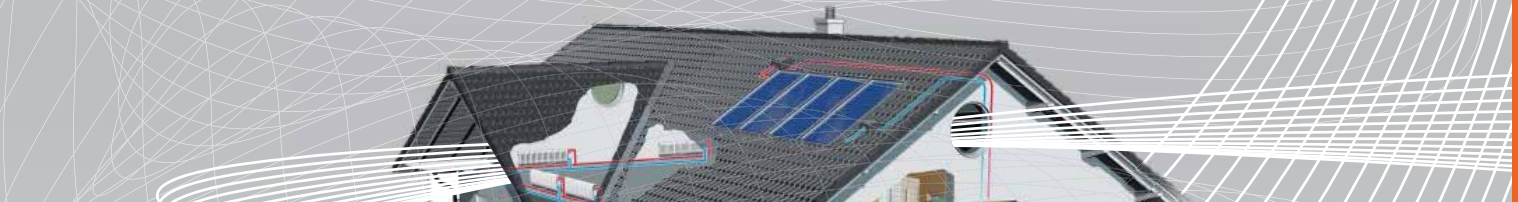
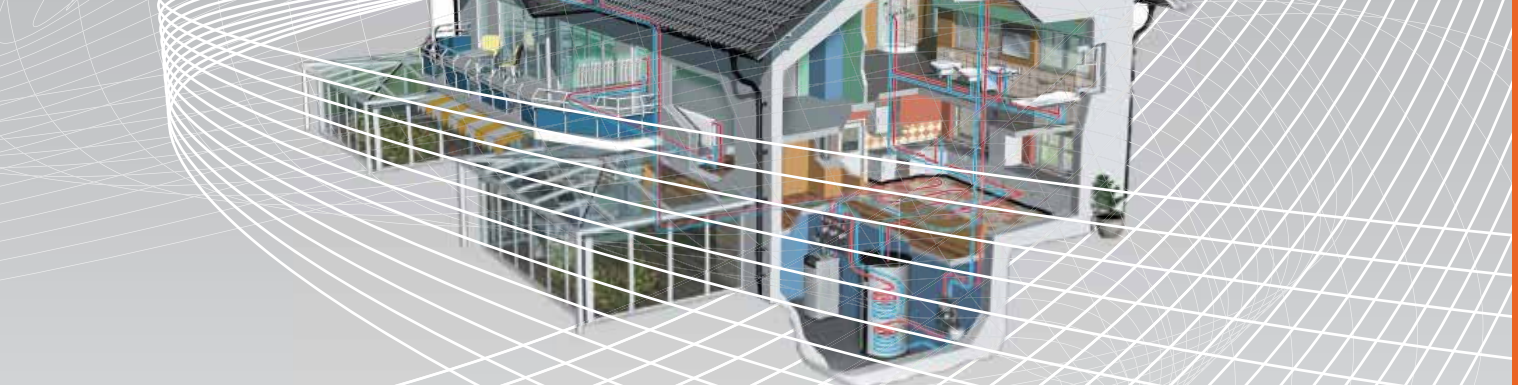
4

APE THERM, Intelligent Comfort.

Plumbing and Heating Systems
Made in Italy





APE® therm

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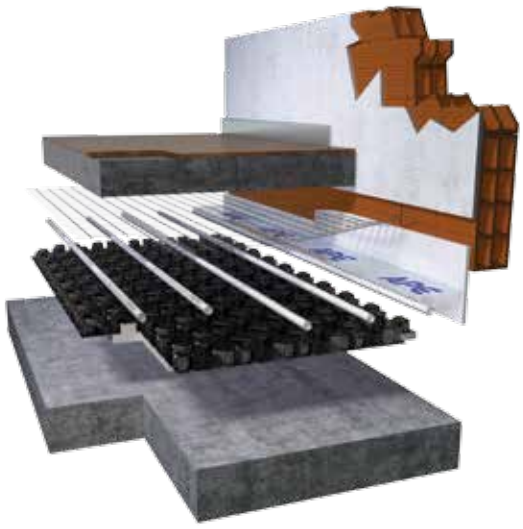
INDEX

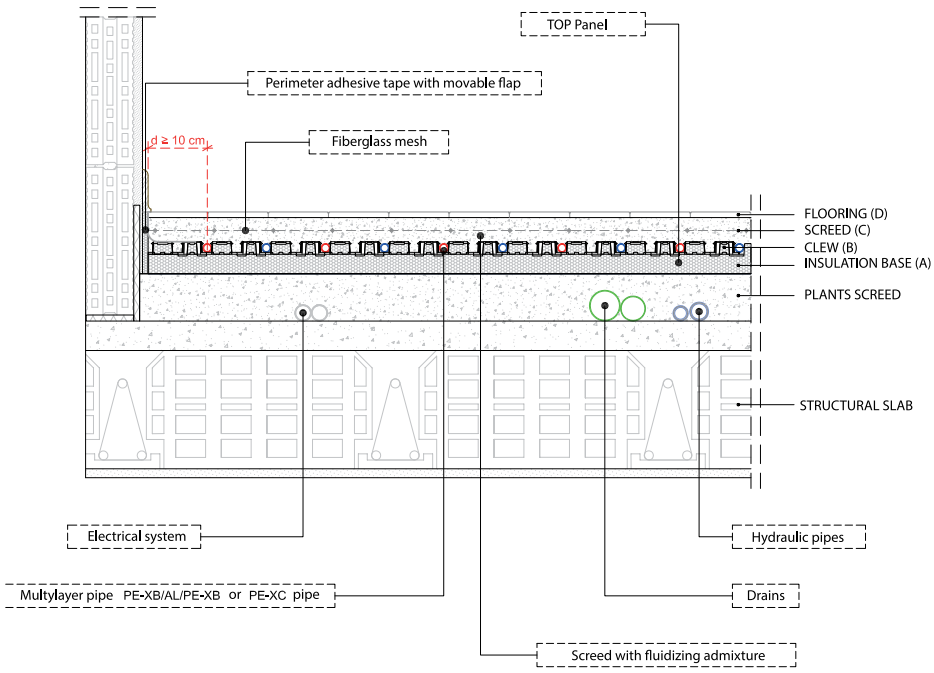
4.1 RADIANT FLOOR HEATING SYSTEMS

TOP SYSTEM

The "Top" system is ideal for housing, especially at the building stage, when circuit construction speed is guaranteed by the type of panel provided with bosses for pipe positioning, and which moreover offers a high tread strength.

The insulating ashlar panel TOP in closed-cell expanded polystyrene, marked CE as to standard UNI EN 13163, is coupled with a thermoformed HIPS film of thickness 0.6 mm to guarantee high tread strength, is undercut to allow perfect placing of the multilayer or polythene pipes (16<Ø<18), at multiple pitch 50 mm, with possible diagonal laying, and has slots and ridges along the perimeter for perfect adjacent panel coupling.





Data sheet

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INSULATING PANEL				COVERINGS			TOTAL THICKNESS	
Code	Insulation base A (mm)	Clew B (mm)	TOT panel A+B (mm)	Traditional screed C_1 (mm)	Self-levelling screed C_2 (mm)	Floor D (mm)	With traditional screed A+B+C_1+D (mm)	With self – levelling screed A+B+C_2+D (mm)
TI40402210	10	20	30	45	30	10	85	70
TI40402220	20	20	40	45	30	10	95	80
TI40402230	30	20	50	45	30	10	105	90
TI40402240	40	20	60	45	30	10	115	100
TI40402250	50	20	70	45	30	10	125	110

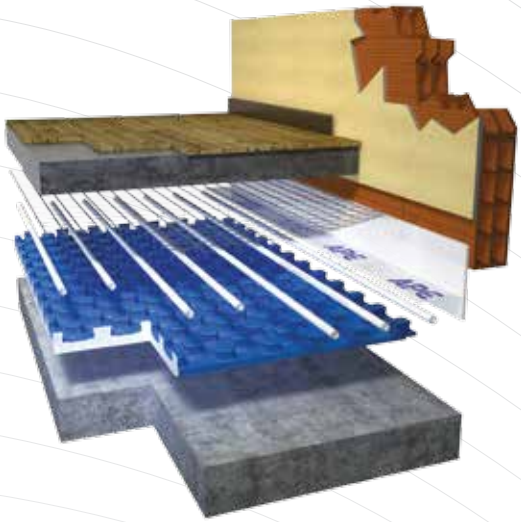
Code	Description	Package (m²)	No. of panels
TI40402210	Ashlar panel TOP mm 1380X690X30 H10/30 EPS200	19,04	20
TI40402220	Ashlar panel TOP mm 1380X690X40 H20/40 EPS150	13,33	14
TI40402230	Ashlar panel TOP mm 1380X690X50 H30/50 EPS150	9,52	10
TI40402240	Ashlar panel TOP mm 1380X690X60 H40/60 EPS150	7,62	8
TI40402250	Ashlar panel TOP mm 1380X690X70 H50/70 EPS150	6,67	7

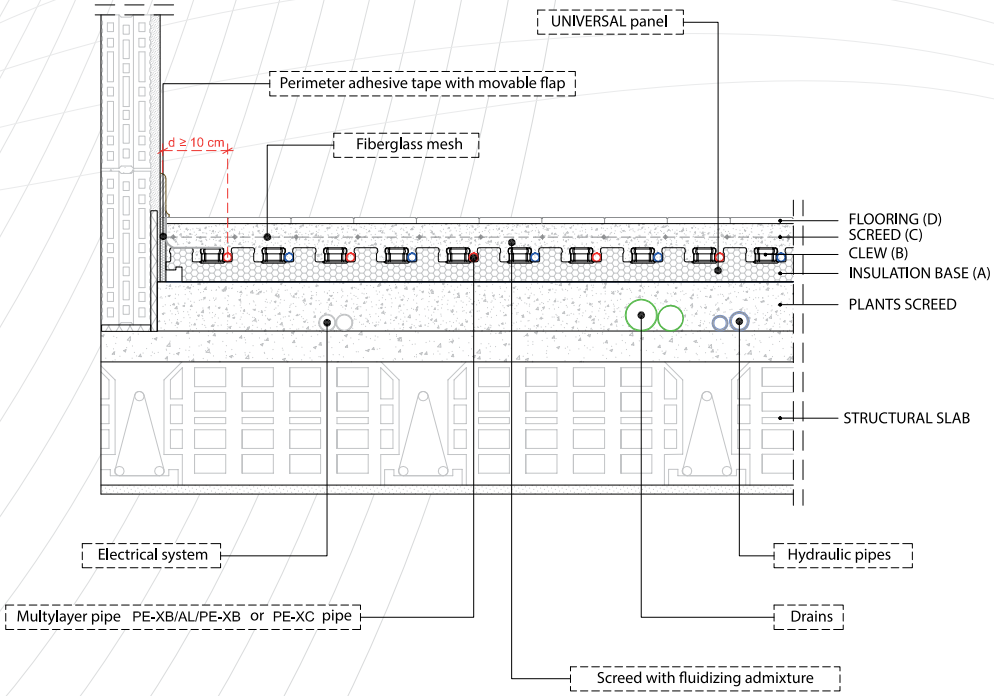
4.1 RADIANT FLOOR HEATING SYSTEMS

UNIVERSAL SYSTEM

The "Universal" system is ideal for housing and offices, the circuit installation speed being guaranteed by the type of panel, provided with bosses for pipe positioning.

The insulating ashlar panel UNIVERSAL in closed cell expanded polystyrene, marked CE as to standard UNI EN 13163, is coupled with a thermoformed HIPS film of thickness 0.16 mm undercut to allow perfect placing of the multilayer or polythene pipes (16<Ø<18), at multiple pitch 50 mm, with possible diagonal laying, and has slots and ridges along its perimeter for perfect adjacent panel coupling.





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INSULATING PANEL				COVERINGS			TOTAL THICKNESS	
Code	Insulation base A (mm)	Clew B (mm)	TOT panel A+B (mm)	Traditional screed C_1 (mm)	Self-levelling screed C_2 (mm)	Floor D (mm)	With traditional screed A+B+C_1+D (mm)	With self – levelling screed A+B+C_2+D (mm)
TI40102517	17	25	42	45	30	10	97	77
TI40102522	22	25	47	45	30	10	102	82
TI40102530	30	25	55	45	30	10	110	90

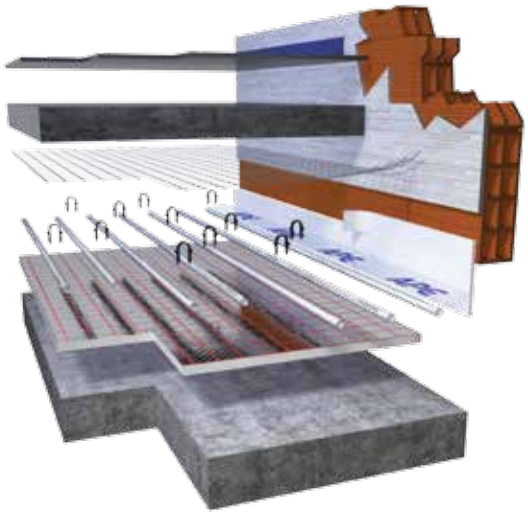
Code	Description	Package (m²)	No. of panels
TI40102517	Beveled panel UNIVERSAL mm 1200x800x42 H17/42 EPS200	13,44	14
TI40102522	Beveled panel UNIVERSAL mm 1200x800x47 H22/47 EPS200	11,52	12
TI40102530	Beveled panel UNIVERSAL mm 1200x700x55 H30/55 EPS200	9,60	10

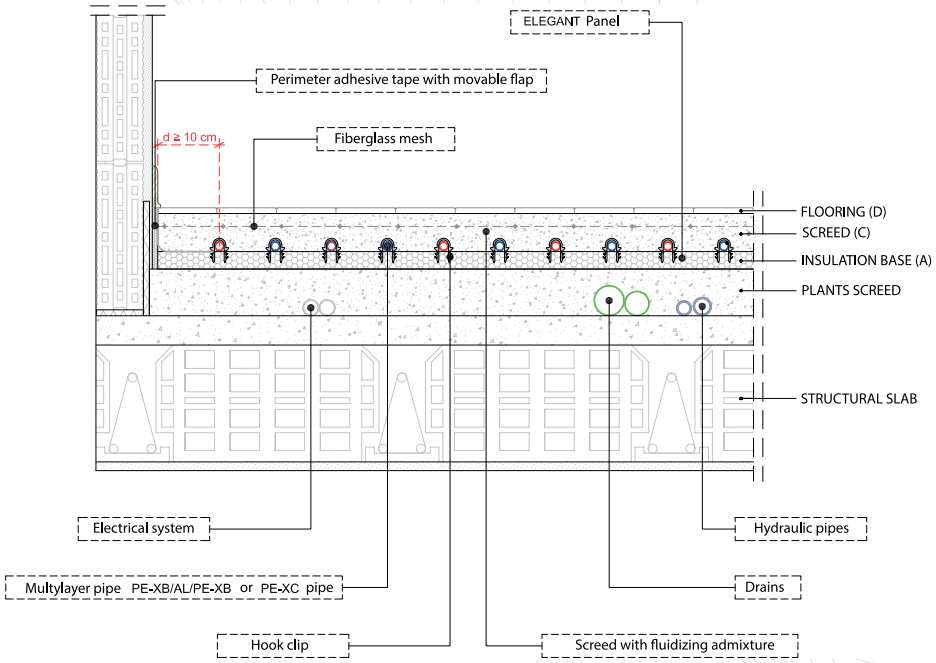
4.1 RADIANT FLOOR HEATING SYSTEMS

ELEGANT SYSTEM

The "Elegant" system is ideal for housing and offices, above all when the areas have a special layout: the flat panel allows easy cutting to special shapes and formats. Using the "Elegant" system the pipe is completely submerged in the screed, so installation times are short.

The flat insulating panel ELEGANT in expanded closed-cell polystyrene in rolls, marked CE as to standard UNI EN 13163, is protected above by a layered sheath of thickness 130-140 µm, made up of met-PET with an aluminium film having guidelines on the surface at pitch 50 mm, to help install the pipework, and has adhesive edges to allow perfect coupling between panels. To increase the thermal resistance of the panel, we also propose the version ELEGANT GRAFITE. This panel is in expanded polystyrene sintered with graphite without formaldehyde and with the same finish as the ELEGANT type panel.





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INSULATING PANEL				COVERINGS			TOTAL THICKNESS	
Code	Insulation base A (mm)	Clew B (mm)	TOT panel A+B (mm)	Traditional screed C_1 (mm)	Self-levelling screed C_2 (mm)	Floor D (mm)	With traditional screed A+B+C_1+D (mm)	With self – levelling screed A+B+C_2+D (mm)
TI40200020	20	0	20	45	30	10	75	60
TI40200030	30	0	30	45	30	10	85	70
TI40210024	24	0	24	45	30	10	69	64
TI40210039	39	0	39	45	30	10	94	79
TI40210045	45	0	45	45	30	10	100	85

Code	Description	Package (m²)	No. of panels/slabs
TI40200020	Panel roll ELEGANT mm 15000X1000 H20 EPS150	15	1
TI40200030	Panel roll ELEGANT mm 10000X1000 H30 EPS 150	10	1
TI40210024	Panel roll ELEGANT GRAFITE mm 10000X1000 H24 EPS140	10	1
TI40210039	Panel roll ELEGANT mm 8000X1000 H39 EPS 140	8	4
TI40210045	Panel roll ELEGANT mm 8000X1000 H45 EPS 140	8	4

***Order only for 500 sq.m minimum lots.**

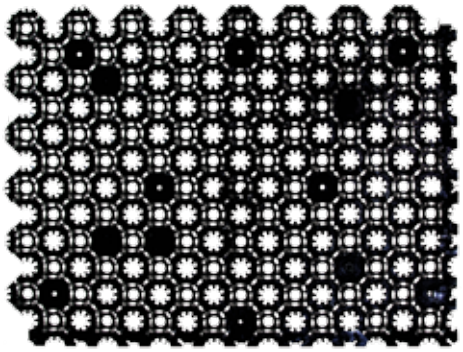
4.1 RADIANT FLOOR HEATING SYSTEMS

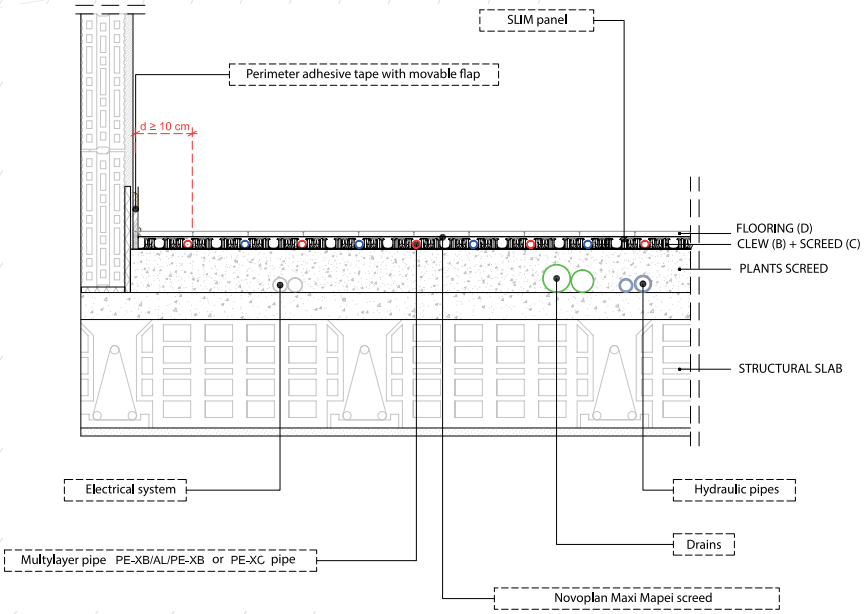
SLIM SYSTEM

The 'SLIM' system allows installation of a radiant floor heating system of thickness just 33 mm including the covering, and so is ideal in all situations where the main need is to limit the thickness. This result is possible thanks to the use as a special cement grout by Mapei Novoplan Maxi that replaces the classic sand/cement and the last-generation self-levelling screed types.

Thanks to the double-sided adhesive, the system can be easily laid on existing floors, as in the case of building refits, satisfying a wide range of building needs.

The SLIM panel is made with a PP compound reinforced with mineral and microsphere fillers having high sound-proofing characteristics, and has 20 mm risers with high compression strength; it is provided with HotMelt bonding and monosilicone paper. The panel has laying pitch 50mm perpendicular and 75mm diagonal, the risers are offset at the head and sides to allow easy and quick concrete casting and filling.





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INSULATING PANEL				COVERINGS			TOTAL THICKNESS	
Code	Insulation base A (mm)	Clew B (mm)	TOT panel A+B (mm)	Screed Mapei panel of existing rigid support C_1 (mm)	Screed Mapei with the panel of insulating layer C_2 (mm)	Floor D (mm)	With traditional screed A+B+C_1+D (mm)	With self – levelling screed A+B+C_2+D (mm)
TI40622000	-	20	20	3	35	10	33	65

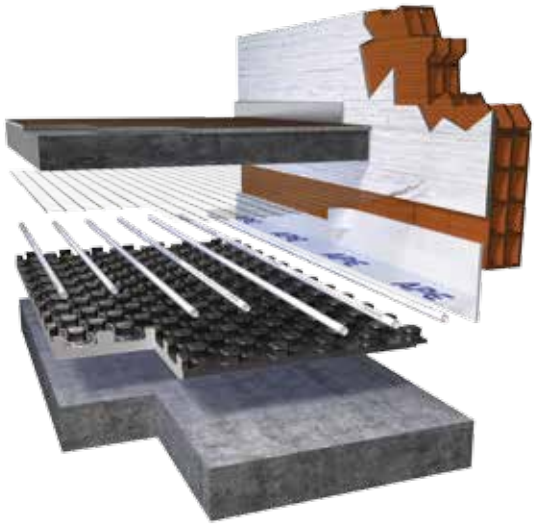
Code	Description	Package (m^2)	No. of panels/slabs
TI40622000	SLIM system mm 820X620 H 200 with adhesive	13,44	28

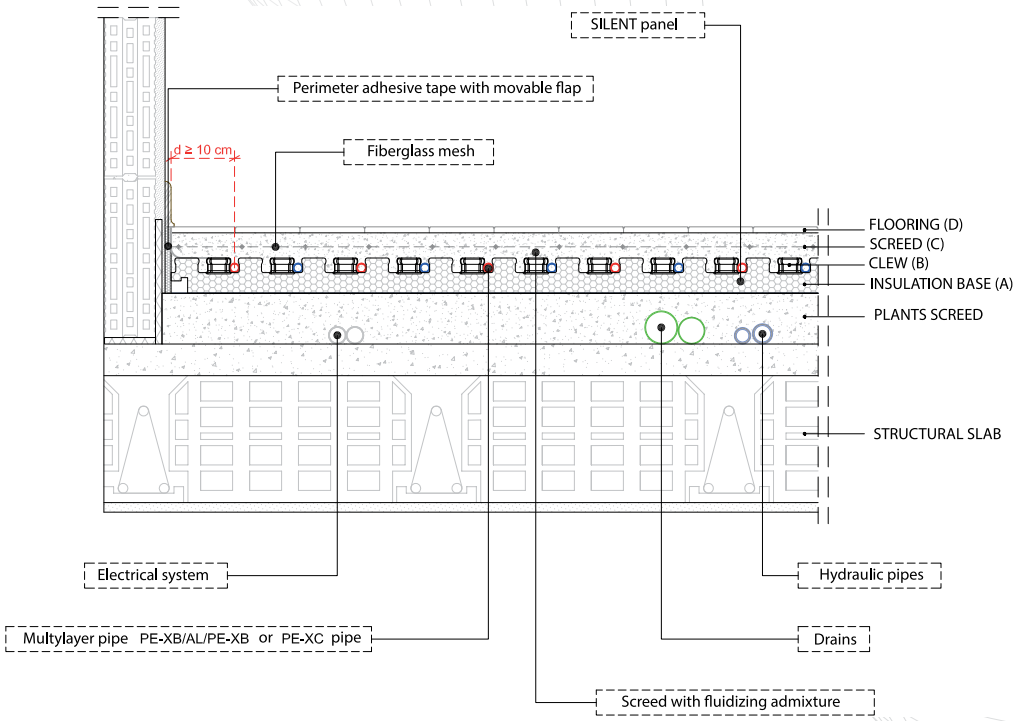
4.1 RADIANT FLOOR HEATING SYSTEMS

SILENT SYSTEM

The "Silent" system is ideal for sound insulation against tread noise; thanks to its special composition the system allows sound energy dispersion like a spring, with the heat insulation characteristics of EPS remaining unaltered. The heating system built using the "Silent" panel offers a floating floor that decouples the floor from the structure.

The insulating ashlar panel SILENT in elasticized polystyrene, marked CE as to standard UNI EN 13163, is coupled to a heat-formed HIPS film of thickness 0.6 mm, to guarantee high tread resistance, with an undercut to allow perfect seating of the multilayer or polyethylene (14<Ø<18) pipework, with an installation pitch of 50 mm and possibility of diagonal installation, having slots and ridges along the perimeter to allow perfect coupling between panels. The noise reduction ΔLW is 29 dB (as to UNI 12354-2 with unit mass of the floating screed 110 kg/m^2).





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INSULATING PANEL				COVERINGS			TOTAL THICKNESS	
Code	Insulation base A (mm)	Clew B (mm)	TOT panel A+B (mm)	Traditional screed C_1 (mm)	Self-levelling screed C_2 (mm)	Floor D (mm)	With traditional screed A+B+C_1+D (mm)	With self – levelling screed A+B+C_2+D (mm)
TI40502230	30	22	52	45	30	10	107	92

Code	Description	Package (m²)	No. of panels
TI40502230	Beveled panel SILENT mm 1400x800X52 H30/52 ΔLW = 29 dB *	11,20	10

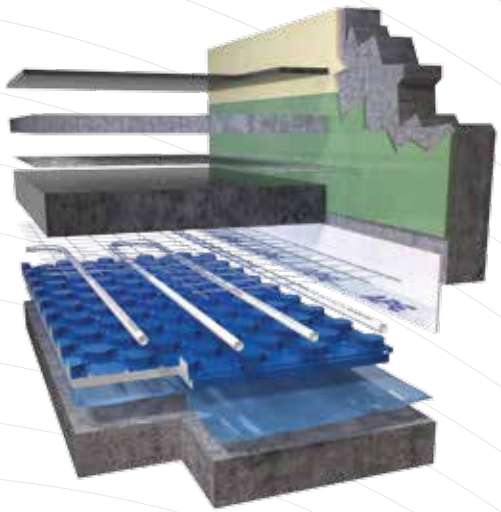
***only on order**

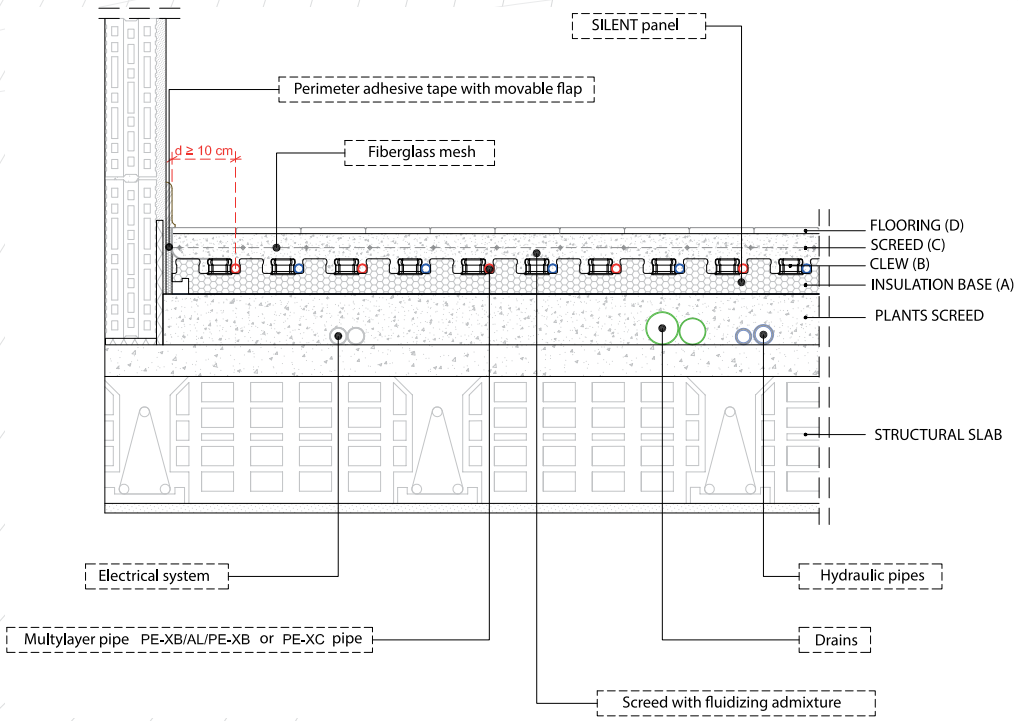
4.1 RADIANT FLOOR HEATING SYSTEMS

INDUSTRIAL SYSTEM

Radiant floor heating systems are most effective when the areas to be heated are of great height, as in industrial sheds, churches and sports centres. As heat transmission is by radiation, the temperature decreases with height, with multiple benefits: a heating economy of 50-60% with respect to traditional systems, as not the entire volume of the building is heated, large savings in the installation cost of the radiant heating system, reduced thermal capacity as only the radiant area is considered and reduced heat losses due to door opening if compared with air heating systems.

The insulating ashlar panel INDUSTRIAL in closed cell expanded polystyrene, marked CE as to standard UNI EN 13163, is hot- coupled with a compact PS film of thickness 160 micron, s provided with bosses to seat the multilayer or polyethylene pipework (14<Ø<20), at multiple pitch 75 mm, and has slots and ridges along the perimeter for optimal edge coupling between panels





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INSULATING PANEL				COVERINGS			TOTAL THICKNESS	
Code	Insulation base A (mm)	Clew B (mm)	TOT panel A+B (mm)	Traditional screed C_1 (mm)	Self-levelling screed C_2 (mm)	Floor D (mm)	With traditional screed A+B+C_1+D (mm)	With self – levelling screed A+B+C_2+D (mm)
TI40303030	30	25	55	45	30	10	110	95

Code	Description	Package (m²)	No. of panels
TI40303030	Beveled panel INDUSTRIAL mm 1200x750X55 H30/55 EPS150 *	9	10

***only on order**

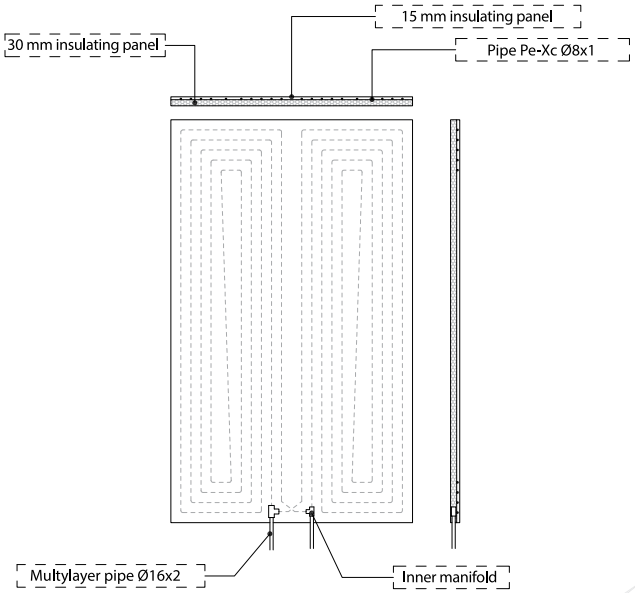
4.1 WALL AND CEILING HEATING RADIANT SYSTEMS

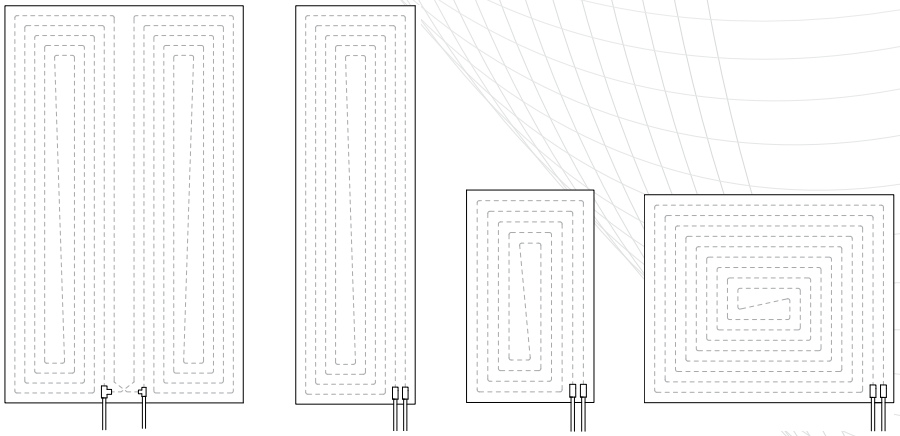
DRY SYSTEM

The "Dry" system is ideal for winter heating but above all for summer use in residential structures, new and rebuilt, and in buildings such as sales centres, hospitals and schools, where the application of a false ceiling is the best choice among the proposed solutions.

The preassembled radiant heating system in gypsum board can be used for both walls and ceilings, the modular panels allowing perfect adaptation to the architecture of the building with no compromise.

The radiant heating DRY panel is prefabricated, composite and multilayer, self-supporting and is made up of an insulating EPS layer of thickness 30 mm and a 15 mm plasterboard with class zero fire resistance and densified with fibreglass, bonded together. In the surface plasterboard panel there are slots to host the hydraulic circuits in HD polythene with oxygen barrier, of size 8x1. The circuits are supplied by brass distributor manifolds lodged in the structure of the panel and that ensure hydraulic system balance, in turn connected to the external supply system by multilayer pipework 16x2 lodged in the insulating layer.





1200x2000 600x2000 600x1000 1200x1000

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Code	Description	Package (m²)
TI41101220	DRY panel mm 1200x2000X45	2,4
TI41101012	DRY panel mm 1200x1000X45	1,2
TI41100620	DRY panel mm 600x2000X45	1,2
TI41100610	DRY panel mm 600x1000X45	0,6
TI41201220	DRY panel mm 1200x2000X45 for wet areas	2,4
TI41201012	DRY panel mm 1200x1000X45 for wet areas	1,2
TI41200620	DRY panel mm 600x2000X45 for wet areas	1,2
TI41200610	DRY panel mm 600x1000X45 for wet areas	0,6
TI41301220	DRY panel mm 1200x2000X45 infill	2,4
TI41311012	DRY panel mm 1000x1200X45 infill for wet areas	1,2

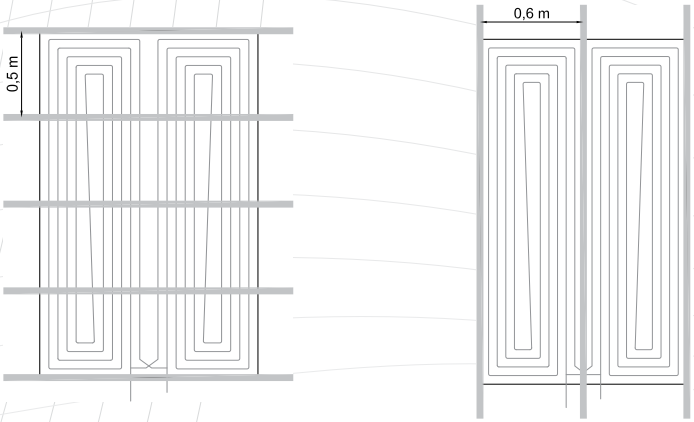
4.1 WALL AND CEILING HEATING RADIANT SYSTEMS

DRY SYSTEM

INSTALLATION

STEP 1: Metal structure preparation

The galvanised steel structure can be installed in adherence at a profile pitch of 40-50 cm or as a false ceiling with a double hanger and floating system; in this case the hanger pitch must be 90 cm, the main support system 100 cm and the riser distance 40-50 cm.



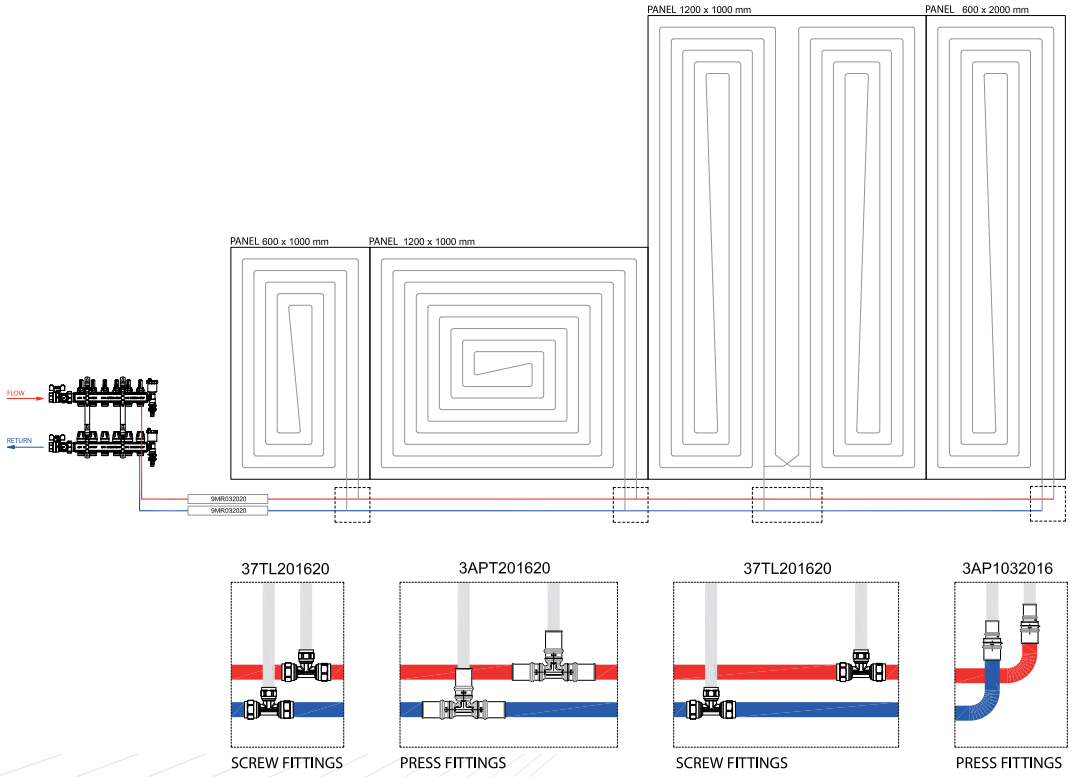
Support system pitch distances

STEP 2 : panel application

The radiant panels are anchored to the metal structure with specific screws, avoiding the printing on the panel; it is important to leave zones without panels, for the passage of the supply pipes, as foreseen in the layout provided on request with the materials, and to leave a few millimetres gap neat the walls. Leave an expansion joint every 16 m^2 of panel.

STEP 3: pipe connections

Connection of the panels to the supply lines Ø20 is by lock fittings [art. series 700L: 37TL201620] or pressure fittings [art. series AP: 3APT201620, 3AP1032016] which then connect to the distributor manifolds. **The maximum number** of circuits supplied by a single line Ø20 is **8**.



Last the system is pressurised and tested, followed by closing and plastering all the panels.

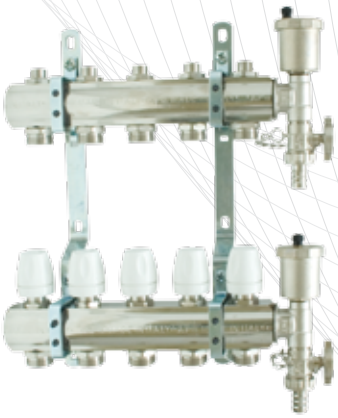
4.2 RADIANT HEATING SYSTEM COMPONENTS

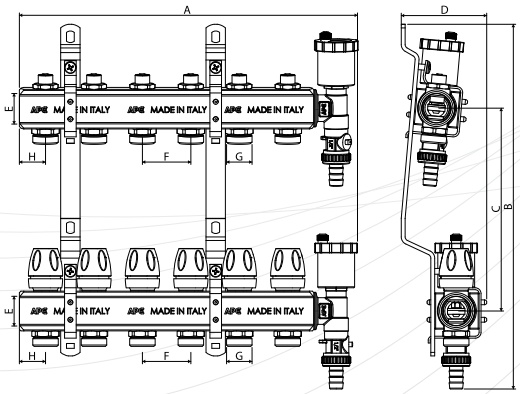
DISTRIBUTOR MANIFOLDS

pre-assembled 1" manifold for radiant floor heating system 930

Manifold Kit mod. 930 preassembled in nickel plated brass size 1" for radiant heating system with connections size 3/4" eurocone at pitch 50 mm, made up of a discharge manifold with micrometric valves and a return manifold with closures prearranged for thermostat heads.
Complete with:
- thermostat fitting kit;
- micro-valve kit;
- two automatic nickel-plated valves for air-purge with o-ring;
- two boiler fill and drain valves;
- two male plugs size 1" with female fittings
- off-centre brackets with vibration stopper grommets for insertion in housing 110 mm or wall fastening.

Temperature range: -20°C to 80 °C – Working pressure: max 6 bar.





Code	Size	Ways	Box (no.)	A (mm)	C (mm)	D (mm)
393002	1" x 3/4"	2+2	1	157	209	88
393003	1" x 3/4"	3+3	1	207	209	88
393004	1" x 3/4"	4+4	1	257	209	88
393005	1" x 3/4"	5+5	1	307	209	88
393006	1" x 3/4"	6+6	1	357	209	88
393007	1" x 3/4"	7+7	1	407	209	88
393008	1" x 3/4"	8+8	1	457	209	88
393009	1" x 3/4"	9+9	1	507	209	88
393010	1" x 3/4"	10+10	1	557	209	88
393011	1" x 3/4"	11+11	1	607	209	88
393012	1" x 3/4"	12+12	1	657	209	88
393013	1" x 3/4"	13+13	1	707	209	88

TECHNICAL FEATURES

Field of application:	heating plants
Fluid:	technical water and water glycol
Degree of glycol:	max 30%
Field of temperature:	from -20°C to 80 °C
Operating pressure:	max 6 bar

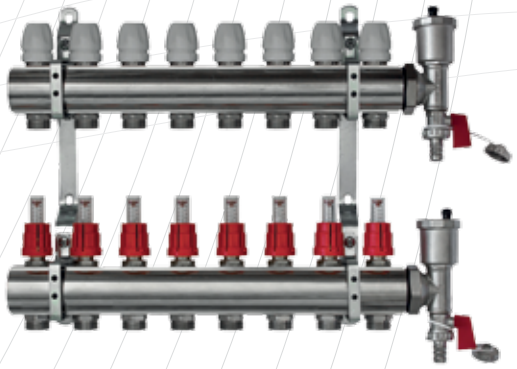
RADIANT HEATING SYSTEM COMPONENTS

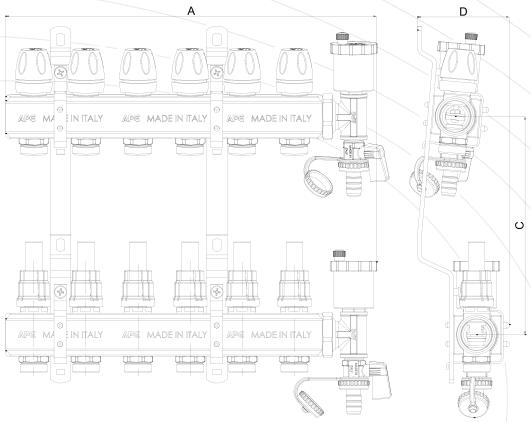
DISTRIBUTOR MANIFOLDS

pre-assembled 1" manifold for radiant floor heating system with flowmeters 940

Manifold Kit mod. 940 preassembled in nickel plated brass size 1" for radiant heating system with flowmeters, connections size 3/4" euro-cone at pitch 50 mm, made up of a discharge manifold with flowmeters (0 – 5 l/min) and a return manifold with closures prearranged for thermostat heads.
Complete with:
- thermostat fitting kit;
- kit micro-valves with flowmeters discharge side to balance the circuits;
- two automatic nickel-plated valves for air-purge with o-ring;
- two boiler fill and drain valves;
- two male plugs size 1" with female fittings;
- off-centre brackets with vibration stopper grommets for insertion in housing 110 mm or wall fastening.

Temperature range: -5°C to 60 °C – Working pressure: max 6 bar.





Code	Size	Ways	Box (no.)	A (mm)	C (mm)	D (mm)
394002	1"x3/4"	2+2	1	157	209	88
394003	1"x3/4"	3+3	1	207	209	88
394004	1"x3/4"	4+4	1	257	209	88
394005	1"x3/4"	5+5	1	307	209	88
394006	1"x3/4"	6+6	1	357	209	88
394007	1"x3/4"	7+7	1	407	209	88
394008	1"x3/4"	8+8	1	457	209	88
394009	1"x3/4"	9+9	1	507	209	88
394010	1"x3/4"	10+10	1	557	209	88
394011	1"x3/4"	11+11	1	607	209	88
394012	1"x3/4"	12+12	1	657	209	88
394013	1"x3/4"	13+13	1	707	209	88

TECHNICAL FEATURES

Field of application:	heating plants
Fluid:	technical water and water glycol
Degree of glycol:	max 30%
Field of temperature:	from -20°C to 80 °C
Operating pressure:	max 6 bar

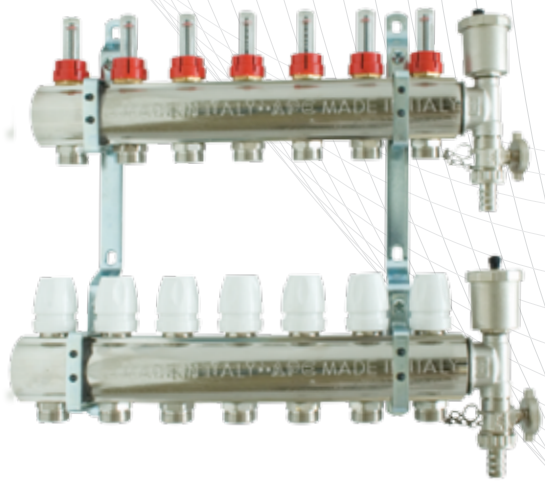
4.2 RADIANT HEATING SYSTEM COMPONENTS

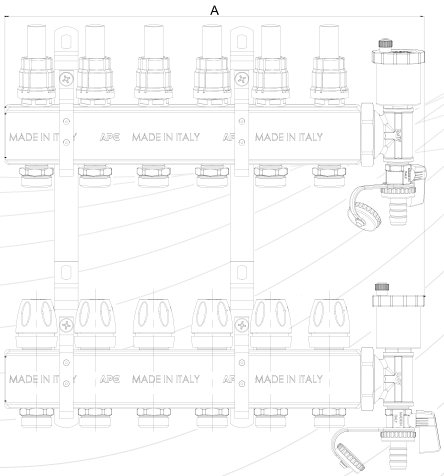
DISTRIBUTOR MANIFOLDS

pre-assembled 1" 1/4 manifold for radiant floor heating system with flowmeters 941

Manifold Kit mod. 941 preassembled in nickel plated brass size 1"¼ for radiant heating system with flowmeters, connections size 3/4" eurocone at pitch 50 mm, made up of a discharge manifold with flowmeters (0 – 5 l/min) and a return manifold with closures prearranged for thermostat heads.
Complete with:
- thermostat fitting kit;
- kit micro-valves with flowmeters discharge side to balance the circuits;
- two automatic nickel-plated valves for air-purge with o-ring;
- two boiler fill and drain valves;
- two male plugs size 1"¼ with female fittings;
- offset brackets with vibration stopper grommets for insertion in housing 110 mm or wall fastening.

Temperature range: -20°C to 80 °C – Working pressure: max 6 bar.





Code	Size	Ways	Box (no.)	A (mm)	C (mm)	D (mm)
394107	1"1/4 x 3/4"	7+7	1	409	209	98
394108	1"1/4 x 3/4"	8+8	1	459	209	98
394109	1"1/4 x 3/4"	9+9	1	509	209	98
394110	1"1/4 x 3/4"	10+10	1	586	209	98
394111	1"1/4 x 3/4"	11+11	1	609	209	98
394112	1"1/4 x 3/4"	12+12	1	686	209	98
394113	1"1/4 x 3/4"	13+13	1	709	209	98

TECHNICAL FEATURES

Field of application:	heating plants
Fluid:	technical water and water glycol
Degree of glycol:	max 30%
Field of temperature:	from -20°C to 80 °C
Operating pressure:	max 6 bar

4.2 RADIANT HEATING SYSTEM COMPONENTS

APETHERM UNITS
CONTROL UNITS

B.T. fixed point control unit size 1" for manifolds series 940 complete with:
- Variable flow electronic pump Askoll Energy Saving ES 2 15/60/130;
- Injection valve rated 1500 l/h (Kvs 3,4) Adjustable thermostat actuator 20 to 70°C;
- Relief by-pass adjustable 1 to 4 m water head;
- Ball valves for pumpset exclusion; Contact thermometer on discharge side;
- Safety thermostat set at 55°C with ΔT 10°C;
- Offset bracket with antivibration grommets for insertion housing or wall fastening.

Code	Description	Package
TC10100001	B.T. fixed point control unit size 1" with bypass	1

B.T. low temperature control unit with climate adjustment size 1" for manifolds series 940 complete with:
- Electronic pump with variable flow, Askoll Energy Saving ES 2 15/60/130; Injection valve rated 1500 l/h (Kvs 3,4);
- Relief by-pass adjustable 1 to 4 m w.h;
- Ball valves for pumpset exclusion;
- Contact thermometer on discharge side; Safety thermostat set at 55°C with ΔT 10°C;
- Climatic temperature control with external, discharge and room sensors;
- Offset bracket with antivibration grommets insertion in housing or wall fastening.

Code	Description	Package
TC10200001	B.T. low temperature control unit with bypass	1

Kit A.T. high temperature in nickel plated brass size 1" with 3/4" eurocone connections at pitch 50 mm, made up of a discharge manifold with micrometric valves and a return manifold with closures arranged for electrothermal heads and complete with:
- Thermostat valve kit;
- Micrometric valve kit;
- Offset bracket with antivibration grommets for insertion in housing or wall fastening 1" nipple with ring.

Code	Description	Package
TC10300001	Kit 1" - 1 way A.T.	1
TC10300002	Kit 1" - 2 way A.T.	1
TC10300003	Kit 1" - 3 way A.T.	1

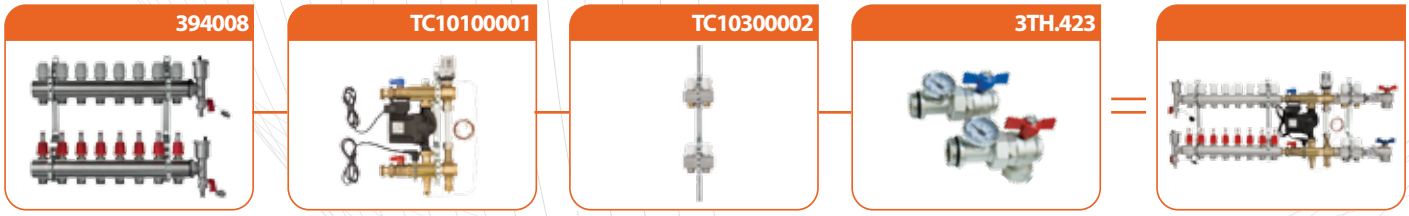
4.2 RADIANT HEATING SYSTEM COMPONENTS

APETHERM UNITS

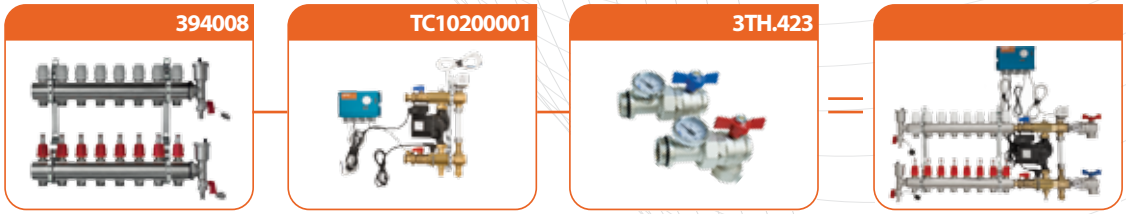
Apetherm Unit made up of:
- Manifold series 940 size 1";
- Fixed point or climatic control unit;
- Kit for high temperature size 1" (option);
- Two ball valves size 1".

The Apetherm control unit can be installed in a metal housing depth 110mm.

Example of fixed-point Apetherm unit, 8-way low temperature and 2 way high temperature

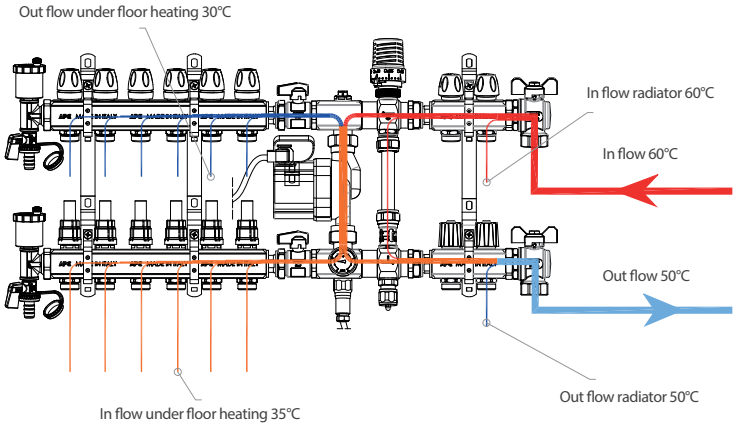


Example of Climatic Apetherm unit, 8-way low temperature



OPERATION PRINCIPLE

The flow diagram here shows how the mixing valve bleeds hot water from the boiler discharge side. The flow needed is determined by the thermostat head, the flow from the boiler is mixed with the return flow from the radiant heating system as to the temperature set on the thermostat valve.
The control unit has a differential bypass on which the head loss in the primary circuit can be adjusted between 1 and 4 m water head, to balance the flowrates in the heater elements.
The control unit is provided in turn with a safety thermostat with automatic reset, operating on the pump power supply.
N.B.: as the mixer valve operates in injection, a pump must be installed in the primary circuit, with a useful waterhead of 1.5 m, if the control unit is installed downstream of a heat storage.



4.2 RADIANT HEATING SYSTEM COMPONENTS

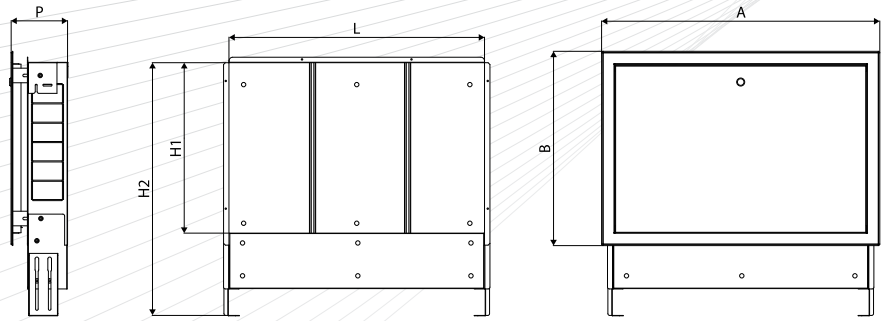
HOUSING FOR MANIFOLD/ APETHERM CONTROL UNIT

metal housing

Housing for manifolds, flush mounting, with adjustable feet and universal cableways, complete with all accessories to fasten manifolds, brackets excluded; assembled cold to avoid corrosion, made in galvanised steel, epoxy-polyester powder coated colour white RAL 9010. The housing is complete with frame and cover with screwdriver lock for inspection, plaster net and knock-outs for side pipe entrances.

Code	Description	Depth (mm)	Box (no.)
TB10010005	Galvanised metal cabinet - 500 mm	110	1
TB10010007	Galvanised metal cabinet - 700 mm	110	1
TB10010008	Galvanised metal cabinet - 850 mm	110	1
TB10010010	Galvanised metal cabinet - 1000 mm	110	1
TB10010012	Galvanised metal cabinet - 1200 mm	110	1
TB10020005	Galvanised metal cabinet - 500 mm	80	1
TB10020007	Galvanised metal cabinet - 700 mm	80	1
TB10020010	Galvanised metal cabinet - 1000 mm	80	1

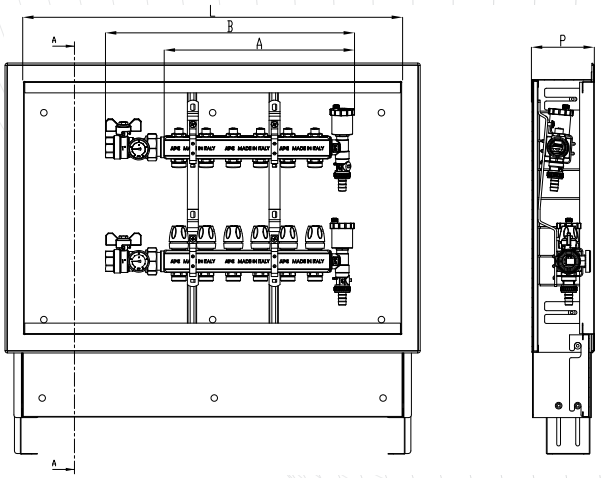
Code	A (mm)	B (mm)	L (mm)	H1 (mm)	H2 (mm)	P (mm)
TB10010005	562	532	500	470	620-760	110-150
TB10010007	762	532	700	470	620-760	110-150
TB10010008	912	532	850	470	620-760	110-150
TB10010010	1062	532	1000	470	620-760	110-150
TB10010012	1262	532	1200	470	620-760	110-150
TB10020005	562	532	500	470	620-760	80-120
TB10020007	762	532	700	470	620-760	80-120
TB10020010	1062	532	1000	470	620-760	80-120



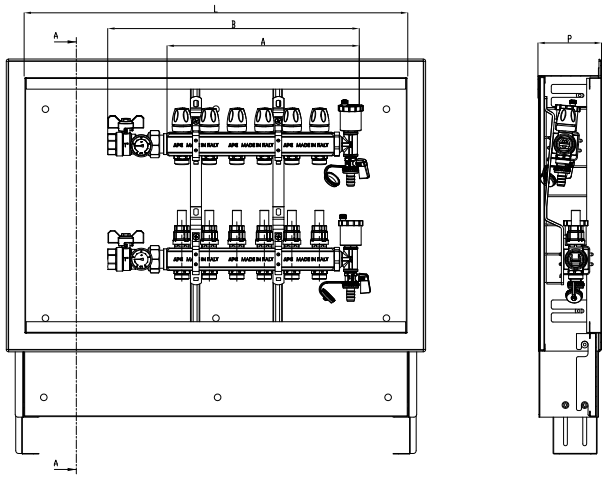
4.2 RADIANT HEATING SYSTEM COMPONENTS

MANIFOLD-HOUSING MATCH

Manifold 930/940 and valve 422/423



Manifold art. 930



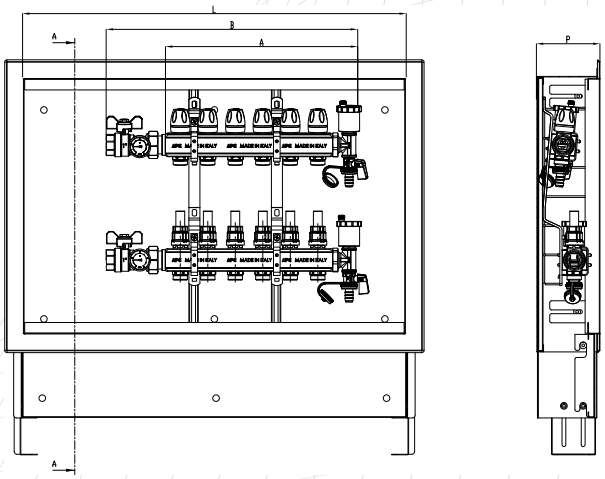
Manifold art. 940

Cabinet Code (depth 110mm)	Dimension L x P (mm)	No. of ways	A (mm)	B (mm)	Dimension L x P (mm)	Cabinet Code (depth 80mm)
TB10010005	500 x 110	**2+2**	114	240	500 x 80	**TB10020005**
		3+3	164	290		
		4+4	214	340		
		5+5	264	390		
TB10010007	700 x 110	**6+6**	314	440	700 x 80	**TB10020007**
		7+7	364	490		
		8+8	414	540		
		9+9	464	590		
TB10010008	850 x 110	**10+10**	514	640	1000 x 80	**TB10020010**
		11+11	564	690		
		12+12	614	740		
TB10010010	1000 x 110	**13+13**	664	790		

4.2 RADIANT HEATING SYSTEM COMPONENTS

MANIFOLD-HOUSING MATCH

Manifold 941 and valve 42202



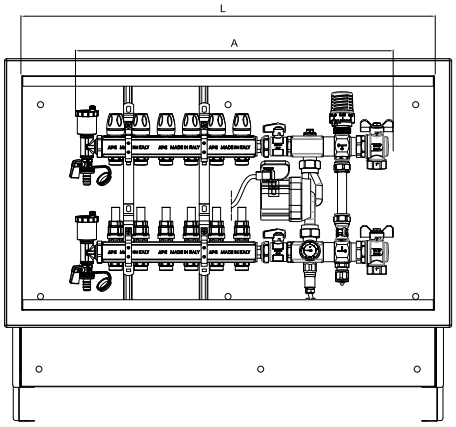
Manifold art. 941

Cabinet Code (depth 110mm)	Dimension L x P (mm)	No. of ways	A (mm)	B (mm)
TB10010007	700 X 110	**7+7**	409	558
		8+8	459	608
TB10010008	850 x 110	**9+9**	509	658
		10+10	586	708
		11+11	609	758
TB10010010	1000 x 110	**12+12**	686	808
		13+13	709	858

4.2 RADIANT HEATING SYSTEM COMPONENTS

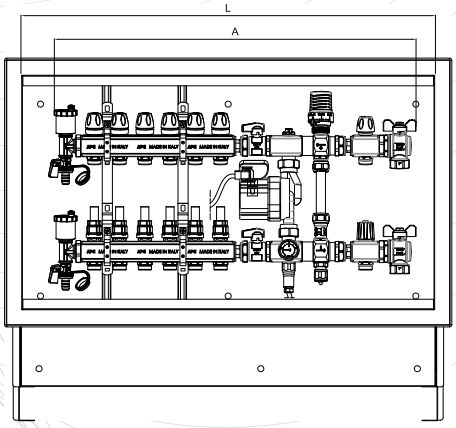
HOUSING – APETHERM MATCH

Apetherm Unit without A.T kit



Cabinet Code	Dimension L x P (mm)	B.T. No. of ways	A.T. No. of ways	A (mm)
TB10010007	700 x 110	**2+2**	-	440
		3+3	-	490
		4+4	-	540
		5+5	-	590
TB10010008	850 x 110	**6+6**	-	640
		7+7	-	690
		8+8	-	740
		9+9	-	790
TB10010010	1000 x 110	**10+10**	-	840
		11+11	-	890
		12+12	-	940

Apetherm unit with 1-way A.T kit

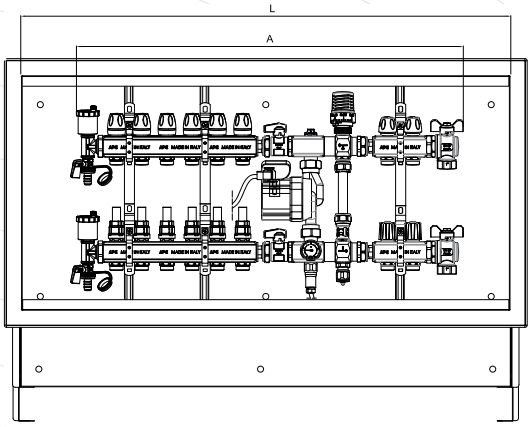


Cabinet Code	Dimension L x P (mm)	B.T. No. of ways	A.T. No. of ways	A (mm)
TB10010007	700 x 110	**2+2**	1	530
		3+3	1	580
		4+4	1	630
TB10010008	850 x 110	**5+5**	1	680
		6+6	1	730
		7+7	1	780
TB10010010	1000 x 110	**8+8**	1	830
		9+9	1	880
		10+10	1	930
TB10010012	1200 x 110	**11+11**	1	980
		12+12	1	1030

4.2 RADIANT HEATING SYSTEM COMPONENTS

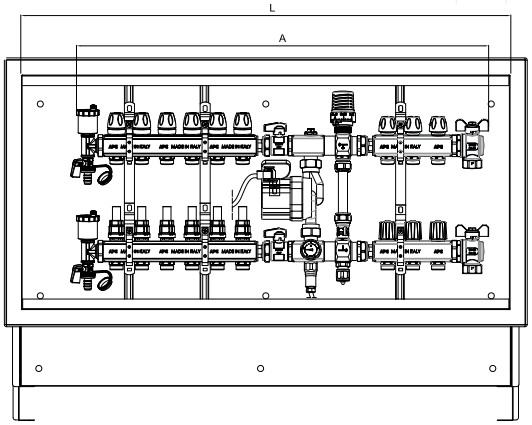
HOUSING – APETHERM MATCH

Apetherm Unit with 2-way A.T kit



Cabinet Code	Dimension L x P (mm)	B.T. No. of ways	A.T. No. of ways	A (mm)
TB10010007	700 x 110	**2+2**	2	577
		3+3	2	627
TB10010008	850 x 110	**4+4**	2	677
		5+5	2	727
		6+6	2	777
TB10010010	1000 x 110	**7+7**	2	827
		8+8	2	887
		9+9	2	927
TB10010012	1200 x 110	**10+10**	2	977
		11+11	2	1027
		12+12	2	1057

Apetherm unit with 3-way A.T kit



Cabinet Code	Dimension L x P (mm)	B.T. No. of ways	A.T. No. of ways	A (mm)
TB10010007	700 x 110	**2+2**	3	627
TB10010008	850 x 100	**3+3**	3	677
		4+4	3	727
		5+5	3	777
TB10010010	1000 x 110	**6+6**	3	827
		7+7	3	877
		8+8	3	927
TB10010012	1200 x 110	**9+9**	3	977
		10+10	3	1027
		11+11	3	1077
		12+12	3	1127

4.2 RADIANT HEATING SYSTEM COMPONENTS

MULTILAYER PIPE PeXb/Al/PeXb

MULTYLAYER PLAIN PIPE PeXb/Al/PeXb

COIL STRETCH FILM PACKAGED

Code	Size	Coil length (m)	Quantity per pallet (m)	Pallet dimensions (cm)
9MN021620100F	16 x 2.0	100	2200	80 x 80 x H.220
9MN021620200F	16 x 2.0	200	2600	80 x 80 x H.220
9MN031820100F	18 x 2.0	100	1500	80 x 80 x H.220
9MN031820200F	18 x 2.0	200	2000	80 x 80 x H.220
9MN032020100F	20 x 2.0	100	1400	80 x 80 x H.220
9MN022020100F	20 x 2.0*	100	1400	80 x 80 x H.220
9MN04263050F	26 x 3.0	50	500	80 x 80 x H.220
9MN45323050F	32 x 3.0	50	600	100 x 100 x H.220

***Aluminium 0.2 mm**

PACKAGING: STRAPPED ROLLS

Code	Size	Coil length (m)	Quantity per pallet (m)	Pallet dimensions (cm)
9MN021620500R	16 x 2.0	500	2500	80 x 80 x H.210
9MN032020300R	20 x 2.0	300	2400	90 x 90 x H.220

4.2 RADIANT HEATING SYSTEM COMPONENTS

PIPE PE-x

PIPE PE-xC

Reinforced HD polythene pipe method "C" (Electronic), conforming to standard UNI 9338, EN ISO 15875-2, with three layers: internal PE-xC; external oxygen barrier in EVOH (Ethylene Vinyl Alcohol); between the two a thin layer of highly adhesive polymer.
Max operation temperature: 80 °C. Max peak temperature: 100 °C. Heat conductivity: 0.35 W/mK. Oxygen permeability at 40 °C: ≤ 0,1 mg/l. Roughness: 7 µm.

Data sheet

QR CODE

Code	Size	Coil length (m)	Quantity per pallet (m)	Pallet dimensions (cm)
***9PEXC1720240**	17 x 2.0	240	2160	80 x 80 x H.210
***9PEXC1720600**	17 x 2.0	600	2400	80 x 80 x H.210

PIPE PE-xA

Reinforced HD polythene pipe method "A" (Chemical), conforming to standard UNI EN 21003, with five layers: internal PE-xA; a thin layer of highly adhesive polymer; oxygen barrier in EVOH (Ethylene Vinyl Alcohol); another adhesive polymer layer; external medium density polythene.
Max operation temperature: 80 °C. Max peak temperature: 110 °C. Heat conductivity: 0.35-0.38 W/mK. Oxygen permeability at 40 °C: ≤ 0,08 g/m^{3}d. Roughness: 7 µm.

Data sheet

QR CODE

Code	Size	Coil length (m)	Quantity per pallet (m)	Pallet dimensions (cm)
***9PEXA1720600**	17x 2.0	600	2400	80 x 80 x H.210

4.2 RADIANT HEATING SYSTEM COMPONENTS

APETHERM ACCESSORIES

Ball valves

Ball valve kit, MM, with thermometer in the version straight and square 1" and straight only size 1"¼ complete with lockring.

Code	Description	Package
3TH.422	Ball valve kit MM with pipe union and thermometer 1"	1
3TH.42202	Ball valve kit MM with pipe union and thermometer 1"1/4	1
3TH.423	Ball valve kit MM with pipe union and thermometer 1" angle	1

Adapters

Eurocone adapter size 3/4" for multilayer and for Pex for use on manifolds series 900.

Adapter for multilayer pipe

Adapter for Pex pipe

Code	Description	Package
3985M341620	Adapter for multylayer pipe ¾" x 16	10
3985M342020	Adapter for multylayer pipe ¾"x 20	10
3985P341720	Adapter for Pex pipe ¾"x 17	10

Hook clip for flat panels

Thermoplastic fastening clip to anchor 16-20 mm pipes on flat panels.

Code	Description	Package
TI45401003	Clip for panel 20mm, H= 40mm	1000
TI45401004	Clip for panel 30mm, H= 60mm	300

4.2 RADIANT HEATING SYSTEM COMPONENTS

APETHERM ACCESSORIES

Rider clip for formed panels

Thermoplastic rider clip to fasten pipework to formed insulating panels, used in systems Top, Universal, Silent and Industrial.

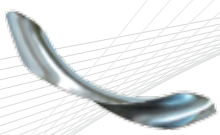
Code	Description	Package
TI45401005	Rider clip (wheelbase 75mm) for beveled panel, H= 28mm	100

Pipe bend support

Pipe support in reinforced thermoplastic, for cold pipe bending, for vertical support of pipes near manifolds and for impact protection.

Code	Description	Package
TI45401006	Pipe bend support for pipes from 16 to 18	10
TI45401007	Pipe bend support for pipes from 20	10

Pipe support in aluminium, for cold pipe bending, for vertical support of pipes near manifolds and for impact protection.



Code	Description	Package
TI45401101	Pipe bend support for Ø16 pipes	60
TI45401102	Pipe bend support for Ø18 pipes	40
TI45401103	Pipe bend support for Ø20 pipes	25

4.2 RADIANT HEATING SYSTEM COMPONENTS

APETHERM ACCESSORIES

Perimeter tape

Perimeter tape in closed cell expanded polythene: light, waterproof, unalterable, resistant to mould, to chemical attack and to cement alkalis; with adhesive surface for wall fastening and a polythene strip for panel edges to avoid infiltration from the screed. Acts to absorb thermal expansion of the screed and to eliminate noise and heat bridges.

Code	Description	Package
TI45401008	Polythene perimeter tape, height 150 mm	50
TI45401009	Polythene perimeter tape, height 250 mm	50

Polythene sheet

Low density co-extruded polythene sheet acting as vapour barrier, to be placed between floor slab and panel to avoid water migration towards the inhabited areas.

Code	Description	Package
TI45401010	Polyethylene sheet, thickness 0.2 mm, height 6 m	125

Net

Fibreglass 40x40 mm net with antialkali dressing, Certificate CE ETAG 004, high longitudinal/transverse mechanical strength to reinforce cement screed, resist cracking and distribute loads.

Code	Description	Package
TI45401011	Fibreglass net 40x40 mm	50

4.2 RADIANT HEATING SYSTEM COMPONENTS

APETHERM ACCESSORIES

Polymer fibre

Structural polymer fibre of high strength, tenacity and ductility for cement screed reinforcement, allowing complete replacement of steel wire nets or other non-prestressed reinforcement. The use of synthetic fibre offers reinforced concrete better able to withstand corrosion and stronger in compression. The chemical and physical characteristics, the geometry and the high modulus of elasticity of these fibres are used to improve the crack resistance of the concrete screed.

Code	Description	Package
TI45401012	Polymer fibre	4

Additive

FLUXAN superfluidifying additive for cement screeds, produced by resin polycondensation, free of chlorides and with no effect on concrete cure-time; no effect on metallic reinforcement or equipment.
Considerable reduction of water amounts, with significant acceleration of concrete strength increase and improvement in heat conductivity; improves compactness, impermeability and adherence to steel reinforcing.
Dosage: 1 kg to 100 kg cement.

Code	Description	Package
TI45401001	Fluidizing additive for cement screed (10 Kg container)	1

4.2 RADIANT HEATING SYSTEM COMPONENTS

APETHERM ACCESSORIES

Film

FILMANT Fluid, anticorrosion film with antialga additive, protects against oxidation, corrosion and the formation of alga and deposits, creating a protective monomolecular film on radiant heating system pipework. Also eliminates gas and thermal loads due to coupling differing materials; compatible with common anti-freeze products.
Dosage: 1 litre to 100 lt circulating water.

Code	Description	Package
TI45401002	Filming agent against corrosion and algae (1 lt container)	1

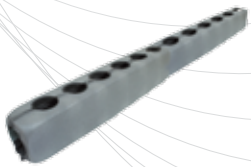
Expansion joint

Expansion joint in closed cell expanded polythene, with adhesive base, positioned on door and window sills and/or in rooms of area larger than 40 m^2, to allow thermal expansion of the concrete screed.
Any excess material is cut off, flush with the floor.

Code	Description	Package
TI45401013	Adhesive expansion joint L=2M	10

Manifold sleeve

Manifold sleeve in polythene for insulation of bar manifolds size 1" and 1¼"4, in two adhesive halves. Serves to avoid formation of condensate in cooling systems.



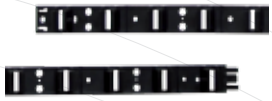
Code	Description	Package
TI45401014	900 series manifold shell 1"12-way	1
TI45401015	900 series manifold shell 1"1/4 12-way	1

4.2 RADIANT HEATING SYSTEM COMPONENTS

APETHERM ACCESSORIES

Pipe guide

Modular guide to anchor pipework types multilayer and Pex, with double face adhesive layer.



Code	Description	Package
TI45401016	Modular guide to anchor pipework types multilayer and Pex, biadhesive. Ø16/17 50 mm, Dimensions: L=1000mm, H=28mm, P= 40mm	1
TI45401017	Double-sided adhesive guide track for Ø20 pipes 100 mm, Dimensions: L=1000mm, H=40mm, P= 50mm	1

Stapler

Stapler to fasten pipes to panel using fastening clips (articles TI45401003 and TI45401004), used when laying radiant heating floor circuits in the Elegant system.

Code	Description	Package
TI45401018	Stapler for hook clip	1

Pipe decoiler

Pipe decoiler; in nickel plated steel, can be completely dismantled.

Code	Description	Package
TI45501001	Pipe decoiler	1

4.2 RADIANT HEATING SYSTEM COMPONENTS

APETHERM ACCESSORIES

Pipe connection

Connection for repair of multilayer and Pex pipework.

Code	Description	Package
3TH.EURO3416	Joint fitting for Ø16 multilayer pipe	5
3TH.EURO3420M	Joint fitting for Ø20 multilayer pipe	5
3TH.EURO3417	Joint fitting for Ø17 PEX pipe	5

Nipples

Nipple with lockring and o-ring seal for connection of manifolds series 900.

Code	Description	Package
3582CO01N	Joint nipples for 1" manifolds	10

4.2 RADIANT HEATING SYSTEM COMPONENTS

PUMPSETS

Direct pumpset

Vertical pumpset with 1"F fittings and offset 100 mm complete with pump class A Askoll Energy Saving ES 2 15/60/130, arranged for installation of a zone valve.
The pumpset has an adjustable over-pressure by-pass on primary and secondary; and is provided with two ball valves 1"F with discharge side thermometer and return of the secondary. The pumpset is complete with an insulating sleeve. Overall height = 380 mm

Code	Description	Package
TC30200002	Vertical direct pumpset 1"	1
TC30200102	Vertical direct pumpset 1" with circulator plus*	1

*** Circulator Askoll Energy Saving ES2 15/70/130**

Fixed point recirculator mixer pumpset

Fixed point recirculating pumpset, vertical with 1"F fittings at offset 100 mm, complete with class A pump Askoll Energy Saving ES 2 15/60/130, injection valve rated 1500 l/h with thermostatic actuator (20-70°C).
The pumpset has adjustable over-pressure by-passes on primary and secondary sides; and is provided with 2 1"F ball valves with thermometer on discharge and return of the secondary. The unit is complete with an insulating sleeve.
Overall height = 380 mm

Code	Description	Package
TC30300002	Vertical fixed point recirculator mixer pumpset 1" (from 20° to 70°C)	1
TC30300102	Vertical fixed point recirculator mixer pumpset 1" (from 20° to 70°C) with circulator plus*	1

*** Circulator Askoll Energy Saving ES2 15/70/130**

4.2 RADIANT HEATING SYSTEM COMPONENTS

PUMPSETS

Mixed water pumpset, climatic

Climatic recirculating pumpset, vertical with 1"F fittings at offset 100 mm, complete with Low Energy class A pump Askoll Energy Saving ES 2 15/60/130, injection valve rated 1500 l/h (Kvs 3.4) with proportional control, bypass valve 1500l/h (Kvs 3.4) climatic temperature control with discharge and outdoor sensors. The pumpset has adjustable over-pressure by-passes on primary and secondary sides; 2 1"F ball valves with thermometer on discharge and return of the secondary, and is complete with an insulating sleeve with velcro closure.
Overall height = 380 mm

Code	Description	Package
TC30400002	Vertical subunit mixed water (from 20° to 43°) pumpset, climatic	1
TC30400102	Vertical subunit mixed water (from 20° to 43°) pumpset, climatic with increased water pump	1

*** Circulator Askoll Energy Saving ES2 15/70/130**

Climatic mixer circulation unit without primary pump

Climatic recirculating pumpset, vertical, without primary pump, with second NA valve. 1"F fittings at offset 100 mm, complete with Low Energy class A pump Askoll Energy Saving ES 2 15/60/130, injection valve rated 1500 l/h (Kvs 3.4) with proportional control, bypass valve 1500l/h (Kvs 3.4) climatic temperature control with discharge and outdoor sensors.
The pumpset has adjustable over-pressure by-passes on primary and secondary sides; 2 1"F ball valves with thermometer on discharge and return and with an insulating sleeve with velcro closure. Overall height = 380 mm.

Code	Description	Package
TC30400003	Vertical subunit mixed water (from 20° to 43°) pumpset, climatic without primary pump	1
TC30400103	Vertical subunit mixed water (from 20° to 43°) pumpset, climatic without primary pump with increased water pump	1

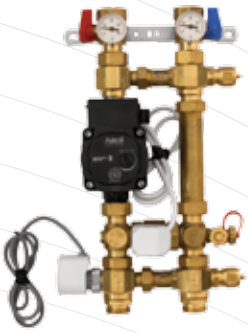
*** Circulator Askoll Energy Saving ES2 15/70/130**

4.2 RADIANT HEATING SYSTEM COMPONENTS

PUMPSETS

Mixed water pumpset, climatic, without regulation

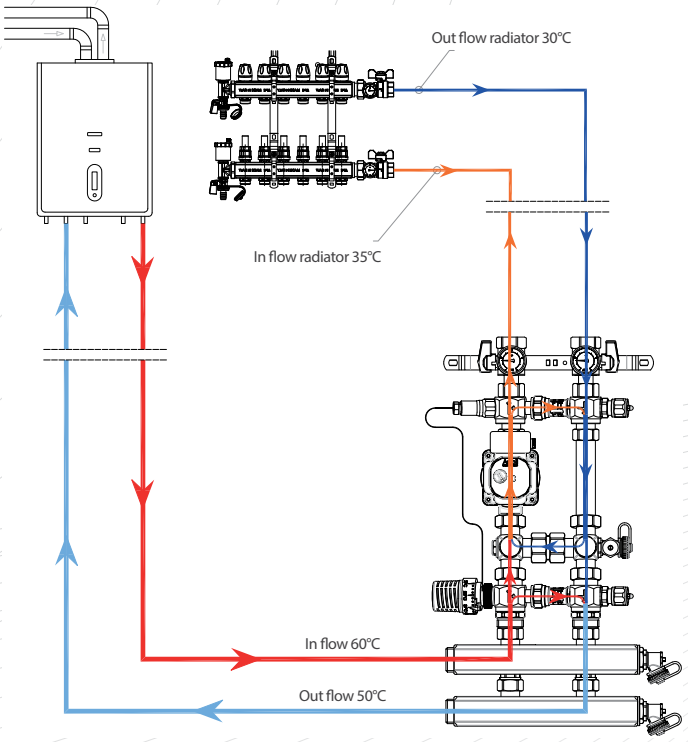
Recirculating mixed water pumpset, three-way, motorised, vertical, without control. Complete with 1"F connections at offset 100 mm, with Low Energy pump class A Askoll Energy Saving ES 2 15/60/130, injection valve 1500 l/h (Kvs 3,4) with proportional control 24V signal 0-10, by-pass valve 1500l/h (Kvs 3,4). The unit has adjustable over-pressure by-passes on primary and secondary, 2 ball valves 1"F with thermometer on discharge and return, two part insulating sleeve with velcro closure. Overall height = 380 mm



Code	Description	Package
TC30410001	Vertical subunit mixed water pumpset, without regulation with proportional control	1
TC30410101	Vertical subunit mixed water pumpset, without regulation with proportional control and increased water pump	1

*** Circulator Askoll Energy Saving ES2 15/70/130**

PRINCIPLE OF OPERATION



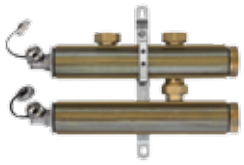
As shown in the flowdiagram here, the mixing valve bleeds hot water from the boiler discharge line. The flow needed is decided by the thermostatic sensor, with the flow from the boiler mixing with the return from the radiant heating system as to the temperature set on the thermostatic valve. The unit is provided with a differential bypass that allows adjustment of the water head loss in the primary circuit between 1 and 4 m w.h. to balance the flowrate in the heater panels. The control unit is provided in turn with a safety thermostat with automatic reset, acting on the pumps power supply.
N.B.: given that the mixing valve operates by injection, a pump is needed in the primary circuit with a useful pressure of 1.5 m water head, if the control unit is installed downstream of an accumulator.

4.2 RADIANT HEATING SYSTEM COMPONENTS

PUMPSETS

1-way manifold

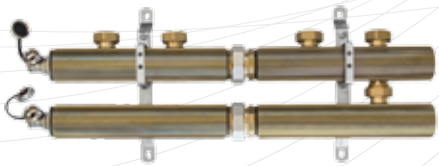
Coplanar manifold 1¼" with one discharge pitch 100 mm and manifold offset 80 mm, length without plugs 255mm. Complete with a set of 2 plugs with drain valve and hose fitting, wall bracket and two part sleeve insulation with velcro closure.



Code	Description	Package
TC30100001	1-way manifold	1

2-way manifold

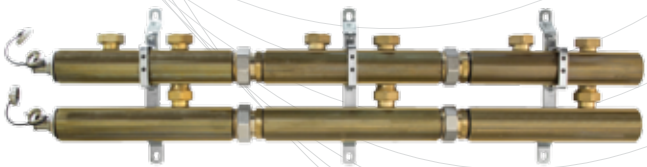
Coplanar manifold 1¼" with 2 discharge fittings offset 100 mm and manifold centres 80 mm, length without plugs 255mm x 2. Complete with a set of 2 plugs with drain valve and hose fitting, wall bracket, set 2 fittings 1¼"+ OR to connect the manifolds. Two part sleeve insulation with velcro closure.



Code	Description	Package
TC30100002	2-way manifold	1

3-way manifold

Coplanar manifold 1¼" with 3 discharge fittings offset 100 mm and manifold centres 80 mm, length without plugs 255mm x 3. Complete with a set of 2 plugs with drain valve and hose fitting, wall bracket, set 4 fittings 1¼"+ OR to connect the manifolds. Two part sleeve insulation with velcro closure.



Code	Description	Package
TC30100003	3-way manifold	1

4.2 RADIANT HEATING SYSTEM COMPONENTS

ACCESSORIES/SPARE PARTS

Electric wiring

Electric wiring set complete with:
- Junction box with electronic card delay circuit (5 min);
- Safety sleeve thermostat setting 55°C (Δt 10°C);
- Cables.

Code	Description	Package
TC50200001	Electric wiring set with Junction box with electronic card delay circuit and safety thermostat	1
TC50200002	Electric wiring set complete with: Junction box with electronic card delay circuit	1
TC50200005	Electronic card delay circuit	1

Actuator

Proportional actuator.

Code	Description	Package
TC50200003	Proportional actuator 220V NA (for art. TC30400003/TC30400103)	1
TC50200010	Proportional actuator 24V with signal 0-10V (for art. TC30410001/TC30410101)	1

Thermostatic valve

Fixed point thermostat valve with copper bulb, allows control of the discharge temperature in radiant heating systems, from 20 to 70 °C. Maximum bulb temperature 80 °C, thread M30x1,5.

Code	Description	Package
TC50200030	Fixed point thermostat valve	1

4.2 RADIANT HEATING SYSTEM COMPONENTS

ACCESSORIES/SPARE PARTS

Temperature control

Electronic microprocessor temperature control, climatic type, with automatic summer/winter switching. Following the preset climate curve for heating and cooling, the temperature control proportionally adjusts the injection valve for the radiant systems. The control operates only if connected to discharge, outdoor and area sensors and a possible time control.

Code	Description	Package
TC50200020	Electronic microprocessor temperature control	1

Remote control thermostat

Area thermostat for climatic temperature control, allows adjustment at any time of the comfort temperature +/- 3°C, so can be used for winter operation with T from 17 to 23 °C.

Code	Description	Package
TC50200021	Remote control thermostat	1

Electrothermic control

Electrothermic control for modulating injection valve 230V NC connected to climatic temperature control.

Code	Description	Package
TC50200022	Electrothermic control for modulating injection valve	1

4.2 RADIANT HEATING SYSTEM COMPONENTS

ACCESSORIES/SPARE PARTS

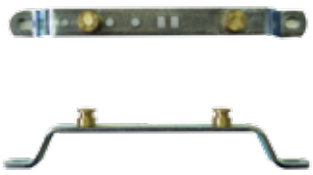
Safety thermostat

Sleeve type safety thermostat TA 55 °C with automatic reset.

Code	Description	Package
TC50200031	Sleeve type safety thermostat	1

Wall bracket

Wall bracket in galvanised steel to carry 1¼" manifold.



Code	Description	Package
TC50300001	Wall bracket	1

4.3 TEMPERATURE CONTROL

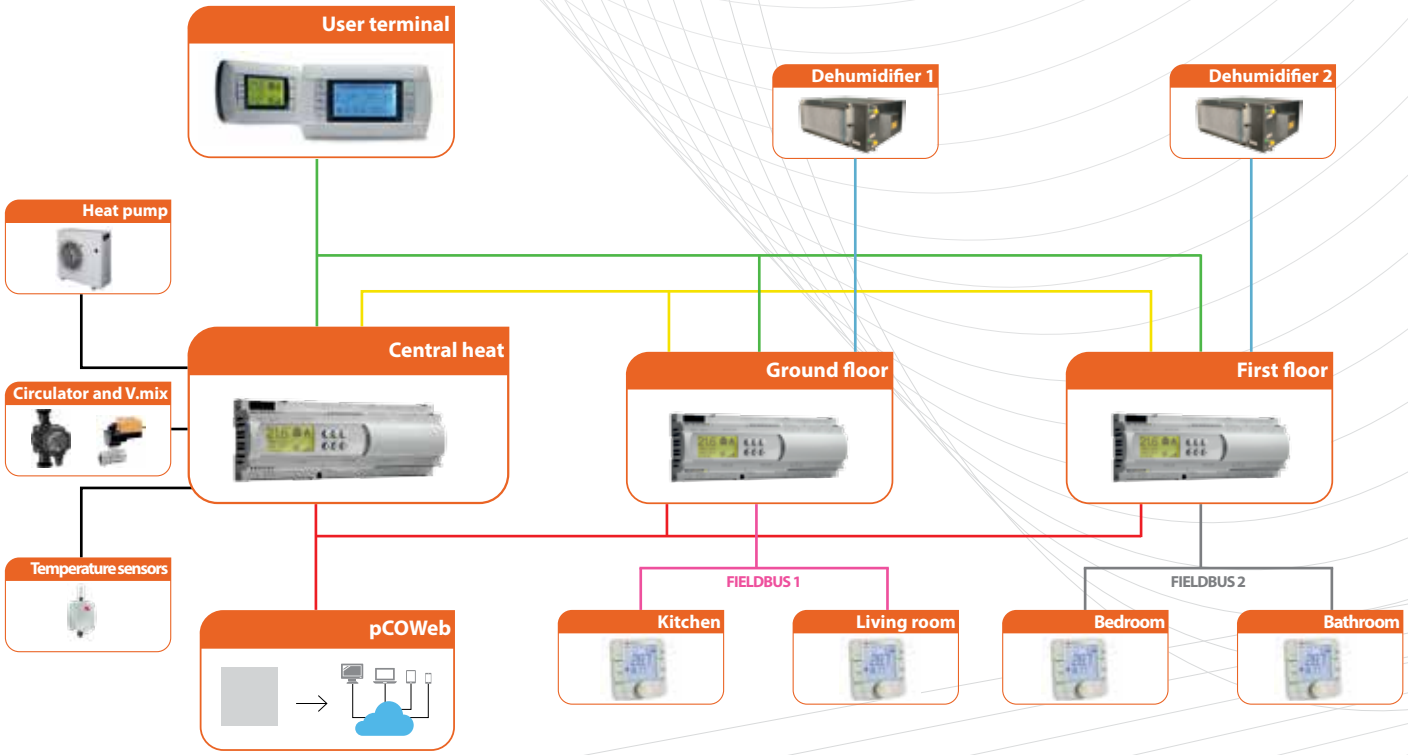
APEKLIMA REGULATION

Apeklima climate control system for automatic and intelligent management of all heating and conditioning functions in domestic, office and industrial installations. The control unit allows management and monitoring of all thermo-hygrometric quantities in up to a maximum of 667 temperature and humidity zones. The unit can be connected to local area network pLAN up to maximum 32 units (apartments).

The main characteristics of the system are:

- System management with heating only or heating/cooling;
- Management of humidity in the areas controlled;
- Multiple mixing system management (max 4 mixing valves), floating or modulating, choice of control (P, PI, PD, PID) and max 5 pumps
- Independent setpoints each valve;
- Zone management via bus zone via bus;
- Use of wire, bus, wireles terminal and zone terminal th-Tune sensors;
- Extendable and connectable system to solar and/or heat-pump unit for fan coil management;
- Air quality control and renewal by VOC sensor;
- Connection to supervisor systems with multi-protocol management;
- On-Off control via SMS;
- Hourly timing;
- Automatic or Manual Anti-legionella procedure;
- Save and reset system operation parameters;
- Connection to semigraphic user terminal or graphic colour touch-screen.

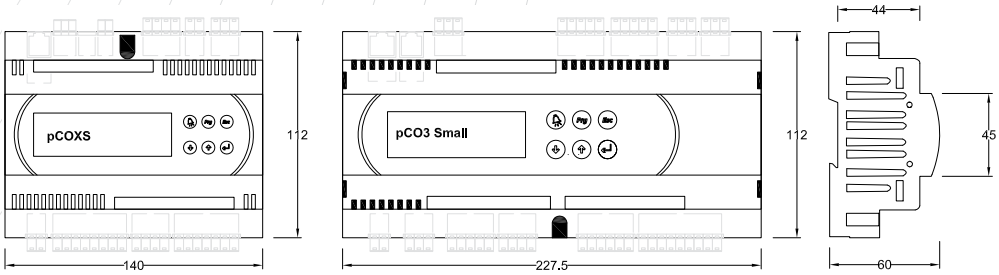
TYPICAL SCHEME:
n°1 unit to manage control room
n°1 unit for typical apartment.

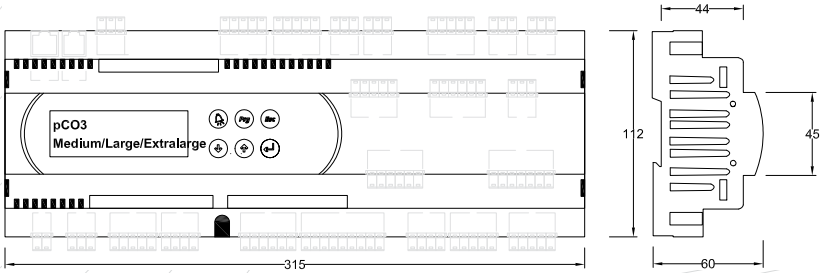


4.3 TEMPERATURE CONTROL

APEKLIMA CONTROL UNITS

APEKLIMA control unit for monitoring and management of all temperature and humidity parameters in the area, up to a maximum of 667 temperature and humidity zones.
The control unit has a display showing the system data and six keys to adjust and control of the radiant system parameters. The unit has a 16-bit microprocessor and a set of terminals to connect to the various devices. The programme and the parameters as set are permanently memorised in a flash memory. Connection is possible to the local net pLAN for up to a maximum of 32 units. A supervisor can be installed as to standard RS485 using Carel communication protocol. The display can be built-in or connected to a user terminal.





Code	DIN Module	Dimensions
TI50100005	8	**110x140x60**
TI50100010	13	**110x227,50x60**
TI50100020	18	**110x315x60**
TI50100030	18	**110x315x60**
TI50100031	18	**110x315x60**

Code	Description	Package
TI50100005	control unit programmed pCO3 COMPACT with display built-in pGD1	1
TI50100010	control unit programmed pCO3 SMALL with display built-in pGD1	1
TI50100020	control unit programmed pCO3 MEDIUM with display built-in pGD1	1
TI50100030	control unit programmed pCO3 LARGE with display built-in pGD1	1
TI50100031	control unit programmed pCO3 EXTRALARGE with display built-in pGD1	1

4.3 TEMPERATURE CONTROL

APEKLIMA CONTROL UNITS

Control Unit selection for zone management

The Apeklima control unit allows system management as intercommunicating subzones via a field bus. There can be up to 30 units connected via pLAN network (one boiler room and 29 distinct control units for the radiant system.

Each unit can control these devices:
- 23 hot/cold zones
- 4 mixing valves
- 5 pumps
- 8 de-humidifiers
- 3 humidifiers
- 1 air damper
- 1 water valve for recirculated air
- 1 recirculating air fan

System configuration is free. As to the input/ouputs, the suitable unit can be selected as to the following table:

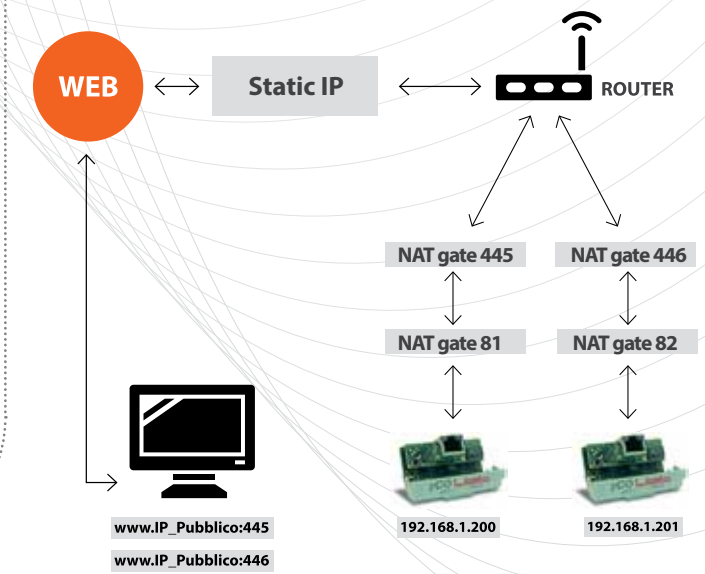
	TI50100005	TI50100010	TI50100020	TI50100030	TI50100031
Digital inputs	6	8	14	18	14
Analog Inputs	4	5	8	10	8
Digital outputs	7	8	13	18	29
Analog outputs	2	4	4	6	4

pCOWeb: SYSTEM ACCESS VIA INTERNET

The control unit allows access to the personalised pages for adjustment of the radiant system from a webserver, so with static IP and suitable settings in the apartment firewall, this can be reached by a PC with Mozilla Firefox or Internet Explorer.

pCOWeb as well as being a webserver is a gateway to Modbus over IP protocol (Modbus TCP/IP) using an ethernet connection.

WIRING DIAGRAM pCOWeb network

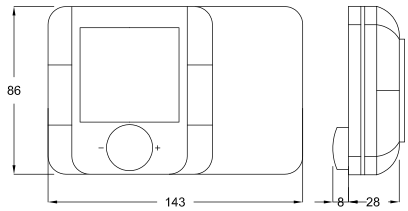
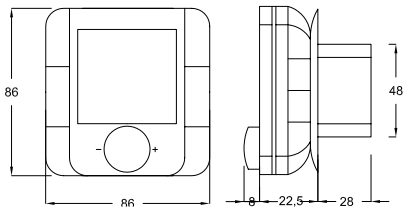
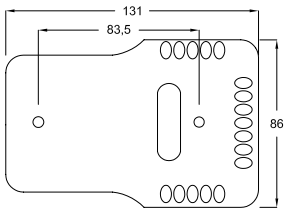
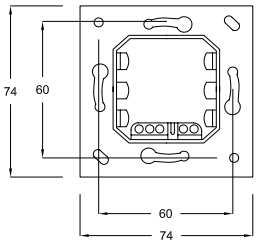


Code	Description	Package
TI50350010	Serial card pCOWeb	1
TI50350020	Electronic board for system home automation Konnex	1
TI50350021	Serial card RS485 for pCO	1

4.3 TEMPERATURE CONTROL

APEKLIMA CONTROL
AREA SENSOR / USER TERMINAL

Area terminal TH-TUNE for user control of temperature and humidity in a residential area connected to a control unit Pco3 with adjustment and display. As to the model, provided with temperature or temperature/humidity sensor.
Power supply 230 Vac.
Temperature and humidity are adjusted simply via the front control. Allows adjustment of operation mode and of the hourly schedule.

TH-TUNE wall terminal	TH-TUNE recess terminal
	
Frontal element	
	
Rear element	

Code	Description	Package
TI50200210	TH-TUNE 230 Vac - T – recess terminal	1
TI50200220	TH-TUNE 230 Vac – T+H – recess terminal	1
TI50200310	TH-TUNE 230 Vac - T – wall terminal	1
TI50200320	TH-TUNE 230 Vac – T+H – wall terminal	1
TI50220310	VOC wall air quality terminal	1

4.3 TEMPERATURE CONTROL

APEKLIMA CONTROL
AREA SENSOR / USER TERMINAL

USER TERMINAL

The LCD user terminal is semigraphic and has an 8-line 22-column display, with six control keys allowing display and adjustment of all parameters of the connected system.
Displays are shown with symbols for unit and zone status, parameters measured, operation setpoints in the main system status menu; parameter setting menu (setpoint, hourly schedule, season change, room names etc) all easy to access and use.
The text and the graphics are dark on green or blue backlighting.

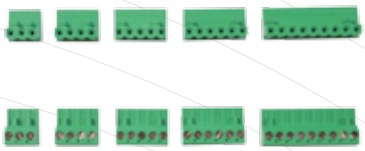
Code	Description	Package
TI50250010	Semigraphic LCD user teminal (132x64 pixel - wall mounted)	1
TI50250011	Semigraphic LCD user teminal (132x64 pixel - recessed)	1

4.3 TEMPERATURE CONTROL

APEKLIMA CONTROL ACCESSORIES

Connector kit

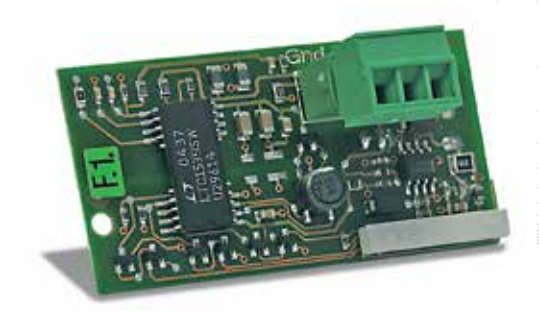
Connector kit with removable screws for pCO3 control unit. Temperature sensors



Code	Description	Package
TI50310005	Connector kit for pCO3 Compact control	1
TI50310010	Connector kit for pCO3 Small control	1
TI50310020	Connector kit for pCO3 Medium control	1
TI50310030	Connector kit for pCO3 Large control	1
TI50310031	Connector kit for pCO3 Extra Large control	1

Fieldbus board

Serial board for connection, via electrically insulated interface, of the control unit to an RS485 network via the removable terminal connector on the board. The function provided is type MASTER (supervisor), so other control units or SLAVE devices can be connected. Maximum number of connected devices is 207.



Code	Description	Package
TI50300010	RS485 Serial board for FieldBus communication	1

4.3 TEMPERATURE CONTROL

APEKLIMA CONTROL ACCESSORIES

Sensor

Temperature sensors.

Code	Description	Package
TI50320010	In flow temperature sensor	1
TI50320011	Thermowell for art. TI50320010	1
TI50320020	Outdoor temperature sensor	1

4.3 TEMPERATURE CONTROL

ELECTRIC TEMPERATURE CONTROLS

Thermostat without micro

NC thermostat for valve control, for use on radiant system manifolds, with position indicator. Valve aperture is controlled by the thermostat.
Thread M30x1.5.

Code	Description	Package
TI51101010	Electrothermal actuator 230V without micro	1
TI51101020	Electrothermal actuator 24V without micro	1

Thermostat with micro

NC thermostat head to control thermostatic valve, for use on radiant system manifolds, with position indicator. Valve opens on controlled supply to the thermostat. Thread M30x1,5.

Code	Description	Package
TI51102010	Electrothermal actuator 230V with micro	10
TI51102020	Electrothermal actuator 24V with micro	10

4.3 TEMPERATURE CONTROL
THERMOSTATS

Flush-mounted thermostat

3 module flush-mounted thermostat with switch off/ summer/winter.

Code	Description	Package
TI51210210	Flush-mounted thermostat	1

Wall mounted thermostat

Digital battery thermostat with timed temperature on two levels (comfort and reduced), in both heating and cooling systems. With counter for the operation time in hours of the relay. Visualises the settings for temperature and time on LCD display. Can be connected to an external timer as a timed thermostat. Arranged for connection to remote sensor.

Code	Description	Package
TI51210310	Wall mounted thermostat	1

4.3 TEMPERATURE CONTROL
TIMER THERMOSTATS

Flush-mount timed hygro-thermostat

Flush-mount 3-unit digital hygro-thermostat with 7-day ½h (48 point) timer, battery operated, heating/cooling. Three level control (Comfort, Low, Off/Antifreeze). Antifreeze. Large backlit display.
Optimised switch-on.
Holiday (1h ÷ 99 days) and cleaner functions.
Colour Anthracite (RAL 7016).

Code	Description	Package
TI51210230	Flush-mount with 7-day timer	1

Wall-mount timed hygro-thermostat

Wall-mount digital hygro-thermostat with 7-day ½h (48 point) timer, battery operated, heating/cooling. Three level control (Comfort, Low, Off/Antifreeze). Antifreeze. Large backlit display.
Optimised switch-on.
Holiday (1h ÷ 99 days) and cleaner functions.

Code	Description	Package
TI51210330	Wall-mount digital hygro-thermostat with 7-day timer	1

Wall-mount timed hygro-thermostat

Digital hygro-thermostat with 7-day ½h (48 point) timer, battery operated, heating/cooling, humidify/dehumidify. Three level control (Comfort, Low, Off/Anti-freeze). Antifreeze and dew-point control. Large backlit display.
Optimised switch-on.
Holiday (1h ÷ 99 days) and cleaner functions.

Code	Description	Package
TI51210320	Digital hygro-thermostat with 7-day timer	1

4.3 TEMPRATURE CONTROL
JUNCTION BOX

Junction box

Electronic control unit for radiant floor heating systems, 230V. The box allows connection of up to 8 thermostats and 8 actuators, with supply at 230V or 24V.
Connection available are for one pump, one boiler control, one input for external timer to start/stop actuators and thermostat.

Code	Description	Package
TI51170008	Electronic control unit (8 channels)	1

4.3 TEMPERATURE CONTROL

ZONE VALVE

Two-way zone valve

Two way zone valve with spring return for water circuits. F-threaded fittings of various size, complete with servomotor and microswitch.

Code	Description	Package
TI51301001	2-way 1/2" zone valve	1
TI51301002	2-way 3/4" zone valve	1
TI51301003	2-way 1" zone valve	1

Three-way zone valve

Three–way zone valve with spring return for water circuits. F-threaded fittings of various size, complete with servomotor and microswitch.

Code	Description	Package
TI51302001	3-way 1/2" zone valve	1
TI51302002	3-way 3/4" zone valve	1
TI51302003	3-way 1" zone valve	1

	Unit of measure	TI51301001	TI51301002	TI51301002	TI51302001	TI51302002	TI51302003
Rated supply voltage	Vac	230					
Absorbed power	W	5÷6					
Degree of protection	IP	20					
Aux. contact capacity	A, Vac	3,250					
Nominal pressure	Kg/cm²	10					
Flow temperature limits	°C	+5 ÷ 110					
Maximum room temperature	°C	60					
Nominal opening time	sec.	10			20		
Nominal closing time	sec.	4			6		
Standard cable lenght	mm	550					
Fluid	Technical water						

4.4 AIR TREATMENT

DEHUMIDIFIERS

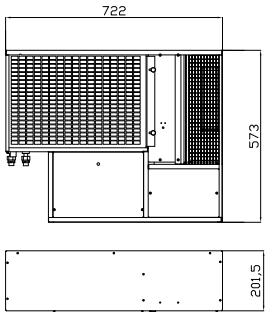
Wall or ceiling dehumidifier, for relative humidity control in areas with floor, wall or ceiling cooling systems.
This is an isothermal machine that uses the same water available to the radiant panel system

The machine is made up of:

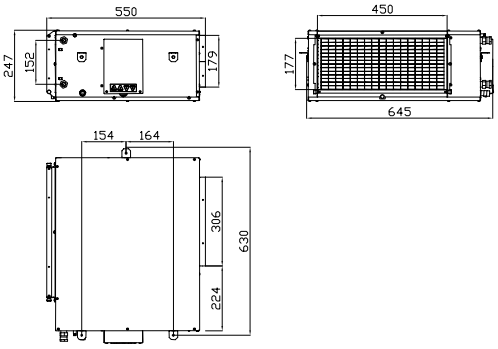
- Frame in galvanised steel covered internally with noise reducing mattress in open-cell expanded polyurethane;
- Copper tube-aluminium fin heat exchangers (with air pre-cooling using water from the radiant system to improve dehumidifying efficiency;
- Brazed stainless steel plate heat exchanger R134A
- Suction filter type G3 Hermetic monocylinder compressor refrigerator unit;
- Humidity filter Thermostatic expansion valve On-off valve for operation mode switch;
- Condensate pan Centrifugal blower (double inlet, forward vanes, 3-speed direct coupled motor);
- Alarm and defrost cycles. Electric control and operation panel.

Data sheet

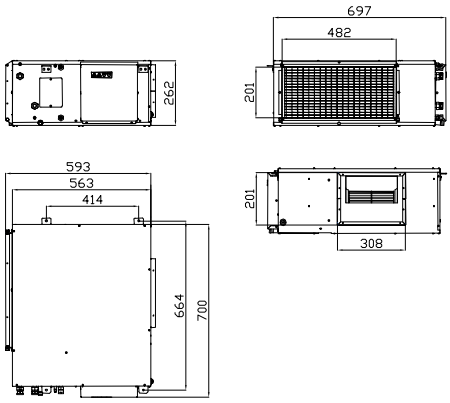
QR CODE



TI60102010



TI60101010



TI60102035

Characteristic	Unit of measure	Code		
		TI60102010	TI60101010	TI60102035
Height	mm	573 / 619[1]	247	262
Length	mm	722 / 760[1]	668	593
Depth	mm	201,5 / 209[1]	550	700

(1) Housing measure

Code	Description	Package
TI60101010	Ceiling dehumidifier 200 mc/h	1
TI60102010	Wall-mounted dehumidifier 200 mc/h	1
TI60102035	Wall-mounted dehumidifier 350 mc/h	1

4.4 AIR TREATMENT

HOME AIR CONDITONERS

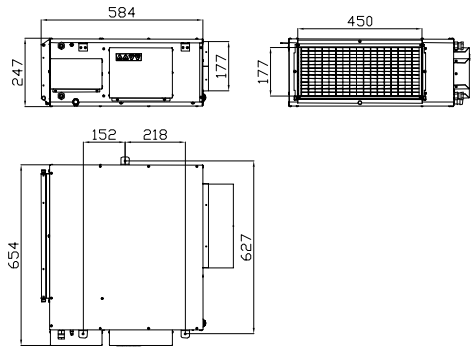
The air conditioner APE in the ceiling or wall version as well as dehumidifying also allows temperature control in areas with floor, wall or ceiling radiant cooling systems.
The unit cools the inlet air using both system water and an internal cooling system, to improve dehumidifying efficiency. The machine can also, on electric command, release the heat generated by the refrigeration unit to the system water, so cooling the outlet air and integrating the cooling effect of the radiant panels.

The unit is made up of:

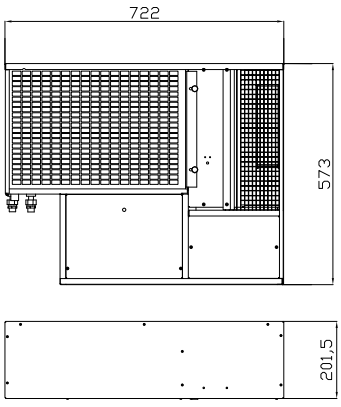
- Frame in galvanised steel covered internally with noise reducing mattress in open-cell expanded polyurethane Air inlet filter type G3;
- The refrigeration circuit includes: heat exchangers in copper-aluminium, plate water heat exchanger R134A in brazed stainless steel, piston compressor 10cc, humidity filter, thermostatic expansion valve, on-off valve for operation mode switch;
- The water circuit includes: copper pipe heat exchanger for air-pretreatment, plate heat exchanger for refrigerant cooling, on-off valve for operation mode switch;
- Condensate pan;
- Centrifugal double inlet fan with forward vanes, 4-speed with direct coupled motor;
- Electric control and operation panel.

Data sheet

QR CODE



TI60201020



TI60202020

Code	Description	Package
TI60201020	Ceiling air conditioner	1
TI60202020	Wall-mounted air conditioner	1

4.4 AIR TREATMENT

INDUSTRIAL CONDITIONERS

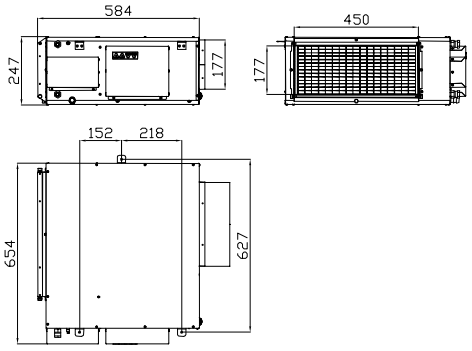
The air conditioner APE in the industrial version is a machine for duct operation in false ceilings that allows both dehumidification and temperature control in areas with floor, wall or ceiling radiant cooling systems.
The unit cools the inlet air using both system water and an internal cooling system, to improve dehumidifying efficiency. The machine can also, on electric command, release the heat generated by the refrigeration unit to the system water, so cooling the outlet air and integrating the cooling effect of the radiant panels.

The unit is made up of:

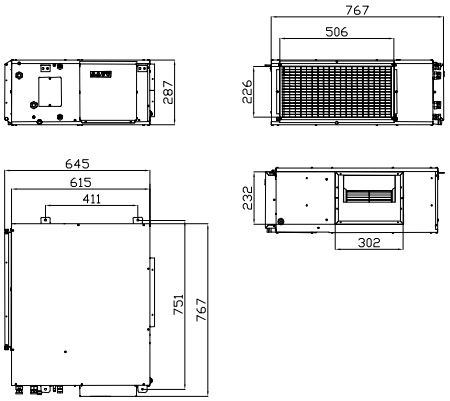
- Frame in galvanised steel covered internally with noise reducing mattress in open-cell expanded polyurethane.
- Suction filter type G3
- The refrigeraton circuit includes: heat exchangers in copper-aluminium, plate water heat exchanger R134A in brazed stainless steel, piston compressor, humidity filter, thermostatic expansion valve, on-off valve for operation mode switch;
- The water circuit includes: copper pipe heat exchanger for air-pretreatment, plate heat exchanger for refrigerant cooling, on-off valve for operation mode switch;
- Condensate pan;
- Centrifugal double inlet fan with forward vanes, 6-speed with direct coupled motor;
- Electric control and operation panel.

Data sheet

QR CODE



TI60201035



TI60201050

Characteristic	Unit of measure	Code	
		TI60201035	TI60201050
Height	mm	262	287
Length	mm	593	645
Depth	mm	700	767

Code	Description	Box (No.)
TI60201035	Ceiling air conditioner 350 mc/h	1
TI60201050	Ceiling air conditioner 500 mc/h	1

4.4 AIR TREATMENT
ACCESSORIES

Outer housing

Housing in galvanised steel for flush-mount dehumidifier/conditioner, with passages for water and electric connections.

Code	Description	Package
TI60402002	Housing for flush-mount dehumidifier/conditioner	10

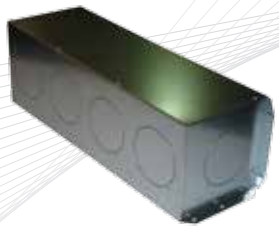
Front panel

Front panel in white painted MDF wood for flush mount dehumidifier/conditioner.

Code	Description	Package
TI60402001	Frontal panel for flush mount dehumidifier/conditioner	1

Supply plenum

Supply plenum D100 for conditioners.



Code	Description	Package
TI60401001	4-ways in flow plenum for art. TI60101010, TI60201020	1
TI60402035	6-ways in flow plenum for art. TI60102035, TI60201035	1

4.5 ACCOUNTING
SAVE CENTRE

The Save Centre is a satellite for energy accounting in a single unit.

The centre includes:

- Accounting unit type 3/4" or 1" complete with adjustable overpressure by-pass and flowmeter, three way zone valve with microswitch controlled by an on-off actuator (230V/50Hz), Y-filter, system fill/drain valve with ball valves;
- Sanitary hot water unit size 3/4" complete with ball and non-return valves;
- Sanitary cold water unit size 3/4" complete with ball and non-return valves;
- Outer flush housing 600x600x110 mm in galvanised steel with painted door and pre-cut side passages.

Data sheet

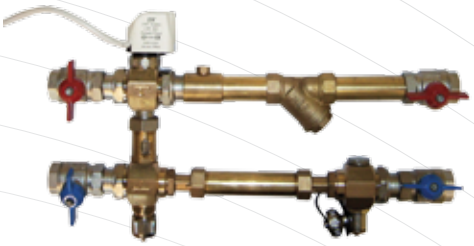
QR CODE

4.5 ACCOUNTING

SAVE CENTRE COMPONENTS

Accounting unit

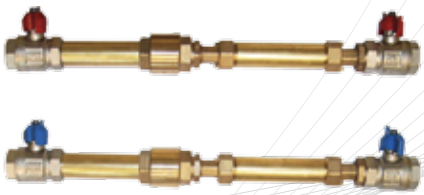
Accounting unit size 3/4" or 1" complete with adjustable over-pressure by-pass, flowmeter, three-way zone valve with micro controlled by on-off actuator (230V/50Hz), Y-filter, system fill/drain valve with ball valves.



Code	Description	Package
TE10100104	¾" counter modul of energy for 3-ways without cabinet	1
TE10100110	1" counter modul of energy for 3-ways without cabinet	1
TE10100204	¾" counter modul of energy for 2-ways without cabinet	1
TE10100210	1" counter modul of energy for 2-ways without cabinet	1

Hot and cold water unit

Sanitary hot and cold water unit size 3/4" or 1" complete with non return valve 1" and relative F ball valves.



Code	Description	Package
TE10200004	¾" counter modul of domestic hot water without cabinet	1
TE10300004	¾" counter modul of domestic cold water without cabinet	1
TE10200010	1" counter modul of domestic hot water without cabinet	1
TE10300010	1" counter modul of domestic cold water without cabinet	1

4.5 ACCOUNTING
VOLUMETRIC COUNTERS

Single jet dry water counter with CEE certificate, for turbid and encrusting water, turning through 360°. Temperature classes T30 and T90, measuring range R80. Complete with impulse emitter, with reed switch cable, length 2 m, max applicable voltage 30 V- 0.2 A.
All models are approved MID as to Directive 2004/22/CE (module B+D), conforming to standards EN 14154 and OIML R49, obtaining R (Q3 / Q1) ≤ 125. Also certified for use with drinking water as to DM 174.

Data sheet

QR CODE

Code	Description	Package
TE20200004	Counter ACS DN15	1
TE20200010	Counter ACS DN20	1
TE20300004	Counter AFS DN15	1
TE20300010	Counter AFS DN20	1

Signal converter M-bus, wall-mounted, 2 or 4 impulse inputs for volumetric counters ACS and AFS.
Protection grade IP54.
Operation temperature range 0 to 55°C. Protocol M-bus standard: EN1434-3.
Transmission rate 300, 2400 baud.

Code	Description	Package
TE40201003	Signal converter M-bus, 2 impulse inputs	1
TE40201004	Signal converter M-bus, 4 impulse inputs	1

4.5 ACCOUNTING

ELECTRONIC HEAT/COLD COUNTERS

Heating and cooling counter, approved MID directive 2004/22/CE MI004, for energy accounting in heating, cooling and sanitary hot water systems.
The counter has three main units:

- Volume counter;
- Electronic unit;
- 2 temperature sensors.

Complete without output M-bus EN1434-3 + 2 impulse inputs for volumetric counters, double accounting record, heat/cold.

Code	Description	Package
TE20101504	Thermal energy counters DN15, nominal flow rate 1,5 mc/h	1
TE20102510	Thermal energy counters DN20, nominal flow rate 2,5 mc/h	1

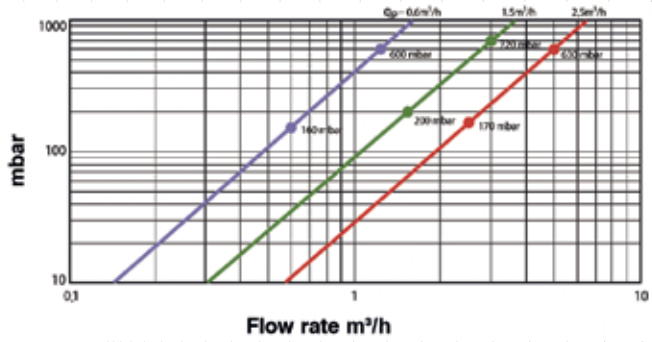
TECHNICAL FEATURES

		Codes	
		TE20101504	**TE20102510**
Electronic counter			
Temperature range	°C	1-130	
Power supply		lithium battery 3V 10+1 years	
Accuracy class	EN1434	**CLASSE 3**	
Electromagnetic class		E1	
Mechanical class		M1	
Hydraulic installation Class		U0-D0	
Degree of protection	IP	54	
Room temperature	°C	5-55	
Interfaces		M-bus / 2 additional pulse	
Flow sensor			
Max flow rate	mc/h	3	5
Nominal flow rate	mc/h	1,5	2,5
Minimum accuracy in horizontal/vertical	l/h	7	10
Nominal pressure	PN[bar]	16	
Head loss	bar	0,2	0,17
Sensors of temperature			
Type		PT500	
Thermowell		PS 50mm / Ø5mm / sylicon cable	
Temperature range	°C	0-130	
Cable lenght	m	1,5	

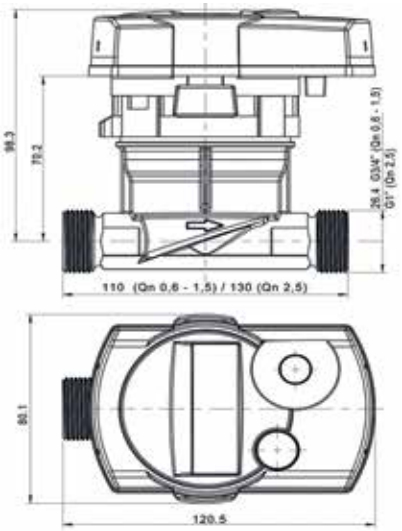
4.5 ACCOUNTING

ELECTRONIC HEAT/COLD COUNTERS

HEAD LOSS DIAGRAM



DIMENSIONS



4.5 ACCOUNTING

ULTRASONIC HEAT/COLD COUNTERS

Static counter with ultrasound technology of high precision, for heat and cold accounting.
The counter has no mechanical parts in water, so with zero wear, high measurement precision at low flow rates, can be installed in any position on the return line.
Approved MID class 2.

Data sheet

QR CODE

Code	Description	Package
TE20301503	Ultrasonic counter DN15, nominal flow rate1,5 mc/h, srewed	1
TE20302504	Ultrasonic counter DN20, nominal flow rate 2,5 mc/h, srewed	1
TE20303510	Ultrasonic counter DN25, nominal flow rate 3,5 mc/h, srewed	1
TE20306010	Ultrasonic counter DN25, nominal flow rate 6 mc/h, srewed	1
TE20310012	Ultrasonic counter DN40, nominal flow rate 10 mc/h, srewed	1
TE20315020	Ultrasonic counter DN50, nominal flow rate 15mc/h, flanged	1
TE20325021	Ultrasonic counter DN65, nominal flow rate 25mc/h, flanged	1
TE20340030	Ultrasonic counter DN80, nominal flow rate 40mc/h, flanged	1
TE20360031	Ultrasonic counter DN100, nominal flow rate 60mc/h, flanged	1

4.5 ACCOUNTING
ACCESSORIES

Installation T

T to install wet sensor, 5mm diameter.

Code	Description	Package
TE40201005	1/2" tee to install wet sensor	1
TE40201006	3/4" tee to install wet sensor	1

Installation kit

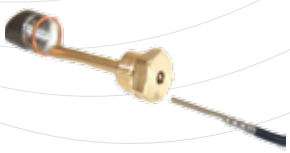
Installation kit complete with:
- 1 T fitting;
- 1 O-Ring;
- 1 nipple.

To install the wet sensor, diameter 5 mm.

Code	Description	Package
TE40201007	1"Installation kit, wet sensor	1

Installation Kit complete with:
- 2 bushes (DN32-40-50-65);
- 2 bushes at 45° (DN80-100); 2 copper gaskets;
- 2 wells, L=40 mm (DN32-40-50-65), L=85mm (DN80-100).

For installation of the dry sensor, diameter 6 mm.



Code	Description	Package
TE40201008	DN 32 installation kit, dry sensor	1
TE40201009	DN 40 installation kit, dry sensor	1
TE40201010	DN 50 installation kit, dry sensor	1
TE40201011	DN 65 installation kit, dry sensor	1
TE40201012	DN 80 installation kit, dry sensor	1
TE40201013	DN 100 installation kit, dry sensor	1

4.5 ACCOUNTING
ACCESSORIES

Sensors

Two PT500 sensors, length 3 m with:
- Fitting M10x1 (nipple 1/2" to 1");
- Cable adapter (DN32 to DN100).

Code	Description	Package
TE40201014	Two PT500 sensors, Ø 5mm for 1/2" to 1" callipers	1
TE40201015	Two PT500 sensors, Ø 6mm for DN 32 to DN 100 callipers	1

Housing

Housing for flush mounting, with height adjustable feet incorporated, with universal cable guides, complete with all brackets need for unit support, cold assembly to avoid corrosion, made in galvanised steel sheet, epoxy-polyester powder coated white RAL 9010. The housing is complete with surround and cover with screwdriver lock for inspection, plaster net and knock-outs for side entrances.

Code	Description	Package
TE40101001	Housing 600x600x110mm for Save Central	1

4.5 ACCOUNTING
DATA CONCENTRATOR

Concentrator for local reading of counters connected in a wired network M-bus with the following characteristics:

- Supports up to 60 physical devices;
- Repeater function with unlimited virtual expansion possibility by a serial connection of twin units on 35mm DIN bar EN60529 or signal regenerator for long distances;
- No local memory available;
- Supply voltage 24Vac/dc;
- Local interrogation by pc with usb/micro usb cable and application software ST for report export in format .csv or .xls;
- Later possibility of remote readout by adding device DL-LC 61;
- Fitting to 35 mm DIN guide.

Code	Description	Package
TE30100020	Concentrator data (supports up to 60 physical devices)	1

Data logger M-bus via cable for remote reading of counters connected to concentrator LC61, with the following characteristics:

- Datalogger function via cable;
- Supports up to 250 units by adding more concentrators LC61;
- Connection via Ethernet port to read consumption on web portal;
- Luminous graphic display for local consultation and multilingual configuration;
- Internal memory to store daily data for up to 10 years;
- Data acquisition via cable with interval from 15 minutes to 24 hours;
- Extended supply 12-24V ac/dc or power over Ethernet (PoE);
- Fitting to guide DIN 35mm;
- 2 Ethernet ports with switching function;
- 3 digital inputs;
- 2 relay outputs for and/or logic management and e-mail send;
- Creation of reports in format .csv or .xls; Data transmission via mail smtp, ftp (client, web server, via LAN, ADSL or UMTS/GPRS);
- Alarm notification via M-bus network;
- Remote network diagnostics.

Code	Description	Package
TE30100021	Data logger with master function	1

4.5 ACCOUNTING

DATA CONCENTRATOR

Compact modem with Ethernet port for connection to datalogger DL-LC61, with the following characteristics:

- Quad band UMTS and GSM;
- Operation with SIM data traffic;
- High transfer rate HSPA+ up to 21 Mbps in download and 5.76 Mbps in upload;
- Network Interface LAN and Wifile;
- Supply voltage AC/DC 100-240 Vac;
- Firewall protection;
- Dimensions: 36x85x100 mm.

Code	Description	Package
TE30100030	Modem MD02	1

Software ST for remote reading of concentrator LC61, with the following characteristics:

- Automatic counter search;
- Information and registry management of systems; Data scan by system and date;
- Setup of connected devices;
- Download counter readings; Interface setup M-bus;
- Creation of reports in format .csv or .xls; System requisites:
- Windows XP/Vista/7/8; hardware: processor 32/64 bit, usb port 1.1 or higher, usb cable.

Code	Description	Package
TE30100031	Software ST	1

4.5 ACCOUNTING

ELECTRONIC HEAT DISTRIBUTOR

The electronic heat distributor us a device to distribute heat over radiators in central heating systems when a direct accounting system cannot be used. The distributor is used together with our thermostatic valve (*3TH. TESVAL) to obtain correct area temperature regulation. There are 2 models, one compact, the other with remote sensor.

Code	Description	Package
TE20401001	Electronic heat cost allocator (compact type) with display indication	1
TE20401002	Electronic heat cost allocator (remote sensor) with display indication	1
TE20401010	Kits for installation on different types of radiator	1

4.5 ACCOUNTING

PORTABLE WIRELESS RECEIVER

Portable wireless receiver M-bus with the following characteristics:

- Walk-by receiver;
- Range up to 100m in free field, 20m in buildings;
- Usb Interface for cable connection to portable notebook; Communication via COM virtual port;
- Conforms to wireless standard M-bus EN13757-4; Supports the open standard OMS;
- Two-way transmission;
- Supported transmission modes: T1-S1 in frequency 868Mhz;
- Data cryptography AES128 supported.

Code	Description	Package
TE20401011	Portable wireless receiver	1

Software

Software for configuration and reading of wireless distributors with the following characteristics:

- OS: Windows XP/Vista/7/8;
- Hardware: 1 Mb Ram and 13 Mb free space on hard disc;
- Automatic search for wireless devices;
- Info and registry system management and data scanning; Data scan by system and date;
- Data report generation format .csv;
- Hardware associated: receiver usb RPWMB;
- optical head with cable OT-usb.

Code	Description	Package
TE20401012	Software wireless	1
TE20401013	Optical head with cable OT-usb	1