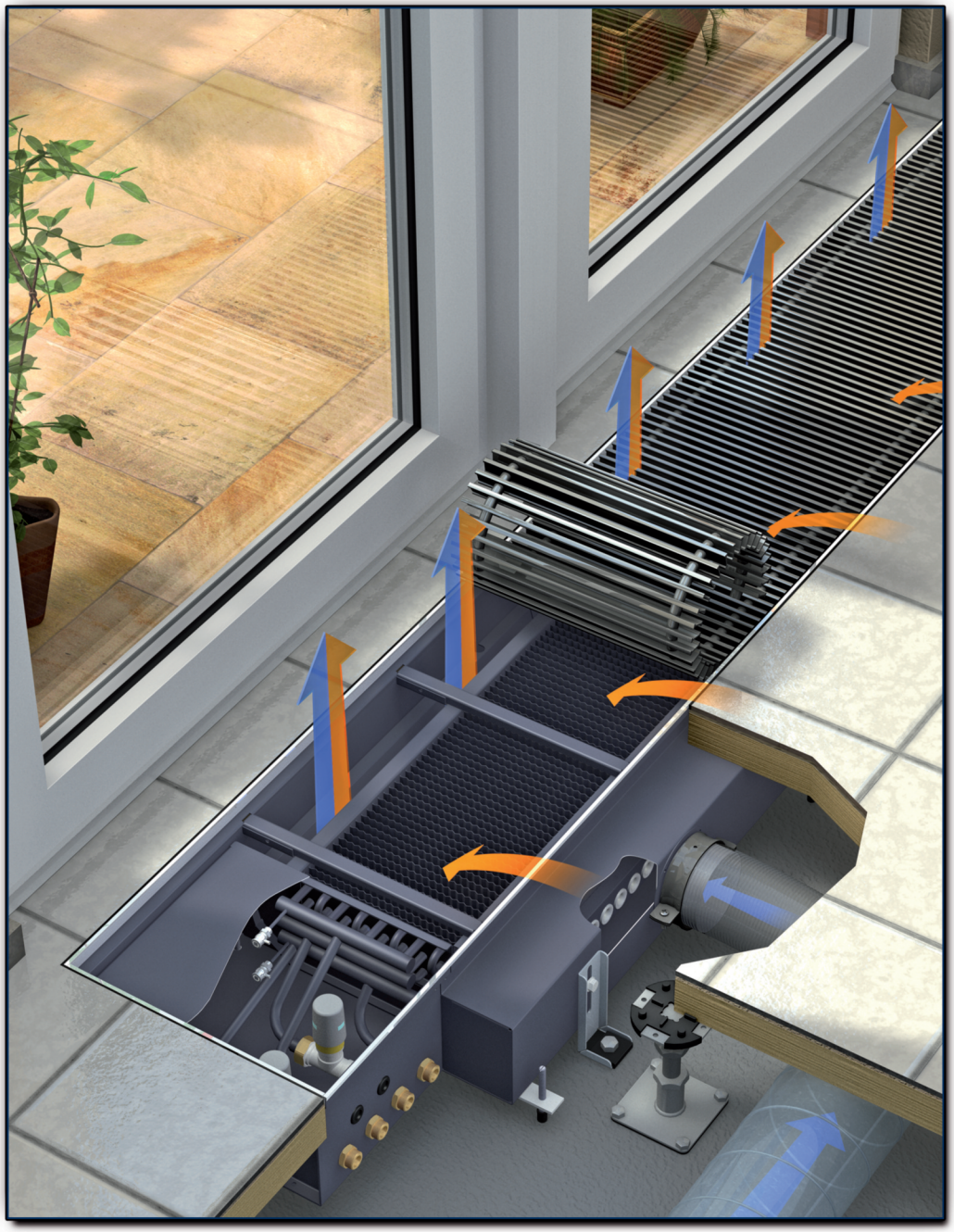
Kampmann konkret
Katherm ID

Heating and cooling with induction



KAMPMANN

Genau mein Klima.

Table of Contents

Further information can be found on our website:

Kampmann-uk.co.uk

Our service for you

- Advice (on-site)
- Seminars and training sessions
- Special solutions
- Project solutions
- Design ideas
- Control technology
- Site measurements
- Customer service

Katherm ID – Induction floor ducts for effective ventilation, heating and cooling

Katherm ID units are floor ducts for decentralised heating or cooling with conditioned primary air. Fed by a central ventilation system, the primary air (conditioned supply air) flows through a duct system (supplied by the customer) to the floor duct. The fed air flows through supply air spigots into a supply air box. The primary air is distributed evenly in this box and then passes through specially developed nozzles in the interior of the floor duct. The primary air flowing under the convector draws in secondary air from the room through the convector. This effect is known as induction. The induced air flowing past the convectors fins is either heated or cooled as required. When the induced air flows out of the convector, it mixes with the primary air and this mixed air is blown through a grille into the room. A series of units with compact dimensions has been developed in the Kampmann Research and Development Centre to meet market demands.

Applications

The main applications are offices and conference rooms. The ducts are installed within the existing raised or hollow floors.

Katherm ID data at a glance

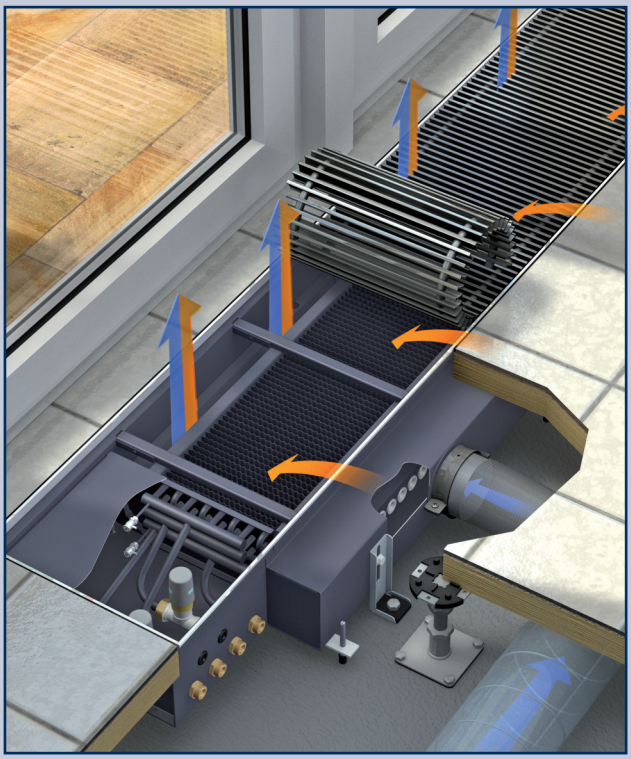
- Floor duct made of sendzimir galvanized sheet steel, painted graphite grey on both sides
- Floor duct height 180 mm, other dimensions on request.
- Overall frame width 340 mm
- Floor duct lengths: 800 mm, 1000 mm, 1200 mm, 1400 mm and 1600 mm
- Internal brackets positioned at regular intervals to reinforce the floor duct
- Special mounting feet for variable height adjustment
- High-output convectors made of copper with aluminium fins (Cu/Al)
- Water connection 1/2" room-side
- Air connection either: 1 or 2 supply air spigots, each Ø 100 mm, room-side
- Precisely fitted, fast installation, also available with mitred corners, recesses, curves etc.
- Covered by attractive roll-up or linear grille
- Available with roll-up and linear grilles

Benefits

- Low noise operation thanks to sound-optimised nozzles
- Low investment costs (saving of rotating parts and motors)
- Low maintenance costs
- Ideal when combined with slower systems, such as thermal mass activation
- 4-pipe system (2-pipe system on request)
- Low noise supply air with post-heating and cooling
- Conditioned supply of fresh air ensures fresh indoor climate at all times of the year
- Effective shielding effect against cold air falling from large expanses of glazing
- Space-saving, thanks to installation of ducts in the raised floor, thereby making better use of the space
- Replaceable nozzles for adaptable air volumes following a change of use
- Possible subsequent installation and maintenance of volumetric flow limiters in the supply air box
- Supply lines can be run within the raised floor

Katherm ID – Heating or cooling with induction

Product description



241 0 6 2 8 1 11 15 K 1 Article key (example)

Art. group

Enter a 0 where there is no digit

Overall frame width
6 = Overall frame width 340 mm

No. of pipes
2 = 2-pipe
4 = 4-pipe

Floor duct height
8 = 180 mm

1 = Roll-up grille
3 = Linear grille

Grille design
(see adjacent figure)

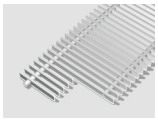
Length key
11 = NP 800 mm
15 = NP 1000 mm
19 = NP 1200 mm
23 = NP 1400 mm
27 = NP 1600 mm

Nozzle versions
K = version 1
L = version 2

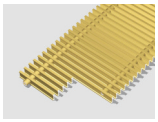
1 = designed for low Vpr *
2 = designed for medium Vpr *
3 = designed for high Vpr *
4 = designed for very high Vpr *

Grille finishes

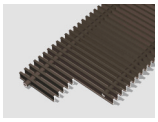
11 = Aluminium, natural anodised



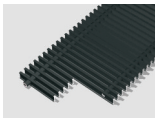
12 = Aluminium, brass anodised



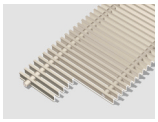
13 = Aluminium, bronze anodised



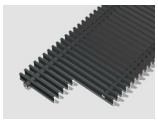
14 = Aluminium, black anodised



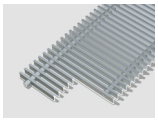
15 = Aluminium, bronze finish



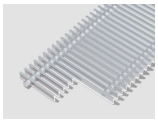
16 = Aluminium, painted DB 703



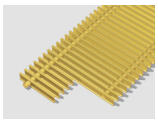
31 = Stainless steel



32 = Stainless steel **polished**

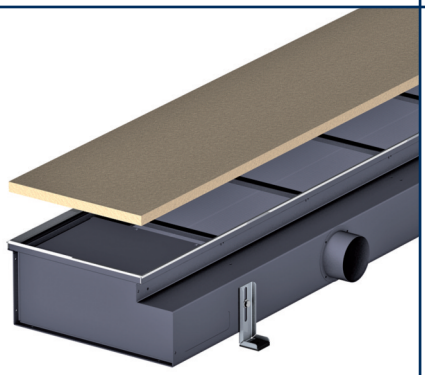
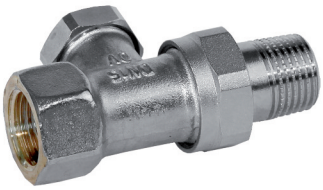


33 = Brass, natural CuZn 44



Other grille finishes (colours) on request
The above grilles are shown using a four-colour printing process and thus do not represent an exact reproduction of the original colour.

* = Primary air volume

	**Thermoelectric actuator 230 V, art. no. 194000146905** actuator to fit valve bodies art. no 194000146909, art. no. 194000346909, Power consumption approx. 5 W Connecting cable length approx. 1900 mm Overall height 69 mm Diameter 42 mm Connecting thread 30 x 1.5 mm
	**Installation cover 194000100986** if required, all Katherm ID units can be supplied with the grilles separately packed to prevent soiling or damage on site prior to fitting. The floor duct is supplied with a disposable wooden installation cover. Width: 340 mm
	**1/2” valve body, art. no. 194000146909, straight** **1/2” valve body, art. no. 194000346909, straight, presettable** Low noise design, optimum flow with stainless steel spindle and double O-ring seal; to fit Katherm ID with actuator art. no. 194000146906 Max operating temperature 120 °C Maximum operating pressure 10 bar
	**1/2" return shut-off valve** **art. no. 194000145952, straight** brass valve, nickel-plated housing, with O-ring seal Max operating temperature 120 °C Maximum operating pressure 10 bar
	**Presetting key, art. no. 194000346915** for valve body art. no. 194000146909 and art. no. 194000346909, presettable

Katherm ID – Heating or cooling with induction

Sound levels • Heat output conversion

Sound levels

When designing the system, note that the sound pressure or sound power level changes according to the primary air flows. The respective sound pressure and sound power levels can be found in the heat output and cooling output tables (Tables 1-10). As the sound level is not only affected by the Katherm ID, but also very much by the acoustic properties of the room, the stated values can deviate in practice.

Conversion to other heating media temperatures

Where the planned heating media temperatures, primary air volumes or primary air losses are not listed, they can be looked up or converted using the charts and calculation formulae; calculation examples on pages 7-8.

Calculation of the secondary air heat output

Katherm ID heat outputs can also be calculated for other flow and return temperatures, as well as for other initial pressures or primary air volumes for all standard lengths. Several outputs are available for every primary air volume, depending on which nozzle version is selected. The different outputs of the individual nozzle versions result from the different primary air pressure losses on the units.

Diagram 1
Heat output conversion factor

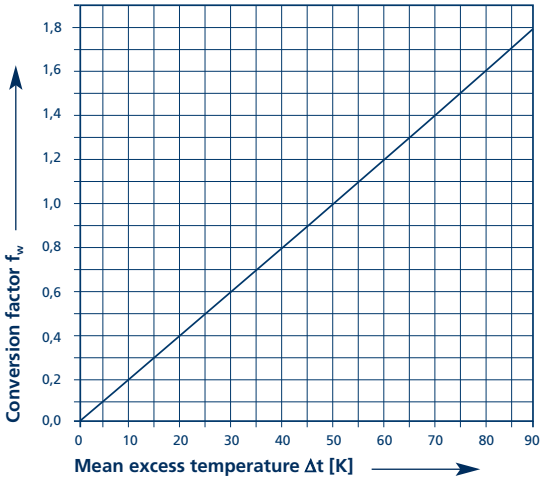
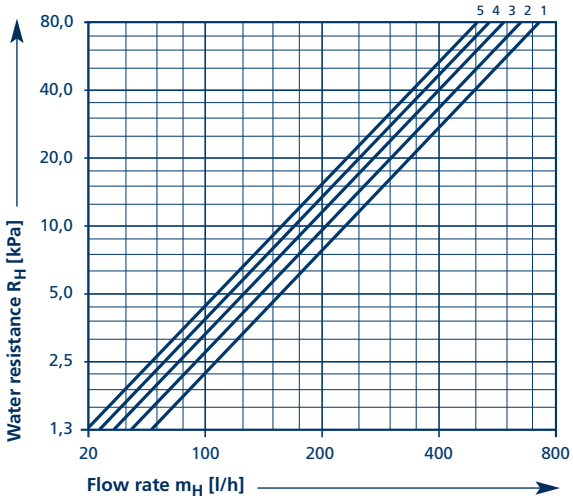


Diagram 2
Water-side pressure loss, Katherm ID, heating



Water-side pressure loss, heating					
Duct length [mm]	800	1000	1200	1400	1600
Curve number	1	2	3	4	5

Calculation formulae for heating

1)	Δt_H	=	$\frac{t_{W1} + t_{W2}}{2} - t_L$
2)	Q_{HS}	=	$f_{WH} \cdot Q_{HNS}$
3)	Δt_{WH}	=	$t_{W1} - t_{W2}$
4)	m_H	=	$\frac{Q_{HS}}{\Delta t_{WH}} \cdot 0{,}86$
5)	Δt_{PrL}	=	$t_{Pr} - t_L$
6)	Q_{Pr}	=	$V_{Pr} \cdot \Delta t_{PrL} \cdot 0{,}336$
7)	Q_H	=	$Q_{Pr} + Q_{HS}$

Symbols

t_{W1}	[°C]	=	Flow temperature
t_{W2}	[°C]	=	Return temperature
t_L	[°C]	=	Room air temperature
Δt_H	[K]	=	Mean excess temperature, heating
Q_{HS}	[W]	=	Secondary heat output
Q_H	[W]	=	Total heat output
Q_{HNS}	[W]	=	QHNS Secondary air nominal output at LPHW 75/65 °C, t_L = 20 °C
f_{WH}	[-]	=	Heat output conversion factor
Δt_{WH}	[K]	=	Water temperature difference
m_H	[l/h]	=	Flow rate
Q_{Pr}	[W]	=	Primary air output
t_{Pr}	[°C]	=	Primary air temperature
V_{Pr}	[m³/h]	=	Primary air volume
Δt_{PrL}	[K]	=	Temperature difference between primary and room air temperature
ΔP_{Pr}	[Pa]	=	Primary air pressure loss
R_H	[kPa]	=	Water-side pressure loss, heating

Calculation example, heating

Given

-Floor duct length: 1200 mm
-Flow temperature (t_{w1}): 65 °C
-Return temperature (t_{w2}): 50 °C
-Room air temperature (t_L): 19 °C
-Required
- Primary air volume (V_{Pr}): 57 m³/h
- Primary air temperature (t_{Pr}): 22 °C

Required

-Heat output Q_{HS} in W
-Water flow rate m_H in l/h
-Water-side pressure loss R_H in Pa
-Primary air output Q_{Pr} in W
-Primary air pressure loss ΔP_{Pr} in the unit in Pa
-Total output

Calculation

1) $\Delta t_H = \frac{t_{W1} + t_{W2}}{2} - t_L = \frac{65 + 50}{2} - 19 =$ **38,5** K

From the Heat output conversion factor f_{WH} diagram, read off on page 6: at Δt = 38,5 K: f_w = 0,76.

Take nominal heat output Q_{HNS} from the heat output tables (Tables 1-10).
With other primary air volumes, the nominal heat output Q_{HNS} (heat output at LPHW 75°/ 65°/ 20°) can also be taken from the diagrams: "Standard heat output at LPHW 75°/65°/20° (corresponding length)" (diagrams: 5, 8, 11, 14, 17).
As the stated V_{Pr} of 57 m³/h is not shown in the heat output tables, Q_{HNS} has to be taken from diagram 11 on page 18.

Nozzle K2: V_{Pr} = 57 m³/h; Q_{HNS} ≈ 2166 W
Nozzle K3: V_{Pr} = 57 m³/h; Q_{HNS} ≈ 1887 W
Nozzle K4: V_{Pr} = 57 m³/h; Q_{HNS} ≈ 1620 W

2) $Q_{HS} = Q_{HNS} \cdot f_{WH}$
Nozzle K2: Q_{HS} = 2166 W · 0,76 ≈ 1646 W
Nozzle K3: Q_{HS} = 1887 W · 0,76 ≈ 1434 W
Nozzle K4: Q_{HS} = 1620 W · 0,76 ≈ 1231 W

Katherm ID – Heating or cooling with induction

Heat output conversion

Calculation of flow rate and water-side pressure loss

3) $\Delta t_{WH} = t_{W1} - t_{W2} = 65 - 50 = \mathbf{15\ K}$

4) $m_H = \frac{Q_{HS}}{\Delta t_{WH}} \cdot 0{,}86$

Nozzle K2: $m_H = \frac{1646}{15} \cdot 0{,}86 = 94$ l/h

Nozzle K3: $m_H = \frac{1434}{15} \cdot 0{,}86 = 82$ l/h

Nozzle K4: $m_H = \frac{1231}{15} \cdot 0{,}86 = 71$ l/h

Take the pressure loss from Diagram 2, "Water-side pressure loss of Katherm ID, heating" on page 6.
Nozzle K2: R≈ 3,0 kPa
Nozzle K3: R≈ 2,5 kPa
Nozzle K4: R≈ 2,0 kPa

Calculation of the primary air volume
The primary air supplied by the central ventilation unit can also have a heat or cooling output.
This primary air output depends on the primary air volume, the primary air temperature and the room temperature.

Calculation example:
V_{Pr} = 57 m³/h; t_{Pr} = 22 °C; t_L = 19 °C

5) $\Delta t_{PrL} = 22 - 19 = \mathbf{3\ K}$
6) $\Delta t_{PrL} = 57 \cdot 3 \cdot 0{,}336 = \mathbf{57}$ W*

* (negative result = cooling output, positive result = heat output)

In this case the primary air has a heat output of 57 watts!
The **total output** results from adding the primary air output and the secondary air output!
In this case:

7) $Q_H = Q_{Pr} + Q_{HS}$
Nozzle K2: Q_H = 57 W + 1646 W = 1703 W
Nozzle K3: Q_H = 57 W + 1434 W = 1491 W
Nozzle K4: Q_H = 57 W + 1231 W = 1288 W

The associated primary air pressure losses can be read from diagrams 7, 10, 13, 16, 19: "Primary air pressure loss (corresponding length)". In this case from diagram 13 on page 19.
At 57 m³ /h primary air volume:
Nozzle K2: 188 Pa
Nozzle K3: 98 Pa
Nozzle K4: 54 Pa

Results:

For nozzle K2:

Secondary air output Q_{HS} :	1646 W
Flow rate m_H :	94 l/h
Water-side pressure loss R_H :	3,0 kPa
Primary air output Q_{Pr} :	57 W
Primary air pressure loss ΔP_{Pr} in the unit :	188 Pa
Total output :	1703 W

For nozzle K3:

Secondary air output Q_{HS} :	1434 W
Flow rate m_H :	82 l/h
Water-side pressure loss R_H :	2,5 kPa
Primary air output Q_{Pr} :	57 W
Primary air pressure loss ΔP_{Pr} in the unit :	98 Pa
Total output :	1491 W

For nozzle K4:

Secondary air output Q_{HS} :	1231 W
Flow rate m_H :	71 l/h
Water-side pressure loss R_H :	2,0 kPa
Primary air output Q_{Pr} :	57 W
Primary air pressure loss ΔP_{Pr} in the unit :	54 Pa
Total output :	1288 W

Sound levels

When designing the system, note that the sound pressure or sound power level changes according to the primary air flows. The respective sound pressure and sound power levels can be found in the heat output and cooling output tables (Tables 1-10). As the sound level is not only affected by the Katherm ID, but also very much by the acoustic properties of the room, the stated values can deviate in practice.

Conversion to other cooling media temperatures

Where the planned cooling media temperatures, primary air volumes or primary air pressure losses are not listed, these can be looked up or converted using the charts and calculation formulae; calculation examples on pages 10-11.

Calculation of the secondary cooling output

Katherm ID cooling outputs can also be calculated for other flow and return temperatures, as well as for other primary air pressure losses or primary air volumes for all standard lengths.

Several outputs are available for every primary air volume, depending on which nozzle version is selected. The different outputs of the individual nozzle versions result from the different primary air pressure losses on the units.

Diagram 3
Cooling output conversion factor

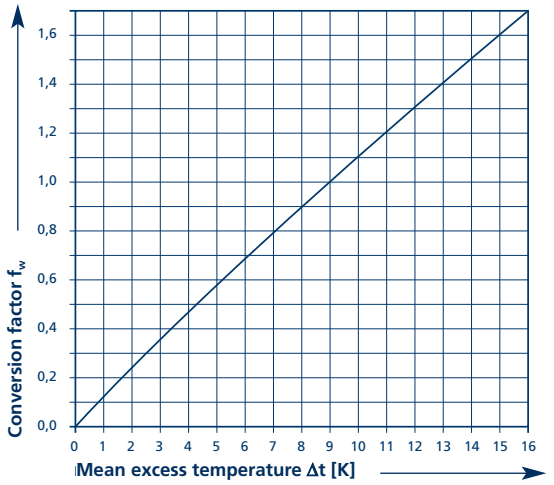
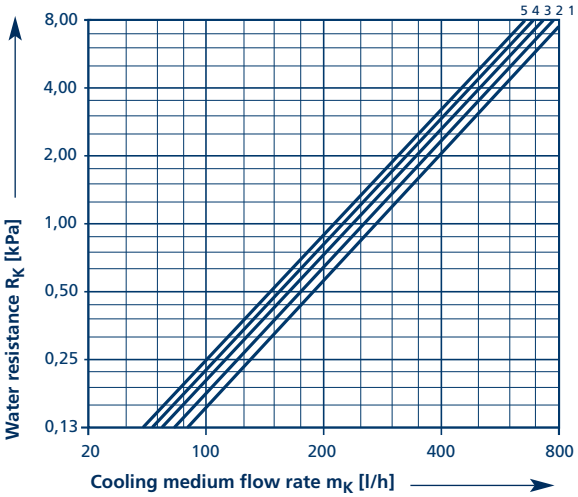


Diagram. 4
Water-side pressure loss, Katherm ID, cooling



Water-side pressure loss, cooling					
Duct length [mm]	800	1000	1200	1400	1600
Curve number	1	2	3	4	5

Katherm ID – Heating or cooling with induction

Cooling output conversion

Cooling calculation formulae

1)	Δt_V	=	$t_L - \frac{t_{W1} + t_{W2}}{2}$
2)	Q_{KS}	=	$f_{WK} \cdot Q_{KNS}$
3)	Δt_{WK}	=	$t_{W2} - t_{W1}$
4)	m_K	=	$\frac{Q_{KS}}{\Delta t_{WK}} \cdot 0{,}86$
5)	Δt_{PrL}	=	$t_{Pr} - t_L$
6)	Q_{Pr}	=	$V_{Pr} \cdot \Delta t_{PrL} \cdot 0{,}336$
7)	Q_K	=	$Q_{Pr} + Q_{KS}$

Symbols

t_{W1}	[°C]	=	Flow temperature
t_{W2}	[°C]	=	Return temperature
t_L	[°C]	=	Room air temperature
Δt_U	[K]	=	Mean excess temperature, cooling
Q_{KS}	[W]	=	Secondary cooling output
Q_K	[W]	=	Total cooling output
Q_{KNS}	[W]	=	Secondary air standard output at LPCW 16/18 °C, t_L = 26 °C
f_{WK}	[-]	=	Conversion factor for cooling output
Δt_{WK}	[K]	=	Cooling medium temperature difference
m_K	[l/h]	=	Cooling medium flow rate
Q_{Pr}	[W]	=	Primary air output
t_{Pr}	[°C]	=	Primary air temperature
V_{Pr}	[m³/h]	=	Primary air volume
Δt_{PrL}	[K]	=	Temperature difference between primary and room air temperature
ΔP_{Pr}	[Pa]	=	Primary air pressure loss
R_K	[kPa]	=	Water-side pressure loss, cooling

Calculation example, cooling

Given

- Floor duct length: 1400 mm
- Flow temperature (t_{W1}): 17 °C
- Return temperature (t_{W2}): 19 °C
- Room air temperature (t_L): 28 °C
- required
- Primary air volume (V_{Pr}): 73 m³/h
- Primary air temperature (t_{Pr}): 18 °C

Required

-Cooling output Q_{KS} in W
-Cooling flow rate m_K in l/h
-Water-side pressure loss R_H in Pa
-Primary air output Q_{Pr} in W
-Primary air pressure loss ΔP_{Pr} in the unit in Pa
-Total output

Calculation

1) $\Delta t_U = t_L - \frac{(t_{W2} + t_{W1})}{2} = 28 - \frac{(17+19)}{2} =$ **10** K

Read from diagram Cooling output conversion factor f_{WK} on page 10: at Δt = 10 K: f_W = 1,1.

Nominal heat output Q_{KNS} from the cooling output tables (Tables 1-10).
With other primary air volumes, the nominal cooling output Q_{KNS} (cooling output at 16°/18°/26°) can also be obtained from diagrams: "Standard cooling output at 16°/18°/26° (corresponding length)" (diagrams: 6, 9, 12, 15 and 18).
As the stated V_{Pr} of 73 m³ /h is not shown on the cooling output tables, Q_{KNS} has to be read from diagram 15 on page 22.

Nozzle K2: V_{Pr} = 73 m³/h; Q_{KNS} ≈ 481 W
Nozzle K3: V_{Pr} = 73 m³/h; Q_{KNS} ≈ 374 W
Nozzle K4: V_{Pr} = 73 m³/h; Q_{KNS} ≈ 283 W

2) $Q_{KS} = Q_{KNS} \cdot f_{WK}$
Nozzle K2: Q_{KS} = 481 W · 1,1 ≈ 529 W
Nozzle K3: Q_{KS} = 374 W · 1,1 ≈ 411 W
Nozzle K4: Q_{KS} = 283 W · 1,1 ≈ 311 W

Calculation of water flow rate and water-side pressure loss

3) $\Delta t_{WK} = t_{W2} - t_{W1} = 19 - 17 = \mathbf{2\ K}$

4) $m_H = \frac{Q_{KS}}{\Delta t_{WK}} \cdot 0{,}86$

Nozzle K2: $m_K = \frac{529}{2} \cdot 0{,}86 = 227$ l/h

Nozzle K3: $m_K = \frac{411}{2} \cdot 0{,}86 = 177$ l/h

Nozzle K4: $m_K = \frac{311}{2} \cdot 0{,}86 = 134$ l/h

Read pressure loss from Diagram 4, "Water-side pressure loss Katherm ID, cooling".
Nozzle K2: R ≈ 1,0 kPa
Nozzle K3: R ≈ 0,65 kPa
Nozzle K4: R ≈ 0,4 kPa

Calculation of the primary air output!
The primary air supplied by the central ventilation unit can also have a heat or cooling output.
This primary air output is dependent on the primary air volume, the primary air temperature and the room temperature.

Calculation example:
V_{Pr} = 73 m³/h; t_{Pr} = 18 °C; t_L = 28 °C

5) $\Delta t_{PrL} = 18 - 28 = \mathbf{-10\ K}$
6) $Q_{Pr} = 73 \cdot (-10) \cdot 0{,}336 = \mathbf{-245\ W}$*

* (negative result = cooling output, positive result = heat output)

In this case the primary air has a cooling output of 245 W!

The **total output** results from adding the primary air output and the secondary air output!
In this case:

7) $Q_K = Q_{Pr} + Q_{KS}$
Nozzle K2: Q_K = 245 W + 529 W = 774 W
Nozzle K3: Q_K = 245 W + 411 W = 656 W
Nozzle K4: Q_K = 245 W + 311 W = 556 W

The associated primary air pressure losses can be taken from diagrams 7, 10, 13, 16, 19: "Primary air pressure loss (corresponding length)". In this case from diagram 16 on page 22.
At 73 m³ /h primary air volume:
Nozzle K2: 203 Pa
Nozzle K3: 106 Pa
Nozzle K4: 56 Pa

Results:

For nozzle K2:

Secondary air output Q_{KS} :	529 W
Heating medium flow rate m_K :	228 l/h
Water-side pressure loss R_K :	1,00 kPa
Primary air output Q_{Pr} :	245 W
Primary air pressure loss ΔP_{Pr} in the unit :	203 Pa
Total output :	774 W

For nozzle K3:

Secondary air output Q_{KS} :	411 W
Heating medium flow rate m_K :	177 l/h
Water-side pressure loss R_K :	0,65 kPa
Primary air output Q_{Pr} :	245 W
Primary air pressure loss ΔP_{Pr} in the unit :	106 Pa
Total output :	656 W

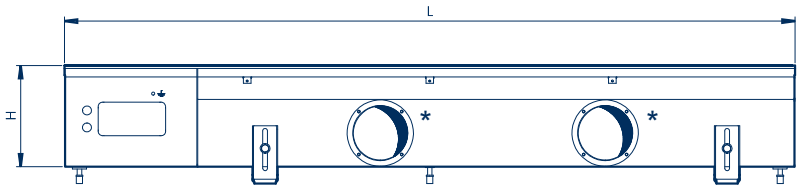
For nozzle K4:

Secondary air output Q_{KS} :	311 W
Heating medium flow rate m_K :	122 l/h
Water-side pressure loss R_K :	0,4 kPa
Primary air output Q_{Pr} :	245 W
Primary air pressure loss ΔP_{Pr} in the unit :	59 Pa
Total output: :	556 W

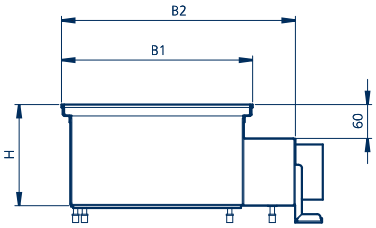
Katherm ID – Heating or cooling with induction

Katherm ID - Dimensions

Dimensions

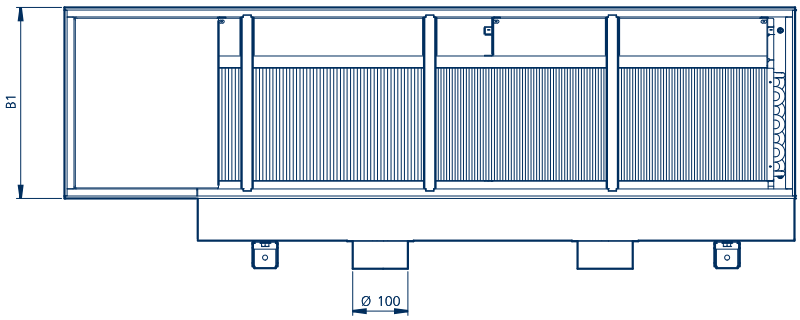


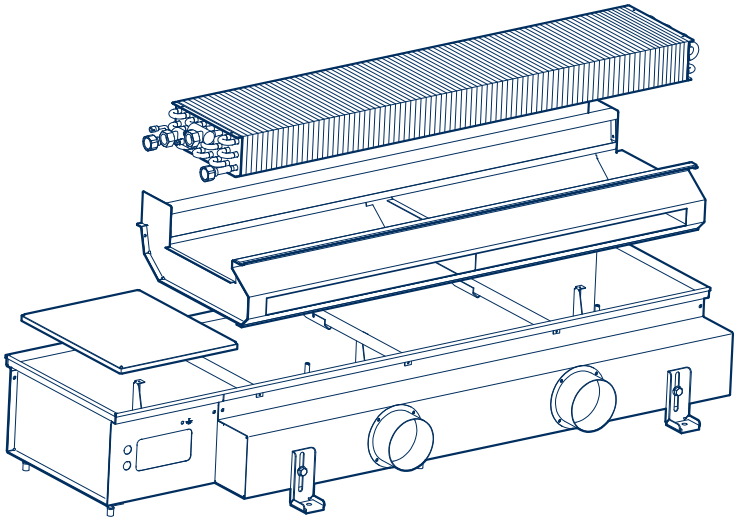
* 2 supply air spigots on request, otherwise 1 supply air spigot



Minimum installed height	184 mm
Maximum installed height	217 mm

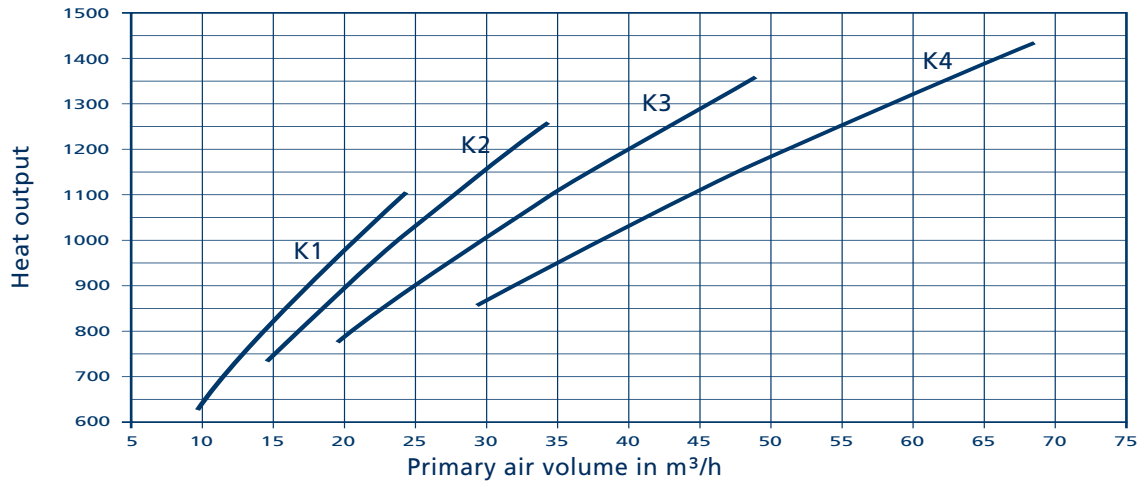
(Higher installed height on request)



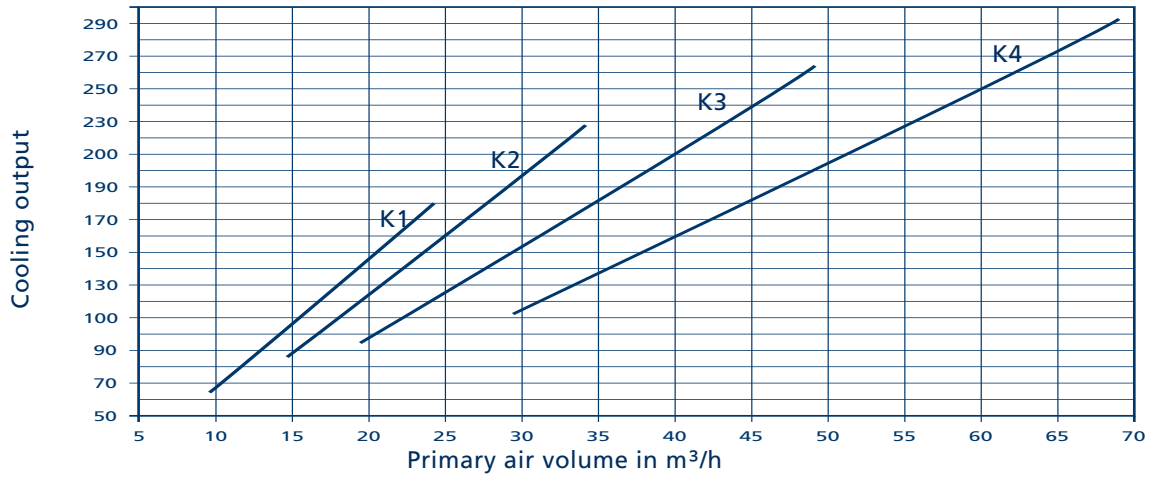


Description	Dimensions
H	180 mm
L	800 mm
	1000 mm
	1200 mm
	1400 mm
	1600 mm
B1	340 mm
B2	465 mm

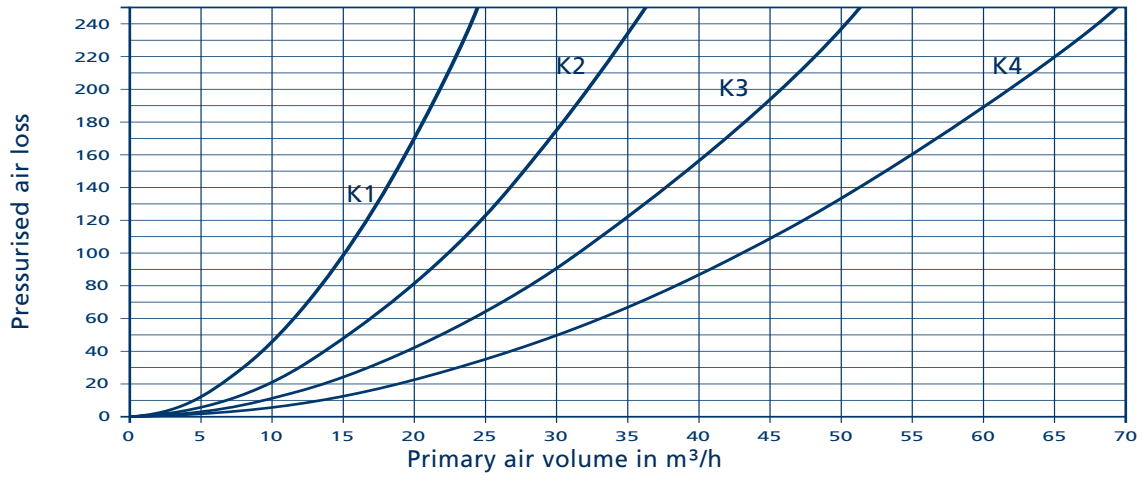
Standard heat output at LPHW 75°/65°/20° floor duct length 800 mm — Diagram 5



Standard cooling output at CHW 16°/18°/26°, floor duct heater length 800 mm — Diagram 6



Primary air pressure loss for floor duct length 800 mm — Diagram 7



Katherm ID – Heating or cooling with induction

Katherm ID 800 — Technical Data

Heat outputs for Katherm ID, duct length 800 mm — Table 1

		Nozzle K1												Nozzle K2					
Primary air volume		13 m³/h			20 m³/h			25 m³/h			15 m³/h			25 m³/h			35 m³/h		
Pre-pressure		75 Pa			170 Pa			260 Pa			48 Pa			125 Pa			234 Pa		
Sound power level [1]		< 28 dB(A) [4]			< 28 dB(A) [4]			31 dB(A)			< 28 dB(A) [4]			< 28 dB(A) [4]			32 dB(A)		
Sound pressure level [1] [3]		< 20 dB(A) [4]			< 20 dB(A) [4]			23 dB(A)			< 20 dB(A) [4]			< 20 dB(A) [4]			24 dB(A)		
Heating medium		Heat outputs																	
PWW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]
75/65	15	824	22	846	1077	34	1111	1235	42	1277	818	25	843	1137	42	1179	1405	59	1464
	18	778	9	786	1016	13	1030	1165	17	1182	771	10	781	1073	17	1089	1325	23	1349
	20	**747**	**0**	**747**	**975**	**0**	**975**	**1119**	**0**	**1119**	**741**	**0**	**741**	**1030**	**0**	**1030**	**1272**	**0**	**1272**
	22	716	-9	707	935	-13	922	1073	-17	1056	710	-10	700	987	-17	970	1220	-23	1196
70/55	15	708	22	730	925	34	959	1061	42	1103	702	25	727	976	42	1018	1207	59	1265
	18	662	9	670	864	13	878	991	17	1008	656	10	666	913	17	929	1128	23	1151
	20	631	0	631	824	0	824	945	0	945	626	0	626	870	0	870	1075	0	1075
	22	600	-9	591	784	-13	770	899	-17	882	595	-10	585	828	-17	811	1022	-23	999
55/45	15	516	22	537	674	34	707	773	42	815	511	25	537	711	42	753	879	59	937
	18	470	9	479	614	13	627	704	17	721	466	10	476	648	17	665	801	23	824
	20	439	0	439	574	0	574	658	0	658	436	0	436	606	0	606	749	0	749
	22	409	-9	400	534	-13	521	613	-17	596	406	-10	396	564	-17	547	697	-23	673
45/40	15	401	22	423	524	34	558	602	42	643	398	25	423	554	42	596	684	59	743
	18	356	9	365	465	13	479	534	17	550	353	10	363	491	17	508	607	23	630
	20	326	0	326	426	0	426	488	0	488	323	0	323	450	0	450	555	0	555
	22	296	-9	287	387	-13	373	443	-17	427	293	-10	283	408	-17	391	504	-23	481
35/30	15	251	22	273	328	34	362	376	42	418	249	25	274	346	42	388	428	59	487
	18	207	9	215	270	13	283	309	17	326	205	10	215	285	17	302	352	23	375
	20	177	0	177	231	0	231	265	0	265	176	0	176	244	0	244	302	0	302
	22	148	-9	139	193	-13	180	221	-17	205	147	-10	136	204	-17	187	252	-23	228
		Nozzle K3									Nozzle K4								
Primary air volume		25 m³/h			35 m³/h			45 m³/h			30 m³/h			45 m³/h			60 m³/h		
Pre-pressure		65 Pa			122 Pa			195 Pa			51 Pa			110 Pa			190 Pa		
Sound power level [1]		< 28 dB(A) [4]			28 dB(A)			36 dB(A)			< 28 dB(A) [4]			34 dB(A)			42 dB(A)		
Sound pressure level [1] [3]		< 20 dB(A) [4]			20 dB(A)			28 dB(A)			< 20 dB(A) [4]			26 dB(A)			34 dB(A)		
Heating medium		Heat outputs																	
PWW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]
75/65	15	994	42	1036	1222	59	1281	1424	76	1500	954	50	1004	1225	76	1301	1461	101	1562
	18	938	17	954	1153	23	1176	1344	30	1374	900	20	920	1156	30	1186	1378	40	1419
	20	**900**	**0**	**900**	**1107**	**0**	**1107**	**1290**	**0**	**1290**	**864**	**0**	**864**	**1110**	**0**	**1110**	**1323**	**0**	**1323**
	22	863	-17	846	1061	-23	1037	1237	-30	1206	828	-20	808	1064	-30	1033	1268	-40	1228
70/55	15	854	42	896	1049	59	1108	1223	76	1299	819	50	870	1052	76	1128	1255	101	1355
	18	798	17	814	981	23	1004	1143	30	1173	766	20	786	983	30	1013	1172	40	1213
	20	760	0	760	935	0	935	1090	0	1090	730	0	730	937	0	937	1118	0	1118
	22	723	-17	707	889	-23	866	1037	-30	1006	694	-20	674	892	-30	861	1063	-40	1023
55/45	15	622	42	664	764	59	823	891	76	966	597	50	647	766	76	842	914	101	1014
	18	566	17	583	696	23	720	812	30	842	544	20	564	698	30	728	833	40	873
	20	530	0	530	651	0	651	759	0	759	508	0	508	653	0	653	779	0	779
	22	493	-17	476	606	-23	583	707	-30	676	473	-20	453	608	-30	578	725	-40	684
45/40	15	484	42	526	595	59	654	694	76	769	465	50	515	597	76	672	711	101	812
	18	429	17	446	528	23	551	615	30	645	412	20	432	529	30	559	631	40	671
	20	393	0	393	483	0	483	563	0	563	377	0	377	484	0	484	578	0	578
	22	357	-17	340	439	-23	415	511	-30	481	342	-20	322	440	-30	410	524	-40	484
35/30	15	303	42	345	372	59	431	434	76	509	291	50	341	373	76	449	445	101	546
	18	249	17	266	306	23	330	357	30	387	239	20	259	307	30	337	366	40	406
	20	213	0	213	262	0	262	306	0	306	205	0	205	263	0	263	314	0	314
	22	178	-17	161	219	-23	195	255	-30	225	171	-20	151	220	-30	189	262	-40	222

Primary air temperature when heating at 20°C!

[1] measured with one primary air spigot

[3] The sound pressure levels were calculated with an assumed room insulation of 8 dB(A). This corresponds to a distance of 2 m, a room volume of 100 m³ and a reverberation time of 0.5 s (in accordance with VDI 2081)

[4] Sound pressure level < 20 dB (A) and sound power level < 28 dB (A) outside the usual measuring and audible range.

KAMPMANN
Genau mein Klima.

Cooling outputs for Katherm ID, duct length 800 mm																					Table 2
		Nozzle K1									Nozzle K2										
Primary air volume		13 m³/h			20 m³/h			25 m³/h			15 m³/h			25 m³/h			35 m³/h			
Pre-pressure		75 Pa			170 Pa			260 Pa			48 Pa			125 Pa			234 Pa			
Sound power level [1]		< 28 dB(A) [4]			< 28 dB(A) [4]			31 dB(A)			< 28 dB(A) [4]			< 28 dB(A) [4]			32 dB(A)			
Sound pressure level [1] [3]		< 20 dB(A) [4]			< 20 dB(A) [4]			23 dB(A)			< 20 dB(A) [4]			< 20 dB(A) [4]			24 dB(A)			
Cooling medium		Cooling outputs																			
PKW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]		
15/17	30	134	52	186	217	81	298	279	101	380	132	60	192	240	101	341	353	141	494		
	28	116	44	160	189	67	256	242	84	326	114	50	165	208	84	292	306	117	423		
	26	98	35	133	159	54	213	205	67	272	97	40	137	176	67	243	258	94	352		
	24	80	26	106	130	40	170	166	50	217	79	30	109	143	50	193	210	70	281		
16/18	30	125	52	177	203	81	284	261	101	361	123	60	183	224	101	325	329	141	470		
	28	107	44	151	174	67	241	223	84	307	105	50	156	192	84	276	282	117	400		
	26	**89**	**35**	**124**	**145**	**54**	**198**	**186**	**67**	**253**	**88**	**40**	**128**	**160**	**67**	**227**	**234**	**94**	**328**		
	24	70	26	97	115	40	155	147	50	197	69	30	100	127	50	177	186	70	256		
16/19	30	120	52	173	196	81	276	251	101	352	119	60	179	216	101	317	318	141	459		
	28	102	44	146	167	67	234	214	84	298	101	50	151	184	84	268	270	117	388		
	26	84	35	119	137	54	191	176	67	243	83	40	123	151	67	218	222	94	316		
	24	66	26	92	107	40	147	137	50	188	65	30	95	118	50	169	174	70	244		
		Nozzle K3									Nozzle K4										
Primary air volume		25 m³/h			35 m³/h			45 m³/h			30 m³/h			45 m³/h			60 m³/h			
Pre-pressure		65 Pa			122 Pa			195 Pa			51 Pa			110 Pa			190 Pa			
Sound power level [1]		< 28 dB(A) [4]			28 dB(A)			36 dB(A)			< 28 dB(A) [4]			34 dB(A)			42 dB(A)			
Sound pressure level [1] [3]		< 20 dB(A) [4]			20 dB(A)			28 dB(A)			< 20 dB(A) [4]			26 dB(A)			34 dB(A)			
Cooling medium		Cooling outputs																			
PKW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]		
15/17	30	188	101	289	274	141	414	362	181	543	174	121	295	275	181	456	379	242	620		
	28	163	84	247	237	117	355	314	151	465	151	101	252	238	151	389	328	201	530		
	26	138	67	205	200	94	294	265	121	386	128	81	208	201	121	322	277	161	439		
	24	112	50	162	163	70	234	216	91	306	104	60	164	164	91	255	226	121	347		
16/18	30	175	101	276	255	141	396	338	181	519	163	121	284	257	181	438	354	242	595		
	28	150	84	234	219	117	336	289	151	440	140	101	240	220	151	371	303	201	504		
	26	**125**	**67**	**192**	**182**	**94**	**276**	**240**	**121**	**361**	**116**	**81**	**196**	**183**	**121**	**304**	**252**	**161**	**413**		
	24	99	50	149	144	70	215	191	91	281	92	60	152	145	91	236	200	121	320		
16/19	30	169	101	270	246	141	387	326	181	507	157	121	278	248	181	429	341	242	583		
	28	144	84	228	210	117	327	277	151	428	134	101	234	211	151	362	290	201	492		
	26	119	67	186	173	94	267	228	121	349	110	81	191	173	121	294	239	161	400		
	24	93	50	143	135	70	205	178	91	269	86	60	146	135	91	226	186	121	307		

Primary air temperature when cooling at 18°C!

[1] measured with one primary air spigot

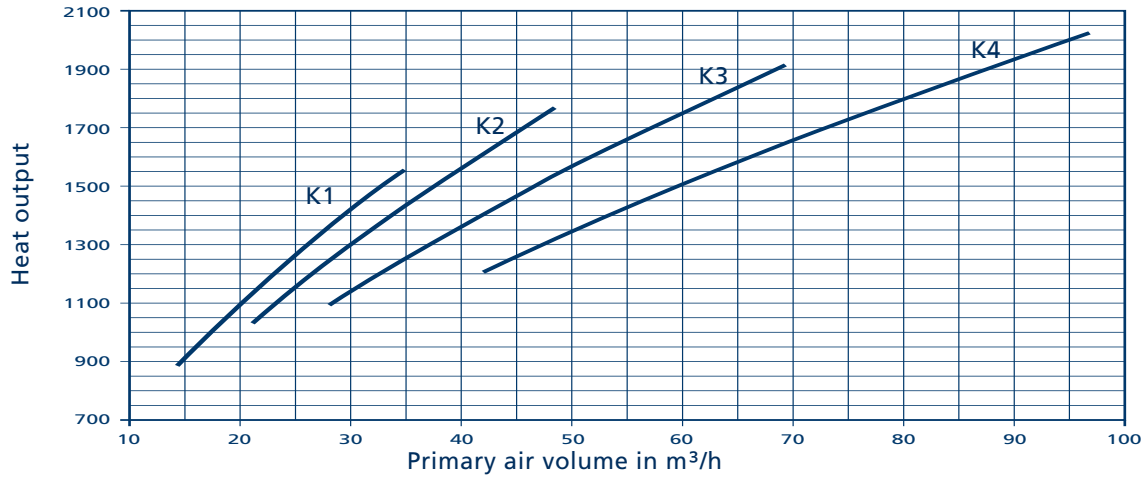
[3] The sound pressure levels were calculated with an assumed room insulation of 8 dB(A). This corresponds to a distance of 2 m, a room volume of 100 m³ and a reverberation time of 0.5 s (in accordance with VDI 2081)

[4] Sound pressure level < 20 dB (A) and sound power level < 28 dB (A) outside the usual measuring and audible range.

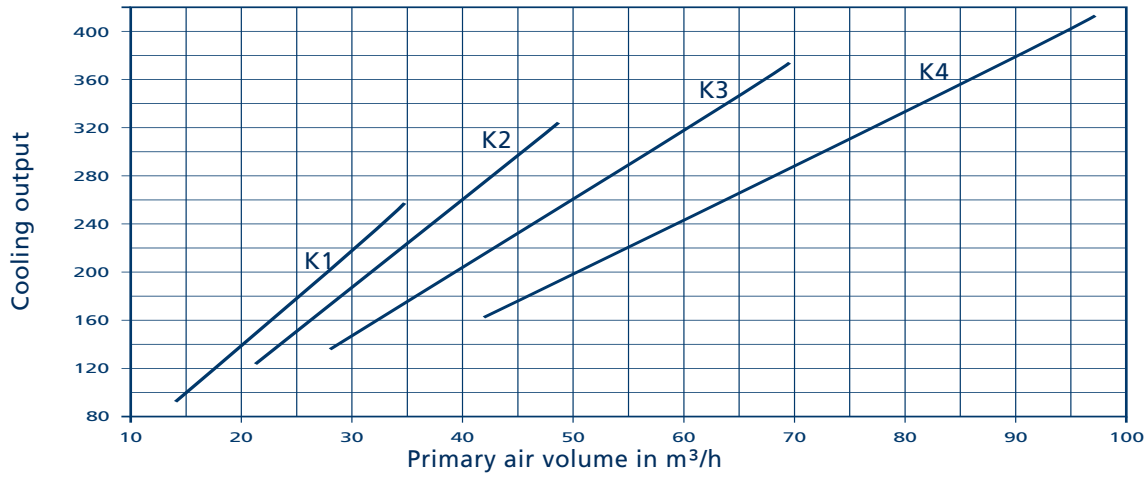
Katherm ID – Heating or cooling with induction

Katherm ID 1000 — Technical Data

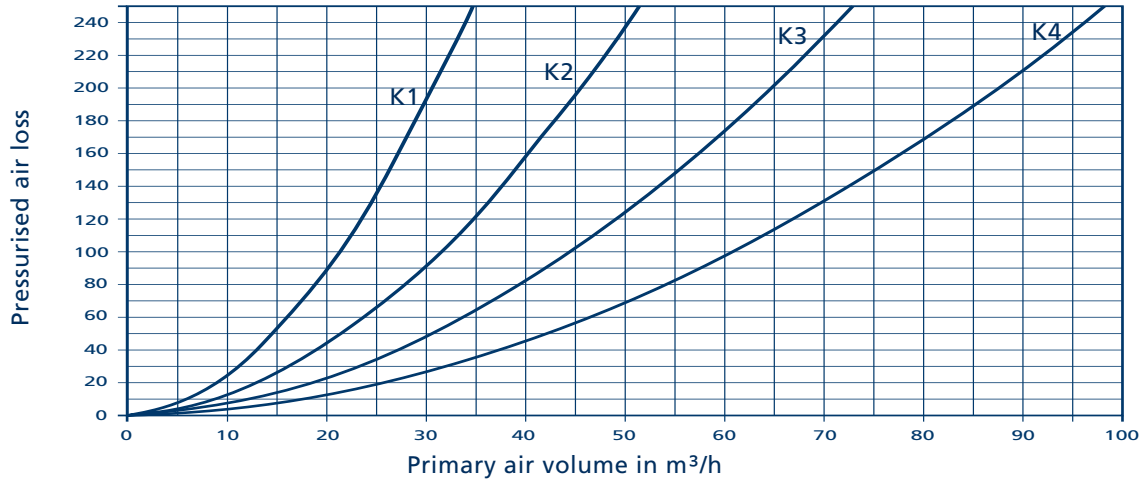
Standard heat output at LPHW 75°/65°/20° floor duct length 1000 mm — Diagram 8



Standard cooling output at CHW 16°/18°/26°, floor duct heater length 1000 mm — Diagram 9



Primary air pressure loss for floor duct length 1000 mm — Diagram 10



Heat outputs for Katherm ID, duct length 1000 mm — Table 3

	Nozzle K1									Nozzle K2								
Primary air volume	**20 m³/h**			**25 m³/h**			**30 m³/h**			**25 m³/h**			**35 m³/h**			**45 m³/h**		
Pre-pressure	**88 Pa**			**134 Pa**			**190 Pa**			**65 Pa**			**122 Pa**			**195 Pa**		
Sound power level [1]	< 28 dB(A) [4]			< 28 dB(A) [4]			29 dB(A)			< 28 dB(A) [4]			< 28 dB(A) [4]			31 dB(A)		
Sound pressure level [1] [3]	< 20 dB(A) [4]			< 20 dB(A) [4]			21 dB(A)			< 20 dB(A) [4]			< 20 dB(A) [4]			23 dB(A)		
Heating medium	**Heat outputs**																	
PWW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]
75/65	15	1230	34	1263	1412	42	1454	1580	50	1631	1288	42	1330	1599	59	1657	1873	76	1949
	18	1160	13	1173	1332	17	1349	1491	20	1511	1215	17	1232	1508	23	1532	1767	30	1797
	20	**1114**	**0**	**1114**	**1279**	**0**	**1279**	**1431**	**0**	**1431**	**1167**	**0**	**1167**	**1448**	**0**	**1448**	**1697**	**0**	**1697**
	22	1067	-13	1054	1226	-17	1209	1372	-20	1352	1118	-17	1102	1388	-23	1365	1626	-30	1596
70/55	15	1056	34	1090	1213	42	1255	1357	50	1408	1106	42	1148	1373	59	1432	1609	76	1684
	18	987	13	1000	1133	17	1150	1268	20	1289	1034	17	1051	1283	23	1307	1503	30	1534
	20	941	0	941	1081	0	1081	1209	0	1209	986	0	986	1223	0	1223	1433	0	1433
	22	895	-13	881	1028	-17	1011	1150	-20	1130	938	-17	921	1164	-23	1140	1363	-30	1333
55/45	15	769	34	803	883	42	925	989	50	1039	806	42	848	1000	59	1059	1172	76	1247
	18	701	13	714	805	17	822	901	20	921	734	17	751	911	23	935	1068	30	1098
	20	655	0	655	753	0	753	842	0	842	687	0	687	852	0	852	998	0	998
	22	610	-13	597	701	-17	684	784	-20	764	639	-17	622	793	-23	770	929	-30	899
45/40	15	599	34	632	688	42	730	770	50	820	627	42	669	778	59	837	912	76	988
	18	531	13	544	610	17	627	683	20	703	556	17	573	690	23	714	809	30	839
	20	486	0	486	558	0	558	625	0	625	509	0	509	632	0	632	741	0	741
	22	441	-13	428	507	-17	490	567	-20	547	462	-17	446	574	-23	550	672	-30	642
35/30	15	374	34	408	430	42	472	481	50	532	392	42	434	487	59	546	570	76	646
	18	308	13	321	354	17	371	396	20	416	323	17	340	401	23	424	469	30	500
	20	264	0	264	303	0	303	339	0	339	277	0	277	343	0	343	402	0	402
	22	220	-13	207	253	-17	236	283	-20	263	231	-17	214	286	-23	263	336	-30	305

	Nozzle K3									Nozzle K4								
Primary air volume	**30 m³/h**			**45 m³/h**			**60 m³/h**			**45 m³/h**			**65 m³/h**			**85 m³/h**		
Pre-pressure	**48 Pa**			**102 Pa**			**174 Pa**			**56 Pa**			**114 Pa**			**190 Pa**		
Sound power level [1]	< 28 dB(A) [4]			29 dB(A)			38 dB(A)			< 28 dB(A) [4]			38 dB(A)			46 dB(A)		
Sound pressure level [1] [3]	< 20 dB(A) [4]			21 dB(A)			30 dB(A)			< 20 dB(A) [4]			30 dB(A)			38 dB(A)		
Heating medium	**Heat outputs**																	
PWW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]
75/65	15	1271	50	1321	1631	76	1707	1945	101	2045	1400	76	1476	1756	109	1866	2070	143	2212
	18	1199	20	1219	1539	30	1569	1835	40	1875	1321	30	1351	1657	44	1701	1953	57	2010
	20	**1151**	**0**	**1151**	**1477**	**0**	**1477**	**1761**	**0**	**1761**	**1268**	**0**	**1268**	**1591**	**0**	**1591**	**1874**	**0**	**1874**
	22	1103	-20	1083	1416	-30	1386	1688	-40	1648	1216	-30	1185	1525	-44	1481	1797	-57	1740
70/55	15	1091	50	1142	1401	76	1476	1670	101	1771	1203	76	1278	1508	109	1618	1777	143	1920
	18	1020	20	1040	1309	30	1339	1561	40	1601	1124	30	1154	1410	44	1453	1661	57	1718
	20	972	0	972	1248	0	1248	1488	0	1488	1071	0	1071	1344	0	1344	1584	0	1584
	22	925	-20	905	1187	-30	1157	1415	-40	1375	1019	-30	989	1278	-44	1235	1506	-57	1449
55/45	15	795	50	845	1020	76	1096	1216	101	1317	876	76	951	1099	109	1208	1294	143	1437
	18	724	20	744	930	30	960	1108	40	1149	798	30	828	1001	44	1045	1179	57	1237
	20	677	0	677	869	0	869	1036	0	1036	746	0	746	936	0	936	1103	0	1103
	22	630	-20	610	809	-30	779	965	-40	925	695	-30	664	871	-44	828	1027	-57	970
45/40	15	619	50	669	794	76	870	947	101	1048	682	76	757	855	109	964	1008	143	1150
	18	549	20	569	705	30	735	840	40	880	605	30	635	759	44	802	894	57	951
	20	502	0	502	645	0	645	769	0	769	554	0	554	694	0	694	818	0	818
	22	456	-20	436	586	-30	555	698	-40	658	503	-30	472	630	-44	587	743	-57	686
35/30	15	387	50	437	497	76	572	592	101	693	426	76	502	535	109	644	630	143	773
	18	318	20	339	409	30	439	487	40	528	351	30	381	440	44	484	519	57	576
	20	273	0	273	350	0	350	418	0	418	301	0	301	377	0	377	444	0	444
	22	228	-20	208	292	-30	262	348	-40	308	251	-30	221	315	-44	271	371	-57	314

Primary air temperature when heating at 20°C!

[1] measured with one primary air spigot

[3] The sound pressure levels were calculated with an assumed room insulation of 8 dB(A). This corresponds to a distance of 2 m, a room volume of 100 m³ and a reverberation time of 0.5 s (in accordance with VDI 2081)

[4] Sound pressure level < 20 dB (A) and sound power level < 28 dB (A) outside the usual measuring and audible range.

KAMPMANN
Genau mein Klima.

Katherm ID – Heating or cooling with induction

Katherm ID 1000 — Technical Data

Cooling outputs for Katherm ID, duct length 1000 mm — Table 4

Primary air volume		Nozzle K1									Nozzle K2								
		20 m³/h			25 m³/h			30 m³/h			25 m³/h			35 m³/h			45 m³/h		
Pre-pressure		88 Pa			134 Pa			190 Pa			65 Pa			122 Pa			195 Pa		
Sound power level [1]		< 28 dB(A) [4]			< 28 dB(A) [4]			29 dB(A)			< 28 dB(A) [4]			< 28 dB(A) [4]			31 dB(A)		
Sound pressure level [1] [3]		< 20 dB(A) [4]			< 20 dB(A) [4]			21 dB(A)			< 20 dB(A) [4]			< 20 dB(A) [4]			23 dB(A)		
Cooling medium		Cooling outputs																	
PKW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]
15/17	30	208	81	289	268	101	368	328	121	449	226	101	327	335	141	476	447	181	629
	28	180	67	248	232	84	316	285	101	385	196	84	280	291	117	408	388	151	539
	26	152	54	206	196	67	263	241	81	321	166	67	233	246	94	340	328	121	449
	24	124	40	164	160	50	210	196	60	256	135	50	185	200	70	271	267	91	357
16/18	30	194	81	275	250	101	351	307	121	427	211	101	312	313	141	454	418	181	599
	28	166	67	234	214	84	298	263	101	364	181	84	265	268	117	386	358	151	509
	26	**138**	**54**	**192**	**178**	**67**	**245**	**218**	**81**	**299**	**151**	**67**	**218**	**223**	**94**	**317**	**297**	**121**	**418**
	24	110	40	150	141	50	191	173	60	234	119	50	170	177	70	247	236	91	327
16/19	30	187	81	268	241	101	342	296	121	417	204	101	305	302	141	443	403	181	584
	28	159	67	227	205	84	289	252	101	352	174	84	257	257	117	375	343	151	494
	26	131	54	185	169	67	236	207	81	288	143	67	210	212	94	306	282	121	403
	24	102	40	143	132	50	182	162	60	222	111	50	162	165	70	236	220	91	311

Primary air volume		Nozzle K3									Nozzle K4								
		30 m³/h			45 m³/h			60 m³/h			45 m³/h			65 m³/h			85 m³/h		
Pre-pressure		48 Pa			102 Pa			174 Pa			56 Pa			114 Pa			190 Pa		
Sound power level [1]		< 28 dB(A) [4]			29 dB(A)			38 dB(A)			< 28 dB(A) [4]			38 dB(A)			46 dB(A)		
Sound pressure level [1] [3]		< 20 dB(A) [4]			21 dB(A)			30 dB(A)			< 20 dB(A) [4]			30 dB(A)			38 dB(A)		
Cooling medium		Cooling outputs																	
PKW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]
15/17	30	221	121	342	348	181	529	479	242	721	263	181	445	398	262	660	536	342	879
	28	192	101	292	302	151	453	415	201	617	228	151	380	345	218	563	465	285	750
	26	162	81	242	255	121	376	351	161	512	193	121	314	292	175	466	393	228	621
	24	132	60	192	207	91	298	286	121	407	157	91	248	237	131	368	320	171	491
16/18	30	206	121	327	325	181	506	447	242	689	246	181	427	372	262	633	501	342	843
	28	177	101	277	278	151	429	383	201	585	211	151	362	318	218	537	429	285	715
	26	**147**	**81**	**227**	**231**	**121**	**352**	**318**	**161**	**480**	**175**	**121**	**296**	**265**	**175**	**439**	**357**	**228**	**585**
	24	116	60	177	183	91	274	253	121	373	139	91	230	210	131	341	283	171	454
16/19	30	199	121	320	313	181	495	431	242	673	237	181	419	358	262	620	483	342	825
	28	169	101	270	267	151	418	367	201	569	202	151	353	305	218	523	411	285	697
	26	139	81	220	219	121	340	302	161	463	166	121	287	251	175	426	338	228	567
	24	109	60	169	171	91	262	236	121	357	130	91	220	196	131	327	264	171	435

Primary air temperature when cooling at 18°C!

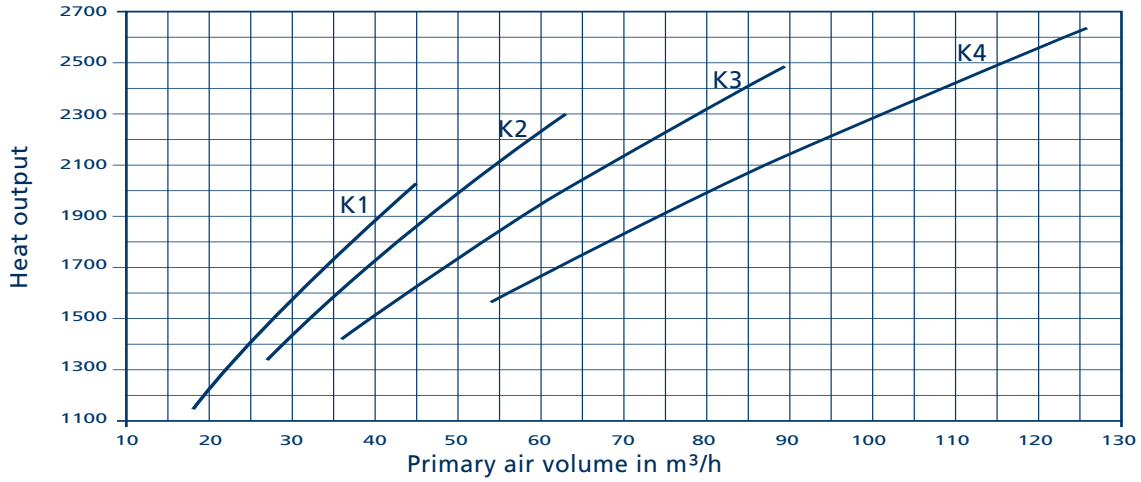
[1] measured with one primary air spigot

[3] The sound pressure levels were calculated with an assumed room insulation of 8 dB(A). This corresponds to a distance of 2 m, a room volume of 100 m³ and a reverberation time of 0.5 s (in accordance with VDI 2081)

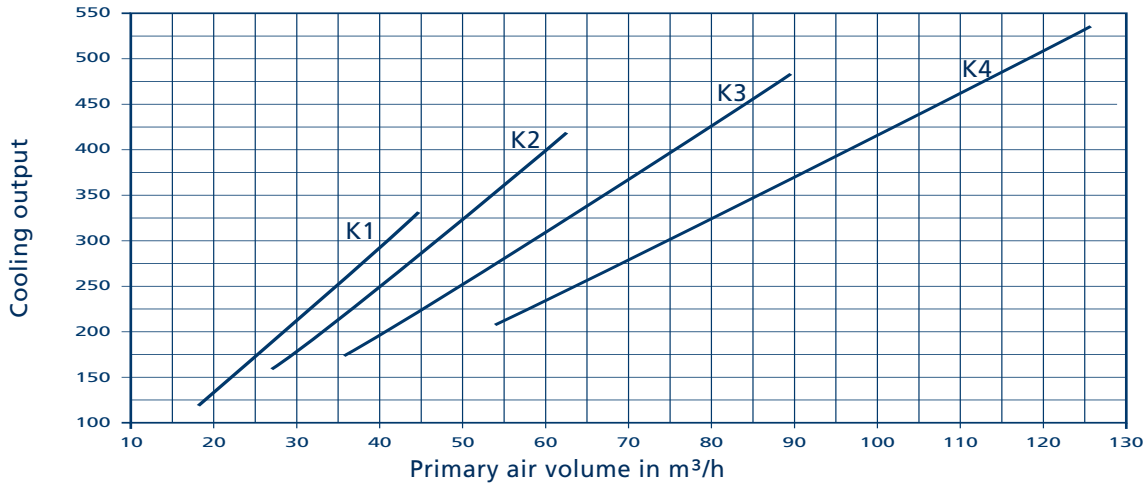
[4] Sound pressure level < 20 dB (A) and sound power level < 28 dB (A) outside the usual measuring and audible range.

KAMPMANN
Genau mein Klima.

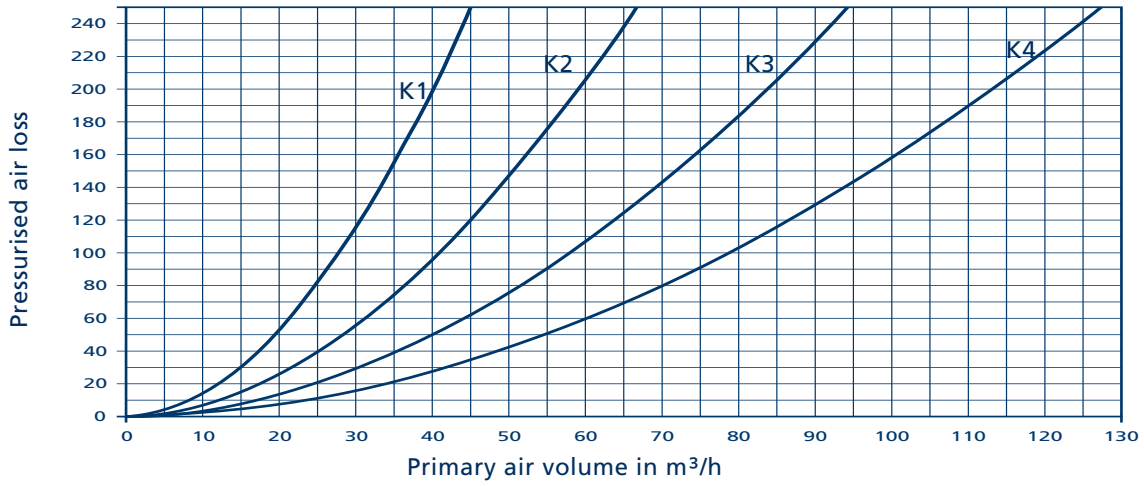
Standard heat output at LPHW 75°/65°/20° floor duct length 1200 mm — Diagram 11



Standard cooling output at CHW 16°/18°/26°, floor duct heater length 1200 mm — Diagram 12



Primary air pressure loss for floor duct length 1200 mm — Diagram 13



Katherm ID – Heating or cooling with induction

Katherm ID 1200 — Technischen Daten

Heat outputs for Katherm ID, duct length 1200 mm — Table 5

		Nozzle K1									Nozzle K2								
Primary air volume		20 m³/h			30 m³/h			40 m³/h			35 m³/h			45 m³/h			55 m³/h		
Pre-pressure		54 Pa			116 Pa			201 Pa			75 Pa			121 Pa			176 Pa		
Sound power level [1]		< 28 dB(A) [4]			< 28 dB(A) [4]			33 dB(A)			< 28 dB(A) [4]			< 28 dB(A) [4]			34 dB(A)		
Sound power level [2]		< 28 dB(A) [4]			< 28 dB(A) [4]			31 dB(A)			< 28 dB(A) [4]			< 28 dB(A) [4]			30 dB(A)		
Sound pressure level [1] [3]		< 20 dB(A) [4]			< 20 dB(A) [4]			25 dB(A)			< 20 dB(A) [4]			< 20 dB(A) [4]			26 dB(A)		
Sound pressure level [2] [3]		< 20 dB(A) [4]			< 20 dB(A) [4]			23 dB(A)			< 20 dB(A) [4]			< 20 dB(A) [4]			22 dB(A)		
Heating medium		Heat outputs																	
PWW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]
75/65	15	1354	34	1387	1744	50	1795	2083	67	2150	1754	59	1813	2060	76	2136	2339	92	2431
	18	1277	13	1290	1646	20	1666	1965	27	1992	1655	23	1679	1944	30	1974	2206	37	2243
	20	**1226**	**0**	**1226**	**1580**	**0**	**1580**	**1887**	**0**	**1887**	**1589**	**0**	**1589**	**1866**	**0**	**1866**	**2118**	**0**	**2118**
	22	1175	-13	1162	1514	-20	1494	1809	-27	1782	1523	-23	1500	1789	-30	1759	2030	-37	1994
70/55	15	1162	34	1196	1498	50	1548	1789	67	1856	1507	59	1565	1770	76	1845	2009	92	2101
	18	1086	13	1100	1400	20	1420	1672	27	1699	1408	23	1431	1654	30	1684	1877	37	1914
	20	1036	0	1036	1335	0	1335	1594	0	1594	1342	0	1342	1577	0	1577	1789	0	1789
	22	985	-13	972	1269	-20	1249	1516	-27	1489	1277	-23	1253	1500	-30	1469	1702	-37	1665
55/45	15	847	34	880	1091	50	1141	1303	67	1370	1097	59	1156	1289	76	1364	1463	92	1555
	18	771	13	785	994	20	1014	1187	27	1214	1000	23	1023	1174	30	1204	1333	37	1370
	20	721	0	721	930	0	930	1110	0	1110	935	0	935	1098	0	1098	1246	0	1246
	22	672	-13	658	865	-20	845	1034	-27	1007	870	-23	847	1022	-30	992	1160	-37	1123
45/40	15	659	34	693	849	50	900	1014	67	1081	854	59	913	1003	76	1079	1139	92	1231
	18	585	13	598	753	20	773	900	27	927	758	23	781	890	30	920	1010	37	1047
	20	535	0	535	690	0	690	824	0	824	694	0	694	815	0	815	925	0	925
	22	486	-13	472	626	-20	606	748	-27	721	630	-23	606	740	-30	709	839	-37	803
35/30	15	412	34	446	531	50	582	634	67	702	534	59	593	628	76	703	712	92	805
	18	339	13	353	437	20	457	522	27	549	440	23	463	516	30	546	586	37	623
	20	291	0	291	375	0	375	447	0	447	377	0	377	442	0	442	502	0	502
	22	243	-13	229	313	-20	292	373	-27	346	314	-23	291	369	-30	339	419	-37	382

		Nozzle K3									Nozzle K4								
Primary air volume		50 m³/h			65 m³/h			80 m³/h			65 m³/h			85 m³/h			105 m³/h		
Pre-pressure		76 Pa			125 Pa			184 Pa			70 Pa			116 Pa			174 Pa		
Sound power level [1]		29 dB(A)			38 dB(A)			44 dB(A)			35 dB(A)			43 dB(A)			49 dB(A)		
Sound power level [2]		< 28 dB(A) [4]			31 dB(A)			37 dB(A)			31 dB(A)			38 dB(A)			44 dB(A)		
Sound pressure level [1] [3]		21 dB(A)			30 dB(A)			36 dB(A)			27 dB(A)			35 dB(A)			41 dB(A)		
Sound pressure level [2] [3]		< 20 dB(A) [4]			23 dB(A)			29 dB(A)			23 dB(A)			30 dB(A)			36 dB(A)		
Heating medium		Heat outputs																	
PWW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]
75/65	15	1922	84	2006	2258	109	2367	2563	134	2697	1940	109	2049	2288	143	2430	2603	176	2780
	18	1814	34	1847	2130	44	2174	2418	54	2472	1830	44	1873	2158	57	2215	2456	70	2527
	20	**1741**	**0**	**1741**	**2045**	**0**	**2045**	**2321**	**0**	**2321**	**1757**	**0**	**1757**	**2072**	**0**	**2072**	**2358**	**0**	**2358**
	22	1669	-34	1635	1960	-44	1917	2225	-54	2171	1684	-44	1640	1986	-57	1929	2260	-70	2190
70/55	15	1651	84	1735	1939	109	2048	2201	134	2335	1666	109	1775	1965	143	2107	2236	176	2412
	18	1543	34	1576	1812	44	1856	2057	54	2111	1557	44	1600	1836	57	1893	2089	70	2160
	20	1471	0	1471	1728	0	1728	1961	0	1961	1484	0	1484	1750	0	1750	1992	0	1992
	22	1399	-34	1366	1643	-44	1600	1865	-54	1812	1412	-44	1368	1665	-57	1608	1895	-70	1824
55/45	15	1202	84	1286	1412	109	1521	1603	134	1737	1213	109	1322	1431	143	1573	1628	176	1805
	18	1096	34	1129	1287	44	1330	1461	54	1514	1105	44	1149	1304	57	1361	1484	70	1554
	20	1025	0	1025	1203	0	1203	1366	0	1366	1034	0	1034	1219	0	1219	1387	0	1387
	22	954	-34	920	1120	-44	1077	1272	-54	1218	962	-44	919	1135	-57	1078	1292	-70	1221
45/40	15	936	84	1020	1099	109	1209	1248	134	1382	944	109	1053	1114	143	1257	1268	176	1444
	18	830	34	864	975	44	1019	1107	54	1161	838	44	881	988	57	1045	1124	70	1195
	20	760	0	760	893	0	893	1013	0	1013	767	0	767	904	0	904	1029	0	1029
	22	690	-34	656	810	-44	767	920	-54	866	696	-44	653	821	-57	764	934	-70	864
35/30	15	585	84	669	688	109	797	781	134	915	591	109	700	697	143	839	793	176	969
	18	482	34	515	566	44	609	642	54	696	486	44	530	573	57	630	652	70	723
	20	413	0	413	485	0	485	550	0	550	417	0	417	491	0	491	559	0	559
	22	344	-34	311	405	-44	361	459	-54	406	348	-44	304	410	-57	353	467	-70	396

Primary air temperature when heating at 20°C!

[1] measured with one primary air spigot
[2] measured with two primary air spigots
[3] The sound pressure levels were calculated with an assumed room insulation of 8 dB(A). This corresponds to a distance of 2 m, a room volume of 100 m³ and a reverberation time of 0.5 s (in accordance with VDI 2081)
[4] Sound pressure level < 20 dB (A) and sound power level < 28 dB (A) outside the usual measuring and audible range.

KAMPMANN
Genau mein Klima.

Cooling outputs for Katherm ID, duct length 1200 mm — Table 6

		Nozzle K1									Nozzle K2								
Primary air volume		20 m³/h			30 m³/h			40 m³/h			35 m³/h			45 m³/h			55 m³/h		
Pre-pressure		54 Pa			116 Pa			201 Pa			75 Pa			121 Pa			176 Pa		
Sound power level [1]		< 28 dB(A) [4]			< 28 dB(A) [4]			33 dB(A)			< 28 dB(A) [4]			< 28 dB(A) [4]			34 dB(A)		
Sound power level [2]		< 28 dB(A) [4]			< 28 dB(A) [4]			31 dB(A)			< 28 dB(A) [4]			< 28 dB(A) [4]			30 dB(A)		
Sound pressure level [1] [3]		< 20 dB(A) [4]			< 20 dB(A) [4]			25 dB(A)			< 20 dB(A) [4]			< 20 dB(A) [4]			26 dB(A)		
Sound pressure level [2] [3]		< 20 dB(A) [4]			< 20 dB(A) [4]			23 dB(A)			< 20 dB(A) [4]			< 20 dB(A) [4]			22 dB(A)		
Cooling medium		Cooling outputs																	
PKW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]
15/17	30	201	81	281	318	121	439	439	161	600	321	141	462	431	181	612	542	222	764
	28	174	67	241	276	101	377	381	134	515	279	117	396	374	151	525	470	185	655
	26	147	54	201	233	81	314	322	107	429	236	94	330	316	121	437	397	148	545
	24	120	40	160	190	60	250	262	81	343	192	70	262	257	91	348	323	111	434
16/18	30	187	81	268	297	121	418	410	161	571	300	141	441	402	181	583	506	222	728
	28	160	67	228	255	101	355	352	134	486	257	117	375	345	151	496	434	185	619
	26	**133**	**54**	**187**	**211**	**81**	**292**	**292**	**107**	**400**	**214**	**94**	**308**	**286**	**121**	**407**	**361**	**148**	**508**
	24	106	40	146	168	60	228	232	81	312	169	70	240	227	91	318	286	111	397
16/19	30	181	81	261	286	121	407	396	161	557	289	141	430	388	181	569	488	222	710
	28	154	67	221	244	101	345	337	134	471	246	117	364	330	151	481	416	185	600
	26	127	54	180	201	81	281	277	107	385	203	94	297	272	121	393	342	148	490
	24	99	40	139	157	60	217	216	81	297	158	70	229	212	91	303	267	111	378

		Nozzle K3									Nozzle K4								
Primary air volume		50 m³/h			65 m³/h			80 m³/h			65 m³/h			85 m³/h			105 m³/h		
Pre-pressure		76 Pa			125 Pa			184 Pa			70 Pa			116 Pa			174 Pa		
Sound power level [1]		29 dB(A)			38 dB(A)			44 dB(A)			35 dB(A)			43 dB(A)			49 dB(A)		
Sound power level [2]		< 28 dB(A) [4]			31 dB(A)			37 dB(A)			31 dB(A)			38 dB(A)			44 dB(A)		
Sound pressure level [1] [3]		21 dB(A)			30 dB(A)			36 dB(A)			27 dB(A)			35 dB(A)			41 dB(A)		
Sound pressure level [2] [3]		< 20 dB(A) [4]			23 dB(A)			29 dB(A)			23 dB(A)			30 dB(A)			36 dB(A)		
Cooling medium		Cooling outputs																	
PKW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]
15/17	30	380	201	581	509	262	771	641	322	963	386	262	648	521	342	863	659	423	1082
	28	329	168	497	441	218	659	556	269	824	335	218	553	452	285	737	572	352	924
	26	278	134	413	373	175	547	470	215	684	283	175	457	382	228	610	483	282	765
	24	226	101	327	303	131	434	382	161	543	230	131	361	311	171	482	393	211	605
16/18	30	355	201	556	475	262	737	598	322	920	360	262	622	486	342	829	615	423	1038
	28	304	168	472	407	218	625	513	269	781	309	218	527	417	285	702	528	352	880
	26	**252**	**134**	**387**	**338**	**175**	**513**	**426**	**215**	**641**	**257**	**175**	**431**	**346**	**228**	**575**	**438**	**282**	**720**
	24	200	101	301	268	131	399	338	161	499	203	131	334	275	171	446	348	211	559
16/19	30	342	201	543	458	262	720	577	322	899	347	262	609	469	342	812	594	423	1017
	28	291	168	459	390	218	608	491	269	760	296	218	514	399	285	685	505	352	858
	26	239	134	374	321	175	495	404	215	619	243	175	418	329	228	557	416	282	698
	24	187	101	288	251	131	381	315	161	477	190	131	321	257	171	428	325	211	536

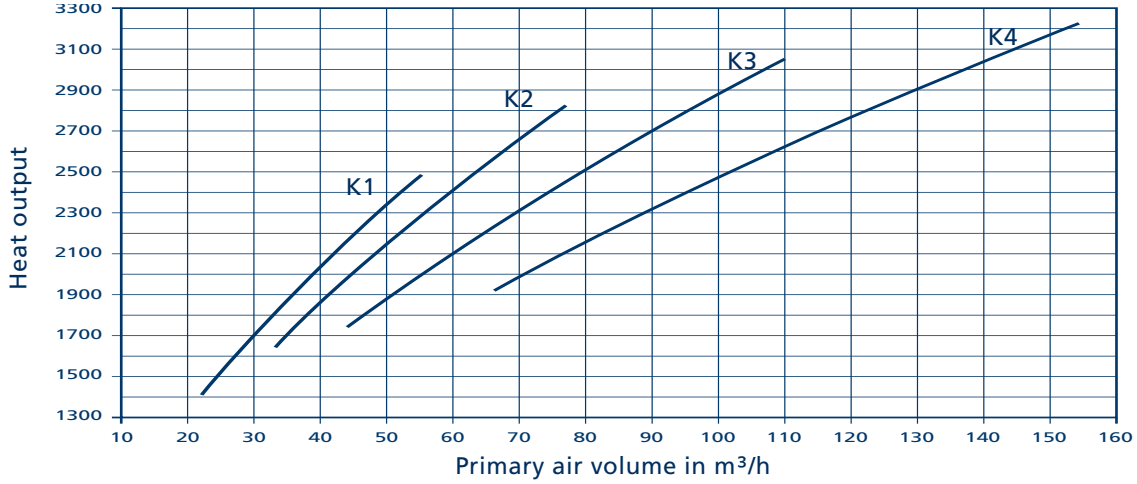
Primary air temperature when cooling at 18°C!

[1] measured with one primary air spigot
[2] measured with two primary air spigots
[3] The sound pressure levels were calculated with an assumed room insulation of 8 dB(A). This corresponds to a distance of 2 m, a room volume of 100 m³ and a reverberation time of 0.5 s (in accordance with VDI 2081)
[4] Sound pressure level < 20 dB (A) and sound power level < 28 dB (A) outside the usual measuring and audible range.

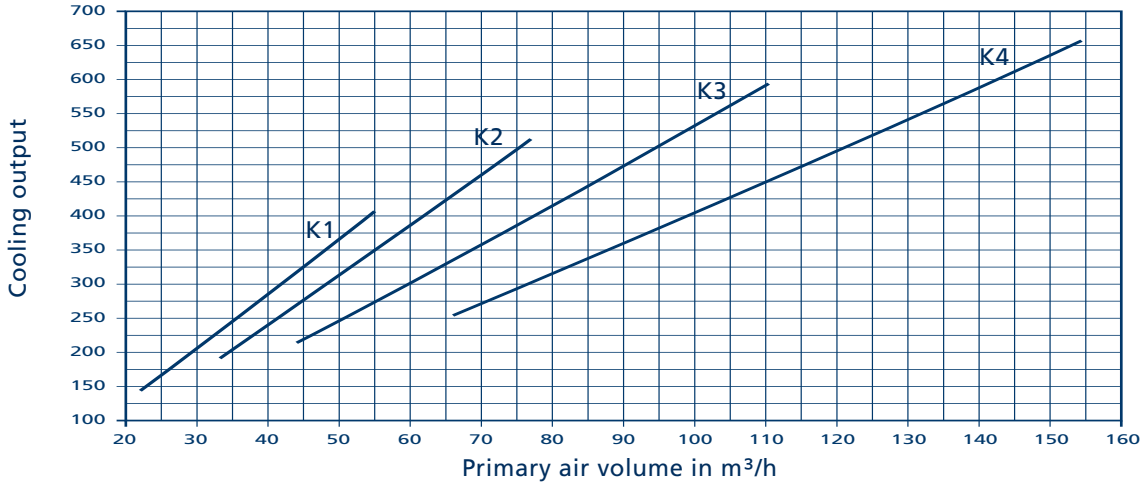
Katherm ID – Heating or cooling with induction

Katherm ID 1400 — Technical Data

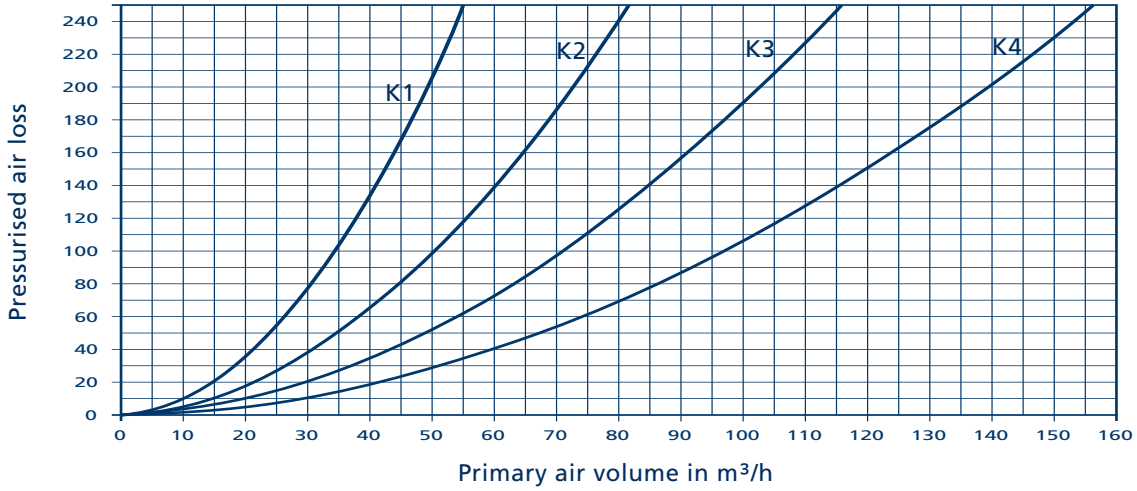
Standard heat output at LPHW 75°/65°/20° floor duct length 1400 mm Diagram 14



Standard cooling output at CHW 16°/18°/26°, floor duct heater length 1400 mm Diagram 15



Primary air pressure loss for floor duct length 1400 mm Diagram 16



Heat outputs for Katherm ID, duct length 1400 mm — Table 7

	Nozzle K1			Nozzle K2		
Primary air volume	**30 m³/h**	**40 m³/h**	**50 m³/h**	**40 m³/h**	**55 m³/h**	**70 m³/h**
Pre-pressure	**79 Pa**	**136 Pa**	**208 Pa**	**66 Pa**	**120 Pa**	**188 Pa**
Sound power level [1]	< 28 dB(A) [4]	28 dB(A)	37 dB(A)	< 28 dB(A) [4]	33 dB(A)	41 dB(A)
Sound power level [2]	< 28 dB(A) [4]	< 28 dB(A) [4]	31 dB(A)	< 28 dB(A) [4]	< 28 dB(A) [4]	33 dB(A)
Sound pressure level [1] [3]	< 20 dB(A) [4]	20 dB(A)	29 dB(A)	< 20 dB(A) [4]	25 dB(A)	33 dB(A)
Sound pressure level [2] [3]	< 20 dB(A) [4]	< 20 dB(A) [4]	23 dB(A)	< 20 dB(A) [4]	< 20 dB(A) [4]	25 dB(A)

Heating medium		**Heat outputs**																	
PWW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]
75/65	15	1884	50	1935	2253	67	2320	2586	84	2670	2056	67	2123	2522	92	2614	2937	117	3054
	18	1778	20	1798	2126	27	2153	2439	34	2473	1940	27	1966	2379	37	2416	2770	47	2817
	20	**1707**	**0**	**1707**	**2041**	**0**	**2041**	**2342**	**0**	**2342**	**1862**	**0**	**1862**	**2284**	**0**	**2284**	**2660**	**0**	**2660**
	22	1636	-20	1616	1956	-27	1929	2245	-34	2211	1785	-27	1758	2190	-37	2153	2549	-47	2502
70/55	15	1618	50	1669	1935	67	2002	2221	84	2305	1766	67	1833	2166	92	2258	2522	117	2639
	18	1512	20	1532	1808	27	1835	2075	34	2109	1650	27	1677	2024	37	2061	2357	47	2404
	20	1442	0	1442	1724	0	1724	1978	0	1978	1573	0	1573	1930	0	1930	2247	0	2247
	22	1371	-20	1351	1640	-27	1613	1882	-34	1848	1496	-27	1469	1836	-37	1799	2137	-47	2090
55/45	15	1179	50	1229	1409	67	1477	1617	84	1701	1286	67	1353	1577	92	1670	1837	117	1954
	18	1074	20	1094	1284	27	1311	1474	34	1507	1172	27	1199	1437	37	1474	1674	47	1720
	20	1004	0	1004	1201	0	1201	1378	0	1378	1096	0	1096	1344	0	1344	1565	0	1565
	22	935	-20	915	1118	-27	1091	1283	-34	1249	1020	-27	993	1251	-37	1214	1457	-47	1410
45/40	15	918	50	968	1097	67	1164	1259	84	1343	1001	67	1068	1228	92	1320	1430	117	1547
	18	814	20	834	973	27	1000	1117	34	1150	888	27	915	1089	37	1126	1268	47	1315
	20	745	0	745	891	0	891	1022	0	1022	813	0	813	997	0	997	1161	0	1161
	22	676	-20	656	809	-27	782	928	-34	894	738	-27	711	905	-37	868	1054	-47	1007
35/30	15	574	50	624	686	67	753	787	84	871	626	67	693	768	92	860	894	117	1012
	18	472	20	492	565	27	591	648	34	681	515	27	542	632	37	669	736	47	783
	20	405	0	405	484	0	484	555	0	555	442	0	442	542	0	542	631	0	631
	22	338	-20	318	404	-27	377	463	-34	430	368	-27	342	452	-37	415	526	-47	479

	Nozzle K3			Nozzle K4		
Primary air volume	**55 m³/h**	**75 m³/h**	**95 m³/h**	**80 m³/h**	**105 m³/h**	**130 m³/h**
Pre-pressure	**62 Pa**	**111 Pa**	**173 Pa**	**70 Pa**	**117 Pa**	**177 Pa**
Sound power level [1]	32 dB(A)	41 dB(A)	48 dB(A)	40 dB(A)	48 dB(A)	53 dB(A)
Sound power level [2]	< 28 dB(A) [4]	31 dB(A)	38 dB(A)	32 dB(A)	39 dB(A)	45 dB(A)
Sound pressure level [1] [3]	24 dB(A)	33 dB(A)	40 dB(A)	32 dB(A)	40 dB(A)	45 dB(A)
Sound pressure level [2] [3]	< 20 dB(A) [4]	23 dB(A)	30 dB(A)	24 dB(A)	31 dB(A)	37 dB(A)

Heating medium		**Heat outputs**																	
PWW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]
75/65	15	2206	92	2298	2668	126	2794	3083	159	3242	2385	134	2519	2819	176	2995	3212	218	3430
	18	2081	37	2118	2518	50	2568	2909	64	2972	2250	54	2303	2659	70	2730	3030	87	3118
	20	**1998**	**0**	**1998**	**2417**	**0**	**2417**	**2792**	**0**	**2792**	**2160**	**0**	**2160**	**2553**	**0**	**2553**	**2909**	**0**	**2909**
	22	1915	-37	1878	2317	-50	2266	2677	-64	2613	2070	-54	2017	2447	-70	2377	2789	-87	2702
70/55	15	1894	92	1986	2292	126	2418	2648	159	2807	2048	134	2182	2421	176	2597	2759	218	2977
	18	1770	37	1807	2142	50	2192	2474	64	2538	1914	54	1967	2262	70	2333	2578	87	2665
	20	1688	0	1688	2042	0	2042	2359	0	2359	1825	0	1825	2157	0	2157	2458	0	2458
	22	1605	-37	1568	1942	-50	1892	2244	-64	2180	1735	-54	1682	2051	-70	1981	2338	-87	2251
55/45	15	1379	92	1472	1669	126	1795	1928	159	2088	1491	134	1626	1763	176	1939	2009	218	2227
	18	1257	37	1294	1521	50	1571	1757	64	1821	1359	54	1413	1606	70	1677	1831	87	1918
	20	1175	0	1175	1422	0	1422	1643	0	1643	1271	0	1271	1502	0	1502	1712	0	1712
	22	1094	-37	1057	1324	-50	1274	1530	-64	1466	1183	-54	1129	1398	-70	1328	1594	-87	1506
45/40	15	1074	92	1166	1299	126	1425	1501	159	1661	1161	134	1295	1373	176	1549	1564	218	1782
	18	953	37	989	1152	50	1203	1331	64	1395	1030	54	1084	1217	70	1288	1387	87	1475
	20	872	0	872	1055	0	1055	1219	0	1219	943	0	943	1114	0	1114	1270	0	1270
	22	792	-37	755	958	-50	907	1107	-64	1043	856	-54	802	1012	-70	941	1153	-87	1066
35/30	15	672	92	764	813	126	939	939	159	1098	726	134	860	858	176	1035	978	218	1196
	18	553	37	589	669	50	719	772	64	836	597	54	651	706	70	777	805	87	892
	20	474	0	474	573	0	573	662	0	662	512	0	512	605	0	605	690	0	690
	22	395	-37	358	478	-50	428	552	-64	489	427	-54	374	505	-70	435	576	-87	488

Primary air temperature when heating at 20°C!

[1] measured with one primary air spigot
[2] measured with two primary air spigots
[3] The sound pressure levels were calculated with an assumed room insulation of 8 dB(A). This corresponds to a distance of 2 m, a room volume of 100 m³ and a reverberation time of 0.5 s (in accordance with VDI 2081)
[4] Sound pressure level < 20 dB (A) and sound power level < 28 dB (A) outside the usual measuring and audible range.

KAMPMANN
Genau mein Klima.

Katherm ID – Heating or cooling with induction

Katherm ID 1400 — Technical Data

Cooling outputs for Katherm ID, duct length 1400 mm — **Table 8**

	Nozzle K1			Nozzle K2		
Primary air volume	**30 m³/h**	**40 m³/h**	**50 m³/h**	**40 m³/h**	**55 m³/h**	**70 m³/h**
Pre-pressure	**79 Pa**	**136 Pa**	**208 Pa**	**66 Pa**	**120 Pa**	**188 Pa**
Sound power level [1]	< 28 dB(A) [4]	28 dB(A)	37 dB(A)	< 28 dB(A) [4]	33 dB(A)	41 dB(A)
Sound power level [2]	< 28 dB(A) [4]	< 28 dB(A) [4]	31 dB(A)	< 28 dB(A) [4]	< 28 dB(A) [4]	33 dB(A)
Sound pressure level [1] [3]	< 20 dB(A) [4]	20 dB(A)	29 dB(A)	< 20 dB(A) [4]	25 dB(A)	33 dB(A)
Sound pressure level [2] [3]	< 20 dB(A) [4]	< 20 dB(A) [4]	23 dB(A)	< 20 dB(A) [4]	< 20 dB(A) [4]	25 dB(A)
Cooling medium	**Cooling outputs**					

PKW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]
15/17	30	310	121	430	429	161	590	550	201	752	363	161	524	526	222	748	694	282	976
	28	268	101	369	372	134	506	477	168	645	315	134	449	456	185	641	602	235	837
	26	227	81	307	314	107	422	403	134	538	266	107	373	386	148	533	509	188	696
	24	185	60	245	256	81	336	328	101	429	216	81	297	314	111	425	414	141	555
16/18	30	289	121	410	400	161	561	514	201	715	339	161	500	491	222	713	648	282	930
	28	248	101	348	343	134	477	441	168	608	290	134	425	421	185	606	555	235	790
	26	**206**	**81**	**286**	**285**	**107**	**392**	**366**	**134**	**500**	**241**	**107**	**349**	**350**	**148**	**497**	**461**	**188**	**649**
	24	163	60	224	226	81	307	290	101	391	191	81	272	277	111	388	366	141	507
16/19	30	279	121	400	386	161	547	496	201	697	327	161	488	474	222	695	625	282	907
	28	237	101	338	329	134	463	422	168	590	278	134	412	403	185	588	532	235	767
	26	195	81	276	270	107	378	347	134	481	229	107	336	332	148	480	438	188	626
	24	152	60	213	211	81	292	271	101	372	179	81	259	259	111	370	342	141	483

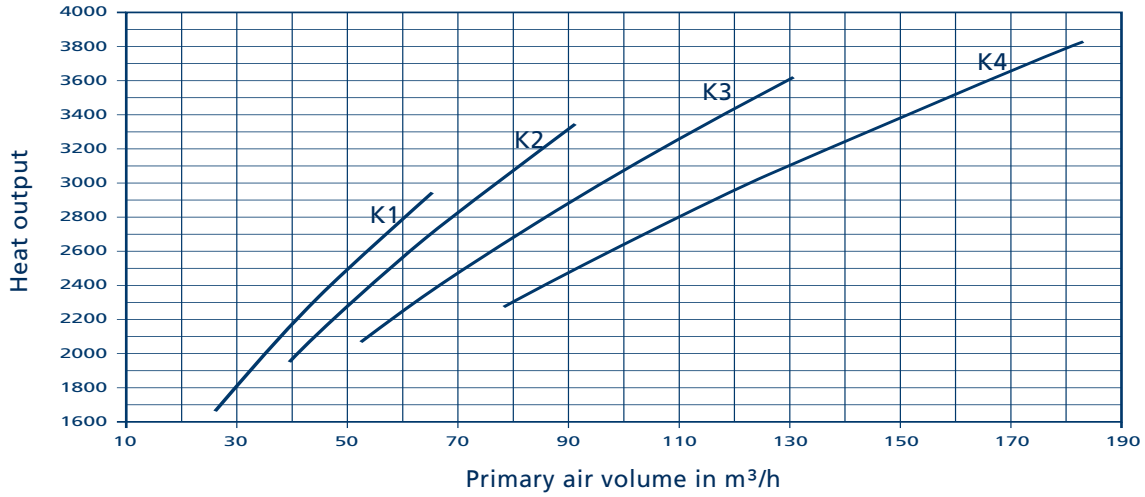
	Nozzle K3			Nozzle K4		
Primary air volume	**55 m³/h**	**75 m³/h**	**95 m³/h**	**80 m³/h**	**105 m³/h**	**130 m³/h**
Pre-pressure	**62 Pa**	**111 Pa**	**173 Pa**	**70 Pa**	**117 Pa**	**177 Pa**
Sound power level [1]	32 dB(A)	41 dB(A)	48 dB(A)	40 dB(A)	48 dB(A)	53 dB(A)
Sound power level [2]	< 28 dB(A) [4]	31 dB(A)	38 dB(A)	32 dB(A)	39 dB(A)	45 dB(A)
Sound pressure level [1] [3]	24 dB(A)	33 dB(A)	40 dB(A)	32 dB(A)	40 dB(A)	45 dB(A)
Sound pressure level [2] [3]	< 20 dB(A) [4]	23 dB(A)	30 dB(A)	24 dB(A)	31 dB(A)	37 dB(A)
Cooling medium	**Cooling outputs**					

PKW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]
15/17	30	412	222	634	583	302	885	758	383	1141	475	322	797	644	423	1067	817	524	1340
	28	357	185	542	506	252	757	657	319	976	412	269	681	559	352	911	708	436	1145
	26	302	148	450	427	201	629	556	255	811	348	215	563	472	282	754	599	349	948
	24	246	111	357	348	151	499	452	191	643	283	161	444	384	211	596	487	262	749
16/18	30	385	222	606	544	302	846	708	383	1091	444	322	766	601	423	1024	763	524	1286
	28	330	185	514	467	252	718	607	319	926	380	269	649	515	352	868	654	436	1090
	26	**274**	**148**	**422**	**388**	**201**	**589**	**504**	**255**	**759**	**316**	**215**	**531**	**428**	**282**	**710**	**543**	**349**	**892**
	24	217	111	328	307	151	458	400	191	591	250	161	412	340	211	551	431	262	693
16/19	30	371	222	593	525	302	827	683	383	1065	428	322	750	580	423	1003	736	524	1259
	28	316	185	501	447	252	699	581	319	900	364	269	633	494	352	846	626	436	1063
	26	260	148	408	368	201	569	478	255	733	300	215	514	406	282	688	515	349	864
	24	203	111	314	287	151	438	373	191	565	234	161	395	317	211	529	402	262	664

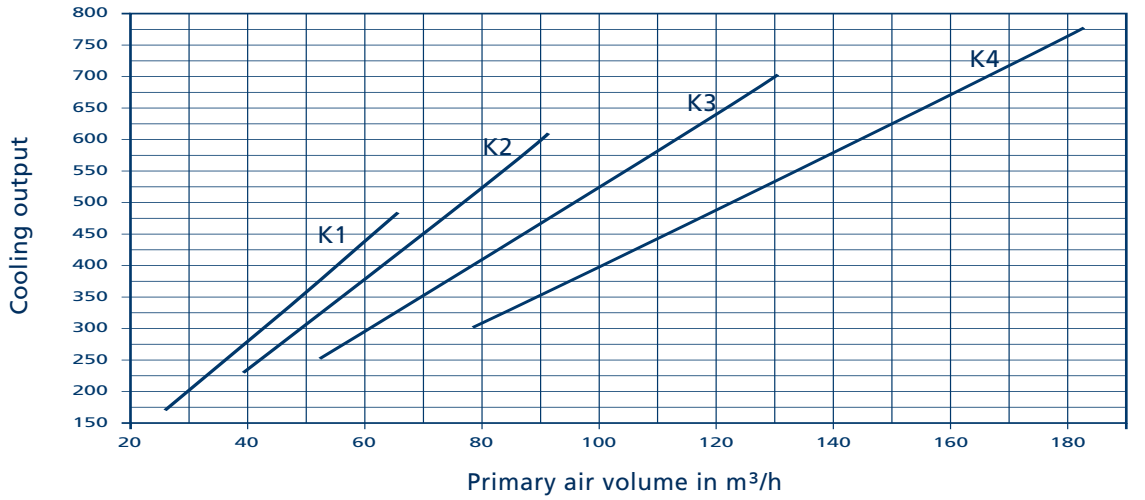
Primary air temperature when cooling at 18°C!

[1] measured with one primary air spigot
[2] measured with two primary air spigots
[3] The sound pressure levels were calculated with an assumed room insulation of 8 dB(A). This corresponds to a distance of 2 m, a room volume of 100 m³ and a reverberation time of 0.5 s (in accordance with VDI 2081)
[4] Sound pressure level < 20 dB (A) and sound power level < 28 dB (A) outside the usual measuring and audible range.

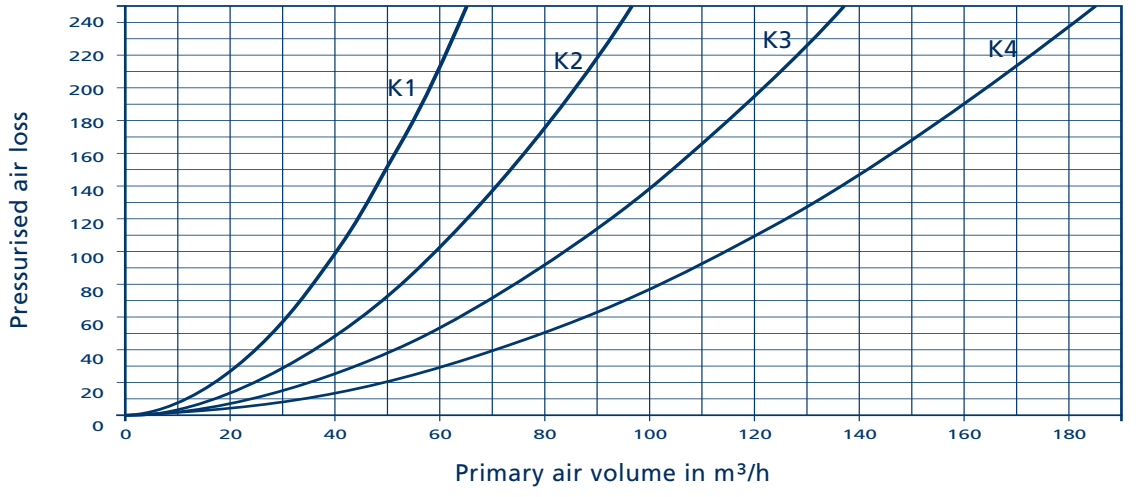
Standard heat output at LPHW 75°/65°/20° floor duct length 1600 mm Diagram 17



Standard cooling output at CHW 16°/18°/26°, floor duct heater length 1600 mm Diagram 18



Primary air pressure loss for floor duct length1600 mm Diagram 19



Katherm ID – Heating or cooling with induction

Katherm ID 1600 — Technical Data

Heat outputs for Katherm ID, duct length 1600 mm — Table 9

		Nozzle K1									Nozzle K2								
Primary air volume		35 m³/h			45 m³/h			55 m³/h			50 m³/h			65m³/h			80 m³/h		
Pre-pressure		77 Pa			123 Pa			181 Pa			73 Pa			119 Pa			176 Pa		
Sound power level [1]		< 28 dB(A) [4]			32 dB(A)			39 dB(A)			30 dB(A)			38 dB(A)			44 dB(A)		
Sound power level [2]		< 28 dB(A) [4]			< 28 dB(A) [4]			30 dB(A)			< 28 dB(A) [4]			< 28 dB(A) [4]			32 dB(A)		
Sound pressure level [1] [3]		< 20 dB(A) [4]			24 dB(A)			31 dB(A)			22 dB(A)			30 dB(A)			36 dB(A)		
Sound pressure level [2] [3]		< 20 dB(A) [4]			< 20 dB(A) [4]			22 dB(A)			< 20 dB(A) [4]			< 20 dB(A) [4]			24 dB(A)		
Heating medium		Heat outputs																	
PWW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]
75/65	15	2211	59	2270	2586	76	2661	2927	92	3019	2522	84	2606	2984	109	3093	3402	134	3536
	18	2086	23	2110	2440	30	2470	2761	37	2798	2379	34	2413	2815	44	2859	3209	54	3263
	20	**2003**	**0**	**2003**	**2342**	**0**	**2342**	**2651**	**0**	**2651**	**2284**	**0**	**2284**	**2702**	**0**	**2702**	**3081**	**0**	**3081**
	22	1920	-23	1896	2245	-30	2215	2541	-37	2504	2190	-34	2156	2590	-44	2547	2953	-54	2900
70/55	15	1899	59	1958	2221	76	2296	2514	92	2606	2166	84	2250	2562	109	2672	2921	134	3056
	18	1775	23	1798	2075	30	2106	2349	37	2386	2024	34	2058	2395	44	2438	2730	54	2784
	20	1692	0	1692	1979	0	1979	2240	0	2240	1930	0	1930	2283	0	2283	2603	0	2603
	22	1609	-23	1586	1882	-30	1852	2130	-37	2093	1836	-34	1802	2172	-44	2128	2476	-54	2422
55/45	15	1383	59	1442	1617	76	1693	1831	92	1923	1578	84	1661	1866	109	1975	2128	134	2262
	18	1260	23	1284	1474	30	1504	1668	37	1705	1437	34	1471	1700	44	1744	1939	54	1992
	20	1179	0	1179	1378	0	1378	1560	0	1560	1344	0	1344	1590	0	1590	1813	0	1813
	22	1097	-23	1074	1283	-30	1253	1452	-37	1415	1251	-34	1218	1480	-44	1437	1688	-54	1634
45/40	15	1077	59	1136	1259	76	1335	1425	92	1518	1228	84	1312	1453	109	1562	1656	134	1791
	18	955	23	979	1117	30	1147	1264	37	1301	1089	34	1123	1289	44	1332	1469	54	1523
	20	874	0	874	1022	0	1022	1157	0	1157	997	0	997	1180	0	1180	1345	0	1345
	22	794	-23	770	928	-30	898	1051	-37	1014	905	-34	872	1071	-44	1027	1221	-54	1167
35/30	15	673	59	732	788	76	863	891	92	984	768	84	852	909	109	1018	1036	134	1170
	18	554	23	578	648	30	678	733	37	770	632	34	665	748	44	791	852	54	906
	20	475	0	475	555	0	555	629	0	629	542	0	542	641	0	641	731	0	731
	22	396	-23	373	463	-30	433	525	-37	488	452	-34	418	535	-44	491	610	-54	556

		Nozzle K3									Nozzle K4								
Primary air volume		70 m³/h			95 m³/h			120 m³/h			100 m³/h			125 m³/h			155 m³/h		
Pre-pressure		71 Pa			126 Pa			195 Pa			77 Pa			118 Pa			168 Pa		
Sound power level [1]		39 dB(A)			48 dB(A)			54 dB(A)			46 dB(A)			52 dB(A)			56 dB(A)		
Sound power level [2]		< 28 dB(A) [4]			34 dB(A)			41 dB(A)			34 dB(A)			41 dB(A)			46 dB(A)		
Sound pressure level [1] [3]		31 dB(A)			40 dB(A)			46 dB(A)			38 dB(A)			44 dB(A)			48 dB(A)		
Sound pressure level [2] [3]		< 20 dB(A) [4]			26 dB(A)			33 dB(A)			26 dB(A)			33 dB(A)			38 dB(A)		
Heating medium		Heat outputs																	
PWW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]
75/65	15	2211	117	2329	2586	159	2745	2927	201	3128	2522	168	2690	2984	210	3194	3402	252	3654
	18	2086	47	2133	2440	64	2503	2761	81	2842	2379	67	2447	2815	84	2899	3209	101	3310
	20	**2474**	**0**	**2474**	**2983**	**0**	**2983**	**3440**	**0**	**3440**	**2645**	**0**	**2645**	**3034**	**0**	**3034**	**3392**	**0**	**3392**
	22	1920	-47	1873	2245	-64	2181	2541	-81	2461	2190	-67	2123	2590	-84	2507	2953	-101	2853
70/55	15	1899	117	2017	2221	159	2380	2514	201	2715	2166	168	2334	2562	210	2772	2921	252	3173
	18	1775	47	1822	2075	64	2139	2349	81	2430	2024	67	2091	2395	84	2479	2730	101	2831
	20	1692	0	1692	1979	0	1979	2240	0	2240	1930	0	1930	2283	0	2283	2603	0	2603
	22	1609	-47	1562	1882	-64	1818	2130	-81	2050	1836	-67	1768	2172	-84	2088	2476	-101	2375
55/45	15	1383	117	1501	1617	159	1777	1831	201	2032	1578	168	1745	1866	210	2076	2128	252	2379
	18	1260	47	1307	1474	64	1537	1668	81	1749	1437	67	1505	1700	84	1784	1939	101	2039
	20	1179	0	1179	1378	0	1378	1560	0	1560	1344	0	1344	1590	0	1590	1813	0	1813
	22	1097	-47	1050	1283	-64	1219	1452	-81	1372	1251	-67	1184	1480	-84	1396	1688	-101	1587
45/40	15	1077	117	1194	1259	159	1419	1425	201	1627	1228	168	1396	1453	210	1663	1656	252	1908
	18	955	47	1002	1117	64	1181	1264	81	1345	1089	67	1156	1289	84	1373	1469	101	1570
	20	874	0	874	1022	0	1022	1157	0	1157	997	0	997	1180	0	1180	1345	0	1345
	22	794	-47	747	928	-64	864	1051	-81	970	905	-67	838	1071	-84	987	1221	-101	1120
35/30	15	673	117	791	788	159	947	891	201	1093	768	168	936	909	210	1118	1036	252	1288
	18	554	47	601	648	64	712	733	81	814	632	67	699	748	84	831	852	101	953
	20	475	0	475	555	0	555	629	0	629	542	0	542	641	0	641	731	0	731
	22	396	-47	349	463	-64	400	525	-81	444	452	-67	385	535	-84	451	610	-101	509

Primary air temperature when heating at 20°C!

[1] measured with one primary air spigot
[2] measured with two primary air spigots
[3] The sound pressure levels were calculated with an assumed room insulation of 8 dB(A). This corresponds to a distance of 2 m, a room volume of 100 m³ and a reverberation time of 0.5 s (in accordance with VDI 2081)
[4] Sound pressure level < 20 dB (A) and sound power level < 28 dB (A) outside the usual measuring and audible range.

KAMPMANN
Genau mein Klima.

Cooling outputs for Katherm ID, duct length 1600 mm — Table 10

		Nozzle K1									Nozzle K2								
Primary air volume		35 m³/h			45 m³/h			55 m³/h			50 m³/h			65 m³/h			80 m³/h		
Pre-pressure		77 Pa			123 Pa			181 Pa			73 Pa			119 Pa			176 Pa		
Sound power level [1]		< 28 dB(A) [4]			32 dB(A)			39 dB(A)			30 dB(A)			38 dB(A)			44 dB(A)		
Sound power level [2]		< 28 dB(A) [4]			< 28 dB(A) [4]			30 dB(A)			< 28 dB(A) [4]			< 28 dB(A) [4]			32 dB(A)		
Sound pressure level [1] [3]		< 20 dB(A) [4]			24 dB(A)			31 dB(A)			22 dB(A)			30 dB(A)			36 dB(A)		
Sound pressure level [2] [3]		< 20 dB(A) [4]			< 20 dB(A) [4]			22 dB(A)			< 20 dB(A) [4]			< 20 dB(A) [4]			24 dB(A)		
Cooling medium		Cooling outputs																	
PKW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]
15/17	30	360	141	501	479	181	660	600	222	822	458	201	659	621	262	883	789	322	1111
	28	313	117	430	415	151	566	520	185	705	397	168	565	539	218	757	684	269	953
	26	264	94	358	351	121	472	440	148	588	335	134	470	455	175	630	578	215	793
	24	215	70	285	286	91	376	358	111	469	273	101	374	371	131	502	471	161	632
16/18	30	336	141	477	447	181	629	560	222	782	427	201	629	580	262	842	737	322	1059
	28	288	117	406	383	151	534	480	185	665	366	168	534	497	218	716	631	269	900
	26	**240**	**94**	**334**	**318**	**121**	**439**	**399**	**148**	**547**	**304**	**134**	**439**	**413**	**175**	**588**	**525**	**215**	**739**
	24	190	70	261	253	91	343	316	111	427	241	101	342	328	131	459	416	161	577
16/19	30	325	141	466	431	181	613	540	222	762	412	201	614	560	262	821	710	322	1033
	28	276	117	394	367	151	518	460	185	645	351	168	519	476	218	695	605	269	873
	26	227	94	321	302	121	423	379	148	526	289	134	423	392	175	567	498	215	712
	24	177	70	248	236	91	326	296	111	406	225	101	326	306	131	437	388	161	550

		Nozzle K3									Nozzle K4								
Primary air volume		70 m³/h			95 m³/h			120 m³/h			100 m³/h			125 m³/h			150 m³/h		
Pre-pressure		71 Pa			126 Pa			195 Pa			77 Pa			118 Pa			168 Pa		
Sound power level [1]		39 dB(A)			48 dB(A)			54 dB(A)			46 dB(A)			52 dB(A)			56 dB(A)		
Sound power level [2]		< 28 dB(A) [4]			34 dB(A)			41 dB(A)			34 dB(A)			41 dB(A)			46 dB(A)		
Sound pressure level [1] [3]		31 dB(A)			40 dB(A)			46 dB(A)			38 dB(A)			44 dB(A)			48 dB(A)		
Sound pressure level [2] [3]		< 20 dB(A) [4]			26 dB(A)			33 dB(A)			26 dB(A)			33 dB(A)			38 dB(A)		
Cooling medium		Cooling outputs																	
PKW [°C]	t_L [°C]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]	Q_{sek} [W]	Q_{Pr} [°C]	Q_{ges} [W]
15/17	30	529	282	811	744	383	1127	964	483	1447	598	403	1000	767	504	1271	940	604	1544
	28	459	235	694	645	319	964	836	403	1239	518	336	854	665	420	1085	815	504	1318
	26	388	188	576	545	255	800	707	322	1029	438	269	707	562	336	898	689	403	1092
	24	316	141	457	444	191	635	575	242	817	357	201	558	458	252	709	561	302	863
16/18	30	494	282	776	695	383	1077	900	483	1384	558	403	961	716	504	1220	877	604	1482
	28	423	235	658	595	319	914	772	403	1174	478	336	814	614	420	1034	752	504	1256
	26	**352**	**188**	**540**	**495**	**255**	**750**	**641**	**322**	**963**	**397**	**269**	**666**	**510**	**336**	**846**	**625**	**403**	**1028**
	24	279	141	420	392	191	584	508	242	750	315	201	517	404	252	656	496	302	798
16/19	30	477	282	758	670	383	1053	868	483	1352	538	403	941	691	504	1194	846	604	1450
	28	406	235	641	570	319	889	739	403	1142	458	336	794	588	420	1008	720	504	1224
	26	334	188	522	469	255	724	608	322	930	377	269	646	484	336	820	593	403	996
	24	261	141	402	366	191	558	475	242	716	294	201	496	378	252	629	463	302	765

Primary air temperature when cooling at 18°C!

[1] measured with one primary air spigot
[2] measured with two primary air spigots
[3] The sound pressure levels were calculated with an assumed room insulation of 8 dB(A). This corresponds to a distance of 2 m, a room volume of 100 m³ and a reverberation time of 0.5 s (in accordance with VDI 2081)
[4] Sound pressure level < 20 dB (A) and sound power level < 28 dB (A) outside the usual measuring and audible range.

Katherm ID – Heating or cooling with induction

Specifications

Quantity	Article no.	Description
each	241 0 6 2 8 1 11 15 K 1	**Katherm ID floor ducts,** ready-to-install heating and cooling ducts with an induction function; c/w convector with supply air connection for the supply of preconditioned primary air, manufactured from: floor duct made of sendzimir galvanized steel sheet, painted graphite grey on both sides in RAL 7024, with adjustable feet on the inside and on the outside of the duct on the room side, for stable height adjustment for use with raised floors; with adjustment feet fitted on the room-side on the side of the duct with sound insulation; with primary air connection spigots DN 100, room-side, on the side wall of the duct, air volume limiters can also be fitted (optional) and extended and retracted from inside; with brackets to reinforce the floor duct, mounting profiles for induction housing, manifolds, cross-struts and openings for water-side and electrical connections, with cover plate for junction box. Induction air guidance housing, designed as an insert for installation in the floor duct, with induction equipment, brackets and air guide walls. With the correct number of nozzle plates and nozzles in the primary air flow. Convector made from hollow copper pipes with aluminium fins, painted graphite grey, suitable for maximum continuous operating pressure of 10 bar and 120 °C, connection 1/2" same end, female, with air vent. Grille made of double-T-profiles, bar dimensions 18 x 5 mm, 12 mm bar spacing; linked by corrosion-proof steel springs with matching spacers; free area approx. 70 %, with colour-coordinated frame profile to match the grille, with transparent dirt and protective cover to protect the frame edge. Heat outputs tested in line with DIN 4704/DIN EN 442, cooling outputs in line with DIN EN 14518
		Primary air volume 1 = low primary air volume 2 = medium primary air volume 3 = high primary air volume 4 = very high primary air volume
		Nozzle versions K = nozzle version 7-4
		Length key 11 = 800 mm 15 = 1000 mm 19 = 1200 mm 23 = 1400 mm 27 = 1600 mm
		Grille finish 11 = Aluminium, natural anodised 12 = Aluminium, brass anodised 13 = Aluminium, bronze anodised 14 = Aluminium, black anodised 15 = Aluminium, bronze finish 16 = Aluminium, painted DB 703 31 = Stainless steel 32 = Stainless steel, polished 33 = Brass, natural CuZn 44
		1 = Roll-up grille 3 = Linear grille
		Duct height 8 = Duct height 180 mm
		System 2 = 2-pipe system 4 = 4-pipe system
	Insert to complete article no. for Datanorm/EDV	**Duct width** 6 = Katherm ID 340, width 340 mm

Quantity	Article no.	Description
each		**Technical Data** Primary air volume m³/h Primary air pressure loss Pa Primary air temperature - Summer °C Room air temperature - Summer °C Heating medium LPHW ____ / ____ °C Heat output, secondary air W Heat output, primary air W Heat output, total W Primary air temperature - Winter °C Room air temperature - Winter °C Cooling LPCW ____ / ____ °C Cooling output, secondary air W Cooling output, primary air W Cooling output, total W Sound power level dB (A) Sound pressure level dB (A) Manufacturer Kampmann, article no. 2410 _ _ _ _ _ _ _ _ _ _, type _ _ _ _ _ _ _ _ _ _
	194 000 146 909	**1/2" valve body, straight,** Manufacturer Kampmann, article no. 194000146909, type 146909
	194 000 346 909	**1/2" valve body, straight,** presettable Manufacturer Kampmann, article no. 194000346909, type 346909
	194 000 346 915	**Adjustment key** for valve body, adjustable Manufacturer Kampmann, article no. 194000346915, type 346915
	194 000 145 952	**Return shut-off valve 1/2", straight** Brass, nickel-plated housing, with O-ring seal Manufacturer Kampmann, article no. 194000145952, type 145952
	194 000 146 905	**Thermoelectric actuator,** 230 V DC Manufacturer Kampmann, article no. 194000146905, type 146905
	194 000 100 986	**Wooden installation cover** to protect the floor duct heating during the construction phase Manufacturer Kampmann, article no. 194000100986, type 100986
	Insert to complete article no. for Datanorm/EDV	

Your Contacts

Professional advice - even on-site

Kampmann systems don't just provide a relaxed environment when they are installed. You can even look forward to a feel-good climate with superior service at the design stage of your projects. Particularly with difficult or more complex requirements, our experts are on hand to advise and actively support you. This will allow you to quickly achieve your goal and your customers will appreciate your excellent work.

But let's have a chat in person about this - you'll see that it will be worthwhile ...

Kampmann.de

Kampmann GmbH . Friedrich-Ebert-Straße 128-130 . 49811 Lingen (Ems) . Deutschland
Tel. +49 591 7108-0 . info@kampmann.de

Kampmann GmbH . UK Office . Dial House . Govett Avenue . Shepperton, Middlesex . TW17 8AG . UK
Tel. +44 1932 228592 . Fax +44 1932 228949
info@kampmann-uk.co.uk . www.kampmann-uk.co.uk

Edition 331/03/12/info GB