

# HANDLER

*Red Wing Quality* 

INSTRUCTION PACKET FOR

## 2010DCU DENTURE CURING UNIT

**IMPORTANT INSTRUCTIONS  
DO NOT DISCARD**



Please **call Handler at 908.233.7796** for programming  
Guidance **before you begin** to operate this 2010DCU

**INSPECT THE UNIT IMMEDIATELY FOR SHIPPING OR HANDLING DAMAGE.  
REPORT ANY DAMAGE IMMEDIATELY TO THE SHIPPER AND FILE A CLAIM.**

Thank you for purchasing the Handler 2010DCU 8 flask programmable Denture Curing Unit. In order to enjoy maximum performance and years of trouble-free operation, please read this user manual carefully before you start work, and operate the unit according to the recommended guidelines. Please ensure that all personnel operating the equipment have read and understood this user manual. Keep this user manual on hand for ready reference.

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**The 2010DCU DENTURE CURING UNIT** is a practical unit with a control panel on which sequences of curing times and temperatures can be programmed as required by the user. Once you program the unit, it will remember the settings. If you use the same settings over and over again, there is no need to reprogram the unit unless power is disconnected.

- Waiting time t0: time in which the water in the tank is at ambient temperature. At the end of this time a warning sounds.
- 1<sup>st</sup> ramp time t1: time when the temperature of the water in the tank rises to the first stage temperature set by the user. At the end of this time a warning sounds.
- 1<sup>st</sup> plateau time t2: time when the temperature of the water in the tank remains steady at the level reached at the end of the previous step. At the end of this time a warning sounds.
- 2<sup>nd</sup> ramp time t3: time when the temperature of the water in the tank rises again, to a final 2<sup>nd</sup> stage level set by the user. At the end of this time a warning sounds.
- 2<sup>nd</sup> plateau time t4: time when the temperature of the water in the tank remains steady at the level reached at the end of the previous step for final curing.

Upon completion of these stages, the unit disconnects automatically, warning sounds 3 times for 5 seconds with a 10 second pause, all lamps blink and the word **End** is displayed. Press the green on/off switch to switch the unit to the OFF position.

The time of each step may be set between 0 and 999 minutes

Example:     Display 0.50 – time: 50 sec  
              Display 5.00 – time: 5 min  
              Display 50.0 – time: 50 min  
              Display 500 – time: 500 min

The preset temperatures at each stage may be regulated by the user between 32 °F and 210 °F (0 °C and 99 °C).

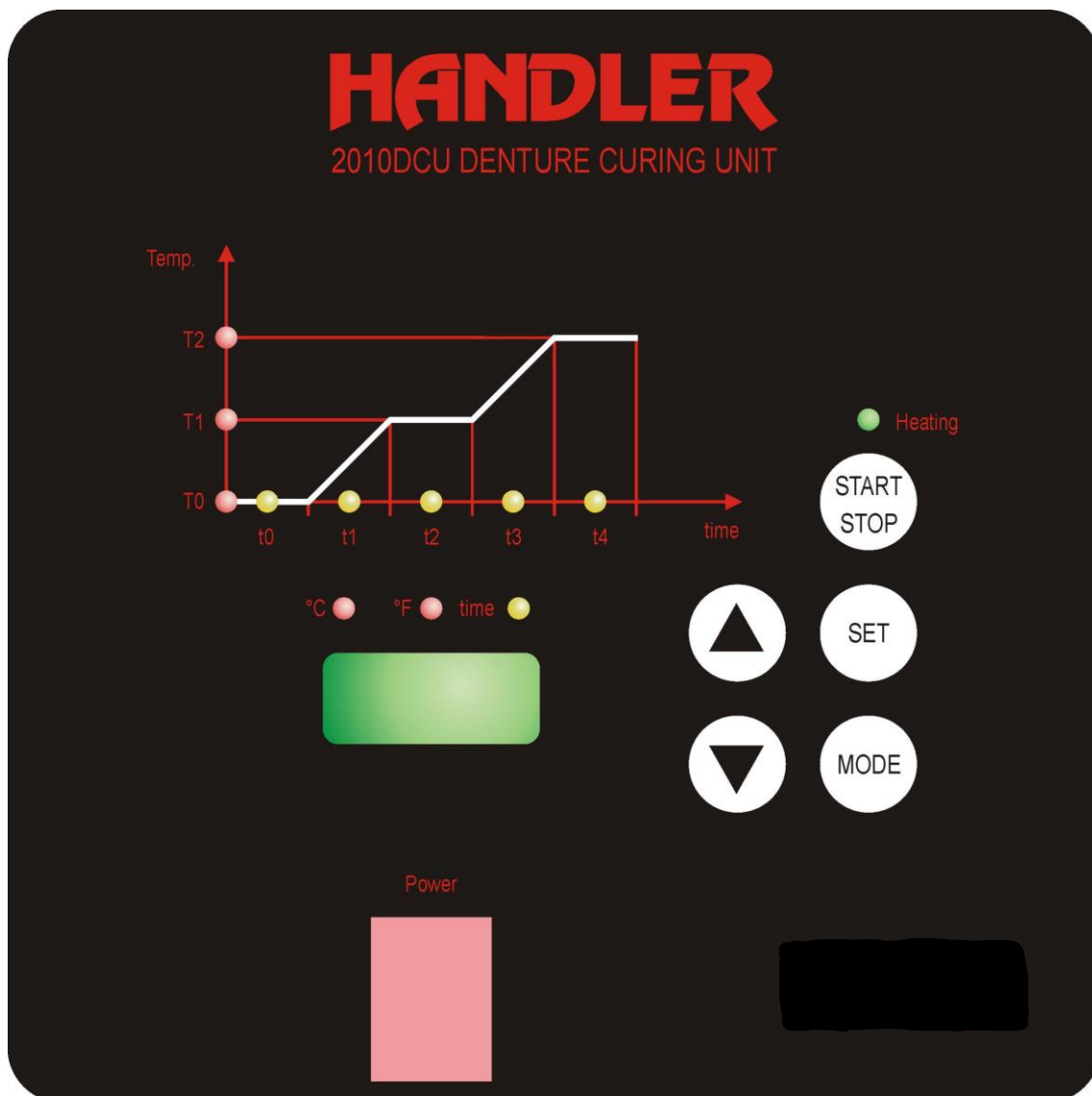
Example:     Display 165 – temperature: 165 °F  
              Display 210 – temperature: 210 °F

Temperature in °C is shown on display with one decimal digit - temperature in °F is without decimal digit.

To enable the user to see the actual program status at all times, the curing unit has a synoptic display. LED diodes (t0, t1, t2, t3, t4) show which step is in process and (T0, T1, T2) also show the temperatures reached.

The unit also has a digital display. The display shows the present temperature of the water in the tank in addition to illustrating the time remaining to the end of processing. Press the MODE key to move between °F, °C and time. The values are shown on the display. By pressing on UP or DOWN key you move between t0, t1, t2, t3, t4 and between T0, T1, T2 (depending in which mode you are - °F, °C or time).

## CONTROL PANEL



- Display – temperature (°C or °F) display and time display
- T0, T1, T2 – Temperature lamps
- t0, t1, t2, t3, t4 – Time indicator lamps
- °C – Temperature lamp in °C (display shows temp. in °C)
- °F – Temperature lamp in °F (display shows temp. in °F)
- time – time lamp (display shows time in minutes and seconds)
- ▲ - UP key
- ▼ - DOWN key
- START/STOP key – Start or Stop process
- MODE key – move between °C, °F and time on display
- SET key – set value of temperature and time
- POWER switch – ON or OFF unit
- Heating – lamp is lit when program is in process

## INSTALLATION

- Carefully unpack the curing unit, removing the packing material.
- Set the unit up on a flat, horizontal, firm surface away from sources of heat or vibration. Ensure that there is a gap of at least 6" between the curing unit and the nearest wall or other objects.
- Check the label for voltage, cycle, wattage and ampere requirements.
- Connect the unit to proper voltage, **GFI outlet** protected by a suitable thermal magnetic cut-out. Consult your local licensed electrician for a proper circuit.
- ***It is recommended that the 2010DCU be plugged into a power surge protector to regulate current and avoid damage to the unit. Damage to the 2010DCU or failure caused by an electrical surge or volatile power supply is not covered under product warranty.***
- ***The 2010DCU DENTURE CURING UNIT has a circuit breaker (fuse (s) in power inlet) that protects the machine against electric overloads. Should an overload occur, replace the fuse (s) with the exact amperage listed on the fuse (s).***

## PROGRAMMING

It is extremely easy to program the heating sequence for the water in the tank. Proceed as follows:

Sequences:

**t0** - Waiting Time

**t1** - 1st Ramp Time

**T1** -1st Stage Temperature

**t2** - 1st Stage Time

**t3** - 2nd Ramp Time

**T2** -2nd Stage Temperature

**t4** - 2nd Stage Time

### **Programming time sequences t0, t1, t2, t3, t4:**

Once you program your unit, it will remember the settings. If you use the same settings over and over again, there is no need to reprogram the unit unless power is disconnected.

Pressing on MODE key move on time lamp (lamp lit).

- t0 lamp lit. Press SET key (t0 lamp blinks). Using the UP or DOWN key set desired waiting time t0. When desired time is set press SET key again.
- Press UP key to move on sequence t1.
- t1 lamp lit. Press SET key (t1 lamp blinks) using the UP or DOWN key set desired time of 1st ramp time t1. When desired time is reached press SET key again.
- Press UP key to move on sequence t2.
- t2 lamp lit. Press the SET key (t2 lamp blinks) and using the UP or DOWN keys set desired time of 1st stage - time t2. When desired time is set press SET key again.
- Press UP key to move on sequence t3.
- t3 lamp lit. Press SET key (t3 lamp blinks) and using the UP or DOWN keys set desired time of 2nd ramp time t3. When desired time is set press SET key again.
- Press UP key to move on sequence t4.
- t4 lamp lit. Press SET key (t4 lamp blinks) and using UP or DOWN keys set desired time of 2nd stage - time t4. When desired time is set press SET key again.

### **Programming Temperature sequences T1, T2:**

Pressing the MODE key adjust unit on to °F or °C lamp (lamp lit). If you want the display to show temperature in °C, move on °C lamp otherwise move by pressing on the MODE key on °F lamp.

- T0 is ambient temperature and not programmable.
- T1 lamp lit. Press the SET key (T1 lamp blinks) and using the UP or DOWN key set desired temperature of 1st stage temperature T1. When desired temperature is set press SET key again.
- Press UP key to move on sequence T2.
- T2 lamp lit. Press SET key (T2 lamp blinks) and using the UP or DOWN key set desired temperature of the 2nd stage temperature T2. When desired value is set press the SET key again.

**NOTE: Unit heats approximately 1.7 °F/min (1 °C/min). If you set ramp time t1 or t3 lower than that, unit will not go on to next sequence until set temperature T1 or T2 is reached. For quicker heating results use warm or hot fill water.**

After finishing programming mode, press START/STOP key to run the curing program. The program can also be stopped at any time by pressing START/STOP again.

The temperature may not exceed 210 °F (99 °C) at the plateau T1 and T2.

Water may boil at slightly above or below 212 °F (100 °C), depending on altitude above sea level, water composition and atmospheric pressure. This means that if the boiling point programmed into the unit is 210 °F (99 °C) the polymerization process may not proceed to the next step because the set temperature may never be reached.

To prevent excessive moisture due to steam given off by the curing unit, HANDLER recommends you do not program the unit for more than 206°F (96°C).

## OPERATION

- Place the flask tray in the bottom of the tank. *Be careful not to disturb the heating element. You may cause damage to the heating element if the flask tray hits it.*
- **MAKE CERTAIN THE DRAIN SPIGOT IS IN THE CLOSED POSITION PRIOR TO FILLING THE TANK.**
- Fill the tank with **distilled water** to a desired level for the number of flasks and compresses you are using at one time. *Never let the water level in the tank drop below 4" (10 cm) during operation to prevent damage to the heating element.*
- Switch on green lighted main ON/OFF switch. Some of the controls on the panel will flash, indicating that the curing unit is ready for operation.
- Place the flask compresses into the unit and on the flask tray. Close over the cover.
- Program the curing unit as per the instructions above. Once programming is completed, press down START/STOP key. The curing unit will start up and lamp Heating will come on to indicate that the program is running as required.

**CAUTION: Never leave the 2010DCU unattended or overnight with no one to supervise or oversee its operation. NEVER let the water evaporate to less than 4" high (10 cm) above the heating coil.**

Once the curing program is completed, the 2010DCU DENTURE CURING UNIT turns off automatically and emits a warning 3 times for 5 sec with 10 sec pauses, all lamps blink and inscription **END** is written on display. Press the green on/off switch to off.

**WARNING:** When removing the flasks, open the cover carefully, as steam coming out from the tank could cause burns. Use long handled, sturdy tongs, a face-mask, and insulated gloves to remove flasks.

## **EXAMPLE OF PROGRAMMING**

1. Turn unit ON, waiting t0: 15 seconds. After this time the unit will beep.
2. 1st ramp time t1: the water in the tank should reach first stage temperature (curing temperature). After this time the unit will beep.
3. 1st stage time: the water in the tank should remain at the set temperature - e.g. 165 °F (74 °C) for 90 minute cure. After this period the unit will beep.
4. 2nd ramp time: the water in the tank should then rise to 2<sup>nd</sup> set temperature e.g. 206 °F (boil out temperature). After this time the unit will beep.
5. 2nd stage time: the water should remain at preset time e.g. 206 °F (97 °C) for 30 minutes, after which the program is completed and the unit beeps 3 times for 5 sec with 10 sec pause, all lamps blink and inscription **END** is written on the display. Press the green on/off switch to turn the unit OFF.

**NOTE: Unit heats approximately 1.7 °F/min (1 °C/min). If you set ramp time t1 or t3 lower than that, unit will not go on to next sequence until temperature T1 or T2 is reached.**

### **The sequence of steps to be programmed is as follows:**

Press the MODE key to display the time lamp (LED light lit).

- t0 lamp lit. Press SET key (t0 lamp blinks) and using the UP or DOWN key set the preferred waiting time t0 on 0.15. When duration is set press the SET key again.
- Press the UP key to move on sequence t1.
- t1 lamp lit. Press SET key (t1 lamp blinks) and using the UP or DOWN key set preferred time of 1st ramp time t1 on 60.0. When this duration is set press the SET key again.
- Press UP key to move on sequence t2.
- t2 lamp lit. Press SET key (t2 lamp blinks) and using the UP or DOWN key set duration of the 1st stage time t2 on 90.0. When this duration is set press SET key again.
- Press UP key to move on sequence t3.
- t3 lamp lit. Press SET key (t3 lamp blinks) and using the UP or DOWN key set duration of the 2nd ramp time t3 to 30.0. When desired duration is set press the SET key again.
- Press UP key to move on sequence t4.

- t4 lamp lit. Press the SET key (t4 lamp blinks) and using the UP or DOWN key set desired time of the 2nd stage t4 to 30.0. When desired duration is set press the SET key again.

Press the MODE key to display the temperature °F (LED light lit).

- T1 lamp lit. Press the SET key (T1 lamp blinks) and using the UP or DOWN keys set the 1st stage temperature T1 on 165. When desired temperature is set press the SET key again.
- Press UP key to move on sequence T2.
- T2 lamp lit. Press the SET key (T2 lamp blinks) and using the UP or DOWN key set the 2nd stage temperature T2 on 206. When the desired temperature is set press the SET key again.

**NOTE: You may also set time t0, time t1 and then with MODE key move on lamp °F, set temperature T1, with MODE key back on lamp time, set time t2 and t3 again with MODE key move on °F, set temperature T2, with MODE key move back on time and set time t4.**


**You can move between the time or temperature lamps with UP or DOWN key.**

The curing unit will start up when the START/STOP button is pressed and will automatically run the program.

Between curing process you can move between time or temperature lights (depending on which MODE program you are in – time, °C or °F) with UP or DOWN key. Also with pressing on UP or DOWN key between processes, you can see set duration of time or temperature for each step. After 5 sec unit is back to curing process.

## MAINTENANCE AND CLEANING

To obtain long, trouble-free service from the 2010DCU, please follow these instructions:

-  **Use only distilled water in the 2010DCU DENTURE CURING UNIT!**
- Clean the inside of the tank approximately every 20 hours of use by heating water to 167 °F (75 °C), then emptying the tank through the drainage spigot at the right side.

The 2010DCU has an automatic cleaning program. Fill the tank with clean water. Hold START/STOP key more than 5 sec. The unit will automatically start heating water to 167 °F (75 °C). All lamps illuminate. Stop the cleaning program with pressing on START/STOP key. Drain tank and allow tank to cool completely.

- **Unplug the curing unit** and clean the inside of the tank with a fine, soft cloth moistened in soapy water. **CAUTION: Take care not to damage the heating**



**element or temperature probe.** Special products for cleaning stainless steel curing units may also be used. **Do not use solvents or chemicals!**

- Rinse the inside of the tank with plenty of clean water after cleaning, then close the drainage valve.
- Every few months, check if any lime scale have been deposited on the inside of the tank and the electric heating element. If necessary, clean them using a scale remover e.g. CLR or Lime Away. Be careful to follow the label instructions and wear proper safety attire.
- To clean the outside housing of the unit use a cloth moistened in soapy water. **Do not use solvents or other inflammable products. Wipe clean with a damp cloth and dry.**
- To get the best results from the curing unit, water additives are available on the market to help dissolve wax. These may be added to the water. The manufacturers' recommendations should always be followed in this case.
- After using the curing unit, remove wax, foam, remains of resin and other materials which may be left floating on the water surface.
- Clean the unit's control panel regularly with a damp cloth. **Always disconnect the 2010DCU before doing this.**

## PRECAUTIONS

- Before connecting the 2010DCU, make certain that the unit is connected to a power supply is with a GFI (Ground Fault Interrupter) for 60Hz or 50 Hz current. Consult a licensed electrician concerning these matters.
- Check the data plate for voltage, cycle, wattage and ampere requirements.
- Do not allow children or unskilled personnel to handle this unit.
- Use sturdy long handle flask tongs whenever you put flasks into the tank or take them out.
- Open the cover very carefully as steam coming out from the tank could cause burns. Use safety glasses, heat protecting gloves and other safety equipment when using the 2010DCU.
- Always keep the unit's cover closed while curing programs are running. Never remove the cover during the processing procedure.
- Always keep at least **4" (10 cm)** of water in the bottom of the tank, as the heating elements may be damaged if the level becomes low.
- Always leave a gap of at least **6" (15 cm)** between the unit and the nearest wall or other objects.
- Do not to exceed temperatures of **205 °F (96 °C)**. At higher temperatures too much steam may be generated causing the water to evaporate from the unit and damaging the heating element.

## TEMPERATURE CALIBRATION (user's calibration)

The 2010DCU curing unit contains software for proper temperature calibration. You must first measure temperature in middle of chamber for a minimum of 1 hour. Measure the temperature with digital temperature calibrated thermometer with precision 0.1 °C or more. After 1 hour read the temperature on thermometer and compare it with temperature on LED display. The difference between the thermometer and display reading may be entered into the software.

**Example 1: Temperature on thermometer is 100°F; temperature on display is 99°F. Difference is  $100 - 99 = 1$ .**

**Value is 1 (value which you enter into the software).**

**Example 2: Temperature on thermometer is 98°F, temperature on display is 99°F. Difference is  $98 - 99 = -1$ .**

**Value is -1 (value which you enter into the software).**

Procedure for temperature calibration:

- Hold (press) UP and DOWN key at same time for more than 5 seconds. The LED display will register COR (correction).
- With UP or DOWN key enter correction value (see Example 1 or Example 2 above). After 2 seconds the unit will exit temperature calibration. The unit is now ready for normal processing.

**Remember: Temperature calibration is only for qualified persons (technical persons). The unit is precise and correcting the calibration is only for a particular process.**

## SPECIFICATIONS - 2010DCU DENTURE CURING UNIT

Height x width x depth:	13 ¾"H x 16 ½"W x 15"D [35.0 cm x 42.0 cm x 38.0 cm]
Tank dimensions:	11"H x 10"W x 10"D [28.0 cm x 25.5 cm x 25.5 cm]
Shipping Weight:	45 lbs/20 kg
Power supply:	115 V, 50/60 Hz, 13 Amps (North American Voltage) 230 V, 50/60 Hz, 7 Amps
Fuses:	1 x T 16A (115 V) 2 x T 10A (230 V)
Power consumption:	1500 Watts

## TEMPERATURE CHARACTERISTICS - 2010DCU DENTURE CURING UNIT

Stability	± 0.36 °F	± 0.20 °C
Accuracy	± 1.80 °F	± 1.00 °C