AIRSYS


# FREECOOL

## Intelligent Control Free Cooling Box

Air volume: 1000-3450 $m^3/h$

www.air-sys.uk

The FREECOOL intelligent ventilation unit is ideal for cooling telecoms shelters, cabins, and even small data centres. When ambient temperatures are lower than the indoor design, the unit will introduce outdoor fresh air to cool the space, without the need for mechanical air conditioning. The FREECOOL unit can also be used to supplement existing legacy equipment, reducing their compressor power usage.

The FREECOOL unit is available in various configurations: outdoor and indoor, packaged and split, and with different power supplies, 220VAC and 48VDC, offering complete flexibility for the application.

# Unit Identification

| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|
| FREECOOL | . | OD | . | SPL | 12 | F1 | . | 220/1/50 | . | XXX |

| | | |
|---|---|---|
| 01 | FREECOOL | Product series name: FREECOOL series fresh air free cooling unit |
| 02 | · | Separator Character "." |
| 03 | OD | Installation type:<br>INDOOR: The unit is installed indoors, abbreviated as "ID"<br>OUTDOOR: The unit is installed outdoors, abbreviated as "OD". |
| 04 | . | Separator character "." |
| 05 | SPL | SPL: Split unit, the unit consists of two independent parts: the main unit and the air discharge section;<br>PACKAGE: Package unit, the air inlet, outlet and the air damper are integrated within the unit. |
| 06 | 12 | Nominal air volume with the unit 100m³/h, i.e. "12" stands for the air nominal air flow of 1,200m³/h |
| 07 | F1 | Fan quantity in the unit.<br>F1 means the unit is equipped with one fan.<br>F2 means the unit is equipped with two fans. |
| 08 | . | Separator Character "." |
| 09 | 230/1/50 | Unit power supply<br>230/1/50: 230V AC, single phase 50Hz<br>48VDC: 48V DC |
| 10 | . | Separator Character "." |
| 11 | XXX | Code for custom design |

# Engineered features

## 1 Energy efficiency

By using the FREECOOL unit, the need to operate existing air conditioning units within the equipment room is greatly reduced, thereby lowering their overall electrical demand.

## 2 Ease of maintenance

The main components such as: fan(s), motor(s), filters, controller and other related components can be accessed and maintained from the front of the unit.

## 3 Intelligent control

FREECOOL unit is microprocessor-controlled, providing a fully automated intelligent system, maximising energy savings.

## 4 EC Fan

The fan is the core component of the unit, utilising EC fan variable speed technology.

## 5 Flexible installation

There are 4 types of installation structures for this product which include: indoor installed packaged type, indoor installed split type, outdoor installed packaged type, outdoor installed split type. These can easily meet the installation expectations of most applications, especially with their compact size.

## 6 Data log

The controller has the capacity to monitor and log the operating running data for a year. The data can then be sent to a remote control and monitoring system so that the customer can analyse the working performance and energy saving achieved.

## 7 Emergency free cooling

When the AC power fails, the unit can keep working as emergency free cooling by 48VDC supplied by batteries in the room, provided by others ( only available for FREECOOL.DC units)

## 8 Remote control and monitoring (optional)

The unit can be installed with a RS232 or RS485 communication card to provide remote control capabilities and monitoring by a BMS system with open communication protocol.

## 9 PCOWEB internet communication (optional)

The unit can be equipped with a PCOWEB Ethernet communication card with TCP/IP protocol to provide remote control and monitoring.

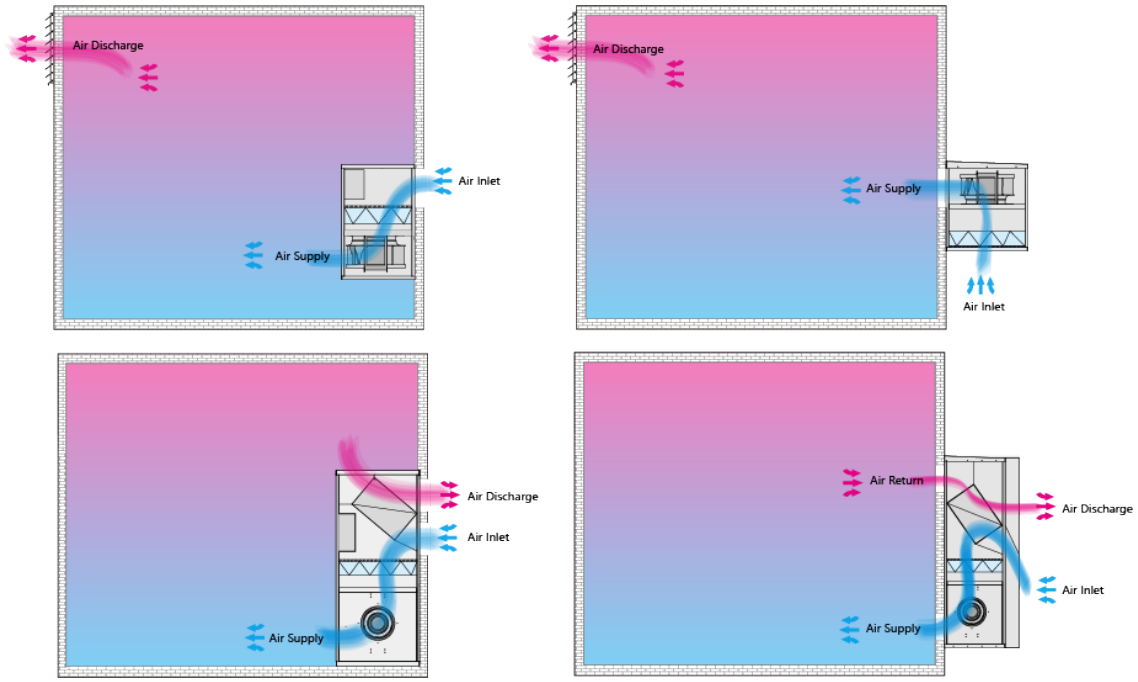
## 10 Humidity control (optional)

The humidity sensor can prevent the introduction of high humidity air into the equipment room. The FREECOOL unit will turn off when the ambient humidity levels reach the room humidity setpoint.

# Working flow schematic diagram

When the outdoor temperature is lower than the room temperature, the FREECOOL unit brings fresh outdoor air in to cool the room. If mechanical back-up cooling has also been installed then the FREECOOL unit can enable this to assist with the cooling when the use of outdoor air is insufficient.
When the room temperature exceeds the emergency setting, the FREECOOL unit will operate in emergency mode.

Below the drawings show the air flow of both the packaged and split FREECOOL units:



# Technical Parameters

## FREECOOL.OD/ID.PCK

| Unit model | | 12F1 | 18F1 | 24F1 | 30F2 | 35F2 |
|---|---|---|---|---|---|---|
| Supply air scheme(1) | $m^3/h$ | 1000 | 1450 | 2050 | 2650 | 3000 |
| Cooling capacity | | | | | | |
| △t=5℃ | kW | 1.7 | 2.4 | 3.4 | 4.5 | 5.0 |
| △t=10℃ | kW | 3.4 | 4.9 | 6.9 | 8.9 | 10.1 |
| △t=12℃ | kW | 4.0 | 5.9 | 8.3 | 10.7 | 12.1 |
| Power supply 48VDC | | | | | | |
| Fan | | Single inlet backward curved EC centrifugal fan | | | | |
| Qty. | n. | 1 | 1 | 1 | 2 | 2 |
| Power input | kW | 0.08 | 0.22 | 0.23 | 0.34 | 0.47 |
| Current | A | 1.70 | 4.50 | 4.70 | 7.00 | 9.80 |
| Power Supply 220VAC (ID only) | | | | | | |
| Fan | | Single inlet backward curved centrifugal fan | | | | |
| Qty | n. | 1 | 1 | 1 | 2 | 2 |
| Power input (1) | kW | 0.13 | 0.18 | 0.39 | 0.36 | 0.50 |
| Current (1) | A | 0.55 | 0.76 | 2.10 | 1.52 | 2.20 |
| Power input (2) | kW | 0.10 | 0.16 | 0.23 | 0.30 | 0.33 |
| Current (2) | A | 0.85 | 1.30 | 1.10 | 2.45 | 2.70 |
| Noise (3) | dB(A) | 52 | 55 | 57 | 54 | 57 |
| Unit dimension and weight | | | | | | |
| Width (ID) | mm | 650 | 650 | 650 | 750 | 750 |
| Depth (ID) | mm | 500 | 500 | 500 | 600 | 600 |
| Height (ID) | mm | 1100 | 1100 | 1100 | 1400 | 1400 |
| Weight (ID) | kg | 60 | 60 | 65 | 85 | 85 |
| Width (OD) | mm | 650 | 650 | 650 | 750 | 750 |
| Depth (OD) | mm | 550 | 550 | 550 | 630 | 630 |
| Height (OD) | mm | 1320 | 1320 | 1320 | 1620 | 1620 |
| Weight(OD) | kg | 65 | 65 | 68 | 115 | 115 |

(1) Power supply is 220V/1Ph/50Hz;
(2) Power supply is 220V/1Ph/60Hz;
(3) The noise of 1 meter away from unit.

# Technical Parameters

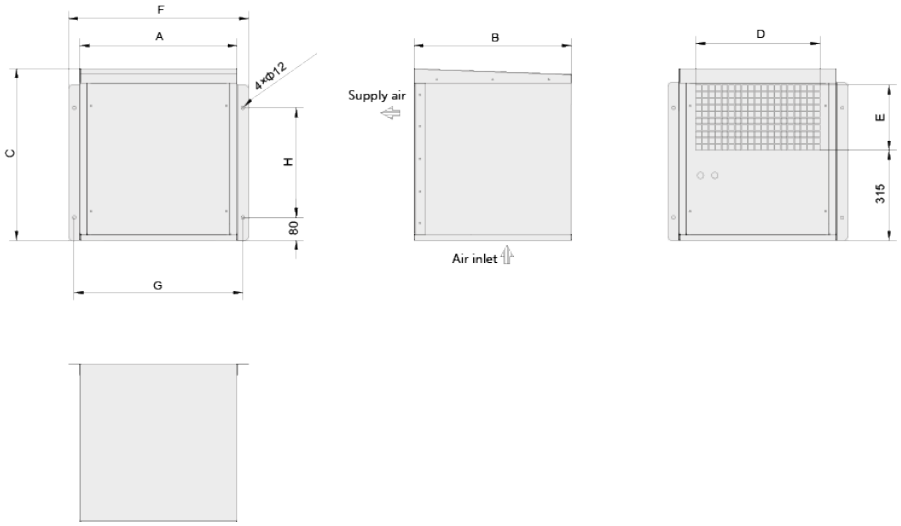
## FREECOOL.OD/ID.SPL

| Unit model | | 12F1 | 18F1 | 24F1 | 30F1 | 35F1 |
|---|---|---|---|---|---|---|
| Supply air scheme(1) | $m^3/h$ | 1000 | 1750 | 2050 | 3030 | 3450 |
| Cooling capacity | | | | | | |
| △t=5℃ | kW | 1.7 | 2.9 | 3.4 | 5.1 | 5.8 |
| △t=10℃ | kW | 3.4 | 5.9 | 6.9 | 10.2 | 11.6 |
| △t=12℃ | kW | 4.0 | 7.1 | 8.3 | 12.2 | 13.9 |
| Power supply 48VDC | | | | | | |
| Fan | | Single inlet backward curved EC centrifugal fan | | | | |
| Qty. | n. | 1 | 1 | 1 | 1 | 1 |
| Power input | kW | 0.08 | 0.22 | 0.23 | 0.26 | 0.41 |
| Current | A | 1.70 | 4.50 | 4.70 | 5.50 | 8.60 |
| Power Supply 220VAC (ID only) | | | | | | |
| Fan | | Single inlet backward curved centrifugal fan | | | | |
| Qty | n. | 1 | 1 | 1 | 1 | 1 |
| Power input (1) | kW | 0.13 | 0.18 | 0.39 | 0.38 | 0.57 |
| Current (1) | A | 0.55 | 0.76 | 2.10 | 1.70 | 2.70 |
| Power input (2) | kW | 0.10 | 0.16 | 0.23 | 0.25 | 0.45 |
| Current (2) | A | 0.85 | 1.30 | 1.10 | 1.30 | 2.20 |
| Noise (*) | dB(A) | 49 | 51 | 53 | 55 | 58 |
| Unit dimension and weight | | | | | | |
| Width (ID) | mm | 550 | 550 | 600 | 600 | 600 |
| Depth (ID) | mm | 450 | 450 | 500 | 500 | 500 |
| Height (ID) | mm | 700 | 700 | 900 | 900 | 900 |
| Weight (ID) | kg | 40 | 40 | 42 | 48 | 50 |
| Width (OD) | mm | 550 | 550 | 610 | 610 | 610 |
| Depth (OD) | mm | 550 | 550 | 610 | 610 | 610 |
| Height (OD) | mm | 600 | 600 | 630 | 630 | 630 |
| Weight(OD) | kg | 38 | 38 | 40 | 45 | 45 |

(1) Power supply is 220V/1Ph/50Hz;
(2) Power supply is 220V/1Ph/60Hz;
(3) The noise of 1 meter away from unit.

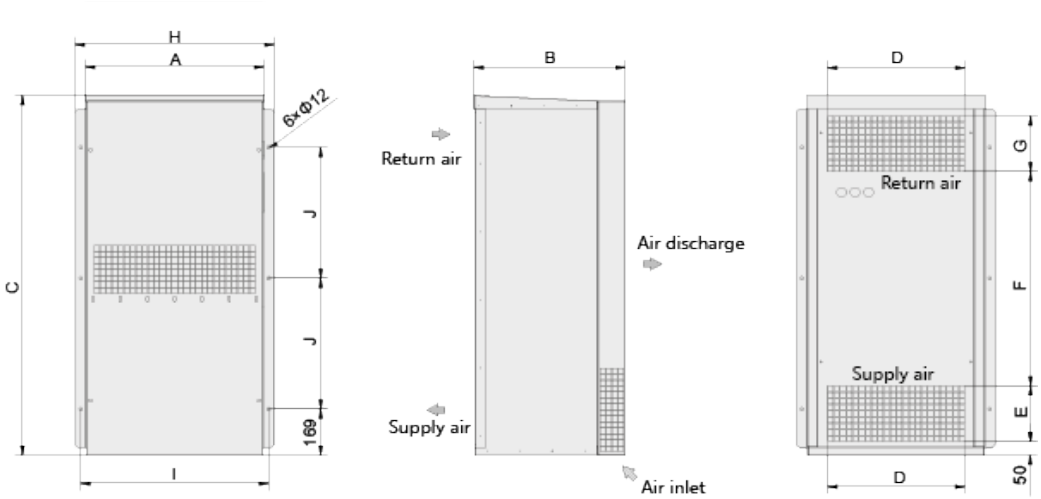
# Unit Dimension Drawings

## Indoor installed split units




| Model | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| FCB.ID.PCK.12F1 | 650 | 500 | 1100 | 500 | 70 | 570 | 730 |
| FCB.ID.PCK.18F1 | 650 | 500 | 1100 | 500 | 70 | 570 | 730 |
| FCB.ID.PCK.24F1 | 650 | 500 | 1100 | 500 | 70 | 570 | 730 |
| FCB.ID.PCK.30F2 | 750 | 600 | 1400 | 560 | 120 | 820 | 830 |
| FCB.ID.PCK.35F2 | 750 | 600 | 1400 | 560 | 120 | 820 | 830 |

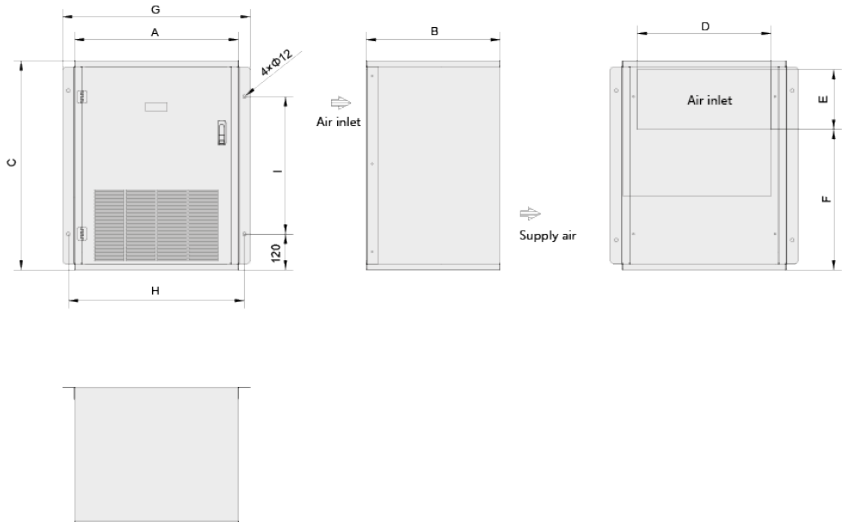
## Outdoor installed packaged units




| Model | A | B | C | D | E | F | G | H | I |
|---|---|---|---|---|---|---|---|---|---|
| FCB.OD.PCK.12F1 | 650 | 550 | 1320 | 500 | 785 | 200 | 55 | 500 | 730 |
| FCB.OD.PCK.18F1 | 650 | 550 | 1320 | 500 | 785 | 200 | 55 | 500 | 730 |
| FCB.OD.PCK.24F1 | 650 | 550 | 1320 | 500 | 785 | 200 | 55 | 500 | 730 |
| FCB.OD.PCK.30F2 | 750 | 630 | 1620 | 600 | 820 | 470 | 50 | 340 | 830 |
| FCB.OD.PCK.35F2 | 750 | 630 | 1620 | 600 | 820 | 470 | 50 | 340 | 830 |

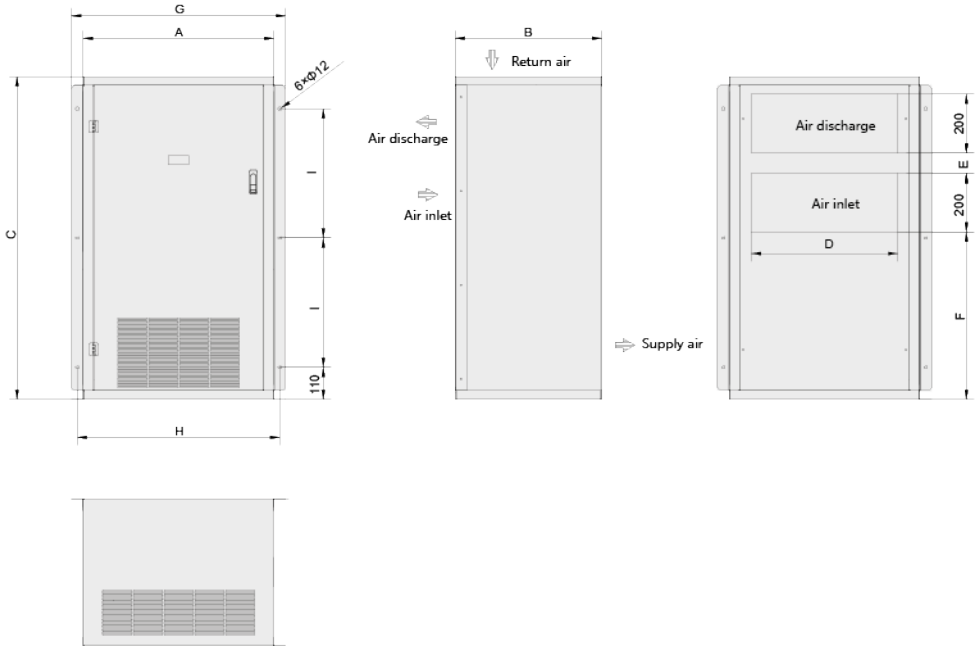

08

## Indoor installed split units




| Model | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| FCB.ID.SPL.12F1 | 550 | 450 | 700 | 450 | 200 | 470 | 630 |
| FCB.ID.SPL.18F1 | 550 | 450 | 700 | 450 | 200 | 470 | 630 |
| FCB.ID.SPL.24F1 | 600 | 500 | 900 | 500 | 310 | 560 | 680 |
| FCB.ID.SPL.30F1 | 600 | 500 | 900 | 500 | 310 | 560 | 680 |
| FCB.ID.SPL.35F1 | 600 | 500 | 900 | 500 | 310 | 560 | 680 |

## Outdoor installed packaged units




| Model | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| FCB.OD.SPL.12F1 | 550 | 550 | 600 | 420 | 225 | 630 |
| FCB.OD.SPL.18F1 | 550 | 550 | 600 | 420 | 225 | 630 |
| FCB.OD.SPL.24F1 | 610 | 610 | 630 | 480 | 255 | 690 |
| FCB.OD.SPL.30F1 | 610 | 610 | 630 | 480 | 255 | 690 |
| FCB.OD.SPL.35F1 | 610 | 610 | 630 | 480 | 255 | 690 |


09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