



Providing sustainable energy solutions worldwide

Installation and Maintenance Manual

CTC V22 Lambda

CTC V40 Lambda

IMPORTANT

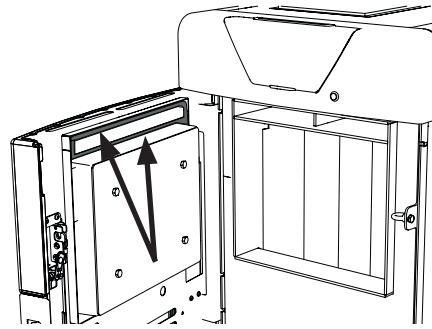
READ CAREFULLY BEFORE USE
KEEP FOR FUTURE REFERENCE



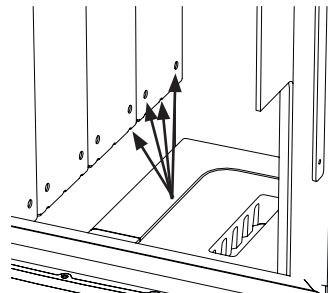
Enertech Group

Check the following on every firing:

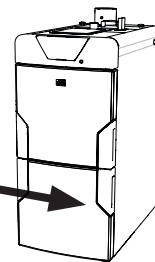
- Check that the sealant strip on the fill door is in tact. If not, replace it. The boiler must not be lit with a damaged strip.



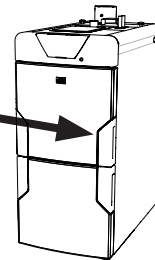
- Check the ash level in the hearth, ash must be removed once it reaches the primary air intake in the hearth plates.



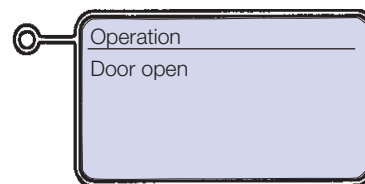
- Ensure that the ash door is fully closed.



- After ignition and filling with firewood, check that the fill door is fully closed.



- Check that the “Door open” message is no longer displayed when the fill door is closed. If it is, the inductive sensor should be adjusted.



NOTE! Firing with the doors open (Fill door/Ash door) is strictly prohibited! This can seriously damage the boiler and cause flue gases to leak out.

CTC V22 Lambda

CTC V40 Lambda



Table of Contents

GENERAL INFORMATION

FOR THE PROPERTY OWNER

Checklist	6
Important to remember!	7
Safety Instructions	7
1. Technical data	11
1.1 Technical data	11
1.2 Dimensional drawing	12
1.3 Detailed overview	13
2. Firing	15
2.1 Reverse burning	15
2.2 Fuel	16
2.3 Air setting	16
2.4 Stoking	17
2.5 Heating phase	18
2.6 Wood charging	18
2.7 Shutdown	18
2.8 Airborne noise	18
3. Instrument panel	19
3.1 The Control Panel	19
4. Control System	20
4.1 Menu overview	20
4.2 Detail Description Menus	22
4.3 Factory values	22
4.4 Main menu/Standard display menu	22
4.5 Time setting	23
4.6 Menu	23
4.7 Room temperature	24
4.8 Operating data	25
4.9 Stored operation data	26
4.10 Night reduction	27
4.11 Day by day	28
4.12 Block	28
4.13 Reset alarm/message.	29
4.14 Alarm info	30
5. Maintenance	31
5.1 General	31
5.2 Safety valves	31
5.3 Expansion system	31
5.4 Flue gas fan	31
5.5 Replacement	31
6. Sweeping	32
6.1 General	32
6.2 Lever sweeping	33
6.3 Sweeping of heat transfer tube	33

FOR THE INSTALLER

7. Boiler room and chimney	34
7.1 Boiler room	34
7.2 Wood supply	34
7.3 Outer and inner door	36
7.4 Removal of doors:	37
7.5 Chimney	38
7.6 Flue pipe connection	38
7.7 Chimney connection	38
8. Pipe installation	39
8.1 General	39
8.2 Connecting to accumulator	39
8.3 Pipe installation	39
8.4 Expansion system	40
8.5 Safety valve boiler	40
8.6 Sensor and thermal valve	40
8.7 Cleaning door	40
8.8 Schematic diagram for system with charge group	41
9. Electrical installation	42
9.1 General	42
9.2 Accessories	43
9.3 Setting after electrical installation	47
9.4 Electrical diagram	48
10. Control System	50
10.1 Installer	50
10.2 Settings	50
10.3 Settings boiler	51
10.4 Setting tank charge	51
10.5 Settings DHW/managing conduits	52
10.6 Settings addheat	52
10.7 Setting Heat circ.	52
10.8 Heating circuit	53
10.9 Service	54
10.10 Function test	54
10.11 Factory settings coded	55
10.12 Alarm and information texts	56
11. Resistances for sensors	57
12. Declaration of Conformity	58

Congratulations on buying your new product



You have chosen a CTC V22/V40 wood boiler, which we hope you will be very pleased with.

CTC V22 / V40 is equipped with automatic air supply control.

The boiler has a powerful suction fan, which gives good combustion with low emissions and has an efficiency of over 90%.

Sweeping is easily performed with a lever, so called lever sweeping.

The best system function is achieved by using a charge group and mixing valve groups which control what should be heated or which areas should be heated.

The boiler is designed to be burning to accumulators and must therefore not be connected for burning directly to a radiator system.

Quick reference

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

Product:	Manufacturing number:
Installer:	Name
Date	Tel. no.:
Electrical installer:	Name
Date	Tel. no.:
Master chimney sweep:	Name
Date	Tel. no.:

Checklist

The check list must be completed by the installer.

- In the event of a service, this information may be called for.
- Installation must always be done according to the installation and maintenance instructions.
- Installation must always be carried out in a professional manner.
- Following installation, the unit should be inspected and checked for functionality.

The points below should be checked off.

Pipe installation

- Boiler filled, positioned and adjusted in the correct manner according to the instructions.
- Boiler placed so fan replacement and other servicing can be performed.
- Correct pipe routing so service and cleaning apertures are not blocked.
- Size of expansion vessel; open approx. 5 % of water volume; closed approx. 10 % of water volume.
- Reprogramming of charge pump or charging system
- Correct pipe dimensions between boiler and tanks; see Installation and Maintenance Instructions.
- Right oxygen valve for overheating protection
- Tightness test.
- Bleed the system.
- Safety valve function test.
- Residual water piping runs from the oxygen outlet and safety valve to the drainage.

Electrical installation

- Main switch installed
- Check/program the control at start, so that the system operates in the intended way (see Installation and Maintenance Instructions) and according to the customer's wishes.

Master chimney sweep

- The flue is seal-tested and approved for firing.
- Check the flue draw.

Information for the customer (adapted to current installation)

- Start-up with customer/installer.
- Menus/controls for selected system
- Installation and maintenance manual supplied to the customer
- Checks and filling, heating system
- Alarm information
- Mixing valve
- Safety valve function test
- Guarantee and insurance
- Information on procedures for fault registration



If these instructions are not followed when installing, operating and maintaining the system, Enertech's commitment under the applicable warranty terms is not binding

Important to remember!


Check the following points in particular at the time of delivery and installation:

- CTC V22/V40 must be transported and stored in an upright position.
- Remove the packaging and check before installation that the product has not been damaged in transit. Report any transport damage to the carrier.
- Place the CTC V22/V40 on a solid foundation, preferably made of concrete.
- Remember to leave a service area of at least 1 m in front of the product.
- 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.

Safety Instructions

The following safety instructions should be followed when handling, installing and using the CTC V22/V40:

- Carefully read through this instruction manual.
- Do not rinse off CTC V22/V40 with water.
- When handling the product with a hoist ring or similar device, make sure that the lifting equipment, eyebolts, etc. are not damaged. Never stand under the hoisted product.
- Never jeopardize safety by removing bolted covers, hoods or similar.
- Never jeopardize safety by deactivating safety equipment.
- Any work on the product should be done by authorised personnel only.
- Safety valve check:
The safety valve for the boiler/system and hot tap water should be checked regularly.
- Do not open the fill door when the boiler has reached its maximum temperature or when the maximum flue gas temperature has been reached, as there is a risk of combustion of flue gases in the hearth.
- If the fill door is opened during firing, smoke and flare-ups may escape into the room.
- Do not open the ash door during operation.

 Close the safety switch before doing any work on the product.

Scope of delivery

Angle flue pipe complete
Sweeping tools for the boiler
Drainage valve
1 x Room sensor
1 x Primary flow sensor
1 x Tank sensor
Outdoor sensor

Your home's heating installation

The House Heating Curve

The heating curve is the central part of the product's control system. It is the heating curve which determines the compensated flow temperature requirements for your property dependent upon the outdoor temperatures. It is important that the heating curve is correctly adjusted, so that you achieve the best operation and economy possible.

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

! The set heating curve is always given priority. The room sensor can only increase or decrease the compensated flow temperature to a certain extent above the set heating curve. Where operating without a room sensor, the selected heating curve determines the flow temperature supplied to the radiators purely from the outside temperature reading.

Adjustment of Default Values for the Heating Curve

You define the heating curve yourself for your property by setting two values in the product control system. This is achieved by selecting the options Inclination or Adjustment under the Installer/Settings/Radiator system menu. Ask your installer to help you set these values.

It is extremely important to set the heating curve and, in some cases, unfortunately, this process may take several weeks. The best way of doing this, upon the initial start-up, is to select operation without any room sensor. The system then operates using the outdoor temperature reading and the property's heating curve only.

During the adjustment period it is important that:

- the night reduction function is not selected.
- all thermostat valves on the radiators be fully opened.
- the outdoor temperature is not higher than +5 °C. (If the outdoor temperature is higher when the system is installed, use the factory set curve until the outdoor temperature falls to a suitable level.)
- the radiator system is operational and correctly adjusted between different circuits.

Appropriate Default Values

During installation you can seldom achieve a precise setting for the heating curve instantly. In this case, the values given below may provide a good starting point. Radiators with small heat-emission surfaces require a higher primary flow temperature. You can adjust the gradient (heating curve gradient) for your heating system under the Installer/Settings/Radiator system menu.

Recommended values are:

Floor heating only	Inclination 35
Low temperature system (well insulated houses)	Inclination 40
Normal temperature system (factory setting)	Inclination 50
High temperature system (older houses, small radiators, poorly insulated)	Inclination 60

Adjusting the heating curve

The method described below can be used to adjust the heating curve correctly.

Adjustment if it is too cold indoors

- If the outdoor temperature is **lower** than 0 degrees:
Increase the Inclination value by a couple of degrees.
Wait 24 hours to see if any further adjustment is required.
- If the outdoor temperature is **higher** than 0 degrees:
Increase the Adjustment value by a couple of degrees.
Wait 24 hours to see if any further adjustment is required.

Adjustment if it is too warm indoors

- If the outdoor temperature is **lower** than 0 degrees:
Decrease the Inclination value by a couple of degrees.
Wait 24 hours to see if any further adjustment is required.
- If the outdoor temperature is **higher** than 0 degrees:
Decrease the Adjustment value by a couple of degrees.
Wait 24 hours to see if any further adjustment is required.



If the values set are too low, this may mean that the desired room temperature is not being reached. You then need to adjust the heating curve, as necessary, following the method shown above. When the basic values have been set more or less correctly, the curve can be finely adjusted directly using the Room temp. shown on the home menu screen.

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 $50\text{ }^{\circ}\text{C}$ primary flow when the outside temperature is $-15\text{ }^{\circ}\text{C}$.

Adjustment -5 means $45\text{ }^{\circ}\text{C}$ 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

You can see in the diagram below how the heating curve changes with different Inclination settings. The gradient of the curve shows the temperatures that the radiators require at different outdoor temperatures.

Curve Inclination

The inclination value which is set is the primary flow temperature when the outside temperature is -15°C .

Adjustment

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

Inclination 50°C
Adjustment $+5^{\circ}\text{C}$

Inclination 50°C
Adjustment 0°C

An example

Inclination 60°C
Adjustment 0°C

In this example, the maximum outgoing primary flow temperature is set at 55°C .

The minimum permitted primary flow temperature is 27°C (e.g. summer-time basement heating or the floor circuits in a bathroom).

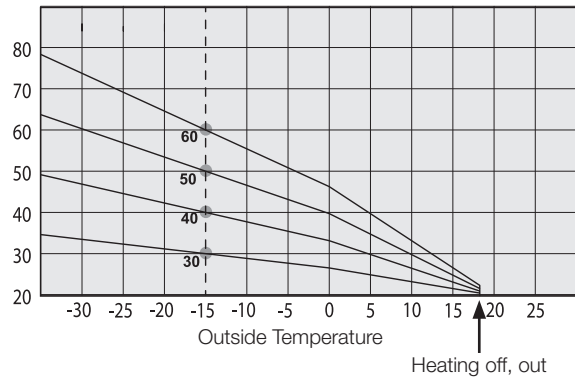
Summer-time operation

All properties have internal heat gains (lamps, oven, personal heat etc.), which means that the heating can be switched off when the outdoor temperature is lower than the desired room temperature. The better insulated the house is, the earlier the heating from the heat pump can be switched off.

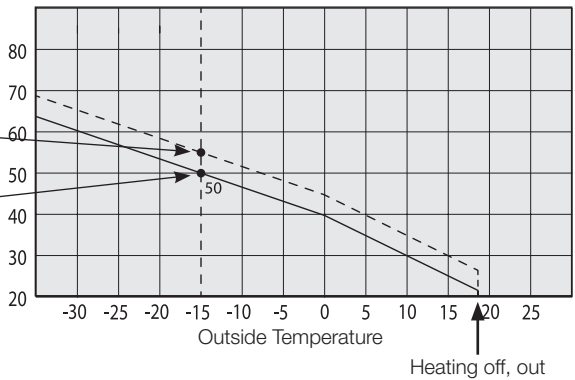
The example shows the product set at the default value of 18°C . This Heating off value can be changed under the Installer/Settings/Radiator system menu.

When the heat is switched off in this way, the radiator pump stops and the mixing valve is shut down. The heating starts up automatically when it is required again.

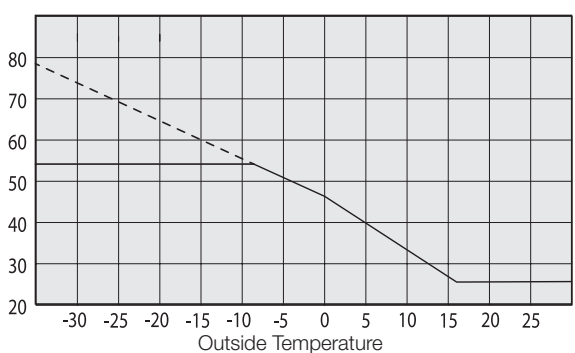
Primary Flow Temperature



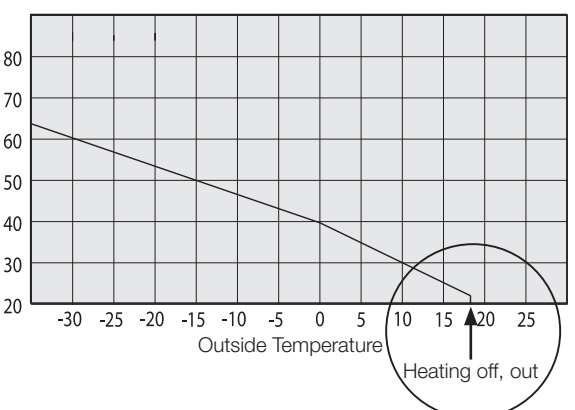
Primary Flow Temperature



Primary Flow Temperature



Primary Flow Temperature



1. Technical data

1.1 Technical data

		V22 Lambda	V40 Lambda	V40
Average output	kW	22	40	
Hearth volume	liter	138		
Hearth measurements (w x h x d)	mm	370 x 680 x 549		
Fill door (w x h)	mm	380 x 302		
Max. operating pressure (PS)	bar	3		
Max. operating temperature (TS)	°C	110		
Water volume (V)	liter	114	105	
Weight (excl. wrapping).	kg	460	470	
Rec. chimney draught	mbar	0.15-0.30 (15-30 Pa)		
Rec. chimney diameter	mm	120-200	150-200	
Flue gas temperature ¹⁾	°C	max. 230		
Flue gas temperature factory setting ²⁾	°C	165		
Flue gas quantity	kg/s	0.012	0.026	0.030
Pressure drop water side $\Delta T = 10K$	mbar	21	20	
Min. return temperature return pipe charge group	°C	55		
Min. return temperature return pipe charging pump	°C	25		
Boiler class in accordance with EN 303-5	class	5		
Rec. accumulator volume	liter	1500-2000	2000-3000	
Min. connection pressure for cooling coil	bar	2.0		
Min. water quantity for cooling coil	l/h	1000		
Produced energy (at 20% humidity, full inlay of birch)	kWh	≈125		
Burning time (at 20% humidity, full inlay of birch)	h	≈5	≈3	
Electrical connection		230V 1N~		
Rated power/current	W/A	159/0,69		
Stand by power/current	W/A	14/0,06		
IP class		IPX1		
Sound power	dB	56		

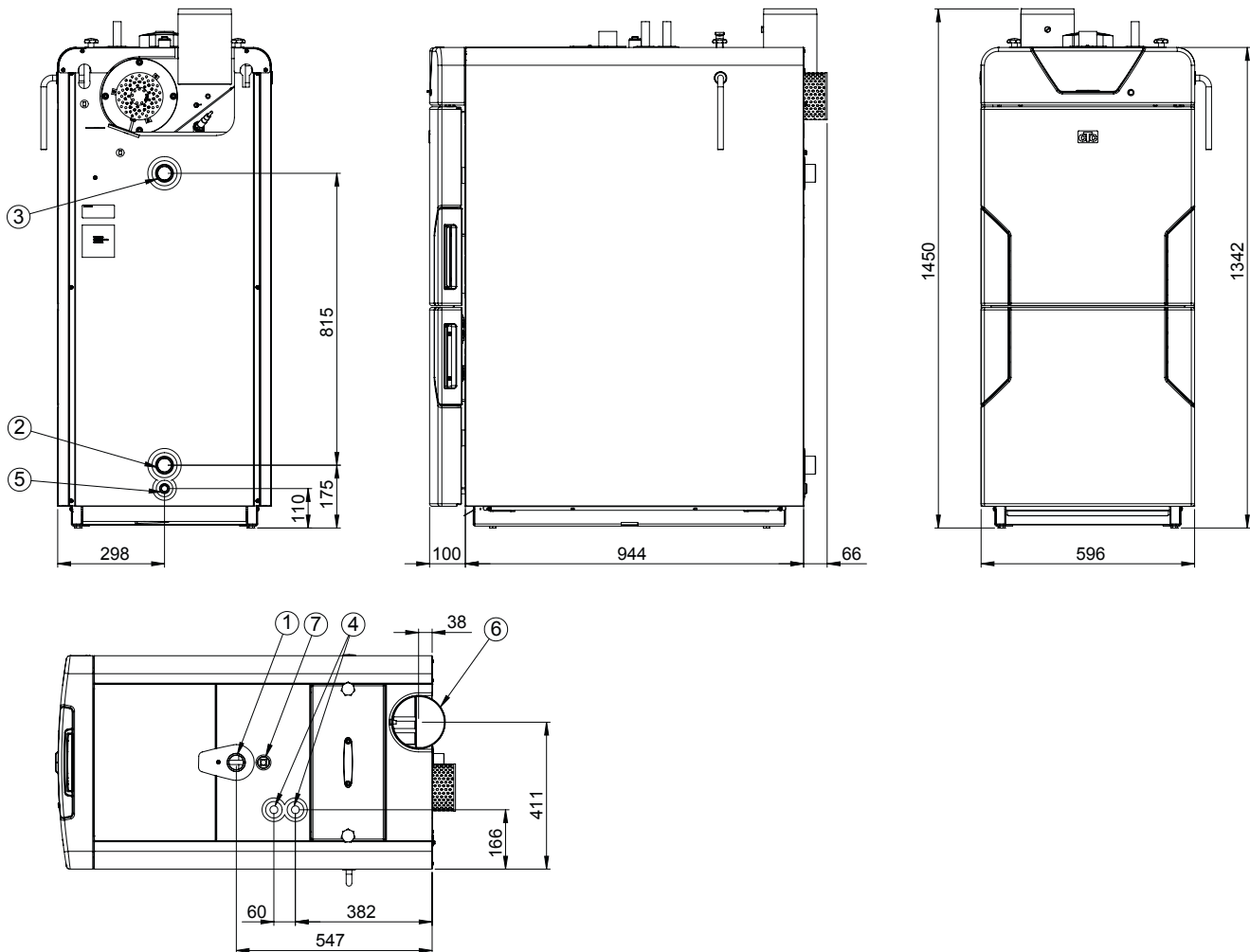
¹⁾ Max. limitation in the control system.

²⁾ The boiler is delivered with a factory-set flue gas temperature of 165 °C. This can be changed in the "Coded" menu where the flue gas temperature can be adjusted between 100-190 °C. Make sure that the flue gas temperature in the chimney is not below 70 °C 1 meter down, to avoid condensation.



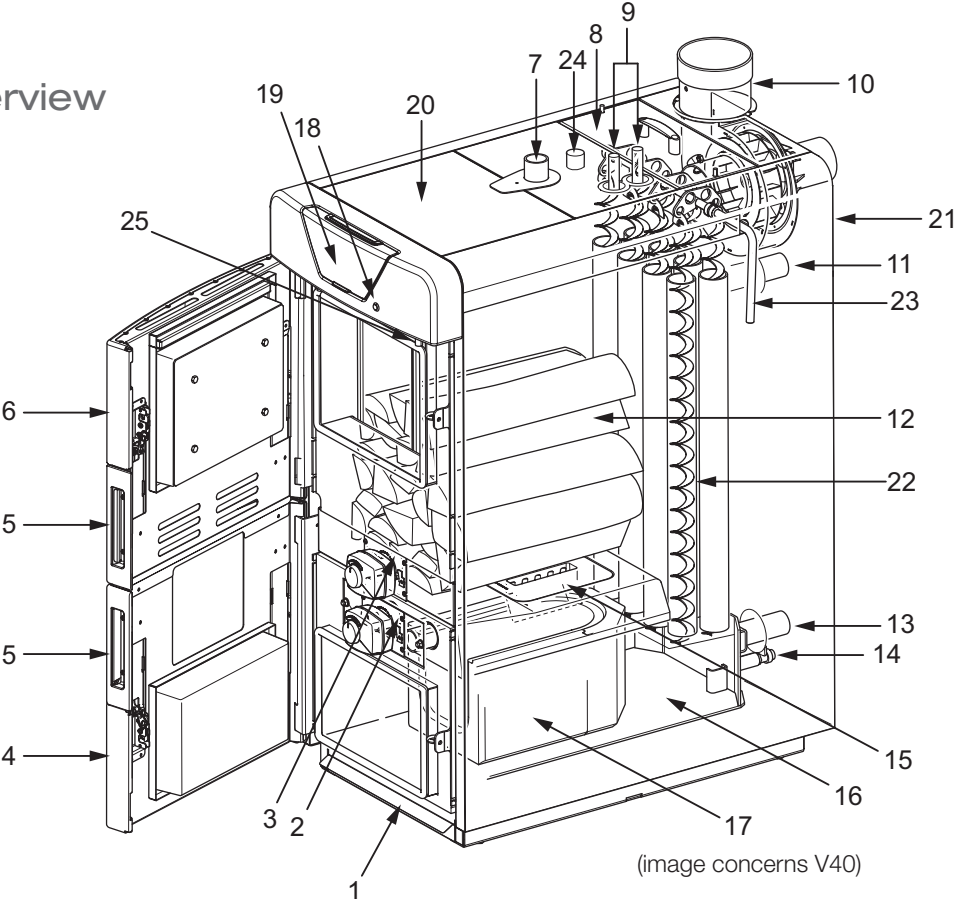
When selecting the group fuse size, the loads connected to the main board and the expansion board should be included. For available options, see the wiring diagram.

1.2 Dimensional drawing

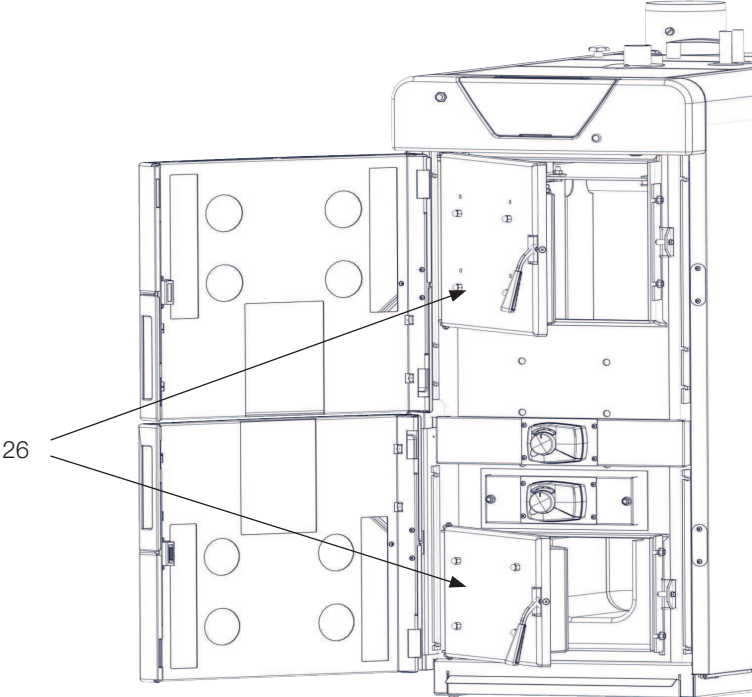


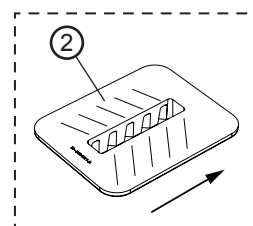
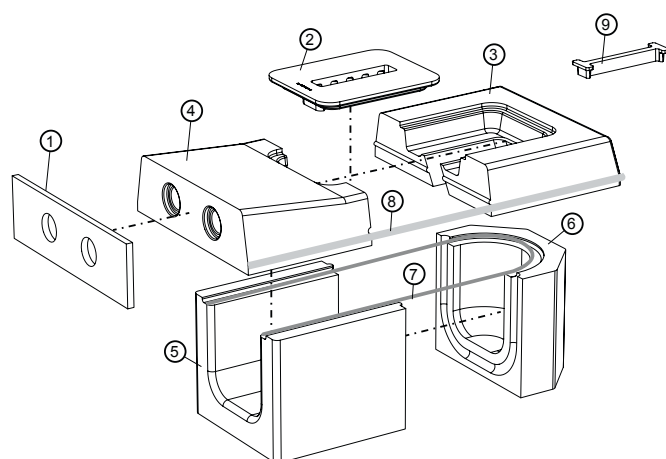
1. Primary flow accumulator tank Rp 1 1/4"
2. Return accumulator tank Rp 1 1/4" (charge group system)
3. Return accumulator tank Rp 1 1/4" (charging pump system)
4. Connection Ø22 cooling coil
5. Connection drainage Rp 1/2"
6. Connection flue pipe Ø150
7. Sleeve 3/4" thermal valve

1.3 Detailed overview



- 1. Ash tray
- 2. Secondary air
- 3. Primary air
- 4. Ash door
- 5. Handle
- 6. Fill door
- 7. Primary flow pipe
- 8. Cleaning door
- 9. Cooling coil
- 10. Flue gas pipe
- 11. Return pipe (charge pump)
- 12. Fire box
- 13. Return pipe (charge group)
- 14. Draining the tank
- 15. Cast steel grate
- 16. After-fire surface
- 17. Ceramics
- 18. Start button
- 19. Display
- 20. Electrical system
- 21. Electrical connection
- 22. Turbulator
- 23. Lever sweeping
- 24. Sleeve thermal valve
- 25. Inductive sensor (indicates door closing)
- 26. Inner door





1. Seal, secondary air intake
2. Cast steel grate
3. Rear ceramic grate
4. Front ceramic grate
5. Front combustion chamber block
6. Rear combustion chamber block
7. Silica fibre braid $\varnothing 15$ mm
8. Glass fibre braid $\varnothing 20$ mm
9. Throttle insert

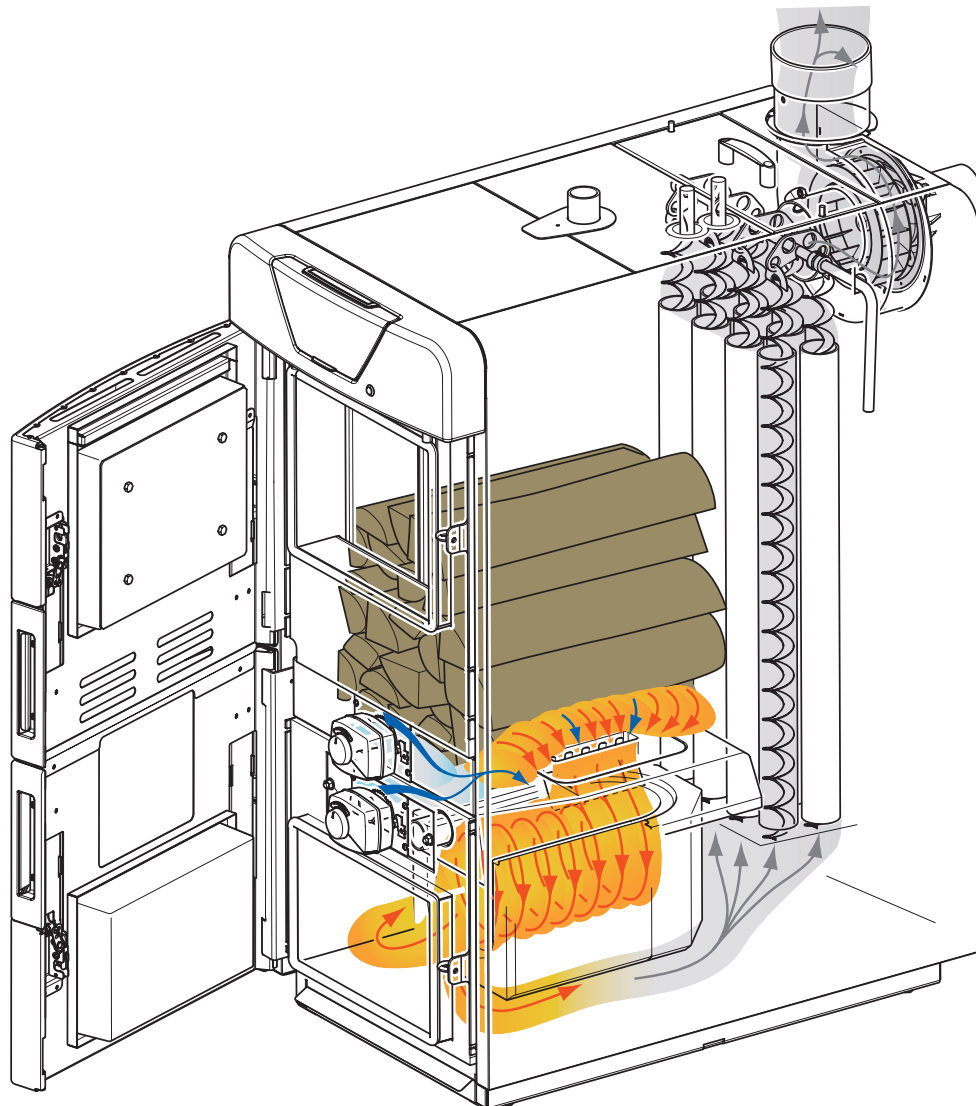
2. Firing

2.1 Reverse burning

The combustion must last during a sufficiently long time, at sufficiently high temperature and at sufficient turbulence. This condition, time, temperature and turbulence is often called the 3 Ts. A good mixture of these three provides good combustion.

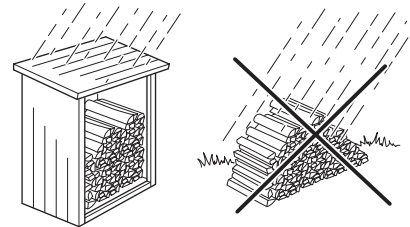
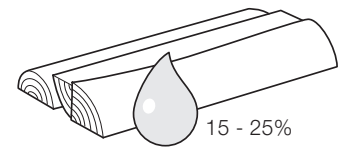
The flue gas fan ensures that the flame finds its way down the grate, and with the help of a control flue the flame starts rotating. The fan sucks the air and the flame on through the ceramics where the remaining gases are burned. The air continues through the heat transfer pipes and out through the chimney.

! If the boiler is powered on, and the fill door is open, the fan operates at maximum speed.



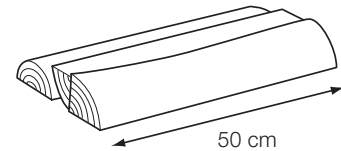
2.2 Fuel

- Moisture content, type, size and cut of the wood is of importance for burning and for the operation of the boiler, among other things the output.
- Suitable moisture content is about 15–25%. Higher moisture content gives lower output and lower efficiency.
- The wood should be stored under roof or rain cover. The drier the surrounding air is, the quicker the wood dries.
- The boiler is designed for 0.5 m wood and it is important that the wood be cut. Large, round logs do not dry as well and are therefore less suitable as fuel. Suitable piece size is when 3–6 logs can be placed next to each other in the hearth.



2.3 Air setting

- CTC V22/V40 with Lambda probe automatically sets itself for best burning with both primary and secondary air settings.
- The CTC V22 boiler supplies approximately 22 kW in ≈5 hours when firing with birch wood with 20% moisture content.
- The CTC V40 boiler supplies approximately 40 kW in ≈2.5 hours when firing with birch wood with 20% moisture content.
- Make sure that the flue gas temperature in the chimney is not below 70 °C, 1 meter down, to avoid condensation.



For damp/roughly chopped wood:

Increase the primary air setting.

For dry/finely chopped wood:

Reduce the primary air setting.

The smoke should always have a transparent, light grey nuance.

! It is both inappropriate and prohibited to heat with waste, chip boards, painted wood, pressure-impregnated wood or similar, as these materials emit gases which are very corrosive and hazardous when heated

2.4 Stoking

In order to get a good combustion, the moisture content of the wood is important. There are two alternative ways to start combustion.

! At delivery the ceramics are not completely dried out. This is done at the first firing. Therefore, during the first two hours, fire very carefully with small wood inlays only.

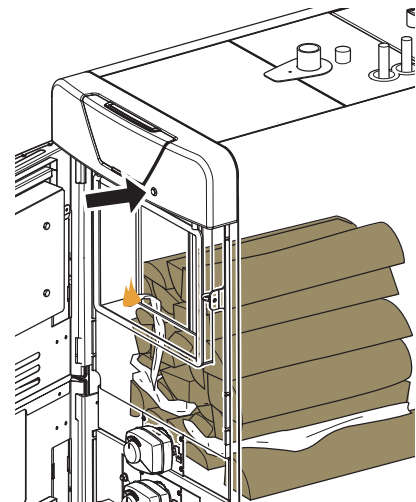
! Too much wood gets the boiler up to max. temperature and the fan stops. This can provide undesirable emissions and possible cooling of the boiler with the cooling coil cooling the boiler without the possibility of benefiting from this heat.

Alternative 1

1. Press the start button.
2. Open the door.
3. Fill with wood so that the bottom is covered with finely chopped wood. Cover with newspaper. Make a small newspaper "fuse" with which to light. Cover with another layer of finely chopped wood. Continue to fill on logs to a sufficient quantity.
4. Light.
5. Close the door.

Alternative 2

1. Open the door.
2. Fill with starting wood/sticks and add newspaper. Continue to fill with a few logs.
3. Light.
4. Press the start button, close the door and wait a few minutes in order to get an ember bed.
5. Open the door and fill the boiler with wood to the suitable quantity.
6. Close the door.




! Appropriate quantity of wood means that, when the accumulator tanks are fully charged, the wood in the boiler has all burned up. The warning High PT means that there is too much wood.

! It is important that, when loading the logs, you stack them as tightly as possible, partly because you then get in more logs and can utilize the boiler maximally, partly because you get more even and environmentally friendly combustion with tightly stacked logs.

! Plan the heating and wood inlay so that you utilise the boiler and the accumulator system maximally.

2.5 Heating phase

- For CTC V22/V40 Lambda: after filling with the appropriate amount of wood, the control system of the boiler monitors the heating fully automatically.
- The ash door must not be opened during heating.

 The ash door must not be opened during heating

2.6 Wood charging

Wood is charged as needed.

If the boiler is in the “Shutdown” phase and wood must be charged, start by pressing the start button and the boiler will enter the “Stoking phase”.


If the fill door is opened during firing, smoke and flare-ups may escape into the room. Open the door a couple of centimetres and wait until the fan turns quicker before opening the door completely.


2.7 Shutdown

When the wood has burned up, the output decreases and the flue gas temperature drops. When the flue gas temperature drops to set value, the fan and the charge group/charging pump stop.

2.8 Airborne noise

Airborne noise originate from the flue gas fan. Normally the boiler room is suited for heating products with a certain noise level. If the noise level is disturbing noise damping material can be used in the boiler room to lower the noise level. Do pay attention to distanses to the boiler and use non burning material. If outdoor noise has to be reduced, use intended flue gas noise damper.

 Do not open the fill door when the boiler has reached its maximum temperature or when the maximum flue gas temperature has been reached, as there is a risk of combustion of flue gases in the hearth.

 Any embers in the ashes could ignite. Always store ashes in a safe manner

3. Instrument panel

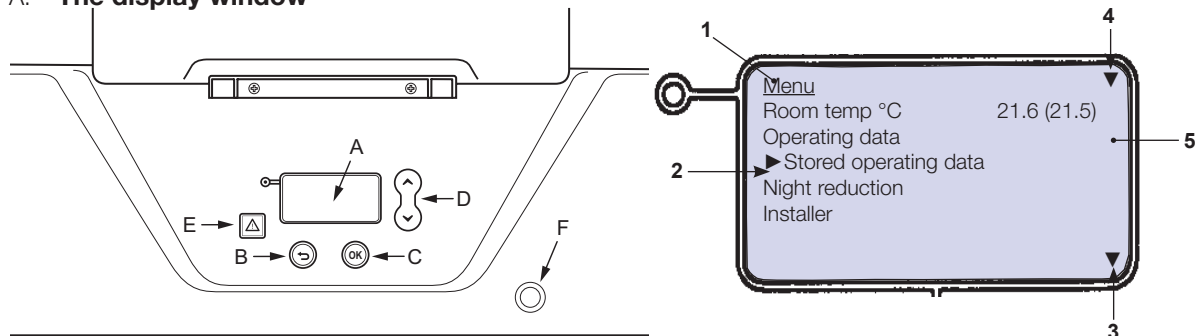
3.1 The Control Panel

All settings are made on the easy-to-read control panel which also gives information on operation and temperatures. The information is displayed in a display window. With a few buttons you easily access all information by selecting from a number of different menus.

Using the buttons

You can easily enter the different menus to find information on the operation or to set your own values.

A. The display window



B. The “backspace” or “undo” button

With this button you go one step back in the menu system to the previous menu. You can also undo a selection of a line.

C. The “OK” button

With this button you accept/confirm a value or a selection.

D. The “increase” or “decrease” button

Here you increase or decrease a value. You can also move the cursor one line up or down.

E. The “Reset alarm” button

With this button you reset the product after an alarm. It is displayed in an alarm situation only.

F. Start button

With this button you start the fan.

1. Menu name

The name of the menu you currently use is shown here. If you are not in the menu system, the product name, week day and time (default display) are shown.

2. Cursor

The cursor is moved up or down to the line you want to select. The cursor is moved with the “increase” and “decrease” button (D). The cursor is blackened when a line is selected. Push the “undo button” (B) to deselect.

3. Indication “more lines” down

The arrow indicates that there are more lines downwards which are not visible. Press the arrow to go down and see more lines. The arrow disappears when there are no more lines.

4. Indication “more lines” up

The arrow indicates that there are more lines upwards which are not visible. Press the arrow to go up and see more lines. The arrow disappears when there are no more lines.

5. Information area

Here information, temperatures, values, etc. are displayed.

4. Control System

4.1 Menu overview

V22/V40	Mon 12:34
Boiler °C	86
O2 %	6.0
Fluegas °C	165
Tank °C	83/46
Status	Stop
Menu	

Time setting	
Weekday	Mon
Time	12:34

Menu	
Room temp °C	21.6 (21.5)
Operation data	
Stored operation data	
Night reduction	
Installer	
Reset Alarm/msg	

Room temperature	
Room temperature 1	
Room temperature 2	

Operation data	
Status	Stop
Boiler °C	86
Fluegas °C	165
Fan %	30
O2 flue gas %	5.9 (6.0)
Damper primary %	75
Damper secondary %	44
Outdoor °C	- 5
Room temp 1	20.1 (20.3)
Primary flow 1 °C	47 (47)
Heat circ. pump 1	On
Mixing valve 1	Opens
Room temp 2	21.6 (22.0)
Primary flow 2 °C	48 (51)
Heat circ. pump 2	On
Mixing valve 2	Opens
Charging pump	Off
Tank °C	80/75
DHW °C	60
DHW pump	Off
Addheat	Off
Program ID	XXXX
Program ver 09	XXXX

Stored operation data	
Operation time h	0
Reduced h	0
High BT tot	0
Max Flue	0
Opendoor	0
Opendoor h	0
N:o starts	0
Failed Ign	0

Reset Alarm/msg	
- No Alarms - / - Ok for reset -	
Service 200h	
Start up failed	
High Boiler temp	
High Flue gas temp	

Night reduction	
Heating circuit 1	
Heating circuit 2	

Installer	
Settings	
Service	
Alarm info	

Room temperature

Fine adjustment

- [●●●●●|●●●●●] +

(50)

Room temperature

Room temp °C 20.0 (20.2)

Displayed if room sensor is defined.

Settings

Language English

Settings boiler

Setting tank charge.

Settings DHW

Settings add heat

Settings heatcirc.

Save settings

Load settings

Load V22/V40 Lamb

Load V40

Alarm info

Latest alarm:

-

Sum alarm:

Boiler sensor 0

Upper sensor 0

Lower sensor 0

DHW sensor 0

Flue gas sensor 0

Fan Fuse 0

Lambda probe 0

Prim flow 1 0

Room sensor 1 0

Prim flow 2 0

Room sensor 2 0

Outdoor sensor 0

Com error 1 0

Com error 2 0

Night red rad sys

Active Yes

Type Block

Room temp decreasing °C -2

Primary flow decreasing -3

Week prog

Block

Settings boiler

Boiler max °C 95

Max flue gas °C 230

Heating phase PT °C 70

Shutdown phase FG °C 120

Stop FG °C 100

Boiler min stop FG °C 90

Start time 60

Tank min temp Off

Type Wood

Setting tank charge

Type Charge group

Start charge group FG °C 90

Start charge pump BT °C 80

Stop charge pump BT °C 76

Settings DHW

DHW pump Off

DHW temp °C 75

DHW diff °C 5

Settings Addheat

Addheat Off

Addheat temp °C 20

Addheat diff °C 5

Settings Heat circ.

Heat circ. 1

Heat circ. 2

Settings

Save settings

Confirm with OK

Settings

Load settings

Confirm with OK

Settings

Load settings V40

Confirm with OK

Inställningar

Load settings V22/V40 Lambda

Confirm with OK

Week prog.

Mon ▲6▼-▲-▼22

Tue ▲6▼-▲-▼22

Wed ▲6▼-▲-▼22

Thu ▲6▼-▲-▼22

Fri ▲6▼-▲-▼23

Sat ▲7▼-▲-▼23

Sun ▲7▼-▲-▼22

Block

Decrease Sun 18.00

Increase Wed 16.00

Decrease Thu 18.00

Increase Fri 16.00

Service

Function test

Settings coded

Heating circuit

Heat circ On

Room sensor Off

Max primary flow °C 55

Min primary flow °C Off

Heating off, outdoor °C 16

Heating off, time 120

Inclination °C 50

Adjustment °C 0

Room temp decrease -2

Primary flow decrease -3

Function test

Flue gas fan % 0

Charging pump Off

Addheat Off

DHW pump Off

Alarm output Off

Damper primary % 0

Damper secondary % 0

Heat circ. pump 1 Off

Mixing valve 1 -

Heat circ. pump 2 Off

Mixing valve 2 -

Setting coded

Code 0 0 0

Alarm reset No

Fan startup 87

Fan max 80

Fan min 30

Fan reg. time s 120

Fan reg. K 2.0

Reduced diff FG °C 10

Reduced diff B °C 5

Heat phase Re °C 3

Start phase time m 5

Set value flue gas °C 165

Lambda control Yes

Value O2 % 6.0

Calibration O2 % 0

Accuracy O2 % 0.3

Prim. start up % 75

Prim. air max % 75

Prim. air min % 30

Prim. reg. K 1.0

Prim. reg. time s 30

Sec. startup % 100

Sec. max high % 100

Sec.min low % 0

Sec. reg. K 2.0

Sec. reg. time s 30

4.2 Detail Description Menus

CTC V22/V40 displays only menus for systems and function selected in the main menu. All other menus which are not defined for your system are hidden. If adjustments are to be made in the heating system, contact your installation engineer for help.

4.3 Factory values

The product is delivered with set factory values which are suitable for a standard house with a standard radiator system. These values are easy to change as and when required. You should perform a special check of the installed values in the menus for the radiator system. Ask your installer to help you determine the correct values.

4.4 Main menu/Standard display menu

This menu is the system's "default menu". The system returns to this menu if no buttons are pressed within 10 minutes. All other current menus can be accessed from this menu.

V22/V40	Mon 12:34
Boiler °C	86
O2 %	6.0
Fluegas °C	165
Tank °C	83/46
Status	Stop
Menu	

V22/V40 **Mon 21:34**

Displays product name, day and time. Day and time can be set by selecting this line. Day and time is only displayed if at least one radiator system is selected.

Boiler °C **86**

Displays current boiler temperature. The sensor is placed on the boiler under the cover of the electrical system.

O2 % **6.0**

Displays current oxygen content in the boiler.

Fluegas °C **165**

Displays current flue gas temperature.

Tank °C

Displays current tank temperature if sensor is connected.

Status **Heating phase**

Displays the status of the boiler. Three status areas are especially important to the function of the boiler. These are *Start up*, *Heating* and *Shut down*. The other areas are: *Stop*, *Open door*, *Reduced*.

Stop: The boiler fan is in the "Off" position. Primary and secondary dampers are closed.

Open door: Displayed if the door is open. If the door is opened during operation, the fan operates at max. speed. If the door has been open more than 10 seconds, the dampers are set completely open.

Reduced: If the temperature of the boiler or flue gases approach max temperature, the boiler will switch over to reduced operation so that the over-heating protector does not turn off the boiler.

4.5 Time setting

(Only if a radiator system is selected) Here you set the day and the time. The clock drive is the frequency of the power grid (50 Hz). After a power failure, the clock may have to be reset. The clock starts at the time of the power failure ± 5 minutes. Summer and winter times have to be set manually.

Weekday **Mon**
 Set the current day (setting Monday-Sunday)

Time **21:34**
 Set the current time (setting 00:00-23:59).

Time setting	
Weekday	Mon
Time	12:34

4.6 Menu

This menu has 5 sub groups which all have different setting possibilities for the operation of the boiler

Room Temp °C **21.6 (21.2)**
 This menu is displayed only when the boiler controls at least one radiator system. Here the room temperature is set in the different defined areas.

Operating data
 Current information from all included components.

Stored operation data
 Here operating values for a longer time past are displayed.

Night reduction
 During scheduled periods the temperature can be reduced.

Installer
 Different settings the property owner should make in consultation with the installation engineer

Reset Alarm/message
 The alarm and message are reset here.

Menu	
Room temp °C	21.6 (21.5)
Operation data	
Stored operation data	
Night reduction	
Installer	
Reset Alarm/msg	

4.7 Room temperature

If more than one radiator system is activated, this menu is displayed. Here you select the radiator system for which the temperature is to be adjusted.

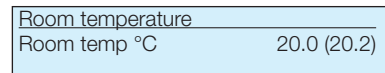
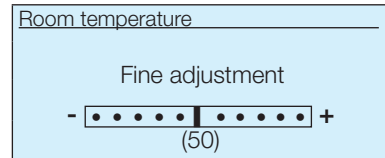
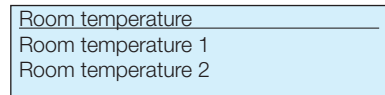
Operation without room sensor

If no room sensor has been installed, the room temperature for each radiator system is set in this menu. The default settings for the house are first set in the menu "Setting Radiator system", often with the help of the installation engineer. The default setting is then adjusted in this menu. This can be done for each of the defined radiator systems.

Operation with room sensor

In this menu you set desired temperature for each room sensor. Arrow up gives higher temperature and arrow down gives lower.

If the temperature indoors is too high or too low, move the cursor towards + (increase) or - (decrease). Move it a small distance at a time, await the result indoors (1 day) before the next change. Several adjustments may be necessary at different outdoor temperatures, but you will gradually achieve the right setting that will not need to be changed. A reference value is displayed (e.g., 50) under the bar. If the default setting is adjusted in the "Installer/Settings/Radiator System 1 (2)" menu, the cursor is reset to the middle position again. For night reduction, "NR" is displayed in the upper right corner



Displayed if room sensor is defined.



The thermostats of the radiators must be fully open and well operating when the system is tuned.

4.8 Operating data

This menu shows current temperatures and operational data for the product and the system. Values in brackets are either desired values or automatic values which the product is working towards (so-called reference values).

Note that only those menus for systems and functions selected in the "Installer/Define system" menu are displayed; all other menus which are not defined for your system are hidden.

- Boiler °C** **86**
Displays current boiler temperature. The sensor is placed on the boiler under the cover of the electrical system.
- Fluegas °C** **165**
Displays current flue gas temperature.
- O2 % Flue gas** **5.9 (6.0)**
Displays current oxygen content and the desired oxygen content in the flue gas as %.
- Fan %** **30**
Displays the fan speed in %. The fan's speed is controlled by the flue gas temperature. When the temperature is equal to the set value (165°C factory-set) the speed does not change and the boiler provides the specified output. If the flue gas temperature rises, the fan speed will reduce. The lowest speed is 30%. If the flue gas temperature falls, the fan speed will increase. The highest speed is 80%. If the flue has a good draught, the fan will normally be at the lowest speed for a large part of the firing time. At 165 °C the boiler provides the specified output.
- Damper primary %** **75**
Shows how much the damper is open in %.
- Damper secondary %** **44**
Shows how much the damper is open in %.
- Outdoor °C** **-5**
This menu is displayed when the radiator system has been activated. The outdoor temperature on the outdoor sensor connected to CTC V22/V40. The sensor is used to control the comfort in the house.
- Room temp 1°C** **20.1 (20.0)**
Current room temperature for room sensor 1, if room sensor has been activated in the menu radiator system 1. If more than one radiator system has been activated, current operating information for each radiator system is displayed
- Primary flow 1°C** **47 (47)**
Current temperature supplied to the system's radiators, along with the temperature which the system is trying to achieve. This value will vary during operation according to the parameters set and the current outdoor temperature.
- Heat circ. pump 1** **On**
The operating state for the radiator pump. During summer, when there is no heating need, the pump stops. The pump is exercised now and then however to avoid seizure.
- Mixing valve 1** **86**
Shows if the mixing valve *open*/increases or *close*/reduces the heat out to the radiators. When the right temperature is mixed out, the valve actuator stands still.

Operation data	
Status	Stop
Boiler °C	86
Fluegas °C	165
Fan %	30
O2 flue gas %	5.9 (6.0)
Damper primary %	75
Damper secondary %	44
Outdoor °C	- 5
Room temp 1	20.1 (20.3)
Primary flow 1 °C	47 (47)
Heat circ. pump 1	On
Mixing valve 1	Opens
Room temp 2	21.6 (22.0)
Primary flow 2 °C	48 (51)
Heat circ. pump 2	On
Mixing valve 2	Opens
Charging pump	Off
Tank °C	80/75
DHW °C	60
DHW pump	Off
Addheat	Off
Program ID	XXXX
Program ver 09	XXXX

Room temp 2°C **21.6 (22.0)**

Current room temperature for room sensor 2, if room sensor 2 has been selected in the operation, and desired value in brackets. If more than one radiator system is defined, their current operating information is displayed underneath.

Primary flow 2°C **48 (51)**

Current temperature supplied to the system's radiators, along with the temperature which the system is trying to achieve. This value will vary during operation according to the parameters set and the current outdoor temperature.

Heat circ. pump 2 **On**

The operating state for radiator pump 2. During summer, when there is no heating need, the pump stops. The pump is exercised now and then however to avoid seizure.

Mixing valve 2 **Opens**

Shows if the mixing valve *open/increases* or *close/reduces* the heat out to the radiators. When the right temperature is mixed out, the valve actuator stands still.

Charging pump **Off**

Indicates if the charge pump is on or off.

Tank °C **80/75**

The menu is displayed only if the tank sensors are connected. Displays the temperature in the connected accumulator tank(s).

DHW °C **60**

Displayed only when the hot water sensor is connected. Displays current hot water temperature.

DHW pump **Off**

Displayed only if the DHW charge pump is set to Yes.

Addheat **Off**

The menu is displayed only when "addheat" is selected ("in tank" or "DHW").

Program ID **XXXX**

The date of the control program version.

Program ver 09 **XXXX**

4.9 Stored operation data

In this menu the operating data for a longer period are shown.

Operating time h **0**

Indicates the total heating time for the boiler.

Reduced h

Displays operating time in reduced mode.

High BT tot **0**

Displays number of times the boiler has had a boiler temperature that is too high.

Stored operation data	
Operation time h	0
Reduced h	0
High BT tot	0
Max Flue	0
Opendoor	0
Opendoor h	0
N:o starts	0
Failed Ign	0

- Max Flue** **0**
Displays number of times the boiler has had a flue gas temperature that is too high.
- Opendoor** **0**
Displays number of times firing has taken place with the fill door open for more than 10 minutes.
- Opendoor h** **0**
Displays operating time the fill door has been open.
- N:o starts** **0**
Displays the number of starts.
- Failed Ign** **0**
Displays the number of failed starts, i.e. failed transfer from stoking phase to firing phase.

4.10 Night reduction

In this menu settings for night reduction are made. A night reduction means that you reduce the temperature indoors during scheduled periods, e.g., at night or when you are working. Two types of night reduction are available: "Week prog." for scheduling daily reductions and "Block" for scheduling night reduction periods lasting several days.

Here you select if the scheduled reduction should be active, "Yes". If "No", no reduction takes place at all.

Activated **Yes**

Here you select if the scheduled reduction should be active, "Yes". If "No", no reduction takes place at all.

Type **Week prog.**

Type of reduction is selected here: "Week prog." means scheduling reductions during all weekdays with the possibility of two reductions per day. This schedule is repeated every week. "Block" means scheduling reductions during several days of the week, e.g., Monday to Friday. Two reduction periods can be scheduled. This schedule is repeated every week.

Room temp red °C **-2**


(alt. Primflow red °C)

You define here by how many degrees the room temperature is to be reduced during the reduction period. Note: "-2" means that the room temperature is reduced by 2°C from its normal temperature. If room sensors are not part of the operation, it would be the primary flow temperature for which you indicate a reduction instead. Rule of thumb: 3–4°C reduction of the primary flow temp equals approx. 1°C reduction of the room temp in a normal system. Factory value "Room reduced" -2 °C (setting -40 to 0 °C). Factory value "Primflow reduc." -3 °C (setting -40 to 0 °C).

Week pr. or Block

The scheduling is done in these menus; see next section.

Night reduction
Heating circuit 1
Heating circuit 2

 If only one radiator circuit is defined, the first menu window for selection of radiator system is not displayed.

Night red rad sys	
Active	Yes
Type	Block
Room temp decreasing °C	-2
Primary flow decreasing	-3
Week prog	
Block	

4.11 Day by day

In this menu, reduction times during the weekdays are scheduled. This schedule is repeated every week. The screen shows the factory values, which can be changed. If more reduction periods are required, the intermediate times should be programmed.

▲ = the temperature increases (to normal temp) at the hour indicated after the arrow.

▼ = the temperature is reduced the number of degrees shown next to the hour indicated after the arrow.

Example 1

Mon ▲6▼-▲-▼22

On Monday morning at 06:00 the temperature is raised to normal and stays normal all day until 22:00 when it is reduced again.

Example 2

Mon ▲6▼12▲16▼22

At 06:00 the temperature is raised to normal, at 12:00 the temperature is lowered until 16:00. Between 16:00 and 22:00 the temperature is normal and thereafter it is reduced again.



Remember that the room temperature changes slowly and depends on, for instance, how well the house is insulated.

Week prog.	
Mon	▲6▼-▲-▼22
Tue	▲6▼-▲-▼22
Wed	▲6▼-▲-▼22
Thu	▲6▼-▲-▼22
Fri	▲6▼-▲-▼23
Sat	▲7▼-▲-▼23
Sun	▲7▼-▲-▼22

4.12 Block

In this menu the reduction can be set for several days of the week, e.g., when working in another place on weekdays and spending the weekends at home.

Decrease **Sun 18.00**

Set the first day and time when the temperature should be reduced.

Increase **Wed 16.00**

Set the day and time when the temperature should be raised again. If two reduction periods are required during the week, they are programmed in chronological order.

Example:

Reduce	Sun	18.00
Raise	Wed	16.00
Reduce	Thu	21.00
Raise	Fri	16.00

Block		
Decrease	Sun	18.00
Increase	Wed	16.00
Decrease	Thu	18.00
Increase	Fri	16.00

4.13 Reset alarm/message.

Confirm alarm/message by pressing "OK"

Service 200h

Check:

- Securing door lock/hinge.
- Seals in the doors.
- Quantity of ash.
- Lift the door above the turbulators and inspect the fan to see whether it needs cleaning.

Start up failed

Check:

- Whether the turbulators can be moved.
- Whether there is tar or contaminants in the fan/fan housing.
- Why did it not take hold. Is the wood too rough? Was there enough fine material for the fire to take hold

High Boiler temp

Check:

- Whether the turbulators can be moved.
- Whether there is tar or contaminants in the fan/fan housing.
- Why the boiler temp is high:
 - Too much wood.
 - Is the circulation pump set at the highest speed, if not, do this.
 - Are all valves open.
 - Are the pipes dimensioned correctly.

High flue gas temp

Check:

- Whether the turbulators can be moved.
- Whether there is tar or contaminants in the fan/fan housing.
- Whether the turbulators are installed.
- Whether the draught in the flue is too strong.

Reset Alarm/msg
- No Alarms - / - Ok for reset -
Service 200h
Start up failed
High Boiler temp
High Flue gas temp

4.14 Alarm info

Resetting alarm info takes place in the coded menu.

Latest alarm:

Latest fault that has occurred

Boiler sensor

Number of faults detected in the Boiler.

Upper sensor

Number of faults detected in the Upper tank sensor.

Lower sensor

Number of faults detected in the Lower tank sensor.

DHW sensor

Number of faults detected in the Hot water sensor.

Flue gas sensor

Number of faults detected in the Flue gas sensor.

Fan fuse

Number of faults detected in the Fan fuse.

Lambda probe

Number of faults detected in the Lambda probe.

Prim flow 1

Number of faults detected in Primary flow sensor 1.

Room sensor 1

Number of faults detected in Room sensor 1.

Primary flow 2

Number of faults detected in Primary flow sensor 2.

Room sensor 2

Number of faults detected in Room sensor 1.

Outdoor sensor

Number of faults detected in Outdoor sensor

Com error 1

Number of faults detected in Communication 1

Com error 2

Number of faults detected in Communication 2

0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0
0

Alarm info	
Latest alarm:	-
Sum alarm:	
Boiler sensor	0
Upper sensor	0
Lower sensor	0
DHW sensor	0
Flue gas sensor	0
Fan Fuse	0
Lambda probe	0
Prim flow 1	0
Room sensor 1	0
Prim flow 2	0
Room sensor 2	0
Outdoor sensor	0
Com error 1	0
Com error 2	0

5. Maintenance

5.1 General

After the installation, check together with the installation engineer that the installation is in good condition. Have the engineer show you the switches, controls, dampers, valves, etc., so that you know how the system works and should be managed. Check and bleed the installation after a few days' operation. This also applies to all the radiators in the house.

5.2 Safety valves

Check any safety valves in the installation by opening the valve and ensuring that water enters the drain pipe.

5.3 Expansion system

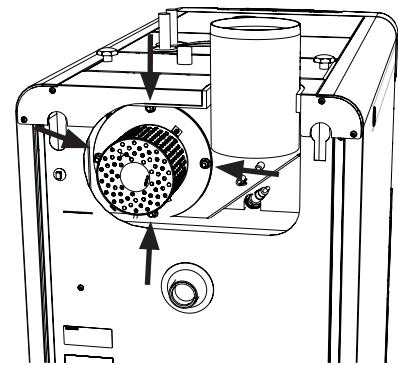
Check the water level in the system by reading the installed pressure gauge; top up with water if necessary. This check is best done when the entire system is up at full temperature. If the entire system or part of it has low temperature, the pressure should not be up at the highest level.

5.4 Flue gas fan

Ensure that the boiler is turned off and that the power is cut. Check that no embers are left in the boiler. The fan should be removed once every year and cleaned if necessary.

5.5 Replacement

When replacing the product, or part of it, disposal shall be made in accordance with current regulations.



Use CTC original parts only for replacement of components.

6. Sweeping

6.1 General

Sweeping shall be conducted in accordance with applicable laws and regulations. Sweeping the boiler provides for better output. The interval between sweepings is determined considering the risk of chimney fire. Master chimney sweepers can inform on intervals.

Do not remove any unburned wood remainder from the ceramic grate. They do not need removing since they will be burned in connection with the next firing up.



Ash in the hearth must not cover air holes in the side cover plates.



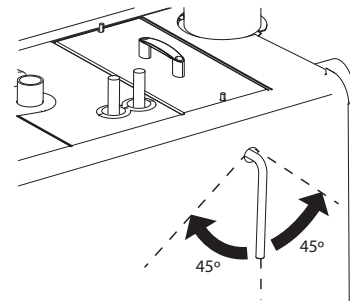
Be careful when sweeping the flue gas cabinet. The Lambda probe cannot take mechanical touching.

- The sweeping performed by the chimney sweeper comprises all flue gas ducts from the combustion chamber to the chimney top.
- Cleaning of hearth and grate is done from the front through the filling door. Ashes and slag are removed from the wood magazine when necessary, normally twice a year.
- The flues under the cast steel grate should be cleaned a few times a year. Lift the grate straight up from the ceramics and clean the secondary air ducts in the ceramics. Be careful when reassembling.

6.2 Lever sweeping

Sweeping of CTC V22/V40 is very simple. This takes place with a lever (placed on the side and can be moved over to the other side) which, by a back-and-forth movement, sweeps the turbulators. Lever sweeping should be performed at each firing of the boiler.

Lever for sweeping

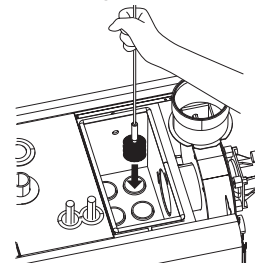


6.3 Sweeping of heat transfer tube

Sweep the turbulators and the heat transfer tubes as necessary, normally 1–2 times/year.

- Remove the cleaning door. Lift up the turbulator pairs.
- Sweep out the heat transfer tubes with sweep brush.

Sweeping of heat transfer tube



! In the hearth, “fatty” gas is formed which contains tar substances. Part of this gas “condenses” on the walls. This is perfectly normal and this tar is newly formed, runs down and burns up continually. Ensure that too much packed slag is not formed in the junction between ceramics and boiler wall in the furnace. In that case it should be removed.

7. Boiler room and chimney

7.1 Boiler room

The design of the boiler room and the setup of the boiler should correspond to applicable standards, both general and local regulations.

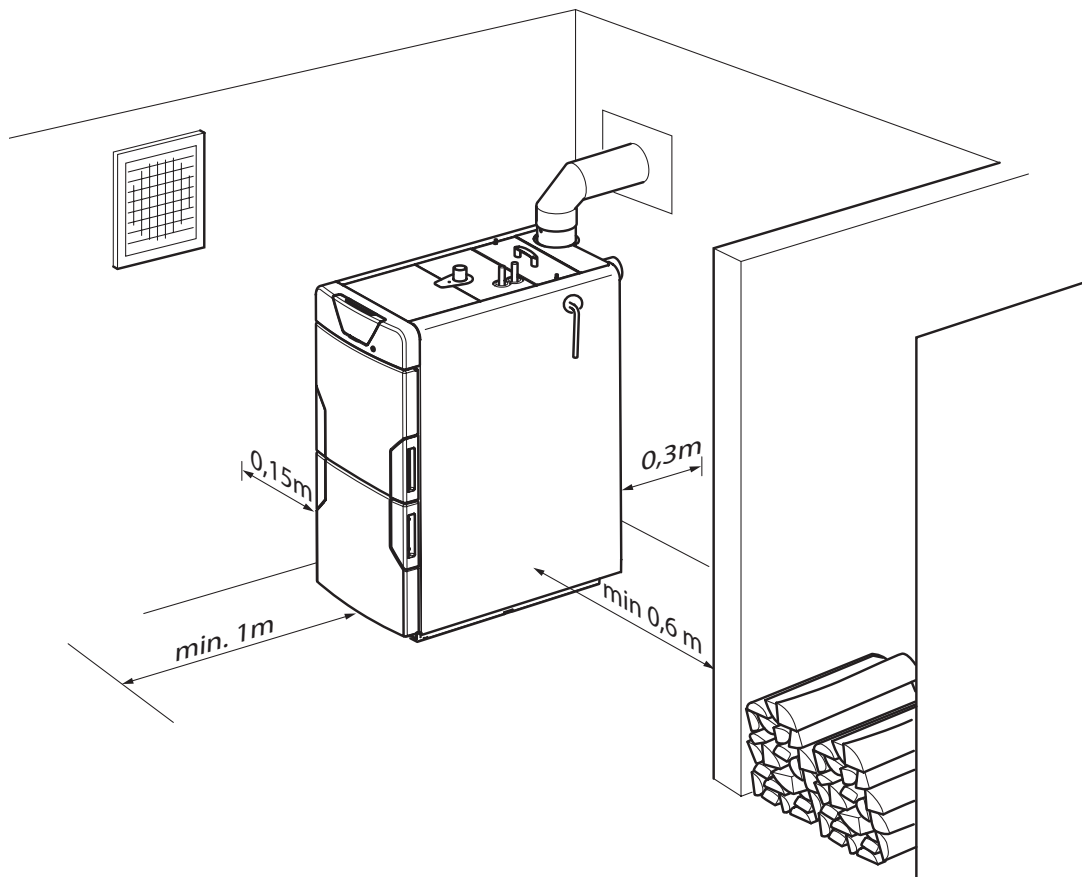
- The boiler room should always have a separate valve for air supply, where the free surface should correspond to the chimney's area.
- The illustration below shows the recommended minimum measurements between the boiler and surrounding walls.
Minimum recommended ceiling height = 1900 mm.

! Always contact a competent inspector (e.g. master chimney sweeper) for inspection and approval before the installation work is started.

7.2 Wood supply

A wood supply in the immediate vicinity of the boiler room should be separated from surrounding areas in the same way as is prescribed for the boiler room.

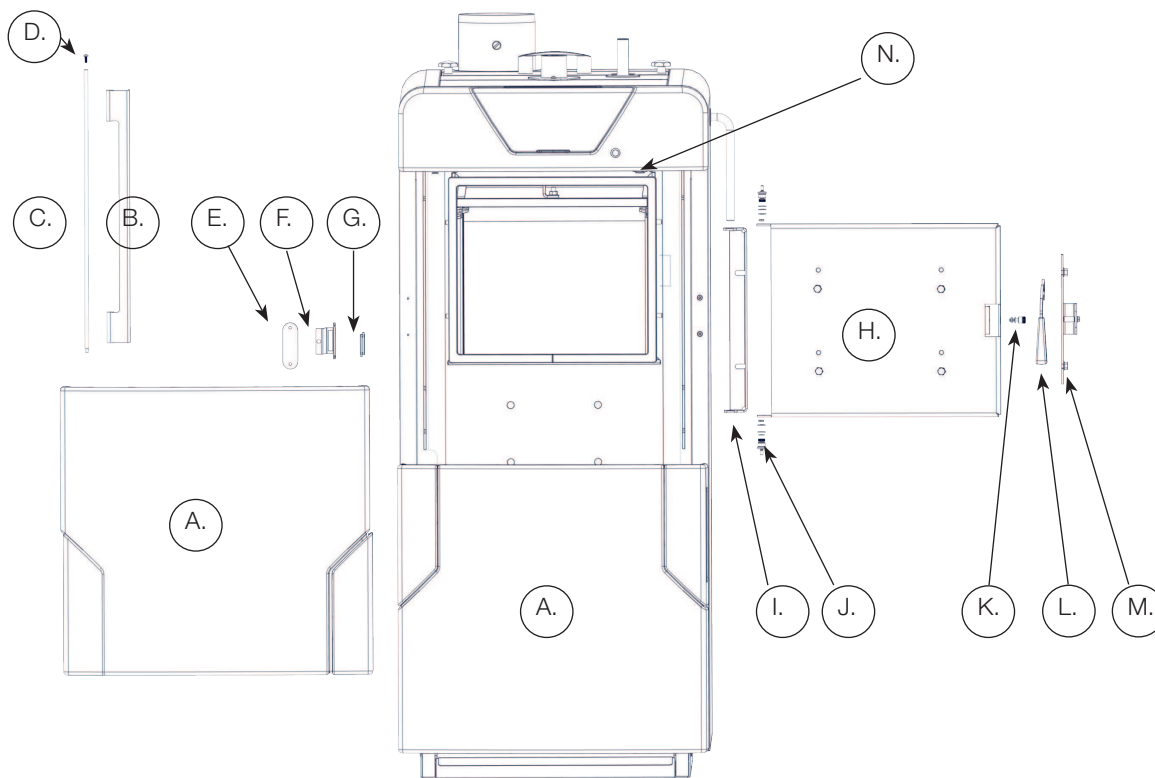
! For easier maintenance, remember to position the lever sweeping lever at the side with a service area of 0.6 m before positioning the boiler.



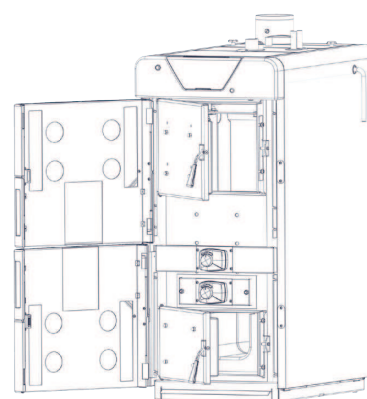
7.3 Outer and inner door

The doors can be installed right or left hung.

- At delivery, the doors are left hung. Re-hanging doors is performed preferably before the boiler is positioned.



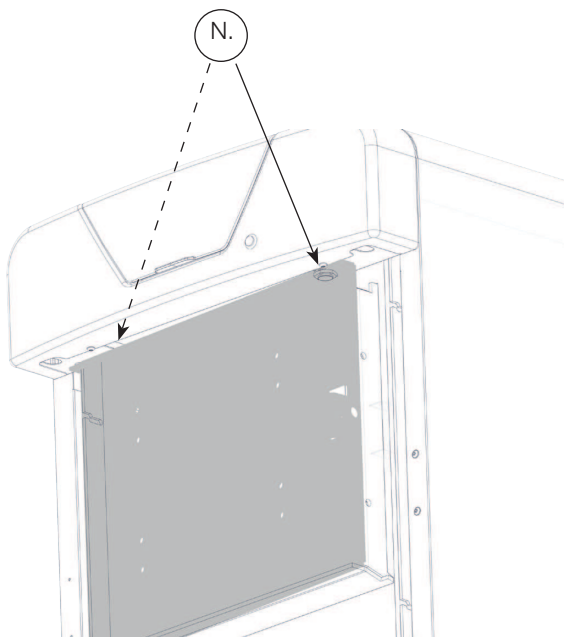
- | | |
|-----------------------------------|-----------------------|
| A. Outer door | J. Fastener |
| B. Hinge for outer door | K. Fastener |
| C. Hinge axis for outer door | L. Handle |
| D. Screw M5x12 | M. The locking device |
| E. Striking plate | N. Inductive sensor |
| F. Magnetic lock | |
| G. Magnet | |
| H. Upper inner door | |
| I. Hinge for the upper inner door | |



! The seal on the fill door must be checked regularly and replaced if damaged.

7.4 Removal of doors:

1. Undo the doors (A) with 2 screws.
2. Undo the hinge (B) for the outer door.
3. Remove the striking plate (E) for the magnetic lock.
4. The upper outer door is rotated 180 degrees and used as the lower outer cover. Remove the hinge (B) and the striking plate (E) on the opposite side. The handle is rotated 180 degrees.
5. The hinge (I) for the upper inner door (H) is removed. The door is rotated 180 degrees. The handle is turned. The insulation brick is taken out and moved so that the insulation brick can be mounted in the bottom holes in order that the bypass channel can be kept open.
6. The locking device (M) is moved to the opposite side, the handle is turned and the door mounted on the opposite side.
7. Adjust the tightness against the boiler body (the door must be tight when closed to avoid false air). Adjust by moving the lock fastener (M) and the hinge (I) out or in. The stamp in the sealing strip must be visible for the complete turn.
8. Unscrew the 2 screws of the instrument panel and fold it up. Then move the inductive sensor (N). **NOTE! Make sure that there is a maximum of 3 mm from the top edge of the door.** Then attach the instrument panel.
9. Check that "Open door" is indicated on the instrument panel status line status. The text should disappear when the door is closed.



7.5 Chimney

- The boiler should be connected to a smoke flue constructed in accordance with applicable standards, general as well as local regulations. It can be connected to most chimneys. For a round chimney, the diameter should be $\text{Ø}150$ mm. The boiler is provided for $\text{Ø}120 - 200$ mm, if the draught requirement has been achieved.

The height of the chimney should follow applicable standards, general as well as local regulations.

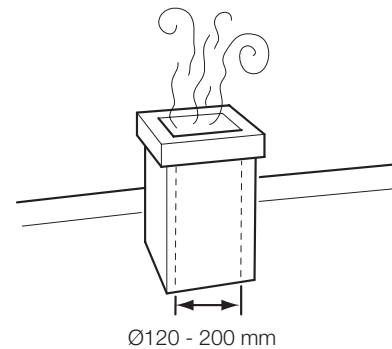
7.6 Flue pipe connection

If the boiler is connected to a steel chimney, do not charge the fan housing with the weight from the chimney.

7.7 Chimney connection

Take the following into account:

- Shortest possible distance between the boiler and the chimney.
- Seal all flue pipe connections.
- Insulate the entire connection (except any draught break) in accordance with applicable standards, general as well as local regulations.



- !** The chimney's condition should always be checked before installation of a new boiler. If necessary, suitable measures shall be taken, e.g. installation of inserts.
 - Contact your local master chimney sweeper for recommendation of any kits or other uncertainties regarding the smoke flue.
- An incorrectly installed boiler can cause condensation damages in the chimney.

8. Pipe installation

8.1 General

The installation should be done in accordance with applicable standards, general as well as local regulations.

The boiler should always be installed with accumulator tanks (if tanks from other manufacturers are used, follow their installation instructions). It should also be connected to an expansion system.

8.2 Connecting to accumulator

- The CTC V22 is prepared for connection to accumulator tanks.
Recommended accumulator volume: 1500–2000 litres.
- The CTC V40 is prepared for connection to accumulator tanks.
Recommended accumulator volume: 2000–3000 litres.

Charge group

For best system function, we recommend that this system be used. The control system of the boiler is factory set for this.

Charge pump system

The boiler can also be used to charge the accumulator tanks with only a charging pump. In this case, the control system of the boiler must reset.

8.3 Pipe installation

- The piping to the accumulator tanks should be made as short as possible and with as few bends as possible. Ensure that air pockets are eliminated, partly considering good function, partly to obtain, if possible, natural circulation at power failures.
- For CTC V22 the minimum recommended pipe dimension is 28 mm (1"). This provides for best power transfer.
- For CTC V40 the minimum recommended pipe dimension is 35 mm (1 1/4"). This provides for best power transfer.

8.4 Expansion system

The expansion system must be installed in accordance with applicable standards. The volume of the expansion vessel is sized according to the prevailing conditions.

Guideline values: For an open expansion system, a vessel volume of approx. 5% of the total system volume should be installed and for a closed system 10%.

In general, we recommend that the open expansion vessel be placed at least 2.5 m above the expansion pipe connection with the boiler or accumulator tank.

In single-storey houses without a cellar, this measurement can be difficult to obtain. A closed vessel is then recommended.

8.5 Safety valve boiler

In a closed system, an approved safety valve must be installed in accordance with applicable standards. The safety valve must be installed in unisolatable contact with the highest point of the boiler, but not on the boiler, and in a continuous incline to the boiler.

Connect the waste pipe to the floor drain or, if the distance is more than two metres, to a funnel. The waste pipe must have an incline towards the floor drain.

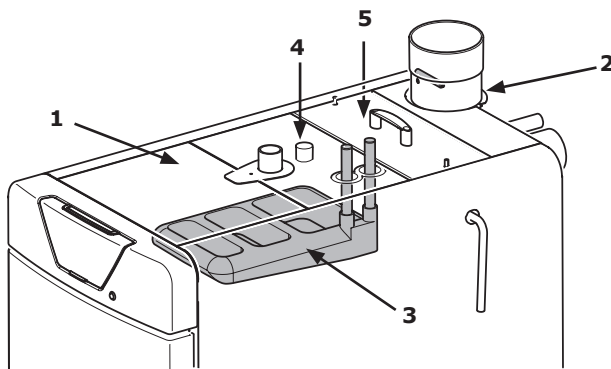
! The safety valve's opening pressure is determined by the component in the system which tolerates the lowest pressure.

8.6 Sensor and thermal valve

- The boiler has two sensors. The boiler sensor (1) is placed on the forward part on top of the boiler body, it can be accessed by opening the door to the electrical system. The flue gas sensor (2) is located at the back of the flue gas fan's fan housing.
- The boiler is equipped with a cooling coil (3) for thermal valve. A sleeve (4) for the sensor pipe is located on the boiler's ceiling behind the primary flow pipe. For installation, please see the installation instructions included with the valve. Applicable standards, general as well as local regulations, should be followed. We recommend thermal valve SYR3065 for cooling coils where municipal water is installed.
- Thermal valve SYR5067 is recommended for properties with their own water supply. This must be installed according to the instructions supplied with the valve.

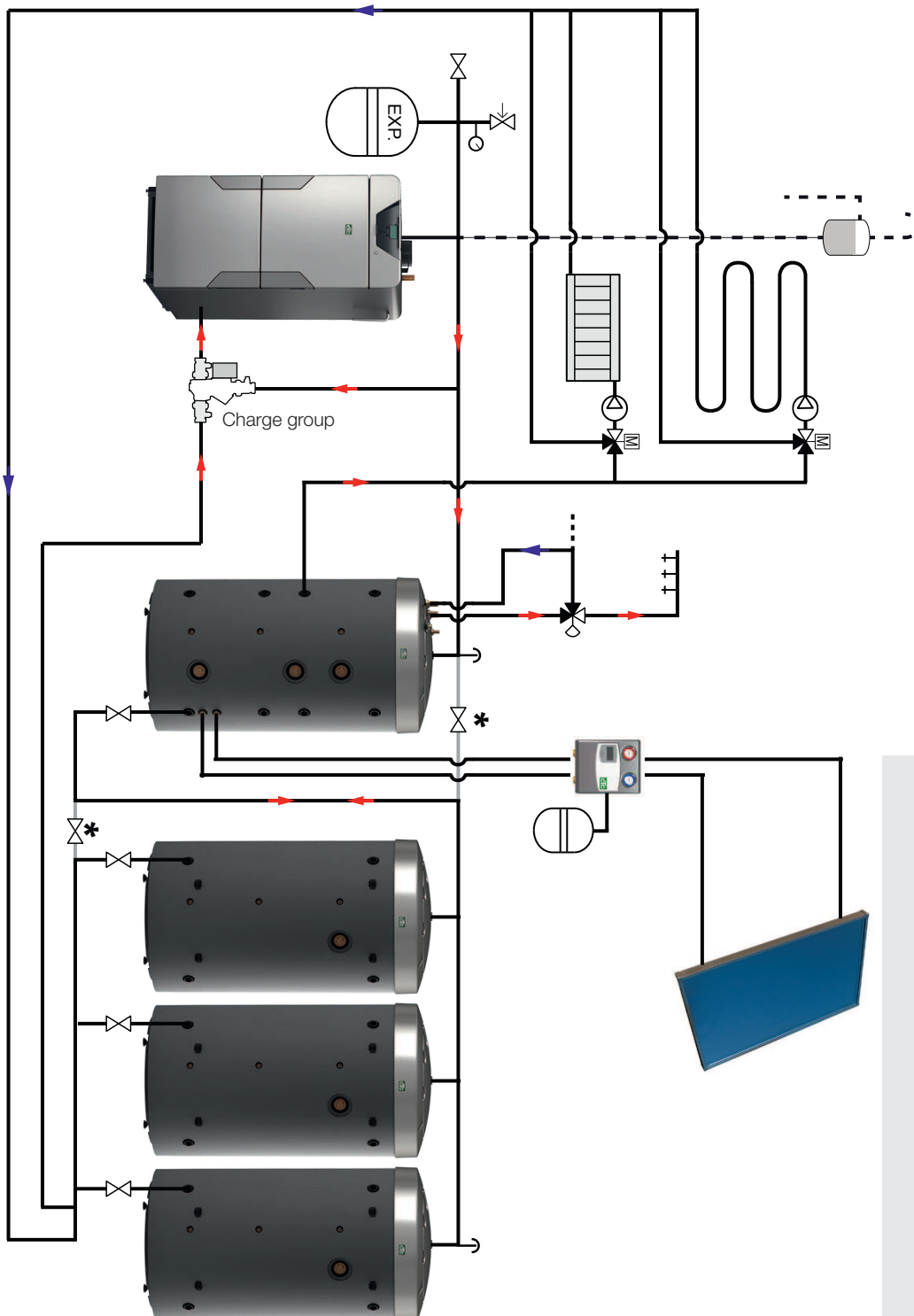
8.7 Cleaning door

The door (5) to the turbulators must be accessible. Minimum recommended ceiling height: 1900 mm.



8.8 Schematic diagram for system with charge group

- ! An expansion vessel must be connected according to applicable requirements.
- ! The safety equipment must be installed according to applicable requirements.



! * Connection alternatives:
 Valves for switching to winter and summer modes, respectively.
 Open valves = Summer mode
 Closed valves = Winter mode

9. Electrical installation

! Installation and connection in the boiler must be undertaken by an authorised electrician. All wiring must be installed according to applicable regulations. The boiler's internal wiring is installed at the factory.

9.1 General

Access to the boiler control.

Supply

The boiler should be connected to 230 V 1N ~ and protective earth. For group fuse size, see technical data/wiring diagram.

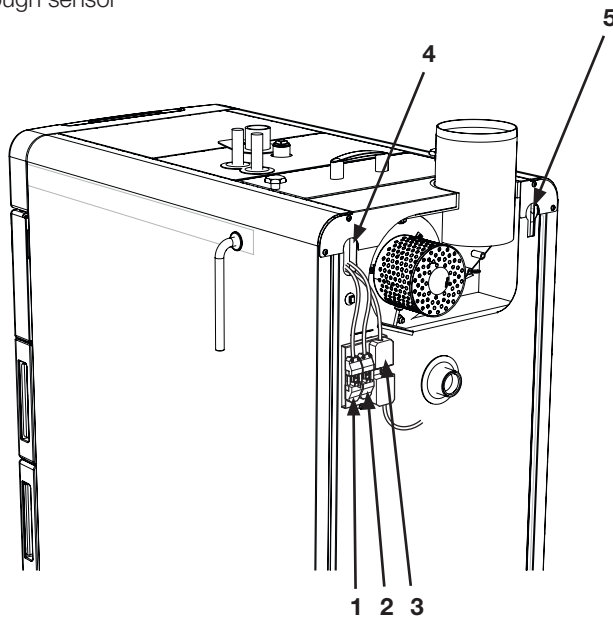
! NOTE! Remember that the capacitor can hold voltage even if the boiler is disconnected from the power source.

! Keep high and low voltage cables apart in order to avoid disturbance problems; this applies outside the product also.
Refer to cable ducts with separation of high voltage, 230 V and protective low voltage for sensors

Safety switch

The installation should be preceded by a omnipolar safety switch (Category III), which ensures disconnection from all electric power sources.

1. Electrical connection 230V 1N ~, 3-wire male
2. Outlet charge group/charging pump 230V 1N ~, 3-wire female
3. Output fan 230V 1N ~, 5-wire female
4. Cable through high voltage 230V
5. Cable through sensor



9.2 Accessories

Accessories:	Connect to circuit card/block:	Check:
Charge group/Charge pump	Connection, see drawing under General 10.1 and wiring diagram	
DHW charging pump 230V 1N~	Phase: Pole A4 Neutral: N Earth: PE	
* The DHW charging pump function can alternatively be used for managing conduits if there is a slave tank.		
Operating coil additional heat 230V 1 N~	Phase: Pole A3 Neutral: N	
Upper tank sensor Should be placed in the tank's upper sensor pipe/alternatively jacket surface.	(A2 relay/main card) at position H8, H9.	
Lower tank sensor Should be placed in the tank's lower sensor pipe/alternatively jacket surface.	(A2 relay/main card) at position H10, H11	
Hot water sensor Should be placed according to the schematic diagram.	(A2 relay/main card) at position H12, H13	
Radiator pump 1 230V 1 N~	Phase: Pole F1 Neutral: Pole F2 Earth: Pole PE	Check that the pump is correctly connected by test running it in menu "Installer/Service/Function test" in the control system
Mixing valve 1 230V 1 N~	Phase open: Pole F5 Phase close: Pole F6 Zero: Pole F7 (If the mixing valve motor has an earth cable, it must be connected to Pole PE)	Check that the pump is correctly connected by test running it in menu "Installer/Service/Function test" in the control system
Radiator pump 2 230V 1 N~	Phase: pole F3 Neutral: pole F4 Earth: Pole PE	Check that the pump is correctly connected by test running it in menu "Installer/Service/Function test" in the control system
Mixing valve 2 230V 1 N~	Phase open: Pole F8 Phase close: Pole F9 Zero: Pole F10 (If the mixing valve motor has an earth cable, it must be connected to Pole PE)	Check that the pump is correctly connected by test running it in menu "Installer/Service/Function test" in the control system

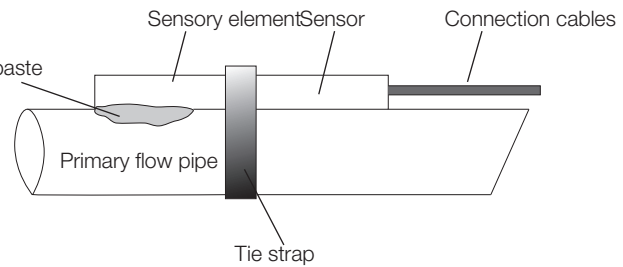
Extra low voltage protection (sensor)

Sensors should be placed according to the section Schematic diagram. A description of the sensors will follow:

Connection primary flow sensor

Fit the sensor to the primary flow pipe, ideally after the circulation pump. The sensing part is towards the end of the sensor, see sketch.

- Attach the sensor using the tie strap provided.
- Ensure that the sensor makes good contact with the pipe. Apply contact paste to the end part of the sensor between the sensor and the pipe.
- Insulate the sensor using pipe insulation
- Connect the cables to the boiler's terminal board.



Primary flow sensor 1 (NTC 22k)

Placement: on the primary flow pipe after radiator pump 1.

The sensor is connected to the circuit card in positions H1 and H2.

Primary flow sensor 2 (NTC 22k)

- ! Insulate the sensor using pipe insulation, for example. Do not attach the sensor cable permanently until you have tested where the best location is.
- ! The wires must be connected correctly in order for the sensor to work.

Placement: on the primary flow pipe after mixing valve 2 after radiator pump 2.

The sensor is connected to the circuit card in positions H3 and H4.

Outdoor sensor connection

Placement: install the sensor on the northwest or north side of the house so that it is not subjected to morning or evening sun. If there is a risk of the sensor being affected by the sun's rays, it must be protected. Place the sensor at around 2/3 of the height of the facade near a corner, but not under a roof projection or other form of wind protection. Do not place it either above ventilation ducts, doors or windows where the sensor may be affected by factors other than the actual outdoor temperature. The sensor is connected to the circuit card in positions H8 and H9.

Room sensor connection

Positioning: The room sensor is fitted at a central point in the house, in the

most open position possible, ideally in a hall between several rooms or in a stairway. This is the best position for the sensor to record an average temperature for the house. Feed a three-conductor cable (minimum 0.5 mm²) between the boiler and room sensor. Then attach the room sensor securely in a position at roughly 2/3 of the way up the wall. Connect the cable to the room sensor and the boiler.

Room sensor (RG 1)

Room sensor cable connection:

V22/V40	Room sensor:
Pole H7	Nr 1
Pole H5	Nr 4
Pole H6	Nr 2

Room sensor (RG 2)

Room sensor cable connection:

V22/V40	Room sensor:
Pole H12	Nr 1
Pole H10	Nr 4
Pole H11	Nr 2

On start-up, an alarm is given if the sensor is incorrectly connected. Test the alarm sensor LED by testing the function in menu *"Installer/Service/Function test/Radiator system/Led Room sensor"*.

In the control system you can select whether or not to have the room sensor operational. If the room sensor is deselected, the heating level is controlled by the outdoor sensor/primary flow sensor. The alarm lamp on the room sensor still functions as normal. A room sensor does not, however, need to be installed if the function is deselected.

9.3 Setting after electrical installation

Setting made by the installation electrician.

The following settings shall be made by the installation electrician after connection:

- Check room sensor connection.
- Check that the sensors connected indicate reasonable values.
- Carry out the following checks:

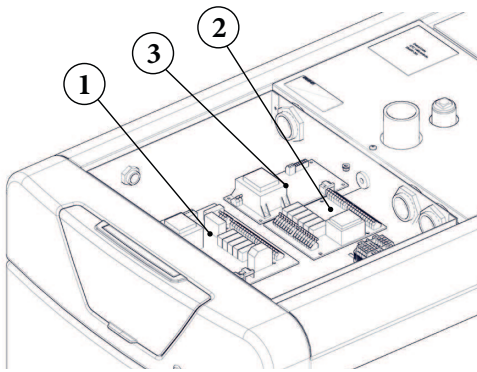
Check room sensor connection

- Go to the "Installer/Service/Function test" menu.
- Go down to Alarm output and press "OK".
- Select "On" with the "Increase" button and press "OK". Check that the room sensor LED lights up. If not, check the cables and connection.
- Select "Off" using the "reduce" button and press "OK". If the "OK" LED goes off, the check is complete.
- Return to normal display by pressing the "Backspace"/"Undo" button.

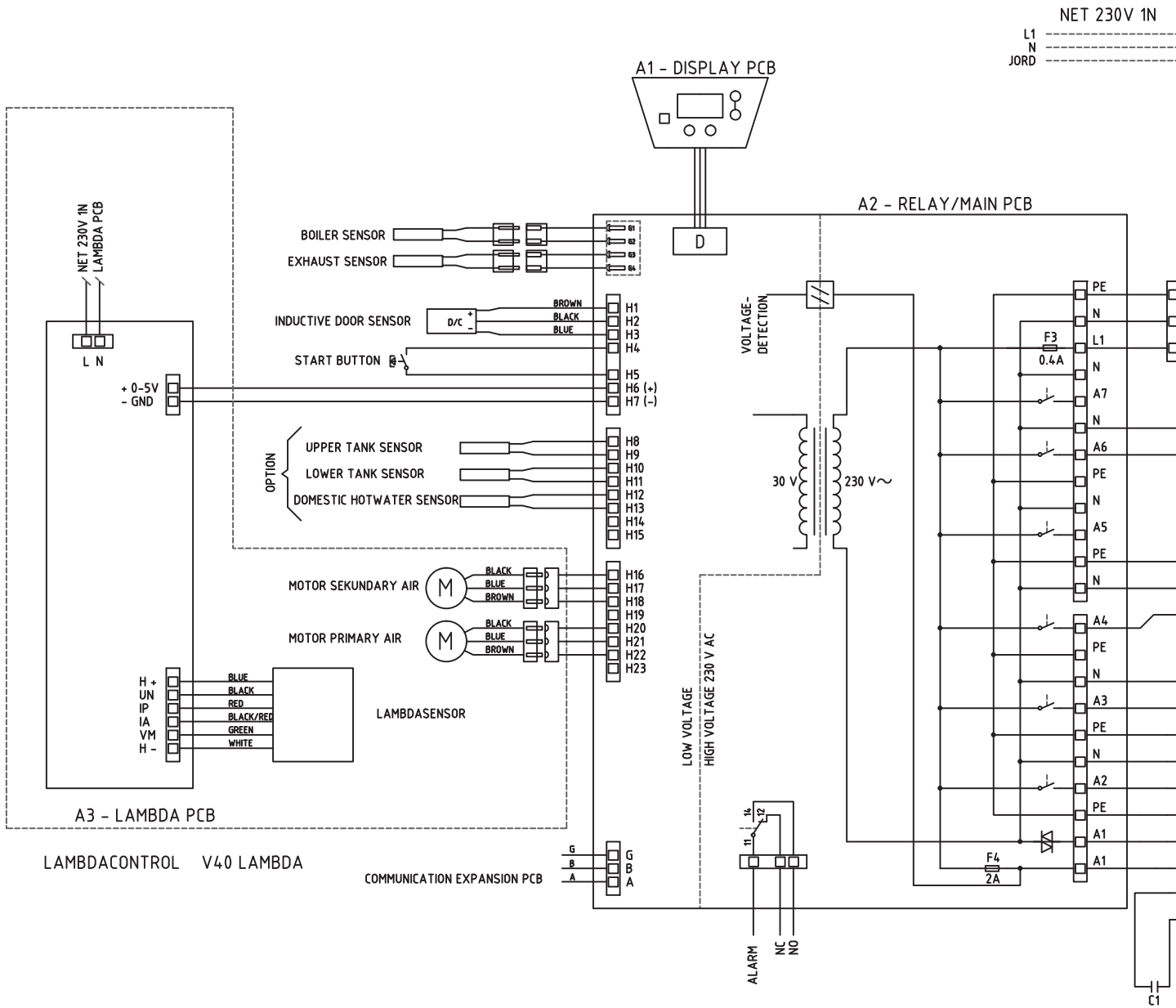
Check connected sensors

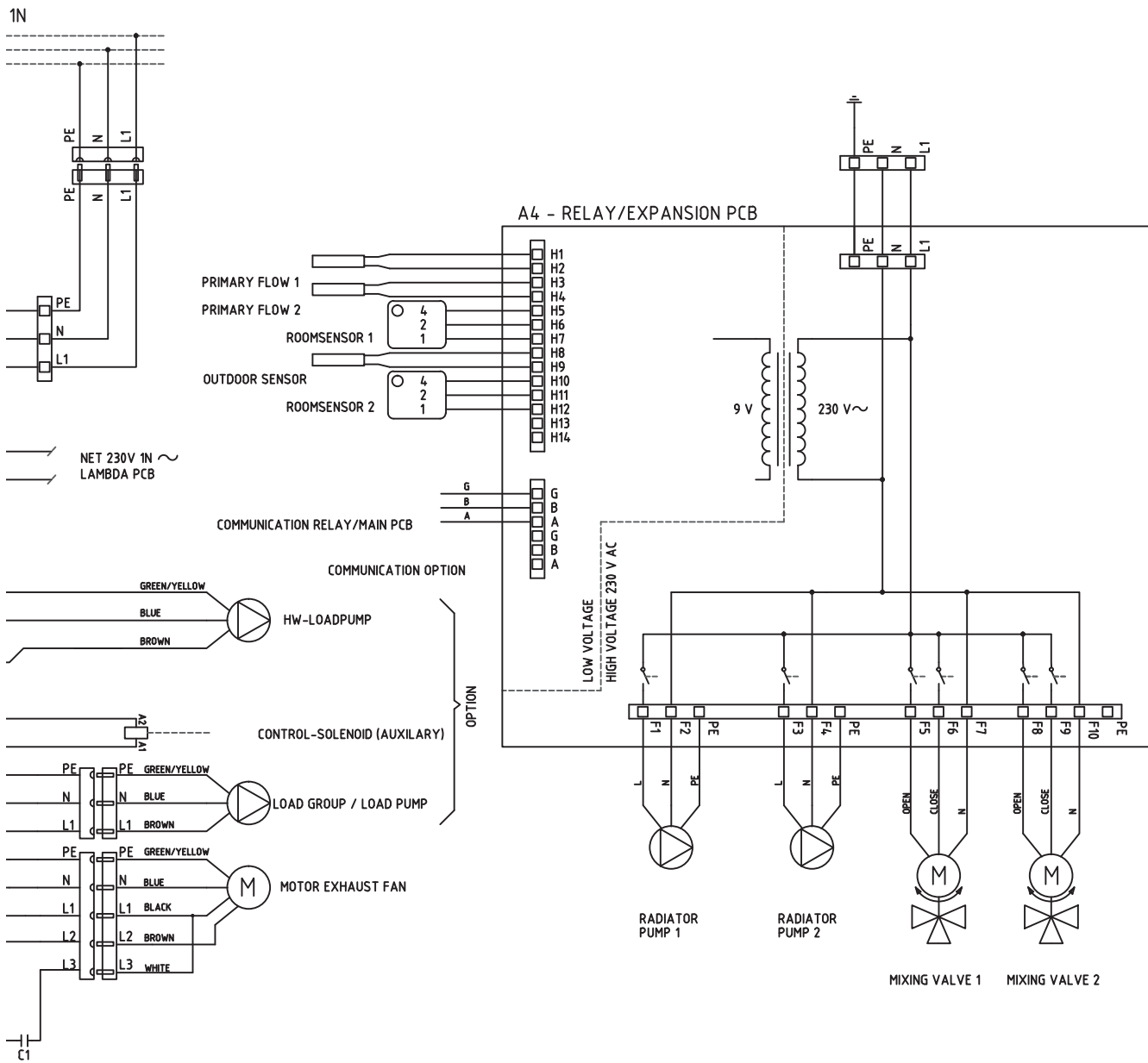
If any sensor is incorrectly connected, a message will appear on the display, e.g. "Alarm sensor out". If several sensors are incorrectly connected, the different alarms are displayed on different rows. If no alarm is displayed, the sensors are connected correctly. Note the the alarm function of the room sensor (LED) cannot be detected on the display. It must be checked on the room sensor. The current sensor connection has no alarm, but the current value can be read in the "Operation data" menu

9.4 Electrical diagram



1. A2 - Relay/main card
2. A4 - Relay Expansion card
3. A3 - Lambda card





10. Control System

10.1 Installer

This menu contains two submenus. "Settings" and "Service". "Service" is used by the installation engineer during troubleshooting.

Settings

Select this menu to make your settings together with the installation engineer, according to your own requirements

Service

This menu is used by service personnel for troubleshooting and diagnostics. The menu also contains a coded section with alarm limits, intended for the manufacturer's settings only.

Alarm info

Displays latest and number of alarms.

Installer
Settings
Service
Alarm info

10.2 Settings

In the "Settings" menu the installation engineer and user make settings as needed and desired.

Language

Setting of language

Settings boiler

The different settings for the boiler are made here for the best function.

Setting tank charg.

The boiler's charge system, charging pump or charge group

Settings DHW

Settings for hot water / managing conduits

Settings add heat

In this menu settings for additional heat, e.g. immersion heaters, oil boilers are made.

Settings heat circ

In this menu you make settings for defined radiator systems such as max and min primary flow, summer mode (heat off), inclination and adjustment as well as night reduction levels.

Save settings

Here **your own** settings can be stored; confirm with the "OK" button.

Load settings

The saved settings can be reloaded using this option. A useful function if you want to test new settings but change your mind and want to recover the old ones. Settings that are made should be saved with this function in order to be able to retrieve them later if the boiler needs to be reset.

Load V22/V40 Lambda

The product is supplied with the factory values set. They can be restored by activating this function.

(Load V40

The product is supplied with the factory values set. They can be restored by activating this function. NB: Not used for this product.)

Settings	
Language	English
Settings boiler	
Setting tank charg.	
Settings DHW	
Settings add heat	
Settings heatcirc.	
Save settings	
Load settings	
Load V22/V40 Lamb	
Load V40	

10.3 Settings boiler

These settings can be adjusted in order to optimise the function of the boiler.

Boiler max °C **95**

Max temperature for the boiler.

Max flue gas °C **230**

Max flue gas temperature out of the boiler.

Heating phase PT °C **70**

Temperature when the boiler goes from the stoking phase to the heating phase.

Shutdown phase FG °C **120**

Temperature when the boiler goes from the heating phase to the shutdown phase.

Stop FG °C **100**

Flue gas temperature when the boiler goes from the shutdown phase to stop. If a lot of unburned wood remains when the boiler has shutdown, this value can be lowered, try 5 degrees at a time.

Boiler min stop FG °C **90**

The temperature the boiler must reach within 60 minutes.

Start time **60**

The time after which the boiler should have reached min. temp as described above.

Tank min temp **Off**

Setting to provide indication at a set temperature to show that it is time to fire. (Potential free contact).

Type **Wood**

Wood

Settings boiler	
Boiler max °C	95
Max flue gas °C	230
Heating phase PT °C	70
Shutdown phase FG °C	120
Stop FG °C	100
Boiler min stop FG °C	90
Start time	60
Tank min temp	Off
Type	Wood

10.4 Setting tank charge

In this menu you define at which temperature the charge group or charge pump should start and stop.

Type **Charge group**

Here the installation technician selects whether the boiler is equipped with med charge group or charging pump.

Start charge gr. FG °C **90**

The menu indicates if charge group is selected as charge type. Here is indicated at which flue gas temperature the charge group should start. The charge group stops when the temperature decreases by one degree. Adjust as required.

Start charge pump BT °C **80**

This menu is displayed if charging pump is selected as charge type. Here is indicated at which boiler temperature the charging pump should start. Adjust as required.

Stop charge pump BT °C **76**

This menu is displayed if charging pump is selected as charge type. Here is indicated at which boiler temperature the charging pump should stop. Adjust as required.

Setting tank charge	
Type	Charge group
Start charge group FG °C	90
Start charge pump BT °C	80
Stop charge pump BT °C	76

10.5 Settings DHW/managing conduits

In this menu you define at which temperature the charging pump for the water should start and the difference the water can have.

Settings DHW	
DHW pump	Off
DHW temp °C	75
DHW diff °C	5

DHW pump **Off**

If charging pump is used, select On.

DHW temp °C **75**

Setting of temperature at which the DHW charge pump should stop.

DHW diff °C **5**

Setting of temperature differences between start and stop for DHW charge pump.

10.6 Settings addheat

Add **Off**

Can be set to Off, In tank, DHW only. Off means that there is no additional heat (immersion heater). In tank, if additional heat (immersion heater) is in the accumulator tank. DHW only, if additional heat (immersion heater) is in the external water heater.

Settings Addheat	
Addheat	Off
Addheat temp °C	20
Addheat diff °C	5

AddHeat temp °C **20**

Setting of stop temperature for additional heat (immersion heater, oil, gas, pellets).

AddHeat diff °C **5**

Setting of temperature differences between start and stop for additional heat (immersion heater, oil, gas, pellets).

10.7 Setting Heat circ.

Settings for different radiator systems/areas over the building.

Heat circ. 1

Setting of defined heating system.

Settings Heat circ.	
Heat circ. 1	
Heat circ. 2	

Heat circ. 2

Setting of defined heating system.

10.8 Heating circuit

In the "Radiator system" menu settings are made for each radiator system that has been defined. This is in order to meet the house's need for heat, "the house heating curve". It is important that this basic setting is right for your property. Values which are set incorrectly may mean that your property is not warm enough or that an unnecessarily large amount of energy is being used for heating. The setting of values for "Inclination" and "Adjustment" is very important.

Heating circuit	
Heat circ	On
Room sensor	Off
Max primary flow °C	55
Min primary flow °C	Off
Heating off, outdoor °C	16
Heating off, time	120
Inclination °C	50
Adjustment °C	0
Room temp decrease	- 2
Primary flow decrease	- 3

Heat circ **On**

Defined radiator system.

Room sensor **Off**

If the room sensor is installed, select "On" if it is to operate. Select "Off" if the room sensor has not been installed, or if a different heat source, e.g. a stove, could disturb the sensor.

Max primary flow °C **55**

The maximum permitted temperature supplied to the radiators. This functions as an "electronic" limiter to protect floor circuits in underfloor heating systems. Factory value 55 °C (setting 30-80 °C).

Min primary flow °C **Off**

If during the summer you want the cellar or floor coils in the bathroom, for instance, to have a certain basic heat, the lowest permissible temperature can be set here. The heating in other parts of your property should then be switched off using thermostatic radiator valves or shut-off valves. Factory value Off (setting Off, 15-65 °C).

Heating off, outdoor °C **16**

Outside temperature limit at which the house no longer requires heating. The radiator pump stops and the mixing valve is kept closed, provided that there is no need for heat on the heating systems 2 or 3. The radiator pump is activated daily for a short period so that it does not jam. The system restarts automatically when heating is required. Factory value 16 °C (setting 10- 30 °C).

Heat off, time **120**

When the outside temperature falls to the limit at which heat is needed again, "Heat Off, outdoor °C", has to remain this low or lower for this many minutes before heat to the house is allowed again. Factory value 120 minutes (setting 30-240 minutes).

Inclination °C **50**

The value set is the outgoing flow temperature to radiators when the outdoor temperature is -15 °C. A lower value is selected for a radiator system with large radiator surfaces (so called low temperature system). Floor heating systems require very 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. High temperature systems are not optimised for heat pump operation which is why the savings will be lower if the heat pump is connected. Factory value 50 °C (setting 25-85 °C).

Adjustment °C **0**

While the inclination indicates by how much the temperature should increase up to the radiators when the outside temperature is falling, the adjustment means that the temperature level can be raised or reduced at a certain outside temperature. Factory value 0 °C (setting -20 to 20 °C).

Room temp decrease -2

If night reduction is programmed, and room sensor is connected, the room temperature is reduced by the set value during the night reduction period.

Primary flow decrease -3

If night reduction is programmed, and a room sensor is not connected, the room primary flow temperature is reduced by the set value during the night reduction period.

10.9 Service

In the "Service" menu you and your installation engineer describe for the CTC V22/V40 how the heating system looks and what it consists of. The V22/V40 then hides menus which are not current and shows only those which are of value to your heating system.

If a menu line in the "Service" menu is selected, the submenu for further selection is shown automatically. If sensors for the radiator system(s) are connected at start-up, the settings are automatically set to "Yes" for these.

Service
Function test
Settings coded

10.10 Function test

In the "Function test" menu, the installer can test the connection and function of separate components of the heating system. When this menu is activated, all functions in CTC V22/V40 are stopped. Only external safety functions are still activated. A return to normal operation follows after 10 minutes' inactivity.

Function test	
Flue gas fan %	0
Charging pump	Off
Addheat	Off
DHW pump	Off
Alarm output	Off
Damper primary %	0
Damper secondary %	0
Heat circ. pump 1	Off
Mixing valve 1	-
Heat circ. pump 2	Off
Mixing valve 2	-

Flue gas fan % 0

To test the fan, press arrow down/up, to increase/decrease the fan rpm.

Charging pump Off

On/Off

Addheat Off

On/Off

DHW pump Off

On/Off

Alarm output Off

Switching contact (potential free) for external alarm signal.

Damper Primary % 0

Press arrow up to open the damper, arrow down to close.

Damper Secondary % 0

Press arrow up to open the damper, arrow down to close.

Heat circ pump 1 Off

On/Off

Mixing valve 1 -

Press arrow up to open the damper, arrow down to close.

Heat circ pump 2 Off

On/Off

Mixing valve 2 -

Press arrow up to open the damper, arrow down to close

10.11 Factory settings coded

Coded menu. Intended for the manufacturer's operation/alarm limits.

A 3-digit code must be specified to be able to amend limits.

This menu is intended for service personnel only.

Incorrect changing of limits could jeopardise the operation, service life and warranty of the product.

Setting coded		
Code	0 0 0	
Alarm reset		No
Fan startup		87
Fan max		80
Fan min		30
Fan reg. time s		120
Fan reg. K		2.0
Reduced diff FG °C		10
Reduced diff B °C		5
Heat phase Re °C		3
Start phase time m		5
Set value flue gas °C		165
Lambda control		Yes
Value O2 %		6.0
Calibration O2 %		0
Accuracy O2 %0		0.3
Prim. start up %		75
Prim. air max %		75
Prim. air min %		30
Prim. reg. K		1.0
Prim. reg. time s		30
Sec. startup %		100
Sec. max high %		100
Sec.min low %		0
Sec. reg. K		2.0
Sec. reg. time s		30

10.12 Alarm and information texts

Alarm text	Description	Action
Alarm Boiler sensor	Sensor fault, not connected, short-circuited or value outside range. The sensor is significant to the system's operation, which is why manual resetting of the alarm is required.	Call out a service engineer
Alarm Flue gas sensor		
Alarm Upper tank sensor	Sensor fault, not connected, short-circuited or value outside range. The alarm is reset automatically after correction.	
Alarm Lower tank sensor		
Alarm Hot water sensor		
Alarm Outdoor sensor		
Alarm Room sensor 1		
Alarm Primary flow sensor 1		
Alarm Room sensor 2		
Alarm Primary flow sensor 2		
Alarm Lambda probe		
Alarm Fan fuse		
Information Text	Description	Action
Door open	Displayed if the door is open.	Adjust the inductive sensor.
Boiler max XX °C	The boiler temperature is higher than the "Boiler max" set value	Do not open the fill door. Check the water flow through the boiler. Do not add more wood.
Max flue gas XX °C	The flue gas temperature is higher than the "Max flue gas" set value	Do not open the fill door. Check turbulators/sweeping at a later occasion.
Communication error	If heating circuit has been selected but is not connected.	

11. Resistances for sensors

NTC 22K - Primary flow sensor, Room sensor

Temperature °C	Resistance Ohm
130	800
125	906
120	1027
115	1167
110	1330
105	1522
100	1746
95	2010
90	2320
85	2690
80	3130
75	3650
70	4280
65	5045
60	5960
55	7080
50	8450
45	10130
40	12200
35	14770
30	18000
25	22000
20	27100
15	33540
10	41800
5	52400

NTC 150 - Outdoor sensor

Temperature °C	Resistance Ohm
70	32
65	37
60	43
55	51
50	60
45	72
40	85
35	102
30	123
25	150
20	182
15	224
10	276
5	342
0	428
-5	538
-10	681
-15	868
-20	1115
-25	1443
-30	1883
-35	2478
-40	3289

NTC 3K3 - Flue gas sensor

Temperature °C	Resistance Ohm	Temperature °C	Resistance Ohm	Temperature °C	Resistance Ohm
0	162212	130	1452	260	113
10	98322	140	1132	270	98
20	61465	150	892	280	85
30	39517	160	710	290	74
40	26064	170	571	300	64
50	17598	180	463		
60	12140	190	379		
70	8541	200	312		
80	6119	210	259		
90	4459	220	217		
100	3300	230	183		
110	2477	240	168		
120	1885	250	132		



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,

V22/V40

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, AFS 1999:4

Electromagnetic Compatibility (EMC) 2004/108/EC

Low Voltage Directive (LVD) 2006/95/EC

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 60335-1:1995	EN 55014-1:2007
EN 60335-2-102:2006	EN 61000-3-2:2006
EN 50336:2002	EN 61 000-3-3:1995 +A1:2001
EN 4330789:1987 +A2:2006	
EN 55014-2:1997 +A1:2001	
EN 61000-4-2, -4, -5, -6, -8, -11	
EN 303-5:1999, 2012	

Ljungby 2014-03-18


Marcus Miller

Technical Manager

