Corrigo user guide

Heating application

REGIN

THE CHALLENGER IN BUILDING AUTOMATION

About this user guide

This user guide covers all the models in the Corrigo series used with the heating application.

The document only covers functions which are available to users with *Operator* access and lower.

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Software revision: 3.3

More information

More information about Corrigo can be found in:

- ***Manual Corrigo Heating –*** Complete manual for configuration and maintenance of Corrigo with heating application.
- ***Manual E tool©*** **–** Manual of how to configure the controllers using the PC software E tool©.
- ***LON-interface variable list*** – Variable list for the Corrigo series, available in Swedish and English.
- ***Corrigo heating variables for EXOline, Modbus and BACnet*** – Variable list for EXOline, BACnet and Modbus communication, available in English
- ***Editable PDF files for Corrigo***
- ***CE - Declaration of conformity, Corrigo***

The information can be downloaded from Regin's website, www.regincontrols.com.

About Corrigo

Corrigo is a series of pre-programmed, configurable controllers for different applications.

Corrigo series comprises three model sizes: 8, 15 or 28 in-/outputs.

Available with or without front panel display and buttons. For units without front panel display and buttons a separate, cable-connected terminal E3-DSP with display and buttons is available.

All normal handling can be carried out using the display and buttons or by using E tool© , a software tool that runs on a computer connected to the controller with E-CABLE2-USB model communication cable or a network cable (crossover or straight).

Heating application, overview of functions

The temperature controllers are PI-controllers for control of heating, cooling and boilers, as well as PID for domestic hot water control. A number of different control functions as well as analogue and digital input and output functions can be bound to these controllers. The choice of which functions are to be used is free, the only restriction is the physical number of inputs and outputs of the different models. This flexibility means that what is shown in the display may differ from one unit to another, depending on which functions have been selected.

In- and output choices and other configuration are not made in the operator access level, the level described in this user guide, but in the Admin level and should be handled by educated personnel with specialised knowledge.

The heating application includes, apart from other things, the following functions:

Heating system

Control of 1-3 heating systems with outdoor compensated supply temperature and optional room temperature influence via a room sensor and a return sensor.

Cooling system

Control of a cooling system via a supply temperature sensor with optional dew point control. Fixed or outdoor compensated setpoint.

Domestic hot water

Control of one or two domestic hot water circuits with constant supply-temperature control and a storage-tank charger circuit.

Extra circuit

A differential thermostat function.

Differential pressure control

One constant differential pressure control circuit.

Boiler control

A boiler control can be configured to control 1-4 boilers in sequence, using 1-step, 2-step or modulating burners. The setpoint can be configured either as constant or as a setpoint value which is set via the other configured systems. A setpoint can also be received via an analogue input, heat demand, which in turn comes from another Corrigo.

Timer outputs

Up to five individually settable timer outputs for control of lighting, door locks etc.

Timer control

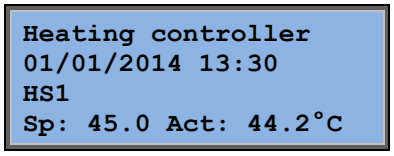
A year-based timer. Used e.g. for control of comfort periods and extra timer outputs.

Display, buttons and LEDs

This section is applicable to Corrigo units with display and buttons but also to the hand terminal E-DSP which can be connected to Corrigo units without display and buttons.

E3-DSP

Display



The display has 4 rows of 20 characters each. It has background illumination. The illumination is normally off, but is activated as soon as a button is pressed. The illumination will be turned off again after a period of inactivity.

Buttons and LEDs

UP ARROW:
Move up a row in the menu.
(Increase the parameter value.)

DOWN ARROW:
Move down a row in the menu.
(Decrease parameter value.)

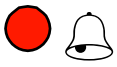
RIGHT ARROW:
Move to a lower menu level.
(Move the cursor to the right in the parameter.)

LEFT ARROW:
Move to a higher menu level.
(Move the cursor to the left in the parameter.)

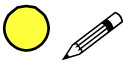
OK:
Open/Activate a selected menu/setting.
(Confirm a parameter value.)

ALARM:
Press to view the alarm list.

CLEAR:
Reset/Abort a parameter change unless OK has already been pressed.



ALARM LED:
Red, flashing light when there is an unacknowledged alarm. Non-flashing light when there is an acknowledged alarm which has not been reset.

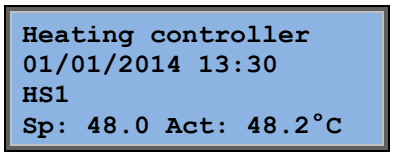


WRITE LED:
Some menus contain settable values. This is indicated by the yellow LED flashing. The value can be changed by pressing OK.

The menu system

Navigating the menus

The choice of access level/user access determines which menus are shown.



The start display, the display normally shown, is at the basic level of the menu tree. The appearance of the start display may vary since there are five types to choose from during configuration. The text in the first row can also be changed via E tool©.

Sp and **Act** stand for Setpoint value and Actual value. In the example above they are the values for HS1.
Actual value = the current measured temperature.
Setpoint value = the desired configured temperature.

Pressing DOWN arrow will move you through the menu choices at this, the lowest level. UP arrow will move you back through the choices.
Which menus are shown depends on which access level you are using (see the section "Access rights" for more information on logging on to higher levels), however also depends on the configured inputs/outputs.

The basic access level, the level normally active when you have not logged on, only shows a limited number of menus and submenus:

HS1-3, CS1, HW1, 2, HP1, Boiler, Extra circuit

Here, relevant values, setpoint values, controller settings, etc. are displayed. Changes can only be made if you have Operator access or higher.

Time/Extra timers

Here you can view and set the current time, date and weekday. If one of the digital outputs Timer output 1-5 is configured, the timer outputs which control when the digital outputs are active will also be displayed. Changes can only be made if you have Operator access or higher.

Holidays

Here you can set all holidays. Changes can only be made if you have Operator access or higher.

Energy/Cold water

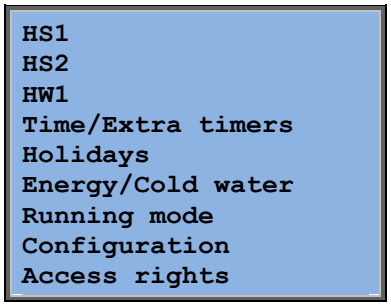
For reading of flow/energy from water meters, district heating meters, the total cold-water monitoring etc.

Running mode

In this menu you can read all inputs/outputs and view the 40 latest alarm events. This menu is read-only, i.e. you cannot configure the controller or manage alarms here.

Access rights

Here, you can log on to a higher level, log off to the basic level and change the password.



Without logging on, you can view a limited selection of menus. You are not allowed to make any changes, only view certain settings such as actual values, setpoint values and time settings.

With Operator access you can change operation parameters such as e.g. setpoint values and time functions.

To get to the next menu level, use UP arrow and DOWN arrow to place the display marker opposite the menu you wish to access and press RIGHT arrow.
At each level there may be several new menus through which you may move using the UP arrow and DOWN arrow buttons.

Sometimes there are further submenus linked to a menu or menu item. This is indicated by an arrow symbol at the right-hand edge of the display. To choose one, use RIGHT arrow again.
To go to a previous menu level, press LEFT arrow.

Change parameters

In some menus there are parameters that can be set. This is indicated by the yellow LED with ✎ flashing.

A quick blinking (2 times/s) indicates that the parameter can be changed using the present user access.

A slower blinking (1 time/s) indicates that a higher user access is required to change the parameter.

To change a parameter, first press the OK button. If you need a higher user access than you have to change the parameter, a log on menu will be displayed, see below. Otherwise, a cursor will appear at the first settable value. If you wish to change the value, do so by pressing the UP arrow and DOWN arrow buttons.

In numbers containing several digits you can move between the digits using the LEFT arrow/RIGHT buttons.

When the desired value is displayed press OK.

If there are further settable values displayed the cursor will automatically move to the next one.

To pass a value without changing it, press RIGHT.

To abort a change and return to the initial setting, press and hold the C-button until the cursor disappears.

HS1-3, CS1, HW1, 2, HP1, Boiler, Extra circuit

Different main menus will be displayed depending on the configuration of the controller. Each main menu has submenus which may look like this:

```
Actual/Setpoint
Temp control
Manual/Auto
HS1 ECO/comf mode
```

Actual/Setpoint

```
Outd temp:   -9.0°C
HS1
Act: 53.5°C   Setp→
Setp: 56.2°C
```

Here you can read actual values from sensors in the system, e.g. outdoor, supply, return and room temperatures. With Operator access or higher you can also adjust setpoints.

By pressing RIGHT arrow when this menu is shown, you access the menu for setting of the setpoint value. The setpoint is set by entering the supply temperatures required at different outdoor temperatures.

```
Outd comp setp HS1
  -20  °C = 67  °C
  -15  °C = 63  °C
  -10  °C = 59  °C
```

There are 8 settable outdoor temperatures and 8 settable supply temperatures.

```
Outd comp setp HS1
  -5  °C = 55  °C
   0  °C = 53  °C
   5  °C = 43  °C
```

```
Outd comp setp HS1
   10  °C = 35  °C
   15  °C = 25  °C
Man paral dis 5  °C
```

A parallel adjustment can also be added in order to displace the entire curve up or down.

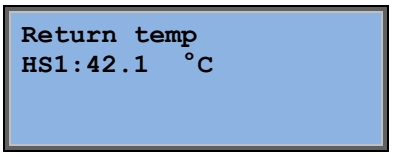
```
Pump stop HS1:On
Stop temp day:  17°C
Stop temp night: 17°C
Hysteresis: 2.0°C
```

Settings for pump stop, featuring option to deactivate the function.

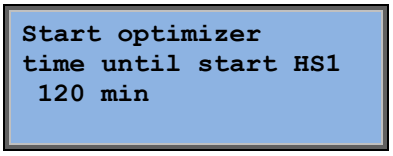
By pressing DOWN instead of RIGHT, the following menus will be displayed:

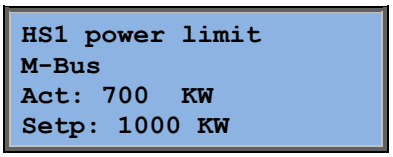
```
Room sensor HS1
      Act: 19.7 °C
     Setp: 20.1 °C
```

Setting of room temperature and reading of the actual temperature.



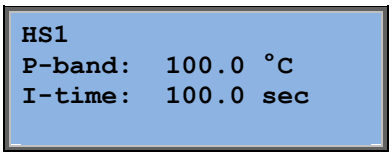
Reading of the actual return temperature.



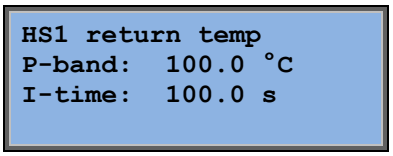


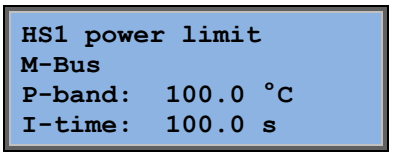
The output of the HS1 circuit can be limited by connecting an energy meter to port 2 of a E….M-3 model Corrigo.

Temp control



In this menu you make controller settings for the system. All systems are controlled by PI-controllers, except for the domestic hot water circuits which are controlled via a PID-controller.

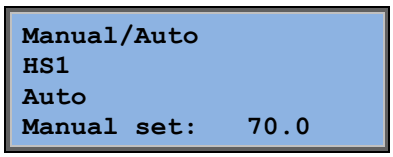




Manual/Auto

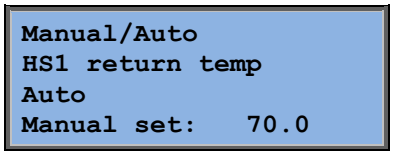
Handy feature which simplifies the checking of individual functions in the Corrigo.

All the configured control circuits can be controlled manually between 0...100 % and all the pumps can be set to On/Off.

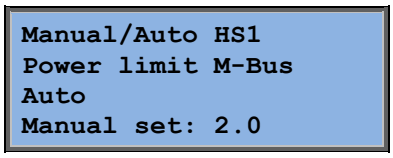


For manual operation of the analogue output belonging to HS1. The output can be set to ”Auto”, ”Manual on” or ”Manual off”.

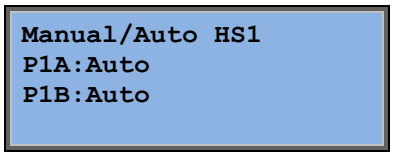
In the Auto position, the output is controlled via the controller. For Manual on, you can set the percent with which the valve is to open under ”Manual set”. If Manual off is selected, the analogue output is set to 0 V.



The same function as above, with the exception that the output refers to the return temperature, i.e. 0 % output gives 10 V and 100 % output gives 0 V on the analogue output HS1.



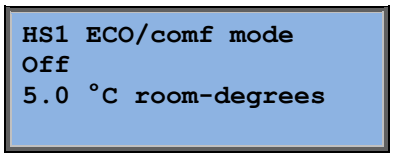
Menu for setting the power limitation controller when in manual mode.



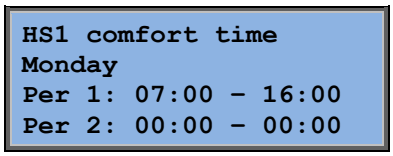
Menu for manual operation of the pump.

Economy/Comfort function

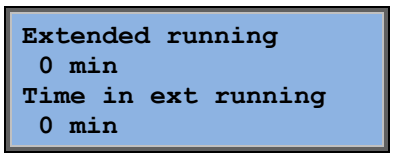
This function is used when you want to lower the temperature during days/nights/holidays. When the time is not within the comfort times, a decrease of the supply setpoint will be added. This decrease is given in room degrees and lowers the supply temperature by 3°C * the set decrease. Extended running can be used via DI to temporary obtain comfort mode on HS1-3.



When this function is On, you can press RIGHT arrow to set the comfort times.

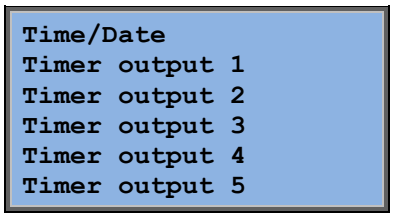


A total of 16 periods can be set, two periods for each weekday and two for holidays.



Information on how long the circuit has remained in extended comfort time, as well as setting of how long it should remain there after the input has been activated.

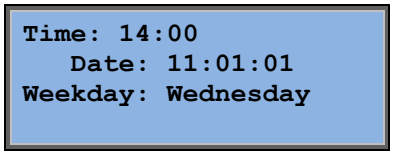
Time/Extra timers



Corrigo has a year-based clock function. This means that a week-schedule with holiday periods can be set for a full year in advance.
The clock has an automatic summer time/winter time change-over.

Up to 5 digital outputs can be used as timer controlled outputs. Each with individual week-schedules with two activation periods per day. These outputs can be used to control lighting, door locks etc. Only outputs which have been configured will be shown.

Time/Date



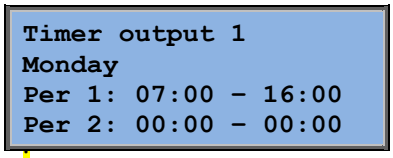
This menu shows and permits the setting of time and date.

Time is shown in 24-hour format.

Date is shown in the format YY:MM:DD.

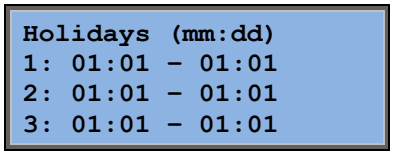
Timer outputs 1…5

Up to 5 digital outputs can be used as timer controlled outputs. Only outputs which have been configured will be shown. Each with individual week-schedules with two activation periods per day.



Each timer output has 8 separate setting menus, one for each weekday and one extra for holidays. Holiday schedules take precedence over other schedules.

Holidays

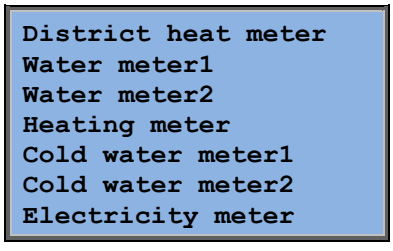


Up to 24 separate holiday periods for a full year can be set.

A holiday period can be any number of consecutive days, from 1 to 365. The dates are in the format: MM:DD.

When the present date falls within a holiday period, the scheduler will use the settings for the weekday “Holiday”.

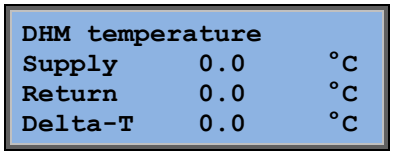
Energy/Cold water

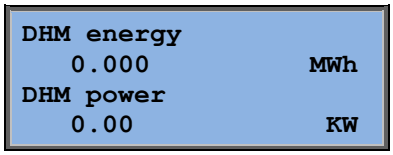


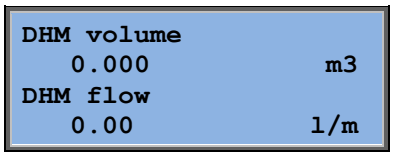
This menu displays the instant and total volume of cold water, hot water and energy consumption registered by the Corrigo. The values can either be obtained via pulses on the digital inputs or via communication from a connected M-Bus meter.

Which of the menus are displayed depends on which inputs are configured and if any M-Bus meters are connected.

District heating meter

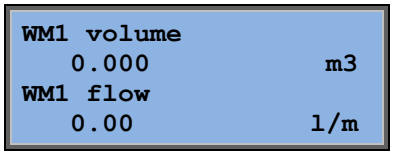






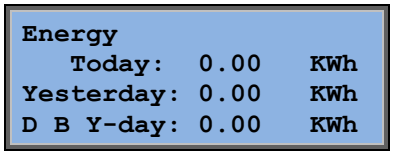
For these menus to be displayed, an M-Bus meter must be connected via port 2 on a 2-port Corrigo.

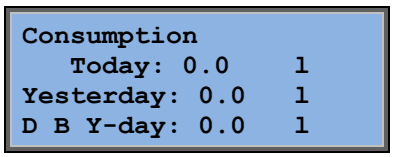
Water meter 1 & 2

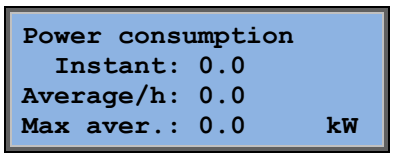


For this menu to be displayed, an M-Bus meter must be connected via port 2 on a 2-port Corrigo.

Heating meter

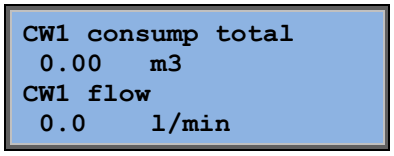




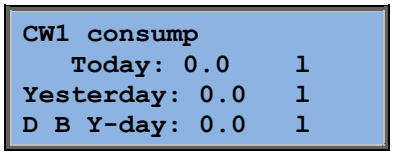


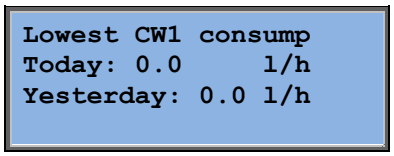
For reading of instant and total energy and hot water consumption.

Cold water meter 1 & 2



For reading of instant and total water consumption.



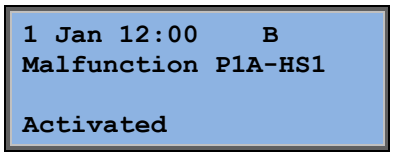


Electricity meter

Running mode

Here you can read all inputs/outputs and view the 40 latest alarm events. This menu is read-only, i.e. you cannot acknowledge alarms or configure in-/outputs here.

Alarm events

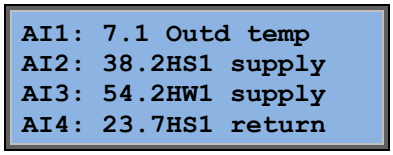


Alarm log which contains the 40 latest alarm events. The most recent event is listed first. The alarm log can only be used for viewing the alarm history. Alarms are handled in a special area, see the section "Alarm handling".

Inputs/Outputs

These menus show the current values for all configured inputs and outputs. These are read-only menus. No changes can be made here.

Universal inputs can be configured as either analogue or digital inputs.



Example of what the analogue inputs may look like.

Access rights

There are four different access levels, **Normal** level which has the lowest access and does not require logging on, **Operator** level, **Service** level and **Admin** level which has the highest access. The choice of access level determines which menus are shown, as well as which parameters can be changed in the displayed menus.

The basic level only permits changes in running mode and gives read-only access to a limited number of menus.

Operator level gives access to all menus except Configuration.

Service level gives access to all menus except the submenus Configuration/In- and Outputs and Configuration/System.

Admin level gives full read/write access to all settings and parameters in all menus.

Repeatedly press DOWN arrow button when the start-up display is shown until the arrow-marker to the left of the text-list points to Access rights. Press RIGHT arrow.

Log on

In this menu it is possible to log on to any access level by entering the appropriate 4-digit code. The log on menu will also be displayed should you try to gain access to a menu or try to do an operation requiring higher authority than you have.

Press the OK-button and a cursor marker will appear at the first digit position. Repeatedly press UP arrow until the correct digit is displayed. Press RIGHT arrow to move to the next position. Repeat the procedure until all four digits are displayed. Then press OK to confirm. After a short while the text on the line: "Present level" will change to display the new log on level. Press LEFT arrow to leave the menu.

Log off

Use this menu to log off from the present level.

Automatic logoff

If the access level is **Operator** or **Admin**, the user will automatically be logged off to Normal after a certain time of inactivity. The time is settable.

Change password

You can only change the password for access levels lower or equal to the presently active level.

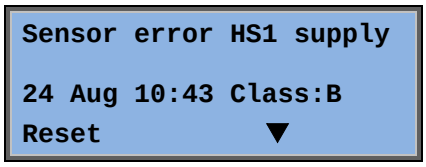
Other functions

Alarm handling

If an alarm condition occurs, the red alarm LED on the front panel of units with display or the alarm LED on a connected display unit will start flashing. The LED will continue to flash as long as there are unacknowledged alarms.

Alarms are logged in the alarm list. The list shows the type of alarm, the alarm date and time and the alarm priority (A, B or C alarm).

To access the alarm list, press the alarm button (the button with the red top) on the front panel of the Corrigo / display unit.



If there are multiple alarms, this is indicated by up/down arrow symbols at the right-hand edge of the display.

Use the buttons UP arrow and DOWN arrow to access the other alarms.

At the left end of the bottom display line the alarm status is shown. For active, unacknowledged alarms the space is blank. Alarms that have been reset will be indicated by the text Acknowledged. Still active or blocked alarms are indicated by the text Acknowledged or Blocked.

Alarms are acknowledged by pressing the OK button. You are then given the choice of acknowledging the alarm or blocking the alarm.

Acknowledged alarms will remain on the alarm list until the alarm input signal resets.

Blocked alarms remain on the alarm list until the alarm has reset and the block has been removed. New alarms of the same type will not be activated as long as the block remains.

Since blocking alarms can be potentially hazardous, you need a high log on authority to block alarms.

Alarms of all types activate the sum alarm output, if it has been configured. A-class alarms will also activate sum alarm A-class alarms will also activate sum alarm A, B/C alarms sum alarms B/C and the sum alarm output will be activated if either a A/B or C alarm is active, if these have been configured.

Class C alarms are removed from the alarm list when the alarm input resets even if the alarm has not been acknowledged.

Optional information screen

If RIGHT arrow is pressed once when the start-menu is shown, a menu showing text of your choice is displayed. The text can be used to show information concerning the commissioning company, name and phone number to service personnel etc. The easiest way to enter text is to use E tool©, but the buttons can also be used. Up to 4 lines of 20 characters can be entered.

Revision numbers

If RIGHT arrow is pressed twice when the start-menu is shown, a menu showing the program revision number and ID number is displayed.

Language

If RIGHT is pressed three times when the start menu is shown, a menu is displayed in which the language can be changed.

The different language files are stored in the application memory, from where are downloaded to the work memory. If a Corrigo has been reloaded with a newer program revision than the factory revision via E tool©, the controller will not permit language files to be downloaded from the application memory. This is because there is a risk that the language files are not compatible with the new revision. Therefore, you are limited to the two languages you have downloaded using E tool©.

Indication LEDs

Status indication can be found in the upper left corner of the controller. For controllers with display, the alarm indication and change mode LEDs are located in the keypad area.

Status indication

Designation	Colour	Description
P1 RxTx	Yellow/Green	Port 1, transmitting/receiving
P2 RxTx	Yellow/Green	Port 2, transmitting/receiving
Serv (...LON models)	Yellow	Service LED LON, commissioning
TCP/IP (…W models)	Yellow/Green	Green: Connected to other network equipment Blinking green: Network traffic Blinking yellow: For identifying
P/B (Power/Battery)	Green/Red	Power on/Battery error
Controllers with built-in display		
🔔	Red	Alarm indication. Flashing: There are unacknowledged alarms. Fixed: There are alarms which have been acknowledged but where the fault remains.
✎	Yellow	Change mode. Flashing rapidly: The display contains changeable values. Flashing slowly: A password is needed to make changes in the display.

Changing the battery

Corrigo has an internal battery to ensure the operation of the memory and real-time clock in the event of a power failure.
When the alarm ”Internal Battery” is activated and the battery LED lights up red, the battery has become too weak and needs to be changed. Nonetheless, due to a backup capacitor, the controller will function at least 10 minutes without power supply.
Since changing the battery requires knowledge of proper ESD protection, as well as dismantling and opening of the unit, this should be handled by skilled service personnel.

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