

# DC MASTER

## ADIA MECHANIC COOLER

SUPERIOR EFFICIENCY FOR DATA CENTERS



# DC MASTER

## TECHNICAL DATA

DCM 215		nominal DT12 Tr: 36°C Ts: 24°C	nominal DT12 Tr: 36°C Ts: 24°C
Type of Unit		Roof	Wall
<b>Performance &amp; Efficiency*</b>			
Total Cooling Performance	kW	228,2	228,2
Sensible Cooling Performance	kW	214,9	214,9
Energy Efficiency Rate (EER)		7,48	7,48
Sensible Heat Rate (SHR)		1	1
<b>Process Air Specifications</b>			
Ambient Air Temperature	°C	35	35
Ambient Air Relative Humidity	%	28	28
Air Flow **	m <sup>3</sup> /h	50550	50550
Fan Count	Pcs.	6	6
Fan Power Input	kW	9,59	9,59
<b>Cooling Air Specifications</b>			
Air Flow ***	m <sup>3</sup> /h	55200	55200
Fan Count	Pcs.	6	6
Fan Power Input	kW	13,4	13,4
<b>Evaporative Cooling Specifications</b>			
Fluid Flow (circulating)	kg/h	5000	5000
Fluid Flow (vaporized)	kg/h	328	328
Nominal Nozzle Pressure	Bar	2	2
Pump Power Input	kW	0,8	0,8
<b>Electrical Specifications</b>			
Total Power Input	kW	30,5	30,5
Power Supply	V/Ph/Hz	400/3/50	400/3/50
<b>Mechanical Cooling Specifications</b>			
Total Cooling Performance	kW	37	37
Compressor Power Input	kW	6,7	6,7
<b>Weight &amp; Dimensions</b>			
Height	m	5,25	6,21
Width	m	3,23	3,23
Length	m	9,91	8,83
Weight	kg	10.300	10.450

We reserve the right to modify product specification without prior notice.

\* DC return air 36 °C DB / 25.1% RH ; DC supply air 24 °C DB / 50% RH; Ambient temp.: 35 °C DB / 21 °C WB

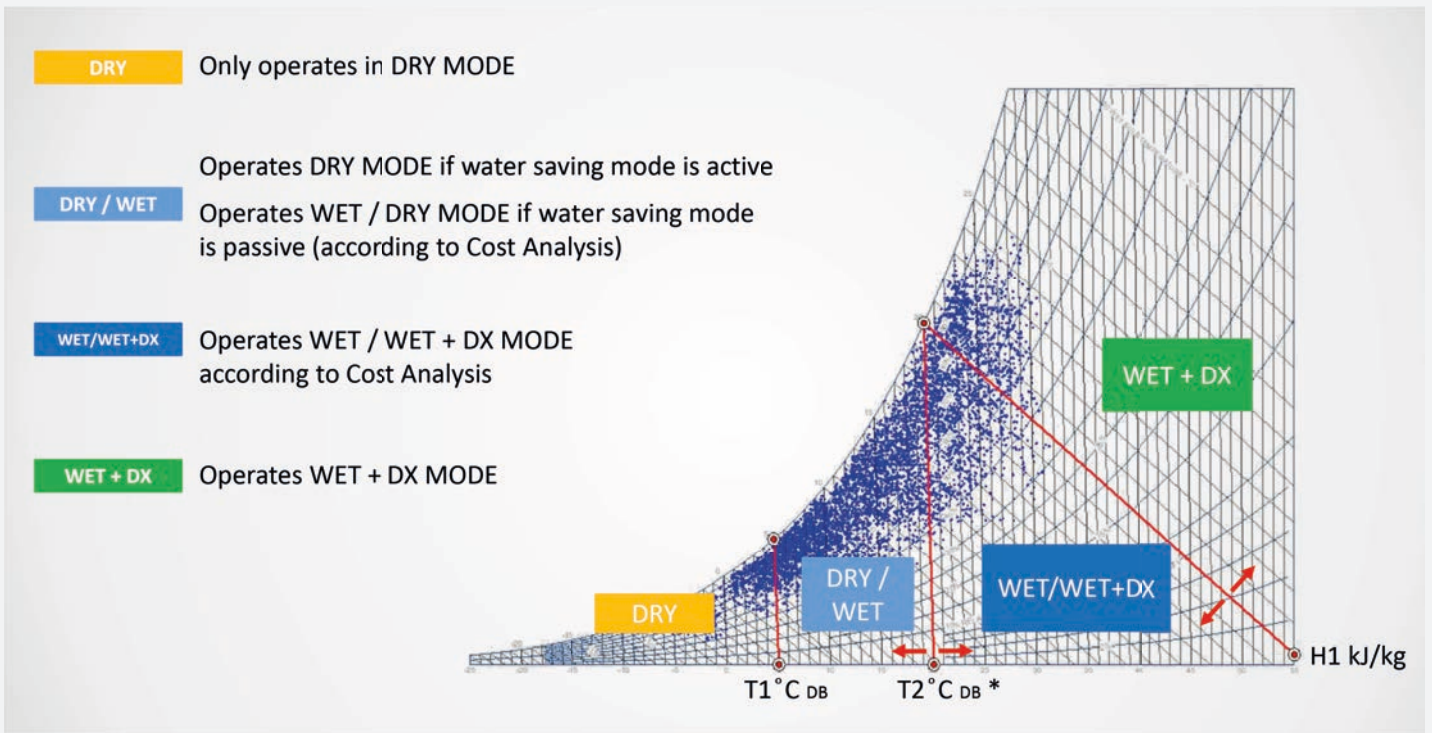
\*\* Average filters / No ductwork

\*\*\* Average filters / 100 Pa ESP



# DC MASTER

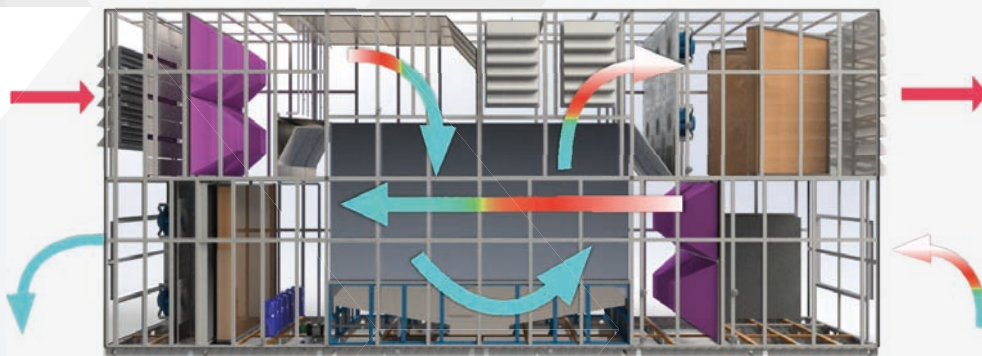
## OPERATING PRINCIPLE



Boreas DC Master controls system operates the units on most efficient and cost-effective mode even outdoor temperature and humidity levels are extreme. Free cooling, indirect evaporative cooling, mechanical cooling modes and mixing of indirect evaporative cooling and mechanical cooling are selected by controls system itself for maximum efficiency.

Increased efficiency heat exchangers for indirect evaporative cooling are developed and tested for use with data centre adiabatic coolers.

Sufficient air flow rate calculated by controls system is provided by highly efficient EC motor plug-fan array. Thus, fans operate with lowest energy consumption.



1



❑ EUROVENT Certified DX Cooler: Copper tube, aluminum fin

2

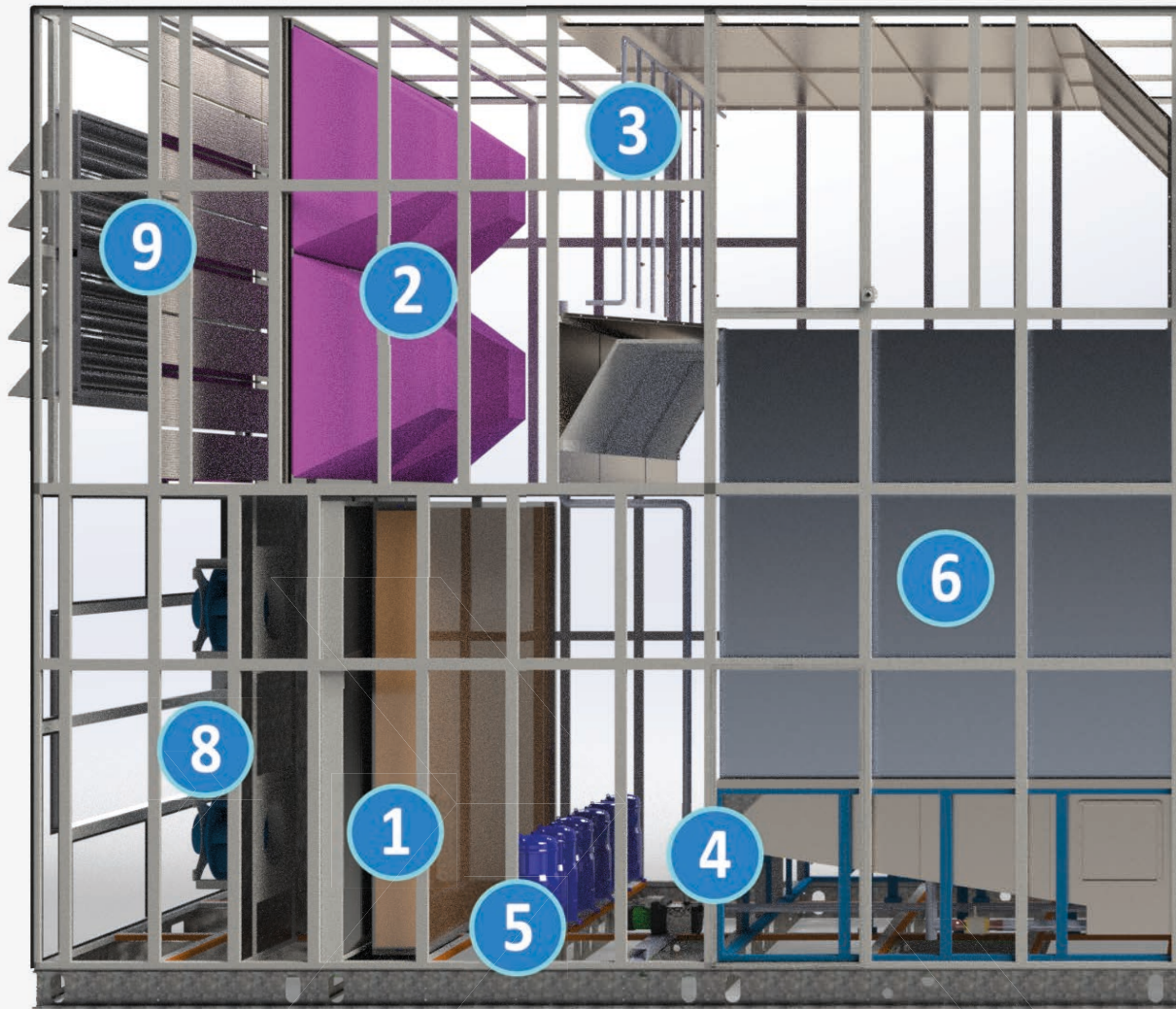


❑ G4 class panel filter and M5 class bag filter with low pressure drops

3



❑ Low pressure (2 bar), spray nozzles with filled cone form



4



❑ Highly efficient water spraying pump

5



❑ The compressors feature IDV (Drain Valves) which provide the same cooling capacity under partial loading conditions and reduce overcompression.





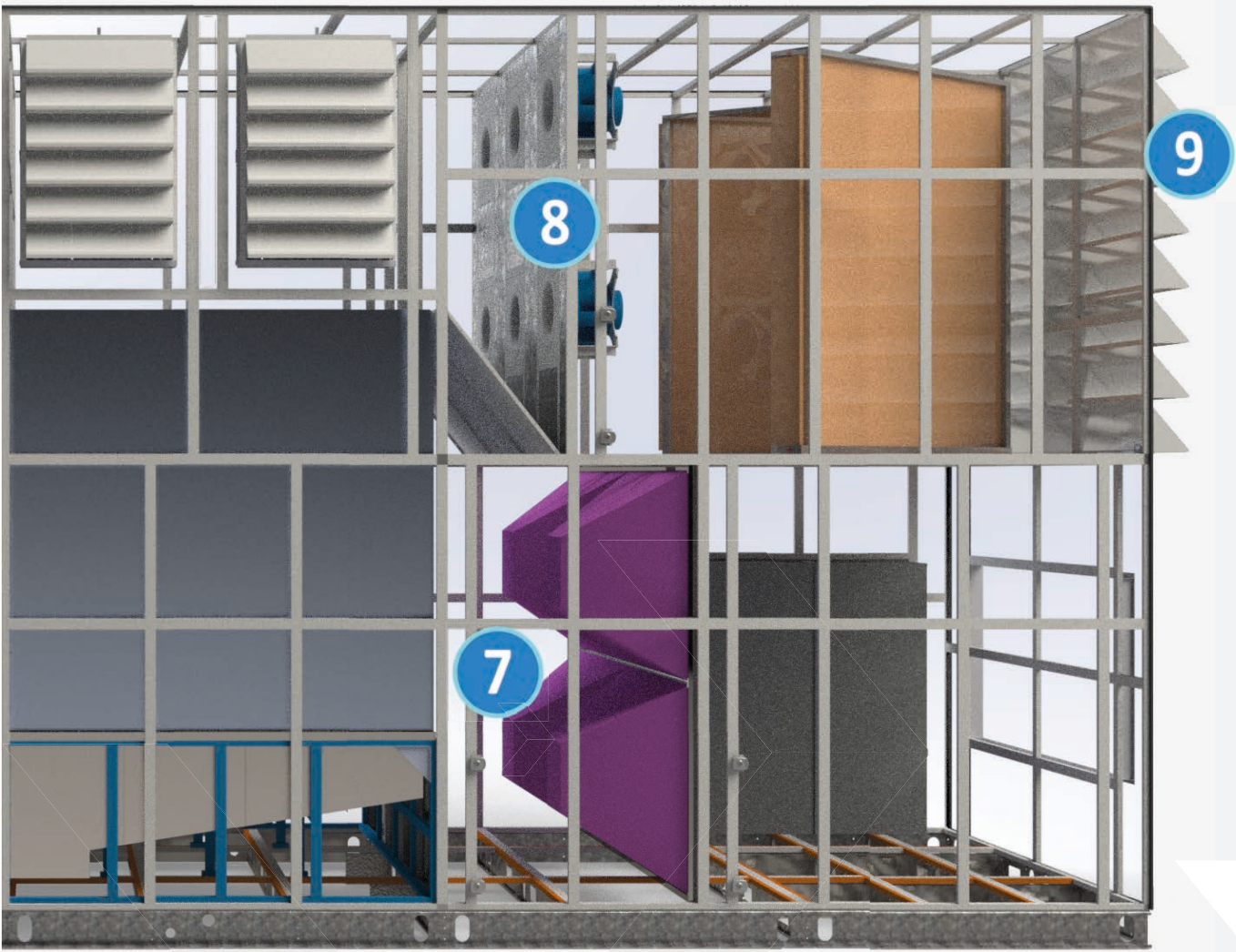
6

□ Air-to-Air Heat Exchanger, which is the heart of the system, all the sprayed water evenly distributed over the plates thanks to its turbulence geometry and special coating.



7

□ M5 class bag filter with low pressure drop



8

9

7



8

□ Innovative drive technology provides that motors operate with optimum efficiency and minimum consumption. Speed control with EC technology and the aero-dynamic feature of the fan blades ensure extremely high efficiency. This results in a high level of energy savings and an improved pPUE value.



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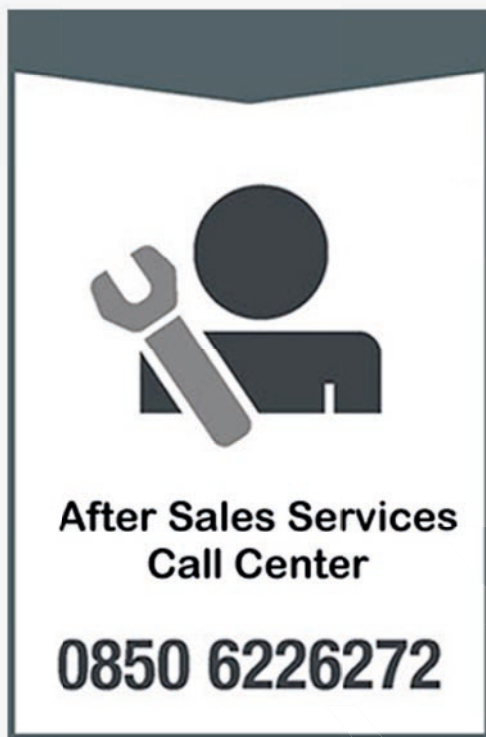
□ Anodised aluminum damper with, Concealed gear design Low pressure drop



## SERVICE

### AFTER SALES SERVICES

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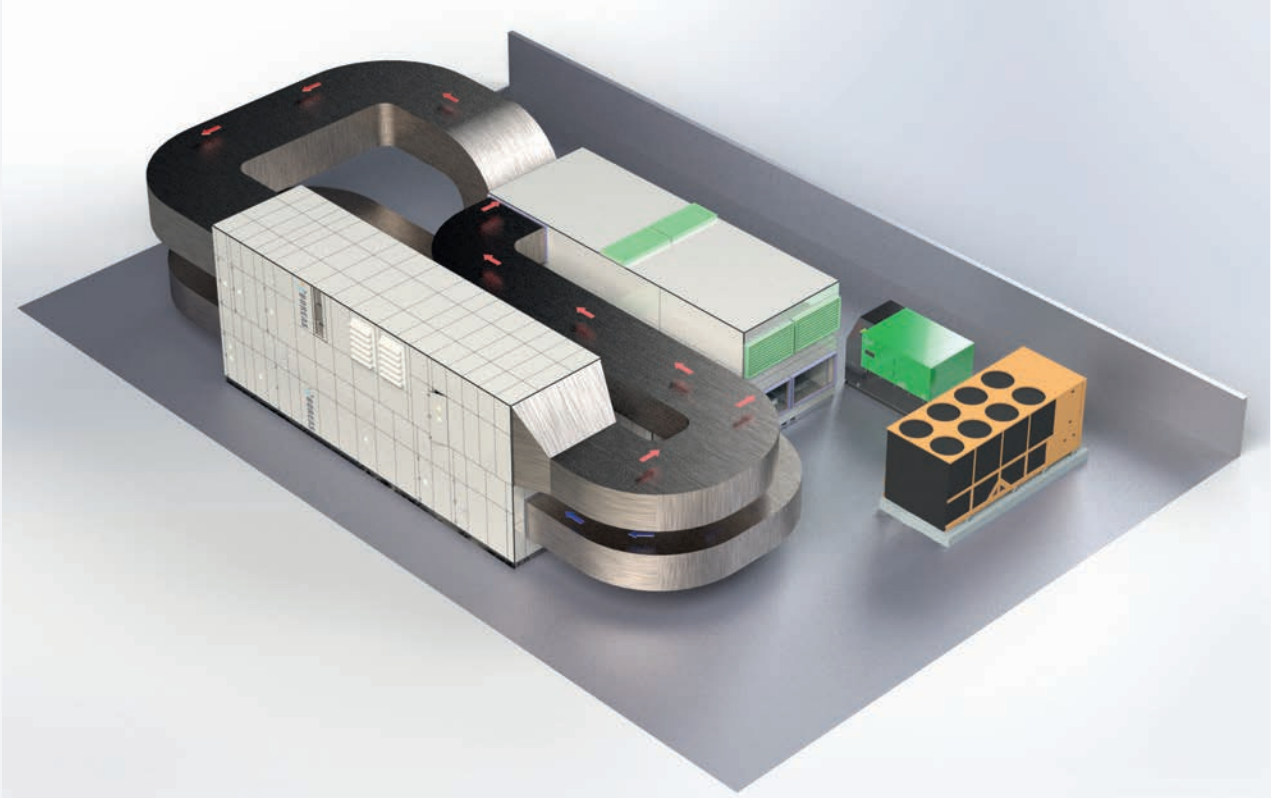


BOREAS After Sales Services Department provides all the after sales services our customers can require over a single telephone number (0850 6226272) that can be directly accessed.

This system facilitates efficient monitoring and control of requests as well as measurement of the quality of customer service calls.

## FACTORY TEST FACILITY

Boreas test facility designed and able to simulate the unit performance under a wide range of conditions.



# DC MASTER

## Controls and Software

BOREAS DC Master selection software is a windows-based selection tool that meets international requirements, using climatic design information tables from ASHRAE Weather database. By using the software, the user can;

- ❑ Calculate the pPUE for the selected weather station.
- ❑ Access the general performance data for the specific ambient temperature data and datacenter design criteria

The screenshot displays the BOREAS DC Master software interface with the following data:

General Properties		Humidifier Properties		Plate Air Properties		Condenser Air Properties	
Calculation Type	Plate + Dx Coils	OUT	OUT	OUT	IN	OUT	
Process Pres. Drop	0 (Pa)	DB	0 (°C)	DB	29,98 (°C)	DB	30,67 (°C)
Cooling Pres. Drop	0 (Pa)	WB	0 (°C)	WB	12,01 (°C)	WB	12,29 (°C)
	Set Humidity 97 (%)	RH	0 (%)	RH	6,53 (%)	RH	6,28 (°C)
	Flow Sens. 200						6,25 (%)

Process Air Properties		Process Air Properties	
IN	OUT	IN	OUT
Air Flow	56000 (m³/h)	Air Flow	56000 (m³/h)
DB	-6 (°C)	DB	30,77 (°C)
WB	-6,97 (°C)	WB	12,47 (°C)
RH	75,08 (%)	RH	6,25 (%)

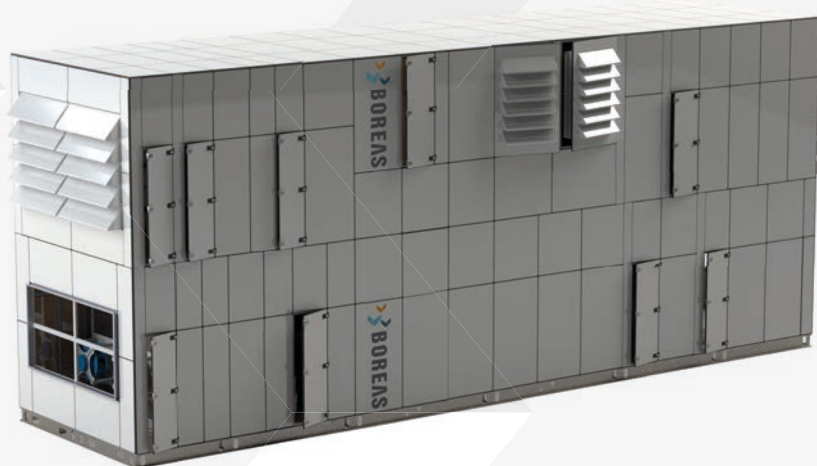
Cooling Air Properties		Cooling Air Properties	
OUT	IN	IN	OUT
Air Flow	55250 (m³/h)	Air Flow	55250 (m³/h)
DB	7,84 (°C)	DB	36 (°C)
WB	7,56 (°C)	WB	20,75 (°C)
RH	96,48 (%)	RH	25,1 (%)

Evaporator Air Properties		Mixing Air Properties		Supply Air Properties	
IN	OUT	OUT	IN	IN	OUT
DB	7,31 (°C)	DB	36 (°C)	Air Flow	0 (m³/h)
WB	7,31 (°C)	WB	20,75 (°C)	DB	39,8 (°C)
RH	100 (%)	RH	25,1 (%)	WB	25,93 (°C)
				RH	34 (%)

Outputs	
Heat Recovery	
Process Air Pressure Drop	255,31 (Pa)
Cooling Air Pressure Drop	264,09 (Pa)
Water	
Evaporation flow	0 (l/h)
Cooling Capacity	
Heat Recovery	674,41 (kW)
DX Cooling	0 (kW)
<b>Total Cooling</b>	<b>637,77 (kW)</b>
Power Input	
Process Air Fans	12,96 (kW)
Cooling Fans	9,66 (kW)
DX Compressors	0 (kW)
Water Spray Pump	0,8 (kW)
<b>Total Power Input</b>	<b>23,42 (kW)</b>
Consumption Cost	
Water Cost	0 (TL)
Electricity Cost	5,62 (TL)
<b>Total Cost</b>	<b>5,62 (TL)</b>
pPUE	1,12
Nu of Compressor	NaN
Process PD	287,29
Cooling PD	365,81





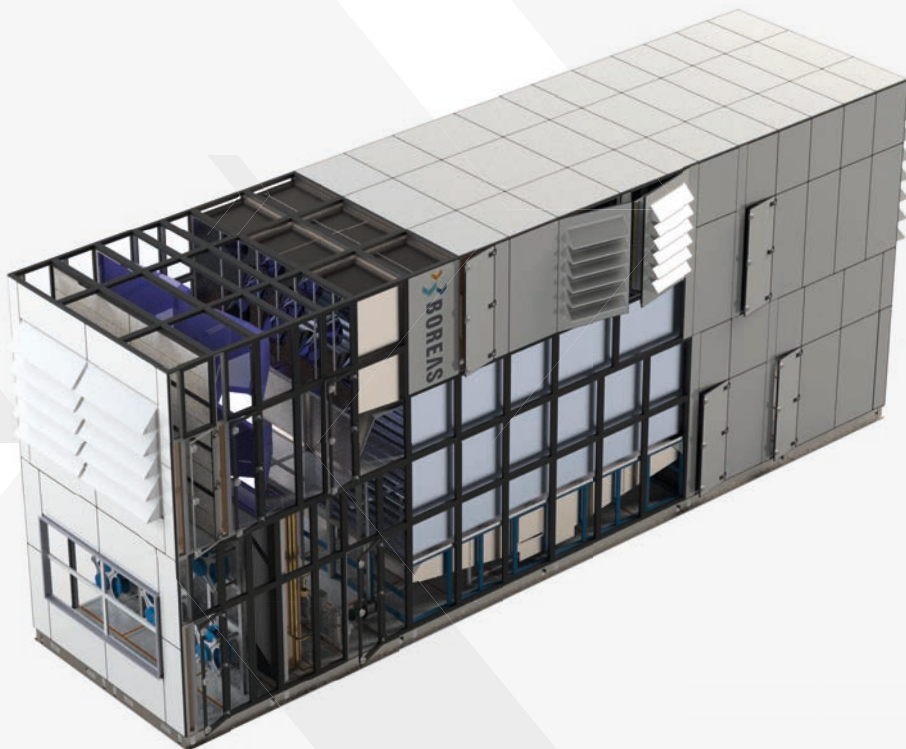
## DC MASTER

### Power and Control Panel

The power and intelligent control panel is housed within the same casing of the unit. DC Master controls maximize the efficiency of the unit together with the teamwork capability.

Main Features;

- ❑ 7" LCD Display
- ❑ BMS interface (Modbus TCP/IP, Modbus RTU, Bacnet IP, Bacnet MSTP)
- ❑ Master & Slave option
- ❑ ATS for UPS and system power supply
- ❑ Remote connection capability
- ❑ Web server application



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