

ANSWERING THE FREQUENTLY ASKED QUESTIONS

GAS-BOOSTED, SOLAR WATER HEATERS

Even the most efficient solar water heaters, sometimes require some amount of auxiliary heating (boosting).

This may be because of a large, late-in-the-day hot water usage or after a long period of extensive cloud cover.

By using an electric, gas or some other form of booster a solar water heater can provide a year-round supply of steaming hot water.

This Fact File describes the use and operation of the Solahart FD 15 -12 gas booster.

- When should a gas booster be considered?
- What is a gas booster?
- How does the FD15 - 12 work?
- How efficient is the FD15 - 12?
- How safe is the FD 15 - 12?
- Does the FD 15 - 12 need electrical power?
- What type of gas does the FD 15 - 12 need?
- Technical Specifications.

When Should a Gas Booster be Considered?

Most solar water heaters are fitted with an electric heating element mounted inside the storage tank. This is a convenient, simple and inexpensive form of booster.

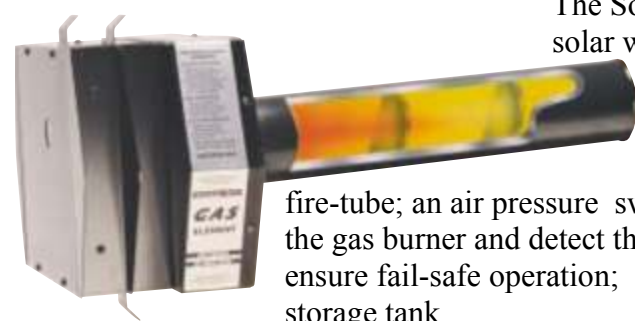
The electric heating element is connected to an electrical power supply and is controlled by a thermostat. The thermostat senses when the water in the storage tank needs boosting and turns the heating element on.

If boosting is only required for a small part of the year, or if the cost of electricity is low, an electrical heating element is the most cost-effective way to boost. If this is not the case, gas boosting should be considered.

What is a Gas Booster?

At its simplest, a gas booster is merely a gas-fired water heater. Sometimes a solar water heater may be connected to a separate gas water heater.

The water from the solar water heater is fed to the gas water heater for supplementary heating. This arrangement does work, but it is cumbersome and inefficient - two water heaters are needed to do the work of one.



The Solahart FD 15 - 12 gas booster will integrate with any Solahart solar water heater and avoid the need for a separate system.

The FD 15 - 12 comprises: a gas burner; a fire-tube through which the burning gas passes; an air-circulation fan to push combustion air to the burner and through the fire-tube; an air pressure switch to detect the function fan; an electric sparker to ignite the gas burner and detect the flame; a solenoid to control the flow of gas to the burner and ensure fail-safe operation; and a thermostat to sense the temperature of the water in the storage tank.

The fire-tube is mounted directly within the solar water heater storage tank and thereby avoids a second water heater.

How Does The FD 15 - 12 Work?

An electronic controller located within the balanced flue/housing and mounted at the end of the Solahart storage tank controls the FD 15 - 12. When the thermostat senses the water in the tank needs heating, the controller begins the ignition cycle. First, the fan runs for about 20 seconds to purge any unburnt gas from the fire tube. Then, provided the air-pressure switch senses air is flowing, the solenoid is opened to release gas to the burner and the sparker.

A Solahart solar water heater fitted with an FD 15 - 12 is a highly-efficient gas water heater in its own right.

If a flame is detected within five seconds, boosting starts. If a flame is not detected, a primary lockout occurs and the solenoid is shut.

The ignition cycle then repeats. If a flame is again not detected, a secondary lockout occurs. The solenoid is re-closed. To recover from a secondary lockout, either the controller must be manually reset by turning off the electrical power supply for at least eight seconds, or the controller will automatically retry each hour until the reason for the lockout is corrected.

Technical Specifications

Model	FD 15 - 12
Power Supply	12 volt DC.
Operating Current Draw	0.48 amps
Maximum Current Draw	1.2 amps
Inlet Gas Pressure	3.5 kPa
Fan Air Flow Rate	16 litres/sec
Gas Consumption	13 MJ/hr

How Efficient Is The FD 15 - 12 Work?

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How Efficient Is The FD 15 - 12 Work?

The Solahart FD 15 - 12 is totally safe. Not only is it protected by a control-logic that monitors for correct operation, the entire system is fail-safe. This means that even in the unlikely event that something does go wrong, a dangerous situation can not result.

The solenoid valve controlling the gas flow incorporates two gates. Both automatically shut if electrical power is lost. Even if one gate fails to close fully, closing the second gate alone is enough to stop the gas flow.

The Australian Gas Association (AGA) has approved the FD 15 - 12 for safe and effective operation.

Best For The Environment

Solar water heaters protect the environment by saving electricity, thereby reducing emissions of damaging greenhouse gases such as carbon dioxide (CO₂).

But even solar water heaters do contribute some CO₂ emissions. Depending on booster type, a solar water heater uses either electricity or gas to provide supplementary heating.

But some energy forms are better than others. Electricity is very CO₂ intensive due to two main factors.

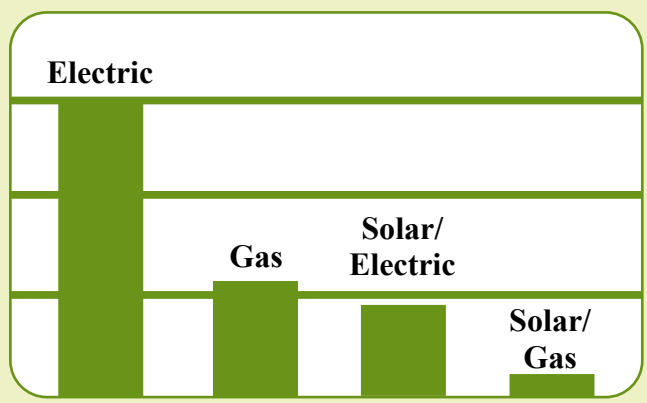
First, electricity is often produced by burning coal. Coal has a very carbon content for each unit of electricity generated. Therefore it produces large amounts of CO₂.

Second, the process of transmitting and distributing electricity introduces inefficiencies that mean some energy is wasted.

By comparison, burning gas directly in a water heater avoids these two problems. In fact a gas water heater contributes one-third of the CO₂ emissions of an electric water heater.

The graph below compares the four main water heater types on the basis of CO₂ emissions per litre of hot water delivered.

Carbon Dioxide Emissions



Does The FD 15 - 12 Need Electrical Power?

The Solahart FD 15 - 12 does need electricity but it need not be from a mains-power or utility-supplied service. The FD 15 - 12 is packaged with a transformer to convert AC electricity to the 12 volt DC power used by the booster.

This means that the FD 15 - 12 can be operated directly from a 12-volt battery-charging device.

What Type Of Gas Does The FD 15 - 12 Need?

The term “gas” is used to describe two fuel types. Depending on location, “gas” may be natural gas or liquefied propane gas (LPG). The Solahart FD 15 - 12 can accommodate either of these gas types provided the correct burner jet is fitted.

The gas for an FD 15 - 12 need not be supplied via the city pipelines either. Bottled gas such as LPG is also an acceptable fuel provided the correct regulator is fitted.

For remote or isolated areas, an FD 15 - 12 fuelled from bottled gas and powered by a 12 volt photovoltaic cell or wind generator provides the ideal, stand-alone solution.

