The temperature uniform distribution inside domestic, work and industrial environments creates a sense of physical well-being, allowing to obtain the optimum values for people comfort.

#### **CLEAN AND HEALTHY**

The low temperatures at which the underfloor heating system works, avoids the absence of air convective currents that can cause a sensation of dryness and irritation in the throat which are often the cause of allergic phenomena, providing a much healthier system. When the installation is placed under the floor, the system is invisible and therefore does not need to condition the placement of static and permanent emitters and therefore to have all the free space for furniture and opens the door to all the possibilities of architecture, interior decoration and the free choice of flooring.









**INDEX** 

- 1.- Plastic pipes.

- By cables

2.- Basic components

3. Regulation and control

- Via Radio (Wireless)

4. Preconfigured Systems for Thermal Centrals

# ¿What is a underfloor heating?

A underfloor heating is the Heating System by irradiation of heat, produced by the conduction under the floor of circuits of hot water, which provides a greater sensation of comfort.

# UNDER FLOOR HEATING PRINCIPLE

20 °C

22 °C

#### ment.

The heat is dissipated through the mortar plate, and this plate to the pavement, being the emitter of the thermal energy necessary to heat each room.

HEATING HOUSES THROUGHT THE FLOOR

# MAIN COMPONENTS UNDER PAVEMENT





- Heating without air movements.
- Compatibility with any source of energy.
- Hidden emitter system, perfect for decoration.
- Compatible with practically any type of pavement.
- Energy saving

# The under floor heating and health With underfloor heating you breathe health

- Avoid dust particles are in suspension (ideal for allergic)
- Easy ventilation and air renewal when opening windows as the slab does not cool.
- It does not cause circulation problems in the blood or produce varicose veins. The surface temperature is up to 8 °C below body temperature.

The basic principle of a under floor heating installation consists in the circulation of hot water at low temperature under the pave-



# Advantages of the underfloor heating



#### **PE-RT EVOH**

Our PE-RT EVOH pipes are manufactured using PE-RT type II, in accordance with the UNE-EN-ISO 22391 standard and are intended for use in underfloor heating installations inside buildings. These pipes incorporate an external film as an anti-oxygen diffusion barrier.

**Oxygen anti-diffusion barrier (EVOH):** The oxygen barrier consists of a thin film of ethylene-vinyl alcohol copolymer resin (EVOH). This resin is characterized by its unequaled properties of oxygen barriers, as well as its excellent chemical resistance to solvents and petroleum products.

In hot water conduction applications in closed circuits, as the temperature increases, the intermolecular space in the pipe wall increases, becoming superior to the oxygen molecule. This fact allows the oxygen molecules to penetrate through the wall of the pipe producing the permanent oxygenation of the water in the installation, with the consequent continuous oxidation of the metallic parts of the installation. All this produces the reduction of the durability of the materials as well as deposits of oxide that can clog the pipe.

**PERT Tipo II:** The polymeric resin used for manufacturing is composed of a last generation ethylene-octene copolymer that provides the pipe with an increase in its long-term hydrostatic resistance. The use of PE-RT type II in the pipes also provides them with the following properties:

**Corrosion resistance:** PE-RT type II pipe provides great resistance to corrosion both against external attack (protection against the environment, contact with construction materials, etc.), as well as the internal attack produced by corrosive waters.

**Roughness:** The low Roughness coefficient that the pipe presents 0.007 mm, decreases the loss of load in the installation achieving a reduction of the costs of pumping. It also helps to reduce the formation of incrustations inside it.

**Permeability:** Standard UNE-EN 1264-2, in ANNEX A specifies that the pipe must have an oxygen permeability  $\leq$  0.32 mg / (m2xd). PE-RT EVOH pipe has a value of 0.01 mg / (m2xd).

#### **PROPERTIES POLYETHYLENE TEMPERATURE RESISTANT (PE-RT)**

Density	0.941	g/cm3
Coeficiente of linear thermal dilation	0.19	m/m °C
Maximum operating temperature	95	°C
Thermal conductivity	0.45	W/m °K
Radius of curvature	5 x DN	From ø16 ø20

**DIMENSIONS**: There is a relationship between the maximum design pressure of the pipe for a given application class with the pipeline series. PE-RT EVOH pipe has the following dimensional characteristics

PIPE SELECTION CHART (mm)					DESIGN PRESSUR	E (BAR)
	Outer diametr	Series	Thickness	Inner Diameter	Class 4	Class 5
	16	4	1,8	12,4	8	6
	20	5	1,9	16,2	6	4



# PLASTIC PIPES FOR UNDER FLOOR HEA-TING

# PE-RT PIPE WITH EVOH BARRIER

#### PE-RT EVOH Ø16x1,8

(Standard manufacture in rolls of 120, 200, 450, 500 y 600 mts.)

#### PE-RT EVOH Ø20x1,9

(Standard manufacture in rolls of 200, 450, 500 y 600 mts.)

Applications: The main application of PE-RT EVOH pipe is underfloor heating due to its excellent properties.

The application classes are according to the UNE-EN-ISO 22391 standard

#### **CLASSIFICATION OF SERVICE CONDITIONS**

	т	Time to	T <sub>máx.</sub>	Time to	T <sub>mal</sub>	Time to	
Kind of	' <sup>0</sup>			T <sub>D máx.</sub>		T <sub>D mal</sub>	Typical field of application
application	¥ر	Years	₽C	Years	₽C	н	
	20	2,5					
4	more accumulated 40	more accumulated	70	2,5	100	100	Underfloor heating and radiators at low temperature
	more accumulated	more accumulated					

All systems that meet the conditions specified in the table (Properties PE-RT) must be suitable for the conduction of cold water for a period of 50 years, at a temperature of 20 °C and at a design pressure of 10 bars.





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#### **PERT-AL-PERT SYSTEM**

#### **APPLICATIONS**

Multilayer pipes are used in the distribution of water in underfloor heating installations. The classes of application according to the UNE-EN-ISO 21003 standard are those expressed in the following table:

#### **CLASSIFICATION OF SERVICE CONDITIONS**

Kind of appli- cation	T <sub>⊳</sub> ℃	Time to T <sub>D</sub> Years	T <sub>móx.</sub> °C	Time to T <sub>D máx.</sub> Years	T <sub>mal</sub> °C	Time to T <sub>D mal</sub> H	Typical field of application
4	20 more accumulated 40 more accumulated 60	2,5 more accumulated 20 more accumulated 25	70	2,5	100	100	Underfloor heating and radiators at low temperature

# PLASTIC PIPES FOR UNDER FLOOR HEA-TING

# **MULTILAYER PIPES PERT-AL-PERT**

MULTILAYER Ø16x2

(Manufacture standard in rolls of 120, 200 y 450 mts.)

MULTICAPA Ø20x2

(Manufacture standard in rolls of 100 y 200 mts.)

AENOR

SYSTEM

#### **REGULATIONS AND CERTIFICATION**

THE PERT-AL-PERT Tube has a Product Certificate granted by AENOR complying with the UNE-EN-ISO 22391 STANDARD







#### MINIMUM RADII OF CURVATURE (MM)

DN (mm)	Wiht hand	With spring
16	80	64
20	100	80

Minimum radii of curvature (mm)



Our PERT-Al-PERT pipes are manufactured using PERT type II according to the UNE EN ISO-21003 standard (ø16 and 20 for Under Heating Floor installations).

· They combine the advantages of metallic and thermoplastic tubes, the result of the union of an aluminum tube with two polyethylene tubes.

Reduces the problems of metallic pipes: rigidity, toxicity, corrosion, incrustations, weight, noise transmission, load losses and galvanic currents

Reduces the problems of plastic pipes: winter fragility, high thermal expansion and little or no malleability.

 $\cdot$  Designed to obtain the maximum performance of resistance and safety in under and cooling floor installations.

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# BASIC COMPONENTS FOR UNDER FLOOR HEA-TING



# FILM

#### Ref. FILM-12

Thickness	Galga 400	UNE 53328	
Presentation	Coil 12kg 125 m2 approx.	UNE 53328	
Longitudinal Retraction 120°C 20"	65-70%	ISO 527-3	
Transverse Retraction 120°C 20"	30-35%	ISO 527-3	
Non-slip material density	0,924	g/cm3	
Fluency rate	1g/10min	-	
Maximum working tempera- ture	-80/+80°C	-	
Tear strength (lengthTransv.)	250 – 590 c/N	ISO 6383-2	
Lengthening in break (lengthTransv.)	449 – 513%	ISO 527-3	
Impact resistance F50	288g	ISO 6383-2	
Global transmission visible liah	95%	-	



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# BASIC COMPONENTS FOR UNDER HEATING FLOOR

#### **PERIMETER STRIP**

#### Ref. BANDA Packed in packs of 5 units

tions and aggressions.

₋enght	50	m
Height	150	mm
Skirt lenght	240	mm
Thickness	8	mm
Density	25	Kg/m3
lemperature of use	-1070	°C
Ozone resistance	Óptimal	-
Resistance to deformation	Óptimal	-
Resistance to mold	Óptimal	-



UNDERFLOOR HEATING

SYSTEM









TECHNICAL CHARACTERISTICS	PLUS 32	PLUS 48			
Useful dimensions	1400x800	1400x800	mm	UNE EN 822	
Total area	1,12	1,12	m2	-	
Thickness without the tube holder.	10	26	mm	-	
Total height	32	48	mm	-	
Density	30	25	Kg/m3	-	
Thermal resistance	0,35	0,75	m2·k/W	UNE EN 12667	
Thermal conductivity	0,030	0,034	W/ m2·k	UNE EN 12667	
Compression resistance at 10%	200	150	kPa	UNE EN 826	
Fire resistance	E	E	Euroclasse	UNE EN 13501-1	
Absorption of water by immersion	<3	<3	%	UNE EN 12087	
Resistance to the diffusion of water vapor (µ)	30 a 70	30 a 70	h	UNE EN 13163	
Permeability to water vapor (µ)	0,010 a 0,024	0,010 a 0,024	mg∕(Pa h m)	UNE EN 13163	
Code Designation CE PLUS 32	EPS-EN 13163-T1-L1-W1-S1-P3-DS(N)5-DS(70/90)1- BS200-CS(10)150-WL(T)3			UNE EN 13163	
Code Designation CE PLUS 48	EPS-EN 13163-T(2)-L(3)-W(3)-S(5)-P(10)-DS(N)5- DS(70/90)1-BS200-CS(10)150-WL(T)3			UNE EN 13163	

#### **CONDITIONS AND PRECAUTIONS FOR USE**

Before beginning the assembly, it must be ensured that the partitions are raised and the drainage network is finished.

· Before placing the board, the perimeter strips should be placed on the perimeter of the rooms, using the partitions as support, until the board are placed. These bands have the function of avoiding thermal bridges and absorbing the dilatations of the mortar.

· The surface of the floor must be as smooth as possible, in addition to being level. To do this, it must be cleaned of possible plaster or concrete pegs.

· The board are placed directly on the clean slab, because if it is placed on irregular surfaces can break, as well as having chances of cracks appearing in the floor of the floating slab.

· Once the boards are installed, the pipe is installed and covered with a layer of mortar with a thickness of 4 cm. above the pipe.

It must have what is indicated in the regulations of

mandatory compliance with the slab.

If the slab was irregular, it could be filled the irregularities with mortar, leaving the boads perfectly seated.

· The boads boxes will be stored in a dry place protected from rain, sun and extreme temperatures.

Solar radiation can cause degradation of the surface of the boads. The rigid original cardboard packaging is used to prevent as far as possible any possibility of degradation.

· Accumulated dirt can be easily cleaned.

Store them in covered and ventilated places that comply with the laws in force regarding their storage.

· Product considered as non-hazardous for transport.

· In all cases, the standards of good practices in Health and Safety in force in the construction sector should be taken into account.

BASIC COMPONENTS

# FOR UNDER FLOOR HEA-TING

## **BOARD PLUS**

**Board PLUS with 32 mm thickness** Presentation: box of board  $16 = 17.92 \text{ m}^2$ 

#### **Board PLUS with 48 mm thickness**

(Certified by AENOR acording to norm 1264) Presentation: box of 8 board =  $8,96 \text{ m}^2$ 

UNDERFLOOR HEATING SYSTEM

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#### **PLUS 32: PLUS 32:**

Thickness total: 32 mm. // Thickness base: 10 mm



#### **PLUS 48:**

Thickness total: 48 mm. // Thickness base:



#### ADVANTAGE

Thanks to its thermal insulation, the loss of heat through the floor is avoided. Thus the comfort of the house is increased at the same time as the energy consumption is reduced.

· The design of the tube holde allows the pipes to be fastened very quickly, without the need for staples or accessories.

Easy placement as it is a light and very handy material.

· The thermoforming gives great mechanical resistance and aging, so it perfectly supports the footsteps that are made during installation.

· Specially designed to meet the requirements of the Technical Building CODF.

· Meets the requirements of the CE marking.

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# **BASIC COMPONENTS**

# FOR UNDER FLOOR HEA-TING



# **AISLAMIENTO** TERMOACÚSTICO REFLECTIVO



#### Ref. RSTSR

**TECHNICAL SPECIFICATIONS** 

11 Kg.
1,20 = 30 m2
35 m² K/W
025 W/mK
88%
22 69 dB (A)
8 mm
10,2 KPa
F
er and water vapor
Yes

#### PROPERTIES AND ADVANTAGES

#### COMPOSITION

#### HOW TO USE

- Clean the surface of work remains and check that there is no moisture in the support. Unroll the sheet along the entire support with the part of the bubbles facing down.



# **BASIC COMPONENTS**

# FOR UNDER FLOOR HEA-TING

#### **UNDER FLOOR HEATING GRIP RAIL FOR** PERT EVOH AND MULTILAYER PIPES

# Material:

Polyamide with fiberglass.

Technical parameter: Working temperature: 0°C - 65°C

SUITABLE FOR T	UBES:			вох	
Diameter	Dimensions X/Y/Z (mm)	Weight (g)	Quantity (box)	Dimensions (box)	Weight (Box)
16 - 20	1000x45x29	185	100 rails	102x41x20 cm	18,5 Kg











# BASIC COMPONENTS FOR UNDER FLOOR HEA-TING

# **EXPANSION JOINT**

#### Ref. JUNTA-D

Density	50	Kg/m3
Thickness of the base	20	mm
Thickness	8	mm
Height	90	mm
Length	2	m





# FOR UNDER HEATING FLOOR

For ø16 pipes

Presentatión: box 40 guides

<b>Material:</b> Polyamide with fiberglass.
<b>Technical parameter:</b> Working temperature: 0°C – 65°C

For Pipe Diameter	Dimensions X, Y, Z (mm)				
ø 16 mm	125 x 17 x 25				
ø 20 mm	140 x 20 x 39				







#### Characteristics / Advantages

Superplasticizer with prolonged effect

• It allows to realize concretes that maintain a great fluidity for more time than the one obtained with traditional superplasticizers.

• Fluidizes in normal conditions and with a duration of effectiveness of 30/60 minutes, all concretes with dry-plastic consistency that have a temperature above 25

• It allows to realize important water reductions, for which very compact concretes are obtained that have very high mechanical resistance and a good impermeability.

• It decreases the segregation and exudation of water. Reduces vibration time



# BASIC COMPONENTS FOR UNDER FLOOR HEA-TING

#### **ADDITIVE FLUIDIFYING FOR MORTAR**

#### Ref. ADITIVO Package of 25 liters

weather. It is free of chlorides.

#### **Applications:**

#### **Certificates/Standard**

# BASIC COMPONENTS FOR UNDER HEATING **FLOOR**

#### **INHIBIDOR** OF INCRUSTATIONS AND CORROSION

#### **Ref. INHIBIDOR**

#### Package of 5 liters

#### Dosage and method of use:

#### **Physical and chemical properties**

Appearance	liquid
Color	Red - Orange
Density	1200 ± 0,020 g/cc
Solubility water	Total



#### Composition

- Corrosion inhibitors
- Chelators
- Dispersants
- Inorganic salts
- Destillad water

#### Precautions

- Irritating to eyes and skin
- Keep out of reach of children
- In case of contact with eyes or skin, wash immediately with plenty of water and seek medical advice

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# BASIC COMPONENTS FOR UNDER FLOOR HEA-TING

# **INSTALLATION DESCALER**



#### Qualitative composition

- Organic and inorganic acids Corrosion inhibidor
- Surfactants

#### Precautions

- Causes burns
- Keep out of reach of children Use proper protective clothing. In case of contact wiht eyes or skin, wash immediately with planty of water and seek medical advice.

#### Ref. DESINCRUSTANTE Package of 10 liters



- **Dosage and method of use:** Dilute depending on the degree of incrustation.

#### **Physical and chemycal properties**

Appearance	Clear liquid
Color	Blue
Density	1,5 ± 0,5
рН (1%)	1100 ± 0,020 g/mL





#### THE METAL BOXES

**1. Body:** Made of steel sheet Galvanized cold, which prevents the possible formation of rust. With two adjustment feet in height from 0 to 100 mm. It incorporates a rear mesh for the grip of the plaster. The thickness of this galvanized steel sheet is 0.8 mm. The sides have pre-cuts of the sheet that allow the incorporation of the pipes at any level.

**2. Front panel:** Made of cold-galvanized steel sheet. It is fixed with standard hooks present laterally and internally to the body. In addition, the front panel incorporates a mesh that has been designed to facilitate the adhesion of plaster.

3. Frame and Door: Made of sheet steel with a thickness of 0.8 mm, painted on the inside and on the outside, resistant to scratching, as well as an additional protective varnish (RAL 9010). Radial lock easy to open using a flat-blade screwdriver.

**4. Support guides:** Set of elements that allow to adjust collectors in the box. It consists of two vertical guides, fastening elements in the base and sliding screws for assembly of collectors.

# BASIC COMPONENTS FOR UNDER FLOOR HEA-TING

#### **METAL BOX FOR MANIFOLD**

#### **DIMENSIONS in mm.**

А								D				
BOX 4	BOX 5	BOX 6	BOX 7	BOX 8	BOX10	BOX12	BOX 13	Б	C	G		M
400	500	600	700	850	1000	1200	1300	630	110	450	80	M8

8 G

#### SELECTION TABLE OF BOXES SUITABLE FOR COLLECTOR Dimensions in mm.

2 tracks	3 tracks	4 tracks	5 tracks	6 tracks	7 tracks	8 tracks	9 tracks	10 tracks	11 tracks	12 tracks
BOX4	BOX5 BOX6		Х6	BC	X7	BC	X8	BO	X10	

TABLE OF SELECTION OF BOXES SUITABLE FOR STAINLESS STEEL COLLECTOR AND POLYMERIC + REF SAL01- SAL02 - SALI01

#### Dimensions in mm.

2 tracks	3 tracks	4 tracks	5 tracks	6 tracks	7 tracks	8 tracks	9 tracks	10 tracks	11 tracks	12 tracks	
BOX6	BOX7		BC	BOX8		BOX10			BOX12		

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Available in 8 different sizes



With white lacquered door and fra-

Adjustable in height (+ 100mm) Adjustable in depth (+ 50mm) Not valid for industrial manifolds

2 adjustable rails





# BASIC COMPONENTS

# FOR UNDER FLOOR



Range from 2 to 12 circuits



#### **DETAIL - SCHEME OF THE MANIFOLD**



Dimens	sions in	mm.														
							L									
A	В	С	F	Н	I	2 tracks	3 tracks	4 tracks	5 tracks	6 tracks	7 tracks	8 tracks	9 tracks	10 tracks	11 tracks	12 tracks
90	90	83	1″	200	50	290	340	390	440	490	540	590	660	690	740	790

N°	DENOMINATION	MATERIALS	FINISHED		
1	Manifold with valves	Steel AISI 304	-		
2	Regulation valves	ABS	Ral 9010		
3	Manifold with Flow regulators	Steel AISI 304			
4	Flow regulators (Flowmeter)				
5	Bracket	Steel	Zinc plated steel- Galvanized		

# **FLOWMETER**



MATERIAL Brass body, heat-resistant plastics and steel stainless. GasKets EPDM.







TECHNICAL DATE	
Maximum ejercise pressure	10 bar.
Maximum working temperature	100°C
Maximum differential pressure	1 bar.

#### **EUROCONECTOR** FOR PIPES WITH THREAD 3/4"

#### INCLUDED IN THE COLLECTOR

Euroconector with 3/4 "thread for ø16 tubes

#### Other options

Euroconector with 3/4 "thread for ø18 tubes Euroconector with 3/4 "thread for ø20 tubes  $\bigcirc$ 



#### **DETAIL SCHEME OF THE MANIFOLD**





#### Dimensions in mm.

					LI					
2 WAYS	3 WAYS	4 WAYS	5 WAYS	6 WAYS	7 WAYS	8 WAYS	9 WAYS	10 WAYS	11 WAYS	12 WAYS
290	340	390	440	490	540	590	660	690	740	790

INLET MANIFOLD C	OLLECTOR:	OUTLET MAN	IFOLD	ACCESSORIES		
Manifold Body:	PAS 777	Manifold Body:	PAS 777	Cutting valve 1":	CW617N	
Flowmeter body:	PES	Thermostatic block:	CW614N	Bracket	PP	
Indicator Body:	POM	Stem:	AISI 303	Screws:	C15	
Spring:	AISI 302	Spring:	AISI 302	Brass parts:	CW617N	
Flowmeter viewer:	ABS	Manual head:	ABS	O-rings:	NBR70	
O-rings:	NBR70	O-rings:	NBR70			
Connection ¾": CW614N		Connection 3/4".	CW614N			



# BASIC COMPONENTS FOR UNDER HEATING FLOOR

# MANIFOLD **PLÁSTIC MULTICAL**

#### Range from 2 to 12 circuits

#### Characteristics:

The new Multical manifold is specially designed and produced for installations of underflour heating/ or cooling surfaces.

It is a compact manifold and is made of polyamide reinforced with fiberglass. This combination allows to obtain a physical and mechanical resistance very similar to light metal alloys but with a resistance to atmospheric agents superior to these.

It is resistant to calcareous incrustations as well as chemical products, UV rays and ozone.

#### Benefits:

Max. glycol percentage: 50% Working pressure: 1.5 ~ 2.5 bar Max. Working pressure: 4 bar Temperature range: -10 ~ 82  $^{\circ}$  C Manifold connections: 1 "x 1" Circuit output: 3/4 " Distance between circuits: 45 mm

#### It includes:

- Manual airvent
- Filling and discharge valve
- Flow regulators
- Mounting brackets to metal box
- Key to regulate the flow meters
- 3/4 "EUROCONECTORS FOR Ø16 TUBE

30





N°	DESCRIPTION			
1	Ball Valve1″			
2	2 Filling and discharge valve			
3	Thermometer			
4	4 Manual airvent			
5	Steering wheel for flowmeters			
6	Impulsion manifold			
7	Return manifold			
8	Support			

# UNDERFLOOR HEATING SYSTEM



# BASIC COMPONENTS FOR UNDERFLOOR HEA-TING

#### **FLOWMETERS** FOR MULTICAL PLASTIC MANIFOLD



# **EUROCONECTOR** FOR MULTICAL PLASTIC MANIFOLD

# INCLUDED IN THE MANIFOLD Euroconector with 3/4 "thread for ø16 pipe

#### Other options

Euroconector with 3/4 "thread for ø20 tubes

Euroconector of press with thread of 3/4 "for tubes of ø16

## HYDRAULIC CHARACTERISTICS OF THE FLOWMETERS



	Kv	
A - ONE WAY – completely open	2	
B - RETURN – completely closed	2,9	
$V_{\rm W} = m^3 / h flow / 1 has$	r procuro loco	

 $Kv = m^{\circ} / h$  flow / 1 bar pressure loss



Ap (kPa)

G (1h)

#### **DETAILS OF MANIFOLD ELEMENTS**



closed

#### INPUT MANIFOLD

inlet manifold is equipped with a flow regulating

valve, normally called a flow meter. By means of the handwheel for flowmeters, the flow-meters are actuated to regulate the flow rate of each circuit, the flow rate can be read directly on the flow-meter and when necessary, allows the hermetic sea-ling of each circuit individually.

#### OUTPUT MANIFOLD

The return manifold is equipped with manual shut-of valves for each circuit. The valves have been specially manufactured to reduce the pressure drop and the noi se of fluid passage.

Electrothermal heads (REF: NC ACTUATOR) can be in





#### **TECHNICAL INFORMATION**

Operating voltage	230 V AC, +10%–10%, 50/60 Hz
Max. input current	< 300 mA during 200 ms max.
Service power	2 W
Actuator stroke	4.0 mm
Actuator force	100 N ±5%
Fluid temperature range	0 a +100°C
Storage temperature	-25°C a +60°C
Ambient temperature	0 a +60°C
Type of protection	IP 54 / II
CE conformity according to	EN 60730
Material and exterior	Polyamide / Light Gray (RAL 7035)
Connection cable	2 x 0.75 mm2 PVC / Light Gray (RAL 7035)
Lenght cable connection	1 m
Weight	100 g
Protection against overvoltages according to EN 60730-1 min. 2.5 kV	min. 2.5 kV

+5.5 mm 4 53.6 mm - 49.4 mm



# **REGULATION AND CONROL CONNECTION BY CABLES**

#### **ACTUATOR** TERMOELECTRIC BY UNDER FLOOR HEA-TING

Ref. ACTUADOR NC

- Silent and maintenance-free

- Certified by TÜV





The actuator uses a PTC thermistor and a compression spring. This thermistor is heated by applying the voltage to 230V of operation and moves an integrated plunger. The force generated by the piston is transferred on the valve, after a few seconds have elapsed (Dead time)

After the operating voltage is cut off and after the hold time has elapsed, the valve is closed evenly by the closing force of the compression spring.



# REGULATIONANDCONTROL

# **CONNECTION BY CABLES**

#### **ELECTRONIC CENTRAL** FOR HEATING SYSTEMS **BY UNDERFLOOR HEATING**

#### Ref. SAL 01

up to **8 themostats and 8 actuators** for each thermostat, with 230V ~ or 24V ~ power

#### TECHNICAL CHARACTERISTICS

# Power supply: Absorbed power: Central: Pump (powered): Boiler (voltage free):

230V ± 10% 50Hz 24V ± 10% 50Hz

Depends on the connected 5A @ 250V ~ SPDT 1A @ 250V ~ SPDT

ABS VO self-extinguishing

Actuators and thermostats: 8x1A @ 250V

Green LED: Red LED:

Power Active pump Degree of protection: IP30

Protection box:

Class Reg.2013 / 811 / ce I = 1.0%

# **REGULATION AND CONTROL**

# **CONNECTION BY CABLES**

#### **ELECTRONIC CENTRAL** FOR HEATING SYSTEMS **BY UNDERFLOOR HEATING**

#### Ref. SAL 02

The control unit offers the possibility of connecting up to 8 thermostats and 5 actuators for each

#### TECHNICAL CHARACTERISTICS

	Power:	230V~ ±10% 50Hz
		24V ±10% 50Hz
	Absorbed power:	
	Central:	Depends on the connected
	Pump (fed):	5A @ 250V~SPST
	Boiler (voltage free):	5A @ 250V~SPST
	Illuminated switch:	On/Off
	LED indicatión:	For each chanel
	Actuators and thermost.	1A por cchanel
	(max. applicable load)	2A totales
	Degree of protection:	IP44
	Actuators and thermostats:	1A for chanel
	(max. applicable load)	2A totals
	Protection box:	ABS V0 self-extinguishing
	Class Reg 2013/811/ce I - 1	0%



INSTALLATION SCHEME 230 V



INSTALLATION SCHEME 24 V





 $\bigcirc$ 





INSTALLATION SCHEME





# **REGULATION AND CONTROL**

# **CONNECTION BY CABLES**

**THERMOSTAT** 



#### INSTALLATIO SCHEME







# Mechanical blocking for limiting the temperature scale

		RISTICS
	Working interval:	8 30 ° C
	Sensor:	to gas expansion.
	Differential:	<1 ° K
	Contact capacity:	16A @ 250V ~ SPDT
	Degree of Protection:	IP30
	Class Reg.2013 / 811	/ ce l = 1.0%v



# **REGULATION AND CONTROL CONNECTION BY CABLES**

#### **LCD THERMOSTAT A BATTERIES (NOT INCLUDED)**

#### Ref. STAD

- Digital thermostat for the control of the room temperature with the possibility of choosing between several regulation modes and temperatures: Comfort, Eco, Anti-freeze etc.

#### TECHNICAL CHARACTERISTICS

Battery power:	2 x 1.5V AA
Ambient temperature	(internal sensor)
Regulation field	5℃ 35℃
Anti-freeze field	Off / 0.5°C
Sensor	NTC (10k Ohm @ 25°C ± 1%
Output (relay)	5 (1) A @ 250V ~ SPDT
Degree of protection	IP30



INSTALLATIO SCHEME



# UNDERFLOOR HEATING SYSTEM - REGULATION AND CONTROL

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# REGULATIONANDCONTROL **CONNECTION BY CABLES**

#### **DIGITAL CHRONOTHERMOSTAT** WEEKLY TO BATTERIES (NOT INCLUDED)

#### Ref. SCTSD

#### **TECHNICAL CHARACTERISTICS** Battery power: 2 x 1.5V AA Programming: On / Off or proportional time 5 ..... .35 ° C Working range: Anti-ice function: 0.5 ° C -5.0°C ... + 5.0°C

Class Reg.2013 / 811 / ce I = 1.0%

# **REGULATION AND CONTROL CONNECTION BY CABLES**

#### **DIGITAL HYGROSTAT** WEEKLY TO BATTERIES (NOT INCLUDED)

#### Ref. SCHSD

	- Digital chrono-thermohydrostat powered by batteries for heat / cool regulation, humidification and dehumidification.
~	- It has up to 7 different programs, one for each day of the week, with a minimum intervention time of 1/2 hour in 48 time slots for each day.
	- Temperatures / humidity in 3 levels (Comfort, Eco, Off / Anti- freeze).
	- Holiday function (1 to 99 days).

TECHNICAL CHARACTERIS	rics
Battery power:	2 x 1.5V AA
TEMPERATURE Adjustable temperatures: ti-freeze) Working range: Antifreeze: Output: Working range: Degree of protection:	3 (Comfort, Eco, Off / An- 5 40°C 0.5 25°C 5 (1) A @ 250V ~ SPDT 535 ° C IP30
Regulation field: ti-freeze) Working range: 3rd regulation levels: Internal sensor: Output: Working range: Degree of protection: Class Reg.2013 / 811 / co	3 (Comfort, Eco, Off / An- 10 95°C HR Off 20 90% RH SHT - 21 5 (1) A @ 250V ~ SPDT 535 ° C IP30 e I = 1.0%



INSTALLATION SCHEME

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Note; for the command via telephone use ITP F22

or ITR 011

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INSTALLATION SCHEME



Note; for the command via telephone use ITP F22

or ITR 011

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#### **FIXED POINT REGULATOR**

#### Examples

- Below you can see some examples of wiring. All operations must be carried out exclusively by qualified personal.

Assembly 1: Electric scheme





#### Assembly 1:

Underfloor heating circuit / cooling at low temperature, with a thermostat and without electro-thermal heads:

#### Assembly 2:

Underfloor heating circuit / cooling at low temperature with zone valve, a single thermostat and without electro-thermal heads. The zone valve opens at the request of the thermostat.

Assembly 3: Underfloor heating circuit / cooling at low temperature, with several thermostats and electro-thermal heads







# REGULATIONANDCONTROL

# **CONNECTION BY CABLES**

# **REGULATOR A FIXED** POINT

#### Ref. REG FIXED POINT

- This device is equipped with a printed circuit board and relay that allows the integration of some basic functions for mixing systems at a fixed point.

FUNCTIONING: The board receives an input signal from the room thermostat; such signal results in the starting of the secondary pump and the ignition switch of the boiler.

- In the event of a fault that causes an overheating in the flow of the heating system, the safety thermostat opens the contact, stopping the secondary ted to allow the correct operation of possible high temperature circuits (radiators or towel racks).





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SCHEME OF THE 5 TERMINALS





# **REGULATION AND** CONTROLL

**RADIO VIA CONNECTION** WIRELESS

**ELECTRONIC CENTRAL** FOR HEATING SYSTEMS **BY UNDERFLOOR HEATING** 

# regulationandcontrol

## **RADIO VIA CONNECTION** WIRELESS

#### **THERMOSTAT BATTERY MANUAL (INCLUDED)**

#### Ref. STAM RADI



#### TECHNICAL CHARACTERISTICS

Power supply to batteries:	2 x 1.5V AAA
Working range:	6 30℃
Transmission frequency:	868,150 MHz
Red LED indicator:	Battery discharged
Max. dist. of the receiver:	50 m (inside buildings)
Transmission time:	3-10 min.
Type of antenna:	Internal
Degree of protection:	IP30

#### Ref. SALI 01

#### **TECHNICAL CHARACTERISTICS**

	Power:	230V ~ -15% + 10% 50Hz
	Absorbed power:	4W
1	Relay capacity:	8x3A @ 250V ~ cosφ = 1
1	Max current total:	8A
	Pump relay capacity:	3A @ 250V ~ cosφ = <b>1 SPST</b>
	Degree of protection:	IP30
	Class Reg 2013 / 811 /	$c_{\rm P}$ IV = 2.0%



INSTALLATION SCHEME



#### POSSIBILITY OF CONFIGURATION

- Each thermostat transmits periodically via radio a command that contains the temperature and setpoint detected in the room. - The commands are received by the active SANI antenna which sends information by cable to the SALI 01 module.

- The SALI 01 module is responsible for regulating and activating or deactivating the output relay for the actuator connected to the thermostat.

The configuration and testing of the system is simple thanks to the self-learning function of the thermostat code.





INSTALLATION SCHEME



Note; For the command vía telephone do not use ITP F22 o ITR 011

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# REGULATIONANDCONTROL

**RADIO VIA CONNECTION** WIRELESS

**THERMOSTAT DIGITAL A BATTERIES (NOT INCLUDED)** 

#### Ref. STADI

- Blue backlit LCD screen.



- external sensor.

	TECHNICAL CHARACTERISTICS	
	Battery powered:	
		868,150 MHz
	Internal / external sensor:	NTC (4k7 @ 25ºC)
	Max. dist. of the receiver:	
	-Degree of protection:	

# REGULATIONANDCONTROL

#### **RADIO VIA CONNECTION** WIRELESS

#### **DIGITAL CHRONOTHERMOSTAT** WEEKLY TO BATTERIES (NOT INCLUDED)

#### Ref. SCTSDI



00 85 225 0 mm 85 mm

INSTALLATION SCHEME



www.isoltubex.net





132 mm



INSTALLATION SCHEME



UNDERFLOOR HEATING SYSTEM - REGULATION AND CONTROL

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# REGULATIONANDCONTROL

**RADIO VIA CONNECTION** WIRELESS

#### **ACTIVE ANTENNA** FOR ELECTRONIC CONTROL UNIT

#### Ref. SANI

TECHNICAL CHARACTERISTICS	
	868,150 MHz
Degree of protection:	
	6 14 Vdc

# regulationandcontrol

#### **RADIO VIA CONNECTION** WIRELESS

#### **1 CHANNEL RECEIVER** OUTPUT

#### Ref. SRE-CALDI

- Radio receiver with 1 channel, equipped with integrated antenna and a relay output SPDT, can operate an actuator, a circulation pump, or direct-ly the boiler.

- It incorporates a bicolor LED for the indication of

	TECHNICAL CHARACTERISTICS
	230V ~ ± 10% 50Hz
	24V ± 10% 50Hz
Output (relay):	6A @ 250V ~ cosφ = 1
	868,150 MHz



85 mm

INSTALLATION SCHEME







INSTALLATION SCHEME



# **UNDERFLOOR HEATING SYSTEM -REGULATION AND** CONTROL

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#### **DRISTRIBUTION GROUP WITH VALVE** THERMOSTATIC MANUAL A FIXED POINT

#### **TECHMICAL CHARACTERISTICS**

-Maximum use temperature: 90 ° C -Maximum working pressure: 10 bar -Rosca female: UNE EN 10226-1 -Rose male: UNE-EN ISO 228-1 -Bomb: Grundfos ALPHA2 25-60 180 -Range of T<sup>ª</sup> thermostatic valve: 30-60 ° C -Liquids: water, glycol water (max 30%) -Range of measurement of thermometers: 0-120 ° C

Ref.	G	G1	L mm.	H mm.	Bomb	Weight Kg
02G	G 1″ F	G 1 ½″ M	125	363	Withount bomb	4,05
02G/B	G 1″ F	G1½″M	125	363	Grundfos UPM3	6,70



#### CHARACTERISTIC CURVE OF HYDRAULIC PUMP





PVci: Power absorbed at constant speed.

PDPpi: Power absorbed at proportional pressure.

PDPci: Power absorbed at constant pressure

# PRECONFIGURED SYSTEM

# **FOR CENTRAL THERMAL**

#### **DISTRIBUTION GROUP** WITH THERMOSTATIC VALVE MANUAL A FIXED POINT

#### Ref. 02G Ref. 02G/B

and thermal insulation.

	TECHNICAL CHARACTERISTICS
	Ball and retention valve:
	Body: Brass UNE EN 12164
	Sealing gaskets: PTFE, EPDM
	•Thermostatic valve:
	Body: Brass UNE EN 12164
	Seals: EPDM
J	Spring: Stainless steel AISI 302
-	•Bomb
	Grundfos UPM3 AUTO L 25-70 180
	Body: Cast iron
	•Thermal isolation:
	Body: EPP
	Density: 60 kg / m3
	Conduct Thermal: 0.039 W / m · K (20 ° C)
	Conduct Thermal: 0.041W / m · K (40 ° C)

Vci: Constant velocity

DPpi: Proportional pressure

DPci: Constant pressure





#### COMPONENTS

1	Recirculation pump: Grundfos UPM3 AUTO L 25-70 180
2	Spherical valve
3	Ball valve with check valve
4	Thermometer
5	Thermostatic mixing valve 30-60 ° C
6	Extension with bypass
7	Thermal isolation

# UNDERFLOR HEATING SYSTEM PRECONFIGURED SYSTEMS



#### **DRISTRIBUTION GROUP WITH MIXING VALVE MOTORIZED FOR CLIMATIC REGULATION**

#### **TECHNICAL CHARACTERISTICS**

-Maximum use temperature: 90 ° C -Maximum working pressure: 10 bar -Rosca female: UNE EN 10226-1 -Rose male: UNE-EN ISO 228-1 -Liquids: water, glycol water (max 30%) -Range of measurement of thermometers: 0-120 ° C

Ref.	G	G1	L mm.	H mm.	Bomba	Weight Kg
03G	G 1″ F	G 1 ½″ M	125	363	With Bomb	4,05
03G/B	G 1″ F	G 1 ½″ M	125	363	Grundfos UPM3	6,70

# PRECONFIGURED SYSTEM

# **FOR CENTRAL** THERMAL

#### **DISTRIBUTION GROUP** WITH MIXING VALVE **MOTORIZED FOR CLIMATIC REGULATION**

Ref.	03G
Ref.	03G/B

	<ul> <li>Drive group that allows the circulation of the heat transfer fluid from the primary circuit, making the adjustment of the temperature of the heat transfer fluid through the help of a motorized mixing valve.</li> <li>This distribution group is optimal for serving underfloor heating / cooling systems whose flow temperature varies depending on the internal temperature or the outside temperature (climate regulation).</li> </ul>
_	
	TECHNICAL CHARACTERISTICS
	• Ball and retention valve:
	Body: Brass UNE EN 12164
	Sealing gaskets: PTFE, EPDM
	Motorized mixing valve:
	Body: Brass UNE EN 12164
	Seals: EPDM
	•Bomb:
	Grundfos UPM3 AUTO L 25-70 180
	Body: Cast iron
	•Thermal isolation:
	Body: EPP
	Density: 60 kg / m3,
	Conduct Thermal: 0.039 W / m · K (20 ° C)
	Conduct Thermal: 0.041W / m · K (40 ° C)





#### CURVE PUMP CHARACTERISTIC GRUNDFOS UPM3 L 25 70





PVci: Power absorbed at constant speed.

PDPpi: Power absorbed at proportional pressure.

PDPci: Power absorbed at constant pressure

Vci: Constant velocity **DPpi:** Proportional pressure

DPci: Constant pressure



1	Recirculation pump: Grundfos UPM3 AUTO L 25 70 180
2	Spherical valve
3	Ball valve with check valve
4	Thermometer
5	Motorized mixing valve.
6	Extension with bypass
7	Thermal isolation







Article	A mm.	B mm.	C mm.	D mm.	Weight gr.
M03	76	106	73	69,5	480



Connection to 3 points:							
Color	indication						
BN	Rotation to the right(schedule)						
BU	Comon						
ВК	Rotate to the left (Anti-clockwise)						



# PRECONFIGURED SYSTEM

FOR CENTRAL THERMAL

#### SERVOMOTOR FOR MOTORIZED MIXING VALVE

#### Ref. M03

mixing valve of the hydraulic group 03G / B. The angle of rotation is limited to 90 °. Once the limit is reached, an electrical disconnection occurs.

of failure, the actuator can be brought to the manual position by pressing the handle, this causes the transmission to be unblocked and can be operated manually.

#### Technical information and material

Rotation time	60 - 120 sec.					
Rotation angle	90°					
Pair	10 N/m					
Feeding	230 Vac - 50Hz					
Absorbed power	4VA					
Commands	2 - 3 points					
Number of poles	3					
Cable length	1,5m					
Degree of protection	IP44					
Electrical protection	class II					
Operation temperature	-10° ; +50°					
Operation temperature	-5° ; +50°C					
Degree of humidity	-95%					
Certification	CE					
Case	PC + ABS					
Axis	Polyamide - Zinc alloy					







#### COMPONENTS

M03							
1	Servomotor / actuator						
2	Lock screw set						
3	Adapter for mixing valve						
4	Anti rotation bolt						



#### MANIFOLD REF. P72

#### FUNCTIONING

The manifold ref. P72 allows the distribution of thermal fluid from a generator (primary circuit). The circuits of return and return are separated from each other by a vertical wall in sinusoidal form. This form allows obtaining large suction spaces and avoids malfunctions between the pumps of the secondary circuits. This manifold must be installed after a hydraulic compensator to avoid the influence of the pump of the primary pumps of the secondary and vice versa.







Reference	тı	T2	L mm.	H mm.	D mm.	l mm.	C mm.	B mm.	E mm.	Departu- res	PowerkW.	Flow m3 / h.
P72-2	G 1 ½″ M	G 1 ½″	540	172	238	125	135	375	156	2	70	3
P72-3	G1½″M	G 1 ½″	790	363	238	125	135	375	156	3	70	3





# PRECONFIGURED SYSTEM

# FOR CENTRAL THERMAL

#### **DISTRIBUTION MANIFOLD** FOR DISTRIBUTION GROUP

Ref. P7 Ref. P7	2-2 2-3		ENTRADA
	<ul> <li>The distribution manifolds are coplanar with a resistant and reduced structure.</li> <li>The heat losses are limited by a cover of insulating material.</li> <li>They are constructed with profiled steel parts welded and coated with a black protective varnish.</li> <li>The distribution manifolds, in combination with the drive units, comply with traditional installations.</li> <li>All manifolds are supplied with brackets for wall</li> </ul>	COMPONENTS	
	mounting.		MANIFOLD P72
		1	Manifold
		2	Insulating cover
	TECHNICAL CHARACTERISTICS	3	Supports
	Maximum temperature of use: 110 ° C -Maximum working pressure: 4 bar -Rosca female according to standard: UNE EN 10226-1 -Rose male according to standard: UNE-EN ISO 228-1 -Liquids allowed: water, glycol water (max 30%)		



• Collector body Body: S235 steel

Density of 38 kg / m3







**MANIFOLD REF. P74** 

#### FUNCTIONING

SYSTEMS

**PRECONFIGURED** 

**SYSTEM** 

HEATING

UNDERFLOOR

The distribution manifold ref. P74 adds to the advantages present in the distribution manifold ref. P72 the integration of a hydraulic compensator. This solution provides the ability to be installed in small spaces.

The hydraulic compensator allows the pumps of the primary and secondary circuits to work independently and prolong their useful life.

The three figures show the possible situations that can occur depending on the primary and secondary flows.



# PRECONFIGURED SYSTEM

# **FOR CENTRAL** THERMAL

#### **DISTRIBUTION MANIFOLD** FOR DISTRIBUTION GROUP WITH HYDRAULIC COMPENSATOR

#### Ref. P74-2 Ref. P74-3

#### **TECHNICAL CHARACTERISTICS**

Maximum temperature of use: 110 ° C -Maximum working pressure: 4 bar -Rosca female according to standard: UNE EN 10226-1 -Rose male according to standard: UNE-EN ISO 228-1 -Liquids allowed: water, glycol water (max 30%)

#### MATERIALS

Body: S235 s nections: S235 stee

ulating housing: Body: EPP Density of 38 kg / m3 0.022W thermal conductivity / mK (10 ° C)





#### COMPONENTS

MANIFOLD P74			
1	Manifold		
2	Insulating cover		
3	Supports		
4	Hydraulic compensator		
5	Socket for expansion vessel		



# PRECONFIGURED SYSTEM

# **FOR CENTRAL** THERMAL

#### HYDRAULIC COMPENSATOR WITH INSULATION

#### Ref. COMH 1 Ref. COMH 114

#### SIMULTANEOUS FUNCTIONS

- Primary circuit and secondary circuit separation.
- Purge the installation eliminating air bubbles.
- Elimination of sludge generated by gravity.



TECHNICAL CHARACTERISTICS			
Material	Stainless Steel 304		
Maximum working pressure:	10 bar		
Maximum working temperature:	110°C		
Usable Fluid: Glicolated	Water / Watera		
Insulation thickness:	20 mm		
Insulation Material: Polypropylene (PP)	Polypropylene (PP)		

REFERENCE	REFERENCE CONNECTIONS		AREA RECOMMENDED	
COMH1	]″	89 l/min	100-300 m <sup>2</sup>	
COMH114	1 ¼″	120 l/min	300-600 m <sup>2</sup>	





REFERENCIA	A mm.	B mm.	C mm.	D mm.	E mm.	F
COMH1	355	76	210	145	1″M	½″H
COMH114	475	90	290	180	1 ¼″M	½″H

60



#### COMPONENTS

СОМН			
1	Compensator 1 "or 11/4"		
2	Automatic drain 1/2 "		
3	Drain tap 1/2 "		
4	Insulation 20 mm		

#### FUNCTIONING

The hydraulic compensator is designed and performs the function of absorbing the volumetric flow difference between the primary circuit and the secondary circuit. In a system where it is installed and where the temperature is the controlled variable, three cases of operation can occur:

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