WAVIN SENTIO

Wavin Underfloor Heating and Sentio Control Systems
Product and Technical Guide

Underfloor heating & cooling

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Wavin is one of the leading companies in the plastic pipe industry in Turkey. Our company offers a wide range of high-quality pipe and fittings system solutions for building and infrastructure. Our company, which has a history of more than half a century, started production in 1971 in Adana. Pilsa Plastik A.Ş. was purchased by Wavin B.V, the largest European company in its own field in the Netherlands in 2008.

In 2012, all Wavin companies joined the Mexichem family which is South America's giant petrochemicals and raw materials producer. Mexichem announced its new name as ORBIA in 2019. ORBIA, with its new changing business structure, provides professional support to its customers with its products and services in 5 main business lines: Building & Infrastructure, Flour, Datacom, Precision Agriculture and Polymer Solutions. With the new structuring of ORBIA, its main mission is to advance life around the world.

In 2019, with the renewed business structure of ORBIA, building & infrastructure business line was started to represent by WAVIN, a single and strong brand across the globe. WAVIN operates in more than 40 countries around the world in 4 main regions: Europe-Middle East-Africa, Asia-Pacific, Latin America and USA-Canada with 12.000 employees.

Wavin is now a global leader in the supply of plastic pipe systems and solutions for both above and below ground applications in projects around the world. Since the 1950s, we have built an unrivalled reputation for continuous innovation, intelligent problem-solving, dedicated technical support and the highest standards.

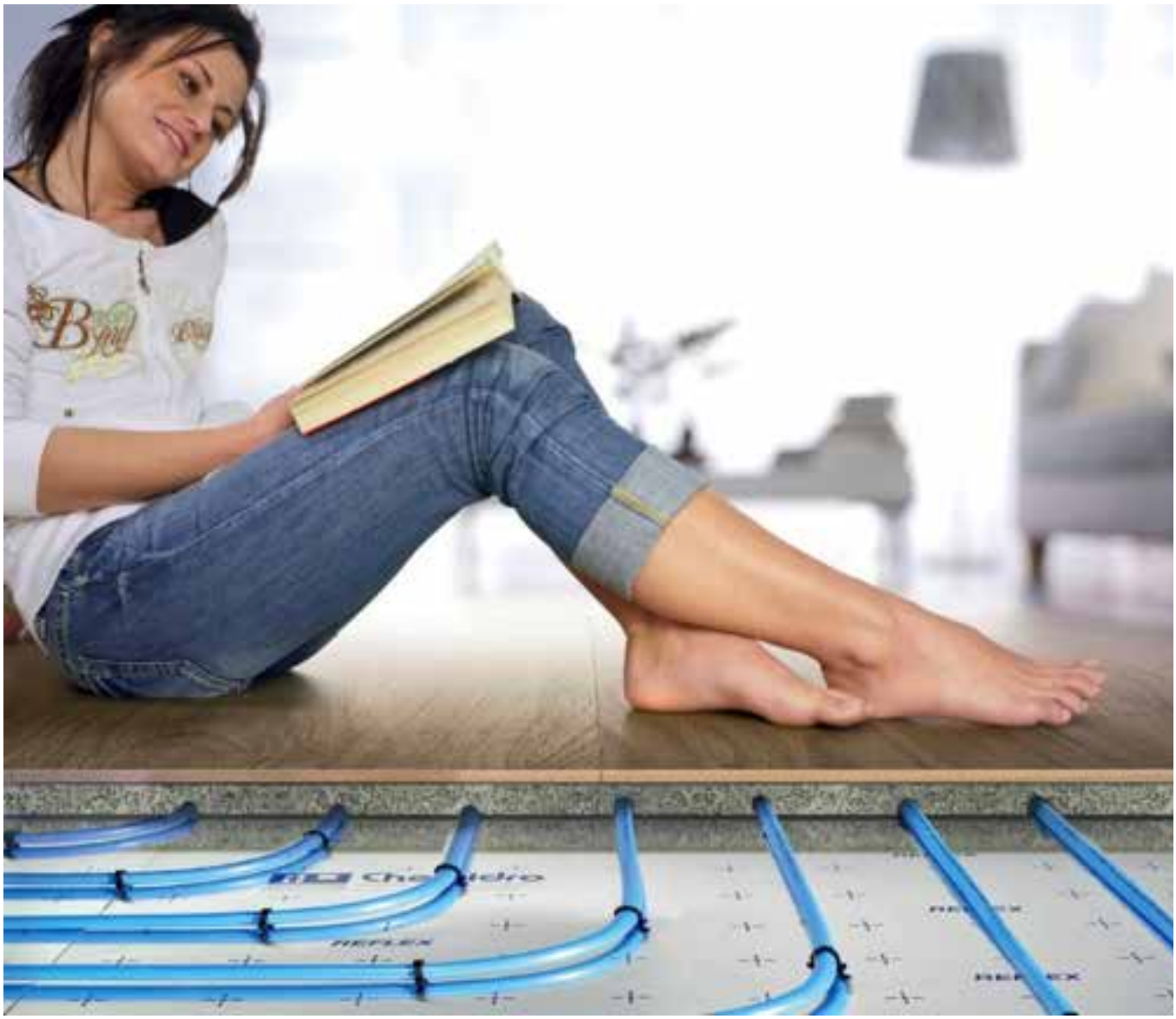
Wavin Turkey offers traditional products such as PPR-C clean water, PVC wastewater as well as the innovative products such as Tigris Press-fit systems, SiTech+ low noise pipes, Qickstream siphonic rainwater drainage systems, Q-Bic Plus infiltration systems, Tegra plastic manholes etc. to the sector. Wavin Academy which is the first training centre of the sector was opened in 2014 within our factory in Adana, Tens of thousands of visitors from various levels of the mechanical installation sector have been able to increase their expertise by attending training at Wavin Academy since 2014. Our company provides fast service with Adana, Istanbul, Ankara and Izmir offices, distribution centres located in Istanbul and Adana and wide dealers network. In addition to our sales staff, our expert engineers and technical personnel support our customers for the projects.

To get more information about our company and products, please visit our website www.wavin.com.tr and follow us on our social media accounts.

Wavin Underfloor Heating System

System Description

Underfloor heating is the most modern and comfortable heating system used for heating of living spaces with low temperature that water passing through the pipes. Underfloor heating offers its users the highest comfort. The system, which has an ever-increasing use, brings many advantages over other heating systems. Underfloor heating systems can be used in apartments, villas, hotels, offices and hospitals, as well as in industrial areas.

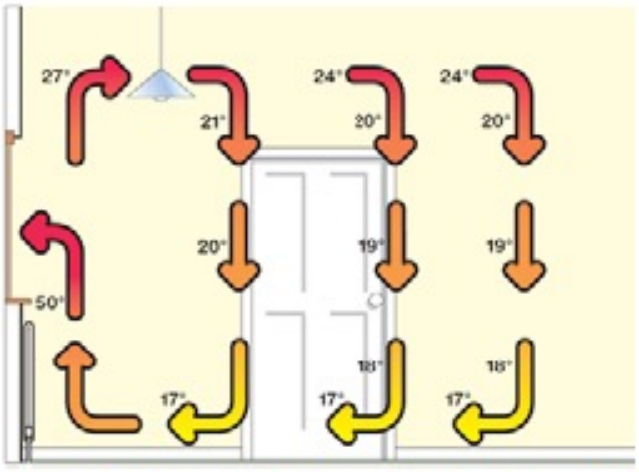


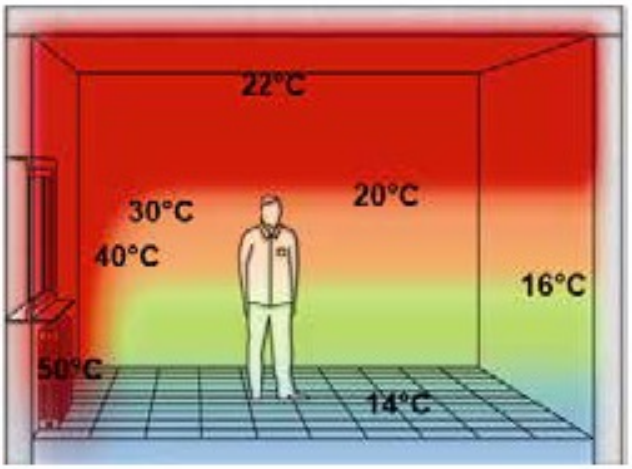
How does it work?

Low-temperature water circulated through the pipes placed under the floor, primarily heats the floor. The environment is heated thanks to the heat emitted from the heated floor by natural radiation. Radiation heating can be thought of as the Sun can remotely heat our planet for kilometers away.

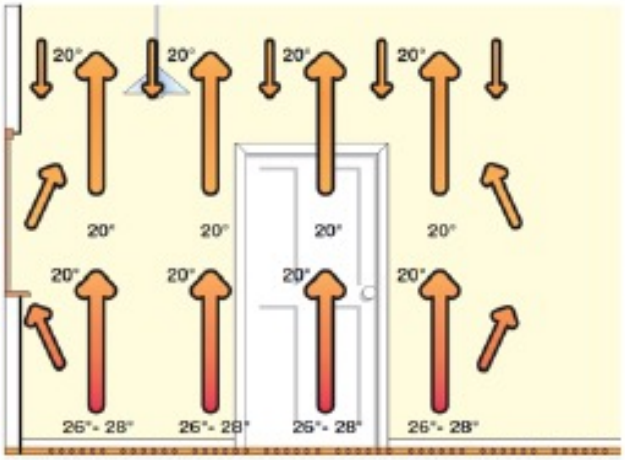
As a result, a homogeneous and comfortable warm-up is achieved because the temperature difference between the feet and the head area is minimal. However, in the alternative radiator system, the temperature difference between the foot and head area of the people in the environment is very high.

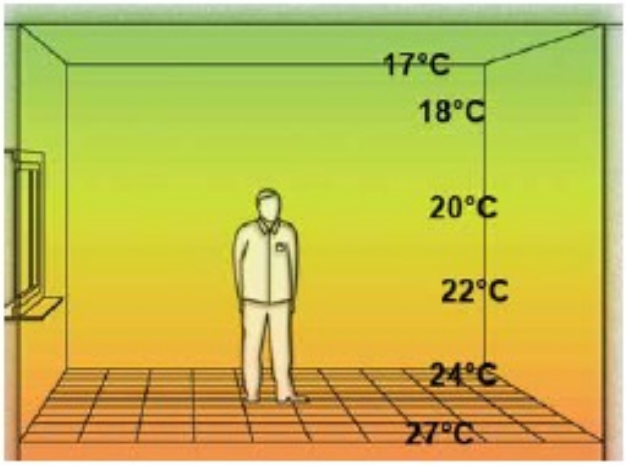
The reason for this is that the radiator spread the heat using convection method which is done by air movement. The air conditioner or fan coil system also uses convection method. When heating with air conditioner, you can feel the hot air blown over you very clearly.





Air movement and heat distribution in the radiator system





Air movement and heat distribution in the underfloor heating

What is the heat source of Under Floor Heating?

Underfloor heating also warms up environment by hot water from a heat source just like other heating systems. In other words, under floor heating system needs a heat source such as boiler or heat pump.

What are the advantages of Underfloor heating system compared to alternative systems?

• Comfort

While making an environment livable, many different objects are used such as furniture, white goods, lighting, digital systems, ect. The most important item that provides comfort conditions in those is the heating system to be chosen. Undoubtedly, underfloor heating systems significantly support the increase in quality of life. It warms up with people in all items in the environment. The temperature is distributed in underfloor heating both on horizontal and vertical axis. For example, the biggest problem with radiator heating is that when the distance to the radiator changes, the room temperature changes accordingly. In other words, heat cannot be distributed equally to the whole environment. In the underfloor heating system, it warms everywhere equally.

•Energy Efficiency

It is possible to capture comfort conditions in home, apartment, hotel, hospital, office or other industrial environments by using various heating, cooling and ventilation systems. The most important issue here is to reach environmentally friendly and sustainable comfort level in maximum quality with minimum expenditure.

In floor heating systems, the maximum sufficient floor temperature is around 26-28 ° C. Since the pipes are placed just below the floor, the heat transfer between the pipes and the floor is fast and it is sufficient to have the water temperature circulating inside the pipes at 40-45 ° C. In this way, the heat source consumes little energy to heat the water. This energy source can be solid fuel, natural gas or electricity, or environmentally friendly systems that provide a relatively low water temperature, such as a heat pump.

No matter what type of heat source is used, if underfloor heating is used in the environment, the amount of energy spent per unit time will be low.

• Freedom of design

Underfloor heating system is invisible. Pipes are placed under the floor in the environment and covered over. In other words, there is no visible equipment in the living area. For example; in radiator heating, the radiators are hung on the walls and the presence of radiators restricts the living space in our day when living spaces gradually become smaller and this heating equipment creates crowd in the environment.

On the other hand, the underfloor heating system does not create aesthetic image pollution.

It does not require cleaning. It offers design freedom to architects and engineers during the project design phase.

• Healthy environment

Since the underfloor heating system heats by radiation, air movement in the living area is minimum. In other words, less dust circulates in the air and minimizes the possibility of allergies. Since it is working with a low temperature, there is a serious decrease in the number of health harmful creatures such as mushrooms and mites.

In an area heated by underfloor heating, you can easily walk around on a warm floor with bare feet or no-worries about getting sick playing on the floor.

• Safety

In an area heated by underfloor heating, surface temperatures are low. In addition, there is no area that hurts outside as in the air duct heating system and any inside. Since there is no equipment, underfloor heating is the best solution in areas such as prisons where high security is required.

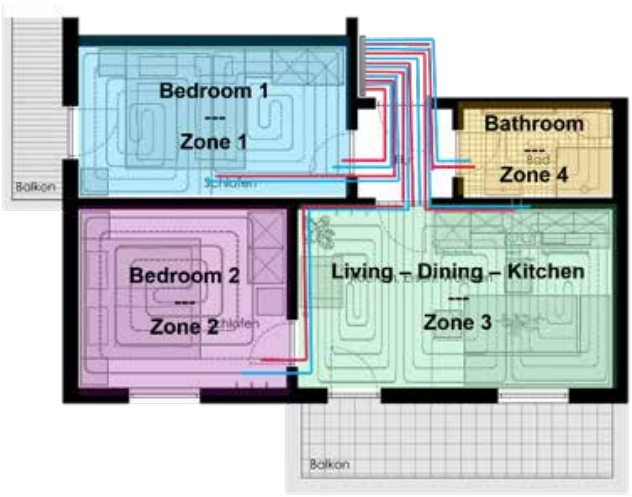
• Low maintenance costs

In the underfloor heating system, the entire installation is exposed to a minimum amount of oxygen. The large part of the system consists of plastic pipes and these pipes are spaced under the floor. Therefore, the equipment in the system does not need to be changed or cleaned due to reasons such as corrosion. The maintenance cost of the underfloor heating system is zero.

What are the advantages of Underfloor heating system compared to alternative systems?

• Expert technical staff and design programme

In addition to underfloor heating design and project services, the expert technical support is provided for the above and below ground products dedicated to Wavin's wide product portfolio. Underfloor heating projects are made through a program specially developed for underfloor heating and offered to the customers.



• Wide range product portfolio

Wavin's under floor heating product range contains all products that used in under floor heating worldwide. It is possible to find all kinds of equipment from different types of pipes to the collectors consisting of different materials, from simple automation systems to the most sophisticated automation systems aiming for the highest efficiency and comfort. Thus, when various projects requirements are needed, the most economical and most prestigious solution is offered to customer by Wavin.

Do you know that Wavin is the only brand that supplies modular composite collector in the market?

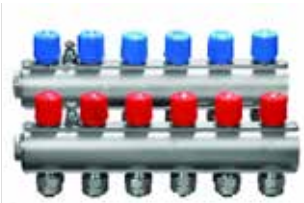
You may find more information concerning products in the next pages.

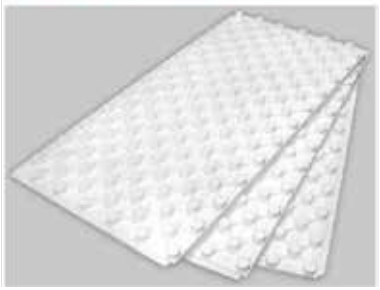
• The Most Advanced Zone Controlled System

Underfloor heating system is laid in its simplest form with pipes, panels and collectors. Such applications are called conventional type applications and there is no automation system in the system where room temperatures can be controlled separately. The heat source is set to a certain temperature and the system operates at the same temperature continuously. It is not sufficient to meet the high comfort expectations of the applications made in this way. For this reason, automation systems have been developed for floor heating systems.

1

Conventional System





2

Zone Controlled System

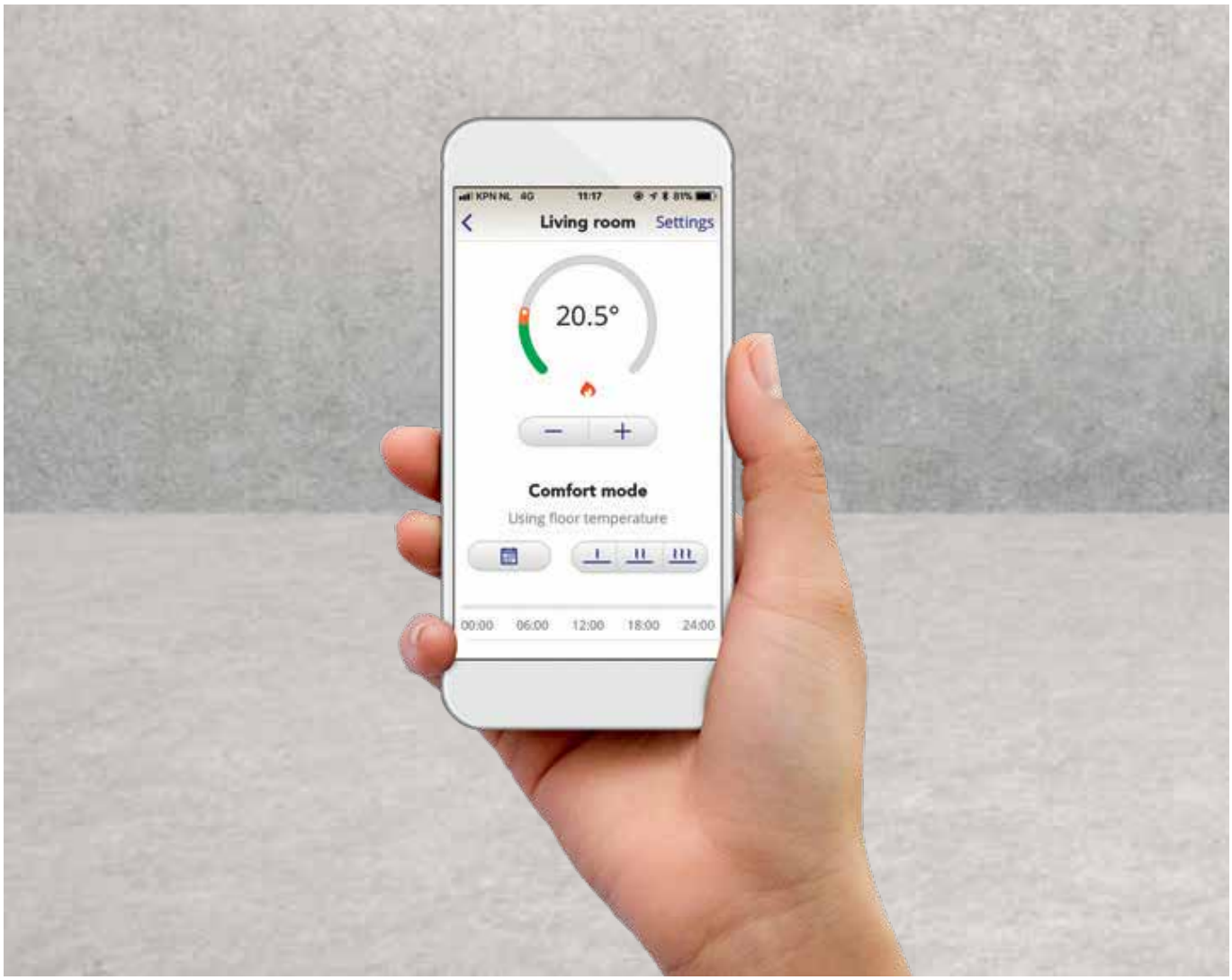
Sentio will change the way you think about underfloor heating & cooling

The Sentio system is designed to make installing underfloor heating & cooling installation smart and effortless. Building on the success of Wavin's AHC 9000, the Sentio product family includes the Central Control Unit (CCU), extension units, room thermostats and sensors, an App and an intuitive LCD touch screen. Altogether, Sentio enables you to deliver comfortable heating & cooling solutions that are very straightforward to install.

To fully take advantage of the benefits of underfloor heating and cooling typically requires advanced understanding of systems and changing a lot of settings. New Wavin Sentio changes all that. By eliminating complexity and common problems through smart and logical features, Sentio makes installation a effortless three-step process that is simply a matter of **Connect. Set. Go.**

• Sustainability

Sentio's ability to monitor, adjust and maintain an optimal temperature in different rooms throughout the building, ensures a high level of indoor comfort while minimising energy consumption.



Sentio Central Control Unit

Sentio's robust CCU makes it simple to control and monitor underfloor temperature throughout the year. Whether heating or cooling, the CCU can maintain the ideal temperature by monitoring inlet and outlet temperatures and adjusting them accordingly. The base unit supports up to eight thermostats, 16 actuators and two circulation pumps. The result is a high level of comfort and energy efficiency. The units feature intuitive wire management with colour-coded terminals angled at 45 degrees. The CCU is able to accommodate heat pumps and district heating, and offers a great deal of flexibility with several programmable Voltage Free Relays.

• Extension units

Should more than eight zones be required, you can install an extension unit to the base unit. There is also an extension unit available that lets you control additional functions such as electric shades, pumps and lighting.

• Room sensor

Sentio room sensors offer the same functionality as the thermostats – monitoring humidity and temperature – but without an interface. They are a clever alternative for when controlling the system via the App is sufficient.

Sentio thermostat

The Sentio thermostat is non-intrusive, intuitive and smooth, and displays information only when required.

A clear example of the future, the display shows both temperature and humidity levels and adjusts light intensity according to its surroundings. With an optional infrared sensor, the Sentio thermostat can even control floor temperatures more accurately. The thermostat is intuitive to use and residents can easily switch between three pre-set comfort modes.

Sentio LCD touch screen

Your personal touch screen is a portable display that you can use for all installations. Its pre-set profiles enable fast and doubt-free commissioning. The screen offers a high degree of setting flexibility, but you do not need to have programming skills to change the settings. As the touch screen includes all programs and schedules, configuration is simply a matter of answering some questions. If you prefer, you can also program directly from your laptop through the same intuitive interface – making it a far more straightforward process to become an underfloor heating & cooling expert.

Product Range

Pipe Types

PE-Xa pipe with EVOH Oxygen barrier

- Cross-linked with peroxite
- 16X2mm pipe is s3,5 and SDR8 according to EN ISO 15875 standard.
- Max operating pressure: 1/10-2/10-4/10-5/8
- 17X2mm pipe is s3,8 and SDR8,6 according to EN ISO 15875 standard.
- Max operating pressure: 1/10-2/8-4/10-5/8

Code	D (mm)	Wall Thickness (mm)	Length (m)
3080945	17	2,0	600
3080947	16	2,0	600

*Please contact with Wavin for different coil lenght requests.

PE-Xb pipe with EVOH Oxygen barrier

- Cross-linked with Silane method
- According to EN ISO 15875 16*2mm s3,5 SDR 8.
- Max. Operating pressure 1/10-2/10-4/10-5/8.

Code	D (mm)	Wall Thickness (mm)	Length (m)
3050468	16	2,0	160
3069805	16	2,0	200
3050469	12	2,0	250

*Please contact with Wavin for different coil lenght requests.

PE-RT pipe with EVOH Oxygen barrier

- High temperature resistant pipe (PE – Raised Temperature)
- 16X2mm pipe is s3,5 and SDR8 according to EN ISO 22391 standard.
- Max operating pressure: 1/10-2/8-4/8-5/8

Code	D (mm)	Wall Thickness (mm)	Length (m)
3060185	16	2,0	160
3071312	16	2,0	200
3080524	16	2,0	250

*Please contact with Wavin for different coil lenght requests.

PE-RT/al/ PE-RT pipe with Aluminium layer

- High temperature resistant pipe (PE – Raised Temperature) with Aluminium layer
- 16X2mm pipe is s3,5 and SDR8 according to EN ISO 22391 standard.
- Max operating pressure: 1/10-2/8-4/8-5/8

Code	D (mm)	Wall Thickness (mm)	Length (m)
3019397	17	2,0	100
3019398	17	2,0	200
3019402	17	2,0	500
3017595	16	2,0	200
3017597	16	2,0	500

*Please contact with Wavin for different coil lenght requests.

Accessories

smartFix Repair Coupler

Code	D (mm)	Pc/Bag	Pc/Box
3004472	16	10	70

Star Calibration Tool

Code	D (mm)
3021196	16/20/25

Calibration Mandrel

Code	D (mm)
4999998	16

Repair Coupler Kit

Code	D	Pc/Bag	Pc/Box
4028744 x 1 adet	3/4”	-	50
4066561 x 2 adet	17x2	2	300

Pipe Coiler

Code	Weight (kg)	PC
4029073	17,7	1

*Max capacity is 600 meter

Pipe Bend Support (Poliamid)

Code	Dia Range (mm)	Pc/Bag	Pc/Box
4028869	14-18	50	500

* You can easily connect UFH pipes to the manifolds with pipe bend supports.
* Pipe bend supports protect pipes after installation while the floor construction continues.
* It is manufactured from PA 6.6 with %30 glass fiber reinforcement. High thermal and mechanical resistance.
* Single product no need any additional screws etc. Easy to install.
* It doesn’t have sharp edges like metal supports.

Panels

Simple L – Panel

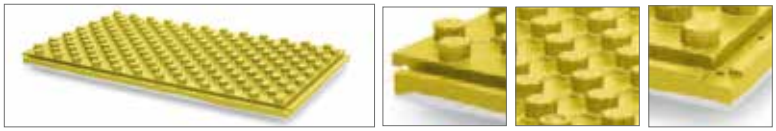
Raw Material: Expanded polystyrene (EPS) with plastic layer coated which increases strength for loads.
It is appropriate for 17x2 mm and 16x2mm pipes.
Modulation: 5cm and multipliers
Fire Resistance: Class E according to TS EN 13501-1
Delivery Type: In boxes

Code	A (mm)	B (mm)	H (mm)	Area (m^2)
4065811	1400	800	H32	1,12
4065812	1400	800	H42	1,12
4065813	1400	800	H50	1,12
4065814	1400	800	H60	1,12

Compact Basic Panel

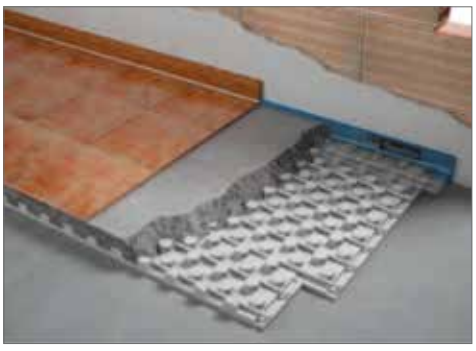
Raw Material: Expanded polystyrene (EPS) with foil coated which increases strength for loads.
It is appropriate for 17x2 mm and 16x2mm pipes.
Modulation: 5cm and multipliers
Fire Resistance: Class E according to TS EN 13501-1
Delivery Type: In boxes

Code	Material	A (mm)	B (mm)	H (mm)	Area (m^2)
4036717	EPS 200	1200	700	H35	0,84
4036718	EPS 200	1200	700	H45	0,84
4036719	EPS 200	1200	700	H60	0,84

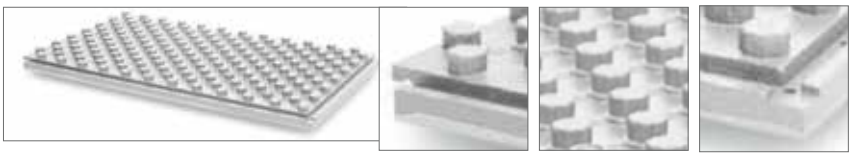


Simple Basic Panel

Raw Material: Expanded polystyrene (EPS). It is appropriate for 17x2 mm and 16x2mm pipes.
Modulation: 7,5 cm and multipliers
Fire Resistance: Class E according to TS EN 13501-1
Delivery Type: In boxes
Gross /Net Area: 1070x620 / 1050x600

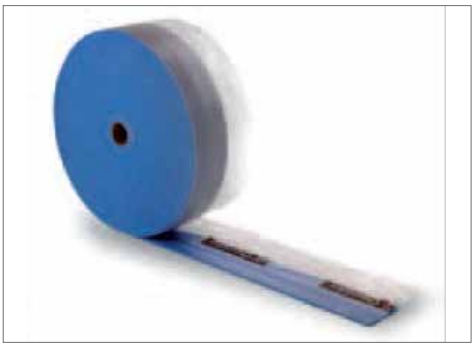


Code	Material	A (mm)	B (mm)	H (mm)	Area (m^2)	Type
4061280	EPS 100	1220	620	43	0,72	A
4061518	EPS 100	1220	620	43	0,72	B
4063844	EPS 100	1220	620	43	0,72	C
4063845	EPS 100	1220	620	43	0,72	D



Edge Insulation Tape for Expansion

Raw Material: LDPE, 23 kg/m3



Code	Raw Material	Sticky surface	PE film coated	Height (mm)	Width (mm)	Length (mm)
4028667	PE-LD	Evet	Evet	150	8	50

Dilatation Insulation Joint for Expansion

Raw material: Expanded polypropylene foam with plastic supports

Code	Raw Material	Sticky surface	Height (mm)	Width (mm)	Length (mm)
3019424	EPP	Evet	100	8	2000

Cement Screed modifying admixture

Admixture meets the requirements of EN 934-2

Code	Phase	Ratio (l/100kg)	Pack Volume	Synthetic
4062812	Liquid	1,0	10 lt	√

Panel Clips

Code	Raw Material	Pipe Diameter (mm)	Thickness (mm)	Panel Height (mm)
4052729	Plastic	16-20	2,7	≥ 30

Manifolds

Composite Manifolds and Fittings

Composite manifolds are the elements of the system that enable distribution and control of the heating and cooling. Composite manifolds are modular. You can make combination of 2 to 12 connections.

Code	Number of Circuits	Flow l/dk	A (mm)	B (mm)	H (mm)	Connection Dia	Stub end
3052726	1	4	50	80	210	-	¾" male thread
3052727	3	4	150	80	210	-	¾" male thread
3052737	Start pack	-	145	80	210	1" female thread	-

3052737

3052727

3052726

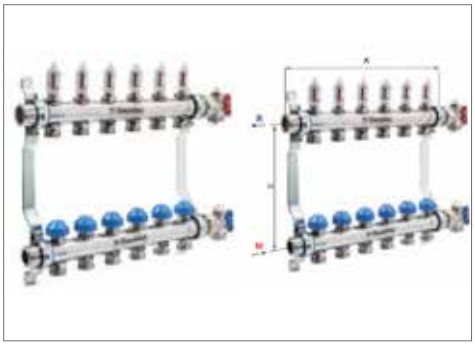
3083036

4026234

Code	Description	Connection Dia (Boiler Side)	Connection Dia (Manifold Side)
3083036	Set of shut-off ball valves 2x1"	1" female thread	1" male thread
4026234	Thermomanometer		½" male thread

Stainless Steel Manifolds and Fittings

Stainless Steel manifolds for underfloor heating systems from 2 to 12 circuits.



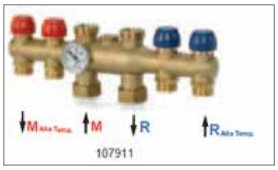
Code	Number of circuits	Flow l/dk	A (mm)	B (mm)	H (mm)	Connection Dia	Stub end
4037291	2	6	220	80	210	1” male thread	¾” male thread
4037292	3	6	270	80	210	1” male thread	¾” male thread
4037293	4	6	320	80	210	1” male thread	¾” male thread
4037294	5	6	370	80	210	1” male thread	¾” male thread
4037295	6	6	420	80	210	1” male thread	¾” male thread
4037306	7	6	470	80	210	1” male thread	¾” male thread
4037307	8	6	520	80	210	1” male thread	¾” male thread
4037308	9	6	570	80	210	1” male thread	¾” male thread
4037309	10	6	620	80	210	1” male thread	¾” male thread
4037310	11	6	670	80	210	1” male thread	¾” male thread
4037311	12	6	720	80	210	1” male thread	¾” male thread

Code	Description	Connection Dia (Boiler Side)	Connection Dia (Manifold Side)
3033596	Set of shut-off ball valves 2x1”	1” female thread	1” female thread
4037314	Thermometer	-	-
4037315	Single connection port set	1” female thread	¾” male thread
4037317	Airvent	-	⅜” male thread
4037316	Connection coupler	1” female thread	1” female thread

Mixing Unit

Mixing unit together with pump and mixing equipment’s. It is appropriate for towel warmer.

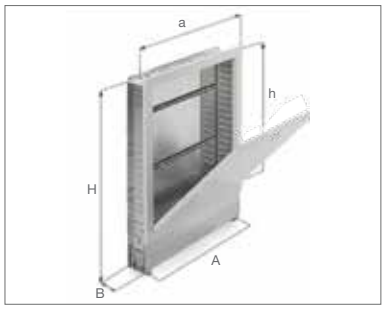
Code	Description	Connection Dia (Boiler Side)	Connection Dia (Manifold Side)
3030058	Mixing system	1” female thread	1” male thread
4037316	Connection coupler	-	1” female thread
4037356	Towel warmer connection set	1” female thread	¾” male thread



Code	Description	Energy (V)	Connection Detail
4030065	Servomotor 0-10V	24	30x1,5
4030066	Servomotor 3 kademeli	230	30x1,5
4048007	Termostatik vana	-	30x1,5
4031823	Sensör kovanı	-	30x1,5

Installation Cabinets

- Produced from stainless steel.
- At least 93mm thickness.
- Height can be adjustable.



Code	a (mm)	h (mm)	A (mm)	B (mm)	H (mm)	Number of Circuits	Number of Circuits together with mixing unit
4047998	600	660	540	93-120	750-890	2-5	2-3
4047999	760	660	700	93-120	750-890	6-8	4-6
4048000	910	660	850	93-120	750-890	9-11	7-9
4048001	1060	660	1000	93-120	750-890	12-14	10-12
4048002	1210	660	1150	93-120	750-890	15-17	13-15
4048003	1360	660	1300	93-120	750-890	-	16-17

Manifold Connection Coupler

Collector connection adapter

Code	Diameter (mm)	Pipe type	Manifold Connection Diameter	Manifold Type
4031711	16x2,0	All	¾”	All
4066561	17x2,0	All	¾”	All

Control Equipments

Actuator Valve

Code	Energy (V)	Normally Open	Mounting Type	Collector Type
4048008	230	No	Pass	All
4048009	230	Yes	Pass	All
4048010	24	No	Pass	All
4048011	24	Yes	Pass	All

Code	Description	Manifold Type
4037357	VA50 Connection adapter	Inox

Zone Control Systems

Sentio System for Heating and Cooling

Central Control Units

4063796

4063800

4063801

4063802

Code	Description
4063796	Sentio Control Unit, 8 Loops, wireless
4063800	Sentio Extension unit, 8 loops
4063801	Sentio Extension Unit, 6 VFR
4063802	Sentio Commissioning Touch Screen

Room Thermostats and Sensors

3077001

4063803

3077004

3077003

4063810

Code	Description
3077000	Sentio Thermostat Wired
3077001	Sentio Thermostat Wireless
4063803	Sentio Wallbox Frame
3077004	Sentio Thermostat Wireless, IR
3077002	Sentio Sensor Wired
3077003	Sentio Sensor Wireless
4063810	Sentio Floor Sensor Wired
4063807	Sentio Outdoor sensor wireless

Basic Automation System – Only for Heating

4064908

4064909

4064910

Code	Description
4064908	Room Thermostat (Analogue)
4064909	Two way Valve Male Thread 1”
4064910	On/Off Electrothermic Actuator, 220V, NC

Working Principle of the System

With the opening of the thermostat that controls the ambient temperature, the thermostat environment reaches the desired temperature by sending command to the central automation device.

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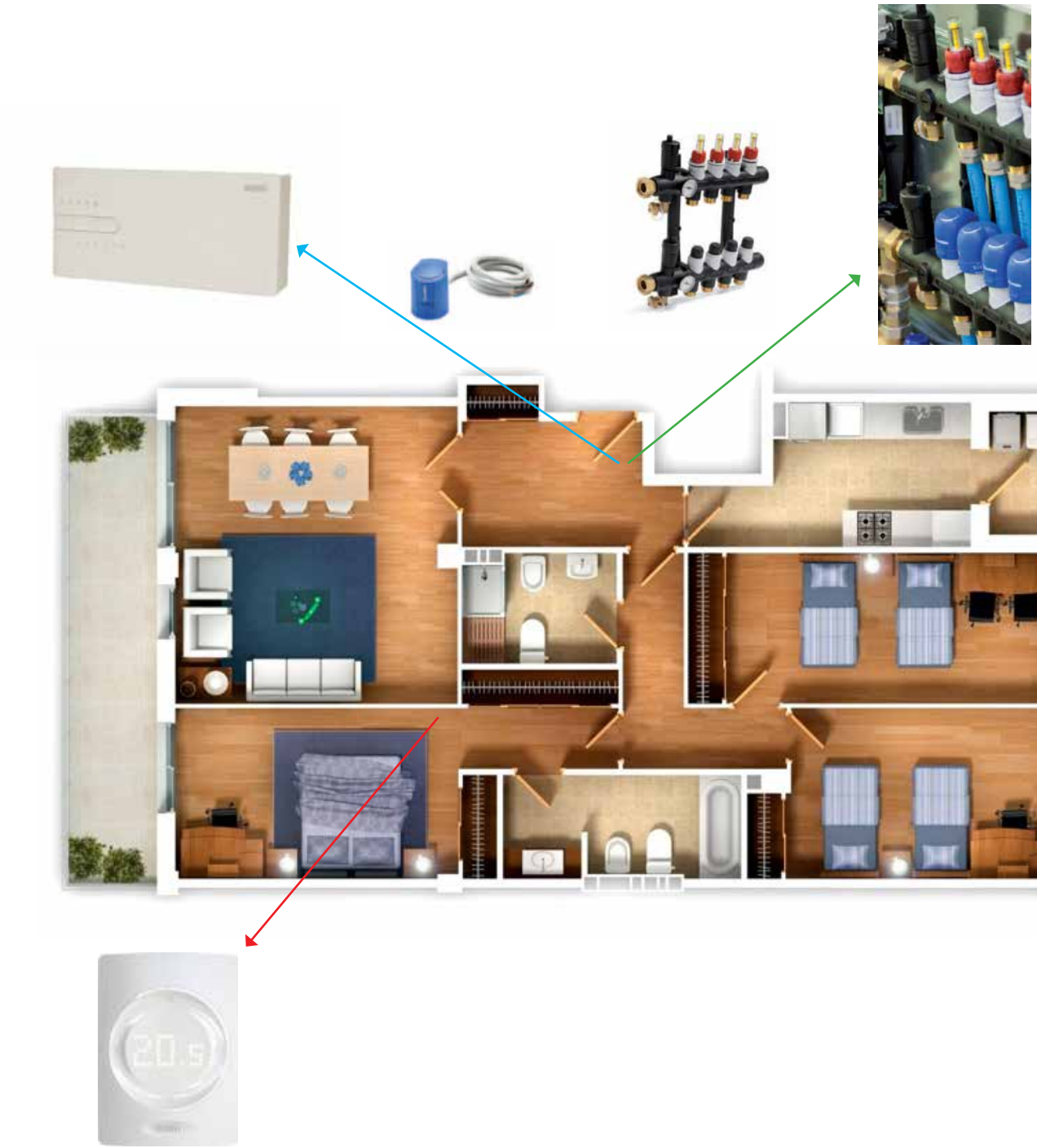
When the command received, the actuator makes the valve on.



Installation Instructions

Application steps to be considered in order to obtain maximum efficiency from underfloor heating system:

• The flooring of the place where the underfloor heating system will be installed is cleaned, the edge where the wall and the floor meet insulation tape is adhered.

The edge insulation tape made of LDPE, disconnects the bond between walls and columns and the horizontal floor screed which prevents the cracks that may occur as a result of thermal changes on the floor surface.



• Underfloor heating panels are laid starting from corner and edge of the wall considering male and female parts.

When the floor heating panels arelaid, heat losses from the subfloor are prevented. Also the heat to be transferred to the lower floor is minimized. In this way, the entire heat is transferred to the environment and the environment is heated. Make sure that the panels cover the floor completely.

• Piping should be done properly based on the project needs.

Installers need to ensure that the piping is made in accordance with the project. Otherwise, cold areas may occur in the area and this may cause to customer dissatisfaction.

• Pressure test is done

The test pressure should be applied as twice of the working pressure and not less than 6 bar.
Test duration must be at least 24 hours.

• Expansion items are placed at the gate transition points.

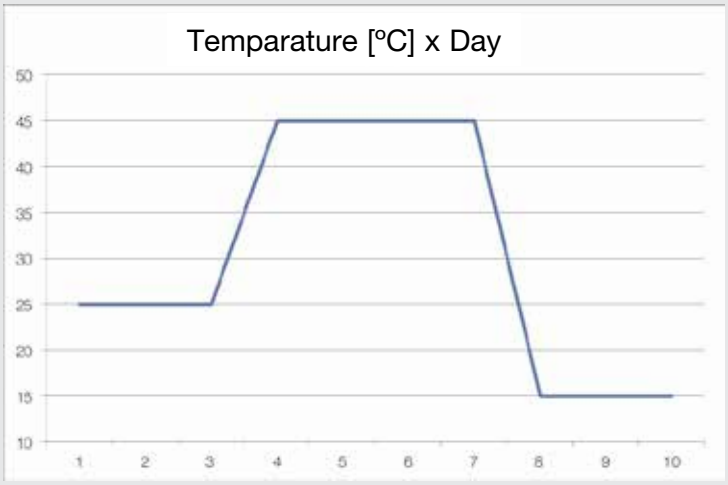
Expansion items should be placed to regulate the behavior at different ambient temperatures.

• The screed additive is mixed and the final screed is applied.

The screed additive removes the air inside the screed in the first days of drying. In this way the pipe wrapped by screed better by increasing heat transfer surface and homogeneous heating is provided. Do not screed if the air temperature is below -5 ° C or above 30 ° C. If possible after screed, it should be covered with nylon linoleum. In this way, one may prevent the surface from drying out faster and protect the screed from dust. The type of concrete used for screed is usually 325. The recommended cement-water mixing ratio is 0.55.

• Before starting the installation of the flooring, the screed is heated to remove the moisture inside the screed.

After the last screed has been laid, 21 days must be passed before the system works. Then the system should be opearted at 20-25 ° C at least 3 days. After starting, it should be operated at maximum design temperature for at least 4 days.



• The last flooring is laid

After laying last floor the installation is completed.

References

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Ankara

Ovva Cadde
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Trakhome Ütopya
Edirne

Topkapı Flores
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Triovista
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Şanlıurfa

Vema Green Park
Şanlıurfa

Kasaba Evleri
İstanbul

San Zeno Salestian Enstitüsü
Verona / Italy

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Smart Construction
Parma / Italy

New Farmhouse
West Yorkshire / England

Imperial War Museum North
Salton / England

The British Museum | Great Court
London / England

Apartment Building Cordia City Garden
Budapest / Hungary

Apartment Building Hermina Happy Land
Budapest / Hungary

Mario Frigerio Spa
Lecco / Italy

Athletes Village
London / England

Atrium Meadway's Sen School
Boston / USA

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Haramain Railway Station
Jaddah / Saudi Arabia

K&H Bank
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