

**MC MicroCooler - Product Presentation**

## MC - Compact Close Control Units

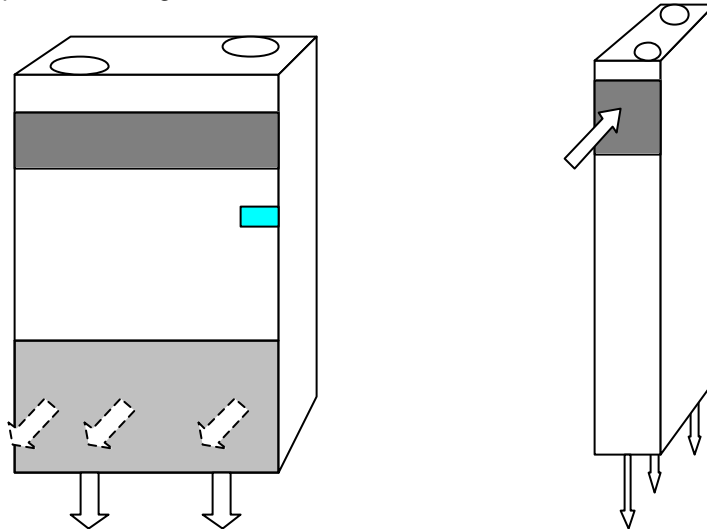
- DX version Down Flow
- DX version Displacement
- DX + Direct Free cooling



**Products Description**

The micro coolers CCAC was developed according "DNP\_P\_04\_02 rev00" MKTG specification for complete satisfy specific market needs.

This units could be supplied only in DX version, down flow or displacement, frontal and side installation as shown in the following simplified drawings,

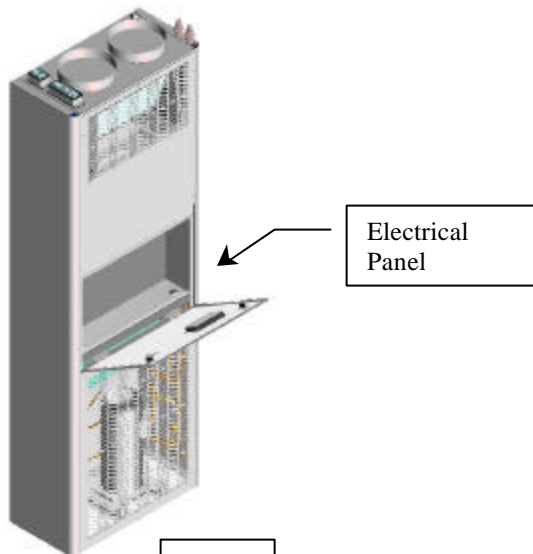


In the upper part of the MC units can be installed a free cooling damper to allow the direct free cooling operation : in this case the fresh air will be ducted to the unit by means of flexible D=200mm ducts connected to the two (2) spigots on the top of the unit .

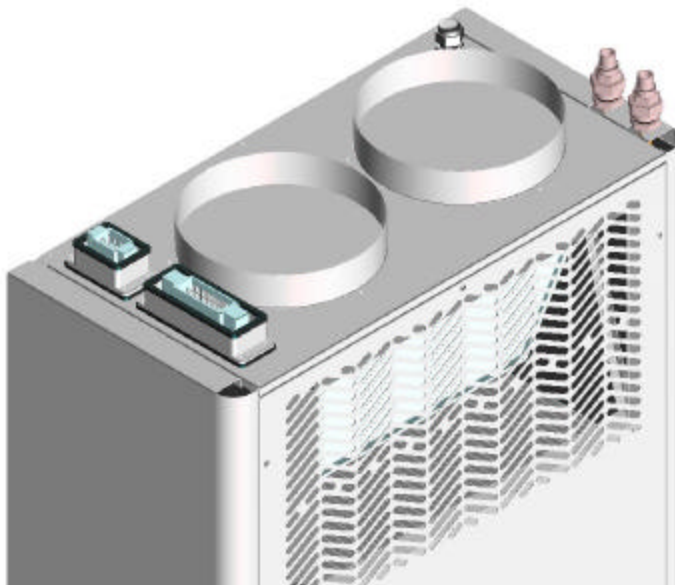
Micro Coolers cover a range between 4.0 => 6.9 kW and have common design philosophy :

1. Compact dimension L x D x H 600 x 300 x 1800 mm
2. Suction from the front ( + from the top for direct free Cooling version )
3. Backward curved blades fans (plug fans) complete with adjustable speed (170-190 Volts @ 20 Pa AESP)
4. Evaporating coil positioned after the fans
5. Hydrophilic treatment on the fins
6. Thermostatic valve with MOP function (EEV as an option)
7. Refrigerant connections from the top right side. Refrigerant shut off valves in the compressor compartement.
8. Electrical connections with IP 65 connectors from the top left side
9. Copeland Scroll compressors for sizes 045, 056, 070
10. Daewoo Carrier Rotary Compressor for size 035
11. Single phase power supply

1. **Electrical panel.** It is located in the middle of the unit and its door supports the LCD display.

**Fig. 1**

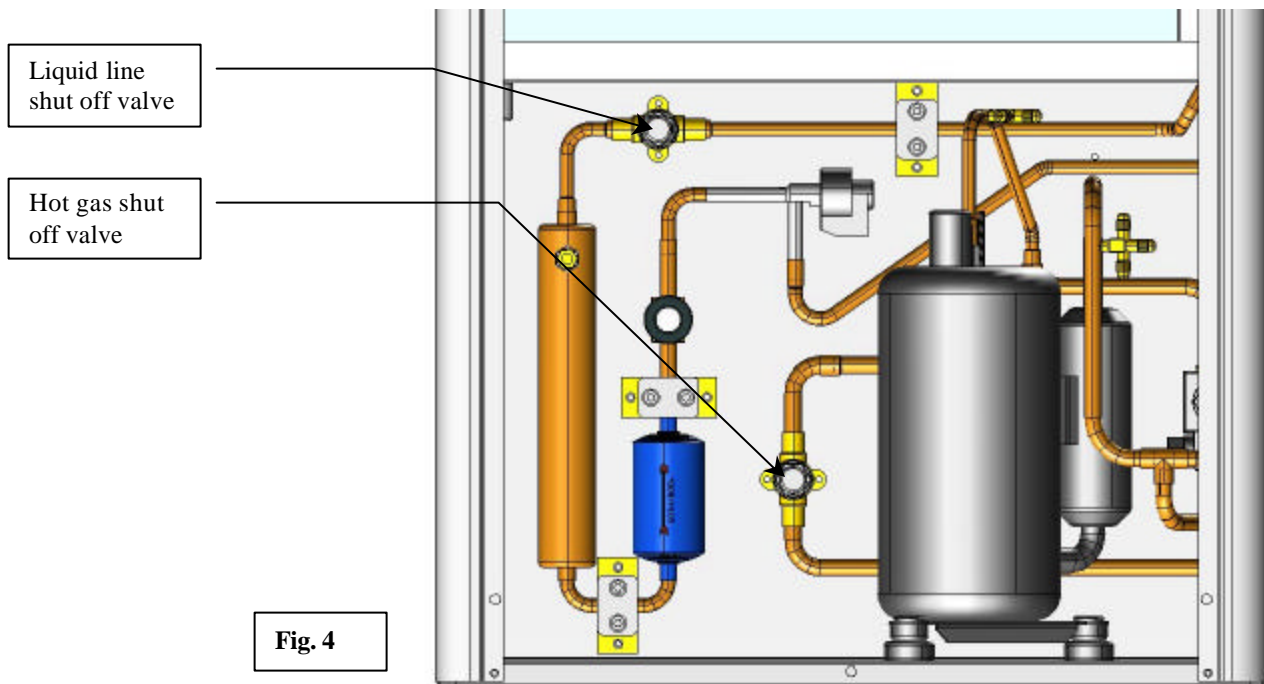
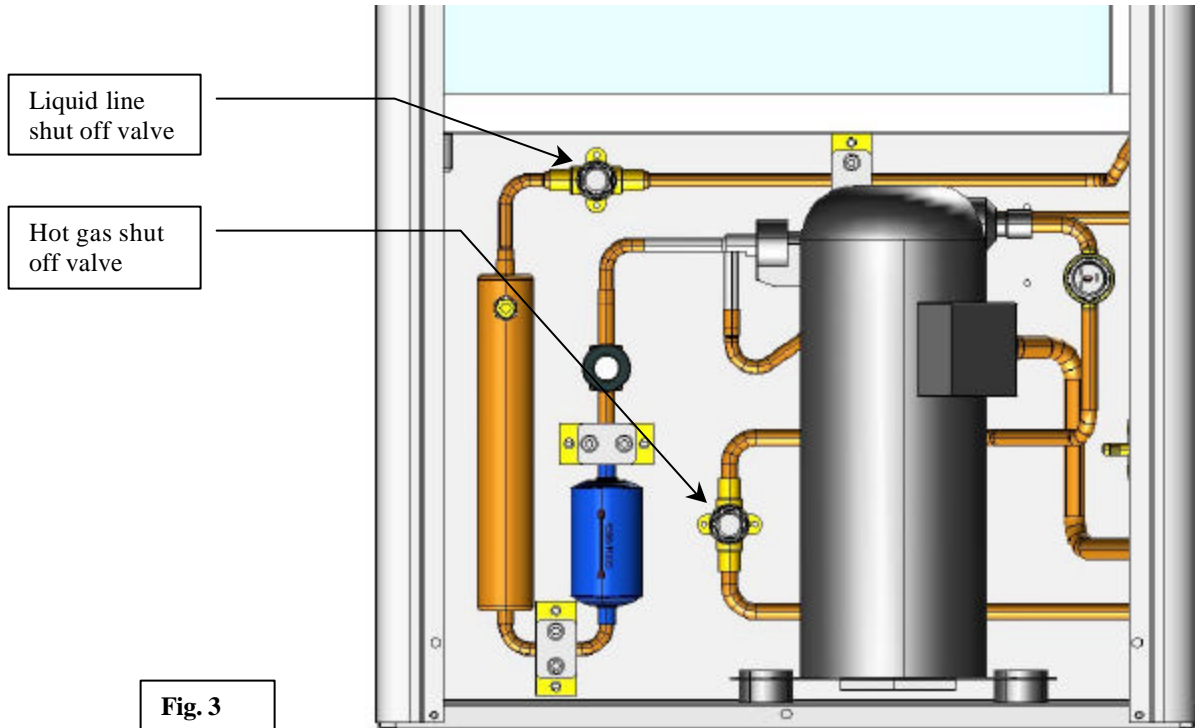
2. **Electrical Connections.** All connections are from the top by means of IP 65 plugs as shown in fig. 2.

**Fig. n° 2**

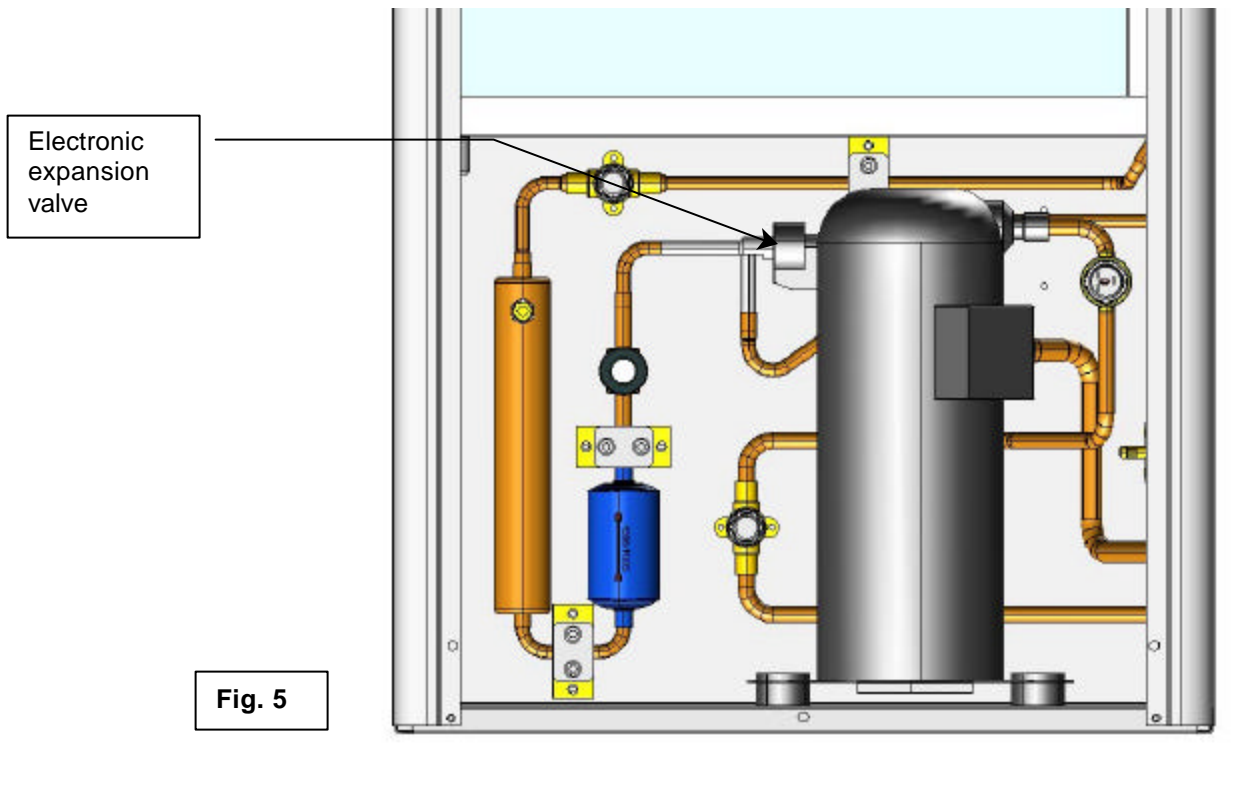
The male connectors are fixed on the unit; the female have to be removed and wired according the electrical drawing HF62000240 page 13.

- The small 6 poles connector "C1" on the left back side is for unit's power supply,
- The big 24 poles connector "C2" on the left side is for signals/alarms : the number of available signals depends on the configuration of the units (alarm board Yes / alarm board Not)
- The small 6 poles connector "C3" on the right side (not fixed on the unit's frame) is for the remote condenser.

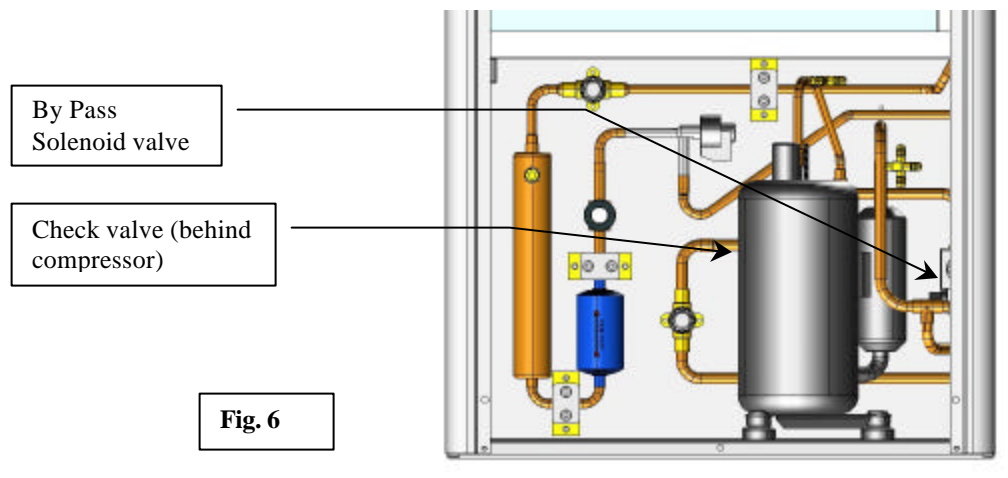
3. **Refrigerant Connections.** The connections are located on the top right side (fig.2) and are provided with rotalock adaptors. The refrigerant shut off valves are located into compressor compartment as shown in fig 3 for scrolls and fig 4 for rotary compressor (model MC 035)



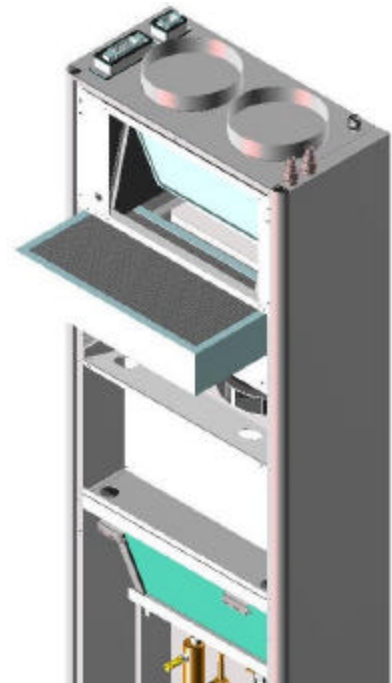
4. **Electronic expansion valve.** The valve is located into compressor compartement as shown in fig. 5, and it is fixed on the back side of the compartement



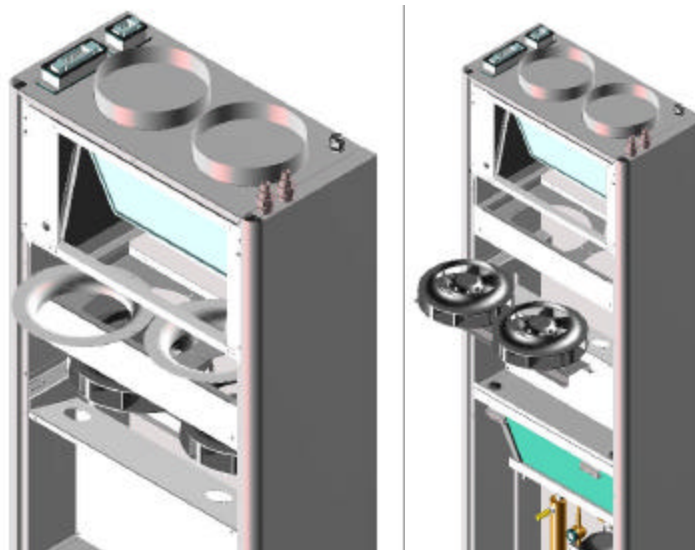
5. **Solenoid valve for start up operation.** This component is only present in the smallest unit MC 035 equipped with rotary compressor: this kind of compressor doesn't allow the pressures equalisation during the stop phase and the single phase e-motor doesn't have a big starting torque. For this reason a solenoid valve between discharge and suction pipes is present: this valve opens when the compressor is switched off to allow the pressure equalisation and, at the same time, the check valve on the discharge line avoids back flow from the condenser. [fig.6]



6. **Air filters.** For remove the filter, open the upper panel and simply extract the filter as shown in fig. 7. The position and the overall dimensions are the same for G4 and F6 filters.

**Fig. 7**

7. **Fans.** The adopted fans are of the backward curved blades (Plug) type made from EBM Germany. These components are equipped with an external rotor motor for the maximum efficiency and reliability and reduced sound emissions, even in fan speed modulation. For remove the fans, firstly remove the fan nozzles (accessible from the filter compartment), remove the two screws of the fan support, turn it up and extract the support with both fans (fig. 8).

**Fig. 8**

**Technical data**

|   |             | MC 070   | MC 056   | MC 045   | MC 035   |
|---|-------------|--|--|--|--|
| <b>Power supply</b>   | [ V/Ph/Hz ] | 230/ 1 /50                                       | 230/ 1 /50                                       | 230/ 1 /50                                       | 230/ 1 /50                                       |
| <b>Air Flow @20 Pa AESP</b>   | [ m3/h ]    | 1350   | 1230   | 1230   | 1050   |
| <b>Frame</b>  |             |  |  |  |  |
| <b>H</b>  | [mm]        | 1800   | 1800   | 1800   | 1800   |
| <b>L</b>  | [mm]        | 600  | 600  | 600  | 600  |
| <b>P</b>  | [mm]        | 300  | 300  | 300  | 300  |
| <b>Weight</b>   | [kg]        | 147  | 139  | 131  | 129  |
| <b>Compressor</b>   |             |  |  |  |  |
| <b>Type</b>   |             | Scroll   | Scroll   | Scroll   | Rotary   |
| <b>Cooling Capacity @ 27°C 40% UR<br/>– external air temp. 35°C</b> | [ kW ]      | 6.90   | 5.75   | 4.66   | 4.08   |
| <b>SHR</b>  | [ - ]       | 0.91   | 0.96   | 0.98   | 1  |
| <b>Power consumption</b>  | [ kW ]      | 1.97   | 1.51   | 1.23   | 1.05   |
| <b>Nominal Absorbed Current</b>                                     | [ A ]       | 9.2  | 7.1  | 5.6  | 4.5  |
| <b>FLA</b>  | [ A ]       | 14.8   | 11.4   | 10   | 8.8  |
| <b>LRA</b>  | [ A ]       | 61   | 47   | 35   | 28   |
| <b>POE Oil charge</b>   | [l]         | 1  | 1  | 0.74   | 0.74   |
| <b>Finned coil evaporator</b>                                       |             |  |  |  |  |
| <b>Front Surface</b>  | [m2]        | 0.17   | 0.17   | 0.17   | 0.17   |
| <b>Geometry</b>   |             | 25 x 21,65                                       | 25 x 21,65                                       | 25 x 21,65                                       | 25 x 21,65                                       |
| <b>Rows</b>   | [ - ]       | 4  | 4  | 3  | 3  |
| <b>Type of fins</b>   | [ - ]       | Hydrophilic                                      | Hydrophilic                                      | Hydrophilic                                      | Hydrophilic                                      |
| <b>TFT (Total Free Cooling Temperature)</b>                         | [ °C ]      | 11.7   | 13.1   | 15.6   | 15.4   |
| <b>Fin pitch</b>  | [ mm ]      | 1.8  | 1.8  | 1.8  | 1.8  |
| <b>Indoor fan</b>   |             |  |  |  |  |
| <b>Type</b>   |             | Plug   | Plug   | Plug   | Plug   |
| <b>Number of fans</b>   |             | 2  | 2  | 2  | 2  |
| <b>Fans absorbed current @20 Pa AESP</b>                            | [ A ]       | 1.1  | 0.93   | 0.93   | 0.82   |
| <b>Fans absorbed power @20 Pa AESP</b>                              | [W]         | 240  | 210  | 210  | 185  |
| <b>Air Filter STD</b>   |             |  |  |  |  |
| <b>Filtration</b>   |             | G4   | G4   | G4   | G4   |
| <b>Overall surface</b>  | [m2]        | 2.8  | 2.8  | 2.8  | 2.8  |
| <b>Electrical heaters</b>   |             |  |  |  |  |
| <b>Total Heating Capacity</b>                                       |             | 1.6  | 1.6  | 1.6  | 1.6  |
| <b>N° of heaters</b>  | [kW]        | 1  | 1  | 1  | 1  |
| <b>Material</b>   | [ - ]       | Aluminium  | Aluminium  | Aluminium  | Aluminium  |
| <b>Sound Data (*)</b>   |             |  |  |  |  |
| <b>Sound power level (with F6 filter)</b>                           | [dB(A)]     | 57   | 56   | 56   | 54   |
| <b>Sound pressure level** (with F6 filter)</b>                      | [dB(A)]     | 43   | 42   | 42   | 40   |
| <b>Sound power level (with G4 filter)</b>                           | [dB(A)]     | 55   | 54   | 54   | 52   |
| <b>Sound pressure level** (with G4 filter)</b>                      | [dB(A)]     | 41   | 40   | 40   | 38   |
| <b>Refrigerant Connections</b>                                      |             | Rotalock 1/2" +<br>1m metallic<br>flexible pipes | Rotalock 1/2" +<br>1m metallic<br>flexible pipes | Rotalock 1/2" +<br>1m metallic<br>flexible pipes | Rotalock 1/2" +<br>1m metallic<br>flexible pipes |
| <b>Refrigerant connection position</b>                              |             | Top of the unit                                  | Top of the unit                                  | Top of the unit                                  | Top of the unit                                  |

\*\* At 1,5 meters height, 2 meters frontal distance in free field – downflow version ( 20 Pa AESP)

\* With F6 filter the fan's speed have to be increased => increasing in sound emissions

**Accessories**

|  | <b>MC</b>                |
|--|--------------------------|
| Electrical heaters   | <input type="checkbox"/> |
| HP Fans  | <input type="checkbox"/> |
| Advanced $\mu$ P with LCD Display                              | <input type="checkbox"/> |
| Electronic Expansion Valve                                     | <input type="checkbox"/> |
| Air flow switch  | <input type="checkbox"/> |
| Dirty filters switch   | <input type="checkbox"/> |
| F6 filter  | <input type="checkbox"/> |
| Smooke & fire sensor   | <input type="checkbox"/> |
| Adjustable bse frame 100-400 mm                                | <input type="checkbox"/> |
| Insulating materials according german B1 classification        | <input type="checkbox"/> |
| Plug connectors IP65   | <input type="checkbox"/> |
| Emergency cooling 48Vcc (with free cooling option)             | <input type="checkbox"/> |
| Flexible connection refrigerant side (metallic pipes) L=1000mm | <input type="checkbox"/> |
| Flexible connection air side L=3000mm D=200mm                  | <input type="checkbox"/> |
| Modulating damper for direct free cooling                      | <input type="checkbox"/> |

**Air flows configuration**

|                       | <b>Discharge ?</b> | <b>Down</b>              | <b>Front</b> | <b>Top</b> | <b>Rear</b> |
|-----------------------|--------------------|--------------------------|--------------|------------|-------------|
| <b>Suction from ?</b> |                    |                          |              |            |             |
| <b>Down</b>           |                    | N.A.                     | N.A.         | N.A.       | N.A.        |
| <b>Front</b>          |                    | <input type="checkbox"/> | Displacement | N.A.       | N.A.        |
| <b>Top</b>            |                    | <input type="checkbox"/> | Displacement | N.A.       | On request  |
| <b>Rear</b>           |                    | N.A.                     | N.A.         | N.A.       | N.A.        |