

DRB200 Temperature Verification and User Program Creation

Introduction

Temperature adjustments on the DRB200 should only be completed by trained Hach[®] Service personnel. The reason for this is that if an adjust is attempted and performed incorrectly, the Interface Board may be damaged and require replacement.

As an alternative to a service adjustment, customers can verify the temperature of the block and create a user program to adjust for any offset from the desired temperature. The temperature offset is not linear and may require trial and error to hit the desired temperature. The DRB200 temperature tolerance is ± 2 °C. To verify that the DRB200 is within this tolerance range, glycerol can be used to check the reactor's programming. This is how to perform a Temperature Check:

Material


- 243134 - Glycerin (Glycerol), USP 500, anhydrous (reagent grade >99%)
- 2630600 - Digital Thermometer, Laboratory thermometer, ASTM 67C (range 95 °C - 155 °C, resolution 0.2 °C, height 379 mm)
- Vial, 13-mm or 16-mm, depending on the block configuration

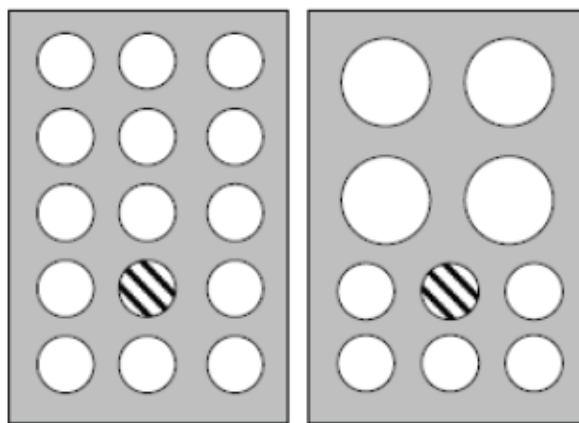
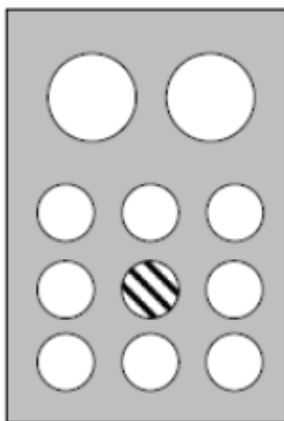
Preparation of the vial

- 13-mm vial: Mark the vial 62 mm (± 0.5 mm) from the base
- 16-mm vial: Mark the vial 56 mm (± 0.5 mm) from the base
- Place the laboratory thermometer in the vial
- Use a pipette to fill the vial up to the mark with glycerol.

Note: The glycerol should be at room temperature

Position of the vial

- Place the vial in the second row from the bottom and in the center well marked 
- Start the temperature program for 150 °C, 60 minutes (or the COD program) for the block
- When the heating phase is complete, the thermometer temperature should be the same as the temperature shown on the display



Application Note: DRB200 Temperature Verification

Notes

The mass/volume of the temperature probe is crucial with smaller probes being better as larger mass to volume probes will read lower temperatures. Hach's service technicians use part number 2630600 when calibrating the DRB200. It is NIST traceable and has a small probe. The probe is approximately 1/16 inches (1.6-mm) in diameter and is barely longer than the vial. The probe should go all the way to the bottom of the vial.

The volume of glycerol in the vial is critical. With the temperature probe inserted, the vial must be filled to a height of 56 mm \pm 0.5 mm for a 16-mm vial and 62 mm \pm 0.5 mm for a 13-mm vial. Less volume will result in higher temperature readings and greater volume will cause lower readings.

The block's temperature can exceed the programmed temperature a few degrees when heating to the target temperature. The operator should wait 30 minutes into the heating cycle before recording the temperature. After 30 minutes, the block will have stabilized.

Air currents can also affect temperature measurements. Because the thermal coupling of the block to the glass vials is minimal, many factors can influence the dissipation of the heat of the vial's contents. Select a laboratory location where there are minimal air currents.

Damage can occur to the instrument if you turn it off and back on before it cools back down to room temperature.

The DRB200 are factory calibrated at 100 °C and due to the slope differences in both the software and temperature sensors,

the actual temperature is usually above 150 °C. Hach's accuracy specification is \pm 2 °C throughout the digester's temperature range.

The DRB200 can be re-calibrated by Hach's service team; however, we do not recommend customers perform this calibration themselves. The reason for this is that the digital board can be irreparably damaged.

If a customer needs to modify the temperature settings on the DRB200, Hach recommends the use of one of the three user programmable methods. These programs are initially named PRG1, PRG2 and PRG3. These programs can be renamed and programmed to a specific temperature and reaction time. The user programming instructions are described in the DRB200 user manual. Three user defined programs are available and may be re-defined as often as needed.

For example, a customer's measured temperature on the COD test program is 145 °C and would like to achieve as close to 150 °C as possible. The customer can set up one of the user programs (PRG) to 155 °C and after 30 minutes into the heating cycle, measure the temperature (following the procedure above) of the DRB200 to determine if it is closer to the desired temperature. If the initial adjustment of 155 °C was not accurate enough, modify the user program in one-degree Celsius increments to reach the desired temperature of 150 °C.

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