

ENERGY OPTIMISATION

VERTICAL WATER-TO-AIR HEAT PUMPS



# NEPTUS

Water loop heat pumps of 24 to 93 kW

INNOVATIVE TECHNOLOGY  
FOR MORE EFFICIENT  
AIR CONDITIONING



COMFORT • AIR QUALITY •

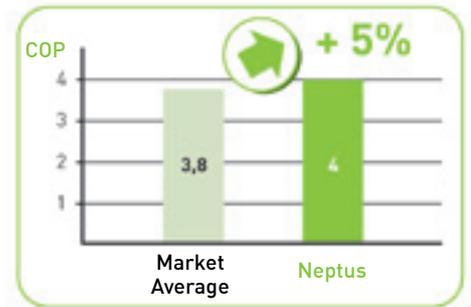
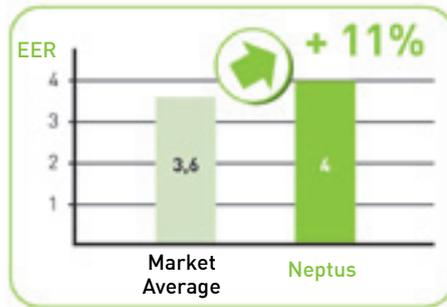
# Sustainable solutions

## Energy optimisation

### R-410A. Energy efficiency

Neptus uses R-410A, a refrigerant with ODP=0 and low TEWI, which respects the environment and the future for generations to come.

### Cutting-edge efficiency



### Plug-fan

New technology of backward-curved propylene-blade impellers which continually adapt to pressure drops from the duct system and filters in order to meet the commissioned air flow rate.

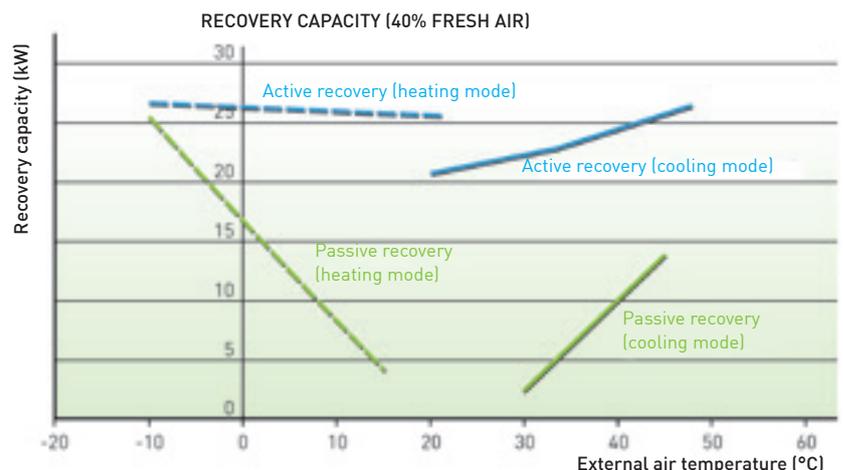
- EC (Electronically Commutated) **Hee** technology motor significantly increases efficiency and extends the system's lifecycle.
- Direct coupling eliminates the use of pulleys and belts, thereby reducing losses and eradicating maintenance costs.
- Increased efficiency of the ventilation system reduces energy consumption by up to 30%.

30% less electrical consumption



### Active recovery

Active recovery as opposed to conventional recovery systems (static) increases both recovery capacity and efficiency when the external temperature is moderate. A specific thermodynamic energy circuit integrated into the unit allows energy to be recovered from exhaust air (MRC assembly) which results in greater energy savings.





# Water-to-Air Heat Pumps

In the NEPTUS range of water-to-air heat pumps, water is the fluid that enables heat to be exchanged with the outdoor circuit. The unit supplies or acquires energy from the water contained in a water loop or exchanges energy with the ground (geothermal energy source).

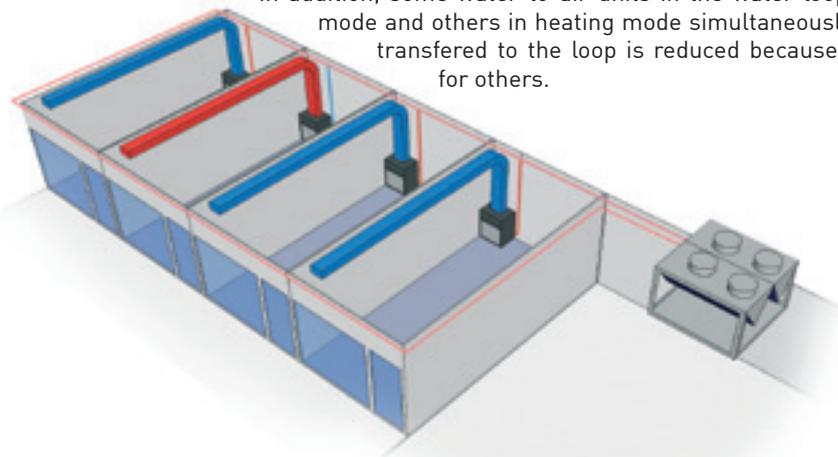
## Water Water loop

The topology of the installation is usually a closed loop in which water circulates by means of a circulation pump. This type of system is often used in multi-zone commercial buildings. This enables water to reach each zone and to supply the adequate temperature by exchanging energy.

Installing the water-to-air heat pumps in each independent zone or room means that only the unit for which heating or cooling is demanded is activated. As a result, this unit alone consumes energy that it collects from the water loop.

Equipment for water heating (boiler, air-water heat pump... ) and cooling (tower, dry-cooler...) is located at the extremity of this loop in order to keep the water at a constant temperature, generally between 20°C and 30°C. Thanks to the stability of the conditions and the temperature of the water loop, very high coefficients of performance can be reached.

In addition, some water-to-air units in the water loop may operate in cooling mode and others in heating mode simultaneously; as a result, the energy transferred to the loop is reduced because some units compensate for others.



## Geothermal applications

The water-to-air heat pumps can be connected to geothermal systems. The water, which acts as the exchange fluid in the outdoor circuit, recovers the energy contained in the ground using various techniques to maintain the appropriate temperature level.

This results in significant savings as no additional equipment (boiler, dry cooler, heat pump ...) is required.

Geothermal energy is renewable energy.



# Comfort

## Reliability

Designed to meet heating and cooling requirements in compliance with current regulations in the retail sector.

### Avant / Avant+

AVANT / AVANT+ controls have the following main functions as standard:

- Electronic control for different operating modes and operational parameters.
- Short-cycle protection management.
- Control of supply air temperature (Proportional Integral Control P+I).
- Weekly and daily scheduling.
- Management of running times and start-ups of fans and compressors.
- Diagnosis of faults and general alarms.

Various optional communication possibilities (BMS, LON, KNX...) and a new customer-oriented TCO thermostat with a wide range of functions are available.



### Avant Pro

The Avant Pro controls include all functions featured in Avant / Avant+ and in addition:

- Local Area Network, pLAN, which enables information from control panels and sensors to be exchanged for up to 15 units.
- The serial bus interface ensures the unit is connected to the required field by means of an optional board.
- Serial RS485 communication by expansion card (one card in each unit) with the following protocols:
  - Carel & Modbus
  - Lonworks
  - Ethernet & BACnet Ethernet
  - Konnex
  - BACnet
- pGD1 remote control panel.
- Fresh air management using air quality sensors.



### Condensation and evaporation pressure control

Possibility of controlling the condensation and evaporation pressure through a proportional valve which results in more effective management and adapts to the installation needs at any time.

## PlantVisor PR02 the future is here

Centralised management of the installations means significant savings in terms of maintenance and operating costs.

PlantVisor PR02 provides you with the tools necessary for controlling main operating parameters and for managing the energy of several installations from one single workstation. A simple internet connection provides access to all the information relating to the installation.

Its many options adapt to the needs and characteristics of the existing installation with ease.

The touch screen version PlantVisor PR02 "Touch" (see photo) is particularly ergonomic and user-friendly.



# Air quality

## Indoor air quality

### High filtration quality

#### Filtration and cleaning

There are two filtration stages, a first gravimetric (up to G4) or opacimetric (F6 or F7) stage plus an additional opacimetric stage (from F6 to F9). Sensors monitor the degree of filter fouling.

The easy-access filters facilitate maintenance with side or bottom extraction. The registers on the ventilation sections provide easy access to the fans, batteries and condensate pans for cleaning and maintenance.



### Fresh air management

#### Free cooling

The introduction of fresh air in free cooling mode means that free outdoor energy may be used making cooling by compressors redundant. The free cooling mode is particularly efficient for commercial premises and can be used over a significant number of months throughout the year. It results in substantial savings as the consumption of energy is reduced.

#### Renewal of hygienic fresh air

Neptus features outdoor air inlets, a mixing box and CO<sub>2</sub>, VOC and exhaust measurement sensors to ensure the correct concentration of air constituents. Fresh air management, using air quality sensors, reduces ventilation needs, and as a result significantly decreases electrical consumption while complying with the demands imposed by health and hygiene regulations (IAQ).

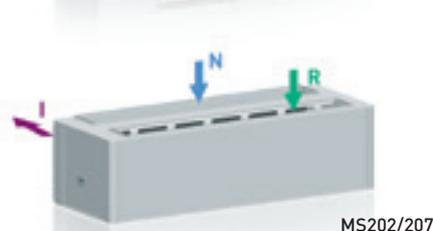
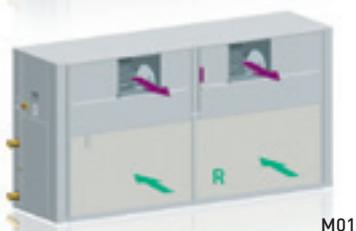
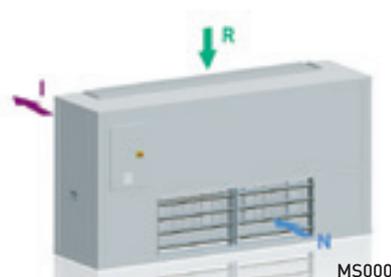
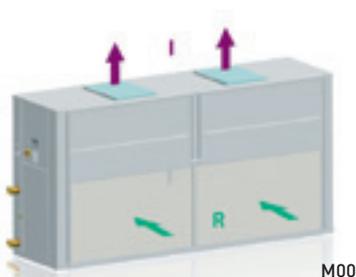


### Easy installation

The multiple assembly and air flow configurations available enable the machines to adapt to installation constraints with ease.

Main units

Mixing box (sizes 182 - 360)



Key

- |                |                        |
|----------------|------------------------|
| I = Outlet (*) | N = External air inlet |
| R = Return     | E = Exhaust air        |

(\*) In mixing boxes outlet air goes to main unit inlet

With over 80 years' experience, more than 2,000 employees and 6 production sites, CIAT has obtained ISO 14001 certification and is renowned as a major player in the HVAC industry.



**The CIAT Group:** European leader in heating, cooling and indoor air quality

# Specifications

NEPTUS XP MODEL		90	100	120	160	182	200	240	320	360
COOLING MODE (kw)	Pf <sup>(1)</sup>	24.4	28.6	31.5	40.7	46.4	57.4	63.3	84.4	93.2
	Pa <sup>(2)</sup>	6.0	7.4	8.1	10.3	11.0	14.7	16.1	19.5	22.4
	EER	4.1	3.9	3.9	3.9	4.2	3.9	3.9	4.3	4.2
HEATING MODE (kw)	Pc <sup>(2)</sup>	28.1	33.2	38.4	47.3	54.2	67.1	74.8	97.6	109.0
	Pa <sup>(3)</sup>	7.1	8.5	10.0	12.2	13.5	15.9	18.1	22.9	26.4
	COP	3.9	3.9	3.8	3.9	4.0	4.2	4.1	4.3	4.1
INDOOR CIRCUIT	Nom.Qa (m <sup>3</sup> /h)	4,700	6,100	6,400	7,300	8,400	11,800	12,800	15,000	17,000
	Avail.P. (mmwcl)	8	8	8	8	8	8	8	8	8
OUTDOOR CIRCUIT	Nom.Qw (m <sup>3</sup> /h)	5.2	6.1	6.7	8.7	9.8	12.2	13.5	17.7	19.6
DIMENSIONS (mm)	length	1,141	1,141	1,141	1,471	2,091	2,091	2,091	2,731	2,731
	width	859	859	859	859	859	859	859	859	859
	height	1,284	1,284	1,284	1,422	1,284	1,284	1,284	1,422	1,422

(1) Cooling capacity calculated in accordance with the UNE-EN-14511 standard given for inlet/outlet water temperature conditions at 30/35°C and indoor air temperature of 27°C (19°C WB)

(2) Heating capacity calculated in accordance with the UNE-EN-14511 standard given for inlet water temperature conditions of 15°C and indoor temperature conditions of 20°C

(3) Total power input by compressor and motorised fans under nominal conditions calculated in accordance with the UNE-EN-14511 standard



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