



Neosys™ Air to Water Liquid Chiller and Heat Pump

Energy efficiency acoustic performance



						
LIQUID CHILLER 200kW			1000kW			
HEAT PUMP 200kW			500kW			

Neosys™ Air to Water Liquid Chiller and Heat Pump Product Overview



The Neosys™ delivers energy efficiency at full and partial load by the use of R410A multi scroll compressors and specific algorithms designed to reduce energy costs.

R410A, unequalled performance with reduced emissions

The Neosys™ is equipped with high performance cooling systems that reduce energy consumption by the use of R410A multi scroll* compressors and an optimised heat exchange area.

- Reduced power input for improved COP
- Increased isentropic efficiency of the compressors
- Greater power efficiency than other HFC fluids
- Zero potential for destruction of the Ozone layer
- Very low refrigerant charge to limit environmental impact



Multi scroll high performance compressors for optimum, long lasting efficiency

- Multi-stage power regulation giving high performance at partial load
- Solid reliability owing to disengagement of the spiral in the event of ingesting liquid or foreign particles (Compliant™ patented system)
- Safe operation. The machine retains at least 50% of its power through having twin cooling circuits



* Multi scroll from 47 kW to 200 kW.
Single scroll 25 to 43 kW.

Intelligent control that continuously optimises power consumption

With the 7 day time programming periods, Climatic™ control manages power consumption according to the use of the premises: automatic switching to occupation mode, unoccupied or frost-free. Regulation permits automatic winter/summer offsetting of water set point according to the outside air temperature.

Climatic™ regulation reduces the heat pump consumption by restricting the number of defrost cycles owing to the patented Dynamic™ Defrost. Depending on the size of the installation, Climatic™ regulation can control from one to eight units in master/slave or cascade operation and provides communication with the building management system (BMS) or Lennox Adalink™ monitoring.

- ModBUS®
- LonWorks®
- BacNET®
- Adalink™



“Designed to encourage eco-efficiency”



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One of the main features of the Neosys™ unit is an adjustable sound level for night and day to comply with the surrounding acoustic requirements.

Intelligent adaptation of the sound level

The Neosys™ is fitted with the patented Active Acoustic Attenuation System™ which enables the customer to program/set noise level by time slot and then choose the performance or required noise level mode. The Active Acoustic Attenuation System™ takes care of everything.



It automatically adjusts the airflow from the Owlet™ variable speed fans according to the building load while complying with the permitted sound level. It also enables floating condensing pressure management.

- Elimination of start/stop noises
- Adjustable sound level
- Floating condensing pressure

OWLET™ fans and acoustic attenuation of compressor noise

The Neosys™ is designed to achieve one of the lowest noise levels on the market. The principal technological innovations are the new fan blades and scroll compressor operation. Usage of Owlet™ fans, together with acoustic insulation of the compressor housings, Neosys™ has achieved acoustic performance that ensures compliance in noise sensitive locations.



“Owlet fan with profiled blades”

Neosys™

Air to Water Liquid Chiller and Heat Pump

Product Overview



The cost of pumping power represents more than 20% of the total energy cost

In a water system, the pump is one of the main energy consumption items. The energy cost of pumping can represent more than 20% of the total energy cost of a chiller. eDrive™ variable speed pump technology is part of the responses made by Lennox to save energy while exploring the possibilities of reducing installation costs.

The power consumption of the pump varies with the cube of the pump speed.

20% flow reduction = Power consumption reduced by 50%

40% flow reduction = Power consumption reduced by 80%

A 10 kW fixed speed pump operating 24h/24 consumes about 87,600 kWh a year or a power bill of \$13,140 (1 kWh = \$0.15 AUD). Choosing eDrive™ technology will save almost \$9,200 a year.

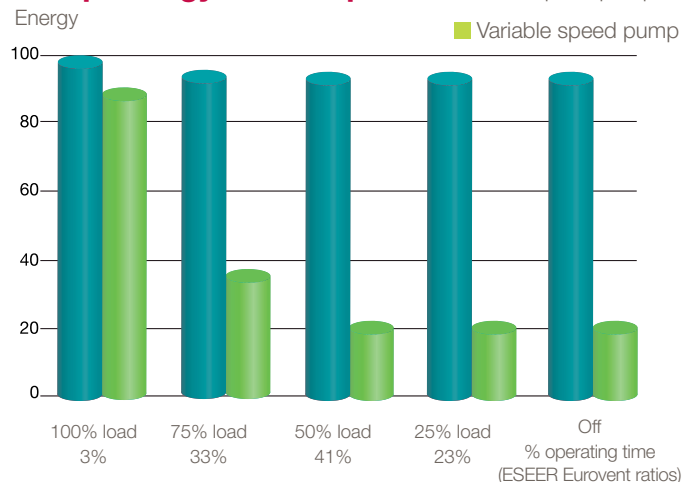
eDrive™ automatically controls energy costs

- At full load owing to electronic adjustment of the pump curve. Elimination of power losses caused by the manual water flow control valve
- At partial load by automatically reducing the pump speed when operating at reduced chiller load
- During shutdown periods of the cooler owing to operation of the pump at minimum speed
- On starting owing to the speed controller which reduces the starting current pump

The Neosys™ was designed in the spirit of Eco-design aiming to:

- **Limit toxic substances, use recyclable materials and reduce components:**
The Neosys™ uses HFC R410A cooling fluid which is an azeotropic mixture that does not damage the ozone layer. Its very low toxicity and non-flammability classify it in the “danger free” group according to ASHRAE standard. The micro channel and plate heat exchangers reduce the refrigerant charge by 40% thereby limiting the direct impact due to accidental loss of refrigerant (irregular loss associated with mechanical breakage or end of life cycle). Made entirely from aluminium, micro channel heat exchangers can be easily recycled and lead to a reduction in material in the order of 30% compared with traditional heat exchangers.

Pump energy consumption



- **Reduce energy consumption:**

The impact of our machines on global warming is mainly due to the primary energy used for their operation. The Neosys™ is designed to achieve optimised energy performance throughout the year and limits the indirect release of CO₂ associated with the consumption of electricity. The use of variable speed fans, the eDrive™ variable speed pump, the high performance of our air/water heat pump have earned Certificates of Energy Reduction (BAT-TH-12, BAT-TH-14 – France only). By reducing energy consumption, the Neosys™ also reduces the energy bill and limits emissions of CO₂. Refer to TEWI to measure the global warming impact (Total Equivalent Warming Impact = direct loss of refrigerant and indirect effect of CO₂ emissions from power consumption).

- **Extension of the life cycle, facilitate repair and end of life recycling:**

The Neosys™ is fitted with multiple scroll of very high reliability, “zero maintenance” compressors. In the event of a failure or the end of the life cycle of a compressor, partial replacement of one of the scroll compressors limits the impact of waste material. The micro- channel heat exchangers with very high corrosion resistance and fan motors fitted with ceramic bearings triple the life cycle of these components versus traditional components.



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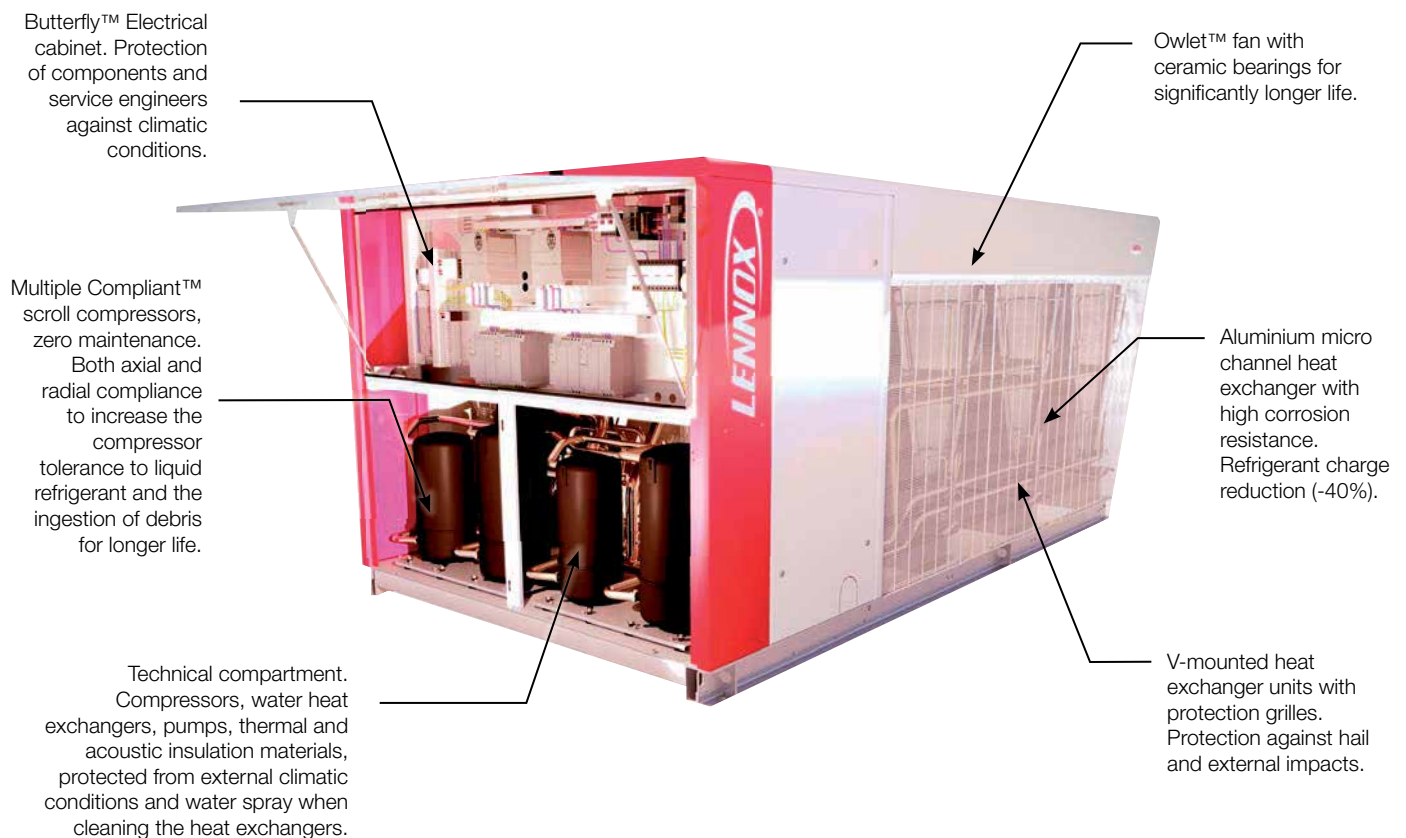


The design of the Neosys™ focused on performance and long life

- Extended qualification tests (vibration, functional, acoustic and field tests) to ensure superior reliability
- Aluminium micro channel heat exchanger (cooling only) providing 3 times the resistance to corrosion and a mechanical design that protects the fins and reduces clogging. These units are produced by automated production process to guarantee better reliability versus traditional units
- Compressors and hydraulic equipment installed in a special compartment, V-mounting of the heat exchangers protecting the components from external climatic conditions (rain, hail) and allowing the use of high pressure cleaners
- Zero maintenance scroll compressors with axial and radial Compliance® which permits disengagement of the spiral in the event of abnormal ingestion of liquid or foreign particles. This technology results in improved reliability and extended life
- Fans fitted with hybrid ceramic bearings which double the life cycle of the motors and reduce the noise level. This type of hybrid sealed ceramic bearing requires limited, or even zero maintenance



Aluminium micro channel heat exchanger



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Product Overview



Lennox designed the Neosys™ with a compact hydraulic module. The machine includes all the necessary hydraulic components: single or double pump, expansion vessel, air bleed, filter, electronic flow switch, manual or electronic water flow control valve, etc.

Neosys™ with low or high pressure pump

Depending on the nature of your hydraulic installation, Neosys™ can be fitted with the choice of a pump providing 150 or 250 kPa of pressure. To facilitate start-up, you can choose a classical hydraulic module with manual water flow control valve or, as an option, an electronic control, that will adjust the water flow to the actual requirements of the installation (optional eDrive™).

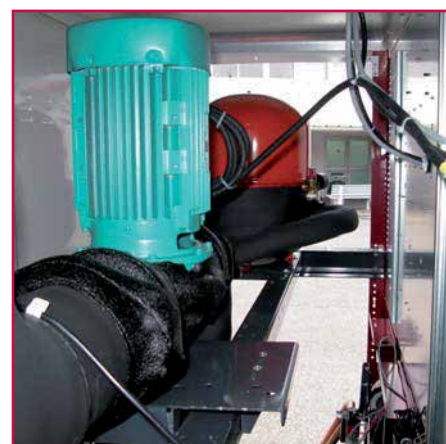
The eDrive™ variable water flow reduces installation costs

Up to now, two types of hydraulic systems were possible for liquid chillers: a “direct” constant flow circuit or a “decoupled” primary-secondary circuit with constant primary flow. The Neosys™ fitted with optional eDrive™ now offers a 3rd choice: variable primary flow. This is particularly beneficial in comparison with a “decoupled” circuit since only one pump is necessary.

Compared with a constant flow “direct” circuit, variable primary flow circuit may use 2-way valves on the terminal units instead of 3-way valves and thus contributes to reducing the installation cost.

In addition, the flow control valve is eliminated since the pump is electronically adjusted to the actual requirements of the plant.

These factors can considerably reduce the initial cost of the installation.



“Hydraulic module with low or high pressure pumps”

“Lennox eDrive™ variable primary water flow”



Lennox variable speed pump



Lennox speed controller



Lennox control Algorithms
Constant delta P mode: terminal units with 2-way valves.



Optional eDrive™
Variable Primary Water Flow by Lennox.

Neosys™

Air to Water Liquid Chiller and Heat Pump

Technical Information



Neosys™	NAC NAH	200	230	270	300	340	420	480	600	640	680	840	960
		200	230	270	300	340	420	480	-	-	-	-	-
Cooling capacity ⁽¹⁾	kW	208	236	273	308	351	430	490	605	627	702	860	980
EER		2.9	2.7	2.6	2.9	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
ESEER		4.2	4.0	4	4.0	4.2	4.2	4.0	4.2	4.2	4.2	4.2	4.0
Heating capacity ⁽²⁾	kW	219	252	313	346	370	459	509	-	-	-	-	-
COP		3.1	3.0	3.0	3.0	3.0	3.0	3.0	-	-	-	-	-
Length NAC	mm	3590			4620		5650		6680		9040	11100	
Length NAH	mm	3590			4620		5650				-		
Width / Height	mm	2280 / 1964											
Operating Weight	kg	1984	2011	2259	2648	2938	3512	3621	3992	4030	6720	8000	8160

Nominal conditions: (1) water 12/7°C, air 35°C
(2) water 40/45°C, air 7°C

Equipment	NAC (Cooling only)	*NAH (Heat pump)
Scroll compressors, brazed plate water heat exchanger, micro-channel air heat exchangers (cooling only) or copper/aluminium (heat pump), OWLET™ variable speed fans, R410A refrigerant, Butterfly™ electrical panel, main switch, CLIMATIC control™, Active Acoustic Attenuation System™, customer display, water filter and electronic flow switch, Victaulic™ connections, all protection grilles, 3 year guarantee on main parts. Full Hydraulics form part of standard delivery up to 640kW. Neosys also uses a true twin circuit brazed plate heat exchanger as the evaporator.	Standard	
Hydraulic module with single or twin low pressure pump	Option	Option
Hydraulic module with single or double low pressure pump	Option	Option
Hydraulic module, e-Drive™ single high pressure variable speed pump	Option	Option
Hydraulic module, double e-Drive™ high pressure variable speed pump	Option	Option
Anti-freeze heater	Option	Option
Winter operation down to -20°C ambient temperature (Including electronic expansion valve)	Option	-
Operation for low temperature glycol down to -10°C (Including electronic pressure reducing valve)	Option	-
Partial heat recovery	Option	Option
"Free cooling" module, 1x V or 2x V	Option	Option
Flange connection /Anti-vibration mounts	Options	Options
Thermoguard™/Blygold™ anti-corrosion condenser coil treatment	Option	Option
Energy meter/Electronic starter/Power factor correction	Options	Options
Remote display/Modbus/Bacnet/ Lonworks/Adalink™	Options	Options

* NAH series available only on specific request





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