

High-efficiency Heaters

Rakon

Article Group

● 1.09



KAMPMAN
Systems for heating · cooling · ventilating

High-efficiency heaters · Trench heating · Air handling units · Radiant panels · Split air conditioning systems

Kampmann – An Overview

System solutions for heating · cooling · ventilating

Kampmann is renowned both in Germany and abroad for its system-solutions.

For us, 'system-solutions' means:

We are not simply suppliers, but work closely with our colleagues in design, wholesale and contracting to develop tailor-made solutions from our wide product range. Our service starts at the design stage and continues once the products have been supplied.

Quality relies on experience. This is not an empty promise but constantly sets us new challenges. We meet the demands of our customers with state-of-the-art manufacturing technology and the know-how of our skilled and experienced staff.



This has resulted in our high quality standard. To this end we have introduced a quality management, as part of our work towards obtaining DIN EN ISO certification. This meets the requirements of EN 46001.

Kampmann is also renowned for its reliable delivery times, exceptional service and the reliability and efficiency of its products.

Kampmann products are to be found all around you: in the home and office, in schools, hospitals and public buildings. In hotels, restaurants and sport centres and in industrial and warehouse premises.

Good, clean air is one of our trademarks.

We would be happy to advise you on our complete range or alternatively arrange a site visit.

Contents

Rakon

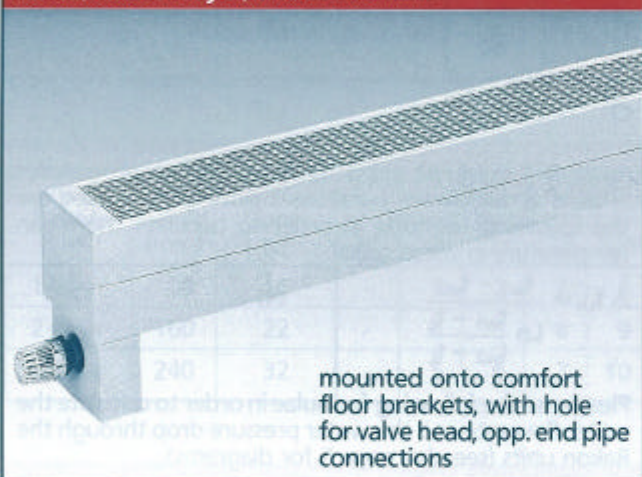
Description · Applications	3
Non-standard applications · Calculations	4
Hydraulic calculations	5
Brackets	6 + 7
Heat outputs	8 - 19

Printed on environmentally-friendly, non-chlorine bleached paper. All rights reserved. Reprinting of this brochure, in whole or part, is only permitted with our approval. Specifications are subject to change without notice. Edition 50/9/98/3.0 GB

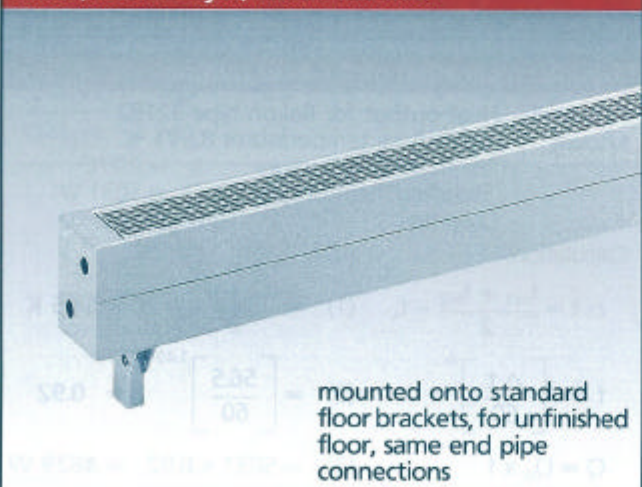
Rakon, single layer, width 246 mm



Rakon, double layer, width 178 mm



Rakon, double layer, width 128 mm



Description

Kampmann Rakons are very shallow attractive heating units which provide heat both by radiation and convection.

They are available in a large range of types and sizes to meet any individual application.

A top cover grille with oval air outlet openings is supplied as standard with our Rakon unit.

The extremely low water content of the units results in short heating-up periods and allows for controls which can react quickly to any temperature change.

Kampmann Rakons produce high outputs even with low water flow temperatures.

The 2 mm thickness of the external radiator wall enables an operating pressure of up to 4.0 bars to be maintained. For other operating pressures please refer to page 4.

Finishes

Rakons come as standard with a powder-coated finish in white, RAL 9016.

Light grey RAL 7035, off white RAL 9001 or white RAL 9010 are available at a surcharge. Other colours are available on request.

A primer finish is not available as the finish achievable on site has proven unsatisfactory.

Applications

Rakons are ideal for mounting along the perimeter of rooms, in front of large areas of glazing or under curtain walling. They are equally at home in domestic, commercial or industrial environments. The convective heat ensures an heat output in areas with highest heat losses with protection against cold draughts. Rakons can also reduce the risk of condensation on window surfaces.

Mixed installations with Rakons and other heat emitters are possible without any problems. Please refer to page 5 for the hydraulic calculations.

1.09 Rakon

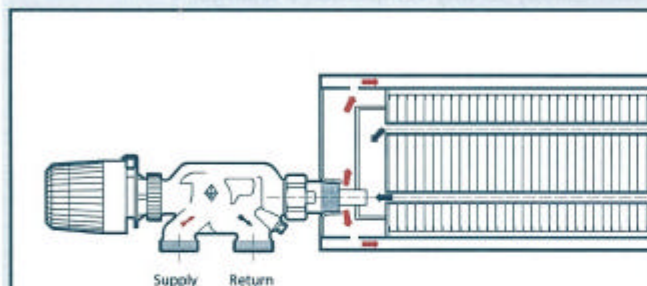
Stylish low-line heaters

Non-standard applications · Calculations

Single pipe connections

When using Rakon units in single pipe heating systems with special single pipe valve bodies, units are available with a special single pipe header. Please contact our office for a price calculation.

When ordering a Rakon with a special single pipe header please state details of single pipe valve incl. the diameter of the inner pipe. If no details are stated, the Rakon units will be supplied with 1/2" BSP fem pipe connections and for an 11 mm inner pipe diameter.



Please note: The special single pipe valve has been turned by 90° on this drawing.

Rakons for operating pressures of up to 12 bars

Rakon units can be used as standard for operating pressures of up to 4 bars. Special 'high' pressure Rakons are available on request.

Thickness of the rectangular external walls	Maximum operating pressure
2.5 mm	8 bars
3.0 mm	12 bars

Rakons for rooms with high humidity

Rakon units can be manufactured as special units for rooms with high humidity (swimming pools, greenhouses, etc.).

Types, dimensions and surcharges are available on request.

Rakons for low water flow temperatures

Modern low temperature or low condensing boilers reach their highest efficiency at low water flow temperatures.

All heat emitters change their heat output when the water flow temperatures are changed.

However, most heat emitters react differently to a water flow temperature change subject to their design details.

DIN testing does not only measure heat outputs under 'standard' conditions. An exponent 'n' is also determined to enable the engineer to calculate heat outputs at 'non-standard' temperatures.

Symbols

t_{w1}	[°C]	= Entering water flow temperature (EWT)
t_{w2}	[°C]	= Leaving water flow temperature (LWT)
t_L	[°C]	= Room air temperature (RT)
Δt_w	[K]	= Water flow temperature difference
Δt	[K]	= Mean temperature difference
Δt_{Ln}	[K]	= Logarithmic mean temperature difference
f	[/]	= Heat output correction factor
Q	[W]	= Heat output
Q_n	[W]	= 'Standard' heat output at EWT/LWT 90/ 70 °C
n	[/]	= Exponent
m	[l/h]	= Water flow rate

Formulae

Please use the following formulae in order to calculate the heat output for 'non-standard' water flow temperatures:

$$\Delta t = \frac{t_{w1} + t_{w2}}{2} - t_L \quad (1)$$

$$f = \left[\frac{\Delta t}{60} \right]^n \quad (2)$$

$$Q = Q_n \times f \quad (3)$$

Formula 1 does not apply for water flow temperatures > 20 K or supply temperatures below 60 °C. Please use the following formulae in order to calculate the mean temperature in these cases:

$$\Delta t_{Ln} = \frac{t_{w1} - t_{w2}}{\ln \frac{t_{w1} - t_L}{t_{w2} - t_L}} \quad (4)$$

Please use the following formulae in order to calculate the water flow rate and the water pressure drop through the Rakon units (see also page 5 for diagrams):

$$\Delta t_w = t_{w1} - t_{w2} \quad (5)$$

$$m = \frac{Q}{\Delta t_w} \times 0,86 \quad (6)$$

Example: calculation of the heat output

Required:	Heat output for Rakon type 32182
Known:	Water flow temperatures 82/71 °C
	Room air temperature $t_L = 20$ °C
	'Standard' heat output $Q_n = 5031$ W
	Exponent $n = 1.40$

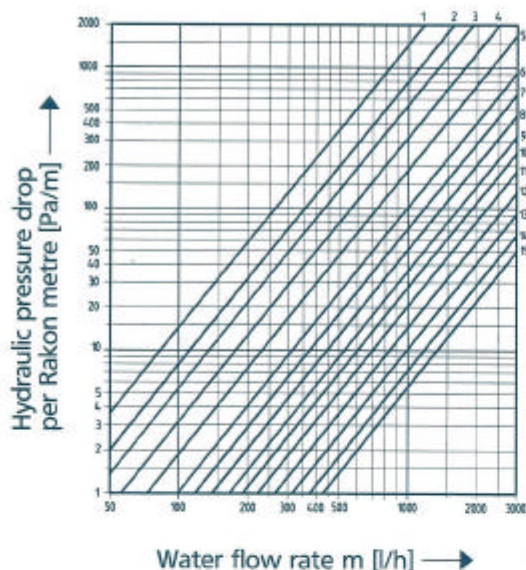
Calculation:

$$\Delta t = \frac{t_{w1} + t_{w2}}{2} - t_L \quad (1) = \frac{82 + 71}{2} - 20 = 56.5 \text{ K}$$

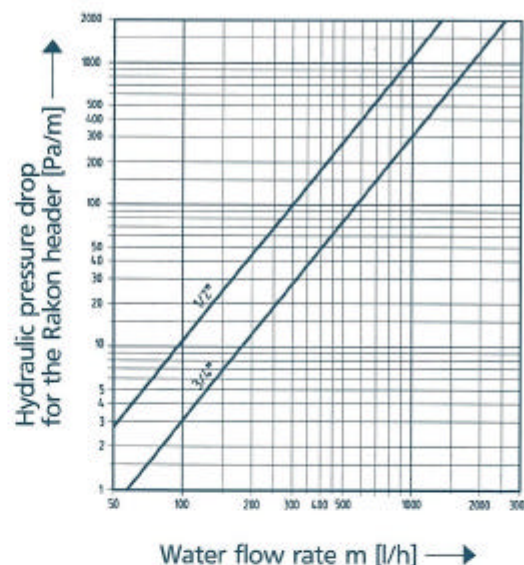
$$f = \left[\frac{\Delta t}{60} \right]^n \quad (2) = \left[\frac{56.5}{60} \right]^{1.40} = 0.92$$

$$Q = Q_n \times f \quad (3) = 5031 \times 0.92 = 4629 \text{ W}$$

Hydraulic pressure drop per Rakon metre



Hydraulic pressure drop for the Rakon header



Hydraulic pressure drop · same end pipe connections · diagram graph no.

Rakon	Height [mm]	Conn. n°	Rakon depth [mm]				
			20	78	128	178	246
1-layer	80	12	-	1	2	3	4
2-layer	160	22	-	4	5	6	9
3-layer	240	32	-	5	6	7	10

Hydraulic pressure drop · opposite end pipe connections · diagram graph no.

Rakon	Height [mm]	Conn. n°	Rakon depth [mm]				
			20	78	128	178	246
1-layer	80	11, 03	-	5	6	7	9
2-layer	160	03	-	9	10	11	14
3-layer	240	03	-	10	11	12	15

Hydraulic pressure drop per Rakon metre and for the Rakon header

The hydraulic pressure drop tables are based on a mean water flow temperature of 80 °C. The hydraulic pressure drops per Rakon metre and for the Rakon header must be added in order to calculate the total hydraulic pressure drop for a Rakon.

Example

Required: Rakon type 32182
(Length 3.2 m, width 178 mm, double layer)
Same end connections n° 22, 1/2" BSP fem
Standard heat output at 90/70 °C and a room air temperature of 20 °C: $Q_n = Q = 5031$ W.

Calculation:

$$\Delta t_w = t_{w1} - t_{w2} \quad (5) \quad = 90 - 70 = 20 \text{ K}$$

$$m = \frac{Q}{\Delta t_w} \times 0.86 \quad (6) \quad = \frac{5031}{20} \times 0.86 = 216 \text{ l/h}$$

Result:

Hydraulic pressure drop for the above Rakon

Diagram, graph 6: $5 \text{ Pa/m} \times 3.2 \text{ m} = 16 \text{ Pa}$

Hydraulic pressure drop for header (1/2") $= 50 \text{ Pa}$

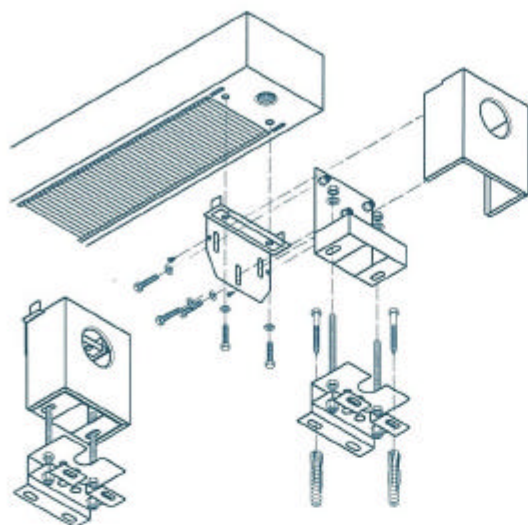
Total hydraulic pressure drop $= 66 \text{ Pa}$

1.09 Rakon

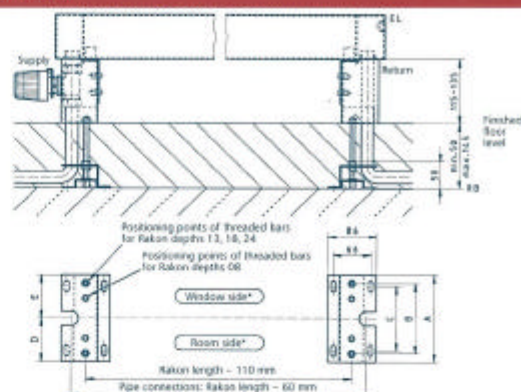
Stylish low-line heaters

Comfort floor bracket

Installation details



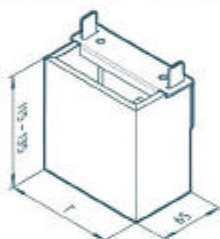
Dimensions



*only for Rakon depth 246 mm

Rakon depth [mm]		78	128	178	246
Dimensions [mm]	A	106	106	156	224
	B	21	71	121	189
	C	65	65	115	183
	D	53	53	78	53
	E	53	53	78	171

Comfort floor bracket, without hole



to be used as intermediate or end bracket, for quantities please refer to table on page 7

Brackets

The standard bracket colour is white RAL 9016. Light grey RAL 7035, off white RAL 9001 or white RAL 9010 are available at a surcharge. Please enquire for further colours.

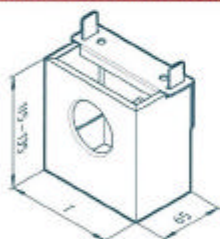
Comfort floor bracket

For invisible screw connections to the finished floor or alternatively to the unfinished floor using the levelling brackets together with the comfort floor brackets.

The comfort floor bracket without hole can be used as intermediate or end bracket.

The comfort floor bracket with hole can be used for the installation of a thermostatic head for a Rakon with downwards pointing pipe connections (no. 03).

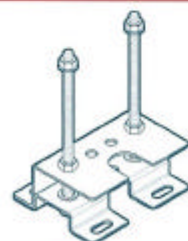
Comfort floor bracket, with hole for valve body



to be used for the installation of thermostatic heads, please use one of this bracket per Rakon

Rakon depth [mm]	78	128	178	246
Without hole for valve body	70080	70130	70180	70240
With hole for valve body	/	71130	71180	71240

Levelling bracket for comfort floor brackets



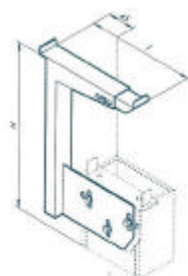
only to be used with comfort floor brackets

Levelling bracket for unfinished floors

Levelling brackets are sendzimir galvanized for height adjusting the comfort floor bracket to the finished floor level.

Rakon depth [mm]	78	128	178	246
Type	77080	77130	77180	77240

Additional window sill bracket



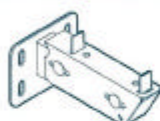
for installation onto the comfort floor bracket

Additional window sill bracket

for installation onto the comfort floor bracket, height and depth adjustable.

Rakon	Height [mm]		Rakon depth [mm]			
			78	128	178	246
1-layer	80	H	292-312	292-312	292-312	292-312
		T	123-147	163-187	213-237	283-307
		Type	95081	95131	95181	95241
2-layer	160	H	372-392	372-392	372-392	372-392
		T	123-147	163-187	213-237	283-307
		Type	95082	95132	95182	95242
3-layer	240	H	452-472	452-472	452-472	452-472
		T	123-147	163-187	213-237	283-307
		Type	95083	95133	95183	95243

Wall bracket

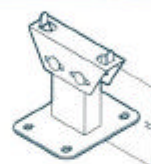


wall distance: 30 - 50 mm

Rakon depth [mm]	78	128	178	246
Type (for all heights)	02080	02130	02180	02240

Standard floor bracket

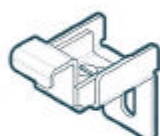
Robust design, the bracket for fast installations, with visible screw fixings.



H = 100 mm for finished floor
H = 220 mm for unfinished floor

Rakon depth [mm]		78	128	178	246
finished floor	Type	10080	10130	10180	10240
unfinished floor	Type	18080	18130	18180	18240

Wall hook, type 03000



for fixing the 3-layer Rakon (only with wall brackets)

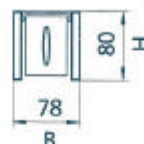
Quantity of brackets required per Rakon

Rakon length [mm]	500	1600	3200	4600
	1500	3000	4400	5000
Quantity required	2	3	4	5

1.09 Rakon

Heat output table

Depth 78 mm, height 80 mm



Depth B: 78 mm
Height H: 80 mm

Water content: 1.3 Ltr./m

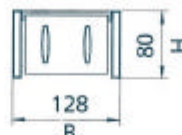
Weight: 10.7 kg/m

Exponent 'n': 1.33

Type			Heat output (watts) for a room air temperature of 20 °C							
Length F dm	Width B cm	Number of layers	LPHW							
			90/70 °C	75/65 °C	70/60 °C	70/55 °C	60/50 °C	55/45 °C	50/40 °C	80/40 °C
05	08	1	190	149	130	120	93	76	58	98
06	08	1	238	187	162	150	116	95	73	123
07	08	1	286	224	195	180	139	114	87	147
08	08	1	333	262	227	211	163	133	102	172
09	08	1	381	299	260	241	186	152	117	196
10	08	1	428	336	292	271	209	171	131	221
11	08	1	476	374	325	301	232	189	146	245
12	08	1	524	411	357	331	256	208	160	270
13	08	1	571	448	390	361	279	227	175	294
14	08	1	619	486	422	391	302	246	189	319
15	08	1	666	523	454	421	325	265	204	343
16	08	1	714	560	487	451	348	284	218	368
17	08	1	762	598	519	481	372	303	233	392
18	08	1	809	635	552	511	395	322	248	417
19	08	1	857	673	584	541	418	341	262	441
20	08	1	904	710	617	572	441	360	277	466
22	08	1	1000	785	682	632	488	398	306	515
24	08	1	1095	859	747	692	534	436	335	564
26	08	1	1190	934	812	752	581	474	364	613
28	08	1	1285	1009	877	812	627	512	393	662
30	08	1	1380	1084	941	872	674	549	422	711
32	08	1	1476	1158	1006	933	720	587	452	760
34	08	1	1571	1233	1071	993	767	625	481	809
36	08	1	1666	1308	1136	1053	813	663	510	858
38	08	1	1761	1383	1201	1113	859	701	539	907
40	08	1	1856	1457	1266	1173	906	739	568	956
42	08	1	1952	1532	1331	1233	952	777	597	1005
44	08	1	2047	1607	1396	1294	999	815	626	1054
46	08	1	2142	1681	1461	1354	1045	853	655	1103
48	08	1	2237	1756	1526	1414	1092	890	685	1152
50	08	1	2332	1831	1591	1474	1138	928	714	1201

1) Heat outputs tested according to DIN 4704, test report no. BLHK 4027.

Correction factors for other temperatures,			based on LPHW 90/70 °C, room air temperature: 20 °C					
Room air temperature	90/70°C	75/65°C	70/60°C	70/55°C	60/50°C	55/45°	50/40°C	80/40°C
14	1.14	0.91	0.81	0.75	0.60	0.50	0.41	0.64
16	1.09	0.87	0.76	0.71	0.56	0.47	0.38	0.60
18	1.04	0.83	0.72	0.67	0.52	0.43	0.34	0.56
20	1.00	0.78	0.68	0.63	0.48	0.39	0.31	0.51
22	0.96	0.74	0.64	0.59	0.45	0.36	0.27	0.47
24	0.91	0.70	0.60	0.55	0.41	0.32	0.24	0.43



Depth B: 128 mm
Height H: 80 mm

Water content: 1.7 Ltr/m

Weight: 13.3 kg/m

Exponent 'n': 1.32

Type			Heat output (watts) for a room air temperature of 20 °C							
Length F dm	Width B cm	Number of layers	LPHW							
			90/70 °C	75/65 °C	70/60 °C	70/55 °C	60/50 °C	55/45 °C	50/40 °C	80/40 °C
05	13	1	315	248	216	200	155	126	97	163
06	13	1	394	310	269	250	193	158	122	204
07	13	1	473	372	323	300	232	190	146	244
08	13	1	552	434	377	350	271	221	170	285
09	13	1	630	495	431	400	310	253	195	326
10	13	1	709	557	485	450	348	284	219	367
11	13	1	788	619	539	500	387	316	243	407
12	13	1	867	681	593	550	426	348	268	448
13	13	1	946	743	647	600	464	379	292	489
14	13	1	1024	805	701	649	503	411	317	530
15	13	1	1103	867	755	699	542	442	341	570
16	13	1	1182	929	808	749	580	474	365	611
17	13	1	1261	991	862	799	619	506	390	652
18	13	1	1340	1053	916	849	658	537	414	693
19	13	1	1418	1115	970	899	696	569	438	733
20	13	1	1497	1177	1024	949	735	600	463	774
22	13	1	1655	1301	1132	1049	813	664	511	856
24	13	1	1812	1425	1240	1149	890	727	560	937
26	13	1	1970	1548	1347	1249	967	790	609	1018
28	13	1	2128	1672	1455	1349	1045	853	657	1100
30	13	1	2285	1796	1563	1449	1122	916	706	1181
32	13	1	2443	1920	1671	1549	1199	980	755	1263
34	13	1	2600	2044	1779	1649	1277	1043	804	1344
36	13	1	2758	2168	1886	1749	1354	1106	852	1426
38	13	1	2916	2292	1994	1848	1432	1169	901	1507
40	13	1	3073	2416	2102	1948	1509	1232	950	1589
42	13	1	3231	2539	2210	2048	1586	1296	998	1670
44	13	1	3388	2663	2318	2148	1664	1359	1047	1752
46	13	1	3546	2787	2425	2248	1741	1422	1096	1833
48	13	1	3704	2911	2533	2348	1818	1485	1144	1915
50	13	1	3861	3035	2641	2448	1896	1548	1193	1996

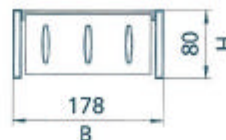
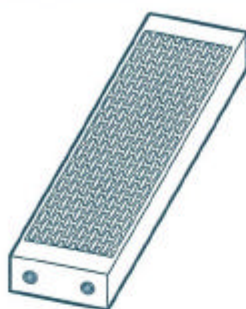
1) Heat outputs tested according to DIN 4704, test report no. BLHK 9016.

Correction factors for other temperatures,				based on LPHW 90/70 °C, room air temperature: 20 °C				
Room air temperature	90/70°C	75/65°C	70/60°C	70/55°C	60/50°C	55/45°C	50/40°C	80/40°C
14	1.13	0.91	0.81	0.76	0.60	0.51	0.41	0.64
16	1.09	0.87	0.77	0.71	0.56	0.47	0.38	0.60
18	1.04	0.83	0.72	0.67	0.52	0.43	0.34	0.56
20	1.00	0.79	0.68	0.63	0.49	0.40	0.31	0.52
22	0.96	0.74	0.64	0.60	0.45	0.36	0.28	0.48
24	0.91	0.70	0.60	0.56	0.41	0.33	0.24	0.43

1.09 Rakon

Heat output table

Depth 178 mm, height 80 mm



Depth B: 178 mm
Height H: 80 mm

Water content: 2.0 Ltr./m

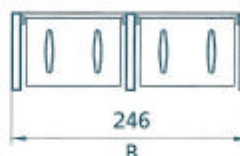
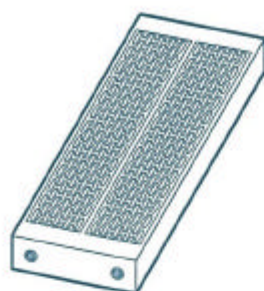
Weight: 16.7 kg/m

Exponent 'n': 1.30

Type			Heat output (watts) for a room air temperature of 20 °C							
Length F dm	Width B cm	Number of layers	LPHW							
			90/70 °C	75/65 °C	70/60 °C	70/55 °C	60/50 °C	55/45 °C	50/40 °C	80/40 °C
05	18	1	412	325	283	263	204	167	130	215
06	18	1	515	406	354	329	255	209	162	269
07	18	1	618	488	425	395	307	251	195	323
08	18	1	721	569	496	461	358	293	227	376
09	18	1	824	650	567	527	409	335	260	430
10	18	1	927	731	638	592	460	376	292	484
11	18	1	1030	813	709	658	511	418	324	538
12	18	1	1133	894	780	724	562	460	357	591
13	18	1	1236	975	850	790	613	502	389	645
14	18	1	1339	1056	921	856	664	544	422	699
15	18	1	1442	1138	992	921	715	585	454	753
16	18	1	1545	1219	1063	987	766	627	487	806
17	18	1	1648	1300	1134	1053	817	669	519	860
18	18	1	1751	1382	1205	1119	868	711	552	914
19	18	1	1854	1463	1276	1185	920	753	584	968
20	18	1	1957	1544	1346	1251	971	795	616	1022
22	18	1	2163	1707	1488	1382	1073	878	681	1129
24	18	1	2369	1869	1630	1514	1175	962	746	1237
26	18	1	2575	2032	1772	1645	1277	1045	811	1344
28	18	1	2781	2194	1913	1777	1379	1129	876	1452
30	18	1	2987	2357	2055	1909	1482	1213	941	1559
32	18	1	3193	2519	2197	2040	1584	1296	1006	1667
34	18	1	3399	2682	2339	2172	1686	1380	1071	1774
36	18	1	3605	2844	2480	2304	1788	1464	1136	1882
38	18	1	3811	3007	2622	2435	1890	1547	1200	1989
40	18	1	4017	3169	2764	2567	1992	1631	1265	2097
42	18	1	4223	3332	2905	2698	2095	1715	1330	2204
44	18	1	4429	3494	3047	2830	2197	1798	1395	2312
46	18	1	4635	3657	3189	2962	2299	1882	1460	2419
48	18	1	4841	3820	3331	3093	2401	1965	1525	2527
50	18	1	5047	3982	3472	3225	2503	2049	1590	2635

1) Heat outputs tested according to DIN 4704, test report no. BLHK 4027.

Correction factors for other temperatures,					based on LPHW 90/70 °C, room air temperature: 20 °C			
Room air temperature	90/70°C	75/65°C	70/60°C	70/55°C	60/50°C	55/45°C	50/40°C	80/40°C
14	1.13	0.91	0.81	0.76	0.61	0.51	0.42	0.65
16	1.09	0.87	0.77	0.72	0.57	0.47	0.38	0.61
18	1.04	0.83	0.73	0.68	0.53	0.44	0.35	0.56
20	1.00	0.79	0.69	0.64	0.49	0.40	0.31	0.52
22	0.96	0.75	0.65	0.60	0.46	0.37	0.28	0.48
24	0.91	0.71	0.61	0.56	0.42	0.33	0.25	0.44



Depth B: 246 mm
Height H: 80 mm

Water content: 2.6 Ltr/m

Weight: 24.1 kg/m

Exponent n: 1.37

Type			Heat output (watts) for a room air temperature of 20 °C							
Length F dm	Width B cm	Number of layers	LPHW							
			90/70 °C	75/65 °C	70/60 °C	70/55 °C	60/50 °C	55/45 °C	50/40 °C	80/40 °C
05	24	1	573	446	386	357	274	222	170	289
06	24	1	716	558	483	446	342	277	212	361
07	24	1	859	669	579	535	411	333	254	433
08	24	1	1002	781	676	624	479	388	297	505
09	24	1	1146	892	772	714	548	443	339	577
10	24	1	1289	1004	869	803	616	499	381	650
11	24	1	1432	1116	965	892	684	554	424	722
12	24	1	1575	1227	1062	981	753	610	466	794
13	24	1	1718	1339	1158	1071	821	665	509	866
14	24	1	1862	1450	1255	1160	890	720	551	938
15	24	1	2005	1562	1351	1249	958	776	593	1010
16	24	1	2148	1673	1448	1338	1027	831	636	1083
17	24	1	2291	1785	1544	1427	1095	887	678	1155
18	24	1	2434	1896	1641	1517	1164	942	721	1227
19	24	1	2578	2008	1737	1606	1232	998	763	1299
20	24	1	2721	2120	1834	1695	1301	1053	805	1371
22	24	1	3007	2343	2027	1873	1437	1164	890	1516
24	24	1	3294	2566	2220	2052	1574	1275	975	1660
26	24	1	3580	2789	2413	2230	1711	1385	1060	1804
28	24	1	3866	3012	2606	2409	1848	1496	1144	1949
30	24	1	4153	3235	2799	2587	1985	1607	1229	2093
32	24	1	4439	3458	2992	2766	2122	1718	1314	2237
34	24	1	4726	3681	3185	2944	2259	1829	1399	2382
36	24	1	5012	3904	3378	3122	2396	1940	1484	2526
38	24	1	5298	4127	3571	3301	2533	2050	1568	2670
40	24	1	5585	4351	3764	3479	2670	2161	1653	2815
42	24	1	5871	4574	3957	3658	2806	2272	1738	2959
44	24	1	6158	4797	4150	3836	2943	2383	1823	3103
46	24	1	6444	5020	4343	4015	3080	2494	1907	3248
48	24	1	6730	5243	4536	4193	3217	2605	1992	3392
50	24	1	7017	5466	4729	4371	3354	2716	2077	3536

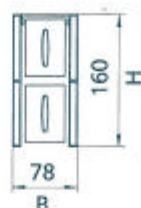
1) Heat outputs tested according to DIN 4704, test report no. BLHK 4027.

Correction factors for other temperatures,				based on LPHW 90/70 °C, room air temperature: 20 °C				
Room air temperature	90/70°C	75/65°C	70/60°C	70/55°C	60/50°C	55/45°C	50/40°C	80/40°C
14	1.14	0.91	0.80	0.75	0.59	0.49	0.40	0.63
16	1.09	0.87	0.76	0.71	0.55	0.45	0.36	0.59
18	1.05	0.82	0.72	0.66	0.51	0.42	0.33	0.55
20	1.00	0.78	0.67	0.62	0.47	0.38	0.30	0.50
22	0.95	0.74	0.63	0.58	0.44	0.35	0.26	0.46
24	0.91	0.69	0.59	0.54	0.40	0.31	0.23	0.42

1.09 Rakon

Heat output table

Depth 78 mm, height 160 mm



Depth B: 78 mm
Height H: 160 mm

Water content: 3.1 Ltr./m

Weight: 20.5 kg/m

Exponent 'n': 1.34

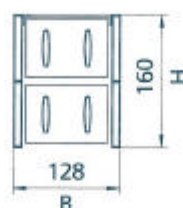
Type			Heat output (watts) for a room air temperature of 20 °C							
Length F dm	Width B cm	Number of layers	LPHW							
			90/70 °C	75/65 °C	70/60 °C	70/55 °C	60/50 °C	55/45 °C	50/40 °C	80/40 °C
05	08	2	274	215	186	173	133	108	83	140
06	08	2	343	268	233	216	166	135	104	175
07	08	2	411	322	279	259	200	162	125	210
08	08	2	480	375	326	302	233	189	146	246
09	08	2	548	429	373	345	266	216	167	281
10	08	2	617	483	419	388	300	244	187	316
11	08	2	685	536	466	432	333	271	208	351
12	08	2	754	590	512	475	366	298	229	386
13	08	2	822	644	559	518	399	325	250	421
14	08	2	891	697	606	561	433	352	271	456
15	08	2	959	751	652	604	466	379	292	491
16	08	2	1028	805	699	647	499	406	312	526
17	08	2	1096	858	745	690	533	433	333	561
18	08	2	1165	912	792	734	566	460	354	596
19	08	2	1233	965	838	777	599	487	375	631
20	08	2	1302	1019	885	820	633	514	396	666
22	08	2	1439	1126	978	906	699	568	437	737
24	08	2	1576	1234	1071	993	766	622	479	807
26	08	2	1713	1341	1165	1079	832	676	521	877
28	08	2	1850	1448	1258	1165	899	731	562	947
30	08	2	1987	1555	1351	1251	965	785	604	1017
32	08	2	2124	1663	1444	1338	1032	839	646	1087
34	08	2	2261	1770	1537	1424	1099	893	687	1157
36	08	2	2398	1877	1630	1510	1165	947	729	1228
38	08	2	2535	1985	1723	1597	1232	1001	770	1298
40	08	2	2672	2092	1817	1683	1298	1055	812	1368
42	08	2	2809	2199	1910	1769	1365	1109	854	1438
44	08	2	2946	2306	2003	1856	1432	1163	895	1508
46	08	2	3083	2414	2096	1942	1498	1218	937	1578
48	08	2	3219	2521	2189	2028	1565	1272	979	1648
50	08	2	3356	2628	2282	2115	1631	1326	1020	1719

1) Heat outputs tested according to DIN 4704, test report no. BLHK 4032.

Correction factors for other temperatures,				based on LPHW 90/70 °C, room air temperature: 20 °C				
Room air temperature	90/70°C	75/65°C	70/60°C	70/55°C	60/50°C	55/45°C	50/40°C	80/40°C
14	1.14	0.91	0.80	0.75	0.60	0.50	0.41	0.64
16	1.09	0.87	0.76	0.71	0.56	0.46	0.37	0.60
18	1.04	0.83	0.72	0.67	0.52	0.43	0.34	0.55
20	1.00	0.78	0.68	0.63	0.48	0.39	0.30	0.51
22	0.96	0.74	0.64	0.59	0.44	0.35	0.27	0.47
24	0.91	0.70	0.60	0.55	0.41	0.32	0.24	0.43

KAMPMANN
Systems for heating · cooling · ventilating

High-efficiency heaters · Trench heating · Air handling units · Radiant panels · Split air conditioning systems



Depth B: 128 mm
Height H: 160 mm

Water content: 3.8 Ltr/m

Weight: 26.0 kg/m

Exponent 'n': 1.36

Type			Heat output (watts) for a room air temperature of 20 °C							
Length F dm	Width B cm	Number of layers	LPHW							
			90/70 °C	75/65 °C	70/60 °C	70/55 °C	60/50 °C	55/45 °C	50/40 °C	80/40 °C
05	13	2	470	367	318	294	226	183	140	238
06	13	2	588	458	397	368	282	229	175	298
07	13	2	705	550	477	441	338	275	210	357
08	13	2	823	642	556	515	395	321	245	417
09	13	2	940	733	635	588	451	367	280	477
10	13	2	1058	825	715	662	508	412	315	536
11	13	2	1175	917	794	736	564	458	350	596
12	13	2	1293	1008	874	809	620	504	385	655
13	13	2	1410	1100	953	883	677	550	420	715
14	13	2	1528	1191	1033	956	733	596	455	774
15	13	2	1645	1283	1112	1030	790	642	490	834
16	13	2	1763	1375	1191	1103	846	687	525	894
17	13	2	1880	1466	1271	1177	902	733	560	953
18	13	2	1998	1558	1350	1250	959	779	595	1013
19	13	2	2115	1650	1430	1324	1015	825	630	1072
20	13	2	2233	1741	1509	1398	1072	871	665	1132
22	13	2	2468	1925	1668	1545	1184	962	735	1251
24	13	2	2703	2108	1827	1692	1297	1054	805	1370
26	13	2	2938	2291	1986	1839	1410	1146	875	1489
28	13	2	3173	2475	2145	1986	1523	1237	945	1608
30	13	2	3408	2658	2303	2133	1636	1329	1015	1728
32	13	2	3643	2841	2462	2280	1748	1421	1085	1847
34	13	2	3878	3024	2621	2427	1861	1512	1155	1966
36	13	2	4113	3208	2780	2574	1974	1604	1226	2085
38	13	2	4348	3391	2939	2722	2087	1696	1296	2204
40	13	2	4583	3574	3098	2869	2200	1787	1366	2323
42	13	2	4818	3758	3257	3016	2312	1879	1436	2442
44	13	2	5053	3941	3415	3163	2425	1970	1506	2562
46	13	2	5288	4124	3574	3310	2538	2062	1576	2681
48	13	2	5522	4308	3733	3457	2651	2154	1646	2800
50	13	2	5757	4491	3892	3604	2764	2245	1716	2919

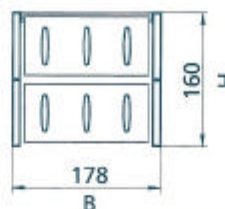
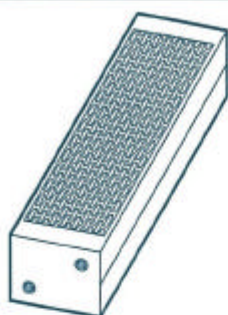
1) Heat outputs tested according to DIN 4704, test report no. BLHK 4032.

Correction factors for other temperatures,				based on LPHW 90/70 °C, room air temperature: 20 °C				
Room air temperature	90/70°C	75/65°C	70/60°C	70/55°C	60/50°C	55/45°C	50/40°C	80/40°C
14	1.14	0.91	0.80	0.75	0.59	0.49	0.40	0.63
16	1.09	0.87	0.76	0.71	0.55	0.46	0.37	0.59
18	1.05	0.82	0.72	0.67	0.51	0.42	0.33	0.55
20	1.00	0.78	0.68	0.63	0.48	0.38	0.30	0.50
22	0.95	0.74	0.64	0.59	0.44	0.35	0.27	0.47
24	0.91	0.70	0.60	0.55	0.40	0.32	0.23	0.42

1.09 Rakon

Heat output table

Depth 178 mm, height 160 mm



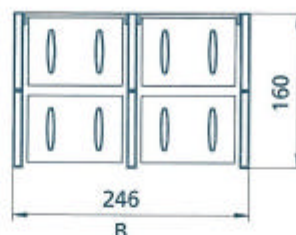
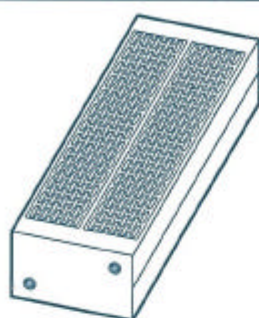
Depth B: 178 mm
Height H: 160 mm
Water content: 4.5 Ltr./m
Weight: 30.7 kg/m
Exponent 'n': 1.40

Type			Heat output (watts) for a room air temperature of 20 °C							
Length F dm	Width B cm	Number of layers	LPHW							
			90/70 °C	75/65 °C	70/60 °C	70/55 °C	60/50 °C	55/45 °C	50/40 °C	80/40 °C
05	18	2	649	503	434	401	305	246	187	323
06	18	2	812	629	542	501	381	308	234	403
07	18	2	974	755	650	601	458	369	280	484
08	18	2	1136	880	759	701	534	431	327	565
09	18	2	1298	1006	867	801	610	492	374	645
10	18	2	1461	1132	976	901	687	554	421	726
11	18	2	1623	1258	1084	1001	763	615	467	807
12	18	2	1785	1384	1193	1102	839	677	514	887
13	18	2	1948	1509	1301	1202	915	738	561	968
14	18	2	2110	1635	1409	1302	992	800	608	1049
15	18	2	2272	1761	1518	1402	1068	861	654	1129
16	18	2	2435	1887	1626	1502	1144	923	701	1210
17	18	2	2597	2013	1735	1602	1220	984	748	1291
18	18	2	2759	2138	1843	1702	1297	1046	795	1371
19	18	2	2921	2264	1951	1803	1373	1107	841	1452
20	18	2	3084	2390	2060	1903	1449	1169	888	1533
22	18	2	3408	2641	2277	2103	1602	1292	982	1694
24	18	2	3733	2893	2494	2303	1754	1415	1075	1855
26	18	2	4058	3145	2710	2503	1907	1538	1169	2017
28	18	2	4382	3396	2927	2704	2060	1661	1262	2178
30	18	2	4707	3648	3144	2904	2212	1784	1356	2339
32	18	2	5031	3899	3361	3104	2365	1907	1449	2501
34	18	2	5356	4151	3578	3305	2517	2030	1542	2662
36	18	2	5681	4402	3795	3505	2670	2153	1636	2823
38	18	2	6005	4654	4011	3705	2822	2276	1729	2985
40	18	2	6330	4906	4228	3905	2975	2399	1823	3146
42	18	2	6654	5157	4445	4106	3128	2522	1916	3307
44	18	2	6979	5409	4662	4306	3280	2645	2010	3469
46	18	2	7304	5660	4879	4506	3433	2768	2103	3630
48	18	2	7628	5912	5096	4707	3585	2891	2197	3791
50	18	2	7953	6163	5312	4907	3738	3014	2290	3952

1) Heat outputs tested according to DIN 4704, test report no. BLHK 9018.

Correction factors for other temperatures,				based on LPHW 90/70 °C, room air temperature: 20 °C				
Room air temperature	90/70°C	75/65°C	70/60°C	70/55°C	60/50°C	55/45°C	50/40°C	80/40°C
14	1.14	0.91	0.80	0.74	0.58	0.48	0.39	0.63
16	1.09	0.86	0.75	0.70	0.54	0.45	0.36	0.58
18	1.05	0.82	0.71	0.66	0.50	0.41	0.32	0.54
20	1.00	0.77	0.67	0.62	0.47	0.37	0.29	0.50
22	0.95	0.73	0.63	0.58	0.43	0.34	0.26	0.45
24	0.91	0.69	0.59	0.54	0.39	0.30	0.22	0.41

KAMPMANN
Systems for heating · cooling · ventilating



Depth B: 246 mm
Height H: 160 mm
Water content: 5.3 Ltr/m
Weight: 45.3 kg/m
Exponent 'n': 1.35

Type			Heat output (watts) for a room air temperature of 20 °C							
Length F dm	Width B cm	Number of layers	LPHW							
			90/70 °C	75/65 °C	70/60 °C	70/55 °C	60/50 °C	55/45 °C	50/40 °C	80/40 °C
05	24	2	770	602	522	484	372	302	232	392
06	24	2	963	753	653	605	465	377	290	490
07	24	2	1156	904	783	726	558	453	348	588
08	24	2	1348	1054	914	847	651	528	406	686
09	24	2	1541	1205	1045	968	744	604	464	784
10	24	2	1733	1356	1175	1089	837	679	522	882
11	24	2	1926	1506	1306	1210	930	755	580	980
12	24	2	2119	1657	1436	1330	1023	830	638	1078
13	24	2	2311	1807	1567	1451	1116	906	696	1176
14	24	2	2504	1958	1698	1572	1209	981	754	1274
15	24	2	2696	2109	1828	1693	1302	1057	812	1372
16	24	2	2889	2259	1959	1814	1395	1132	870	1471
17	24	2	3082	2410	2089	1935	1488	1208	928	1569
18	24	2	3274	2560	2220	2056	1581	1283	986	1667
19	24	2	3467	2711	2350	2177	1674	1359	1044	1765
20	24	2	3659	2862	2481	2298	1767	1434	1101	1863
22	24	2	4045	3163	2742	2540	1954	1585	1217	2059
24	24	2	4430	3464	3003	2782	2140	1736	1333	2255
26	24	2	4815	3765	3265	3024	2326	1887	1449	2451
28	24	2	5200	4067	3526	3266	2512	2038	1565	2647
30	24	2	5585	4368	3787	3508	2698	2189	1681	2843
32	24	2	5971	4669	4048	3750	2884	2340	1797	3039
34	24	2	6356	4970	4309	3991	3070	2491	1913	3235
36	24	2	6741	5271	4570	4233	3256	2642	2029	3431
38	24	2	7126	5573	4832	4475	3442	2793	2145	3627
40	24	2	7511	5874	5093	4717	3628	2944	2261	3823
42	24	2	7897	6175	5354	4959	3814	3095	2377	4019
44	24	2	8282	6476	5615	5201	4000	3246	2493	4215
46	24	2	8667	6778	5876	5443	4186	3397	2609	4412
48	24	2	9052	7079	6137	5685	4372	3548	2725	4608
50	24	2	9437	7380	6399	5927	4558	3699	2841	4804

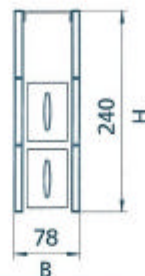
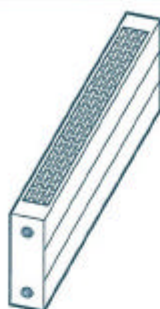
1) Heat outputs tested according to DIN 4704, test report no. BLHK 4032.

Correction factors for other temperatures,			based on LPHW 90/70 °C, room air temperature: 20 °C					
Room air temperature	90/70°C	75/65°C	70/60°C	70/55°C	60/50°C	55/45°C	50/40°C	80/40°C
14	1.14	0.91	0.80	0.75	0.59	0.50	0.41	0.64
16	1.09	0.87	0.76	0.71	0.55	0.46	0.37	0.59
18	1.05	0.82	0.72	0.67	0.52	0.42	0.33	0.55
20	1.00	0.78	0.68	0.63	0.48	0.39	0.30	0.51
22	0.96	0.74	0.64	0.59	0.44	0.35	0.27	0.47
24	0.91	0.70	0.60	0.55	0.41	0.32	0.24	0.43

1.09 Rakon

Heat output table

Depth 78 mm, height 240 mm

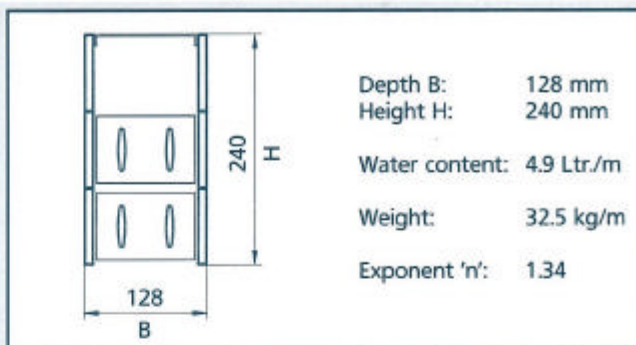
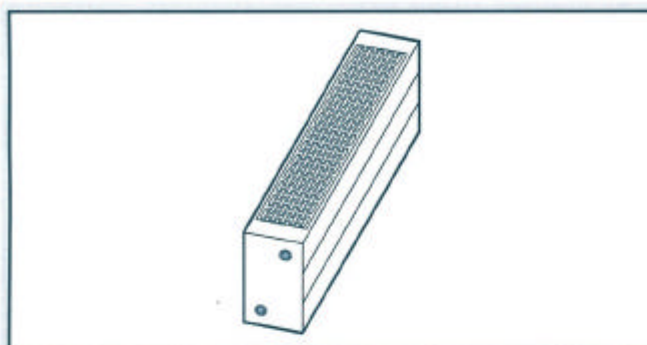


Depth B: 78 mm
Height H: 240 mm
Water content: 3.9 Ltr/m
Weight: 25.5 kg/m
Exponent 'n': 1.33

Type			Heat output (watts) for a room air temperature of 20 °C							
Length F dm	Width B cm	Number of layers	LPHW							
			90/70 °C	75/65 °C	70/60 °C	70/55 °C	60/50 °C	55/45 °C	50/40 °C	80/40 °C
05	08	3	374	293	255	236	182	149	114	192
06	08	3	467	367	318	295	228	186	143	241
07	08	3	560	440	382	354	273	223	171	289
08	08	3	654	513	446	413	319	260	200	337
09	08	3	747	587	510	472	365	297	229	385
10	08	3	841	660	573	531	410	335	257	433
11	08	3	934	733	637	590	456	372	286	481
12	08	3	1027	807	701	649	501	409	314	529
13	08	3	1121	880	764	708	547	446	343	577
14	08	3	1214	953	828	767	593	483	372	625
15	08	3	1308	1026	892	826	638	520	400	673
16	08	3	1401	1100	955	885	684	558	429	722
17	08	3	1494	1173	1019	944	729	595	457	770
18	08	3	1588	1246	1083	1003	775	632	486	818
19	08	3	1681	1320	1147	1063	820	669	514	866
20	08	3	1775	1393	1210	1122	866	706	543	914
22	08	3	1961	1540	1338	1240	957	781	600	1010
24	08	3	2148	1686	1465	1358	1048	855	657	1106
26	08	3	2335	1833	1592	1476	1139	929	715	1203
28	08	3	2522	1980	1720	1594	1231	1004	772	1299
30	08	3	2709	2126	1847	1712	1322	1078	829	1395
32	08	3	2895	2273	1975	1830	1413	1152	886	1491
34	08	3	3082	2420	2102	1948	1504	1227	943	1587
36	08	3	3269	2566	2229	2066	1595	1301	1000	1684
38	08	3	3456	2713	2357	2184	1686	1375	1057	1780
40	08	3	3643	2859	2484	2302	1778	1450	1115	1876
42	08	3	3829	3006	2612	2420	1869	1524	1172	1972
44	08	3	4016	3153	2739	2538	1960	1598	1229	2068
46	08	3	4203	3299	2866	2656	2051	1673	1286	2165
48	08	3	4390	3446	2994	2774	2142	1747	1343	2261
50	08	3	4577	3593	3121	2892	2233	1821	1400	2357

1) Heat outputs tested according to DIN 4704, test report no. BLHK 9051.

Correction factors for other temperatures,					based on LPHW 90/70 °C, room air temperature: 20 °C			
Room air temperature	90/70°C	75/65°C	70/60°C	70/55°C	60/50°C	55/45°C	50/40°C	80/40°C
14	1.14	0.91	0.81	0.75	0.60	0.50	0.41	0.64
16	1.09	0.87	0.76	0.71	0.56	0.47	0.38	0.60
18	1.04	0.83	0.72	0.67	0.52	0.43	0.34	0.56
20	1.00	0.78	0.68	0.63	0.48	0.39	0.31	0.51
22	0.96	0.74	0.64	0.59	0.45	0.36	0.27	0.47
24	0.91	0.70	0.60	0.55	0.41	0.32	0.24	0.43



Type			Heat output (watts) for a room air temperature of 20 °C							
Length F dm	Width B cm	Number of layers	LPHW							
			90/70 °C	75/65 °C	70/60 °C	70/55 °C	60/50 °C	55/45 °C	50/40 °C	80/40 °C
05	13	3	634	496	431	399	308	250	193	325
06	13	3	793	621	539	499	385	313	241	406
07	13	3	951	745	647	599	462	376	289	487
08	13	3	1110	869	754	699	539	438	337	568
09	13	3	1268	993	862	799	616	501	385	649
10	13	3	1427	1117	970	899	693	563	434	730
11	13	3	1585	1241	1078	999	770	626	482	812
12	13	3	1744	1365	1186	1098	847	689	530	893
13	13	3	1902	1489	1293	1198	924	751	578	974
14	13	3	2061	1613	1401	1298	1001	814	626	1055
15	13	3	2219	1737	1509	1398	1078	877	675	1136
16	13	3	2378	1862	1617	1498	1155	939	723	1217
17	13	3	2536	1986	1724	1598	1232	1002	771	1298
18	13	3	2695	2110	1832	1698	1310	1064	819	1380
19	13	3	2853	2234	1940	1797	1387	1127	867	1461
20	13	3	3012	2358	2048	1897	1464	1190	915	1542
22	13	3	3329	2606	2263	2097	1618	1315	1012	1704
24	13	3	3646	2854	2479	2297	1772	1440	1108	1866
26	13	3	3963	3103	2695	2496	1926	1565	1205	2029
28	13	3	4280	3351	2910	2696	2080	1690	1301	2191
30	13	3	4597	3599	3126	2896	2234	1816	1397	2353
32	13	3	4914	3847	3341	3096	2388	1941	1494	2516
34	13	3	5231	4095	3557	3295	2542	2066	1590	2678
36	13	3	5548	4344	3772	3495	2696	2191	1686	2840
38	13	3	5865	4592	3988	3695	2850	2316	1783	3003
40	13	3	6182	4840	4203	3894	3004	2442	1879	3165
42	13	3	6499	5088	4419	4094	3158	2567	1976	3327
44	13	3	6816	5337	4635	4294	3312	2692	2072	3490
46	13	3	7133	5585	4850	4493	3466	2817	2168	3652
48	13	3	7449	5833	5066	4693	3620	2943	2265	3814
50	13	3	7766	6081	5281	4893	3775	3068	2361	3976

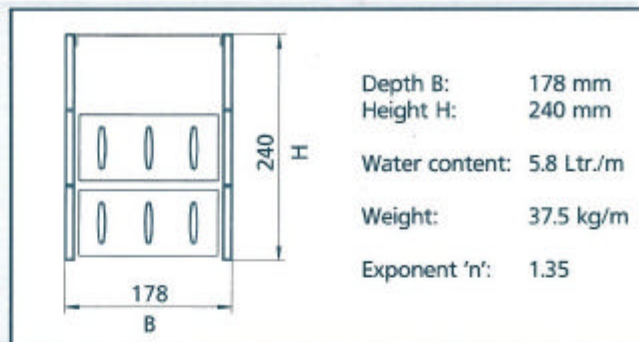
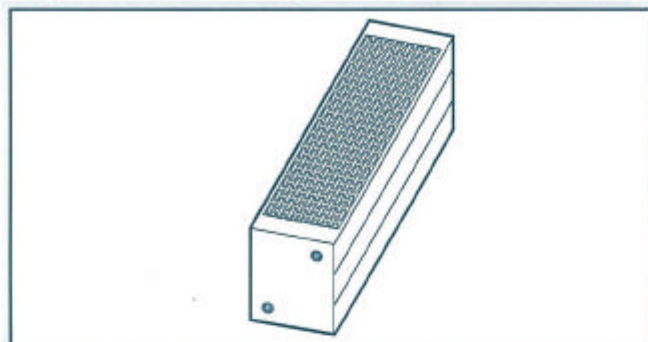
1) Heat outputs tested according to DIN 4704, test report no. BLHK 9049.

Correction factors for other temperatures,					based on LPHW 90/70 °C, room air temperature: 20 °C			
Room air temperature	90/70°C	75/65°C	70/60°C	70/55°C	60/50°C	55/45°C	50/40°C	80/40°C
14	1.14	0.91	0.80	0.75	0.60	0.50	0.41	0.64
16	1.09	0.87	0.76	0.71	0.56	0.46	0.37	0.60
18	1.04	0.83	0.72	0.67	0.52	0.43	0.34	0.55
20	1.00	0.78	0.68	0.63	0.48	0.39	0.30	0.51
22	0.96	0.74	0.64	0.59	0.44	0.35	0.27	0.47
24	0.91	0.70	0.60	0.55	0.41	0.32	0.24	0.43

1.09 Rakon

Heat output table

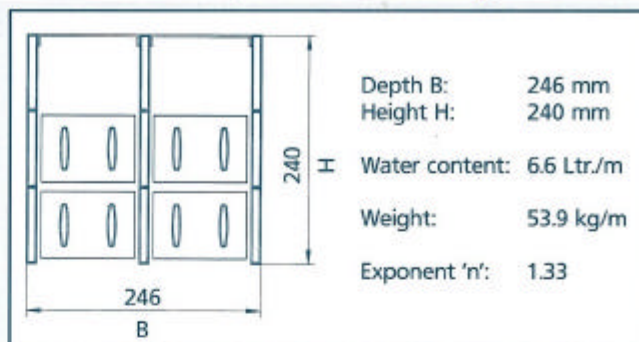
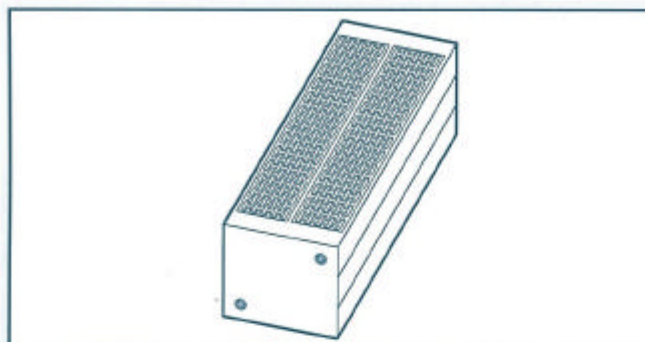
Depth 178 mm, height 240 mm



Type			Heat output (watts) for a room air temperature of 20 °C							
Length F dm	Width B cm	Number of layers	LPHW							
			90/70 °C	75/65 °C	70/60 °C	70/55 °C	60/50 °C	55/45 °C	50/40 °C	80/40 °C
05	18	3	857	670	581	538	414	336	258	436
06	18	3	1071	838	726	673	517	420	322	545
07	18	3	1285	1005	871	807	621	504	387	654
08	18	3	1499	1173	1017	942	724	588	451	763
09	18	3	1714	1340	1162	1076	828	672	516	872
10	18	3	1928	1508	1307	1211	931	756	580	981
11	18	3	2142	1675	1452	1345	1035	840	645	1090
12	18	3	2356	1843	1598	1480	1138	924	709	1199
13	18	3	2570	2010	1743	1614	1242	1008	774	1308
14	18	3	2785	2178	1888	1749	1345	1092	838	1417
15	18	3	2999	2345	2033	1883	1448	1176	903	1526
16	18	3	3213	2513	2178	2018	1552	1259	967	1635
17	18	3	3427	2680	2324	2152	1655	1343	1032	1744
18	18	3	3641	2848	2469	2287	1759	1427	1096	1853
19	18	3	3856	3015	2614	2421	1862	1511	1161	1963
20	18	3	4070	3183	2759	2556	1966	1595	1225	2072
22	18	3	4498	3518	3050	2825	2173	1763	1354	2290
24	18	3	4927	3853	3340	3094	2380	1931	1483	2508
26	18	3	5355	4188	3631	3363	2586	2099	1612	2726
28	18	3	5783	4523	3921	3632	2793	2267	1741	2944
30	18	3	6212	4858	4212	3901	3000	2435	1870	3162
32	18	3	6640	5193	4502	4170	3207	2603	1999	3380
34	18	3	7069	5528	4793	4439	3414	2771	2128	3598
36	18	3	7497	5863	5083	4708	3621	2939	2257	3816
38	18	3	7925	6198	5373	4977	3828	3107	2386	4034
40	18	3	8354	6533	5664	5246	4035	3275	2514	4252
42	18	3	8782	6868	5954	5515	4242	3443	2643	4470
44	18	3	9211	7203	6245	5784	4449	3611	2772	4688
46	18	3	9639	7538	6535	6053	4656	3778	2901	4906
48	18	3	10067	7873	6826	6322	4863	3946	3030	5124
50	18	3	10496	8208	7116	6591	5069	4114	3159	5342

1) Heat outputs tested according to DIN 4704, test report no. BLHK 9053.

Correction factors for other temperatures,			based on LPHW 90/70 °C, room air temperature: 20 °C					
Room air temperature	90/70°C	75/65°C	70/60°C	70/55°C	60/50°C	55/45°C	50/40°C	80/40°C
14	1.14	0.91	0.80	0.75	0.59	0.50	0.41	0.64
16	1.09	0.87	0.76	0.71	0.55	0.46	0.37	0.59
18	1.05	0.82	0.72	0.67	0.52	0.42	0.33	0.55
20	1.00	0.78	0.68	0.63	0.48	0.39	0.30	0.51
22	0.96	0.74	0.64	0.59	0.44	0.35	0.27	0.47
24	0.91	0.70	0.60	0.55	0.41	0.32	0.24	0.43

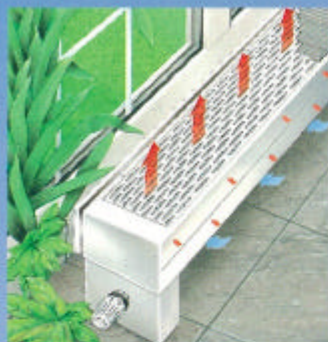


Type			Heat output (watts) for a room air temperature of 20 °C							
Length F dm	Width B cm	Number of layers	LPHW							
			90/70 °C	75/65 °C	70/60 °C	70/55 °C	60/50 °C	55/45 °C	50/40 °C	80/40 °C
05	24	3	1018	799	694	643	497	405	312	524
06	24	3	1273	999	868	804	621	506	389	655
07	24	3	1527	1199	1041	965	745	608	467	786
08	24	3	1782	1398	1215	1126	869	709	545	917
09	24	3	2036	1598	1389	1287	994	810	623	1049
10	24	3	2291	1798	1562	1448	1118	912	701	1180
11	24	3	2545	1998	1736	1608	1242	1013	779	1311
12	24	3	2800	2198	1909	1769	1366	1114	857	1442
13	24	3	3054	2397	2083	1930	1490	1215	935	1573
14	24	3	3309	2597	2256	2091	1615	1317	1012	1704
15	24	3	3563	2797	2430	2252	1739	1418	1090	1835
16	24	3	3818	2997	2604	2413	1863	1519	1168	1966
17	24	3	4072	3197	2777	2574	1987	1621	1246	2097
18	24	3	4327	3396	2951	2734	2111	1722	1324	2228
19	24	3	4581	3596	3124	2895	2236	1823	1402	2359
20	24	3	4836	3796	3298	3056	2360	1925	1480	2490
22	24	3	5345	4195	3645	3378	2608	2127	1635	2752
24	24	3	5854	4595	3992	3699	2857	2330	1791	3015
26	24	3	6363	4995	4339	4021	3105	2532	1947	3277
28	24	3	6872	5394	4686	4343	3353	2735	2103	3539
30	24	3	7381	5794	5034	4664	3602	2937	2258	3801
32	24	3	7890	6193	5381	4986	3850	3140	2414	4063
34	24	3	8399	6593	5728	5308	4098	3343	2570	4325
36	24	3	8908	6992	6075	5630	4347	3545	2726	4587
38	24	3	9417	7392	6422	5951	4595	3748	2881	4849
40	24	3	9926	7792	6769	6273	4844	3950	3037	5112
42	24	3	10435	8191	7116	6595	5092	4153	3193	5374
44	24	3	10944	8591	7463	6916	5340	4356	3349	5636
46	24	3	11453	8990	7811	7238	5589	4558	3504	5898
48	24	3	11961	9390	8158	7560	5837	4761	3660	6160
50	24	3	12470	9789	8505	7881	6086	4963	3816	6422

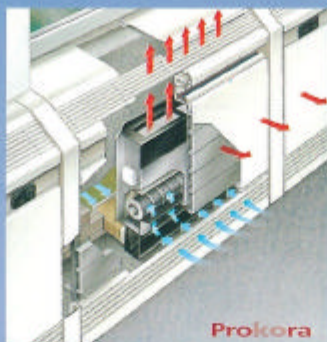
1) Heat outputs tested according to DIN 4704, test report no. BLHK 7012.

Correction factors for other temperatures,			based on LPHW 90/70 °C, room air temperature: 20 °C					
Room air temperature	90/70°C	75/65°C	70/60°C	70/55°C	60/50°C	55/45°C	50/40°C	80/40°C
14	1.14	0.91	0.81	0.75	0.60	0.50	0.41	0.64
16	1.09	0.87	0.76	0.71	0.56	0.47	0.38	0.60
18	1.04	0.83	0.72	0.67	0.52	0.43	0.34	0.56
20	1.00	0.78	0.68	0.63	0.48	0.39	0.31	0.51
22	0.96	0.74	0.64	0.59	0.45	0.36	0.27	0.47
24	0.91	0.70	0.60	0.55	0.41	0.32	0.24	0.43

Systems for heating · cooling · ventilating



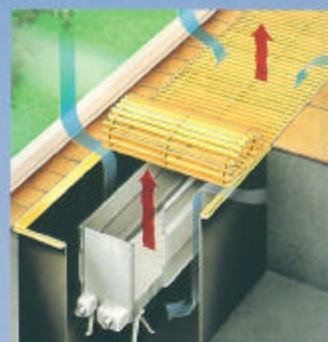
Rakon — High-efficiency heaters



Perimeter casings, tailor-made design



Encased convectors



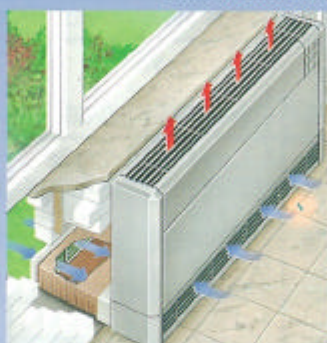
Deep trench heating with roll-up grilles



Floor duct heating with roll-up grilles



Church heating



Fan convectors, wall-mounted



Fan convectors, ceiling-mounted



Door air curtains



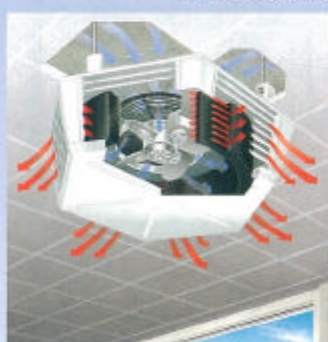
Airblock air handling units



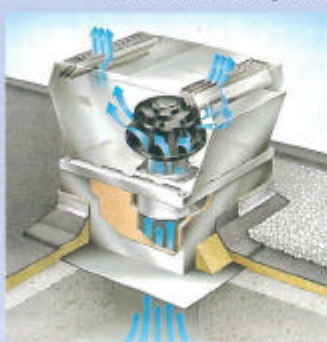
Unit heaters



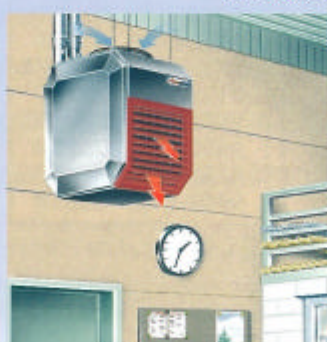
Resistent 8000 Stainless steel unit heaters



Ultra 6000 Air heating/cooling units



Roof extract fans



Warm air heaters



Radiant panels

Designs for Comfort



KAMPMANN

Systems for heating · cooling · ventilating

Kampmann HKL GmbH · D-49794 Lingen

Tel. [+49] 591-7108192 · Fax [+49] 591-7108173

e Mail: info@kampmann.de

Internet: <http://www.kampmann.de>

High-efficiency heaters · Trench heating · Air handling units · Radiant panels · Split air conditioning systems