	SERVICE DOCUMENT	80000497 – Issue 1 05/16
	Ventilation of family houses DV250/300/400 Entro Part No: 90000397/90000398/90000399	Validity from 01.05.2016

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2) Validity of the documentation, description of the changes

This documentation is valid for units **DV250/300/400 Entro** supplied since May 2016 with the drivers of the **CPA**.

3) General description

The Entro series of ventilation units are designed to ventilate living and other areas within a domestic home that have a normal environment. Units are equipped with basic regulation and controller (regulator) CPA with firmware version 2.0. Optional accessories are pipe air heaters EPO-PTC.

4) Description of regulatory functions

- See operating instructions

BASIC REGULATION

a) Control of wattage of EC fans

- Wattage (speed) of two ventilators is controlled simultaneously by using the continuous signal 0-10V
- Entro EC fans switch on at a voltage of 1.3V (0 - 1.2V = off)
- Control analogue signal 1.5-10V is generated by the controller CPA (clamp Y1)
- Source of supply voltage +24V for the controller is a switch mode power supply 24V DC in the unit of the wattage of 35W or 150W (in a case of supplying +24V EC ventilators as well)

b) Airflow distribution

- Module Mx serves to regulate airflow in intake and outlet ducting
- Individual trimmers Me and Mi are used to regulate power of intake or outlet ventilators 0-20 % (def 0%)

c) Frost protection of heat exchanger

- The temperature of the exhausted air is controlled via a mechanical thermostat TFR (with a fixed temperature of 2°C), which reduces the power of the intake Me to 50% of the current power level (via a resistor) in the event of frost developing.
- The temperature of the extracted air after recuperation is controlled by a mechanical thermostat TFR (set at a fixed temperature of -2°C), which in the case of activation causes a decrease of a wattage of a supply ventilator on 50% of the current wattage (ensured by the inclusion of a resistor 92 kΩ)
- If a very low ventilation output is selected it is possible that with activation of frost protection of the heat exchanger may result in the shutdown of the supply ventilator (a closing valve for intaking the outside air still remains open)
- After increase of the temperature of the extracted air occurs automatically switching over of the thermostat to normal condition and return of the supply ventilator to its original wattage

c) Automatic control of a valve of the bypass

- The temperature of the incoming air maintained at 18°C when inside the unit by the TFB thermostat, which automatically opens the bypass valve when the temperature goes above 18°C.

d) Protection against short circuit and overload

- Switching power supply 24V DC and both EC ventilators 230V is secured by a tube - fuse 4A located in a clampcase

DIGITAL REGULATOR (CONTROLLER) CPA

- is equipped with a monochromatic touchscreen and provides basic regulatory function of the unit
- DV250/300/400 Entro units have all external equipment connected to CPA regulator

a) External control of the power of ventilation

- Regulator of the CPA supports control of the power or ventilators using digital input DI1 and/or analogue input IN1
- **Digital input** (clamps DI1 - GN) is intended for the connection of the non-voltage switch contact of external switches (bathroom / WC / kitchen), through which are both ventilators switched on presetted (increased) power
- Function of the digital input DI1 allows to set a delay start and reduce the ventilation after shutdown (i.e. as a switch can be used a push button as well)
- **Analogue input** (clamps IN1-GN) is intended for the control signal 0-10V, through which is possible to smoothly control the output of both electric ventilators
- Function of the analogue input IN1 allows to set the curve of dependence (points A-B) on the level of ventilation power of the input signal and is therefore usable for all common air quality sensors (CO₂, VOC, humidity, etc.) with output 0-10V

Editor's Note - in the case of concurrence of multiple requests to different output of ventilators, the highest will be applied

b) External shut-off valves

- The regulator CPA contains the output S1 for controlling actuators of external closing valves in the pipeline
- To output (valves S1 / S11 -GN) it is possible to connect a standard 24V actuators (e.g. BELIMO CM24 or LM24A)
- Permissible load of output S1 / S11 is max. 0.5A
- Valid: if the ventilators are in service, then the valve S1 / S11 has the voltage of 24V DC

c) Power supply to external device

- Output 24V DC can be used for supplying external air quality sensors and/or actuators of closing valves
- Permissible load is max. 0.5 A

d) Alternative frost protection of the heat exchanger - pre-heating of the air

- If there is in a VZT system electric pipe preheater EPO-PTC (optional accessory), then its internal regulation will ensure minimum required temperature of the intaken air (usually -5°C)
- Electric heater EPO-PTC is controlled by its own built-in electronic regulator with the air temperature sensor
- To permit the operation of the preheater there is use of voltage 24V DC from clamp S1
- Range -5°C is necessary to select using a DIP switch to position "0" and turn the temperature to the extreme position of the drivers (both elements are part of the electric heater EPO-PTC)

e1) Control of electrical 'afterheater' EPO-PTC

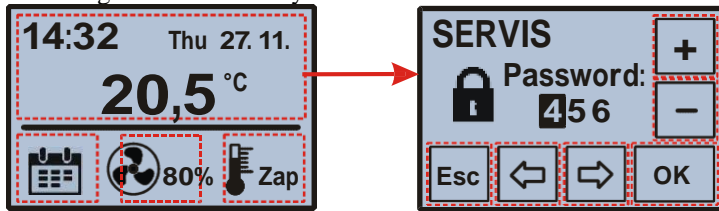
- Pneumatic electric 'afterheater' EPO-PTC (optional accessory) is switched on by voltage of 24V DC from clamp S2
- Use of reheater requires minimal power of intake ventilator to be 30% (i.e. Pin Y1 voltage >3.0V)
- Range of +10 to +40°C must be selected by setting the DIP switch to the position "2"
- The temperature of the output air can be set by the revolving controller of the EPO-PTC heater

Editor's Note - the EPO-PTC heater includes two safety thermostats +70°C with manual reset

5) Service menu of regulator CPA

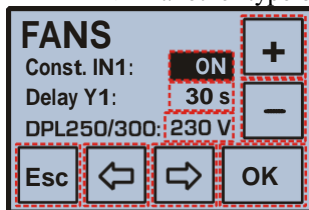
a) Access to service menu

- After pressing and holding (for 5s) in the upper part of the menu, it's required that you enter the standard three digit password according to the current day of the week



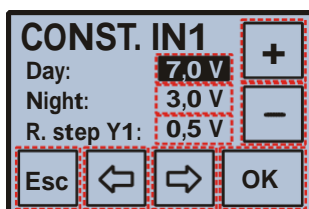
b) Service menu "FANS"

- Turn on/off function regulating constant pressure in intake pipeline
- Setting ventilator turn on delay after opening of the flaps
- Setting ventilator type (24V or 230V) contained in unit
- => If another type of ENTRO unit is controlled by CPA regulator it must be set to 24V!



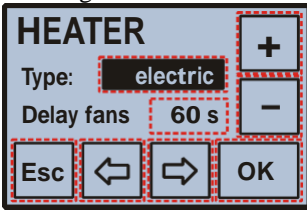
c) Service menu "CONST.IN1"

- Menu is displayed only if the regulation to constant pressure has been activated in previous window
- Setting the desired level of voltage on input IN1 (pressure sensor signal) in range 0-10V for standard usage (Day)
- Setting the desired level of voltage on input IN1 (pressure sensor signal) in range 0-10V for attenuated usage (Night)
- Setting magnitude of regulating intervention in range 0.1-1V (def.0.5V)
 - => Setting jump too high might have negative influence on stabilizing the system
 - => Setting jump too low might cause undesired slowing of ventilator power regulation



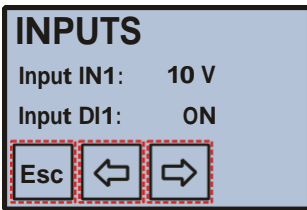
d) Service Menu "HEATER"

- Setting the type of reheater (choices: none / water / electric)
- Setting ventilator decelerating time for cooling down the heating spirals of the reheater in range 0-120s (def.60s)



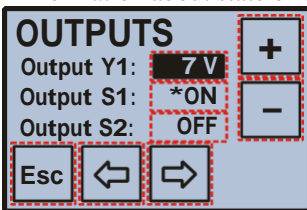
e) Service menu "INPUTS"

- Information about actual voltage on input IN1
- Information about state of input DI1 (switch on/switch off in relation to pin GN)



f) Service menu "OUTPUTS"

- Information about voltage on output Y1
- Information about state of outputs S1 and S2 (turned on = 24V turned off= 0V)

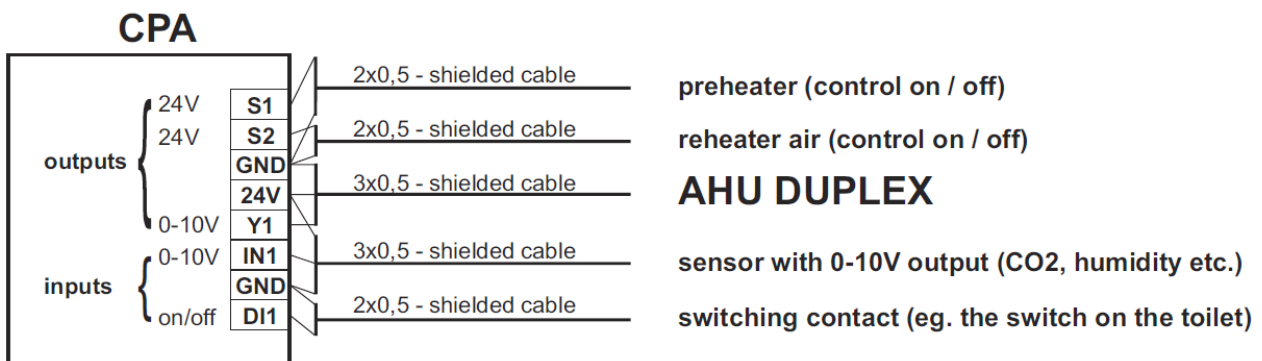


- After selecting the chosen output it is possible to force-feed it the desired value, which can be used for testing external equipment (this state is symbolized by displaying "*" in front of the selected value)
- After leaving the "OUTPUTS" menu occurs an automatic setting of all outputs to their previous state according to the management regulation

6) Description of regulator CPA

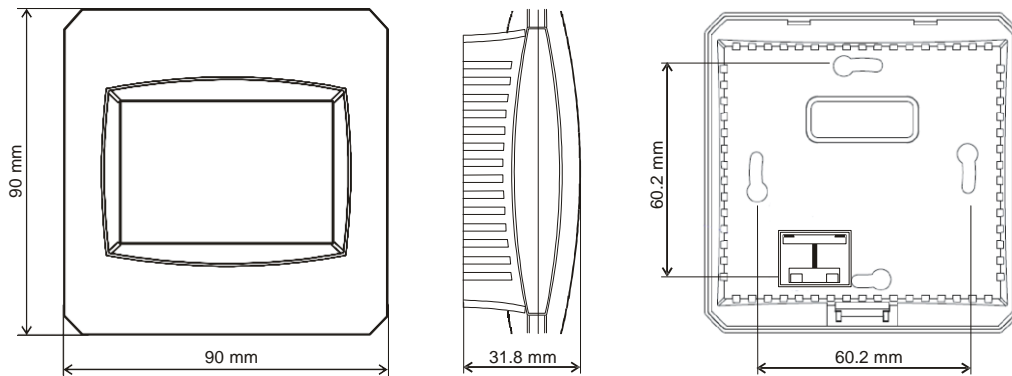
Clamp connection

- Electric diagram of connecting internal clamp



Mechanical installation

- The controller can be either placed on the wall or there can be prepared electric installation box under the plaster



7) Description of clamps

DV250/300/400 Entro

Mark	Description	Where it leads to	Note
L	Phase 230V	Supplying	
LS	Phase 230V - after the fuse 4A	Supplying of switched on source of +24V DC and ventilators 230V	
N	Working zero		
PE	Safety conductor		
GND	Earth		
24V	Output voltage +24V (max. 0.5A)	Supplying of the controller CPA, ventilators +24V and actuator of a valve of the by-pass	
Y1	Input control of voltage 0-10V	External connection - the controller CPA	
Me	Output control of ventilator 0-10V	EC ventilator M1/M2 according to the orientation	1.5-10V => ventilators in service (output 15-100%)
Mi	Output control of ventilator 0-10V		
SB	Control of an actuator of a valve of the by-pass	Thermostat TFB, actuator SB	+24V => by-pass opened

The regulator CPA

Mark	Description	Where it leads to	Note
S1	Output voltage +24V (max. 0.5A)	Control of closing valves of the actuator, permit the operation of electric preheater	+24V => clamps opened, operation of 'afterheater' enabled
S2	Output voltage +24V (max. 0.5A)	Permit the operation of electric preheater	+24V => operation of 'afterheater' enabled
GND	Earth		
24V	Output voltage +24V (max. 0.5A)	Supplying of actuators of external clamps and sensors	
Y1	Output voltage control 0-10V	Output control of ventilators in the unit	
IN1	Input for external voltage 0-10V	Air quality sensor with output 0-10V	
GND	Ground		
DI1	Input for external non-voltage contact	Switches in a bathroom / WC / kitchen	DI1 connected to GND => activation

8) Problems and their possible solution

(See also the instructions for use and maintenance)

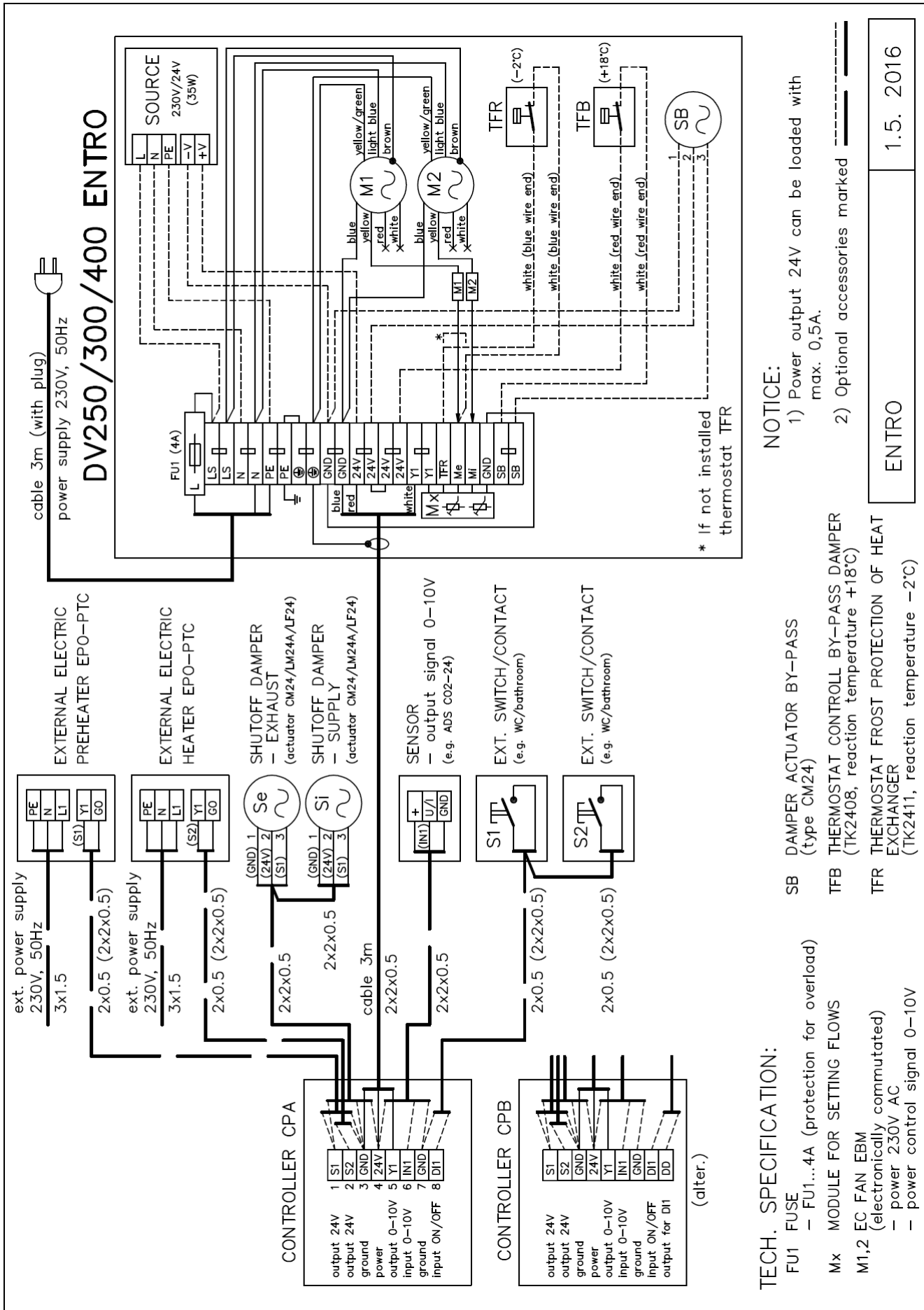
Issue	Solution
Non-functional ventilators or 'afterheater' EPO-PTC / EPO-V	Check settings of the CPA controller and its power supply (+24V), check the connection of clamps and connector (proper insertion) etc., check the control signal Y1 (0-10V) and outputs S1 and S2 / S12 and S2 (+24V), check safety thermostats in the unit and in the heater
Non-functional control of ventilators on the controller	Check the voltage at the clamp Y1, whether changes in the range of 0-10V according to the settings on the controller (external signals must be turned off!)
Non-functional actuator of the closing valve	Check a fuse FU in the regulatory module, check the voltage at clamps 24V and S1 / S11 (+24V)
Non-functional control of an output of the ventilators from external sensors	Check the power supply of the sensor (clamp 24V), check the level of the output voltage 0-10V from the sensor, check the driver settings (the response curve A – B in the menu "SENSOR")
Non-functional switching of an increased output from external signals	Check the connection of switch and controller CPA, check controller settings in the menu "SWITCH" and "INPUTS"

9) Spare parts list

See spare parts price list.

10) Attachments (charts)

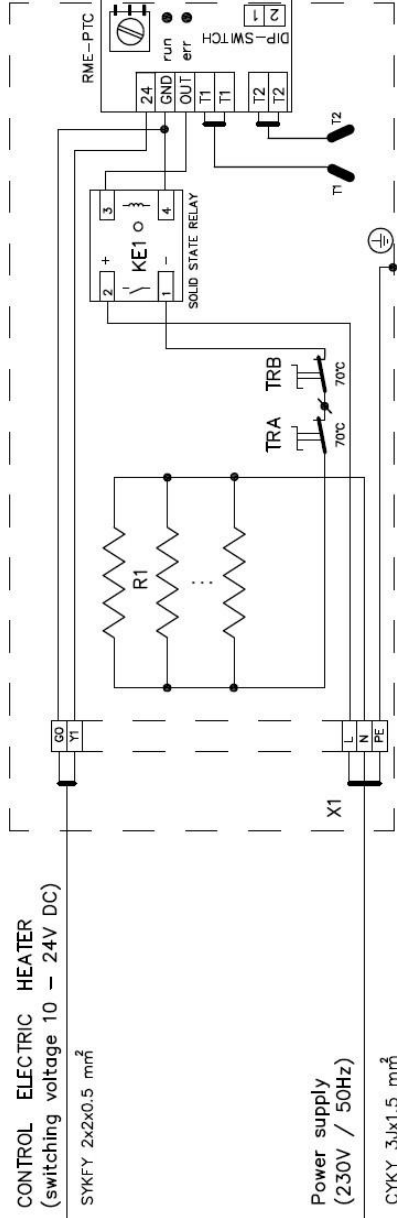
Diagrams of internal connection of the DV250/300/400 Entro ventilation unit and the pipe electric heater EPO-PTC.



NOTICE:
 1) Power output 24V can be loaded with max. 0,5A.
 2) Optional accessories marked -----

ENTRO 1.5. 2016

ELECTRIC HEATER EPO-PTC 0.4kW / 0.7kW / 1.7 kW



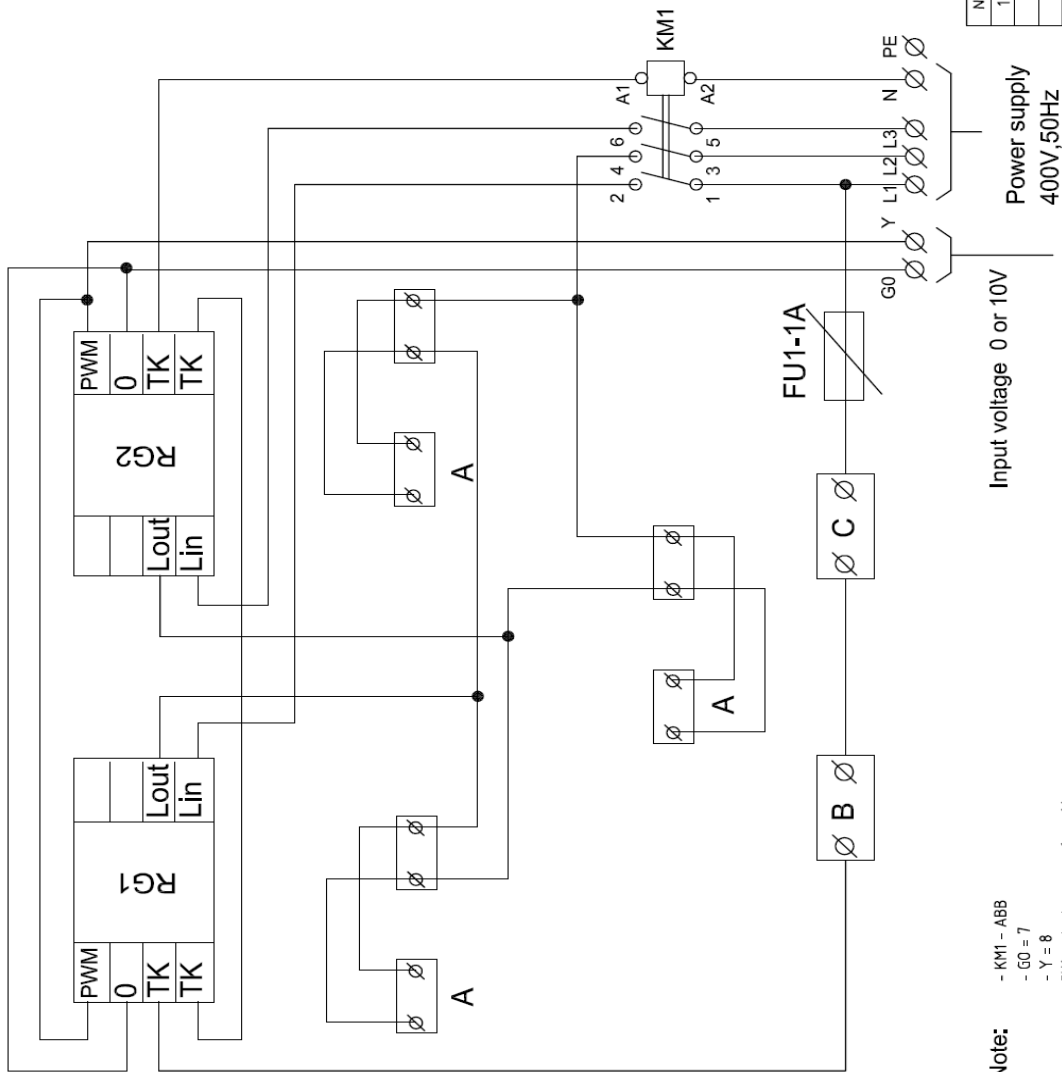
TYPES ELECTRIC HEATERS PTC

- Ø 125 EPO-PTC 0.7
- Ø 160 EPO-PTC 0.4/0.7/1.7
- Ø 200 EPO-PTC 0.7/1.7
- Ø 250 EPO-PTC 1.7

TECH. SPECIFICATION :

- X1 SAFETY THERMOSTAT (+60°C) – quick return CONNECTING
- KE1 SOLID STATE (electronic) RELAY 25A
- T1 TEMPERATURE SENSOR – ADJUSTABLE (–2+35°C)
- T2 OPERATING THERMOSTAT ADJUSTABLE +10° OR +40°C
- TRA,TRB SAFETY THERMOSTAT (+70°C) – manual return
- R1 PTC HEATING ELEMENTS – 0.4 kW (1pcs) /0.7kW (2pcs) /1.75 kW (5pcs)
(PTC element – 350W/pcs, 230V, 50Hz, 1.5A)
- RME-PTC CONTROL MODULE
- DIP-SWITCH SETTING 1– PRE-HEATER
SETTING 2– HEATER

ELECTRIC HEATER EPO-PTC 1.5. 2016



No.	Date:	No.	Date:
1	15.2016		
Title: EPO-V		Group: Venimatika	
Author: lng.O.Salc		Note:	
Ser.: 1			

Note:

- KM1 - ABB
- G0 = 7
- Y = 8
- FU1 - electr. power fuse 1A
- A - heating element
- B - automatic reset overheating thermostat
- C - manual reset overheating thermostat
- RG1,2 - ESKM controller



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