GERHMAN

Trench Technology

MODUS.HC-200

- Modus.HC
- Heating /Cooling Floor Convector

- POWERFULLY SIMPLE. A special design of Gerhman Modus.HC-200 floor convector system with energy efficient EC fans. Modus.HC 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

POWERFULLY SIMPLE. The Modus.HC, floor convector such as underfloor fan coil unit 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.

- **Decentralized underfloor fan coil unit and climate** concepts differ from centralized 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 decentralized 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-optimized commutation electronics, resulting in energy- savings of up to 60% compared with conventional fans!

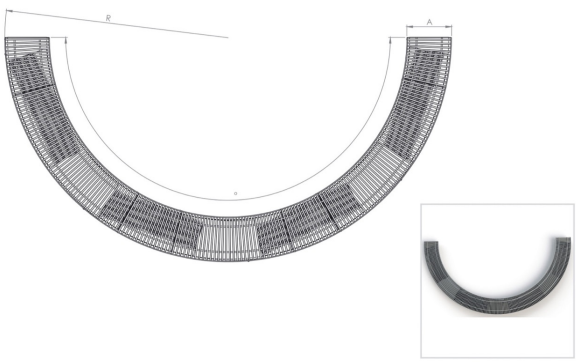
Flow-optimized barrel impellers ensure quiet operation and guarantee that air flows through the coil along its entire length.

ectechnology

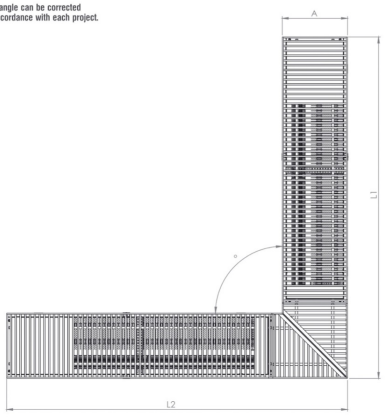
EN EURONORM 16430

MITRED CORNERS

CURVED TRENCH TECHNOLOGY

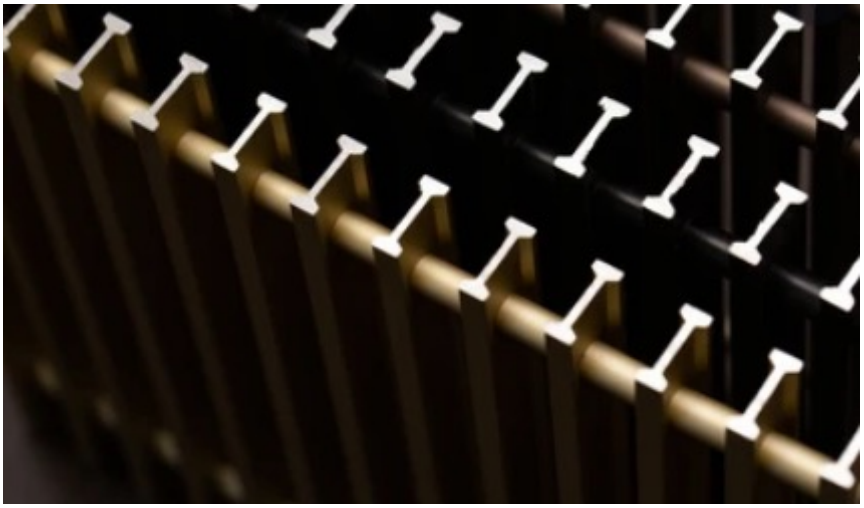


The angle can be corrected in accordance with each project.



GRILLS

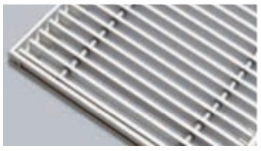
MODUS.HC



ALUMINIUM GRILLS

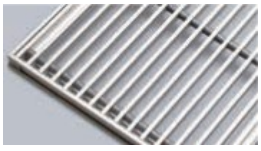
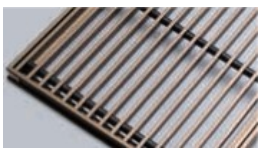
ROLL-UP GRILLS

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

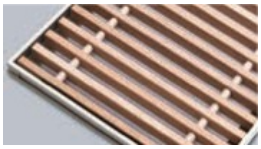
Lengthwise perforated aluminium lamellas are linked by carrying steel bar. Residual rollers of cured plastic delimitate the spacing.

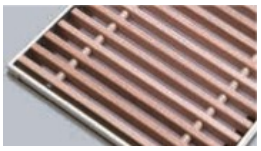




WOODEN GRILLS

ROLL-UP GRILLS

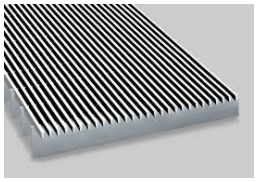
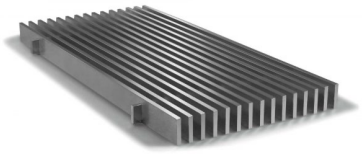
The spacing between spring loaded oak or beech lamellas is delimitated by residual rollers made of cured plastic. The surface is raw or stained.



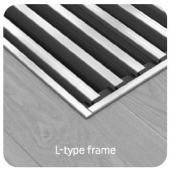


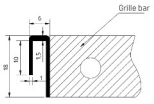
STAINLESS STEEL GRILLS

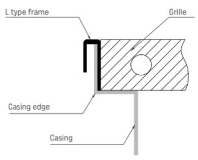
Stainless steel rectangular profiles are linked by steel drawbars. The spacing of lamellas is delimitated by residual metal rollers. A fix non-rolling grill.

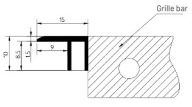




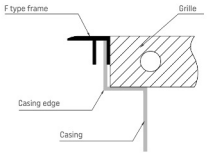
FRAMES











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).

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

Product data

MODUS.HC-200

- Energy-saving EC tangential fan with flow-optimized 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]	3490-10373
Cooling output (W) [2]	1417-4589
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 MODUS.HC-200				
4-pipe				
Heat output	Cooling output, total	Height	Width	Length
LPHW	CHW			(A)
(W)	(W)	(mm)	(mm)	(mm)
3490	1796	200	320	1250
7161	3479			2000
10373	4589			2750

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

Features

Application

The **Gerhman Modus.HC-200** floor-mounted convector is designed for secondary cooling during periods of high thermal demand, and in certain cases, it can also serve as the primary cooling solution for interior spaces. Optimal performance is achieved when the unit is installed near heat sources—such as large glazed façades or sun-exposed windows—helping to suppress rising room temperatures.

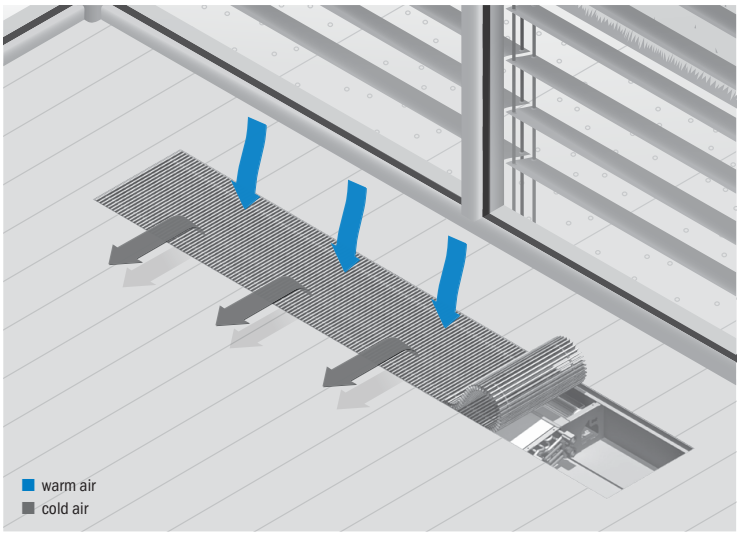
Modus.HC-200 is ideal for modern spaces with extensive glass surfaces or architectural elements where ceiling-mounted cooling systems are not viable due to structural limitations. During the heating season, the unit also functions as an efficient room heater, offering performance comparable to traditional trench heating systems.

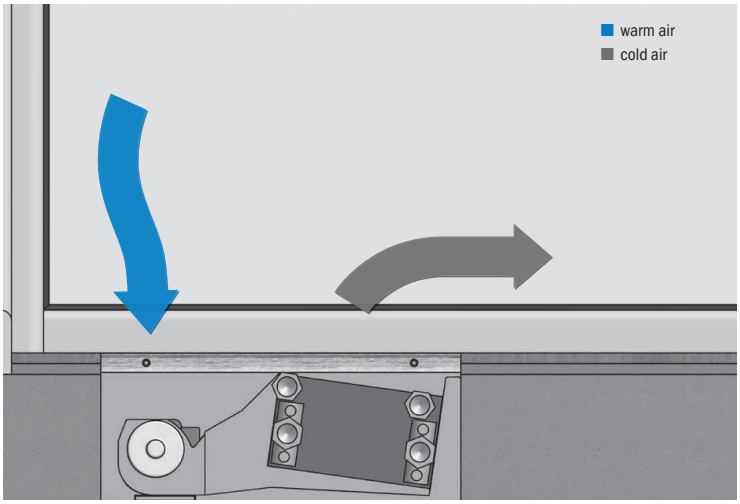
Operation

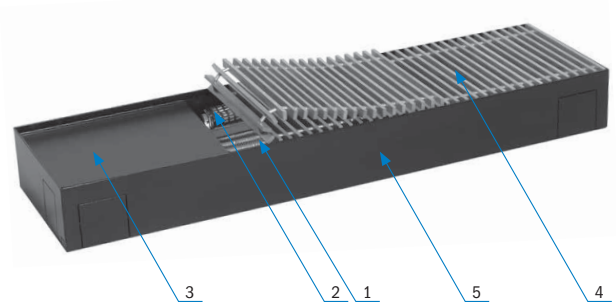
In cooling mode, **Modus.HC-200** draws in warm air from areas near windows or warm surfaces, cools it through an integrated heat exchanger, and recirculates it back into the room.

An insulated condensate tray beneath the heat exchanger collects and safely discharges any condensation formed during the cooling process.
In heating mode, the airflow is reversed: cold air is drawn into the unit, heated, and then released back into the room for uniform warmth distribution.

warm air intake
cooled air outlet
cold air intake
heated air outlet



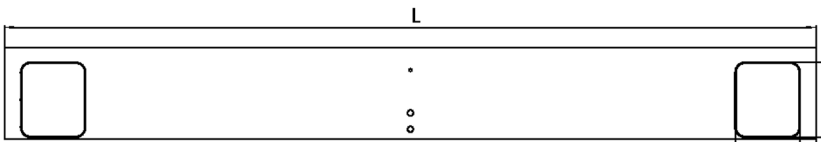


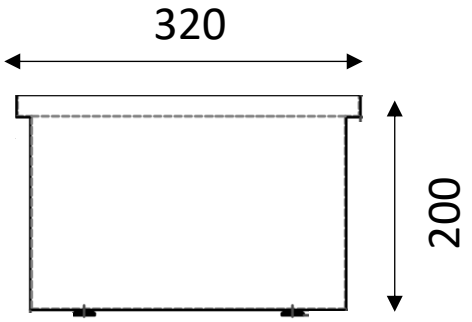


Core Components (Standard Configuration)
1.High-efficiency heat exchanger
2.Tangential low-noise fan
3.Electrical connection socket
4.Heavy-duty tread-on grille
5.Durable metal housing
6.Condensate drainage tray with thermal insulation

Performance data / 4 pipe system — Height 200 mm

Technical sizes



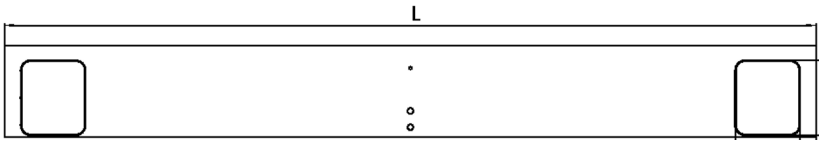


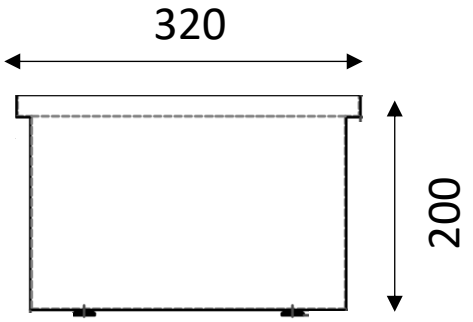
Cooling

Housing length L [mm]	Fan speed			Temperature regime								
		T_w	[˚C]	7/12			8/14			14/18		
	AC	T_a	[˚C]	24	26	27	24	26	27	24	26	27
1250	MAX	$Q_{c,t}$	[W]	1457	1714	1845	1223	1507	1633	659	843	956
		$Q_{c,s}$	[W]	1225	1407	1500	1076	1253	1343	659	836	925
		$\dot{m}_w$	[kg/h]	250	294	316	175	215	233	141	181	205
		Δp_w	[kPa]	0,99	1,30	1,46	0,57	0,78	0,89	0,41	0,60	0,73
	MED	$Q_{c,t}$	[W]	1352	1592	1713	1120	1399	1516	575	740	850
		$Q_{c,s}$	[W]	1068	1227	1308	938	1093	1171	575	729	807
		$\dot{m}_w$	[kg/h]	232	273	294	160	200	217	123	159	182
		Δp_w	[kPa]	0,88	1,15	1,29	0,50	0,70	0,79	0,34	0,49	0,61
	MIN	$Q_{c,t}$	[W]	1098	1292	1390	899	1136	1231	442	574	667
		$Q_{c,s}$	[W]	822	945	1007	722	841	902	442	561	621
		$\dot{m}_w$	[kg/h]	188	221	238	128	162	176	95	123	143
		Δp_w	[kPa]	0,64	0,82	0,92	0,36	0,51	0,57	0,23	0,34	0,42
2000	MAX	$Q_{c,t}$	[W]	2857	3361	3617	2402	2955	3202	1303	1665	1885
		$Q_{c,s}$	[W]	2420	2782	2965	2127	2477	2655	1303	1652	1829
		$\dot{m}_w$	[kg/h]	490	576	620	343	422	457	279	357	404
		Δp_w	[kPa]	4,45	5,93	6,76	2,41	3,44	3,95	1,71	2,58	3,19
	MED	$Q_{c,t}$	[W]	2523	2971	3198	2093	2611	2830	1081	1391	1595
		$Q_{c,s}$	[W]	2008	2308	2460	1765	2055	2202	1081	1370	1518
		$\dot{m}_w$	[kg/h]	433	509	548	299	373	404	232	298	342
		Δp_w	[kPa]	3,58	4,77	5,43	1,92	2,78	3,19	1,27	1,91	2,40
	MIN	$Q_{c,t}$	[W]	2317	2726	2933	1900	2397	2597	941	1220	1415
		$Q_{c,s}$	[W]	1748	2009	2141	1536	1789	1917	941	1193	1321
		$\dot{m}_w$	[kg/h]	397	467	503	271	342	371	202	261	303
		Δp_w	[kPa]	3,09	4,10	4,66	1,64	2,41	2,75	1,02	1,54	1,96
2750	MAX	$Q_{c,t}$	[W]	3655	4302	4630	3062	3782	4098	1641	2100	2385
		$Q_{c,s}$	[W]	3048	3504	3734	2679	3120	3343	1641	2080	2303
		$\dot{m}_w$	[kg/h]	627	738	794	438	540	585	352	450	511
		Δp_w	[kPa]	9,08	12,19	13,95	4,81	6,97	8,04	3,31	5,06	6,32
	MED	$Q_{c,t}$	[W]	3195	3762	4050	2650	3307	3584	1369	1761	2020
		$Q_{c,s}$	[W]	2543	2923	3115	2235	2603	2789	1369	1735	1922
		$\dot{m}_w$	[kg/h]	548	645	694	379	472	512	293	377	433
		Δp_w	[kPa]	7,14	9,57	10,92	3,76	5,50	6,34	2,45	3,74	4,73
	MIN	$Q_{c,t}$	[W]	2736	3220	3465	2244	2832	3068	1111	1441	1671
		$Q_{c,s}$	[W]	2065	2373	2529	1814	2113	2264	1111	1409	1560
		$\dot{m}_w$	[kg/h]	469	552	594	321	405	438	238	309	358
		Δp_w	[kPa]	5,44	7,24	8,25	2,84	4,21	4,83	1,75	2,67	3,42

Performance data / 4 pipe system — Height 200 mm

Technical sizes





Heating

Housing length L [mm]	Fan speed		Temperature regime			
		T_w	[°C]	75/65	70/55	55/45
	AC	T_a	[°C]	20	20	20
1250	MAX	Q_h	[W]	4541	3708	2626
		$\dot{m}_w$	[kg/h]	389	212	225
		Δp_w	[kPa]	1,85	0,68	0,75
	MED	Q_h	[W]	3283	2681	1899
		$\dot{m}_w$	[kg/h]	281	153	163
		Δp_w	[kPa]	1,07	0,41	0,45
	MIN	Q_h	[W]	2552	2084	1476
		$\dot{m}_w$	[kg/h]	219	119	127
		Δp_w	[kPa]	0,72	0,29	0,31
2000	MAX	Q_h	[W]	9131	7456	5281
		$\dot{m}_w$	[kg/h]	783	426	453
		Δp_w	[kPa]	9,18	3,11	3,45
	MED	Q_h	[W]	6507	5314	3763
		$\dot{m}_w$	[kg/h]	558	304	323
		Δp_w	[kPa]	4,98	1,75	1,94
	MIN	Q_h	[W]	4861	3969	2811
		$\dot{m}_w$	[kg/h]	417	227	241
		Δp_w	[kPa]	2,99	1,09	1,20
2750	MAX	Q_h	[W]	13743	11222	7949
		$\dot{m}_w$	[kg/h]	1178	641	681
		Δp_w	[kPa]	25,84	8,42	9,40
	MED	Q_h	[W]	9731	7946	5628
		$\dot{m}_w$	[kg/h]	834	454	482
		Δp_w	[kPa]	13,60	4,57	5,08
	MIN	Q_h	[W]	8134	6642	4704
		$\dot{m}_w$	[kg/h]	697	380	403
		Δp_w	[kPa]	9,80	3,36	3,72

Definition of symbols

AC	AC 230 V fan
$Q_{c,t}$ [W]	Total cooling capacity at 50 % relative air humidity
$Q_{c,s}$ [W]	Sensible cooling capacity
Q_h [W]	Heating capacity
$\dot{m}_w$ [kg/h]	Water flow
Δp_w [kPa]	Pressure drop on the waterside
T_w [°C]	Water temperature
T_a [°C]	Air temperature

Performance data / 4 pipe system — Height 200 mm

Housing length L [mm]	No. of fans	Water connector dimension ["]	Water content in the heat exchanger, heating [l]	Water content in the heat exchanger, cooling [l]	Sound power L_{WA} [dB]	Sound pressure L_{pA} [dB]	Max. input power [W] AC	Max. input current [A] AC
1250	1	1/2	0,5	1,4	50	42	20	0,12
					43	35		
					36	28		
2000	2	1/2	0,9	2,6	52	43	40	0,24
					45	36		
					38	29		
2750	3	1/2	1,3	3,9	54	44	60	0,36
					47	37		
					40	30		

The level of sound pressure LpA is calculated based on the level of sound power LWA emitted by the noise source at a certain distance (1 m) and depends on the installation type (free space or next to a wall).

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.

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:

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.

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.

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

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.

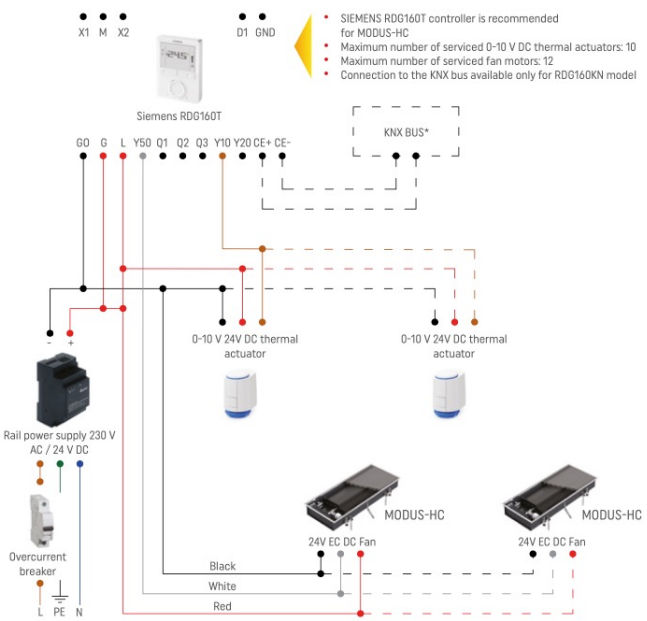
GERHMAN offers solutions that enable connecting MODUS.HC units into the following BMS systems:

• 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-200

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