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HMI
MANUAL

This documentation contains key information for HMI controller safety electrical connection and configuration guidelines.

For your safety it is recommended to comprehensive study HMI manual, before any operations related to electrical connection.

It is suggested to keep this HMI manual for later use.

The manufacturer reserves the right to make revisions and changes in the operation manual at any time and without notice, and also to make changes in the device without influencing its operation.

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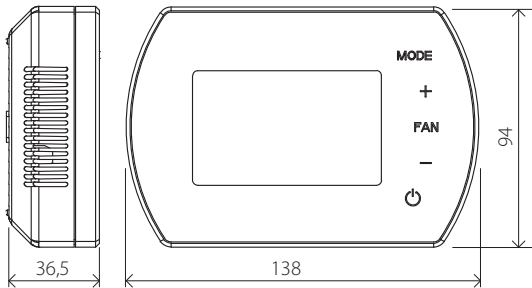
1. GENERAL DESCRIPTION

- HMI controller is compatible with LEO FB V-type water heaters.
- Automatic or manual 3-step fan speed adjustment.
- Control room temperature (by opening/closing the valve, or by adjusting air volume automatically).
- Antifreeze mode – protection against dropping room temperature below critical level.
- HMI controls up to 6 LEO V-type units (it is required to use RX signal distributor while connecting more than one unit).
- Possibility to connect external NTC temperature sensor.

2. TECHNICAL DATA

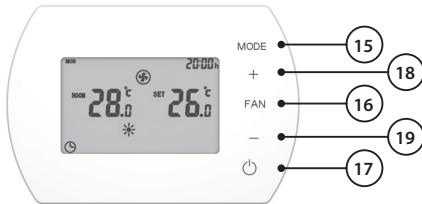
Power supply	230VAC/50Hz
Regulation	Panel buttons / LCD display
Setpoint range	+5 ÷ +40°C
Speed of the fan control range	3 steps
Storage conditions temperature	-10 ÷ +60°C
Ambient temperature range	0 ÷ +50°C
Temperature sensor	Built-in internal/ external NTC (option)
IP	20
Montage	surface
Casing	ABS & Acrylic material
Weekly programmer	ON: 5d+2d, OFF
Rated switching power	830 W (single-phase motor)

2.1 Dimensions



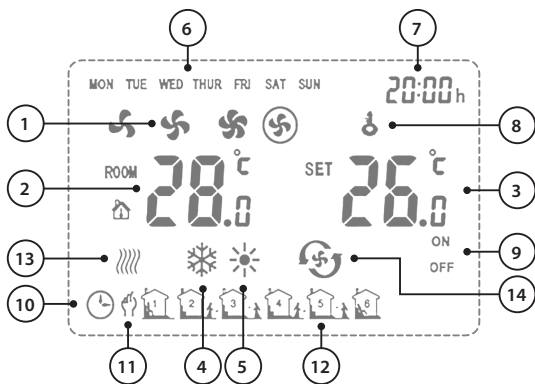
3. HMI PANEL

3.1 Buttons description



- 15. Mode changing button
- 16. Changing the fan speed button
- 17. Power ON/OFF button
- 18. Temperature up button (or parameters setting)
- 19. Temperature down button (or parameters setting)

3.2 Main screen



1. Fan Speed: LOW, MED, HI and AUTO
2. ROOM TEMP. or NTC EXTERNAL SENSOR TEMP. (measured temperature)
3. SET TEMP. (desired temperature)
4. Cooling Mode
5. Heating Mode
6. Weekday
7. Clock
8. Buttons Lock
9. ON/OFF Status of time zones
10. Automatic programmable mode
11. Manual mode
12. 6 Time Zones for each day
13. Anti-freeze indication
14. Ventilation Mode

4. FUNCTIONS AND MODES

4.1 Function modes

MANUAL MODE – Fan is operating with chosen speed (LOW, MED or HI). There are three additional modes: Heating, Cooling and Ventilation. According to set temperature, valve is opened/closed.

AUTOMATIC MODE – air volume V is regulated automatically depending on differential between pre-set Set Temperature (3) and measured Room Temperature (2) (there is no possibility to change fan speed manually). **In this mode there is possibility to resign from the valve, heating source will control flow and proper temperature of water.**

4.2 Fan function

To choose fan function see point 5.1.

Continuous – after reaching pre-set temperature (3) valve is closed, fan operating with:

MANUAL MODE - pre set speed (1)

AUTO MODE - low speed

Thermostatic – after reaching pre-set temperature (3) valve is closed, fan stops operating.

4.3 Working mode

Heating – valve is open and fan is on when Room Temp. < Set Temp.

Cooling – valve is open and fan is on when Room Temp. > Set Temp.

Ventilation – fan is turned ON and operate with pre-set V.

4.4 Temperature sensor

To choose sensor see point 5.1.

Internal – room temperature is measured by built-in sensor.

External – room temperature measured by external sensor NTC (optional). It is possible to connect one external NTC sensor to one HMI.

NOTE!

Alarm will appear if there is error with internal or external temperature sensor: **E0**.

4.5 Antifreeze

When external sensor or internal sensor detect temperature below 5°C (default setting), valve and fan is about to open immediately even if the thermostat is set on OFF status.

5. SETTINGS MENU

5.1 Parameters setting

- When HMI is switched off, press and hold MODE for 3 seconds.
- To change option use MODE button.
- To change value use +/- buttons.

Menu setting	Option	Value
1	Temperature calibration	-9°C ~ +9°C
2	Fan status	C1: Thermostatic mode C2: Continuous mode
3	Temperature sensor	0: Internal Sensor 1: External Sensor NTC
4	Antifreeze	0: Off 1: On
5	Antifreeze	+5°C ~ +10°C
6	Modbus ID setting	1~247(01~F7)

5.2 Button lock/unlock

- To LOCK all buttons press and hold + and then – buttons for 5 seconds.
- To UNLOCK all buttons press and hold + and then – buttons for 5 seconds.

5.3 Clock setting

- When HMI controller is turned off, press and hold FAN button for 3 seconds and enter into time clock setting.
- Option sequence as follows: hour, minute weekday.
- To change option use FAN button.
- To change value use + and – buttons.

6. PROGRAMMING

6.1 Setting mode

- Push shortly MODE button (15) to select Manual Mode and Programmable Mode.
- Push MODE button (15) for 3 seconds and select Cooling Mode, Heating Mode or Ventilation Mode.

6.2 Setting fan speed

- Push shortly FAN button (16) to select the fan speed: LOW, MEDIUM, HIGH, AUTO.

6.3 Programming weekly programmer

- Push and hold FAN button for 3 seconds and program time, setpoints and time zones accordingly.

Monday to Friday

1st time setting (Hour and Minute), 1st time zone ON or OFF, 1st setpoint setting 6th time setting (Hour and Minute), 1st time zone ON or OFF, 6th setpoint setting.

Saturday

1st time setting(Hour and Minute), 1st time zone ON or OFF, 1st setpoint setting 6th time setting(Hour and Minute), 1st time zone ON or OFF, 6th setpoint setting.

Sunday

1st time setting(Hour and Minute), 1st time zone ON or OFF, 1st setpoint setting 6th time setting(Hour and Minute), 1st time zone ON or OFF, 6th setpoint setting.

- Example settings

		Weekday					
		Mon ~ Fri		Sat.		Sun.	
		S1	S2	S1	S2	S1	S2
Time Zone	1 06:00 ~ 08:00	ON	26°C	ON	26°C	ON	26°C
	2 08:00 ~ 11:30	ON	24°C	ON	24°C	ON	24°C
	3 11:30 ~ 13:30	ON	22°C	ON	22°C	ON	22°C
	4 13:30 ~ 17:00	ON	22°C	ON	22°C	ON	22°C
	5 17:00 ~ 22:00	ON	24°C	ON	24°C	ON	24°C
	6 22:00 ~ 06:00	ON	24°C	ON	24°C	ON	24°C

S1: Status; S2: Setpoint

- Remarks
 - During setting, displays can be set while they are flickering.
 - When the beginning time is flickering, it is able to be set (10 mins each step) via scrolling + – buttons. The time setting is the beginning of current time zone, also the end time of last time zone.
 - When ON/OFF is flickering, it is able to be set via scrolling + – buttons. When status is ON, thermostat will run according to setpoint; when status is OFF, thermostat will be switch off
 - When the setpoint is flickering, it is able to be set via scrolling + – buttons. Even choosing OFF status, setpoint is able to set. And this setpoint will be the working if someone switch thermostat ON manually this time; however in next time zone, it will run according to automatic programmable setting.

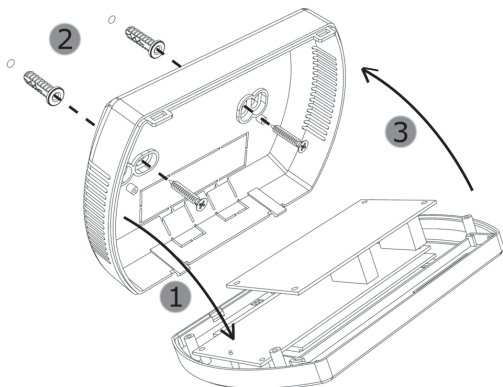
- Example
 - As ex-factory setting, press FAN button for 3 sec and enter into programmable setting; from Mon to Fri display on the left top of LCD; the time is flickering, and the beginning time of 1st time zone we should enter 06:00(also it is ending time of 6th time zone); then press FAN again, to choose ON by scrolling + - ; Continually press FAN again, to set 26°C by scrolling + - buttons.
 - Press FAN again, to set the beginning time of 2nd time zone at 08:00 (also it is the ending time of 1st time zone); then press FAN again, to choose ON by scrolling + - ; continually press again, to set 24°C by scrolling + - buttons
 - Press FAN again and follow the same steps to set time zones from 3rd to 6th time, 22:00 is the beginning time of 6th time zone, also the ending time of 5th time zone.
 - After 6 time zones for Mon to Fri are done, keep pressing FAN again and move to Sat. to set data by same steps; press FAN again and move to Sun. to set data by same steps.
 - After all settings are done, please press FAN or wait for 5 seconds to confirm settings.

7. INSTALLATION

NOTE!

Mind to disconnect HMI panel before starting work. Control panel should be installed on height 1,5m in place where is proper air circulation, away from heat/cold source.

7.1 Wall-mounting



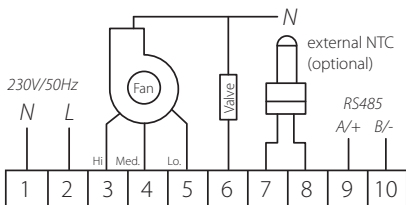
- 1st** Take off the baseplate from controller.
- 2nd** Fix the baseplate using screwdriver on wall.
- 3rd** Insert and clip the display unit on baseplate.

8. WIRING DIAGRAM

WARNING!

RISK OF ELECTRICAL SHOCK. Disconnect power supply before making any electrical connections. Contact with components carrying hazardous voltage can cause electrical shock and may result in severe personal injury or death.

- Wires must be finished with cord end terminals.
- Wires size should be chosen by the designer.
- Dimension of supplying wire is min. OMY 2 x 1 mm².
- Close the cover before start-up.



9. BMS COMMUNICATION

Communication parameters:

Physical layer	RS485
Protokol	MODBUS-RTU
Transmission speed [bps]	2400
Parity	None
Data bits count	8
Stop bits count	1

10. DECLARATION OF CONFORMITY



Declaration of conformity

We hereby confirms that room thermostat HMI was produced in accordance to the following Europeans Directives:

2006/95/WE – Low Voltage Electrical Equipment (LVD),

2004/108/WE – Electromagnetic Compatibility (EMC),

and harmonized with below directives norms:

EN 62233:2008

EN 60335-1:2012

EN 55014-1:2012

EN 61000-3-2:2014-10

EN 61000-3-3: 2013-10

EN 55014-2:2015-06

CE: 15