

Electronic Pellet Burner Controller NPBC-V3M



INTRODUCTION

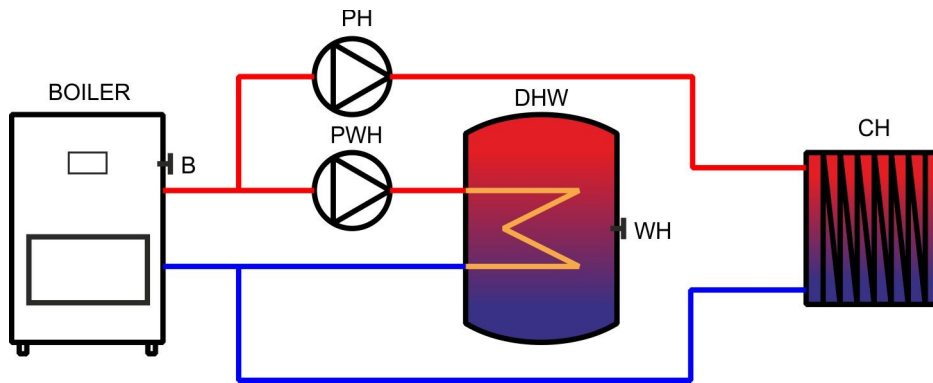
NPBC-V3M is an advanced, functionally completed controller for pellet burners. All the mechanisms and sensors of the burner, as well as those for the water heater and the heating installations, can be directly connected to the controller. Due to the provided wide range of adjustment for all of the work parameters, **NPBC-V3M** can be easily adapted to control many different kinds of burners with different power.

Main advantages of the controller NPBC-V3M:

- Outputs with reliable semiconductive switches with increased carrying capacity up to 16 A
- Inputs, protected from high-voltage peaks, induced in the cables
- Improved input filter to suppress the noises to the mains power supply
- Adjustment of all the parameters of the ignition, burning, extinguishing and cleaning processes
- RS-232 interface for remote monitoring, control or software update
- Supports date and time and can be programmed with up to three working periods for the burner during the day
- Full self diagnostic of the hardware and the sensors. If a problem occurs, a short message with the reason appears and, if necessary, the work mode automatically changes
- An option to set up from 1 to 4 automatic cleanings that require full extinguishing or cleanings on certain periods without extinguishing the fire, but only by increasing the power of the fan. This provides independent continuous performance with no attendance needed
- An option to control an additional powerful fan for better cleaning
- Automatic three-level power regulation for reaching the set temperature in the boiler and an additional temporary Suspend mode to avoid ignition and extinction cycles during temporary reduction of needed energy.
- Control of the pumps of the heating installation and hot water installation from the same controller.
- **(Optional)** Could be used in more powerful burners due to an analog output for a frequency inverter for a powerful air fan
- **(Optional)** A secondary control module could be connected to the executive module to display the information about the burner and the heating installation in a different room. This control module could function as a digital room thermostat, as well.
- **(Optional)** A high temperature pt100 sensor measures the temperature of the flue gases to rate the pollution of the boiler's heat exchanger. If the heat exchanger has gained a lot of soot, the temperature of the flue gases is higher and the boiler works less efficiently.
- **(Optional)** Could be used a bigger control module with 2.7" LCD display and a new face panel.
- Due to its universal power supply and the required output power that it has, the controller can be used in countries with mains power supply on 110V/60Hz

PELLET BURNER CONTROLLER VERSION NPBC-V3M-1

The controller **NPBC-V3M-1** is designed to run burners, which use a photo sensor to detect the burning fire. It measures the level of illumination from the burning fire. The pulsing control of the auger motor from the pellet tank allows the precise dosing of the amount of pellets that goes to the burner. **NPBC-V3M-1** is able to control an optional internal auger motor that forwards the pellets inside the burner. The controller runs two blowers: one that provides the air to the burning chamber and the other one is an additional fan, for example, for taking out the exhaust gases from the boiler, if necessary. Both blowers' power can be adjusted from the controller. NPBC-V3M-1 has an option to control the temperature of the exhaust gases by a high temperature sensor pt100, mounted in the entrance of the vent. An additional powerful blower could also be connected to the controller to blow away the ashes from the burning chamber during the cleaning procedures. The controller runs up to two circulation pumps: for the heating installation and for the hot water heater installation. **All of the controlled mechanisms must work on 220VAC or 110VAC mains power supply!**

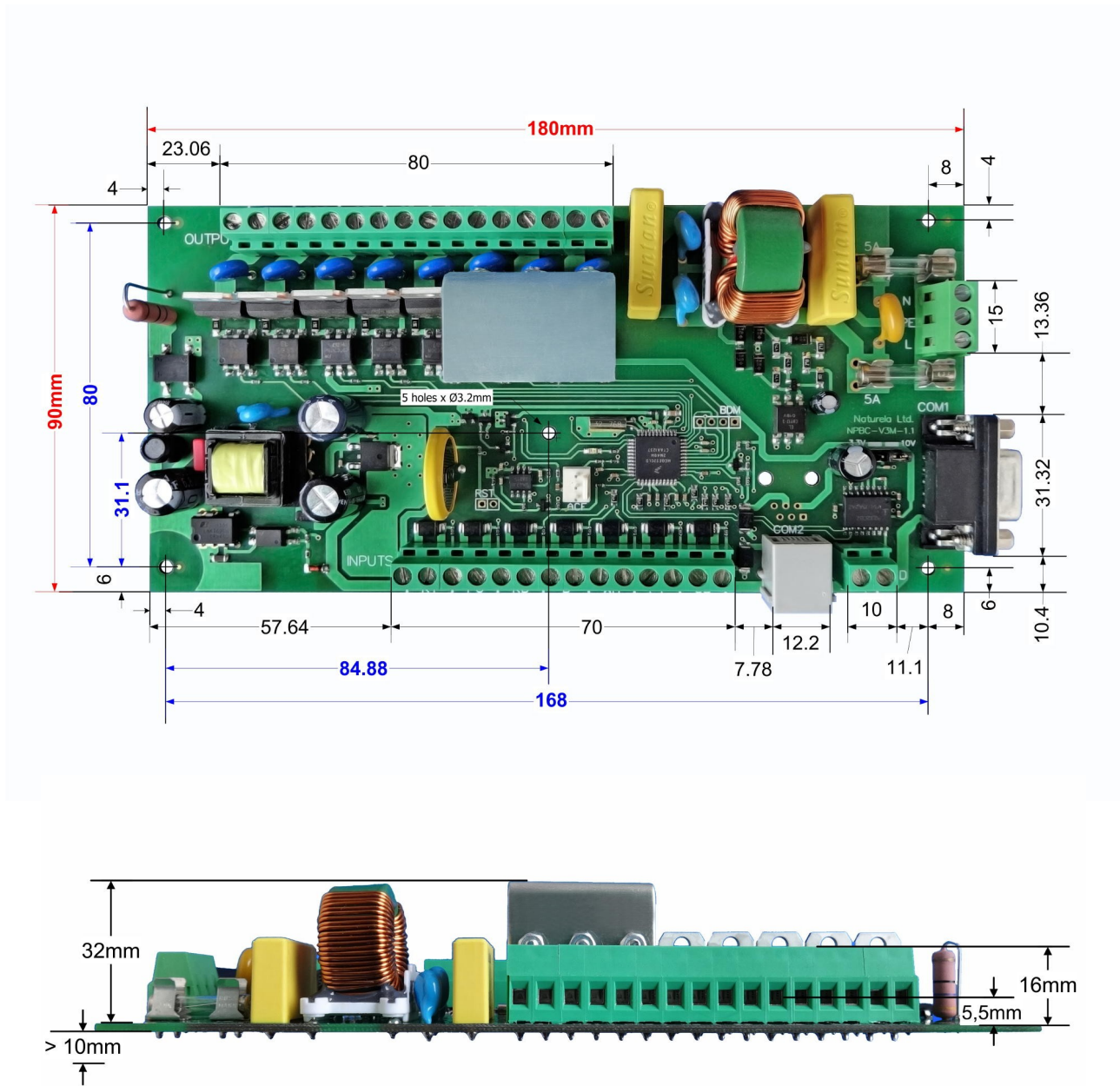


Hydraulic scheme of the outside heating and hot water installation, controlled by NPBC-V3

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VIEW AND DIMENSIONS OF THE MODULES OF NPBC-V3M

The controller consists two modules: **Executive module** and **Control module**. They are connected with 4 wired cable with connectors type RJ11



Dimensions and mounting holes of the Executive module

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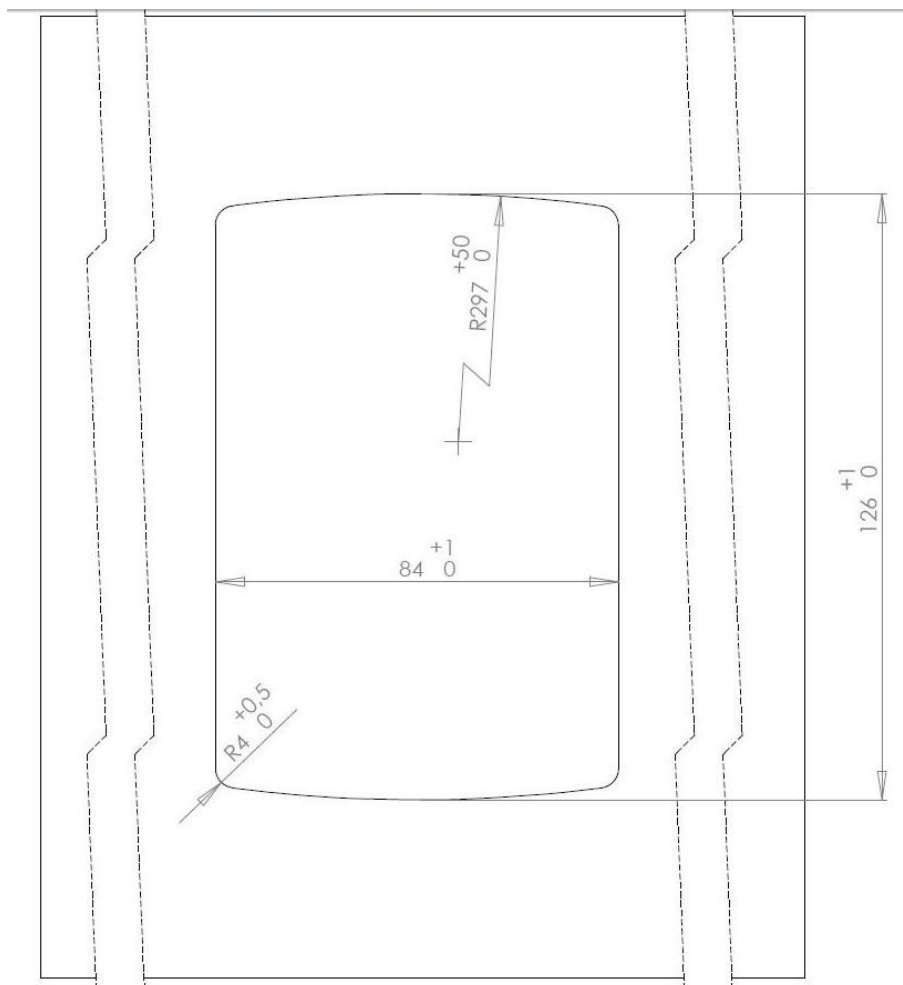


External dimensions of the Control module in a housing box

The control module could be mounted on a wall, by using 2 screws vertically placed on 60 mm from each other with size of the head between 5 mm and 7.8 mm.

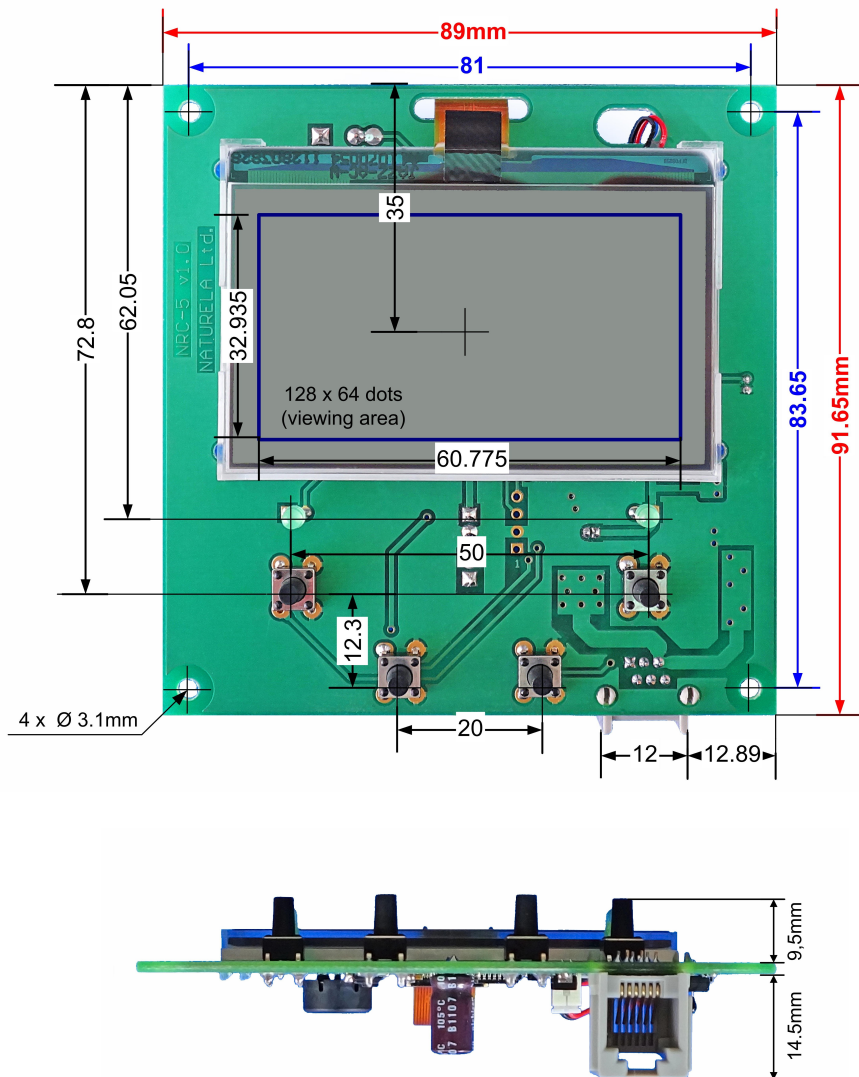
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The construction of the housing box allows it to be mounted in the wall of the burner, like it is shown on the picture below. When they are tightened, the back and the front panel of the box keep the Control module on the burner.



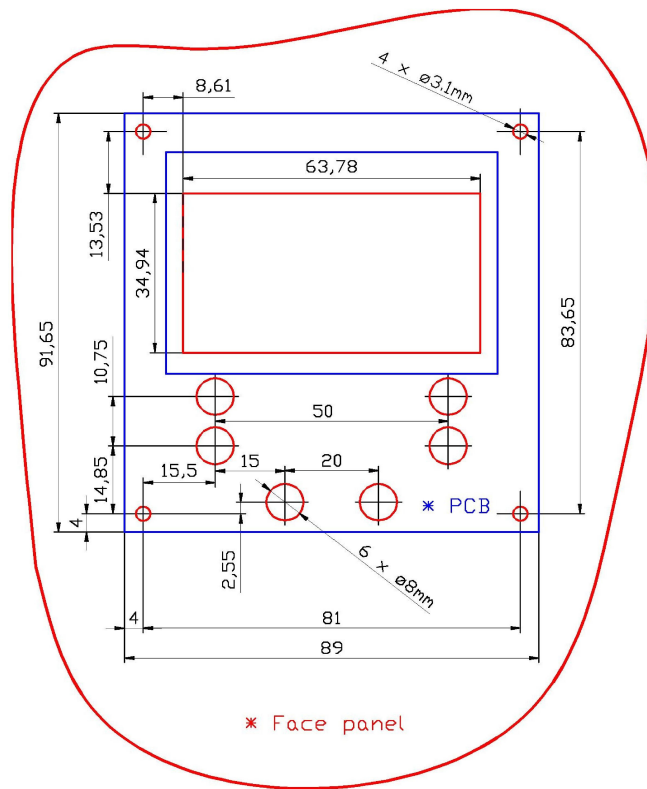
A hole in the tin of the burner with thickness up to 1.5mm for the Control module's housing panels

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External dimensions of the Control module NRC-5 with 2.7" LCD display

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Face panel dimensions of NRC-5



Face pane for NRC-5

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Mechanisms and sensors that could be connected to NPBC-V3M

- Electric feed screw motor to transfer pellets from the bunker to the burner (power up to 180W)
- Electric internal auger motor to forward the fuel to the burning area (power up to 180W)
- Main blower with smooth speed control to regulate the air flow (power up to 180W)
- Cleaner motor - an additional high power blower to clean the burner (power up to 800W)
- A blower for the flue gases (power up to 180W)
- Heater for firing the pellets (power up to 550W)
- Hot water heater circulation pump (power up to 180W)
- Central heating circulation pump (power up to 180W)
- **(Optional)** Frequency inverter to power up a powerful air fan
- Photo sensor to detect ignition
- Temperature sensor or thermostat to control the backfire
- Temperature sensor to control the water in the boiler
- Temperature sensor for the hot water heater
- High temperature pt100 sensor to measure the temperature of the flue gases. This temperature sensor is not used to detect the burning fire, but only to provide information
- A potential free contact of a room thermostat for more precise control of the burning process, depending on the room temperature.
- RS 232 interface for connection with a computer.

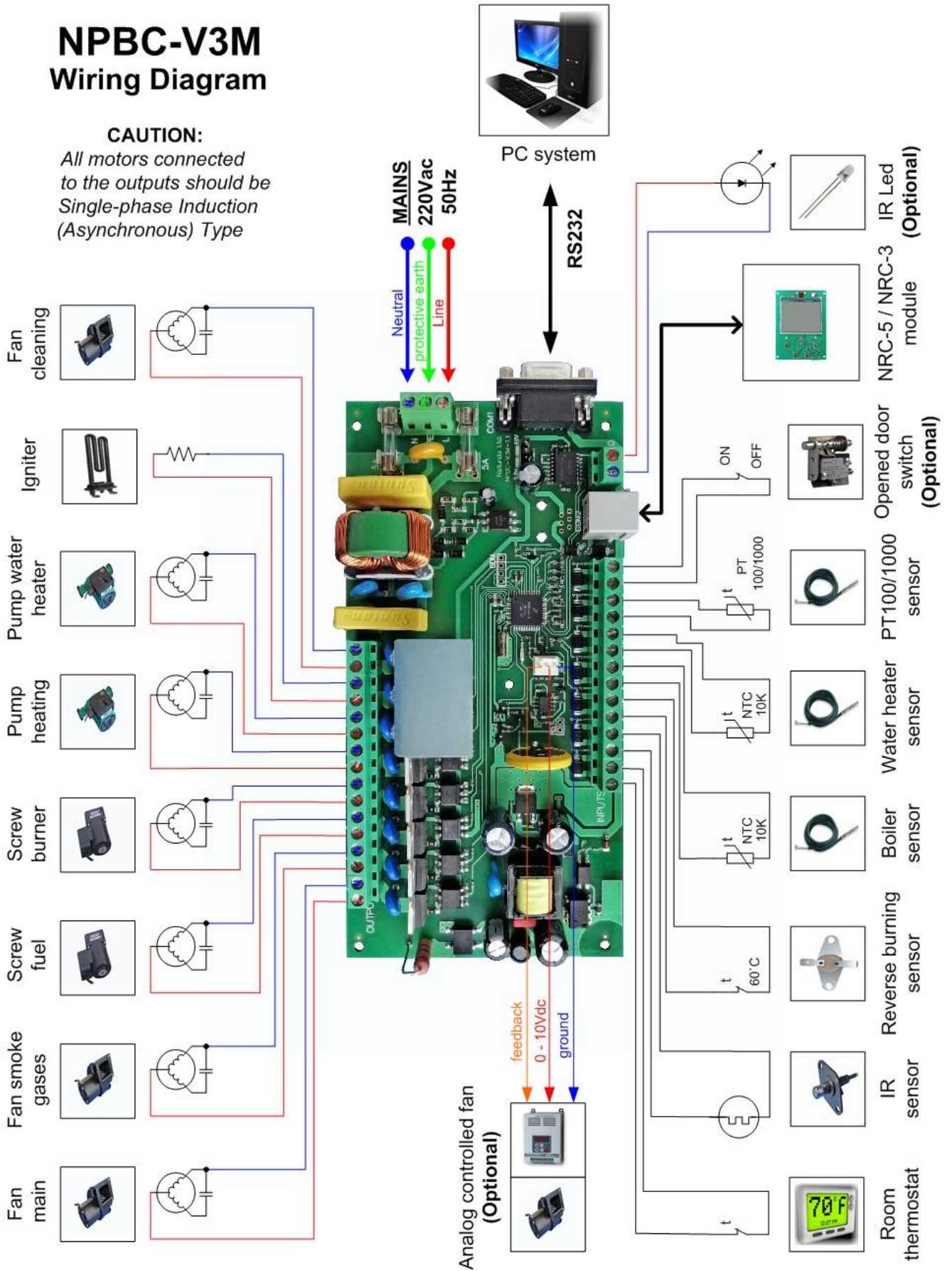
NPBC-V3M INPUTS AND OUTPUTS DESCRIPTION:

Outputs		Inputs	
FM	Main fan	RT	Room thermostat
FSG	Fan for the flue gases	PS	Photo sensor
SF	Screw for fuel	RB	Reverse burning sensor
SB	Internal screw	B	Boiler temperature sensor
PH	Heating installation pump	WH	Water heater temperature sensor
PWH	Hot water heater pump	PT	pt100 high temperature sensor
IGN	Ignition heater	OD	Opened door switch (Optional)
FC	Fan for cleaning	LED	IR LED (Optional)
ACF	Analog controlled fan (Optional)		

NPBC-V3M Wiring Diagram

CAUTION:

All motors connected to the outputs should be Single-phase Induction (Asynchronous) Type



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NPBC-V3M TECHNICAL SPECIFICATION

1	Number of inputs	7
2	Temperature sensors type	NTC 10K
3	Maximum measuring temperature	110°C
4	Detecting ignition	By a photo sensor
5	Temperature measuring accuracy	1%
6	Number of outputs	8
7	Supply voltage of each output	power supply voltage
8	Type of the motors of the air fan and the flue gases fan	induction motor with power up to 180W
9	Ignition heater maximum power	550W
10	Additional cleaning blower maximum power	800W
11	Maximum power consumed by any other output	180W
12	Maximum short time current on each output	16A AC
13	Maximum section of the plugged in cables in each terminal	2.5mm ²
14	Serial interface RS-232	Yes, with connector DB9
15	Power supply voltage	90-250V AC 50Hz / (60Hz optional)
16	Power consumed in Standby mode	<1W
17	Executive module PCB dimensions	180x90mm
18	Control module PCB dimensions	90x75mm
19	Maximum length of the connecting wire between Executive module and Control module	up to 40m