

## SCM REF Standard Outdoor Ammonia Chiller Line Information Sheet

### 1. Application:

- AC comfort chillers (+12°C / +7°C)
- MT process chillers (-3°C / -8°C)

### 2. Condensing methods:

- Air-cooled condenser
- Water-cooled condenser

### 3. Capacity range:

- Indoor AC chiller: 304 kW to 1385 kW;
- Indoor process chiller: 166 kW to 765 kW;
- Outdoor AC chiller: 190 kW to 956 kW;
- Outdoor process chiller: 103 kW to 514 kW.

### 4. Major Components of Outdoor Chillers

#### - Compressor:

- Semi-hermetic or open-drive screw compressor
- Semi-hermetic compressors built with PM motor and coated aluminum windings
- Capacity control with inverter and slider
- VI adjustment
- Motor overheating protection
- Discharge temperature protection and motor phase protection
- Internal pressure relief valve
- Built-in discharge check valve
- Built-in oil flow switch, sight glass

#### - Oil management system:

- Three stage oil separator
- Three-way valve based on oil temperature
- Oil pump for selected models
- Oil fine filters
- Oil flow switch

- Automatic oil return from evaporator to compressor
- Additional manual oil drainage valve at the bottom of evaporator
- **Condenser**
  - Air-cooled condenser with stainless steel tubes / pre-painted aluminum fins
  - EC axial fans, FeZn casing with epoxy powdered coating
  - Integrated oil cooling loop
  - Horizontal and V-shaped layout are both available
  - Sound level at 60dba in 10m
  - Service switch on each fan
  - Condenser pressure regulation system
  - Electrical control integrated with chiller including floating condenser pressure control
- **Evaporator**
  - Compact plate-in-shell heat exchanger. Carbon steel shell with SS316L plates.
  - Optimized design for chiller application providing stable thermal performance under different conditions
  - Built-in demister package
  - Liquid level control column with service valves and gauges
  - Externally insulated with Armaflex and optional AL/stainless steel cladding
  - Oil collector
  - Two liquid level sight glass
- **Refrigerant Circuits**
  - Motorized expansion valve & motorized hot gas supply valve
  - Advanced suction vapor quality analysis and control
  - High pressure liquid receiver with sight glass
  - HP, LP and oil manometers
  - HP, LP and oil 4-20mA pressure sensors
  - Temperature sensors at discharge, suction and oil line
  - Pipes made of stainless steel 304L
  - Winter regulation and severe low ambient package as option
- **Water / Brine connections**
  - Inlet / outlet temperature sensors
  - Flow switch at line outlet
  - Flange connections with flexible outgoing positions

- Externally insulated with Armaflex and optional AL/stainless steel cladding

## - Safety

- Dual pressure relief valves on each isolated pressure vessel
- Mechanical pressure switches
- Internal pressure relief valve on compressor
- Motor overheating protection and phase protection
- Temperature and pressure protection on critical points in refrigerant and oil circuit
- NH3 detector with adjustable detection level for high and low gas alarm
- Independent power supply for NH3 detector, alarm and siren
- Power line phase protection
- Controlled temperature and humidity inside electrical cabinet
- HP, LP and oil pressure sensors and gauges
- Service valves and shutoff valves for maintenance
- Condenser main power circuit protection without neutral

## - Electrical Control and Inverter

- Siemens PLC installed with SCM REF chiller control software
- 7" LCD touchscreen
- Main power switch
- Main electrical cabinet with IP54 rating
- Power switch on cabinet
- Inverter box integrated
- Codified terminal board and halogen free cables
- Emergency push buttons mounted interiorly and exteriorly to allow quick response
- Condenser electrical cabinet with IP54 rating
- Thermostat, hygostat and ventilation for controlling environment inside cabinet
- Electrical cabinet without neutral (transformer equipped)

## - Weather-proof Housing

- Weather-proof housing made of thick galvanized steel sheet, additionally protected with a coat of oven-baked polyester-based thermosetting paint
- Optional explosion proof ventilation fans
- Optional sound proof panel



## 5. Safety features

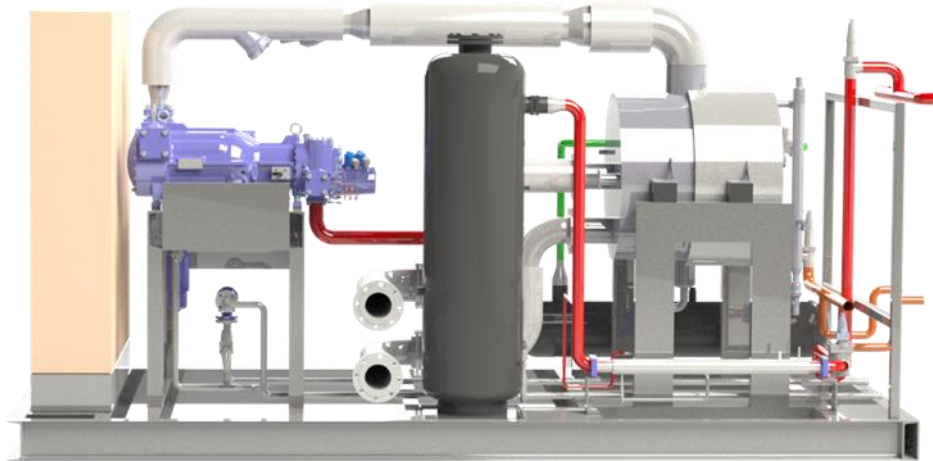
- The ammonia charge per kw is very low thanks to unique design and the use of shell & plate heat exchangers. The risk of ammonia leakage is controlled to minimum level by semi-hermetic compressors.
- SCM Ref's chiller controller enables automatic self-regulation on its chillers facing abnormal situations. Double pressure switches equipped on each chiller will shut it down when pressure keeps rising.
- SCM chillers are equipped with dual safety relief valves on all pressure vessels.
- Ammonia leakage detector and alarm is also built into the casing.
- The design of chillers and casings fully comply with European Refrigeration Standard, EN378.

## 6. Easy maintenance

- Inside the casing, each chiller component is arranged considerably to leave enough space at each service point, while keeping the whole package very compact.
- Every oil filter can be easily isolated for maintenance by the two service valves and one purging valve.

- The connecting pipes where oil filters are installed on are designed to be short as possible to minimize ammonia loss.
- Bypass line is installed at each oil filter to avoid downtime during maintenance. A hand drain valve is installed at the bottom of evaporator for checking or releasing oil.

## 7. Example Image of Outdoor Chiller with V-shape Air-Cooled Condenser



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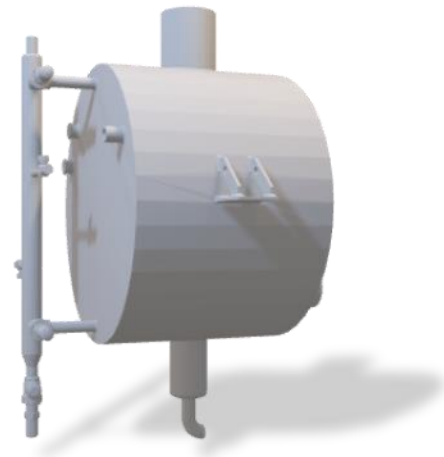
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- VI adjustment
- Motor overheating protection
- Discharge temperature protection and motor phase protection
- Internal pressure relief valve
- Built-in discharge check valve
- Built-in oil flow switch, sight glass

#### - Oil management system:

- Three stage oil separator
- Welded stainless steel plate heat exchanger for oil cooling
- Three-way valve based on oil temperature
- Oil pump for selected models
- Oil fine filters

- Oil flow switch
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