EH-201/V User manual

Domestic hot water regulator

Ouman EH-201/V is domestic hot water controller which can be used in district heating exchangers or boiler plants. EH-201/V contains a patented control strategy giving you optimal control even in all kinds of problematic situations.

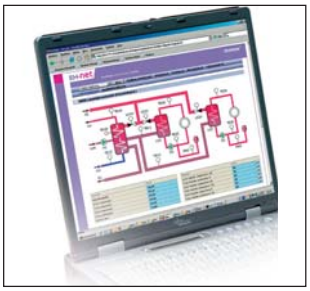
EH-201/V also has two relays, making it possible to control, for example, an accumulator's loading pump or time control an electrical unit (a sauna, door locks, yard lights, etc.)

Locations:

- Apartment buildings
- Business premises and office buildings
- Row houses
- Private homes and summer cabins

Remote control options:

- **EH-net**
  Web based user interface
  Internet/Intranet



Web-based remote control and monitoring is made possible with the EH-net server (optional equipment) connecting to a web-browser.

LonWorks® MODBUS® EH-net

www.ouman.fi

OUMAN®

OUMAN EH-201/V FOR STARTERS

Congratulations on your extraordinary selection! You have obtained a versatile new generation domestic hot water controller for residential buildings and business facilities – a super-efficient product that can be used in boiler plants as well as district heating solutions.

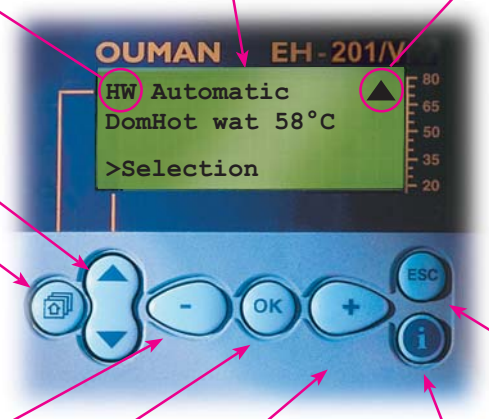
Next we will introduce the regulator and the basic principles for using the user manual.

User panel

Regulating circuit code indicates that this is one circuit domestic hot water regulator.

The example shows the regulating circuit's operating mode.

Symbols which indicate actuator control mode.



▲ Regulator opens the 3-point controlled actuator.

▼ Regulator closes the 3-point controlled actuator.

Height up the pillar shows the position of the voltage controlled actuator.

Valve is fully open (100%) and the control voltage is 10 V.

Valve is fully closed (0%) and the control voltage is 0 V or 2 V (2 ... 10 V actuator).

Browse button - moves the > cursor up and down.

Group select button - not in use in Ouman EH-201/V

Decrease button

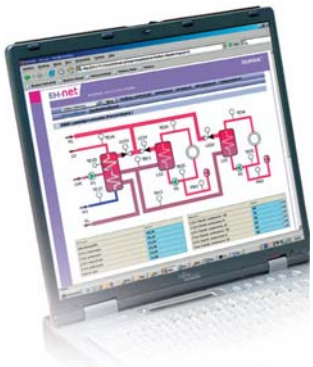
OK button

Increase -button HINT! When you press + button in adjoining basic display mode, the regulator displays all the measure-ment results in turn and then returns to the basic display mode.

INFO-button -gives operating instructions and additional information on the display in different situations

ESC press to return to the previous display

Remote control options:



EH-net

Web based user interface

Ouman controllers can also be controlled and monitored via an inexpensive web user interface. A web scanner is easy to use and can illustrate remote control and monitoring of even large Ouman control systems regardless of the time and place.

OUMAN EH-201/V

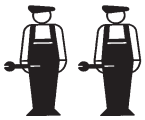
CONTENT

User guide

Maintenance guide

These pages contain directions for maintenance persons authorized by Ouman. Access to the regulator´s maintenance mode is prevented by a maintenance mode.

Service



Special maintenance

OUMAN®

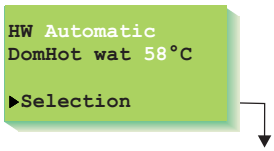
OUMAN FINLAND OY
Voimatie 6, 90440 Kempele
Tel. +358 424 8401
Fax +358 8 815 5060

Espoo sales office:
Upseerinkatu 1, 02600 Espoo
Tel. +358 424 840 202
Fax +358 9 4780 1030

www.ouman.fi

SETTINGS Browsing, making changes

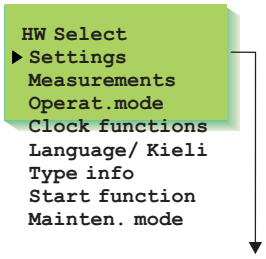
In Ouman EH-201/V is is possible to set the domestic hot water (HW) setting value. If relay 1 is controlled according to temperature (see page 19), you can set the temperature limit for the relay control in this mode. Settings are inspected and adjusted in the following manner:



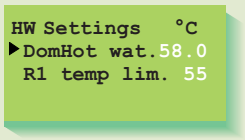
OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.

Press **OK.**



Press the button to move cursor to "Settings". Press **OK.**



Changing the temperature of domestic hot water:

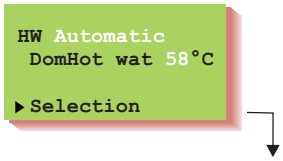
Press **OK** (or press first the button to move cursor to "R1 temp lim.").
Change the setting by pressing the **-** or **+** button. Press **OK.**
Exit with **ESC.**

INFORMATION ABOUT SETTINGS:

Setting:	Factory setting:	Range:	Explanation:	Attention!
Dom.hot.water	58,0°C	5,0 - 95,0 °C	Domestic hot water setting	Because of danger of bacteria, it is recommended that the domestic hot water temperature is not set below +55°C.
Re1 temp lim.	55°C	0 - 95 °C	**Relay 1 temperature limit:** Temperature of measurement 11 when relay 1 is to be activated.	The function is taken into use in the maintenance mode, in the relay 1 control mode (p. 19).

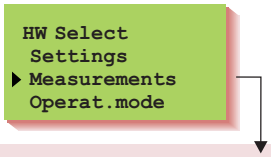
The regulator can be connected to 8 different measurement data at the same time (6 NTC measurements + 2 digital inputs). Measurement data can also be read through the bus. Also the position of the voltage controlled (0...10V or 2...10V) actuator can be seen. Measurements 4, 6, 9, 10, and 11 can be used to indicate external alarms (additional information on alarms page 13).

ATTENTION! **Only the measurements connected to the regulator appear on the display.**

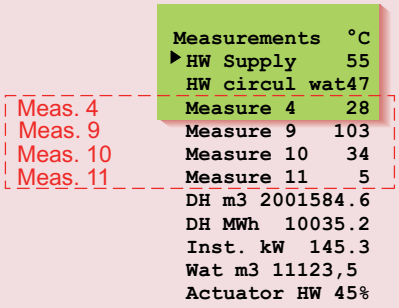


OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.
Press **OK.**



Press the button to move cursor to "Measurements". Press **OK.**



Browsing through measurements:

Press the button to browse different measurements.

Press **ESC** to exit from the measurements display

Every sensor has it's own typical range. (Ex. supply water sensor 0...+130 °C). If the sensor's measured value is outside of this range, a **-** or **+** character will appear on the measurements display in place of the sensor's measured value to indicate whether the value is above or below the range.

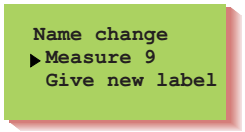
If there is a sensor defect the regulator gives an alarm (see p. 13) and "err" will appear in place of the measured value.

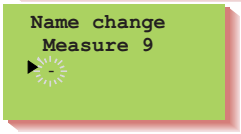
Measurements 4, 9, 10: Only information type temperature measurements. They can be labeled through text editing for other uses, *e.g., DH supply, DH return, cold water, cooler, accumulator upper, accumulator lower, etc.*

Measurement 11: Can be used as a free temperature measurement that can be labeled. If a temperature controlled relay has been selected for relay 1 control (see p. 19), the regulator automatically reserves measurement 11 for relay 1 temperature control.

Relabeling measurements 4, 9, 10 and 11:

Move the cursor to the measurement (4, 9, 10 or 11) that has to be relabeled. Press **OK.**





Move the cursor to "Give new label". Press **OK.**

A letter "-" appears on the display. You can move forward or backward in the character row by pressing the **+** or **-** button. Confirm the letter/character by pressing **OK**, then the same letter/character that you selected will blink in the next space. The character that has been fed last can be deleted by pressing **ESC**. If you press the **ESC** button for a while you can delete the new name and the previous name remains in effect. When you have written the name, press **OK** for a while (over 2 sec.), to exit from the data entry mode and the name that has been written will come into effect.

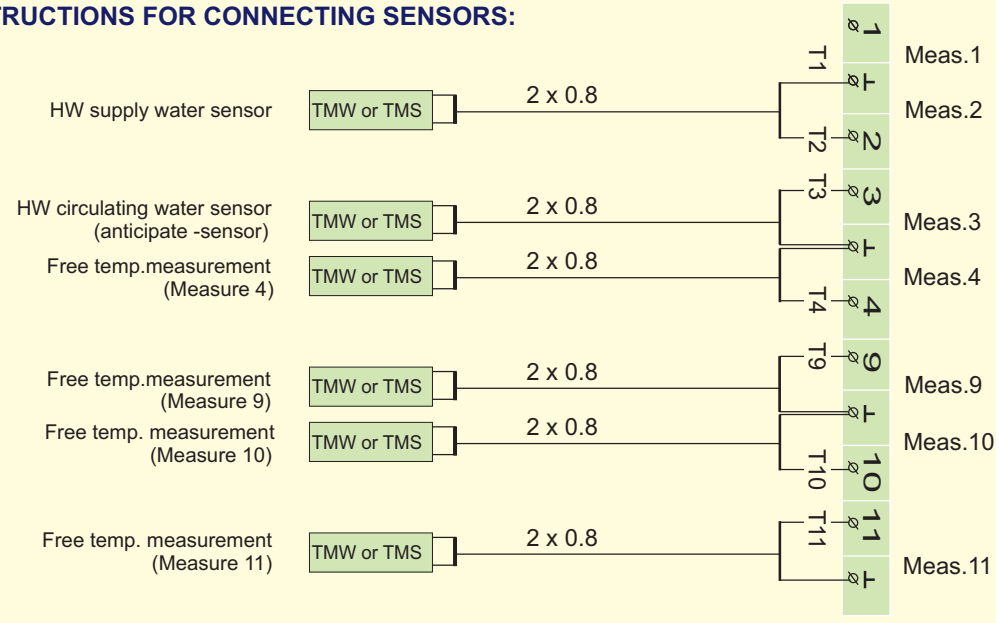
Text editor's characters in the order in which they appear:

"Empty" . - numbers 0 ... 9 letters: A ... Z and a ... z ä ö å

MEASUREMENTS Additional information

Strip con-nector	Measure-ment:	Measurement information:	Setting range:	Attention!
1		**It is not in use**		
2	HW supply	HW (domestic hot water) supply water temp.	0...+130	
3	HW circul wat	Temp. of HW return water in heat exchanger. (an anticip. sensor is used in the HW heat exchanger to improve the setting results)	0...+130	
4	Measure 4	Free measurement; name using the text editor	0...+130	
9	Measure 9	Free measurement; name using the text editor	0...+130	
10	Measure 10	Free measurement; name using the text editor	0...+130	
11	Measure 11	Free measurement; name using the text editor	0...+130	
	DH m3	Measured consumption of DH water (m^3)	0...9999999.9	Measurement data through a digital input or the LON network.
	DH Mwh	Measured energy consumption of DH water (MWh)	0...99999.9	
	Inst. KW	DH energy consumption in kW (5 min. Period)	0...3276.7	
	Wat m3	Measured water consumption of facility (m^3)	0...99999.9	
	ActuatorHW	Actuator position in regulating circuit HW		Appears only when using a 0...10V (2...10V) controlled actuator.

INSTRUCTIONS FOR CONNECTING SENSORS:



Putting sensor into use and removing it from use:

When you connect the sensor to the regulator or remove it, the sensor recognizes connections that have changed only after it has been in the start function (see p. 12).

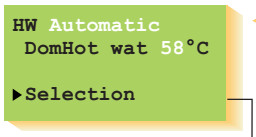
Resistance value table

°C	Ω
-30	177 100
-25	130 400
-20	96 890
-15	72 830
-10	55 340
-5	42 340
0	32 660
5	25 400
10	19 900
15	15 710
20	12 490
25	10 000
30	8 064
35	6 531
40	5 330
45	4 368
50	3 602
55	2 987
60	2 490
65	2 084
70	1 753
75	1 482
80	1 259
90	917
100	680
110	511

OPERATING MODES

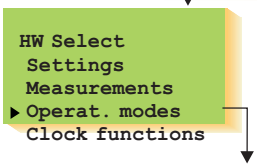
Ouman EH-201/V can be controlled with the automatic or manual operating modes. The factory set automatic regulation is a normal regulating situation, in which clock controlled HW temperature increases are also possible.

The selected operating mode always appears on the basic display on the top line.

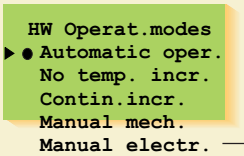


OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.
Press **OK.**



Press the button to move cursor to "Operat. modes". Press **OK.**



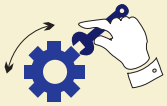
Press the button to browse control modes.
The ● symbol indicates which control mode has been selected.

Changing operating mode:
Move the cursor to the operating mode that you want. Press **OK.**
Exit with **ESC.**

Automatic regulation:
HW temperature is automatically regulated. HW temperature increases occur according to a clock program. (see p. 9, HW temp.incr.)

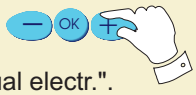
No temperature increases:
A nominal temperature is kept on disregarding the clock program.

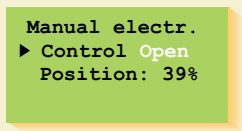
Continuous increase:
A continuous increase is kept on disregarding the clock program. The setting range for the amount of increase is 0…25°C and it is set in the maintenance mode. (see p. 16, HW increase)



Manual operation of actuator mechanically:
No electricity to actuator.
Only mechanical manual operation of actuator is possible.

Manual operation of actuator electrically:





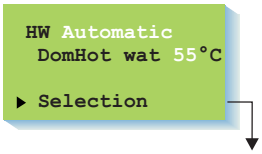
Press the button to "Manual electr.".
Press **OK.** Press the **-** or **+** button to change the position of the actuator. The direction the actuator is being driven can be seen from the display.
The position's %-reading indicates the actuator`s position if a voltage controlled 0...10V or 2...10V actuator (0% = closed, 100% = open) is being used.
Confirm the actuator position by pressing **OK.**

The valve can also be connected so that 100% is closed.

CLOCK FUNCTIONS Setting the time

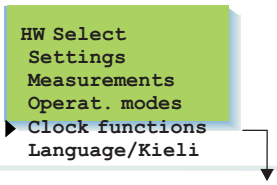
The Ouman EH-201/V regulator's clock registers summer time and standard time changes and leap years. The battery lasts approx. 10 years.

Setting the time happens in the following manner:

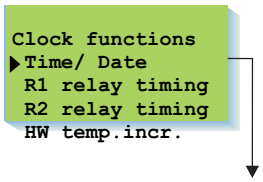


OPERATING INSTRUCTION:

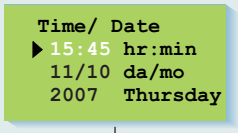
Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.
Press **OK.**



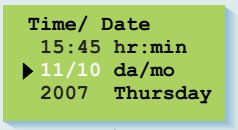
Press the button to move cursor to “Clock functions”. Press **OK.**



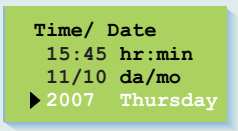
The cursor is at "Time/Date". Press **OK.**



Set the time:
The cursor is at time. Press **OK.**
The hours blink. Press the **-** or **+** button to set the hours. Press **OK.**
The minutes blink. Press the **-** or **+** button to set the minutes. Press **OK.**



Set the date: Press **OK.**
The day blinks. Press the **-** or **+** button to set the day. Press **OK.**
The month blinks. Press the **-** or **+** button to set the month. Press **OK.**

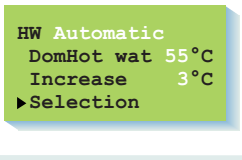


Set the year and weekday: Press **OK.**
The year blinks. Press the **-** or **+** button to set the year. Press **OK.**
The weekday blinks. Use the **-** or **+** button to set the weekday. Press **OK.**
Exit with **ESC.**

Clock programs - browsing, adding, deleting

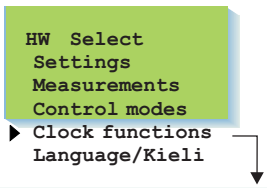
With the freely programmable 24 hour/7 day clock you can:

1. **Increase the domestic hot water temp. (anti-bacteria function)**
2. **Time control the desired on/off connections with two relays (ex. ventilator, outdoor lights, sauna stove, outside doors, see p. 19-20).**

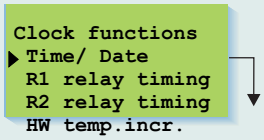


OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.
Press **OK.**
"Increase" appears if the domestic hot water increase program is on.



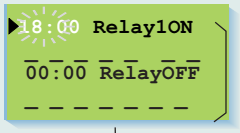
Press the button to move cursor to "Clock functions". Press **OK.**



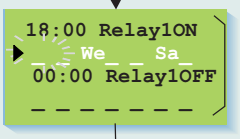
Press the button to move cursor to the program (HW temperature increasing or relay control program) whose time controls you want to access (browse, add or delete). Press **OK.**

Browse/ location for additional programming:

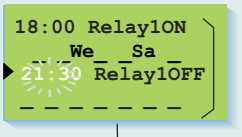
Press the button to browse the clock programs which have been made. If you want to make additional programs, move cursor to first empty program block.



Set the start time for the relay connection: Press **OK.**
Relay 1 ON-connection start time hours blink.
Press the **-** or **+** button to set hours. Press **OK.**
Minutes blink. Press the **-** or **+** button to set minutes. Press **OK.**

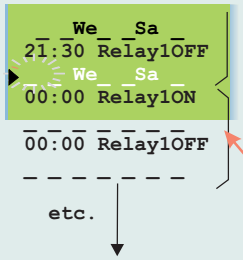


Set the weekdays (when the start time is effective):
Use the **-** or **+** button to select weekday.
The day is left unselected/ use the **-** -button to delete the selection.
The remaining selection is taken into use with the **OK** button.
Make your selection for each day and press **OK.**



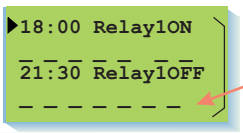
Set the end time for the relay connection: Press **OK.**
Hours blink. Press the **-** or **+** button to set hours. Press **OK.**
Minutes blink. Press the **-** or **+** button to set hours. Press **OK.**

Set the weekdays (when the end time is effective):
Use the **+** button to select weekday.
The day is left unselected/ use the **-** to delete the selection.
The remaining selection is taken into use with the **OK** button.
Make your selection for each day and press **OK.**



There is always one program block inside the brackets (drop on and off).
The cursor moves to the beginning of the next program block (new brackets).
Continue programming as before or exit with **ESC.**

In the example the sauna stow is warming on Wednesday and Saturday between 18:00 and 21:30.

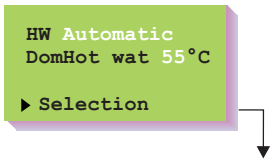


DELETING THE PROGRAM BLOCK:

You can delete the program block inside the brackets by deleting the weekdays in that program block with the **-** button.

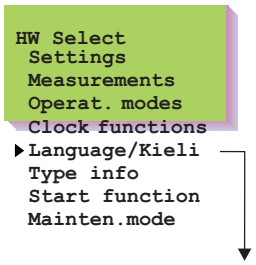
LANGUAGE/KIELI

The Finnish, Swedish or English language can be selected for the Ouman EH-201/V regulator. The factory setting is Finnish. The regulator can be switched to the Swedish or English language in the following manner:

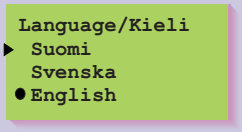


OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.



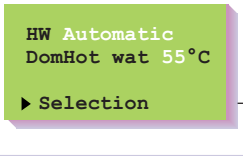
Press the button to move cursor to "Language/Kieli". Press **OK.**



Press the button to move the cursor to the language you want to use. Press **OK.**

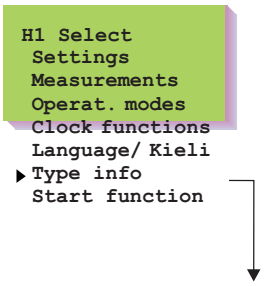
TYPE INFORMATION

Type information indicates which regulator is in question and which program version is in use. Ouman EH-201/V is single circuit temperature regulator for one domestic hot water circuit.

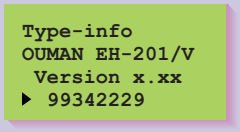


OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.



Press the  button to move cursor to "Type info". Press **OK.**

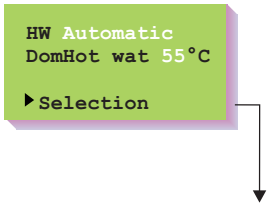


Ouman Finland Oy invests strongly in continuous product development. The version number informs the producer which version is in question.

START FUNCTION Regulat. mode sel.

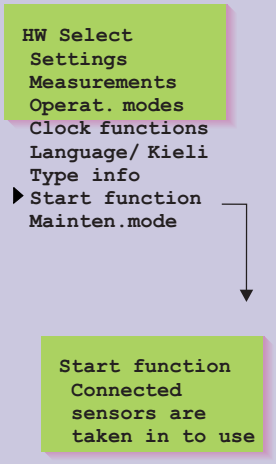
In the start function the regulator detects the sensors that are attached to it. The regulator takes the regulating circuit into use according to the supply water sensors.

The start function also activates the sensor's fault alarms.



OPERATING INSTRUCTION:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.



Taking sensors into use and deleting sensors:

If you connect a sensor to the controller or disconnect a sensor from the controller, you must go to start function and then the controller will take sensors into use or delete them.

Press the button to move the cursor to “Start Function”. Press **OK**.
The controller identifies sensors that have been connected and disconnected and displays control modes that can be selected. If you do not want to adjust the control mode, you can press **ESC** to exit from the control mode display without making changes.

ALARMS!

Alarms that indicate sensor faults, a supply water deviation that is larger than the value set by the regulator and HW overheating are EH-201/V's standard equipment. The regulator can also be used to indicate external alarms through measurements 4, 9, 10, or 11 or through digital inputs 1...2. Examples of external alarms are the network's water pressure and circulation pump (alarm labeling is done using text editing).

ALARMS:

Sensor fault alarms:

```
Alarm!

Measurement 2
HW supply err
```

In case of sensor fault, the regulator gives an alarm and a message appears on the display: Alarm! Measurement number and name and err. The alarm relay contact closes (strip connectors 31 and 32).

Deviation alarm:

```
Deviation alarm!

Measurement 2
HW supply 25
```

The regulator gives a deviation alarm if the supply water temp permanently deviates (factory setting 60 min) from the temp set for it by the regulator. (The maximum allowed deviation is listed in special maintenance under "HW Dev. alarm" settings and the duration of the deviation that causes the alarm to go off is under settings "DevAlaDela", page 22.)

HW overheating alarm:

```
Overheating!

Measurement 2
HW supply 78
```

If the HW supply water temperature exceeds the HW alarm limit (factory setting 65 °C), the alarm goes off. The present supply water temperature appears on the display. The alarm relay contact closes (strip connectors 31 and 32). See "Settings", page 16.

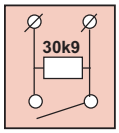
EXTERNAL ALARMS:

Measurements 4, 9, 10 and 11 as alarms:

Measurements 4, 9, 10, and 11 can also be used to indicate external alarms (potential free switch). In that case a 30k9 resistance must be connected to the strip connector of the measurement in question.

```
Alarm!

Measurement 10
Water press  err
```



When the contact is open "1" appears on the display. When the switch closes, an alarm goes off and the alarm in question appears on the display. The alarms can be labeled using text editing. See page 5.

Digital inputs as alarms

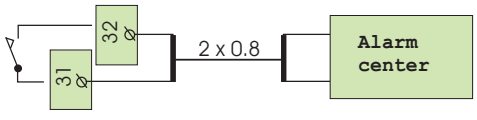
```
Alarm!

Dig 1
HW pump      err
```

The regulator has 2 digital inputs which can be used when transferring an alarm if "Alarm Dig 1 (2)" has been selected in the Dig-selection. When the switch closes, an alarm goes off and "**err**" appears on the display. If an alarm has been labeled, the name of the alarm appears on the display, for eg., "HW pump err". If the alarm is not labeled, "Alarm!, Dig 1 (2), Alarm Dig1(2)" will appear on the display. In the event of an alarm, the alarm relay contact closes (strip connectors 31 and 32).

CONNECTING THE ALARM RELAY:

24 VAC/ 1A



ALARM ACKNOWLEDGEMENT:

Turn the alarm off by pressing any button. The display will return to the mode it was in before the fault appeared or if there are additional sensor faults their alarm information will appear on the display. If you don't press the keyboard in 20 seconds the alarm will return to the display if the fault has not been corrected.

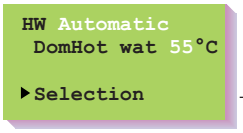
ENTERING THE MAINTEN. MODE

The maintenance person's maintenance guide begins here (p. 14 - 32).

Access to the Ouman EH-201/V maintenance mode is prevented by user rights. Only those persons who have a maintenance code have access to the maintenance mode.

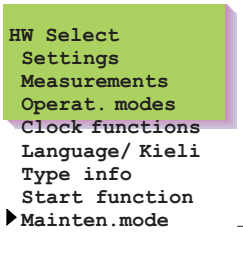
There are typical tuning values and settings in the **maintenance mode** which the maintenance person needs in conjunction with installation. An ordinary district heating exchanger is tuned in this mode.

Settings that are not needed as often can be done in the **special maintenance mode**, for ex., restoring original factory settings, special settings, digital input settings, LON and bus settings.

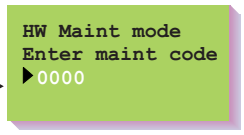


ENTERING THE MAINTENANCE MODE:

Press **ESC** until the display no longer changes.
You are then in the "Selection" display shown in the adjoining picture.

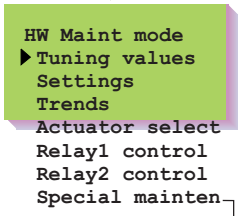


Press the button to move the cursor to "Mainten. mode".
Press **OK.**



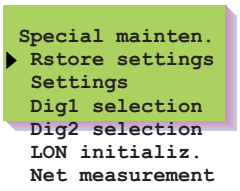
Press **OK.**
Press the **-** or **+** button to set the correct maintenance code one number at a time and press **OK** after each number.

MAINTENANCE MODE:



Press the button to choose what you want to access from the adjoining menu. Each item is presented individually on a separate page.

SPECIAL MAINTENANCE MODE:

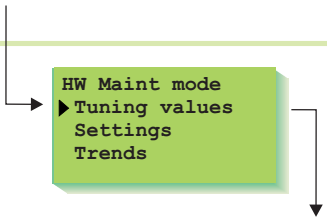


TUNING VALUES

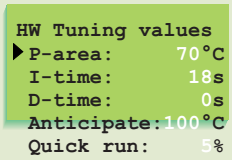
Anticipate and quick run can be set in the HW regulating circuit in addition to PID. The tuning values may have to be adjusted, for example, when the district heating exchanger is installed if the setting wavers with the original factory setting.

Directions for entering the maintenance mode are on page 14

Tuning takes place in the following manner:



The cursor is at "Tuning values". Press **OK.**



Press the button to move the cursor. Press **OK.**

Press the **-** or **+** button to make changes. Press **OK** to confirm.

You can see the anticipate, if the anticipate sensor is connected (measurement 3).

INFORMATION ABOUT TUNING VALUES

Settings:	Factory settings:	Range:	Explanation:	Attention!
P-area	70 °C	10...300 °C	Supply water temperature change at which the actuator runs the valve at 100%.	Eg. If the supply water temperature changes 10°C and the P area is 100 °C the position of the actuator changes 10%.
I-time	18 s	5...300 s	The deviation in the supply water temperature from the set value is corrected by P amount in I time.	
D-time	0 s	0...10 s	Regulation reaction speed up in the event of a temperature change.	Beware of constant waver!
Anticipate	100 °C	50...250 °C	Uses anticipate sensor measurement information to speed up regulation when HW consumption changes.	Increase the anticipate value to decrease reaction to changes in consumption.
Quick run	5%	0...100 %	Functions during consumption changes.	Decrease this value to decrease reaction to quick temperature changes.

The original factory settings may vary from the above. Shorten the I time (to approx. 12 seconds) in the HW 3-way mixer.

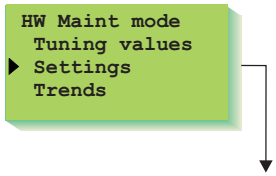
SETTINGS

Ouman EH-201/V has three types of settings:

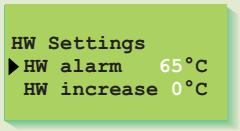
a) **user level settings** which the user can adjust (p. 4)
b) **maintenance mode settings** which the maintenance person may have to adjust
c) **special maintenance mode settings** which seldom have to be adjusted (p. 22)

Directions for entering the maintenance mode are on page 14.

The original factory settings are restored in special maintenance (p. 21)



Press the button to move the cursor to "Settings". Press **OK.**



Press the button to move the cursor to the setting whose value you want to change. Press **OK.**
Press the **-** or **+** button to change the setting. Press **OK.**

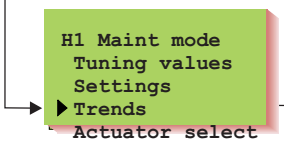
INFORMATION ABOUT MAINTENANCE MODE SETTINGS:

Settings:	Factory settings:	Range:	Explanation:	Attention!
HW alarm	65 °C	65...120°C	Domestic hot water alarm limit.	The alarm limit automatically rises during an increase in HW.
HW increase	0 °C	0...25°C	Domestic hot water increase (anti-bacteria function).	HW **increase time** is set in clock functions.

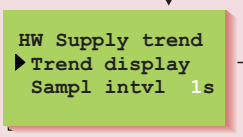
TRENDS

Directions for entering the maintenance mode are on page 14.

It is possible to follow supply water temperature changes on the trend display with the graphic depictor. You can decide yourself how often the temperature is measured. The factory set sampling interval is 1 second.

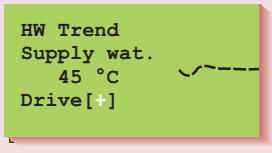


Press the button to move the cursor to “Trends”. Press **OK.**



If you want to see the supply water temperature depictor, press **OK.**

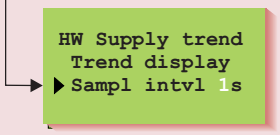
You can read supply water temperature changes graphically.
A supply water temperature scale is printed on the right edge of the display. The exact temperature of the supply water also appears as a numerical value.



If a 3-point actuator is being used, the direction the actuator is being run can be seen on the display. The + character indicates that the actuator is being run into an open position. The - character indicates that the actuator is being run into a closed position.

If a voltage controlled actuator (0...10V or 2...10V) is being used, the actuator's position information can be seen on the display. (0% = closed, 100% = open).

Exit with **ESC.**

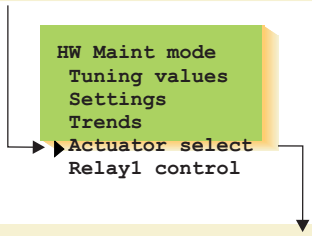


If you want to change the sampling interval, press the button to move the cursor to "Sampl intvl".
Press **OK.**
The time blinks. Press the **-** or **+** button to set the time.
Press **OK.**

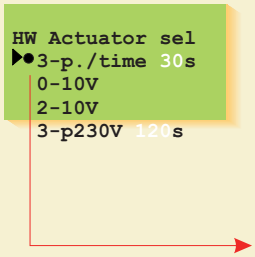
ACTUATOR SELECTION

Directions for entering the maintenance mode are on page 14.

The control mode for regulating circuit actuator is selected in actuator selection. Options are either 24 VAC 3-point control or DC voltage control (0...10V or 2...10V). If relays 1 and 2 are free, they can be utilized to implement 230VAC 3-point control. (first choose "230V Actuator" for the relay control mode. See pages 19 and 20)



Press the button to move the cursor to “Actuator select”. Press **OK.**

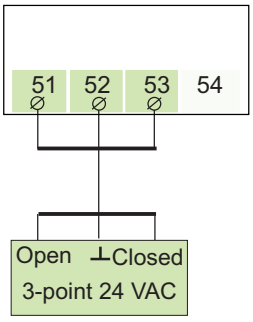


Press the button to move the cursor to the actuator control mode that you want to use.
Press **OK.**

If you select the 3-point control mode, the regulator asks for the actuator's running time. The running time indicates how many seconds go by if the actuator drives a valve nonstop from a closed position to an open position.
Press the **-** or **+** button to set the time. Press **OK.**
The ● character indicates which control mode is being used.

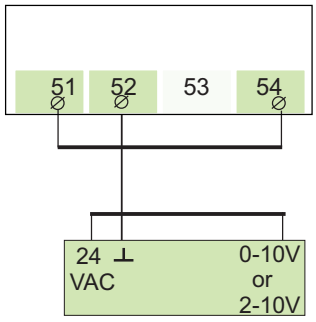
VALVE ACTUATOR CONNECTION:

3-point controlled actuator (24VAC)



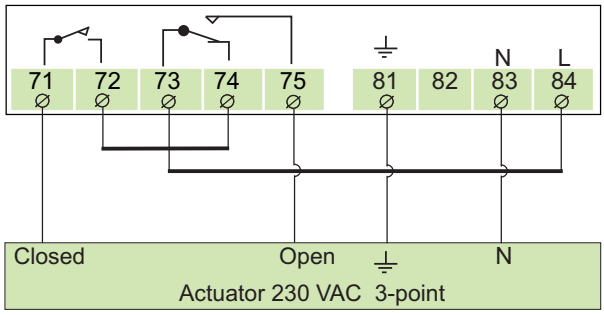
HW actuator
(control output M1)

0...10V or 2...10V DC controlled actuator (24VAC)



HW actuator
(control output M1)

3-point controlled actuator (230 VAC)



Attention! If "230V actuator" has been selected for relays 1 and 2, 230VAC 3-point controlled actuator can be connected to the regulator. Selection of relay control modes is shown on pages 19 and 20.

RELAY 1 CONTROL SELECTION

EH-201/V has two 230VAC/6A relays for relay controls, of which relay 1 is a break before make contact relay and relay 2 is an on/off relay.

The following functions can be implemented with relay 1:
1. Timing control
2. 230VAC actuator 3-point control (needs both relays)
3. Relay control according to temperature (measurement 11) (application example: control of cooler, control of accumulator charging pump)

Directions for entering the maintenance mode are on page 14.

```
HW Maint mode
 Tuning values
 Settings
 Trends
 Actuator select
▶Relay1 control
 Relay2 control
```

Press the button to move the cursor to “Relay1 control”. Press **OK.**

```
 Relay1 ctrl sel
▶● Not in use
   Time program
   230V actuator
   Temp operated
```

Press the button to move the cursor to the control mode that you want to use. Press **OK.**
The ● character indicates which control mode is being used.

```
R1 Temp operated
▶ Setting    55°C
  Hysteresis 3°C
```

Temperature controlled function:
The factory setting for measurement 11 in temp. controlled functions is 55 °C (setting range 0 ... 100 °C) and the hysteresis is 3°C (setting range 1 ... 10°C). The setting for measurement 11 can be adjusted either in this mode or on the user level (see p. 4, R1 temp lim.)

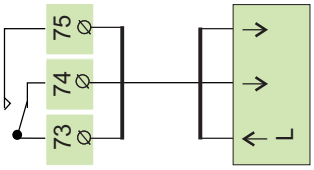
Changing the settings:

Press the button to move the cursor to the setting whose value you want to change. Press **OK.**
Press the **-** or **+** button to change the setting.
Press **OK.**

ADDITIONAL INFORMATION ABOUT RELAY CONTROLS:

On the display:	Explanation:
Not in use	Relay 1 is not being used.
Time program	The regulator time controls any electric apparatus using the relay, eg. a sauna stove, door locks. Timing programming is done in clock functions (p. 9). In the timing program's "ON" mode the relay is activated.
230V actuator	When you have reserved relay 1 for 230V actuator control, the regulator automatically also reserves relay 2 for 230V actuator control if relay 2 is free. If relay 2 is not free, the regulator first requests to free relay 2 for 230V actuator control. After this you can begin using 230VAC 3-point control in the "actuator selection" mode (see page 18)
Temp operated	The regulator controls relay 1 according to the temperature of measurement 11. The break before make contact relay is activated at the setting (73-75 closed) and released (73-74 closed) at the end of the set hysteresis (setting - hysteresis). E.g., a cooler's compressor or an accumulator's charging pump can be controlled with a temperature controlled relay. You can also adjust the temperature setting for measurement 11 on the user level (see p. 4).

Connection information:



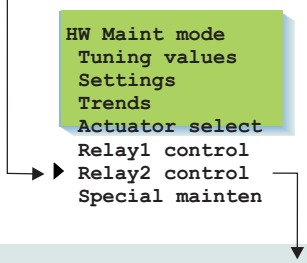
When the relay **is inactive** (timing program "OFF" mode or no electricity to actuator) the space between contacts **73-74 is closed** in the relay.
When the relay **is active** (timing program "ON" mode) the space between contacts **73-75 is closed** in the relay.

RELAY 2 CONTROL SELECTION

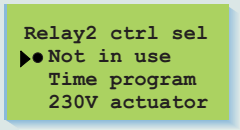
EH-201/V has two 230VAC/6A relays for relay controls; relay 1 is a break before make contact relay and relay 2 is an on/off relay.

The following functions can be implemented with relay 2:
1. Timing control
2. 230VAC actuator 3-point control (needs both relays)

Directions for entering the maintenance mode are on page 14.



Press the button to move the cursor to “Relay 2 control”. Press **OK.**



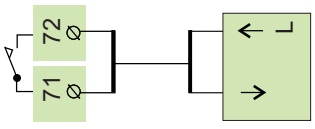
Press the button to move the cursor to the control mode that you want to use. Press **OK.**

The ● character indicates which control mode is being used.

ADDITIONAL INFORMATION ABOUT RELAY CONTROLS:

On the display:	Explanation:
Not in use	Relay 2 is not being used.
Time program	The regulator time controls any electric apparatus using the relay, ex. a sauna stove, door locks. Timing programming is done in clock functions (p. 9). In the timing program's "ON" mode the relay is activated.
230V actuator	When you have reserved relay 2 for 230V actuator control, the regulator automatically also reserves relay 1 for 230V actuator control if relay 1 is free. If relay 1 is not free, the regulator first requests to free relay 1 for 230V actuator control. After this you can begin using 230VAC 3-point control in the "actuator selection" mode (see page 18).

Connection information:



When the relay is inactive (timing program "OFF" mode or no electricity to actuator) the space between contacts 71-72 is open in the relay.

RESTORING SETTING

Restoring settings:

1. Eliminates clock functions
2. Restores user and maintenance level settings
3. Selects automatic control for the operating mode
4. Identifies the connected sensors and take use domestic hot water circuit.
5. Restores factory settings to the tuning values and trend sampling interval.
6. Selects the 3-point control for actuator control which has a 15 s running time
7. Relay controls are not in use.
8. Measurements are not read from the bus.

Original factory settings can be restored with the regulator in the following manner:

Directions for entering the special maintenance mode are on page 14.

```
Special mainten.
▶Rstore settings
 Settings
 Dig1 selection
 Dig2 selection
 LON initializ.
 Net measurement
```

Press the button to move the cursor to "Special maintenance".
Press **OK.**
The cursor is at "Rstore settings". Press **OK.**

```
Restore original
Factory settings
▶No
 Yes
```

Restore original factory settings:

Press the button to move the cursor to "Yes".
Press **OK.**

ORIGINAL FACTORY SETTINGS:

Operating mode:

```
HW Control modes
▶●Automatic ctrl
  No temp. incr
  Contin.incr.
  Manual mech.
  Manual electr.
```

Actuator selection:

```
HW Actuator sel
▶●3-p./time 15s
  0-10V
  2-10V
  3-p230V 30s
```

Settings:	Factory setting:
User level settings:	
Domestic hot water	58.0°C
Relay 1 temperature limit	55°C
Maintenance level settings:	
Domestic hot water alarm	65 °C
Domestic hot water increase	0 °C
Special maintenance settings:	
The amount of deviation from the setting, which causes the alarm	75°C
Temp. (meas. 11) deviation from the setting of "R1 Temp operated" which causes the alarm.	75°C
The duration of the deviation that causes the alarm	60min
Domestic hot water alarm delay	240s

Tuning values:

```
HW Tuning values
▶P-area:      70°C
 I-time:       18s
 D-time:        0s
 Anticipate:100°C
 Quick run:     5%
```

Relays:

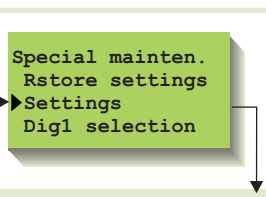
```
Relay1 ctrl sel
▶●Not in use
  Time program
  230V actuator
  Temp operated
```

```
Relay2 ctrl sel
▶●Not in use
  Time program
  230V actuator
```

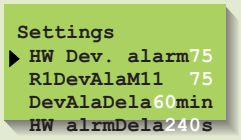
SETTINGS

Directions for entering the maintenance mode are on page 14.

This special maintenance mode deals with fault alarms caused by the domestic hot water temperature.



Press the button to move the cursor to "Settings". Press **OK.**

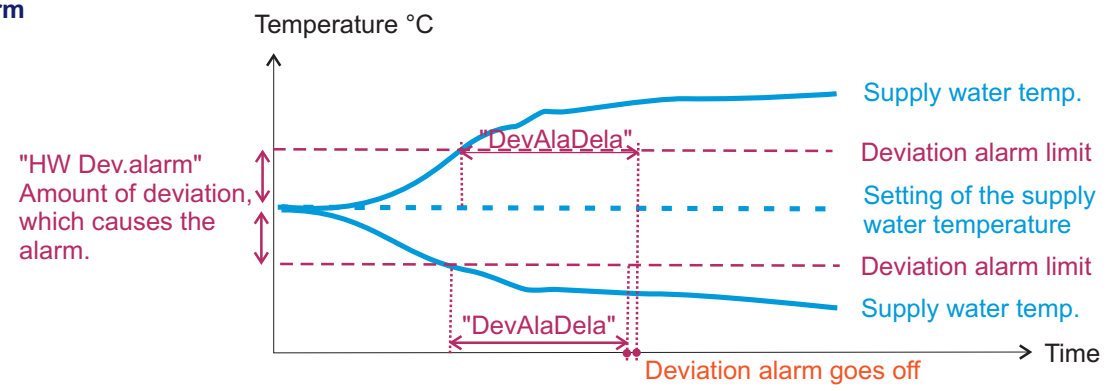


Press the button to move the cursor to the parameter that you want to change.
Press **OK.**
Press the **-** or **+** button to change the setting.
Press **OK.**

INFORMATION ABOUT SPECIAL MAINTENANCE SETTINGS:

Setting:	Factory setting:	Range:	Explanation:
HW Dev. alarm	75°C	1...75	Supply water temperature deviation from the setting which causes the alarm.
R1DevAlaM11	75°C	1...75	Temp. (meas. 11) deviation from the setting of "R1 Temp operated" which causes the alarm. This setting appears if "Temp operated" has been selected in the relay1 control mode (see page 19).
DevAlaDela	60 min	0...90	The alarm goes off if the supply water temperature deviation from the setting has lasted for the set time.
HW alrmDela	240s	0...590	The length of time from which the regulator calculates the HW average temperature for the alarm.

Deviation alarm

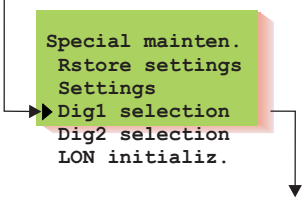


DIGITAL INPUTS 1 and 2

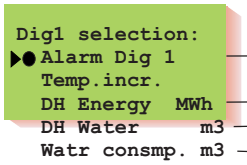
EH-201/V has two digital inputs. They can be used for receiving alarms. District heating energy and water meter pulses can also be connected to digital inputs.

Control of an external temperature increase with an on/off switch can be connected to a digital input.

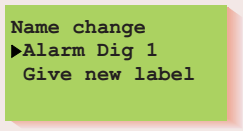
Directions for entering the maintenance mode are on page 14.



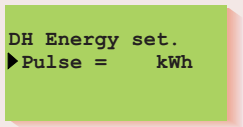
Press the button to move the cursor to"Dig 1 or Dig 2 selection".
Press **OK.**



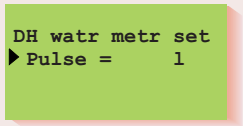
Press the button to move the cursor to indicate which information has been connected to the Dig channel in question. Press **OK.**
The ● character indicates the selection made.



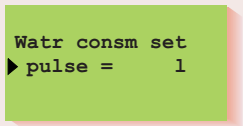
Use the text editor to label alarms, eg., Pump (see page 5)



The adjoining display appears after the DH energy consumption measurement. Press **OK.**
Set the number of kWh equivalent to one pulse and press **OK.**



The adjoining display appears after the DH water consumption measurement. Press **OK.**
Set the number of liters equivalent to one pulse and press **OK.**



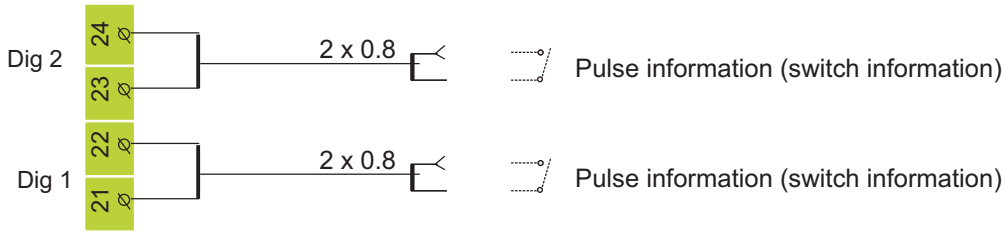
The adjoining display appears after the water consumption measurement. Press **OK.**
Set the number of liters equivalent to one pulse and press **OK.**

Addit. inform. about digital inputs

ADDITIONAL INFORMATION ABOUT DIGITAL INPUTS:

On the display:	Explanation:
Alarm Dig 1	Alarm switch information. When the switch is closed an alarm goes off.
Temp. incr.	Temperature increase program: Temperature increase switch information (switch closed, increase is on).
DH Energy Mwh	Pulse information from the district heat energy meter.
DH Water m3	Pulse information from the district heat water meter (m^3).
Watr consmp. m3	Pulse information from the facility water meter (m^3).

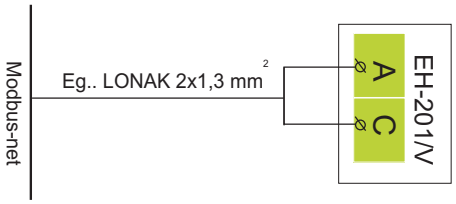
Connection guide:

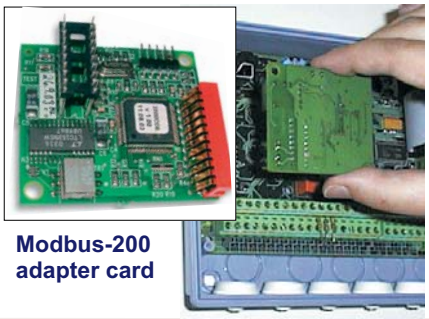


OUMAN EH-201/V NET CONNECTIONS

The Ouman EH-201/V controller can be connected to the MODBUS or LON bus. When the EH-201/V controller is connected to the bus, a (Modbus-200 or LON-200 card) bus adapter card (optional equipment) is installed. Detailed instructions for installing and initializing the bus adapter card are provided.

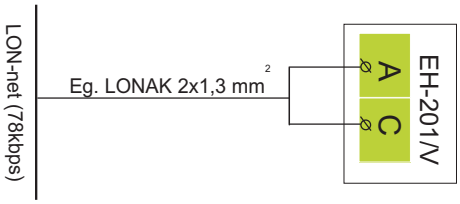
Connect the EH-201/V to a MODBUS field bus:



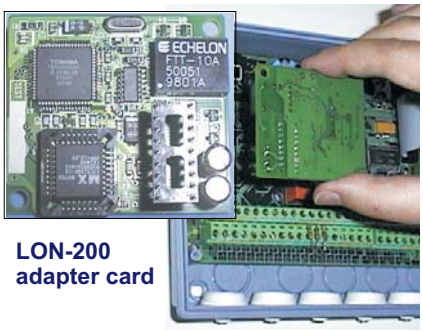


Modbus-200 adapter card

Connect the EH-201/V to a LON field bus:



When using an LON bus connect the protective ground of the 230VAC supply current to strip connector 81 of the controller!



LON-200 adapter card

OUMAN EH-201/V LON INITIALIZION

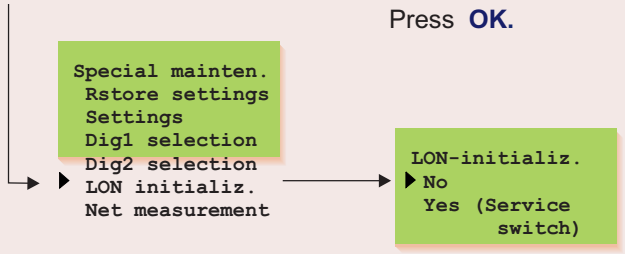
When connecting the controller to the LON-field bus, LON-bus initialization occurs in the controller's special maintenance mode. Other buses do not have to be initialized from the controller.

Directions for entering the maintenance mode are on page 21.

LON initialization:

Press the button to move the cursor to"LON initializ.".

Press **OK.**

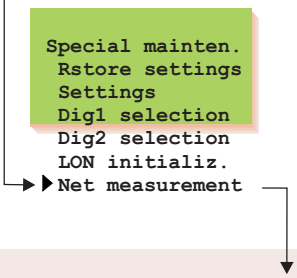


In this special maintenance mode you can control the Neuron processor's service pin which is on the LON-200 card so that the Neuron sends the bus its own identification (48 bit Neuron ID). This procedure is necessary when initializing EH-201/V + LON-200 into the facility's LON net .

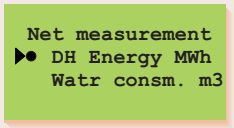
NET MEASUREMENT

Directions for entering the maintenance mode are on page 14.

Ouman EH-201/V has an Modbus-200 and LON-200 adapter card (optional equipment) which makes it possible to connect the regulator to a Modbus or LON net. In this special maintenance mode you can select the measurement information which is to be read from the net.



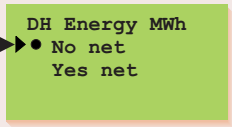
Press the button to move the cursor to"Net measurement".
Press **OK.**



Browsing the net measurements:

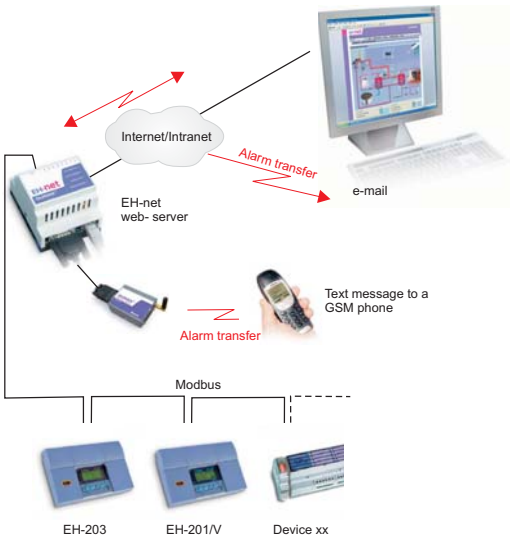
By using the button to browse, you can see which measurements can be read from the net.

Setting net measurements:



Move the cursor to the measurement you want and press **OK.**
If you want to select a net for the measurement in question, move the cursor to Yes net and press **OK.**

The ● character indicates that the measurement information is read from the net.



The EH-net server (optional equipment) makes it possible for Ouman to offer a Web-based remote control and monitoring solution. The EH-201/V controller is connected to the Modbus using the Modbus-200 adapter card (optional equipment). It is easy, inexpensive and safe to link the EH-net server and devices connected to the Modbus to the internet using SEC1 and SEC2 (internet and data security packages produced by Ouman) When you buy the SEC internet and data security package you acquire the Ouman name service, top quality data security and expert services. If you have a broad band internet connection, just plug in the EH-net server to connect to the internet.

By using the browser it is possible to communicate with the EH-201/V controller from any pc connected to the internet. Check your computer display to see, e.g., controller settings, measurements and alarms. If desired, users can be denied entry to certain functions.

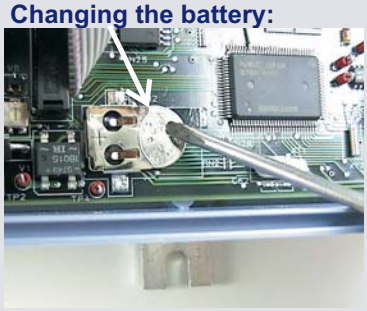
If the controller gives off an alarm, alarm information can be transmitted by e-mail or text message via a GSM phone. A GSM modem must be connected to the EH-net server for alarm information to be transmitted to a GSM phone.

Specific instructions for installing the MODBUS into the EH-201/V controller and initialization come with the bus adapter card. Instructions for network connections and initialization come with the EH-net. Ouman Finland's product development invests in developing remote control solutions. Check out the newest recommendations and information about remote use at www.ouman.fi.

Changing the fuse:

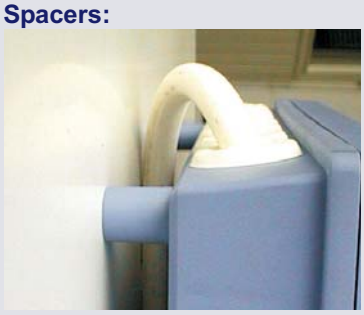
Switch off the voltage from the regul. Press the fuse socket and turn it counterclockwise. Change the 160mA (5x20mm) glass tube fuse. Press and turn the fuse socket clockwise into place.

Changing the battery:



EH-201/V has a backup that saves the time and time program in case of a short power failure. If the time is not correct after the power failure, the battery must be changed. Battery type: Lithium button battery CR 1220, 3V. Unfasten the regulator's fuse (see the topmost picture). Carefully pry the old battery from its holder, for eg., with a thin screw driver. Push the new battery into the holder with the + end up. The old battery can be put into the garbage.

Spacers:



The cables can be routed between the regulator and installation base when spacers are used to mount the regulator.

Plugs:

EH-201/V is fastened to its mounting base with three screws (two mounting points under the cover in the connection space and one in the installation bracket.
Cables can be brought for the regulator from above (standard factory delivery) or from below. In addition, there are 6 cable through-holes in the bottom of the regulator case which can be opened, e.g., with a screw driver. Then the cables can be brought into the connection space through the bottom.

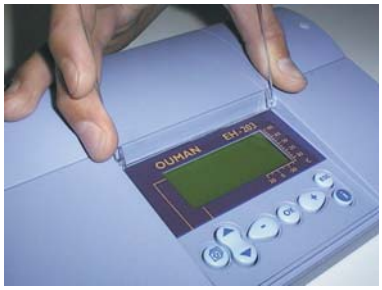
Cabling from above:
(standard factory delivery)

Cabling from below:
(turn the keyboard/display unit)

Mounting guide:
Screw the regulator to the wall using the installation bracket. Position the unit so it is level. Screw the regulator firmly into place using two screws through the connection space.

If you want to bring the cables to the regulator from below, you must turn the keyboard/display unit according to the following instructions.

Changing the cabling direction:



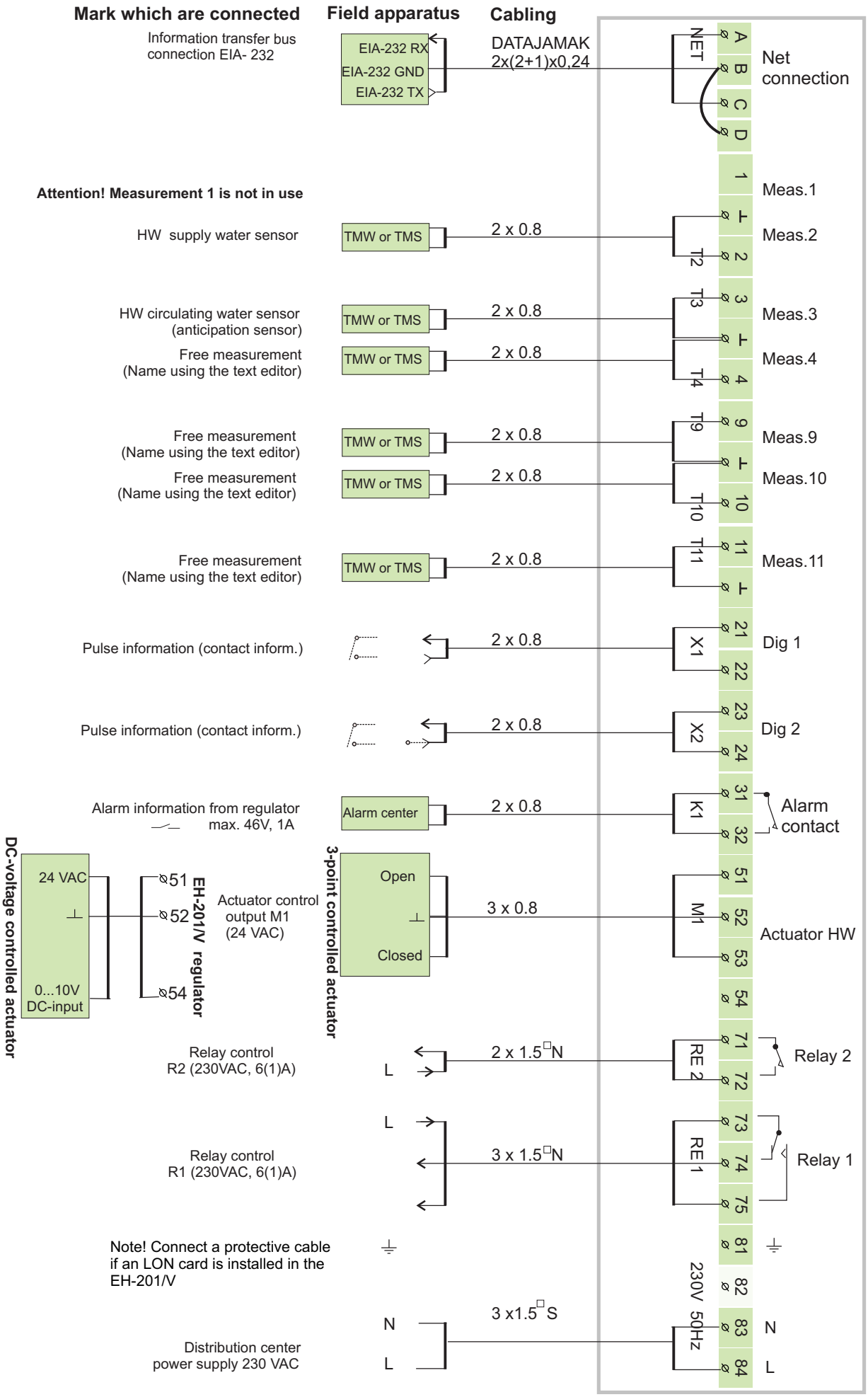
Remove the clear cover. Press as illustrated in the picture and pull the cover out of place.

Detach the keyboard/display unit carefully by prying it with a screwdriver.

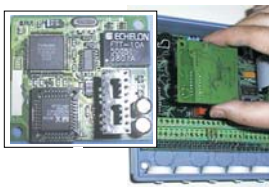
Turn the keyboard/display unit into the opposite position.

Press the keyboard/display unit carefully into place.

OUMAN EH-201/V GENERAL CONNECTION DIAGRAM



OPTIONAL EQUIPMENT



LON-200

LON-200 is an adapter card which makes the EH-200 series controllers' serial communication bus compatible with the LON-200 field bus. Installation and initialization instructions come with the LON-200 adapter card.

MODBUS-200

MODBUS-200 is an adapter card which makes the EH-200 series controllers' serial communication bus compatible with the RS-485 field bus. The physical interface to the field bus is galvanically isolated RS-485 network.

EH-net

EH-201/V can be remotely used (browser-based) in the Ethernet network using an EH-net server. The EH-201/V controller must have a modbus-200 adapter card to enable an EH-net connection.

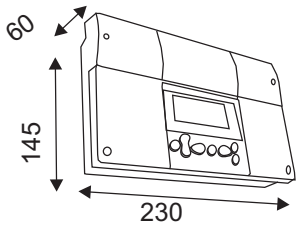
PAN-200

The panel installation kit can be used to install the EH-201/V controller to e.g., the control cabin. The size of the installation hole is 222 mm x 138 mm.

INDEX

OUMAN EH-201/V

Technical information:

Operat. voltage:	230 VAC, 50 Hz, 0.16 A
Casing:	PC/ ABS
Protection class:	Without cover seal IP 41
Measurements (mm):	
Weight:	1.1 kg
Cabling direct.:	From above or below (turnable display and keyboard). Through holes on the bottom.
Regulator type:	PID + exchange + quick run
Measurements:	6 pieces (NTC 10 kΩ)
Clock programs:	max. 7 program phases/ HW regulating circuit max. 7 program phases/ relay (begins-ends = 1 program phase)

Digital inputs:	2 pieces The potential free contact is connected to the digital input (load 6...9 VDC/20 mA)
Outputs:	1 actuator control outputs 3- point 24 VAC or voltage control (0...10 V or 2...10 V) Actuator's output power max. 19 VA
Relay outputs:	1 break before make contact relay 230VAC/ 6(1)A and 1 norm. open contact relay 230 VAC/ 6(1)A
Alarm relay outputs:	1 24 VAC/ 1A
Information transfer connection:	Standard equipment: EIA-232C Optional equipment: MODBUS or LON
Operating temp.:	0 … +50°C
Storing temperature:	-20 … +70 °C
Approvals: EMC-directive -Interference toler. -Interf. emissions: Small voltage direct. - Safety	 89/336/EEC, 92/31/EEC EN 61000-6-1 EN 61000-6-3 73/23/EEC EN 60730-1
Warranty:	2 years
Manufacturer:	Ouman Finland Oy Voimatie 6 90440 Kempele FINLAND Tel. 00 358 424 840 1 Fax. 00 358 8 815 5060 www.ouman.fi

We reserve the rights to make technical changes.