Academy

Technical Training Series

Troubleshooting Fault ‘EE’ and ‘EB’

VIESMANN

We create living spaces for generations to come

Vitodens 222-F, B2TB

Single Model 125 000 BTU Maximum Input

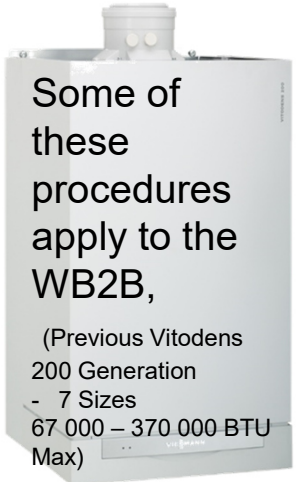
Vitodens 200, B2HA&B

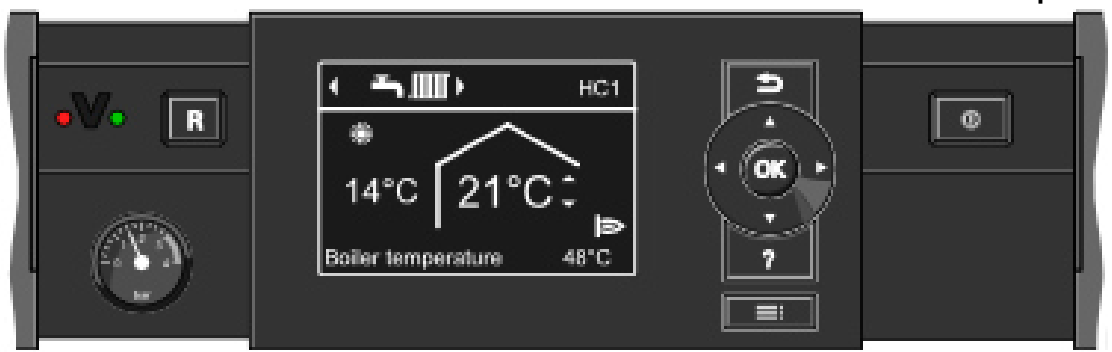
Ten Models

Vitocrossal 300, CU3A

Four Models 94 000 to 199 000 BTU Maximum Input

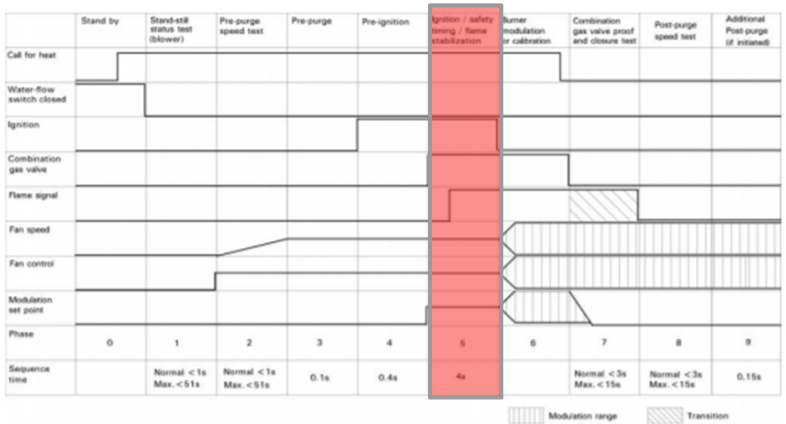
Vitodens 200, WB2B





Fault Information Located in the - Service Instructions Manual -

Fault code on display	Detailed fault code *2	System behavior *1	Cause	Corrective action
EE	132	Burner in a fault mode	At burner start, flame signal is missing or too weak	Check gas supply (gas pressure and gas regulator). Check gas train. Check ionization electrode and connecting cable. Check ignition: - Connecting leads to ignition module and ignition electrode. - Ignition electrode gap and contamination (see page 26). Check condensate drain. Press reset button **R**.



Phase 0: Stand-by
Complete shutdown until the next call for heat. In this phase both the combination gas valve and the blower are not energized.

Phase 1: Stand-still status test (blower)
A call for heat initiates internal blower sensory communications to confirm that the blower is truly in stand-still position. Blower speed measured must be < 300 rpm within a 51 second period.

Phase 2: Pre-purge speed test
Controller sends and receives signal to / from fan speed controller to verify maximum rpm of the blower.

Phase 3: Pre-purge
Pre-purge cycle starts within the pre-programmed timing. Pre-purge timing is in addition to previous phase (2). The fan speed must be greater than and within the range of rpm requested by the controller.

Phase 4: Pre-ignition
The ignition spark is initiated and controlled.

Phase 5: Ignition / safety timing / flame stabilization
The gas valve opens during the safety timing period (4 seconds). If a flame is detected, this phase ends immediately in < 1.5 seconds. If the flame is not established after 3 trials, the burner will lock out and will require a manual reset. Controller required time for flame stabilization.

Phase 6: Burner modulation operation or calibration
At the end of the flame stabilization period (4.5 seconds.), a release for modulation occurs and the burner temperature controller will take over from the flame safeguard. Forced shutdown after 24 hours continuous operation. Automatic calibration may be initiated by the controller.

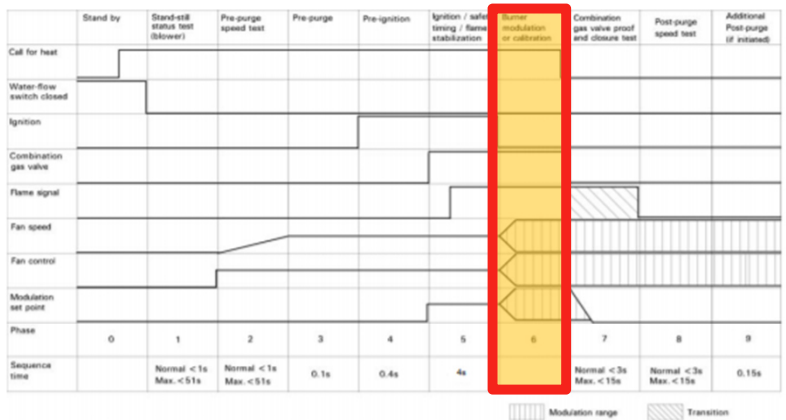
Phase 7: Combination gas valve proof of closure test
If during the normal operation of the burner a controlled (or uncontrolled) shut-down occurs, a complete mechanical and electrical gas valve proof of closure test will be performed by the flame safeguard. After a successful mechanical and electrical proof of closure test, the flame safeguard will expect that the flame is not present. If, however, the flame existed for a period of >15 seconds, the flame safeguard will go into permanent lock-out.

Phase 8: Post-purge speed test
Both gas valves are closed during this phase. End call for heat.
Post-purge occurs during the programmed period.

Phase 9: Additional post-purge
If the fixed high limit trips during normal operation, the blower will purge for 15 minutes to cool the heat exchanger.

Fault Information Located in the - Service Instructions Manual -

EB	194	Burner in a fault mode	Repeated flame loss during calibration	Check gap between ionization electrode and burner gauze assembly (see page 26). Check allocation of gas type (see page 19). Check flue system; remedy flue gas recirculation if required. Press reset button **R**.



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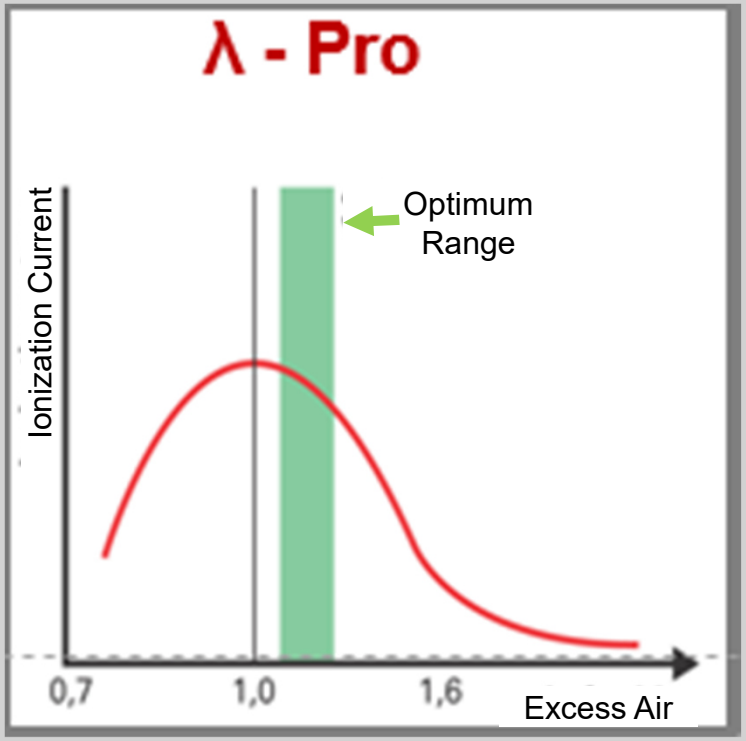
Lambda Pro
Burner Combustion Management



Lambda Pro Technology: How it works:

-Controls gas and air independently of each other

-Ionization current indicates flame quality, not just proof of flame

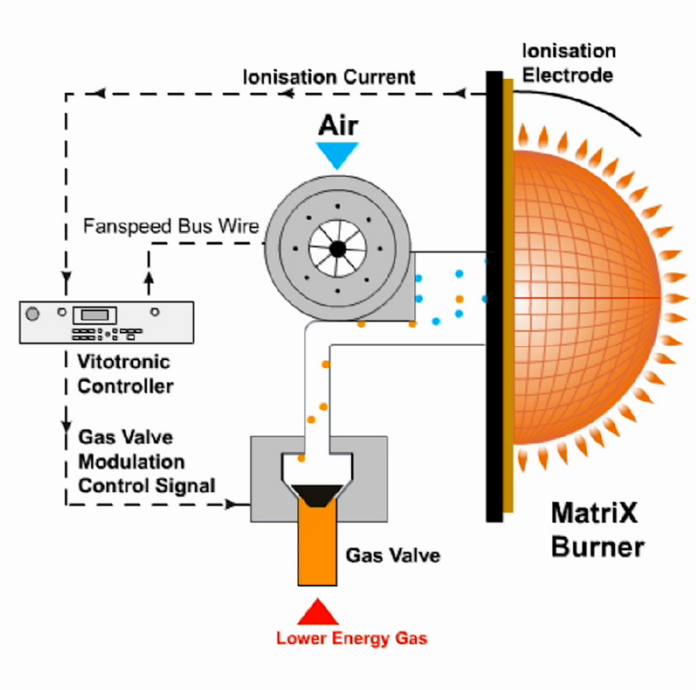
-Gas and air control constantly adjusts to changes

-No field adjustments required

The Lambda calibration point is used to maintain optimum combustion throughout the burner operation.

Lambda Pro Burner Combustion Management

What happens while calibrating?



- Calibration is an automatic alignment which occurs at regular intervals to consider drift and aging of the ionization electrode

- It adjusts the firing process to the existing gas quality maintaining a more consistent fuel air ratio, resulting in more reliable boiler operation

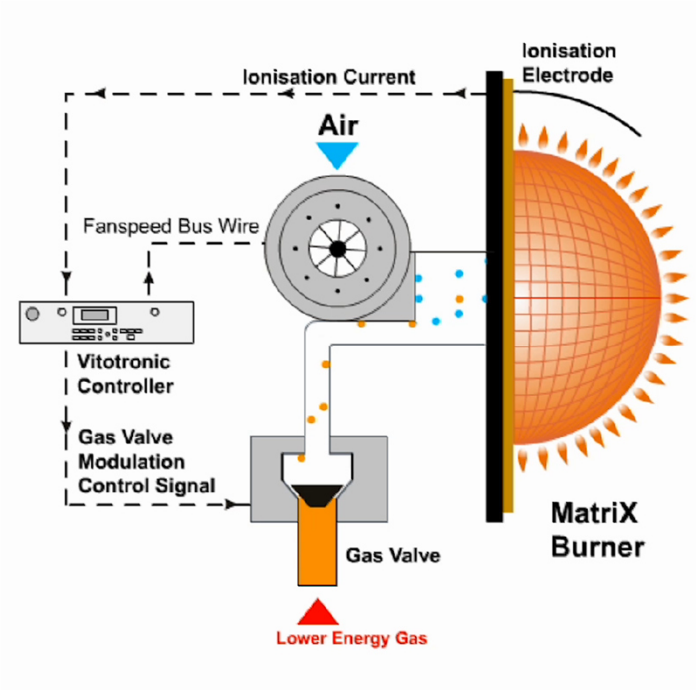
- The flame signal is measured and compared to the factory default range, an internal computing process calculates then adjusts Fuel/Air ratio

- Burner runs at constant speed, (Approximately 2880 RPM)

- The calibration process takes about 1 minute

Lambda Pro Burner Combustion Management

What happens while calibrating?



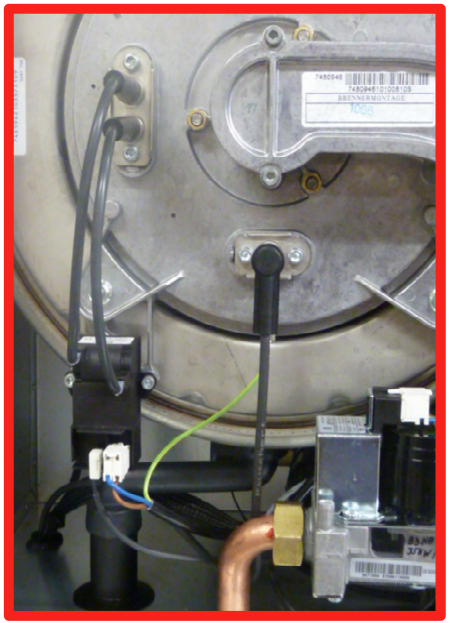
- There are two kinds of calibration 20% and 100%

- 20% calibration occurs after every error message, after every power up and then after every 2nd, 4th, 8th, 16th, 32nd, 64th, 256th and 512th burner start. Then every 512th burner start

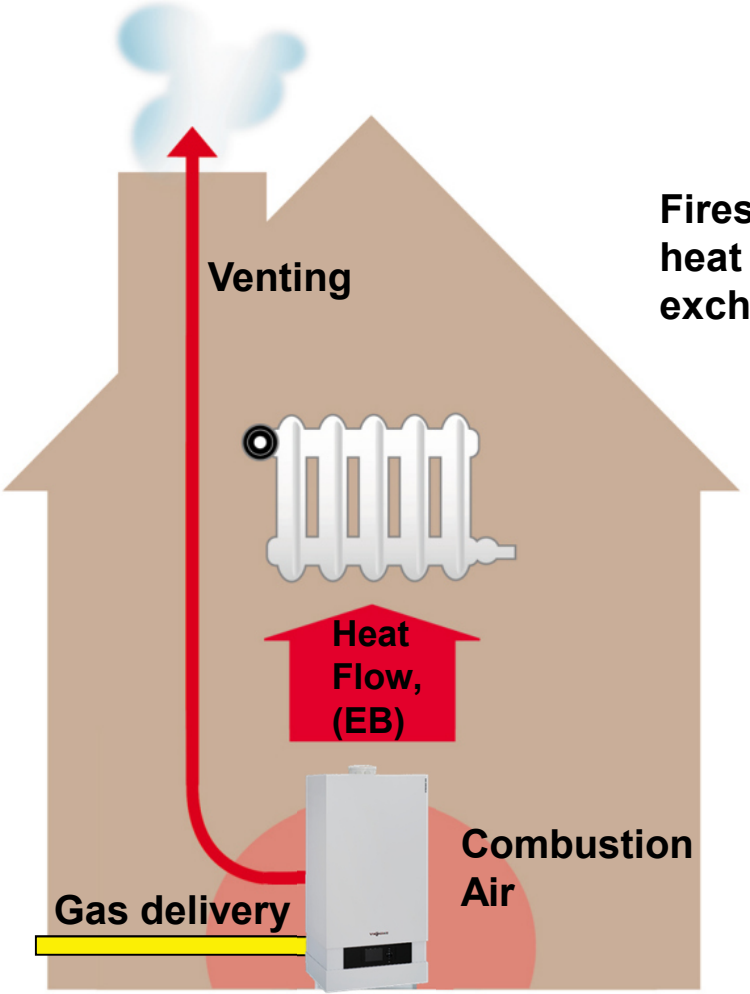
- The difference between a 20% calibration to 100% calibration?
- A 20% calibration is added/compared with past calibrations to position the base value
- A 100% calibration becomes the new base value

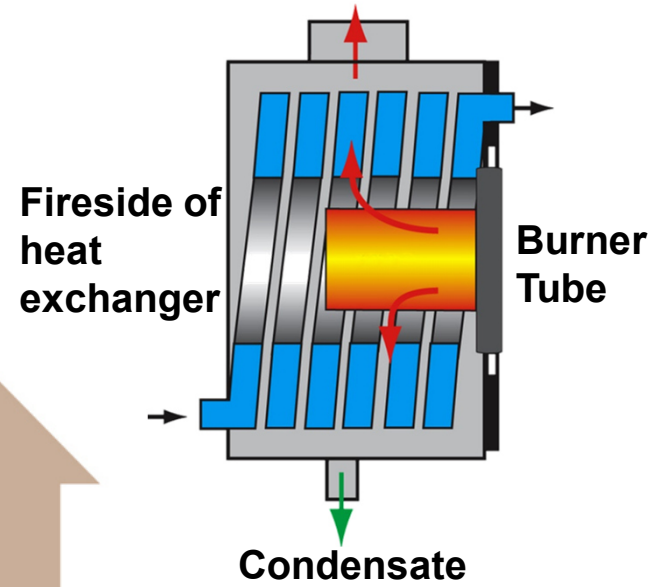
- A 100% calibration can be conducted manually

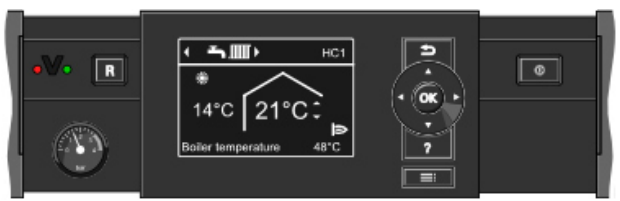
Overview of the areas to troubleshoot for Fault ‘EE’ & ‘EB’



Gas Valve/Burner Assembly
Ignition and Ionization







Electrical/control

Service Tools Required for Combustion Fault Troubleshooting

https://viessmannorange.weeverapps.com/?postLogin=true

https://www.viessmann.ca/en/services/login.html

Welcome to V-Orange

If you do not already have an account, please register.
Your registration will be reviewed and approved by our account team.

Pro Toolbox

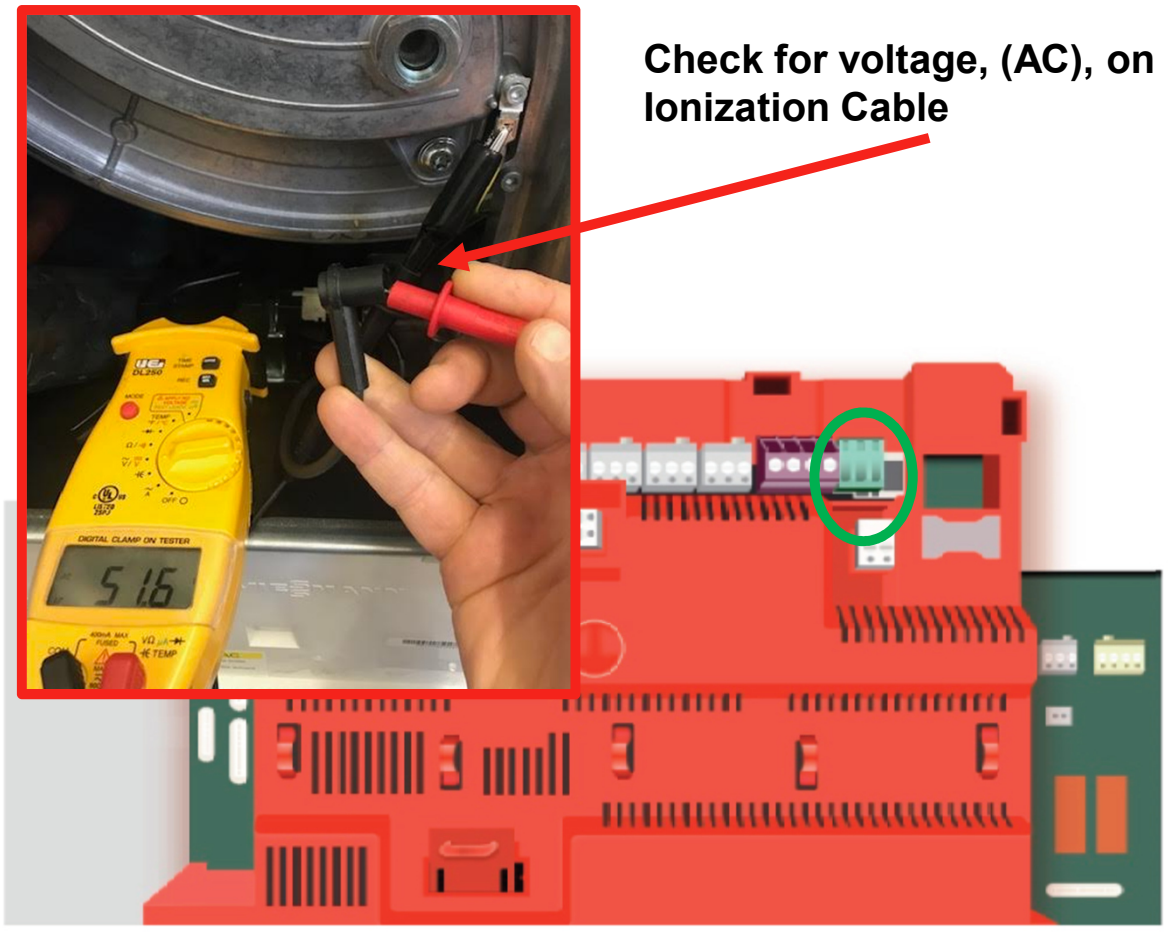
This section of our website is designed specifically for our industry partners – heating contractors, wholesale partners and consulting engineers.

Most of the Pro Toolbox is accessible without a password:

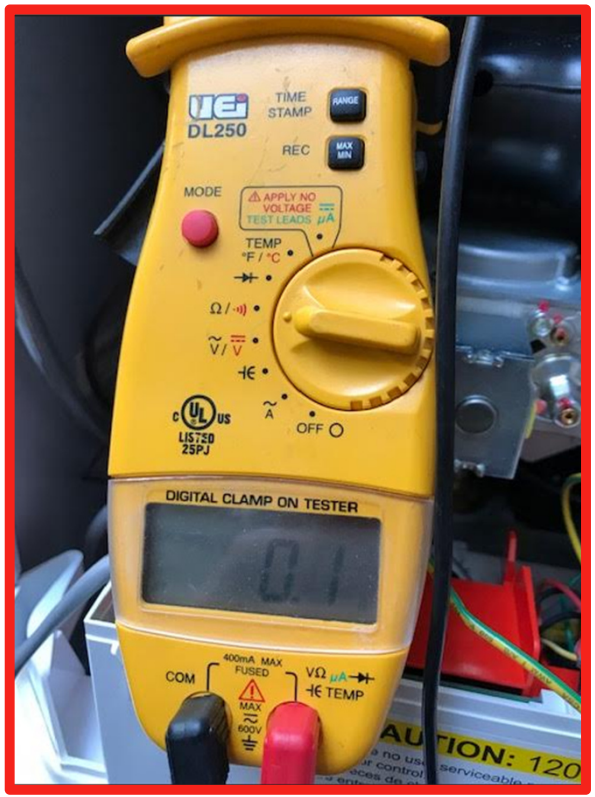
> Current product manuals
> Historic product manuals
> Fault code checker
> Technical service bulletins
> Parts catalog
> Forms – Commercial project sign-offs, RGA requests, etc
> Vitospec – Engineering specifications and product submittals
> DHW Sizing Tool – New!

■ Carbon monoxide measuring equipment 0 to 400 ppm

Troubleshooting – Fault ‘EE’ & ‘EB’ – Checking Polarity



Troubleshooting – Fault ‘EE’ & ‘EB’ – Checking Ground

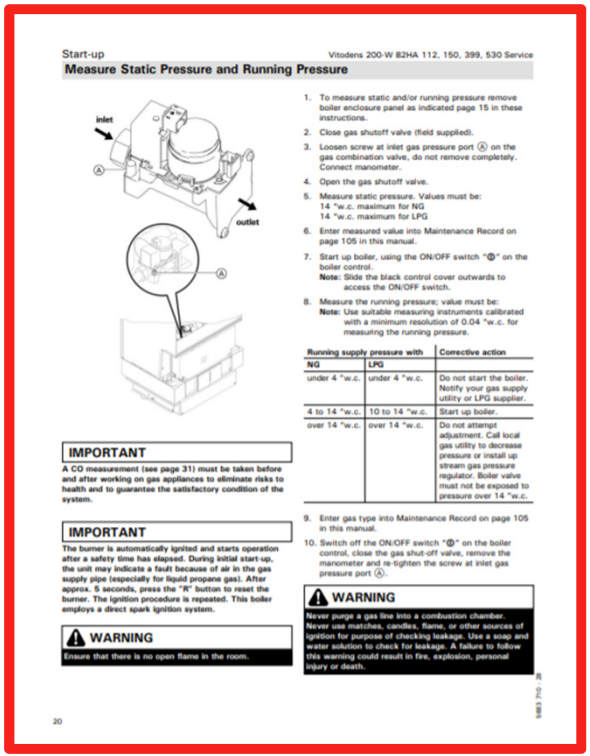


Troubleshooting – Fault ‘EE’ & ‘EB’ – Gas Delivery Pressure

Measuring Gas Pressure

Three Measurements must be checked:

Check Static – 14” wc Maximum



Start-up — Vitodens 200-W B2HA 112, 150, 399, 530 Service

Measure Static Pressure and Running Pressure

1. To measure static and/or running pressure remove boiler enclosure panel as indicated page 15 in these instructions.
2. Close gas shutoff valve (field supplied).
3. Loosen screw at inlet gas pressure port Ⓐ on the gas combination valve, do not remove completely. Connect manometer.
4. Open the gas shutoff valve.
5. Measure static pressure. Values must be:
   14 "w.c. maximum for NG
   14 "w.c. maximum for LPG
6. Enter measured value into Maintenance Record on page 105 in this manual.
7. Start up boiler, using the ON/OFF switch "⏻" on the boiler control.
   Note: Slide the black control cover outwards to access the ON/OFF switch.
8. Measure the running pressure; value must be:
   Note: Use suitable measuring instruments calibrated with a minimum resolution of 0.04 "w.c. for measuring the running pressure.

Running supply pressure with		Corrective action
NG	LPG	
under 4 "w.c.	under 4 "w.c.	Do not start the boiler. Notify your gas supply utility or LPG supplier.
4 to 14 "w.c.	10 to 14 "w.c.	Start up boiler.
over 14 "w.c.	over 14 "w.c.	Do not attempt adjustment. Call local gas utility to decrease pressure or install up stream gas pressure regulator. Boiler valve must not be exposed to pressure over 14 "w.c.

9. Enter gas type into Maintenance Record on page 105 in this manual.
10. Switch off the ON/OFF switch "⏻" on the boiler control, close the gas shut-off valve, remove the manometer and re-tighten the screw at inlet gas pressure port Ⓐ.

IMPORTANT

A CO measurement (see page 31) must be taken before and after working on gas appliances to eliminate risks to health and to guarantee the satisfactory condition of the system.

IMPORTANT

The burner is automatically ignited and starts operation after a safety time has elapsed. During initial start-up, the unit may indicate a fault because of air in the gas supply pipe (especially for liquid propane gas). After approx. 5 seconds, press the "R" button to reset the burner. The ignition procedure is repeated. This boiler employs a direct spark ignition system.

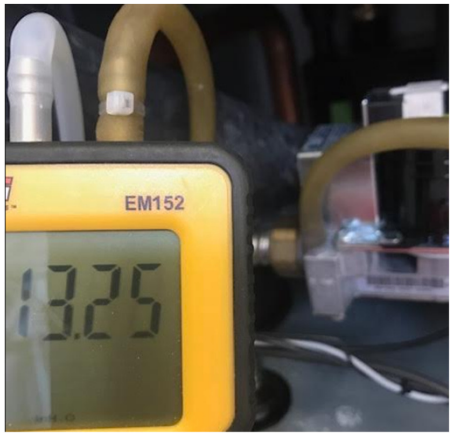
⚠ WARNING

Ensure that there is no open flame in the room.

⚠ WARNING

Never purge a gas line into a combustion chamber. Never use matches, candles, flame, or other sources of ignition for purpose of checking leakage. Use a soap and water solution to check for leakage. A failure to follow this warning could result in fire, explosion, personal injury or death.

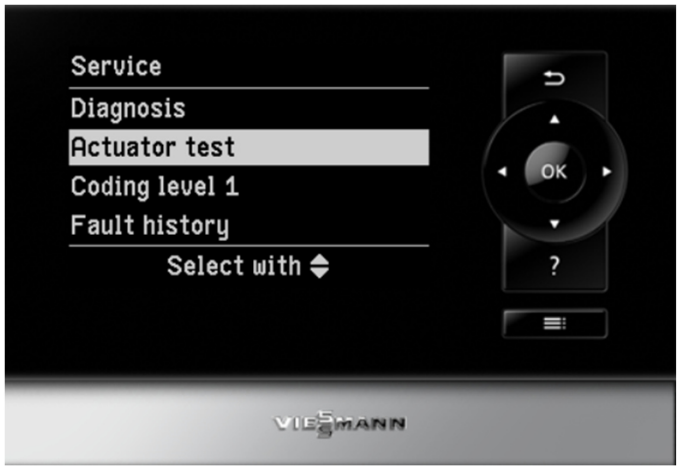
20

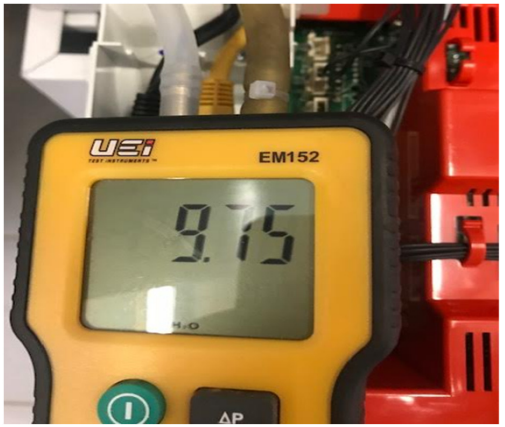


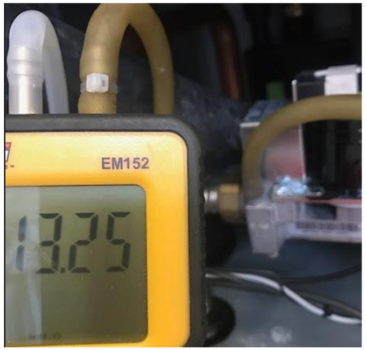
Troubleshooting – Fault ‘EE’ & ‘EB’ – Gas Delivery Pressure

Measuring Gas Pressure

Perform Relay Test – Full Load, (High Fire) – 4” wc Minimum, 10” for Propane





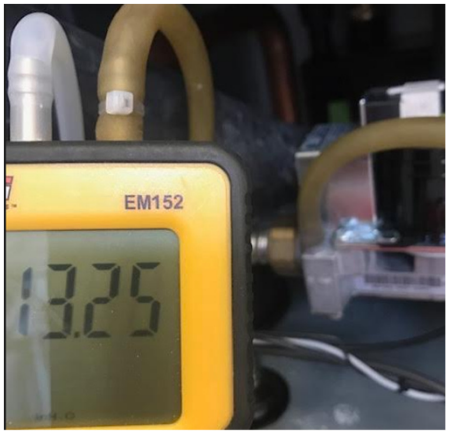


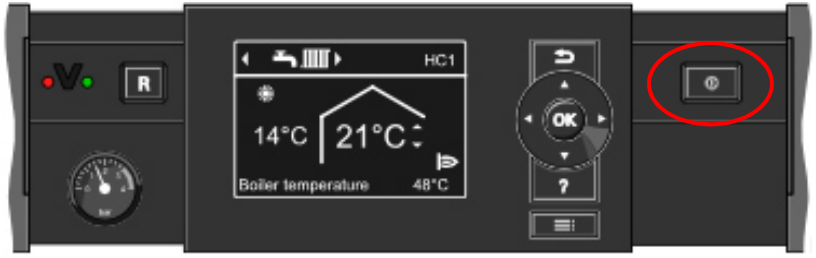
Troubleshooting – Fault ‘EE’ & ‘EB’ – Gas Delivery Pressure

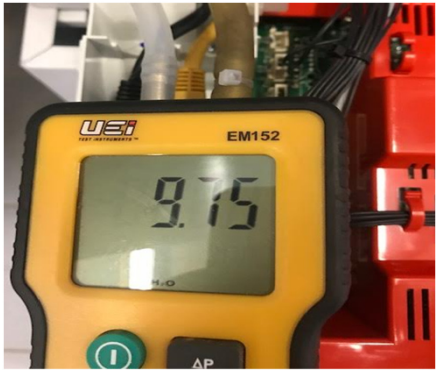
Measuring Gas Pressure

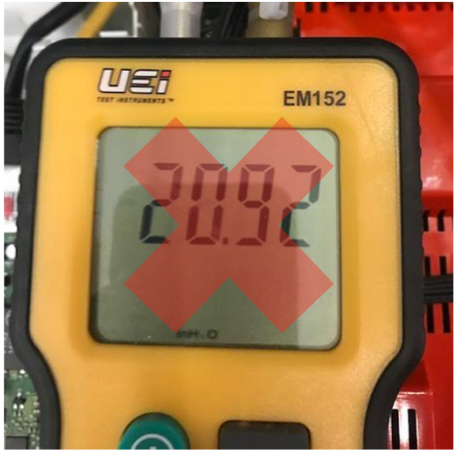
Power boiler off as burner is in high fire to check

Lock-up pressure, must stay below 14”

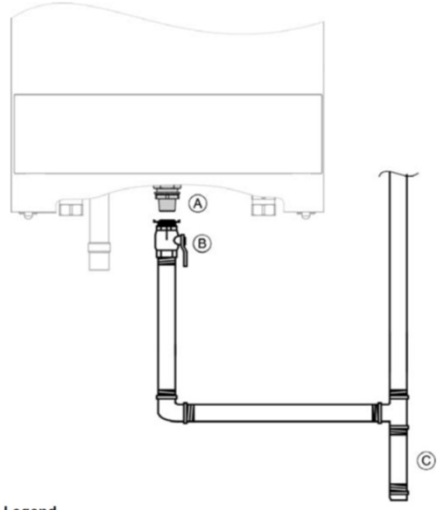








Troubleshooting – Fault ‘EE’ & ‘EB’ – Gas Piping

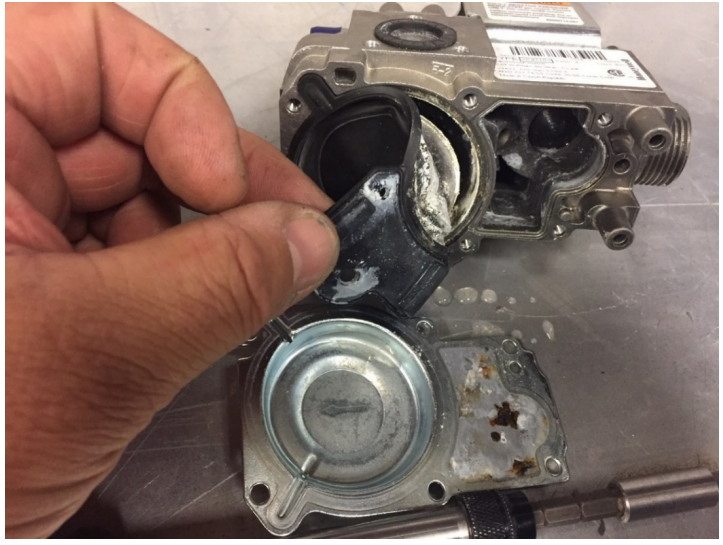


Legend

Ⓐ Gas connection

Ⓑ Accessible manual gas shutoff (factory supplied)

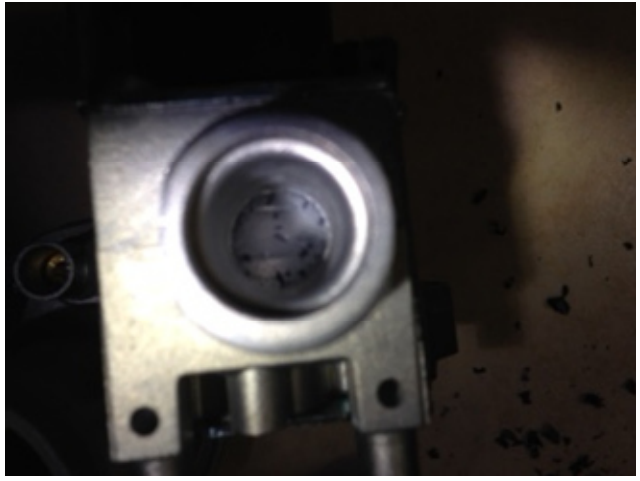
Ⓒ Drip leg



Gas Piping – Keep Gas Regulators more than 3’ upstream of boiler ensure proper piping of system to avoid damage to gas valve

Troubleshooting – Fault ‘EE’ & ‘EB’ – Gas Piping - Sulfidation

Copper Gas Line Issues – High Pressure Drop

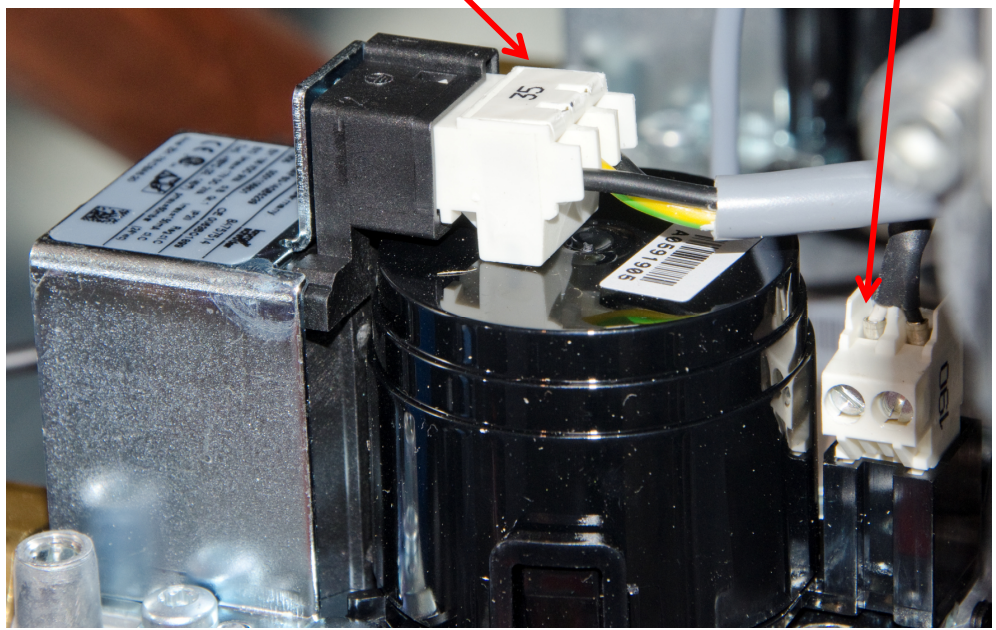


Troubleshooting – Fault ‘EE’ & ‘EB’ – Gas Valve

Gas Valve Power Connections

Power – 35 Plug – Vdc

Analogue Lambda Pro
Control Signal – 190 Plug - Vdc



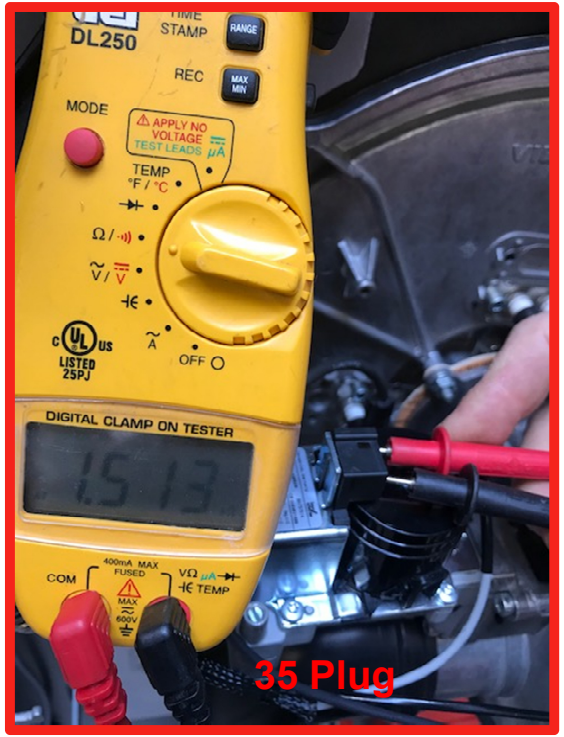
Troubleshooting – Fault ‘EE’ & ‘EB’ – Gas Valve

Measure for resistance across valve coil – Both 35 and 190

Small Gas Valve 75 ohm

Large Gas Valve 20 ohm

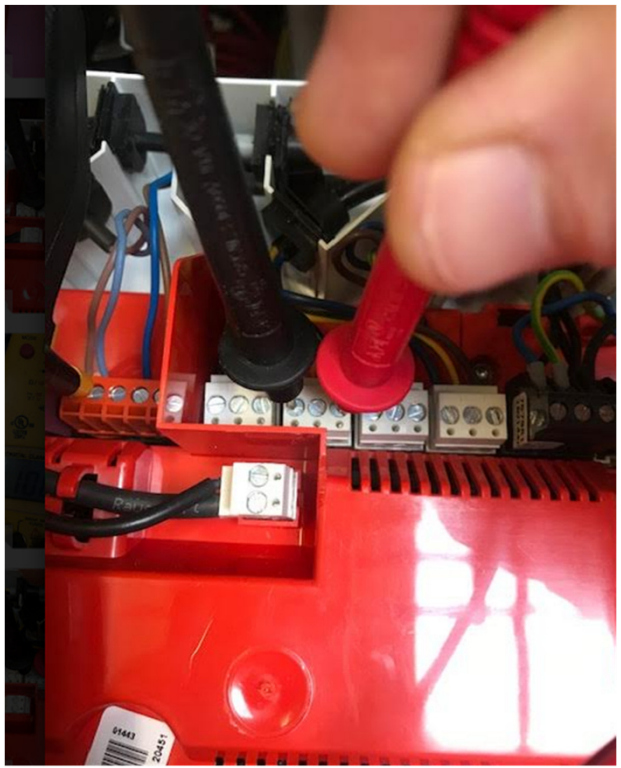
Small Gas Valve 1.6 Kohm

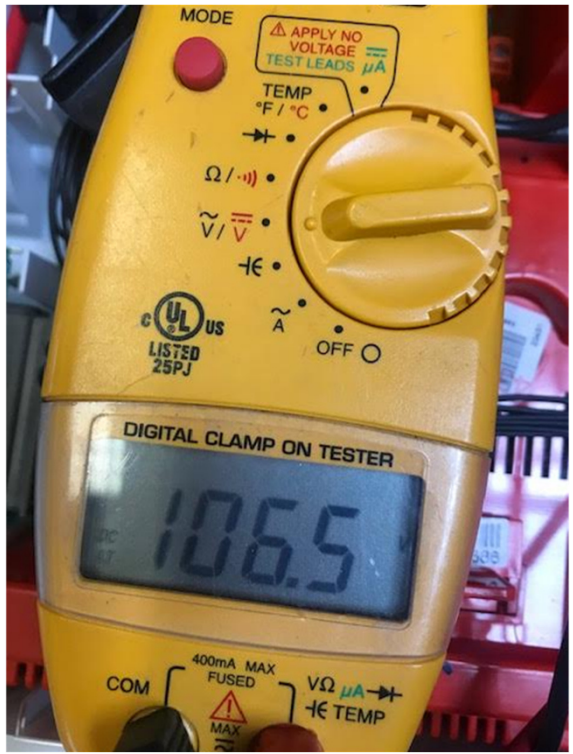


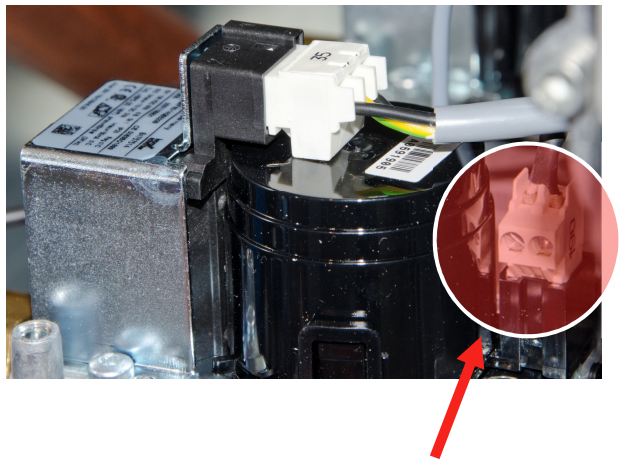
Large Gas Valve 0.6 Kohm

Troubleshooting – Fault ‘EE’ & ‘EB’ – Gas Valve

Measure for Voltage to Gas Valve







Measurement of Vdc from 190 Plug – Low Fire 3.5Vdc
High Fire 5.5Vdc

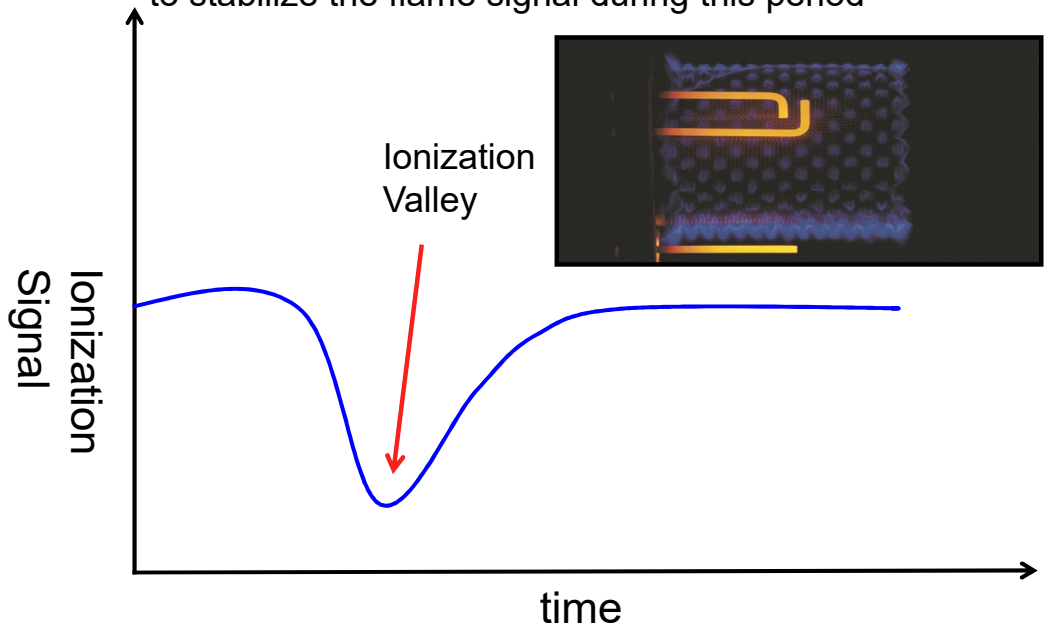
Lambda-Pro-Control Version 2

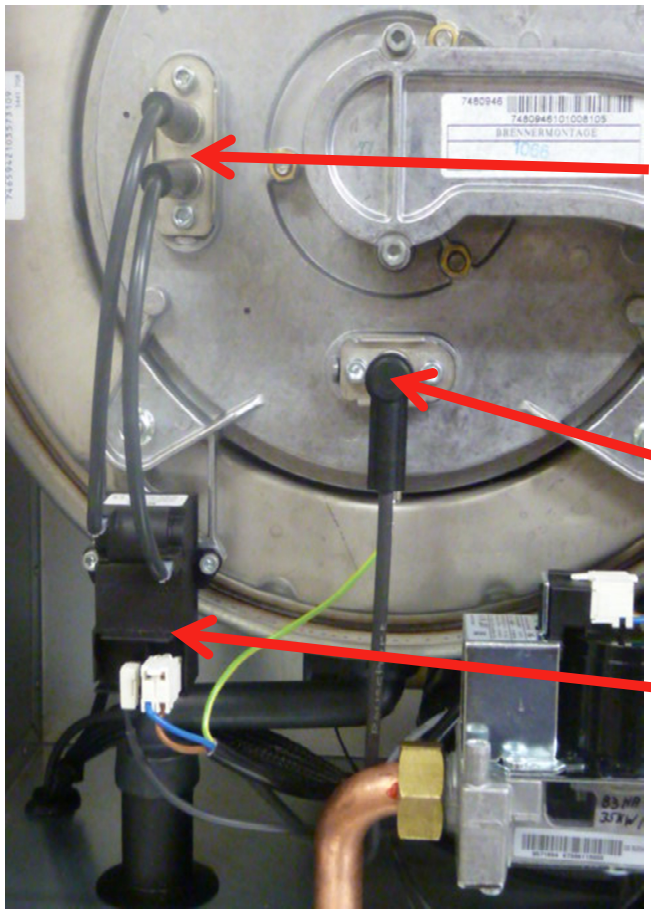
The Ignition Electrode Used As A Second Io Electrode

Addressing The Ionization Valley

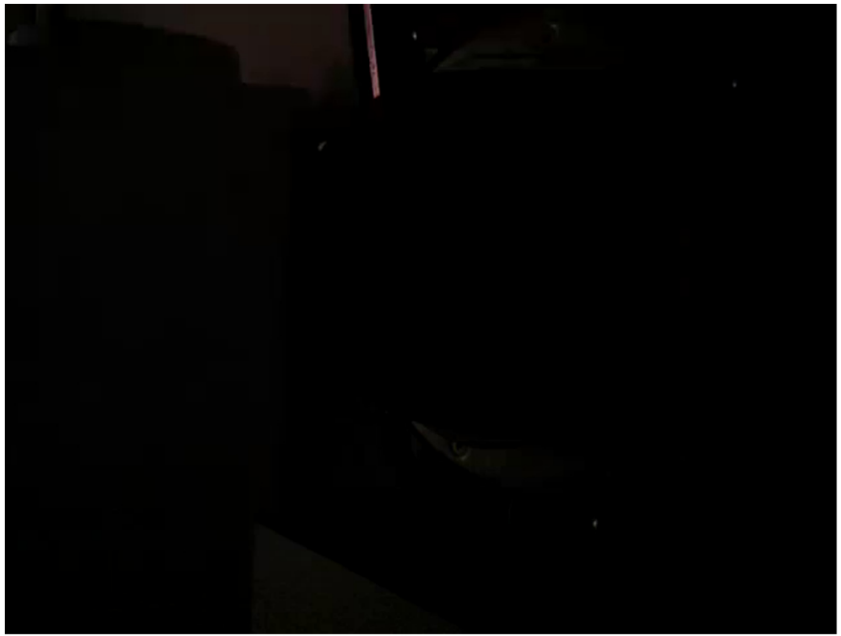
- On Startup the ionization signal dips as the electrode warms up

- Lambda Pro Version 2 uses a second flame detector to stabilize the flame signal during this period





Troubleshooting – Fault ‘EE’ & ‘EB’ – Checking Ionization Current



Maintenance and Servicing

Lambda Pro combustion control

Procedure for checking the ionisation current :

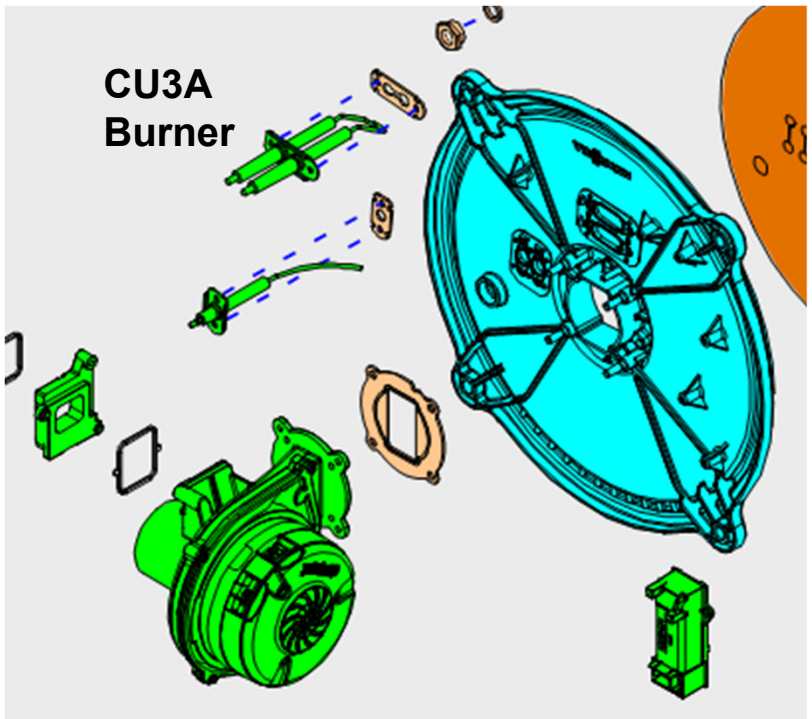
1. Fire Boiler
2. Access Coding level 2
3. Scroll to Code 8A : 175 change to 176
4. Scroll to Code 42 : ? This figure is the m/amps measurement by the ionization electrode as the burner is firing. The figure should steadily rise from a starting point of 6 or 7.
5. Immediately after a miss-fire of the burner resulting in an F4 lockout, scroll to Code 48:?, accessed via 8A : 175 to 176, if the resultant figure is less than 9, then it is an ionization electrode fault.

Troubleshooting – Fault ‘EE’ & ‘EB’ – Ignition and Ionization Rod

Checking Electrodes – Condition/Conductivity/Cracks in Porcelain

Vitodens
200 Burner

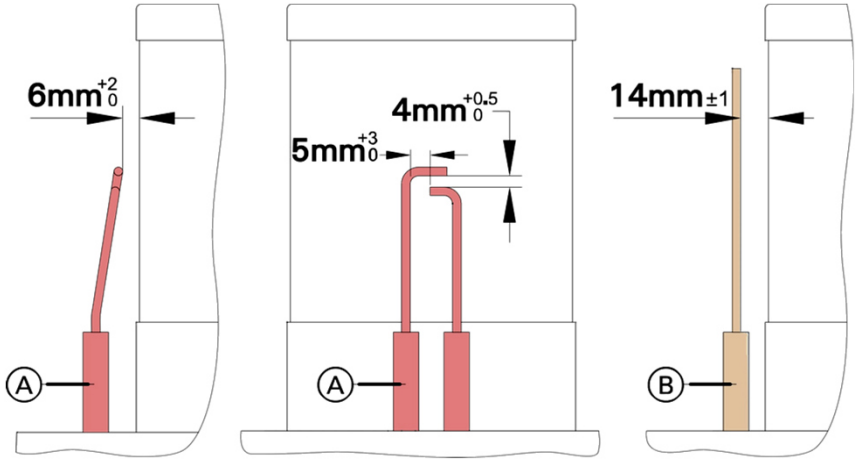
CU3A
Burner

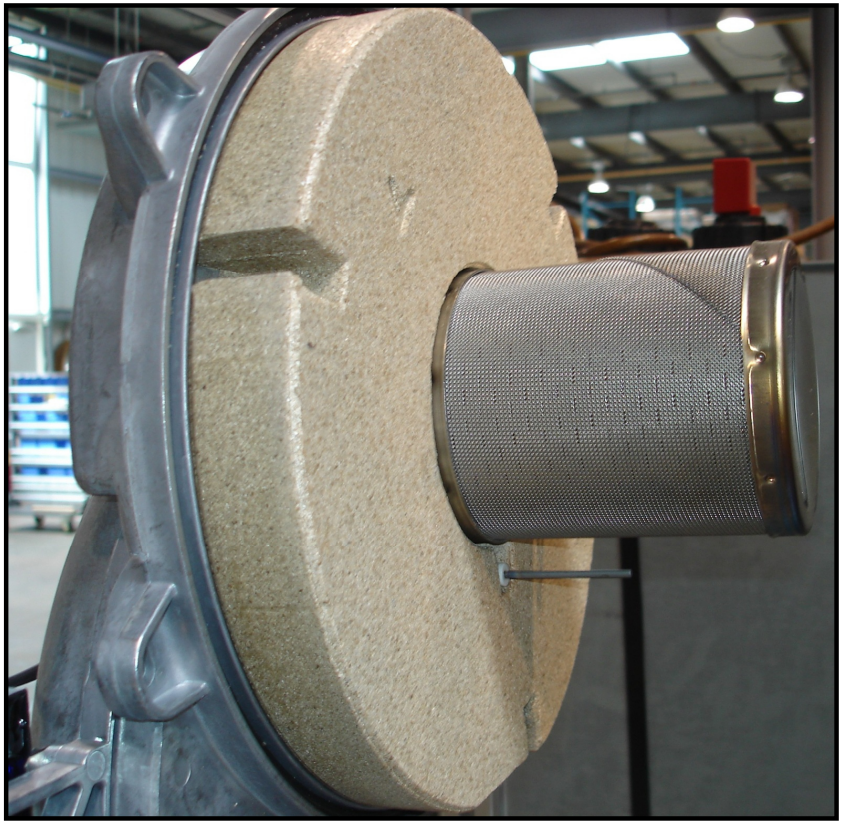


Troubleshooting – Fault ‘EE’ & ‘EB’ – Electrodes

Igniter & Ionization Electrode Settings

Vitodens 200 B2TB/B2HB/B2HA

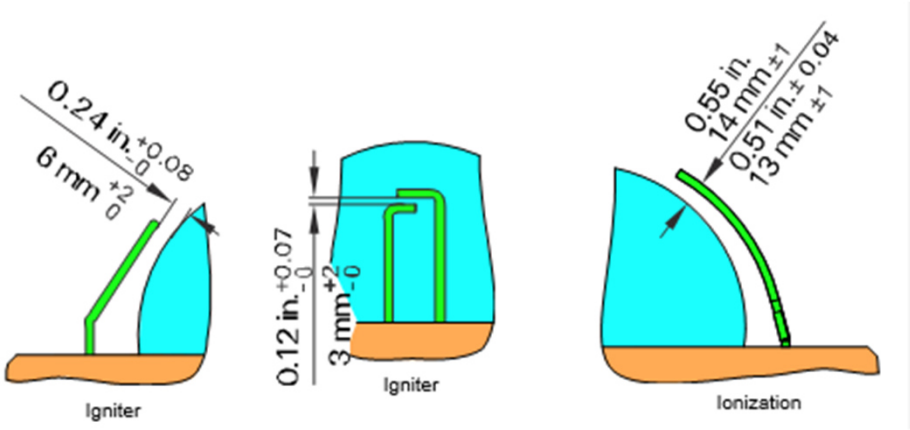




Troubleshooting – Fault ‘EE’ & ‘EB’ – Electrodes

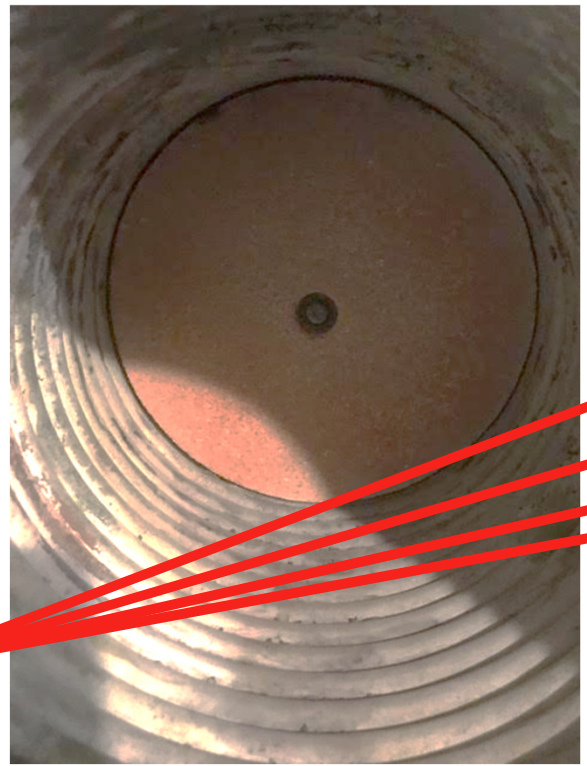
Igniter & Ionization Electrode Settings

Vitocrossal 300 CU3A

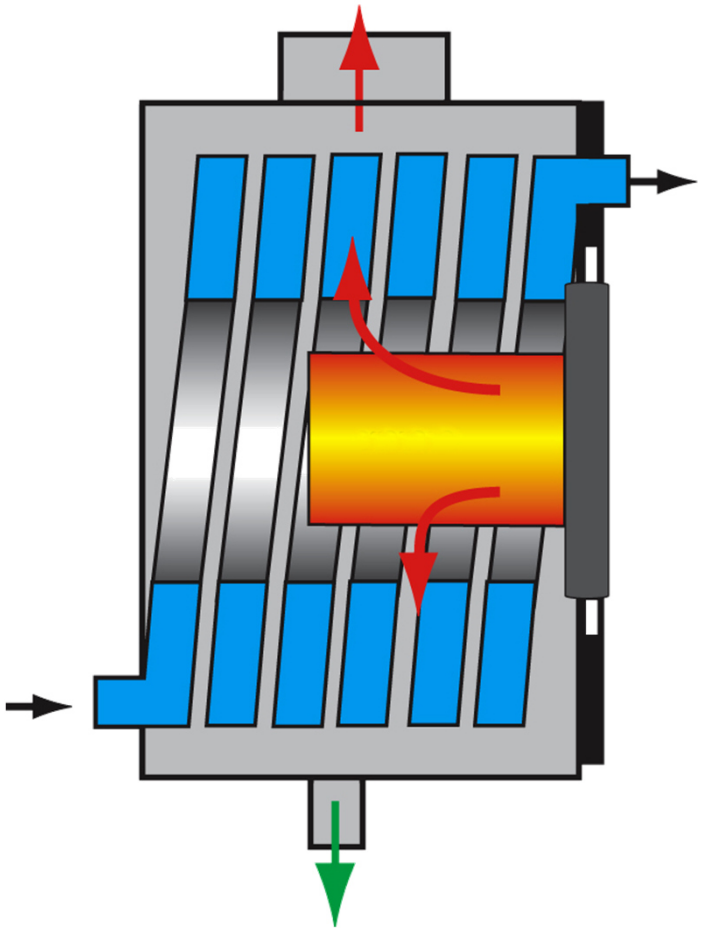


Troubleshooting – Fault ‘EE’ & ‘EB’ – Service and Maintenance

Cleaning Tool is designed to remove debris from flue gas gaps



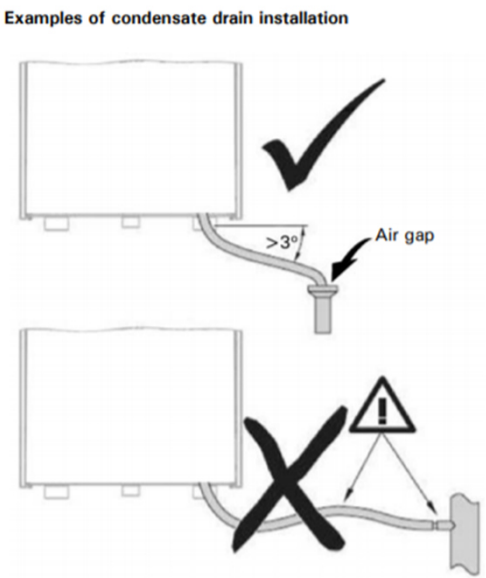
Troubleshooting – Fault ‘EE’ & ‘EB’ – Vent Pressure

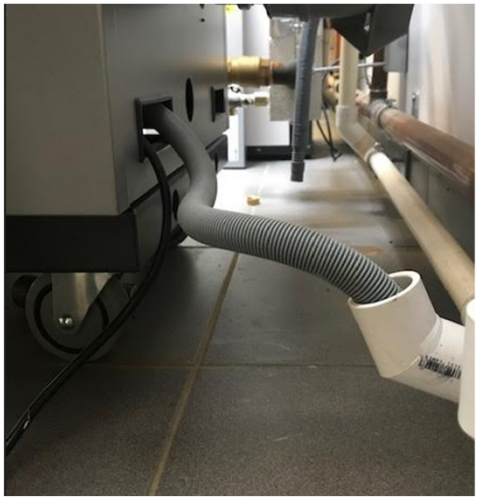


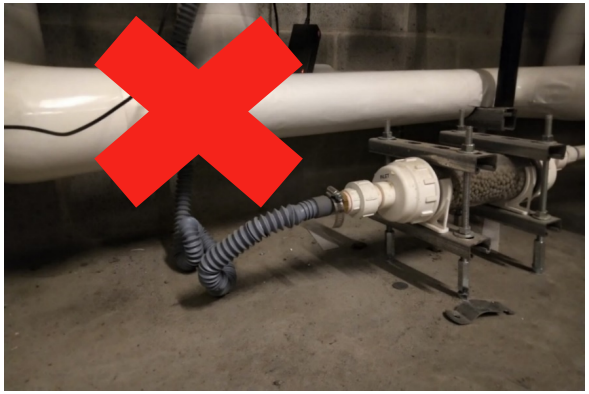
Low Fire

High Fire

Troubleshooting – Fault ‘EE’ & ‘EB’ – Condensate Flow







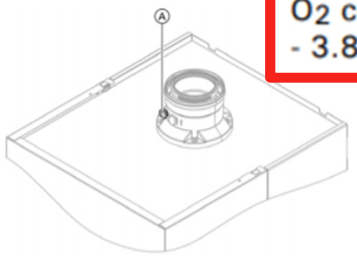
Troubleshooting – Fault ‘EE’ & ‘EB’ – Forced Calibration

Combustion testing – Manual Calibration Function – ALL VALUES MUST BE RESET TO ZERO WHEN DONE

Check CO_2 Setting

The Vitodens 200-W, B2HA boiler is equipped with the Combustion Management System developed by Viessmann which ensures optimal combustion quality independent of gas quality and type. (For a description of the Combustion Management System, see page 34 in this manual). During initial start-up and maintenance you will only need to check the CO_2 and O_2 content at the boiler vent pipe adaptor.

Note: The Vitodens 200-W, B2HA boiler com… to operation with natural gas. (For instr… to convert to operation with liquid prop… page 19). For high-altitude operation ab… (1,500 m), see page 19. The MatriX cy… of this boiler is preset for the entire gas… adjustment or readjustment of the burn…



CO_2 content range:
- 7.5 to 10.5% for natural gas
- 9.0 to 11.3% for LPG

O_2 content range:
- 3.8 to 7.3% for all gas types

1. Connect a flue gas analyzer to test port Ⓐ at boiler vent pipe adaptor.
2. Open gas shut-off valve, start up boiler and create heat demand.
3. Selecting low/high fire:
   Service menu
   … check that the boiler is set for the gas type used (see subsection on page 19).
   CO_2 content range:
   - 7.5 to 10.5% for natural gas
   - 9.0 to 11.3% for LPG

   O_2 content range:
   - 3.8 to 7.3% for all gas types
5. Enter measured values into the Maintenance Record on page 105. Terminate by selecting ‘all actuators off’.
6. Selecting high fire: select “Full load OFF”. Then “Full load ON” appears and the burner operates in high fire.
7. Measure CO_2 and O_2 content at boiler vent pipe adaptor. If the measured values deviated by more than 1% from the ranges listed in the right column or in the table on page 34.
   - check the venting system for leaks (see subsection on page 24).
   - check that the boiler is set for the gas type used (see subsection on page 19).

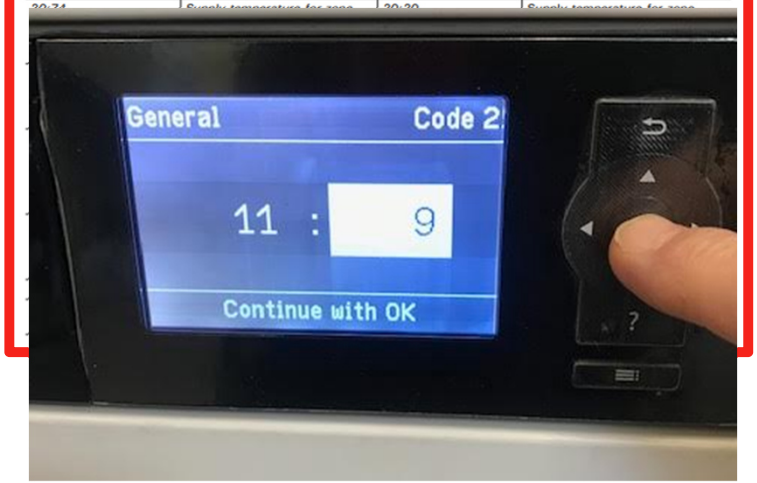
   CO_2 content range:
   - 7.5 to 10.5% for natural gas
   - 9.0 to 11.3% for LPG

   O_2 content range:
   - 3.8 to 7.3% for all gas types
8. Press ⮌ to exit actuator test after testing and enter measured values into the Maintenance Record on page 105.

General *(continued)*

Value address 00: …	System type	Description
7	4	One heating circuit with mixing valve M2 (heating circuit 2) and one heating circuit with mixing valve M3 (heating circuit 3), without DHW heating.
8	4	One heating circuit with mixing valve M2 (heating circuit 2) and one heating circuit with mixing valve M3 (heating circuit 3), with DHW heating.
9	5	One heating circuit without mixing valve A1 (heating circuit 1), one heating circuit with mixing valve M2 (heating circuit 2) and one heating circuit with mixing valve M3 (heating circuit 3), without DHW heating (code is adjusted automatically).
10	5	One heating circuit without mixing valve A1 (heating circuit 1), one heating circuit with mixing valve M2 (heating circuit 2) and one heating circuit with mixing valve M3 (heating circuit 3), with DHW heating (code is adjusted automatically).

Coding in the factory setting		Possible change	
11:≠ 9	No access to the coding addresses for the combustion controller parameters	11:9	Access open to the coding addresses for the combustion controller parameters.



Troubleshooting – Fault ‘EE’ & ‘EB’ – Forced Calibration

Combustion testing – Manual Calibration Function

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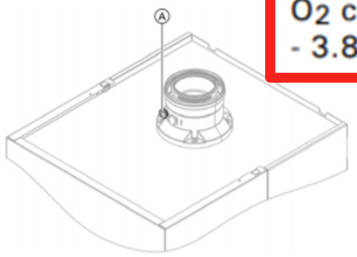

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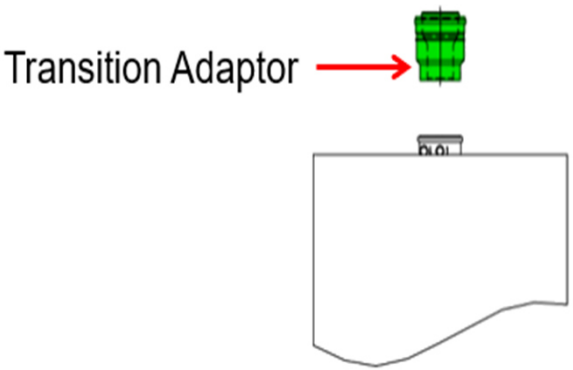
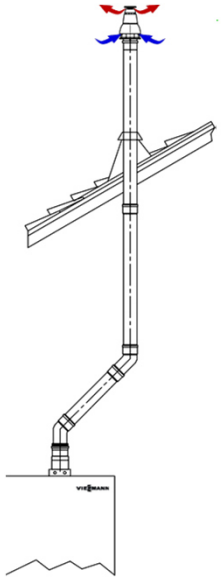
   O_2 content range:
   - 3.8 to 7.3% for all gas types
8. Press ⮌ to exit actuator test after testing and enter measured values into the Maintenance Record on page 105.

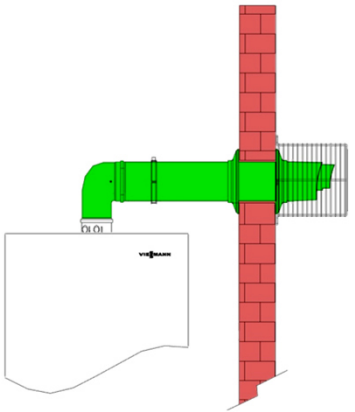
85:0	Standard mode	85:1	Manual calibration of the combustion controller (only adjustable if coding address 11:9 has been set). The red fault indicator also flashes during calibration. The process has terminated when the red fault indicator no longer flashes (after approx. 1 min.). ***Note:*** *Heat generated by the boiler must be dispersed during manual calibration.*

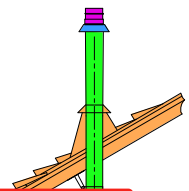
Vitodens 200-W, B2HA/B, B2TB & CU3A

Venting Layouts Supported



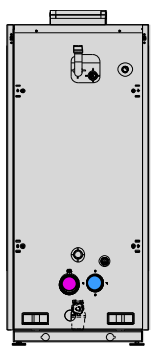




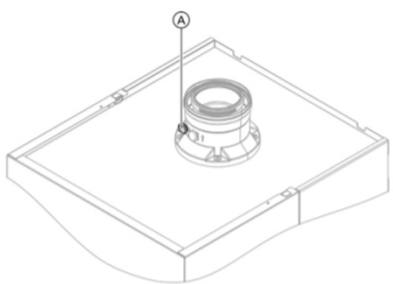


Important Note:
Boiler sizes 285, 311, 352, 399, 530 using concentric vent systems require an vent transition adaptor.

- Condensate must drain from the flue pipe to the boiler. Ensure a suitable gradient of at least 2-3° based on the vent manufacturer's system design [example: for a 3° system approx. 2 in. per 3.3 ft. (50 mm per 1 m) on any horizontal venting components].



Check Coaxial Venting System for Leaks (circular air gap measurement)

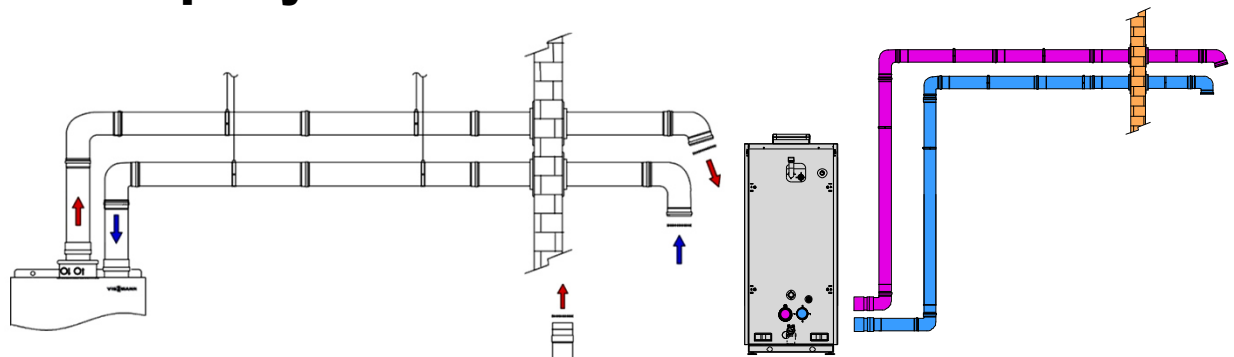


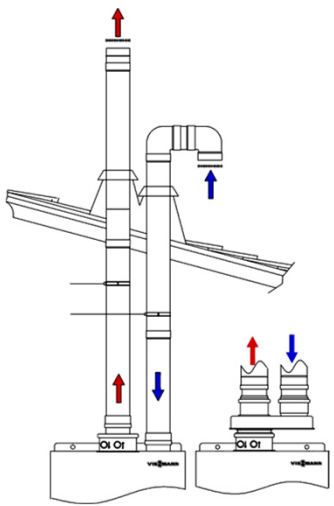
Viessmann strongly recommends that the heating contractor perform a simplified leak test during boiler start-up. For this purpose it is sufficient to measure the CO_2 concentration of the combustion air in the coaxial gap of the air intake pipe. The vent pipe is considered sufficiently leak-proof if a CO_2 concentration in the combustion air no higher than 0.2% or an O_2 concentration no lower than 20.6% is measured.
If higher CO_2 values or lower O_2 values are measured, check venting system thoroughly.

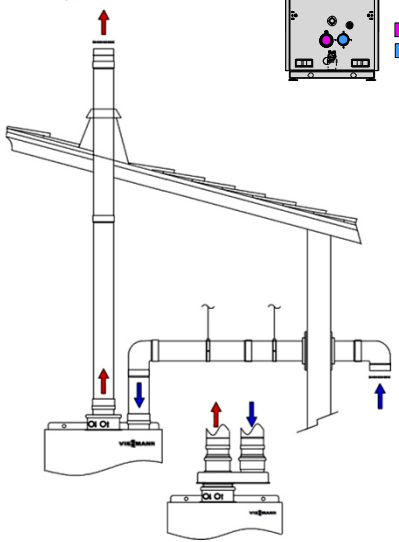
Note: The vent pipe adaptor comes with two measurement ports, one for combustion air-intake measurement and one for flue gas measurement.

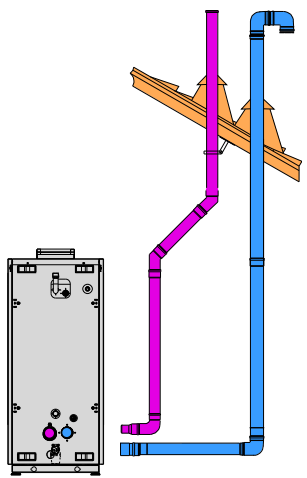
Rigid Single Wall Venting Layouts Supported

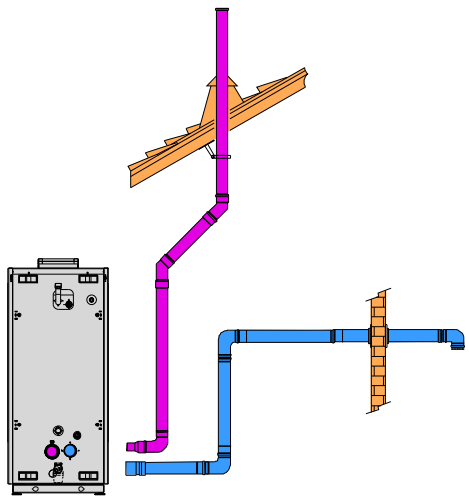
Two Pipe systems







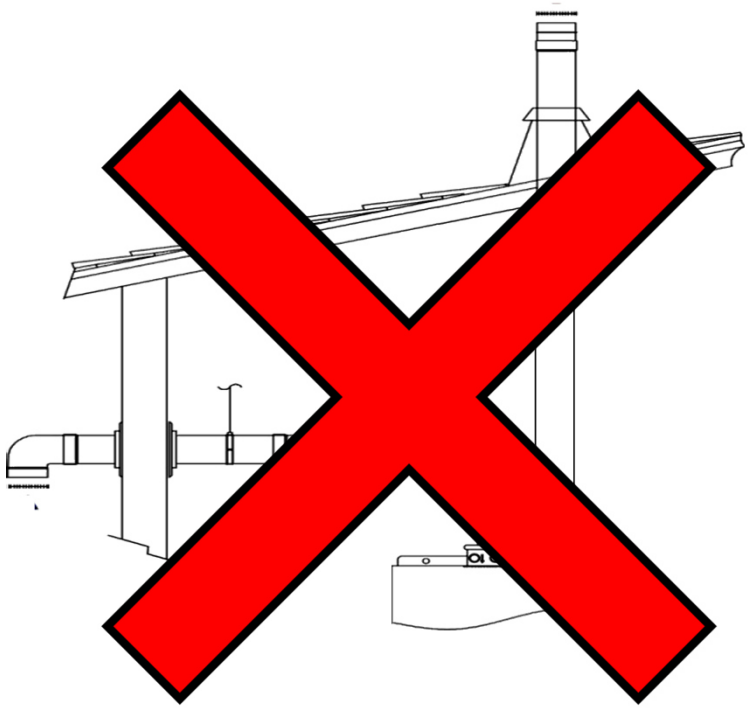




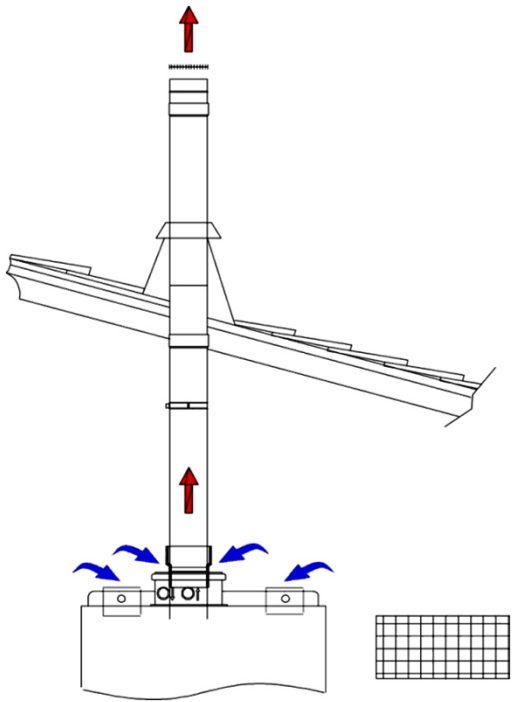
- Condensate must drain from the flue pipe to the boiler. Ensure a suitable gradient of at least 2-3° based on the vent manufacturer's system design [example: for a 3° system approx. 2 in. per 3.3 ft. (50 mm per 1 m) on any horizontal venting components].

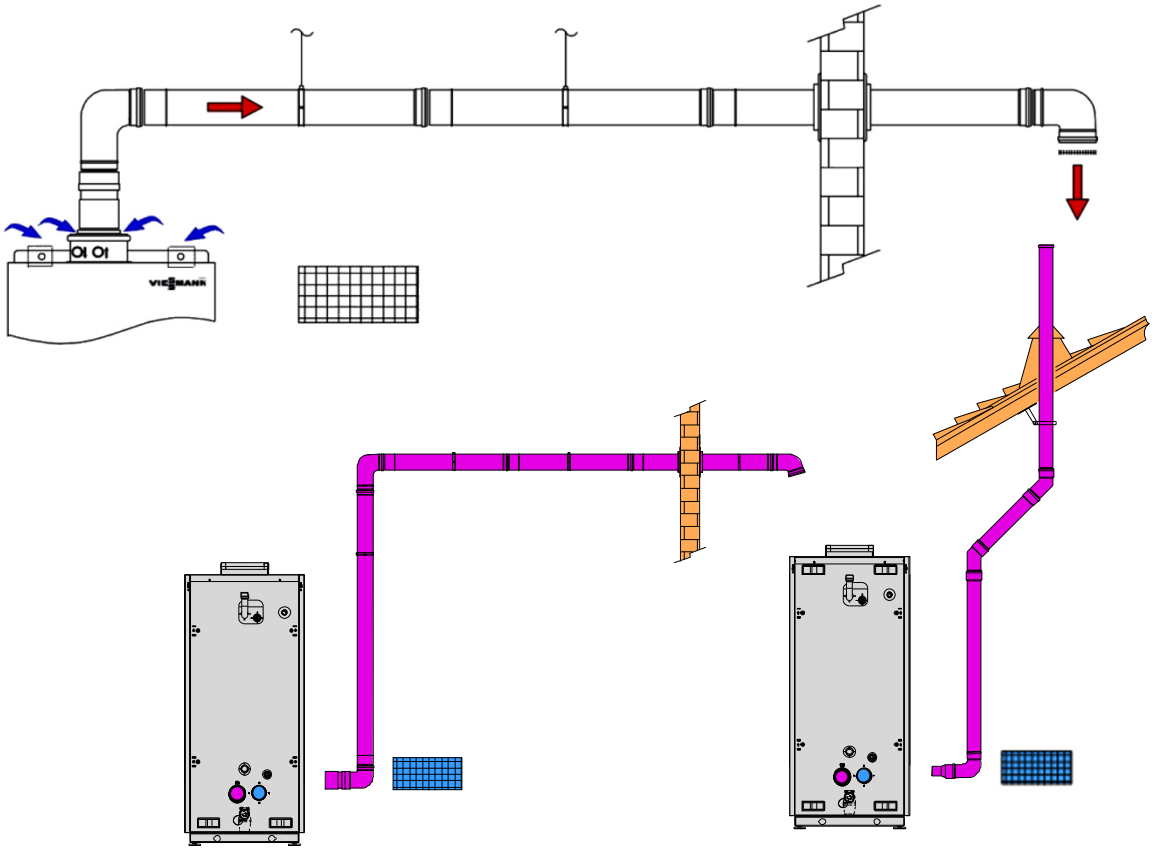
Vitodens 200-W, B2HA/B

Rigid Single Wall Venting Layouts NOT Supported



Rigid Single Wall Venting Layouts Supported – Single pipe





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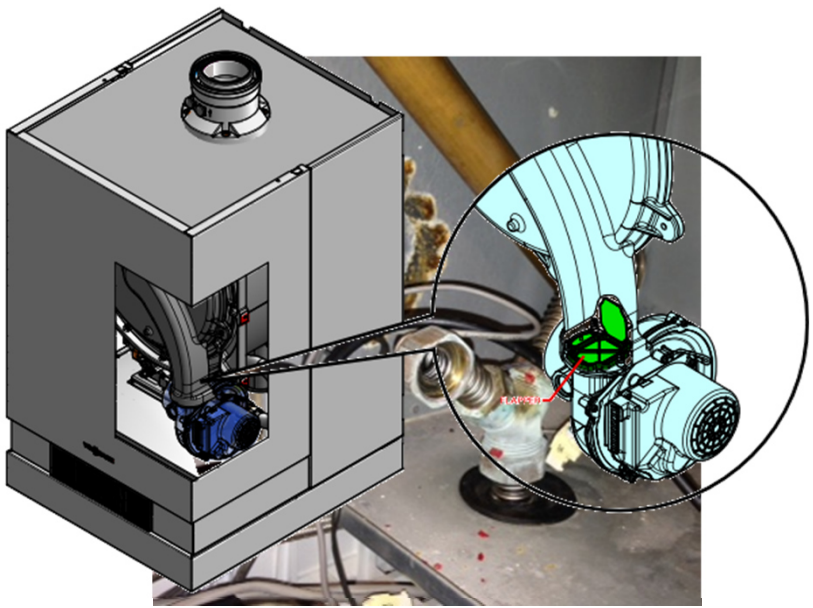
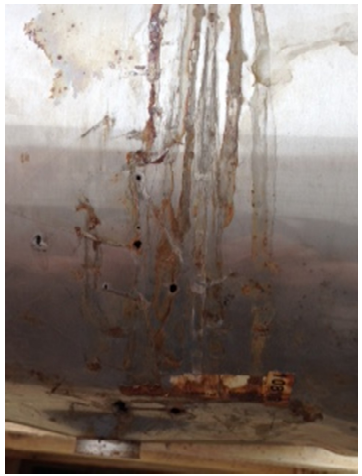
Negative Pressure in Mechanical Room

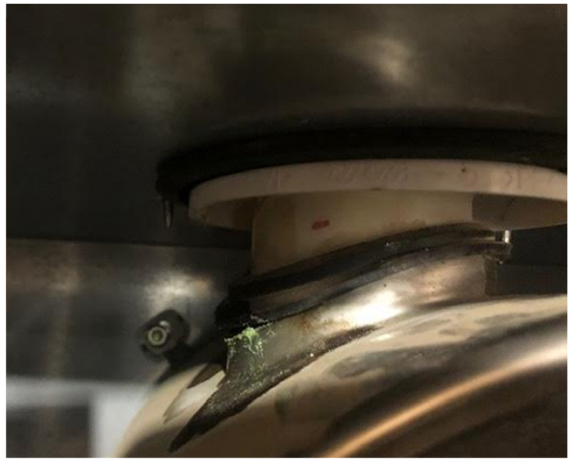
The boiler location should never be under negative pressure. Exhaust fans, attic fans, or dryer fans may cause air to be exhausted at a rate higher than the air can enter the structure for safe combustion. Corrective action must be taken to ensure enough air is available. Never cover the boiler or store debris or other materials near the boiler, or in any way block the flow of adequate fresh combustion air to the boiler.



FGR Signs to Be Aware



Troubleshooting – Fault ‘EE’ & ‘EB’ – Venting and Combustion Air



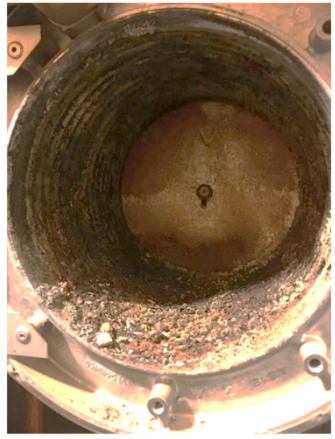
Venting Not Straight

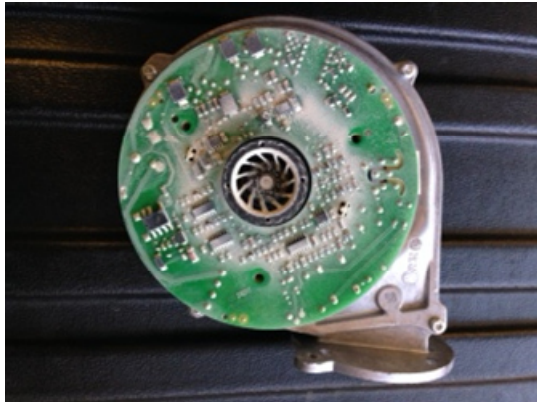
Exhaust and Combustion Air Too Close, even considering prevailing winds

Blockage Due to Ice Buildup/Condensate Restriction

The vent termination for side wall air intake installations should be located on a wall that is least affected by prevailing winds. High winds may affect boiler operation and/or degrade the exterior finish of the wall. They may also cause recirculation of the appliance’s own flue products. Recirculation of flue products can result in poor combustion and inlet condensation problems. If wind is a problem, steps must be taken to shield the vent termination from high winds, such as building a fence or planting shrubs. Ensure that the total equivalent vent length is not exceeded.

Troubleshooting – Fault ‘EE’ & ‘EB’ – Venting and Combustion Air





Contamination increases pressure drop through the burner, all Contamination must be thoroughly cleaned from boiler cabinet to the burner cylinder

Troubleshooting – Fault ‘EE’ & ‘EB’ – Venting and Combustion Air

Mechanical Room

During the early stages of designing a new home, we recommend that proper consideration be given to constructing a separate mechanical room dedicated to the gas- or oil-fired heating equipment and domestic hot water storage tank(s).

The boiler must be located in a heated indoor area, near a floor drain, and as close as possible to a wall. Whenever possible, install the boiler near an outside wall so that it is easy to duct the venting system to the boiler.

Locate the boiler on a wall capable of supporting the weight of the boiler filled with water (see section entitled “Technical Data” on page 102 for information required for total boiler weight calculation). Ensure that the boiler location does not interfere with the proper circulation of combustion and ventilation air of other fuel burning equipment within the mechanical room (if applicable).

The maximum room temperature of the mechanical room where the boiler is located must not exceed 104°F (40°C).

Installation area conditions

WARNING

Incorrect ambient conditions can lead to damage to the heating system and put safe operation at risk.

- Ensure ambient temperatures are higher than 32°F (0°C) and lower than 104°F (40°C).
- Prevent the air from becoming contaminated by halogenated hydrocarbons (e.g. as contained in paint solvents or cleaning fluids) and excessive dust (e.g. through grinding or polishing work). Combustion air for the heating process, and ventilation of the boiler room must be free of corrosive contaminants. To that end, any boiler must be installed in an area that has no chemical exposure. The list to the right indicates the main, currently known sources.
- Avoid continuously high levels of humidity (e.g. through frequent drying of laundry).
- Never close existing ventilation openings.

WARNING

If you notice fire coming from the appliance, call the fire department immediately! Do not attempt to extinguish the fire unless qualified to do so.

IMPORTANT

The service life of the boiler’s exposed metallic surfaces, such as the casing and fan housing, is directly influenced by proximity to damp and salty marine environments. In such areas, higher concentration levels of chlorides from sea spray, coupled with relative humidity, can lead to degradation of the exposed metallic surfaces mentioned above. Therefore, it is imperative that boilers installed in such environments not be installed using direct vent systems which draw outdoor air for combustion. Such boilers must be installed using room air dependent vent systems; i.e. using room air for combustion. The indoor air will have a much lower relative humidity and, hence, potential corrosion will be minimized.

Sources of combustion and ventilation air contaminants

Areas likely to contain contaminants:

- New building construction
- Swimming pools
- Remodelling areas, hobby rooms
- Garages with workshops
- Furniture refinishing areas
- Dry cleaning/laundry areas and establishments
- Auto body shops
- Refrigeration repair shops
- Metal fabrication plants
- Plastic manufacturing plants
- Photo processing plants
- Beauty salons

Products containing contaminants:

- Chlorine-type bleaches, detergents and cleaning solvents found in household laundry rooms
- Paint and varnish removers
- Hydrochloric acid, muriatic acid
- Chlorine-based swimming pool chemicals
- Spray cans containing chlorofluorocarbons
- Chlorinated waxes and cleaners
- Cements and glues
- Refrigerant leaks
- Calcium chloride used for thawing
- Sodium chloride used for water softening salt
- Permanent wave solutions
- Adhesives used to fasten building products and other similar items
- Antistatic fabric softeners used in clothes dryers

Boiler operation in marine environments (damp, salty coastal areas)

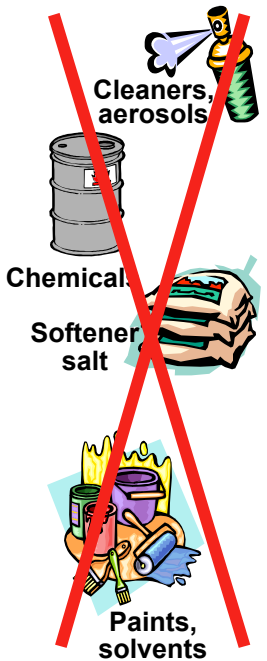
WARNING

Fire causes a risk of burns and explosion!
- **Shut down the boiler**
- **Close fuel shut-off valves**
- **Use a tested fire extinguisher, class ABC.**

5685 528 18

0

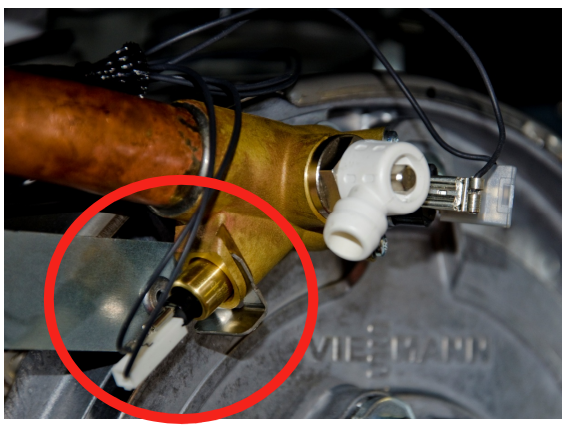
Product to avoid
Spray cans c/w chloro/fluorocarbons
Chlorinated waxes/cleaners
Chlorine-based pool chemicals
Calcium chloride for thawing
Sodium chloride for water softening
Refrigerant leaks
Paint or vanish removers
Cements and glues
Antistatic fabric softeners
Chlorine bleaches, detergents and cleaning solvents
Adhesives used to fasten building products
Hydrochloric and muriatic acid



Areas likely to have contaminants
Dry cleaning/laundry areas and establishments
Swimming pools
Metal fabrication plants
Beauty salons
Refrigeration repair shops
Photo processing plants
Auto body shops
Plastic manufacturing plants
Furniture refinishing areas and establishments
New building construction
Garages and workshops
Remodeling areas

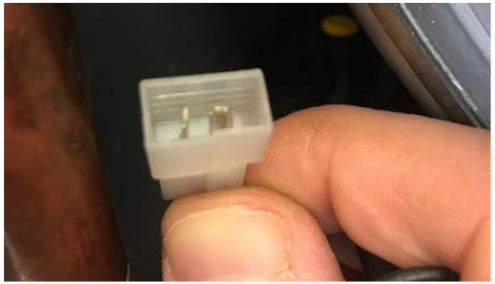
Troubleshooting – Fault ‘EB’ – Checking Water Side

Boiler Sensor #3



Troubleshooting – Fault ‘EB’ – Checking Water Side

Measure Amperage to check Circulator Functionality



Check continuity of flow switch for proper

Measure Ohms to check Sensor Accuracy/Drifting

Academy

VIESMANN

Technical Troubleshooting Series

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