SCM REF Standard Outdoor Ammonia Chiller Line Information Sheet

1. Application:

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

2. Condensing methods:

- Air-cooled condenser

3. Capacity range:

- 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(s)
- 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, oil filter and sight glass

- Oil management system:

- Three stage oil separator
- Three-way valve
- Oil pump for selected models
- Oil fine filters
- Oil flow switch
- Automatic oil bleeding
- Additional manual oil drainage valve at the bottom of evaporator

- Condenser

- Air-cooled condenser with stainless steel tubes and 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
- Optional: winter package for extreme low ambient temperature

- 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
- Automatic oil bleeding from evaporator
- 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
- Temperature sensors at discharge, suction and oil line
- Pipes made of stainless steel 304L
- Winter regulation and severe low ambient package as option

- Gauge Panel

- HP, LP and oil manometers
- HP, LP and oil 4-20mA pressure sensors
- HP, LP pressure switches

- Water / Brine connections

- Inlet / outlet temperature sensors

- Flow switch at line outlet
- Flanged connections can be connected on either side of the chiller
- Externally insulated with Armaflex and optional AL/stainless steel cladding

- Safety

- Dual pressure relief valves on each isolated pressure vessel
- Mechanical pressure switches on HP and LP
- 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
- Well positioned service valves and shutoff valves to facilitate 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
- 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, hygrostat and ventilation for controlling environment inside cabinet
- Electrical cabinet without neutral
- Built-in transformer

- Weather-proof Housing

- Weather-proof housing made of thick galvanized steel sheet, additionally protected with a coat of oven-baked polyester-based thermosetting paint
- ATEX proved fans
- Optional: closed casing with sound-proof panel, mechanical cooling and NH3 leakage ventilation. ATEX fans.

5. Safety features

- The ammonia charge per kw is very low thanks to unique design and the use of shell & plate heat exchangers. Special design like semi-hermetic screw compressor and fully welded pipes reduce the risk of ammonia leakage to minimum.
- 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 isolated pressure vessels.
- Ammonia leakage detector with adjustable detection level is standard on the chiller unit. NH_3 leakage sirens are are placed inside and outside of 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 considerately 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. 3D model

- The image of an outdoor chiller with V-shape air-cooled condenser on an elevated frame.
- All the frameworks and pipings between condenser and chiller are prefabed and will be delivered.
- In case of remote condenser, the elevated framework may not be necessary and can be replaced with a basic framwork.