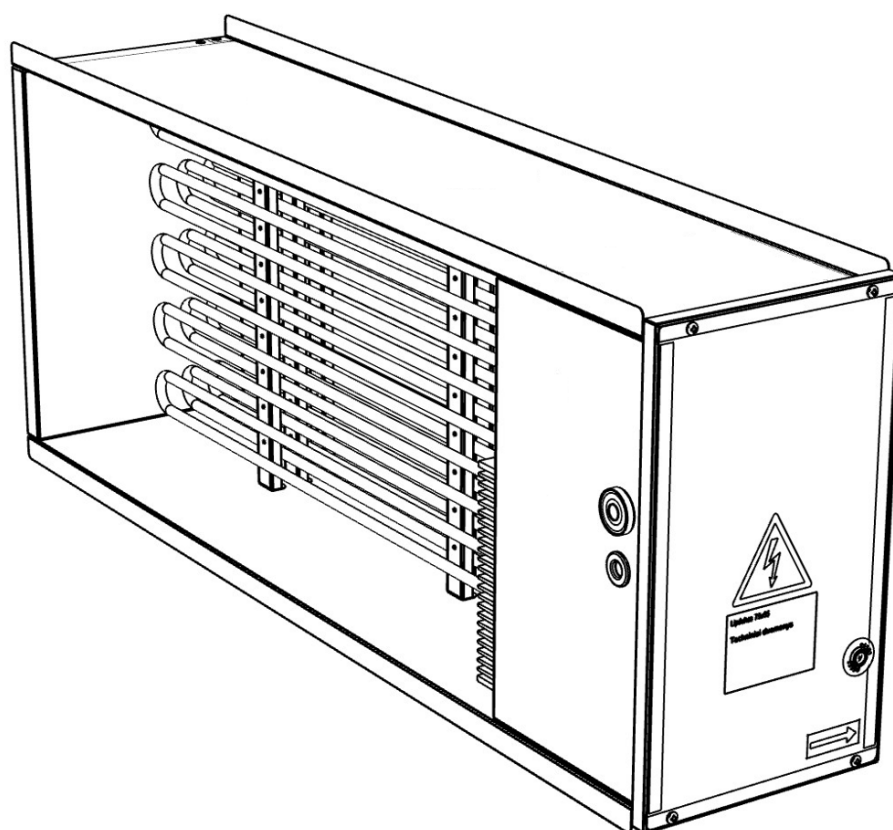


VENTMATIKA

ELECTRICAL HEATERS FOR AIR
HANDLING UNITS

EMS/EJS



Technical data
Mounting
Maintenance



Thank you for your purchase of this product. This manual describes how to use and install the supplied product. Be sure that you have read and understood its contents before using the heater.



The electrical *heater's model* and *serial number* are located on the label of the product.

WARNING! SAFETY REQUIREMENTS



Improper use of this heater can be result of serious bodily injury due to hazards of fire and explosion, burn and electrical shock.



Use only with **electrical voltage** and **frequency** specified on **model label**. Do not perform any service with heater plugged in. Serious injury or death may occur if personnel come in contact with high voltage lead.



Parts of the heater become very hot when operating and immediately after operating. Severe burns may occur if the heater is not allowed to cool down properly before servicing.

TRANSPORTING AND STORING



All products are packed by producer for normal transporting conditions. For unloading and storing use proper lifter to prevent product damage and employees injuries. Do not lift product by power supply cable, connection box. Avoid impacts and impact loads.

Until final installation store products in dry place with humidity not more 70% (20°C), average ambient temperature must be 5-40°C. Storing place must be covered from water and dirt. Avoid long-term storing. It is not recommended to store products more then 1 (one) year.

RECEIVING AND HANDLING



Inspect heater for any possible shipping damage. Inspect heater element wire for any deformation that could cause a short circuit or ground. Make sure that casing of the heater is not damaged.

SERVICE



No special service is required for electrical heaters, only to check electrical connection not less than 1 time per year.

QUALITY



We care about quality. 100% of heaters are tested before shipment.

DISPOSAL



Important environmental information about this product.

This symbol on the device or the package indicates that disposal of the device after its lifecycle could harm the environment. Do not dispose of the unit as unsorted municipal waste; it should be taken to a specialized company for recycling. Respect the local environmental rules.

If in doubt, contact your local waste disposal authorities.

Table of contents

<i>Description</i>	<i>5</i>
<i>Installation and electrical connection</i>	<i>6</i>
<i>Dimensions.....</i>	<i>7</i>
<i>Standard power steps</i>	<i>10</i>
<i>Model marking.....</i>	<i>11</i>
<i>Model type marking.....</i>	<i>12</i>
<i>Description of accessories.....</i>	<i>12</i>
<i>Description of operating B control type</i>	<i>13</i>
<i>Description of operating NV control type</i>	<i>13</i>
<i>Description of operating NI control type.....</i>	<i>13</i>
<i>Description of operating NIS control type.....</i>	<i>13</i>
<i>Overheating protection.....</i>	<i>13</i>
<i>LED indications</i>	<i>14</i>
<i>Service</i>	<i>15</i>
<i>Troubleshooting</i>	<i>15</i>
<i>Warranty.....</i>	<i>15</i>

Description

Electrical heaters EMS/EJS are designed to heat fresh air in air handling units. Casing is made from Aluzinc (AZ 150 or AZ 185) coated steel which is high temperature proof. There are at least 2 overheating protection thermostats and terminal blocks for easy connection installed in the heaters.

Heater can't be installed in explosive and aggressive substances environment. Heaters can be used only for the filtered air heating or preheating. The air velocity in the duct of the heater must be 1,5 m/s minimum. The maximum temperature of the output is 50 °C.

Electrical heaters are manufactured with IP44 degree of protection as standard and IP55 optional.

Heaters EMS/EJS with integrated temperature controller can be controlled in different ways depending on control type:

Type **B** – without control board. External EKR or other controller required.

Type **NV** – Autonomous heater with connected temperature sensor and setpoint in connection box

Type **NI** – Autonomous heater with connected temperature sensor and external setpoint TR5K or TR5KNNTC10.

Type **NIS** – External 0...10VDC control.

Electrical heaters EMS/EJS with integrated temperature controller works by PID regulator. This enables fine temperature control. Load is controlled by Triacs/thyristors without moving parts, which causes no-noise commutation.

Installation and electrical connection

Electrical heaters EMS/EJS can be installed in any position except electrical connection box downward.

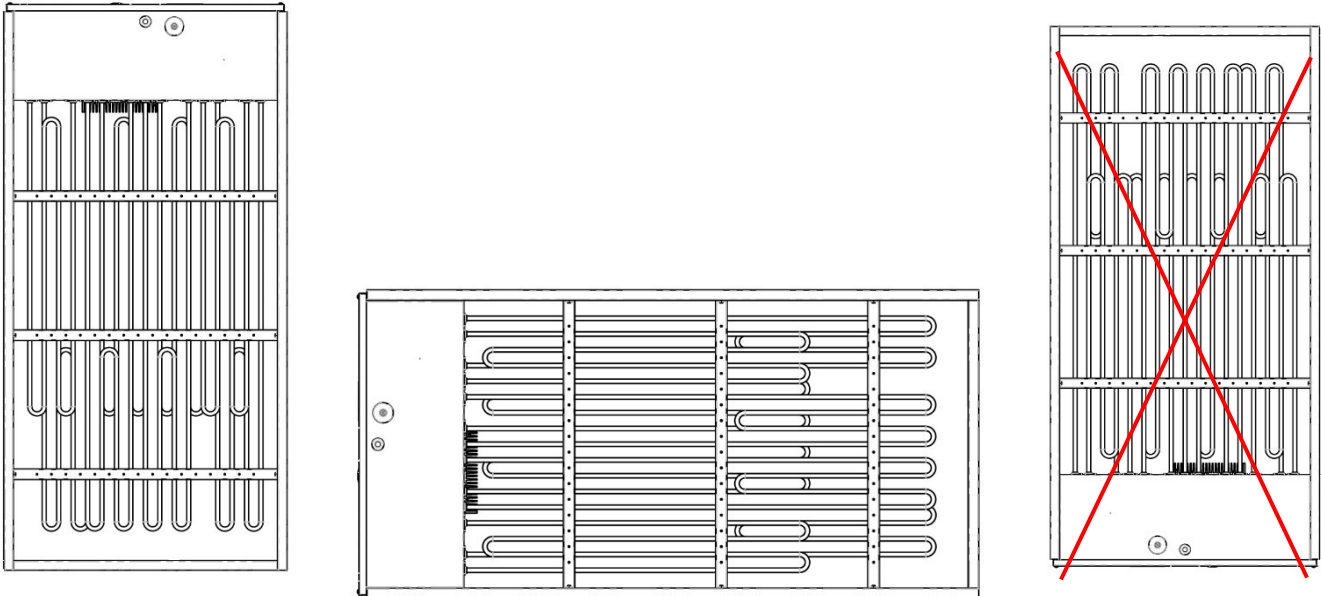


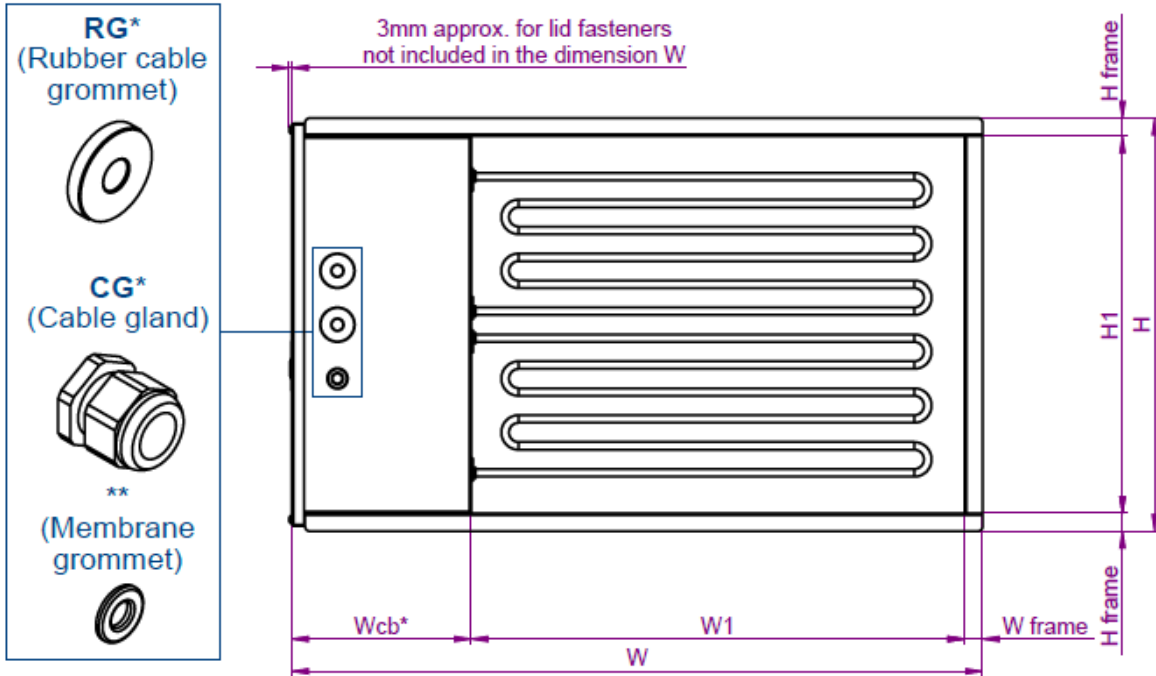
Fig. 1. Heater's installation positions

IMPORTANT:

The installation to the mains power supply may only be wired by a competent electrician. The power supply cable must be selected in the ratio with power of the heater. When installing these heaters, the standards, and regulations in force in your country must be strictly adhered to. Within the installation an electrical isolation automatic circuit breaker (not included) must be present, to enable the installer to cut all power supply lines. Automatic circuit breaker must be selected regarding power and nominal current (see the electrical rating plate on the lid of heater) of the heater and should have characteristic B. Connect the heater to the mains power supply, check that the voltage, frequency, power, and current are the same as those indicated on the electrical rating plate. The heater must be earthed.

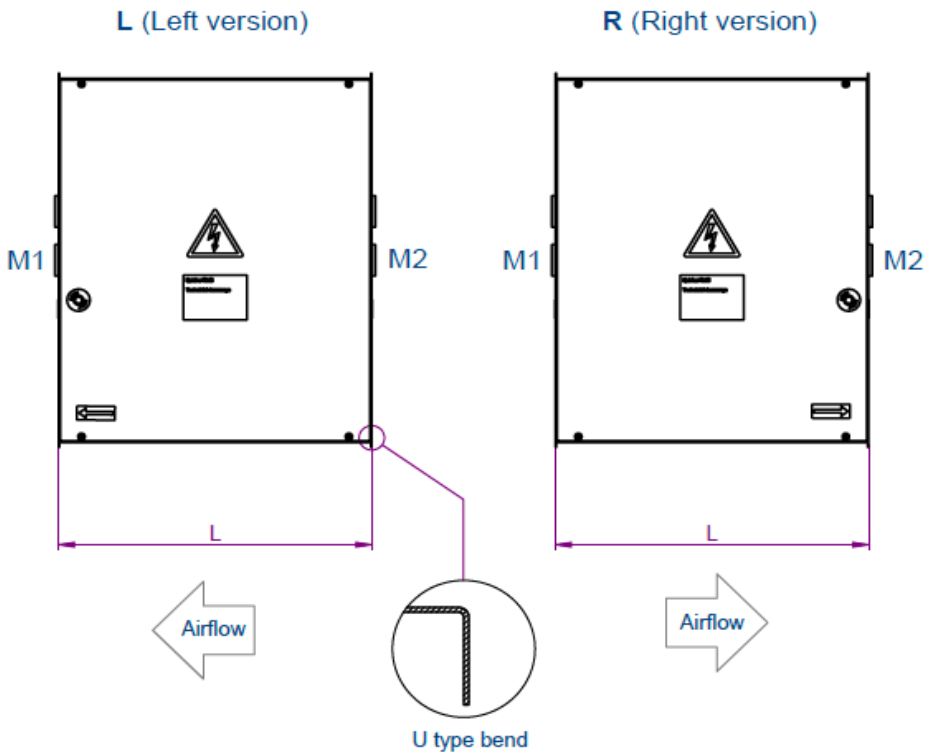
Dimensions

EMS dimensional drawing

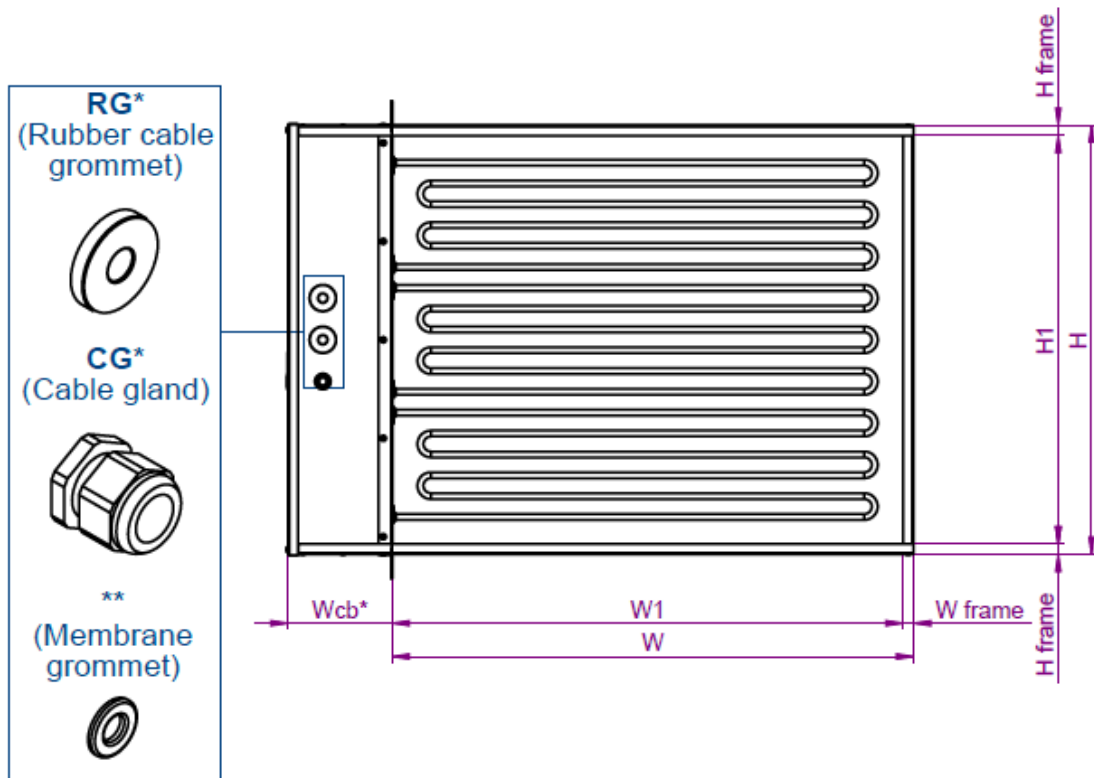


* Number of RG and CG depends on the power of the heater.

** Membrane grommet is used for control cable and pressure sensor hose (if present) only

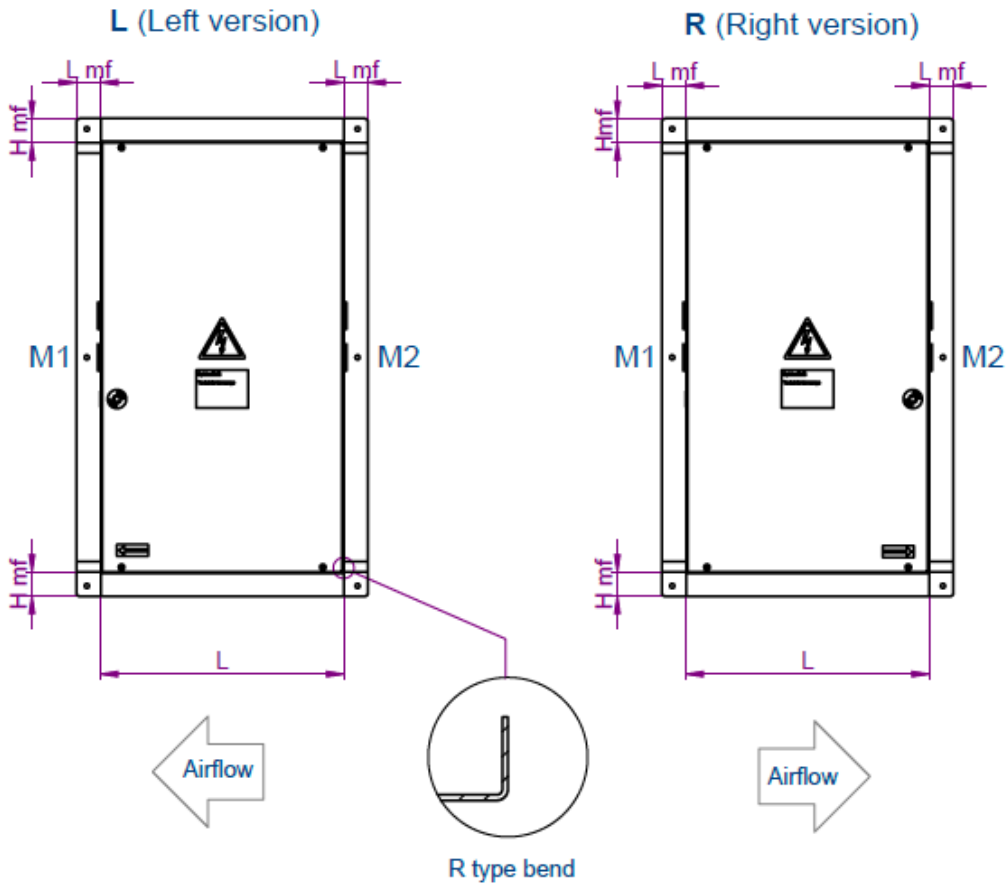


EJS dimensional drawing



* Number of RG and CG depends on the power of the heater.

** Membrane grommet is used for control cable and pressure sensor hose (if present) only



NOTES:

H – external height

H1 – internal (air passage) height

W – external width (EMS - including width of the connection box, EJS - excluding width of the mounting frame & connection box)*.

L – length (depth)

W1 – internal (air passage) width

M1/M2 – cable gland entry position

L (Left version) – connection box left

R (Right version) – connection box right

* - In selection tool, total width of EJS heaters will include width of the mounting frame & connection box. E.g. customer enters required duct width as 1500 mm, then selection tool shows 1700 mm as total width in the product key.

Wcb – width of the connection box: 200mm for NV, NI, NIS and B type with accessories, 150mm – for B control type without accessories.

W frame (EMS) – dimension of the side frame of the housing. W frame dimension can be selected by customer by 10mm steps (20,30,40,50,.....). Min W frame dimension is 20mm if $H \leq 1000\text{mm}$ and Min W frame dimension is 30mm if $H > 1000\text{mm}$.

W frame (EJS) – dimension of the side frame of the housing. W frame dimension can be selected by customer by 10mm steps (15,25,35,45,.....) Min W frame dimension is 15mm if $H \leq 1000\text{mm}$ and Min W frame dimension is 25mm if $H > 1000\text{mm}$.

H frame (EMS) – dimension of the bottom and top frames of the housing. H frame dimension can be selected by customer from the list (20,30). Min H frame dimension is 20mm if $W \leq 1500\text{mm}$ and Min H frame dimension is 30mm if $W > 1500\text{mm}$.)

H frame (EJS) – dimension of the bottom and top frames of the housing. H frame dimension can be selected by customer from the list (15,25). Min H frame dimension is 15mm if $W \leq 1000\text{mm}$ and Min H frame dimension is 25mm if $W > 1000\text{mm}$

H mf, L mf (EJS) – dimensions of the mounting frame. Default value is 35mm, optional 25/45mm.

SLIM version – “L” dimension is as small as it is possible by changing internal component size and component layout.

Please contact sales@ventmatika.lt for the heaters with a total width or height exceeding 2000mm.

Standard power steps

Power (kW)	Main step	I-STEP	II-STEP	III-STEP	IV-STEP	Power (kW)	Main step	I-STEP	II-STEP	III-STEP	IV-STEP
3	3					72	18	18	18	18	
4,5	4,5					75	15	15	15	15	15
6	6					78	18	15	15	15	15
7,5	7,5					81	18	18	15	15	15
9	9					84	18	18	18	15	15
10,5	10,5					87	18	18	18	18	15
12	12					90	18	18	18	18	18
13,5	13,5					93	21	18	18	18	18
15	15					96	21	21	18	18	18
16,5	16,5					99	21	21	21	18	18
18	18					102	21	21	21	21	18
19,5	19,5					105	21	21	21	21	21
21	12	9				108	24	21	21	21	21
22,5	12	10,5				111	24	24	21	21	21
24	12	12				114	24	24	24	21	21
25,5	13,5	12				117	24	24	24	24	21
27	15	12				120	24	24	24	24	24
28,5	15	13,5				123	27	24	24	24	24
30	15	15				126	27	27	24	24	24
33	18	15				129	27	27	27	24	24
36	18	18				132	27	27	27	27	24
39	15	12	12			135	27	27	27	27	27
42	15	15	12			138	30	27	27	27	27
45	15	15	15			141	30	30	27	27	27
48	18	15	15			144	30	30	30	27	27
51	18	18	15			147	30	30	30	30	27
54	18	18	18			150	30	30	30	30	30
57	15	15	15	12		153	33	30	30	30	30
60	15	15	15	15		156	33	33	30	30	30
63	18	15	15	15		159	33	33	33	30	30
66	18	18	15	15		162	33	33	33	33	30
69	18	18	18	15		165	33	33	33	33	33

Please contact sales@ventmatika.lt for the heaters over 165kW.

EMS/EJS heaters conform to the requirements of the standards:

LST EN 60335-2-30:2010+AC:2010+A11:2012+AC:2015 (EN60335-2-30:2009+ AC:2010+ A11:2012+AC:2014);

LST EN 61000-4-2:2009 (EN61000-4-2:2009);

LST EN 61000-4-3:2006+A1:2008+A2:2010 (EN 61000-4-3:2006+A1:2008+A2:2010);

LST EN 61000-4-4:2013 (EN 61000-4-4:2012);

LST EN 61000-4-5:2014 (EN 61000-4-5:2014);

LST EN 61000-4-11:2004 (EN 61000-4-11:2004);

LST EN 61000-6-2:2005 (EN 61000-6-2:2005);

LST EN 61000-3-2:2014 (EN 61000-3-2:2014);

LST EN 61000-6-3:2007 + A1:2011 (EN 61000-6-3:2007 + A1:2011);

LST EN 61000-3-3:2014 (EN 61000-3-3:2013).

and therefore complies with the essential requirements and provisions of the 2014/35/EU and 2014/30/EU Directives.

The CE mark is affixed.

Model marking

EMS NIS 1550x1500x200-111kW-3f PS 75°C-100°C IP55 R

1 2 3 4 5 6 7 8 9 10 11

1 – Heater type (EMS/EJS)

2 - Control type (B, NV, NI, NIS)

3 - Width (mm)

4 – Height (mm)

5 – Length (mm)

6 – Power (kW)

7 – **Input voltage:**

1f – Single phase 230V

2f – 2-phase 400V

3f – 3-phase 400V

3f 230V – 3-phase 230V

8 – Additional accessories*

9 – Overheat protection thermostats if not standard (standard 50°C-100°C)

10 – IP level if not standard (standard IP44 and IP55 optional)

11 - L – Connection box Left, R – Connection box Right, N – not known (connection box side must be confirmed before proceeding the orders).

Additional accessories*:

PS – Differential pressure switch for air flow detection

PTC – Sensor for minimum air velocity detection

K – Internal contactor (for type B – on/off)

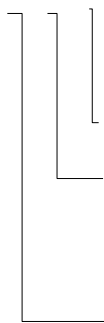
TFA – triac alarm module

AL – alarm contacts (NO/NC)

Model type marking

S1 2 1 1, S1 2 1 2, S1 2 1 3, S1 2 1 4, S1 2 2 1, S1 2 2 2, S1 2 2 3, S1 2 2 4, S1 2 3 1, S1 2 3 2, S1 2 3 3, S1 2 3 4, S1 2 4 1, S1 2 4 2, S1 2 4 3, S1 2 4 4, S1 2 5 1, S1 2 5 2, S1 2 5 3, S1 2 5 4, S1 2 6 1, S1 2 6 2, S1 2 6 3, S1 2 6 4, S1 2 7 1, S1 2 7 2, S1 2 7 3, S1 2 7 4

S1 X Y Z



Power type marking 1 – 4 (1 – 230 V, 2 – 2x400 V, 3 – 3x400 V, 4 – 3x230 V);

Integrated control type 1 – 7: (1 – NV (PTC/PS) AL 2NTC, 2 - NI (PTC/PS) AL 2NTC, 3 - NIS (PTC/PS) AL 2NTC, 4 –RECO (PTC/PS), 5 – ESKM (PS), 6-SS PSR, 7 – wires only (ON/PFF PS);

2 – rectangle (power - from 0,3 kW to 200 kW);

Description of accessories

PS - mechanical protection against loss or insufficient airflow with differential pressure switch. The heater is not allowed to heat unless a minimum airflow of 1,5m/s is reached.

By ordering the PS, an internal contactor for power supply is added to the heater as well.

PTC - designed for air velocity detection. The flow switch continuously monitors the airflow and switches off the heater if the air velocity drops below 1,5m/s.

K - internal contactor for power supply. Can be added in the heater.

TFA – triac fault alarm module. Detects triac failure, turns off the heating and indicating alarm status with LED on TFA board and potential free alarm contacts.

AL - heaters can be equipped with an integrated relay with potential free alarm contacts (NO/NC). It indicates whether the overheating thermostat has tripped.

Description of operating B control type

Electrical heaters B ... are designed without control board. External EKR or other controller required.

Description of operating NV control type

Electrical heaters NV ... are designed with integrated temperature control, one temperature sensor, potentiometer is inside connection box for temperature setpoint.

Heaters EKA NV ... operates by the supply (TJ-K10K) air temperature sensor. Setpoint temperature (0...30) °C.

There can be set the different desired (*setpoint*) air temperature by potentiometer under the heater lid.

Supply air temperature sensor (TJ-K10K) is provided with the heater.

Description of operating NI control type

Electrical heaters NI ... are designed with integrated temperature control, one temperature sensor, wired remote control panel (TR5K) for temperature setpoint.

Heaters NI ... operates by the supply (TJ-K10K) air temperature sensor. Setpoint temperature (0...30) °C.

There can be set the different desired (*setpoint*) air temperature by wired remote control panel.

Supply air temperature sensor (TJ-K10K) is provided with the heater.

Additional accessories TR5K or TR5KNTC10 must be purchased separately.

Description of operating NIS control type

Electrical heaters NIS ... are designed for the heaters power (0...100) % control by analog signal input (0...10) VDC.

Overheating protection

At least two overheat protection thermostats are installed in the electrical heater. Automatic reset turns off the heating when the temperature reaches reset temperature limit and turns on when the temperature drops below reset temperature. Manual reset temperature is higher and turns off the heating when the temperature reaches manual reset temperature. Only way to reset it, push the

reset button when the temperature drops below reset temperature. Various temperature thermostats are available to choose (automatic 50°C/75°C, manual 75°C/100°C/120°C), as well as easily adjustable automatic thermostats (10°C – 55°C).

LED indications

NI/NV

When the heater power supply is switched on, LED 6 (LED 2 with TFA module) on the controller PCB flashes once every 8 seconds if setpoint is 0 °C and every second if setpoint is higher than 0 °C. If controller turns on the heating depending on the demand, LED 5 (LED 1 with TFA module) lights.

If LED 6 (LED 2 with TFA module) lights continuously it means that there is a failure of: supply (TJ-K10K) air temperature sensor or wired remote control panel TR5K.

NIS

When the heater power supply is switched on, LED 6 (LED 2 with TFA module) the controller PCB flashes every second. If controller turns on the heating depending on analog signal, LED 5 (LED 1 with TFA module) lights.

PTC

When the heater power supply is switched on, controller is in preparing mode for 30 seconds, LED 5 flashes once every 5 seconds. If there is air velocity (*Min. 1,5 m/s*) in the duct heater after preparing mode, LED 5 flashes once per second and controller turns on the heating depending on the demand, LED 6 lights. If there is no air velocity, controller don't turn on the heating till air velocity appears.

Service

No special service is required for electrical heaters, only to check electrical connection not less than 1 time per year.

Troubleshooting

No heating from heater	<ol style="list-style-type: none">1. Manual reset thermostat is cut off. In this case need to figure the cause of the overheating of the heater. Eliminate overheating cause, press „RESET“ button on heaters cover.2. No power supply to heater – check all external electrical connection components (relays, switches).3. Temperature sensor fault. Check sensor resistance, it must be 10kΩ at 25°C.4. Pressure switch fault. Check if pressure in system is set correctly (check the pressure when air flow is not less than 1,5m/s).5. If LED 1 lights continuously it means that there is a failure of: PTC (air velocity) sensor, supply (TJ-K10K) or room (NTC10) air temperature sensor, potentiometer on the top of the heater casing, wired remote control panel TR5K.6. When the heater power supply is switched on, after power supply interruption or after any failure, controller is in repairing mode for 30 seconds.7. PCB fault. Contact: quality@ventmatika.lt
Heater gives full output, not by set point	<ol style="list-style-type: none">1. Temperature sensor fault. Check sensor resistance, it must be 10kΩ at 25°C.2. Air flow sensor fault. Check sensor resistance. It must be 22Ω between X15...X16 and 10Ω between X15...X18. Sensor must be clear.3. When the heater power supply is switched on, after power supply interruption or after any failure, controller is in repairing mode for 30 seconds.4. Triacs fault. Contact: quality@ventmatika.lt5. PCB fault. Contact: quality@ventmatika.lt
Automatic circuit breaker switching off	<ol style="list-style-type: none">1. Check circuit breakers data, it must correspond to heaters electrical data.2. Check isolation of connection cables, wires, check is heater grounded.3. Check power supply source data, it must correspond to heaters electrical data.
Protection thermostat cut off	<ol style="list-style-type: none">1. Low air flow speed through heater. Check filters, fans, ducts of system.2. Pressure switch fault. Check if pressure in system is set correctly (check the pressure when air flow is not less than 1,5m/s).

IMPORTANT: *If failure appears, power supply must be switched off and only then performed fault elimination works.*

Warranty

1. Manufacturer declares **2 years** warranty term from the date of manufacturer's invoice. Warranty is applied in case if all requirements of transporting, storing, installation and electrical connection are fulfilled.

2. In case of damaged or faulty product during warranty term customer must inform producer in 5 days and deliver product to manufacture as soon as possible at customer's costs. In other case warranty is not valid.

3. Manufacturer is not responsible for damages which occur during transportation or installation.



Manufacturer:

VENTMATIKA UAB

Metalistu str. 2A-1, 78107 Siauliai

Lithuania

EMS2022_001