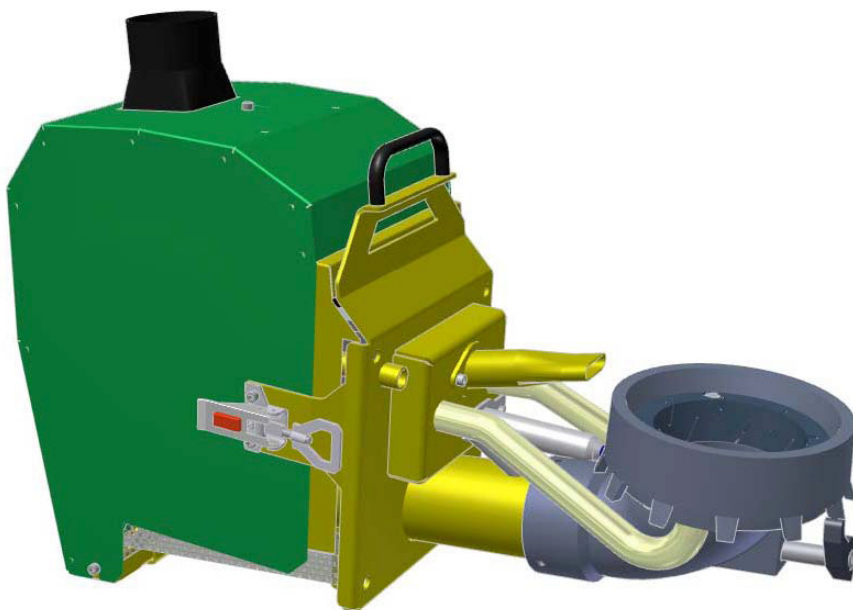




Operation and Maintenance of the BioLine 20/25



Keep this manual
in a safe place where it is easily accessible for
future use.

Read this manual carefully before starting to
operate your Ecotec pellet burner system.

The output of the pellet burner is calculated on the
basis of the maximum quantity of pellets which can be
fed in and burnt in the combustion bowl. (This refers to
the combustion of normal wood pellets with the aver-
age values from our fuel specification.)

If you need a higher output of between 25 and 300 kW,
please contact Ecotec Sweden AB.

IMPORTANT!

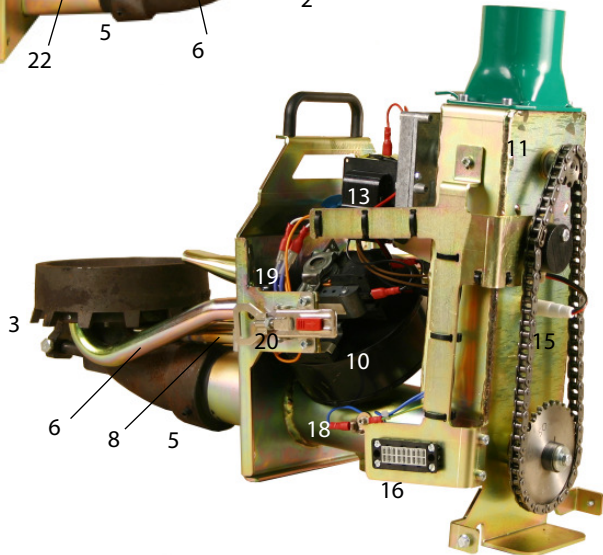
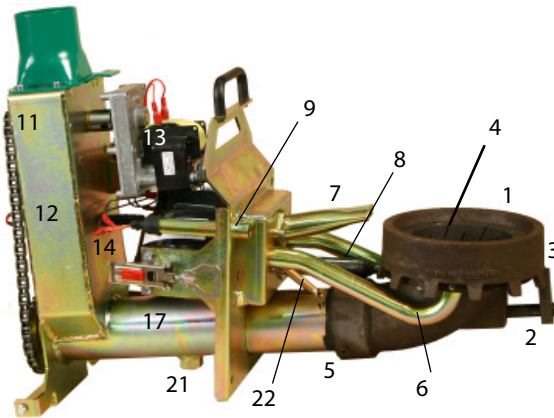
The green protective hood over the burner and the cover
of the control unit must not be removed unless the power supply
(main electricity) to the system has been disconnected.

The warranty is valid only if the product is installed by an authorised
Ecotec Sweden distributor.

FOLLOW THE INSTRUCTIONS IN THE MANUAL CAREFULLY AND
CARRY OUT SERVICING AND MAINTENANCE AS RECOMMENDED.

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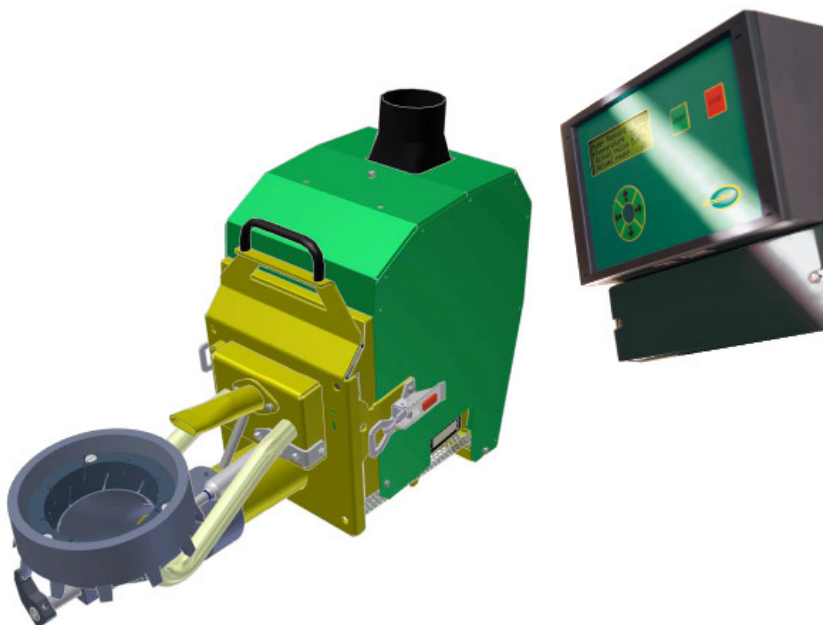


- | | | | |
|----|-------------------------------------|----|-----------------------------------|
| 1 | Combustion bowl | 11 | Sluice feeder |
| 2 | Rotating arm | 12 | Internal fuel store |
| 3 | Cog wheel | 13 | Drive motor |
| 4 | Primary ring | 14 | Level sensor (receiver), black |
| 5 | Stop screws for the combustion bowl | 15 | Level sensor (transmitter), white |
| 6 | Primary vent pipe | 16 | Connector |
| 7 | Secondary vent pipe | 17 | Feed auger |
| 8 | Hot-air ignition | 18 | Thermal contact |
| 9 | Optical sensor | 19 | Microswitch |
| 10 | Combustion fan | 20 | Quick release fastener |
| | | 21 | Swinging arm mount |
| | | 22 | Tube for counterpressure |



3006 control box

- | | |
|---|--|
| 1 Start button | 6 Maximum thermostat cable input |
| 2 Stop button | 7 Unused input |
| 3 Display | 8 Input/output for multicore cable to the burner |
| 4 Control buttons for operating the display | 9 Power input 230/240 VAC |
| 5 Operating thermostat cable input | 10 External feed output |
| | 11 Cover for Terminal block |



BURNING PELLETS

Burning pellets in Ecotec's pellet burner is a very similar process to burning oil. Pellet burners need very little more maintenance than oil burners. We recommend carrying out maintenance, such as removing the soot from the boiler, to ensure that the system functions as efficiently as possible.

The Ecotec pellet burner comes as standard with an automatic ignition system, but it can always be lit manually.

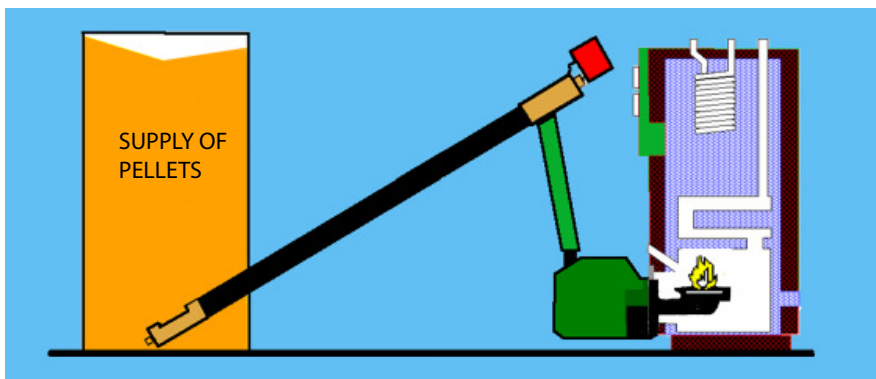
FULLY AUTOMATIC

The burner and the accompanying feed system operate fully automatically. The burner is controlled by its own thermostat.

A preset oxygen function with primary and secondary air supplies ensures the complete combustion of the pellets which is both cost-effective and environmentally friendly.

The burner's control unit is pre-programmed to work within a specified output range. The engineer who installs the burner can adjust the output range to suit the system in question. The engineer or the operator can adjust the fuel feed to match the energy value of the current fuel in order to ensure the best possible combustion in the boiler.

The burner is automatically fed with pellets from the external fuel store by a feed system which is adjusted and controlled by the burner's control unit.



FEED SYSTEM

The feed system is based on the safety principle of an interrupted flow of fuel with a free fall (in the hose) between the external feed and the burner.

NOTE: THE ECOTEC BURNER MUST NOT BE USED WITH FEED SYSTEMS OTHER THAN ORIGINAL ECOTEC FEED SYSTEMS.

NOTE: Do not switch off the main power supply until you are ready to carry out the maintenance.

In order to ensure that the burner operates safely and without problems, the following measures must be taken and checks made every time the ash is emptied or at least once a month, if you do not yet have experience of the necessary maintenance intervals.

More about maintenance on page 18

As an optional accessory is a metal ash collector that connects to a standard vacuum cleaner.

EMPTYING THE ASH

All systems which burn solid fuel, even automatic systems like the Ecotec pellet burners, require maintenance and servicing. The majority of the maintenance depends on the type and quality of the fuel. This is illustrated by the comparison below. Good quality pellets contain no more than 0.5% ash. As a result the ash will need to be emptied at 3 or 4 week intervals, depending on the type of boiler. Using pellets with a 2% ash content will result in the ash needing to be emptied at least once a week under the same conditions.

NOTE: ALWAYS TAKE CARE WHEN HANDLING THE ASH, AS THE EMBERS CAN REMAIN HOT FOR A LONG PERIOD.

Control system

The functioning of the burner is controlled and monitored by the accompanying control system. The following pages in the manual describe the options for adjusting the burner settings which are available to users. If you are not sure about how to use the control system or if a specific setting is not available, contact your distributor.

NOTE: When the control system starts up, the processor is always disconnected for about 180 seconds.

If you want to bypass the countdown, press the Stop button once.

You can change the parameters in the control system using its menu options.



Button	Description
	Used to start the burner.
	Used to stop the burner.
	Used to move up through a menu and to change a parameter to a higher value. Deletes information messages, such as alarms.
	Used to move down through a menu and to change a parameter to a lower value.
	Used to select a submenu or a parameter and to confirm the changed value.
	Used to return to a previous menu. Used when changing a parameter value to go back without changing the value.

In the menus, the cursor ► is used to indicate which command line can be changed. When a parameter can be changed, the cursor switches from ► to ▷

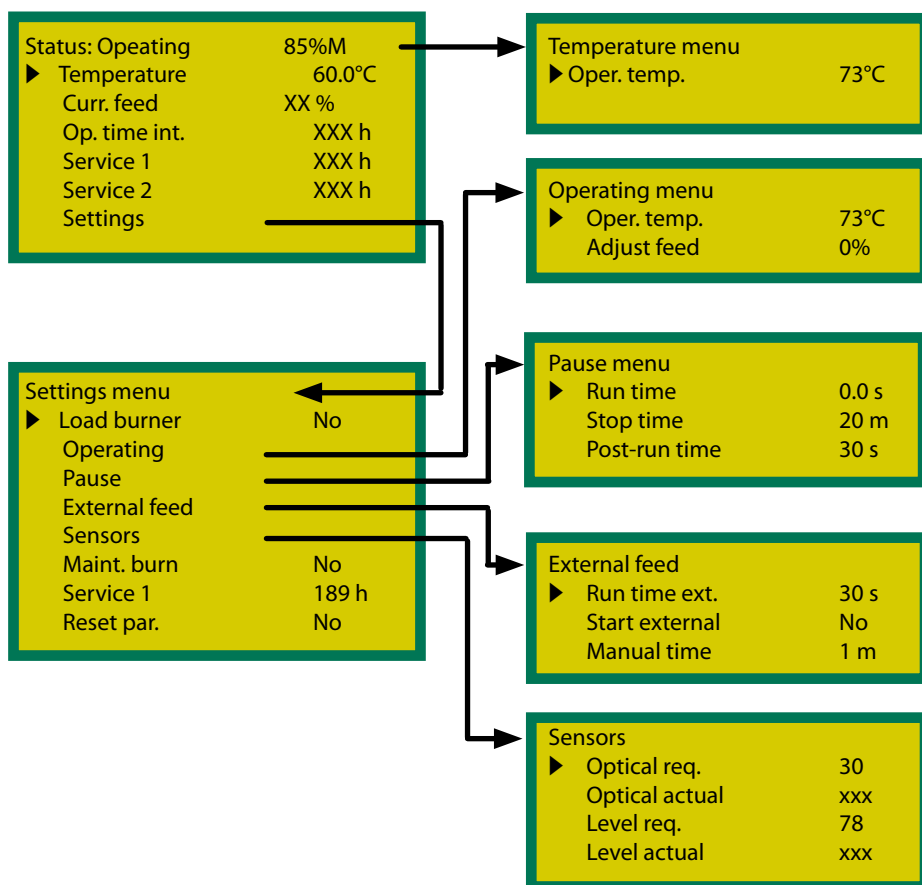
To confirm a value that you have entered/changed, press 

To go back/undo what you have changed, press 

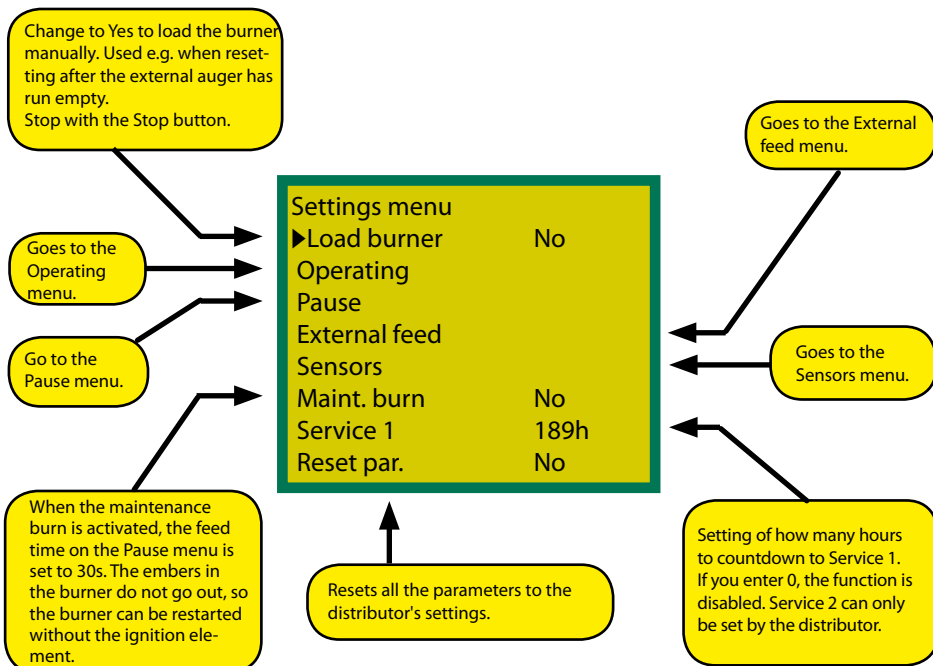
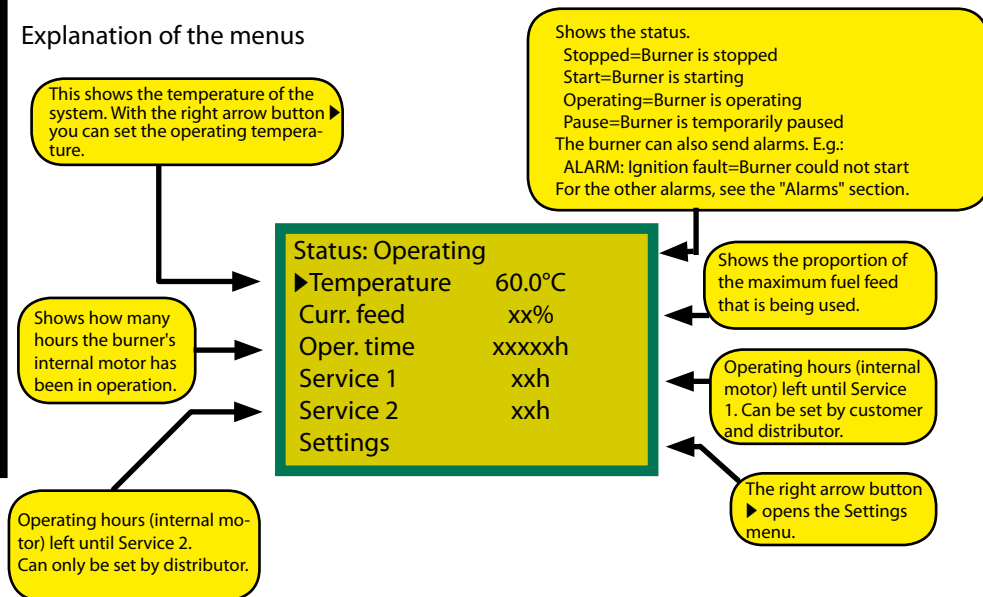
The control system can be in one of the following modes: Start, Operating, Pause or Stopped.

When the output control is activated, "Operating" appears on the top line of the display. In fixed output mode, the display shows "Man. oper."

Menu structure



Explanation of the menus



Temperature menu

► Oper. temp. 73°C

Shows the water temperature which the burner tries to maintain.

Operating menu

► Oper. temp. 73°C
Adjust feed 0%

Shows the water temperature which the burner tries to maintain.

Adjusts the feed relative to the distributor's setting. If the parameter is set to 10%, 10% more fuel than the basic setting will be fed in.

Pause menu

► Run time 0.0s
Stop time 20m
Post-run time 30s

Shows how long the burner will run between each stop time. If the value is 0, the burner will go out completely and must then be started with the ignition element or manually.

Shows the time between each feed in pause mode.

Shows how long the fan will run after the feed has stopped.

External feed

► Run time ext. 30s
Start external No
Manual time 1m

Shows how long the external motor will run each time the internal fuel store is emptied.

Starts the external feed without the burner operating. Only the external feed runs.

Shows how long before the external feed will run, if it is started as shown above.

Sensors

► Optical req. 30
Optical actual XXX
Level req. 78
Level actual XXX

The value which the optical sensor must exceed for the burner to identify that the pellets are burning.

A low value means that no light is reaching the receiver. (There are pellets in the burner). A value greater than 94 means that the burner is emitting light. (There are no pellets.)

Shows the value that the optical sensor records when it detects the flames. During operation this will rise above 300.

Shows the value that the level sensor must exceed for the system to identify that the store is empty.

DESCRIPTION OF THE BURNER'S NORMAL IGNITION, OPERATING AND SHUTDOWN SEQUENCE

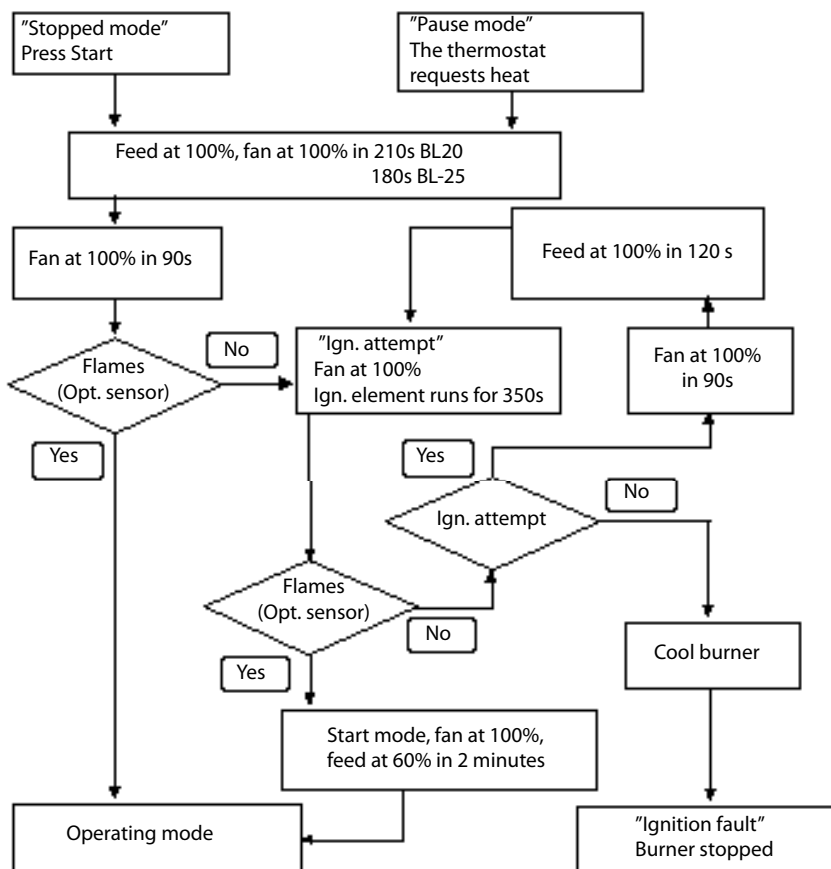
Loading the burner

If the burner is completely empty, it must be loaded with fuel before you can start it. The simplest way of doing this is to select "Load burner" (see the menu structure). This function runs the feed continuously until the level sensor indicates that fuel has reached the burner.

There is also the option of running only the external auger, using the function "Start external". In this mode you have to stop the filling process manually to ensure that the hose to the burner is not overfilled.

Starting the burner

When the burner is loaded, you can start it by pressing the Start button. The burner goes through the start sequence shown below. Note that the burner is constantly monitoring to see whether the pellets are burning and will move directly to "Operating" or "Start" mode when this is possible.



Operating the burner

When the burner is operating, there are two different modes available. You can run the burner in manual mode, which means that the distributor manually sets both the fuel feed and the fan speed to achieve the most efficient combustion. This mode is indicated by the text "Man. oper." on the display. The second mode involves using output control. In this mode the distributor sets an upper and a lower limit for the system to operate between. The burner then adjusts the output itself depending on the demand. This mode is indicated by the text "Operating" on the display.

Pausing the burner

When the burner has reached a heat slightly above working temperature (standard plus 6 degrees), the burner switches from operating to pause mode. When the temperature then falls slightly below working temperature (standard minus 2 degrees), the boiler restarts. Pause mode is indicated by the text "Pause" on the display.

Stopping the burner

To stop the burner, press the Stop button once. The fuel feed will stop and the fan will run for a while in order to burn the contents of the bowl. If you need to stop the fan immediately, press the Stop button again.

Output

The burner's factory setting is to use output control with both the maximum and the minimum output set to 70%. This means in practice that the burner will always operate in the same mode unless the engineer changes the setting. When adjusting the burner's output, the flue gas temperature, amongst other things, must be taken into account. If the output is too low, the flue gases will be too cool and condensation will form in the chimney. If the output is too high, the flue gases will be too hot and as a result the burner will operate less efficiently. The high temperatures can also damage the chimney.

After the burner is installed, some minor adjustments may be needed in order to compensate for variations in the fuel (size, quality). These adjustments are made using the "Adjust feed" parameter. (see page 11). For example, by setting this parameter to -5%, the feed is reduced by 5%, which may be necessary if the fuel has an unusually high energy content.

The table below shows the relationship between the fuel feed and the output. The figures relate to the output entered and are calculated on the basis of normal quality pellets. The highlighted row corresponds to the factory settings.

Output in kW	Burner fan in %	Feed in %
25	100	86

Output in kW	Burner fan in %	Feed in %
20	100	100
18	90	90
16	80	80
14	70	70
12	60	60



SAFETY

EcoTec pellet burners are designed on the basis of the main principles used for oil-fired heating systems. The advantage of this is that the systems are easy to manage if the positioning of the fuel supply is not restricted by the type of boiler room. From a safety perspective, separating the burner and the fuel supply, together with an interrupted flow of fuel between them, increases safety levels and helps prevent fire spreading in the case of a back burn.

The damage caused by incorrect use or faulty functioning or installation will be restricted to the burner's internal fuel store. The internal fuel store is only filled with a limited quantity of fuel from the external feed system on each occasion. The fuel flows through a sluice which is tight-fitting and synchronised with the internal feed.

A thermal contact directly outside the boiler on the fuel feed pipe will sense the spread of heat up the fuel feed pipe towards the internal store. If this occurs, this fuel is automatically fed into the burner and no more fuel is fed into the internal store.

The burner's control unit is linked to the boiler's maximum thermostat.

If there is a fault in the operating thermostat, the maximum thermostat prevents the boiler from overheating.

The burner is designed to return to normal operating mode after interruptions such as power cuts, fuel problems etc. If the burner cannot restart, this is shown on the display and the burner shuts down.

THE FOLLOWING POINTS MUST ALWAYS BE TAKEN INTO ACCOUNT AND CHECKED

- 1 The main switch must always be switched on.
- 2 The connections between the burner and the external feed system must be correctly fixed in place and sealed.
- 3 The blades of the sluice feeder must not be damaged or discoloured and the seals with the walls of the sluice housing must be intact.

ALARMS

If an operating fault occurs, a message appears on the display. There are eight different alarm messages. Alarm messages can be removed from the display using the up arrow button. There are two hardware-related alarm messages: "Hot boiler" and "Hot stoker".



When the protection is reset, the alarm message disappears.

Alarm message	Description
Safety alarm alt. 1 Hot boiler	The burner has stopped because the maximum thermostat has been triggered. The burner can be restarted using the Start button once the maximum thermostat has been reset. When the maximum thermostat is reset, the alarm message disappears.
Safety alarm alt.2 Error connection	The burner has stopped because the burner and boiler have become separated. The burner can be restarted using the Start button once it has been correctly re-installed. When the sensor has been reset, the alarm message disappears.
Combustion fan	The burner has stopped because the combustion fan has stopped. The burner can be restarted using the Start button once the fault has been rectified.
Hot stoker	The burner has stopped because the thermal contact on the input feed pipe has been triggered. The internal motor runs continuously for 15 minutes. The burner can be restarted using the Start button once the thermal contact has been reset. When the thermal contact is reset, the alarm message disappears.
Min. temp. stop	The burner has stopped because the boiler temperature has dropped below the set minimum value. The burner can be restarted using the Start button. This generally occurs when a new system has been installed and filled with cold water.
Ignition error	Remove the alarm message using the up arrow button. The burner has stopped because a set number of ignition attempts have failed (basic setting = 3 attempts). The burner can be restarted using the Start button once the fault has been rectified. Remove the alarm message using the up arrow button.
Fire burned out	The burner has stopped because the fire has gone out. The burner can be restarted using the Start button. Remove the alarm message using the up arrow button.
Pellets failure	The burner has stopped because the external feed has not supplied any fuel within the specified period. The burner can be restarted using the Start button once fuel has been refilled and supplied to the burner. Remove the alarm message using the up arrow button.
External alarm Thermomotor Safety alarm Store open	NOTE: Optional! (Depends on the settings entered by the distributor.) The burner has stopped because an external unit (e.g. a smoke detector) has been triggered (no contact between 3 and 13). The burner can be restarted using the Start button once the fault has been rectified. Remove the alarm message using the up arrow button.

TROUBLESHOOTING

The majority of the faults that can occur are a direct consequence of poor pellet quality, handling or storage. Therefore you must check your deliveries carefully, preferably before you accept them.

Remember that it is for your safety that the boiler is pre-programmed to stop and send an alarm if it cannot rectify the fault. If a fault occurs, always make a visual check of the combustion bowl and the combustion chamber.

FAULT: No text on the display.

CHECK: That the mains switch is on and that the main fuse in the house fuse box is intact.

ACTION: Switch the mains switch on or replace the faulty fuse in the fuse box.

NOTE: Switch off the mains switch when you replace the fuse. If the fault remains, contact the installation engineer.

Alarm message: * Hot stoker *

CHECK: Whether the resettable thermal contact has triggered.

ACTION: Press the button on the top of the thermal contact. The alarm message will disappear.

ACTION: Replace the blades on the sluice feeder if they are discoloured or misshapen.

ACTION: Check that the flue damper is fully open and that the boiler flues are free of fly ash.

ACTION: Check that the back-draught hatch is not stuck. The underpressure should be between 10 and 20 Pa to allow the burner to operate as efficiently as possible.

Alarm message: *Safety alarm

Alt. 1 Hot boiler*

CHECK: Whether the boiler's maximum thermostat has triggered.

ACTION: Reset the button on the boiler's maximum thermostat and restart the system. A common cause is burning wood in combination with pellets.

Check that there is enough water pressure in the boiler and/or if there is trapped air from the heating circuit in the boiler. Release any air as this also can cause the sensor to say Hot boiler. Replace faulty air vent.

Alarm message: *Safety alarm

Alt. 2 Error connection*

CHECK: Is the burner correctly fitted and is the micro-switch affected by the guide pin in the boilers connection plate

Action: Fit the burner and/or adjust/replace the micro-switch.

Alarm message: * No flame *

The burner has been stopped because the optical sensor has not detected any light in the combustion chamber while the burner is operating.

CHECK: That the optical sensor or the optical sensor pipe is not sooty or partially blocked with ash particles and therefore cannot detect the light.

ACTION: Clean the optical sensor. If the burner is installed correctly, the optical sensor should not become clogged with soot between normal services. If there is an air leak, if the surface of the combustion chamber is too cold or if there is a poor supply of air to the boiler room, this can cause poor drafting in the boiler chamber itself and can cause soot to form. Resolve the problem as soon as possible. If the burner is incorrectly installed,

the optical sensor can overheat and stop detecting light. Backpressure in the boiler itself will cause soot to form on the optical sensor; this will not have been allowed to exist at boiler commissioning, but can occur after the fact, if, for example, the boiler is not cleaned internally (soot building up at the mouth of the chimney).

CHECK: Start the burner and check that both drive motors are operating and that the sluice shaft and the auger shaft are rotating in the combustion bowl.

ACTION: If there is a fault, contact the installation engineer.

CHECK: That the burner is taking fuel from the external store.

ACTION: If the burner does not attempt to take fuel from the external store, this may be because it thinks there is fuel in the internal store. Contact your distributor to have the level sensor (receiver) replaced.

Alarm message: * Ignition error *

The burner has received a signal to stop, because the optical sensor is not detecting light in the combustion chamber during the ignition sequence.

The burner makes three ignition attempts.

ACTION: The maintenance burn function is enabled, see pages 9-11.

Contact the installation engineer for help.

During a manual start, check the optical sensor. Also see * Fire burned out * description.

Alarm message: * Combustion fan *

The burner does not run, due that the combustion fan which is equipped with a tachometer has stopped during operation.

CONTROL: The fanwheel spins properly and runs without obstacles.

ACTION: Adjust the wheel, if it does not spin freely.

CHECK: That the cable with its pins are connected.

ACTION: Connected the loose pins, otherwise call the installer.

Alarm message: * Pellets failure *

This fault is caused by a lack of fuel in the burner's internal store.

CHECK: That there are pellets in the external store.

ACTION: Add pellets. CHECK: That the angle of the auger is not too steep (maximum 45°) or that the flow has not stopped because an airlock has formed in the base of the external store.

ACTION: Adjust the auger to a shallower angle and turn it to and for a few times. It must be positioned in the centre of the external store.

CHECK: That the drive motor of the external auger is working and that the motor shaft is turning the auger.

ACTION: Test the external motor separately using the parameters on pages 9-11. Tighten the Allen bolt on the bevelled part of the motor shaft. If the motor is faulty, contact the installation engineer.

CHECK: That the hose to the burner is not at too shallow an angle.

ACTION: Adjust the angle so that the pellets do not block the hose.

CHECK: That an airlock (cone) has not formed in the internal or external store.

ACTION: Airlocks (cones) can form in the store if the angle of the base of the store is to flat or as a result of damp pellets, dust or overfilling. Tap on the store. Replace the damp pellets immediately. Damp pellets can bring the system to a complete stop and cause damage. If the store has been overfilled, contact the installation engineer. Airlocks (cones) could also form if there has build up dust in the store. If airlocks (cones) form in external store then, when possible, the store should be cleaned from dust, e.g. before external store is refilled.

MAINTENANCE

For best economy and performance follow this care and maintenance instructions.

NOTE! The draught valve in boiler or chimney must always be fully open. Turn off the burner on the control box stop button in time for service.

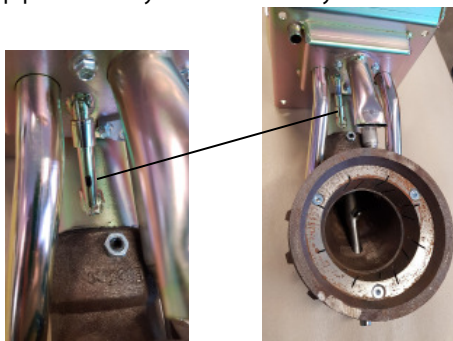
NOTE! The main voltage to the burner must always be broken at the maintenance or service. Remove the ash from the boiler, clean the boiler walls and flue from fly ash. Store the ashes outside in a metal vessel with cover, at least one day.

BioLine 25: control by lifting the primary ring / cog wheel that there is no ash or slag below the ring or in the primary air tubes.

- Pay close attention when you receive a new delivery or replacement pellets.
- When checking the combustion bowl, the burner must always be taken out. (Check that the three stop screws which hold the combustion bowl in place are tightened, (see the picture on page 4).
- Knock or scrape off any coke which has formed in the combustion bowl right down to the feed auger. (This should be done once a month, or as required.)



- Check the optical sensor and clean it if necessary.
- Check the seals on the sluice feeder for the burner's internal fuel store and clean it if necessary. If the blades have become deformed or discoloured (not sealing), they must be replaced.
- Check the hose connections between the external feed and the burner and refit them after servicing the burner.
- Check and lubricate the chain and sprockets.
- At errors that can not be corrected, contact your installer / dealer
- Lift the sleeve on the counterpressure tube and clean out the counterpressure pipe 2 times / year or if necessary.
- Check both the horizontal and the angled air springs in the primary ring which may have become clogged. (They can be cleaned, for example, with a hacksaw blade.)
- Check that the cog wheel is close to the primary ring and is easy to rotate. Check that the rotating arm does not lift the wheel. After cleaning, check that the primary ring and the secondary vent pipe are in place.



DO NOT FORGET TO SWITCH OFF THE MAINS SWITCH BEFORE SERVICING THE BURNER AND TO SWITCH IT ON AGAIN WHEN THE SERVICE IS COMPLETED.



RAW MATERIALS

The pellets can be made from different raw materials. The most common material is wood, but there are suitable alternative materials available on the market.

The raw materials have different properties which give them both advantages and disadvantages as a pellet fuel. The important factors are the energy value, the ash content, the volatile matter content, the environmental impact and, last but not least, the price.

You should choose a fuel which has the lowest cost per unit of energy, taking into account the fuel's function in the burner, the ash content and the environmental impact.

Ecotec pellet burners are designed to be able to burn most types of pellet fuels.

PELLET QUALITY

The majority of problems that occur because of poor fuel quality are caused by faults in the manufacturing, handling or interim storage processes before the fuel reaches the customer.

At high concentrations of fine chips are usually the lack of production and due to separation plant at the place of loading..

Sintering of the ash is often caused by silicate impurities and cannot be identified before combustion. The pellets can become damp during interim handling and transport.

If possible, check when you buy the pellets that they are clean and dry and have not broken down into small particles.

**DAMP PELLETS MUST
BE REJECTED IMMEDIATELY**

APPROVED FUEL SPECIFICATION

WEIGHT	600-750 kg/m ³
ENERGY CONTENT	4.7-5.0 kWh/kg
SIZE/DIAMETER	6-12 mm
SIZE/LENGTH	Note: max. 35 mm
MOISTURE CONTENT	max. 12%
ASH CONTENT/WEIGHT	(wood pellets) 0.5-1%
FINES CONTENT/WEIGHT	max. 3%
ASH MELTING TEMPERATURE	min. 1100°

HOUSING AND ASSEMBLY

The housing consists of a plastic box with a separate connector.

The top cover must NOT be opened. It acts as mechanical and electrical (static electricity) protection for the electronic card.

If this component is opened without permission from Ecotec, ALL the warranties will be invalidated.

The unit must be mounted vertically on a wall using three screws. The top attachment point has an outlet for the screw head on the back of the box. The outlets for the two other attachment points are under the bottom cover of the box (connector).

With the exception of the fuse, the unit does not contain any parts which can be replaced by ordinary users.

Faulty units must always be returned to the manufacturer. The maximum ambient temperature is 40° C.

CONNECTION INSTRUCTIONS

The control system must be connected to the fuse box of the house with a fixed connection.

Feed voltage: 230 VAC

Maximum fuse: 10 A

The terminal blocks in the box are screw terminal blocks. Maximum area = 1.5 mm²

TRANSIENT PROTECTION

To protect the control system from disruption, the external components (relays, solenoids etc.) must be transient protected. (The DC relay and the solenoids are protected with diodes and the AC relay and solenoids with RC filters.)

MAIN SWITCH

The system must be equipped with permanent installed fully isolating main switch (overvoltage category III) and fused with external fuse 10A



IMPORTANT

- Ensure that the phase and neutral wires are in the correct position when you connect the box. This will not affect the functioning of the control system, but because the neutral wire forms an unbroken connection with the motors, there is the risk of there being a full voltage supply to the motors when they appear to be switched off.
- Ensure that the load on the outputs never exceeds the system's total maximum load for outputs (2000 W). The maximum load per output is 500 W.

The maximum (resistive) load on the alarm output (potential-free relay output):
1 A, 30 V DC

THE MAINS SWITCH MUST ALWAYS BE SWITCHED OFF DURING SERVICING AND MAINTENANCE.

DO NOT FORGET TO SWITCH THE MAINS
SWITCH ON WHEN THE SERVICING WORK IS
FINISHED.

Burner cabling

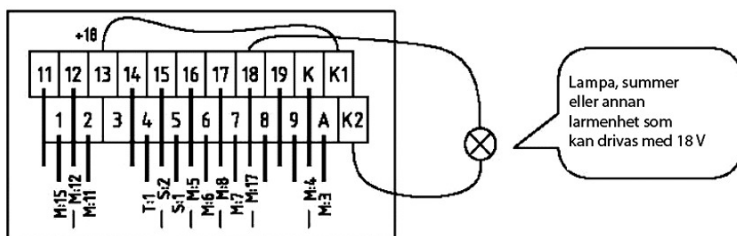
The multicore cable to the burner is prefitted to the control system. The contacts connected to the left side of the burner.

Microswitch

The burner's connection to the boiler is monitored using a microswitch.

Connecting the alarm unit

It is possible to connect an external alarm unit using contacts K1 and K2. When the burner emits an alarm, there is contact between K1 and K2, which means that K2 has the same voltage as K1. By connecting various signals to K1, you can choose which alarm function you want to use. The diagram below shows how to apply 20V to an alarm unit when the burner emits an alarm.



NOTE: The load on the potential-free contact must not exceed 1A 30 V DC. The maximum load on connection 13 is 0.8 A (corresponds to about 15 W).

Connecting an external start/stop mechanism

When a burner is used with an accumulator tank, you will generally want to be able to start and stop the burner depending on the tank temperature. An external control unit can be connected to terminal blocks 3 and 13. The input is pre-programmed for this function.

When the contact closes, the burner starts up. When it opens, the burner switches off. The burner's operating temperature is set so that the burner does not shut itself down when the temperature in the boiler is too high. The maintenance burn function cannot be used with this function. The connection is shown in the diagram below.

WIRING TABLE FOR CONTROL UNIT 3006

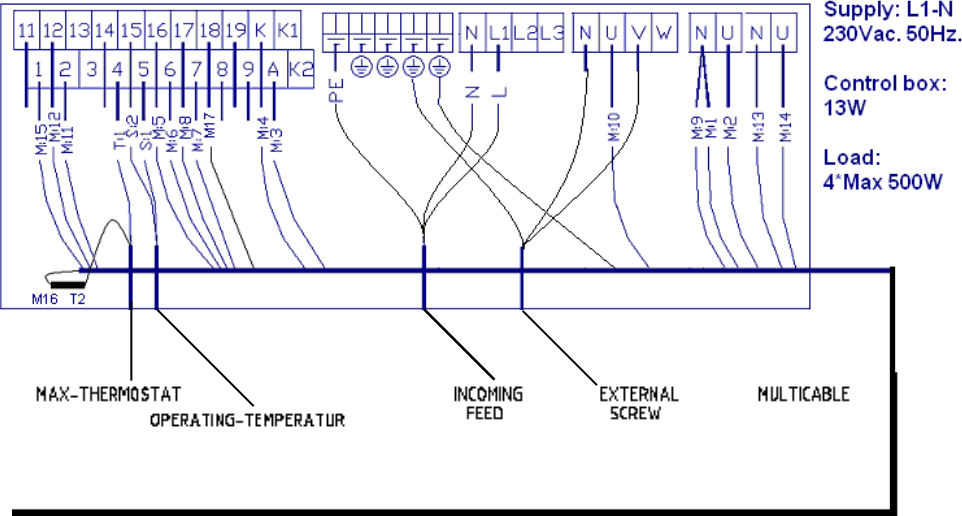
Connection	Voltage (V)	Cable Part *)	Terminal block					Not.
				Supply	Stock-er	Blower	Ign.	
COMBUSTION FAN	230 Vac	M:1				N		
COMBUSTION FAN	230 Vac	M:2				U		
LEVEL GUARD TRANSMITTER+	Signal+	M:3	A					
LEVEL GUARD TRANSMITTER	Signal	M:4	K					
LEVEL GUARD RECEIVER+	Signal+	M:5	16					
LEVEL GUARD RECEIVER-	Signal	M:6	6					
OPTICAL GUARD	Signal	M:7	7					
OPTICAL GUARD	Signal+	M:8	17					
INTERNAL MOTOR	230 Vac	M:9				N		
INTERNAL MOTOR	230 Vac	M:10			U			NB
THERMAL CONTACT BACK HEAT	Signal	M:11	2					
THERMAL CONTACT BACK HEAT TACHOMETER+ LIMIT POSITION, BURNER IN BOILER+	Signal+	M:12	12					
IGNITION ELEMENT	230 Vac	M:13					N	Present in BioLine 20 & 25
IGNITION ELEMENT	230 Vac	M:14					U	Present in BioLine 20 & 25
TACHOMETER	Signal	M:15	1					
LIMIT POSITION, BURNER IN BOILER+	Signal+	M:16						T:2
TACHOMETER-	Signal-	M:17						
EARTH		M:18 GN/GU					PE	PE earth-bar
MAX TEMP_N	Signal	T:1	4					
MAX TEMP_N	Signal+	T:2						M:16
OPERATING TEMPERATURE	Signal	S:1	5					
OPERATING TEMPERATURE	Signal+	S:2	15					
EXTERNAL START	Signal		3					OPTION
EXTERNAL START	Signal+		13					
INCOMING FEED (PHASE)	230 Vac	L		L1				
INCOMING FEED (NEUTRAL)	230 Vac	N		N				
INCOMING FEED (EARTH)		PE						PE earth-bar
PE earth-bar				PE				
EXTERNAL FEED (PHASE)	230 Vac	L			V			
EXTERNAL FEED (NEUTRAL)		N			N			
EXTERNAL FEED (EARTH)		PE						PE earth-bar
ALARM OUTPUT	Signal		K1					Potential-free 1 A, 30 Vdc
ALARM OUTPUT	Signal		K2					

M:x = Multicore cable to the burner

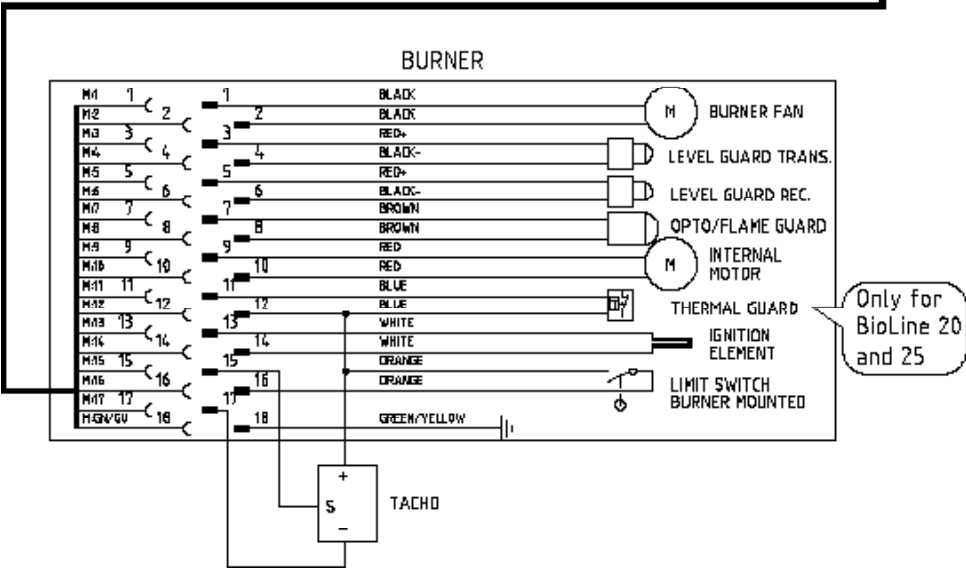
T:x = Cable to the Max. thermostat

S:x = Operating temperature

CONTROL CABINET



WIRING TABLE



OPERATING NOTES

Date	Measure

OPERATING NOTES

Date	Measure

OPERATING NOTES

Date	Measure

OPERATING NOTES

Date	Measure



Our corporate vision is simple: A local approach, satisfied customers and a concern for the environment. We work with authorised distributors who offer a full service. Our quality approach is based on high levels of technical skill and constant development. We manufacture burners with an output between 7 kW and 300 kW. We are confident that we can offer you the best products on the market and a reduction in your heating costs.

We regard pellets as today's fuel, not as the fuel of the future. The earth's resources are not unlimited and our environment will not withstand everything it is exposed to. For this reason it is important to invest in renewable, environmentally friendly, cheap sources of energy.

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