

4. Underfloor Heating System

UNDERFLOOR HEATING

Underfloor heating, which many consider an innovation in the area of heating applications, actually dates back to antiquity with firewood as the basic material for fuel and air channelled under the floor as the transport medium.

Underfloor heating operates with water at a low temperature of between 30 and 45°C that circulates in pipes embedded in the floor. The heat is distributed evenly throughout the space by radiation, warming the area and giving a sense of thermal comfort, with lower operating costs. Most of the advantages of floor heating derive from using the floor as a radiator.

Interplast, in its continued efforts to offer high quality products and reliable services to the technical world, provides integrated solutions for the design and implementation of underfloor heating systems.



Advantages

A warm and comfortable healthy environment

Uniform temperature throughout the space, heating upwards from the feet to the head, at a lower temperature, which does not dry the air.

Great energy-savings

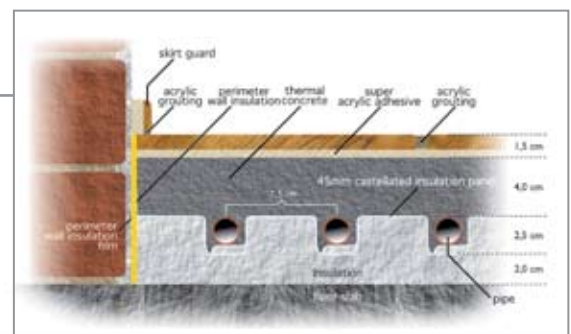
Lower operating temperatures, reduction in heat losses from the ceiling, freedom from draughts.

Complete freedom of arrangement of spaces

There are no limitations whatsoever to space.

Clean spaces

Thanks to the low temperatures and lack of draughts there is no blackening of walls in the areas being heated.



Underfloor heating materials

Como-floor

Como-pex cross-linked polyethylene pipe with oxygen barrier, designed for underfloor heating. The pipe is characterised by its exceptional flexibility and mainly by the fact that it covers and exceeds the temperature requirements of the specific installation. Furthermore the barrier protects the metal components of the installation (e.g. boiler) extending their lifespan.

Pipe decoiler

To assist the technician Interplast can provide a special pipe decoiler to hold long lengths (600m) of pipes. It is lightweight for ease of transportation to outdoor areas and is coated with electrostatic paint.



Distribution panel

Made of galvanised steel, 1mm in width. It is adjusted to a height of up to 81,5 cm. It bears an adjustable removable frame for protection from the plaster, which sets the panel depth from 11,5 to 16,5 cm.





Manifold

A bar type manifold of nickel-plated brass, nominal diameter 1" and 1 1/4" with 3/4" threading (Eurocone). The flow manifold bears Allen bolts or a flow meter for regulation of circuit flow, while the return manifold includes thermoelectric actuator valves enabling the fitting of thermoelectric actuators which receive commands from the thermostats of each space and enable independent operation of the respective circuits of each space.

In order to achieve optimum balance of the heating system, we propose special inflow and return nipples with attached thermometers.

The success of an underfloor heating installation is based on the smallest possible difference between water supply temperature and water return temperature.



Actuator

The thermoelectric actuator is connected via a transformer/distributor with the respective thermostat of each space thus enabling different temperature settings for each space. The thermoelectric actuators are connected to the thermostats of each space by means of the transformer/distributor.



24 or 230 Volt bases

24 or 230 Volt bases are controlled by the thermostats and give commands to the thermoelectric actuators on the manifold to open and close the circuits depending on the desired temperature in each space.



Pump module

This starts or stops the pump with the required time delay when the thermostats give start and stop heating commands to the thermoelectric actuators.



Thermostat

A discreet and elegant wired thermostat to achieve the area's desired temperature, which can be adjusted gradually to 1/4 degree Celsius accuracy.

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Panel

Castellated panel made of expanded polystyrene with vapour barrier (PE film) and 30 kg/m³ heat insulation density, dimensions 135x75x4.5 cm, with interlocking edges for perfect fit.



Expansion joint

This is placed at predetermined points, selected during our study, and on the lower cases of the building's internal doors so that they can accommodate the thermal concrete's contractions and expansions.



Perimetric insulation tape

This is made of polyethylene foam with film (placed on the castellated panels for proofing against concrete) and an adhesive strip for fixing.



Clip rails

These are used for fixing the pipe to the panel, when required.



Concrete plasticizer

Improves the thermal concrete mix, increasing strength, watertightness and plasticity. This results in easier pumping and pouring.





Polypropylene fibres

These reinforce the concrete and protect against cracking while increasing tensile and compressive strength, resulting in improved strength of the thermal concrete and mitigating problems related to temperature changes.



Three and four-way mixing valves

This achieves regulation of water supply temperature, on the basis of the thermal requirements for operation of the underfloor heating system.



Electric valve motor with temperature preset function

This is installed on the three-way mixing valve where, with the aid of a sensor, the desired feed water temperature is fixed (15-70°C). We are also able to adjust the time intervals (recommended time: 30 sec) at which the sensor commands the electromotor to balance the feed water temperature.



Cut-off hydrostat

This interrupts the circulator's operation when the water temperature exceeds the maximum desired setting.



Compensator

It controls, by means of sensors, the ambient temperature, room temperature of the spaces and boiler temperature, intervening to adjust operation of the three-way valve so that it provides the required operating temperature for the underfloor heating system.

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Actuator valve

The actuator is mounted on the three-way valve and connected to the compensator control panel. It determines the supply temperature on the basis of the outdoor temperature.



Pump

By means of the pump, hot water circulates in the circuits (loops) of the underfloor heating system. Power and cross-section (pump nozzles) are determined by the underfloor heating design (losses-loops) and vary according to the needs and requirements of the space we want to heat.



Compact Unit

This unit is mounted on the distribution panel enabling the mixing of water to obtain the desired temperature of feed water in the horizontal system of underfloor heating. It is recommended mainly in cases of mixed heating systems (underfloor and radiators). If the mixing system is chosen for the installation, then separate devices and branches to the boiler are not required.



Wireless communication system

A wireless communication system for the thermostats which act as transmitters, and a base acting as receiver and giving commands to the thermoelectric actuators to open or close the circuits according to the desired space temperature. The system is an intelligent and flexible solution when we want to install individual thermostats after construction for individual temperature control of each space, without having to install electric wiring.

