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# Control Unit E9T For Triboelectric Probe

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## Use And Maintenance Instructions

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## Description

The E9T control unit is used to set, manage display signals that have been coming from the triboelectric probe.

The triboelectric probe is a measuring instrument with continuous control.

Detects dust emissions caused by breakage of dedusting filters, scrubbers and purifiers.

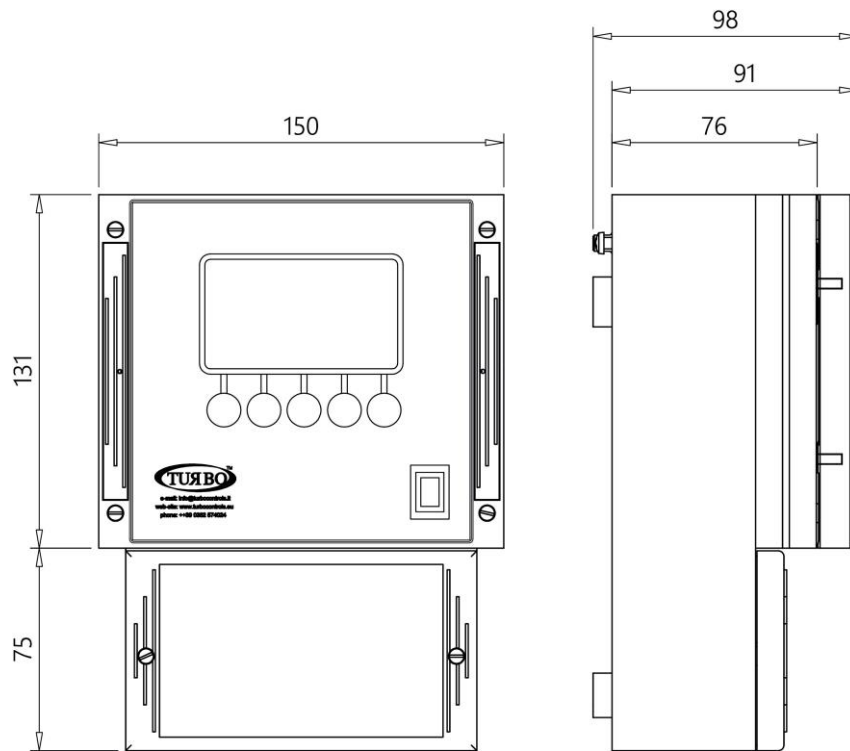
The probe generates a current signal proportional to the amount of dust that impact the electrode, the electrical charges are transported from the powder immersed in the gaseous fluid. The signal is dependent upon the mechanical and electrical characteristics of powders to be measured.

An increase in the concentration of the powders, causes a proportional increase of the signal that reaches the microprocessor.

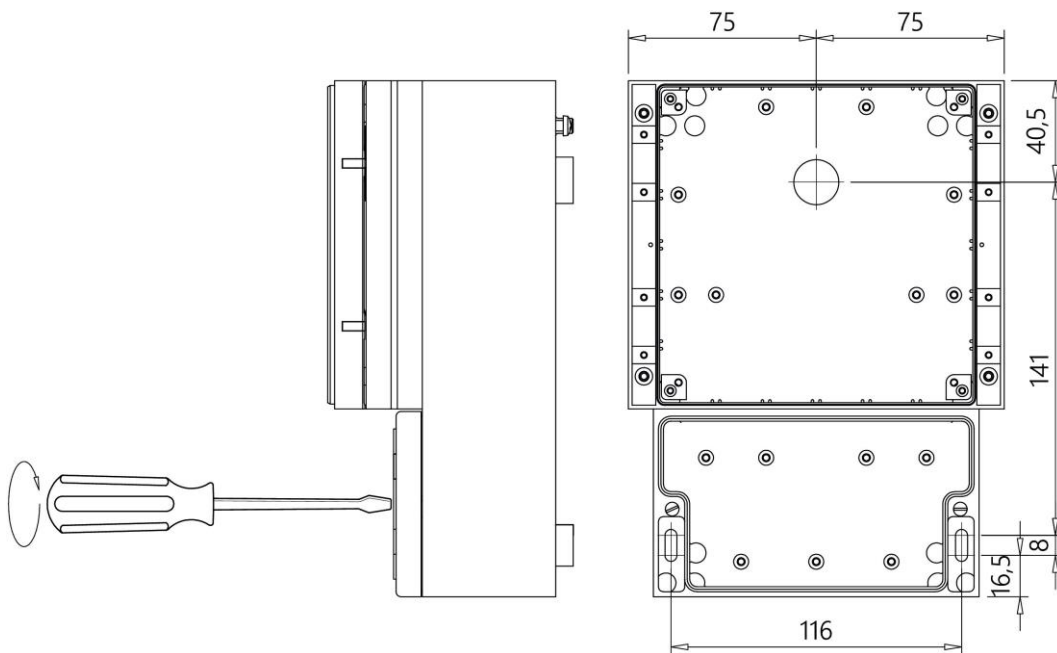
## Features

Supply Voltage	115 Vac 50-60 Hz $\pm$ 10 % 230 Vac 50-60 Hz $\pm$ 10 %
Supply Voltage Alternative To Request	24 Vdc - 24 Vac $\pm$ 10 %
Power Consumption	3 Watts Maximum Load
Outputs Proportional To the Value Of 4 $\div$ 20 mA	1
Alarm Relays	3
Transmission Interfaces Serial 485 Type With Modbus RTU Protocol	1 For Probe Connection 1 For PC - PLC - SV
Display	Mono Chromatic Graphic B/W LCD 128 x 64 Pixel.
Operating Temperature	-10 °C $\div$ 55 °C
Storage Temperature	-20 °C $\div$ 60 °C
Humidity Range	0 $\div$ 95% Relative Non-Condensed
Casing	ABS Base Polycarbonate Cover
Protection Degree From Water And Dust	IP65 DIN EN 60529

## Size And Dimensions






## Fastening





Weight 1.1 Kg

## Warning Symbols Used In This Manual

The information regarding safety are highlighted using the symbols:

	Warning-Danger	Generic - Warning-
	Risk – Danger	Electric Current
	Dispose according to the standards for electrical and electronic equipment RAAE	

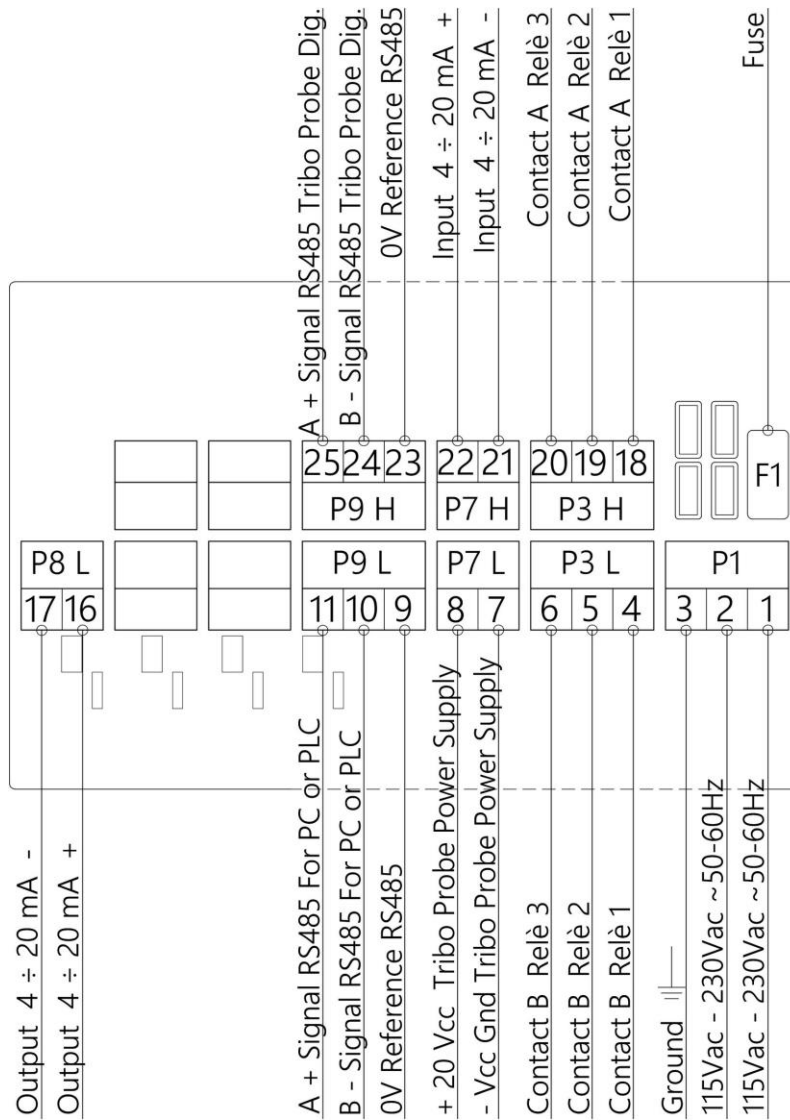
## Installation Rules Notes and Warnings

- ⇒ Protect the device from direct exposure to sunlight.
- ⇒ Do not position the device near or directly in contact with sources of heat or electromagnetic fields. 
- ⇒ Fix the device of a height of at least 60 cm from the ground.  
In a clearly visible place easily accessible.
- ⇒ Connect the device to power lines other than those for operating motors or other large power devices which could generate network interference.
- ⇒ The electrical supply of the unit must be protected by a differential switch 230Vac~ 30mA and a bipolar magneto thermic 230Vac~ 10A, positioned in a place easily accessible.
- ⇒ Before working on the equipment to perform any operation switch off the magneto thermic differential switch. 
- ⇒ For electric operations, always remove voltage, wait 30 seconds for the inside capacitors to discharge before opening. At the end of the operations, close the device to restore the correct degree of protection before powering up.
- ⇒ For the connection of the supply voltage, use anti-flame wires with a minimum section of 0.75mm<sup>2</sup> certified and conform to the standard IEC60227 or IEC60245.
- ⇒ Use flame-retardant cables with a minimum cross-section area of 0.75 mm<sup>2</sup> for all control signals.
- ⇒ Use flame-retardant cables with a minimum cross-section area of 0.75 mm<sup>2</sup> to connect to the indicating relays.
- ⇒
- ⇒ The wire ground conductor of protection must be yellow/green.
- ⇒ The wire ground conductor of protection must be connected first.
- ⇒ The wire which is colored yellow/green must only be used for the ground conductor.

- ⇒ The cable glands must be chosen according to the diameter of the cable to be used.
- ⇒ The sealing of the press cable is guaranteed by the compression of the rubber gasket that tightens on the outer diameter of the cable.
- ⇒ The tightness of the cable gland is guaranteed by the compression of the rubber seal that tightens on the outer diameter of the cable.
- ⇒ The size of cable and cable gland must ensure that a power cord traction is not acting on the terminals.
- ⇒ The terminal block must not be the point of mechanical anchoring of the conductors.
- ⇒ The cable gland PG9 supplied on request, has cable diameter minimum of 4mm and a maximum of 8mm, with clamping nut by 19mm.
- ⇒ Any use not described in this user instruction manual or incorrect use of the device may cause damage to the device or to the devices connected to it.
- ⇒ Furthermore, incorrect use or tampering with the device may cause injury.
- ⇒ Waterproofness of the casing is guaranteed when the flap is closed.
- ⇒ Make sure that rigid or flexible ducts used for wiring, if any, do not fill up with water or other liquids.
- ⇒ Do not make holes not protected on the container or protected by accessories with protection degree lower than that of the housing of the control unit.
- ⇒ Cut off power supply immediately if water is found in the casing.
- ⇒ If the control unit is used in ways not specified by the manufacturer, the protection provided by the device may be impaired.
- ⇒ The Control Unit does not release potentially toxic or harmful substances to the health and the environment.
- ⇒ No part with dangerous voltage is normally accessible.

Do not use the control unit if you have not read or do not understand this manual.

## Connection Diagram Control Board



Make a jumper between terminals 7-21 for versions of analogue probe 4÷20mA with 3 wires.

## Fuse Table

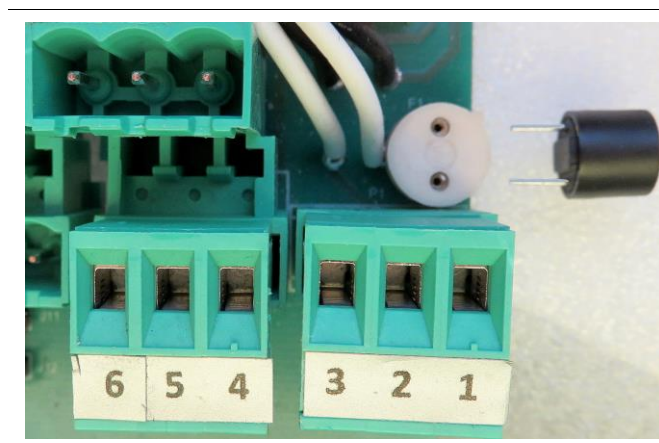
Tensione	Valore
230 V	1 A
115 V	1 A
24 Vdc	2 A

## Fuse Replacement

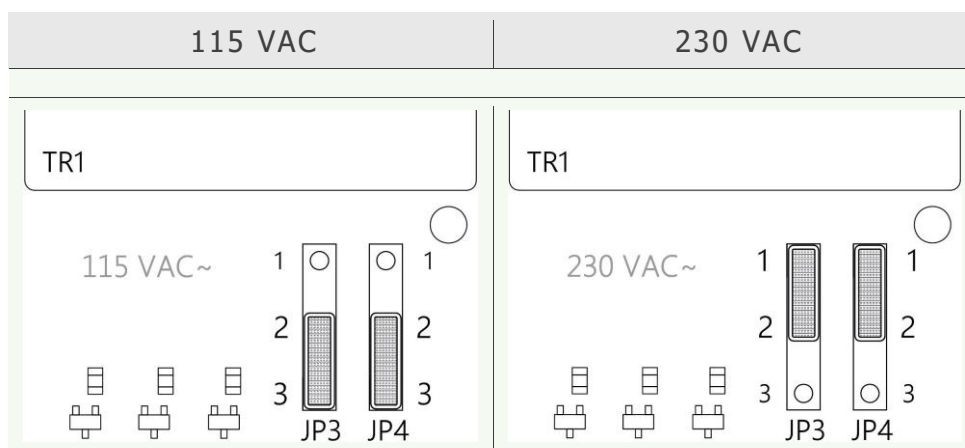
The micro fuse is located on the right side, above the terminal block for the input of the mains power supply.

Fuse type is delayed cylindrical with axial conductors.

Extracted from its housing by pulling it upwards.



## Jumper Configuration Power Input





## Display and Keypad

On the front panel there are 5 circular keys for the equipment control, at power on, the screen is as shown in the picture, and shows the version of the firmware that is installed on the instrument.



- ➔ Press the first button on the left to access the Configuration Main menu.
- ➔ Using the   buttons to select the settings of the various available configurations, they increase or reduce the values to set, consult the alarms if they are more than one.
- ➔ Pressing the button corresponding to the letter L is accessing the menu that allows to choose one of the 5 available languages Italian, English, French, German, Spanish.



- ➔ Use the arrows to scroll through the selectable items in the menu.
- ➔ To access a function, select it and press OK.
- ➔ The OK button is then used to confirm the choices.



If using a digital probe with RS485 connection, in the first 10 seconds after the switch on, the control unit interrogates the probe and waits for the response signals for establishing the communication, the screen flashes the indication that the probe is not present.

## Main Menu

The menu and the individual functions within it are organized as follows.

Triboelectric Probe Alarms	Parameters	Factory Setting
Pre-Alarm Threshold	0.01 mg/m <sup>3</sup>	800
Pre-Alarm Time Recognition	Multiple of 0.5 Sec.	300
Threshold Alarm	0.01 mg/m <sup>3</sup>	1500
Time Alarm Recognition	Multiple of 0.5 Sec.	60
Threshold Peak	0.01 mg/m <sup>3</sup>	3000
Time Recognition Peak	Multiple of 0.5 Sec.	10

The three different alarms are associated to the three different relays

Pre-Alarm	Relay 1	Terminals 4-18
Allarm	Relay 2	Terminals 5-19
Peak	Relay 3	Terminals 6-20

The relays are normally closed, open in the case of alarms, open if board is off in the absence of power.

In the main screen when an alarm is active, the corresponding relay flashed, the   buttons will scroll through the alarms.

The letter L change of status becomes A.



The Pre-Alarm and Alarm parameters are understood as:

Pre-Alarm	Sets a value that indicates that the quantity of emissions tolerated was exceeded.
Time of Pre-Alarm	Sets the time interval duration in which emissions above the critical threshold should remain before being reported.

In the same way you set the alarm, so doing a peak of moments is not reported as a warning, but the warning only occurs if a value is high and permanent over time.

Analog Triboelectric Probe	Parameters	Factory Setting
Enabling	Enabled - Disabled	Disabled
Zero offset Emissions	0.01 mg/m <sup>3</sup>	0
Calibration mA Input For Probe Not Calibrated	0.001 mA	0
Emission Input	0.01 mg/m <sup>3</sup>	0

Digital Triboelectric Probe	Parameters	Factory Setting
Enabling	Enabled - Disabled	Disabled
Zero offset Emissions	0.01 mg/m <sup>3</sup>	0
K Value of Calibration	mg/m <sup>3</sup>	150

By changing the K-Value Of Calibration, improve the response sensitivity of the calculation of the emissions of the probe, the parameter is set to 150 show the results as they are received by the probe.

By setting the parameter downwards, increases the Constant of the Factory reading, if set upwards reduces proportionally the value of the reading.

Alarms Counters	Parameters	Factory Setting
Enabling	Enabled - Disabled	Disabled
Hour Counter Threshold First Turning On	0 ÷ 50000	0

Alarms are signaled on the screen and the buzzer does not have relay activation.

Counters	Parameters	Factory Setting
Power-on hours		000000

Parameters Serial Communication Modbus	Parameters	Factory Setting
Address Of the Control Unit	1 ÷ 255	1000
Baud Rate	38400 19200 - 9600	9600
Parity	None Odd - Even	None
Number Stop Bit	1 Stop Bit 2 Stop Bit	1 Stop Bit

## Maintenance

The E9T control unit has no parts that can be replaced, except for the fuse.

All repair operations must be carried out by the manufacturer.

To clean dust and dirt from the surfaces, gently rub with cotton or other soft cloth soaked with non-aggressive, non-abrasive detergents, use those used for glass surfaces; do not use solvents or aromatic compounds and do not rub with abrasive sponges.



## Disposal

Do not disperse in the environment after use. Dispose of the product according to current regulations for the disposal of electronic equipment.



This device is used in a dust collector system and, therefore, it is part of a fixed installation.

## Warranty

The warranty has a duration of 2 years. The company will replace any electronic component deemed defective exclusively at our workshop, except in the presence of contrary agreements to be authorized by the company.

## Exclusions From Warranty

The warranty is void in the case of:

- Signs of tampering and unauthorized repairs.
- Incorrect use of the equipment that does not comply with the technical data.
- Incorrect electrical connections.
- Failure to comply with the installation standards.
- Use beyond EC standards.
- Atmospheric events (lightning, electrostatic discharge), over voltages.
- Clogged air connections. Damaged tubes.

## Declaration Of Conformity Of The Manufacturer



The manufacturer:

TURBO SRL

The manufacturer's address:

Via Po 33/35 20811 Cesano Maderno, Italy

Declares that the product:

Control Unit E9T For Triboelectric Probe

Complies with the following directives:

Directive 2014/30/EU Electromagnetic Compatibility compliant with Harmonised European standards EN61000-6-2:2005 class B of EN61000-6-4:2001

Directive 2014/35/EU Low Voltage compliant with Harmonised European Standards EN 60947-1:2004

A typical configuration of the product was tested.

Cesano Maderno, 22 January 2017

F. Messina (C.E.O.)



TURBO s.r.l.