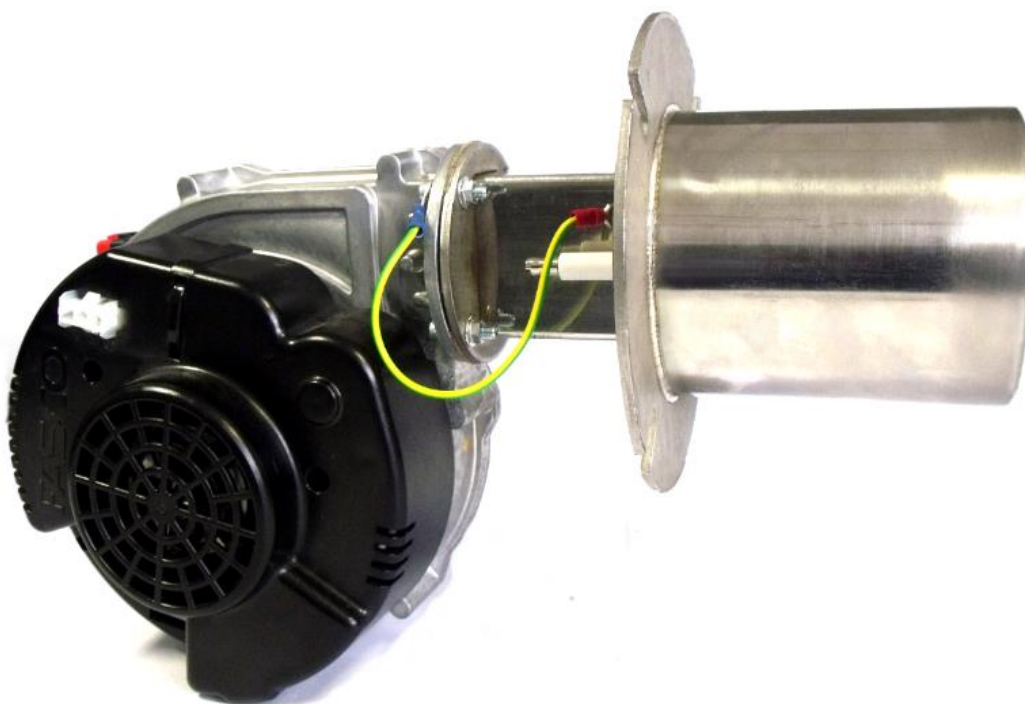


INSTALLATION / SERVICE / USER MANUAL



INVERTERJET M SERIES

MODEL	PRODUCT CODE	CLASS
INVERTERJET 30M/L	91353	MODULATING PRE-MIX BURNER
INVERTERJET 30M/N	91354	MODULATING PRE-MIX BURNER
INVERTERJET 50M/L	91320	MODULATING PRE-MIX BURNER
INVERTERJET 50M/N	91330	MODULATING PRE-MIX BURNER
INVERTERJET 90M/L	91323	MODULATING PRE-MIX BURNER
INVERTERJET 90M/N	91329	MODULATING PRE-MIX BURNER

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1 Declaration

The Inverterjet burners are state of the art burner system.

Designed with imagination and passion. It utilises the very latest technology to provide a reliable, hot, clean and compact gas heating solution.

A truly market leading product which is quite simply;

‘Taking Burner Technology into the 21st Century’.

Please read this manual before Unpacking and Installing the Burner.

For Burner Installation/ Operation advise please contact Burnertech

To ensure maximum product reliability, we advise and request that a Burnertech Approved Engineer who has attended our product course conducts the 1st burner commissioning.

For Training, Service or Commissioning information please contact Burnertech

This manual is provided as an integral part of the equipment and its delivery to the end user is essential.

Please keep this manual for future reference, more copies of this manual are available upon request. It is possible to download this Manual and Technical Datasheet from the www.burnertech.co.uk Burnertech Website.

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SPECIAL ATTENTION BOXES

The following defined terms are used throughout this manual to bring attention to the presence of hazards of various risk levels, or to important product information



DANGER

DANGER indicates an imminently hazardous situation which if not avoided will result in death or serious injury.



WARNING

WARNING indicates a potentially hazardous situation which if not avoided, could result in death or serious injury.



CAUTION

CAUTION indicates a potentially hazardous situation which if not avoided, could result in minor or moderate injury.

CAUTION

CAUTION used without a safety alert symbol indicates a potentially hazardous situation which, if not avoided, may result in property damage.

NOTICE

NOTICE is used to address practices not related to personal injury

SAFETY INSTRUCTIONS

SAFETY INSTRUCTIONS (or equivalent) signs indicate specific safety related instructions or procedures

NOTE: Contains additional information important to a procedure

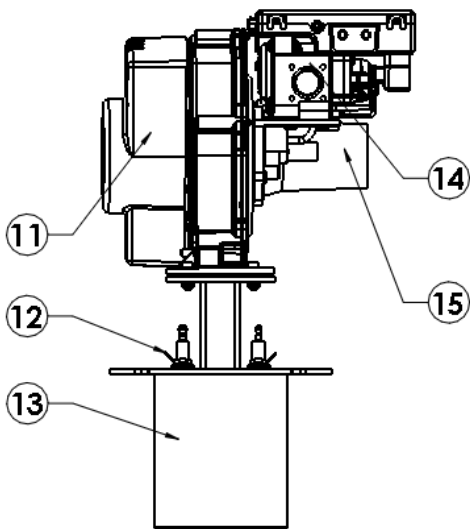
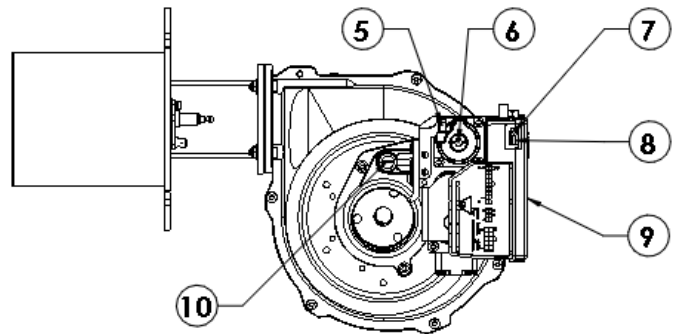
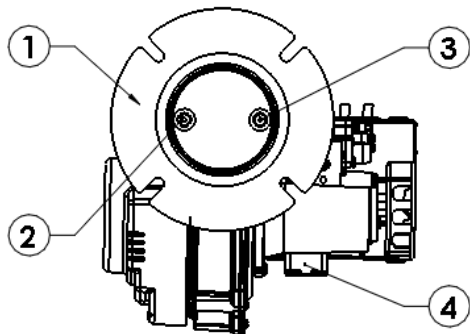
2 Technical Information

2.1 Technical Data

INVERTERJET MODEL			30M/L	30M/N	50M/L	50M/N	90M/L	90M/N
Type			Pre-Mix Burner		Pre-Mix Burner		Pre-Mix Burner	
Fuel Type			LPG	NG	LPG	NG	LPG	NG
Power	Min	kW	6		10		18	
	Max	kW	30		50		90	
Modulation Range			1:5		1:5		1:5	
Nominal Voltage	VAC		230		230		230	
Frequency	Hz		50/60		50/60		50/60	
Phase			1 ~		1 ~		1 ~	
Fan Current Draw	Max	A	0.3		1.9		1.9	
Gas Connection Flange Size			1/2 "BSP		1/2 "BSP		1/2 "BSP	
Gas Inlet Pressure	Min	mbar	10		10		10	
	Max	mbar	60		60		60	

2.2 Technical Description of the Burner Parts

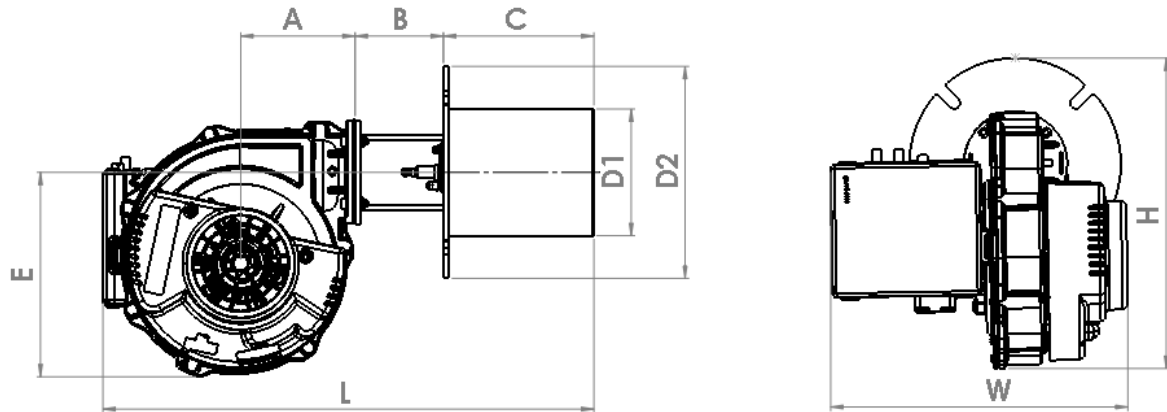
The Burners in the Inverterjet M series have the following technical description of the parts.



- 1 Burner Mounting Plate
- 2 Ignition Electrode
- 3 Ionisation Probe
- 4 Gas Connection Flange
- 5 Pressure Feedback Connector
- 6 Offset Adjustment Screw
- 7 Reset Button
- 8 Indicator Light (Alarm)
- 9 Burner Controller
- 10 Throttle Adjustment Screw
- 11 Fan Housing
- 12 Burner Head Earth Connector
- 13 Burner Head
- 14 Gas Valve
- 15 Venturi

2.3 Burner dimensions and weight

The diagrams below show the major dimensions and weight of the burner.



MODEL	A	B	C	D1	D2	E	H	L	W	Weight
	mm	mm	mm	mm	mm	mm	mm	mm	mm	kg
Inverterjet 30M/L	89	71	91	Ø101.6	Ø170	133	218	361	225	5.2
Inverterjet 30M/N	89	71	91	Ø101.6	Ø170	133	218	361	225	5.2
Inverterjet 50M/L	92	71	91	Ø101.6	Ø170	164	244	365	238	5.6
Inverterjet 50M/N	92	71	91	Ø101.6	Ø170	164	244	365	238	5.6
Inverterjet 90M/L	92	71	121	Ø101.6	Ø170	164	244	395	238	5.9
Inverterjet 90M/N	92	71	121	Ø101.6	Ø170	164	244	395	238	5.9

CAUTION

When installing the burner ensure adequate clearance around the burner and any boiler to which the burner is installed.

2.4 Burner operation

2.4.1 Control operation

The microprocessor-based burner controller is made for fan assisted, direct burner ignition applications.

The control powers the gas valve and DC-fan. Normal heat demand is given by a 230 VAC switch input (depending on the model)

After heat demand and successful ignition, modulation can be controlled by external 0 - 10V or 4 - 20mA signal.

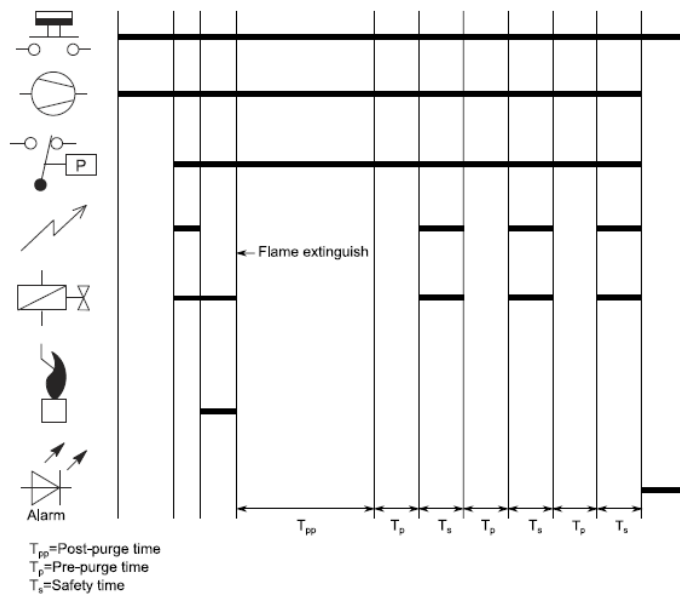
2.4.2 Basic sequence of operation

The Normal Heating mode is started when the High Voltage Heat Demand input is closed. When ignition is successful, the fan can be controlled in a number of ways depending on parameter setting:

NOTE: Configurable to suit the application via PC interface only

- **0-10 V control**, a DC voltage between zero and ten volts can be applied to connector (X3 Pins 8 & 16). At zero volt the fan will run on Minimum Fan speed. At ten volt the fan will run on Maximum Fan speed.
- **4-20 mA control**, with an external resistor of 500 Ω 1 % placed between connector (X3 Pins 8 & 16), the fan speed can be controlled with a current in the range of 4 to 20 mA. At 4 mA the fan will run on Minimum Fan speed. At 20 mA the fan will run at Maximum Fan Speed.
- **On/Off control**, when the option On/Off control is selected, the fan speed depends on the fan Slope control parameter: When slope control is off (parameter set to zero), the fan speed will immediately go to maximum. Otherwise the fan speed will rise from Ignition Fan speed to Maximum Fan speed with (value)*50 RPM/sec. Slope control works for both increasing and decreasing of fan speed.

2.4.2.1 Burner Program



NOTE: The Control can be reset by depressing the internal/external reset button

3 Installation

3.1 General Installation Information



WARNING

The burner **MUST** be installed by competent personnel such as a Gas safe/ACS registered gas installer in compliance with **ALL** current local Regulations, including any National or International Standards that may apply and according to the manufacturer's instructions as detailed in this manual.

CAUTION

The burners are of the pre-mix type and must be installed in a purpose-designed room with sufficient ventilation openings to comply with the current local Regulations, including any National or International Standards that may apply.

Please ensure the opening in the appliance front is large enough to prevent damage to any of the burner parts during fitting.

IF YOU SUSPECT THE BURNER IS DAMAGED, DO NOT USE. You must report any damage to your supplier immediately and seek further advice.

Before connecting the burner, make sure that the burner rating matches the appliance requirements and that both gas and electrical services are adequately rated.

CAUTION

The Maximum operating conditions for the Gas Valve and Electronic Control are 60°C and 90% RH at 40°C non-condensing

SAFETY INSTRUCTIONS

All packing materials should be stored or disposed of with care, as they may prove harmful to children, animals and the environment.

NOTICE

The manufacturer cannot be held liable for injury to people and animals, or damage to property as a result of improper installation.



WARNING

During installation, the burner **MUST** be firmly secured to the appliance using the burner mounting gasket supplied.

The burner **MUST** be connected to an adequately sized gas supply.

The pipe work **MUST** ensure the minimum required dynamic gas supply pressure is achieved when all appliances are operating.

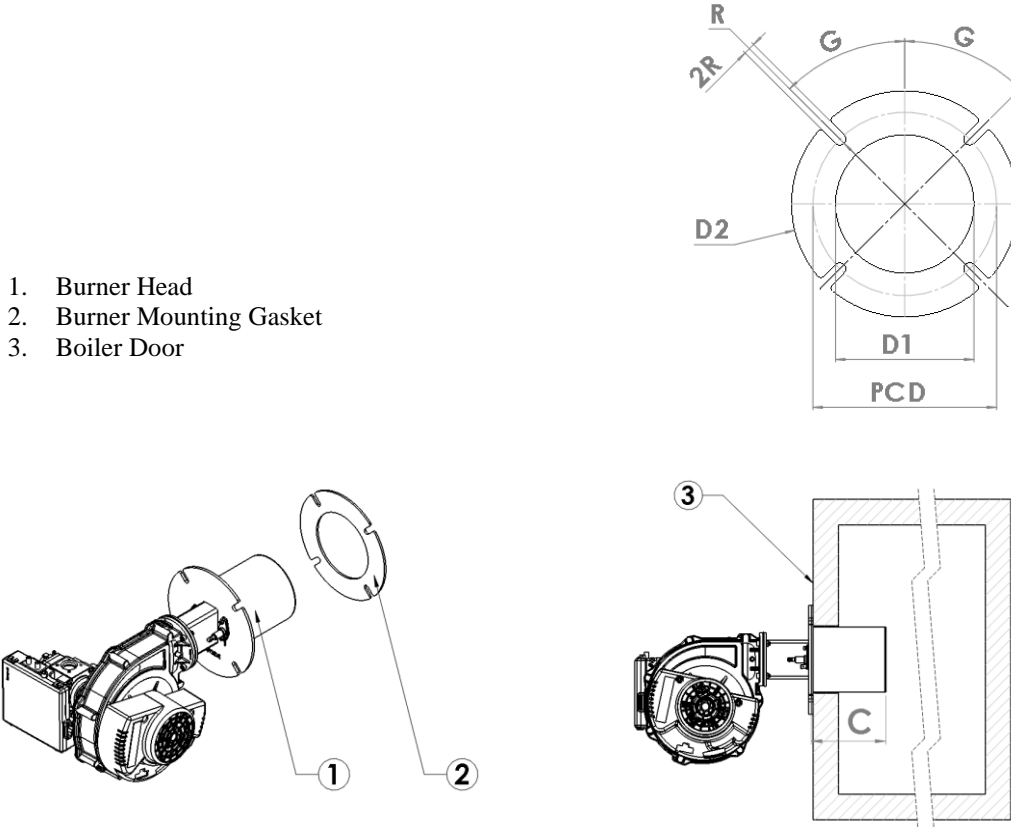
The gas supply **MUST** have an approved isolation valve adjacent to the burner and appropriate means of disconnection for removal of the burner for service and repair.

The electrical supply to the burner **MUST** have a suitable electrical isolation switch. This is required to have a contact separation of at least 3mm in all poles. The burner **MUST** be adequately earthed and installed as required by the current local Safety and Electrical Regulations, and any National or International Standards that apply.

3.2 Burner Mounting

To mount the burner, suitable mounting studs or threads for bolts need to be provided for the burner Mounting Plate. Appropriate dimensions are shown below. When installing the burner, please be sure to use the gasket provided for sealing and insulating between the Mounting Plate and the bearing wall of the appliance.

3.2.1 Standard Burner Mounting Detail



1. Burner Head
2. Burner Mounting Gasket
3. Boiler Door

MODEL	C	D1	D2	G	PCD	R	2R
	mm	mm	mm	deg.	mm	mm	mm
Inverterjet 30M/L	88	101.6	170	45°	Ø 138	4.5	9
Inverterjet 30M/N	88	101.6	170	45°	Ø 138	4.5	9
Inverterjet 50M/L	88	101.6	170	45°	Ø 138	4.5	9
Inverterjet 50M/N	88	101.6	170	45°	Ø 138	4.5	9
Inverterjet 90M/L	118	101.6	170	45°	Ø 138	4.5	9
Inverterjet 90M/N	118	101.6	170	45°	Ø 138	4.5	9

CAUTION

If the appliance is of the 'Reverse Flame' type, we strongly recommend that high temperature ceramic insulation is used to back fill between the burner head and appliance door front to prevent overheating around the burner mounting plate. A dedicated mounting plate can be provided upon request.

3.3 Gas Installation



WARNING

Before commencing the installation, ensure that the gas supply is turned off and that all electrical supplies to the burner are also disconnected.

When connecting a pipe to the Gas Valve inlet always use a sound taper fitting with thread according to ISO 7-1 or a piece of new, properly reamed pipe, free from swarf, dirt or debris.

The burner **MUST** be connected to an adequately sized gas supply. The pipe work must ensure the minimum required dynamic gas supply pressure is achieved when all appliances are operating.

The gas supply **MUST** have an approved isolation valve adjacent to the burner and appropriate means of disconnection for removal of the burner for service and repair.

To Install the Gas supply to the Burner, follow the instruction bellow:

1. Remove the seal in front of the Gas connection flange at the rear of the burner
2. Check the thread on the flange and ensure that there is no debris in the threads
3. Connect the corresponding gas pipe/fittings to the Gas connection flange in the Burner.
4. Tighten the gas pipe/fittings and the Gas connection flange securely, ensuring that there is no possibility for gas leakage.

CAUTION

DO NOT over-tighten gas pipe/ fittings on to the burner as this can cause damage and may affect the gas soundness of the burner.

ALWAYS clean off excess pipe thread cutting oil from gas pipe work before connection to the gas valve. Thread cutting oil will damage the gas valve and will void the warranty supplied with the burner.

ALL gas pipe work installations/ connections to the burner **MUST** be purged and tested for gas soundness by suitably qualified personnel such as a Gas safe/ACS Registered Engineer and **MUST** comply with all Local and National Standards and Regulations before the burner is operated.

3.4 Electrical Installation



WARNING

Suitably qualified and competent personnel must carry out the electrical installation.

Before commencing the installation, ensure that all electrical supplies to the burner are disconnected and that the gas supply is turned **OFF**.

A means of disconnection from the supply having a separation of at least 3mm in all poles **MUST** be provided.

The electrical wiring diagram for the Burners are shown in the following page.

CAUTION

The burner **MUST** be connected as shown on the burner wiring diagram and **NOT** as shown on any other wiring diagrams.

NOTICE

You **MUST** always comply with the basic safety and electrical regulations that are in force when carrying out the electrical installation of the burner. This includes Statutory Regulations and National and International Standards where they apply.

3.5 Basic Electrical Safety



WARNING

Do not allow children or inexperienced people to use the burner.

Do not touch the burner with any wet or damp parts of the body.

Do not pull or strain electrical cables.

Do not leave the burner exposed to the weather unless expressly required to do so.

The burner must be adequately earthed and installed as required by current safety and electrical regulations. Earthing must not be made to any gas carrying components.

Ensure the supply input cable is adequate for the power demand of the burner.

The use of adaptors, multiple outlet or extension cables to connect the burner to the electrical supply is **NOT** permitted.

The burner input cable must not be replaced by the user. In case of damage to the cable, isolate the burner and contact suitably qualified personnel to perform the replacement.

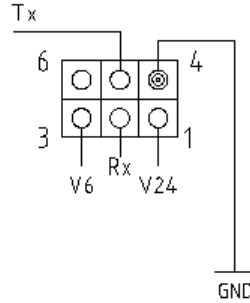
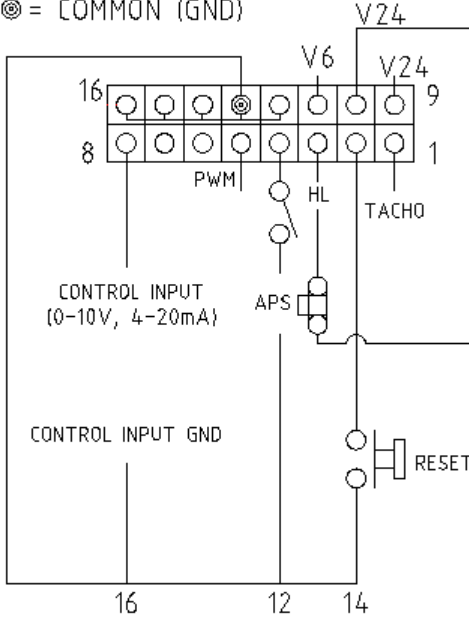
3.5.1 Burner Wiring Diagrams – Inverterjet M Series

X3 Microfit

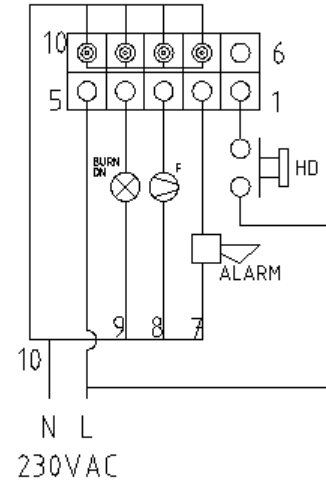
***X2 Communication
(see note)**

X1 Minifit

⊙ = COMMON (GND)



⊙ = COMMON (NEUTRAL)



-016A

NOTE:

In the diagram shown, the **X1 Minifit** connector contains the High Voltage (230VAC) connections, and the **X3 Microfit** connector contains the safety extra low voltage connections.

X2 Microfit connector is used for communication via a dedicated Windows based PC software and USB lead (Please contact Burnertech for more information).

An Earth must be connected to the 6.3mm spade connector on the gas valve, not to signal ground on X3

HL must be normally closed for the control to operate, if a Hi Limit stat is not used, then a link must be fitted between **X3.3** and **X3.10**.

Heat demand is given by 230VAC input.

*For use with dedicated Windows based **USB** interface, please contact Burnertech for more information about this option

4 Commissioning

NOTICE

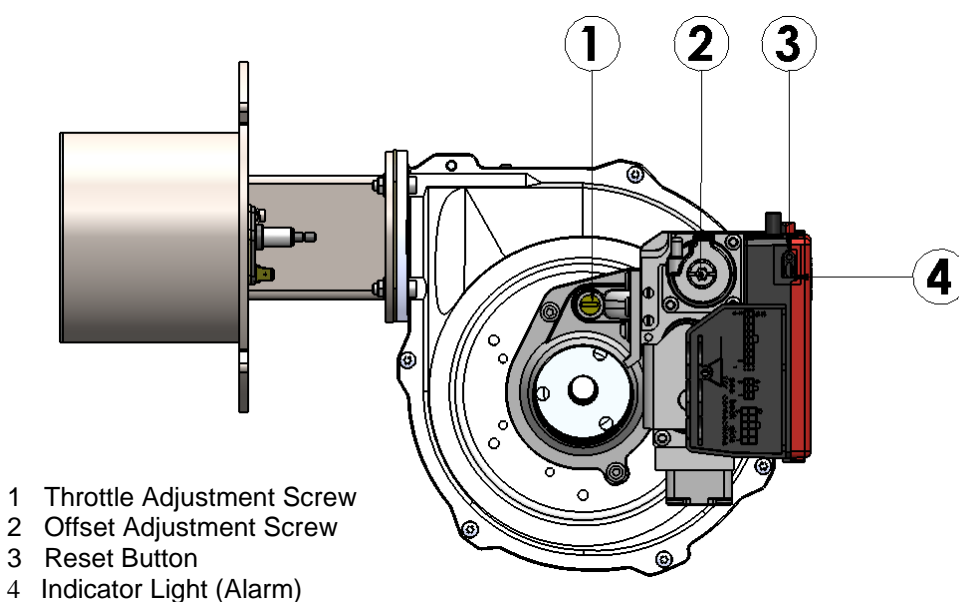
All Inverterjet premix burners are test fired in the factory prior to despatch to the customer. Whenever possible, Burnertech prefer to pre-set the maximum and minimum fan speed to assist the commissioning process

In order to ensure maximum product reliability, we advise and request that a Burnertech approved engineer conduct the 1st burner commissioning. Failure to comply with this requirement may result to inappropriate burner setting which can lead to damage to property and injuries to personnel.

4.1 Commissioning procedure

To start the commissioning procedure, follow the steps below:

1. Connect a Manometer to the gas inlet pressure test nipple on the burner gas inlet connection.
2. Locate CO/CO₂ combustion analyser into flue pipe as close as possible to the appliance outlet.
3. Confirm and record that adequate ventilation is available for the safe operation of the burners.
4. Establish that the system pipe work is complete, fully purged and adequate system load and circulation exists to facilitate firing of the burners.
5. Turn 'On' the gas supply and ensure adequate static gas pressure is available at the burner inlet.
6. Locate the position of the Throttle adjustment screw (High rate throttle adjuster)
7. Locate the position of the Offset adjustment screw (Low rate offset adjuster).



4.1.1 Turning on the Burner



WARNING

FIRE AND/OR EXPLOSION HAZARD

DO NOT Ignite the Burner until all supply and Installation checks have been made and the test equipment is ready and connected in order to conduct the commissioning procedure.

Turn 'On' the main electrical supply and turn on the burner demand interlock/switch. The burner fan will start and pre-purge. The burner Control will then drive the fan to a pre-set ignition speed. The ignition spark is generated at this point and the Burner will ignite. The 0-10V temperature control (if used) will then modulate the Burner to the desired fan speed (output).

4.1.2 Commissioning operation

NOTE: During the burner commissioning, the maximum and minimum fan speeds can be adjusted if required. The fan speed can be adjusted using the dedicated PC software.

Adjustment of the ignition speed is not recommended as this may affect the reliability of operation and can only be done using the dedicated PC software.

Since the inverterjet can be used in a multitude of different applications, then the CO₂ should be adjusted to suit the application to which the burner is fitted.

4.1.2.1 Maximum rate CO₂

The maximum CO₂ may be adjusted by use of the throttle screw. turning clockwise decreases the value and anti-clockwise will increase the value.

- 8 Adjust the burner output to high fire by increasing the fan speed
- 9 Measure the flue CO₂ level and adjust the throttle screw to bring the level to between 9 and 9.5%.

CAUTION

Generally, the CO₂ should not normally exceed 9.5% on NG or 11% on LPG. We recommend that the operating CO₂ is between 0% to +0.5 % higher at maximum fan speed than at minimum.

4.1.2.2 Minimum rate CO₂

Minimum CO₂ should be adjusted using the offset adjustment screw.

Remove the T40 Torx cap (if present) and turn the screw anti-clockwise to decrease the CO₂ and clockwise to increase the CO₂. This adjustment should ideally be made with the use of a micromanometer to help ensure that it is set accurately as this is a sensitive adjustment

- 10 Adjust the burner output to low fire.
- 11 adjust the offset adjustment screw (4) to bring the CO₂ level to between 8.5 and 9%.
- 12 Changing the high fire setting will affect the low setting but changing the low setting will have minimal effect on the high setting. It may therefore be necessary to repeat step 9 to 12 several times in order to achieve the acceptable level of CO₂ at both firing rates.
- 13 Analyse the flue products on both high and low fire. In both cases, ensure that all readings (CO₂, CO and O₂) are within acceptable figures.

4.1.2.3 Burner Heat Input

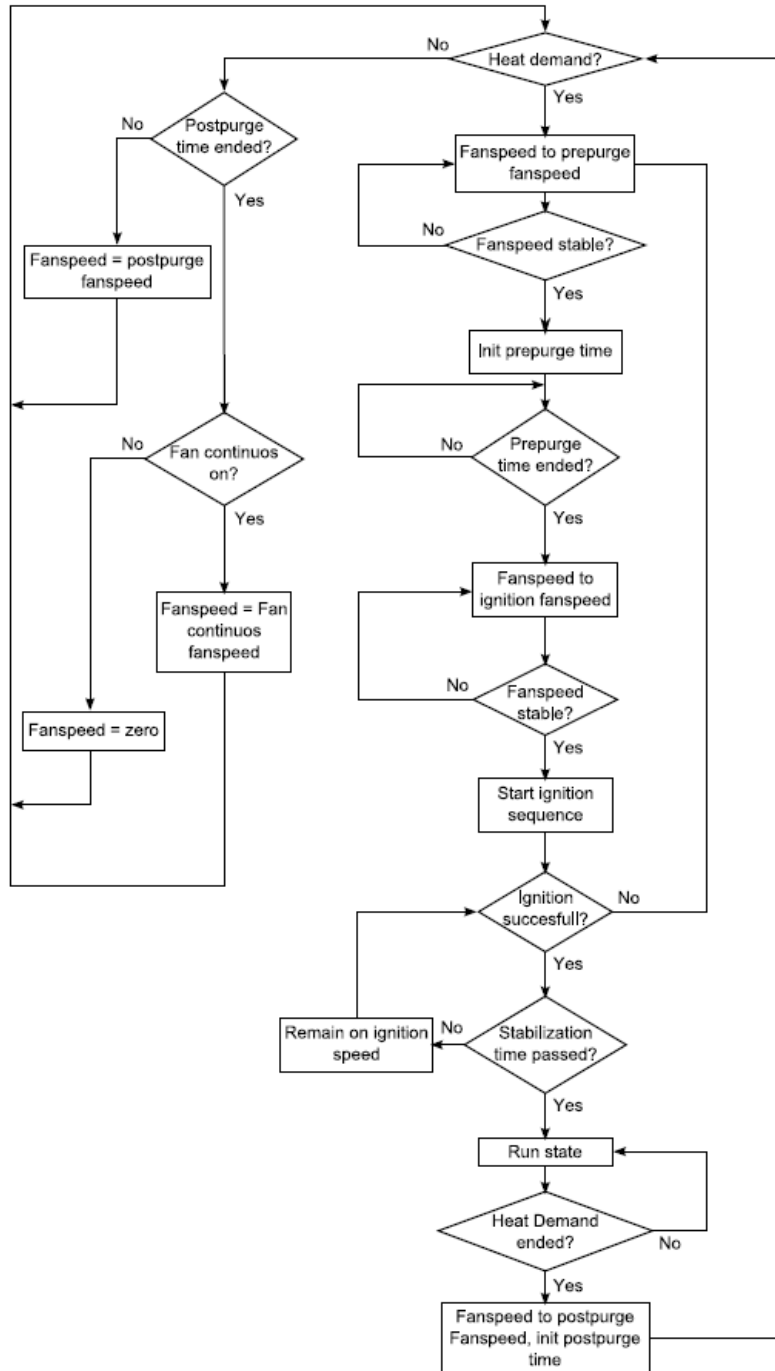
- 14 With an appropriate gas meter, conduct a heat input measurement whilst operating at maximum rate. Ensure the rate is within $\pm 5\%$ of that required for the appliance. If the heat input is outside the required $\pm 5\%$ tolerance, adjust the fan speed until a satisfactory input is achieved.
- 15 Record all combustion input and working gas pressures and return the burner to normal run condition.

4.1.2.4 Burner Sequence

The following flowchart (Fan speed control flowchart) shows how the fan speed is controlled during a complete burner sequence. The basic states are:

- Stand-by, fan is off or at Continuous Fan speed when this option is selected;
- Pre-purge;
- Ignition;
- Run state, fan speed is controlled by modulation input, see section “Normal heating mode”.
- Post purge.

The desired fan speed in Continuous and Ignition mode can be independently programmed.



Flow chart – Burner sequence

4.1.3 Test Mode

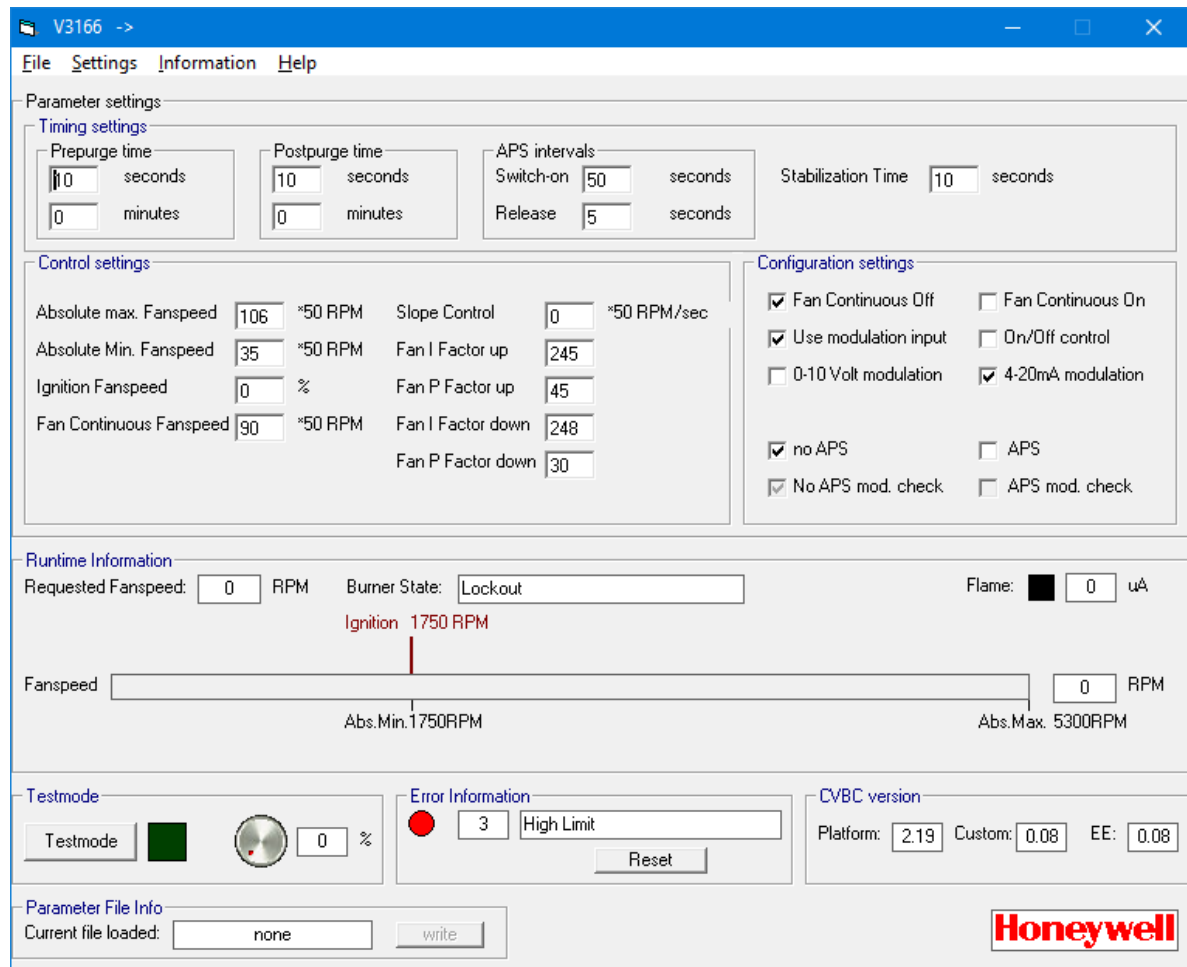
The test mode can be used to manually control the burner with external communication.

4.1.3.1 PC USB Interface

If required, a windows-based software along with a dedicated USB cable and driver is available to enable programming of certain parameters in the control and also to read fault codes, etc.

NOTE: Please contact Burnertech for more information relating to this option.

An example screenshot is shown below.



5 User Instructions

5.1 Limitations on use of Burner



CAUTION

The burner **MUST** not be operated before a suitably qualified Burnertech Approved Engineer has conducted a 1st Commissioning. Failure to comply with this requirement may result to improper burner settings which can lead to damage to property and injuries to personnel

The burner **MUST** only be operated when installed into an appliance connected to a suitable flue system. All other uses are improper and therefore dangerous.

The burner **MUST** be electrically connected as described and shown in this manual. The regulating and safety equipment of the burner and associated appliance, which ensure the safe and proper operation of the burner, are of great importance.

CAUTION

Burnertech recommend a 12-month Service Interval for the burner.

If the appliance is of the **Reverse flame** type, we **strongly** recommend that high temperature ceramic insulation is used to back fill between the burner head and door of the appliance.

On-Site' modification of burner components or internal wiring is **strictly forbidden**.

Never dismantle any part of the burner or installation unless professionally qualified to do so. Improper handling can lead to damage of the burner.

The burners are not suitable for dusty process applications without prior modification by Burnertech and/or air filter protection.

DO NOT operate the burner in dusty environments for long periods of time or whilst sweeping the boiler plant room. Dust ingress can cause blocking of the burner combustion head leading to reduced heat input and a significant increase in the chance of premature burner failure.

CAUTION

The Maximum operating conditions for the Gas Valve and Electronic Control are 60°C and 90% RH at 40°C non-condensing

5.2 Using the Burner

The controller has the following modes of operation (from lowest to highest priority)

MODES	DESCRIPTION
STAND-BY MODE	When there is no heat demand and error present
HEATING MODE	Activated when high voltage heat demand is given.
TEST MODE	Activated when external test mode heat demand is given
ERROR / FAULT	Any violation of (programmable) limits (and/or internal thermostat functions) will lead to an error/fault or blocking condition.

5.2.1 Start up

After power On, manual reset each 12/24 hours, the control will perform its start up routine. 12/24 hour reset depends whether a head demand is present. When no heat demand is present, the control will perform a reset 12 hours after the last one. When a heat demand is present, the control will wait a maximum of 24 hours to perform the reset.

5.2.2 Stand-by Mode

In Stand-by mode igniter is off, gas valve is closed, and fan is off if fan overrun time is finished and Continuous Fan speed option is switched off.

5.2.3 Heating Mode

The normal heating mode is started when a high voltage heat demand input is closed. When ignition is successful, the fan can be controlled between maximum in the following ways depending on parameter setting:

- 0 – 10 Volt Control
- 4 – 20 mA Control
- On/Off Control

5.2.4 Burner operation

Turn 'On' the main electrical supply and turn on the burner demand interlock/switch. The burner fan will start and pre-purge. The burner Control will then drive the fan to a pre-set ignition speed. The ignition spark is generated at this point and the Burner will ignite.

If satisfactory ignition takes place, the burner will remain alight and the fan speed will modulate in response to the modulation signal input.

If however satisfactory ignition does not take place, the burner will go through '**Post-purge**' and '**Pre-purge**' before re-attempting '**Ignition**'.

This re-cycling will take place three times (depending on the settings) before the burner will enter a Lock-Out condition which will require manual reset by the user by depressing the **Reset** button to restart the burner ignition sequence.

NOTE: The maximum number of remote resets in one hour is five
--

6 Servicing

NOTICE

We recommend that a Bumertech Approved Engineer, who will have the specific product knowledge and genuine spare parts carry out service and repair operations to ensure continued reliability of the burner system.

A suitably qualified and competent engineer such as a Gas safe/ACS Registered Installer must carry out all the maintenance operations discussed in this section at least once a year. In the case of seasonal servicing, it is recommended that the service operations be carried out at the end of each heating season. In the case of continuous operation, the service operations should be carried out every six months.



WARNING

Isolate all gas and electrical supply before carrying out any service or repair on the burner.

Before removing the burner from the appliance:

1. Ensure you have a replacement burner mounting gasket for re-fitting the burner afterwards.
2. Prepare an appropriately sized and relatively clean and tidy work area to conduct the maintenance operation.

6.1 Service Inspection

Isolate and disconnect both the gas and electrical supplies from the burner. Supporting the weight of the burner, carefully remove the fixings securing it to the appliance and withdraw it from the chamber.

6.1.1 The condition of the burner head

Some discolouration of the burner material is normal, but the material should not be cracked or open. Under no circumstances should any of the perforated holes in the burner tube beneath the material be visible. Inspect the flange of the burner for any signs of cracking or severe overheating, which may indicate leakage.

Any serious burner head defect would constitute an **'Immediate Danger'** and the burner system **SHOULD NOT** be put back into operation until adequately repaired.

6.1.2 The condition of the electrodes

Check the ceramics are not cracked or damaged and check that the wire head is still approximately 4mm gap between the Ignition electrode and the burner surface.

NOTICE

The electrode wires are manufactured from a special metal specifically designed to remove the need for cleaning and withstand very high operating temperatures without movement. However, this special metal can become brittle.

DO NOT clean the electrodes and if adjustment is required always try and adjust the wires near to the ceramic and preferably using a blowtorch to pre-heat the wire.

6.1.3 The condition of the electrical circuits

Check the condition and integrity of the internal burner wiring harness and plugs, ensuring that all connections are secure. Check that both the ignition and detection leads are in good condition.

6.2 Service operation



WARNING

To commence a service operation of the burner, the gas and electrical supply must be turned off and completely isolated from the burner.

Burner head

The burner head should be examined carefully for cracks and/or damage. If there are signs that there has been over heating of the material or dust on the burner face, the burner head must be removed from the burner. Close examination of the silver foil at the rear of the inside of the burner head should be done and if all is okay, the inside of the Inverterjet burner head should be blown out using compressed air.

If the inside of the burner head is found to be severely blocked with dust and dirt please examine the burner material more closely. It is likely that the burner head material will have overheated due to the blockage and will be blackened in appearance and may need replacing. If so, the customer must be advised to protect the burner from dust ingress and/or increase the service intervals.

CAUTION

CAUTION Do not use abrasive brushes on the burner combustion head

Electrodes

Inspect the ignition and flame electrodes, if extensive signs of damage are detected, they must then be removed and replaced.

Fan

The fan is not a serviceable component. Simply ensure it is positively secured and sealed. The gasket material, electrical plug connections and cover must be secure and in good condition. The fan case has gas tight seals and the fan casing must never be opened. Due to the 1:1 gas/ air ratio operating principle of the burner a reduction in fan performance (i.e. dust build up) will not result in unsafe burner performance.

The gas flow is directly proportional to the air flow therefore any reduction in fan flow would simply result in a gradual reduction of the appliance heat input.

Venturi Unit

Examine and clean the Venturi unit checking that it is securely attached, and that any gasket is in good condition. Ensure that any Air Pressure Sensing point is secure and unobstructed (if fitted).

Cleaning: Using a cloth, soft brush and vacuum, carefully remove any dust and grime from the whole burner assembly taking care not to disturb electrical connections.



DANGER

NEVER use water on or around any of the burner electrical connections.

6.2.1 Re-assembly

Using a new replacement gasket, carefully and securely slide it to the burner head up until the gasket and the mounting plate are in contact. Carefully refit the burner system into the appliance combustion chamber and secure using the fixings.

Re-connect gas and electrical connections.

Check for gas soundness as detailed by Local, National Standards and Regulations and turn 'ON' the Gas and Electrical supplies.

Finally check and record the combustion and ventilation performance of the burner. Check the basic operation/control of appliance before restoring automatic control to any Boiler Management System (if applicable).

6.3 Fault Finding

6.3.1 Lockouts/Blockings

Several checks are included to protect the boiler and its environment. High limit switch is constantly monitored, safety times are constantly compared etc.

Any violation of (programmable) limits (and/or internal thermostat functions) will lead to an error/fault or warning condition. The fan will not operate if there is a lockout or blocking condition.

6.3.1.1 Lock-out reset

Severe error will cause a lockout condition which can be cleared by pressing the reset button on the control. In case of lockout and blocking conditions, Fan will not operate. Blocking error will be resolved automatically if the cause of the error disappeared.

Error codes / Faults can be divided in two groups:

- Lock-out condition codes
- Blocking condition codes

Complete list of errors of the controller is given in the following table:

NOTE: The Error / Fault codes are visible only through a PC interface

ERROR CODE	DESCRIPTION	CAUSE AND POSSIBLE SOLUTION
LOCK-OUT ERRORS		
01	Flame lockout after several ignition trials	Lockout signal after no flame and all ignition trials are expired. This error condition is stopping the boiler from running. To get to the normal operation again, manual/remote reset is required. By using the local reset key, number of resets are not limited. However, all remote resets (communication) are limited to 5 resets per hour.
02	False Flame Indication	Error is created if flame current is detected in illegal situations (no heat demand currently present, gas valve closed, safety time passed). This error condition requires manual reset action.
03	High Limit error	High Limit error is created if the safety cut-off switch opens due to an overheat situation in the application,
04	APS related Errors	If the APS is configured and the APS does not open or close within the configured time limits Error 4 is generated. If the APS is not configured but an APS switch is detected on the input Error 4 is also generated.
05	Fan Tacho signal error	If the measured fan speed is not within 900 RPM of the requested fan speed in 20 seconds, error will be generated
08	Flame circuit error	During normal operation of the ignition controller, flame circuit is regularly checked. This check has predictable behaviour and several steps. If check fails, error 8 will be set.
09	Gas valve driver circuit error	During normal operation of the ignition controller, valve drive circuit is regularly checked. This check has predictable behaviour and several steps. If check fails, error 9 will be set.
13	Remote reset lockout (volatile)	All remote resets (communication) are limited to 5 resets per hour. If the limit is exceeded, Volatile lockout error is set; the error disappears after power off/on the boiler.
21	ADC error	Internal controller error.
25	CRC error	Matching error on CRC codes (different software versions).
BLOCKING ERROR		
34	Low Mains Voltage	Low Mains voltage (less than 150 +/- 10 VAC) will trigger this error. When Mains brought back (VAC), error is resolved in 10 seconds.



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