



VKN

**FAN ASSISTED
TRENCH HEATERS**



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FORCED CONVECTION



OPERATING PRINCIPLE OF FAN ASSISTED TRENCH HEATERS

Convection heating systems utilize the phenomenon of heat absorption by air particles flowing through heat exchanger. The difference in densities of cold and heated air causes a delicate draft that initiates the airflow in the exchanger.

This principle is used in trench heaters, that is low mass, low water capacity and low heat inertia convection heaters.

These heaters are considered simplest in setting and allow for shortest reaction times for changes in room heat demand.

Use of fan allows to increase the airstream flowing through the trench heater exchanger, which in turn results in higher dynamics of heat transfer process and substantial increase of heating power of the trench heater.

The adjustment of fan heater is achieved by simultaneous change of fan speed and the light of the thermostatic valve with use of actuator fitted on that valve. The fan and the actuator are controlled by room controller that can be programmed according to user preferences.

The automatic adjustment of heater operation that initiates the heating mode only if it is required, allows for significant energy savings and thus lowering of operating cost of the whole building.

The fans used in VERANO products are equipped with low-voltage EC motors that allow for silent, safe and easy adjustment of heater.

You will find details pertaining to the construction of installation in the „Installation and maintenance manual for VKN heaters“ section.



OUR ADVANTAGES



HIGHLY EFFICIENT HEAT EXCHANGER

Based on the research and development works, the optimal dimensions of the heat exchanger were used. As a result of that, an increase product heating output was obtained by 10 to 20%, depending of the unit length and height.



ADJUSTMENT OF THE TRENCH

Adjustment legs allow for easy, one-step adjustment of the height of the trench in the mounting hole, as well as its trouble-free levelling.



DEDICATED CONTROL SYSTEM

Modern room controllers allow for full control of heater operations.



MODERN EC FANS

Using 24V DC fan motors will provide much quicker and quiet air distribution, yet the entire product is safe and hassle free for install and maintenance.



WIRELESS CONTROL

It is extremely easy to precisely control the heaters using a phone or tablet with the free application installed.



TOOLS FOR DESIGNERS

Our products are available in the renowned INSTALSOFT and SANKOM design programs.



COMPLIANCE WITH EN 16430 STANDARD

VKN5 Verano trench heaters have been tested in accordance with the applicable EN 16430 standard, which confirms their high quality.



CAD AND BIM LIBRARIES

The VERANO product families used in BIM allow modification of the heater DIMENSIONS and the selection of the type of grille and frame. They also provide all information about the parameters of the products, and allow the heat output of the device to be measured depending on the operating parameters of the installation.



VERANO SELECT

The selection program enables the selection of an appropriate type of device for any operating parameters, depending on the required heat output.



CONFIRMED QUALITY

Years of thorough research, analyses and measurements, including those in the Warsaw, Cracow and Lublin Universities of Technology, Polish Academy of Sciences and own research we developed high class heating and heating-cooling devices.

They increase the energy efficiency of hot / cold air supply and significantly increase the efficiency of low-temperature systems that they work with.

The perfect technical parameters of VERANO products were also confirmed in the tests conducted in the HEATEST s.r.o. notified body and the Heizung – Lüftung – Klimatechnik Stuttgart at the Institut für GebäudeEnergetik Universität Stuttgart.

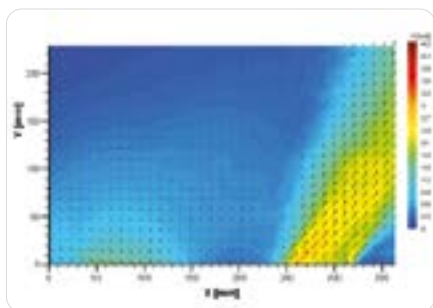
VERANO heaters are designed for heating both residential (detached homes and apartment buildings), office, service, retail, hotel, sacral spaces; sports objects, swimming pools and many others.

The choice of convector heaters is recommended to designers utilizing computer software for designing C.H. installation.

A correct technical design secures optimal choice of heater sizes and other devices, correct construction and hydraulic adjustment of heating installation, which influences future faultless and energy-saving use. VERANO heaters hold all the required EU documents:

- Technical approval and declaration of operating characteristics pursuant to the EN 16430 Standard,
- EU Declaration,
- PZH hygienic certificate.

RESEARCH AND DEVELOPMENT



The airspeed analysis is one of the basic parameters that influence the heating power of the device. The measurement of distribution of airspeeds allowed us to eliminate detrimental phenomena occurring in operation of typical trench heaters, i.e. the appearance of zones with very low airspeed and the return suction of already heated air.

The VKN series trench heaters are characterized by airflow formed by specially designed injectors. This allows to reduce the airspeed in the zone where people are staying to generally acceptable levels. This in turn largely reduces the risk of discomfort connected with airflow, so called "draft".



All R&D studies that concern our VKN trench heaters are conducted in the specially constructed and prepared climatic chamber that ensures that all compliance standards in accordance to BS/EN 16430-2 are rigorously met.



The acoustic power measurement of fan assisted VKN trench heaters is carried out in accordance with the European standard EN ISO 3744 at the VERANO headquarters. The measurement is made at points located on the measuring surface surrounding the tested heater above the sound reflecting plane. Thanks to the use of a digital sound analyzer, it is possible to measure broadband as well as in octave bands.



VKN1 Height 65 mm and 90 mm

PRODUCT VISUALIZATION



EQUIPMENT

STANDARD EQUIPMENT:

- casing made of galvanized steel sheet in RAL 9005 black,
- highly efficient cooper-aluminium heat exchanger, powder coated in black with air vent,
- modern fan with silent and efficient 24V DC motor
- connection space cover,
- fan cover, so called grille, with airflow baffle,
- water connection: 1/2" female thread,
- assembly struts,
- fixing anchors,
- levelling legs.

ADDITIONAL EQUIPMENT:

- casing made of galvanised steel sheet in any RAL colour,
- decorative frame (F or L type) made of natural or anodized aluminium,
- decorative grille made of natural or anodized aluminium, roll-up, linear or modular type; stainless steel grille; natural wooden grille,
- assembly protection fibreboard for transporting and installation,
- raised floor kit,
- bimetal temperature sensor,
- casing protective film,
- foil sleeve for heat exchanger,
- anti dust filer (requires raising the trench by 10 mm),
- BMS controls.

DIMENSIONS

DIMENSIONS	[mm]
Trench height (H)	65, 90
Trench bottom width (B)	140, 170
Top width/Grille width (Bk)	164, 194
Trench length (L)	950÷2000

Non-standard (NS) heater lengths are available on request.

EXAMPLE OF ORDER CODE: VKN1-9/14/110 (L)

Trench height H
[cm]

Trench bottom width B
[cm]

Trench length L [cm]

Connection side
(L- Left/P - Right)



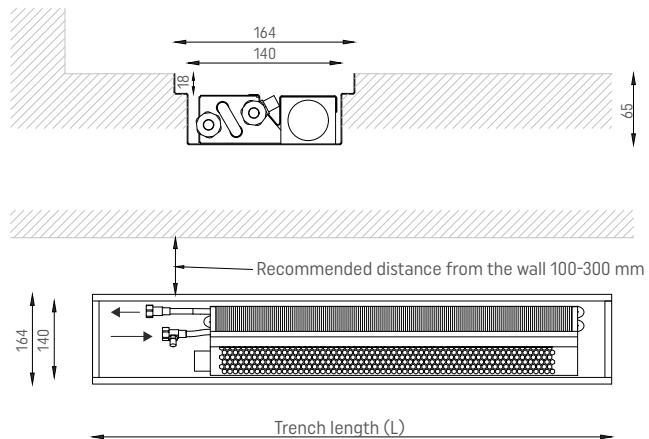
HEIGHT 65 mm

VKN1-6,5/14/L (L/P)



ORDER CODE

DIMENSIONS	[mm]
Trench height (H)	65
Trench bottom width (B)	140
Top width/Grille width (Bk)	164
Trench length (L)	950÷2000
CONNECTIONS	TYPE
Connectors	½" female thread
Connection side	Left (L) standard, Right (P) optional
ACCESSORIES	TYPE
Grille H=18 mm	Roll-up / linear / modular
Frames	L lub F



Trench length L [mm]	Operating mode [-]	Heating output for t_s/t_r °C			Sound pressure level Lp [dB(A)]	Sound power level Lw [dB(A)]	Electric power demand P [W]	Current I [A]	Number of fan motors [-]
		75/65 °C	55/45 °C	35/30 °C					
950	Min	99	59	25	<18	<26	0,8	0,03	1
	Med	447	268	112	<18	<26	1,2	0,05	
	Max	767	460	191	<18	<26	2,2	0,09	
	Boost	1206	723	361	28	36	6,0	0,25	
1100	Min	116	70	29	<18	<26	0,8	0,03	1
	Med	525	315	131	<18	<26	1,2	0,05	
	Max	900	540	225	<18	<26	2,4	0,10	
	Boost	1416	849	424	28	36	7,0	0,29	
1250	Min	149	89	37	<18	<26	0,8	0,03	1
	Med	673	404	168	<18	<26	1,2	0,05	
	Max	1155	693	288	<18	<26	2,7	0,11	
	Boost	1817	1089	544	28	36	9,2	0,38	
1450	Min	173	104	43	<18	<26	0,8	0,03	1
	Med	779	467	194	<18	<26	1,5	0,06	
	Max	1337	802	334	<18	<26	2,9	0,12	
	Boost	2103	1261	630	28	36	10,4	0,43	
1650	Min	198	119	49	<18	<26	1,5	0,06	2
	Med	894	536	223	<18	<26	2,4	0,10	
	Max	1532	918	382	18	26	4,4	0,18	
	Boost	2408	1444	721	31	39	12,0	0,50	
1800	Min	232	139	58	<18	<26	1,5	0,06	2
	Med	1050	630	262	<18	<26	2,4	0,10	
	Max	1801	1080	449	18	26	4,6	0,19	
	Boost	2832	1698	848	31	39	13,0	0,54	
2000	Min	248	148	62	<18	<26	1,5	0,06	2
	Med	1120	672	280	<18	<26	2,4	0,10	
	Max	1920	1151	479	18	26	4,8	0,20	
	Boost	3019	1810	904	31	39	15,2	0,63	

- Normative heating power output [W] compliant to EN-16430 for room temperature of $\theta = 20^\circ\text{C}$.
- Control voltages for the respective modes of operation: Min - 2 V, Med - 4 V, Max - 6 V, Boost - 10 V.
- Min, Med, Max fan speeds are for continuous operations, the Boost mode for fast additional heating of rooms.
- Sound power level according to ISO-3745 standard, sound pressure level for a distance of 2m in a room of a total volume of 100 m³ and reverb time of 0.5 s assuming room dampening of 8 dB(A).



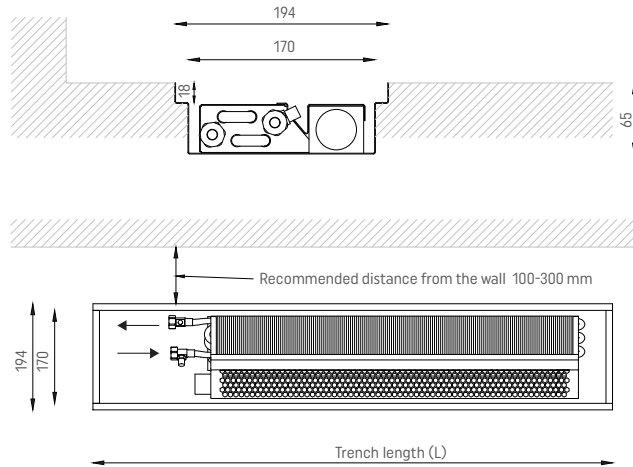
HEIGHT 65 mm

VKN1-6,5/17/L (L/P)



ORDER CODE

DIMENSIONS	[mm]
Trench height (H)	65
Trench bottom width (B)	170
Top width/Grille width (Bk)	194
Trench length (L)	950÷2000
CONNECTIONS	TYPE
Connectors	½" female thread
Connection side	Left (L) standard, Right (P) optional
ACCESSORIES	TYPE
Grille H=18 mm	Roll-up / linear / modular
Frames	L lub F



Trench length L [mm]	Operating mode [-]	Heating output for t_s/t_r °C			Sound pressure level Lp [dB(A)]	Sound power level Lw [dB(A)]	Electric power demand P [W]	Current I [A]	Number of fan motors [-]
		75/65 °C	55/45 °C	35/30 °C					
950	Min	107	64	27	<18	<26	0,8	0,03	1
	Med	559	335	139	<18	<26	1,2	0,05	
	Max	967	580	241	<18	<26	2,2	0,09	
	Boost	1500	899	374	28	36	6,0	0,25	
1100	Min	126	76	31	<18	<26	0,8	0,03	1
	Med	656	393	164	<18	<26	1,2	0,05	
	Max	1135	680	283	<18	<26	2,4	0,10	
	Boost	1761	1056	439	28	36	7,0	0,29	
1250	Min	161	96	40	<18	<26	0,8	0,03	1
	Med	842	505	210	<18	<26	1,2	0,05	
	Max	1457	873	363	<18	<26	2,7	0,11	
	Boost	2259	1355	564	28	36	9,2	0,38	
1450	Min	187	112	47	<18	<26	0,8	0,03	1
	Med	975	585	243	<18	<26	1,5	0,06	
	Max	1686	1011	421	<18	<26	2,9	0,12	
	Boost	2616	1568	653	28	36	10,4	0,43	
1650	Min	214	128	53	<18	<26	1,5	0,06	2
	Med	1116	669	278	<18	<26	2,4	0,10	
	Max	1931	1158	482	18	26	4,4	0,18	
	Boost	2995	1796	747	31	39	12,0	0,50	
1800	Min	251	150	63	<18	<26	1,5	0,06	2
	Med	1313	787	328	<18	<26	2,4	0,10	
	Max	2271	1362	567	18	26	4,6	0,19	
	Boost	3522	2112	879	31	39	13,0	0,54	
2000	Min	268	161	67	<18	<26	1,5	0,06	2
	Med	1399	839	349	<18	<26	2,4	0,10	
	Max	2421	1451	604	18	26	4,8	0,20	
	Boost	3755	2251	937	31	39	15,2	0,63	

- Normative heating power output [W] compliant to EN-16430 for room temperature of $\theta = 20^\circ\text{C}$.
- Control voltages for the respective modes of operation: Min - 2 V, Med - 4 V, Max - 6 V, Boost - 10 V.
- Min, Med, Max fan speeds are for continuous operations, the Boost mode for fast additional heating of rooms.
- Sound power level according to ISO-3745 standard, sound pressure level for a distance of 2m in a room of a total volume of 100 m³ and reverb time of 0.5 s assuming room dampening of 8 dB(A).



CORRECTIVE FACTORS FOR 65 mm HIGH VKN1 HEATERS

Heating output corrective factors for VKN1 65 mm high units for installation temperatures other than 75/65/20°C.

SUPPLY AND RETURN TEMPERATURES [°C]		ROOM AIR TEMPERATURE θ_1 [°C]						
t_s	t_r	5	8	12	16	20	24	32
90	85	1,651	1,591	1,511	1,431	1,351	1,270	1,110
	80	1,601	1,541	1,461	1,381	1,301	1,220	1,060
	75	1,551	1,491	1,411	1,331	1,250	1,170	1,010
	70	1,501	1,441	1,361	1,280	1,200	1,120	0,960
85	80	1,551	1,491	1,411	1,331	1,250	1,170	1,010
	75	1,501	1,441	1,361	1,280	1,200	1,120	0,960
	70	1,451	1,391	1,311	1,230	1,150	1,070	0,910
	65	1,401	1,341	1,260	1,180	1,100	1,020	0,860
80	75	1,451	1,391	1,311	1,230	1,150	1,070	0,910
	70	1,401	1,341	1,260	1,180	1,100	1,020	0,860
	65	1,351	1,290	1,210	1,130	1,050	0,970	0,810
	60	1,301	1,240	1,160	1,080	1,000	0,920	0,760
75	70	1,351	1,290	1,210	1,130	1,050	0,970	0,810
	65	1,301	1,240	1,160	1,080	1,000	0,920	0,760
	60	1,250	1,190	1,110	1,030	0,950	0,870	0,710
	55	1,200	1,140	1,060	0,980	0,900	0,820	0,660
70	65	1,250	1,190	1,110	1,030	0,950	0,870	0,710
	60	1,200	1,140	1,060	0,980	0,900	0,820	0,660
	55	1,150	1,090	1,010	0,930	0,850	0,770	0,610
	50	1,100	1,040	0,960	0,880	0,800	0,720	0,560
65	60	1,150	1,090	1,010	0,930	0,850	0,770	0,610
	55	1,100	1,040	0,960	0,880	0,800	0,720	0,560
	50	1,050	0,990	0,910	0,830	0,750	0,670	0,509
	45	1,000	0,940	0,860	0,780	0,700	0,620	0,459
60	55	1,050	0,990	0,910	0,830	0,750	0,670	0,509
	50	1,000	0,940	0,860	0,780	0,700	0,620	0,459
	45	0,950	0,890	0,810	0,730	0,650	0,570	0,409
	40	0,900	0,840	0,760	0,680	0,600	0,519	0,359
55	50	0,950	0,890	0,810	0,730	0,650	0,570	0,409
	45	0,900	0,840	0,760	0,680	0,600	0,519	0,359
	40	0,850	0,790	0,710	0,630	0,550	0,469	0,309
	35	0,800	0,740	0,660	0,580	0,499	0,419	0,259
50	45	0,850	0,790	0,710	0,630	0,550	0,469	0,309
	40	0,800	0,740	0,660	0,580	0,499	0,419	0,259
	35	0,750	0,690	0,610	0,529	0,449	0,369	0,210
45	40	0,750	0,690	0,610	0,529	0,449	0,369	0,210
	35	0,700	0,640	0,560	0,479	0,399	0,319	0,160
40	35	0,650	0,590	0,509	0,429	0,349	0,269	0,110
	30	0,600	0,540	0,459	0,379	0,299	0,220	0,060
35	30	0,550	0,489	0,409	0,329	0,249	0,170	0,010

HEATING OUTPUT CORRECTIVE FACTORS FOR VKN HEATERS ACCORDING TO THE GRILLE TYPE

GRILLE TYPE	AIRFLOW	CORRECTIVE FACTOR
Roll-up double T-bar profile aluminium grille - 13 mm gap	67%	1,00
Roll-up double T-bar profile aluminium grille - 8 mm gap	63%	0,99
Roll-up closed profile aluminium grille	62%	1,00
Roll-up wooden grille	52%	0,98
Modular snap on profile aluminium grille	62%	0,97
Linear snap on profile aluminium grille	62%	1,08
Linear stainless steel grille	71%	1,09

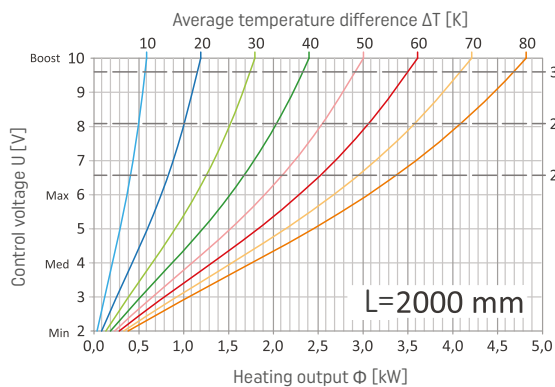
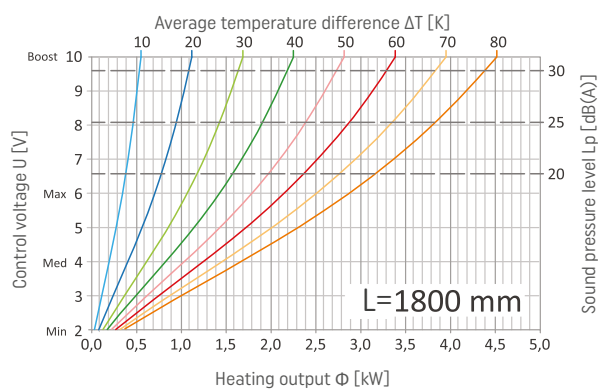
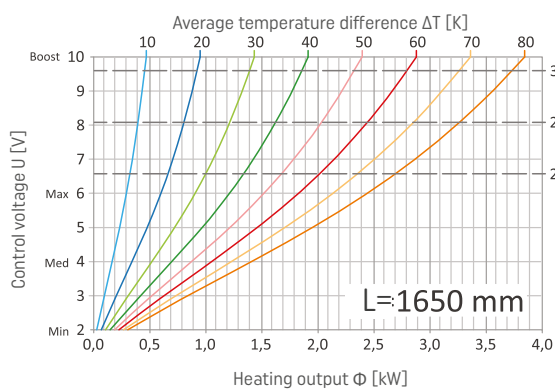
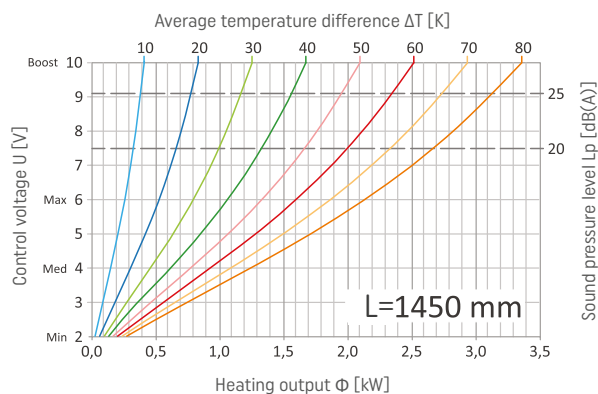
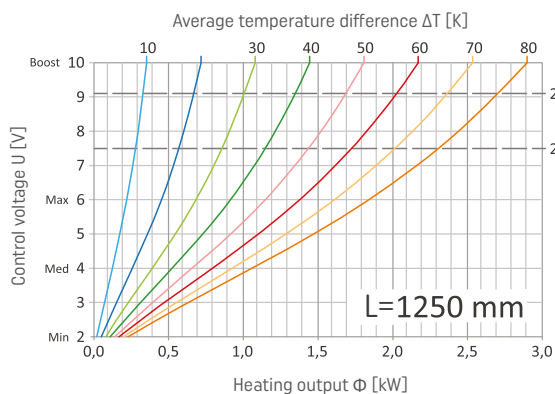
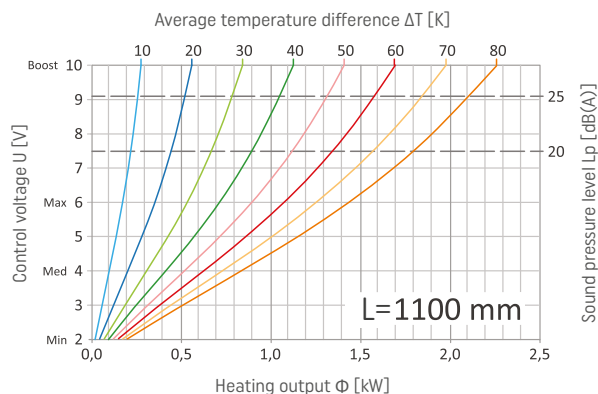
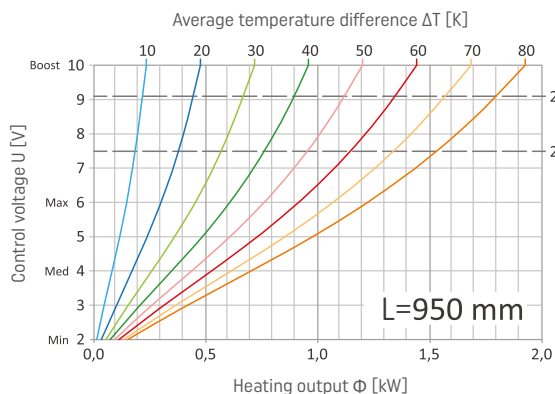


HEATING OUTPUT AND SOUND PRESSURE OF VKN1-6,5/14/L

The graphs present how heating power Φ [W] depends on the respective average temperature differences ΔT [K], for control voltages U [V]. The graphs also present the acoustic pressure levels for the respective heater operating conditions.

NOTE!

An example readout of control voltages and acoustic pressure for different values of heating power is included in page no. 43.



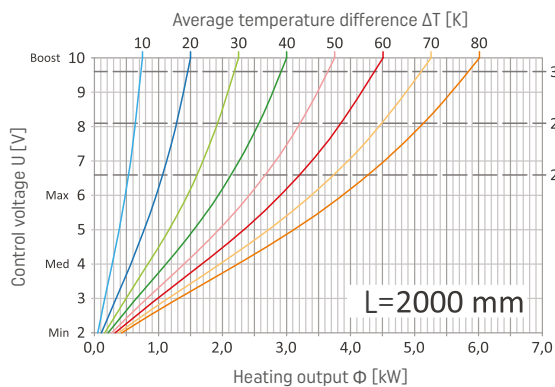
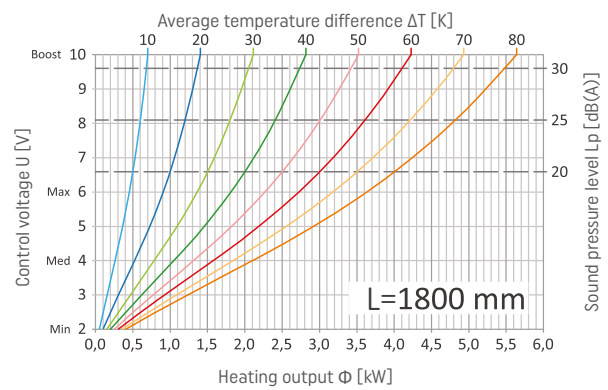
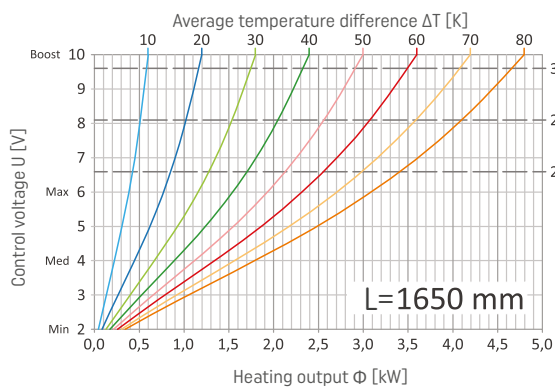
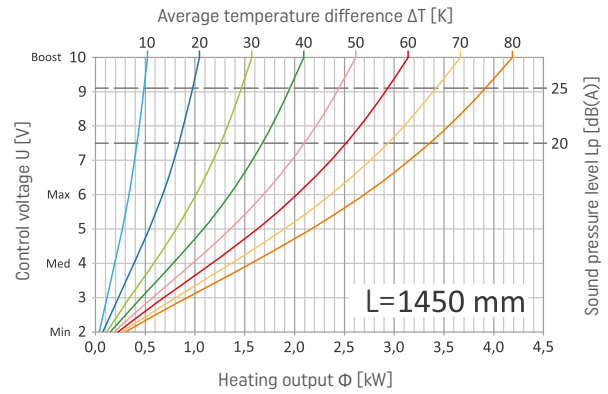
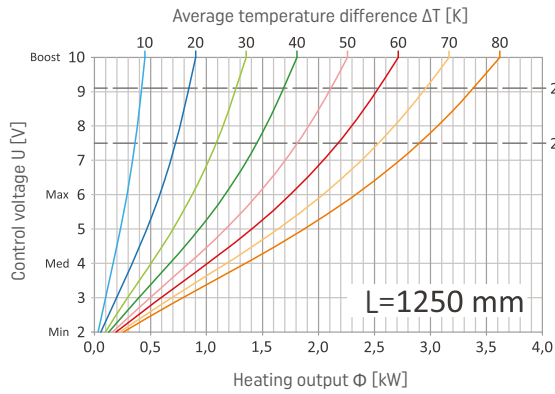
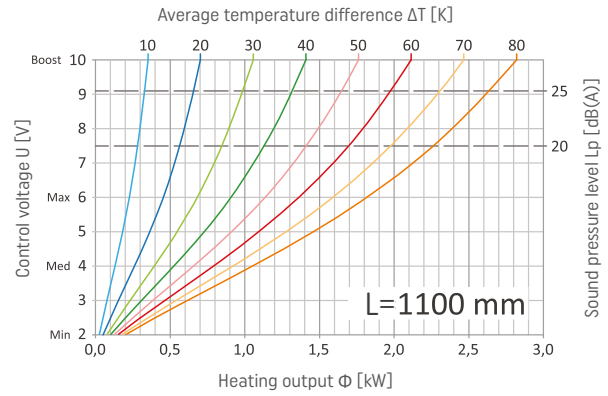
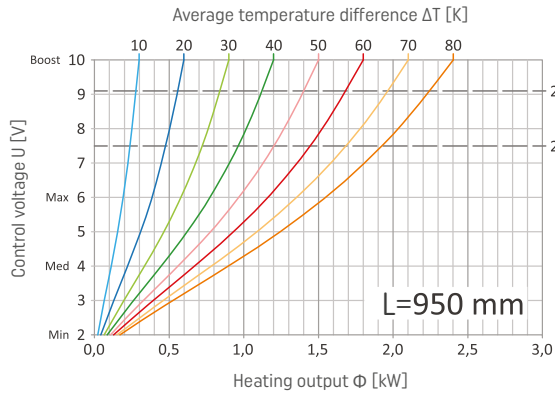


HEATING OUTPUT AND SOUND PRESSURE OF VKN1-6,5/17/L

The graphs present how heating power Φ [W] depends on the respective average temperature differences ΔT [K], for control voltages U [V]. The graphs also present the acoustic pressure levels for the respective heater operating conditions.

NOTE!

An example readout of control voltages and acoustic pressure for different values of heating power is included in page no. 43.







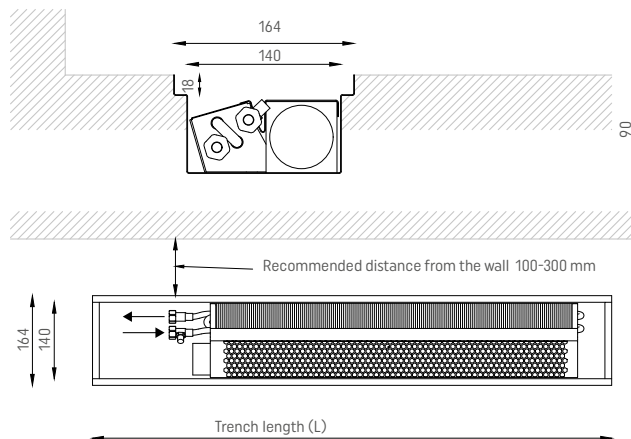
HEIGHT 90 mm

VKN1-9/14/L (L/P)



ORDER CODE

DIMENSIONS	[mm]
Trench height (H)	90
Trench bottom width (B)	140
Top width/Grille width (Bk)	164
Trench length (L)	950÷2000
CONNECTIONS	TYPE
Connectors	½" female thread
Connection side	Left (L) standard, Right (P) optional
ACCESSORIES	TYPE
Grille H=18 mm	Roll-up / linear / modular
Frames	L lub F



Trench length L [mm]	Operating mode [-]	Heating output for t_s/t_r °C			Sound pressure level Lp [dB(A)]	Sound power level Lw [dB(A)]	Electric power demand P [W]	Current I [A]	Number of fan motors [-]
		75/65 °C	55/45 °C	35/30 °C					
950	Min	230	138	58	<18	<26	1,0	0,04	1
	Med	559	337	141	18	26	2,2	0,09	
	Max	846	509	213	28	36	5,3	0,22	
	Boost	1225	737	309	40	48	18,0	0,75	
1100	Min	270	163	68	<18	<26	1,0	0,04	1
	Med	656	395	166	18	26	2,4	0,10	
	Max	937	564	236	28	36	6,0	0,25	
	Boost	1438	866	363	40	48	20,7	0,86	
1250	Min	346	208	87	<18	<26	1,0	0,04	1
	Med	842	507	212	18	26	2,7	0,11	
	Max	1275	768	322	28	36	7,2	0,30	
	Boost	1845	1111	465	40	48	26,4	1,10	
1450	Min	401	241	101	<18	<26	1,2	0,05	1
	Med	975	587	246	18	26	2,9	0,12	
	Max	1476	889	372	28	36	8,2	0,34	
	Boost	2136	1286	539	40	48	30,8	1,28	
1650	Min	484	291	122	<18	<26	2,0	0,08	2
	Med	1178	709	297	21	29	4,4	0,18	
	Max	1784	1074	450	31	39	10,6	0,44	
	Boost	2581	1554	651	43	51	36,0	1,50	
1800	Min	565	340	143	<18	<26	2,0	0,08	2
	Med	1374	827	347	21	29	4,6	0,19	
	Max	2081	1253	525	31	39	11,3	0,47	
	Boost	3012	1813	760	43	51	38,7	1,61	
2000	Min	600	361	151	<18	<26	2,0	0,08	2
	Med	1461	880	369	21	29	4,8	0,20	
	Max	2213	1332	558	31	39	12,5	0,52	
	Boost	3202	1928	808	43	51	44,4	1,85	

- Normative heating power output [W] compliant to EN-16430 for room temperature of $\theta = 20^\circ\text{C}$.
- Control voltages for the respective modes of operation: Min - 2 V, Med - 4 V, Max - 6 V, Boost - 10 V.
- Min, Med, Max fan speeds are for continuous operations, the Boost mode for fast additional heating of rooms.
- Sound power level according to ISO-3745 standard, sound pressure level for a distance of 2m in a room of a total volume of 100 m³ and reverb time of 0.5 s assuming room dampening of 8 dB(A).



HEIGHT 90 mm

VKN1-9/17/L (L/P)

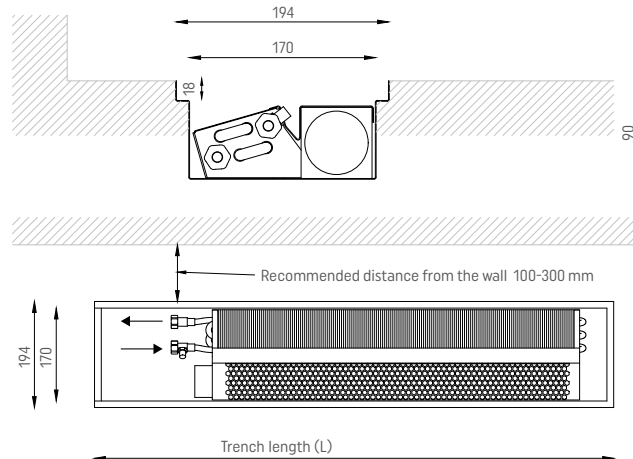


ORDER CODE

DIMENSIONS	[mm]
Trench height (H)	90
Trench bottom width (B)	170
Top width/Grille width (Bk)	194
Trench length (L)	950÷2000

CONNECTIONS	TYPE
Connectors	½" female thread
Connection side	Left (L) standard, Right (P) optional

ACCESSORIES	TYPE
Grille H=18 mm	Roll-up / linear / modular
Frames	L lub F



Trench length	Operating mode	Heating output for t_s/t_r °C			Sound pressure level	Sound power level	Electric power demand	Current	Number of fan motors
		75/65 °C	55/45 °C	35/30 °C					
L[mm]	[-]	Φ [W]			Lp [dB(A)]	Lw [dB(A)]	P [W]	I [A]	[-]
950	Min	411	247	103	<18	<26	1,0	0,04	1
	Med	981	590	247	18	26	2,2	0,09	
	Max	1468	882	369	28	36	5,3	0,22	
	Boost	2087	1255	524	40	48	18,0	0,75	
1100	Min	482	290	121	<18	<26	1,0	0,04	1
	Med	1152	693	289	18	26	2,4	0,10	
	Max	1724	1036	433	28	36	6,0	0,25	
	Boost	2450	1473	616	40	48	20,7	0,86	
1250	Min	619	372	156	<18	<26	1,0	0,04	1
	Med	1478	888	371	18	26	2,7	0,11	
	Max	2212	1330	556	28	36	7,2	0,30	
	Boost	3144	1890	790	40	48	26,4	1,10	
1450	Min	717	431	180	<18	<26	1,2	0,05	1
	Med	1711	1029	430	18	26	2,9	0,12	
	Max	2561	1540	644	28	36	8,2	0,34	
	Boost	3639	2188	914	40	48	30,8	1,28	
1650	Min	821	494	206	<18	<26	2,0	0,08	2
	Med	1959	1178	492	21	29	4,4	0,18	
	Max	2932	1763	737	31	39	10,6	0,44	
	Boost	4168	2506	1047	43	51	36,0	1,50	
1800	Min	965	580	242	<18	<26	2,0	0,08	2
	Med	2304	1385	579	21	29	4,6	0,19	
	Max	3448	2073	866	31	39	11,3	0,47	
	Boost	4901	2946	1232	43	51	38,7	1,61	
2000	Min	1029	619	259	<18	<26	2,0	0,08	2
	Med	2456	1476	617	21	29	4,8	0,20	
	Max	3676	2210	924	31	39	12,5	0,52	
	Boost	5225	3141	1313	43	51	44,4	1,85	

- Normative heating power output [W] compliant to EN-16430 for room temperature of $\theta = 20^\circ\text{C}$.
- Control voltages for the respective modes of operation: Min - 2 V, Med - 4 V, Max - 6 V, Boost - 10 V.
- Min, Med, Max fan speeds are for continuous operations, the Boost mode for fast additional heating of rooms.
- Sound power level according to ISO-3745 standard, sound pressure level for a distance of 2m in a room of a total volume of 100 m³ and reverb time of 0.5 s assuming room dampening of 8 dB(A).



CORRECTIVE FACTORS FOR 90 mm HIGH VKN1 HEATERS

Heating output corrective factors for VKN1 90 mm high units for installation temperatures other than 75/65/20°C.

SUPPLY AND RETURN TEMPERATURES [°C]		ROOM AIR TEMPERATURE θ_1 [°C]						
t_s	t_r	5	8	12	16	20	24	32
90	85	1,647	1,587	1,508	1,428	1,349	1,269	1,110
	80	1,597	1,538	1,458	1,378	1,299	1,219	1,060
	75	1,547	1,488	1,408	1,329	1,249	1,169	1,010
	70	1,498	1,438	1,358	1,279	1,199	1,120	0,960
85	80	1,547	1,488	1,408	1,329	1,249	1,169	1,010
	75	1,498	1,438	1,358	1,279	1,199	1,120	0,960
	70	1,448	1,388	1,309	1,229	1,149	1,070	0,910
	65	1,398	1,339	1,259	1,179	1,100	1,020	0,860
80	75	1,448	1,388	1,309	1,229	1,149	1,070	0,910
	70	1,398	1,339	1,259	1,179	1,100	1,020	0,860
	65	1,349	1,289	1,209	1,129	1,050	0,970	0,811
	60	1,299	1,239	1,159	1,080	1,000	0,920	0,761
75	70	1,349	1,289	1,209	1,129	1,050	0,970	0,811
	65	1,299	1,239	1,159	1,080	1,000	0,920	0,761
	60	1,249	1,189	1,110	1,030	0,950	0,870	0,711
	55	1,199	1,139	1,060	0,980	0,900	0,821	0,661
70	65	1,249	1,189	1,110	1,030	0,950	0,870	0,711
	60	1,199	1,139	1,060	0,980	0,900	0,821	0,661
	55	1,149	1,090	1,010	0,930	0,851	0,771	0,611
	50	1,100	1,040	0,960	0,880	0,801	0,721	0,561
65	60	1,149	1,090	1,010	0,930	0,851	0,771	0,611
	55	1,100	1,040	0,960	0,880	0,801	0,721	0,561
	50	1,050	0,990	0,910	0,831	0,751	0,671	0,511
	45	1,000	0,940	0,860	0,781	0,701	0,621	0,461
60	55	1,050	0,990	0,910	0,831	0,751	0,671	0,511
	50	1,000	0,940	0,860	0,781	0,701	0,621	0,461
	45	0,950	0,890	0,811	0,731	0,651	0,571	0,411
	40	0,900	0,841	0,761	0,681	0,601	0,521	0,361
55	50	0,950	0,890	0,811	0,731	0,651	0,571	0,411
	45	0,900	0,841	0,761	0,681	0,601	0,521	0,361
	40	0,851	0,791	0,711	0,631	0,551	0,471	0,311
	35	0,801	0,741	0,661	0,581	0,501	0,421	0,261
50	45	0,851	0,791	0,711	0,631	0,551	0,471	0,311
	40	0,801	0,741	0,661	0,581	0,501	0,421	0,261
	35	0,751	0,691	0,611	0,531	0,451	0,371	0,211
45	40	0,751	0,691	0,611	0,531	0,451	0,371	0,211
	35	0,701	0,641	0,561	0,481	0,401	0,321	0,161
40	35	0,651	0,591	0,511	0,431	0,351	0,271	0,111
	30	0,601	0,541	0,461	0,381	0,301	0,221	0,061
35	30	0,551	0,491	0,411	0,331	0,251	0,171	0,010

HEATING OUTPUT CORRECTIVE FACTORS FOR VKN HEATERS ACCORDING TO THE GRILLE TYPE

GRILLE TYPE	AIRFLOW	CORRECTIVE FACTOR
Roll-up double T-bar profile aluminium grille - 13 mm gap	67%	1,00
Roll-up double T-bar profile aluminium grille - 8 mm gap	63%	0,99
Roll-up closed profile aluminium grille	62%	1,00
Roll-up wooden grille	52%	0,98
Modular snap on profile aluminium grille	62%	0,97
Linear snap on profile aluminium grille	62%	1,08
Linear stainless steel grille	71%	1,09

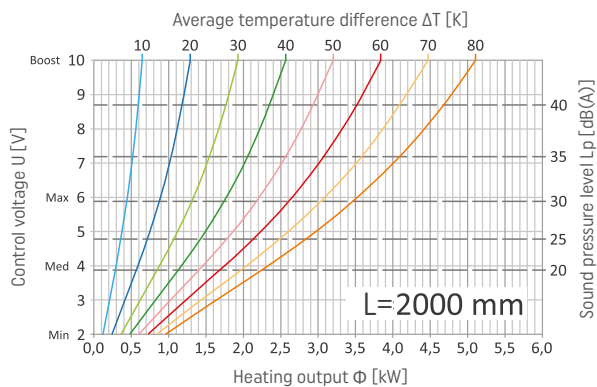
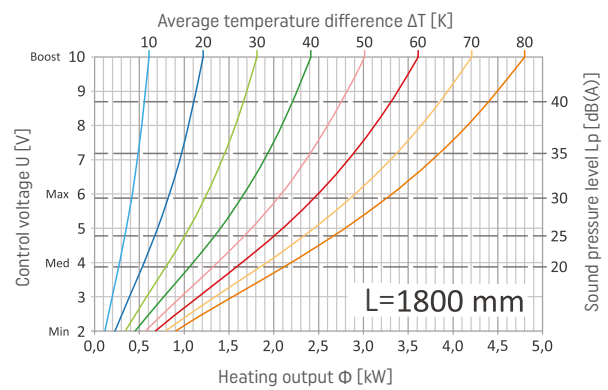
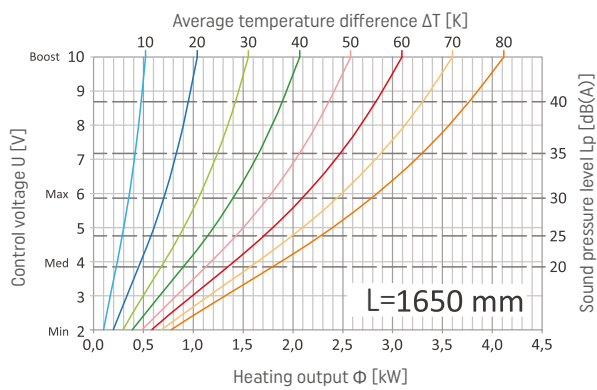
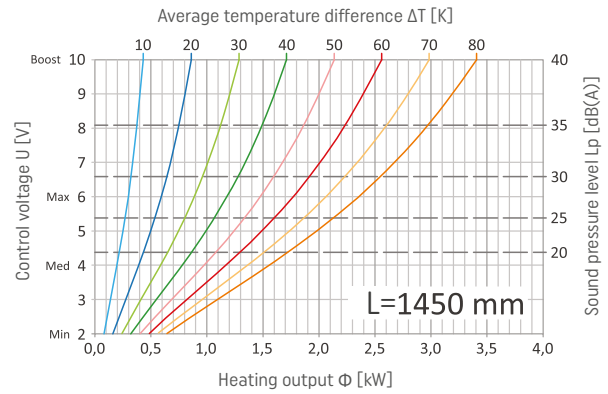
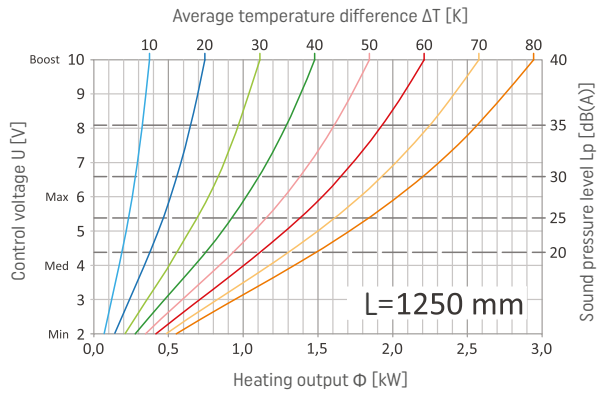
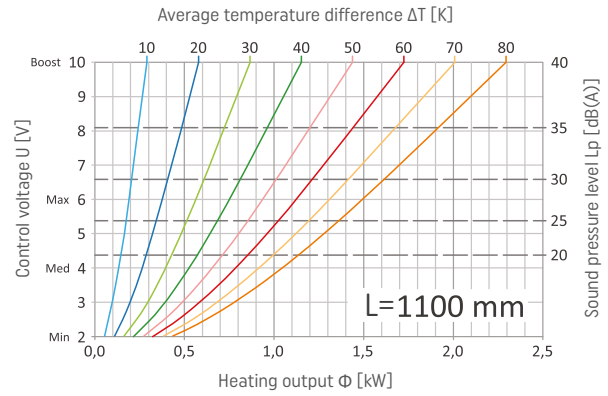
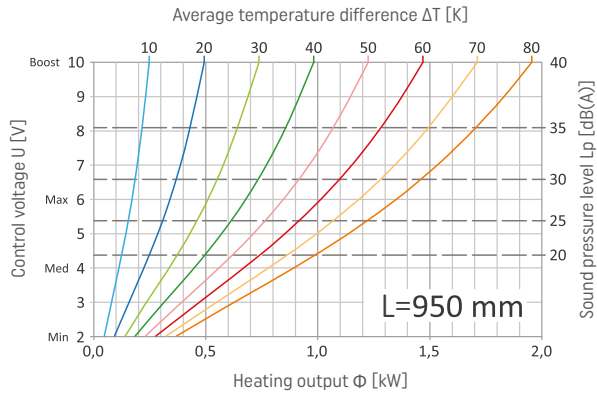


HEATING OUTPUT AND SOUND PRESSURE OF VKN1-9/14/L

The graphs present how heating power Φ [W] depends on the respective average temperature differences ΔT [K], for control voltages U [V]. The graphs also present the acoustic pressure levels for the respective heater operating conditions.

NOTE!

An example readout of control voltages and acoustic pressure for different values of heating power is included in page no. 43.



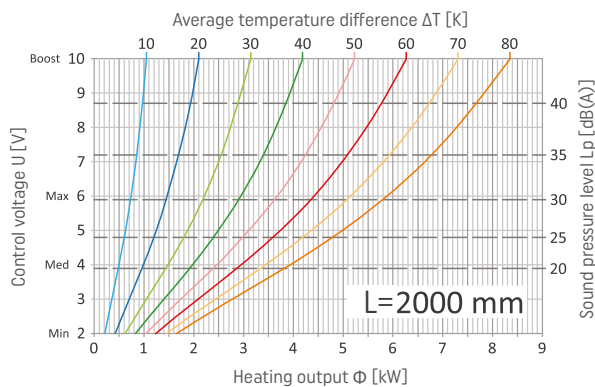
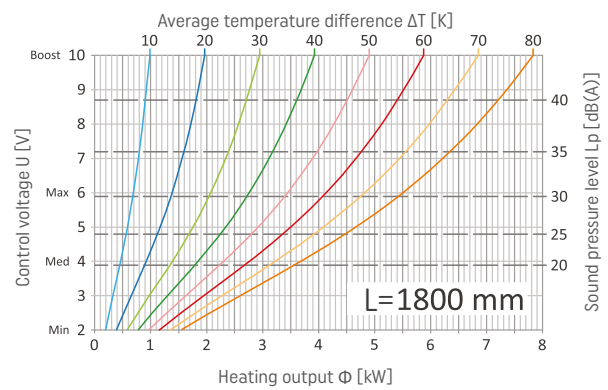
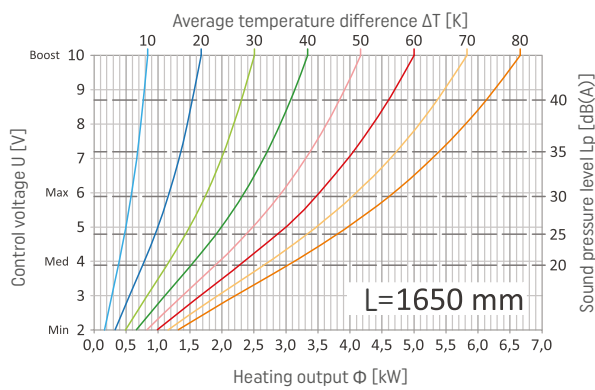
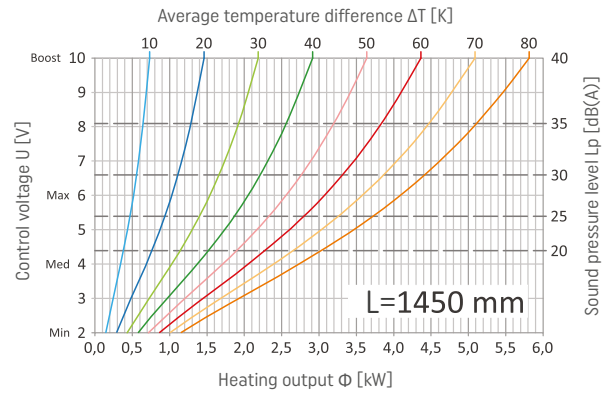
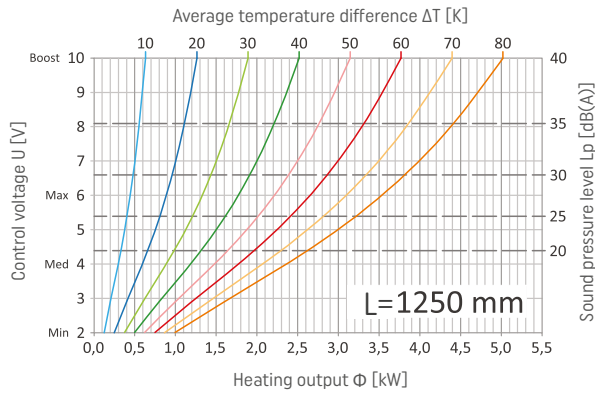
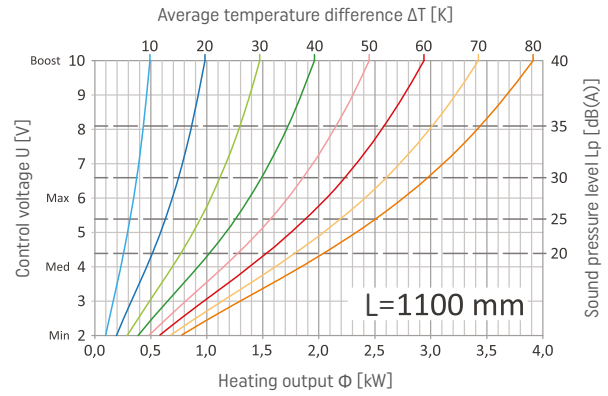
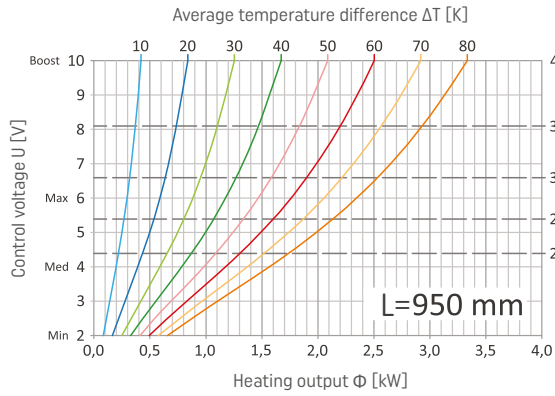


HEATING OUTPUT AND SOUND PRESSURE OF VKN1-9/17/L

The graphs present how heating power Φ [W] depends on the respective average temperature differences ΔT [K], for control voltages U [V]. The graphs also present the acoustic pressure levels for the respective heater operating conditions.

NOTE!

An example readout of control voltages and acoustic pressure for different values of heating power is included in page no. 43.





VKN1 WATER CAPACITY

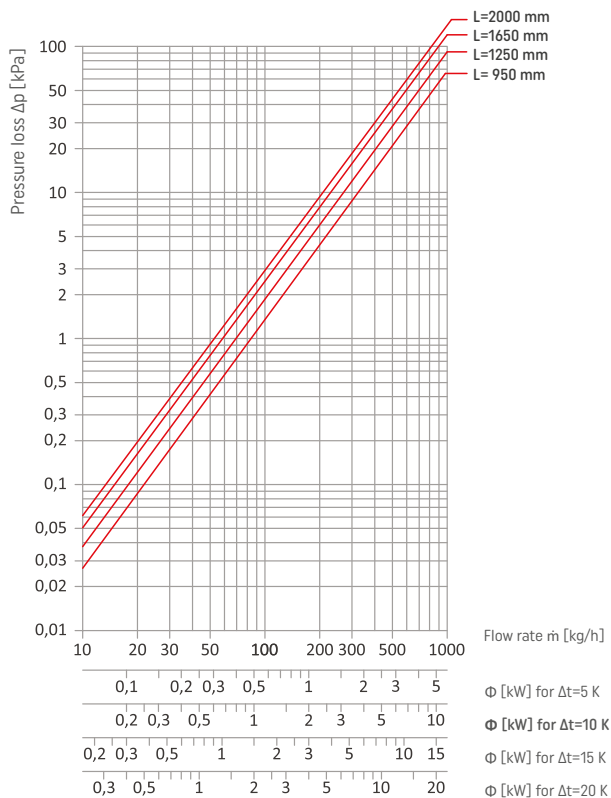
HEATER LENGTH L [mm]	HEATER TYPE	
	VKN1-6,5/14/L VKN1-9/14/L	VKN1-6,5/17/L VKN1-9/17/L
	WATER CAPACITY [dm ³]	
950	0,20	0,29
1100	0,22	0,34
1250	0,28	0,42
1450	0,32	0,48
1650	0,38	0,57
1800	0,41	0,61
2000	0,46	0,69

DECLARED PROPERTIES

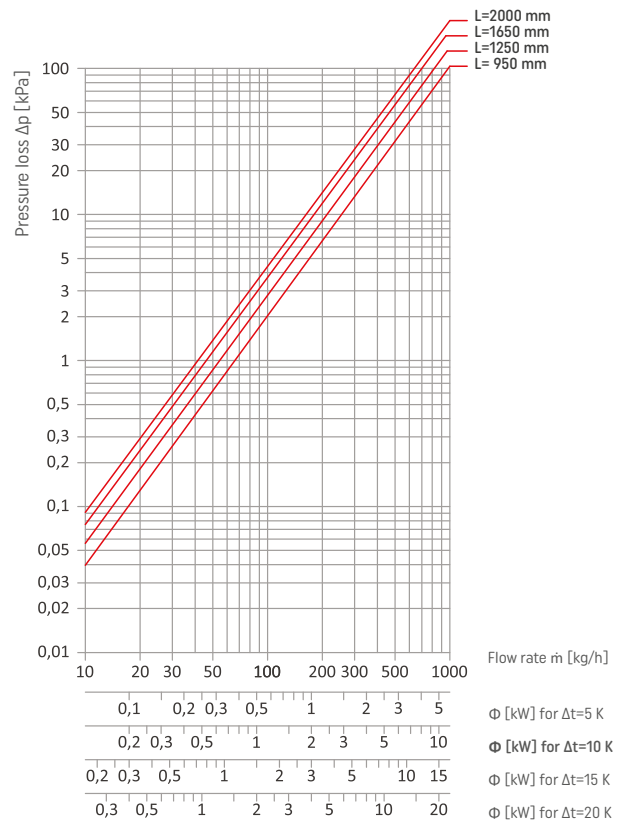
Maximum permissible operating pressure:	1,60 MPa.
Test pressure:	2,08 MPa.
Maximum hydraulic pressure:	2,70 MPa.
Maximum operating temperature:	110°C

PRESSURE LOSS

| VKN1-6,5/14/L, VKN1-9/14/L



| VKN1-6,5/17/L, VKN1-9/17/L





VKN5 Height 75 mm, 90 mm 140 mm and 180 mm

PRODUCT VISUALIZATION



EQUIPMENT

STANDARD EQUIPMENT:

- casing made of galvanized steel sheet in RAL 9005 black,
- highly efficient cooper-aluminium heat exchanger, powder coated in black with air vent,
- modern fan with silent and efficient 24V DC motor
- connection space cover,
- fan cover, so called grille, with airflow baffle,
- water connection: 3/4" female thread,
- assembly struts,
- fixing anchors,
- levelling legs.

ADDITIONAL EQUIPMENT:

- casing made of galvanised steel sheet in any RAL colour,
- decorative frame (F or L type) made of natural or anodized aluminium,
- decorative grille made of natural or anodized aluminium, roll-up, linear or modular type; stainless steel grille; natural wooden grille,
- assembly protection fibreboard for transporting and installation,
- raised floor kit,
- bimetal temperature sensor,
- casing protective film,
- foil sleeve for heat exchanger,
- anti dust filter (requires rasing the trench by 10 mm),
- BMS controls.

DIMENSIONS

DIMENSIONS	[mm]	
Trench height (H)	75, 90	140, 180
Trench bottom width (B)	250, 350	300
Top width/Grille width (Bk)	274, 374	324
Trench length (L)	950÷2750	800÷2700

Non-standard (NS) heater lengths are available on request.

EXAMPLE OF ORDER CODE: VKN5-9/14/110 (L)

Trench height H
[cm]

Trench bottom width B
[cm]

Trench length L [cm]

Connection side
(L- Left/P - Right)



HEIGHT 75 mm

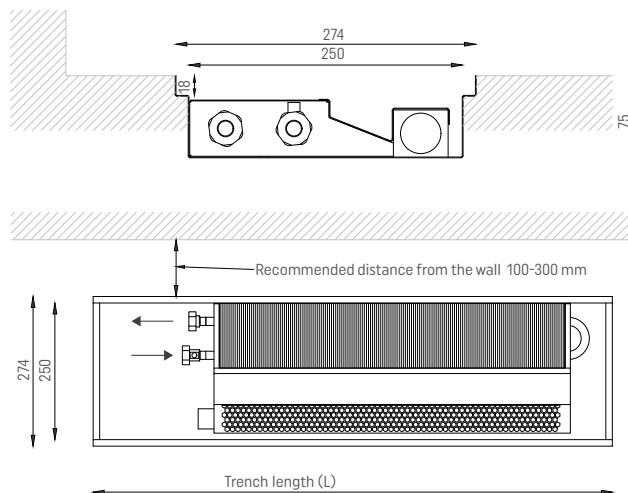
VKN5-7,5/25/L (L/P)

◀ ORDER CODE

DIMENSIONS	[mm]
Trench height (H)	75
Trench bottom width (B)	250
Top width/Grille width (Bk)	274
Trench length (L)	950÷2750

CONNECTIONS	TYPE
Connectors	¾" female thread
Connection side	Left (L) standard, Right (P) optional

ACCESSORIES	TYPE
Grille H=18 mm	Roll-up / linear / modular
Frames	L lub F



Trench length L [mm]	Operating mode [-]	Heating output for t_s/t_r °C			Sound pressure level Lp [dB(A)]	Sound power level Lw [dB(A)]	Electric power demand P [W]	Current I [A]	Number of fan motors [-]
		75/65 °C	55/45 °C	35/30 °C					
950	Min	199	115	45	<18	<26	0,8	0,03	1
	Med	555	321	126	<18	<26	1,2	0,05	
	Max	871	504	197	<18	<26	2,2	0,09	
	Boost	1267	733	287	28	36	6,0	0,25	
1100	Min	234	135	53	<18	<26	0,8	0,03	1
	Med	652	377	148	<18	<26	1,2	0,05	
	Max	1023	592	232	<18	<26	2,4	0,10	
	Boost	1487	860	337	28	36	7,0	0,29	
1250	Min	300	174	68	<18	<26	0,8	0,03	1
	Med	836	484	189	<18	<26	1,2	0,05	
	Max	1312	759	297	<18	<26	2,7	0,11	
	Boost	1908	1104	432	28	36	9,2	0,38	
1450	Min	347	201	79	<18	<26	0,8	0,03	1
	Med	968	560	219	<18	<26	1,5	0,06	
	Max	1519	879	344	<18	<26	2,9	0,12	
	Boost	2209	1278	500	28	36	10,4	0,43	
1650	Min	398	230	90	<18	<26	1,5	0,06	2
	Med	1108	641	251	<18	<26	2,4	0,10	
	Max	1739	1006	394	18	26	4,4	0,18	
	Boost	2529	1463	572	31	39	12,0	0,50	
1800	Min	468	271	106	<18	<26	1,5	0,06	2
	Med	1303	754	295	<18	<26	2,4	0,10	
	Max	2045	1183	463	18	26	4,6	0,19	
	Boost	2974	1720	673	31	39	13,0	0,54	
2000	Min	499	289	113	<18	<26	1,5	0,06	2
	Med	1389	803	314	<18	<26	2,4	0,10	
	Max	2180	1261	493	18	26	4,8	0,20	
	Boost	3171	1834	718	31	39	15,2	0,63	
2150	Min	550	318	124	<18	<26	1,5	0,06	2
	Med	1531	886	346	<18	<26	2,7	0,11	
	Max	2403	1390	544	18	26	5,1	0,21	
	Boost	3495	2021	791	31	39	16,4	0,68	
2300	Min	599	346	136	<18	<26	1,5	0,06	2
	Med	1670	966	378	<18	<26	2,4	0,10	
	Max	2621	1516	593	18	26	5,3	0,22	
	Boost	3812	2205	863	31	39	18,3	0,76	
2500	Min	647	374	146	<18	<26	1,5	0,06	2
	Med	1804	1043	408	<18	<26	2,7	0,11	
	Max	2831	1637	641	18	26	5,6	0,23	
	Boost	4117	2381	932	31	39	19,5	0,81	
2750	Min	713	412	161	<18	<26	2,2	0,09	3
	Med	1986	1149	449	<18	<26	3,6	0,15	
	Max	3117	1803	705	20	28	7,0	0,29	
	Boost	4534	2622	1026	33	41	21,2	0,88	

- Normative heating power output [W] compliant to EN-16430 for room temperature of $\theta = 20^\circ\text{C}$.
- Control voltages for the respective modes of operation: Min - 2 V, Med - 4 V, Max - 6 V, Boost - 10 V.
- Min, Med, Max fan speeds are for continuous operations, the Boost mode for fast additional heating of rooms.
- Sound power level according to ISO-3745 standard, sound pressure level for a distance of 2m in a room of a total volume of 100 m³ and reverb time of 0.5 s assuming room dampening of 8 dB(A).

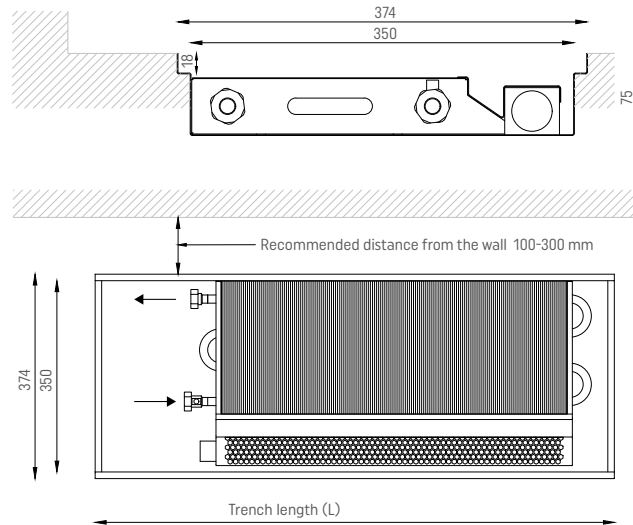


HEIGHT 75 mm

VKN5-7,5/35/L (L/P)

◀ ORDER CODE

DIMENSIONS	[mm]
Trench height (H)	75
Trench bottom width (B)	350
Top width/Grille width (Bk)	374
Trench length (L)	950÷2750
CONNECTIONS	TYPE
Connectors	¾" female thread
Connection side	Left (L) standard, Right (P) optional
ACCESSORIES	TYPE
Grille H=18 mm	Roll-up / linear / modular
Frames	L lub F



Trench length L [mm]	Operating mode [-]	Heating output for t_s/t_r °C			Sound pressure level Lp [dB(A)]	Sound power level Lw [dB(A)]	Electric power demand P [W]	Current I [A]	Number of fan motors [-]
		75/65 °C	55/45 °C	35/30 °C					
950	Min	256	148	58	<18	<26	0,8	0,03	1
	Med	625	361	141	<18	<26	1,2	0,05	
	Max	993	574	225	<18	<26	2,2	0,09	
	Boost	1577	912	357	28	36	6,0	0,25	
1100	Min	301	174	68	<18	<26	0,8	0,03	1
	Med	734	425	166	<18	<26	1,2	0,05	
	Max	1166	674	264	<18	<26	2,4	0,10	
	Boost	1851	1071	419	28	36	7,0	0,29	
1250	Min	386	223	87	<18	<26	0,8	0,03	1
	Med	941	545	213	<18	<26	1,2	0,05	
	Max	1496	865	339	<18	<26	2,7	0,11	
	Boost	2375	1374	538	28	36	9,2	0,38	
1450	Min	446	258	101	<18	<26	0,8	0,03	1
	Med	1090	630	247	<18	<26	1,5	0,06	
	Max	1731	1001	392	<18	<26	2,9	0,12	
	Boost	2750	1591	622	28	36	10,4	0,43	
1650	Min	511	296	116	<18	<26	1,5	0,06	2
	Med	1248	722	282	<18	<26	2,4	0,10	
	Max	1983	1147	449	18	26	4,4	0,18	
	Boost	3149	1821	713	31	39	12,0	0,50	
1800	Min	601	348	136	<18	<26	1,5	0,06	2
	Med	1468	849	332	<18	<26	2,4	0,10	
	Max	2332	1349	528	18	26	4,6	0,19	
	Boost	3703	2142	838	31	39	13,0	0,54	
2000	Min	641	371	145	<18	<26	1,5	0,06	2
	Med	1564	905	354	<18	<26	2,4	0,10	
	Max	2486	1438	563	18	26	4,8	0,20	
	Boost	3947	2283	893	31	39	15,2	0,63	
2150	Min	706	408	160	<18	<26	1,5	0,06	2
	Med	1725	998	390	<18	<26	2,7	0,11	
	Max	2740	1585	620	18	26	5,1	0,21	
	Boost	4352	2517	985	31	39	16,4	0,68	
2300	Min	770	445	174	<18	<26	1,5	0,06	2
	Med	1881	1088	426	<18	<26	2,4	0,10	
	Max	2988	1728	676	18	26	5,3	0,22	
	Boost	4746	2745	1074	31	39	18,3	0,76	
2500	Min	832	481	188	<18	<26	1,5	0,06	2
	Med	2031	1175	460	<18	<26	2,7	0,11	
	Max	3227	1866	730	18	26	5,6	0,23	
	Boost	5125	2964	1160	31	39	19,5	0,81	
2750	Min	916	530	207	<18	<26	2,2	0,09	3
	Med	2237	1294	506	<18	<26	3,6	0,15	
	Max	3554	2056	804	20	28	7,0	0,29	
	Boost	5644	3264	1277	33	41	21,2	0,88	

- Normative heating power output [W] compliant to EN-16430 for room temperature of $\theta = 20^\circ\text{C}$.
- Control voltages for the respective modes of operation: Min - 2 V, Med - 4 V, Max - 6 V, Boost - 10 V.
- Min, Med, Max fan speeds are for continuous operations, the Boost mode for fast additional heating of rooms.
- Sound power level according to ISO-3745 standard, sound pressure level for a distance of 2m in a room of a total volume of 100 m³ and reverb time of 0.5 s assuming room dampening of 8 dB(A).



CORRECTIVE FACTORS FOR 75 mm HIGH VKN5 HEATERS

Heating output corrective factors for VKN5 75 mm high units for installation temperatures other than 75/65/20°C.

SUPPLY AND RETURN TEMPERATURES [°C]		ROOM AIR TEMPERATURE θ_1 [°C]						
t_s	t_r	5	8	12	16	20	24	32
90	85	1,710	1,644	1,555	1,467	1,379	1,292	1,118
	80	1,655	1,588	1,500	1,412	1,325	1,238	1,064
	75	1,600	1,533	1,445	1,358	1,270	1,183	1,011
	70	1,544	1,478	1,390	1,303	1,216	1,129	0,957
85	80	1,600	1,533	1,445	1,358	1,270	1,183	1,011
	75	1,544	1,478	1,390	1,303	1,216	1,129	0,957
	70	1,489	1,423	1,336	1,248	1,162	1,075	0,904
	65	1,434	1,368	1,281	1,194	1,108	1,021	0,851
80	75	1,489	1,423	1,336	1,248	1,162	1,075	0,904
	70	1,434	1,368	1,281	1,194	1,108	1,021	0,851
	65	1,379	1,314	1,227	1,140	1,054	0,968	0,798
	60	1,325	1,259	1,172	1,086	1,000	0,915	0,745
75	70	1,379	1,314	1,227	1,140	1,054	0,968	0,798
	65	1,325	1,259	1,172	1,086	1,000	0,915	0,745
	60	1,270	1,205	1,118	1,032	0,947	0,861	0,693
	55	1,216	1,151	1,064	0,979	0,893	0,808	0,641
70	65	1,270	1,205	1,118	1,032	0,947	0,861	0,693
	60	1,216	1,151	1,064	0,979	0,893	0,808	0,641
	55	1,162	1,097	1,011	0,925	0,840	0,756	0,589
	50	1,108	1,043	0,957	0,872	0,787	0,703	0,537
65	60	1,162	1,097	1,011	0,925	0,840	0,756	0,589
	55	1,108	1,043	0,957	0,872	0,787	0,703	0,537
	50	1,054	0,989	0,904	0,819	0,735	0,651	0,486
	45	1,000	0,936	0,851	0,766	0,682	0,599	0,435
60	55	1,054	0,989	0,904	0,819	0,735	0,651	0,486
	50	1,000	0,936	0,851	0,766	0,682	0,599	0,435
	45	0,947	0,883	0,798	0,714	0,630	0,547	0,385
	40	0,893	0,830	0,745	0,661	0,578	0,496	0,335
55	50	0,947	0,883	0,798	0,714	0,630	0,547	0,385
	45	0,893	0,830	0,745	0,661	0,578	0,496	0,335
	40	0,840	0,777	0,693	0,609	0,527	0,445	0,285
	35	0,787	0,724	0,641	0,558	0,476	0,395	0,236
50	45	0,840	0,777	0,693	0,609	0,527	0,445	0,285
	40	0,787	0,724	0,641	0,558	0,476	0,395	0,236
	35	0,735	0,672	0,589	0,506	0,425	0,345	0,188
	30	0,682	0,620	0,537	0,455	0,375	0,295	0,140
45	40	0,735	0,672	0,589	0,506	0,425	0,345	0,188
	35	0,682	0,620	0,537	0,455	0,375	0,295	0,140
40	35	0,63	0,568	0,486	0,405	0,325	0,246	0,094
	30	0,578	0,517	0,435	0,354	0,275	0,197	0,049
35	30	0,527	0,466	0,385	0,305	0,226	0,15	0,007

HEATING OUTPUT CORRECTIVE FACTORS FOR VKN HEATERS ACCORDING TO THE GRILLE TYPE

GRILLE TYPE	AIRFLOW	CORRECTIVE FACTOR
Roll-up double T-bar profile aluminium grille - 13 mm gap	67%	1,00
Roll-up double T-bar profile aluminium grille - 8 mm gap	63%	0,99
Roll-up closed profile aluminium grille	62%	1,00
Roll-up wooden grille	52%	0,98
Modular snap on profile aluminium grille	62%	0,97
Linear snap on profile aluminium grille	62%	1,08
Linear stainless steel grille	71%	1,09

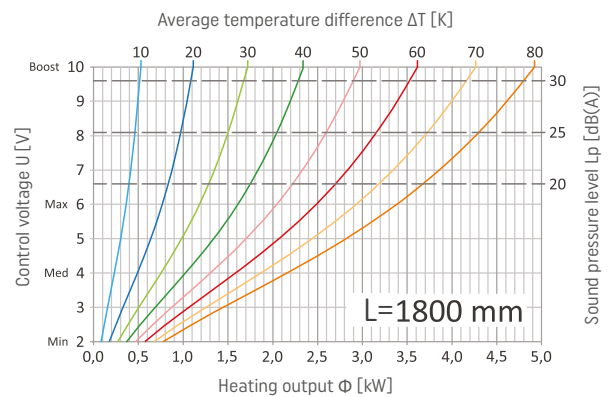
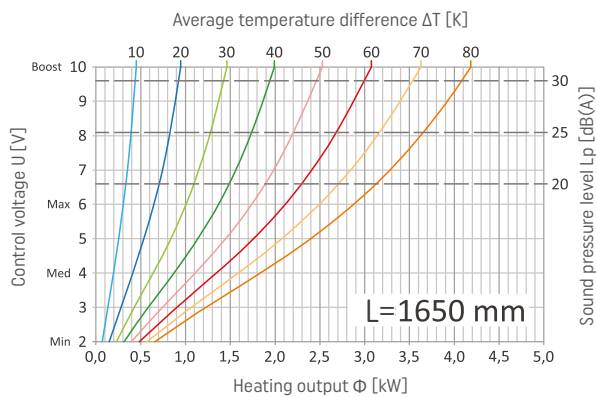
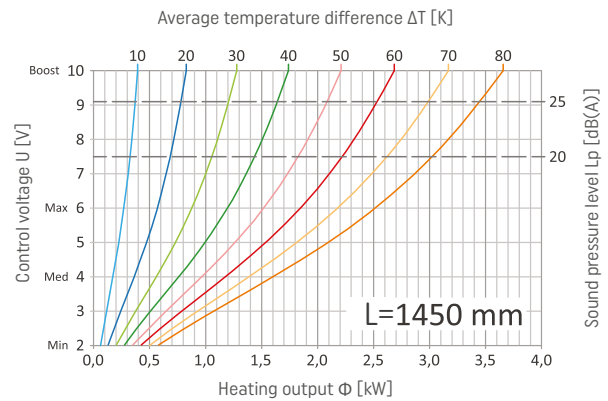
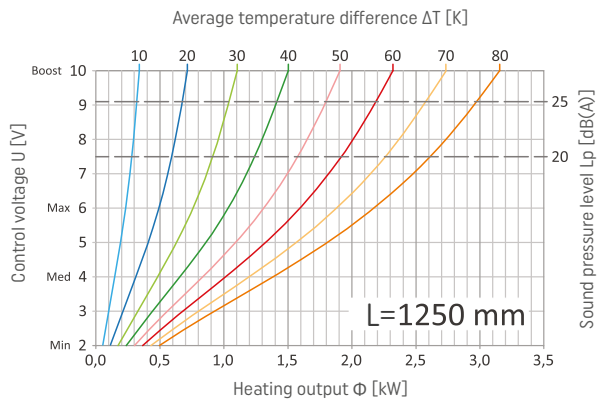
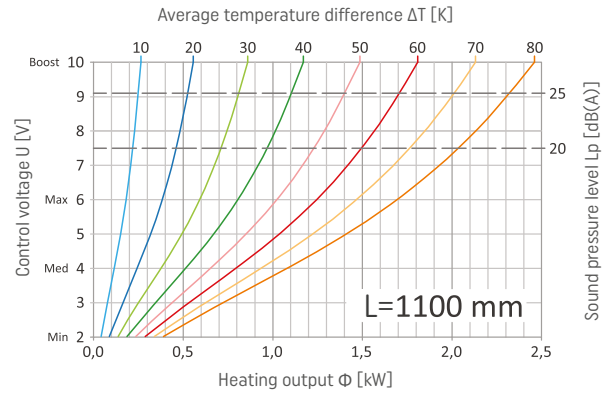
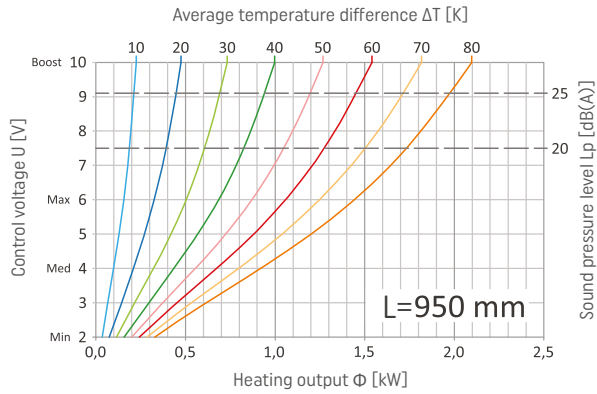


HEATING OUTPUT AND SOUND PRESSURE OF VKN5-7,5/25/L

The graphs present how heating power Φ [W] depends on the respective average temperature differences ΔT [K], for control voltages U [V]. The graphs also present the acoustic pressure levels for the respective heater operating conditions.

NOTE!

An example readout of control voltages and acoustic pressure for different values of heating power is included in page no. 43.



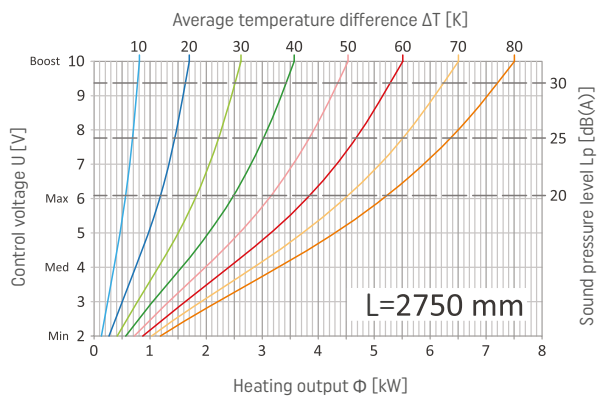
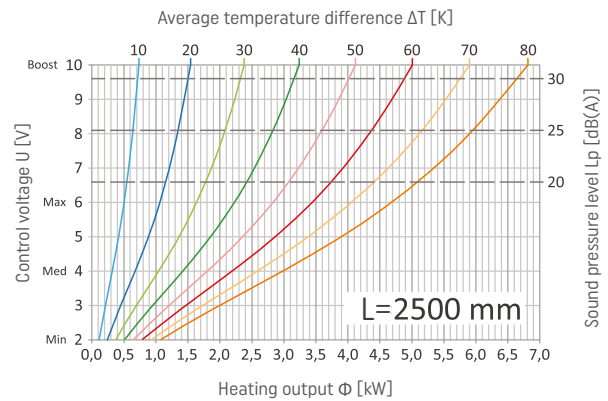
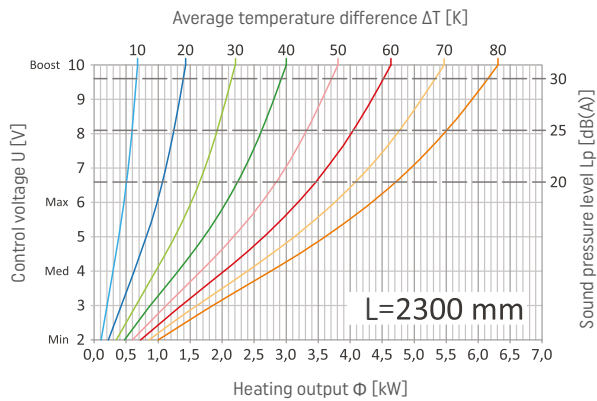
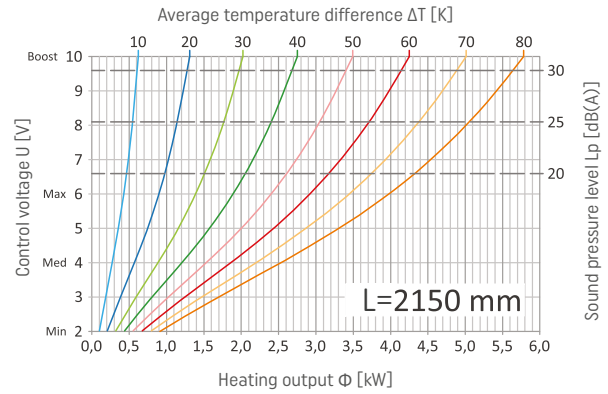
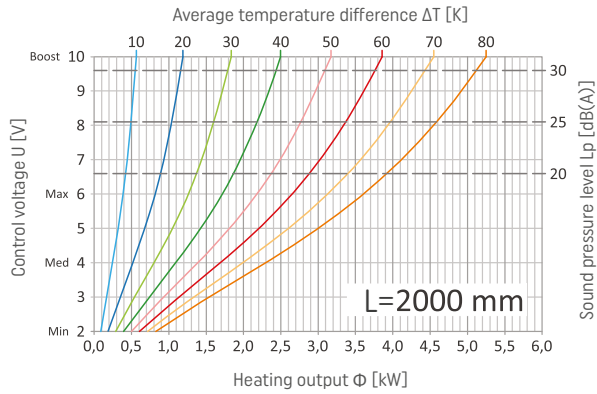


HEATING OUTPUT AND SOUND PRESSURE OF VKN5-7,5/25/L

The graphs present how heating power Φ [W] depends on the respective average temperature differences ΔT [K], for control voltages U [V]. The graphs also present the acoustic pressure levels for the respective heater operating conditions.

NOTE!

An example readout of control voltages and acoustic pressure for different values of heating power is included in page no. 43.



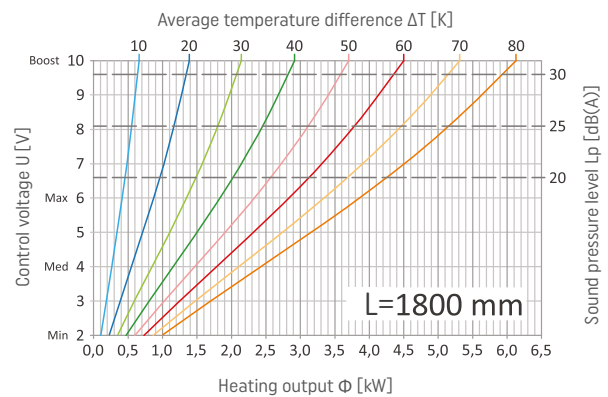
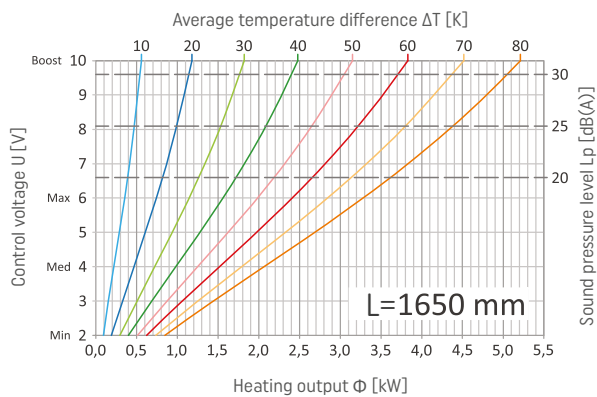
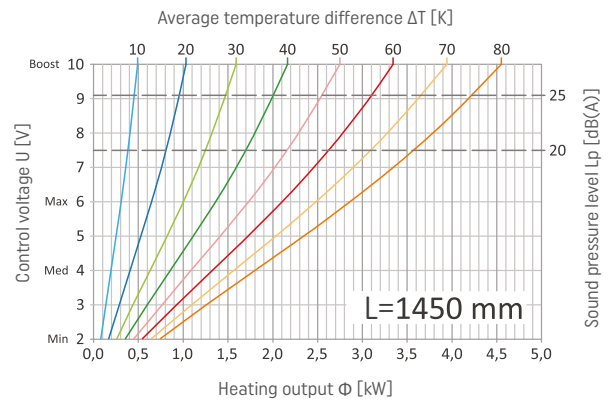
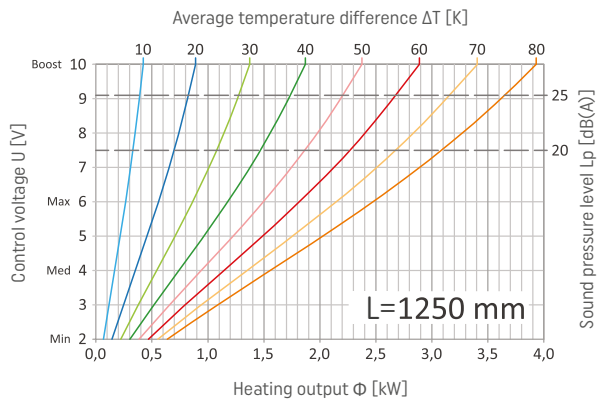
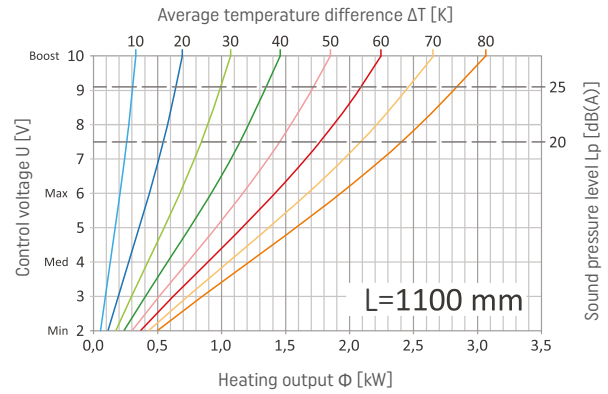
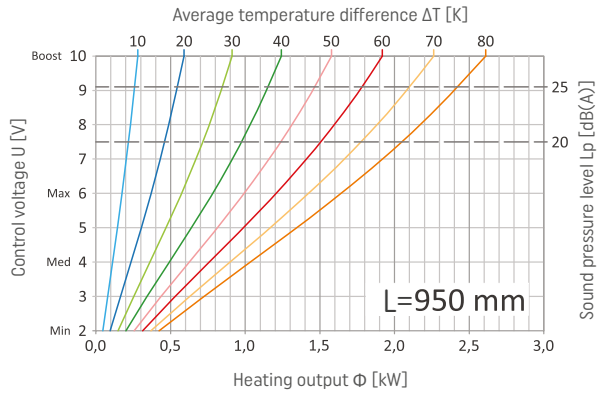


HEATING OUTPUT AND SOUND PRESSURE OF VKN5-7,5/35/L

The graphs present how heating power Φ [W] depends on the respective average temperature differences ΔT [K], for control voltages U [V]. The graphs also present the acoustic pressure levels for the respective heater operating conditions.

NOTE!

An example readout of control voltages and acoustic pressure for different values of heating power is included in page no. 43.



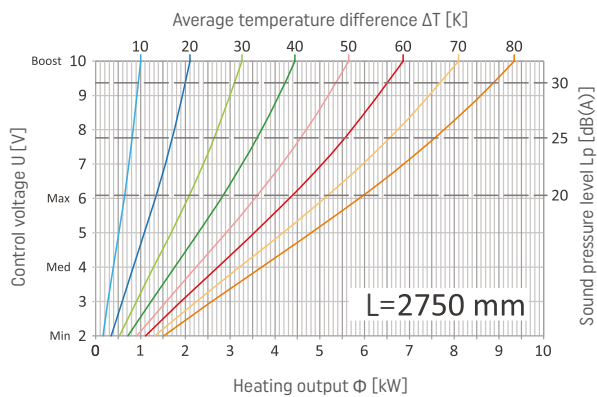
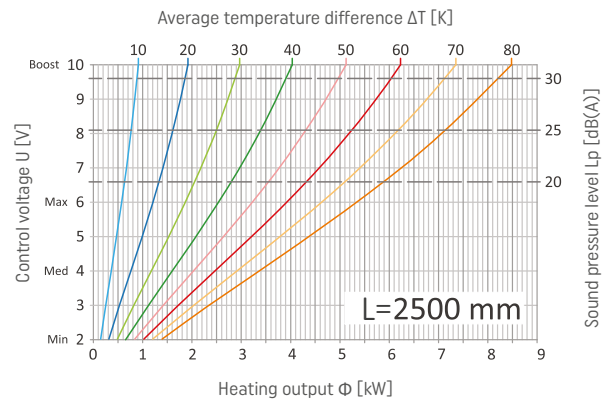
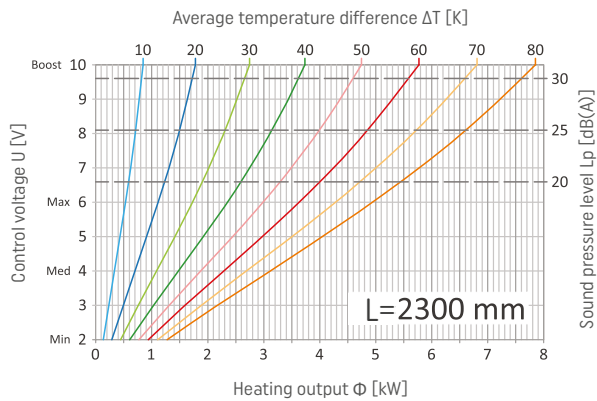
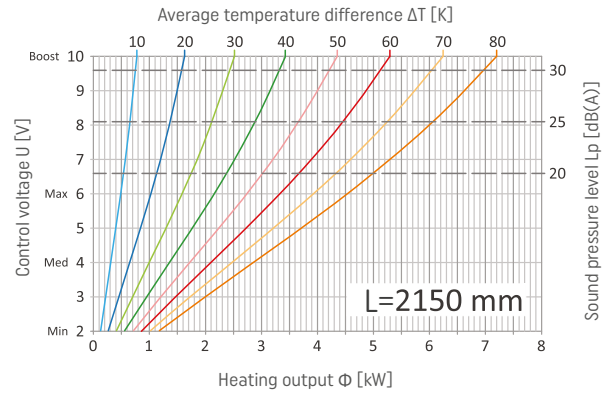
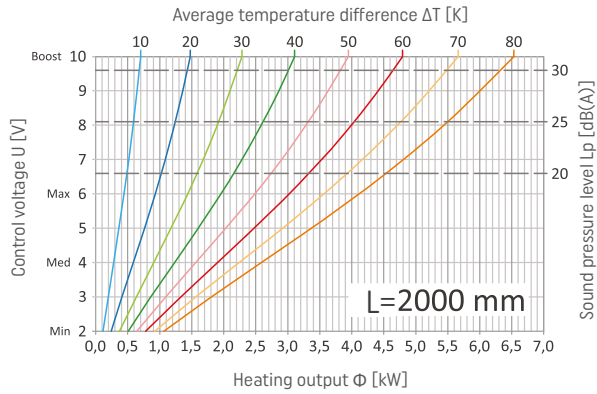


HEATING OUTPUT AND SOUND PRESSURE OF VKN5-7,5/35/L

The graphs present how heating power Φ [W] depends on the respective average temperature differences ΔT [K], for control voltages U [V]. The graphs also present the acoustic pressure levels for the respective heater operating conditions.

NOTE!

An example readout of control voltages and acoustic pressure for different values of heating power is included in page no. 43.





HEIGHT 90 mm

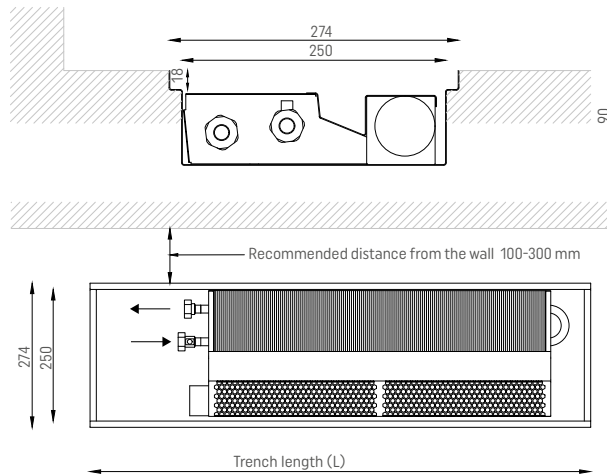
VKN5-9/25/L (L/P)

◀ ORDER CODE

DIMENSIONS	[mm]
Trench height (H)	90
Trench bottom width (B)	250
Top width/Grille width (Bk)	274
Trench length (L)	950÷2750

CONNECTIONS	TYPE
Connectors	¾" female thread
Connection side	Left (L) standard, Right (P) optional

ACCESSORIES	TYPE
Grille H=18 mm	Roll-up / linear / modular
Frames	L lub F



Trench length L [mm]	Operating mode [-]	Heating output for t_s/t_r °C			Sound pressure level Lp [dB(A)]	Sound power level Lw [dB(A)]	Electric power demand P [W]	Current I [A]	Number of fan motors [-]
		75/65 °C	55/45 °C	35/30 °C					
950	Min	542	313	123	<18	<26	1,0	0,04	1
	Med	1165	674	264	18	26	2,2	0,09	
	Max	1634	945	370	28	36	5,3	0,22	
	Boost	2068	1196	468	40	48	18,0	0,75	
1100	Min	637	368	144	<18	<26	1,0	0,04	1
	Med	1368	791	310	18	26	2,4	0,10	
	Max	1918	1109	434	28	36	6,0	0,25	
	Boost	2428	1404	549	40	48	20,7	0,86	
1250	Min	817	473	185	<18	<26	1,0	0,04	1
	Med	1755	1015	397	18	26	2,7	0,11	
	Max	2461	1423	557	28	36	7,2	0,30	
	Boost	3115	1802	705	40	48	26,4	1,10	
1450	Min	946	547	214	<18	<26	1,2	0,05	1
	Med	2032	1175	460	18	26	2,9	0,12	
	Max	2849	1648	645	28	36	8,2	0,34	
	Boost	3606	2086	816	40	48	30,8	1,28	
1650	Min	1083	626	245	<18	<26	2,0	0,08	2
	Med	2326	1345	526	21	29	4,4	0,18	
	Max	3262	1887	738	31	39	10,6	0,44	
	Boost	4129	2388	934	43	51	36,0	1,50	
1800	Min	1274	737	288	<18	<26	2,0	0,08	2
	Med	2736	1582	619	21	29	4,6	0,19	
	Max	3836	2219	868	31	39	11,3	0,47	
	Boost	4856	2809	1099	43	51	38,7	1,61	
2000	Min	1358	785	307	<18	<26	2,0	0,08	2
	Med	2916	1687	660	21	29	4,8	0,20	
	Max	4090	2366	926	31	39	12,5	0,52	
	Boost	5176	2994	1171	43	51	44,4	1,85	
2150	Min	1497	866	339	<18	<26	2,2	0,09	2
	Med	3215	1860	728	21	29	5,1	0,21	
	Max	4508	2607	1020	31	39	13,5	0,56	
	Boost	5706	3300	1291	43	51	48,8	2,03	
2300	Min	1632	944	369	<18	<26	2,0	0,08	2
	Med	3506	2028	793	21	29	5,3	0,22	
	Max	4917	2844	1113	31	39	14,4	0,60	
	Boost	6223	3599	1408	43	51	52,8	2,20	
2500	Min	1763	1020	399	<18	<26	2,2	0,09	2
	Med	3787	2190	857	21	29	5,6	0,23	
	Max	5310	3071	1202	31	39	15,4	0,64	
	Boost	6721	3887	1521	43	51	57,2	2,38	
2750	Min	1941	1123	439	<18	<26	2,9	0,12	3
	Med	4170	2412	944	22	30	7,0	0,29	
	Max	5847	3382	1323	32	40	17,8	0,74	
	Boost	7401	4281	1675	45	53	62,4	2,60	

- Normative heating power output [W] compliant to EN-16430 for room temperature of $\theta = 20^\circ\text{C}$.
- Control voltages for the respective modes of operation: Min - 2 V, Med - 4 V, Max - 6 V, Boost - 10 V.
- Min, Med, Max fan speeds are for continuous operations, the Boost mode for fast additional heating of rooms.
- Sound power level according to ISO-3745 standard, sound pressure level for a distance of 2m in a room of a total volume of 100 m³ and reverb time of 0.5 s assuming room dampening of 8 dB(A).

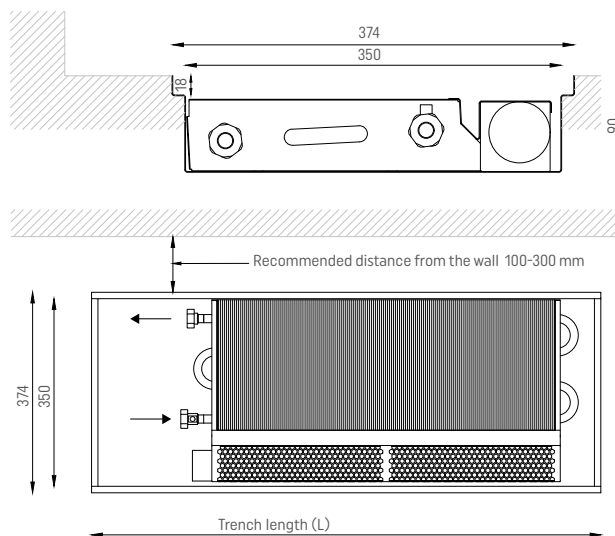


HEIGHT 90 mm

VKN5-9/35/L (L/P)

◀ ORDER CODE

DIMENSIONS	[mm]
Trench height (H)	90
Trench bottom width (B)	350
Top width/Grille width (Bk)	374
Trench length (L)	950÷2750
CONNECTIONS	TYPE
Connectors	¾" female thread
Connection side	Left (L) standard, Right (P) optional
ACCESSORIES	TYPE
Grille H=18 mm	Roll-up / linear / modular
Frames	L lub F



Trench length L [mm]	Operating mode [-]	Heating output for t_s/t_r °C			Sound pressure level Lp [dB(A)]	Sound power level Lw [dB(A)]	Electric power demand P [W]	Current I [A]	Number of fan motors [-]
		75/65 °C	55/45 °C	35/30 °C					
950	Min	698	404	158	<18	<26	1,0	0,04	1
	Med	1537	889	348	18	26	2,2	0,09	
	Max	2208	1277	500	28	36	5,3	0,22	
	Boost	2940	1700	665	40	48	18,0	0,75	
1100	Min	819	474	185	<18	<26	1,0	0,04	1
	Med	1805	1044	408	18	26	2,4	0,10	
	Max	2592	1499	587	28	36	6,0	0,25	
	Boost	3452	1996	781	40	48	20,7	0,86	
1250	Min	1051	608	238	<18	<26	1,0	0,04	1
	Med	2315	1339	524	18	26	2,7	0,11	
	Max	3326	1924	753	28	36	7,2	0,30	
	Boost	4429	2561	1002	40	48	26,4	1,10	
1450	Min	1217	704	275	<18	<26	1,2	0,05	1
	Med	2680	1550	607	18	26	2,9	0,12	
	Max	3850	2227	871	28	36	8,2	0,34	
	Boost	5126	2965	1160	40	48	30,8	1,28	
1650	Min	1394	806	315	<18	<26	2,0	0,08	2
	Med	3069	1775	695	21	29	4,4	0,18	
	Max	4409	2550	998	31	39	10,6	0,44	
	Boost	5871	3396	1329	43	51	36,0	1,50	
1800	Min	1639	948	371	<18	<26	2,0	0,08	2
	Med	3609	2087	817	21	29	4,6	0,19	
	Max	5185	2999	1173	31	39	11,3	0,47	
	Boost	6903	3993	1562	43	51	38,7	1,61	
2000	Min	1747	1010	395	<18	<26	2,0	0,08	2
	Med	3847	2225	871	21	29	4,8	0,20	
	Max	5527	3197	1251	31	39	12,5	0,52	
	Boost	7359	4256	1665	43	51	44,4	1,85	
2150	Min	1926	1114	436	<18	<26	2,2	0,09	2
	Med	4241	2453	960	21	29	5,1	0,21	
	Max	6093	3524	1379	31	39	13,5	0,56	
	Boost	8113	4692	1836	43	51	48,8	2,03	
2300	Min	2101	1215	475	<18	<26	2,0	0,08	2
	Med	4626	2676	1047	21	29	5,3	0,22	
	Max	6645	3843	1504	31	39	14,4	0,60	
	Boost	8848	5118	2002	43	51	52,8	2,20	
2500	Min	2269	1312	514	<18	<26	2,2	0,09	2
	Med	4995	2889	1130	21	29	5,6	0,23	
	Max	7176	4151	1624	31	39	15,4	0,64	
	Boost	9555	5527	2162	43	51	57,2	2,38	
2750	Min	2498	1445	565	<18	<26	2,9	0,12	3
	Med	5501	3182	1245	22	30	7,0	0,29	
	Max	7903	4571	1789	32	40	17,8	0,74	
	Boost	10523	6086	2382	45	53	62,4	2,60	

- Normative heating power output [W] compliant to EN-16430 for room temperature of $\theta = 20^\circ\text{C}$.
- Control voltages for the respective modes of operation: Min - 2 V, Med - 4 V, Max - 6 V, Boost - 10 V.
- Min, Med, Max fan speeds are for continuous operations, the Boost mode for fast additional heating of rooms.
- Sound power level according to ISO-3745 standard, sound pressure level for a distance of 2m in a room of a total volume of 100 m³ and reverb time of 0.5 s assuming room dampening of 8 dB(A).



CORRECTIVE FACTORS FOR 90 mm HIGH VKN5 HEATERS

Heating output corrective factors for VKN5 90 mm high units for installation temperatures other than 75/65/20°C.

SUPPLY AND RETURN TEMPERATURES [°C]		ROOM AIR TEMPERATURE θ_r [°C]						
t_s	t_r	5	8	12	16	20	24	32
90	85	1,710	1,644	1,555	1,467	1,379	1,292	1,118
	80	1,655	1,588	1,500	1,412	1,325	1,238	1,064
	75	1,600	1,533	1,445	1,358	1,270	1,183	1,011
	70	1,544	1,478	1,390	1,303	1,216	1,129	0,957
85	80	1,600	1,533	1,445	1,358	1,270	1,183	1,011
	75	1,544	1,478	1,390	1,303	1,216	1,129	0,957
	70	1,489	1,423	1,336	1,248	1,162	1,075	0,904
	65	1,434	1,368	1,281	1,194	1,108	1,021	0,851
80	75	1,489	1,423	1,336	1,248	1,162	1,075	0,904
	70	1,434	1,368	1,281	1,194	1,108	1,021	0,851
	65	1,379	1,314	1,227	1,140	1,054	0,968	0,798
	60	1,325	1,259	1,172	1,086	1,000	0,915	0,745
75	70	1,379	1,314	1,227	1,140	1,054	0,968	0,798
	65	1,325	1,259	1,172	1,086	1,000	0,915	0,745
	60	1,270	1,205	1,118	1,032	0,947	0,861	0,693
	55	1,216	1,151	1,064	0,979	0,893	0,808	0,641
70	65	1,270	1,205	1,118	1,032	0,947	0,861	0,693
	60	1,216	1,151	1,064	0,979	0,893	0,808	0,641
	55	1,162	1,097	1,011	0,925	0,840	0,756	0,589
	50	1,108	1,043	0,957	0,872	0,787	0,703	0,537
65	60	1,162	1,097	1,011	0,925	0,840	0,756	0,589
	55	1,108	1,043	0,957	0,872	0,787	0,703	0,537
	50	1,054	0,989	0,904	0,819	0,735	0,651	0,486
	45	1,000	0,936	0,851	0,766	0,682	0,599	0,435
60	55	1,054	0,989	0,904	0,819	0,735	0,651	0,486
	50	1,000	0,936	0,851	0,766	0,682	0,599	0,435
	45	0,947	0,883	0,798	0,714	0,630	0,547	0,385
	40	0,893	0,830	0,745	0,661	0,578	0,496	0,335
55	50	0,947	0,883	0,798	0,714	0,630	0,547	0,385
	45	0,893	0,830	0,745	0,661	0,578	0,496	0,335
	40	0,840	0,777	0,693	0,609	0,527	0,445	0,285
	35	0,787	0,724	0,641	0,558	0,476	0,395	0,236
50	45	0,840	0,777	0,693	0,609	0,527	0,445	0,285
	40	0,787	0,724	0,641	0,558	0,476	0,395	0,236
	35	0,735	0,672	0,589	0,506	0,425	0,345	0,188
45	40	0,735	0,672	0,589	0,506	0,425	0,345	0,188
	35	0,682	0,620	0,537	0,455	0,375	0,295	0,140
40	35	0,630	0,568	0,486	0,405	0,325	0,246	0,094
	30	0,578	0,517	0,435	0,354	0,275	0,197	0,049
35	30	0,527	0,466	0,385	0,305	0,226	0,15	0,007

HEATING OUTPUT CORRECTIVE FACTORS FOR VKN HEATERS ACCORDING TO THE GRILLE TYPE

GRILLE TYPE	AIRFLOW	CORRECTIVE FACTOR
Roll-up double T-bar profile aluminium grille - 13 mm gap	67%	1,00
Roll-up double T-bar profile aluminium grille - 8 mm gap	63%	0,99
Roll-up closed profile aluminium grille	62%	1,00
Roll-up wooden grille	52%	0,98
Modular snap on profile aluminium grille	62%	0,97
Linear snap on profile aluminium grille	62%	1,08
Linear stainless steel grille	71%	1,09

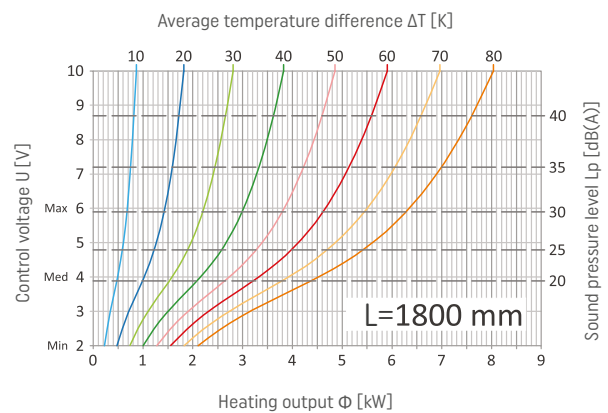
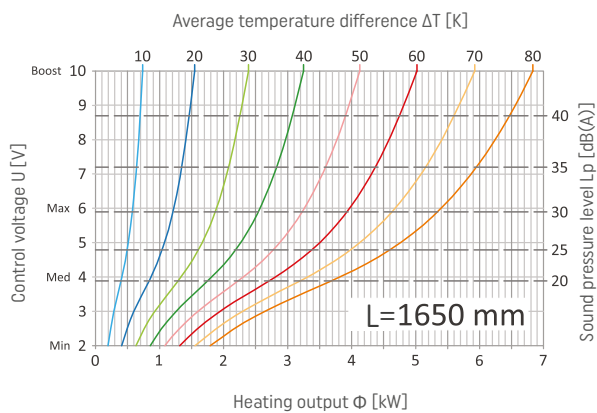
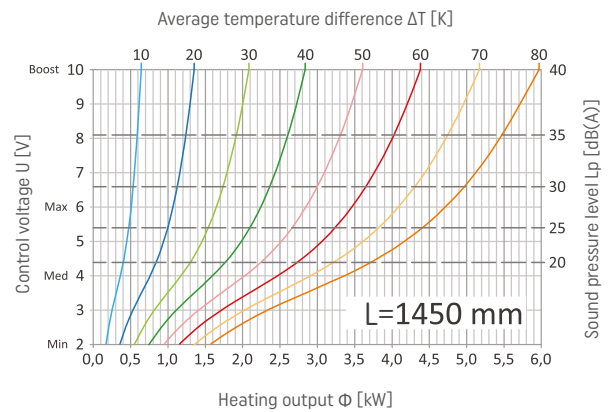
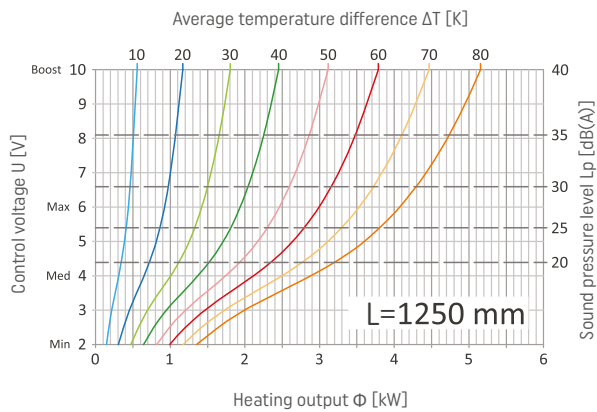
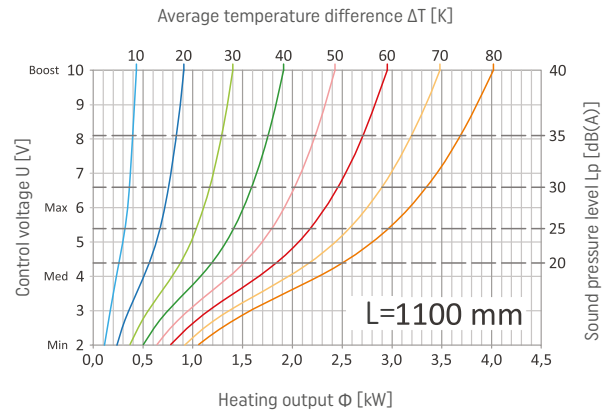
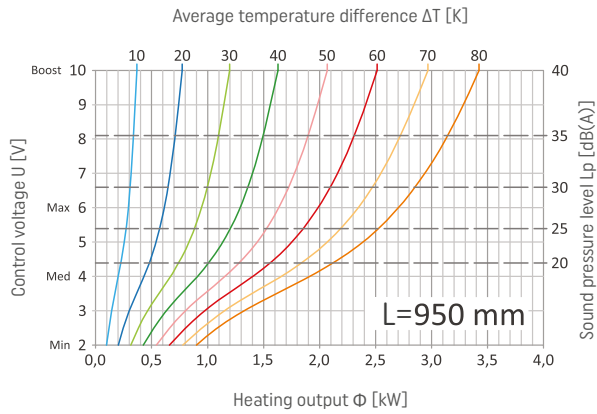


HEATING OUTPUT AND SOUND PRESSURE OF VKN5-9/25/L

The graphs present how heating power Φ [W] depends on the respective average temperature differences ΔT [K], for control voltages U [V]. The graphs also present the acoustic pressure levels for the respective heater operating conditions.

NOTE!

An example readout of control voltages and acoustic pressure for different values of heating power is included in page no. 43.



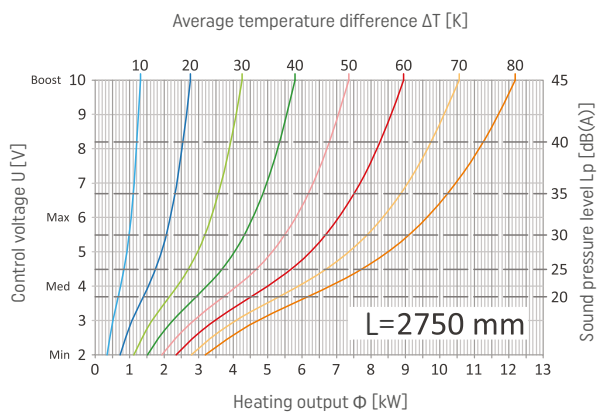
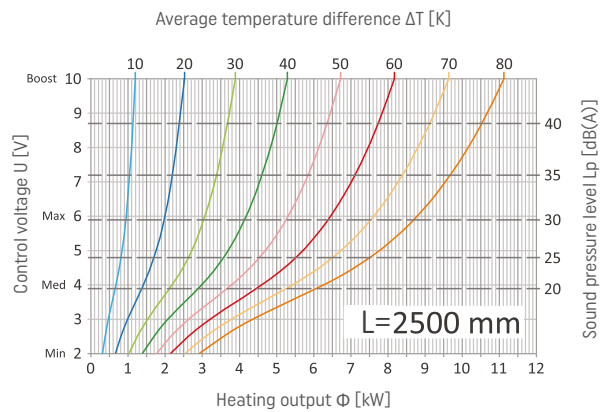
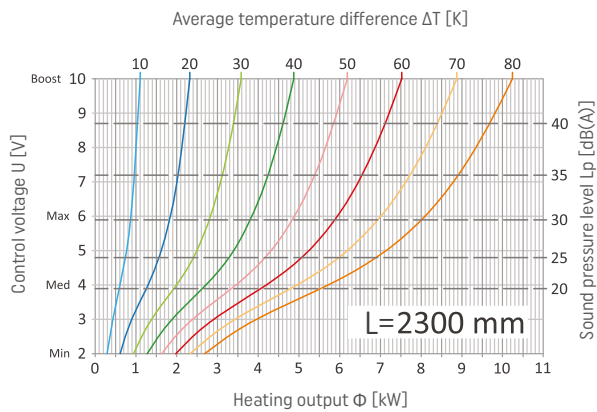
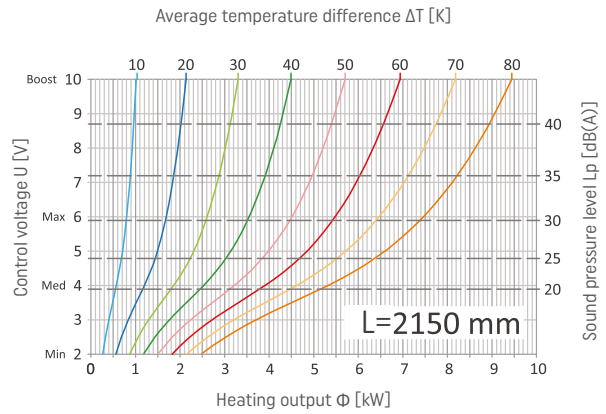
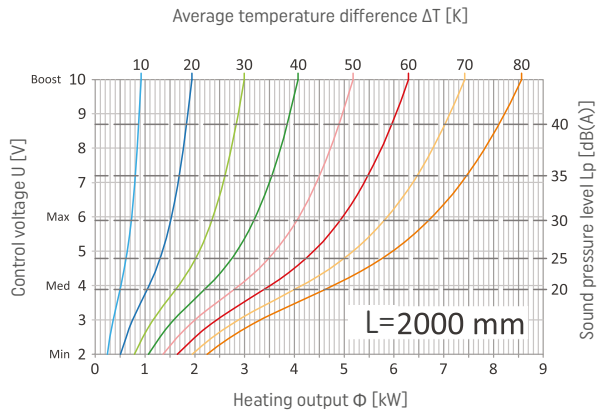


HEATING OUTPUT AND SOUND PRESSURE OF VKN5-9/25/L

The graphs present how heating power Φ [W] depends on the respective average temperature differences ΔT [K], for control voltages U [V]. The graphs also present the acoustic pressure levels for the respective heater operating conditions.

NOTE!

An example readout of control voltages and acoustic pressure for different values of heating power is included in page no. 43.



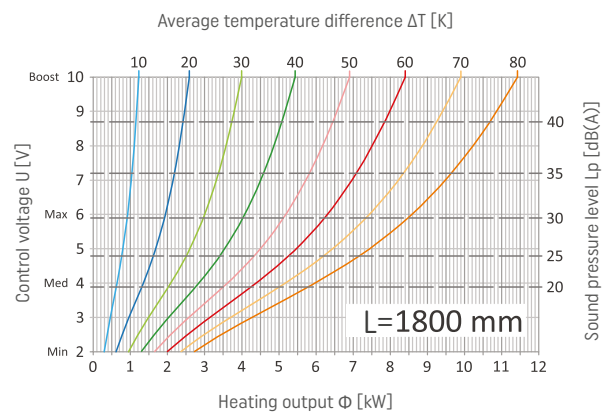
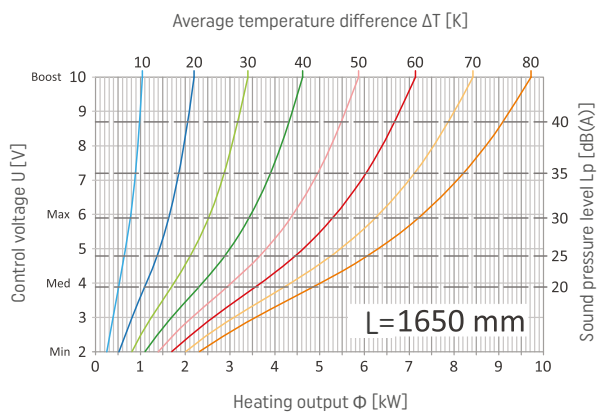
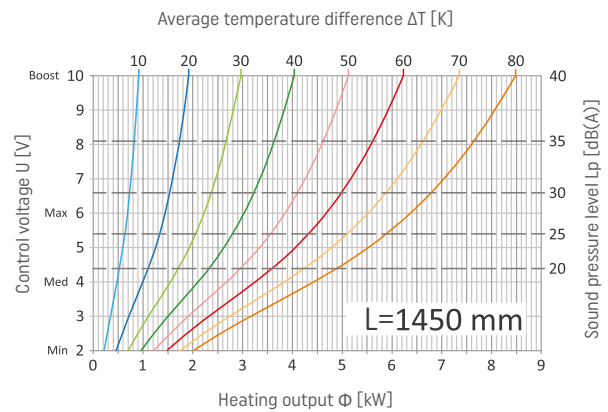
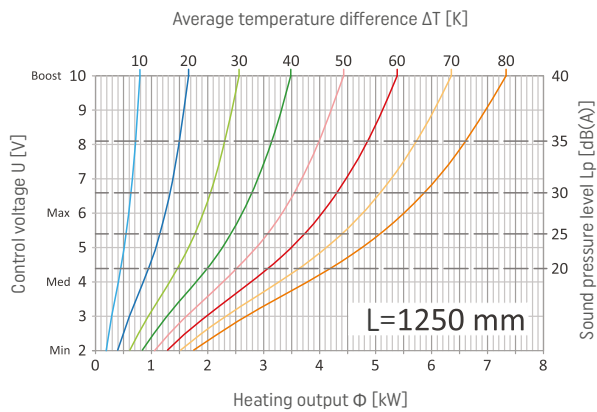
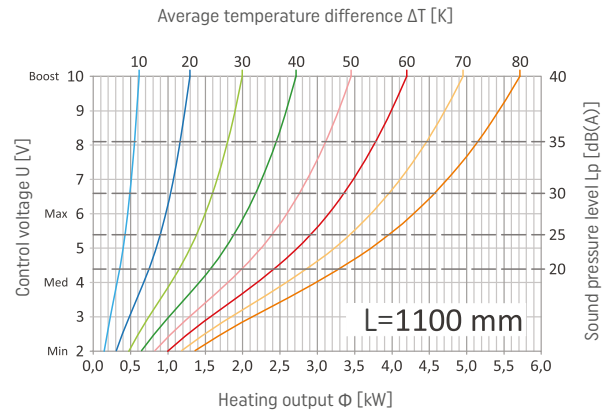
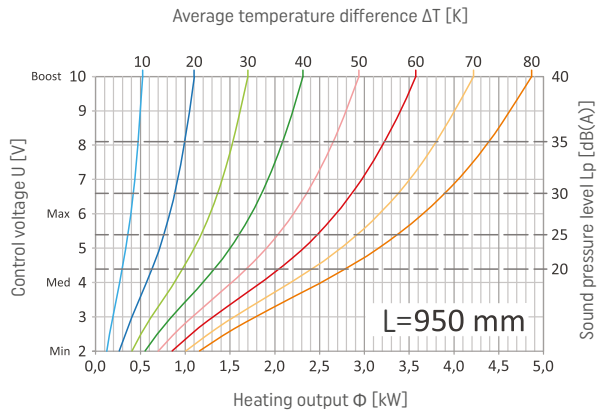


HEATING OUTPUT AND SOUND PRESSURE OF VKN5-9/35/L

The graphs present how heating power Φ [W] depends on the respective average temperature differences ΔT [K], for control voltages U [V]. The graphs also present the acoustic pressure levels for the respective heater operating conditions.

NOTE!

An example readout of control voltages and acoustic pressure for different values of heating power is included in page no. 43.



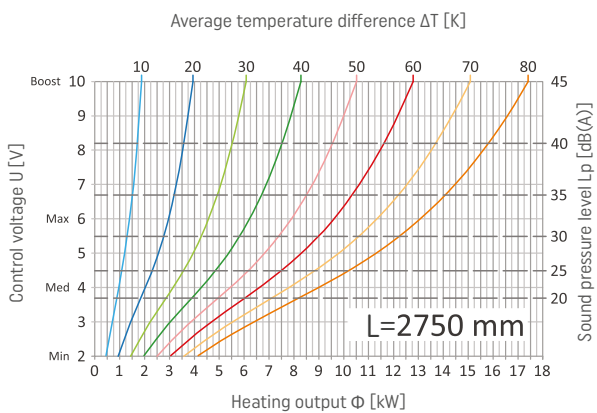
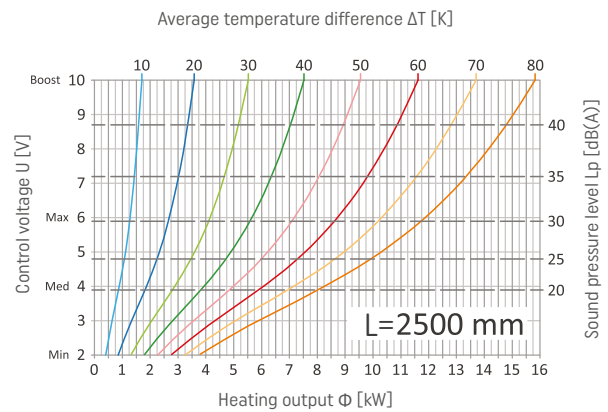
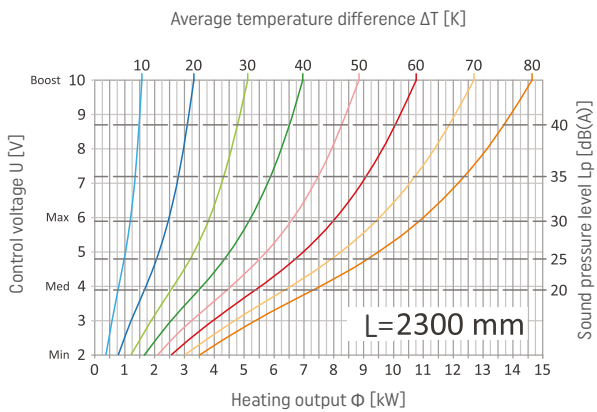
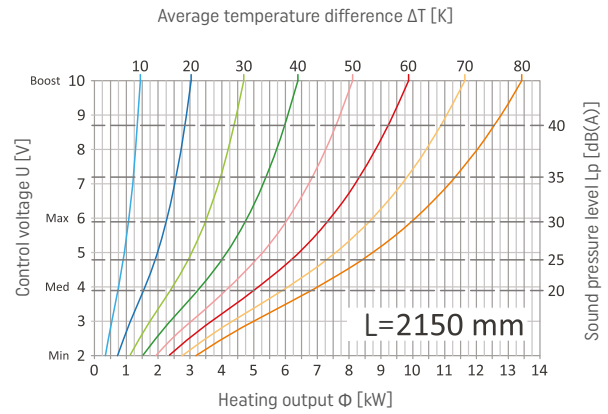
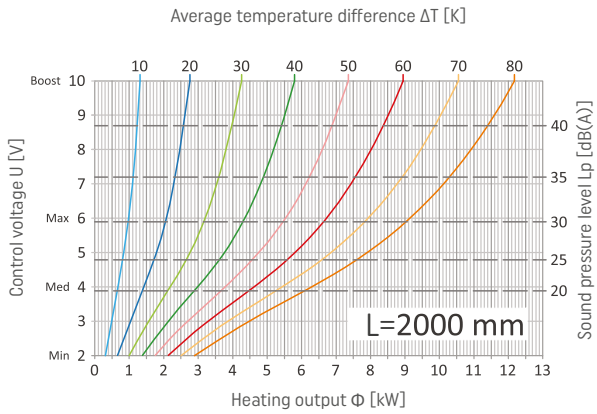


HEATING OUTPUT AND SOUND PRESSURE OF VKN5-9/35/L

The graphs present how heating power Φ [W] depends on the respective average temperature differences ΔT [K], for control voltages U [V]. The graphs also present the acoustic pressure levels for the respective heater operating conditions.

NOTE!

An example readout of control voltages and acoustic pressure for different values of heating power is included in page no. 43.



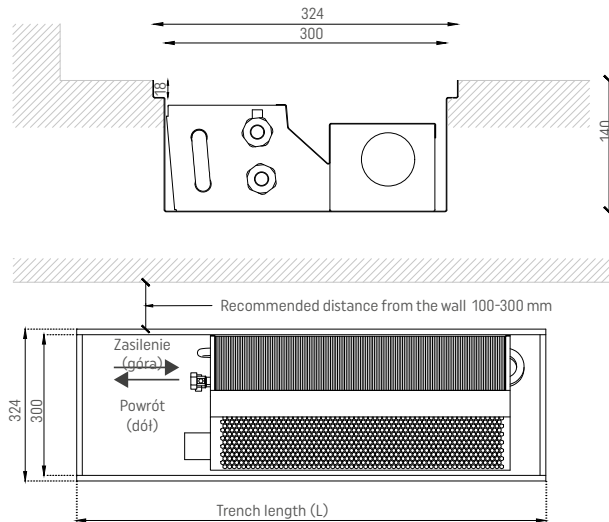


HEIGHT 140 mm

VKN5-14/30/L (L/P)

◀ ORDER CODE

DIMENSIONS	[mm]
Trench height (H)	140
Trench bottom width (B)	300
Top width/Grille width (Bk)	324
Trench length (L)	800÷2700
CONNECTIONS	TYPE
Connectors	¾" female thread
Connection side	Left (L) standard, Right (P) optional
ACCESSORIES	TYPE
Grille H=18 mm	Roll-up / linear / modular
Frames	L lub F



Trench length	Operating mode	LOW PARAMETERS Heating output for t_s/t_r °C			Sound pressure level	Sound power level	Electric power demand	Current	Number of fan motors
		55/45 °C	45/50 °C	35/30 °C					
L [mm]	[-]	Φ [W]			Lp [dB(A)]	Lw [dB(A)]	P [W]	I [A]	[-]
800	Min	420	312	170	<18	<26	0,8	0,03	1
	Med	758	563	306	18	26	1,7	0,07	
	Max	1078	800	435	25	33	4,1	0,17	
	Boost	1434	1064	579	40	48	19,2	0,80	
1000	Min	599	444	242	<18	<26	1,2	0,05	1
	Med	1081	802	436	19	27	2,7	0,11	
	Max	1536	1140	620	26	34	6,0	0,25	
	Boost	2043	1517	825	41	49	21,6	0,90	
1250	Min	850	631	343	<18	<26	1,5	0,06	1
	Med	1535	1139	619	23	31	3,2	0,13	
	Max	2180	1618	880	29	37	8,0	0,33	
	Boost	2900	2152	1170	41	49	33,6	1,40	
1550	Min	1019	757	411	<18	<26	2,0	0,08	2
	Med	1840	1365	742	24	32	4,4	0,18	
	Max	2613	1940	1055	30	38	10,1	0,42	
	Boost	3477	2581	1403	43	51	40,8	1,70	
1750	Min	1198	889	483	<18	<26	2,4	0,10	2
	Med	2162	1605	873	24	32	5,3	0,22	
	Max	3072	2280	1239	30	38	12,0	0,50	
	Boost	4087	3033	1649	43	51	43,2	1,80	
2000	Min	1449	1075	585	18	26	2,7	0,11	2
	Med	2616	1941	1056	24	32	5,8	0,24	
	Max	3716	2758	1499	31	39	14,0	0,58	
	Boost	4944	3669	1995	44	52	55,2	2,30	
2250	Min	1700	1262	686	20	28	2,9	0,12	2
	Med	3069	2278	1239	26	34	6,3	0,26	
	Max	4360	3235	1759	32	40	15,9	0,66	
	Boost	5801	4305	2341	44	52	67,2	2,80	
2500	Min	1797	1333	725	20	28	3,6	0,15	3
	Med	3244	2407	1309	26	34	8,0	0,33	
	Max	4607	3419	1859	33	41	18,0	0,75	
	Boost	6130	4550	2474	45	53	72,0	3,00	
2750	Min	2048	1520	826	20	28	3,9	0,16	3
	Med	3697	2744	1492	27	35	8,4	0,35	
	Max	5252	3898	2119	33	41	20,0	0,83	
	Boost	6987	5185	2820	45	53	76,8	3,20	

- Normative heating power output [W] compliant to EN-16430 for room temperature of $\theta = 20^\circ\text{C}$.
- Control voltages for the respective modes of operation: Min - 2 V, Med - 4 V, Max - 6 V, Boost - 10 V.
- Min, Med, Max fan speeds are for continuous operations, the Boost mode for fast additional heating of rooms.
- Sound power level according to ISO-3745 standard, sound pressure level for a distance of 2m in a room of a total volume of 100 m³ and reverb time of 0.5 s assuming room dampening of 8 dB(A).



CORRECTIVE FACTORS FOR 140 mm HIGH VKN5 HEATERS

Heating output corrective factors for VKN5 140 mm high units for installation temperatures other than 55/45/20°C.

SUPPLY AND RETURN TEMPERATURES [°C]		ROOM AIR TEMPERATURE θ_r [°C]						
t_s	t_r	5	8	12	16	20	24	32
90	85	2,854	2,746	2,603	2,460	2,318	2,176	1,892
	80	2,764	2,657	2,514	2,371	2,229	2,087	1,804
	75	2,675	2,567	2,425	2,282	2,140	1,998	1,716
	70	2,585	2,478	2,336	2,193	2,051	1,910	1,628
85	80	2,675	2,567	2,425	2,282	2,140	1,998	1,716
	75	2,585	2,478	2,336	2,193	2,051	1,910	1,628
	70	2,496	2,389	2,247	2,105	1,963	1,821	1,540
	65	2,407	2,300	2,158	2,016	1,874	1,733	1,452
80	75	2,496	2,389	2,247	2,105	1,963	1,821	1,540
	70	2,407	2,300	2,158	2,016	1,874	1,733	1,452
	65	2,318	2,211	2,069	1,927	1,786	1,645	1,365
	60	2,229	2,122	1,981	1,839	1,698	1,558	1,278
75	70	2,318	2,211	2,069	1,927	1,786	1,645	1,365
	65	2,229	2,122	1,981	1,839	1,698	1,558	1,278
	60	2,140	2,034	1,892	1,751	1,610	1,470	1,191
	55	2,051	1,945	1,804	1,663	1,522	1,382	1,104
70	65	2,140	2,034	1,892	1,751	1,610	1,470	1,191
	60	2,051	1,945	1,804	1,663	1,522	1,382	1,104
	55	1,963	1,857	1,716	1,575	1,435	1,295	1,017
	50	1,874	1,769	1,628	1,487	1,347	1,208	0,931
65	60	1,963	1,857	1,716	1,575	1,435	1,295	1,017
	55	1,874	1,769	1,628	1,487	1,347	1,208	0,931
	50	1,786	1,681	1,540	1,400	1,260	1,121	0,845
	45	1,698	1,593	1,452	1,313	1,173	1,035	0,759
60	55	1,786	1,681	1,540	1,400	1,260	1,121	0,845
	50	1,698	1,593	1,452	1,313	1,173	1,035	0,759
	45	1,610	1,505	1,365	1,225	1,087	0,948	0,674
	40	1,522	1,417	1,278	1,139	1,000	0,862	0,589
55	50	1,610	1,505	1,365	1,225	1,087	0,948	0,674
	45	1,522	1,417	1,278	1,139	1,000	0,862	0,589
	40	1,435	1,330	1,191	1,052	0,914	0,776	0,504
	35	1,347	1,243	1,104	0,965	0,828	0,691	0,420
50	45	1,435	1,330	1,191	1,052	0,914	0,776	0,504
	40	1,347	1,243	1,104	0,965	0,828	0,691	0,420
	35	1,260	1,156	1,017	0,879	0,742	0,606	0,337
45	40	1,260	1,156	1,017	0,879	0,742	0,606	0,337
	35	1,173	1,069	0,931	0,793	0,657	0,521	0,254
40	35	1,087	0,983	0,845	0,708	0,572	0,437	0,172
	30	1,000	0,897	0,759	0,623	0,487	0,353	0,092
35	30	0,914	0,811	0,674	0,538	0,404	0,271	0,014

HEATING OUTPUT CORRECTIVE FACTORS FOR VKN HEATERS ACCORDING TO THE GRILLE TYPE

GRILLE TYPE	AIRFLOW	CORRECTIVE FACTOR
Roll-up double T-bar profile aluminium grille - 13 mm gap	67%	1,00
Roll-up double T-bar profile aluminium grille - 8 mm gap	63%	0,99
Roll-up closed profile aluminium grille	62%	1,00
Roll-up wooden grille	52%	0,98
Modular snap on profile aluminium grille	62%	0,97
Linear snap on profile aluminium grille	62%	1,08
Linear stainless steel grille	71%	1,09

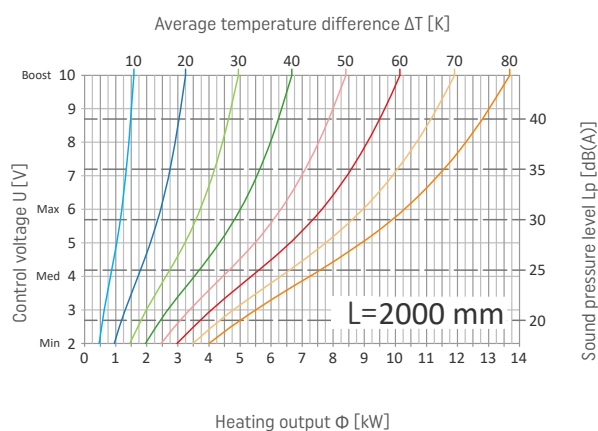
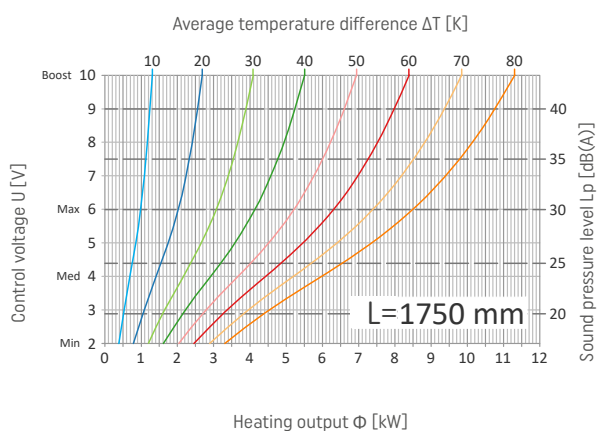
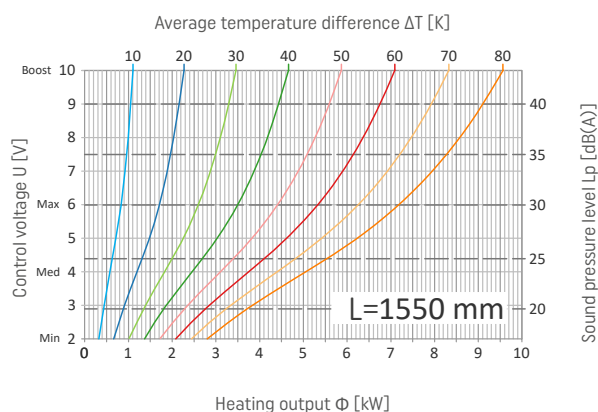
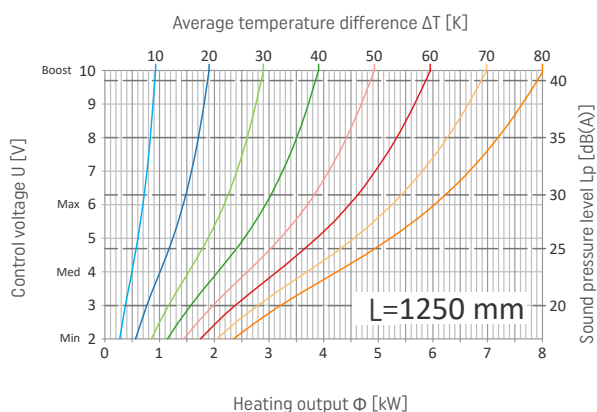
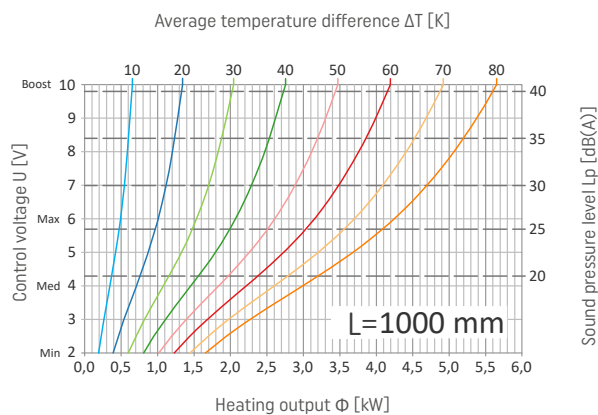
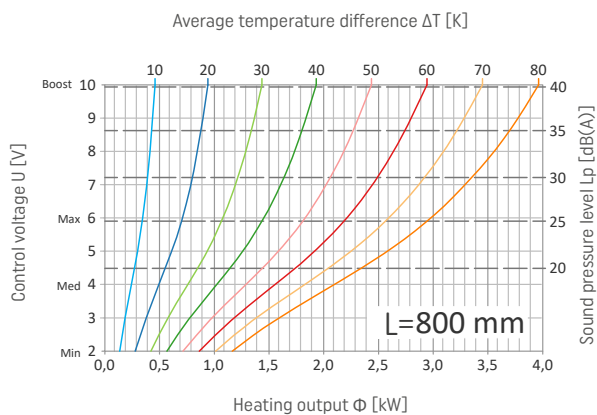


HEATING OUTPUT AND SOUND PRESSURE OF VKN5 14/30/L

The graphs present how heating power Φ [W] depends on the respective average temperature differences ΔT [K], for control voltages U [V]. The graphs also present the acoustic pressure levels for the respective heater operating conditions.

NOTE!

An example readout of control voltages and acoustic pressure for different values of heating power is included in page no. 43.



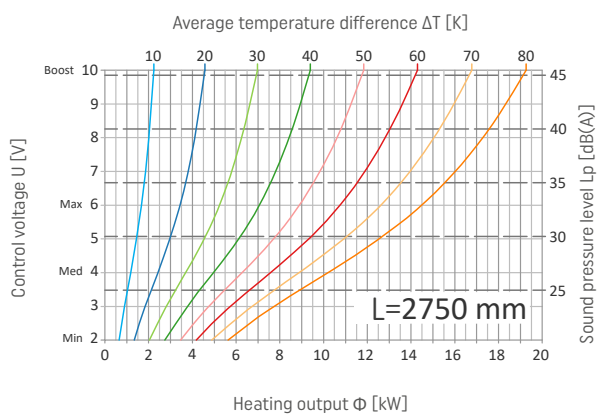
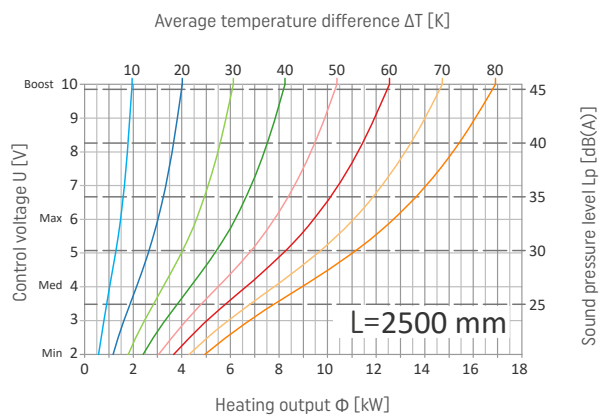
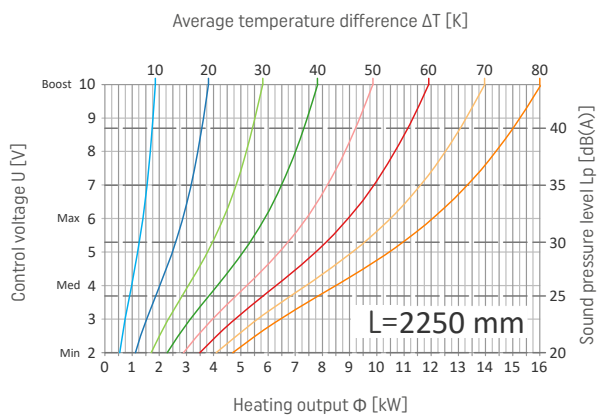


HEATING OUTPUT AND SOUND PRESSURE OF VKN5 14/30/L

The graphs present how heating power Φ [W] depends on the respective average temperature differences ΔT [K], for control voltages U [V]. The graphs also present the acoustic pressure levels for the respective heater operating conditions.

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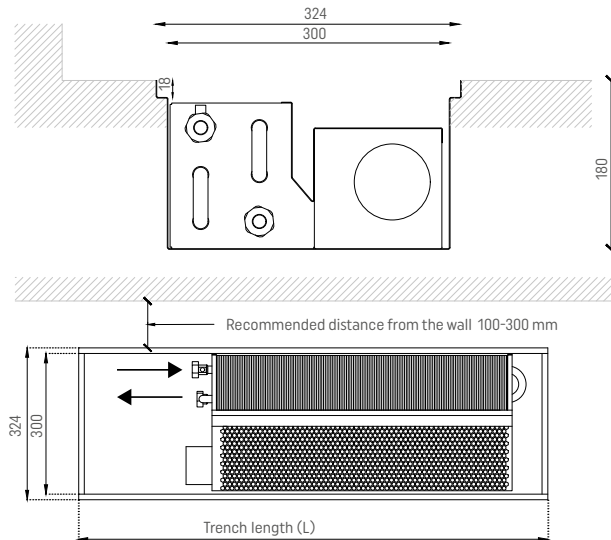


HEIGHT 180 mm

VKN5-18/30/L (L/P)

◀ ORDER CODE

DIMENSIONS	[mm]
Trench height (H)	180
Trench bottom width (B)	300
Top width/Grille width (Bk)	324
Trench length (L)	800÷2700
CONNECTIONS	TYPE
Connectors	¾" female thread
Connection side	Left (L) standard, Right (P) optional
ACCESSORIES	TYPE
Grille H=18 mm	Roll-up / linear / modular
Frames	L lub F



LOW PARAMETERS

Trench length L[mm]	Operating mode [-]	Heating output for t_r/t_r , °C			Sound pressure level Lp [dB(A)]	Sound power level Lw [dB(A)]	Electric power demand P [W]	Current I [A]	Number of fan motors [-]
		55/45 °C	45/50 °C	35/30 °C					
800	Min	816	608	334	<18	<26	2,0	0,08	1
	Med	1492	1112	611	21	29	3,9	0,16	
	Max	2013	1501	825	29	37	7,5	0,31	
	Boost	2596	1936	1063	42	50	21,6	0,90	
1000	Min	1149	857	471	<18	<26	2,2	0,09	1
	Med	2102	1567	861	23	31	4,4	0,18	
	Max	2837	2116	1162	32	40	8,9	0,37	
	Boost	3658	2728	1498	43	51	25,2	1,05	
1250	Min	1594	1189	653	<18	<26	2,7	0,11	1
	Med	2915	2174	1194	25	33	6,5	0,27	
	Max	3935	2935	1612	35	43	14,4	0,60	
	Boost	5074	3784	2078	46	54	42,0	1,75	
1550	Min	1964	1465	805	19	27	4,1	0,17	2
	Med	3593	2680	1472	26	34	8,2	0,34	
	Max	4850	3617	1987	34	42	16,4	0,68	
	Boost	6254	4664	2561	46	54	46,8	1,95	
1750	Min	2298	1714	941	20	28	4,4	0,18	2
	Med	4203	3135	1722	26	34	8,7	0,36	
	Max	5674	4232	2324	35	43	17,8	0,74	
	Boost	7316	5456	2996	46	54	50,4	2,10	
2000	Min	2743	2045	1123	20	28	4,8	0,20	2
	Med	5017	3742	2055	27	35	10,8	0,45	
	Max	6772	5051	2774	36	44	23,3	0,97	
	Boost	8732	6512	3576	48	56	67,2	2,80	
2250	Min	3187	2377	1305	20	28	5,3	0,22	2
	Med	5830	4348	2388	28	36	13,0	0,54	
	Max	7871	5870	3224	38	46	28,8	1,20	
	Boost	10148	7568	4156	49	57	84,0	3,50	
2500	Min	3447	2570	1412	21	29	6,3	0,26	3
	Med	6305	4702	2582	28	36	14,2	0,59	
	Max	8511	6347	3486	37	45	30,5	1,27	
	Boost	10974	8184	4495	48	56	88,4	3,68	
2750	Min	3891	2902	1594	22	30	7,0	0,29	3
	Med	7119	5309	2916	29	37	15,2	0,63	
	Max	9610	7167	3936	38	46	32,2	1,34	
	Boost	12390	9240	5075	49	57	92,4	3,85	

- Normative heating power output [W] compliant to EN-16430 for room temperature of $\theta = 20^\circ\text{C}$.
- Control voltages for the respective modes of operation: Min - 2 V, Med - 4 V, Max - 6 V, Boost - 10 V.
- Min, Med, Max fan speeds are for continuous operations, the Boost mode for fast additional heating of rooms.
- Sound power level according to ISO-3745 standard, sound pressure level for a distance of 2m in a room of a total volume of 100 m³ and reverb time of 0.5 s assuming room dampening of 8 dB(A).



CORRECTIVE FACTORS FOR 180 mm HIGH VKN5 HEATERS

Heating output corrective factors for VKN5 180 mm high units for installation temperatures other than 55/45/20°C.

SUPPLY AND RETURN TEMPERATURES [°C]		ROOM AIR TEMPERATURE θ_1 [°C]						
t_s	t_r	5	8	12	16	20	24	32
90	85	2,805	2,701	2,563	2,424	2,286	2,148	1,872
	80	2,718	2,615	2,476	2,338	2,200	2,062	1,786
	75	2,632	2,528	2,390	2,252	2,114	1,976	1,701
	70	2,545	2,442	2,303	2,165	2,027	1,890	1,615
85	80	2,632	2,528	2,390	2,252	2,114	1,976	1,701
	75	2,545	2,442	2,303	2,165	2,027	1,890	1,615
	70	2,459	2,355	2,217	2,079	1,941	1,804	1,529
	65	2,372	2,269	2,131	1,993	1,855	1,718	1,443
80	75	2,459	2,355	2,217	2,079	1,941	1,804	1,529
	70	2,372	2,269	2,131	1,993	1,855	1,718	1,443
	65	2,286	2,183	2,045	1,907	1,769	1,632	1,358
	60	2,200	2,096	1,958	1,821	1,683	1,546	1,273
75	70	2,286	2,183	2,045	1,907	1,769	1,632	1,358
	65	2,200	2,096	1,958	1,821	1,683	1,546	1,273
	60	2,114	2,010	1,872	1,735	1,598	1,461	1,187
	55	2,027	1,924	1,786	1,649	1,512	1,375	1,102
70	65	2,114	2,010	1,872	1,735	1,598	1,461	1,187
	60	2,027	1,924	1,786	1,649	1,512	1,375	1,102
	55	1,941	1,838	1,701	1,563	1,426	1,290	1,017
	50	1,855	1,752	1,615	1,478	1,341	1,204	0,932
65	60	1,941	1,838	1,701	1,563	1,426	1,290	1,017
	55	1,855	1,752	1,615	1,478	1,341	1,204	0,932
	50	1,769	1,666	1,529	1,392	1,255	1,119	0,847
	45	1,683	1,581	1,443	1,307	1,170	1,034	0,763
60	55	1,769	1,666	1,529	1,392	1,255	1,119	0,847
	50	1,683	1,581	1,443	1,307	1,170	1,034	0,763
	45	1,598	1,495	1,358	1,221	1,085	0,949	0,678
	40	1,512	1,409	1,273	1,136	1,000	0,864	0,594
55	50	1,598	1,495	1,358	1,221	1,085	0,949	0,678
	45	1,512	1,409	1,273	1,136	1,000	0,864	0,594
	40	1,426	1,324	1,187	1,051	0,915	0,780	0,510
	35	1,341	1,238	1,102	0,966	0,830	0,695	0,426
50	45	1,426	1,324	1,187	1,051	0,915	0,780	0,510
	40	1,341	1,238	1,102	0,966	0,830	0,695	0,426
	35	1,255	1,153	1,017	0,881	0,746	0,611	0,343
45	40	1,255	1,153	1,017	0,881	0,746	0,611	0,343
	35	1,170	1,068	0,932	0,797	0,661	0,527	0,260
40	35	1,085	0,983	0,847	0,712	0,577	0,443	0,177
	30	1,000	0,898	0,763	0,628	0,493	0,360	0,096
35	30	0,915	0,813	0,678	0,544	0,410	0,276	0,015

HEATING OUTPUT CORRECTIVE FACTORS FOR VKN HEATERS ACCORDING TO THE GRILLE TYPE

GRILLE TYPE	AIRFLOW	CORRECTIVE FACTOR
Roll-up double T-bar profile aluminium grille - 13 mm gap	67%	1,00
Roll-up double T-bar profile aluminium grille - 8 mm gap	63%	0,99
Roll-up closed profile aluminium grille	62%	1,00
Roll-up wooden grille	52%	0,98
Modular snap on profile aluminium grille	62%	0,97
Linear snap on profile aluminium grille	62%	1,08
Linear stainless steel grille	71%	1,09

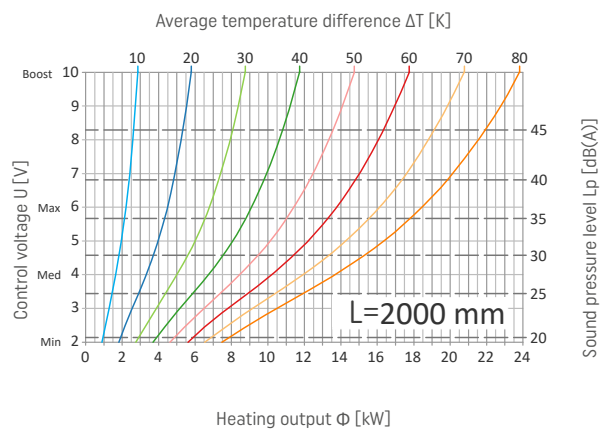
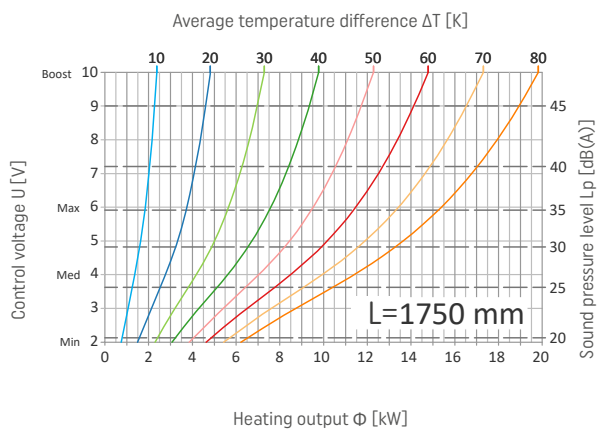
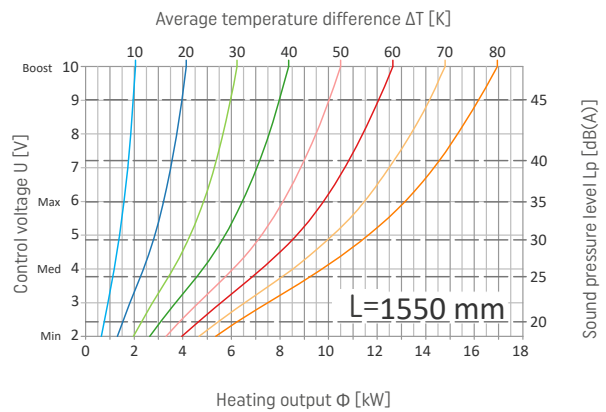
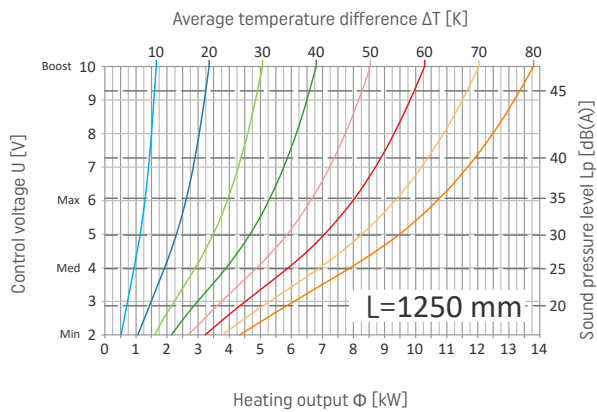
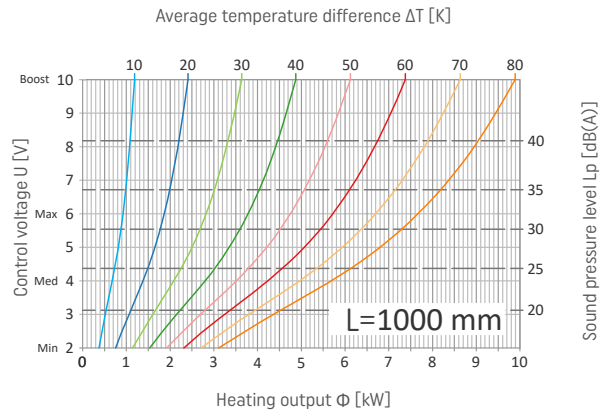
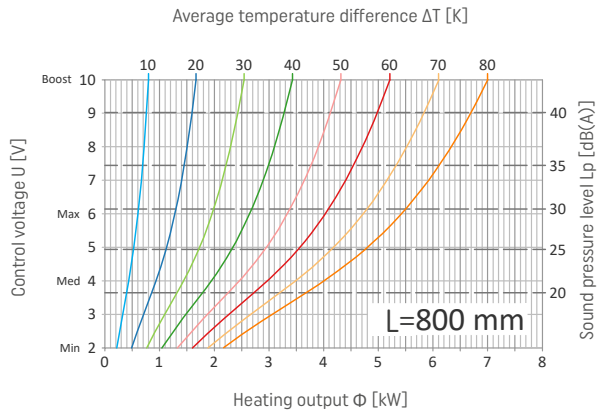


HEATING OUTPUT AND SOUND PRESSURE OF VKN5 18/30/L

The graphs present how heating power Φ [W] depends on the respective average temperature differences ΔT [K], for control voltages U [V]. The graphs also present the acoustic pressure levels for the respective heater operating conditions.

NOTE!

An example readout of control voltages and acoustic pressure for different values of heating power is included in page no. 43.



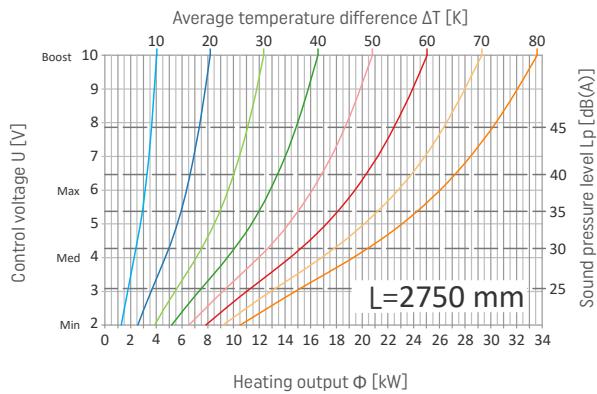
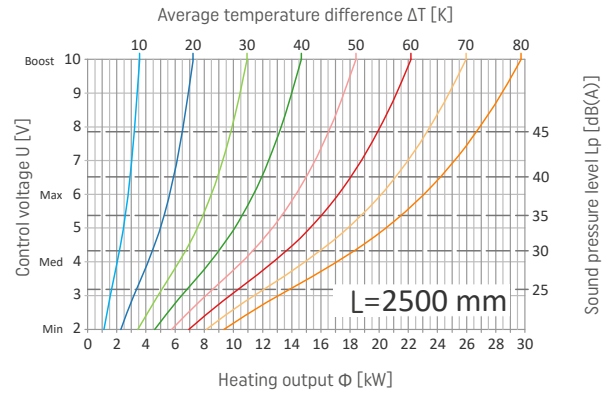
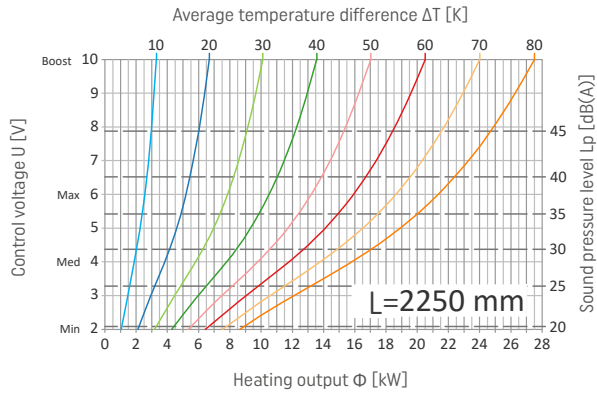


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NOTE!

An example readout of control voltages and acoustic pressure for different values of heating power is included in page no. 43.



VKN5 WATER CAPACITY

HEATER LENGTH L [mm]	HEATER TYPE	
	VKN5-7,5/25/L VKN5-9/25/L	VKN5-7,5/35/L VKN5-9/35/L
WATER CAPACITY [dm ³]		
950	0,25	0,53
1100	0,29	0,59
1250	0,35	0,73
1450	0,40	0,82
1650	0,47	0,96
1800	0,51	1,03
2000	0,57	1,16
2150	0,61	1,24
2300	0,67	1,36
2500	0,73	1,48
2750	0,79	1,61

HEATER LENGTH L [mm]	HEATER TYPE	
	VKN5-14/35/L	VKN5-18/35/L
WATER CAPACITY [dm ³]		
800	0,39	0,44
1000	0,50	0,56
1250	0,66	0,72
1550	0,84	0,90
1750	0,96	1,01
2000	1,12	1,17
2250	1,28	1,34
2500	1,41	1,47
2750	1,58	1,63

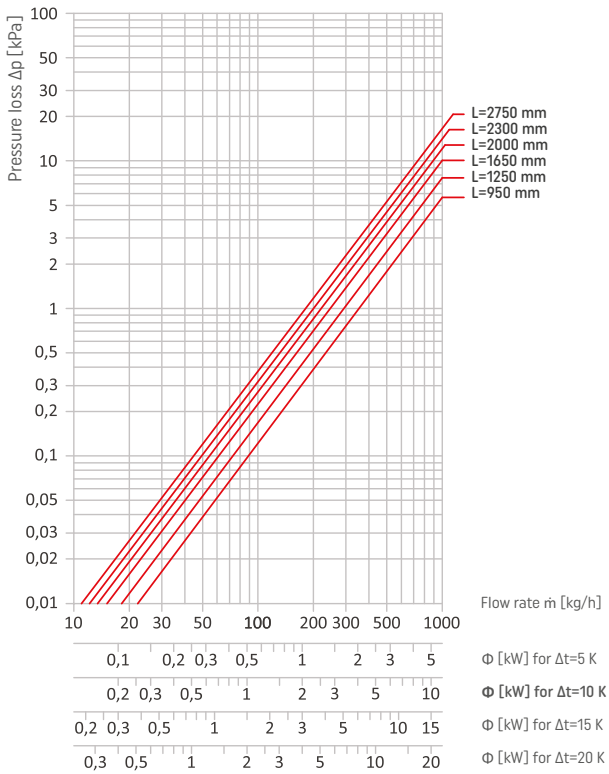
DECLARED PROPERTIES

Maximum permissible operating pressure:	1,60 MPa.
Test pressure:	2,08 MPa.
Maximum hydraulic pressure:	2,70 MPa.
Maximum operating temperature:	110°C

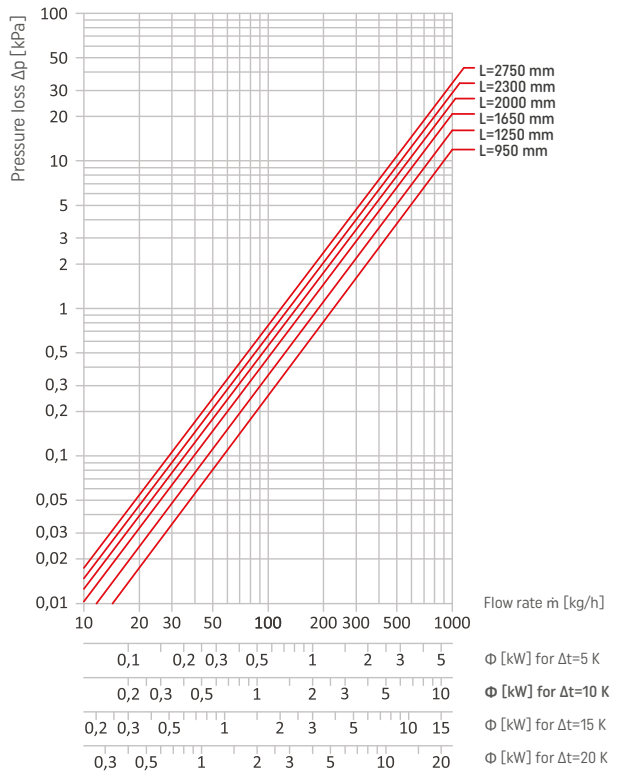


PRESSURE LOSS

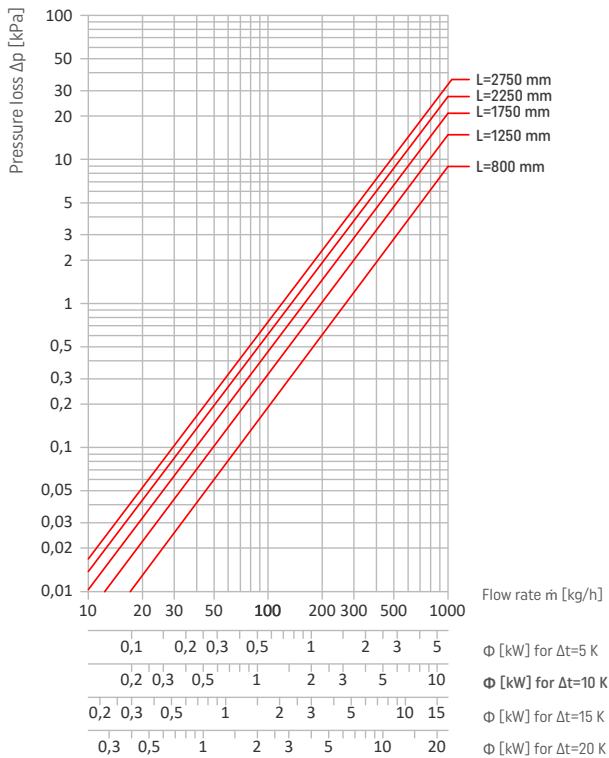
VKN5-7,5/25/L, VKN5-9/25/L



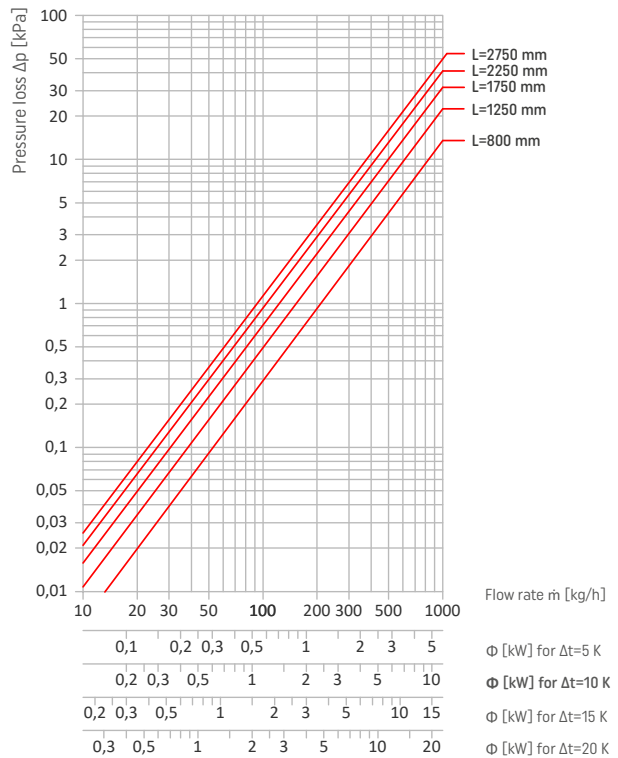
VKN5-7,5/35/L, VKN5-9/35/L



VKN5-14/30/L



VKN5-18/30/L





HOW TO SELECT THE CORRECT HEATER?

Exemplary calculations:

The calculated heat demand of a room is 680 W.

The design parameters for water supply, returning water and room temperature are (respectively):

$t_s/t_r/\theta_i = 55/45/20^\circ\text{C}$ (water parameters typical for low-temperature heat sources such as condensing gas boiler or heat pump).

METHOD 1 Based on corrective factors

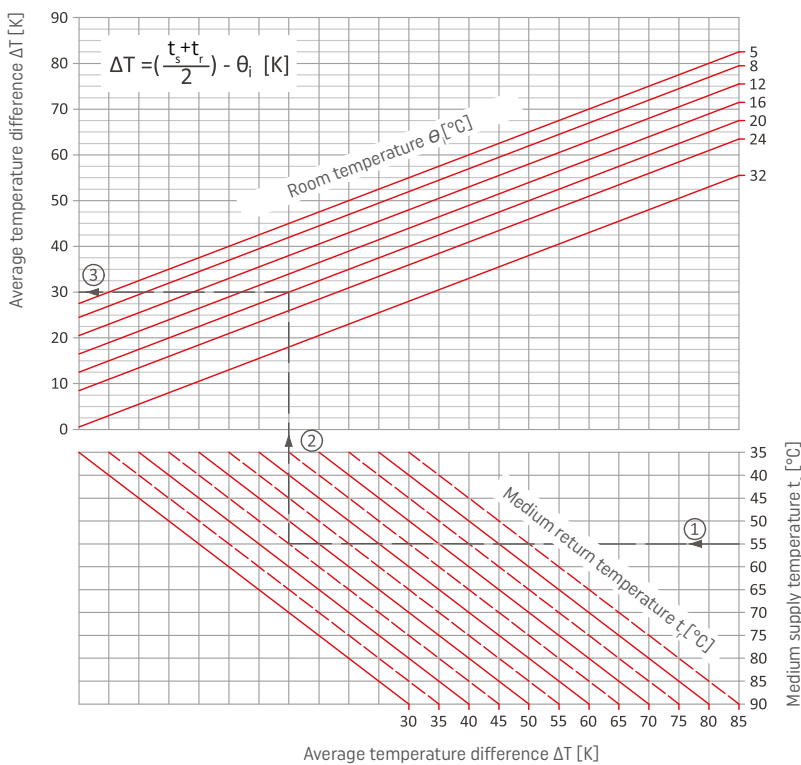
Read out the right conversion factor for project installation temperatures. In this case conversion factor is 0.600.

Next divide the calculated heating power demand (680 W) by the CORRECTIVE FACTOR read (0.600). The result is the heating power (1135) for which we select the 75/65/20°C parameters adjusted heater.

The last step is to select a heater with room-appropriate size, e.g. the **VKN1-6,5/17/110** model, which in the Max mode for 75/65/20°C will reach the power of 1135 W, and 680 W for 55/45/20°C.

METHOD 2 Based on heating output and noise level

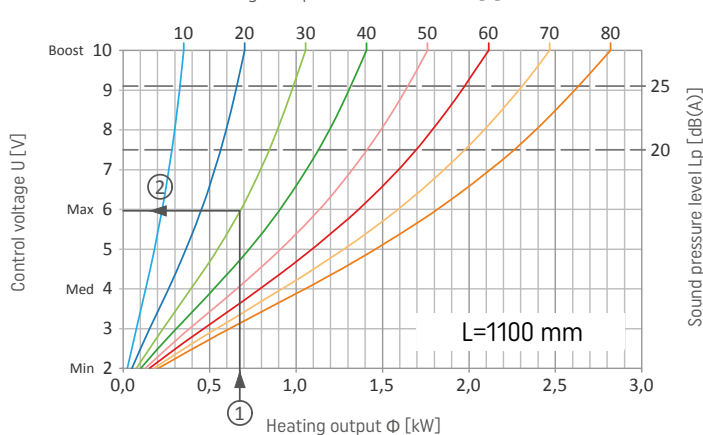
Using the graph below read/calculate the average temperature difference for selected temperatures.



The graph allows for easy readout of average temperature difference ΔT for selected heating media parameters t_s & t_r , depending on room temperature θ_i .

1. Draw a horizontal line from the supply temperature of $t_s = 55^\circ\text{C}$ to the crossing point with the transverse line of returning water temperature $t_r = 45^\circ\text{C}$
2. Draw a vertical line to the crossing point with the transverse room temperature line $\theta_i = 20^\circ\text{C}$
3. Draw a horizontal line and read the average temperature difference $\Delta T = 30$ K.

Next, using the graphs from page no. 10 select a heater with appropriate parameters for that room. Always take the mode of fan operations and the connected acoustic pressure level into account.



1. Draw a vertical line from the calculated heating power demand (682) to the crossing point with the 30 K temperature difference curve.
2. Read the control voltage and corresponding level of acoustic pressure L_p .

The selected **VKN1-6,5/17/110** heater reaches the assumed design parameters with a control voltage of $U = 4$ V (Med. mode) and thus the acoustic pressure level is below 20 dB(A).



HOW TO SELECT THE CORRECT HEATER?

METHOD 3

Based on **VERANO SELECT** selection programme: WWW.SELECT.VERANO-GLOBAL.COM or scan the QR code:



RAIL POWER SUPPLY SELECTION

- Using the table included in the catalogue read the maximum power of electric fan of selected heater. Selection of power lower than the maximal will result in switching off fans in higher fan speed and may result in damage to power supply unit or fan motor. Maximum energy demand and current are to be read from the table for the Boost mode.
- Using the technical sheet of the selected actuator read its maximum electric power – e.g. 4.8 W / 0.2 A for the VERSST24 actuator.
- Using the technical sheet of the selected controller read its maximum electric power – e.g. 1.3 W / 0.06A for VER-24 and VER-24S controllers.
- Sum up all maximum powers and loads for all devices used (including multiple use of devices).
- After calculations select the smallest power supply unit that provides the required electric power.

EXAMPLE:

3 heaters were selected for a room according to its heating power demand:

- 1 x VKN1-6,5/17/125,
- 2 x VKN1-6,5/17/165.

Additionally there are 3 VERSST24 thermal actuators and 1 VER-24 controller in the system.

Using the electric data for VKN1 heaters included on page 8 and the technical sheets of control devices we read:

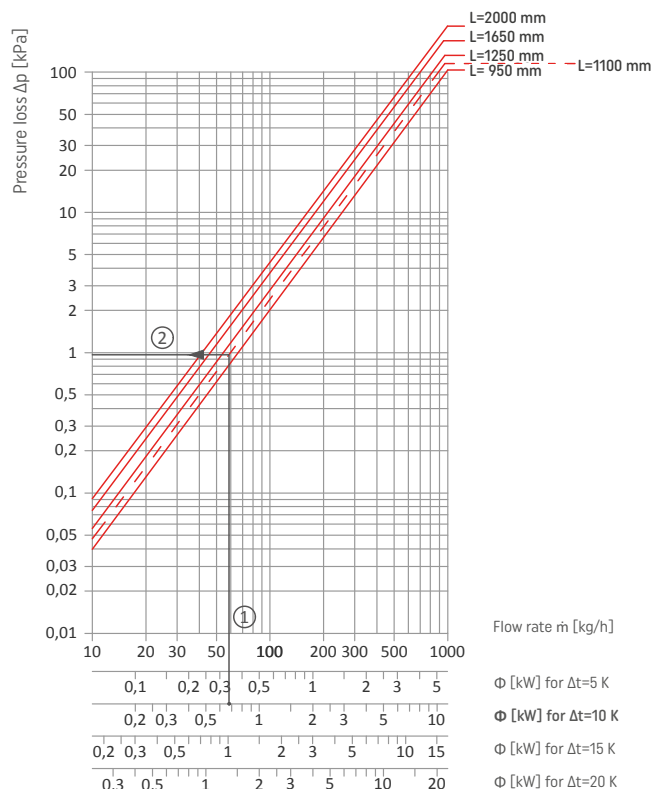
DEVICES TYPE	MAXIMUM ELECTRIC POWER	MAXIMUM CURRENT
1 x VKN1-6,5/17/125 fan assisted trench heater	1 x 9,2 W	1 x 0,38 A
2 x VKN1-6,5/17/165 fan assisted trench heater	2 x 12 W	2 x 0,5 A
VERSST24 thermal actuator	3 x 4,8 W	3 x 0,2 A
VER-24 controller	1 x 1,3 W	1 x 0,06 A
TOTAL:	48,9 W	2,04 A

POWER SUPPLY UNIT SELECTED: Z060W 24VDC (60 W / 2,5 A)

PRESSURE LOSS

Based on heater selection mode, as presented on page 43 we selected the **VKN1-6,5/17/110** heater with a power of 680 W at fan voltage of 6V. Cooling down temperature of the heating medium is $\Delta t=10^{\circ}\text{C}$

- Using the axis for 10°C cooled medium we draw a vertical line to the heating power of 0.68 kW till it crosses the transverse line representing heater length of $L=1100$ mm.
- Draw a horizontal line and read the pressure loss value of $\Delta p=0.98$ kPa.





ELECTRIC CONNECTION (WIRING) DIAGRAM

Fan assisted trench heaters are regulated automatically by using a room controller and a thermal actuator. The controller, using the built-in sensor, measures the temperature in the room and maintains its value at the set value. High regulation precision is possible thanks to the simultaneous, fully automatic control of both the 2-position valve actuator and the fan motor.



VER-24S

- Room air temperature control
- Front panel made of glass
- Physical buttons
- Available in white colour
- Surface mounting



VER-24

- Room air temperature control
- Front panel made of glass
- Colourful, touch display.
- Available on white or black colour.
- Surface mounting



VER-24 WIFI

- Features the same as VER-24.
- The built-in WIFI module allows to control using a mobile device.
- The ability to control from anywhere on earth, thanks to the online application.

Common features of the regulators: built-in temperature sensor, control output of the 0-10 V DC actuator and ON / OFF actuator of the NC and NO type, the control output of the 0-10V DC EC fan. All regulators are supplied with 24 V DC.

The following are required for correct operation of trench heater with fan: room controller, thermal actuator installed on thermostatic valve and 24V DC power supply unit selected according to the electrical characteristics of installed heaters.

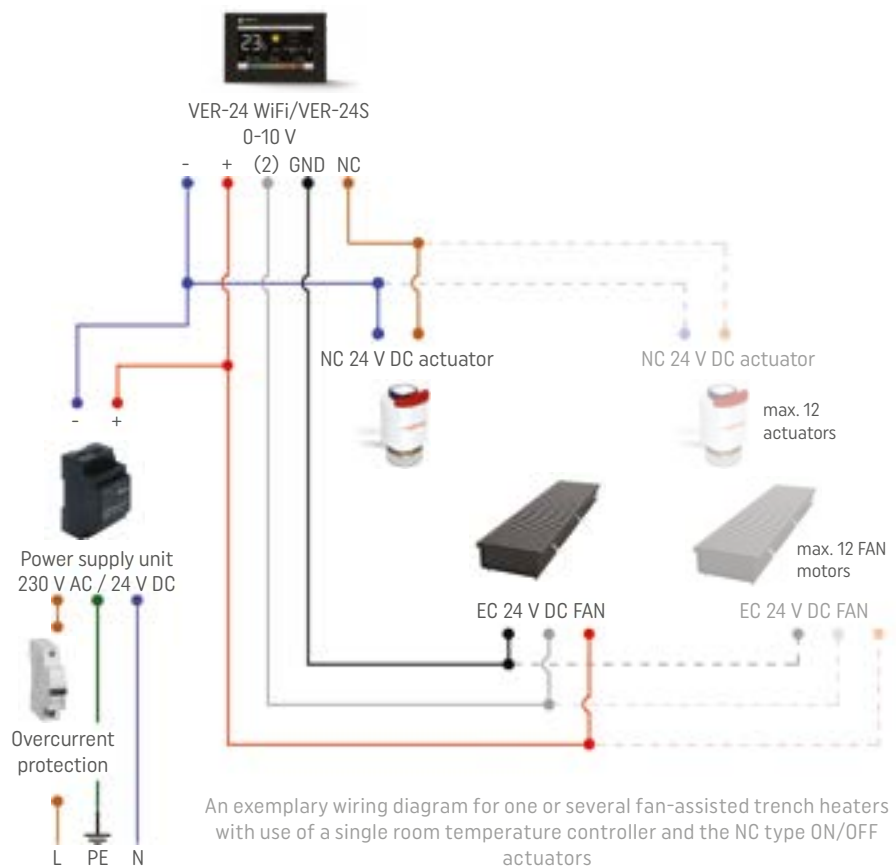
The room regulator, according to diagram below, is connected with heater fan and the actuator installed on thermostatic valve. The recommended cable type for control system is LIY or LIYCY. Due to the built-in temperature sensor the room controller should not be built over or covered with furniture or other interior design elements.

It is also possible to connect several fan-assisted heaters to a single regulator. In order to do that the heating zones should be correctly designated, so that the number of fan motors does not exceed 12 pieces, that is the upper limit for VER-24 WiFi and VER-24S controllers in each of those zones. The detailed electric data are presented in the respective sections of the product catalogue.

VERANO also offers 230 V AC/ 24 V DC DIN-rail or switchboard mounted power supply units. The example procedure for selection of power supply unit is presented on page 43. The power supply unit should be protected with appropriate overcurrent protection that will also allow to switch the power off during service and maintenance.

Only properly skilled and trained personnel, holding licenses and observing applicable standards can install electric connections. Power can only be switched back on when the correctness of the whole wiring was checked and approved.

Due to use of safe low-voltage fans the heaters can only be powered by 24 V DC voltage. It is prohibited to connect the heaters directly to 230 V AC power grid.





INSTALLATION AND MAINTENANCE MANUAL FOR VKN FAN ASSISTED HEATERS

Prior to start of assembly always make sure to prepare a trench in the floor with dimensions exceeding the dimensions of the heater by some 40-50mm in every direction. Plan the depth of the trench in such a way, that the surface of grille matches the expected floor finish level.

Levelling the trays of fan assisted trench heaters is achieved with use of levelling legs. The legs shall rest on the construction layer of the floor. The next step is to assemble the anchoring screws and anchors that fix the heater to the concrete.

Due to the strength requirements we recommend insulation materials with compression strength of no less than 70 kPa, e.g. the EPS70, for insulation of heater tray. Free spaces between insulation and heater tray should be filled with low compression foam. Tray of trench heater should only be installed after the heating set was first removed from it.

Fan assisted trench heater is installed in such a way that the heat exchanger faces the division and the fan faces the heated room. The fan assisted heaters are not universal – always remember to quote the correct connection side when ordering.

For the duration of finishing works it is recommended to cover the tray with assembly cover that protects the elements of the heater from mechanical damage and dust.

Prior to pouring concrete that the edge of the tray will rest on make sure that all heater water and control connections were installed.

Electric and installation ducts may be connected to the tray from its longer or shorter side. After hydraulic and electric connection of the heater test the correctness of control system and remove all dirt from tray. The poured concrete that the edge of the tray will rest on should be at least 50 mm thick.

During assembly of trench heater always remember about the assembly spreaders that are included with the heater and prevent the tray and heater edge from deformation. Addition of dilatation mat on the side of heater tray allows to lower the contact surface of concrete and heater tray, thus serving as additional acoustic insulation of the heater.

The border L and F type frames are accessories that allow the finishing of the tray borders during finishing works.

All assembly operations should be performed by properly skilled and trained construction industry, electrical and installation workers.

Fan assisted trench heaters could be optionally equipped with adjustable edge. This allows to level the difference between the expected and final height of floor finish without the need to chisel the floor to do that.

The trench heaters used in heating season should not be covered by carpets, furniture or curtains. The grilles can resist pressure and abrasion connected with low intensity pedestrian traffic. Avoid exercising excessive pressure on the grille bars, e.g. by placing room furnishings on them.

Due to the possible influence of dirt on the efficiency of heater we recommend the periodic cleaning of heater tray.

EXAMPLE OF CONNECTION VKN TRENCH HEATERS TO THE CENTRAL HEATING INSTALLATION



| Connection of the VKN trench heater



| Example: Straight connection

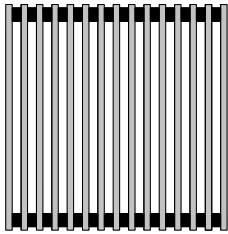


| Example: Angle connection



GRILLES FOR TRENCH HEATERS

Roll-up grille double T-bar profile



TOP VIEW



SINGLE BAR
CROSS SECTION

STANDARD:

- Spacers 17 mm.
- Distance between the bars - 13 mm.
- Spacers made of black PVC.

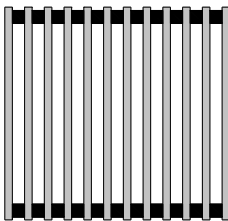
OPTION:

- Spacers are available in other colours and size:
- grey 13 mm, 8 mm.

Maximum length of one grille section is 6 m.

GRILLE TYPE	COLOUR	ORDER CODE
Roll-up grille, double T-bar profile - natural aluminium	Natural aluminium	ZDW-1,8/B/L
	Satin	ZADWS-1,8/B/L
Roll-up grille, double T-bar profile - anodized aluminium	Stainless steel	ZADWST-1,8/B/L
	Gold	ZADWZ-1,8/B/L
	Black	ZADWC-1,8/B/L

Roll-up grille closed profile



TOP VIEW



SINGLE BAR
CROSS SECTION

STANDARD:

- Spacers 13 mm.
- Distance between the bars - 13 mm.
- Spacers made of black PVC.

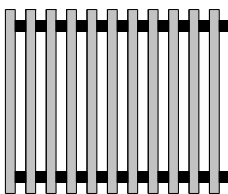
OPTION:

- Spacers are available in other colours and size:
- grey 17 mm, 8 mm.

Maximum length of one grille section is 6 m.

GRILLE TYPE	COLOUR	ORDER CODE
Roll-up grille, closed profile - natural aluminium	Natural aluminium	ZAL-1,8/B/L
Roll-up grille, closed profile - anodized aluminium	Satin	ZAALS-1,8/B/L
	Stainless steel	ZAALST-1,8/B/L

Roll-up wooden grille (made of natural wood)



TOP VIEW



SINGLE BAR
CROSS SECTION

STANDARD:

- Spacers 13 mm
- Distance between the bars - 13 mm
- Spacers made of black PVC.

OPTION:

- Spacers are available in other colours and size:
- wooden spacers (beech) 17 mm
 - grey 17 mm, 8 mm

Maximum length of one grille section is 6 m.

It is possible to make a corner grille for corner section of the heaters at an angle of 90° (herringbone grille). The corner grille can be made only if it is ordered with a heater at the same time.



OAK



ASH



BEECH



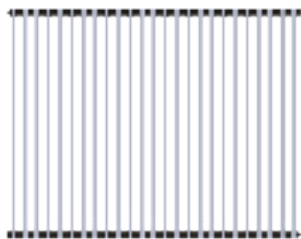
SAPELI

GRILLE TYPE	COLOUR	ORDER CODE
Roll-up wooden grille	Oak	ZD-1,8/B/L
	Ash	ZJ-1,8/B/L
	Beech	ZB-1,8/B/L
	Sapeli	ZM-1,8/B/L



GRILLES FOR TRENCH HEATERS

Modular grille (made of aluminium)



TOP VIEW

THE GRILLE IS AVAILABLE IN TWO VERSIONS:

- natural aluminium,
- anodized aluminium.

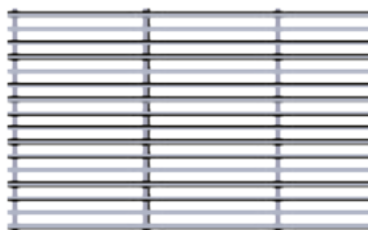
The grilles joints are made of black PVC only.



CROSS SECTION

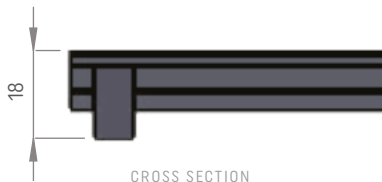
GRILLE TYPE	COLOUR	ORDER CODE
Modular grille - natural aluminium	Natural aluminium	ZAL-1,8/B/L
Modular grille - anodized aluminium	Satin	ZAALS-1,8/B/L
	Stainless steel	ZAALST-1,8/B/L

Linear grille (made of aluminium)



TOP VIEW

GRILLE ENTIRELY MADE OF ALUMINIUM.



CROSS SECTION

The grille is available in the following variants:

- natural aluminium (cross – bar joiners are coated in black RAL 9005),
- aluminium coated in any RAL colour (grille entirely coated in RAL),
- anodized aluminium (cross – bar joiners are coated in black RAL 9005).

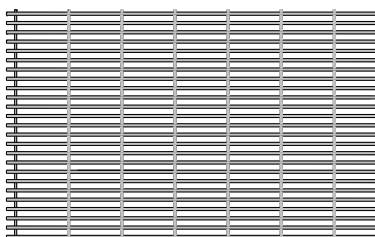
It is possible to make a corner grille for corner section of the heaters at an angle of 90° and others.

The corner grille can be made only if it is ordered with a heater at the same time.

Maximum length of one grille is 3 m.

GRILLE TYPE	COLOUR	ORDER CODE
Linear grille, snap profile - natural aluminium	Natural aluminium	PZW-1,8/B/L
Linear grille, snap profile - anodized aluminium	Satin	PZWAS-1,8/B/L
	Stainless steel	PZWAST-1,8/B/L
Linear grille, snap profile - any RAL colour	RAL colour	PZWR-1,8/B/L

Stainless steel linear grille



TOP VIEW



CROSS SECTION

THE GRILLE IS AVAILABLE ONLY AS A RIGID VERSION.

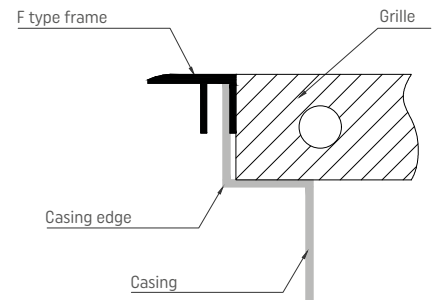
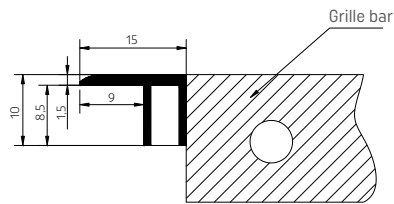
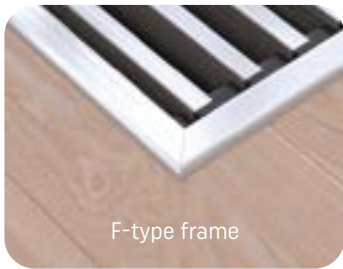
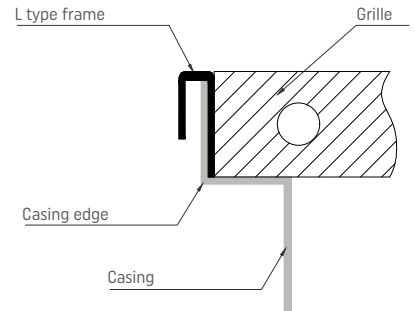
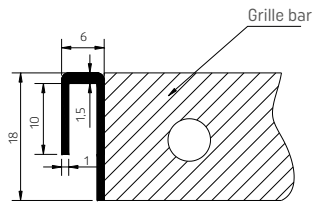
Maximum length of one section of the grille is 2 m.

Grille length longer than 2 m are made of several elements of equal lengths.

GRILLE TYPE	COLOUR	ORDER CODE
Stainless steel linear grille	Stainless steel	SN-1,8/B/L



FRAMES type L and F



GRILLE TYPE	FRAMES F	FRAMES L
Natural aluminium	OF-B/L	OL-B/L
Satin	OFS-B/L	OLS-B/L
Stainless steel	OFST-B/L	OLST-B/L
Gold	OFZ-B/L	OLZ-B/L
Black	OFC-B/L	OLC-B/L
Any RAL colour	OFRAL-B/L	OLRAL-B/L

ADDITIONAL EQUIPMENT FOR TRENCH HEATERS

ZPP Raised floor kit

Kit contains:

- 1x support
- 2x expansion bolt with a screw
- 4x nut and washer

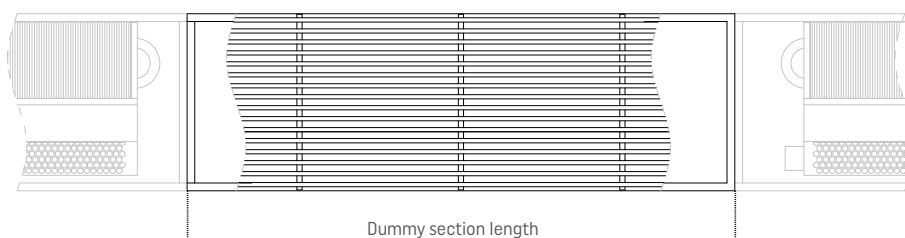
ZPP kit allow to level the unit up by 50 mm.
Other heights on request.



EXTENSION OR ADDITIONAL DUMMY SECTION OF THE TRENCH

First step of heating and cooling units selection is choosing the standard unit with required heating and cooling output. Sometimes, standard lengths of units does not come together with architectural vision of the room. For this kind of situation we can offer customized solutions, such as:

- extension of the heater casing to the required length,
- making a separate dummy section of the trench equipped with all necessary assembly elements.



Separate dummy section is not compatible for heat exchanger or fan installation.
Maximum dummy section length is 4000 mm. Grilles and frames can be also customized.



CORNER TRENCH AND GRILLE OPTIONS



| Corner trench with linear grille

FRAMES:
F Type



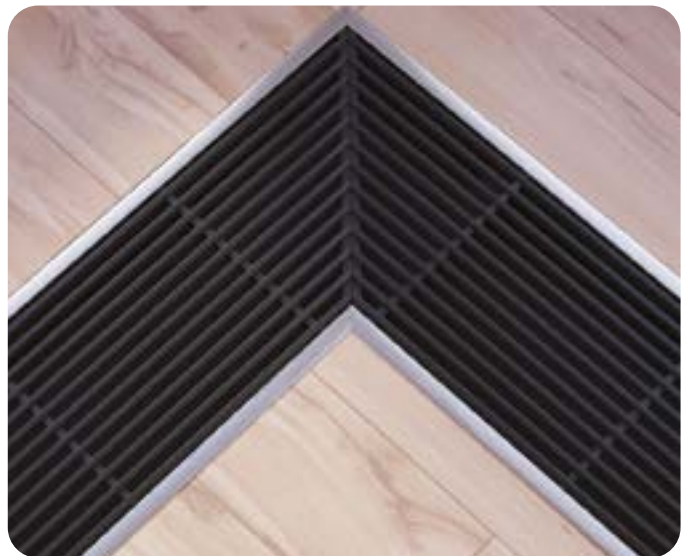
| Corner trench with cross-bar grille.

FRAMES:
F Typ



| Corner trench with cross-bar grille. Herringbone grille shape.

FRAMES:
F Typ



| Corner trench with linear grille. Herringbone grille shape.

FRAMES:
F Typ

Anodized aluminium colours



SATIN



BLACK



STAINLESS STEEL



GOLD

RAL Palette



Frame and linear aluminium grilles are available in any RAL colour at additional surcharge.

F and L frames are available in exact the same anodizing colours.



CERTYFICATES

Notifizierte Stelle durch
DIBt Deutsches Institut
für Bautechnik
Nr. 0626
Notified body

Prüfstelle
Heizung
Lüftung
Klimatechnik **HLK**
Stuttgart

1. Ausfertigung
Edition / Exemplaire

**Bericht über die Prüfung eines Raumheizkörpers nach
DIN EN 16430: 2015: Heizfall**
Report for testing a trench convectors according to DIN EN 16430: 2015: Heating capacity
Rapport de l'essai d'un convecteurs de caniveaux par DIN EN 16430: 2015: Puissance thermique

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Anerkennungen von Zertifizierungsstellen: **DINCERTCO / RAL / AFNOR / BSI / AENOR**
Acceptances from certification bodies: / Reconnaissance par les organismes certificateurs:

Erstprüfung
Initial test Essai initial

Prüfbericht

Test report / Rapport d'essai

Nr., no.: **A17 F.715.4637-H-6V**

Handelsbezeichnung des Antragstellers:
Trademark of the applicant:
Symbol d'identification par demandeur: **VKN1-9/14/125**

Bezeichnung der Modellreihe:
Identification symbol of the type:
Symbole d'identification de la gamme: **VKN1-9/14/125**



Dieser Bericht umfasst 8 Seiten und darf ohne schriftliche
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FAN ASSISTED TRENCH HEATERS WITH FRESH AIR SUPPLY

freshAIR+

The freshAIR + VKN5P family of products are completely new trench heaters with the function of supplying conditioned air from the ventilation unit.



More details in the freshAIR+ catalogue.

The traditional heating system is based on recirculation air. In the construction of VKN5P trench heaters, which are part of the freshAIR+ system, it is possible to supply conditioned air from a AHU in which it undergoes initial filtration.

To optimize air flow regulation, VKN5P radiators have a factory-fitted constant air volume regulator (CAV), which allows quick and easy set-up of the designed air stream.

When designing a Demand Controlled Ventilation (DCV), it is possible to install an additional module with a variable air volume controller (VAV). Available BMS modules allow the use of a panel with an air quality meter (CO₂ measurement).

The airflow of conditioned air is supplied directly to the heat exchanger, thanks to which the supply air temperature can be locally adapted to the needs of users.

The supply air temperature is regulated by an additional temperature sensor connected to the VER-44 WiFi controller or the BMS system.

ADVANTAGES OF VKN5P HEATERS USAGE:

- additional heating of air supplied from the air handling unit,
- quick setting of the projected air stream thanks built-in CAV regulator,
- the possibility of using one or two connection ventilation slots,
- a choice of three heights of the heaters: 120, 140 or 180 mm,
- the length of the heater is adjusted for the needs of interior design: from 1000 to 2550 mm,
- depending on the height of the heater there are three ventilation slots diameters available: 80, 100 and 125 mm.



VER-44 WiFi



AHUs, HEATERS, COOLERS, FAN ASSISTED HEATERS AND CLIMACONVECTORS

freshAIR+

The family of **freshAIR+** products also includes air handling units, air heaters and air coolers, as well as trench heaters and climaconvectors, which will ensure comfort and clean air in your home.



freshAIR+ AIR HANDLING UNITS

Compact **freshAIR+** air handling units are equipped with a two-stage filtration system, a heater or cooler and an enthalpy heat exchanger. The used Constant Flow system makes it easy to adjust installation and guarantees a constant air flow, regardless of weather conditions or the degree of contamination of the filters.



freshAIR+ DUCT HEATERS AND COOLERS

freshAIR+ heaters and coolers have a built-in control valve and actuator. The used screw connections allow for the separable connections, e.g. using a PEX connector. Coolers are also available with a built-in condensate pump.



freshAIR+ TRENCH HEATERS AND CLIMACONVECTORS

freshAIR+ trench heaters and climaconvectors are equipped with modern heat exchangers to ensure thermal comfort in the room thanks to the possibility of local and central regulation. Built-in constant flow regulator and PICV valves allow you to simplify installation work. They are perfect especially in office spaces.



freshAIR+ AIR HANDLING UNITS ADVANTAGES:

- Modern casing made of EPP,
- Recovery of temperature and moisture from the removed air,
- Automatic bypass,
- ePM10 and ePM1.0 anti-smog filters compliant with the new standard,
- Control with PM2.5 and CO2 sensors,
- A constant stream of air regardless of weather conditions and the degree of filter contamination,
- Built-in PTC pre-heater
- Built-in reheater or water cooler,
- Energy-saving EC fans,
- Aesthetic frame masking the condensate drain,
- Wireless control via a mobile application (Android and iOS) and a website,
- High thermal and acoustic insulation,
- Light construction,
- High energy efficiency.



VERANO

G L O B A L



VK15
NATURAL CONVECTION
TRENCH HEATERS

VK5
Natural convection
trench heaters



VKN
FAN ASSISTED

2020/06

VKN
Fan assisted
trench heaters



**COMODO
CALIENTE
STANDARD**
WALL-MOUNTED AND FLOOR-MOUNTED CONVECTORS

2022/11

COMODO CALIENTE STANDARD
Wall/Floor-mounted convectors




CVK
TRENCH HEATING AND COOLING
UNITS

CVK
Heating and cooling
trench units



FRESHAIR+
FRESH AIR SUPPLY
SYSTEM

FRESHAIR+
Fresh air
supply system



PRICE LIST

PRICE LIST

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