Regulus

www.regulus.eu

Instruction Manual **EN**
IR 14 Heating Controller
V.: IR14 CTC

Valid for FW 1.0.11.0

IR 14 CTC

Technical Description of IR 14 Heating Controller

Variant IR14 CTC

IR 14 Heating Controller (var. IR14 CTC) is a controller of heating systems with a CTC heat pump and a solar thermal system. The controller can handle up to 6 heating zones with a mixing valve, DHW heating by a heat pump, DHW heating by a switched heat source, it can also control auxiliary heat sources (electric or gas-fired boilers) and a HRV unit.

IR 14 Heating Controller is controlled by seven keys. Information is shown on a 4-line display. The Controller features 11 analogue inputs for temperature measurements (by Pt 1000 temperature sensors) one analogue input for a pressure transducer (4-20mA) and one input for Ripple control signal. Each of the analogue inputs can be used a a binary input. Further it features 11 relay outputs (250V 3A) and two PWM/0-10V outputs capable of continuous control.

The Controller is fitted with an Ethernet interface for a service intervention, firmware upgrades and eventually elementary visualization of the concerned heating system. The Controller also features an RS485 communication interface for connection of CTC heat pumps. As an option, an extension module can be connected to the Controller, e.g. for communication with OpenTherm boilers or to increase the number of heating zones, a module for control of HRV etc...

1.   How to operate IR 14 Controller

The controller is operated using 6 keys ◄, ►, ▲, ▼, **ESC**, **ENTER** on its front panel.
The **DISP** key switches between the control program menu and menu with information on the controller. It is not necessary to use this key during operation.
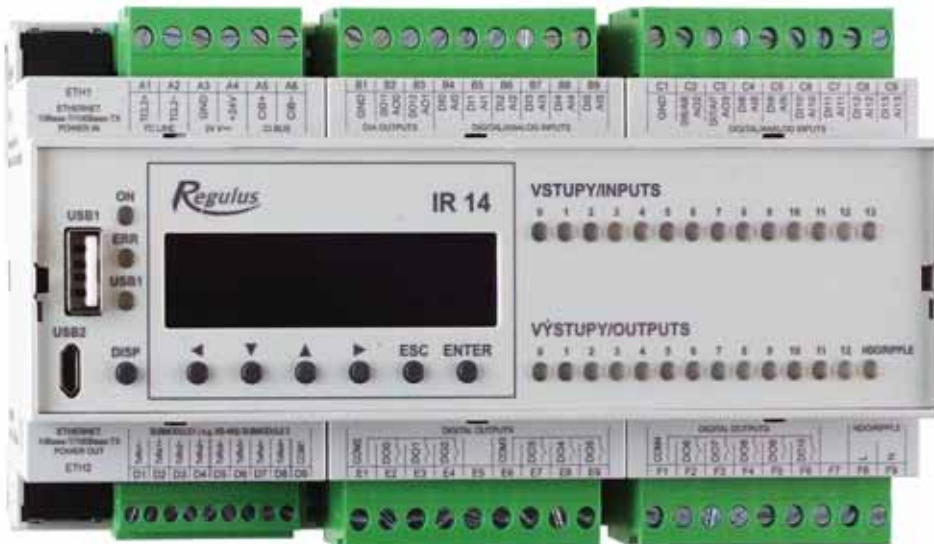
The keys ꜜ, ꜛ are used to browse in the menu. In order to edit a parameter, press **ENTER** and a cursor appears on the parameter. The values of numeric parameters can be increased/decreased by pressing ꜜ/ꜛ keys. Selection parameters (e.g. ON/OFF) are chosen by pressing keys ◄, ►. When finished, pressing **ENTER** will move the cursor to the next parameter in the same display. Parameter editing can be also exited without saving by pressing the key **ESC**.

1.1.   Basic User Menu

Pressing **ESC** in the basic User menu will always bring back the first – basic display.
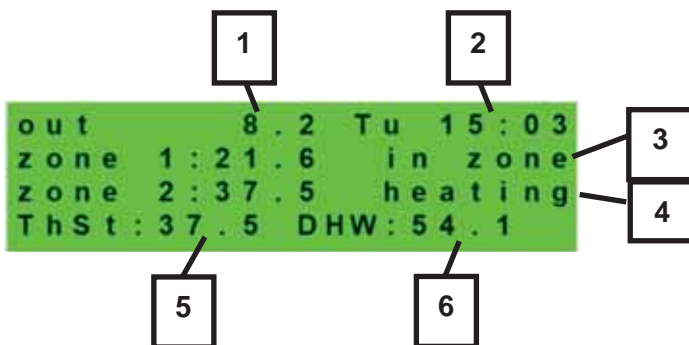
1 – outdoor temperature

2 – weekday and time

3 – temperature in zone (if room temp. sensor is used)

4 – heating water temperature (if no room temp. sensor is used)

5 – temperature in thermal store

6 – temperature in DHW storage tank

Heating zone display (zone 1, zone 2):


```
Zone1:perm. comfort
room t. : 21.7(21.7)
adjust :    0.0 RC25
heat.w. : 29.6(29.9)
```

1 – zone state (information on the current heating zone state)

2 – current and desired room temperature (if no room sensor is used, the data is shown as 0.0)

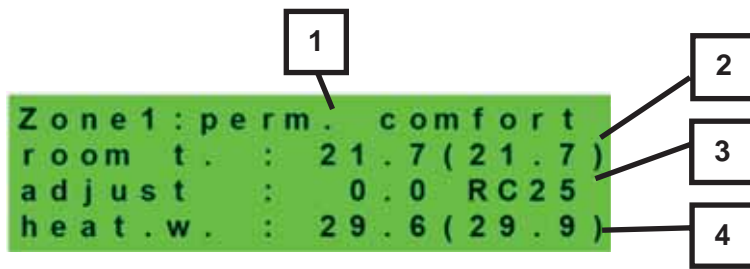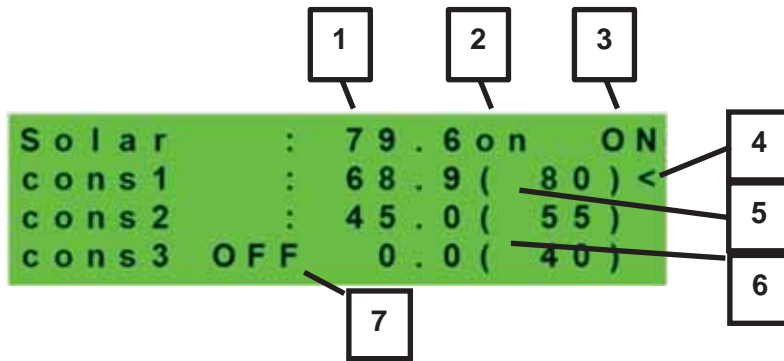*3 – adjustment to the desired room temperature. When a room unit is used, "PJ" appears and the adjustment made by this unit is shown.*

4 – current and desired heating water temperature for the zone

Below are the possible operating states indicated on the service display and their equivalent in the web interface of the controller:

Service display	Web interface display
off by service	DISABLED BY SERVICE
off by user	DISABLED BY USER
low syst.press	TOO LOW SYSTEM PRESSURE
extern. block	BLOCKED EXTERNALLY
store low t-HP	THERMAL STORE BELOW HP MIN. TEMP.
fast loading	FAST BOILER/FIREPLACE LOADING
stor.low t-zon	THERMAL STORE BELOW ZONE MIN.TEMP.
max.z.temp.exc	MAX. ZONE TEMPERATURE EXCEEDED
block-cool.t.	COOLING BELOW ZONE TEMPERATURE
cool.other z.	COOLING IN ANOTHER ZONE
block-period	HEATING BLOCKED IN SET PERIOD
block-outd.t.	HEATING BLOCKED BY OUTDOOR TEMPER.
off-time prog.	TIME PROGRAM – SETBACK, ZONE OFF
block-room t.	ROOM TEMPERATURE REACHED
air cooling	AIR COOLING
cool. active	COOLING ACTIVE
floor drying	FLOOR DRYING PROGRAM
comf-low out.t	COMFORT - LOW OUTDOOR TEMPERATURE
time prog.comf	TIME PROGRAM – COMFORT TEMPERATURE
time prog.setb	TIME PROGRAM – SETBACK TEMPERATURE
th.st.overheat	THERMAL STORE OVERHEATED
holidays	HOLIDAYS
perm. comfort	COMFORT TEMPERATURE CONTINUOUS
perm. setback	SETBACK TEMPERATURE CONTINUOUS
DHW heating	DHW BEING HEATED
heat.- holid.	HOLIDAYS
cool. holid.	HOLIDAYS

Solar thermal system display:

```
S o l a r        :    7 9 . 6 o n      O N
c o n s 1        :    6 8 . 9 (    8 0 ) <
c o n s 2        :    4 5 . 0 (    5 5 )
c o n s 3    O F F     0 . 0 (    4 0 )
```

1 – solar collector temperature

2 – system ON

3 – ON = solar pump running

4 – marking of the currently heated DHW storage tank

5 – DHW storage tank 1, current temp (desired in solar heating)

6 – DHW storage tank 2, current temp (desired in solar heating)

7– DHW storage tank 3, not used

Display of DHW zone:

```
D H W   z o n e
s t a t e        : o n
t a n k          : 5 0 . 3 (    5 0 )
D H W   h e a t : n o   h e a t
```
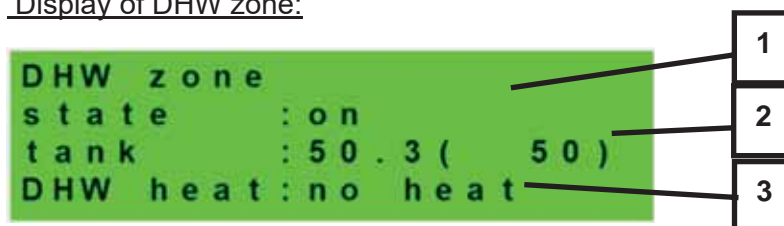
1 – zone state (on / off / no)

2 – current and desired temperature in DHW tank

3 – heating by heat pump, aux. source (heat / no heat)

Display of heat pump, HP cascade:

```
H e a t   p u m p
1 : r e a d y
2 : O F F    -   s e r v i c e
3 : O F F    -   s e r v i c e
```

1 – state of heat pump No.1, No. 2, No. 3

In this section, heat pump states are shown that are enabled on the Service level.

The states can be following:

- **OFF – service -** heat pump is turned off by a heating engineer

- **OFF - user** - heat pump is turned off on the controller User level

- **fault** - heat pump is in alarm mode, alarm details are shown on the User level in HP Alarms menu
- **return - max.T -** heat pump is blocked by max. possible return temperature
- **flow - max.T** - heat pump is blocked by max. possible flow temperature
- **ambient – min.T** - heat pump is blocked by min. possible outdoor temperature
- **ambient – max.T** - heat pump is blocked by max. possible outdoor temperature
- **sup.refrig.vapor** - heat pump is blocked by max. compressor temperature
- **high T earth circ.** - heat pump is blocked by max. brine circuit temperature
- **vapor – low T** - heat pump is blocked by low evaporation temperature
- **vapor – high T** - heat pump is blocked by high evaporation temperature
- **cond. – high T** - heat pump is blocked by high condensing temperature
- **EEV-low T intake** - heat pump is blocked by expansion valve's low suction gas temp
- **EEV-low T vapor** - heat pump is blocked by expansion valve's low evaporation temperature
- **EEV-high T vapor** - heat pump is blocked by expansion valve's high evaporation temperature
- **EEV-low superheat** - heat pump is blocked by expansion valve's low superheat temperature
- **EEV-high T cond.** - heat pump is blocked by expansion valve's high condensing temperature
- **high pressure** - heat pump is blocked by high refrigerant pressure
- **defrosting** - heat pump is defrosting (only for air/source heat pumps)
- **min.run time** - HP min. running time is active. This activates always after start, DHW heating or defrosting
- **DHW heating** - heat pump is heating DHW
- **rebooting** - heat pump is blocked by min. time between 2 compressor starts
- **heating** - heat pump is heating your home
- **RC blocking** - heat pump is blocked by Ripple control
- **vol.flow control** - heat pump's circulation pump is running
- **ready** - heat pump is ready to start heating as soon as there is call for heat
- **vapor - low T-IR** - heat pump is blocked by refrigerant low evaporation temperature
- **vol.flow control-IR -** heat pump's circulation pump is running
- **IR internal error** – controller fault preventing heat pump from starting
- **external blocking** – heat pump start is externally blocked
- **heating from the PV** – heat pump utilizes electricity from PV system
- **waiting for PV** – heat pump is waiting for desired current values from PV to start
- **low flow** – heating water flow through heat pump is too low
- **PWM pump failure** – PWM circulation pump fault
- **PWM mod.disconnected** – PWM output module is disconnected (if used)
- **compr.driver error** – error of HP's compressor driver
- **min.run time – DHW** – HP min. running time during DHW heating
- **min.run time - PV** – HP min. running time when powered from PV system

Display of auxiliary heat source and thermal store:

```
ON/OFF  sour.no  heat        ─── 1

Th.Store:   47.6(  0.0)      ─── 2
Ripp.c.  :   off             ─── 3
```
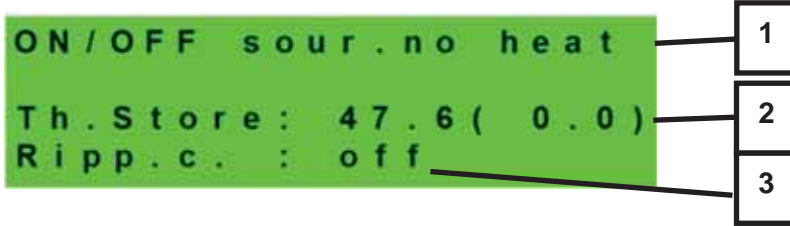
1 – state of auxiliary source: heat / no heat / none

2 – current thermal store temperature (desired)

3 – Ripple control signal: on / off

Display of auxiliary heat source connected via OpenTherm interface:

```
OpenTherm  sour.   none      ─── 1
req.temper.  :  0.0
flow  temp.  :  0.0          ─── 2
communicat.  :OK             ─── 3
```

1 – state of OT source: heat / no heat / none

2 – desired and real flow temp. of OT source

3 – state of communication with OT source: OK / error

Display with firmware version and release date:

```
IR14CTC
FW:v1.0.10.107
23.07.2024
www.regulus.cz
```

Controller in factory setting:

```
        !WARNING!
After   failure
controller  reset  to
FACTORY  SETTINGS!!!
```

If the display shows the text above with warning about the controller being reset to default settings, it is necessary to contact a service provider who shall set the respective controller parameters.

Selection of the desired setting (menu):

While in MENU, use arrow keys ◄, ➤ to select the desired setting:

Settings < for user > – user setting of zones, DHW heating and other parameters.

Settings < add.modules > - display of basic information on additional modules, if present.

Settings < service > – service setting of zones, DHW heating, heat sources and other parameters.

Access to the Service Menu is password protected and parameter adjustments in the Service Menu are not intended for laymen!

< circulation > - setting of immediate DHW recirculation (circulation period). After the set recirculation time expires, the function will be turned off automatically.

< zones 3 to 6 > - basic setting of heating zones 3 to 6 (zones have to be connected to IR via additional modules). The adjustment range is described in Chapter 2.1 (setting of heating zones 1 and 2).

2.   <u>User Menu</u>

The keys ◄, ➤ enable browsing in the User Menu, and the selected item can be entered by pressing **ENTER.**

2.1.   <u>Heating Zones</u>

<u>Heating Zone basic settings</u>

T comfort (°C) ....………. Desired comfort room temperature in zone.

Decrease during setback time (°C) ………. Setting by how many °C the desired room temperature will be decreased during setback time.

During a day, the controller switches the desired zone temperatures by the preset time schedule (for zones 3 to 6 adjustable from the web interface only).

zone on.......................Switching on a heating zone on the User level. When a zone is switched off on the User level, the circulation pump will be switched off and the mixing valve will shift to closed position..

The pump and valve can be activated by frost protection (if on and active).

<u>Summer/winter mode</u>

state ....Switching on/off the function for automatic transition between summer and winter modes. *Summer/Winter* mode is intended to turn on zone heating when the outdoor temperature stays below the preset threshold temperature **(winter temp)** for a certain time **(winter time)**, and vice versa, to turn off zone heating when the outdoor temperature exceeds the preset threshold temperature **(summer temp)** for a certain time **(summer time)**.

summer temp (°C) .....If the outdoor temperature keeps above this value for the time set in parameter *summer time*, the Controller will switch to *summer* mode.

summer time (h) ....see *summer temp.*

winter temp (°C).........If the outdoor temperature keeps below this value for the time set in parameter *winter time*, the Controller will switch to *winter* mode.

winter time (h)............see *winter temp.*

2.2. HRV Zone

<u>Basic settings of HRV Zone</u>

comfort (%) ....HRV unit power settings during a "comfort" mode from 15 to 100%.

setback (%) ....HRV unit power settings during a "setback" mode from 15 to 100%.

During a day, the controller switches the desired HRV unit power by the preset time schedule (adjustable from the web interface only).

zone on.......................Switching on Zone on the User level.

<u>Boost function 1, 2, 3 settings</u>

boost 1, 2, 3................Switching on the Boost function. HRV unit power will be temporarily raised to the set *power* level for a time span set by the *period* value. After the Boost period expires, the HRV unit will be switched back to automatic mode. This function could be also switched on by a button connected to one of the controller inputs (see the service level).

power (%) ....see *boost 1, 2, 3*.

duration (hh:mm).......see *boost 1, 2, 3*.

<u>Summer bypass settings</u>

summer bypass ....Switching on the Summer bypass function. This function can be assigned to a room sensor in one of heating zones (however only when a room sensor/unit is present in the respective zone). The sensor used is defined by the parameter **assign function to zone**. This function opens the bypass flap when the outside temperature is lower than set room temperature **(request t.)** on the selected room sensor. At the same time, the outdoor temperature shall be higher than the minimum outdoor temperature value set on the service level. The summer bypass function can only be switched on in the summer mode of the selected zone (the parameter can be set on the service level).

assign function to zone (zone number 1 – 6)
 ....see *summer bypass*.

request t. (°C)............see *summer bypass*.

2.3.   Time programs

Time programs can be set either for separate days, or in blocks Mo-Fr and Sa-Su.

When the program is being set for separate days, there are 2 transitions from Comfort to Setback and 2 from Setback to Comfort for each day.

When the program is being set in blocks, there are similarly 2 transitions for the blocks Mo-Fr and Sa-Su. By selecting *copy YES*, the respective blocks of time program will be rewritten.

If program copying is not desired, keep the option *copy NO* and leave the menu by pressing **ESC**.

Holiday mode – specific temperatures in zones can be set for the set holiday period which the controller will maintain.

2.4.   OTC curves

The basic weather-compensating heating curve is calculated from heating system parameters that are entered on the Controller service level. On the User level, the basic curve can be shifted in parallel or its inclination changed using two parameters.

OTC curve shift (°C)

 .... OTC curve shift for the set outdoor temperatures of -15 °C and +15 °C. When the curve is shifted at one of the points, the other point always remains unchanged (i.e. the curve rotates around it). In order to shift the whole curve, it is necessary to enter the same values into both the shift values.

The next displays can show a modified OTC curve described by 4 points [E1, I1] to [E4, I4], where E1, E2, E3 and E4 are set outdoor temperatures and I1, I2, I3 and I4 the respective calculated desired weather-compensated heating water temperatures.
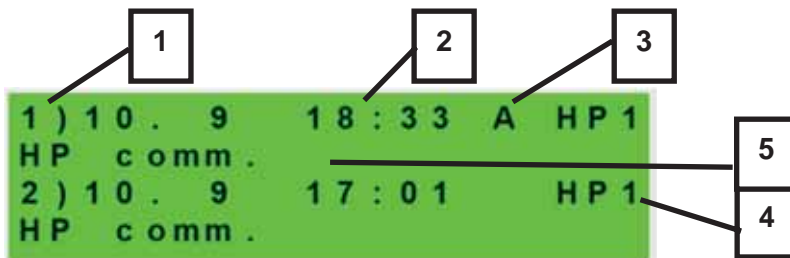
2.5.   Heat pump control

HP1, HP2, HP3 ....Switching on/off one of heat pumps in cascade on the user level.
A heat pump switched off on the User level still communicates with the Controller, however no demands from heating/DHW are sent to it.

2.6.   Heat pump errors

In this menu all heat pump errors can be reset (by changing the option *Reset all errors* to *Yes*). By pressing the down arrow, the HP error log can be browsed.

1 – error serial number (1 – 10)
2 – date & time of error occurrence
3 – information if the error is still active (A)
4 – number of HP with error (1 – 10)
5 – error text description

2.7.   Other errors

List of recent controller faults other than heat pump errors. These errors include, for example, errors of sensors, connected modules, errors of heat sources...

2.8.   Settings of hot water heated by heat pump (DHW)

DHW on ....Switching on DHW heating by heat pump on the User level.
T comfort (°C) ....Desired DHW temperature.
Decrease during setback time (°C) ... Setting by how many °C the desired DHW temperature will be decreased during setback time.

During a day, the controller switches the desired DHW temperature from HP by the preset time schedule.

2.9.   Settings of thermal store heating

ThSt on ....Switching on thermal store heating on the User level.
T comfort (°C) ....Desired temperature in thermal store.
Decrease during setback time (°C) ... Setting by how many °C the desired thermal store temperature will be decreased during setback time.

During a day, the controller switches the desired thermal store temperature by the preset time schedule.
The real desired thermal store temperature is the maximum of all demands from zones (heating zones, thermal store zone, demands from universal functions...).

2.10. DHW recirculation settings

DHW recirculation and its time program settings on the User level. When recirculation is on, it is performed following the time schedule set for each day. For this period, circulation time and idle time of the circulation pump can be set if its continuous operation is not desired.

on ....Recirculation switched on.

circ time (min)............Circulation pump running time setting (pump is running).

idle time (min)............Circulation pump idle time setting (pump is stopped).

circulation times - Setting time intervals for individual days when the recirculation is active.

2.11. Statistics

HP statistics is displayed here (operating time and number of compressor starts) and statistics of DHW and auxiliary source operating time.

2.12. Operating data

All temperatures, pressure, most important heat pump temperatures and states and controller output values are displayed here for the user.

```
out        8.2  Tu  18:36
zone  1:29.6    heating
zone  2: 0.0    heating
ThSt:45.0  DHW:50.2
```

An **E** letter at the end of the temperature sensor line means that the given temperature sensor is outside its permitted working range and it is necessary to check this sensor and its connection and correct the fault.

2.13. Other

Website password reset

....................................Controller website username and password reset for User level (select *reset*). By resetting the default values are set (username: user, password: user).

Lang. of heat pump state and error email language

....................................Selection of the language in which the heat pump statuses, sensor names, blocks and system faults will be displayed on the display and on the web.

2.14. Time and date setting

Time and date shall be set to ensure proper operation of time programs (zones, recirculation, DHW heating etc.). Clock is set in 24 hour format.
If the controller is connected to the Internet, the date and time are automatically updated every hour using NTP time servers.

After time and day are set, pressing ▼ key will show the display:

```
Saving  time      OK

press  "C"  for  return
```

When this display appears, the time and date will be stored in the controller memory.

2.15.   RegulusRoute – parameters of connection with the service

RegulusRoute service enables remote access to the Controller avoiding the need to use a public IP address. If you wish to have this service configured, kindly contact Regulus.

RegulusRoute ....displays whether the service is on.
Service status ....displays the current service status and error information.

Then follows the information about IR driver, remote server of RegulusRoute service along with a detailed description of the last fault of the service. This information can be useful when solving connection errors with a service technician.

IR14 name ....IR14 Controller login name to RegulusRoute service.

3.   <u>Additional modules</u>

In the basic menu, when ***add.modules*** are selected, user information on additional modules (if present) can be viewed.

<u>Fire Module</u>

```
F i r e               :
t e m p e r a t u r e :  4 5 . 0 ° C
d a m p e r            : 1 0 0 %
D H W   p u m p        : n o n e
```

Temperature (°C) ....Fireplace flow temperature.

Damper (%) ....Display of how opened is the damper of the air supply to the fireplace.

DHW pump ....Display of the state of pump for DHW heating from Thermal Store (on/off).

<u>UNI module, UNI module 2</u>

```
U N I   m o d u l e   :
o u t p u t           : n o n e
t e m p .   1         :      0 . 0
t e m p .   2         :      0 . 0
```

Output (on/off) ....   State of universal output of UNI module (1, 2) displayed.

T1 (°C) ....   Display of t1 temperature from UNI module (1, 2).

T2 (°C) ....   Display of t2 temperature from UNI module (1, 2).

4. Web interface

The controller involves an integrated website showing a heating system overview and user settings.

For its website access, the controller shall be connected to a LAN or directly to a PC using a network cable. The parameters for the network connection (IP address, gateway address and subnet mask) can be found in the controller information by pressing the **DISP** key. Pressing **DISP** again will return the controller to user display.

After the controller is connected to a LAN, by entering its IP address into the browser address bar the initial login form will be displayed:
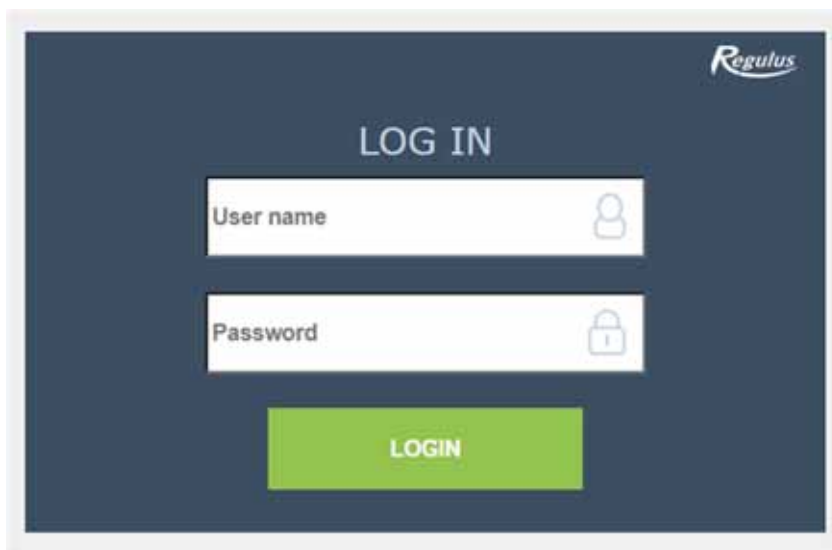
Login name for user level is: **user**,
Password for user level is: **user**.

After login to the IR controller via the website interface through IR Client app or RegulusRoute service the basic screen with tiles appears.

On the computer, in the left part of the screen there is a menu for entering the individual sections to set, at the top right there is a button for logging out of the web interface and a flag allowing to change the language version of the web interface.

In the mobile version of the website, it is possible to expand the menu by clicking on the icon in the upper left corner, while the logout button and the flag for changing the language version is located in the upper right corner.

When editing values (numbers, texts), it is necessary to confirm each change by pressing the **SAVE CHANGES** button.

4.1.   Home screen (HOME)
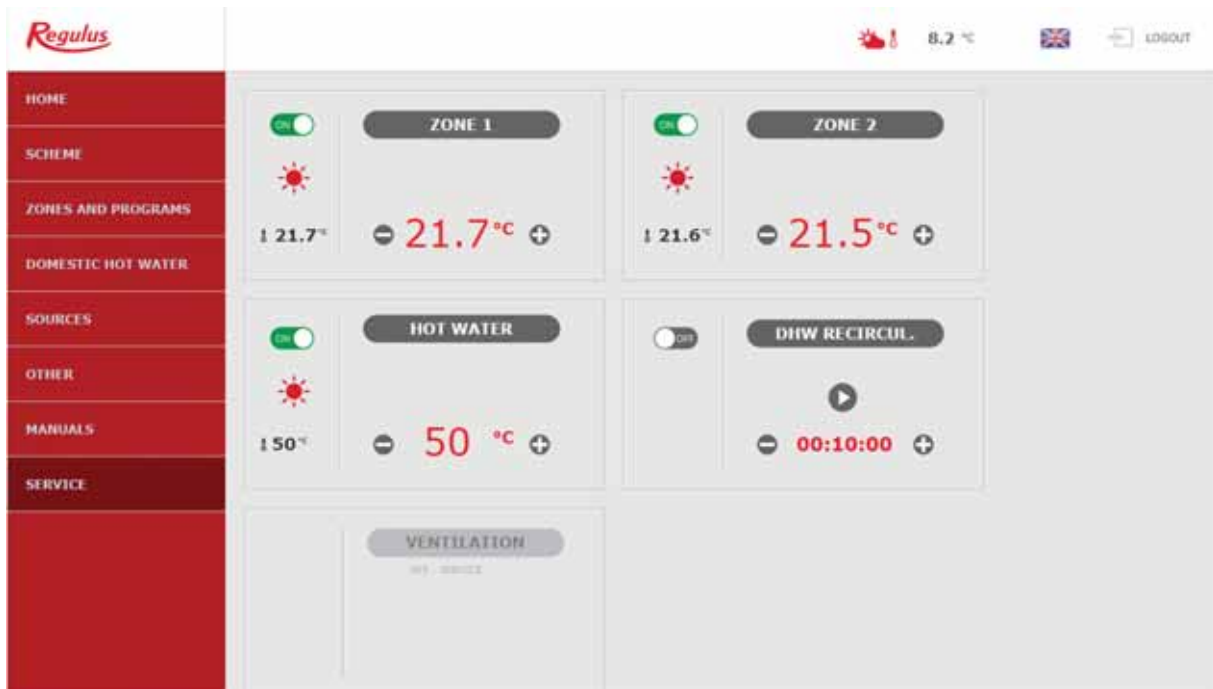
The home screen contains basic information about the two heating zones, DHW heating, recirculation and Heat Recovery Ventilation zone.

Service-enabled zones are highlighted in colour and can be controlled.
Service-deactivated zones are only shown and cannot be controlled.

The home page displayed in a computer browser

The home page displayed in the IR Client mobile app
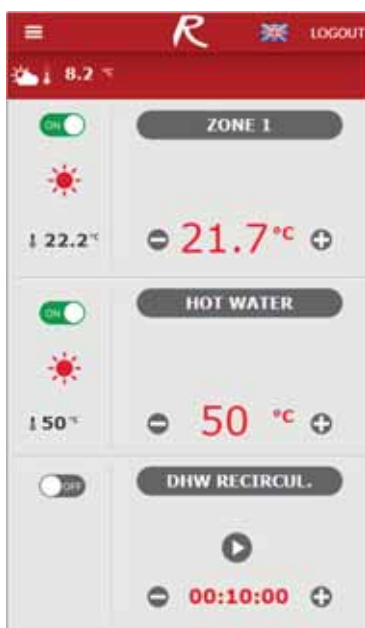
Tiles for space and DHW heating

The ON/OFF button is used to turn the zone on or off on the user level.

Clicking on this button will open the detailed zone settings.

Sun-Moon (comfort-setback). The snow-flake indicates active cooling. Information about the current zone mode.

ZONE 1

21.7°c

21.7°c

Heating zones: current room temperature (if a room sensor is installed)
DHW zone: DHW temperature

Desired temperature. This temperature can be increased or decreased with the plus and minus buttons.

If the zone or DHW is in setback period, a moon symbol is shown here.

ZONE 2

Click on the (i) button to change the desired temperature during a setback period.

21.6°c

19.5°c

During a setback period, the desired temperature reduced by the decrease value is shown on the tile.

During a setback period the desired temperature cannot be adjusted by the plus/minus buttons on the tile (they are hidden).

In some cases, warning triangles can appear in the DHW tile. You can find a more detailed description of their meaning in the DHW menu (4.4).

Tiles for DHW recirculation and heat recovery ventilation

The ON/OFF button is used to turn the zone on or off on user level.

Clicking on this button will open the detailed zone settings.

Sun-Moon (comfort-setback). The snowflake indicates active cooling. Information about the current zone mode.

DHW Recircul.: start immediate circulation
Ventilation: start the boost function

Current HRV unit fan power in percent.

DHW Recircul.: period for which the immediate circulation function will be on.
Ventilation: period for which the boost function will be on.
The plus and minus buttons can be used to increase or decrease the set time.

4.2.　Display of the Diagram (DIAGRAM)

Schematic representation of your hydraulic connection with a clear display of important quantities, states and information. The diagram should therefore always correspond to your current hydraulic connection.

To get a proper presentation in the mobile application, it is necessary to rotate the device to landscape view.

Shown in the upper left corner

OUTDOOR TEMPERATURE...........Display of the current outdoor temperature.

HC pressure ....Display of the current pressure in the heating system.

RIPPLE CONTROL STATUS...........If Ripple control is applied for the controller, the current status will be displayed here according to the distributor rate (*HIGH*/*LOW*).

HOLIDAYS..................Here it is displayed whether or not the holiday function is active. This function allows you to adjust the heating temperature of the individual zones and the hot water to a lower value during a longer stay outside the heated building, without changing the permanent settings in the individual zones. Holidays are controlled in the HEATING menu.

These icons provide quick access to the settings of each system element, depending on the location of the icon.

Temperatures without brackets: real (measured) temperatures. **Temperatures in brackets:** desired temperatures.

Heat pump inlet and outlet temperatures and compressor operation indication.

The arrow shows the operation of the heat pump, in this case heating. When DHW is being heated, it will point to the top of the tank.

4.3. Heating zone menu (HEATING)

The menu is used to select the settings of one of the heating zones (Zones 1 to 6), to set the thermal store heating (ThSt Zone) and holiday mode settings (Holidays), or to set the pool heating. (Pool heating - if pool heating is solved through the mixing pump station and bound to one heating zone. If pool heating is unmixed, the UNI function 4.6.8 turns into pool function.)

4.3.1. Heating zone settings (Zones 1 to 6)

The heating zone can be switched on or off by the user with the **ON/OFF** button. If the zone is switched off by the user, the circulation pump is switched off and the mixing valve shifts to the closed position.

The pump and valve can be switched on by frost protection (if switched on and active).

Display of the current status of the heating zone.

If a room sensor is present, the current room temperature is displayed here, if a room unit is used, also the air humidity is shown.

Current heating water temperature.

UNIT STATE	HEATING	ROOM TEMPERATURE	21.8	HEATING WATER TEMP.	29.7 °C
COMFORT TEMPERATURE CONTINUOUS		RELATIVE HUMIDITY	45.0 %	DESIRED TEMPERATURE	29.7 °C
		DESIRED TEMPERATURE	21.7 °C		

Additional information on the heating zone status (e.g. information on mode...).

Desired room temperature.

Desired heating water temperature calculated from the OTC curve.

Room temperature setting

Desired temperature (°C)… Setting the desired room temperature in zone. The temperature can also be changed using plus and minus keys.

Decrease during setback time (°C) ... Setting by how many °C the desired room temperature will be decreased during setback time.
The decrease can be changed using plus and minus keys.

The decrease value during setback temperature can only be set with the time program switched on.

In terms of optimal heat pump operation, a maximum difference between comfort and setback temperature of 2°C is recommended.

(This is a maximum value in the factory setting, it can be changed on the service level.)

This function is designed to save energy so that it does not switch on an auxiliary bivalent source in the event of a sudden request for a higher zone temperature. This function can be switched off on the service level.

If a RC 25 room unit is connected in the given zone, permitting to change (correct) the desired temperature using the rotating knob, correction is shown in the room temperature menu.

Time program settings

Depending on the type of heating system selected on the service level, the possibility of using a time program is automatically adjusted.

When underfloor heating is selected, the factory time program is switched off. One time program can be enabled on the service level. (We do not recommend using a time program due to the great thermal inertia of floor heating.)

When choosing radiators or fan coils, the factory time program is enabled. It is also possible to use a second period, or to switch off the time program.

If the time program is switched off, the heating zone follows the set desired temperature.

Use time program … Setting the time period during which the zone will heat to the desired room temperature. Outside the time period, the desired room temperature will be reduced by the reduction value.

Use second period ....Setting the second time period during which the zone will heat to the desired room temperature.

Pre-set time periods can be easily overwritten.

The following buttons are meant to copy easily the set values to further days: **COPY Mo TO Mo-Fr, Mo-Su** and **COPY Sa TO Sa-Su**.

Zone off during setback … This permits to switch off the heating zone completely in setback mode. The circulation pump stops and the mixing valve closes. (This function is switched off on the service level in the factory setting, it is not suitable for all installations, and a service technician must be contacted to activate it.)

Winter / Summer function settings (blocks heating in summer)

When activating **HEATING BLOCKED IN SET PERIOD**, set the date of the beginning and end of the period when heating will be always blocked, disregarded of the current outdoor temperature (overriding heating block by the outdoor temperature).

When activating **HEATING BLOCKED BY OUTDOOR TEMPER**., set the time intervals for the preset outdoor temperatures after which the heating will be blocked (summer mode will be enabled) and the heating will be unblocked (winter mode will be enabled).

Another condition for automatic mode switching is reaching the required indoor temperature. This means that if the indoor temperature is lower than required, then there will be no automatic switch to summer mode. Similarly, there is no automatic switch to winter mode if the indoor temperature is higher than required.

In winter mode, zone heating is switched on (the zone is heated to the required temperature according to the current comfort/setback mode). In summer mode, zone heating is switched off.

<u>OTC curves settings</u>

The purpose of weather compensating control is to reduce the heating water temperature when the outdoor temperature rises (and vice versa). This can effectively reduce overheating or underheating of dwelling space and also increase the efficiency of system operation. From the point of view of energy savings and thermal comfort in living rooms, it is more advantageous to heat the building to the required room temperature with a lower heating water temperature for a longer time than with a higher heating water temperature for a shorter time.

The basic parameters of the OTC curve, the maximum and minimum temperatures for the zone are set by the service technician during commissioning at the service level.
The resulting calculated OTC temperature is automatically adjusted according to changes in the desired room temperature. (If a room sensor is installed, the calculated OTC temperature is also affected by the value at the given sensor.)
OTC curve menu is intended only for minor adjustments in case of zone overheating or underheating. Bigger changes are better made on the service level.

The OTC curve is displayed in a simplified menu in the factory settings of the controller, with the current outdoor temperature and the calculated current OTC temperature displayed. The current OTC temperature (currently desired heating water temperature) can be adjusted with the plus and minus buttons.

Make the changes in small steps only, 2-3°C max., and wait for a longer time (recommended: 1 day) too see how the changes take effect.
Remember that in the simplified menu, the part of OTC curve is modified that is related to the current outdoor temperature.
In order to set the entire OTC curve, expert settings are needed.

<u>Expert settings are intended for more experienced users, there are two pairs of plus and minus buttons.</u>

One for temperatures above zero and the other for temperatures below zero. By clicking on the individual buttons, the OTC curve is readjusted, especially in the values corresponding to the location of the buttons.

NEW TEMP.................Displays temperatures adjusted by the buttons at the current outdoor temperature.

SAVE CHANGES........Confirmation of changes made, saving them to the controller's memory.

CANCEL ....Return of values, cancelling current changes.

RESTORE FACTORY SET.

...................................Reset of the OTC curve to default values.

The expert setting is fully linked to the basic OTC curve setting and all changes are reflected in the zone setting.

Note: When setting the curve on the mobile phone, keep it in a horizontal position. (This item may not appear on the display in the vertical position.)

Cooling settings

With CTC heat pumps, only passive cooling from ground bores is possible.

Passive cooling function is disabled on the service level in the factory setting (hidden on the user level).

Passive cooling kit installation required.

With the ON/OFF button, cooling can be switched on by the user and the desired room temperature can be set (corresponding to the desired temperature for heating).

Cooling above the outdoor temperature means that cooling is only active if the outdoor temperature exceeds the set limit (Transition outdoor temp.).

4.3.2. ThSt Zone

Zone of thermal store heating to a preset temperature following a time program. The zone can be switched on/off by the user with the **ON/OFF** button.

This function is mainly used when there is an increased heat demand outside the heating season or to accumulate more heat than is needed for heated rooms. A good example could be a swimming pool in combination with underfloor heating.

Desired temperature (°C)… Setting the desired thermal store temperature. The temperature can also be changed using plus and minus keys.

Decrease during setback time (°C) ... Setting by how many °C the desired heating water temperature in thermal store will be decreased during setback time. The temperature can also be changed using plus and minus keys.

The time program setting is identical with the time program setting in zones 1-6.

The real desired thermal store temperature is then calculated as the maximum of all demands from the thermal store zone and active heating zones.

4.3.3. Pool heating

This pool heating function is available only if pool heating is solved through the mixing pump station and bound to one heating zone. If pool heating is unmixed, the UNI function 4.6.8 turns into pool function. viz 4.6.8.

Pool heating can be switched on/off by the user with the **ON/OFF** button..

Desired temperature (°C)… Setting the desired pool temperature.

The menu displays pool temperature, heat source temperature and information whether pool heating is active or not.

Thermostat … here the switch-on and switch-off difference for pool heating control is shown.

Request for heat source … with the ON/OFF button, you can choose whether the heating source will be used to heat the pool. When the demand for the source is switched off, only the excess heat in the thermal store (PV, thermal solar heating, fireplace...) will be used for heating.

Timer … timer function allows entering 2 time periods in one day during which the pool will be heated.

4.3.4. Holidays

The Holiday function is intended for background heating of the building during a longer absence. The holiday function can be switched on/off with the **ON/OFF** button.

After turning on the Holidays, it is important to set the start and end time and date of the holidays function. For each heating zone and DHW heating the temperature can be set this zone will be heated to during the holidays.

If the heated space is divided into several zones, the ON/OFF buttons can be used to determine whether the holiday function will be activated for the whole or for the individual zones only. If DHW circulation or HRV zone is connected, you can use the ON/OFF button to select whether the function will be active during the holidays.

4.4. DHW Zone Menu (Domestic hot water)

The DHW menu opens by clicking on the DHW tile.

If the hot water recirculation function is switched on, there is also displayed the CIRCULATION tile.

4.4.1. Domestic Hot Water

The DHW heating can be switched on or off with the **ON/OFF** button.

In the upper part of the page, the COMFORT/SETBACK status of the zone and the current and desired temperature in the hot water tank are displayed.

In addition to the heat pump, another auxiliary heat source can participate in hot water heating.

In case of high requirement for hot water temperature, the following message will be displayed below the desired temperature:

Too high desired temperature, auxiliary heat source will be used.

On the HOME page in the DHW tile, this status is signaled by

In the event that the auxiliary source is switched off and the hot water requirements exceed the heat pump capabilities, the warning is displayed in the same place: **The desired temperature reduced.**

On the HOME page in the DHW tile, this status is signaled by

In this case, the desired temperature will be reduced to avoid cycling and malfunctions of the heat pump.

Setting the desired temperatures

Desired temperature (°C)… Setting the desired DHW temperature. The temperature can also be changed using plus and minus keys.

Decrease during setback time (°C)   ... Setting by how many °C the desired DHW temperature will be decreased during setback time.
The decrease can also be changed using plus and minus keys.

The decrease value during setback temperature can only be set with the time program switched on.

One-time heating (°C)… Setting the desired DHW temperature for one-time heating function. The temperature can also be changed using plus and minus keys.

The time program setting is identical to the time program setting in zones 1-6..

If recirculation or Anti-Legionella function is enabled on the service level, the tile for their setting will be shown in the DHW menu.

4.4.2. Settings of DHW recirculation

Recirculation can be switched on/off by the user with the **ON/OFF** button.

Interval setting

Circulation period......Setting the circulation pump running time (pump running)
Recirculation delay ...Setting the circulation pump idling time (pump stopped)

The time program setting is identical to the time program setting in zones 1-6.
Use time program of DHW zone

...................................For starting the circulation pump, a time program is set identical to the time program for DHW heating by the heat pump.
The circulation pump starts following the set intervals (circulation time and idle time) only in comfort mode according to the time program.

Immediate recirculation

After this function is activated, the circulation pump switches on immediately and then runs for the set time. After this time, the function switches back to automatic mode according to the time program.

4.4.3. Anti-Legionella

5. The function can be switched on/off by the user with the **ON/OFF** button.

The top of the page shows the DISINFECTION IN PROGRESS/INACTIVE status and the date and time when the desired temperature in the hot water tank was last met by the Anti-Legionella function.

Setting Anti-Legionella function

Temperature for Anti-Legionella … Setting the desired temperature of the hot water tank during the Anti-Legionella function.

Weekday and hour of function execution … Setting which day and at what time the function will start.

Immediate start … ON/OFF button for immediate start of hot water tank disinfection.

4.5 Sources menu (SOURCES)

In the Source menu it is possible to display parameters and adjust some settings of all system sources (heat pump, switched and modulated sources, solar thermal system, fireplace). If an electric heating element is used for hot water heating (auxiliary source for DHW), the DHW el. element tile is displayed in the Sources menu.

4.5.1 Heat pump

The heat pump can be switched on or off by the user with the **ON/OFF** button.

Current status of the heat pump, information on compressor operation (for inverter models, also compressor speed).

Heat pump operation statistics - operating hours and number of starts.

Statistics of DHW heating by heat pump – operating hours and number of starts.

COMPRESSOR	RUNNING (50.1 rps)
HP STATUS	min.run time - DHW
FLOW TEMPERATURE	49.0 °C
INLET TEMPERATURE	42.5 °C
HP RUNNING ALREADY	00:03:03
HP IDLE ALREADY	00:00:00

OVERALL STATISTICS

TOTAL	4329 : 00
STARTS COUNTER	1479
TODAY	0 : 3
STARTS COUNTER	1
YESTERDAY	0 : 47
STARTS COUNTER	2

DOMESTIC HOT WATER STATISTICS

TOTAL	495 : 00
STARTS COUNTER	323
TODAY	0 : 3
STARTS COUNTER	1
YESTERDAY	0 : 46
STARTS COUNTER	2

Heat pump inlet temperature (heating return) and heat pump outlet temperature.

Time period of the current heat pump cycle. How long the pump has been running or idling in the current cycle.

4.5.2 Solar heating

The solar circuit can be switched on or off with the **ON/OFF** button.

The solar circuit allows heating of up to three solar appliances.

Current temperature of solar collectors

Solar pump operation information

SOLAR COLLECTORS TEMPERATURE	55.4 °C	SOLAR PUMP

SOLAR CONSUMER 1	ON	SOLAR CONSUMER 2	OFF	SOLAR CONSUMER 3
Consumer for collector cooling				
Heating	YES			
Temperature	48.0 °C			
Demand	70 °C			
Maximum temperature	80 °C			

Current temperature: temperature measured by the hot water tank sensor. **Desired temperature:** desired temperature for solar heating of a given hot water tank.
Maximum temperature: limit temperature for heating from the solar thermal system.

During commissioning, the service technician sets the correct differential values for switching on and off the solar thermal system. He will adjust solar appliances and their values to the current system requirements to ensure long service life and efficiency of solar heating.

4.5.3 PV (Photovoltaic system)

The cooperation of the PV system with the IR controller depends on the degree of system interconnection (type of inverter, PV modules used and other components in the system).

From simpler applications, where the IR controller switches the DHW heating, the heating of the thermal store or a combination of both after receiving a request (signal) from the inverter, to more complex systems, where the power overflows are consumed by the heat pump (the speed of the heat pump compressor is automatically adjusted to the PV power output) or are consumed by the heating element (through SSR relays the individual elements of the heating element consume the current overflow on individual phases).

If the PV system is enabled on the service level, a photovoltaic panel will be displayed in the diagram with information about the PV plant performance. (The performance display depends on the inverter used.) Via the information link (i) at the PV panel, you can move to the PV diagram.

PV diagram

Depending on the individual components wiring, the individual elements of the system are shown in the diagram of the photovoltaic system.
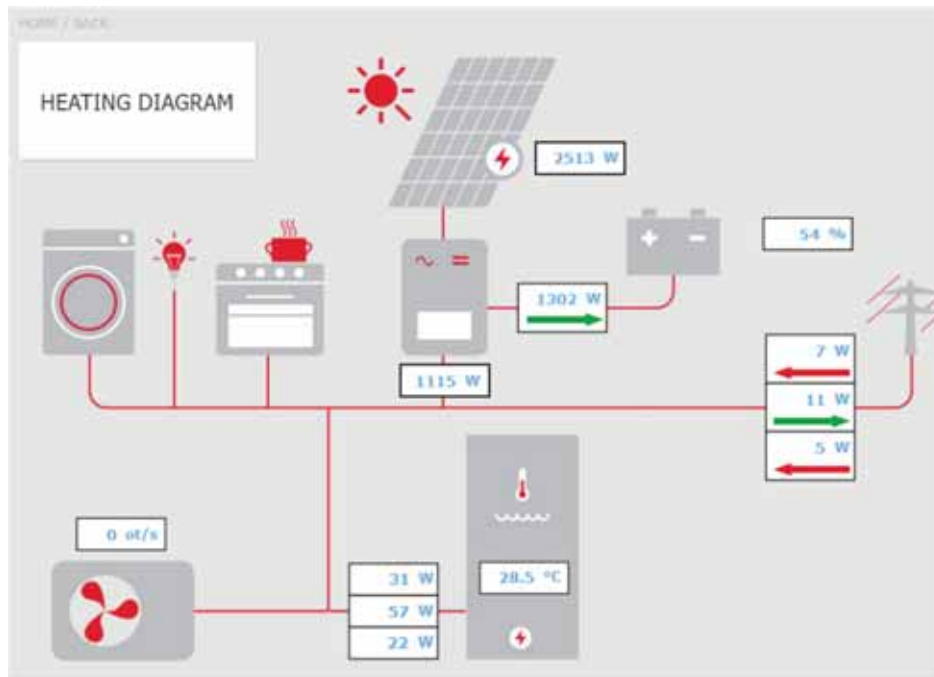
HEATING DIAGRAM tile… It is used to return to the main diagram of the controller.

Arrows in the diagram show the direction of electric current flow. The red arrow indicates consumption from the power grid, or consumption from the battery. The green arrow indicates overflow into the power grid, or battery charging.

Current power input of el. heating element … If the function of utilizing the excess power from PV system by an electric heating element is activated, the current power input on individual heating elements is displayed here.

Heat pump … If the heat pump is running, the speed of the compressor is displayed here.

PV system menu

Via the tile SOURCES → PV, you can get to the photovoltaic system menu.

The function of utilization of PV system power overflow can be switched on/off with the **ON/OFF** button.

Utilization of excess solar power by HC temperature increase … The function enabling temporary temperature increase in a zone can be switched on separately for each zone with the **ON/OFF** button.

Increase of desired temperature … Setting by how many °C the desired temperature in the given zone will be increased.

Thermal Store temperature limit above which the function is active … setting the value of thermal store temperature above which the function will be activated.

4.5.4 Fire, solid fuel boiler

Control of solid-fuel boiler pump.

Current measured values on the control sensors for switching the boiler pump.

Status of boiler pump, the rotating red triangle indicates that the circulation pump is running. If the triangle is gray and does not rotate, the circulation pump is stopped.

FIREPLACE OUTLET WATER TEMPERATURE	50.3 °C	FIREPLACE PUMP	▽
THERMAL STORAGE	46.9 °C		
DIFFERENCES FOR SWITCHING THE PUMP ON/OFF		LIMITS FOR SWITCHING THE PUMP ON/OFF	
ON	5 °C	TH. STORE MAX TEMPERATURE	95 °C
OFF	3 °C	FIREPLACE MINIMUM TEMPERATURE	55 °C
Difference between fireplace and thermal store temperatures to control pump.			

Differences for boiler pump control.

Limitation of the minimum temperature at the boiler sensor for switching on the pump and of the maximum temperature of the thermal store for switching it off.

Pump control difference

ON ....Switch-on difference. If the actual temperature measured by the boiler sensor rises by the value of the switching difference above the thermal store temperature, the pump is switched on. (The temperature at the fireplace sensor must be higher than the minimum fireplace temperature to turn on the pump.)

OFF ....Switch-off difference. If the difference between the boiler and thermal store temperatures is lower than the value of the switch-off difference, the boiler pump is switched off.

Setting the minimum temperature

The factory set temperature is 65°C. The value can be changed by overwriting.

4.5.5 Switched auxiliary heat sources (ON/OFF Source, ON/OFF Source 2)

The ON/OFF source is primarily intended as an auxiliary source for heating or as a backup source in the event of a heat pump failure. If no heat pump is connected in the system, it can be used as a main heating source. In most cases, this source will be an electric heating element located in the thermal store or an electric boiler connected in series with the heat pump. (Depending on the hydraulic and electrical connections, it can be also used as an auxiliary or main heating source.)

The respective heat source can be switched on/off by the user with the ON/OFF button.

Desired temperature for auxiliary heat source.

Status of auxiliary heat source and Ripple control (if used).

Auxiliary heat source operation statistics.

Time remaining until the auxiliary heat source is switched on after the switch-on difference is met. (Remaining time to switch source.)

Difference for auxiliary heat source control.

In order to avoid unnecessary switching on of the auxiliary heat source and thus increased expenses for electrical energy, certain conditions must be met for switching on the auxiliary source.

Source blocking by Ripple control … If Ripple control is connected to the controller and blocking is switched on at a high tariff on the service level, the auxiliary source will only be switched on at a low tariff and when other conditions are also met.

Source blocking by outdoor temperature … The factory-set outdoor temperature for heat source blocking is 5°C. (This can be changed on the service level.)

If the outdoor temperature is higher, the auxiliary source will not switch on when requested; if it is lower and the other conditions are also met, the auxiliary source will be switched on.

Auxiliary source switch-on difference … If the heating water temperature at the control sensor drops by the value of the switching difference and the previous conditions are met, the time countdown will be activated (switching delay).

Switching delay … If the conditions are not met at the control sensor during the countdown (the heat pump does not reach the desired heating water temperature), the auxiliary source will be activated.

The most common reason for unnecessary switching of an auxiliary source is a big difference between the desired room temperature and the decrease during setback, when the requirement for heating water increases and thus the switching difference is met. *(From the point of view of optimal operation of the heat pump, a maximum difference between comfort and setback temperature of 2°C is recommended.)*

If the ON/OFF source is used as the MAIN heating source (the heat pump is not connected), it is controlled only by the switch-on and switch-off difference, blocking by the Ripple control signal or by another external blocking (external switching). Blocking by outdoor temperature and switching delay is not supported in this case.

Auxiliary source ON when HP fails … If this function is enabled on the service level, in the event of a heat pump failure, the auxiliary heat source will be changed to the main source.

If the user does not regularly check the condition of the system, it is not possible to find out whether there has been a fault in the heat pump, which could lead to increased costs for both space and hot water heating.

4.5.6   OpenTherm auxiliary source

The heat source can be switched on or off by the user with the **ON/OFF** button.
Settings page intended for modulated sources equipped with OpenTherm communication. To control them, an add-on module for OpenTherm communication needs to be connected to the controller.

Change of source operation mode (heating + DHW heating) and summer operation (DHW heating only).

Current status and output of the modulated heat source

Important measured temperatures and desired temperature for the OpenTherm source.

⚙ SOURCE SETTINGS

ON ⬤ Winter operation - heating

Heating and DHW

SOURCE OPERATION	heating	
SOURCE POWER	0	%
HEATING WATER PRESSURE	0.6	bar

FLOW TEMPERATURE	30.0	°C
DESIRED TEMPERATURE	0.0	°C
BOILER RETURN TEMP.	29.0	°C

Information on the status of the OpenTherm add-on module, on the communication status and on the current status of the heat source.

Operating hours of the OpenTherm auxiliary heat source.

OPENTHERM MODULE	NOT CONNECTED	OK
COMMUNICATION		OK
SOURCE (BOILER)		OK

TOTAL	212	. 20
CURRENT YEAR	212	. 20
CURRENT MONTH	4	. 9
TODAY	0	. 24
CURRENT HOUR	0	

4.5.7 Auxiliary source 0-10V

The heat source can be switched on or off by the user with the **ON/OFF** button.

Settings page intended for sources modulated by 0-10V voltage signal.

Measured temperature at the control sensor and desired temperature for the auxiliary heat source. Current output of the source in percent.

Status of auxiliary heat source and Ripple control (if used).

CONTROL SENSOR TEMP.	52.5 °C		SOURCE STATE	INACTIVE
DESIRED TEMPERATURE	0.0 °C		RIPPLE CURRENT CONTROL	ACTIVE
POWER	0 %			

Limitation of the minimum and maximum boiler outlet temperature. These values are set by the technician in the service menu during commissioning.

MAXIMUM AND MINIMUM TEMPERATURE LIMITS

MINIMUM TEMPERATURE	0 °C
MAXIMUM TEMPERATURE	70 °C
REMAINING TIME TO SWITCH SOURCE	00:45:00 hh:mm:ss

Remaining time to switch source, the same as in settings of ON/OFF heat source (4.5.4).

4.5.8 EL. HEATING ELEMENT IN DHW

If an electric element placed in the hot water storage tank is used for auxiliary heating, the DHW el. element tile is displayed in the Sources menu.

The heat source can be switched on or off by the user with the **ON/OFF** button.

The temperature in the hot water tank and the desired temperature are displayed in the menu of the electric heating element.

4.6   Menu with other settings (OTHER)

4.6.1 Inputs & outputs

After clicking on the Inputs and outputs tile, tables with current information about all sensors, sources, pumps, add-on modules and three-way valves are displayed.
This is a complete overview of all connected and unconnected inputs and outputs from the controller.

4.6.2   Access, password

In the Access, password menu, the login data to the IR controller can be changed.
This also permits entering MAC addresses for access from the local network without the need to enter a password.

4.6.3   General settings

Options for automatic time synchronization and time zone selection.
Manual adjustment of date and time.
It is also possible to change the controller's system language (language of faults, blocking, sensor names and email notifications).

4.6.4   Functions overview

All functions of the controller are displayed in the function overview.
Depending on the selected controller settings, the functions switched on the service and user level are highlighted in colour here.

4.6.5   Error log

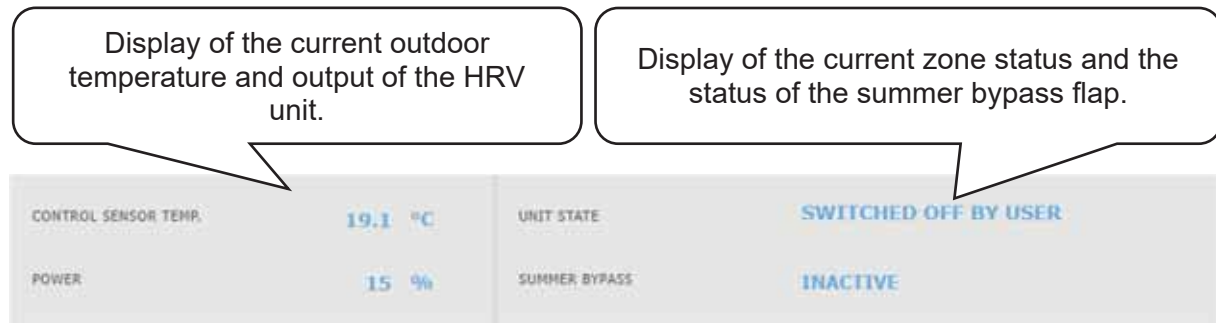Display of heat pump fault history and history of other system faults (sensors, communications, modules ...).

If the fault is active, it is highlighted in red. Faults written in gray are inactive and are only recorded here.

4.6.6 HRV Zone / HRV 2 Zone

The IR controller permits to control 2 separate HRV units.

Setting of HRV 2 is identical with setting of HRV.

The zone can be switched on or off by the user with the **ON/OFF** button.

Display of the current outdoor temperature and output of the HRV unit.

Display of the current zone status and the status of the summer bypass flap.

| CONTROL SENSOR TEMP. | 19.1 °C | UNIT STATE | SWITCHED OFF BY USER |
| POWER | 15 % | SUMMER BYPASS | INACTIVE |

Setting the Ventilation unit output

Comfort ....Setting the HRV unit output in comfort mode.
Setback........................Setting the HRV unit output in setback mode.
Output setting in the setback mode is only possible with the time program switched on.

The time program setting is identical to the time program setting in zones 1-6.

Filter replacement settings

Setting the filter life and the possibility of confirming its replacement. The function calculates the operating hours of the HRV unit and notices the user when the filter needs to be replaced.

Boost function 1, 2, 3

Boost can be temporarily switched on or off with the **ON/OFF** button.
Up to 3 boost periods can be preset and then activated in these sections. After switching on the boost function, the HRV unit sets the output to the value set in the *Desired power* field for the time *Boost period*.
After this time, the function is deactivated and the HRV unit switches back to automatic mode.

Summer bypass function

The Summer bypass flap function can be switched on or off with the **ON/OFF** button.
In this section, the desired temperature and the heating zone the function is related to are set (a room sensor must be located in this zone). If the room temperature in the heating zone is higher than the set limit and at the same time the conditions for the outdoor temperature (set on the service level) are met, the summer bypass flap opens.

While the function is running, it is possible to set a constant output of the ventilation unit (the unit then ignores the time program and the alternation of comfort/setback modes).

Function of temporarily limited output

The function can be switched on/off with the **ON/OFF** button.

This function can be used, for example, for reducing the HRV output at night. The % of output and the setback time are set here.

Cooling function

If this function is enabled on the service level, the cooling function will appear in the HRV menu.

The cooling function can be switched on/off with the **ON/OFF** button.

In this section, it is possible to enter the required temperature of the cooling water and set the cooling parameters. **Cooling determined by outdoor temperature** means that cooling into HRV will start only if the outdoor temperature rises above the set outdoor temperature for cooling to start. When the outdoor temperature drops below the set outdoor temperature for cooling to start, cooling will be deactivated again.

While the function is active, it is possible to set a constant output of the HRV unit (the unit then ignores the time program and the alternation of comfort/setback modes).

With CTC heat pumps, only passive cooling from ground bores is possible.

The Cooling by HP option must be switched on in the heat pump menu to activate the heat pump to the cooling mode.

4.6.7 Universal outputs (Universal function)

The menu of Universal functions (UNI function and UNI function 2) is displayed if this function is enabled on the service level.

In the upper left part, the temperatures on the control sensors are displayed, temperature t1 is for thermostat 1, temperature t2 is the temperature for thermostat 2.

In the upper right part, information is displayed whether the function is active or inactive (whether or not heating is in progress).

Most commonly, the UNI function is used to control a pool or to control a three-way valve between two tanks. But it can also be used for other functions based on thermostat control, temperature difference, timer and their combination.

A universal function consists of sub-functions connected in series. The output is therefore switched on only if the conditions for switching on all functions in series are met. For example,

if just the Thermostat 1 parameter is activated, the UNI function will be switched on when the Thermostat 1 switch-on condition is met. However, if the parameters Thermostat 1, Thermostat 2 and Timer are activated, the UNI function will be switched on only after the conditions for all these 3 activated parameters are met.

For easier orientation, the basic principles of universal functions will be explained further and their practical use in the most frequently used application, pool heating, will be shown. Settings of other applications of these functions is similar.

UNI Additional module (UNI function 1)

The UNI function can be switched on/off with the **ON/OFF** button.

THERMOSTAT 1 … It is used in situations where it is desirable to use in the application thermostatic switching on/off based on the temperature t1 overshoot or undershoot.

For example, an installation with solar thermal or photovoltaic panels, where excess heat is used to heat the pool only when a certain temperature of the thermal store is exceeded, and thus solar heat is preferred for hot water or space heating. (The purpose is not to cool down the tank below a certain temperature.)

Desired temperature (°C) … Setting the desired temperature in thermal store when the conditions are met for switching on the parameter.

Switch on/off difference … A parameter adjustable on the service level, for the user the value is only displayed. It determines the temperatures at which thermostat 1 will switch on/off.

A typical setting of Thermostat 1 when using excess energy for pool heating is:

the desired temperature 55°C with switch-on difference 0°C and switch-off difference -5°C. With the parameters set in this way, the UNI function will be switched on when the temperature of 55°C is reached at the control sensor (temperature t1) and switched off again when the temperature t1 drops by 5°C to 50°C.

THERMOSTAT 2 … Similarly to Thermostat 1, also Thermostat 2 is used in situations when it is desirable to use in the application thermostatic switching on/off based on the temperature overshoot or undershoot but this time at the sensor labelled temperature t2.

Thermostat 2 in the pool function is used to set the desired temperature and display the parameters of the pool water temperature differences.

Desired temperature (°C) … Setting the desired pool temperature when the conditions are met for switching on the parameter.

Switch on/off difference … A parameter adjustable on the service level, for the user the value is only displayed. It determines the temperatures at which thermostat 2 will switch on/off.

A typical setting of Thermostat 2 when used in the pool function is:
the desired temperature 28°C with switch-on difference -0.5°C and switch-off difference -0.5°C. With the parameters set in this way, the UNI function will be switched on when the pool temperature drops by 0.5°C (control sensor is temperature t2) and switched off again when the temperature t2 rises by 0.5°C above the desired temperature 28°C.

Request for heat source … with the ON/OFF button, you can choose whether the heating source will be used to heat the pool. When the demand for the source is turned off, only the excess heat in the thermal store (PV system, thermal solar heating, fireplace...) will be used for pool heating.

Timer … the timer function allows you to enter 2 time periods in one day during which the pool will be heated. The timer function is superior to all previous functions.

UNI Additional module

UNI 2

The UNI function 2 can be switched on/off with the **ON/OFF** button.
The UNI function 2 setting is identical with the UNI function 1 setting.

For pool purposes, UNI function 2 can be used, for example, to control filtration. Using the timer, you can set 2 time periods in one day when the pool will be filtered.
UNI function 2 can be combined with UNI function 1 and switch on filtration while the pool is being heated.

4.6.8 RegulusRoute

Information about remote controller management is displayed in the RegulusRoute menu. You will use this information to communicate with the service technician in case the controller is unavailable through the RegulusRoute service for any reason.

4.7 Menu with access to manuals (MANUALS)

In the Manuals menu you will find this manual and the manuals for the RCM and RCD room units.

Service Guide for IR 14 Controller

Valid for FW: 1.0.11.0

1. Controller Wiring

Warning: Controller wiring may be performed by a qualified person only. Layman adjustments of the controller may cause damage to parts of the system.

Left label	Pin		Pin	Right label
TČ kom. 2	D1		A1	TCL2 +
TČ kom. 1	D2		A2	TCL2 -
			A3	napájení -24V
			A4	napájení +24V
			A5	moduly CIB +
TČ kom. 3	D9		A6	moduly CIB -
napájení L (230V)	E1		B1	společná zem svorkovnice B
zóna 1 ventil otvírá	E2		B2	výstup PWM B2 (PWM pro oběh. čerp. TČ)
zóna 1 ventil zavírá	E3		B3	výstup PWM B3 (PWM pro solární čerp.)
zóna 1 čerpadlo	E4		B4	čidlo tlaku (4-20mA)
			B5	venku
napájení L (230V)	E6		B6	topná voda – zóna 1
zdroj ON/OFF	E7		B7	pokojová teplota – zóna 1
doplňkový zdroj TV (TV-E)	E8		B8	vstup iPWM B8 (oběhové čerpadlo TČ)
ventil TČ do TV (TV-TČ)	E9		B9	vstup iPWM B9 (solární čerpadlo)
napájení L (230V)	F1		C1	společná zem svorkovnice C
výstup F2 (zdroj ON/OFF 2)	F2		C2	vstup C2 (AKU-h)
výstup F3 (UNI funkce 1)	F3		C3	vstup C3 (AKU-s)
výstup F4 (cirkulace TV)	F4		C4	vstup C4 (TV-h)
výstup F5 (čerpadlo KTP)	F5		C5	vstup C5 (solár)
výstup F6 (zóna 2 čerpadlo)	F6		C6	vstup C6 (KTP)
			C7	vstup C7 (topná voda – zóna 2)
HDO L	F8		C8	vstup C8 (pokojová teplota – zóna 2)
HDO N	F9		C9	vstup C9 (TV-s)

1.1 List of output optional functions

LIST OF OPTIONAL FUNCTIONS FOR OUTPUTS F2-F6	
1	On/Off source 2
2	UNI function 1
3	DHW recirculation
4	solid-fuel boiler pump
5	zone 2 pump
6	zone 2 valve opening
7	zone 2 valve closing
8	cooling 1
9	UNI function 2
10	HP1 pump
11	SOL pump
12	2nd solar consumer valve
13	3rd solar consumer valve
14	DHW heating from ThSt
15	Alarm
16	
17	
LIST OF OPTIONAL INPUTS C2-C9	
101	ThSt-upper
102	ThSt- lower
103	DHW-upper
104	DHW-lower
105	Solar
106	solid fuel boiler
107	heating water – zone 2
108	room temp. – zone 2
109	sensor 1
110	sensor 2
LIST OF OPTIONAL FUNCTIONS FOR OUTPUTS B2-B3	
201	PWM output for circ. pump in HP1
202	PWM output for circ. pump in HP 2
203	PWM output for circ. pump in HP 3
204	PWM output for SOL circ. pump
205	0-10V for boiler control
206	0-10V for HRV control
207	0-10V for control of SSR relay in PV system
LIST OF OPTIONAL FUNCTIONS FOR INPUTS B8-B9	
301	iPWM input for circ. pump in HP1
302	iPWM input for circ. pump in HP2
303	iPWM input for circ. pump in HP3
304	iPWM input for SOL circ. pump

2. Technical data for IR 14 Controller

Power supply

Voltage...24 V DC ± 5%

Power consumption..max. 10 W

Installation...power distribution box, DIN rail (9 modules)

IP rating..IP 20

Working temperatures ....-20 to +55 °C

Relative humidity...10% to 95%, non-condensing

Relay outputs (DO0 to DO10)

Max. current over common COM terminal ....10 A

Max. relay current...3 A (5 to 230 V AC)

Relay type ....electromechanical

Analogue outputs 0-10 V (AO0 to AO1)

Output voltage...0 to 10.5 V DC

Common conductor ....GND

Max. current ....10 mA

Analogue inputs (AI0 to AI13)

Temperature inputs ....resistance sensors Pt 1000 (-90°C to +400 °C)

Pressure sensor transducer..............................current loop 4-20 mA

Common terminal ....GND

3. Technical data for OpenTherm module

Power supply voltage ....24 V DC ± 5%

Power consumption..max. 0.24 W

Installation...power distribution box, DIN rail (1 module)

IP rating..IP 10B

Working temperatures ....0 to 50 °C

Relative humidity...10 to 95%, non-condensing

4. Controller installation

The Controller is designed to be installed on DIN rail in a power distribution box. It may be installed by a properly qualified person only!!

The Controller and power supply unit shall be installed next to each other (see wiring fig.). The recommended min. cross section of the power supply conductors is 0.75 mm^2.

Heat pump wiring diagram
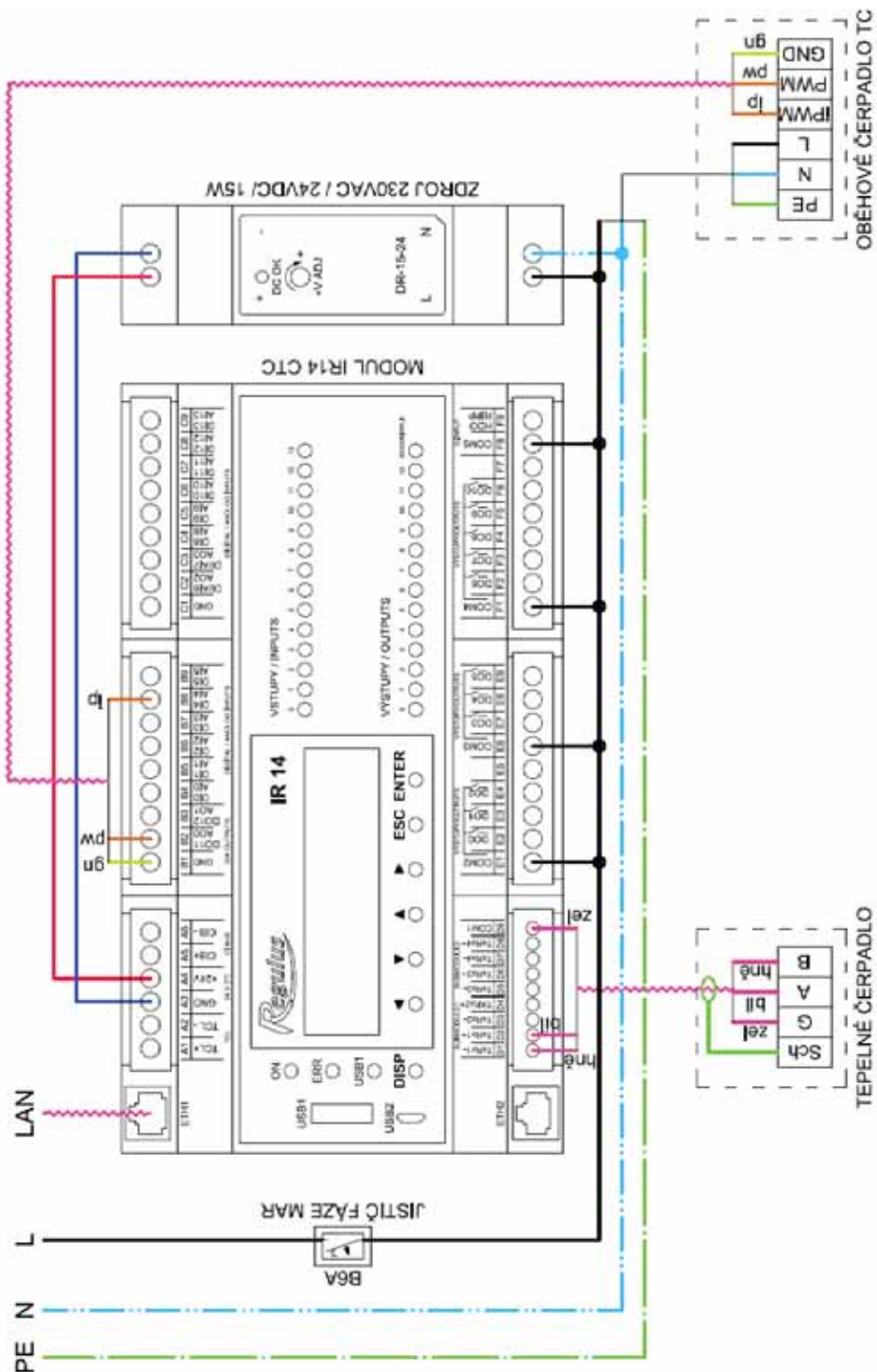
translation of terms used in wiring diagrams:

Jistič fáze MAR = Circuit braker for the IR14 controller,

Module = Module,
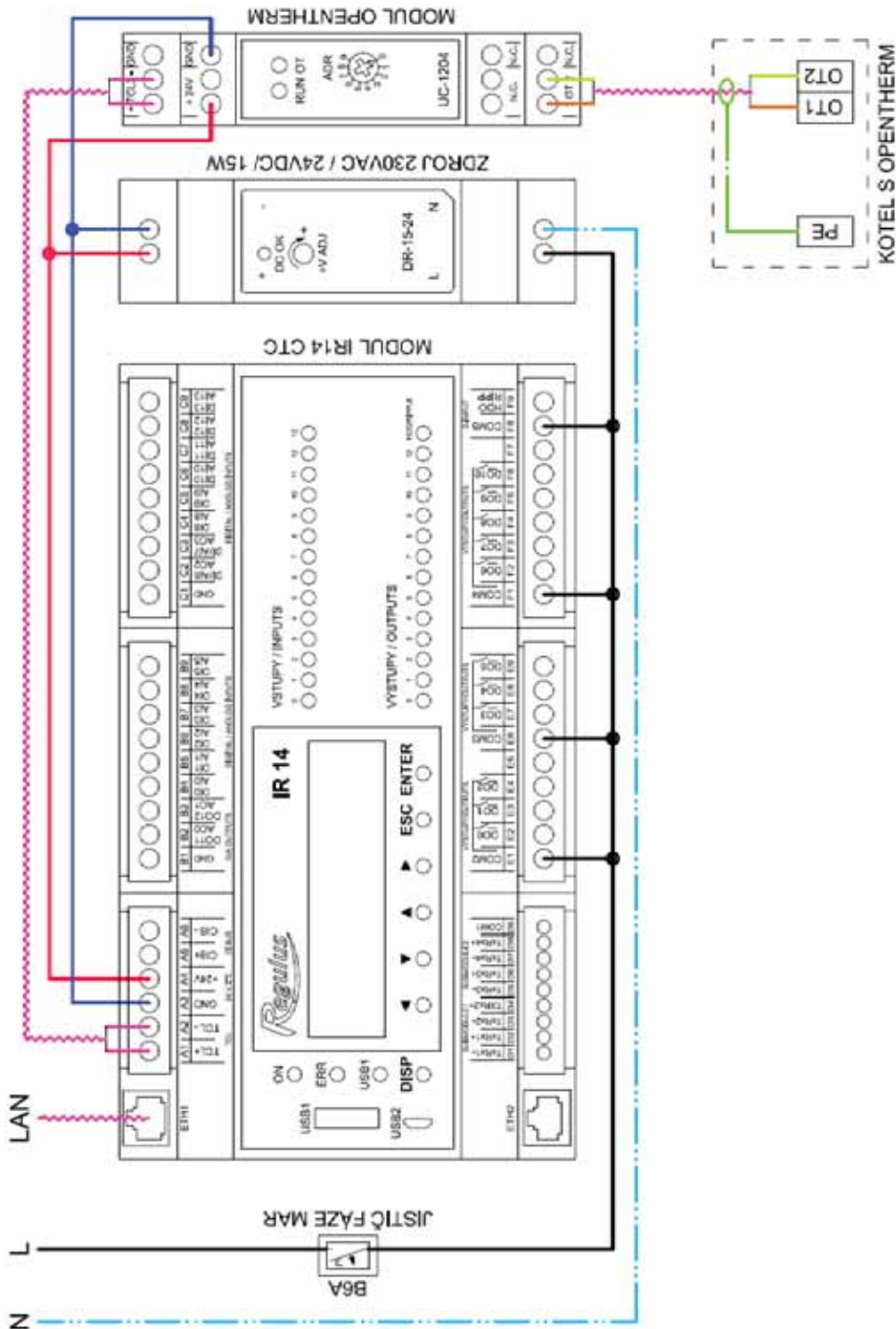
Zdroj = Power supply,

Tepelné čerpadlo = Heat pump,

Oběhové čerpadlo = Circulation pump of the heat pump,

Kotel s opentherm = Boiler with opentherm

Boiler wiring diagram with OpenTherm communication

The address switch of the OT module shall be set to pos. 0.

5.   Service menu

Warning: Service menu is intended for a specialist only. Layman adjustments of parameters in the Service menu may lead to damage to parts of the heating and solar thermal system.

In the Basic menu, the Service option shall be selected in order to enter this section, and confirmed by **ENTER.**

By repeated pressing ENTER you move between password digits. The digits not being edited are not visible and are shown as *. After all digits have been entered, press ⌄ (down arrow) to enter Service menu. The default service password is: 1234.
It is highly recommended to change the default password to your own!

The Service menu consists of these items:

zone 1 ....setting service parameters for Zone 1

zone 2........................setting service parameters for Zone 2

HVAC unit ....setting service parameters for HRV Zone

floor drying ....setting service parameters for floor drying program

solar ....setting service parameters for solar thermal system

heat pump.................setting service parameters for heat pump

HP operat. data..........detailed info on heat pump

HP blocking ....detailed info on heat pump

source on/off ....setting service parameters for ON/OFF source

source OT ....setting service parameters for source with OT communication

source 0-10V…………setting service parameters for 0-10V source

DHW ....setting service parameters for DHW heat. by a heat pump

DHW-E........................setting service parameters for DHW heat. by an auxiliary source

ThStore.......................setting service parameters for thermal store heating

sensors ....temperature sensors management (offset, sensor condition)

other...........................setting other service parameters

module Fire................setting parameters for Fire add-on module

UNI function...............setting parameters for a universal function

UNI function 2............setting parameters for a universal function 2

CIB addresses ....setting HW addresses for CIB devices

IP address..................setting IP address, network mask, default gateway, DNS server

RegulusRoute............setting RegulusRoute service

test..............................controller output tests

5.1. Settings for Zones 1 and 2

zone (on/off)...............Service switch on / off the zone. When a zone is switched off on service level, there is no zone frost protection function.

max.t to zone (°C)......Setting max. heating water temperature into a zone. The desired temperature calculated by Controller will not exceed this set value.

min.t to zone (°C).......Setting min. heating water temperature into a zone. The desired temperature calculated by Controller will not be below this set value.

room sensor ....Selection if a temperature sensor (Pt1000, or a WiFi sensor), an RC 25 room unit or room unit with display (RCM2, RCD or RCA) is used, or if the controller works without a room sensor. Or you can choose a WiFi sensor or thermostat (therm) that will only switch between comfort and setback temperature.

no room sens.recalc. DTheat./room (°C)

.....................................Setting a temperature drop for heating water and room temperature. E.g., the value 3 means that if the heating water temperature changes by 3°C, the room temperature will change by circa 1°C. This parameter applies when no room sensor is present.

external blocking input (sensor list)

.....................................Setting the terminal to which an input will be connected that is used for blocking the heating zone externally. It is possible to select any free input to IR, or inputs from an add-on digital input module (if present).

turn pump OFF (--).....If this function is on (option *yes*), the zone circulation pump will switch off when the temperature in zone reaches the desired value (with ± 0.3 °C difference).

input for bivalent valve (sensor list)

.....................................Setting the terminal to which the input from a bivalent valve will be connected (in case of a Lyra/Vega type control). It is possible to select any free input to IR, or inputs from an add-on digital input module (if present).

Setting the weather compensating (OTC) curve

exponent (-)................Projected exponent of heating system (based on the heating system design). It is generally recommended to set this parameter to 1.0 - 1.1 for floor heating system and to 1.3 for convector radiators.

temp. drop (°C) .... Projected temperature drop of heating system (based on the heating system design). It shall be entered in the following order: heating water temperature / heating return temperature.

Calculation temps. indoor (°C)

.... Indoor calculation temperature of heating system; it varies based on the purpose of the building/room to be heated (for majority of applications it is recommended to leave this temperature at 20 °C).

Calculation temps. outdoor (°C)

.... Outdoor calculation temperature depending on the location of the building to be heated.

5.2. Settings for heat recovery ventilation (HVAC) unit:

HVAC unit (on/off) ..... Switching on/off the zone on service level.

signal min (V) .... Minimum signal level (corresponds to 0% performance value).

signal max (V) .... Maximum signal level (corresponds to 100% performance value).

percentOFF (%) .... Percentage of performance value that will be set when the HRV unit is switched off by user.

Summer bypass function

Summer bypass .... Switching on the Summer bypass function on the Service level. This function can be related to a room sensor in any of heating zones (however only when a room sensor is present in the respective zone, or possibly a room unit). The installed sensor is defined by the parameter **Summer bypass off assign function to**. This function opens the bypass flap when the outside temperature is lower than set temperature (on the User level) for the selected room sensor. At the same time, the outdoor temperature has to be higher than the set minimum value **(min.out.t.)**. It is possible to launch the bypass function only in the summer mode of the selected zone (**Run bypass only in summer mode** parameter).

Boost function

Input for boost fnc. button 1, 2, 3 (sensor list)

.... Setting the terminal to which the input for starting the Boost function will be connected (see the user settings). It is possible to select any free input to IR, or inputs from an add-on digital input module (if present).

5.3. Floor drying program

This function has its own manual.

5.4. Settings for solar thermal heating

A solar thermal system may work with one or two hot water storage tanks. Heating the tanks is controlled by so called *Oscillating storage tank loading*, when the Controller tries to heat up tank No. 1 first. If this is not possible due to too small temperature difference between the collector and tank, and at the same time the difference for tank 2 is sufficient, it will load tank 2 for the preset time. After the preset loading time the Controller stops loading tank No. 2 and tests if the collector temperature rises. If not, it continues loading tank No. 2. If the collector temperature rises, the Controller waits until the difference for loading tank No. 1 is met.

Solar (active/off) ....Switching on solar zone.

sol.cons. 1,2 (active/off)

....................................Switching on separate tanks in solar circuit.

Solar consumer 1, 2

sensor (sensor list) ...Choice of temperature sensor in a solar tank.

diff. on (°C).................Difference to switch on heating from solar circuit. Difference between solar collector and temperature sensor set in parameter *sensor*.

diff. off (°C).................Difference to switch off heating from solar circuit.

desired t. (°C).............The desired temperature. Under the normal solar circuit mode, the tank is heated up to this temperature. As soon as all switched-on tanks are heated up to the *demand temperature*, the Controller continues heating up to max. temperature.

max. temp. (°C) ....Max. temperature. Maximum temperature the solar tank is heated to in normal mode (the function of solar collectors cooling is turned off).

bore regen. (yes/no)

....................................Set if this tank is used for ground-source heat pump's deep bore regeneration. Selecting "yes" will start a ground loop circulation pump together with the given consumer.

Oscillating loading

t. increase (°C) ....Temperature increase during oscillating loading. If a solar tank of a higher priority cannot be loaded, the Controller waits for the time set in parameter *idle time*. If the temperature rises after this time by the value

55

set in parameter *t. increase*, the Controller keeps idling. This repeats until the consumer switch-on difference is reached. If this condition is not reached, the tank of lower priority is loaded, supposed the condition of switching difference is met – cf. more details in the description of *Oscillating loading* function.

idle time (min)............Time period the Controller idles, waiting if the solar collector temperature rises. For description see parameter *t. increase.*

sol.cons.2 (min).........If a tank of higher priority cannot be loaded, a tank of lower priority is loaded for the time period set in this parameter.

Collector cooling

When this function is on, solar collector is cooled. As soon as the max. temperature is reached (in all active tanks), tank loading is stopped. When the solar collector temperature exceeds the preset max. collector temperature, the circulation pump starts and the collector is cooled by heating that tank which number is selected in parameter **Solar consumer no. for collector/tank cooling**. If the temperature in this tank exceeds the preset critical tank temperature, collector cooling is stopped.

on (active / off)...........Switching on the function of collector cooling.

crit.storT (°C) ....Setting a critical tank temperature. Collector cooling by heating the tank selected in parameter **Solar consumer no. for collector/tank cooling** may run only until the tank temperature set by this parameter is reached. When this temperature is exceeded in this tank, the collector stops cooling by heating this consumer.

max.coll.T (°C) ....Max. collector temperature. When this value is exceeded, collector cooling by heating the tank selected in the parameter **Solar consumer no. for collector/tank cooling** is started, supposed this function is on.

Storage tank cooling function

If the temperature in tank selected in parameter **Solar consumer no. for collector/tank cooling** is higher than that set in parameter *Max. temp.* (e.g. due to collector cooling), this tank will get cooled via the collector. Cooling shall start if the collector is cooler by at least 6°C than this tank.

On (active/off)............Switching on the function of tank cooling.

If the temperature set in parameter *crit. t.* is exceeded on a solar collector, solar pump is blocked. This function protects other solar component from destruction by too hot solar fluid.

crit. t. (°C)...................Solar collector critical temperature.

Solar consumer no. for collector/tank cooling (-)

....................................No. of solar consumer used for safety functions of collector and tank cooling.

Solar pump control through PWM

The pump is controlled by PID controller to the desired temperature difference between solar collector and the active solar consumer. Upon switching the solar pump on the power is set to maximum for the period defined in parameter purge time, then the speed drops to minimum and is increased/decreased following the predefined period by the set control step.

solar PWM pump (on/off)

....................................Switching on the PWM pump function.

set. differ. (K).............Desired temperature difference between solar collector and storage tank.

purge time (mm:ss)

....................................Purging time (time when pump is running at maximum power after switching on).

PWM profile (sol., heat.)

....................................PWM profile according to VDMA standard (default is solar).

min. power (%)...........Minimum speed of PWM pump.

max. power (%)..........Maximum speed of PWM pump.

ctrl.period (s).............Control period of the control algorithm (how often the algorithm intervenes in the control of the pump).

ctrl.step (%)................One control step of the controller (how much will the speed of the pump be increased/reduced during one control step).

5.5. Heat pump settings

The Controller can manage a cascade of max. 10 heat pumps.

After switching on or off one or more heat pumps and returning to user mode it is advisable to reset the Controller by disconnecting it from power supply. It is necessary to wait a couple seconds between de-energizing and energizing the Controller again. After it turns on, the type and number of heat pumps are detected within seconds.

When a demand to start a HP appears, first a circulation pump starts, then with a delay also a fan/brine pump of the respective heat pump, and finally the HP's compressor. After the heat pump switches off, the same HP may not be switched on again before so called restart time expires that is set to 10 minutes as default.

Heat pump No. 1 (address 1) is able to heat a hot water storage tank (DHW). The diverting valve that distributes HP flow between a hot water storage tank and a thermal store diverts in advance before the HP's compressor starts.

HP (active/no) ....This activates the function of heat pump cascade control. It shall be active even when just one heat pump is used.

diff. on (°C).................Temperature difference to switch on a heat pump / cascade. A difference between the desired thermal store sensor temperature and the real temperature to switch on the heat pump.

diff. off (°C).................Temperature difference to switch off a heat pump / cascade. A difference between the desired thermal store sensor temperature and the real temperature to switch off the heat pump.

RC for heat. (yes / no)

...................................Ripple control for heating. With *no* the heat pump runs disregarded of the Ripple control signal.

Control sensors for HP cascade

on (sensor list)...........Control sensor to switch on a HP/cascade.

off (sensor list) ....Control sensor to switch off a HP/cascade. For a cascade, the default choice *HP1 return* is not recommended.

No block by Ripple control under set outdoor temp. (yes/no)

...................................HP is not blocked by Ripple c. below the set outdoor temperature.

outdoor temp. (°C).....Outdoor temperature below which HP will not be blocked by Ripple control.

delay of next HP in series (min)

....................................If more heat pumps in a cascade are used, each further heat pump is switched on with this delay.

zone pumps off at DHW (yes / no)

....................................If the heat pump runs in DHW heating mode, zone circulation pumps are blocked.

close zone mixing valves at HW (yes / no)

....................................If the heat pump runs in DHW heating mode, mixing valves for heating zones are closed.

Oscillating during DHW heating

If there is a concurrent demand for DHW and space heating, HP No. 1 will oscillate between DHW and space heating following the times:

to DHW (min)..............Max. time of HP1 running in DHW heating mode under concurrent space heating demand

to heat.wat. (min).......Max. time of HP1 running in space heating mode under concurrent DHW heating demand

Ripp.for DHW (yes / no)

....................................Ripple c. for DHW. With *no* the heat pump runs disregarded of the Ripple control signal.

No block by Ripple control under set outdoor temp. (yes / no)

....................................Heat pump is not blocked by Ripple c. during DHW heating under the set outdoor temp.

outdoor temp. (°C).....Outdoor temperature below which HP will not be blocked by Ripple c. during DHW heating.

external blocking input (sensor list)

....................................Setting the terminal to which an input used for blocking the heat pump externally can be connected. It is possible to select any free sensor input to IR or inputs from the add-on digital input module (if present).

Heat pump 1 settings

It is necessary to use the web interface to set other heat pumps in the cascade.

State (off/on)..............Switching off/on the specific heat pump.

Max.flow. t. (°C)..........Max. heat pump flow temperature. When this temperature is exceeded, the heat pump is switched off. The heat pump will also switch off when

the flow temperature exceeds a certain value, established by the manufacturer depending on the heat pump type (see the heat pump service manual).

Max.return t. (°C) .... Max. heat pump return temperature. When this temperature is exceeded, the heat pump is switched off. The heat pump will also switch off when the return temperature exceeds a certain value, established by the manufacturer depending on the heat pump type (see the heat pump service manual).

Min.outd.t. (°C) .... Min. outdoor temperature for heat pump operation. When the temperature drops below this value, the heat pump is switched off. The heat pump will also switch off when the outdoor temperature drops below a certain value, established by the manufacturer depending on the heat pump type (see the heat pump service manual).

Max.outd.t (°C) .... Max. outdoor temperature. When the outdoor temperature exceeds this value, the heat pump is switched off.

Max.brine.t. (°C) .... Max. brine circuit temperature. When the brine temperature exceeds this value, the heat pump is switched off. Applies to ground-coupled heat pumps only.

Restart time (min) ...... Min. delay between two heat pump starts.

Min.run.time (min)

.... Minimum time of HP operation. It is activated either after compressor start, or after DHW heating is finished (if the heating circuit demand is higher than 10°C), or after a defrosting cycle is finished.

5.6. Heat pump 1 operating data

In this menu, detailed information about heat pump number 1 is displayed. For data on other pumps in the cascade, it is necessary to use the web interface.

Flow temp. (°C) .... HP flow temperature

Return t. (°C) .... HP return temperature

Hot gas (°C) .... HP compressor hot gas temp.

Flow temp. (°C) .... HP flow temperature

Cond.temp. (°C) .... HP condensing temp.

Cond.press. (bar) .... HP condensation pressure

**Evapor.1 t. (°C)** .... Temperature of discharged air/incoming brine circuit

Evapor.2 t. (°C) .... Temperature of brine into the ground loop from HP

Outdoor t. (°C) .... Outdoor temp. to HP (air source HPs only)

Evapor. t. (°C) .... HP evaporation temp.

60

Suction t. (°C) ....HP compressor intake temp.

Superheat (°C) ....Superheat at HP compressor suction

Evap.press. (bar) ....HP Evaporation pressure

EEV opened (%).........HP EEV opened in %

HP SW ver. (-)............HP SW ver.

SW EEV ver. (-) ....HP EEV electronics ver.

5.7. HP blocking
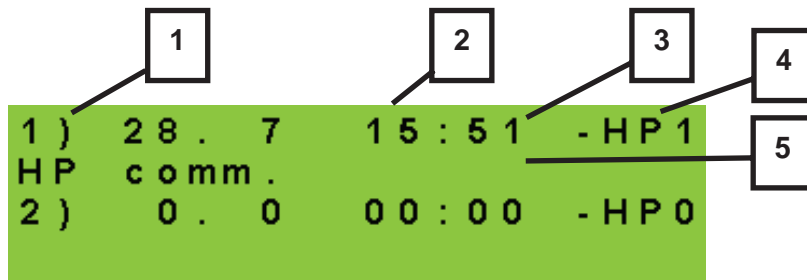
1 – error serial number (1-10)

2 – date & time of error occurrence

3 – information if the error is still active

4 – number of HP with error (1-10)

5 – error type

5.8. Settings for an ON/OFF source

source (active/off) .....Switching on an auxiliary source on service level.

diff. on (°C)................Setting a temperature difference between the desired thermal store upper and real temperature for switching on an auxiliary source.

diff. off (°C)................Setting a temperature difference between the desired thermal store upper and real temperature for switching off an auxiliary source.

delay (min) ....Setting the delay for auxiliary source start after the demand for start appeared.

block out. t (°C)..........Setting outdoor temp. above which an auxiliary source is blocked.

Ripple cont. (yes/no). Ripple control. With *no* the heat pump runs disregarded of the Ripple control signal.

at HP failure (on/off)

...................................If *on*, a boiler is switched on in case of a heat pump fault. For cascades, all the heat pumps must be out of operation.

external blocking input

...................................Setting the terminal to which an input used for switching an auxiliary heat source externally will be connected. It is possible to select any

free input to IR or inputs from the add-on digital input module (if present).

Control sensors (sensor list)

...................................Control sensors to switch on/off an auxiliary source.

5.9. Settings for an auxiliary source with OpenTherm

source (active/off) .....Switching on an auxiliary source on service level.

DHWE heating (yes/no)

...................................If *yes*, OT boiler is started simultaneously with DHW-E zone demand. DHW-E output continues to be active and can be used to switch terminals in boilers that require this.

DHW in boiler (0 / 1 / 2)

...................................determines a DHW type connected to the boiler:

...................................0 - boiler with no integrated DHW tank

...................................1 - boiler with a hot water storage tank and thermostat

...................................2 - boiler with a hot water storage tank and temperature sensor

delay (min) ....Setting the delay for auxiliary source start after the demand for start appeared.

block. out.t (°C)..........Setting outdoor temperature above which an auxiliary source is blocked.

Ripple cont. (yes/no) .Ripple control. With *no* the auxiliary source runs disregarded of the Ripple control signal.

max. temper. (°C).......Max. source temperature. When this temperature is exceeded, the source is switched off. At the same time, this is the upper limit for demands (e.g. if a DHW demand is 95°C and a boiler max. temp. is 80°C, the DHW temperature demand sent to the boiler is 80°C).

at HP fail. (yes/no)

...................................Switching on the source when the heat pump shows a fault. In case of an active heat pump fault (or of all heat pumps in a cascade) the OT source acts as a main heat source instead of the heat pump (takes over heating/DHW demands from the heat pump).

commun.speed (0 - 9)

...................................Speed of OT communication with the source. The parameter sets the communication bus speed between the IR and source. Lower numbers mean higher speed but higher inclination to a communication fault. The recommended setting is 4 or 5.

5.10.   Settings for a modulated (0-10V) heat source

source (yes/no)..........Switching on a 0-10V signal controlled heat source on service level.

output (power/temp.)

...................................Setting the type of output signal. With ***power*** selected, the 0-10V signal is in direct relationship to the desired source output (in the range adjustable on the respective adjustment page). With ***temp.*** selected, the 0-10V output signal is in direct relationship to the desired temperature.

Ripple c. (yes/no)

...................................Settings for 0-10V source control by Ripple control signal.

DHWE heating (yes/no)

...................................If ***yes***, 0-10V source is started simultaneously with DHW-E zone demand. DHW-E output continues to be active and can be used to switch terminals in boilers that require this.

sensor (sensor list)

...................................Control sensor for a 0-10V source.

max. temp. (°C)..........Setting of max. flow temperature from a heat source. This temperature will be used as the upper limit value for a desired boiler temperature.

5.11.   Settings for DHW heating

on (active/off).............Switching on DHW heating by a heat pump on service level.

diff. on (°C).................Setting the DHW heating switch-on difference.

diff. off (°C).................Setting the DHW heating switch-off difference.

Control sensors (sensor list)

5.12.   Settings for thermal store heating

on (active/off).............Switching on Thermal Store zone on service level.

5.13.   Sensor management

IN (-)............................The terminal number to which the temperature sensor is connected. Option 1 indicates a sensor is not used and options 2 to 9 correspond to terminals C2 to C9.

connected (yes/no)....***No*** option shall be selected in case no temperature sensor is connected (to avoid the program reporting an error when the sensor is disconnected). For some temperature sensors, this option cannot be changed. The setting depends on the system configuration. (E.g.,

when DHW zone is switched on in service level, the HP sensor is activated, while when the DHW zone is switched off, the sensor deactivates automatically).

adjustment (°C/bar) ...Temperature sensor offset in case the value measured by the sensor differs from the real value. This is intended e.g. to compensate for the resistance of a long sensor cable.

state (OK / error)........The sensor state – if the sensor is in an error state (either a too high or a too low temperature is sensed), the text *fault* is displayed.

For a pressure transducer only:

range (bar) ....Pressure transducer range (maximum transducer value).

5.14. Other service settings

password ....Setting a numeric password to access the service level menu.

Frost protection

When Frost protection is on, the flow temperature to a switched off zone is monitored. Should the outdoor temperature drop below the value set in the *out. temp.* parameter, then the heating water temperature to the zone is kept at the value set by *water temp.* parameter.

state (active / off).......Turning frost protection on/off.

out. temp. (°C)............Setting outdoor temperature limit below which Frost protection is activated.

water temp. (°C).........Heating water temperature kept in a zone when Frost protection is active.

Critical Thermal Store temperature

If the temperature in thermal store exceeds the set critical temperature, cooling will start with heating into all zones switched on in service menu, i.e. incl. those switched off in user menu. During cooling, the zone pump is on and the max. temperature is set for the zone. *(Max.t to zone)* Cooling will be finished when the thermal store temperature drops by 5°C.

temper. (°C)...............Setting critical temperature in thermal store.

website password reset (no/reset)

..................................Selecting reset will reset the website service level password and username to default values.

5.15.   Fireplace

A fireplace or solid fuel boiler can be controlled directly via one of the optional outputs on terminal block F of the IR controller or via an add-on module. In this way, the heating of the hot water storage tank from the thermal store can be effectively controlled.

Fireplace module (on/off)………… Option if the module is used in the system.

ThSt sensor for Fire (sensor list).. Selecting a sensor for differential function of switching on a fire circulation pump.

min. Fire temp. (°C) ..Flow temperature from fireplace to start fireplace circulation pump.

dif. Fir/ThS on (°C) ....Setting the switch-on difference to start the fire pump.

dif. Fir/ThS off (°C) ....Setting the switch-off difference to stop the fire pump.

max. ThSt temp. (°C)...Max. temperature in thermal store (or exactly at the sensor selected in parameter ThSt sensor for Fire for fire circulation pump operation.

DHW heating by ThSt

DHW pump (no/yes)..Turning on/off the function of heat transfer from thermal store to hot water storage tank.

diff. on (°C) ....Setting the switch-on difference to start DHW pump.

diff. off (°C) ....Setting the switch-off difference to stop DHW pump.

DHW sens. for DHWpump (sensor list)… Selecting a sensor in hot water storage tank for differential function to start DHW pump.

ThS sens. for DHWpump (sensor list)…… Selecting a sensor in thermal store for differential function to start DHW pump.

5.16.   UNI function, UNI function 2

The output of the universal function consists of sub-functions connected in series. The output is therefore closed only if the conditions for switching on all functions in the series according to the following diagram are met. Closing of the output is also conditioned on switching on the universal function.

The setting of universal function 2 is identical to the setting of UNI function 1.
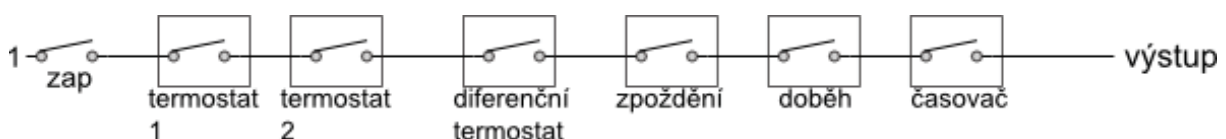
It is obvious from the picture that the Delay function can delay signal from thermostat and diff. thermostat functions, the Overrun function can hold disconnection (switching off) from

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thermostat, diff. thermostat and delay functions. The Timer function is superior over all the preceding functions.

Basic settings

UNI function active (on/off) Switching on the universal function.

sens. 1 ....Selection of sensor 1 for universal function.

sens. 2 ....Selection of sensor 2 for universal function.

Thermostat 1, Thermostat 2

Thermostat 1 is related to sensor 1, thermostat 2 to sensor 2.

demand (°C) *...............*Thermostat 1 (2) demand (set) temperature.

d. ON/OFF (°C) ....Thermostat 1 (2) switch-on and switch-off temperature difference.

Thermostat 1 (2) is used for cooling (yes/no)

....................................If the *yes* option (cooling mode) is selected then the Thermostat 1 (2) function will be switched on when the temperature reaches demand (+ switch-on difference) and will be switched off again if the temperature drops below demand (- switch-off difference). If the *no* option (heating mode) is selected then the Thermostat 1 (2) function will be switched on when the temperature drops below demand (- switch-on difference) and will be switched off again if the temperature reaches demand (+ switch-off difference).

Call for heat from Thermostat 1 (2) (on/off)

....................................Switch-off temperature for Thermostat 1 (2) will be taken over as the desired temperature for heat sources. Valid only if Thermostat 1 (2) is set in "heating" mode. When *Timer* function is also On, the request will be taken over during active time period only.

Differential thermostat

Differential thermostat between sensors 1 and 2.

diff. on (°C) *.................*Switch-on difference between temperatures.

diff. off (°C) *.................*Switch-off difference between temperatures.

Delay

Output switch-on delay function.

period (minutes) *........*Delay time in case when all the preceding functions are switched on.

Overrun

Output switch-off delay function.

overrun (minutes) *......* Output overrun time after the preceding functions are switched off.

Timer

A simple timer with two time periods.

on 1 (hh:mm) .... The first period switch-on time.

off 1 (hh:mm) .... The first period switch-off time.

on 2 (hh:mm) .... The second period switch-on time.

off 2 (hh:mm) .... The second period switch-off time.

reset state of T1&T2 with every start of the period of the program

.... When this function is On, at every start of time period in time program the state of both thermostats, T1 and T2, will be reset according to the current temperatures.

Using the UNI function for pool heating

To activate and display the pool in the system diagram, it is necessary to use the web interface and set the value 1 (= pool) in the configuration settings of the UNI module. Subsequently, the required pool heating parameters can be set.

Optionally, **Thermostat 1** is set to prevent unwanted cooling of the thermal store (source) and mandatory **Thermostat 2** to set the required temperature and hysteresis of the pool heating (consumer).

In the case of free outputs (at terminal block F), this function can also be used without using the UNI module.

5.17. Addresses of CIB modules

A wide range of add-on modules can be connected to the Controller on CIB bus. The module is also power-supplied from this bus. After the module is connected, its 4-character HW address shall be set in the Controller that is printed on the module's side, otherwise the module will not be recognized by the Controller and an error will occur.

The addresses of only some modules can be set on the display, for complete settings it is necessary to use the web interface of the controller.

module addr. (-) *.........* Hexadecimal HW address of a module.
load address (no/yes)

..................................After entering the HW address, confirm *yes* to load the address into the Controller. The lower line will read *OK* and the green **RUN** lamp on the module will start flashing.

5.18. IP addresses

Setting the IP address, network mask, gateway, DNS server address and DHCP server. IP addresses are entered in the range from 0.0.0.0 to 255.255.255.255.

IP ....Controller IP address.

Mask ....Network mask the Controller is connected to.

GW..............................IP address of the default gateway the controller is connected to.

DNS ....IP address of DNS server.

Set new IP (yes/no)

..................................Confirmation of the new IP addresses set. The new IP addresses will not be saved to the Controller memory without this confirmation. At the same time, DHCP will be turned off.

Set DHCP (yes/no)

..................................When *yes* is selected, the Controller will receive the address from the DHCP server.

MAC...........................MAC address of the Controller (information only).

Serial number ....Controller serial number (information only).

5.19. RegulusRoute

RegulusRoute service enables remote access to the Controller avoiding the need to use a public IP address. If you wish to have this service configured, kindly contact Regulus.

RegulusRoute (yes/no)

..................................Enabling RegulusRoute service.

Status ....RegulusRoute service state.

IR name ....Controller login name to RegulusRoute service.

IR password...............Controller login password to RegulusRoute service.

Set new Regulus Route parameters (yes/no)

..................................When *YES* is selected, the Controller will start using the newly entered name and password for RegulusRoute service (parameters can be entered via web interface only).

5.20.   Output test

When *test* in Service Menu is entered, all outputs from the Controller are switched off. Then separate outputs can be tested. The output turns on when a display with the name of the output in question is shown and the option *test* = 1 selected. On leaving a display with the option *test* = 1, the respective output switches off.

Some outputs can not be tested in this menu, they can be tested from the web interface only.

termin ....Terminal number for the respective Controller output.

operat ....Description of the output function.

test (0,1) ....State of the tested output, 1 = output on.

6. Service web interface of the Controller

Both the Controller and the computer should be connected to the same server (router) within the same network. If the Controller is not connected to the network, it is possible to connect the Controller to the computer using a LAN cable. You can use the instructions in point 8 of this manual to set up your computer's network adapter correctly.

In order to access the Controller's interface via web browser, you need to know its IP address. The IP address set in the Controller can be revealed by hitting *DISP* key. Then pressing arrow down key will display the IP address of the device, its mask and gateway.

Entering the IP address into the address bar of your browser will open a log-in window that enables visiting either User or Service level.

level	username	password
user	user	user
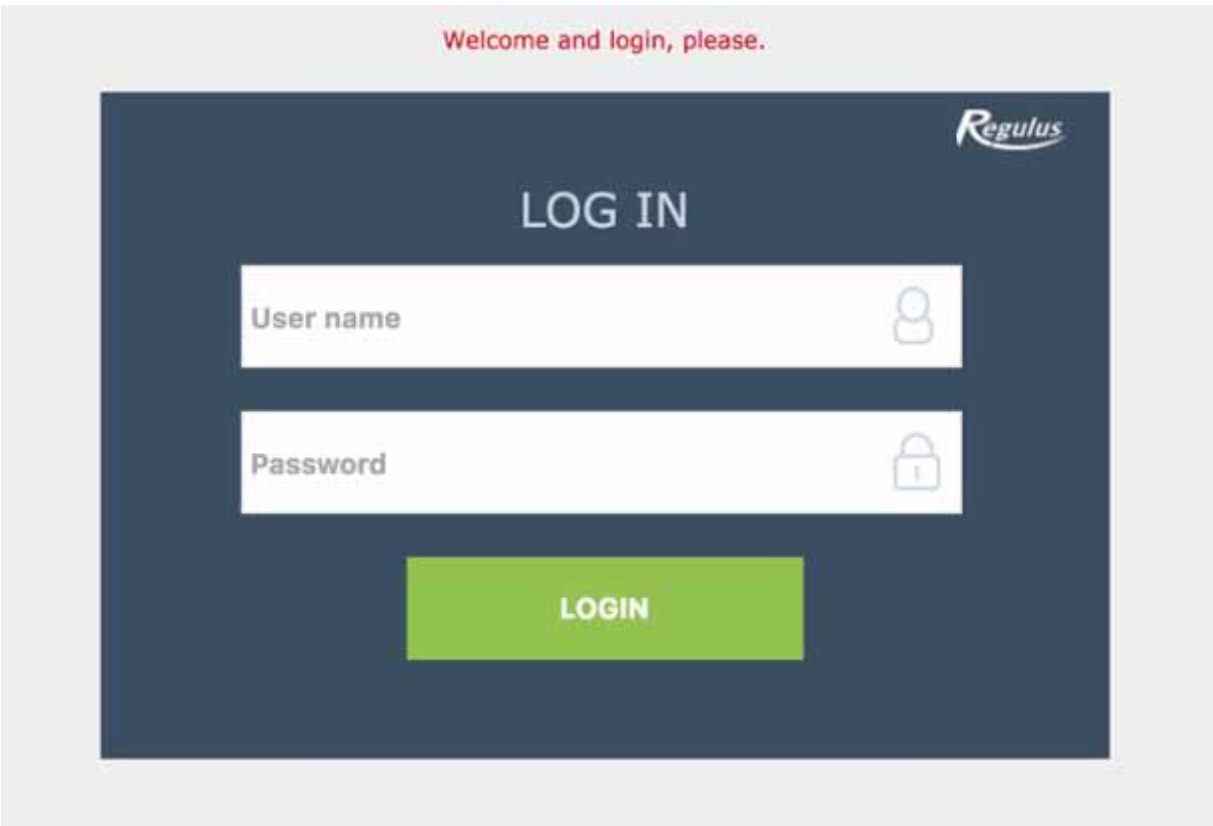
After successful login the home screen appears with the Service Menu.

7.   Room units, thermostat

A room sensor, an RC25 room unit, a pair of room units can be connected to each heating zone.

It is possible to choose the control of the zone by a room sensor or a unit from any other zone from the web interface of the Controller. This option is not available on the display.

Room sensor

A Pt1000 sensor can be connected to the Controller.

Zone 1 ....Terminal B7 (AI3).

Zone 2 ....Any free terminal C2 to C9, or an add-on module for zone 2. The appropriate terminal must then be selected in the input management.

Zones 3 to 6 ....Add-on modules.

RCM2, RCD or RCA room units

RCM2, RCD or RCA room units shall be connected to a CIB bus. After connecting, their HW address shall be entered in the menu *module addr.* for zones 1 and 2. For other zones, the web interface needs to be used.

RC25 room unit

The RC25 room unit can also be connected to the Controller via the CIB bus. It senses the room temperature and relative humidity in the heated zone, allows easy correction of the desired temperature by a knob, indicates the operating status or alarm, or may have other optional functions.
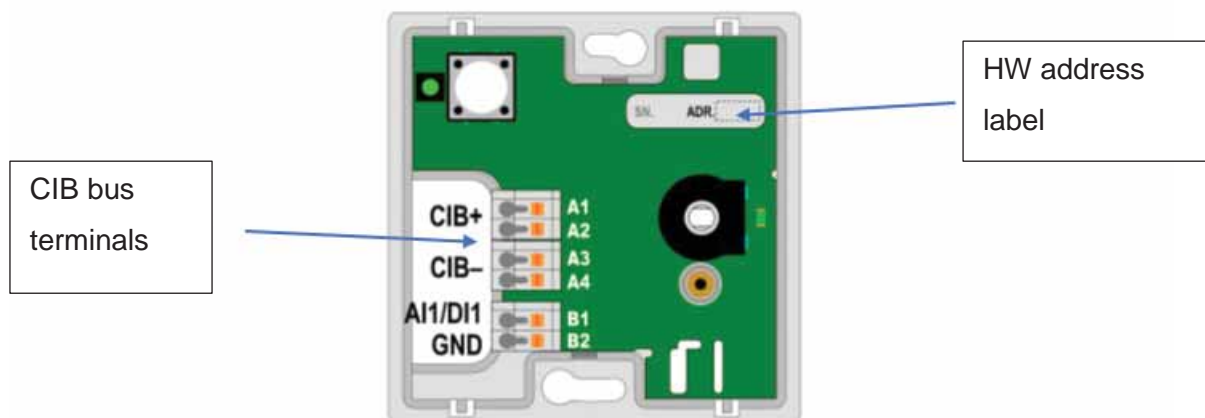
We recommend using a cable with a twisted shielded pair and a core diameter of preferably 0.8 mm (e.g. J-Y (St) Y 1x2x0.8).

<u>Thermostat</u>

A simple thermostat with a potential-free contact can be connected to the Controller.

Zone 1 ....Any free terminal C2 to C9. The appropriate terminal must then be selected in the input management.

Zones 2 to 6 ....Add-on modules.

<u>Wireless WiFi room sensor</u>

First select the power supply method in the sensor (either from the battery "***BAT***" or from the USB "***USB***") - the "***POWER***" switch on the printed circuit board of the wireless sensor is used to select the power supply. After pressing the "***WiFi settings***" button, the blue LED lights up and the WiFi sensor creates an access point (hotspot) called "***Regulus_RSW***".

It is necessary to connect to this access point using a PC or mobile device and set the parameters needed to connect the sensor to the Controller - the IP address of the Controller and the parameters of the WiFi network. The sensor shall be connected to the same network as the controller, or to the USB WiFi module of the IR14 Controller, if it is in Hotspot mode.

8. Procedure for direct connection of PC with Controller

1. Determine the static IP address of the Controller

The Ethernet (network) cable shall be disconnected from the Controller.

Press the DISP key on the Controller, scroll using the down arrow until the parameters of **ETH2** channel appear on the display. Here the IP address is shown (second line, **IP**).

2. Connect the PC and the Controller with an Ethernet cable

3. Set up a network connection on the PC

On your computer, right-click on the internet connection icon (small screen icon in the lower right corner).

Click the Network and Internet Settings link.

Click on Network and Sharing Center - a window with a list of network connections will open.

Click **Ethernet** - the connection status window will open.
Click on Properties at the bottom - the Ethernet properties window will open.
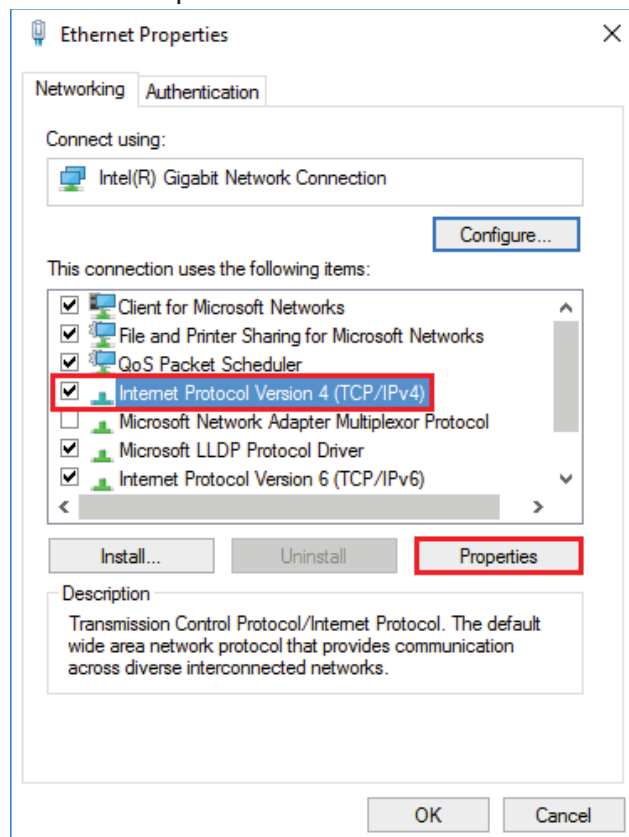
Double-click on **IP Protocol version 4** - the protocol properties window will open.
This window can also be accessed in other ways.

Select the **Use the following IP address** option and enter the IP address manually in the appropriate box.

If you already use the "**Use the following IP address**" option, make a note of the values to return to the original settings before changing the settings.

The IP address must match the IP address found from the controller in the first three triple digits and must be different in the fourth triple digits.

In this case, the controller has the address 192.168.100.14 and the PC address 192.168.100.15.

The three digits must be in the range 001-254.

After filling in the IP address, press the tab key on the computer keyboard. This will automatically fill in the subnet mask (255.255.255.0). It is not necessary to fill in the next field. Press **OK**. The window will close. However, to save the settings, it is necessary to press **OK** in the previous window with Ethernet settings, too.

By entering the IP address of the Controller into the browser, you will now get to the login form, from which it is possible to visit the User or Service level.

After terminating the connection between the computer and the controller, we recommend returning the network connection to its original state.

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WARRANTY CERTIFICATE

IR 14 HEATING CONTROLLER

Seller: ....

Date of purchsse: ....

WARRANTY CONDITIONS

1. The Seller grants the Buyer a warranty period of 24 months from the date of sale.

2. The product shall be installed and put into operation by an authorised firm or by a person trained by the manufacturer.

3. When claiming the warranty, present a duly completed Warranty Certificate and proof of purchase of the product.

4. The condition of the warranty is compliance with the manufacturer's technical specifications, installation and operation manual and with the instructions contained in the accompanying product documentation as well as on the product itself.

5. The warranty does not cover defects caused by external influences or improper operating conditions, when the product is not used in accordance with its intended use, defects caused by normal wear and tear, when the product is defective due to mechanical damage, improper operation, tampering by a third party, improper installation, improper storage, natural disaster, etc.

COMMISSIONED BY:

Company: ………………………………..

Date: ……………………..

Rubber stamp print, signature of the technician:

FW 1.0.11.0
updated 12.11.2024

v1.1-11/2024

REGULUS spol. s r.o.
E-mail: sales@regulus.eu
Web: www.regulus.eu