

9972-E3010

# Operation and maintenance *Pellet burner*



2001-09

*Keep this instruction book handy in case you need it in the future.*

Read through the instruction book carefully before you use your EcoTec Pellet Installation.

The power of your Pellet burner is calculated on the maximum amount of pellets that can be fed in and burned in the burn pot in one hour (using normal wood pellets, with an average value from our fuel spec.).

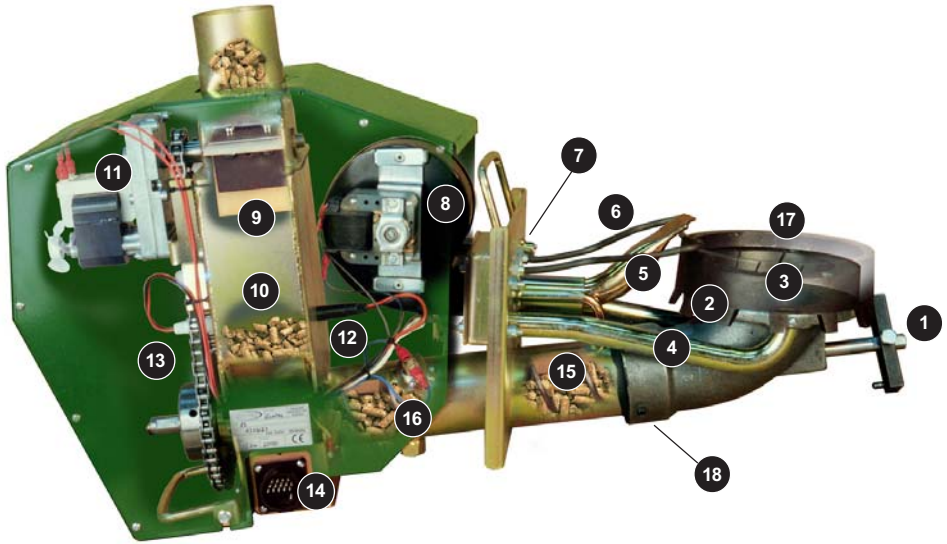
Contact Sahlins EcoTec AB if you require higher power, between 25-300 kW.

## **IMPORTANT!**

Do not remove the green protective cover over the burner, or the cover for the control unit unless the power (main supply) to the installation is switched off.

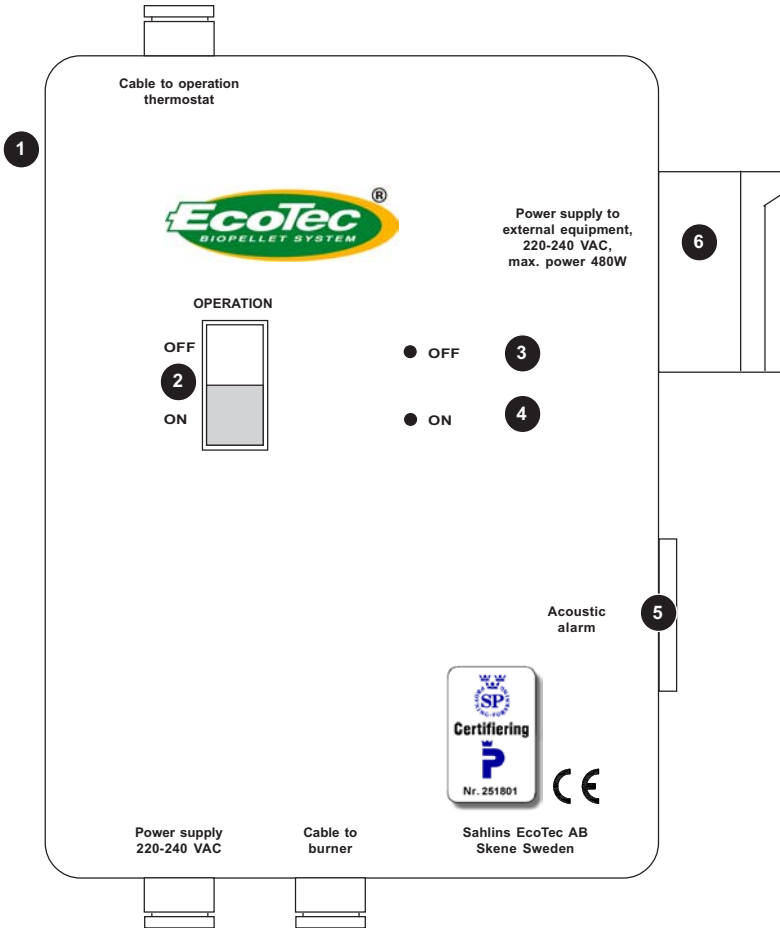
**FOLLOW THE INSTRUCTION IN THIS BOOK CAREFULLY AND CARRY OUT THE RECOMMENDED CARE AND MAINTENANCE.**

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4

- |                      |                                       |
|----------------------|---------------------------------------|
| 1 Rotor arm          | 10 Internal fuel store                |
| 2 Toothed ring       | 11 Fuel drive motor                   |
| 3 Primary ring       | 12 Level monitor (receiver), black    |
| 4 Primary air pipe   | 13 Level monitor (transmitter), white |
| 5 Secondary air pipe | 14 Plug-in connector                  |
| 6 Ignition element   | 15 Auger                              |
| 7 Optical monitor    | 16 Thermal switch                     |
| 8 Combustion fan     | 17 Burn pot                           |
| 9 Feed gate          | 18 Stop screws for burn pot           |



- 1 Control box
- 2 Switch (On/Off)
- 3 Red indicator light
- 4 Green indicator light
- 5 Acoustic signal (buzzer)
- 6 Outlet for external feed



### **BURNING PELLETS**

Burning pellets with the EcoTec pellet burner is very similar to burning oil. A burner fitted with automatic ash removal doesn't need much more maintenance than an oil burner. But we recommend measures such as regular cleaning of the heating surfaces of the boiler.

The EcoTec pellet burner is supplied with automatic ignition as standard, but you can also light it manually.

### **FULLY AUTOMATIC**

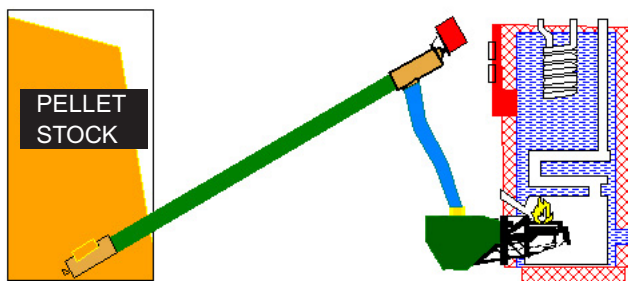
The burner and its associated feed system operate totally automatically, and are controlled by the boiler thermostat.

Total combustion is achieved by pre-set oxygenation, with primary and secondary air, which is both cost-effective and environmentally friendly.

The burner can be set for different energy contents (see fuel specification).

The burner control unit is pre-programmed, so that the installer can set the initial value for the fuel to be used.

A specially designed feed system feeds the pellets from the external fuel store to the burner, under the control of the burner control unit.



### THE FEED SYSTEM

The feed system is based on the safety principle of cutting the flow of fuel by free fall (in the tube) between the external feed and the burner.

**NB! THE ECOTEC BURNER CANNOT BE USED WITH FEED SYSTEMS OTHER THAN THE ORIGINAL ECOTEC FEED SYSTEM.**

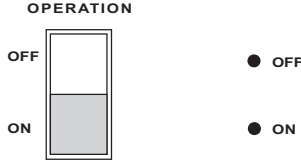
### AUTOMATIC ASH REMOVAL

All burners can be fitted with automatic ash removal (see pages 23-24, accessories). For a simple installation, in which the ash pan can be placed

under the ash remover, there should be a gap of 250 mm under the burner. The ash must be fed to a separate ash pan if there is less space.

You can also remove the ash by taking the burner out of the boiler, so that the combustion chamber is exposed, or by putting a suction nozzle into the ash removal hole and sucking the ash out to a special ash box (accessory for an ordinary vacuum cleaner).

**NB! ALWAYS TAKE CARE WITH ASH AS IT COULD STILL BE ALIGHT.**



### TROUBLE-FREE USE

The EcoTec pellets burner is designed on the basic principles that we are familiar with from oil heating. The advantage of these basic principles is trouble-free use, with the positioning of the fuel store not restricted by the layout of the boiler room. From a safety standpoint, separation of the burner and fuel store, combined with cutting off the supply between the two, provides increased safety against damage in the event of a blowback. Damage caused by incorrect use, malfunctions or incorrect installation are limited to the fuel store inside the burner.

The internal store is filled with a limited amount of fuel via the external feed system at each filling. The fuel is fed in via a gate, which is sealed and synchronised with the external feed. A thermal switch, placed just outside the boiler on the fuel feed pipe, detects any spread of heat back up the fuel feed pipe towards the internal store. If this happens, the supply to the burner is cut

off and no new fuel is fed from the external store. The burner control unit is linked to the boiler's operating and maximum thermostats.

If a fault occurs in the operating thermostat, the maximum thermostat will cut out in and prevent the boiler overheating. The burner is designed such that it returns to normal operation after disruptions such as power cuts, disruptions to the fuel supply etc. If it doesn't reset properly, a red light comes on and the burner shuts down.

If this light comes on at the same time as the warning buzzer is sounding, the fault is in the fuel feed (see fault finding on pages 13-14).





**ALWAYS NOTE AND CHECK THE FOLLOWING**

- 1** The main switch should always be on (the red or green light should be on).
- 2** The connections between the burner and the external feed system should be properly attached and sealed.
- 3** The plates of the gate feeder should not be damaged or discoloured, and the seal onto the

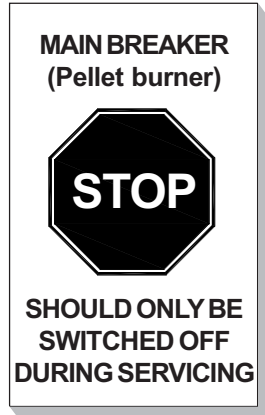
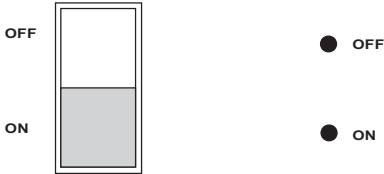
walls of the gate housing should be good.

- 4** You can easily check the sealing of the gate feeder plates by turning down the operating thermostat, and letting the burner remain off for a prolonged period (up to 1 hour).

**IF THE BURNER STARTS DURING THE OFF PERIOD, DESPITE THE FACT THAT THE OPERATING THERMOSTAT HAS NOT CALLED FOR HEAT, CHECK THE CAUSE AND RECTIFY IT. IF YOU CAN'T FIND THE PROBLEM, CONTACT THE INSTALLER IMMEDIATELY TO TAKE MEASURES.**



## OPERATION



## START UP

Before you start the burner, make sure that there is power to the control unit, by checking that the red light is on (the main switch should always be on) and that pellets come from the external feed auger. An external feed system is filled by removing the hose and inserting the connector, which is normally plugged into the control cabinet, into an ordinary wall socket. When the external auger has been filled, move the plug back to the control cabinet and the hose can be installed.

To start the burner, press “ON.” The burner fan starts, and also the auger motor, which feeds fuel from the internal store to the burn pot along the burner’s auger pipe. At the same time, the ignition element starts to glow.

When the fuel level reaches the bottom of the air slits, press OFF. Pour on some fire lighting fluid and light manually. Wait about 2 minutes, then press ON. Electric ignition is only used after a power cut.

The ignition process from a cold burner can vary in length, depending on how much fuel there is in the burner auger, the quality of the pellets, the position of the igniter etc. The burner attempts to light for up to 30 minutes, after which it shuts down, which is indicated by the red lamp. You can also light it using fire lighters, etc.

### OPERATING/RUNNING

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When running, the boiler's running and maximum thermostats control the functions of the burner.

The burner does not have any intermediate modes. It is either ON or OFF.

In order to guarantee reliable ignition during normal thermostat operation, without needing to use the ignition spiral, the burner starts after one hour's stoppage and runs for one minute. We call this phase the heat activation phase.

The green light indicates that the burner is running.

A red light indicates a stoppage (Please refer to pages 13-14, Fault Finding).

### OFF

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- Press "OFF" to shut down the burner.
- Do not switch off the main switch.
- In the "OFF" position, the red light on the control box should always be on, indicating the main supply is off.

**THE MAIN SWITCH SHOULD ONLY BE SWITCHED OFF DURING SERVICING. DON'T FORGET TO SWITCH IT BACK ON WHEN THE SERVICING IS COMPLETE.**

### ASH REMOVAL

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All burning of solid fuels requires a little more maintenance than does oil, even when the burning takes place automatically in an EcoTec pellets burner. Most of the maintenance is concerned with the fuel and its quality, which is shown by the following comparison: Good pellets contain no more than 0.5% ash, which means that the ash has to be emptied every 3-4 weeks, depending on the type of boiler. If you burn pellets with 2% ash, you will need to empty at least once a week under the same conditions.

Shut down the burner about one hour before you remove the ash and perform checks. NB: Don't switch off the main switch until you are about to start work on the boiler. To ensure safe and trouble free operation, you should carry out the following measures and checks every time you empty the ash, or at least once a month until you have gained enough experience about the maintenance frequency required.

## MAINTENANCE

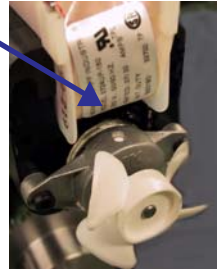
- Pay particular attention when you get a new delivery of pellets or use a different type.
- Emptying the ashes and brushing the boiler and its channels clean can be done by sucking through the burner's ash hatch or by removing the burner from the combustion area.
- You always have to remove the burner to check the burner cup. *(Check that the three screws that hold the burner cup have been tightened, please refer to page 4).*

- Tap or scrape off any carbon deposits in the burn pot, right down to the feed auger *(do this once a month, or as necessary).*



- Clean the openings in the primary ring, which can become blocked *(use a hacksaw blade etc. to do this)*
- Check that the toothed ring is against the primary ring and can be rotated easily, and that the rotor arm doesn't lift it. After cleaning, check that the primary ring and secondary air pipe are in place.

- Check the optical monitor and clean it if necessary.
- Check the seals of the gate feeder for the burner's internal store and clean if necessary. If there is any deformation or discoloration (leaks), the bellows should be changed.
- Check the hose connections between the external feed and the burner, and reconnect them after servicing.
- Lubricate the rear motor bearing with a few drops of oil (once a year).



**DON'T FORGET TO CONNECT MAIN  
BREAKER AFTER SERVICE!**

## FAULTFINDING

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Most faults that occur are caused by poor quality pellets, or the way they have been handled or stored.

Check your deliveries carefully, preferably before you accept them.

Remember that for your safety, we have pre-programmed the burner to stop and sound an alarm if it can't rectify the fault itself.

### FAULT: ALL LIGHTS ARE OFF

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**CHECK:** That the main switch is on and the fuses in the burner control unit are intact.

**ACTION:** Switch on the main switch or replace a blown fuse in the control unit.

**NOTE:** Switch off the main switch before you change the fuse. Contact the installer.

### FAULT: THE RED LIGHT IS ON AND THE BURNER MOTOR RUNS CONSTANTLY.

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**CHECK:** If the re-settable thermal cut-out has tripped.

**ACTION:** Press the button on the side of the thermal switch in. Switch the mains voltage off and then on.

**ACTION:** Change the gate feeder flaps if they are discoloured or distorted.

**ACTION:** Check that the flue damper is fully open and that the fly ash in the smoke channels inside the stove is cleared off.

### FAULT: THE RED LIGHT IS ON AND THE AUDIBLE ALARM IS SOUNDING

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This only occurs if there is a shortage of fuel in the internal store.

**CHECK:** That there are pellets in the external store.

**ACTION:** Fill with pellets.

**CHECK:** That the angle of the auger isn't too steep or the flow has stopped because an arch has formed in the bottom of the external store.

**ACTION:** Put the auger at a gentler angle and turn it back and forth a few times. It should be positioned in the centre of the external store.

**CHECK:** That the drive motor for the external auger is working and that the shaft of the motor is driving the auger.

**ACTION:** Remove the hose from the burner, insert the plug into an ordinary wall outlet and check that the motor and auger turn round. Tighten the socket cap screw on flat on the motor spindle. If there is a fault in the motor, contact the installer.

**CHECK:** That the hose to the burner isn't at too flat an angle.

**ACTION:** Change the angle so the pellets don't get blocked.

**CHECK:** That an arch hasn't formed in the internal store.

**ACTION:** The only reasons an arch forms in the store are damp pellets of overfilling. Tap the store. Change the pellets immediately. Damp pellets can cause a total stoppage and mal-functions. If you have overfilled your store you must contact the installer.

**FAULT: THE RED LIGHT COMES ON**

**CHECK:** If the maximum thermostat has cut out. Switch the burner switch off and on again, without resetting the maximum thermostat. If the burner doesn't start and the diode still shows red, the fault is: **A** the maximum thermostat has tripped. If the burner starts and the diode shows red the fault is: **B** the optical monitor can't see any light in the combustion chamber.

**ACTION: A** If the maximum thermostat has tripped out, reset the button on the maximum thermostat and restart. A common reason is burning wood together with pellets. If you can't find the cause of the overheating, you will need to check the operating thermostat

**CHECK: B** If there is still fuel in the burn pot and auger pipe, go to **B1**.

**B** If there is no fuel in the burner, go to **B2**.

**CHECK: B1** That the combustion chamber is not overfilled with ash.

**ACTION:** Remove the ash.

**CHECK: B1** That the optical monitor isn't sooty, preventing it from seeing the light.

**ACTION:** Wipe the optical monitor clean. If the boiler has been installed correctly, the optical monitor shouldn't get sooty between normal inspections. Air leakage or a burner too close to a cold ceiling can cause soot to build up, as can insufficient air coming into the boiler room.

Rectify this as soon as possible. If the boiler has been installed incorrectly, the optical monitor could also get too hot and stop detecting the light. Contact the installer if you suspect that the boiler has been incorrectly installed.

**CHECK: B2** Start the burner and check that the drive motor, gate shaft and auger shaft are rotating in the burn pot.

**ACTION:** Contact the installer to deal with it.

**CHECK: B2** That the level monitors for the internal store indicate low fuel level.

**ACTION:** Start the burner and check that the external auger starts and feeds fuel to the burner. If it does not do so, the burner level monitors have reacted to back pressure in the system and have shut off the fuel supply. If the burner level monitors have reacted to back pressure in the system and shut off the fuel feed, open the boiler's damper and clean out fly ash from the flue channels. Poor draught is usually due to a defective chimney, which should be attended to as soon as possible. Masonry chimneys with large cold surfaces and cold downdraughts can also cause back pressure, especially at warm times of the year. If this is the case, a flue fan should be fitted. Contact the installer for further advice. You should also contact the installer if the level monitors aren't working as described above.



### RAW MATERIALS

Fuel pellets can be made from various raw materials. Wood is most common but there are already suitable alternative raw materials on the market.

The raw materials have different characteristics, which give them advantages and disadvantages as pellet fuel. Important factors are energy value, ash content, moisture content, effect on the environment and last but not least price.

You should choose the fuel that has the lowest cost per unit of energy, after considering how the fuel will operate in the boiler, the ash content and the environmental effects.

The EcoTec pellet burner is designed to be able to burn most types of pellet fuel.

If you are unsure about anything, read our pamphlet about pellet fuel, and take careful note of the effects of changing fuel.

### PELLET QUALITY

Most of the problems that can arise due to poor fuel quality are due to shortcomings in manufacture, handling and intermediate storage, before the fuel reaches the final customer.

If there are high levels of fine particles, the fault is usually in the manufacturing, or separation during storage at the distribution points. If there is clinker in the ash, this is due to silicate contamination and cannot be seen before burning. Pellets can get damp during intermediate handling and transport.

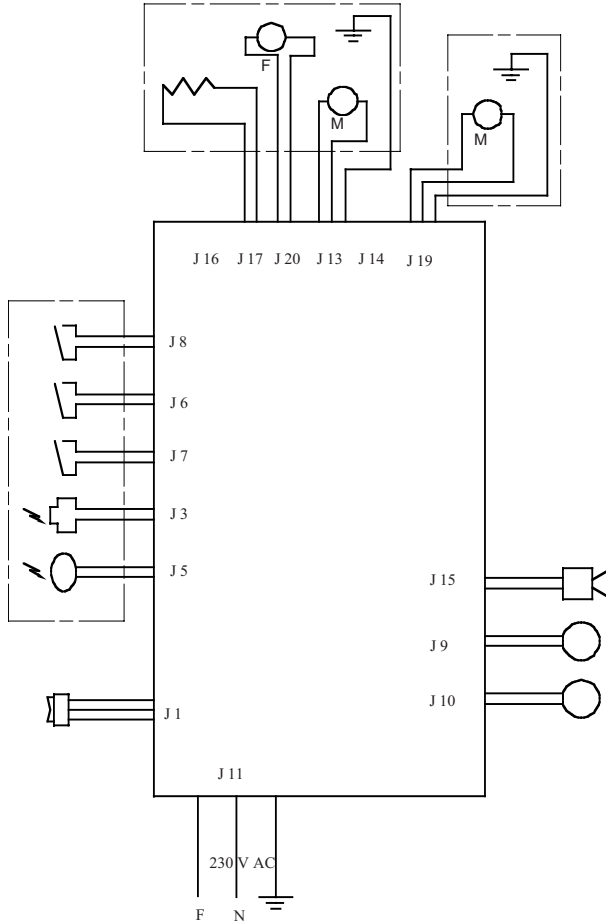
If possible, check on the truck to see that you are getting clean and dry pellets, and not sawdust.

### YOU SHOULD DISPOSE OF DAMP PELLETS IMMEDIATELY

#### APPROVED FUEL SPECIFICATION

WEIGHT	600-750 kg/m <sup>3</sup>
ENERGY CONTENT	4.7-5.0 kWh/kg
SIZE/DIAMETER	6-12 mm
SIZE/LENGTH	NB max.35 mm
MOISTURE CONTENT	max. 12%
ASH CONTENT BY WEIGHT	0.5-1%
FINES CONTENT BY WEIGHT	max. 3%
ASH MELTING POINT	1100°C

CONNECTION DIAGRAM - CONTROL CARD



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- |           |                            |                       |                           |
|-----------|----------------------------|-----------------------|---------------------------|
| <b>J1</b> | ON - OFF                   | <b>J10</b>            | Red LED                   |
| <b>J3</b> | Level monitor (receiver)   | <b>J11</b>            | 220V AC                   |
| <b>J5</b> | Optical monitor            | <b>J13</b>            | Internal feed motor       |
| <b>J6</b> | Operation thermostat 5V DC | <b>J15</b>            | Alarm                     |
| <b>J7</b> | Temperature switch         | <b>J17</b>            | Fumer                     |
| <b>J8</b> | Max. temp. Switch 5V DC    | <b>J19</b>            | External feed motor       |
| <b>J9</b> | Green LED                  | <b>J20</b>            | Combustion fan            |
|           |                            | <b>J15-1 o. J10-2</b> | Level guard (transmitter) |



## CONNECTION TABLE - BURNER

DESCRIPTION	ITEM NO.	18 CONDUITS CABLE NO.	4 CONDUITS TO THERMOSTAT CABLE NO.	3 CONDUITS EXT. FEEDER CABLE NO.	COLLOUR ON BOX COVER CABLE
Combustion fan	J20-1	1			
Combustion fan	J20-2	2			
Level monitor IR transmitter	J15-1	3			
Level monitor IR transmitter	J10-2	4			
Level monitor IR receiver	J3-1	5			
Level monitor IR receiver	J3-2	6			
Optical monitor	J5-1	7			
Optical monitor	J5-2	8			
Internal feed motor	J13-1	9			
Internal feed motor	J13-2	10			
Temperature switch screw	J7-1	11			
Temperature switch screw	J7-2	12			
Operatin thermostat	J6-1		1	NOTE! 5VDC	
Operatin thermostat	J6-2		2		
Max. thermostat	J8-1		3	NOTE! 5VDC	
Max. thermostat	J8-2		4		
External feeder	J19-1			1	
External feeder	J19-2			2	
Fumer	J17-2	13			
Fumer	J17-3	14			
Switch OFF	J1-1				white
Switch ON	J1-3				red
Buzzer alarm (+)	J15-1				red
Buzzer alarm	J15-2				white
LED, green (-)	J9-1				red
LED, green	J9-2				white
LED, red (-)	J10-1				red
LED, red	J10-2				white
Spare 1		15			
Spare 2		16			
Spare 3		17			

	
Garantibevis / Installationsbevis	
<b>KUND</b>	
Namn: _____ Tel: _____	
Adress: _____	
Postnr: _____ Ort: _____	
<b>BEHÖRIG INSTALLÖR/ÅP</b>	
Namn: _____ Tel: _____	
<b>PRODUKT KAMINBRÄNNARE</b>	
Modell: _____	
Tillvs nr: _____ best. datum: _____	
<b>INSTALLATIONEN GJORD TILL</b>	
Färdig: _____	
Modell: _____ Till: år: _____	
Måttal skorsten <input type="checkbox"/> Stålrör <input type="checkbox"/> Ansv: _____ Horisontell skorstenlängd i m: _____	
<b>INSTALLATIONEN GODKÄND</b> (om sjuget av godkännelseman/kunde har jag läst och uppfyller installationskrav för drift och underhåll.)	
Gvt: _____ Datum: _____	
Behörig ÅP/Installatör: _____ Kund: _____	
<b>MÄTVÄRDEN</b>	
COP: _____ % Utdrivtryck: _____ Min VP: _____ Rökgasstemperatur: _____ °C	
<p>For att garantin skall gälla måste en kopia insändas till Sahlins EcoTec AB under tecknad av såväl kund som behörig ÅP/installatör.</p> <p><small>Om utrustning producerad senare än 2 års garanti tid måste från installatörskunden under förvaring av en kopia av denna handling insändas till Sahlins EcoTec AB för att kunna användas som bevis för att utrustningen är godkänd av en behörig installatör. För ytterligare information eller problem avse en av Sahlins EcoTec AB produkter för drift och underhåll kontakta Sahlins EcoTec AB via telefon eller e-post. Detta gäller även om utrustningen är godkänd av en behörig installatör. För de flesta av våra produkter gäller att vi inte ansvarar för skador som uppstår på grund av felaktig användning eller felaktig installation.</small></p>	
	
<small>Sahlins EcoTec AB, Box 2103, S-211 02 Skåne, tel. 0320 - 310 80, fax. 0320 - 310 38, e-mail: info@sahlins.se</small>	

## GUARANTEE

Sahlins EcoTec AB will replace all parts in accordance with the applicable guarantee. Any damage caused by incorrect operation is not covered. The guarantee does not cover damage to parts caused by lack of maintenance, incorrect fuel or handling. If you wish to make a claim on the basis of this guarantee, you must indicate the serial number of the burner (the number is on the top of the fan box). Any parts that are sent back should be accompanied by a fault report.

## CLAIMS

The guarantee applies on condition that

- the final customer should acquaint himself/herself with the information in this book and be informed by the installer regarding operation and maintenance.
- the appendix to the guarantee/installation report is filled in and sent to Sahlins Eco Tec within one month after installation.



**NOTES**

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### Sahlins EcoTec

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Our business mission is simple. Proximity, satisfied customers and care of the environment.

We collaborate with authorised retailers, who offer full service. Our quality philosophy is based on high technical competence and constant development work. We make burners from

7 kW up to 300 kW. We believe that we can offer the best products on the market and lower fuel costs.

We do not regard pellets as a fuel of the future, it is a fuel which is available right now. The earth's resources are not inexhaustible, and our environment can not withstand unlimited abuse. For this reason, it is important to invest in renewable, environmentally friendly and low-cost sources of energy.

If you would like to comment on our products, or want the name of our nearest dealer, please phone, write or fax us. We are here for your sake

