



DATASHEET

CoolTop CW

CoolTop DX

COMPARISON OF DIFFERENT DC COOLING PRINCIPLES

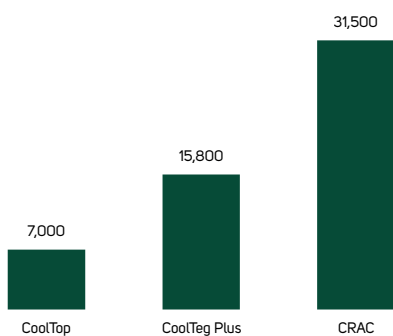
	CoolTop	CoolTeg Plus	CRAC
Cooling layout	Above racks	In row of racks	Perimeter of the room
Air delivery	Only where needed	Only where needed	To the whole room
Different power and temperature zones in one room	Simple	Simple	Impossible
Future system expansion	Easy	Easy	Very high
Redundancy cost	Low; in-row combo possible	Low	Very high
Occupied floor area	None	Small	Large
Contained Hot Aisle arrangement	Possible	Easy	Difficult
Contained Cold Aisle arrangement	Easy	Easy	Easy
Modular Closed Loop system	Impossible	Easy	Impossible

COMPARISON OF COOLTOP CW/COOLTOP DX

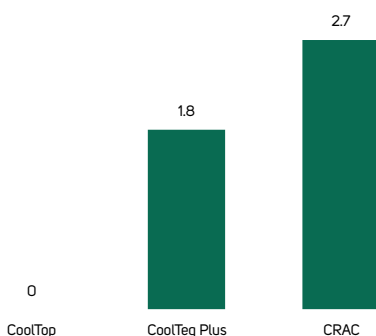
	CoolTop CW	CoolTop DX	
System	Indoor units Cooltop CW + water piping system + battery of chillers (variable number of units in each system)	Cooltop DX indoor unit + refrigerant piping system + outdoor compressor unit AC-PUHZ (always 1 or 2 in each system)	
Installation	On top of IT racks	On top of IT racks	
Cooling medium	Water / Anti-freezing mixture	Refrigerant R410A	
Application	Minimum 4 IT racks (600 mm)	Minimum 4 IT racks (600 mm)	
Occupied floor area (in DC)	None	None	
Outdoor unit	Chiller	AC-PUHZ-ZRP200Y	AC-PUHZ-ZRP250Y
Cooling capacity per unit (kW) ¹	36kW (CoolTop2) / 48kW (CoolTop3)	One outdoor unit CoolTop3 19 kW CoolTop2 19 kW Two outdoor units CoolTop3 38 kW CoolTop2 38 kW	One outdoor unit CoolTop3 22 kW CoolTop2 22 kW Two outdoor units CoolTop3 45 kW CoolTop2 42 kW
CAPEX	Reasonable for bigger systems (over 50 kW)	Reasonable for smaller system (up to 120 kW)	
OPEX	Very low, due to variable temperature of water and free-cooling possibility	Higher, in comparison to CW system	
Advantage	Free-cooling possibility	Simple installation, no water in DC	
System size	Unlimited	Limited by maximal distance and height difference	

¹ Nominal capacity at these conditions: air temperature in hot zone 35 °C, water temperature 10/15 °C, without condensation, resp. evaporation temperature 6 °C.

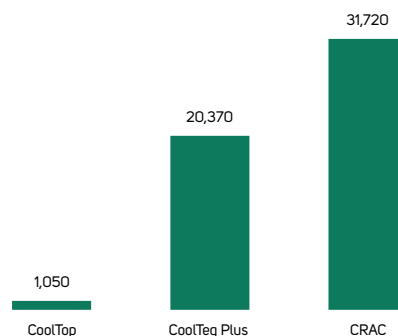
Annual power consumption [kWh]



Floor area usage [m²]



Annual costs [€]



Assuming the cost of energy at 0.15 €/kWh and the cost of 1 rack space (0.6 m²) in a DC 500 €/month.

CHILLED WATER UNIT

COOLING UNIT COOLTOP CW



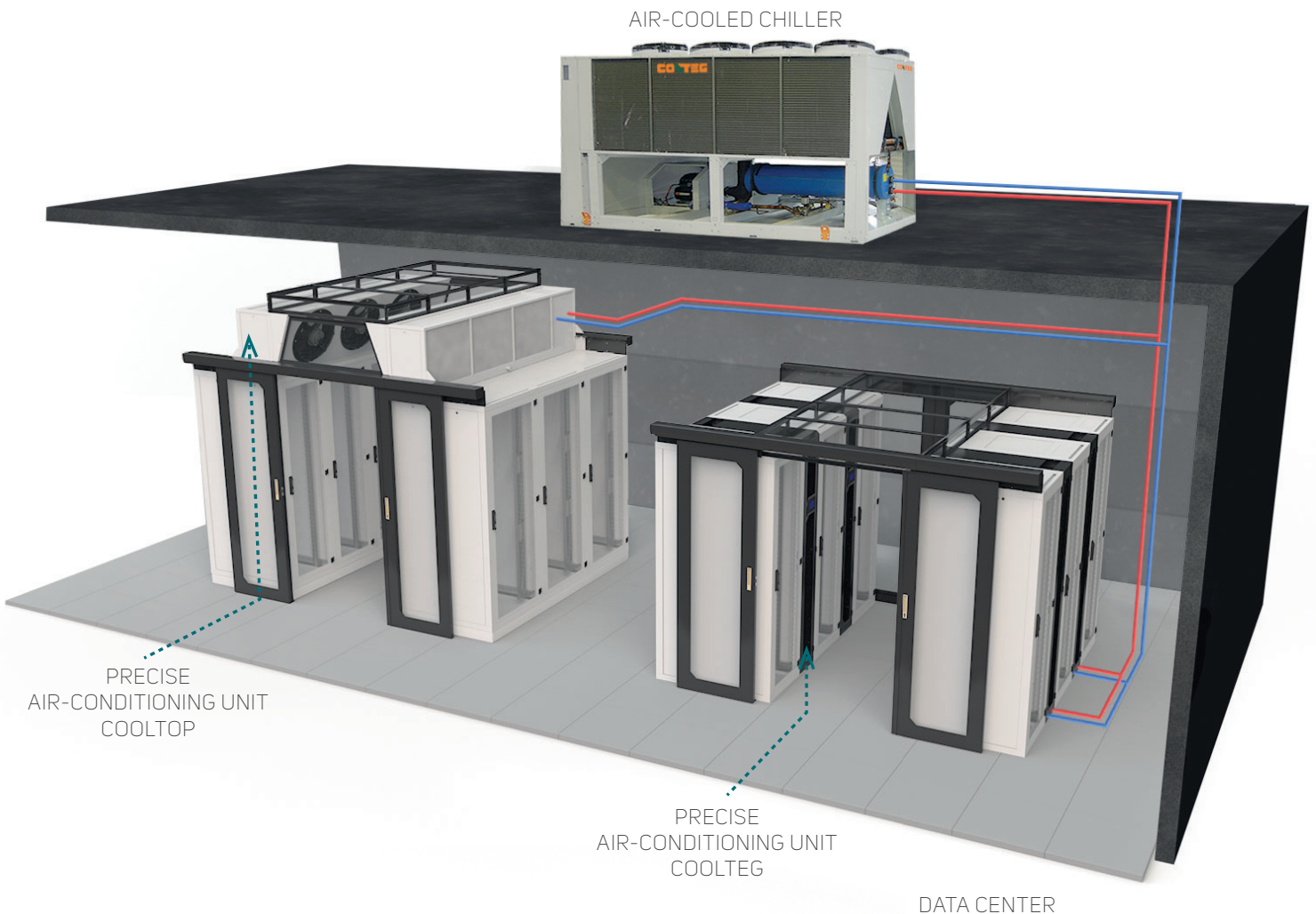
SUITABLE FOR

- Contained cold aisle
 - Contained hot aisle
- Can be combined with CoolTeg Plus units in the same zone (aisle)

➤ **CoolTop CW** cooling units are specially designed for easy installation above IT racks, and are uniquely suitable for effective targeted cooling of server rooms and large data centers.

MAIN ADVANTAGES

- Does not occupy floor area
- Brings chilled air directly to cold aisle in front of server racks
- Vertical air loop, with local flexibility
- Extremely low power consumption, due to large heat exchanger and EC axial fans
- Modern "server-friendly" control system
- Allows flexibility of room arrangement
- Raised floor unnecessary for air distribution
- Installs easily in contained hot or cold aisle
- Perfectly compatible with Conteg IT racks
- Comes with a wide range of accessories
- Stainless steel double condensate tray located under the heat exchanger
- Continuous regulation 0-100 %
- Controller with communication ModBus (contained in the controller)



Technical parameters CoolTop CW

COLOR:  RAL 9005  RAL 7035



COOLTOP CW			
		CoolTop2	CoolTop3
Indoor unit code	Unit	AC-TOP2-CW-240/60	AC-TOP3-CW-240/60
Connected outdoor unit		Chilled water system	
BASIC DATA			
Cooling system	-	Chilled water	
Architecture	-	Open	Open
Nominal cooling capacity ¹	kW	37,0	49,2
Nominal net cooling capacity ²	kW	36,3	48,1
Power supply	V/f/Hz	230/1/50	
Running current	A	3,4	5,0
Maximum current	A	4,6	6,8
Nominal power consumption	W	710	1100
Nominal airflow ³	m ³ /h	7 700	11 000
Number of fans	pcs	2	3
Motor fan technology	-	EC	
Water flow	l/h	6 200	8 200
Filter class	-	G2 (+ droplet separator)	
DIMENSIONS			
Height ⁴	mm	600	
Width	mm	2 400	
Depth ⁵	mm	400 (600)	
Weight ⁶	kg	175	184
PIPING CONNECTION			
Supply pipe diameter and type	-	6/4" female	
Return pipe diameter and type	-	6/4" female	

¹ Cooling capacity can be changed via electronic controller. Nominal cooling capacity is stated for air temperature of 35 °C in hot zone, without condensation (heat-exchanger's temperature above dew-point). Water temperature is 10/15 °C, clean filters.

² Net cooling capacity (without heat from fans) is usable cooling capacity of entire system.

³ Airflow is changed by control needs. Nominal airflow equals nominal cooling capacity.

⁴ Without any base frame.

⁵ Bottom side length 400 mm; top side length 600 mm.

⁶ For weight with droplet separator, add 11 kg.

CoolTop unit dimensions



DIRECT EXPANSION

COOLING UNIT COOLTOP DX



SUITABLE FOR

- Contained cold aisle
- Contained hot aisle
- Can be combined with CoolTeg units in the same zone (aisle)

- **CoolTop DX** cooling units are specially designed for easy installation above IT racks and are uniquely suitable for effective targeted cooling of server rooms and large data centers.

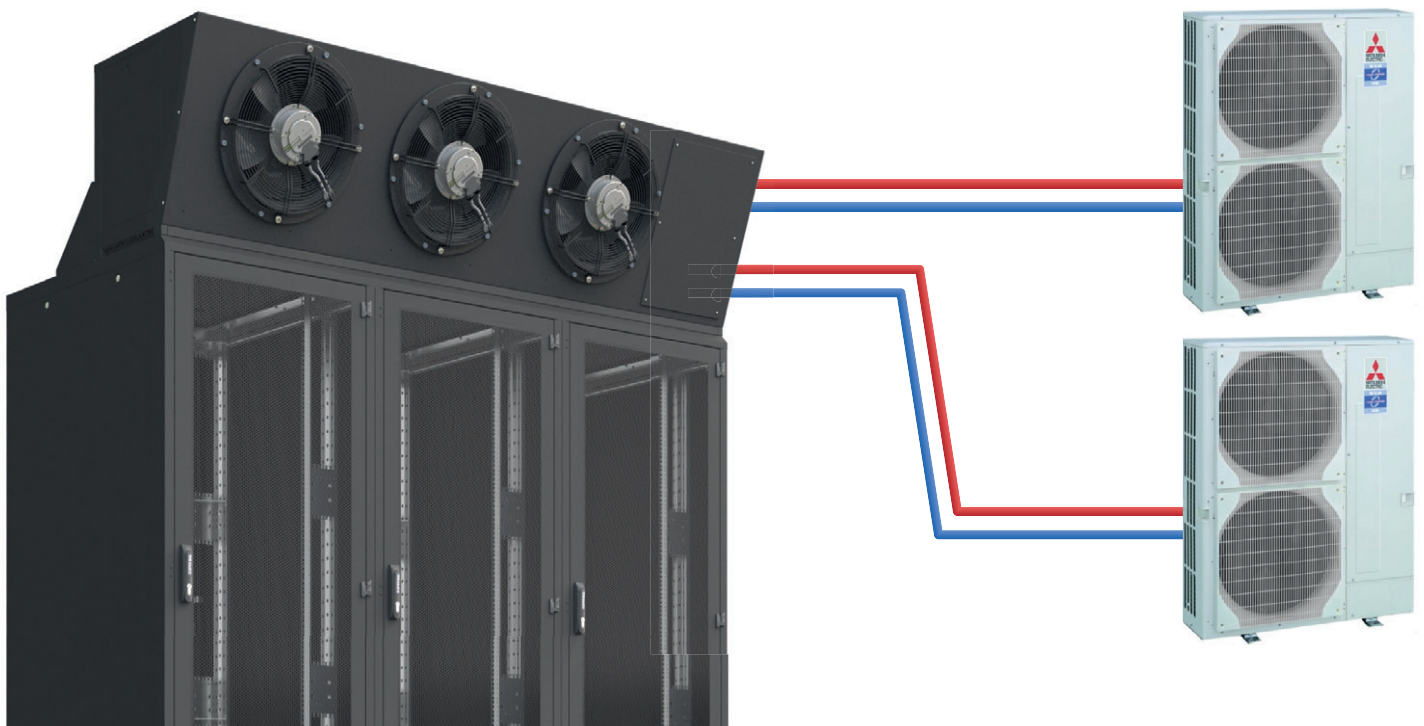
Indoor unit Cooltop DX is connected with outdoor condensing unit/units via refrigerant piping. CoolTop DX includes special heat exchanger with two separate refrigerant circuits.

In basic mode (first stage) CoolTop unit can be connected with one outdoor unit with cooling capacity 19 kW or 24 kW. If there is a need of higher cooling capacity, the unit can be extended by second outdoor unit. At this time, the cooling capacity increases at 38 kW or 48 kW.

CoolTop is a solution even for energy-conscious client or for immediate increase of cooling capacity in the existing space without the need for any structural modifications.

MAIN ADVANTAGE

- Does not occupy floor area
- No water in data center
- Brings chilled air directly to cold aisle in front of server racks
- Vertical air loop, with local flexibility
- Extremely low power consumption due to large heat exchanger and EC axial fans
- Modern "server-friendly" control system
- Allows flexibility of room arrangement
- Raised floor unnecessary for air distribution
- Installs easily in contained hot or cold aisle
- Perfectly compatible with Conteg IT racks
- Comes with a wide range of accessories
- Dual circuit heat exchanger
- Regulation between 30-100 % cooling capacity
- Ready to be connected with 2 outdoor units
- Wide range of accessories
- Stainless steel double condensate tray located under the heat exchanger
- Controller with communication ModBus (contained in the controller)



Technical parameters CoolTop DX

COLOR:  RAL 9005  RAL 7035



COOLTOP DX					
		CoolTop2		CoolTop3	
Indoor unit code	Unit	AC-TOP2-DX-240/60		AC-TOP3-DX-240/60	
Connected outdoor unit		System with direct expansion			
BASIC DATA					
Refrigerant	-	R410A			
Architecture	-	Open		Open	
Outdoor condensing units		AC-PUHZ-ZRP-200Y One/Two outdoor units	AC-PUHZ-ZRP-250Y One/Two outdoor units	AC-PUHZ-ZRP-200Y One/Two outdoor units	AC-PUHZ-ZRP-250Y One/Two outdoor units
Nominal cooling capacity ¹	kW	19,7/39,3	22,8/42,5	19,7/39,3	22,8/45,6
Nominal net cooling capacity ²	kW	19,0/38,6	22,1/41,8	18,6/38,2	21,7/44,5
Power supply	V/f/Hz	230/1/50			
Running current	A	3,4		5,0	
Maximal current	A	4,6		6,8	
Nominal power consumption	W	710		1100	
Nominal air flow ³	m ³ /h	7 700		11 000	
Number of fans	ks	2		3	
Motor fan technology	-	EC			
Filter class	-	G2 (+ droplet separator)			
DIMENSIONS					
Height ⁴	mm	600			
Width	mm	2 400			
Depth ⁵	mm	400 (600)			
Weight ⁶	kg	175		184	
CONNECTION PIPING					
Supply pipe diameter and type ⁷	mm	16			
Return pipe diameter and type ⁷	mm	22			

¹ Cooling capacity can be changed via electronic controller. Nominal cooling capacity is stated for air temperature of 35 °C in hot zone, without condensation (heat-exchanger's temperature above dew-point). Evaporation temperature 6 °C, clean filters.

² Net cooling capacity (without heat from fans) is usable cooling capacity of entire system.

³ Airflow is changed by control needs. Nominal airflow equals nominal cooling capacity.

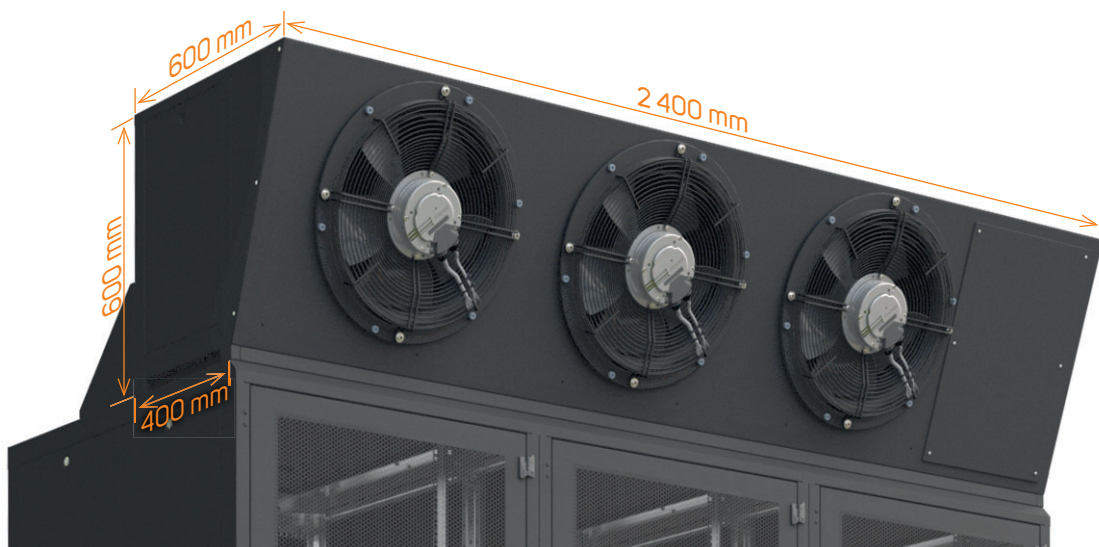
⁴ Without any base frame.

⁵ Bottom side length 400 mm; top side length 600 mm.

⁶ For weight with droplet separator, add 11 kg.

⁷ Only connection diameter is mentioned. Please design the refrigerant piping according manual of outdoor condensing unit, depending on the length of the pipe.

CoolTop DX unit dimension



OUTDOOR CONDENSING UNITS



➤ **CoolTop DX** cooling unit can be connected with up to 2 outdoor condensing units, which contain all of control elements (compressor, expansion valve, frequency driver). The units are equipped with a scroll compressor that works with the R410A refrigerant.

Technical parameters of outdoor units with direct expansion

BASIC DATA	Unit	AC-PUHZ-ZRP200Y	AC-PUHZ-ZRP250Y
Nominal cooling capacity	kW	19,7	22,8
Power supply	V/f/Hz	400/3/50	400/3/50
Operation current	A	7,77	8,28
Maximum current	A	19	21
Nominal current	kW	5,46	8,3
Compressor control	-	Inverter	
Control valve	-	Linear expansion valve	
Refrigerant volume R410A ²	kg	7,1	7,7
DIMENSIONS			
Width	mm	1050	1050
Depth	mm	330	330
Height	mm	1338	1338
Weight	kg	135	144
PIPING CONNECTION			
Supply pipe diameter (liquid) ³	mm	10	10
Return pipe diameter (gas) ³	mm	25	25
Max. pipe length	m	100	100
Max. height difference	m	30	30
Operation conditions	°C	from -15 up to +46	

¹Outdoor unit AC-PUHZ-ZRP125 requires power supply: 400V/3ph/50Hz, it is also available in 1ph version. ²Outdoor units are prefilled with the refrigerant R410A for piping length 30 m. ³This datasheet considers piping dimensions only. Please follow outdoor unit's manual to design the proper diameters of refrigerant piping.

PLEASE FOLLOW THE STEPS TO GET PROPER CODE OF COOLTOP UNIT

AC - 1. - 2. - 3. / 4. - 5. 6. 7. 8. 9. 10. 11. 12. 13.

An example of a correct Code:

AC - TOP3 - CW - 240 / 60 - O R C O W P O O O

Explanation of an example of a correct Code: Cooling unit CoolTop3 with 3 EC fans, chilled water, for open architecture, width 2 400 mm, depth 400 mm and height 600 mm. Water rope detector; Condensate pump; Power supply 230V/1ph/50Hz; Communication card SNMP pCO WEB; Pressure control; 3-way valve.

1. CoolTop COOLING SYSTEM		2. COOLING SYSTEM		3. WIDTH	
Code	Model	Code	Options	Code	Width (mm)
TOP2	With 2 fans	CW	Chilled water	240	2400
TOP3	With 3 fans	DX	Direct expansion		

4. HEIGHT		5. DROPLET SEPARATOR		6. SECURITY		7. CONDENSATE PUMP		8. POWER SUPPLY	
Code	Height (mm)	Code	Options	Code	Options	Code	Options	Code	Options
60	600 mm	O	Without	O	Standard	O	Without	O	Standard 230V/1f/50Hz
		E	Droplet separator	S	Dew sensor	C	Condensate pump	A	Dual power supply
				R	Water rope detector				
				A	Dew sensor + Water rope detector				

9. COMMUNICATION		10. CONTROL		11. CONTROL VALVES		12. OTHER ACCESSORIES		13. SPECIAL MODIFICATION	
Code	Options	Code	Options	Code	Options	Code	Options	Code	Options
O	Without	O	Standard	O	Standard (3-way valve)	O	—	O	Standard
M	Modbus	P	Pressure control	2	2-way valve	D	Display	2	Ready to be connected to 2 outdoor units (only DX)
W	SNMP	H	Humidity sensor	Z	Without				
		R	Pressure control + humidity sensor						

BASIC ACCESSORIES

TOUCH-SCREEN DISPLAY

- For user-friendly communication with the unit controller, you can use the 4.3-inch color touch-screen display.
- One touch screen can control up to 16 cooling units. We recommend using up to 8 units for fast communication and full BMS functionality.
- RS485 port and the Ethernet port enables remote control and tracking using different superior systems. The micro USB allows easy software update and download of historical data.
- The touch-screen display has many features. Such as customer network connectivity, remote control, ModBus communication and many more.
- The display can be placed directly on the CoolTop unit, on the side of the cabinet, or on the wall of the data room.



WATER ROPE DETECTOR

- Device for water detection. It is located at the top edge of condensate pan. If the water level reaches this level, the cooling unit goes to mode Emergency OFF. It is powered directly from the CoolTop controller.



PRESSURE CONTROL

- Airflow can be controlled even based on temperature difference between hot and cold zones or based on pressure difference.
- Pressure difference airflow control ensures that the air is supplied to the servers at exactly the same amount as the air sucked by the servers.
- Airflow control ensures perfect environment for servers (no risk of server damage caused by over- or under-pressure).

- Pressure control minimizes power consumption of entire cooling system due to precise delivery of conditioned air.



CONDENSATE PUMP

- All Conteg precision cooling units can be connected to a standard gravity drainage system.
- If drainage system is not available under the cooling units, it is possible to equip the unit with condensate pump to reject the water out of the condensate pan to the drainage system in different room.
- Each unit includes water detection sensor to start operation of the condensation pump and water level sensor to stop the unit if high water level is detected.



DUAL POWER SUPPLY

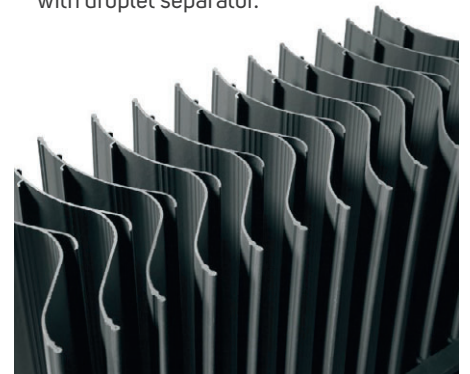
- Electrical switchboard for two power supply systems. This device ensures to supply the unit from two independent power sources.

HANDRAIL (for moving)

- Special steel handrail designed for easy manipulation and placement of CoolTop units above racks. They are supplied in a pair and are connected with by screws from front and back side of the unit.

WATER DROPLET SEPARATOR

- Horizontal construction located behind the heat exchanger in the direction of airflow.
- The separator prevents dripping of water droplets by the airflow into the fans.
- We recommend using the droplet separator if high relative humidity or low temperature of the chilled water is assumed, generally every time when there is a potential risk of condensation on the heat exchanger. CoolTop DX should be always equipped with droplet separator.



DEW SENSOR

- Dew sensor is placed on a heat exchanger and measures its surface temperature. If the temperature is lower than temperature of dew point, the controller triggers alarm, or switch the unit off.



COMMUNICATION CARD "pCO WEB"

- Accessory compatible with CoolTop controllers.
- Enables additional individual communication (monitoring and control).
- Communication via Ethernet networks protocols.
- Functions: Web server, E-mail, FTP, SNMP, BACNet, ModBus TCP/IP and others.





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