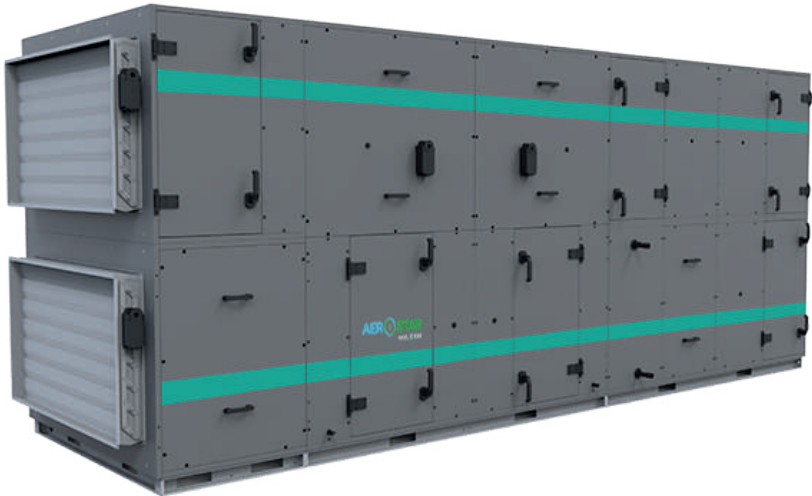




Installation and Operation Manual

POOL S TAR



Order number	
Unit	
Serial Number	
Date	



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GENERAL

- The air handling units are produced in accordance with applicable Ukrainian and European technical standards and regulations.
- PoolStar units shall only be installed and operated in accordance with this documentation.
- The Manufacturer bears no liability for damages resulting from improper use of the equipment, the Buyer of the equipment bears all risks.
- Installation and operational documentation shall be available to maintenance personnel and the service company. It is recommended to keep it near the air handling unit.
- During operation, installation, electrical connection, commissioning, as well as repair and maintenance operations, the personnel shall comply with the applicable safety rules, standards and generally accepted technical regulations. First of all, it is necessary to use personal protective equipment (gloves), since the unit has sharp edges and corners. All connected equipment shall comply with applicable safety standards.
- It is strictly prohibited to replace or repair any individual components of the PoolStar unit, which could affect safe and proper operation of the equipment.
- Carefully read and strictly follow the instructions and recommendations provided in the following sections before installation and use of the equipment.
- Installation and commissioning of the equipment may only be carried out by qualified personnel of a specialized company authorized by the Manufacturer in accordance with applicable standards and regulations.
- Properly designed and installed air handling unit will not work efficiently unless it is not properly maintained.
- After the installation is completed, the air handling unit shall be checked (tested), adjusted in accordance with the project design and transferred to operational personnel in perfect condition and ready for operation.
- During the testing it shall be checked whether the actual fan capacity and heaters output match the ones indicated in the design.

NOTE

- UNIT DESIGN CAN HAVE modifications that do not deteriorate its consumer properties and are not described in this manual.
- Operation and installation MANUAL for automation system is provided by the automation system supplier.

SAFETY RULES!



Do not turn on ungrounded air handling unit.



Before turning on the unit make sure that all the doors are closed and covers are mounted and fastened.



Before starting the unit, its sections shall be interconnected as described in this installation manual.



Make sure that the unit is disconnected from the mains and that all rotating parts are in stall position before performing an internal inspection.



Before opening the doors, turn off the unit and the main switch, wait (1-2 minutes) until the fans stop.



The air handling unit can only be connected in the ways indicated in this manual.



Be careful when performing installation or repair of the water heater since the heat transfer fluid temperature can reach 130 °C.



If the air handling unit is operated with an automation system that was not agreed with the Manufacturer, the automation system installer shall be responsible for functionality, reliability, and safety of unit protection!



Moving part – protection zones

The moving parts in the unit are fan impellers, rotary recuperator belt drive (if any), and components of the shut-off and bypass valves of the plate recuperator (if any). Inspection doors are lockable; they protect employers against direct contact with moving parts. Fan section outlets that are not connected to air ducts or other sections shall be covered using protective mesh.

APPLICATION AND OPERATING CONDITIONS

PoolStar units are used to create a comfortable climate. PoolStar units feature sectional design, which allows installation of the unit indoors and outdoors. Units for outdoor installation are equipped with protective structure (consisting of a set of sections and locks), and air grid.

PoolStar units are designed to supply air free of solid, fibrous, adhesive, aggressive or explosive impurities. The air shall be free of substances that contribute to corrosion or erosion of zinc, steel, or aluminium. The operating temperature range for a standard model is -30...+40 °C.

Unit structure

The units feature modular, panel-based design.

PoolStar units are of frameless design and consist of metal panels with mineral wool filling. Stiffness of structure is achieved due to use of labyrinth connection for the panels and a special frame. Panels and partitions are fastened to each other with screws. Panels that provide access to internal equipment for rarely performed maintenance operations are equipped with handles.

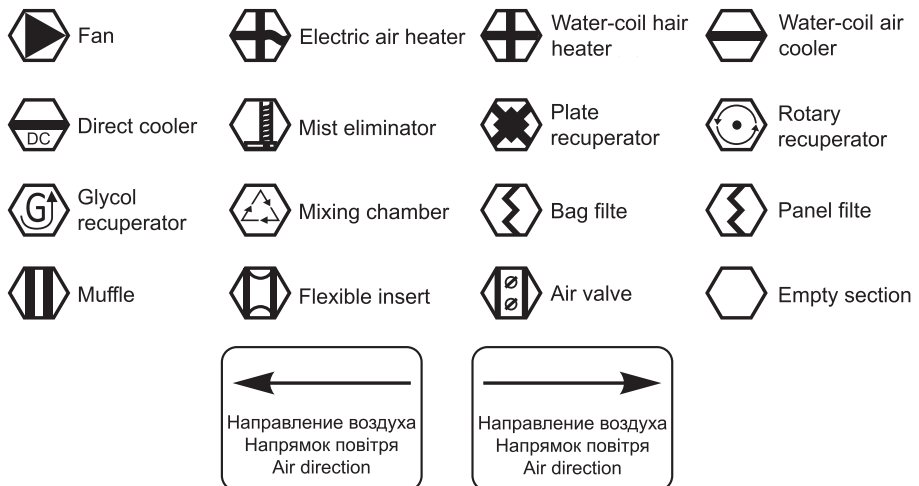
Some sections are equipped with doors with turn handles for the equipment maintenance or inspection (replacing filters, fans, or cleaning). Sections requiring less frequent maintenance of internal components (electric heating section, valve section, recuperator section, etc.) are fitted with removable panels with handles. Such panels are fastened with M6x25 screws GOST 11738-84. The panels are sealed with a self-adhesive gasket 5x12 mm. In the fan and filters sections (bag or panel type) the rear panels are fastened with self-tapping screw M6x25, GOST 11738-84. All sandwich panels with a thickness of 50 mm have a case made of galvanized steel with polymer coating and high-quality anti-corrosion treatment. The panels are insulated with 50 mm thick non-combustible mineral wool with a volume density of 110 m3. Contact surfaces of the panels are sealed with a self-adhesive rubber sealant. Slits are sealed with a joint sealing compound.

Right- and left-sided design

The PoolStar unit design allows choosing the side for power connections and service access. The side is determined in relation to the air flow direction, right or left.

Information and safety

PoolStar units and individual sections are also equipped with identification plates describing the function of the equipment, connection diagrams, medium inlets and outlets (Fig. 1).




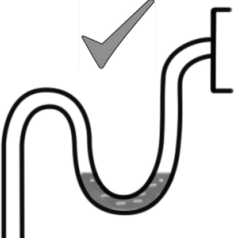
Signs attached to the unit (Fig. 1)


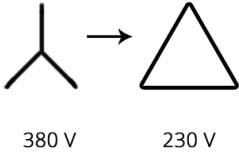



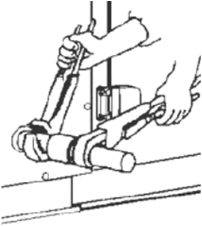
The service panel of the electric heating section, individual terminal boxes and service panels that cover the electrical equipment bear warning label "Danger – Electricity".



Rotating parts warning sign with warning notice "Danger" is located on the outside of the unit's service doors.

Important		Важно
<p>Drain</p> <p>Must trap condensate Unit must be level to drain properly</p>		<p>Дренаж</p> <p>Должен улавливать конденсат. Оборудование должно быть подключено к дренажу</p>

Attention!		Внимание!
<p>Motor connection is made on a «Star» pattern , 380v For use with single-phase frequency inverter need to reconnect for "triangle" pattern, 230v</p>		<p>Подключение двигателя выполнено по схеме «звезда» , 380v Для использования двигателя с однофазным частотником необходимо переключить по схеме «треугольник» ,230v</p>

Attention!		Внимание!
<p>When connecting two wrench must be used</p>		<p>При подключении трубопровода необходимо использовать два ключа</p>

SHIPMENT

Scope of delivery

Each PoolStar unit comes with:

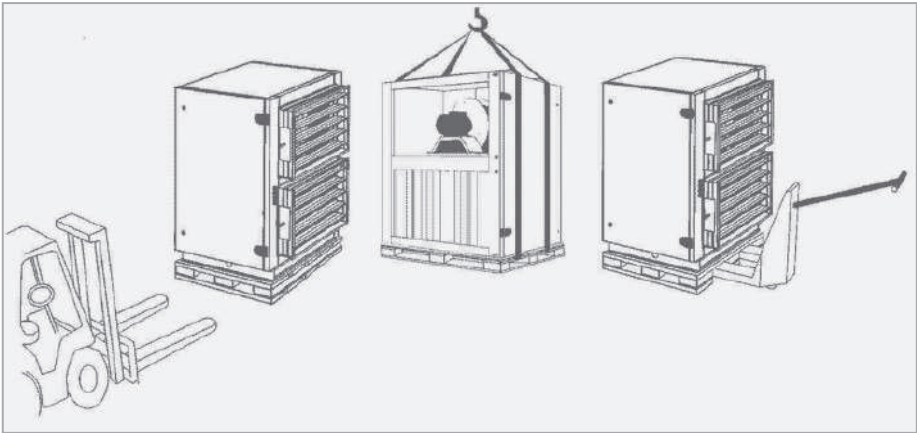
- This manual.
- Equipment certificate (Passport).
- Instrumentation and controls elements (optional).
- Accessories according to the order.
- Connection kit (in case of transportation in sections).

Transportation and storage

- The unit is delivered with no additional tools.
- The unit is equipped with a frame, there is no need to place it on a pallet.

Packing

PoolStar unit sections are packaged in PE film. For lifting using a crane, the holes in the support frame can be used (Fig. 2).



Packing of section (Fig. 2)

Handling operations

PoolStar units are delivered to the installation site either disassembled in transportable sections or assembled. Loading and unloading is carried out using a forklift or crane. When lifting with crane, the unit shall be protected from damage and deformation by inserting spacers between the cable ropes.

When lifting a section without a support frame, the forks of a forklift shall be placed under the entire width of the section. When lifting a section with a support frame, the forks of a forklift shall be placed under the entire width of the section, so that the section can be lifted resting on two side members of the support frame. Before lifting, it is always necessary to slightly raise the section to determine its centre of gravity. Move the section with care.

The exception are sections with protruding service accesses (electric and gas heating, water heating with concealed connections). When being lifted and transported, these sections shall be picked up from the side opposite to the service access.

Attention: When transporting or loading, special attention shall be paid to the parts of the transport section (pipes, wiring elements) protruding from the panels.

All sections shall be transported in the position of subsequent installation

Storage

The unit is delivered to the site packed in shrink film and protected with polystyrene inserts. The units shall be stored in covered premises that ensure the following conditions:

- max. relative humidity does not exceed 85%;
- moisture condensation does not occur
- air temperature is in the range -20...+40 °C;
- ingress of corrosive dust, gases, and vapours, which can contribute to corrosion of the internal equipment structural elements shall be excluded;
- unit sections shall only be stored in the position, in which they will be operated;
- transportation sections may only be stacked under the following conditions:

1. Max. 2 sections can be stacked;
2. The upper section shall not have a support frame;
3. Under no circumstances shall dimensions of the upper section outsize dimensions the of the supporting (lower) section;
4. Protective inserts shall be placed between the sections in order to avoid damage;
5. When stacking, the fan section shall always be placed at the bottom;
6. Plate and rotary recuperator sections shall not be placed one onto another.

INSTALLATION

Positioning

The unit installation place shall be horizontal and have a smooth surface, which is important for the installation and proper operation of the equipment. The unit requires no special anchoring.

Providing service access

When positioning the unit, make sure to provide sufficient space for maintenance. This space depends on the unit configuration, i.e. on the functional sections selected (Fig. 3).

Inspection before installation

Check the following before installation: integrity of the cargo (scope of delivery according to the consignment note), the free rotation of fans, dampers, rotary recuperator, parameters of electric equipment and the connected utilities. All detected faults shall be repaired before installation.

The Equipment certificate (Passport) for the unit is stuck (and enclosed in a special pocket) onto the inner surface of the fan section door. When installing the sections, it is important to use the Equipment certificate (Passport) to position the sections in correct order. Sections bolted together. Bolted joints are located inside the section, as well as along the section frame. It is necessary to dismantle the side panels or to open the door to gain access to bolt locations. Remove the internal elements of the section (filter, heat exchanger, electric heater frame) for convenience of installation

Identification of unit components

Each section has a label and identification plate (located on the outside of the section door (Fig. 4), a ventilation section is given as an example).

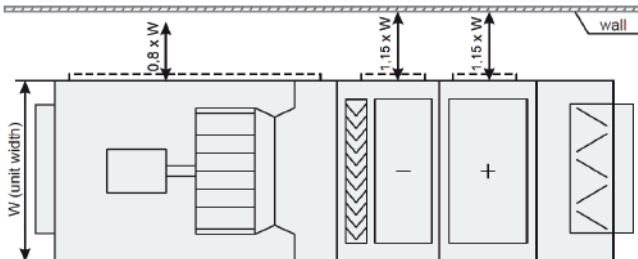
Each section label contains order information, i.e. unit No. and position No. of the section as indicated in the figure in the Equipment certificate (Passport).

The unit sections shall be assembled according to the scheme given in the Equipment certificate (Passport), as well as using information on identification plates on the sections (Fig. 1).

Ensure the following clearances from the walls to provide adequate space for maintenance:

- 1.) $0.8 \times$ unit width (W) = clearance between wall and unit; factor 0.8 shall be used for the following components: fan, filter, rotary recuperator.
- 2.) $1.15 \times$ unit width (W) = clearance between wall and unit; factor 1.15 shall be used for the following components: heater, cooler, mist eliminator, plate recuperator.

Plane view:

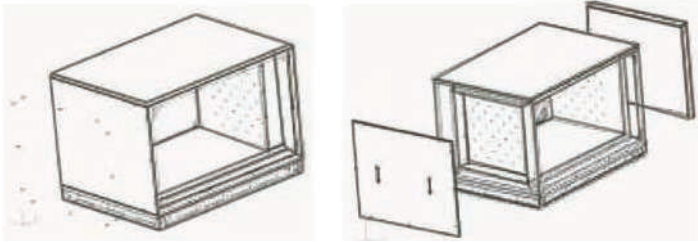


The clearance from the wall required for service maintenance (Fig. 3)

Sequence for joining unit sections and support frames

1. Remove the side panels from one of the sections to be connected, or, in case there is a door in the section, open it.

Remove the internal elements of the section (filter, heat exchanger, electric heater frame) for convenience of installation. The side panels are fastened with M6x25 screws, which are located inside the panel under the plastic caps. Use an Allen key for disassembly. Check integrity of the seal under the panel.

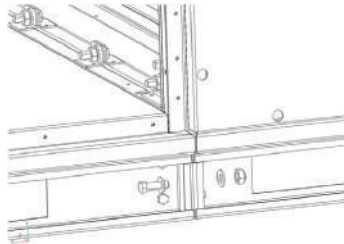


(Fig. 4)

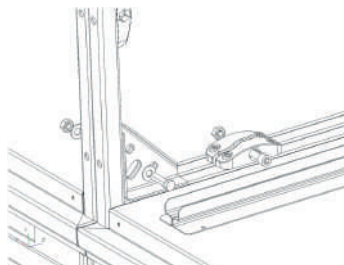
2. For convenience, when installing such sections as the bag and panel filters section, electric heaters, water and Freon heat exchangers, it is recommended to remove the component parts (filters, heat exchangers, frame with heaters) (Fig. 5).

3. Push sections to each other until their mating planes come in contact. Align sections relative to each other.

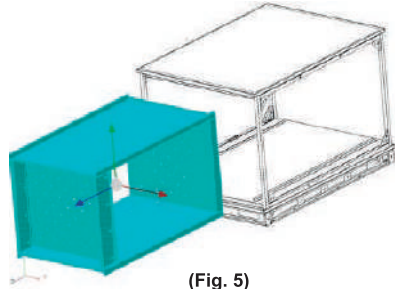
4. Join the sections using M8x30 bolts in points indicated in the figure. Place washers under the bolt head and nut. Do not install washers under the screws of special aluminium fasteners.



5. Sections with a frame are joined using M8x30 bolts. Place washers under the bolt head and nut



6. In PoolStar installations, on horizontal tubes of the frame (bottom and top), two fasteners with a bolt (toad) are installed, on vertical - one at a time.



(Fig. 5)

Frame: holes:

- a) the sides: for M6 threaded bushes (see para. 1 above)
- b) internal contour: along the perimeter for M6 threaded bushes (see para. 2 and 3 above)

Holes in a removable panel (end face) for M6 threaded bushes.

7. To connect the fan section to other sections, the joint angle profiles are fastened with M8x30 bolts (2 for each angle profile) at diffuser side. Washer shall be placed under the bolt head. Other sections are joined with M8x30 bolts by means of joint angle profiles (1 bolt for each profile)

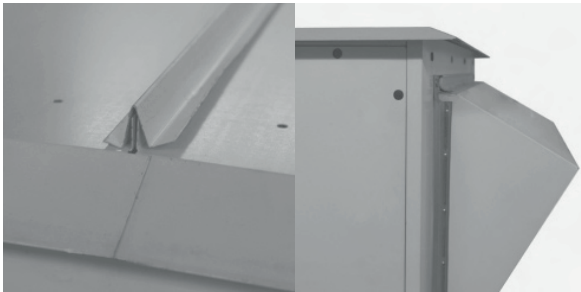
8. Reassemble the panels in the reverse order.

Heat exchanger connections

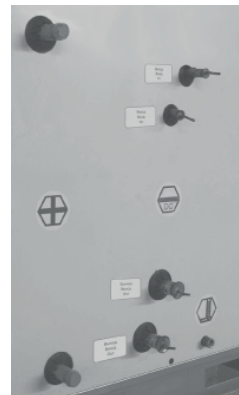
All power connections are performed outside the unit (Fig. 7). Internal connections are made during manufacture of the unit.

Water-medium heat exchangers

When connecting heat transfer lines, make sure the loads from the lines are not transferred to the unit.



Canopy of the unit (Fig. 8)



Connections (Fig. 7)

Water heat exchangers connections

To achieve maximum efficiency, the heat exchanger shall be connected reversely. When connecting the fittings, tighten them using two wrenches (see page 7) in order to avoid rotating the manifold connection. Water-coil heat exchangers of all coolers are connected by means of external thread C1. The maximum allowable pressure is 1.5 MPa.

The cooler is tested for tightness by the Manufacturer by applying compressed air at a pressure of 2 MPa for 5 minutes under water.

After connection of the heat exchangers and mixing valves it is necessary to water-pressurize and remove air from the system, check tightness of the connections and the heat exchanger itself, including inspection inside the unit section.

The Manufacturer does not accept claims for damage caused by spills due to leaks in the connections or damage to the heat exchanger. It should be noted that frequent change of water in the water heating system leads to accelerated corrosion of pipelines due to oxidation by atmospheric oxygen contained in fresh tap water. Besides, the same air, when trapped in the heating system during heat exchangers connection, may block water circulation in certain parts of the system.

Heat pump

Each PoolStar model is equipped with a heat pump. When the heat pump is in heating mode, the evaporator, located in the extract air stream, absorbs residual heat while hot the heat exchanger (condenser) is located in the flow supply air and additionally heats it. Aggregates PoolStar aims to achieve a regime that gives maximum efficiency, regardless of whether it works unit for heating or cooling. Heat exchangers designed for optimal performance regardless of whether they are included as vaporizers, or as capacitors.

Water cooled condenser

A water-cooled condenser can be supplied to the heat pump module to transfer excess heat in pool or shower water. System connections have already been made on factory, and the connection to the water circuit of the pool or shower is made on site.

Connecting air ducts

The connection of the air ducts is carried out using a flexible insert that prevents vibration transfer and alignment of the channel alignment with the installation (Fig. 10). Compound executed in such a way that the channel does not load or deform the installation panel on exit. The accessories are installed according to the specification and the installation instructions. manufacturer. All connections and parts must not interfere with the opening of doors and maintenance.



Connecting air ducts (fig. 10)

Direct expansion evaporators

Direct expansion evaporators shall be connected by a company specialized in refrigeration equipment. During production, direct expansion evaporators are filled with nitrogen and sealed. These evaporators are pressurized when not connected to the unit.

When evaporators are being de-sealed, gas escapes under pressure and a distinctive sound is heard.

Connection of direct expansion evaporators

Installation, operation, and service maintenance, including connection of compressor-condensing unit, shall be performed by personnel of a specialized company in accordance with applicable law. However, in no case shall the coolers be mechanically loaded, especially by twisting loads from the connected pipeline. Prior to installation, a self-adhesive gasket shall be applied to the front mating surface of the cooler flange.

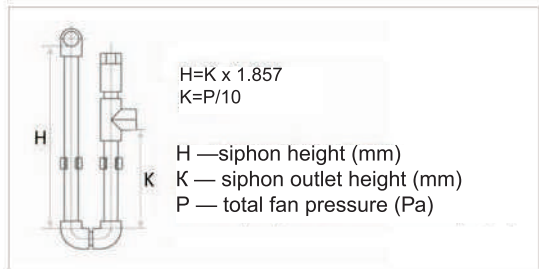
Condensate drain

In the sections of cooling, plate recuperator and steam humidification, stainless condensate collectors are installed, equipped with a drain for connecting the condensate drain system (Fig. 11), which is supplied separately. Each section is equipped with a separate system. The siphon height depends on the total fan pressure and ensures its proper operation.

The siphon shall be selected according to the fan pressure. If the siphon height is bigger than the frame height, it is recommended to provide legs with a height of 150 mm under the frame. The legs can be ordered from the Manufacturer as a separate item.

Before starting and after long downtime of the equipment, it is necessary to fill the siphon with water.

The siphon can be equipped with an anti-odour valve and a ball valve (with negative pressure). Such siphon shall not be filled with water before start of operation.



Condensate drain (Fig. 11).

Recuperator installation

The recuperator shall be installed in accordance with the requirements of DSTU B A.3.2-12:2009 , DSTU-N B V.2.5-73:2013, design documentation, and this Manual. Perform visual inspection of the recuperator (Fig. 12). It is forbidden to commission recuperators without consent of the Seller in case of damages or defects due to improper transportation or storage. Use spring washers when joining flanges to ensure electrical conductivity of the joint.



Plate recuperator (Fig. 12)

ELECTRICAL CONNECTIONS

Internal electrical equipment of the unit is connected via junction boxes located on unit case (service sides to be selected during design); terminals of these junction boxes are used for connecting the electrical equipment. Wiring and connection of instrumentation and automation components shall be performed by qualified personnel authorized to install this type of equipment. The connection shall meet the requirements of applicable regulations. Before starting, an initial check of the electrical equipment shall be carried out. Check the following before connection:

- mains voltage, frequency, and protection shall agree with the data indicated on the nameplate of the section to be connected;
- cross-section of cables used for wiring.

Electrical requirements

Electrical connections shall be performed with due consideration of the following recommendations:

- The units shall be grounded in accordance with the Electrical Installation Code (PUE)
- Resistance between the grounding terminal and each accessible metallic current-conducting component of the unit that may get energized shall not exceed 0.1 Ohm.
- Use the necessary protective equipment during wiring.
- Technician performing the electrical wiring shall have the required permit for high-voltage operations.

• When connecting the units, it is always necessary to check the direction of rotation of the impeller in the fan section of the unit, which is accessed through a quick-removable service panel or door. The rotation direction shall match with the arrow on the impeller housing. Failure to observe the direction of rotation may result in motor overheating. The rotation direction is changed by switching the fan motor phases.



Important:

Contact your electricity supplier if the mains voltage has a phase imbalance of more than 5%.

No warranty claims will be accepted in case of phase imbalance above 10%.

Motor connection

The motor (Fig. 13) shall be connected according to the diagram indicated in the terminal box.

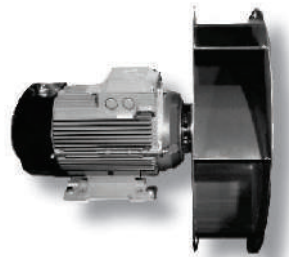
To protect the motor, a protective circuit breaker or thermal switch is used.

Do not connect the motor to the mains in case of a phase imbalance above 5%.

The main motor parameters are always shown on the motor nameplate.

Use the following formula:

$$\text{phase imbalance (\%)} = (\text{maximum voltage deviation}) / (\text{average voltage}) * 100\%$$



Motor (Fig. 13)

Connection of electric heaters

Wiring of electric heaters (Fig. 14) shall be performed in accordance with the electrical diagram (Fig. 16). Installation of electric heaters shall be performed by qualified, specially trained electrical personnel. Thoroughly check the wiring for quality and correctness before starting the unit.

Before commissioning, check the correct operation of the safety and emergency thermostat circuits connected to the control panel. When the emergency thermostat circuit is opened, the control panel has to deenergize the heater and to generate the overheating alarm signal.

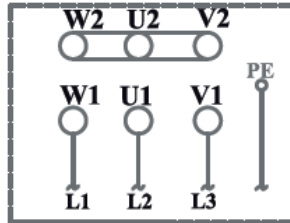
Check that the cables are securely fastened in the terminal box and mounting clamps. Check grounding for reliability. It is prohibited to use neutral line for grounding. During startup run, oil present on the heating elements burns out within 20 minutes, producing smoke and a characteristic odour.



Electric heater (Fig. 14)

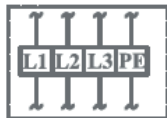
Wiring diagrams

400V



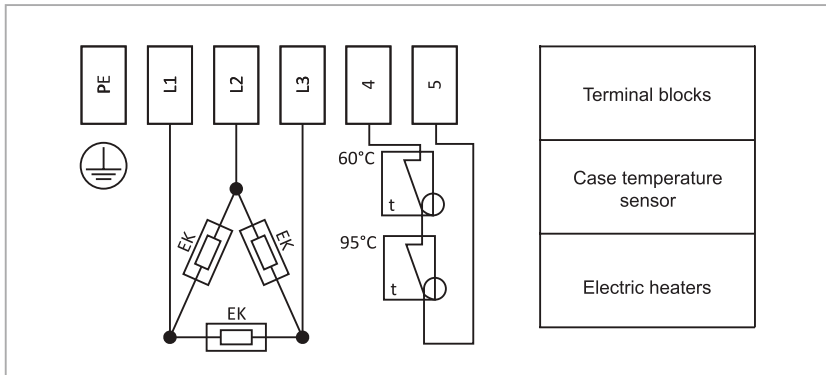
- U1 - brown
- V1 - blue
- W1- black
- U2 - red
- V2 - grey
- W2- orange

400V



Terminal Box

Fan motor connection diagrams (Fig. 15)



Electric air heater connection diagrams (Fig. 16)

Test Run:

- close the air valve;
- close the service door of the fan panel;
- turn on the fan;
- check the direction of rotation (it shall match with the arrow on the housing, otherwise, interchange the two motor phases);
- measure current in each phase line, their values shall not exceed the rated ones;
- open the air valve;
- measure current in each phase again, and compare them to the rated values indicated on the motor nameplate.

Test functioning of protection and safety elements

- voltage loss protection;
- motor overtemperature protection;
- motor overcurrent protection;
- protection against frosting of the water-coil air heater;
- protection against frosting of recuperator;
- electric heater overheat protection, etc.

During test run unusual sounds or vibrations shall not appear. Test run shall last for at least 15 minutes. Inspect the unit upon completion of the test run. It is also necessary to adjust the system. Before continuous operation it is recommended to regenerate or replace the filters

Operational inspections and guidelines for operation

The following items shall be routinely inspected:

- system operation, tightness of joints, doors, service panels, heat transfer fluids temperature and air temperature, clogging of filters (by means of sensors);
- condition and operation of systems associated with the air handling unit, functions that affect the operation of the unit and the entire ventilation system. First of all:
 - electrical equipment;
 - instrumentation and controls elements;
 - pump operation, water filters;
 - cooling systems;
 - condensate drain systems.

Regular inspection

The user defines the inspection frequency depending on the operating conditions. However, inspections shall be carried out at least once every 3 months. Inspection includes:

General condition monitoring

- cleaning all parts of the unit

Inspection of fans

- inspecting impeller for cleanliness, inspection of filter

Inspection of filters

Bag- and panel-type filters are used in the units. Filters are installed by means of guide slots in the filter section.

The filters are inspected for the following:

- filter condition and clogging (clogged inserts shall be replaced)
- the used inserts shall be disposed of in accordance with environmental guidelines;
- monitoring the differential pressure sensors

Inspection of heat exchangers

- the heat exchange surfaces are to be cleaned using a vacuum cleaner or by rinsing with hot water;
- perform cleaning with care, so as not to damage the heat exchanger plates;
- bleed air from the heat exchanger – this operation is very important;
- condensate drain shall be regularly inspected (for coolers).



Attention: When the heat exchanger is disconnected for winter period, it is necessary to thoroughly drain the water, for example by purging with compressed air, or fill the heat exchanger with water-glycol mixture. Residual water can freeze and break the copper tubes of the heat exchanger.

Troubleshooting

Problem	Probable cause	Remedy	Remarks
Insufficient unit performance.	<ol style="list-style-type: none"> 1. Pressure drop across the system is higher than the design value. 2. The fan wheel rotates in the opposite direction. 3. Air leakage through non-hermetic joints. 	<ol style="list-style-type: none"> 1. Reduce pressure drop. 2. Interchange the two phases at the motor terminals. 3. Tighten the bolted joints. 4. Eliminate leaks. 	
Excessive unit performance.	Pressure drop across the system is lower than the design value.	<ol style="list-style-type: none"> 1. Throttle the circuit. 2. Reduce rotational speed. 	
Increased vibration of the unit.	<ol style="list-style-type: none"> 1. Imbalance of motor-wheel assembly. 2. Dirty fan motor-wheel. 	<ol style="list-style-type: none"> 1. Clean the motor-wheel. 	
Loud noise during unit operation.	<ol style="list-style-type: none"> 1. There are no flexible inserts between the unit and the air ducts. 2. Bolted joints are loosely tightened. 	<ol style="list-style-type: none"> 1. Fit the system with flexible inserts. 2. Tighten the bolted joints. 	
The fan spontaneously turns off.	<ol style="list-style-type: none"> 1. Motor overheating – thermal contacts of the winding tripped. 2. the fan is malfunction. 	<ol style="list-style-type: none"> 1. Restart the fan after cooling of the thermal protection contacts. 2. Replace fan motor. 	

MAINTENANCE RECOMMENDED BY VENT-SERVICE LLC SERVICE DEPARTMENT FOR AIR HANDLING UNITS

Once a month:

- 1.External inspection of equipment, checking of fastenings, guards and air handling unit structures;
- 2.Phase power check (voltage imbalance check, current imbalance check);
- 3.Condition monitoring and cleaning (replacement) of air filters;
- 4.Checking the electric actuators of regulating and stop valves;
- 5.Control and recording the status of automatics and instruments readings;
- 6.Checking the vibration isolation mounts;
- 7.Maintenance of the water pump;
- 8.Unit drainage system operation check and cleaning the drainage if necessary;
- 9.Drive belts condition control;
- 10.Checking the heat exchanger condition;

Once every 3 months:

11. Checking power and control circuits of the Equipment and tightening the threaded connections if necessary;
12. Control and adjustment of the three-way valve of the water-coil air heater;
13. Control and adjustment of the three-way valve of the water-coil air cooler;
14. Lubrication of the air handling unit bearings;
15. Drive belts checking and tensioning;
16. Checking and centring the impeller on the shaft;
17. Removing surface deposit from the impeller;
18. Tightening the damping springs at the fan motor base;
- 19.Checking the flexibility and strength of fasteners;

Once every 6 months:

20. Chemical cleaning of condensate drainage;
21. Checking water strainers for clogging;

Once a year:

22. Cleaning louvre grilles;
23. Inspection of air channels for tightness;
24. Chemical cleaning of the heat exchanger;
25. Washing and cleaning the internal space of the air handling unit;
26. Planned air channel sealing;
27. Inspection/maintenance of the fan motor bearings;
28. Checking instrumentation for conformity;
29. Inspection/maintenance of the unit impeller;
30. Checking the electric actuators of regulating and stop valves;
31. Maintenance of drainage siphons;
32. Maintenance of the water pump.

WARRANTY TERMS AND CONDITIONS

WARRANTY PERIOD

The warranty period for the equipment is 36 calendar months from the date of shipment of the Equipment, but not longer than 38 months from readiness of Equipment.

WARRANTY SCOPE

The Supplier shall independently decide on the replacement of defective parts of the goods. The warranty period for the equipment components is to be extended for the period when the repair activities prevented its normal operation.

WARRANTY EXCLUSIONS

Parts of equipment and maintenance materials subject to normal physical wear (filters, gaskets, V-belts, electric lamps, fuses, etc.).

Defects of the equipment that arose due to reasons, which are not defined by the properties and characteristics of the equipment under warranty.

Damage to the equipment caused by environmental effects, transportation, and improper storage by the Buyer, any mechanical damages and breakdowns resulting from unsatisfactory operation and maintenance or non-compliance with recommendations and requirements of the technical and operational documentation (hereinafter referred to as TOD).

Any modifications, changes in operating parameters, reconstruction, repair and replacement of parts of equipment not agreed with the Supplier.

Routine maintenance, equipment inspections, configuration and programming of the controllers shall be carried out in accordance with the requirements of TOD in regard to normal functioning of the equipment.

Losses caused by downtime of the equipment during warranty service waiting or any damage caused to Buyer's property, except for equipment under warranty.

Equipment that does not have a fully completed commissioning protocol with the indicated responsible persons and the date of filling.

WARRANTY TERMS AND CONDITIONS FOR MOTORS/FANS SHALL NOT APPLY TO THE FOLLOWING CASES:

Mechanical damages due to loading and unloading, transportation, installation, commissioning, storage, operation, and other actions that occurred after shipment of the equipment.

Evidences or odours associated with motor overheating.

Damages to power supply, grounding wires, thermal fuse and connecting wires of the starting capacitor of adequate rating.

Evidences of corrosion, salt deposits, sticky/fibrous substances on the impeller blades, as well as traces of dust of more than 80 g/m³.

Cases specified in section "Warranty Exclusions".

The warranty shall become void if the equipment has not been maintained in accordance with the routine maintenance schedule for this type of equipment (Appendix 1 to the Installation and Operation Manual).

WARRANTY CLAIMS

The claim form can be obtained from Supplier's technical specialist.

Warranty claims shall be sent in written to the Supplier's technical specialist.

A claim is examined only if the mandatory fields in the claim form are filled

In case of a warranty claim for motors/fans, the filled claim form shall be supplemented with photographs of the fan/motor and the unit with the installed fan/motor; the photos shall clearly show the fan and its position.

WARRANTY SERVICES

Warranty service shall be carried out within the following periods:

- 5 business days upon arrival of the technical specialist;

- in case there are no spare parts at the Supplier's warehouse — within 30 business days.

This period may be extended in exceptional cases, particularly in cases when more time is required for delivery of parts, or if the service cannot be performed on-site.

The components dismantled from the equipment during warranty replacement are the property of the Supplier.

Costs arising from unjustified claims or due to interruptions in service at the request of the claimant shall be borne by the claimant. Repair services shall be charged in accordance with the service pricelist.

The Supplier has the right to refuse to perform warranty services or maintenance if the Buyer delays payment for the equipment or for previous service works.

The Buyer supports service personnel in guarantee maintenance of the equipment in the city/town of installation:

- a) timely provides access to the equipment and its documentation (TOD);
- b) provides security for the service team property, as well as ensures compliance with all occupational safety requirements on site where the servicing is performed;
- c) creates conditions for immediate commencement of works upon arrival of the service personnel and smooth performance of works;
- d) provides any free assistance necessary for the performance of works, for example, ensures availability of lifting devices, scaffolding, and free sources of electricity.

COMMISSIONING PROTOCOL

unit type	<input type="text"/>	site	<input type="text"/>
serial number	<input type="text"/>	address	<input type="text"/>
manufacturer	<input type="text"/>	date	<input type="text"/>
customer	<input type="text"/>		<input type="text"/>

EQUIPMENT OPERATION PARAMETERS

supply voltage, V	<input type="text"/>		<input type="text"/>
supply fan motor current, A	<input type="text"/>		<input type="text"/>
exhaust fan motor current, A	<input type="text"/>		<input type="text"/>
supply air flow rate, m ³ /h	<input type="text"/>	according to the Equipment certificat	actual values <input type="text"/>
exhaust air flow rate, m ³ /h	<input type="text"/>		<input type="text"/>
Compressor (compressors) current, A	<input type="text"/>		<input type="text"/>

AUTOMATION TESTING

shut down in case of fire	<input type="checkbox"/>	outdoor temperature sensor	<input type="checkbox"/>
phase control relay	<input type="checkbox"/>	supply air temperature sensor	<input type="checkbox"/>
air heater freezing risk	<input type="checkbox"/>	exhaust air temperature sensor	<input type="checkbox"/>
recuperator freezing risk	<input type="checkbox"/>	indoor air temperature sensor	<input type="checkbox"/>
overheating of the electric air heater	<input type="checkbox"/>	heat transfer fluid temperature sensor	<input type="checkbox"/>
humidity transducer	<input type="checkbox"/>	supply damper servomotor	<input type="checkbox"/>
humidistat	<input type="checkbox"/>	exhaust damper servomotor	<input type="checkbox"/>
circulation pump	<input type="checkbox"/>	recirculation damper servomotor	<input type="checkbox"/>
remote control	<input type="checkbox"/>	recuperator damper servomotor	<input type="checkbox"/>
cooling unit failure	<input type="checkbox"/>	fan differential pressure sensors	<input type="checkbox"/>
heater valve servomotor	<input type="checkbox"/>	filter differential pressure sensors	<input type="checkbox"/>
cooler valve servomotor	<input type="checkbox"/>	rotary recuperator rotation	<input type="checkbox"/>
cooling unit start	<input type="checkbox"/>	rotary recuperator fault	<input type="checkbox"/>

AIR PREPARATION PROCESSES CONTROL

heating	<input type="checkbox"/>	recovery	<input type="checkbox"/>
cooling	<input type="checkbox"/>	humidification	<input type="checkbox"/>
recirculation	<input type="checkbox"/>	dehumidification	<input type="checkbox"/>

PREPARED BY

CONFIRMED BY

FULL NAME	<input type="text"/>	FULL NAME	<input type="text"/>
position	<input type="text"/>	position	<input type="text"/>
company	<input type="text"/>	company	<input type="text"/>
signature	<input type="text"/>	signature	<input type="text"/>

ACCEPTANCE CERTIFICATE

The POOLSTAR air handling unit
was manufactured in accordance with the Order,
has passed the acceptance tests,
meets the requirements of technical specification TU U
28.2-35851853-006:2020 was found to be operational.

Date of manufacture « _____ » _____ 20 _____

Inspector _____

Signature _____ LS

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