



WARNING

For your safety, turn off electrical power supply at service panel and allow unit to cool before proceeding. Failure to do so can cause severe personal injury or death. The ability to properly perform service on this equipment requires certain expertise, mechanical skills, tools, and equipment. If you do not possess these, do not attempt to perform any service on this equipment. A failure to follow this warning could result in possible damage to this equipment, serious personal injury, or death.

DANGER

Installing and servicing boiler equipment, parts and accessories, can be hazardous due to gas and electrical components. Only trained personnel should install or service heating equipment. When working on boiler equipment, observe precautions in the literature, on tags, and on labels attached to the unit. Recognize safety information. This is the safety-alert symbol. When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury

NOTE

These instructions are to be closely followed, and referenced to the details in the boiler's current certified Installation and Operating Instruction Manual.

The P-142 Ignitor Kit contains a single-pronged ignitor and an ignitor gasket. It is used for IBC boiler models VFC 15-150 and VFC 45-225 with the original 'neck'-access heat exchanger, known as the 'classic' heat exchanger. The ignitor also serves as a flame sensor.

The P-142 is not used for the new removable lid heat exchangers. Since September 2012 the VFC models have been built with a removable heat exchanger lid held in place by bolts on the top: if that is the style of your heat exchanger, you will not use the P-142. Removable lid VFCs use the double-prong ignitor kit, IBC part P-111.

Early fixed-fired and VFC models not listed above (these were built only until 2003) also use the P-142.

The space or gap between the burner and the end of the ignitor is critical to ignition and to flame proving. When replacing the P-142 ignitor this spark gap must be confirmed, and typically a small adjustment will need to be made. See installation directions over.

Checking the Flame Current

It may be useful to measure the flame current before changing the ignitor. If you have an ignition failure after 4 seconds, checking the current allows you to identify whether the cause is a poor flame current or a defective ignition module.

The ignition module is designed to cut the power to the gas valve after a 4 sec. trial for ignition if the flame signal drops below $0.7\mu\text{A}$. Note that if the module registers a fair flame signal (above $1.5\mu\text{A}$) but still cuts the power to the gas valve after the 4 sec. trial, then the module should be replaced.

The Fenwal Ignition module registers the rectified flame current at the two test ports FC+ and FC-, visible on the front of the module.

- Set your multimeter to DC microamps ($\text{---}\mu\text{A}$)
- During a call for ignition, measure the amperage at the test ports on the ignition module, labelled FC+ and FC-. A good signal is 2-4+ μA .



Checking the Flame Current *continued*

• 1 μ A would be a weak signal, and if the flame signal drops below 0.7 μ A the module will turn off the gas valve. The primary causes of poor flame signal are a worn ignitor or a poor gap; as well, burner fouling can be a factor, particularly with a flame signal that drops during operation.

Replace the old ignitor

- Turn off the gas supply to the boiler.
- Remove the two M4 Philips-head screws securing the ignitor. In some cases it may be necessary to loosen the burner V-clamp enough to move it aside the ignitor flange.
- White gaskets should always be replaced with the new graphite gasket included with the ignitor.
- Install the new ignitor and gasket with hand-tightness only. Do not use a powered driver.

Observing the spark gap

- Remove the view port. Older view ports should be removed using a $\frac{3}{4}$ " socket wrench or closed-end wrench. Newer view ports (IBC part 500-029A) can be removed with a $\frac{7}{8}$ " wrench.
- The gap between the ignitor tip and the burner can be seen by looking through the view port hole at the correct angle.
 - A mini flex-head flashlight put through this hole can make direct observation much easier. See *inset Figure 1*.
 - Alternatively the gap can be gauged by observing the spark directly during a trial for ignition (note that the gas is turned off for this). See *inset Figure 2*.
 - If the spark 'ticking' can be heard but not seen at the end of the ignitor, the spark may be lost to some ground other than the burner. Remove the ignitor and look down its hole; if refractory is visible, push or carve it out of the way, and check the ignitor ceramic for a crack.
- The correct spark gap is $\frac{1}{8}$ " (3.2mm) to $\frac{3}{16}$ " (4.8mm). The diameter of the ignitor itself is $\frac{1}{8}$ " so look for a gap 1-1 $\frac{1}{2}$ times the width of the rod. The gap can also be compared to a stick of solder, whose diameter is typically $\frac{1}{8}$ ". **The spark should be a sharp, bright, straight line.**
- When adjusting the gap do not put stress on the ceramic insulator. Hold the ignitor with two pliers, one on each side of the bend, and gently decrease or increase the rod angle. It may be necessary to make several attempts to achieve a suitable gap. Note that if adjustment is necessary to a used ignitor, it should be heated (e.g. by a torch) first.
- Retighten the v-clamp if it was loosened, confirming that this does not move the burner and thus alter the spark gap. Replace the view port. Restore the gas and give the boiler a call for heat. Confirm dependable ignition. It is recommended to measure the flame current (see p. 1).



Figure 1 Gap observed by flashlight



Figure 2 Spark observed