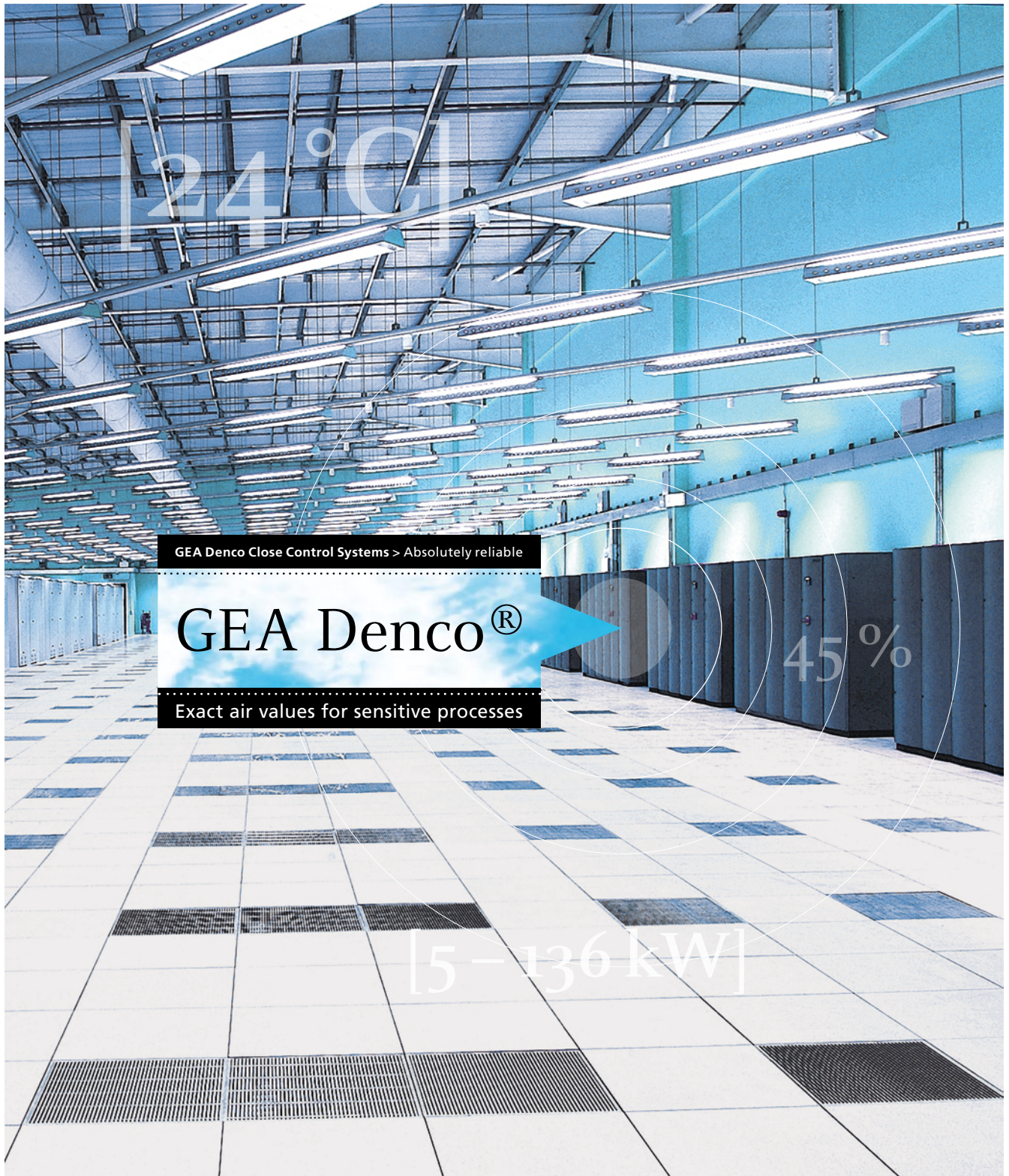


Air Eco₂nomy[®]



Contents

4	■ GEA Denco close control systems	Exact air values for sensitive processes
5	■ Overview of GEA Denco system diversity	An extensive product portfolio for virtually any application
6	■ Overview of GEA Denco cooling duties	Performance diversity – from 5 to 140 kW
7	■ Designed for IT applications	The GEA Denco T-Range
8	■ Designed for equipment and process cooling in industrial applications	The GEA Denco E-Range
9	■ Designed for small rooms and retrofits	The GEA Denco MS-Range
10	■ Outdoor units	The GEA Denco C-Range The GEA Denco DCRA and DDRA-Range
12	■ Standard model configurations	Solution possibilities – with clever combinations
15	■ Energy-saving option with freecooling	Up to 35 % less energy consumption Up to 20 metric tonnes reduction in CO ₂ emissions annually
18	■ Energy-saving option with an EC fan	Up to 60 % less fan power consumption
20	■ Energy-saving option with twin-compressor technology	Up to 40 % energy savings in compressor power by partial-load operation
21	■ Energy-saving option with an electronic expansion valve	Up to 25 % additional energy savings
22	■ Energy-saving option with an automatic pressurisation system	Advanced HVAC concepts for computer facilities
24	■ GEA Lplus software	Designed down to the last decisive point
25	■ Air directions and air routing	Airflow routing alternatives
26	■ Intelligent close control	Our climate control is communicative
28	■ GEA Denco components	Overview

Technical data

■ Air conditioning controls

30 ■ C3-05 controller

31 ■ T3-04 controller

■ GEA Denco T-Range

32 ■ DX A models 5 – 28

34 ■ DX A models 32 – 103

36 ■ DX W models 5 – 28

38 ■ DX W models 32 – 103

40 ■ DX F models 8 – 28

42 ■ DX F models 32 – 103

44 ■ DX X models 5 – 28

46 ■ DX X models 32 – 83

48 ■ C models 5 – 103



■ GEA Denco E-Range

50 ■ DX A models 24 – 94

52 ■ DX W models 24 – 94

54 ■ DX F models 24 – 94

56 ■ DX X models 24 – 94

58 ■ C models 34 – 94

60 ■ HS models



62 ■ GEA Denco MS-Range

64 ■ GEA Denco C-Range

66 ■ GEA Denco DDRA-Range

68 ■ GEA Denco DCRA-Range





GEA Denco close control systems

Exact air values for sensitive processes



Optimal climate control with GEA Denco

- Precise maintenance of temperature and humidity levels
- 24/7 performance
- Planning and project engineering support
- Inhouse testing at GEA Denco and precise production processes
- Fast service response
- Certification according to ISO 9001:2008
- Extensive range of various systems and model sizes
- Optimised solutions

Close control is for GEA HVAC Systems (HVAC = Heating, Ventilation, Air Conditioning) not just a name: it is a promise. A promise that we can keep on the basis of our many years of experience. All systems of the GEA Denco product portfolio promise the following: exact cooling with a precision of one degree Celsius; precise maintenance of relative humidity; and absolutely reliable, space-saving, and energy-efficient climate control solutions.

Perfect climate control for the most demanding of requirements

GEA Denco close control systems satisfy the most stringent specifications in computer centres and telecommunications facilities. They make a valuable contribution to the reliable operation and uninterrupted availability of IT systems. All close control systems in the GEA Denco portfolio satisfy temperature requirements, and in parallel maintain constant humidity levels in rooms, thereby preventing heat-related malfunctions and premature aging of hardware. But it's not only for IT that GEA Denco provides valuable services. In laboratories and chip production as well – and in nanotechnology and in medical facilities – the exact maintenance of specified air parameters and particularly good air quality are of great importance.

In the final analysis, quality can be seen and measured

GEA HVAC Systems manufactures air treatment systems, supports these facilities while they are in service, guides planners in project engineering to obtain optimal climate control and air distribution, and tests its products in its own laboratories and measurement centres under realistic conditions. GEA technicians check the performance capability of the equipment, simulate and verify the airflow at the installation site, and measure the sound power level – in addition to much more. As a result, our customers always receive a technologically mature and completely tested product that, moreover, has been manufactured in accordance with ISO 9001:2008.

Overview of GEA Denco system diversity

An extensive product portfolio for virtually any application

No two projects are alike. Laboratories have different basic conditions and requirements than computer centres and telecommunications facilities. Rooms are located in different types of buildings, have all kinds of climate conditions, and are arranged and furnished in different ways. For this reason, we offer you a whole spectrum of solutions that allows selections such as the following:

Flexibility and application diversity through modularity

- Various duties from 3 to more than 100 kilowatts of sensible cooling duty (for overview, see page 6)
- Indoor equipment or weatherproof outdoor versions
- Air or water cooled
- Cooling by refrigerants or chilled water
- Choice of refrigerant (R407C, R134a, or R410A)
- Indoor installation in a server room, or in an adjacent equipment room
- Intrinsic equipment redundancy
- Upflow or downflow air directions and air distribution through raised floors (for overview, see page 25)
- Equipment optimised for part load, with compressors in twin configurations, or freecooling for energy-saving operations
- Various filter classifications
- Various heating systems
- Systems containing parallel configurations of refrigerant and chilled-water systems

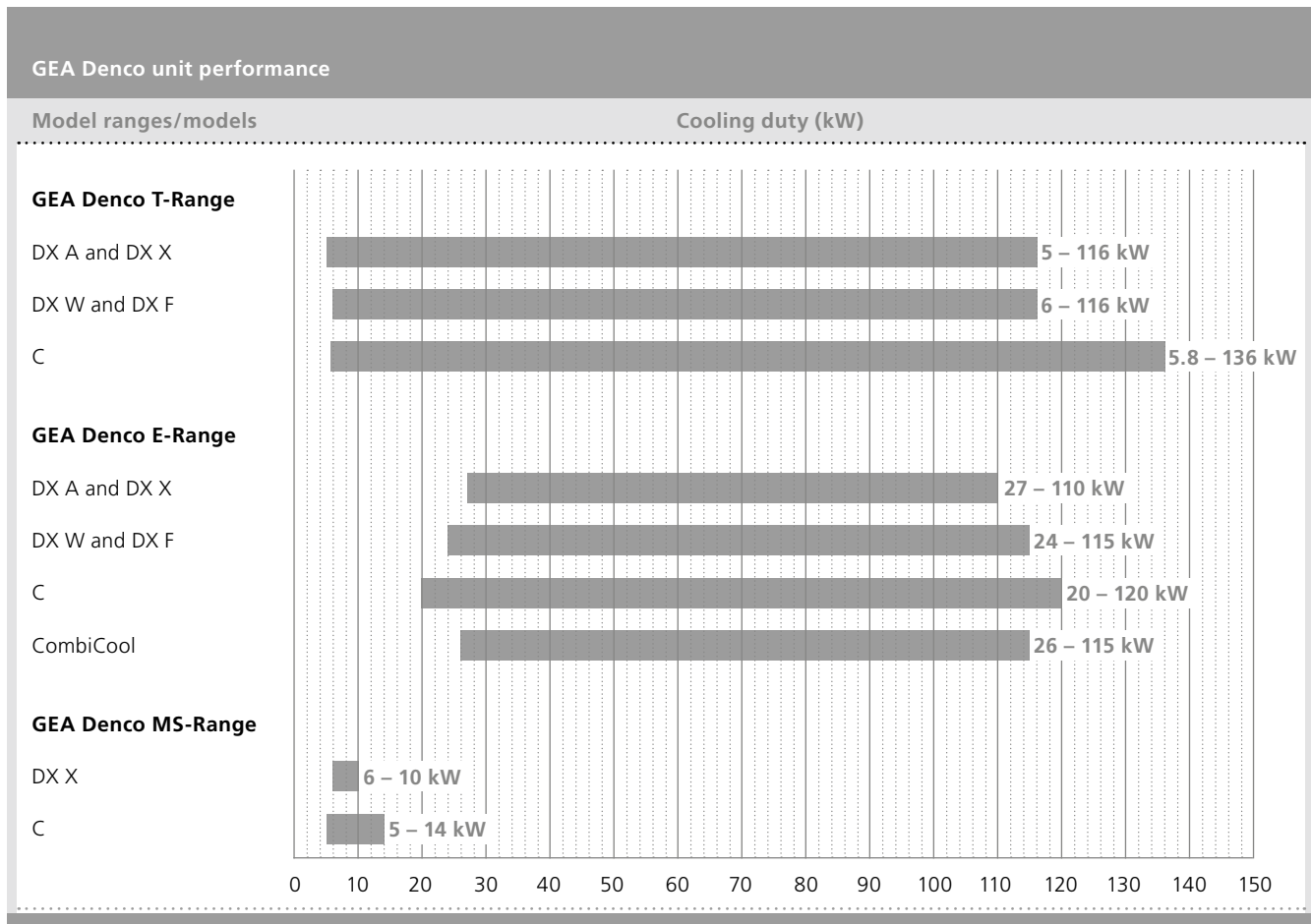


Perfect fit – modular solutions with systematic sophistication

Every square metre counts. That's why GEA Denco close control equipment has such a small footprint. Especially interesting for computer centres: the grid dimensions of our close control systems match the typical dimensions of computer racks and floor tiles. In width, our smallest units take little more space than a rack. As a result, GEA Denco units can be harmoniously embedded in small server rooms. Where greater duties are required, multi-door close control cabinets can be used.

Overview of GEA Denco cooling duties

Performance diversity – from 5 to 140 kW



GEA Denco models

- DX A version:
Air cooled with internal compressor and external condenser
- DX X version:
Air cooled with external condensing unit
- DX W version:
Water cooled
- DX F version (AmbiCool):
Water cooled with freecooling option
- C version:
Chilled-water model
- CombiCool version:
With redundant circuit

Model ranges and cooling duties

The T-Range and the E-Range of GEA Denco close control systems are especially designed for applications in sensitive areas such as telecommunications, chip factories, and computer centres: i.e., for all operations in which constant temperature, humidity, and air quality are essential. These two ranges operate with great energy efficiency and environmental harmony. Models such as those with variable refrigerant flow control or with freecooling, efficiently enable demand-driven and energy-saving applications.

The TW models are T-Range units in weatherproof version for outdoor applications. The MS-Range was developed especially for retrofit projects, and is available in smaller cooling ranges.

The cooling models DX A and DX X involve the use of units with direct expansion and an air-cooled condenser. DX W and DX F, on the other hand, operate with direct-expansion and water-cooled condensers or condensing unit. C models operate with an external chiller (also see pages 12 – 14).

Designed for IT applications

The GEA Denco T-Range



- The T-Range is ideal for application in server and computer rooms, telecommunications facilities, control and switching centres, laboratories, printing and graphics areas, sales zones, chip production, and high-tech offices
- Compact full-function units
- Fully modulating chilled-water operation
- Equipped as standard with high-quality, directly driven fans
- Air directions upflow or downflow
- Air-cooled, water-cooled, and split-system versions
- Optimised for environmentally friendly refrigerants
- Equipped as standard with fully hermetic scroll compressors (twin-compressor technology/VRF)
- Large number of standard options
- User-friendly, networkable control systems
- Complete front access for easy service and operation
- Units also available in weatherproof versions, with all functions (Box size 5 – 42)
- Large selection of matching accessories and options: e.g., electronic expansion valves, VRF technology and EC fans

Models in the T-Range are available in 5 versions, for cooling duties between 5 and 136 kW. They are provided with environmentally friendly refrigerants.

Features of the GEA Denco T-Range

The GEA Denco close control units from the T-Range are compact and are available with various heat-rejection systems. Fully hermetic scroll compressors operate inside the units; they are also optionally available in twin version for energy-efficient VRF application. The air direction of the units can be either upflow or downflow. The models can be fitted with various supply air and return air configurations. An intelligent electronic system controls the units: it assures that precise tolerances are maintained for temperature and humidity, and it allows energy-saving operations. This close control system also allows the units to be networked together for master-slave operation, or as individual units. Data entry takes place via a matching soft-touch keypad, which is either mounted with the display on the close control unit, or is used as a remote control system. The heat exchangers are designed for maximum heat exchange area, minimum pressure drop, and quiet operation. The units in the T-Range are equipped with direct-drive fans, the fitting of EC fans is also possible as an option.

TW models: T-Range units in weatherproof version

The weatherproof models of the T-Range are installed in water- and dustproof enclosures with outer panels having a high-quality synthetic coating on a metal substrate. This solution means that they effectively resist the worst of storms and rain and can be easily installed on outside walls. The close control units of the TW models have cooling duties of 3 to 42 kW. The units are splashproof in accordance with IP54.



Designed for equipment and process cooling in industrial applications

The GEA Denco E-Range



- The E-Range is ideal for uses in industrial facilities, computer rooms, control centres, and machine rooms
- Full functional capacity with large bandwidth
- Various possibilities of cooling
- Heat-dissipation configurations
- Air directions upflow or downflow
- Air-cooled direct evaporators, as well as chillers
- Optimised for environmentally friendly refrigerants
- Equipped as standard with scroll compressors
- Energy-saving VRF technology
- Large numbers of standard options
- User-friendly, networkable control system
- Availability of G4 and F7 filters

Units in the E-Range are offered in 5 versions, for cooling duties between 20 and 120 kW.

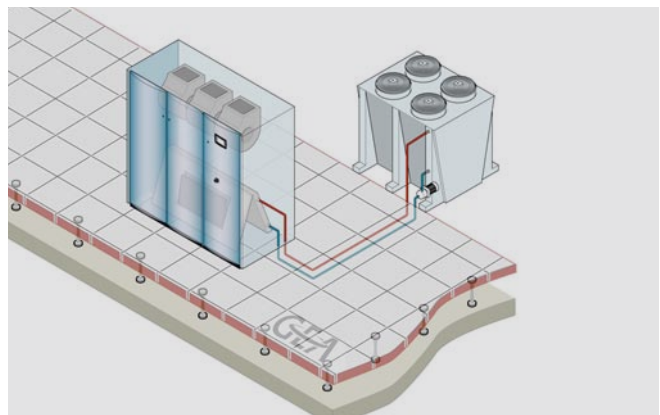
Features of the GEA Denco E-Range

The GEA Denco direct-expansion systems in the E-Range are outwardly similar to the T-Range, but are less deep – which saves room. E-Range units are equipped with autonomous fans driven by V-belts. As an option, backward-curved fans are also available for greater external static pressure requirements.

HS models: high static pressure

HS models are specifically designed for upflow applications such as clean rooms, hospitals, and laboratories, where external static pressures of up to 800 Pa can be required for HEPA filtration and often complex air distribution systems. Efficient, backward curved centrifugal fans are used with inverter drives to maintain constant temperature, air volume or pressure differential as required, all with minimal energy consumption. Rigid cartridge-filters to EU7 grade can be provided for use as pre-filters with a digital pressure loss indication system fitted as standard.

Cooling is C or DX X type, and a coil bypass is provided when high room air-change rates are required without high-density cooling loads. This bypass arrangement can facilitate very close control of temperature to ± 0.2 K, relative humidity to ± 2 %, and air-differential pressure to within 2 Pa of setpoint.



The HS models (high static pressure)

Designed for small rooms and retrofits

The GEA Denco MS-Range

Units in the MS-Range are available in 2 versions, for cooling duties between 5 and 14 kW.

Features of the GEA Denco MS-Range

The MS-Range units in box design for floor and wall mounting are generally used in small areas with no raised floor, lack of floor space, or low room height.

These full-function units with humidity control in DX X or C version, can be used typically for small server rooms, switch cabin controls, and machine rooms. Options such as heaters, humidifiers, BMS interfaces, base stands, and many more for flexible but precise requirements give the MS-Range the opportunity to serve as an efficient alternative to conventional split solutions.

MS-Range application

The MS-Range offers a wall-mounted solution with high sensible heat ratio, rugged metal casing, integral temperature and humidity controls, and on-board humidification system. Units discharge air from the top or front surface at high level, with front return at lower level, and are available with up to 12 kW sensible cooling duty, either using an external matched condensing unit (DX X type) or a chilled-water supply (C type).

Electric heating is standard for year-around cooling applications, while alternative low temperature hot water (LTHW) can be selected for winter heating. Unlike most wall mounted units, the MS-Range also uses recyclable panel filters up to EU4 standard, and its metal casing makes it suitable for certain demanding environments such as underground areas, electrical plant rooms, and battery rooms.



The MS-Range is ideal for retrofitting, and for application in small server rooms.

Outdoor units

The GEA Denco C-Range



C-Range: condensing units from 4 – 38 kW

Functions of the C-Range

- Emergency-off main switch
- Speed control via the indoor unit
- Refrigerants R407C, R134a, or R410A

Accessories of the C-Range

- Blygold coating
- VRF twin compressor, optional
- Separate high-pressure switch for stepped switching
- Hot-gas bypass
- Liquid receiver with safety valve
- Compressor soft start

The air-cooled condensing units in the C-Range are available with cooling duties of 4 to 38 kW.

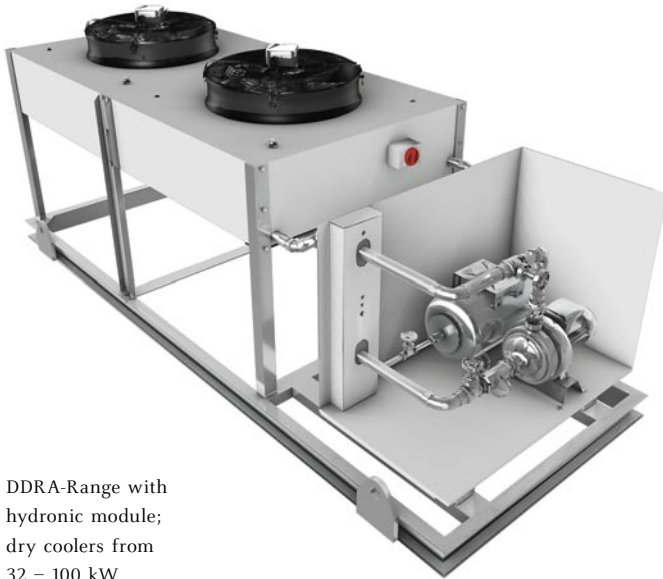
The C-Range is designed for installation outdoors, and is manufactured in accordance with quality standard ISO 9001:2008.

The equipment components are mounted on a sturdy base frame made of galvanised steel. They are located in an enclosure with synthetic-coated steel sheet. The compressor is protected by high- and low-pressure safety switching, and the condensing pressure is regulated by means of a fan-speed controller. High- and low-pressure measuring fittings are located on the compressor. The condensing units are delivered with a small holding charge of nitrogen.

Scroll compressors are fitted as standard with R407C refrigerant, and are equipped with shut-off valves and a crankcase heater. If requested, refrigerants R134a and R410A can also be used.

Outdoor units

The GEA Denco DCRA and DDRA-Range



DDRA-Range with hydronic module; dry coolers from 32 – 100 kW

The condensers in the DCRA-Range are available in ratings from 3 to 75 kW – and the dry coolers in the DDRA-Range from 32 to 100 kW.

The two ranges are absolutely identical when seen from the outside. They have the same dimensions, and are designed and manufactured for installation outdoors in accordance with quality standard ISO 9001:2008.

The condensers and dry coolers are equipped with directly driven, quiet-running axial fans with protection guards according to DIN 31001 and 24167.

Selection is possible in 3 sound power classes (6, 8, or 12-pole motors). The fans are statically and dynamically balanced with balancing quality Q 6.3. They are outstandingly suited for air-intake temperatures of -25 to +55 °C. The weather-protected and maintenance-free motors have an IP54 class of enclosure protection, and class F for insulating material. The frame, enclosure, and feet are made of aluzinc steel sheet.

Functions of the DCRA/DDRA-Range

- Emergency-off main switch
- Horizontal or vertical air routing
- Refrigerants R407C, R134a, and R410A or chilled water
- 3 sound power classes, with 6-pole motor as standard (8 or 12-pole motor as option)
- Blygold coating, optional

Accessories of the DDRA-Range

- Hydronic module (hydraulic kit), mounted on the common equipment frame
- Accessories of the hydronic module:
 - Expansion tank
 - Separate pumpset
 - Manual shut-off valve
 - Copper and steel fittings, or copper and brass
 - Soldered or threaded connections

Accessories of the DCRA-Range

- Temperature-controlled, separate speed regulation (not necessary for use with any GEA Denco A-Type indoor unit)
- Winter start kit (down to -40 °C)
- Stacking kit

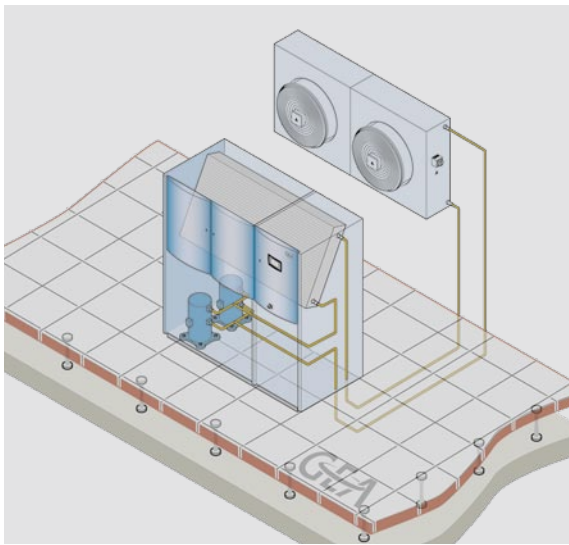


DCRA-Range: air-cooled condensers from 3 – 75 kW

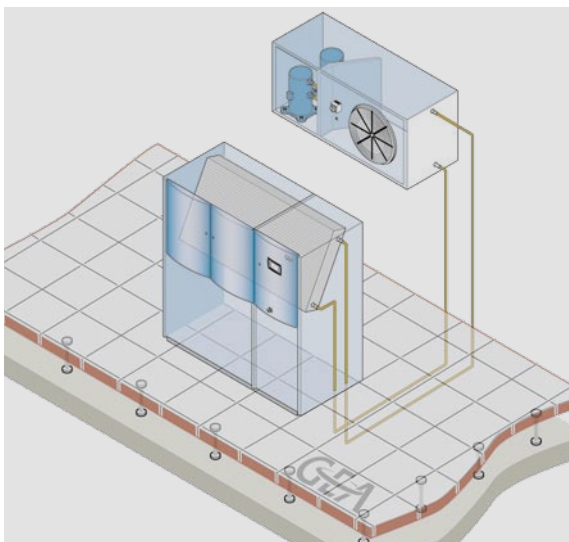
Standard model configurations

Solution possibilities – with clever combinations

GEA Denco close control units are available in various cooling versions, depending on the requirements. This means that optionally matched solutions can be implemented for each location and each building situation.



DX A version: direct-expansion, EER = 3.8¹⁾



DX X version: direct-expansion, EER = 3.6²⁾

DX A version

Air cooled with internal compressor and external condenser

This model is a close control system featuring direct-expansion with an air-cooled condenser. The close control unit is available with either 1 or 2 cooling circuits, and with 1 or 2 compressors (twin-compressor VRF technology) per cooling circuit. The air-cooled condensers of DCRA-Range are offered in 3 different sound power level classes (6, 8, or 12-pole motors), and optionally with a winter start kit (with additional liquid receiver and liquid backup control) for extremely low outdoor temperatures (down to -40 °C).

Both DX A and DX X versions are characterised by comparatively low investment and installation costs and by good cost effectiveness. As a result, it is particularly interesting for machine rooms and server rooms, small to medium-sized data centres, and installations with short and medium-length pipe lengths. An additional advantage of version DX A is the low sound power level of the air-cooled condensers in comparison to the outdoor units of the DX X versions, which additionally are fitted with compressors.

DX X version

Air cooled with external condensing unit

This is a close control system configured as a direct-expansion version with an external air-cooled compressor-condenser unit. The close control unit is available with either 1 or 2 cooling circuits, and with 1 or 2 compressors (twin-compressor VRF technology) per cooling circuit. The DX X version is offered in 3 different sound power level classes (6, 8, or 12-pole motors), and optionally with a winter start kit (with additional liquid receiver and liquid backup control) for extremely low outdoor temperatures (down to -40 °C).

The DX X version is characterised by comparatively low investment and installation costs and by good cost effectiveness. As a result, it is particularly interesting for machine rooms and server rooms, small to medium-sized data centres, and installations with short and medium-length pipe lengths.

¹⁾ Selection parameter: 24 °C/45 %/T_{ambient}: 35 °C
(External unit excluded)

²⁾ Selection parameter: 24 °C/45 %/T_{ambient}: 35 °C

DX W version

Water cooled

This version is configured with internal compressors and heat rejection to external dry coolers via inbuilt stainless steel plate heat exchangers. The close control unit is available with either 1 or 2 cooling circuits, and with 1 or 2 compressors (twin-compressor VRF technology) per cooling circuit. The dry coolers of the DDRA-Range are offered in 3 different sound power level classes (6, 8, or 12-pole motors). They are also optionally available with a hydraulic kit (hydronic module) matched to the piping system, and mounted on a common unit frame.

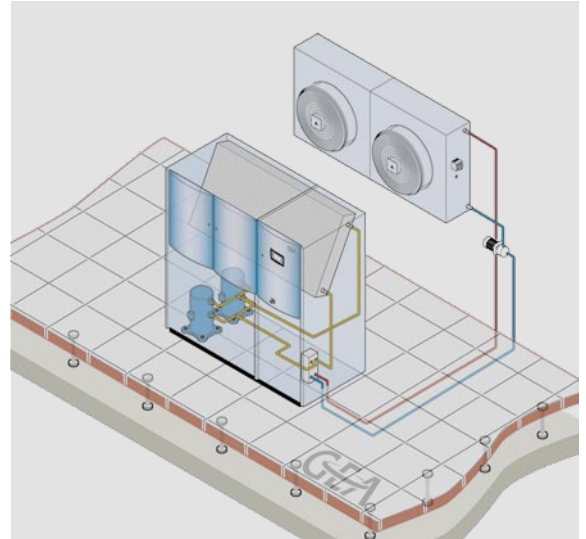
The DX W version is especially effective in machine rooms and server rooms, small to medium-sized data centres, and installations with long pipe lengths, since all close control units can be connected to 1 piping system.

C version

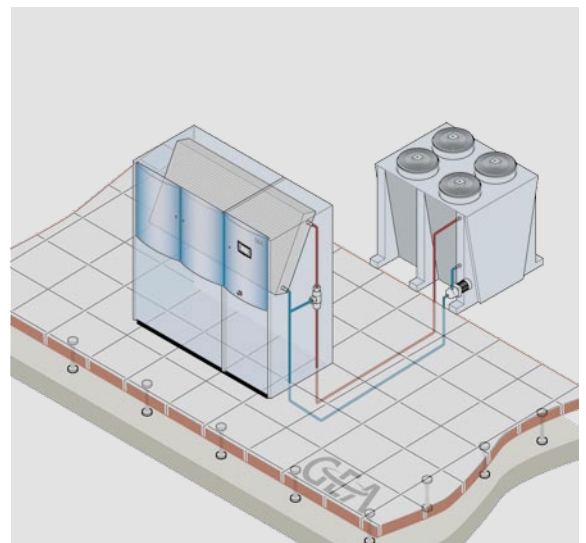
Chilled-water model

This is a close control unit configured as a chilled-water system for connection to a separate chiller. The unit is equipped with a cooling coil and a modulating (0 – 10 V) 2- or 3-way servo-valve. All air- and water-cooled GEA chillers can be used with the C version.

The C version is primarily used for medium-sized computer centres, large data centres, and installations with long pipe lengths. In connection with the freecooling range of GEA chillers³⁾, the C version is especially relevant today because of its highly economic energy consumption. Together with the latest in EC fan technology, very low power consumption is achieved by the C version when referenced to the power input of the fans, particularly when configured as a standby-redundant system.



DX W version: direct-expansion, EER = 4.4¹⁾

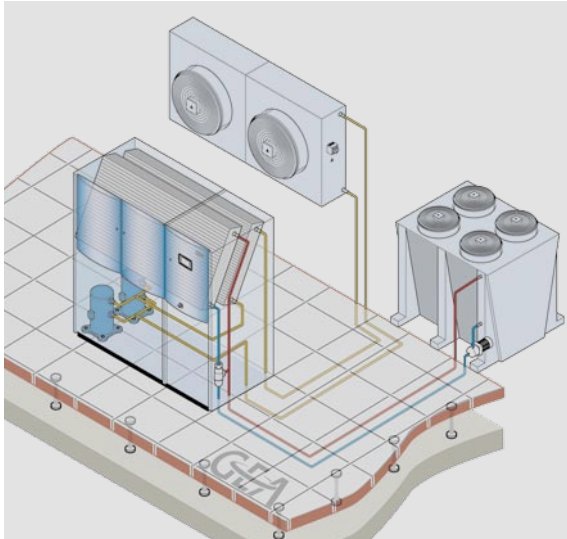


C version: chilled water, EER = 25.0²⁾

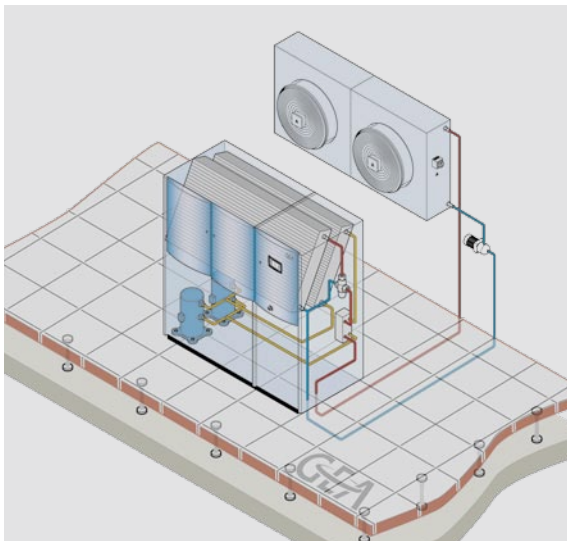
¹⁾ Selection parameter: 24 °C/45 %/Water: 30/35 °C
(External unit excluded)

²⁾ Selection parameter: 24 °C/45 %/Glycol 0 %/Water: 7/12 °C
(External unit excluded)

³⁾ Please consult our product brochure about GEA chillers
for detailed information.



CombiCool version: redundant cold-water circuit, EER = 3.8¹⁾



DX F version: freecooling and energy-saving option, EER = 4.3²⁾

¹⁾ Selection parameter: 24 °C/45 %/C/T_{ambient}: 35 °C
(External unit excluded)

²⁾ Selection parameter: 24 °C/45 %/Water: 30/35 °C
(External unit excluded)

CombiCool version

Enhanced availability with redundant chilled-water circuit

The CombiCool version includes 3 different models:

- Direct-expansion with air-cooled condenser + chilled-water cooling coil
- Direct-expansion with water-cooled condenser + chilled-water cooling coil
- Chilled-water cooling coil + chilled-water cooling coil (dual coil)

All CombiCool versions consist of 2 independent cooling circuits, either chilled water/DX or CW/CW. This enables switch-over between the respective cooling types. Primary cooling is normally achieved by the chilled-water coil, fed from the building chiller. In case of failure, malfunction, or service of the primary source, operation is automatically switched over to the direct-expansion unit or to the second chilled-water system. A major advantage of the CombiCool version is the inherent redundancy of the system with a small installation footprint. In addition, the second chilled-water coil can be used as a secondary freecooling coil for high-load or energy-saving aspects.

DX F version (AmbiCool)

Water cooled with freecooling and energy-saving option

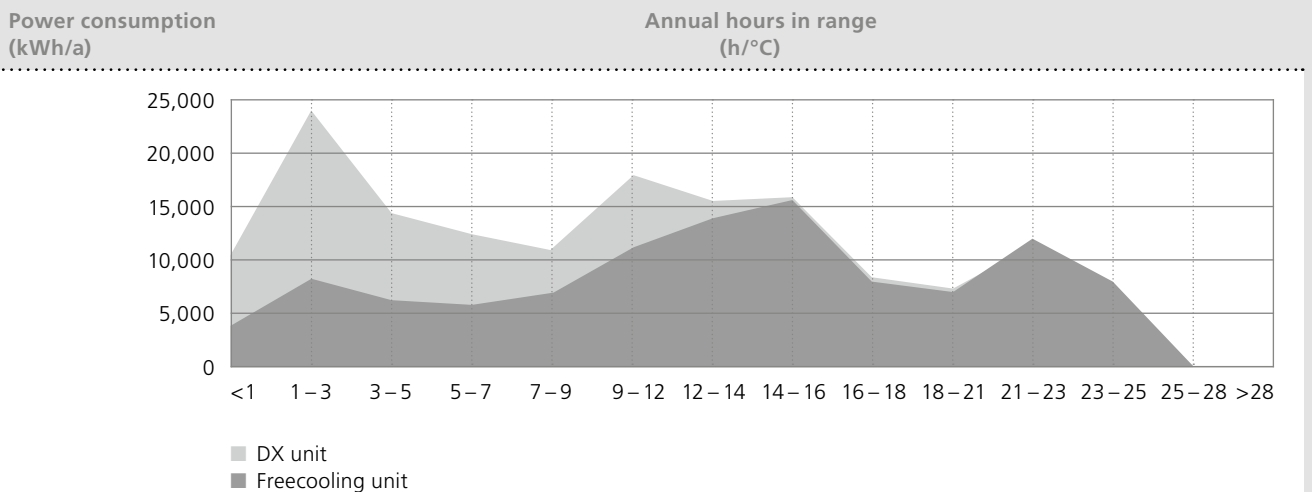
This is a close control system configured as a version with direct-expansion cooling, a water-cooled condenser as a stainless steel plate heat exchanger, a 3-way servo-valve, a freecooling coil, and an external dry cooler. The close control unit is available with 1 freecooling circuit and with either 1 or 2 cooling circuits, and with 1 or 2 compressors (twin-compressor VRF technology) per cooling circuit. When glycol water supply temperatures are at least 2 K below the return air temperature setpoint, mixed operation takes place: i.e., with compressors and freecooling. When glycol water supply temperatures are low enough to maintaining the required return air temperature, the system operates under a pure freecooling mode. The dry coolers of DDRA-Range provide freecooling and are available in 3 different sound power level classes (6, 8, or 12-pole motors). They are also optionally offered with a hydraulic kit (hydraulic module) matched to the piping system, and are mounted on a common unit frame.

The DX F (AmbiCool) version is especially effective for applications in which the primary importance is operational costs. Compared to version DX W, version DX F offers considerable total cost savings.

Energy-saving option with freecooling

Up to 35 % less energy consumption

Power consumption of a freecooling unit in the T and E-Ranges, as version DX F



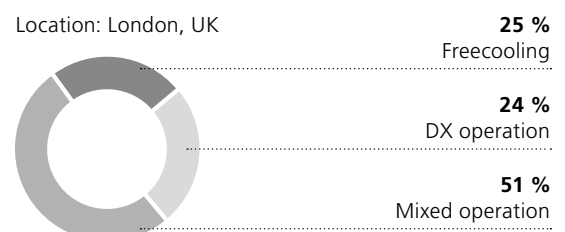
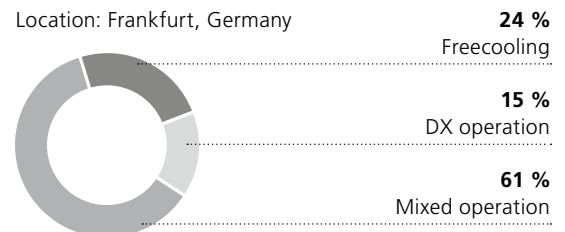
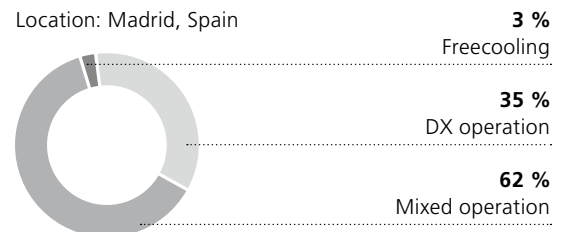
Savings enabled by a freecooling unit in comparison to a direct-expansion system (example given for Frankfurt, Germany)

In many cases, IT professionals prefer refrigerant-based climate control over solutions with water circuits – and they lose hard money by their decisions. Close control systems with a glycol-water circuit and freecooling enable more economical cooling of servers. Their power consumption is up to 35 % less, since the freecooling principle enables the compressor to stay off on cool days, or to operate in partial-load mode.

Benefits of freecooling

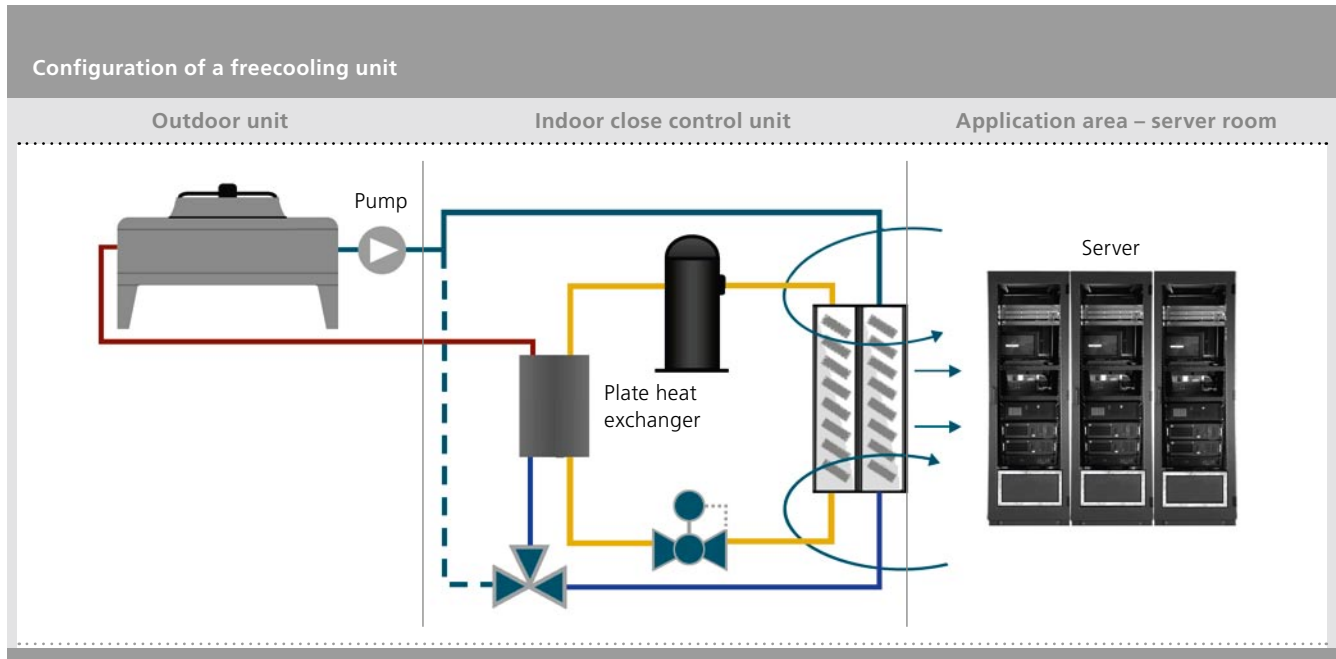
Once the system capacities, air distribution, and installation site have been decided, the question often arises of the optimal functional principle. To prevent water damage, many users prefer a refrigerant-based system. This decision, however, brings a number of disadvantages. Any leaks in the cold-water circuit, for example, are easier to localise than leaks in a refrigerant circuit: because any leaking refrigerant will immediately evaporate. In addition, cold-water networks enable a piping system with long pipe lengths, to which additional equipment units can be easily connected. Finally, a glycol-water system offers the possibility of locating the freecooler at any point, and to use it for freecooling. To avoid any risk of leaking water, it is sufficient to install a drip tray in a normal raised floor. The dimensions of the floor are smaller than often assumed, and installation costs and loss of space are insignificant.

Operational times for freecooling



Energy-saving option with freecooling

Up to 20 metric tonnes reduction in CO₂ emissions annually



At sufficiently low outdoor temperatures, close control systems equipped with freecooling require no compressor operation – or only partial-load compressor operation. In Germany this saves approximately one-third of power costs over conventional solutions.

System comparison Close control systems with and without freecooling		Water-cooled system	Freecooling system
		DX W version	DX F version
Cooling duty	kW	40.8	40.8
Power input compressor	kW	5.78	5.84
Annual compressor runtime ¹⁾	h/a	7,008	2,516
Annual compressor power input	kWh/a	40,500	14,700
Power input fans	kW	2.82	3.12
Annual fan runtime	h/a	8,760	8,760
Annual fan power input	kWh/a	24,700	27,300
Annual total power input	kWh/a	65,200 ²⁾	42,000 ²⁾
Annual operating costs (at € 0.15/kWh)	€/a	9,780	6,300
Annual operating costs (at £ 0.13/kWh)	£/a	8,480	5,460
Annual savings of costs	%/a	–	35.6
Annual savings of tons of CO ₂	t/a	–	24.0

¹⁾ Estimated load 80 %

²⁾ Location: Berlin, Germany

You can save money by considering close control units with water-glycol circuits and freecooling – especially in cases where high internal cooling loads must be dissipated. The calculated example above shows the energy-saving potentials by comparing 2 GEA Denco close control units (with and without freecooling) from the T-Range with identical cooling duty.



In both versions, DX W and DX F, a refrigerant circuit is installed inside the close control unit. This circuit transfers the heat to be dissipated via a heat exchanger to a water-glycol circuit. This circuit, in turn, is integrated with an air water cooler installed outside.

In the DX F version, the heat produced is dissipated via an additional interior air-water heat exchanger in a supporting function. Under most favourable conditions, freecooling suffices to provide the required temperature without support from the compressor. In transitional periods – i.e., spring and autumn – the compressor will switch in, under partial load if possible (and depending on the model). Both operational cases minimise the operational time and the load carried by the compressors: which saves power.

Freecooling offers major savings in Central and Northern Europe

Increased investment in a system with freecooling saves money when there are high cooling loads inside, and if the outdoor temperature is often below the required supply air temperature on the annual average. This is the case as a rule in Central and Northern Europe. The calculation example in the table left shows the potential savings: the cost basis is a power price of € 0.15/kWh. With the DX F version, the compressor can remain off for around one-third of the year, with the result that power consumption is only around 42,000 kWh per year. This version saves about € 6,300 (£ 5,460) per year over the DX W version, which requires about 65,200 kWh annually. Increased investment costs for the DX F Version therefore amortise in less than 2 years – and environmental benefits result at the same time. On the basis of generation in a German power plant, freecooling eliminates almost 20 metric tonnes of CO₂ emissions per year: which amounts to almost the power consumed by 10 three-person households.

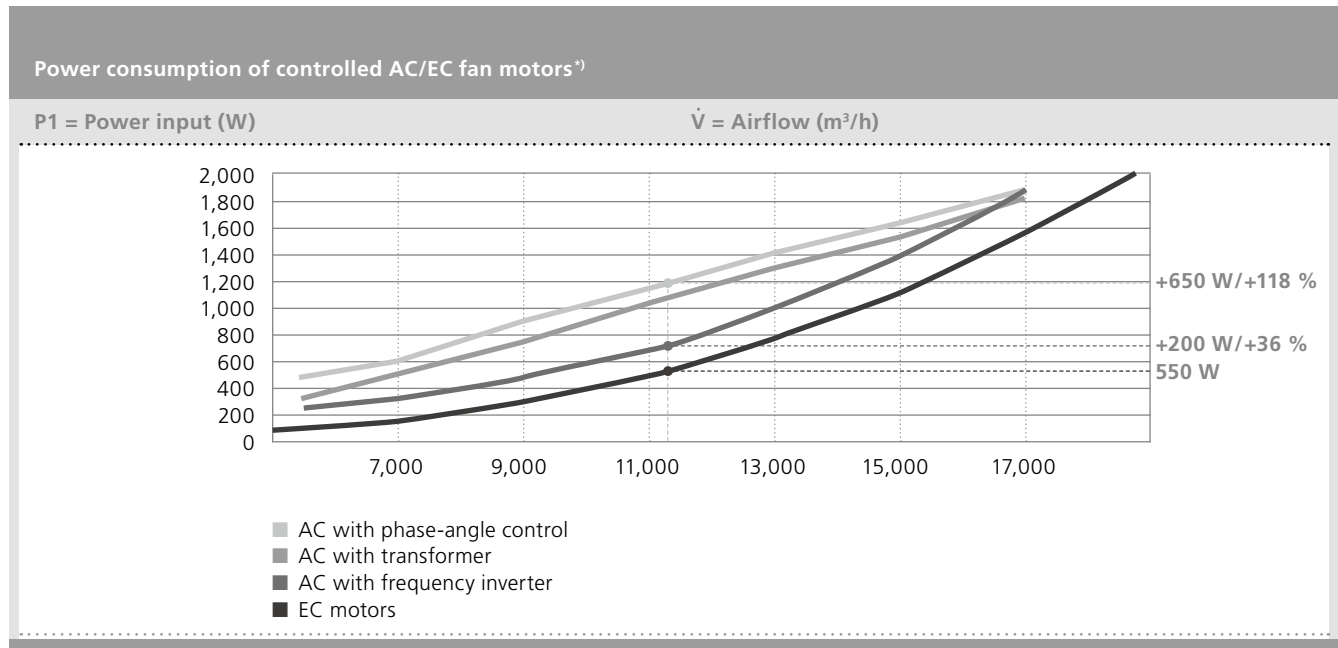
Close control systems with freecooling also compare quite favourably with models based on refrigerant. In comparison with a split model with the same duty, a freecooling system saves more than 20,000 kWh of power and, at the same time, offers structural benefits over a water-based system.

Advantages of freecooling at a glance

- Reduced energy consumption for at least 70 % of the year
- Can be combined easily with heat reclaim systems
- Allows energy-efficient control of room relative humidity
- Maintains integrity and isolation of room environment
- Much cleaner indoor air with minimal contaminants
- Refrigeration-engineer skills not required for installation
- Minimal refrigerant content in accordance with EN 378
- Greater inbuilt redundancy when freecooling available
- Partial freecooling available 60 % of the year
- Security from gas or smoke infiltration or attack
- No variation in air volume or pressure due to external conditions
- Freecooling still possible with high external moisture contents
- Low external noise levels achievable without energy penalty
- Increased flexibility regarding plant location and reconfiguration
- Maintenance for filters significantly reduced

Energy-saving option with an EC fan

Up to 60 % less fan power consumption



^{*)} Source: ebm-papst, Muldingen, Germany

Comparison of operating costs T-Range with EC fan / T-Range with AC fan		TD083C-AC	TD083C-EC	TD083C-EC
		Stand-by unit	Stand-by unit	Running redundancy
Number of units		6 (+1 stand-by)	6 (+1 stand-by)	7
Airflow	m³/h	96,000	92,820	87,600
Cooling duty net sensible	kW	435	435	435
Fan power consumption	kW	31.8	17.5	11.6
Annual operating costs (at € 0.15/kWh)	€/a	41,800	23,000	15,200
Annual operating costs (at £ 0.13/kWh)	£/a	36,200	19,900	13,200
Annual cost savings	€/a	–	18,800	26,600
	£/a	–	16,300	23,000
Annual savings	%/a	–	45.0	63.6

In this application example, the EC motor saves 45.1 % of energy costs in comparison to an asynchronous motor (AC) with the same extractable heat load. If the redundant unit is running in parallel (only possible with an EC motor), the total savings here are around 63.7 %. The percent savings are greater for a lower number of units (minimum = 2).

The EC motor is an electronically commutated permanent-magnet, direct-current motor with efficiency of over 90 %.

The infinitely variable speed control of the EC motor takes place electronically, by semiconductors. As a result, it is not subject to wear. All motor-protection functions are integrated and contribute to a reliable and especially long motor life cycle. The motor fulfils all regulations for electromagnetic compatibility.

The efficiency of the EC fan is over 90 % and enables energy-savings of up to 45 % with respect to equipment with conventional asynchronous motors (AC).

The GEA Denco microprocessor control system offers additional energy savings: this is because, for example, operation of several units (including a redundant unit) is possible with reduced airflow and speed under normal conditions. If, for example, one unit is shut down for maintenance, the airflow of the remaining units in operation will be automatically increased.

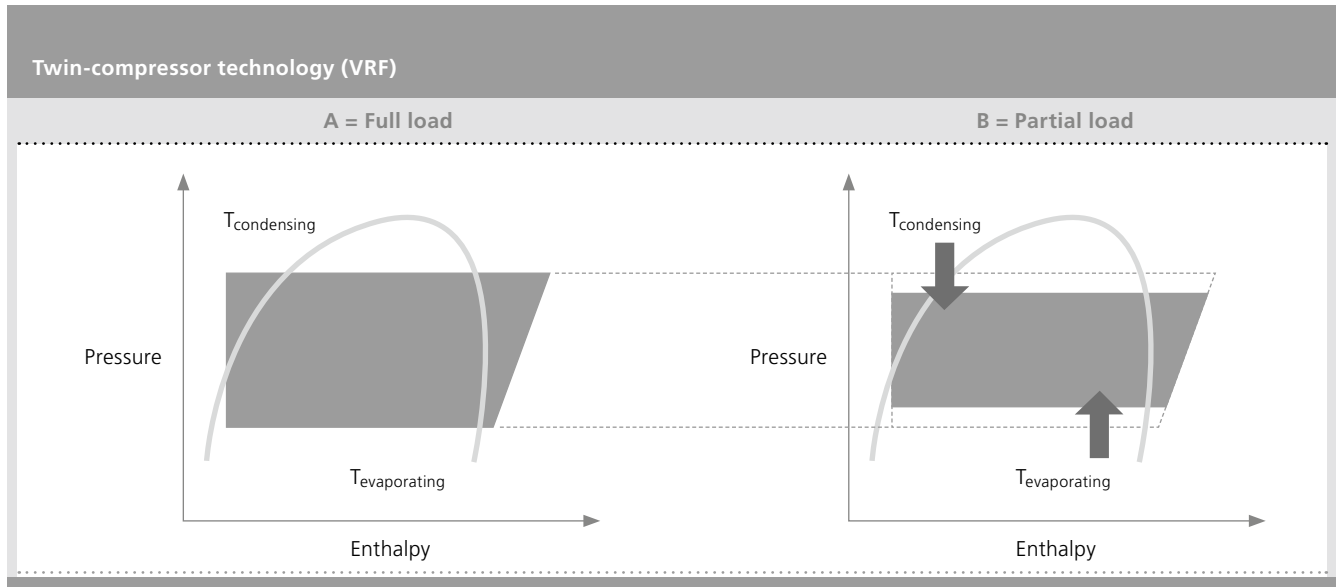
Additional possibilities of savings arise by reduction of the airflow under low heat loads. The airflow is infinitely variably controlled within the freely selected upper and lower limits of airflow.



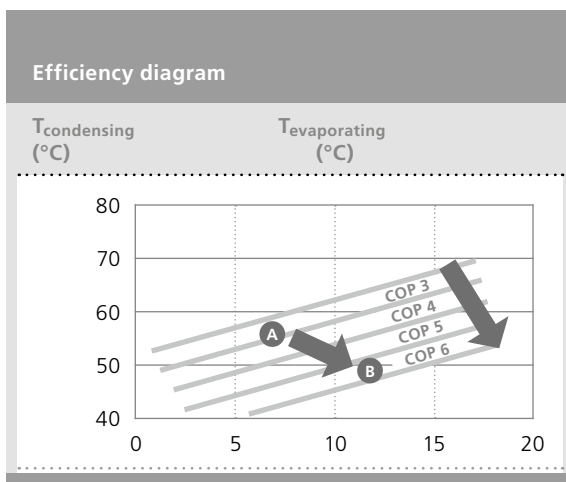
Fans with EC technology

Energy-saving option with twin-compressor technology

Up to 40 % energy savings in compressor power by partial-load operation



In comparison to full-load operation, partial-load operations (1 instead of 2 compressors per circulation system in operating mode) are characterised by a reduction in condensing temperature (and/or pressure), and by an increase in evaporation temperature (and/or pressure). This leads to a reduction in the consumption of power by the compressor, with increase in cooling output at the same time.



In the efficiency diagram shown here (COP/EER), it is evident that both factors – i.e., reduction of the condensing temperature and increase in the evaporation temperature – enhance system efficiency.

Beginning at cooling duties of approx. 20 kW, GEA Denco supplies direct-expansion models with variable refrigerant-flow technology (VRF).

VRF signifies a further improvement of the efficiency of the unit or the system in partial load ranges (B). This benefit is especially important for GEA Denco close control systems, since the units must be configured on the basis of the highest outdoor temperatures under conditions of full load (A). As a result, the units operate more than 97 % of the hours of the year in a partial-load range. VRF systems can be controlled by twin compressors, either in 2 or 4 stages. This enables energy-savings of up to 40 % in load stages 1, 2, and 3, by larger heat exchanger surfaces on the evaporator and condenser sides. These savings are directly reflected by conventional partial load coefficients (e.g., the European Seasonal Energy Efficiency Ratio, ESEER), even if, with partial-load coefficients, only about 70 % of the entire annual hours are involved. The energy savings of the twin compressors can be combined with other energy-savings options such as EC fans, electronic expansion valves, AmbiCool freecooling units, etc.

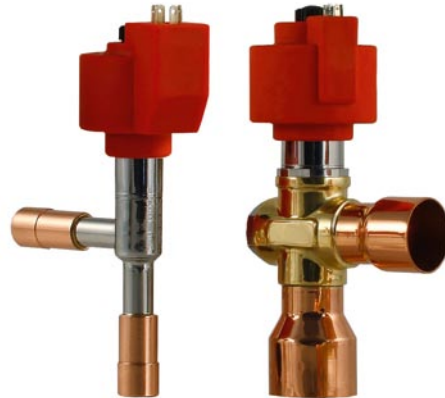
Energy-saving option with an electronic expansion valve

Up to 25 % additional energy savings

The use of an electronic expansion valve (EEV) with direct-expansion systems enables additional energy savings, which can (depending on operating point) amount to up to 25 % of the compressor power consumption of conventional thermostatic expansion valves (TEV).

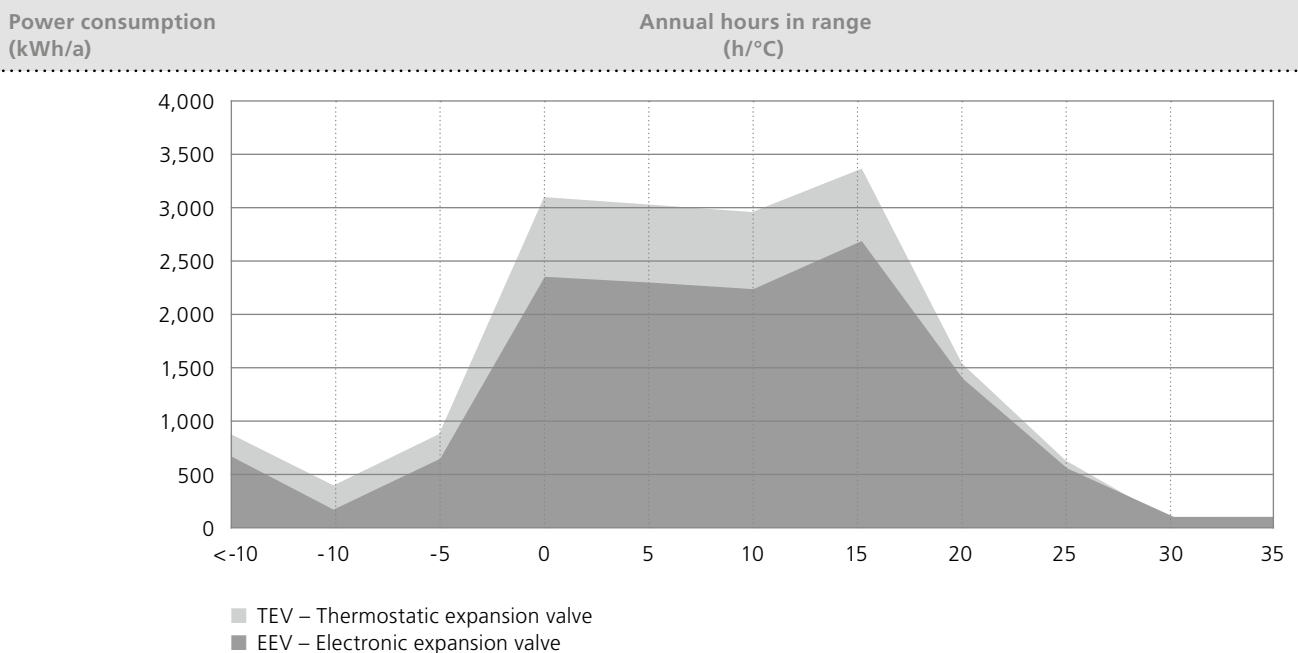
This is possible by lowering the operating temperatures or operating pressures during low outdoor temperatures, down to a minimum condensing temperature of +28 °C.

In addition, an electronic expansion valve can regulate the amount of refrigerant very precisely, and can therefore always maintain the cooling system at its optimal operating point. During dehumidification, this allows constant airflow by lowering the evaporation temperature.



Electronic expansion valves

Energy savings by EEV – electronic expansion valve



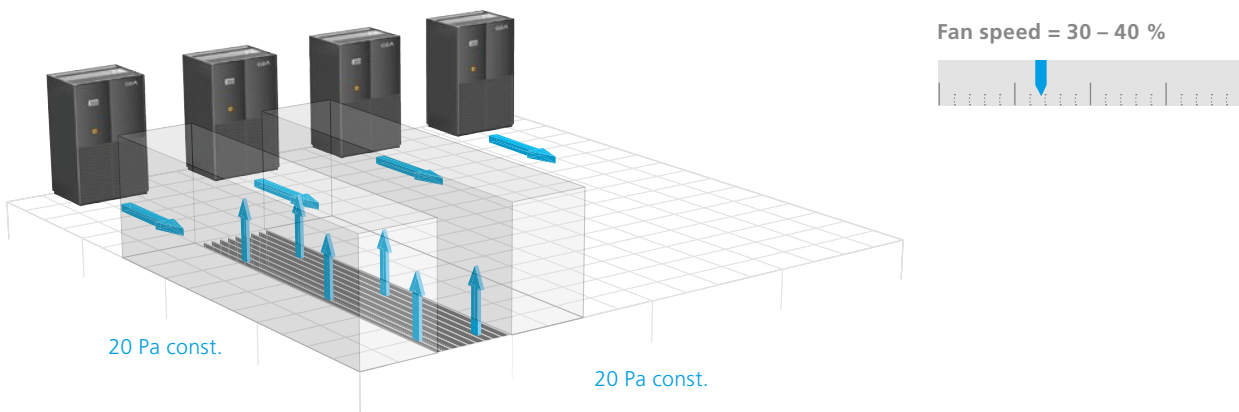
Savings enabled by an electronic expansion valve in comparison to a thermostatic expansion valve (example given for Berlin, Germany, at constant minimum T_C of 28 °C and 35 kW unit).

Energy-saving option with an automatic pressurisation system

Advanced HVAC concepts for computer facilities

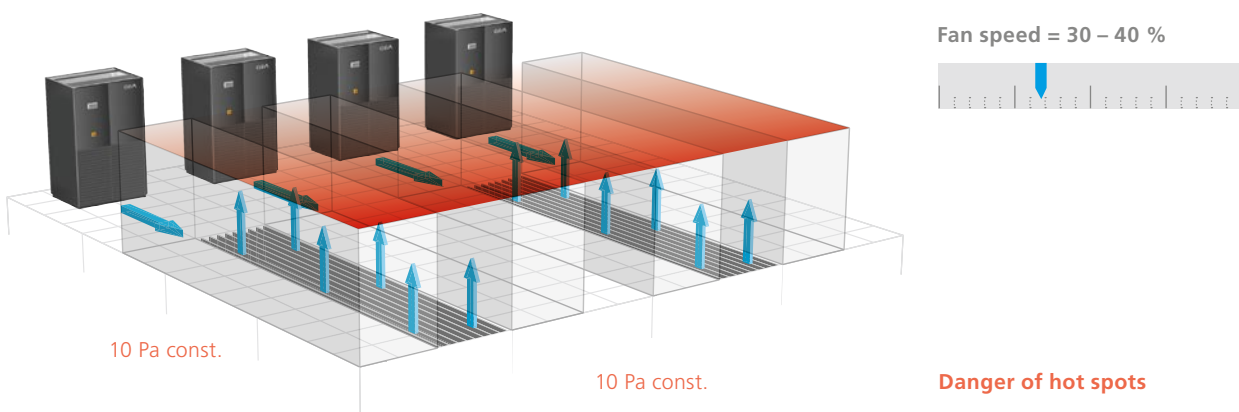
Control: Cooling demand

Phase 1: Return air temperature reached



Control: Cooling demand

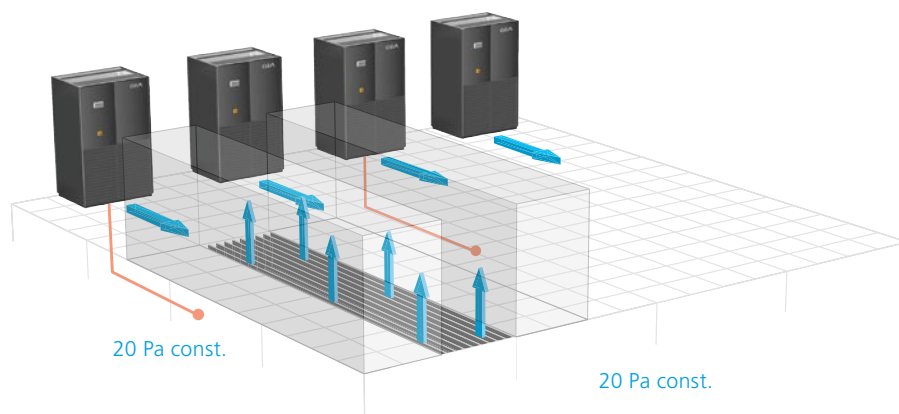
Phase 2: Return air temperature reached



Effectively controlling the pressure conditions in a pressurised floor plenum is the major challenge for an advanced and future-oriented computer HVAC concept used for data and computer centres with high thermal loads.

Control: Automatic pressurisation system

Phase 1: Return air temperature reached

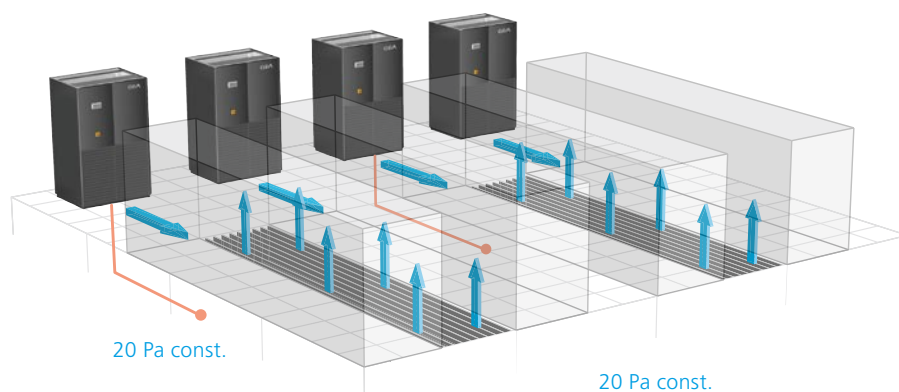


Fan speed = 30 – 40 %



Control: Automatic pressurisation system

Phase 2: Return air temperature reached



Fan speed = 70 – 80 %



Prevention of hot spots

With its newly developed automatic pressurisation system (APS), GEA Denco ensures constant pressure in the floor plenum, under conditions up to the performance limit of the installed computer systems. This means not only prevention of hot spots and fast adaption to changes in air-flow during setup and expansion of a computer facility: but also signifies a very high energy-saving potential. This is possible because only the air volume must be moved that is actually required at any one time by the server racks. The APS can be especially efficient when it is combined with cold-aisle containment. The use of EC fans is mandatory for APS systems.

GEA *Lplus* software

Designed down to the last decisive point

GEA close control systems offer a customised solution for all requirements placed on a computer centre. The selection and configuration of the most suitable unit for you are considerably simplified by the use of GEA *Lplus* design software.

Time is money: and this especially applies to the project engineering of HVAC facilities. We have developed the GEA *Lplus* design software to make your selection and configuration as fast and as simple as possible of a close control system that is optimal for your needs.

Planning fast and reliably

GEA close control systems have the advantage that all products can be designed to meet individual requirements. The GEA *Lplus* design software helps you to implement your desired system at the turn of a hand. The system makes configuration proposals in accordance with your entry of information. *Lplus* immediately calculates and outputs unit sub-divisions, configuration of the modules, as well as dimensions and weights. Believe us: there is no way for faster and more reliable planning. And you gain valuable time for other tasks.

With its integrated energy-calculation tool, GEA *Lplus* design software also calculates operational expenses. In addition, it also simply and easily forecasts life cycle costs.



Benefits of GEA *Lplus* design software

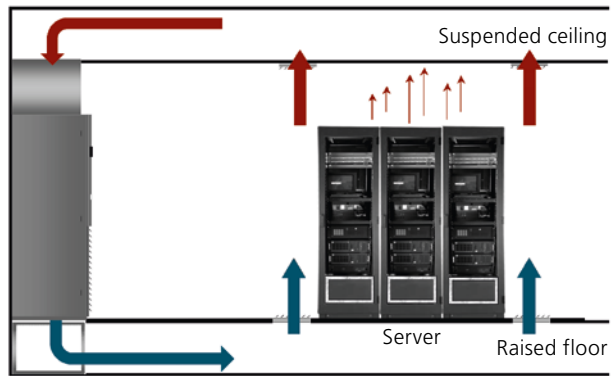
- Individualised configuration proposals
- Calculation and output of unit sub-divisions, configuration of the modules, as well as dimensions and weights
- Calculation of life cycle costs (LCC)
- Simple handling
- Fast, reliable selection and planning
- Time saved for your other work
- Information provided for energy-efficiency classes
- Periodic inspection and certification of the calculation procedures

GEA *Lplus* design software covers all products by GEA HVAC Systems. The free full version can be downloaded under www.gea-airtreatment.com under the menu link "Media/Download/*Lplus* Software." Or, it can be ordered from us.

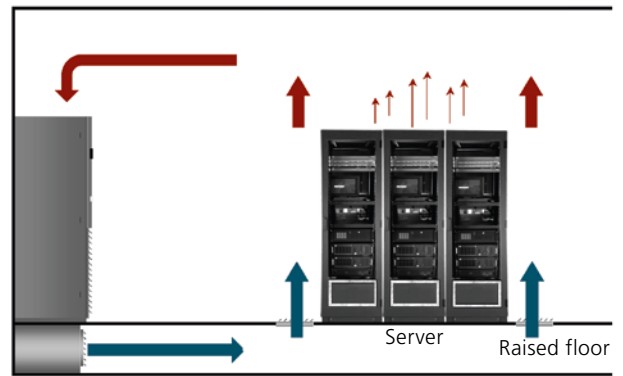


Airflow routing alternatives

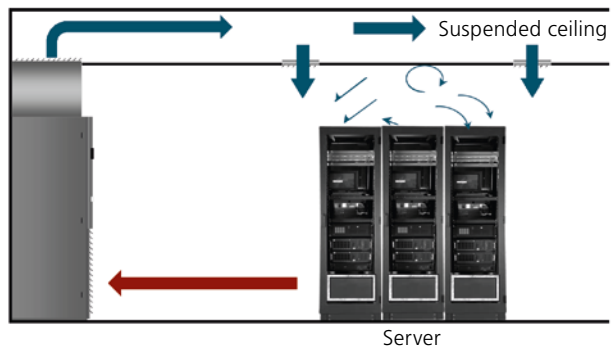
Downflow unit for suspended ceiling and raised floor



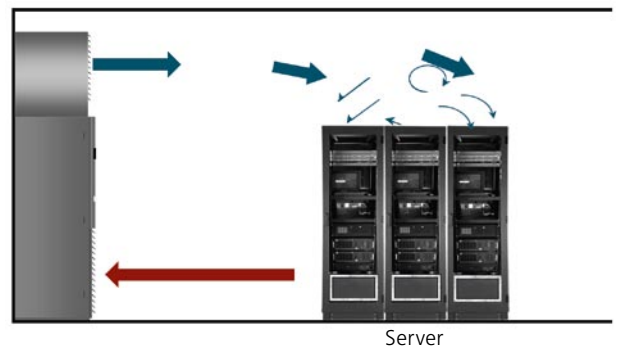
Downflow unit for raised floor



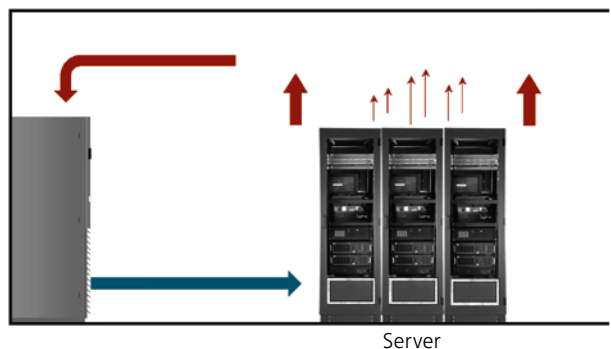
Upflow unit with ceiling duct for suspended ceiling



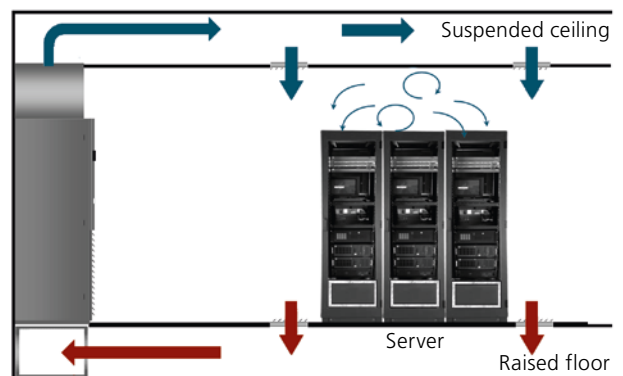
Upflow unit with horizontal air discharge



Option for T-Range models 8 – 42
Downflow unit with low level discharge



Upflow unit for suspended ceiling and raised floor



Intelligent close control

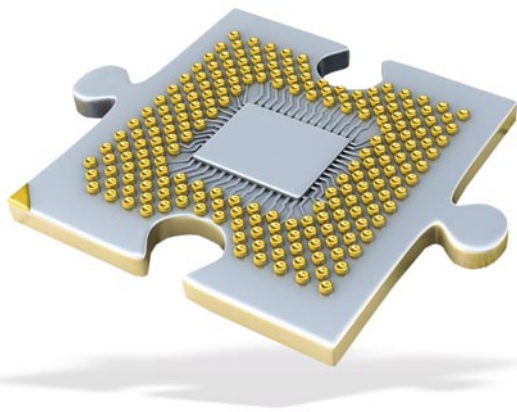
Our climate control is communicative

Precise climate control also requires precise close control. This task is performed by our electronic control modules. They ensure conformity to the specified temperature and relative humidity and additionally monitor essential components. Clearly organised displays offer a quick overview of equipment status and momentary operating conditions.

On its own, the internal climate control of our close control units assures efficient and demand-driven operation. The electronic close control systems monitor conformity to supply and exhaust air parameters as set, and enable fully automatic operation. If several close control units are installed, the control systems communicate with each other and assure optimal operations for the entire equipment plant.

Our close control systems are also communicative toward the outside. If you wish, you can receive e-mails with malfunction and error messages, and via a web interface you can even take a look at current operational data. And even more: you can use remote functions to assign new setpoints from off-premises: from your office or from home.

Our close control units of course offer interfaces to your building-services management system. This assures that your GEA Denco close control solution will never let you down.



Interface-friendly

- Sensitive control of temperatures and humidity
- Monitoring of the most important equipment components
- Possibility of networking several control systems
- Interface to commonly used building-services management systems
- Web interface for remote queries and setting of parameters
- Sending of malfunction messages via various channels



GEA Denco > T-Range, E-Range, MS-Range, and outdoor units

[24 °C room temperature in
24-hour operation] [Constant
45 % relative humidity]

Solutions for all applications and all requirements

GEA Denco close control systems implement temperature setpoints with one-degree precision, and maintain constant relative humidity in a room. The portfolio of GEA Denco products, within an extensive range of staggered duties, offers the optimal solution for all applications and for all requirements.

Heat exchangers



- 4 row coil as standard
- 6 row high-efficiency coil as an option

Twin compressors



- Energy-efficient twin-compressor technology (VRF) selectable

EC/AC fans



- Standard direct AC fans
- EC plug fans
- Belt driven AC fans





EEV/TEV expansion valves



- Choice between usual TEV or more exact control and energy-saving EEV

Microprocessor controls



- C3-05 unit as standard controller



- T3-04 controller with touch display, freely programmable for options like APS

Humidity control



- Proportional electrode steam humidifiers for exact room humidity
- 3 cylinders for a range of conductivity (125 – 1,250 μ S)

Outdoor units



- Air-cooled condensers from 3 – 75 kW (DCRA-Range)
- Dry coolers from 32 – 100 kW (DDRA-Range)



- Condensing units from 4 – 38 kW (C-Range)



- Chillers from 5 kW – 2.5 MW
- Freecooling chillers from 26 – 350 kW
- Please consult our product brochure about GEA chillers for detailed information

Options and accessories

- Base stands
- Installation plinth
- Ceiling return ducts
- Horizontal discharges
- R407C, R134a and R410A
- Electric heaters
- LPHW heaters
- Filters in EU4 and EU7 grade
- Compressor softstart
- BMS interfaces
 - LON
 - BACNET
 - MODBUS
 - ETHERNET
 - etc.
- Audible alarm
- Water detection
- Smoke detection
- Refrigerant detection
- Sump pump
- Fresh-air kit
- Filter gauge
- Hot-gas bypass
- Winter start
- And much more

C3-05 controls Display details and functions



Graphical display



UNIT RUN shown when unit fan(s) are running



COOL shown when cooling demand is greater than 0 %



HEAT shown when heating demand is greater than 0 %



HUMIDIFY shown when humidification is greater than 0 %



DEHUMIDIFY shown when dehumidification is greater than 0 %

Graphical display comprises:

- Unit ON/OFF key, providing "master" control of the local unit
- Graphical liquid crystal display, providing icon status of the unit functions, parameter menus, historic data logging, alarm buffer, and access to other controllers via the network system
- Four programming keys, providing access to display features
- Alarm key to view active alarms

The 8 row LCD indicates unit function via the icons on rows 1 and 2. The remaining rows show the selected data, updated in real time. The programming keys (↑ ↓ ← →) have to be pressed in a coded sequence in order to enter or change the function currently being accessed. Current alarm status can be reviewed by using the ← key to access the alarm buffer from the timeout display.

Functions

The C3-05 controller consists of a 32-byte microprocessor that operates the GEA Denco application software that caters for all the requirements for close control air conditioning. The multi-functional C3-05 controller utilises 18 digital outputs, 6 analogue outputs, 18 digital inputs, and 9 analogue inputs to operate functions, such as:

- Variable-speed fan control
- Up to four stages of direct-expansion cooling
- Electronic expansion-valve control
- Energy-efficient freecooling system (AmbiCool)
- Dual cooling system (CombiCool)
- Chilled-water cooling
- Up to three stages of electric heating
- Low pressure hot water heating
- Reverse-cycle heat pump control complete with defrost control

The C3-05 controller can interface with many of the most commonly used serial communication standards, such as:

- BACnet MS/TP
- BACnet I/P
- Lonworks
- Modbus
- SNMP
- Webpage monitoring via Ethernet

Please refer to the C3-05 controls operation & maintenance manual for full details.

T3-04 controls Display details and functions



Graphical display



Temperature display with temperature range



Plotting of all alarms, temperatures, humidity levels, and other operating parameters



Exact servo-action feedback with graphical plot

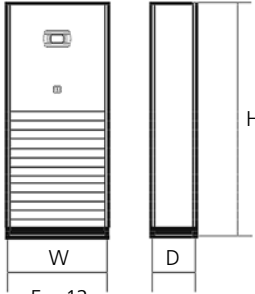
Functions

A user-programmable DDC microprocessor, optimised for integration into advanced building-management systems. The T3-04 control unit processes 128 inputs and outputs, and can be interfaced to a local PC or notebook via the RS232 interface. Operation is fully intuitive via the large 4.3-inch (10.9 cm) sensor touch screen, with 64,000 colours in TFT-LCD standard and 480 x 272 pixels (WQVGA). Acoustic and visual feedback prevent errors in operation. A USB interface enables saving and output of all user-configuration data, as well as records of alarms and of temperature and humidity plots. Software updating is also possible via the USB interface.

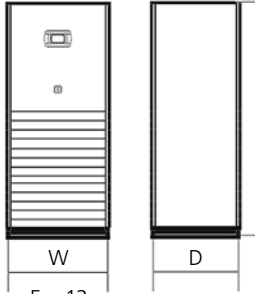
- Intel XScale technology processor
- Maximum 624-Hz clock frequency
- Maximum 64-MB flash memory
- USB interface (max. 2 GB)
- RS232 connection
- Power-failure protection via flash memory
- Ethernet 10-MB/s network with TCP/IP protocol
- Integrated Web server with access security
- BACnet/IP option
- Service button
- Fast overview by an individual start page
- Favourites/bookmark pages for the most important operation characteristics
- Automatic pressure-compensation sensor for raised floor; APS option
- Plots of temperature and humidity in real time

DX A version Model size		5	8	10	12	17	19	21	23 ¹⁾	28 ¹⁾
Cooling²⁾										
Gross total duty (AC)	kW	5.8	9.2	12.6	15.4	17.0	19.7	22.6	27.3	31.7
Net sensible duty (AC)	kW	5.1	7.8	9.9	11.8	14.8	16.4	19.3	23.0	24.9
EER (AC)		3.2	3.2	3.1	3.0	3.1	3.1	2.9	3.1	3.1
Gross total duty (EC) ³⁾	kW	–	9.2	12.7	15.4	17.1	20.1	22.5	26.9	31.4
Net sensible duty (EC)	kW	–	8.2	10.6	12.2	16.1	18.5	20.3	23.1	25.1
EER (EC)		–	3.8	3.5	3.3	3.8	3.8	3.5	3.5	3.4
CombiCool option⁴⁾										
CW-Coil total duty (AC)	kW	–	5.4	6.3	7.5	12.0	12.0	14.9	16.6	16.6
CW-Coil sensible duty (AC)	kW	–	5.4	6.3	7.5	12.0	12.0	14.9	16.6	16.6
CW-Coil total duty (EC)	kW	–	5.4	6.5	7.4	12.5	13.1	14.6	15.6	16.0
CW-Coil sensible duty (EC)	kW	–	5.4	6.5	7.4	12.5	13.1	14.6	15.6	16.0
Fans										
Airflow (AC)	m³/s	0.44	0.60	0.76	1.02	1.31	1.31	1.85	2.22	2.22
	m³/h	1,584	2,160	2,736	3,658	4,720	4,720	6,674	7,992	7,992
Airflow (EC)	m³/s	–	0.60	0.80	1.00	1.40	1.50	1.80	2.00	2.09
	m³/h	–	2,160	2,880	3,600	5,040	5,400	6,480	7,200	7,524
Ext. static (AC)	Pa	20	20	20	20	20	20	20	20	20
Ext. static (EC)	Pa	–	20	20	20	20	20	20	20	20
Sound pressure level⁵⁾										
Downflow (AC)	dB(A)	45	52	53	54	56	56	57	58	60
Downflow (EC)	dB(A)	–	44	51	56	51	52	56	58	58
Electrical data⁶⁾										
Power input (AC)	kW	1.82	2.85	4.03	5.06	5.50	6.31	7.66	8.93	10.15
Power input (EC)	kW	–	2.40	3.62	4.61	4.53	5.28	6.48	7.80	9.24
Humidifier										
Capacity humidifier (AC)	kg/h	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Capacity humidifier (EC)	kg/h	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Power input (AC)	kW	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Power input (EC)	kW	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Heating										
Electrical heating	kW	3.0	6.0	6.0	6.0	12.0	12.0	12.0	12.0	12.0
LPHW heating	kW	–	6.0	6.0	6.0	15.0	15.0	15.0	15.0	15.0
Air-cooled condensers										
Model size	DCRA	08-6	13-6	21-6	26-6	26-6	32-6	32-6	26-2	32-6
Number of condensers		1	1	1	1	1	1	1	2	1


DX A version Model size		5	8	10	12	17	19	21	23 ¹⁾	28 ¹⁾
Weights and dimensions										
Weight	kg	165	255	255	255	445	445	445	445	445
Height (H)	mm	1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,940
Width (W)	mm	665	665	665	665	1,250	1,250	1,250	1,250	1,250
Depth (D)	mm	385	685	685	685	685	685	685	685	685

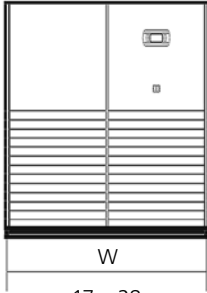


5 – 12




5 – 12





17 – 28



¹⁾ VRF option available (standard from model size 48)

²⁾ Return air conditions: 24 °C / 45 % relative humidity / 35 °C ambient temperature

³⁾ Available in downflow only

⁴⁾ Return air conditions: 24 °C / 45 % relative humidity / 0 % glycol / water: 7/12 °C

⁵⁾ Sound pressure level in 2-metre free field

⁶⁾ Data for "cooling only" mode of operation

DX A version Model size		32 ¹⁾	37 ¹⁾	42 ¹⁾	48	53	63	73	83	103
Cooling ²⁾										
Gross total duty (AC)	kW	34.2	40.2	43.8	54.1	61.8	65.8	78.4	87.7	–
Net sensible duty (AC)	kW	29.3	34.1	36.4	44.8	48.0	56.4	66.4	70.9	–
EER (AC)		3.1	3.0	3.0	3.1	3.0	3.2	2.9	3.1	–
Gross total duty (EC) ³⁾	kW	33.7	39.2	43.2	53.6	61.3	67.2	76.7	85.4	116.9
Net sensible duty (EC)	kW	30.5	34.1	36.5	46.5	49.7	59.2	65.0	69.0	96.6
EER (EC)		3.7	3.5	3.3	3.6	3.5	3.7	3.2	3.5	3.2
CombiCool option ⁴⁾										
CW-Coil total duty (AC)	kW	22.8	25.6	25.6	31.6	31.6	40.5	48.4	48.4	–
CW-Coil sensible duty (AC)	kW	22.8	25.6	25.6	31.6	31.6	40.5	48.4	48.4	–
CW-Coil total duty (EC)	kW	21.3	22.8	24.3	44.3	44.3	57.4	64.6	64.6	92.6
CW-Coil sensible duty (EC)	kW	21.3	22.8	24.3	44.3	44.3	57.0	64.6	64.6	92.6
Fans										
Airflow (AC)	m³/s	2.79	3.38	3.38	4.09	4.09	4.61	6.19	6.19	–
	m³/h	10,051	12,168	12,168	14,724	14,724	16,596	22,284	22,284	–
Airflow (EC)	m³/s	2.50	2.80	3.10	4.00	4.00	4.60	5.40	5.40	8.10
	m³/h	9,000	10,080	11,160	14,400	14,400	16,560	19,440	19,440	29,160
Ext. static (AC)	Pa	20	20	20	20	20	20	20	20	–
Ext. static (EC)	Pa	20	20	20	20	20	20	20	20	20
Sound pressure level ⁵⁾										
Downflow (AC)	dB(A)	59	59	59	61	61	61	62	62	–
Downflow (EC)	dB(A)	56	59	61	63	63	64	68	68	70
Electrical data ⁶⁾										
Power input (AC)	kW	10.96	13.47	14.71	17.46	20.30	20.66	27.00	27.92	–
Power input (EC)	kW	9.00	11.13	13.16	14.74	17.50	18.32	23.61	24.53	36.36
Humidifier										
Capacity humidifier (AC)	kg/h	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	–
Capacity humidifier (EC)	kg/h	3.0	3.0	3.0	8.0	8.0	8.0	8.0	8.0	15.0
Power input (AC)	kW	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	11.3
Power input (EC)	kW	2.3	2.3	2.3	6.0	6.0	6.0	6.0	6.0	11.3
Heating										
Electrical heating	kW	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
LPHW heating	kW	21.0	21.0	21.0	–	–	–	–	–	–
Air-cooled condensers										
Model size	DCRA	32-6	32-6	32-6	50-6	50-6	50-6	50-6	75-6	75-6
Number of condensers		2	2	2	2	2	2	2	2	2

Weights and dimensions GEA Denco T-Range DX A models 32 – 103

Weights and dimensions GEA Denco T-Range DX A models 32 – 103

DX A version		32 ¹⁾	37 ¹⁾	42 ¹⁾	48	53	63	73	83	103
Model size										
Weights and dimensions										
Weight	kg	520	520	520	860	860	1,010	1,010	1,010	1,190
Height (H)	mm	1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,940
Width (W)	mm	1,840	1,840	1,840	1,250	1,250	1,840	1,840	1,840	2,450
Depth (D)	mm	685	685	685	985	985	985	985	985	985

Technical drawings and 3D rendering of DX A version lockers. The drawings show front, side, and depth views for models 32-42, 48-53, and 63-83. The 3D rendering shows a row of three lockers with the 'GEA' logo on the top right door.

¹⁾ VRF option available (standard from model size 48)

²⁾ Return air conditions: 24 °C / 45 % relative humidity / 35 °C ambient temperature

³⁾ Available in downflow only

⁴⁾ Return air conditions: 24 °C / 45 % relative humidity / 0 % glycol / water: 7/12 °C

⁵⁾ Sound pressure level in 2-metre free field

⁶⁾ Data for "cooling only" mode of operation

DX W version Model size		5	8	10	12	17	19	21	23 ¹⁾	28 ¹⁾
Cooling²⁾										
Gross total duty (AC)	kW	6.1	9.5	12.8	15.5	17.2	20.0	23.1	27.0	31.1
Net sensible duty (AC)	kW	5.3	7.9	10.0	11.9	14.9	16.7	19.8	22.8	24.7
EER (AC)		3.9	3.4	3.3	3.1	3.1	3.4	3.2	3.0	3.0
Gross total duty (EC) ³⁾	kW	–	9.5	12.9	15.4	16.5	20.4	23.0	26.6	30.8
Net sensible duty (EC)	kW	–	8.4	10.7	12.3	15.6	18.7	20.6	23.0	24.9
EER (EC)		–	4.4	3.7	3.4	3.8	4.0	3.7	3.3	3.2
CombiCool option⁴⁾										
CW-Coil total duty (AC)	kW	–	5.4	6.3	7.5	12.0	12.0	14.9	16.6	16.6
CW-Coil sensible duty (AC)	kW	–	5.4	6.3	7.5	12.0	12.0	14.9	16.6	16.6
CW-Coil total duty (EC)	kW	–	5.4	6.5	7.4	12.5	13.1	14.6	15.6	16.0
CW-Coil sensible duty (EC)	kW	–	5.4	6.5	7.4	12.5	13.1	14.6	15.6	16.0
Fans										
Airflow (AC)	m³/s	0.44	0.60	0.76	1.02	1.31	1.31	1.85	2.22	2.22
	m³/h	1,584	2,160	2,736	3,658	4,720	4,720	6,674	7,992	7,992
Airflow (EC)	m³/s	–	0.60	0.80	1.00	1.40	1.50	1.80	2.00	2.09
	m³/h	–	2,160	2,880	3,600	5,040	5,400	6,480	7,200	7,524
Ext. static (AC)	Pa	20	20	20	20	20	20	20	20	20
Ext. static (EC)	Pa	–	20	20	20	20	20	20	20	20
Sound pressure level⁵⁾										
Downflow (AC)	dB(A)	45	52	53	54	56	56	57	58	58
Downflow (EC)	dB(A)	–	44	51	52	51	52	56	58	60
Electrical data⁶⁾										
Power input (AC)	kW	1.57	2.77	3.90	4.99	5.51	5.95	7.20	9.15	10.51
Power input (EC)	kW	–	2.16	3.48	4.54	4.33	5.11	6.18	8.04	9.60
Humidifier										
Capacity humidifier (AC)	kg/h	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Capacity humidifier (EC)	kg/h	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Power input (AC)	kW	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Power input (EC)	kW	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Heating										
Electrical heating	kW	3.0	6.0	6.0	6.0	12.0	12.0	12.0	12.0	12.0
LPHW heating	kW	–	6.0	6.0	6.0	15.0	15.0	15.0	15.0	15.0

Weights and dimensions GEA Denco T-Range DX W models 5 – 28

Weights and dimensions GEA Denco T-Range DX W models 5 – 28

DX W version		5	8	10	12	17	19	21	23 ¹⁾	28 ¹⁾
Weights and dimensions										
Weight	kg	175	270	270	270	460	460	460	460	460
Height (H)	mm	1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,940
Width (W)	mm	665	665	665	665	1,250	1,250	1,250	1,250	1,250
Depth (D)	mm	385	685	685	685	685	685	685	685	685

¹⁾ VRF option available (standard from model size 48)

²⁾ Return air conditions: 24 °C / 45 % relative humidity / water: 30/35 °C

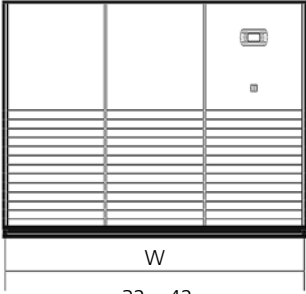
³⁾ Available in downflow only

⁴⁾ Return air conditions: 24 °C / 45 % relative humidity / 0 % glycol / water: 7/12 °C


⁵⁾ Sound pressure level in 2-metre free field⁶⁾ Data for "cooling only" mode of operation

DX W version Model size		32 ¹⁾	37 ¹⁾	42 ¹⁾	48	53	63	73	83	103
Cooling ²⁾										
Gross total duty (AC)	kW	33.8	40.1	43.8	53.3	61.2	65.8	79.1	86.5	–
Net sensible duty (AC)	kW	29.2	34.0	36.5	44.3	47.7	56.0	67.0	70.4	–
EER (AC)		3.0	3.0	3.0	3.0	3.0	3.1	3.0	3.0	–
Gross total duty (EC) ³⁾	kW	33.3	39.0	43.3	–	–	63.0	73.4	80.2	110.2
Net sensible duty (EC)	kW	30.1	34.0	36.5	–	–	55.8	64.4	67.6	96.6
EER (EC)		3.5	3.5	3.3	–	–	3.6	3.4	3.4	3.3
CombiCool option ⁴⁾										
CW-Coil total duty (AC)	kW	22.8	25.6	25.6	31.6	31.6	40.5	48.4	48.4	–
CW-Coil sensible duty (AC)	kW	22.8	25.6	25.6	31.6	31.6	40.5	48.4	48.4	–
CW-Coil total duty (EC)	kW	21.3	22.8	24.3	–	–	57.4	64.6	64.6	92.6
CW-Coil sensible duty (EC)	kW	21.3	22.8	24.3	–	–	57.0	64.6	64.6	92.6
Fans										
Airflow (AC)	m³/s	2.79	3.38	3.38	4.04	4.04	4.61	6.19	6.19	–
	m³/h	10,051	12,168	12,168	14,544	14,544	16,596	22,284	22,284	–
Airflow (EC)	m³/s	2.50	2.80	3.10	–	–	4.60	5.40	5.40	8.10
	m³/h	9,000	10,080	11,160	–	–	16,560	19,440	19,440	29,160
Ext. static (AC)	Pa	20	20	20	20	20	20	20	20	–
Ext. static (EC)	Pa	20	20	20	–	–	20	20	20	20
Sound pressure level ⁵⁾										
Downflow (AC)	dB(A)	59	59	59	67	67	61	62	62	–
Downflow (EC)	dB(A)	56	59	61	–	–	64	68	68	70
Electrical data ⁶⁾										
Power input (AC)	kW	11.18	13.57	14.69	17.87	20.47	21.01	26.52	28.68	–
Power input (EC)	kW	9.40	11.25	13.12	–	–	17.40	21.46	23.70	33.88
Humidifier										
Capacity humidifier (AC)	kg/h	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	–
Capacity humidifier (EC)	kg/h	3.0	3.0	3.0	3.0	3.0	8.0	8.0	8.0	15.0
Power input (AC)	kW	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	11.3
Power input (EC)	kW	2.3	2.3	2.3	2.3	2.3	6.0	6.0	6.0	11.3
Heating										
Electrical heating	kW	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
LPHW heating	kW	21.0	21.0	21.0	–	–	–	–	–	–


DX W version Model size		32 ¹⁾	37 ¹⁾	42 ¹⁾	48	53	63	73	83	103
Weights and dimensions										
Weight	kg	535	535	535	890	890	1,040	1,040	1,040	1,270
Height (H)	mm	1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,940
Width (W)	mm	1,840	1,840	1,840	1,250	1,250	1,840	1,840	1,840	2,450
Depth (D)	mm	685	685	685	985	985	985	985	985	985

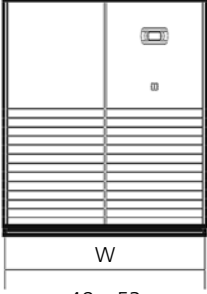


W
32 – 42

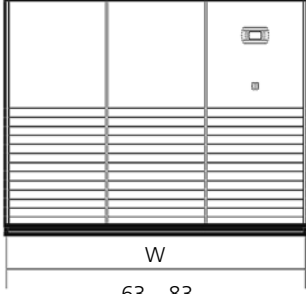


H
D

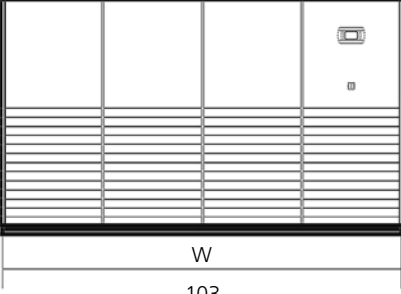




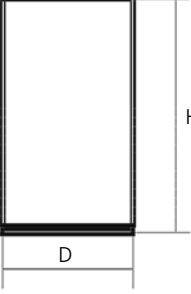
W
48 – 53



W
63 – 83



W
103



H
D

¹⁾ VRF option available (standard from model size 48)

²⁾ Return air conditions: 24 °C / 45 % relative humidity / water: 30/35 °C

³⁾ Available in downflow only

⁴⁾ Return air conditions: 24 °C / 45 % relative humidity / 0 % glycol / water: 7/12 °C

⁵⁾ Sound pressure level in 2-metre free field

⁶⁾ Data for "cooling only" mode of operation

DX F version Model size		8	10	12	17	19	21	23	28
Cooling¹⁾									
Gross total duty (AC)	kW	9.4	12.6	15.2	17.2	20.9	22.9	26.7	30.8
Net sensible duty (AC)	kW	7.7	9.7	11.5	14.8	17.9	19.5	22.5	24.2
EER (AC)		3.6	3.2	3.0	3.1	3.1	3.1	2.9	2.9
Gross total duty (EC) ²⁾	kW	9.4	12.7	15.2	17.3	20.5	22.8	26.3	30.4
Net sensible duty (EC)	kW	8.2	10.4	11.8	16.3	18.7	20.4	22.5	24.2
EER (EC)		4.3	3.6	3.3	3.9	3.8	3.6	3.2	3.2
Freecooling coil³⁾									
CW-Coil total duty (AC)	kW	6.2	7.4	8.6	13.2	16.1	16.3	18.3	18.8
CW-Coil sensible duty (AC)	kW	5.9	7.0	8.5	12.8	16.1	16.3	18.3	18.4
CW-Coil total duty (EC)	kW	6.2	7.6	8.6	13.6	15.1	16.2	17.4	18.2
CW-Coil sensible duty (EC)	kW	6.0	7.3	8.5	13.4	14.8	16.0	17.1	17.6
Fans									
Airflow (AC)	m³/s	0.59	0.75	1.00	1.31	1.84	1.84	2.17	2.17
	m³/h	2,135	2,707	3,600	4,702	6,635	6,635	7,812	7,812
Airflow (EC)	m³/s	0.60	0.80	1.00	1.40	1.60	1.80	1.95	2.00
	m³/h	2,160	2,880	3,600	5,040	5,760	6,480	7,020	7,200
Ext. static (AC)	Pa	20	20	20	20	20	20	20	20
Ext. static (EC)	Pa	20	20	20	20	20	20	20	20
Sound pressure level⁴⁾									
Downflow (AC)	dB(A)	52	53	54	56	56	57	58	58
Downflow (EC)	dB(A)	44	51	52	51	52	56	58	59
Electrical data⁵⁾									
Power input (AC)	kW	2.60	3.90	5.00	5.50	6.80	7.40	9.10	10.50
Power input (EC)	kW	2.20	3.50	4.60	4.40	5.40	6.30	8.10	9.50
Humidifier									
Capacity humidifier (AC)	kg/h	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Capacity humidifier (EC)	kg/h	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Power input (AC)	kW	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Power input (EC)	kW	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Heating									
Electrical heating	kW	6.0	6.0	6.0	12.0	12.0	12.0	12.0	12.0
Dry coolers									
Model size	DDRA	32-6	50-6	50-6	50-6	50-6	50-6	50-6	75-6
Number of dry coolers		1	1	1	1	1	1	1	1

Return all conditions. 24 °C / 45 % relative humidity / water. 30/35 °C

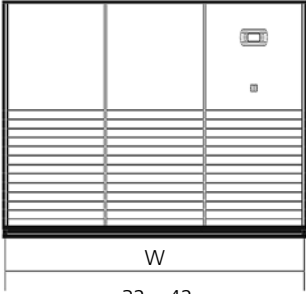
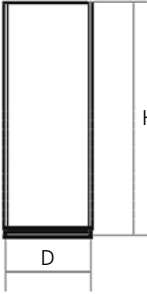

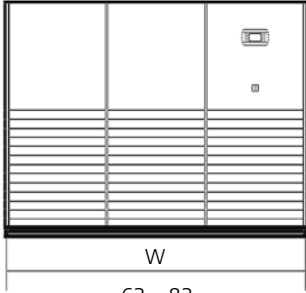
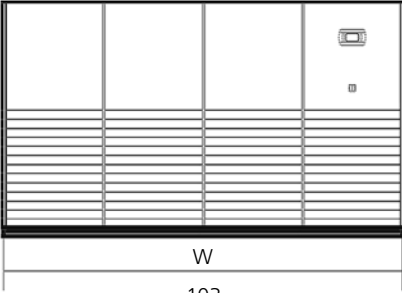
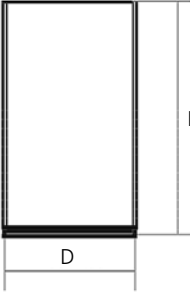
²⁾ Available in downflow only

³⁾ Return air conditions: 24 °C / 45 % relative humidity / 25 % glycol / water: 7 °C

⁴⁾ Sound pressure level in 2-metre free field

⁵⁾ Data for "cooling only" mode of operation

DX F version Model size		32	37	42	63	73	83	103
Cooling¹⁾								
Gross total duty (AC)	kW	31.9	38.8	43.6	–	–	–	–
Net sensible duty (AC)	kW	25.8	32.3	36.3	–	–	–	–
EER (AC)		3.1	3.0	3.0	–	–	–	–
Gross total duty (EC) ²⁾	kW	33.0	38.9	43.0	63.0	73.4	80.2	110.2
Net sensible duty (EC)	kW	29.9	33.9	36.0	55.8	64.4	67.6	96.6
EER (EC)		3.6	3.4	3.3	3.6	3.4	3.4	3.3
Freecooling coil³⁾								
CW-Coil total duty (AC)	kW	21.3	25.8	28.5	–	–	–	–
CW-Coil sensible duty (AC)	kW	20.1	25.2	28.3	–	–	–	–
CW-Coil total duty (EC)	kW	23.4	25.9	27.3	61.6	69.1	71.0	100.2
CW-Coil sensible duty (EC)	kW	22.8	25.4	26.7	57.6	65.2	66.1	95.8
Fans								
Airflow (AC)	m³/s	1.97	2.78	3.31	–	–	–	–
	m³/h	7,078	9,997	11,927	–	–	–	–
Airflow (EC)	m³/s	2.40	2.80	3.00	4.40	5.20	5.20	7.90
	m³/h	8,640	10,080	10,800	15,840	18,720	18,720	28,440
Ext. static (AC)	Pa	20	20	20	–	–	–	–
Ext. static (EC)	Pa	20	20	20	20	20	20	20
Sound pressure level⁴⁾								
Downflow (AC)	dB(A)	57	58	59	–	–	–	–
Downflow (EC)	dB(A)	56	59	61	63	67	67	70
Electrical data⁵⁾								
Power input (AC)	kW	10.40	12.90	14.60	–	–	–	–
Power input (EC)	kW	9.20	11.50	13.10	17.43	21.46	23.70	33.88
Humidifier								
Capacity humidifier (AC)	kg/h	3.0	3.0	3.0	3.0	3.0	3.0	–
Capacity humidifier (EC)	kg/h	3.0	3.0	3.0	8.0	8.0	8.0	15.0
Power input (AC)	kW	2.3	2.3	2.3	2.3	2.3	2.3	11.3
Power input (EC)	kW	2.3	2.3	2.3	6.0	6.0	6.0	11.3
Heating								
Electrical heating	kW	12.0	12.0	12.0	–	–	–	–
Dry coolers								
Model size	DDRA	75-6	50-6	50-6	75-6	50-6	75-6	75-6
Number of dry coolers		1	2	2	2	3	3	4

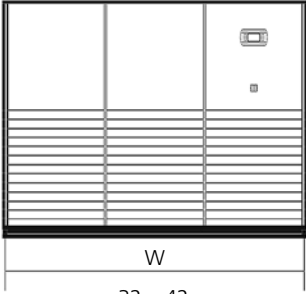
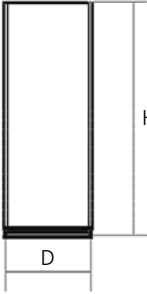

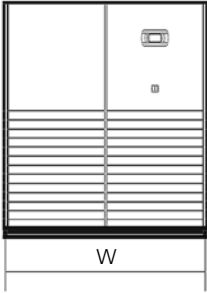
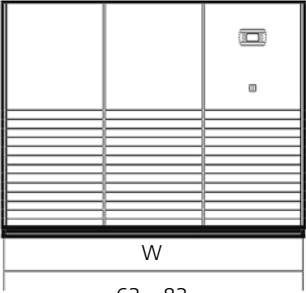
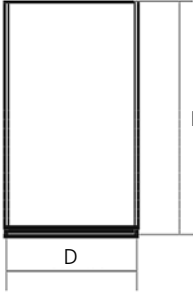
DX F version								
Model size		32	37	42	63	73	83	103
Weights and dimensions								
Weights	kg	535	535	535	1,040	1,040	1,040	1,270
Height (H)	mm	1,940	1,940	1,940	1,940	1,940	1,940	1,940
Width (W)	mm	1,840	1,840	1,840	1,840	1,840	1,840	2,450
Depth (D)	mm	685	685	685	985	985	985	985
<div><div><div><p>W</p><p>32 – 42</p></div><div><p>H</p><p>D</p></div><div></div></div></div>								
<div><div><div><p>W</p><p>63 – 83</p></div><div><p>W</p><p>103</p></div><div><p>H</p><p>D</p></div></div></div>								

¹⁾ Return air conditions: 24 °C / 45 % relative humidity / water: 30/35 °C
²⁾ Available in downflow only
³⁾ Return air conditions: 24 °C / 45 % relative humidity / 25 % glycol / water: 7 °C
⁴⁾ Sound pressure level in 2-metre free field
⁵⁾ Data for "cooling only" mode of operation

DX X version Model size		5	8	10	12	17	19	21	23 ¹⁾	28 ¹⁾
Cooling²⁾										
Gross total duty (AC)	kW	5.8	9.0	12.2	15.0	18.3	20.5	24.0	28.4	31.3
Net sensible duty (AC)	kW	5.2	7.7	9.7	11.7	15.8	16.7	20.4	23.6	24.7
EER (AC)		3.2	3.1	2.9	2.9	3.0	2.9	3.0	2.9	2.8
Gross total duty (EC) ³⁾	kW	–	9.0	12.3	15.0	18.4	21.1	24.0	28.0	31.0
Net sensible duty (EC)	kW	–	8.1	10.4	12.1	17.1	19.3	21.4	23.5	24.9
EER (EC)		–	3.6	3.2	3.2	3.5	3.2	3.5	3.2	3.1
CombiCool option⁴⁾										
CW-Coil total duty (AC)	kW	–	5.4	6.3	7.5	12.0	12.0	14.9	16.6	16.6
CW-Coil sensible duty (AC)	kW	–	5.4	6.3	7.5	12.0	12.0	14.9	16.6	16.6
CW-Coil total duty (EC)	kW	–	5.4	6.5	7.4	12.5	13.1	14.6	15.6	16.0
CW-Coil sensible duty (EC)	kW	–	5.4	6.5	7.4	12.5	13.1	14.6	15.6	16.0
Fans										
Airflow (AC)	m³/s	0.44	0.60	0.76	1.02	1.31	1.31	1.85	2.22	2.22
	m³/h	1,584	2,160	2,736	3,658	4,720	4,720	6,674	7,992	7,992
Airflow (EC)	m³/s	–	0.60	0.80	1.00	1.40	1.50	1.80	2.00	2.09
	m³/h	–	2,160	2,880	3,600	5,040	5,400	6,480	7,200	7,524
Ext. static (AC)	Pa	20	20	20	20	20	20	20	20	20
Ext. static (EC)	Pa	–	20	20	20	20	20	20	20	20
Sound pressure level⁵⁾										
Downflow (AC)	dB(A)	45	52	53	54	56	56	57	58	60
Downflow (EC)	dB(A)	45	44	51	56	51	52	56	58	58
Electrical data⁶⁾										
Power input (AC)	kW	1.80	2.92	4.26	5.17	6.17	7.16	8.01	9.81	11.08
Power input (EC)	kW	–	2.48	3.85	4.73	5.20	6.54	6.83	8.65	10.16
Humidifier										
Capacity humidifier (AC)	kg/h	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Capacity humidifier (EC)	kg/h	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Power input (AC)	kW	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Power input (EC)	kW	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Heating										
Electrical heating	kW	3.0	6.0	6.0	6.0	12.0	12.0	12.0	12.0	12.0
LPHW heating	kW	–	6.0	6.0	6.0	15.0	15.0	15.0	15.0	15.0
Condensing units										
Model size		CT22	CS40	CM48	CM61	CP72	CP81	CL90	CL11	CL12
Number of units		1	1	1	1	1	1	1	1	1

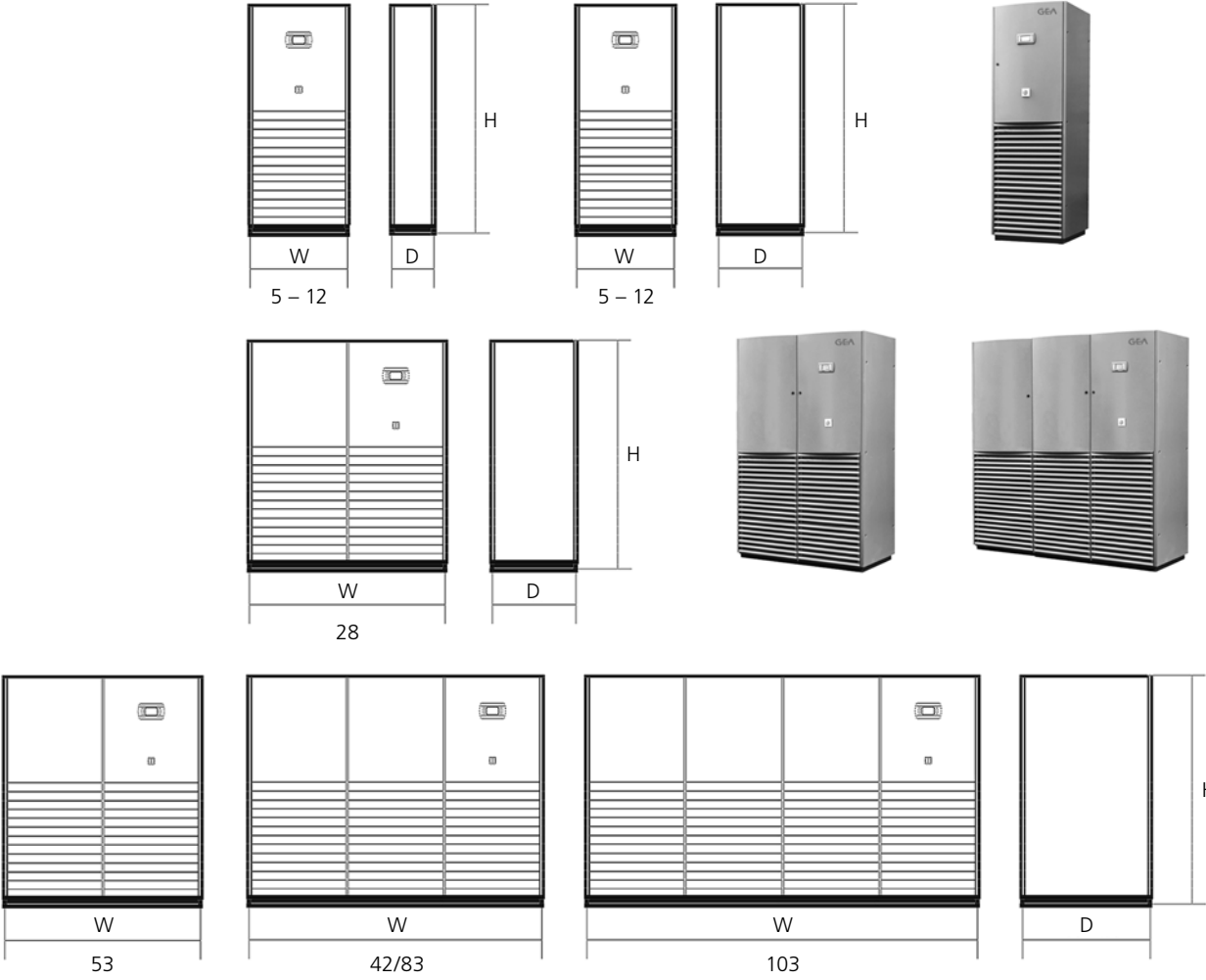
- ¹⁾ VRF option available (standard from model size 48)
- ²⁾ Return air conditions: 24 °C / 45 % relative humidity / 35 °C ambient temperature
- ³⁾ Available in downflow only
- ⁴⁾ Return air conditions: 24 °C / 45 % relative humidity / 0 % glycol / water: 7/12 °C
- ⁵⁾ Sound pressure level in 2-metre free field
- ⁶⁾ Data for “cooling only” mode of operation

DX X version Model size		32 ¹⁾	37 ¹⁾	42 ¹⁾	48	53	63	73	83
Cooling²⁾									
Gross total duty (AC)	kW	33.7	38.5	46.4	52.5	59.9	63.3	81.6	89.1
Net sensible duty (AC)	kW	28.9	32.8	37.6	44.1	47.2	55.1	68.4	71.5
EER (AC)		2.8	2.7	3.0	2.9	2.8	3.0	2.6	2.5
Gross total duty (EC) ³⁾	kW	33.2	37.6	45.8	52.1	59.4	63.4	79.8	86.9
Net sensible duty (EC)	kW	30.2	33.4	37.5	45.8	48.9	57.1	66.6	69.6
EER (EC)		3.4	3.2	3.3	3.4	3.2	3.3	2.9	2.7
CombiCool option⁴⁾									
CW-Coil total duty (AC)	kW	22.8	25.6	25.6	31.6	31.6	40.5	48.4	48.4
CW-Coil sensible duty (AC)	kW	22.8	25.6	25.6	31.6	31.6	40.5	48.4	48.4
CW-Coil total duty (EC)	kW	21.3	22.8	24.3	44.3	44.3	57.4	64.6	64.6
CW-Coil sensible duty (EC)	kW	21.3	22.8	24.3	44.3	44.3	56.9	64.6	64.6
Fans									
Airflow (AC)	m ³ /s	2.79	3.38	3.38	4.09	4.09	4.61	6.19	6.19
	m ³ /h	10,051	12,168	12,168	14,724	14,724	16,596	22,284	22,284
Airflow (EC)	m ³ /s	2.50	2.80	3.10	4.00	4.00	4.60	5.40	5.40
	m ³ /h	9,000	10,080	11,160	14,400	14,400	16,560	19,440	19,440
Ext. static (AC)	Pa	20	20	20	20	20	20	20	20
Ext. static (EC)	Pa	20	20	20	20	20	20	20	20
Sound pressure level⁵⁾									
Downflow (AC)	dB(A)	59	59	59	61	61	61	62	62
Downflow (EC)	dB(A)	56	59	61	63	63	64	68	68
Electrical data⁶⁾									
Power input (AC)	kW	12.04	14.21	15.45	18.10	21.06	21.43	31.25	36.26
Power input (EC)	kW	9.85	11.85	13.90	15.38	18.30	19.16	27.77	32.73
Humidifier									
Capacity humidifier (AC)	kg/h	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Capacity humidifier (EC)	kg/h	3.0	3.0	3.0	8.0	8.0	8.0	8.0	8.0
Power input (AC)	kW	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
Power input (EC)	kW	2.3	2.3	2.3	6.0	6.0	6.0	6.0	6.0
Heating									
Electrical heating	kW	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
LPHW heating	kW	21.0	21.0	21.0	–	–	–	–	–
Condensing units									
Model size		CL12	CL16	CL90	CLV48	CLV51	CLV61	CLV81	CL19
Number of units		1	1	2	2	2	2	2	2

DX X version									
Model size		32 ¹⁾	37 ¹⁾	42 ¹⁾	48	53	63	73	83
Weights and dimensions									
Weight	kg	420	420	420	660	660	810	810	810
Height (H)	mm	1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,940
Width (W)	mm	1,840	1,840	1,840	1,250	1,250	1,840	1,840	1,840
Depth (D)	mm	685	685	685	985	985	985	985	985
<div><div><div><div>W</div><div>32 – 42</div></div><div><div><div>D</div></div><div><div><div>H</div></div></div></div><div><div><div><div>W</div><div>48 – 53</div></div><div><div><div>W</div><div>63 – 83</div></div><div><div><div>D</div><div>H</div></div></div></div></div></div></div></div>									

¹⁾ VRF option available (standard from model size 48)
²⁾ Return air conditions: 24 °C / 45 % relative humidity / 35 °C ambient temperature
³⁾ Available in downflow only
⁴⁾ Return air conditions: 24 °C / 45 % relative humidity / 0 % glycol / water: 7/12 °C
⁵⁾ Sound pressure level in 2-metre free field
⁶⁾ Data for "cooling only" mode of operation

C version Model size		5	12	28	42	53	83	103
Cooling¹⁾								
Gross total duty (AC)	kW	6.1	14.1	29.2	46.3	54.5	86.3	–
Net sensible duty (AC)	kW	5.3	11.3	23.9	37.5	45.0	70.3	–
EER (AC)		22.7	10.3	9.9	10.2	9.8	10.2	–
Gross total duty (EC) ²⁾	kW	–	13.9	27.8	43.2	53.1	76.9	106.1
Net sensible duty (EC)	kW	–	11.6	23.6	36.4	46.5	65.6	92.3
EER (EC)		–	15.1	13.5	14.4	18.8	14.9	13.7
HE-Coil option ³⁾	kW	–	16.6	38.1	58.5	72.6	102.6	147.6
EER (EC)		–	16.8	19.7	20.2	25.0	19.4	18.7
CombiCool option⁴⁾								
CW-Coil total duty (AC)	kW	–	7.5	16.6	25.6	31.6	48.5	–
CW-Coil sensible duty (AC)	kW	–	7.5	16.6	25.6	31.6	48.5	–
CW-Coil total duty (EC)	kW	–	7.4	16.0	24.3	44.3	63.0	92.6
CW-Coil sensible duty (EC)	kW	–	7.4	16.0	24.3	44.3	63.0	92.6
Fans								
Airflow (AC)	m³/s	0.44	1.02	2.22	3.39	4.09	6.19	–
	m³/h	1,588	3,672	7,992	12,204	14,724	22,284	–
Airflow (EC)	m³/s	–	1.00	2.10	3.10	4.00	5.20	8.10
	m³/h	–	3,600	7,560	11,160	14,400	18,720	29,160
Ext. static (AC)	Pa	20	20	20	20	20	20	–
Ext. static (EC)	Pa	–	20	20	20	20	20	20
Sound pressure level⁵⁾								
Downflow (AC)	dB(A)	45	54	58	59	60	62	–
Downflow (EC)	dB(A)	–	56	60	61	63	68	70
Electrical data⁶⁾								
Power input (AC)	kW	0.27	1.37	2.95	4.53	5.54	8.44	–
Power input (EC)	kW	–	0.92	2.06	3.00	2.82	5.17	7.76
Humidifier								
Capacity humidifier (AC)	kg/h	3.0	3.0	3.0	3.0	3.0	3.0	–
Capacity humidifier (EC)	kg/h	3.0	3.0	3.0	3.0	8.0	8.0	15.0
Power input (AC)	kW	2.3	2.3	2.3	2.3	2.3	2.3	11.3
Power input (EC)	kW	2.3	2.3	2.3	2.3	6.0	6.0	11.3
Heating								
Electrical heating	kW	–	6.0	12.0	12.0	12.0	12.0	12.0
LPHW heating	kW	–	6.0	15.0	15.0	–	–	–
CW-Data								
Water flow rate (AC)	m³/h	1.0	2.4	5.0	8.0	9.4	14.9	–
Pressure drop (unit, AC)	kPa	54	59	68	83	52	65	–
Water flow rate (EC)	m³/h	–	2.4	4.8	7.4	9.1	13.2	18.3
Pressure drop (unit, EC)	kPa	–	58	62	73	49	53	52

C version Model size		5	12	28	42	53	83	103
Weights and dimensions								
Weight	kg	140	215	355	430	680	830	930
Height (H)	mm	1,940	1,940	1,940	1,940	1,940	1,940	1,940
Width (W)	mm	665	665	1,250	1,250	1,250	1,840	2,450
Depth (D)	mm	385	685	685	985	985	985	985
								

¹⁾ Return air conditions: 24 °C / 45 % relative humidity / 0 % glycol / water: 7/12 °C

²⁾ Available in downflow only

³⁾ Optional high-performance heat exchanger; different hydraulic parameters; data here: gross total

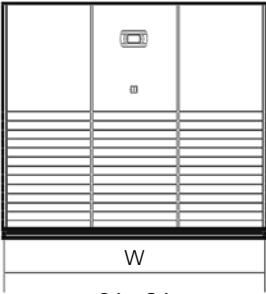
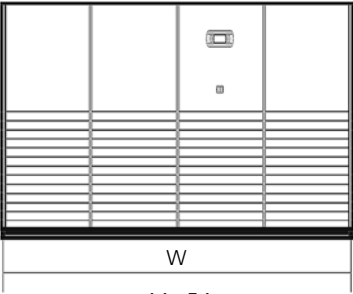

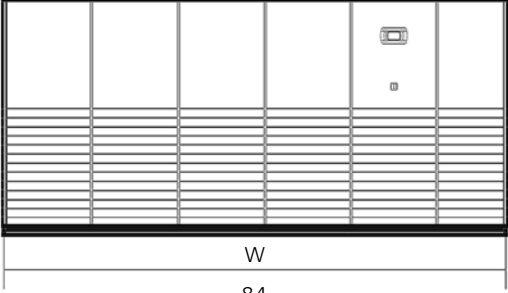
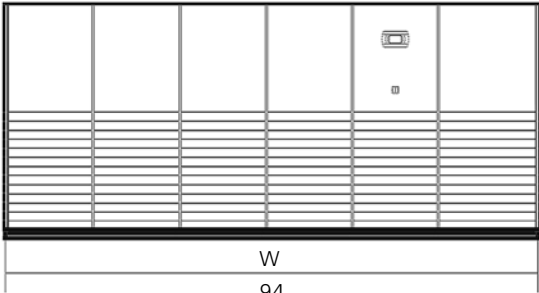
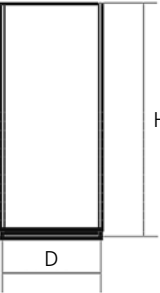
⁴⁾ Return air conditions: 24 °C / 45 % relative humidity / 0 % glycol / water: 7/12 °C

⁵⁾ Sound pressure level in 2-metre free field

⁶⁾ Data for "cooling only" mode of operation

DX A version Model size		24 ¹⁾	34 ¹⁾	44 ¹⁾	54 ¹⁾	64 ¹⁾	74 ¹⁾	84 ¹⁾	94
Cooling²⁾									
Gross total duty	kW	27.6	40.8	45.0	65.0	69.6	84.6	90.1	120.8
Net sensible duty	kW	24.9	32.1	40.4	51.3	61.3	69.2	78.1	92.4
EER		3.4	3.1	3.5	3.2	3.4	3.0	3.5	2.9
CombiCool option³⁾									
CW-Coil total duty	kW	31.4	34.9	49.7	57.5	75.3	80.0	83.8	99.7
CW-Coil sensible duty	kW	30.0	33.9	46.8	55.7	73.0	78.6	83.0	96.7
Fans									
Airflow (AC)	m ³ /s	2.2	2.6	3.4	4.3	5.6	6.2	6.7	7.5
	m ³ /h	7,920	9,360	12,240	15,480	20,160	22,320	24,120	27,000
Ext. static	Pa	20	20	20	20	20	20	20	20
Heating									
Electrical heating	kW	12.0	12.0	12.0	12.0	18.0	18.0	18.0	18.0
LPHW heating	kW	12.0	12.0	21.0	21.0	30.0	30.0	36.0	36.0
Sound pressure level⁴⁾									
Upflow	dB(A)	65	68	67	65	69	70	69	71
Downflow	dB(A)	58	61	60	62	62	64	63	64
Humidifier									
Capacity humidifier	kg/h	8.0	8.0	15.0	15.0	15.0	15.0	15.0	15.0
Power input	kW	6.0	6.0	11.3	11.3	11.3	11.3	11.3	11.3
Electrical data⁵⁾									
Power input (cooling only)	kW	8.02	13.19	12.82	20.06	20.69	27.85	25.62	41.64
Full load current	A	37	48	62	80	87	100	100	125
Air-cooled condensers									
Model size	DCRA	21-6	26-6	32-6	50-6	50-6	50-6	75-6	75-6
Number of condensers		2	2	2	2	2	2	2	2

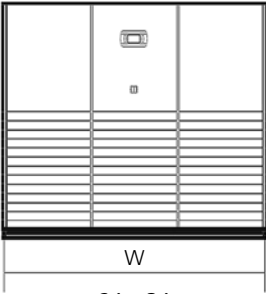
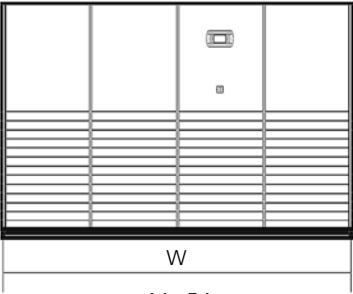
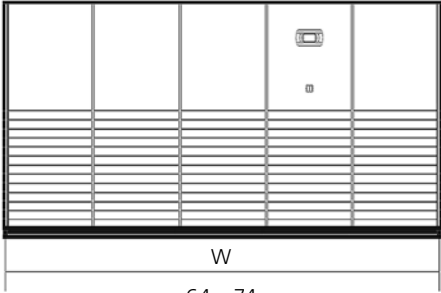
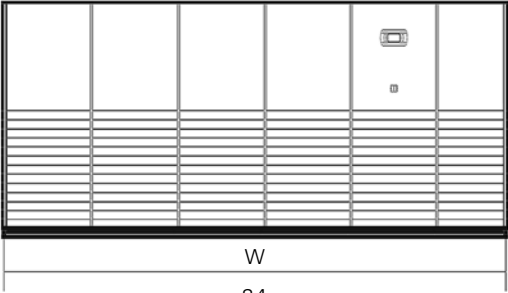
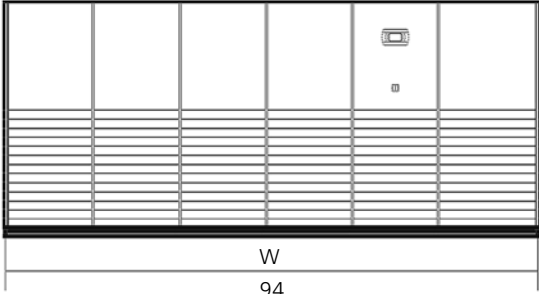
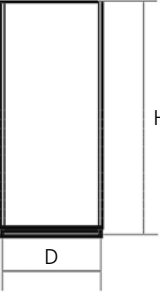

¹⁾ VRF option available²⁾ Return air conditions: 24 °C / 45 % relative humidity / 35 °C ambient temperature³⁾ Return air conditions: 24 °C / 45 % relative humidity / 0 % glycol / water: 7/12 °C⁴⁾ Sound pressure level in 2-metre free field⁵⁾ Data for "cooling only" mode of operation

DX A version									
Model size		24 ¹⁾	34 ¹⁾	44 ¹⁾	54 ¹⁾	64 ¹⁾	74 ¹⁾	84 ¹⁾	94
Weights and dimensions									
Weight	kg	520	535	770	795	1,045	1,090	1,220	1,230
Height (H)	mm	1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,965
Width (W)	mm	1,915	1,915	2,500	2,500	3,090	3,090	3,680	3,980
Depth (D)	mm	830	830	830	830	830	830	830	830
<div><div><div><p>W</p><p>24 – 34</p></div><div><p>W</p><p>44 – 54</p></div><div></div></div></div>									
<div><div><div><p>W</p><p>64 – 74</p></div><div><p>W</p><p>84</p></div></div></div>									
<div><div><div><p>W</p><p>94</p></div><div><p>H</p><p>D</p></div></div></div>									

¹⁾ VRF option available

DX W version Model size		24 ¹⁾	34 ¹⁾	44 ¹⁾	54 ¹⁾	64 ¹⁾	74 ¹⁾	84 ¹⁾	94
Cooling²⁾									
Gross total duty	kW	28.4	42.3	46.2	65.9	71.5	88.0	91.2	124.9
Net sensible duty	kW	25.5	32.8	41.3	51.7	62.8	70.6	78.5	94.2
EER		3.8	3.5	3.8	3.4	3.7	3.4	3.7	3.2
CombiCool option³⁾									
CW-Coil total duty	kW	31.4	34.9	49.7	57.5	75.3	80.0	83.8	99.7
CW-Coil sensible duty	kW	30.0	33.9	46.8	55.7	73.0	78.6	83.0	96.7
Fans									
Airflow (AC)	m ³ /s	2.2	2.6	3.4	4.3	5.6	6.2	6.7	7.5
	m ³ /h	7,920	9,360	12,240	15,480	20,160	22,320	24,120	27,000
Ext. static	Pa	20	20	20	20	20	20	20	20
Heating									
Electrical heating	kW	12.0	12.0	12.0	12.0	18.0	18.0	18.0	18.0
LPHW heating	kW	12.0	12.0	21.0	21.0	30.0	30.0	36.0	36.0
Sound pressure level⁴⁾									
Upflow	dB(A)	65	68	67	68	69	70	69	71
Downflow	dB(A)	58	61	60	62	62	64	63	64
Humidifier									
Capacity humidifier	kg/h	8.0	8.0	15.0	15.0	15.0	15.0	15.0	15.0
Power input	kW	6.0	6.0	11.3	11.3	11.3	11.3	11.3	11.3
Electrical data⁵⁾									
Power input (cooling only)	kW	7.56	12.11	12.08	19.42	19.55	25.53	24.94	38.48
Full load current	A	34	45	59	71	78	91	91	116
Dry coolers									
Model size	DDRA	75-6	50-6	50-6	75-6	50-6	75-6	75-6	75-6
Number of dry coolers		1	2	2	2	3	3	3	4

¹⁾ VRF option available²⁾ Return air conditions: 24 °C / 45 % relative humidity / water: 30/35 °C³⁾ Return air conditions: 24 °C / 45 % relative humidity / 0 % glycol / water: 7/12 °C⁴⁾ Sound pressure level in 2-metre free field⁵⁾ Data for "cooling only" mode of operation

DX W version									
Model size		24 ¹⁾	34 ¹⁾	44 ¹⁾	54 ¹⁾	64 ¹⁾	74 ¹⁾	84 ¹⁾	94
Weights and dimensions									
Weight	kg	535	550	860	890	1,075	1,130	1,280	1,305
Height (H)	mm	1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,965
Width (W)	mm	1,915	1,915	2,500	2,500	3,090	3,090	3,680	3,980
Depth (D)	mm	830	830	830	830	830	830	830	830
<div><div><div><p>W</p><p>24 – 34</p></div><div><p>W</p><p>44 – 54</p></div><div><p>W</p><p>64 – 74</p></div><div><p>W</p><p>84</p></div><div><p>W</p><p>94</p></div><div><p>H</p><p>D</p></div><div></div></div></div>									

¹⁾ VRF option available

DX F version Model size		24 ¹⁾	34 ¹⁾	44 ¹⁾	54 ¹⁾	64 ¹⁾	74 ¹⁾	84 ¹⁾	94
Cooling²⁾									
Gross total duty	kW	28.3	42.2	46.1	65.6	71.3	87.4	91.1	124.0
Net sensible duty	kW	25.2	32.3	41.0	51.1	62.1	69.4	78.1	93.0
EER		3.6	3.4	3.7	3.3	3.5	3.4	3.5	3.1
Freecooling coil³⁾									
CW-Coil total duty	kW	31.4	34.9	49.7	56.7	75.3	78.5	83.8	98.1
CW-Coil sensible duty	kW	30.0	33.9	46.8	54.7	73.0	76.7	83.0	95.0
Fans									
Airflow (AC)	m ³ /s	2.2	2.6	3.4	4.2	5.6	6.0	6.7	7.3
	m ³ /h	7,920	9,360	12,240	15,120	20,160	21,600	24,120	26,280
Ext. static	Pa	20	20	20	20	20	20	20	20
Heating									
Electrical heating	kW	12.0	12.0	12.0	12.0	18.0	18.0	18.0	18.0
Sound pressure level⁴⁾									
Upflow	dB(A)	66	69	68	69	70	71	71	72
Downflow	dB(A)	60	62	61	63	64	65	64	65
Humidifier									
Capacity humidifier	kg/h	8.0	8.0	15.0	15.0	15.0	15.0	15.0	15.0
Power input	kW	6.0	6.0	11.3	11.3	11.3	11.3	11.3	11.3
Electrical data⁵⁾									
Power input (cooling only)	kW	7.81	12.48	12.45	19.71	20.22	25.83	25.75	39.83
Full load current	A	34	45	52	71	78	91	91	116
Dry coolers									
Model size	DDRA	75-6	50-6	50-6	75-6	50-6	75-6	75-6	75-6
Number of dry coolers		1	2	2	2	3	3	3	4

¹⁾ VRF option available²⁾ Return air conditions: 24 °C / 45 % relative humidity / water: 30/35 °C³⁾ Return air conditions: 24 °C / 45 % relative humidity / 25 % glycol / water: 7 °C⁴⁾ Sound pressure level in 2-metre free field⁵⁾ Data for "cooling only" mode of operation


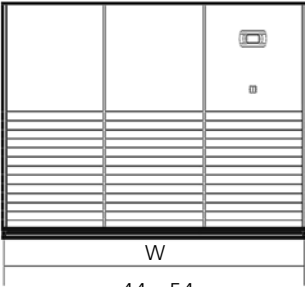
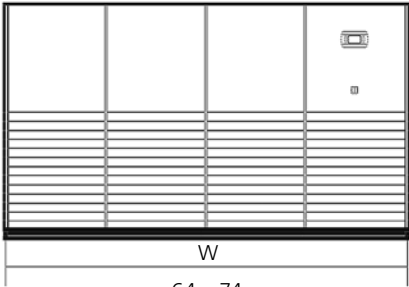
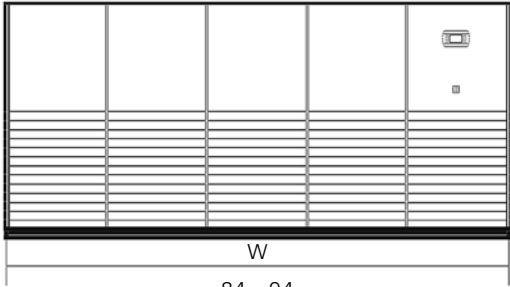
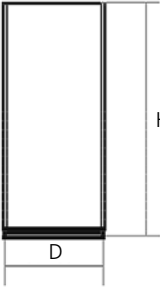

DX F version Model size		24 ¹⁾	34 ¹⁾	44 ¹⁾	54 ¹⁾	64 ¹⁾	74 ¹⁾	84 ¹⁾	94
Weights and dimensions									
Weight	kg	720	740	1,165	1,200	1,480	1,525	1,705	1,760
Height (H)	mm	1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,965
Width (W)	mm	1,915	1,915	2,500	2,500	3,090	3,090	3,680	3,980
Depth (D)	mm	830	830	830	830	830	830	830	830

Technical drawings of GEA Denco E-Range DX F models showing front and side views with dimensions W, H, and D. The drawings are arranged in a grid: top row shows models 24-34 and 44-54; middle row shows models 64-74 and 84; bottom row shows model 94 and a side view with dimensions H and D.

¹⁾ VRF option available

DX X version Model size		24 ¹⁾	34 ¹⁾	44 ¹⁾	54 ¹⁾	64 ¹⁾	74 ¹⁾	84 ¹⁾	94
Cooling²⁾									
Gross total duty	kW	30.3	46.7	51.5	61.0	67.2	78.0	83.7	110.3
Net sensible duty	kW	26.7	34.7	43.5	49.6	59.4	66.4	74.1	88.0
EER		2.9	3.1	3.2	3.0	3.1	2.8	2.9	3.1
CombiCool option³⁾									
CW-Coil total duty	kW	31.4	34.9	49.7	57.5	75.3	80.0	83.8	99.7
CW-Coil sensible duty	kW	30.0	33.9	46.8	55.7	73.0	78.6	83.0	96.7
Fans									
Airflow (AC)	m ³ /s	2.2	2.6	3.4	4.3	5.6	6.2	6.7	7.5
	m ³ /h	7,920	9,360	12,240	15,480	20,160	22,320	24,120	27,000
Ext. static	Pa	20	20	20	20	20	20	20	20
Heating									
Electrical heating	kW	12.0	12.0	12.0	12.0	18.0	18.0	18.0	18.0
LPHW heating	kW	12.0	12.0	21.0	21.0	30.0	30.0	36.0	36.0
Sound pressure level⁴⁾									
Upflow	dB(A)	65	67	67	68	69	70	69	71
Downflow	dB(A)	58	61	61	62	63	64	63	65
Humidifier									
Capacity humidifier	kg/h	8.0	8.0	15.0	15.0	15.0	15.0	15.0	15.0
Power input	kW	6.0	6.0	11.3	11.3	11.3	11.3	11.3	11.3
Electrical data⁵⁾									
Power input (cooling only)	kW	10.30	15.13	16.06	20.36	21.67	28.27	29.06	35.32
Condensing units									
Model size		CM61	CP72	CL90	CL12	CL12	CL16	CP90	CL90
Number of units		2	2	2	2	2	2	4	4

¹⁾ VRF option available²⁾ Return air conditions: 24 °C / 45 % relative humidity / 35 °C ambient temperature³⁾ Return air conditions: 24 °C / 45 % relative humidity / 0 % glycol / water: 7/12 °C⁴⁾ Sound pressure level in 2-metre free field⁵⁾ Data for "cooling only" mode of operation

DX X version									
Model size		24 ¹⁾	34 ¹⁾	44 ¹⁾	54 ¹⁾	64 ¹⁾	74 ¹⁾	84 ¹⁾	94
Weights and dimensions									
Weight	kg	345	345	485	485	735	735	795	795
Height (H)	mm	1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,940
Width (W)	mm	1,275	1,275	1,865	1,865	2,450	2,450	3,040	3,040
Depth (D)	mm	830	830	830	830	830	830	830	830
<div><div><div><p>W 24 – 34</p></div><div><p>W 44 – 54</p></div><div><p>W 64 – 74</p></div><div><p>W 84 – 94</p></div><div><p>H D</p></div><div></div></div></div>									

¹⁾ VRF option available

C version Model size		34	54	74	94
Cooling¹⁾					
Gross total duty	kW	36.9	62.1	87.4	108.0
Net sensible duty	kW	30.5	50.0	70.3	87.1
EER (AC)		13.7	13.2	13.0	13.4
HE-Coil option ²⁾	kW	50.6	83.6	118.1	145.4
EER (EC)		18.0	17.0	16.8	17.1
CombiCool option³⁾					
CW-Coil total duty	kW	34.9	57.5	80.0	99.7
CW-Coil sensible duty	kW	33.9	55.7	78.6	96.7
Fans					
Airflow (AC)	m³/s	2.6	4.3	6.2	7.5
	m³/h	9,360	15,480	22,320	27,000
Ext. static	Pa	20	20	20	20
Heating					
Electrical heating	kW	12.0	12.0	18.0	18.0
LPHW heating	kW	12.0	21.0	30.0	36.0
Sound pressure level⁴⁾					
Upflow	dB(A)	67	68	70	71
Downflow	dB(A)	61	62	64	65
Humidifier					
Capacity humidifier	kg/h	8.0	15.0	15.0	15.0
Power input	kW	3.3	6.1	6.1	6.1
Electrical data⁵⁾					
Power input (cooling only)	kW	2.69	4.72	6.73	8.08
Full load current	A	35	51	67	67
CW-Data					
Water flow rate	m³/h	6.2	10.4	14.7	18.6
Pressure drop (unit)	kPa	77	98	80	103


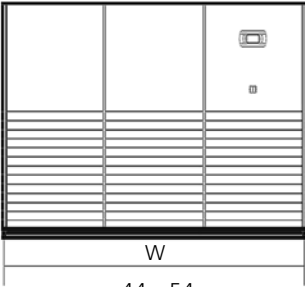
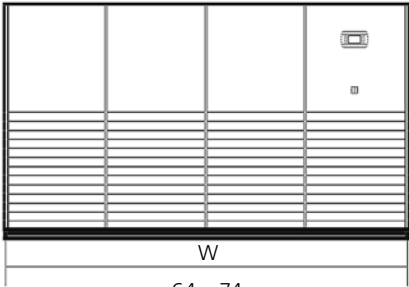
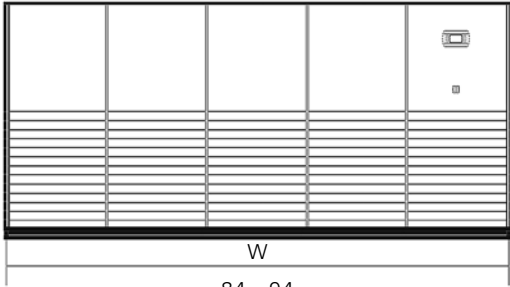
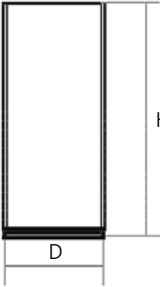

¹⁾ Return air conditions: 24 °C / 45 % relative humidity / water: 7/12 °C / 0 % glycol

²⁾ Optional high-performance heat exchanger; different hydraulic parameters; data here: gross total

³⁾ Return air conditions: 24 °C / 45 % relative humidity / 0 % glycol / water: 7/12 °C

⁴⁾ Sound pressure level in 2-metre free field

⁵⁾ Data for "cooling only" mode of operation


C version					
Model size		34	54	74	94
Weights and dimensions					
Weight	kg	345	485	735	795
Height (H)	mm	1,940	1,940	1,940	1,940
Width (W)	mm	1,275	1,865	2,450	3,040
Depth (D)	mm	830	830	830	830
<div><div><div><p>W 24 – 34</p></div><div><p>W 44 – 54</p></div><div><p>W 64 – 74</p></div><div><p>W 84 – 94</p></div><div><p>H D</p></div><div></div></div></div>					

Model size		DX X version				C version			
		34	54	74	94	34	54	74	94
6 row coil data¹⁾									
Gross total duty	kW	40.6	62.1	82.6	120.0	40.6	62.1	82.6	120.0
Net sensible duty	kW	33.2	50.5	67.4	98.4	33.2	50.5	67.4	98.4
Water flow rate	m³/h	–	–	–	–	–	–	–	–
Pressure drop (unit)	kPa	–	–	–	–	121	128	96	166
Condensing units	Size	CP81	CL12	CL19	CL12	–	–	–	–
Number of condensers		2	2	2	4	–	–	–	–
4 row coil data¹⁾									
Gross total duty	kW	29.2	45.7	60.3	88.3	40.7	62.2	82.7	121.0
Net sensible duty	kW	27.3	41.9	55.8	81.1	33.3	50.6	67.5	98.5
Water flow rate	m³/h	–	–	–	–	–	–	–	–
Pressure drop (unit)	kPa	–	–	–	–	57	62	45	82
Condensing units	Size	CM61	CP90	CL11	CP90	–	–	–	–
Number of condensers		2	2	2	4	–	–	–	–
2 row coil data¹⁾									
Gross total duty	kW	19.9	31.0	41.1	57.2	40.8	62.3	82.8	122.0
Net sensible duty	kW	19.2	29.6	39.4	55.7	33.4	50.7	67.6	98.6
Water flow rate	m³/h	–	–	–	–	–	–	–	–
Pressure drop (unit)	kPa	–	–	–	–	41	48	36	47
Condensing units	Size	CS40	CM61	CP72	CM48	–	–	–	–
Number of condensers		2	2	2	4	–	–	–	–
Fans									
Airflow (AC)	m³/s	2.0	3.0	4.0	6.0	2.0	3.0	4.0	6.0
	m³/h	7,200	10,800	14,400	18,000	7,200	10,800	14,400	18,000
Ext. static	Pa	800	800	800	800	800	800	800	800
Heating									
Electrical heating	kW	12.0	12.0	18.0	18.0	12.0	12.0	18.0	18.0
LPHW heating	kW	12.0	21.0	30.0	36.0	12.0	21.0	30.0	36.0
Sound pressure level²⁾									
Upflow	dB(A)	74.2	73.9	75.1	76.9	74.2	73.9	75.1	76.9
Humidifier									
Capacity humidifier	kg/h	8.0	15.0	15.0	15.0	8.0	15.0	15.0	15.0
Power input	kW	6.0	11.3	11.3	11.3	6.0	11.3	11.3	11.3

¹⁾ 24 °C / 45 % relative humidity / T_{ambient}: 35 °C²⁾ Sound pressure level in 2-metre free field

Weights and dimensions

GEA Denco E-Range HS models – High static pressure

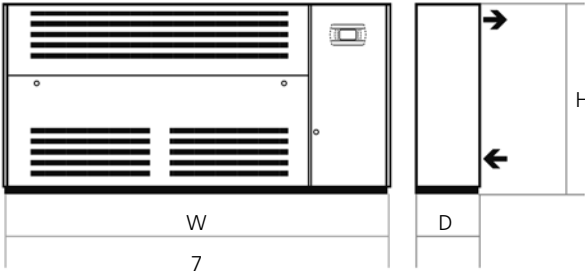
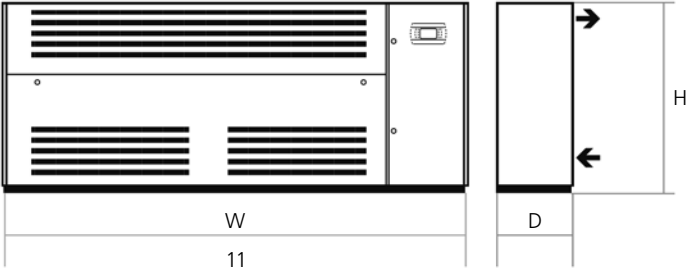
Model size		DX X version				C version			
		34	54	74	94	34	54	74	94
Weights and dimensions									
Weight	kg	345	485	735	795	345	485	735	795
Height (H)	mm	1,940	1,940	1,940	1,940	1,940	1,940	1,940	1,940
Width (W)	mm	1,275	1,865	2,450	3,040	1,275	1,865	2,450	3,040
Depth (D)	mm	800	800	800	800	800	800	800	800
<div> <div> <div> <div> <div>W</div> <div>34</div> </div> <div> <div>W</div> <div>54</div> </div> <div> <div>W</div> <div>84</div> </div> </div> <div> <div> <div>W</div> <div>94</div> </div> <div> <div>H</div> <div>D</div> </div> </div> <div>  </div> </div> </div>									

Model size		DX X version		C version	
		7	11	7	11
Cooling¹⁾					
Gross total duty	kW	6.6	10.5	5.4	13.4
Net sensible duty	kW	5.2	9.5	4.7	11.3
EER		3.3	3.1	15.5	16.7
Fans					
Airflow (AC)	m³/s	0.35	0.80	0.35	0.80
	m³/h	1,260	2,880	1,260	2,880
Ext. static	Pa	20	20	20	20
Heating					
Electrical heating	kW	2.5	5.0	2.5	5.0
Sound pressure level²⁾					
Upflow	dB(A)	52	55	52	55
Humidifier					
Capacity humidifier	kg/h	3.0	3.0	3.0	3.0
Power input	kW	2.3	2.3	2.3	2.3
Electrical data³⁾					
Power input (cooling only)	kW	2.01	3.43	0.35	0.80
CW-Data					
Water flow rate	m³/h	–	–	0.9	2.3
Pressure drop (unit)	kPa	–	–	124	95.5
Condensing units					
Model size		CS28	CT34	–	–
Number of condensers		1	1	–	–

¹⁾ Return air conditions: 24 °C / 45 % relative humidity / 35 °C ambient temperature / water: 7/12 °C

²⁾ Sound pressure level in 2-metre free field

³⁾ Data for "cooling only" mode of operation

Model size		DX X version		C version	
		7	11	7	11
Weights and dimensions					
Weight	kg	85	120	85	120
Height (H)	mm	800	800	800	800
Width (W)	mm	1,400	2,000	1,400	2,000
Depth (D)	mm	300	360	300	360
<div><div><div>W 7</div></div><div><div>W 11</div></div></div>					

C-Range condensing units		CT type			CS type			CM type		
Model size		CT18	CT22	CT28	CS28	CS34	CS40	CM40	CM48	CM61
Cooling ¹⁾										
Gross total duty	kW	4.5	5.4	6.6	7.2	8.2	9.4	9.9	11.9	14.0
Net sensible duty	kW	–	3.7	4.8	5.0	5.7	6.5	6.7	8.0	10.0
Electrical data ²⁾										
Full load current 1 ph	A	8.2	10.3	13.0	–	–	–	–	–	–
Full load current 3 ph	A	–	4.3	5.2	5.2	6.2	6.9	7.3	8.4	10.5
Connection details										
Suctionline	ins	3/4	3/4	3/4	7/8	7/8	7/8	1-1/8	1-1/8	1-1/8
Liquidline	ins	3/8	3/8	3/8	1/2	1/2	1/2	5/8	5/8	5/8
Sound pressure level ³⁾										
	dB(A)	54.0	54.0	54.0	54.7	54.7	54.7	54.1	54.1	54.1
Weight										
	kg	74	75	77	85	85	90	125	125	130

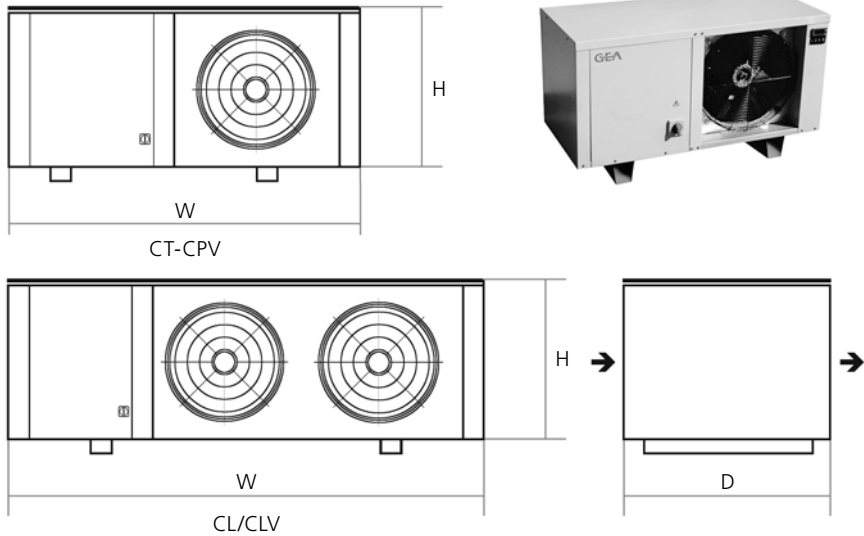
C-Range condensing units		CP type				CL type				
Model size		CP61	CP72	CP81	CP90	CL90	CL11	CL12	CL16	CL19
Cooling ¹⁾										
Gross total duty	kW	14.9	17.2	19.0	21.0	23.2	27.3	31.0	36.8	42.5
Net sensible duty	kW	10.4	12.2	13.4	14.5	15.2	18.5	21.2	25.5	29.7
Electrical data ²⁾										
Full load current 3 ph	A	10.7	12.0	14.1	15.4	16.8	19.4	21.8	25.8	29.9
Connection details										
Suctionline	ins	1-1/8	1-1/8	1-1/8	1-1/8	1-3/8	1-3/8	1-3/8	1-3/8	1-3/8
Liquidline	ins	3/4	3/4	3/4	3/4	7/8	7/8	7/8	7/8	7/8
Sound pressure level ³⁾										
	dB(A)	57.5	57.5	57.5	57.5	57.5	57.5	57.5	57.5	57.5
Weight										
	kg	185	185	190	215	245	245	245	260	275

¹⁾ Duties are evaporator duty available based on 35 °C ambient temperature and 5 °C evaporating temperature

²⁾ Full-load current at 10 °C evaporating temperature, 60 °C condensing temperature with refrigerant R407C

³⁾ Sound pressure level in 10-metre free field

C-Range condensing units		CPV type	CLV type			
Model size		CPV48	CLV48	CLV61	CLV72	CLV81
Cooling¹⁾						
Gross total duty	kW	22.1	24.8	29.4	33.8	37.3
Net sensible duty	kW	15.4	16.4	20.6	24.1	26.6
Electrical data²⁾						
Full load current 3 ph	A	15.8	15.8	21.4	24.0	28.2
Connection details						
Suctionline	ins	1-1/8	1-3/8	1-3/8	1-3/8	1-3/8
Liquidline	ins	3/4	7/8	7/8	7/8	7/8
Sound pressure level³⁾						
	dB(A)	57.5	57.5	57.5	58.0	58.0
Weight						
	kg	200	225	225	230	230

C-Range condensing units		CT	CS	CM	CP	CL	CPV	CLV
Model type								
Dimensions								
Height (H)	mm	590	690	850	910	910	910	910
Width (W)	mm	1,030	1,180	1,410	1,610	2,310	1,610	2,310
Depth (D)	mm	480	480	560	710	710	710	710
 <p>CT-CPV</p> <p>CL/CLV</p>								

¹⁾ Duties are evaporator duty available based on 35 °C ambient temperature and 5 °C evaporating temperature

²⁾ Full-load current at 10 °C evaporating temperature, 60 °C condensing temperature with refrigerant R407C

³⁾ Sound pressure level in 10-metre free field

DDRA-Range Dry coolers					
6-pole motor models ¹⁾	DDRA	32-6	50-6	75-6	100-6
Gross total duty	kW	23.2	49.7	73.2	99.5
Water flow	m ³ /h	2.65	5.67	8.34	11.34
Number of fans		1	2	3	4
Pressure loss	kPa	15.0	23.0	25.2	74.5
Sound pressure level upflow ⁴⁾	dB(A)	52	53	55	56
Connections	mm	35	42	54	54
8-pole motor models ²⁾	DDRA	25-8	40-8	60-8	80-8
Gross total duty	kW	17.7	33.4	52.1	66.8
Water flow	m ³ /h	2.02	3.81	5.94	7.613
Number of fans		1	2	3	4
Pressure loss	kPa	11.1	12.1	14.5	37.4
Sound pressure level upflow ⁴⁾	dB(A)	43	45	47	48
Connections	mm	35	42	54	54
12-pole motor models ³⁾	DDRA	17-12	29-12	39-12	58-12
Gross total duty	kW	11.6	22.4	35.8	44.8
Water flow	m ³ /h	1.32	2.56	4.075	5.11
Number of fans		1	2	3	4
Pressure loss	kPa	8.1	7.0	8.3	19.2
Sound pressure level upflow ⁴⁾	dB(A)	30	33	35	36
Connections	mm	35	42	54	54
Weights and dimensions 6, 8 and 12-pole motor models					
Dry weight	kg	90	180	270	380
Vertical airflow version ⁵⁾					
Height (H)	mm	945	945	945	1,045
Width (W)	mm	1,230	2,100	2,780	2,100
Depth (D)	mm	1,121	1,067	1,067	2,200
Horizontal airflow version ⁶⁾					
Height (H)	mm	1,142	1,088	1,088	–
Width (W)	mm	1,225	2,095	2,760	–
Depth (D)	mm	620	620	620	–

All the above technical data are based on a 25 % ethylene glycol solution, flow at 40 °C with return at 48 °C (i.e., 8 K ΔT) and with ambient temperature of 35 °C (i.e., 8 K ΔT approach temperature = equivalent to glycol leaving temperature minus ambient temperature)

¹⁾ 6-pole models: standard versions

²⁾ 8-pole models: quiet and residential versions

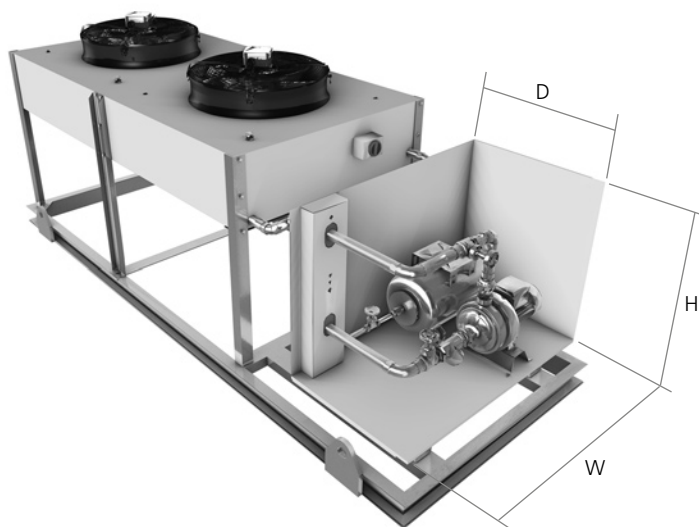
³⁾ 12-pole models: super-quiet versions for special applications

⁴⁾ Sound pressure level in 10-metre free field

⁵⁾ Vertical airflow version: vertical discharge, see page 69

⁶⁾ Horizontal airflow version: horizontal discharge, see page 69

DDRA-Range Hydronic modules for dry coolers ¹⁾		DH307	DH301	DH361	DH362	DH402	DH285
Main data							
Power input	W	800	1,100	1,900	2,200	3,000	4,000
Water flow, min.	m ³ /h	1.8	2.16	2.16	4.68	4.68	4.68
Pressure Drop	kPa	290	280	340	350	400	330
Water flow, max.	m ³ /h	7.2	10.8	10.8	18.0	18.0	36.0
Pressure drop	kPa	130	180	260	230	280	200
Connections							
Water inlet	mm	42	42	42	42	54	54
Water outlet	mm	42	42	42	42	54	54
Weights and dimensions²⁾							
Weight	kg	44	45	45	45	47	49
Height (H)	mm	715	715	715	715	715	715
Width (W)	mm	1,045	1,045	1,045	1,045	1,045	1,045
Depth (D)	mm	600	600	600	600	600	600



¹⁾ Also available together with the dry cooler on a mounting frame (see image above)

²⁾ For hydronic module only

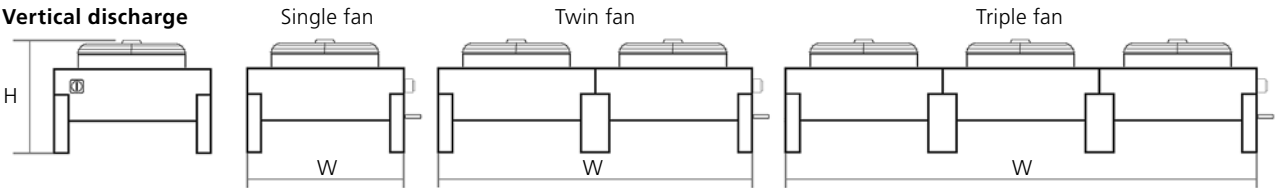
DCRA-Range Air-cooled condensers								
6-pole motor models ¹⁾	DCRA	08-6	13-6	21-6	26-6	32-6	50-6	75-6
Gross total duty	kW	7.7	13.5	21.4	26.5	31.4	54.0	75.0
Airflow	m ³ /s	0.72	1.20	2.00	2.40	2.60	4.80	6.70
	m ³ /h	2,590	4,320	7,200	8,640	9,360	17,300	24,120
Number of fans		1	1	1	1	1	2	3
Full load current	Amps	0.87	1.65	3.30	3.30	3.30	6.60	9.90
Sound pressure level upflow ⁴⁾	dB(A)	45	47	49	50	52	53	55
8-pole motor models ²⁾	DCRA	05-8	10-8	15-8	20-8	25-8	40-8	60-8
Gross total duty	kW	5.6	10.0	15.0	20.0	25.0	40.0	60.0
Airflow	m ³ /s	0.45	0.80	1.15	1.60	1.95	3.00	4.20
	m ³ /h	1.620	2.880	4.140	5.760	7.020	10.800	15.120
Number of fans		1	1	1	1	1	2	3
Full load current	Amps	0.61	0.72	1.15	1.25	1.65	2.50	3.75
Sound pressure level upflow ⁴⁾	dB(A)	36	39	40	42	43	45	47
12-pole motor models ³⁾	DCRA	04-12	07-12	11-12	14-12	17-12	29-12	39-12
Gross total duty	kW	–	7.2	10.8	15.4	17.1	29.4	40.4
Airflow	m ³ /s	–	0.52	0.75	1.05	1.2	1.95	2.95
	m ³ /h	–	1,870	2,700	3,780	4,320	7,020	10,620
Number of fans		–	1	1	1	1	2	3
Full load current	Amps	–	0.5	1.1	1.1	1.3	2.6	3.9
Sound pressure level upflow ⁴⁾	dB(A)	–	27	28	29	30	33	35
Weights and dimensions 6, 8 and 12-pole motor models								
Dry weight	kg	35	45	50	70	80	135	210
Vertical airflow version⁵⁾								
Height (H)	mm	690	790	810	945	950	950	950
Width (W)	mm	650	830	980	1,130	1,230	2,100	2,780
Depth (D)	mm	581	717	867	1,021	1,121	1,067	1,067
Horizontal airflow version⁶⁾								
Height (H)	mm	602	738	888	1,042	1,142	1,088	1,088
Width (W)	mm	645	825	975	1,125	1,225	2,095	2,760
Depth (D)	mm	530	600	600	620	620	620	620

¹⁾ 6-pole models: standard versions²⁾ 8-pole models: quiet and residential versions³⁾ 12-pole models: super-quiet versions for special applications⁴⁾ Sound pressure level in 10-metre free field⁵⁾ Vertical airflow version: vertical discharge, see page 69⁶⁾ Horizontal airflow version: horizontal discharge, see page 69

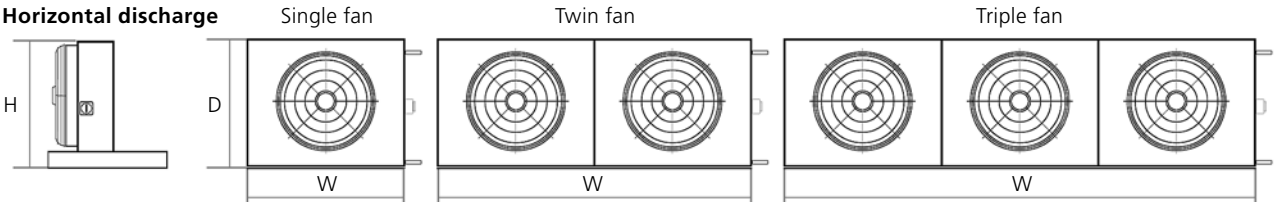
DDRA and DCRA-Range
Discharge of dry coolers and air-cooled condensers



Vertical discharge



Horizontal discharge





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