

Coolblade In Rack

8÷30 kW



General

Coolblade In Rack has been designed for IT Cooling applications. Thanks to the extremely compact design Coolblade In Rack can fit inside any different rack type, thus allowing a cooling solution as closed loop (in rack) or open loop (in row).

Configurations

Coolblade In Rack DX: Direct expansion air conditioning units, for coupling to external condensing units.

Coolblade In Rack CW: Chilled water air conditioning units.

Strengths

- ▶ Extremely compact design to fit inside any different 42U (or bigger) rack design
- ▶ Application Flexibility (chilled water and direct expansion versions; open and closed loop solutions; etc...)
- ▶ High installation flexibility (top and bottom connections; top and lateral unit handling; etc...)
- ▶ Design for a simple and easy maintenance (Hot Swappable EC Fans; quick connectors for all power and signal cables; etc...)
- ▶ Extremely efficient design with minimum air side pressure drops



APPLICATION	3
CONFIGURATION	5
SPECIFICATIONS	5
DESCRIPTION OF ACCESSORIES	7
TECHNICAL SPECIFICATIONS	9
COOLBLADE IN RACK DX	9
COOLBLADE IN RACK CW	10
ELECTRICAL DATA	11
NOISE LEVELS	12
REFRIGERANT DIAGRAMS	13
COOLBLADE IN RACK DX	13
HYDRAULIC DIAGRAMS	13
COOLBLADE IN RACK CW	13
WORKING LIMITS – COOLBLADE IN RACK DX	14
WORKING LIMITS – COOLBLADE IN RACK CW	15
DIMENSIONAL DIAGRAMS	16
INSTALLATION TIPS	17



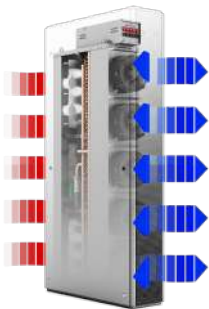
APPLICATION

Coolblade In Rack has been designed with an extremely compact design to allow its installation within different rack types. Two versions are available: Open Loop and Closed Loop. Open Loop solution allows the unit installation as In Row (within the rows of racks). Closed Loop solution allows instead the installation as In Rack (closed air circuit inside a unique frame). Unit operation can be concisely described as follows: the racks draw in fresh air from the front and expel hot air from the back using the fans supplied with the equipment contained inside them. The servers are arranged in opposing rows, so that they are facing the same aisle; the result is the creation of alternately one or more cold (in front of the servers) and hot aisles (behind the servers).

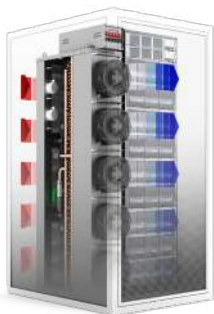
For Closed Loop application it's more correct defining cold/hot areas (created in the space within the server/unit and the frame of the overall rack) instead that aisles. Anyhow working and installation logics remain the same.

Coolblade In Rack units draw in hot air directly from the hot aisle/area and put it, cooled, into the cold aisle/area. Coolblade In Rack units are installed inside different type of racks. A sufficient number of racks containing Coolblade In Rack units are then installed alongside and in between the racks to cover the design heat load, usually with the addition of one or more redundant units to guarantee continuity of cooling in all situations.

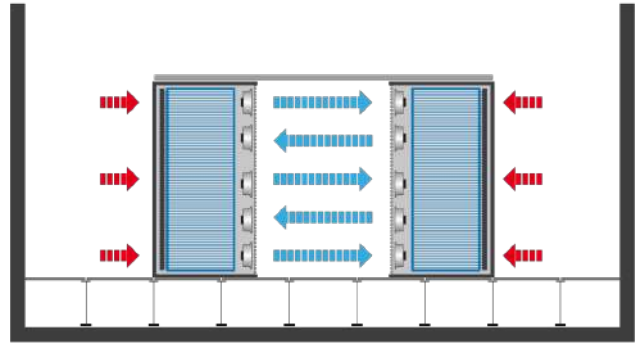
In case of In Row applications maximization of energy efficiency is obtained with so-called containment, through which the hot and/or cold areas are isolated, thereby preventing any air bypass or recirculation between the two sections.



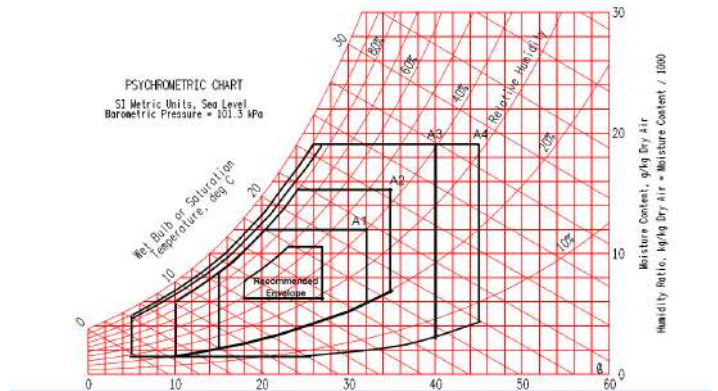
In Case of In Rack applications the same effect is naturally achieved thanks to the specific solution design.



It should also be emphasized that this type of application does not require a raised floor for air distribution. A moderately high raised floor for just power or refrigerant distribution might be used as well, anyhow this is not necessary having units as standard top and bottom connections.

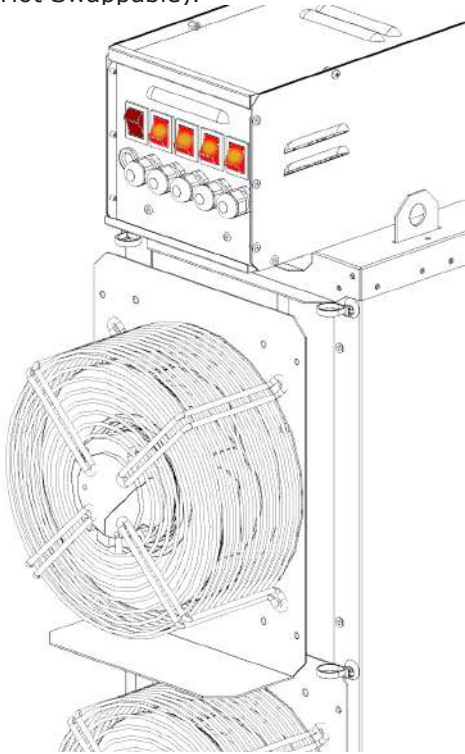


Coolblade In Rack units manage the heat load using various methods and strategies, which can vary according to the specific installation method and the type of cooling system; in any case, with reference to the ASHRAE guidelines (TC9.9 /2011).



A feature common to all versions is the presence of variable speed fans with electronically commutated (EC) motors, which can modulate based on the return temperature (from the hot aisle/area); depending on configurations, it is also possible to modulate the cooling capacity based on the return temperature or, alternatively, choose to keep the supply temperature constant in front of the servers (this last functionality is valid only for chilled water or direct expansion systems with modulation of cooling capacity).

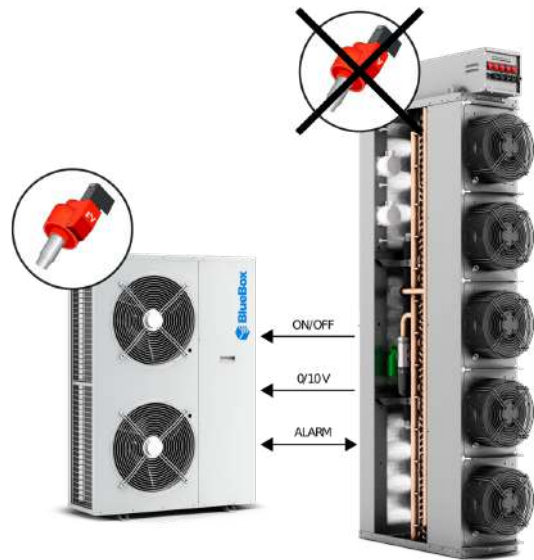
The unit design allows a quick fan replacement without the need of stopping the entire cooling, granting the full availability (Hot Swappable).



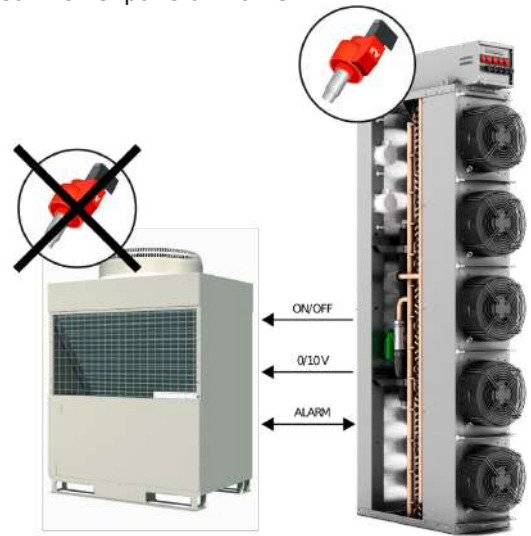
Direct expansion units, provided with evaporating coils, are designed to be connected to an external condensing unit, which can indifferently be provided with a variable speed or fixed speed compressor. It is possible to use condensing units provided with expansion valve (which therefore feed the internal unit with a liquid/gas mixture) and condensing units without expansion valve (which feed the internal unit with subcooled high pressure liquid); in the second case, the expansion valve can be installed on the Coolblade DX unit.

The unit can control the external condensing unit through a modulating 0-10V or on/off signal, and receive an alarm signal from it.

For chilled water applications, Coolblade are also available as CW (Single circuit chilled water circuit with or without valve).



Example of connection with Blue Box condensing unit, provided with expansion valve.



Example of connection with condensing unit not provided with expansion valve.

CONFIGURATION

Configuration example:

Coolblade IR DX OL 24
 1 2 3 4 5

1	Series	Coolblade
2	Version	In Rack
3	Type	DX: direct expansion CW: chilled water, single water circuit
4	Fan Section	OL: Open Loop CL: Closed Loop
5	Size	24: Cooling Capacity (at nominal catalogue conditions)

SPECIFICATIONS

DIMENSIONS AND CONFIGURATION

Coolblade In Rack units dimensions are for Open Loop version 290x770x1943 (width x depth x height, expressed in mm) or for Closed Loop version 290x722x1943. All units are provided with copper coils with aluminum fins, fans, electrical control panel and electronic microprocessor controller; Open Loop units have also filters at the air inlet.

Air is always sucked in from the back, cooled, and then expelled from the front thanks to the action of the fans positioned downstream of the exchange coil, evenly distributed over the entire height of the unit.

STRUCTURE

The structural frame is fabricated from polished sheet-steel with oven-baked epoxy polyester powder coating. The unit color is RAL9005 (Black) with textured finished. Units are provided with hooks embedded to the structure, which allow unit lifting from the top.

All the materials making up the unit are recyclable and CFC-free.

FANS

The units are equipped with 3, 4 or 5 (depending on size) variable speed electric fans with directly coupled electronically commutated (EC) motor. Each fan is provided with integrated thermal overload protection.

The fans are installed on the front, downstream of the handling coil and can be accessed from the front of the unit even after installation, without having to take the unit out of the row of racks. The unit design allows each fan maintenance keeping the unit in operation (Hot Swappable).

Air flow is constantly monitored by a differential pressure switch, which signals an alarm condition when there is no flow.

AIR FILTERS (Only for Open Loop version)

The non-regenerable air filter is class ISO Coarse 35% (according to ISO 16890; G2 - EN779) and is designed to minimize head loss while maintaining an adequate level of filtration. The filters are pleated and contained in a 50mm-thick galvanized sheet-iron frame. They can be accessed from the back of the unit for maintenance operations.

The condition of the filters is constantly monitored by a differential pressure switch that signals when they are excessively fouled.

CHILLED WATER COIL AND HYDRAULIC CIRCUIT (CW units)

The Coolblade In Rack CW units are provided with handling coils with copper tubes and high turbulence aluminum fins, with hydrophilic coating.

A condensate drip tray is positioned under the handling coil. It's integrated into the base of the unit and therefore it's painted and protected with silicones suited for high temperatures. The drain connection is from the bottom of the unit, unless a condensate booster pump (option) is requested, in which case the drain is plugged.

The CW units are provided with a single hydraulic circuit, without control valves in the basic version. Optionally available is a three-way valve with modulating servo control (0-10V control); or a two-way valve (for variable flow rate systems). The hydraulic connections can be carried out indifferently from the bottom or the top.

EVAPORATING HANDLING COIL AND REFRIGERANT CIRCUIT (DX units)

The Coolblade DX units are provided with handling coil with small-section copper tubes, specifically designed for use with refrigerant R410A, and high-efficiency aluminium fins with hydrophilic coating.

The refrigerant circuit includes shut-off valves for gas and liquid and two 5/16" service outlets for each side. The refrigerant connections can be carried out indifferently from the top or the bottom.

If the external condensing unit is not provided with expansion valve, the electronic expansion valve integrated in the Coolblade unit and managed directly by the installed electronic controller is available as option.

ELECTRICAL CONTROL PANEL

The electrical control panel is provided with an automatic circuit breaker and an isolation transformer for supplying power to the electronic controller, based on a microprocessor board and a display.

The wiring for the power supply and the field signals can be carried out indifferently from the top or the bottom, through suitable provision on the top or on the base of the unit.

The microprocessor controller inside the electrical control panel is provided with the following functions/features:

- Display of the return air temperature.
- Display of the supply temperature (on all the direct expansion units and on the chilled water units if the valve is present).
- Display of the fan speed.
- Alarm signalling on two levels (serious alarm and minor alarm).
- Log recording of the last 150 alarms.
- Display of the status of controlled devices.
- Display of the status of inputs and outputs of the microprocessor.

The electrical panel is inside an electrical box positioned on the top of the unit. The box has quick connectors for all power and signal cables. This allows an easy accessibility in case of needs (the box can be removed both from the front as from the back)

The standard power supply is 230V/1~/50Hz for all sizes.

STANDARD FEATURES

In addition to what was described in the previous sections, the standard features of the Coolblade units include:

- Air flow alarm.
- Water leakage sensor (flooding alarm).
- Thermal overload protection (internal) for each fan.

TESTING

Leak tests and functional tests are carried out at the factory.

DESCRIPTION OF ACCESSORIES

HYDRAULIC ACCESSORIES

PSC Condensate Pump

Allows any condensate formed on the cooling coil and collected in the condensate drip tray to be boosted up to a hydrostatic head of 6m. Recommended in all cases where the hydraulic connections are carried out exclusively from the top.

VRM3 3-way chilled water valve

In chilled water units, this allows control of the supply temperature.

VRM2 2-way chilled water valve

In chilled water units, this allows control of the supply temperature in variable water flow rate applications.

REFRIGERANT CIRCUIT ACCESSORIES

VTE Electronic Expansion Valve

For direct expansion units, this is necessary when the condensing unit is not provided with a throttling device. Guarantees constant and precise control of superheating of the sucked-in gas. If available on the condensing unit, a potential-free contact that shows the operating status of the compressor can also be connected to the direct expansion units, thereby optimizing the operation of the electronic expansion valve.

AEREAULIC CIRCUIT ACCESSORIES

FG6 High Efficiency Filters (ISO Coarse 75% - G4)

For those applications which need an higher filtration grade, higher efficiency filters are available. Coolblade can therefore be made available with ISO Coarse 75% (according to ISO 16890 - corresponding to EU4 Eurovent BSEN - 779-4/5 - MERV8 with reference to ASHRAE 52.2 - 75% by ASHRAE 52.1). This accessory can be available only with radial fans.

AF Clogged Filter Alarm

Differential pressure sensor which can monitor pressure drop through the filters and trigger an alarm once the value overcomes a specific threshold.

ELECTRICAL ACCESSORIES

DAA Dual Power Supply with Automatic Changeover

This allows immediate automatic switching to the other source if one of the two power supplies fails, in order to maintain continuity of service in installations where high redundancy is required. This obligatorily requires a dual power supply system.

ALMA No Water Flow Alarm

For chilled water units, this keeps the water flow at the inlet monitored and signals when there is no flow by generating an alarm condition.

A216 Power Supply 210 V - 1 ph - 60 Hz

60 Hz power supply configuration for single phase sizes.

MUSR Multiple (4) Return Air Sensors

Solution with 4 sensors which read the return temperatures and make the average of the readings This allows a more distributed temperature reading and therefore a more precise regulation. The accessory is supplied loose, to be cabled on site based upon the specific length needs required by the application layout.

MUSM Multiple (4) Supply Air Sensors

Solution with 4 sensors which read the supply temperatures and make the average of the readings This allows a more distributed temperature reading and therefore a more precise regulation. The accessory is supplied loose, to be cabled on site based upon the specific length needs required by the application layout.

NETWORK ACCESSORIES

SERI RS485 serial board

Serial connection boards allow connection to supervision and remote management systems, thereby making it possible to display the main operating parameters and edit the main operational parameters. The RS485 serial board allows connection to supervision systems with the Modbus RTU protocol.

BAC BacNet Serial Card

Serial connection boards allow connection to supervision and remote management systems, thereby making it possible to display the main operating parameters and edit the main operational parameters. The BacNet serial board allows connection to supervision systems with the MS/TP protocol.

LON LonWorks Serial Card

Serial connection boards allow connection to supervision and remote management systems, thereby making it possible to display the main operating parameters and edit the main operational parameters. The LonWorks serial board allows connection to supervision systems with the FTT-10 protocol.

ETH Ethernet Serial Card

Serial connection boards allow connection to supervision and remote management systems, thereby making it possible to display the main operating parameters and edit the main operational parameters. The Ethernet serial board allows connection to supervision systems with the HTTP, SNMP, BAcnet/IP and Modbus/IP protocols. The Rj45 connector is placed on the back of the unit to make connection easier. A mini web server is installed in the serial board for remote display of the unit via html.

GRLD Datalink Local Network

Datalink local network management allows to have in place unit to unit communication in order to optimize the system operation both from efficiency and effectiveness point of view.

TECHNICAL SPECIFICATIONS

Coolblade In Rack DX

Unit size			OL 9	CL 9	OL 14	CL 14	OL 20	CL 20	OL 24	CL 24
Total Cooling Capacity	(1)	kW	8.7	9.9	14.0	15.8	18.9	21.2	21.5	23.6
Sensible cooling capacity	(1)	kW	8.7	9.9	14.0	15.8	18.9	21.2	21.5	23.6
SHR			1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Fans										
Number			2	2	3	3	4	4	5	5
Nominal airflow		m ³ /h	2300	2350	3200	3350	3900	4100	4200	4200
Min. air flow rate		m ³ /h	1100	1100	1600	1600	1800	1800	2000	2000
Power input with nominal airflow		kW	0.32	0.32	0.49	0.50	0.65	0.64	0.74	0.60
Max. air flow rate		m ³ /h	2300	2400	3200	3400	3900	4100	4200	4200
Noise Level										
Sound power level, suction side		dB(A)	74.8	75.5	75.3	76.1	75.9	76.7	76.5	77.3
Sound power level, discharge side		dB(A)	78.2	79.0	78.8	79.5	79.3	80.1	79.9	80.7
Refrigerant circuit										
Suction connection		n°x mm	1x16	1x16	1x16	1x16	1x16	1x16	1x16	1x16
Liquid connection		n°x mm	1x12	1x12	1x12	1x12	1x12	1x12	1x12	1x12
Blue Box matching condensing unit										
Model			Epsilon Echos+LE 9	Epsilon Echos+LE 9	Epsilon Echos+LE 15	Epsilon Echos+LE 15	Epsilon Echos+LE 20	Epsilon Echos+LE 20	Epsilon Echos+LE 26	Epsilon Echos+LE 26
Total Cooling Capacity	(2)	kW	8.1	9.9	13.4	15.5	18.8	21.2	23.8	25.6
Sensible cooling capacity	(2)	kW	8.1	9.9	13.4	15.5	18.8	21.2	23.8	25.6
Power input condensing unit Epsilon Echos+ LE	(2)	kW	2.0	2.4	3.2	3.5	5.2	5.2	7.0	7.0
Total Cooling Capacity	(3)	kW	10.7	11.5	15.1	16.9	21.0	23.3	25.9	27.8
Sensible cooling capacity	(3)	kW	10.7	11.5	15.1	16.9	21.0	23.3	25.9	27.8
Power input condensing unit Epsilon Echos+ LE	(3)	kW	3.2	3.4	4.5	4.9	7.1	7.0	9.6	9.5
Dimensions and weights of basic unit										
Length		mm	290	290	290	290	290	290	290	290
Depth		mm	770	722	770	722	770	722	770	722
Height		mm	1943	1943	1943	1943	1943	1943	1943	1943
Operating weight		kg	60	60	66	66	72	72	78	78

(1) Saturated evaporating temperature 12°C, saturated condensing temperature 45°C; OL Version Air 35°C 27%; CL Version Air 40°C 20%

(2) Compressor speed 90 rps, External air temperature 35°C; OL Version Air 35°C 27%; CL Version Air 40°C 20%

(3) Compressor speed 120 rps, External air temperature 35°C; OL Version Air 35°C 27%; CL Version Air 40°C 20%

Coolblade In Rack CW

Unit size			OL 14	CL 14	OL 18	CL 18	OL 23	CL 23
Total Cooling Capacity	(1)	kW	13.1	17.1	17.4	22.8	20.8	26.2
Sensible cooling capacity	(1)	kW	13.1	17.1	17.4	22.8	20.8	26.2
SHR	(1)		1.00	1.00	1.00	1.00	1.00	1.00
Fans								
Number			3	3	4	4	5	5
Nominal airflow		m ³ /h	3180	3300	3850	4050	4200	4200
Min. air flow rate		m ³ /h	1000	1000	1200	1200	1400	1400
Power input with nominal airflow		kW	0.50	0.49	0.65	0.65	0.82	0.64
Max. air flow rate		m ³ /h	3200	3300	3850	4050	4200	4200
Hydraulic circuit								
Total pressure drop without valves	(1)	kPa	50	52	34	60	32	48
Total pressure drop with valves	(1)	kPa	63	74	57	100	45	68
In/out connections			G3/4"	G3/4"	G3/4"	G3/4"	G1"	G1"
Internal volume		dm ³	4.9	4.9	7.1	7.1	9.2	9.2
Noise Level								
Sound power level, suction side		dB(A)	75.3	76.1	75.9	76.7	76.5	77.3
Sound power level, discharge side		dB(A)	78.8	79.5	79.3	80.1	79.9	80.7
Dimensions and weight								
Length		mm	290	290	290	290	290	290
Depth		mm	722	770	722	770	722	770
Height		mm	1943	1943	1943	1943	1943	1943
Operating weight		kg	66	66	72	72	78	78

(1) Water 13°C / 18°C; OL Version Air 35°C 27%; CL Version Air 40°C 20%

ELECTRICAL DATA

Coolblade In Rack DX

Unit size		OL/CL 9	OL/CL 14	OL/CL 20	OL/CL 24
Max. absorbed power	kW	0.33	0.50	0.67	0.84
Max. absorbed current	A	2.8	4.2	5.6	7.0
Power supply	V/ph/Hz	230/1~/50 ±5%	230/1~/50 ±5%	230/1~/50 ±5%	230/1~/50 ±5%

Coolblade In Rack CW

Unit size		OL/CL 14	OL/CL 18	OL/CL 23
Max. absorbed power	kW	0.5	0.67	0.8
Max. absorbed current	A	4.2	5.6	7.0
Power supply	V/ph/Hz	230/1~/50 ±5%	230/1~/50 ±5%	230/1~/50 ±5%

NOISE LEVELS

COOLBLADE IN RACK DX -Supply side

Model	Sound power level octave-band [dB]								Total [dB(A)]	
	Central frequency [Hz]								Lw	Lp
	63	125	250	500	1000	2000	4000	8000		
10 OL	68.8	68.9	69.8	71.1	72.5	73.7	68.8	59.4	78.2	64.2
10 CL	70.3	69.9	70.8	71.9	73.3	74.5	69.2	59.8	79.0	65.0
15 OL	69.8	69.7	70.6	71.7	73.1	74.3	69.0	59.6	78.8	64.8
15 CL	71.3	70.7	71.6	72.5	73.9	75.1	69.4	60.0	79.5	65.5
21 OL	70.8	70.5	71.4	72.3	73.7	74.9	69.2	59.8	79.3	65.3
21 CL	72.3	71.5	72.4	73.1	74.5	75.7	69.6	60.2	80.1	66.1
25 OL	71.8	71.3	72.2	72.9	74.3	75.5	69.4	60.0	79.9	65.9
25 CL	73.3	72.3	73.2	73.7	75.1	76.3	69.8	60.4	80.7	66.6

COOLBLADE IN RACK DX -Suction side

Model	Sound power level octave-band [dB]								Total [dB(A)]	
	Central frequency [Hz]								Lw	Lp
	63	125	250	500	1000	2000	4000	8000		
10 OL	66.9	66.5	68.4	69.5	70.2	69.0	64.5	51.8	74.8	60.8
10 CL	68.4	67.5	69.4	70.3	71.0	69.8	64.9	52.2	75.5	61.5
15 OL	67.9	67.3	69.2	70.1	70.8	69.6	64.7	52.0	75.3	61.3
15 CL	69.4	68.3	70.2	70.9	71.6	70.4	65.1	52.4	76.1	62.1
21 OL	68.9	68.1	70.0	70.7	71.4	70.2	64.9	52.2	75.9	61.9
21 CL	70.4	69.1	71.0	71.5	72.2	71.0	65.3	52.6	76.7	62.7
25 OL	69.9	68.9	70.8	71.3	72.0	70.8	65.1	52.4	76.5	62.5
25 CL	71.4	69.9	71.8	72.1	72.8	71.6	65.5	52.8	77.3	63.2

COOLBLADE IN RACK CW -Supply side

Model	Sound power level octave-band [dB]								Total [dB(A)]	
	Central frequency [Hz]								Lw	Lp
	63	125	250	500	1000	2000	4000	8000		
15 OL	68.0	68.1	69.0	70.4	71.8	73.0	68.2	58.8	77.6	63.5
15 CL	69.5	69.1	70.0	71.2	72.6	73.8	68.6	59.2	78.3	64.3
19 OL	69.0	68.9	69.8	71.0	72.4	73.6	68.4	59.0	78.1	64.1
19 CL	70.5	69.9	70.8	71.8	73.2	74.4	68.8	59.4	78.9	64.8
24 OL	70.0	69.7	70.6	71.6	73.0	74.2	68.6	59.2	78.7	64.6
24 CL	71.5	70.7	71.6	72.4	73.8	75.0	69.0	59.6	79.4	65.4

COOLBLADE IN RACK CW -Suction side

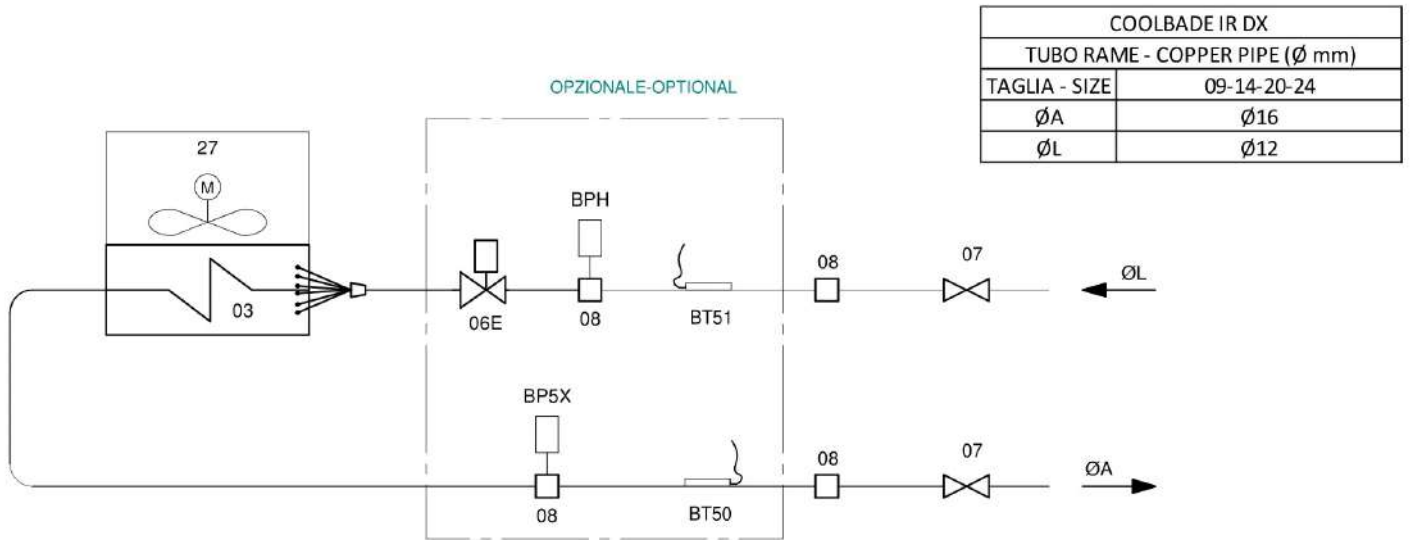
Model	Sound power level octave-band [dB]								Total [dB(A)]	
	Central frequency [Hz]								Lw	Lp
	63	125	250	500	1000	2000	4000	8000		
15 OL	66.3	65.7	67.9	68.8	69.5	68.8	63.9	52.0	75.5	61.5
15 CL	67.8	66.7	68.9	69.6	70.3	69.6	64.3	52.4	75.0	61.0
19 OL	67.3	66.5	68.7	69.4	70.1	69.4	64.1	52.2	76.1	62.1
19 CL	68.8	67.5	69.7	70.2	70.9	70.2	64.5	52.6	75.6	61.6
24 OL	68.3	67.3	69.5	70.0	70.7	70.0	64.3	52.4	75.4	61.4
24 CL	69.8	68.3	70.5	70.8	71.5	70.8	64.7	52.8	76.2	62.2

Lp: Sound pressure level at 2 m free field weighted "A" method

Lw: Sound power level weighted "A" method

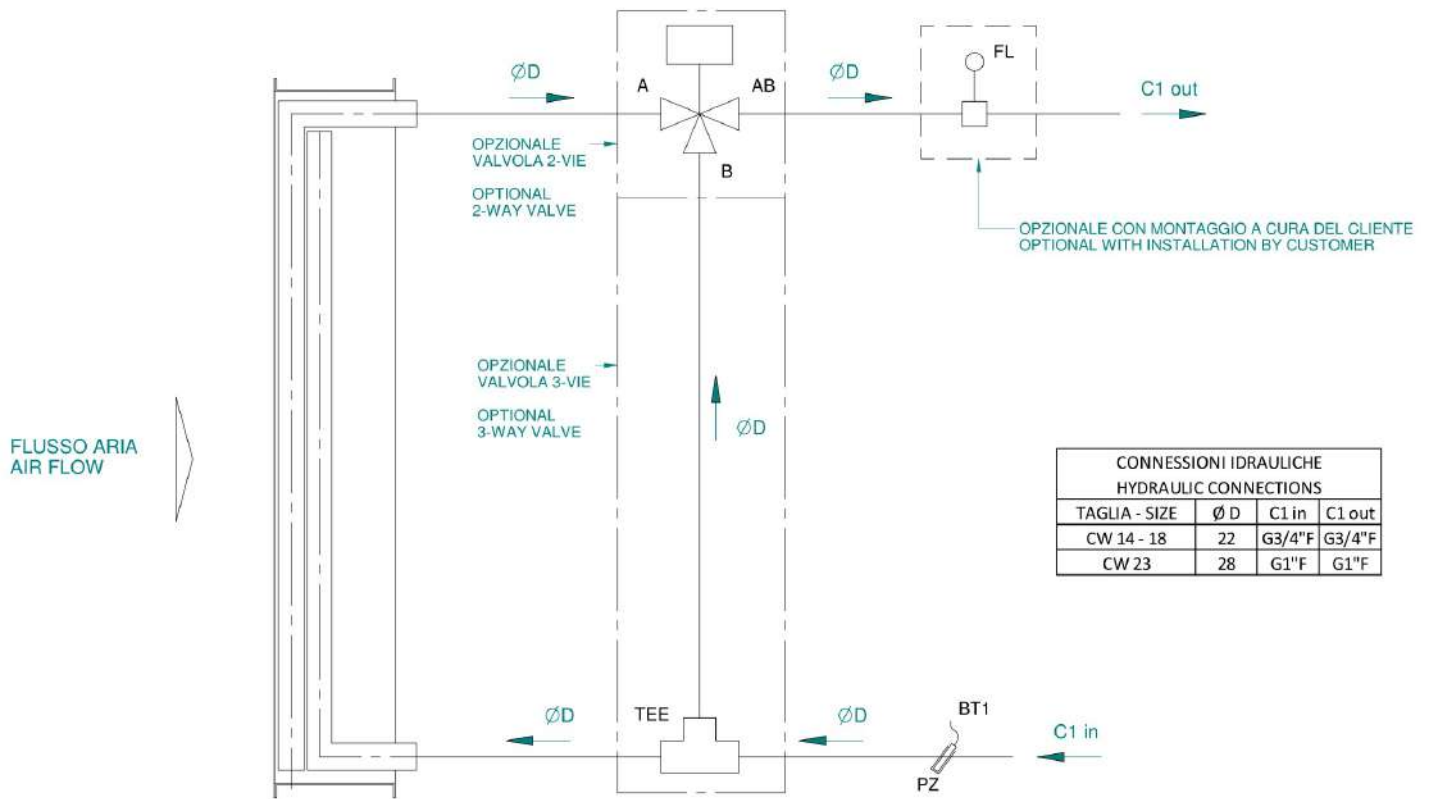
REFRIGERANT DIAGRAMS

COOLBLADE IN RACK DX



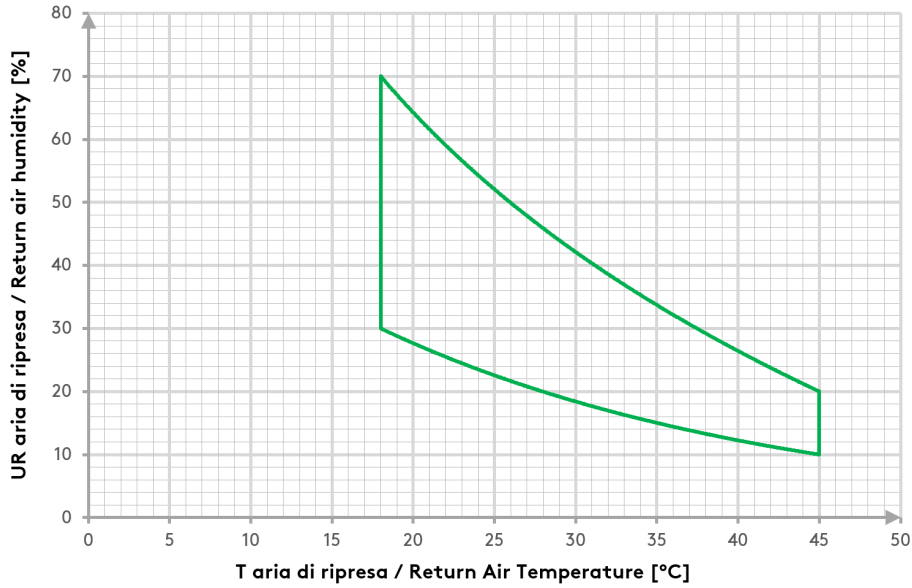
HYDRAULIC DIAGRAMS

COOLBLADE IN RACK CW



WORKING LIMITS – COOLBLADE IN RACK DX

As concerns the combination of temperatures and relative humidities, it is strongly recommended that the design conditions of the return air (hot aisle) fall within the limits specified below:

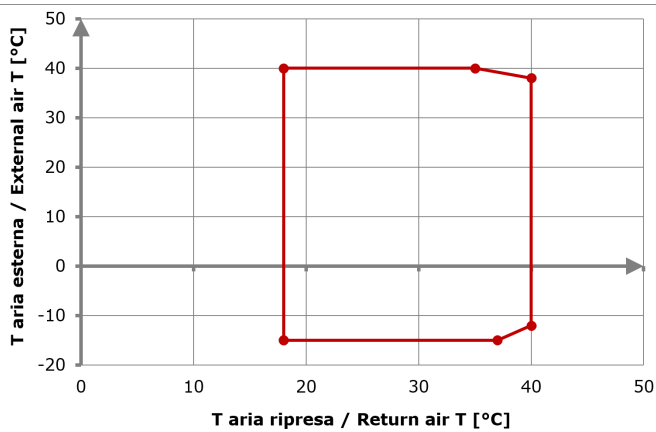


It should be emphasised that the standard design temperatures of a hot aisle/cold aisle system with containment are usually higher than 30°C; however, Coolblade DX units can also operate at lower return air temperatures, within the limits stated below.

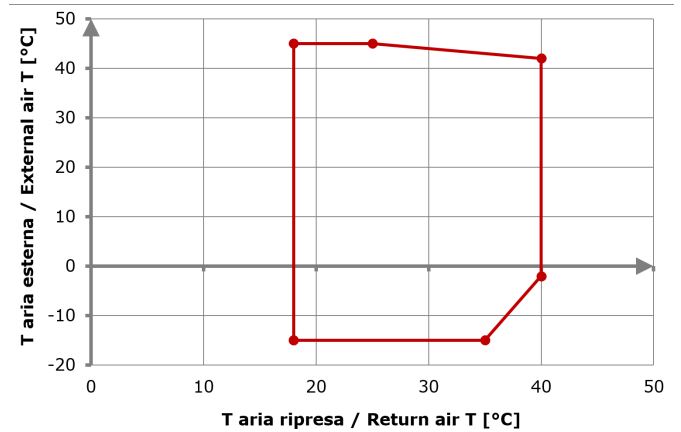
COOLBLADE IN RACK DX - EPSILON ECHOS+ LE

Coupled to Epsilon Echos + LE condensing unit

The operating limits indicated below are valid only for the standard coupling (see the “technical specifications” section).



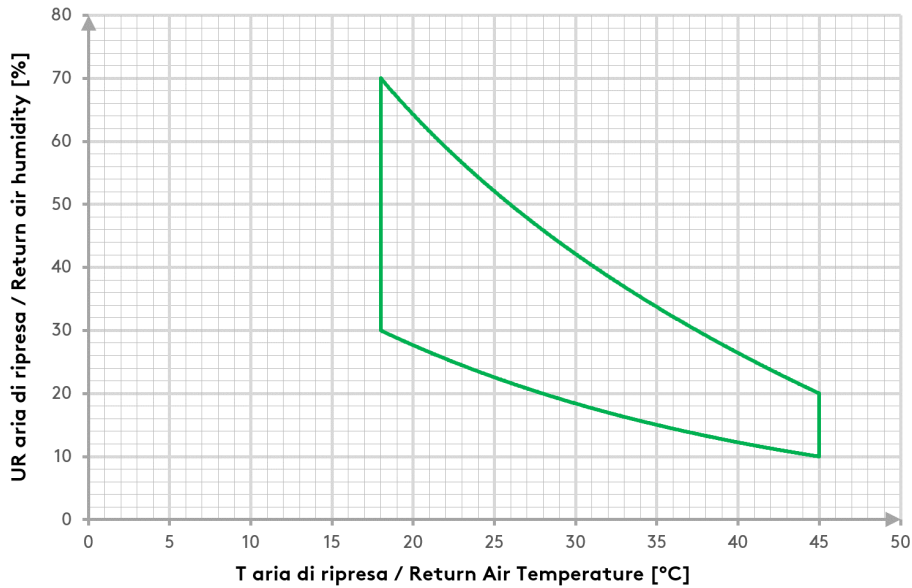
Condensing unit at maximum capacity (compressor at 120rps)



Condensing unit at rated capacity (compressor at 90rps)

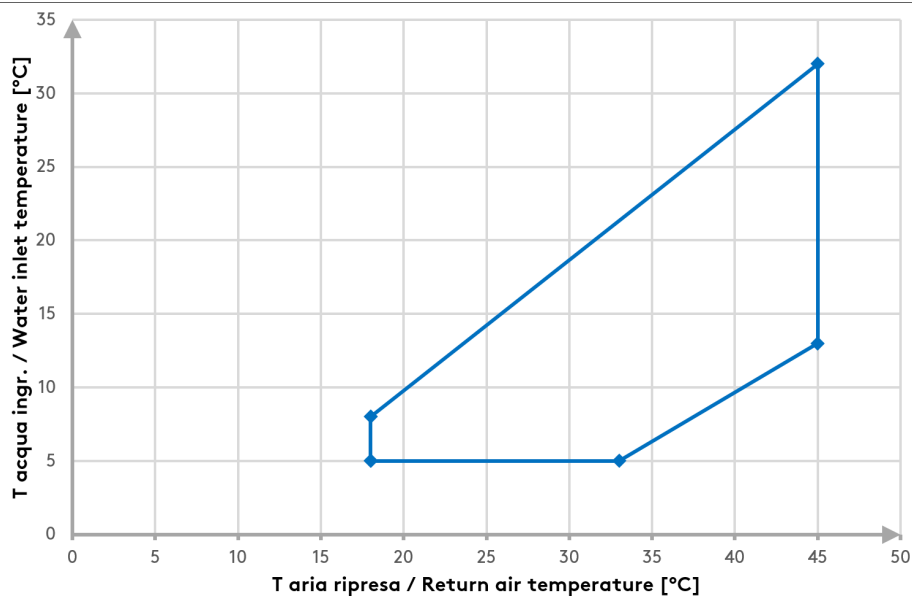
WORKING LIMITS – COOLBLADE IN RACK CW

As concerns the combination of temperatures and relative humidities, it is strongly recommended that the design conditions of the return air (hot aisle) fall within the limits specified below:



It should be emphasised that the standard design temperatures of a hot aisle/cold aisle system with containment are usually higher than 30°C; however, Coolblade In Rack CW units can also operate at lower return air temperatures, within the limits stated below.

The operating limits indicated below refer to the optimal operation of the units. Outside the indicated limits, undesirable condensate and dehumidification problems, high head losses on hydraulic side or insufficient heat exchange may occur.

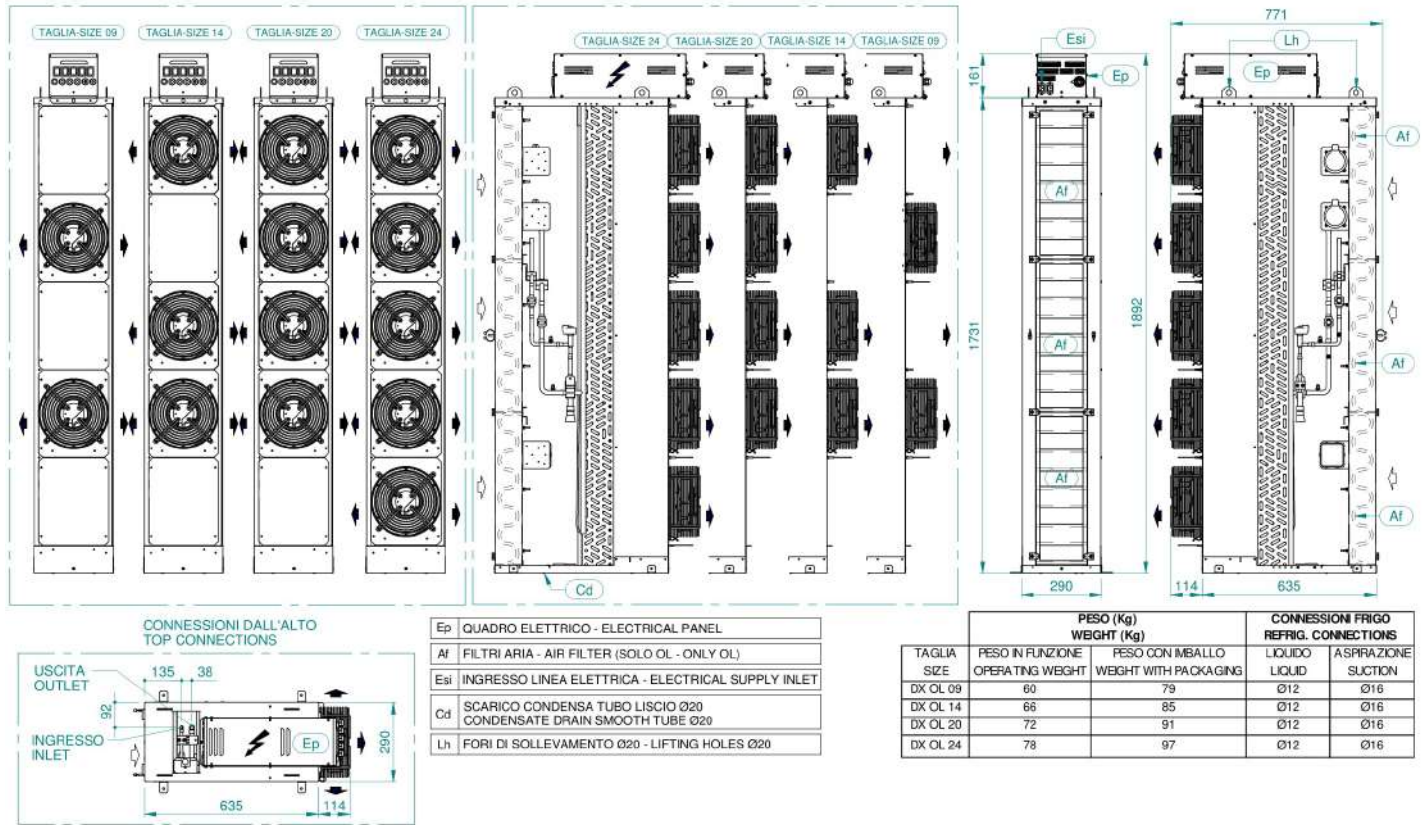


The maximum percentage of glycol is 50%.

DIMENSIONAL DIAGRAMS

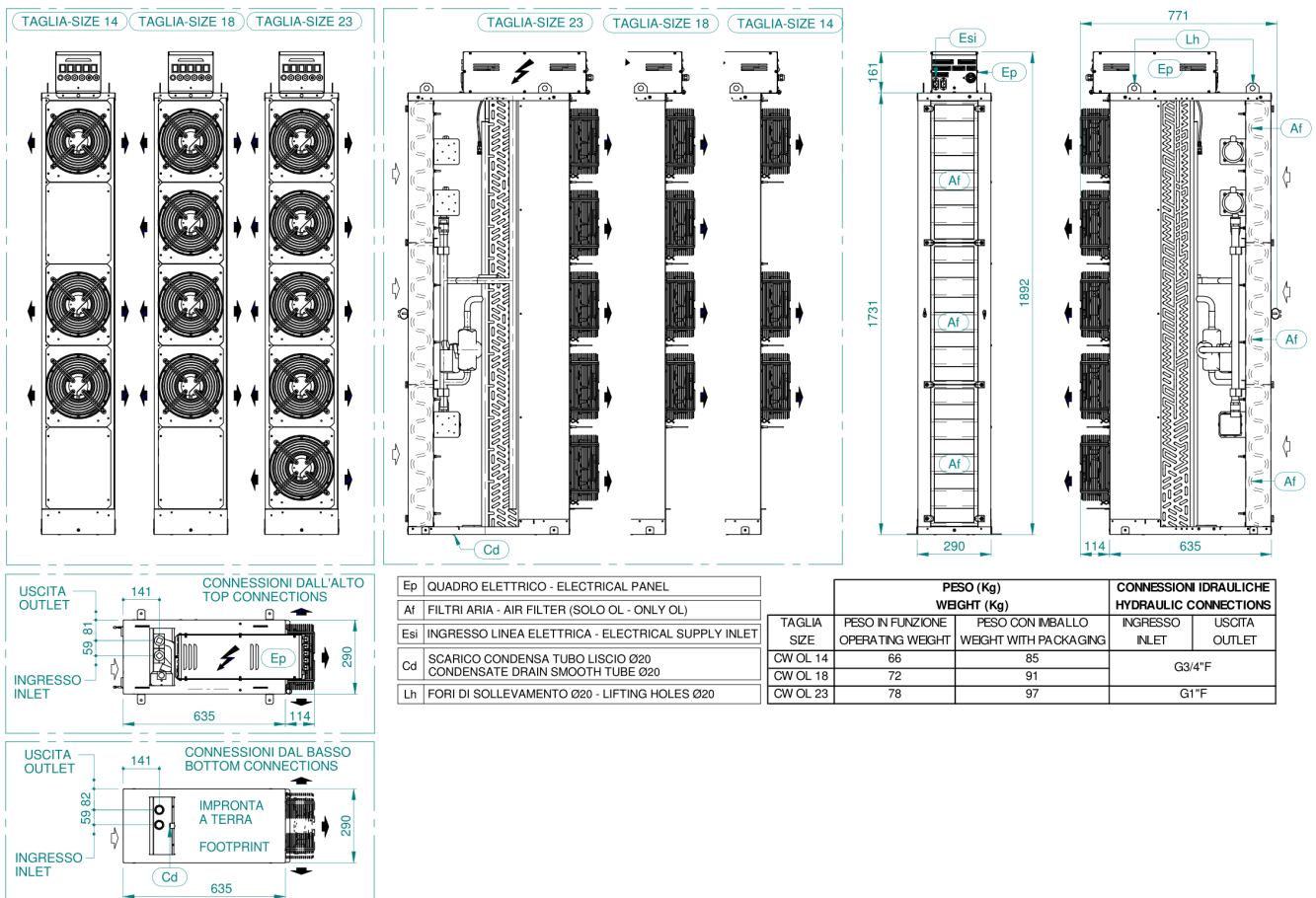
COOLBLADE IN RACK DX

DDIM000494-A



COOLBLADE IN RACK CW

DDIM000430-B



INSTALLATION TIPS

POSITIONING

- Coolblade units are perfectly balanced, but they are tall and slender and have their centre of gravity about halfway up, so care must be taken when handling and positioning them.
- Strictly comply with the clearance spaces indicated in the catalogue.
- Coolblade units are designed and made for interior use only. The hydraulic circuits are not provided with freeze protection.

ELECTRICAL CONNECTIONS

- Always consult the attached wiring diagram, which provides all the instructions necessary for making the electrical connections.
- Electrical connections to be made for Coolblade units: it is possible to carry one or two (based upon the unit configuration) single-phase/three phases (depending on the unit size) power lines and connect both to the disconnect switch. For all the units if fitted with accessory DAA (Dual power supply with automatic changeover) will be possible to select the preferred line.
- For unit Coolblade DX: if the power supply comes from the external unit, connect it to just one of the incoming lines available on the Coolblade DX unit.
- The power supply line must be protected in accordance with current regulations.

HYDRAULIC AND REFRIGERANT CONNECTIONS

- If the hydraulic connections are carried out from the bottom, thoroughly vent the hydraulic system, with pumps switched off, by operating the air valves of the Coolblade units. This procedure is particularly important because even small air bubbles can cause reduced performance of the finned pack heat exchanger of the Coolblade units. If the hydraulic connections are carried out from the top, the air vent must be positioned by the customer on the highest point of the system.
- Make the hydraulic circuit with inclusion of the typical components used in closed hydraulic circuits (for example, expansion vessel, flow switch, storage tank, air valves, shutoff valves, anti-vibration couplings, etc.).
- Make the refrigerant connections strictly following the instructions provided with the installation, operation and maintenance manual, in particular as regards the brazewelding, cleaning, vacuum and charging operations.

START-UP AND MAINTENANCE

- Strictly follow the instructions given in the operation and maintenance manual. These operations must in any case be carried out by qualified persons.

Blue Box Group S.r.l.

Via Valletta, 5 - 30010

Cantarana di Cona, (VE) Italy - T. +39 0426 921111 - F. +39 0426 302222

www.blueboxcooling.com - info@bluebox.it



Blue Box Group S.r.l. a socio unico - P.IVA 02481290282

Company directed and coordinated by Investment Latour (Sweden)