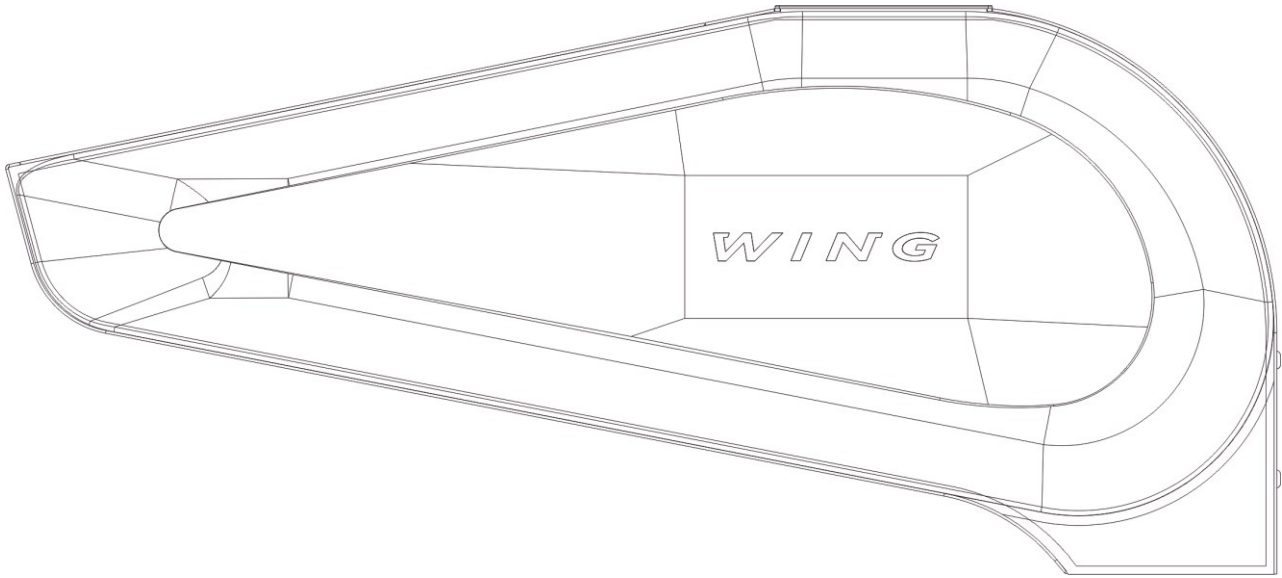


EN

VTS



Technical documentation

WING by VTS



Check us on



WING W100-200
WING E100-200
WING C100-200

WING W100-200

WING E100-200

WING C100-200

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1. INTRODUCTION

1.1. PRECAUTIONS, REQUIREMENTS, RECOMMENDATIONS

Detailed analysis of this documentation, as well as assembly and use of equipment, according to the descriptions contained therein, and following all safety requirements, is the basis for the correct and safe operation of the device. Any other use that contradicts this instruction may cause accidents with serious consequences. Unauthorized personnel should have limited access to the device, while the personnel should be properly trained. The term operational personnel refers to people, who, as the result of completed training, own experience and knowledge of important standards, documentation and provisions, concerning safety and working conditions, have been authorized to carry out necessary work and are able to recognize potential hazards and avoid them. This technical documentation must be delivered together with the device. The documentation contains information concerning all possible configurations of air curtains. Examples of air curtain assembly and installation, as well as activation, use, repair and maintenance. Provided that the device is operated according to the intended use, this documentation contains a sufficient number of instructions, required by the qualified personnel. The documentation should be placed near the device and be readily available to the service team. The manufacturer reserves the right to introduce changes to the instruction, as well as changes to the device that affect its operation, without prior notice. VTS shall bear no responsibility for on-going maintenance, inspections, programming of equipment and damage, caused by standstills of equipment related to the waiting for warranty services, all and any damage related to the Client's property, other than the device in question, as well as malfunctions that result from incorrect installation or improper use of the device.

WING air curtains are intended for indoor installation only.

DO NOT COVER

WARNING: To avoid overheating - do not cover the device!

1.2. TRANSPORT

Prior to the installing and taking the device out of the cardboard box, it is required to check whether the cardboard box has not been damaged in any way and/or the adhesive tape (installed at the company) has not been broken off or cut. It is recommended to check whether the device's casing has not been damaged in transport. Should any of the above situation occur, please contact us through telephone or e-mail: Tel. +1 470-809-6811, email: america@vtsgroup.com, fax: +1 470-809-6815.

The device should be transported by two people. Use appropriate tools, when transporting the device, so as to avoid the damaging of goods and potential hazard to health.

1.3. INITIAL STEPS TAKEN BEFORE THE INSTALLATION

Record the serial number of the device on the warranty card, prior to the commencement of the installation process. It is required to properly fill-in the warranty card, once the installation is complete. Prior to the commencing of any installation or maintenance work, it is required to disconnect power supply and protect it against unintentional activation.

Installation and start-up should be performed by qualified personnel, according to the guidelines provided in this manual. The order of

installation steps are as follows:

- Mount the device in its intended operation place
- Perform the hydraulic connection, check connections for tightness and vent the system
- Perform the electrical connection
- Make sure the device is correctly connected (according to the diagram)
- In the case of an electrical curtain, vacuum the heaters to avoid the unpleasant smell of burning dust
- Turn the power on and start the device.

2. STRUCTURE, INTENDED USE, PRINCIPLE OF OPERATION

2.1. INTENDED USE

For the convenience of users as well as different types of installations in commercial and industrial facilities we have designed an air curtain in three different options and three sizes:

- a WING W100 240/1/60 curtain 42in wide with a water heater (13.6-58MBH, 1089 CFM)
- a WING E100 (models: WING E100 240/1/60, WING E100 240/3/60, WING E100 480/3/60) curtain 42in wide with electric heaters (6.8/13.6/20.5 MBH, 1089 CFM)
- a WING C100 240/1/60 curtain 42in wide (1107 CFM)
- a WING W150 240/1/60 curtain 62in wide with a water heater (34.1- 109 MBH, 1825 CFM)
- a WING E150 (models: WING E10 240/3/60, WING E150 480/3/60) curtain 62in wide with electric heaters (13.6/27.3/40.9 MBH, 1854 CFM)
- a WING C150 240/1/60 curtain 62in wide (1884 CFM)
- a WING W200 240/1/60 curtain 82in wide with a water heater (58- 160 CFM, 2590 CFM)
- a WING E200 (models: WING E200 240/3/60, WING E200 480/3/60) curtain 82in wide with electric heaters (20.5/30.7/51 MBH, 2649 CFM)
- a WING C200 240/1/60 curtain 82in wide (2708 CFM)

The above sizes of curtains are available with three options of voltage supply: 1x240VAC, 3x240VAC, 3x480VAC

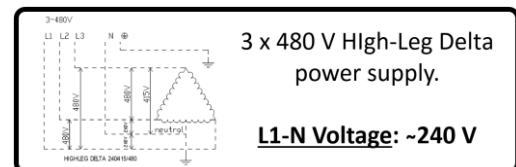
! Voltage supply 1x240VAC is available only for the curtains WING E100 240/1/60, all WING W and all WING C

! Caution

The following models of WING air curtains must be supplied using High-Leg Delta supplying circuit:

- WING E100 480/3/60 Air Curtain
- WING E150 480/3/60 Air Curtain
- WING E200 480/3/60 Air Curtain

For these models, the L1-N voltage will must be 240 VAC.

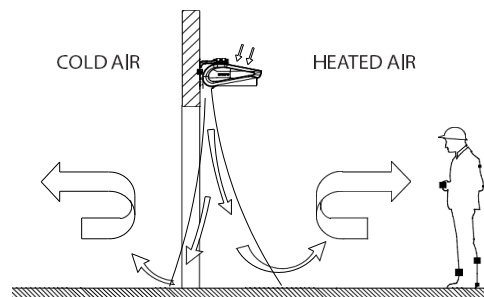


The use of the WING air curtain enables the leaving of the room door open, regardless of weather conditions, thus providing a protective barrier. The curtain also enables a simultaneous keeping of the required heating comfort inside the room/facility. The modern design of the WING air curtain is a result of its wide range of application. The places in which it is possible to install the device include: malls, office buildings, supermarkets, cinema complexes, as well as shops, store-rooms, manufacturing facilities or warehouse rooms. Please notice that the use of an air curtain not only provides a protective barrier, but also it is an additional heat source in the room. **APPLICATION:** warehouse rooms, warehouses, sports facilities, supermarkets, religious buildings, hotels, clinics, pharmacies, hospitals, office buildings, manufacturing facilities. **PRIMARY ADVANTAGES:** protection of climatic conditions in the room, reduction of heating/cooling costs, universal size, ability to work both in vertical and horizontal position; simple, quick and intuitive assembly.

2.2. PRINCIPLE OF OPERATION

WING W100-200 - heating medium, for example hot heating water, returns heat through a heat exchanger with a wide heat-exchange surface, thus providing high heating output (13.6-160 MBH). A transverse fan (518-2590 CFM) sucks in the air in the room, and pumps it through the heat exchanger, back into the room. The jet of warm air is directed downstream at high velocity, thus providing an air barrier.

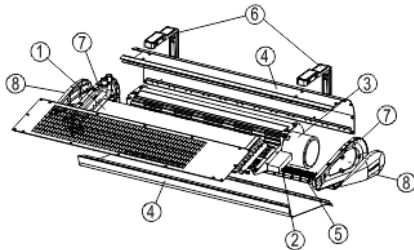
WING E100-200 - electric heaters (6.8-51.2 MBH) heat up, as a result of the flowing of electric current, and return the heat to the air; the air is blown off through the fan, which sucks in the air in the room. A jet of warm air is directed downstream at high velocity, thus providing an air barrier.



2.3. STRUCTURE (WING 100-200)

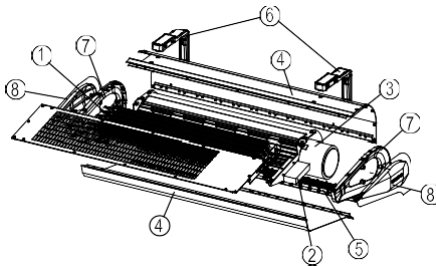
WING W100-200 – WATER AIR CURTAIN

1. Heat exchanger
2. Control system
3. Transverse fan
4. Casing
5. Outlet grille
6. Assembly jigs
7. Side cover
8. Side cap



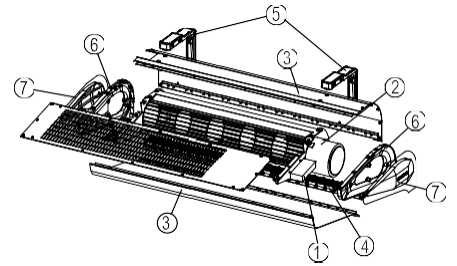
WING E100-200 – ELECTRIC AIR CURTAIN

1. Electric heaters
2. Control system
3. Transverse fan
4. Casing
5. Outlet grille
6. Assembly jigs
7. Side cover
8. Side cap



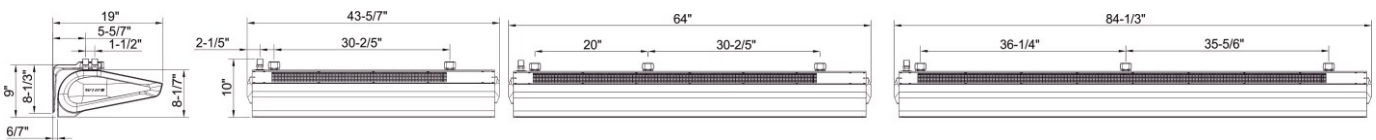
WING C100-200 – COLD AIR CURTAIN

1. Control system
2. Transverse fan
3. Casing
4. Outlet grille
5. Assembly jigs
6. Side cover
7. Side cap



1. **HEAT EXCHANGER – WATER HEATER:** Maximum parameters of the heating agent for the heat exchanger are: 200°F, 232 psi. The aluminum and copper construction consists of copper pipes of the coil and aluminum lamellae. The connection manifold (3/4" male thread) is situated in the upper part of the housing. An optimally selected water exchanger was adapted to work in three positions: horizontally and vertically, with stub pipes facing upwards and downwards. Appropriate lead of hydraulic connections makes it possible for the curtain to be assembled directly by the wall as close to the door frame as possible. The air curtain with a water heater generates power from 13.6 to 160 MBH.
ELECTRIC HEATER: each electrical curtain consists of 6 electrical heaters of 670W to 2,950W, depending on the size of the curtain. The heaters are connected into two sections of 2 and 4 kW for a 42in curtain, 4 and 8 kW for a 62in curtain, and 6 and 9kW for an 82in curtain. The heating section is connected to form a 1x230V or 3x230V, 3x480V power supply star depend on the chosen device. Thanks to such technical solutions and the application of a wall-mounted controller, the heater of each curtain can work in two heating programs, e.g. for a WING E100 curtain - option 1): heating program 1 - 2kW, heating program 2 - 4kW, option 2): program 1 - 4kW, program 2 - 6kW, and analogously for the remaining curtain sizes. Change of program is displayed on the diagram and consists in a cable switch in controller HMI. The heating program is independent from the fan speed setting.
 Electric heater are protected with 4 thermostats, 2 for each section: one with automatic reset and second with manual reset. The thermostat button for manual reset is available to push from the top of the curtain via the top cover grid on the motor side.
2. **CONTROL SYSTEM:** it is equipped with an outlet on the connection clamp block X1 for WING W100-200 and on the X2 block for WING E100-200 for connecting an on-wall controller as well as a valve actuator for WING W100-200. WING air curtains can be additionally equipped with a wall-mounted DX controller. The DX controller has a three-position heating switch. In the case of a water curtain, to guarantee the proper functioning of the water valve, the heating switch must be set to position II (central) - otherwise the valve will not open.
 The system of WING E100-200 is equipped with a safety device in the form of a fuse in the 115 V AC circuit.
3. **HORIZONTAL FAN:** the maximum temperature of operation is 200°F; the rated voltage is 240 V/60Hz. The motor protection level is IP44. The horizontal fan applied in the device with an advanced profile of blades and impeller geometry made of plastic makes it possible to obtain air capacities up to 2648 CFM. The control of the electric motor as well as thermal protections of the winding has been coupled with the control system which resulted in increasing safety of operation. Due to optimum power of the motor the WING curtain is energy saving and durable.
5. **INSTALLATION BRACKETS:** WING is characterized by simple, quick and aesthetic assembly that can be performed on a wall in both horizontal and vertical position. There are from 2 to 3 installation handles attached (as an option) to the curtain (depending on the option (length)). Connections of electric wires and water channels have been especially designed not to interfere with the general aesthetic values of the device. The name WING includes devices that are 42, 62 and 82in long that, if necessary, can be additionally joined both horizontally and vertically to achieve different air supply options: from the left to the right and the opposite. The reach of the air stream is up to 13 ft.

2.4. OVERALL DIMENSIONS (WING E, W, C 100-200)



3. MOUNTING

IMPORTANT!

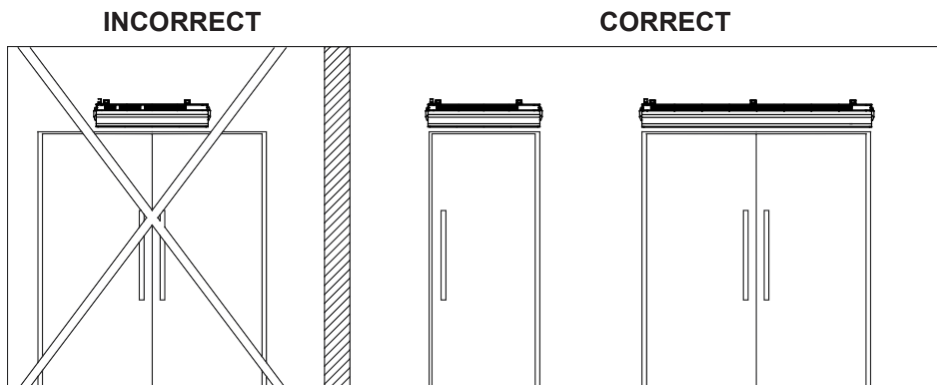
- The place of assembly should be carefully selected, taking into account the occurring of potential loads or vibrations.
- Prior to all installation or maintenance work, disconnect power supply and secure it against unintentional reactivation.
- It is recommended to use filters in the hydraulic system. It is recommended to clean/rinse the system, draining a few liters of water, prior to the connecting of hydraulic conduits (the supply conduits, in particular).

IMPORTANT!

The air is blown out of the curtain at high velocity, along the surface of the opening, thus creating a protective barrier. Air curtains should cover the entire width of the door opening, in order to obtain the maximum performance of the curtain.

IT IS RECOMMENDED TO TAKE INTO ACCOUNT THE FOLLOWING PARAMETERS, WHEN ASSEMBLING THE CURTAIN:

The width of the door frame should be less or equal to the width of the supplied air stream.



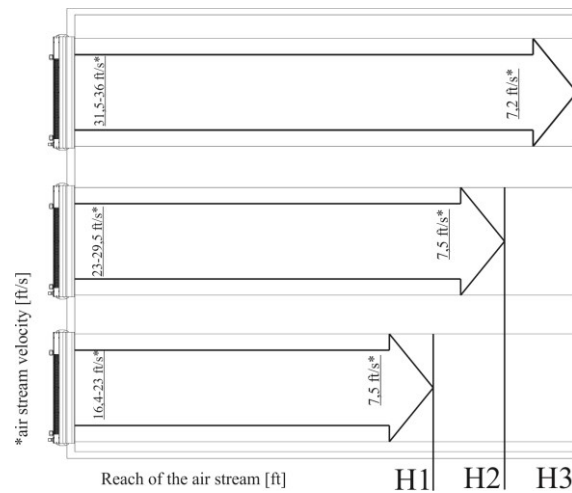
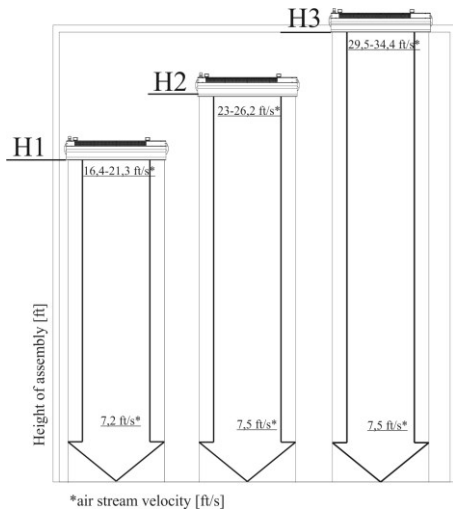
The range of the air jet - installation height

- Horizontal installation

fan speed	III	II	I
height of installation [ft]	H3	H2	H1
WING W100, W150, W200	12	9-1/2	7-1/2
WING E100, E150, E200	12	9-1/2	7-1/2
WING C100, C150, C200	13	9-1/2	7-1/2

- Vertical installation

fan speed	III	II	I
width of the door [ft]	H3	H2	H1
WING W100, W150, W200	12	9-1/2	7-1/2
WING C100, C150, C200	13	9-1/2	7-1/2



CAUTION! Air curtains with electric heat (models E100, E150 and E200) are not intended for vertical installation.

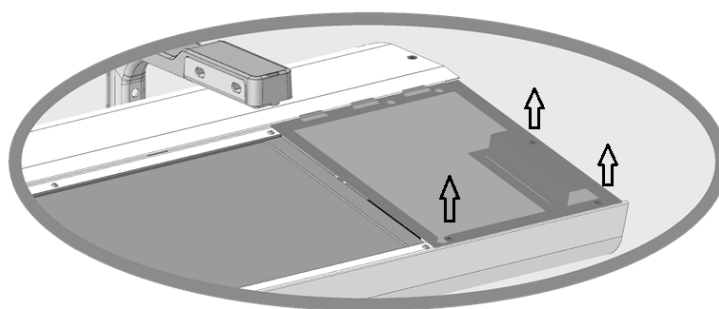
IMPORTANT! The heating output should be adjusted to the temperature inside the room, as well as the strength and direction of the wind outside. The primary criterion for the regulation of the heating power is the temperature inside the room, near the door. Should a room thermostat be used, WING activates the heating mode, depending on the temperature settings.

IMPORTANT! Please consider additional factors that affect device operation.

Factors that have a negative effect on curtain operation	Factors that have a positive effect on curtain operation
doors or windows that are constantly open in the room, thus creating a draft	presence of awning, roofs etc. on the outer side of the door
constant and open access to staircases, available through the room, the chimney draft effect	use of revolving doors

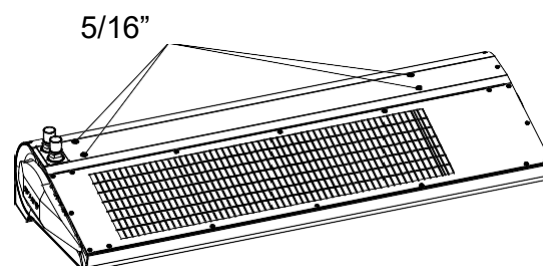
3.1. ASSEMBLY/ DISASSEMBLY OF JUNCTION BOX COVER

To access the terminal block remove the screws from the junction box cover and tilt it.



3.2. INSTALLATION OF DEVICE

For directly installation use the threaded sleeves (5/16") in the top of the device.



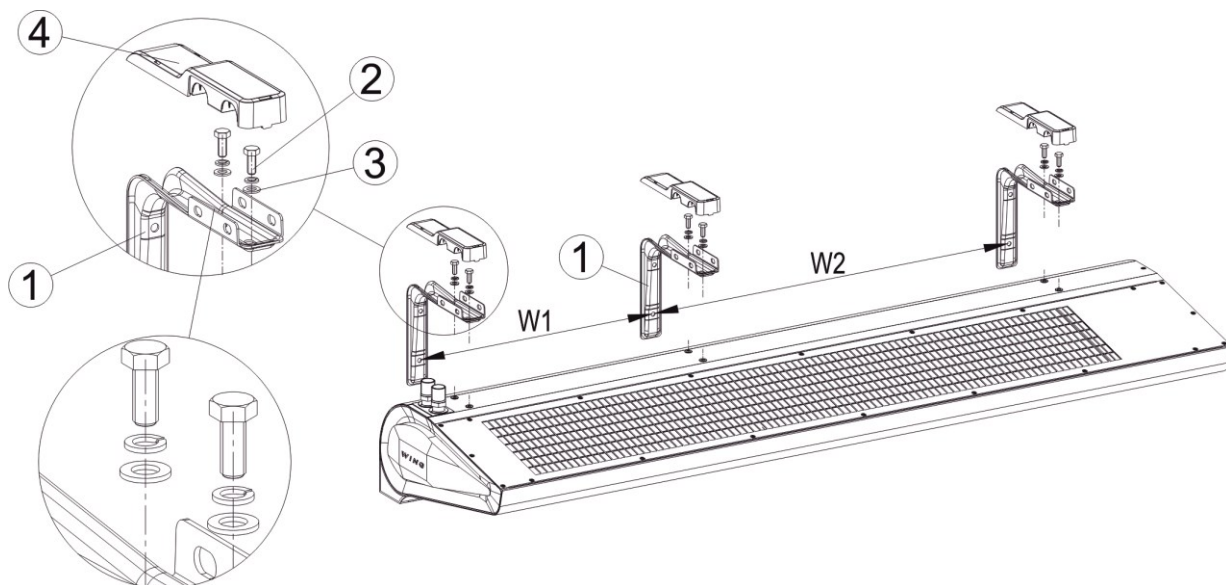
IMPORTANT! The minimum distance between the unit and the ceiling should be 4 in.

WING W100-200
 WING E100-200
 WING C100-200

3.2.1. HORIZONTAL INSTALLATION BY MEANS OF BRACKETS.

It is possible to install the WING do the wall horizontally in two options:

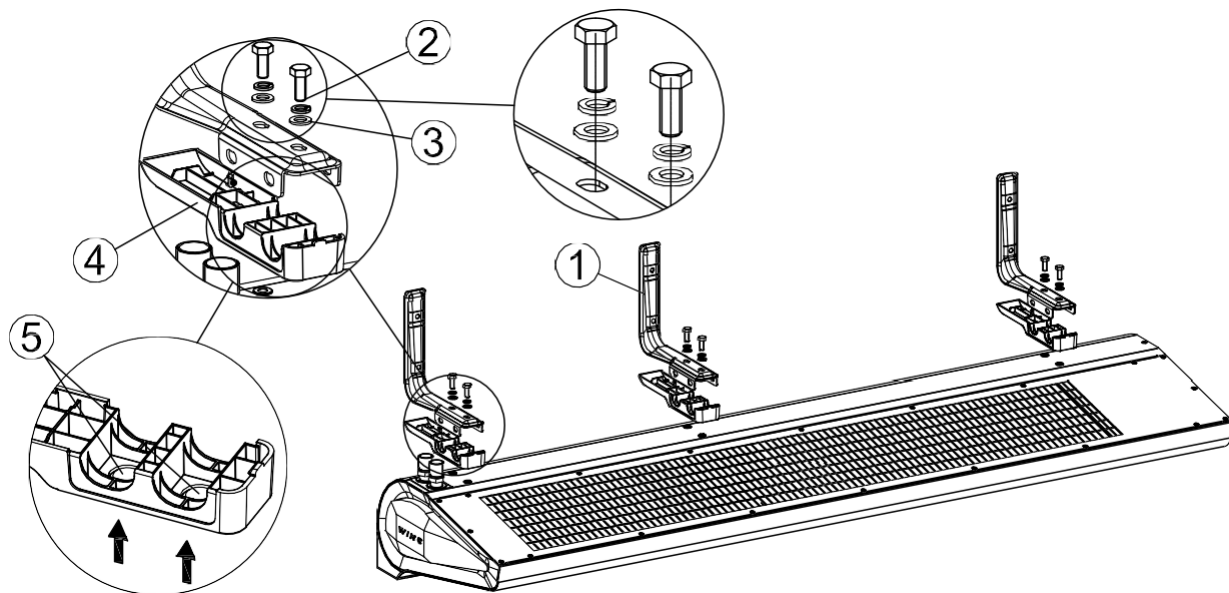
OPTION I: installation brackets with their arms faced upwards. In this option you should first screw the installation brackets to the wall (1) with intervals W1 for a 42in curtain (there are 2 installation handles) and W1, W2 for 62in and 82in curtain (there are 3 installation handles) so that the handles' arms are levelled. Then lift the curtain and assembly with using screws (2) 1/4-UNC x 3/4 and plain washers (3). Tighten the screws (2) and close the handle's covers (4).



	W1 [in]	W2 [in]
WING W, E, C100	30	-
WING W, E, C150	20	30
WING W, E, C200	36	35

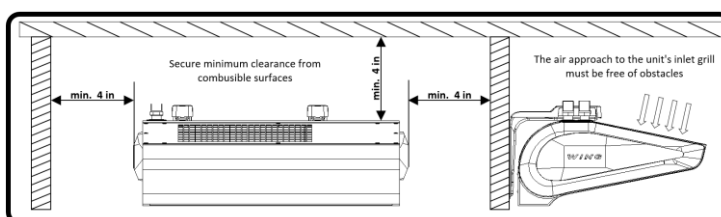
OPTION II: Installation brackets with their arms faced downwards.

Installation consists in screwing brackets to the curtain (1). To mount the brackets to the curtain, with the housing upside down, punch holes (5) from the outside in the shields (4) using a hammer and a screw. Click the shields on the brackets (1). Mount the brackets on the curtain using 1/4-UNC x 3/4 screws (2) and washers (3). This installation option allows for mounting brackets to the curtain first, and then screwing the entire housing to the wall.



Caution!

For any of above listed installation method, the minimum distance between the unit and the ceiling/side walls - minimum **4 inches**.



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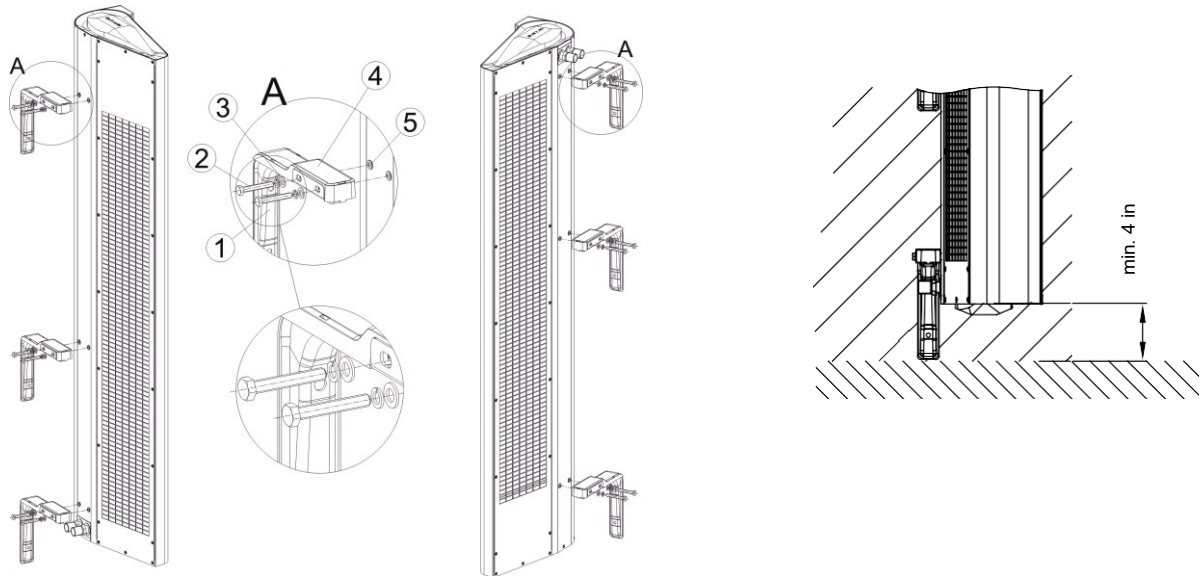
3.2.2. VERTICAL INSTALLATION USING INSTALLATION BRACKETS.

It is possible to install WING to a wall vertically on both sides of the gate (with the motor on the bottom or on the top).

For this option it is not important if you screw the handles down to the unit first and then screw the whole down to the wall or first attach the handles to the wall and then screw the curtain down to the handles.

To install the curtain vertically, use 1/4-UNC x 2 3/4 (outside the scope of VTS delivery) screws. Screw 2 or 3 brackets using the screws, passing through flat washers (3), to the threaded sleeves mounted in the upper part of the housing.

IMPORTANT: For vertical installation, keep minimum distance of 4 inches between the floor and the lower end of the curtain. This is to secure free access to the water coil air vent.



IMPORTANT! The device is intended for the operation in dry rooms, exclusively. Thus, pay particular attention to the condensation of water vapor on engine elements, since it is not fitted for operating in humid environment.

IMPORTANT! The WING air curtains are not intended for the installation:

- Outdoor.
- In humid rooms;
- In rooms categorized as explosive environments.
- In rooms with very high levels of dustiness;
- In rooms with aggressive atmosphere (due to the presence of copper and aluminum structural elements in the heat exchanger and electric heaters).

IMPORTANT! The WING EH air curtains are not intended for the installation on suspended ceilings.

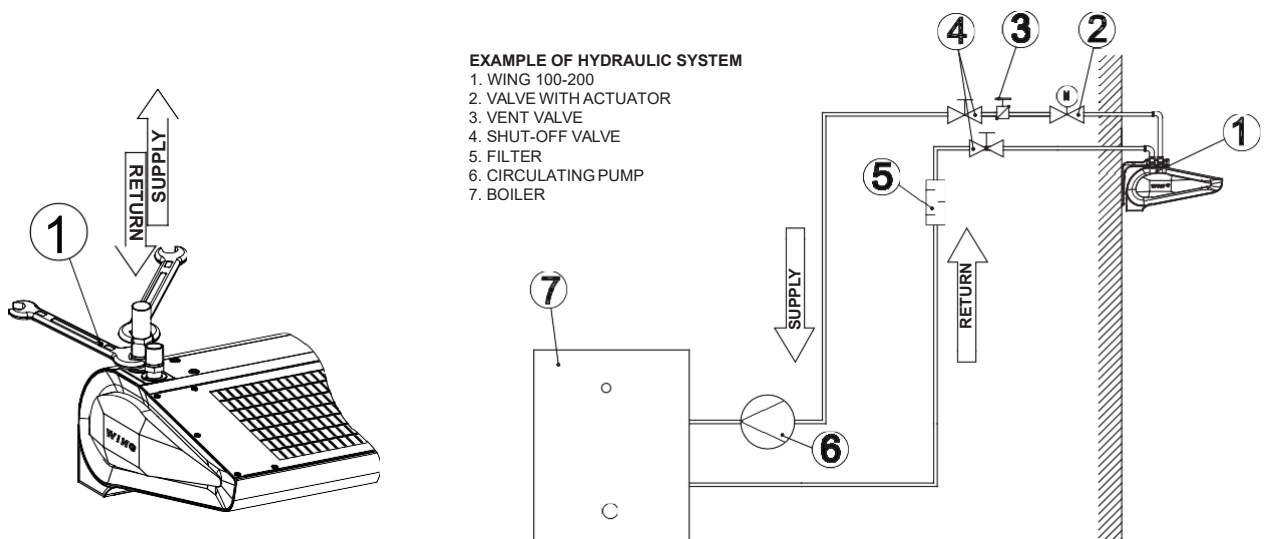
3.3. INSTALLATION GUIDELINES

CONNECTION OF THE HEATING MEDIUM

When connecting the air curtain to the heating water pipeline, secure the coil headers from excessive torque using set of two keys. The weight of installed pipelines should not impose a load on the heater's headers.

IMPORTANT! Pay particular attention to the leak-tightness of connections, when filling the hydraulic system. Make sure that the water flowing from a leaky connection does not leak to the electric engine (at the vertical installation)

IMPORTANT! It is recommended to use filters in the hydraulic system. It is recommended to clean/rinse the system, draining a few liters of water, prior to the connecting of hydraulic conduits (the supply conduits, in particular).



VENTING OF DEVICE/DRAINING OF HEATING MEDIUM

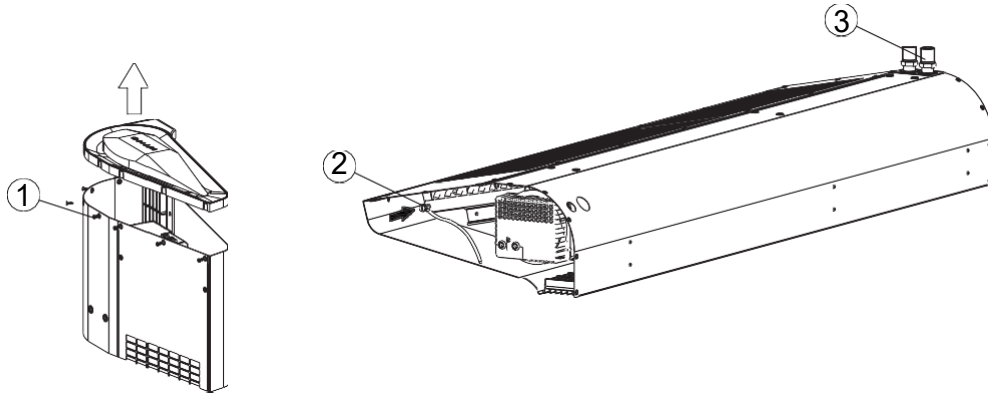
To perform horizontal and vertical installation, the exchanger on the right-hand side of the door vents automatically. In the case of horizontal installation with the stub pipes facing downwards, to vent the exchanger, remove the side cover. Unscrew the screws (1) around the cover and remove the cover. A valve with a hose is situated below the cover.

WING W100-200
WING E100-200
WING C100-200

VENTING OF DEVICE/DRAINING OF HEATING MEDIUM

Venting of the curtain water coil followed by loosening the union connection on the outlet connection. In case of the vertical installation with the coils connection on the bottom side, the access to the vent valve is by removing the side cover. To do it one should remove the screws (1) around the cover and lift the cover. There is a valve (2) with a hose.

WORKING POSITION			
A	horizontal (downward air feed)	drain	automatic venting
B	vertical (air feed from left to right)	drain	automatic venting
C	vertical (air feed from right to left)	venting	drain



IMPORTANT! While venting the exchanger you should pay special attention to securing the device against accidental penetration of water into electrical elements.

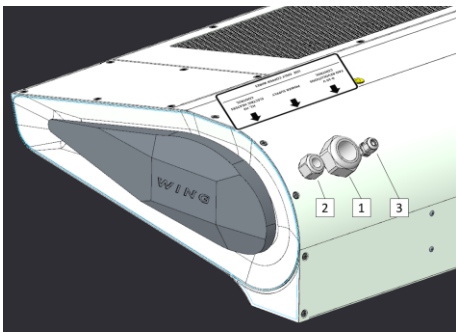
IMPORTANT! Remember to vent the heater, if it has been activated after a prior draining of the heating medium.

IMPORTANT! Pay particular attention to the leak-tightness of connections, when filling the hydraulic system. Make sure that the water flowing from a leaky connection does not leak to the electric engine (at the vertical installation).

CONNECTING OF POWER SUPPLY

IMPORTANT! The system must be equipped with protective equipment that guarantees the disconnecting of the device on all poles of the power source.

Connection to the electric system must be performed by a duly authorized and qualified person. Wire grommets are located on the back side of the curtain, a per drawing below.



- Central gland [1]
 - Power supply input
- Left gland [2]
 - Heating stage control signals input - only Wing air curtains with electric heat (E type)
- Right gland [3]
 - Fan revolutions control signal input

CAUTION

For all connections (Power supply input, Heating stage control input, Fan revolutions control signal input):

Minimum cables rating: **UL/CSA 600 Volts.**

CABLES CROSSING BETWEEN THE GLANDS AND TERMINAL BLOCK

To ensure proper separation between high and low voltage cables, follow below wiring instruction:

Power supply cable (high voltage)

- Cross the cables through the central gland (No. 1 on the drawing above).
- Cross the cable through the central mounting point and tight the strain relief.
- Gently pull the cable from outside to make it straight between the gland and mounting point. Then tighten the gland.
- Connect the wires to the relevant high-voltage terminals.

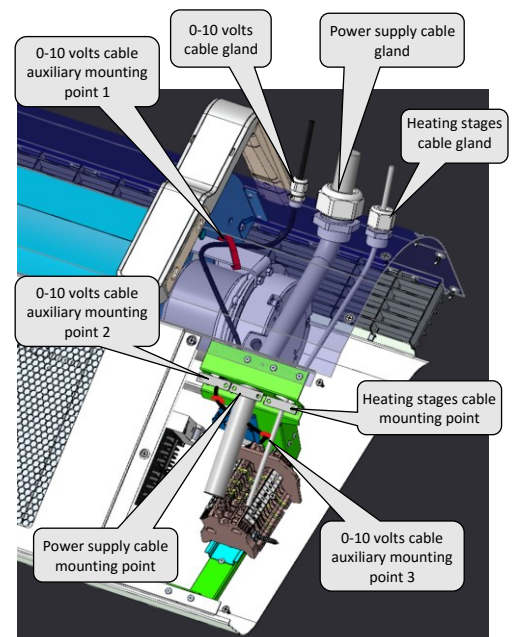
Heating stages control H₁ & H₂ (High voltage)

- Cross the cables through the gland no. 2 on the drawing above.
- Cross the cable through its mounting point (see diagram on the right) and tight the strain relief.
- Gently pull the cable from outside to make it straight between the gland and mounting point. Then tighten the gland.
- Connect the wires to the relevant high-voltage terminals.

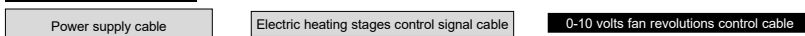
Low voltage cable (0-10 volts fan revolutions control (low voltage))

- Cross the cable between the small gland no 3 on the drawing above.
- Mount the cable to the top mounting arm of the motor using cable tie (supplied with the curtain kit) – auxiliary mounting point no 1.
- Cross the cable through its mounting point (see diagram on the right) tighten the strain relief.
- Cross the cable through auxiliary mounting points no 2 and 3.
- Connect the wires to the relevant low-voltage terminals.
- Gently pull the cable from outside to make it straight between the gland and mounting point. Then tighten the gland.

*Heating stages high-voltage control signals concern only Wing air curtains with electric heat.



Cables marked as below:






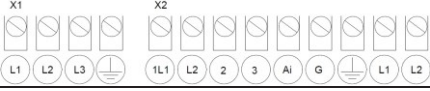


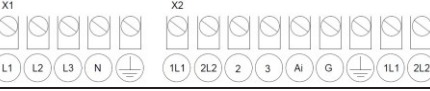


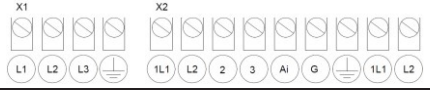


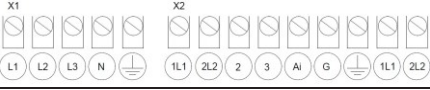


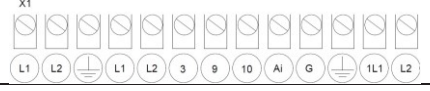


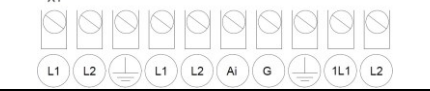


Recommended safety devices and wires

Device	WING E100-200		
	E100	E150	E200
Supply voltage 1~240V			
MCB	35A		
MCA	33.5A		
FLA	27.1A		
Power wire cross-section	3 x 10 AWG		
Cable Nominal Voltage UL/CSA 600 V			
Supply voltage 3~240V			
MCB	25A	45A	55A
MCA	20.5A	38.8A	49.8A
FLA	16.7A	32A	40.6A
Power wire cross-section	5 x 12 AWG	5 x 10 AWG	5 x 8 AWG
Cable Nominal Voltage UL/CSA 600 V			
Supply voltage 3~480V			
MCB	15A	25A	30A
MCA	11A	20.2A	26.7A
FLA	9.1A	17.2A	22.1A
Power wire cross-section	5 x 14 AWG	5 x 12 AWG	5 x 12 AWG
Cable Nominal Voltage UL/CSA 600 V			

Device	WING W100-200 and WING C100-200		
	W/C100	W/C150	W/C200
Fan supply voltage 1~240V			
MOP	15	15	15
MCA	1.9A	2.8A	4.4A
FLA	1.5A	2.2A	3.5A
Power wire cross-section	3 x 14 AWG		
Cable Nominal Voltage UL/CSA 600 V			

IMPORTANT! The specification of cables and protections refers to unbounded arrangement of. One should always abide by the local laws and recommendations concerning device connection.

WING is equipped with a terminal strip adjusted to an appropriate thickness of wires.

Air curtain model	Terminals view	Terminals description and function
WING E100 240/1/60 EC		<p>L1 – Power supply phase L2 – Power supply phase  – Ground 1L1 – N/C L2 – N/C 2 – first heating stage controlled by applying 240VAC</p> <p>3 – second heating stage controlled by applying 240VAC Ai – 0-10VDC analog input for fan speed regulation G – Reference ground for 0-10VDC speed regulation  – connected internally 1L1 – connected internally L2 – connected internally</p>
WING E100 240/3/60 EC		<p>L1 – Power supply phase L2 – Power supply phase L3 – Power supply phase  – Ground 1L1 – N/C L2 – N/C 2 – first heating stage controlled by applying 240VAC</p> <p>3 – second heating stage controlled by applying 240VAC Ai – 0-10VDC analog input for fan speed regulation G – Reference ground for 0-10VDC speed regulation  – connected internally L1 – connected internally L2 – connected internally</p>
WING E100 480/3/60/HLD EC		<p>L1 – Power supply phase L2 – Power supply phase L3 – Power supply phase  – Ground 1L1 – N/C L2 – N/C 2 – first heating stage controlled by applying 240VAC</p> <p>3 – second heating stage controlled by applying 240VAC Ai – 0-10VDC analog input for fan speed regulation G – Reference ground for 0-10VDC speed regulation  – connected internally 1L1 – connected internally 2L2 – connected internally</p>
WING E150 240/3/60 EC WING E200 240/3/60 EC		<p>L1 – Power supply phase L2 – Power supply phase L3 – Power supply phase  – Ground 1L1 – N/C L2 – N/C 2 – first heating stage controlled by applying 240VAC</p> <p>3 – second heating stage controlled by applying 240VAC Ai – 0-10VDC analog input for fan speed regulation G – Reference ground for 0-10VDC speed regulation  – connected internally 1L1 – connected internally L2 – connected internally</p>
WING E150 480/3/60/HLD EC WING E200 480/3/60/HLD EC		<p>L1 – Power supply phase L2 – Power supply phase L3 – Power supply phase  – Ground 1L1 – N/C L2 – N/C 2 – first heating stage controlled by applying 240VAC</p> <p>3 – second heating stage controlled by applying 240VAC Ai – 0-10VDC analog input for fan speed regulation G – Reference ground for 0-10VDC speed regulation  – connected internally 1L1 – connected internally 2L2 – connected internally</p>
WING W100 240/1/60 EC WING W150 240/1/60 EC WING W200 240/1/60 EC		<p>L1 – Power supply phase L2 – Power supply phase  – Ground 1L1 – N/C L2 – N/C 2 – input signal form HMI to control on/off valve 9 – valve with actuator Control</p> <p>10 – valve with actuator control Ai – 0-10VDC analog input for fan speed regulation G – Reference ground for 0-10VDC speed regulation  – connected internally 1L1 – connected internally L2 – connected internally</p>
WING C100 240/1/60 EC WING C150 240/1/60 EC WING C200 240/1/60 EC		<p>L1 – Power supply phase L2 – Power supply phase  – Ground L1 – N/C L2 – N/C</p> <p>Ai – 0-10VDC analog input for fan speed regulation G – Reference ground for 0-10VDC speed regulation  – connected internally 1L1 – connected internally L2 – connected internally</p>

WING W100-200
WING E100-200
WING C100-200

Air curtains control

- The motor is controlled by applying voltages in the range 0-10VDC to terminals Ai and G
- The motor will not start when a voltage of 0-1VDC is applied to terminals Ai and G
- The motor speed is controlled by changing the voltage supply to the terminals Ai and G in the range 1-10VDC. The value of the given voltage in a linear manner influences the motor speed in the range from 10-100% of its full efficiency.
- The electric heating coils should only be turned ON when the motor is running at least 45% of its full capacity. Starting electric heating coils when the motor is switched OFF can be dangerous and can lead to damage to the device.
- Electric heating coils are divided into two independent sections controlled by applying 240VAC to terminals 2 and 3 on the terminals of electric curtains

EN

IMPORTANT!

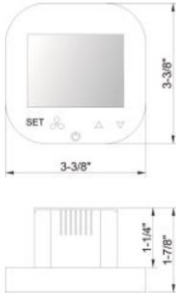
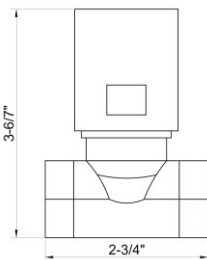
- It is recommended to connect wires to the terminal strip with previously clamped appropriate clip ends.
- Make sure that the space around the place where the air is sucked in by the curtains, as well as around the exhaust grid, is free of any structural elements of the building, which might hamper the flow of air (e.g. suspended ceilings, covering development, ventilating ducts etc.).

4. ELEMENTS OF CONTROLS.

Electrical connections can be carried out only by qualified electricians, according to the binding regulations of:

- industrial safety;
- installation instructions.
- technical documentation for each individual element of automatics.

IMPORTANT! Before starting the controls installation, please read the operation and installation instruction for each of them. Instructions are included in the box for each control.

MODEL	DIAGRAM	TECHNICAL DATA	COMMENTS
HMI WING UL		<p>HMI-WING UL</p> <ul style="list-style-type: none"> • Device operation: touch buttons • Power supply: 120-240 V AC • Temperature measurement: 14 °F ... 210 °F ; NTC10K • Outputs: <ul style="list-style-type: none"> - 1 analog output 0-10V (8 bit, I_{max} = 20mA) - 2 relays outputs (250 VAC, AC1 500 VA dla 230 VAC) • Communication: Modbus RTU 	<ul style="list-style-type: none"> • used for control all types of WING EC curtains • touch control panel • the main on / off switch (ON / OFF) • three-stage adjustable fan speed of the EC motor • built-in thermostat with possibility weekly programming • continuous mode • function of heating and ventilation • door sensor operation • 3-levels of heating power • RS 485 with ModbusRTU • Suggested cross sections of electrical cables:: <ul style="list-style-type: none"> - L, N : 2x18 AWG - H1, H2 : 2x18 AWG - AO, GND : 2x18 AWG - RS 485 : 2xAWG18
TWO-WAY VALVE WITH ACTUATOR		<p>TWO-WAY VALVE</p> <ul style="list-style-type: none"> • Terminal diameter: 3/4" • Mode of operation: two-way ON/OFF • Maximum differential pressure: 13psi • Pressure class: PN 16 • Kvs flow ratio: 2.65 CFM • Maximum temperature of heating medium: 200°F • Parameters of working environment: from 32 to 140°F <p>VALVE ACTUATOR</p> <ul style="list-style-type: none"> • Power consumption: 7 VA • Supply voltage: 230VAC +/-10% • Closing/opening time: 4-5/9-11 s • Position without power: closed • Level of protection: IP54 • Parameters of working environment: from 89 to 200°F 	<ul style="list-style-type: none"> • It is recommended to install a two-way valve on the return pipeline. • The drawings with the elements of automatics contain only visualizations of sample products. • It is recommended to connect the supply, using a conductor of the min. size 0.08x0.03 in². • The drawings with the elements of automatics contain only visualizations of sample products.

IMPORTANT! If required, the conductors that belong to additional elements of control automatics (thermostat, door switch, wall-mounted controller) should be installed in separate cable channels, out-of-parallel to the supply conductors.

5. START-UP, OPERATION, MAINTENANCE

5.1. START-UP/PUTTING INTO OPERATION

- Prior to the commencing of any installation or maintenance work, disconnect power supply and secure it against unintentional reactivation.
- It is recommended to use filters in the hydraulic system. It is recommended to clean/rinse the system, draining a few liters of water, prior to the connecting of hydraulic conduits (the supply conduits, in particular).
- It is advised to use vent valves in the highest point of the system.
- It is recommended to install shut-off valves directly after the device, should the disassembly of the device be necessary.
- All protective equipment is to be installed before the pressure increases, according to maximum the permissible pressure rating of 232 psi.
- Hydraulic connection should be free of any stresses and loads.
- Check the correctness of hydraulic connections (leak-tightness of the vent, collecting pipes, correctness of fittings installation), prior to the initial start-up of the device.
- It is recommended to check the correctness of electrical connections (of automatics, power supply), prior to the initial start-up of the device. It is advised to use an additional, external residual-current protection.

IMPORTANT! All connections should be carried out, according to this technical documentation and the documentation delivered with automation equipment.

5.2. OPERATION AND MAINTENANCE

- It is advised to carefully analyze all the operational and installation guidelines listed in chapter 3 and 4.
- The casing of the device does not require maintenance.
- The heat exchanger should be cleaned on a regular basis from dust and fat deposit. It is especially recommended to clean the exchanger before the heating season with the use of compressed air from the air intake side (after removing the inlet grid). You should pay special attention to the exchanger's lamellae which are very delicate.
- Should the lamellas be deformed (bent), straighten them with a special tool.
- The fan's motor does not require any exploitation service, the only service activities that may be necessary concern cleaning the air intakes from dust and fat deposit.
- Disconnect phase voltage, if the device is shut down for longer periods of time.
- The heat exchanger does not have any anti-freezing protections.
- It is recommended to provide a periodical purging of the heat exchanger, preferably using compressed air.
- Should the temperature in the room drop below 32°F, with a simultaneous drop of the heating medium temperature, there is a risk that the heat exchanger might freeze (crack).
- The level of air pollutants should meet the criteria allowable concentrations of pollutants in indoor air, for non-industrial areas, the level of dust concentration up to 1.87x10⁻⁵ lbs/ft³.
- It is forbidden to use device for the duration of the construction works except for the start-up of the system.
- The equipment must be operated in rooms used throughout the year, and in which there is no condensation (large fluctuations in temperature, especially below the dew point of the moisture content). The device should not be exposed to direct UV rays.
- The device should be operated at the supply water temperature up to 200 °F with working fan.

6. SERVICING

6.1. PROCEDURE IN CASE OF MALFUNCTION

WING W100-200/EHN		
Symptoms	What to check	Description
Leakage in the WING W100-200 heat exchanger	<ul style="list-style-type: none"> Fitting of the heat exchanger terminals, using two keys acting in two opposite directions (apply the keys on each terminal), which protects against the possibility of internal breaking of the collecting pipes. Relation between the leaking and a potential mechanical damage to the exchanger. Leaking of vent valve elements or drain plug. Parameters of the heating medium (pressure and temperature) should not exceed the permissible values. Correctness of the draining of the exchanger. type of agent (it cannot be any aggressive substance Al or Cu active), Circumstances in which leaking occurred (e.g. during the trial/initial start-up of the system; after having drained the heating medium, followed by the filling of the system) and the external ambient temperature at the moment of the defect taking place (freezing hazard to the exchanger). Potentially aggressive atmosphere (air) in the place of work (e.g. high concentration of ammonia in the sewage-treatment plant). 	<ul style="list-style-type: none"> Pay particular attention to the possibility of the freezing of the heat exchanger in the winter. 99% of leaks occur during start-up/pressure checks. The rectifying of the defect consists in the pulling back of the vent/drain valve.
The fan of the device works too loudly WING W100-200, EHN	<ul style="list-style-type: none"> Installation of the device, according to the guidelines in the Operation and Maintenance Documentation (among others, the distance from the ceiling). Correctness of the horizontal alignment of the device. Correctness of electrical connections and qualifications of Parameters of the supply current (among others: voltage, frequency). Incorrect covering of the curtain in the suspended ceiling. Noise in lower speeds (damaged winding). Noise present only in the higher speeds – blocking of the air outlet. Type of other equipment working in the facility (e.g. exhaust fans) – increasing noise may be a result of several pieces of equipment working simultaneously. 	<ul style="list-style-type: none"> Minimum distance: 4 in from the ceiling Louder operation of WING devices may be a result of inappropriate place of installation: e.g. choking the fan or the acoustic specifics of a room.
The fan in the device is not operational WING W100-200	<ul style="list-style-type: none"> Correctness and quality of electrical connections and qualifications of the fitter. Parameters of the supply current (among others: voltage, frequency) on the terminal block of the fan's engine. Operational correctness of other pieces of equipment present in the facility. Correct fitting of the conduits on the engine side – information available from VTS Service Department. Voltage on the PE conductor (if present, it may indicate a breakdown). 	<ul style="list-style-type: none"> The electrical connection of the device must be carried out, according to the diagrams found in the Operation and Maintenance Documentation.
Damaged casing of the device WING W100-200	<ul style="list-style-type: none"> Circumstances in which the defect occurred: remarks on the bill of lading, inventory issue, condition of cardboard. 	<ul style="list-style-type: none"> Should the casing be defective, it is required to present photos of the cardboard and device, as well as photos that confirm the compliance between the serial number on the device and cardboard. If the damage was done in transport, it is necessary to prepare a proper statement by the driver/forwarder that delivered the goods.
Actuator does not open the valve	<ul style="list-style-type: none"> Correctness of electrical connections and qualifications of the fitter. Operational correctness of the thermostat (the characteristic "ticking" when switching the device). Parameters of the supply current (among others: voltage). 	<ul style="list-style-type: none"> The most important step is to check whether the actuator has reacted to the electrical impulse within 11 s. When actuator damage is claimed, a complaint must be submitted for the damaged element, and the actuator must be uninstalled from the valve to open the valve mechanically (permanently).



It is forbidden to place, dispose of and store worn-out electric and electronic equipment, together with other waste. Dangerous compound contained in electronic and electric equipment have a very adverse impact on plants, micro-organisms, and, most importantly, on humans, as they damage our central and peripheral nervous system, as well as circulatory and internal system. Additionally, they cause serious allergic reactions. Worn-out equipment is to be delivered to a local collection point for used electric equipment, which carries out a selective collection of waste.

REMEMBER!

The user of equipment intended for households, and which has been worn out, is obliged to transfer such equipment to a collecting unit that collects worn-out electric and electronic equipment. The selective collecting and further processing of waste from households contributes to the protection of environment, reduces the penetration of hazardous substances into the atmosphere and surface waters.

6.2. COMPLAINT PROCEDURE

In order to report a problem with the device or elements of automation, please fill in and send the appropriate form (p.74), using one of the three available ways:

1. E-mail:

america@vtsgroup.com

2. Fax: +1 470-809-6815

3. Website: <https://vtsgroup.com/us/service-vts>

Our service department will contact you immediately.

In the case of damage in transport, send a complaint notification, including the delivery documentation (bill of lading, inventory issue) and photographs showing the defects.

Should you have any questions, please contact us, using this telephone number: +1 470-809-6811

IMPORTANT! The complaint procedure shall be initiated when the Service Department has received a correctly filled complaint notification, a copy of the purchase invoice and the Warranty Card, filled by the company that carried out the installation.

7. INDUSTRIAL SAFETY INSTRUCTION

Special instructions concerning safety

IMPORTANT!

- Prior to the commencing of any work related to the device, it is required to disconnect the system, secure it properly and wait, until the fan stops revolving.
- Use stable working platforms and hoists.
- Depending on the temperature of the heating medium, pipes, elements of casing and surfaces of the heat exchanger can be very hot, even after the fan has stopped revolving.
- Sharp edges may be present! Wear gloves, protective shoes and clothing, when transporting the device.
- Strictly observe safety guidelines and industrial safety regulations.
- Loads can be placed only in the previously selected areas on the transporting unit. Protect the edges of the device, when lifting it, using a set of machines. Remember to distribute weight evenly.
- The equipment must be protected against moisture and dirt, and kept in rooms protected against the impact of weather conditions.
- Utilization of waste: make sure that operating and auxiliary materials, including packaging material and spare parts, are disposed of in a safe, environment friendly manner, according to the binding, local statutory regulations.

8. TECHNICAL SPECIFICATION

8.1. WATER AIR CURTAIN – WING W100-200

T_w – temperature of water at the inlet to the device
 T_p – temperature of water at the outlet from the device
 T_{p1} – temperature of air at the inlet to the device
 T_{p2} – temperature of air at the outlet from the device
 P_g – heating output of the device
 Q_w – water flow
 Δp – pressure drop in the heat exchanger

Parameters	WING W100															
	194/158				176/140				158/122				140/104			
T_w/T_p [°F]																
T_{p1} [°F]	41	50	59	68	41	50	59	68	41	50	59	68	41	50	59	68
	<i>III/1088[CFM]/59dB(A)*</i>															
P_g [MBH]	60	55	50	46	50	45	40	35	39	34	29	23	27	17	14	12
T_{p2} [°F]	89	95	101	107	81	87	92	98	73	78	83	88	63	64	71	78
Q_w [CFM]	0.47	0.41	0.41	0.35	0.41	0.35	0.29	0.29	0.29	0.29	0.24	0.18	0.24	0.12	0.12	0.12
Δp [psi]	0.073	0.05	0.05	0.04	0.05	0.04	0.02	0.02	0.02	0.02	0.01	0.01	0.015	0.01	0.006	0.00
		8	8	4	8	4	9	9	9	9	5	5	5	5	5	4
	<i>II/794[CFM]/48dB(A)*</i>															
P_g [MBH]	51	47	43	39	42	38	34	30	33	29	24	16	18	15	13	11
T_{p2} [°F]	94	100	105	110	85	90	96	101	76	81	85	85	60	66	73	80
Q_w [CFM]	0.41	0.35	0.35	0.29	0.35	0.29	0.24	0.53	0.24	0.24	0.18	0.12	0.12	0.12	0.12	0.06
Δp [psi]	0.058	0.044	0.044	0.029	0.044	0.029	0.029	0.015	0.029	0.015	0.015	0.015	0.015	0.015	0.006	0.004
	<i>I/518[CFM]/44dB(A)*</i>															
P_g [MBH]	40	37	33	30	33	30	27	23	26	22	15	13	15	13	11	9
T_{p2} [°F]	101	106	111	116	91	96	100	104	79	83	83	89	64	70	76	83
Q_w [CFM]	0.29	0.29	0.24	0.24	0.24	0.24	0.24	0.18	0.18	0.18	0.12	0.12	0.12	0.12	0.12	0.06
Δp [psi]	0.029	0.029	0.029	0.015	0.029	0.015	0.015	0.015	0.015	0.015	0.000	0.015	0.006	0.004	0.004	0.003

Parameters	WING W150															
	164/158				176/140				158/122				140/104			
T_w/T_p [°F]																
T_{p1} [°F]	41	50	59	68	41	50	59	68	41	50	59	68	41	50	59	68
	<i>III/1824[CFM]/61dB(A)*</i>															
P_g [MBH]	108	100	91	83	91	83	75	67	75	66	59	50	58	49	41	32
T_{p2} [°F]	93	99	104	110	85	90	96	102	77	82	88	93	69	74	79	84
Q_w [CFM]	0.82	0.76	0.70	0.64	0.70	0.64	0.59	0.53	0.59	0.53	0.47	0.41	0.41	0.35	0.29	0.23
Δp [psi]	0.304	0.261	0.232	0.188	0.232	0.203	0.174	0.130	0.174	0.145	0.116	0.087	0.116	0.087	0.058	0.043
	<i>II/1206[CFM]/48dB(A)*</i>															
P_g [MBH]	90	83	76	70	76	70	63	56	63	56	49	42	48	41	34	26
T_{p2} [°F]	98	104	109	114	89	95	100	105	81	86	91	96	71	76	81	85
Q_w [CFM]	0.70	0.64	0.59	0.53	0.59	0.53	0.47	0.41	0.47	0.41	0.35	0.29	0.35	0.29	0.23	0.17
Δp [psi]	0.217	0.188	0.174	0.145	0.174	0.145	0.116	0.101	0.130	0.101	0.087	0.058	0.087	0.058	0.043	0.029
	<i>I/835[CFM]/43dB(A)*</i>															
P_g [MBH]	73	68	62	57	62	57	51	46	51	45	40	34	39	33	27	16
T_{p2} [°F]	104	110	115	120	95	100	105	110	85	90	95	99	75	79	83	83
Q_w [CFM]	0.60	0.53	0.47	0.41	0.47	0.41	0.41	0.35	0.41	0.35	0.29	0.23	0.29	0.23	0.23	0.12
Δp [psi]	0.159	0.130	0.116	0.101	0.116	0.101	0.087	0.072	0.087	0.072	0.058	0.043	0.058	0.043	0.029	0.014

Parameters	WING W200															
	164/158				176/140				158/122				140/104			
T_w/T_p [°F]																
T_{p1} [°F]	41	50	59	68	41	50	59	68	41	50	59	68	41	50	59	68
	<i>III/2589[CFM]/62dB(A)*</i>															
P_g [MBH]	160	145	134	122	134	122	111	100	111	99	88	76	87	76	64	52
T_{p2} [°F]	94	100	106	111	86	92	98	103	78	84	90	95	70	76	81	86
Q_w [CFM]	1.17	1.12	1.00	0.94	1.00	0.94	0.82	0.76	0.82	0.76	0.64	0.59	0.64	0.59	0.47	0.41
Δp [psi]	0.812	0.710	0.609	0.522	0.623	0.536	0.449	0.377	0.464	0.377	0.304	0.246	0.319	0.246	0.188	0.130
	<i>II/1854[CFM]/48dB(A)*</i>															
P_g [MBH]	139	129	118	108	119	108	98	88	98	88	78	68	77	67	57	46
T_{p2} [°F]	97	103	109	114	89	95	100	106	81	86	92	97	72	78	83	88
Q_w [CFM]	1.06	1.00	0.88	0.82	0.88	0.82	0.76	0.64	0.76	0.64	0.59	0.53	0.59	0.53	0.41	0.35
Δp [psi]	0.652	0.565	0.493	0.420	0.507	0.435	0.362	0.304	0.377	0.304	0.246	0.203	0.261	0.203	0.145	0.101
	<i>I/1206[CFM]/45dB(A)*</i>															
P_g [MBH]	116	107	98	90	99	90	82	73	82	73	65	56	64	56	47	38
T_{p2} [°F]	103	109	114	119	94	100	105	110	85	90	95	100	76	81	85	90
Q_w [CFM]	0.88	0.82	0.76	0.70	0.76	0.70	0.64	0.59	0.64	0.59	0.47	0.41	0.47	0.41	0.35	0.29
Δp [psi]	0.464	0.406	0.348	0.304	0.362	0.319	0.261	0.217	0.275	0.232	0.174	0.145	0.188	0.145	0.101	0.072

WING W100-200
WING E100-200
WING C100-200

8.2. ELECTRIC AIR CURTAIN – WING E100-200

T_{p1} – temperature of air at the inlet to the device
T_{p2} – temperature of air at the outlet from the device
P_g – heating output of the device

Parameters	WING E100				WING E150				WING E200			
	41	50	59	68	41	50	59	68	41	50	59	68
T _{in} [°F]												
	III/1088[CFM]/59dB(A)*				III/1854[CFM]/61dB(A)*				III/2648[CFM]/62dB(A)*			
P _g [kW]	2/4/6	2/4/6	2/4/6	2/4/6	4/8/12	4/8/12	4/8/12	4/8/12	6/9/15	6/9/15	6/9/15	6/9/15
T _{out} [°F]	46/51/59	55/60/68	64/69/77	73/78/86	48/53/59	57/62/68	66/71/77	75/80/86	48/50/57	57/59/66	66/68/75	75/77/84
	II/824[CFM]/48dB(A)*				II/1206[CFM]/48dB(A)*				II/1883[CFM]/48dB(A)*			
P _g [kW]	2/4/6	2/4/6	2/4/6	2/4/6	4/8/12	4/8/12	4/8/12	4/8/12	6/9/15	6/9/15	6/9/15	6/9/15
T _{in} [°F]	48/53/60	57/62/69	66/71/78	75/80/87	50/57/66	59/66/75	68/75/84	77/84/93	50/53/60	59/62/69	68/71/78	77/80/87
	I/541[CFM]/44dB(A)*				I/853[CFM]/43dB(A)*				I/1265[CFM]/45dB(A)*			
P _g [kW]	2/4/6	2/4/6	2/4/6	2/4/6	4/8/12	4/8/12	4/8/12	4/8/12	6/9/15	6/9/15	6/9/15	6/9/15
T _{in} [°F]	51/60/69	60/69/78	69/78/87	78/87/96	55/66/78	64/75/87	73/84/96	82/93/105	53/59/69	62/68/78	71/77/87	80/86/96

8.3. WING C100-200 – COLD AIR CURTAIN

Parameters	WING C100			WING C150			WING C200		
	III	II	I	III	II	I	III	II	I
Fan speed									
Qp [CFM]	1147	882	618	1883	1324	882	2707	2001	1377
noise level [dB(A)]*	62	49	45	63	49	43	63	49	45

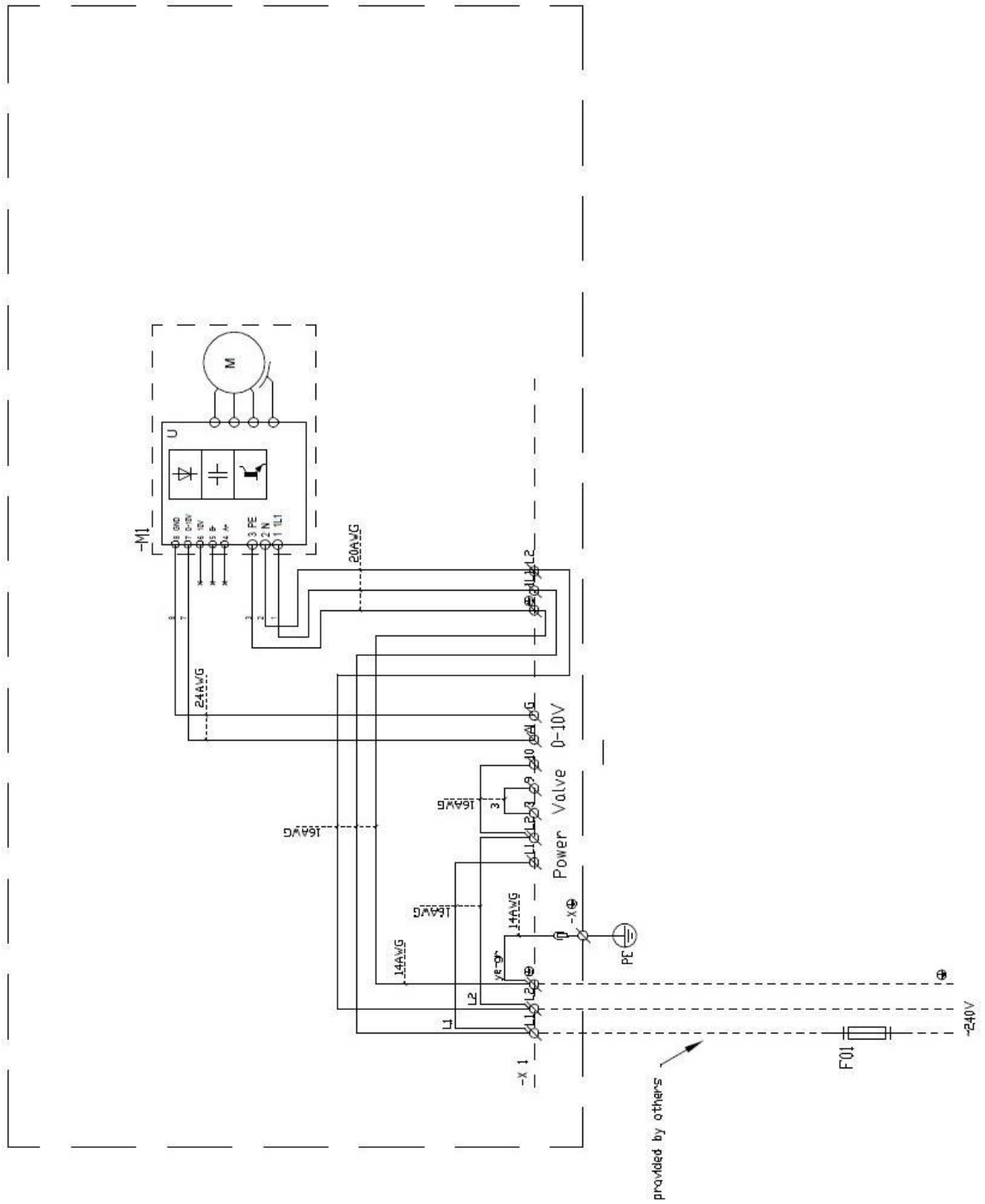
* The noise level has been measured within a 10 ft distance from the device; reference conditions: semi-open space – wall-mounted device.

Parameters	unit of measure	WING W100-200			WING E100-200			WING C100-200		
		W100	W150	W200	E100	E150	E200	C100	C150	C200
Maximum width of a single door for one device	in	39	59	79	39	59	79	39	59	79
Maximum height of door	ft	12						13		
Heating output range	MBH	13 – 58	34 – 109	58 – 160	7/20 or 14/20	13/41 or 27/41	20/51 or 30/51	-		
Maximum flow rate	CFM	1089	1824	2589	1088	1854	2648	1147	1883	2707
Maximum temperature of heating medium	°F	200			-			-		
Maximum working pressure	psi	232			-			-		
Water volume	in³	97	158	219	-			-		
Diameter of stub pipe connectors	"	3/4			-			-		
Supply voltage	V/ph/Hz	~240/1/(50/60)			~240/1/(50/60) or ~240/3/(50/60) or ~480/3/(50/60)	~240/3/(50/60) or ~480/3/(50/60)	~240/1/(50/60)	~240/1/(50/60)		
Power of the electric heater	kW	-			2 and 4	4 and 8	6 and 9	-		
Rated current of the electric heater	A	-			9 or 5/10/15 or 3/5/8	10/20/30 or 5/10/15	15/22/37 or 8/11/19	-	-	-
EC Engine power	HP	0,27	0,4	0,64	0,27	0,4	0,64	0,27	0,4	0,64
EC engine rated current	A	1.5	2.2	3.5	1.5	2.2	3.5	1.5	2.2	3.5
Weight	lbs	47	64	83	49	67	86	42	56	72
IP	-	20								

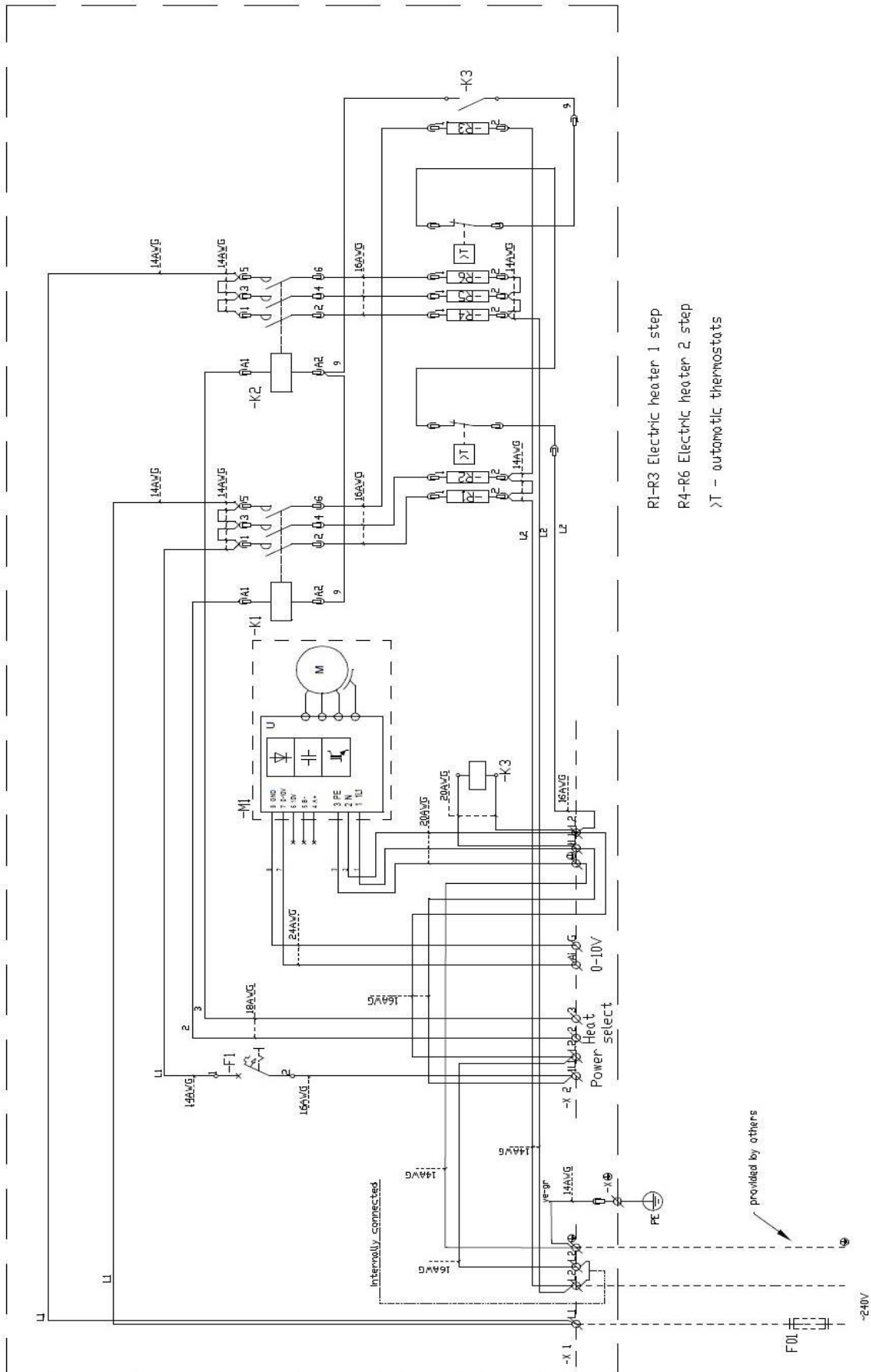


9. ELECTRICAL DIAGRAMS

9.1. Electrical diagram of WING W100-200-EC – 1~240V



9.3. Electrical diagram of WING E100-EC 1~240V

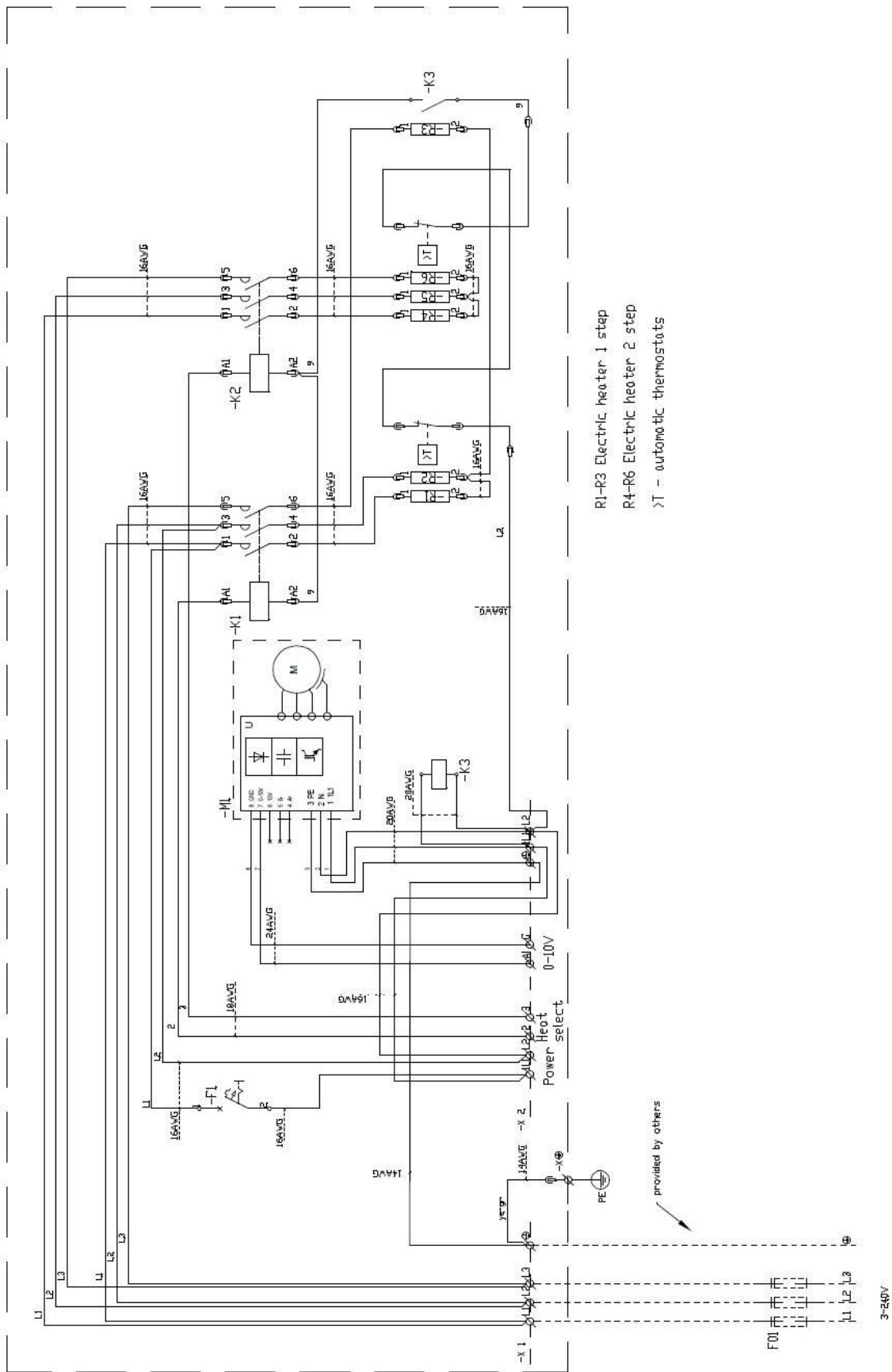


R1-R3 Electric heater 1 step

R4-R6 Electric heater 2 step

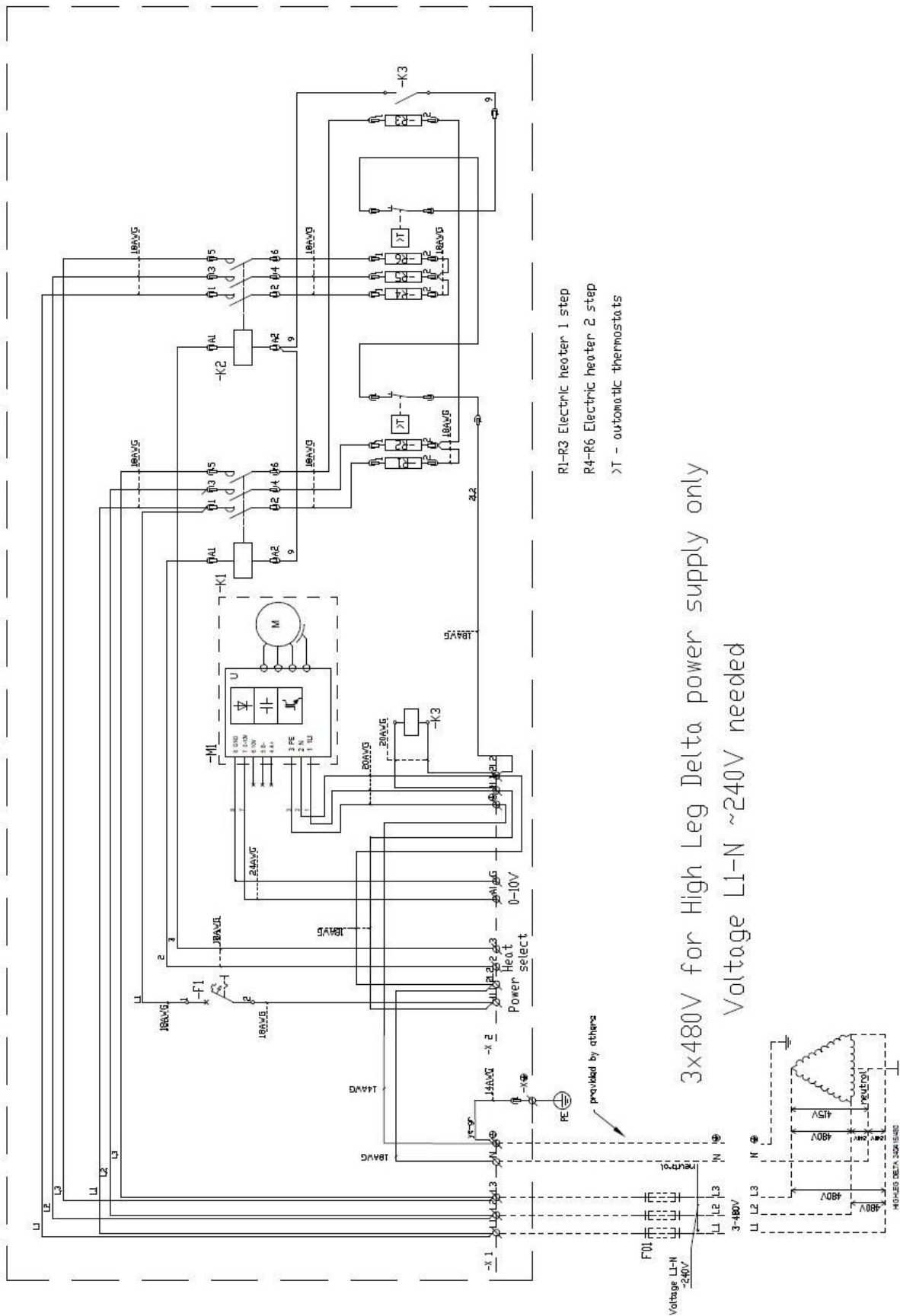
T - automatic thermostats

9.4. Electrical diagram of WING E100-EC -3~240V

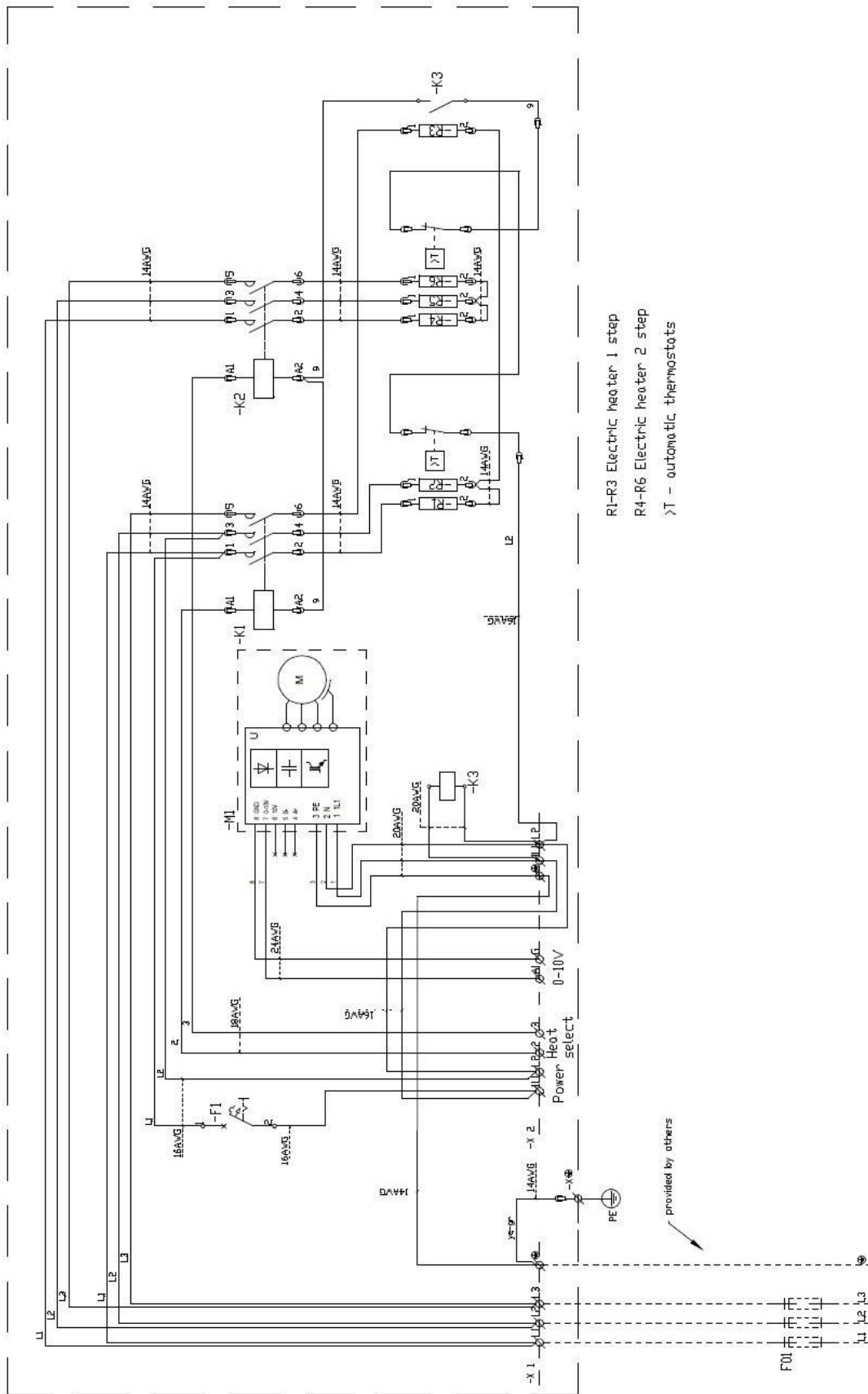


R1-R3 Electric heater 1 step
 R4-R6 Electric heater 2 step
 >T - automatic thermostats

9.5. Electrical diagram of WING E100-EC- 3~480V



9.6. Electrical diagram of WING E150-200-EC- 3~240V

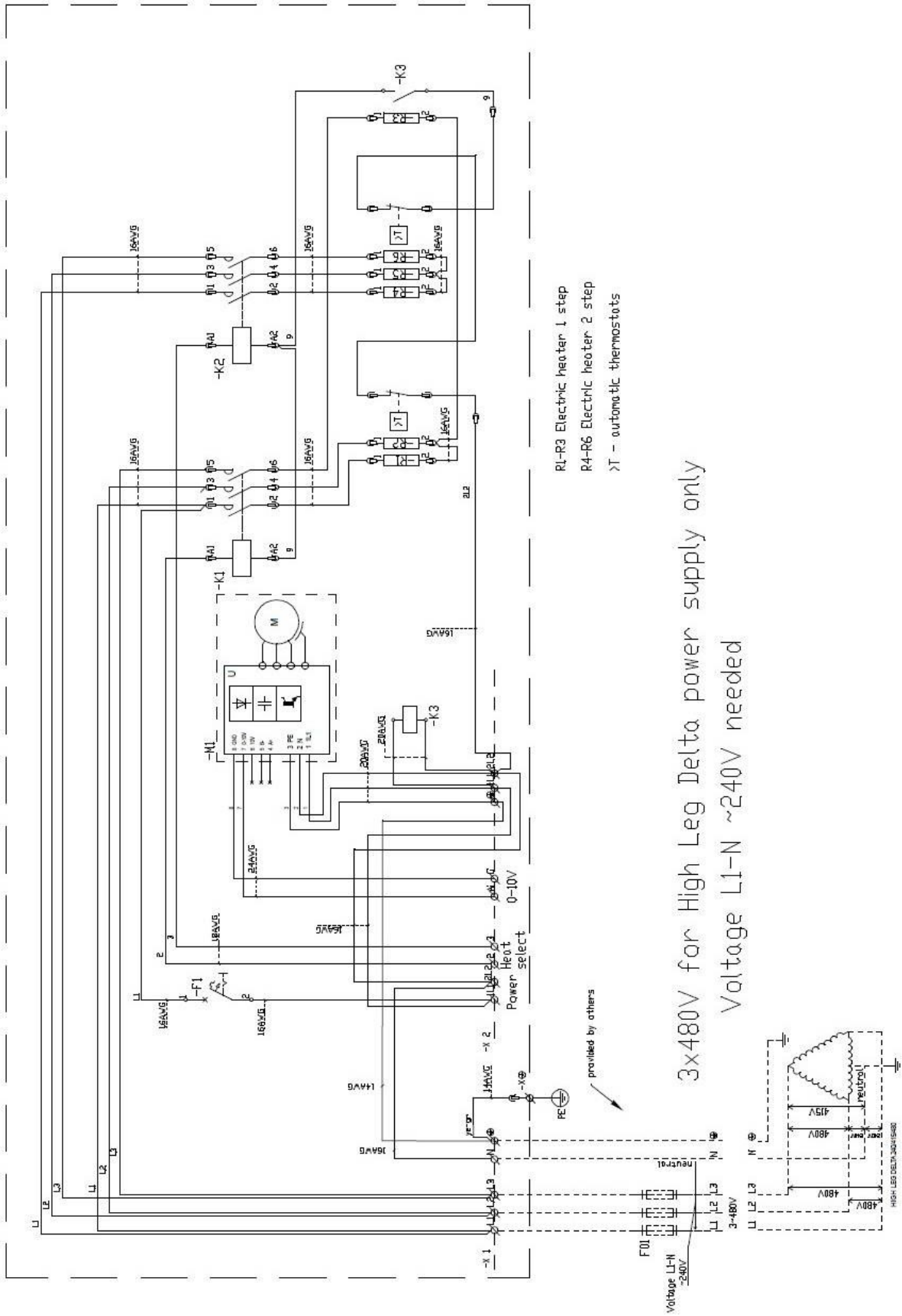


R1-R3 Electric heater 1 step
 R4-R6 Electric heater 2 step
 >T - automatic thermostats

Marzetti Murinaria

3-240V

9.7. Electrical diagram of WING E150-200-EC- 3~480V



WING W100-200
WING E100-200
WING C100-200

Complaint Form

VTS America Inc. 3535 Gravel Springs Rd Ext #203, Buford, GA 30519 PH: 470-809-6811, FAX: 470-809-6815						
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The company submitting the notification:
The company that installed the equipment:
Date of notification:
Type of device:
Factory number*:
Date of purchase:
Date of installation:
Place of installation:
Detailed description of defect:
Contact person:
Name and surname:
Telephone:
E-mail:

* This field must be filled, if the complaint notification refers to the following equipment: VOLCANO VR1, VR2, VR3 and VRMini unit, and WING air curtains.

Warranty card

1. Stamp of the company to carry out installation	VTS America Inc. 3535 Gravel Springs Rd Ext #203, Buford, GA 30519 PH: 470-809-6811, FAX: 470-809-6815
2. Factory number of device	
3. Place of installation	4. Date of installation
5. Address, street	6. Apartment number
7. City	8. Postal code

Based on these Warranty Terms and Conditions, the company from the VTS Group (hereinafter: VTS) specified in the warranty card hereby guarantees to the owner (hereinafter: Customer) that the Volcano VR, WING W100 - 200, WING E100 - 200, WING C100 - 200 devices (hereinafter: devices) sold by VTS will work without malfunctions.

§ 1 Warranty period

1. The warranty period for the devices shall be 5 years following the date when the devices were purchased by the Customer.
2. The warranty period for the automation elements shall be 3 years following the date when the devices were purchased by the Customer.
3. The purchase date shall mean the date when VTS or a VTS distributor issued a VAT invoice documenting the sale of the device to the Customer.

§ 2 Scope of warranty

1. If a complaint is recognized as justified, VTS shall, at its option, either replace the devices or their defective parts or repair them on the site of their installation or in another place, after they are sent for repair.
2. If the warranty service is provided on the site of device installation in the country of VTS's registered office, VTS shall cover the costs of transporting VTS Licensed Service Technicians and the costs of transporting spare parts. The current list of VTS Licensed Service Centres, hereinafter service centres, is available on www.vtsgroup.com and in VTS business offices.
3. A warranty report is only processed if the device has been purchased in the country of VTS's registered office.
4. A warranty service does not interrupt, suspend or change the warranty period; the warranty for replaced parts shall expire along with the expiry of the device warranty.
5. A warranty granted by VTS shall neither exclude nor limit or suspend the Customer's rights arising from the regulations regarding implied warranty for defects of a sold item.
6. These Warranty Terms and Conditions shall be binding for the parties of all contracts connected with the devices, unless the contract specifies otherwise, with the consent of VTS.

§ 3 Exclusions

1. This warranty shall not include:
 - a. Any parts subject to normal wear and tear, consumables.
 - b. Any damage arising through no fault of VTS and device defects occurring for reasons other than inherent to the devices.
 - c. Device damage resulting from the impact of the surroundings, improper transport, storage.
 - d. Mechanical damage arising from incorrect operation and use of the device, repair and maintenance incompatible with the technical documentation enclosed with the device, the Operation & Maintenance Manual or by individuals without proper qualifications.
 - e. Devices whose installation or start-up was conducted in a manner incompatible with the technical documentation enclosed with the device, the Operation & Maintenance Manual or by individuals without proper qualifications.
 - f. Devices which were not inspected at least once a year and were not subject to current maintenance activities as required by the Operation & Maintenance Manual or whose technical inspections or maintenance activities were conducted by individuals without proper qualifications.
 - g. Devices which were subject to modifications, changes of operation parameters, repair or replacement of parts without the written consent of VTS.
 - h. Any damage to or defects of devices which do not affect the functionality and correct operation of the devices.
2. This warranty shall not cover VTS's obligation to ensure current maintenance, inspections or programming of devices.
3. This warranty shall cover neither VTS's liability for any damage caused by device downtime while waiting for warranty services nor any damage to any property of the Customer other than the devices.
4. In order to exercise their rights under the Warranty, the Customer shall file a complaint in the country where they have purchased the device. If a report is filed in another country than the country of purchase, VTS is under no obligation to provide service under the warranty.

§ 4 Complaints

1. File any complaints online by sending the electronic application available on www.vtsgroup.com or on the phone by calling the complaint department along with sending the electronic application specified above.
2. A complaint report ought to include:
 - device type and serial number,
 - date of device purchase and start-up,
 - device installation site,
 - business name of the seller and installer of the device,
 - Customer's phone number and the Customer's contact person,
 - description of the device malfunction (description of the incorrect functioning, specifying the damaged part).
3. If the Customer claims that the device was damaged during transport, complete device in the original packaging securing the device against damage shall be delivered to the place of repair specified by VTS. The device serial number must be consistent with the number on the original packaging and in the Warranty Card.
4. Filing a complaint, the Customer shall deliver a copy of the VAT invoice documenting the purchase of the device covered by the complaint.

§ 5 Warranty service

1. Services arising from this warranty shall be provided within the 14 days following the report date. In special cases, this time limit may be extended to 30 days.
2. Any parts removed from the device by the service technicians within warranty services and replaced with new parts shall become the property of VTS.
3. Any costs arising from a groundless complaint report or interruptions in the work of service technicians at the Customer's request shall be borne by the Customer in line with the technical service price list available on www.vtsgroup.com
4. VTS shall have the right to refuse to perform a warranty service if the Customer fails to pay for the device or for any previous technical service.
5. The Customer shall cooperate with the service technicians in terms of a warranty service performed on the site of the device installation, in particular by:
 - a. providing free access to the device in due time,
 - b. preparing the site for service provision, in particular providing any additional structures to access a device installed higher than 1.5 m above the floor and, if necessary, to remove and re-install the devices,
 - c. disconnecting and connecting the hydraulic system (water, glycol system) and the freon system, performing additional works to allow the service technicians to handle the complaint,
 - d. presenting the documents provided together with the device (a warranty card filled out by the installer),
 - e. making it possible for the service technicians to commence work immediately upon arrival, without unnecessary delay,
 - f. providing, free of charge, all possible assistance in service provision (e.g. providing access to an electrical power source or lighting in the place of service provision),
 - g. taking the actions necessary to protect people and objects and following OHS regulations at the place where the warranty service is being performed, which includes making sure that the service performance site meets the requirements defined in legal regulations.
6. The Customer shall promptly accept and confirm completion of the warranty service on the Service Card document. When in doubt as to the quality and completeness of the warranty service, the Customer has the right to complain to VTS. Provisions of § 4 hereof shall apply to such a complaint as appropriate.

§ 6 Other provisions

1. In the event of any discrepancies between the Proposal plus the Purchase Order and these VTS Standard Warranty Terms and Conditions, VTS Standard Warranty Terms and Conditions shall prevail. In such an event, any contradictory provisions of the Proposal and the Purchase Order shall not apply.
2. In the event of any discrepancies between a contract signed by the Parties and these VTS Standard Warranty Terms and Conditions, VTS Standard Warranty Terms and Conditions shall prevail.
3. The Operation & Maintenance Manual is available on www.vtsgroup.com.