MULTIZONE CONTROL KIT

Installation, Operation and Maintenance Manual

Applicable models:
MCK12/24V200 · MCK48V200 · MCK12-24-48

Document: Multizone Control Kit Manual
Revision: 2026_09_05
Language: English

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1. GENERAL INFORMATION

1.1 Purpose of this manual

This manual provides the information necessary for the correct:

- installation;
- electrical connection;
- commissioning;
- operation;
- maintenance;
- troubleshooting

of the Blue-Airco Multizone Control Kit.

The manual applies to the following models:

Model	Description
MCK12/24V200	Multizone Control Kit, 12/24 VDC, including in-line fan, motorized damper, 2.4" touchscreen display, black Bticino Living bezel and 6 m cable
MCK48V200	Multizone Control Kit, 48 VDC, including in-line fan, motorized damper, 2.4" touchscreen display, black Bticino Living bezel and 6 m cable
MCK12-24-48	Multizone Control Kit, 12/24/48 VDC, including motorized damper, 2.4" touchscreen display, black Bticino Living bezel and 6 m cable

An optional 500 m^3/h centrifugal BLDC fan is available for all supply-voltage configurations.

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2. PRODUCT DESCRIPTION

The Blue-Airco Multizone Control Kit is designed to allow a portion of the air produced by a Blue-Airco air-conditioning unit to be diverted to an adjacent cabin or zone.

The system provides independent temperature control of the secondary cabin while using the air-conditioning capacity of the main unit.

The Multizone Control Kit consists of:

- 2.4" touchscreen thermostat/display;
- main electronic control PCB;
- motorized air damper (shutter);

- fan, depending on the configuration;
- 6 m display cable;
- black Bticino Living bezel.

The thermostat measures the temperature of the secondary cabin through a temperature sensor integrated into the display.

When the secondary cabin requires cooling or heating, the control system activates the motorized damper and fan, allowing conditioned air to be supplied to the secondary zone.

When the required temperature is reached, the fan stops and the damper closes.

Typical application

Primary cabin / AC unit → air duct → motorized damper → fan → secondary cabin

The amount of air supplied to the secondary cabin depends on the air-conditioning unit, ductwork, fan capacity, duct length and pressure losses.

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3. SYSTEM COMPONENTS

3.1 Main components

The Multizone Control Kit consists of the following main components:

A. 2.4" touchscreen display

The display functions as the thermostat and user interface.

It provides:

- room-temperature indication;
- temperature set-point adjustment;
- heating/cooling selection;
- fan-speed selection;
- automatic/manual fan-speed selection;
- alarm indication;
- system settings.

The temperature sensor is integrated into the display.

B. Main control PCB (Electrical Box)

The PCB manages:

- communication with the display;
- temperature-control logic;
- motorized damper (shutter);
- fan;
- fan-speed control;
- fan feedback;
- system status indication;
- alarm monitoring.

C. Motorized damper (shutter)

The motorized damper controls the flow of conditioned air toward the secondary cabin.

The damper is automatically opened when there is a heating or cooling demand and closed when the demand is satisfied.

D. Fan

The fan increases and controls the airflow supplied to the secondary cabin.

Depending on the model, the kit can be supplied with an in-line BLDC fan or used with an optional centrifugal fan.

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4. MODELS AND CONFIGURATIONS

4.1 MCK12/24V200

The MCK12/24V200 is designed for 12 VDC or 24 VDC nominal supply.

The kit includes:

- main control PCB;
- 2.4" touchscreen display;
- motorized damper;
- 48 VDC in-line BLDC fan with 12/24-48VDC transformer;
- 6 m display cable;
- black Bticino Living bezel.

4.2 MCK48V200

The MCK48V200 is designed for 48 VDC nominal supply.

The kit includes:

- main control PCB;
- 2.4" touchscreen display;
- motorized damper;
- 48 VDC in-line BLDC fan;
- 6 m display cable;
- black Bticino Living bezel.

4.3 MCK12-24-48

The MCK12-24-48 is designed for 12 VDC, 24 VDC or 48 VDC nominal supply.

The kit includes:

- main control PCB;
- 2.4" touchscreen display;
- motorized damper;
- 6 m display cable;
- black Bticino Living bezel.

The fan is not included.

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5. OPTIONAL CENTRIFUGAL FAN

A high-capacity centrifugal BLDC fan with a nominal airflow of 500 m^3/h is available as an option.

The centrifugal fan is available in:

- 12 VDC;
- 24 VDC;
- 48 VDC.

The fan must be selected according to the supply voltage of the installation.

The optional centrifugal fan can be used with all three Multizone Control Kit models.

WARNING
Always verify the fan supply voltage before connecting the fan to the Multizone Control PCB.

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6. INSTALLATION

6.1 General requirements

Installation must be performed by qualified personnel familiar with marine electrical systems and marine air-conditioning installations.

Before installation:

1. Read this manual completely.
2. Verify the Multizone model and nominal supply voltage.
3. Check all components for damage.
4. Verify that the selected fan is compatible with the system voltage.
5. Identify a suitable position for the main PCB.
6. Identify the position of the display.
7. Plan the air duct routing.
8. Ensure that all electrical connections are protected from water and condensation.

---

7. INSTALLATION OF THE DISPLAY

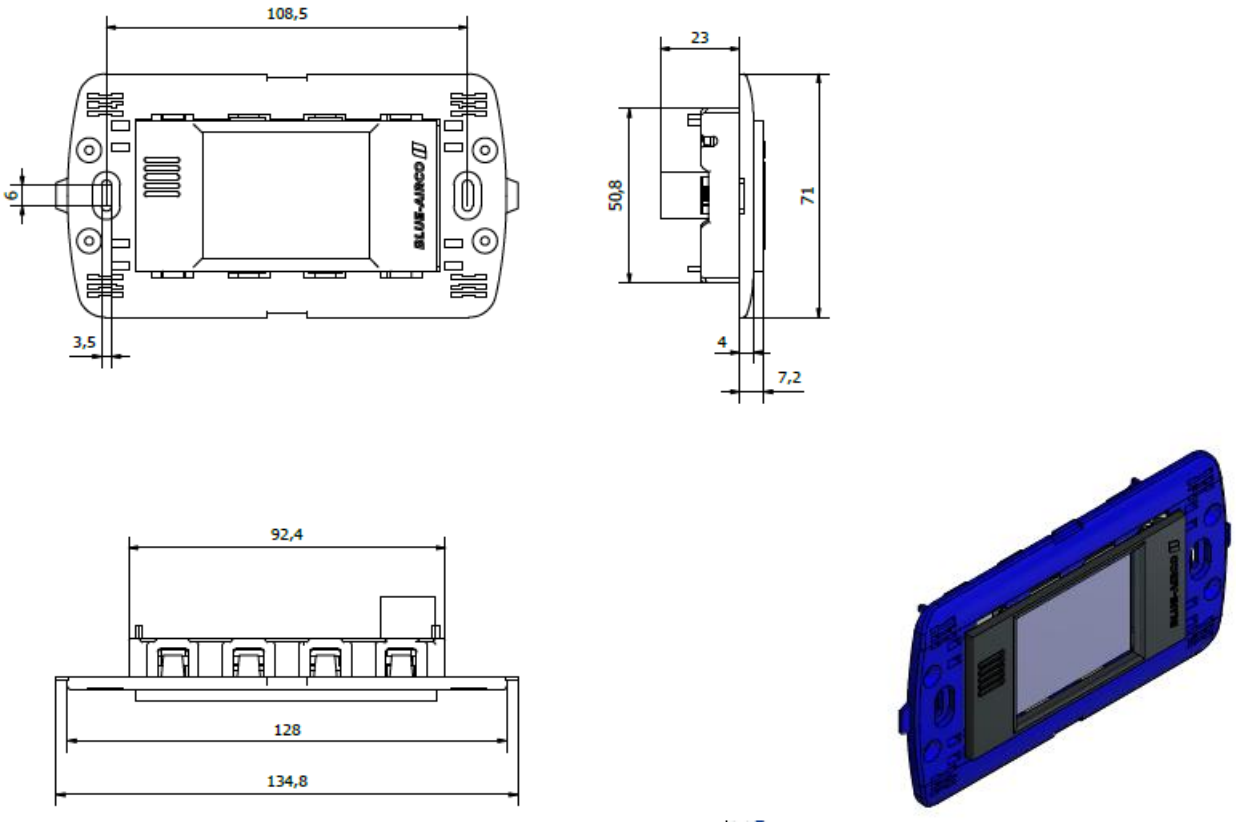
The 2.4" touchscreen display incorporates the room-temperature sensor.

For accurate temperature measurement, install the display:

- in the cabin being controlled;
- in a representative position;
- away from direct sunlight;
- away from direct airflow from the air outlet;
- away from heat sources;
- away from cold surfaces;
- at a convenient height for operation.

The display is supplied with a 6 m cable.

Display installation drawing



8. INSTALLATION OF THE ELECTRICAL BOX (MAIN PCB CONTROL DEVICE)

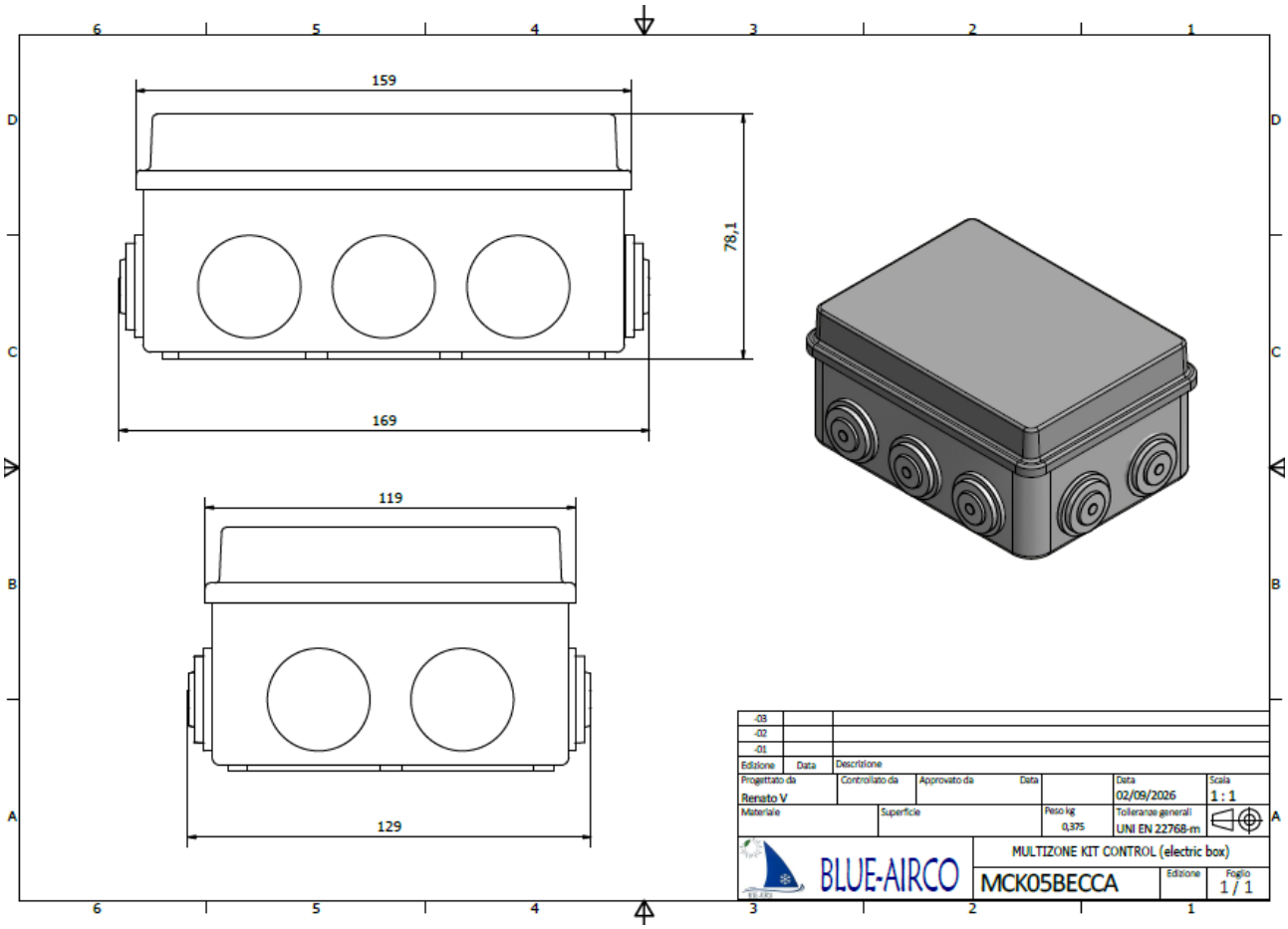
Install the box:

- dry location;
- protected location;
- ventilated location;
- accessible location for service.

The PCB must not be exposed directly to water and excessive heat.

The maximum specified ambient operating temperature of the PCB is: 50°C

Electrical Box dimensions



9. AIR DUCT AND DAMPER INSTALLATION

The motorized damper must be installed in the air duct supplying the secondary cabin.

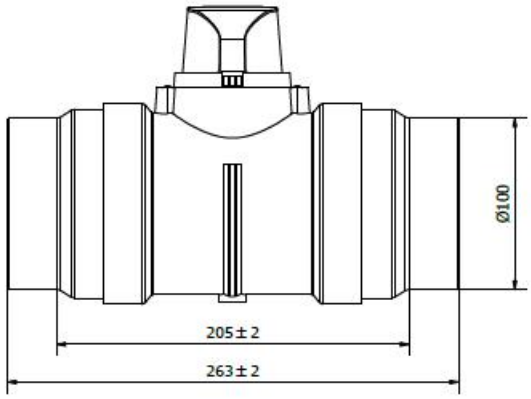
The airflow direction must correspond to the arrow or airflow indication on the fan.

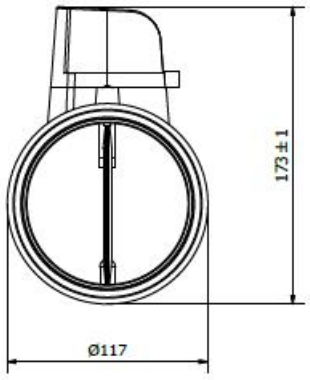
The duct should be installed to minimise:

- sharp bends;
- unnecessary restrictions;
- excessive length;
- air leakage.

The installer must ensure that the selected duct diameter and fan capacity are appropriate for the required airflow.

Damper (shutter) dimensions





10. FAN INSTALLATION

The fan must be installed according to the manufacturer's airflow direction and mounting instructions.

The fan must be securely mounted and supported to avoid:

- vibration;
- excessive noise;
- mechanical stress on the duct;
- damage to electrical connections.

Standard in-line fan

The in-line fan is included with:

- MCK12/24V200;
- MCK48V200.

Optional centrifugal fan

The optional centrifugal fan has a nominal airflow of:

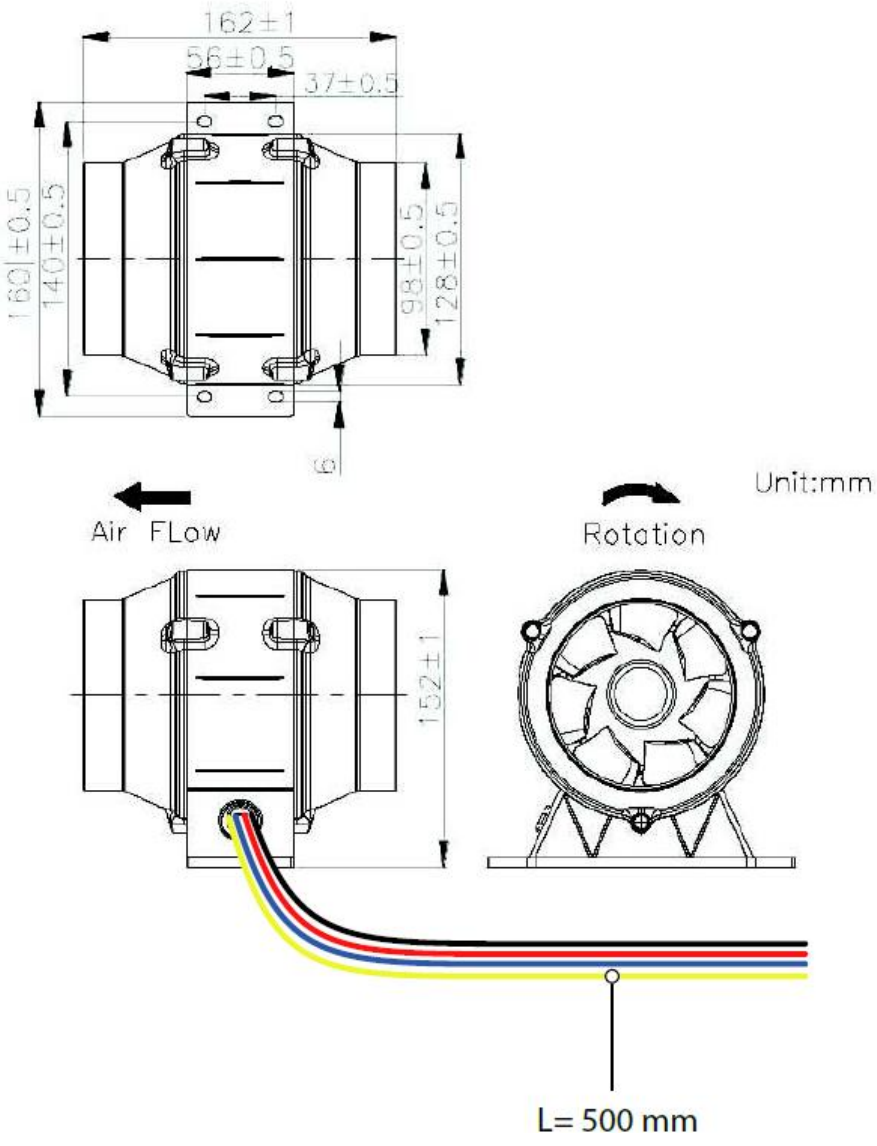
500 m³/h

and is available in:

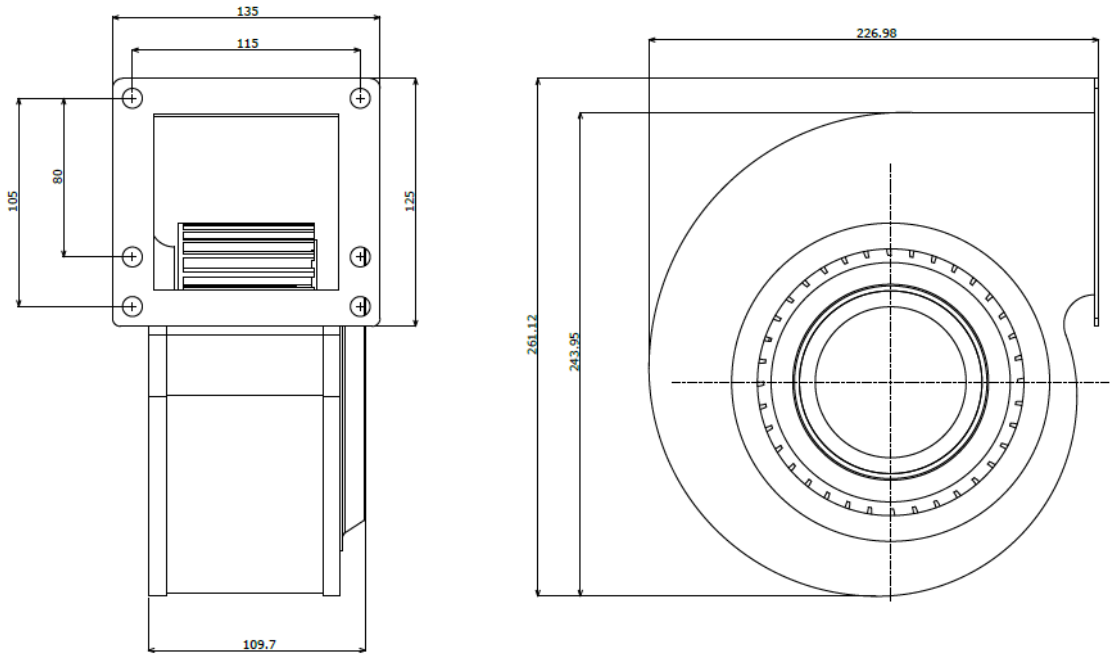
- 12 VDC;
- 24 VDC;
- 48 VDC.

Fan dimensions

IN-LINE FAN DIMENSIONS



CENTRIFUGAL FAN DIMENSIONS



11. ELECTRICAL CONNECTIONS

11.1 Power supply

The Multizone Control Kit is available in the following nominal supply voltages:

- 12 VDC
- 24 VDC
- 48 VDC

The supply voltage must correspond to the model/configuration being installed.

Model	Nominal supply
MCK12/24V200	12 / 24 VDC
MCK48V200	48 VDC
MCK12-24-48	12 / 24 / 48 VDC

WARNING
Do not connect a Multizone Control Kit to a supply voltage other than the voltage specified for the selected configuration.

12. FAN ELECTRICAL CONNECTION

The fan is connected to the main PCB using four connections:

Connection	Function
FAN +	Fan power supply positive
FAN −	Fan power supply negative
PWM	Fan speed-control signal
FG	Fan feedback signal

The fan control signal depends on the fan type.

In-line fan

The standard in-line BLDC fan uses a:

0–5 V fan speed-control signal

Optional centrifugal fan

The optional 500 m^3/h centrifugal BLDC fan uses a:

0–10 V fan speed-control signal

The FG connection provides the fan feedback signal to the control system.

13. MOTORIZED DAMPER ELECTRICAL CONNECTION

The motorized damper (shutter) is controlled directly by the main PCB.

The damper operates at:

12 VDC nominal

The damper supply is provided by the main PCB regardless of whether the main PCB is supplied with:

- 12 VDC;
- 24 VDC;
- 48 VDC.

The damper requires approximately:

6 W during opening or closing.

IMPORTANT
The motorized damper (shutter) must not be connected directly to the 24 VDC or 48 VDC system supply. It is supplied through the dedicated 12 VDC output provided by the Multizone Control PCB as shown in the wiring diagrams.

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14. DISPLAY CONNECTION

The touchscreen display is connected to the main PCB using the supplied 6 m cable.

The cable uses the same connection system as the current Blue-Airco thermostat.

Display cable

Length: 6 m

Connection: RJ11 / flat cable connection

The cable must be routed carefully and protected against:

- mechanical damage;
- water;
- excessive heat;
- interference from other electrical equipment.

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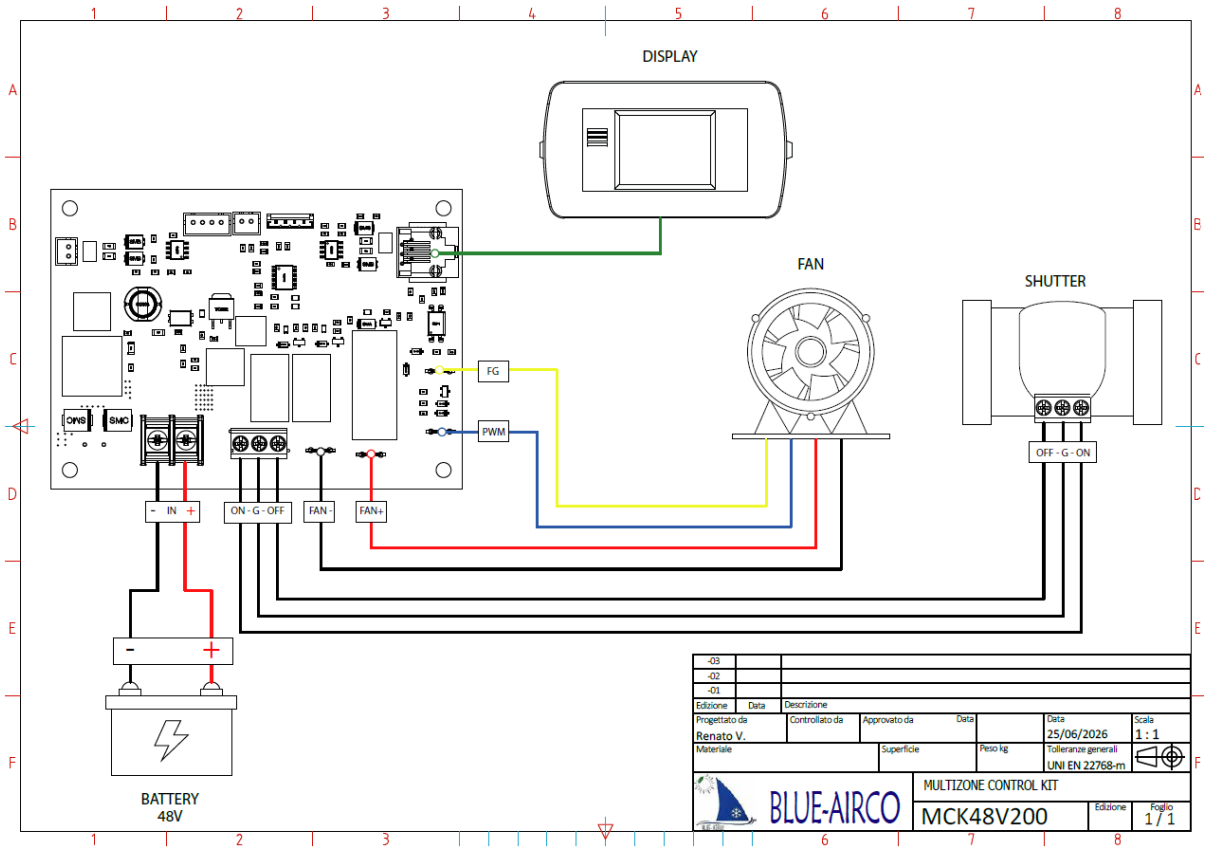
15. COMPLETE SYSTEM WIRING

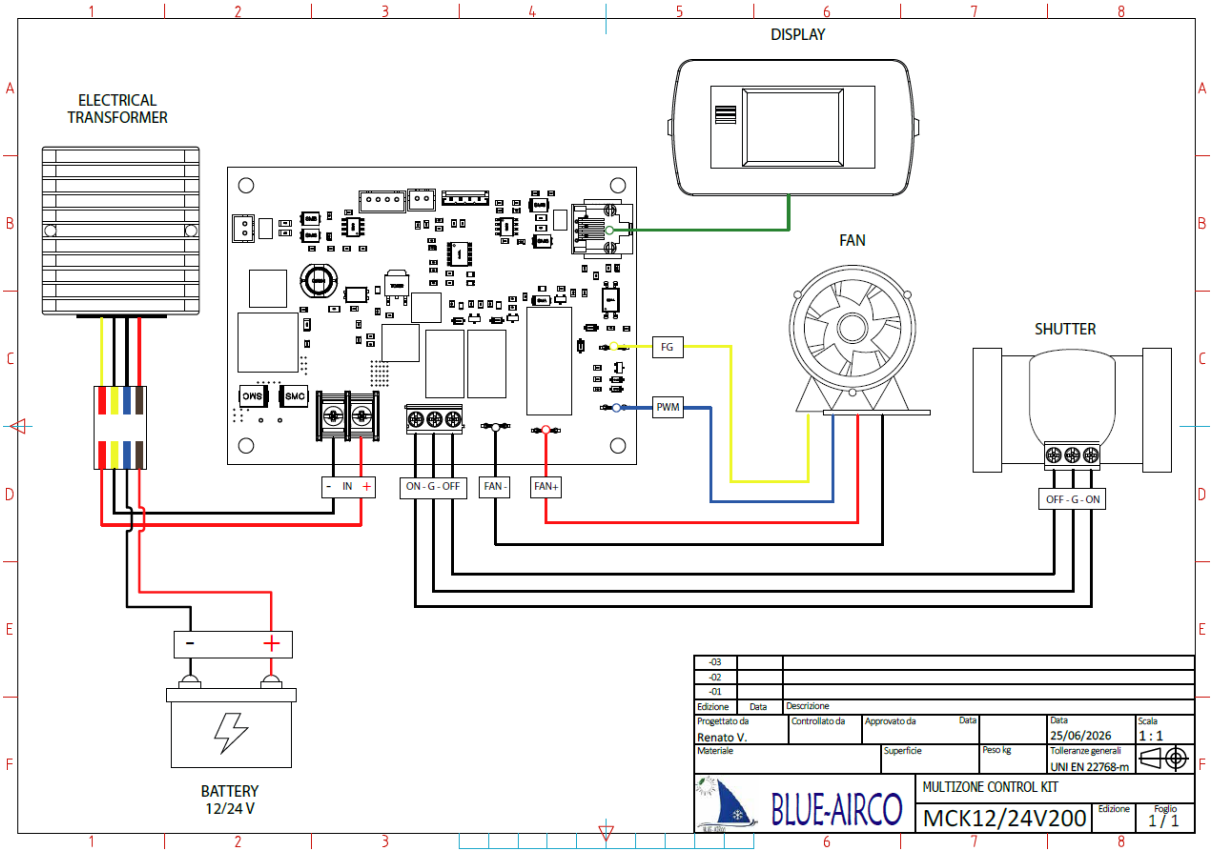
The complete wiring diagram must show:

- DC power supply;
- main PCB;
- touchscreen display;
- motorized damper;
- fan;
- fan feedback;
- fan speed-control signal.

48 VDC configuration



12-24VDC configuration



16. COMMISSIONING

After completing the installation:

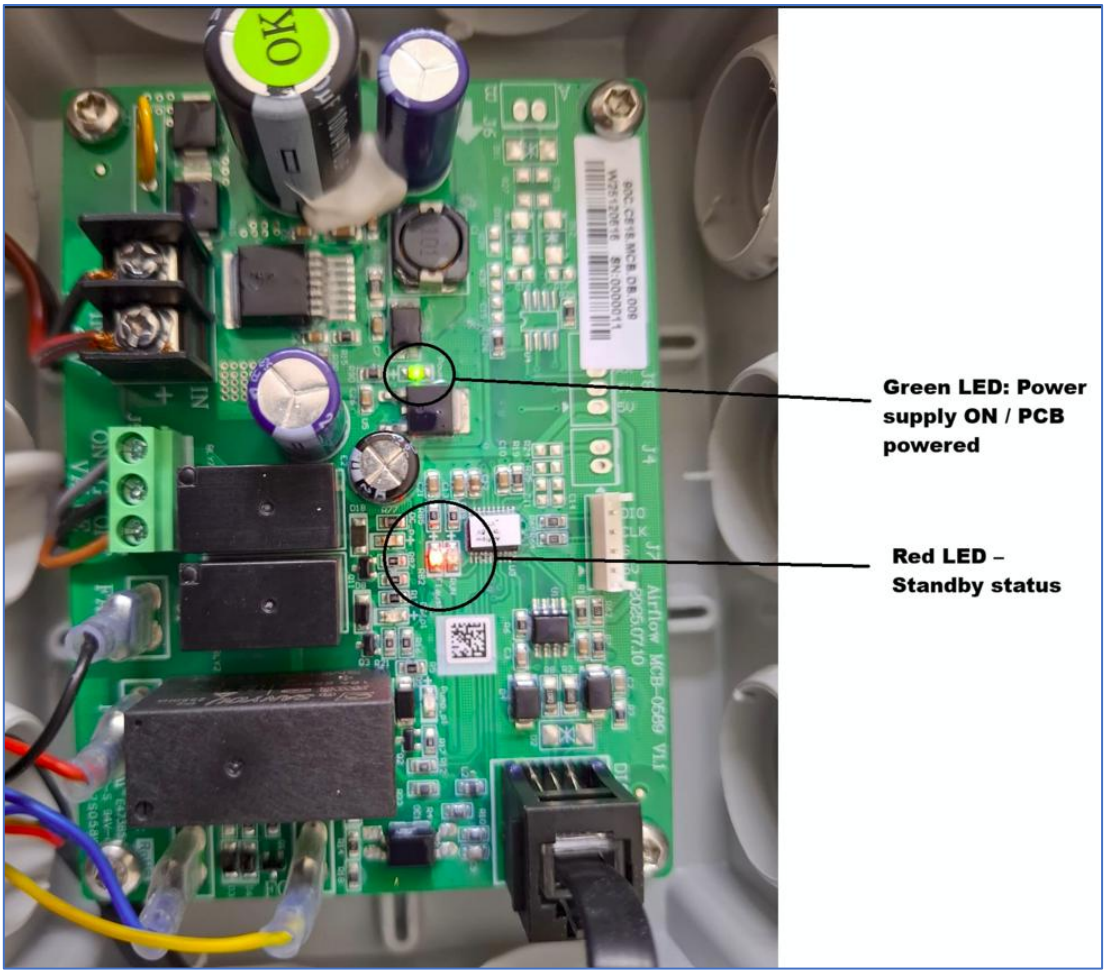
1. Verify all electrical connections.
2. Verify the supply voltage.
3. Verify fan voltage.
4. Verify that the damper is correctly connected.
5. Verify the display cable.
6. Verify that the air duct is correctly connected.
7. Switch on the power supply.
8. Check the PCB LEDs.
9. Check the display.
10. Set the required temperature.
11. Select the correct operating mode.
12. Test fan operation.
13. Test damper opening and closing.
14. Verify the temperature reading.

17. PCB STATUS LEDS

The main PCB includes status LEDs that indicate the operating condition of the system.

The LED indications are:

Status	LED indication	Meaning
OFF	No LED illuminated	Device is not powered
STDB	STDB LED blinking	Device in standby
DAMPER	Damper LED blinking	Motorized damper activation
FAN	Fan LED blinking	Fan activation



The green and red LED indicate power ON and standby status.

The damper LED indicates damper (shutter) activation during opening or closing.

The fan LED indicates fan activation.

18. DISPLAY USER INTERFACE

The Multizone Control Kit uses a 2.4" touchscreen display.

The display provides access to the main operating functions.

Display information

The main screen can provide information regarding:

- actual cabin temperature;
- temperature set point;
- operating mode;
- fan speed;
- fan operating status;
- system status;
- alarms.

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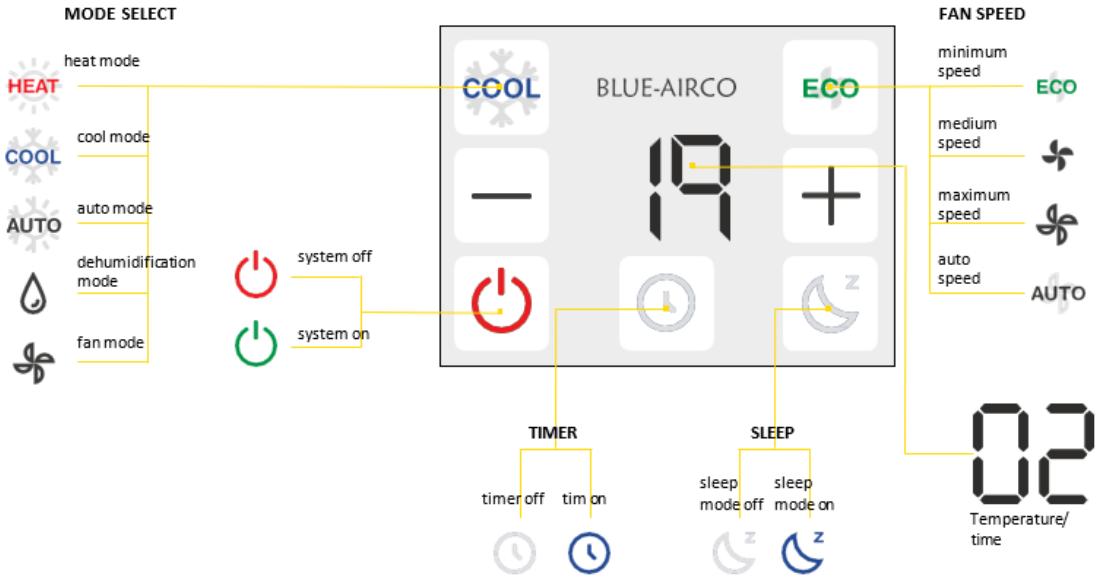
19. DISPLAY PICTOGRAMS

The manual shall include an annotated photograph of the display showing the meaning of each pictogram.



Recommended identification:

Pictogram	Function
Temperature	Current cabin temperature
Set point	Desired temperature
Cooling	Cooling mode
Heating	Heating mode
Fan	Fan status
Auto	Automatic fan speed
Low	Low fan speed (ECO)
Medium	Medium fan speed
High	High fan speed
Alarm	Alarm indication
°C / °F	Temperature unit

20. OPERATING MODES

The Multizone Control Kit provides:

- Cooling mode;
- Heating mode.

20.1 Cooling mode

In cooling mode, the system activates the fan and opens the damper when the cabin temperature exceeds the selected set point by at least 1°C.

When the temperature reaches the set point:

- the fan stops;
- the damper closes.

Example

Set point: 24°C

Fan/damper activation:

≥ 25°C

Fan/damper stop:

24°C

20.2 HEATING MODE

In heating mode, the system activates the fan and opens the damper when the cabin temperature falls below the selected set point by at least 1°C.

When the temperature reaches the set point:

- the fan stops;
- the damper closes.

Example

Set point: 20°C

Fan/damper activation:

≤ 19°C

Fan/damper stop:

20°C

21. SYNCHRONISATION WITH THE AIR-CONDITIONING UNIT

The operating mode selected on the Multizone Control Kit must always correspond to the operating mode of the main air-conditioning unit.

Main air-conditioning unit	Multizone Control
Cooling	Cooling
Heating	Heating

For correct operation, it is recommended to operate the main air-conditioning unit in either Cooling or Heating mode.

The use of the full Automatic mode on the main air-conditioning unit is not recommended when using the Multizone Control Kit.

22. FAN SPEED CONTROL

The fan can be operated in:

- Manual mode;
- Automatic mode.

22.1 Manual mode

The user can select:

- LOW
- MEDIUM
- HIGH

22.2. AUTOMATIC FAN SPEED

In automatic mode, the fan speed is automatically adjusted according to the difference between the actual cabin temperature and the selected set point.

Temperature difference	Fan speed
> 3°C	HIGH
1–3°C	MEDIUM
< 1°C	LOW

The same control principle is applied in both cooling and heating modes.

The system therefore increases the airflow when the cabin temperature is further from the desired set point and reduces the airflow as the set point is approached.

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23. USER SETTINGS

The Multizone Control Kit provides the following user settings.

23.1 Temperature unit

The user can select:

- °C;
- °F.

23.2 Temperature offset

A temperature offset can be configured to compensate for differences between the temperature measured by the display and the actual cabin temperature.

23.3 Backlight

The display backlight duration can be adjusted according to the available settings.

23.4 Night mode

Night mode reduces the display illumination and is intended for nighttime use.

23.5 Buzzer

The audible buzzer can be enabled or disabled according to the available setting.

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24. ALARMS

The Multizone Control Kit monitors the main system functions and communication between the display and main PCB.

The system can generate alarms in case of:

Sensor failure

The temperature sensor integrated into the display is not operating correctly.

Fan failure E4

The system detects a fan operating fault through the fan control/feedback system.

Communication failure

Communication between the touchscreen display and the main PCB has been interrupted.

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25. TROUBLESHOOTING

Problem	Possible cause	Recommended action
Display is OFF	No power supply	Check DC power supply and PCB connections
No LED on PCB	PCB not powered	Check power supply and wiring
Display operates but fan does not start	No temperature demand	Check set point and cabin temperature
Fan does not start when there is demand	Fan connection/fan fault	Check FAN +, FAN −, PWM and FG
Damper does not open	Damper connection/fault	Check damper wiring
Fan operates but airflow is insufficient	Duct restriction	Check ductwork and fan selection
Incorrect temperature reading	Display position/offset	Check display location and temperature offset
Communication alarm	Display cable/connection	Check cable and connectors on both sides
Fan failure alarm	Fan or feedback problem	Check fan and FG connection

Problem	Possible cause	Recommended action
System operates in wrong direction	Incorrect operating mode	Check that Multizone and main AC modes correspond

26. MAINTENANCE

The Multizone Control Kit requires limited routine maintenance.

Periodically inspect:

- touchscreen display;
- display cable;
- PCB;
- electrical connectors;
- fan;
- motorized damper;
- air duct;
- air filters, where installed.

Check that:

- the fan operates smoothly;
- the damper opens and closes correctly;
- there are no unusual vibrations or noises;
- electrical connections remain secure;
- the PCB remains dry and free from contamination.

WARNING
Always disconnect the DC power supply before carrying out maintenance on the PCB, fan, damper or electrical connections.

27. TECHNICAL SPECIFICATIONS

Specification	MCK12/24V200	MCK48V200	MCK12-24-48
Nominal supply	12/24 VDC	48 VDC	12/24/48 VDC

Specification	MCK12/24V200	MCK48V200	MCK12-24-48
Display	2.4" touchscreen	2.4" touchscreen	2.4" touchscreen
Display cable	6 m	6 m	6 m
Bezel	Black Bticino Living	Black Bticino Living	Black Bticino Living
Motorized damper	Included	Included	Included
Damper voltage	12 VDC	12 VDC	12 VDC
Damper power	6 W during opening/closing	6 W during opening/closing	6 W during opening/closing
Standard fan	In-line BLDC	In-line BLDC	Not included
Maximum in-line fan power	24 W	22 W	0
PCB operating temperature	≤50°C	≤50°C	≤50°C

28. SAFETY WARNINGS

ELECTRICAL HAZARD
Disconnect the power supply before installing or servicing the Multizone Control Kit.

SUPPLY VOLTAGE
Always verify the nominal supply voltage before connecting the system.

FAN VOLTAGE
The fan supply voltage must correspond to the fan model

MOTORIZED DAMPER
The damper operates at 12 VDC and is supplied by the Multizone Control PCB. Do not connect the damper directly to a 24 VDC or 48 VDC supply.

WATER PROTECTION
Protect the PCB and all electrical connections from water, seawater and condensation.

OPERATING MODE
The Multizone Control Kit and the main air-conditioning unit must operate in the same heating/cooling mode.

INSTALLATION
Installation and electrical connections must be performed by qualified personnel.

29. WARRANTY AND SERVICE

The Multizone Control Kit is covered by the Blue-Airco warranty conditions applicable at the time of purchase.

For technical assistance, replacement parts or warranty service, contact:

Blue-Airco Srl

Via Scaruglia 1-2
16040 San Colombano Certenoli GE
Italy
www.blue-airco.com

info@blue-airco.com

29.1 Warranty

Warranty period

Blue-Airco warrants the Multizone Control Kit against defects in materials and workmanship for a period of **two (2) years from the date of purchase**.

The warranty covers the repair or replacement, at Blue-Airco's discretion, of components found to be defective due to manufacturing or material defects under normal and proper conditions of use.

Warranty limitations

The warranty does not cover failures, damage or defects resulting from:

- incorrect or improper installation;
- installation that does not comply with the instructions provided in this manual;
- incorrect electrical connection or use of an unsuitable supply voltage;
- improper use, misuse or use outside the intended application;
- accidental damage or mechanical damage;
- water, seawater, flooding or excessive exposure to moisture;
- condensation or corrosion resulting from improper installation or environmental conditions;
- modifications or alterations to the product without prior authorization from Blue-Airco;
- use of components or accessories not approved or supplied by Blue-Airco where such use causes or contributes to the failure;
- inadequate maintenance;
- normal wear and tear;

- damage caused by external equipment or systems.

The warranty does not cover damage resulting from failure to follow the installation, operating and maintenance instructions contained in this manual.

Warranty claims

For warranty assistance, the customer should contact Blue-Airco and provide:

- product model;
- serial number, where available;
- date of purchase;
- description of the problem;
- photographs or other information requested by Blue-Airco.

Blue-Airco reserves the right to inspect the product or request the product to be returned for evaluation before approving a warranty claim.

Any repair or replacement carried out under warranty does not restart or extend the original warranty period, unless otherwise required by applicable law.

IMPORTANT: The warranty conditions stated above are subject to the applicable terms and conditions of sale and to mandatory provisions of the law applicable to the sale of the product.