Cube OV

Rooftop unit

Technical and commissioning documentation | Dokumentacja techniczno-rozruchowa

Техническая и пусконаладочная документация | Technische documentatie en documentatie voor de inbedrijfstelling

Műszaki és üzembe helyezési dokumentáció | Documentație tehnică și de punere în funcțiune

V1.03 MT-DTR-CUBE/OV-EN-V1
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Thank you for purchasing the Cube OV device.

These operating instructions were issued by FLOWAIR Ltd. The technical and operating documentation is a collection of recommendations and instructions aimed at presenting procedures, methods and notes leading to correct installation, commissioning and operation of the device.

The manufacturer reserves the right to make corrections and changes to the manual at any time and without notice, as well as changes to the device that do not affect its operation.

This manual is an integral part of the appliance and must be delivered with it to the user. Before assembling, commissioning and operating the Cube OV, please read these instructions in detail, especially the section on safety, to exclude any possible risk of damage to health or property. All instructions contained herein should be followed without omitting any point. Failure to comply with the following instructions may result in danger to life due to incorrect transport and installation and may lead to damage to the appliance or its malfunction. The manufacturer will not be held liable for incorrect installation or malfunction of the device due to non-compliance with the following recommendations. At the same time, the guarantee provided by the manufacturer will not be recognised in the event of gross negligence or failure to comply with the following set of recommendations.

Please contact the manufacturer's service in the event that this manual contains descriptions that are incomprehensible or ambiguous.

Ensure that all users of the appliance are familiar with this manual before carrying out operations. If the appliance is passed on to a subsequent user, this manual must also be passed on to that user.

All electrical connection operations must be carried out by personnel with the necessary qualifications and certificates for working with live equipment in accordance with the applicable national laws.

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TECHNICAL DOCUMENTATION: **EN**

IMPORTANT INFORMATION

This manual contains important information to prevent possible accidents and damage to the Cube OV equipment during operation. Special care must be taken in all operations on the equipment and the following notes and all technical documentation must be adhered to. FLOWAIR cannot be held responsible for omissions or damage resulting therefrom.

In the following instructions you will find a warning and important notes marked as follows:

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

- Danger of electric shock.

- Warnings regarding unauthorised uses of Cube OV equipment. Dangerous practices, the occurrence of which may result in damage to property or minor personal injury.

- Advice and information on how to use the Cube OV.

IMPORTANT SAFETY INFORMATION:

- It is forbidden to use Cube OV units in room ventilation systems where aggressive chemicals, oil mist or corrosive substances enter the air.
- The unit is dedicated to work with air with a maximum dust content of 0.3 g/ $.m^3$
- The device poses a risk of injury caused by rotating parts.
- The appliance poses a risk of injury caused by sharp edges and heavy weight.
- The appliance poses a risk of injury from low and high temperature elements.
- The appliance poses a risk of injury from burns caused by high temperature fumes.

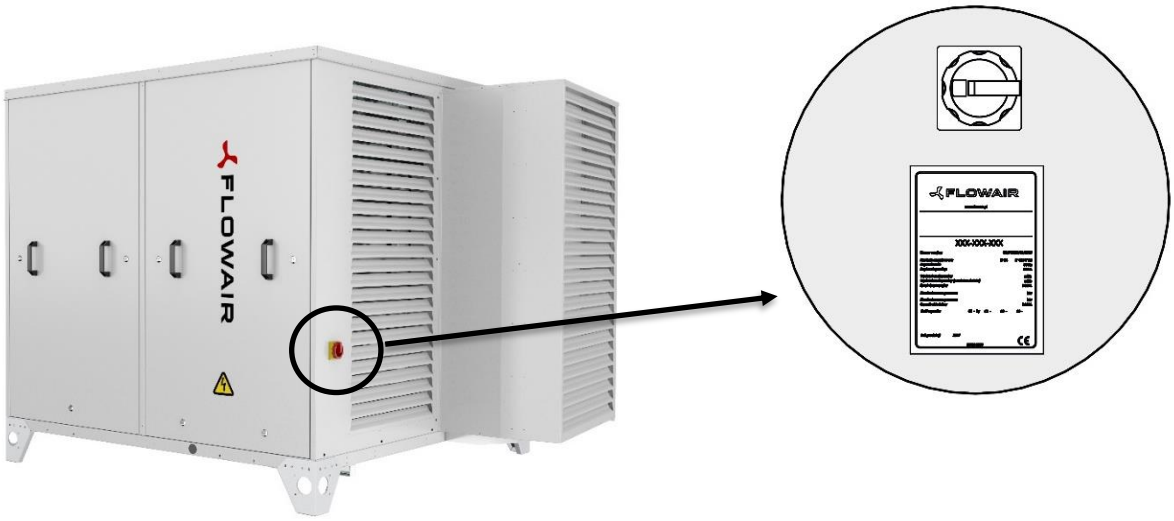
- It is essential to disconnect the appliance from the main power supply via the main switch before carrying out any work.
- Before opening the housing covers, it is essential to ensure that the electrical supply has been disconnected and protected to prevent uncontrolled switching on again, e.g. by others.
- Electrical equipment should be connected to a permanent electrical installation equipped with means of disconnection from the power supply, having contact breaks at all poles, ensuring full disconnection under category III surge conditions.

- Cube OV devices must not be operated by children or adults with reduced mobility, sensory and intellectual abilities.
- Cube OV equipment must not be operated by persons who are not trained or who are not thoroughly familiar with these operating instructions.
- The Cube OV must only be used for its intended purpose.

- All installation and service work must be carried out by suitably qualified personnel with electrical and gas installation qualifications.
- Personnel must wear appropriate protective equipment (helmet, gloves, goggles, etc.).
- During operation of the refrigeration system, some parts of the system become hotter than 60°C. Precautions must be taken. Even after the appliance has been switched off, high temperatures may persist for some time, being a source of skin burns.
- Do not touch the fins of the water exchanger.
- To comply with CE requirements, use only original spare parts or components approved by the manufacturer.
- Make sure to close the door after servicing.
- Before starting the unit, ensure that the free movement of the fans and moving parts is not restricted in any way by any external factors.
- If it is required to start the appliance in the process of servicing the appliance with the doors and housing covers open, it is absolutely and particularly important to observe the health and safety regulations.

NAMEPLATE

Each Cube OV unit is equipped with a rating plate stuck under the main switch (roof section) or near the automation cabinet (in ceiling-mounted configurations), as shown in the figure below:



The rating plate contains basic information about the unit, such as: the unit code to identify the configuration, serial number, parameters and basic electrical parameters.

1. GENERAL INFORMATION

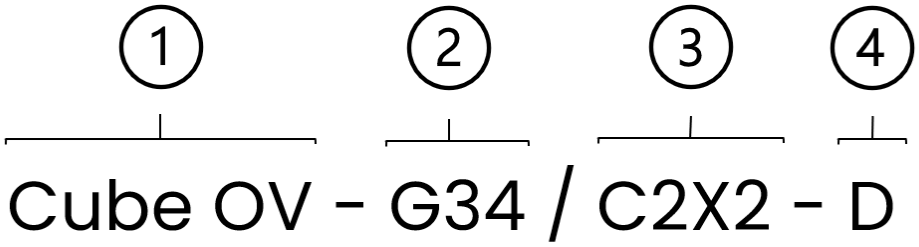
1.1. Description of the Cube OV

The Cube OV unit is a ductless supply and extract unit with heat recovery and recirculation function. The Cube OV can be equipped with all necessary systems for heating, cooling. providing bi-directional room ventilation. They are used in the following facilities:

- large-scale industrial buildings such as production halls and warehouses, printing works, logistics centres,
- commercial buildings (hypermarkets, shopping centres, discount stores and shopping malls, car showrooms, shopping arcades),
- public buildings such as cinemas, theatres and gymnasiums.

1.2. Possible device configurations

The Cube OV can be equipped with a heater and/or a cooler to raise/lower the supply air temperature. In combination with the types and versions of optional equipment, they form a series described according to the diagram below:

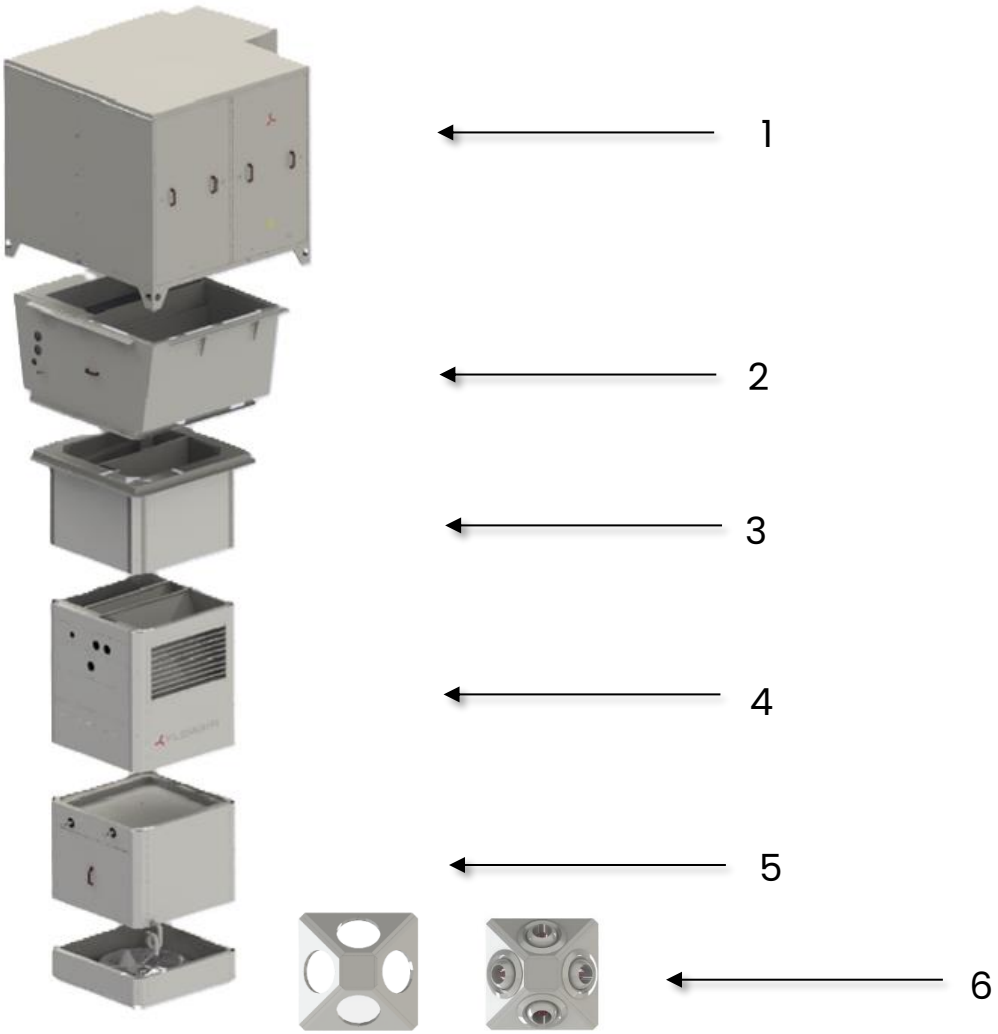


Legend		
Category	**Designation**	**Description**
1. Series	OV	Design family "Cube OV"
2. Source device	G	Gas heater GM34/GM45/GM65
	N	No heat source.
	-	-
3. Primary and secondary sources	WX	Water coil - W2/W3/W4
	CX	Chilled water coil - C2/C2/C4
	XX	Reversible (heating & cooling) water coil - X2/X3/X4
	FA2/FA5	DX exchanger
	N	No heat exchanger

4. Supply air element	D	Swirl diffuser with actuator.
	J	4 long-range nozzles
	N	No section
	V	Duct connection

Full configuration of the unit takes place during ordering, which is preceded by consultation with the Sales Department or Project Support.

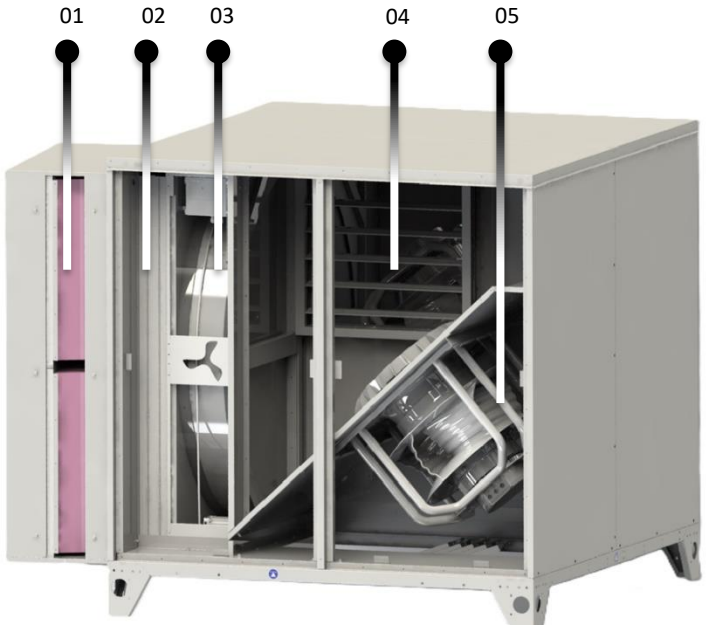
1.3. General description and construction of Cube OV



Legend

1. Canopy section - Cube OV
2. Gas header module (GM34/GM45/GM65)
3. Transition module
4. Water coil module (W2, W3, W4)
5. Chilled water coil module (X2, X3, X4)
6. Supply air module (D - swirl diffuser, V - duct connection, J - long-distance nozzles)

Cross-section of Cube OV - Supply side

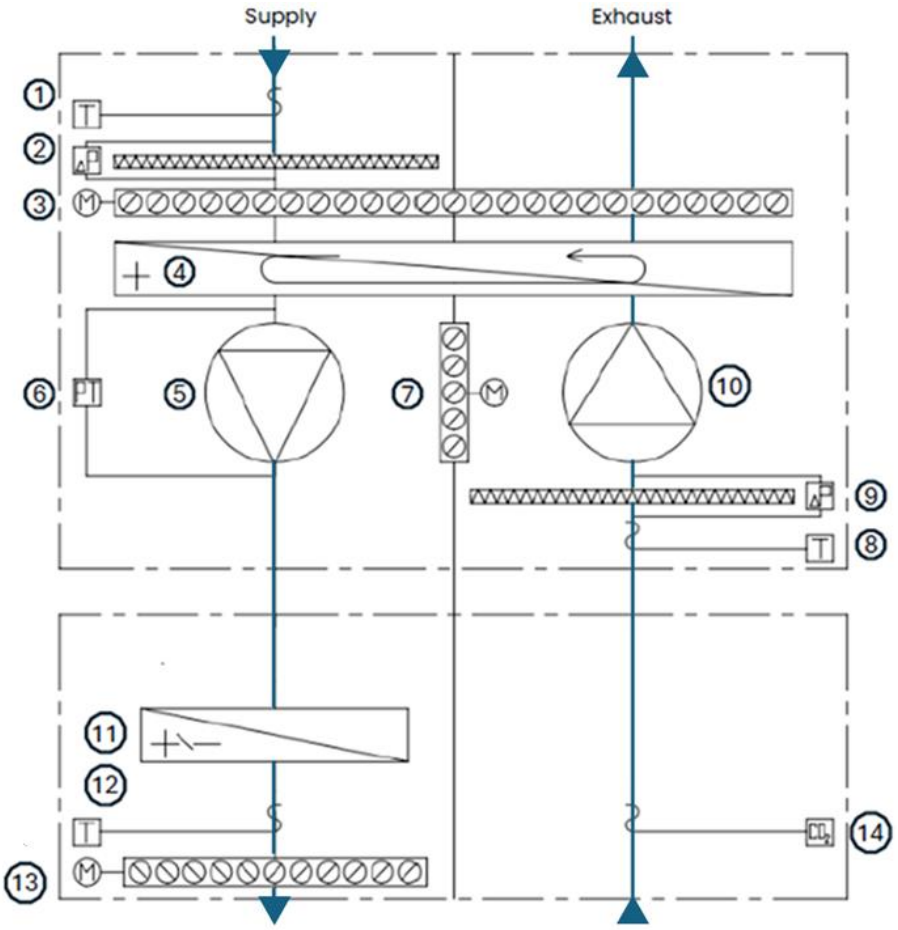


01	Fresh air filters
02	Shut-off damper
03	Rotary heat exchanger
04	Recirculation damper with actuator
05	Supply air fan

Cross-section of Cube OV - extraction side

06	Exhaust air filters
07	Exhaust air fan
08	Exhaust filter pressure switch
09	Electrical switchgear
10	Main switchboard
11	Air outlet
12	Air intake

1.4. Functional diagram Cube OV



Legend:

1. Outside temperature sensor
2. Pressure switch + supply air filter,
3. Actuator + supply air and exhaust air damper;
4. Rotary heat exchanger
5. Supply air fan
6. Supply fan pressure transducer
7. Actuator + recirculation damper
8. Room temperature sensor
9. Pressure switch + exhaust filter
10. Exhaust fan
11. Heating/cooling module
12. Supply air temperature sensor
13. Swirl diffuser with actuator
14. CO2 sensor (optional)

2. TECHNICAL SPECIFICATIONS

2.1. Technical specifications

Model		**CUBE OV**
Nominal air flow rate	m^3/h	8 000
Displacement pressure at discharge for 8,000 m3/h	Pa	250
Gas heater	[-]	available
Water heater	[-]	available
Water cooler	[-]	available
Filters - air intake - pocket / filtration class	mm	860x695x300 ePM2.5 65% (~F7)
Filters - extract - cassette / filtration class	mm	800x592x50 ePM10 50% (~M5)
Emission sound pressure level at 10m	dB	47

Heat recovery

Recovery efficiency[1]	m^3/h	>74,1
Exchanger type	-	Rotary heat exchanger

Construction data

Construction

Thermal insulation class	-	M0 (in accordance with PN-EN 13501-1)
Material	-	AZ185
Housing colour	-	RAL 9007
Enclosure	-	50mm sandwich panels
Insulation	-	mineral wool 90m3/kg
Underframe	-	integrated steel
Weight	kg	~600 (applies to roof section)

Electrical data

Power supply	VAC/Hz	3x400/50	
Cube OV configurations		Rated current[A]	Rated power[kW]
OV/N		14,2	7,75
OV/W		16,7	8,12
OV/X		16,7	8,12
OV/C		16,7	8,12
OV/W-X		19,2	8,49
OV-Gm		15,2	8,00
OV-Gm/C		17,7	8,37
OV-Gm/W		17,7	8,37
OV-Gm/X		17,7	8,37

Options

Water coil (Cube W)			T_{ext}= -16°C				$T_{(ext)}$= -20°C			
Flow rate	Type	T_z/T_p	Q_g	T_{naw}	Dp	m_w	Q_g	T_{naw}	dp	m_w
m^3/h	-	°C / °C	kW	°C	kPa	m^3/h	kW	°C	kPa	m^3/h
8000	**W2**	70/50	62,4	33,1	14,3	2,74	63,0	32,5	15,9	2,81
	W3	60/40	68,7	35,3	9,5	3,01	70,8	35,3	10,1	3,10
	W4	40/30	56,0	30,8	15,4	4,86	58,5	30,6	16,7	5,08
6000	**W2**	70/50	50,8	36,5	9,8	2,23	51,9	36,1	10,2	2,28
	W3	60/40	54,2	38,2	6,2	2,37	55,7	37,9	6,5	2,44
	W4	40/30	52,4	31,0	13,6	4,55	54,7	30,8	14,7	4,75

Legend:

Flow - amount of air flowing through the Cube OV,
T_{zew}- outdoor air temperature (-16°C - 1st climatic zone*, -20°C - 3rd climatic zone*) - measured at the unit's air intake,
Type - type of water heater [W2 - two-row, W3 - three-row, W4 - four-row],
T_{naw}- supply air temperature,
T_z/T_p- parameters of water supplying the exchanger,
Q_g- heating power of exchanger,
Dp - hydraulic gradient on exchanger,
m_w- water flow through the exchanger,

The given parameters are for the following assumptions:
100% fresh air
Exhaust - air with parameters 20°C/40%.

*The given zones refer to the area of Poland (for more details see the subsection - Climatic zones of Poland).

Chilled water coil (Cube C)		T_{zew}= 30°C / 45%											
T_z/ T_p	°C/°C	6°C/12°C						5°C/10°C					
Flow	Type	Q_C	Q_j	T_{naw}	cond.	Dp	m_w	Q_g	Q_j	T_{naw}	cond.	Dp	m_w
m^3/h	-	kW	kW	°C	l/h	kPa	m^3/h	kW	kW	°C	l/h	kPa	m^3/h
8000	**X2**	24,6	18,0	19,0	9,6	28,6	3,52	30,0	20,2	18,3	14,4	57,5	5,14
	X3	35,9	25,3	16,3	15,6	31,1	5,13	43,4	28,3	15,2	22,0	61,7	7,44
	X4	48,7	32,4	13,6	23,8	34,1	6,97	58,2	36,4	12,2	31,9	66,4	9,97
6000	**X2**	21,1	14,9	18,1	9,2	21,7	3,02	25,7	16,7	17,2	13,1	43,3	4,40
	X3	30,1	20,3	15,4	14,3	22,6	4,31	36,3	22,9	14,1	19,6	44,4	6,22
	X4	40,8	26,0	12,5	21,6	24,6	5,83	48,4	29,2	10,9	27,9	47,1	8,28

Legend:
Flow rate - amount of air flowing through the Cube OV [m3/h],
T_{zew}- outdoor air temperature (climate zone I*) - measured at the unit's inlet,
Type - type of water cooler [X2 - two-row, X3 - three-row, X4 - four-row],
T_{naw}- supply temperature,
T_z/T_p- exchanger feed water parameters,
Qc - cooling power of the exchanger,
Qj - sensible cooling power,
Dp - hydraulic gradient on exchanger
m_w- water flow through the exchanger,
cond. - amount of condensed condensate,

The parameters given are for the following assumptions:
100% fresh air
Exhaust - air with parameters 24°C/50%.
*The given zone refers to the area of Poland (more information in the subsection - Climatic zones of Poland).

Data of water exchangers

Exchanger code	-	**W2, X2**	**W3, X3**	**W4, X4**
Spigots	inch	2 x G1"	2 x G1"	2 x G1 1/4"
Capacity	dm3	5,85	7,81	10,26
Max. working pressure - PS	bar	16		
Max. working temperature – TS	°C	90		

Gas heater data((1) (3) (2))

Gas heater code	-	**Gm34**	**Gm45**	**Gm65**
Nominal heat output	kW	33,6	40,5	62,9
Gas consumption G20	m3/h	3,69	4,44	6,88
Exhaust system	-	integrated		
Connection	inch	GZ ¾"	GZ ¾"	GZ ¾"
Minimum flow rate	m3/h	3500	4200	6500

(1) according to EU 1253/2014
(2) water heater capacities determined for a heating medium temperature of 70/50˚C, air temperature before the exchanger 8˚C
(3) data are for G20 gas supply

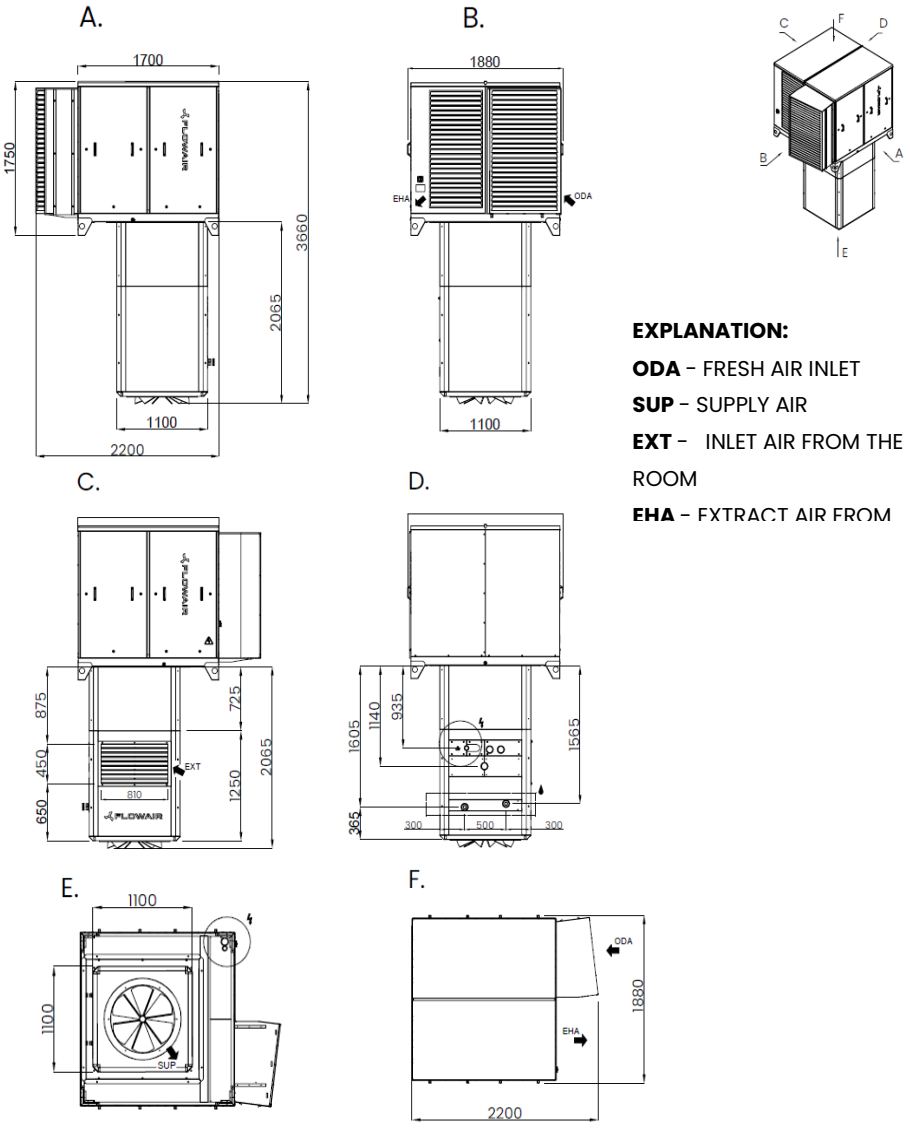
Data of DX exchanger

Exchangers	-	**DX – FA2**	**DX – FA5**
Expenditure range	m3/h	4000 – 8000	4000 – 8000
Dedicated condensing unit	kW	28	56
Recommended temperature range before the exchanger in cooling*	°C DB / °C WB	18/13 – 32/23	18/13 – 32/24
Recommended temperature range before the heat exchanger in heating* °C	°C DB	10 – 24	10 – 24
Fluid connection diameter	inch	½" (12.7 mm)	5/8" (15.88 mm)
Gas nipple diameter	inch	¾" (19.05 mm)	1 1/8" (28.9 mm)
Capacity	dm3	3,25	8,75
Max. working pressure - PS	bar	42	
Factor	-	R410a	

* - exact parameters depend on the condensing unit used

2.2. Dimensions of the appliance

The following projection shows the CUBE OV unit in the CUBE OV-N / WX-D configuration:



EXPLANATION:

ODA - FRESH AIR INLET

SUP - SUPPLY AIR

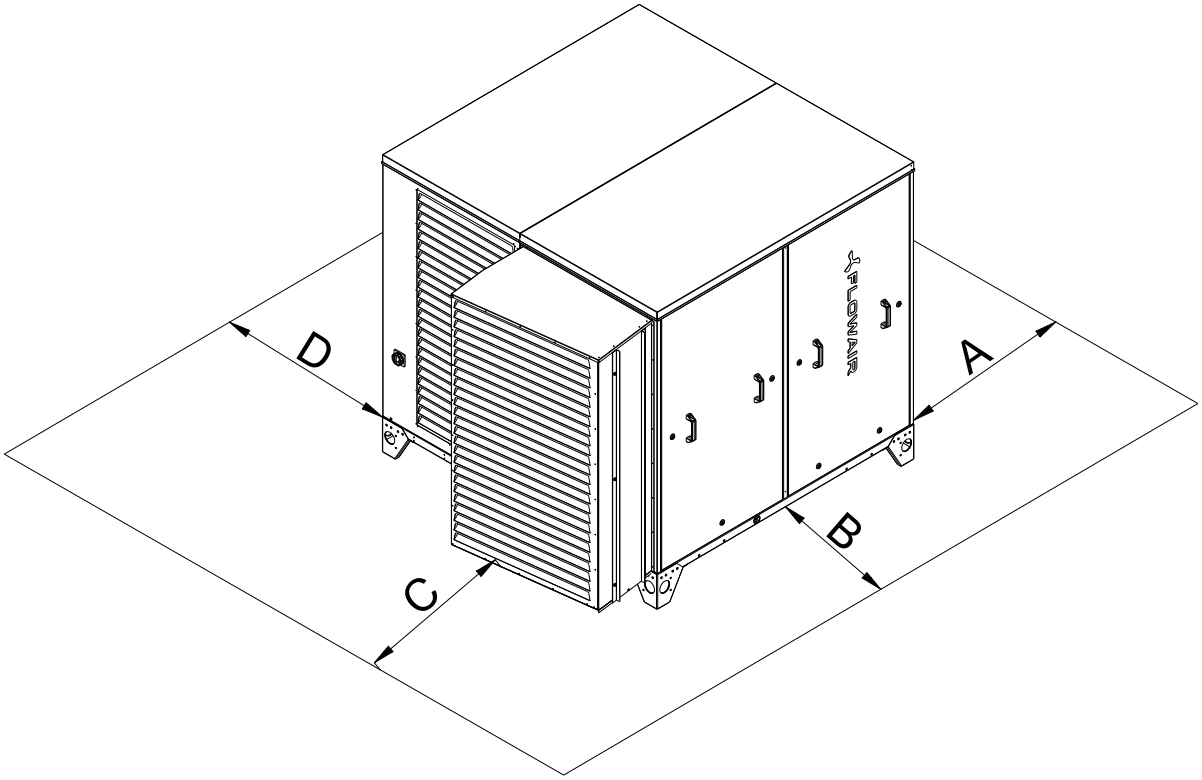
EXT - INLET AIR FROM THE ROOM

EHA - EXTRACT AIR FROM

2.3. Cube OV service distances

Special attention should be paid to maintain a larger distance on the inspection sides during foundation.

- The dimensions given are only the minimum dimensions necessary for servicing and do not reflect the distances of the unit's air intake to partitions or building structures determined by the legal regulations in force in the country concerned.
- If the unit is located on a flat roof (<5%) at a height higher than 50 cm, safe service access to the unit must be provided by using a service platform.
- For units with a gas heater, special attention must be paid to ensure service access in terms of the gas installation.

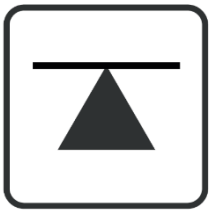


Minimum required service distances for Cube OV units	
A	min. 0,5 m
B	min. 1,5 m
C	min. 1,5 m
D	min. 1,5 m

3. TRANSPORT

The roof section has been designed for transport by forklift. In addition, the roof section of the OV and the underfloor section have been equipped with transport handles for lifting with ropes.

The following provisions must be observed when transporting the Cube OV unit:



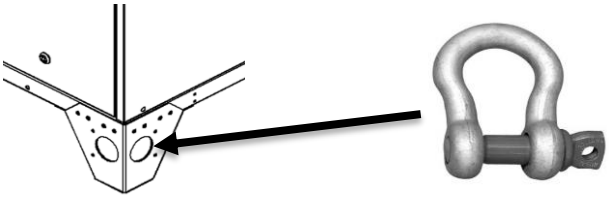
- Before unloading the transport, the delivery and acceptance report must be completed.
- Immediately upon receipt of the transport, the condition of the equipment and the completeness of the shipment (T-box / M-box - option, room temperature sensor) must be checked in the presence of the carrier. If any irregularities are found, a damage report should be drawn up, which will enable a claim for compensation from the shipping company at a later date.
- The equipment should be unloaded using a forklift with 1.9 m forks. The centre of gravity is indicated on the carrying frame.
- The unit must absolutely stand on the transport supports integrated into the support frame during storage and transport. Positioning the unit in any other way will lead to damage.
- After unloading the unit, a cover must be used to protect it from external influences while it is waiting to be installed and set down.

The manufacturer will not be held responsible for any damage or injury to the unit caused by failure to comply with the guidelines in the technical documentation and irregularities during transport.

3.1. Information on lifting

When lifting the Cube OV, observe the following provisions:

- Ensure that the ropes are correctly hooked to all handles,
- Use spreader bars of at least the width of the unit,
- Ensure that the unit is level during lifting,
- Special care must be taken when lifting the unit from the lorry to avoid damaging the unit by hitting components on the trailer,
- Take care not to hit any other objects with the unit,
- Do not lift the unit at excessive speed,
- Do not change direction abruptly,
- Take special care when placing the unit on the structural frame or roof base.



Do not stay under the unit during lifting.

- Before lifting, check that the locks of all service panels are closed by pulling on the handles.
- The manufacturer will not be held responsible for any damage or harm to the unit caused by not following the instructions in the technical documentation or by irregularities during the lifting operation.

3.2. Cube OV foundation

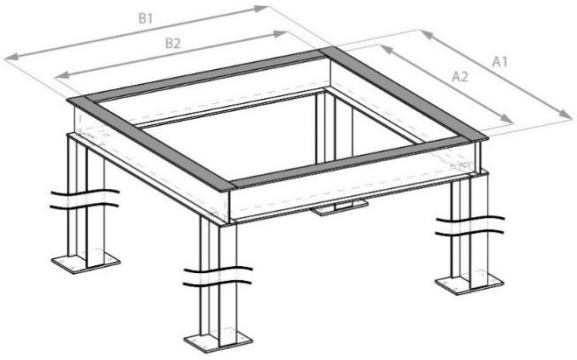
The Cube OV is constructed on a self-supporting frame with transport supports which, in accordance with the applicable building regulations in the country of construction, must be placed on the frame or on supports connected to the roof structure and offset from the roof slope to the height stipulated by law. The manufacturer specifies the foundation of the appliance on the frame along the outline of the appliance according to the dimensions of the frame below. It is permitted to base the unit on a frame with support on two sides of the unit frame. It is forbidden to unscrew the transport supports after the unit has been planted.

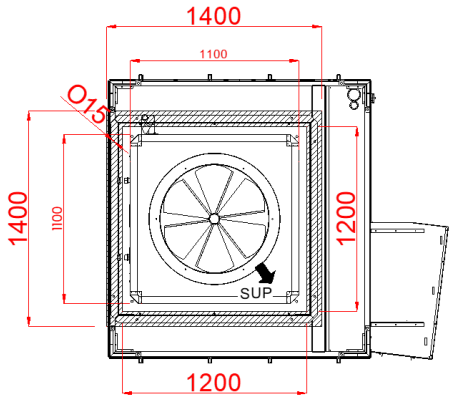
- When the unit is placed on the frame, it must be secured to the frame in such a way that any movement of the unit is prevented.
- **The unit must be secured to the frame in such a way that no movement of the unit is possible. 5mm or a rubber seal between the unit and the mounting frame. The seal prevents blow outs, ingress of rain water into the unit/room, and prevents the transmission of vibrations during unit operation**.
- The unit should be orientated so that the air intake is not directed towards the direction from which the wind usually blows.
- The manufacturer allows the unit to be placed on a frame with support on the two longer sides of the unit frame.

Canopy module OV

Illustrative solution

A1 [mm]	1400
A2 [mm]	1200
B1 [mm]	1400
B2 [mm]	1200



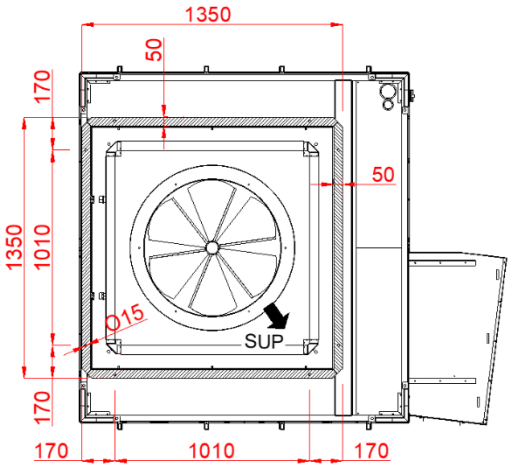


3.3. Roof penetration (Cube OV with underfloor section)

Cube OV units are fitted with a base/plate which acts as both a roof penetration and an adaptor for the swirl diffuser. The base support frame under which the substructure must be designed is shown in Figure 1.

A hole must be made in the ceiling in order to pass the roof base duct with the diffuser. The hole should be made according to the guidelines in Figures 2 and 3.

1



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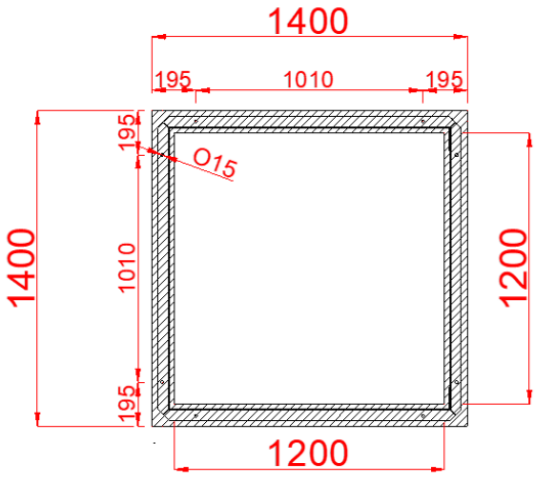

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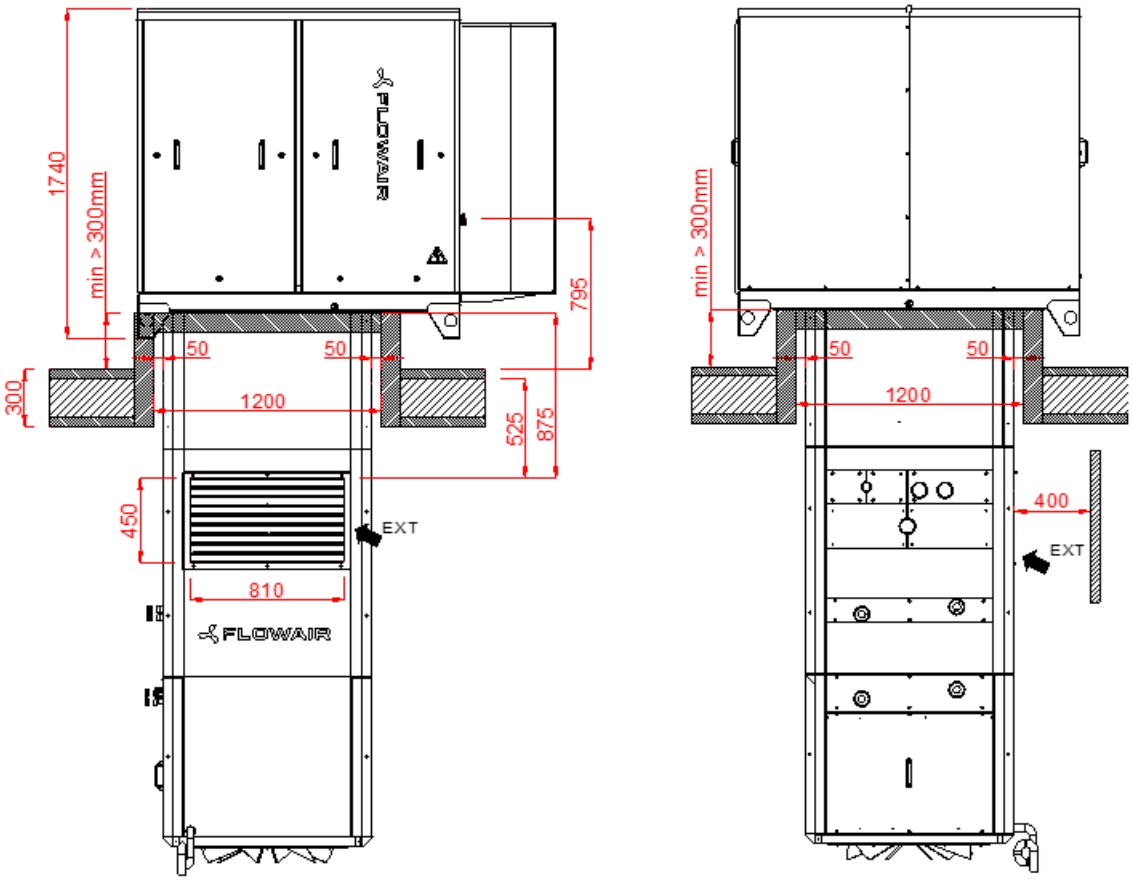


- The CUBE OV unit placed on a plinth should be fixed to the frame in such a way as to prevent any movement of the unit.
- **It is required to use rubber spacers of min. 5mm or a rubber seal between the unit and the mounting frame. The seal prevents blow-outs, ingress of rainwater into the unit/room, prevents the transmission of vibrations during operation of the unit.**
- Orient the unit so that the air intake is not directed towards the direction from which the prevailing winds blow.
- Ensure a clearance of min. 400mm from the exhaust air grille so as not to block the free flow of air.

INFORMATIVE:

The standard plinth height should be:

- Minimum: **300mm (30cm)** - this is the absolute minimum for protection from rainwater and snow.
- Recommended height: **400-500 mm (40-50 cm)** - the most common height to:
    - avoid contact with water from lingering snow or rain,
    - ensure adequate roof pitch around the unit,
    - facilitate installation and connections under the unit.

3.4. Installation of the underfloor unit

During foundation, attention should be paid to the orientation of the unit relative to the supply module.

A	Supply air duct - SUPPLY
B	Exhaust duct - EXHAUST

The above pictograms are affixed to the unit frame and the underfloor section - they indicate the direction of air flow:

1 - **Supply** - fresh air part

2 - **Exhaust** - extract part - room air

Before placing the overhead section on the roof penetration, pull the supply and control cables from the supply module to the unit control cabinet through the prepared openings as described below.

4. INSTALLATION

4.1. Hydraulic connection

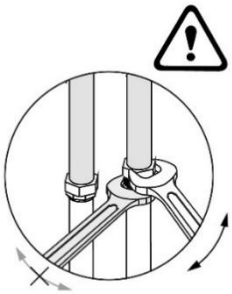
Cube units in the water heat exchanger configuration are equipped with a three-way mixing valve. The three-way valve is transported in the appliance control cabinet. The valve must be installed in accordance with the hydraulic diagram included in this manual.

When installing the system, it is absolutely necessary to fix the connection ferrules (control).

Water coil

Passive and active anti-freeze system used in CUBE units reduces the risk of freezing of working medium in emergency situation. The systems used allow action to be taken to restore proper operation of the unit and/or system. At the same time, these systems do not constitute a complete protection against freezing of the working medium, e.g. in case of power failure.
The protections are not designed for continuous operation, i.e. for normal operating conditions. If the equipment is designed to operate in sub-zero temperatures, a mixture of water and antifreeze in a concentration that ensures no freezing under the designed operating conditions, or another system that avoids the freezing of working mediums regardless of the operating conditions and the occurrence of emergency situations, including lack of mains power. The warranty does not cover hydraulic components damaged by freezing of the working fluid.

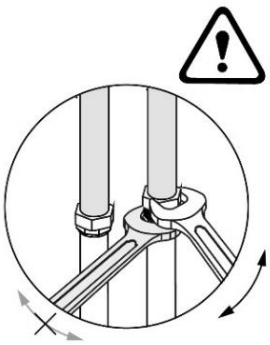
Units fitted with a passive anti-freeze protection system.



Chilled water coil

Cube OV units can be equipped with a water cooler. Precipitation of condensate is possible. Cube units are supplied with a condensate drain and trap.

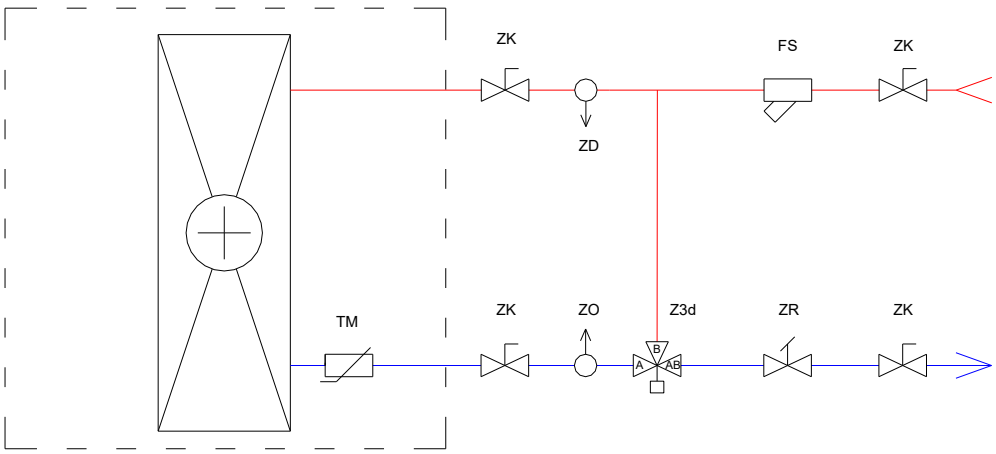
Ensure that excess condensate drains properly into the plumbing system according to the illustrations below.



- A water filter on the system is required to protect the plumbing system of the Cube units.
- In the case of units fitted with a water heater, particular attention must be paid to ensuring service access in terms of the plumbing system.

Remember the obligation to periodically check the filling level of the water trap.
It is necessary to carry out the condensate drainage installation yourself if such a need arises.

4.2. Hydraulic diagram for a water heater / water cooler



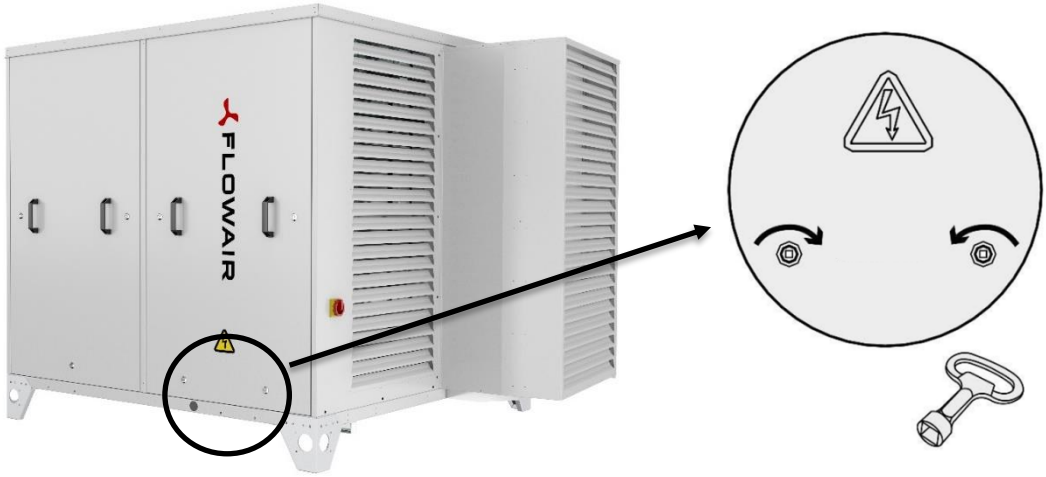
ZK - shut-off valve
ZO - vent valve
ZD - drainage valve
TM - temperature sensor (anti-freeze)

ZR - balancing valve

FS - mesh filter
Z3d - 3-way valve with actuator

4.3. Electrical connection

To access the electrical switchboard, remove the right-hand control panel on the exhaust side of the unit, using a special key.



Before starting the electrical connection work, make sure that the installation is disconnected from the power supply. The appliances should be supplied with a cable with the appropriate diameter based on the length, routing and power rating of the appliance.

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

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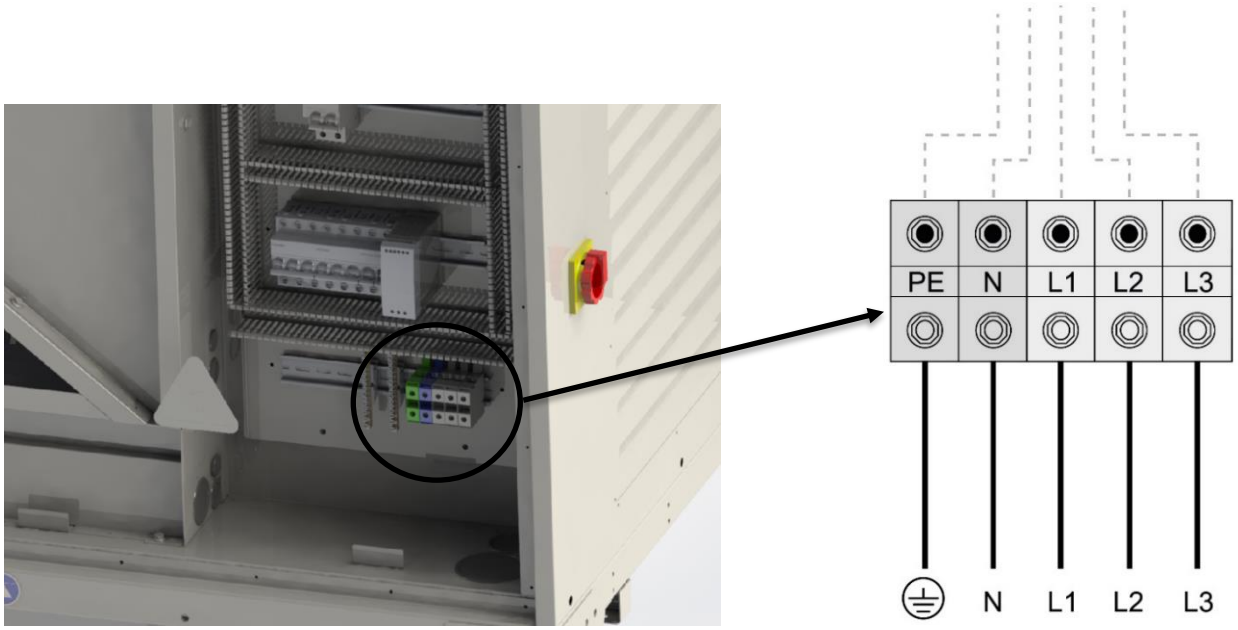
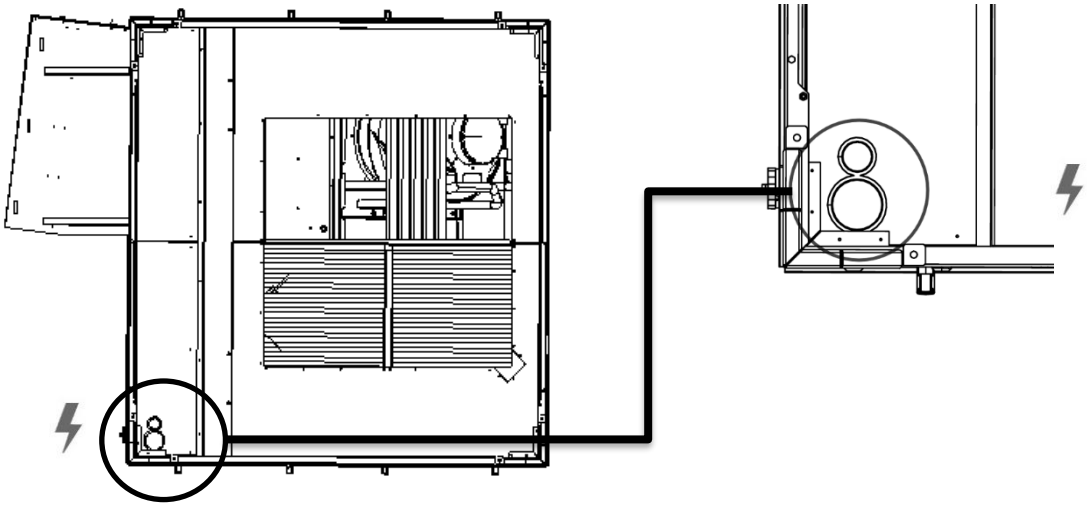


Cube OV overhead section

Route the unit's power cable through the prepared opening to the automation cabinet cover. The cable should then be connected to the ZUG terminals as described later in the description.



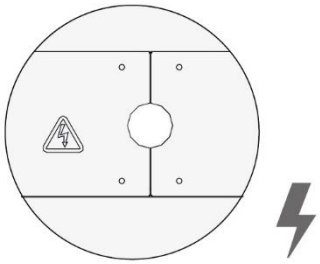
(view from underneath the unit)

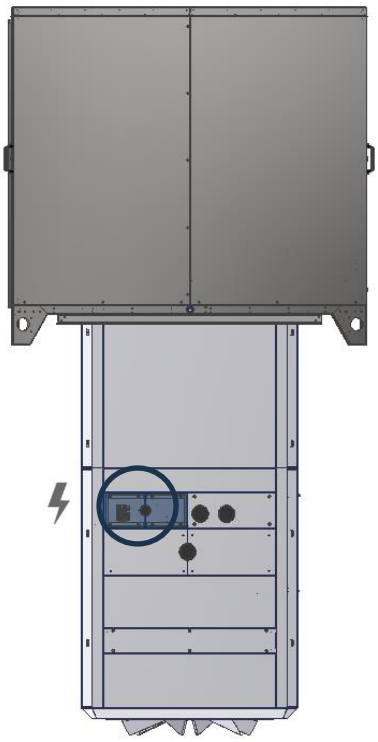
Cube OV underfloor sections

Route the unit's power cable through the prepared opening in the room section. The cable must then be connected to the ZUG terminals as described later in this description.

All electrical connection operations must be carried out by qualified personnel with authorisations and certificates for working with live equipment in accordance with the applicable laws in your country.

- Remember to earth the appliance and provide lightning protection by using lightning arresters.
- A copper cable must be used.
- An incorrect phase sequence will result in the equipment not being able to be switched on.





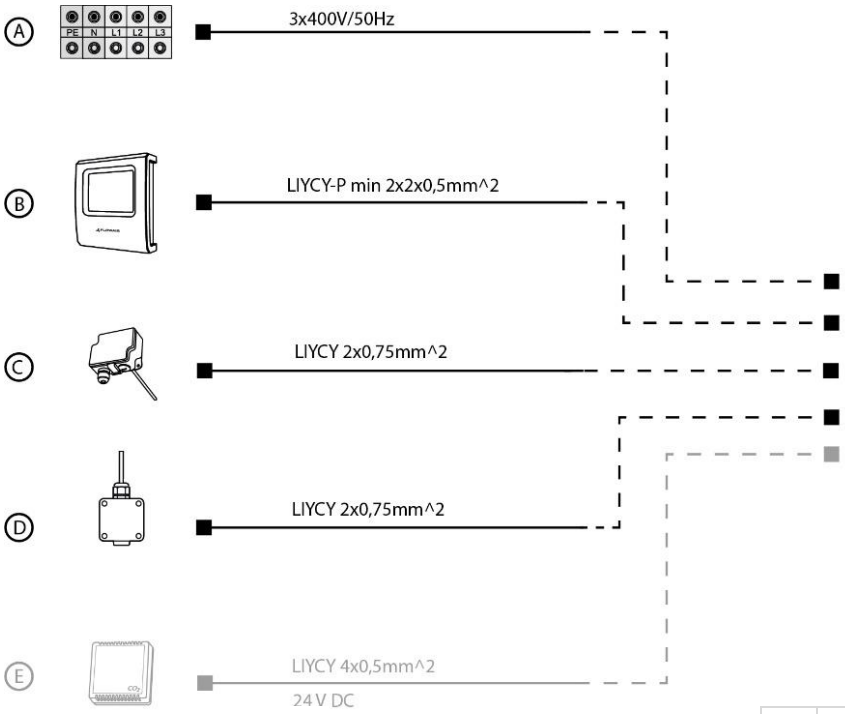
4.4. Wiring block diagram

The controller built into the appliance enables the T-box/M-box to be connected, allowing the user to change the appliance operating parameters from the room.

The Climatix controller built into each Cube unit enables connection to the Internet. The Internet connection enables ad hoc changes to the unit's operating parameters directly via a web browser, remote service access. For such access, please contact an authorised service centre.

Before commissioning the appliance, the power supply must be connected in accordance with para. 6.6. of this documentation and connect the following cables: communication cable of the control system (T-box or M-box), duct air supply temperature sensor and optionally the cable of the room temperature sensor to the automation chamber.

T-box /M-box - Cube

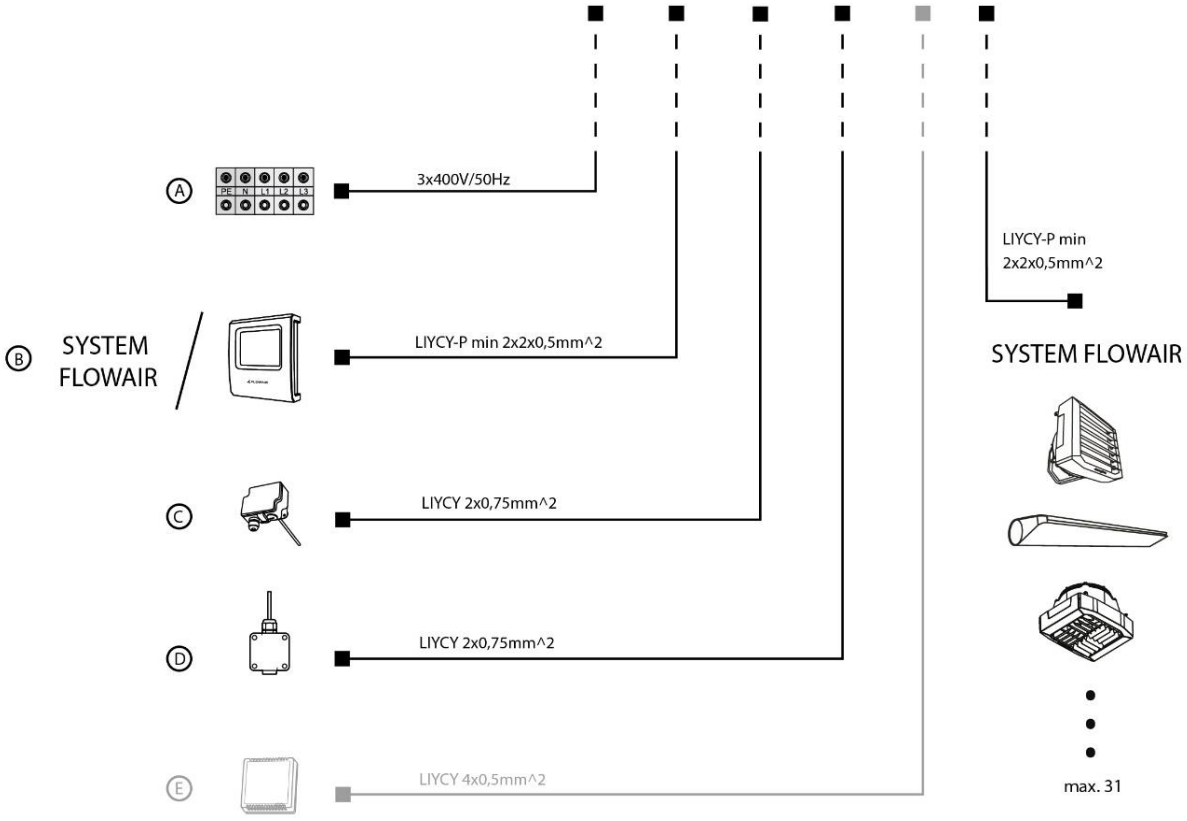


A	Supply
B	T-box / M-Box controller
C	Optional duct temperature sensor
D	Wall-mounted temperature sensor
E	Optional CO2 sensor (*4x0.5 mm²for 1-way sensor; 6x0.5 mm2 for 2-way sensor)

The cross-section of the supply cable should be selected by the designer taking into account their length and the maximum load current given in the technical data table, individually for each type of unit.

Controls within the Flowair system

A	Supply
B	T-box / M-box control
C	Optional channel temperature sensor
D	Wall-mounted temperature sensor
E	Optional CO2 sensor (*4x0.5〖mm〗^2 for 1-threshold sensor; 6x0.5mm^2 for 2-threshold sensor)



The cross-section of the supply cable should be selected by the designer taking into account their length and maximum load current given in the technical data table, individually for each type of device.

5. COMMISSIONING AND OPERATION

5.1. Rotary heat exchanger

Before commissioning, it should also be checked:

- that the exchanger rotor rotates without resistance,

- that the V-belt tension is correct,

- correctness of electrical connections,

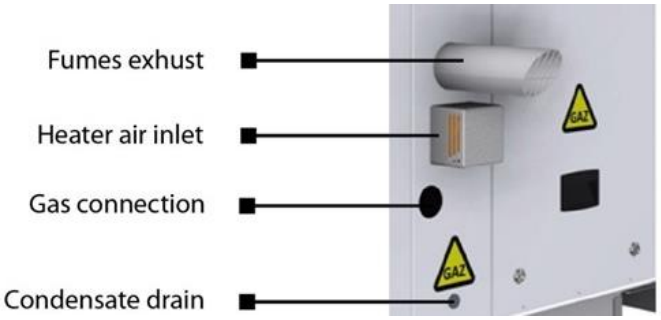
If a rotary heat exchanger is integrated in the unit, its operation should be checked during start-up by setting different supply temperatures by starting the exchanger.

5.2. Gas heater

The gas connection to the appliance may only be carried out by qualified personnel with appropriate authorisation.

The first start-up should be carried out by an authorised service centre. Refer to the detailed documentation of the gas unit manufacturer.

Caution high temperature
high flue gas temperature!



Special care must be taken to ensure service access to the gas installation. The connection should be made in such a way that service access is not impeded.

A shut-off valve should be fitted in front of each appliance, in a location easily accessible to the user. It is also recommended that mesh gas filters should be fitted in front of each appliance. The use of such filters protects the internal gas fittings (solenoid valve) from impurities and allows quick and reliable bleeding of the installation without the need to unscrew the installation (this is particularly important during the first start-up).

Before switching on the heater, check that:

- the air supply pipe to the combustion chamber and the exhaust pipe are unobstructed,
- the gas pipes are vented,
- the supply system and all safety and control devices are correctly installed,
- the heater is set up for the correct type of gas (nozzle diameters),
- if a gas other than G20, G30 or G31 is used, the service department must be informed in advance in order to equip the staff with the appropriate nozzles,
- the gas pressure in the heater supply connection is correct.

Gas heater data		Gm34	Gm45	Gm65
Nominal heating power	kW	33,6	40,5	62,9
Gas consumption G20	m^3/h	3,69	4,44	6,88
Exhaust system	-	integrated		
Connection	″	GZ 3/4"	GZ 3/4"	GZ 3/4"
Minimum flow rate	m^3/h	3500	4200	6500

(1) figures apply to G20 gas supply

If a gas other than G20, G30 or G31 is used, it is necessary to inform the service department in advance in order to equip staff with the appropriate nozzles.

Gas type	Nozzle	Gas 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 installation of the condensate drainage from the gas heater must be adapted to the designed operating conditions taking into account local regulations and standards.

The condensate drainage from the gas heater is via an unthreaded PEX pipe with diameters: external 16 mm, internal 12 mm.

5.3. Water coil

The unit is equipped with a water heater and a proportional 3-way mixing valve. The system is protected by a temperature sensor embedded in a scabbard mounted on the return pipe. The valve may only be connected by agreement with an authorised service centre. Before commissioning, the correct connection of the supply and return lines must be checked at , make sure that the system is filled, tight and vented. After commissioning, the correct operation of the mixing valve should also be checked; the whole should be completed by checking the conformity of the supply temperature obtained and the set temperature.

Special attention should be paid to ensuring service access to the hydraulic system. The connection should be made in such a way that service access is not hindered.

5.4. Chilled water coil

When using a water (glycol) cooler, the procedure and fittings are the same as for the water heater. When the water cooler is connected by qualified service personnel during commissioning, the operation must be checked by verifying that the set temperatures are reached. Please note that the correct operation of the cooler depends on the correct operation of the functioning refrigeration system. Before commissioning, check

- the correct connection of the supply and discharge lines,

- the correct positioning of the condenser with respect to the air flow direction,

- correct installation of the siphon

- before start-up of the air handling unit, pour water over the siphon,

- patency of the condensate drainage system.

5.5. Fans

The fan modules used in all types of units are factory built components that do not require inspection. Due to the design of the electronically commutated centrifugal fan, operation control should be based on determining whether the fan is rotating in the correct direction and thus the direction of air flow. Fans of this type do not have drive belts or frequency converters, which excludes control at start-up. The only thing to be checked is:

- that there are no objects in the vicinity of the fan that could be sucked into the impeller when it is started up,

- the fan impeller rotates freely without rubbing against housing parts,

- all bolts, holding down parts and electrical connections are firmly tightened,

- the power cables inside the fan section are away from all moving parts of the drive and fixed with suitable electrical cable holders,

5.6. Dampers

The commissioning procedure requires correct operation of the dampers, both shut-off, recirculation. The check should be preceded by checking that the dampers operate freely, this can be checked by pressing the release button on the actuator and manually checking the force required to open the damper. The damper should turn freely without any resistance. The further procedure is to check that the dampers are operating when the unit is switched on and to set the appropriate parameters.

5.7. Automatic control system

The Cube range of units uses the Climatix® system including control fittings and accessories. The first commissioning of the unit is carried out by the manufacturer's expert service, which checks the correctness of the connections and the configuration of the controller depending on the model. If the control system is found to be malfunctioning during operation, it is necessary to contact the manufacturer's service.

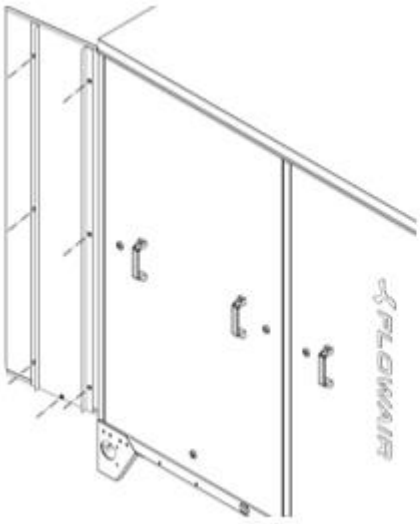
5.8. Filter replacement

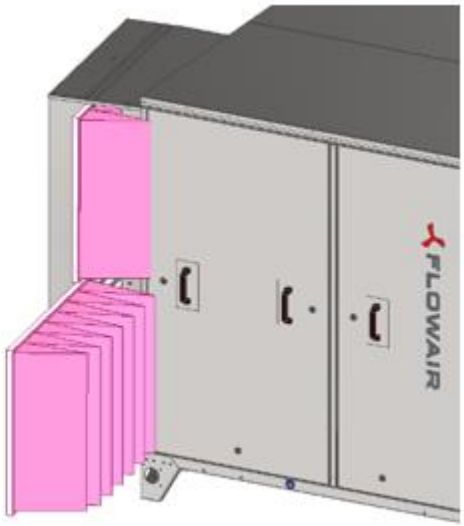
Cube units use air filters that prevent dust and dirt from entering the ventilated room. In addition, they effectively protect the remaining functional components of the air handling unit, above all the heat exchangers, from contamination. It is recommended to replace them at least **twice a year**, and more often if the ventilation air is highly polluted. The filters are protected by a pressure drop control system through the use of a differential pressure switch. In the event of an excessive pressure drop, a dirty filter alarm appears on the controller, signalling that the filter needs to be replaced. Before initial start-up, check that the filters are properly seated and that no alarms are displayed. If a dirty filter alarm is displayed and the condition of the filters does not require replacement, check the set pressure loss parameter on the pressure switch, which is located inside the centre post or power post. Filters can be purchased by contacting the manufacturer. To replace the filters, replacement instructions are shown below.

OV - supply side

Instructions for filter replacement:

1) Remove the screws from the unit's air intake;
2) Remove the closing panel;
3) Apply an adhesive gasket to the vertical walls of the filter frame (gasket thickness 3mm)
4) Remove used pocket filters and install fresh ones;
5) Reinstall the locking panel;
6) Tighten the panel with screws.



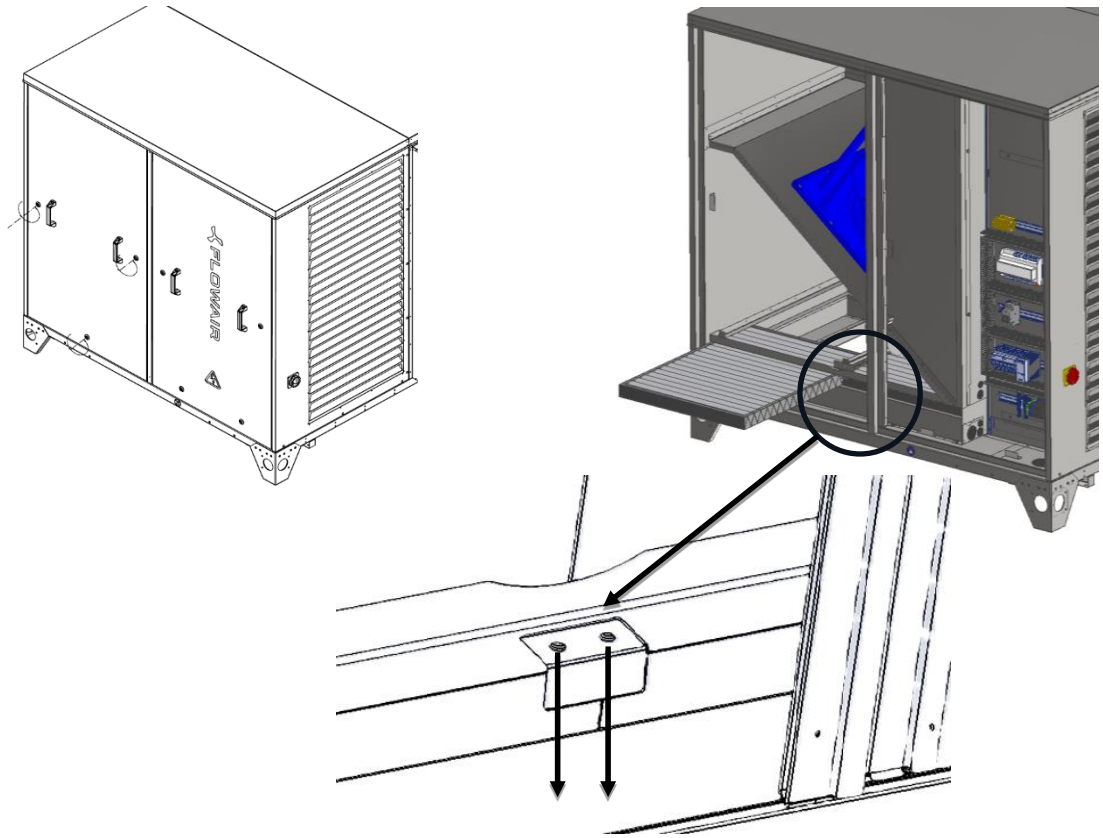


OV - exhaust side

Filter replacement instructions

1) Open the unit locks;
2) Remove the locking panel;
3) Remove clamping bracket
4) Apply adhesive gasket to filter frames on baffle side (gasket thickness 3mm)
5) Remove used cartridge filters and fit fresh ones;
6) Install push-on angle bracket

7) Reinstall the closure panel;
8) Tighten the unit panel locks.



5.9. Panel protection films

FLOWAIR Cube units are delivered protected by a protective film. The film helps to minimise the impact of external conditions on the units during transport and while waiting for installation. Before declaring the unit ready for commissioning and starting operation, remove the protective films from all unit components.

6. WORKING LIMITS

FLOWAIR sp. z o.o.

Chwaszczyńska 135 ul.

81-571 Gdynia

Gdynia, 30.05.2025.

FLOWAIR CUBE WORK LIMITS	JM	CUBE OV
Minimum air flow rate	m3/h	3000
Maximum air flow rate	m3/h	8000
Maximum pressure drop F7 (INFLUSION)	Pa	300
Maximum pressure drop M5 (EXHAUST)	Pa	300
Intake temperature range	°C	-25 ÷ 50
Extract air temperature range	°C	5 ÷ 50
Maximum absolute humidity of the exhaust air	kg/kg	0,02
Supply air temperature range	°C	10 ÷ 45
Diffuser opening range	°	40÷ 90
Discharge range with Dx FA2	m^3/h	4000 ÷ 8000
Discharge range with Dx FA5	m^3/h	6000 ÷ 8000
Operating range Dx in cooling	°C	-5 ÷ 50
Operating range Dx in heating	°C	-20 ÷ 15,5
Minimum air flow for individual gas modules	m^3/h	**GM34** - 3500 **GM45** - 4200 **GM65** - 6500

7. RESPONSE TABLE

	Contractors	Manufacturer service	Remarks
Foundation of the unit according to the unit documentation.	x		
Pulling the cable harness from the vortex diffuser to the unit control cabinet	x		applies to units with overhead section OV
Connection of the supply cable to the terminals located in the Cube unit control cabinet (ensuring correct phase sequence connection)	x		Applies to units with overhead section OV
Connect the power cable to the terminals in the Cube vortex air distributor module (ensure correct phase sequence). Caution: Previously carry out the scope of work mentioned in the previous point.	x		
Connecting the power and control cables, temperature sensors and communication cables to the control cabinet according to the device documentation .	x		
Supply, connection and bleeding of the hydraulic system.	x		option
Gas supply, connection to the appliance and bleeding.	x		option
Installation of siphon trap and filling of siphon with water	x		option
Provide service access in accordance with equipment documentation .	x		
Roofing treatment	x		
Tear-off of film protecting the outer sheet sheathing	x	option	
Connection of cables: power and control, temperature sensors and Tbox controller in the control cabinet.		x	
Initial start-up of the unit		x	

8. ERP data

Fan efficiency data given in accordance with ErP2018 requirements for air handling units

Model	**Cube OV**	
Unit type	SWNM, DSW	
Fan drive type	Continuously variable fan speed control, EC fans	
Type of heat recovery system	other, rotary exchanger	
Manufacturer	FLOWAIR Sp. z o.o. ul. Chwaszczyńska 135, 81-571 Gdynia	
Fresh air flow [m3/h]	**8 000**	
Heat recovery efficiency [%]	74,1%	
Nominal flow rate [m3/s].	2,22	
Effective power consumption [kW]	3,14	
JMWint W/(m3/s)	811	
Face velocity [m/s]	2,35	
Nominal external pressure $\Delta p_{(s,ext)}$ [Pa].	Supply: 223	extract: 234
Internal pressure drop for parts with ventilation function $\Delta p_{(s,int)}$ [Pa].	supply: 250	extract: 250
Static efficiency of fans used in accordance with Regulation (EU) No 327/2011 [%]: Supply: 67.6	supply: 67.6	extract: 67,8%
Declared maximum air leakage [%].	Outside: 2.0	Internal: 3.0
Description of filter contamination warning mechanism	Indication of the need to change the filter based on information from the pressure sensor	
Filter class	F7/ePM2.5 65% - supply air filter;	M5/ePM10 55% - extraction filter
Website address	www.flowair.com	

SERVICE AND WARRANTY

In the event of any malfunction, please contact the manufacturer's service department.

Warranty: The warranty period for all Cube units is 24 months from the date of first commissioning, but no longer than 27 months from the date of delivery. As an option, it is possible to purchase additional maintenance services, i.e. remote access and warranty extension. It is possible to extend the warranty period to up to 60 months from the date of first commissioning, but no longer than 63 months from the date of delivery. The cost of warranty extension is priced individually depending on the configuration of the unit. A prerequisite for maintaining the warranty is a paid initial start-up by an authorised service centre and paid periodic warranty inspections every 6 months in the case of units equipped with a cooling unit or every 12 months for other units. If you are interested in additional services, please contact the manufacturer's service department.

Warranty conditions:

- The customer has the right under the guarantee to replace the appliance or its component with a new one, free of defects, if during the guarantee period the manufacturer determines that it is not possible to rectify the defect.
- Parts that are dismantled and replaced with new parts during the service provision become the property of the manufacturer.
- If the warranty service is performed at the place of installation of the device, the manufacturer covers the costs of travel of the authorised service staff and shipment of the spare parts.
- The proof of purchase is the basis for the user to apply for a free of charge warranty repair.
- Warranty repairs are carried out by the manufacturer's service department or by an authorised service centre. In the event of an unfounded call for warranty repair or service work being interrupted through the fault of the user, the user will be liable for the full costs thereof.
- The warranty is valid only in the territory of the Republic of Poland.
- The manufacturer reserves the right to consider the warranty claim and undertake servicing within 48 working hours.
- The manufacturer reserves the right to remove defects resulting from manufacturer's fault within 14 working days. In exceptional cases, this period may be prolonged, in particular when the warranty service requires parts or sub-assemblies to be brought in from the sub-supplier and when the service is not available.
- In the event that the defect is not permanent and its determination requires a longer diagnosis, the manufacturer reserves the right to extend the warranty consideration period specified in the preceding paragraph. The manufacturer will notify the need for an extension of the warranty consideration period in writing as soon as it becomes necessary.
- If it is found that the fault is due to the appliance not being used in accordance with the manufacturer's instructions or the advertised appliance proves to be fully operational - the warranty will not be recognised and the applicant will have to pay for the arrival of an authorised service centre or any other costs incurred by the manufacturer as a result of unjustified notification.
- The guarantee does not apply in the following cases:

- the appliance has not been subjected to regular warranty inspections,
- warranty inspections and other servicing were not performed by an authorised manufacturer's service,
- installation, electrical or hydraulic connection of the appliance is not in compliance with the recommendations contained in the manufacturer's technical documentation,
- installation and foundation of the equipment not in conformity with the manufacturer's guidelines,

- defects caused by physical or electrical influences inconsistent with the recommendations in the technical documentation, overheating or dampness or environmental conditions, getting wet, corrosion, oxidation, damage or fluctuation of electrical voltage, lightning, fire or other force majeure causing damage or destruction to the product,
- failure to comply with other recommendations contained in the manufacturer's technical documentation,
- modification, change of operating parameters, repair or replacement of parts of the device without the manufacturer's written consent,
- mechanical damage or destruction and defects caused thereby,
- the warranty does not cover parts subject to normal wear and tear, consumables (filters, seals, belts, bulbs, fuses, bearings, etc.),
- lack of commissioning by the manufacturer's authorised service.

The customer is obliged to allow service staff safe and immediate access to the equipment.

Manufactured in Poland / EU

Manufacturer: FLOWAIR Sp. z o.o.

FLOWAIR SP. Z O.O.
ul. Chwaszczyńska 135, 81-571 Gdynia
e-mail: info@flowair.pl www.flowair.com

Jednostki Cube OV / Cube OV units; 30.06.2025

CE

DEKLARACJA ZGODNOŚCI WE / DECLARATION OF CONFORMITY WE	**PL /EN**

Niniejszym deklarujemy, iż urządzenia recyrkulacyjno – nawiewno - wywiewne/ FLOWAIR hereby confirms that rooftop units:

- Cube OV;

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

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

1. **2006/42/EC** Maszynowej (MD) / Machinery (MD);
2. **2014/30/UE** Kompatybilności elektromagnetycznej (EMC) / Electromagnetic Compatibility (EMC);
3. **2014/35/UE** Niskonapięciowe wyroby elektryczne (LVD) / Low Voltage Electrical Equipment (LVD);
4. **2009/125/EC** wg / acc. 327/2011 Wentylatory (ErP) / Fans (ErP);
5. **2009/142/EC** Urządzenia spalające paliwa gazowe (GAD) / Units burning gaseous fuels (GAD)

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

PN-EN 60335-2-40:2004	Elektryczny sprzęt do użytku domowego i podobnego - Bezpieczeństwo użytkowania – 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 60335-1:2012	Elektryczny sprzęt do użytku domowego i podobnego - Bezpieczeństwo użytkowania – Część 1: Wymagania Ogólne / Household and similar electrical appliances - Safety - Part 1: General requirements
PN-EN 60529:2003	Stopnie ochrony zapewnianej przez obudowy (Kod IP) / Degree of protection provided by enclosures (IP code)
PN-EN ISO 12100:2012	Bezpieczeństwo maszyn - Ogólne zasady projektowania - Ocena ryzyka i zmniejszanie ryzyka / Machine Safety - General Principles of Design - Risk Assessment and Risk Reduction
PN-EN 55014-1:2020	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 55014-2:2021	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 61000-6-1:2008	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 61000-6-2:2019	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 61000-6-3:2021	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 61000-6-4:2021	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 61000-3-12:2007	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

30.06.2025

Managing Director
Maciej Ośka

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