

# Tender Specification

*SyScroll 40-75 Air CO / HP*

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**SERIES:** SyScroll 40-75 Air CO / HP / RE

**TYPE:** Air cooled water chiller, heat pump and condensing unit

**TECHNOLOGY:** multi-scroll compressors, R410A refrigerant

**CAPACITY RANGE:**

Cooling → 40-76 [kW]

Heating → 40-77 [kW]

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### 1 General description

SyScroll Air 40-75 CO / HP / RE units have been designed and optimized to operate with R410A refrigerant and scroll compressors

Thanks to multi-scroll technology and asymmetric design in tandem combination, it is possible to reach very high level of seasonal performances

SyScroll Air 40-75 CO units are available in 6 sizes, with a nominal capacity range from 41 to 77 [kW]

SyScroll Air 40-75 HP units are available in 6 sizes, with a nominal capacity range from 37 to 72 [kW] in cooling mode and from 39 to 76 [kW] in heating mode

All units are equipped with a single refrigerant circuit, equipped with 2 compressors in tandem design

SyScroll Air can be supplied with 2 acoustic options:

- Basic Low Noise (-): the units are equipped with delta connected fans. The chillers are supplied with compressors box to reduce the noise emissions
- Super Low Noise (S): the units are equipped with star connected fans, to operate with a very low rotation speed. Besides very low fan deck sound emission, the chillers are supplied with compressors box and soundproof jackets on compressors

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To increase its application field, SyScroll Air range is available in three additional versions:

- HT (High Temperature) version: same equipment as the basic version, but also fitted with brushless EC fan motors to ensure low energy consumption and to operate on a wider envelope
- HPF (High Pressure Fans) version: same equipment as the basic version, but also fitted with brushless EC fan motors so as to provide external static pressure
- PH (Polar Heating) version: same equipment as the basic version, but also fitted as a standard with electronic expansion valve to ensure a precise control of suction superheat, dedicated controller to implement compressor envelope protection, blue fins coils to have a more effective drainage during defrost cycles, EC fan motors to extend application field

Partial heat recovery option is available:

- Desuperheater: plate type heat exchanger fitted on the compressor discharge line, to recover about 20 % of the total heat rejected to the condenser

Several hydraulic options are available in order to cover a wide range of requirements in terms of pump available static pressure, redundancy and inertia water side

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### 2 Key points

- High seasonal performances → ESEER up to 4.1
- Simple refrigerant circuit with easy access to inner components for maintenance purpose
- Aeraulic independence between refrigerant circuit and condensing side
- Common configuration for the different versions → Easy upgrade of the units in stock or on field
- Compressors box → Remarkable sound reduction even for the basic noise version
  
- Several options / accessories provided with standard delivery:
  - Sequence phase control → safe electric installation
  - Double set-point → different daily profiles
  - Dynamic set-point → water profile in accordance with OAT
  - Water flow switch / Water differential pressure switch → protection against low water flow
  - Antifreeze electrical heater → protection against BPHE freezing
  - Water filter → protection against impurities
  - Rubber pads → basic vibration attenuation

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### **3 Cabinet**

The cabinet is made of heavy gauge galvanized steel.

All galvanized steel components are individually painted by a special painting process before the assembly of the unit. This painting system performs a homogeneous protection to the corrosion.

The painting is a polyester powder based type, colored in RAL 7040. The units are suitable for outdoor installation, directly on the building roof or at the ground level.

### **4 Compressors**

Compressors are of hermetic scroll type and fitted with an electronic control system ensuring protection against high temperature and excessive load.

All compressors have direct-on-line starting and are mounted on rubber vibration isolators in order to minimize noise and vibration transmission

### **5 Evaporator**

Indoor heat exchangers are brazed stainless steel plate type. They are insulated with a 10 [mm] thick closed cell polyethylene foam material and provided with male gas threaded connections.

They are protected by a 35 [W] antifreeze electric heater to ensure a good

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protection against freezing at low ambient temperature when the unit is switched off.

Maximum working pressure is 10 [bar] at water side and 45 [bar] at refrigerant side.

### **6 Condenser**

Condenser coils are made of seamless copper tubes, arranged in staggered rows, mechanically expanded into corrugated aluminum fins.

Fin spacing is optimized according coil version (CO/HP).

### **7 Condenser fans**

Basic units (in all different sound versions) are equipped with a single axial fan, direct drive with asynchronous three-phase motor.

A special fan with electronic brushless type motors is used in HT and HPF versions.

Fans are equipped with externally mounted nozzle profile housing generating low sound levels

### **8 Refrigerant circuit**

All the units are equipped with a single refrigerant circuit, equipped with filter-drier with solid core, sight glass and thermostatic expansion valve (electronic expansion valve is available as option).

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Heat pump units (HP) are additionally provided with 4-way reversing valve, suction accumulator and liquid receiver.

### **9 Control panel**

A new optimized control is supplied on all the units with a simple user interface (possibility to customize keys functions and to set menus visibility).

In addition to standard features as water temperature control (with possibility to choose LWT/EWT probe), the control can also manage following functions:

- DHW control with anti-legionella function daily and weekly activated
- Dynamic set point (4-20 [mA], 0-1 [V], 0-5 [V], 0-10 [V])
- Double set point
- OAT compensation
- Boiler / Electrical heater integration
- Auto adaptive function to reduce the water content of the plant
- Managing of DHW 3 ways valve (ACCESSORY)
- Advanced pump management
- Remote keyboard (ACCESSORY) with possibility to connect (up to 100 [m] distance) without any serial interface

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### 10 Safety and control devices

Each unit is complete with the following safety and control devices.

#### Safety

- Power disconnect switch with an emergency stop function
- Fan motor overload protection
- Compressor motor overload protection
- Phase sequence control
- High pressure switch
- Low pressure switch
- Discharge gas thermostat (HP units)
- Crankcase oil electric heater
- Water flow switch / Water differential pressure switch
- Safety valve on discharge line

#### Control

- High pressure transducer
- Low pressure transducer (in case of EEV option)
- Return water temperature sensor
- Leaving water temperature sensor (with an antifreeze function)



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- Suction temperature sensor (for EEV control)
- Outdoor ambient temperature sensor
- Coil temperature sensors (HP only)

### **11 Optional hydro kits**

On board mounted and remote hydro-kits are available as option.

On board hydro kits can be supplied with or without buffer tank while remote hydro kits (supplied loose for field installation) are always provided with internal tank.

On board hydro kit without buffer tank are provided with following components:

- Single or double pump with low available static pressure (100 [kPa])
- Expansion tank (12 [l] for all models)
- Check valves (in case of 2 pumps)
- Safety valve
- Automatic air vent valve
- Thermal insulation for pipes and water pump(s)

On board hydro kit with buffer tank are provided with following components:

- Single or double pump with low available static pressure (100 [kPa])
- Buffer tank (98 [l] from 40 to 50 size, 152 [l] from 60 to 75 size)

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- Expansion tank (12 [l] for all models)
- Check valves (in case of 2 pumps)
- Safety valve
- Automatic air vent valve
- Thermal insulation for pipes and water pump(s)
- Antifreeze electric heater inside buffer tank

### **12 Factory installed options**

- Modbus protocol kit for BMS
- Compressors soft-starter
- Fan speed control for low ambient operation
- Power factor correction capacitors
- Electronic expansion valve
- Compressor overload protection
- Power supply without neutral
- Automatic circuit breaker
- HP & LP gauges
- E-coating treatment for Al/Cu coils
- Blue fins treatment for Al/Cu coils
- Condenser coils with Copper fins
- Coil grilles
- Compressor jackets
- Desuperheater

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- On board hydro kits 1P/2P with/without tank

### **13 Field installed accessories**

- Remote ON/OFF control
- Modbus protocol kit for BMS
- Remote keyboard panel
- Sequencer, up to max four units
- Anti-vibration spring
- Water pressure switch
- In/out valve kit
- Remote hydro kits with buffer tank, 1 or 2 low or high pressure pump(s), relevant accessories, with or without antifreeze heater

### **14 Conformity with standards**

The units are in conformity with the following standards:

- Machine Directive: 2006/42/EC
- Electromagnetic Compatibility Directive: 2014/30/EU
- Pressure Equipment Directive: 2014/68/EU