

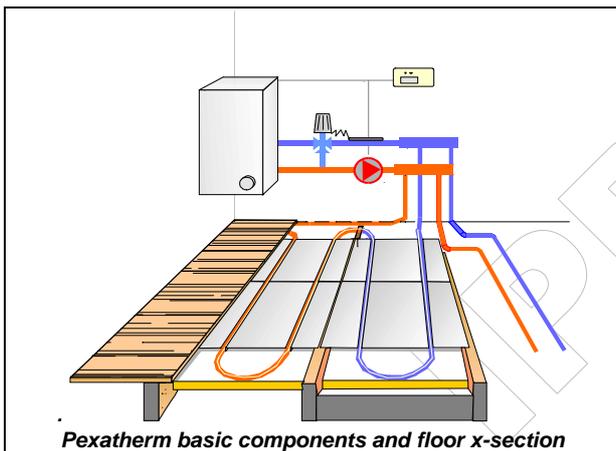
PEXATHERM Underfloor Central Heating

Installation and Operation Guide for Pipe-in-Plate System

Thank you for choosing PEXATHERM underfloor central heating. We hope you will enjoy the benefits of comfort and energy savings for years to come.

Easy to Install Pipe-in-Plate System

Pexatherm warm water pipe-in-plate central heating systems are easy to install. A high degree of components prefabrication and attention to detail ensure fast and problem-free installations. The heating packages include black aluminium plates designed to fix the pipe in non-solid floors. The PEX pipe is pushed in the grooves of the plates at predefined spacing and then connected to the Pexatherm manifold, which is then ready for connection to the heat source. All types of boilers or sources of warm or hot water can be used. Pexatherm systems are ideally suited with condensing boilers for further saving in running costs.



Pexatherm basic components and floor x-section

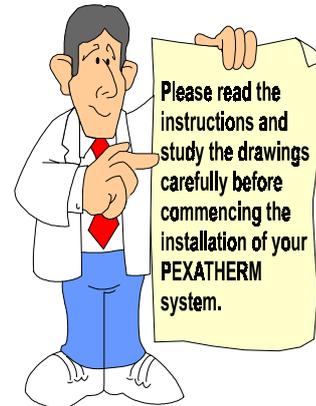
Pexatherm plate system does not require any special tools to fix the heating pipe to the plates. Tools such as hammer and hacksaw (for cutting the soft aluminium sheets).

INSTALLATION

1- Site preparation

The following points should be carried out in the following order:

- 1- **Pexatherm** plate system is designed for, suspended or raised timber floors.
- 2- The joists or battens must be ready in place to support the metal plates. Timber bracing between the joists support insulation under the metal plates in case of suspended joists.
- 3- The thickness of insulation between joists is 30 - 75 mm. This is dependent on the type of insulation used and the floor level in question. Ground floors require more insulation than first or second floor. Therefore joists must be deep enough to accept the insulation and its support.



- 4- It is recommended that all walls and partitions must be in position.
- 5- You may require few standard pipe brackets where there are no plates and to lay some of the pipe back to the manifold.

2- Distribution Manifold

The manifold cabinet is built into the wall at this stage if used (optional extra). The **Pexapipe** primary supply pipes (if purchased) from boiler to manifold are laid at this stage on floor and will be covered by the floor insulation.

The **Pexatherm** manifold is assembled and fixed to the walls in a reasonably central position. The top of the manifold is approximately half a metre from the finished floor level.



Pexatherm manifold with all circuits connected.

a separate sheet is supplied for assembly and operation of the Pexatherm underfloor distribution manifold. Electric cables from the boiler, programmer and room thermostats should also be in place at this time. These cables will terminate and at a junction box or the Multizoner centre from IPPEC placed near the manifold.

3- Insulation Material

Any type of floor insulation board can be used underneath the heat diffusion plates. The insulation boards are placed tightly together on the floor or on the noggins. Polythene sheet (300-500 micron) is laid under the insulation to form a vapour barrier on

ground floor. Make sure the sheet overlaps are at least 150mm. Insulation in the form of quilt can be used between of the appropriate thickness.

4- The Black Heat Diffusion Plates

The aluminium plate fixes the pipe and diffuses the heat from the pipe to the floorboards. There are painted black to produce maximum amount of radiant heat even though they may not be a contact with floorboards everywhere. They are placed end to end next to each other in a row, resting on top of joists and directly on top of insulation such as Pexatherm polyurethane insulation boards with reflective foil. The plates which can be tacked to the joists are just proud of joists to make sure of good contacts with floorboards. Small air gaps between plates and boards reduce heat output. There is no need for plates where pipes bend to go across the joists. The



ML pipe in black plates with PE sheet in between plate and floorboard.

pipe spacing for the plate system is fixed to 150 or 200 mm centres between pipes.

5- ML and PEX Heating Pipe

The Multilayer PEX 16 pipe is used with the plate system. The pipe coefficient of expansion is similar to the plate avoiding relative movement between pipe and plate during heat up time. Thus even the faint clicking or scraping noises are avoided. The pipe is laid according to drawings supplied. Where no drawings are provided make sure that the flow is at the outside wall, to ensure even floor temperature and better heat distribution in the room. Notches of 25 mm diameter are made in the relevant joists and near the wall. Short length of conduit or pipe insulation is wrapped around the pipe when crossing joists or battens.

Hint: If pipe is laid from below (such as in the case of ready decked floors of timber frame houses), the standard flexible PEX pipe is used. Thread the pipe through the notched joists and then pull slowly in between the joists. Start pulling the pipe between the furthest joists from the manifold. The pipe can be warmed by space heater to increase its flexibility before laying in Winter.

Make sure that pipes will not cross each other anywhere on the floor and especially near the manifold. Mark the rooms or zones on the manifold using the provided labels in the manifold box.

The maximum pipe length per circuit should not exceed 100 metres. A large room may need more than one circuit. Corridors are usually heated from the pipes leading to other rooms.

The pipe is marked at one metre intervals and the length should be checked regularly while being laid. Pipe laying starts at flow part of the manifold and is laid as a continuous loop back to the manifold. PEX pipe must not be bent to a radius of less than 5 times pipe diameter to avoid buckling and damaging the pipe.

Hint: To avoid pipe getting entangled, your helper should uncoil the pipe by rolling the coil on its edge only a metre or two at a time and ahead of you. Walk on the joists or battens to avoid damaging the plates. In case of floated floor lay one row of plates at time than unroll the pipe in the grooves before starting another row.

6- Filling and Pressure Testing.

Please follow instruction provided under the Pexatherm manifold section.

Anti-freeze and inhibitors are added at this stage. Please follow manufacturers' instructions for type and amount to be used with plastic pipe.

Fernox Copal or Sentinel is used aluminium boilers and CP3 with cast iron ones. The system is then subjected to a pressure test (up to 10 bar) to check for leaks in the pipe. It is normally kept at this pressure overnight if possible. The underfloor heating installation is complete once the Pressure Test Certificate has been signed.



FLOOR COVERING

Most types of floorboards can be used over **Pexatherm** pipe-in-plate system. However, the response time varies from one type of covering to another. Floors covered with carpets transmit their heat slower than those covered with tiles. The overall resistivity of carpet (and underlay if used) should not exceed 0.15 W/mK or 1.5 tog..

Hardwood or parquet wooden flooring is fixed with fine nails to allow slight movement in either direction. Surface temperature must not exceed 28 deg. C.

Tiles can be used on marine plywood in bathrooms. Flexible water resistant tile adhesive is used. If in doubt consult suppliers of floor finishes and adhesive.

Expansion strip at the floor edges is fixed before floor covering is laid. The skirting board is fixed only to the wall to allow the floor move with change of humidity and heat.

TEMPERATURE CONTROL

It is recommended that all electric wiring must be carried out by experienced electricians for safety and reliability. The connection of manifold to the boiler primary circuit must be completed by an experienced person or plumber.

- 1- The mixer and pump supplied are required to reduce the water temperature in the floor. The pump must be installed between the mixer and the manifold as shown in the diagram. A separate instruction sheet is supplied for the Pexatherm mixer. Pexatherm UFH systems can be connected to an existing central heating system. It is advisable that the connection must be near the boiler to avoid draining the heat from the existing central heating.
- 2- The Pexatherm programmable electronic Thermostat is wired according to the enclosed circuit diagram. It operates the circulating pump at the manifold the boiler via a two port motorised valve, or the Multizoner wiring centre.
- 3- Separate rooms or zones can be controlled by zone actuators at the manifold using individual room thermostats (available separately). All the thermostats supplied have a night 'set-back' facility ensuring good response from the floor central heating. The actuators replace the hand wheel located at the return part (top bar) of the manifold.
- 4- Alternatively the optional Delta programmer / compensator is wired to the servo-motor (at the 3 or 4-port valve), the pump and sensor (at the manifold), to the boiler and optionally internal room thermostat. See separate instructions and wiring diagram.

COMMISSIONING AND OPERATION

Once the rigid plumbing is checked for leaks and the air is vented from the system the boiler is fired at low temperature. Pexatherm underfloor heating requires a pressure head of at least 1 -1.5 to ensure that the pipes in the floor are free of air. Unvented sealed circuits using expansion vessel and filling must be used with the system.

To operate the system at the optimum setting the following procedure should be followed:

- 1- Set the water temperature control valve situated next to the return part of the manifold to about

45°C and read temperature gauge after the system temperature stabilises (approx. 30 - 40 min.) This may take longer dependant how cold is the ambient temperature.

If Delta is used, open the 3 or 4-port mixer using the manual setting on the programmer/compensator.



Typical manifold/Mixer arrangement.

- 2- Now read the temperature difference between flow and return of each zone using a differential thermometer. The difference should be between 5-10°C. in a stable mode.
- 3- Adjust the flow lock shield valve, using Allen key to maintain the same temperature difference between zones. Shorter length of pipe requires the lock shield valve to be closed a few turns more to balance pressure drop and flow rate compared with longer circuit pipes.
- 4- The electric zone/circuit thermal actuators replace the hand wheel at the return section of the manifold where required.
- 5- Measure air and floor temperature in various rooms. The floor surface temperature should not exceed 30°C at this stage. If it does, close the lock shield valve further for that zone or turn down the water temperature control valve to reduce the overall temperature at the manifold.

Allow several hours for system commissioning as it takes time for the floor to reach required stable temperature.

FAULT FINDING AND RECTIFICATION

Fault finding and rectification procedure depending on system and options supplied is available separately.