DECADE II
Electrochemical Detector

Installation of Dual Cell Control upgrade kit

Symbols

The following symbol are used on the rear panel and oven compartment of the DECADE II:

Consult the manual for further safety instructions

Frame or chassis ground terminal

The following pictograms are used in the DECADE II manual:

Caution

Caution, risk of electric shock or other electrical hazard (high voltage)

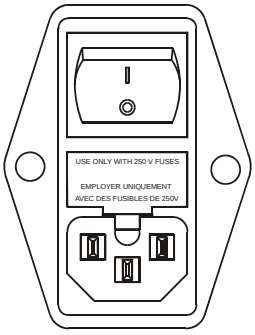
Safety practices

The following safety practices are intended to insure safe operation of the equipment.

Electrical hazards

The removal of protective panels on the instrument can result in exposure to potentially dangerous voltages. Therefore, disconnect the instrument from all power sources before disassembly. Untrained personnel should not open the instrument.

Replace blown fuses with fuses of proper type and rating as stipulated on the rear panel and specified in the installation section of this manual. The fuse holder is integrated in the mains connector. Ensure that the instrument is never put in operation with fuses of a different type. This could cause fire.



Connect the detector to a grounded AC power source, line voltage 100 – 240 VAC. The instrument should be connected to a protective earth via a ground socket. The power source should exhibit minimal power transients and fluctuations. Replace faulty or frayed power cords.

Place the detector on a flat and smooth surface. Do not block the fan located at the bottom of the detector. Blocking the fan will impair the cooling capability of the power supply.
Before starting the replacement of the EPROMS please read the following safety instructions carefully:

Take precautions against electrostatic discharge during installation/removal of boards, EPROM's or other electrical components at all time to prevent damage of the circuit boards.

Spare parts and service availability

Manufacturer provides operational spare parts of the instrument and current accessories for a period of five years after shipment of the final production run of the instrument. Spare parts will be available after this five years period on an ‘as available’ basis.
Manufacturer provides a variety of services to support her customers after warranty expiration. Repair service can be provided on a time and material basis. Contact your local supplier for servicing. Technical support and training can be provided by qualified chemists on both contractual or as-needed basis.

Table of contents

C H A P T E R 1

Dual Cell Control upgrade kit

Congratulations on your purchase of the DECADE II Dual Cell Control upgrade kit, p/n 171.0216, 171.0218 or 171.0220. This DCC kit enables you to upgrade your DECADE II to an electrochemical workstation with two flow cells allowing serial or independent parallel operation.

Important notice

Your DECADE II is factory installed with a LM35 temperature sensor mounted in the heater compartment. The LM35 sensor has a cable with three wires (red/white/ black) and a 6-pin Molex KK connector (white) . This cable is originally not connected to any board and is fixed into the grey cable clamp on the left side panel of the DECADE II inside the housing.

Only a few DECADE II detectors on the market do not have the LM35 sensor preinstalled (first series s/n, < 171.00025).

If your DECADE II has a s/n < 17100025 DO NOT procede with the installation of the DCC kit, but please contact the manufacturer. In that case the DECADE II should be upgraded at the factory.

There are three versions of the DECADE II DCC kit available. The particular kit required for the upgrade of your detector is depending on the serial number of the DECADE II.

P/n	Description
171.0216	DECADE II DCC upgrade kit, s/n 92 -
171.0218	DECADE II DCC upgrade kit, s/n 72 - 91
171.0220	DECADE II DCC upgrade kit, s/n 25 - 71

Depending on the upgrade kit purchased some of the installation steps can be skipped. Please follow further instructions in the description of the installation procedure on page 11 of this manual.

C H A P T E R 2

Installation guide

Unpacking

Inspect the *transport box* for possible damage as it arrives. Immediately inform the transport company in case of damage, otherwise she may not accept any responsibility. Keep the transport box as it is designed for optimum protection during transport and it may be needed again. Carefully unpack the kit and inspect it for completeness and for possible damage. Contact your supplier in case of damage or if not all marked items on the checklist are included.
Prior to shipment, the parts of your upgrade kit have been inspected and tested to ensure the best possible performance.

Contents of kits

Below the contents of the available upgrade kits are listed:

1. p/n 171.0216, DECADE II DCC upgrade kit s/n 92 -, consists of the following parts:

P/n	Description	Qty
171.0624	DECADE II sensor board	1
171.0208	DECADE II DCC mounting kit	1
171.0224	DECADE II DCC accessory kit	1
	Software:	
171.9007	DECADE II Dialogue, demo version	1
	Documentation:	
171.0020	DECADE II service manual	1
171.7032	DECADE II FW upgrade user guide	1
171.7034	DECADE II DCC upgrade kit install guide	1

2. p/n 171.0218, DECADE II DCC upgrade kit s/n 72 - 92, consists of the following parts:

P/n	Description	Qty
171.0684	DECADE II temp control board	1
171.0690	Temp control board fixing conn.	1
171.0624	DECADE II sensor board	1
171.0600	DECADE II control boot-EPROM	1
171.0605	DECADE II sensor boot-EPROM	1
171.0208	DECADE II DCC mounting kit	1
171.0224	DECADE II DCC accessory kit	1
	Software:	
171.9007	DECADE II Dialogue, demo version	1
	Documentation:	
171.0020	DECADE II service manual	1
171.7032	DECADE II FW upgrade user guide	1
171.7034	DECADE II DCC upgrade kit install guide	1

3. p/n 171.0220, DECADE II DCC upgrade kit s/n 25 - 71, consists of the following parts:

P/n	Description	Qty
171.0684	DECADE II temp control board	1
171.0690	Temp control board fixing conn.	1
171.0624	DECADE II sensor board	1
171.0600	DECADE II control boot-EPROM	1
171.0605	DECADE II sensor boot-EPROM	1
171.0208	DECADE II DCC mounting kit	1
171.0226	DECADE II DCC internal cell cable kit	1
171.0224	DECADE II DCC accessory kit	1
	Software:	
171.9007	DECADE II Dialogue, demo version	1
	Documentation:	
171.0020	DECADE II service manual	1
171.7032	DECADE II FW upgrade user guide	1
171.7034	DECADE II DCC upgrade kit install guide	1

Tools

The following tools are necessary for the installation of the dual sensor upgrade kit:

Service tools
[a] IC-puller and normal screw driver
[b] Hex key 3/16”
[c] Phillips screwdriver no.1 (long or normal shaft)

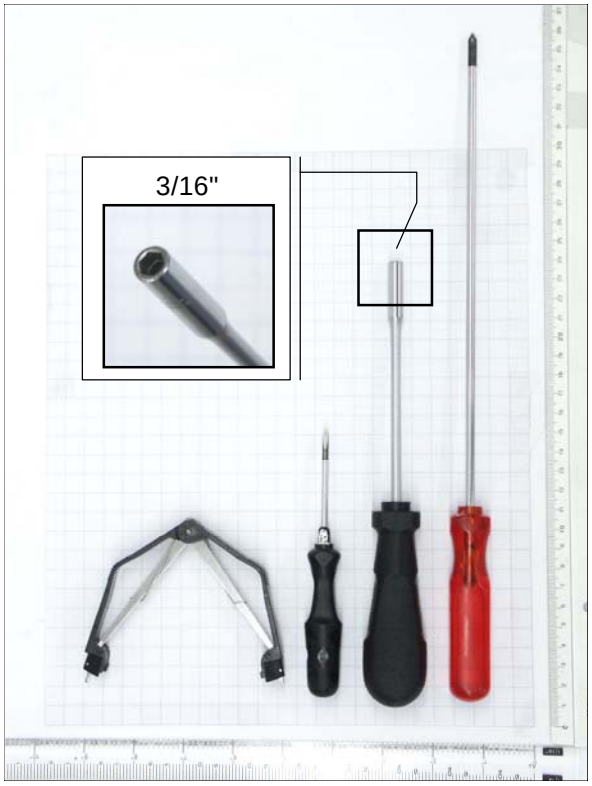


Figure 1 *IC-puller, screwdriver, hex key and Phillips screwdriver*

Solvents
Ethanol (cleaning).

Test equipment
External dummy flow cells (p/n 250.0040)

Installation procedure

The installation procedure consists of the following steps:

1. Upload of FW version 3.20 >
2. Removing rear panel
3. Installation of internal cell cable *(for s/n < 17100072 only)*
4. Labelling cables for identification
5. Removing sensor board
6. Replacement of boot EPROMS *(for s/n < 17100092 only)*
7. Reconfiguration of heater connector 7 *(for s/n < 17100092 only)*
8. Installation of temperature control board *(for s/n < 17100092 only)*
9. Installation of power cable for 2nd sensor board
10. Configuration of dip switches
11. Placement of I/O label on rear panel
12. Installation of sensor boards
13. Installation of cell and column clamps
14. Placement of cell identification labels
15. Upload of firmware version 3.xx
16. Check & calibration

For upgrade kit with p/n 171.0216 the installation steps 3, 6, 7 and 8 can be skipped.

For upgrade kit with p/n 171.0218 the installation step 3 can be skipped.

For upgrade kit with p/n 171.0220 ALL installation steps should be executed.

Some steps of the installation and calibration procedure are described in the service manual (171.0020) which is provided with this upgrade kit (see references in this installation guide). The FW upgrade procedure using the FW wizard in Dialogue is described in the FW upgrade user manual (171.7032). The standard dummy cell test is described in chapter 13 in the DECADE II user manual (171.0010). Please make sure that you have the user manual available during the upgrade procedure.

The complete upgrade procedure will take approximately 2 hours, 30 minutes to install hardware and 100 minutes to check and recalibrate the DECADE II.

1. Upload of firmware version 3.xx

Upgrade the firmware of the single sensor board DECADE II with an FW version which supports dual sensor board control (FW > 3.20) as described in the FW upgrade user guide (171.7032). This step is necessary to be able for the system to recognize the second board after installation. Note that in step 15 the firmware should be installed for a second time after the installation of the second sensor board. A CD-ROM is provided with DECADE II Dialogue and DECADE II firmware release 3.20 >. Please check for new releases on the internet: http://www.antecleyden.com/support/. If newer versions of either the FW and Dialogue are available please install these versions.

2. Removing the rear panel

Both circuit boards are mounted on a separate metal frame, which are fixed on the rear panel of the detector. The circuit boards can be accessed by removal of the rear panel by means of the four M3 Phillips screws as depicted in figure 2. The screws are marked with red arrows and the letters A and B.

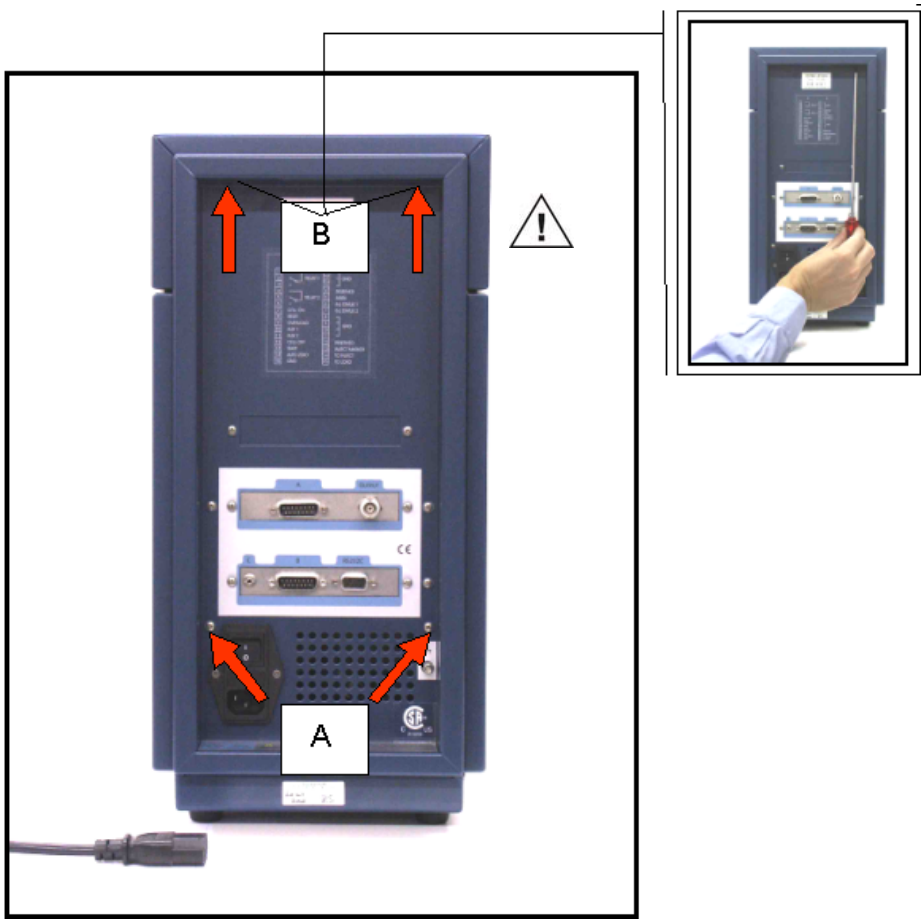


Figure 2 *Connector panel of the DECADE II*.

1. Remove the two screws located below (A) completely by means of a Phillips screwdriver. The screws in the top part (B) can be accessed via the two holes in the connector panel, see top-right picture in figure.

Do not remove the two screws in the top part completely. Just loosen the screws five turns to remove rear panel.

2. Subsequently, pull the rear panel backwards as far as depicted in figure 3. The rear panel is constrained by the length of the connected cables. The control board can rest on the isolated casing of the power supply compartment without any problem.

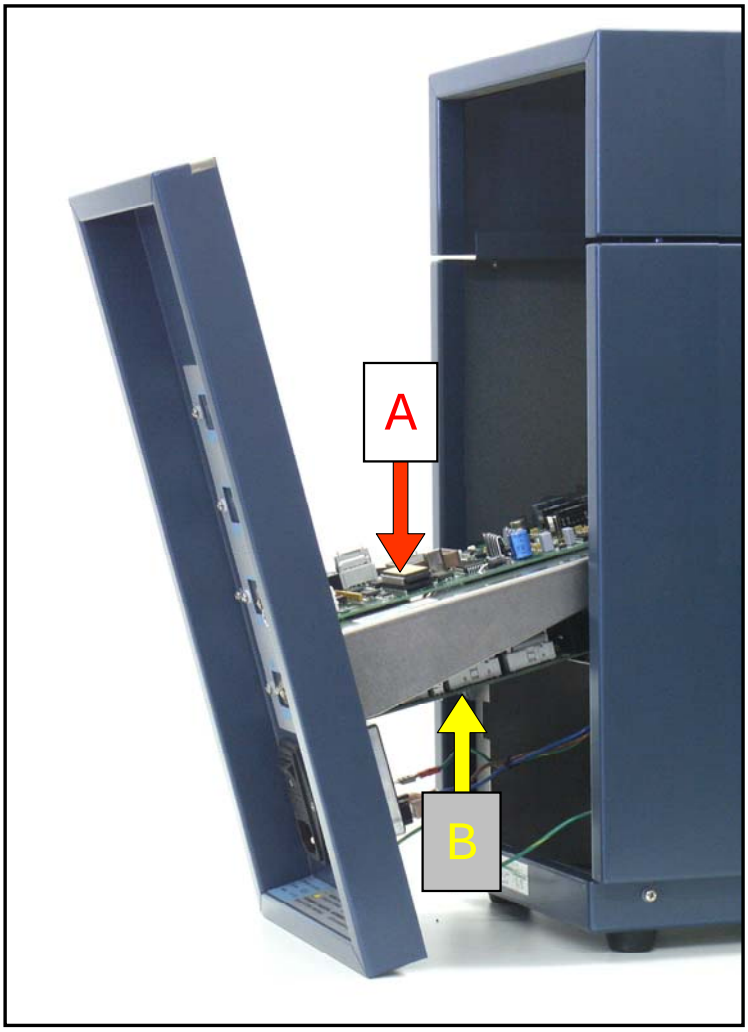


Figure 3 *Detector with rear panel pulled backwards. (A) sensor board and (B): control board.*

3. Installation of 2nd internal cell cable

If the DECADE II has a s/n < 17100072 (upgrade kit p/n 171.0220) it is necessary to install the internal cell cable now. Please continue with the installation procedure described in appendix A.

For an upgrade of a DECADE II with s/n > 17100072 (upgrade kits p/n 171.0216 & 171.0218) this procedure can be skipped. Please continue with the next installation step, the labelling of cables for identification.

4. Identification of cables (labels)

On the sensor board the following parts can be identified (see figure 4):

A. Sensor board boot-EPROM
B. Internal cell cable
C. I^2C/power cable

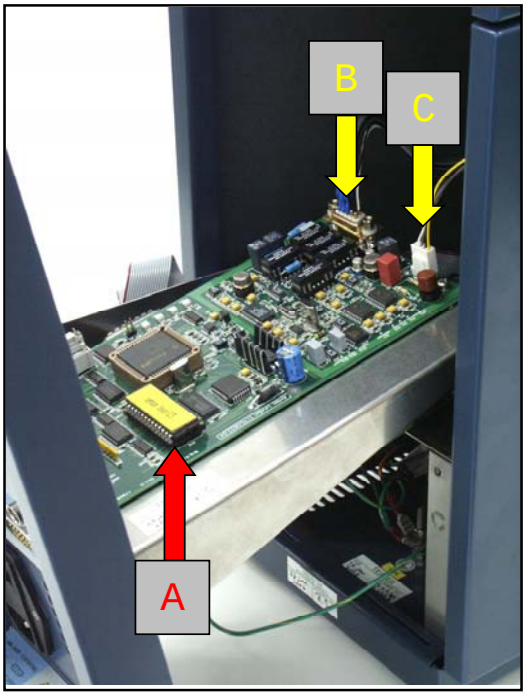


Figure 4 *Top view sensor board. (A) sensor board EPROM, (B): internal cell cable connector and (C): I^2C/power cable connector.*

Both the internal cell cable and the I^2C/power cable of sensor board 1 should be labelled for identification using the vinyl label marked "sensor 1" provided in the kit. The labels can be found in the white envelope (p/n 171.0208). Label the cables as depicted in figure 5. Place label at the end of the cable next to the connectors which are mounted on sensor board 1.

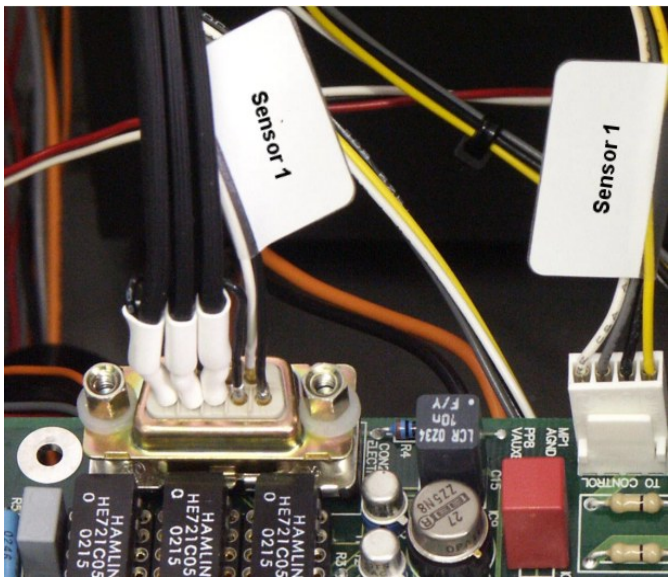


Figure 5 *Labelling of cables sensor board 1.*

Label the internal cell cable of sensor board 2 with a vinyl label marked "Sensor 2". The internal cell cable for sensor board 2 is not connected to any board and is fixed in the black cable clamp mounted to the top cover inside the housing.

5. Removing sensor board

To access the control board it is necessary to remove the sensor board completely. This is done in the following manner:

- Disconnect the internal cell cable depicted in figure 4(B) and 6 This is a subD connector, which is fixed with two screws. Remove the screws with the hex key and remove the connector of the sensor board.

- Disconnect the I^2C/power cable depicted in figure 4 (C). This is a Molex kk connector, which can be removed by gentle pulling it in the upward direction.

- Remove the three M3 screws which secure the sensor board on the connector panel using a Phillips screwdriver. The screws are marked in figure 7 with red circles.

Figure 6 *Removal of internal cell cable connector.*

Figure 7 *Removal of sensor board from the connector panel.*

6. Replacement of boot EPROMS

This installation step can be skipped for upgrade kit with p/n 171.0216 (DECADE II with s/n > 17100091)

Remove both EPROM's on control and sensor board as described in the service manual in paragraph "Replacement of EPROM's". Replace the EPROM's with the EPROM's provided to you in the upgrade kit. The EPROM of the control board is located on the position (A) marked with the arrow in figure 8. For the location of the EPROM on the sensor board see figure 4 (A).

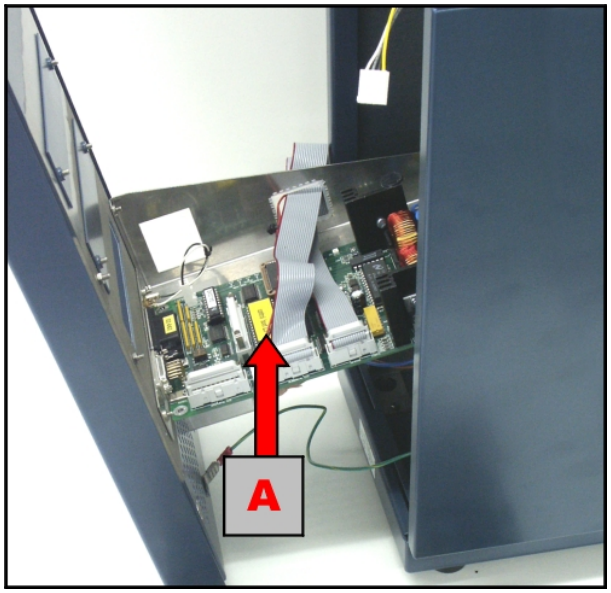


Figure 8 *Top view of control board. (A) control board EPROM.*

Take precautions against electrostatic discharge during installation/ removal of the EPROMS at all time.

Both EPROMS can be removed from the board using an IC-puller or alternatively a flat screwdriver. An IC-puller is the recommended tool. Clip the IC-puller around the EPROM (on end) and lift it gently out of its socket. Make sure that you don't bend the legs of the EPROM. In case of a screw driver, insert it between the EPROM and the socket and lift the EPROM gently bit-by-bit out of the socket. NOTE: avoid scratching the circuit board with the screwdriver.

7. Reconfiguration of connector 7 (heater)

This installation step can be skipped for upgrade kit with p/n 171.0216 (DECADE II with s/n > 17100091)

In order to be able to drive the oven with the updated analog heater control it is necessary to rewire connector 7 on the control board. See figure 9. To remove connector 7 from the control board use a flat screw driver to release the connector from the socket. Insert the screw driver between the connector and the retaining clip on the socket. Push the retaining clip aside by means of a screw driver and firmly pull the connector from the socket.

The connector is fixed tightly in the socket and considerable force has to be used to remove it. To avoid damage of the control board PCB prevent it from bending by holding it in place with your hands.

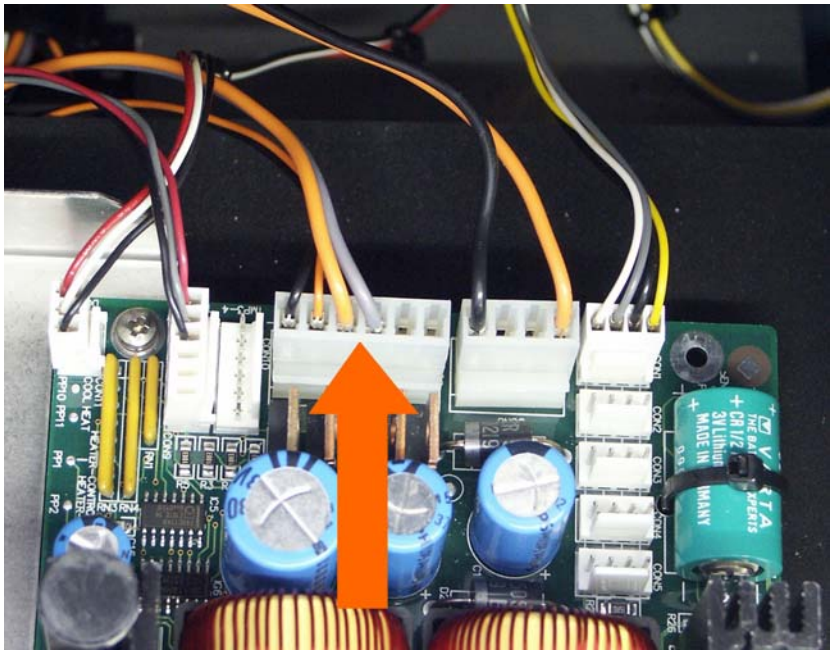


Figure 9 *Connector 7 on the DECADE II control board (conventional wiring).*

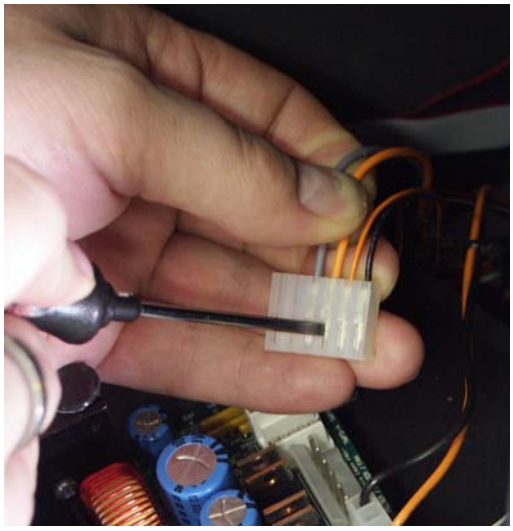
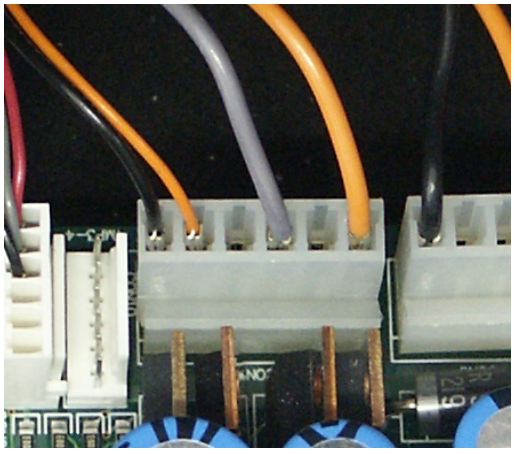


Figure 10 *Releasing contact 4 (with thick orange wire) from kk Molex connector 7 using a flat screw driver.*

Remove contact 4 attached to the thick orange wire as depicted in figure 10. Use a flat screwdriver to unlock the contact from the plastic housing. Unlocking is achieved by inserting the screw driver in the slit, and gentle pushing the metal contact while simultaneously pulling the wire out of the housing.



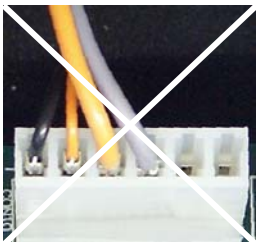


Figure 11 *Connector 7 with new wire configuration for analog heater control (left-side). For reference the old wire configuration is shown on the right-side.*

Subsequently insert the contact in position 1 of connector 7 as depicted in figure 11. Make sure that the contact is firmly locked into the plastic housing and insert the connector back into the corresponding socket on the control board.

8. Installation of the DECADE II TC-board

This installation step can be skipped for upgrade kit with p/n 171.0216 (DECADE II with s/n > 17100091)

In order to be able to run a DECADE II with dual sensor boards it is necessary to install a new PC board for the measurement of the oven temperature via a LM35 temperature sensor. The board is shown in figure 12.

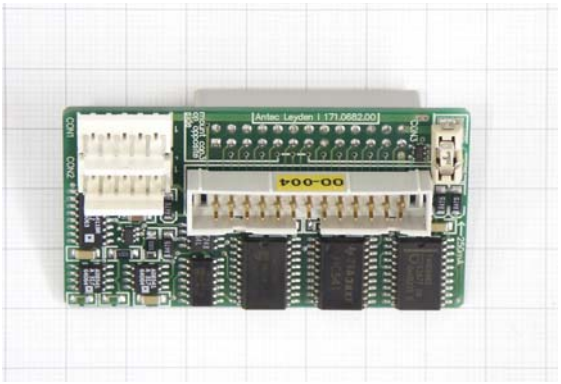


Figure 12 *DECADE II temperature control board (TC-board).*

Install the temperature control board (from here on abbreviated as TC-board) on connector 15 of the main control board as depicted in figure 13 and 14. Make sure that the board is pressed firmly in the socket to ensure good contact.

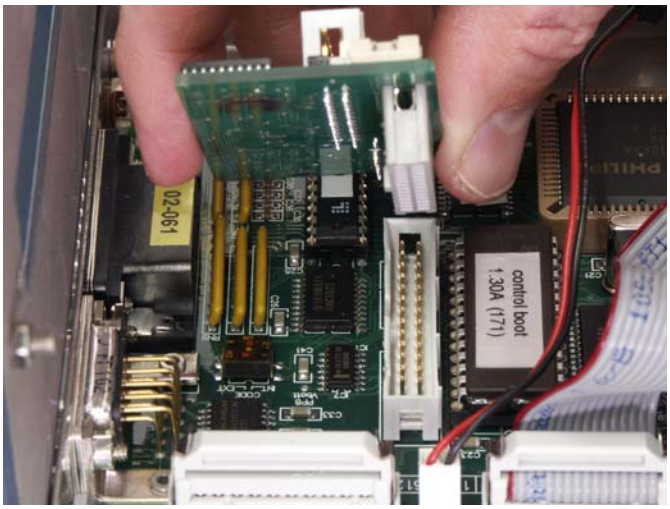


Figure 13 *Installation of TC-board on control board.*

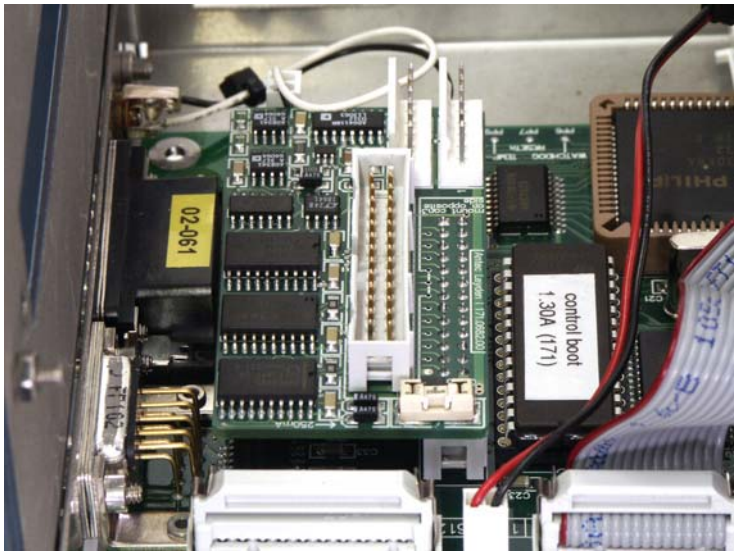


Figure 14 *TC-board fixed on control board.*

Your DECADE II is factory installed with an extra LM35 temperature sensor mounted in the heater compartment. The LM35 signal cable consists of three wires (red/white/black) with a 6-pin Molex KK connector (white) to connect it to the TC-board. This cable is originally not connected to any board and is fixed in the grey cable clamp located on the left side panel inside the DECADE II housing.

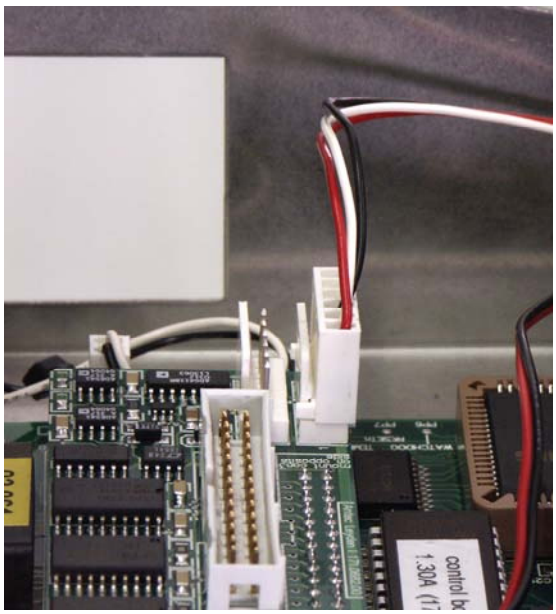


Figure 15 *LM35 cable connected to CON1 on TC-board.*

Only a few DECADE II detectors on the market do not have this additional LM35 sensor preinstalled (first series s/n, < 171.00025).

If your DECADE II does not have a pre-installed LM35 sensor, do not procede with the installation and contact the manufacturer. The DECADE II should be upgraded at the factory.

Fix the LM 35 connector on the socket, designated CON1, on the TC-board as shown in figure 15.

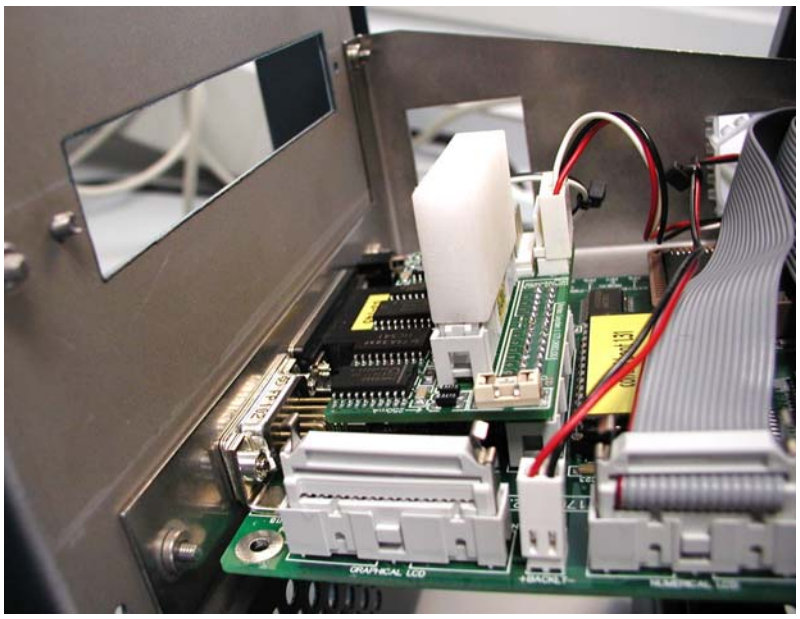


Figure 16 *TC board with mounted TC-board fixing connector.*

Place the TC-board fixing connector (p/n 171.0690) on top of connector 4 on the TC-board as shown in figure 16.

Use gentle force when installing the TC-board fixing connector (p/n 171.0690) on the TC-board. Prevent bending of the TC-board by holding in place with your hands. during installation.

This connector fixes the TC-board between control and sensor board to ensure that the board will not detach of the DECADE II control board.

9. Installation of power cable for 2nd sensor board

Install the I²C/power cable with label “sensor 2” as shown in the photographs below. Mount the Molex kk connector of the cable on CON2 on the control board (figure 17) . Make sure that the identification label "sensor 2" is located on the end of the I²C/power cable which will be connected to sensor board 2 (figure 18).

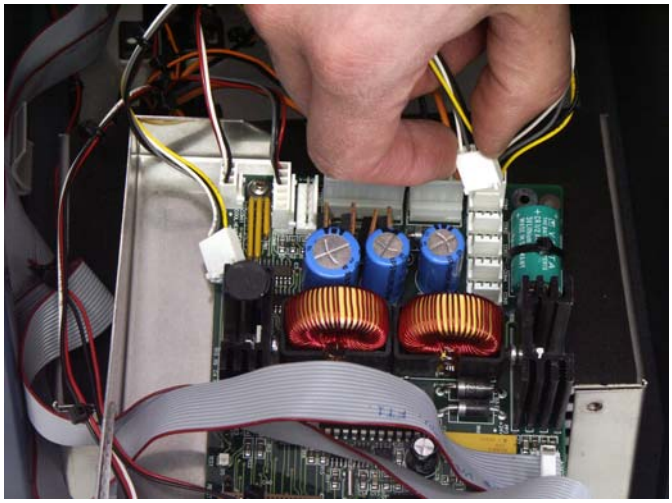


Figure 17 *Installation of I²C/power cable of sensor board 2 on control board.*

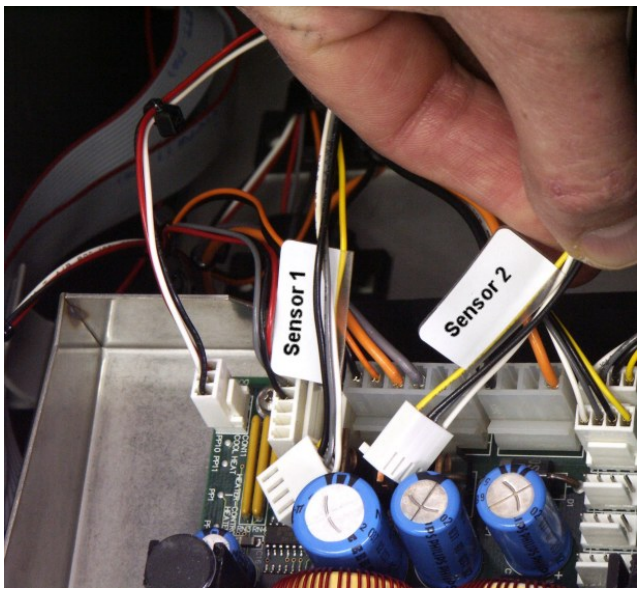


Figure 18 *Installation of I²C/power cable of sensor board 2 on control board*.

10. Configuration of dip switches

In order for the embedded software of the DECADE II to recognize both boards properly the board address of the sensor boards should be set by means of the dip switches. The dip switches are located between the BNC connector and sub-D I/O connector at the edge of the board. The dipswitches are protected by means of a brown transparent foil. Remove this adhesive foil to free switches for programming. Program the dips switches as depicted in figure 19 and 20 for sensor board 1 and 2 respectively.

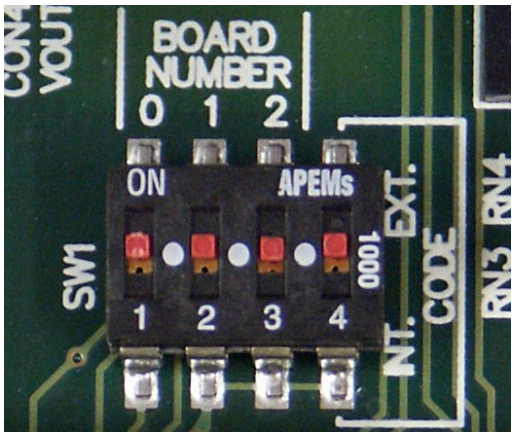


Figure 19 *Dip switch settings for sensor board 1: 1-on, 2-on, 3-on and 4-on.*

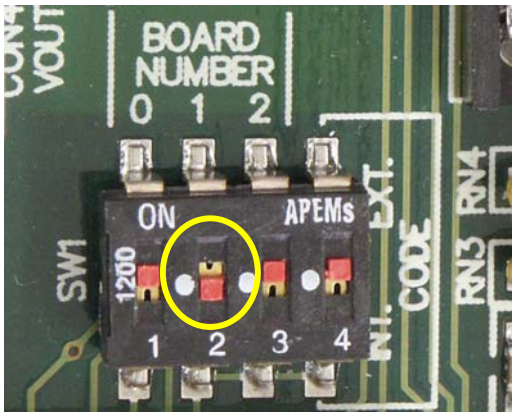


Figure 20 *Dip switch settings for sensor board 2: 1-on, 2-off, 3-on and 4-on.*

Please place the transparent adhesive foil back after programming for protection.

11. Placement of I/O label

- Remove the blue metal strip which covers the slot for the second sensor board by removing the two retaining screws with a phillips screw driver.
- Remove the retaining screw and bolt on the right side of the rear panel (red arrow, in figure 21).

Do not dispose the three retaining screws because they are needed to fix the second sensor board to the rear panel.

- Degrease/clean area around the second sensor board slot on the rear panel using a tissue soaked in ethyl alcohol (figure 16). Caution: do not use any other organic solvent to clean the surface, because this can result in removal or damage to the paint layer.
- After cleaning of the surface around the sensor board slot mount the additional IO label.

Figure 21 *Degrease rear panel with ethyl alcohol.*

12. Installation of sensor boards

- Mount sensor board 1 to rear panel.
- Connect the corresponding internal cell cable and power cable on sensor board 1.
- Mount sensor board 2 to rear panel.
- Connect the corresponding internal cell cable and power cable on sensor board 2. To install the internal cell cable of board 2 use the D-connector mounting set provided. Only the hex screws (see figure 22) should be used of the D-connector mounting set. Other parts can be disposed. Mount the connector in the same way as in the case of sensor board 1 using the hex screws and two plastic rings.

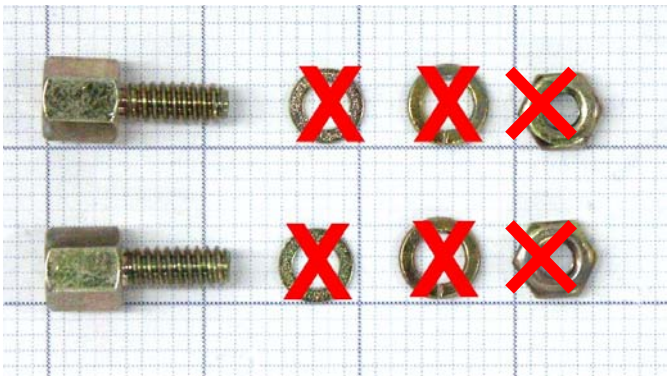


Figure 22 *D-connector mounting set*

- Fix rear panel on the DECADE II (see figure 2).

13. Installation of cell and column clamps

- Fix the black cell clamp for the second flow cell inside the oven compartment in the middle between the fans using one of the three available M4 screw holes.
- If necessary fix the two grey 12 mm column clamps using the available M3 screw holes located on the left and right side in the oven compartment. Remove the plastic protective covers from the M3 screw holes prior to installation.

14. Placement of cell identification labels

In the upgrade kit four labels are provided for identification of the two sensor boards in the DECADE II. Two labels with the text "Cell 1" and two with the text "Cell 2":

- Place two labels on the rear panel for the identification of the sensor boards on the rear panel as depicted in figure 23.
- Place two labels in the oven compartment for the identification of the cell connectors as depicted in figure 24.

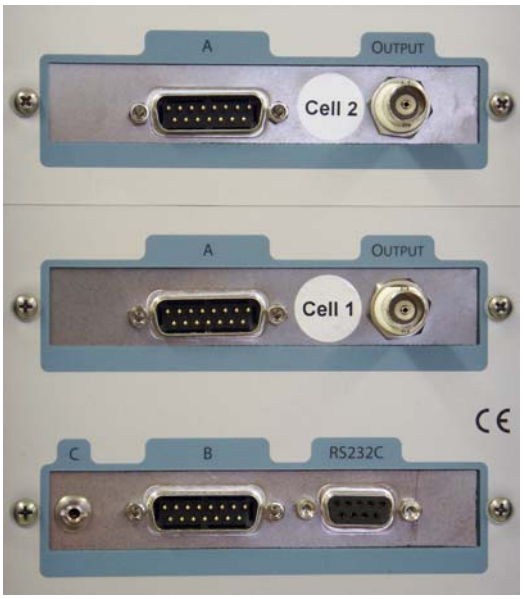


Figure 23 *DECADE II rear with identification labels "Cell 1" & "Cell 2*".

Figure 24 *Oven compartment with identification labels "Cell 1" and "Cell 2".*

15. Upload of firmware version 3.xx

Upgrade the firmware of the DECADE II with an FW version which supports dual sensor board control (FW > 3.20) as described in the FW upgrade user guide (171.7032). A CD-ROM is provided with DECADE II Dialogue and DECADE II firmware release 3.20 >. Please check for new releases on the internet: http://www.antecleyden.com/support/. If a newer version of the FW and Dialogue are available please install these versions.

If something goes wrong during the installation or upload procedure the detector will start up with one of the error messages listed in chapter 4 “Error messages” of the service manual.

In case of an error message, follow the corresponding instruction in the table with error messages in the service manual.

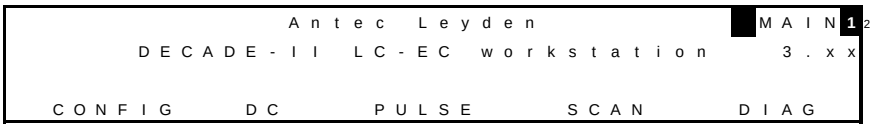
16. Check & calibration of DECADE II DCC

1. Check FW version

After upload of the dual sensor FW restart detector and check if the FW version displayed in the MAIN screen corresponds with the version number of the uploaded anl file.

2. Check configuration of sensor boards

The presence of both boards can be simply checked in the DECADE II MAIN screen.



Toggle with the “+” / “-“ buttons between sensor board 1 and 2. The inverted number in the top right corner should change from “1” to “2” corresponding to sensor board 1 and 2. If the board number does not change it means that the second sensor board is not properly recognized.

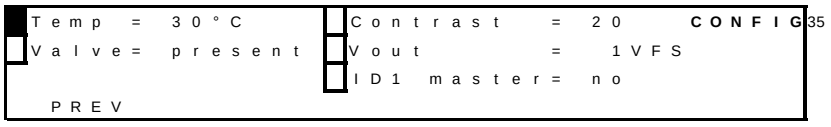
If the second sensor board is not recognized, re-check the dip switch settings on both sensor boards and check if the sensor cable I^2C/power cable is connected properly.

3. Initialization

After upload of the new dual sensor FW the DECADE II should be reset to a defined state by executing the following steps:

a. *Clear existing time files:* A power-up of the detector while depressing the F5 button will clear the existing time files in SRAM memory (so hold F5 button and switch on detector)

b. *Reset to factory settings:* this action will reset all non-volatile parameters to their default values. To execute a factory reset go to the CONFIG screen by pressing F1 in the MAIN menu:

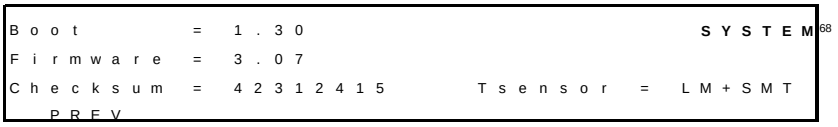


Subsequently hold the <ENTER> button for 4 seconds. After a factory reset please re-adjust the LCD contrast in the CONFIG screen to an appropriate level (~9).

The DECADE II will malfunction if the reset procedures described in point (a) and (b) are not executed. (embedded software can freeze or detector remains in a reboot loop after power-up)

4. Check detection of the TC-board board by the DECADE II firmware

The LM 35 board is recognized by the software during start up of the DECADE II. To check if the installation was successful start up the detector and enter the DIAG mode from the MAIN menu. Subsequently, enter the SYSTEM menu by pushing F5. In the SYSTEM menu, "Tsensor = LM + SMT", should be displ ayed.

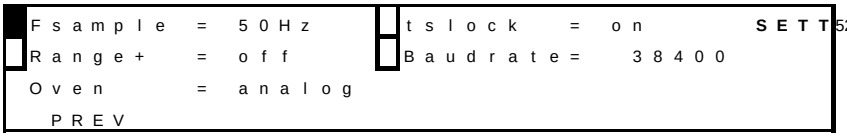


If "Tsensor = SMT" is displayed, please restart the detector again.

If the TC-board is not correctly recognized, please re-check if the TC-board and LM35 sensor cable are firmly fixed in their sockets.

5. Setting heater control to "analog"

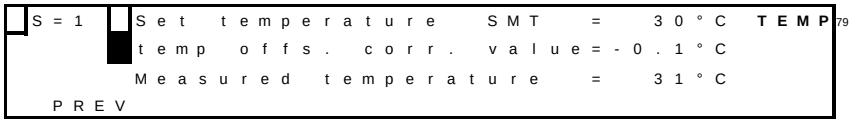
Go to the SERVICE mode by holding the <ENTER> button for 4 seconds in the MAIN screen. Enter the SETT screen and set the oven to ANALOG.



If "oven = digital" is selected the heater will NOT work.

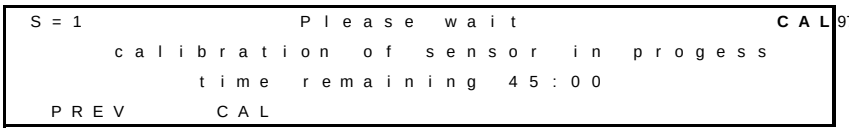
6. Calibration of the LM35 temperature sensor

Go to the SERVICE mode by holding the <ENTER> button for 4 seconds in the MAIN screen. Enter the Adjustments screen (F4) and subsequently go to TEMP adjustment screen (F5):



- Check if “LM” is displayed in the first line of the LCD screen. If “SMT” is displayed instead re-check if the TC-board is fixed firmly in its socket on the control board and if the LM35 cable is connected properly. If problem persists please contact supplier.

- Press “CAL” button= (F2). By pressing the “CAL” button an auto-calibration routine will start. Internally the oven temperature is set to 45 ^{o}C and the detector is allowed to stabilise for 45 minutes. During that period the detector will display a 45 minute countdown timer to indicate the progress of the calibration routine.



Do not open the oven compartment during the calibration procedure because this will result in an erratic calibration of the temperature sensor and subsequently in deviations in the set and actual oven temperature

7. Check the calibration of the IE convertor

After the temperature sensor calibration, the residual currents of the IE convertor circuitry of both sensor boards should be checked.

- Switch cel off and disconnect cell cable.
- Set the oven temperature at Toven = 35 ^{o}C. Allow the detector to stabilize for 30 minutes.
- Go to the SERVICE mode by holding the <ENTER> button for 4 seconds in the MAIN screen. Enter the Adjustments screen (F4) and subsequently go to ZER.IE adjustment screen (F2) of sensor board 1.
- Follow the instructions in chapter 5 on page 24 of the service manual.

Only re-adjust the I/E convertor using the AUTO function if the residual currents for the different resistors is higher than the values specified in table VIII of the service manual.

- After the IE convertor calibration, leave the service mode and enter the DC mode. Make sure that no cell cable is connected and scroll through all current ranges. Check if the cell current approaches 0 in all ranges which gives an indication that the calibration procedure was completed successfully.
- Follow the same procedure for sensor board 2. One can access board 2 in the SERVICE mode by selecting board 2 with the “+” / “-“buttons in the SERVICE mode main screen.

8. Dummy cell test

Perform a dummy cell test for both sensor boards as described in chapter 15 on page 55 of the DECADE II user manual (171.0010).

After completion of this installation & calibration procedure the DECADE II with dual sensor board is ready for use !

Appendix A - Installation of 2nd internal cell cable

If the DECADE II has a s/n < 17100072 (upgrade kit p/n 171.0220) it is necessary to install a second internal cell cable in the detector for sensor board 2.

If your DECADE II has a s/n > 17100072 do not follow this procedure and return to page 14 of the install guide.

To be able to install the internal cell cable for sensor board 2 it is necessary to remove the top cover of the DECADE II. This is done in the following manner:

- Back-side: Remove the two screws inside the housing of the DECADE II using a Phillips screwdriver as depicted in figure 25.
- Front-side: Remove the four screws in the oven compartment with a Phillips screwdriver as depicted in figure 26 (see red arrows for location).
- The top cover can now be lifted (gently) of the DECADE II and placed aside the detector as depicted in figure 27. Note: remove the cover gently because the internal cell cable of sensor board 1 is fixed at the bottom of the cover by means of a black cable clamp.
- Release the cable clamp by opening the locking mechanism by inserting a screwdriver as depicted in figure 28.

Figure 25 *Removal of screws of top cover at back-side.*

Figure 26 *Removal of screws of top cover in oven compartment.*

Figure 27 *Release of cable clamp of the internal cell cable of sensor board 1.*

Figure 28 *Clearing sub-D connector mounting position on oven compartment: removal of black cover.*

- Remove the black cover on the oven compartment as shown in figure 28. Bend (outwards) the metal blades fixing the plastic cover by means of a screwdriver and remove black cover out gently.

- Mount the FEMALE connector of the internal cell cable on the oven compartment using a D-connector mounting set. Only the hex screws with nuts should be used of the D-connector mounting set. Other parts (rings) can be disposed, see figure 29.

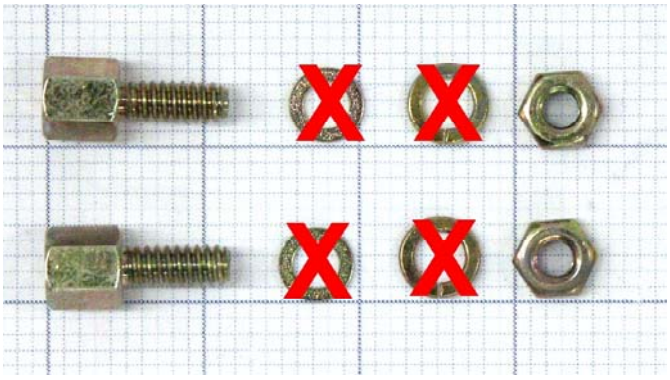


Figure 29 *D-connector mounting set.*

- Mount the connector as shown in figure 30. Place the contact rings M3 underneath the nut, with the sharp side facing the connector, and tighten hex screw.

- Fix both internal cell cables of sensor board 1 and 2 in the black cable clamp located on the bottom side of the DECADE II top cover as shown in figure 31.

- Continue with section "Labelling cabels for identification" on page 14 of this installation guide.

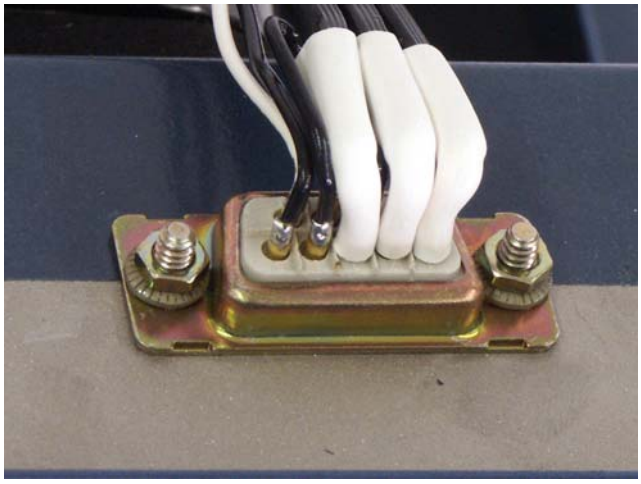


Figure 30 *Internal cell cable of sensor board 2 mounted on oven compartment (Top view). Note the contact rings M3 under the nuts*.

Figure 31 *Both internal cell cables in black cable clamp on bottom side of DECADE II top-cover.*