6. MAINTENANCE (authorized personnel)

6.1 General Warnings

⚠ **All maintenance operations must be carried out by professionally qualified personnel, authorised by Granby/Pensotti LLC.**

⚠ **The frequency of boiler maintenance must comply with current law and, nevertheless, should be carried out once a year.**

⚠ **In order to guarantee the long life of the appliance and in accordance with the current gas safety regulations, only use original spare parts**

⚠ **Before carrying out any type of maintenance operation, disconnect the appliance from the mains electricity supply and close the gas valve.**

6.2 Boiler inspection

In order to ensure that the boiler operates efficiently and safely, it is **required** that the appliance is inspected by a suitably competent technician at least once a year.
The following is a minimum recommendation of service that should be carried out annually

- Check the condition of the gas seals and replace where necessary.
- Check the condition of the water seals and replace where necessary.
- Visually inspect the condition of the combustion chamber and flame.
- Remove and clean any oxidation from the burner.
- Check that the seal of the room-sealed chamber is undamaged and positioned correctly.
- Check the primary heat exchanger and clean if necessary using a soft nylon brush and subitle vacum
- Check the condition and operation of the ignition and gas safety systems.
- Remove and clean the scaling from the ignition and flame detection electrodes, paying particular attention to place them at the correct distance from the burner. Fig 1.

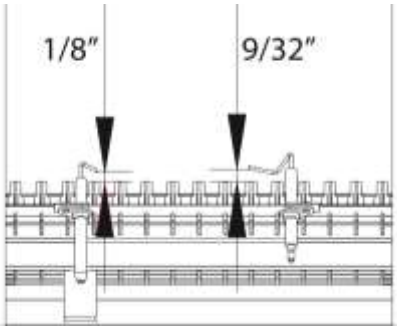


Fig 1.

- Check the pre-fill pressure of the integral expansion tank
- Check the presence of air intake/permanent ventilation openings correctly sized according to the boiler installed and in respect with current law.
- Check the integrity and operation of the flue gas exhaust system.
- Check the integrity of the gas piping system.
- Check that the connection to the electricity supply complies with that reported in the boiler's instruction manual.
- Check the electrical connections inside the control panel.
- Check Fernox inhibitor integrity
- Check and clean if necessary the dirt separator
- Check for and remove any combustible or flammable materials that are in the vicinity of the boiler
- Lubricate the 3-way valve using a TPFE aersol lubricant. Fig 2


Fig 2.

- Check Relief Valve or proper operation
- Check the maximum and minimum modulation pressures and the modulation itself.
- Check that the combustion is correctly regulated and if necessary make adjustments according to section 4.4 "Starting the boiler".
- Check all heating safety systems. Ex; termpeature saeftly limit, air pressure switch, flame failure, etc.

6.3 Accessing the boiler

All maintenance operations require one or more of the boiler casing panels to be removed.

The side panels can only be removed after the front panel has been removed.

Front panel:

- Remove the fixing screws at the lower edge of the front panel.
- Grasp the lower part of the panel and pull it outwards (see fig. 1) and then up (see fig. 2).

Left and right side panel:

- Remove the fixing screws at the front and lower edge of the side panel to remove.
- Grasp the bottom of the panel, move it sideways and then upwards to remove it.

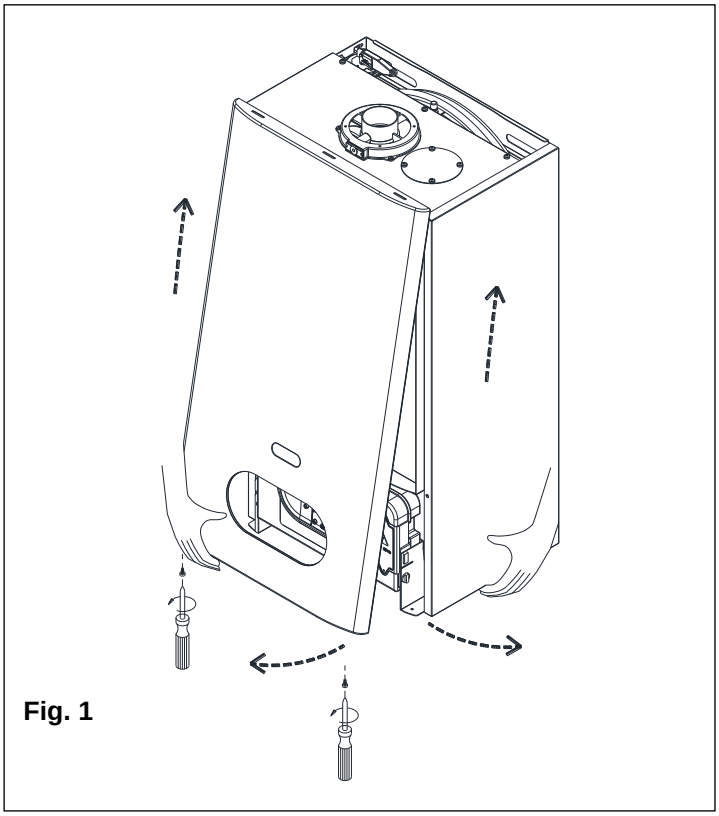


Fig. 1

To access the electrical connections of the control panel, proceed as follows:

- ⚠ Switch off the power supply at the main switch.
- Remove the front panel (see fig. 1 and fig. 2).
- Grasp the left and right control panel support brackets (see fig. 5) and pull them outwards, at the same time rotating the panel downwards.
- Unscrew the four fixing screws (see fig. 6) and remove the panel back piece.

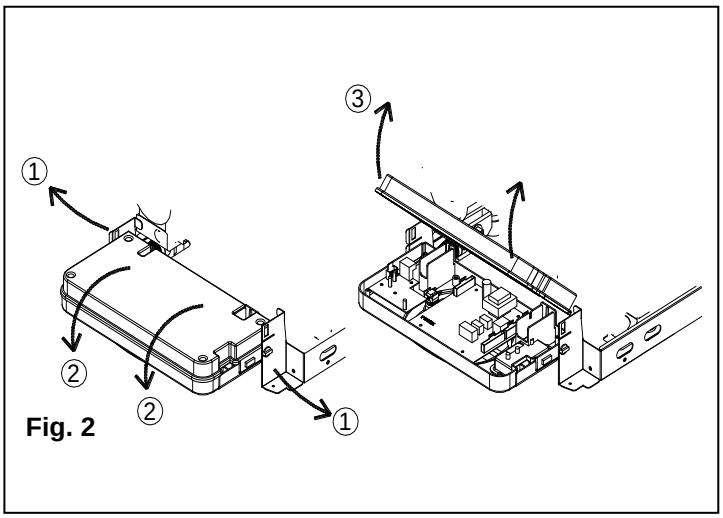


Fig. 2

6.4 Flushing out the primary side

Fill the boiler as per the filling instructions.

Using a drain off cock on the lowest point of the system allow the water to drain from the system and boiler.

In order to flush the system correctly, turn off all radiators or fan coils. Open the filling loop and drain cock simultaneously and allow the water to flow through the boiler.

Open each individual radiator or fan coil, allowing water to flow through. Then turn that radiator or fan coil off and repeat for all radiators or fan coil on the system.

Turn off the filling loop and close the drain cock open all radiators and open the filling valve to fill the system. Continue to fill the system until the pressure gauge reads in the Green section of the gauge 14.5 psi.

In order to safeguard all waterside components the supplied Fernox Commissioning Kit must be used in its entirety.

6.5 Draining the central heating system

If the need arises to drain the system, this can be done as follows:

- Switch the system to “HEAT” mode and ignite the boiler.
- Switch off the power supply to the boiler.
- Wait for the appliance to cool down.
- Connect a hose to the system drain point **R** and locate the other end of the hose in a suitable drainage system.
- Open the system drain valve (fig. 1).
- Open the air vents on the radiators, starting with the highest and moving down the system to the lowest.
- When the system has been drained, close the radiator air vents and the drain valve.

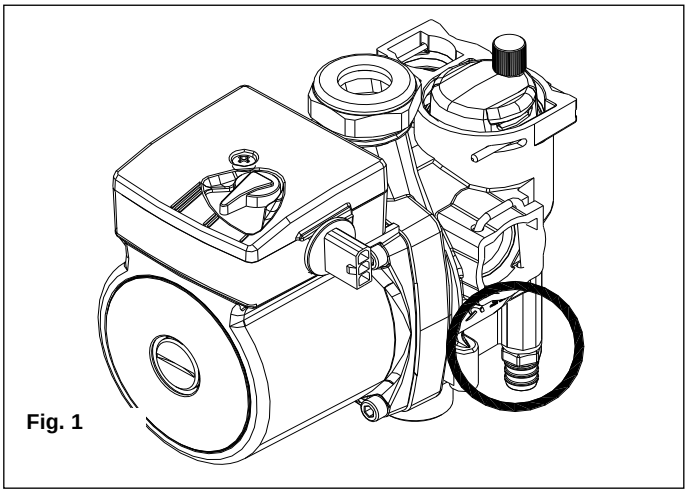


Fig. 1

Draining the domestic hot water system

If there is a danger of freezing, the domestic hot water system should be drained. This can be done as follows:

- Close the main water supply valve.
- Open all the hot and cold water taps.
- Drain the water from the system. Used compressed air to evacuate the pipes of any remaining water.
- Use non-toxic antifreeze to protect the DHW system.
- On completion, close all the previously opened taps.

Freeze Protection

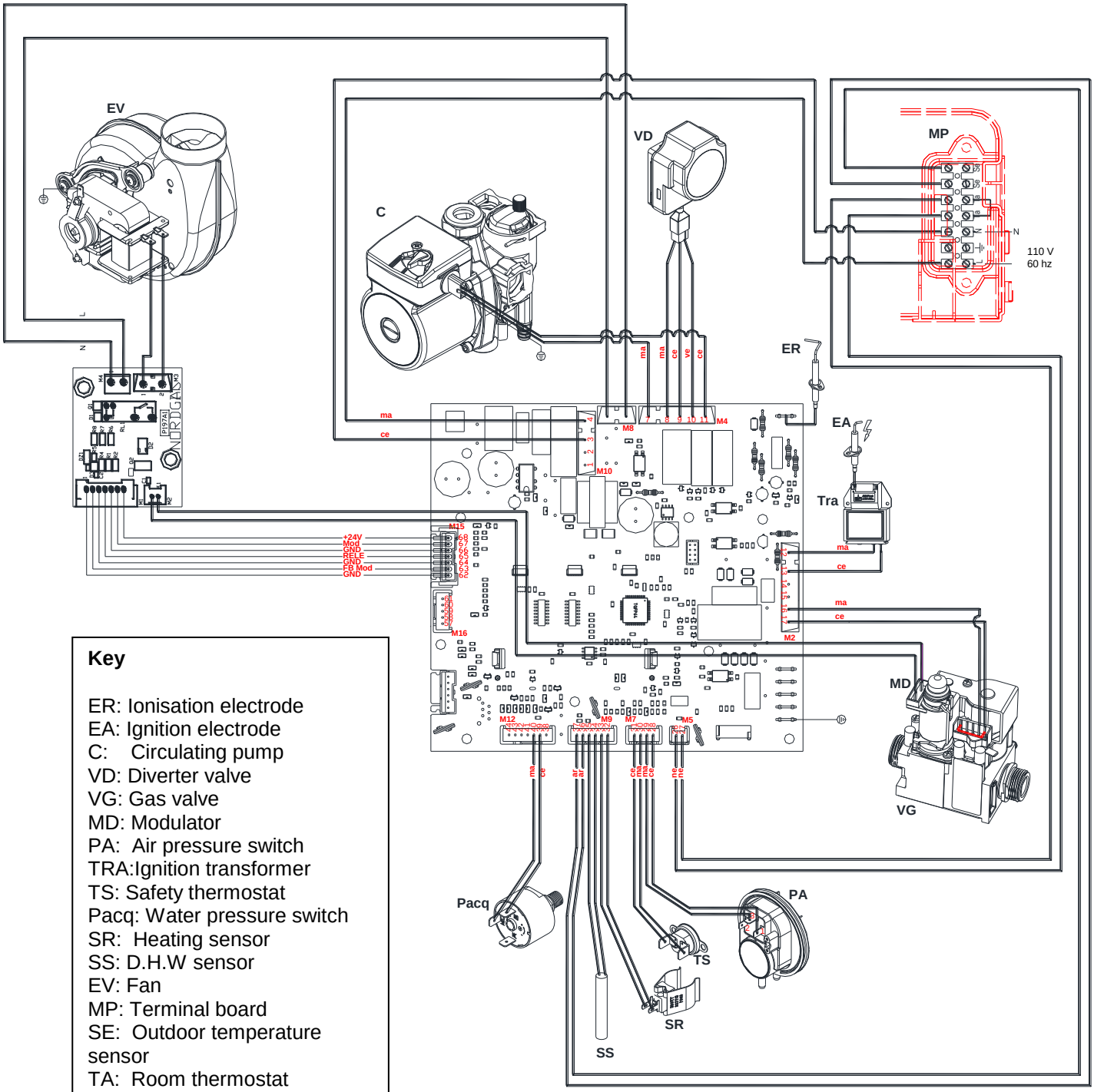
⚠ **Glycol must not be used in Domestic Hot Water applications.**

System winterization (non-operative system)
Because it may be impossible to completely drain the boilers heating circuit, D.H.W circuit and distribution system. Pensotti recommends the introduction of the proper type antifreeze to protect these systems from freezing damage.

System winterization (operating system)

Pensotti boilers are certified for indoor use ONLY. Proper precautions for freeze protection are recommended for boilers and associated piping in areas where the danger of freezing exists. Do not use automotive antifreeze. Pensotti recommends the use of inhibited glycol concentrations between 20-35% glycol. Glycol products must be maintained properly so they do not become inactive or corrosive, consult glycol specifications for more information.

6.6 Wiring diagrams – DIGITECH®TR Printed Circuit Board (MIAH403)



Key

ER: Ionisation electrode
EA: Ignition electrode
C: Circulating pump
VD: Diverter valve
VG: Gas valve
MD: Modulator
PA: Air pressure switch
TRA:Ignition transformer
TS: Safety thermostat
Pacq: Water pressure switch
SR: Heating sensor
SS: D.H.W sensor
EV: Fan
MP: Terminal board
SE: Outdoor temperature sensor
TA: Room thermostat
L: Line
N: Neutral
ne: Black
ce: Blue
ma: Brown
ar: Orange
gi: Yellow
bi: White
gr: Grey
ve: Green

6.7 Electrical connections (Option)

Connect the power supply to the terminal board located on the control panel as follows:

a. switch off the power supply at the main switch;
b. remove the front case panel of the boiler. (see paragraph '6.3 Accessing the boiler');
c. remove the screws and remove plate A from the control panel (see fig. 1). With the plate removed, proceed with the following wires connection:
- install the outdoor temperature sensor on contacts marked as **Se-Se** on the terminal board "**B**";
- install the room thermostat or end switch by removing the jumper **Ta-Ta** from the terminal board "**B**" first, and then connecting the room thermostat or end switch wires (24 DC at these terminals);

d. When wires have been connected, place plate "**A**" back to position and then the front case panel.

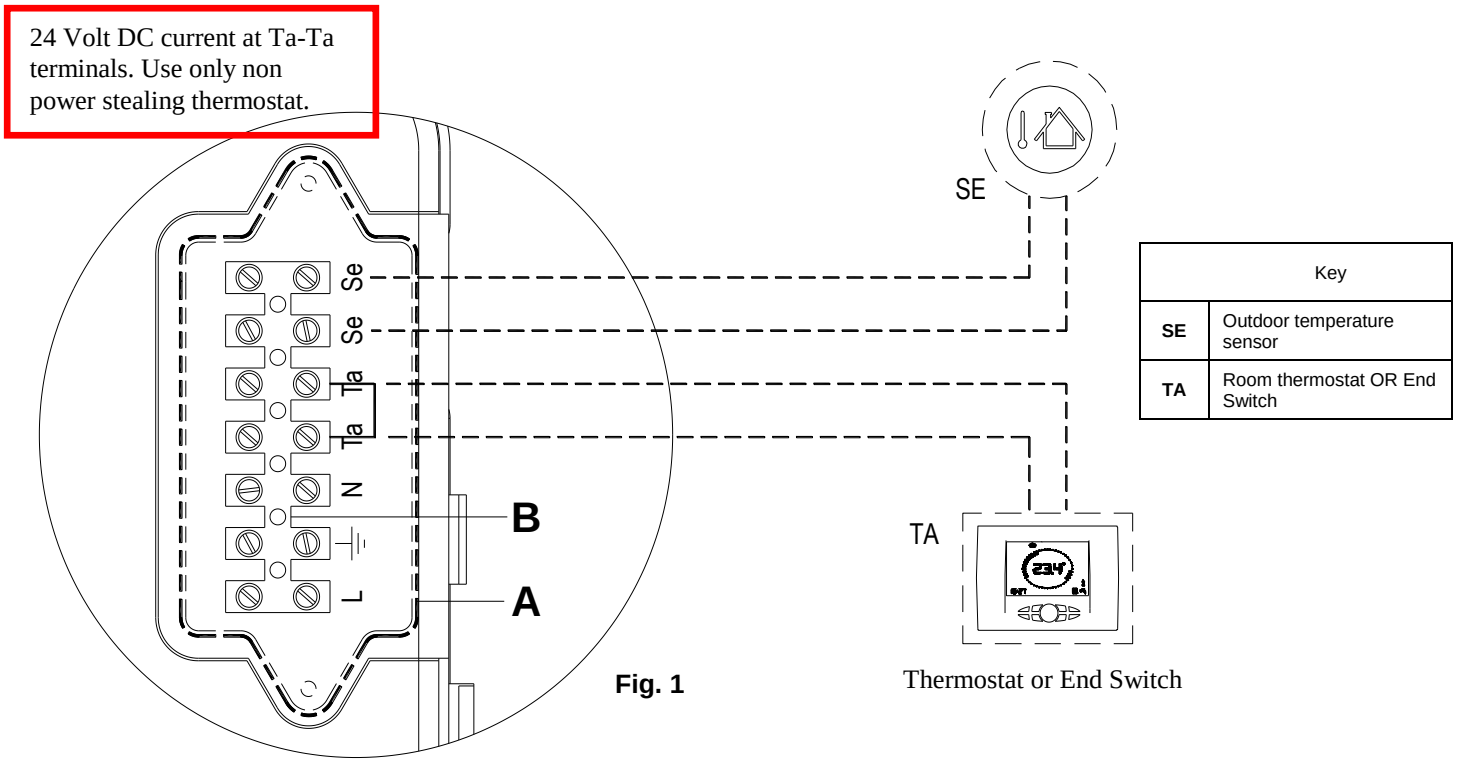


Fig. 1

Thermostat or End Switch

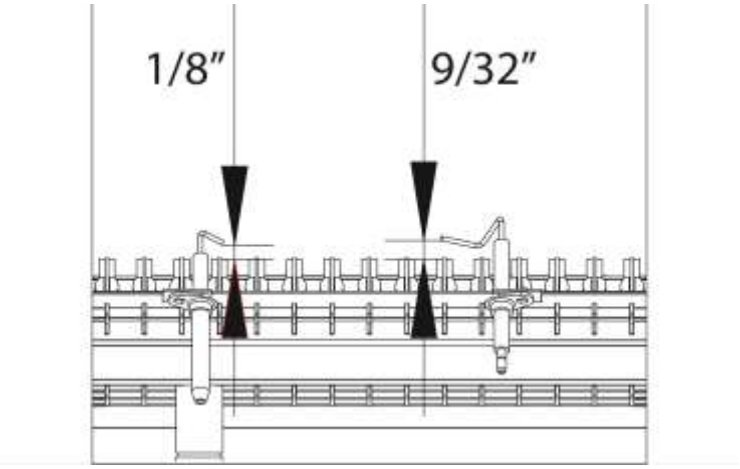
6.8 Troubleshooting

To display the last 5 errors, keep pressed the ' ⓘ ' INFO button, in OFF mode position, for 5 seconds. The errors number will appear in chronological order (-1- = first fault… -5- = last fault). Use ' ⊕ ' and ' ⊖ ' buttons of Heating Temperature setting, to scroll the list of saved errors. To reset the errors list press the' Ⓡ ' RESET button. Press the ' ⓘ ' INFO button to exit the errors display mode.

ERROR CODE	PROBLEM	POSSIBLE CAUSE	REMEDY	RESET
E01	IONISATION PROBLEM	*WITHOUT FLAME IGNITION* **a.** NO GAS. **b.** IGNITION ELECTRODE BROKEN OR EARTHED. **c.** GAS VALVE MALFUNCTION. **d.** MECHANICAL MINIMUM ADJUSTMENT (ON GAS VALVE) SET TOO LOW OR IGNITION SEQUENCE SET TOO LOW. **e.** GAS VALVE INLET PRESSURE TOO HIGH (FOR LPG BOILERS ONLY). *WITH FLAME IGNITION* **f.** IONISATION ELECTRODE MALFUNCTION. **g.** IONISATION ELECTRODE CABLE DISCONNECTED.	**a.** CHECK GAS SUPPLY. **b.** REPLACE PART. **c.** REPLACE PART. **d.** REGULATE MECHANICAL MINIMUM OR SLOW IGNITION. **e.** CHECK THE MAXIMUM PRESSURE SETTING. **f.** REPLACE PART. **g.** CONNECT THE IONISATION ELECTRODE CABLE.	Manual Reset (press the ' Ⓡ ' Reset button)
E02	SAFETY THERMOSTAT TRIPPED	**h.** THERMOSTAT MALFUNCTION OR OUT OF CALIBRATION. **i.** THERMOSTAT CABLE DISCONNECTED.	**h.** REPLACE PART. **i.** CHECK THE WIRING.	Manual Reset (press the ' Ⓡ ' Reset button)
E03	AIR PRESSURE SWITCH	**j.** SWITCH OUT OF ORDER. **k.** INLET OR OUTLET FLUE PIPES OBSTRUCTED. **l.** SWITCH CABLE NOT STABLE.	**j.** REPLACE PART. **k.** CHECK FLUE PIPES **l.** CHECK CABLE.	Manual Reset (press the ' Ⓡ ' Reset button)
E04	NO WATER IN THE SYSTEM	**m.** INSUFFICIENT WATER PRESSURE IN THE SYSTEM (OPENS ELECTRICALLY AT 7.2 psi). **n.** WATER PRESSURE SWITCH CABLE DISCONNECTED. **o.** WATER PRESSURE SWITCH MALFUNCTION.	**m.** FILL THE SYSTEM. **n.** CHECK THE WIRING. **o.** REPLACE PART.	Automatic
E05	HEATING SENSOR	**p.** SENSOR MALFUNCTION OR OUT OF CALIBRATION (RESISTANCE VALUE 10 kOhms AT 77°F). **q.** SENSOR CABLE DISCONNECTED OR WET.	**p.** REPLACE PART. **q.** CHECK THE POWER SUPPLY CONNECTION;	Automatic
E06	D.H.W. SENSOR	**r.** SENSOR MALFUNCTION OR INCORRECT (RESISTANCE VALUE 10 kOhms AT 77°F). **s.** SENSOR CABLE DISCONNECTED OR WET.	**r.** REPLACE PART. **s.** CHECK THE POWER SUPPLY CONNECTION .	Automatic
E17	MODULATOR	**t.** GAS VALVE MODULATOR OUT OF ORDER	**t.** REPLACE PART.	Manual Reset (Switch off the power supply)
E18	INADEQUATE CIRCULATION	**u.** PRIMARY OR SECONDARY HEAT EXCHANGER OBSTRUCTED. **v.** PUMP MALFUNCTION OR PUMP IMPELLER DIRTY.	**u.** CLEAN OR REPLACE PART. **v.** CLEAN OR REPLACE PART.	Manual Reset (Switch off the power supply)

ERROR CODE	PROBLEM	POSSIBLE CAUSE	REMEDY	RESET
E21	GENERAL PCB MALFUNCTION	**y.** MICROPROCESSOR MALFUNCTION: IT DETECTS A WRONG SIGNAL .	**u.** THE PCB RESETS THE ERROR AUTOMATICALLY	Automatic
E22	PARAMETER PROGRAMMING REQUEST	**w.** LOSS OF MICROPROCESSOR MEMORY.	**w.** REPROGRAM PARAMETERS.	Manual Reset (Switch off the power supply)
E35	FLAME DETECTION MALFUNCTION	**x.** IONISATION ELECTRODE MALFUNCTION **y.** IONISATION ELECTRODE CABLE MALFUNCTION **z.** PRINTED CIRCUIT BOARD MALFUNCTION	**x.** REPLACE OR CLEAN PART **y.** REPLACE PART **z.** REPLACE PART	Manual Reset (press the ' ® ' Reset button)
E40	ELECTRIC POWER SUPPLY	**aa.** ELECTRIC POWER SUPPLY OUT OF THE OPERATION RANGE (≤95 /≥130 volts)	**aa.** CHECK THE POWER SUPPLY NETWORK (THE ERROR DISAPPEARS AUTOMATICALLY WHEN THE POWER SUPPLY IS BACK WITHIN THE REQUIRED RANGE)	Automatic

Burner Electrode & Ionization Specifications



*Pressures in excess of 14"WC may damage the internal components of this boiler. Pensotti **REQUIRES** replacment of the gas valve if it is subjected to pressures in excess of 14"WC. Faliure to comply could cause dangerous operating conditions, fire, explosion, bodily injury or possible death.*