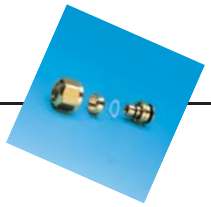
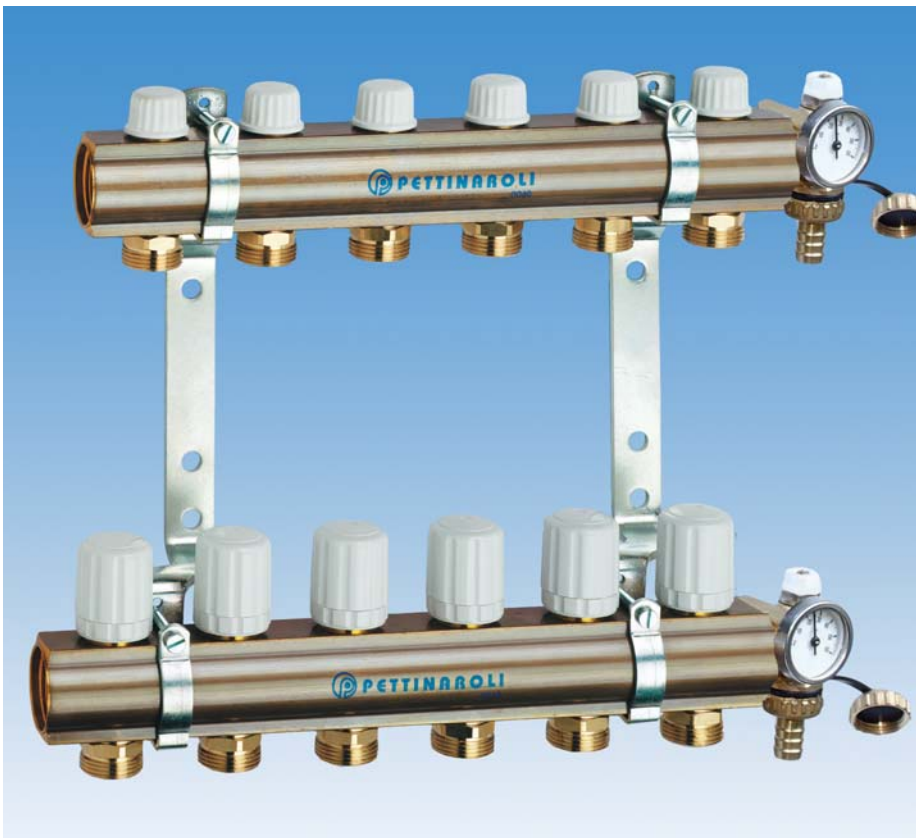
MANIFOLD TYPE 7035TDM



Installation and User Manual



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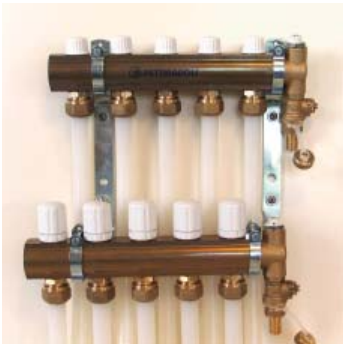
1. CONTENTS

The Pettinaroli manifolds are made of extruded copper, type OT58.



The Pettinaroli manifold system is delivered with 2 to 12 outlets, and the manifold is mounted on wall brackets. The upper manifold for the inlet water is supplied with integrated balancing valves for balancing the circuits. The manifold below is for the outlet water. This manifold is supplied with thermostatic valves / hand wheels for regulation. The manifold is delivered with two preassembled terminal sets (T-piece, drain/filling ball valve and air vent).

2. INSTALLATION STANDARDS

The heating system has to content and to be regulated according to the current standards, which you find in the regulations for buildings. And according to the standards for heating systems.

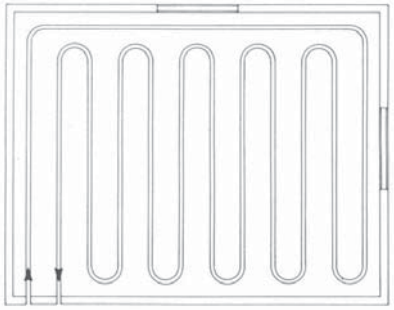
The basics are the heat loss in the house, the way you place the pipes in the floor and the choosen construction of the floor. The floor heating pipe has to be placed in the floor according to the instructions for the choosen construction.

3. PLACING THE PIPES

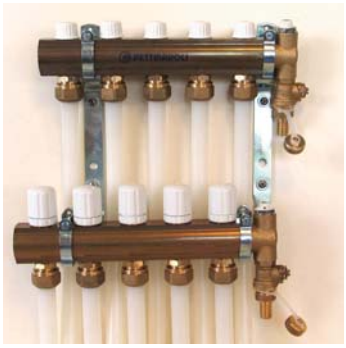
To achieve the most optimal comfort in the room, the pipes have to be placed in the floor after the standard principles. If there have been made drawings of the installation, the pipes have to be placed according to those drawings.

To achieve the best result – planning how to place the pipes in the floor is very important.

Before placing the pipe in the floor you have to connect the pipe to the inlet manifold. When the pipe has been placed in the floor, the end of the pipe will be connected to the outlet manifold. Placing the pipe has been completed.



4. CONNECTING THE PIPES



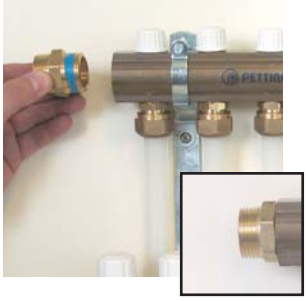
Lead the pipe to the upper bar. Cut of the pipe at the right length. It is important with a sharp and straight cut. Place the fitting at the pipe and connect it to the manifold.

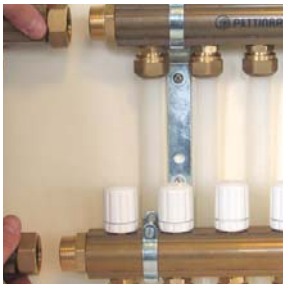
5. CONNECTING THE MIXING UNIT

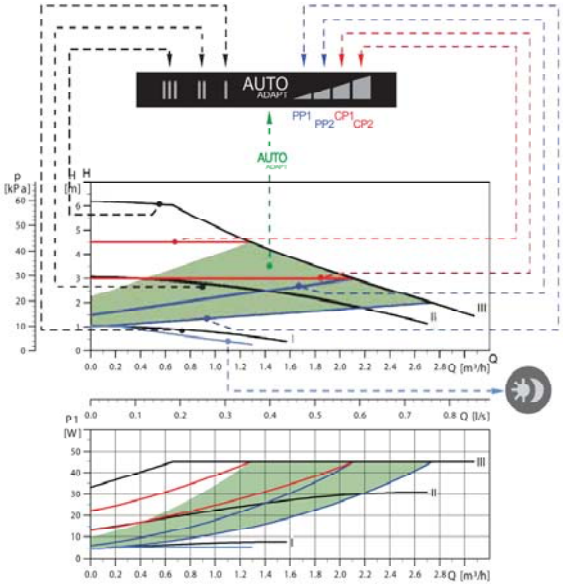
To achieve the most optimal comfort in the room and the best solution saving money at energy costs, it is very important that the system will be supplied with water at the right temperature.
The correct temperature can be calculated in the programme which you will be able to find at our web-site www.pettinaroli.dk. If the heating source can not ensure the correct temperature, it will be necessary to connect a mixing unit to the system.

The mixing unit 7021 with Grundfos Alpha2 pump, has to be mounted on the left side of the manifold. The calculated temperature will be regulated by the thermostat.

7021







Alpha 2 pump: For under floor heating system use CP2

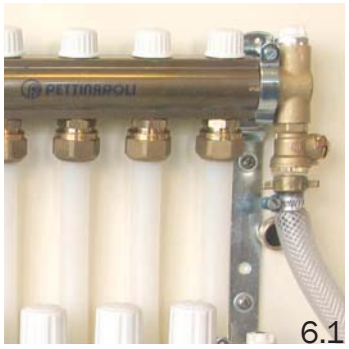
It will be possible to mount the mixing unit on the right hand. But it is very important to be aware of this before connecting the pipes to the manifolds, because the upper bar has to be moved one place to the left, or else it does not fit with the mixing unit.

If there is no room for the mixing unit in continuation of the manifold, it is possible to mount it with an angle set art. ACC7021.

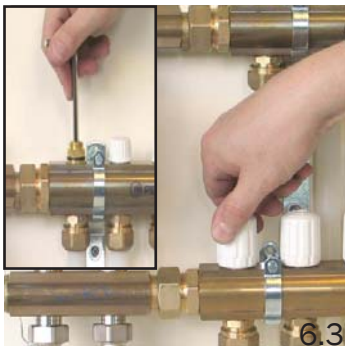
6. FILLING AND AIRING THE SYSTEM

Filling and airing the system has to be done very systematic. Air in the system can give you problems regulating the system and in worst case burn of the pump.

6.1. Connect a hose to the upper bar and fill in water and lead air/water out of


6.1


6.2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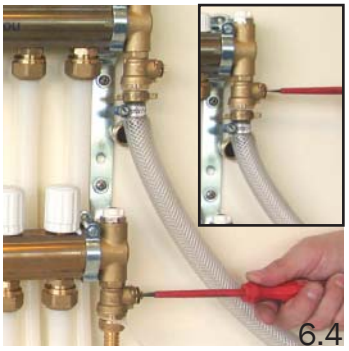
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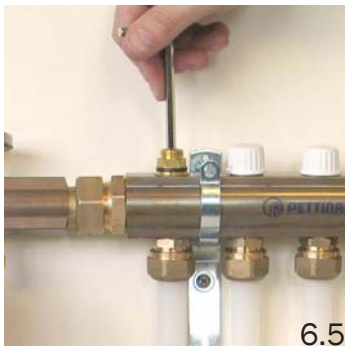

6.5

the return manifold with another hose.

6.2. Turn off the thermostat and the return valve

6.3. Turn off the balancing and thermostatic valves on the manifolds

6.4. Turn on the water on the upper bar and open for the drain valve on the bar below

6.5. Turn on the circuit (balancing/thermostatic valves) which is closed to the mixing unit. Keep filling in water until no more air comes out of the drain valve. Now you can turn off the first circuit.

6.6. Repeat this procedure circuit by circuit, until all circuits have been filled with water and drained for air

6.7. Dismount the hoses and replace the caps on the drain/filling valves

7. TEST OF WATERTIGHTNESS

When testing the tightness all balancing and thermostatic valves have to be in open position. If there is any possibility of freezing water, then add glycol or something similar to avoid the pipes busting. The glycol shall be washed out of the system before it is started.

7.1. Floor heating pipes

The pipes have to be tested for tightness when they still are visible. If nothing else has been specified the pipes have to be tested by 0,6MPa (6Bar). Keep the pressure for 30 minutes and check that all connections are tight. Then lower the pressure to 0,3MPa (3Bar). Keep this pressure for 2 hours, without dropping the pressure on the system.

7.2. Report

A report has to be prepared form the results of the pressure test. Keep this report with other manuals for the heating system of the house.

7.3. Concreting

By concreting, the pipes have to be under pressure to avoid damage on the pipes during the work. If there is any risk of freezing pipes, add glycol or something similar until the work has been ended.

7.4. Other types of floor

It is always recommendable to keep the pipes under pressure to avoid damage and leaks from the pipes during the work.

8. BALANCING THE SYSTEM

Balancing the floor heating circuits can be done in 4 different ways:

8.1 QUICK INSTALLATON OF MANIFOLDS

Adjusting according to the quick guide, see Encl.: 1

- Place the adjusting screw on the longest circuit in open position
- In the column with the longest circuit you will be able to find the values for the other circuits.

8.2. DIAGRAM FOR REGULATION

The method is based on a PQ-diagram for the manifolds:

- Based on the need of heat in the longest pipe, the necessary quantity of water will be calculated. At the intersection point with the diagram line, marked T.O. (totally open), the pressure loss can be readed for the heating circuits.

It is optimal with the same loss in all the heating circuits. By the intersection point with the oblique lines, it is possible to find how many turns to open the valves on each circuit, at the inlet manifold.

8.3. FLOOR HEATING PROGRAMME

Pettinaroli thermofloor - calculating programme and instructions can be down loaded from the following web site www.pettinaroli.dk

In column "Trim" you can see how many turns you have to open the valve in each circuit at the inlet manifold.

Microsoft Excel - PFLOOR2D_V3ENGLISH_edited

PETTINAROLI FLOOR HEATING		PROJECT NAME:	DATE:	04-11-2004	calc.	Clear
PROJECT NR.:	M215-2004-48	Kindergarten "Sunshine"	SIGN.:	AC		

INPUT:			INPUT:		RESULT:		
HEAT LOSS	45	W/m²			TOTAL PIPE LENGTH	667	m
TEMPERATURE LOSS - ΔT	5	C°	ROOM TEMPERATURE	20 C°	MIN. PUMP PRESSURE	3,02	mH²O
CC - CENTER DISTANCE	30	cm	FLOOR TYPE	Stone floor	PUMP CAPACITY	23,2	l/min
PIPE - TYPE	PEXAL 20x2		FLOOR CONSTRUC.	Concrete	MIN. HEAT CAPACITY	8100	W

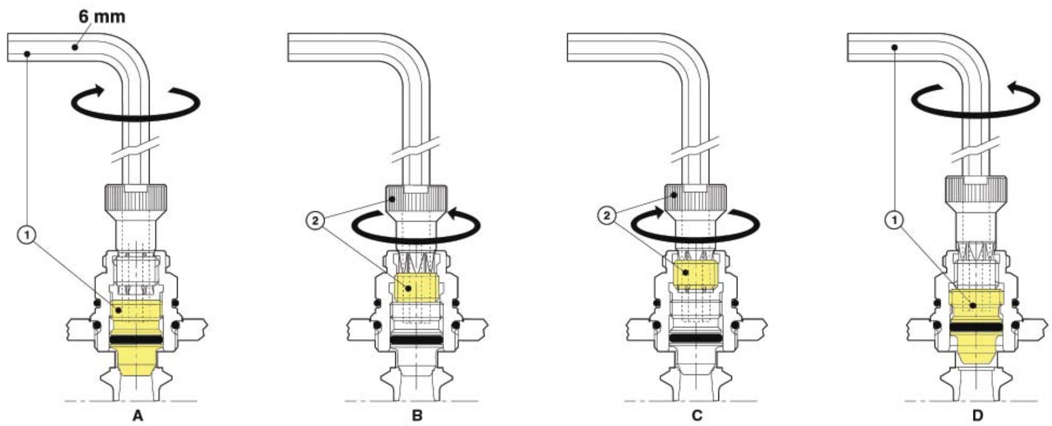
Circ. no.	Room name	Area m²	Roomtemp. C°	Heat capacity W	Con. Pipe m	Pipe m	Pipe TYPE	Pipe loss m H²O	Floor TYPE	Floor CONSTRUCTION	FLOW l/min	Set point C°	TRIM Turns	ΔT C°
1	Bathroom 1	6	22	270	4	24	PEXAL 20x2	0,0359	Stone floor	Concrete	0,8	24,5	0,7	5
2	Bathroom 2	6	22	270	4	24	PEXAL 20x2	0,0359	Stone floor	Concrete	0,8	24,5	0,7	5
3	Nursering room	11	22	495	8	45	PEXAL 20x2	0,1579	Stone floor	Concrete	1,4	24,5	0,7	5
4	Kitchen	12	20	540	11	51	PEXAL 20x2	0,22088	Stone floor	Concrete	1,5	22,5	0,7	5
5	Red room	30	20	1350	15	115	PEXAL 20x2	1,94063	Stone floor	Concrete	3,9	22,5	0,7	5
6	Green room	35	20	1575		117	PEXAL 20x2	2,01963	Stone floor	Concrete	4,5	22,5	4,0	5
7	Blue room	30	20	1350	15	115	PEXAL 20x2	1,94063	Stone floor	Concrete	3,9	22,5	0,7	5
8	Yellow room	35	20	1575		117	PEXAL 20x2	2,01963	Stone floor	Concrete	4,5	22,5	4,0	5
9	Staff room	15	20	675	10	60	PEXAL 20x2	0,336	Stone floor	Concrete	1,9	22,5	0,7	5
10			20	0		0	PEXAL 20x2	0	Stone floor	Concrete	0,0	0		5
11			20	0		0	PEXAL 20x2	0	Stone floor	Concrete	0,0	0		5
12			20	0		0	PEXAL 20x2	0	Stone floor	Concrete	0,0	0		5
13			20	0		0	PEXAL 20x2	0	Stone floor	Concrete	0,0	0		5
14			20	0		0	PEXAL 20x2	0	Stone floor	Concrete	0,0	0		5
15			20	0		0	PEXAL 20x2	0	Stone floor	Concrete	0,0	0		5

MANIFOLD	AREA	Heat capacity	Pipe	FLOW
9	180	8100	667	23,2
CIRCUIT	m2	W	m	l/h

8.4. PROCEDURE FOR BALANCING

Balancing the system with a 6 mm allen key art. no. 0991B. When starting balancing the system it is important to start from closed position. For balancing the system correctly, proceed as follows:

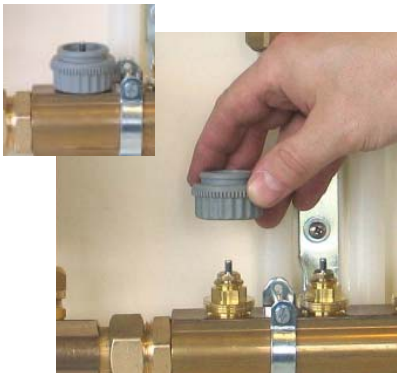
a. close the seat (1) with the 6 mm allen key
b. unscrew the regulating ring (2) with the fitted key maintaining the seat (1) closed with the 6 mm allen key
c. adjust by a number of turns 0.5, 1, 1.5, ...the regulating ring (2) with the fitted key, according to fluid dynamic chart
d. re-open the seat using the 6 mm allen key



9. CONNECTING THE ACTUATORS

According to the standards DS469, a heating system which is the primary heating souce has to be regulated automaticly. Below it is illustrated how to replace the hand wheels with actuators for controlling the system.

Afmonter det nederste håndgreb



Skru den medfølgende platadapter på ventiltoppen

Klik telestaten på adapteren

10. WIRED CONTROL SYSTEM

The system consits of a control system for 1 to 12 heating zones which is controlled by room thermostats and max. 14 actuators, which regulate the quantity of water supplying the circuits.
Pettinaroli has 230V and 24V systems.

Components for 230V systems have the series number 2000
Components for 24V systems have the series number 4000

The quick guide for installation of the wired control system can be downloaded from our website www.pettinaroli.dk, see Encl.: 2

11. WIRELESS CONTROL SYSTEM

The system consits of a 6 or 12 canal control system to control 1 to 12 heating zones with a 868 MHz signal and max 13 actuators, which regulate the quantity of water supplying the circuits.

The quick guide for installation of the wireless control system can be downloaded from our website www.pettinaroli.dk, see Encl.: 3

QUICK INSTALLATION OF MANIFOLDS FOR FLOORHEATING

GUIDED INSTALLATION OF PETTINAROLI FLOORHEATING SET

LONGEST PIPE												
OTHER PIPES	**m**	120	110	100	90	80	70	60	50	40	30	20
	120	4,0										
	110	3,4	4,0									
	100	2,0	3,3	4,0								
	90	1,6	2,0	3,2	4,0							
	80	1,3	1,6	1,9	3,1	4,0						
	70	1,1	1,3	1,5	1,9	3,0	4,0					
	60	1,0	1,1	1,3	1,5	1,8	2,8	4,0				
	50	0,9	0,9	1,0	1,2	1,4	1,8	2,7	4,0			
	40	0,8	0,8	0,9	1,0	1,1	1,3	1,7	2,5	4,0		
	30	0,7	0,7	0,8	0,8	0,9	1,0	1,2	1,5	2,3	4,0	
	20	0,6	0,6	0,7	0,7	0,7	0,8	0,9	1,0	1,3	2,0	4,0
	10	0,5	0,6	0,6	0,6	0,6	0,7	0,7	0,7	0,8	1,0	1,5

The longest pipe has always to be completely open

INSTRUCTIONS

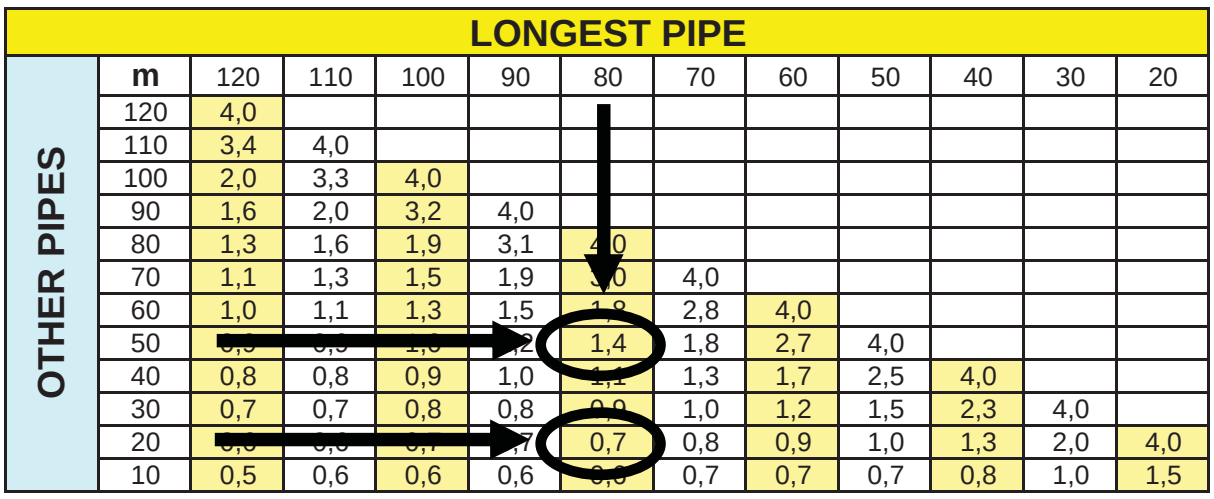
1. The longest pipe has to be completely open
2. Choose the column which contains the longest pipe
3. Find the line for the pipes which should be regulated
4. Read in the column for the longest pipe, how many rounds the pipes have to be installed for

EXAMPLE

Longest pipe = 80 m / pipe 2 = 50 m / pipe 3 = 20 m

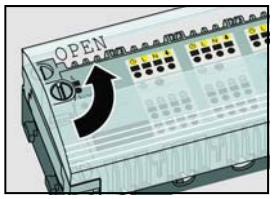
In column for 80 m and for line of 50 m you can read that that the regulation for the second pipe is a turning of 1,4

In the same way you can read the regulation for the second pipe that is a turning of 0,7

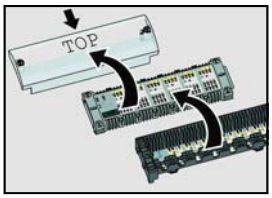


QUICK GUIDE FOR INSTALLTION OF WIRED FLOORHEATING

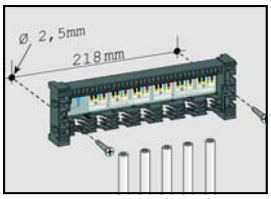
INSTALLATION OF THE CONTROL UNIT



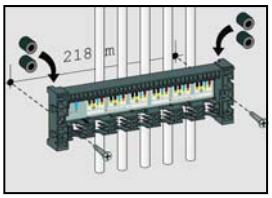
Turn the screw 1/4 and remove the cover



In the same way remove the connecting part

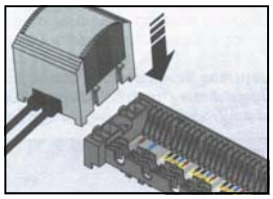


Install the control unit on the wall with the included screws

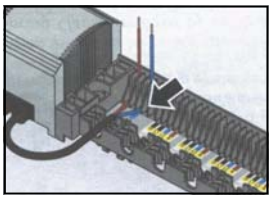


If the cables have to be behind the control unit, use the four spacers

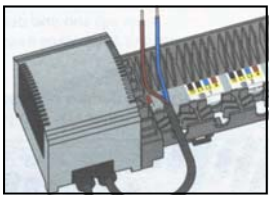
CONNECTION OF TRANSFORMER



Connect the transformer with the control unit

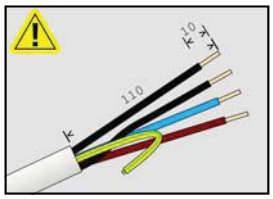


Lead the wires through the system-box.

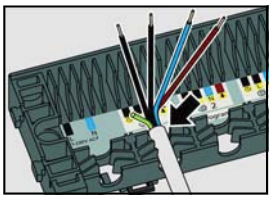


Correct wire´s installation.

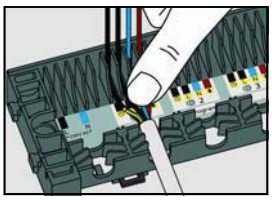
CABLE FROM THE ROOMTERMOSTAT



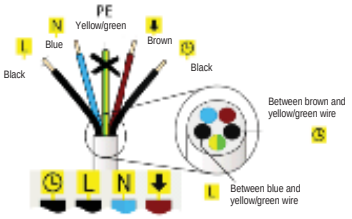
Put away 10 mm of the isolating material from the cable.



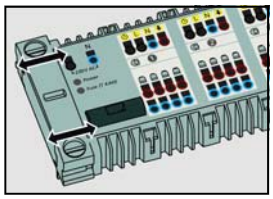
Place the cable in the lowest part of the control unit



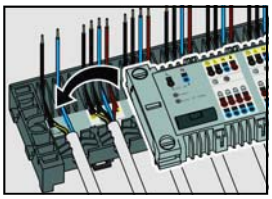
Put the wires in the respective slots



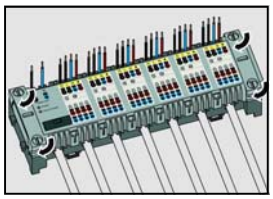
CONNECTION OF INSTALLATION



Make sure the screws are in the right position before proceeding



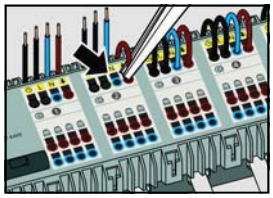
Place the connecting part over the control unit.



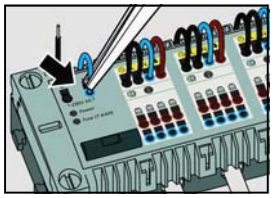
Lock the connection by turning the screws 1/4 around

CONNECTION OF THE THERMOSTAT

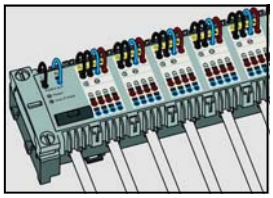
Connect the cables from the roomthermostat with the upper row



Place the cables according to the colours, pressing them well



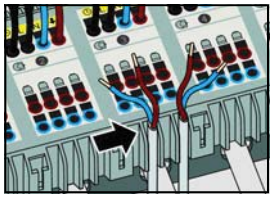
Connect the cables from the transformer in the same way



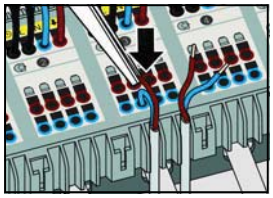
Correctly connected cables

CONNECTION OF THE ACTUATORS

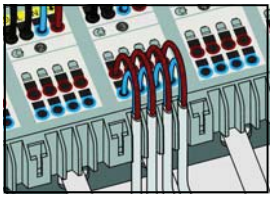
Connect the cables from the actuator with the lower row



Press the cables into the slots of the lower edge of the connection part

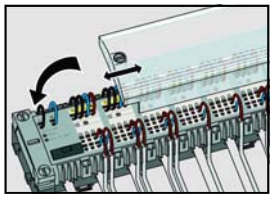


Press the cables well, observing the matching colours

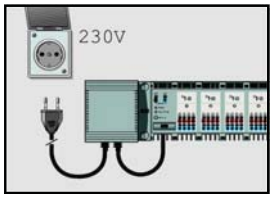


Only 4 actuators can be connected in the same zone. Max 14 per box

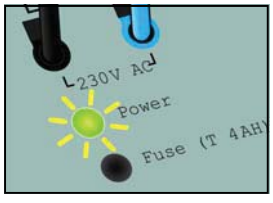
READY FOR WORKING



Place the cover on the box, make sure the screws are locked correctly.



Connect the box to the electrical power

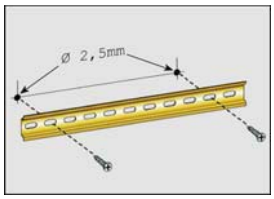


Power diode lightens up when the power is connected.

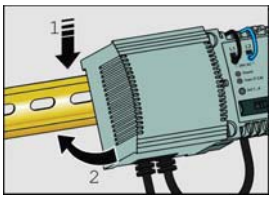
The diode of each zone lightens when the actuator opens.

GUIDE TO INSTALLATION OF WIRELESS FLOORHEATING

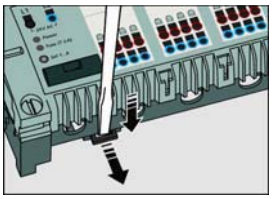
INSTALLATION OF THE SYSTEMBOX



Mount the rail on the wall with the included screws

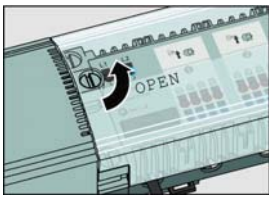


1) Hang the box on the rail
2) Place the controlbox in place

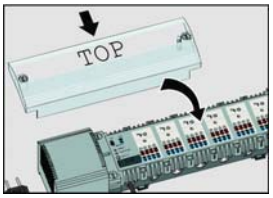


The controlbox can be dismounted by loosening the clips under it

OPEN THE COVER OF THE BOX

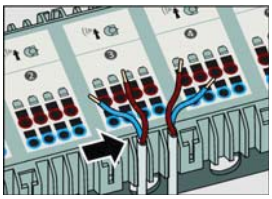


Turn the screws to lift the cover

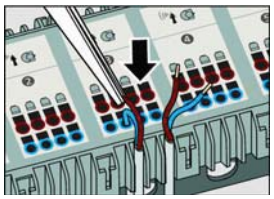


Control the screws are in correct position before placing the cover

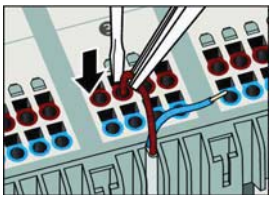
CONNECTION OF THE ACTUATOR



Press the wires from the actuators into the slots on the box´ underside.

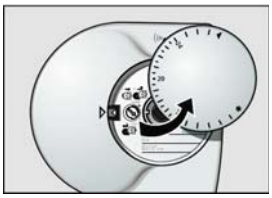


Press well the cables into the slots, according to the colour.

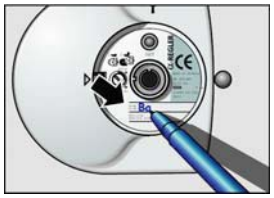


If the cable has to be removed again you can loosen it with a screwdriver

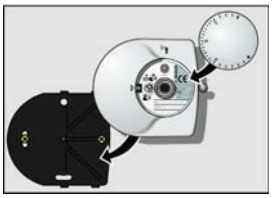
INSTALLATION OF THE THERMOSTAT



Under the cover there´s a set-button and a label to give it a name.



Write the name on it and place the batteries in the rear slot

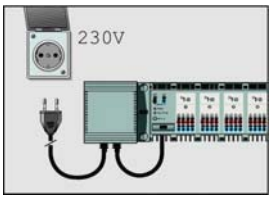


Mount the base and push the thermostat in place. Put on the cap

TIP!

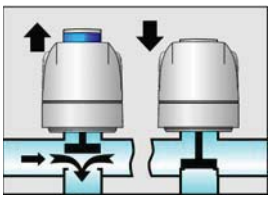
When writing room description and zone of each thermostat you can take this out of the systembox. When the programming is over the thermostats can be mounted again on the bases.

CONNECTION OF THE SYSTEMBOX

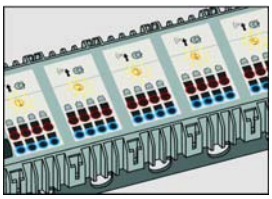


Connect the box to the electrical power

Power diode starts lighting up

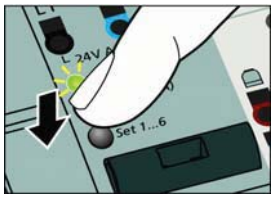


The actuators start an automatical setting (takes 15 min.)



During this procedure the diodes will turn on and off for all the zones

PROGRAMMING THEMOSTAT



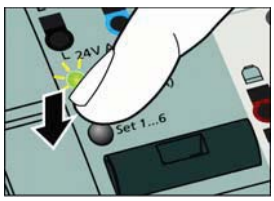
Press down the set-button for 5 seconds

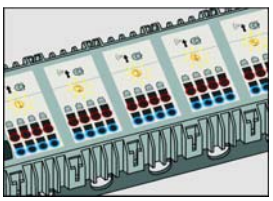
Diode 1 blinks. Press shortly the set-button to change to zone 2-3...

Press the set-button of the thermostat within 3 minutes

Diode of the zone will stop blinking

RESETTING OF THE PROGRAMMING





Press down the set-button for 5 sec. Diode for zone 1 will now start blinking.
Press down the set-button again (this time for 10 sec.), all diodes will blink.
The system is now reset and diode 1 will blink.

PETTINAROLI WIRELESS SYSTEM
4 COMMON QUESTIONS:

1. One or more diodes blinks on the control system after programming the room thermostats.

There is no contact between the room thermostat and the control unit.

The problem can be the following:

A) To check that the room thermostat is programmed to the right zone, keep the set-button down for 10 seconds. Is the room thermostat programmed correctly, the following will happen:
The diode on the control unit will turn on the red light (it is calling for heat), then the actuators will open and close within 15 minutes.

B) Check that the batteries are placed correctly in the roomthermostat.

C) Pull out the plug to the control unit and insert again. A self-test will now be running. All diodes which are programmed to a roomthermostat will now blink, constantly lighten up and then turn off, if they do not call for heat.
The actuators will open and close, and heat will be sent out in the circuits. This procedure will last approx. 25 minutes.
If one or more of the diodes blinks after this self-test, it is recommendable to re-programme the room thermostats, please look in the guide.

D) The room thermostat can not reach the control unit. Normally the operational range is 25 meters, but some constructive conditions in the building can give some problems. For instance electronical components and boxes in metal placed close to the control unit. An external anten na can solve this problem

During programming of the room thermostat, do not touch the print-plate on the back of the roomthermostat. It is also recommendable to keep the room thermostat at least 1 meter from the control unit during the programming.

2. How often do you have to change batteries?
The nomal lifetime of the batteries are 3 years. Do not use rechargeable batteries.
OBS: Be careful when you place/replace the batteries.

3. How can you know that you have to change the batteries?
If a diode starts blinking, there is no contact between the roomthermostat and the control unit. Is it not possible to activate the room thermostat by pressing down the set-button for 10 seconds (the diode on the circuit will lighten up) it might be the batteries which have to be changed.

4. How much power does the system use per year?
Each actuator use 3 Watt during start-up and 2 Watt during operation.
Per actuator : 1750 hours/year à 2 Watt = 3,5 kWh/year

IMPORTANT INFORMATIONS CONCERNING THE CONTROL UNIT:

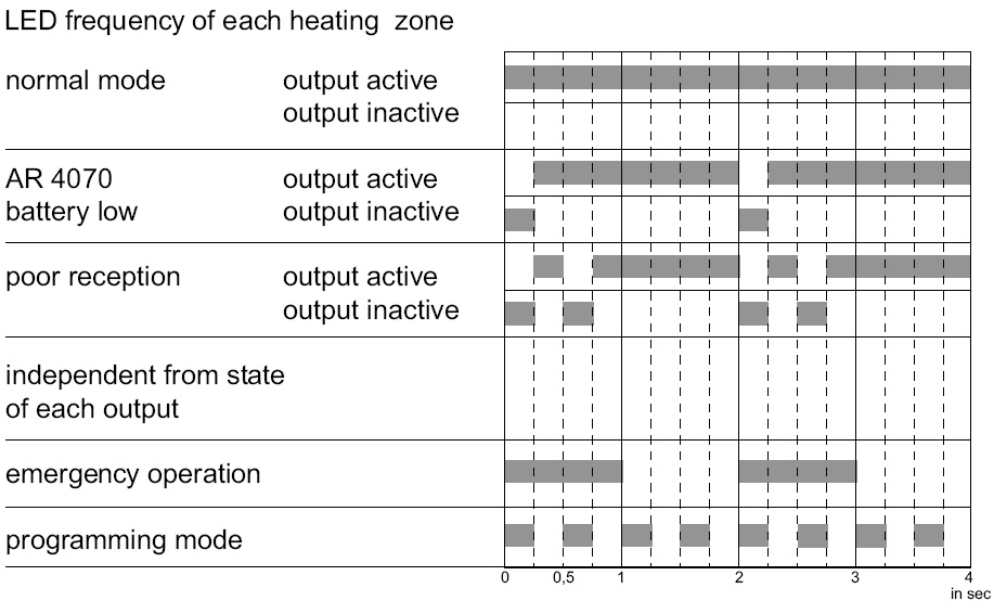
In the plastic cabinet at the control unit a circuit breaker is placed.

It is recommendable to place the room thermostats in a height of 1.50 meter and in a place without direct sun. If you just place the room thermostat on a closet or a table, the batteries will fall out and you will loose the connection between the control unit and the room thermostat.
Every 10 minutes each room thermostat will send a signal to the control unit. If the room temperature is not correct it will call for heat and the diode will lighten up in the control unit. The control unit will open and close the actuators until the right temperature has been achieved.

The time before the floor heating will react can be several hours.

If the control unit loose the power it will keep the data which has been programmed.

LED frequency of each heating zone for a control system 868MHz:



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