor is single-phase, IP44.

If the unit is complete with the Emergency Freecooling option, the evaporating fan section is composed by two free wheel fans (backward curved blades), each of them direct driven by a *dc* electric motor.

1.7 – Motor–condensing section

Reliability

1.7.1 – Heat transfer coil

A wide face air condensing coil is provided. It is designed in copper tubes with aluminium fins and sized to allow operations up to 45 °C outdoor air temperature.

1.7.2 – Fan features (condensing temperature control with Variex, variable fan speed)

The units are equipped with 4-pole axial fan. The electrical motor is directly coupled on the motor shaft, with internal thermal protection and IP44. The innovative design of the impeller allows the maximum efficiency with the minimum noise.

As standard, the condensing fan speed is smoothly regulated by Variex control, in order to maintain constant the condensing pressure and therefore the temperature. Two kind of advantages: higher reliability for less start/stops of the compressor, and lower noise disturbance because the fan is running at a lower speed, mainly during night time, and with less discontinuity.

1.8 – Air filter section

Air Purity

The filter section is placed vertically, before the evaporating coil and provides filtration of the recirculated or the fresh air to obtain the required degree of air cleanliness in the room. The filter can be removed from the bottom of the unit (indoor side) by simply opening the relevant panel and unlocking the support bracket. Hisp SE unit features 48 mm (SE 04–05–06), 60 mm (SE 08–10–14) thick, pleated type air filter, specially designed to minimize the pressure drop and improve the efficiency. The standard filter class is EU3, according to Eurovent EU4/5 standard).

1.9 – Electric board

Power Supply with Safety

The electrical board of the indoor SE unit is housed in a compartment isolated from the air stream and closed by a screwed dedicated panel. Power connections and auxiliary wires can be driven on right or left side, through two couples of dedicated opening, to increase the flexibility during the installation.

The electrical board is built in accordance with IEC 204–1 recommendations.

The units are designed for the following power supply:

- 230 V 1 ph 50 Hz (SE+SC 04–05–06)
- 400 V 3 ph 50 Hz (SE+SC 08–10–14)
- 230 V 1 ph 60 Hz (SE+SC 04–05–06)
- 230 V 3 ph 60 Hz (SE+SC 08–10–14)
- 460 V 3 ph 60 Hz (SE+SC 08–10–14)

One circuit breaker with magnetic and thermal protection against short circuits and current overload is supplied for the electrical apparatus. A single phase transformer for power supply to the 24 V to the electronic control and to a secondary circuit is provided for maximum safety. Automatic restart is provided after a power failure.

The outdoor SC unit receives main power supply from the indoor unit, together with the control signals collected in a dedicated weather-proof terminal block.

1.10 – Electronic control

Cleverly Control

1.10.1 – Microface control

The standard microprocessor control is Microface.

Where. The Microface electronic board is located in the electrical panel (SE evaporating unit), connected to a remote display installed in a metallic box and placed inside the room or the container.

Display. The interface with the user is a 3–digit backlighted display enabling the machine SET–UP in a very simple way by a tree menu that, as an alternative to the parameter number (which can be easily found in the user’s manual), gives an abbreviation of the selected function.

Remote alarms. There is a warning contact with HT, LT and heater failure. There is another alarm contact with LP, HP, fan failure, and control failure. With the Microface it is possible to have, as option, an additional alarm board allowing further remote alarms.

Management of Freecooling. There is an intelligent management of the freecooling, starting not to a fixed ambient temperature, but depending from the difference ($T^{\text{set}} - T^{\text{out}}$) compared with a settable value. At the same time there is a control of the delivery air temperature, never allowed to go under a defined value.

Connectivity. The Microface has been produced and studied to obtain high performances concerning connectivity. Hiobus (the local area network of controllers) allows to connect up to 16 Microface (16 units) controlling the group; this means sharing the adjustment parameters, rotating the units during their operation keeping 1, 2 or 3 units in stand by and re–activating them when required.

Stand–by. It is sufficient to connect two units or more (up to 16) with a bus cable to create a local network: in case of failure or overload of the running unit, the second one will start automatically.

Automatic rotation. With this control it is possible to obtain the unit rotation and also the working of the two units at the same time if necessary.

Cascade. Two or more units can really work as a team: through the subdivision of the proportional band from Microface, it is possible to split the heat load on the available Hisp air conditioners.

1.10.2 – Microface control plus Hiromatic Graphic (optional)

Microface is a *Hi–Tech solution* that enables the connection of the display for Hiromatic Graphic, for the temperature record over the last 24 hours and the alarm report functionality. The Microface (if connected with Hiromatic Graphic) also records the number of working hours of the main components (fan, compressor, heating elements), controls the starts and stops of the compressor cleverly, shows the alarms available in the unit, and allows the setting of the important parameters covered by 3 password levels.

Also with a serial port RS422, available as option in the Hiromatic Graphic, we can link together in a network by the Hirolink accessory the Hisp units located in different sites. So we can monitorize with a personal computer all the installed air conditioners.

1.11 – Freecooling (optional)

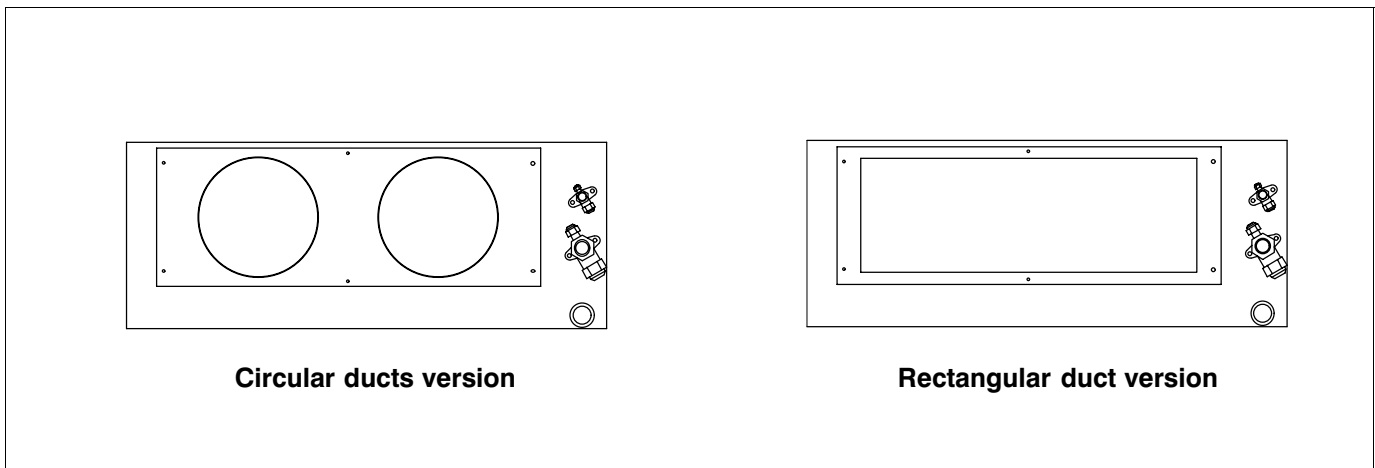
Energy Saving

All units can be made available with the freecooling option (FC). Please see the concept diagram. In this way we save energy and achieve better reliability, for the lower number of compressor starts and stops, and the shorter running time.

Inside the SE evaporating unit an internal damper modulates his position from 0 to 100% of fresh air, just to achieve the required cooling capacity. The exhaust air is discharged outdoor through an overpressure damper mounted on the wall and available as accessory.

The consensus to FC is given when the difference between the indoor and outdoor air temperatures is higher than a set value. No freecooling and mechanical cooling are allowed at the same time.

Rear view:



1.12 – Electric heating (optional)

Heating

The heating option is available with electric heaters, located in the air discharge plenum, for a total of 3 kW (SE 04–05–06) or 6 kW (SE 08–10–14) capacity. There is one stage, one contactor and ON–OFF temperature control. Each heater is fitted with safety thermostat, with manual reset from the air discharge grille.

1.13 – Emergency cooling (optional)

Ventilating Without Interruption

The unit is optionally equipped with an emergency cooling system that allows to supply the indoor fans, the control and the motor damper, if fitted with 48 Vdc or 24 Vdc power supply. When it is required to guarantee the air circulation inside the room or shelter even when the ac main electric supply is missing. For this purpose, two free wheel fans (backward curved blades), each of them direct driven by a dc electric motor, represent the evaporating fan section, allowing to use the 24 Vdc or 48 Vdc batteries that are generally installed inside the shelter to provide emergency energy to the electronic equipment.

The emergency cooling consists of a system (evaporating fans, control and damper motor) always supplied by dc power (48V or 24V options are available); the remaining components are supplied by ac power (230V or 400V, according to the model of the unit). When the main supply fails, the system takes energy from the dc batteries and the compressor is not powered. So, in this way, the control is energized, the air recirculation inside the shelter is ensured and also the freecooling, if fitted, is working.

1.14 – Noise level

Silentness

Sound pressure levels, for measurement carried out with fan speed regulator (Variex).

Model 50Hz		Octave band frequency (Hz)									Sound pressure level [dB(A)]
		31.5	63	125	250	500	1000	2000	4000	8000	
SE 04 SE 05 SE 06	Indoor, free field at 2 m in front of the unit	58	52	56	50	48	51	49	46	42	55
SE 08 SE 10		48	55	61	58	56	54	52	51	49	60
SE 14		49	56	61	58	57	55	52	51	50	62
SC 04	Outdoor, free field at 2 m in front of the unit	55	57	54	46	44	40	37	28	23	46
SC 05		55	58	53	49	44	40	37	28	23	47
SC 06		55	55	55	50	47	41	38	28	24	48
SC 08		46	52	57	56	54	50	47	46	45	56
SC 10		46	53	58	56	54	52	48	46	45	57
SC 14		53	57	60	58	57	53	49	47	45	59

Sound pressure levels, for measurement carried out with fan speed regulator (Variex).

Model 60Hz		Octave band frequency (Hz)									Sound pressure level [dB(A)]
		31.5	63	125	250	500	1000	2000	4000	8000	
SE 04 SE 05 SE 06	Indoor, free field at 2 m in front of the unit	48.5	53	57.5	57	53.5	49.5	47	44.5	42.5	56
SE 08 SE 10		60.5	60	61	56	54.5	56	54.5	52	49.5	61
SE 14		67.5	63	60.5	57.5	59	60	59	56	51.5	65
SC 04	Outdoor, free field at 2 m in front of the unit	39	43.5	47	51.5	46.5	43	39.5	36	31	49
SC 05		43	47.5	51	55	50	47.5	44	40	35.5	53
SC 06		45	49.5	53	57	52	49.5	46	42	37.5	55
SC 08		52.5	57.5	62.5	57.5	54.5	50	49	44	39	57
SC 10		48.5	53.5	58	61	57	52	50.5	46	41	59
SC 14		49.5	54.5	59	64	61.5	57.5	53	48.5	45	63

1.15 – Installation accessories

Finishing

The Freecooling unit can be supplied complete with all main accessories for the installation:

- Wall indoor plate for Freecooling flexible duct connections (two circular holes);
- Freecooling flexible ducts (ø202 mm for SE+SC04–05–06 models, ø250 mm for SE+SC08–10–14) complete with professional fixing clamps;
- Wall indoor plate for Freecooling rigid duct connection (single rectangular hole);
- External rain–proof grille with metallic prefilter for Freecooling intake;
- Overpressure gravity damper, to discharge outdoor the exhaust air from inside, especially designed for this machine;
- External rain–proof grille, to protect the overpressure damper from worst weather and foreign bodies;

All grilles and dampers are made of extruded aluminium, to achieve the maximum lifetime.

The motor–condensing unit can also be supplied complete with the wall mounting kit, made up of a couple of shelves in galvanized steel, painted with polyester powders in the color RAL 9002 and smooth finishing, suitable vibration–damping supports in elastomer and all the small connecting parts in stainless steel, with screw anchors for wall mounting (see Fig. Wall mounting).

NOTE: the screw anchors supplied in the kit are to be used only in case of shelf mounting on concrete or brick walls (hollow bricks included). Do not use on sandwich walls (e.g. container) or with unknown composition. In these cases the most suitable mounting system for the specific material shall be applied.

1.16 – Packing

Delivery

Standard packing consists of a wooden pallet and cardboard box. Polythene foam protects the units' painted surfaces. On request, a cardboard box with an additional wooden crate or wooden case for sea transport can be supplied.

1.17 – Tests and reference norms

Production System Quality

The units are planned, manufactured and tested in compliance to the European directives 98/37/CE (89/392/CEE; 91/368/CEE; 93/68/CEE); 89/336/CEE; 73/23/CEE. More deeply, the unit is verified about Electromagnetic Compatibility according to the following standards: EN55022, radiated and conducted emission, class B; ENV 50/40/IEC 801–3 radiated immunity; IEC 801–6: radiated immunity on the supply/signal cables; IEC 801–4 fast transient; IEC 801–2 ESD.

According to that, the machine is supplied complete with a test certificate and a certificate of conformity to the European directives. Hisp units are marked "CE".

Further, the Company Quality System of Air Conditioning Division is approved by Lloyd Register Quality Assurance, in compliance with the standards UNI EN ISO 9001: 1994 and the product is the result of activities carried out according to the provisions contained in the Quality procedures and plans.

2 – Technical data and performances

HISP model		SE+SC04	SE+SC05	SE+SC06	SE+SC08	SE+SC10	SE+SC14
POWER SUPPLY		230/1/50			400/3/50		
CABINET							
Frame		galvanized steel					
Painting		polyester powder					
Insulation type		mineral wool, 10 mm thick					
OVERALL DIMENSIONS (SE internal unit)							
Height	mm	310			395		
Width	mm	800			1100		
Depth	mm	800			1095		
		(1050 included optional Freecooling)			(1395 included optional Freecooling)		
Weight	kg	54			110	110	120
		Optional Freecooling module weight = 8 kg			Optional Freecooling module weight = 12 kg		
OVERALL DIMENSIONS (SC external unit)							
Height	mm	537			690		
Width	mm	800			1050		
Depth	mm	285			500		
Weight	kg	49	49	56	112	115	125
EVAPORATING COIL							
Tubes material / Fins material		copper / aluminium					
EVAPORATING SECTION FAN							
Quantity and type		2, coupled (single motor)					2 (2 motors)
Poles		4					
Blades material		galvanized sheet steel					
Driven		direct					
Air flow	m ³ /s	0.42			0.72		1.15
ROOM AIR FILTER							
Quantity / Type		1 / pleated					
Efficiency filter class (Eurovent EU 4/5)		EU3					
ELECTRIC HEAT COIL (opt)							
Type / Steps number		tube / 1			wire / 1		
Total heating capacity	kW	3			6		
FREECOOLING (opt)							
New air max. flow rate	m ³ /s	0.39			0.62		1.00
COMPRESSOR							
Type		rotary			scroll		
Refrigerant		R22 (R407C option)					
CONDENSING COIL							
Tubes material / Fins material		copper / aluminium					
CONDENSING SECTION FAN							
Quantity and type		1 / axial					
Poles		4					
Control system		modulating speed (Variex)					
Max rotation speed	rpm	1390			1210		
Blades material		galvanized sheet steel					
Air flow	m ³ /s	0.67			1.53		

HISP model		SE+SC04	SE+SC05	SE+SC06
POWER SUPPLY		230/1/60		
CABINET				
Frame		galvanized steel		
Painting		polyester powder		
Insulation type		mineral wool, 10 mm thick		
OVERALL DIMENSIONS (SE internal unit)				
Height	mm	310		
Width	mm	800		
Depth	mm	800		
		(1050 included optional Freecooling)		
Weight	kg	58		
		Optional Freecooling module weight = 8 kg		
OVERALL DIMENSIONS (SC external unit)				
Height	mm	537		
Width	mm	800		
Depth	mm	285		
Weight	kg	54		
ELECTRIC HEAT COIL (opt)				
Tubes material / Fins material		copper / aluminium (wave type)		
EVAPORATING SECTION FAN				
Quantity and type		2, coupled (1 motor)		
Poles		4		
Blades material		galvanized sheet steel		
Driven		direct		
Air flow	m ³ /s	0.399		
ROOM AIR FILTER				
Quantity / Type		1 / pleated		
Efficiency filter class (Eurovent EU 4/5)		EU3		
ELECTRIC HEAT COIL (opt)				
Type / Steps number		tube / 1		
Total heating capacity	kW	3		
FREECOOLING (opt)				
New air max. flow rate	m ³ /s	0.324		
COMPRESSOR				
Type		rotary		
Refrigerant		R22 or R407C		
CONDENSING COIL				
Tubes material / Fins material		copper / aluminium		
CONDENSING SECTION FAN				
Quantity and type		1 / axial		
Poles		4		
Control system		modulating speed (Variex)		
Max rotation speed	rpm	1610		
Blades material		galvanized sheet steel		
Air flow	m ³ /s	0.722		

HISP model	SE+SC08	SE+SC10	SE+SC14	SE+SC08	SE+SC10	SE+SC14	
POWER SUPPLY	230/3/60			460/3/60			
CABINET							
Frame	galvanized steel						
Painting	polyester powder						
Insulation type	mineral wool, 10 mm thick						
OVERALL DIMENSIONS (SE internal unit)							
Height	mm	395					
Width	mm	1100					
Depth	mm	1095					
		(1395 included optional Freecooling)					
Weight	kg	105	125	115		135	
		Optional Freecooling module weight = 12 kg					
OVERALL DIMENSIONS (SC external unit)							
Height	mm	690					
Width	mm	1050					
Depth	mm	500					
Weight	kg	113	117	120	113	117	120
EVAPORATING SECTION FAN	kg						
Tubes material / Fins material	copper / aluminium (wave type)						
EVAPORATING SECTION FAN							
Quantity and type	2, coupled (1 motor)		2, coupled (2 motors)	2, coupled (1 motor)		2 (2 motors)	
Poles	4						
Blades material	galvanized sheet steel						
Driven	direct						
Air flow	m ³ /s	0.779	1.12	0.779		1.12	
ROOM AIR FILTER							
Quantity / Type	1 / pleated						
Efficiency filter class (Eurovent EU 4/5)	EU3						
ELECTRIC HEAT COIL (opt)							
Type / Steps number	wire / 1						
Total heating capacity	kW	6					
FREECOOLING (opt)							
New air max. flow rate	m ³ /s	0.619	0.865	0.619		0.865	
COMPRESSOR							
Type	scroll						
Refrigerant	R22 or R407C						
CONDENSING COIL							
Tubes material / Fins material	copper / aluminium						
CONDENSING SECTION FAN							
Quantity and type	1 / axial						
Poles	4						
Control system	modulating speed (Variex)						
Max rotation speed	rpm	1440					
Blades material	galvanized sheet steel						
Air flow	m ³ /s	1.38			1.38		

2.1 – Performances

Cooling capacities, absorbed power and current, compressor running mode—SE+SC04 model

230 V / 1 Ph / 50 Hz		Outdoor temperature [°C]				
		25 230 / 1 / 50	30 230 / 1 / 50	35 230 / 1 / 50	40 230 / 1 / 50	45 230 / 1 / 50
Indoor conditions: 21°C, 50% r.h.						
Total cooling capacity	kW	4.2	4.1	3.9	3.8	3.6
Sensible cooling capacity	kW	4.0	3.9	3.9	3.8	3.6
Compressor absorbed power	kW	0.9	1.0	1.1	1.3	1.4
Compressor absorbed current	A	3.9	4.3	4.8	5.3	5.9
Indoor conditions: 24°C, 50% r.h.						
Total cooling capacity	kW	4.5	4.4	4.2	4.1	3.9
Sensible cooling capacity	kW	4.1	4.1	4.0	4.0	3.9
Compressor absorbed power	kW	0.9	1.0	1.2	1.3	1.4
Compressor absorbed current	A	4.0	4.4	4.9	5.4	6.0
Indoor conditions: 27°C, 47% r.h.						
Total cooling capacity	kW	4.9	4.6	4.5	4.3	4.1
Sensible cooling capacity	kW	4.5	4.4	4.4	4.3	4.1
Compressor absorbed power	kW	1.0	1.1	1.2	1.3	1.4
Compressor absorbed current	A	4.0	4.4	4.9	5.4	6.0
Indoor conditions: 30°C, 40% r.h.						
Total cooling capacity	kW	5.0	4.9	4.8	4.6	4.4
Sensible cooling capacity	kW	5.0	4.9	4.8	4.6	4.4
Compressor absorbed power	kW	1.0	1.1	1.2	1.3	1.4
Compressor absorbed current	A	4.1	4.5	5.0	5.5	6.0

Max cooling capacities, freecooling mode—SE+SC04 model

230 V / 1 Ph / 50 Hz		Outdoor temperature [°C]		
		10 230 / 1 / 50	15 230 / 1 / 50	20 230 / 1 / 50
Indoor temperature: 21°C				
Sensible cooling capacity	kW	5.1	2.8	0.5
Indoor temperature: 24°C				
Sensible cooling capacity	kW	6.6	4.2	1.9
Indoor temperature: 27°C				
Sensible cooling capacity	kW	8.0	5.6	3.3
Indoor temperature: 30°C				
Sensible cooling capacity	kW	9.4	7.0	4.7

Note: Capacities are quoted for R22 (5 m equivalent distance between SE and SC units). For details of R407C capacities, please contact the Technical Support Department. Quoted capacities are gross capacities: for net capacities, subtract fan motor heat.

Cooling capacities, absorbed power and current, compressor running mode—SE+SC05 model

230 V / 1 Ph / 50 Hz		Outdoor temperature [°C]				
		25 230 / 1 / 50	30 230 / 1 / 50	35 230 / 1 / 50	40 230 / 1 / 50	45 230 / 1 / 50
Indoor conditions: 21°C, 50% r.h.						
Total cooling capacity	kW	5.1	4.9	4.7	4.5	4.4
Sensible cooling capacity	kW	4.5	4.5	4.4	4.3	4.2
Compressor absorbed power	kW	1.2	1.3	1.5	1.6	1.8
Compressor absorbed current	A	5.4	5.7	6.2	6.8	7.6
Indoor conditions: 24°C, 50% r.h.						
Total cooling capacity	kW	5.5	5.3	5.1	4.9	4.8
Sensible cooling capacity	kW	4.7	4.6	4.6	4.5	4.4
Compressor absorbed power	kW	1.3	1.4	1.5	1.7	1.8
Compressor absorbed current	A	5.6	5.9	6.3	7.0	7.8
Indoor conditions: 27°C, 47% r.h.						
Total cooling capacity	kW	5.8	5.6	5.5	5.2	5.0
Sensible cooling capacity	kW	5.0	5.0	4.9	4.8	4.8
Compressor absorbed power	kW	1.3	1.4	1.5	1.7	1.8
Compressor absorbed current	A	5.7	6.0	6.4	7.1	7.9
Indoor conditions: 30°C, 40% r.h.						
Total cooling capacity	kW	6.0	5.7	5.6	5.4	5.2
Sensible cooling capacity	kW	5.8	5.7	5.6	5.4	5.2
Compressor absorbed power	kW	1.3	1.4	1.5	1.7	1.9
Compressor absorbed current	A	5.8	6.1	6.5	7.3	8.2

Max cooling capacities, freecooling mode – SE+SC05 model

230 V / 1 Ph / 50 Hz		Outdoor temperature [°C]		
		10 230 / 1 / 50	15 230 / 1 / 50	20 230 / 1 / 50
Indoor temperature: 21°C				
Sensible cooling capacity	kW	5.1	2.8	0.5
Indoor temperature: 24°C				
Sensible cooling capacity	kW	6.6	4.2	1.9
Indoor temperature: 27°C				
Sensible cooling capacity	kW	8.0	5.6	3.3
Indoor temperature: 30°C				
Sensible cooling capacity	kW	9.4	7.0	4.7

Note: Capacities are quoted for R22 (5 m equivalent distance between SE and SC units). For details of R407C capacities, please contact the Technical Support Department. Quoted capacities are gross capacities: for net capacities, subtract fan motor heat.

Cooling capacities, absorbed power and current, compressor running mode—SE+SC06 model

230 V / 1 Ph / 50 Hz		Outdoor temperature [°C]				
		25 230 / 1 / 50	30 230 / 1 / 50	35 230 / 1 / 50	40 230 / 1 / 50	45 230 / 1 / 50
Indoor conditions: 21°C, 50% r.h.						
Total cooling capacity	kW	5.9	5.6	5.5	5.3	5.0
Sensible cooling capacity	kW	5.2	5.1	5.0	4.9	4.8
Compressor absorbed power	kW	1.5	1.6	1.8	2.0	2.2
Compressor absorbed current	A	6.6	7.2	8.0	8.8	9.7
Indoor conditions: 24°C, 50% r.h.						
Total cooling capacity	kW	6.3	6.1	5.9	5.7	5.5
Sensible cooling capacity	kW	5.3	5.3	5.1	5.1	5.0
Compressor absorbed power	kW	1.5	1.7	1.8	2.0	2.2
Compressor absorbed current	A	6.7	7.3	8.1	8.9	9.9
Indoor conditions: 27°C, 47% r.h.						
Total cooling capacity	kW	6.7	6.5	6.3	6.0	5.8
Sensible cooling capacity	kW	5.7	5.7	5.6	5.5	5.4
Compressor absorbed power	kW	1.5	1.7	1.9	2.1	2.3
Compressor absorbed current	A	6.8	7.4	8.2	9.1	10.1
Indoor conditions: 30°C, 40% r.h.						
Total cooling capacity	kW	6.9	6.7	6.4	6.2	6.1
Sensible cooling capacity	kW	6.5	6.4	6.4	6.2	6.1
Compressor absorbed power	kW	1.5	1.7	1.9	2.1	2.3
Compressor absorbed current	A	6.8	7.5	8.3	9.2	10.2

Max cooling capacities, freecooling mode – SE+SC06 model

230 V / 1 Ph / 50 Hz		Outdoor temperature [°C]		
		10 230 / 1 / 50	15 230 / 1 / 50	20 230 / 1 / 50
Temperatura interna: 21°C				
Sensible cooling capacity	kW	5.1	2.8	0.5
Indoor temperature: 24°C				
Sensible cooling capacity	kW	6.6	4.2	1.9
Indoor temperature: 27°C				
Sensible cooling capacity	kW	8.0	5.6	3.3
Indoor temperature: 30°C				
Sensible cooling capacity	kW	9.4	7.0	4.7

Note: Capacities are quoted for R22 (5 m equivalent distance between SE and SC units). For details of R407C capacities, please contact the Technical Support Department. Quoted capacities are gross capacities: for net capacities, subtract fan motor heat.

Cooling capacities, absorbed power and current, compressor running mode—SE+SC08 model

400 V / 3 Ph / 50 Hz		Outdoor temperature [°C]				
		25 400 / 3 / 50	30 400 / 3 / 50	35 400 / 3 / 50	40 400 / 3 / 50	45 400 / 3 / 50
Indoor conditions: 21°C, 50% r.h.						
Total cooling capacity	kW	7.5	7.5	7.2	7.0	6.8
Sensible cooling capacity	kW	7.5	7.5	7.2	7.0	6.8
Compressor absorbed power	kW	1.4	1.5	1.7	1.9	2.1
Compressor absorbed current	A	2.9	3.0	3.2	3.5	3.9
Indoor conditions: 24°C, 50% r.h.						
Total cooling capacity	kW	8.1	7.9	7.8	7.6	7.2
Sensible cooling capacity	kW	8.1	7.9	7.8	7.6	7.2
Compressor absorbed power	kW	1.4	1.5	1.7	1.9	2.1
Compressor absorbed current	A	3.1	3.1	3.2	3.5	3.9
Indoor conditions: 27°C, 47% r.h.						
Total cooling capacity	kW	8.7	8.5	8.2	8.0	7.8
Sensible cooling capacity	kW	8.7	8.5	8.2	8.0	7.8
Compressor absorbed power	kW	1.4	1.5	1.7	1.9	2.1
Compressor absorbed current	A	3.1	3.1	3.2	3.5	3.9
Indoor conditions: 30°C, 40% r.h.						
Total cooling capacity	kW	9.2	9.0	8.7	8.5	8.2
Sensible cooling capacity	kW	9.2	9.0	8.7	8.5	8.2
Compressor absorbed power	kW	1.4	1.5	1.7	1.9	2.2
Compressor absorbed current	A	3.0	3.1	3.3	3.6	3.6

Max cooling capacities, freecooling mode – SE+SC08 model

400 V / 3 Ph / 50 Hz		Outdoor temperature [°C]		
		10 400 / 3 / 50	15 400 / 3 / 50	20 400 / 3 / 50
Indoor temperature: 21°C				
Sensible cooling capacity	kW	7.8	4.3	0.7
Indoor temperature: 24°C				
Sensible cooling capacity	kW	10.0	6.4	2.8
Indoor temperature: 27°C				
Sensible cooling capacity	kW	12.1	8.5	5.0
Indoor temperature: 30°C				
Sensible cooling capacity	kW	14.2	10.7	7.1

Note: Capacities are quoted for R22 (5 m equivalent distance between SE and SC units). For details of R407C capacities, please contact the Technical Support Department. Quoted capacities are gross capacities: for net capacities, subtract fan motor heat.

Cooling capacities, absorbed power and current, compressor running mode—SE+SC10 model

400 V / 3 Ph / 50 Hz		Outdoor temperature [°C]				
		25 400 / 3 / 50	30 400 / 3 / 50	35 400 / 3 / 50	40 400 / 3 / 50	45 400 / 3 / 50
Indoor conditions: 2x1°C, 50% r.h.						
Total cooling capacity	kW	10.0	9.7	9.3	9.0	8.8
Sensible cooling capacity	kW	9.4	9.3	9.1	9.0	8.8
Compressor absorbed power	kW	2.1	2.3	2.5	2.8	3.0
Compressor absorbed current	A	3.9	4.2	4.6	4.9	5.3
Indoor conditions: 24°C, 50% r.h.						
Total cooling capacity	kW	10.8	10.5	10.1	9.7	9.4
Sensible cooling capacity	kW	9.7	9.6	9.5	9.3	9.2
Compressor absorbed power	kW	2.1	2.3	2.5	2.8	3.1
Compressor absorbed current	A	4.0	4.3	4.6	5.0	5.4
Indoor conditions: 27°C, 47% r.h.						
Total cooling capacity	kW	11.3	11.0	10.7	10.4	9.9
Sensible cooling capacity	kW	10.4	10.3	10.2	10.1	9.9
Compressor absorbed power	kW	2.1	2.3	2.6	2.8	3.1
Compressor absorbed current	A	4.0	4.3	4.6	5.0	5.4
Indoor conditions: 30°C, 40% r.h.						
Total cooling capacity	kW	11.9	11.5	11.2	10.9	10.5
Sensible cooling capacity	kW	11.9	11.5	11.2	10.9	10.5
Compressor absorbed power	kW	2.1	2.4	2.6	2.8	3.1
Compressor absorbed current	A	4.0	4.3	4.7	5.1	5.4

Max cooling capacities, freecooling mode – SE+SC10 model

400 V / 3 Ph / 50 Hz		Outdoor temperature [°C]		
		10 400 / 3 / 50	15 400 / 3 / 50	20 400 / 3 / 50
Indoor temperature: 21°C				
Sensible cooling capacity	kW	7.8	4.3	0.7
Indoor temperature: 24°C				
Sensible cooling capacity	kW	10.0	6.4	2.8
Indoor temperature: 27°C				
Sensible cooling capacity	kW	12.1	8.5	5.0
Indoor temperature: 30°C				
Sensible cooling capacity	kW	14.2	10.7	7.1

Note: Capacities are quoted for R22 (5 m equivalent distance between SE and SC units). For details of R407C capacities, please contact the Technical Support Department. Quoted capacities are gross capacities: for net capacities, subtract fan motor heat.

Cooling capacities, absorbed power and current, compressor running mode—SE+SC14 model

400 V / 3 Ph / 50 Hz		Outdoor temperature [°C]				
		25 400 / 3 / 50	30 400 / 3 / 50	35 400 / 3 / 50	40 400 / 3 / 50	45 400 / 3 / 50
Indoor conditions: 21°C, 50% r.h.						
Total cooling capacity	kW	14.0	13.5	13.0	12.4	11.8
Sensible cooling capacity	kW	13.0	12.8	12.6	12.4	11.8
Compressor absorbed power	kW	3.3	3.7	4.1	4.6	5.1
Compressor absorbed current	A	7	7.4	8	8.5	9.1
Indoor conditions: 24°C, 50% r.h.						
Total cooling capacity	kW	15.1	14.6	13.8	13.3	12.7
Sensible cooling capacity	kW	13.4	13.3	13.0	12.8	12.7
Compressor absorbed power	kW	3.4	3.8	4.2	4.7	5.2
Compressor absorbed current	A	7.0	7.4	7.9	8.4	9.0
Indoor conditions: 27°C, 47% r.h.						
Total cooling capacity	kW	15.8	15.3	14.7	14.1	13.5
Sensible cooling capacity	kW	14.4	14.3	14.1	14.1	13.5
Compressor absorbed power	kW	3.4	3.8	4.3	4.8	5.3
Compressor absorbed current	A	7.1	7.6	8.0	8.5	9.1
Indoor conditions: 30°C, 40% r.h.						
Total cooling capacity	kW	16.3	15.9	15.4	15.0	14.4
Sensible cooling capacity	kW	16.3	15.9	15.4	15.0	14.4
Compressor absorbed power	kW	3.5	3.9	4.3	4.8	5.4
Compressor absorbed current	A	7.2	7.7	8.1	8.7	9.3

Max cooling capacities, freecooling mode – SE+SC14 model

400 V / 3 Ph / 50 Hz		Outdoor temperature [°C]		
		10 400 / 3 / 50	15 400 / 3 / 50	20 400 / 3 / 50
Indoor temperature: 21°C				
Sensible cooling capacity	kW	11.6	6.3	1.1
Indoor temperature: 24°C				
Sensible cooling capacity	kW	14.7	9.5	4.2
Indoor temperature: 27°C				
Sensible cooling capacity	kW	17.9	12.6	7.4
Indoor temperature: 30°C				
Sensible cooling capacity	kW	21.1	15.8	10.5

Note: Capacities are quoted for R22 (5 m equivalent distance between SE and SC units). For details of R407C capacities, please contact the Technical Support Department. Quoted capacities are gross capacities: for net capacities, subtract fan motor heat.

Cooling capacities, absorbed power and current, compressor running mode—SE+SC04 model

230 V / 1 Ph / 60 Hz		Outdoor temperature [°C]				
		25 230 / 1 / 60	30 230 / 1 / 60	35 230 / 1 / 60	40 230 / 1 / 60	45 230 / 1 / 60
Indoor conditions: 21°C, 50% r.h.						
Total cooling capacity	kW	4.3	4.2	4.0	4.0	3.8
Sensible cooling capacity	kW	4.3	4.2	4.0	4.0	3.8
Compressor absorbed power	kW	0.9	1.0	1.1	1.2	1.3
Compressor absorbed current	A	4.5	4.5	4.8	5.2	5.8
Indoor conditions: 24°C, 50% r.h.						
Total cooling capacity	kW	4.6	4.5	4.4	4.2	4.1
Sensible cooling capacity	kW	4.6	4.5	4.4	4.2	4.1
Compressor absorbed power	kW	0.9	1.0	1.1	1.2	1.4
Compressor absorbed current	A	4.1	4.3	4.7	5.2	5.8
Indoor conditions: 27°C, 47% r.h.						
Total cooling capacity	kW	5.0	4.8	4.7	4.5	4.3
Sensible cooling capacity	kW	5.0	4.8	4.7	4.5	4.3
Compressor absorbed power	kW	0.9	1.0	1.1	1.2	1.4
Compressor absorbed current	A	3.8	4.3	4.8	5.3	5.9
Indoor conditions: 30°C, 40% r.h.						
Total cooling capacity	kW	5.3	5.2	5.0	4.8	4.7
Sensible cooling capacity	kW	5.3	5.2	5.0	4.8	4.7
Compressor absorbed power	kW	0.9	1.0	1.1	1.3	1.4
Compressor absorbed current	A	3.8	4.3	4.8	5.4	5.9

Max cooling capacities, freecooling mode—SE+SC04 model

230 V / 1 Ph / 60 Hz		Outdoor temperature [°C]		
		10 230 / 1 / 60	15 230 / 1 / 60	20 230 / 1 / 60
Indoor temperature: 21°C				
Sensible cooling capacity	kW	4.3	2.3	0.4
Indoor temperature: 24°C				
Sensible cooling capacity	kW	5.4	3.5	1.6
Indoor temperature: 27°C				
Sensible cooling capacity	kW	6.6	4.7	2.7
Indoor temperature: 30°C				
Sensible cooling capacity	kW	7.8	5.8	3.9

Note: Capacities are quoted for R22 (5 m equivalent distance between SE and SC units). For details of R407C capacities, please contact the Technical Support Department. Quoted capacities are gross capacities: for net capacities, subtract fan motor heat.

Cooling capacities, absorbed power and current, compressor running mode—SE+SC05 model

230 V / 1 Ph / 60 Hz		Outdoor temperature [°C]				
		25 230 / 1 / 60	30 230 / 1 / 60	35 230 / 1 / 60	40 230 / 1 / 60	45 230 / 1 / 60
Indoor conditions: 21°C, 50% r.h.						
Total cooling capacity	kW	5.0	4.9	4.7	4.5	4.3
Sensible cooling capacity	kW	4.7	4.6	4.5	4.5	4.3
Compressor absorbed power	kW	1.1	1.2	1.4	1.5	1.7
Compressor absorbed current	A	5.2	5.4	5.8	6.3	7.0
Indoor conditions: 24°C, 50% r.h.						
Total cooling capacity	kW	5.5	5.2	5.1	4.9	4.7
Sensible cooling capacity	kW	4.9	4.7	4.7	4.6	4.6
Compressor absorbed power	kW	1.1	1.2	1.4	1.5	1.7
Compressor absorbed current	A	5.1	5.4	5.8	6.4	7.1
Indoor conditions: 27°C, 47% r.h.						
Total cooling capacity	kW	5.7	5.6	5.4	5.2	5.0
Sensible cooling capacity	kW	5.2	5.2	5.1	5.0	5.0
Compressor absorbed power	kW	1.1	1.3	1.4	1.5	1.7
Compressor absorbed current	A	5.1	5.4	5.9	6.5	7.2
Indoor conditions: 30°C, 40% r.h.						
Total cooling capacity	kW	5.9	5.8	5.6	5.5	5.3
Sensible cooling capacity	kW	5.9	5.8	5.6	5.5	5.3
Compressor absorbed power	kW	1.1	1.3	1.4	1.6	1.7
Compressor absorbed current	A	5.2	5.5	6.0	6.6	7.4

Max cooling capacities, freecooling mode – SE+SC05 model

230 V / 1 Ph / 60 Hz		Outdoor temperature [°C]		
		10 230 / 1 / 60	15 230 / 1 / 60	20 230 / 1 / 60
Indoor temperature: 21°C Temperatura interna: 21°C				
Sensible cooling capacity	kW	4.3	2.3	0.4
Indoor temperature: 24°C				
Sensible cooling capacity	kW	5.4	3.5	1.6
Indoor temperature: 27°C				
Sensible cooling capacity	kW	6.6	4.7	2.7
Indoor temperature: 30°C				
Sensible cooling capacity	kW	7.8	5.8	3.9

Note: Capacities are quoted for R22 (5 m equivalent distance between SE and SC units). For details of R407C capacities, please contact the Technical Support Department. Quoted capacities are gross capacities: for net capacities, subtract fan motor heat.

Cooling capacities, absorbed power and current, compressor running mode—SE+SC06 model

230 V / 1 Ph / 60 Hz		Outdoor temperature [°C]				
		25 230 / 1 / 60	30 230 / 1 / 60	35 230 / 1 / 60	40 230 / 1 / 60	45 230 / 1 / 60
Indoor conditions: 21°C, 50% r.h.						
Total cooling capacity	kW	5.6	5.5	5.3	5.1	4.9
Sensible cooling capacity	kW	4.9	4.9	4.8	4.7	4.6
Compressor absorbed power	kW	1.4	1.5	1.7	1.9	2.1
Compressor absorbed current	A	5.7	6.5	7.3	8.2	9.0
Indoor conditions: 24°C, 50% r.h.						
Total cooling capacity	kW	6.1	5.9	5.7	5.5	5.3
Sensible cooling capacity	kW	5.1	5.0	5.0	4.9	4.9
Compressor absorbed power	kW	1.4	1.6	1.7	1.9	2.1
Compressor absorbed current	A	5.7	6.6	7.5	8.3	9.1
Indoor conditions: 27°C, 47% r.h.						
Total cooling capacity	kW	6.4	6.3	6.1	5.9	5.7
Sensible cooling capacity	kW	5.5	5.4	5.3	5.3	5.2
Compressor absorbed power	kW	1.4	1.6	1.7	1.9	2.1
Compressor absorbed current	A	5.8	6.7	7.6	8.4	9.2
Indoor conditions: 30°C, 40% r.h.						
Total cooling capacity	kW	6.7	6.5	6.3	6.0	5.9
Sensible cooling capacity	kW	6.3	6.2	6.1	6.0	5.9
Compressor absorbed power	kW	1.4	1.6	1.8	1.9	2.1
Compressor absorbed current	A	5.9	6.8	7.6	8.5	9.3

Max cooling capacities, freecooling mode – SE+SC06 model

230 V / 1 Ph / 60 Hz		Outdoor temperature [°C]		
		10 230 / 1 / 60	15 230 / 1 / 60	20 230 / 1 / 60
Temperatura interna: 21°C				
Sensible cooling capacity	kW	4.3	2.3	0.4
Temperatura interna: 24°C				
Sensible cooling capacity	kW	5.4	3.5	1.6
Temperatura interna: 27°C				
Sensible cooling capacity	kW	6.6	4.7	2.7
Temperatura interna: 30°C				
Sensible cooling capacity	kW	7.8	5.8	3.9

Note: Capacities are quoted for R22 (5 m equivalent distance between SE and SC units). For details of R407C capacities, please contact the Technical Support Department. Quoted capacities are gross capacities: for net capacities, subtract fan motor heat.

Cooling capacities, absorbed power and current, compressor running mode—SE+SC08 model

230 V / 3 Ph / 60 Hz		Outdoor temperature [°C]				
		25 230 / 3 / 60	30 230 / 3 / 60	35 230 / 3 / 60	40 230 / 3 / 60	45 230 / 3 / 60
Indoor conditions: 21°C, 50% r.h.						
Total cooling capacity	kW	7.0	6.9	6.7	6.5	6.3
Sensible cooling capacity	kW	7.0	6.9	6.7	6.5	6.3
Compressor absorbed power	kW	1.3	1.4	1.5	1.7	1.9
Compressor absorbed current	A	4.2	4.5	5.0	5.5	6.0
Indoor conditions: 24°C, 50% r.h.						
Total cooling capacity	kW	7.5	7.3	7.2	6.9	6.8
Sensible cooling capacity	kW	7.5	7.3	7.2	6.9	6.8
Compressor absorbed power	kW	1.3	1.3	1.5	1.7	1.9
Compressor absorbed current	A	4.6	4.8	5.2	5.5	5.9
Indoor conditions: 27°C, 47% r.h.						
Total cooling capacity	kW	7.9	7.9	7.7	7.4	7.2
Sensible cooling capacity	kW	7.9	7.9	7.7	7.4	7.2
Compressor absorbed power	kW	1.2	1.3	1.5	1.7	1.9
Compressor absorbed current	A	4.9	5.0	5.2	5.5	6.0
Indoor conditions: 30°C, 40% r.h.						
Total cooling capacity	kW	8.5	8.4	8.2	7.9	7.7
Sensible cooling capacity	kW	8.5	8.4	8.2	7.9	7.7
Compressor absorbed power	kW	1.2	1.3	1.5	1.7	1.9
Compressor absorbed current	A	4.7	4.8	5.1	5.5	6.1

Max cooling capacities, freecooling mode – SE+SC08 model

230 V / 3 Ph / 60 Hz		Outdoor temperature [°C]		
		10 230 / 3 / 60	15 230 / 3 / 60	20 230 / 3 / 60
Temperatura interna: 21°C				
Sensible cooling capacity	kW	8.2	4.5	0.7
Temperatura interna: 24°C				
Sensible cooling capacity	kW	10.4	6.7	3.0
Temperatura interna: 27°C				
Sensible cooling capacity	kW	12.6	8.9	5.2
Temperatura interna: 30°C				
Sensible cooling capacity	kW	14.9	11.1	7.4

Note: Capacities are quoted for R22 (5 m equivalent distance between SE and SC units). For details of R407C capacities, please contact the Technical Support Department. Quoted capacities are gross capacities: for net capacities, subtract fan motor heat.

Cooling capacities, absorbed power and current, compressor running mode—SE+SC10 model

230 V / 3 Ph / 60 Hz		Outdoor temperature [°C]				
		25 230 / 3 / 60	30 230 / 3 / 60	35 230 / 3 / 60	40 230 / 3 / 60	45 230 / 3 / 60
Indoor conditions: 2x1°C, 50% r.h.						
Total cooling capacity	kW	9.4	9.3	9.0	8.9	8.6
Sensible cooling capacity	kW	9.1	9.0	9.0	8.9	8.6
Compressor absorbed power	kW	1.9	2.1	2.4	2.7	3.0
Compressor absorbed current	A	6.9	7.5	8.0	8.6	9.2
Indoor conditions: 24°C, 50% r.h.						
Total cooling capacity	kW	10.5	10.2	9.9	9.6	9.2
Sensible cooling capacity	kW	9.5	9.5	9.4	9.3	9.2
Compressor absorbed power	kW	1.9	2.2	2.5	2.8	3.1
Compressor absorbed current	A	7.3	7.7	8.1	8.6	9.3
Indoor conditions: 27°C, 47% r.h.						
Total cooling capacity	kW	11.3	10.9	10.4	10.1	9.7
Sensible cooling capacity	kW	10.5	10.3	10.1	10.1	9.7
Compressor absorbed power	kW	2.0	2.2	2.5	2.8	3.1
Compressor absorbed current	A	7.3	7.6	8.1	8.7	9.4
Indoor conditions: 30°C, 40% r.h.						
Total cooling capacity	kW	11.7	11.3	11.0	10.8	10.4
Sensible cooling capacity	kW	11.7	11.3	11.0	10.8	10.4
Compressor absorbed power	kW	2.0	2.3	2.5	2.8	3.1
Compressor absorbed current	A	7.2	7.6	8.1	8.7	9.5

Max cooling capacities, freecooling mode – SE+SC10 model

230 V / 3 Ph / 60 Hz		Outdoor temperature [°C]		
		10 230 / 3 / 60	15 230 / 3 / 60	20 230 / 3 / 60
Temperatura interna: 21°C				
Sensible cooling capacity	kW	8.2	4.5	0.7
Temperatura interna: 24°C				
Sensible cooling capacity	kW	10.4	6.7	3.0
Temperatura interna: 27°C				
Sensible cooling capacity	kW	12.6	8.9	5.2
Temperatura interna: 30°C				
Sensible cooling capacity	kW	14.9	11.1	7.4

Note: Capacities are quoted for R22 (5 m equivalent distance between SE and SC units). For details of R407C capacities, please contact the Technical Support Department. Quoted capacities are gross capacities: for net capacities, subtract fan motor heat.

Cooling capacities, absorbed power and current, compressor running mode—SE+SC14 model

230 V / 3 Ph / 60 Hz		Outdoor temperature [°C]				
		25 230 / 3 / 60	30 230 / 3 / 60	35 230 / 3 / 60	40 230 / 3 / 60	45 230 / 3 / 60
Indoor conditions: 21°C, 50% r.h.						
Total cooling capacity	kW	13.5	13.1	12.7	12.2	11.6
Sensible cooling capacity	kW	12.7	12.5	12.3	12.2	11.6
Compressor absorbed power	kW	3.1	3.5	3.9	4.4	5.0
Compressor absorbed current	A	10.0	10.8	11.7	12.8	14.0
Indoor conditions: 24°C, 50% r.h.						
Total cooling capacity	kW	14.5	14.0	13.7	13.0	12.6
Sensible cooling capacity	kW	13.1	12.9	12.8	12.5	12.6
Compressor absorbed power	kW	3.2	3.5	3.9	4.4	5.0
Compressor absorbed current	A	10.0	10.9	11.8	12.9	14.0
Indoor conditions: 27°C, 47% r.h.						
Total cooling capacity	kW	15.4	15.0	14.4	13.8	13.3
Sensible cooling capacity	kW	14.2	13.9	13.8	13.8	13.3
Compressor absorbed power	kW	3.3	3.6	4.0	4.5	5.1
Compressor absorbed current	A	10.1	11.1	12.1	13.1	14.2
Indoor conditions: 30°C, 40% r.h.						
Total cooling capacity	kW	15.9	15.6	15.1	14.6	14.1
Sensible cooling capacity	kW	15.9	15.6	15.1	14.6	14.1
Compressor absorbed power	kW	3.3	3.7	4.1	4.6	5.1
Compressor absorbed current	A	10.2	11.2	12.2	13.3	14.4

Max cooling capacities, freecooling mode – SE+SC14 model

230 V / 3 Ph / 60 Hz		Outdoor temperature [°C]		
		10 230 / 3 / 60	15 230 / 3 / 60	20 230 / 3 / 60
Temperatura interna: 21°C				
Sensible cooling capacity	kW	11.4	6.2	1.0
Temperatura interna: 24°C				
Sensible cooling capacity	kW	14.5	9.3	4.2
Temperatura interna: 27°C				
Sensible cooling capacity	kW	17.6	12.5	7.3
Temperatura interna: 30°C				
Sensible cooling capacity	kW	20.8	15.6	10.4

Note: Capacities are quoted for R22 (5 m equivalent distance between SE and SC units). For details of R407C capacities, please contact the Technical Support Department. Quoted capacities are gross capacities: for net capacities, subtract fan motor heat.

Cooling capacities, absorbed power and current, compressor running mode—SE+SC08 model

460 V / 3 Ph / 60 Hz		Outdoor temperature [°C]				
		25 460 / 3 / 60	30 460 / 3 / 60	35 460 / 3 / 60	40 460 / 3 / 60	45 460 / 3 / 60
Indoor conditions: 21°C, 50% r.h.						
Total cooling capacity	kW	6.9	6.8	6.7	6.5	6.2
Sensible cooling capacity	kW	6.9	6.8	6.7	6.5	6.2
Compressor absorbed power	kW	1.3	1.4	1.6	1.8	2.0
Compressor absorbed current	A	2.4	2.5	2.7	2.9	3.1
Indoor conditions: 24°C, 50% r.h.						
Total cooling capacity	kW	7.4	7.3	7.1	6.9	6.7
Sensible cooling capacity	kW	7.4	7.3	7.1	6.9	6.7
Compressor absorbed power	kW	1.4	1.4	1.6	1.8	2.0
Compressor absorbed current	A	2.5	2.6	2.7	2.9	3.1
Indoor conditions: 27°C, 47% r.h.						
Total cooling capacity	kW	8.0	7.9	7.7	7.4	7.2
Sensible cooling capacity	kW	8.0	7.9	7.7	7.4	7.2
Compressor absorbed power	kW	1.4	1.5	1.6	1.8	2.0
Compressor absorbed current	A	2.7	2.7	2.8	2.9	3.1
Indoor conditions: 30°C, 40% r.h.						
Total cooling capacity	kW	8.5	8.4	8.2	7.9	7.7
Sensible cooling capacity	kW	8.5	8.4	8.2	7.9	7.7
Compressor absorbed power	kW	1.3	1.4	1.6	1.8	2.1
Compressor absorbed current	A	2.8	2.8	2.8	2.9	3.1

Max cooling capacities, freecooling mode – SE+SC08 model

460 V / 3 Ph / 60 Hz		Outdoor temperature [°C]		
		10 460 / 3 / 60	15 460 / 3 / 60	20 460 / 3 / 60
Temperatura interna: 21°C				
Sensible cooling capacity	kW	8.2	4.5	0.7
Temperatura interna: 24°C				
Sensible cooling capacity	kW	10.4	6.7	3.0
Temperatura interna: 27°C				
Sensible cooling capacity	kW	12.6	8.9	5.2
Temperatura interna: 30°C				
Sensible cooling capacity	kW	14.9	11.1	7.4

Note: Capacities are quoted for R22 (5 m equivalent distance between SE and SC units). For details of R407C capacities, please contact the Technical Support Department. Quoted capacities are gross capacities: for net capacities, subtract fan motor heat.

Cooling capacities, absorbed power and current, compressor running mode—SE+SC10 model

460 V / 3 Ph / 60 Hz		Outdoor temperature [°C]				
		25 460 / 3 / 60	30 460 / 3 / 60	35 460 / 3 / 60	40 460 / 3 / 60	45 460 / 3 / 60
Indoor conditions: 2x1°C, 50% r.h.						
Total cooling capacity	kW	9.4	9.3	9.0	8.9	8.6
Sensible cooling capacity	kW	9.1	9.0	9.0	8.9	8.6
Compressor absorbed power	kW	1.9	2.1	2.4	2.7	3.0
Compressor absorbed current	A	3.6	3.8	4.0	4.3	4.6
Indoor conditions: 24°C, 50% r.h.						
Total cooling capacity	kW	10.5	10.2	9.9	9.6	9.2
Sensible cooling capacity	kW	9.5	9.5	9.4	9.3	9.2
Compressor absorbed power	kW	1.9	2.2	2.5	2.8	3.1
Compressor absorbed current	A	3.4	3.7	4.0	4.3	4.7
Indoor conditions: 27°C, 47% r.h.						
Total cooling capacity	kW	11.3	10.9	10.4	10.1	9.7
Sensible cooling capacity	kW	10.5	10.3	10.1	10.1	9.7
Compressor absorbed power	kW	2.0	2.2	2.5	2.8	3.1
Compressor absorbed current	A	3.3	3.6	4.0	4.4	4.8
Indoor conditions: 30°C, 40% r.h.						
Total cooling capacity	kW	11.7	11.3	11.0	10.8	10.4
Sensible cooling capacity	kW	11.7	11.3	11.0	10.8	10.4
Compressor absorbed power	kW	2.0	2.3	2.5	2.8	3.1
Compressor absorbed current	A	3.2	3.6	4.0	4.4	4.8

Max cooling capacities, freecooling mode – SE+SC10 model

460 V / 3 Ph / 60 Hz		Outdoor temperature [°C]		
		10 460 / 3 / 60	15 460 / 3 / 60	20 460 / 3 / 60
Temperatura interna: 21°C				
Sensible cooling capacity	kW	8.2	4.5	0.7
Temperatura interna: 24°C				
Sensible cooling capacity	kW	10.4	6.7	3.0
Temperatura interna: 27°C				
Sensible cooling capacity	kW	12.6	8.9	5.2
Temperatura interna: 30°C				
Sensible cooling capacity	kW	14.9	11.1	7.4

Note: Capacities are quoted for R22 (5 m equivalent distance between SE and SC units). For details of R407C capacities, please contact the Technical Support Department. Quoted capacities are gross capacities: for net capacities, subtract fan motor heat.

Cooling capacities, absorbed power and current, compressor running mode—SE+SC14 model

460 V / 3 Ph / 60 Hz		Outdoor temperature [°C]				
		25 460 / 3 / 60	30 460 / 3 / 60	35 460 / 3 / 60	40 460 / 3 / 60	45 460 / 3 / 60
Indoor conditions: 21°C, 50% r.h.						
Total cooling capacity	kW	13.5	13.1	12.7	12.2	11.6
Sensible cooling capacity	kW	12.7	12.5	12.3	12.2	11.6
Compressor absorbed power	kW	3.1	3.5	3.9	4.4	5.0
Compressor absorbed current	A	5.9	5.9	6.2	6.5	7.0
Indoor conditions: 24°C, 50% r.h.						
Total cooling capacity	kW	14.5	14.0	13.7	13.0	12.6
Sensible cooling capacity	kW	13.1	12.9	12.8	12.5	12.6
Compressor absorbed power	kW	3.2	3.5	3.9	4.4	5.0
Compressor absorbed current	A	5.7	5.9	6.2	6.6	7.0
Indoor conditions: 27°C, 47% r.h.						
Total cooling capacity	kW	15.4	15.0	14.4	13.8	13.3
Sensible cooling capacity	kW	14.2	13.9	13.8	13.8	13.3
Compressor absorbed power	kW	3.3	3.6	4.0	4.5	5.1
Compressor absorbed current	A	5.7	5.9	6.3	6.6	7.0
Indoor conditions: 30°C, 40% r.h.						
Total cooling capacity	kW	15.9	15.6	15.1	14.6	14.1
Sensible cooling capacity	kW	15.9	15.6	15.1	14.6	14.1
Compressor absorbed power	kW	3.3	3.7	4.1	4.6	5.1
Compressor absorbed current	A	5.7	6.0	6.3	6.7	7.0

Max cooling capacities, freecooling mode – SE+SC14 model

460 V / 3 Ph / 60 Hz		Outdoor temperature [°C]		
		10 460 / 3 / 60	15 460 / 3 / 60	20 460 / 3 / 60
Temperatura interna: 21°C				
Sensible cooling capacity	kW	11.4	6.2	1.0
Temperatura interna: 24°C				
Sensible cooling capacity	kW	14.5	9.3	4.2
Temperatura interna: 27°C				
Sensible cooling capacity	kW	17.6	12.5	7.3
Temperatura interna: 30°C				
Sensible cooling capacity	kW	20.8	15.6	10.4

Note: Capacities are quoted for R22 (5 m equivalent distance between SE and SC units). For details of R407C capacities, please contact the Technical Support Department. Quoted capacities are gross capacities: for net capacities, subtract fan motor heat.

2.2 – Electric data

2.2.1 – Standard features

50 Hz – Electrical characteristics – SE evaporating unit

MODEL	Power supply	EVAPORATOR FAN			absorbed power [kW]
		OA [A]	FLA [A]	LRA [A]	
Hisp SE04	230/1/50	1.1	1.2	1.75	0.2
Hisp SE05					
Hisp SE06					
Hisp SE08	400/3/50	3.20	5	–	0.7
Hisp SE10				–	
Hisp SE14				2.5 x 2	

60 Hz – Electrical characteristics – SE evaporating unit

MODEL	Power supply	EVAPORATOR FAN			absorbed power [kW]
		OA [A]	FLA [A]	LRA [A]	
Hisp SE04	230/1/60	1.4	1.6	2.1	0.32
Hisp SE05					
Hisp SE06					
Hisp SE08	230/3/60	3.8	4.5	6.1	0.82
Hisp SE10					
Hisp SE14					
Hisp SE08	460/3/60	3.8	4.5	6.1	0.82
Hisp SE10					
Hisp SE14					

50 Hz – Electrical characteristics – SC motor condensing unit (external)

MODEL	Power supply	CONDENSER FAN				COMPRESSOR			
		OA [A]	FLA [A]	LRA [A]	absorbed power [kW]	OA [A]	FLA [A]	LRA [A]	absorbed power [kW]
Hisp SC04	230/1/50	1.3	1.4	3.0	0.3	5.9	10	34	1.4
Hisp SC05						7.1	12	37	1.7
Hisp SC06						8.8	15	48	2.0
Hisp SC08	400/3/50	3.4	3.5	7.4	0.8	3.9	4.8	31	2.1
Hisp SC10						5.3	6.6	43	3.0
Hisp SC14						8.5	12.4	65	4.7

60 Hz – Electrical characteristics – SC motor condensing unit (external)

MODEL	Power supply	CONDENSER FAN				COMPRESSOR			
		OA [A]	FLA [A]	LRA [A]	absorbed power [kW]	OA [A]	FLA [A]	LRA [A]	absorbed power [kW]
Hisp SC04	230/1/60	2.4	2.9	7.4	0.54	4.8	7.7	33.2	1.1
Hisp SC05						5.9	9.2	38.0	1.4
Hisp SC06						7.6	11.2	49.5	1.7
Hisp SC08	230/3/60	3.1	3.8	8.0	0.71	5.2	7.3	45.0	1.5
Hisp SC10						8.1	10.9	77.0	2.5
Hisp SC14						12.1	15.5	91.0	4.0
Hisp SC08	460/3/60	3.1	3.8	8.0	0.71	2.8	3.8	22.4	1.6
Hisp SC10						4.0	5.5	39.0	2.5
Hisp SC14						6.3	7.4	50.0	4.0

2.2.2 – Optional features

Electrical characteristics – SE evaporating unit (optional)

MODEL	EVAPORATOR FAN 48 Vdc (*)		EVAPORATOR FAN 24 Vdc (**)		ELECTRIC HEATING (optional)	
	FLA [A]	absorbed power [W]	FLA [A]	absorbed power [W]	FLA [A]	absorbed power [kW]
Hisp SE04	3.0x2	140x2	5.8x2	140x2	13.1	3
Hisp SE05						
Hisp SE06						
Hisp SE08	8.4x2	400x2	9.6x2	230x2	8.7 (400/3/50)	6
Hisp SE10			NA	NA	15.1 (230/3/60)	
Hisp SE14					7.5 (460/3/60)	

OA: Operating Amps, absorbed current in standard operation;

FLA: Full Load Amps;

LRA: Locked Rotor Amps

NA: Not available at the current time. This feature will be available in the near future: please contact the Technical Support Department

(*) With emergency cooling 48 Vdc option

(**) With emergency cooling 24 Vdc option

2.2.3 – Differential current protection switch and cable size, AC supply

UNIT VERSION (50 Hz)		Protection switch with differential current $I_{\Delta n} = 0.3 \text{ A}$		Cable sizing
		230V / 1 / 50Hz	400V / 3 / 50Hz	
Cooling	HISP 04–05–06	20 A	–	2 x 10 mm ² + T x 10 mm ²
	HISP 08–10–14	–	20 A	4 x 10 mm ² + T x 10 mm ²
Cooling + Heating	HISP 04–05–06	20 A	–	2 x 10 mm ² + T x 10 mm ²
	HISP 08–10–14	–	20 A	4 x 10 mm ² + T x 10 mm ²
Cooling + Heating + Freecooling	HISP 04–05–06	20 A	–	2 x 10 mm ² + T x 10 mm ²
	HISP 08–10–14	–	20 A	4 x 10 mm ² + T x 10 mm ²

UNIT VERSION (60 Hz)		Protection switch with differential current $I_{\Delta n} = 0.3 \text{ A}$			Cable sizing
		230V / 1 / 60Hz	230V / 3 / 60Hz	460V / 3 / 60Hz	
Cooling	HISP 04–05–06	20 A	–	–	2 x 10 mm ² + T x 10 mm ²
	HISP 08–10–14	–	32 A	–	4 x 16 mm ² + T x 16 mm ²
	HISP 08–10–14	–	–	25 A	4 x 10 mm ² + T x 10 mm ²
Cooling + Heating	HISP 04–05–06	20 A	–	–	2 x 10 mm ² + T x 10 mm ²
	HISP 08–10–14	–	32 A	–	4 x 16 mm ² + T x 16 mm ²
	HISP 08–10–14	–	–	25 A	4 x 10 mm ² + T x 10 mm ²
Cooling + Heating + Freecooling	HISP 04–05–06	20 A	–	–	2 x 10 mm ² + T x 10 mm ²
	HISP 08–10–14	–	32 A	–	4 x 16 mm ² + T x 16 mm ²
	HISP 08–10–14	–	–	25 A	4 x 10 mm ² + T x 10 mm ²

2.2.4 – Main disconnect switch and cable size, DC supply

UNIT VERSION		Switch		Cable sizing
		48 Vdc (*)	24 Vdc (**)	
Emergency cooling (24 or 48 Vdc)	HISP 04–05–06	10 A	16 A	2 x 2.5 mm ²
	HISP 08–10–14	20 A	32 A	2 x 4 mm ²

(*) With emergency cooling 48 Vdc option

(**) With emergency cooling 24 Vdc option

2.3 – Application ranges

The Hisp (50 Hz) units are provided for operation within the following ranges. The limits are intended for new or correctly installed and maintained units.

		MODEL					
		SE+SC 04	SE+SC 05	SE+SC 06	SE+SC 08	SE+SC 10	SE+SC 14
Power supply voltage		230 V ac ± 10%/1/50 Hz			400 V ca ± 10%/3/50 Hz		
		24±17% Vdc with emergency cooling (*) 48±17% Vdc with emergency cooling (*)					
Outdoor conditions (**)	from:	-25°C					
	to:	52°C	52°C	48°C	49°C	48°C	46°C
Indoor conditions with running compressor	from:	20°C, 30% R.H. and 20°C, 80% R.H.					
	to:	30°C, 40% H.R.					
Storing conditions	from:	-40°C, 5% H.R.					
	to:	55°C, 90% H.R.					

Note: Values are referred to R22. For details of R407C limits, please contact the Technical Support Department.

(*) Emergency Cooling option is requested.

(**) Maximum outdoor temperature referred to indoor air temperature = 24°C (5 m equivalent distance between SE and SC units).

The Hisp (60 Hz) units are provided for operation within the following ranges. The limits are intended for new or correctly installed and maintained units.

		MODEL								
		HISP 04	HISP 05	HISP 06	HISP 08	HISP 10	HISP 14	HISP 08	HISP 10	HISP 14
Power supply voltage		230 V ac ± 10%/1/60 Hz			230 V ca ± 10%/3/60 Hz			460 V ca ± 10%/3/60 Hz		
		24±17% Vdc with emergency cooling (*) 48±17% Vdc with emergency cooling (*)								
Outdoor conditions (**)	from:	-25°C								
	to:	52°C	50°C	48°C	52°C	49°C	46°C	52°C	49°C	46°C
Indoor conditions with running compressor	from:	20°C, 30% R.H. and 20°C, 80% R.H.								
	to:	30°C, 40% H.R.								
Storing conditions	from:	-40°C, 5% H.R.								
	to:	55°C, 90% H.R.								

Note: Values are referred to R22. For details of R407C limits, please contact the Technical Support Department.

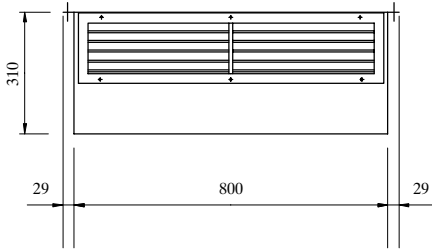
(*) Emergency Cooling option is requested.

(**) Maximum outdoor temperature referred to indoor air temperature = 24°C (5 m equivalent distance between SE and SC units).

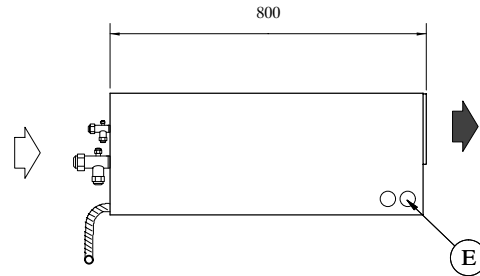
Overall dimensions

Evaporator version without freecooling – SE 04–05–06

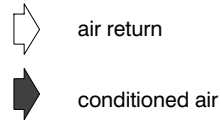
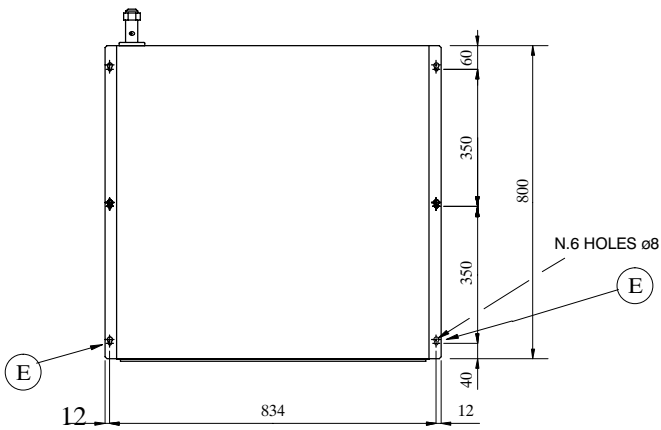
FRONT VIEW



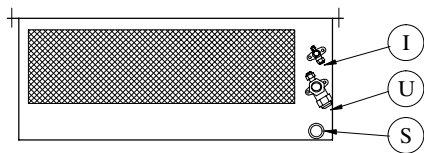
SIDE VIEW



TOP VIEW



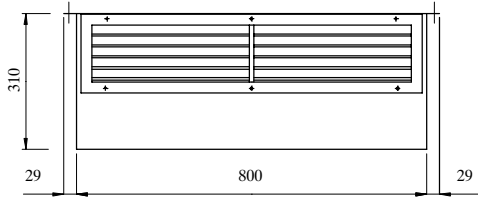
REAR VIEW



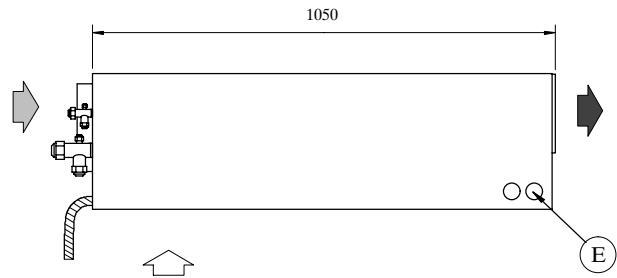
POS.	Description
E	Electrical connections
S	Condensate drain
U	Refrigerant outlet
I	Refrigerant inlet

Evaporator version with freecooling – SE 04–05–06

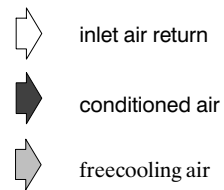
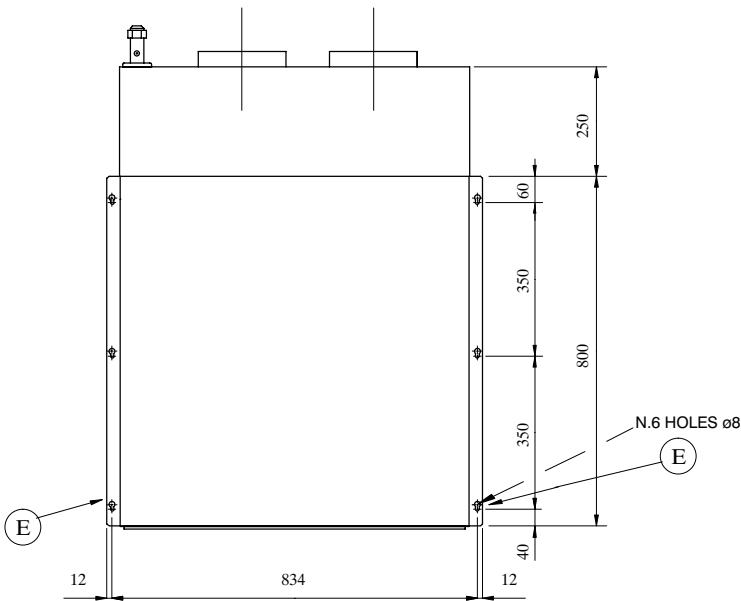
FRONT VIEW



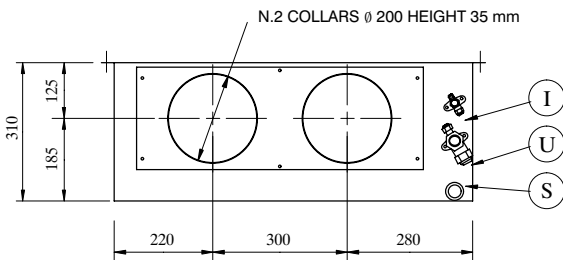
SIDE VIEW



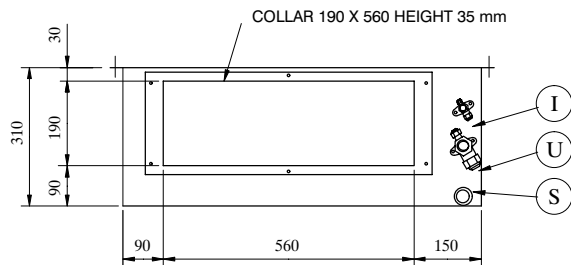
TOP VIEW



REAR VIEW
Circular ducts version



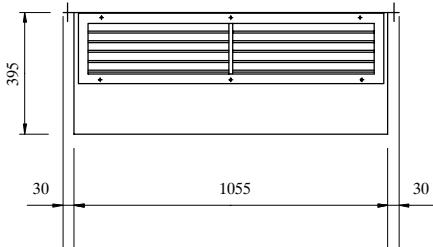
REAR VIEW
Rectangular duct version



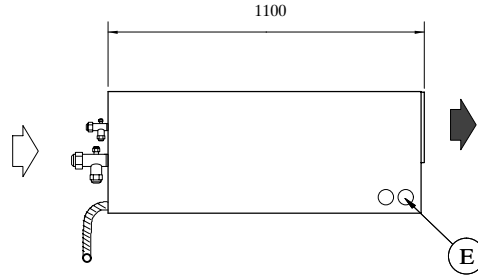
POS.	Description
E	Electrical connections
S	Condensate drain
U	Refrigerant outlet
I	Refrigerant inlet

Evaporator version without freecooling – SE 08–10–14

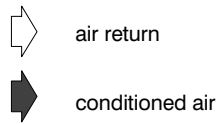
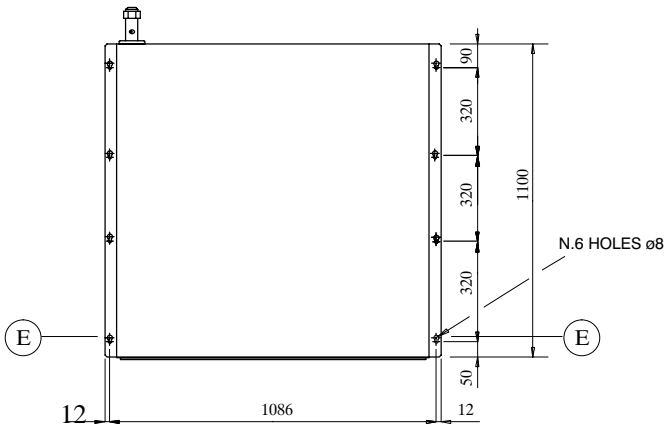
FRONT VIEW



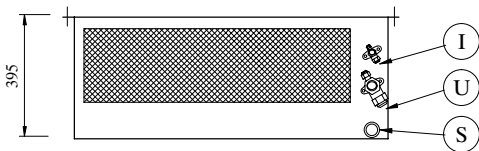
SIDE VIEW



TOP VIEW



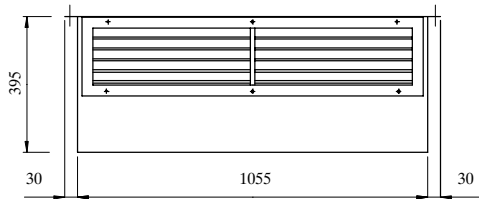
REAR VIEW



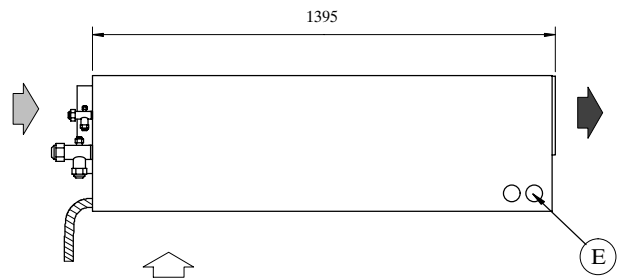
POS.	Description
E	Electrical connections
S	Condensate drain
U	Refrigerant outlet
I	Refrigerant inlet

Evaporator version with freecooling – SE 08–10–14

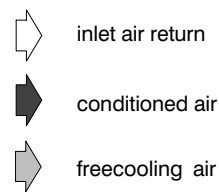
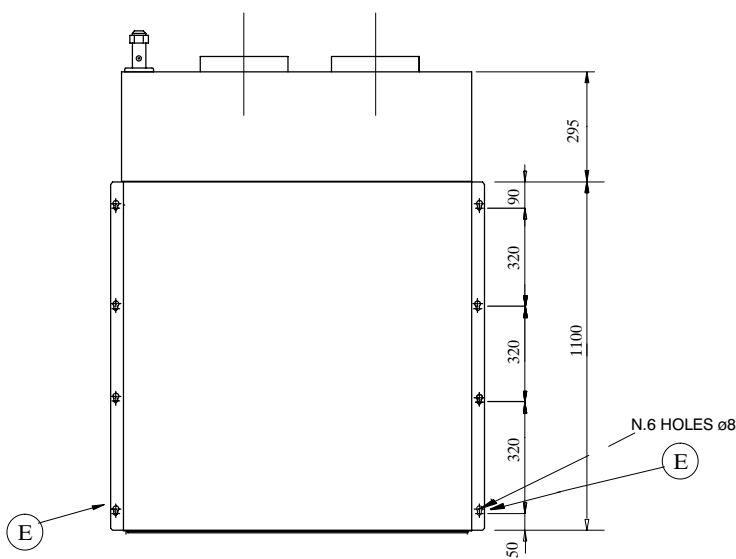
FRONT VIEW



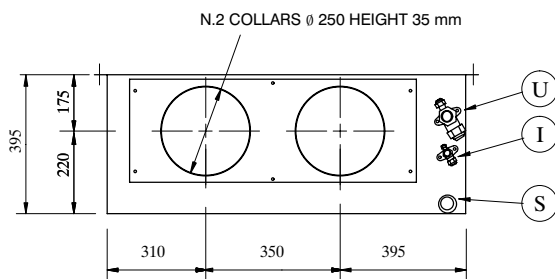
SIDE VIEW



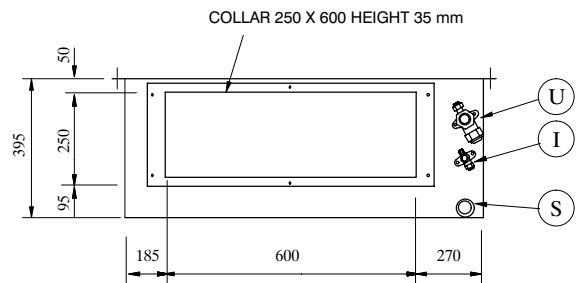
TOP VIEW



REAR VIEW
Circular ducts version



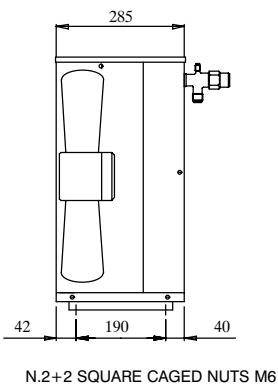
REAR VIEW
Rectangular duct version



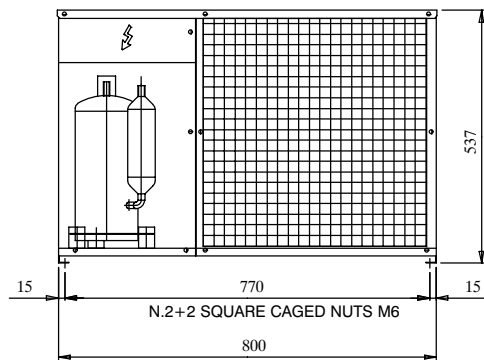
POS.	Description
E	Electrical connections
S	Condensate drain
U	Refrigerant outlet
I	Refrigerant inlet

Condensing unit – SC 04–05–06

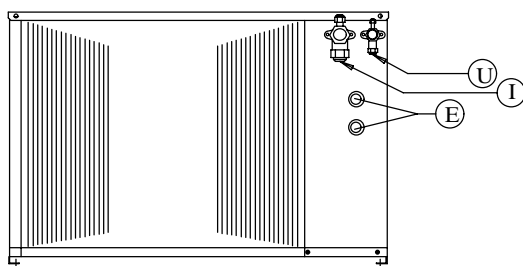
SIDE VIEW



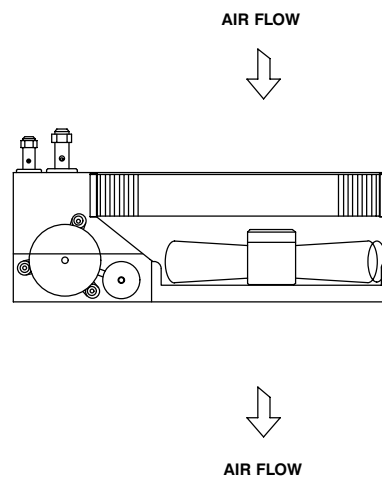
FRONT VIEW



REAR VIEW



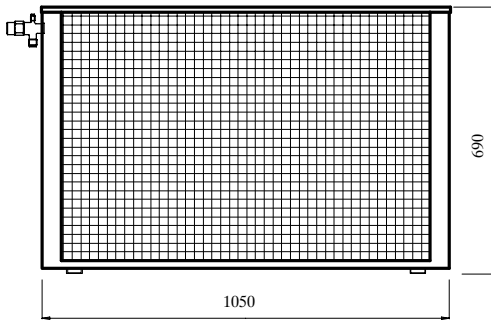
TOP VIEW



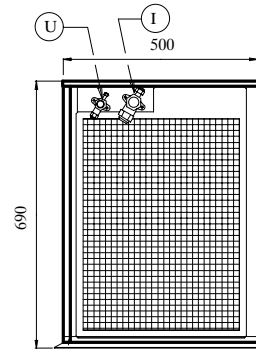
POS.	Description
E	Electrical connections
U	Refrigerant outlet
I	Refrigerant inlet

Condensing unit – SC 08–10–14

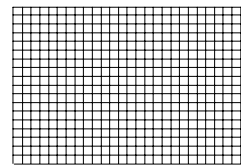
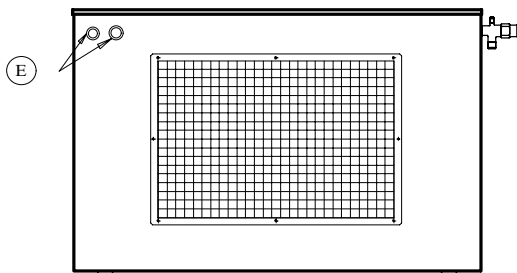
FRONT VIEW



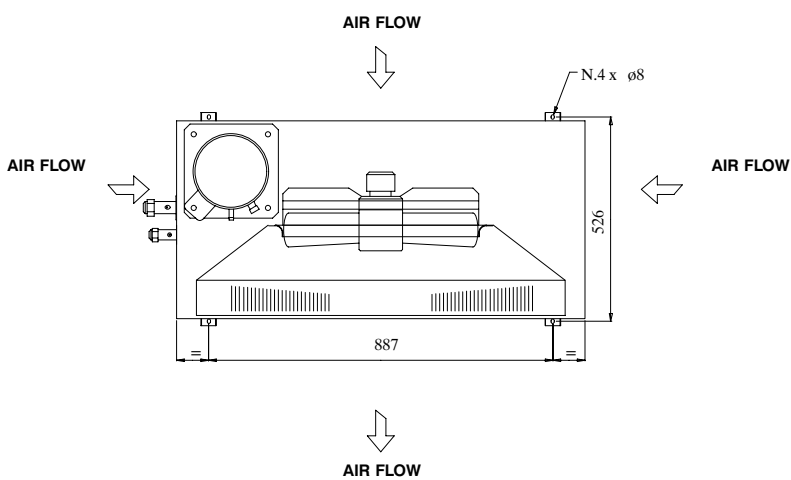
SIDE VIEW



REAR VIEW



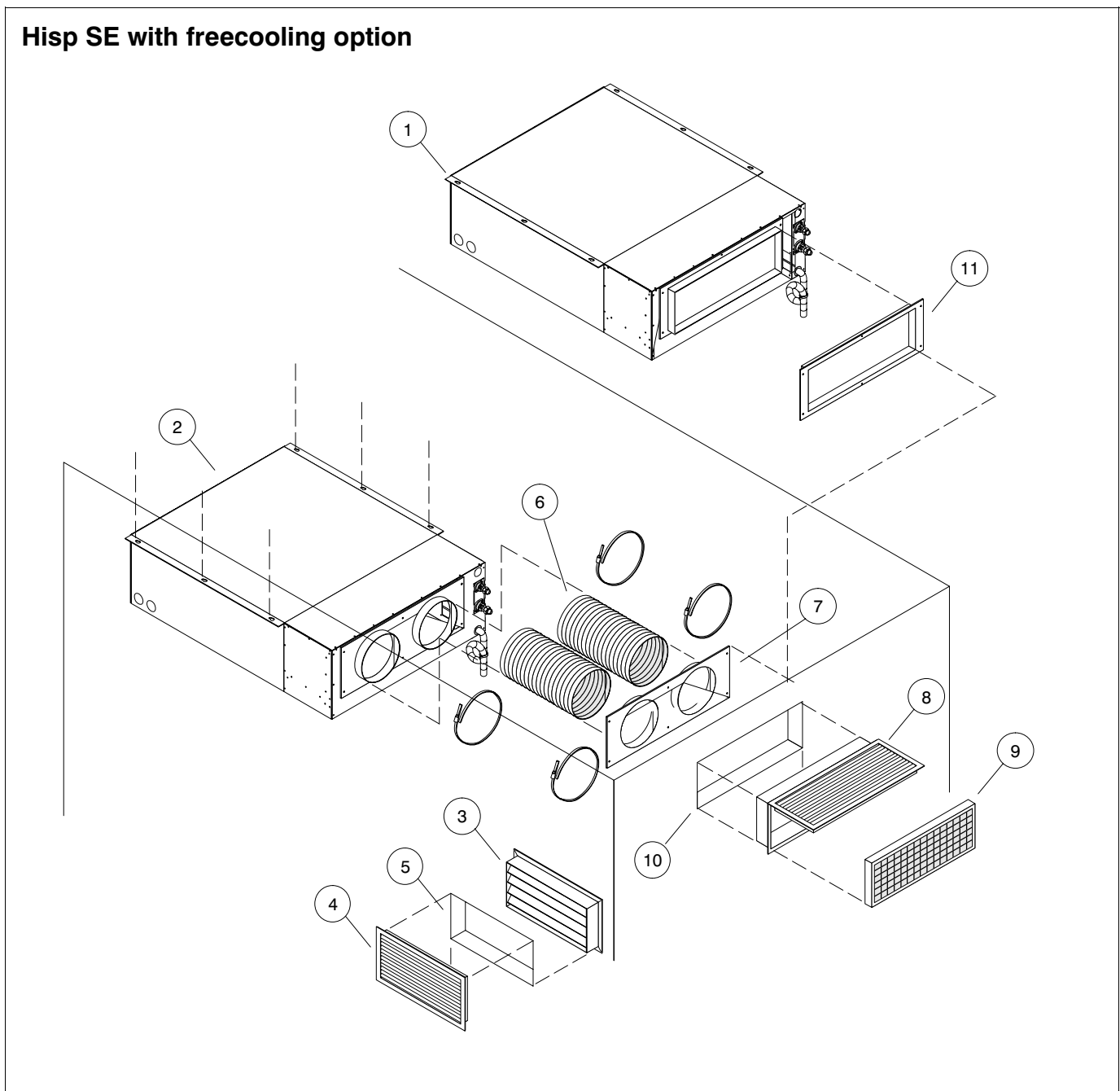
TOP VIEW



POS.	Description
E	Electrical connections
U	Refrigerant outlet
I	Refrigerant inlet

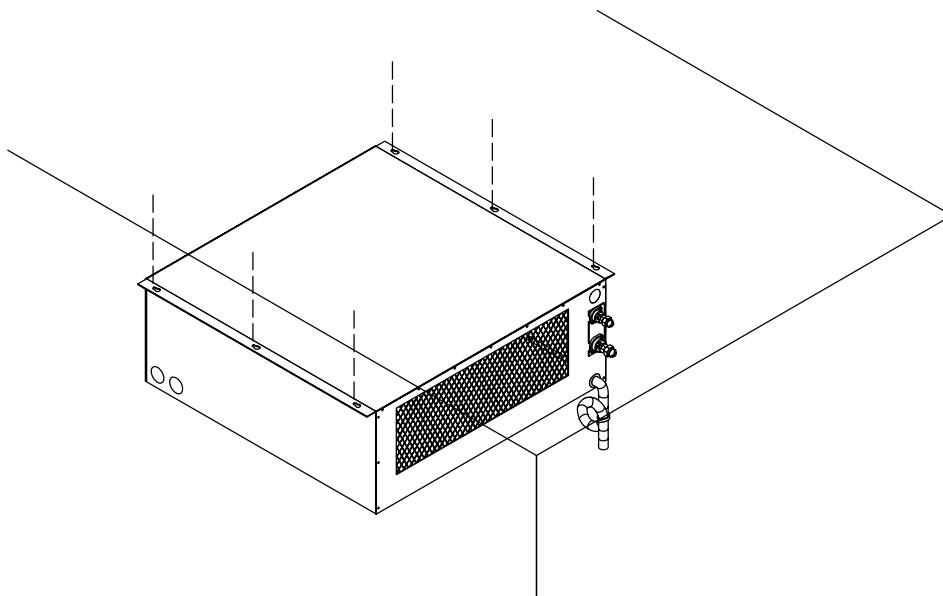
Examples of installation

Hisp SE with freecooling option

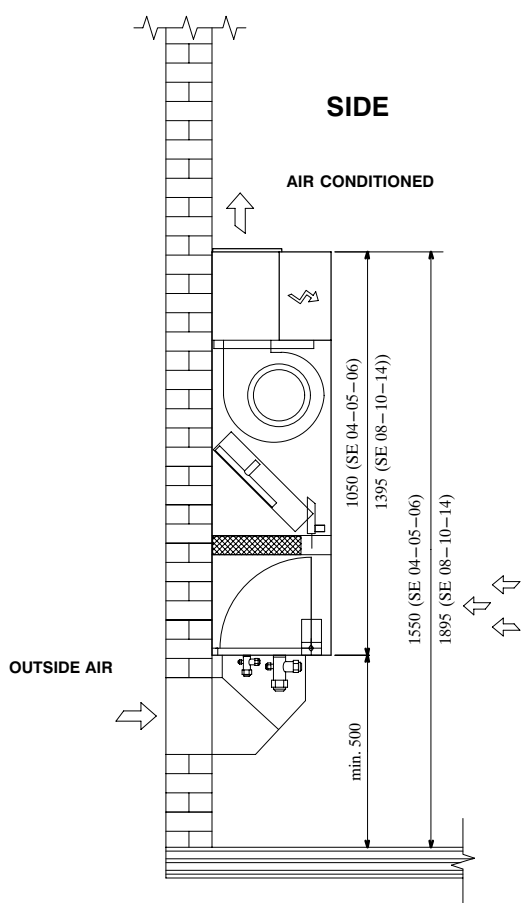


POS.	DESCRIPTION	CODE	
		SE+SC 04-05-06	SE+SC 08-10-14
1	Hisp SE with FC option (optional rectangular hole)		
2	Hisp SE with FC option (standard circular hole)		
3	Overpressure damper	134948	134992
4	Grille for overpressure damper	270206	117832
5	Hole in the wall	400 x 200 mm	600 x 400 mm
6	2 FC flexible ducts with fixing clamps, l = 0.5 m	270190	270191
7	Wall plate for FC circular duct	135038	135361
8	Aluminum grille with metallic prefilter	270202	270219
9	Metallic prefilter (included in (8))		
10	Hole in the wall	550 x 210 mm	590 x 230 mm
11	Wall plate for FC rectangular duct	135018	135360

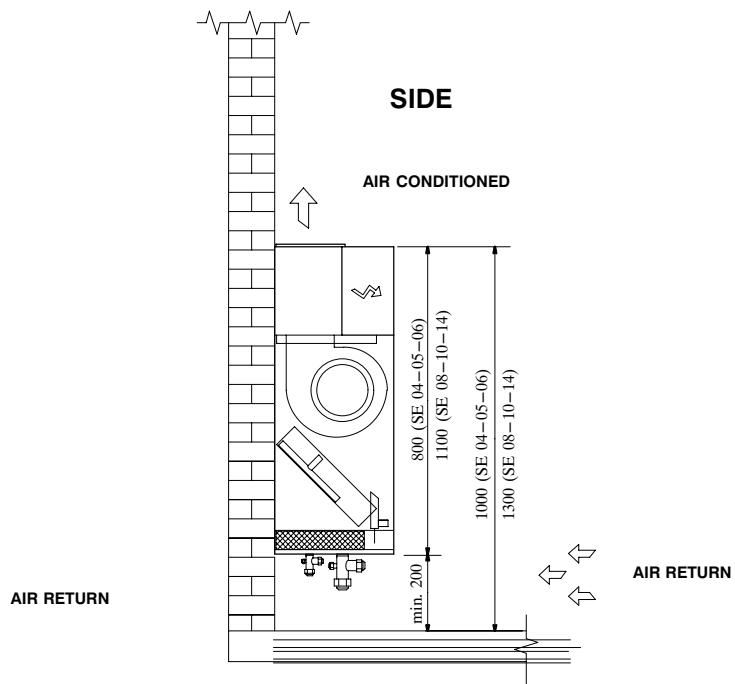
Hisp SE without freecooling option (ceiling installation)



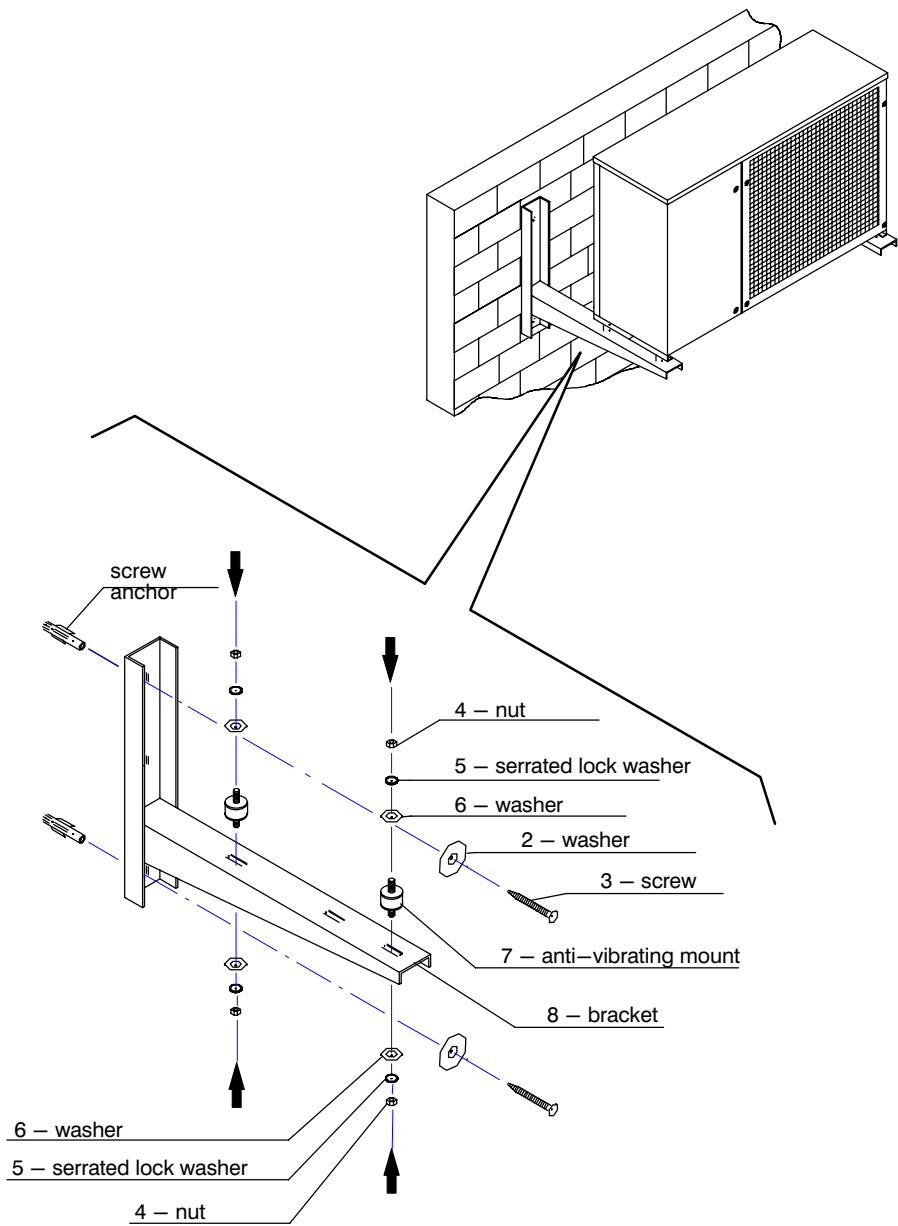
Hisp SE with freecooling option (wall installation)



Hisp SE without freecooling option (wall installation)

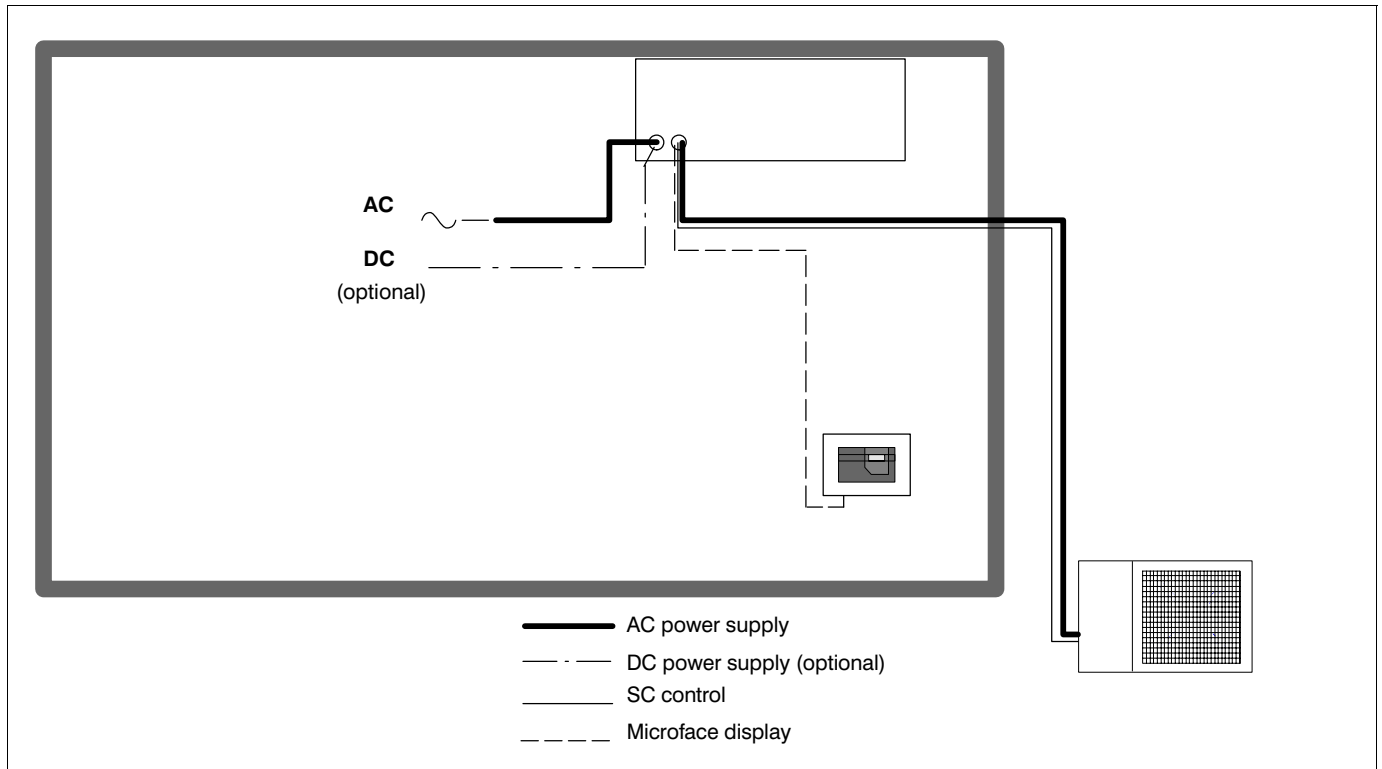


Wall fixing of condensing unit

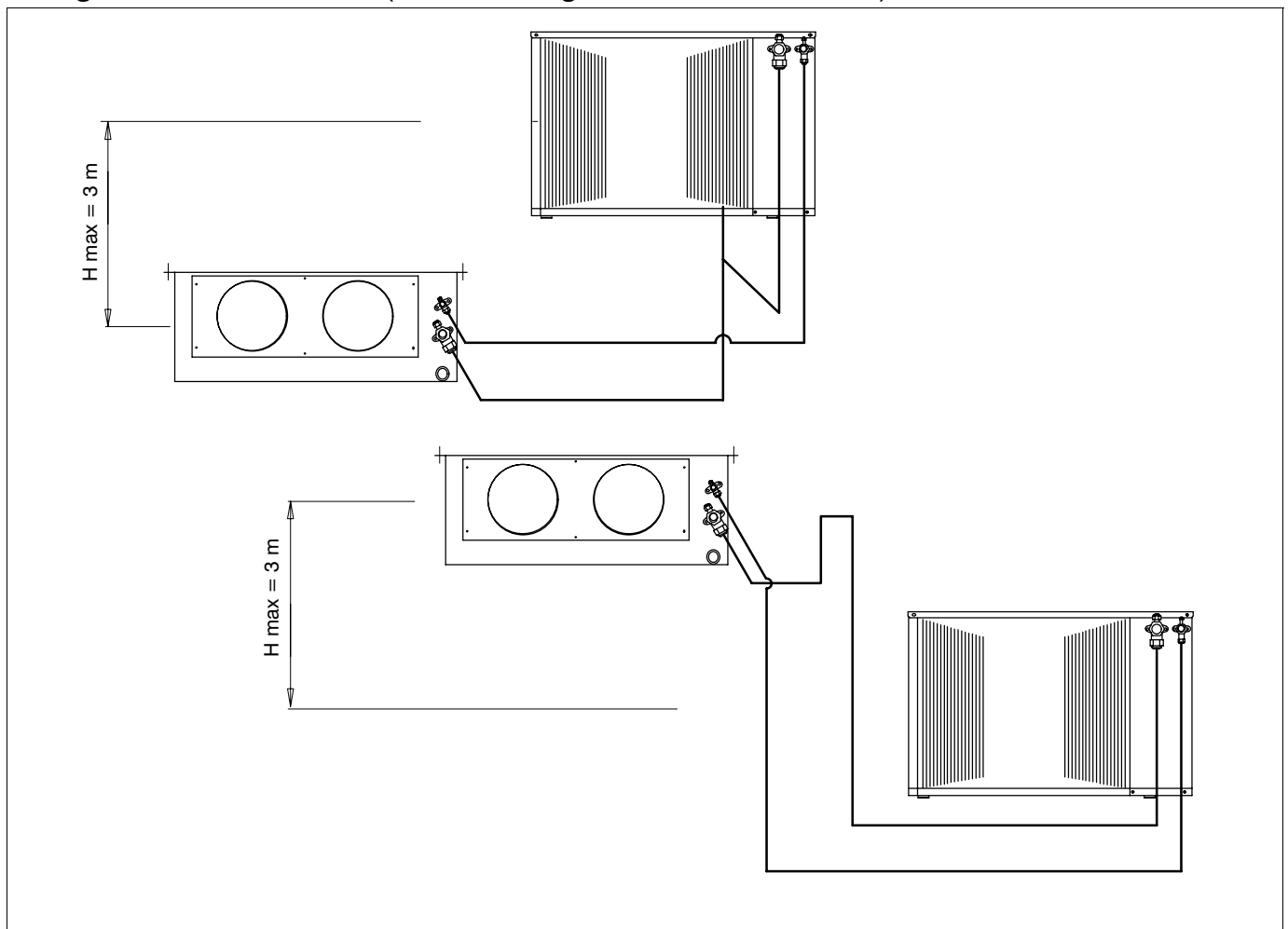


POS.	DESCRIPTION	CODE	
		SC 04-05-06	SC 08-10-14
1-2-3-4-5 -6-7-8	Condensing unit installation kit (optional)	129160	-
		-	129161

Electrical connections



Refrigeration connections (max. line length: see Service manual)



Liebert
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