



Steel Panel Radiators

KORAD

Production Program



Manufactured since 1968

www.usskorad.sk

U. S. STEEL KOŠICE, s.r.o. - MANUFACTURER OF STEEL PANEL RADIATORS KORAD

COMPANY

U. S. Steel Košice, s.r.o. is a subsidiary of the U. S. Steel Corporation based in Pittsburgh, USA. The Corporation is engaged for over one hundred years in production and processing of steel and is one of the world's largest producers.

The U. S. Steel Košice, s.r.o. Company is one of the leading producers of flat rolled products in Central Europe. This modern integrated metallurgical enterprise comprises the processes from the primary processing of raw materials through the production of pig iron and steel to outputs of final products with high added values. Its production program consists of a wide range of hot and cold rolled sheets and coated sheets, including hot-dip galvanized sheets, tin plates, color-coated sheets and non-grain oriented steels designed for various industries.

In addition to the steel sheets, the Company also manufactures spirally-welded pipes and steel panel radiators under the KORAD brand.

PRODUCTION QUALITY

U. S. Steel Košice, s.r.o. has established and applies the Quality Management System in accordance with EN ISO 9001, the Environmental Management System according to EN ISO 14001 and the Energy Management System according to EN ISO 50001, issued by TÜV SÜD Slovakia.

The company also holds several international and domestic product certificates issued for KORAD radiators.

In addition to quality products, the company provides its customers with comprehensive technical and advisory services in:

- Research
- Technical Customer Service
- Marketing and Trade

Tradition of providing quality products and services and, above all, trust of partners are the values that the U. S. Steel Košice is firmly committed to protect and develop.



INNOVATIONS, TRADITION & QUALITY - PRODUCTION OF KORAD RADIATORS IN U. S. STEEL KOŠICE, s.r.o.

The production of steel radiators has a long-term tradition in our Company dating back to 1968. The KORAD panel radiators are manufactured in one of the U. S. Steel Company's production mills equipped with modern lines with a high degree of automation.

The input materials for production of radiators are cold rolled sheets with specific composition. To achieve the highest quality of sheets, the experts are continually monitoring and regulating the chemical and mechanical parameters of materials from the starting materials to the finished products.

The coils made of cold-rolled sheets are unwound again, cut to desired lengths, shapes and welded into desired shapes. Each product passes a pressure test to ensure that the radiator will be able to properly fulfill its long-term function. In the following section of the line, radiators pass through a series of surface treatments. The last of the treatments is cathaphoretic

application of surface powder paint, after which the product goes to the baking oven. With covers in place, the radiator is ready for packaging.

A special attention is paid to the radiator protection during storage and transport. Each radiator is provided with cardboard package, while edges are protected with plastic triangular profiles. At the end, the radiator is wrapped in a protective plastic foil and placed on wooden pallets to be exported to customers.

The production constantly responds to the requirements of the markets and the global developments by on-going innovations that for years make the KORAD radiators the advanced products of high quality, as evidenced by the fact that this product is successfully sold through Europe and is able to withstand the toughest competition of the top European manufacturers.



TABLE OF CONTENTS	
BASIC TECHNICAL DATA, TYPE AND DIMENSIONAL ASSORTMENT	4
BASIC TECHNICAL DATA, POSITIONING, INSTALLATION	5
LAYOUT OF FIXING TABS, INSTALLATION PROCEDURE	6
CONNECTING RADIATORS TO THE HEATING SYSTEM	7
FLOW CHARACTERISTICS OF THE KORAD KOMPAKT RADIATORS	8
FLOW CHARACTERISTICS OF THE KORAD VK, VKS RADIATORS	9
OPERATION, CLEANING AND MAINTENANCE, WARRANTY, DISPOSAL; RECOMMENDED THERMOSTATIC HEADS	10
ACCESSORIES - MOUNTING COMPONENTS AND CONNECTION FITTINGS	11
HEAT OUTPUTS - HEIGHT OF 300 mm	12 - 13
HEAT OUTPUTS - HEIGHT OF 400 mm	14 - 15
HEAT OUTPUTS - HEIGHT OF 500 mm	16 - 17
HEAT OUTPUTS AND CONVERSION TABLES: COLUMN RADIATORS TO RADIATORS KORAD H 550	18
HEAT OUTPUTS - HEIGHT OF 550 mm	19
HEAT OUTPUTS - HEIGHT OF 600 mm	20 - 21
HEAT OUTPUTS - HEIGHT OF 900 mm	22 - 23
CONVERSION FACTORS "f" FOR OTHER OPERATING CONDITIONS	24
EXAMPLES - VALVE PRE-SETTING CALCULATION; OUTPUT CONVERSION FOR OTHER OPERATING CONDITIONS	25
HEAT OUTPUTS - RADIATORS WITH FLAT FRONT PANEL (PLAN) - ALL HEIGHTS	26
ADDITIONAL SURFACE COLORS, GALVANIZED RADIATORS, RADIATOR LABELING AND CODE LIST	27



PRODUCT DESCRIPTION

The KORAD radiators are heaters allowing heat exchange between the heat-carrying medium (water) and the surrounding area.

The radiator body consists of one, two or three panels. The radiator panel itself is welded from two steel cold rolled stamped pieces, by a seam weld around the perimeter and by the resistance spot welds in the vertical ribs. The axis pitch of vertical channels is 33.33 mm.

To increase the heating efficiency, some types of radiators are equipped with one, two or three additional heat-exchanging bent sheets - convectors. The convector is spot-welded to the vertical channels of radiator bodies. Its surface increases the heating capacity of the heating body up to about 30%.

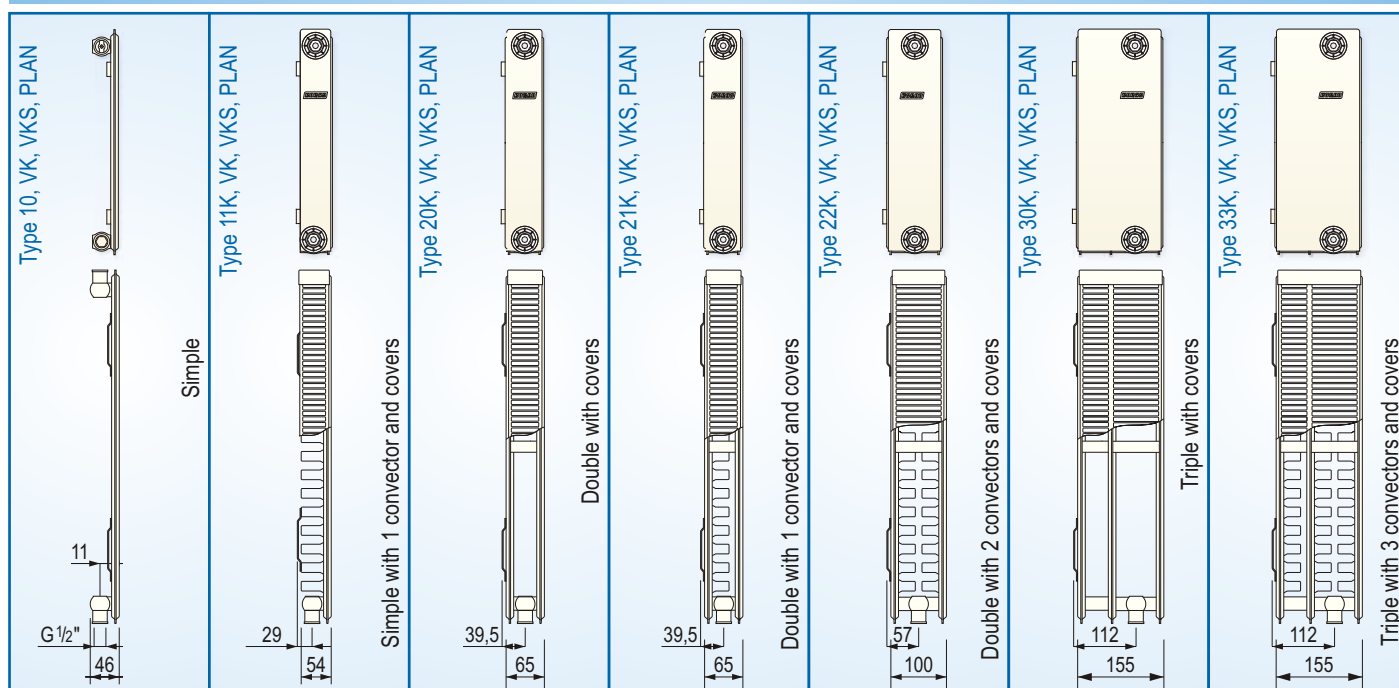
The Ventil-Kompakt (VK) radiators are equipped with additional flow piping enabling bottom connections and a valve insert with adjustable k_v values. The VK radiators are supplied with a connection on the bottom right, left, or center connection (VKS). All types of radiators can be supplied with a flat front panel - KORAD PLAN (-P).

TECHNICAL PARAMETERS

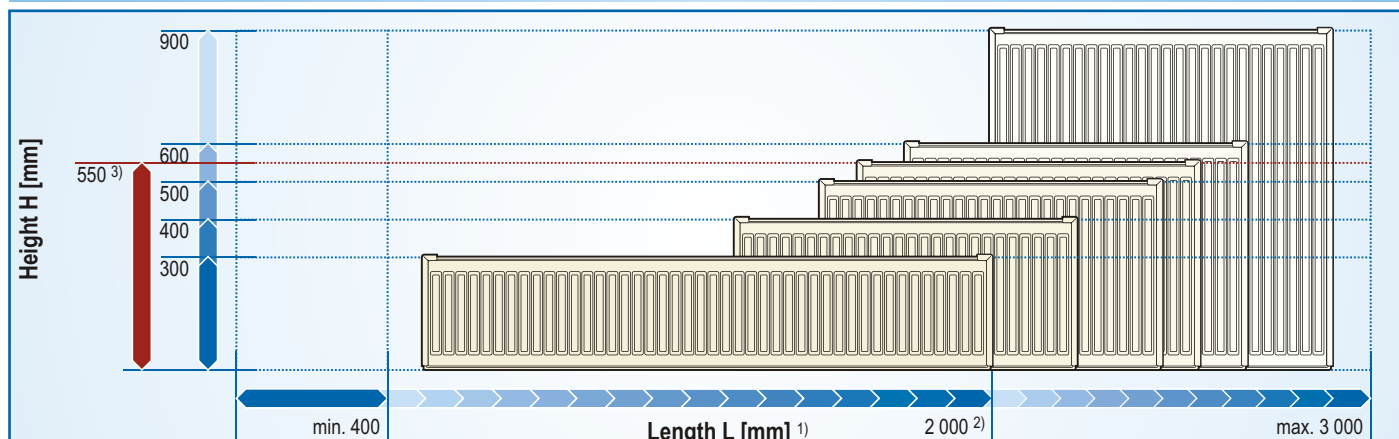
Technical parameters of the KORAD steel panel radiators meet the requirements of EN 442-1:1997/A1:2004. Radiators are certified according to EN 442:1 by Notified Body No. ES1015, Strojirnský zkušební ústav, s. p. Brno, the Czech Republic and are CE marked on the basis of the Declaration of Conformity.

The fact that the quality requirements according to EN 442 have been met is confirmed by the radiator performance tests conducted by the renowned accredited laboratory HLK Stuttgart accredited laboratory and by the registration in DIN CERTCO in Berlin. The Declaration of Conformity and certificates can be downloaded from the website www.usskorad.sk, or may be sent on request.

TYPE ASSORTMENT



KORAD HEIGHT AND LENGTH ASSORTMENT [mm]



¹⁾ Production length of radiators is graded by 100 mm.

²⁾ Radiators - type 11, with bottom middle connection (VKS) and flat front panel (PLAN) are available only up to lengths of 2 000 mm.

³⁾ Radiators H 550 mm are manufactured only with side connections (including flat front panel) in reduced length assortment - see pages 18 - 19.

MATERIAL

The KORAD panel radiators and convectors are made of low carbon cold rolled steel sheets produced by U. S. Steel Košice, s.r.o. according to STN EN 10130 + A1. The steel is characterized by increased tensile strength and good weldability.

PACKAGING

Each radiator is wrapped in the PE foil. The edges of the radiators are protected by U-shaped cardboard; the corners are protected by plastic angles. During transport and storage, the radiators are placed on non-returnable wooden pallets in accordance with the Pallet Arrangement Plan.

STORAGE AND HANDLING

Radiators must be stored in their original wrappings. A storage place must be protected against weather exposure, high humidity and rapid temperature changes. The radiators must not be stored in an open area.

Stored or transported radiators must not be exposed to strong static pressure. Do not store materials and tools on radiators. Radiators can be stacked only if they are wrapped on original pallets. Only two pallets with the

SURFACE TREATMENT

- Degreasing
- Phosphate layer
- Cathaphoretic basic paint
- Top coat - electrostatically applied powder coat - RAL 9010 shade

PRESSURE, TEMPERATURE

- | | |
|--|---------|
| • Minimum test pressure | 1,3 MPa |
| • Maximum operating pressure | 1,0 MPa |
| • Maximum temperature of heat-carrying substance | 110 °C |

Each radiator must pass a leak test.

same dimensions can be stored on each other on a flat and stable floor. Pallets with the models of radiators 10 and 11, as well as all the PLAN radiators can be stored in one layer only.

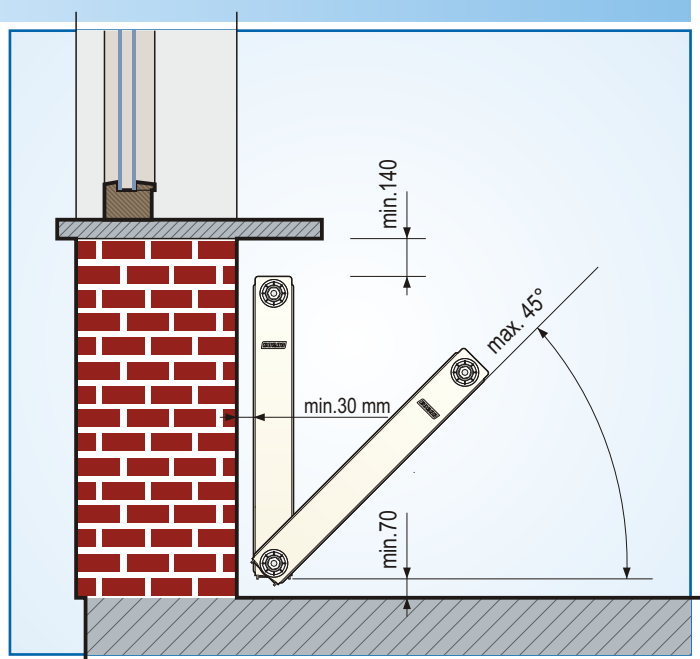
Radiators must not be dragged on the floor to an assembly place even if they are wrapped.

POSITIONING

The KORAD panel radiators are suitable for heated spaces with low level of humidity (30-60%) and negligible pollution, for example apartments, offices, schools, hotels, shops, museums and the like. They can be used also in environments with higher relative moisture, but free of condensation and air pollution, such as the sports facilities, warehouses, corridors, but with sufficient and regular ventilation or a permanent operation of the radiators.

The panel radiators should be optimally placed at least 140 mm below the window sill and 70 mm over the floor in the vertical axis of the window. The distance from the wall is usually determined by brackets, but should not be less than 30 mm. The air must freely circulate around the surface of radiators. The maximal recommended slope of the radiator is 45° (attics). Failure to meet these distances may cause a decline of the heat output.

The bodies should be positioned so as to be out of reach of water from showers, sinks, etc. In areas with the increased hygiene requirements (health care facilities), we recommend radiators without additional heat transferring surfaces (convectors).



INSTALLATION

Method of installation depends on material of the wall behind the radiator. The KORAD drill-in brackets are intended for walls from solid materials. Do not use the KORAD brackets for walls from perforated bricks! Use brackets with special fasteners for this type of walls instead. Positions of lugs serving as fixing points are drawn on the attached picture. If radiators cannot be fastened to a wall (glass-covered wall, plasterboard and so on), installation is carried out by rack consoles anchored to the floor.

Installed radiators usually form 90° angle towards the floor. In reasonable cases radiators can be installed with maximum inclination of 45° without impact on their heating output (e.g. in attics). It is necessary to consult other installation methods with the manufacturer.

We recommend installing the radiators fully wrapped to ensure their maximum protection until completion of all construction works. When

necessary, radiators can be operated fully wrapped to temper the building.

Cut the protective foil at protective corners before mounting. Plastic protective corners are designed to be folded up at connection points. At first, remove plastic blanking plugs. Always remove the plastic plugs before putting the radiator into operation! The only purpose of the plugs is to protect radiators during manufacturing, storage and transportation.

Install all necessary valves, blanking plugs and the air vent. When hanging the radiator on wall bracket, remove protective components of lugs from the rear side of the radiator.

Start installation. Install radiators with inclination of 5 to 10 mm per 1 m so that a blanking plug will be at the highest point.

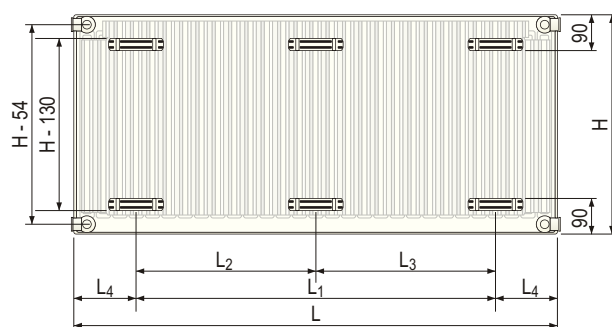
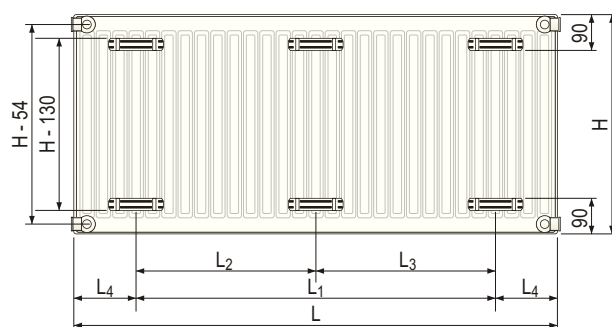
LAYOUT OF FIXING TABS - TYPE 10, 20, 21, 22, 30, 33

Length L [mm]	No. of Tabs	L ₁ [mm]	L ₂ [mm]	L ₃ [mm]	L ₄ [mm]
400	4 pcs	L-200	-	-	100
500, 600, 700, 800, 900, 1 000, 1 100, 1 200, 1 300, 1 400, 1 500, 1 600	4 pcs	L-266	-	-	133
1 700, 1 900, 2 100, 2 300, 2 500, 2 700, 2 900	6 pcs	L-266	$\frac{L_1}{2} + 16,5$	$\frac{L_1}{2} - 16,5$	133
1 800, 2 000, 2 200, 2 400, 2 600, 2 800, 3 000	6 pcs	L-266	$\frac{L_1}{2}$	$\frac{L_1}{2}$	133

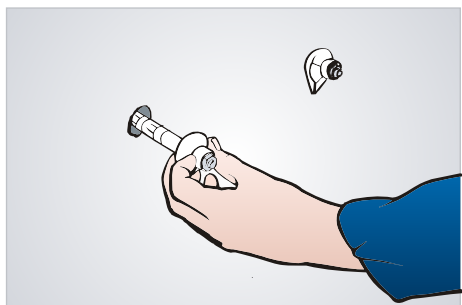
LAYOUT OF FIXING TABS - TYPE 11

Length L [mm]	No. of Tabs	L ₁ [mm]	L ₂ [mm]	L ₃ [mm]	L ₄ [mm]
400	4 pcs	L-234	-	-	117
500, 600, 700, 800, 900, 1 000, 1 100, 1 200, 1 300, 1 400, 1 500, 1 600	4 pcs	L-300	-	-	150
1 700, 1 900	6 pcs	L-300	$\frac{L_1}{2} + 16,5$	$\frac{L_1}{2} - 16,5$	150
1 800, 2 000	6 pcs	L-300	$\frac{L_1}{2}$	$\frac{L_1}{2}$	150

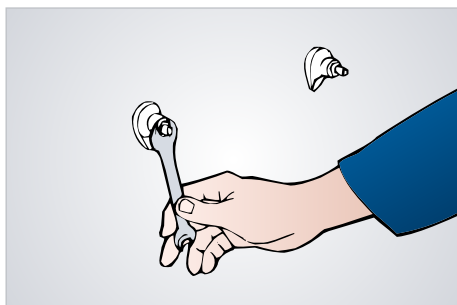
H = height of radiator [mm]



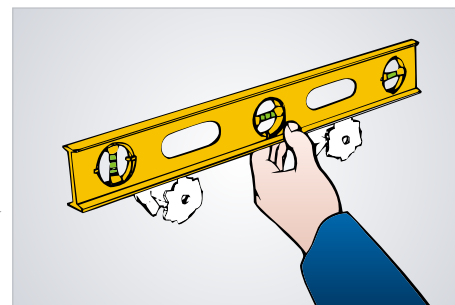
INSTALLATION OF KORAD KOMPAKT RADIATOR WITH THE KORAD DRILL-IN WALL CONSOLE



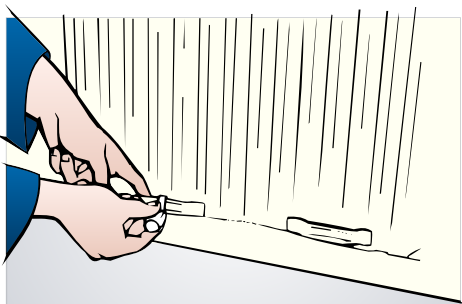
Drill the holes in the wall and insert the KORAD brackets (the KORAD bracket is shown on page 11).



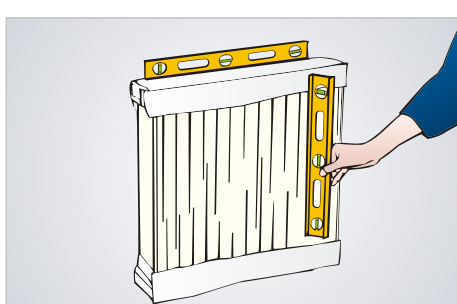
Fix holders carefully by tightening a nut.



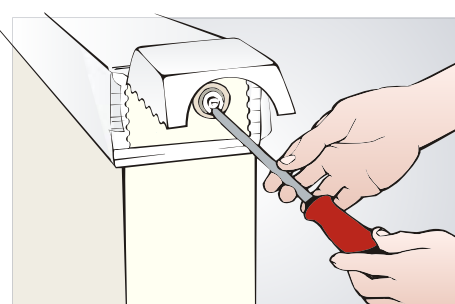
Check the height leveling of bracket adjustment.



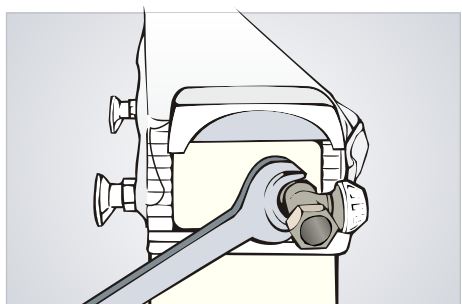
Remove polystyrene covers of holders, mount brackets on the lower holder of the radiator.



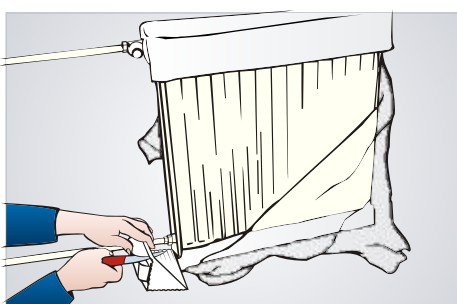
Hang the radiator on brackets and check the horizontal and vertical leveling.



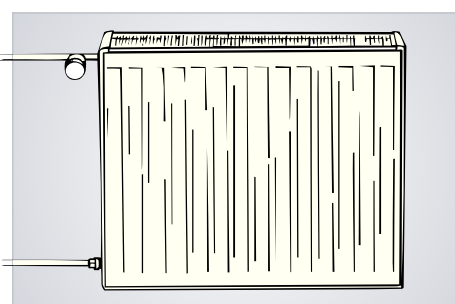
Remove transportation plastic plugs.



Mount the vent plug, a blinder, a valve and connect to the heating circuit.



After completion of construction works, remove foils, cardboards and plastic edges.



A properly installed radiator.

CONNECTING THE RADIATORS TO THE HEATING SYSTEM

According to the method of connection to the heating system, the KORAD radiators are broken down in terms of their design to the KORAD Kompakt (K) type and KORAD Ventil Kompakt (VK) type.

The KORAD Kompakt radiators are designed for side connections to the heating system with gravity or forced circulation.

The Ventil Kompakt radiators are designed primarily for lower connection to the system with forced circulation, but they also allow the unilateral lateral connection similar to KORAD Kompakt type.

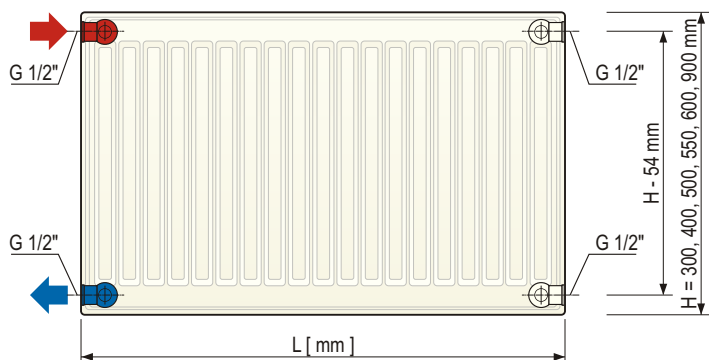
The KORAD Ventil-Kompakt radiator is supplied with a valve Heimeier - type 4360, which is built in the radiator fittings and serves as hydraulic setup regulation.

The valve insert is equipped with a plastic cover protecting it from damage during transportation and installation of the heater and also allows the manual adjustment.

Thermostatic head can be mounted directly to the KORAD Ventil-Kompakt radiator, which allows controlling the room temperature. The connecting thread for the thermostatic head is M 30 x 1.5 mm.

CONNECTING THE BODY TO THE SYSTEM - TYPE KOMPAKT

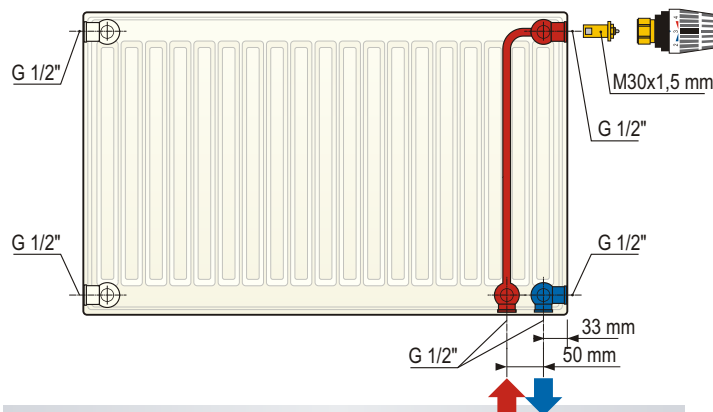
- 4 x internal thread G 1/2"
- connecting spacing = the structural height H - 54 [mm]



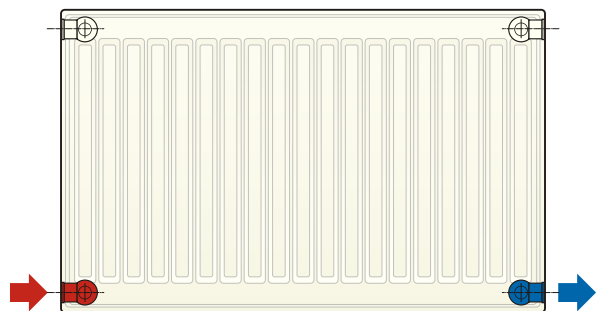
One-sided connection
 $\varphi = 1$

CONNECTING THE BODY TO THE SYSTEM - VENTIL KOMPAKT

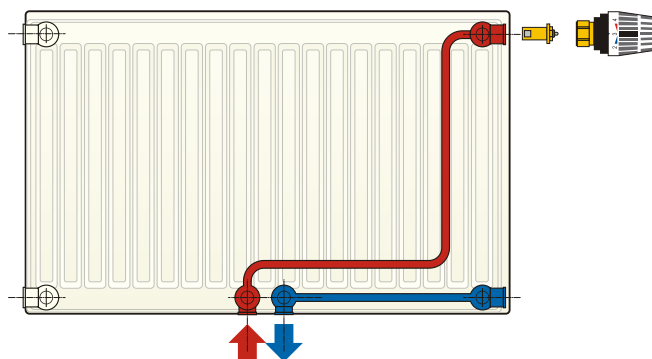
- 2 x internal thread for bottom connection G 1/2"
- connecting spacing = 50 mm $\pm$ 0.5 mm
- thermostat valve with thread M 30 x 1.5 mm
- 4 x internal threads for side connection G 1/2"
- connecting spacing = overall height H - 54 mm



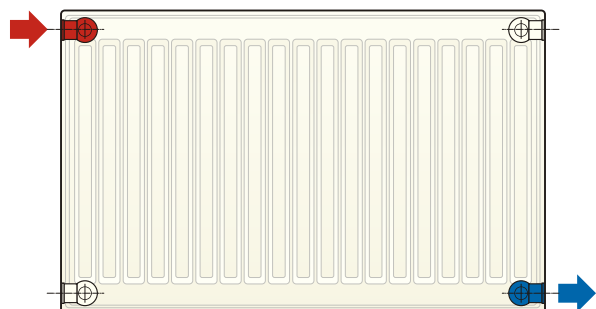
Right connection



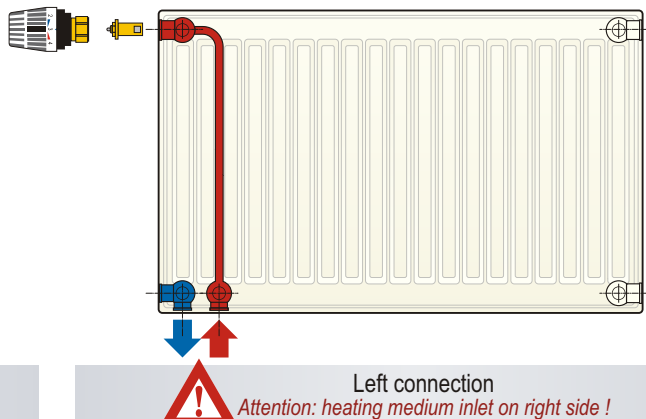
Both-sided bottom connection
 $\varphi = 0,9$



Middle connection



Cross connection
 $\varphi = 1$ recommended at: $L \geq 3 \times H$



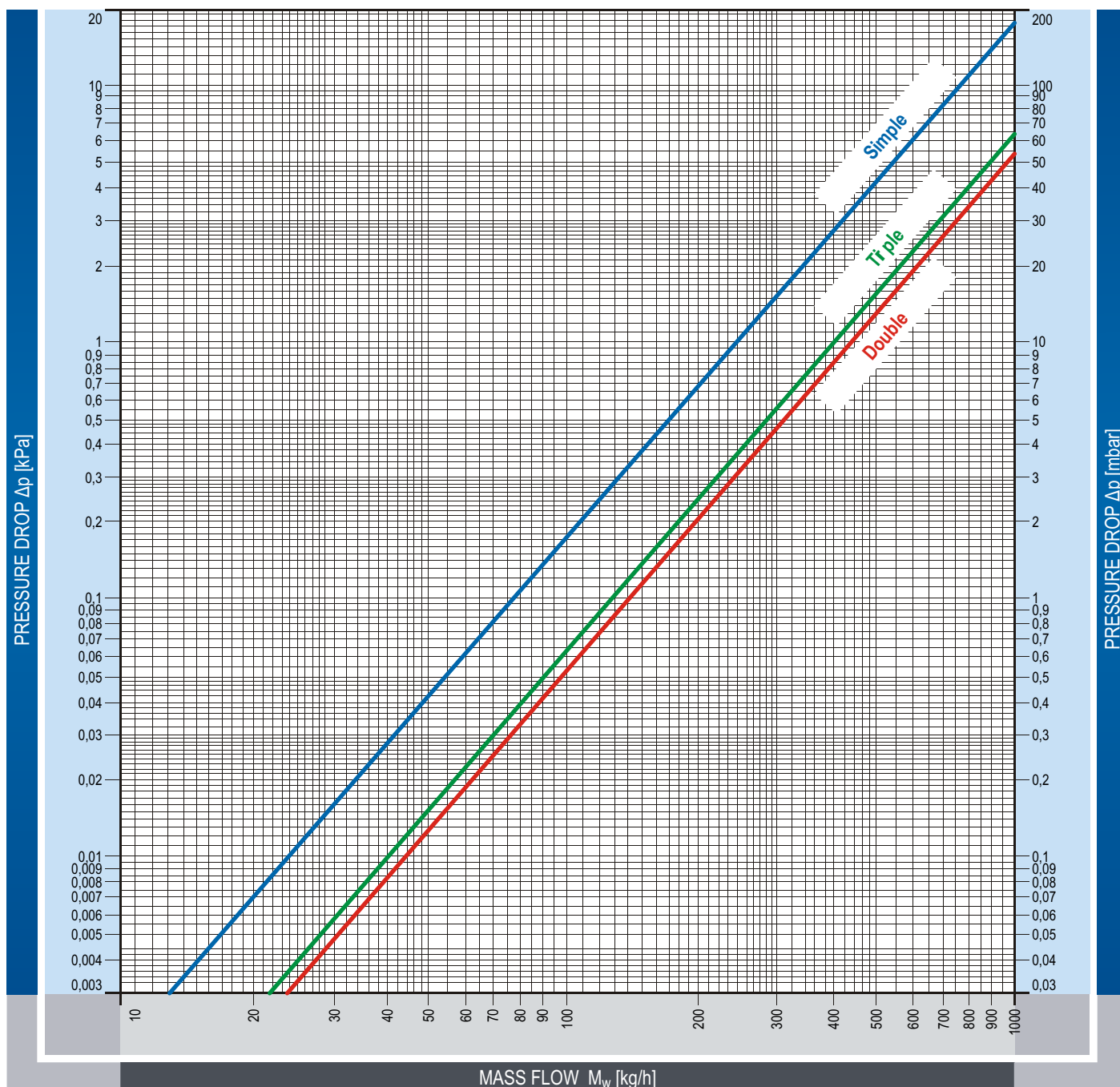
Left connection
Attention: heating medium inlet on right side !

EQUATION FOR PRESSURE LOSS CALCULATION

For heat-carrying medium: water

$$\Delta p = \frac{M_w^2}{A_T^2 \cdot \rho_w \cdot 1,296} \cdot 10^{-10} = \left[\frac{\dot{V}}{A_T} \right]^2 \cdot \rho_w \cdot 10^{-3} = \xi_T \cdot \frac{w^2}{2} \cdot \rho_w \cdot 10^{-3} \text{ [kPa]}$$

FLOW CHARACTERISTICS OF KORAD KOMPAKT RADIATORS



FLOW PARAMETERS FOR KOMPAKT TYPE

Type of radiator	Variable	For dimension of internal connecting thread = G 1/2"
Simple 10, 11	A_T [m ²]	$6,64 \cdot 10^{-5}$
	ξ_T [-]	18,4
Double 20, 21, 22	A_T [m ²]	$1,2 \cdot 10^{-4}$
	ξ_T [-]	5,62
Triple 30, 33	A_T [m ²]	$1,10 \cdot 10^{-4}$
	ξ_T [-]	6,7

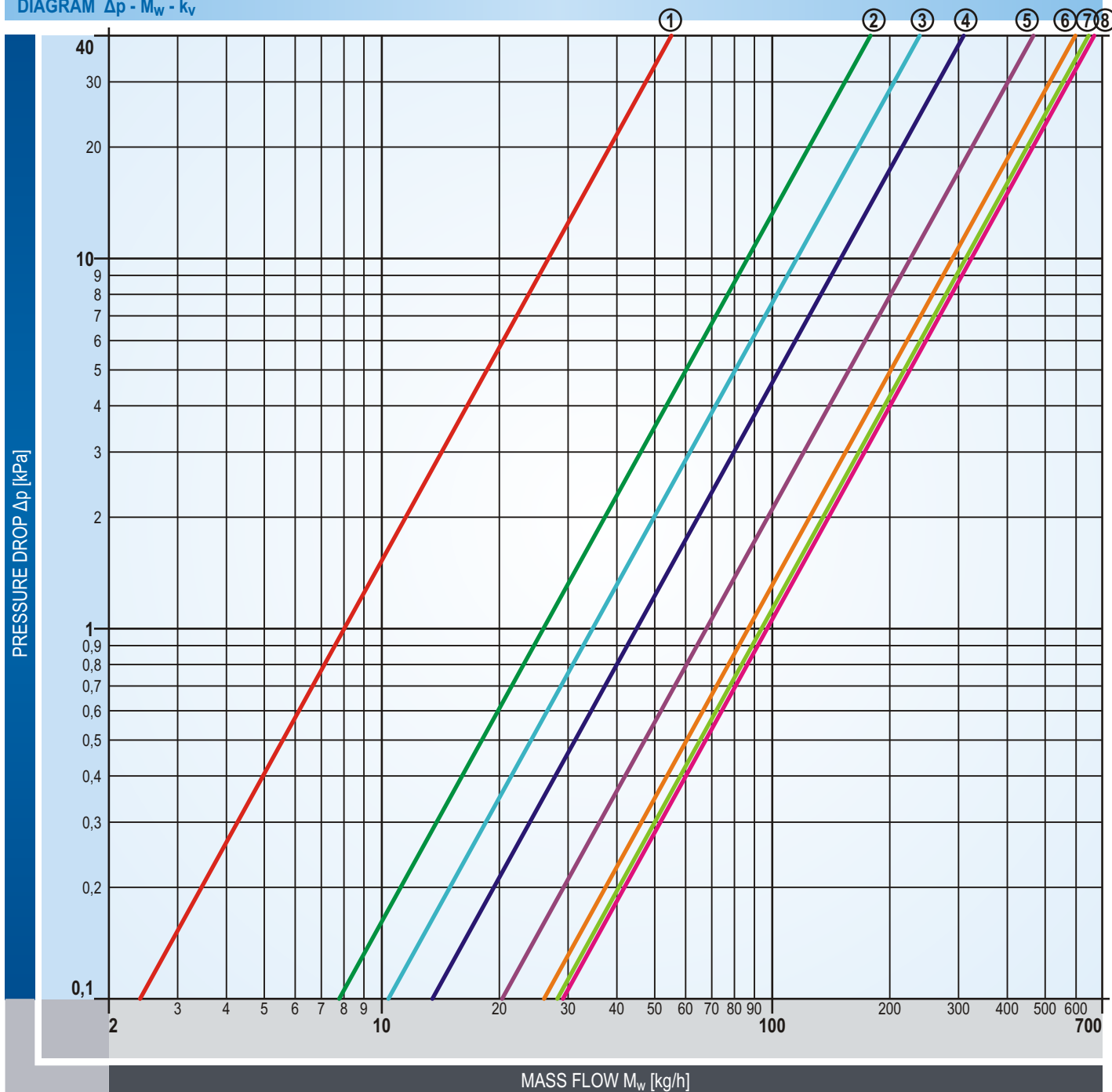
USED SYMBOLS

M_w	[kg/h]	mass flow
Δp	[kPa]	pressure drop
$\dot{V}$	[m ³ ·s ⁻¹]	volume flow
A_T	[m ²]	flow coefficient
ρ_w	[kg·m ⁻³]	the density of heat-carrying medium
ξ_T	[-]	resistance coefficient
w	[m·s ⁻¹]	velocity of heating medium related to the inner diameter of connected pipes

EQUATION FOR MASS FLOW CALCULATION

For heat-carrying medium: water

$$M_w = \frac{\Phi}{C \cdot \Delta t} \text{ [kg} \cdot \text{h}^{-1}]$$

DIAGRAM $\Delta p - M_w - k_v$ 

SETTING THE VALVE INSERT FLOW RATE

valve pre-setting							
①	②	③	④	⑤	⑥	⑦	⑧
0,089	0,288	0,385	0,499	0,753	0,964	1,044	1,084
value k_v [m ³ /h]							
max. temp. of heat-carrying medium						110 °C	
max. operating pressure						1 MPa	

USED SYMBOLS

M_w	[kg · h ⁻¹]	mass flow
Φ	[W]	heat output
Δt	[K]	water temperature decrease
Δp	[kPa]	pressure drop
C	[m ² · s ⁻² · K ⁻¹]	specific heat of water = 4 186
k_v	[m ³ · h ⁻¹]	flow coefficient

Example of valve setting calculation is on page 25

The KORAD VK radiators are supplied with the Heimeier valve of the 4360 type, which allows fine - tune setting

OPERATION

Check if all valve inserts, air vents and plugs are screwed tight before a heating system is filled with water.

Flush the heating system before use. Untreated water (tap water) can be used for flushing. A cleaning effect of the flushing water can be increased by foamless degreasing agents. Run the system with full delivery of pump with water warmed up to 60°C for about 30 minutes. Then allow the system to cool down to 40°C. Clean mechanical dirt sifters before refilling with heating water.

Fill the heating system with water corresponding to the property requirements of the STN 07 7401 Standard. In order to maximize the operational lifespan of radiators it is essential that water circulating in the heating bodies have pH $\geq 8,5$. We recommend adding a suitable corrosion inhibitors in heating water. **Never discharge the heating system for a longer time if not necessary!** Correct operation and long lifespan of radiators require releasing air from radiators completely and discharging water only in unavoidable cases. Eliminate air penetration into the system by proper setup and regular checkup of expansion tank pressure.

Recommended air pressure values in the expansion tank should not exceed interval $(h_v + 0,2 \text{ bar}) < p_{exp} < (p_{pv} - 10\%)$, i.e. the pressure should be higher by at least 0,2 bar than the hydrostatic height of the system; minimal pressure should be 1 bar and maximal pressure should be at least 10% lesser than the maximal permitted value of the safety valve. The air pressure inspection can be performed only after the expansion tank is disconnected from the heating system. Leave radiator valves fully open out of heating season. It will facilitate and speed up air releasing when the heating system will start be restarted.

Secure your heating system against freezing! The heating circuits can be filled with antifreeze mixture to protect radiators against freezing.

It is important to use antifreeze mixtures designated for heating systems. Car antifreezes are not suitable for steel radiators. It is important to realize that the specific heating output of radiators will decrease by specific heat capacity of heating water after adding antifreeze mixture to the system.

Please, see the informative values in the following table.

Antifreeze ratio [vol.%]	Solidification point [°C]	Decrease of output [%]
20	- 10	- 5
35	- 20	- 10
45	- 30	- 15

We do not recommend using the radiators in standard heating systems as cooling elements out of heating season. As consequence of the temperature difference between radiator and its surrounding, the air moisture condensate on the radiator surface giving rise to corrosion after certain period of time.

Do not dry cloths on radiators. Covering the radiator decreases the heat output approximately by half and increases the risk of corrosion.

CLEANING AND MAINTENANCE

Do not clean radiators with abrasive cleaners, chlorine agents or acids. For touch-ups or complete recoating use lacquers and paints exclusively designated for radiators, otherwise the color hue might gradually degrade.

PRODUCT DISPOSAL

Wrapping material contains plastic and paper components, which are subject to separation. All the materials are fully recyclable.

Discharge all residues of heating water from the radiator before disposing. The emptied radiator might be passed for recycling.

WARRANTY

A 10 year warranty period applies to each KORAD radiator under condition that the product is mounted and operated according to the requirements inserted in the radiator packaging.

NOTICE



Manufacturer does not take responsibility for any damage caused by improper manipulation and storage, by unskilled mounting of the product, by improper operation and maintenance which are not in accordance with above instructions for use, or by non-authorized modifications of products as well as by utilization of the product for any other purpose, as intended.

Technical changes are reserved.



KORAD radiator 21 VKP 500 x 800

RECOMMENDED THERMOSTATIC HEADS

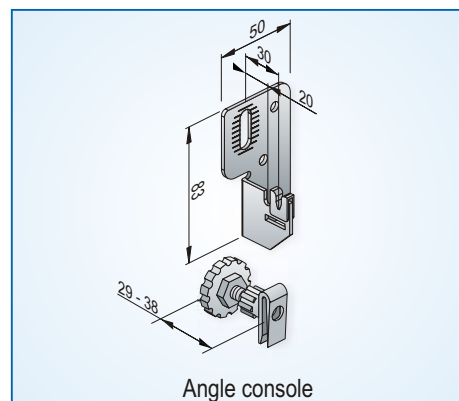
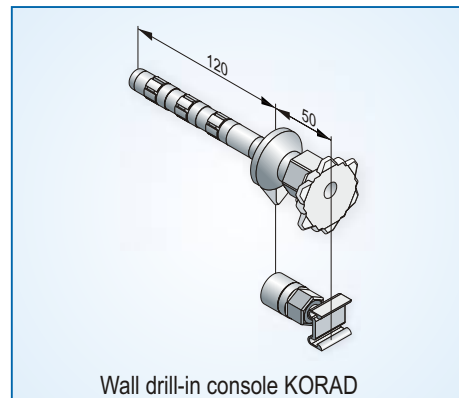
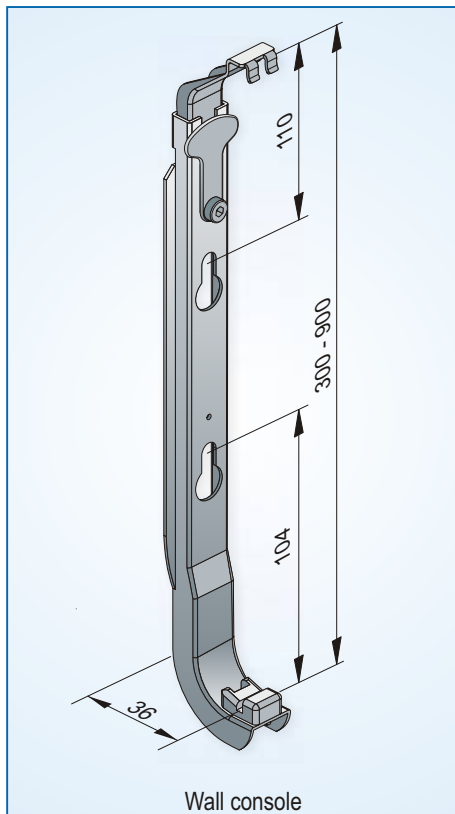
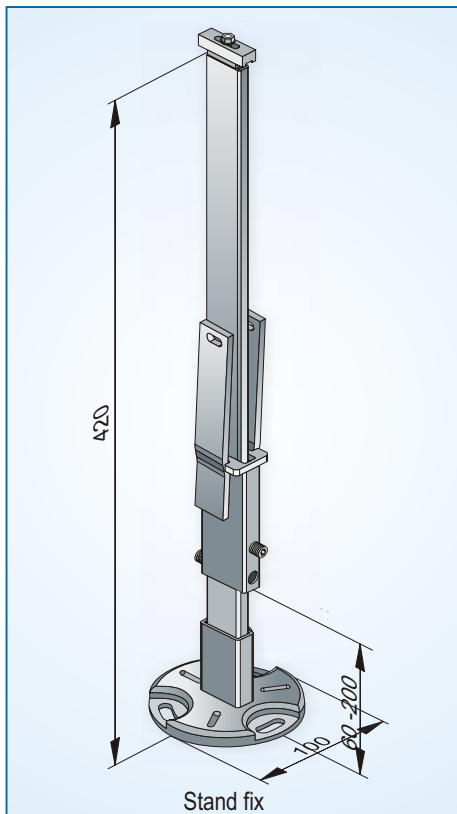
Manufacturer	Type of thermostatic head
Heimeier	All types
Comap	IF 1
Danfoss	RAWK
Drayton	TRV 4
Gampper	340012.100
Herz	Porsche design „H“, Mini „H“, Thermostat „H“
Honeywell	Brauckmann T 100 - 361
Oventrop	Uni LH
MNG	thera 2 / thera 3
Rosswainer	Star Tec
Ivar	type 3000, type 5000
Siemens	RTN 51



INSTALLATION ACCESSORIES

To install the radiators, we offer several types of fixing consoles and supports used depending on the construction material of the wall. The KORAD console, which is most commonly used type of a fixing console, is suitable for full building materials, but not for walls made of perforated bricks! In plaster or glazed walls we suggest the floor brackets.

Accessories for panel radiators, i.e. vent caps and plugs, and fixing consoles and supports are supplied by the manufacturer of panel radiators on the basis of specific order.

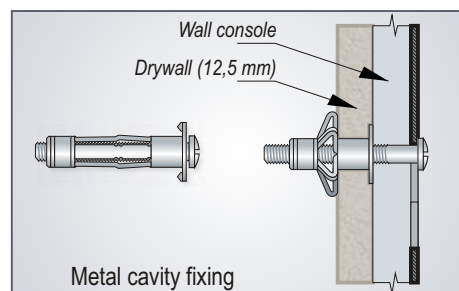


MOUNTING A RADIATOR ON A DRYWALL

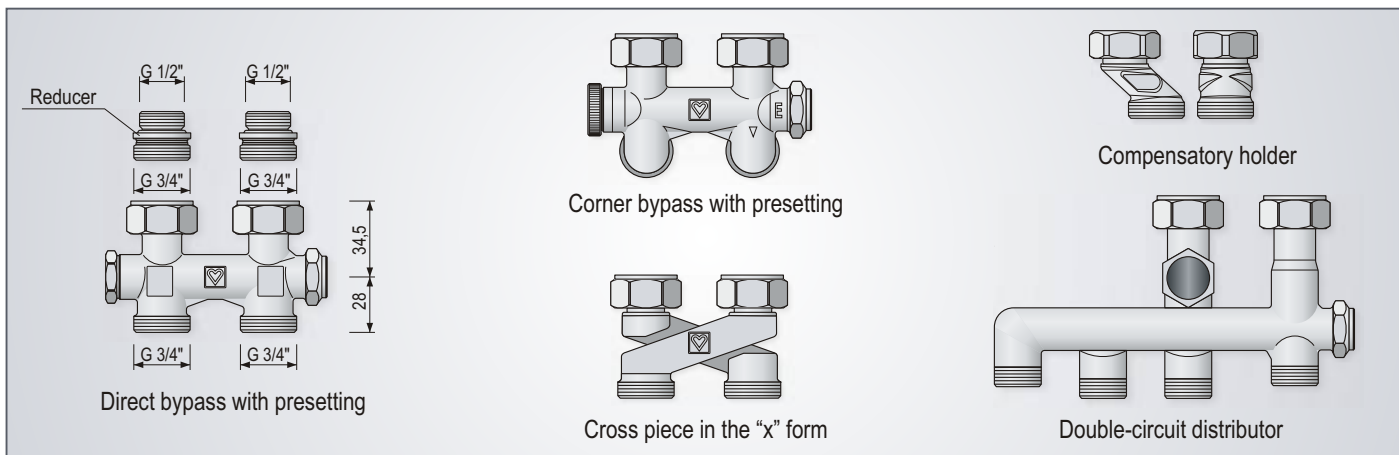
For mounting the KORAD radiator on a drywall, we recommend wall consoles and metal cavity fixing screws HM 4 or HM 5. Approximate bearing capacity of one metal cavity screw is 20 kg on a drywall 12,5 mm thick and 30 kg for double drywalls 25 mm thick.

Weight of water volume must be added to the weight of radiator. Not all types and dimensions of radiators may be mounted this way!

Always consult the type of radiator fixation with a qualified person!



CONNECTION FITTINGS



Note: the above brackets and fittings are not included with delivered radiators!

H = 300 mm

HEAT OUTPUTS Φ [W] AND BASIC TECHNICAL DATA



U. S. Steel Košice

TYPE 10 K, VK, VKS



TYPE 11 K, VK, VKS



TYPE 20 K, VK, VKS (65 mm)



TYPE 20W K, VK, VKS (100 mm)



HEAT OUTPUTS Φ [W] - HEIGHT 300 mm

TYPE 10 K, VK, VKS					TYPE 11 K, VK, VKS					TYPE 20 K, VK, VKS (65 mm)					TYPE 20W K, VK, VKS (100 mm)				
Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$			
	90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45
400	174	137	110	70	400	276	218	177	113	*400	281	224	182	117	*400	310	245	199	127
500	217	171	138	87	500	345	273	221	141	*500	352	280	228	147	*500	387	306	248	158
600	261	205	166	105	600	414	327	265	169	*600	422	335	273	176	*600	465	367	298	190
700	304	239	193	122	700	483	382	309	197	*700	493	391	319	205	*700	542	428	347	222
800	348	274	221	139	800	552	436	353	225	*800	563	447	364	235	*800	619	490	397	253
900	391	308	248	157	900	621	491	398	254	*900	633	503	410	264	*900	697	551	447	285
1 000	435	342	276	174	1 000	690	545	442	282	*1 000	704	559	455	293	*1 000	774	612	496	317
1 100	478	376	304	192	1 100	759	600	486	310	*1 100	774	615	501	323	*1 100	852	673	546	348
1 200	522	410	331	209	1 200	828	654	530	338	*1 200	844	671	546	352	*1 200	929	734	596	380
*1 300	565	445	359	227	*1 300	897	709	574	366	*1 300	915	727	592	381	*1 300	1 007	796	645	412
1 400	609	479	386	244	1 400	966	763	619	395	*1 400	985	783	637	411	*1 400	1 084	857	695	443
*1 500	652	513	414	262	*1 500	1 034	818	663	423	*1 500	1 056	839	683	440	*1 500	1 161	918	744	475
1 600	696	547	442	279	1 600	1 103	872	707	451	*1 600	1 126	894	728	469	*1 600	1 239	979	794	507
*1 700	739	581	469	296	*1 700	1 172	927	751	479	*1 700	1 196	950	774	499	*1 700	1 316	1 040	844	538
1 800	783	616	497	314	1 800	1 241	981	795	507	*1 800	1 267	1 006	819	528	*1 800	1 394	1 102	893	570
*1 900	826	650	524	331	*1 900	1 310	1 036	839	535	*1 900	1 337	1 062	865	557	*1 900	1 471	1 163	943	602
2 000	870	684	552	349	2 000	1 379	1 090	884	564	*2 000	1 407	1 118	911	586	*2 000	1 548	1 224	993	633
*2 100	913	718	580	366						*2 100	1 478	1 174	956	616	*2 100	1 626	1 285	1 042	665
*2 200	957	752	607	384						*2 200	1 548	1 230	1 002	645	*2 200	1 703	1 346	1 092	697
*2 300	1 000	787	635	401						*2 300	1 619	1 286	1 047	674	*2 300	1 781	1 408	1 141	728
*2 400	1 044	821	662	418						*2 400	1 689	1 342	1 093	704	*2 400	1 858	1 469	1 191	760
*2 500	1 087	855	690	436						*2 500	1 759	1 398	1 138	733	*2 500	1 936	1 530	1 241	792
*2 600	1 131	889	718	453						*2 600	1 830	1 453	1 184	762	*2 600	2 013	1 591	1 290	823
*2 700	1 174	923	745	471						*2 700	1 900	1 509	1 229	792	*2 700	2 090	1 652	1 340	855
*2 800	1 218	958	773	488						*2 800	1 970	1 565	1 275	821	*2 800	2 168	1 714	1 390	887
*2 900	1 261	992	800	506						*2 900	2 041	1 621	1 320	850	*2 900	2 245	1 775	1 439	918
*3 000	1 305	1 026	828	523						*3 000	2 111	1 677	1 366	880	*3 000	2 323	1 836	1 489	950

* Marked dimensions might be subjects to special delivery conditions - please consult your retailer.

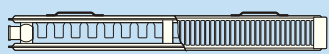
BASIC TECHNICAL DATA - HEIGHT 300 mm

TYPE 10 K, VK, VKS					TYPE 11 K, VK, VKS					TYPE 20 K, VK, VKS (65 mm)					TYPE 20W K, VK, VKS (100 mm)				
Length [mm]	M _T ^K [kg.m ¹]	M _T ^{VK} [kg.m ¹]	V _T [dm ³ .m ¹]	n [-]	Length [mm]	M _T ^K [kg.m ¹]	M _T ^{VK} [kg.m ¹]	V _T [dm ³ .m ¹]	n [-]	Length [mm]	M _T ^K [kg.m ¹]	M _T ^{VK} [kg.m ¹]	V _T [dm ³ .m ¹]	n [-]	Length [mm]	M _T ^K [kg.m ¹]	M _T ^{VK} [kg.m ¹]	V _T [dm ³ .m ¹]	n [-]
1 000	6,75	6,95	1,81	1,3187	1 000	10,60	10,81	1,81	1,2912	1 000	14,06	14,25	3,50	1,2630	1 000	14,06	14,25	3,50	1,2897

Radiators of type 11, radiators with bottom middle connection (VKS) and radiators with flat front panel (Plan) are manufactured only to 2 000 mm of length.

Heat output conversion table for different heat drop t_1 / t_2 and different ambient temperature t_r - see page 24.

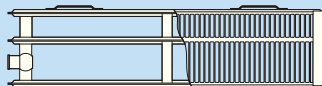
TYPE 21 K, VK, VKS



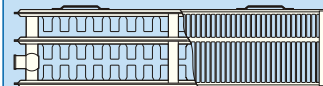
TYPE 22 K, VK, VKS



TYPE 30 K, VK, VKS



TYPE 33 K, VK, VKS

HEAT OUTPUTS Φ [W] - HEIGHT 300 mm

TYPE 21 K, VK, VKS					TYPE 22 K, VK, VKS					TYPE 30 K, VK, VKS					TYPE 33 K, VK, VKS				
Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$			
	90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45
400	383	301	243	153	400	499	393	318	202	*400	418	331	269	172	400	704	555	449	286
500	479	376	303	191	500	624	492	397	252	*500	523	414	336	215	500	880	694	562	357
600	574	451	364	229	600	749	590	477	302	*600	628	497	403	258	600	1 056	833	674	429
700	670	526	424	268	700	874	688	556	353	*700	732	580	471	301	700	1 232	972	786	500
800	766	602	485	306	800	998	786	636	403	*800	837	662	538	344	800	1 408	1 110	899	571
900	862	677	546	344	900	1 123	885	715	453	*900	942	745	605	387	900	1 583	1 249	1 011	643
1 000	957	752	606	382	1 000	1 248	983	795	504	*1 000	1 046	828	672	430	1 000	1 759	1 388	1 124	714
1 100	1 053	827	667	421	1 100	1 373	1 081	874	554	*1 100	1 151	911	739	473	1 100	1 935	1 527	1 236	786
1 200	1 149	902	728	459	1 200	1 497	1 180	954	605	*1 200	1 255	994	807	516	1 200	2 111	1 666	1 348	857
*1 300	1 244	978	788	497	*1 300	1 622	1 278	1 033	655	*1 300	1 360	1 076	874	559	*1 300	2 287	1 804	1 461	929
1 400	1 340	1 053	849	535	1 400	1 747	1 376	1 113	705	*1 400	1 465	1 159	941	602	1 400	2 463	1 943	1 573	1 000
*1 500	1 436	1 128	910	574	*1 500	1 872	1 475	1 192	756	*1 500	1 569	1 242	1 008	645	*1 500	2 639	2 082	1 685	1 071
1 600	1 532	1 203	970	612	1 600	1 997	1 573	1 271	806	*1 600	1 674	1 325	1 075	688	1 600	2 815	2 221	1 798	1 143
*1 700	1 627	1 278	1 031	650	*1 700	2 121	1 671	1 351	856	*1 700	1 779	1 408	1 143	731	*1 700	2 991	2 360	1 910	1 214
1 800	1 723	1 354	1 092	688	1 800	2 246	1 769	1 430	907	*1 800	1 883	1 490	1 210	774	1 800	3 167	2 498	2 022	1 286
*1 900	1 819	1 429	1 152	727	*1 900	2 371	1 868	1 510	957	*1 900	1 988	1 573	1 277	817	*1 900	3 343	2 637	2 135	1 357
2 000	1 915	1 504	1 213	765	2 000	2 496	1 966	1 589	1 008	*2 000	2 092	1 656	1 344	860	2 000	3 519	2 776	2 247	1 429
*2 100	2 010	1 579	1 273	803	*2 100	2 621	2 064	1 669	1 058	*2 100	2 197	1 739	1 412	903	*2 100	3 695	2 915	2 359	1 500
*2 200	2 106	1 654	1 334	841	*2 200	2 745	2 163	1 748	1 108	*2 200	2 302	1 822	1 479	946	*2 200	3 871	3 054	2 472	1 571
2 300	2 202	1 730	1 395	880	2 300	2 870	2 261	1 828	1 159	*2 300	2 406	1 904	1 546	989	2 300	4 047	3 192	2 584	1 643
*2 400	2 298	1 805	1 455	918	*2 400	2 995	2 359	1 907	1 209	*2 400	2 511	1 987	1 613	1 032	*2 400	4 223	3 331	2 697	1 714
*2 500	2 393	1 880	1 516	956	*2 500	3 120	2 458	1 987	1 259	*2 500	2 616	2 070	1 680	1 075	*2 500	4 399	3 470	2 809	1 786
2 600	2 489	1 955	1 577	994	2 600	3 245	2 556	2 066	1 310	*2 600	2 720	2 153	1 748	1 118	2 600	4 574	3 609	2 921	1 857
*2 700	2 585	2 030	1 637	1 032	*2 700	3 369	2 654	2 146	1 360	*2 700	2 825	2 236	1 815	1 161	*2 700	4 750	3 748	3 034	1 929
*2 800	2 680	2 106	1 698	1 071	*2 800	3 494	2 752	2 225	1 411	*2 800	2 929	2 318	1 882	1 204	*2 800	4 926	3 886	3 146	2 000
*2 900	2 776	2 181	1 759	1 109	*2 900	3 619	2 851	2 305	1 461	*2 900	3 034	2 401	1 949	1 247	*2 900	5 102	4 025	3 258	2 071
3 000	2 872	2 256	1 819	1 147	3 000	3 744	2 949	2 384	1 511	*3 000	3 139	2 484	2 016	1 290	3 000	5 278	4 164	3 371	2 143

* Marked dimensions might be subjects to special delivery conditions - please consult your retailer.

BASIC TECHNICAL DATA - HEIGHT 300 mm

TYPE 21 K, VK, VKS					TYPE 22 K, VK, VKS					TYPE 30 K, VK, VKS					TYPE 33 K, VK, VKS				
Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]
1 000	14,97	15,16	3,50	1,3239	1 000	17,13	17,33	3,50	1,3087	1 000	21,60	21,79	5,20	1,2831	1 000	25,31	25,50	5,20	1,3005

Φ [W] - heat output
 t_1 [°C] - input temperature of heat transferring media
 t_2 [°C] - output temperature of heat transferring media
 t_r [°C] - ambient temperature (= 20°C)

M_T^K [kg.m⁻¹] - Kompakt radiator body weight
 M_T^{VK} [kg.m⁻¹] - Ventil Kompakt radiator body weight
 V_T [dm³.m⁻¹] - water volume of radiator body
n [-] - temperature exponent

H = 400 mm

HEAT OUTPUTS Φ [W] AND BASIC TECHNICAL DATA



U. S. Steel Košice

TYPE 10 K, VK, VKS



TYPE 11 K, VK, VKS



TYPE 20 K, VK, VKS (65 mm)



TYPE 20W K, VK, VKS (100 mm)



HEAT OUTPUTS Φ [W] - HEIGHT 400 mm

TYPE 10 K, VK, VKS					TYPE 11 K, VK, VKS					TYPE 20 K, VK, VKS (65 mm)					TYPE 20W K, VK, VKS (100 mm)				
Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$			
	90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45
400	225	177	143	91	400	349	276	223	142	*400	351	279	227	146	*400	390	308	249	159
500	281	222	179	114	500	436	345	279	178	*500	439	349	284	182	*500	487	385	312	198
600	337	266	215	136	600	524	413	335	213	*600	527	418	340	219	*600	584	461	374	238
700	394	310	251	159	700	611	482	391	249	*700	615	488	397	255	*700	682	538	436	278
800	450	354	287	182	800	698	551	447	284	*800	703	558	454	292	*800	779	615	498	317
900	506	399	322	204	900	785	620	502	320	*900	791	627	510	328	*900	876	692	561	357
1 000	562	443	358	227	1 000	873	689	558	356	*1 000	878	697	567	364	*1 000	974	769	623	397
1 100	618	487	394	250	1 100	960	758	614	391	*1 100	966	767	624	401	*1 100	1 071	846	685	436
1 200	675	532	430	273	1 200	1 047	827	670	427	*1 200	1 054	836	680	437	*1 200	1 169	923	748	476
*1 300	731	576	466	295	*1 300	1 134	896	726	462	*1 300	1 142	906	737	474	*1 300	1 266	1 000	810	516
1 400	787	620	501	318	1 400	1 222	965	781	498	*1 400	1 230	976	794	510	*1 400	1 363	1 077	872	556
*1 500	843	665	537	341	*1 500	1 309	1 034	837	533	*1 500	1 318	1 046	851	547	*1 500	1 461	1 154	935	595
1 600	900	709	573	364	1 600	1 396	1 102	893	569	*1 600	1 406	1 115	907	583	*1 600	1 558	1 230	997	635
*1 700	956	753	609	386	*1 700	1 483	1 171	949	604	*1 700	1 493	1 185	964	620	*1 700	1 656	1 307	1 059	675
1 800	1 012	797	645	409	1 800	1 571	1 240	1 005	640	*1 800	1 581	1 255	1 021	656	*1 800	1 753	1 384	1 121	714
*1 900	1 068	842	681	432	*1 900	1 658	1 309	1 061	675	*1 900	1 669	1 324	1 077	692	*1 900	1 850	1 461	1 184	754
2 000	1 124	886	716	454	2 000	1 745	1 378	1 116	711	*2 000	1 757	1 394	1 134	729	*2 000	1 948	1 538	1 246	794
*2 100	1 181	930	752	477						*2 100	1 845	1 464	1 191	765	*2 100	2 045	1 615	1 308	833
*2 200	1 237	975	788	500						*2 200	1 933	1 533	1 248	802	*2 200	2 142	1 692	1 371	873
*2 300	1 293	1 019	824	523						*2 300	2 021	1 603	1 304	838	*2 300	2 240	1 769	1 433	913
*2 400	1 349	1 063	860	545						*2 400	2 108	1 673	1 361	875	*2 400	2 337	1 846	1 495	952
*2 500	1 406	1 108	896	568						*2 500	2 196	1 743	1 418	911	*2 500	2 435	1 923	1 558	992
*2 600	1 462	1 152	931	591						*2 600	2 284	1 812	1 474	948	*2 600	2 532	1 999	1 620	1 032
*2 700	1 518	1 196	967	613						*2 700	2 372	1 882	1 531	984	*2 700	2 629	2 076	1 682	1 071
*2 800	1 574	1 240	1 003	636						*2 800	2 460	1 952	1 588	1 020	*2 800	2 727	2 153	1 744	1 111
*2 900	1 630	1 285	1 039	659						*2 900	2 548	2 021	1 645	1 057	*2 900	2 824	2 230	1 807	1 151
*3 000	1 687	1 329	1 075	682						*3 000	2 635	2 091	1 701	1 093	*3 000	2 922	2 307	1 869	1 190

* Marked dimensions might be subjects to special delivery conditions - please consult your retailer.

BASIC TECHNICAL DATA - HEIGHT 400 mm

TYPE 10 K, VK, VKS					TYPE 11 K, VK, VKS					TYPE 20 K, VK, VKS (65 mm)					TYPE 20W K, VK, VKS (100 mm)				
Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]
1 000	8,60	8,84	2,24	1,3072	1 000	13,70	13,94	2,24	1,2953	1 000	17,70	17,94	4,37	1,2693	1 000	17,70	17,94	4,37	1,2953

Radiators of type 11, radiators with bottom middle connection (VKS) and radiators with flat front panel (Plan) are manufactured only to 2 000 mm of length.

Heat output conversion table for different heat drop t_1 / t_2 and different ambient temperature t_r - see page 24.

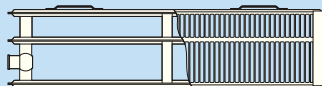
TYPE 21 K, VK, VKS



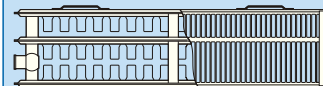
TYPE 22 K, VK, VKS



TYPE 30 K, VK, VKS



TYPE 33 K, VK, VKS

HEAT OUTPUTS Φ [W] - HEIGHT 400 mm

TYPE 21 K, VK, VKS					TYPE 22 K, VK, VKS					TYPE 30 K, VK, VKS					TYPE 33 K, VK, VKS				
Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$			
	90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45
400	478	375	302	190	400	627	493	398	252	*400	529	418	338	216	400	890	700	566	358
500	597	469	377	237	500	784	617	498	315	*500	661	522	423	270	500	1 113	876	707	447
600	717	562	453	284	600	941	740	597	378	*600	793	626	508	323	600	1 335	1 051	848	537
700	836	656	528	332	700	1 097	863	697	440	*700	925	731	592	377	700	1 558	1 226	990	626
800	956	750	604	379	800	1 254	986	796	503	*800	1 057	835	677	431	800	1 780	1 401	1 131	716
900	1 075	843	679	427	900	1 411	1 110	896	566	*900	1 190	940	761	485	900	2 003	1 576	1 273	805
1 000	1 195	937	754	474	1 000	1 568	1 233	995	629	*1 000	1 322	1 044	846	539	1 000	2 225	1 751	1 414	894
1 100	1 314	1 031	830	521	1 100	1 724	1 356	1 095	692	*1 100	1 454	1 148	931	593	1 100	2 448	1 926	1 555	984
1 200	1 434	1 124	905	569	1 200	1 881	1 480	1 195	755	*1 200	1 586	1 253	1 015	647	1 200	2 671	2 101	1 697	1 073
*1 300	1 553	1 218	981	616	*1 300	2 038	1 603	1 294	818	*1 300	1 718	1 357	1 100	701	*1 300	2 893	2 276	1 838	1 163
1 400	1 673	1 312	1 056	664	1 400	2 195	1 726	1 394	881	*1 400	1 850	1 462	1 184	755	1 400	3 116	2 451	1 980	1 252
*1 500	1 792	1 406	1 132	711	*1 500	2 351	1 850	1 493	944	*1 500	1 983	1 566	1 269	809	*1 500	3 338	2 627	2 121	1 342
1 600	1 912	1 499	1 207	759	1 600	2 508	1 973	1 593	1 007	*1 600	2 115	1 670	1 354	863	1 600	3 561	2 802	2 262	1 431
*1 700	2 031	1 593	1 282	806	*1 700	2 665	2 096	1 692	1 070	*1 700	2 247	1 775	1 438	916	*1 700	3 783	2 977	2 404	1 520
1 800	2 151	1 687	1 358	853	1 800	2 822	2 219	1 792	1 133	*1 800	2 379	1 879	1 523	970	1 800	4 006	3 152	2 545	1 610
*1 900	2 270	1 780	1 433	901	*1 900	2 978	2 343	1 891	1 196	*1 900	2 511	1 984	1 607	1 024	*1 900	4 228	3 327	2 687	1 699
2 000	2 390	1 874	1 509	948	2 000	3 135	2 466	1 991	1 259	*2 000	2 644	2 088	1 692	1 078	2 000	4 451	3 502	2 828	1 789
*2 100	2 509	1 968	1 584	996	*2 100	3 292	2 589	2 090	1 321	*2 100	2 776	2 192	1 777	1 132	*2 100	4 673	3 677	2 970	1 878
*2 200	2 629	2 061	1 660	1 043	*2 200	3 449	2 713	2 190	1 384	*2 200	2 908	2 297	1 861	1 186	*2 200	4 896	3 852	3 111	1 968
2 300	2 748	2 155	1 735	1 090	2 300	3 605	2 836	2 290	1 447	*2 300	3 040	2 401	1 946	1 240	2 300	5 119	4 027	3 252	2 057
*2 400	2 868	2 249	1 811	1 138	*2 400	3 762	2 959	2 389	1 510	*2 400	3 172	2 506	2 030	1 294	*2 400	5 341	4 202	3 394	2 147
*2 500	2 987	2 343	1 886	1 185	*2 500	3 919	3 083	2 489	1 573	*2 500	3 304	2 610	2 115	1 348	*2 500	5 564	4 378	3 535	2 236
2 600	3 107	2 436	1 961	1 233	2 600	4 076	3 206	2 588	1 636	*2 600	3 437	2 714	2 200	1 402	2 600	5 786	4 553	3 677	2 325
*2 700	3 226	2 530	2 037	1 280	*2 700	4 232	3 329	2 688	1 699	*2 700	3 569	2 819	2 284	1 456	*2 700	6 009	4 728	3 818	2 415
*2 800	3 346	2 624	2 112	1 327	*2 800	4 389	3 452	2 787	1 762	*2 800	3 701	2 923	2 369	1 509	*2 800	6 231	4 903	3 959	2 504
*2 900	3 465	2 717	2 188	1 375	*2 900	4 546	3 576	2 887	1 825	*2 900	3 833	3 028	2 453	1 563	*2 900	6 454	5 078	4 101	2 594
3 000	3 585	2 811	2 263	1 422	3 000	4 703	3 699	2 986	1 888	*3 000	3 965	3 132	2 538	1 617	3 000	6 676	5 253	4 242	2 683

* Marked dimensions might be subjects to special delivery conditions - please consult your retailer.

BASIC TECHNICAL DATA - HEIGHT 400 mm

TYPE 21 K, VK, VKS					TYPE 22 K, VK, VKS					TYPE 30 K, VK, VKS					TYPE 33 K, VK, VKS				
Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]
1 000	19,46	19,70	4,37	1,3338	1 000	22,99	23,22	4,37	1,3168	1 000	27,39	27,61	6,53	1,2939	1 000	33,97	34,19	6,53	1,3151

Φ [W] - heat output
 t_1 [°C] - input temperature of heat transferring media
 t_2 [°C] - output temperature of heat transferring media
 t_r [°C] - ambient temperature (= 20°C)

M_T^K [kg.m⁻¹] - Kompakt radiator body weight
 M_T^{VK} [kg.m⁻¹] - Ventil Kompakt radiator body weight
 V_T [dm³.m⁻¹] - water volume of radiator body
n [-] - temperature exponent

H = 500 mm

HEAT OUTPUTS Φ [W] AND BASIC TECHNICAL DATA



U. S. Steel Košice

TYPE 10 K, VK, VKS



TYPE 11 K, VK, VKS



TYPE 20 K, VK, VKS (65 mm)



TYPE 20W K, VK, VKS (100 mm)



HEAT OUTPUTS Φ [W] - HEIGHT 500 mm

TYPE 10 K, VK, VKS					TYPE 11 K, VK, VKS					TYPE 20 K, VK, VKS (65 mm)					TYPE 20W K, VK, VKS (100 mm)				
Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$			
	90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45
400	272	214	174	111	400	419	330	268	170	400	420	333	270	173	400	467	368	298	189
500	339	268	217	138	500	523	413	334	213	500	525	416	338	217	500	583	460	372	237
600	407	322	261	166	600	628	496	401	255	600	630	499	406	260	600	700	552	447	284
700	475	375	304	194	700	733	578	468	298	700	735	582	473	304	700	816	644	521	331
800	543	429	347	221	800	837	661	535	340	800	840	666	541	347	800	933	736	596	379
900	611	482	391	249	900	942	743	602	383	900	945	749	609	390	900	1 050	828	670	426
1 000	679	536	434	276	1 000	1 047	826	669	425	1 000	1 050	832	676	434	1 000	1 166	920	745	473
1 100	747	590	478	304	1 100	1 151	909	736	468	1 100	1 155	915	744	477	1 100	1 283	1 012	819	521
1 200	815	643	521	332	1 200	1 256	991	803	510	1 200	1 260	998	811	520	1 200	1 400	1 104	894	568
*1 300	882	697	564	359	*1 300	1 361	1 074	869	553	*1 300	1 365	1 082	879	564	*1 300	1 516	1 196	968	615
1 400	950	750	608	387	1 400	1 466	1 156	936	595	1 400	1 470	1 165	947	607	1 400	1 633	1 288	1 043	663
*1 500	1 018	804	651	415	*1 500	1 570	1 239	1 003	638	*1 500	1 575	1 248	1 014	650	*1 500	1 749	1 380	1 117	710
1 600	1 086	858	695	442	1 600	1 675	1 322	1 070	681	1 600	1 680	1 331	1 082	694	1 600	1 866	1 472	1 191	757
*1 700	1 154	911	738	470	*1 700	1 780	1 404	1 137	723	*1 700	1 785	1 414	1 150	737	*1 700	1 983	1 564	1 266	805
1 800	1 222	965	782	498	1 800	1 884	1 487	1 204	766	1 800	1 890	1 498	1 217	781	1 800	2 099	1 656	1 340	852
*1 900	1 290	1 018	825	525	*1 900	1 989	1 569	1 271	808	*1 900	1 995	1 581	1 285	824	*1 900	2 216	1 748	1 415	899
2 000	1 358	1 072	868	553	2 000	2 094	1 652	1 338	851	2 000	2 100	1 664	1 352	867	2 000	2 333	1 840	1 489	947
*2 100	1 426	1 126	912	581						*2 100	2 205	1 747	1 420	911	*2 100	2 449	1 932	1 564	994
*2 200	1 493	1 179	955	608						*2 200	2 310	1 830	1 488	954	*2 200	2 566	2 024	1 638	1 041
*2 300	1 561	1 233	999	636						*2 300	2 415	1 914	1 555	997	*2 300	2 682	2 116	1 713	1 089
*2 400	1 629	1 286	1 042	664						*2 400	2 520	1 997	1 623	1 041	*2 400	2 799	2 208	1 787	1 136
*2 500	1 697	1 340	1 086	691						*2 500	2 625	2 080	1 691	1 084	*2 500	2 916	2 300	1 862	1 183
*2 600	1 765	1 394	1 129	719						*2 600	2 730	2 163	1 758	1 128	*2 600	3 032	2 392	1 936	1 231
*2 700	1 833	1 447	1 172	747						*2 700	2 835	2 246	1 826	1 171	*2 700	3 149	2 484	2 011	1 278
*2 800	1 901	1 501	1 216	774						*2 800	2 940	2 330	1 893	1 214	*2 800	3 266	2 576	2 085	1 325
*2 900	1 969	1 554	1 259	802						*2 900	3 045	2 413	1 961	1 258	*2 900	3 382	2 668	2 160	1 373
*3 000	2 037	1 608	1 303	829						*3 000	3 149	2 496	2 029	1 301	*3 000	3 499	2 760	2 234	1 420

* Marked dimensions might be subjects to special delivery conditions - please consult your retailer.

BASIC TECHNICAL DATA - HEIGHT 500 mm

TYPE 10 K, VK, VKS					TYPE 11 K, VK, VKS					TYPE 20 K, VK, VKS (65 mm)					TYPE 20W K, VK, VKS (100 mm)				
Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]
1 000	10,60	10,87	2,67	1,2958	1 000	17,05	17,32	2,67	1,2994	1 000	21,30	21,57	5,23	1,2755	1 000	21,30	21,57	5,23	1,3010

Radiators of type 11, radiators with bottom middle connection (VKS) and radiators with flat front panel (Plan) are manufactured only to 2 000 mm of length.

Heat output conversion table for different heat drop t_1 / t_2 and different ambient temperature t_r - see page 24.

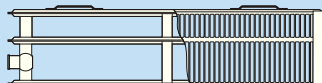
TYPE 21 K, VK, VKS



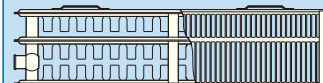
TYPE 22 K, VK, VKS



TYPE 30 K, VK, VKS



TYPE 33 K, VK, VKS

HEAT OUTPUTS Φ [W] - HEIGHT 500 mm

TYPE 21 K, VK, VKS					TYPE 22 K, VK, VKS					TYPE 30 K, VK, VKS					TYPE 33 K, VK, VKS				
Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$			
	90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45
400	570	446	359	225	400	749	588	474	299	400	636	501	405	257	400	1 066	836	674	424
500	712	558	448	281	500	936	735	593	374	500	795	627	507	322	500	1 332	1 046	842	530
600	855	669	538	337	600	1 123	882	711	448	600	954	752	608	386	600	1 599	1 255	1 011	636
700	997	781	627	393	700	1 310	1 029	830	523	700	1 113	877	710	450	700	1 865	1 464	1 179	742
800	1 140	892	717	449	800	1 497	1 176	948	598	800	1 272	1 002	811	515	800	2 132	1 673	1 348	848
900	1 282	1 004	807	505	900	1 685	1 323	1 067	672	900	1 431	1 128	912	579	900	2 398	1 882	1 516	954
1 000	1 425	1 115	896	561	1 000	1 872	1 470	1 185	747	1 000	1 590	1 253	1 014	643	1 000	2 665	2 091	1 685	1 060
1 100	1 567	1 227	986	617	1 100	2 059	1 617	1 304	822	1 100	1 748	1 378	1 115	708	1 100	2 931	2 300	1 853	1 166
1 200	1 709	1 338	1 076	674	1 200	2 246	1 764	1 422	896	1 200	1 907	1 504	1 216	772	1 200	3 198	2 509	2 022	1 272
*1 300	1 852	1 450	1 165	730	*1 300	2 433	1 911	1 541	971	*1 300	2 066	1 629	1 318	836	1 300	3 464	2 718	2 190	1 378
1 400	1 994	1 561	1 255	786	1 400	2 620	2 058	1 659	1 046	1 400	2 225	1 754	1 419	901	1 400	3 731	2 927	2 358	1 484
*1 500	2 137	1 673	1 344	842	*1 500	2 808	2 205	1 778	1 121	*1 500	2 384	1 880	1 520	965	1 500	3 997	3 137	2 527	1 590
1 600	2 279	1 784	1 434	898	1 600	2 995	2 352	1 896	1 195	1 600	2 543	2 005	1 622	1 029	1 600	4 264	3 346	2 695	1 696
*1 700	2 422	1 896	1 524	954	*1 700	3 182	2 499	2 015	1 270	*1 700	2 702	2 130	1 723	1 094	*1 700	4 530	3 555	2 864	1 802
1 800	2 564	2 007	1 613	1 010	1 800	3 369	2 646	2 133	1 345	1 800	2 861	2 255	1 824	1 158	1 800	4 796	3 764	3 032	1 908
*1 900	2 707	2 119	1 703	1 066	*1 900	3 556	2 793	2 252	1 419	*1 900	3 020	2 381	1 926	1 222	*1 900	5 063	3 973	3 201	2 014
2 000	2 849	2 230	1 793	1 123	2 000	3 743	2 940	2 370	1 494	2 000	3 179	2 506	2 027	1 287	2 000	5 329	4 182	3 369	2 120
*2 100	2 992	2 342	1 882	1 179	*2 100	3 931	3 087	2 489	1 569	*2 100	3 338	2 631	2 129	1 351	*2 100	5 596	4 391	3 538	2 226
*2 200	3 134	2 453	1 972	1 235	*2 200	4 118	3 234	2 607	1 644	*2 200	3 497	2 757	2 230	1 415	*2 200	5 862	4 600	3 706	2 332
2 300	3 276	2 565	2 061	1 291	2 300	4 305	3 381	2 726	1 718	2 300	3 656	2 882	2 331	1 480	2 300	6 129	4 809	3 875	2 438
*2 400	3 419	2 676	2 151	1 347	*2 400	4 492	3 528	2 845	1 793	*2 400	3 815	3 007	2 433	1 544	*2 400	6 395	5 018	4 043	2 544
*2 500	3 561	2 788	2 241	1 403	*2 500	4 679	3 675	2 963	1 868	*2 500	3 974	3 133	2 534	1 609	*2 500	6 662	5 228	4 211	2 650
2 600	3 704	2 899	2 330	1 459	2 600	4 866	3 822	3 082	1 942	2 600	4 133	3 258	2 635	1 673	2 600	6 928	5 437	4 380	2 756
*2 700	3 846	3 011	2 420	1 515	*2 700	5 054	3 969	3 200	2 017	*2 700	4 292	3 383	2 737	1 737	*2 700	7 195	5 646	4 548	2 862
*2 800	3 989	3 122	2 510	1 572	*2 800	5 241	4 116	3 319	2 092	*2 800	4 451	3 508	2 838	1 802	*2 800	7 461	5 855	4 717	2 968
*2 900	4 131	3 234	2 599	1 628	*2 900	5 428	4 263	3 437	2 167	*2 900	4 610	3 634	2 939	1 866	*2 900	7 728	6 064	4 885	3 074
3 000	4 274	3 345	2 689	1 684	3 000	5 615	4 410	3 556	2 241	*3 000	4 769	3 759	3 041	1 930	3 000	7 994	6 273	5 054	3 180

* Marked dimensions might be subjects to special delivery conditions - please consult your retailer.

BASIC TECHNICAL DATA - HEIGHT 500 mm

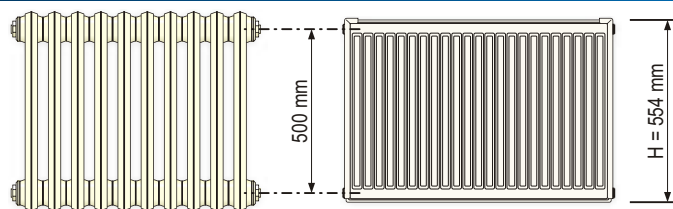
TYPE 21 K, VK, VKS					TYPE 22 K, VK, VKS					TYPE 30 K, VK, VKS					TYPE 33 K, VK, VKS				
Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]
1 000	23,98	24,25	5,23	1,3437	1 000	27,60	27,86	5,23	1,3250	1 000	33,17	33,43	7,87	1,304	1 000	40,70	40,95	7,87	1,3298

Φ [W] - heat output
 t_1 [°C] - input temperature of heat transferring media
 t_2 [°C] - output temperature of heat transferring media
 t_r [°C] - ambient temperature (= 20°C)

M_T^K [kg.m⁻¹] - Kompakt radiator body weight
 M_T^{VK} [kg.m⁻¹] - Ventil Kompakt radiator body weight
 V_T [dm³.m⁻¹] - water volume of radiator body
n [-] - temperature exponent

REPLACEMENT OF THE COLUMN RADIATORS WITH THE KORAD PANEL RADIATORS H 550

DIMENSIONS AND CONNECTIONS OF THE KORAD RADIATOR H 550



The KORAD H550 connection distance = 500 mm is equal to connection distance of many standard column radiators. It makes possible to minimize conduit adaptation works and replacement cost.

HEAT OUTPUTS OF THE COLUMN RADIATORS [W / 1column]

Heat drop input / output at 20°C	Width of column of cast iron radiator [mm]						Width of column of steel radiator [mm]			
	110	150	160	200	220	250	110	150	160	200
90 / 70 °C	90	105	120	134	150	169	90	105	120	134
75 / 65 °C	71	83	95	106	118	133	71	83	95	106

Presented heat outputs are informative and may not hold to all column radiator trademarks.

CONVERTER: CAST IRON COLUMN RADIATOR TO THE KORAD PANEL RADIATOR H = 550 mm

	Number of cast iron columns																								
	column width = 110 mm				column width = 150 mm				column width = 160 mm				column width = 200 mm				column width = 220 mm					column width = 250 mm			
400	6	8	7	12	5	7	6	10	5	6	5	9	4	6	5	8	4	5	4	7	3	4	4	6	400
500	8	11	9	15	7	9	8	13	6	8	7	11	5	7	6	10	5	6	5	9	4	5	5	8	500
600	10	13	11	19	8	11	9	16	7	10	8	14	6	9	7	12	6	8	6	11	5	7	6	10	600
700	11	15	13	22	10	13	11	19	8	11	10	16	7	10	9	14	7	9	8	13	6	8	7	11	700
800	13	17	15	25	11	15	13	21	10	13	11	19	9	12	10	17	8	10	9	15	7	9	8	13	800
900	15	20	17	28	13	17	14	24	11	15	12	21	10	13	11	19	9	12	10	17	8	10	9	15	900
1 000	17	22	19	31	14	19	16	27	12	16	14	23	11	15	12	21	10	13	11	19	9	11	10	17	1 000
1 200	20	26	23	38	17	23	19	32	15	20	17	28	13	18	15	25	12	16	13	23	10	14	12	20	1 200
1 400	23	31	26	44	20	26	22	38	17	23	20	33	15	21	18	29	14	18	16	26	12	16	14	23	1 400
1 600	27	35	30	51	23	30	26	43	20	26	22	38	18	24	20	34	16	21	18	30	14	19	16	27	1 600
1 800	30	40	34	57	26	34	29	49	22	30	25	42	20	27	23	38	18	24	20	34	16	21	18	30	1 800
2 000	34	44	38	63	29	38	32	54	25	33	28	47	22	30	25	42	20	27	23	38	18	23	20	34	2 000
2 200	37	49			32	42			27	36			25	33			22	29			19	26			2 200
2 400	40	53			34	46			30	40			27	36			24	32			21	28			2 400
2 600	44	58			37	49			33	43			29	39			26	35			23	31			2 600
2 800	47	62			40	53			35	46			31	42			28	37			25	33			2 800
3 000	51	67			43	57			38	50			34	45			30	40			27	35			3 000
Length [mm]	21	22	30	33	21	22	30	33	21	22	30	33	21	22	30	33	21	22	30	33	21	22	30	33	Length [mm]
Type of radiator																									

CONVERTER: STEEL COLUMN RADIATOR TO THE KORAD PANEL RADIATOR H = 550 mm

	Number of steel columns																
	column width = 150 mm				column width = 160 mm				column width = 200 mm				column width = 220 mm				
400	6	8	7	12	6	8	7	12	5	7	6	10	5	6	5	9	400
500	8	11	9	15	8	10	9	15	6	9	7	13	6	8	7	11	500
600	10	13	11	19	9	13	11	18	8	10	9	15	7	10	8	14	600
700	11	15	13	22	11	15	13	21	9	12	10	18	8	11	10	16	700
800	13	17	15	25	13	17	14	24	11	14	12	20	10	13	11	19	800
900	15	20	17	28	14	19	16	27	12	16	14	23	11	15	12	21	900
1 000	17	22	19	31	16	21	18	31	13	18	15	26	12	16	14	23	1 000
1 200	20	26	23	38	19	26	22	37	16	21	18	31	15	20	17	28	1 200
1 400	23	31	26	44	23	30	26	43	19	25	21	36	17	23	20	33	1 400
1 600	27	35	30	51	26	34	29	49	22	29	25	41	20	26	22	38	1 600
1 800	30	40	34	57	29	39	33	55	24	32	28	46	22	30	25	42	1 800
2 000	34	44	38	63	33	43	37	62	27	36	31	52	25	33	28	47	2 000
2 200	37	49			36	48			30	40			27	36			2 200
2 400	40	53			39	52			33	43			30	40			2 400
2 600	44	58			43	56			36	47			33	43			2 600
2 800	47	62			46	61			38	51			35	46			2 800
3 000	51	67			49	65			41	54			38	50			3 000
Length [mm]	21	22	30	33	21	22	30	33	21	22	30	33	21	22	30	33	Length [mm]
Type of radiator																	

LEGEND - CONVERTER

	column width = 110 mm				
400	6	8	7	12	D
500	8	11	9	15	
600	10	13	11	19	
700	11	15	13	22	
2 800	47	62			
3 000	51	67			C
Length [mm]	21	22	30	33	
Type of radiator					A

A Type and dimensions of the old column radiator

B Number of columns of the old radiator

C Type of the new KORAD panel radiator H 550 mm

D Length of the new KORAD panel radiator H 550 mm

How to work with conversion tables:

Find the width of column radiator in the table for cast iron or steel radiator (A). Find required type of the KORAD radiator in bottom line (C). In the bar above, find the number of the radiator columns (or next higher number) (B). Read out corresponding length of the KORAD radiator in the left-rightmost bar (D).

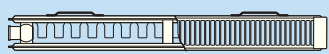
Example: find a replacement for an old cast iron radiator, width = 110 mm, number of columns = 13.

Solution: choose a preferable type of the KORAD radiator (e.g. type 22). Find value 13 in column 22 of corresponding table.

Read out appropriate length of the KORAD radiator = 600 mm.

Suitable replacement for the above cast iron radiator is hence KORAD 22K 550/600.

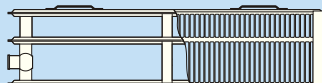
TYPE 21 K, VK, VKS



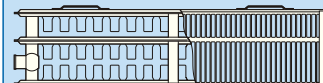
TYPE 22 K, VK, VKS



TYPE 30 K, VK, VKS



TYPE 33 K, VK, VKS

HEAT OUTPUTS Φ [W] - HEIGHT 550 mm

TYPE 21 K, VK, VKS					TYPE 22 K, VK, VKS					TYPE 30 K, VK, VKS					TYPE 33 K, VK, VKS				
Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$			
	90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45
400	617	483	389	244	400	812	638	514	324	400	692	545	441	280	400	1 156	906	729	458
500	771	604	486	304	500	1 015	797	643	405	500	865	682	551	350	500	1 445	1 133	912	572
600	926	725	583	365	600	1 218	956	771	486	600	1 038	818	661	420	600	1 734	1 359	1 094	687
700	1 080	846	680	426	700	1 421	1 116	900	567	700	1 210	954	772	490	700	2 023	1 586	1 276	801
800	1 234	966	777	487	800	1 624	1 275	1 028	648	800	1 383	1 090	882	560	800	2 312	1 812	1 458	916
900	1 388	1 087	874	548	900	1 827	1 435	1 157	729	900	1 556	1 227	992	630	900	2 601	2 039	1 641	1 030
1 000	1 543	1 208	971	609	1 000	2 030	1 594	1 285	810	1 000	1 729	1 363	1 102	700	1 000	2 890	2 265	1 823	1 145
1 200	1 851	1 450	1 166	731	1 200	2 435	1 913	1 542	972	1 200	2 075	1 636	1 323	840	1 200	3 467	2 718	2 188	1 374
1 400	2 160	1 691	1 360	852	1 400	2 841	2 232	1 799	1 134	1 400	2 421	1 908	1 543	980	1 400	4 045	3 171	2 552	1 603
1 600	2 468	1 933	1 554	974	1 600	3 247	2 550	2 056	1 296	1 600	2 767	2 181	1 764	1 120	1 600	4 623	3 624	2 917	1 832
1 800	2 777	2 174	1 749	1 096	1 800	3 653	2 869	2 313	1 458	1 800	3 113	2 453	1 984	1 259	1 800	5 201	4 077	3 281	2 061
2 000	3 085	2 416	1 943	1 218	2 000	4 059	3 188	2 570	1 620	2 000	3 458	2 726	2 205	1 399	2 000	5 779	4 530	3 646	2 290
*2 200	3 394	2 658	2 137	1 339	*2 200	4 465	3 507	2 827	1 782										
2 300	3 548	2 778	2 234	1 400	2 300	4 668	3 666	2 956	1 863										
*2 400	3 702	2 899	2 331	1 461	*2 400	4 871	3 826	3 085	1 944										
2 600	4 011	3 141	2 526	1 583	2 600	5 277	4 144	3 342	2 106										
*2 800	4 319	3 382	2 720	1 705	*2 800	5 683	4 463	3 599	2 268										
3 000	4 628	3 624	2 914	1 827	3 000	6 089	4 782	3 856	2 430										

* Marked dimensions might be subjects to special delivery conditions - please consult your retailer.

BASIC TECHNICAL DATA - HEIGHT 550 mm

TYPE 21 K, VK, VKS					TYPE 22 K, VK, VKS					TYPE 30 K, VK, VKS					TYPE 33 K, VK, VKS				
Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n [-]
1 000	27,00	-	5,30	1,2776	1 000	31,20	-	5,30	1,3413	1 000	35,95	-	8,15	1,3053	1 000	46,05	-	8,15	1,3357

Φ [W] - heat output
 t_1 [°C] - input temperature of heat transferring media
 t_2 [°C] - output temperature of heat transferring media
 t_r [°C] - ambient temperature (= 20°C)

M_T^K [kg.m⁻¹] - Kompakt radiator body weight
 M_T^{VK} [kg.m⁻¹] - Ventil Kompakt radiator body weight
 V_T [dm³.m⁻¹] - water volume of radiator body
n [-] - temperature exponent

H = 600 mm

HEAT OUTPUTS Φ [W] AND BASIC TECHNICAL DATA



U. S. Steel Košice

TYPE 10 K, VK, VKS



TYPE 11 K, VK, VKS



TYPE 20 K, VK, VKS (65 mm)



TYPE 20W K, VK, VKS (100 mm)



HEAT OUTPUTS Φ [W] - HEIGHT 600 mm

TYPE 10 K, VK, VKS					TYPE 11 K, VK, VKS					TYPE 20 K, VK, VKS (65 mm)					TYPE 20W K, VK, VKS (100 mm)				
Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$			
	90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45
400	314	248	202	129	400	487	384	311	197	400	488	386	314	201	400	542	427	345	219
500	392	311	252	161	500	609	480	388	247	500	610	483	392	251	500	678	534	432	274
600	471	373	302	193	600	731	576	466	296	600	732	580	471	301	600	813	641	518	329
700	549	435	353	226	700	852	672	544	345	700	854	676	549	351	700	949	748	605	384
800	628	497	403	258	800	974	768	621	395	800	976	773	627	402	800	1 084	854	691	438
900	706	559	454	290	900	1 096	864	699	444	900	1 098	869	706	452	900	1 220	961	777	493
1 000	785	621	504	322	1 000	1 218	960	777	493	1 000	1 220	966	784	502	1 000	1 355	1 068	864	548
1 100	863	683	554	354	1 100	1 339	1 056	854	543	1 100	1 342	1 063	863	552	1 100	1 491	1 175	950	603
1 200	942	745	605	387	1 200	1 461	1 152	932	592	1 200	1 464	1 159	941	602	1 200	1 626	1 282	1 036	657
*1 300	1 020	807	655	419	*1 300	1 583	1 248	1 010	641	*1 300	1 586	1 256	1 020	652	*1 300	1 762	1 388	1 123	712
1 400	1 099	869	706	451	1 400	1 705	1 344	1 087	691	1 400	1 708	1 352	1 098	703	1 400	1 897	1 495	1 209	767
*1 500	1 177	932	756	483	*1 500	1 826	1 440	1 165	740	*1 500	1 830	1 449	1 177	753	*1 500	2 033	1 602	1 296	822
1 600	1 256	994	806	516	1 600	1 948	1 536	1 243	789	1 600	1 953	1 546	1 255	803	1 600	2 168	1 709	1 382	877
*1 700	1 334	1 056	857	548	*1 700	2 070	1 632	1 320	839	*1 700	2 075	1 642	1 333	853	*1 700	2 304	1 816	1 468	931
1 800	1 413	1 118	907	580	1 800	2 192	1 728	1 398	888	1 800	2 197	1 739	1 412	903	1 800	2 440	1 922	1 555	986
*1 900	1 491	1 180	958	612	*1 900	2 313	1 824	1 476	937	*1 900	2 319	1 835	1 490	954	*1 900	2 575	2 029	1 641	1 041
2 000	1 570	1 242	1 008	644	2 000	2 435	1 920	1 553	987	2 000	2 441	1 932	1 569	1 004	2 000	2 711	2 136	1 727	1 096
*2 100	1 648	1 304	1 058	677	2 100					*2 100	2 563	2 029	1 647	1 054	*2 100	2 846	2 243	1 814	1 151
*2 200	1 727	1 366	1 109	709	2 200					*2 200	2 685	2 125	1 726	1 104	*2 200	2 982	2 350	1 900	1 205
*2 300	1 805	1 428	1 159	741	2 300					*2 300	2 807	2 222	1 804	1 154	*2 300	3 117	2 456	1 986	1 260
*2 400	1 884	1 490	1 210	773	2 400					*2 400	2 929	2 318	1 882	1 205	*2 400	3 253	2 563	2 073	1 315
*2 500	1 962	1 553	1 260	806	2 500					*2 500	3 051	2 415	1 961	1 255	*2 500	3 388	2 670	2 159	1 370
*2 600	2 041	1 615	1 310	838	2 600					*2 600	3 173	2 512	2 039	1 305	*2 600	3 524	2 777	2 246	1 425
*2 700	2 119	1 677	1 361	870	2 700					*2 700	3 295	2 608	2 118	1 355	*2 700	3 659	2 884	2 332	1 479
*2 800	2 198	1 739	1 411	902	2 800					*2 800	3 417	2 705	2 196	1 405	*2 800	3 795	2 990	2 418	1 534
*2 900	2 276	1 801	1 462	934	2 900					*2 900	3 539	2 801	2 275	1 455	*2 900	3 930	3 097	2 505	1 589
*3 000	2 355	1 863	1 512	967	3 000					*3 000	3 661	2 898	2 353	1 506	*3 000	4 066	3 204	2 591	1 644

* Marked dimensions might be subjects to special delivery conditions - please consult your retailer.

BASIC TECHNICAL DATA - HEIGHT 600 mm

TYPE 10 K, VK, VKS					TYPE 11 K, VK, VKS					TYPE 20 K, VK, VKS (65 mm)					TYPE 20W K, VK, VKS (100 mm)				
Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]
1 000	12,53	12,83	3,10	1,2843	1 000	19,95	20,25	3,10	1,3035	1 000	25,45	25,76	6,10	1,2818	1 000	25,45	25,76	6,10	1,3066

Radiators of type 11, radiators with bottom middle connection (VKS) and radiators with flat front panel (Plan) are manufactured only to 2 000 mm of length.

Heat output conversion table for different heat drop t_1 / t_2 and different ambient temperature t_r - see page 24.

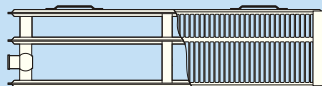
TYPE 21 K, VK, VKS



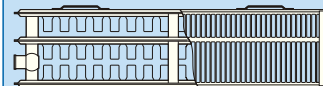
TYPE 22 K, VK, VKS



TYPE 30 K, VK, VKS



TYPE 33 K, VK, VKS

HEAT OUTPUTS Φ [W] - HEIGHT 600 mm

TYPE 21 K, VK, VKS					TYPE 22 K, VK, VKS					TYPE 30 K, VK, VKS					TYPE 33 K, VK, VKS				
Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$			
	90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45
400	659	515	413	258	400	866	679	547	344	400	740	582	470	297	400	1 232	964	775	485
500	824	644	516	322	500	1 083	849	684	430	500	925	728	587	372	500	1 540	1 205	968	606
600	988	772	620	387	600	1 299	1 019	820	516	600	1 110	873	705	446	600	1 848	1 446	1 162	728
700	1 153	901	723	451	700	1 516	1 189	957	602	700	1 295	1 019	822	520	700	2 156	1 687	1 356	849
800	1 318	1 030	826	516	800	1 732	1 358	1 094	688	800	1 480	1 164	940	594	800	2 464	1 928	1 550	970
900	1 483	1 158	930	580	900	1 949	1 528	1 231	773	900	1 664	1 310	1 057	669	900	2 771	2 169	1 743	1 091
1 000	1 647	1 287	1 033	645	1 000	2 165	1 698	1 367	859	1 000	1 849	1 455	1 175	743	1 000	3 079	2 410	1 937	1 213
1 100	1 812	1 416	1 136	709	1 100	2 382	1 868	1 504	945	1 100	2 034	1 601	1 292	817	1 100	3 387	2 651	2 131	1 334
1 200	1 977	1 544	1 239	774	1 200	2 598	2 038	1 641	1 031	1 200	2 219	1 746	1 410	892	1 200	3 695	2 892	2 324	1 455
*1 300	2 141	1 673	1 343	838	1 300	2 815	2 207	1 777	1 117	*1 300	2 404	1 892	1 527	966	1 300	4 003	3 133	2 518	1 577
1 400	2 306	1 802	1 446	902	1 400	3 031	2 377	1 914	1 203	1 400	2 589	2 037	1 645	1 040	1 400	4 311	3 374	2 712	1 698
*1 500	2 471	1 931	1 549	967	1 500	3 248	2 547	2 051	1 289	*1 500	2 774	2 183	1 762	1 115	1 500	4 619	3 615	2 905	1 819
1 600	2 636	2 059	1 653	1 031	1 600	3 464	2 717	2 188	1 375	1 600	2 959	2 328	1 880	1 189	1 600	4 927	3 856	3 099	1 940
*1 700	2 800	2 188	1 756	1 096	*1 700	3 681	2 887	2 324	1 461	*1 700	3 144	2 474	1 997	1 263	*1 700	5 235	4 097	3 293	2 062
1 800	2 965	2 317	1 859	1 160	1 800	3 897	3 056	2 461	1 547	1 800	3 329	2 619	2 115	1 337	1 800	5 543	4 338	3 487	2 183
*1 900	3 130	2 445	1 962	1 225	*1 900	4 114	3 226	2 598	1 633	*1 900	3 514	2 765	2 232	1 412	*1 900	5 851	4 579	3 680	2 304
2 000	3 294	2 574	2 066	1 289	2 000	4 330	3 396	2 734	1 719	2 000	3 699	2 910	2 350	1 486	2 000	6 159	4 820	3 874	2 425
*2 100	3 459	2 703	2 169	1 354	*2 100	4 547	3 566	2 871	1 805	*2 100	3 884	3 056	2 467	1 560	*2 100	6 467	5 061	4 068	2 547
*2 200	3 624	2 831	2 272	1 418	*2 200	4 763	3 736	3 008	1 891	*2 200	4 069	3 201	2 585	1 635	*2 200	6 775	5 302	4 261	2 668
2 300	3 789	2 960	2 376	1 483	2 300	4 980	3 905	3 145	1 977	2 300	4 254	3 347	2 702	1 709	2 300	7 083	5 543	4 455	2 789
*2 400	3 953	3 089	2 479	1 547	*2 400	5 196	4 075	3 281	2 063	*2 400	4 439	3 492	2 820	1 783	*2 400	7 391	5 784	4 649	2 911
*2 500	4 118	3 218	2 582	1 611	*2 500	5 413	4 245	3 418	2 148	*2 500	4 624	3 638	2 937	1 858	*2 500	7 699	6 025	4 842	3 032
2 600	4 283	3 346	2 685	1 676	2 600	5 629	4 415	3 555	2 234	2 600	4 808	3 783	3 055	1 932	2 600	8 006	6 266	5 036	3 153
*2 700	4 448	3 475	2 789	1 740	*2 700	5 846	4 585	3 692	2 320	*2 700	4 993	3 929	3 172	2 006	*2 700	8 314	6 507	5 230	3 274
*2 800	4 612	3 604	2 892	1 805	*2 800	6 063	4 754	3 828	2 406	*2 800	5 178	4 074	3 290	2 080	*2 800	8 622	6 748	5 424	3 396
*2 900	4 777	3 732	2 995	1 869	*2 900	6 279	4 924	3 965	2 492	*2 900	5 363	4 220	3 407	2 155	*2 900	8 930	6 989	5 617	3 517
3 000	4 942	3 861	3 099	1 934	3 000	6 496	5 094	4 102	2 578	*3 000	5 548	4 365	3 525	2 229	3 000	9 238	7 230	5 811	3 638

* Marked dimensions might be subjects to special delivery conditions - please consult your retailer.

BASIC TECHNICAL DATA - HEIGHT 600 mm

TYPE 21 K, VK, VKS					TYPE 22 K, VK, VKS					TYPE 30 K, VK, VKS					TYPE 33 K, VK, VKS				
Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]
1 000	28,50	28,81	6,10	1,3536	1 000	32,75	33,03	6,10	1,3331	1 000	38,96	39,25	9,20	1,3156	1 000	48,72	49,00	9,20	1,3444

Φ [W] - heat output
 t_1 [°C] - input temperature of heat transferring media
 t_2 [°C] - output temperature of heat transferring media
 t_r [°C] - ambient temperature (= 20°C)

M_T^K [kg.m⁻¹] - Kompakt radiator body weight
 M_T^{VK} [kg.m⁻¹] - Ventil Kompakt radiator body weight
 V_T [dm³.m⁻¹] - water volume of radiator body
 n [-] - temperature exponent

H = 900 mm

HEAT OUTPUTS Φ [W] AND BASIC TECHNICAL DATA



U. S. Steel Košice

TYPE 10 K, VK, VKS



TYPE 11 K, VK, VKS



TYPE 20 K, VK, VKS (65 mm)



TYPE 20W K, VK, VKS (100 mm)



HEAT OUTPUTS Φ [W] - HEIGHT 900 mm

TYPE 10 K, VK, VKS					TYPE 11 K, VK, VKS					TYPE 20 K, VK, VKS (65 mm)					TYPE 20W K, VK, VKS (100 mm)				
Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$			
	90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45
400	422	332	268	169	400	685	538	434	274	400	695	548	443	281	400	763	600	484	306
500	527	415	334	211	500	856	673	542	342	500	869	685	553	351	500	953	750	606	383
600	633	497	401	253	600	1 027	807	651	410	600	1 043	821	664	421	600	1 144	900	727	459
700	738	580	468	295	700	1 198	942	759	479	700	1 217	958	775	491	700	1 335	1 050	848	536
800	844	663	535	338	800	1 370	1 076	868	547	800	1 391	1 095	885	561	800	1 525	1 200	969	613
900	949	746	602	380	900	1 541	1 211	976	616	900	1 564	1 232	996	631	900	1 716	1 350	1 090	689
1 000	1 055	829	669	422	1 000	1 712	1 345	1 085	684	1 000	1 738	1 369	1 107	701	1 000	1 907	1 500	1 211	766
1 100	1 160	912	736	464	1 100	1 883	1 480	1 193	752	1 100	1 912	1 506	1 217	771	1 100	2 098	1 650	1 332	842
1 200	1 266	995	803	506	1 200	2 055	1 614	1 302	821	1 200	2 086	1 643	1 328	842	1 200	2 288	1 800	1 453	919
*1 300	1 371	1 078	869	549	*1 300	2 226	1 749	1 410	889	*1 300	2 260	1 780	1 439	912	*1 300	2 479	1 950	1 574	995
1 400	1 477	1 161	936	591	1 400	2 397	1 883	1 519	958	1 400	2 433	1 917	1 549	982	1 400	2 670	2 100	1 696	1 072
*1 500	1 582	1 244	1 003	633	*1 500	2 568	2 018	1 627	1 026	*1 500	2 607	2 054	1 660	1 052	*1 500	2 860	2 250	1 817	1 149
1 600	1 688	1 326	1 070	675	1 600	2 739	2 152	1 735	1 094	1 600	2 781	2 190	1 771	1 122	1 600	3 051	2 400	1 938	1 225
*1 700	1 793	1 409	1 137	717	*1 700	2 911	2 287	1 844	1 163	*1 700	2 955	2 327	1 881	1 192	*1 700	3 242	2 550	2 059	1 302
1 800	1 899	1 492	1 204	760	1 800	3 082	2 421	1 952	1 231	1 800	3 129	2 464	1 992	1 262	1 800	3 432	2 700	2 180	1 378
*1 900	2 004	1 575	1 271	802	*1 900	3 253	2 556	2 061	1 300	*1 900	3 302	2 601	2 103	1 333	*1 900	3 623	2 850	2 301	1 455
2 000	2 110	1 658	1 338	844	2 000	3 424	2 690	2 169	1 368	2 000	3 476	2 738	2 213	1 403	2 000	3 814	3 000	2 422	1 532
*2 100	2 215	1 741	1 404	886	*2 100					*2 100	3 650	2 875	2 324	1 473	*2 100	4 004	3 150	2 543	1 608
*2 200	2 321	1 824	1 471	928	*2 200					*2 200	3 824	3 012	2 434	1 543	*2 200	4 195	3 300	2 664	1 685
*2 300	2 426	1 907	1 538	971	*2 300					*2 300	3 998	3 149	2 545	1 613	*2 300	4 386	3 450	2 786	1 761
*2 400	2 532	1 990	1 605	1 013	*2 400					*2 400	4 172	3 286	2 656	1 683	*2 400	4 576	3 600	2 907	1 838
*2 500	2 637	2 073	1 672	1 055	*2 500					*2 500	4 345	3 423	2 766	1 753	*2 500	4 767	3 750	3 028	1 914
*2 600	2 743	2 155	1 739	1 097	*2 600					*2 600	4 519	3 559	2 877	1 823	*2 600	4 958	3 900	3 149	1 991
*2 700	2 848	2 238	1 806	1 140	*2 700					*2 700	4 693	3 696	2 988	1 894	*2 700	5 148	4 050	3 270	2 068
*2 800	2 954	2 321	1 873	1 182	*2 800					*2 800	4 867	3 833	3 098	1 964	*2 800	5 339	4 200	3 391	2 144
*2 900	3 059	2 404	1 939	1 224	*2 900					*2 900	5 041	3 970	3 209	2 034	*2 900	5 530	4 350	3 512	2 221
*3 000	3 165	2 487	2 006	1 266	*3 000					*3 000	5 214	4 107	3 320	2 104	*3 000	5 720	4 500	3 633	2 297

* Marked dimensions might be subjects to special delivery conditions - please consult your retailer.

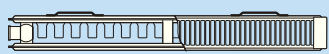
BASIC TECHNICAL DATA - HEIGHT 900 mm

TYPE 10 K, VK, VKS					TYPE 11 K, VK, VKS					TYPE 20 K, VK, VKS (65 mm)					TYPE 20W K, VK, VKS (100 mm)				
Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]
1 000	18,32	18,70	4,30	1,3216	1 000	29,47	29,85	4,30	1,3237	1 000	37,54	37,95	8,70	1,3094	1 000	37,54	37,95	8,70	1,3162

Radiators of type 11, radiators with bottom middle connection (VKS) and radiators with flat front panel (Plan) are manufactured only to 2 000 mm of length.

Heat output conversion table for different heat drop t_1 / t_2 and different ambient temperature t_r - see page 24.

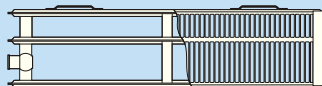
TYPE 21 K, VK, VKS



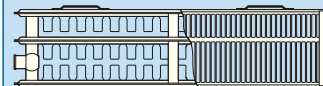
TYPE 22 K, VK, VKS



TYPE 30 K, VK, VKS



TYPE 33 K, VK, VKS

HEAT OUTPUTS Φ [W] - HEIGHT 900 mm

TYPE 21 K, VK, VKS					TYPE 22 K, VK, VKS					TYPE 30 K, VK, VKS					TYPE 33 K, VK, VKS				
Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$				Length [mm]	t_1 / t_2 [°C] for $t_r = 20^\circ\text{C}$			
	90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45		90/70	75/65	70/55	55/45
400	915	715	574	359	400	1 198	939	756	475	400	1 038	816	659	416	400	1 674	1 307	1 048	653
500	1 144	894	718	448	500	1 497	1 174	945	594	500	1 297	1 020	823	520	500	2 092	1 634	1 310	816
600	1 372	1 073	861	538	600	1 797	1 409	1 134	712	600	1 557	1 224	988	624	600	2 511	1 960	1 572	980
700	1 601	1 252	1 005	628	700	2 096	1 644	1 323	831	700	1 816	1 428	1 152	728	700	2 929	2 287	1 834	1 143
800	1 830	1 430	1 148	717	800	2 396	1 878	1 512	950	800	2 076	1 632	1 317	832	800	3 348	2 614	2 096	1 306
900	2 059	1 609	1 292	807	900	2 695	2 113	1 701	1 069	900	2 335	1 836	1 482	936	900	3 766	2 940	2 358	1 469
1 000	2 287	1 788	1 436	897	1 000	2 995	2 348	1 890	1 187	1 000	2 595	2 040	1 646	1 040	1 000	4 185	3 267	2 620	1 633
1 100	2 516	1 967	1 579	987	1 100	3 294	2 583	2 079	1 306	1 100	2 854	2 244	1 811	1 144	1 100	4 603	3 594	2 882	1 796
1 200	2 745	2 146	1 723	1 076	1 200	3 594	2 818	2 268	1 425	1 200	3 114	2 448	1 976	1 248	1 200	5 022	3 920	3 144	1 959
*1 300	2 973	2 324	1 866	1 166	1 300	3 893	3 052	2 457	1 544	*1 300	3 373	2 652	2 140	1 352	1 300	5 440	4 247	3 406	2 122
1 400	3 202	2 503	2 010	1 256	1 400	4 193	3 287	2 646	1 662	1 400	3 633	2 856	2 305	1 456	1 400	5 859	4 574	3 668	2 286
*1 500	3 431	2 682	2 153	1 345	1 500	4 492	3 522	2 835	1 781	*1 500	3 892	3 060	2 470	1 560	1 500	6 277	4 901	3 930	2 449
1 600	3 660	2 861	2 297	1 435	1 600	4 792	3 757	3 024	1 900	1 600	4 152	3 264	2 634	1 664	1 600	6 696	5 227	4 192	2 612
*1 700	3 888	3 040	2 441	1 525	*1 700	5 091	3 992	3 213	2 018	*1 700	4 411	3 468	2 799	1 768	*1 700	7 114	5 554	4 454	2 775
1 800	4 117	3 218	2 584	1 614	1 800	5 391	4 226	3 402	2 137	1 800	4 670	3 672	2 963	1 872	1 800	7 533	5 881	4 716	2 939
*1 900	4 346	3 397	2 728	1 704	*1 900	5 690	4 461	3 591	2 256	*1 900	4 930	3 876	3 128	1 976	*1 900	7 951	6 207	4 978	3 102
2 000	4 575	3 576	2 871	1 794	2 000	5 990	4 696	3 780	2 375	2 000	5 189	4 080	3 293	2 080	2 000	8 370	6 534	5 240	3 265
*2 100	4 803	3 755	3 015	1 883	*2 100	6 289	4 931	3 969	2 493	*2 100	5 449	4 284	3 457	2 184	*2 100	8 788	6 861	5 502	3 428
*2 200	5 032	3 934	3 158	1 973	*2 200	6 589	5 166	4 158	2 612	*2 200	5 708	4 488	3 622	2 288	*2 200	9 207	7 187	5 764	3 592
2 300	5 261	4 112	3 302	2 063	2 300	6 888	5 400	4 347	2 731	2 300	5 968	4 692	3 787	2 392	2 300	9 625	7 514	6 026	3 755
*2 400	5 489	4 291	3 445	2 152	*2 400	7 188	5 635	4 536	2 850	*2 400	6 227	4 896	3 951	2 496	*2 400	10 044	7 841	6 288	3 918
*2 500	5 718	4 470	3 589	2 242	*2 500	7 487	5 870	4 725	2 968	*2 500	6 487	5 100	4 116	2 600	*2 500	10 462	8 168	6 550	4 081
2 600	5 947	4 649	3 733	2 332	2 600	7 787	6 105	4 914	3 087	2 600	6 746	5 304	4 280	2 704	2 600	10 881	8 494	6 812	4 245
*2 700	6 176	4 828	3 876	2 421	*2 700	8 086	6 340	5 103	3 206	*2 700	7 006	5 508	4 445	2 808	*2 700	11 299	8 821	7 074	4 408
*2 800	6 404	5 006	4 020	2 511	*2 800	8 386	6 574	5 292	3 325	*2 800	7 265	5 712	4 610	2 912	*2 800	11 718	9 148	7 336	4 571
*2 900	6 633	5 185	4 163	2 601	*2 900	8 685	6 809	5 481	3 443	*2 900	7 525	5 916	4 774	3 016	*2 900	12 136	9 474	7 598	4 735
3 000	6 862	5 364	4 307	2 691	3 000	8 985	7 044	5 670	3 562	*3 000	7 784	6 120	4 939	3 120	3 000	12 554	9 801	7 860	4 898

* Marked dimensions might be subjects to special delivery conditions - please consult your retailer.

BASIC TECHNICAL DATA - HEIGHT 900 mm

TYPE 21 K, VK, VKS					TYPE 22 K, VK, VKS					TYPE 30 K, VK, VKS					TYPE 33 K, VK, VKS				
Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]	Length [mm]	M _T ^K [kg.m ⁻¹]	M _T ^{VK} [kg.m ⁻¹]	V _T [dm ³ .m ⁻¹]	n [-]
1 000	42,59	43,00	8,70	1,3507	1 000	48,30	48,68	8,70	1,3348	1 000	56,34	56,72	13,00	1,3192	1 000	73,37	73,75	13,00	1,3580

Φ [W] - heat output
 t_1 [°C] - input temperature of heat transferring media
 t_2 [°C] - output temperature of heat transferring media
 t_r [°C] - ambient temperature (= 20°C)

M_T^K [kg.m⁻¹] - Kompakt radiator body weight
 M_T^{VK} [kg.m⁻¹] - Ventil Kompakt radiator body weight
 V_T [dm³.m⁻¹] - water volume of radiator body
n [-] - temperature exponent

CONVERSION FACTORS "F" FOR OTHER OPERATING CONDITIONS

t ₁ [°C]	t ₂ [°C]	Ambient temperature t _r [°C]							n = 1,3331
		10	12	15	18	20	22	24	
110	90	0,4568	0,4707	0,4929	0,5171	0,5344	0,5528	0,5722	EN 442: t ₁ [°C] = 75 t ₂ [°C] = 65 t _r [°C] = 20
110	80	0,4929	0,5141	0,5406	0,5695	0,5904	0,6127	0,6365	
105	90	0,4742	0,4891	0,5129	0,5389	0,5575	0,5773	0,5983	
105	80	0,5129	0,5300	0,5575	0,5877	0,6094	0,6387	0,6642	
105	70	0,5681	0,5890	0,6230	0,6607	0,6881	0,7177	0,7496	Example of valve pre-setting calculation is on page 25.
100	90	0,4929	0,5088	0,5344	0,5624	0,5824	0,6038	0,6266	
100	80	0,5344	0,5528	0,5824	0,6150	0,6386	0,6637	0,6907	
100	70	0,5904	0,6127	0,6491	0,6895	0,7189	0,7507	0,7851	
95	80	0,5575	0,5773	0,6094	0,6447	0,6703	0,6977	0,7271	
95	70	0,6094	0,6387	0,6777	0,7211	0,7529	0,7872	0,8244	
95	60	0,6881	0,7177	0,7666	0,8217	0,8625	0,9072	0,9562	
90	80	0,5824	0,6038	0,6386	0,6770	0,7049	0,7348	0,7671	
90	75	0,6094	0,6325	0,6703	0,7122	0,7427	0,7756	0,8112	
90	70	0,6386	0,6637	0,7049	0,7507	0,7842	0,8205	0,8598	
90	65	0,6777	0,7061	0,7529	0,8054	0,8442	0,8864	0,9326	
90	60	0,7189	0,7507	0,8034	0,8630	0,9072	0,9558	1,0091	
90	55	0,7666	0,8025	0,8625	0,9311	0,9826	1,0394	1,1025	
90	50	0,8224	0,8637	0,9332	1,0137	1,0748	1,1430	1,2196	
85	75	0,6386	0,6637	0,7049	0,7507	0,7842	0,8205	0,8598	
85	70	0,6703	0,6977	0,7427	0,7930	0,8300	0,8701	0,9138	
85	65	0,7049	0,7348	0,7842	0,8397	0,8899	0,9361	0,9866	
85	60	0,7529	0,7872	0,8442	0,9090	0,9573	1,0103	1,0688	
85	55	0,8034	0,8422	0,9072	0,9818	1,0379	1,1000	1,1691	
85	50	0,8625	0,9072	0,9826	1,0701	1,1367	1,2112	1,2953	
80	70	0,7049	0,7348	0,7842	0,8397	0,8807	0,9253	0,9739	
80	65	0,7427	0,7756	0,8300	0,8915	0,9370	0,9868	1,0414	
80	60	0,7842	0,8205	0,8899	0,9607	1,0137	1,0721	1,1367	
80	55	0,8442	0,8864	0,9573	1,0388	1,1004	1,1688	1,2452	
80	50	0,9072	0,9558	1,0379	1,1336	1,2067	1,2889	1,3817	
75	65	0,7842	0,8205	0,8807	0,9491	1,0000	1,0559	1,1176	
75	60	0,8300	0,8701	0,9370	1,0135	1,0708	1,1340	1,2040	
75	55	0,8899	0,9361	1,0137	1,1036	1,1717	1,2476	1,3327	
75	50	0,9573	1,0103	1,1004	1,2059	1,2868	1,3780	1,4816	
70	60	0,8807	0,9253	1,0000	1,0860	1,1508	1,2227	1,3029	
70	55	0,9370	0,9868	1,0708	1,1681	1,2419	1,3390	1,4349	
70	50	1,0137	1,0721	1,1717	1,2889	1,3793	1,4816	1,5983	
70	45	1,1004	1,1688	1,2868	1,4281	1,5388	1,6660	1,8137	
70	40	1,2067	1,2889	1,4329	1,6093	1,7506	1,9169	2,1154	
65	55	1,0000	1,0559	1,1508	1,2617	1,3465	1,4417	1,5495	
65	50	1,0708	1,1340	1,2419	1,3855	1,4876	1,6037	1,7370	
65	45	1,1717	1,2476	1,3793	1,5380	1,6630	1,8076	1,9764	
65	40	1,2868	1,3780	1,5388	1,7370	1,8968	2,0859	2,3128	
60	55	1,0708	1,1340	1,2419	1,3692	1,4674	1,5787	1,7055	
60	50	1,1508	1,2227	1,3465	1,4939	1,6088	1,7401	1,8913	
60	45	1,2419	1,3390	1,4876	1,6680	1,8113	1,9780	2,1741	
60	40	1,3793	1,4816	1,6630	1,8886	2,0719	2,2901	2,5540	
55	50	1,2419	1,3243	1,4674	1,6399	1,7758	1,9328	2,1156	
55	45	1,3465	1,4417	1,6088	1,8129	1,9758	2,1877	2,4205	
55	40	1,4876	1,6037	1,8113	2,0719	2,2857	2,5425	2,8561	
55	35	1,6630	1,8076	2,0719	2,4155	2,7078	3,0726	3,5407	
55	30	1,8968	2,0859	2,4443	2,9382	3,3871	3,9919	4,8591	
45	40	1,7758	1,9328	2,2188	2,5882	2,8994	3,2824	3,7638	
45	35	1,9758	2,1877	2,5540	3,0449	3,4750	4,0269	4,7582	
45	30	2,2857	2,5425	3,0403	3,7478	4,4106	5,3295	6,6924	
40	35	2,2188	2,4538	2,8994	3,5087	4,0532	4,7650	5,7920	
40	30	2,5540	2,8639	3,4750	4,3652	5,2199	6,4346	8,2919	
40	25	3,0403	3,4812	4,4106	5,9371	7,6598	10,7835	19,2984	

CHARACTERISTICS OF THE KORAD VK TYPE RADIATORS - VALVE PRE-SETTING CALCULATION

EXAMPLE

Adjust the valve pre-setting for KORAD radiator - type 22;
height = 600 mm, length = 1 000 mm in system with projected decrease of
water temperature 90 / 70 °C and pressure drop of 3 kPa.

Given parameters:

- heat output $\Phi = 2\,165\text{ W}$
- drop in water temperature $\Delta t = 20\text{ K [90/70 °C]}$
- pressure drop $\Delta p = 3\text{ kPa}$
- specific heat of water $C = 4186\text{ m}^2 \cdot \text{s}^{-2} \cdot \text{K}^{-1}$
- mass flow rate $M_w [\text{kg} \cdot \text{h}^{-1}]$

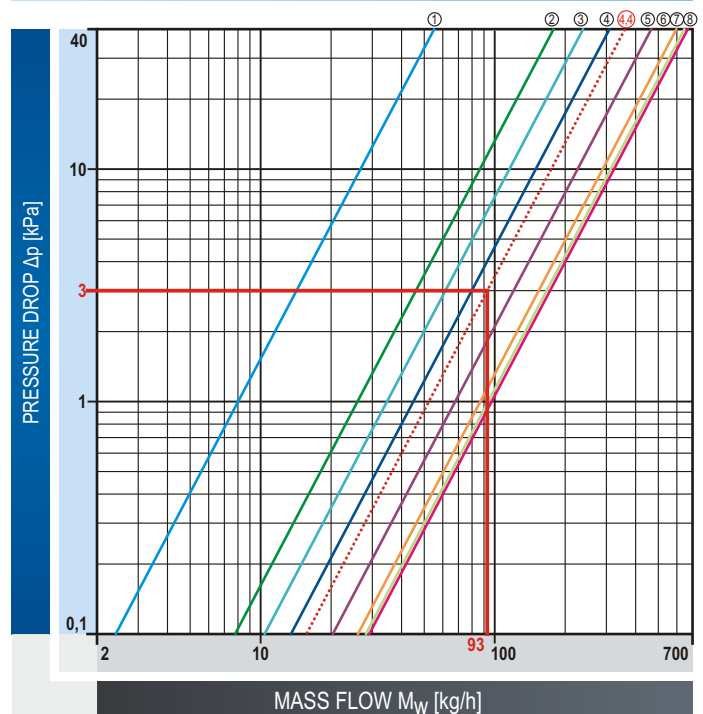
SOLUTION

$$M_w = \frac{\Phi}{C \cdot \Delta t} = \frac{2165}{4186 \cdot 20} \cdot 3600 \approx 93 [\text{kg} \cdot \text{h}^{-1}]$$



The valve insert Heimeier 4360 in addition to eight basic positions enables also fine adjustment of intermediate positions. This insert is fitted as a standard to the KORAD Ventil Kompakt radiators as part of delivery.

DIAGRAM $\Delta p - M_w - k_v$



On the above diagram $\Delta p - M_w - k_v$ draw intersection of mass flow value and pressure drop, then draw a parallel line with slant lines through the intersection. Read out the required valve pre-setting is : **4,4**.

RADIATOR PERFORMANCE CONVERSION TO OTHER OPERATING CONDITIONS

CALCULATION PROCEDURE

Heat outputs of radiators are applicable to basic operating conditions according to EN 442:

- input water temperature $t_1 = 75\text{ °C}$
- output water temperature $t_2 = 65\text{ °C}$
- reference air temperature $t_r = 20\text{ °C}$

For other operating conditions the conversion of heat outputs must be performed according to the following equation: $\Phi = \Phi_c \cdot f$

where: Φ [W] - calculated heat output (heat loss) of heating body at other operating conditions than those specified by EN 442

Φ_c [W] - calculated heat output of heating body at operating conditions according to EN 442.

f - a conversion factor for other operating conditions under the table

Find suitable radiator in tables of heat output Φ (pages 12 - 23) for operating conditions of 76/65/20 °C.

SOLUTION

For the operating conditions of 70/40/18 °C, the table states the following conversion factor $f = 1.6093$.

Calculation: $\Phi = 1150 \times 1,6093 = 1\,851\text{ W}$

Find the most suitable heating body in tables on pages 12 - 23 (operating conditions 75/65/20 °C) with heat output Φ closest to the value calculated above. The catalog of KORAD panel radiators offers the following radiators:

Type 11K, VK, VKS	600 x 1 800	1 942 W
Type 20 K, VK, VKS	600 x 2 000	1 932 W
Type 21 K, VK, VKS	600 x 1 500	1 931 W
Type 22 K, VK, VKS	600 x 1 100	1 868 W
Type 33 K, VK, VKS	600 x 800	1 928 W

For practical reasons, the search was limited to heating bodies with height of $H = 600\text{ mm}$.

EXAMPLE

Design a suitable KORAD heating body into a room with an ambient air temperature of 18 °C and with a heating system operated with a temperature gradient of 70/40 °C with calculated heat loss of 1 150W:

- input water temperature $t_1 = 70\text{ °C}$
- output water temperature $t_2 = 40\text{ °C}$
- reference air temperature $t_r = 18\text{ °C}$
- heat loss $\Phi_c = 1\,150\text{ W}$



Cross section of type 21 VKS.

RADIATORS WITH FLAT FRONT PANEL (TYPE PLAN)

TYPE 10 PLAN

H [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n	Φ_n [W.m ⁻¹] for $t_1/t_2; t_r = 20^\circ\text{C}$			
					90/70	75/65	70/55	55/45
300	9,38	9,59	1,81	1,2690	398	316	257	165
400	12,10	12,34	2,24	1,2674	502	399	325	209
500	14,98	15,25	2,67	1,2657	600	476	388	249
550	-	-	-	-	-	-	-	-
600	17,78	18,08	3,10	1,2649	690	548	446	287
900	26,20	26,58	4,30	1,2641	927	735	597	383

TYPE 11 PLAN

H [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n	Φ_n [W.m ⁻¹] for $t_1/t_2; t_r = 20^\circ\text{C}$			
					90/70	75/65	70/55	55/45
300	13,22	13,44	1,81	1,2790	639	506	411	263
400	17,20	17,44	2,24	1,2797	788	624	507	325
500	21,43	21,70	2,67	1,2804	936	741	602	385
550	-	-	-	-	-	-	-	-
600	25,20	25,50	3,10	1,2811	1086	860	698	447
900	37,34	37,72	4,30	1,2732	1560	1237	1006	646

TYPE 20W PLAN (width = 100 mm)

H [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n	Φ_n [W.m ⁻¹] for $t_1/t_2; t_r = 20^\circ\text{C}$			
					90/70	75/65	70/55	55/45
300	16,68	16,88	3,50	1,3088	710	559	452	287
400	21,20	21,44	4,37	1,3033	902	711	575	365
500	25,68	25,95	5,23	1,2977	1082	854	692	440
550	-	-	-	-	-	-	-	-
600	30,70	31,01	6,10	1,2918	1252	989	802	511
900	45,42	45,83	8,70	1,2659	1708	1356	1104	710

TYPE 20 PLAN (width = 65 mm)

H [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n	Φ_n [W.m ⁻¹] for $t_1/t_2; t_r = 20^\circ\text{C}$			
					90/70	75/65	70/55	55/45
300	16,68	16,88	3,50	1,2547	642	511	416	269
400	21,20	21,44	4,37	1,2595	811	645	525	339
500	25,68	25,95	5,23	1,2642	972	772	629	405
550	-	-	-	-	-	-	-	-
600	30,70	31,01	6,10	1,2668	1127	894	727	468
900	45,42	45,83	8,70	1,2956	1567	1237	1002	638

TYPE 21 PLAN

H [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n	Φ_n [W.m ⁻¹] for $t_1/t_2; t_r = 20^\circ\text{C}$			
					90/70	75/65	70/55	55/45
300	17,59	17,79	3,50	1,3015	883	697	564	358
400	22,96	23,20	4,37	1,3114	1086	855	691	438
500	28,36	28,63	5,23	1,3213	1280	1006	812	512
550	31,85	-	5,30	1,3640	1382	1085	875	551
600	33,75	34,06	6,10	1,3266	1469	1152	928	584
900	50,47	50,88	8,70	1,3312	2010	1575	1268	796

TYPE 22 PLAN

H [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n	Φ_n [W.m ⁻¹] for $t_1/t_2; t_r = 20^\circ\text{C}$			
					90/70	75/65	70/55	55/45
300	19,76	19,95	3,50	1,3036	1157	913	739	469
400	26,49	26,72	4,37	1,3121	1454	1146	927	588
500	31,98	32,23	5,23	1,3207	1732	1364	1103	699
550	36,05	-	5,30	1,3290	1875	1477	1193	756
600	38,00	38,28	6,10	1,3292	1995	1570	1268	803
900	56,17	56,56	8,70	1,3321	2708	2129	1718	1085

TYPE 30 PLAN

H [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n	Φ_n [W.m ⁻¹] for $t_1/t_2; t_r = 20^\circ\text{C}$			
					90/70	75/65	70/55	55/45
300	24,23	24,42	5,20	1,2911	993	785	636	406
400	30,89	31,11	6,53	1,2930	1243	982	796	507
500	37,55	37,80	7,87	1,2950	1484	1172	949	605
550	40,80	-	8,15	1,2960	1611	1272	1031	656
600	44,21	44,50	9,20	1,2969	1719	1357	1099	700
900	64,22	64,60	13,00	1,3116	2418	1904	1538	974

TYPE 33 PLAN

H [mm]	M_T^K [kg.m ⁻¹]	M_T^{VK} [kg.m ⁻¹]	V_T [dm ³ .m ⁻¹]	n	Φ_n [W.m ⁻¹] for $t_1/t_2; t_r = 20^\circ\text{C}$			
					90/70	75/65	70/55	55/45
300	27,94	26,13	5,20	1,3022	1648	1300	1052	668
400	37,47	37,69	6,53	1,3070	2073	1634	1321	838
500	45,07	45,33	7,87	1,3117	2477	1951	1576	998
550	50,90	-	8,15	1,3446	2689	2116	1709	1081
600	53,97	54,25	9,20	1,3143	2866	2255	1820	1151
900	81,25	81,63	13,00	1,3346	3969	3112	2505	1574

LEGEND

Φ [W] - heat output
 t_1 [°C] - input temperature of heat transferring media
 t_2 [°C] - output temperature of heat transferring media
 t_r [°C] - ambient temperature (= 20°C)

M_T^K [kg.m⁻¹] - Kompakt radiator body weight
 M_T^{VK} [kg.m⁻¹] - Ventil Kompakt radiator body weight
 V_T [dm³.m⁻¹] - water volume of radiator body
n [-] - temperature exponent

OPTIONAL SURFACE COLORS

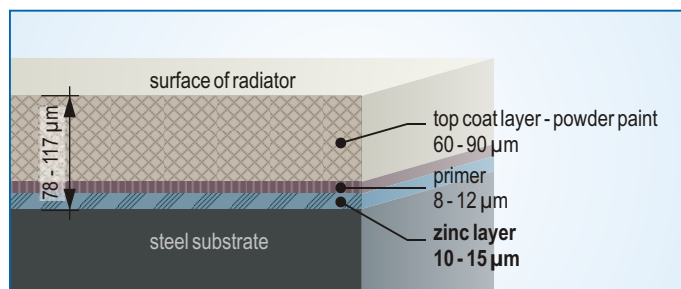
The depicted colours are for guidance only - use RAL Color Chart



GALVANIZED RADIATORS

Galvanized radiators are suitable for rooms with elevated humidity. The enhanced resistance against corrosion is due to an additional zinc layer 10 - 15 μm thick. The zinc layer is electro-galvanically applied directly to steel surface of radiator. After galvanization, the radiator obtains standard surface treatment; i.e. cathodically applied baking primer and top coat layers.

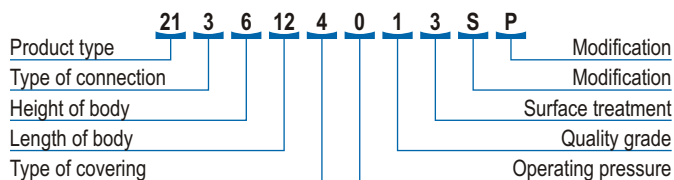
Due to characteristics of technology, galvanized radiators are manufactured in limited assortment - types without convectors (10, 20, 30) and length up to 2 000 mm.



LABELING OF PANEL RADIATORS

Each KORAD radiator is tagged with a bar code label indicating the date of production, the operating pressure and the type of radiator. Furthermore, a paper sheet with type, size and with warranty conditions is inserted under the protective foil.

Each radiator bears an alphanumeric code (see below):



EXAMPLE OF THE COMMERCIAL ORDER

2136124013SP - panel radiator type 21 VKS (Ventil Kompakt, central connection with a valve insert on the right side), height of 600 mm, length of 1 200 mm, with flat front panel.

2246122013 - panel radiator type 22K (Kompakt), side connections, height of 600 mm, length of 1 200 mm.

RADIATOR CODEBOOK

No.	Description	Designation
1.+ 2.	Type of product	1 st position: number of panels (1, 2, 3) 2 nd position: number of convectors (0, 1, 2, 3)
3.	Type of connection	4- type K 3- type VKP (right) 5- type VKL (left) 6- type VK without fixing tabs 8- type K without fixing tabs
4.	Height	3- 300 mm 1- 550 mm 4- 400 mm 6- 600 mm 5- 500 mm 9- 900 mm
5.+ 6.	Length	04-30 - (400-3000 mm) e.g. 12 = length 1200 mm
7.	Type of covering	0- without covers 2- with covers 4- with covers (narrow type 20, 21) 5- covers G (GU)
8.	Operating pressure	0- 1 MPa 6- sample (cross section) 2- 0,2 MPa 8- 0,8 MPa
9.	Quality grade	1- class I 2- class II
10.	Surface treatment *	0- without surface treatment 1- Zn-layer* only 2- primer only 3- standard surface (primer + coat RAL9010) 4- Zn-layer* + primer 5- Zn-layer* + primer + coat RAL9010 8- optional RAL (other than RAL9010)

Additional data (referred to when applied)

11.	Modification	S- middle connection U- narrow (type 20, 21 = 65mm) G- offset fixing tabs 0- auxiliary character
12.	Modification	P- flat front panel

* Zn-layer - the zinc layer applied electro-galvanically on steel surface.



U. S. Steel Košice, s.r.o. tel.: + 421 55 673 45 24
Vstupný areál U. S. Steel + 421 55 673 45 56
044 54 Košice fax: + 421 55 675 45 24
Slovak Republic + 421 55 673 62 81