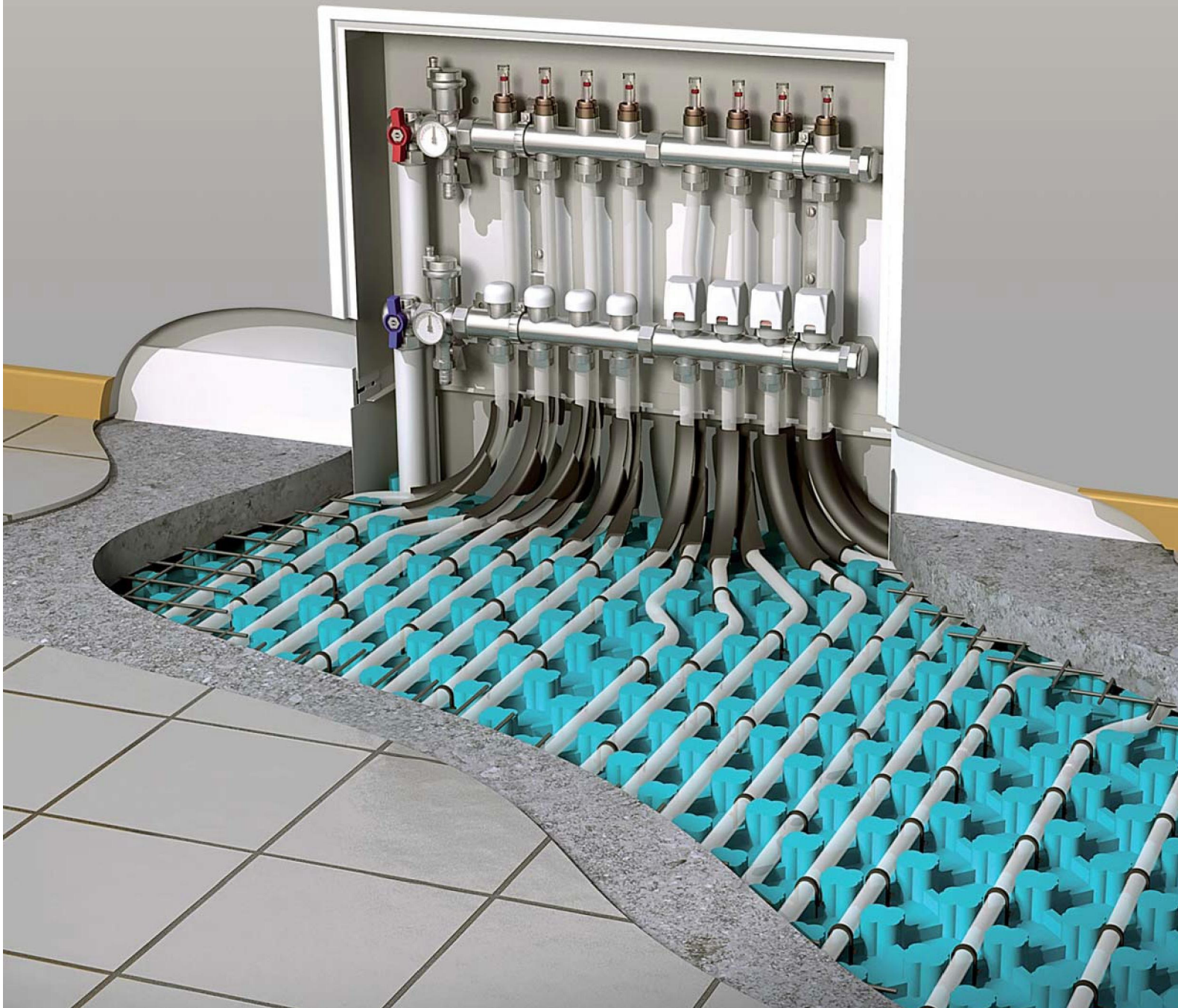


# Underfloor heating systems



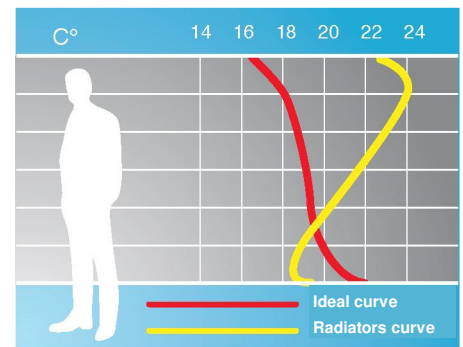
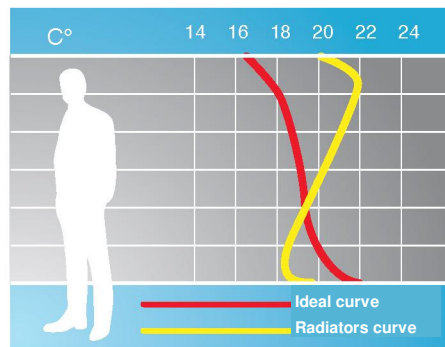
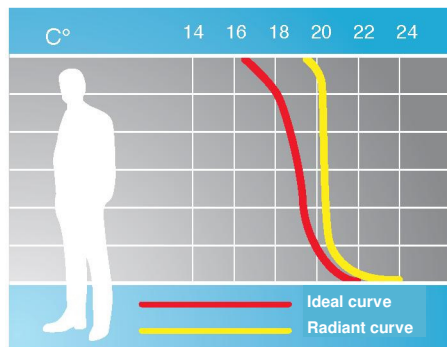
DIVISION  
**HOUSE ENERGY**  
Floor Power  
■ ■ ■ ■

Environmental well-being for the human body

# Underfloor heating systems

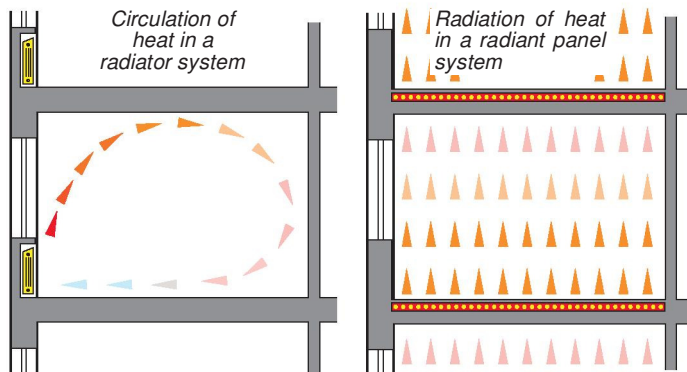
## Thermal comfort

In order to ensure comfortable temperatures in a room, there must be slightly warmer areas near the floor and slightly cooler areas near the ceiling.



The underfloor heating systems are the best solution based on:

- 1- the specific position (at floor level) of the radiant panels
- 2- the fact that they mainly give off heat by means of radiation, thus preventing convective flows of warmer air at the ceiling and cooler air along the floor.



## Quality of the air

Radiant panel heating can avoid two problems that are typical in heating appliance systems:

- 1- the combustion of atmospheric dust, which can cause the sensation of being parched as well as throat irritation
- 2- the high circulation of dust, which (especially in rooms that are not very clean) can cause allergies and respiratory problems.

## Cleanliness

Radiant panel systems have a positive effect in helping keep environments clean, since they avoid:

- 1- damp spots from forming on the floor, thus eliminating an environment ideal for dust mites and bacteria
- 2- the growth of mildew (and the relative bacterial fauna) on walls that border the warm floors.

## Environmental impact

In new buildings and for floor restoration and reconstruction projects, radiant panel systems have a lower environmental impact since they:

- 1- have no aesthetic restrictions (the invisibility of the panels is very important, especially for heating architecturally and historically important buildings, where the presence of heating appliances can compromise the aesthetic balance of the original forms)
- 2- offer total freedom in furnishing a room, thus allowing the available space to be used in the most rational way
- 3- do not contribute to the degradation of plaster, wooden floors, doors and windows because they:
  - do not soil the walls with thermal black
  - do not allow damp areas to form on the floor
  - considerably reduce the cases of interior condensation, since they increase the temperature of the walls near the slabs with the panels.





# Comfort and energy savings today

## The use of low temperature heat

Due to their high amount of dissipating surface, radiant panel systems can heat areas with low temperature heating fluid. This characteristic makes them ideal for use with heat sources whose performance (thermodynamic and economic) increase as the temperature required decreases, such as with:

- condensation boilers
- heat pumps
- solar panels
- heat recovery systems
- zone heating systems, with the cost of the heat related (directly or indirectly) to the return temperature of the primary fluid.

## Energy savings

With respect to traditional heating systems, radiant panel systems offer considerable energy savings, mainly because of two factors:

- 1- the higher operating temperature (with respect to room temperature) which offers average savings between 5 and 10%
- 2- a lower thermal gradient between the floor and ceiling that offers more energy savings the higher the ceilings are for the rooms.

Other elements that can also increase the energy savings:

- the use of low temperatures which reduces heat losses along the piping
- the fact that the walls behind the radiators do not overheat
- there is no movement of warm air over glass surfaces.

Compared to traditional systems, radiant panel systems offer an average energy savings of between 10 and 15%.



*Pre-assembled distribution manifold*



*Pre-assembled distribution manifold with wall box.*



*Pre-assembled stainless steel distribution manifold with wall box.*

## Regulations

The national and regional regulations relating to energy savings are more frequently requiring the use of underfloor heating systems.

As for example:

### Piedmont, Italy

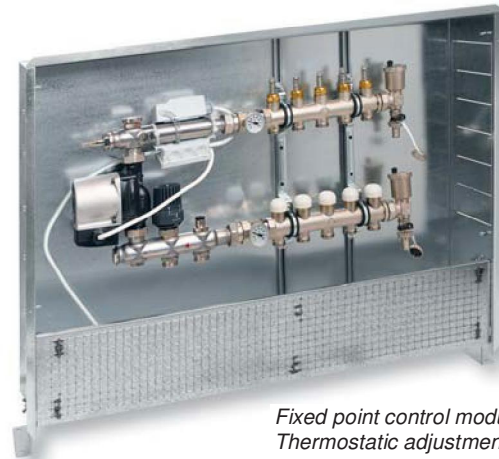
Regional Council Decree 46 - 11968 of August 4, 2009

*In order to encourage the use of renewable sources of energy (especially the installation of solar heating systems) and to optimize the use of highly efficient heat generators, the possibility of installing low temperature heating systems based, where possible, on the use of radiant terminals must be evaluated.*

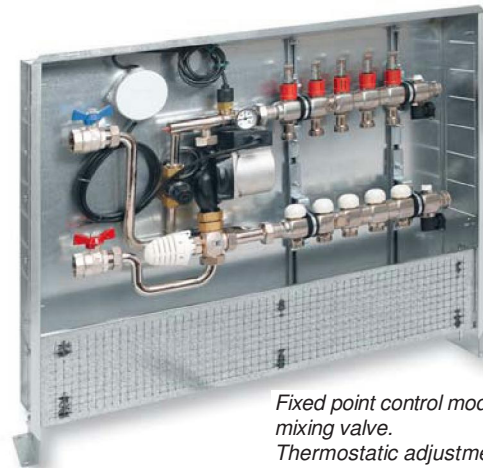
### Lombardy, Italy

Regional Council Decree VIII/8745 of December 22, 2008

*For condensation boilers, heat pumps or other heat generators that have higher efficiency with a low temperature heating fluid, this fluid must not have a supply temperature greater than 50°C when relating to new construction interventions and in the case of new installation or renovation of the heating system, if there are no technical obstructions. The regulation mentioned above is respected if the return temperature of the heating fluid is less than or equal to 35°C.*



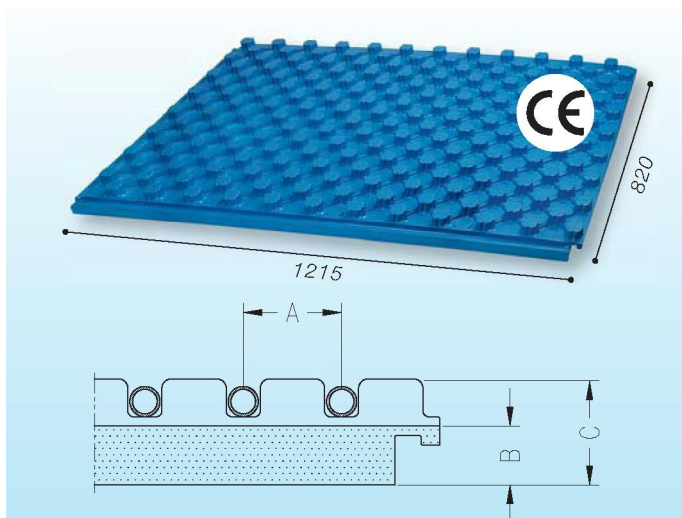
Fixed point control module  
Thermostatic adjustment 20 °-50 °C



Fixed point control module with 3-way  
mixing valve.  
Thermostatic adjustment 20 °-50 °C

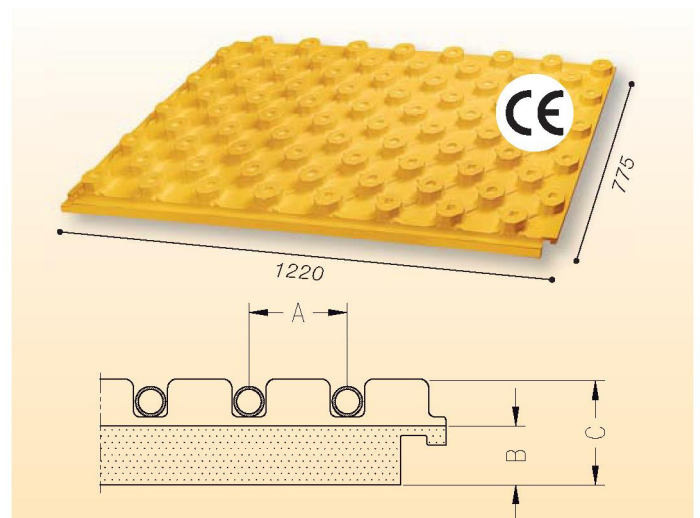
## Underfloor panel POLYSTYRENE FOAM INSULATING PANEL

- density 30 Kg/m<sup>3</sup> • CE mark • complies with Standard EN 13163



Spacing 50 - meas. 1215x820 mm

Type	A (spacing)	B	C
PR15015	50	15	40
PR15020	50	20	45
PR15025	50	25	50
PR15030	50	30	55



Spacing 75 - meas. 1220x775 mm

Type	A (spacing)	B	C
PR17520	75	20	50
PR17530	75	30	60





Edging strip with adhesive band



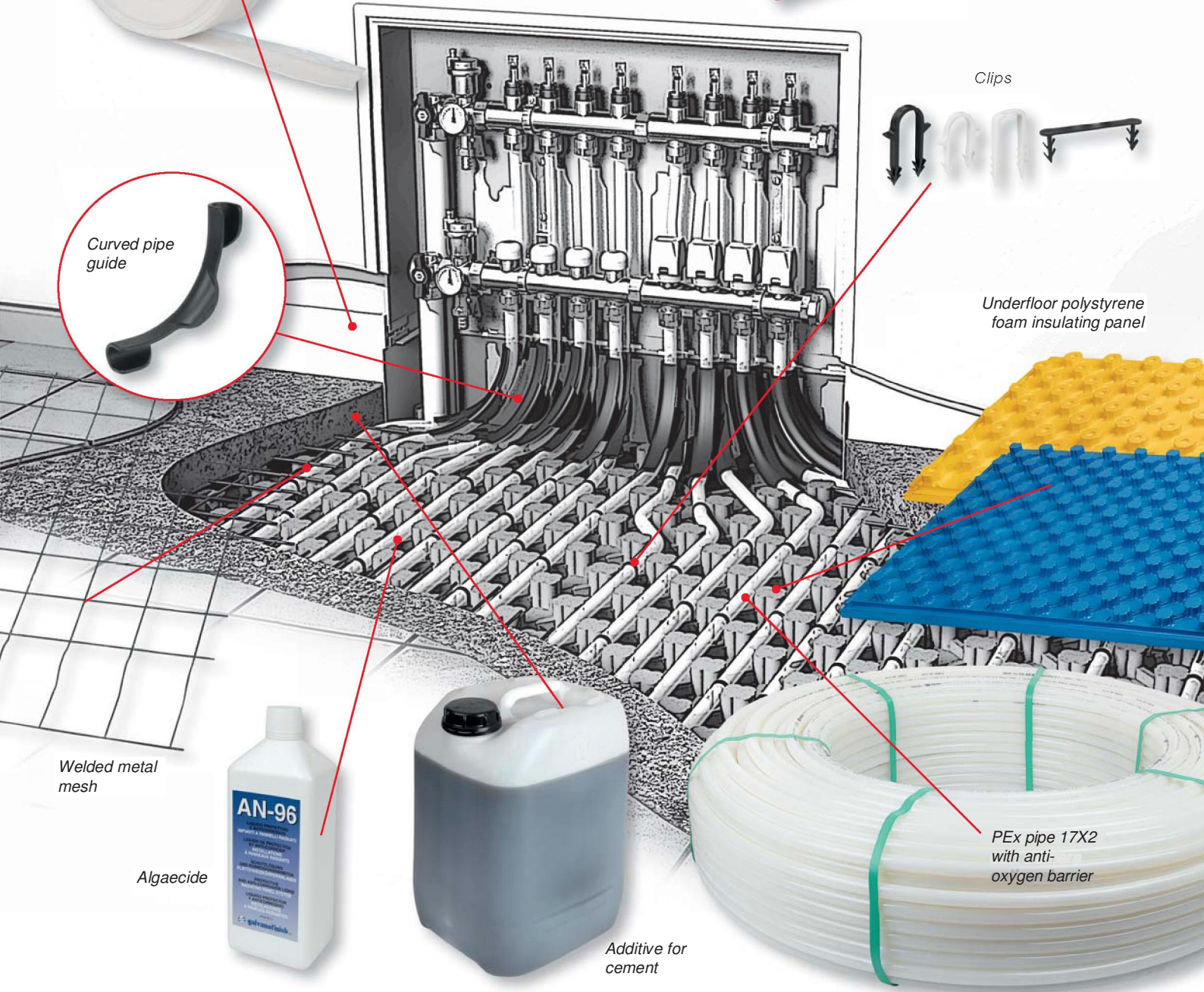
Expansion joint



Curved pipe guide



Clips



Underfloor polystyrene foam insulating panel

Welded metal mesh



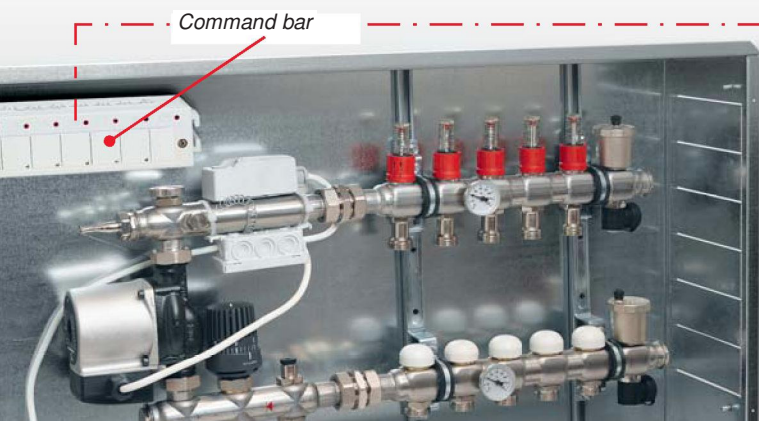
Algaecide



Additive for cement



PEX pipe 17X2 with anti-oxygen barrier



Command bar



Control panel



Thermostat

The controlling of the environmental temperature can be highly personalized with the use of traditional wired or wireless systems.



## Technical consulting and design assistance

**HOUSEENERGY will assist you in all stages of project development.**

It is at your complete disposal for:

- general quotes
- feasibility studies
- executive quotes
- sizing and drafting of installation diagrams
- on-line technical consulting for those working in the sector

## Technical consulting and installation assistance

**HOUSEENERGY will assist you in all stages of installation and commissioning of the systems.**

It is at your complete disposal for:

- on-site technical service
- possible support of qualified installers
- testing, adjusting and commissioning
- on-line technical consulting for the end user
- after-sales service

