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Manual Cell Ageing Oven EB 01-II

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**Technical documentation supplied
on USB flash drive**

1. Setting up the Cell Ageing Oven

Place the Ageing Oven on a stable and horizontal bench.
 Connect the oven to a grounded mains outlet, according to the type label on the oven. We recommend the use of an Earth Leakage Detector.

2. Running the Cell Ageing Oven

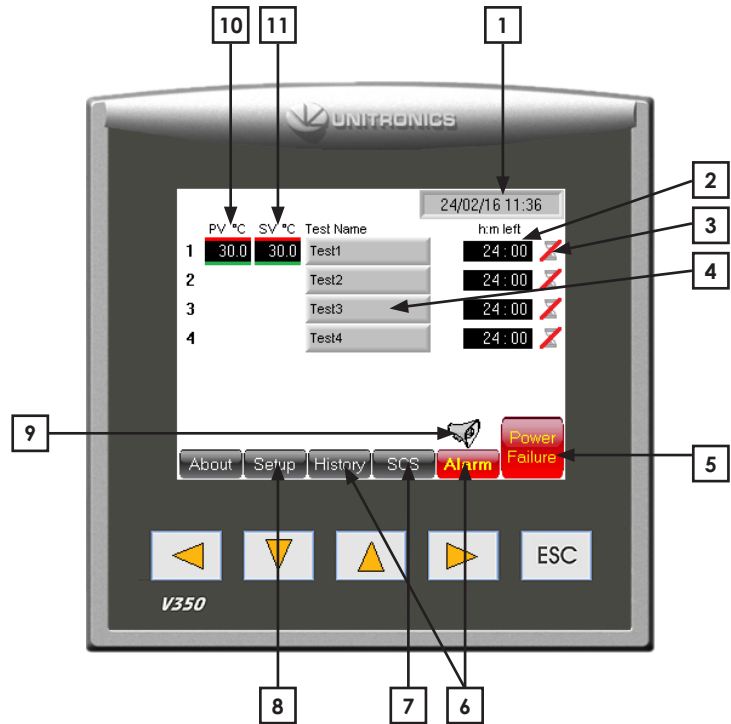
2.1 Starting

Switch on the power (red switch).
 Reset the power failure and alarm, see 2.2.4 and 2.2.6.
 Set the temperature on the PLC, see 2.2.1.

2.2 Settings

Explanation

1. Date & time
2. Countdown time left
3. Countdown timer on or off (off in this example)
4. Test name
5. Power Failure
6. Alarm and History – tap this symbol and the alarm history will be visible on the PLC screen
7. SCS – multiple cells will be shown as slides shifting in a sequence with enlarged displays
8. Set up for
 - date & time
 - communication with software
 - calibration offset
9. Alarm Buzzer on or off
10. PV = Process value – the actual temperature in the cells
11. SV = Set value – the temperature set for this cell



The oven has a touch controlled screen. A touch pen will be included

Note: Do not use sharp objects to touch the screen.
 This can cause damage on the screen.

2.2.1 Temperature setting

Tap on the "SV" box (Set value) to set the test temperature (Fig 2.2.1a).

A numeric keyboard will show. Type in the set temperature with the numeric keyboard and finish with a tap on the return button (Fig 2.2.1b).

Or use the panel keys to mark the SV display and adjust the temperature setting.



Press the arrow down or up to mark the SV box and then use the arrow key left and right to adjust the value.

The "PV" box is an indicator and shows the present temperature in the oven.

2.2.2 Test name (Fig 2.2.2)

Press the grey box labeled Test name, on the main screen. Type the test name from the touch screen keyboard. One test name row on the screen can hold up to 40 characters.

1. Use the white arrow keys on the upper left corner to swap between different keyboard character layouts.
2. Tap on the Enter key to finalize the test name input.
3. To re-enter any character on the same test name row, it is possible to correct any character in the test name with a tap on any of the white left or right arrow buttons in the lower left and right corner on the screen.
4. To cancel any input changes, tap on the ESC key and return to the previous screen.

2.2.3 Test time

In the "Time" box (h:m left) to the right of each cell a count-down time can be typed in (Fig 2.2.3). Tap the box, type in the time and press Return. The time will now start countdown. This time can only be changed when the time symbol to the right is disabled. Press the symbol for at least 2 seconds and a red line is shown. The time can now be changed.

This function can also be used if the user don't want the countdown to start immediately. Press the symbol for at least 2 seconds until the red line is shown. Click the "Time" box, type in the time and press enter. When the countdown should start press the symbol (again >0 sec) until the red line disappears.

The countdown will now start. Time can also be changed by marking hours and use the arrows left and right.

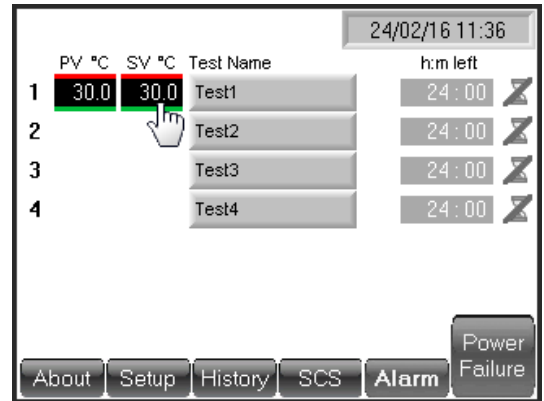


Fig 2.2.1a Temperature setting

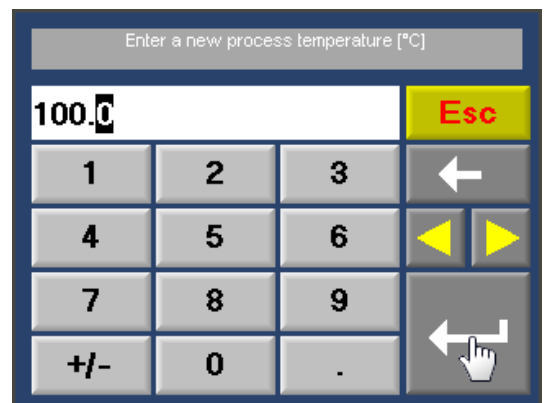


Fig 2.2.1b Temperature setting



Fig 2.2.2 Test name

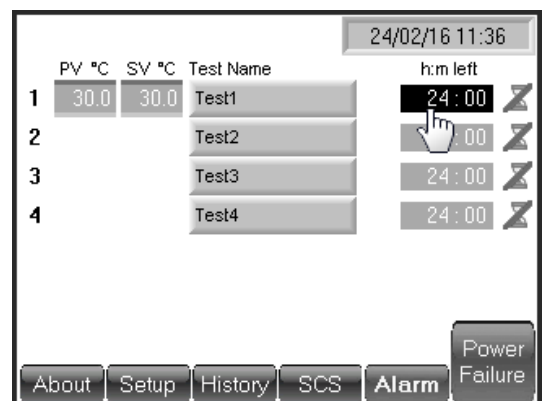


Fig 2.2.3 Test time

2.2.4 Power failure

Power failure during a test

If the test time is running when a power failure occurs, the oven temperature and test time counters will continue from the time when the power failure occurred, when the power is resumed.

Power failure indicator

When the power is resumed after a power failure during a test with temperature control at set point and test timer running, the screen will lit up a power failure button.

Tap on the *Power Failure* button to see more information and to reset the power failure (Fig 2.2.4a).

A new screen will show (Fig 2.2.4b).

This feature will give the operator information about duration of the power failure and temperature drop caused by the power failure. The power failure button will remain until the button *Clear & Exit* is tapped.

2.2.5 Set up screen (user)

Password

A password is needed to enter the set up mode.

Tap on the *Setup* button on the main screen to enter the password screen for set up.

Default password is: 1111

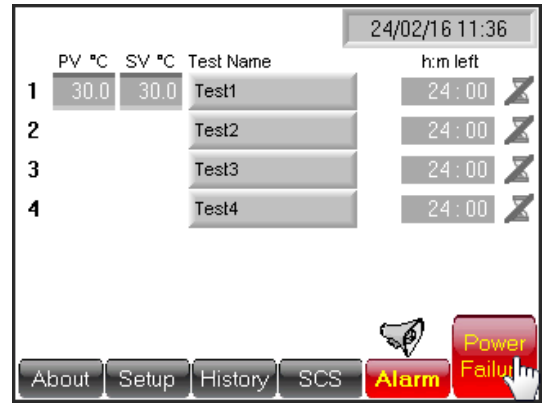


Fig 2.2.4a Power failure

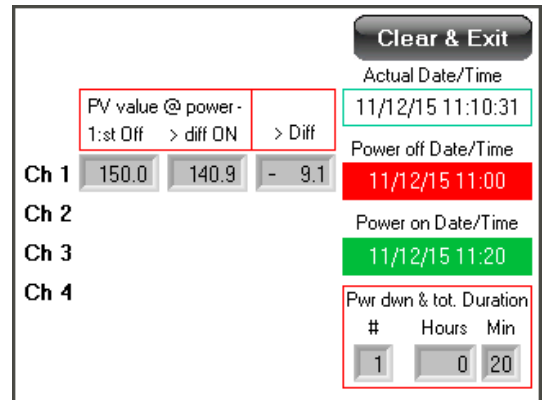


Fig 2.2.4b Power failure

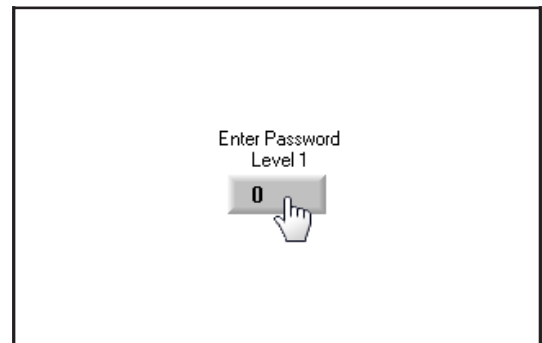


Fig 2.2.5 Password

IP-address

In the Set up mode an IP-address can be typed in to establish a communication with a PC-software e.g. monitoring program. Tap on the *IP-addr.* field to enter an IP-address.

The *IP-addr.* field is divided into smaller fields.

The oven main power must be switched off and on (restart) for the IP settings to refresh and initiate.

Temperature offset

In the set up mode the offset is adjusted according to calibration. When a re-calibration is done, values may have to be adjusted again.

An individual offset value can be added to both the temperature-indicator and -controller.

Standby temperature

The operator can in this *Set up* also preset a standby temperature. That means when the test timer has reached 0:00, the oven will be set to this pre-set temperature. To access the standby temperature setting, tap on the control box below *Stdby.*

A zero value in this control means that it is not active and after the test timer timeup the oven will remain at the same temperature as during the test.

A higher value than zero represents the temperature set value. Eg. if the operator sets the standby control to 30, the oven will go to 30 °C after the test time has reached the end. Minimum set value (SV) for the oven is 30 °C.

The oven has no cooling. The temperature will just cool off naturally. The cooling time depends on the room ambient temperature.

Real time clock

Tap on the real time clock control to set time and date.

This is the system time and date and this time/date stamp will be included to all alarm and time critical information visible on the screen.

Use the numeric keyboard to set a new time and date.

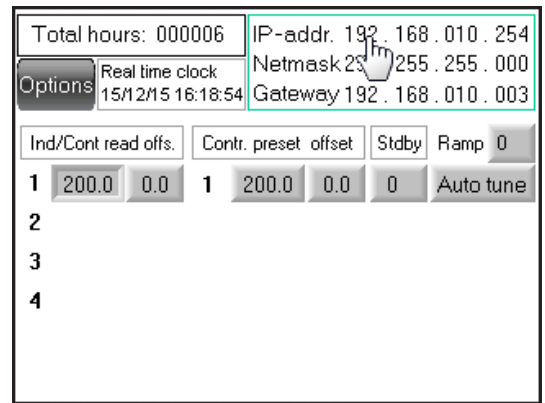


Fig 2.2.5 IP-address

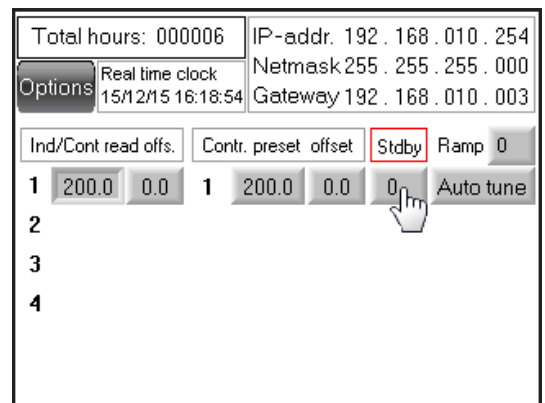


Fig 2.2.5 Standby temperature 1



Fig 2.2.5 Standby temperature 2

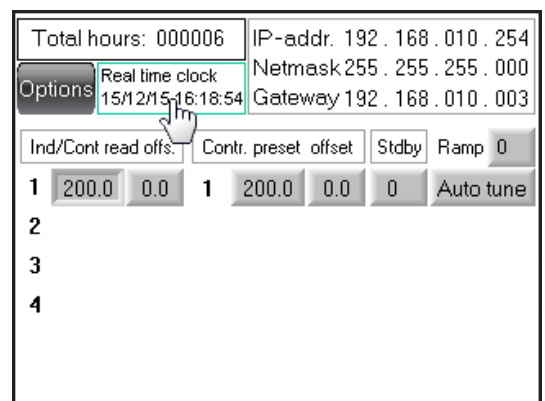


Fig 2.2.5 Real time clock

2.2.6 Alarm

Alarm is activated at:

- high temperature in the test chamber, +1 °C from set value
- low temperature in the test chamber, -1 °C from set value
- high temperature of the controller, +5 °C from set value ¹⁾

¹⁾ This alarm will be reset automatically when the temperature is within tolerance from set value again.

Error code	Problem cause	Remedy
001 Cell 1	Oven cell is too warm.	The alarm will be reset when the alarm has been acknowledged and the cell has cooled down.
007 Cell 1	Temperature difference between set value and process value ± 1 °C.	Wait until the temperature is within range to acknowledge the alarm.
013	Low pressure from airpump.	Check the airpump filter and function.
014	Shinko Communication Timeout.	Contact support.
015	Low battery.	Replace backup battery in OPLC (contact support).
016 Cell 1	Loop break controller #.	Broken temperatur sensor, call for service.
022 Cell 1	Temperature difference between set value of controller and actual value +5 °C.	Acknowledge the alarm. When temperature is within range the alarm will be reset. If the alarm is not reset contact support.

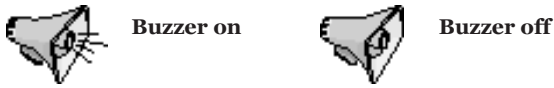
Coloured lines on PV and SV display indicates alarm status.

- A red line above PV display = PV temperature differs +1 °C from SV temperature.
- A light blue line below PV = PV temperatures differs -1 °C from SV temperature.
- A red line above SV = SV differs +5 °C from actual controller temperature.
- A green line below SV = PV temperature is within ± 1 °C from SV temperature.

SV temp. diff. alarm to general alarm collection list and flashing alarm button will only be active for running channels (active count down meter).

Alarm will activate a buzzer and/or a flashing red Alarm button. The buzzer can be switched on and off by a tap on the buzzer symbol.

If the alarm button starts to flash, go through the check list in chapter 2.2.6 Alarm to identify the alarm and address the problem for proper action.



Acknowledge any alarm

To acknowledge any alarm, tap on the button Alarm.

Fig 2.2.6a. All active alarms can be seen on this screen. Press the magnifying glass to the right side of the alarm ID 00 in the alarm group list to view all active alarms in that group.

This oven will present all active alarms in the group named ID 00.

All the alarms in this group are divided into two levels depending on how serious the alarm is.

First level will reset the alarm automatically, but still requires an acknowledgement to be cleared from the alarm list.

Second level must always be acknowledged by the operator manually.

Fig 2.2.6b. To acknowledge an alarm, press the magnifying glass to the right of the chosen alarm.

Fig 2.2.6c. Press the button *Ack* and the alarm will be reset.

Any alarm that is reset automatically will remain in the alarm list until a normal condition is met. The red *Alarm* button will however switch from flashing to a fixed state.

Alarm that still persists will show up again after the acknowledge procedure.

Press the *Esc* button several times to return to main screen.



The *History* button will show a record of all previous alarm.



Fig 2.2.6a

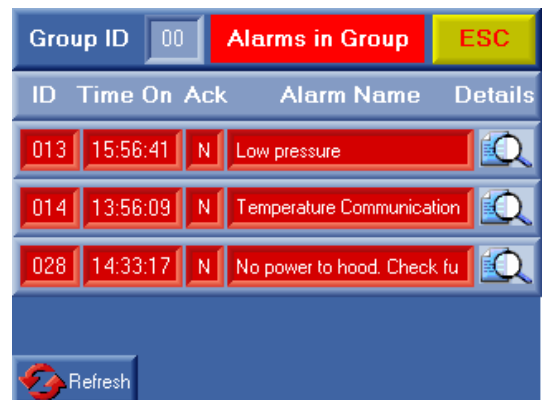


Fig 2.2.6b



Fig 2.2.6c

2.2.7 Set the air change rate

According to standards the air has to be changed during the test. ISO 188 Accelerated ageing, method A, requires an air change of 3 to 10 times an hour.

IEC 811 Ageing of cable insulation, requires an air change rate of 8 to 20 times an hour.

The cells in the oven have a volume of 2,4 l/cell.

This gives the following flow of air through the flow meters:

air change rate	
changes/h	l/min
3	0,12
5	0,2
7,5	0,3
10	0,4
12	0,5
15	0,6
17,5	0,7
20	0,8

For ageing of rubber materials it is suggested to set the flowmeters to 0,3 l/min.

For ageing of cable insulation materials it is suggested to set the flowmeters to 0,6 l/min.

Read the flow of the flowmeters at the center of the floats.

The floats shall rotate slowly to show the correct reading.

Note: If the floats does not rotate properly check if the oven is placed horizontally.

2.3 Start the test

When the test temperature is reached, take up the test piece holders and place your samples on the pins, then return the sample holders in the cells. Be careful when placing the lid of the test piece holder, to achieve a good contact with the aluminium block of the oven.

3. Temperature calibration

The instrument is adjusted and calibrated according to the attached calibration certificate at the delivery.

Calibration should be done annually.

4. Service and maintenance

The cell oven shall be cleaned on both the outside and inside, at regular intervals. The oven can be cleaned with water and a detergent or ethanol on the outside.

On the inside, most dirt is accumulated on the inside of the upper lid, by volatiles from the samples condensing. The lid can be cleaned with a suitable solvent such as ethanol or white spirit.

The most sensitive parts of the oven are the air filter and the air pump, which should be checked at least once a year.

5. Troubleshooting

When the oven does not work properly, check the following.

Problem	Problem cause	Remedy
No power	No main power	The main fuse, 10 AT, is placed in the connector for the mains lead on the back of the oven.
	Broken main power	Check power supply socket.
Alarm button flashing	Any alarm	See chapt 2.2.6 Alarm.

Check electric schematics for fuses. Before changing a defective fuse, check for any possible short circuit, causing the fuse to burn.

6. Safety

Note: Use gloves when the samples are placed in the oven or removed from the oven.

Important! For the best performance of the instrument, we recommend the following working environment:

- Standard laboratory temperature of either 23 °C ±2° or 27 °C ±2°.
- Humidity not more than 90 % RH – non condensing.
- Other environmental aspects: Pollution degree 2 – Laboratory environment.

7. Technical specification

	EB 01-II
Temperature range, °C:	+ 40 to + 200
Temp. control, +40 to +100 °C, °C:	± 0,5
+101 to +200 °C, °C:	± 1,0
Temp. variation in time, °C:	± 0,25
Temp.variation in space, %:	± 0,5
Temperature sensors:	Pt 100, 1/3 DIN
No. of temperatures:	1
No. of cells:	4
Air speed, m/s:	<0,001
Air changes, changes/hour:	3 to 20
Useful volume, l:	4 x 2,4
Dimensions, inner, dia x h, mm:	100 x 300
Dimensions, external, w x h x d, mm:	760 x 500 x 510
Weight, kg:	50
Voltage, V/phase/freq:	220–240/1/50 (110–120/1/60)
Power, W:	900
Standards:	ISO 188 method A IEC 60811-1-2 IEC 60216-4-3

Common specifications:

- The ovens perform well inside the apparatus requirements in ISO 188, IEC 60811-1-2 and other equivalent standards.
- The ovens are controlled from a PLC (with a colour touch screen).
- Special design with controlled air exchange rate and low air speed.
- The casing consists of steel, painted with powder paint in bluegreen colour.
- The inner cells are made of aluminium.
- Temperature controller with 0,1 °C setpoint (PLC).
- Temperature indicator with sensor in one of the cells (PLC).
- Fixed over temperature fuse.
- Flowmeters with needle valves, for setting the air exchange rate.
- The air speed is low and is dependent on the air exchange rate only, as specified in ISO 188 method A and IEC 60811-1-2.
- Alarm for low air pressure (PLC).
- Built in air pump.
- Cooling channels in the casing for low surface temperature.
- Temperature controlled cooling fan for the electronics cabinet.
- Indication of power failure (PLC).
- Run-time meter (PLC).
- Countdown timer (PLC).
- Microfilter for the air which removes 99,99 % of all particles over 0,1 µm.

Optional accessories

EB-P Ramp function for temperature setting in the PLC.

EC 11 Monitoring software.

ED 04 Computer, PC.

Network cable.

Support

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