User's Guide

ECO2080 / ECO2099

COLUMN OVEN WITH HEATING AND COOLING / COLUMN OVEN WITH HEATING

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1. GENERAL INFORMATION

Column oven is designed for use in laboratories in systems of liquid chromatography for column temperature stabilization. Temperature range is of 0 – 80°C for ECO2080 and ambient temperature +5°C – 99.9°C for ECO2099.

1.1. Product Function

The unit works as **column oven**, which can accommodate up to three columns with length 25 cm and less. In ECO2080 usage of peltier technology offers the possibility of heating and cooling, providing complete independence from the room temperature. ECO2099 offers heating up to 99.9°C.

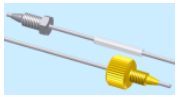
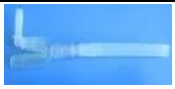
With built-in leak sensor and other conveniences, it is a save, accurate and flexible choice for liquid chromatograph. It can be controlled using display and keyboard and it is equipped with RS232 and Ethernet(LAN) interface.

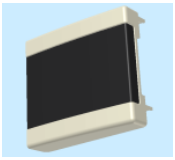
1.2. Produced Versions

ECO2080 Column oven with heating and cooling	Cat.: AOA0000X
ECO2099 Column oven with heating	Cat.: AOB0000X

1.3. Accessories

BASIC ACCESSORIES

P/N	Qty		Description
EKAB-040	1		LAN cable 1 m (for ETHERNET connector)
EKAB-011	1		Mains cable 10A - 250V 2 m
00051478	1		Terminal block 8 pins green (for IO INTERFACE connector)
AOA99100	1		Input capillary for column oven (OD=1/16“, l=900 mm; volume= 44 µL; thread 10-32 UNF)
AOA99000	1		Waste set ECO2000
AOA80000	1		Pre-column heating exchanger up to 0.5ml/min (OD=1/16“,ID=0.25 mm; l=540 mm; volume= 6 µL)
18331000	1		Screwdriver Torx T20 5x100 mm (for mounting of columns holder (prismo))
00024046	1		Fuse T – 10A/250V, CSA (internal fuse for professional service; mustn’t be used as main fuse !!!)
00343122	1		Fuse T - 3,15A/250V, CSA (main unit fuse; for combined power socket with main switch and main fuse)

P/N	Qty		Description
00016	1		Door 2000 (To be installed after complete installation of the unit! Never manipulate with the unit, if the door is mounted!)
DOC00001	1	-	User's guide
DOC00002	1	-	Production protocol

2. GENERAL OPERATING INSTRUCTIONS

Caution:	**If the unit is used in a manner not specified by the manufacturer, the protection provided by the unit may be impaired!**
Caution:	**The unit may not be used, if it is leaking.**
Caution:	**Do not place unit or any other equipment so that disconnecting power cord is difficult.**
Caution:	**Never manipulate with the unit, if the door is mounted. It may cause its break-out.**

2.1. Safety Symbols on Unit

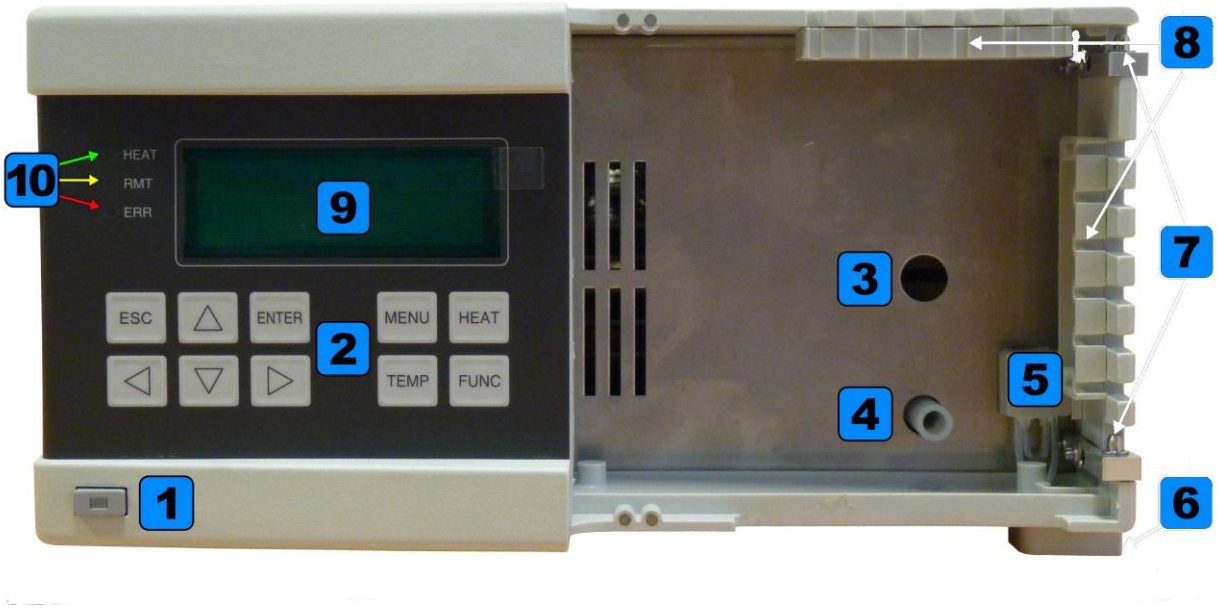
Caution, electrical device! Disconnect power cord before servicing.

Electrical device! Disconnect power cord before servicing. Read the operational guide before replacing fuse!

Hot surface.

3. DESCRIPTION

FRONT VIEW

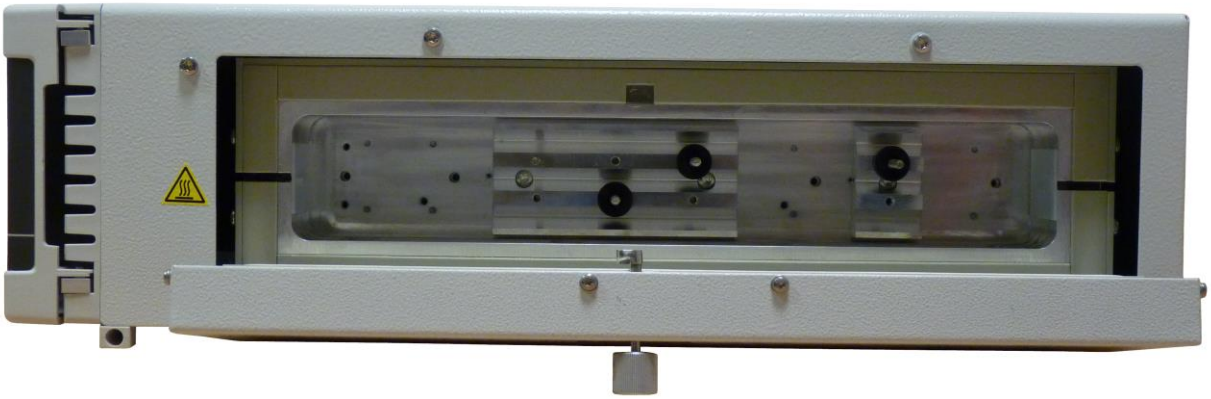


No.	Description
1	Standby switch.
2	Keyboard.
3	Slot for capillary.
4	Drain of leaking liquid.
5	Leakage sensor.
6	Drain channel with cone for connecting waste system conjunction.
7	Hinges for door emplacement.
8	Slots for tubing and capillaries.
9	Display.
10	LED status lights: HEAT (green) switches on in mode RUN, when unit heats or cools. RMT (yellow) indicates status of unit remote control. It lights when the unit is communicating through interface ETHERNET or RS232. ERR (red) indicates error status of the unit. It lights, if an error is indicated and blinks, if a fatal error is indicated, when unit status has been changed.

KEYBOARD BUTTONS AND THEIR FUNCTION

Symbol	Description
MENU	Entering unit MENU, fast menu leaving.
HEAT	Turn on/off heating/cooling.
TEMP	Direct setting of temperature.
FUNC	Fast enter into item *Menu/Parameters/Select Temperature* (choice of preset temperature).
ENTER	Confirms selected MENU item, confirms newly set parameter value, evokes *QUICK DIAGNOSTICS* screen.
ESC	Returns one step back without saving changes.
◁▷△▽	Direction keys. Using arrows up/down increases/decreases value of set parameter.

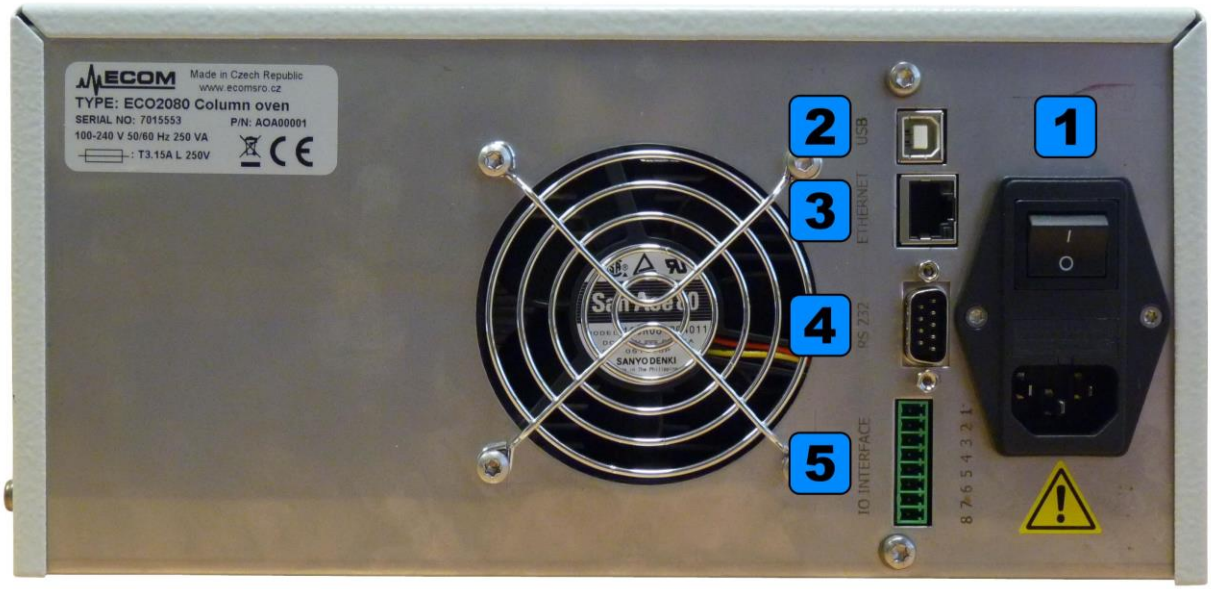
SIDE VIEW



TEMPERATURE CONTROLLED SPACE FOR COLUMN

On the door of temperature controlled space is a button. Turning it counter clockwise enables to open the door, turning it clockwise enables closing the door.

REAR VIEW



No.	Description
1	Combined power socket with main switch and main fuse.
2	USB socket. Not supported yet.
3	Ethernet/LAN socket.
4	RS232 socket.
5	IO Interface connector.

4. INSTALLATION AND BASIC CONTROL USING KEYBOARD

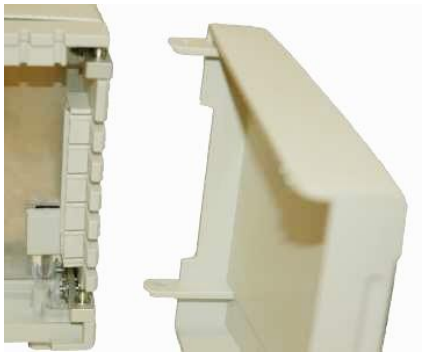
Place the unit in a suitable location that satisfies the following conditions:

- Horizontal place.
- Keep at least 10 cm space behind the rear of the unit.
- Keep away from equipment generating strong magnetic field.
- Equipment is intended for use in regular laboratory environment only - see *Technical parameters – operating environment conditions*.

4.1. Door Installation

In order to avoid hinge damage, the door is not mounted for shipment. It is slipped on the hinges in opened position.

Setting of the door must go easily, with no strength applied; otherwise the hinges may be damaged.



4.2. Column Installation and Connection

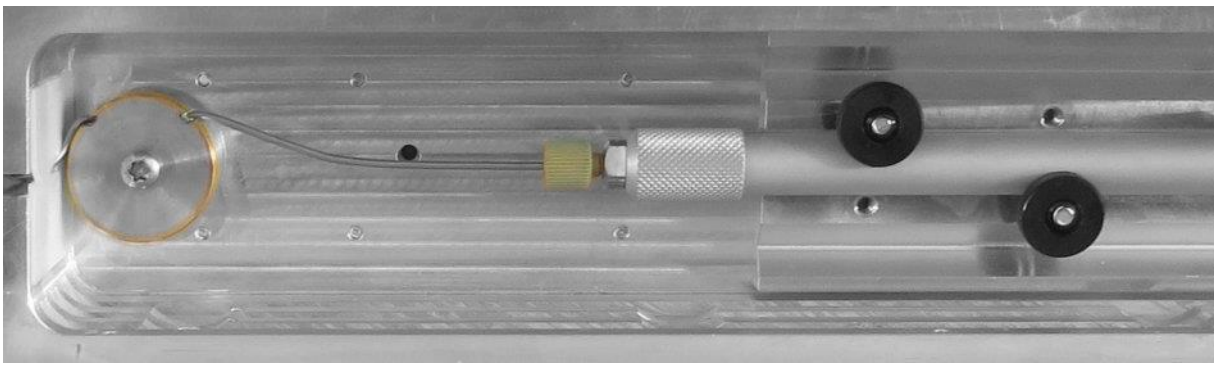
The side door of column space is opened using button for opening heated/cooled space. Column is installed into heated space into brackets (see chapter 3 Side view) and the capillaries go out next the door or they can be ked through front panel hollow.

Note:	The upper and side sockets in the unit front panel are determined for gripping tubing and capillaries. FEP tubing with outer diameter 1/8“ are fixed by snapping into the slot. Capillaries and tubing with outer diameter 1/16“ are fixed using a short FEP tubing with outer diameter 1/8“ and inner diameter 1/16“, threaded on the capillary. Such a threaded tubing cannot be snapped in the slot, it should be pushed in from the side.

4.3. Heat Exchangers

Heat exchangers for column ovens type ECO2080 / ECO2099 are an optional component of the unit. They can be selected in different sizes for different maximum nominal flowrates. Heat exchanger type can be selected according to flowrate used in application, for most effective heat transfer to mobile phase and also minimal extra dead volume of the system. Easy mounting into thermostat space using one screw included in unit accessories. Usage of heat exchanger is the most effective method for fast and even stabilization of temperature in column. Ask for selectable options for your applications.

HEAT EXCHANGER BEFORE COLUMN



4.4. Assemblage of Waste System

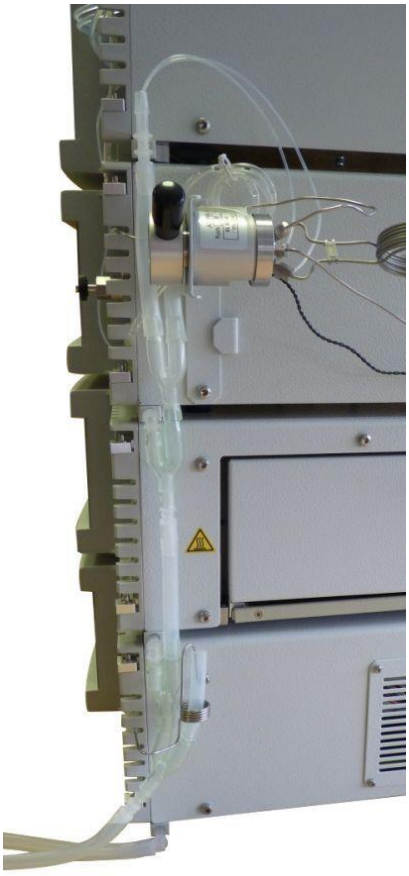
The column ovens ECO2080 / ECO2099 is equipped with waste channel, leading the liquid off the tempered block. In its proximity is leakage sensor. The function of the sensor is closely described in chapter 6.2.4 in chapter 6.4.3.4 is described the setting of *IO INTERFACE Digital Out Switch – LEAKAGE* signalizing the leakage of column oven to another unit. In chapter 6.6.5 is displayed the status of *IO INTERFACE* and in chapter *6.6.6* is shown the leakage sensor status.

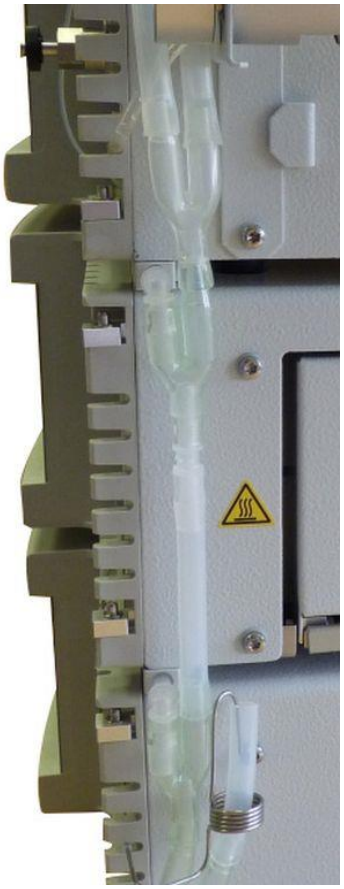
SOUPRAVA ODPAD ECO2000

Silicone tube with connector I, L, Y.

The L connector in the Y connector is inserted to the drain channel. The other end of the Y connector is inserted into waste set of pump and tube is inserted into detector waste set.

Complete system HPLC is composed box, pump, column oven, detector. Each unit from the HPLC system has among its accessories all necessary parts for interconnection of entire waste system. On picture below is shown complete waste system and detailed picture of the column oven.





All parts of waste system are parallel with unit lateral sides, neatly connected without twisting, so that the waste liquid may fluently run down to waste reservoir. In the tubing junctions with connectors may accumulate liquid, that after a while flows through connector openings.

Note:	New setting is leaking at the beginning. It stops after some time.

4.5. Connection to Power Supply and Connection of Communication Cables

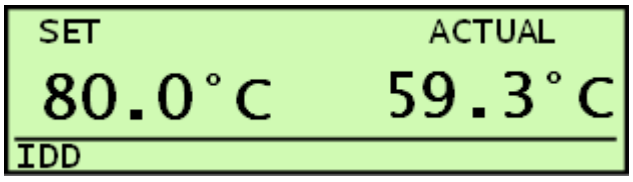
Plug the power supply cord into the instrument socket on the rear panel. Connect PC via Ethernet (chapter *6.4.1*) or using RS232 (chapter 8). If you are connecting whole system, connect in the same manner also other units.

4.6. Start of the Unit

Use a switch on the rear panel of the detector for connecting to mains voltage, then switch on the unit using push button on the front panel. The push button glows red, if power source is off and green, if power source is on. If power supply is disconnected, the unit remembers last status of this push button and after power supply reconnection it restores the last status. This can be used for automatic start in the system with a common switch of power source for whole system of liquid chromatograph (for example using a multiple socket-outlet with a switch).

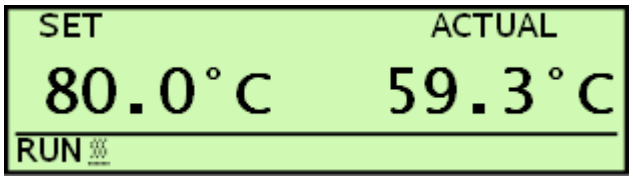
4.7. Basic Control by Keyboard

After unit start (Mode START) display shows unit type.



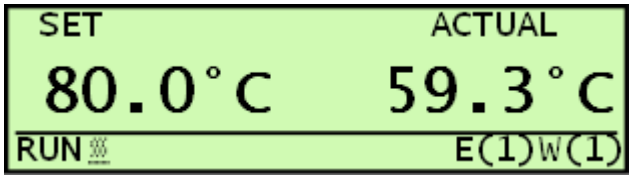
Then the unit turns to mode IDLE (IDD), where heating/cooling mode is off.

Now you can set desired temperature by pressing key TEMP. Keys left and right move the cursor and keys up and down change the value. Press ENTER for confirming selected temperature.



After pressing key HEAT the unit turns into mode RUN, starts heating/cooling and display shows changes of actual temperature, which reaches desired temperature in a certain period of time. By pressing key HEAT again, heating/cooling mode is turned off.

4.8. Description of Symbols on the Display



Value/symbol	Description
SET 80.0°C	Desired value of column oven.
ACTUAL 59.3°C	Actual temperature of column oven.
RUN	Actual mode of the unit.
	Heating turned on.
	Cooling turned on (only for ECO2080).
	Leakage sensor is activated.
E (1)	Error message with number of errors
W (1)	Warning message with number of warnings

5. CONTROL FROM PC

When the unit is controlled from PC, the communication runs through serial line RS232 or via LAN. Communication protocol is available upon request.

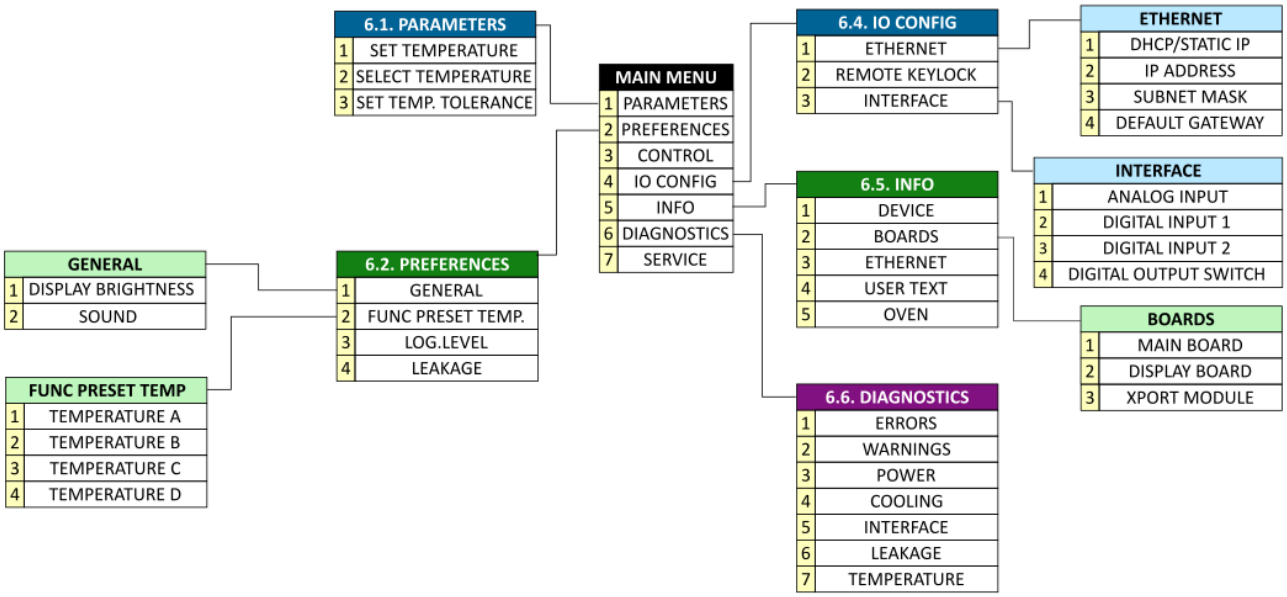
Currently the unit can be controlled by SW Clarity or ECOMAC.

6. WORKING WITH MENU

Menu enables setting all parameters and functions of the unit, its diagnostics and service.

MAIN MENU is entered by pushing key MENU. In the menu you can move using arrows, ENTER and ESC. To leave any part of the menu, press MENU again.

MENU FLOW DIAGRAM



6.1. Parameters

Here can be set basic parameters of the unit, mainly temperature and its tolerance.

6.1.1. Set Temperature

The screen is identical to the screen displayed after pressing key TEMP. The temperature can be set in the range of 0 – 80°C for ECO2080 and in the range of ambient temperature +5°C – 99.9°C for ECO2099. This range is displayed on left together with actual set temperature. Keys left and right move the cursor and keys up and down change the value. Press ENTER for confirming selected temperature.

6.1.2. Select Temperature

On this screen can be selected one of four pre-set adjustable temperature values for faster set-up. This function is used for frequent changes of set temperatures. Key FUNC enables jump into this part of menu.

Setting these temperatures is performed in *Menu/Preferences/Func preset temperature.*

6.1.3. Set Temperature Tolerance

It is possible to set monitoring of temperature tolerance in the range 0.5 – 2.0°C. If the temperature of column oven exceeds set value, display shows warning. Defaulted value is 1.0°C.

6.2. Preferences

Here can be optimized unit function to satisfy and user needs.

6.2.1. General

6.2.1.1. Display Brightness

The display brightness can be set in eight levels, where value 8 is maximum brightness.

6.2.1.2. Sound

Sound signals of the unit can be set as follows:

SOUND SETTING

Setting	Description
KEYBOARD	At each touch of button will be generated short beep when the key does not have any significance at the moment, mid-length beep for value change and moving in menu and longer beep for confirmation of value changes.
ERRORS	At error occurrence will be generated sound signal of the error. Three consecutive longer beeps in case of an error and in case of a fatal error with repetition every 5 s. Repetition can be interrupted by pressing any key.
WARNINGS	At warning occurrence will be generated sound signal of warning. Three consecutive shorter beeps.
OPERATIONS	During operation will be generated longer beep and for long operations may be this beep generated at the beginning and at the end of an operation.

6.2.2. Func Preset Temperature

This function enables to pre-set four different temperature values for choice *Select Temperature* in chapter *6.1.2*.

6.2.3. Log. Level

It is possible to select detailed or abbreviated method of login. It is used for unit troubleshooting.

6.2.4. Leakage

Leakage sensor is created by reference and measuring sensor. If the measuring sensor is immersed in liquid, sensor generates a signal. Signal processing is depending on actual setting.

If a leakage occurs, at first it is necessary to eliminate the leakage, then dry up the area of liquid drain and especially the measuring sensor. After drying the sensor, it is necessary to wait at least 1 min, then the icon and warning on main screen turns off. Error will be removed after column oven restart.

In *Menu/Diagnostics/Leak* is displayed the status of leakage sensor. The items are described in chapter *6.6.6.*

SETTING OF LEAKAGE SENSOR BEHAVIOR

Setting	Behavior
OFF	Signal is ignored.
AS WARNING	Warning is displayed. Default setting.
AS ERROR	Invokes fatal error, when light sources turn off and unit goes to initial idle state.

6.3. Control

This window is inactive

6.4. IO Config

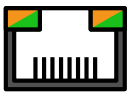
6.4.1. Ethernet

In each submenu can be set possibilities of Ethernet connection.

Note:	**Before connecting the unit into "corporate" network, always contact local network administrator and consult connecting parameters. This way you will prevent colisions in the network. For more information and troubleshooting with connecting ethernet devices, read document *Manual-Ethernet_devices*, available upon request.**

Ethernet interface supports communication speed 10/100 Mb/s. Common UTP cable (Cat 5e) can be used for connection. Main communication runs on port 10001 and function of automatic lookup uses port 30718. Unit also supports these services: DHCP client (automatic IP address allocation), AUTOIP [automatic IP address is 169.254.x.y. (x.y. …ramdomly generated numbers), when DHCP server is not accessible in the network], web server (port 80) and ICMP protocol (test connection test using tool PING).

Socket for conneting Ethernet is on rear panel of the unit and has two sinalization diodes:

Location	Description
LED1 LED2 	LED1 Meaning: OFF = no connection; orange = 10Mbps; green = 100 Mbps.
	LED2 Meaning: OFF = no activity; orange = half-duplex mode; green = fully duplex mode.

Communication with the unit can be easily tested from a computer using internet browser by entering address http://XXX.XXX.XXX.XXX, where XXX.XXX.XXX.XXX is actual IP address of the unit.

Current setting can be found in *Menu/Info/Ethernet*.

6.4.1.1. DHCP/Static IP

The choice of *AUTO VIA DHCP* enables automatic setting of connecting parameters (IP address, Subnet masc, Defaul gateway) in network, where this function is supported. Allocation of address can take several seconds. Actual connecting parameters can be found in Menu/Info/Ethernet.

The choice of *STATIC IP* enables manual setting of connecting parameters in next subchapters. This choice is suitable for direct connection with PC (using a cable/switch) without other connection to another network. It is necessary to set on the unit and also in PC suitable connecting parameters (e.g. ECP2000: IP=192.168.91.40, MASK=255.255.255.0 and PC: IP=192.168.91.1, MASK=255.255.255.0).

Caution:	**When using static address in corporate network, always contact network administrator in order to avoid colisions!**

Default setting is automatic setting of parameters using DHCP, which enables easier first connection. Despite that it is necessary to contact network administrator, if you are in corporate network, in order to ensure stability of connecting parameters in time

6.4.1.2. IP Address

IP address, used in mode *STATIC IP*. Default value is 192.168.91.40

6.4.1.3. Subnet Mask

Subnet mask, used in mode *STATIC IP*. Default value is 255.255.255.0

6.4.1.4. Default Gateway

Default gateway, used in mode *STATIC IP*. Default value is 0.0.0.0.
It is usually not necessary to set this item.

6.4.2. Remote Key lock

If the unit is controlled or there are collected data via serial line (RS232) or using Ethernet interface, the LED RMT is alight. The unit switches to mode of remote control immediately after receiving first query or demand through RS232 line or Ethernet, and leaves this mode, if it does not receive any query or demand for a period of 3s.

KEY LOCK SETTING

Setting	Description
LOCKED	Keypad is fully locked. All keys work only for interrupting repetition of fatal error signal. Default value.
ALLOW HEAT, TEMP, FUNC	Keypad is locked except keys HEAT, TEMP, FUNC. Other keys work only for interrupting repetition of fatal error signal.
UNLOCKED	Keypad is fully functional.

6.4.3. Interface

The unit is equipped with auxiliary external interface (connector *IO INTERFACE*), which can be used according to setting described below. Number of interface pins are stated on unit rear panel.

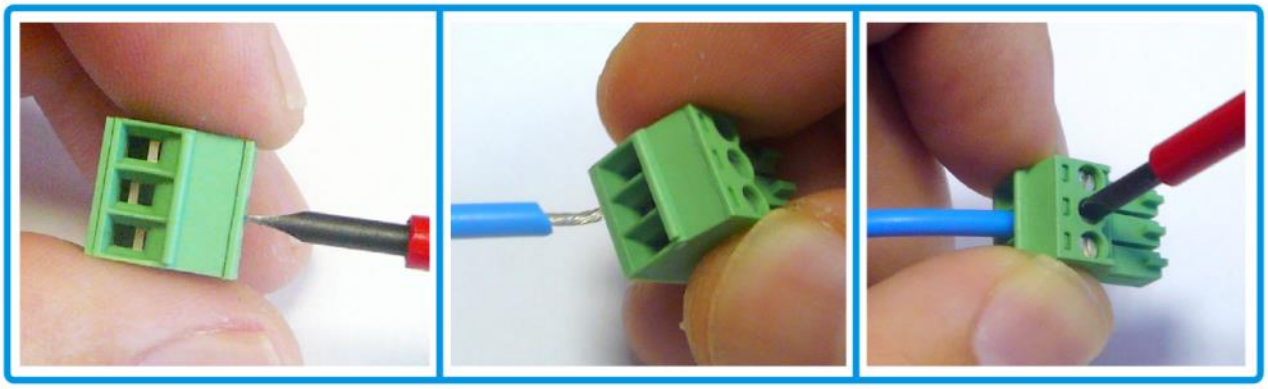
IO INTERFACE SPECIFICATION

Pin	Abb.	Name	Description
1	+5V	-	Auxiliary power supply +5 V DC max. 40 mA.
2	AIN−	ANALOG INPUT	Analog input ground. Internally connected with GND and chassis.
3	AIN+		Analog input signal. 0 - 10 V DC. Overvoltage protection up to 24 V. Sampling frequency min. 100 Hz, input impedance 100 kΩ, resolution 2.5 mV.
4	GND	-	Ground.
5	DIN2	DIGITAL INPUT 2	Digital input 2. Compatible with TTL, HC, HCT. Overvoltage protection up to 24 V. In opened status it is on level H.
6	DIN1	DIGITAL INPUT 1	Digital input 1. Compatible with TTL, HC, HCT. Overvoltage protection up to 24 V. In opened status it is on level H.
7	ACOB	DIGITAL OUTPUT SWITCH	Semiconductor switching device, contact A and B. Working voltage max. 60 Vdc, 42 Vac. Working current max. 240 mA. Switch impedance ON max. 2.5 ohm. Residual current max. 1 uA.
8	ACOA		

For external input/output interface IO INTERFACE are used connector blocks with screwing contact (included in accessories).

For connecting cable to connector block, loosen the nut using small flat-tip screwdriver. Remove isolation from the connected cable in the length of approximately 3 to 4 mm. Insert the skinned part of cable into the place under the nut and tighten the nut. Try carefully, if the conductor holds in the block. If the conductor is too thin, it is better to remove isolation from longer part and bend the skinned part before inserting in the block.

Note:	Connector blocks are meant for cables with section up to 1.5 mm^2.



Diagnostics of actual IO INTERFACE status can be done in *Menu/Diagnostics/Interface*. For digital inputs value OPEN (H) means opened input, high level and CLOSE (L) means closed input, low level. For digital output is displayed OFF (for open switch) and ON (for closed switch).

Analog input, digital input 1, 2 and digital output switch can always be read through remote control (RS232/ETHERNET).

6.4.3.1. Analog Input

ANALOG INPUT can be used as follows:

SETTING MODES OF ANALOG INPUT

Setting	Description
OFF	Analog input does not have any assigned function. Default setting.
TEMPERATURE CONTROL	Analog input is used for setting temperature. 0 V = 0°C and 10 V = max. temperature of column oven. Temperature cannot be set using keyboard nor through remote control (RS232/ETHERNET).

6.4.3.2. Digital Input 1

DIGITAL INPUT can be used as follows:

SETTING ACTIONS ON DIGITAL INPUTS

Setting	Description
OFF	Digital input does not have any assigned action. Default setting.

Setting	Description
SAFETY STOP	When switching input to level L, heating/cooling is stopped and a fatal error is evoked. This error must be cancelled using key HEAT or with a command Start/Toggle function through remote control (RS232/ETHERNET). This error and held heating/cooling cannot be cancelled using signal HEAT on any other digital input.
HEAT	Level H means running heating/cooling and level L means stopped heating/cooling. Key HEAT and Start/Toggle function command through remote control serve only for interrupting, SAFETY STOP. In case of a fatal error (except SAFETY STOP) and this signal is stil on level H, heating/cooling stops and after 2 s the unit tries to start heating/cooling again. This may result in oscillation of this behavior. When this action is set on the input, and there is no signal connected to the input, this input is on level H and this means start heating/cooling.

6.4.3.3. Digital Input 2

The same possibilities and setting as for Digital input 1.

6.4.3.4. Digital Output Switch

Digital output (DIGITAL OUTPUT SWITCH) can be used as follows:

SETTING ACTIONS ON DIGITAL OUTPUT

Setting	Description
OFF	The output is not controlled by any action. Default setting.
REMOTE	Output remote control.
LEAKAGE	When measuring sensor is immersed in liquid, output is connected.
ERROR	When at least one error is evoked, output is connected.
HEAT	When column oven runs, output is connected.
COPY DIN1	When digital input 1 is on level L, output is connected. Even in case of setting digital input on OFF.
COPY DIN2	When digital input 2 is on level L, output is connected. Even in case of setting digital input on OFF.

6.5. Info

6.5.1. Device

Displays *NAME* – unit name, *S/N* – serial number and *TIME* – total operating time.

6.5.2. Boards

Displays information about electronic boards in the unit. *BN* - board name, *HW* - board version, *FW* - firmware version, *UN* - board identification number.

6.5.3. Main Board

Unit main board.

6.5.4. Display Board

Board for display and keyboard.

6.5.5. Ethernet

Displays information about actual setting of ethernet. *IP*-IP address of the unit, *MASK* – subnet mask, *GATE* – default gateway, *MAC* – unique hardware address.

6.5.6. User Text

Inactive.

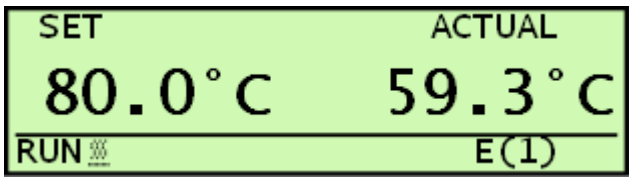
6.5.7. Oven

In this submenu are displayed supplementary information about the heating/cooling runs from unit start-up. *OPER. TIME* - operating time.

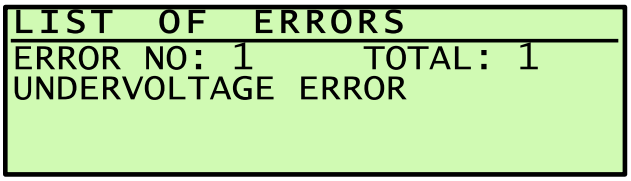
6.6. Diagnostics

6.6.1. Errors

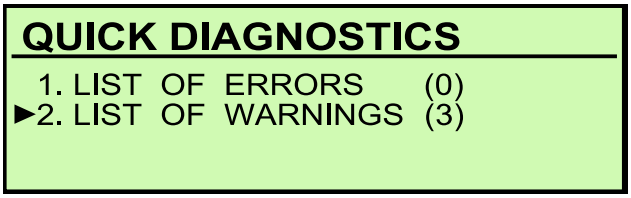
On screen is displayed *ERROR*. Unit knows three types of errors – simple error, operating error and fatal error. When reporting simple error, heating/cooling does not stop, error is announced by three beeps and LED ERR still shines red. When reporting operating error, heating/cooling stops and after pressing HEAT it starts running again, if the fault source has been corrected. When reporting fatal error, heating/cooling stops and its start is blocked. Reset can be done by turning the unit off and on, after elimination of the fatal error.



If an error occurs, display shows symbol ***E*** with a number of errors.

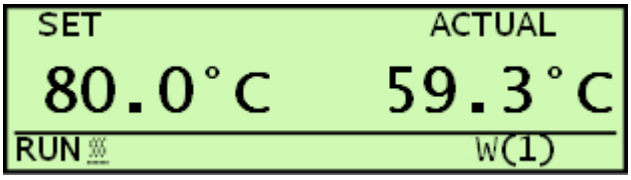


When entering *Menu/Diagnostics/Errors* a number is displayed (*ERROR NO:*) and a description of actually displayed error, total number of errors (*TOTAL:*) and eventually arrows suggesting possibility of listing, when there is more then one error. When entering this detailed screen, an actual status is displayed and it is not updated. For updating this information, it is necessary to re-enter this screen.



For quick access to error and warning descriptions, the *QUICK DIAGNOSTICS* screen is displayed, which can be called from the main screen by pressing ENTER. When entering this detailed screen, an actual status is displayed and it is not updated. For updating this information, it is necessary to re-enter this screen.

6.6.2. Warnings



If there occurs some deviation from standard unit behavior, on main screen displays ***W*** with a number of warnings.
The access to descriptions and other behavior is the same as for errors, see chapter above.

6.6.3. Power

In this item is displayed value of main supply voltage, nominal value is 24 V and it should be within the range of 23 – 25 V. Performance for the heating/cooling section is displayed in items *OUT PWR A*, *OUT PWR B.* Heating values are positive %, cooling values are negative %.

6.6.4. Cooling

In this item is displayed rotation speed of *FAN1 (rpm)* and their voltage *(V)* (only for module ECO2080).

6.6.5. Interface

This menu item gives information about inputs/outputs of *IO INTERFACE*.

STATUS OF IO INTERFACE

Item	Description
AIN	Voltage on analog input.
DIN1 a DIN 2	Status of digital inputs.
DOUT	Status of digital output switch.

6.6.6. Leakage

Status of leakage sensor.

STATUS OF LEAKAGE SENSOR

Item	Description
VSL	Voltage of measuring sensor L (L … low current).
VSH	Voltage of measuring sensor H (H … high current).
VRL	Voltage of reference sensor L.
VRH	Voltage of reference sensor H.
CNTD	Countdown to current status change L/H, H/L (Countdown).
HEAT	Sensor heating – YES = heating (current High); NO = cooling- (current Low).
DIF	Difference between reference and measurement sensors (mV).
LEAK	Leakage sensor YES/NO.

6.6.7. Temperature

In this item is displayed temperature of A, B sensors which measure temperature od bath.

6.7. Service

Service menu is used for unit calibration. It is accessible only for schooled service engineers.

7. WORKING MODES

The unit may run in different working modes, depending on desired operation. Some modes are entered based on operator or controlling PC command, other are invoked automatically in order to execute sequence of certain operations.

Mode **EN name** **Abbreviation**	**Description**
Start START	Transition stage after unit start. Unit is initialized.
Idle IDDLE IDD	Mode during turned off heating/cooling. It is possible to preset operating parameters. Unit is waiting for command HEAT – heating/cooling start.
Working mode RUN	Mode during turned on heating/cooling, unit is trying to reach and maintain preset temperature. It is possible to preset operating parameters. Unit is waiting for command HEAT – heating/cooling shutdown.

8. RS232

The unit enables communication via line RS232. On the unit is connector Canon DB9 male and on the cable must be Cannon DB9 female connector. For connecting must be used shielded cable, containing on both sides connectors Canon DB9 female. Parameters for connection are 115 200 Baud, 8 data bit, 1 start bit, 1 stop bit, no parity. Unit communicates based on communication protocol, available upon request.

9. REPLACEMENT OF LINE FUSE

Disconnect the unit from power source!!!

Using a flat-tip screwdriver relase the fuse holder from its bottom.

Take out the fuse holder.


Replace the old line fuse.

In the holder insert new fuse from unit accessories, **its value is stated on unit lable**.


Insert the fuse holder back.

Push the fuse holder all the way inside.

10. TROUBLESHOOTING

Problem	Caused by / Conditions	Solution
After turn unit on, LED and display on front panel doesn´t switch on.	Line fuse is wrong.	Check line fuse in rear part of unit (see chapter *9*).
	Electronic failure.	Contact service center.
Warning or error message.	-	Try to find out a fault according to chapter *6.6*. Try to reset the error, and if unsuccessful, contact service center.
Complications during installing a heat exchanger.	Lack of space between the column and heat exchanger.	Replace column holder (prismo) higher (see chapter *12*).

11. MAINTENANCE

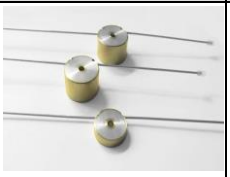
11.1. Periods

Checking unit function (Operational qualification OQ, unit validation) under heavy-duty operating conditins is recommended to be done once per 6 months, or once per 1 year, if the working conditions are optimal, max. once per 2 years. During unit validation a complete unit control is proceeded, and according to observed unit condition can be replaced damaged parts.

11.2. Cleaning and Decontamination

Follow safety instructions of agents used in chromatography process.
Use dry or moistened cotton cloth for cleaning or unit surface.

12. SPARE PARTS

P/N	Picture	Description
AOA8000X AOA8100X AOA8200X		Pre-column heating exchanger up to 0.5ml/min (OD=1/16“,ID=0.25 mm; l=540 mm; volume= 6 µL) Pre-column heating exchanger up to 2 ml/min. (OD=1/16“,ID=0.25 mm; l=953 mm; volume= 27.5 µL) Pre-column heating exchanger up to 10 ml/min. (OD=1/16“,ID=1 mm; l=1020 mm; volume= 49.5 µL)
AOA00051		Long increased prismo. (when using a heat exchanger)
AOA00061		Short increased prismo. (when using a heat exchanger)

13. WARRANTY AND POST-WARRANTY REPAIRS

Warranty and post-warranty repairs are provided by the manufacturer or by dealer organization authorized by company ECOM to do this.

Repair of products in the warranty period carried out by other person than that authorized by the service organization is a reason for warranty nullification.

The scope of the warranty and its duration is given in the certificate of warranty.

Manufacturer:
Ecom spol. s r.o.
Trebonicka 239
252 19 Chrastany u Prahy
Czech Republic

Tel.: + 420 221 511 310
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E-mail: info@ecomsro.cz
www.ecomsro.com

14. TECHNICAL PARAMETERS

Parameter	Value for ECO2080	Value for ECO2099
Operating temperature range	0-80°C	ambient temperature +5°C to max. 99.9 ºC
Temperature stability	± 0.2 °C	
Temperature repeatability	± 0.2 °C	
Temperature accuracy	± 2 °C	
Communication	RS 232, Ethernet(LAN)	
Display, keypad	VFD 140x32 pixels, 10 pushbuttons	
Power supply	100-240 V 50/60 Hz 250 VA	
Heated/cooled space inside dimensions (w x h x d)	328 x 54 x 42 mm	
Dimensions (w x h x d)	280 x 135 x 498 mm	
Weight	14 kg	
Operational environment conditions	Indoor use only. Altitude: up to 2000 m Temperature: 5-40 °C Humidity: maximum relative humidity 80 % for temperatures up to 31°C decreasing linearly to 50 % rel. humidity at 40°C. Voltage fluctuations: up to ±10 % of nominal voltage. Overvoltage category II. Installation category II. Pollution degree 2.	

15. APPENDIX 1 – DECLARATION OF CONFORMITY

We,
ECOM spol. s r.o.
Trebonicka 239, CZ-252 19 Chrastany u Prahy
Czech Republic
Company ID No.: 41 192 192

as manufacturer declare, that the product meets all applicable provisions of the EU directive on electromagnetic compatibility 89/336/EEC (EMC directive) as well as all applicable provisions of the EU low voltage directive 93/68/EEC (LVD directive).

Product: **Column Oven**
Type: **ECO2080**

Contextual models: ECO2099
Application of the product: Equipment is used in the lab for stabilization of column temperature by chromatographic analysis.
Manufacturer: ECOM spol. s r.o., Trebonicka 239, CZ-252 19 Chrastany u Prahy, Co. ID No.: 41192192

The following technical standards were applied when evaluating conformity:

EN 55011 ed. 3:2010, A1:2011, group 1, class A
EN 61000-3-2 ed.3:2006, A1:2010, A2:2010 (EN 61000-3-2:2006, A1:2009, A2:2009)
EN 61000-3-3 ed.2:2009, (EN 61000-3-3:2008)
EN 61326-1 ed.2:2013, class A
EN 61326-1:2013 art.6, Table 1
EN 61010-1 ed.2:2011 (EN 61010-1:October 2010)

Evaluation of conformity was performed by division VTÚPV Vyškov with certified quality system according to ČSN EN ISO 9001; Technology testing department – Testing Laboratory No.1103 accredited according to ČSN EN ISO/IEC 17025; EMC TESTING LABORATORY and ELECTRICAL SAFETY AND ELECTRICAL EQUIMPMENT TEST ROOM, which issued the followings reports:

11.4.2014 Test Report No. 194400-013/2014
28.2.2014 Test Report of Electromagnetic Compatibility No. 194300-077/2014
20.2.2014 EMC test report No. 194300-078/2014
20.2.2014 Test report Electromagnetic Compatibility No. 194300-079/2014

Prague 24.03.2014

Ing. Jaroslav Formánek
director