

# THE BAKER COMPANY

161 Gatehouse Rd., Sanford, Maine 04073 USA

*"Creating Immaculate Atmospheres"*

## Operation of the Ultraviolet Lamp in Baker biological safety cabinets.

The Baker Company currently offers an optional ultraviolet lamp in all Class II Biological Safety Cabinets. This lamp provides ultraviolet light which may be used to help disinfect the work area of a cabinet. NSF requirements for safety interlocks, tested by Underwriter Laboratories (UL) require that before the UV light may be turned on, the view screen must be fully closed. (See *Operator's Manual for more information on UV operation*).

The Baker Company has received many questions pertaining to this feature. Listed below are the questions with Baker responses.

### **1. When the viewscreen is closed during the UV operation and the cabinet blower is running, will the motor overheat and cause premature failure in the future?**

**Answer: No**

- The operation of motor does not have any effect on the UV disinfection.
- In Baker type A1 and A2 cabinets it is recommended that the motor blower runs continuously.
- On Baker TX (B2) cabinets it is recommended that the motor blower be turned off during UV operation. (See response to question 3 for details)

The following information was provided by Baker's motor suppliers.

1. The worst enemy a motor has is heat. Our motor suppliers tested these motors under multiple conditions for heat. During the UV light cycle, when the viewscreen is closed, the temperature rise inside the cabinet is not high enough to cause premature failure of the motor.
2. The failure point of a motor would most likely be caused by repetitive stops and starts of the motor. This stopping and starting causes high heat loads on the starting switch which can reduce the life expectancy of the motor.

Tests completed at The Baker Company on A1 and A2 cabinets show that the motor amperage *goes down* when the viewscreen is closed which *reduces* the heat load on the motor (thus reducing failures).

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**2. Will the cabinet viewscreen crack or shatter when completely closed during the UV operation?**

**Answer: No**

- A Class II Type A1 and A2 cabinet re-circulates approximately 70% and exhausts 30% of its incoming air. When the viewscreen is closed, the result is a higher negative pressure inside. **This increase in negative pressure can cause the window to flex inward but would not be great enough to cause the window to crack or break. Therefore on Baker A1 and A2 BSC's the motor/blower can remain on during the UV operation.**
- In the case of the Baker TX (B2) cabinet the supply motor blower provides downflow air inside the work area only. The cabinet's intake is provided and maintained by an external blower system that is connected via building ductwork. When the viewscreen is closed on the TX cabinet for UV operation, the total volume of air exhausted is now being partially drawn through the supply blower inlet located behind the vertical dress panel. **This increase in negative pressure can cause the window to flex inward but would not be great enough to cause the window to crack or break.**

**Additional Concerns:**

- **It is recommended that the cabinet motor/blower be turned off on the Baker TX (B2) cabinet during UV operation.** Due to the exhaust suction required on a Baker TX cabinet, the motor/blower may reverse when the window is in its closed position for UV operation. *This can happen with the cabinet blower on or off.* The operator may not notice that the motor has reversed and continue working inside the cabinet risking loss of product protection. To avoid this, the following steps need to be taken for UV operation.
  1. After closing the viewscreen for UV operation, turn off the motor/blower.
  2. Next, turn on the UV light at the control pad. (Some models require manually turning off the fluorescent light first).
  3. After the UV cycle is complete or manually de-activated, **open the view screen to the proper height setting.** The majority of the air will then enter the front of the cabinet allowing the blower to slow down.
  4. Wait for a period of one minute before turning the motor/blower on. This will allow the blower to come to a complete stop.
  5. Next, turn the motor/blower on. The motor will now start in its correct counter clockwise rotation to provide the proper downflow air inside the cabinet.
  6. Lastly, wipe down the interior area of the cabinet with a surface disinfectant (review Section III of the operator's manual for more information) and wait the standard 3 minute warm up period before beginning any work.

- Most labs are designed to generate a required number of air changes per hour for safety or other reasons. Depending on the room design and BSC exhaust configuration, a BSC may be used in the room air exchange process and therefore will have an adverse effect when the viewscreen is closed for UV operation. If needed, consult with your buildings HVAC professional to provide additional control valves for compensation during this period.

**3. If I choose to turn the blower off during the UV light cycle period will the cabinet maintain aseptic conditions?**

It is stated in our Operator's manual, "In order to keep the interior workspace clean and free of particulates, all type A1 and A2 Baker biosafety cabinets are designed for continuous operation". This statement also applies when using the UV light cycle, if the motor/blower is turned off, the possibility that "contaminated" room air will deposit "dirty" particles or organisms into the work area. While the UV will in theory "kill" organisms, it has no effect on non-living particulate matter that might be deposited within the unit.

If this "blower off" option is chosen during UV operation on A1 and A2 cabinets only, Baker suggests opening the viewscreen to the proper height setting and then turning the motor/blower on to evacuate any airborne contaminants. Next wipe down the interior area of the cabinet with a surface disinfectant (review Section III of the operator's manual for more information) and wait the standard 3 minute warm up period before beginning any work.

*As stated in the response for question 3, it is recommended that the motor/blower be turned off on the SterilchemGard (TX) cabinet during the operation of the Ultraviolet Light. Then follow the steps provided to start and maintain the proper downflow of air inside the cabinet. Lastly, disinfect the interior workarea of the cabinet properly before beginning any work.*

**4. Sometimes during the UV light cycle period there is an annoying whistling sound coming from the cabinet. Can anything be done about this?**

The whistling that is occasionally present during the UV cycle may be coming from the wiper area behind the top of the window. This rush of air sometimes causes a whistling sound and can be an annoyance; however it is not harmful to the cabinet. Unfortunately, there is no method to eliminate this whistling on current designs.

*In conclusion, the Baker Company recommends that all Class II Type A1 and A2 biosafety cabinets be run continuously to keep the interior workspace free of particles and reduce premature failure of the motor/blower system. On the Baker B2 (TX) cabinets it is recommended that the motor/blower be turned off during the UV cycle and after to follow the proper startup procedure outlined in this report. Prior to working in any biosafety cabinet please follow the proper disinfection techniques discussed in this article and in the Operator's Manual for safe and effective operation.*