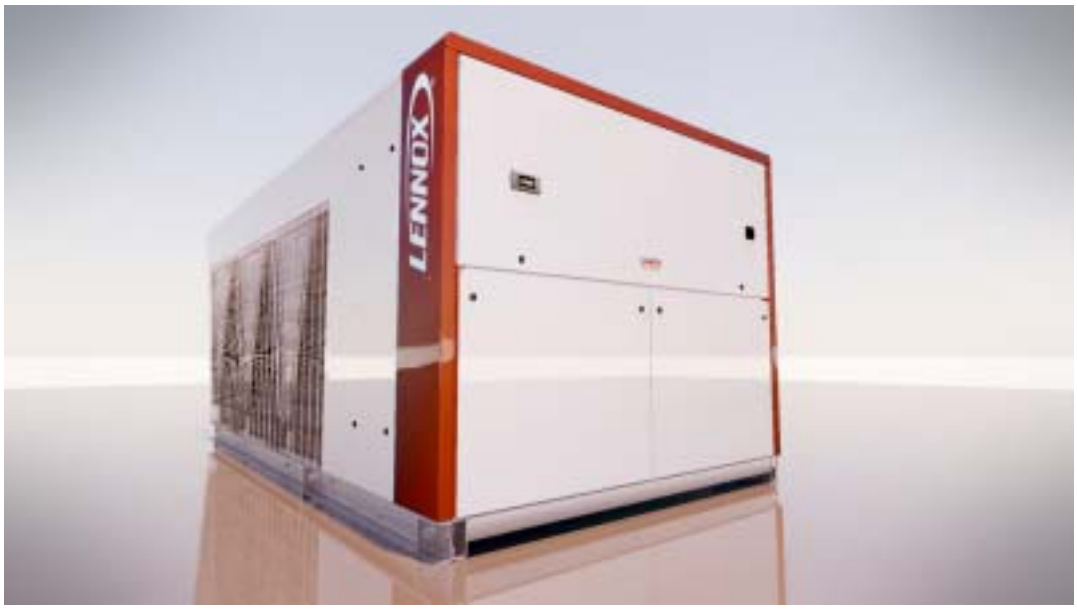
SPECIFICATION GUIDE

NEOSYS™



Air-cooled Liquid Chiller for outdoor installation (NAC)
Nominal cooling capacity: 200 to 460 kW

Air-to-water Heat Pump for outdoor installation (NAH)
Nominal cooling capacity: 200 to 300 kW
Nominal heating capacity: 200 to 350 kW

SPECIFICATIONS

1. Packaged air-cooled chiller (or Air to water heat-pump)

- The contractor shall furnish and install a NEOSYS packaged air-cooled scroll liquid chiller (or Heat-pump) from Lennox or an equivalent unit.
- The air-cooled scroll liquid chiller (or Heat-pump) shall be operating with R410A HFC-based refrigerant.
- The unit shall be designed and installed in strict accordance with this specification.
- The unit shall be certified and rated in accordance with Eurovent standard.
- The unit shall be designed to be integrated into urban or residential environments.
- The unit shall offer ***state of the art design*** to match architectural constraints and ***adjustable sound level performances*** during day and night to satisfy local environmental constraints.

2. Performances and dimensions

- The air-cooled scroll liquid chiller (or Heat-pump) shall have following characteristics:

Cooling mode

- Cooling capacity: ..... kW
- Minimum EER: .....
- Minimum ESEER: .....
- In/outlet water temperature : .....°C
- Glycol rate: .....%
- Outside air temperature : .....°C
- Maximum sound power/pressure level:

  Daytime (07:00-23:00 hrs): ..... dB(A)

  Night-time (23:00-07:00 hrs): ..... dB(A)

Heating mode (Heat-pump only)

- Heating capacity: ……..kW
- Minimum COP: .....
- In/outlet water temperature: ....°C
- Outside air temperature: …… .....°C

Unit dimensions:

Length * width * height : …….. * ……. * …….. mm

Unit type or equivalent:

Cooling only : NAC - - - DNM1M

Heat-pump : NAH - - - DNM1M

3. Casing/Chassis

- Casing made of galvanised steel sheet metal painted white RAL 9002 powdered polyester paint and a RAL3003 red stripe.
- Fully RAL 7016 grey colour painted chassis protecting against corrosion.
- ***State of the art design*** with hidden compressors, fans and pump for perfect architectural integration.
- Flat top, aesthetic grilles, ***very low unit height (< 2m)*** for discrete installation on a roof reducing the requirement of costly cladding solutions around the unit
- ***Aesthetic side anti-intrusion grilles*** as standard to protect the unit during transportation and against human aggressions.

4. Compressor

- ***Exclusive Compliant Scroll® design with both axial and radial compliance*** to increase compressor operation tolerance to liquid refrigerant or debris, substantially improving durability and reliability. 3 year warranty*.
- Motor cooled by suction gas.
- Electronic control of the compressor discharge temperature.
- Motor protection device against high temperature or over current situations.
- Discharge non-return valve.
- Low noise scroll compressors mounted in a sound-proofed technical cabinet to reduce noise emissions.
- Compressors assembly installed on an independent chassis supported by anti-vibration mountings.

5. Water heat exchanger

- True dual circuit ***plate heat exchanger***
- Copper brazed Stainless steel plate heat exchanger.
- Thermal insulation foam.
- ***Water heat exchanger located in a technical cabinet*** protecting the insulation against climatic conditions (UV light, rain).

6. Air heat exchanger

- ***High efficiency aluminium Micro Channel heat exchangers (MCHX)*** with improved corrosion resistance in moderate marine or urban environment (Cooling only version). 3 year warranty*.
- Standard copper tubes/aluminium fins heat exchanger (Heat pump version). 3 year warranty*.
- V-coil design to protect the unit against climatic conditions (e.g. hail).

7. Fans

- ***Variable speed driven fans*** (0 to 900 rpm operating range). 3 year warranty*.
- ***Active Acoustic Attenuation System™*** to meet changing building load requirements while automatically adjusting the air flow to respect night and day sound level constraints (Adjustable setting over time schedule with 4 time zones per day).
- ***Elimination of intrusive start/stop noise*** that is irritating to the human ear.
- Fan-motor assembly using ***external rotor technology*** associated with Shark high performance aluminium fan blades of the latest generation.
- IP 54 electrical motor, class F protected against high temperature with an internal sensor.
- Exclusive fan design with ***hybrid Ceramic bearings*** to extend the service life of motors and to reduce noise level. With these sealed hybrid ceramic bearings, the customer shall expect little or no maintenance of the motor throughout its life.
- Extremely rigid fan assembly via the integration of the fans mounted within a pre-formed bell mouth roof panel, thus improving rigidity while reducing vibrations.
- Rounded side panels to hide the fans and reduce noise emissions for quieter operation.

8. Refrigerant circuit

The NEOSYS or equivalent unit shall be using R410A refrigerant in 2 independent circuits. Each circuit shall include:

- ***Refrigerant charge reduced by 30%*** due to the use of R410A combined with micro channel heat exchanger (Cooling only version).
- Suction piping with thermal insulation.
- Filter drier with removable cartridge filter.
- Thermostatic or electronic expansion valve (Electronic device when "winter operation" option selected).
- Temperature sensors and pressure transducers.
- Four-way valve and liquid receiver (heat pump units only).
- Leak-tight refrigerant circuit with brazing carried out under nitrogen by certified engineers.
- Each refrigerant circuit shall be pressure and leak tested with a Hydrogen/Nitrogen mixture, and vacuumed before being charged with refrigerant. All units shall be then subjected to a complete functional and operational run test to guarantee perfect sealing before leaving the factory.

9. Water side piping

- ***Victaulic couplings delivered as standard*** to ease customer water connections.
- Electronic water flow switch delivered as standard to protect the evaporator against frost.

Hydraulic module (option):

- Hydraulic module fitted inside the unit.
- ***Hydraulic module shall be mounted in a sound-proofed technical cabinet*** to reduce noise emissions and protect the insulation against climatic aggressions (NAC/NAH sizes 200 to 300) or it shall be mounted under the coils and shall be protected by aesthetic side grilles (NAC sizes 340 to 480).

The hydraulic module shall include the following factory installed components:

- Monocell centrifugal single or twin pump with low or high pressure pump (150 kPa to 250 kPa available static pressure).
- Operating time balancing and automatic changeover to the back-up pump if a fault develops.
- ***Water flow regulating valve with wheel*** to adjust manually the required customer water flow at unit commissioning.
- Pressure taps to check filter pollution and measure the system water flow rate.
- Removable screen filter (1.000 microns efficiency) supplied loose with piping and Victaulic couplings for ease of cleaning outside of the unit.
- Electronic water flow switch without any capillary to avoid frost or obstruction risk.
- High-capacity membrane expansion tank (50 or 80 litres starting NAC size 300) delivered with relief valve and high-pressure gauge.
- Thermal insulation with close-cell foam and frost protection down to -20°C, using an electric resistance heater (option).

10. Electrical box

- Unit electrical cabinet, components and wiring in compliance with EN 60204-1 electrical directive.
- 400 V/3/50 Hz power supply (without neutral) with a single point of power connection.
- Bottom entry (through the base) for electrical power.
- IP54 protection class.
- ***Air spring powered Butterfly Electrical Panel™*** with top opening providing protection to the service engineers against rain or snow during commissioning and maintenance operations.
- Recognized brand electrical components (Schneider) for ease of maintenance.
- Main on/off switch mounted on the front panel.
- DC50™ user interface mounted on the front panel.
- Main disconnect switch with high trip capacity allowing optimized sizing of the customer power supply.
- 400/24 V transformer to supply the control circuit.
- Numbered electrical wires to facilitate maintenance and diagnostic.
- ***Variable Frequency Drives (VFD) to control the fan speed.***

11. Control

Climatic™ microprocessor based control or equivalent control shall be providing the following functions:

- 4 scheduling time zones per day over 7 days to allow energy consumption and sound level management according to the building use and environmental constraints.
- PI control of the water temperature with operating time equalisation of the compressors.
- Water set-point offset based on outdoor air temperature (BE50™ option needed).
- ***Active variable speed control of all fans*** to optimize the unit condensing pressure and energy performances at full- and part-load while meeting authorized maximum noise level in the time zone (***Active Acoustic Attenuation System***™ control patented).
- Intelligent advanced control algorithm to protect the compressors against excessive short-cycling and to allow ***operation of the unit without buffer tank*** in most comfort air conditioning applications (e.g. unit with fan-coils). Refer to minimum installation water loop volume recommendations.
- ***Dynamic defrost*** to limit the number and the duration of the defrost cycles in winter for high performance of the unit (Dynamic Defrost patented).
- Automatic compressor unloading in case of excessive condensing pressure allowing the operation of the machine at high outdoor air temperature (operation extended up to 46°C ambient).
- Water pump control with operating time equalization and automatic change-over in case of a pump fault (Twin pump only).
- Master/slave or cascade control of two chillers operating in parallel with operating time equalization and automatic change-over in case of a unit fault.

Climatic™ controller or equivalent microprocessor-based controller shall be pre-factory configured with default settings allowing a fast commissioning on site. The DC50™ user interface with graphical display or equivalent user interface shall be easy to use, intuitive. Main customer parameters shall be read or modified without main power shut-off (Entering/leaving water temperatures, outdoor air temperature, alarm history, scheduling of the different time zone, water and noise level set-points, high and low pressures reading...).
The DS50™ service display (optional) or equivalent service display shall be a “plug and play" controller that allows service people to read and modify all unit parameters (Unit settings, operating time and number of compressor starts, low and high pressure reading, read the history of last 32 faults...).

12. Communication

The control board shall be equipped with a RS485 serial communication port to allow remote management through communication bus. According to the wished communication protocol, the control board shall be fitted with ***ModBUS***®, ***LonWorks***® ***or BacNET***® ***communication interfaces*** (options).

The main control board shall have free dry contacts that allow remote control of the unit by wired cable:

- Remote on/off of the unit.
- Remote alarm reset to re-start the unit.
- Alarm or alert indications.
- Free customer contact.
- Force Ventilation at 100%.

With the optional extension board BE50™ or equivalent relay card, it shall be possible to get additional customized digital or analog inputs and outputs for remote control of the unit:

- Fault fans or pumps (dry contact).
- Operation indication at 100% on circuit 1 or 2 (dry contact).
- Dual water set-point management (dry contact).
- Force heating or cooling mode (24V AC input).
- Power limitation by disabling circuit 1 or 2 (24V AC input).
- Force unoccupied mode (24V AC input).
- Water set-point offset based on outdoor air temperature (4-20mA input). Note: non available with heat-pump units.

13. Directives

The unit shall be built to meet European norms and standards & Eurovent certification performance standards.

- DI 97/23/CE Pressure Equipment Directive.
- DI 98/37/CE Machinery Directive.
- DI 73/23/CE Low Voltage Directive.
- DI 89/336/CE Electro Magnetic Compatibility Directive
- EN 378-2 Safety and Environmental Directive.
- ***The European Restriction of the Use of Certain Hazardous Substances (RoHS)***.

* This 3 year warranty shall cover parts only. This warranty shall apply to fans, compressors and heat exchangers. This warranty shall be liable if the start up and periodic maintenance agreement is contracted by the equipment manufacturer or any company accredited by the equipment manufacturer.