Centrometal
HEATING TECHNIQUE

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ENG

Technical instructions

for install and using the CMNET module - cascade connection of PelTec/PelTec-lambda boilers

CE

WWW

You can find the latest technical instructions for CMNET by scanning the QR code or at the web address:

https://www.centrometal.hr/cm-download-cmnet/

CMNET

(connecting PelTec/PelTec-lambda in a cascade)

TU-CMNET-12_1-2022-v2.88f-ENG

GENERAL

These instructions are valid for software versions v2.88f or later.

1.0. CONNECTING BOILERS IN CONFIGURATION 4 (BUF) OR IN CONFIGURATION 10 (CRO) IN CASCADE

It is possible to connect a maximum of 7 PelTec/PelTec-lambda boilers in a cascade.
Peltec/PelTec-lambda 12-48 kW: all boilers connected in cascade must have configuration 4 (BUF) or configuration 10 (CRO) selected.
PelTec-lambda 69/96 kW: all boilers connected in cascade must have configuration 4 (BUF) selected.

Important!
PelTec-lambda 69/96 kW boilers with selected configuration 10 (CRO) cannot be connected in a cascade.

1.1. MASTER / LEADING BOILER

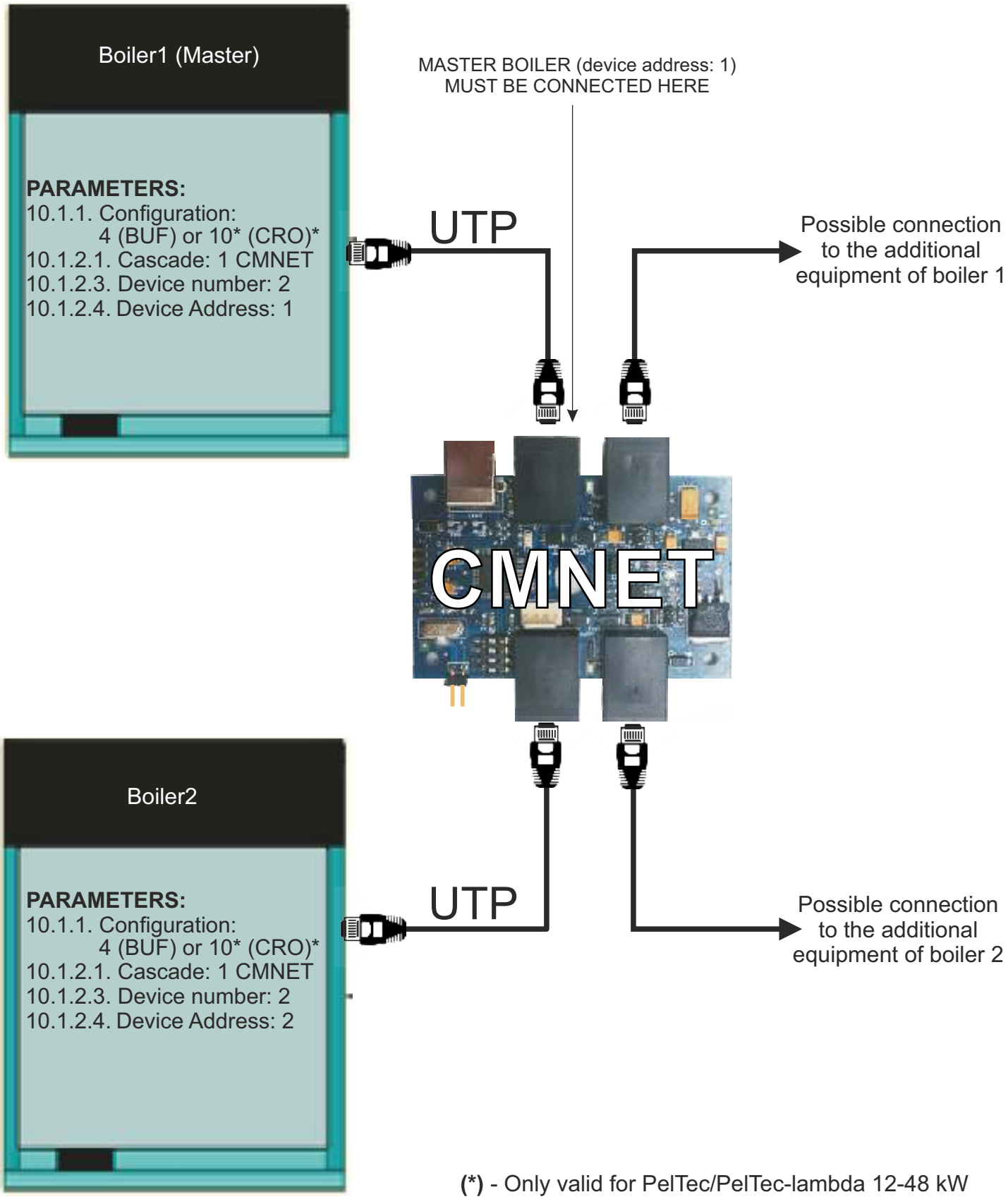
Boiler-1 is the "Master" (the boiler that leads the cascade). If Boiler-1 is disconnected from the cascade (or runs out of electricity or shuts down at the main switch), Boiler-2 (next by device address) automatically becomes "Master", but it can perform the function of "Master" only if the sensors of the Accumulation (buffer) tank / Hydraulic crossover are also connected to it. When Boiler-1 is connected to the cascade again, it automatically becomes "Master". This "Master" function, if the need arises, can be taken over by any boiler in the cascade in order according to the address of the device.

The sensors of the Accumulation (buffer) tank / Hydraulic crossover must be connected to the boiler control of the "Master" boiler (Boiler-1), but there must also be additional sensors of the Accumulation (buffer) tank / Hydraulic crossover that must be connected to the boiler controllers of the other boilers in the cascade so that any of the boilers in cascade could become "Master" if the previous "Master" was disconnected from the cascade for any reason.

The "Master" boiler in cooperation with the CMNET module determines all actions within the cascade (determines when the next boiler will start/shut down, determines which boiler is "Leading Boiler"...).
The "Leading" boiler is the boiler that starts first, after the first start-up of the boilers in the cascade, the leading boiler is the "Master", but when it completes a certain number of working hours, the "Leading" boiler becomes the next boiler according to the serial number of the address, and so on.

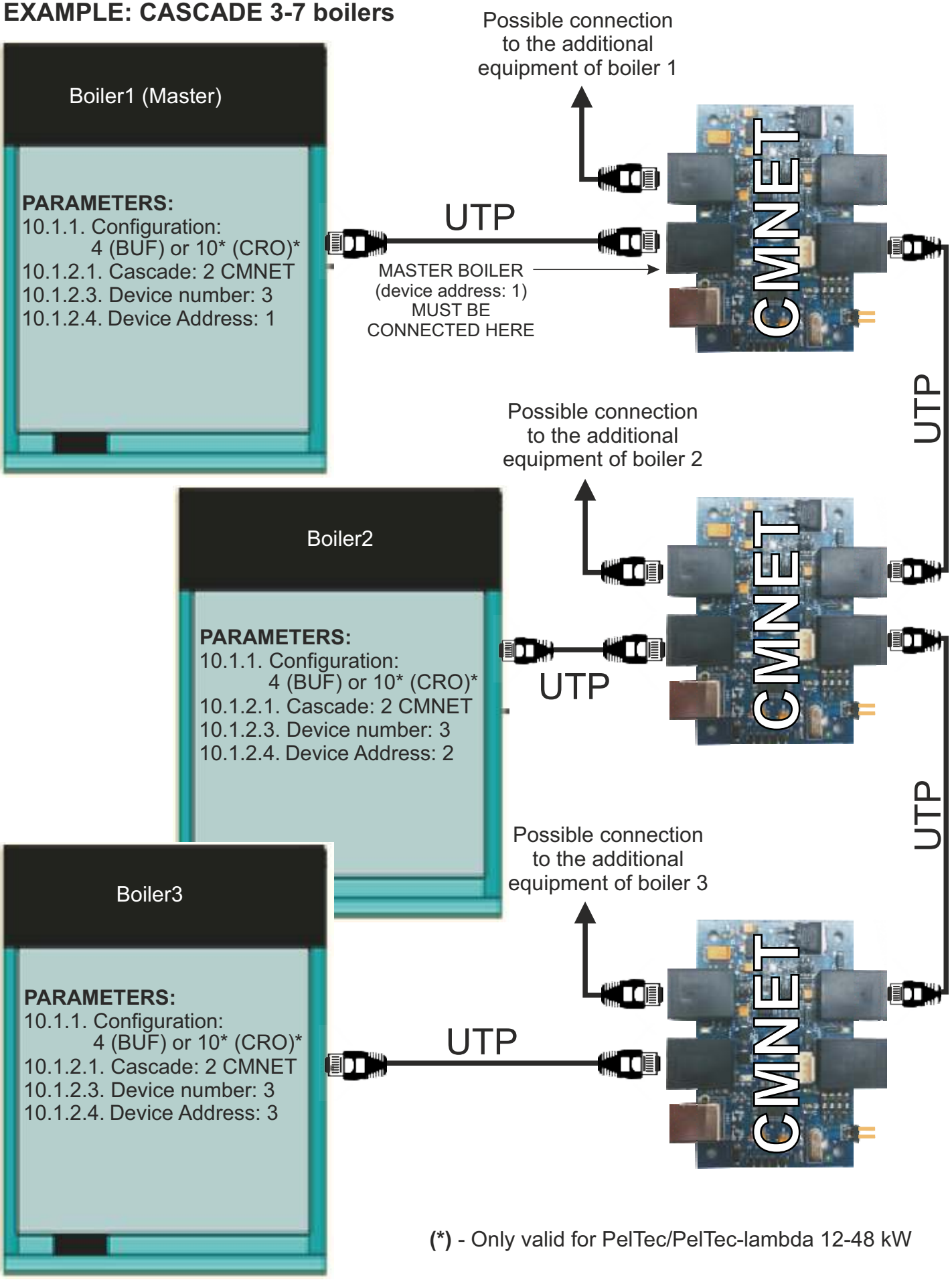
1.2. POSSIBLE WAYS OF CONNECTING BOILERS IN CASCADE

EXAMPLE: CASCADE 2 boilers



(*) - Only valid for PelTec/PelTec-lambda 12-48 kW

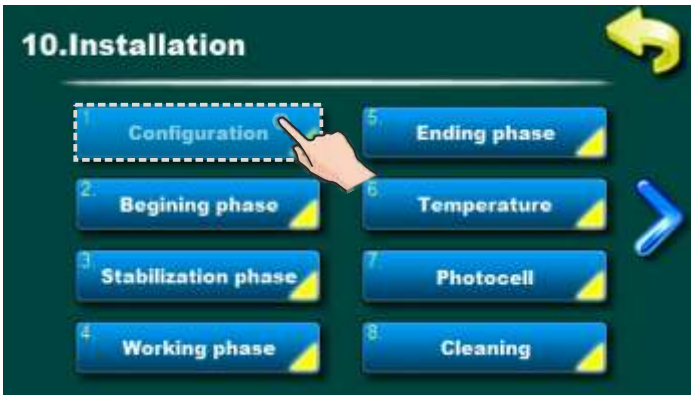
EXAMPLE: CASCADE 3-7 boilers

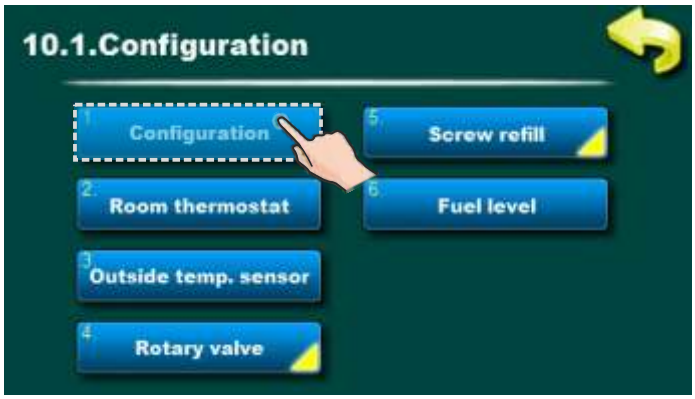


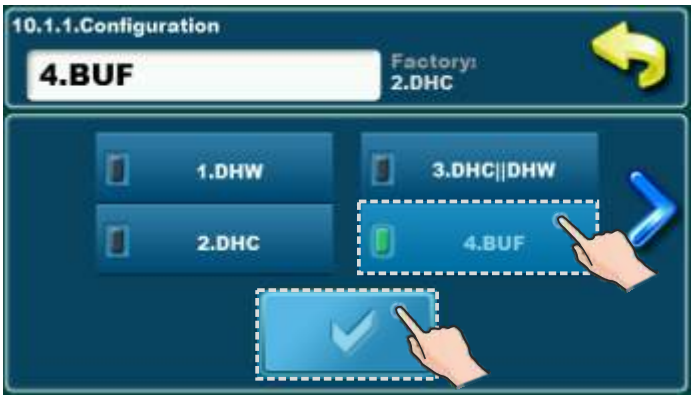
(*) - Only valid for PelTec/PelTec-lambda 12-48 kW

1.3. SELECTION OF BOILER CONFIGURATION - (4 (BUF) / 10 (CRO))

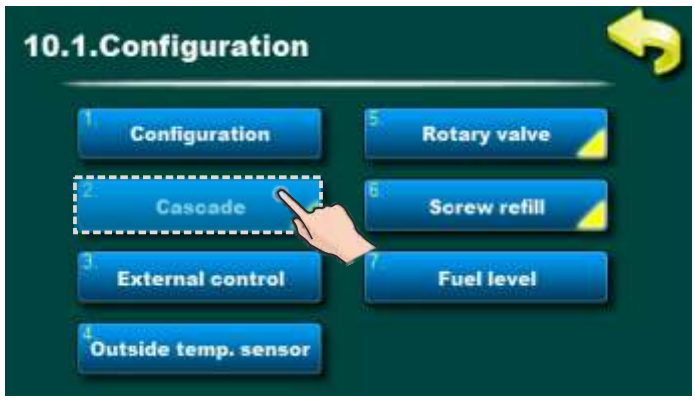
Cascade can work (can be enabled) only on boilers that have selected configuration 4 (BUF) or configuration 10 (CRO). All boilers in the cascade must have the same configuration selected.







1.4. CONFIGURING THE CASCADE



CASCADE

Factory: OFF
Possible selection: OFF, 1 CMNET, 2 CMNET

OFF: Cascade is OFF

1 CMNET: cascade of 2 boilers
- 2 boilers in cascade with 1 CMNET device.

2 CMNET: cascade of 2-7 boilers
- 2 boilers in cascade with 2 CMNET devices.
- 3 boilers in cascade with 3 CMNET devices.
- 4 boilers in cascade with 4 CMNET devices.
- 5 boilers in cascade with 5 CMNET devices.
- 6 boilers in cascade with 6 CMNET devices.
- 7 boilers in cascade with 7 CMNET devices.

CASCADE MANAGER

Factory: ON
Possible selection: OFF, ON

This parameter must always be ON, on all boilers in the cascade. If this parameter is turned OFF, the boiler on which it is turned OFF, as well as boilers with an address that has a higher ordinal number, regardless of whether this parameter is turned ON or OFF, will not be able to become "Master". This parameter must not be turned OFF on the boiler with the address "Master" because the cascade will not work.

DEVICE NUMBER

Factory: 2
Possible selection: - Min: 2
- Max: 7

With this parameter, we define the number of boilers in the cascade. If we selected 1 CMNET under "CASCADE", then the number of devices must be 2. If we chose 2 CMNET, then the number of devices must be as many as there are boilers in the cascade (2-7). It is set on each boiler separately and must be the same number on all boilers in the cascade.

DEVICE ADDRESS

Factory: 1
Possible selection: - Min: 1
- Max: 7

This parameter determines the address (ordinal number) of the boiler. The boiler with address 1 is the "Master", and if the boiler with address 1 is disconnected from the cascade (or remains without electricity or is turned off at the main switch), the boiler with address 2 automatically becomes "Master" (if the boiler with address 2 is ready in the cascade) and so on. The address of the boilers is also used to determine the "leading boiler" - the boiler that starts first (depending on the "Time difference" - after how many hours of operation the boilers change priority of work). The "DEVICE ADDRESS" is entered into the controller of each boiler in the cascade and each boiler must have a different address.

TIME TO ON

a) Configuration 4 (BUF)

Factory: 3600s
Possible selection: min. 0s, max. 18000s
This parameter defines the time from the last arrival of the "Leading boiler" (if several boilers in the cascade are currently working, then all boilers that are working), to power D6, until the moment of checking the conditions for the need to start the next boiler (with each modulation of any boiler in the cascade, the time reset). If at that moment (the moment of checking the conditions for the need to start the next boiler) the difference in the Accumulation (buffer) tank **(Taku_set - Taku_measured)** is greater than the **dTaku_kz** parameter, the next boiler will start.
After checking the conditions for the need to start the next boiler, the time is reset, and when the "Leading boiler" (if several boilers are currently working in a cascade, then all the boilers that are working) comes to power D6 starts a new countdown, if this condition is not met, the time stands at zero and waits with the start of the countdown until this condition is fulfilled. With each modulation of any boiler in the cascade, the time is reset.

b) Configuration 10 (CRO)

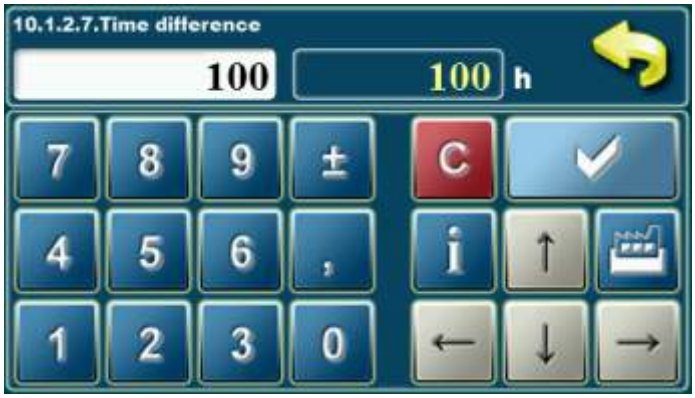
Factory: 3600s
Possible selection: min. 0s, max. 18000s
This parameter defines the time from the last arrival of the "Leading boiler" (if several boilers in the cascade are currently working, then all boilers that are working), to power D6, until the moment of checking the conditions for the need to start the next boiler (with each modulation of any boiler in the cascade, the time reset). If at that moment (the moment of checking the conditions for the need to start the next boiler) the difference in the Hydraulic crossover **(Ths_set - Ths_measured)** is greater than the **dThs_kz** parameter, the next boiler will start.
After checking the conditions for the need to start the next boiler, the time is reset, and when the "Leading boiler" (if several boilers are currently working in a cascade, then all the boilers that are working) comes to power D6 starts a new countdown, if this condition is not met, the time stands at zero and waits with the start of the countdown until this condition is fulfilled. With each modulation of any boiler in the cascade, the time is reset.

TIME TO OFF

Factory: 600s
Possible selection: min. 0s, max. 3600s

This parameter determines after how long operate "Leading boiler" at power (maximum) D3, last boiler go to extinction phase. It is set on each boiler separately and can be a different value.

TIME DIFFERENCE



Factory: 100h
Possible selection: min. 0h, max. 500h

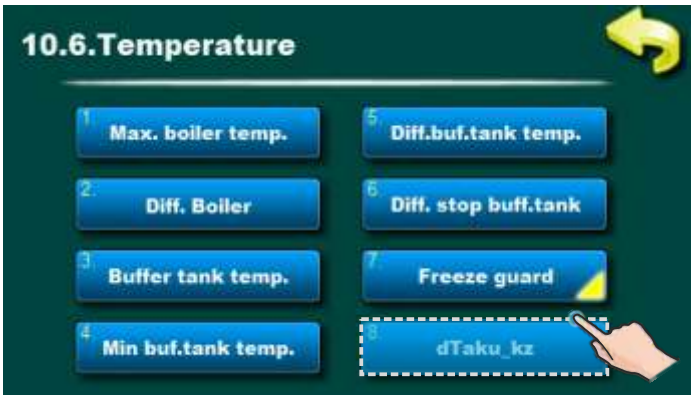
This parameter define after how many hours of work boilers change priority of work. It is set on each boiler separately and can be a different value.

COUNTER RESET

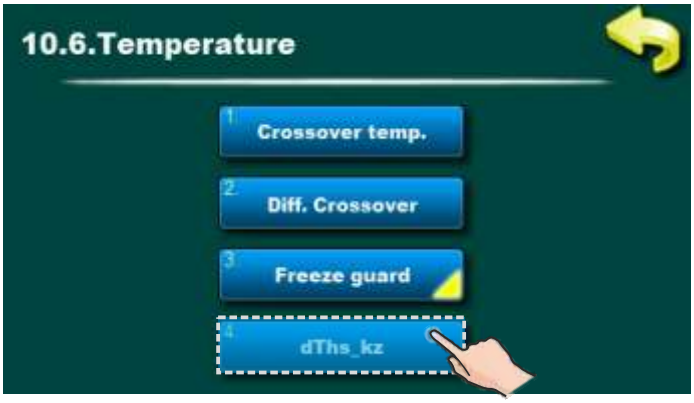
This parameter enable reset of boiler work time counter. It can be reset on each boiler separately.

1.5. ADJUSTMENT dTaku_kz / dThs_kz:

Depending on the selected configuration, dTaku_kz or dThs_kz will appear, if cascade is enabled.
dTaku_kz - the temperature difference in the Accumulation (buffer) tank (Taku_set - Taku_measured) occurs when configuration 4 (BUF) is selected on the boilers. This parameter is used by the controller at the moment of checking the conditions for the need to start the next boiler. If at the moment of checking the conditions for the need to start the next boiler, the difference in the Accumulation (buffer) tank **(Taku_set - Taku_measured)** is greater than the dTaku_kz parameter, the next boiler will be start. (For the definition of the moments of checking the conditions for the need to start the next boiler, see under the point **"TIME TO ON"**).
dThs_kz - the temperature difference in the Hydraulic crossover (Ths_set - Ths_measured) occurs when configuration 10 (CRO) is selected on the boilers. This parameter is used by the controller at the moment of checking the conditions for the need to start the next boiler. If at the moment of checking the conditions for the need to start the next boiler, the difference in the Hydraulic crossover **(Ths_set - Ths_measured)** is greater than the dThs_kz parameter, the next boiler will be start.(For the definition of the moments of checking the conditions for the need to start the next boiler, see under the point **"TIME TO ON"**).



Factory: 6°C
Possible selection: min. 1°C, max. 15°C



Factory: 6°C
Possible selection: min. 1°C, max. 15°C

1.6. USER INTERFACE (disconnect the boiler from the cascade, disabling the start of the boiler)

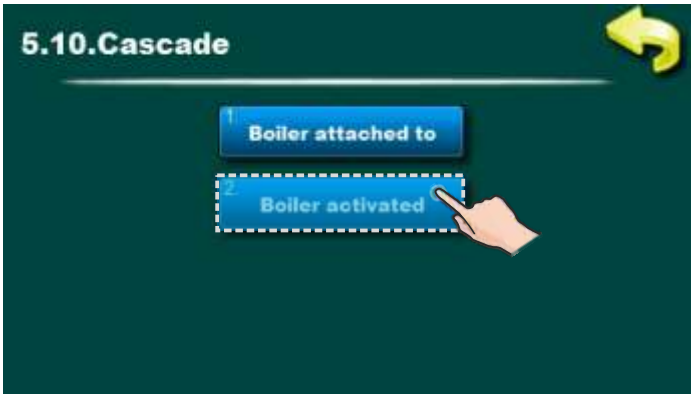
BOILER ATTACHED TO

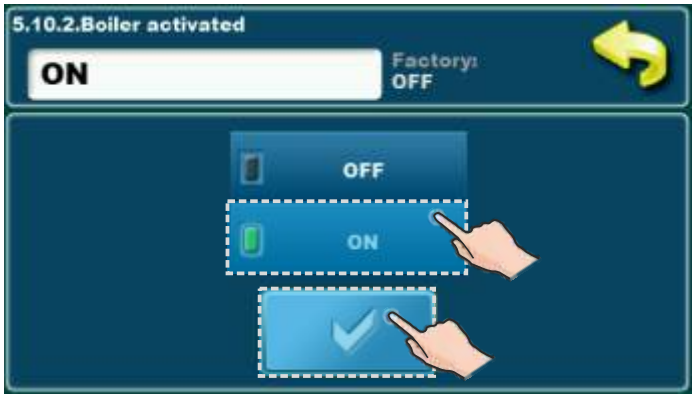
Factory: ON
Possible selection: OFF, ON

ON - The boiler is part of the cascade
OFF - The boiler has been removed from the cascade
- this boiler will be displayed in gray on the cascade screen
- this boiler will have a STOP/START switch on the boiler screen

Note:
Before taking off the boiler from the cascade, it is necessary to turn off the "BOILER ACTIVATED" option, otherwise the boiler will start after removing it from the cascade.

BOILER ACTIVATED





Factory: OFF
Possible selection: OFF, ON

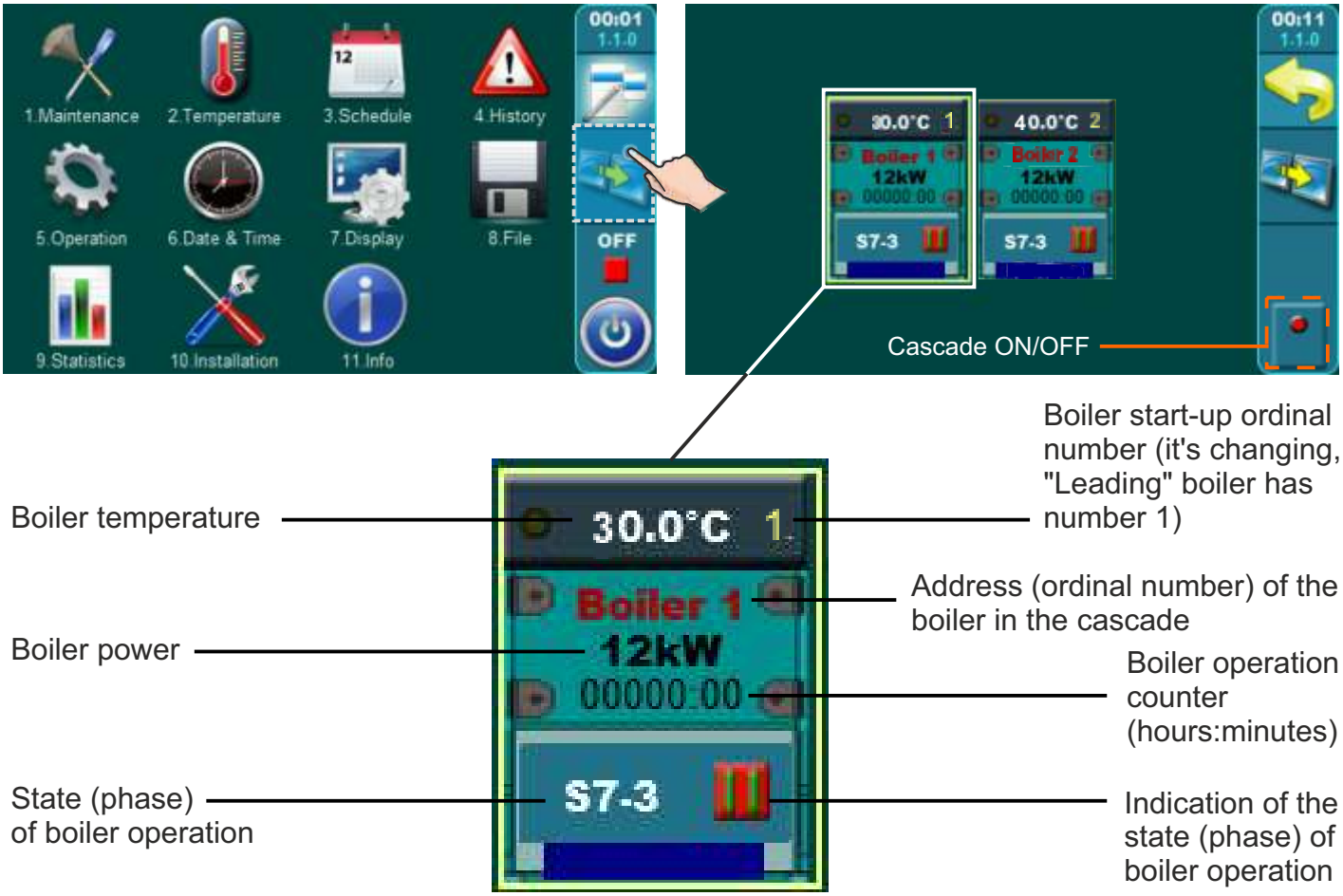
ON - The boiler is active in the cascade system, and if the "BOILER ATTACHED TO" option is turned on, the "cascade" can control that boiler (start/stop).
OFF - The boiler is not active in the cascade system and "cascade" cannot control it, on the cascade screen this boiler is shown in standard form except that it is marked "STOP" (red square).

Important:
1. This option is turned off at the factory, if we want this boiler to be controlled by "cascade" it is necessary to turn on this option.
2. If an individual boiler goes into error, the "BOILER ACTIVATED" option will automatically be turned off, after the error has been eliminated (corrected) and confirmed, the "BOILER ACTIVATED" option must be turned on if we want the "cascade" to control this boiler.

1.7. CASCADE SCREEN

Cascade screen can be displayed on each boiler in the cascade. The display on the screen of the cascade of an individual boiler will highlight (frame) the boiler on which we are viewing the cascade display.
A boiler in a cascade with the "BOILER ATTACHED TO" option turned off will be displayed in gray.

Example:
Screen display of a cascade with two boilers, the review is performed on boiler-1.



2.0. CONNECTING BOILERS IN CONFIGURATION 11 (CRO/BUF)

It is possible to connect a maximum of 7 PelTec/PelTec-lambda boilers in a cascade.
Note: Scheme 11 (CRO/BUF) is used only in cascade and external start (external control).

Important!
- in this configuration PelTec-lambda 69/96 boiler works only with CM2K module which must be installed and configurated
- in this configuration at PelTec-lambda 69/96 boiler shown is only Accumulation tank i.e. 2 sensors (at selection -/BUF)

2.1. MASTER / LEADING BOILER

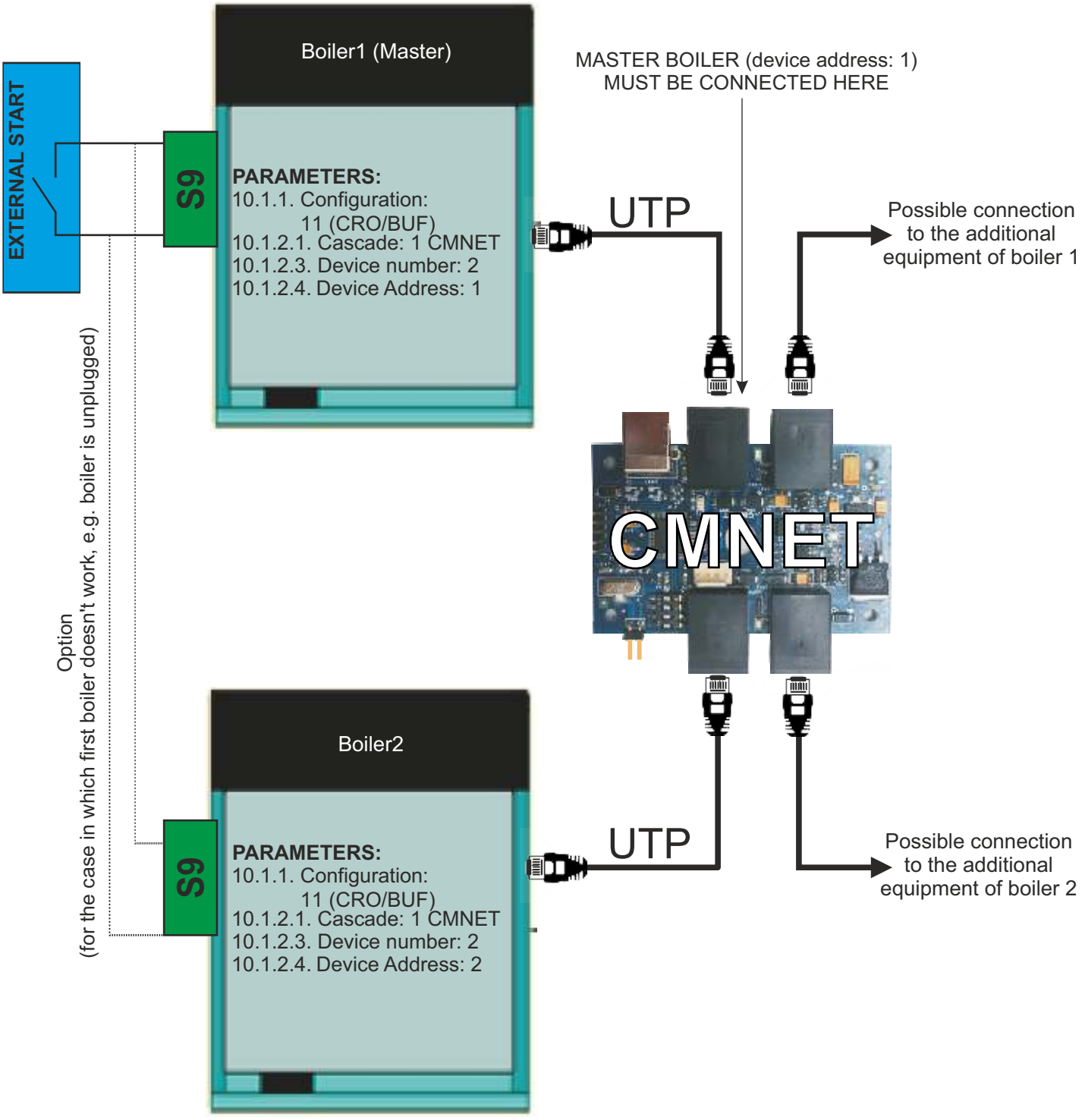
Boiler-1 is the "Master" (the boiler that leads the cascade). If Boiler-1 is disconnected from the cascade (or runs out of electricity or shuts down at the main switch), Boiler-2 (next by device address) automatically becomes "Master", but it can perform the function of "Master". When Boiler-1 is connected to the cascade again, it automatically becomes "Master". This "Master" function, if the need arises, can be taken over by any boiler in the cascade in order according to the address of the device.

Connecting the Accumulation (buffer) tank sensor / Hydraulic crossover sensor is not required because these temperatures are only informative, if sensors are not connected, regulation will show temperature " - °C". The boiler regulation will not report any error even if the sensors are defective.

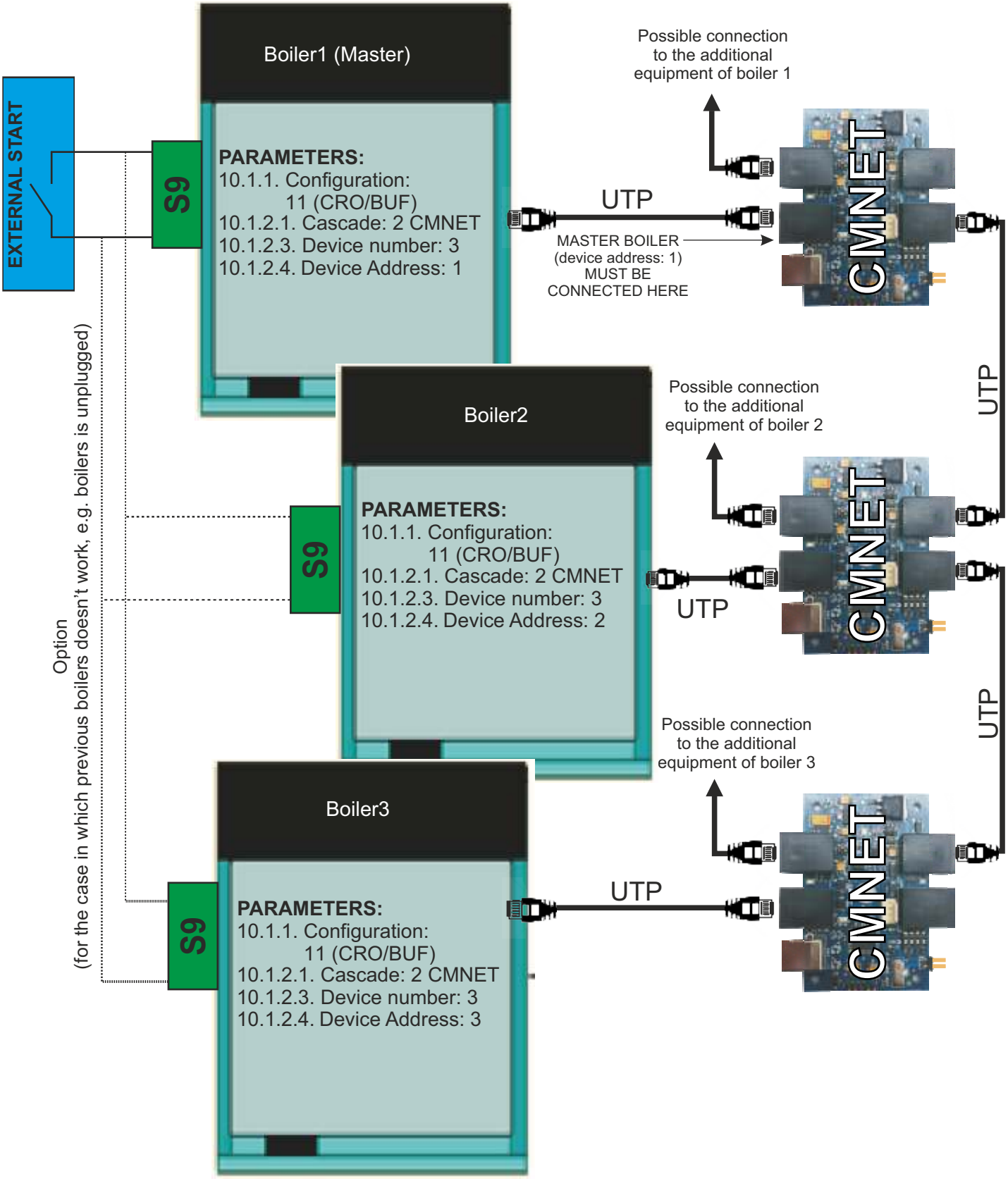
The "Master" boiler in cooperation with the CMNET module determines all actions within the cascade (determines when the next boiler will start/shut down, determines which boiler is "Leading Boiler"...).
The "Leading" boiler is the boiler that starts first, after the first start-up of the boilers in the cascade, the leading boiler is the "Master", but when it completes a certain number of working hours, the "Leading" boiler becomes the next boiler according to the serial number of the address, and so on.

2.2. POSSIBLE WAYS OF CONNECTING BOILERS IN CASCADE

EXAMPLE: CASCADE 2 boilers

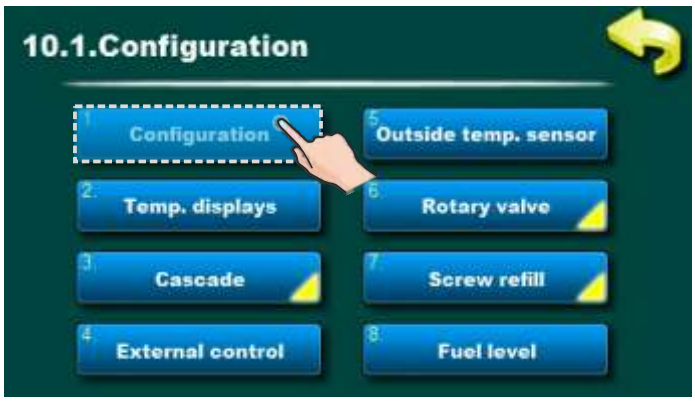


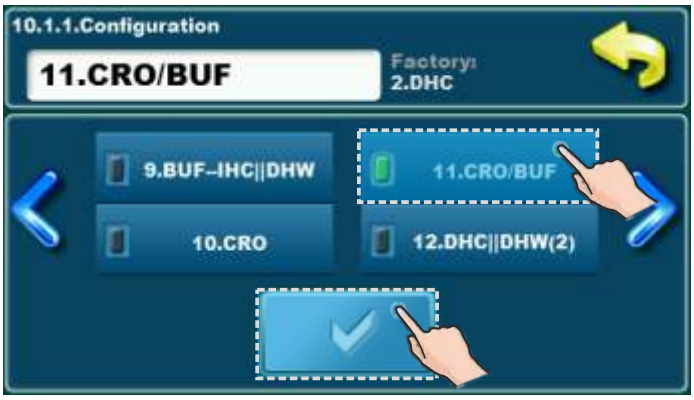
EXAMPLE: CASCADE 3-7 boilers



2.3. SELECTION OF BOILER CONFIGURATION - (11 (CRO/BUF))

Cascade can work (can be enabled) only on boilers that have selected configuration 11 (CRO/BUF). All boilers in the cascade must have the same configuration selected.

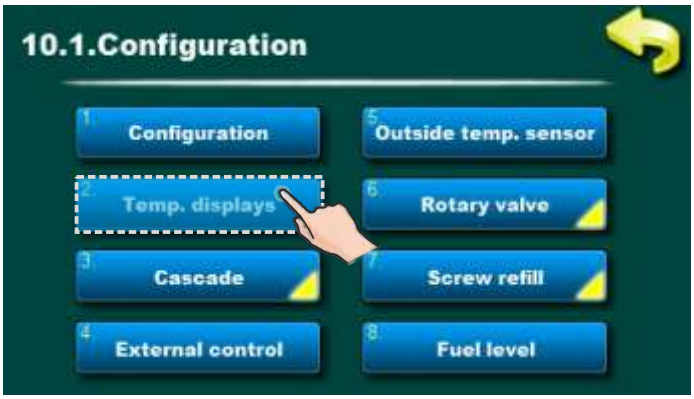




2.4. TEMPERATURE DISPLAYS

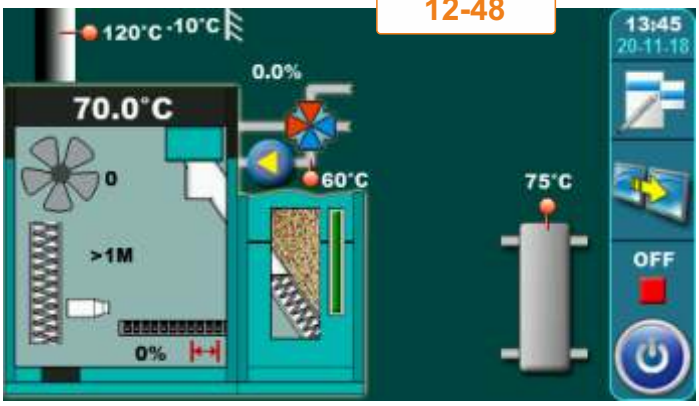
With this configuration, it is necessary to select the display of temperatures.
Factory: 1 Temperature
Possible selection: 2 Temperatures

1 TEMPERATURE: Hydraulic crossover (not possible for PelTec-lambda 69/96)
2 TEMPERATURES: Accumulation (buffer) tank

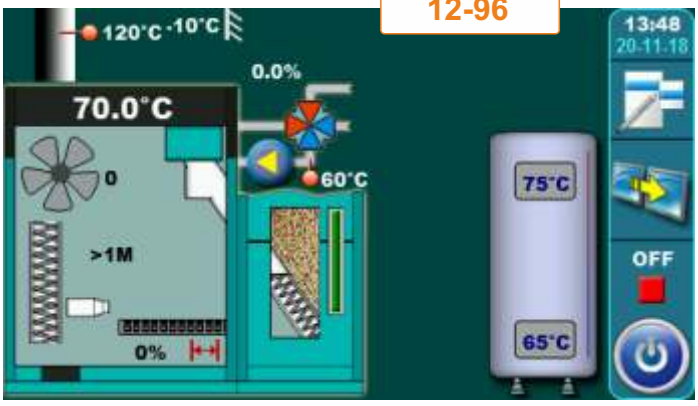


When ''1 Temperature'' is selected, screen shows hydraulic crossover with 1 temperature **(not possible at 69/96).**
When ''2 Temperatures'' is selected, screen shows Accumulation (buffer) tank with 2 temperatures.
This option can be changed only by authorized serviceman.

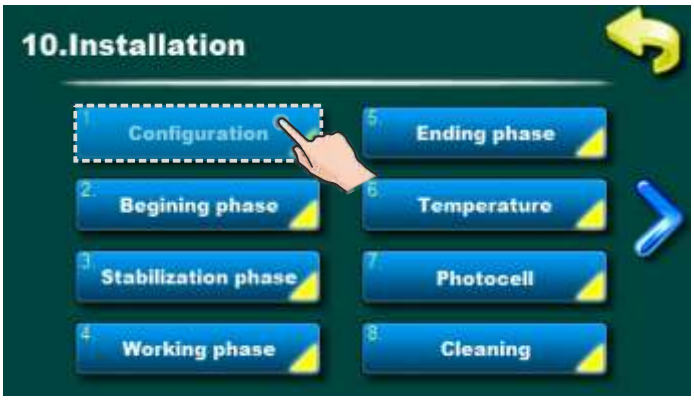
12-48

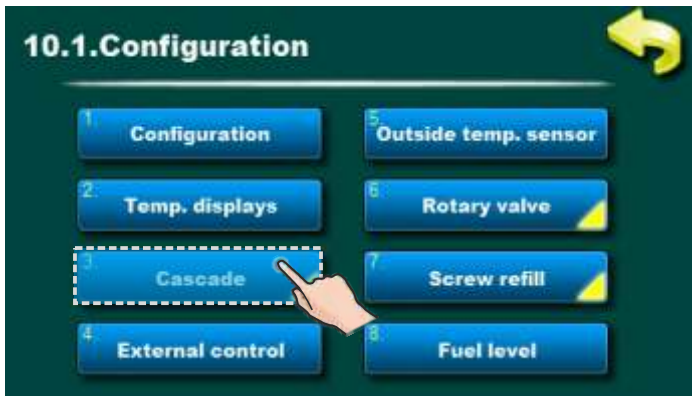


12-96



2.5. CONFIGURING THE CASCADE





CASCADE

Factory: OFF
Possible selection: OFF, 1 CMNET, 2 CMNET

OFF: Cascade is OFF

1 CMNET: cascade of 2 boilers
- 2 boilers in cascade with 1 CMNET device.

2 CMNET: cascade of 2-7 boilers
- 2 boilers in cascade with 2 CMNET devices.
- 3 boilers in cascade with 3 CMNET devices.
- 4 boilers in cascade with 4 CMNET devices.
- 5 boilers in cascade with 5 CMNET devices.
- 6 boilers in cascade with 6 CMNET devices.
- 7 boilers in cascade with 7 CMNET devices.

CASCADE MANAGER

Factory: ON
Possible selection: OFF, ON

This parameter must always be ON, on all boilers in the cascade. If this parameter is turned OFF, the boiler on which it is turned OFF, as well as boilers with an address that has a higher ordinal number, regardless of whether this parameter is turned ON or OFF, will not be able to become "Master". This parameter must not be turned OFF on the boiler with the address "Master" because the cascade will not work.

DEVICE NUMBER

Factory: 2
Possible selection: - Min: 2
- Max: 7

With this parameter, we define the number of boilers in the cascade. If we selected 1 CMNET under "CASCADE", then the number of devices must be 2. If we chose 2 CMNET, then the number of devices must be as many as there are boilers in the cascade (2-7). It is set on each boiler separately and must be the same number on all boilers in the cascade.

DEVICE ADDRESS

Factory: 1
Possible selection: - Min: 1
- Max: 7

This parameter determines the address (ordinal number) of the boiler. The boiler with address 1 is the "Master", and if the boiler with address 1 is disconnected from the cascade (or remains without electricity or is turned off at the main switch), the boiler with address 2 automatically becomes "Master" (if the boiler with address 2 is ready in the cascade) and so on. The address of the boilers is also used to determine the "leading boiler" - the boiler that starts first (depending on the "Time difference" - after how many hours of operation the boilers change priority of work). The "DEVICE ADDRESS" is entered into the controller of each boiler in the cascade and each boiler must have a different address.

TIME TO ON

Factory: 3600s
Possible selection: min. 0s, max. 18000s

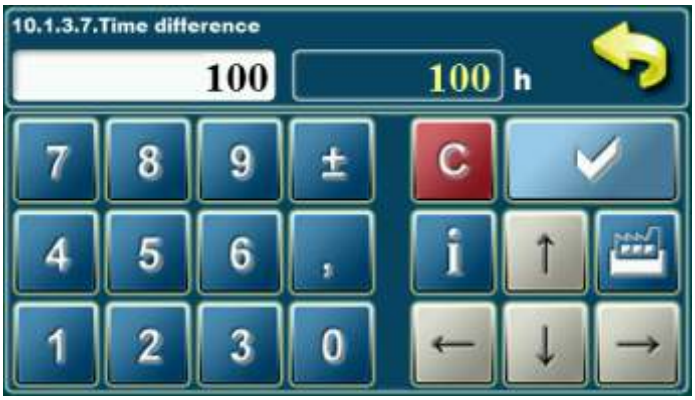
This parameter define after how long of work previous boiler on nominal power (D6) will be turned ON next boiler. It is adjust in each boiler separately and each boiler can have different values.

TIME TO OFF

Factory: 600s
Possible selection: min. 0s, max. 3600s

This parameter determines after how long operate "Leading boiler" at power (maximum) D3, last boiler go to extinction phase. It is set on each boiler separately and can be a different value.

TIME DIFFERENCE

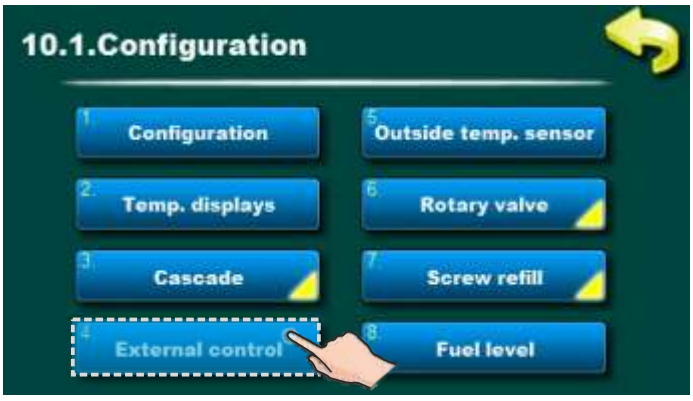


Factory: 100h
Possible selection: min. 0h, max. 500h
This parameter define after how many hours of work boilers change priority of work. It is set on each boiler separately and can be a different value.

COUNTER RESET

This parameter enable reset of boiler work time counter. It can be reset on each boiler separately.

2.6. EXTERNAL CONTROL



Factory: OFF
Possible selection: OFF, ON
This parameter define if boiler can be turned on with external start (e.g. heating regulator). It is adjust in each boiler separately and each boiler can have different values (ON/OF). If previous boiler loses electrical power managment takes over next boiler. To make this possible, external start must be performed with parallel connection on all boilers in cascade.

2.7. USER INTERFACE (disconnect the boiler from the cascade, disabling the start of the boiler)

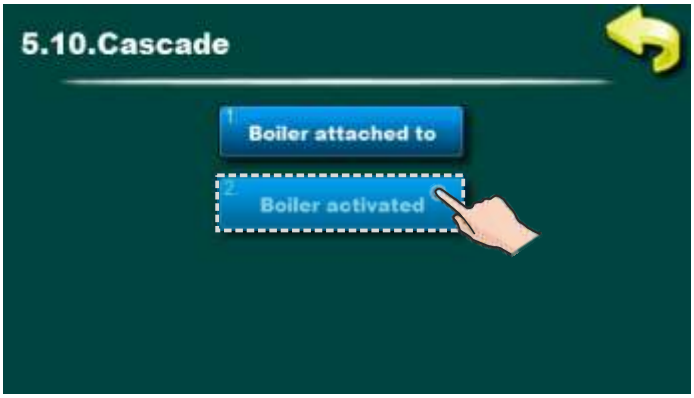
BOILER ATTACHED TO

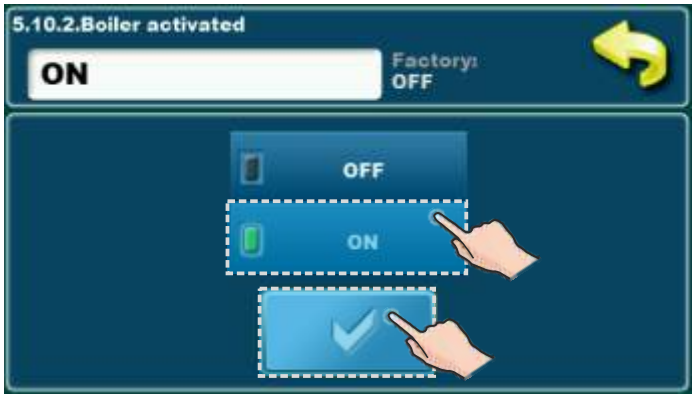
Factory: ON
Possible selection: OFF, ON

ON - The boiler is part of the cascade
OFF - The boiler has been removed from the cascade
- this boiler will be displayed in gray on the cascade screen
- this boiler will have a STOP/START switch on the boiler screen

Note:
Before taking off the boiler from the cascade, it is necessary to turn off the "BOILER ACTIVATED" option, otherwise the boiler will start after removing it from the cascade.

BOILER ACTIVATED





Factory: OFF
Possible selection: OFF, ON

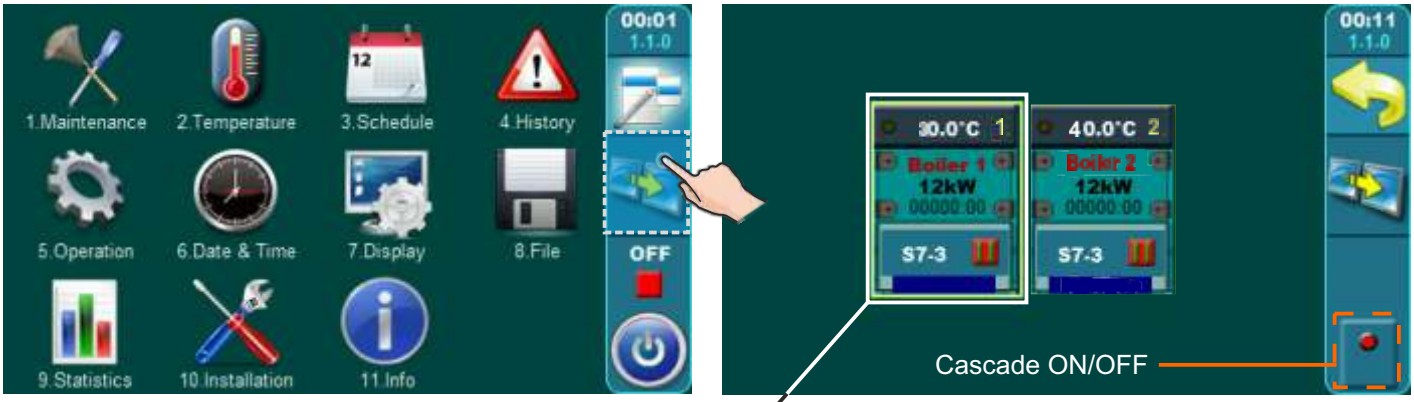
ON - The boiler is active in the cascade system, and if the "BOILER ATTACHED TO" option is turned on, the "cascade" can control that boiler (start/stop).
OFF - The boiler is not active in the cascade system and "cascade" cannot control it, on the cascade screen this boiler is shown in standard form except that it is marked "STOP" (red square).

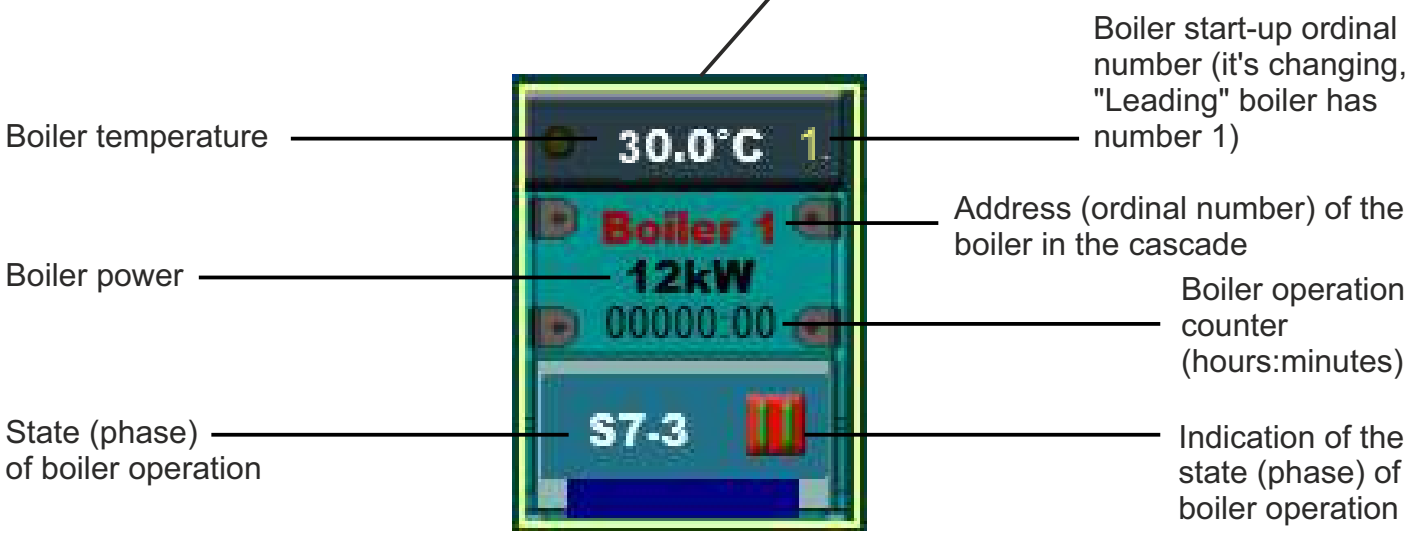
Important:
1. This option is turned off at the factory, if we want this boiler to be controlled by "cascade" it is necessary to turn on this option.
2. If an individual boiler goes into error, the "BOILER ACTIVATED" option will automatically be turned off, after the error has been eliminated (corrected) and confirmed, the "BOILER ACTIVATED" option must be turned on if we want the "cascade" to control this boiler.

2.8. CASCADE SCREEN

Cascade screen can be displayed on each boiler in the cascade. The display on the screen of the cascade of an individual boiler will highlight (frame) the boiler on which we are viewing the cascade display.
A boiler in a cascade with the "BOILER ATTACHED TO" option turned off will be displayed in gray.

Example:
Screen display of a cascade with two boilers, the review is performed on boiler-1.





Centrometal
TEHNIKA GRIJANJA

EZ IZJAVA O SUKLADNOSTI
EC DECLARATION OF CONFORMITY

Proizvođač *Manufacturer:* Naziv i adresa *Name and address:*	**Centrometal d.o.o.** HR-40306 Macinec, Glavna 12, Hrvatska / *Croatia*

Punom odgovornošću izjavljuje, da
We declare under our sole responsibility that

Proizvod *Product designation:*	Modul za upravljanje kotlovima u kaskadi *Module for managing boilers in cascade*
Tip / model *Type / model:*	**CMNET**

odgovara zahtjevima sljedećih propisa i također zadovoljava zahtjeve sljedećih standarda
is in conformity with the provisions of the following regulations and also complies with the following standards

Direktiva 2011/65/EU (RoHS) ***Directive 2011/65/EU (RoHS)***	EN IEC 63000:2018

Godina izdavanja CE oznake ***Year of affixing of CE marking***	2019.

Mjesto i vrijeme izdavanja
Place and date of issue

Macinec, 01.07.2021.

Ime, prezime i potpis ovlaštene osobe
Name, surname and signature of authorized person

Direktor / *Director*: Davor Zidarić

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