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Installation- and maintenance manual

CTC EcoFlex

Wood pellet boiler

IMPORTANT

READ CAREFULLY BEFORE USE
KEEP FOR FUTURE REFERENCE



Enertech Group

Installation- and maintenance manual

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CTC EcoFlex

Wood pellet boiler



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For your own reference

Fill in the information below. It may be useful if anything should happen

Product:	Manufacturing No.
Date of installation	Telephone No.
Installer:	



Welcome

Congratulations! You have just bought a CTC EcoFlex wood pellet boiler, which we hope you will be very pleased with. You can read about how to operate your boiler in the following pages. One chapter is written for the property owner and one chapter for the installation engineer.

Keep this handbook with the installation and maintenance instructions. The CTC EcoFlex is designed to last for many years, and it is here you will find the information you need to operate and maintain the unit correctly and ensure its longevity.

CTC EcoFlex wood pellet boiler

CTC EcoFlex is the next generation of wood pellet boilers and is equipped with a 15 kW integrated pellet burner. Pellet fired heating is very similar to oil fired heating.

The biggest difference between the two is that all solid fuel firing produces a certain amount of ash, which must be removed if efficiency or boiler function is not to be impaired. The boiler has been developed to meet the high reliability, convenience and safety requirements that we set.

CTC EcoFlex is a modern and very efficient pellet boiler. Optimal combustion and good insulation allow a high level of efficiency to be achieved, while maintaining releases which can harm the environment at a very low level.

The boiler is equipped with automatic ignition, but can always be lit manually if required. It is also pre-programmed with two ignition programs, one for starting from a shut off mode and one for starting from an operating mode.

The boiler and the feed system are fully automated and are controlled by the built in control system in 1–3 steps. A balanced mixture of fuel and air is supplied to the burner, which gives a complete and cost efficient combustion.

CTC EcoFlex is equipped with a large ash bin to make maintenance easier. Sweeping is usually carried out from the top.

CTC EcoFlex consists of a combustion chamber with connected flue gas ways, surrounded by an outer mantle holding 150 litres of water. When firing with pellet, the heat from the burner is transmitted from the combustion chamber and heating surfaces directly to the boiler water.

The way CTC EcoFlex is designed makes it very simple to install. The small dimensions mean that it can be installed in boiler rooms, which are often very small. Most pipe fittings are on the top of the boiler. Electrical installation is to a terminal block behind the control panel. Boiler service is simplified by all connections and components being easily accessible from the front. The boiler is swept through the combustion chamber hatch and through the cleaning door on the top.

Ashes are emptied from the large ash bin attached to the ash door. The ash bin holds around 45 litres of ash and is emptied as required. The carefully developed design and the good fault tracing functions in the control system makes the CTC EcoFlex service friendly. A light diode is fitted to the room sensor, which flashes when there is a fault. Store this instruction book carefully, so that it is easily accessible for later reference. Read through the instruction book carefully before starting to use your pellet system. Follow the instructions given in the instruction book carefully and carry out maintenance and service as recommended.

Safety regulations

The following safety regulations should be taken into consideration when handling, installing and using the boiler:

- Installation must be done according to applicable local standards and regulation.
- Shut off the operation switch before carrying out any service or maintenance on boiler or peripheral equipment.
- The casing over the pellet burner is an important part of the boiler's safety equipment and must always be fitted and secured when the boiler is in operation.
- The power supply to the burner must always be shut off if the casing is to be removed, for example when cleaning the burner.
- Never undermine safety through deactivating safety equipment.
- The boiler and its peripheral equipment are not to be washed down with water.
- The flue gas ways and the boiler room air supply duct are not to be blocked.
- When moving the boiler using a crane or similar, make sure that lifting equipment, eyes and other components are undamaged. Never stand or walk under a lifted boiler.
- In a closed system, a non closable safety valve (max 2.5 bar) approved according to existing standards must be installed. See the section "Hydraulic installation".

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

Pellet quality

Recommendation:

Only use pellet fuel which meets standard SS 187120 class 1. The use of lower quality pellet can cause operation disruptions, for example due to sintering of ashes or blockages in the external feed system. Significantly larger volumes of ash will in addition be produced.

The Pellet boiler is from factory pre-set for operation with pellet with a diameter of 8 mm. By utilization of pellet with a diameter of 6 mm, see section "First start" in order to perform the required settings.

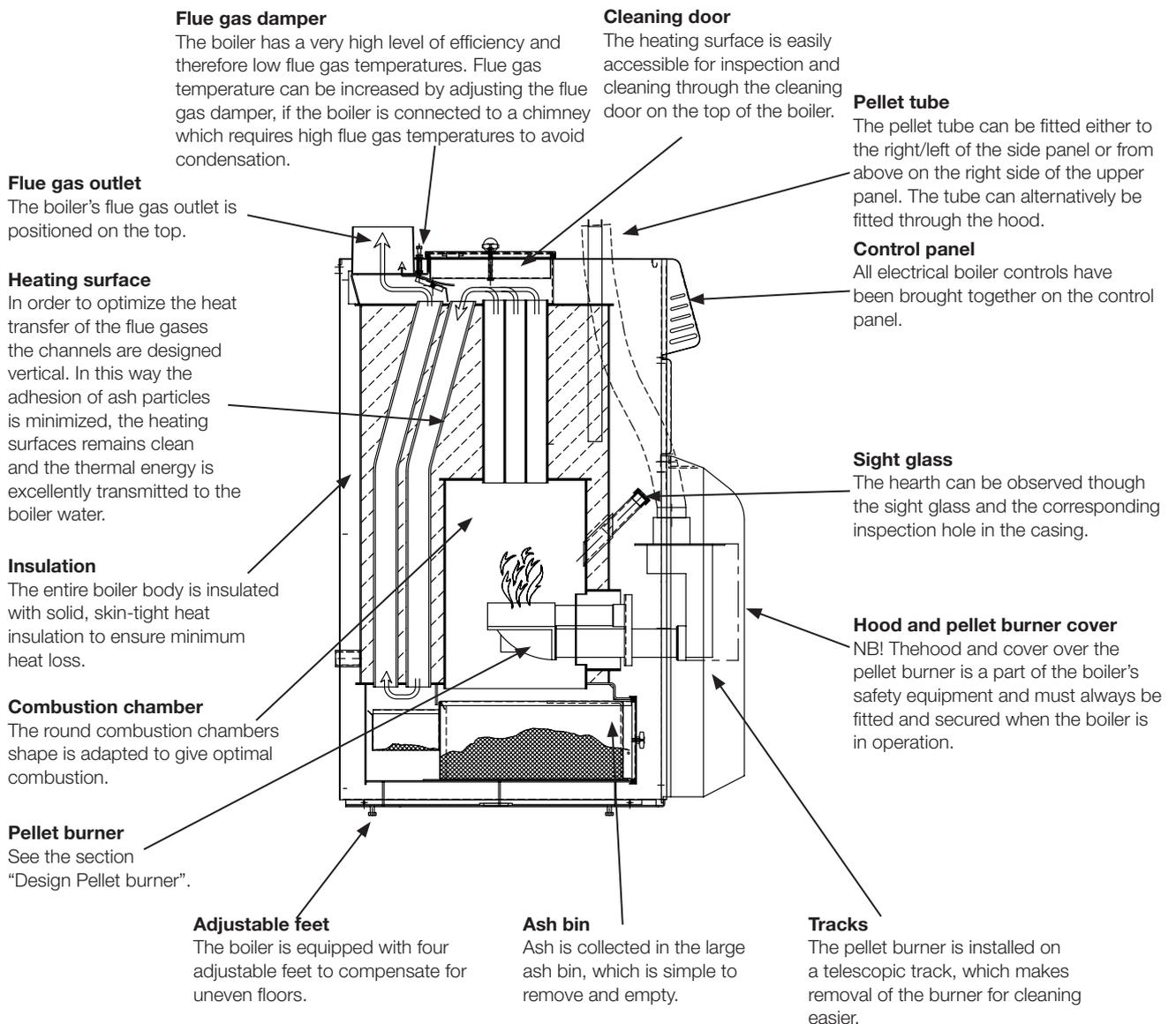
Handling of pellet fuel

Follow the pellet supplier's instructions on handling and storage of pellet fuel.

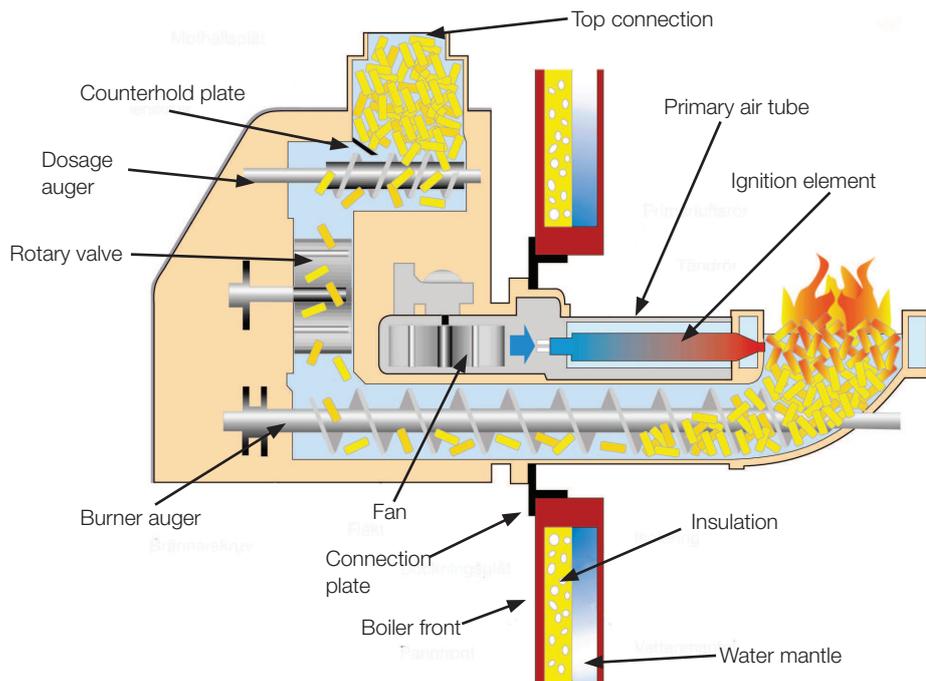
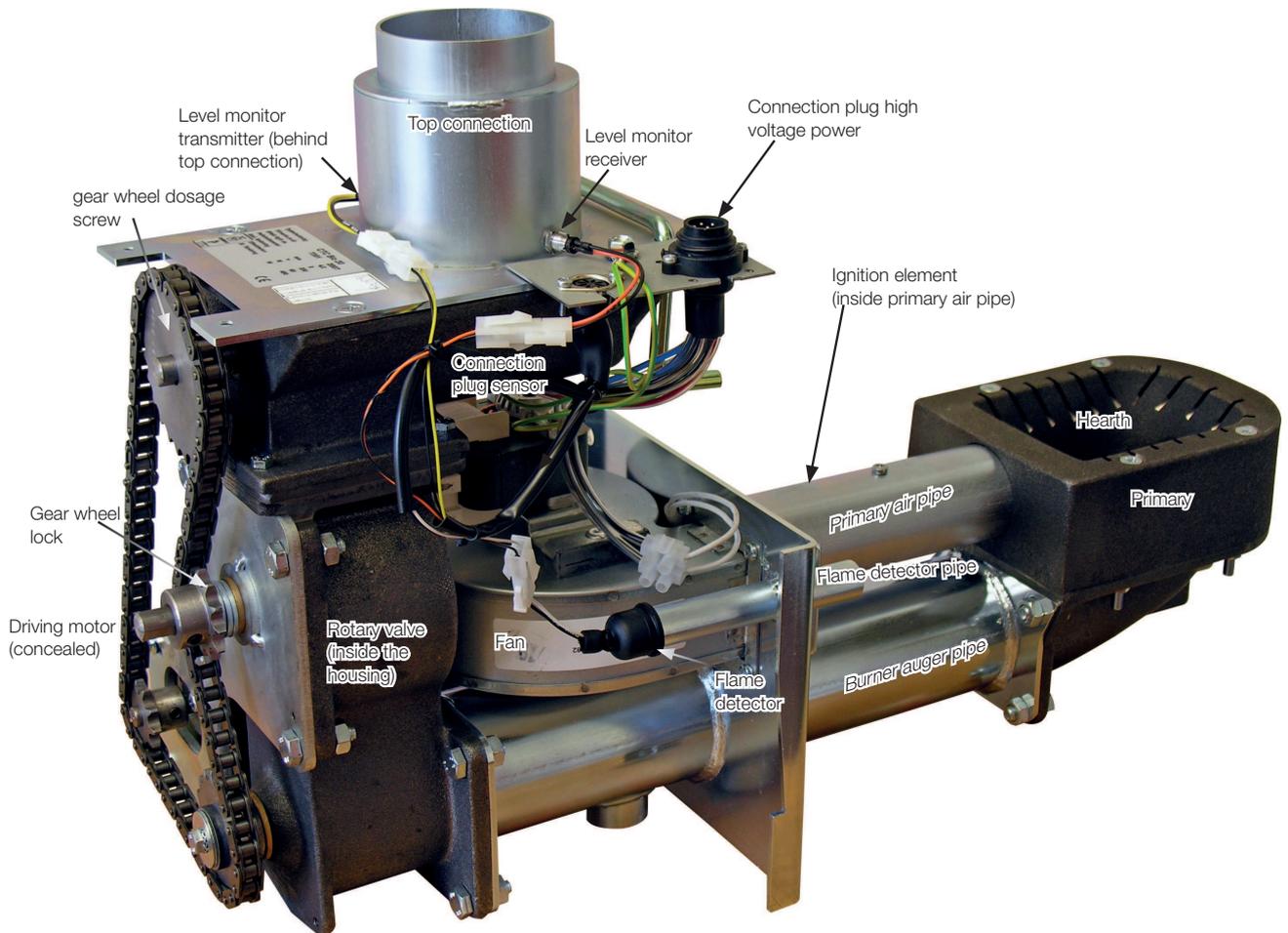
Specification	Sweden SS 18 71 20
	Class 1
Size	max.4 Ø
Bulk density	≥ 600 kg/m
Fines in % <3mm	≤ 0,8
Moisture content	≤ 10 %
Ash content	≤ 0,7 %
Calorific value	≥ 16,9 Mj/kg ≥ 4,7 kWh/kg
Sulphur	≤ 0,08 %
Chlorine	≤ 0,03%

Design CTC EcoFlex

The principle boiler body components are made of welded steel plates. The boiler is pressure and tightness tested at the factory, insulated with skin-tight heat insulation and clad with powder coated steel sheets.



Design pellet burner



Safety/alarm

The boiler is designed in accordance with the main principles we use in oil fired heating. The advantage with this system is convenient handling, as fuel storage location is not limited by boiler room lay out. The separation of the boiler and fuel storage, combined with discontinuous fuel supply between these, gives a high level of safety against the spread of fire. The effects and the damage resulting from incorrect operation or a fault in function or installation should therefore be limited to the burner.

If a fault occurs on the boiler temperature sensor, the safety limit thermostat should intervene and prevent the boiler from boiling. In addition, the boiler is designed to automatically return to normal operating mode after any operation disruptions such as power failure, fuel disruption etc.

If a fault occurs which results in the system stopping, this is indicated by a red light signal on the control panel (light diode) combined with a message on the cause of the fault on the display. In addition, the light diode on the room sensor flashes. The boiler has a unique design in which safety is a part of the function of the system. Safety is therefore not provided by an add-on safety system. Safety is secured by the path of fuel in the burner auger pipe in practice being broken within the boiler itself. There is therefore no continuous line of fuel outside the boiler which can transfer heat.

A description of alarms can be found in the chapter "Alarm texts and fault tracing/measures"

Safety, a natural part of the function

A small limited volume of pellets is fed from pellets storage via the external feed system to the top connection each time refilling takes place. Dosaging uses a special feed auger which supplies fuel via the rotary valve and burner auger to the hearth, so ensuring the supply of a precise and even pellet volume to the hearth. When the burner auger supplies the pellet at a rate which is three times faster than the supply of pellet, a safety zone is formed with very few individual pellet between the hearth and the top connection. This safety zone remains intact, irrespective of power failure, maintenance failures or equipment breakdown. Safety has become a part of operation.

Heating curve

The heating curve is a central part of the product's control system. It is the heating curve which determines the temperature requirement for your property at different outdoor temperatures. It is important that the heating curve is correctly adjusted, so that you achieve the best function and economy possible.

One property requires a radiator temperature of 30°C when the outdoor temperature is 0°C. A different property requires 40°C. The difference between different properties is determined by radiator surface area, the number of radiators and how well insulated the house is.

! The set heating curve is always prioritised. The room sensor can only call on the mixing valve to increase temperatures to a specific level beyond the set heating curve. Where operating without a room sensor, the selected graph determines the temperature supplied to the radiators.

Adjustment of heating curve basic values

The heating curve for your property is set using two values in the product control system. This is set in the menu Installer/Settings/Setting Heating/Inclination and Adjustment.

Arriving at the correct heating curve can take some time. The best way to achieve this is to select operation without room sensor in the initial period. The system then operates using outdoor temperatures only.

During the adjustment period it is important that:

- Night reduction function is not selected.
- All radiator thermostat valves are fully open.
- Outdoor temperature is not higher than +5°C. (If the outdoor temperature is higher when the system is installed, use the factory set graph until the outdoor temperature falls to this level.)
- The radiator system functions well and is correctly adjusted for the different circuits.

Description of inclination and adjustment

Inclination 50:

The value set is the outgoing temperature of the water supplied to the radiators at an outdoor temperature of $-15\text{ }^{\circ}\text{C}$, e.g. $50\text{ }^{\circ}\text{C}$. A lower value is selected where a radiator system has large radiator areas (a low temperature system). Floor heating systems require low temperatures. A low value should therefore be selected. The value must be increased for high temperature systems to achieve a high enough indoor temperature.

Adjustment 0:

The adjustment means that the flow temperature can be raised or lowered at a specific outdoor temperature.

Adjustment 0 means $20\text{ }^{\circ}\text{C}$ primary flow when the outside temperature is $20\text{ }^{\circ}\text{C}$.

Adjustment -5 means $20\text{ }^{\circ}\text{C}$ primary flow when the outside temperature is $15\text{ }^{\circ}\text{C}$.

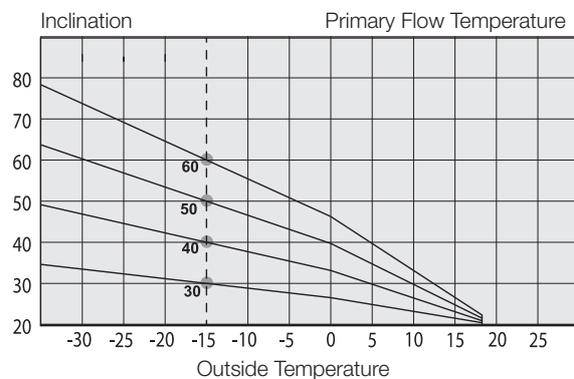
For example:

Inclination 50 means that the temperature of the water supplied to the radiators will be $50\text{ }^{\circ}\text{C}$ when the outdoor temperature is $-15\text{ }^{\circ}\text{C}$ (if adjustment is set to 0). If the adjustment is set to $+5$, the temperature will be $55\text{ }^{\circ}\text{C}$ instead. The curve is increased by $5\text{ }^{\circ}\text{C}$ at all temperatures, i.e. it is parallel displaced by $5\text{ }^{\circ}\text{C}$.

Examples of Heating Curves

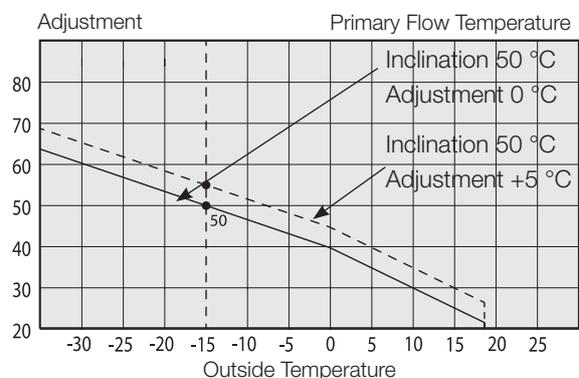
Here you find three charts where you can see how the heating curve changes by different settings of the Inclination. The gradient of the curve shows which temperature the heating system requires at different outdoor temperatures.

The set value of the gradient is the primary flow temperature at an outdoor temperature of $-15\text{ }^{\circ}\text{C}$.



Adjustment

The curve can be parallel displaced (adjusted) by the desired number of degrees to adapt to different systems/houses.



Suitable standard values

At the time of the installation it is seldom possible to instantly set the heating curve exactly. The values to the right may then be a good starting-point before the more accurate adjustment is set. Radiators with small heat emission surfaces require higher primary flow temperatures.

Menu:

Installer/Settings/Setting Heating	—————>	Inclination
Floor heating only		Inclination 35
Low temperature system (well insulated house)		Inclination 40
Standard temperature system (older house)		Inclination 50
High temperature system (older house, small radiators, poorly insulated)		Inclination 60

Adjustment (if the outdoor temperature is lower than 0 degrees)

- At to cold indoors: Increase the value at Inclination a couple of degrees. Wait one day before the next adjustment.
- At to warm indoors: Decrease the value at Inclination a couple of degrees. Wait one day before the next adjustment.

Adjustment (if the outdoor temperature is higher than 0 degrees)

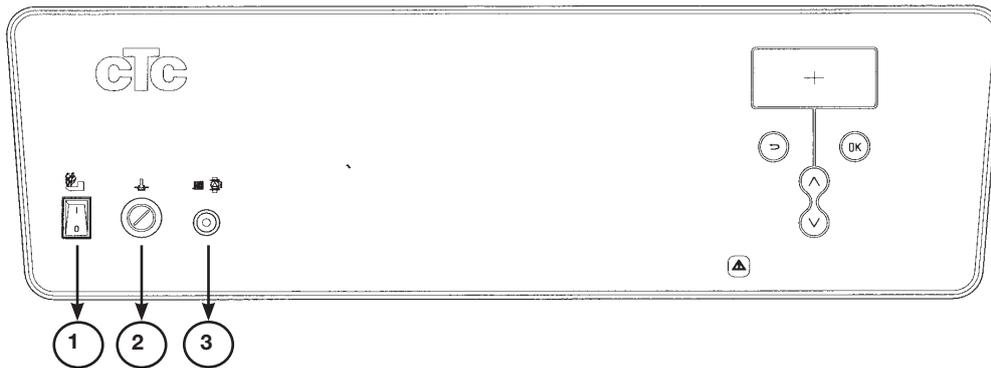
- At to cold indoors: Increase the value at Adjustment a couple of degrees. Wait one day before the next adjustment.
- At to warm indoors: Decrease the value at Adjustment a couple of degrees. Wait one day before the next adjustment.

! When the standard values are fairly correct adjusted, the curve can be displaced directly in the normal display menu Indoor°C.

! To low adjusted values might imply that the required indoor temperature is not being reached. Then you have to adjust the heating curve according to need.

1. Control panel

All settings are set on the well structured control panel. The control panel also provides you with information on operation and temperatures. Information is displayed in the display screen. A few keystrokes and a few menu selections will provide you with all the information you need.



1 Pellet burner switch

The pellet burner is started/shut down using this switch. For more information, see the section "Start/stop the pellet burner".

2 Safety limit thermostat

Safety limit thermostat is triggered when the temperature in the boiler becomes too high.
Reset by pressing the centre button under the cover casing.

3 Fuse 10 A

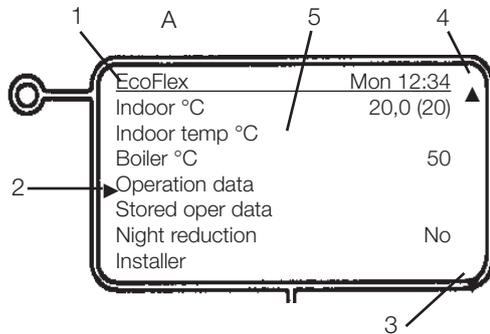
The fuse protects the heating circuit pump.
Reset by pressing the centre button.

How the buttons are used

Accessing the menus, to display operation information or to set values, is simple. The button functions are described below.

A Display screen

- 1 Menu name
The name of the menu you are currently in is displayed here. When you are not in the menu system, the product name, day and time (normal display) are displayed.
- 2 Row marker
You can scroll the cursor up or down the screen to the row you want to select. The cursor is moved using the increase or reduce button (D).



The cursor becomes filled and black when a row is selected. Press the “undo” button (B) to deselect a row.

- 3 The indicator “more rows”
The arrow shows that there are more rows below which are not visible. Scroll the cursor downwards to view these rows. The arrow disappears when there are no more rows.
- 4 More rows indicator
The arrow shows that there are rows above which are not visible in the display. Scroll the cursor upwards to view more rows. The arrow disappears when there are no more rows.

5 Information area

All information, temperatures, values etc. are displayed here.

B Button “step backwards” or “undo”

Use this button to step backwards in the menu system to the previous menu. You can also use this button to deselect a selected row.

C Button – “OK”

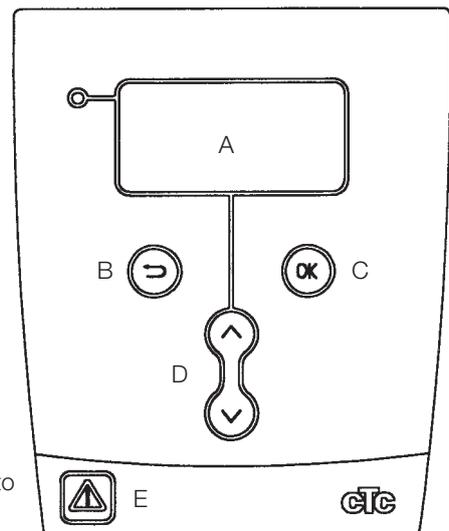
Use this button to approve/confirm a value or a selection.

D Button “increase” or “reduce”

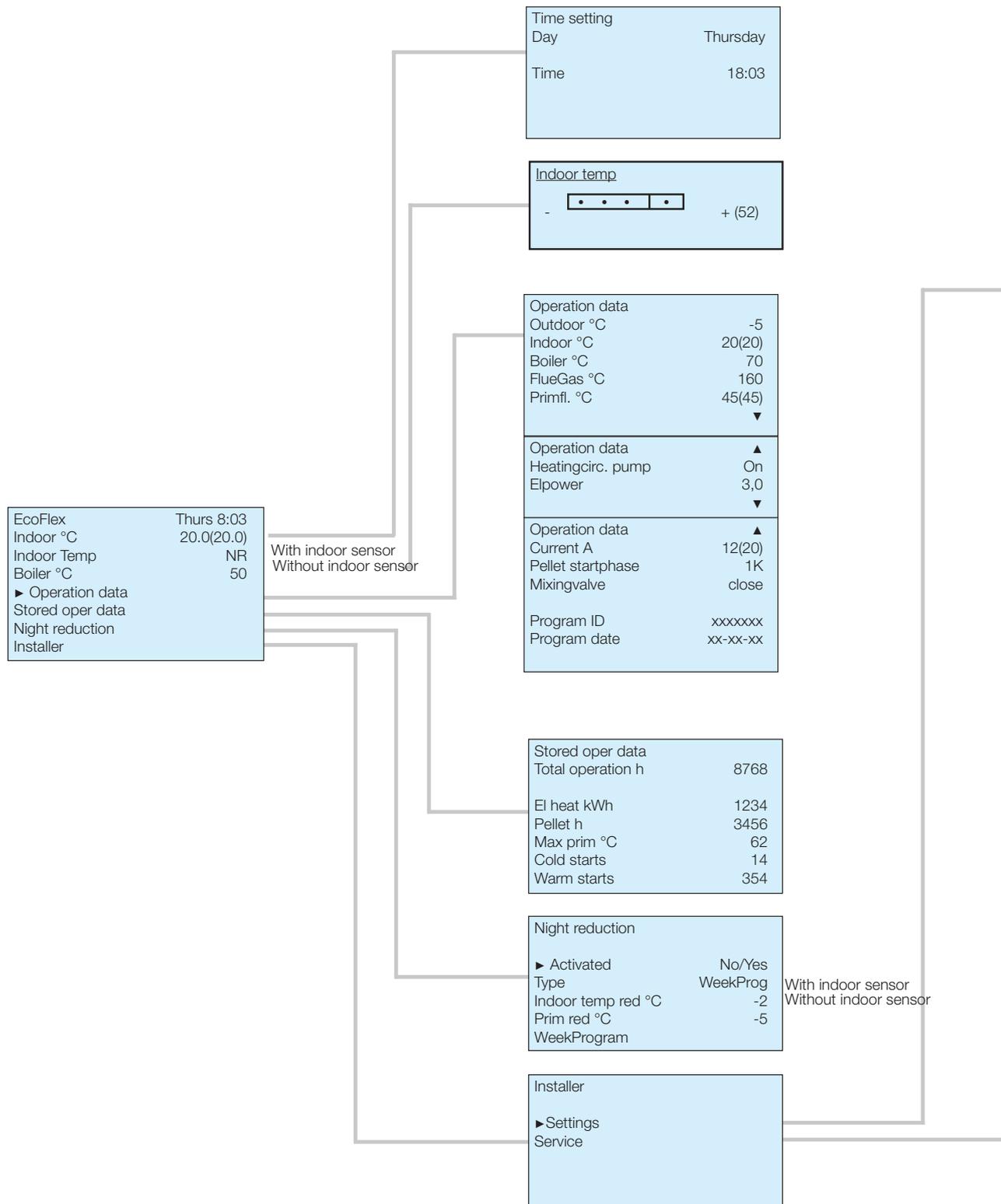
Use the button to increase or reduce a value. The button can also be used to move the row marker upwards or downwards.

E Button – “Alarm reset”

Use this button to reset the product after an alarm has been triggered.



2. CTC EcoFlex menu map



<u>Settings</u>	
► Lang.	English
Heat pump	No
Indoor sens	No
Boiler pellet °C	80
Alarm FlueGas °C	240
El Boiler °C	50
El boiler max kW	6,0
Max fuse A	20
External control	NR
Setting house Param	
Setting pellet	
Holiday	off
Set. tank	
Setting DHW	
Save setting	
Load setting	
Load factory setting	

<u>Setting Heating</u>	
► Max Primfl °C	55
Min Primfl °C	Off
Heating off	16
Heat curve	
Inclination	50
Adjustment	0

<u>Setting pellet</u>	
► Level sensor %	0(50)
Flame detector %	99(50)
Burner type kW	15
Power full auger %	68
Power full fan %	40
Power part auger %	41
Power part fan %	20
Power min auger %	0
Power min fan %	0
Holding min	60
Auger Feeder s	30
Sequenz code	0

<u>Set. tank</u>	
► Charge tank	Yes
Temp tank °C	70
Diff °C	5
Tank prio	No

<u>Service</u>	
► Funktiontest pellets	
Funktionstest other	
Alarm info	

<u>Functiontest pellet</u>	
► Auger Feeder	Off
Fan %	0
Auger burner %	0
El ignition	Off

<u>Funct. test other</u>	
► ElRelay 1,5/3 kW	0
ElRelay 3/6 kW	0
Pellet	Off
Heatingcirpump.	Off
MixingValve	Close
DHW pump	Off
Diode sensor	Off

<u>Alarm stored</u>	
Last alarm	
xxxxx	
Stored alarm	
xxxxx	
xxxxx	
xxxxx	
xxxxx	

3. Detailed menu description

3.1 Factory set values

The product is supplied with a set of values, set by the factory, which are suitable for a normal house with a normal radiator system. These values can be changed as required. House parameters should in particular be checked. Ask your installation engineer to determine the correct values.

The following basic values are set by the factory:

Night reduction	Off (constant normal temperature)
Room sensor:	No
Boiler pellets:	80°C
Alarm smoke gas:	240 °C
Electric boiler	50 °C (only Swedish version)
Electric boiler max kW:	6 (only Swedish version)
Main fuse:	20A (only Swedish version)
Burner type:	15 kW
House parameters:	Inclination = 50 Adjustment = 0

EcoFlex	Thurs 8:03
Indoor °C	20.0(20.0)
Indoor Temp	NR
Boiler °C	50
► Operation data	
Stored oper data	
Night reduction	
Installer	

3.2 Main menu/Normal display menu

This menu is the system's "basic menu". The system returns to this menu if no buttons are pressed within a 10 minute period. All other menus can be accessed from this menu.

EcoFlex	Mon 15:43	Displays selected product, day and time. Day and time can be set by selecting this row.
Indoor °C	20,0 (20,0)	Displays current room temperature. The set temperature is displayed in brackets. Select this row to change set temperature. Can be set in the range 0.0 ... 35.0 °C.
Indoor temp	NR	If an indoor sensor has not been fitted, temperature is adjusted using the outdoor temperature. Select this row to adjust the temperature supplied to radiators, see the "Indoor temperature" menu below. If "NR=" is displayed, night reduction is in progress.
Boiler°C	80	Boiler water temperature is displayed here. Only display.
Operation data		Select this menu to view all current product operating data, all current temperatures, which components are active etc.
Stored oper data		Select this menu to view the operating data which has been stored over a longer time period.

Night reduction No

Here you can select whether you want to activate night time temperature lowering (lower room temperature at night). Two periods of lower temperatures per day, seven days a week can be programmed. Lowering can also be programmed for blocks of days.

Installer

This menu contains two sub menus. One menu is used to set all basic settings and one menu is used by service personnel.



3.3 Menu Time setting

(at the top of the normal display menu)

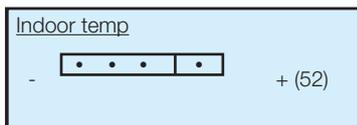
Day and time can be set here. The clock is metered by the mains electricity network frequency (50 Hz). If there is a power cut, reset the clock. The clock restarts at the time immediately before the power cut \pm 5 minutes. Summer time/winter time is set manually.

Day Mon

Set current day (Monday...Sunday).

Time 00:00

Set current time (00:00... 11:59 pm)



3.4 Menu Indoor temperature

(the menu can be accessed directly from the main menu)

(when "operation without room sensor" is selected)

The room temperature is set in this menu if a room sensor has not been fitted (selected in the settings menu). The house's basic settings are first set in the "house parameters" menu, usually with the help of the installation contractor. Basic settings are then fine tuned using this menu.

If the indoor temperature is experienced as being too low or too high, move the cursor towards + (increase) or - (reduce). Move a little at a time and see what effect this has on indoor temperatures (1 day) before making further changes. Several adjustments may be necessary at different outdoor temperatures. However, a correct setting will be arrived at which will not require further changing. A reference value (for example 50) is displayed under the bar. This value depends on the basic value set. If the bar does not extend far enough to allow the correct indoor temperature to be obtained, the basic setting must be adjusted in the Installer/Settings/Setting Heating menu. The cursor is then centred in relation to the new values.



radiator thermostats must be fully open and fully functioning when adjusting the system.

Operation data	
Outdoor °C	-5
Indoor °C	20(20)
Boiler °C	70
FlueGas °C	160
Primfl. °C	45(45)
▼	
Operation data ▲	
Heatingcirc. pump	On
Elpower	3,0
▼	
Operation data ▲	
Current A	12(20)
Pellet startphase	1K
Mixingvalve	close
Program ID xxxxxxxx	
Program date xx-xx-xx	

3.5 Menu Operation data

(the menu is directly accessed from the main menu)

This menu displays current product and system temperatures and operating data. Values in brackets are either required values or automatically generated values which the product aims to achieve (set point).

Outdoor°C	-5	Displays current outdoor temperature. The product uses this value to determine a number of different operating data.
Indoor°C	21 (21)	Displays current room temperature (if indoor sensor in operation is selected), and required value "set point value" (in brackets).
Boiler°C	80	Displays the boiler temperature.
FlueGas °C	160	Displays current flue gas temperature.
Primfl. °C	35 (35)	Displays the temperature of the primary flow to the house's heating system, and the temperature which the system aims to achieve. This value will vary during operation depending on set parameters and current outdoor temperatures.
Heatingcir. pump	On	Displays the heating circuit (radiator) pump's operating status. The pump stops in the summer time when there is no heating requirement. The pump is however exercised occasionally to avoid it jamming.
Elpower kW	0,0	Displays supplementary power supplied by the electric boiler (0...9 kW). The electric boiler connects power in steps of 1,5 kW (6 connection steps). (Only Swedish version)
Current A	7,3 (20)	Displays the house's total current consumption on the hardest loaded phase. The house's main fuse size is displayed in brackets. Assumes that the current sensor supplied has been fitted to the incoming cables. If the current drawn exceeds the main fuse size, the electric boiler automatically steps down a power step to protect the fuses, for example when several high consumption equipment units in the house are being used. (Only Swedish version)
Pellet Startph	1K	Displays the pellet burner's current operating status Shut off: Off: Start phase: Stop: Temp control: Full: Part: Min:
Mixingvalve	Open	Displays whether the mixing valve valve increases/opens or reduces/closes the heat supplied to the heating system. When the correct temperature has been supplied, the valve solenoid then remains stationary.
Program ID	1011111	Control program identity.
Prog date	06-01-11	Control program version date.

Stored oper data	
Total operation h	8768
El heat kWh	1234
Pellet h	3456
Max prim °C	62
Cold starts	14
Warm starts	354

3.6 Menu Stored operation data

(the menu can be directly accessed from the main menu)

Operation values across longer periods of time are reported in this menu.

Total operation h	8768	Displays the total time the product has been connected to power.
El heat kWh	1234	Displays the immersion heaters total estimated consumption. This is not a direct energy measurement. Reported data can differ from real consumption due to temperature conditions in the property. Household energy lies outside this measurement range (Only Swedish version)
Pellet h	3456	Displays the time the pellet burner has been in operation.
Max prim °C	62	Displays the maximum temperature which has been supplied to the radiators. The value can indicate the radiator system's/the house's temperature requirement. The value can be reset by pressing the "OK" button in this menu.
Cold starts	14	The number of cold starts of the boiler.
Warm starts	354	The number of warm starts of the boiler.

Night reduction	
▶ Activated	No/Yes
Type	WeekProg
Indoor temp red °C	-2
Prim red °C	-5
WeekProgram	

3.7 Menu Night reduction

(the menu can be directly accessed from the main menu)

Night time lowering of temperatures can be activated and set in this menu. Night time temperature lowering means that the indoor temperature is lowered during scheduled periods, for example at night or when you are at work. Two types of night time temperature lowering can be selected. Week Program is selected to schedule daily lowering of temperatures. Block is selected to schedule night temperature lowering periods which last for several days.

Activated Yes Here you can select whether scheduled temperature lowering is active. Where "No" is selected, there is no temperature lowering.

Typ WeekProgram The type of lowering is selected here: WeekProgram means that periods of lower temperatures can be scheduled for all days of the week, with the option of two periods of lower temperatures per day. The schedule repeats every week.

Block means that lowering is scheduled for several days of the week, for example Monday to Friday. Two lower temperature periods can be scheduled.

The schedule repeats every week.

Indoor Temp°C red -5

Here you can set how many degrees the room temperature is to be lowered during the lower temperature periods. NB: -5 means that the room temperature is lowered 5°C below the ordinary temp. If the room sensor is not included in operation, the lowering is applied to the primary flow temperature. Rule of thumb: a 3–4°C lower primary flow temperature gives around 1°C lower room temp in a normal system.

WeekProgram or Block

Scheduling is set under these menus, see next section.

WeekProgram	
Mon	▲ 06 ▼ -- ▲ -- ▼ 22
Tue	▲ 06 ▼ -- ▲ -- ▼ 22
Wed	▲ 06 ▼ -- ▲ -- ▼ 22
Thu	▲ 06 ▼ -- ▲ -- ▼ 22
Fri	▲ 06 ▼ -- ▲ -- ▼ 23
Sat	▲ 08 ▼ -- ▲ -- ▼ 23
Sun	▲ 08 ▼ -- ▲ -- ▼ 22

3.8 Menu Week program

(Night reduction/WeekProgram)

Lowering times during days of the week can be scheduled in this menu. The schedule repeats every week. The picture shows the factory values, which can be changed. If further lowering periods are required, intermediate times can be programmed.

▲ = the temperature is raised (to normal temp) at the times specified after the arrow.

▼ = the temperature is lowered the number of degrees specified at the time specified after the arrow.

Ex 1. Mon ▲ 06 ▼ -- ▲ -- ▼ 22 :

On Monday morning at 6.00 am, the temperature is raised to normal and remains normal throughout the day until 10.00 pm when the temperature is lowered.

Ex 2. Mon ▲ 06 ▼ 12 ▲ 16 ▼ 22 :

At 6:00 am, the temp is raised to normal, at 12:00 pm the temp is lowered until 4:00 pm. Between 4:00 pm and 10:00 pm the temp is normal, after which the temperature is lowered.

3.9 Menu Block

(Night reduction/Block)

Temperature lowering for several days of the week can be set in this menu. For example, if you work somewhere else during the week but are at home at the weekend.

Decr. Sunday 6:00 pm

Set the first day and time at which the temperature should be lowered.

Incr. Friday 4:00 pm

Set the day and time at which the temperature is to be returned to normal.

If two lowering periods are required in the week, they are programmed in chronologic order.

E.g.:

Decr. Sunday 6:00 pm

Incr. Wednesday 4:00 pm

Decr. Thursday 9:00 pm

Incr. Friday 4:00 pm

3.10 Menu Installer

(the menu can be accessed directly from the main menu)

This menu contains two sub menus. The Settings menu is used by the installation contractor and the user and the Service menu is used when fault tracing.

Settings

Select this menu to adjust the settings to your own requirements.

Service

This menu is used by service personnel for fault tracing and diagnostics. The menu also contains an encoded section with alarm limits, where manufacturer's settings are stored.

Settings	
► Lang.	English
Heat pump	No
Indoor sens	No
Boiler pellet °C	80
Alarm FlueGas °C	240
El Boiler °C	50
El boiler max kW	6,0
Max fuse A	20
External control	NR
Setting house Param	
Setting pellet	
Holiday	off
Set. tank	
Setting DHW	
Save setting	
Load setting	
Load factory setting	

3.11 Menu Settings

(Installer/Settings)

In the menu "Settings", the installer and user make the adjustments to the requirements and demands.

U = settings made by the user.

I = settings made by the installer.

Lang.	English	I/U. Setting the language.
Heat pump	No	I. The control system contains functions for connecting a system with EcoFlex to heat pump CTC EcoAir or CTC EcoPart. See the separate instructions book. (Only Swedish version with DHW-heat exchanger)
Indoor sens	Yes/No	I. Select here whether an indoor sensor is to be included in operation. An indoor sensor can be temporarily deselected, for example when a fire place is being used.
Boiler Pellet	°C 80	I/U. The boiler temperature required under pellet operation is set here. Adjustable from 50-85.
Alarm FlueGas °C	240	I. Alarm flue gas °C 240 I. The flue gas temperature at which the alarm is activated/displayed in the display is set here. Remark. This alarm does not stop the pellet burner. Tip. Setting a suitable alarm level allows this to be used as a reminder that it is time to clean the boiler.
El Boiler °C	50	I/U. The boiler temperature required when heating using the immersion heater is set here. (Only Swedish version)
El boiler max kW	6	I. Setting of immersion heater maximum permitted power. 0 to 9 kW with steps of 1.5 kW. (Only Swedish version)

Main fuse A	20	I. The house's main fuse size is set here. Together with a fitted current sensor, the fuses are protected when using equipment which provides temporary power peaks, for example cooker, oven, engine heater etc. where the product temporarily reduces connected electrical power output. (Only Swedish version)
External control	NR	I. Selection of remote control type. NR= remote controlled night reduction, for example via the minicall system. SO = power supplier control. Disconnection of immersion heater for specific periods of time, controlled by the electricity power supplier (special equipment is required).
Setting house		I/U. When this is selected, a sub menu will be displayed in which the house's temperature Param requirement (heating curve) is set, see the "Setting heating" menu.
Setting pellet		I/U. This selection leads you to a sub menu for pellet burner settings, see menu Set pellet burner.
Holiday	Off	U. Where you require constant night time lowering of temperatures (for example when on holiday), the number of days (holiday) can be set here. Up to 250 days can be set. Off = not activated.
Set.tank		I/U. This option takes you to a submenu for tank settings; see Tank Setting Menu.
Indoor temp red	°C -2	U. If the holiday function is activated, the number of degrees the temperature is to be lowered is set here. If a room sensor is not selected, the number of degrees the radiator prime flow temperature is to be lowered is set instead.
Save setting		I/U. Your own settings can be saved here. Confirm using the "OK" button.
Load setting		I/U. Saved settings can be retrieved here. Can be useful if you test new settings, which are subsequently shown to not be satisfactory and want to restore the old settings.
Load factory setting		I/U. The product is supplied with factory settings. These can be restored by using this function. Confirm using "OK". Language, product and product size are however not reset.

Setting Heating	
► Max Primfl. °C	55
Min Primfl. °C	Off
Heating off	16
Heat curve	
Inclination	50
Adjustment	0

3.12 Menu Setting House Parameters (Heating)

(Installer/Settings/Setting Heating)

The house's heating requirement (the heating curve) is set in this menu. It is important that this basic setting is correct for your house. Incorrectly set values can result in insufficient heating, or that unnecessarily high levels of energy are used to heat your house. Particularly great emphasis should be focussed on determining the "Inclination" and "Adjustment" values.

Max Primfl. °C	55	Maximum permitted temperature of the water supplied to the radiators. This functions as an "electronic" lock to protect floor circuits in floor heating systems.
Min Primfl. °C	Off	Adjustable from 15–65. If, in the summer months, you want cellar or floor circuits (e.g. bathrooms) to have a specific level of background heating, a minimum permitted temperature can be set here. Other sections of the house should be shut off using thermostat valves or shut off valves.
Heating off °C	16	Outdoor temperature at which the house no longer requires heating. The radiator pump stops and the mixing valve valve remains closed. The radiator pump is exercised daily for a short period so that it does not jam. The system starts automatically when heating is required.
Heat curve		Collective name for the house's heating curve. The heating curve consists of an "inclination" and an "adjustment", which together define the temperature the house requires at different outdoor temperatures.
Inclination °C	50	This value is the temperature of the water supplied to the radiators at an outdoor temperature of –15°C. A lower value is set for radiator systems with larger radiator surface areas (a low temperature system). Floor heating systems require much lower temperatures. An even lower value should therefore be selected. The value is increased for high temperature systems, so that sufficient indoor temperatures are achieved. High temperature systems are not optimised for heat pump operation and savings will therefore be lower.
Adjustment °C	0	The inclination defines how much the temperature of the water supplied to the radiators should be increased where outdoor temperatures fall. The adjustment specifies that the temperature level can be raised or be lowered at a specific outdoor temperature. Example: Inclination 50 specifies that the temperature of the water supplied to the radiators is 50°C when the outdoor temperature is –15°C, if the adjustment is set to 0. If the adjustment is set to +5, the temperature is 55°C. The graph is increased by 5°C at all outdoor temperatures, i.e. the graph is parallel displaced by 5°C.

Setting pellet	
▶ Level sensor %	0(50)
Flame detector %	99(50)
Burner type kW	15
Power full auger %	68
Power full fan %	40
Power part auger %	41
Power part fan %	20
Power min auger %	0
Power min fan %	0
Holding min	60
Auger Feeder s	30
Sequenz code	0

3.13 Menu Setting pellet

(Installer/Setting/Setting pellet)

Pellet burner parameters are set in this menu. CTC EcoFlex is supplied with the pellet burner set for most normal heating systems. Changes are only to be made to the pellet burner by qualified installation engineers or service technicians.

Level sensor%	0 0(50)	The value is the signal strength measured (%) in the level monitor receiver. The value in brackets is the limit at which the control system interprets the signal from the level monitor receiver as being on or off. Value 0 means free passage between the flame detector transmitter and the level monitor receiver, i.e. no pellets in the top connection. Value 99 means that the beam between the level monitor transmitter and receiver is fully interrupted, i.e. there are pellets in the top connection.
Flame detector %	99(50)	The value is measured light strength (%) in the flame detector. The value in brackets is the limit at which the control system interprets the signal from the flame detector as meaning there is or there is not a flame. Measured value = 1, the flame detector does not detect light. Measured value = 99, the flame detector detects a strong flame.
Burner type kW	15	The burner factory settings are full load 15 kW, part load 9 kW and min load 0 kW. 20 kW not in use.
Power full auger %	68	Factory set value to full load 15 kW
Power full fan%	40	Factory set value to full load 15 kW.
Power part auger %	41	Factory set value for part load 9 kW.
Power part fan %	20	Factory set value for part load 9 kW.
Power min auger %	0	Output mode min is blocked at delivery.
Power min fan %	0	Output mode min is blocked at delivery.
Holding min	60	The time in minutes between each feed of pellets when the burner is in the holding mode (i.e. no heat output from the boiler).
Auger Feeder s	30	The time in seconds which the external feed auger runs each time it receives a signal from the level monitor to fill pellets to the burner top connection.
Sequenz code	0	Contains important factory set values for the burner function. Must not be changed.

<u>Set. tank</u>	
► Charge tank	Yes
Temp tank °C	70
Diff °C	5
Tank prio	No

3.14 Menu Inst tank

Charge tank	Yes	Indicates tank charging function.
Temp tank °C	70	Indicates tank temperature that stops tank charging.
Diff °C	5	Temperature below tank temperature set value that starts tank charging
Tank prio	No	Indicates whether mixing valve should be closed during tank charging.

<u>Service</u>	
► Functiontest pellets	
Funktionstest other	
Alarm info	

3.15 Menu Service

(Installer/Service)

There are three sub menus in the service menu:

Function test Pellet	The components in the pellet burner can be function tested in this sub menu. Intended for fault tracing the product
Function test other	The components of the boiler can be function tested in this sub menu- Intended for fault tracing the product
Alarm info	Information on the last alarm triggered is provided in this menu.

<u>Functiontest pellet</u>	
► Auger Feeder	Off
Fan %	0
Auger burner %	0
El ignition	Off

3.16 Menu Function test Pellet

(Installer/Service/Function test Pellet)

This menu is used to test pellet burner component function. It is therefore used by qualified service personnel. All product functions stop when the menu is activated. Each component can then be tested separately or together. All control functions are shut off. The only protection against incorrect operation is the electric cartridge overheating protection.

If no button is pressed within a 10 minute period, the product automatically returns to normal operation.

Auger Feeder	Off	Activation of feed auger.
--------------	-----	---------------------------

Fan %	0	Pellet burner fan can be activated here. Adjustable 0–100%. Stepless speed regulation.
Auger burner %	0	The pellet burner auger can be activated here. Adjustable 0–100%. 100% means that the augers run continuously. A lower per cent means they are sometimes stationary and sometimes run.
El. ignition	Off	Electric ignition can be activated here.



Is only to be activated when the fan is in operation.

Funct. test other	
► ElRelay 1,5/3 kW	0
ElRelay 3/6 kW	0
Pellet	Off
Heatingcirkump.	Off
MixingValve	Close
DHW pump	Off
Diode sensor	Off

3.17 Menu Function test other

(Installer/Service/Function test)

This menu is used to test the product component function. It is therefore used by qualified service personnel. All product functions stop when the menu is activated. Each component can then be tested separately or together. All control functions are shut off, the only protection against incorrect operation is the safety limit thermostat of the boiler.

If no button is pressed within a 10 minute period, the product automatically returns to normal operation. The exception is in menu Pellets in the menu Function test. This function does not reset automatically.

ElRelay 1,5/3kW	0	Immersion heater 3kW semi activated. First relay 1a (1.5kW), then relay 1b (3kW). Connected power is displayed. (Only Swedish version.)
ElRelay 3/6kW	0	Immersion heater 6kW semi activated. First relay 2a (3kW), then relay 2b (6kW). Connected power is displayed. (Only Swedish version.)

Pellet	Off	This function can be used to lock the pellet burner in operating mode, min, part or full. Useful by adjusting the pellet burner combustion values, or when adjusting flue gas temperature. Off = this function is shut off, the pellet burner is controlled by the ordinary control program.
Heatingcir. pump	Off	Activation of the heating circuit pump.
MixingValve	Closing	The mixing valve motor can be operated from here. Closing – No signal – Open.
DHW pump	Off	Activation of the DHW charging pump.
Diode Sensor	Off	The indoor sensor alarm function montage can be checked here. The indoor's sensor red diode comes on and lights continuously when activated. The panel's alarm diode also comes on.

```
Alarm stored
Last alarm
xxxxx
Stored alarm
xxxxx
xxxxx
xxxxx
xxxxx
```

3.18 Menu Alarm info

(Installer/Service/Alarm stored)

Alarm history can be read here.

The four last alarms are reported.

Latest alarm	Displays the last alarm in text form.
Stored alarm	Displays the three previous alarms. If all four alarms are of the same alarm type, this can indicate an intermittent fault, for example a bad contact.

4. Operation and maintenance

When the installation engineer has finished installing your new heating boiler, he should together with you check that the system is in a satisfactory condition. Let the installation engineer show you switches, control systems and fuses so you know how the system works and how it should be operated. Bleed the radiators after around three days' operation and top up with water if required. If a fault occurs, you should always contact the installation engineer who installed your unit. If the engineer believes the malfunction is due to a materials or design fault, the installation engineer will contact us to check and rectify the fault. Always provide the product's serial number.

4.1 The heating system

An indoor sensor, which always should be installed, ensures that the temperature in the room is correct and steady. Radiator thermostats should always be fully open in areas where the room sensor is located, if the signals sent to the control system are to be correct. Always adjust the system with all radiator thermostats fully open. After a few days, the thermostats can be adjusted individually in the other rooms.

If you do not manage to set room temperature, check:

- That the radiator system is correctly adjusted and is functioning normally. That radiator thermostats are open and that the radiators are equally warm. Feel the entire radiator surface.
Bleed the radiators.
- That the boiler is in operation and no error messages are displayed.
- That the product is not set in the "Max permitted prime flow temperature" mode at a value that is too low.
- That a sufficiently high "heating curve" value is selected. Increase as necessary. For more information on this, see menu "Setting House Parameters".
- That temperature lowering is not incorrectly set.
- That the heating circuit mixing valve is not in the manual position.

If heating is uneven, check:

- That the room sensor position is representative for the house.
- That radiator thermostats do not affect the room sensor.
- That no secondary heat source/cold source affects the indoor sensor.
- That the shunt is not in the manual position.

Indoor sensor

You can select no Indoor sensor in the Installer/Settings/Indoor sens → No. This can be set if the indoor sensor is difficult to place, if there are several apartments, if the floor heating system has an individual indoor sensor or if you use a fire place or open hearth. The alarm diode on the room sensor, however, functions as normal. If you occasionally use a fireplace or open hearth, the room sensor can be affected and reduce the temperature supplied to the radiators. Other rooms in the house can therefore become cold. The room sensor can temporarily be deselected during firing. EcoFlex then supplies heat to the radiators using the heat graph set (see the chapter "Heating curve"). The radiator thermostats throttle the section of the house in which you are using an open fire.

In case of a fault on the outdoor sensor/indoor sensor

If a fault occurs on the outdoor sensor, an outdoor temperature of -5°C is simulated so that the house does not become cold. Alarm is displayed in the display screen. If a fault occurs on an indoor sensor, EcoFlex automatically switches to graph based operation. Alarm is displayed in the display screen.



If you do not have radiator thermostats on upper floors, you may need to fit these.

Summer basement heating

Background heating in basements/recreation room/bathrooms is often required in the summer months, to avoid damp air. Your EcoFlex can provide this by you setting a "minimum permitted primary flow temperature" to a suitable temperature ($15-65^{\circ}\text{C}$). See the Installer/Settings/Setting heating/Min Primfl. $^{\circ}\text{C}$ menu.

This means that the temperature supplied to the radiators does not fall below a selected temperature, for example $+27^{\circ}\text{C}$.

Functioning radiator thermostats or shut off valves are required in the rest of the house for this to function. These shut off heating in the rest of the property.

The function can also be used for bathroom floor heating to heat floors in the summer.

Night reduction

With night time temperature lowering, you have the opportunity to automatically vary the temperature in the house during the day, every day of the week. See under menu "Night reduction"

Load monitor

EcoFlex has a load monitor. If the system is fitted with a current sensor, the house's main fuses are then continuously monitored to ensure they are not overloaded. If overloading occurs, an electrical step on the electric cartridge heater is disconnected. The electric cartridge heater power can therefore be limited where high levels of heating are required and this is combined with, for example, a single phase engine heater, cooker, washing machine or tumble dryer. For more information see the section "Information texts". (Only Swedish version.)

Mixing valve

The heating circuit mixing valve is operated automatically from the control system, so that the heating system receive the correct temperature irrespective of season.

Safety valve for boiler and heating system (for closed system)

Check regularly that the valve works by manually turning/lifting the regulation device. Check that water runs from the drain pipe. The outlet from the drain pipe must always be open. Water can drip from the safety valve.

Drainage

The boiler should be disconnected from the power source when drained. The drainage valve is positioned at the bottom left of the unit when viewed from the front, behind the casing. When draining the whole system, the heating circuit valve should be fully open. Air must be supplied to closed systems.

Operation stops

The boiler is shut down using the operating switch. If there is a risk that the water can freeze, all water should be drained from the boiler and the heating system. Shut off the cold water supply to the boiler, open a hot water tap and drain all the water from the hot water system.

5. Start/stop of the pellet burner

The pellet burner is started/shut down using the switch on the control panel.

Start up from shut off mode (cold start with electric ignition)

This type of start up only occurs when the burner has been shut off using the pellet burner switch on the control panel or after the power returns following a power failure. The boiler temperature must also be more than 8 degrees under the set point value.

If the external feed system is empty of pellet, it should be filled before the pellet burner is started:

- Make sure that the pellet burner switch is in the “0” position.
- Remove the pellet tube from the external auger and place a container under it.
- Set the pellet burner switch in the “1” position.
- Go into the menu: Installer/Service/Function test pellet/Auger Feeder.
- Change Auger feeder → On and wait until pellets begin to be fed from the external auger.
- Change Auger feeder → Off.
- Set the pellet burner switch in the “0” position.
- Refit the tube to the external auger.

To start the pellet burner, set the pellet burner switch in the “1” position. The burner auger motor should now start and the fuel should be fed, via the burner auger, to the hearth. The fan and ignition element start after approximately 3 minutes. When the fuel reaches the ignition element’s hot air outlet, the feed rate falls and the pellet fuel ignites after around 6–7 minutes.

The burner’s flame detector indicates when the fuel has been ignited and shuts off the ignition element. The fan speed then falls to the reduced rate. The fuel feed stops completely for 3 minutes so that all of the fuel in the hearth has time to ignite. Reduced feeding then continues for 5 minutes. After a subsequent pause of 10 minutes, the burner’s operating program is activated and controls the burner’s functions. If ignition fails, this is indicated by an alarm text shown in the display.

Start and stop in operation mode (warm start)

During operation, it is the boiler temperature sensor which controls the boiler’s start/stop functions.

When the water temperature has fallen to 5 degrees below the selected set point value, the burner starts in the part load mode. If the temperature falls a further 2 degrees to 7 degrees below the expected value, the full power load is activated. The burner then runs in this operating mode until its temperature is 4 degrees below the set point value, at which point the part power load is reactivated.



The first time the burner is started or if it is empty of pellet for any other reason, an additional restart may be required after around 3 minutes of operation.

6. Cleaning

Cleaning the boiler

All combustion using solid fuels, even though automated, normally requires a little more maintenance and service than oil fired units. CTC EcoFlex has been designed to minimise the need for maintenance. Ash emptying is carried out as required. Cleaning of the boiler's convection surfaces (combustion chamber and heating surfaces) should be carried out regularly, cleaning of the boiler's combustion chamber should be carried out as required. Tip! By setting a suitable alarm temperature level Alarm FlueGas°C in menu Installer/Settings makes this function useful as a reminder that it is time to clean the boiler.

Shut off the pellet burner using the switch on the control panel well in advance of cleaning, so that the burner has time to cool.

The following should be carried out when cleaning:

NB! Shut of the power supply to the boiler before the casing is removed.

- Open the cleaning door on the top of the boiler.

NB! The cleaning door can be hot.

- Lift off the flue gas damper (picture 1).
- Clean the round tubes with the long soot brush supplied.
- Clean the square ducts using the short soot brush supplied.
- Refit the flue gas damper (picture 2).

IMPORTANT! Make sure the damper is fitted the right way around.

- Refit the cleaning door.
- Remove the boiler hood (picture 3).
- Undo the electric cable contacts (picture 4).
- Undo the hose clamp and remove the pellet tube.
- Open the quick couplings and draw out the burner (picture 5).
- Brush the combustion chamber walls if required.
- Empty the ash bin (picture 6).



Picture 1



Picture 2



Picture 3



Always take great care, as there can still be embers in the bin. The ash should be stored in a fire proof container.



Picture 4



Picture 5



Picture 6

Cleaning and maintenance of the pellet burner

Carry out the following checks and measures as required or when cleaning the boiler:

- The hearth does not normally require any special maintenance, but it should be checked for cinder accumulation when emptying ashes. This should, where required, be removed.
- Refit the burner. Take care and check that no hatch seals are damaged.

Carry out the following inspections and measures 1–2 times/year.

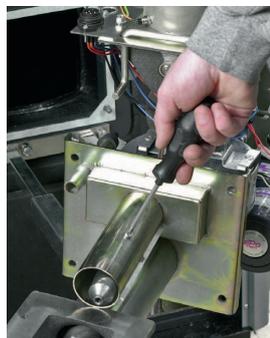
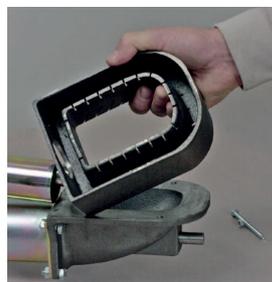
- Remove the boiler's primary ring and the primary air pipe.
- Clean dust and shavings from the inside of components. Clean the slots in the primary ring carefully. Fit the components.
- Check for wear of the dosage wheel's pins, toothed gear and back lock. Adjust and replace where required. Where required, lubricate the drive chain with a little thin oil.

Sintering

Each time a delivery of pellets is received, the hearth should be checked so that any sintering (continuous ash crust or stone and gravel like particles in the hearth) is quickly detected. These types of particles must always be removed from the hearth at short intervals so that the primary ring does not overheat and become damaged.

Sintering is due to contaminants in the fuel and a claim should immediately be submitted to the fuel supplier.

! Only use pellets fuel which meets standard SS 187120 class 1.



7. Alarm and fault tracing/measures

The boiler is equipped with a control system which continuously monitors operation. The texts below can be shown in the display:

Alarm:

An alarm is activated if a fault is detected which affects boiler function and the light diode on the room sensor starts flashing. The fault can be read as a text message on the display on the control panel.

The alarm is reset by pressing the panel reset button, see the "Control panel" section.

Operation info:

The control system provides information on boiler operation, such as when the pellet burner is shut off. The alarm diode does not flash, as there is no fault.

Alarm texts (boiler)

<p>Alarm Sensor Prim</p>	<p>Fault on primary flow sensor, not connected, short circuited or outside range.</p>
<p>Alarm Sensor DHW</p>	<p>Fault on DHW sensor, not connected, short circuited or outside range</p>
<p>Alarm Sensor Outdoor</p>	<p>Fault on outdoor sensor, not connected, short circuited or outside range. When a fault occurs, the control system simulates an outdoor temperature of -5°C. An alarm can be triggered if the outdoor sensor is exposed to direct sunlight. Move the sensor to a more suitable position</p>
<p>Alarm Sensor indoor</p>	<p>Fault on indoor sensor, not connected, short circuited or outside range.</p>
<p>Alarm Sensor boiler</p>	<p>Fault on boiler sensor, not connected, short circuited or outside range.</p>
<p>Alarm Sensor flue gas</p>	<p>Fault on flue gas sensor, not connected, short circuited or outside range.</p>
<p>Alarm High flue gastemp xxx °C Clean the boiler</p>	<p>Fault: Flue gas temperature exceed the value set in the menu "Alarm flue gas C"</p>
	<p>Action: Clean the boiler as specified in the maintenance section</p>
	<p>Note: This alarm does not stop the pellet burner. This can be used as a reminder that it is time to clean the boiler, where a suitable alarm level is set.</p>

Alarm
Flue gas 300 °C

Fault:

Flue gas temperature exceed 300 °C.

Action:

Check that the flue gas damper is correctly fitted, clean the boiler.
If the alarm recurs, contact the installation engineer.

Alarm
Safety limit thermostat

Fault:

The safety limit thermostat has triggered.

Action:

Reset by pressing the centre button under the cover casing. If the alarm recurs, contact the installation engineer.

Alarm texts (Pellet burner)

Alarm
Pellet missing

Fault:

The burner has requested fuel but not received any.

Check:

That there are pellets in the external fuel storage.

Action :

Fill pellets.

Check:

That the filling tube does not have a too shallow slope.

Action:

Shake the tube and change the angle so that pellets do not clog in the tube.

Check:

That the feed auger angle is not too steep or flow has stopped due to bridging in the external fuel storage

Action:

Set the feed auger at a shallower angle and turn it forwards and backwards a few times to loosen bridges. The inlet opening should be in the middle of the external fuel storage (applies to smaller weekly storage).

Check:

That the external feed auger drive motor is functioning and that the motor shaft drives the auger helix around.

Action:

If the motor does not run, check this by dismantling it from the auger motor shaft. Then disconnect the incoming power cable from the boiler and connect directly to a wall power point using the supplied adapter cable. If the motor has overheated due to blocking, the motor's thermal protection can have been triggered. The motor will not start before it has cooled. Do not forget to check whether the auger helix is blocked. If it is, unblock by hand using suitable measures.

Call a service technician if there is a fault on the motor.

Alarm
Flame detector

Fault:

The flame detector has not indicated a flame for 10 min. of normal operation Fuel has been supplied to the burner

Check:

Check that the flame detector and the hearth are not filled with ashes and that the flame detector has not overheated or is soot covered

Measures:

Remove ashes from the hearth, remove any fly ash and wipe clean the flame detector.

Remark:

If the flame detector often becomes soot coated, this is due to incorrect adjustment. This is most probably due to the fuel feed rate being too high. A service technician should be called

Alarm
Contr rotary valve

Fault:

The flame detector has not indicated a flame for a period of time during hot starts Fuel has been supplied to the burner.

Check/Action:

Check the flame detector.

Check that the pellets fed to the hearth consists of whole pellets and not just shavings. If the fuel consists of shavings, a bed of embers cannot be maintained. In the event of frequent stops, call in a service technician to check rotary valve tightness.

(If the lock is not sufficiently tight, a bed of embers cannot be maintained.)

Alarm
Contr El. ignition

Fault:

The flame detector has not indicated a flame for a period of time during cold starts Fuel has been supplied to the burner.

Check/Action:

Check the flame detector.

If ignition is not successful after two start attempts, check the ignition element function, see Installer/ Service/ Functiontest pellet / El. ignition

If the ignition element does not function, call in a service technician.

Alarm
 Contr level monitor
 Shown alternatively with
 Blocking pellets

Fault:

The flame detector has not indicated a flame for 10 min. Fuel has not been supplied to the hearth.

Check:

Check whether there is fuel in the top connection.

Action if there is no fuel in the top connection:

Check cable connections to the level monitors. If this does not rectify the fault, clean the level monitors by wiping clean. If the boiler external feed does not start, the level monitors are faulty and a service technician should be called out. If the level monitors must be frequently wiped clean, this can be due to the pellets being electrostatically charged. wipe clean using an anti-static agent and investigate why the pellet are charged.

Action if there is fuel in the top connection:

Check that the feed auger, rotary valve and burner auger rotate and are not jammed by, for example, foreign objects. Where the back stop is incorrectly set, the gear can be exposed to high levels of wear or the dosage wheel and the gear can be so close together that in some cases they can come into contact, which can result in the rotating components being jammed. Rectify any faults. Do not forget to set the back lock to its original position. If there are foreign objects in the pellet fuel, the feed auger feeds or the rotary valve, they must be removed. Remove the top connection and check and remove any objects from the feed auger or the rotary valve. Do not forget to first remove all cable connections.

Alarm
 Fuse El. ignition

Fault:

The fuse has been triggered for the ignition element.

Alarm
 Fuse ext auger

Fault:

The fuse has been triggered for the external auger.

Alarm
 Fuse auger

Fault:

The fuse has been triggered for the auger inside the burner.

Alarm
 Fuse fan

Fault:

The fuse has been triggered for the burner fan.

Information texts

Operation data
Pellets switch Off

If the pellet burner is shut off, this is normally shown in the display alternately with the main menu. I.e. the pelletburner switch on the control panel is in position "0"

Water filled?
Confirm using OK

This text will be displayed in the first operating hour after the voltage is switched on. No function starts before you confirm that water has been filled. If the system and the product have been filled with water, confirm by pressing the "OK" button.

Operation data
Power supplier control

Shows that power supplier control is active. Power supplier control uses equipment which an electricity power supplier can install to disconnect high power demanding electricity equipment by district for shorter periods of time. The immersion heater is shut off by active power supplier control.
(Only Swedish version)

Operation data
High electric power demand
Reduced electrical power A

The house's main fuses are overloaded.
The boiler's (immersion heater) electrical power is therefore reduced.
(Only Swedish version)

Operation data
House heating off
Outdoor temperature xx °C

Shows that no heating is required in the house. The heating circuit pump is shut off and the mixing valve remains closed. The pump is exercised daily for a short period so that it does not jam. Current outdoor temperature is also displayed.

8. Installation

General

This chapter is for those who are responsible for one or more of the installations required for CTC EcoFlex to function as the property owner wishes. Take the time required to go through the functions, controls and settings with the property owner and answer any questions he/she may have.

Both you and the boiler benefit from ensuring that the user fully understand how the system works and how it should be operated.

Transport

Transport the boiler to the installation site before the packaging is removed.

Move the CTC EcoFlex in one of the following ways:

- Fork lift truck
- Lifting strap around the pallet. NB! Only to be used with packaging in place. Handle with care.
- Lifting eye which is fitted to the expansion line socket. NB! The socket is not at the centre of gravity. The boiler will lean to one side.

Removal of packaging

The packaging can be removed when the boiler is alongside the installation point. Check that the product has not been damaged in transport. Report any transport damage to the shipping agent. Also check that the below items are included in the delivery.

Standard delivery

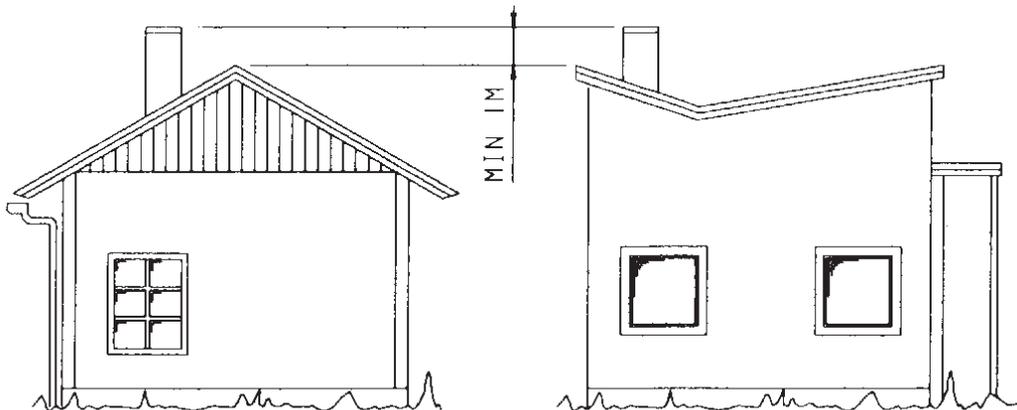
- Pellet boiler CTC EcoFlex
- Indoor sensor
- Primary flow sensor
- Outdoor sensor
- DHW storage tank sensor
- Drain valve
- Sweeping equipment

Boiler room

The boiler room must correspond to existing building regulations and particularly then the firing regulations of the present country. The boiler should be set directly on the floor. The boiler's adjustable feet can be used to compensate for uneven floors, up to a certain extent. Minimum distance in front of the boiler is 1000 mm. The boiler room must be equipped with a venthole for air supply. The cross section area of the venthole must minimum be equal to the flue gas channel area in the chimney.

Connection to chimney

Existing regulations for the design of the chimney must be taken into consideration. The chimney must be minimum 1 meter higher in relation to the highest point of the roof. An optimal utilization of the flue gases and with that an energy-saving operation, requires hereby a mostly optimized adaption between boiler and chimney.



The most important conditions are the following:

- Good thermal insulation in order to as much as possible avoid temperature losses from the connection between the boiler and the chimney.
- Accurate sealing of the flue gas connections.
- Smooth surfaces to avoid turbulence.
- Heat-shock resistance as well as water- and steam tight.

According to regulations:

- The boiler must be connected to the chimney with the shortest feasible flue duct at an angle of 30-40°.
- The flue duct must not be fully inserted through the chimney wall.
- If flue ducts with a cross-sectional dimension which deviate from the dimension of the flue gas outlet would be used, the connection must be cone-shaped. Cone angle of maximum 7,5°.
- By the construction of the flue duct between boiler and chimney must feasible actions be taken to secure that no condensate can flow back to the boiler (condensate trap).

The recommended minimum dimension of the chimney is half-brick x half-brick (about 140 x 140 mm) or by the installation of a stainless steel chimney, 100 mm diameter. If the nominal output of the boiler is limited on 15 kW is it in exceptional cases possible to use stainless steel chimney of 90 mm diameter. To less cross section area of the chimney results in insufficient draught in the boiler which may lead to operation disturbances. Recommended chimney draught is 0,1 - 2,5 mBar.

Flue gas temperature/Condensation risk

CTC EcoFlex has a very high efficiency and therefore low flue gas temperature. There therefore is a risk of condensation of flue gases in the chimney. The boiler is equipped with a flue gas damper, to allow a suitable flue gas temperature to be set for the chimney.

The flue gas damper can be adjusted by turning the adjustment screw on the top of the boiler



Turn the screw clockwise:

The flue gas damper is opened = higher flue gas temperature.

Turn the screw anticlockwise:

The flue gas damper closes = lower flue gas temperature.

The flue gas damper is factory set to 6 mm opening, measured between the upper edge of the flue gas damper and the top of the flue gas chamber roof. This setting should ensure that the flue gas temperature is sufficiently high to prevent, under normal operation conditions, condensation forming.

Connection to external feed auger and pellet storage

The pellet tube can by the connection of a 2 metres feed auger be fitted either to the right, left or from above on the right side of the upper panel.

The pellet tube outlet can alternatively be moved up into the hood by the connection of a 1.5 metres feed auger.

The feeding time for external feed auger is on the CTC EcoFlex factory pre-set to 30 seconds. By the connection of a feed auger from other manufacturers, the feeding time might need some adjustment.

The CTC feed augers (1.5 and 2 metres) is well suited for the CTC Pellet storage of 400 Litres. By the use of other storages and feed augers, it's necessary to secure that the feed system provides a faultless fuel feed to the EcoFlex.



9. Hydraulic installation

The installation must be carried out by authorized personnel according to existing engineering standards and building regulations. The boiler must be connected to an expansion tank in open (the expansion vessel of high placement together with safety- and return valve) or closed systems. At an open system the distance between the expansion vessel and the highest placed radiator must not be less than 2,5 m to avoid oxygen-enrichment of the system. Do not forget to flush the radiator system clean before connection.

Set all settings as described in the "First start up" chapter

Hydraulic connection boiler

The dimensioning and plumbing of the system shall be accomplished according to the measurements in the section "Technical data".

The heating system can be carried out according to the hydraulic installation diagram on the following page.

Refer to other headings in this section for the connection of required components.

Safety valve boiler

In a closed system, an approved safety valve according to existing regulations must be mounted.

The max. Operation pressure of the boiler is 3 bar. The connection pipe between boiler and safety valve must be constructed in such a way that no pressure increase is possible. The safety valve drain pipe must be uncovered and visible. Possible exhausting high temperature hot water must without danger be removed (Caution! Risk of scalding!).

Return temperature

The temperature of the return flow (at connection number 4, page 50) must not be lower than 50 °C.

Heating circuit pump

A heating circuit pump must be mounted on the primary flow of the boiler. The pump is being supplied with electric current from the boiler, see "Electrical installation".

Heating circuit mixing valve

A heating circuit mixing valve must be mounted on the primary flow of the boiler.

The heating circuit mixing valve is being supplied with electric current from the boiler, see "Electrical installation"

Connection of DHW storage tank (water heater)

If the CTC EcoFlex will be combined together with DHW storage tank, it is of high importance that its size and power capacity corresponds to the installed boiler output. The installation must correspond to existing building regulations. Recommended to connect on the upper expansion- and rear return flow of the boiler.

DHW charging pump

By the connection of a DHW storage tank, a DHW charging pump must be mounted on the left/right, expansion/primary flow DHW storage tank connection of the boiler. The pump is being supplied with electric current from the boiler, see "Electrical installation".

Drainage/Drain valve

Shall be mounted on the drainage connection on the front side of the boiler.

Filling

Filling is performed via the heating system filling valve. Alternatively filling can be connected to the drainage valve.

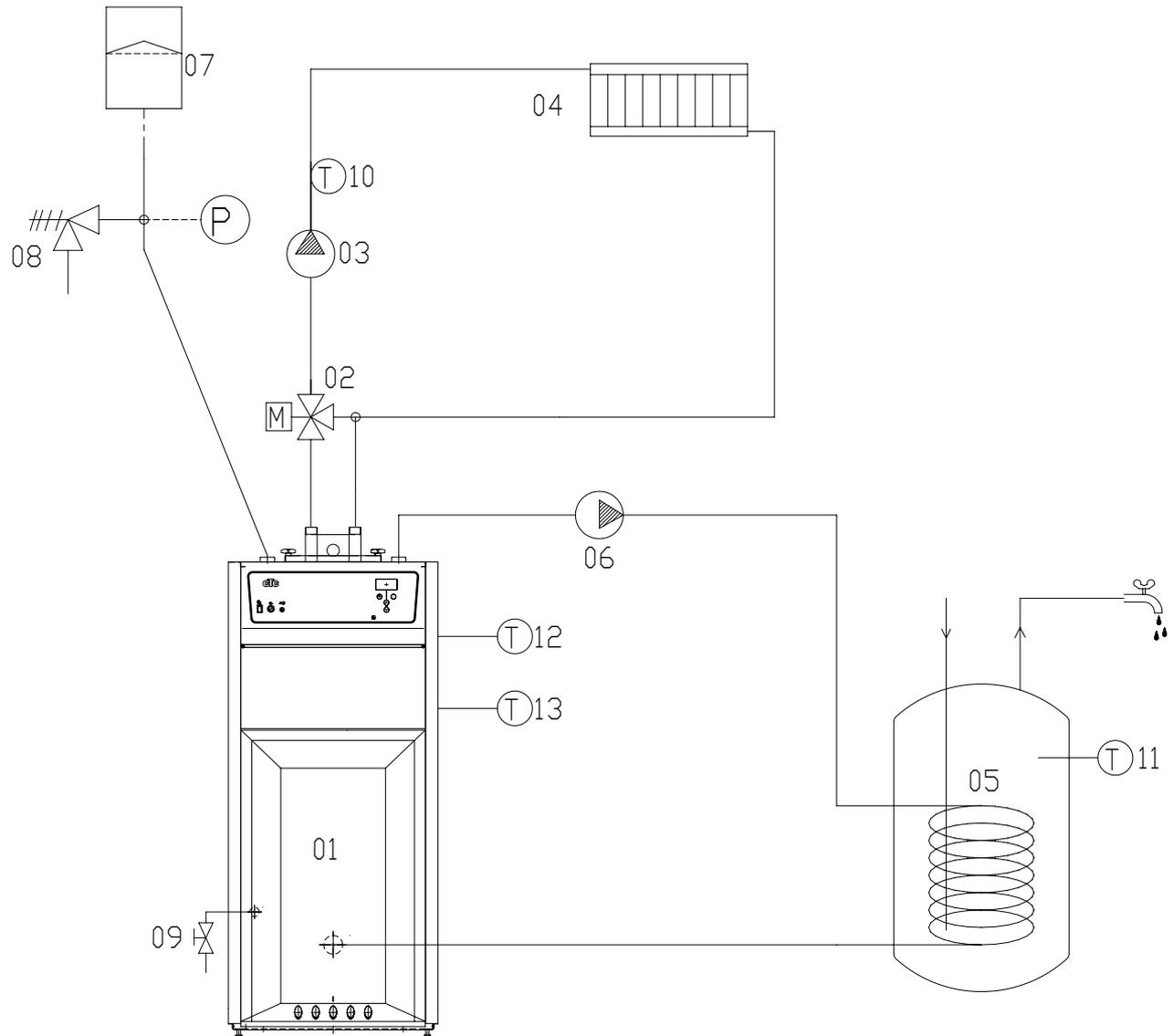
Pressure gauge (manometer)

On closed systems, a pressure gauge is usually supplied with the expansion vessel. No additional pressure gauge is required.

A pressure gauge is otherwise fitted to the boiler's expansion flow.

System diagram for pipe connection

How the heating boiler is connected to a property's radiator and hot water connections is shown here. Different equipment and systems can look different, for example one or two pipe systems. The completed installation can therefore differ from what is shown here.



Legend

- | | |
|----------------------------------|---|
| 01. CTC EcoFlex Pellet boiler | 08. Safety valve |
| 02. Heating circuit mixing valve | 09. Drain valve (in delivery) |
| 03. Heating circuit pump | 10. Primary flow sensor (in delivery) |
| 04. Heating circuit system | 11. DHW storage tank sensor (in delivery) |
| 05. DHW storage tank | 12. Indoor sensor (in delivery) |
| 06. DHW charging pump | 13. Outdoor sensor |
| 07. Expansion vessel | |

10. Electrical installation

Installation and change over of the boiler should be carried out by a qualified electrician. All wiring and installation must be done according to applicable local standards and regulations. The boiler is internally connected by the factory.

General information

The panel is opened by first removing the two screws at the bottom edge of the panel and then carefully pressing the panel upwards. The boiler is equipped with two cables ducts, one on the left side designed for high voltage cables and one on the right side designed for safety low voltage cables

Safety extra low voltage

The following output and inputs have extra low voltage protection: current sensor, outdoor sensor, room sensor and flow line sensor.

Current sensor connection

The three current sensors (one for each phase) are fitted in the fuse panel as follows:

Each phase fed to the fuse panel from the electricity meter, is led through a current sensor before being attached to each rail. The boiler is then connected as shown in the picture of the connection block.

This ensures that the phase current is continuously monitored and compared with the set value on the load monitor on the boiler. If the current is higher than this value, the control unit disconnects a power step. A further step is disconnected if this still is too high etc.

When the current falls below the set value, the step is reconnected. The current sensors, together with the electronics, prevents more power being connected than the house fuses can withstand. (Only Swedish version)

Power supply

The boiler should be connected to 230V 1n~ and protective earth, respectively 400V 3n~ and protective earth. (Only Swedish version)

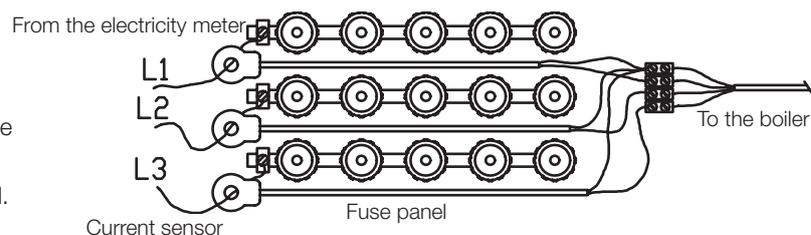
All pole breaker

An all pole breaker should be installed. (Only Swedish version)

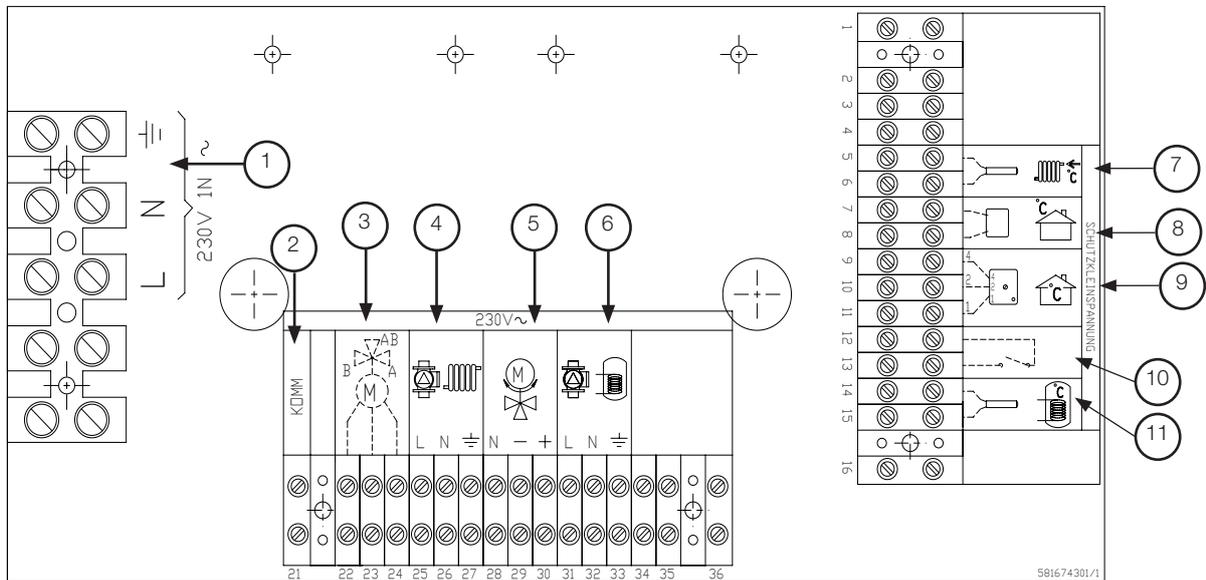
Connection of outdoor sensor

The sensor should be set up on the house's northwest or north side, so that it is not exposed to morning and evening sun. The sensor must be shielded if there is a risk that the sensor is affected by the sun.

Place the sensor at around 1.5 m high of the facade near a corner, but not under roof projections or other wind protection. Do not position above ventilation ducts, doors and windows where the sensor can be affected by other elements than the outdoor temperature.



11. Terminal block



1. Connection to the grid 230 V 1N~.
2. Communication, only used for systems with heat pump, see separate instruction (Only Swedish version)
3. Reverse valve, only used for systems with heat pump, see separate instruction (Only Swedish version)
4. Connection of heating circuit pump 230 V 1 N~
5. Mixing valve motor
6. DHW charging pump
7. Primary flow sensor
8. Outdoor sensor.
9. Indoor sensor.
10. Additional input for remote control/night reduction/power supplier control
11. DHW storage tank sensor

Connection of indoor sensor

The indoor sensor is positioned centrally at the most open position possible in the house, ideally in a hall between several rooms or in a stairway. This position will allow the sensor to register an average temperature for the house.

Lead a three conductor cable (minimum 0,5 mm²) between the boiler and indoor sensor. Then mount the room sensor at approx two thirds wall height.

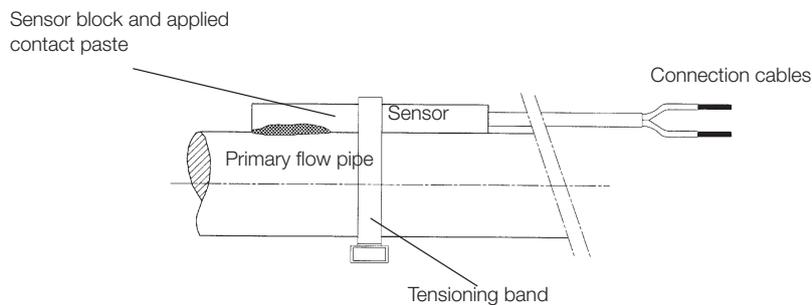
Connect the cable to the indoor sensor and to the boiler.

Important! The wires must be correctly connected for the sensor to function. Markings 1.2 and 4 on the heat pump match the markings on the sensor.

Connection primary flow sensor

Fit the sensor to the primary flow pipe, ideally after the heating circuit pump. The sensor probe is in the sensor front section, see diagram.

- Fasten the sensor in place using the enclosed tensioning band.
- Ensure that the sensors has good contact with the pipe. Contact paste can also be applied to the sensor's front, between the sensor and the pipe.
- Important! Isolate the sensor, for example using pipe insulation.
- Connect the cables to the boiler's terminal block.



! Do not permanently mount the sensor cable before you have tested and found the best position.

Connection DHW storage tank sensor

The DHW storage tank sensor is being connected to the terminal block according to the picture on previous page.

Connection heating circuit pump

The heating circuit pump is being connected to the terminal block according to the picture on previous page.

Electrical data: 230 V 1N~. Internal mounted fuse 10 A

Connection DHW charging pump

The DHW charging pump is being connected to the terminal block according to the picture on previous page.

Electrical data: 230V 1n~.

Connection heating circuit mixing valve

The heating circuit mixing valve is being connected to the terminal block according to the picture on previous page.

Electrical data: 230V 1n~.

Remote controlled time reduction of temperature

Night time temperature reduction can be activated by a closed function on the "Power supplier control" input on the connection block.

The function can be remote controlled using, for example, "Minicall".

Night time temperature reduction is activated when the input is short circuited, irrespective of other night time temperature reduction settings. When the short circuit ceases, the product returns to ordinary night time temperature reduction.

Reduction size is set in the Night reduction menu.

Note: The input function is selectable in accordance with the following:

NR = night reduction (time controlled temperature reduction).

SO = Power supplier control (blocking of electrical power by the power supplier)

The function is made available by selecting NR in the Settings menu..

Safety limit thermostat (STB)

If the boiler has been stored extremely cold, the safety limit thermostat may have been released. Reset by pressing the button under the cover of the panel.

Settings to be carried out by an electrician

After connection, the following settings should be set by the electrician:

- Selection of main fuse (only Swedish version)
- Selection of power limitation of electric immersion heater (only Swedish version)
- Check of indoor sensor connection
- Check that connected sensors register reasonable values Carry out check as described below

Setting main fuse and power limitation

Main fuse size in Menu: Installer/Settings/Mainfuse A Power limitation of immersion heater in Menu: Installer/Settings/EI boiler max kW (only Swedish version)

Check of indoor sensor connection

- Go to the menu Installer/Service/Function test other.
- Step down to Diode sensor and press "OK" Check that the room sensor diode lights - if not, check cables and connections.
- Select "Off" using the button "decrease" button and press. If the "OK" diode goes out the check is ready.
- Return to normal display by pressing the "step backwards"/"undo" button.

Check of connected sensors

Text will appear in the display if any sensor is incorrectly connected. For example "Alarm outdoor sensor". If several sensors are incorrectly connected, the alarms will be displayed sequentially. When one fault is rectified, the next is displayed. If no alarm is displayed, the sensors are correctly connected.

Note that the room sensor alarm function (the diode) cannot be shown in the display, but must be checked as described in the previous section. The current sensor connection has no alarm, but the current value can be read in the Operation data/Current A menu.

12. First start

Before first start

1. Check that the flue gas by-pass valve has not been displaced during transport/installation.
2. Check that the boiler and system are full of water and bled.
3. Check that all connectors are tight and that the connection to the chimney has been correctly carried out.
4. Check that all sensors and heating circuit pump are connected to the power supply.
5. Set the pellet burner switch to position "0".

First start, boiler (burner not started)

1. Switch on the power using the operation switch. The display comes on
2. The heating boiler now asks whether the system and the boiler have been filled with water. Confirm using "OK".

First start, pellet burner

1. Make sure that the external feed system (the external auger) is filled with pellets, see the section "Start up from shut off mode".
2. To start the burner, set the pellet burner switch in position "1". Check that the burner starts as described in the section "Start up from shut off mode". The pellet burner is factory set to power: Full = 15 kW, Part = 9 kW.

First start, set pellet size (diameter)

(Installer/Settings/Setting pellet)

The pellet burner is from factory pre-set for operation of pellet sizes with a diameter of 8 mm. By the operation of pellet with a diameter of 6 mm, perform the necessary settings according to the chart below. The settings are made according to the description in the section "Menu Setting pellet"

Flue gas temperatures:

Check and adjust the flue gas temperature, see the section "Flue gas temperature/condensation risk".

System settings

The installation engineer should set the settings on the boiler when installing. Settings set in Menu: Installer / Settings / ... In addition see the section "The menu system."

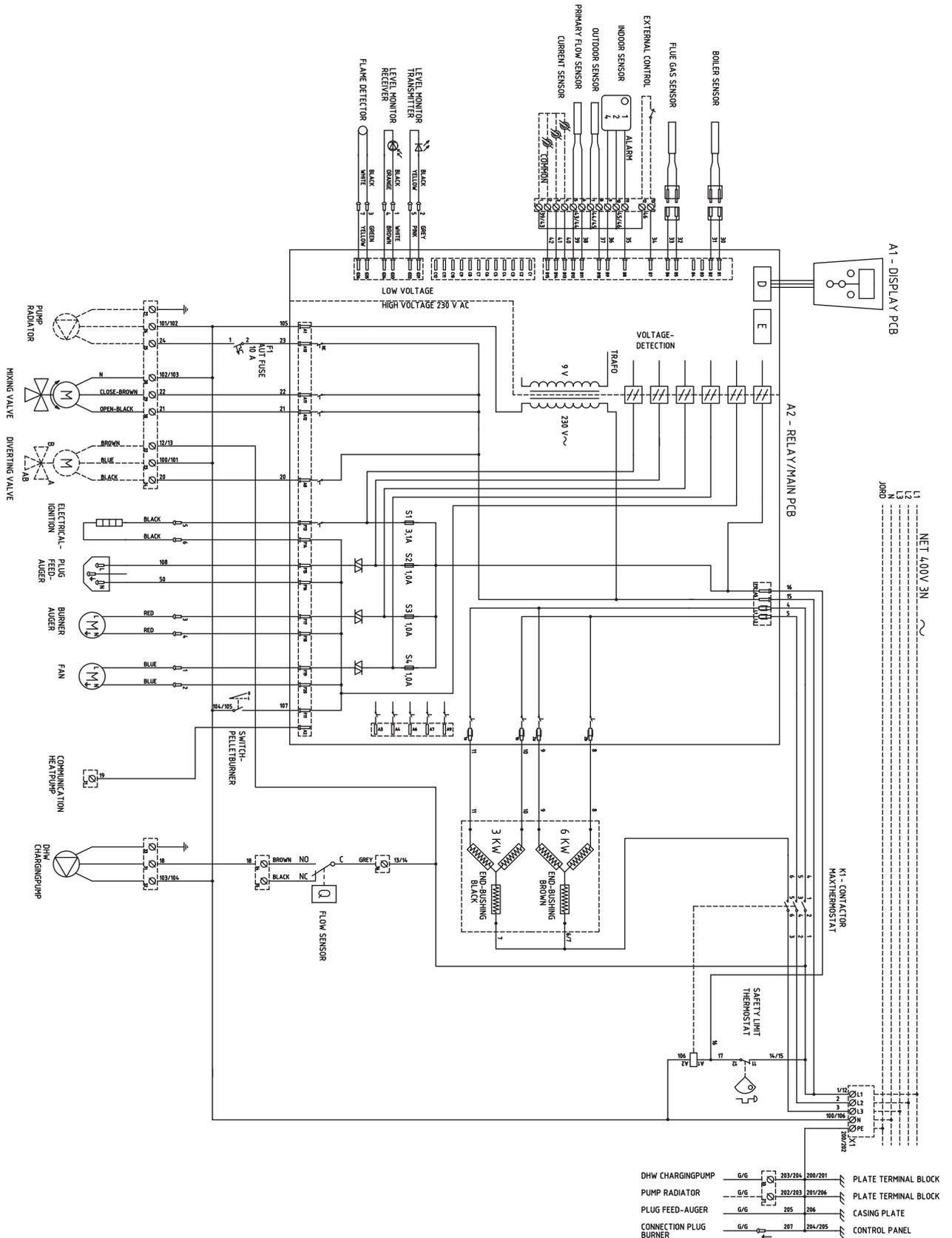
When the system is warm, check that all connections are tight, that the various systems are bled, that the heat comes out of the system and that hot water comes out of the tapping point.

Go through the settings with the user.

Diameter ø Pellet (mm)	6
Setting pellet	
Level sensor, %	*
Flame detector, %	*
Burner type, kW	15
Power full auger, %	50
Power full fan, %	*
Power part auger, %	30
Power part fan, %	*
Power min auger, %	*
Power min fan, %	*
Holding min	*
Auger Feeder	*
Sequenz code	*

*) Settings you should not change

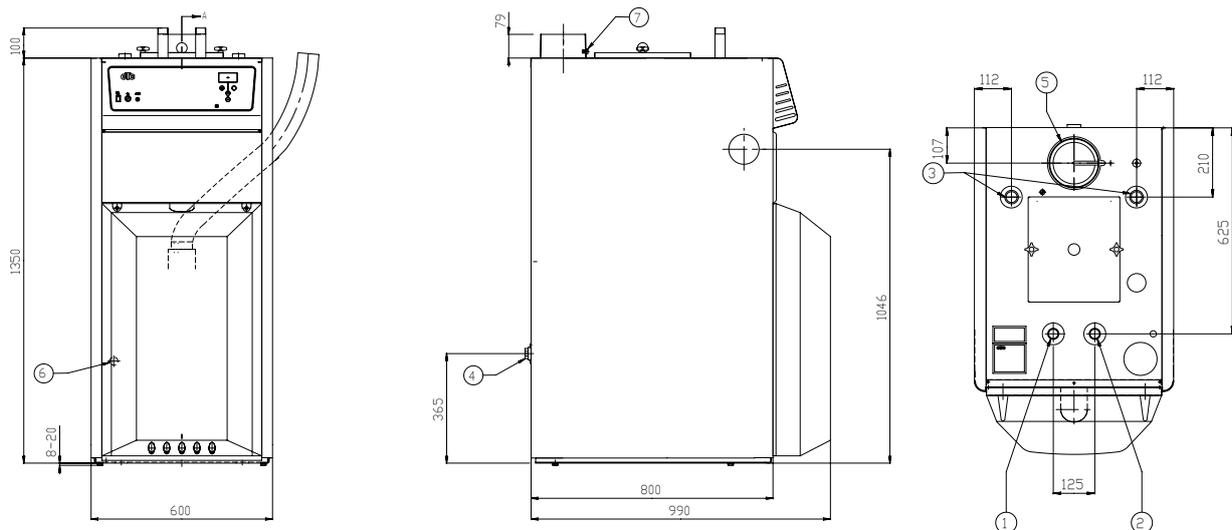
14. Electric diagram 400V 3N~



15. Technical data

CTC EcoFlex	15
Rated output Pellet	14,6 kW
Rated input Pellet	15,87 kW
Boiler efficiency	92 %
Output range Pellet	5-15 kW
Output steps from factory Pellet Full/Part/Min	15/9/0 kW
Output range immersion heater (Swedish version only)	0-9 kW
Factory output immersion heater (Swedish version only)	6 kW
Water content boiler	150 l
Water content DHW- heat exchanger (Swedish version only)	1 l
Max operation pressure DHW-heat exchanger (Swedish version only)	9 Bar
Max operation pressure boiler	2,5 Bar
Max operation temperature	110 °C
Weight (Excl. packing)	265 kg
Electrical data	230V 1N~
Auxiliary power requirement	0,5 kW
Electrical data (Swedish version only)	400V 3N~
Auxiliary power requirement (Swedish version only)	9,6 kW
Water-side resistance	202 mbar
Exhaust mass flow at nominal output	8 kg/s
Exhaust mass flow at minimum output	3 kg/s
Exhaust gas temperature at nominal output	123 °C
Exhaust gas temperature at minimal output	83 °C
Boiler class (efficiency, emissions)	3

Measurements



- | | |
|---|---|
| 1. Primary flow R 1" | 5. Flue gas outlet \varnothing 150 mm |
| 2. Return flow R 1" | 6. Drainage R 1/2" |
| 3. Expansion connection/
Primary flow R 1" | 7. Flue gas analysis M10 |
| 4. Return flow DHW storage
tank R 1" | |



Enertech Group



Försäkran om överensstämmelse
Déclaration de conformité
Declaration of conformity
Konformitätserklärung

Enertech AB
Box 313
S-341 26 LJUNGBY

försäkrar under eget ansvar att produkten
confirme sous sa responsabilité exclusive que le produit,
declare under our sole responsibility that the product,
erklären in alleiniger Verantwortung, dass das Produkt,

CTC EcoFlex

som omfattas av denna försäkran är i överensstämmelse med följande direktiv,
auquel cette déclaration se rapporte est en conformité avec les exigences des normes suivantes,
to which this declaration relates is in conformity with requirements of the following directive,
auf das sich diese Erklärung bezieht, konform ist mit den Anforderungen der Richtlinie,

EC directive on:
Pressure Equipment Directive 97/23/EC, § 3.3
(AFS 1999:4, § 8)
Electromagnetic Compatibility (EMC) 89/336/EEC
Low Voltage Directive (LVD) 73/23 EEC, 93/68/EEC
Machinery Directive 98/37 EEC

Överensstämmelsen är kontrollerad i enlighet med följande EN-standarder,
La conformité a été contrôlée conformément aux normes EN,
The conformity was checked in accordance with the following EN-standards,
Die Konformität wurde überprüft nach den EN-normen,

EN 719	EN 55014-1 /-2
EN 729-2	
EN 288-3	EN 61 000-3-2 /-3
EN 1418	EN 60335-1 /-2-21
EN 287-1	EN 50165, -336
EN 10 204, 3.1B	EN 303-5
EN 10 025, S 235 Jr-G2	EN ISO 12100-1-2

Ljungby 2006-06-21

Kent Karlsson
Technical Manager

