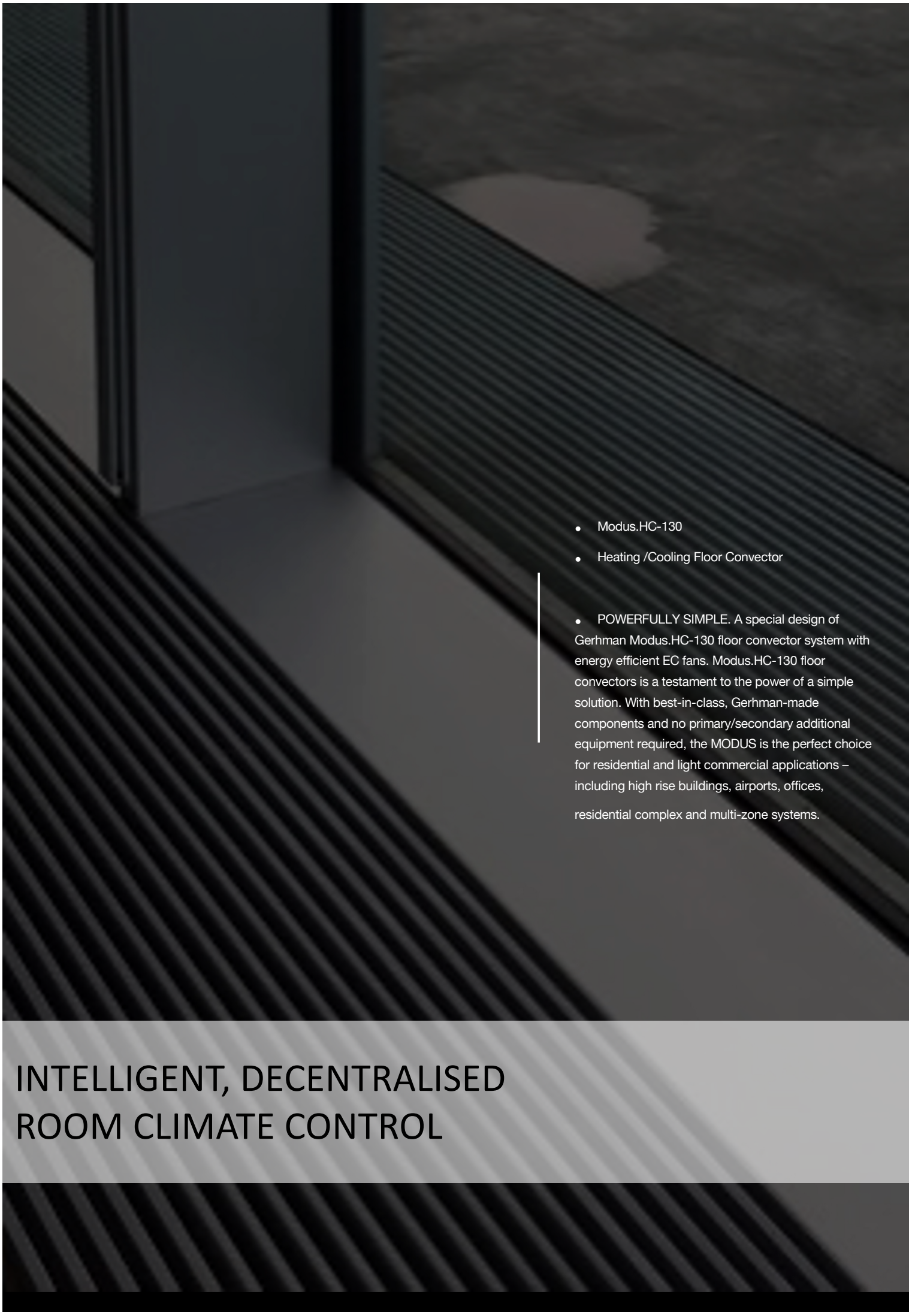
GERHMAN

Trench Technology

MODUS.HC-130



- Modus.HC-130
- Heating /Cooling Floor Convector

- POWERFULLY SIMPLE. A special design of Gerhman Modus.HC-130 floor convector system with energy efficient EC fans. Modus.HC-130 floor convectors is a testament to the power of a simple solution. With best-in-class, Gerhman-made components and no primary/secondary additional equipment required, the MODUS is the perfect choice for residential and light commercial applications – including high rise buildings, airports, offices, residential complex and multi-zone systems.

INTELLIGENT, DECENTRALISED ROOM CLIMATE CONTROL

Trench Technology

MODUS.HC-130

FOR HEATING

FOR COOLING

LOW-NOISE

POWERFULLY SIMPLE. The Modus.HC-130, floor convector is a testament to the power of a simple solution. With best-in-class, Gerhman-made components and no additional primary/secondary equipment required, the Modus is the perfect choice for residential and light commercial applications – including high rise buildings, airports, residential applications, offices and multi-zone systems

- **Decentralised climate** concepts differ from centralised systems because they are planned and installed 'room by room'. The space to be ventilated can be extended to several rooms by taking clever additional measures.

There are many reasons for using decentralised climate systems:

•Protection and conservation of the building fabric
•Prevention of mould formation
•Assistance in eliminating moisture damage
•Controlled room dehumidification and automatic cellar dehumidification
•Domestic ventilation according to DIN1946-6 in the living area and the basement in order to achieve a good air quality
•Preservation of a constant climate to protect the valuables in museums and archives
•Server and compressor room cooling
•Energy-efficient room ventilation and utilization of heat recovery effects
•and many more

Energy-efficient solution

A much more energy-efficient and reliable solution is an intelligent indoor climate control system.

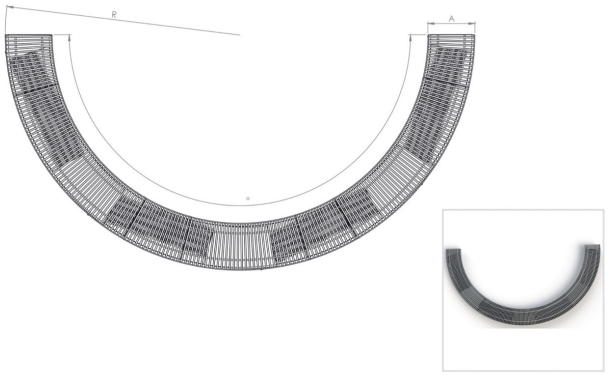
A higher level of efficiency is achieved with energy efficient EC tangential fans with noise-optimised commutation electronics, resulting in energy- savings of up to 60% compared with conventional fans!
Flow-optimised barrel impellers ensure quiet operation and guarantee that air flows through the coil along its entire length.

EN EURONORM 16430

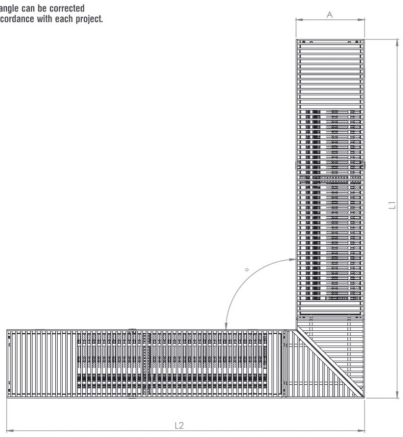
ectechnology

MITRED CORNERS

CURVED TRENCH TECHNOLOGY

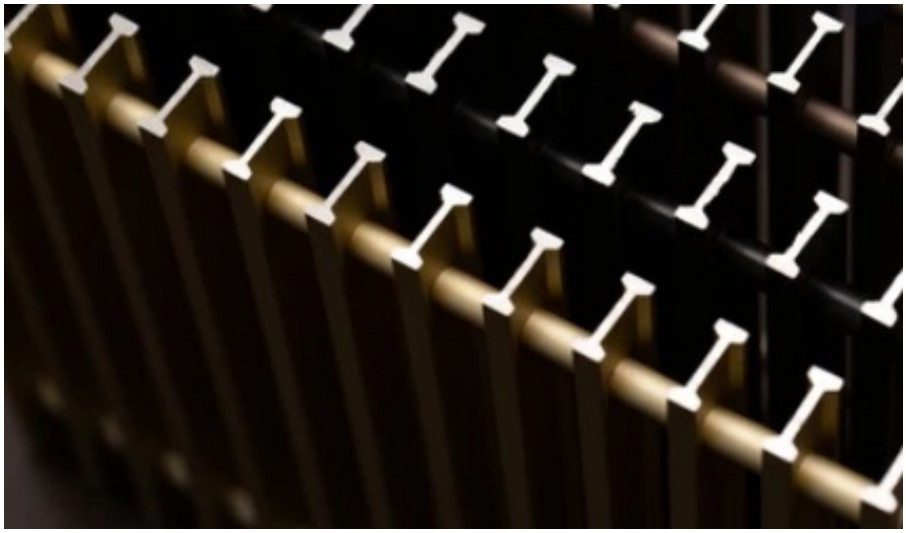


The angle can be corrected
in accordance with each project.



GRILLS

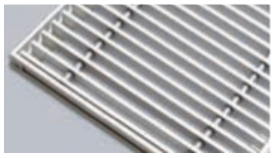
MODUS.HC-130



ALUMINIUM GRILLS

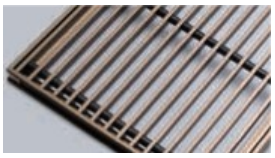
ROLL-UP GRILLS

The spacing between spring loaded transverse lamellas of aluminium alloy is delimitated by residual rollers made of cured plastic. The lamellas have anodized and tinted surface. Any RAL shade may be reached by powder colour coating.



LINEAR GRILLS

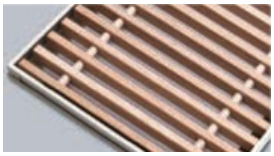
Lengthwise perforated aluminium lamellas are linked by carrying steel bar. Residual rollers of cured plastic delimitate the spacing.

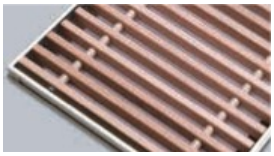




WOODEN GRILLS

ROLL-UP GRILLS

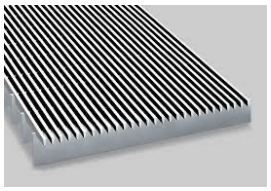
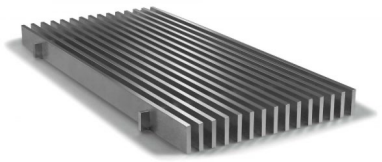
The spacing between spring loaded oak or beech lamellas is delimitated by residual rollers made of cured plastic. The surface is raw or stained.



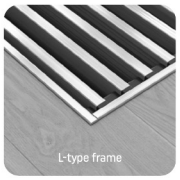


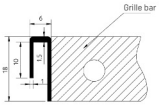
STAINLESS STEEL GRILLS

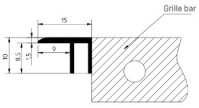
Stainless steel rectangular profiles are linked by steel drawbars. The spacing of lamellas is delimitated by residual metal rollers. A fix non-rolling grill.

FRAMES







Information on design

MODUS.HC are suitable for use in all kinds of buildings in which there is a cooling load owing to internal loads and the effects of sunlight.

They are generally positioned directly in front of the external façade without a large gap. MODUS.HC can provide cost-effective and efficient cooling, particularly in front of large areas of glazing

Heat and cooling performance
The heat and cooling outputs were calculated based on DIN EN 16430.

Outlet
MODUS.HC are positioned with output on the façade side. If it is arranged on the room side, the high air output would result in lower levels of comfort in the occupied zone.

Sound Level
When designing a system, it should be noted that disruptive noise may occur at higher fan speeds. The respective sound power levels of MODUS.HC are indicated in the tables (see "Technical data"). The sound pressure levels were calculated with an assumed room insulation of 8 dB(A). This corresponds to a distance of 2m, a room volume of 100m3 and a reverberation time of 0.5 s (in accordance with VDI 2081).

Modus.HC-130: Heating/Cooling from the floor with 2 pipe and 4 pipe system units.

Product data

MODUS.HC-130

- Energy-saving EC tangential fan with flow-optimised impellers
- Condensate tray can be removed to the room side for complete cleaning
- Sound-decoupled fixing of the tangential fan, easy removal without tools
- Connection and control box for fast and safe electrical connection
- Condensate pump mounting kit, supplied separately or factory-fitted
- Extensive range of control accessories
- Roll-up and linear grilles with colour-coordinated spacers

Performance data

Heat output (W) [1]	2444-10815
Cooling output (W) [2]	684-3922
Sound pressure level (db (A)) [3]	20-48
Sound power level (db (A)) [4]	28-57

1.1) at LPHW 75/65 °C, tL1 = 20 °C
2.2) at CHW 16/18, tL1 =27 °C, 48% relative humidity
3.3) 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)

Operating limits

` Max. operating pressure: 12 bar

` Max. entering water temperature: 120 °C ` Min. entering water temperature: 5 °C ` Inlet air temperature: 40 °C

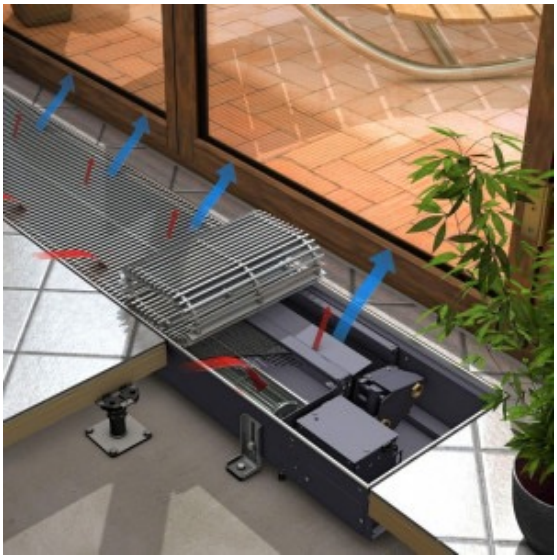
` Max. glycol volume: 50 %

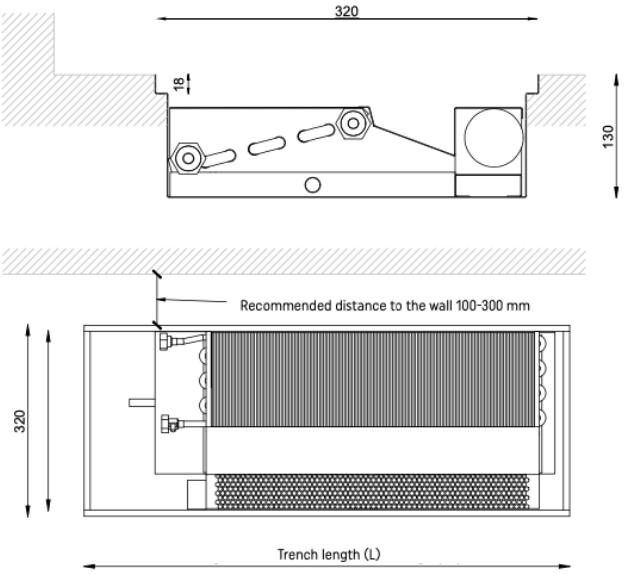
Quick selection

System						
2-pipe		4-pipe				
Heat output	Cooling output	Heat output	Cooling output	Height	Width	Length
LPHW		LPHW				(A)
(W)	(W)	(W)	(W)	(mm)	(mm)	(mm)
1000 - 2444	222 - 684	452 - 1095	112 - 325	130	320	950
1530 - 3541	324 - 1096	735 - 1950	159 - 521			1250
1747 - 5389	444 - 1960	1325 - 3358	215 - 931			1750
1975 - 6099	494 -2179	1467 - 3750	242 - 1130			2150
2261 - 8251	636 - 3050	2125 - 5115	339 - 1452			2550
3020 - 10815	846 - 3922	2710 - 6705	419 - 1920			3050

1) at LPHW 75/65 °C, tL1 = 20 °C, with fan coils
2) with CHW 7/12 °C, tL1= 27 °C, 48% rel. humidity, with fan coils
3) when operating with an electric heating element

Technical drawing





Performance data / 2 pipe system — Height 130 mm

Length	0-10V control	Heat output at LPHW 75/65 °C, tL1 = 20 °C	Outlet air temp. at LPHW 75/65 °C, tL1 = 20 °C	Heat output at LPHW 55/45 °C, tL1 = 20 °C	Outlet air temp. at LPHW 55/45 °C, tL1 = 20 °C	Cooling output, total at CHW 16/18, tL1 =27 °C, 48% relative humidity	Cooling output, sensitive at CHW 16/18, tL1 =27 °C, 48% relative humidity	Outlet air temperature at CHW 16/18, tL1 =27 °C, 48% relative humidity	Cooling output,total at CHW 7/12 °C, tL1 = 27 °C, 48% relative humidity	Cooling output, sensitive at CHW 7/12 °C, tL1 = 27 °C, 48% relative humidity	Outlet air temperature at CHW 7/12 °C, tL1 = 27 °C, 48% relative humidity	Power consumption	Air flow	Sound pressure level	Sound power level
(mm)	(V)	(W)	(°C)	(W)	(°C)	(W)	(W)	(°C)	(W)	(W)	(°C)	(W)	[m3/h]	(db (A))	(db (A))
950	10	2444	52,9	1422	39,2	337	337	19,5	684	561	14,6	7,8	174	35	43
	8	2270	55,7	1317	41,2	300	300	19,7	613	500	14,8	6,5	144	30	38
	6	1947	58,3	1125	43,0	238	238	19,8	492	397	15,0	5,5	108	24	31
	4	1584	60,4	907	44,5	177	177	19,8	367	293	15,1	4,9	77	20	27
	2	1000	59,7	563	42,7	110	110	19,9	222	175	15,1	4,6	46	20	27
1250	10	3541	53,3	2062	39,0	545	545	19,5	1096	899	14,5	11,2	292	37	45
	8	3289	56,7	1909	41,5	480	480	19,6	969	789	14,7	8,4	236	32	40
	6	2836	57,9	1635	42,3	367	367	19,6	750	605	14,7	6,4	185	25	33
	4	2337	59,8	1335	43,5	262	262	19,5	538	429	14,6	5,2	133	20	27
	2	1530	57,6	859	41,2	159	159	19,5	324	256	14,5	4,9	82	20	27
1750	10	5389	56,5	3199	41,5	978	978	19,6	1960	1608	14,8	16,5	472	37	45
	8	4871	56,6	2882	41,4	857	857	19,6	1725	1407	14,7	12,5	425	35	43
	6	3969	57,8	2328	42,2	646	646	19,5	1307	1055	14,6	9,2	352	28	36
	4	3042	60,8	1760	43,8	436	436	19,5	881	702	14,4	6,7	249	20	27
	2	1747	58,5	986	41,7	226	226	19,2	444	351	14,0	5,0	152	20	27
2150	10	6099	53,3	3579	38,9	1075	1075	19,5	2179	1787	14,5	22,5	617	40	48
	8	5512	56,3	3224	41,2	943	943	19,6	1917	1563	14,7	16,8	503	35	43
	6	4491	57,9	2605	42,2	710	710	19,5	1452	1172	14,6	12,9	390	28	36
	4	3442	60,4	1970	43,9	479	479	19,5	979	781	14,4	10,6	276	20	28
	2	1976	58,7	1103	41,8	248	248	19,2	494	390	14,0	9,9	168	20	27
2550	10	8251	55,1	4875	40,3	1505	1505	19,6	3050	2502	14,6	27,7	812	40	48
	8	7379	56,4	4349	41,2	1318	1318	19,6	2683	2187	14,7	20,9	704	37	45
	6	5854	57,8	3425	42,2	994	994	19,5	2030	1637	14,6	15,6	547	30	38
	4	4308	60,1	2485	43,7	666	666	19,4	1353	1080	14,4	12,0	390	21	29
	2	2261	58,9	1267	42,1	325	325	19,2	636	503	13,8	10,0	233	20	27
3050	10	10815	56,3	6372	41,3	1934	1934	19,6	3922	3216	14,7	32,9	1001	40	48
	8	9712	56,4	5706	41,2	1695	1695	19,6	3450	2812	14,7	24,8	904	38	46
	6	7768	58,0	4534	42,3	1279	1279	19,5	2614	2108	14,6	18,3	698	31	39
	4	5758	60,1	3319	43,8	861	861	19,4	1754	1401	14,4	13,4	498	22	30
	2	302	59,1	1695	42,2	431	431	19,2	846	669	13,9	10,1	298	20	27

1.Values rounded up within the measurement tolerances.

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

Performance data / 4 pipe system — Height 130 mm

Length	0-10V control	Heat output at LPHW 75/65 °C, tL1 = 20 °C	Outlet air temp. at LPHW 75/65 °C, tL1 = 20 °C	Heat output at LPHW 55/45 °C, tL1 = 20 °C	Outlet air temp. at LPHW 55/45 °C, tL1 = 20 °C	Cooling output, total at CHW 16/18, tL1 =27 °C, 48% relative humidity	Cooling output, sensitive at CHW 16/18, tL1 =27 °C, 48% relative humidity	Outlet air temperature at CHW 16/18, tL1 =27 °C, 48% relative humidity	Cooling output, total at CHW 7/12 °C, tL1 = 27 °C, 48% relative humidity	Cooling output, sensitive at CHW 7/12 °C, tL1 = 27 °C, 48% relative humidity	Outlet air temperature at CHW 7/12 °C, tL1 = 27 °C, 48% relative humidity	Power consumption	Air flow	Sound pressure level	Sound power level
(mm)	(V)	(W)	(°C)	(W)	(°C)	(W)	(W)	(°C)	(W)	(W)	(°C)	(W)	[m3/h]	(db (A))	(db (A))
950	10	1107	40,8	694	32,2	329	329	19,5	673	552	14,5	7,7	173	35	43
	8	1001	43,0	625	33,2	293	293	19,6	605	492	14,7	6,5	143	30	38
	6	815	45,1	505	34,3	234	234	19,7	486	391	15,0	5,5	107	24	31
	4	629	47,3	385	35,2	174	174	19,8	363	289	15,1	4,9	76	20	27
	2	445	52,0	265	37,6	108	108	19,8	219	173	15,1	4,6	46	20	27
1250	10	1845	40,6	1157	32,1	530	530	19,4	1076	880	14,5	11,1	291	37	45
	8	1668	43,3	1042	33,5	466	466	19,5	951	774	14,7	8,3	234	32	40
	6	1359	44,3	842	33,9	359	359	19,5	738	594	14,7	6,4	184	25	33
	4	1050	46,2	642	34,6	256	256	19,5	531	423	14,6	5,2	133	20	27
	2	741	50,0	442	36,4	157	157	19,5	321	253	14,5	4,9	82	20	27
1750	10	3440	43,0	2015	33,3	927	927	19,7	1922	1573	14,8	16,4	469	37	45
	8	3109	43,1	1816	33,2	836	836	19,5	1690	1375	14,7	12,3	423	35	43
	6	2533	44,2	1467	33,6	631	631	19,5	1282	1032	14,6	9,1	331	28	36
	4	1956	46,5	1119	34,7	425	425	19,4	854	681	14,3	6,8	234	20	27
	2	1381	50,6	770	36,9	220	220	19,2	431	339	13,9	5,1	143	20	27
2150	10	3747	40,4	2239	32,0	1060	1060	19,4	2114	1731	14,4	22,6	581	40	48
	8	3387	42,9	2018	33,1	930	930	19,5	1861	1514	14,5	16,9	474	35	43
	6	2759	44,2	1630	33,7	701	701	19,5	1410	1135	14,5	12,9	367	28	36
	4	2131	46,5	1242	34,7	473	473	19,4	949	756	14,3	10,6	260	21	28
	2	1504	50,8	854	36,9	245	245	19,2	479	377	13,9	10,0	158	20	27
2550	10	5246	41,9	3135	32,7	1485	1485	19,5	2961	2423	14,5	27,9	765	40	48
	8	4741	42,9	2824	33,1	1301	1301	19,5	2605	2119	14,6	21,0	663	37	45
	6	3862	44,2	2282	33,7	982	982	19,5	1974	1589	14,5	15,7	515	30	38
	4	2984	46,3	1739	34,6	662	662	19,4	1329	1059	14,3	12,0	367	22	29
	2	2106	51,1	1197	37,1	343	343	19,2	671	529	13,9	10,0	219	20	27
3050	10	6744	42,9	4031	33,2	1909	1909	19,6	3807	3116	14,6	33,1	943	40	48
	8	6096	42,9	3631	33,2	1673	1673	19,5	3349	2724	14,6	25,0	851	38	46
	6	4966	44,4	2933	33,7	1262	1262	19,5	2537	2042	14,5	18,4	658	31	39
	4	3836	46,5	2236	34,7	849	849	19,4	1702	1355	14,3	13,4	469	23	30
	2	2707	51,3	1539	37,2	423	423	19,1	818	645	13,8	10,1	280	20	27

1.Values rounded up within the measurement tolerances.

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

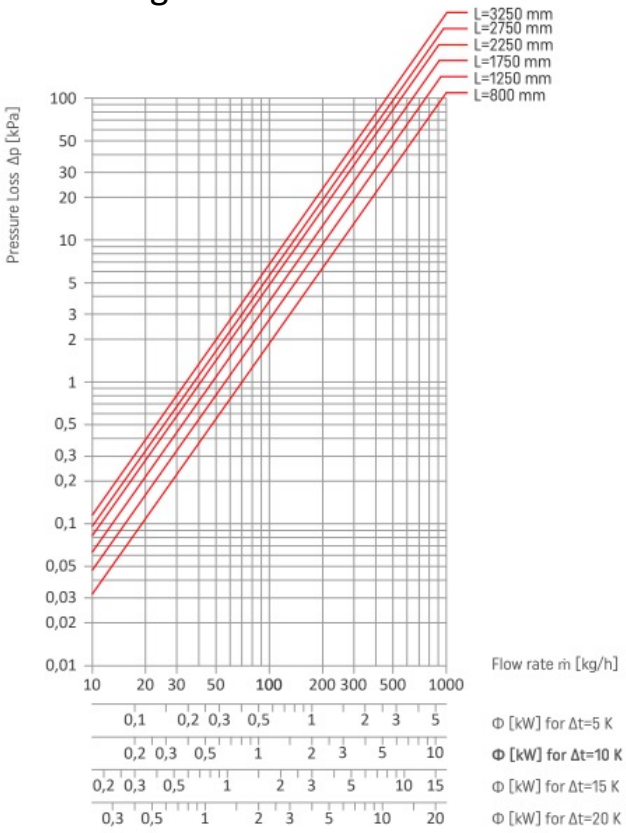
... because I can sleep better.

At night it‘s too cold with open windows and there‘s a draught, with closed windows the air quickly becomes stuffy. Who doesn‘t know about this conflict? For me, MODUS.HC controlled living space is the solution – insulated ambient noise, very quiet operation for a relaxed night‘s sleep.

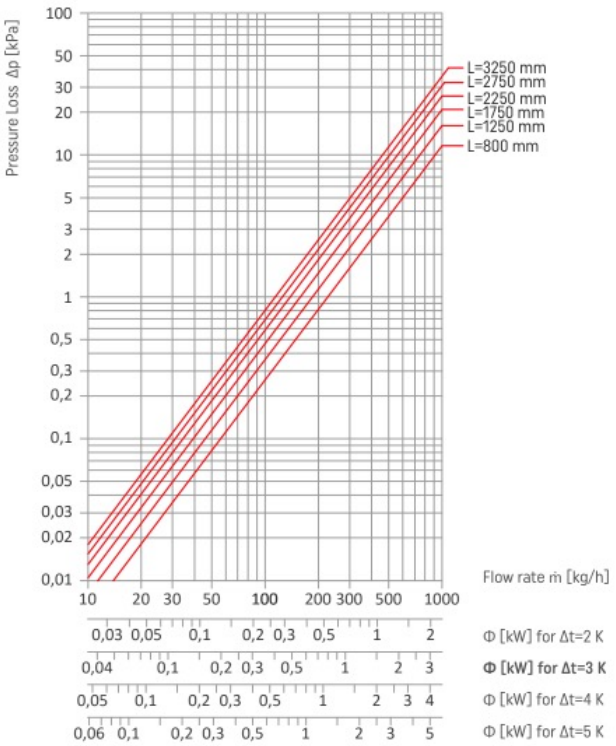
Performance data

Height 130 mm

Pressure loss
Heating



Pressure loss
Cooling



Control options

Heating and cooling MODUS.HC units are designed to be installed in a floor void. One can distinguish two basic models of this product that are different through the way they are build and function:

2-PIPES MODUS.HC UNITS
The heat exchanger has only a single pipe circuit that can be used for heating or cooling. Only one set of valves and thermal actuator is required.

4-PIPES MODUS.HC UNITS
Two independent copper pipe circuits - one for heating and one for cooling and 2 sets of valves and thermal actuators are required (one for heating and one for cooling installation connection).

As MODUS.HC is a part of the heating/cooling system in the building they proper operation rely on:

- central heating installation being fitted correctly
- chilling/cooling installation being fitted correctly
- the valves and controls have been fitted, connected and configured properly.

It is forbidden to connect the unit directly to the 230 V AC power grid.

The complete set of controls includes:

- room air controller that should be connected to the thermal actuators and fans
- 24 V DC rail power supply (transformer) Thanks to the built-in temperature sensor Room Temperature Controller measure the ambient temperature to keep it on the constant, required level:
- by adjusting the thermostatic valve opening/closing angle
- by adjusting the fan speed.

Due to the ambient temperature sensor the Room Temperature Controller should not be covered by any obstacles such as furniture or curtains.

Each heating/ cooling zone should be controlled by the single Room Temperature Controller.

For BMS systems Room Controller and Temperature sensor is usually split into 2 separate devices.

Due to the use of electric safe fans and low-voltage actuators, fan assisted units must be supplied with 24 V DC power converter.

The 24 V DC power supply should be protected by an appropriate overcurrent circuit breaker and an installation switch off that allows the power cut off while conducting service work on GERHMAN products.

NOTE! Electric wiring should be done only by the electrical skilled worker who can confirm his membership in an approved self-certification scheme. Power can only be switched back on when the correctness of the whole wiring was checked and approved.

UNIT OPERATIONS IN VARIOUS SYSTEMS

MODUS.HC are suitable for any building, and they are easy to select thanks to a variety of available options controlling the unit.

CONTROLLING BY STANDARD ROOM AIR CONTROLLER

Each heating zone has a separate controller, which is responsible for readout of the temperature in the room and controlling the work of connected heating/cooling units. The controllers are not connected to each other, while each of them must be programmed separately.

BUILDING MANAGEMENT SYSTEM (BMS)

The system that integrates the various technical installations in the building to allow single point of management is commonly known as the BMS. BMS is quite practical in the office and commercial buildings, yet these days might be also met in residential housing installations. When concerning connecting the MODUS.HC units into the BMS system, please be aware of such a solution benefits

:• including MODUS.HC as a part of the general HVAC in the building by coordinating its operation together with ventilation, A/C and heating/cooling sources,

• combining the operation of multiple home technical appliances into one management scheme by coordination the work between window blinds, lighting, audio / video devices etc.

• better management of your heating system i.e. by more flexible and quicker temperature control from a central communication point

• more flexibility for open space heating/ cooling functions such as re-arranging the heating zones when complementing open space re-arrangements.

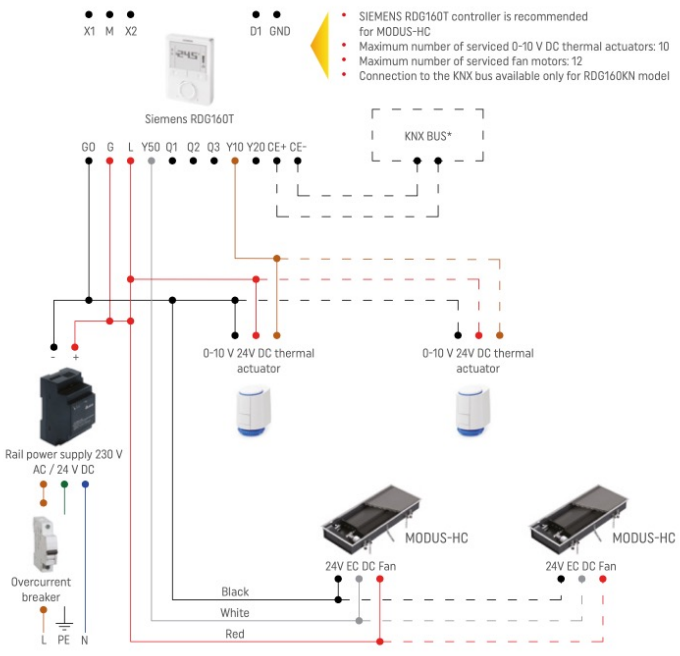
GERHMAN offers solutions that enable connecting MODUS.HC units into the following BMS systems:

• KNX

• BACnet

• Modbus

Control options



An exemplary connection diagram of one or several MODUS-HC units

Configuration of RDG160T basic work parameters for MODUS-HC units		
Configuration of switches inside the controller		
DIP1	ON	ON 1 2 3 4 5
DIP2	OFF	
DIP3	OFF	
DIP4	OFF	
DIP5	OFF	
Recommended settings of individual work parameters		
Parameter	Setting	Description
P01	0	Heating only
	1	Cooling only
P05	-3...3 K	Temperature sensor calibration
P30	0,5...6 K	P-band/switching differential in heating mode
P31	0,5...6 K	P-band/switching differential in cooling mode
P38	0	No additional external sensor
P40	0	
P42	0	
P46	2	Output of 0-10 V DC thermal actuator
P52	1	Fan operation - Active
P60	89 min	Fan kick interval in Comfort mode
P61	359 min	Fan kick interval in Economy mode

SETTING OF OPERATION PARAMETERS RDG160T

Press the two buttons on the regulator for at least 3 seconds. Then release both but- tons and press the left button for another more than 3 seconds. Without releasing, turn the controller's knob half a turn anti-clockwise. The display will show the symbol of parameter, that confirms the entry into the service settings mode. The parameter is selected by turning the knob and confirming with the right button (OK). Use the knob to set the desired value, eg changing the setting P52=1, after changing P52=2. Use the right button to accept the selection. After finishing the settings, press the left button (ESC).

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MODUS.HC-130

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