THE CRITERIA FOR RADIATOR SELECTION

Getting the desired output from the radiators is depended on the selection of the appropriate radiator. During selection, the pressure loss in the radiator, the capacity variance according to the various water inlet&outlet and room temperatures must be calculated. The principles relating to these calculations are explained below.

However the type of the connection to the heating system and the placement conditions would affect the radiator effectiveness. Therefore these conditions must be considered while selecting panel radiators.

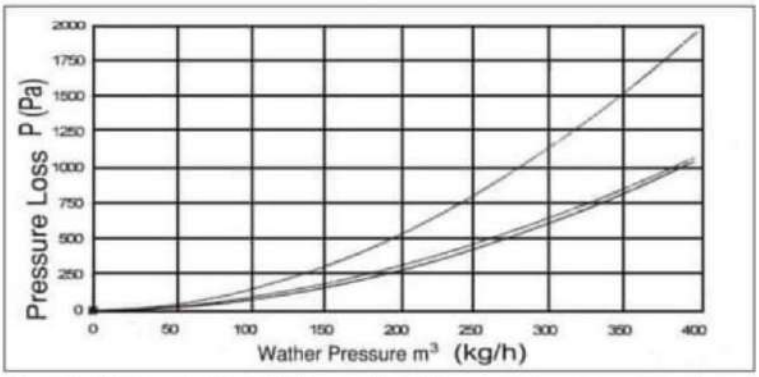
Pressure Loss

The pressure loss with the radiators is associated with the water flow rate and the radiator capacity. If the flow rate is given, then the pressure loss may be found using the following graph.

Capacities in Various Environment Temperatures

The standard "Heat Power Values" 90/70°C at panel radiators are arranged according to the water moving forward&back temperature (80°C in average) and 20° C room temperature.

In this booklet, alongside with this standard values, additional tables are given for various environment and water inlet&outlet tempe ratures. If the data conform to these values, then, referring to these tables, the Heat Power Tables having Heat Power values and the pages they are contained in are shown below.



If water flow rate is not given, then the pressure loss may be calculated through the following method. The function for pressure fall (P) depending on the radiator types:

P=Pressure loss (Pa); m= water flow rate (kg/h)

Types	P	
Types 10-P, 11-PK	$P = 0.0233.m^{1.892}$	E
Types 20-PP, 21-PKP, 22-PKKP	$P = 0.0245.m^{1.785}$	E
Types 33-PKKPKP	$P = 0,0114.m^{1.909}$	I

Example:

What is the pressure loss in 22/600/1500 radiator?
From the table 4, for the 22/600/1500 radiator

Qn= 3926 Watt

$$m = \frac{Qn \times 0.86}{90-70} \quad I \qquad m = \frac{3926 \times 0.86}{20} = 168.81 \text{ kg/h}$$

$P = 0,0245 \times m^{1.785}$ (from the formula No E")

$P = 0,0245 \times 168.81^{1.785} = 0,0245 \times 9460.3$

$P = 231.8$ Pa

Table No	Room Temperature (°C)	Water Inlet-Outlet Temperature (°C)
4	20	90/70
5	10	90/70
6	12	90/70
7	15	90/70
8	18	90/70
9	22	90/70
10	24	90/70
11	26	90/70
12	20	70/55-55/45

If the room temperature and water inlet-outlet temperatures are different from the values given on the table above, The Heat Power Values must be calculated using the "F Factor" (f) given in Table 1. Calculation samples are given below.

Example-Calculation of Heat Power Values, using the "F Factor" (f):

Radiator Type= 22, Height= 600 mm,
Length= 1500 mm. (22/600/1500)
Radiator water inlet temperature: 80°C
Radiator water outlet temperature: 65°C
Room temperature: 22°C
From the Table 1, for 22°C room temperature, 80°C water inlet and 65°C water outlet temperatures, f is found out to be f= 1.25.

For the radiator 22/600/1500, the Heat Power Value (Qn) at 90/70°C inlet-outlet temperatures and 20°C environment temperature is found through the Table 4 in page 25 to be Qn=3926.

The Heat Power Value for 22°C room temperature, 80°C water inlet and 65°C water outlet temperatures:

Q= Qn/f I"
Q= 3926/1.25= 3140.8 Watt.

Example 2- Radiator selection that is suitable for the room temperature and the water inlet-outlet temperatures, according to the calculated heat need.

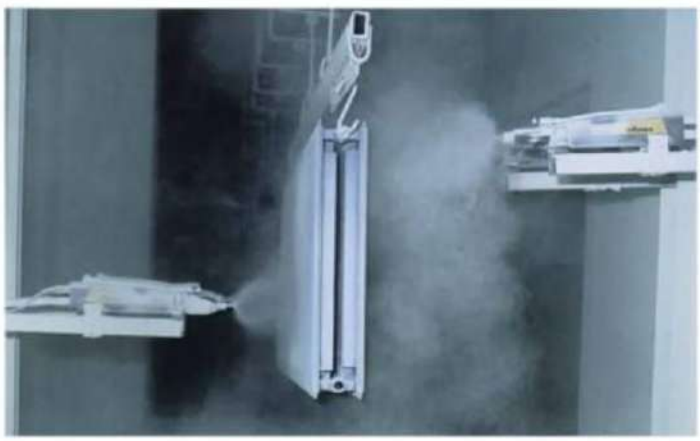
Calculated heat need : 971 W.
Radiator water inlet temperature : 80°C
Radiator water outlet temperature : 65°C
Room temperature : 22°C
Through Table 1, f is found out to be f=1.25. Through the formula I" above:

Qn=Qxf= 971x1.25 = 1213,75 Watt.

Montage Application

Panel radiators are hanged on the mounting brackets screwed in the wall, through the bracket metal sheets mounted on the rear surface of radiator. The measurements of bracket metal sheets are given below:

- At radiators with lengths up to 1800 mm, 2 mounting brackets are used and there are 4 bracket metal sheets on the radiator.
- At lengths of 1800 mm and more than 1800 mm, 3 mounting brackets are used and there are 6 bracket metal sheets on the radiator.



MONTAGE

To mount the panel radiators on the wall, necessary mounting accessories are contained in a bag at the bottom of the radiator. Mounting brackets are present on the side of the radiator.

To avoid damaging of the radiators during installation works, they can be mounted without being removed from their packaging.

Therefore to get only the accessories out of the packaging and for the mounting, the appropriate sections are cut out. The mounting accessories are taken out and the radiator is mounted on the wall in its packaging.

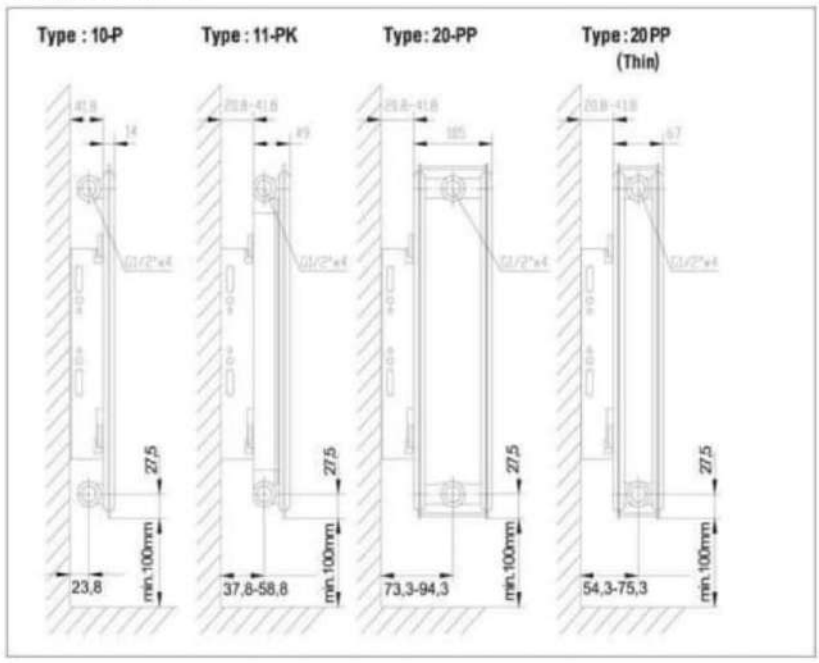
After finishing the installation, the packaging of the radiators are removed completely and it is set to a workable position. Especially for the buildings under construction this method is recommended.

If the radiators are to be kept waited in a building under construction, construction site or in a storage, they should be kept in their packaging.

Accessory bag comprises screws and threaded inserts, bracket clips, purger stopper and purger switch, and blind cap. Screws, threaded inserts and bracket clips are used during the mounting.

The fitting holes of the radiators are closed with plastic stoppers in order to prevent foreign bodies from entering in the radiators. Plastic stoppers must be removed during installation, fitting holes should not be kept open for long times.

Montage Dimensions



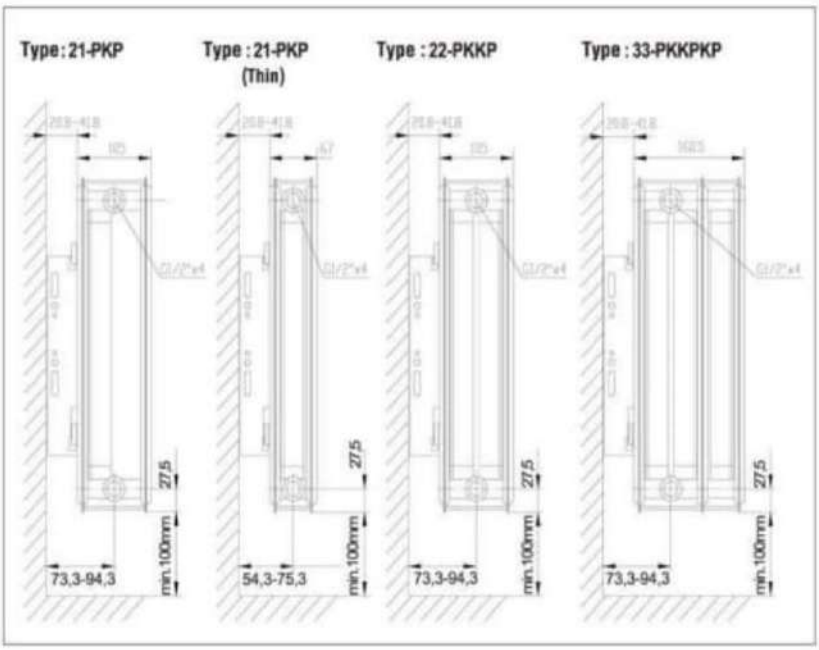
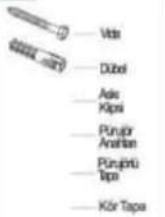


Table 3 (measurements in mm)

Radiator Height (mm)	Bracket Sheet Metal Gap (B) (mm)
300	115
400	215
500	315
600	415
900	715

Mounting and Commissioning Operations/Standard Types

1

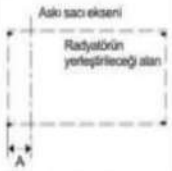


Cut carefully the packaging containing the accessories without damaging the radiator to get the accessories out of the packaging. Check if the accessories inside the bag are completed. If there is a missing material, procure it before starting to the installation.

2

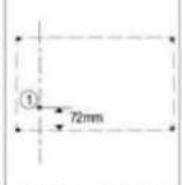
Cut the section on the side of the packaging where the mounting brackets are located and take out the mounting brckets. Make sure they are complete. If brackets are missing, procure it before starting to the installation.
(See page 11)

3



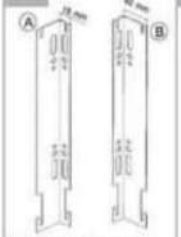
Determine the inlet-outlet directions into and from the radiator depending on the system connection type. Mark the area in which the radiator shall be placed, leaving spaces from the floor, from the top, left and right of the radiator. Make sure that there is sufficient space on the left and right hand side of the radiator to ensure easy use of the valves.

4



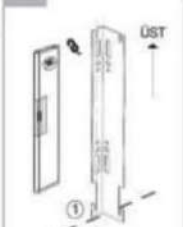
Mark the point 1 that is about 72 mm above the bottom side of the radiator, on the sprocket metal sheet on the wall.

5



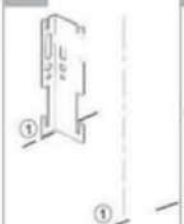
Mounting bracket may be mounted in two ways such that its narrow or broad side shall be adjacent to the wall. If the broad side A comes next to the wall, the space between the radiator and the wall would be 20,8 mm, if the narrow side comes next the wall then it would be 41,8 mm. In 10P types, mounting brackets should be placed so that its narrow side shall come next to the wall.

6



By using themounting bracket as a template, in the direction shown as UP, its bottom side shall come to the point 1 and place it on the wall perpendicular to the floor so that the holes on the mounting bracket shall be centered with the axis line. During this operation water gauge must be used.

7

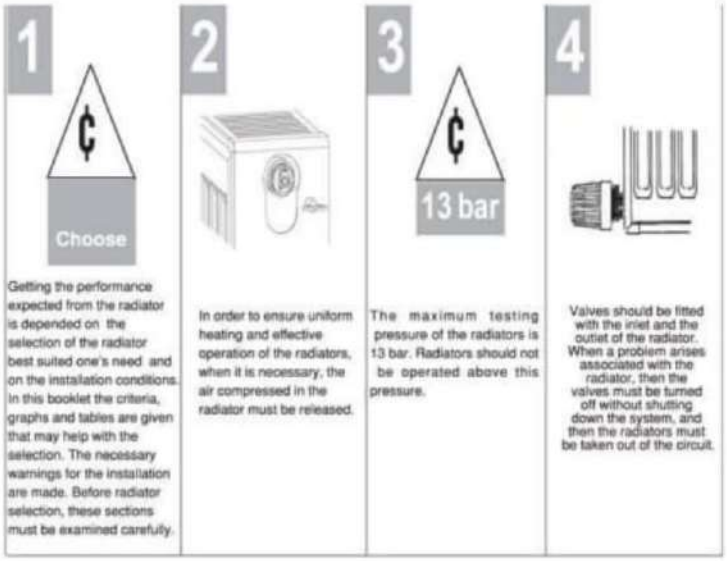


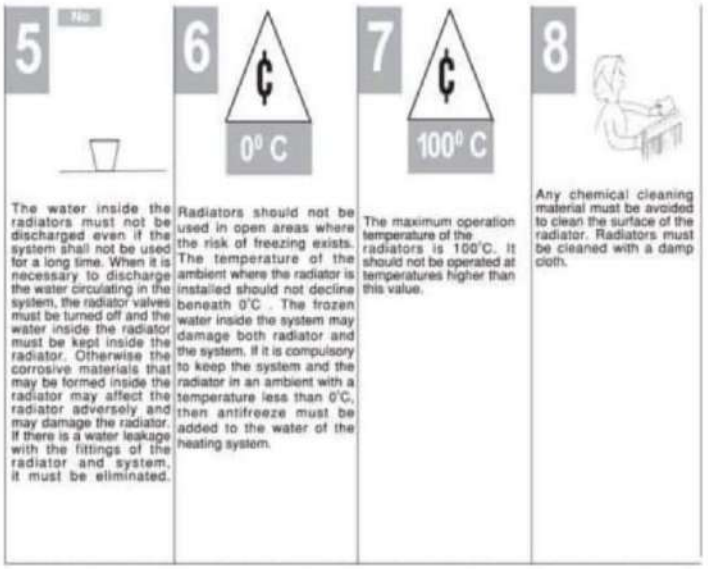
Place marks on the wall through the holes where the mounting bracket shall be screwed in the wall.

8

Using the Table 3, mark the axes where the mounting bracket shall come across according to the measurements "L1, L2" or "L". Again mark the points to be drilled into the wall using the mounting brackets as a template.

During Use, Attention Cases Rules





1. Water inlet to and outlet from the radiator, from the bottom and from the sides:

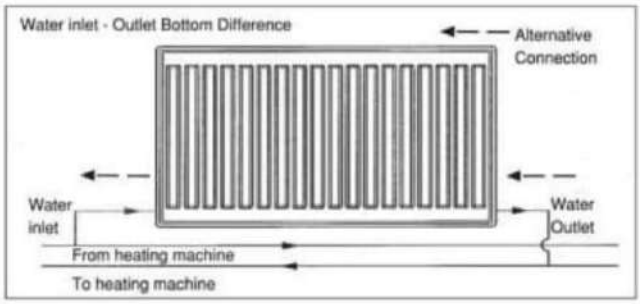
This is preferred when it is not possible to ensure the water inlet to the radiator from the top. It should not be used except where it is compulsory. At inlets from the top, the water entering into the radiator is expanded over the top section through the water channels and moves downwards. The water collected at the bottom is directed to the outlet. Thus the surface of the radiator gets warmed uniformly. However at the inlets from the bottom, some water moves upwards. The water moving from the top to the bottom gets mixed with the water in motion at the bottom. Therefore the performance of the radiator with the type of connection from the bottom would reduce by 10-20% depending on the radiator type, radiator height and length. This performance loss must be taken into consideration in radiator selection.
Inlet and outlet places may be changed.

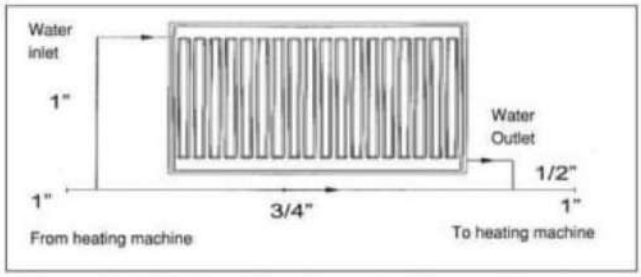
2. Connection to single-pipe heating system: In this connection type, the cold water coming out of one radiator shall mix with the hot water in the system and therefore the temperature in each radiatör would be different. For an effective heating the pipe diameters are important. Radiator inlet pipe must be selected bigger than the pipe of the system, enabling the water to enter in the radiator, and by selecting the radiator outlet pipe smaller than that of the system the full circulation of the water inside the radiator is ensured. However to ensure circulation of the system water, flow rate adjustment must be done with the radiator through the radiator valves, and while reducing the flow rates of the first radiators, the flow rates of the radiators towards the end must be increased.

3. Serial (side by side) radiator connection: This connection type is used rarely on a wall, but in compulsory situations where a single radiator can not be used, for example at the buildings that is divided by the columns due the construction form. In this connection type a water coming out of one radiator enters into another radiator. Accordingly the temperature in each radiator would be different. Water inlet-outlet can be done either from the same side or different sides. In connections from different sides, the total heat power of the serially connected radiators is a bit less than the total heat powers of the individual radiators. However at the connection made from the same side the heat power of the serially connected radiators is less by 8-10% than the total heat power of individual radiators. In practical, the connection from different sides must be preferred, if connection from the same side is being done, performance loss must be considered. Depending on the circulation pump on the system, the total heat charge on the radiators must not exceed 7000-8000 Kcal/h.

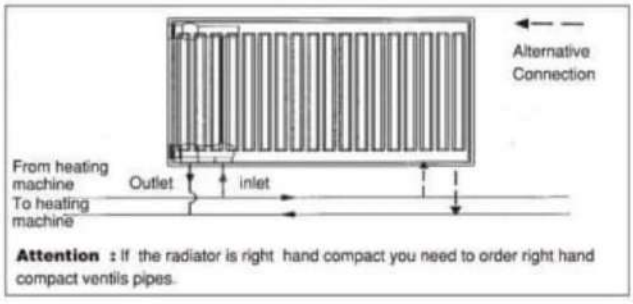
Aksan Panel Radiators are also produced as with compact valve, which ensure connection to the system to be made from the bottom. At compact-valve radiators, the water entering into the radiator from the bottom moves up. The water expands over the radiator as it is with the top connections, and no any power loss would occur.

A thermostatic valve is recommended to be used with compact valve panel radiators. Thus the temperature of each radiator can be checked separately. While the radiator temperature is checked automatically, it ensures an economic





4. Compact Ventille Radiators Bottom Connection : These type of connections using that under floor heating systems.



Attention : If the radiator is right hand compact you need to order right hand compact ventils pipes.

PACKAGING, HANDLING AND STORAGE

Aksan Panel Radiators are packaged severally at the end of the production line. Thanks to its precision made tough packaging, the panel radiators are protected from foreign bodies, frictions and damages during handling and mounting, and it would not get dirty.

The sides of the radiators are supported for the whole length with cardboard and bracket metal sheets are protected against damages with plastic caps. After the whole surface of the radiator is wrapped around with air-bubble nylon, a second protective nylon cover is stretched with shrink method.

Crate Packaging

The 10P and 11 PK model radiators are packaged being put into a crate rather than onto a pallet, perpendicularly and side by side and 10 pcs for one crate.

Handling and Loading

Radiator pallets must be handled carefully and they should not fall onto the floor. The carrying from one place to another must be done via a carrier, rather than being pushed or drawn. Radiator pallet must elevated from the ground fully and its rubbing against the floor must be avoided. The necessary gaps are left in order to let the arms of the carrier to extend under the pallet.

Pallet Packaging

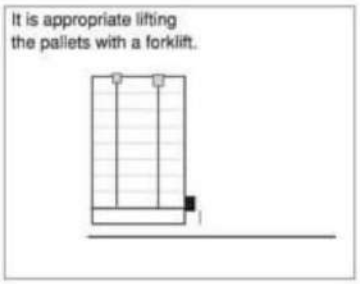
After the Aksan Panel Radiators are packaged severally, they are also packaged in pallets in order to be transferred safely and practically.

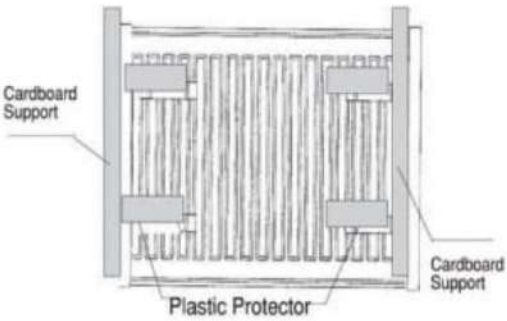
- 10-11 type radiators are lined up on the pallet perpendicularly and side by side.
- 20-21-22-33 type radiators:

In the event radiator pallet is carried with any lifter , a balanced and safe lifting method is advised.
Only crate-type packaging may be put one on another.

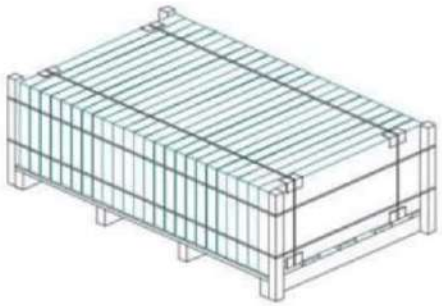
Packaging Heights

Pallet packaging heights and the number of radiators inside the pallet packaging are shown in the following table.





Length (mm)	Height 400 - 900 mm
400-500	2 transverse lines on the pallet
600-3000	Single line on the pallet



Perpendicular side by side configuration

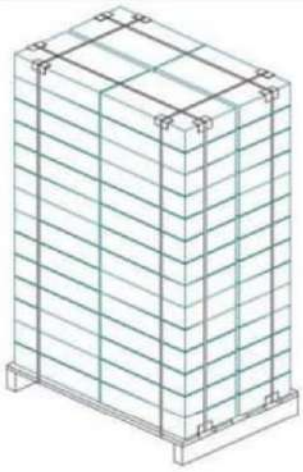


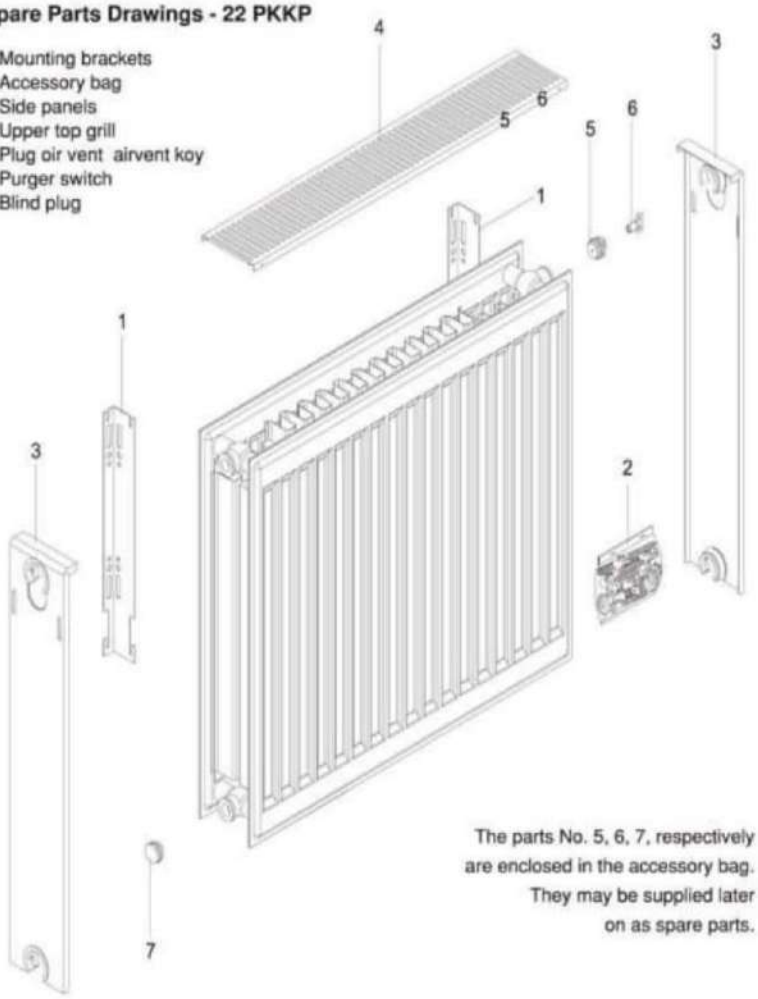
Table 2: Packaging dimensions

Radiator										
Height mm	400 - 500 - 600								
Length mm	400-500			600-1900			2000-2500		
Type	20-21-22	33	20-21-Thin	20-21-22	33	20-21-Thin	20-21-22	33	20-21-Thin
Height cm	173	165	135	173	165	135	150	148	120
Quantity of Radiators in pcs	28	18	32	14	9	16	12	8	14

Radiator										
Height mm	900								
Length mm	400-500			600-1900			2000-2500		
Type	20-21-22	33	20-21-Thin	20-21-22	33	20-21-Thin	20-21-22	33	20-21-Thin
Height cm	150	148	120	150	148	120	127	114	104
Quantity of Radiators in pcs	24	16	28	12	8	14	10	6	12

Spare Parts Drawings - 22 PKKP

1-Mounting brackets
2-Accessory bag
3-Side panels
4-Upper top grill
5-Plug oir vent airvent koy
6-Purger switch
7-Blind plug

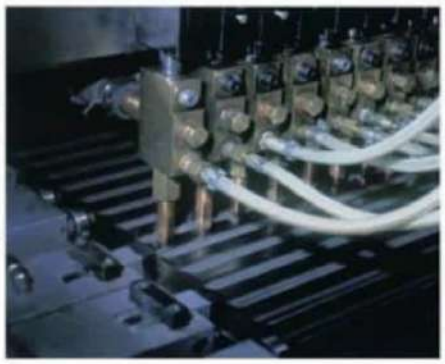


The parts No. 5, 6, 7, respectively are enclosed in the accessory bag. They may be supplied later on as spare parts.

EN 442 DELTA T 50 °C (75 °C / 65 °C) HEAT OUTPUTS

HEIGHT (mm)		400					500					600					900				
TYPE		P	PK	PKP	PKKP	PKKPKP	P	PK	PKP	PKKP	PKKPKP	P	PK	PKP	PKKP	PKKPKP	P	PK	PKP	PKKP	PKKPKP
ROOM TEMPERATURE 20 °C																					
400	(Kcal / hm)	145	218	316	403	571	178	261	379	484	685	210	302	438	562	796	296	420	579	749	1078
	(Watt / hm)	169	253	368	469	665	208	304	440	562	796	244	351	510	653	926	345	488	673	870	1254
	(BTU / hm)	574	865	1255	1600	2269	708	1036	1503	1919	2719	833	1199	1739	2230	3159	1177	1666	2298	2970	4281
500	(Kcal / hm)	181	272	395	504	714	223	327	473	605	856	263	378	548	703	995	370	525	724	935	1348
	(Watt / hm)	210	317	460	586	830	259	379	550	703	996	305	439	637	817	1157	431	610	842	1088	1568
	(BTU / hm)	718	1081	1570	2000	2836	885	1295	1879	2399	3399	1042	1499	2174	2789	3950	1471	2082	2872	3712	5351
600	(Kcal / hm)	217	327	474	605	857	268	391	568	725	1028	315	453	657	843	1193	445	630	869	1122	1617
	(Watt / hm)	252	380	551	703	997	311	455	661	844	1195	366	527	764	980	1389	517	732	1010	1305	1881
	(BTU / hm)	862	1298	1883	2400	3403	1062	1554	2255	2879	4079	1250	1799	2609	3346	4739	1766	2499	3447	4455	6422
700	(Kcal / hm)	253	381	553	706	1000	312	457	663	846	1199	368	529	767	984	1392	519	734	1013	1310	1887
	(Watt / hm)	294	444	644	820	1163	363	531	770	984	1394	428	615	891	1144	1620	604	854	1178	1523	2194
	(BTU / hm)	1006	1514	2197	2800	3970	1239	1813	2630	3359	4759	1458	2099	3044	3904	5529	2060	2915	4021	5198	7491
800	(Kcal / hm)	290	436	632	806	1143	356	522	757	967	1370	420	604	876	1124	1591	593	839	1157	1496	2157
	(Watt / hm)	337	507	735	937	1330	414	607	881	1125	1593	489	703	1019	1307	1851	690	976	1347	1740	2509
	(BTU / hm)	1150	1730	2510	3200	4537	1415	2072	3007	3838	5438	1667	2399	3478	4462	6319	2353	3331	4595	5940	8562
900	(Kcal / hm)	326	490	711	907	1286	401	588	852	1088	1541	472	680	986	1265	1790	667	944	1302	1684	2427
	(Watt / hm)	379	570	828	1054	1495	467	683	990	1265	1792	550	790	1147	1470	2083	776	1098	1514	1958	2822
	(BTU / hm)	1293	1947	2825	3600	5105	1592	2331	3383	4318	6118	1875	2698	3913	5019	7109	2648	3749	5170	6683	9632
1000	(Kcal / hm)	362	545	790	1008	1429	446	652	947	1209	1712	525	755	1095	1405	1990	741	1049	1447	1870	2696
	(Watt / hm)	421	633	919	1171	1661	518	759	1101	1406	1991	610	878	1273	1633	2313	862	1220	1683	2175	3135
	(BTU / hm)	1437	2163	3138	4000	5671	1770	2590	3758	4798	6798	2083	2998	4349	5577	7898	2942	4165	5745	7426	10703
1100	(Kcal / hm)	398	599	870	1109	1571	490	718	1041	1330	1884	577	830	1205	1546	2189	815	1154	1591	2057	2966
	(Watt / hm)	463	697	1011	1289	1828	570	834	1211	1546	2190	671	966	1401	1797	2545	949	1342	1851	2392	3449
	(BTU / hm)	1580	2379	3452	4400	6239	1947	2849	4134	5278	7478	2291	3298	4783	6134	8689	3236	4581	6319	8168	11772
1200	(Kcal / hm)	434	653	949	1210	1714	535	783	1136	1450	2055	630	907	1314	1686	2388	890	1259	1736	2245	3235
	(Watt / hm)	505	760	1103	1407	1993	622	910	1321	1687	2390	732	1054	1529	1960	2776	1034	1464	2019	2610	3762
	(BTU / hm)	1724	2595	3766	4800	6806	2124	3108	4510	5758	8158	2500	3598	5218	6692	9478	3530	4997	6893	8910	12843
1300	(Kcal / hm)	470	709	1028	1310	1857	579	849	1230	1571	2226	682	982	1424	1827	2587	964	1364	1881	2431	3505
	(Watt / hm)	548	824	1195	1524	2160	674	987	1431	1828	2589	793	1142	1656	2124	3008	1121	1586	2188	2828	4076
	(BTU / hm)	1868	2811	4080	5200	7373	2300	3367	4886	6237	8837	2709	3898	5652	7250	10268	3825	5414	7468	9653	13913
1400	(Kcal / hm)	507	763	1107	1410	2000	624	913	1326	1692	2397	734	1057	1533	1967	2786	1037	1469	2026	2618	3774
	(Watt / hm)	590	887	1287	1641	2326	726	1062	1541	1968	2788	854	1230	1783	2288	3239	1207	1708	2356	3046	4390
	(BTU / hm)	2011	3028	4393	5600	7940	2477	3626	5262	6717	9517	2916	4197	6088	7808	11058	4119	5830	8043	10395	14984
1500	(Kcal / hm)	543	817	1186	1511	2143	669	979	1420	1813	2569	788	1133	1643	2108	2985	1111	1573	2170	2806	4044
	(Watt / hm)	631	950	1379	1758	2492	777	1138	1651	2109	2988	915	1317	1910	2450	3470	1293	1830	2525	3263	4703
	(BTU / hm)	2155	3244	4708	6000	8508	2654	3885	5637	7197	10197	3125	4497	6522	8366	11848	4413	6247	8617	11138	16053
1600	(Kcal / hm)	579	871	1265	1612	2286	713	1044	1514	1933	2740	840	1209	1752	2248	3183	1186	1678	2315	2992	4313
	(Watt / hm)	673	1013	1470	1875	2658	830	1214	1762	2249	3187	976	1406	2038	2614	3702	1379	1952	2692	3480	5016
	(BTU / hm)	2299	3460	5021	6400	9074	2831	4144	6013	7677	10877	3333	4797	6957	8923	12637	4708	6664	9191	11881	17124
1700	(Kcal / hm)	615	926	1344	1713	2429	758	1110	1610	2054	2911	892	1284	1862	2389	3382	1260	1783	2460	3180	4583
	(Watt / hm)	715	1077	1563	1992	2825	881	1290	1871	2390	3386	1037	1493	2166	2777	3933	1466	2074	2861	3698	5330
	(BTU / hm)	2443	3676	5335	6800	9642	3009	4403	6390	8156	11557	3542	5097	7391	9481	13428	5002	7080	9766	12623	18194
1800	(Kcal / hm)	651	981	1423	1813	2571	802	1174	1704	2175	3082	945	1359	1971	2529	3581	1334	1889	2605	3367	4852
	(Watt / hm)	757	1140	1655	2110	2990	933	1366	1982	2530	3585	1098	1581	2292	2941	4165	1551	2196	3030	3915	5644
	(BTU / hm)	2586	3893	5649	7200	10209	3185	4662	6765	8636	12237	3750	5397	7827	10038	14217	5296	7496	10340	13366	19265
1900	(Kcal / hm)	688	1035	1502	1914	2700	847	1240	1799	2296	3235	997	1435	2081	2670	3777	1409	1993	2750	3553	5114
	(Watt / hm)	800	1204	1747	2227	3140	985	1442	2091	2670	3764	1160	1669	2420	3104	4390	1638	2318	3197	4133	5949
	(BTU / hm)	2730	4110	5963	7600	10718	3362	4921	7141	9116	12849	3958	5697	8261	10596	14985	5590	7912	10914	14109	20305
2000	(Kcal / hm)	724	1090	1581	2015	2834	891	1305	1893	2417	3396	1050	1510	2190	2810	3973	1482	2098	2894	3741	5385
	(Watt / hm)	842	1267	1839	2344	3296	1037	1517	2202	2811	3951	1221	1757	2548	3268	4617	1724	2440	3366	4350	6264
	(BTU / hm)	2873	4326	6276	8001	11253	3539	5180	7516	9596	13490	4167	5996	8696	11154	15764	5885	8330	11490	14850	21401
2100	(Kcal / hm)	758	1139	1656	2111	2975	935	1370	1983	2532	3566	1099	1582	2294	2943	4175	1552	2197	3031	3937	5653
	(Watt / hm)	880	1328	1930	2455	3461	1089	1592	2306	2945	4149	1278	1840	2668	3430	4852	1806	2558	3525	4557	6576
	(BTU / hm)	3010	4531	6574	8379	11815	3715	5438	7874	10062	14165	4364	6282	9118	11696	16568	6164	8733	12036	15558	22470
2200	(Kcal / hm)	796	1198	1739	2217	3124	981	1435	2083	2659	3744	1154	1662	2410	3090	4384	1630	2308	3184	4115	5935
	(Watt / hm)	926	1394	2023	2578	3633	1140	1670	2422	3092	4355	1343	1932	2802	3594	5094	1896	2684	3702	4786	6905
	(BTU / hm)	3161	4758	6904	8801	12406	3893	5698	8269	10555	14872	4583	6596	9566	12270	17395	6472	9162	12638	16336	23593
2300	(Kcal / hm)	830	1250	1815	2313	3280	1030	1498	2174	2775	3927	1205	1726	2515	3210	4598	1702	2407	3322	4295	6231
	(Watt / hm)	967	1455	2111	2690	3814	1196	1742	2528	3228	4569	1401	2016	2914	3751	5338	1979	2801	3865	4995	7250
	(BTU / hm)	3300	4967	7207	9187	13026	4088	5948	8631	11019	15601	4780	6853	9986	12808	18230	6756	9565	13192	17053	24772
2400	(Kcal / hm)	869	1308	1897	2418	3444	1070	1566	2272	2901	4114	1259	1812	2629	3371	4813	1779	2518	3472	4489	6543
	(Watt / hm)	1010	1521	2207	2812	4005	1244	1821	2642	3373	4788	1465	2108	3057	3921	5589	2069	2928	4039	5221	7611
	(BTU / hm)	3449	5190	7531	9601	13676	4247	6216	9020	11515	16350	5000	7196	10435	13385	19086	7061	9995	13787	17821	26010
2500	(Kcal / hm)	908	1366	1982	2527	3615	1123	1640	2383	3031	4308	1315	1893	2747	3523	5034	1859	2630	3629	4690	6870
	(Watt / hm)	1055	1589	2306	2938	4205	1306	1908	2770	3525	5012	1530	2202	3194	4097	5845	2161	3059	4220	5455	7992
	(BTU / hm)	3604	5424	7870	10032	14360	4458	6514	9452	12033	17117	5225	7520	10905	13987	19963	7378	10445	14407	18623	27310

INTRODUCTION



This booklet includes the technical data regarding Aksan Panel Radiators, the data required to select most suitable radiator type according to various placement and usage conditions, the placement and mounting recommendations for correct and efficient usage. Aksan Panel Radiators are produced in the ·certified factory of Aksan, on computer-aided modern production lines. Aksan Panel Radiators allows the solutions best suiting any installations and location conditions, with its varying types and dimensions. Aksan Panel Radiators are used widely in domestic market and exported to foreign countries as well, conform to
and German Tuv standards, plus CE standards

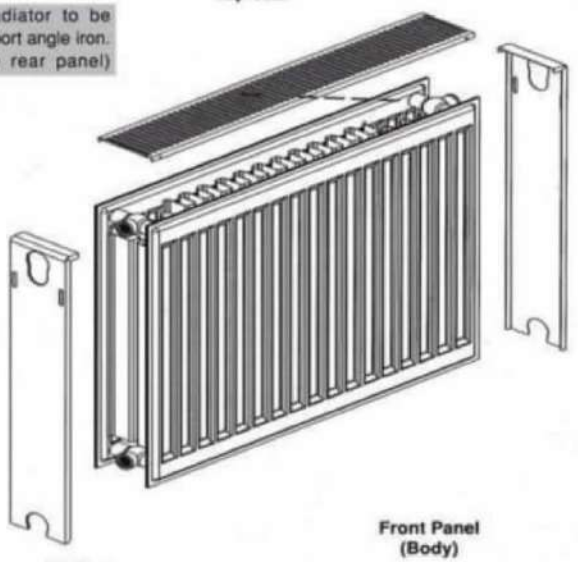
MAIN PARTS

Main Parts
Ensures the radiator to be fitted on the support angle iron. (Welded to the rear panel)

Top Grill

Rear Panel (Body)

Convector (Fin)



Hand Size
Side Cover on the right

Front Panel (Body)
At Aksan Panel Radiators, convectors are directly welded onto the water channels, thus allofin the mean heat transfer through the radiators are elevated to the outmost level. Radiator output is higher.

T Piece
It is used for connection to the installation or for fitting a blind plug. Welded to the panel. (At standard types.)

Left Side Cover

Radiators inside and exterior parts are step by step oil take, steel phosphat, passivasion, splashing priming paint, hot ovened, RAL 9010 epoxy polyester white paint

Output: 90 %
Room temperature: 20°C
Water inlet outlet temperature: 90/70°C and accordingly
Heat-Power (W/m)= 2134 Watt
Capacity= Nominal capacity x Output
= 2134 x 0.90
= 1920.6 Watt

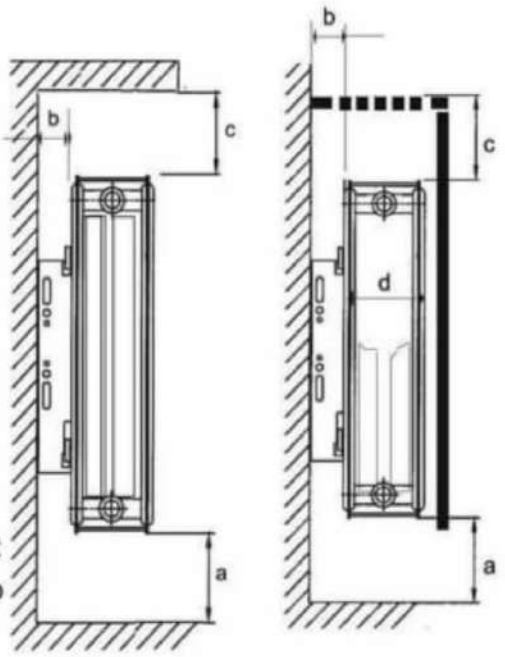
Example 2
Radiator type:
22 PKKP
Height : 600 mm,
Length : 1000 mm,
Placement:
Inside the furniture as illustrated in the figure heretofare
c= 80 mm
b= 40 mm
d= 105 mm
a= 0.70xd=0.70x105=73.5 mm
Likewise, the output is:
Output: 105%.
Room temperature: 20°C,
Vater inlet &outlet
Temperature = 90/70°C, and accordingly
Heat Power (W/m)= 2134 Watt
Capacity: Nominal capacity x Output
=2134 x 1.05
=2240.7 Watt.

Examples for calculating the radiator output :

Example 1

Radiator type:
22PKKP

Height: 500 mm
Length: 1000 mm
Placement:
Embedded into the wall as illustrated on the right
a: 100 mm
b: 40 mm
c= 80 mm
The output is worked out from the table relating to the placement position.



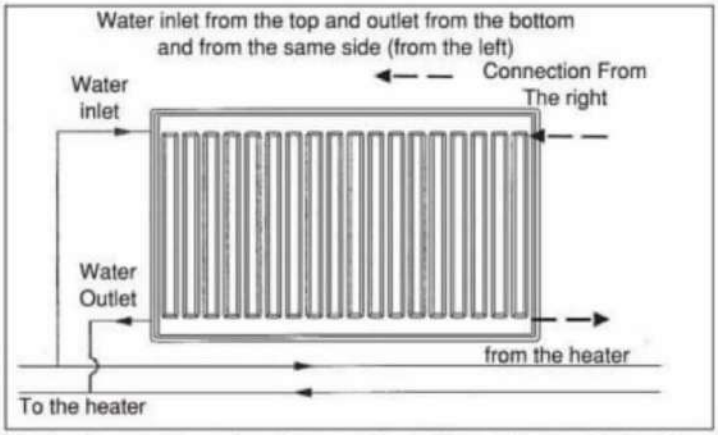
Recommendations for the Installation Connection

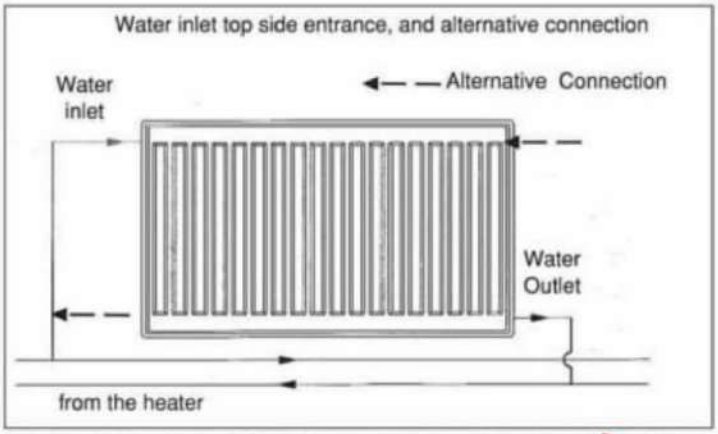
The connection of panel radiators to the heating installation may be done in various ways, depending on the placement conditions and the radiator properties.

It is recommended that a valve be fitted on radiator inlets and outlets at connections. This, when it is necessary, without discharging the water of the system and while the heating system in operation, a single radiator can be parted from the system by turning off the valves. Heating system –radiator connection forms would also affect the radiator output. The data regarding the connection types and the output are described below:

1. The warm water inlet to the radiator from the top and its outlet from the bottom:

Water inlet and outlet may on the same sides or on the different sides. Inlet and outlet may be done from the right or left hand side of the radiator. This feature would allow a mounting that is suitable for the placement conditions to be effected. It is used commonly.





Whether the connection is from the same side or different sides would affect the output due to the change of water flow. In the experiments carried out for all types it was ascertained that the connection's being made either from the same side or different sides do not affect the output up to the height 2500 mm at various radiator heights. Therefore connection can be made from both sides up to the 2500 mm that is the maximum standard length of Aksan Panel Radiators.

Placement Considerations to be Noted in Respect of Comfort Conditions

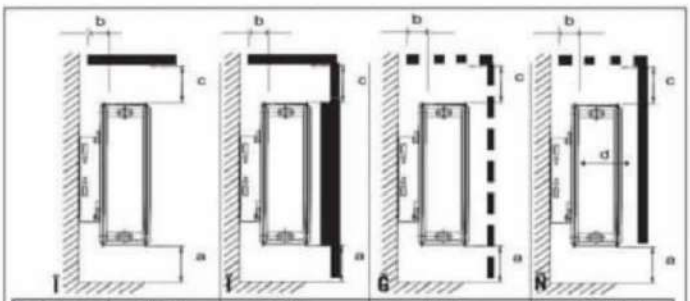
In some rooms, there may be a recess in the wall right under the window in which the radiator shall be placed. In this case the radiator must be placed in the recess. However in some environments the top and the around of the radiator is covered with furniture for decorative purposes. The most appropriate configuration desired is that in which the top and the around of the radiator is completely open. When the top and the around of the radiator is grilled, the air flow and consequently the effectiveness of the radiator would be affected from it.

The Considerations to be Noted In Placement in Respect of Radiator Efficiency

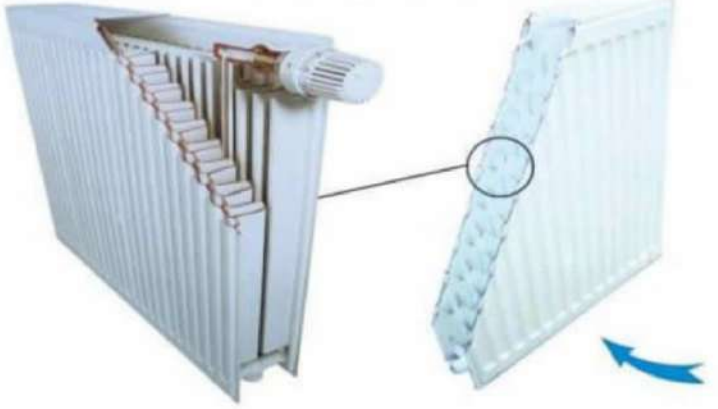
As a result of closing the top and the around of the radiator, the air circulation between the fins is blocked and the radiator's efficiency would decrease. In this case when choosing a radiator the decline in efficiency of the radiator that may occur for that reason should be taken into consideration. Ideally, as specified in the top of the radiator must be open completely, a space of min 100 mm on the bottom and on the back 40 mm from the wall as well must be left. In this case the radiator efficiency is accepted to be 100 %.

The capacity values given in this booklet and in the panel radiator brochure apply to this ideal condition. When the radiator is placed into the recess in the wall under the window, the width of the window base would affect the distribution and the effectiveness of the air in the internal media that is released from the radiator.

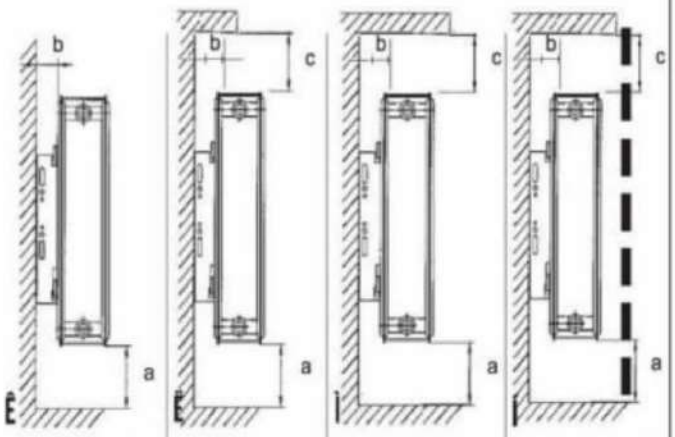
The effectiveness where the window base covers the top of the radiator fully and in half respectively is as follows:



Evidence (mm)							
a (min)	100		100		100	a = 0.70 d	
b (min)	40		40		40	40	
c	100	50	100	50	80	80	
Output %	**97**	**95**	**90**	**85**	**90**	**105**	



In the cases where the top of the radiator is closed, a cover grill must be used, which shall ensure the top of the radiator to remain open even if partially.



Evidence (mm)					
a (min)	100	100	100	100	
b (min)	40	40	40	40	
c	-	80	80	80	
Output %	**100**	**96**	**90**	**75**	

The variance of effectiveness for the situations where the top and the around of the radiator is covered with furniture is shown in the following figures.