

R PANEL[®]
LOW-TEMPERATURE
RADIANT PANELS
CLASS A



L I V E A N E T E R N A L S P R I N G .

With R Panel® you enter a new Era where well-being, healthiness and energy savings are in close contact with ecology and improvement of the life quality. Specific feature of the R Panel® technology is its capacity in transmitting heat and cold to the walls and not to the air.



	POLITECNICO DI MILANO - DIPARTIMENTO DI ENERGETICA Laboratorio Misure Ricerche Termotecniche M.R.T. - Notified body number: 1695 Laboratorio abilitato ai sensi della direttiva 89/106/CE dal Ministero delle Attività Produttive, Prot. N. 19379/04 Aprile 2005 Laboratory notified according 89/106/CE Directive by Italian Ministry in charge; Prot. N. 19379/04 April 2005 Laboratorio di riferimento conforme a EN 442 Reference Laboratory according EN 442 Accreditation n° / Assessment report No : N° 104 Rilasciato da / Issued by: SIT data / date: 11 / 04 / 2002
	Indirizzo / Address: Piazza Leonardo da Vinci, 32 - 20133 Milano - ITALY Phone +39 02 2399 3834 or +39 02 2399 3849; fax +39 02 2399 3940 or +39 02 2399 3863; e-mail : mrt @polimi.it

Attestato **CE** di Tipo

CE Type examination

Direttiva Prodotti da Costruzione 89/106/CEE

Construction Product Directive 89/106/CEE

Documento n°: ENE/MRT.EEC.06029

Il Politecnico di Milano – Laboratorio Misure e Ricerche Termotecniche - M.R.T. esaminati i Rapporti di Prova e la Documentazione fornita dal Costruttore

Politecnico di Milano - M.R.T. Laboratory,

after examination and verification of test reports and declarations furnished by Manufacturer

DICHIARA / ATTEST

Tipo di corpo scaldante / Type of heating body:

RADIATORI / Radiators

Fabbricati da / Manufactured by:

BGVM S.r.l.
Corso dei Mille n. 510
90047 - Partinico (PA) – ITALIA

Marchio commerciale / Trade mark:

BGVM

Gamma

I modelli che compongono la
Gamma sono elencati in Tabella I

Type

Models that constitute the
Type are written in Tabella I

R PANEL

Materiale / material:

ALLUMINIO / Aluminium

Designazione / designation:

Radiatore composto da collettori orizzontali ed elementi verticali; la circolazione d'acqua è prevalentemente verticale.

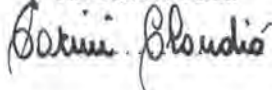
Radiator composed by horizontal collectors and vertical elements, the water circulation is mostly vertical.

E' conforme ai requisiti essenziali della Direttiva Prodotti da Costruzione 89/106/CEE.

Complies with the essential requirements of the Product of Construction Directive 89/106/CEE.

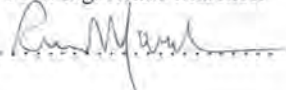
Responsabile delle prove
Operator

P.I. Claudio Tarini



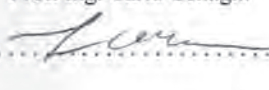
Responsabile Laboratorio
Laboratory Manager

Prof. Ing. Renzo Marchesi



Direttore Dipartimento
Institut Director

Prof. Ing. Carlo Osnaghi

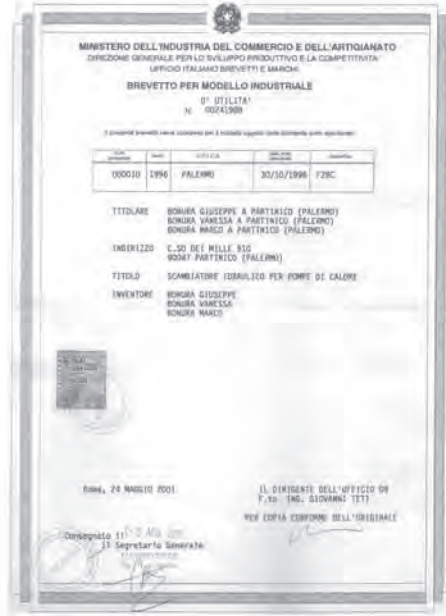
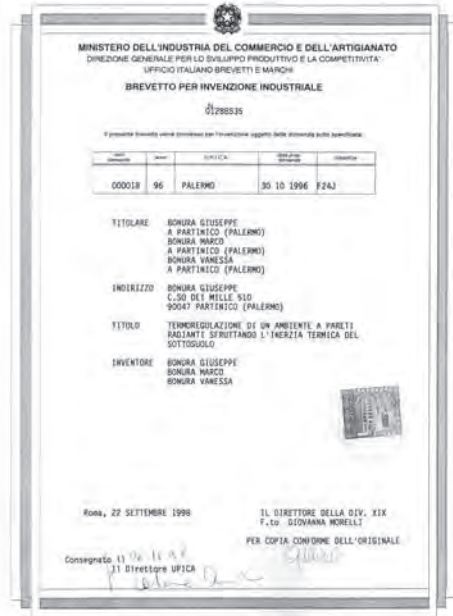


Milano: 03/02/2006



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Italian Patents



European Patents



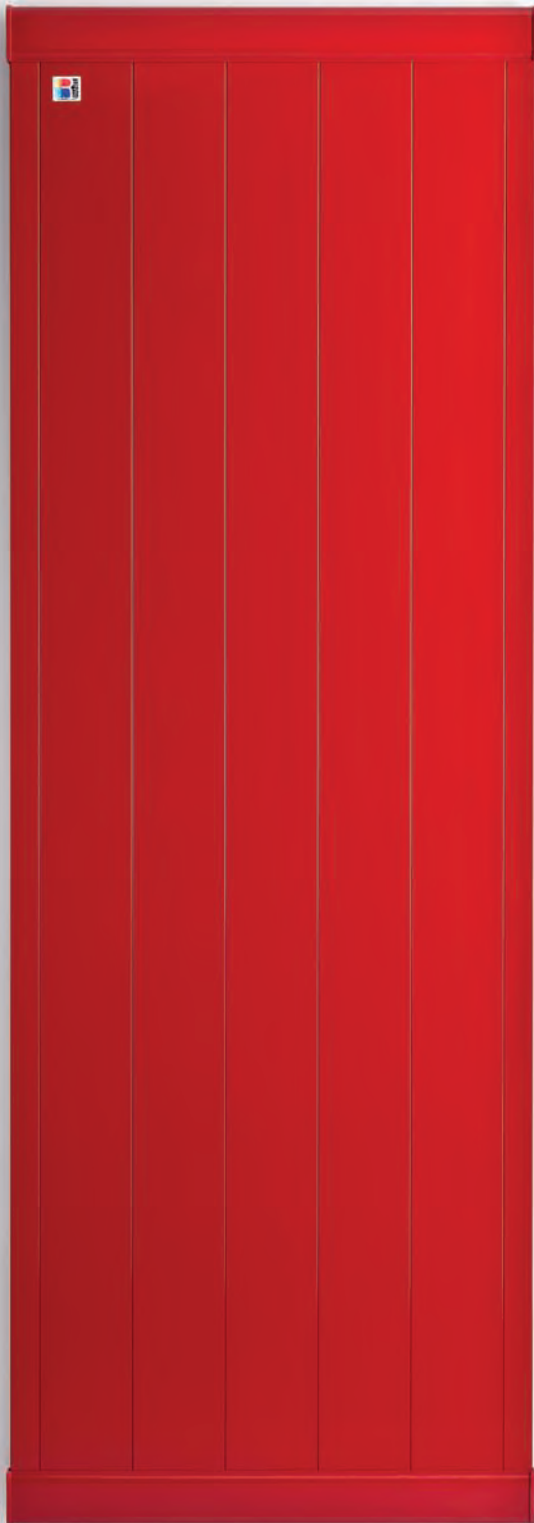
USA Patents



System for the thermoregulation of a room with radiant panels

Publication number: US6276429
 Publication date: 2001-08-21
 Inventor: BONURA GIUSEPPE (IT); BONURA MARCO (IT); BONURA VANESSA (IT)
 Applicant: BONURA GIUSEPPE
 Classification: F24D21/22, F24D21/24, F24D21/26, F24D21/28, F24D21/30, F24D21/32, F24D21/34, F24D21/36, F24D21/38, F24D21/40, F24D21/42, F24D21/44, F24D21/46, F24D21/48, F24D21/50, F24D21/52, F24D21/54, F24D21/56, F24D21/58, F24D21/60, F24D21/62, F24D21/64, F24D21/66, F24D21/68, F24D21/70, F24D21/72, F24D21/74, F24D21/76, F24D21/78, F24D21/80, F24D21/82, F24D21/84, F24D21/86, F24D21/88, F24D21/90, F24D21/92, F24D21/94, F24D21/96, F24D21/98, F24D21/100, F24D21/102, F24D21/104, F24D21/106, F24D21/108, F24D21/110, F24D21/112, F24D21/114, F24D21/116, F24D21/118, F24D21/120, F24D21/122, F24D21/124, F24D21/126, F24D21/128, F24D21/130, F24D21/132, F24D21/134, F24D21/136, F24D21/138, F24D21/140, F24D21/142, F24D21/144, F24D21/146, F24D21/148, F24D21/150, F24D21/152, F24D21/154, F24D21/156, F24D21/158, F24D21/160, F24D21/162, F24D21/164, F24D21/166, F24D21/168, F24D21/170, F24D21/172, F24D21/174, F24D21/176, F24D21/178, F24D21/180, F24D21/182, F24D21/184, F24D21/186, F24D21/188, F24D21/190, 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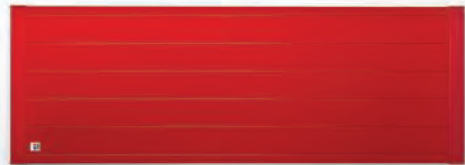
R PANEL®
LOW-TEMPERATURE
RADIANT PANELS CLASS A



R PANEL®
 Towel warmer
 Models from
 ST2 to ST9.



R PANEL®
 Horizontal model.



R PANEL®
 Under-window model
 vertical from ST2 to ST9.



R PANEL® is made of extruded 6060-TS aluminum, is painted with high-quality polyester powders, has a thickness variable from 8 mm to 22,5 mm. It is available in different height: 800 mm, 1600 mm, 2000 mm, 2500 mm e 3000 mm. The width varies, as a function of the model, from 320 mm to 1160 mm.

CLASSIFICATION:

Low-Temperature radiant system CLASS A

HEATING

Working temperature: 35°C ÷ 42°C [95°F ÷ 108°F] (*)
 With traditional boilers: 45°C ÷ 55°C [113°F ÷ 131°F] (**)

COOLING

Working temperature: modulating 13°C ÷ 21°C [55°F ÷ 69°F]

Max working pressure: 3 bar
 Max working temperature: 95°C [203°F]
 Thermovector fluid: water + additive
 Average liquid capacity: 2.4 l/m²
 Hydraulic connections: 3/8"
 Panel feeding: crossed with input from down (***)
 Energetic compatibility: fonti energetiche convenzionali,
 traditional energy sources, solar energy, geothermal
 energy.

(*) See the section: "Feeding Temperature"

(**) See the section: "Feeding Temperature"

(***) Production after 01/01/2010

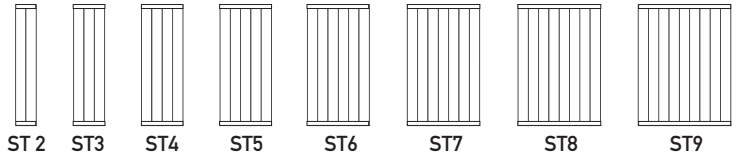
SPECIFICATIONS FOR TENDER.

Low-temperature radiant panel for the promotion of alternative energies, energy saving and reduction of atmospheric pollution.

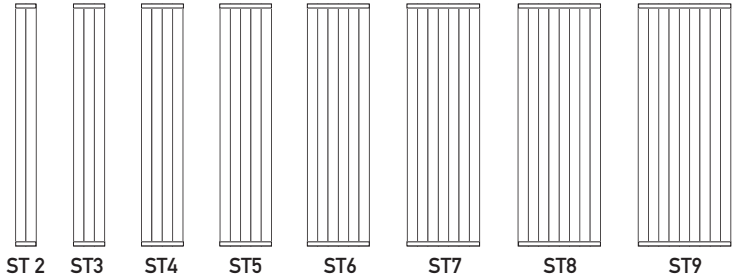
- European CE certificate.
- Percentage of heat transmitted by irradiation **greater than 70%**.
- Made of extruded 6060-TS aluminum according to UNI 9006/1.
- Painted with high quality powder.
- Vertical or horizontal installation.
- hydraulic or electric alimentation.
- Working temperature: Heating: 35°C ÷ 42°C (95°F ÷ 108°F)
 Cooling: temperature controlled by specific anti-condensate system.
- Thermovector fluid: water and specific additive.
- Average liquid content: 2.4 l/m²
- Max temperature : 95°C [203°F]
- Installation on the wall, vertical or horizontal.
- Installation Kit: for hidden hydraulic connections and the enhancement of the radiant thermal exchange.
- Hydraulic connection size: 3/8" (also with quick-connect fitting)
- Radiating shield to be applied on the wall, behind the panel.
- Hangers to fix the panel on the wall.
- Mass: 10 kg/m² - 12 kg/m².
- Width: from 320 mm to 1160 mm.
- Height: from 800 mm to 3000 mm.
- Max. distance from the wall: 40 mm.
- Particularly suitable for operating at low temperature.

R PANEL® MODELS

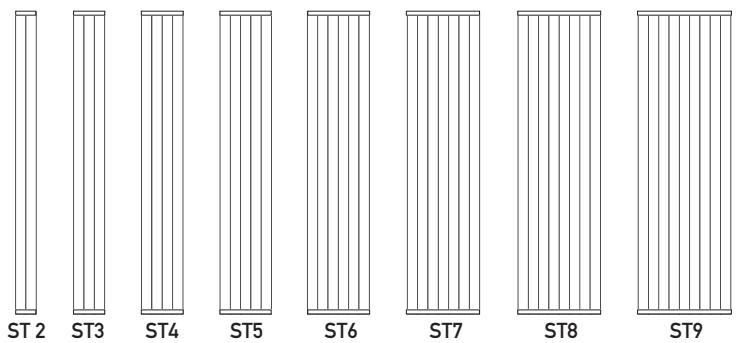
SERIES 800



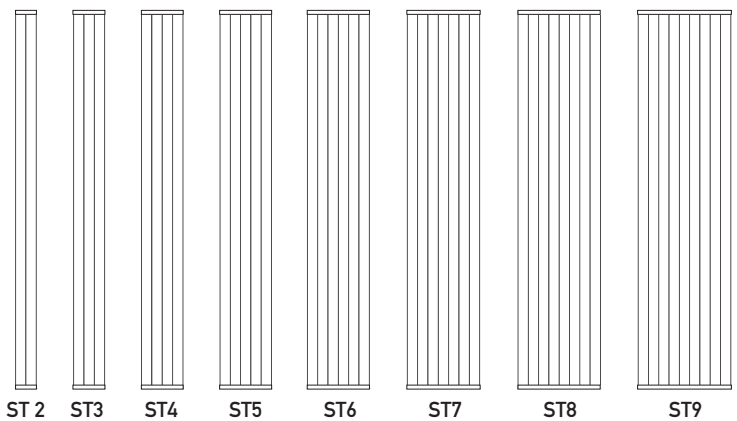
SERIES 1600



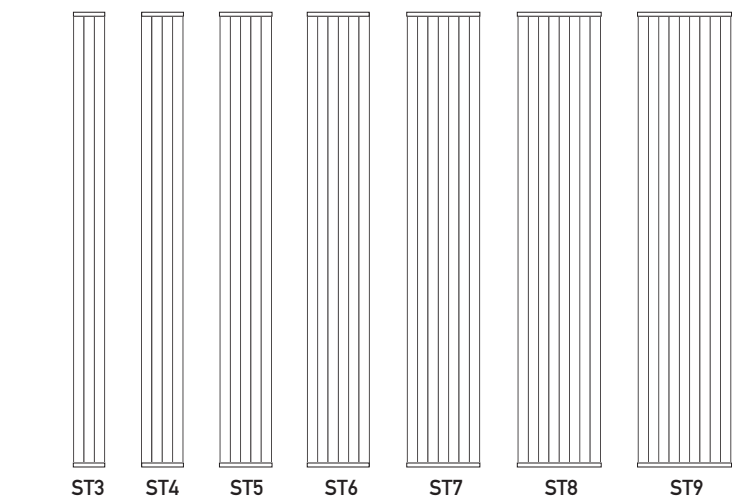
SERIES 2000



SERIES 2500

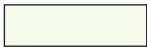


SERIES 3000



COLORS

Ivory
RAL 1013



Pure white
RAL 9010



Red
RAL 3003



Blue
RAL 5007



Green
RAL 6005



Raffaello grey
RAL 0924

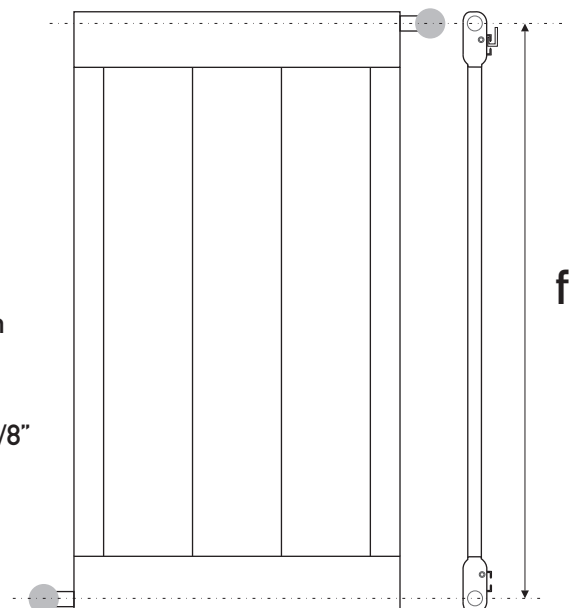
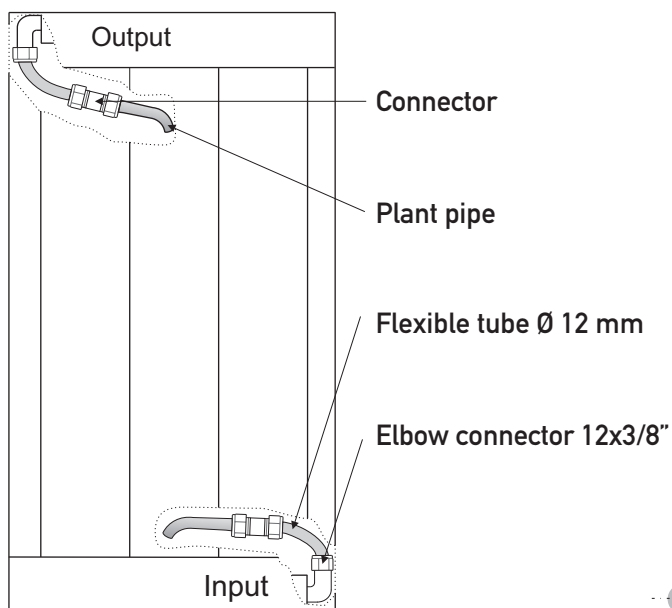
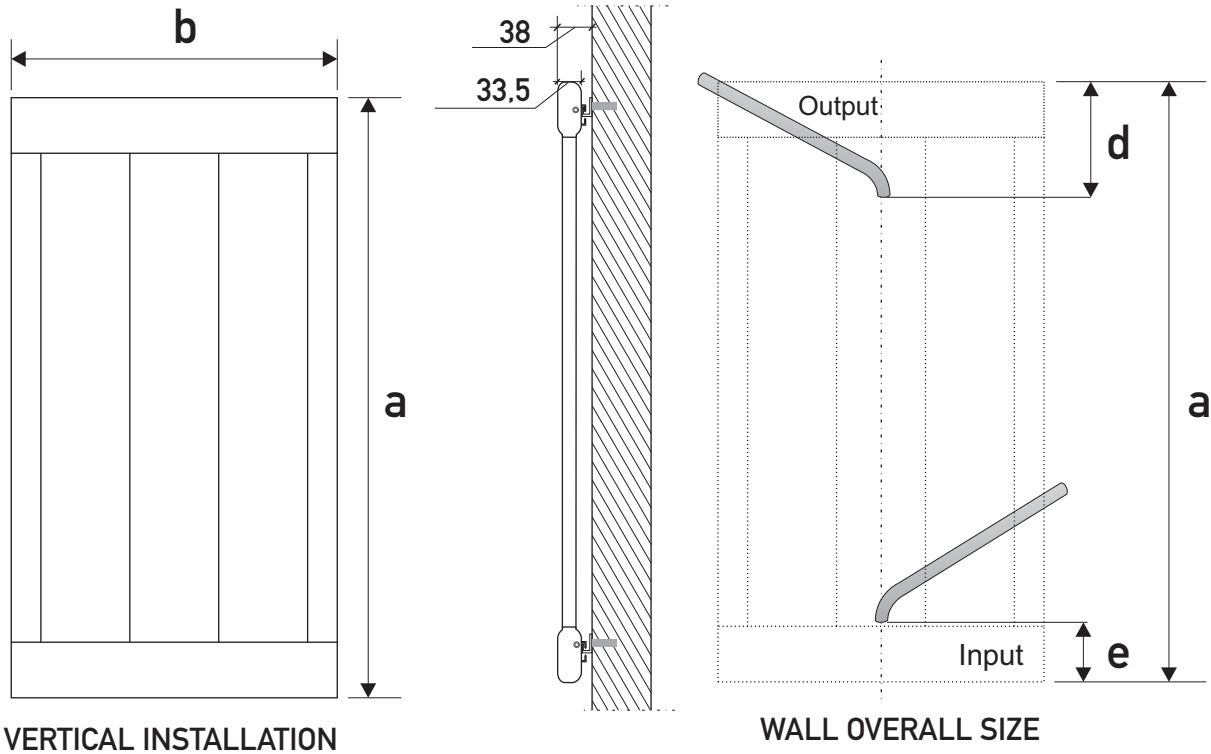


N.B. On choosing the color, please refer to the Ral code (or in any case to the constructor code). Real colors can be different from that visualized in the catalogue.

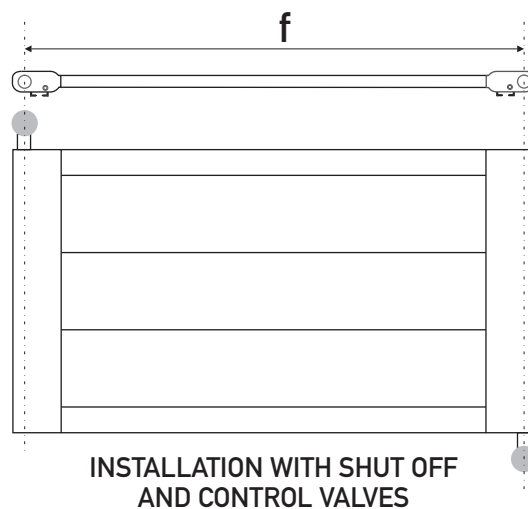
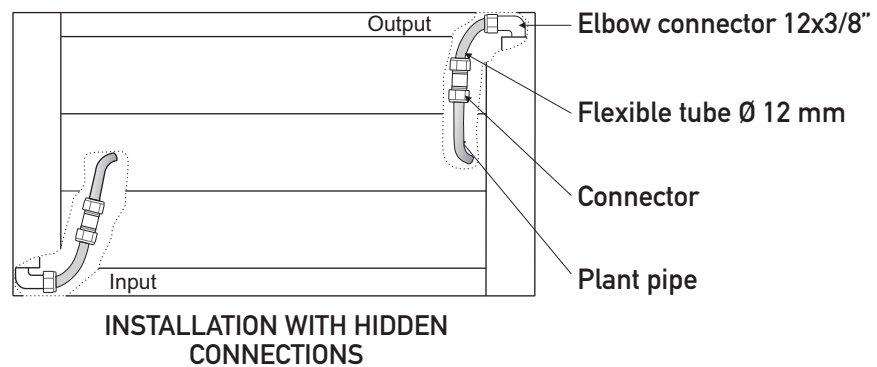
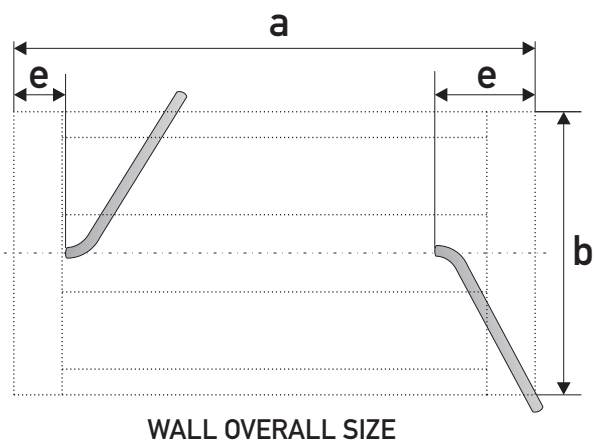
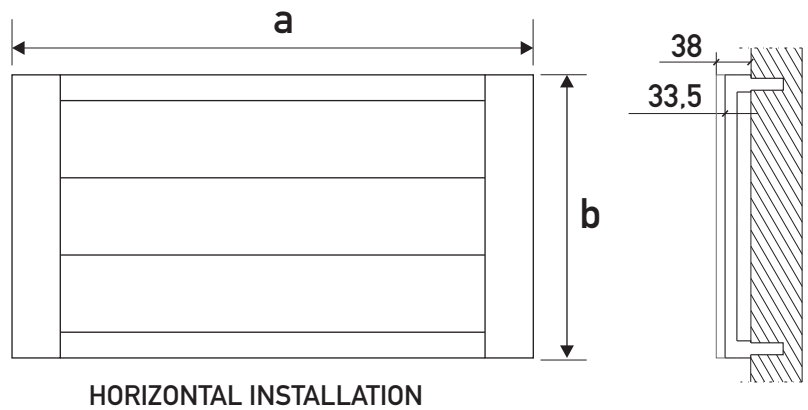
TECHNICAL SHEET

R PANEL®	a	b	c	d	e	f	Water content	Mass
model	mm	mm	mm	mm	mm	interaxis mm	lt	kg
ST2/800	811	320	33,5	200	350	784,7	0,46	3,5
ST3/800	811	440	33,5	200	350	784,7	0,67	5,0
ST4/800	811	560	33,5	200	350	784,7	0,89	6,4
ST5/800	811	680	33,5	200	350	784,7	1,13	7,9
ST6/800	811	800	33,5	200	350	784,7	1,34	9,3
ST7/800	811	920	33,5	200	350	784,7	1,58	10,8
ST8/800	811	1040	33,5	200	350	784,7	1,80	12,2
ST9/800	811	1160	33,5	200	350	784,7	2,02	13,7
ST2/1600	1611	320	33,5	200	350	1584,7	0,91	6,3
ST3/1600	1611	440	33,5	200	350	1584,7	1,37	8,7
ST4/1600	1611	560	33,5	200	350	1584,7	1,82	11,1
ST5/1600	1611	680	33,5	200	350	1584,7	2,28	13,5
ST6/1600	1611	800	33,5	200	350	1584,7	2,74	15,9
ST7/1600	1611	920	33,5	200	350	1584,7	3,19	18,3
ST8/1600	1611	1040	33,5	200	350	1584,7	3,65	20,7
ST9/1600	1611	1160	33,5	200	350	1584,7	4,10	23,2
ST2/2000	2010	320	33,5	200	350	1983,7	1,15	6,6
ST3/2000	2010	440	33,5	200	350	1983,7	1,70	9,9
ST4/2000	2010	560	33,5	200	350	1983,7	2,28	13,2
ST5/2000	2010	680	33,5	200	350	1983,7	2,86	16,3
ST6/2000	2010	800	33,5	200	350	1983,7	3,43	19,3
ST7/2000	2010	920	33,5	200	350	1983,7	3,98	22,3
ST8/2000	2010	1040	33,5	200	350	1983,7	4,56	25,4
ST9/2000	2010	1160	33,5	200	350	1983,7	5,16	28,4
ST2/2500	2511	320	33,5	200	350	2484,7	1,44	8,05
ST3/2500	2511	440	33,5	200	350	2484,7	2,14	12,07
ST4/2500	2511	560	33,5	200	350	2484,7	2,86	16,1
ST5/2500	2511	680	33,5	200	350	2484,7	3,58	19,6
ST6/2500	2511	800	33,5	200	350	2484,7	4,30	23,1
ST7/2500	2511	920	33,5	200	350	2484,7	4,99	26,6
ST8/2500	2511	1040	33,5	200	350	2484,7	5,71	30,1
ST9/2500	2511	1160	33,5	200	350	2484,7	6,43	33,6
ST3/3000	3011	440	33,5	200	350	2984,7	2,57	14
ST4/3000	3011	560	33,5	200	350	2984,7	3,43	19
ST5/3000	3011	680	33,5	200	350	2984,7	4,30	23
ST6/3000	3011	800	33,5	200	350	2984,7	5,16	27
ST7/3000	3011	920	33,5	200	350	2984,7	6,00	30,9
ST8/3000	3011	1040	33,5	200	350	2984,7	6,86	34,9
ST9/3000	3011	1160	33,5	200	350	2984,7	7,73	38,9

ARRANGEMENT FOR THE HYDRAULIC CONNECTION/VERTICAL INSTALLATION.



ARRANGEMENT FOR THE HYDRAULIC CONNECTION/HORIZONTAL INSTALLATION.

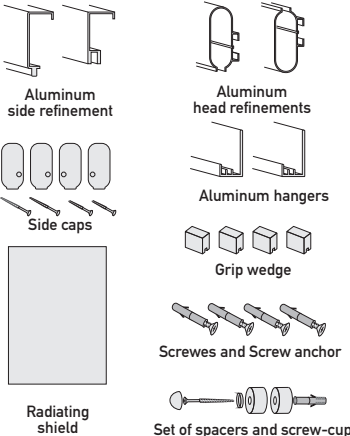



THERMAL POWER UNI EN 442 REGULATION

R PANEL® modello	Radiant Surface m ²	Flow ¹ q l/m	Pressure drop mm c.a.	Thermal power UNI EN 442 $w = k \Delta T^n q^c$			
				K	n	c	W($\Delta T = 30^\circ\text{C}$)
ST2/800	0,19	0,4	1,2	2,29027	1,23091	0	150,7
ST3/800	0,28	0,5	1,7	2,92188	1,23351	0	194,0
ST4/800	0,37	0,6	2,0	3,54149	1,23611	0	237,2
ST5/800	0,47	0,7	2,9	4,14950	1,23871	0	280,4
ST6/800	0,56	0,8	3,8	4,74455	1,24132	0	323,4
ST7/800	0,66	0,9	4,6	5,32712	1,24392	0	366,4
ST8/800	0,75	1,0	5,5	5,89744	1,24652	0	409,2
ST9/800	0,84	1,1	6,3	6,50545	1,24912	0	455,4
ST2/1600	0,38	0,6	7,9	4,50912	1,22302	0	288,8
ST3/1600	0,57	0,8	8,6	5,51441	1,23140	0	363,4
ST4/1600	0,76	1,0	9,1	6,51994	1,23978	0	442,1
ST5/1600	0,95	1,2	9,9	7,53759	1,24816	0	525,9
ST6/1600	1,14	1,3	10,7	8,48279	1,25655	0	609,0
ST7/1600	1,33	1,5	11,6	9,35916	1,26493	0	691,3
ST8/1600	1,52	1,6	12,4	10,16976	1,27331	0	772,9
ST9/1600	1,71	1,8	13,9	11,18741	1,28169	0	874,9
ST2/2000	0,48	0,65	8,1	5,71597	1,24314	0	392,1
ST3/2000	0,71	0,9	12,5	6,57396	1,25702	0	472,7
ST4/2000	0,95	1,3	16,2	7,43194	1,27090	0	560,2
ST5/2000	1,19	1,5	16,9	8,26856	1,28478	0	653,4
ST6/2000	1,43	1,7	17,7	8,99614	1,29865	0	745,3
ST7/2000	1,66	1,9	18,6	9,62376	1,31253	0	835,8
ST8/2000	1,90	2,1	19,5	10,15963	1,32640	0	925,0
ST9/2000	2,14	2,3	20,5	10,99637	1,34028	0	1049,6
ST2/2500	0,60	0,75	9,9	5,95111	1,27102	0	448,8
ST3/2500	0,89	1,1	14,8	6,92667	1,28390	0	545,8
ST4/2500	1,19	1,5	19,8	7,90222	1,29678	0	650,5
ST5/2500	1,49	1,8	20,5	8,99165	1,30966	0	773,3
ST6/2500	1,79	2,1	21,4	9,95465	1,32254	0	894,5
ST7/2500	2,08	2,4	22,3	10,80130	1,33542	0	1014,0
ST8/2500	2,38	2,7	23,3	11,54049	1,34830	0	1131,9
ST9/2500	2,68	3,0	24,4	12,62992	1,36118	0	1294,3
ST3/3000	1,07	1,4	20,7	8,18851	1,29252	0	664,4
ST4/3000	1,43	1,8	21,4	9,11294	1,30500	0	771,4
ST5/3000	1,79	2,3	22,1	10,40310	1,31750	0	918,9
ST6/3000	2,15	2,7	22,9	11,54937	1,33000	0	1064,5
ST7/3000	2,50	3,1	23,9	12,56253	1,34250	0	1208,1
ST8/3000	2,86	3,4	24,9	13,45268	1,35500	0	1349,9
ST9/3000	3,22	3,7	26,1	14,74284	1,36750	0	1543,6

¹ For the cooling, increase water flow of 15%.

ACCESSORIES

ACCESSORIES	ARTICLE	CODE	DESCRIPTION
 <p>Aluminum side refinement</p> <p>Aluminum head refinements</p> <p>Aluminum hangers</p> <p>Side caps</p> <p>Grip wedge</p> <p>Screws and Screw anchor</p> <p>Radiating shield</p> <p>Set of spacers and screw-cup</p>	<p>INSTALLATION KIT It includes all the cosmetic details and the accessories required for installation on the wall.</p>	<p>K.INST. 1 (Vertical Installation Kit)</p>	<p>n. 2 Aluminum side refinement n. 2 Aluminum head refinements n. 4 Grip wedge n. 4 Side caps n. 1 Radiating shield n. 2 Aluminum hangers n. 4 Screw anchor n. 4 Screws</p>
<p>K.INST. ORIZ (Horizontal Installation Kit)</p>		<p>n. 2 Aluminum side refinement n. 2 Aluminum head refinements n. 4 Side caps n. 1 Radiating shield n. 4 Screw anchor n. 4 Screws Set of spacers and screw-cup</p>	
	<p>FITTING KIT It includes all the components necessary to connect the panel to the hydraulic plant.</p>	<p>K.R1</p>	<p>n. 2 Elbow connectors 3/8" x 12mm n. 1 Stopper 3/8" n. 1 Air vent valve n. 2 Extension connectors 3/8" x 12mm n. 2 Hose pieces Ø 12mm</p>
<p>K.R3/M</p>		<p>n. 1 Stopper 3/8" n. 1 Air vent valve n. 2 Elbow connectors 3/8" n. 2 Connectors for multilayer pipe 16 x 2mm</p>	
	<p>R PANEL® PROTECTIVE LIQUID</p>	<p>AD34-1 1 l bottle</p>	<p>It is a protective liquid, to be added to the water of the hydraulic plant. It ensures thermal efficiency and protection of the panels.</p>
	<p>R PANEL® CHRONOTHERMOSTAT</p>	<p>106/nob 106/sim</p>	<p>It's a digital chronothermostat, weekly programmable, capable of detecting the room irradiation. It provides excellent thermal responses in radiant systems.</p>
	<p>R PANEL® TOWEL HANGER</p>	<p>SCD/2 SCD/3 SCD/4 SCD/5 SCD/6 SCD/7 SCD/8 SCD/9</p>	<p>It's a band in brushed steel with a modern and linear design. It can be mounted on the R Panel at the desired height.</p>

ACCESSORIES

	ARTICLE	CODE	DESCRIPTION
	<p>R PANEL® ELECTRIC KIT</p> <p>It allows to operate the panel with the electric power supply.</p>	<p>K.EL-R1 (electric feeding)</p>	<p>n. 1 PTC resistor suitable to the model n. 1 Electronic controller n. 1 Safety valve n. 2 Stopper 3/8" n. 2 Chrome fittings 3/8" x 1/2"</p>
	<p>R PANEL® ANTICONDENSATION CONTROL</p>	<p>QR2-50/PLC/1 (1 ZONE) QR2-50/PLC/2 (2 ZONES) QR2-50/PLC/3 (3 ZONES) QR2-50/PLC/4 (4 ZONES)</p>	<p>It's an electronic regulator for the prevention of condensation in the R Panel® cooling systems (also in combination with radiant floor heating systems).</p>
	<p>ANTICONDENSATION PROBE</p>	<p>HRV 818/PLC</p>	<p>It's a probe that can detect the dew point with precision and speed.</p>
	<p>MIXING VALVES</p>	<p>HM 2030 RS42126190 RS42126200 RS42126210</p>	<p>Valve motor 230V/50Hz 3-way mixing valve with 1" shutter 3-way mixing valve with 1" ¼ shutter 3-way mixing valve with 1" ½ shutter</p>
	<p>COLLECTORS</p>	<p>1404152 (for 2 circuits) 1404158 (for 8 circuits) 1404153 (for 3 circuits) 1404159 (for 9 circuits) 1404154 (for 4 circuits) 1404160 (for 10 circuits) 1404155 (for 5 circuits) 1404161 (for 11 circuits) 1404156 (for 6 circuits) 1404162 (for 12 circuits) 1404157 (for 7 circuits)</p>	<p>Pre-assembled manifold for radiant system with flow meter 1-6 l/s. Equipped with loading and unloading valves, air vent valves, temperature gauge.</p>
	<p>MANIFOLDS FITTINGS</p>	<p>1027441 (copper pipe) 1507955 (multilayer pipe 16 x 2mm)</p>	<p>LOCK FITTING FOR PIPES</p>
	<p>THERMOSTATIC HEAD</p>	<p>1012485 230V 1012486 24V</p>	<p>Lock fittings for pipes</p>

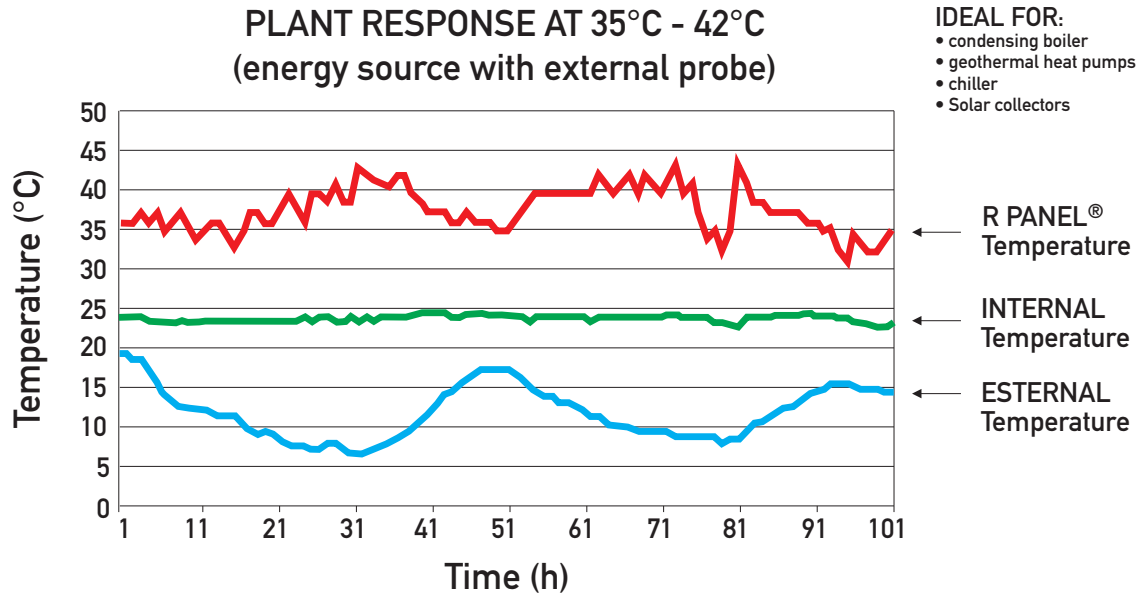
FEEDING TEMPERATURE.

The peculiarities of the R Panel® technology imply some differences, with respect to traditional air systems, for what regards the plant sizing.

Whilst the dimension of the radiators varies as a function of the feeding temperature, the amount of R Panel® to be installed is the same for temperatures between 35°C and 55°C.

For the R Panel® system, what varies is the time of activation of the energy source. In case of low temperature feeding (35°C-42°C), the energy source remains almost continuously activated (Fig. 1). In case of medium temperature feeding (45°C-55°C), the energy source is not continuously activated (Fig. 2).

In both the cases, the energetic source is regulated by the thermostat.



Technical Tip: it is a good idea to equip the power source with an external temperature probe, in order to adjust the input temperature to the rigors of climate.

Fig. 1

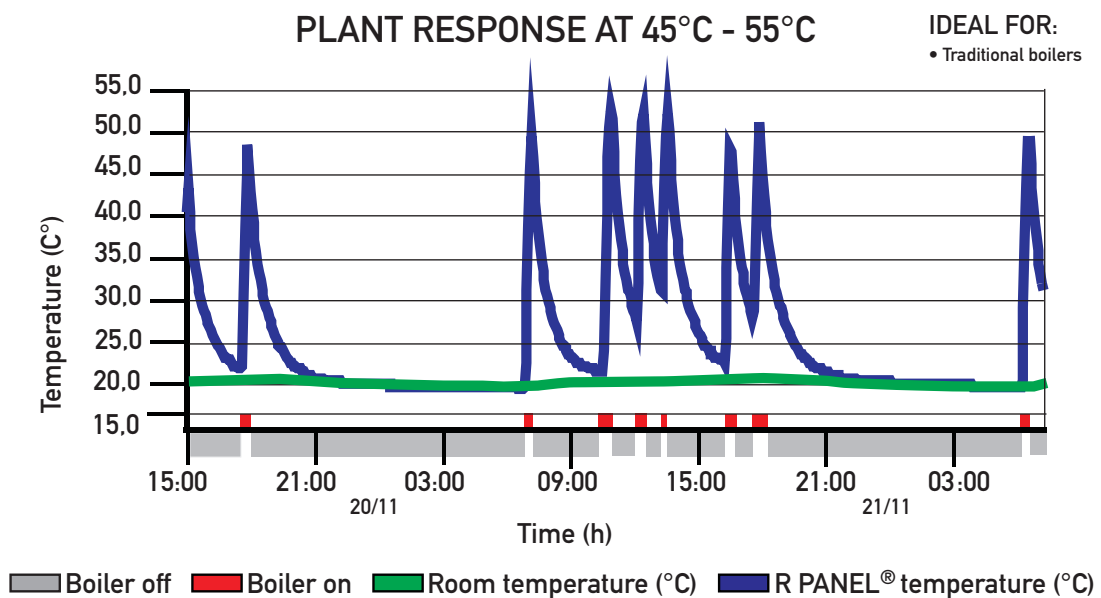
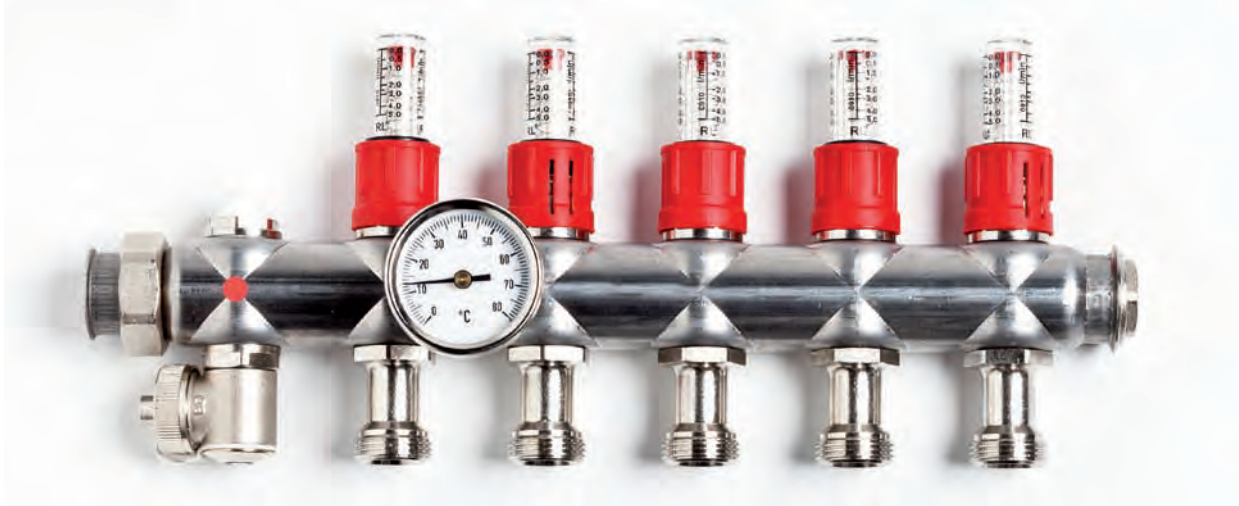


Fig. 2

WHAT DO I HAVE TO PAY ATTENTION TO IN PREPARING THE PLUMBING?

WATER FLOW REGULATION.

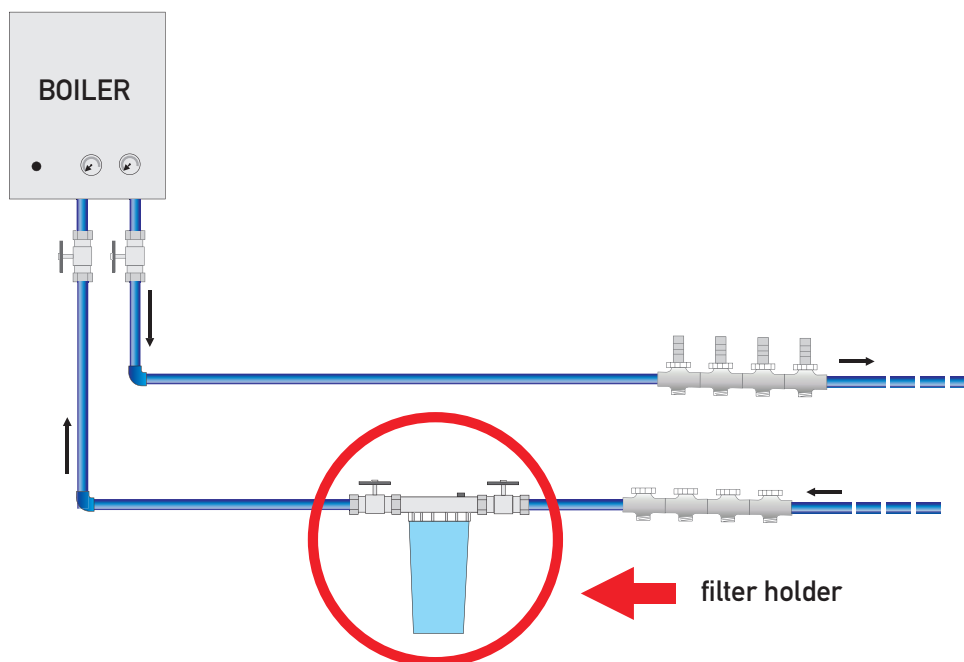
In the Standard Installation of R Panels, shut off and control valves are not used. For this reason, the plant must be equipped with valves manifold for the regulation and the closure of the flows. It is also strongly recommended the use of flow counters to measure the water flow to each panel..



HYDRAULIC-PLANT LIQUID

For the R Panel® system, it is required to install on the input (return) of the hydraulic plant a filter holder (without cartridge) in order to add to the liquid water of AD34-1. The use of the additive R Panel® AD34-1 is required both to maintain the efficiency of the panels, both to protect the system from possible corrosions, deposits and gas formations.

WARNING! Failure to observe these requirements will result in the termination of the guarantee.



ELECTRIC R PANEL®**THE R PANEL® TECHNOLOGY IN THE ELECTRIC VERSION**

ELECTRIC R PANEL®
Towel warmer
Models from ST2 to ST9

ELECTRIC R PANEL®
Under-window model
vertical from ST2 to ST9



R PANEL® is made of extruded 6060-TS aluminum, is painted with high-quality polyester powders, has a thickness variable from 8 mm to 22,5 mm. It is available in different height: 800 mm, 1600 mm, 2000 mm, 2500 mm e 3000 mm. The width varies, as a function of the model, from 320 mm to 1160 mm.

CLASSIFICATION:

Low-Temperature radiant system CLASS A

ELECTRIC KIT SPECIFICATIONS**ELECTRICAL RATING**

Rated supply: 230VAC - 50 HZ
 Max Wattage: 1000W - 230VAC

PERFORMANCE

Ambient Temperature set: 7°C ÷ 32°C

SAFETY

IP grade: : IP44 IP44
 Insulation class: I, II
 Safety Mark: CE
 Environmental: WEEE, RoHS
 EMC Standard: 89/336/EEC

USED MATERIALS

Plastic box: ABS-V0
 Pilot Lamp: Policharbonate
 Knob/button: ABS-V0
 Power supply cord: PVC

**K.EL1**

Electric Kit with electronic control.

MODELS	SUGGESTED NOMINAL POWER
ST4/800	300W
ST5/800	300W
ST6/800	300W
ST7/800	300W
ST8/800	300W
ST9/800	500W
ST2/1600	300W
ST3/1600	300W
ST4/1600	500W
ST5/1600	500W
ST6/1600	500W
ST7/1600	700W
ST8/1600	700W
ST9/1600	700W
ST2/2000	300W
ST3/2000	300W
ST4/2000	500W
ST5/2000	700W
ST6/2000	700W
ST7/2000	700W
ST8/2000	1000W
ST9/2000	1000W
ST2/2500	300W
ST3/2500	500W
ST4/2500	700W
ST5/2500	700W
ST6/2500	700W
ST7/2500	1000W
ST8/2500	1000W
ST9/2500	1000W
ST3/3000	500W
ST4/3000	700W
ST5/3000	700W
ST6/3000	1000W
ST7/3000	1000W
ST8/3000	1000W
ST9/3000	1000W

ELECTRIC R PANEL® REPROPOSES ALL THE ADVANTAGES OF THE R PANEL® TECHNOLOGY.

It allows the realization of hightech heating plants with costs considerably lower than that needed in the case of hydraulic feeding (no boiler, no hydraulic plant, etc.).

ELECTRIC R PANEL® IS THE IDEAL CHOICE FOR:

- Short-stay houses (e.g. holiday homes), also thanks to the quick thermal response (thermal comfort in 15 min).- In the rooms of your home where you cannot install a radiator linked to the hydraulic plant.
- Houses equipped with photovoltaic panels

Average power required for m2 of the room: 50W

ELECTRIC R PANEL® IS MULTIFUNCTION:

- Electric feeding (no hydraulic plant) *.
- Double feeding: Hydraulic-Electric *.

* in both the cases the panel has to be filled with water and additive R Panel AD-34/1.

It is equipped with a PTC resistor which allows a reduction of the absorbed power up to the 30%. Its electronic control allows the regulation of the temperature in each room. The Boost function assures the maximum power when needed.

ADVANTAGES:

- High flexibility.
- Energy saving
- Maximum Comfort.
- 30% reduction of the absorbed electric power when the panel-temperature is achieved.
- In solar-panel plants it can be used for thermal energy integration.

FUNCTIONS.

Three operation modes: Comfort, Boost, Stand-by.

COMFORT

The electronic control maintains the ambient temperature to the set point decided by the user (through the knob) supplying or not the heating element of the R Panel®.

BOOST

The electronic control supplies the heating element for 2h, at the end of this period the control restarts from the previous operation mode. During that period the load is supplied independently from the ambient temperature, anyway for safety reason the ambient temperature has not to exceed 35°C (95°F); at that temperature the relay open the contacts.

STAND-BY

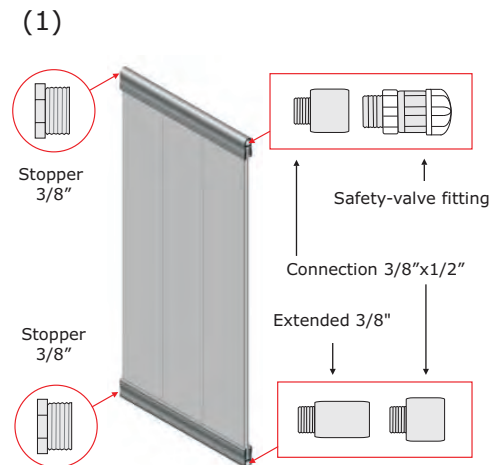
The heating element is not supplied and all the pilot lights are switched off.

- By a single push of the button is possible to move from 'Comfort' to 'Stand by' mode.
- For 'Boost' function is needed by the user a long push of the button (at least 3 sec); in order to abort it's enough a single pressure and the control moves to the previous function mode.
- The back light of the button indicates the condition of the load:
heating element supplied (back light in red); heating element disconnected (back light in blue, it means ambient temperature equal to the set point);
stand-by (back light switched off);
problem occurred on the electronic control (back light flashing in red). In this condition the heating element is disconnected.
- The led flashing in red indicates 'Boost' function running.
- The mechanical switch positioned on the bottom of the plastic cover allows the user to have mechanical disconnection of the units from the supply net (OFF function).

R PANEL® ELECTRIC KIT: INSTRUCTIONS

1

Assemble the fittings of the Electric Kit as shown, taking care to place the connectors 3/8"x1/2" on the side that provides space of maneuver for the safety valve and the electrical resistance.

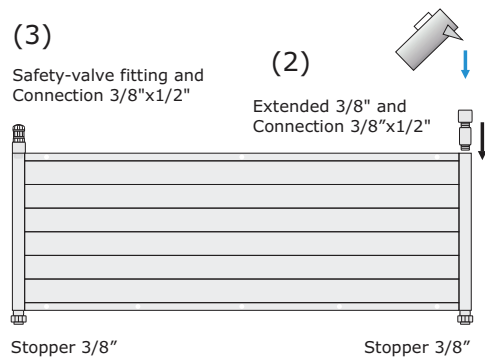


2

Prepare a mixture of water and additive AD-34/1 to the extent of 0.05% (50 ml) per liter of water (the average water content of the R Panel is 2.4 liters per square meter).

3

Place the R Panel® horizontally with the stoppers down and slowly fill it up until it is completely full.



4

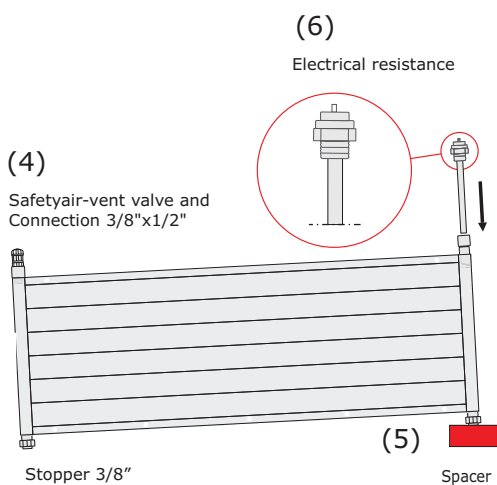
Screw the safety valve on the "top" of the R Panel®.

5

Place a spacer (10 cm) below the panel (as shown) and fill the panel until it is completely full.

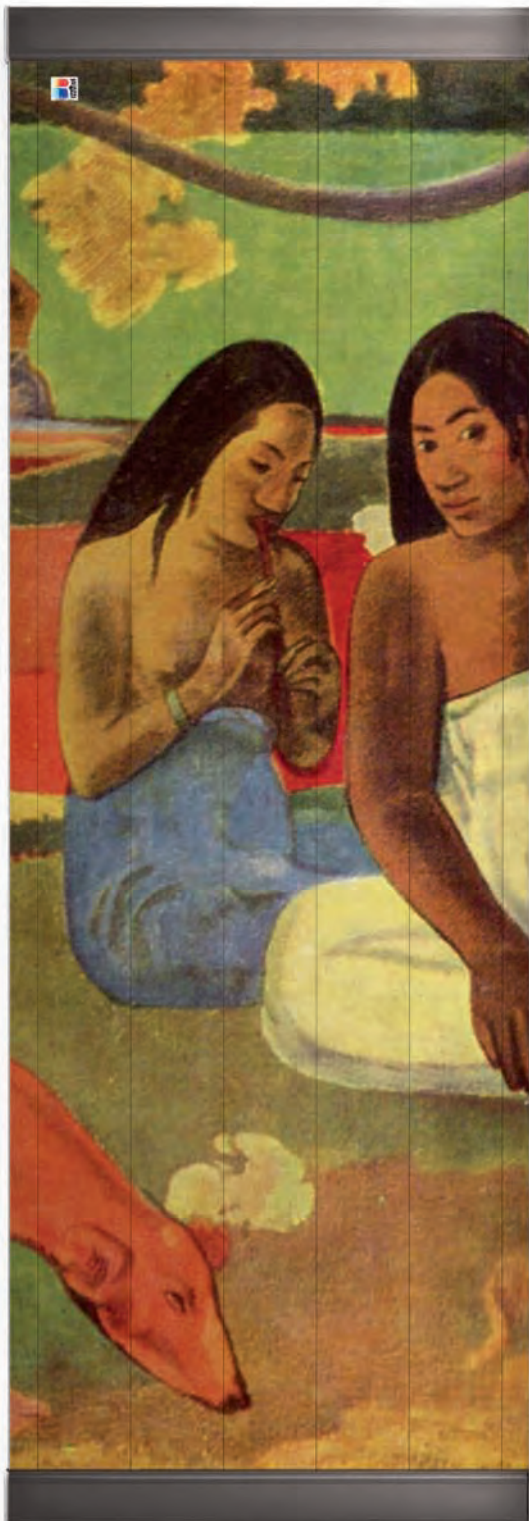
6

Insert slowly the electrical resistance and tighten not excessively.



ART PANEL®

"Do you want to customize your R Panel®? Provide us with a masterpiece picture or your photos!"



ART PANEL®
Towel warmer
Models from
ST2 to ST9



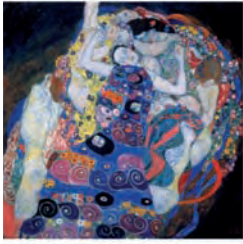
ART PANEL®
Horizontal model



ART PANEL®
Under-window model
vertical from ST2 to ST9



ART PANEL® is a new product of the R Panel® family.
ART PANEL® is a design radiant panel in which the decoration is directly impressed on the panel surface by sublimation, ensuring maximum quality and aesthetic perfection.
ART PANEL® ensures the maximum thermal efficiency and a wide freedom to customize your room.



ART PANEL® is a new way to personalize your space. We can reproduce your image or photograph on the surface of our radiant panels, helping to make your rooms more elegant and refined.

THE COOLING

Have you ever experienced the feeling of well being that we live in a cellar on a hot summer day?

Have you ever thought about the nuisance caused by air systems? (colds, cervical aches, etc.).

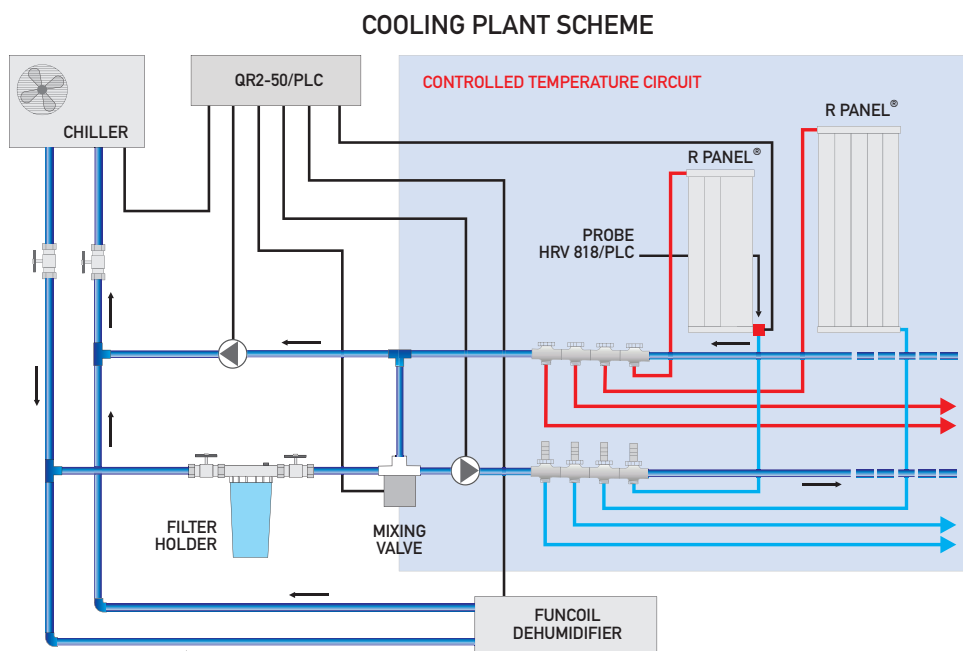
The R Panel® cooling system incorporates all the advantages of irradiation, i.e. the maximum thermal comfort and energy savings, allowing to achieve temperatures typical of the air systems. It overcomes the limitations of radiant systems embedded into the structures through an anticondensation control and the technical features of the panel.

HOW DOSE THE R PANEL® COOLING WORKS?

The radiant cooling R Panel® is an innovative, high technology, the result of important scientific research in the radiant cooling.

The hydraulic plant is composed of two circuits: a primary at low temperature and a secondary at controlled temperature. The primary circuit consists of the chiller (or geothermal heat pump), which feeds at a temperature of about 8°C to 10°C the mixing valve and the funcoil that acts as a dehumidifier. One funcoil, housed in a corridor, generally allows to control the humidity of the whole house. Its use, in place of a common dehumidifier, may be particularly beneficial because it allows both both the dehumidification and an energy integration when required.

The secondary circuit is under the control of anti-condensation unit that processes the information received from the probe HRV 818 and control a mixing valve that modulates the temperature of the plant.



IN WHAT R PANEL® OVERCOMENS OTHER RADIANT SYSTEMS?

The technical problems of radiant cooling systems embedded in the structures (radiant floor, walls and ceilings) are connected with the formation of dew. This forms on the surfaces of the terminals when you reach the condensation threshold, resulting in moisture, mold and a lower efficiency.

At the state of the art, the problems of condensation can be managed with the help of controllers, which maintain the water temperature above the threshold value. However, for the radiant systems embedded in the structures, it remains difficult to control the formation of dew in the substrates where coils are housed, because there may have very different humidity values. Form this, the need to operate well above the thermal threshold of condensation. Another limitation is related to the thermal losses which take place in the layers that separate the coil from the surface of the floor.

The R Panel cooling system overcome all these limitations, ensuring excellent performance in terms of efficiency, speed of thermal response, healthiness and comfort.

R PANEL® COOLING ADVANTAGES.

- terminals not embedded in the building structure
- irradiation temperatures 5°C-7°C lower with respect to wall and floor systems
- very fast thermal response
- innovative anti-condensation control
- Air humidity control
- energy contribution from the dehumidification system
- anti-condensation alarm

R PANEL® SPECIFIC ACCESSORIES

ARTICLE

CODE

DESCRIPTION



R PANEL®
ANTICONDENSATION
CONTROL

QR2-50/PLC

The R2-50 PLC units are multi-zone climate controls designed to prevent condensation in the R Panel cooling systems (also in combination with radiant floor heating systems). The PLC series is equipped with a computerized system capable of ensuring the full well-being and of optimizing the performance of radiant systems.



R PANEL®
ANTICONDENSATION
PROBE

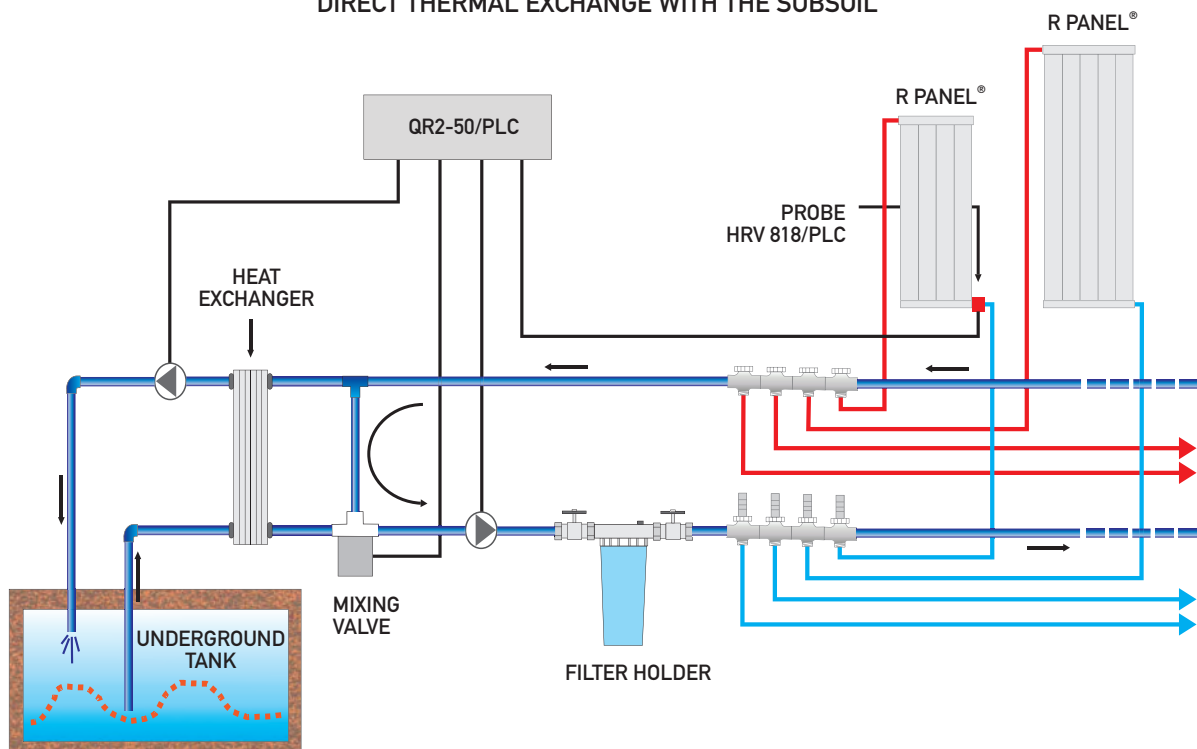
HRV 818/PLC

The probe HRV818 is a R Panel technological innovation. It allows a fast and accurate measure of the relative humidity, by analyzing the vapor pressure, the air temperature and the absolute humidity (parameters defining the dew point).

COOLING WITH DIRECT THERMAL EXCHANGE WITH THE SUBSOIL.

R Panel® was originally designed for cooling with direct thermal exchange with the subsoil using only the water from a tank or a well (BGVM Patent n° IT00241998 & n°IT0288535). R Panel® is therefore unique in the international technology landscape to be able to operate without the use of heat engines, using only alternative energy. It operates at thermal regimes between 17°C and 22°C; in its use is not generally required to use dehumidifiers. The plant results energy-independent (except for the servo-assistance) and is able to maintain throughout the summer ambient temperatures between 25.5° C and 26.5°C.

DIRECT THERMAL EXCHANGE WITH THE SUBSOIL



ENERGETIC ANALYSIS OF THE R PANEL® COOLING

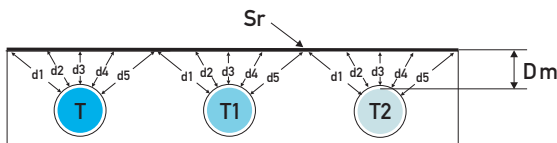
This section wants to give information on the cooling efficiency of the R Panel® system, by making a comparison with the radiant panels embedded in the structures.

For sake of synthesis, analytical proofs and graphs refer exclusively to the heat transferred by irradiation. In this sense, there are not taken into account neither the heat transfer by convection nor by conduction to the building structures.

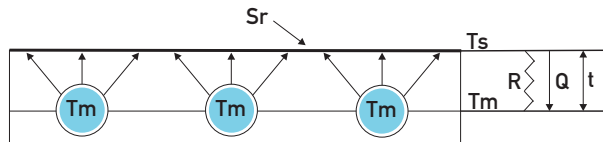
Subjects:

- Energy losses in transmitting heat from the thermovector fluid to the radiant surface.
- Graphs of comparison between the different energy systems.
- Terminal-man heat transfer.

ENERGY LOSSES IN TRANSMITTING HEAT FROM THE THERMOVECTOR FLUID TO THE RADIANT SURFACE.

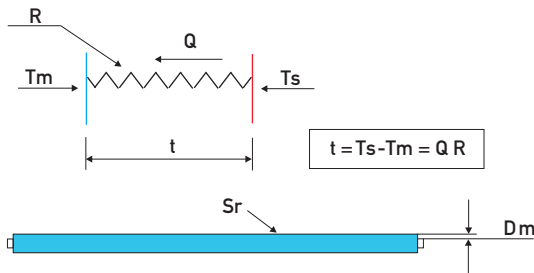


For radiant systems embedded in the structures, the ΔT between the input and the return is very high. This gives an average supply temperature (T_m) 3-5 °C higher than the input one.



The average thickness of the layer (D_m) that is interposed between the tubes and the radiating surface (S_r) is the arithmetic mean of the distances d_1, d_2, \dots, d_n .

- For wall or ceiling radiant systems $D_m = 25$ mm.
- For radiant floor systems $D_m = 50$ mm.
- The higher D_m the lower is the efficiency of the system.



The heat transfer from the surface T_s to the thermovector fluid determines a temperature gradient (ΔT) in the layer D_m .

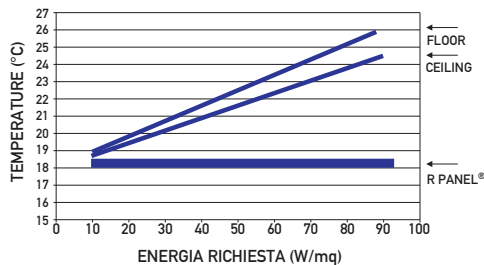
The temperature difference between T_s and T_m is proportional to the thermal resistance R of the layer and to the heat Q heat passing through it.

For R Panel®, the average layer D_m is about 1.5 mm.

For the R Panel® systems, the ΔT between the input and the output is low, thanks to low thermal losses. This gives an average feeding temperature, T_m , 1-2 °C greater than the input one.

ENERGY COMPARISON GRAPHS.

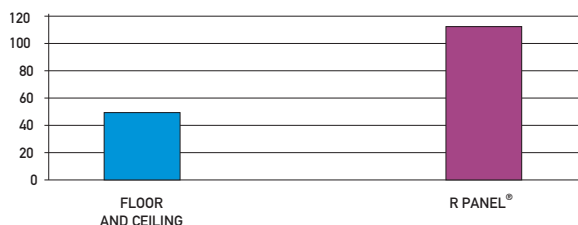
Despite the extent of the surfaces and in spite of static calculations, the high thermal resistance of the materials interposed between the thermovector and the radiant surface, greatly reduce both the response to thermal transitions and the heat transfer capability of the embedded radiant systems.



TEMPERATURE ASSUMED BY THE RADIANT SURFACE AS A FUNCTION OF ENERGY REQUIRED BY THE ENVIRONMENT.

On increasing the thermal loads, the surface temperature of the radiant floor or ceiling system undergoes a significant increase. In contrast, the temperature of the R PANEL® remains constant, ensuring the maximum efficiency.

TERMINAL/MAN HEAT TRANSFER HEAT DISPERSED FROM HUMAN SKIN TO TERMINALS.



The heat exchange between the man and the terminal is radiant higher for the R PANEL® in comparison with the radiant floor or ceiling. This leads to a higher level of thermal comfort for who lives in the room.

INSTALLATION GUIDE.

Different options of installation are possible for the R Panels®:

1. Standard Installation (*hidden fittings*) – with compression fitting – with quick-connect fittings
2. Installation with shut-off and control valves.
3. Horizontal installation.

It's left to the user the option that best meets its needs.

STANDARD INSTALLATION.

Installation of the hydraulic fittings to the panel.

Screw the elbow fittings 12 × 3/8", the air vent valve and the stopper, as shown.

Note: the choice of input and output sides has to be done considering the place that allows the best accessibility to the air vent valve. The Input and output connectors must be installed "crossed".

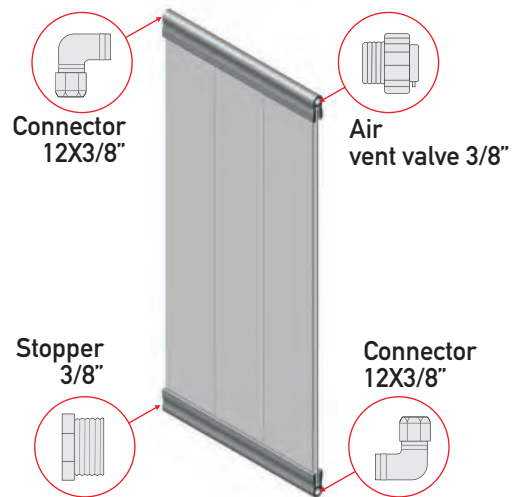


Fig. a

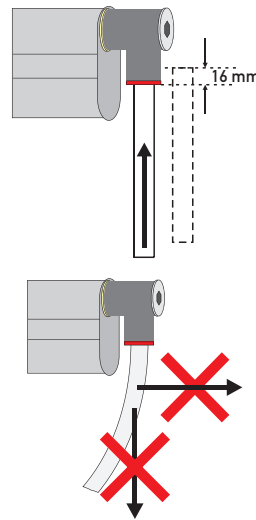
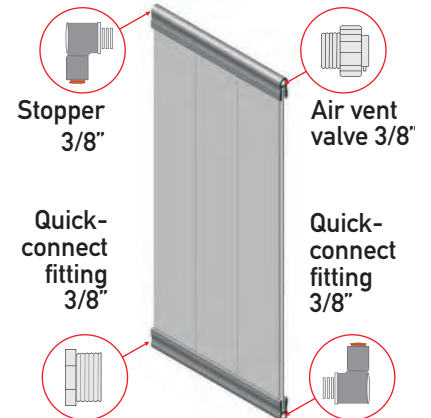


Fig. b



Option:
articulated quick-connect fittings.

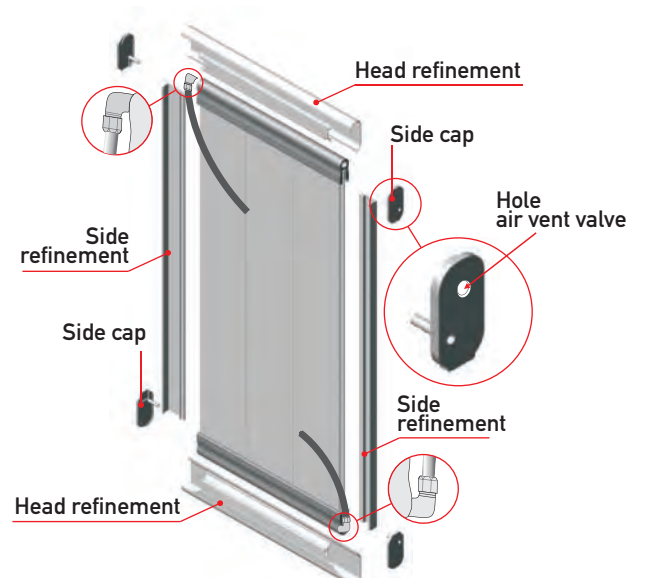
Be sure that the tube is fully inserted for about 16 mm (Fig. a).

In order to don't break the o-ring seal, it is important to reduce tractions between the fitting and the hose (Fig. b).

Assembly of the R Panel®

In order to facilitate the assembly and the installation procedures, it is advisable to assemble the R Panel® on a shelf. Only after you have connected the PB tubes, proceed with the installation. Make a hole in the plastic side cap relative to the air vent valve, in order to perform air-vent operations with a screwdriver.

Rear view of the panel assembled with the tubes for connection

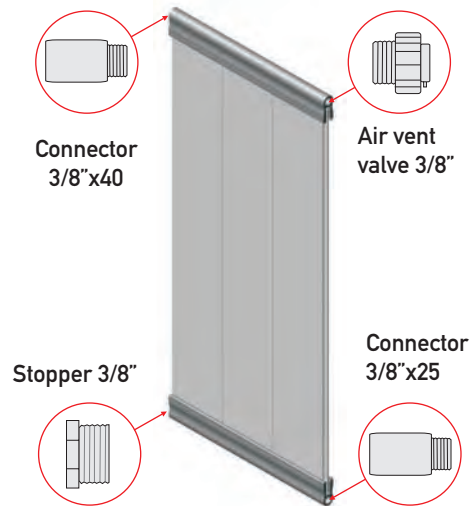


INSTALLATION WITH SHUT-OFF AND CONTROL VALVES.

Installation of the hydraulic fitting to the panel.

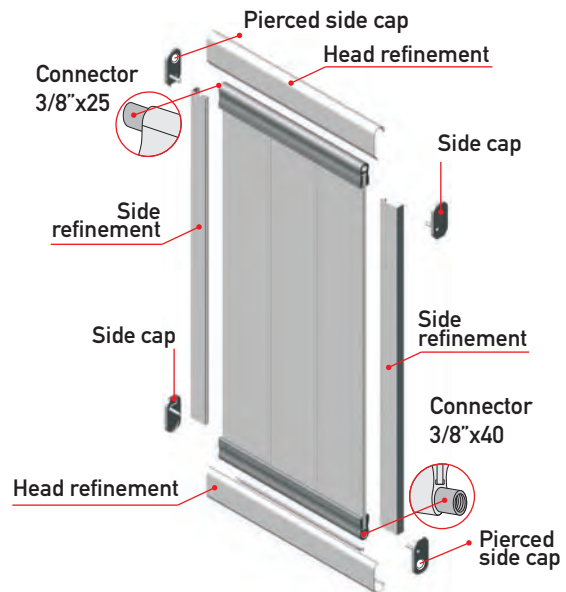
Screw the extension connectors $3/8" \times 40$, the air vent valve and the stopper as shown.

Note: the choice of input and output sides has to be done considering the place that allows the best accessibility to the air vent valve. The Input and output connectors must be installed "crossed".



Assembly of the R Panel.®

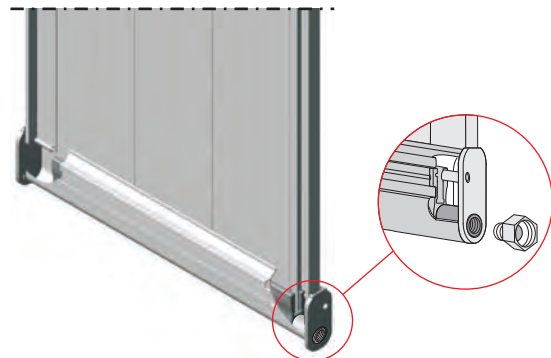
Assemble the R Panel® as shown in the figure



Installation of the control and shut-off valves.

After having assembled the panel, install the control and shut off valves.

For the installation on the wall, please refer to the section dedicated to the installation.

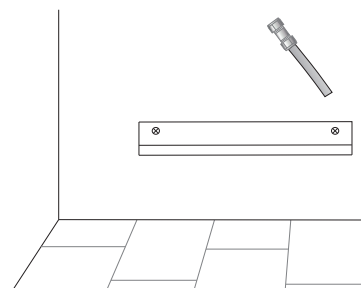


STANDARD INSTALLATION

Installation of the hangers.

1

Fix the lower hanger with the screw anchors.



Installation of the upper hanger.

2

Insert the two head refinements on the R Panel®.

3

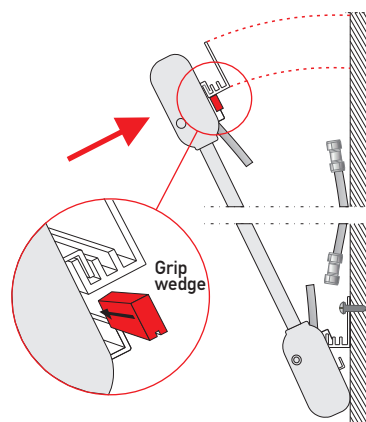
Use the grip wedge to fix the upper head refinement to the upper hanger.

4

Place the panel on the bottom hanger, previously attached on the wall, and push it against the wall to mark the position of the upper hanger on the wall.

5

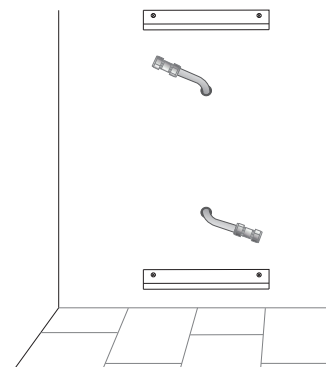
Remove the R Panel® and fix the upper hanger to the wall, taking care to position it 2 mm below the mark, in order to make the panel weight only on the lower hanger.



Application of the radiant shield.

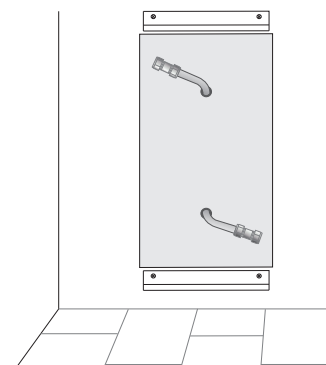
6

After having fixed the two hangers, put the radiant shield on the wall and perform two incisions to bring up the pipes.



7

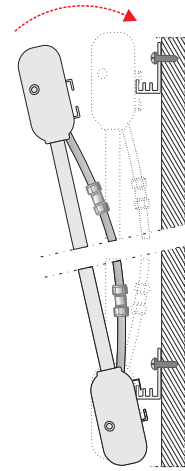
Remove the protective film and stick the radiant shield on the wall, as shown in the figure.



Hydraulic fitting connection.

8

Replace the panel on the bottom hanger and fasten the hydraulic connections.



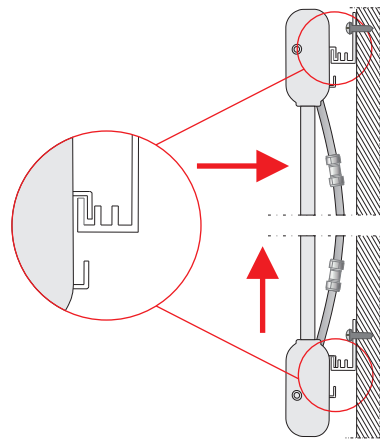
Application of the R Panel to the hangers.

9

Push the panel towards the wall and hang it on the hangers.

10

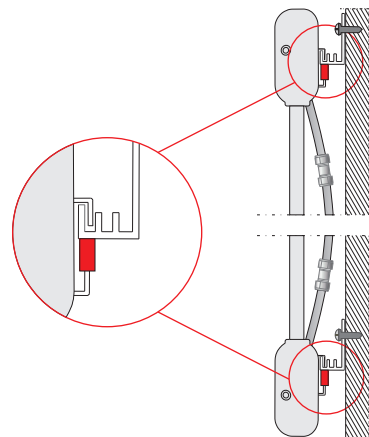
Verify that the procedure was successful in both the upper and lower parts.



11

Fix the panel to the two hangers from both the sides, using the 4 wedges.

N.B. On request it is possible to require a screw fixing.



HORIZONTAL INSTALLATION. Installation of the hangers.

For the horizontal installation it is requested that the air vent valve is positioned at the highest point of the panel. For this reason, two spacers are supplied (No. 1 is 5 mm higher than No. 2).

1
Place the spacers 1 and 2 on the floor, having care to position No. 1 from the side of the air vent valve.

2
Place the panel on the spacers; successively draw on the wall the points for the drilling, using the holes already on the R Panel.®.

3
Remove the panel and drill the wall, using an 8mm drill bit.

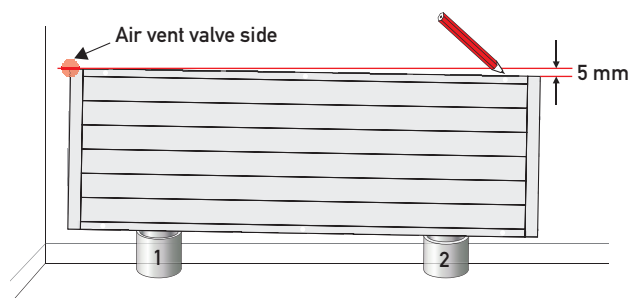
4
Apply the aluminum foil, placing it on the wall starting from the lowest holes.

5
Replace the panel on the spacers and fasten plumbing.

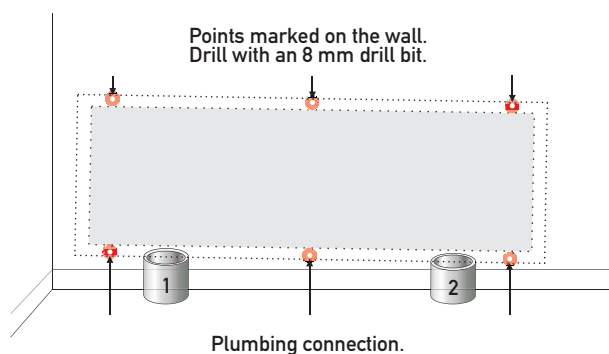
6
Fix the R Panel using the fixing kit (see figure).

7
Remove the spacers.

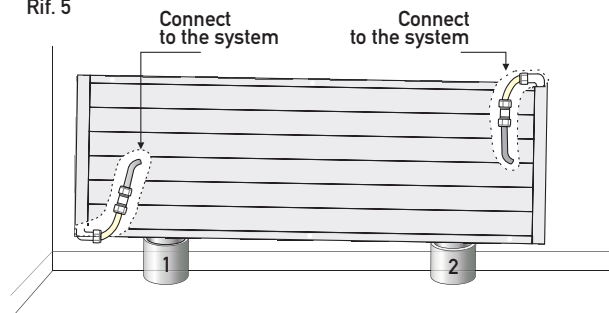
Rif. 1-2



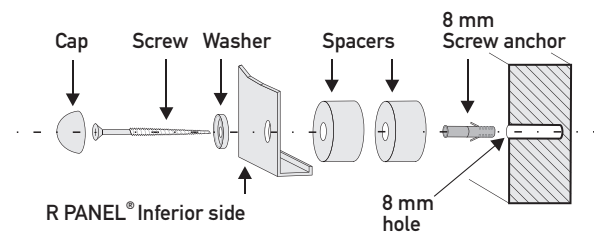
Rif. 3-4



Rif. 5



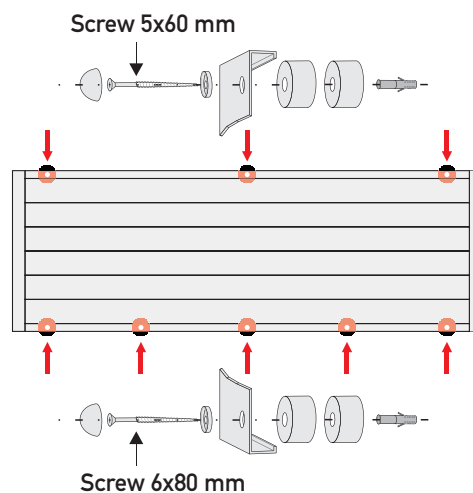
Rif. 6



The kit for the horizontal installation of the R Panel® contains two types of accessories; one with a screw 6x80 mm, the other with a screw 5x60 mm.

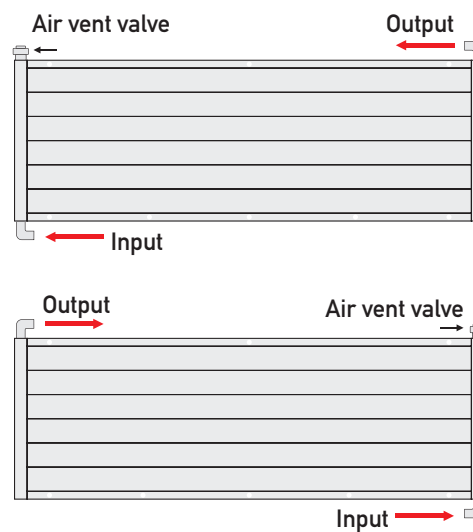
The accessories with 5mm screws are used for the upper edge of the R Panel®.

The accessories with 6 mm screws must be used only to fix the lower edge of the R Panel®.



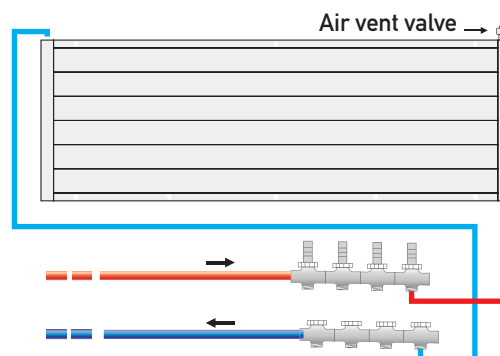
HYDRAULIC CONNECTION.

In the horizontal version, the R Panels® are fed from below, both for heating and for cooling.



LOADING AND AIR VENTING.

- 1
Open the air vent valve.
- 2
Open only the input taking closed the output until the complete air vent.
- 3
Open the output tap.

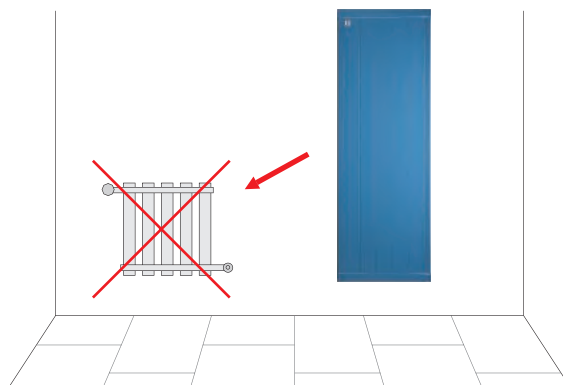


INSTALLATION OF THE R PANELS® REPLACING THE RADIATORS.

1

In the case of a preexisting plant, it is possible to replace the radiators with the R Panels®. In this way, a traditional convection system is converted into a radiant one. This implies many advantages related to livability, comfort and energy saving. Furthermore, the system can also be used for cooling, with the addition of a chiller and of the specific R Panel® accessories.

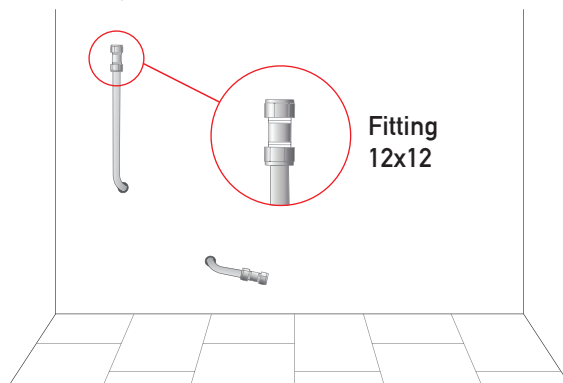
Rif. 1



2

After having removed the radiator, prepare the hydraulic connections with copper tubes of 12mm diameter (or others that provide the same hydraulic flow).

Rif. 2-3



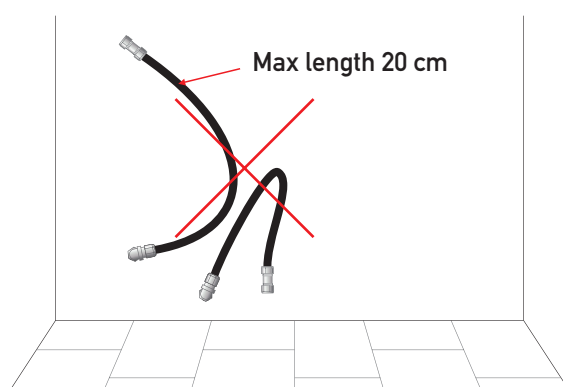
3

Install the 2 connectors 12x12 on the tube ends.

4

It is recommended to limit the use of the PB tube of 12 mm diameter only at the panel connection. Normally it should not exceed 20 cm, in order to limit the pressure drop.

Rif. 4



5

Link the panel to the hydraulic circuit and fix it to the wall following the instructions.

Rif. 5

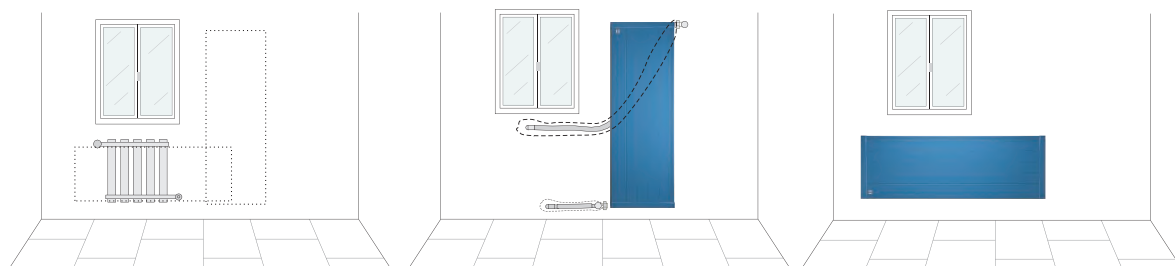


Warning:

In case of R Panel® installation in place of radiators, it is very important to clean the hydraulic system and to remove any deposits of debris and mud.

UNDERWINDOW INSTALLATION.

If the available area above the window is not sufficient, one can install the R Panel on a side, vertically or horizontally.



1
Do not activate the system before having completed the air vent operations.

2
Close the valve which correspond to the higher collector of the panel and load from the lower collector.

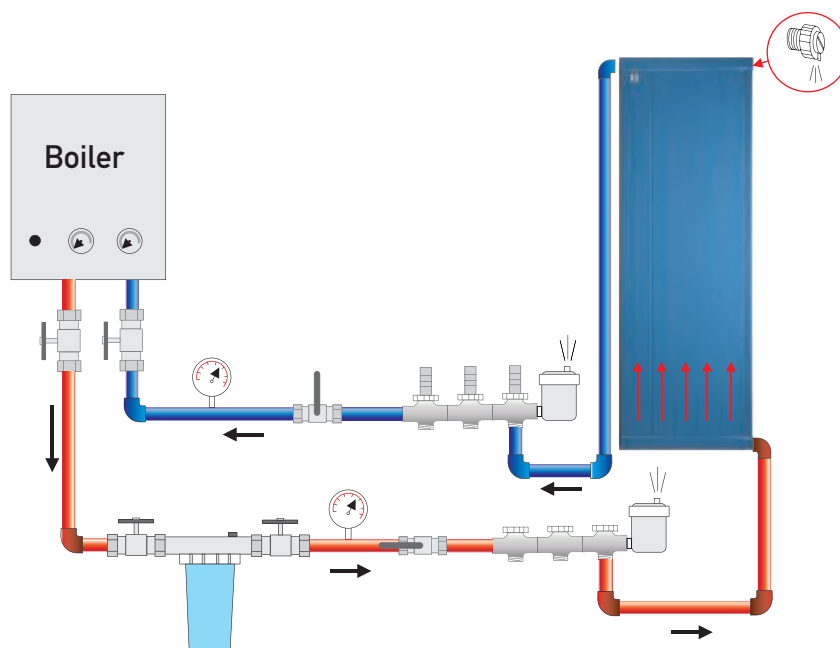
3
Vent the hydraulic system (we recommend to equip the collectors with automatic air vent valves).

4
When the plant is fully operating, measure the ΔT between the input and the output of the energy source. A hydraulic system, with a good thermal insulation and appropriate flows, should have a ΔT lower than 5°C .

5
Dilute the additive liquid with water and enter it in the hydraulic circuit using the filter "F".

6
Keep the system on, for at least three consecutive hours.

FIRST START OF THE PLANT. Loading the plant.





BGVM S.r.l.

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