BOREAS

DCI INROW UNITS

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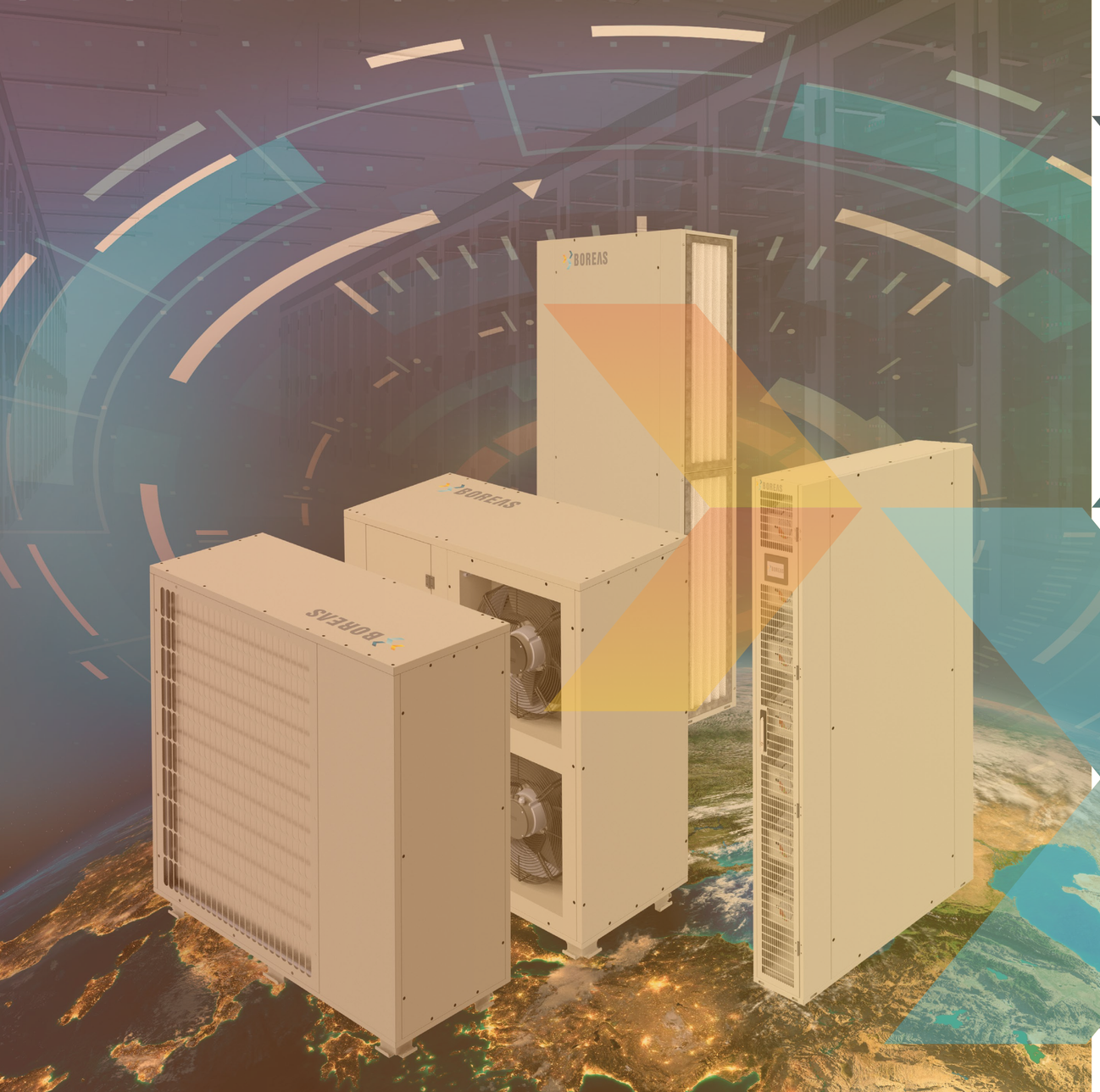


Technological Solutions for Critical Facilities

Boreas Technology engages in manufacturing and sales of Mobile Data Center solutions, DC Master and CRAC/CRAH models which are specially designed for data centers as well DC Pro units, air- conditioning units distinguished for their authentic design, and central air-conditioning equipment.

With its know-how of more than 20 years, it offers state of the art solutions for critical buildings such as hospitals, malls and hotels as well as industrial buildings and data centers in various countries in the world.

As the choice of leading global brands, the company is dedicated to offering technology solutions for a sustainable world with high efficiency, customized products thanks to its R&D investments and engineering know-how.

Data Center and Boreas

- Cooling data centers and other critical environments is a taxing task which have constantly varying requirements.
- Boreas' innovative DCI Inrow series comprising a total of 5 models with cooling capacities ranging from 8-38 kW rise up to this challenge by providing uninterrupted system security with a focus on energy efficiency.
- Selecting the right type of cooling system is one of the most critical decisions in data center design. For preventing malfunctions and extending the useful life of IT equipment, expulsion of the heat manufactured by such devices out of data centers is of critical importance.
- These units that are widely known as Inrow Units have been designed for environments such as system rooms, data centers, and telecommunication centers, where maintaining temperature and humidity at the required levels is of critical importance.

Technical Spesifications

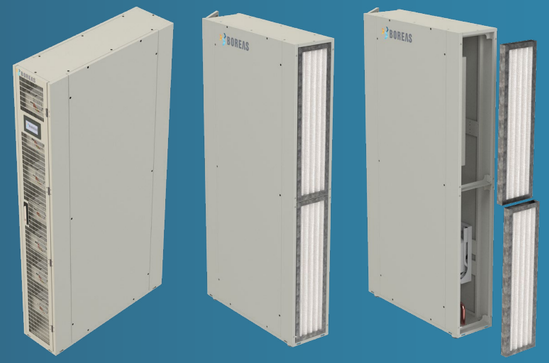
		DCI1008	DCI1016	DCI1020	DCI1025	DCI1035
Air Intake Temperature	°C	35	35	35	35	35
Air Intake Relative Humidity	%	25	25	25	25	25
Air Flow	m^3/h	3000	3500	4500	5300	7500
Air Flow	m^3/s	0,83	0,97	1,25	1,47	2,08
Total Cooling Capacity	Kw	8,7	16,7	21,1	26,2	38,5
Sensible Cooling Capacity	Kw	8,7	16,7	21,1	26,2	38,5
Net Sensible Cooling Capacity	Kw	8,4	16,3	20,5	25,4	37,4
SHR		1,00	1,00	1,00	1,00	1,00
EER		3,64	4,20	4,09	3,96	3,95
Indoor Unit						
Fan Type		EC Plug	EC Plug	EC Plug	EC Plug	EC Plug
Number of Fans		5	5	6	7	10
Fan Energy Consumption	Kw	0,30	0,45	0,66	0,82	1,05
External Static Pressure	Pa	0	0	0	0	0
Steam Humidifier (optional)	kg/h	1,5-3	1,5-3	1,5-3	1,5-3	1,5-3
Electrical Heater (optional)	Kw	2	3	3	3	6
Filter Type / Number of Filters		G4 / 2	G4 / 2	G4 / 2	G4 / 2	G4 / 2
Height	mm	2030	2030	2030	2030	1990
Length	mm	300	300	300	300	600
Depth	mm	1000	1000	1000	1000	1000
Net Weight	Kg	150	150	154	155	170
Outdoor Unit						
Number of Outdoor Units		1	1	1	1	1
External Temperature	°C	35	35	35	35	35
Number of Compressors		1	1	1	1	1
Compressor Type		Variable Speed or Constant Speed Compressor	Variable Speed or Constant Speed Compressor	Variable Speed or Constant Speed Compressor	Variable Speed or Constant Speed Compressor	Variable Speed or Constant Speed Compressor
Compressor Energy Consumption	Kw	2,1	3,5	4,5	5,8	8,7
Number of Fans (For 1 Outdoor Units)		1	1	2	2	2
Fan Type		EC Axial	EC Axial	EC Axial	EC Axial	EC Axial
Fan Energy Consumption	Kw	0,19	0,58	0,35	0,99	1,07
Height	mm	1000	1000	1510	1510	1510
Length	mm	1214	1214	1414	1414	1764
Depth	mm	600	600	600	600	600
Net Weight	Kg	128	155	179	179	215

Casing

The casing is manufactured of galvanized material.

Service doors and closure panels are manufactured of 1 mm galvanized sheet material and then treated with an electrostatic powder paint coating with code RAL9002 paint.

The number of service doors and closure panels are increased by using joints depending on capacity in order to increase casing strength.



Compressors

Compressor

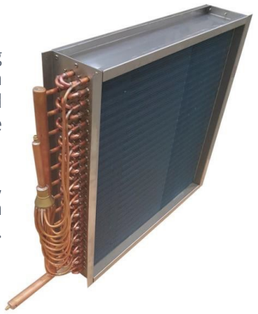
Constant speed scroll compressors which can reach high cooling capacities for little energy are compatible with operation with low GWP refrigerants.

They are used as standard equipment in DCI series units with a single refrigerant circuit. They are capable of operating effectively during changing outdoor temperatures thanks to its wide range.

Evaporator and Condenser

The evaporator and condenser are manufactured with copper tubes and aluminum fins. Fin spacing is between 1.8 and 2.5 mm. Fins are treated with hydrophilic coating to combat condensation that can occur on the evaporator. The droplets of condensed water drain down from the hydrophilic coated fins to the drain pan manufactured of stainless steel material that is found at the bottom of the evaporator.

Copper tubes are manufactured to increase turbulence during the flow of refrigerant inside the tube, thus increasing the efficiency of heat transfer by making sure the refrigerant comes into contact with the entire internal surface of the tube. Fin spacing is between 2.1 and 2.5 mm in the condenser coil. Fins are epoxy coated to prevent corrosion that can occur due to the outside environment.

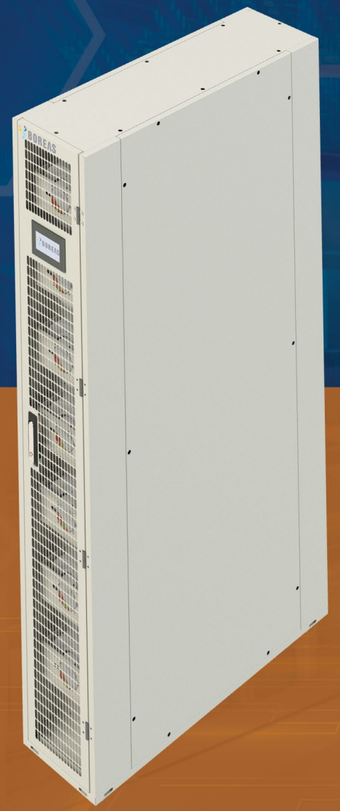


Fan

Indoor Unit Fan Group

Plug fans manufactured of high performance composite material and equipped with EC motor technology meet high pressure and high air flow rate requirements in an optimum fashion by virtue of their special blade design. The special design of blades minimizes the operating noise of the fan, enabling the DCI series to operate quite silently.

The rotation speed information can be proportionally adjusted from the control panel according to the cooling requirement. The unit can operate at ambient temperatures ranging from -20 to +40 °C. It can facilitate substantial reduction in annual power consumption by virtue of its fan efficiency of up to 70%.



Outdoor Unit Fan Group

Axial fans are used. They facilitate fairly silent operation thanks to their special blade design. They can be proportionally adjusted from the control panel for a constant high pressure value, depending on the capacity needed at variable outdoor temperatures.

For winter conditions, the speed of rotation slows considerably or stops, depending on requirements. This prevents frost from occurring on the outdoor unit. In the event that the temperature exceeds the required design temperature during summer, the unit raises the speed of rotation even further, enabling the compressor to operate more efficiently. The unit can operate at ambient temperatures ranging from -35 to +70 °C.

Filter

ePM10 panel filters conforming to the EN ISO 16890 standard are used, and have an average efficiency of 80% to 90%. Casettes are manufactured from galvanized steel sheet as a standard for the DCPro series.

The flame resistance of the filter medium is class F1 according to the DIN 53438 standard. Maximum operating temperatures can reach +70 °C.

Electronic Expansion Valve

The electronic expansion valve that is commanded from the automation panel can adjust its aperture precisely according to the operating speed of the compressor.

By keeping the superheat value fixed at the set value by virtue of its capability to provide the adequate amount of gas charge into the evaporator, the valve ensures that the refrigerant is fully vaporized inside the evaporator. It prevents flow back of liquid phase refrigerant to the compressor and minimizes the chances of compressor malfunctions.

Electrical and Control Panel

All internal equipment is commanded from a single point via the PLC controlled automation system. The unit operation is managed by connecting the following equipment to the control system.

- Discharge Air Temperature and Humidity Sensor
- Return Air Temperature and Humidity Sensor
- Pressure Differential Sensor (Discharge Fan)
- High Pressure Sensor
- Low Pressure Sensor
- High/Low Pressure Switches
- Differential Pressure Switch (For filter dirtiness information)
- High Temperature Thermostat (For the electrical heater option)
- Water Leakage Detector
- Energy Analyzer (Optional)
- ATS (Optional)
- Steam humidifier control card (Optional)
- Gas circuit temperature circuit

Accesories

Steam Humidifier

The steam humidifier can be subjected to precision control in order to return the ambient air to the required level of humidity, should the humidity in the room drop.

Energy Analyzer

An energy analyzer is used to monitor the amount of power that is received by and the amount of power consumed by the unit. The unit's EER value can be monitored by using real-time power consumption information.

Water Drainage Pump

In cases where there is a difference in levels between the unit and the drainage area, a water drainage pump is used to pressurize the water that accumulates within the drain pan for drainage outside the unit. In spaces where excessive condensation is expected, this component is also used to facilitate uninterrupted operation of the water leakage detector system.

Electrical Heater

When the humidity in the room increases, the unit transitions into dehumidifying mode. The system's evaporation temperature is reduced and the cooling capacity is increased further. The resistors located on the air discharge area are activated. Humidity is reduced by incrementally heating the air until the desired dry bulb temperature is reached. Condensation that can occur inside the room can lead to oxidation on equipment, which can reduce operating efficiency and cause malfunctions.

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