

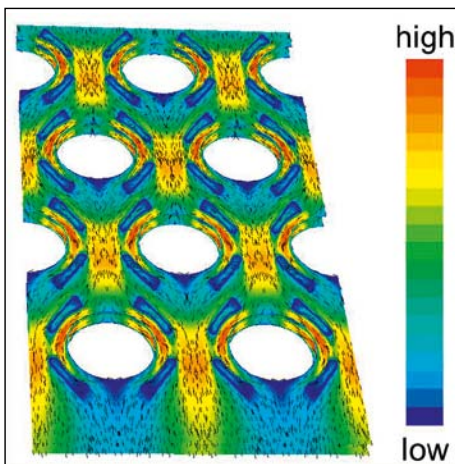


GEA *Multi-DENCO*®

Flexible and efficient:
Close Climate Control for IT equipment

GEA *Multi-DENCO*® at a glance:

- Multiple functions and applications
- High flexibility
- Large portfolio – variations and size
- Precise cooling, heating, humidifying and dehumidifying
- High energy efficiency
- Low investment cost
- Low operating cost
- Low carbon footprint
- According to "Green IT"
- Maintenance-friendly
- Comprehensive after-sales service (for operators)
- Refrigerant R-410A
- Inverter-driven speed-controlled scroll compressor
- EC plug fans
- High SHR (sensible heat ratio)
- Air flow direction in downflow and upflow
- Controls with touchscreen display
- Depth 88 cm max.
- Optional humidifier and heaters



Computational Fluid Dynamics (CFD)

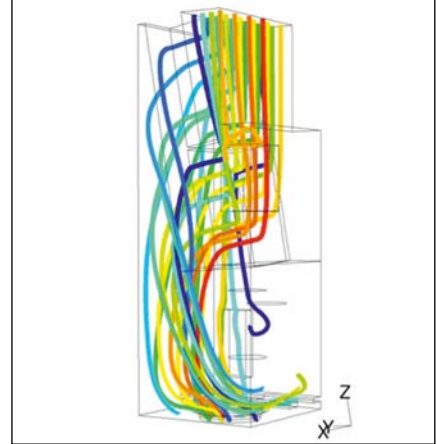
Computational fluid dynamics (CFD) is used to predict air flow and heat transfer in HVAC components as well as for room flow analysis. Within Engineering CFD is used for prediction and calculation of velocity, pressure and temperature fields in different applications.





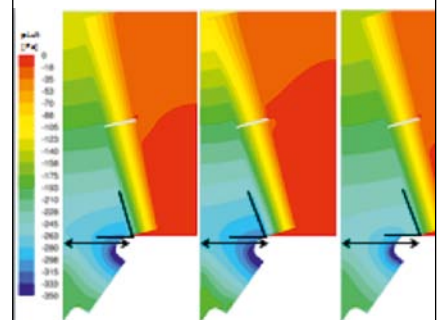
Optimization by CFD

Air flow

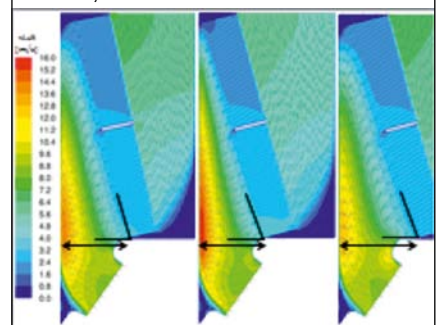


- 3D optimization of main components arrangement regarding air flow
- The goal is a small air pressure loss and even air velocity, resulting in low fan power input

Pressure drop



Velocity



- 2D optimization of geometry concerning pressure drop and velocity
- For all unit sizes
- Different heat exchanger setting angles and distances

Goal:

- Low fan power input due to low air pressure drop
- Maximum utilization of heat exchanger due to even airflow velocity

Efficiency and cost reduction

Inverter-based compressor speed control



Energy savings from inverter-based compressor speed control

1 Compressor 2 Inverter

Energy saving potential of an inverter compressor, using the example of <i>Multi-DENCO</i> ® DMA030 at partial load			
Type of compressor control		Conven-tional	Inverter
Cooling load	kW	21.3	21.3
Cooling duty	kW	27.7	21.3
Power input	kW	5.75	3.85
Energy efficiency (EER)		4.82	5.53
Operating hours per year	h	6,736	8,760
Annual power input	kWh	38,732	33,741
Annual energy savings	kWh	0	4,991
Electricity rate	€ / kWh	0.15	0.15
Annual cost savings	€	0	750
Cost savings in 10 years	€	0	7,500

Air flow concept

Typical data center air flow equipped with *Multi-DENCO*® downflow units

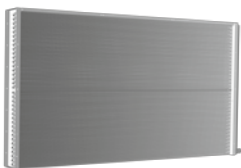
- 1 *Multi-DENCO*®
- 2 Supply air 18 - 27°C, in the raised floor
- 3 Cold aisle
- 4 Warm air circulates back along the ceiling to the *Multi-DENCO*®

Downflow version with air discharge into the raised floor



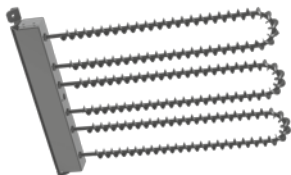
Electronic expansion valve

- Decrease of condensing temperature at low ambient temperatures enables energy savings as compared to thermostatic expansion valves
- Exact adjustment of the refrigerant flow = system always at optimum operating point



Heat exchanger

- Copper/aluminum high-performance heat exchanger with corrugated fins
- Designed for optimal air pressure drops
- Drip tray made of stainless steel



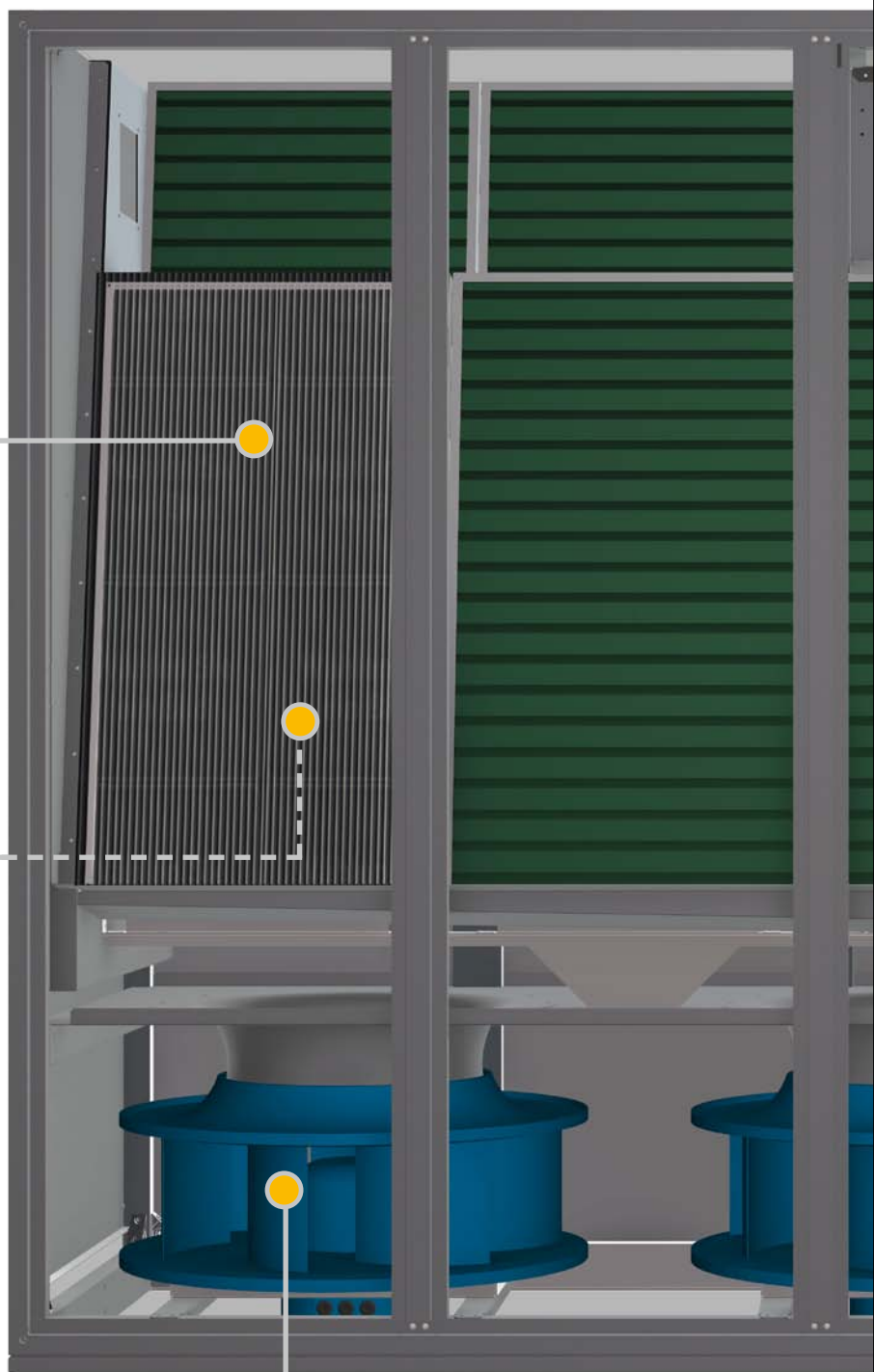
Re-heater

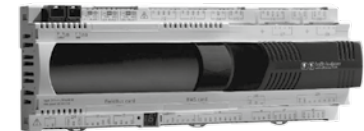
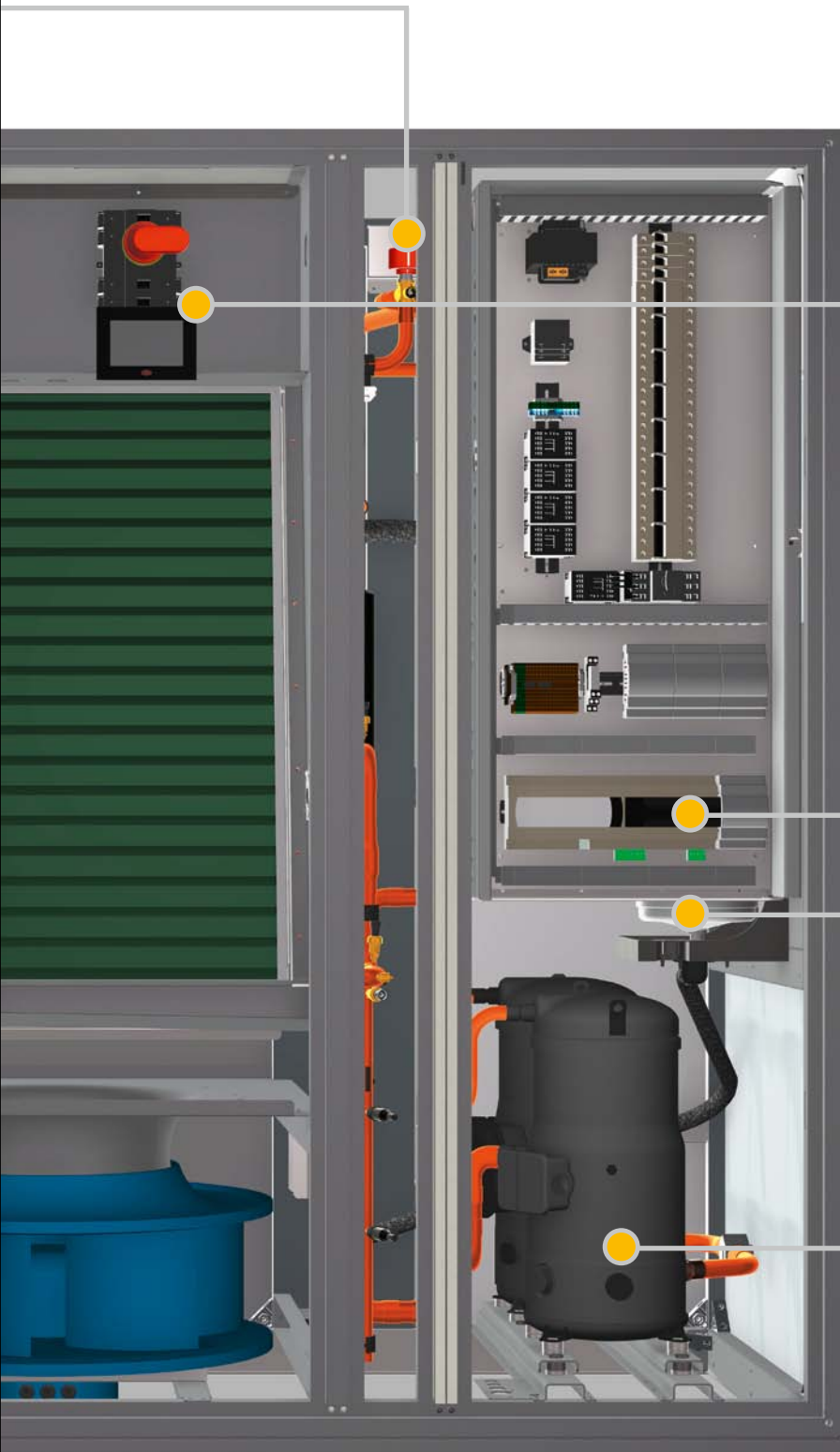
- Electric heating elements with stainless steel fins
- Low surface temperature to avoid glowing and sparking
- Also available with thyristor control as well as hot water heat exchanger



Fans

- Plug fan with 7 backward curved, three-dimensional, profiled blades made from high-performance composite material
- EC motor
- High efficiency





Controls

- Microprocessor controls
- Various interfaces for building management systems, etc.
- Touchscreen display



Humidifier

- Proportional-control electrode steam humidifier
- Microprocessor control with alarm and diagnosis unit



Compressors

- Inverter speed-controlled scroll compressor adjusts to requirements
- Refrigerant R-410A for efficient operation
- One to two compressors with a total cooling capacity of 5 to 130 kW
- Permanent magnet brushless DC motor

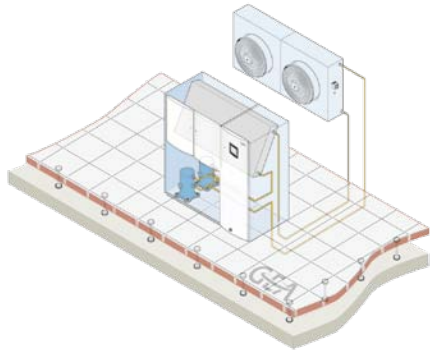
Model sizes		DMA010	DMA018	DMA030	DMA045	DMA065	DMA092	DMA130
Cooling ¹⁾								
Total cooling duty	kW	10.0	18.0	30.0	45.0	65.0	92.0	130
Sensible cooling duty	kW	9.6	16.9	28.7	42.8	60.7	84.4	119.3
Sensible heat ratio (SHR)		0.96	0.94	0.95	0.95	0.93	0.92	0.92
Fans								
Air flow	m³/s	0.83	1.43	2.40	3.53	5.09	6.47	9.19
Air flow	m³/h	2,993	5,148	8,640	12,722	18,338	23,280	33,100
External pressure	Pa	50	50	50	50	50	50	50
Power input	kW	0.6	1.6	1.5	2.5	4.1	6.8	10.8
Number of fans		1	1	1	1	2	2	3
Compressors ¹⁾								
Refrigerant		R-410A						
Type		Inverter Scroll						
Number of compressors		1	1	1	2	2	2	2
Power input	kW	2.2	4.2	6.7	10.2	15.2	21.6	31.1
Energy efficiency ratio (EER)		4.5	4.3	4.5	4.4	4.3	4.3	4.2
Humidifier								
Humidifier duty	kg/h	3	3	8	8	8	15	15
Power input	kW	2.3	2.3	6.0	6.0	6.0	11.3	11.3
Heating								
Electrical heating	kW	4	6	9	12	12	18	18
Electrical thyristor heating	kW	6	9	9	12	12	18	18
Sound								
Sound pressure level ²⁾	dB (A)	60	70	66	74	72	75	75
Weight and Dimensions								
Height	mm	1,940	1,940	1,940	1,940	1,972	1,972	1,972
Width	mm	600	800	1,180	1,670	1,992	2,500	3,380
Depth	mm	600	600	780	780	780	880	880
Weight	kg	180	210	290	410	550	700	1,000

We reserve the right to make technical modifications without prior notice.
¹⁾ Return air conditions: 24 °C / 50 % r.h., Condensing temperature 45 °C
²⁾ Sound pressure level at a distance of 2 m, under free-field conditions, above a raised floor

GEA *Multi-DENCO*®

Unit configuration and air path

Unit configuration: A-Version with air-cooled condenser

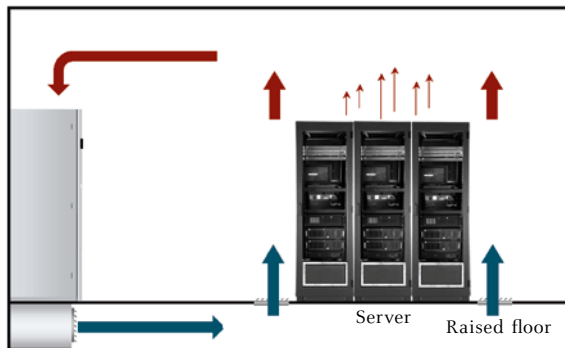


Unit configuration – versions

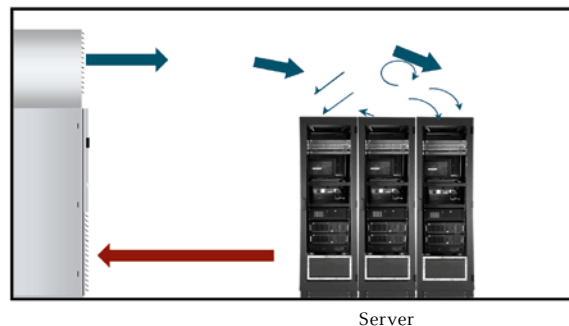
- A version with air-cooled condenser
- C version with chilled water cooling
- X version with direct evaporation, air cooled with external condensing unit
- All three versions can be fitted with an additional chilled water heat exchanger called "CombiCool"
- W version with water cooling
- F version with free cooling

Multi-DENCO® units are available with various air paths to cover applications from data centers to laboratories.

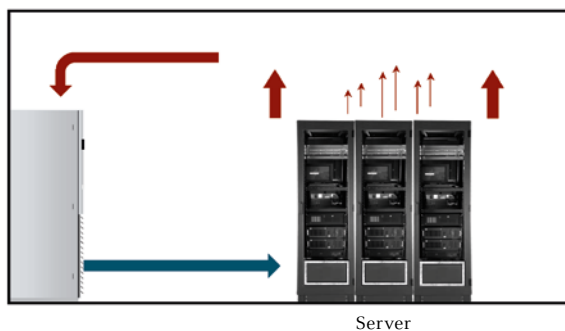
Air path downflow for raised floors



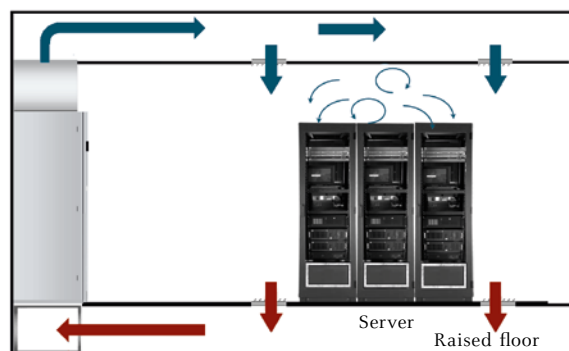
Air path upflow with horizontal air discharge



Air path downflow with front air discharge



Air path upflow for false ceiling and raised floor



GEA *Multi-DENCO*®

Applications and unit configurations

Multiple applications

- Data centre
- Server room
- Telecommunications facilities
- Switch room
- Machinery room
- Museum
- Archive
- Measurement centres
- Laboratories

Multiple configurations

Options

- Humidifier
- G4 or F7 filter
- Various heating options
- Shut-off valves
- Interface cards for building management systems
- Water detection
- Floor void air pressure control (APS)
- Air volume flow monitoring
- Energy monitoring
- Dual power supply
- Refrigerant leakage detection
- Smoke detection
- Protection grille unit top
- Air shut-off damper
- Outdoor unit with EC or AC fans
- Winter kit for very low ambient temperatures
- Heat exchanger coating outdoor unit

Designed to your requirements:

Plan quickly and reliably via webbrowser with
GEA AiD@ Software

GEA Close Control HVAC systems have the advantage that all these products can be designed to suit individual requirements. GEA AiD@ design software helps you here to implement your desired system at the turn of a hand. AiD@ provides configuration suggestions and calculates the performance. AiD@ instantly calculates and outputs system cooling capacity, temperatures, sound data, electrical input and dimensions and weights. You can't really plan faster than that, and at the same time more reliably! This means that you gain valuable time for other tasks. Request a login at your GEA sales office and select your desired unit on <https://www.aida.geagroup.com>



Accessories

- Base stand
- Condensate pump
- Horizontal air discharge
- Remote monitoring display



With its integrated energy calculation tool, the software determines operational costs. It also calculates forecast lifecycle costs – simply and conveniently.





We live our values.

Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA Group is a global engineering company with multi-billion euro sales and operations in more than 50 countries. Founded in 1881, the company is one of the largest providers of innovative equipment and process technology. GEA Group is listed in the STOXX® Europe 600 Index.