

Cube O

TECHNICAL DOCUMENTATION
USER'S AND INSTALLATION MANUAL



Thank you for purchasing Cube O unit.

This manual was published by FLOWAIR Sp. z o. o. User's and installation manual is a set of recommendations and tips designed to show procedures, methods and remarks for proper installation, launch and operation of the unit.



The manufacturer reserves the right to correct and change the user's manual anytime without notice, so as changes in the devices not influencing its operation.

The manual is an integral part of the device and must be delivered with it to the customer. Before installation, launch and operation of Cube O device, the customer should read thoroughly this manual, especially with security section to eliminate risk of harm to the health or damage to material property. All guidelines mentioned in the manual should be applied without omitting any point. Failure to adhere to the following points may result in life-threatening due to improper transport and installation and can lead to damages to the unit or its improper operation. The manufacturer shall not be liable for deficiencies during installation and unit improper operation due to failure to comply with this manual. Meanwhile, the producer's warranty will not be applied in case of gross negligence or not complying with this manual.



You should consult the service or manufacturer if this manual contains incomprehensible or ambiguous descriptions.



It should be ensured that all users of unit are complied with this manual before launching it. In case of unit's transfer to another user, this manual must also be transferred.



All activities during connecting to electrical installation must be conducted by qualified staff, having necessary attestations and certificates to work with voltage devices according to the laws of the country.

This manual is only intended to use for persons using or installing the Cube O devices. Its content is legally protected and must not be copied, translated or processed (including electronic media) in total or partially without the manufacturer's written declaration of consent.

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TECHNICAL DOCUMENTATION:

EN

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1. IMPORTANT INFORMATION

This manual contains important information about preventing possible accidents and damage to Cube O units during operation. Special care should be taken during all actions with the unit and obey to this manual and all technical data. FLOWAIR shall not be responsible for any omissions and damages caused by them.

In the manual you will find warnings and important tip marked as below:



- Threat of loss of life or health or permanent damage to the unit.



- Risk of electric shock.



- Warnings regarding unauthorized use of Cube O devices. Unsafe practices, the occurrence of which may result in property damage or minor personal injury.



- Advice and information on how to use Cube devices.

SAFETY INFORMATION:



- It is prohibited to use Cube units for industrial vacuum caused by renovations or other construction works when dust, harsh or explosive compounds are emitted.
- The device is dedicated to work with air with a maximum dust content of $0,3 \text{ g/m}^3$.
- The appliance presents a risk of injury from rotating parts.
- The appliance presents a risk of injury from sharp edges and considerable weight.
- The appliance presents a risk of injury from high and low temperature elements.
- The appliance presents a risk of injury from burns from high-temperature exhaust fumes.



- Prior to start operations it is essential to switch off the unit with main switch.
- Prior to open casing it is essential to assure that electricity is disconnected and secured against accidental switching on by other persons.
- Electrical equipment should be connected to a fixed electrical installation equipped with means for disconnection from the power source, having contact gaps in all poles, ensuring full disconnection in overvoltage category III conditions.

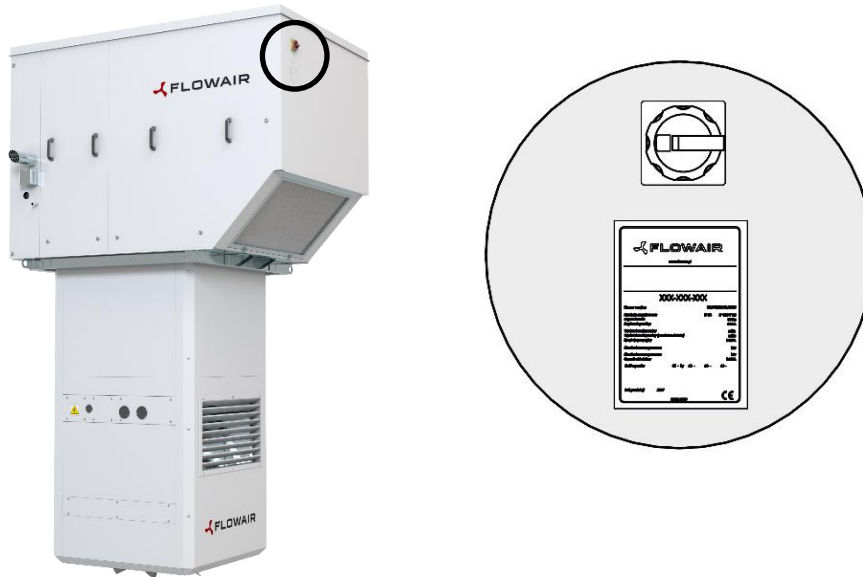


- Cube O units must not be used by children or adults with reduced mobility, or limited mental abilities.
- Cube O units must not be used by non-trained users or who are not familiar with this manual.
- Cube O unit must be used in accordance with its intended use.
- All installation or service works must be done by qualified staff with proper attestations for electricity.
- Staff should wear suitable protective equipment (helmet, glasses, gloves, etc.).
- During unit operation, some of its parts heat up over 60°C . Precautions shall be taken. Even after switching off the unit, high temperature may persist which can lead to skin burns.
- Do not touch water exchanger.
- Do not touch electric heaters with skin under any circumstances.
- In order to comply with CE regulations, only original spare parts accepted by the manufacturer can be used.
- After service works make sure that doors are closed.

- Before unit is launched make sure that all fans and moving parts won't be interfered by any external factors.

NAMEPLATE

Each Cube O unit is equipped with a nameplate glued under the main switch (the roof section) or near the automation cabinet (in ceiling mounted configurations), as shown in the figure below:



The nameplate contains basic product information such as unit's code allowing to determine configuration, serial number, parameters and basic electrical and air flow parameters.

2. GENERAL INFORMATION

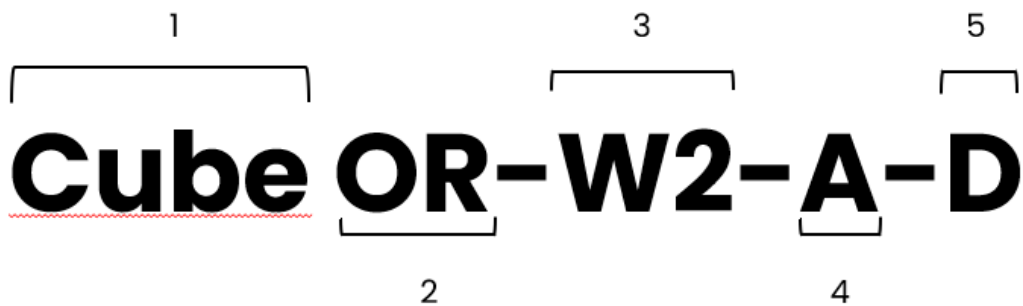
2.1. Cube O application

The Cube O devices, due to their modular construction, can be equipped with all the necessary systems for heating, cooling, and single-direction ventilation of rooms. Depending on the type and size of the Cube O device, it can be applied in the following facilities:

- large industrial buildings.: production or storage halls, printeries, logistic centers,
- commercial buildings (shopping malls, supermarkets, petrol stations, car showrooms),
- public buildings such as: cinemas, theatres, gyms.

2.2. Device configuration

Cube O units can be additionally equipped with a heater or cooler to increase or cool down the air temperature at the outlet. There is water heater, electric and gas modulating heater or water cooler. Unit's size, together with types and optional equipment creates range described according to chart below:



1	Type	
	Model	
2	OR	Recirculation device
	ON	Supply device
	ORK	Recirculation device with roof section
	ORK	Supply device with roof section
	ORNK	Recirculation and supply unit with roof section
3	Source of heat / cold	
	N	No heater/cooler
	W ₂	2-row water heater
	W ₃	3-row water heater
	C ₂	2-row water cooler-heater
	C ₃	3-row water cooler-heater
	G[xx]	Gas heater [nominal heating power in kW]
E[xx]	Electric heater [nominal heating power in kW]	
4	Fan type	
	A	EC axial fan
	2A	2x EC axial fan
	P ₁	EC radial fan size 1
	P ₂	EC radial fan size 2
	P ₃	EC radial fan size 3
	P ₄	EC radial fan size 4
5	Supply module	
	D	Swirl diffuser with actuator
	V[x]	Ventilation ducts connections [number of duct connections]
	J[x]	Long range nozzles [number of air nozzles]



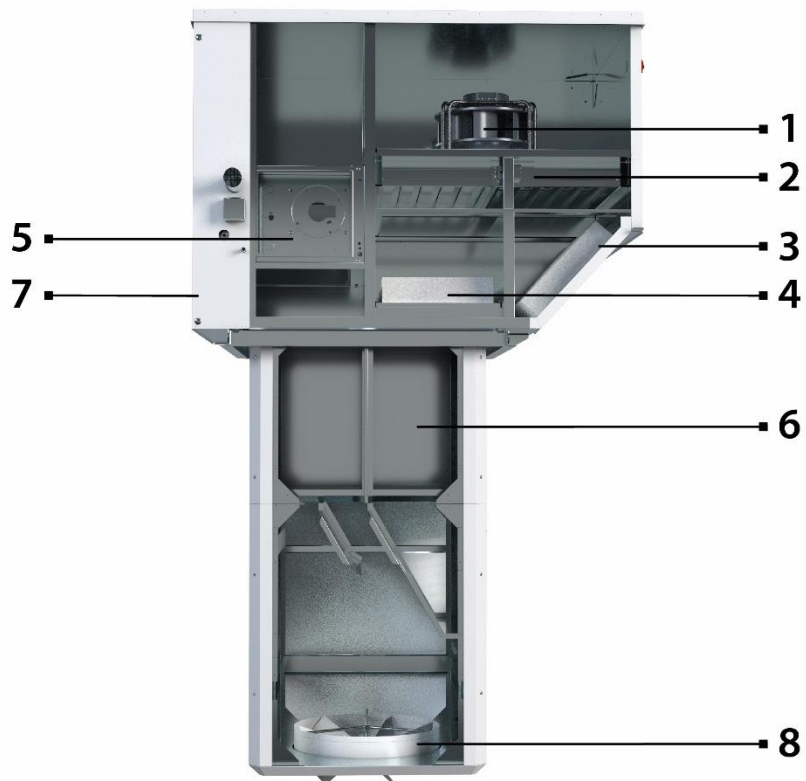
Full unit's configuration is set on ordering process, leaded by our Sales Department or Project Support Department consultations.

2.3. General characteristics construction Cube O



1. K-Roof section (ORK, ONK, ORNK)
2. Axial fan section (A, 2A)
3. Water cooler section (C2, C3)
4. Radial fan section (P1, P2, P3, P4)
5. Electric heater section (E)
6. Water heater section (W2, W3)
7. Supply module (D, V, J)

2.4. General characteristics construction of the Cube ORNK configuration with the roof section



1. EC radial fan
2. Recirculation damper
3. Fresh air filter
4. Recirculation air filter
5. Gas heater (Cube O – G)
6. Acoustic silencers
7. Housing with insulation

8. Possible supply module configurations
 D - swirl diffuser with actuator
 V - ventilation ducts connections
 3J - long range nozzles

2.5. General characteristics construction of the Cube OR

1. EC axial fan
2. Water heater
3. Housing with insulation
4. Possible supply module configurations
 D - swirl diffuser with actuator
 V - ventilation ducts connections



3. TECHNICAL DATA

3.1. Technical parameters

Options

Model		OR	ON	ORNK	ONK	ORK
Nominal air flow	m ³ /h	12 000	12 000	12 000	12 000	12 000
Water heater	[-]	available	available	available	available	available
Water cooler	[-]	available	available	available	available	available
Electric heater	[-]	on request	on request	on request	on request	on request
Gas heater	[-]			available	available	available
Filters	[-]	Coarse 80% (~G4) / ePM2,5 65% (~F7) / ePM10 50% (~M5)				

Construction data

Construction

Thermal insulation class	-	Mo
Casing / middle panel color	-	RAL 7035
Casing	-	insulated panels with 50 mm mineral wool
Main frame	-	steel, integrated
Weight	kg	>60 <460

Electrical data

Electrical data

Max. power consumption	kW	on request
Max. current consumption	A	on request
Power supply	V/Hz	3x400/50

Optional data

Water heater (Cube W)

Type of exchanger	-	2-row / 3-row
Nominal heating power ⁽¹⁾	kW	14,0 – 68.3 / 16,8 – 100,8

Connection	"	G 1" external
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Water cooler (Cube C)

Type of exchanger	-	2-row / 3-row
Nominal cooling power ⁽²⁾	kW	10,0 – 22,7 / 14,4 – 33,4
Connection	"	G 1" external

Electric heater (Cube E)

Nominal heating power	kW	on request
Heating degrees	-	on request

Gas heater technical data ⁽³⁾

		Gm20	Gm34	Gm45	Gm65
Nominal heating power	kW	18,2	33,6	40,5	62,9
Gas consumption (G20)	m ³ /h	2,01	3,69	4,44	6,88
Flue gas exhaust system	-	integrated			
Gas connection	"	GZ 3/4"	GZ 3/4"	GZ 3/4"	GZ 3/4"
Minimum air flow	m ³ /h	3000	3500	4200	6500

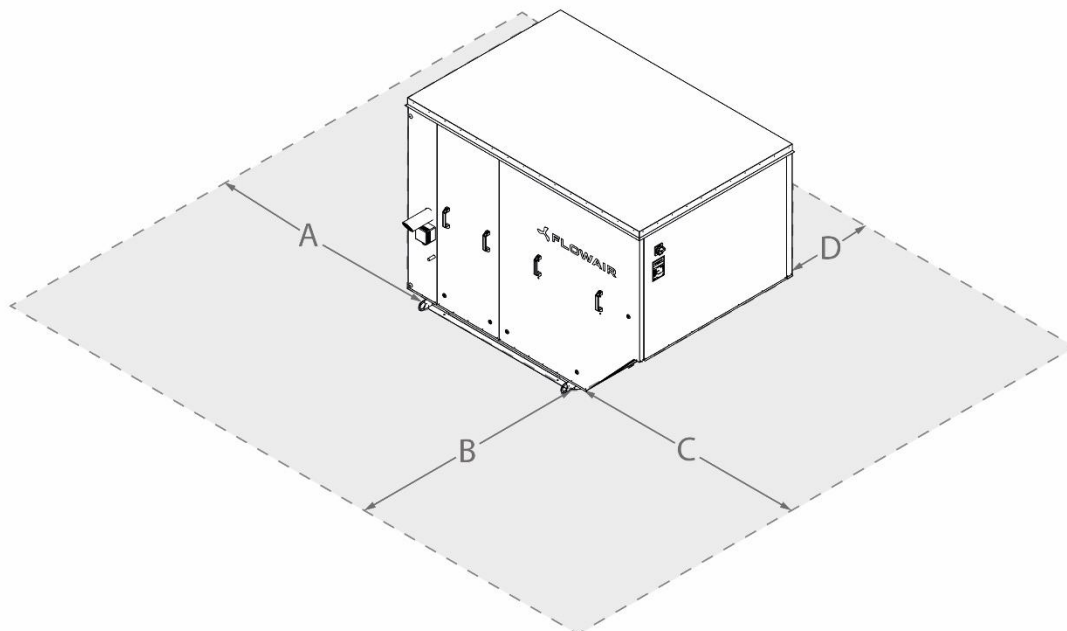
- (1) heating factor's temperature 70/50°C and inlet air temperature 8°C
- (2) cooler factor's temperature 7/12°C and inlet air temperature 26°C / 50%
- (3) data refer to G20 gas supply

3.2. Service distances K-roof section

In the configuration with the roof section, it is important to pay special attention to maintaining a greater distance on the inspection side, as shown in the diagram below.



- The dimensions given are only minimal ones, necessary for any service works and do not reflect the distance between unit's inlet and outlet and buildings determined by law regulation in certain country..
- If the device is installed on a flat roof (<5%) at a height of more than 50 cm, safe service access to the device must be ensured through the use of a service platform.
- Make sure there is easy service access to the connection stub.



Minimal required service distance		
A		min. 0,5 m
B		min. 1,5 m
C		min. 0,5 m

4. TRANSPORT

The K-roof section has been designed for transport with an integrated frame that allows for lifting the unit using a forklift. Additionally, K-roof section and room section are equipped with transport handles for lifting with ropes.

Please follow below regulations during transport:

- Before unloading the transport, complete the handover protocol.
- Please check parcel completion and unit state immediately after delivery (T-box - option, three-way valve with actuator – option, room temperature sensor). In case of any irregularities a damage protocol should be written down. This can help claiming indemnities from shipping company later.
- Unloading should be done with forklift (using frame handles or palette where unit is mounted) or a lift (using handles on unit's casing).
- During transport or storage, the unit must stand on integrated frame or palette where unit is mounted. Leaving unit in different way may lead to its damage.
- After unloading, during waiting for installation, a cover protecting from external factors must be used.



The manufacturer is not responsible for damages caused by not following the guidelines written in the manual or for transport irregularities.

4.1. Horizontal transport

The Cube O devices are prepared for transport using a forklift. The integrated frame of the K-roof section or the pallet on which the room section is mounted allows for easy transportation with a forklift.



Because of unit's weight and front-end center of gravity, the size of the forklift and length of truck forks must be adapted to unit's dimension. Pay special attention to the length of truck forks. Shorter truck forks application may result in damage to the unit or accident what the manufacturer is not responsible for.

4.2. Lifting information

When lifting the Cube O, follow these rules:

- Make sure that the ropes are properly attached to all holders,
- Make sure that the device is level during lifting,
- Be especially careful when removing from the truck, so as not to damage the device by hitting the trailer elements,
- Be careful not to hit the device with any other objects,
- Do not lift the device at excessive speed,
- Do not change direction abruptly,

- Be especially careful when setting the device on a structural frame or a roof base.



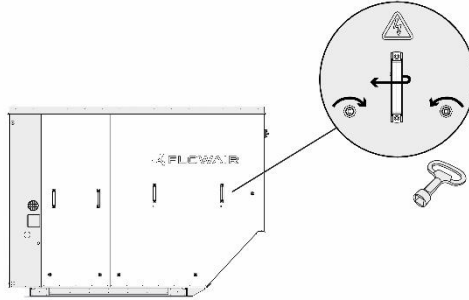
Do not stand under the device during lifting.



- The manufacturer is not responsible for damages caused by not following the guidelines written in the manual or for transport irregularities.
- Before lifting, check that the locks on all service panels are closed and verify by pulling the handles.



Before placing the K-roof section on the room section, unscrew the transport lugs.

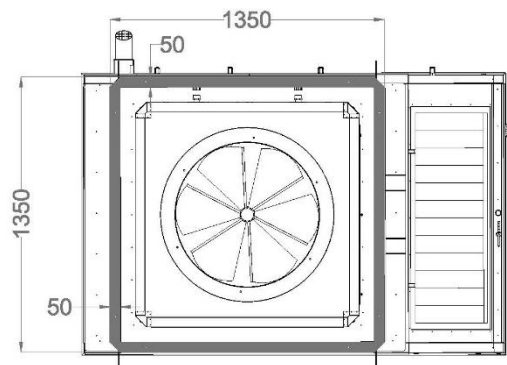
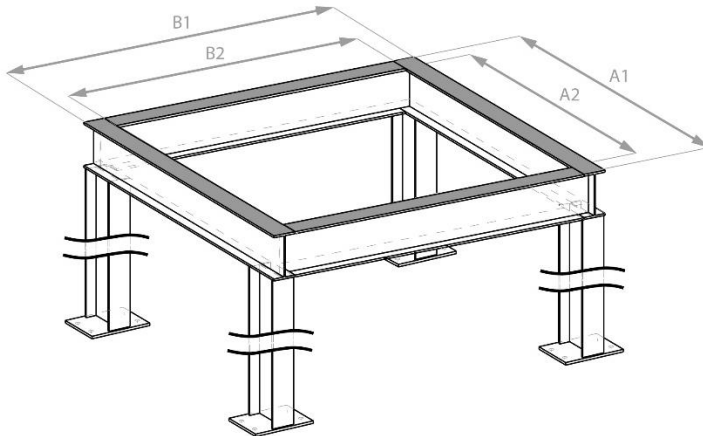


5. FOUNDATION

5.1. Foundation Cube O unit

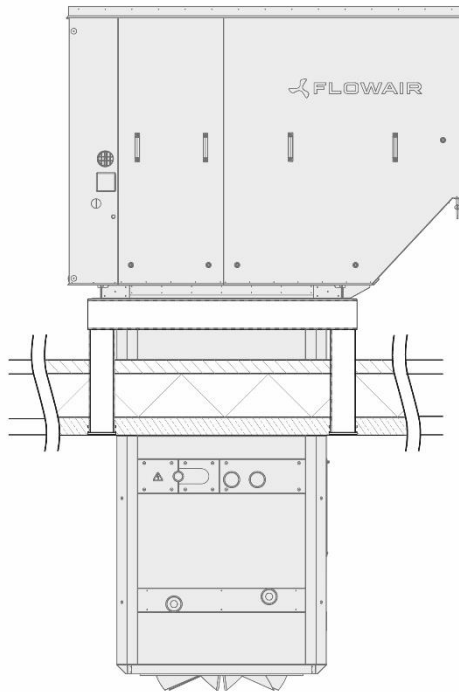
Cube O units are built on self-supporting frame, which should be installed on brackets or frames connected to the roof, according to construction law in specific country and must be ousted from roof slope to a height determined by this law. The manufacturer determines unit's installation on the unit's contour in accordance with frame dimensions listed below. The manufacturer allow installing on a supported frame on two longer sides of unit's frame.

K-roof section



A1 [mm]	max. 1400 *
A2 [mm]	min. 1200
B1 [mm]	max. 1400 *
B2 [mm]	min. 1200

demonstrative solution



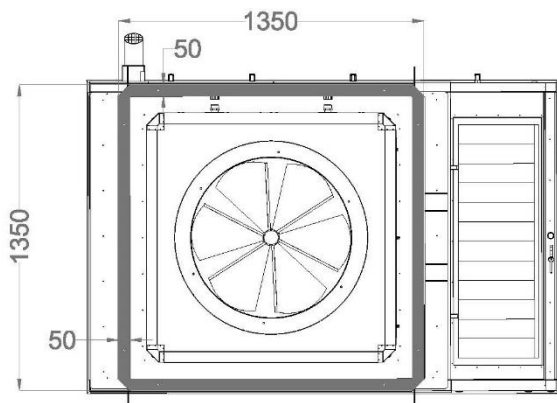
- Unit should be mounted to a frame in such way to ensure no move of unit. Using rubber pads between unit and frame is highly advisable.
- Install unit in such way that inlet is not directed to windward.
- The manufacturer allows installation on a frame with support on the two long sides of the unit's frame.
- The K-roof section is attached to the base using the assembly screws provided in the kit.

5.2. Roof crossing (Cube O wit K-roof section)

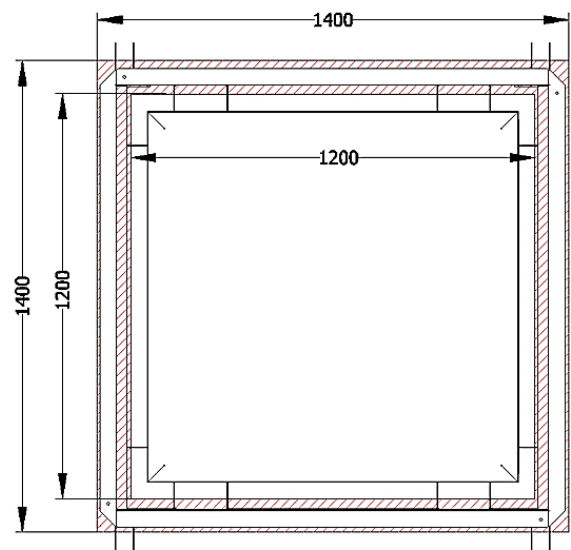
For the Cube O with the K-roof section, as additional accessories there is a base that serves as a roof transition and an adapter for the room section. The base supporting frame, under which the substructures shown in the drawing [1] should be designed.

A hole in the roof should be made in order to mount the roof base duct with the room section. The hole should be made in accordance with the guidelines contained in the figures [2], [3].

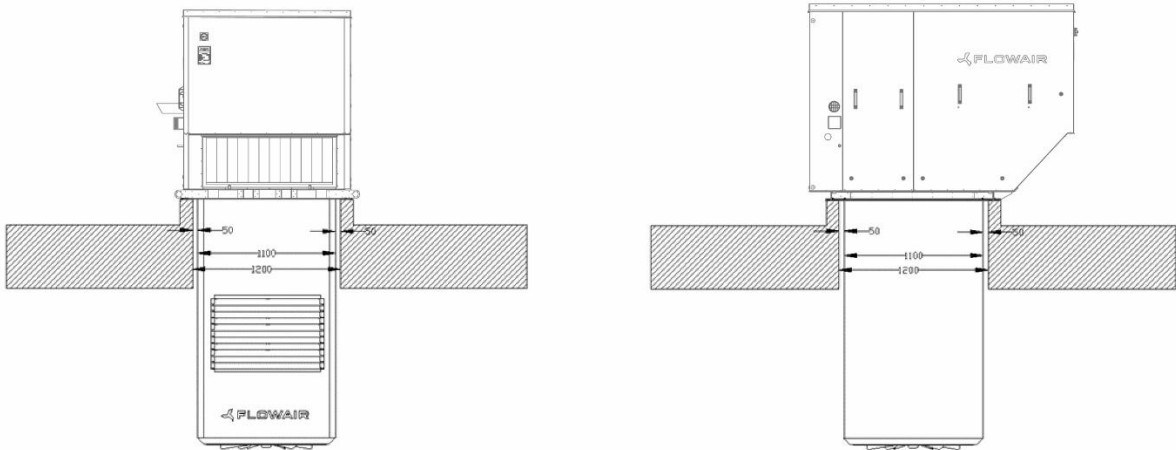
1.



2.



3.

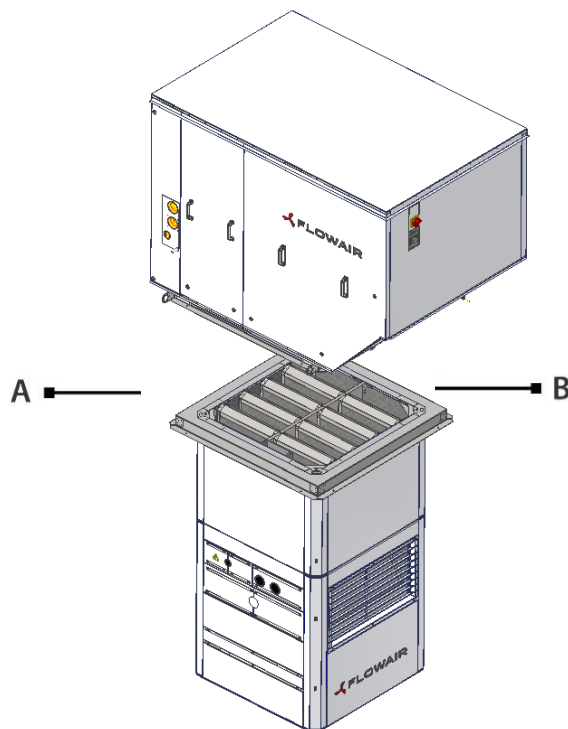


- Device should be attached to the frame in a way that prevents any movement. It is recommended to use rubber spacers between the device and the mounting frame.
- Install unit in such way that inlet is not directed to windward.

5.3. Cube O with K-roof section installation

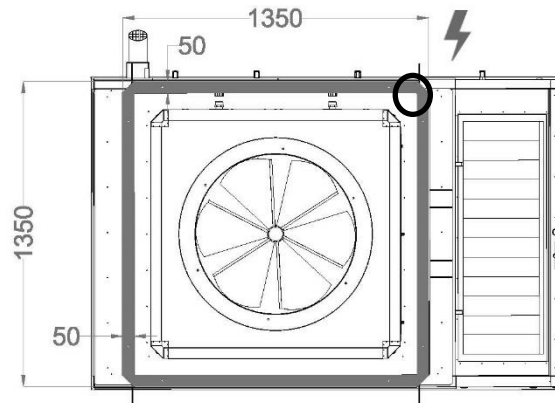
During the foundation, pay attention to the correct assembly in relation to the ducts.

A	Supply channel
B	Exhaust channel



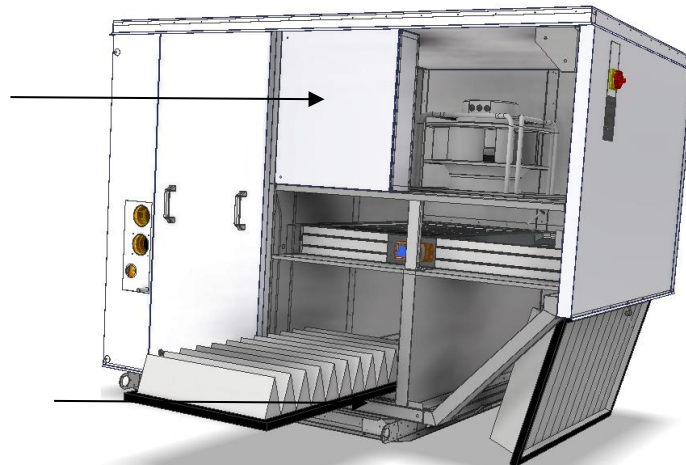
Before placing the K-roof section on the room section, unscrew the transport holders. Then, through the prepared openings, route the power and control cables from the supply air module to the device control cabinet as described below.

Through the prepared openings, route the power and control cables from the room section to the device control cabinet in K-section [1].



(bottom view)

Open the service panel and route cables as shown in the figure [2].



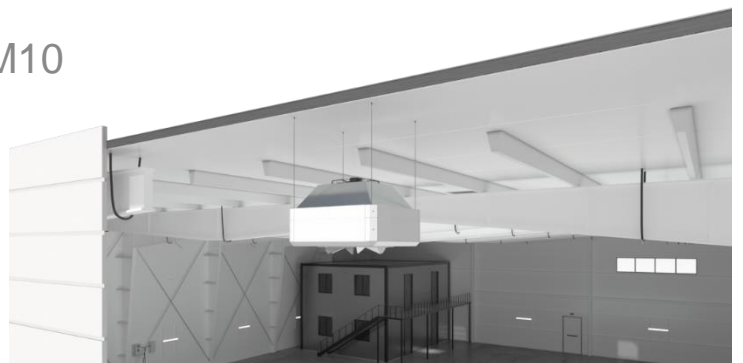
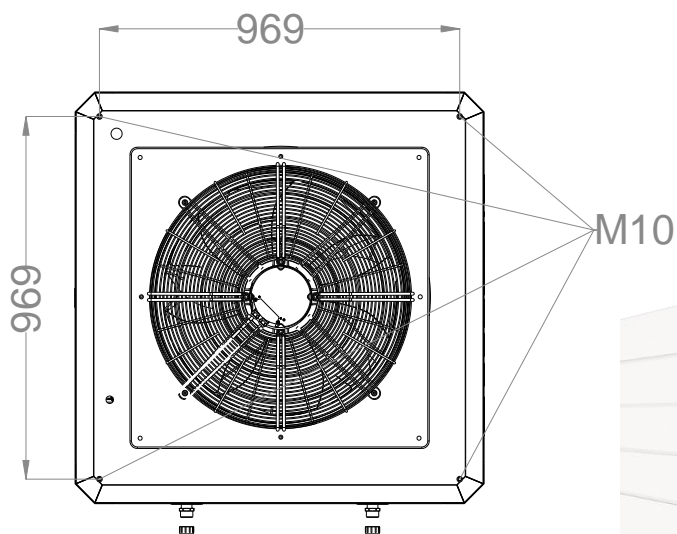
The K-roof section is attached to the base using the assembly screws provided in the kit.



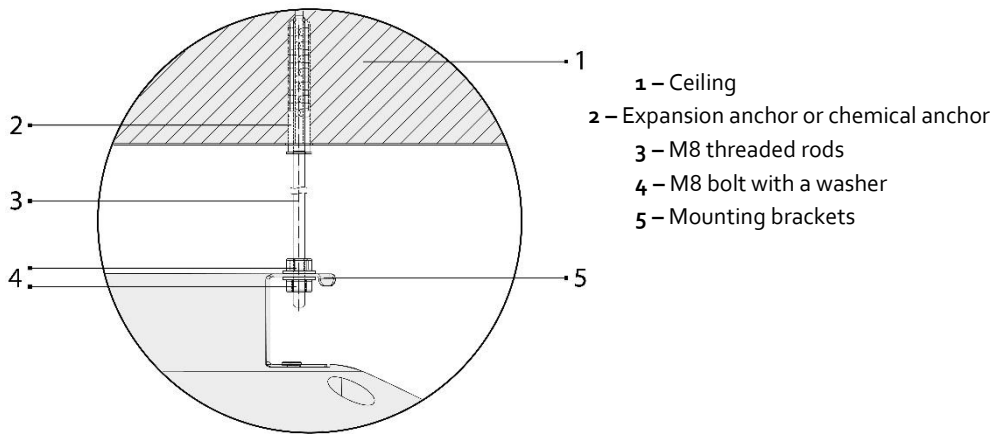
- Before placing the K-section on the base it is necessary to lead the cables from room section to the control cabinet.
- It is necessary to seal the area of connection between the room section and roof section.

5.4. Installation of ceiling devices

The Cube O device, designed for indoor installation, is suitable for horizontal mounting using 4 pieces of M10 threaded studs. The installation process should begin by preparing 4 mounting holes in the ceiling according to the provided diagram.



The mounting studs should be installed in the solid ceiling using, for example, expansion anchors or chemical anchors, and then secure the device according to the following diagram.



- The ceiling must have sufficient load-bearing capacity.
- The device must be leveled.
- The manufacturer does not provide the mentioned mounting accessories.

6. INSTALLATION

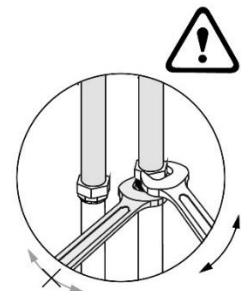
6.1. Hydraulic connection

Cube units in configuration with a water heat exchanger are equipped with a three-way mixing valve. The three-way valve is transported in the device control cabinet. The valve should be installed in accordance with the hydraulic diagram of this manual.

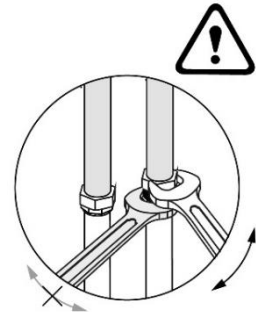


During assembly of the installation it is absolutely necessary to immobilize the exchanger's connector pipes (counter).

Water heater

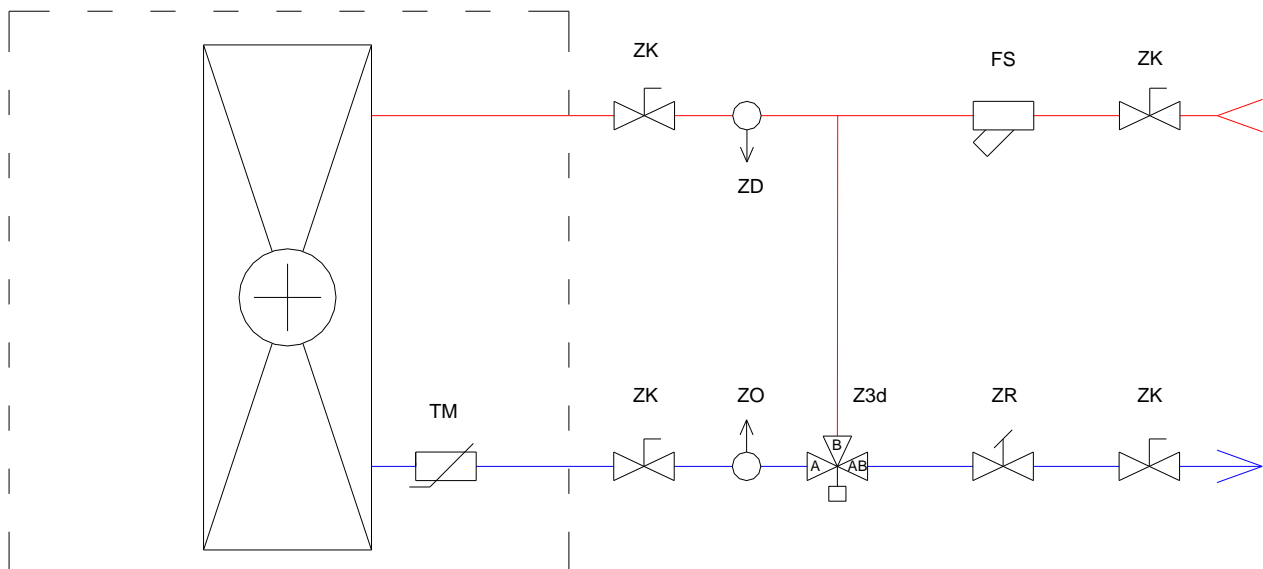


Water cooler



- A water filter must be installed. It is required to protect the hydraulic system.
- Make sure there is easy service access to the connection stub.

6.2. Hydraulic hub chart for water heater / cooler



ZK – shut-off valve
 ZO – vent valve
 ZD – drain valve
 TM – temperature sensor

ZR – regulating valve
 FS – mesh filter
 Z3d – 3-way valve with actuator



To avoid water exchanger damage caused by freezing, if electrical power is not available, glycol must be used as a refrigerant.

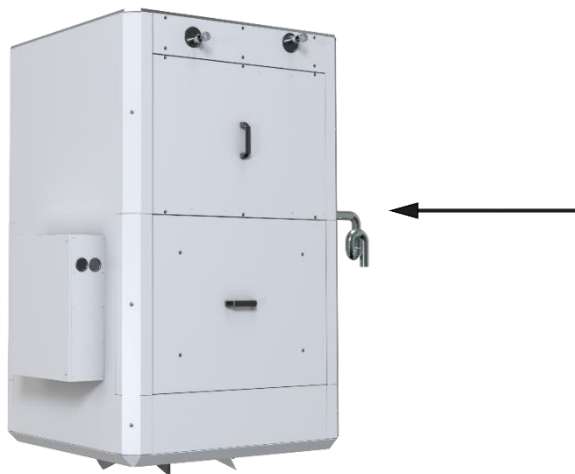


Units are equipped with a passive frost protection system.

6.3. Condensation drain

Cube O units can be equipped with a water cooler. Condensate precipitation is possible. The Cube unit's in the set are equipped with a condensation drain and a siphon.

Please ensure proper drainage of excess condensate to the plant's plumbing installation according to pictures below.



Remember to periodically check the water level in the siphon. It is necessary to install the condensate drainage on your own.

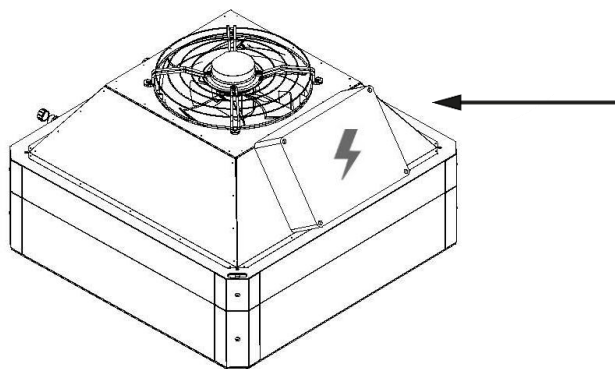
6.4. Electric connection

Before installing the unit make sure that the system is disconnected from power supply. Units should be powered with power cords of proper diameter resulting from the length, method of routing and unit's rated power.

The following pictures show where to route the power cord for each device.

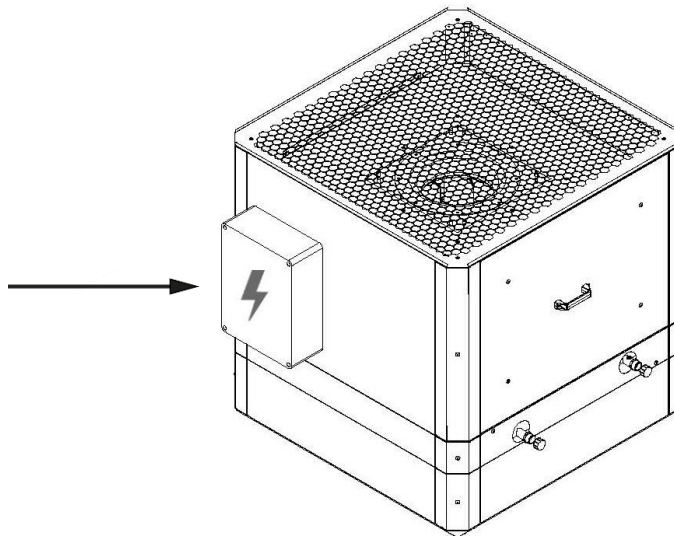
Cube OR-W-A-D

Lead the power cord of the device to the power supply and control cabinet. Next, the cable should be connected to the ZUG terminals as described in the further part of the description.



Cube OR-W/C-P-D

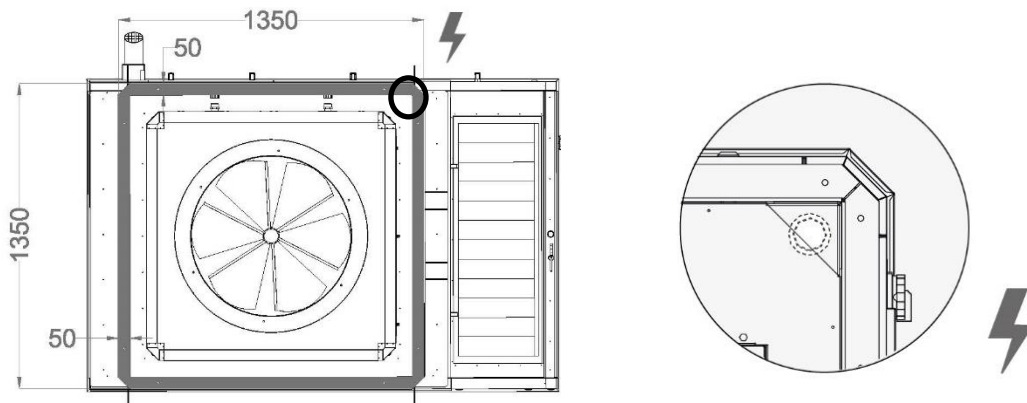
Lead the power cord of the device to the power supply and control cabinet. Next, the cable should be connected to the ZUG terminals as described in the further part of the description.



All activities during connecting to electrical installation must be conducted by qualified staff, having necessary permissions and certificates to work with live electrical devices according to the laws of the country.

Cube O K-roof section

The power cord of the device should be led through the prepared hole to the automation cabinet cover. Then the cable should be connected to the ZUG terminals as described in the further part of the description.



(bottom view)

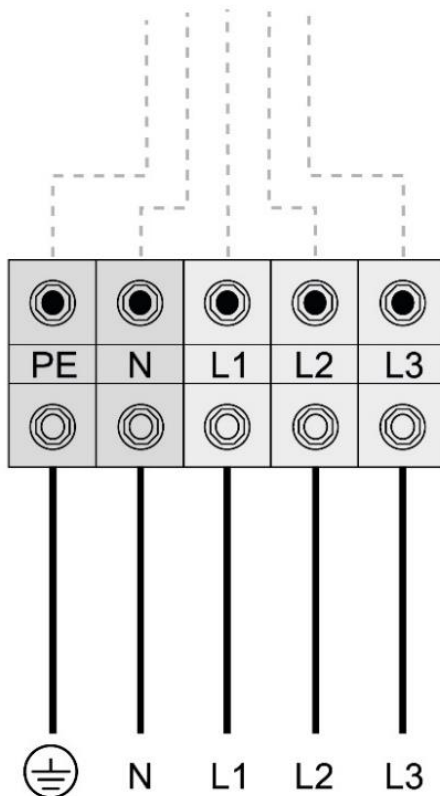
Cube O K-roof section

The power cord of the device should be led through the prepared hole in the room section. Then the cable should be connected to the ZUG terminals as described in the further part of the description.



All activities during connecting to electrical installation must be conducted by qualified staff, having necessary permissions and certificates to work with live electrical devices according to the laws of the country.

The ZUG terminals on the vertical bus are marked: L1, L2, L3, N and PE.





All activities during connecting to electrical installation must be conducted by qualified staff, having necessary permissions and certificates to work with live electrical devices according to the laws of the country.



- Remember to ground the unit and to use lightning rod to secure the unit.
- Copper cable must be used.
- Incorrect phase sequence prevents the device from being switched on.

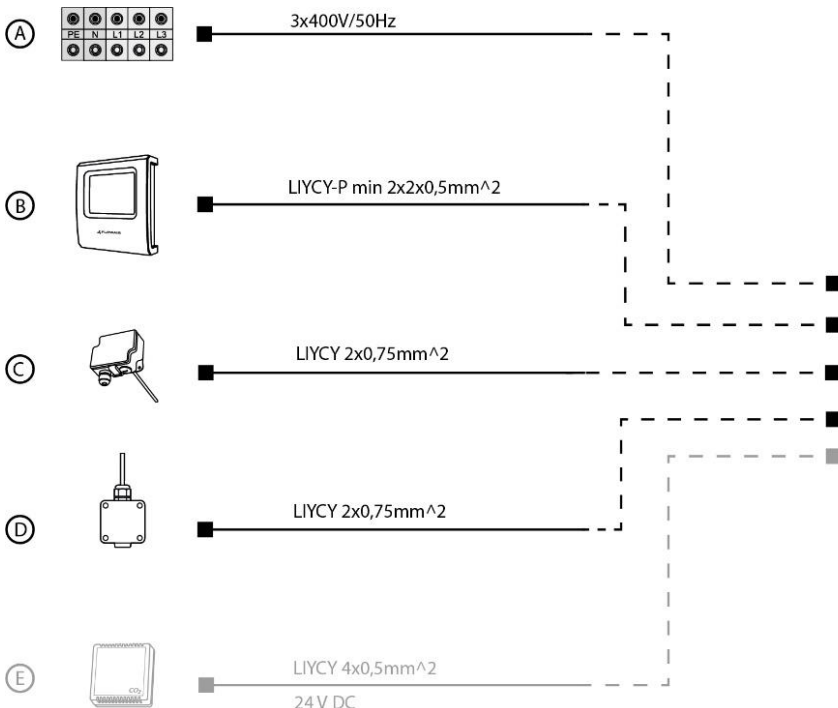
6.5. Installation flow chart

The controller in the device allows you to connect the Tbox controls, which allows the user to change the operating parameters of the device from the room.

Climatix controller, present in every Cube O unit can be connected to the Internet. By connecting to the Internet, user can change operation parameters directly from web browser. To obtain such access, contact an authorized service center.

Before the first start-up of the device, connect the power supply in accordance with the guidelines of this documentation. Lead the communication cable of the control system (T-box) and optionally, the room temperature sensor cable to the control cabinet.

T-box - Cube



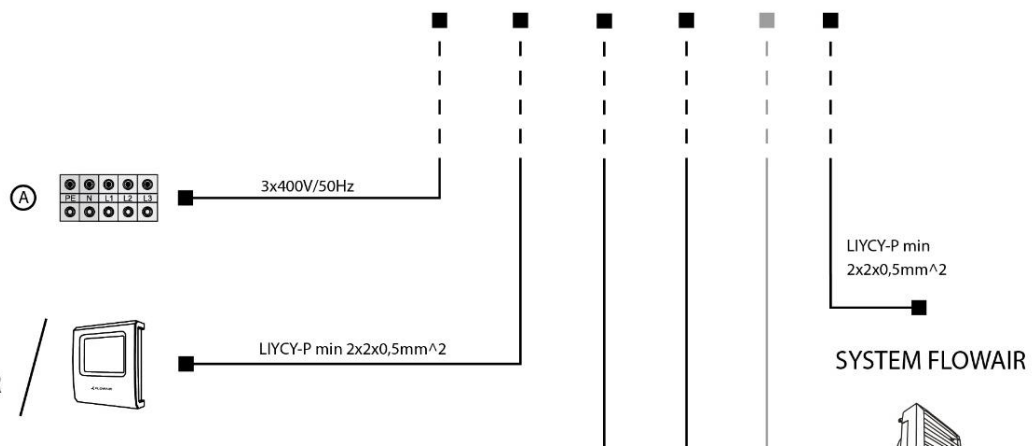
A	Power supply
B	Controller T-box
C	Optional duct air supply temperature sensor
D	Room temperature sensor
E	Optional CO ₂ detector



Power cord cross-section should be selected by a designer based on its length and maximum current flow specified in technical data chart and should be selected individually for each unit.

Cube as part of the System Flowair

A	Power supply
B	Controller T-box
C	Optional duct air supply temperature sensor
D	Room temperature sensor
E	Optional CO ₂ detector





Power cord cross-section should be selected by a designer based on its length and maximum current flow specified in technical data chart and should be selected individually for each unit.

7. START-UP AND EXPLOITATION

7.1. Gas heater



Gas connection to device can be conducted only by qualified staff with proper attestations.
First launch must be conducted by authorized service staff.
Please refer to the detailed documentation of the gas module manufacturer.



Caution high exhaust
gas outlet temperature.

Fumes exhaust
Heater air inlet
Gas connection
Condensate drain



Make sure there is easy service access to the connection stub.

Before each device, install a shut-off valve and mesh gas filter. The use of such filters protects the solenoid valve against contamination and allows for quick and reliable deaeration of the installation (it is especially important during the first start-up).

Before switching on the heater check:

- air duct to burning chamber and smoke outlet duct are unobstructed,,
- gas pipes are vented,
- power system and all controlling and securing devices are installed properly,
- heater is set for proper gas type (nozzle diameter),
- in the case of using gas other than G20, G30 or G31, it is necessary to inform the service department in advance in order to equip employees with adequate nozzles,
- gas pressure in heater is correct.

Gas heater technical data ⁽⁴⁾		Gm20	Gm34	Gm45	Gm65
Nominal heating power	kW	18,2	33,6	40,5	62,9
Gas consumption (G20)	m ³ /h	2,01	3,69	4,44	6,88
Flue gas exhaust system	-	integrated			
Gas connection	"	GZ 3/4"	GZ 3/4"	GZ 3/4"	GZ 3/4"
Minimum air flow	m ³ /h	3000	3500	4200	6500

(1) data refer to G20 gas supply

An additional nozzle must be purchased when using a gas other than G20, G30 or G31. The nozzles can be purchased by contacting the manufacturer.

Gas type	Pilot nozzle	Supply pressure
G20	0,70 mm	20 mbar [min 17 – max 25]
G27	0,75 mm	20 mbar [min 16 – max 23]
G2,350	0,70 mm	13 mbar [min 10 – max 16]
G30	0,51 mm	30 [min 25-max 35] - 50 [min 42,5-max 57,5]
G31	0,51 mm	30 [min 25-max 35] - 37 [min 25-max 45] - 50 [min 42,5-max 57,5]



The condensate drainage system from the gas heater must be adapted to the designed operating conditions, taking into account local regulations.

Condensate is discharged from the gas heater through a non-threaded PEX pipe with the following diameters: external 16 mm, internal 12 mm.

7.2. Electric heater

When using electric heater unit please check if each electric wire is connected properly. Electric heater is equipped with thermostat with temperature set option and separate temperature limiting system. When requested temperature is reached, thermostat will switch off the current, and switch it on again after heater is cooled. When the temperature limit is exceeded, to start system again, temperature limit system reset is necessary. Please remember to switch off the unit when resetting system. Heater proper working is determined by service staff during first launch, and also during maintenance checks.

7.3. Water heat exchanger

Unit equipped with fan heater and including 3-way mixing valve. System is secured by temperature sensor mounted in exhaust duct. Connecting valve can be done only by authorized service. Please make sure that installation is filled, sealed and vented. After launching please check valve. At the end please check inlet temperature with requested temperature.

Make sure there is easy service access to the connection stub.



- To protect the components of the Cube O units, filling of the water systems is required all year round.
- To avoid water exchanger damage caused by freezing, if electrical power is not available, glycol must be used as a refrigerant.



- Units are equipped with a passive frost protection system.

7.4. Water cooler

In case of water cooler, the procedure is similar to fan heater. Water cooler installed by qualified staff needs checks by controlling requested temperatures. Proper cooler working depends on proper cooling system work.

7.5. Fans

All fans in units are pre-installed and do not need control. Because of inner electronic switched fan construction a check is done by determining fan's proper rotation and proper air flow. Such fans are not equipped with drive belts or inverters, what makes check during launch impossible.

7.6. Dampers

Unit's launching procedure requires proper work of recirculation, shut off, or by-pass damper if installed. Please check if damper is working freely by pressing actuator switch which will release it from interlocking and checking manual force needed to open the damper. It should rotate freely with no resistance. Next checks involve examining working damper with requested parameters.

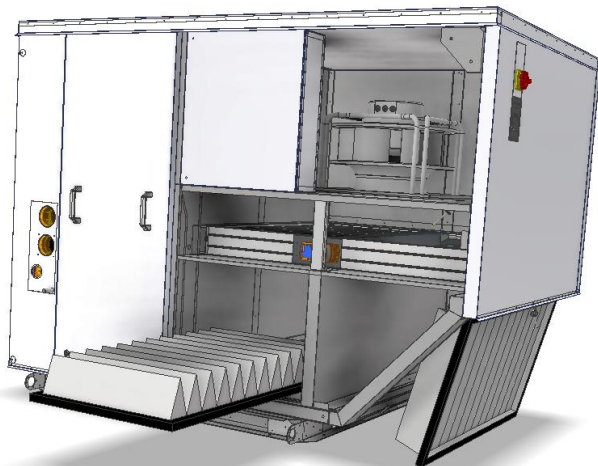
7.7. Automation control systems

Cube O units are equipped with Climatix control system. First launch is conducted by qualified manufacturer's staff that checks proper configuration and connections depending on model. In case of improper working of control system please contact manufacturer's service.

7.8. Filter replacment

It is recommended to change the filters used in the Cube units at least twice a year or in case of serious air pollution – more frequent. Filters are secured against pressure drop with differential pressure switch. In case of excessive pressure drop, an alarm message on controller is displayed suggesting filter change. Before first launch please check, if filters are installed properly and there are no alarm messages. When message suggests filter change, but in fact they do not need to be changed, please check pressure loss parameter on pressure switch. To change filters please remove side panel and pull out filter cases. Please contact the manufacturer to purchase additional filters.

K-roof section



8. RESPONSIBILITY TABLE

	Executive company	Manufacturer's service	Remarks
Placement of the unit in accordance with producers documentation .	x		
Leading the cables from the room section to the control cabinet located in the roof section K.	x		refers to Cube O with K-roof section
Connection of power supplies to the connectors in the K-roof section control cabinet (please observe the correct phase connection).	x		refers to Cube O with K-roof section
Connection of power supplies to the connectors in the room section module (please observe the correct phase connection). ATTENTION! Before performing this action please finish the task in the point above (for configuration with roof section).	x		
Lead the power/control cables, temperature sensor and communication cables to the Cube control cabinet according to device documentation.	x		
Hydraulic installation and bleeding (remove air) must be correct way.	x		option
Installation of the gas system and bleeding (remove air) must be done according the device documentation.	x		option
Installation of the siphon and filling the siphon with water.	x		option
Providing service access in accordance with the device documentation.	x		
Roofing works to seal the connection and protect between the K-roof section and roof structure.	x		
Connection of power/control cables, temperature sensors and communication cables to the Cube control cabinet.		x	
First start-up of device.		x	

9. SERVICE AND WARRANTY

Please contact your dealer in order to get acquainted with the warranty terms and its limitation.

In the case of any irregularities in the device operation, please contact the manufacturer's service department.

The manufacturer bears no responsibility for operating the device in a manner inconsistent with its purpose, by persons not authorised for this, and for damage resulting from this!

Made in Poland

Made in EU

Manufacturer: FLOWAIR Sp. z o. o.

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DEKLARACJA ZGODNOŚCI WE / DECLARATION OF CONFORMITY WE

PL / EN

④ Niniejszym deklarujemy, iż urządzenia recyrkulacyjno – nawiewne/ FLOWAIR hereby confirms that rooftop units:

- ② Cube O;

Opcje wykonania: wszystkie konfiguracje wyposażenia obejmujące nagrzewnice i chłodnice (N/W/C/E/G), moduły nawiewne (D/J/V) oraz inne / options: all options configurations including heaters and coolers (N/W/C/E/G), supply modules (D/J/V) and others

⑤ zostały wyprodukowane zgodnie z wymaganiami następujących Dyrektyw Unii Europejskiej / were produced in accordance to the following Europeans Directives:

- | | |
|------------------------------------|--|
| 1. 2006/42/WE | Maszynowej (MD) / Machinery (MD) |
| 2. 2014/30/UE (EMC) | Kompatybilności elektromagnetycznej (EMC) / Electromagnetic Compatibility |
| 3. 2014/35/UE (LVD) | Niskonapięciowe wyroby elektryczne (LVD) / Low Voltage Electrical |
| 4. 2009/125/EC wg / acc. 1253/2014 | Jednostki wentylacyjne (ErP) / Ventilation units (Ecodesign) (ErP) |
| 5. 2009/125/EC wg / acc. 327/2011 | Wentylatory (ErP) / Fans (ErP) |
| 6. 2009/142/EC | Urządzenia spalające paliwa gazowe (GAD) / Units burning gaseous fuels (GAD) |

⑥ Zgodność produktów z wymaganiami dyrektyw została sprawdzona na podstawie następujących norm zharmonizowanych / and harmonized norms with above directives:

- | | |
|-------------------------|--|
| PN-EN 378-1 | Instalacje ziębnicze i pompy ciepła - Wymagania dotyczące bezpieczeństwa i ochrony środowiska – Część 1: Wymagania podstawowe, definicje, klasyfikacja i kryteria wyboru / Cooling systems and heat pumps – Safety and environmental requirements – Part 1: Basic requirements, definitions, classification and selection criteria |
| PN-EN 378-2 | Instalacje ziębnicze i pompy ciepła - Wymagania dotyczące bezpieczeństwa i ochrony środowiska – Część 2: Projektowanie, wykonywanie, sprawdzanie, znakowanie i dokumentowanie / Cooling systems and heat pumps – Safety and environmental requirements – Part 2: Design, execution, checking, marking and documentation |
| PN-EN 378-3 | Instalacje ziębnicze i pompy ciepła - Wymagania dotyczące bezpieczeństwa i ochrony środowiska – Część 3: Usytuowanie i ochrona osobista / Cooling systems and heat pumps – Safety and environmental requirements – Part 3: Location and personal protection |
| PN-EN 378-4 | Instalacje ziębnicze i pompy ciepła - Wymagania dotyczące bezpieczeństwa i ochrony środowiska – Część 4: Obsługa, konserwacja, naprawa i odzysk / Cooling systems and heat pumps – Safety and environmental requirements – Part 4: Operation, maintenance, repair and recovery |
| PN-EN 60335-2-40 | Elektryczny sprzęt do użytku domowego i podobnego - Bezpieczeństwo użytkownika – Część 2-40: Wymagania szczegółowe dotyczące elektrycznych pomp ciepła, klimatyzatorów i osuszaczy / Household and similar electrical appliances - Safety - Part 2-40: Particular requirements for electric heat pumps, air conditioners and dehumidifiers |
| PN-EN 60335-1 | Elektryczny sprzęt do użytku domowego i podobnego - Bezpieczeństwo użytkownika – Część 1: Wymagania Ogólne / Household and similar electrical appliances - Safety - Part 1: General requirements |
| PN-EN 60529 | Stopnie ochrony zapewnianej przez obudowy (Kod IP) / Degree of protection provided by enclosures (IP code) |
| PN-EN ISO 12100 | Bezpieczeństwo maszyn - Ogólne zasady projektowania - Ocena ryzyka i zmniejszanie ryzyka / Machine Safety - General Principles of Design - Risk Assessment and Risk Reduction |

PN-EN 55014-1	Kompatybilność elektromagnetyczna - Wymagania dotyczące przyrządów powszechnego użytku, narzędzi elektrycznych i podobnych urządzeń - Część 1: Emisja / Electromagnetic compatibility - Requirements for consumer products, electrical tools and similar equipment - Part 1: Emissions
PN-EN 55014-2	Kompatybilność elektromagnetyczna (EMC) - Wymagania dotyczące przyrządów powszechnego użytku, narzędzi elektrycznych i podobnych urządzeń -- Odporność na zaburzenia elektromagnetyczne - Norma grupy wyrobów / Electromagnetic Compatibility (EMC) - Requirements for consumer devices, electrical tools and similar devices - Electromagnetic compatibility - Product group standard
PN-EN 61000-6-1	Kompatybilność elektromagnetyczna (EMC) - Część 6-1: Normy ogólne - Odporność w środowiskach: mieszkalnym, handlowym i lekko uprzemysłowionym / Electromagnetic Compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
PN-EN 61000-6-2	Kompatybilność elektromagnetyczna (EMC) - Część 6-2: Normy ogólne - Odporność w środowiskach przemysłowych / Electromagnetic Compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments
PN-EN 61000-6-3	Kompatybilność elektromagnetyczna (EMC) - Część 6-3: Normy ogólne - Norma emisji w środowiskach: mieszkalnym, handlowym i lekko uprzemysłowionym / Electromagnetic Compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments
PN-EN 61000-6-4	Kompatybilność elektromagnetyczna (EMC) - Część 6-4: Normy ogólne - Norma emisji w środowiskach Przemysłowych / Electromagnetic Compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments
PN-EN 61000-3-12	Kompatybilność elektromagnetyczna (EMC) - Część 3-12: Poziomy dopuszczalne – Poziomy dopuszczalne emisji harmonicznych prądu dla odbiorników o znamionowym prądzie fazowym >16A i < lub = 75 A przyłączonych do publicznych sieci zasilającej niskiego napięcia / Electromagnetic Compatibility (EMC) - Part 3-12: Permissible Levels - Harmonic Current Limits for receivers with rated phase current > 16 A and <or = 75 A connected to the public mains power supply

③ 30.06.2023

Sylwester Ciepaliński

⑦ Business Development Manager

