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## TECHNICAL INFORMATION

### DFO Development Control Chamber

#### Catalog No. DFC100

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#### INTRODUCTION

This units are specifically designed for the development of DFO treated latent prints. DFO is a fluorescent agent that attaches to fingerprint residues on paper and other porous surfaces, causing them to emit light when viewed under blue light. It develops up to two and a half times the number of prints as Ninhydrin and can be repeated several times to enhance development.

DFO treated prints will slowly develop unaided, but research shows that they can be accelerated safely and significantly by the judicious application of heat. The DFC100 conforms to the findings of current research by independent forensic investigators and laboratories to provide an optimum acceleration environment.

The DFC100 chamber features a solid-state, single set point temperature controller with a digital readout. Temperature is pre-set for optimum DFO



development and can be easily adjusted to individual needs. Efficient, high-temperature insulation surrounds the oven chamber while automatic cutoff at 220°F (104°C) reduces the possibility of damage to sensitive papers.

For efficiency, the chamber is designed to allow for the hanging of multiple documents and removable shelves are provided for the development of items not easily hung. Optically clear, double-pane, tempered glass door allows monitoring of development without disturbing the chamber's controlled atmosphere.

The most accurate judgement of DFO development is accomplished using fluorescence techniques. Its broad excitation band requires that DFO treated prints be excited with blue light such as a BLUEMAXX™ system and can be viewed through its barrier filter.

### **PRECAUTIONS**

- Before using this unit, consult the appropriate Material Safety Data Sheets (MSDS) found on our website at [www.sirchie.com/support](http://www.sirchie.com/support).
- Temperatures in excess of 200°F can be reached inside the chamber. DO NOT touch the support rods, document clips, shelf or other interior parts as serious burns may result.
- DO NOT spray documents inside the chamber.
- DO NOT perform iodine fuming inside the chamber.
- Allow treated items to thoroughly air dry before placing them into the chamber.
- *DFO formulations utilize flammable mixtures whose flash points and auto-ignition temperatures are often below temperatures that are reached within the chamber. Loss of evidence may occur in such circumstances. To avoid this, DO NOT spray items within the oven chamber, and allow all items treated with DFO to thoroughly air dry before placing them within the oven chamber.*

**LEADING PARTICULARS:**

- Full length hinge, positive latch door
- Silicone door seals
- Baked enamel exterior
- Efficient high-temperature Fiberglass insulation surrounds the oven chamber
- Solid-state temperature controller with digital temperature readout
- Front mounted ON/OFF switch
- Single set point controller factory set for optimum DFO development
- Easily adjusted
- Easy-to-clean welded brushed nickeloid oven chamber
- Optically clear, double-pane, tempered glass door allows monitoring without disturbing the controlled atmosphere

**OPERATION**

*NOTE: Evidence treated with DFO or ninhydrin may be processed in this unit.*

1. If you will be processing more than one document in the chamber, remove the support rods and document clips and set them aside. Remove the shelf if documents are to be suspended from document clips. Be certain to include control prints along with the evidence to be processed.
2. Turn the oven chamber ON and allow it to preheat to at least 200°F. This may take an hour or more.
3. Spray the documents and items to be examined in an approved development chamber, fuming hood or forensic workstation. After air drying the documents, attach the document clips.
4. Assure that the oven temperature is at least 200°F, and then open the oven door by lifting and then turning the door latch clockwise.

5. Quickly place the support rods with the documents attached onto the support rod hangers, and then close and latch the oven door. Be careful not to touch any of the interior surfaces as burns may result.
6. Opening the chamber door may cause a dip in temperature. If this happens, allow the temperature to return to 200°F.
7. Documents should remain in the heated chamber for 5-10 minutes. You may check for the state of development by directing the beam of an alternate light source through the glass door.
8. After 10 minutes of heating, turn the power OFF and open the chamber door to permit cooling of the interior.
9. After the chamber has cooled, remove and examine the evidence.

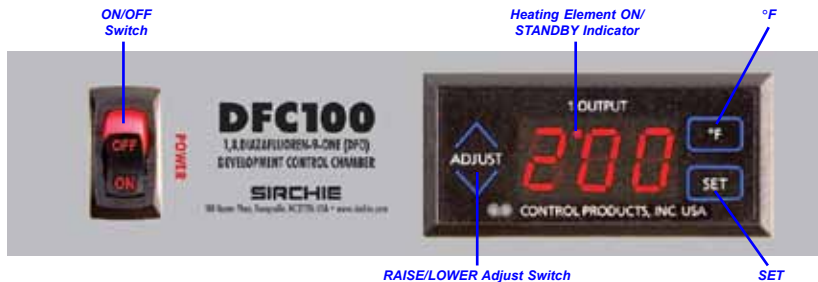
*SPECIAL NOTE: The addition of moisture to treated documents will often accelerate development to a greater degree than if heat alone is used. At the time that documents are placed in the chamber, place two cups (16 oz.) of warm water on the bottom of the chamber. DO NOT use styrofoam cups as they may melt.*

## **CHANGING FACTORY SETTINGS**

### **OVEN CONTROLS**

The oven controls are located on the instrument's front panel. They consist of an ON/OFF switch and a temperature controller. *The temperature controller has been set to **optimum** at the factory, and should not need adjustment.* Should you wish to adjust these settings, follow the instructions below.

- **TEMPERATURE CONTROLLER:** The temperature controller has a LED temperature display and 4 switches: RAISE (∧), LOWER (∨), °F, and SET. These switches are active only when oven power is ON. When first powered up, the display should flash "t1" and then display a number. This number is the current temperature within the oven in degrees Fahrenheit. Temperature rise within the oven can be monitored by watching the display. When the chamber reaches a temperature between 200°F and 212°F, it is ready to use.



### Adjusting The Set Point

The SET switch allows adjustment of the controller set point. The controller set point is the temperature at which power to the heating element is shut OFF. The set point is factory set at 200°F.

- PROGRAMMING SEQUENCE:** To adjust or check the set point, press and release the SET switch. The controller will display “SP1” (set point 1). Press and release the SET switch a second time. The controller displays the current set point value. If still set at the factory setting, this value should be 200. To increase or decrease the value, utilize the appropriate RAISE/LOWER switch (∧ or ∨). To complete the programming sequence, again press and release the SET switch. The display will go blank momentarily to be followed by display of the oven’s current temperature.
- IMPORTANT:** *If the programming sequence is interrupted for a period of 15 seconds, or if it is not carried through to the point where the blank screen is displayed, the controller will revert to its former settings, ignoring any changes that may have been entered.*

- The maximum set point (HI) is 212°F. If the HI/LO factory settings are not changed, the set point must be between 200°F and 212°F. To reduce the possibility of the chamber exceeding the 212°F limit, the factory has established a set point (LO) of 200°F. Even after the heating elements are shut off, the temperature may continue to rise several degrees.

### **Other Settings**

The °F switch allows adjustment of the operating mode, differential temperature HI/LO limits and provides for a calibration adjustment. (Actual programming sequence is described after the setting descriptions that follow immediately.)

- 1. DIFFERENTIAL ADJUSTMENTS:** How quickly the controller responds to drift in temperature is controlled by the differential adjustments setting. The number entered tells the controller how many degrees the temperature is allowed to drift from the set point before corrective action is taken. The factory setting is “1”, (i.e. the controller responds after a drift of only one degree); this is the tightest setting. The DFC100 is a heating application, and operation of the chamber requires that a positive value be entered for the “dF” setting. *DO NOT attempt to operate the oven with a negative value entered.*
- 2. HI/LO ADJUSTMENTS:** These settings control the range of temperatures within which the set points can be adjusted. For example, if “LO” is set to 200 and “HI” to 212, only set points within this range can be entered using the SET function described above. If both are set to the same number, a fixed set point is established. Factory settings are LO=200 and HI=212.
- 3. CALIBRATION ADJUSTMENT:** A calibrating adjustment of up to +/- 30°F to compensate for sensor variations can be entered here. There is a factory-set calibration setting for each individual oven.
  - *PROGRAMMING SEQUENCE:* Press and release the °F switch. “dF” is displayed. Press and release a second time. The current value is displayed. This should be set to one (1) for fastest

response. Use the appropriate RAISE/LOWER switch ( $\wedge$  or  $\vee$ ) to set this value. DO NOT enter a negative number.

- Press and release °F switch again. “HI” is displayed. Again press and release the °F switch. The current HI limit to the allowed set points is displayed. Make adjustments using the appropriate raise/lower switch. DO NOT set this value above 212.
- Press and release °F switch again. “LO” is displayed. Again press and release the °F switch. The current LO limit to the allowed set points is displayed. Make adjustments using the appropriate RAISE/LOWER switch ( $\wedge$  or  $\vee$ ).
- Press and release the °F again. “CAL” is displayed. Again press and release the °F switch. The current calibration factor is displayed. *We recommend against changing the calibration adjustment.* Press and release the °F switch again. The display goes blank momentarily followed by a return to the continuous display of the oven temperature.
- **IMPORTANT:** *As with the SET key, if the programming is interrupted for a period of 15 seconds, or if it is not carried through to the point where the blank screen is displayed, the controller will revert to its former settings, ignoring any changes which may have been entered. NOTE: If the factory calibration is ever lost or changed, refer to the calibration sheet supplied with the oven.*

## OPERATIONAL CONSIDERATIONS

Documents may be developed either by hanging them from the metallic clips or by placing them on the adjustable shelf.

### **Clips**

Attach clips to 2 corners of the document. Pass the suspension rod through the loops on the clips. Insert into the hooks at the top of the oven. **CAUTION:** *Both clips and metal suspension rods reach the set point temperature during document processing. Use care in removing documents to prevent serious burns.*

### **Shelf**

The shelf should be adjusted to the highest position that still accommodates the piece of evidence. *DO NOT place materials on the floor of the chamber as heating may be erratic. CAUTION: The shelf reaches the set point temperature during document processing. Use care in removing materials to prevent serious burns.*

### **MAINTENANCE**

Wipe down the exterior and interior of the chamber on a regular basis. Use a damp cloth. *DO NOT use any commercial cleaning materials.*

### **COMPONENTS:**

- 1- DFC100 Oven
- 1- SFL283 AC Power Cord
- 1- SFL912 Mesh Shelf
- 6- SFL9028 Document Clips
- 3- SFL9037 Suspension Rack Rods
- 1- SFL1237 Spare Fuse (6.25 A, Slo-Blo)

### **SPECIFICATIONS:**

- Dimensions: 26" x 15.875" x 13" (66cm x 40.3cm x 33cm)
- Net Weight: 42.5 lbs. (19.3kg)