PELLET'S BOILER FUTURA PICUS

Designed and tested in Sweden !

CE

1. Description of the system

Futura plus is steel water boiler designed for combustion of wood pellet (with installed pellet burner) and wood/coal (without installed burner) and oil (with installed oil burner of Herrmann) . Pellet is renewable ,environmentally friendly, very cheap and easy to buy domestic fuel. The boilers with output of 20 kW can be used for heating of small buildings such as family houses, lodging-houses, motels, workshops, etc. The boilers with output of 50 and 75 kW suit for heating of buildings up to 700 m^2 of area like shops, schools, apartment houses, etc. We can provide also bigger units f.e: up to 200 kW but all dimensions and features of the system are individually proposed to the customer.

Boiler was tested on different burners from Sweden. Structure of the boiler, design is made among Swedish project. System of the combustion, boiler was tested in Sweden.

FEATURES:

- Possibility of combustion of pellets and solid fuels like wood/coal
- Mechanical fuel feeding system connected with easy-throw system of pellet to the combustion chamber
- Automatic ignition system;
- Economical operation - 300 L fuel tank guarantee reloading of the fuel every 5-7 day
- Self diagnostic system Efficiency like in gas boilers – up to 92 % (pellet)
- Fuel tank in wheels is very easy to transport

1. steering of pump 2 hopper 3 burner
4 plastic tube 5 motor 6 burner steering

2. Technical data of FUTURA

Futura pellet boiler contains :

- 3 pass boiler made from steel (5/6 mm) with iron coast plate in combustion chamber
- Outer Jacket with insulation
- Fuel tank on wheels with volume 300 L
- Eurofire pellet burner with screw (feeding system), motorgear
- Blower
- Automatic ignitron system (pellet)
- Digital boiler/burner control panel with self-diagnostic system
- burn-back protection system
- Overheat safety device
- Ash drawer

Our product is manufactured conforming the ISO Norm 9000:2001 TUV CERT GERMANY, and fulfill hardest emission norms in Europe.

Tab. 1. Dimensions and technical parameters of boiler.

Parameter	SI	FUTURA 25	FUTURA 35	FUTURA 60
Weight	kg	350	480	580
Water capacity	l	60	100	130
Fuel hopper capacity	l	160	160	250
Dimensions of the boiler width x depth x height	mm	510 x 810 x 1290	570 x 810 x1290	630 x 810 x 1310
Dimensions of the tank width x length x height	mm	510 x 810 x 1300	510 x 810 x 1300	510 x 810 x 1300
Working water pressure !	bar	max. 2,0		
Recommended working water temperature	°C	65 – 80		
Minimal return water temperature	°C	60		
Maximum height of heating system above boiler's base level.	m	25		
Maximum safety valve opening pressure	bar	2,0		
Noise level	dB	52 -60dB (A)		
Required chimney draught	mbar	0,1 – 0,2		
Connector pipes - heating water	Js	G 1 1/2"		
- return water	Js	G 1 1/2"		
Supply voltage		1 PEN ~ 50 Hz 230 V TN – S		

3. Description of the boiler and burner

3.1. Boiler's construction.

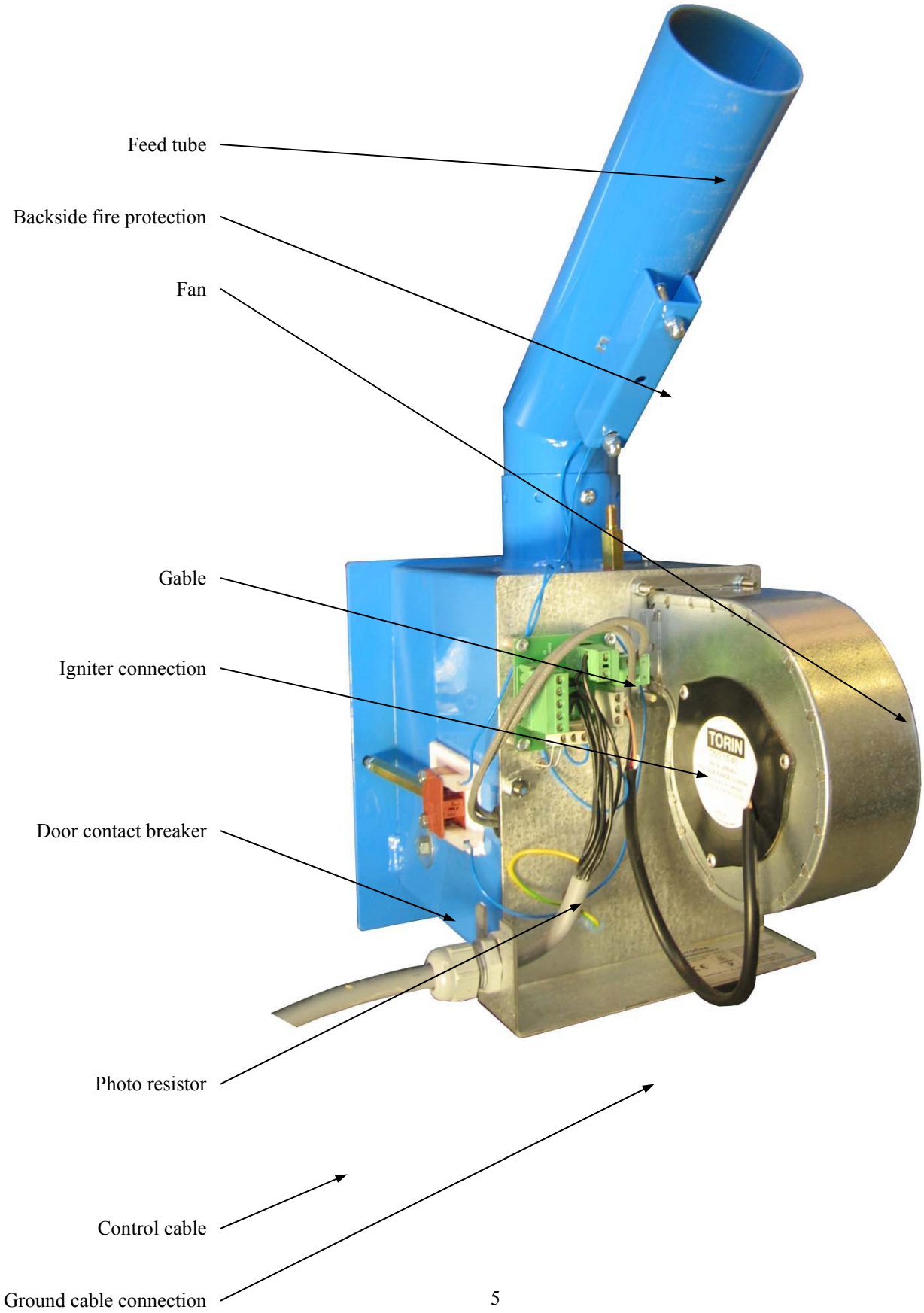
The main part of the boiler is a heat exchanger consisting of combustion tubes. In the lower part of the boiler's body the combustion chamber with primary air pre-mixer and ceramic catalyst is located. The ceramic catalyst , lowers volatilizing of volatile matter and radiates heat back to the burner what guarantees perfect combustion of fuel. Combustion of pellet is provided by installed burner Euro Fire with automatic feeding system. Under the combustion chamber is located ash drawer.

The fuel hopper is made from steel , whole construction is located on the wheel. It provides easy transport and easy arrangement of the boiler room, In the lower part of the fuel hopper feeding screw mechanism is located. Motor and steering are installed in upper part of the fuel tank.

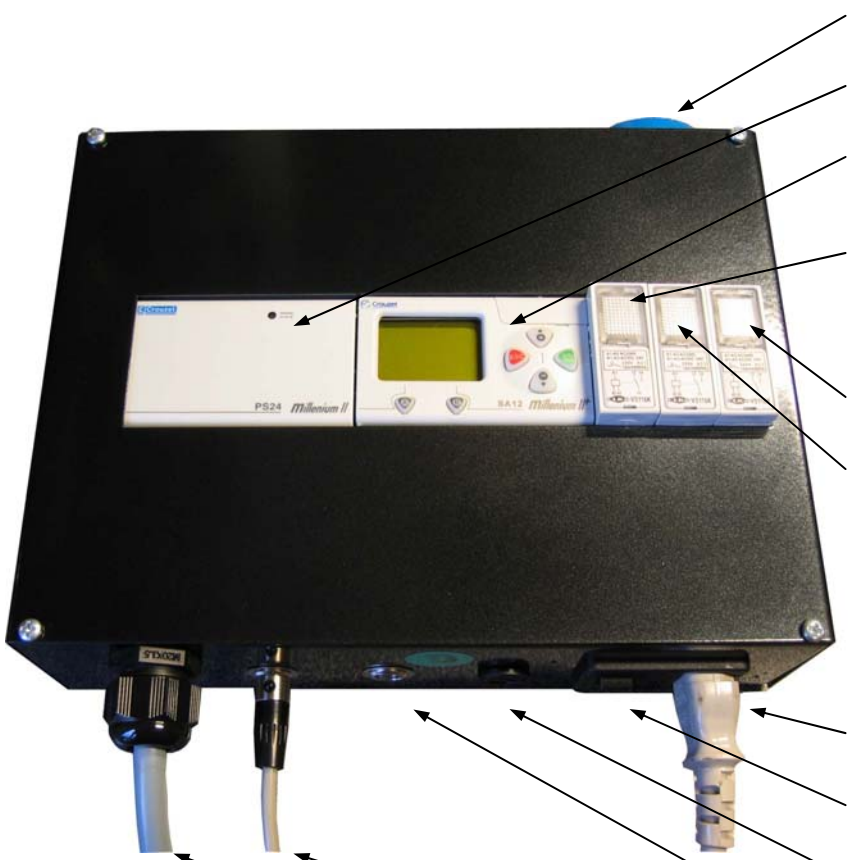
On the back wall of the boiler's body the heating and return water connector pipes and smoke conduit are located. The connector pipes are screwed and theirs size is 1½".
The steel heat exchanger, its steel cover as well as the combustion chamber and ash box door are coated with thermal insulation, which guarantees low environment heat loss.
According to EN 303-5 norm, we have to versions of the boiler:

1) with built in water exchanger (spiral) to protect system against pressure and water overheating
2) without water exchanger , in this version You can install boiler in opened installation systems

3.2. Burner 's description



3.3. Control and safety devices.



Electricity outlet for feed screw

Transformer

PLC

Lamp indicates that unit is connected to power and that the security circuit is closed.
(overheat thermostats for furnace and feed tube and also furnace door security switch).

Lamp indicating feed screw movements

Lamp indicating connected igniter

Power supply, 230V

Main switch

Strapping (in fuse box)

Connection of optional external thermostat

Cable connection for temperature sensor

Cable to burner

4. Location and installation of the boiler in boiler room.

4.1. Norms and regulations.

Due boiler gasses temperature 90-100° C it is obligatory to put the INOX or other material tubes into the chimney.

The solid fuel boiler must be installed in accordance to current norms and regulations f.e EN 303-5 . Unauthorized changes in boiler's mechanical or electrical construction will be treated as a violation of Guarantee Agreement and its consequence is immediate termination of the guarantee. The fact of installation and first start of the boiler should be signed in Guarantee Card.

The heating system should be installed according to the following plans:

a) Heating System – during installation and operation of the boiler it is very important to keep safe distance from the inflammable materials. The boiler is allowed to work only in open type heating systems!
b) Electrical installation – the boiler's power supply is 230V/50Hz
c) Chimney – the connection of the boiler to chimney can be done only after agreement from authorized chimneysweep. It must be done with respect to current norms and regulations. The chimney should be built form few layers. Due boiler gasses temperature 90-100 C it is obligatory to put the INOX or other material tubes into the chimney. Required chimney draught is 0,1 – 0,2 mbar.
d) Following Law regulations should be fulfilled :

98/37/EEG
89/336/EEG
73/23/EEG
EN 55014-1, 1993 /A1, 1997
EN 55014-1
EN 55014-2 C1 1998
EN 61000-3-2
EN 61000-4-2, -3-4-5-6-11, Level2
EN 50165
EN 50165 C1
EN 60335-1
EN 303-5

4.2. Possibilities of boiler's localization.

Localization of the boiler according to Fire Protection Regulation:

1. Placing on flammable foundation.

- place the boiler on non-flammable and thermal insulating pad which should protrude not less than 20 mm outside boiler's dimensions;
- if the boiler is located in the basement it is required to place it on a base raised not lower than 50 mm over floor's level. The boiler and the fuel hopper must stand vertically and can be leveled using the regulating screw in fuel hopper's leg.

2. Safe distance from inflammable materials.

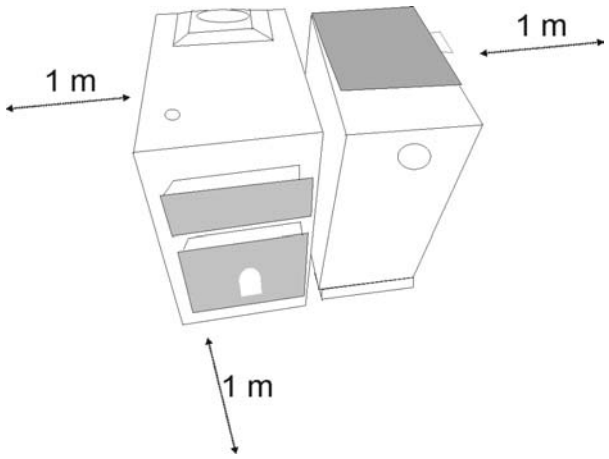
- during installation and operation of the boiler the safe distance of 200 mm from inflammable materials must be kept;
- during installation and operation of the boiler the safe distance of 400 mm from class C_3 inflammable materials (paper, cartoon, wood, plastic, etc.) must be kept;
- unless the material's inflammability class is known the distance should be doubled.

Tab. 9. Inflammability classes for building materials.

Inflammability classes for building materials	Materials
A – non-flammable	sandstone, concrete, bricks, fire protection plaster, mortar, ceramic tiles, granite
B – inflammable with difficulty	wood-cement boards, glassfiber, gullfiber
C_1 – inflammable with difficulty	beech wood, oak wood, plywood
C_2 – medium inflammable	pine wood, larch wood and spruce wood, cork, wood boards, rubber floor covers
C_3 – easy inflammable	asphalt plywood, celluloid mass, polyurethane, polystyrene, polyethylene, plastic, PVC

Localization of the boiler according to required maintenance and service space:

- 1 000 mm of free space must be left in front of the boiler.
- Minimal distance between back wall of the boiler and boiler room's wall is 400 mm.
- Minimum distance between free side of the boiler and boiler room's wall is 100 mm.
- The (230V/50Hz) electr. socket should be easy to access.



Pic. 3. Localization of the boiler in the boiler room.

Fuel storage:

- **Only dry fuel can provide high efficiency of boiler operation**. It is recommended to store the fuel in the basement or if storing outdoor the fuel must be at least covered with roof.

Boiler room's ventilation:

Appropriate supply and exhaust ventilation must be provided in the boiler room (the air consumption for FUTURA 25-75 kW is 50 m^3/ h - 225 m^3/ h). The supply ventilation outlet's lower edge should be placed not higher than 300 mm over floor level and exhaust ventilation inlet should be placed as high as possible under boiler room's ceiling.

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Installation of the burner

Chimney

The chimney can be made up of bricks, steel tube or be an approved prefabricated steel tube chimney. A draught of 10-20 Pa is sufficient. If the area of the chimney is too big a metal tube can be installed to decrease the area. If you have doubts regarding your chimney please contact your local chimney-sweeper. Be aware that tall chimneys and also chimneys with large area necessitate more heat to avoid condensation.

The chimney gas temperature needed is determined by whether condensate is formed at the top of chimney. As a guideline the temperature must be at least 80°C one metre down from the top of the chimney.

Strong wind or high chimneys can sometimes cause big variations in chimney draught. This affects the conditions for a high efficiency in the burner and the settings that have been made. A draught stabiliser mounted after the furnace helps level the variations in draught and will also ventilate the chimney.

Furnace

Eurofire pellet burner can me mounted on most furnaces. The minimum recommended fireplace dimensions are: depth 390mm, height 200mm and width 250mm. When mounting in furnaces with less space or when using the maximum capacity an extensional sleeve coupling can with advantage be used between the burner and the furnace. This is to make sure the combustion is not interfered by the flame hitting the rare wall in the combustion chamber. Sleeve coupling can be bought as extra equipment.
If possible, mounting in combination furnaces should be done in the oil combustion chamber to get the highest efficiency possible. Due to poor draught, too small combustion chamber or suchlike this may not work. If that is the case, mount the burner in the chamber made for firewood. If the original furnace door is used a hole must be made according to the template on page 21. Also drill four 6 mm holes in accordance with the template for the burner's lock arms. As an alternative the burner can be screwed on directly to the door.

Pellet Store

A feed screw supplies the burner with fuel from an external fuel store of some kind. The store can be of different sizes; from weekly stores to stores big enough to contain the whole annual need. The pellet store

should be constructed in a way so that the feed screw forms a maximum angle of 45° with the floor plane. The store must have some kind of a cover to keep rubbish and other things from getting in touch with the rotating feed screw.
When building big pellet stores for bulk filling, your retailer can assist with drawings and material suggestions for an optimal result.
Filling of pellet is done by air injection from bulk carrier to a big store or manually from smaller or bigger bags to a weekly store.

When for the first time starting the burner or if you have run out of fuel, the feed screw between the store and the burner must be filled with pellet before starting the burner. This is done by covering the inlet of the feed screw with pellet and then plugging the plug into a power point. Let the screw operate until it is filled with pellet. Make it a practice to control the pellet quantity in the starting dose when new pellet have been delivered. This is to guarantee a problem-free operation.

Store the pellet on a dry place to keep the pellet in its original hard consistency. Damp pellet will be soft and dissolved. Do not use the pellet if it gets damp since this will cause operational disturbance and problem.

Feed Screw
Install the screw-engine on top of the feed screw and pull it firm. After that, place the feed screw in the intended pellet store. Make sure it does not slope any steeper than 45°. Fill up with pellets enough to cover the feed screw inlet properly. Connect the screw to a power point and run it until it is completely filled with pellets. Do not put fingers or other items in the outlet of the rotating feed screw!
Structure
The burner consists of burner housing with detachable gable and channel for the pellet transport up to the combustion part. Housing, channel and gable are made of lacquered steel plate. The burner housing serves as a hold for the combustion part and the detachable gable. Also the igniter is attached inside the gable. The burner housing gable serves as a hold for the combustion fan, the photo resistor and an electronic card with switchboard panels.

The combustion part consists of a cassette with a top in the shape of a hood. The cassette is pushed into the burner housing and fastened with two bolts. The combustion part is completely made of heat-resisting stainless steel. The cassette also serves as a hold for the electric ignition. The cassette system makes the electric ignition very simple to replace when necessary. The burner consists further of a separate control unit and a feed screw for the pellet fuel. The security system consists of a backside fire protection, a photo resistor and a door contact breaker. The backside fire protection consists of a fall shaft and a thermo switch placed on the feed tube. The thermo switch must be restored manually, if it for some reason has been triggered.

Connection of Burner with Temperature Sensor (standard)
The burner is delivered with a temperature sensor which function is to control the start and stop of the burner.
The sensor makes an adjustable difference for start and stop possible (reduces the number of start ups) and shows the present furnace temperature in the display of the furnace control.

Accumulator Control
In combination with the burners temperature sensor the burner can also be controlled from e.g. an accumulator tank using a mechanic or electronic thermostat. The thermostat switches off when the recipient gets warmer than the pre-set temperature and close if the recipient gets colder. The advantage with this connection can be if you only wish to charge the recipient with heat to a certain level.
Note that the thermostat must be potential free, i.e. stress free!
For the burner to be able to start the furnace temperature must be within the burner control temperature and the thermostat in the accumulator tank must be closed.

Connecting up of Burner to Furnace's Existing Double Thermostat

If it is not possible to use the burner control's temperature sensor the existing furnace thermostat (overheating protection and operating thermostat) can be used to control the burner. The start temperature on the burner is set on the furnace's operating thermostat.

Note that the thermostats (overheating protection and operating thermostat) must be potential free, i.e. stress free. Also note that the clamp (fuse) in the fuse holder must be removed for the overheating protection to function correct.

Installation Instructions

1. If the enclosed connection sheet is to be used (the burner can sometimes be mounted directly on the existing door) the size of the sheet is adjusted to the furnace door. Make sure the sheet is big enough to make room for the holes of the fastening bolts, and that the arms of the two locks are turned upwards on the sheet.

2. Fasten the sheet in a way that it tightens properly to the furnace. Use exhaust paste or the like that can stand a minimum of 250°C as tightening between connection sheet and furnace. If connection sheet is not used the furnace door must be 150 x 150 mm with holes for the lock arms. As an alternative the burner can be screwed on directly on to the door.

3. Connect the burner to the furnace through the connection sheet. Lock the burner with the lock arms.

4. Connect the PLC to the burner via the connection block equipped cables. The connection blocks are gently pressed towards the corresponding blocks until located in the correct position. Do not forget the ground cable! After that, the loose cable fitting is mounted and fastened in its socket on the left side of the burner.

5. Place the PLC on furnace room wall, pellet store or furnace, make sure that the box and the cable are not exposed to radiant heat from furnace doors or the like. Fasten the box properly.

6. Connect the PLC to the overheating protection in the furnace (see Electricity Scheme). If the furnace has an attachment plug for oil burners this can be used for the pellet burner. The burner is then connected both via the overheating protection and the furnace's operating thermostat and since the burner is equipped with a separate temperature control the furnace's operating thermostat must be put on maximum to avoid operations disturbance.

Put the burner's temperature sensor in a thermostat tube in the furnace

Adjustments of Burner

This may only be performed by trained service staff or person with equivalent knowledge.

Settings at Delivery

The control box has pre-set settings from factory but adjustments can be needed due to variations in power supply and quality in the pellet, required power, chimney draught and feed screw used. These adjustments should be made by trained retailer or person with equivalent knowledge.

Quality of the Pellet

Insist on an undissolved pellet of hard consistency when purchasing from your supplier. The pellet must be made of wood with a weight of 650 - 700kg/m^3. The power supply in the pellet must be between 4.7 and 5.1 kWh/kg and the proportion of ashes no more than 1 %.

Chimney Draught

Normal draught in the chimney is 10 - 20 Pa. If the negative pressure gets to big a draught stabiliser can be installed on the chimney.

Photo Resistor

The photo resistor makes indicates that a flame has been established. The sensitivity of the photo resistor can be adjusted. (see Manual for Control Unit).

Chimney Gas Temperature

The chimney gas temperature varies depending on furnace and the pre-set power settings for the burner. Too low temperature can result in problems with condensation in the tube. One meter down from the top of the chimney the temperature of the gas should be at least 80°C. If you get condensation in your chimney contact your retailer or chimney-sweeper for advice. A too high temperature will result in uneconomical

operation and risk for damages on the chimney. Consult with your retailer or chimney-sweeper since they are experts on these questions.

Adjusting the Thermostat

Your burner is equipped with a temperature sensor controlling the burner. It can be set with a minimum and maximum temperature between which the burner will work (see Manual for Control Unit).

Starting Dose

Loosen the hose from the burner and hold a litre measure below it. Start the burner and wait until the feed screw has fed the starting dose. For a normal ignition the starting does should be about 0.3 litre Adjust the quantity using the control unit.

Starting and Stopping the Burner

To stop the burner the switch on the control switch is set on 0 (Off). Avoid stopping the burner before it has reached the pre-set furnace temperature since the furnace then will not blow the heating surface.

Air of Combustion / Amount of Fuel

To optimise the burning/combustion it is necessary with a smoke meter. Adjustments of feed screw times, fan speed and so is done using the burner's control box (see Manual for the control unit for adjustment of pre-set settings).

Feed screws can be found in different variants. From a general point of view they should not lean more than 45°, since uneven feeding and varying start dose sizes can arise. Feed screws longer than 3 metres are not recommended for direct feed to the burner. All feed times are depending on pellet size and quality and also the gradient of the feed screw.

The control is furnished with a TEST position giving the possibility to adjust to the required power, that is the amount of pellet, without the burner being in operation. The feed screw will then work for 3 minutes while it pellet is collected. By weighting the pellet the input power can be read in the table below.
1kg pellet = 4.8kWh energy content

Activating the TEST position:
Undo the temperature sensor, make sure that any extern start signal is in off position.
Simultaneously press **A** , **B**, **OK.**
TEST-position indicates by flashing * in the furthest down to the right in the display. The test position ends by pressing **ESC**. After the test the temperature sensor is connected again where after the equipment is ready to start.

Do not forget to make the control unit dead before the temperature sensor is disconnected and reengaged.

Power Input	Amount of Pellet Gram per 3 Minutes	Approximate Amount of Pellet Decilitre per 3 Minutes	Power With 80% Furnace Efficiency
10kW	104	1.6	8kW
12.5kW	130	2	10kW
15kW	156	2.4	12kW
17.5kW	182	2.8	14kW
20kW	208	3.2	16kW

For rough adjustments the colour of the flame can be used as guideline. The colour should be light orange. A white flame indicates that there is too much air and a dark red a lack of air. Adjust the fan speed on the burner control box. Every time an adjustment has been done it is important to let the burner operate for a few minutes before new control and adjustments are done again. Adjustments are necessary every time pellet of another quality is used.

For optimal adjustments a smoke meter must be used.
Be aware that fluctuations in these values and also in flame height are normal.

6. User's manual.

Only authorized person can carry the installation of the boiler and its connection to the heating system

First start-up of the boiler must be carried out by service, which is authorized by boiler's Producer. The installation and service responsibility lies with the company, which installed the boiler. Any manipulation, repairs or service in any part of the boiler (excl. users setting on control panel) are allowed only for Authorized Service and are forbidden for boiler's user.

- **It is forbidden to use inflammable liquids for fuel firing up, boiler has automatic ignition system and it take 3 minutes for start up !**
- **It is not allowed to overheat of the boiler during operation.**
- **It is forbidden to put any inflammable materials on boiler or in its environment.**
- **Any inflammable materials can't be closer to the boiler than 1500 mm during ash removal. The ash should be stored in special non-flammable container with cover.**
- **If the boiler operates with water temperature lower than 60°C, there is a danger of condensation on boiler's heat exchanger walls what results in corrosion and shorter boilers life.**
- **After the heating season is finished the boiler, smoke conduit and chimney must be cleaned. The boiler room should be kept clean and dry.**
- **Any manipulations in mechanical or electrical parts of the boiler are forbidden.**

Manual for Control Unit

Description

The control unit consists of a control panel with PLC, feeding device and various electronics. The connection to the furnace and the burner is through cables with instantaneous coupling. An extern temperature sensor for mounting in the furnace comes with the control unit.
The burner starts and stops automatically according pre-set operation temperatures. Ignition takes place via hot air. Automatic restart of burner takes place after volt break down. Current status is indicated on the display. All settings are kept in the PLC's memory also during a volt break down.
When working with the burner the control unit must be off.
Any reset of the PLC is done by breaking the supply voltage for a short while.

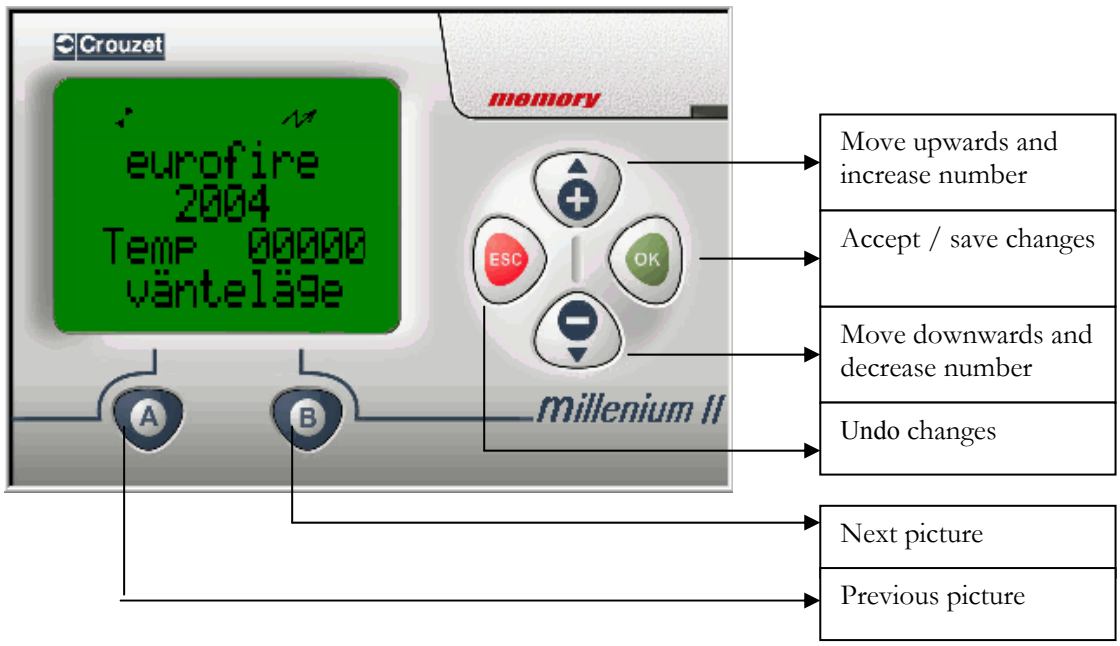
Course of Events at Start and Stop

Feed screw starts and feed pre-set amount of pellet (starting dose)
Electrical ignition activates.
When the photo resistor has detected sufficient light from the burner the pellet feed starts at low power. After a few minutes the burner passes into high power.
When pre-set stop temperature is reached the pellet feed stops and the burner cleaning of the burner takes place, where after wait statues is hold until temperature has dropped to start temperature

When a flame is not detected due to shortage of pellet the burner stops and the display alerts.

If overheating would take place in burner or furnace the control power is disconnected and the burner stops.
Note that this demands a manual restart.
After for example cleaning of the burner, manual feed of the pellet screw can be done by pressing the **ESC** switch.

Handling the PLC
The control unit is equipped with display to show status, alarm and to simplify adjustments.
To adjust the burner for optimal burning a number of parameters can be changed via the control unit.
Its functions are as follows:



When pressing **A** or **B** the display lighting is turned on for about 2 minutes. There are a total of 7 different display slides with varying information and data. Explanations to what is shown can be found on the following pages.
Default parameters are shown within square brackets.

Display slide 1
”eurofire 2004, Temp xxxx ” and drift status.
Drift status is shown furthest down and can be of five different kinds.

Vänteläge	=	Wait State	The burner is ready for start
Uppstart	=	Starting	Start sequence has begun.
Min effekt	=	Minimum Power	Burner in low power state
Max effekt	=	Maximum Power	Burner in high power state
Renblasning	=	Cleaning	Cooling / Cleaning in process
Larm	=	Alarm	Burner stopped due to fault (display light flashing)

Display slide 2
"Temperatur, Till, Från"

Till	=	On	Lowest temperature, where the burner to starts	[75]
Fran	=	Off	Highest temperature, where the burner stops	[85]

Display slide 3

Ljus	=	Light	Shows the photo resistor’s present rate between 0-255	
Gräns	=	Limit	Limited acceptable value on the photo resistor	[20]

Display slide 4

Start	=	Start	Time of duration at start for feed screw (starting dose)	[60]
Dos2	=	Dose 2	Extra pellet feed at long at long ignition time	[12]
Vänta	=	Wait	Time in low power position after ignition before high power position is allowed	[40]

Display slide 5
"Matn pellets" = Pellet feeding

Min	=	Minimum	Time of duration for feed screw at minimum power	[2.5]
Max	=	Maximum	Time of duration for feed screw at maximum power	[5.0]

Display slide 6

"Fläktvärden"	=	Fan status		
Tänd	=	Ignite	Fan speed at ignition *(0-255)	[215]
Max	=	Maximum	Fan speed at maximum power *(0-255)	[230]

* Maximum fan speed is 255

Display slide 7
"INFO“
“Ekosystem AB“
“Ver:2004.1" (given at support inquiry regarding control unit)

Changing a value
Choose wanted display slide using **A** and **B**.
To change a value start by choosing wanted line with **+** and **–**.
The line chosen will be indicated by a dark flashing field.
Press **OK.** The chosen value will flash without being highlighted.
Change the value by using **+** and **–** and accept and save with **OK**.
The value is saved when the line once more starts flashing.
By pressing **+** or **–** for a few seconds the alteration speed will increase gradually.
An incorrect unsaved input can be undone by using **ESC.**

Accumulator Control Position
It is possible to control start/stop of burner in combination with an external signal (accumulator thermostat). For the burner to get the start order in this position the temperature sensor on the furnace must call for heat and an external plug must be connected to input 1-2.

The Burner stops when the furnace has reached its temperature or when the eternal plug is disconnected.
Activating/Deactivating of the accumulator control position is done by simultaneously pressing **+**, **-** and **OK.**
When the accumulator control position is activated the first display slide shows **ACK** .

TEST-position

The normal is to use the DRIFT (operating) position when the burner starts and stops automatically after pre-set operating temperatures. The control is furnished with a TEST position giving the possibility to adjust to the required power, that is the amount of pellet, without the burner being in operation. The feed screw will then work for 3 minutes while it pellet is collected. By weighting the pellet the input power can be read in the table under Air of Combustion / Amount of Fuel.
1kg pellet = 4,8kWh energy content

Activating the TEST position:
Undo the temperature sensor; make sure that any external start signal is in off position.
Simultaneously press **A** , **B**, **OK.**
TEST-position indicates by flashing * in the furthest down to the right in the display. The test position ends by pressing **ESC**. After the test the temperature sensor is connected again where after the equipment is ready to start.
Do not forget to make the control unit dead before the temperature sensor is disconnected and reengaged.

Putting the Control Unit in Operation

Before the control unit is connected all cables must be connected in a satisfactory way.
Ensure the temperature sensor is set up in a thermostat tube in the furnace.
Actuate the operation switch and ensure that the display shows the following slide after a few seconds.

Browse through the display slides using **A** and **B** and ensure that the values are reasonable.
If needed pellet can be fed manually using **ESC**.
Leave hold of the switch when pellet is falling into the burner.
Switch on the operation switch and wait for the furnace to start.
Make sure that the temperature sensor is activated and is showing the furnace temperature *(recalibration might be needed).
The burner should be ignited after a few minutes. Normal duration of starting period is 3-6 minutes.
Control the flame and make sure that no smoke is coming into the furnace room. If needed, adjust the pre-set settings for minimum and maximum power and the fan speed during ignition and maximum power.

Note! Before the control unit is started pellet should be fed up to the burner by connecting the feed screw to a 230VAC socket.

*** Calibration of temperature sensor**

The temperature sensor is calibrated before delivery, but recalibration can be necessary.

Adjustment is done by carefully turning the small potentiometer located on the temperature transductor card in the control unit until correct temperature is shown in the display (compare with furnace temperature).

Trouble Shooting

The control unit indicates nothing in the display:	Ensure that the operation switch on the furnace is switched on and that the overheating protection, backside fire protection or door contact breaker have not triggered.
The burner does not ignite:	The stating dose is wrong, should be approximately 3 decilitres. Make sure that the igniter gets warm. Clean the burner.
The burner starts but stops again after a few minutes and alarms:	Check the **Light** value in the display when the burner has ignited. This must be higher than the **Limit** value for about 10 seconds before **Minimum power** is used. Adjust the **Limit** value of needed. If no value on **Light** is given even though there is a flame the photo resistor might be broken, dirty or wrongly adjusted.
The burner ignites and turns into low power position, but turns off and alarms before pellet is fed:	Too long time duration on the value Wait
The burner ignites and turns into minimum power position, but turns off and alarms before pellet is fed:	Too long time duration on the value Wait
The burner ignites and turns into low power position, but turns off and alarms before turning into high power position:	Not enough time duration on the value Wait
The burner turns off due to the overheating protection on the furnace:	The value on **Temperature Off** is too high.
The burner turns off due to the backside fire protection on the burner:	Poor chimney draught or too high input power to the burner.
The burner is acting generally strange:	Cut the electricity connection to the control unit for at least 1 minute and try again.
Pellet is not fed even though there is pellet in the store and the feed screw is plugged directly to a wall socket, 230 V.	Cut the electricity connection to the screw. Take the screw out of the fuel store and clean. The screw slopes too much (maximum 45°).
The burner is totally “dead”.	Make sure the door contact breaker is pressed in properly. There should be a sharp clicking sound when it is connected to the burner. Check the overheating protection on the furnace and the backside fire protection on the feed tube. It is reset manually by pressing in the reset button.
Reset the alarm in the PLC:	Cut the electricity connection to the control unit for at least 1 minute and reconnect.

For further trouble shooting, please contact your retailer.

Note that the overheating protection and the backside fire protection only trigger if fault has occurred!

Find the cause before pressing the reset plug. A common problem for triggered backside fire protection is shut chimney damper. It should be more open than when the same furnace is used for oil-burning. This is because the oil-burner is working with a higher fan pressure and has less volume of flue gases.

7. Maintenance of the boiler.

Boiler should be cleaned every time after the end of the heating season. Every week it should be checked level of ash in the drawer.

Service / Maintenance

Cleaning the Burner

Cut out the electricity before service is begun.

Clean the combustion room from ashes and other possible slag rests and clear the slots in the rear part of the room with a wire brush. This should be done once every fortnight or, when using pellet of poor quality, more frequently.

Once every burning season the hind gable should be taken off while the burner is cleaned on the inside from possible burning rests. At the same time, check if the photo resistor or the igniter needs to be cleaned or changed.

Photo resistor

Replacement or cleaning of photo resistor: The photo resistor is placed into a pipe that is installed under the printed circuit card in the burner housing. It is connected to a screw terminal block on the printed circuit card. A soft rag with some washing-up liquid is suitable to use for cleaning.

Igniter

Replacement of igniter: Cut the electricity supply to the burner, and remove the protection cover from the burner by loosening the wing nut on the top and the two bolts on the sides. Then take a thin screwdriver and loosen the igniter cables from the board. Now loosen the two wing nuts that are holding the hind gable to the burner and lift the gable out. Now the lock screw of the igniter can be loosened and the element can be pulled out. Install the new igniter, but do not fasten the lock screw too hard. Make sure the igniter is put in place.

Backside Fire Protection

The feed tube is equipped with backside fire protection that breaks at 70°C. The fire protection is placed on the underside of the feed tube. Reset by pressing the small plug.

Note that the protection only triggers if fault has occurred! Find the cause before pressing the reset plug.

A common problem for triggered backside fire protection is shut chimney damper, clogged convection tubes in the furnace, poor draught in the chimney or poorly cleaned burner.

Door Contact Breaker

The door contact breaker in the burner terminates the burning if the is not properly connected to the furnace.

Safety System

The burner is equipped with five different safety systems to give maximal security for the user.

These systems are:

1. Feed hose in plastic between burner and feed screw. The hose melts when the surrounding temperature is too high which results in a broken contact between the pellet feed and the burner.
2. Backside fire protection on the underside of the feed tube. The system triggers at a temperature of 70°C and must be reset manually by pressing the small plug until a click sound arise.
3. Fall shaft in the burner prevents contact between pellet store and burning.

4. Photo resistor in burner detects a correct ignition.
5. Door contact breaker placed on the left side of the burner switches the electricity supply to burner and and feed screw off if the burner of some reason would come off the furnace.

Electricity Scheme

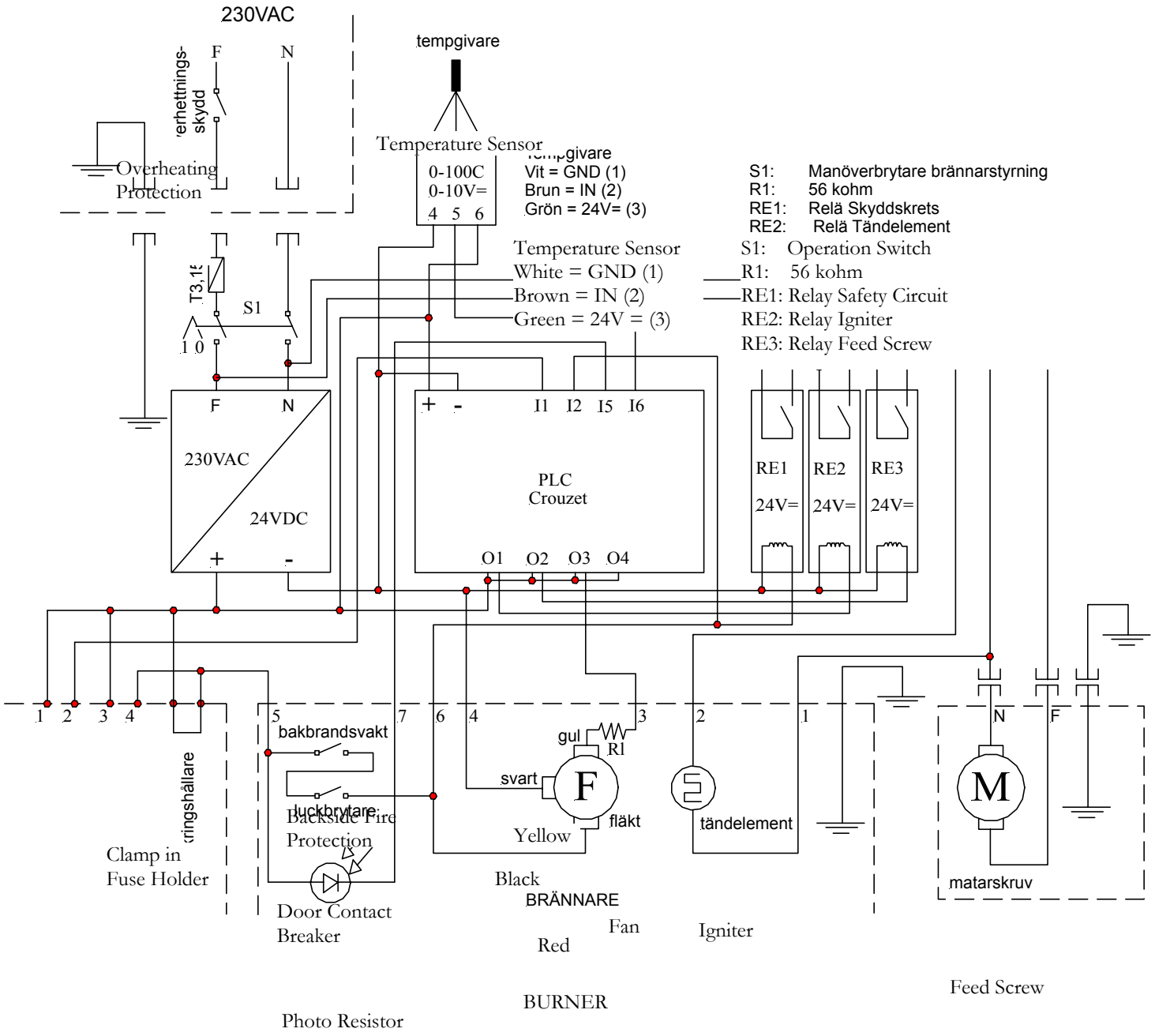
Connection of Burner with Temperature Sensor (standard)

The burner is delivered with a temperature sensor which function is to control the start and stop of the burner.

The sensor makes an adjustable difference for start and stop possible (reduces the number of start ups) and shows the present furnace temperature in the display of the furnace control.

The temperature sensor is to be put in a thermostat tube in the furnace for it to sense the temperature in the furnace. Ensure the sensor cannot fall out of the tube.

The burner's control is to be connected to 230V from the furnace's overheating protection. If the furnace gets too warm the protection will work as an emergency stop device to the burner. The overheating protection can only be rese manually.



Connection of Burner with Temperature Sensor and Accumulator Control

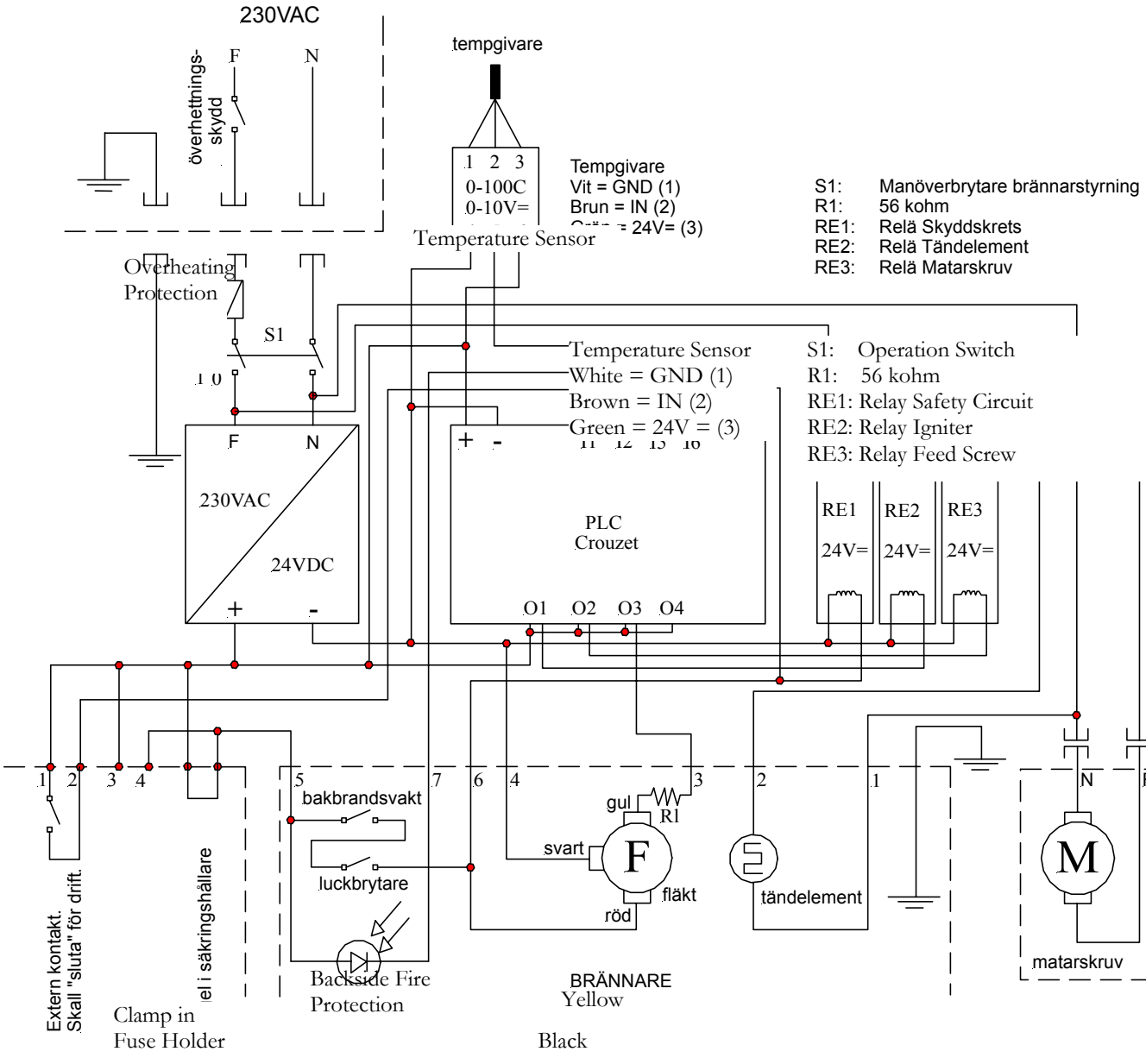
The burner is delivered with a temperature sensor which function is to control the start and stop of the burner.

The sensor makes an adjustable difference for start and stop possible (reduces the number of start ups) and shows the present furnace temperature in the display of the furnace control.

The temperature sensor is to be put in a thermostat tube in the furnace for it to sense the temperature in the furnace. Ensure the sensor cannot fall out of the tube.

The burner's control is to be connected to 230V from the furnace's overheating protection. If the furnace gets too warm the protection will work as an emergency stop device to the burner. The overheating protection can only be rese manually.

A mechanical thermostat can be used to control the burner from an accumulator tank. The thermostat triggers when the tank gets warmer than the pre-set temperature and close when it gets colder. The thermostat is to be connected to input 1 and 2. Note that the thermostat is to be potential free, that is stress free.

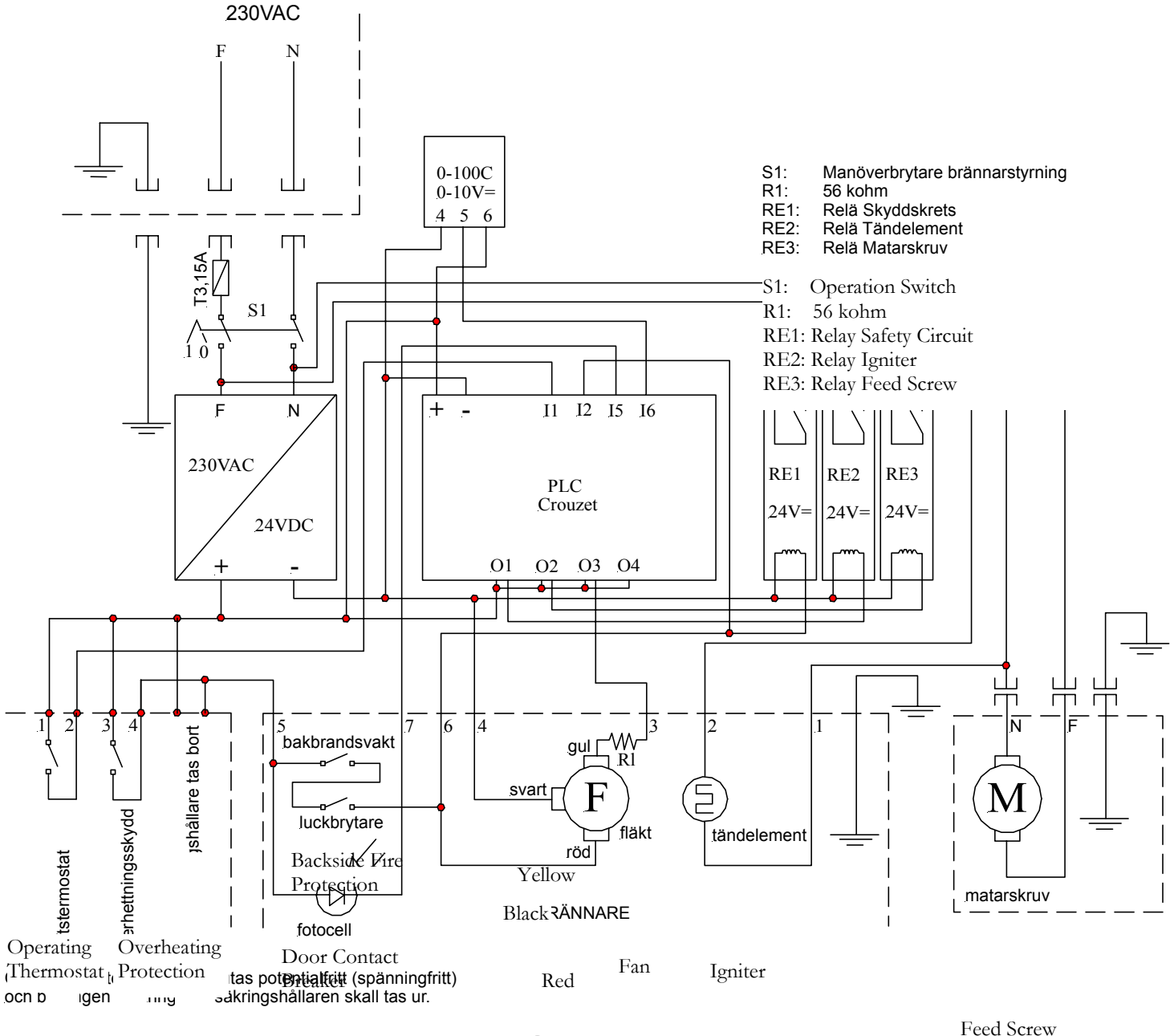


Connection of Burner to the Double Thermostat on the Furnace

If it is not possible to use the temperature sensor on the burner control the existing furnace thermostat (overheating protection and operating thermostat) can be used to control the burner. The starting temperature is then set on the furnace's operating thermostat.
The temperature sensor on the burner cannot be used.
The control of the burner is connected to 230V from a grounded socket.

The operating thermostat on the furnace is to be connected to 1 and 2 on the plug and the overheating protection to 3 and 4. The thermostat trigger cut off when pre-set temperature is reached. The overheating protection will work as an emergency stop device to the burner if the operating thermostat ceases to work. The overheating protection can only be reset manually.

Note that the thermostats (overheating protection and operating thermostat) must be potential free, that is stress free.
Also note that the clamp in the fuse holder must be removed for the function of the overheating protection.



Technical Data

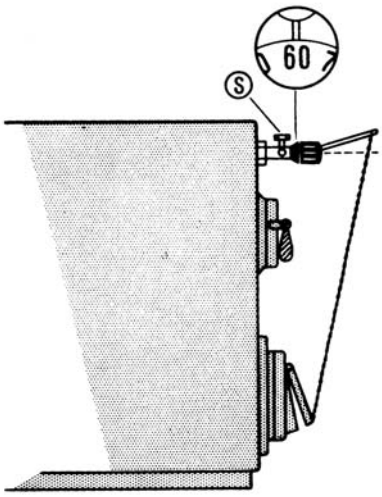
Heating Capacity	kW	2 - 20 (35, 60 kW)
Combustion Efficiency	%	ca. 85 - 95 %
Electrical Data	volt	230 (ground protected socket)
Maximum Electricity Consumption	W	ca. 600
Total Length	mm	490
Length Outside Furnace	mm	300
Height (feed tube included 450 mm)	mm	230
Width	mm	190
Min. recommended distance in front of burner tube	mm	200
Weight	kg	9
Pellet Recommendation		
Diameter	mm	6 - 8
Maximum Length	mm	32

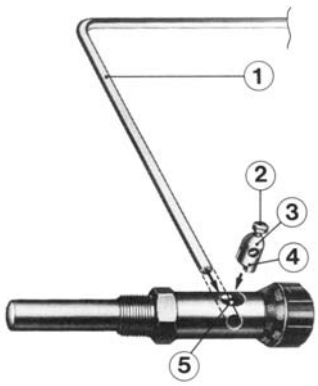
Eurofire pellet burner with associated control and feed system is CE- marked and is manufactured in accordance with following European Union standards and regulative directives:
89/332/EEC
89/336/EEC
72/73/EEC
93/68/EEC

The burner is tested and approved by the Swedish Testing and Research Institute for its safety, quality and environmental performance. Certification number 319901.

Manual steering

When we would like to use solid fuel, You have to use manual steering and remove burner.





8. Recommended connection of the boiler to heating system.

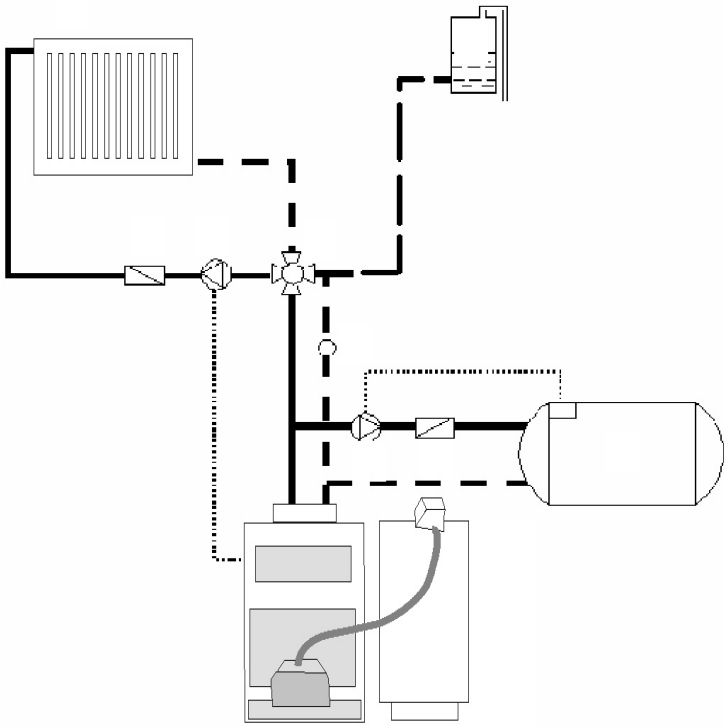
According to EN 303-5 norm, we have to versions of the boiler:

3) **with built in water exchanger (spiral) to protect system against pressure and water overheating (for closed installation system)**
4) **without water exchanger , in this version You can install boiler in opened installation systems**

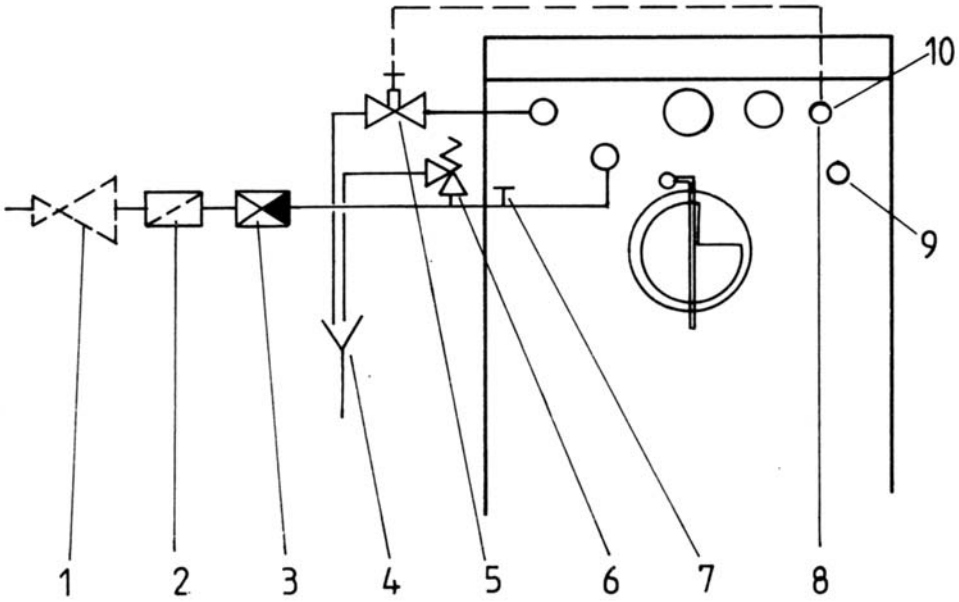
To get 3 years guarantee ,heating system should be equipped in 4 way mixing valve (hand operated), which should be set to keep return water temperature over 55°C. The mixer can be ordered as the boiler's accessory.

1) OPEN INSTALLATION SYSTEM

When You want to install boiler in open installation system, please use following schema:



2) CLOSED INSTALLATION SYSTEM



If You wish to install the boiler in closed installation system, You have to install water supply and return to water exchanger built in the boiler. There are 2 pipes form side of the boiler for connection . It is very important , that You will use special valve to realase water supply when temperature will grow up above 100 C

Important ! Please use all parts of installation from picture of above for protection of high pressure . Installation should be made be authorized installer.

Guarantee Card

FUTURA

Installation Report

Retailer

Company: _____

Name: _____

Address: _____

Zip Code: _____ City: _____

Contact Person: _____

Telephone: _____ Mobil phone: _____

Fax: _____ E-mail: _____

Type / Effect: _____

Production Number: _____

Year of Production: _____

Measured and Set Values

Date	CO	CO2	Chimney Gas Temperature	Chimney Draught	Performed By
	ppm	%	°C	Pa	
	ppm	%	°C	Pa	
	ppm	%	°C	Pa	
	ppm	%	°C	Pa	
	ppm	%	°C	Pa	
	ppm	%	°C	Pa	
	ppm	%	°C	Pa	
	ppm	%	°C	Pa	
	ppm	%	°C	Pa	

The user confirms that:

- During first start-up the boiler don't disclose any defects.
- End user received a current User's Manual.
- Customer was trained and is familiar with boiler's operating and maintenance as well as with the safety rules.

Date of installation (First start-up):	Service company (signature and stamp):	User's name, date and signature:
.....	.....	.....

TABLE OF REPAIRS OF THE BOILER			
Date	**Description of the operation**	**Signature and stamp of the Service company**	**User's signature**

1.10.2004

CE

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Established in 1978
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EG- Konformitatserklarung gemaB
Niederspannungsrichtilinie 73/23/EWG
EMV Richtlinie 89/336/EWG

Wir erklaren ,daB die Festbrennstoffkesseln:
Fabrikat: Cichewicz-kotly c.o.
Hersteller: Cichewicz- kotly c.o. sp z o.o.
Ilino 20 B 09-100 Plonsk
Typen: FUTURA
Fabrikatsnummern: ab 2400

1. Ubereinstimmen mit den Bestimmungen der Niderspannungsgerateverordnung 1995 – NspGV 1995, BGBI Nr 19/95 und damit mit der durch sie umgesetzten Niderspannungrichtlinie 73/23/EWG einschlieBlich der Anderung durch die Richtlinie 93/68/EWG
2. Angewandte Normen und Richtlinien sind:

98/37/EEG
89/336/EEG
73/23/EEG
EN 55014-1, 1993 /A1, 1997
EN 55014-1
EN 55014-2 C1 1998
EN 61000-3-2
EN 61000-4-2, -3-4-5-6-11, Level2
EN 50165
EN 50165 C1
EN 60335-1
EN 303-5