

Dear Customer,

Thank you for expressing your trust in this traditional Slovak brand by purchasing the KORAD radiator. This modern product meets all demanding technical standards with its parameters, quality of workmanship and long service life. Thanks to its high qualities, it can successfully succeed in the demanding domestic and foreign markets, as evidenced by the number of certificates and awards. We believe that this product will fully satisfy you as well. For the radiator to serve you flawlessly for a long time, please pay attention to the following operating instructions. KORAD steel panel radiators are designed for installation in water-filled heating systems with a maximum operating temperature of up to 110 °C and a maximum operating pressure of 1 MPa. The warranty period for functional and surface defects is 10 years in compliance with the prescribed conditions of use and operation.

1. Storage and handling

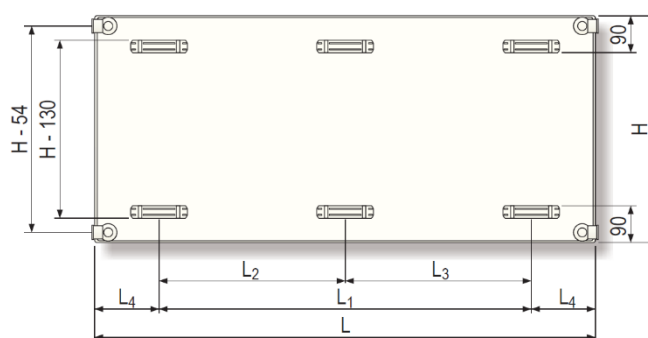
- 1.1. Radiators must be stored packed in their original packaging. They must be protected at the place of storage against the weather, high humidity, and sudden changes in temperature. Storing radiators in an open area is not permitted.
- 1.2. Radiators stored or transported must not be exposed to strong static pressure. Do not store materials and tools on radiators. Radiators can only be stacked if they are packed in the original pallets. A maximum of two pallets of the same dimensions can be stacked on a flat solid floor. Pallets with radiators type 10 and 11 as well as all types of radiators in PLAN design can be stored in only one layer.
- 1.3. During transport to the installation site, the radiators must not be pulled on the floor nor in the packaged state.

2. Position

- 2.1. Radiators are designed for heated areas with low relative humidity (30 to 60%) and negligible pollution, such as living rooms, offices, schools, hotels, shops, museums, etc. [Environment of corrosion category C1 according to EN ISO 12 944-2].
- 2.2. They can also be used in environments with higher relative humidity, but without the occurrence of condensation and air pollution such as e.g., sports facilities, warehouses, and corridors, however adequate and regular ventilation or continuous operation of radiators must be ensured. We recommend using radiators without convectors (types 10, 20 and 30) for this type of environment. [Environment of corrosion category C2 according to EN ISO 12 944-2].
- 2.3. For installation in areas with high humidity, such as bathrooms, toilets or areas with water spray only galvanized radiators are intended.
- 2.4. Radiators cannot be installed in areas where the air contains increased concentrations of salts, solvents, chlorine compounds, etc. The warranty does not cover such use.
- 2.5. The radiator is usually placed on the wall under the window without covering. The distance from the floor must be at least 70 mm. The minimum distance of the windowsill covering the radiator must be at least 140 mm from its upper edge. If these distances are not observed, a decrease in heat output must be considered.

3. Installation

- 3.1. The anchoring points are the hangers (on the back side of the radiator), on which the radiator can be hung on the wall brackets. The choice of suitable brackets depends on the wall material. Drilling brackets can be used for walls made of solid materials. However, these brackets are not suitable for use in hollow brick, aerated concrete and plasterboard walls! Brackets with special anchors can be used for these types of walls. If the radiators cannot be mounted on the wall, the installation will be performed using stand brackets that are anchored to the floor.
- 3.2. Radiators are usually mounted so that they form an angle of 90 ° with the floor. In justified cases, it is possible to install radiators with an inclination of up to 45 ° without affecting their heat output [e.g., in the attic]. Other, special installation methods must be consulted with the manufacturer.
- 3.3. We recommend installing the radiators in a packaged state, which will ensure maximum protection of the radiators until the completion of all construction work. The radiators can be operated in a packaged state for the needs of building tempering.
- 3.4. Before mounting, cut the protective foil in the place of the protective corners. The plastic protective corners are designed so that they can be flipped open at the radiator connection point. First remove the plastic blanking plugs. Never use plastic plugs when operating the radiator! They are intended only for protection during the production, storage, and transport of radiators.
- 3.5. Install the required valves, plugs and vent plug. When installing using wall brackets, remove the protective elements of the hangers on the back side of the radiator.
- 3.6. Radiators must be installed with an inclination of 5 to 10 mm to a length of 1 m so that the vent plug will be at the highest point.



Position of hangers for types 10, 20, 21, 22, 30, 33

Length L /mm/	Number of hangers	L ₁ /mm/	L ₂ /mm/	L ₃ /mm/	L ₄ /mm/
400	4	L - 200	-	-	100
500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500, 1600	4	L - 266	-	-	133
1700, 1900, 2100, 2300, 2500, 2700, 2900	6	L - 266	L ₁ /2 + 16,5	L ₁ /2 - 16,5	133
1800, 2000, 2200, 2400, 2600, 2800, 3000	6	L - 266	L ₁ /2	L ₁ /2	133

Position of hangers for type 11

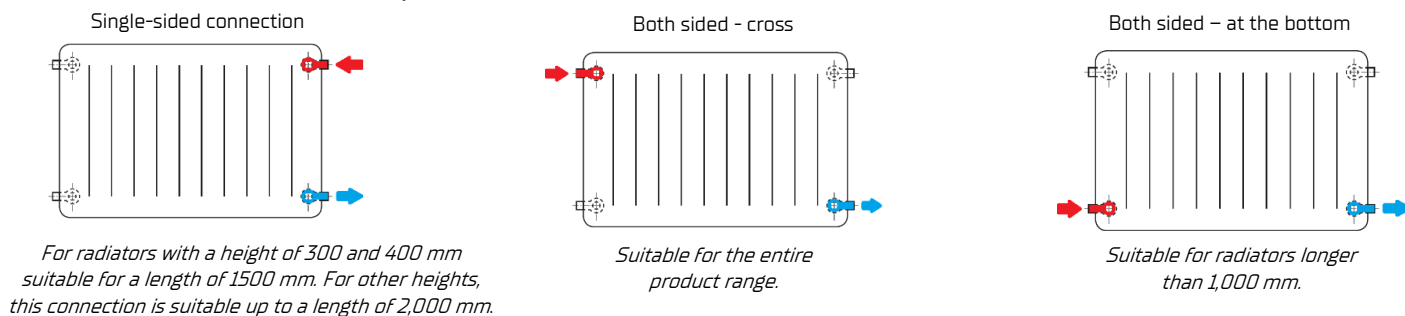
Length L /mm/	Number of hangers	L ₁ /mm/	L ₂ /mm/	L ₃ /mm/	L ₄ /mm/
400	4	L - 234	-	-	117
500, 600, 700, 800, 900, 1000, 1100, 1200, 1300, 1400, 1500, 1600	4	L - 300	-	-	150
1700, 1900,	6	L - 300	L ₁ /2 + 16,5	L ₁ /2 - 16,5	150
1800, 2000,	6	L - 300	L ₁ /2	L ₁ /2	150

4. Connection to the heating system

- 4.1. The way the radiator is connected affects its heat output. By default, a single-sided connection is used where the inlet water supply is connected at the top and the water outlet on the same side at the bottom. For radiators with a Ventil Kompakt (VK) set, the supply points are led to the lower part of the radiator so that the outlet is always closer to the edge of the radiator, whether it is the right or left version. **Sufficient attention must be paid to the correct connection of the radiator, as the opposite connection causes a decrease in heat output (30 to 40%) and can lead to undesirable sound effects on the valve insert.**
- 4.2. Radiators Ventil Kompakt are equipped with Heimeier or Oventrop valve inserts. They are designed for presetting hydraulic resistance and flow control in cooperation with a thermostatic head. The flow settings through the valve insert can be changed continuously in eight steps with the possibility of setting the intermediate position. The valve inserts are factory-set to the maximum flow [8]. We recommend that experts change the preset values using a special setting key. It is possible to attach a thermostatic head directly to the valve insert using the M30x1.5mm connection thread. During transport, the thread is protected by a plastic cap, which also allows manual regulation of the valve.

Valve insertion	1	2	3	4	5	6	7	8
$k_v / m^3 \cdot h^{-1}$	0,089	0,288	0,385	0,499	0,753	0,964	1,044	1,084

- 4.3. Radiators Ventil Kompakt (VK) cannot be used in self-circulating systems. High hydraulic resistance of the valve inserts would cause the radiators to malfunction. In such cases, it is necessary to dismantle the original valve inserts and use low-resistance control valves instead, which have $k = 5m^3 \cdot h^{-1}$.



Recommended connections of KORAD Kompakt radiators

5. Prevádzkovanie

- 5.1. Before filling the heating system with water, make sure that the valve inserts, vent valves and plugs are tightened.
- 5.2. **The heating system must be flushed before use.** Flushing of the system can be performed with normal untreated water (water supply). To increase the cleaning efficiency, it is possible to add suitable non-foaming degreasers to the rinsing water. Operate the system for approx. 30 minutes at maximum pump output and temperatures up to 60 °C. Then allow the system to cool to 40 °C and drain the water. Before filling the heating water, it is necessary to clean the filter strainers for mechanical impurities.
- 5.3. From the point of view of service life and trouble-free operation of radiators, it is essential that the circulating water has a pH of 8.5 to 10. The water hardness should not exceed 1 mmol / l [5.6 °). The high hardness of the water leads to the formation of limescale, which causes clogging of the control valves and strainers and can lead to a malfunction of the system. The dissolved oxygen content in the circulating water must not exceed 0.1 mg / l, otherwise there is a risk of corrosion. We recommend using suitable corrosion inhibitors for heating water.
- 5.4. **Never drain the heating system for a long time for no reason!** For proper operation and service life of the radiators, it is important to perform a perfect deaeration and limit the discharge of water only to the necessary cases. Prevent air from entering the system by setting it correctly and checking the pressure in the expansion vessel regularly. Recommended values of air pressure in the expansion vessel bag should be in the range $[p + 0.2 \text{ bar}] < p_{\text{exp}} < [p_{\text{sv}} - 10\%]$ which means that the pressure should be at least 0.2 bar higher than the hydrostatic height of the system, but it should be at least 1 bar and the maximum pressure 10% lower than the value of the safety pressure on the safety valve. The air pressure must be checked after disconnecting the expansion vessel from the heating system.
- 5.5. We recommend installing radiators in a closed heating system. Open systems must be designed in such a way that water does not flow in the expansion vessel and thus its excessive oxygenation. Excessive oxygen concentration then leads to rapid corrosion of the radiators. The product warranty cannot be claimed in this case.
- 5.6. If the system requires regular water replenishment, it must be checked by a specialist. Make-up water contains a large amount of oxygen and can cause corrosion of radiators over time.
- 5.7. **Treat the heating system against freezing!** To protect against freezing, the heating circuits with radiators can be filled with antifreeze. It is important that you use antifreeze mixtures designed for heating systems. Compounds intended for car cooling systems are not suitable for steel radiators. When filling the system with antifreeze, it is necessary to consider the reduction of the heat output of the radiators due to the decrease of the specific heat capacity of the heating water. See the following table for approximate values.

Mixture concentration [vol.%]	Freezing point [°C]	Decrease in output [%]
20	-10	5
35	-20	10
45	-30	15

- 5.8. The use of radiators in standard heating systems as cooling surfaces is not recommended. Due to the temperature difference between the surface of the radiator and the surrounding air, air moisture condenses on the surface of the radiator, which leads to corrosion after a certain time. This method of using radiators is not covered by the warranty.
- 5.9. Do not use abrasive cleaners or chlorine- and acid-containing cleaners to clean the radiators. Any repairs to the paintwork or perform a complete repainting with paints exclusively intended for radiators, otherwise there is a risk of gradual degradation of the color shade.
- 5.10. Do not cover the radiator with objects or use it to dry clothes. This will reduce their heat output by about half and at the same time increase the risk of corrosion.

6. Disposal of the product

- 6.1. The packaging material contains plastic and paper elements that must be separated. All materials used are recyclable.
- 6.2. When disposing of the product, remove any residual heating water from the radiator. Subsequently, the radiator can be handed over for scrap collection.

The manufacturer is not liable for damage caused by incorrect handling and storage of the product, its improper installation, operation, or maintenance, which are against these instructions for use or unauthorized design interventions, or when using the product for other purposes than intended.