

# SYSAER – Specification guide



## 1.0 - General description

### 1.1 - Unit description

Provide and install as shown on the plans, factory assembled, factory charged with R410A, and factory run tested, a packaged rooftop unit in the quantity and size specified. Each unit shall consist of multiple hermetic scroll compressors, direct expansion evaporator, air-cooled condenser section, control system and all components necessary to protect and control the unit operation.

#### 1.2 - Design requirement

Provide a complete rooftop unit as specified herein and as shown on the drawings.

Furnish and install where shown on plans, \_\_\_\_ SysAer rooftop unit from Systemair, model SR \_\_\_\_.

#### Cooling:

The unit(s) shall have a capacity of \_\_\_\_kW of refrigeration, cooling \_\_\_\_l/h of water from \_\_\_\_°C to \_\_\_\_°C when operating in \_\_\_\_°C ambient air.

Total unit power consumption in cooling mode (including compressors, fans and controls) shall not exceed \_\_kW. The unit SEER shall be of at least \_\_\_\_ at nominal conditions in order to comply with Ecodesign Lot 21 requirements.

#### Heating:

The unit(s) shall have a capacity of \_\_ kW of heating, heating \_\_\_ l/h of water from \_\_\_°C to \_\_\_°C when operating in \_\_\_°C ambient air.

Total unit power consumption in heating mode (including compressors, fans and controls) shall not exceed \_\_kW. The unit SCOP shall be of at least \_\_\_ at nominal conditions. SCOP energetic class should be \_\_\_.

The evaporator shall be selected for a  $\_\_$  m<sup>2</sup>K/W fouling factor and a maximum of water pressure drop of  $\_\_$  kPa. The condenser shall be selected for a  $\_\_$  m<sup>2</sup>K/W fouling factor.

Power shall be supplied to the unit on \_\_\_\_\_volt, \_\_\_\_Hertz, 3-phase electrical service.

Performance shall be certified or rated under the latest EN 14511 standard as Applicable. Only Rooftop that are under Eurovent certification program scope for Rooftop unit are acceptable.

Sound power and sound pressure data shall be provided in decibels. Sound pressure data shall be provided in 6 octave band format at full load according to ISO 3744 within 10 meters. In addition a weighted sound pressure shall be provided.



# 2.0 - Components

## 2.1 - Casing

The unit casing and frame shall be fabricated of heavy duty galvanized steel. All galvanized steel components shall be individually painted by a special painting process to provide a homogeneous protection to the corrosion before the assembly for the unit. The painting shall be a polyester powder based type, colored in RAL 7040.

The unit should be delivered with 25mm double skin in the air treatment section.

#### 2.2 - Compressors

The compressor shall be vibration isolated from the frame by rubber pads.

The compressor motors shall have direct startup and be cooled by the refrigerant gas. Each motor shall be protected from thermal overloads. A phase sequence monitor shall be supplied as standard.

The compressors shall be easily accessible and installed in a compartment acoustically insulated from the air flow, in order to guarantee a low noise operation.

[Option] A factory-installed soft starter shall be provided to automatically start up the compressors gradually.

#### 2.3 - Refrigerant circuit

The units should have 2 independent circuits well balanced, to guarantee a constant supply temperature even during defrost cycles and optimize energy consumption at part load.

The unit shall contain refrigerant circuit that includes scroll compressor, a plate heat exchanger, a thermostatic or electronic expansion valve, 4 way reverse cycle valve and liquid reservoir, \_\_\_\_\_ condenser coil(s), as well as safety and control devices such as high pressure switch, high/low pressure transducers and PED safety valve.

Inspection on refrigerant via a sight glass shall be possible during service operation by removing an access panel, without disturbing the unit operation conditions.

#### 2.4 - Condenser/Evaporator

The condenser/Evaporator coil shall be constructed with seamless copper tubes mechanically bonded to aluminum plate fins. The fins shall have fully drawn collars to completely cover the copper tubes and protect against atmospheric corrosion.

The evaporator fin shall be covered with a layer of anti-rust coating (blue fins) to protect the condenser from corrosion and natural element (wind, dust and salty air) hence increasing its reliability and life span.

The evaporator shall be over dimensioned to optimize performance and limit the frequency of defrosting cycles. The unit should run alternate defrost cycle on each evaporator in order to avoid cold draught in small volume.

[Option] Copper tubes mechanically bounded into aluminum fins with Blygold<sup>®</sup> coating after coil assembly to enhance corrosion and chemical resistance.

[Option] Copper tubes mechanically bounded into aluminum fins with Epoxy<sup>®</sup> pre-coating to enhance corrosion and chemical resistance.

A protection grilles to protect the condenser from unauthorized intrusions and shocks shall be installed as a standard in the factory.

Each circuit shall have axial fan(s). Each fan shall be cabled in order to have high speed for standard version.

Each fan shall be individually driven by a direct drive motor. The Fan motor shall have an IP54 grade and equipped with a thermal overload protection.

Each fan shall be housed in its own compartment and protected by a heavy gauge grille.

[Option] A pressostatic type fan speed controller shall be delivered as a factory fitted option to allow operation in low ambient temperature (-10°C) in cooling mode.

#### 2.5- Fans

At the supply, the unit shall be equipped with plug fan for better Indoor Air Quality and Efficiency When the set point is reached, the unit shall automatically reduce the fan speed to decrease the consumption of the fan [Option] The unit shall be delivered with EC plug fan [Option] At the supply/exhaust, the unit should be delivered with a High Static Pressure plug fan

#### [Option] 2.6 – Fresh Air Management (2 way Dampers)

The unit shall be equipped with a 2 way damper system in order to manage the rate of Fresh air [Option] The unit should be equipped with a G4-50mm filter and F7-100mm filter for better indoor air quality



[Option] 2.7 – Exhaust air Management (3 way Dampers) The unit shall be equipped with an EC plug fan on standard to manage the extraction of the air As a standard, the unit shall be able to recover Energy on the extract air

## [Option] 2.8 - Recovery module

The unit should be equipped with a thermodynamic module, independent from the main circuit, in order to transfer energy from the exhaust air to the supply air.

The unit should be delivered plug and play ready to install on site.

#### [Option] 2.9 – Food Refrigeration Recovery "FRECO"

The unit should be equipped with a specific recovery system which can be connected to the condenser of the food refrigeration system. This recovery system should allow free heating.

### [Option] 2.10 - Auxilliary heating

The unit should be equipped with one of the following auxiliary heating option available both for cooling only units or heat pump which allow to extend the operating limits

- [Option] Electric heater
- [Option] Hot Water coil equipped with 3 way valve
- [Option] Atmospheric Gas burner

#### 2.9- Control panel

The units shall be fitted with an external control that displays the operating parameters and alarms.

The control panel shall be accessible without removing any parts nor shutting down the unit.

The unit shall contain a main switch to cut the power supply lines.

The control system shall contain contacts for remote general fault signaling, remote ON/OFF switching, remote Cooling/Heating switching and be compatible with BMS (ModBus protocol RS 485 connection).

The unit incorporated safety devices shall include fan and compressor motor overload protection, water flow switch, water filter (supplied loose), high pressure switch, high and low pressure transducers, evaporator antifreeze electric heater, crankcase heater, safety valve on 45 bar on refrigerated side and 3 bar on water side.

The unit incorporated control devices shall include entering and leaving water temperature sensors, coil temperature sensor, discharge temperature sensor, air temperature sensor and suction and discharge pressure transducers.

## 3 - Conformity with standards

The units shall comply with applicable Standard

- EN 14511
- Machine Directive: 2006/42/EC
- Low Voltage Directive: 2014/35/UE
- Electromagnetic Compatibility Directive: 2014/30/UE,
- Pressure Equipment Directive: 2014/68/UE
- RoHS directive: 2011/65/EU
- The unit shall be manufactured in an ISO certified facility.