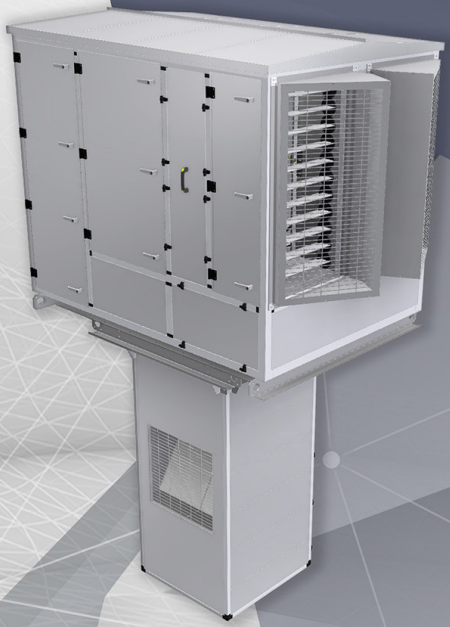
JUWENT

OPTIMAX TOP

DUCTLESS AIR HANDLING UNITS

INSTRUCTION MANUAL



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PCA Polski Centrum Akredytacji Certyfikacja Systemów Zarządzania AC 137 QMS

Manufactured in accordance with EN 1886 and EN 13053 standards

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1. INTRODUCTION

For the correct and safe operation of the unit, it is essential to read this manual carefully and to use the unit in accordance with the rules and safety conditions specified in it. All tasks related to unloading and transporting the AHU's components and sections, connecting them to systems, and performing maintenance must be carried out by qualified personnel or under the supervision of authorized personnel. Qualified personnel are individuals who, through their training, work experience, and knowledge of relevant standards, documents, and regulations on occupational safety and working conditions, have been authorized to perform the necessary tasks and are capable of recognizing and avoiding potential hazards.

- The installation of the unit, connection to related systems, start-up, use, and maintenance must be conducted in accordance with the relevant directives and regulations in effect in the country where the unit is installed.
- It is recommended to use the services of JUWENT Authorized Service Providers for installation, start-up, post-warranty repairs, inspections, and maintenance of the equipment.
- Ensure that the documentation is always kept near the unit and is easily accessible to maintenance personnel.

2. INTENDED USE

OPTIMAX-TOP is a series of energy-efficient compact air handling units that incorporate the latest thermal and ventilation technology. This series includes four unit types:

OPTIMAX-TOP-O: Supply and exhaust unit with heat recovery.
OPTIMAX-TOP-NW: Supply and exhaust unit with recirculation.
OPTIMAX-TOP-N: Supply unit with recirculation.
OPTIMAX-TOP-R: Recirculation unit.

The high-efficiency rotary heat exchanger enables the recovery of thermal energy from exhaust air with up to 90% efficiency. Additionally, the **high-efficiency fans with EC motors** are used to minimize electricity consumption. The double-skin panels are 50 mm thick and insulated with mineral wool to reduce heat loss to the environment. They also provide excellent acoustic insulation for the working fans.

The OPTIMAX-TOP air handling units come fully pre-wired with a built-in, pre-configured control panel. They are equipped with air distributors featuring swirl diffusers that provide direct air distribution to the serviced space, removing the need for additional ventilation ductwork. They are designed for use in facilities such as sports halls, warehouses, production halls, stores, and other large industrial and public-use spaces.

3. OPERATING CONDITIONS

The units must not be used under the following conditions:

- The air being transferred may contain solid, pasty, fibre and aggressive substances causing corrosion or decomposition of zinc, copper, steel and aluminium.
- Temperature and humidity values for external air in summer or winter fall outside the limits specified for Europe.
- Operation is expected in maritime or tropical climates.
- The air is excessively dusty, requiring frequent replacement of air filters within the unit.
- Prolonged power supply interruptions occur, which may disrupt hot water production and compromise regulation and control systems. Consequently, even high-performance automatic safety mechanisms may fail to prevent heating coils from freezing, potentially leading to coil damage, property damage, and other associated losses.
- The limit values of certain operational parameters are exceeded:
  - Minimum supply temperature of the heat transfer medium in the water heating coil: 20°C
  - Maximum supply temperature of the heat transfer medium in the water heating coil: 130°C
  - Maximum operating pressure of the water heating coil: 1.5 MPa
  - Minimum temperature of the handled air: -35°C
  - Maximum temperature of the handled air: +35°C
  - Minimum ambient temperature: -35°C
  - Maximum ambient temperature: +50°C

4. FUNCTIONS OF AIR HANDLING UNIT

5. AIR FLOW RANGE

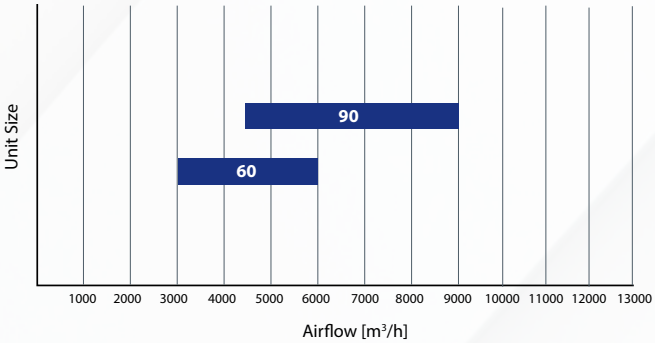
OPTIMAX-TOP-O	60	90
V min (m^3/h)	3000	4500
V max (m^3/h)	6000	9000

OPTIMAX-TOP-N	60	90
V min (m^3/h)	3000	4500
V max (m^3/h)	6000	9000

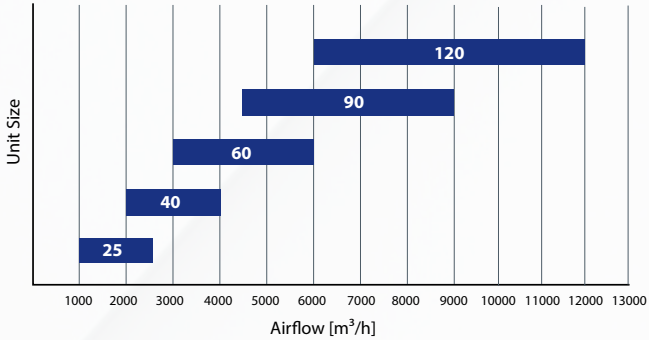
OPTIMAX-TOP-NW	60	90
V min (m^3/h)	3000	4500
V max (m^3/h)	6000	9000

OPTIMAX-TOP-R	25	40	60	90	120
V min (m^3/h)	1000	2000	3000	4500	6000
V max (m^3/h)	2500	4000	6000	9000	12000

Airflow Range of **OPTIMAX-TOP-O, NW, N**



Airflow Range of **OPTIMAX-TOP-R**



6. DESIGN AND CONSTRUCTION OF OPTIMAX-TOP-O, -NW, -N

The O-, NW-, and N-type units consist of a basic section designed for rooftop installation and an air distributor installed below the ceiling inside the building. The installation requires a roof curb made of either a steel structure or concrete/masonry, along with appropriate mounting openings in the roof deck.

6.1. CASING PARAMETERS

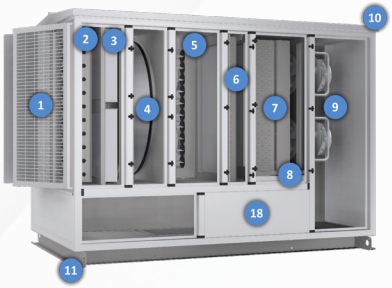
The parameters below are provided in accordance with EN 1886:

PARAMETER	mechanical strength	casing air leakage	filter bypass leakage	thermal transmittance	thermal bridging factor
CLASS	D1	L1	F9	T3	TB1

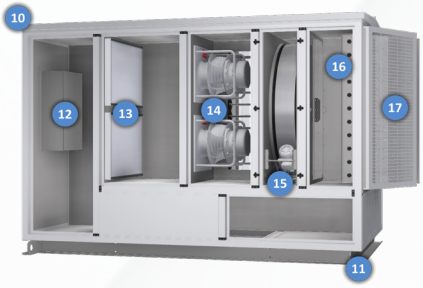
6.2. BASIC SECTION

The casing design of the basic section is based on a framework of aluminium profiles. The casing consists of 50 mm thick double-skin panels filled with mineral wool. Inspection panels are hinged and secured with lever handles or pull handles. The base frame for each AHU size is constructed using steel profiles. The basic section is available in several versions, depending on the configuration of the air treatment components. It comes fully pre-wired with a built-in electrical control panel. Additionally, air shut-off dampers are fitted inside the basic section to the intake and discharge.

OPTIMAX-TOP-O SUPPLY



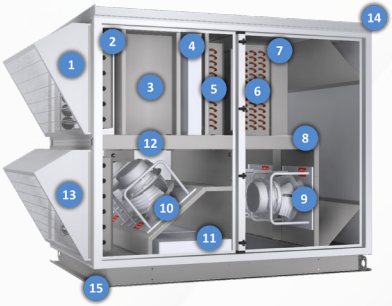
OPTIMAX-TOP-O EXHAUST



AHU Components

1. Air Intake Cowl
2. Outdoor Air Damper
3. Outdoor Air Filter
4. Rotary Heat Exchanger
5. Mixing Chamber
6. Water/Electric Heater
7. Water/DX Cooling Coil
8. Droplet Eliminator
9. Supply Fans
10. Roof
11. Base Frame
12. Electrical Control Panel
13. Exhaust Air Filter
14. Exhaust Fans
15. Rotary Heat Exchanger Drive
16. Extract Air Damper
17. Air Extract Cowl

OPTIMAX-TOP-NW
SERVICE SIDE

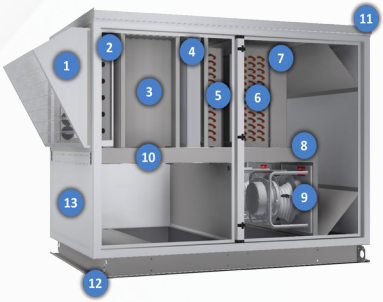


OPTIMAX-TOP-NW
NON-SERVICE SIDE

AHU Components

1. Air Intake Cowl
2. Outdoor Air Damper
3. Electrical Control Panel
4. Supply Air Filter
5. Water/Electric Heater
6. Water/DX Cooling Coil
7. Droplet Eliminator
8. Condensate Drip Tray
9. Supply Fans
10. Exhaust Fans
11. Exhaust Air Filter
12. Air Recirculation Damper
13. Air Extract Cowl
14. Roof
15. Base Frame
16. Water Heating Coil Connections
17. Water/DX Cooling Coil Connections
18. Condensate Drain Connection
19. Casing

OPTIMAX-TOP-N
SERVICE SIDE



OPTIMAX-TOP-N
NON-SERVICE SIDE

AHU Components

1. Air Intake Cowl
2. Outdoor Air Damper
3. Electrical Control Panel
4. Supply Air Filter
5. Water/Electric Heater
6. Water/DX Cooling Coil
7. Droplet Eliminator
8. Condensate Drip Tray
9. Supply Fans
10. Air Recirculation Damper
11. Roof
12. Base Frame
13. Casing
14. Water Heating Coil Connections
15. Water/DX Cooling Coil Connections
16. Condensate Drain Connection

6.3. AIR DISTRIBUTOR

The casing design of the air distributor is also based on a framework of aluminium profiles. The casing consists of 30 mm thick double-skin panels filled with mineral wool. Inspection panels are removable, equipped with pull handles, and secured with wing thumb screws. A load-bearing steel frame is located at the top of the distributor, designed for mounting on a roof curb and connecting to the basic section. The air distributor is available in two versions: with or without swirl diffusers. The version with swirl diffusers can be equipped with 1, 2, or 4 diffusers. The version without diffusers includes 2 or 4 side air outlets for connecting to ductwork. The version with 2 or 4 swirl diffusers requires short spiral duct segments ending in plenum boxes to be connected to the air distributor. The plenum boxes and swirl diffusers are supplied with the air distributor, The ductwork is not included in the scope of delivery.

SINGLE VERTICAL AIR OUTLET WITH SWIRL DIFFUSER

TWO HORIZONTAL AIR OUTLETS

FOUR HORIZONTAL AIR OUTLETS

AHU Components

1. Supply Air Inlet
2. Supply Air Outlet
3. Exhaust Air Inlet
4. Exhaust Air Outlet
5. Access Panel
6. Load-Bearing Frame
7. Casing

7. DESIGN AND CONSTRUCTION OF OPTIMAX-TOP-R

The R-type unit consists of a basic section and a trapezoidal air distributor attached to it. The entire assembly is designed for ceiling-mounted installation in the serviced room using M8 threaded rods.

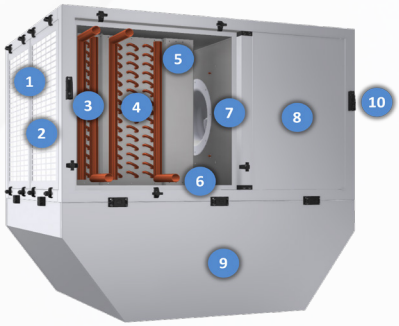
7.1. BASIC SECTION

The casing design of the basic section is based on a framework of aluminium profiles. The casing consists of 50 mm thick double-skin panels filled with mineral wool. Inspection panels are removable, equipped with pull handles, and secured with wing thumb screws. The unit is designed to be suspended from the ceiling using M8 threaded rods held by suspension brackets mounted on the sides of the basic section. Connectors for attaching the air distributor are installed at the bottom of the basic section. The basic section is available in several versions, depending on the configuration of the air treatment components. It comes fully pre-wired, with the electrical control panel pre-installed on the casing.

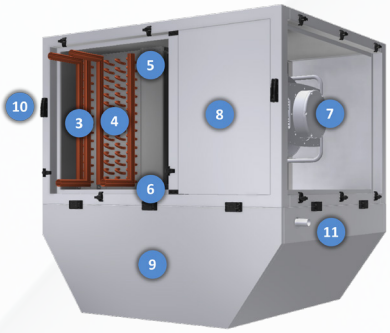
7.2. AIR DISTRIBUTOR

The air distributor is made with self-supporting construction. Its casing consists of 20 mm thick double-skin panels filled with mineral wool for thermal insulation. Connectors for attaching the air distributor to the basic section are located at the top. The air distributor is available in two versions: with or without swirl diffusers. The version with swirl diffusers can be equipped with 1, 2, or 3 diffusers. The version without diffusers includes two side air outlets for connecting to ductwork. The version with 2 or 3 swirl diffusers requires short spiral duct segments ending in plenum boxes to be connected to the air distributor. The plenum boxes and swirl diffusers are supplied with the air distributor, but the ductwork is not included in the scope of delivery.

OPTIMAX-TOP-R
SERVICE SIDE



OPTIMAX-TOP-R
NON-SERVICE SIDE

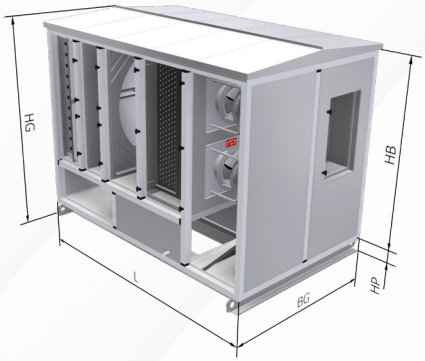


AHU Components

1. Exhaust Air Inlet
2. Air Filter
3. Water/Electric Heating Coil
4. Water/DX Cooling Coil
5. Droplet Eliminator
6. Condensate Drip Tray
7. Fan
8. Casing
9. Air Distributor
10. Suspension Bracket
11. Condensate Drain Connection

8. EXTERNAL DIMENSIONS OF THE UNIT

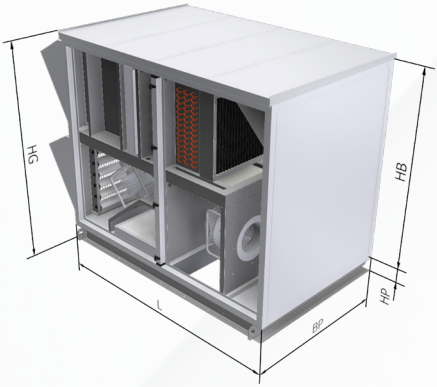
OPTIMAX-TOP-O BASIC SECTION



Dimension / Size	HG	HB	HP	BG	L	LMC*	LMNC*
60	1940	1700	120	1550	2150	2450	2650
90	2140	1900	120	1750	2250	2450	2750

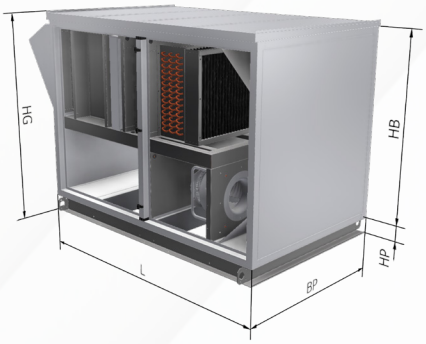
L — length of the section with a heating coil and/or cooling coil
LMC* — length of the section with a mixing chamber and cooling coil
LMNC* — length of the section with a mixing chamber, heating coil, and cooling coil
All dimensions are in mm.

OPTIMAX-TOP-NW BASIC SECTION



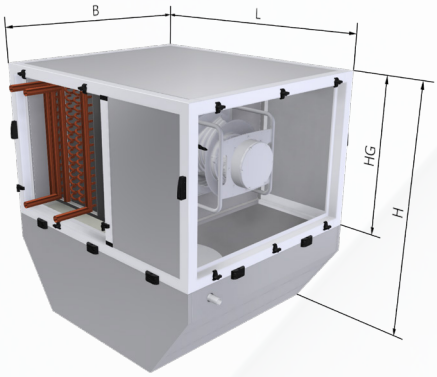
Dimension / Size	HG	HB	HP	L	BP
60	1800	1600	120	2050	1300
90	2050	1850	120	2250	1500

OPTIMAX-TOP-N BASIC SECTION



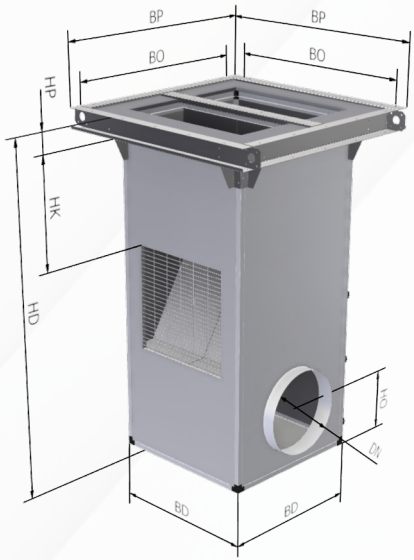
Dimension / Size	HG	HB	HP	L	LP
60	1570	1400	120	2050	1300
90	1780	1600	120	2250	1500

OPTIMAX-TOP-R BASIC SECTION WITH AIR DISTRIBUTOR



Dimension / Size	HG	H	B	L
25	600	1100	800	1200
40	800	1300	800	1200
60	800	1300	1100	1300
90	1100	1700	1100	1300
120	1100	1700	1400	1300

AIR DISTRIBUTOR FOR OPTIMAX-TOP-O, -NW, -N



Dimension / Size	HD	HK	HP	BP	BO	BD	DN	HO
60	2000	610	120	1300	1150	900	315, 400, 500	370
90	2000	570	120	1500	1350	1100	400, 500, 630	420

9. PRODUCT DESIGNATION

OPTIMAX-TOP - O - 60 - EC12 - P - ZV - K - M - NLW / CLW - D4 - S5

UNIT TYPE:
O – supply and exhaust air handling unit with heat recovery
NW – supply and exhaust air handling unit with air recirculation
N – supply air handling unit with air recirculation
R – recirculation air handling unit

UNIT SIZE
60, 90 – applicable to types O, NW, N
20, 40, 60, 90, 120 – applicable to type R

TYPE AND NUMBER OF FANS
EC – fan with electronically commutated motor
1 – number of fans in the same airstream
2 – fan size

ACCESS SIDE
P – right-hand
L – left-hand

VERSION
ZV – outdoor
W – indoor

ROTARY HEAT EXCHANGER TYPE
P – condensation
K – epoxy-coated
E – hygroscopic
N – sorption

M – MIXING CHAMBER

HEATING COIL
NLW – water coil
NE – electric

COOLING COIL
CLW – water coil
CF – evaporator coil

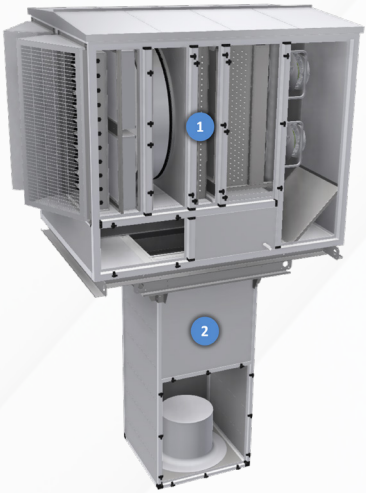
AIR DISTRIBUTOR TYPE
D1, D2, D3, D4 – digit represents the number of outlets

SWIRL DIFFUSER TYPE
S – maximum vertical air throw: 15 m
O – maximum vertical air throw: 30 m
2, 3, 4, 5, 6 – swirl diffuser size

10. EXAMPLE CONFIGURATIONS

10.1. EXAMPLE CONFIGURATIONS OF OPTIMAX-TOP-O

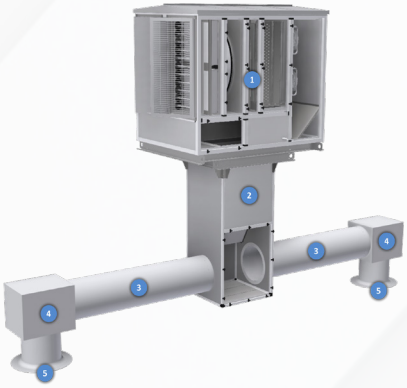
VERSION WITH 1 SWIRL DIFFUSER



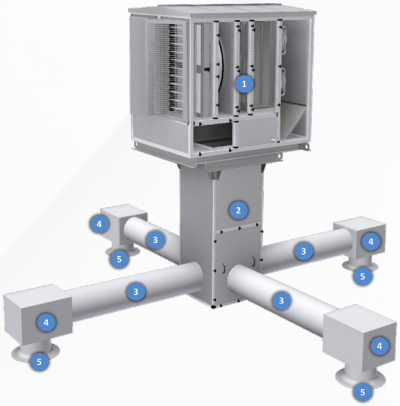
AHU Components:

1. Basic Section
2. Air Distributor
3. Ductwork
4. Plenum Box
5. Swirl Diffuser

VERSION WITH 2 SWIRL DIFFUSERS



VERSION WITH 4 SWIRL DIFFUSERS



In the version with 2 or 4 air outlets, the unit can be supplied without plenum boxes and swirl diffusers, allowing for direct connection to ductwork equipped with air supply grilles or equivalent components.
The ductwork is not included in the scope of delivery.

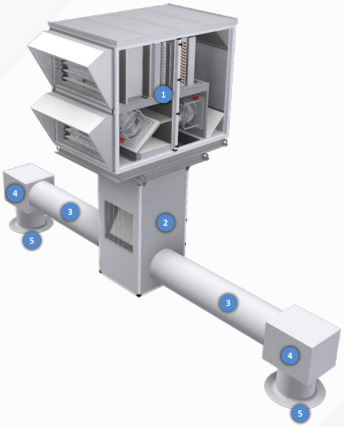
10.2. EXAMPLE CONFIGURATIONS OF OPTIMAX-TOP-NW

VERSION WITH 1 SWIRL DIFFUSER

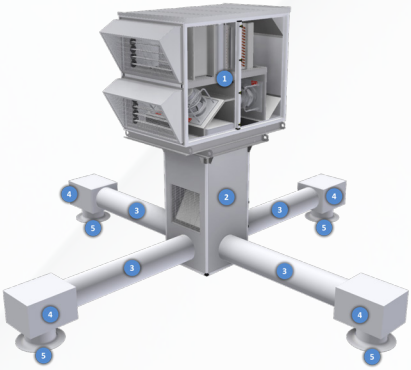
AHU Components:

1. Basic Section
2. Air Distributor
3. Ductwork
4. Plenum Box
5. Swirl Diffuser

VERSION WITH 2 SWIRL DIFFUSERS



VERSION WITH 4 SWIRL DIFFUSERS



In the version with 2 or 4 air outlets, the unit can be supplied without plenum boxes and swirl diffusers, allowing for direct connection to ductwork equipped with air supply grilles or equivalent components.
The ductwork is not included in the scope of delivery.

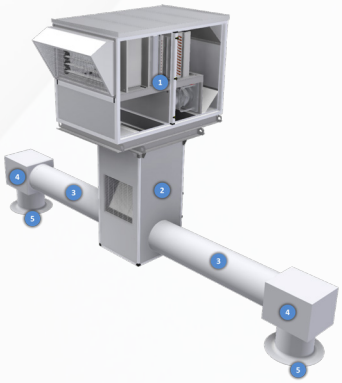
10.3. EXAMPLE CONFIGURATIONS OF OPTIMAX-TOP-N

VERSION WITH 1 SWIRL DIFFUSER

AHU Components:

1. Basic Section
2. Air Distributor
3. Ductwork
4. Plenum Box
5. Swirl Diffuser

VERSION WITH 2 SWIRL DIFFUSERS



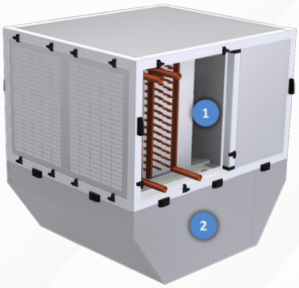
VERSION WITH 4 SWIRL DIFFUSERS

In the version with 2 or 4 air outlets, the unit can be supplied without plenum boxes and swirl diffusers, allowing for direct connection to ductwork equipped with air supply grilles or equivalent components.

The ductwork is not included in the scope of delivery.

10.4. EXAMPLE CONFIGURATIONS OF OPTIMAX-TOP-R

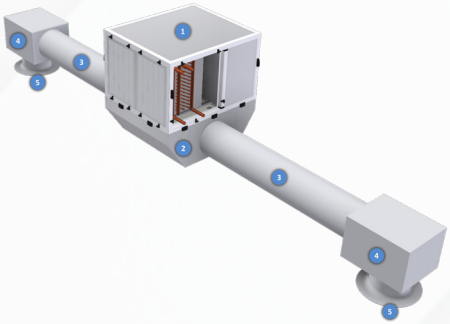
VERSION WITH 1 SWIRL DIFFUSER



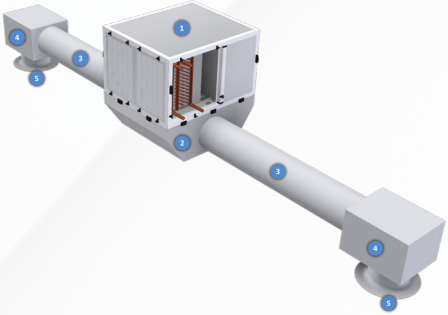
AHU Components:

1. Basic Section
2. Air Distributor
3. Ductwork
4. Plenum Box
5. Swirl Diffuser

VERSION WITH 2 SWIRL DIFFUSERS



VERSION WITH 3 SWIRL DIFFUSERS



In the version with 2 or 3 air outlets, the unit can be supplied without plenum boxes and swirl diffusers, allowing for direct connection to ductwork equipped with air supply grilles or equivalent components.
The ductwork is not included in the scope of delivery.

11. AVAILABLE VERSIONS

Standard version: Suitable for most ventilation system applications where there are no specific requirements for increased resistance to chemicals and their vapours in the ambient or transported air.

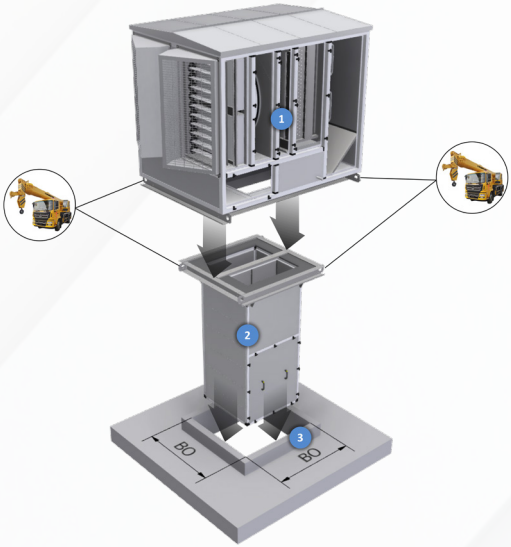
Hygienic Version (HS): Designed for environments requiring higher resistance to chemicals and their vapours in the ambient or transported air. This version is ideal for use in the food and pharmaceutical industries or healthcare facilities, except for class S1 rooms such as operating theatres.

Swimming Pool Version: Specifically tailored for environments such as swimming pool facilities and indoor pool areas, where chemical vapours from water treatment processes are present in the surrounding or transported air.

AHU COMPONENTS		AHU VERSIONS		
		STANDARD	HYGIENIC HS	SWIMMING POOL
CASING	framework	aluminium	aluminium	epoxy coated aluminium
	inner skin – walls	galvanised steel	aluzinc/magnelis	epoxy coated galvanised steel
	inner skin – ceiling	galvanised steel	aluzinc/magnelis	epoxy coated galvanised steel
	inner skin – floor	galvanised steel	acid-proof stainless steel	epoxy coated galvanised steel
	outer skin	aluzinc/magnelis	aluzinc/magnelis	aluzinc/magnelis
	internal structural elements	galvanised steel	acid-proof stainless steel	epoxy coated galvanised steel / acid-proof stainless steel
	insulation	mineral wool	mineral wool	mineral wool
	base-frame	galvanised steel	galvanised steel	galvanised steel
AIR DAMPERS	frame	galvanised steel	acid-proof stainless steel	epoxy coated galvanised steel
	blades	aluminium	aluminium	epoxy coated aluminium
COILS	frame	galvanised steel	acid-proof stainless steel	epoxy coated galvanised steel
	fins	aluminium / epoxy coated aluminium	aluminium / epoxy coated aluminium	epoxy coated aluminium
	tubes	copper	copper	copper
CONDENSATE DRIP TRAY	condensate drip tray	prepainted galvanised steel	prepainted galvanised steel	epoxy coated galvanised steel / acid-proof stainless steel
	drain connection	plastic	plastic	plastic
BAFFLES OF SOUND ATTENUATORS	frame	galvanised steel	acid-proof stainless steel	epoxy coated galvanised steel
	infill	mineral wool covered with fabric	mineral wool covered with fabric	mineral wool covered with fabric
FANS	impeller	plastic	plastic	plastic
	motor	prepainted steel	prepainted steel	prepainted steel
	frame	galvanised steel	epoxy coated galvanised steel	epoxy coated galvanised steel
DROPLET ELIMINATOR	frame	galvanised steel	acid-proof stainless steel	epoxy coated galvanised steel
	blades	plastic	plastic	plastic
FLEXIBLE CONNECTORS	frame	galvanised steel	galvanised steel	epoxy coated galvanised steel
	flexible strip	galvanised steel	galvanised steel	acid-proof stainless steel
CORROSION CLASS	inner skin / outer skin	C3/C4	C3/C4	C3/C3

12. TRANSPORTATION

- The air handling unit is delivered in sections. It becomes the property of the customer once the delivery note is signed by the customer's representative.
- Upon receipt, immediately check the condition of the packaging and verify the completeness of the delivery against the enclosed specifications and delivery notes.
- Unloading the AHU sections and transporting to the installation site should be performed by suitably qualified personnel using a forklift or crane.
- The AHU sections must be transported only in their normal operating position and must not be stacked on top of each other.
- When transporting the AHU or its sections using a forklift, the length of the forks should be adjusted so that the ends extend beyond the outline of the base frame.
- When transporting the AHU or its sections using a crane, the unit's casing must be protected to prevent the lifting ropes or chains from damaging it during lifting.



Installation Components:

1. Outdoor Part
2. Air Distributor
3. Roof Curb

13. STORAGE

- The sections of the air handling unit should be stored away from areas with heavy machinery traffic (such as cars, cranes, and other construction equipment), in a location where they are protected from mechanical damage, moisture, aggressive chemicals, dust, sand, and other external factors that could cause deterioration.
- To ensure proper storage and prevent condensation and moisture buildup inside, gently open the plastic film wrapping the AHU sections to allow for adequate ventilation. Avoid completely removing the film to protect against environmental exposure.
- The AHU sections should be stored in areas where:
  - Air relative humidity φ<80% at t= 20°C.
  - Ambient temperature -40°C < t <+60°C.
  - There is no exposure to dust, corrosive gases, vapours, and other chemical substances that could damage the equipment and its components, even if the packaging is partially open.

14. POSITIONING, INSTALLATION, AND CONNECTION TO ASSOCIATED SYSTEMS

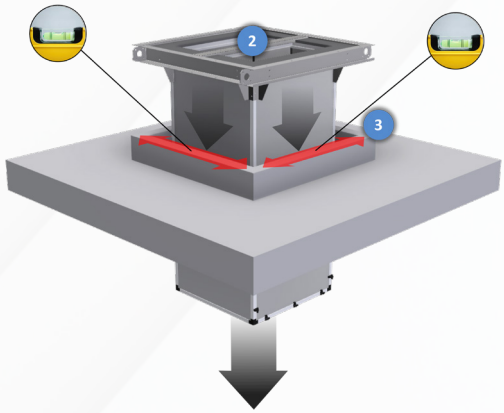
14.1. INSTALLATION GUIDELINES FOR OPTIMAX-TOP-O, -NW, -N

14.1.1. Positioning

The AHU should be installed on one of the following:

- A concrete foundation.
- A steel foundation frame embedded in the ground.
- A specially prepared, rigid steel structure.

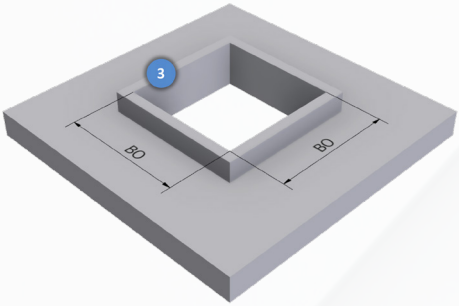
The foundation, frame, or steel structure must be flat and level to ensure the unit's stability throughout its operational lifespan. Additionally, it must be strong enough to support the full weight of the unit.



Installation Components:

1. Air Distributor
2. Roof Curb

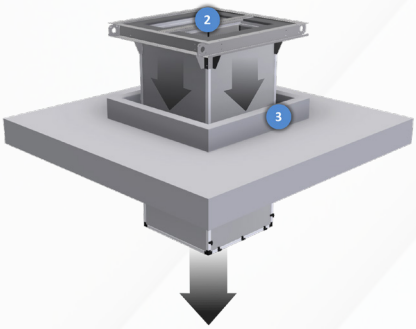
14.1.2. Dimensions of the Roof Curb Opening



Size \ Dimension	BO
60	1150
90	1350

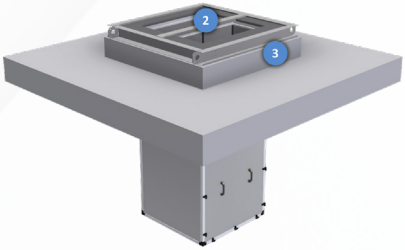
14.1.3. Installation Sequence

STEP 1



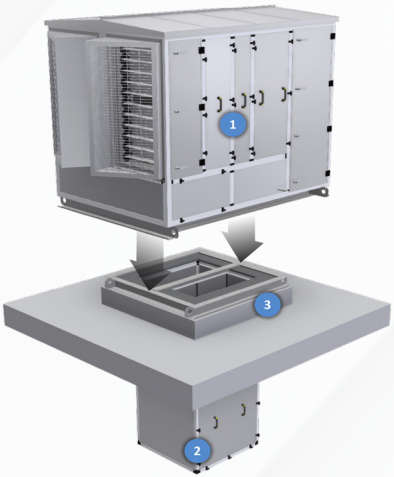
Place the air distributor (2) into the opening of the roof curb (3) from above.

STEP 2



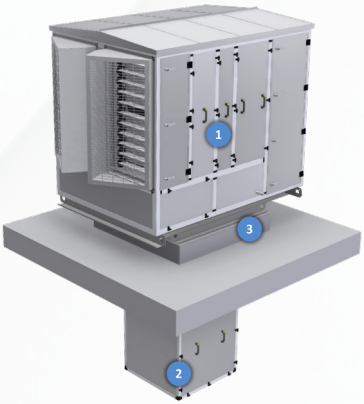
Align the air distributor (2) so that the inner surfaces of its load-bearing steel frame are parallel to the walls of the roof curb (3). Screw the load-bearing frame of the air distributor (2) securely to the roof curb (3).

STEP 3



Place the basic section (1) on the load-bearing frame of the air distributor (2) so that their frame surfaces are parallel.

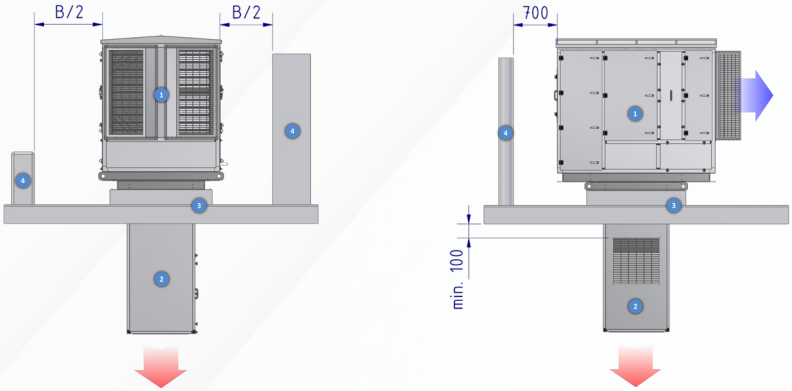
STEP 4



Screw the frame of the basic section (1) to the load-bearing frame of the air distributor (2). Seal the entire connection using sealants and roof flashing suitable for the specific type of roof.

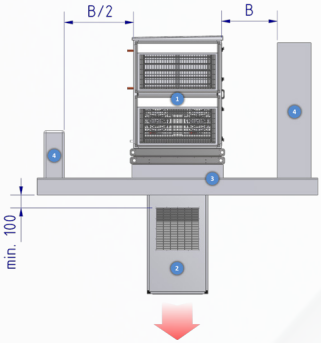
14.1.4. Installation Location

Position the unit so that connections to associated systems (ductwork, pipework, cable routing) do not obstruct access to the inspection panels. To ensure efficient installation, operation, and servicing of the unit, a minimum clearance must be maintained between the service side and any fixed structural elements at the installation site (such as walls, supports, piping, etc.), as specified in the table below. In the service area, systems, piping, or support structures may only be installed if they can be easily dismantled and reassembled for service, repair, and maintenance work.



Minimum Clearance Required for TOP-O Service Access

The air distributor must be positioned so that its exhaust air inlet grille is aligned with the exhaust side of the basic section.



Size \ Dimension	B
TOP-O-60	1550
TOP-O-90	1750
TOP-NW-90	1500
TOP-NW-60	1300
TOP-N-60	1500
TOP-N-90	1300

Minimum Clearance Required for TOP-NW, -N Service Access

The air distributor must be positioned so that its exhaust air inlet grille is located on the same side as both the intake and discharge air openings of the basic section.

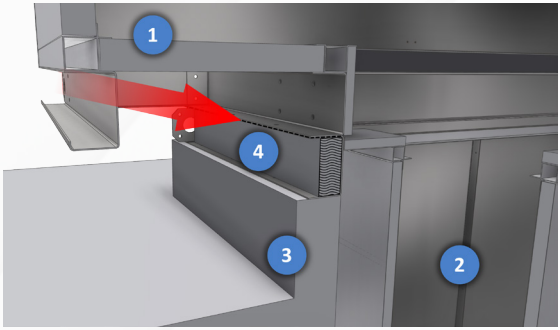
14.1.5. Connecting Sections

First, apply a layer of silicone around the perimeter of the air distributor frame (2) to seal the connection with the basic section (1). Next, position the basic section (1) on the previously levelled air distributor frame (2).

Ensure correct alignment of the basic section relative to the air distributor, as described in section 14.1.4. The mounting surfaces of the air distributor frame (2) and the basic section (1) must be parallel to one another.

Once the base section (1) is properly positioned, fasten both frames together using M10 bolts. Then, apply thermal insulation around the perimeter of the air distributor frame (note: insulation is not included in the scope of delivery).

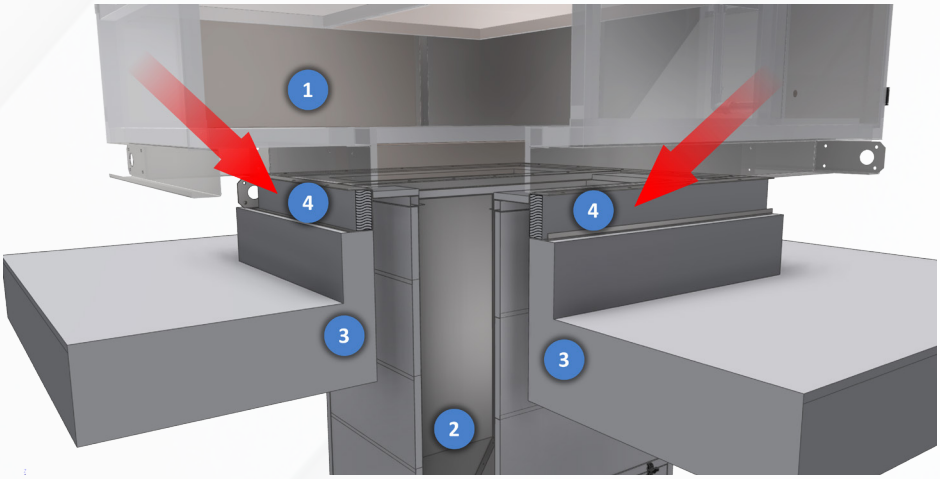
Do not connect any pipework, ductwork, condensate drains, power supply, or other associated systems until the sections have been properly fastened.



Seal the joint between the base frame (1) of the basic section and the air distributor frame (2) with silicone.

Installation Components:

1. Basic Section
2. Air Distributor
3. Roof Curb
4. Thermal Insulation

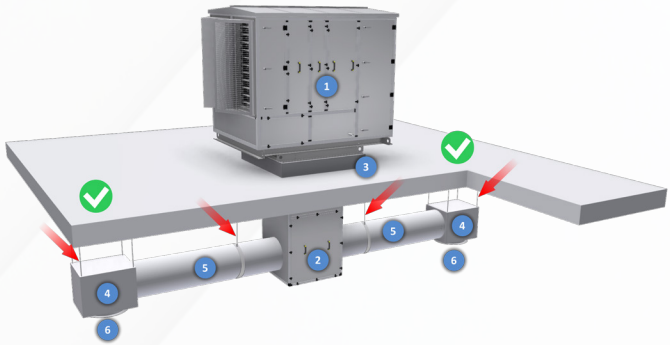


Area for additional thermal insulation of the air distributor frame (2).

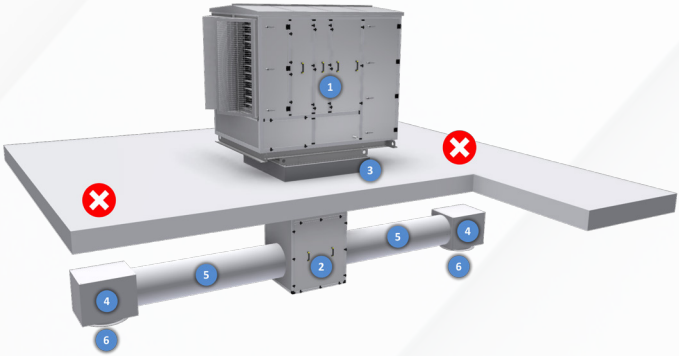
14.1.6. Connecting Ductwork

In units equipped with multi-outlet air distributors, it is necessary to connect circular ventilation ducts and plenum boxes with swirl diffusers. The connection diameters are specified individually in the unit's technical data sheet. **The ductwork is not included in the scope of delivery.** Duct routing, including the use of fittings, should be carefully planned to reduce the risk of increased noise levels within the ventilation system.

It is important that all ducts attached to the unit are supported or suspended independently by their own structures, ensuring no additional load is placed on the air handling unit



Correct duct connection using appropriate mounting hardware, such as threaded rods.



Incorrect duct connection without any supporting elements for ducts and plenum boxes.

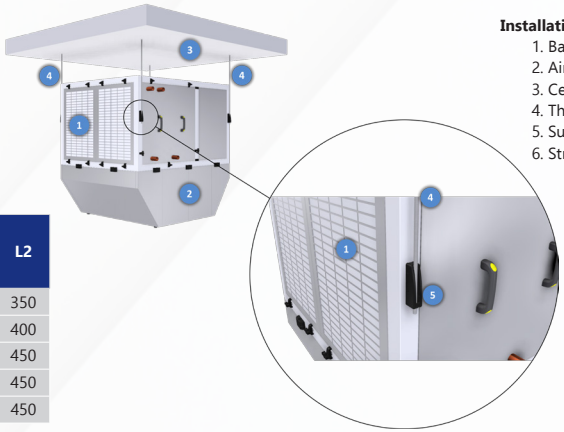
Installation Components:

1. Basic Section
2. Air Distributor
3. Roof Curb
4. Plenum Box
5. Ductwork
6. Swirl Diffuser

14.2. INSTALLATION GUIDELINES FOR OPTIMAX-TOP-R

14.2.1. Positioning

The unit must be suspended from the ceiling slab or a properly prepared steel structure using threaded rods. It must be carefully levelled to ensure stability throughout its entire operational lifespan. The mounting points must have sufficient strength to support the weight of the unit.



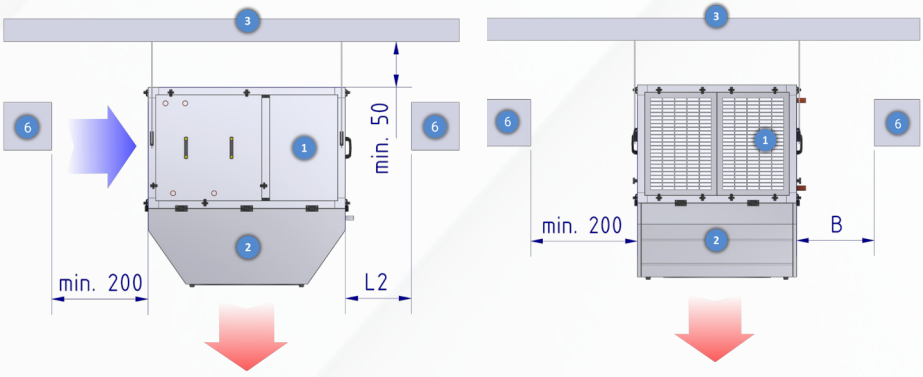
Installation Components:

1. Basic Section
2. Air Distributor
3. Ceiling Slab
4. Threaded Rod M10
5. Suspension Bracket
6. Structural Obstructions

Dimension / Size	B	L2
25	800	350
40	800	400
60	1100	450
90	1100	450
120	1400	450

14.2.2. Installation Location

Suspend the unit so that connections to associated systems (ductwork, pipework, cable routing) do not obstruct access to the inspection panels. To ensure efficient installation, operation, and servicing of the unit, a minimum clearance must be maintained between the service side and any fixed structural elements at the installation site (such as walls, supports, piping, etc.), as specified in the table below. In the service area, systems, piping, or support structures may only be installed if they can be easily dismantled and reassembled for service, repair, and maintenance work.



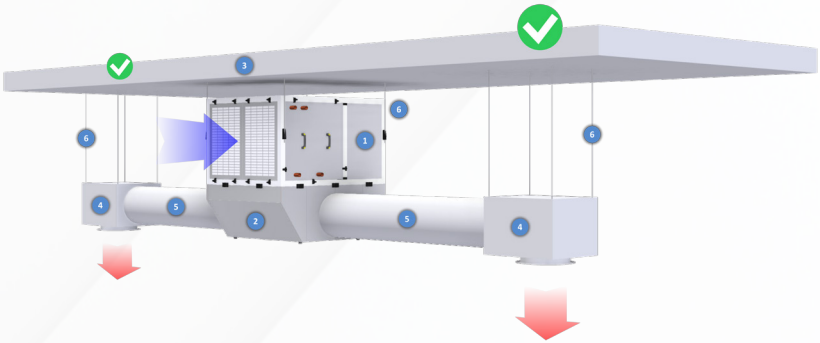
Installation Components:

1. Basic Section
2. Air Distributor
3. Ceiling Slab
4. Threaded Rod M10
5. Suspension Bracket
6. Structural Obstructions

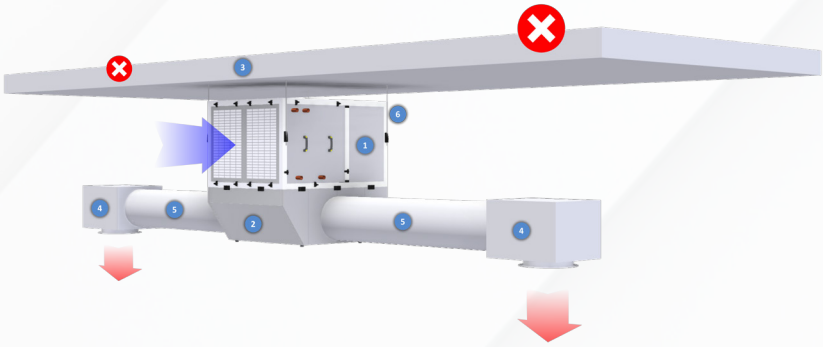
14.2.3. Connecting Ductwork

In units equipped with multi-outlet air distributors, it is necessary to connect circular ventilation ducts and plenum boxes with swirl diffusers. The connection diameters are specified individually in the unit's technical data sheet. **The ductwork is not included in the scope of delivery.** Duct routing, including the use of fittings, should be carefully planned to reduce the risk of increased noise levels within the ventilation system.

It is important that all ducts attached to the unit are supported or suspended independently by their own supporting structures



Correct duct connection using appropriate mounting hardware, such as threaded rods.



Incorrect duct connection without any supporting elements for ducts and plenum boxes.

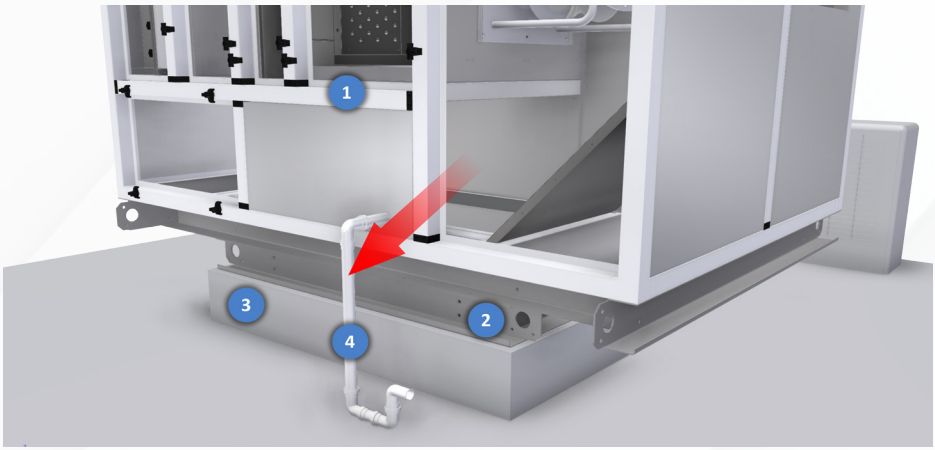
Installation Components:

1. Basic Section
2. Air Distributor
3. Ceiling Slab
4. Plenum Box with Swirl Diffuser
5. Ductwork
6. Suspension Bracket

14.3. CONDENSATE DRAINAGE

Condensate from the water cooling coil and DX coil is collected via drip trays and routed outside the casing through designated drain connections. These connections should be linked to siphons to ensure proper drainage from the unit. The recommended siphon height is a minimum of 100 mm. Prior to the start-up of the unit, ensure all siphons are filled with water. In cold environments, insulate the water return pipeline and, if necessary, install a suitable system to protect the condensate drainage from freezing.

Due to varying pressures in different sections of the unit during operation, multiple condensate drain connections may be routed to a single siphon if necessary. Additionally, siphons from different sections can be connected to a common drain line, as long as the drain line remains vented (in contact with ambient air).



Example of siphon connection solution: (1) basic section, (2) air distributor, (3) roof curb, (4) siphon.

14.4. CONNECTING HEATING AND COOLING COILS

When connecting coils, ensure they are protected from potential stresses that could lead to mechanical damage or leaks. The coil connections must not bear the weight of the pipework or be subjected to thermal stresses. To accommodate lengthwise expansion in the piping, use expansion compensators in the supply and return lines, depending on local conditions. While tightening threaded connections of the coil use two wrenches so as not to damage the coil manifold. Position the piping system so that it does not obstruct access to other sections of the unit. Ensure the supply and return connections are set up for countercurrent flow, because a co-current configuration, where the fluids flow in the same direction, reduces the average temperature difference and therefore has a negative effect on coil performance.

The connection of the DX coil to the refrigeration system must be carried out by a qualified installer in accordance with the regulations applicable to such equipment.

14.5. ELECTRICAL CONNECTION

Before carrying out electrical connections, ensure that:

- The mains voltage, frequency and protection ratings are as specified on the nameplate. In the event of non-compliance, do not connect the electrical control panel.
- Electrical control panels must be installed and used in accordance with the documentation (wiring diagrams with additional elements to be connected), which must always be available to the operator and maintenance personnel (it is recommended that it be placed inside or near the panels).
- Electrical connection, installation, maintenance and repairs must be carried out by authorised personnel with the appropriate qualifications and in accordance with current legislation.
- Electrical control panels can operate in the TN-S system with protection against indirect contact (automatic disconnection of the power supply circuit breakers) in accordance with the regulations in force and the European standard HD-60364-4-41.
- Electrical control panels are manufactured in accordance with current regulations and European standards EN 61439-1 and EN 61439-3.
- Any modifications to the components or documentation of electrical control panels that could affect their safety or proper operation are strictly prohibited.

15. CONTROL SYSTEM

Air handling units are equipped with advanced control systems, meticulously designed to speed up and streamline the startup process. The factory-configured control system including built-in electrical control panel and pre-wiring ensures comfort at the lowest possible running costs, as well as safety and monitoring of the operation of control devices against damage. The electrical control panel is pre-installed in the basic section of the unit and is ready for direct electrical connection. It comes equipped with all necessary automation components, as well as terminals for connecting the supply air temperature sensor, heating/cooling valve actuators, pumps, and other components. All details regarding connection diagrams and control components are provided in a separate controls manual.

16. PREPARATION FOR START-UP

The start-up of the unit during the commissioning of the ventilation system must only be performed by properly qualified and skilled personnel.

Prior to start-up, thoroughly clean the interior of the unit and the ductwork, and ensure that:

- No equipment, system components, controls, or accessories have been damaged during assembly.
- All ventilation devices are properly installed and connected to the ventilation system.
- Earthing conductors connecting the unit to the ductwork are securely mounted.
- The water and refrigeration systems are fully installed, operational, and that the heating or cooling medium is available for start-up.
- Electrical power receivers are wired and ready for operation.
- Siphons and the condensate drainage system for drip trays are installed.
- All control elements are installed and wired.

When outdoor units are connected to the ductwork but are not running or are out of service, condensation may form inside the unit during heating periods due to gravitational airflow within the ductwork. In extreme cases, frost may also develop inside the air handling unit. To prevent these issues, take necessary precautions, such as disconnecting the air handling unit from the ductwork, to neutralize the effects of gravitational air movement within the ducts.

16.1. ELECTRICAL WIRING

Before closing the junction boxes for electric power receivers, ensure the following:

- Wiring and terminal connections match the provided wiring diagrams.
- Protective devices for electric power receivers are functioning correctly.
- All bolts are tightened, and support elements, electrical connections, including any unused auxiliary terminals, are properly mounted.
- Wires and cables meet all requirements for protection, routing, and cross-section, and other specifications.
- Earthing and protective connections are correctly installed.
- There are no wire scraps inside the junction boxes.
- Gaskets and sealing surfaces are in good condition.

16.2. FILTERS

Air filters in air handling units prevent the penetration of dust and dirt into ventilated spaces. Additionally, they provide effective protection from dust and debris for other functional components of the unit, particularly heat exchangers. The air handling unit must never be operated without filters installed. Before operating the unit, ensure the following steps are completed for the filters:

- Remove the protective foil from the filters.
- Install the filters in their guides.
- Inspect the condition of the filters and ensure they are securely fitted in their guides.
- Check the settings of differential pressure switches (if installed), which signal the need to replace the filter when the allowable difference in static pressure is exceeded. According to EN 13053, this value is 200 Pa for M5 and F7 filters.

16.3. WATER HEATING COIL

Steps to complete:

- Check the condition of the heating coil fins.
- Verify that the supply and return pipework connections are correct.
- Ensure the thermostat capillary, which protects the coil from freezing, is securely attached to the heating coil casing.
- Verify the set point of the thermostat protecting the coil against freezing (factory set point is +5°C).
- Ensure the control valve on the heating coil is installed according to the markings on its body.

16.4. WATER COOLING COIL

Steps to complete:

- Check the condition of the cooling coil fins.
- Verify that the supply and return pipework connections are correct.
- Ensure the droplet eliminator is positioned correctly relative to the airflow direction.
- Confirm that the siphon is correctly mounted and fill it with water before starting up the unit.
- Check the patency of the condensate drain system.

16.5. DX COOLING COIL

Steps to complete:

- Check the condition of the cooling coil fins.
- Verify that the supply and return pipework connections are correct.
- Ensure the droplet eliminator is positioned correctly relative to the airflow direction.
- Confirm that the siphon is correctly mounted and fill it with water before starting up the unit.
- Check the patency of the condensate drain system.
- After completing the installation of the refrigeration system and before filling it with refrigerant, perform a pressure test and an end-to-end leakage test. The test pressure should be based on the working pressure of the refrigerant used.
- Perform the pressure test using dried nitrogen only (air or standard nitrogen can introduce too much moisture into the system).
- Conduct the leakage test carefully. If maintaining vacuum conditions during subsequent vacuum pumping is not possible, repeat the pressure test.

16.6. ROTARY HEAT EXCHANGER

Steps to complete:

- Verify that all wheel locking devices have been removed.
- Ensure that the transverse and circumferential seals do not obstruct or hinder the rotation of the wheel.
- Check the correct connection of the motor, controller and rotation sensor.

16.7. FAN ASSEMBLY

Steps to complete:

- Ensure no objects are present around the fan that could be sucked into the impeller when started.
- Verify that the fan impeller rotates freely without making contact with any part of the housing during operation.
- Check that the motor is properly aligned, and that the system's operating conditions (voltage, current, frequency, and winding connections) comply with the specifications on the rating plate.
- Ensure the motor rotor rotates freely without making contact with the stator.
- Verify that airflow for motor cooling is unobstructed, ensuring proper air inlet and outlet from the motor housing.
- Ensure earthing and protective connections are correctly installed.
- Confirm that the fan's designed rotational speed is not exceeded (refer to the unit specifications).
- Check that all bolts, support elements, and electrical connections are securely tightened.
- Ensure that power supply cables are routed away from moving parts inside the fan section and are securely fastened along with other electrical wires using appropriate cable fasteners.
- Check that all dampers in the ductwork system are correctly positioned as per the design.
- Ensure that the impeller rotates in the same direction as indicated by the arrow on the fan housing.
- Briefly activate the fan (impulse start). If the rotation direction is incorrect, swap any two phases at the motor terminal box or adjust the rotation direction on the frequency converter.
- Once all checks are completed, securely close all inspection panels.

Do not operate the air handling unit with any inspection panel open.

Basic section with open and closed inspection panels.

17. START-UP AND ADJUSTMENT

The purpose of the start-up is to verify that the unit operates according to design specifications and is ready for use. The start-up procedure and system adjustments for ventilation and air conditioning must only be carried out by qualified personnel with expertise in start-up processes and equipped with basic measuring instruments. Once the steps outlined in the "Preparation for Start-up" section have been completed, the first start-up can be initiated. Begin by starting the fan at a reduced load, gradually increasing it to approach the intended operating point. While increasing the load, continuously monitor the current drawn by the motor to ensure safe operation.

- Ensure that the fan motor's current remains within its rated limits for the specified air parameters.
- It is recommended to configure the control system to ensure that the dampers on the air inlet are opened before starting the fan. This helps to maintain damper durability and proper operation.

Failure to follow these initial start-up recommendations may result in fan motor overload and severe damage. Steps to complete after start-up:

- Check for any alarming noises or unnatural mechanical sounds.
- Ensure that the unit is not vibrating excessively.

Allow the unit to run for approximately 30 minutes. Then turn it off and inspect the sections. Pay particular attention to:

- Filters: Check for any damages.
- Condensate Drainage: Ensure efficient drainage.
- Fan Assembly: Verify its condition.

Once the start-up process is completed, clean or replace the primary filters. To achieve optimal performance, carry out necessary adjustments and control measurements.

17.1. AIR FLOW RATE MEASUREMENT AND ADJUSTMENT

Before performing any measurements or adjustments, ensure that all dampers and regulation elements at grilles, diffusers, and ducts are set according to the design specifications. The air handling unit is equipped with measuring points intended to measure the pressure difference between the fan inlet cone and the fan suction chamber. Using this value and a constant coefficient specific to the fan size, the current airflow rate can be calculated using the following formula:

$$Qv=k * \sqrt{dP}$$

Where:
Qv = air volume flow rate [m^3/h] (if the unit has two fans handling the same air flow, multiply the Qv value by 2)
k = coefficient value provided on the unit's nameplate (specified for air density of 1.2 kg/m^3)
dP = Measured pressure difference [Pa]

If the calculated value differs from the design value, adjust the frequency set points on the frequency inverter to achieve the desired air flow rate. When increasing the fan speed, strictly monitor the motor current to prevent exceeding the rated current. If necessary, contact a JUWENT Authorized Service Provider or the company's Technical Department to determine the maximum allowable fan speed or the maximum permissible frequency setting for the specific fan size.

If no specific design definition exists for the measurement uncertainty of the airflow rate for the whole system, refer to PN-EN 12599-2002. A deviation within ±15% of the design value is considered acceptable.

17.2. ADJUSTING THE WATER HEATING COIL

Adjustment of the water heating coil involves assessing its performance by measuring the air temperature upstream and downstream of the coil, monitoring the supply and return water temperatures and ensuring that the flow rate of the heating medium is within the design specifications.

Adjustments to the performance of the water heating coil should only be made after establishing the correct air flow rate within the unit.

Performance is regulated by adjusting the water supply temperature through a 3-way valve that mixes high-temperature supply water with the lower-temperature return water from the heating coil. The mixed water should reach the desired temperature based on the degree of mixing. Since external conditions that closely match measurement conditions occur briefly within a year-cycle, adjustments are typically made under intermediate conditions. In these cases, an appropriate conversion factor is applied to align with the design parameters.

If no specific design definition exists for the measurement uncertainty of the air temperature downstream of the heating coil, refer to PN-EN 12599: 2002. A deviation within ±2% of the design value temperature is considered acceptable.

The operation of the anti-freeze thermostat can only be checked when the air temperature upstream of the coil is lower than the thermostat setpoint (factory setpoint: +5°C). The safest approach is to perform this step when the air temperature upstream of the coil is between 1 and 2 degrees above freezing. With the unit in operation, temporarily shut off the water supply and monitor the thermostat's response. This should be done before commissioning the unit for regular use.

17.3. ADJUSTING THE WATER COOLING COIL

Adjustment of the water cooling coil involves assessing its performance by measuring the air temperature upstream and downstream of the cooling coil, monitoring the supply and return water temperatures and ensuring that the chilled water flow rate is within the design specifications.

Adjustments to the performance of the cooling coil should only be made after establishing the correct air flow rate within the unit.

Performance is regulated by adjusting the cooling coil supply temperature through a 3-way valve that mixes low-temperature supply water with the higher-temperature return water from the cooling coil. The mixed water supplied to the cooling coil should reach the desired temperature depending on the degree of mixing. Since external conditions that closely match measurement conditions occur briefly within a year-cycle, adjustments are typically made under intermediate conditions. In these cases, an appropriate conversion factor is applied to align with the design parameters.

If no specific design definition exists for the measurement uncertainty of the air temperature downstream of the cooling coil, refer to PN-EN 12599- 2002. A deviation within ±2% of the design value temperature is considered acceptable.

17.4. ADJUSTING THE DX COOLING COIL

Adjustment of the DX cooling coil involves assessing its performance by measuring the air temperature upstream and downstream of the coil and ensuring that the refrigerant flow rate meets the design specifications.

Adjustments to the performance of the cooling coil should only be made after establishing the correct air flow rate within the unit.

Performance is regulated by adjusting the refrigerant temperature. Since external conditions that closely match measurement conditions occur briefly within a year-cycle, adjustments are typically made under intermediate conditions. In these cases, an appropriate conversion factor is applied to align with the design parameters.

If no specific design definition exists for the measurement uncertainty of the air temperature downstream of the cooling coil, refer to PN-EN 12599- 2002. A deviation within ±2% of the design value temperature is considered acceptable.

18. USE AND MAINTENANCE

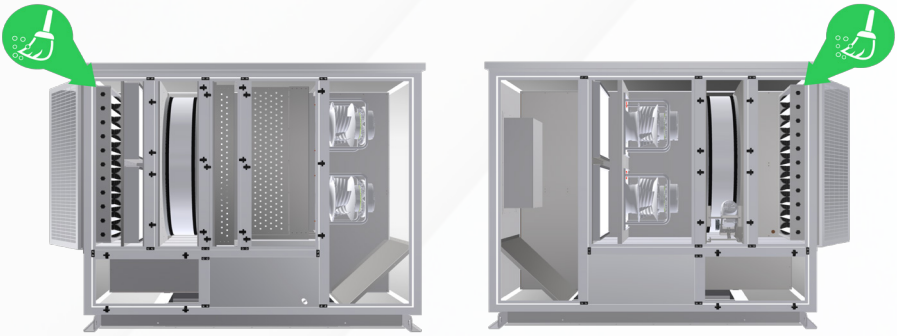
This manual provides general guidelines for inspection intervals to ensure the correct operation of the unit. However, actual intervals may vary depending on specific operating and external conditions. Therefore, the inspection intervals must be adapted to the actual conditions (such as air quality, number of starts, load, etc.). From the time of start-up, the operator of the air handling unit should keep an up-to-date record in the 'Inspection and Maintenance Chart' of the warranty card, documenting all work resulting from the routine operation of the unit.

- All personnel responsible for the operation of the unit must thoroughly familiarise themselves with this manual before using or servicing the equipment. If qualified personnel is not available, ongoing inspections should be carried out by a JUWENT Authorized Service Provider.
- Any damage to the unit or its components resulting from failure to follow the guidelines in this manual will not be covered under warranty. The unit's basic technical data, such as model type, component specifications (filters, heat exchangers, fans, electric motors), are provided in the data sheet supplied with each unit.
- All service and maintenance work must be carried out with the unit switched off. A service switch should be installed outside the basic section to safely disconnect the power supply to the fan motors during maintenance.
- Power disconnection must occur only when the unit is de-energized.
- Regular and careful maintenance, along with frequent inspections, is essential to detect potential issues early and prevent major damage.
- Maintaining a detailed service record is crucial, as it serves as the primary document confirming the operational condition of the unit, scheduled inspections, and any malfunctions identified.
- When contacting JUWENT representatives, always provide the unit's serial number, which can be found on both the casing and the documents delivered with the unit.
- Maintenance intervals are set for continuous operation of the unit in low-dust environments and conditions that support normal operation.
- In cases where high dust levels are present in the supply or exhaust air, more frequent inspections are recommended.
- Spare parts and accessories can be ordered from your local JUWENT Authorized Service Provider. When placing an order, always provide the unit's type and serial number, which can be found on the nameplate located on the casing of the basic section.

18.1. AIR DAMPERS

If excessive dirt or improper operation is detected, clean the dampers using one of the following methods:

- Use an industrial vacuum cleaner with a soft suction nozzle.
- Blow with compressed air.
- Clean with pressurized water and mild, non-corrosive detergents suitable for aluminium.
- After cleaning, carefully check the damper tightness when closed, particularly on the fresh air side, to prevent the water heating coil from freezing.

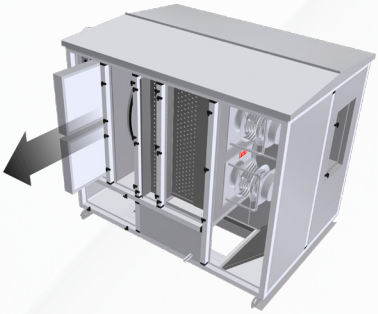


To clean the supply air damper, the supply filters must first be removed.
Access to the exhaust air damper is available after opening the inspection door.

18.2. FILTERS

Under standard operating conditions, filters should be replaced approximately every six months. Indicators for filter replacement include visual observation of their condition and an increase in pressure drop above the threshold set on the pressure switch, according to the current version of EN 13053. The degree of filtration varies for different types of filters, so it is crucial to install filters of the same filtration class when replacing them.
Panel and bag filters are designed for single use only. When replacing a filter, remember to clean the filtration section by dusting or wiping it with a damp cloth. When ordering a new set of filters from a JUWENT Authorized Service Provider, provide the filter type, class, unit size, and, if possible, the size and number of filters. This information is available on the nameplate located on the casing in the basic section.

The air handling unit must always operate with installed filters. Running the unit without them can lead to increased power consumption by the fans, potentially resulting in motor winding burnout. The table below shows the filter dimensions for each unit size.



The filters are removed by sliding them out.

Unit Size	Supply filter		Exhaust filter	
	Dimensions	Quantity	Dimensions	Quantity
TOP-O-60	690x535x96	2	690x535x96	2
TOP-O-90	395x635x96	4	395x635x96	4
TOP-NW-60	595x675x96	2	595x675x96	2
TOP-NW-90	695x800x96	2	695x800x96	2
TOP-N-60	595x675x96	2	595x675x96	2
TOP-N-90	695x800x96	2	695x800x96	2
TOP-R-25	695x495x48	1	695x495x48	-
TOP-R-40	695x695x48	1	695x695x48	-
TOP-R-60	495x695x48	2	495x695x48	-
TOP-R-90	495x995x48	2	495x995x48	-
TOP-R-120	620x995x48	2	620x995x48	-

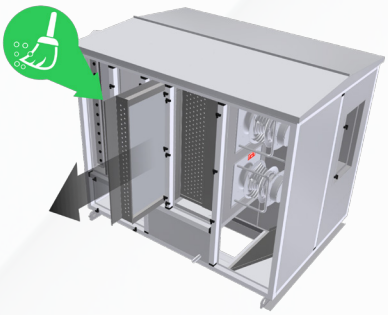
18.3. WATER HEATING COIL

The water heating coil should be fitted with a control system to protect it from freezing during operation. As an alternative, during winter, the coil can be supplied with a non-freezing medium (e.g., glycol solution). If the heating medium supply is interrupted or the air handling unit is out of operation and the air temperature is at risk of dropping below +5°C, the heating coils must be drained.
The cleanliness of the heating coil fins should be inspected at least every six months. Dust accumulation on the coil surface reduces heating capacity and increases air pressure drop. Even with filters installed, dust will eventually accumulate on the coil fins on the air inlet side. When significant dirt buildup is detected, cleaning can be carried out using the following methods:

- Use a vacuum cleaner with a soft nozzle on the air inlet side.
- Use compressed air to blow in the opposite direction of the normal airflow, ensuring the air stream runs parallel to the fin arrangement.
- Wash with warm water mixed with non-corrosive detergents suitable for aluminum and copper.

Before cleaning, ensure that adjacent sections of the air handling unit are protected from any dislodged dirt. To achieve full heating capacity, the coil must be properly vented. Air vents, ideally positioned at the highest point in the supply pipework, are used for this purpose. During unit downtime, the flow of the heating medium should be minimized to ensure that the internal temperature of the unit does not exceed +60°C. Exceeding this temperature may damage components or subassemblies, such as the motor, bearings, and plastic elements, located in sections adjacent to the heating coil. For coils supplied with glycol solution, the glycol content and density in the circuit should also be checked.

If water is used as the heating medium and a prolonged power outage occurs, the freeze protection system will not protect the coil from the water freezing. In this case, the coil must be completely drained and dried without delay.



The heating coil is removable for cleaning purposes.

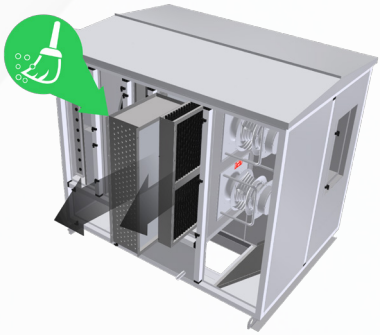
18.4. WATER COOLING COIL

The cleanliness of the cooling coil fins should be inspected at least every six months. Dust accumulation on the cooling coil surface reduces cooling output and increases air pressure drop. Even with filters installed, dust will eventually accumulate on the cooling coil fins on the air inlet side. When significant dirt buildup is detected, cleaning can be carried out using the following methods:

- Use a vacuum cleaner with a soft nozzle on the air inlet side.
- Use compressed air to blow in the opposite direction of the normal airflow, ensuring the air stream runs parallel to the fin arrangement.
- Wash with warm water mixed with non-corrosive detergents suitable for aluminum and copper.

Before cleaning, ensure that adjacent sections of the air handling unit are protected from any dislodged dirt. To achieve full cooling capacity, the coil must be properly vented. Air vents, ideally positioned at the highest point in the supply pipework, are used for this purpose. When checking for dirt accumulation, also inspect the cleanliness of the droplet eliminator and the condensate drip trap, as well as the patency of the condensate drip tray and the siphon. The siphon should be filled with water before starting the unit. If dirt buildup is present, the droplet eliminator should be cleaned with warm water mixed with a detergent. For coils supplied with glycol solution, the glycol content and density in the circuit should also be checked.

If water is used as the heating medium and a prolonged power outage occurs, the freeze protection system will not protect the coil from the water freezing. In this case, the coil must be completely drained and dried without delay.



The coil and droplet eliminator can be easily removed from the unit for cleaning.

18.5. DX COOLING COIL

The cleanliness of the cooling coil fins should be inspected at least every six months. Dust accumulation on the cooling coil surface reduces cooling output and increases air pressure drop. Even with filters installed, dust will eventually accumulate on the cooling coil fins on the air inlet side. When significant dirt buildup is detected, cleaning can be carried out using the following methods:

- Use a vacuum cleaner with a soft nozzle on the air inlet side.
- Use compressed air to blow in the opposite direction of the normal airflow, ensuring the air stream runs parallel to the fin arrangement.
- Wash with warm water mixed with non-corrosive detergents suitable for aluminum and copper.

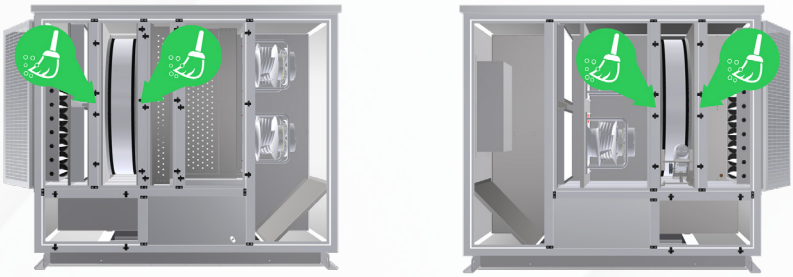
Before cleaning, ensure that adjacent sections of the air handling unit are protected from any dislodged dirt. When checking for dirt accumulation, also inspect the cleanliness of the droplet eliminator and the condensate drip trap, as well as the patency of the condensate drip tray and the siphon. The siphon should be filled with water before starting the unit. If dirt buildup is present, the droplet eliminator should be cleaned with warm water mixed with a detergent. When cleaning the DX cooling coil with warm water, the refrigeration system must first be recovered by transferring the refrigerant into a recovery cylinder. Failure to do so may lead to an uncontrolled increase in pressure, posing a high risk of damage to the refrigeration system.

18.6. ROTARY HEAT EXCHANGER

Maintenance of the rotary heat exchanger involves a technical inspection and evaluation of the wheel cleanliness every six months. During maintenance, check that:

- The wheel rotates freely. Any noticeable resistance may be caused by excessive pressure from the sealing brushes rubbing against the wheel edge. In such a case, the brush alignment should be adjusted. Worn sealing brushes must be replaced. If a previously removed sealing brush is to be reinstalled, it must be positioned in the same orientation relative to the wheel's direction of rotation.
- After replacing or adjusting the sealing brushes, allow the exchanger to operate for 30 minutes so the brushes can conform to the wheel surface. After this run-in period, measure the motor current and compare it to the rated current to verify that the motor is not overloaded.
- The drive belt is undamaged, clean, and not slipping on the cylindrical part of the wheel. If slack is present despite maximum tension from the tensioning system, the belt must be shortened or replaced.
- The air inlet surfaces are not covered with dust or other contaminants. To clean the wheel, use one of the methods described earlier for other heat exchangers.

The wheel and drive motor bearings are continuously lubricated during operation. The amount of grease applied at the time of assembly is sufficient for long-term operation, and no additional lubrication is required during operational lifespan. It is recommended to periodically clean the motor and gearbox of accumulated dust to prevent the formation of an insulating layer that may raise the operating temperature of the drive system.



The rotary heat exchanger should be cleaned from both the supply air side and the exhaust air side.

18.7. FAN ASSEMBLY

Before carrying out any work (troubleshooting, maintenance, servicing) on the unit, and in particular before opening the fan section inspection panels and removing guards from live parts, ensure that:

- The unit has been properly disconnected from the power supply, including both main and auxiliary circuits.
- The impeller has come to a complete stop.
- The fan has cooled down, and the surface temperature does not present a burn hazard.
- The fan is secured against accidental start-up.

18.7.1. FANS

Fans are designed for moving dust-free or slightly dusty air. They are not suitable for aggressive gases, vapours, or heavily dusty air. Operating the fan in an unsuitable environment can result in bearing damage, corrosion, impeller imbalance, and excessive vibrations. For fan maintenance, check the following:

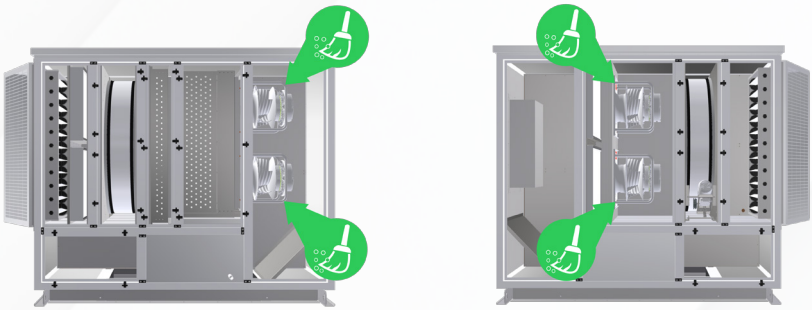
- The impeller rotates freely.
- The impeller is balanced and does not rub against any surfaces.
- The impeller is securely mounted on the shaft.
- The impeller has not shifted relative to the inlet cone.
- The flexible connection (if present) is undamaged.
- All bolts securing structural elements of the fan assembly are properly tightened.

The loss of impeller balance can be caused by:

- Dust accumulation on the impeller blades.
- Detachment of additional balancing weights.
- Damage to the impeller blades

Inspect the interior cleanliness of the fan section casing, as well as the cleanliness of the impeller and motor, every six months, and clean them as necessary:

- Use a vacuum cleaner to clean the interior of the casing.
- Clean the impeller with a vacuum cleaner or by wiping it down with a damp cloth and mild detergent.



For supply-exhaust air handling units, ensure that both the supply and exhaust fan sections are cleaned.

18.7.2. MOTORS

Regular and thorough maintenance, including frequent inspections, is essential for detecting potential issues early and preventing major damage. Before carrying out any work on the motor or its components, particularly before removing protective covers that shield against direct contact with moving parts or live electrical components, ensure that the motor is properly disconnected from the power supply. Additionally, all auxiliary and secondary circuits must also be disconnected. Follow these safety precautions:

- Disconnect the power supply.
- Use a safety mechanism to prevent the motor from accidentally restarting.
- Verify that the power source is safely isolated.
- Install guards on adjacent live parts.

These precautions must remain in place until all maintenance work is completed, and the motor is fully reassembled and ready for operation. During fan motor maintenance, check the following:

- Compliance with specified technical parameters (e.g., power consumption, winding temperature, and bearing temperature).
- Absence of grease leaks.
- Proper motor operation, ensuring there are no unusual noises from the motor or bearings.
- Secure fastening of all mechanical and electrical connections.
- Insulation resistance of the windings is within acceptable limits.
- Wires and insulation are in good condition, with no signs of discoloration or wear.

Any identified irregularities or changes must be immediately corrected. Additionally:

- Verify that the motor is properly mounted and all mounting bolts are tightened.
- Inspect the motor housing for cleanliness.

Excessive dirt buildup reduces motor cooling efficiency, which can result in overheating of the windings and potential motor damage. The motor can be cleaned with a dry brush or by blowing it with dry compressed air.

19. PERFORMANCE CHECKS

After inspections and maintenance, carry out performance checks and adjust unit parameters in accordance with the 'Start-up and Adjustment' section.
The completion of maintenance and measurements must be recorded in the 'Inspection and Maintenance Log'.

20. DISPOSAL

The unit must be disposed of by a specialist dismantling and recycling company.

21. OHS INSTRUCTIONS

- Connection and start-up of air handling units must be performed by qualified personnel in compliance with applicable regulations, particularly regarding electrical equipment.
- Do not power the system before connecting it to a protective system.
- Before performing any repair or maintenance, ensure the unit's power supply is turned off.
- Do not operate the unit with any inspection panel removed.
- Personnel responsible for operation, repair, or maintenance must be properly qualified and authorized according to the regulations of the country where the unit is installed.
- The place where the unit is installed must be equipped with the required protective equipment providing safe operation and necessary fire safety equipment in accordance with local regulations.

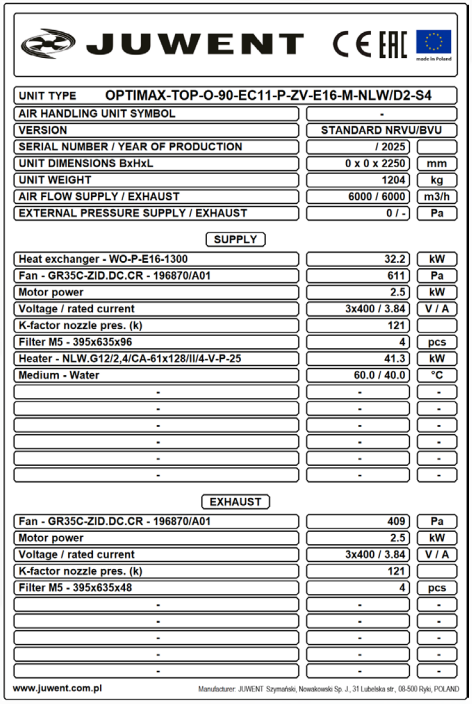
Despite being designed and manufactured in compliance with applicable standards at the time of production, the unit presents an unavoidable risk of injury or health hazards during use. This risk is influenced by factors such as frequency of operation, cleaning, maintenance, the presence of personnel in hazardous areas, and failure to follow the safety instructions provided. The severity of potential injuries or health risks depends on numerous factors, some of which cannot be fully mitigated through design, warning labels, or operating instructions.
Therefore, residual risks remain if operators do not adhere to the guidelines in the operating manual and the safety warnings displayed on the air handling unit.

22. SERVICE AND TECHNICAL SUPPORT

Regular inspections performed by qualified technicians or JUWENT Authorized Service Providers ensure reliable, trouble-free operation of the units for many years. Service personnel are always available to assist with unit start-ups, maintenance tasks, and provide emergency support.
JUWENT Authorized Service Providers supply spare parts and consumables for JUWENT air handling units. When ordering spare parts, it is essential to provide the unit type, size, and serial number.

23. GRAPHIC MARKINGS ON THE UNIT

NAMEPLATE



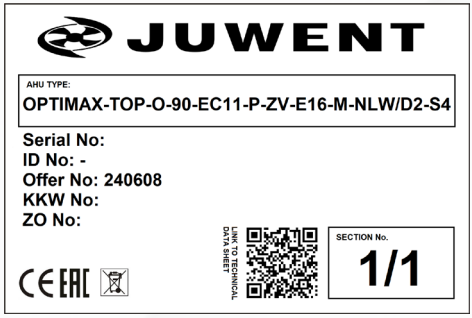
JUWENT

UNIT TYPE	OPTIMAX-TOP-O-90-EC11-P-ZV-E16-M-NLW/D2-S4	
AIR HANDLING UNIT SYMBOL	-	
VERSION	STANDARD NRVU/BVU	
SERIAL NUMBER / YEAR OF PRODUCTION	/ 2025	
UNIT DIMENSIONS BxHxL	0 x 0 x 2250	mm
UNIT WEIGHT	1204	kg
AIR FLOW SUPPLY / EXHAUST	6000 / 6000	m3/h
EXTERNAL PRESSURE SUPPLY / EXHAUST	0 / -	Pa
SUPPLY		
Heat exchanger - WO-P-E16-1300	32.2	kW
Fan - GR35C-ZID.DC.CR - 196870/A01	611	Pa
Motor power	2.5	kW
Voltage / rated current	3x400 / 3.84	V / A
K-factor nozzle pres. (k)	121	
Filter M5 - 395x635x96	4	pcs
Heater - NLW.G12/2,4/CA-61x128/II/4-V-P-25	41.3	kW
Medium - Water	60.0 / 40.0	°C
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
EXHAUST		
Fan - GR35C-ZID.DC.CR - 196870/A01	409	Pa
Motor power	2.5	kW
Voltage / rated current	3x400 / 3.84	V / A
K-factor nozzle pres. (k)	121	
Filter M5 - 395x635x48	4	pcs
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

www.juwent.com.pl Manufacturer: JUWENT Szymański, Nowakowski Sp. J., 31 Lubelska str., 08-500 Ryki, POLAND

The nameplate provides the unit's essential technical data, including its external dimensions and weight. It also displays the serial number and production year, which must be provided when reporting faults or in any situation requiring consultation with the manufacturer.

SECTION IDENTIFICATION LABEL



The section identification label contains key information to identify each air handling unit section, including its numerical identifier. During the unit selection process, the configuration is defined through the selection software, which assigns a numerical identifier to each section (e.g., 1/6, 2/6, etc.) to indicate its position within the overall assembly. The technical data sheet lists these numbers in the 'SECTION WEIGHTS' section to guide the on-site assembly according to the specified layout. The QR code on the label provides convenient access to the unit's technical data sheet, ensuring detailed information is readily available during installation.

23.1. INFORMATION LABELS

- water heating coil

- electric heater

- gas heater

- steam heating coil

- water cooling coil

- DX cooling coil

- fan

- filter

- rotary heat exchanger

- humidifier

- condensate drainage connection

- lifting point

- cooling coil inlet

- electrical equipment

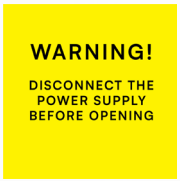
- heating coil inlet

- cooling coil outlet

- heating coil outlet

23.2. WARNING LABELS

Particular attention should be paid to the components of the unit where the following labels are placed. For safety reasons, it is necessary to follow the instructions indicated on the labels.



- refers to electrical power supply

- refers to the method of connecting coils

- refers to the fan assembly

- refers to the fan assembly

24. EC DECLARATION OF CONFORMITY TEMPLATE

EC DECLARATION OF CONFORMITY
No: 01/24

JUWENT

Szymański, Nowakowski Sp. j.
31 Lubelska Str., 08-500 Ryki, Poland
phone +48 81 883 56 00,
www.juwent.com.pl, info@juwent.com.pl

Authorized representative:

Person authorized to prepare the technical documentation:
..... 6 Przemysłowa Str., 08-500 Ryki, Poland

We declare that the product:

Type:
serial number:

to which this declaration relates is in conformity with the following directives, when applicable:

Directive number	Symbol	Directive title
2006/42/WE	MAD	Machinery Safety Directive
2014/68/UE	PED	Pressure Equipment Directive
2009/125/WE	ErP	General principles of eco-design requirements for energy-using products with components sourced from suppliers

that comply with the directives' requirements, when applicable:

2014/35/UE	LVD	Low Voltage Directive
2014/68/UE	PED	Pressure Equipment Directive
2014/30/UE	EMC	Electromagnetic Compatibility
2009/142/WE	GAD	Appliances burning gaseous fuels
2014/34/UE	ATEX	Equipment and protective systems intended for use in potentially explosive atmospheres

and standards, when applicable:

Standard number	Issue date
PN-EN ISO 12100	2012
PN-EN 1886	2008
PN-EN 60204-1	2018

and with the exchanger production technology acknowledged by the following documents, when applicable:

Acknowledgement record in accordance with PN-EN 13134:2004	BPAR no. IS/ZT/113, -114, -115/05 of 10 October 2005
Qualification record in accordance with PN-EN ISO 15613:2005(U) PN-EN ISO 15614-8:2005	WPQR no. IS/ZT/105-112, -122, -123/05 of 14 November 2005, issued by the Welding Institute in Gliwice, Identification No. 1405

This EU Declaration of Conformity is no longer valid in case the air handling unit is changed or rebuilt without our consent.

Ryki — Production Manager

Issue Date — .....

25. WARRANTY CONDITIONS

1. JUWENT Szymański, Nowakowski General Partnership, based in Ryki (hereinafter referred to as the 'Warrantor'), provides a warranty for air handling units of its own manufacture, provided that the unit is used in accordance with the conditions specified in this instruction manual and the terms outlined below.
2. Warranty claims are processed exclusively by the Warrantor or its Authorized Service Provider (hereinafter referred to as the 'Obligor').
3. The warranty is granted under the following conditions:
   a) Standard warranty – valid for 36 months from the date of sale, if the equipment is started by the user without the involvement of the Obligor.
   b) Extended warranty – valid for 60 months from the date of sale, provided that the Buyer enters into a service agreement with the Warrantor, which includes, in particular:
   – Startup of equipment by the Obligor (at an additional cost).
   – Training of a designated individual responsible for supervising the air handling unit (at an additional cost).
   – Periodic inspections and maintenance (at an additional cost).
4. Regardless of the warranty period granted for the air handling unit, the warranty for the heating elements of electric heaters is limited to 12 months.
5. For air handling units equipped with a gas heater, the warranty conditions for this component are specified in the Warranty Card issued by the respective manufacturer.
6. External equipment operating in conjunction with the unit but not forming an integral part of it (e.g., condensing units, steam generators) is covered solely by the warranty provided by its respective manufacturer.
7. The unit remains under warranty only if the following conditions are met:
   a) The Buyer presents a valid Start-up Report along with a Service Request Form.
   b) The Buyer performs or arranges for ongoing and periodic inspections in accordance with the instruction manual and documents them in the Inspection and Maintenance Log.
8. During the extended warranty period (60 months), only the Obligor is authorized to perform periodic inspections. Any performed work does not extend the warranty period for the unit or its components.
9. Any physical defects, including failure to provide clear specifications for the unit by the Warrantor, that are detected during the warranty period will be repaired free of charge at the installation site within 14 calendar days from the date of defect reporting, unless an immediate import of a replacement part is necessary. In such cases, the repair period shall be extended by the time required for delivery. If repair is not feasible or would entail unreasonably high costs, the Obligor shall replace the defective unit or its faulty component with a new one.
10. The Warrantor shall determine the method of defect rectification.
11. Replaced parts during the repair shall become the property of the Warrantor.
12. The Warrantor shall not be liable for damages and/or malfunction of the equipment resulting, in particular, from:
    a) Mechanical damage caused by improper assembly, including incorrect installation of the utility supply system, or transportation performed by personnel other than the Warrantor or the Obligor.
    b) Improper storage, use not in accordance with the operating instructions, unauthorized modifications, or repair attempts.
    c) Replacement of parts without the Obligor's consent, or continued operation of the air handling unit despite an identified defect.
    d) Random incidents and Force Majeure, including adverse weather conditions.
    e) Operational errors, lack of or improper maintenance, incorrect adjustment, or failure to follow the operating instructions.
    f) Use of non-original spare parts or components (motors, fans, filters, etc.) without the Warrantor's consent.
    g) Failure to perform periodic inspections, i.e., every 6 months, or lack of ongoing maintenance between inspections.
    h) Operation in aggressive environments, including exposure to chemical agents beyond the unit's design parameters, or in environments with high dust levels requiring additional dust extraction systems.
    i) Use of supply water or boiler water with parameters other than those specified in PN-85/C-04601.
13. The warranty does not cover:
    a) Third-party systems within which the air handling unit operates.
    b) Refrigerant costs and labor for refilling the refrigeration system due to a leak in the unit's cooling coil.
    c) Wear-and-tear components and consumables, such as filters, gaskets, light bulbs, V-belts, and fuses.
    d) Standard maintenance and inspections as specified in the unit's operating instructions.
    e) Travel expenses for the Warrantor's or Obligor's service technicians.
    f) Compensation for losses or increased costs incurred by the Buyer due to air handling unit downtime while awaiting warranty service.
14. If a service request is deemed unjustified, all related expenses shall be borne by the Buyer.
15. To confirm compliance with the required maintenance activities, qualified personnel must record all performed work in the Inspection and Maintenance Log.
16. The Warrantor's liability for physical defects is limited to the normal price of the defective parts, which shall be understood as the purchase prices valid at the Warrantor on the date of the warranty repair.
17. The Warrantor shall not be liable for any damages incurred by the Buyer or user due to a defect, particularly those resulting from the conditions specified in Section 12.
18. If a part or component is replaced, the warranty period for the air handling unit shall be extended by the duration in which the Buyer was unable to use the unit.
19. The Buyer must provide the Obligor with free access to the rooms where the air handling unit is installed. For units installed at considerable heights, the Buyer must arrange appropriate scaffolding and lifting equipment at their own expense. The Buyer is responsible for disconnecting water, DX, or steam coils from the supply system before service.
20. All warranty claims must be submitted in writing to the nearest authorized representative using the Service Request Form, sent via email along with a copy of the Start-up Report.
21. The Obligor reserves the right to refuse warranty service (including periodic maintenance and repairs) if the Buyer has outstanding payments for the air handling unit or previous service provided by the Warrantor or the Obligor.

DATE OF SALE **STAMP AND SIGNATURE**

Special Warranty Terms and Conditions:

Warranty period is extended up to ..... months.

Other:

STAMP AND SIGNATURE

26. STARTUP REPORT

USER OF THE EQUIPMENT:	
INSTALLATION SITE:	
PRODUCT TYPE:	
SERIAL NUMBER:	

INSTALLATION AND STARTUP

Activity	Contractor's name and address stamp / full name / telephone no.	Date and signature	Remarks
Mechanical installation			
Hydraulic connection			
Electric connection			
Cooling system leakage test report			
Startup			
Measurements			

MEASURED OPERATING PARAMETERS

SUPPLY		EXHAUST	
Air flow		Air flow	
Designed (m^3/h)	Measured (m^3/h)	Designed (m^3/h)	Measured (m^3/h)
Motor		Motor	
Rated current (A)	Measured current (A)	Rated current (A)	Measured current (A)
Setpoint (Hz/%)		Setpoint (Hz/%)	

The start-up of the air handling unit should be carried out in accordance with corresponding chapter of the operating instructions manual.

27. INSPECTION AND MAINTENANCE LOG

PRODUCT TYPE:	
SERIAL NUMBER:	

Inspection Date	Inspected by	Scope of Work	Air Dampers	Filters	Heating Coil	Cooling Coil	Fan Assembly	Heat Recovery	Control System	Remarks
		Check								
		Clean								
		Replace								
		Check								
		Clean								
		Replace								
		Check								
		Clean								
		Replace								
		Check								
		Clean								
		Replace								
		Check								
		Clean								
		Replace								
		Check								
		Clean								
		Replace								
		Check								
		Clean								
		Replace								
		Check								
		Clean								
		Replace								
		Check								
		Clean								
		Replace								
		Check								
		Clean								
		Replace								
		Check								
		Clean								
		Replace								

Inspection of the equipment should be carried out in accordance with the corresponding chapter of the operating instructions manual.

28. SERVICE REQUEST FORM

Date of completion:

Service type WARRANTY ☐ POST-WARRANTY ☐ PAID ☐

User of the product (name)	
Contact person	
User's address	
Telephone, fax and e-mail	
Unit type	
Serial number	
Year of manufacture	
Start-up carried out by	

Description of defect/damage:

NOTE!
ONCE COMPLETED, PLEASE EMAIL THIS SERVICE REQUEST ALONG WITH A COPY OF THE START-UP REPORT TO serwis@juwent.com.pl.
JUWENT will only accept service requests that are legible and complete.
If the complaint is found to be unjustified, the requester will be charged for the service.

Warranty issue date ..... Order number ..... (Company Stamp)

29. ADDITIONAL DOCUMENTS

Depending on the unit configuration, the following documents may be provided:

1. Technical Data Sheet
   This document contains all information on the designed and measured values of air parameters and selected components.

2. Declaration of Conformity

3. List of Components Installed in the Air Handling Unit
   This document lists all components installed in the air handling unit and clearly distinguishes between supply and exhaust items.

4. Specification of Controls
   This document provides a list of controls installed in the air handling unit and a drawing indicating the location of these components. Note: If the controls are not supplied by JUWENT, this document will not be provided.

5. List of Components Included with the Air Handling Unit
   This list is included only if certain components of the air handling unit are supplied separately (i.e., not pre-installed in or on the unit), for example, when the unit is assembled on-site at the customer's location. Such a list refers to components such as adhesives, gaskets, screws and other components.

CONTACTS

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