CROCO-CIL®

SCREEN : CHOICE OF THE LANGUAGE
FRENCH / ENGLISH :
When connecting, keep pushing on the key:
[+] for english
[-] for french

HPLC
COLUMN HEATER

Operating instructions

CE

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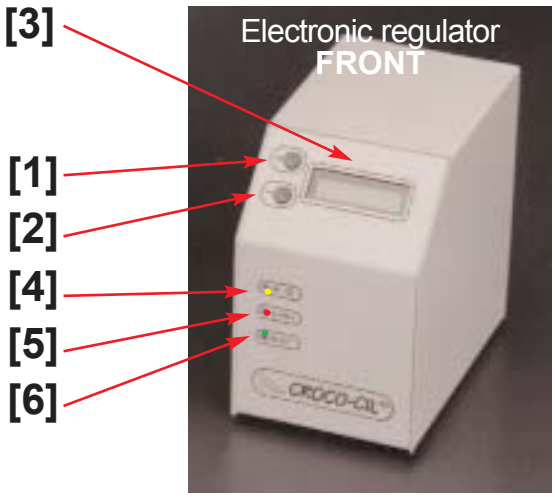
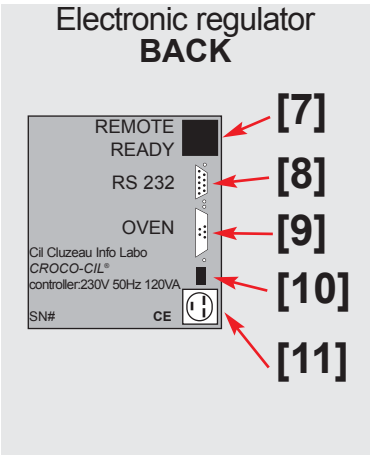
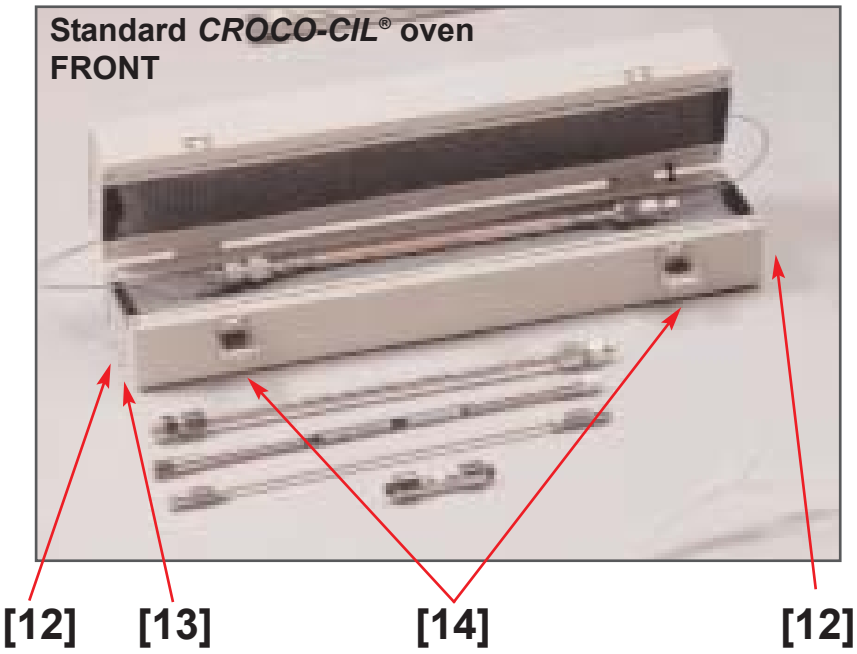
CLUZEAU INFO LABO

CROCO-CIL® HPLC COLUMN HEATER







1°/ELECTRONIC REGULATOR :

FRONT :

[1] : PUSH BUTTON TO RAISE TEMPERATURE

[2] : PUSH BUTTON TO LOWER TEMPERATURE

[3] : LIQUID CRYSTAL DISPLAY

[4] : BLINKING YELLOW LED FOR TEMPERATURE ADJUSTMENT

[5] : RED LED ALARM

[6] : READY GREEN LED TO SHOW THAT THE TEMPERATURE OF THE COLUMN HEATER IS STABILIZED IT LIGHTS UP AFTER ROUGHLY 16 MINUTES WHEN TEMPERATURE IS STABLE

BACK:

[7] : REMOTE/READY CONNECTOR (cable free, only upon request)

[8] : RS232 CONNECTOR (**not included**)

[9] : CONNECTOR FOR TEMPERATURE CONTROL

[10] : ON/OFF SWITCH

[11] : 230V POWER SUPPLY

2°/OVEN

[12] : POSSIBLE LEAK DRAIN OUTLET

[13] : CONTROL CABLE CONNECTOR

[14] : OPENING CLIPS

3°/DESCRIPTION

CROCO-CIL® is a patented HPLC column heater. Its unique heated mesh beds are especially designed for adjusting automatically to various types of columns. They are perfectly adapted to HPLC temperature requirements.
Different models of oven are available to accommodate different sets of columns :
- 1 to 15 columns,
- column length from 3 to 80 cm (for longer columns please contact us)

Temperature is kept constant between ambient to 99°C (+/- 0.1°C).
Developed according to European electric and electromagnetic standards, and thanks to its oven working on 24 volts, ***CROCO-CIL***® is totally safe.
CROCO-CIL® standard equipment includes :
- one easy to use electronic regulator,
- one oven,
- one 230 V grounded power cord,
- one cable from electronic regulator to oven,

Upon request :
- one REMOTE/READY CONNECTOR (cable free only).

4°/INSTALLATION

CROCO-CIL® is designed to work at 230 V in a normal Laboratory environment.
Keep the command electronic regulator away from damp places and condensation.
The oven is designed to operate vertically or horizontally. In operation close to horizontal, make sure the drain outlet is low enough to insure correct drainage.
The connection to the mains must be grounded.
Each command electronic regulator has been calibrated to work with an oven of the same series. Connecting an electronic regulator with another oven could result in a difference between “SET” and “OVEN” (see § 8 : trouble shooting).
It is advisable to dry the device after transport or storage, in order to avoid condensation that could have appeared in the inside. **In order to avoid any danger and to obtain optimal security, place the device for 4 hours at room temperature (20 to 25°C without condensation), or for 2 hours at 40°C.**
When proceeding, the device should not be connected to the mains.

5°/ADVICE

- Make sure that the couplings of the columns are tightly screwed. Although it is equiped with a leak drainage system, ***CROCO-CIL***® can be deteriorated by some corrosive liquids.

It is not advisable to place a liquid container on the different parts of the device.
Do not place ***CROCO-CIL***® near a hot or cold source.
Because of electric shock the device should not be covered.
Because of its function, a column heater emits heat, consequently the surface could be hot and the inside burning.

6°/ OPERATION

- Make sure the power cord is correctly installed
- Connect the electronic regulator with the oven
- Turn on with ON/OFF switch **[10]**
- The screen reads :

CROCO-CIL version # 1.21

SET	40° C	(chosen temperature)
OVEN	25°.0C	(oven temperature)

Insert the column, **check the connections for leaks,** and **close the oven securely**.
USE THE + or - KEY TO ADJUST THE SET POINT
The temperature (OVEN) will progressively reach the desired temperature (SET). The yellow LED **[4]** indicates heating. When the LED **[6]** is green and stable (after 16 minutes) the temperature in the column is at equilibrium. Now the reproducible retention times are guaranteed.

7°/ ALARM : SELF-DIAGNOSTICS

CROCO-CIL® is fitted with an alarm system red led **[5].** An error message for autodiagnostic automatically displays :
ERROR 1 : temperature too high or control cable unplug.
ERROR 2 : control cable or connection to oven defective.
ERROR 3 : problem with power supply, switch off and switch on the device. If the problem remains, contact your distributor.
ERROR 4 : problem with power supply, switch off and switch on the device. If the problem remains, contact your distributor. This error could happen when connecting ***CROCO-CIL***®. This does not mean there is a power fault with the oven : in this case switch off and switch on ***CROCO-CIL***®.
ERROR 5 : RS232 mode, transmission error, parity error.
ERROR 6 : RS232 mode, message misunderstood.
The lack of a message on the screen signals a major fault with the micro processor.

8°/ TROUBLESHOOTING

PROBLEMS	SOLUTIONS
Blank screen	Make sure that : - the power cable is connected, - the fuse is OK, - the ON/OFF switch is in position “I”. If the screen is still blank : contact your distributor.
The “SET” & “OVEN” temperatures are different	Make sure that : - the oven is closed, - the metal mesh bed is OK, Check the oven temperature with a standard thermometer and reset as § 9 :Linearization Procedure - the oven and the electronic regulator have the same serial number
The alarm sounds	Follow the autodiognosis : see § 7 “Alarm”
Memory change	Contact your distributor.

9°/ IMPORTANT NOTICE ABOUT CALIBRATION

CIL® = Calibration - Intelligence - Linearization

PROCEDURE FOR AUTOMATIC TEMPERATURE LINEARIZATION WHEN QUALIFICATION CONTROL ACCORDING TO YOUR OWN STANDARDS.

CROCO-CIL® has been calibrated using an AOIP certified temperature system :

"National chain of calibration BNM-COFRAC"
N°2-1332

CROCO-CIL® includes a linearization correction program to adjust "in situ" **possible** discrepances between the temperature displayed at 1/10°C and the temperature read in the oven by an independent calibrated thermometer.

If the temperature of your calibrated thermometer (YY.Y°C) does not match "oven = XX.X°C" displayed on the screen, proceed as follows (**Anyway, avoid to recalibrate *CROCO-CIL*® when discrepance is higher than 1°C**) :

A/ Switch off the electronic regulator **[10]**

B/ Press simultaneously on the two keys **[+]** and **[-]** and switch on **[10]**
The screen displays :

CALIBRATION
RELEASE KEYS

C/ Release the two keys **[+]** and **[-]**.
Place your calibrated thermometer inside the oven when running. Wait for the green led "READY" to light on and read the temperature on your calibrated thermometer.
The screen now displays :

CALIBRATING	40°C
OVEN	40.0°C

D/ Press on the keys **[+]** or **[-]** until you reach the temperature of your calibrated thermometer (YY.Y°C).
If manual error, turn back to **A.**
The screen displays **(WARNING : this message appears only for 2 seconds)** :

THERMOMETER	
OVEN	YY.Y°C

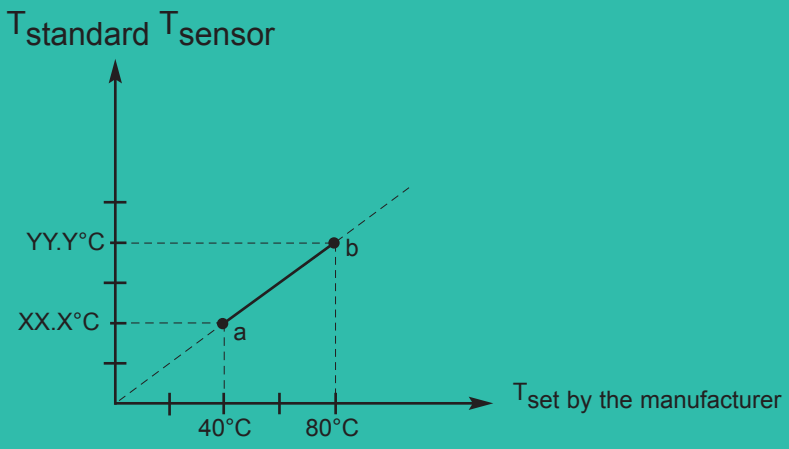
E/ After the adjustment at 40°C (minimum 30mn), the program automatically displays :

SET	80°C
OVEN	YY.Y°C

F/ Wait for stabilization at 80°C until the green led "READY" lights on.

G/ Repeat the same operation now displaying the temperature of the oven that you can read on **the calibrated thermometer**.
Linearization and calibration at 80°C are automatic as well.
When linearization at 40°C and at 80°C completed, **your instrument is ready and "qualified" for your own standards.**
Press on the push button + of - to display the desired temperature (T° you want to work at).

Roughly 30 mn later, check for the last time that the 3 temperatures match together :
SET : XX°C
OVEN : XX.0°C
THERMOMETER : XX.0°C



The coordinates of points a and b are memorized.
If the operation fails, return to **A**.

10°/ RS232 (cable not included : available in any specialized supermarket)

CONFIGURATION OF THE TRANSMISSION
Transmission Rate : 4800 bauds
Bits : 7
Stop bits : 1
Parity : Even

CONNECTING RS232
- Connector SUB-D 9 point plug
- Signals controlled : only RX and TX
- RTS and CTS pins are connected inside the housing (null modem)

CHOICE OF THE TEMPERATURE
- To change the temperature : send the temperature in ASCII code, 2 digits and “return”.
- Reading of instructions : send a “C” in ASCII, then “return”. ***CROCO-CIL***® send the instructions on ASCII form (2 digits).
Reading of the oven temperature : send a “T” in ASCII, then “return”. ***CROCO-CIL***® send the oven temperature on ASCII form with a “.” (dot) between the decimal and the integer part.
On RS232 mode the keys of the electronic regulator are desactivated, ***CROCO-CIL***® displays RS232.

11°/ ELECTRICAL SPECIFICATIONS

Power : 230V/Ac 50Hz
Consumption : 132VA (145VA for triple width ***CROCO-CIL***®)
Fuse : T2.5AL 250V
Maximum power : 10mA
Maximum voltage : +5V
Open commutator

12°/ DESCRIPTION OF *CROCO-CIL*® SECURITY ELEMENTS

Temperature sensor :
Protected against short-circuits and breakers by comparator. 2 relays turn the power off and error 1 or 2 message displays.
Oven :
- protected against short-circuits by fuse and power monitoring. Fuses are situated under the basic electronic regulator, only a qualified person can replace them.
- 2 relays and fuse turn the power off and “error 4” displays.
- The break in a fuse should come from a failure. In this case, send the device back to the distributor.
- Protected against over heat by 110°C +/- 5°C fixed alarm. 2 relays turn the power off and “error 4” displays.

Power circuit :
Protected against power short-circuits in the oven. 2 relays turn the power off and “error 3” displays.
Protected by fuse against short-circuits, no display.
In case of leaks, **the whole device** must be sent back to the manufacturer for cleaning and repair.

13°/ GUARANTEE

CROCO-CIL® is guaranteed against all defects for one year after the shipping date.
Your distributor pledges during this time to replace any faulty parts. The cost of returning ***CROCO-CIL***® is charged to the buyer.
The present guarantee does not cover damage caused by accidents, misuse, negligence, bad connection and natural wear and tear. It does not cover the casing or the colour.
The maintenance of the device must be made by a qualified person ; the user can only clean it.To avoid any unnecessary cost, it is advised to contact your distributor before returning the instrument.

Environmental Conditions :
CIL CLUZEAU™ products are designed to function in the following conditions :
indoor usage ; altitude not higher than 2000 m, exceeding 2000 m if specified by the constructor ; temperature between 4° and 40°C ; maximum relative humidity of 80% at temperatures up to 31°C, dropping progressively to 50% relative humidity at 40°C without condensation ; fluctuations in specified power supply not greater than +/- 10% ; transient power surges conforming to installation categories : 2 ; level of pollution : 2 ; connection to mains conforms NFC 15-100.