Adjustment Control Units
Radiant Panels

FIXED POINT OR WEATHER COMPENSATION CONTROL FOR HEATING AND COOLING WITH MODBUS-RTU REMOTE MANAGEMENT

USE

- **Temperature regulation control modern radiant panel heating and/or cooling systems.**

FUNCTIONS

- **Fixed-point or weather compensation for heating regulation**
- **Fixed-point or dew-point tracking for cooling regulation**
- **Summer/winter switching**
- **System pump management with room thermostat control**
- **Electronic security system against over temperature**
- **Control of the adiabatic room dehumidification system with integration function**
- **Remote management with Modbus-RTU protocol**

APPLICATIONS

- The control unit can be combined with all Comparato's motorised valves with **3-POINT CONTROL**

Modbus Adjustment control units

TECHNICAL FEATURES	codice CPRMB0
Power supply	230V 50/60 Hz
Input power	9 VA
Motorised valve control output	2 x triac protected by varistor 275 Vac
Motorised valve control	3-point
Motorised valve maximum consumption	0.5 A
Box material	Polycarbonate + ABS
Protection degree	IP40
Operational room temperature	-10°C ÷ 50°C, RH max 85%
Flow temperature probe	contact-type NTC 10kΩ, 80 cm length
Electronic adjuster	PID
Fixed-point heating temperature adjustment range	24°C ÷ 50°C
Fixed-point cooling temperature adjustment range	10°C ÷ 30°C
Precision	± 1°C
Serial interface	RS485
Communication protocol	Modbus RTU
System pump relay flow rate	1 A
Input signals	
Room thermostat	connect to a device with voltage-free contacts
Summer/winter selector	connect to a device with voltage-free contacts
External probe for climatic function	NTC 10kΩ type
Room temperature sensor	NTC 10kΩ s type
Relative humidity sensor	0-10V proportional signal (4-20mA on request)
Output signals	
System pump relay control	N.A, max 250V 1A resistive
Summer / winter mode warning	N.A, max. 24V DC 50mA
Adiabatic dryer activation	N.A, max. 24V DC 50mA
Activation of integration function	N.A, max. 24V DC 50mA
Maintenance	None
Certification	CE

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OPERATION

The control units are used in modern heating and cooling systems equipped with floor, wall or ceiling radiant panels. Once the motorised valve has been installed in the system, it is possible to select the type of operation, enabling or disabling the various functions.

HEATING

- **Fixed-point regulation:** the setpoint temperature for winter heating and summer cooling is set by means keyboard and display. The control unit is activated by the room thermostat and keeps the outlet temperature constant on the setpoint value with an accuracy of +/- 1°C.
- **Weather compensation:** the outlet temperature to the radiant system is automatically calculated by the software according to the external temperature detected by the relevant probe (optional), following programmable climatic curves. The setpoint value is calculated by means of the following equation:

  Tsetpoint = (Texternal * C1) + C2

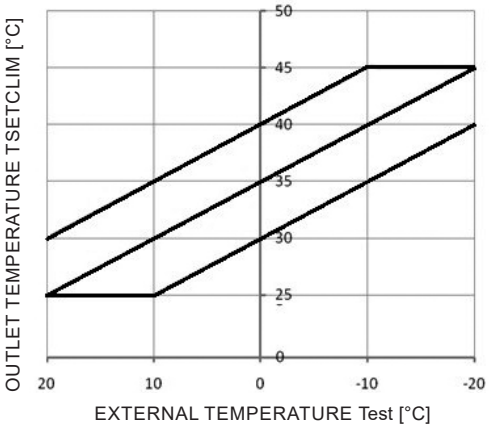
  where:

  Texternal = temperature measured by the external probe.

  C1 = slope of the climatic curve.

  C2 = outlet temperature to the system when the outside temperature is 0°C.

EXAMPLE WITH C1 = 0.5



The setpoint temperature is constrained to a temperature range of [+25°C; +45°C].

COOLING

- **Fixed-point regulation:** the temperature delivered to the radiant system is kept constant according to the design value. In this configuration, the relative humidity adjustment within the air-conditioned rooms is managed by dedicated management devices. If the relative humidity and ambient temperature probe (optional) is connected, if the outlet temperature reaches the calculated dew point, the control unit triggers an alarm by closing a digital contact and a warning appears on the display. Moreover, the relative humidity value is constantly monitored and compared with a programmable reference value: if the threshold value is exceeded, the control unit activates a special alarm by closing a digital contact and a warning appears on the display.
- **Continuous cooling adjustment with relative humidity control:** the outlet temperature to the radiant system is kept close to the dew point temperature calculated by means of the relative humidity and room temperature probe (optional). In order to keep the relative humidity below a reference value, the dehumidification system is activated or deactivated depending on the maximum relative humidity set on the motorised valve. If the dehumidifiers have an integration function, it is possible to set a minimum room temperature beyond which the motorised valve activates the function in order to introduce dry air at a lower temperature than the room temperature into the housing unit.

SUMMER / WINTER SWITCHING

The summer/winter function modifies the control and management logic of the control unit during the transition from summertime (cooling) to wintertime (heating). The switching can be done locally using the keyboard and display or remotely by means of a digital contact.

SYSTEM MANAGEMENT

The control unit receives the activation command from the room thermostat (not included). The system pump (not included) starts and the electronic system, which operates by means of PID algorithm, controls the outlet temperature according to the pre-set values. When the room thermostat sends the signal to cut the power supply to the system, the control unit locks the pump, stops the regulation and connects the outlet (mixed) way to the system return: this avoids any temperature fluctuation at system restart, which could activate the thermal security devices.

ELECTRONIC SAFETY

It is possible to set two limit temperature for the fluid: one for winter heating and one for summer cooling. When these values are exceeded, the control unit enters the “safety” mode: it stops the pump and connects the common (mixed) way to the system return. The display shows an alarm message and the system resumes its normal operation only when the temperature returns within the normal operation temperature limits.

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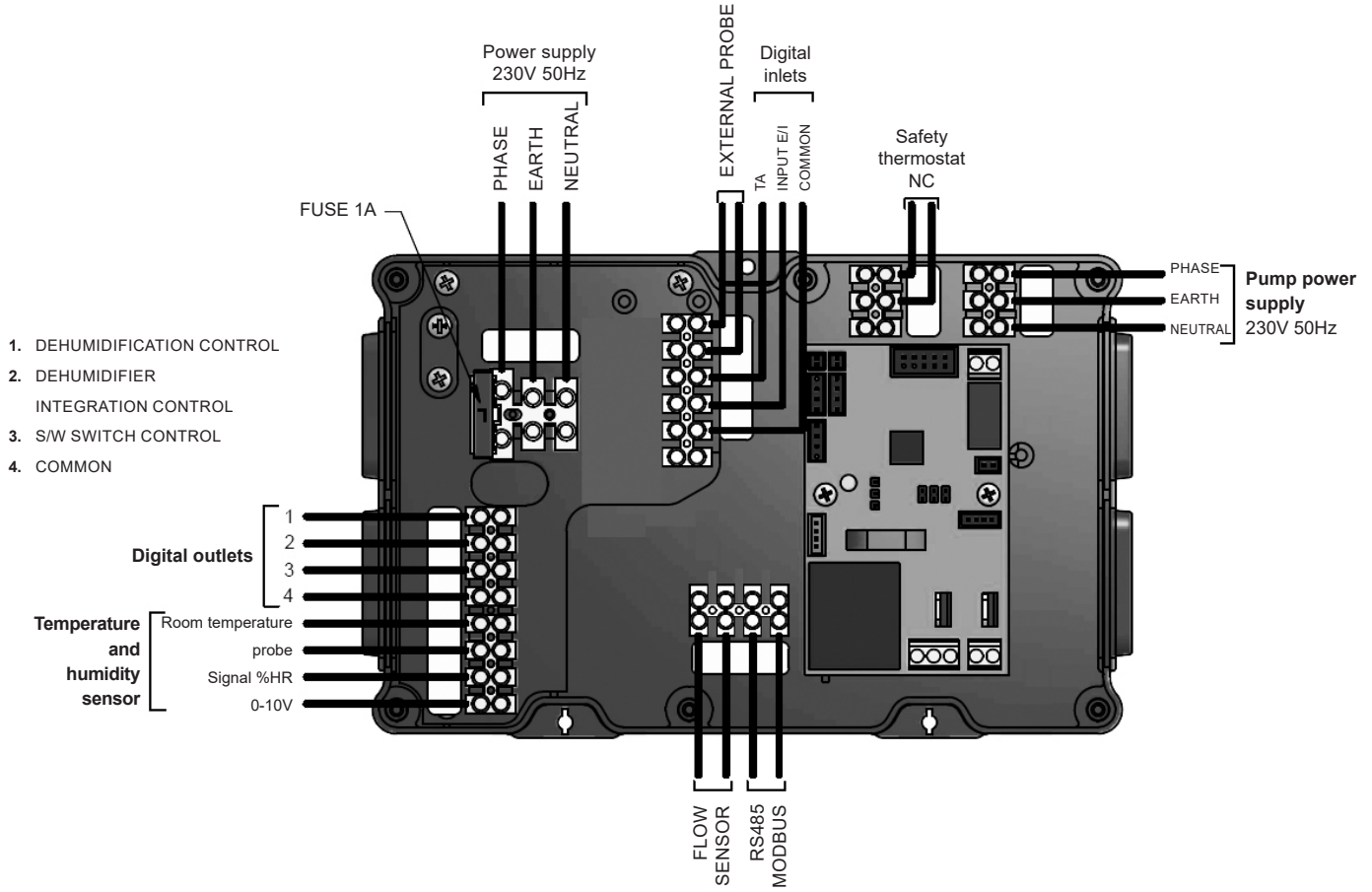
REMOTE MANAGEMENT - Modbus RTU

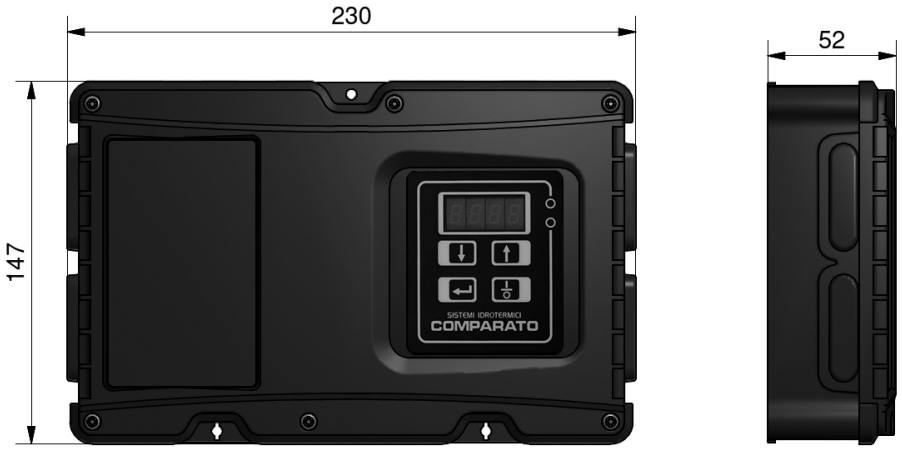
MODBUS RTU

The control unit is equipped with a MODBUS RTU interface; using the RS485 serial connection, it is possible to modify all the operating parameters, send commands to the valve and receive information on the operating status. The control units can be connected to the modern Building Management (BMS). The Modbus address table can be downloaded from www.comparato.com.

ELECTRICAL CONNECTIONS



OVERALL SIZE



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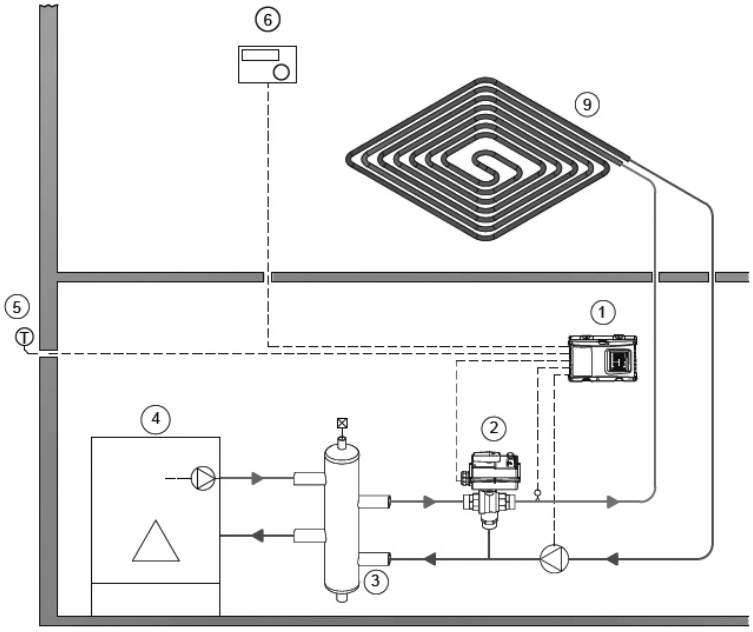
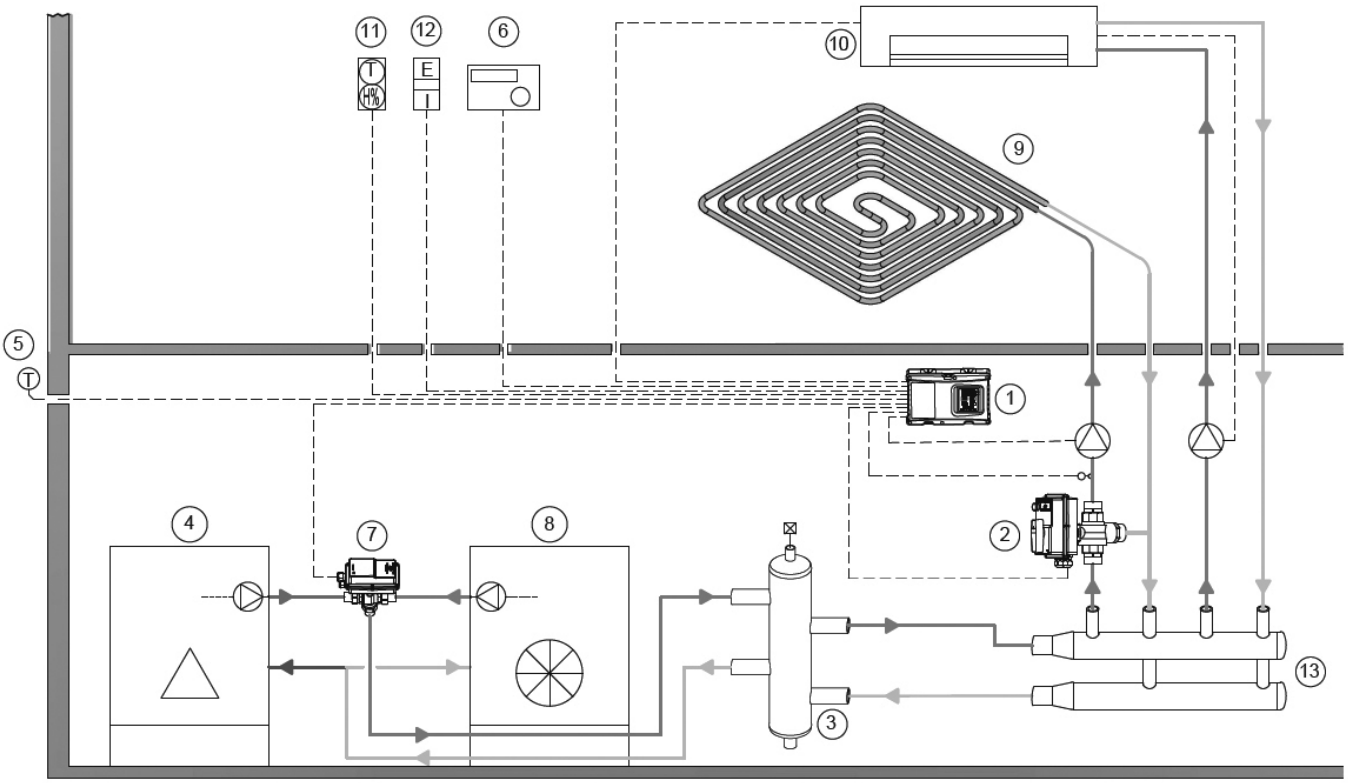
APPLICATION EXAMPLES

RADIANT HEATING SYSTEM ADJUSTMENT



1. Control unit of radiant panels
2. 3-point **COMPARATO motorised valve**
3. **DIACOM** hydraulic separator
4. Boiler
5. External temperature probe for weather compensation
6. Room thermostat
7. Diverter motorised valve
8. Chiller
9. Radiant panel system
10. Dehumidifier
11. Room temperature and humidity sensor
12. Summer/winter selector
13. **DIACOL** manifold

RADIANT HEATING AND COOLING SYSTEM ADJUSTMENT



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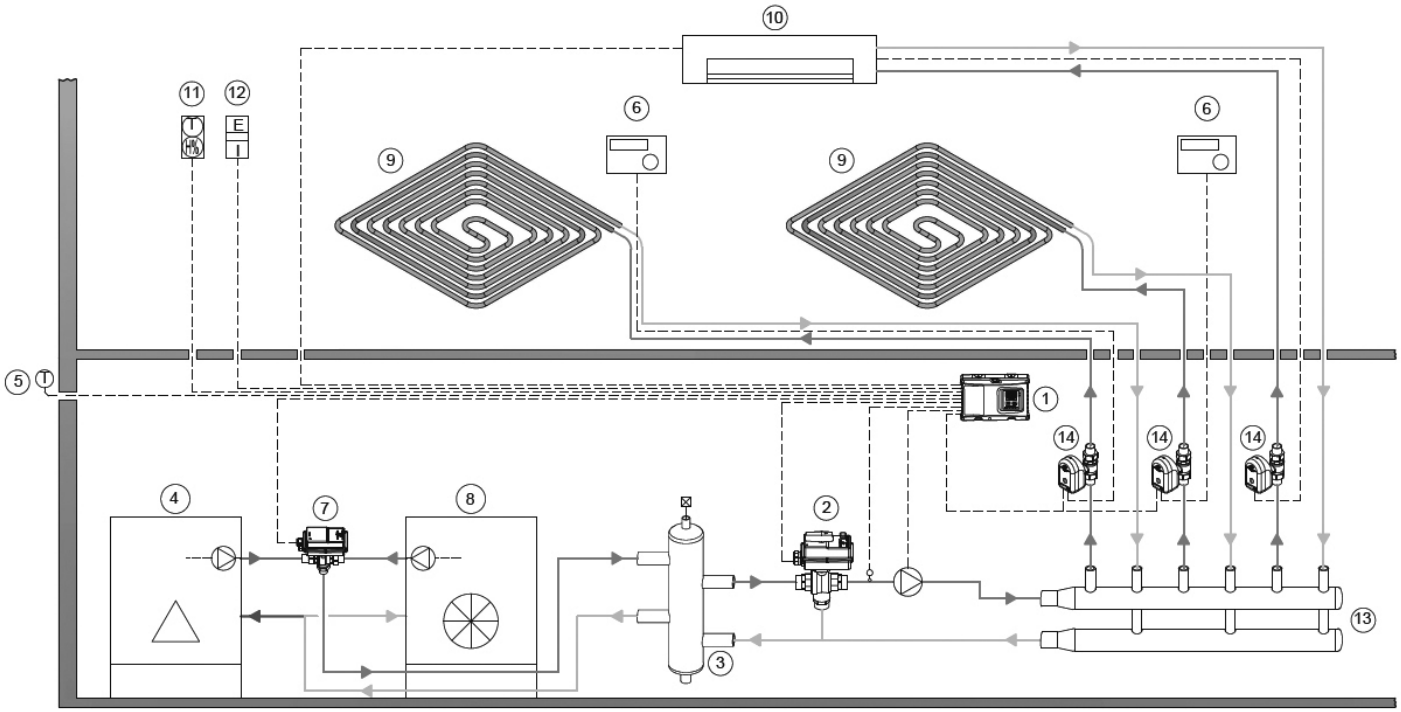
APPLICATION EXAMPLE

RADIANT HEATING AND COOLING SYSTEM ADJUSTMENT WITH ZONE DISTRIBUTION



1. Control unit for radiant panels
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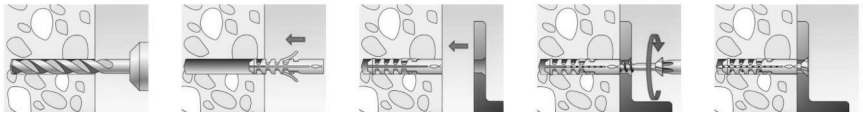
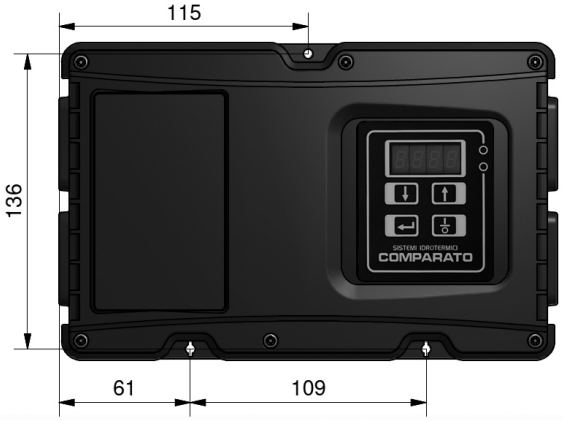
10. Dehumidifier
11. Room temperature and humidity sensor
12. Summer / winter selector
13. **DIACOL** manifold
14. **SINTESI** zone valve

ASSEMBLY

The installer must arrange the installation wall according to the sizes shown on page 3. Three Ø5 mm plugs (not included) must be used to secure the control unit; they must be suitable for the type of wall chosen for installation.





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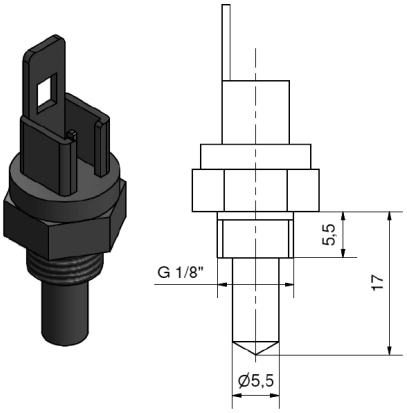
ACCESSORIES

BRASS IMMERSION PROBE WITH CONNECTOR • Add **"K"** to the end of the code



NOTE: sensor plug not included

EXTERAL TEMPERATURE PROBE • Code **RFSONDAE**

Case material: plastic
Thermal well material: stainless steel
Operating environmental conditions -40°C ÷ 100°C, relative humidity: 0 ÷ 100%
Sensor: NTC
Minimum insulation resistance: 100Ω to 100Vdc
Degree of protection: IP65

TEMPERATURE AND RELATIVE HUMIDITY PROBE

Code **RFTRUEE10**

Wall mounting, IP30
Humidity working range = 0...95% Rh
Analog output 0-10v relative humidity
Temperature sensor: NTC
Power supply 15 - 40V DC / 24V AC

EXAMPLE OF SPECIFICATIONS

CONTROL UNIT FOR FIXED-POINT CLIMATIC CONTROL RADIANT PANELS FOR HEATING WITH COOLING AND REMOTE MODBUS-RTU MANAGEMENT • control output for 3-point motorised valve, with contact outlet temperature probe; 230V 50/60 Hz power supply, fixed-point heating control range 24°C÷50°C, fixed-point cooling range 10°C÷30°C, input signals for room thermostat, summer/winter switch, output signals for system pump control, summer/winter output signal, adiabatic dryer activation and integration activation, protection degree IP40.

Brand: **COMPARATO**
Code: **CPRMB0**

EXTERNAL PROBE for weather compensation function.

Brand: **COMPARATO**
Code: **RFSONDAE**

ROOM TEMPERATURE AND RELATIVE HUMIDITY SENSOR for anti-condensing function.

Brand: **COMPARATO**
Code: **RFTRUEE10**

UPDATED DATA SHEETS AVAILABLE AT www.comparato.com

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HYDROTHERMAL SYSTEMS
COMPARATO NELLO s.r.l.
17014 CAIRO MONTENOTTE (SV) ITALIA VIALE DELLA LIBERTÀ • LOCALITÀ FERRANIA • Tel. +39 019 510.371 - FAX +39 019 517.102
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