

# Osby Parca EL 36 & 50 Eco

– Our new generation of electric boilers with touchscreen

The Professional's Choice Since 1935

## Installation and Operating Instructions



### **IMPORTANT**

READ CAREFULLY BEFORE USE  
SAVE FOR FUTURE REFERENCE

1700 890 88-3 EN 24/08/2020



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Subject to any errors in writing and subject to changes.

# Congratulations on your new electric boiler!

You have just purchased an Osby Parca electric boiler which we hope you will be completely satisfied with. On the following pages, you can read about how to take care of your electric boiler.

Save this user manual with installation and care instructions. Your Osby Parca electric boiler will bring you joy for many years, and all the information and initial assistance you need can be found herein.

To ensure a long and fulfilling relationship with your electric boiler, you should sign a servicing contract with your installer.

This will enable the electric boiler to function in good condition for a long time. It will then produce the heat you need – at the lowest total cost – for many years to come.

## Contact info service department:

Enertech AB, Osby Parca div  
Tel no +46 (0)479 177 28 | [service@osbyparca.se](mailto:service@osbyparca.se)  
[www.osbyparca.se](http://www.osbyparca.se)  
Box 93 | 283 22 Osby  
SWEDEN

<b>Note:</b> Fill in the information below. This information is valuable if servicing is required.	
Product no 1:	Manufacturer no:
Product no 2:	Manufacturer no:
Installation company:	Tel. no:
Date:	Name:
Electrical contractor:	Tel. no:
Date:	Name:



If these instructions are not followed during installation, operation and maintenance, Enertech's obligation pertaining to the applicable warranty terms and conditions is not binding.

## Important to keep in mind!

- Care of the boiler must be done according to the instructions.
- Any inspection of the boiler must be carried out by certified technicians who are trained to work with boilers, associated equipment and accessories.
- Prior to any inspection activities being carried out, this user manual and other associated manuals and documents applicable to the equipment must be read in full and understood.

It is of particular importance that the following points are adhered to upon delivery and installation:

- The product must be transported and stored in an upright position. When being moved, the product can be placed flat for a short time only.
- Remove the packaging and, prior to installation, make sure the product has not been damaged during transport. Report any shipping damage to the transporter.
- Place the product on a stable surface, preferably concrete.  
**If the product is to stand on a soft surface, support slabs must be placed under the feet.**
- Remember that a servicing access area of at least 1.2 metres in front of the product is required.
- The product must not be sunk below floor level.

## Safety Instructions

The following safety instructions must be taken into account when handling, installing and using the product:

- Turn off the safety switch before performing any work on the product. Please note that the boiler requires both 400 V supply along with 230 V supply for the control system.
- The product may not be rinsed with water.
- When handling the product with lifting eyes or similar, make sure that the lifting devices, eye bolts and other parts are intact. Never stand or walk underneath a raised product.
- Never compromise safety by detaching or unscrewing covers, hoods or other parts.
- Never compromise safety by disconnecting safety equipment.
- Any work in the product's electrical system may only be carried out by a certified electrician.

**This device is not designed to be used by persons (including children) with reduced physical, sensory or mental abilities, or persons with a lack of experience and knowledge who have not received guidance or instruction on the use of the device by a person responsible for their safety. Children must be supervised to ensure they do not play with the device.**

## Recycling

- The packaging must be deposited at a recycling station or with the installation engineer for correct waste management.
- At the end of the product's life cycle, it must be recycled in a correct way and be transported to a waste station or reseller offering a service of that type. Disposing of the product as household waste is not permitted.
- It is of great importance that the product's electrical/electronic equipment are properly disposed of.

# 1. Installation

## 1.1 Installation – HVAC

The boiler must be installed in accordance with current national regulations, as well as DHW system requirements. In addition, the boiler is approved for zero flow but is designed for pump circulation.

To facilitate servicing, pipes and cabling must not be placed over the boiler or attached to the boiler's rear top cover. The distance between the boiler top and the ceiling should not be less than 500 mm.

The Swedish Electrical Safety Board recommends that an area of 1,200 mm in front of the boiler be kept free. The smaller boiler (up to 50 kW), should always be installed on a 500 mm tall floor stand (accessory) or on a plinth.

### 1.1.1 Water Quality / Boiler Water

The following requirements apply:

- Boiler water must not contain salt and lime concentrations at levels that may damage the boiler and increase the risk of limescale build-up.
- Water hardness must not exceed 10 dH.
- The pH-value of the water must not be too low (min. 7).
- The water must not contain sludge or any other contaminants.
- Requirements regarding water quality must always be met. Good water increases the service life of the boiler.

### 1.1.2 Glycol in boiler water

It's not uncommon to want to mix glycol into the boiler water. However, the addition of glycol reduces the heat capacity of the water, i.e. to gain full output the flow must be increased.

There are different types of glycol but, as a rule of thumb, the following changes will occur:

- A 25 % glycol mixture reduces output by approx. 10 %.
- A 35 % glycol mixture reduces output by approx. 15 %.
- A 50 % glycol mixture reduces output by approx. 30 %.

The values above should be considered guidelines and should not be taken at face value.

## 1.2 Installation – Electrical

Electrical installation must be carried out by a certified electrician and must be performed in accordance with applicable regulations.

Connect 230 and 400 V according to the electrical circuit diagram. Electrical connections (up to 50 kW) may be made using connection terminals, but for the best results, crimped cable shoes should be used.

Cabling or cables should not be placed over or attached to the boiler's rear top cover.

### 1.2.1 Re-tightening the power cable connections

**When the boiler is put into operation, inspection and re-tightening of the power cable connections must be carried out for the immersion heaters (on the top of the boiler), current strips and their bolted joints, contactors, incoming phases - zero - earth, and other electrical connections. See chapter Servicing and "Instruction for Re-tightening".**

Inspection and re-tightening must then be carried out after 100 hours of operation, after 1 year and, thereafter, at intervals of no more than 2 years. A signature is required in the table on page 10 to support any eventual warranty claim.

Work in the boiler's electrical system may only be performed by a certified electrician.

NOTE! The boiler's electrics must not be put into operation until the water system is full and the boiler has been bled.

## 1.3 Installation – Ventilation

The electric boiler must be placed in an area supplied with fresh air intake and of sufficient space, where the ambient temperature does not exceed 25 °C and does not fall below 0 °C.

Requirements regarding ambient temperature must be strictly adhered to, as these are functional prerequisites for the electric boiler's internal ventilation/cooling.

## 1.4 Installation with external control (eg heat pump)

When the electric boiler is to be controlled from an external unit, connection must be done according to the electrical diagram.

The control system defines how to control the boiler, external control, external control input etc, see chapter 7-9.

# 2. Overheating protection

## 2.1 Overheating protection (Thermal cut-off)

The boiler is equipped with a thermal cut-off (Max. thermostat - Tz), which has been set to 105 °C and interrupts the control circuit voltage to the boiler's contactors. The thermal cut-off remains in the interrupted position after overheating.

Reset is performed by pressing in the centre button behind the protective cover. This resets the alarm in the alarm menu. To reset the circuit breaker, the max. thermostat (Tz) must be reset.



**Main switch Q1**



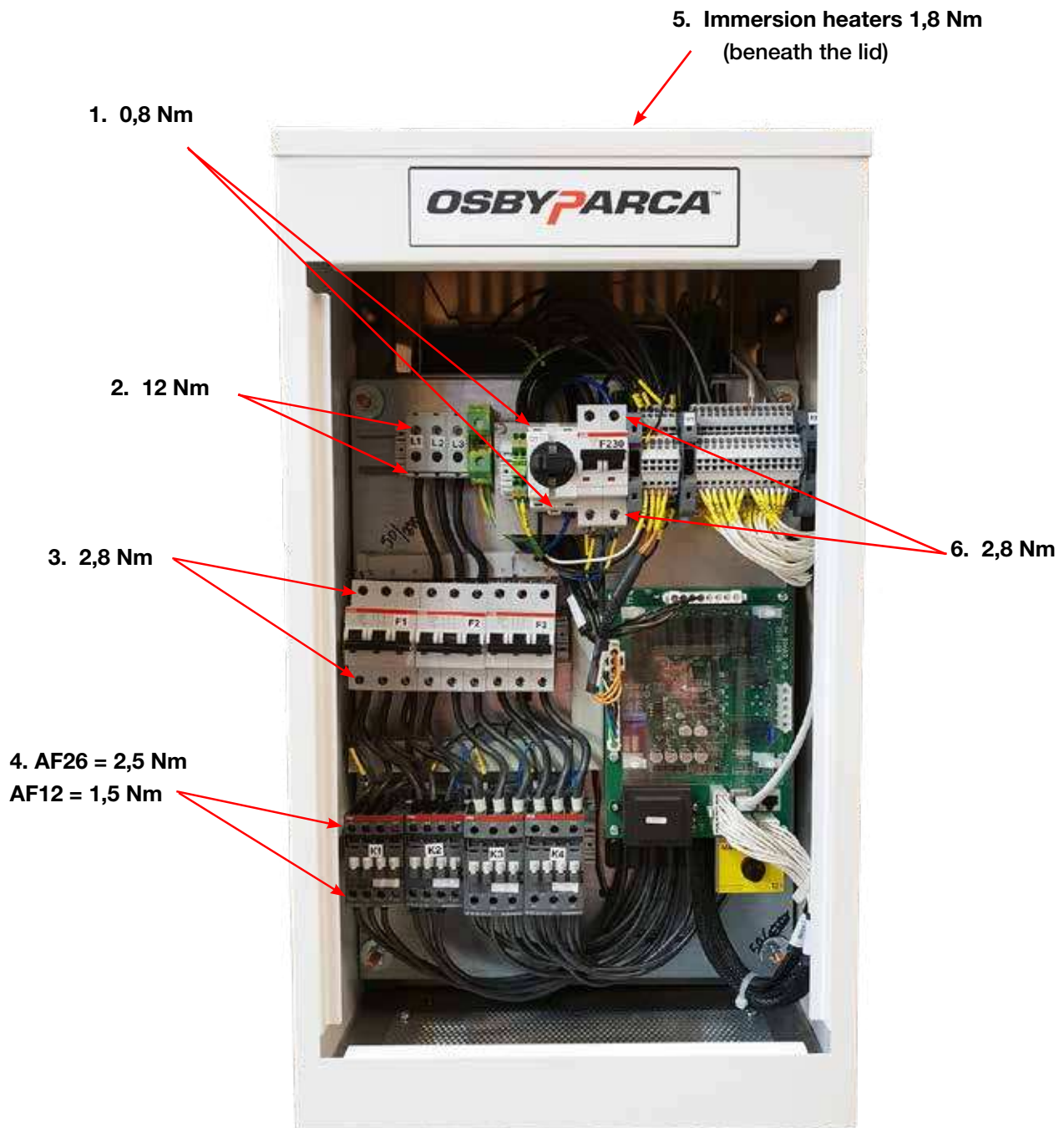
**Max thermostat - Tz**







## Instructions for re-tightening Osby Parca EL 36 och EL 50 Eco



## 5. Technical Data

### 5.1 Technical Data EL 36 & 50 Eco, 36-50 kW

Art. No	Output	1st step	Power steps	Voltage	Current	Main fuse	Weight (excl. water))
	kW	kW	Antal	V	A	A	kg
7700110-01	36	5,2	7	400 V	52	63	40
7700110-11*	36	5,2	7	230 V	91	100	40
7700120-01	50	8,3	6	400 V	72	80	40
7700120-11*	50	8,3	6	230 V	125	160	40

\* Mainly for the Norwegian market.

#### 5.1.1 Design data - EL 36 & 50 Eco

Design pressure	4,0 bar
Testing pressure	5,7 bar
Design temperature	110 °C
Maximum operating temperature	100 °C
Boiler water volume	24 liter
Protection class	IP21

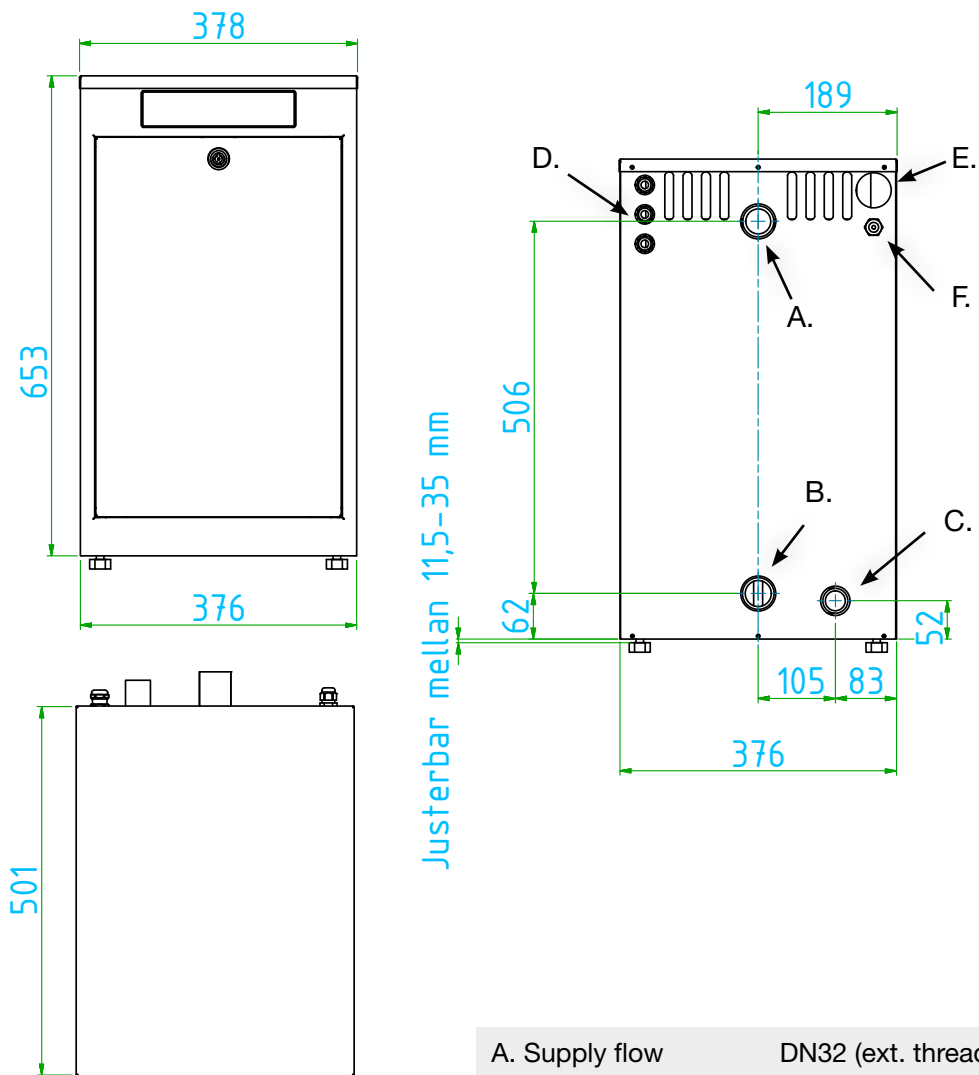
#### 5.1.2 Water Flow / Water resistance EL 36 & 50 Eco

EL 36 Eco		$\Delta T$
	(l/s)	(°C)
Recommended flow	0,3	30
Max. flow	1,7	5

EL 50 Eco		$\Delta T$
	(l/s)	(°C)
Recommended flow	0,4	30
Max. flow	2,4	5

Water resistance: 4,9 kPa.

### 5.1.3 Dimensions & Connections EL 36 & 50 Eco



A. Supply flow	DN32 (ext. thread)
B. Return flow	DN32 (ext. thread)
C. Drainage	R1" ext.
D. Connection slot	3 x PG11
E. Connection 400 V	1 x Ø 48 mm
F. Connection 230 V	

Separate power supply 230 V 1 ~ is required for operating voltage.

For the touch screen a cable of 3 m length is delivered (already connected to the cabinet).

The feet are adjustable about 11,5 to 35 mm height

To facilitate immersion heater replacement, pipes and cabling must not be placed over the boiler or attached to the boiler's rear top cover. The distance between the boiler top and the ceiling should not be less than 500 mm.

### 5.1.4 Power steps EL 36 Eco

**7700110-01**                      **El 36 Eco 36 kW**                      **400 V 3-phase**

Step	%	Kw	Kw			CURRENT
			5,2	10,4	20,6	
			R 1	R 2	R 3	
			K1	K3	K2+K4	
1	14%	5,2	1	0	0	7,5
2	29%	10,4	0	1	0	15,0
3	43%	15,6	1	1	0	22,5
4	57%	20,6	0	0	1	29,8
5	71%	25,8	1	0	1	37,3
6	86%	31	0	1	1	44,8
7	100%	36,2	1	1	1	52,3

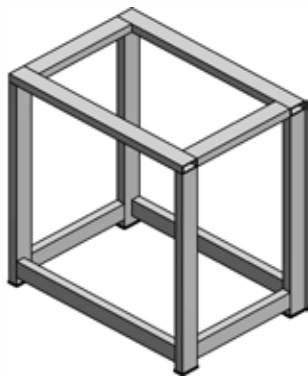
### 5.1.5 Power steps EL 50 Eco

**7700120-01**                      **El 50 Eco 50 kW**                      **400 V 3-phase**

Step	%	Kw	Kw			CURRENT
			8,3	16,6	24,9	
			R 1	R 2	R 3	
			K1	K3	K2+K4	
1	17%	8,3	1	0	0	12,0
2	33%	16,6	0	1	0	24,0
3	50%	24,9	1	1	0	36,0
4	50%	24,9	0	0	1	36,0
5	66%	33,2	1	0	1	48,0
6	83%	41,5	0	1	1	60,0
7	100%	49,8	1	1	1	72

## 6. Accessories

Accessories Eco-series electric boilers		
Art. No.	Image	Designation
7641437-01	1	Stand for EL 36 Eco and EL 50 Eco. H = 500 mm
3366-9005	2	GSM Alarm with battery back-up
584196401	3	Outdoor temperature sensor, incl. 15 m cable
585513301	4	BMS / Internet module
1118404-01	5	3 st current sensors for secondary measurement, Max. 5A. Excl. current transformer



1.



2.



3.



4.



5.

# 7. Control system

Osby Parca's new Eco series of electric boilers has an advanced but easy-to-use control system with a touchscreen via which all settings can be made.

### Control system functions:

- monitors all electric boiler functions
- allows for individual settings
- displays the desired values for e.g. temperature, operating time, energy consumption, and fault alerts
- enables simple and structured settings and troubleshooting.

### Factory values

Electric boilers in the Eco series come with factory-set values as standard. These are monitored by the control system, which constantly ensures optimal functionality and economical operation. These values can be easily changed if required.

### Menu structure

The product's menus are described on the following pages. An overview is provided first, followed by a detailed description of each menu.

## 7.1 Factory-set values

Step Time	30 sec
Max. temp	100 °C
Min. temp	20 °C
Set point	80 °C
Delta T	4 °C
Lang.	Eng



When connecting the control voltage, a start-up image is displayed while the system check is being performed.



Home screen and main menu

# 8. Menu overview

## Home screen



## Alarm menu



## Operating time, energy calculator and highest boiler temperature menu



## Advanced settings menu



## Advanced settings menu



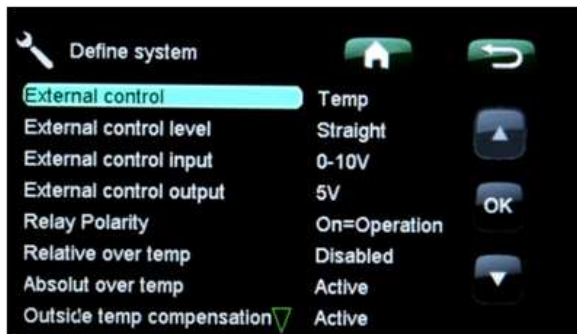
## Time, date and language menu



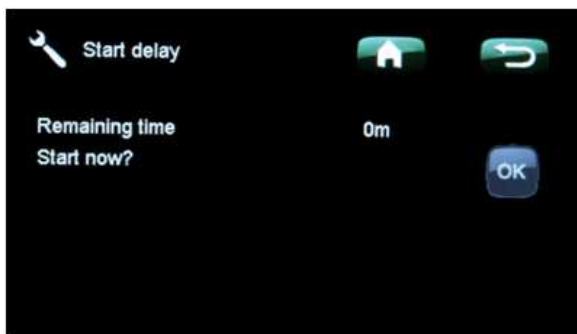
## Settings menu



## Define system menu

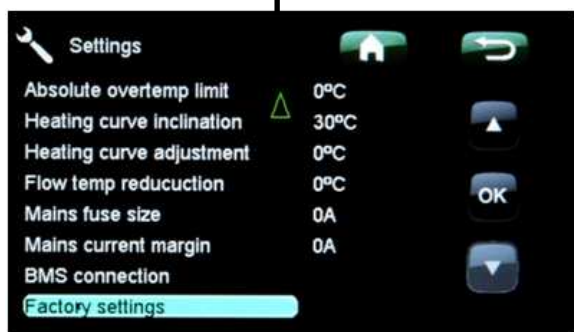
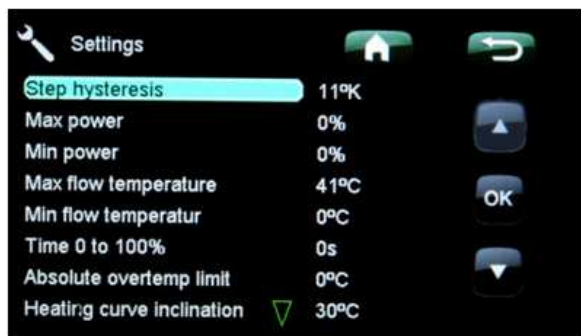


## Quick start menu





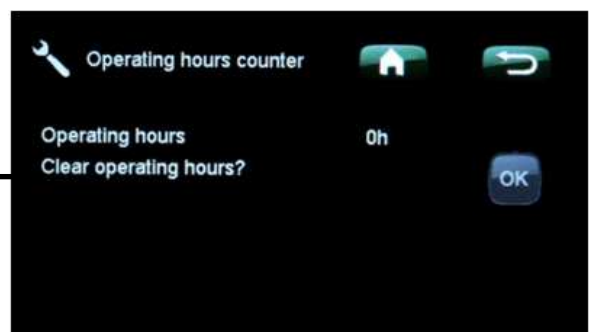
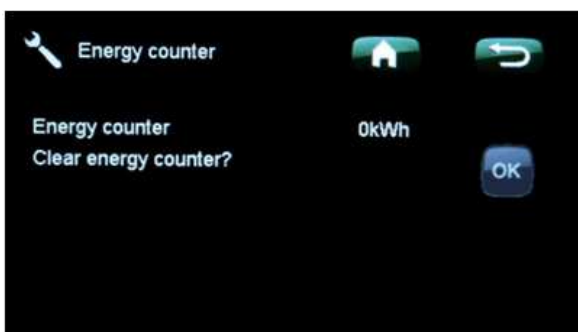
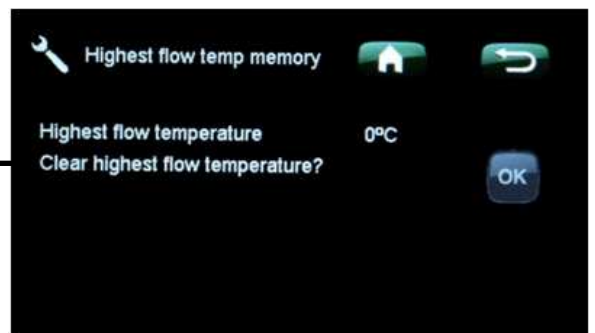
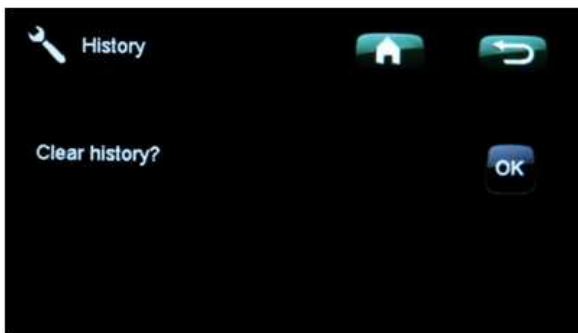
## Setting type menu



## BMS communication menu



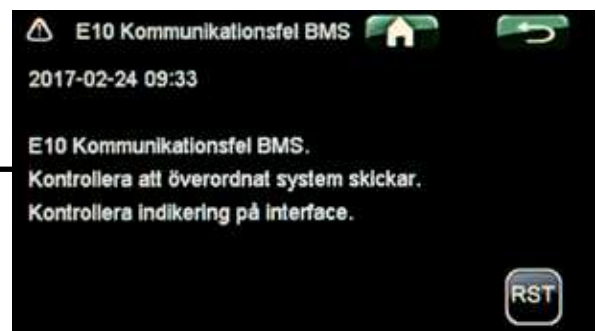
## Service menu



### Alarm menu



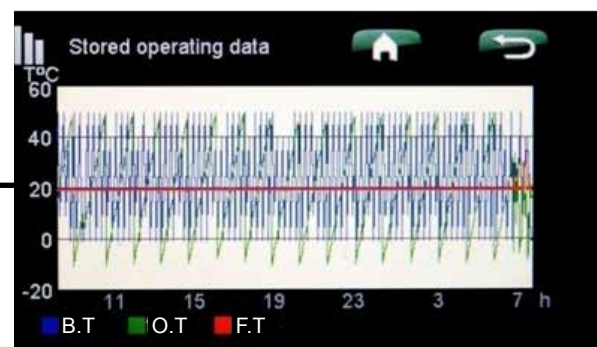
### Alarm description menu



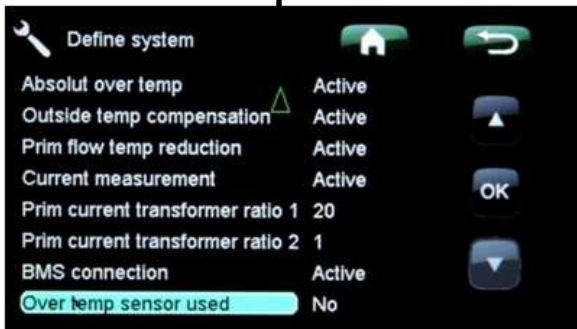
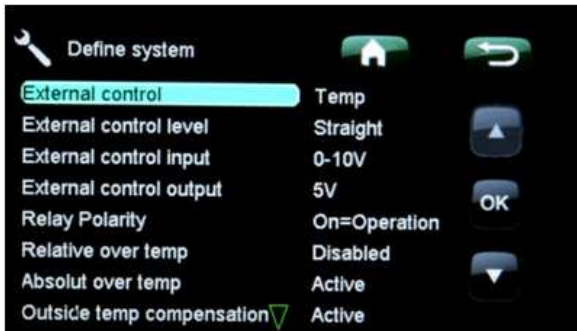
### Operating history menu



### Graph and chart menu



## Define system menu



# 9. Detailed menu descriptions

All settings can be configured directly on-screen using the easy-to-read control panel. The large icons function as buttons on the touchscreen.

Operational and temperature information is also displayed here. You can easily access the different menus to view operational information or set your own values.

## 9.1 Home screen


This menu is the system's home screen. An overview of the current operational data is provided here.

If a button is not pressed within 2 minutes, the system will revert to this menu screen. All other menus can be accessed from here.


**NOTE! Some menus are only displayed if their function is active.**




## 9.2 Description of icons

-  **Stop button**  
Stops boiler operation. The boiler enters Standby mode.


---

-  **Start button**  
Starts boiler operation. The boiler enters Idle mode for approx. 5 seconds before the first output stage begins.


---

-  **Operational info**  
Current operational data for the boiler is displayed here. Also displays historical operational data.


---

-  **Advanced**  
Electric boiler and system settings and servicing are done here.


---

-  **Alarm**  
Displays the alarm menu and alarm history.


---

-  **Active alarms**  
Active alarms are displayed here along with a clear description of the alarm and actions for resetting.


---


-  **Operational and alarm history**  
The total number of hours in operation are displayed here.

---


-  **Quick start**  
Here, the remaining time for delays can be viewed, and the function can be overridden.

---


-  **Home**  
Press the Home button to return to the home screen.

-  **Return**  
Press the Return button to return to the previous page/screen.


---

-  **OK**  
Press the OK button to highlight and confirm text and selections in the menus.


---

-  **Information**  
Displays alarm descriptions and help text.


---

-  **Reset**  
Used to reset an alarm.


---

-  **Service indicator**  
A flashing icon indicates that it is time for the boiler to be serviced.


---

-  **Service**  
Advanced settings must be made by a professional.


---

-  **Time & Language**  
Settings for date, time and preferred menu language.

---

-  **Settings**  
Opens the boiler's Settings menu.

---

-  **Define system**  
The heating system's structure can be set/changed here.

## 9.3 Main menu

All other menus can be accessed via the main menu. It displays the boiler model, as well as output, time & date, status, output stages, phase currents (if the function is active), boiler temperature, set point (desired boiler temperature), outdoor temperature (if the sensor is installed and the function is active). The set point can be directly adjusted using the + and - buttons. Operation can always be stopped with the 0 button, regardless of how the boiler is controlled (analogue signal, BMS, etc.). However, the boiler cannot always be started with the 1 button. This is contingent on the way the boiler system is controlled. The reason for this is explained later in the manual under the menu that manages this function.



The example above shows the values for when the boiler uses current measurement.

## 9.4 Alarm menu



All alarms and operational disruptions are indicated by the alarm icon flashing red. When the icon is pressed, the menu displaying the active alarm is opened. The arrows can be used to highlight the alarm you wish to investigate. Press the ? button for a description of the alarm.



The example above shows how system alarms are presented.

### 9.4.1 Alarm description



The system has 18 different alarm descriptions. If the alarm cannot be reset, the RST button will be dim. This may mean that the alarm is still active or that the power breaker and monitors have not been reset.

The alarm description explains why the alarm has been triggered, how to check a sensor for example, and how to reset.

If the fault cannot be reset, you will be advised to contact Support. This may happen if e.g. the relay board has broken.



The example above shows an alarm description for the boiler temperature sensor.



The alarm can be reset



The alarm cannot be reset

## 9.4.2 Operational information



The total number of hours the boiler has been in operation can be viewed here. The energy calculator displays the total number of produced kWh as well as the boiler's highest temperature.



## 9.4.3 Saved operational info

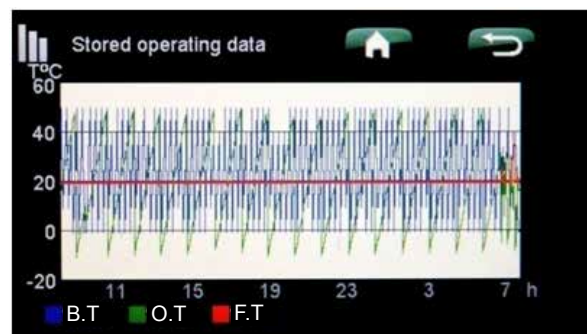


The boiler's operational information for the last 24 hours is displayed here. Actual time is displayed on the far right, and the last 24 hours on the far left. The time "rolls" forward.

The green curve is the current outdoor temperature.

Red is the primary flow temperature.

Blue is the boiler temperature.



## 9.5 Advanced



This menu contains five submenus. Time & Language, Settings, Define System, Service and Quick Start

Also displayed here is the boiler's article number, serial number, and program versions for the relay board and panel.

Time & Language has settings for language, date and time.

The settings are used by both the installer and user to set values and functions.

Define System is used to define how the boiler is to be controlled, to specify limit values and communication.

Service is used for troubleshooting, diagnostics, history, program updates and to enter the reset PIN code.

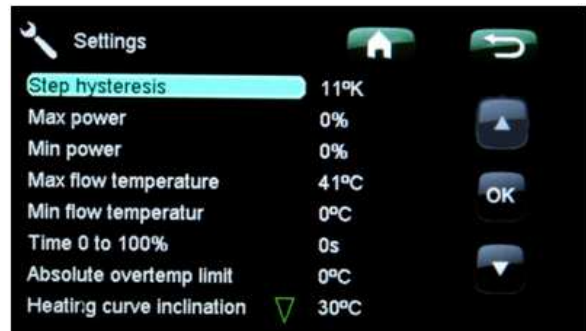


## 9.6 Settings



Boiler values and functions can be set here. The functions displayed depend on how the system has been defined. Use the arrows to select the desired function. Press OK to open, and use the + and - buttons to increase/decrease values or activate/deactivate functions.

- Stage hysteresis (1...16°C)
- Max. power (0...100%)
- Min. power (0...100%)
- Max. flow temperature (0...100°C)
- Max. flow temperature (0...100°C)
- Step rate (20...240 sec)
- Relative over-temp limit (0...15°C)
- Absolute over-temp limit (0...105°C)
- Heating curve inclination (30...60°C)
- Heating curve adjustment (-10...+10°C)
- Flow temp reduction (-15...+15°C)
- Max boiler temperature (40...100°C)
- Main fuse size (16...2000A)
- Main current margin (0...50A)
- BMS communication (only visible when active)
- Factory settings



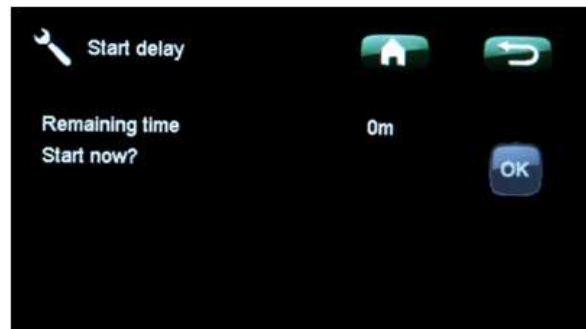
## 9.7 Quick start



Activates if the boiler has been without power for more than 3 minutes.

The current duration of the 1h delay can be viewed here, and an override to quick-start the boiler directly can be performed.

Limits the boiler's power to about 25% of the total power.



## 9.8 Time & Language



Language is selected by pressing the flags. To set the time, press OK and then use + and - to go up or down. The date is set in the same way.



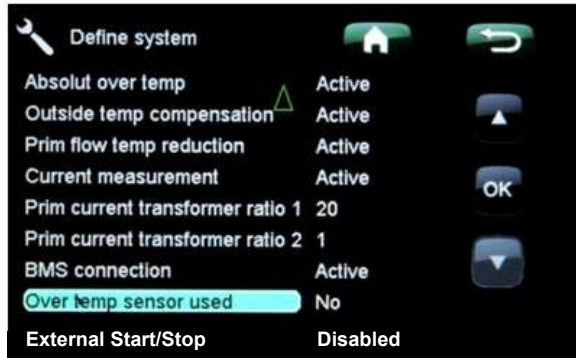
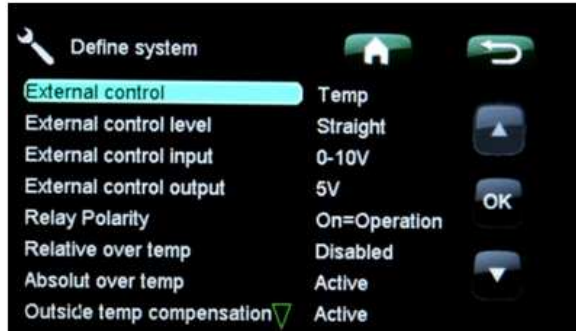


### 9.8.1 Define system



How the boiler will be controlled is defined here, limit values can be specified and functions can be managed.

- Internal control (temp/power)
- External control (none/temp/power)
- External control level (Straight/inverted)
- External control input (0-5V, 0-10V, 0-20mA, 4-20mA)
- External control output (0-5V, 0-10V, 0-20mA, 4-20mA)
- Relay polarity (alarm/operation)
- Relative over-temp (active/disabled)
- Absolute over temp (Always active)
- Outdoor temp compensation (active/disabled)
- Prim flow temp reduction (active/disabled)
- Current measurement (active/disabled)
- Prim current transformer ratio 1 (10...1000)
- Sec current transformer ratio 2 (5, fixed value)
- BMS connection (active/disabled)
- Heat exchanger used (yes/no)
- Tariff active (closed contact/disabled)
- External control Start/Stop (active/disabled)



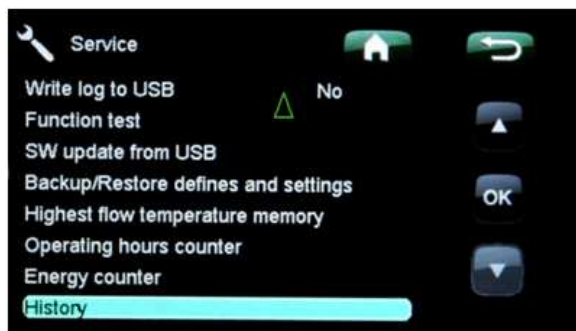
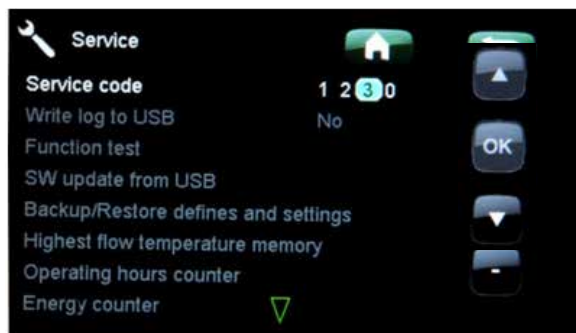
### 9.8.2 Service



Service is used for troubleshooting, diagnostics, history, program updates and reset. To reset saved operational history and the service timer, a 4-digit PIN code must be entered.

- Service code
- Write log USB (yes/no)
- Function test (opens new menu)
- Update SW from USB (opens new menu)
- Backup/Restore settings (opens new menu)
- Reset max. temperature (PIN code)
- Reset operating time calculator (PIN code)
- Reset energy calculator (PIN code)
- History (PIN code)
- Service timer (PIN code)

Also see chapter 4, Servicing.



## 9.9 Write log to USB

Requires a USB flash drive to be plugged into the panel's port. Logs operational data, inputs and outputs to a file on the USB flash drive every 30 seconds for 24 hours.

**Used by Osby Parca for advanced analyses of the boiler functions.**

## 9.10 Function Test

Function testing allows simple system status troubleshooting to be carried out. When function testing is active, the boiler's normal functions are switched off. Ap04 refers to connector A, position 4 on the relay board. All inputs are off and cannot be changed. These can only be read. If, for example, a sensor displays -999 or +999, this means that the sensor's input is open and short-circuited, respectively.

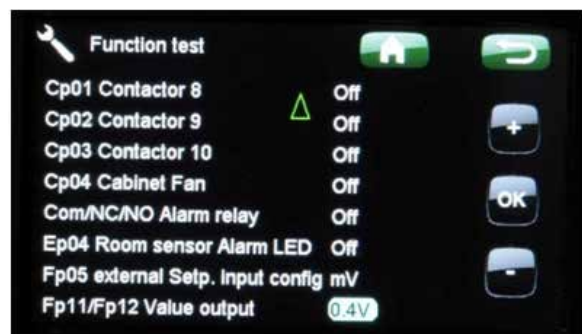
Outputs are on and can be changed. Use the arrow buttons to select the desired position for testing, then press OK and + or - to switch between on/off. If no menu selection is made within 5 minutes, the panel will revert to the main menu.

### Inputs

- 230 V Safety circuit
- 230 V Interruptible power
- Boiler temp reduced
- Tariff
- Outdoor sensor
- Room sensor = external Start/Stop
- Boiler temp sensor
- Internal temp sensor relay board
- External set point
- Phase current L1
- Phase current L2
- Phase current L3
- Internal raw voltage
- System temp sensor
- Temp sensor heat exchanger out
- Temp sensor heat exchanger in

### Outputs

- Output relay 1 (on/off)
- Output relay 2 (on/off)
- Output relay 3 (on/off)
- Output relay 4 (on/off)
- Output relay 5 (on/off)
- Output relay 6 (on/off)
- Output relay 7 (on/off)
- Output relay 8 (on/off)
- Output relay 9 (on/off)
- Output relay 10 (on/off)
- Cabinet fan (on/off)
- Room sensor alarm LED (on/off)
- External set point input config. (mV/Ma)



### 9.10.1 Update SW from USB

When the control system needs to be updated, select this option from the Service menu. Updating is performed with a USB flash drive plugged into the panel's port. Then press OK in the menu. The program is written to the panel. The system will then restart. The boiler displays the start-up screen while a system check is done, after which the main menu will be displayed. Boiler updating is now complete.



**Prior to start, check to ensure the settings made have not changed after the update.**

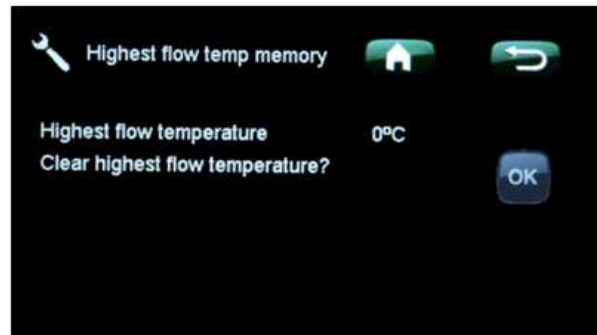


### 9.10.2 Backup/reset settings from USB

Insert a USB flash drive into the panel's port. Then select the Backup or Reset menu, press OK.

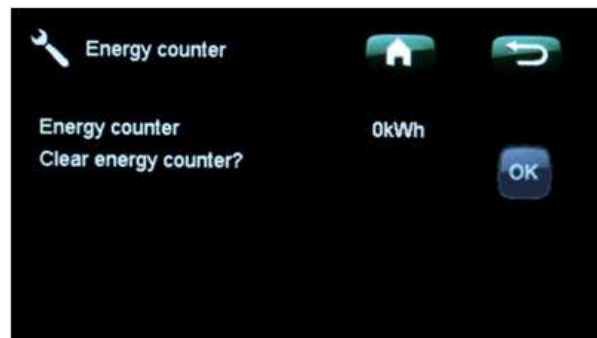
### 9.10.3 Reset highest boiler temperature

This menu displays the highest temperature reached by the boiler and shows a reset prompt. Pressing OK resets the value to zero. PIN code is required to access the menu\*.



### 9.10.4 Reset operating time calculator

This menu displays the total number of hours the boiler has been in operation and shows a reset prompt. Pressing OK resets the calculator to zero. PIN code is required to access the menu\*.

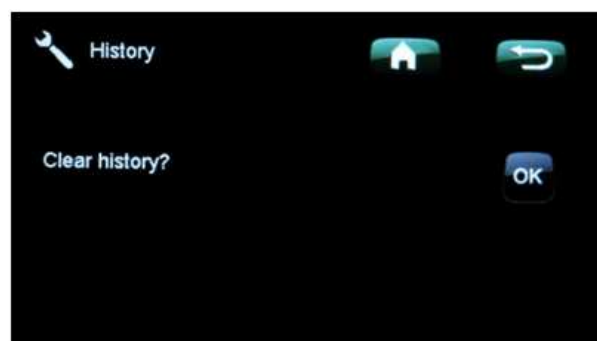


### 9.10.5 Reset energy calculator

This menu displays the total number of produced kWh and shows a reset prompt. Pressing OK resets the calculator to zero. PIN code is required to access the menu\*.

### 9.10.6 Reset history

The menu shows a reset history prompt. Pressing OK resets the graphs. PIN code is required to access the menu\*.



### 9.10.7 Service timer

Shows time remaining until the next service. The interval length between services is set here. This function can be deactivated after the warranty has expired.

\* PIN code is sent when the warranty registration is done.

### 9.10.8 BMS Building Management automation

To facilitate integration with overall systems, RS485 and Modbus are used. This requires a module (BMS/Internet art.no: 585513301) to be connected to the panel with the supplied cable. BMS/Internet is an optional extra and not included in the delivery.

*Adress, Baud rate, Paritet, Stop bit and Timeout* are set to match the data at the other end. There is no right or wrong, as long as the data is the same at both ends.



### 9.10.9 BMS variables

These variables are available:

#### Read-only register

Reg no.	Function	Type	Unit	Direction	Comment
1	Register version	U16		R	1 = This version
2	Display software version	U16		R	
3	Relay board hardware version	U16		R	
4	Article no. high value	U16		R	Always displays 3317
5	Article no. low value	U16		R	Always displays 2015
6	Serial no. high value	U16		R	
7	Serial no. low value	U16		R	
8	Operating time high value	U16	kh	R	Max. 64 Mh = 7,300 years
9	Operating time low value	U16	0.1 h	R	
10	Highest boiler temp value	S16	0.1°	R	
11	Energy calculator high value	U16	10 MWh	R	Max. 640 TWh
12	Energy calculator low value	U16	kWh	R	
13	Boiler status	U16		R	0 = Off, 1 = Wait, 2 Active
14	1h delay	U16		R	0=Deactivated, 1=Activated
15	Boiler temp	S16	0.1°	R	
16	Outdoor temp	S16	0.1°	R	
17	Reserved				Room temp
18	Relay board temp	S16	0.1°	R	
19	Phase current L1	S16	0.1A	R	Max. 3 kA
20	Phase current L2	S16	0.1A	R	
21	Phase current L3	S16	0.1A	R	
22	Boiler output	S16	kW	R	Max. 32MW
23	System temp sensor	S16	0.1°	R	Optional
24	Temp sensor from heat exchanger	S16	0.1°	R	Optional
25	Temp sensor to heat exchanger	S16	0.1°	R	Optional
26	Active BMS alarms low value	U16		R	Bit encoded: Bit 0 alarm 0... Bit 15 alarm 15
27	Active BMS alarms high value	U16		R	Bit encoded Bit 0 alarm 16... Bit 4 alarm 20

## Read/Write register

50	Set point temp	S16	0.1°	R/W	
51	Set point output	S16	%	R/W	
52	Heating curve ascension/inclination	S16	0.1°	R/W	
53	Heating curve adjustment	S16	0.1°	R/W	
54	Reduced boiler temp	S16	0.1°	R/W	
55	Boiler start	S16		R/W	0 = Stop, 1= Start Reading returns 999
56	Reset alarm low value	U16		R/W	Bit encoded 1 = reset Alarm 0..15 Reading returns 0xFFFF
57	Reset alarm high value	U16		R/W	Bit encoded 1 = reset Alarm 16..17 Reading returns 0xFFFF

**NOTE!** If one try to read an invalid address the answer from BMS will be code 0x83 ERROR.  
The user must clarify that any invalid addresses will not be read or accept to deal with the problem.

These are the valid commands for Modbus communication:

- 03 (0x03) Read Holding Registers
- 06 (0x06) Write Single Register
- 16 (0x10) Write Multiple registers
- 23 (0x17) Read/Write Multiple registers

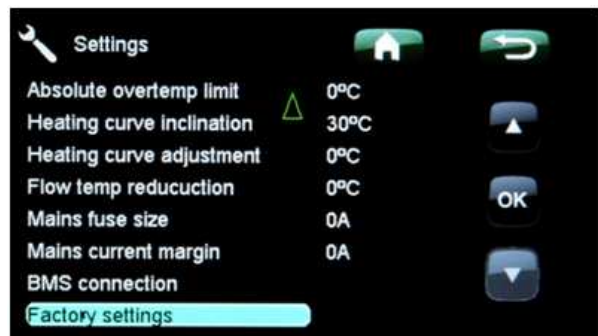
Max. read and write speed: 1000 mS

## 9.11 Outdoor Compensation – UTK

Once an existing sensor has been defined, the outdoor temperature will be displayed in the main menu.



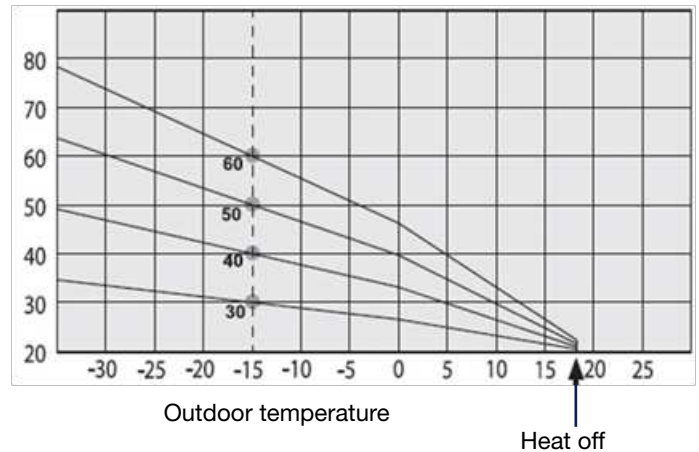
The heating curve defines the starting value for the boiler temperature. The outdoor temperature generates regulation of the boiler temperature.



### 9.11.1 Heating curve ascension/ inclination

The curve can be set between 30° and 60° inclination. In the example below, the set heating curve's inclination provides a boiler temperature of 60 °C when the outdoor temperature is -15 °C.

Primary boiler temperature

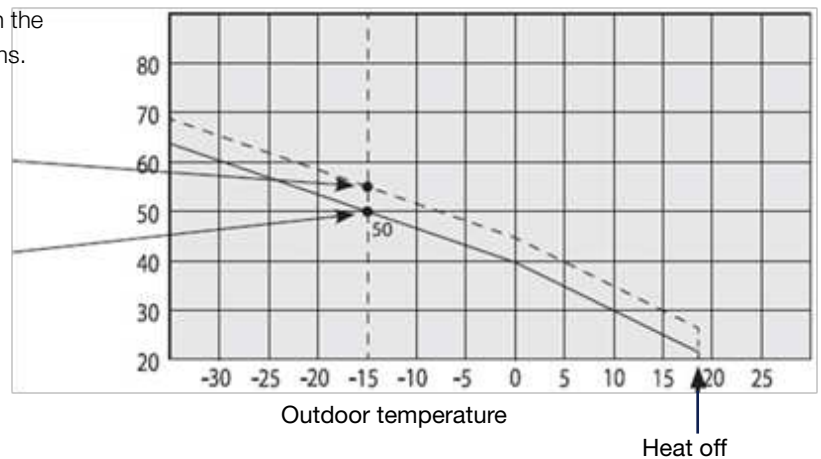


### 9.11.2 Heating curve adjustment

The heating curve can be adjusted in parallel with the desired value in order to adapt to different systems. Adjustment values are -10 °C... +10 °C.

- Inclination 50 °C  
Adjustment +5 °C
- Inclination 50 °C  
Adjustment 0 °C

Primary boiler temperature



### 9.11.3 Highest primary boiler temperature

Highest permitted temperature for the heating system.

### 9.11.4 Lowest primary boiler temperature

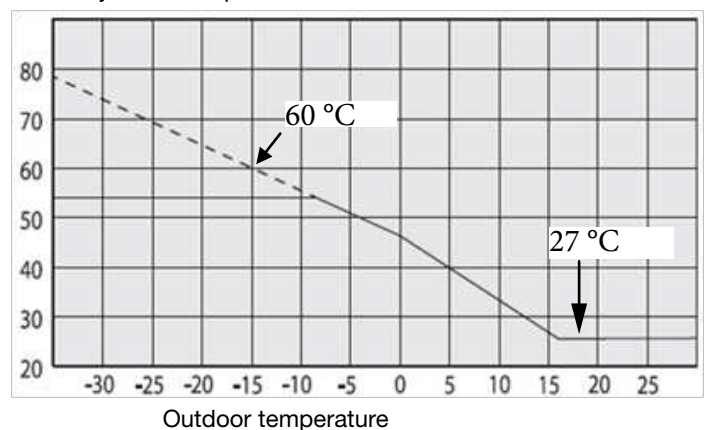
Lowest permitted temperature for each heating system

**One example:**

Inclination 60 °C  
Adjustment 0 °C

In this example, the highest permitted primary flow temperature has been set to 55 °C. The lowest temperature is 27 °C (summertime compensation or systems unable to tolerate very high temperatures).

Primary boiler temperature

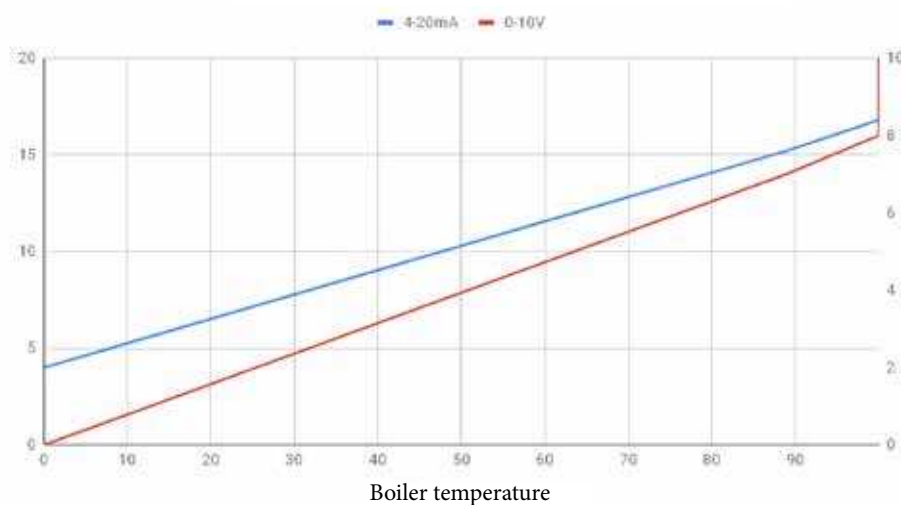


### 9.11.5 Reduced boiler temperature

This setting defines the number of degrees by which the boiler temperature is reduced in the heating system when Input is closed. Adjustment values are -15 °C... +15°C.

## 9.11.6 Diagram boiler temperature

Boiler temperature when external control



## 9.12 Stage regulator

The regulator utilises stage numbers. These are fixed in the system and cannot be set manually.

### Output in percent

Calculated by using the boiler model's rated output and the output of connected stages. This value can be configured to analogue output.

### Output set point in percent

Set point in percent is converted to an output stage. This is used to limit the stage regulator.

### Overcurrent

No comparison of the next output stage's expected current increase/decrease. The current margin defined in the Settings menu is used to reconnect an output stage. Explained in more detailed under the "Current Overload" section.

### Stage duration

Stage duration can be increased in the Settings menu.

**NOTE! Initial stage duration cannot be adjusted or changed. It is fixed at 16 seconds.**

## 9.13 Delta T, deadband

The function of delta T is to produce the most obtuse temperature angle possible before the set point is reached. If delta T is too small, there is a significant risk of major temperature fluctuations. This value is factory-set at 4 °C, and is adapted according to the heating system in which the boiler is installed.

## 9.14 Deadband range



### The temperature is higher than the deadband

The output stage is disconnected after each step.

### The temperature is within the deadband

The stage regulator does nothing.

### The temperature is lower than the deadband

The output stage is connected during the step depending on the temperature's tendency.

## 9.15 Current overload

The current controller uses the highest measured current value for phases L1, L2, and L3. If this current value exceeds the set value of the main fuse, the temperature controller is overridden by the stage regulator downshifting. In this mode, the temperature regulator is only permitted to downshift or retain the present value.

If the current value + current margin is less than the value of the main fuse, the temperature controller is permitted to increase the stage output. The current margin is set in the Settings menu.



## 9.16 Output control

The regulator utilises normal temperature control. The output stage is not permitted to increase above the output set point. When the external output set point changes, the regulator follows the signal and shifts up every 16 seconds.

## 9.17 Current limitation

If necessary, the output of the boiler can be limited when, for example, the current drawn exceeds the main fuses of the system. The connection of current sensors to the system-specific current transformers' 0–5 A side must be done in accordance with the boiler's associated wiring diagram. The function is activated in the Define System menu. Here, the current transformer's conversion can be specified (primary and secondary side).

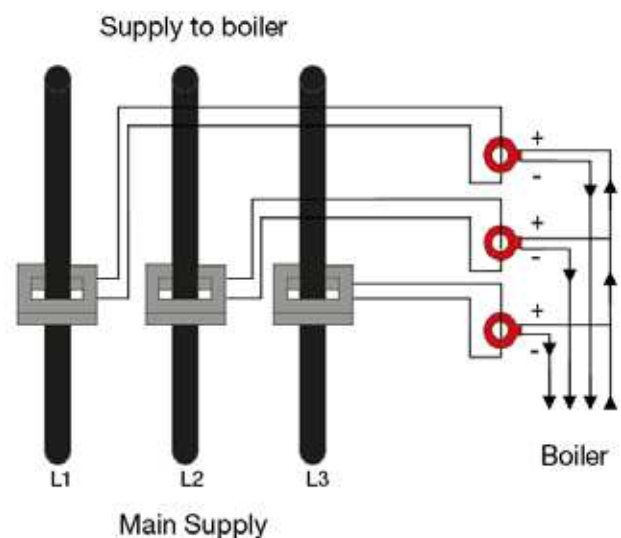
## 9.18 Current sensors

As depicted in the illustration, the current sensors must be mounted to the current transformer's cabling. For connection to the boiler, please refer to the actual model's wiring diagram. Current sensors are available from Osby Parca as boiler accessories.



These current sensors may be ordered from Osby Parca. Art. no. 1118404-01

System-specific current transformer





## 9.19 Alarm messages



In the event of a system alarm or fault, the alarm icon will flash red. When the icon is pressed, the alarm menu will be displayed along with a message describing the alarm, e.g. E01 Primary flow sensor. If several alarms are active, they will be displayed sequentially. A persisting fault must first be rectified before it can be reset. Some alarms are reset automatically if the fault ceases. Press the Info button for a description of the alarm and to reset.

This menu explains why the alarm was activated and how it can be reset. The system is able to display a total of 18 alarm messages (8 at a time).

### Alarm messages

E00 Relay board memory error

E01 Boiler temp sensor

E02 High cabinet temperature

E03 Cabinet overheated

E05 Outdoor temp sensor

E06 External control signal deviation

E07 Safety circuit tripped

E08 Boiler temperature too high

E09 Communication error relay board

E10 Communication error BMS.

E11 Phase L1 Missing

E12 Phase L2 Missing

E13 Phase L3 Missing

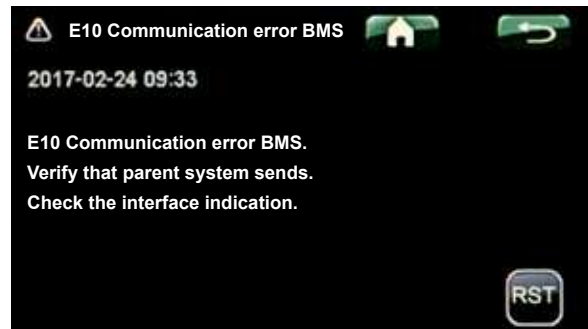
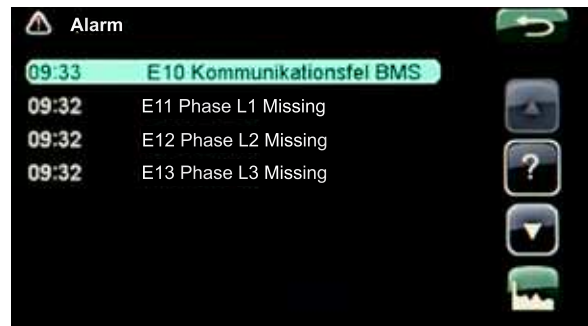
E14 USB error

E15 Room sensor

E16 System temp sensor from boiler

E17 Temp sensor from exchanger

E18 Temp sensor to exchanger



## 9.20 External power

With a closed potential-free contact from overall systems or other external circuits, the boiler can be started or stopped provided the safety circuit conditions are met. When the circuit is broken, the boiler quickly downshifts and enters OFF mode. When the circuit is closed again, the boiler first enters STANDBY mode and then, once the step duration permits, ON mode.

## 10. Sensor resistors

Boiler temp sensor NTC 22 k $\Omega$

Temperature °C	NTC 22 k Resistance $\Omega$
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
0	66200
-5	84750
-10	108000
-15	139000
-20	181000
-25	238000

Outdoor sensor NTC 150

Temperature °C	Outdoor sensor Resistance $\Omega$
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

NOTE! The sensors must be disconnected before measuring the resistance!

# 11. CE Certificate



## FÖRSÄKRAN OM ÖVERENSSTÄMMELSE DECLARATION OF CONFORMITY (CE-intyg / CE-Certificate )

**LVD 2014/35/EU  
EMC 2014/30/EU**

**Produkt: Elpanna / Electric boiler**

Fullständigt produktnamn/nummer/Full identification of the product :

Modell/Type : **El 36/50 Eco** \_\_\_\_\_ Effektområde/Capacity : **36 / 50 kW**

Övrig information: \_\_\_\_\_

Ett urval av produkten har bedömts och funnits vara i överensstämmelse med /  
A Sample of the product has been assessed and found to be in conformity with :

Direktiven 2014/30/EU (EMC-direktivet) och 2014/35/EU (Lågspänningsdirektivet)  
Directive 2014/30/EU (EMC-directive) and 2014/35/EU (Low Voltage Directive)  
Ecodesign 811/2013/EU labelling and 813-814/2013/EU Commission regulation

Följande standarder har använts vid testning/bedömning/  
Following standards were used in assessing:

EMC (gällande lätt industri eller industriföremål samt för fastighetsbruk /  
regarding light industry or industrial equipment and for real estate use )

EN 61000-6-4 : 2007 , A1 :2011  
EN 61000-6-2 :2005  
EN 61000-4-2  
EN 61000-4-3  
EN 61000-4-4  
EN 61000-4-5  
EN 61000-4-6  
EN 61000-4-11

Osby 2018-01-05

.....  
Ort och datum / Place and date

.....  
(Namnteckning / Signature)  
Dennis Eliasson General Manager  
Enertech AB Osby Parca Div.

## 12. Spare parts Eco series

<b>Immersion heaters with packings</b>			
Boiler (kW)	Art.no.	Designation	Insertion length (mm)
36	7612027-01	Immersion heater, compl. 18,2 kW / 230 V	485
	7112185-02	Packing cartridge EL 36 / EL 50	
50	3311-0040	Immersion heater, compl. 25 kW / 230 V	485
	7112185-02	Packing cartridge EL 36 / EL 50	

<b>Control system</b>		
Boiler (kW)	Art.no.	Designation
36-504	587057301	Display unit complete PIC 24
36-504	583742307	Boiler temp sensor ECO L=2,5 m
36-504	3317-2015	Relay board electric boiler ECO
36-504	587057301	Touchscreen (Serial number must be specified at order)
36-504	7020160-01	Max. thermostat (Tz+)

**Also refer to the “SPARE PARTS LIST” at the circuit diagram for the actual boiler.**

## 13. Appendices

- Circuit diagram
- Warranty document

Subject to errors or updates made after this edition.