

# clima PRO

● PERFORMANCE ● RELIABILITY ● OPTIMISATION

Turn your  
plant room  
into a value  
generating asset

- ✓ Run the plant room at optimum efficiency
- ✓ Enhance your property's value and its appeal to tenants
- ✓ Improve uptime and system performance
- ✓ Reduce Maintenance costs

 **CLIMVENETA**  
SUSTAINABLE COMFORT

# In commercial buildings, HVAC is the most energy intensive system

Nearly half of the total energy consumption comes from the HVAC system.

By optimising the plant room conditions there is an immense potential for energy savings.

45%  
HVAC

26%  
Lighting

21%  
Other

8%  
Office

29%

of your building's total energy consumption is spent in the Plant Room



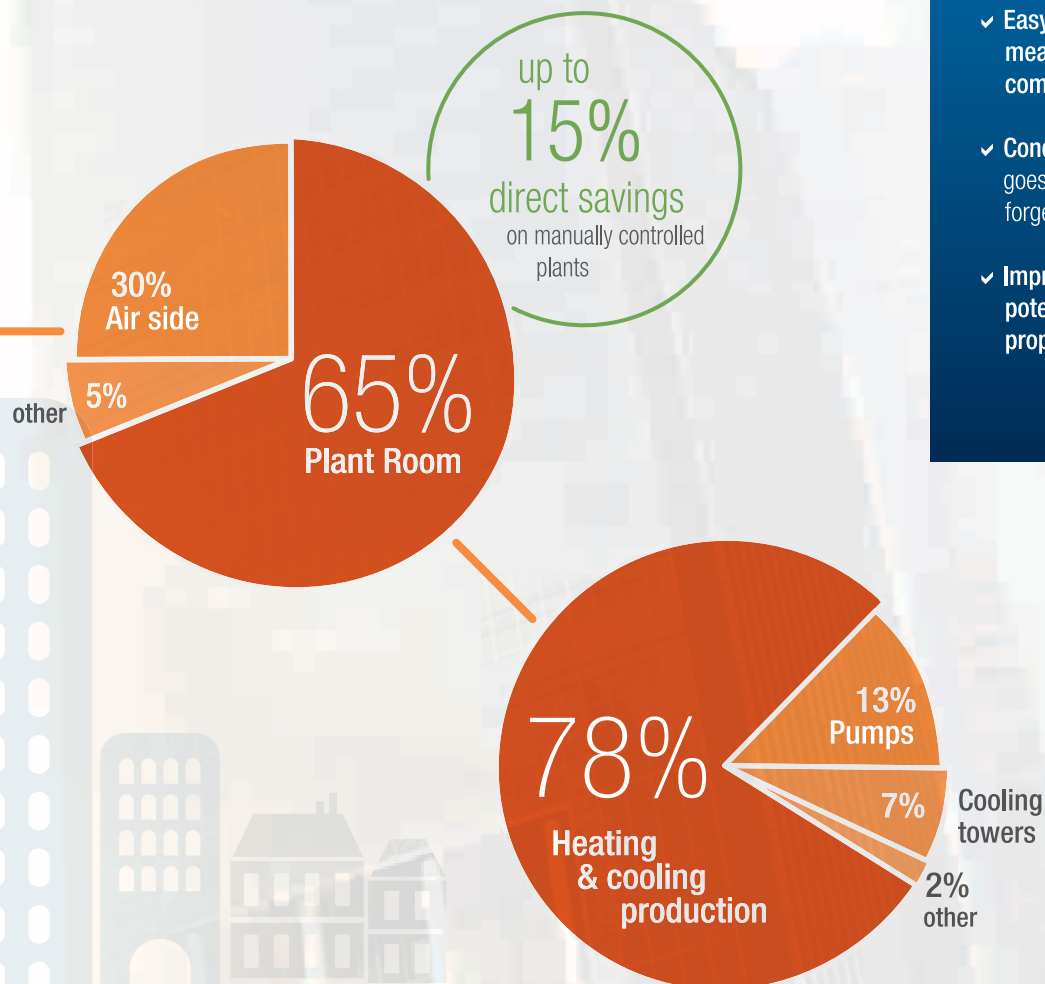
# Chiller plants provide one of the largest energy savings opportunities in any building

Climaveneta has developed a new, reliable, yet dynamic optimisation and control software solution: **ClimaPRO**.

Based on solid engineering principles and advanced pre-programmed control logic, ClimaPRO provides the best solution to realise the true energy savings potential in the plant room.

ClimaPRO is a simple to install, web based, easy to integrate, optimisation system that takes full control of the plant room, providing:

- ✓ **Direct savings in energy consumption** (typically 5 -15% on manually controlled plant)
- ✓ **Easy-to-access performance measurement of key plant room components**
- ✓ **Condition-based maintenance;** goes beyond the traditional 'fix and forget' regimes
- ✓ **Improved Green Building rating potential and enhanced property value**



# ClimaPRO

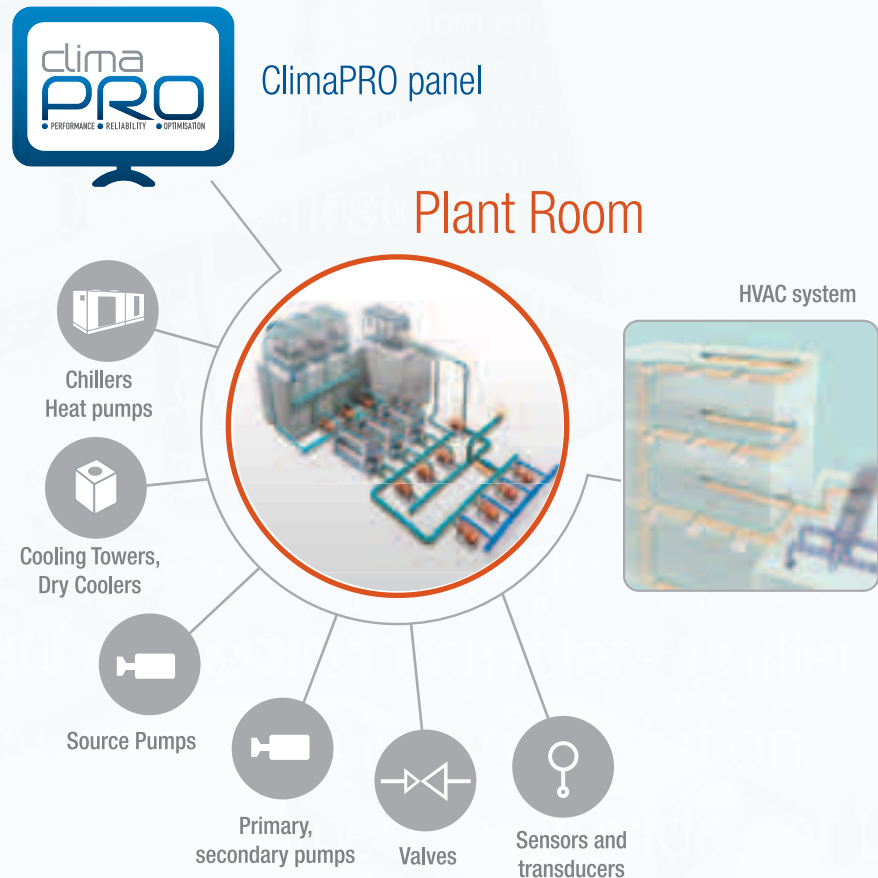
## The ultimate plant room optimisation solution

### The Solution

Developed from a history of innovative HVAC design & manufacturing experience, ClimaPRO carves out the plant room from the BMS, executing data and operations much more efficiently.

Thanks to advanced, built-in algorithms, the software:

- ✓ controls the main operating variables of all HVAC equipment
- ✓ manages the system more efficiently
- ✓ delivers seamlessly & transparently critical information to the BMS



The simple system architecture of ClimaPRO is designed on the following principles:

- 1 Performance feed-back loop operating logic,** instantaneously detecting changes to the plant and modifying actions accordingly.
- 2 Web based powerful user interface.** User profile based access with visibility tailored on specific user's needs.
- 3 High configurability** based on a powerful wizard preventing errors in programming.
- 4 State-of-the-art technology** Using industry standard communication protocols (Modbus, LonWorks, BACnet and BACnet over IP)
- 5 Modular approach** based on 5 independent, yet complimentary software modules

# Transparent integration with BMS and full control of the plant room



## Building Management Systems (BMS)

Full visibility of critical plant room variables, using standard open protocols (BACnet, LON or Modbus)



ClimaPRO offers further, unique functions that allow you to carve out the control of the plant room equipment from the BMS ensuring a greater focus on the HVAC system, thereby achieving an unchallenged quality of optimisation.

Its state-of-the-art technology infrastructure, designed to be completely transparent and integrated to the BMS, ensures full control of the system through various operating modules.

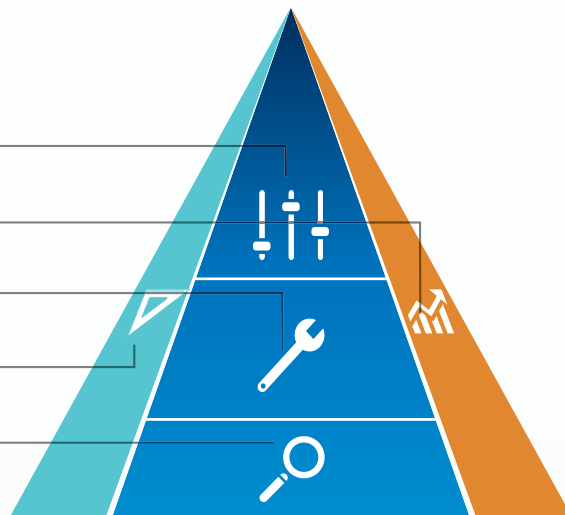
Control & Optimisation module

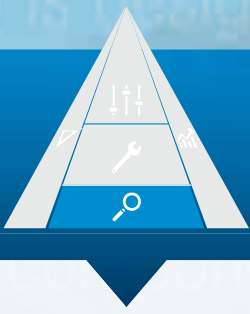
Reporting & Chart Building module

Maintenance & Diagnostics module

Measurement & Verification module

Management & Monitoring module





# Management and Monitoring

Providing local and remote access as well as complete visibility of the plant room



Operating over the Niagara Framework® by Tridium, ClimaPRO can be natively interfaced with any BMS or it can successfully perform all functions stand-alone:

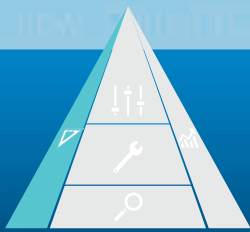
▶ **If operating under the BMS**

ClimaPRO manages the plant room according to BMS driven occupancy schedules or simple command signals, set-point changes.

▶ **When operating stand-alone**

ClimaPRO implements its own schedules and optimised control strategies to manage the plant room settings according to the demands of the building or process

- ✓ Powerful and intuitive graphic interface to monitor all the main operating variables
- ✓ Instantaneous overview of critical variables
- ✓ Web-based interface
- ✓ Local and remote monitoring from any computer connected on the LAN
- ✓ Stand-alone or 3-rd party integration
- ✓ Complete visibility of the plant room



# Measurement and Performance Verification

Calculates the actual system performance in real time whilst benchmarking against system design efficiency



- ✓ Comparison between actual performance and design data derived from the calculation engine
- ✓ Instantaneous overview of critical variables
- ✓ Calculation of efficiency indices (EER, COP, TER)
- ✓ Measurement of plant room costs and CO<sub>2</sub> emissions

Actual measured efficiency data is accurately compared with the design data of each single unit at various working conditions to measure and calculate efficiency and performance indices of the whole plant room.

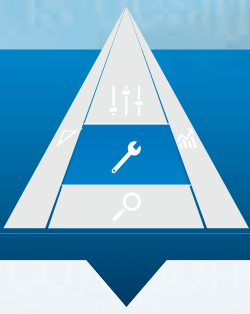
In particular it provides specific real-time calculations at:

## Unit level

- ▶ Measure
  - cooling and heating capacity delivered
  - instantaneous free energy produced
  - energy absorbed
  - actual EER, COP and TER values.
- ▶ Compare actual efficiency values with the design efficiency at the same measured operating conditions
- ▶ Check validity for sensor calibration control

## Plant room level

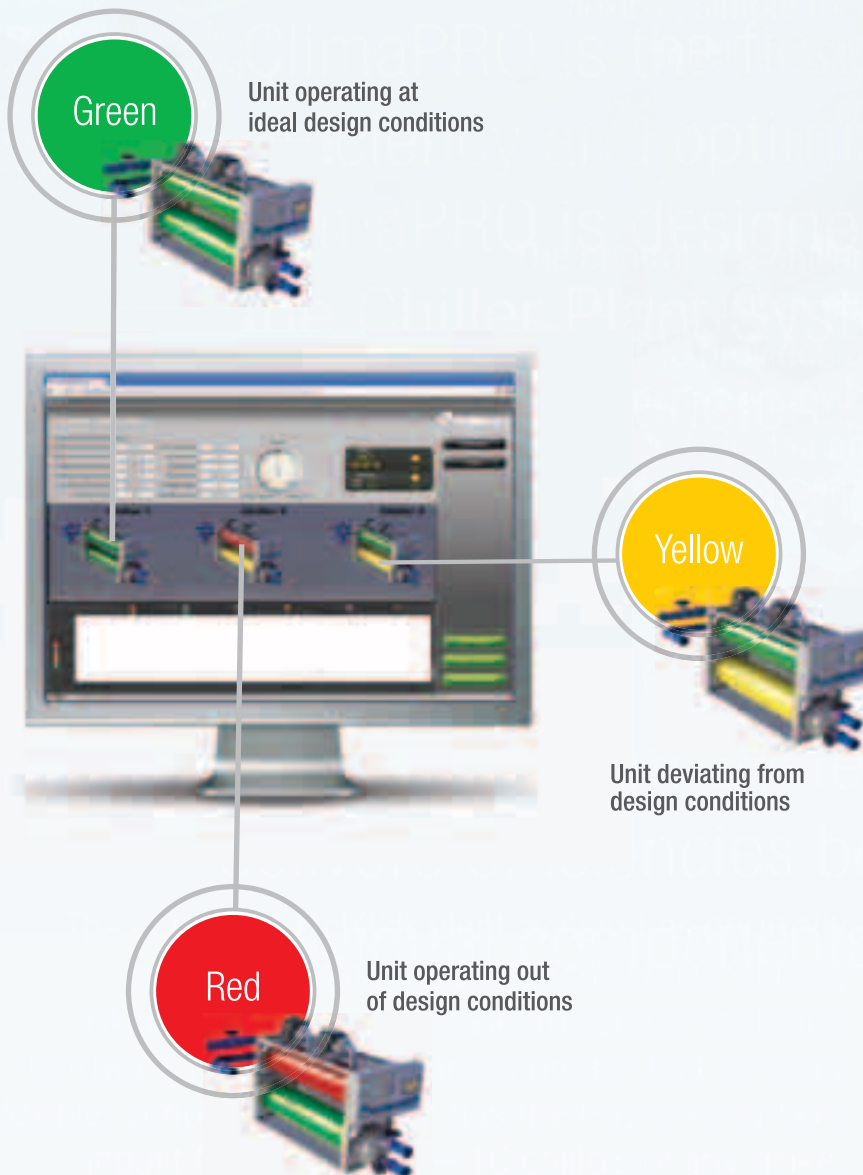
- ▶ Measure
  - total cooling and heating capacity delivered
  - instantaneous total free energy produced by the plant room
  - total energy absorbed
  - full plant room efficiency
  - cost for producing each kilowatt of cooling and heating capacity delivered by the plant room
  - plant CO<sub>2</sub> emissions



# Maintenance and Diagnostics

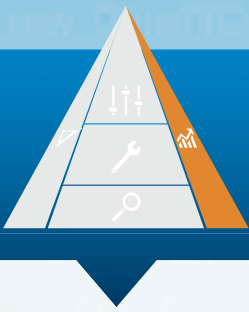
Early detection of system faults for enhanced uptime and minimised efficiency losses

The advanced diagnostic module allows the effective performance level of each unit to be easily assessed. By using comparisons of live conditions versus those at start-up, and built-in diagnostic analysis, this module translates complex data into easy-to-read information:



- ✓ Real time monitoring of the system status
- ✓ Simple, easy-to-read colour graphics
- ✓ Automatic display of the effective performance of key components in each HVAC unit.
- ✓ Advanced plant diagnostics integrating alarm acknowledgement
- ✓ Simplification and optimisation of maintenance activities
- ✓ Early detection of system faults
- ✓ Early warning system to support service activity





# Reporting and Chart Building

Turning data into valuable, easy-to-read, actionable system knowledge

ClimaPRO incorporates a powerful and comprehensive report & chart builder module

Monthly Plant Report			
ClimaPRO Monthly Plant Report			climaPRO
Ferrante Aperti			page 1
2013-12-31			
<b>Plant Report</b>			
	December 2013	No Yearly Data	TER
Electricity Used	54,062 kWh	82,113	7
Electricity Cost	3,794	5,676	6
Cooling Produced	21,024 kW/h	31,536	5
Heating Produced	262,800 kW/h	394,200	4
Total Free Energy	19,973 kW/h	29,959	3
Run Hours	740	1,110	2
Avg TER	5.25	5.18	1

<b>Unit Report</b>			
Eracs_1	MTD	Diagnostics	MTD
Avg TER	6.75	lowCoolLoadDiag	60%
Electricity Used	21,024 kW/h	Sensor Imbalance Circuit 1	10%
Electricity Cost	1,472	Fouled/Scalced Evaporator circuit 1	9%
Energy Cost	0.010	Low Refrigerant Level Circuit 1	7%
Cooling Produced	10,512 kW/h	-	-
Heating Produced	131,400 kW/h	-	-
Total Free Energy	9,986 kW/h	-	-
Run Hours	180	-	-
Unit Starts	151	-	-

## 'Report' module

- ▶ Prepares and sends reports to individually selected users
- ▶ Presents information at the right level of detail according to different user profiles
- ▶ Uniquely supports real time system efficiency performance analysis and maintenance
- ▶ Includes system data and analysis of the main plant room Climaveneta HVAC devices as well as the energy indices for each single unit and the entire chiller plant

- ✓ Configurable charts for easy trend analysis
- ✓ Easy-to-read reports with downtime analysis
- ✓ Instantaneous dynamic efficiency indices and trends display
- ✓ Customised analysis and dedicated reports for different users
- ✓ Clear information displayed at the right level of detail according to the user profile

## 'Chart Builder' module

ClimaPRO includes a customisable Chart Builder function:

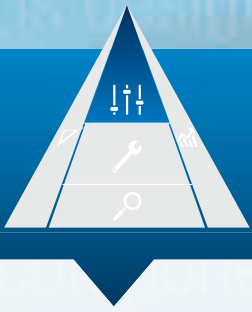


A large set of pre-configured charts are available as standard for all users



Certain user profiles can easily create their own customised charts by selecting any combination of ALL the measured variables in the system — from the entire data-points list





# Control and Optimisation

Runs the plant room at the optimal energy consumption rate by

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**PRO**  
● PERFORMANCE ● RELIABILITY ● OPTIMISATION

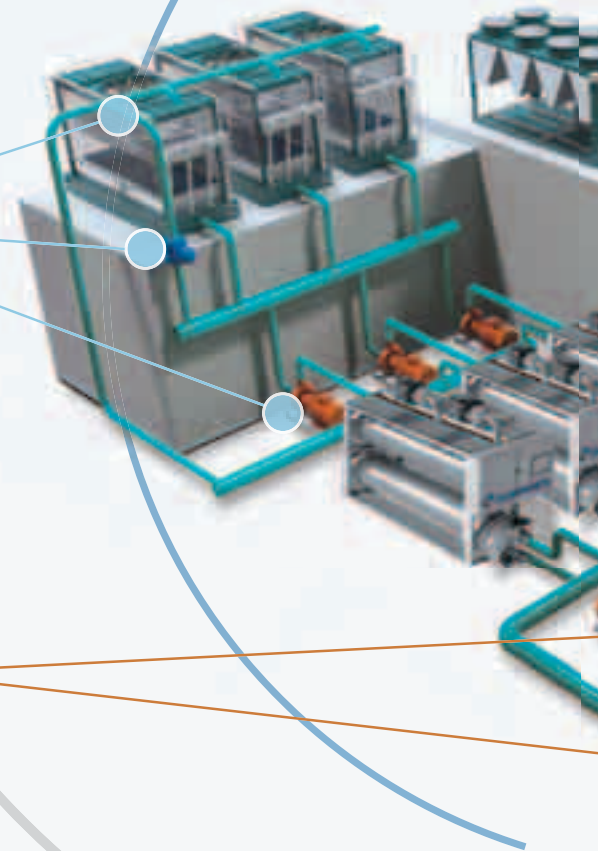
ClimaPRO continuously optimises the plant working conditions by promptly adjusting equipment staging and

## Source side

- ✓ **Advanced control of any type of source-side loop** (e.g. well water, river, ground or air source loops, cooling tower basin and dry coolers, etc )
- ✓ **Smart reduction of the condenser water temperature, whenever possible**

## Distribution

- ✓ **Re-set of chilled and hot water set-points**
- ✓ **Managing of all possible piping configurations** (constant or variable flow circuits)
- ✓ **More accurate control over the variable speed pump-sets**

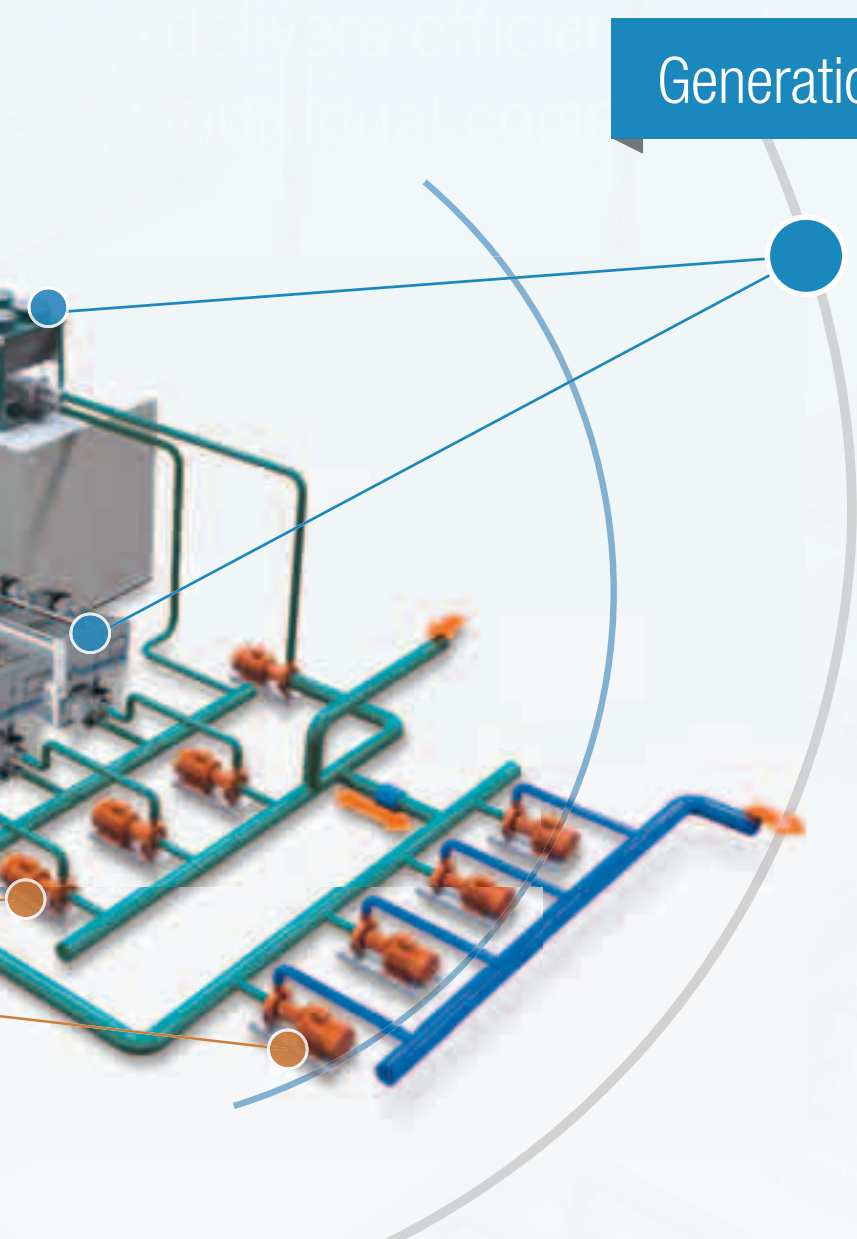


controlling all HVAC equipment and the main system devices

## Energy and optimisation solutions

sequencing, managing operating set-points as well as controlling water flows throughout the entire HVAC system.

### Generation

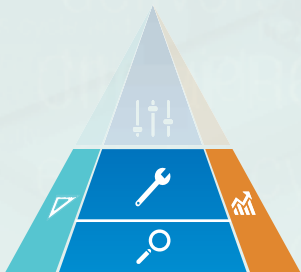
- 
- ✓ **Intelligent staging and sequencing of chillers, heat pumps, 4-pipe systems**, according to the performance profile of the HVAC unit
  - ✓ **Efficient and effective integration of diverse technologies** (scroll, screw and centrifugal compressors, various refrigerant types, fixed and variable speed air- and water source)
  - ✓ **Reliable management of redundancy** in mission-critical applications
  - ✓ **Smart management of the best operating condition of each HVAC unit to reduce energy consumption**

# ClimaPRO solutions Two Packages...

Achieving both direct and indirect savings. In both new and existing installations, ClimaPRO is the most effective tool for enabling and executing a successful energy reduction strategy. This comprehensive and complete approach has been possible thanks to the development of two different packages with specific features.

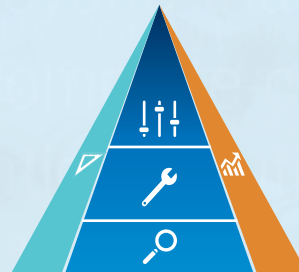
## ClimaPRO Silver Package

- x Control & Optimisation
- ✓ Report & Chart Building
- ✓ Maintenance & Diagnostics
- ✓ Measurement & Verification
- ✓ Management & Monitoring



## ClimaPRO Gold Package

- ✓ Control & Optimisation
- ✓ Report & Chart Building
- ✓ Maintenance & Diagnostics
- ✓ Measurement & Verification
- ✓ Management & Monitoring



### Silver Package



Maintain HVAC unit conditions under control (diagnostic)



Rating HVAC unit performance



Enabling condition-based maintenance



Charting for historical data, Energy Reporting and Downtime analysis



Early detection of potential faults and thereby cost avoidance



Reporting plant performance, energy consumption and downtime analysis

### Gold Package



Takes full control of the plant room



Runs the plant at the optimum efficiency



Includes all the options and functionalities featured by the CPMV version

...One proven, elegantly simple, yet powerful and reliable solution

In-depth, precise measurement of the performance of the building is a key factor in every successful energy reduction strategy.



ClimaPRO, thanks to its advanced system architecture is the ideal solution to address all these needs . Using this simple optimisation and control system in your plant room, you can ensure:

- ✓ Lower operating cost
- ✓ Better energy efficiency
- ✓ Longer life of building assets
- ✓ Better occupant comfort
- ✓ Improved output and productivity
- ✓ Greater visibility and control of operations
- ✓ Higher building value
- ✓ Improved sustainability

# “By far the best

Providing highly efficient HVAC and HPAC systems has been always one of the core values of Climaveneta's vision.

## Aporti Palace

Milan (Italy)

### Application

Office building  
retrofit installation

### Type of system

4-pipe

### Description of the plant

2,4 MW cooling and heating  
4 x Climaveneta ERACS 2-Q  
2 pump set per unit (primary loop)  
2 common pumps on secondary loop  
1 ClimaPRO plant room optimiser  
- Silver package

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### Achievements

- ✓ Increases the level of optimisation
- ✓ Detailed measurement of the electrical power consumption of the plant room
- ✓ Rationalises costs of maintenance activities and improves service levels
- ✓ Supports the local “Energy Manager” with a reliable tool for calculating cost vs occupancy

## Sheraton Mirage Resort

Gold Coast (Australia)

### Application

Hotel  
retrofit installation

### Type of system

4-pipe

### Description of the plant

3 Megawatt total cooling and heating capacity  
2 high efficiency TECS units  
1 ERACS-W heat pump for combined production of heating and cooling  
4 Cooling Towers  
1 ClimaPRO plant room optimiser  
Gold package

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# proof is experience”

ClimaPRO follows this extensive experience in controlling and integrating HVAC systems contributing to making properties more efficient and profitable through a optimal plant room control.

## Amazon

Piacenza (Italy)

### Application

Industrial  
New building

### Type of system

4-pipe

### Installed units

4 Megawatt total cooling and heating capacity  
3 x Climaveneta ERACS 2-Q  
2 x Climaveneta FOCS2-N  
1 ClimaPRO plant room optimisation system  
Gold package



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### Achievements

- ✓ Runs the plant room at optimum efficiency providing simultaneous cooling and heating energy
- ✓ Provides a complete stand alone solution due to the system independency with respect to the local BMS
- ✓ Supports the local Building Manager with adequate energy reporting system
- ✓ Assists service staff for predictive maintenance and continuous commissioning activities

## Bowe St.

Canberra (Australia)

### Application

Office building  
Retrofit installation

### Type of system

4-pipe

### Installed units

700 kW total cooling capacity  
2 water cooled NECS-W chillers  
2 cooling towers  
1 ClimaPRO plant room optimisation system Silver package



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### Achievements

- ✓ From Nabers 3 to Nabers 5 star rating
- ✓ 40% increased energy efficiency
- ✓ Increased rental potential
- ✓ Optimised use of the cooling towers and condenser water temperature
- ✓ Optimised use of the pumping energy

The control of a chiller plant system has generally

For solutions-based guidance on how Climaveneta's innovative, proven ClimaPRO systems will contribute to the ongoing success and profitability of your building...

contact our sales team:



[climaveneta.com](http://climaveneta.com)

Accreditations



Climaveneta is the European leader in central climate control systems, providing high efficiency, sustainable HVAC & HPAC solutions for commercial, retail, residential, and data centre customers. With 40 years' experience, Climaveneta's solutions-led approach combines optimum comfort and premium energy efficiency to ensure an attractive return on investment and the highest

Memberships



standards of environmental respect in each type of building. Manufactured in 9 specialised production centres in Europe, China and India, Climaveneta integrates air-conditioning, heating, process cooling solutions with measurement devices and services in the most prestigious, complex and demanding projects worldwide through its global network of branches and business partners.

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