

TECHNICAL CATALOGUE

PANEL RADIATORS

PURMO 05/2017



Conditions for application of panel radiators



The PURMO radiators are intended for applications in forced circulation heating systems with black steel, copper or plastic piping with diffusion barrier where water is used as heating medium. They can be used in both single and double-pipe systems. These radiators can also be installed in gravity fed systems, but with restrictions due to their hydraulic resistance.

The PURMO radiators are used for heating of residential, office, commercial and other spaces where the atmosphere is free from adverse influence of corrosive substances and particularly where there is no permanent or periodic moistness of radiator surfaces. These radiators must not be used in spaces where such adverse influence takes place, e.g. in bathrooms, laundry rooms, baths, swimming pool halls, car washes, refrigeration plants and food processing plants. For the same reason the PURMO radiators must not be installed in houses which will not be heated during the first year after their construction or modernization.

The PURMO radiators should be installed in tight, sealed heating systems protected with diaphragm expansion tanks. They may also be installed in small open-vent systems of heating power up to 25 kW, provided approved corrosion inhibitors are used as well.

Systems with the PURMO radiators installed must be filled and replenished with water of appropriate quality. Main water quality indicators may not exceed the following values:

- summarized content of chloride and sulphide ions may not exceed 150 mg/l (in the case of copper piping systems it may not exceed 50 mg/l),
- oxygen content may not exceed 0.1 mg/l,
- pH value should fall within the range of 7.0 ÷ 10.0,
- general hardness may not exceed 4.0 mval/l.

Except for emergency situations, it is unacceptable to drain water from the central heating system. In case of necessity of draining water e.g. due to a repair, only parts of system, where it is necessary, should be drained. The drained parts should be re-filled with water immediately after the completion of repair works. Yearly loss of water in the central heating system should not exceed 5% and 10% of the total water volume, respectively, for closed and open-vent systems.

Using these radiators in systems where the maximal working pressure may exceed 10 bar or the maximal working temperature may exceed 110°C is forbidden. The leakproof test pressure may not exceed 12 bar.

Heating systems with the PURMO radiators installed can be powered with boilers or heat exchange centres. The radiators must not be installed in central heating systems directly connected to a high-temperature heating network e.g. through a hydroelevator or a pump mixing heat distribution centre.

The radiators must be installed with their individual factory packaging even if the central heating system is in operation for building heating during finishing works or for building drying. It is recommended for the packaging to be removed by a user of the space after the completion of all finishing works. The PURMO radiators must be stored indoors only, in closed and dry spaces. It is not allowed to store the radiators outdoors or in moist spaces. The radiators must be transported with due care in dry and closed cargo spaces and handled only in vertical position.

It is not allowed to use cleaning agents containing solvents, acids or other corrosive substances for cleaning the surfaces of the radiator.

production

The PURMO panel radiators are made in accordance with PN-EN 10130 and PN-EN 10131 of the DC01 cold rolled steel delivered in form of coiled strips. Heating panels are produced from sheets of thickness in accordance with PN-EN 442. Forming of heating panels with vertical water channels spaced at 33.3 mm (in the Vertical model – 50 mm) is performed on fully automated, computer controlled production lines where one process line (interconnected with roller conveyors) delivers products ready for painting and packing. The processes of coating and packing are automated as well.

The Plan Compact, Plan Ventil Compact, Plan Ventil Compact M, Plan Hygiene and Plan Ventil Hygiene models of panel radiators are equipped with an additional, decorative front panel glued to the front heating panel. The Plan Ventil Compact D model of height 200 mm also has an additional, decorative panel glued to the rear heating panel.

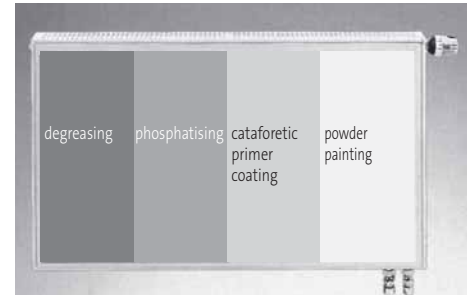
The Ramo Compact, Ramo Ventil Compact, Ramo Ventil Compact M model of panel radiators are equipped with an additional flat front panel, but with subtle horizontal ribbing, also glued to the front heating panel. The Ramo Ventil Compact D model of height 200 mm has similar decorative panel glued to the rear heating panel.

painting

After passing through the first stages of process line, the raw radiators are subjected to further processing providing a surface ready for varnishing. This processing consists of:

- preparing the surface (washing, degreasing, iron phosphatising, flushing) in a pass through a washer with a special chemical showering system,
- priming with the use of the second generation cataforetic KTL II method by complete submerging of the radiators in a white priming paint ensuring an excellent corrosion protection,
- after-priming drying in a dripping chamber and a gas tunnel dryer,
- powder painting with an epoxy paint by electrostatic coating in a painting chamber, with the use of special painting tools,
- polymerization (curing) of the powder paint coat during a pass through a gas furnace in a temperature of ~190°C.

As a standard, all the panel radiators with a profiled or flat front panel are finished in white RAL 9016 colour. Other colours in accordance with the RAL colour chart are available at an additional charge.



Radiator surface preparation



The RAL colour palette radiators

	Compact	Ventil Compact	Ventil Compact M	Hygiene	Ventil Hygiene	Plan Compact	Plan Ventil Compact	Plan Ventil Compact M	Plan Hygiene	Plan Ventil Hygiene	Ramo Compact	Ramo Ventil Compact	Ramo Ventil Compact M	Vertical
profiled front panel	x	x	x	x	x	-	-	-	-	-	-	-	-	x
flat front panel	-	-	-	-	-	x	x	x	x	x	x	x	x	-
max. working pressure [bar]	10	10	10	10	10	10	10	10	10	10	10	10	10	6
no. of connectors – side + bottom	4	4+2	4+2	4	4+2	4	4+2	4+2	4	4+2	4	4+2	4+2	0+4
side connection – GW ½ "	x	x	x	x	x	x	x	x	x	x	x	x	x	-
bottom connection – GW ½ "	-	x	-	-	x	-	x	-	-	x	-	x	-	x
mid-bottom connection – GW ½ "	-	-	x	-	-	-	-	x	-	-	-	-	x	x
brackets bundled with the radiator	x	x	x	x ¹⁾	x ¹⁾	x	x	x	x ¹⁾	x ¹⁾	x	x	x	x
side covers	x	x	x	-	-	x	x	x	-	-	x	x	x	x
top grille	x	x	x	-	-	x	x	x	-	-	x	x	x	-
built-in thermostatic valve	-	x	x	-	x	-	x	x	-	x	-	x	x	-

Note:

¹⁾ The Hygiene, Ventil Hygiene, Plan Hygiene and Plan Ventil Hygiene radiators are not bundled with mounting brackets. The special Monclac MCK type hospital mountings must be ordered separately. For more information see pages 30, 36, 60, 66.

thermal output of the radiators

Thermal output of the radiators was determined in accordance with PN-EN 442-2 based on laboratory measurements. The temperatures of 75/65/20 °C were accepted as reference values.

Thermal output of the radiators for other values can be calculated with the following formula:

$$\phi = \phi_n \left[\frac{\Delta t}{\Delta t_n} \right]^n$$

where:

ϕ - thermal output of the radiator [W]

ϕ_n - thermal output of the radiator determined based on measurements in accordance with PN-EN 442-2 [W]

Δt - logarithmic difference of temperatures [K]

Δt_n - logarithmic difference of temperatures 49.833 [K] calculated for reference temperatures 75/65/20 °C

n - exponent characteristic for a given type of radiator

The logarithmic difference of temperatures is calculated according to the following formula:

$$\Delta t = \frac{t_z - t_p}{\ln \left(\frac{t_z - t_i}{t_p - t_i} \right)}$$

where:

t_z - supply water temperature [°C]

t_p - return water temperature [°C]

t_i - room temperature [°C]

All the PURMO radiators have a declaration of conformity with PN-EN 442-2. Every radiator is factory marked at the bottom of a panel with the following data: the name of manufacturer, country of origin, type, PN-EN 442-2 conformity register number, maximal working pressure and date and time of production.

These are some examples of conformity register numbers printed inside the individual radiators types:

type 10 = 0810, type 11 = 0811, type 21s = 0812, type 22 = 0813, type 33 = 0814



VENTIL COMPACT (PURMO CV)

The versatile PURMO Ventil Compact panel radiators with profiled heating panels and convection fins are equipped with side covers and a top grille. Two bottom and four side G ½ " threaded female connectors allow for bottom or side connection. The radiator is also equipped with a built-in thermostatic Oventrop valve insert providing pre-setting.

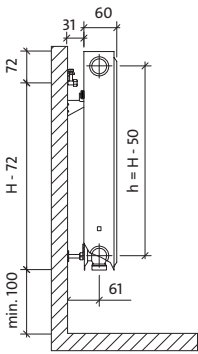
technical specifications

- Material : high quality, deep-drawing, low-carbon, cold rolled DC01 steel sheet in accordance with PN-EN 10130.
- Spacing of vertical water channels : 33.3 mm
- Connections : 2 x G ½ " bottom, right side connectors (left side - available on request)
4 x G ½ " side connectors
- Working pressure : 10 bar
- Maximal temperature : 110 °C
- Test pressure : 13 bar
- Colour : RAL 9016 white, other colours from the RAL colour chart are available on request.
- Accessories bundled with the radiator: brackets, plug, air vent.

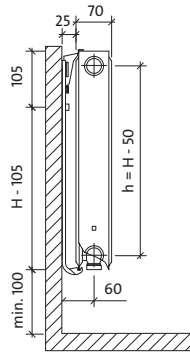


side views

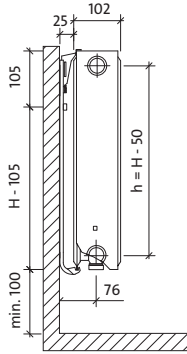
type CV 11



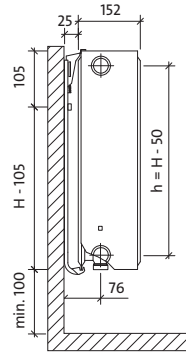
type CV 21 s



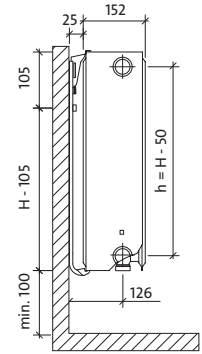
type CV 22



type CV 33



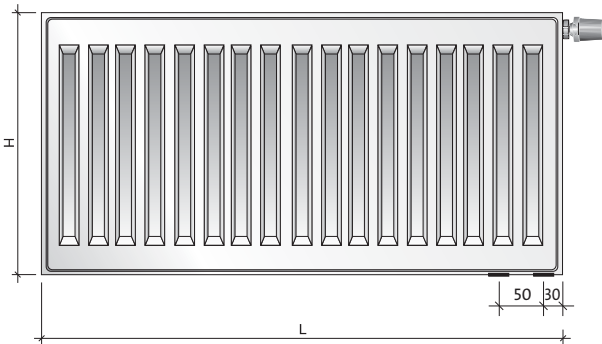
type CV 33
(after conversion
to the left side)



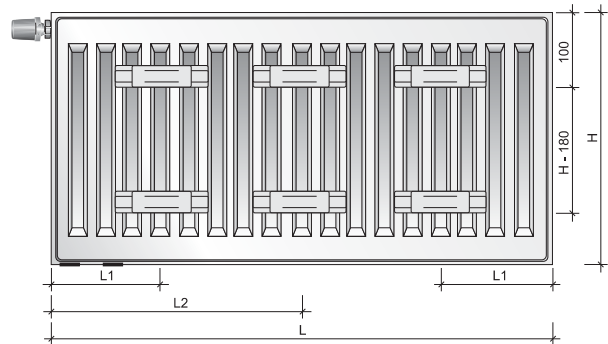
dimensions in mm

H = height
 L = length
 h = spacing of connectors

front view



rear view - CV 11 type only



water volume, weight and mounting distances

water volume : l/m

height type	300	400	450	500	600	900
11	1.7	2.2	2.5	2.7	3.2	4.5
21s	3.4	4.5	5.0	5.5	6.6	9.0
22	3.4	4.5	5.0	5.5	6.6	9.0
33	5.1	6.7	7.5	8.2	9.8	13.3

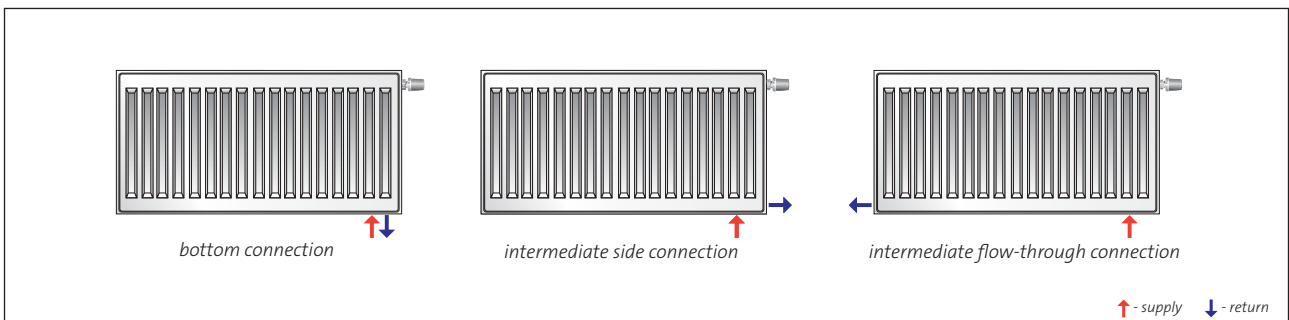
weight : kg/m

height type	300	400	450	500	600	900
11	9.1	12.3	13.9	15.5	18.7	28.3
21s	14.0	18.8	21.2	23.5	28.3	42.3
22	16.3	22.0	24.9	27.7	33.4	50.7
33	24.5	33.1	37.4	41.6	50.2	75.8

mounting distances : mm

type	CV 11	
	L	L2
400-1600	117	-
1800	117	917
2000	117	1017
2300	117	1150
2600	117	1317
3000	117	1517

recommended connections



↑ - supply ↓ - return



RADIATOR DESCRIPTION - AN EXAMPLE : **PURMO CV 22 600 x 1200**

name _____
type _____
height _____
length _____

length [mm]	parameters $t_z / t_p / t_i$	height					
		300	400	450	500	600	900
400	75/65/20 °C	384	488	539	588	684	955
	55/45/20 °C	195	247	272	296	343	474
500	75/65/20 °C	481	611	674	735	855	1194
	55/45/20 °C	244	309	340	370	428	592
600	75/65/20 °C	577	733	808	882	1025	1433
	55/45/20 °C	293	371	408	444	514	711
700	75/65/20 °C	673	855	943	1029	1196	1672
	55/45/20 °C	342	432	476	518	600	829
800	75/65/20 °C	769	977	1078	1176	1367	1910
	55/45/20 °C	391	494	544	592	685	948
900	75/65/20 °C	865	1099	1212	1323	1538	2149
	55/45/20 °C	440	556	612	666	771	1066
1000	75/65/20 °C	961	1221	1347	1470	1709	2388
	55/45/20 °C	488	618	680	740	857	1185
1100	75/65/20 °C	1057	1343	1482	1617	1880	2627
	55/45/20 °C	537	680	748	814	943	1303
1200	75/65/20 °C	1153	1465	1616	1764	2051	2866
	55/45/20 °C	586	741	816	888	1028	1422
1400	75/65/20 °C	1345	1709	1886	2058	2393	3343
	55/45/20 °C	684	865	952	1037	1200	1659
1600	75/65/20 °C	1538	1954	2155	2352	2734	3821
	55/45/20 °C	781	988	1088	1185	1371	1896
1800	75/65/20 °C	1730	2198	2425	2646	3076	4298
	55/45/20 °C	879	1112	1224	1333	1542	2133
2000	75/65/20 °C	1922	2442	2694	2940	3418	4776
	55/45/20 °C	977	1236	1360	1481	1714	2370
2300	75/65/20 °C	2210	2808	3098	3381	3931	5492
	55/45/20 °C	1123	1421	1564	1703	1971	2725
2600	75/65/20 °C	2499	3175	3502	3822	4443	6209
	55/45/20 °C	1270	1606	1768	1925	2228	3080
3000	75/65/20 °C	2883	3663	4041	4410	5127	7164
	55/45/20 °C	1465	1853	2040	2221	2571	3554

Thermal output of the radiators [W] in accordance with PN-EN 442-2 for parameters 75/65/20 °C and 55/45/20 °C. A surcharge for other colours - see page 113

[W/m] 90/70/20 °C	1211	1540	1701	1857	2163	3033
exponent n	1.3094	1.3180	1.3226	1.3270	1.3358	1.3561

Warranty terms and conditions

1. PURMO panel radiators are marketed and made available pursuant to the Regulation (EU) of the European Parliament and of the European Council No. 305/2011 laying down harmonized conditions for the marketing of construction products.
2. **Rettig Heating Sp. z o.o. (hereinafter referred to as the Guarantor) gives 10 years guarantee (from date of purchase) in the EU area for PURMO panel radiators mounted in water installation of the central heating, yet not longer than 11 years since the production date given on the radiator. 10 years guarantee applies to radiators manufactured since 06.03.2007.**



3. **The guarantee is valid for radiators mounted in the water installations of the central heating:**
 - in closed system with an expansion tank;
 - powered from the heat centre, boiler house or heat pump;
 - made from black steel / copper or plastic pipes with an antidiffusion barrier;
 - equipped with local air vents (no central vent system is allowed);
 - used for heating residential areas, office buildings, service stations or other buildings that are neither exposed on pernicious corrosive substance activity nor permanent or temporary moistness of the radiator surface.

Installation of Purmo panel radiators in small open system installations (up to 25 kW) is allowed provided the corrosion inhibitors are used.

During the warranty period the radiators and their components with the faults originated from the manufacturer and reported not later than one month after having been discovered will be repaired or exchanged into new, free of defects devices.

4. The guarantee is recognized when:
 - **there is an evidence of purchase, that is the invoice,**
 - **the radiators have been mounted in water central heating systems in compliance with the national technical regulations and standards,**
 - **adhering to the requirements of the Guarantor included in „ Terms and conditions of Purmo panel radiators usage”.**
5. Maximal operating pressure in central heating installation for PURMO panel radiators may not exceed 10 bars (6 bars for Vertical radiators) and the maximal service temperature is 110 °C.

In high and high-rise buildings a zone distribution system must be applied. The tightness test must be carried out at the experimental pressure equal to working pressure in the installation, adding two bars, yet not lower than four bars. Maximal pressure during the installation tightness test shall be equal to 13 bars (8 bars for Vertical radiators).

6. **The guarantee does not cover radiators mounted:**
 - in central heating installation connected to a high temperature heat distribution network through a suction elevator or pump mixing loop;
 - in swimming pool areas, car wash centers, laundries, slaughterhouses, public toilets, bathrooms or other rooms with high activity of corrosive substances in the air, as well as areas where the radiator is exposed on permanent or temporary moistness – **it does not refer to galvanized radiators, with additional anti-corrosive protection and guarantee for 6 years, yet not longer than 7 years since the production date;**
 - in central heating installations connected with the water- supply system without protective fittings, against backflows;
 - in central heating installation with water removed more frequently or for longer periods than advised in exploitation requirements;
 - in steam installations;
 - in central heating installations where the water quality rating level has been higher than advised, that is:
 - the total amount of chloride and sulfate ions may not be higher than 150 mg/l (for installations with copper pipes not higher than 50 mg/l),
 - oxygen content not higher than 0.1 mg/l,
 - pH water reaction within 7.0 ÷ 10.0,
 - total water hardness not higher than 4.0 mval/l.
7. **The guarantee does not cover damages to the radiator or its parts (brackets) that are due to improper handling, storage, transport or misuse.**

It refers, in particular, to radiators:

- stored in the open air before mounting,
- with mechanical damage,

Warranty terms and conditions

- polluted from inside with solid bodies or noxious liquids,
- deformed by excessive experimental pressure or static pressure in the installation,
- deformed due to freezing,
- with mechanical damage due to an overload as a result of sitting on the radiator.

8. The radiators must be mounted with the original packaging. The packaging must be left on the radiator even if the central heating installation is activated for heating in buildings during finishing works or for drainage purposes. It is recommended to remove the packaging after accomplishing all finishing works.

The radiators require periodical cleaning. It is recommended to use only soft and gentle fabrics that can be slightly moistened. For cleaning the radiators it is not advised to use aggressive or corrosive agents (e.g. acidic solvents or agents with chlorine). Panel radiators cannot be used for drying wet or dump objects put on the radiator. Claims for damage of varnished surfaces to improper handling or maintenance will not be granted.

9. It is forbidden to remove the water from the entire installation or its part and to leave it in this condition. It also refers to new installations with the tightness test. If there is a need to remove the water, e.g. due to renovation or maintenance works, the water must be removed only from the given part. After accomplishing all works the installation must immediately be filled with water. Quantity of water used for the filling or filling up process must be monitored, e.g. by a watermeter.
10. The guarantee of our product is granted provided it has not been repaired or modified by a buyer or third party without Guarantor's approval.
11. Occurrence of faults within the warranty period is followed by a claim procedure by notifying the Retailer about the damage in a special claim form including the origin and details of damage. The retailer accepts the claim form and forwards it to the Guarantor via registered letter, fax or e-mail within 24 hours since it has been accepted. In case of incomplete data, the form shall be returned in order to be completed. The invoice or its copy shall be attached with the form. In specific cases the Guarantor may request a photo documentation of the claimed product. The Guarantor is obliged to reply for the complaint in writing within 14 days since a completed form was accepted.
12. In order to recognize the claim a visual inspection is performed by the Guarantor in the mounting area or other area determined by the Guarantor. The original packaging used for delivery must be kept for the inspection in case of a damage with mechanical origin. If the claim has been recognized, the Guarantor is obliged to repair or replace the parts found to be defective due to improper manufacturing or material defects or exchange the radiator into a new device that is free of defects. In specific cases, (e.g. when the product needs to be sent from abroad) the Guarantor has the right to extend the deadline to recognize the claim that is normally defined to be 14 days.
- In case of damages that do not affect the radiator functionality, a discount may also be offered.
- In case of the claim regarding a product, manufacturing of which has been ceased, the Guarantor will offer an equivalent with similar parameters or a money back guarantee at the date of the purchase. The Guarantor does not deliver an alternative device for the time of claim recognition process.
13. The Guarantor has the right to select the method of claim settlement.
- In case the claim is recognized in the form of exchange, all mounting shall be delivered by an authorized Purmo service centre. In case any difficulties occur when mounting the exchanged radiator, e.g. lack of valve for separating the radiator from installation, the service centre may refuse to disassemble or mount the new radiator. As a consequence, the warranty claim is recognized as exercised by the Guarantor.
14. The warranty period shall be extended due to reparation time calculated since the date of delivery to the Guarantor to the reparation date. In case of exchange a new warranty period is granted.
15. The Guarantor reserves the right to make modifications to his products without prior notice unless they refer to any significant technical details affecting the process of selection.
16. The warranty terms on goods sold do not exclude, limit or suspend rights of the buyers when the product fails to comply with the contract.
17. Warranty conditions are valid as stated since 25.12.2014.

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PR_05_2017_EN_PL