Protecting your laboratory environment

LABCONCO

PROCEDURE

FOR

FIELD VACUUM CALIBRATION

OF

PC ASSEMBY Part No. 7445590

Rev	Date	By	Description	ECO#
-	09/07/04	GH	Release	C557

1.0 Scope

This document is intended to cover the step by step procedure required when performing a In the field calibration of the vacuum measurement system.
This procedure can also be used in the event a replacement vacuum sensor is required.

2.0 In the field Vacuum calibration for Labconco freeze dry controller # 7445500

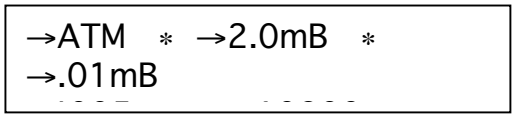
IMPORTANT: A calibrated vacuum reference standard is required to perform the vacuum calibration described below. If you are not certain of the accuracy of this connected standard, do not continue with this procedure. The vacuum standard is best connected as close to the Labconco vacuum sensor as possible, or at least in immediate contact with the main Freeze Dry vacuum chamber. DO NOT CONNECT the standard to the DRAIN HOSE, as this point is too far removed form the chamber to give accurate vacuum readings.

Access the calibration mode: Hold the MENU key down for 10 seconds until the LCD display says PRODUCTION MENU. Release the MENU key for 1 sec, and then hold the MENU key down again for 5 seconds—until the LCD reads PASSWORD.

To access the user calibration procedures, quickly press the following keys in succession: MANUAL, AUTO, MANUAL, AUTO, and then SELECT. The LCD should now display: VACUUM CALIBRATION--USER.

Once the display shows VACUUM CALIBRATION----then use the SELECT key to get the LCD to flash either USER or FACTORY calibration methods. Once USER is flashing, press the MENU key to enter the USER calibration methods. The refrigeration will turn on at this point---allow the chamber temperature to stabilize before proceeding.

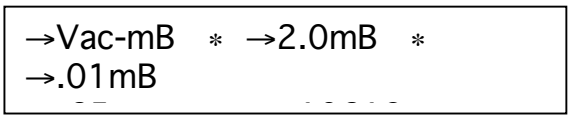
Having accessed the USER calibration method, the LCD display looks as shown below:



Note: numbers on line 2 above are examples only---your unit may be calibrated slightly differently

The above display screen shows the three vacuum levels/points that will be used to calibrate the vacuum sensor. Note the LCD display is separated into three areas, one for each vacuum level calibration point. On the left side, ATM stands for the atmospheric level of vacuum calibration. The numbers below ATM are the actual values used by the micro controller, and may not match exactly what the above LCD drawing shows. Note that the letters ATM are flashing to indicate this is the vacuum level the unit is ready to calibrate----if the user then presses SELECT, the calibration of the atmospheric level will proceed. If the VACUUM key is pressed instead, the LCD display will scroll over and begin to flash the "2.0mB" characters, to indicate that is the vacuum level that will be calibrated—if the SELECT key is used to access that calibration setup. The VACUUM key can be used to select any of the three levels, but it is suggested that the calibration be done as follows—first ATM, then .010mB, and finally 2.0 mB. A detailed description of each vacuum calibration level is given below:

ATM: Once the letters ATM are flashing, and the SELECT key is pressed to access this set point, that section of the LCD will change to show the actual vacuum reading that the Labconco unit is reading at that vacuum level as shown below:



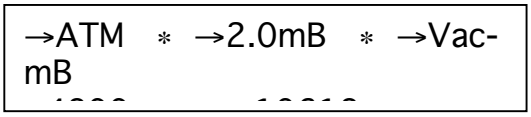
Note: numbers on line 2 above are examples only---your unit may be calibrated slightly differently

Note that both the Vac-mB and actual reading/numeric value will flash to confirm you are ready to calibrate the atmospheric level. The actual vacuum level displayed may show 65 mB as this is the largest vacuum level the unit can display. Also, note that once the ATM set point

procedure is accessed, the bleed valve is opened and the vacuum pump is shut off to allow the chamber to reach an atmospheric vacuum level. The user should allow the vacuum level to reach atmosphere inside the vacuum chamber, as evidenced by a steady numeric value on the LCD display as well as a steady value on the connected calibrated reference standard. When a stable atmosphere is reached (allow 5 minutes), the user can exit this calibration point and the value will be recorded as a calibration point. This exit can be done by pressing the VAC key twice, to scroll to the next vacuum calibration point--.01mB (skipping the 2.0mB point for now).

.01mB Set point *Note that for both the .01mB and the 2.0mB set points, the exact value of .01mB or 2.0Mb is NOT required. Labconco recommends something in the range of 1.5 to 2.0 mB for the 2.0 mB set point, and a vacuum level below .060mB mB for the .01 mB set point .*

Once the letters ".01mB" are flashing, and the SELECT key is pressed to access this set point, that section of the LCD will change to show the actual vacuum reading that the Labconco unit is reading at that vacuum level as shown below:



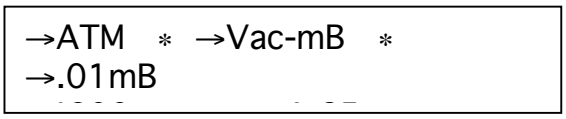
Note: numbers on line 2 above are examples only---your unit may be calibrated slightly differently

Note that both the Vac-mB and actual reading/numeric value will flash to confirm you are ready to calibrate the .01mB level. The actual vacuum level displayed can now be compared to the value read by the connected vacuum standard gauge. Also, note that once the ".010mB" set point procedure is accessed, the bleed valve is closed and the vacuum pump turned on to allow the chamber to reach a vacuum level below .060mB. Once the vacuum level has stabilized below .060 mB on both the LCD display and calibrated standard gauge, the user can use the AUTO and

MANUAL keys on the front panel to adjust the Labconco unit to read higher (Use AUTO) or lower (Use MANUAL) and adjust the Labconco display to agree exactly with the connected vacuum standard gauge. Once these two readings agree, the user can exit this calibration point and the value will be recorded as a calibration point. This exit can be done by pressing the VAC key twice, to scroll to the next vacuum calibration point--2.0mB.

2.0mB Set point *Note that for both the .01mB and the 2.0mB set points, the exact value of .01mB or 2.0Mb is NOT required. Labconco recommends something in the range of 1.5 to 2.0 mB for the 2.0 mB set point.*

Once the letters "2.0mB" are flashing, and the SELECT key is pressed to access this set point, that section of the LCD will change to show the actual vacuum reading that the Labconco unit is reading at that vacuum level as shown below:



Note: numbers on line 2 above are examples only---your unit may be calibrated slightly differently

Note that both the Vac-mB and actual reading/numeric value will flash to confirm you are ready to calibrate the 2.0mB level. The actual vacuum level displayed can now be compared to the value read by the connected

vacuum standard gauge. Also, note that once the “2.0mB” set point procedure is accessed, the bleed valve is closed and the vacuum pump turned on to allow the chamber to reach a vacuum level between 1.5mB and 2.5mB. The Labconco unit will control the vacuum pump so that the pump will be turned on when the vacuum is above 2.5mB and will shut off when the vacuum level reaches 1.5Mb. By doing this, the Labconco system tries to provide a stable vacuum in the chamber between 1.5mB and 2.0mB. Once the vacuum pump is shut off at the 1.5mB level, the vacuum in the chamber will slowly increase due to slight leakage. If the user observes this rate of leakage is too slow to achieve a vacuum level around 2.0mB, the MENU key may be pressed very quickly——to quickly actuate the bleed valve in the system and thus raise the vacuum level in the chamber to the 2.0mB level. Do not hold MENU down for more than 5 seconds, as the unit may exit the calibration mode. IT IS VERY IMPORTANT THAT THE VACUUM LEVEL BE VERY STABLE SO THAT BOTH THE LABCONCO SENSOR AND THE CONNECTED VACUUM STANDARD HAVE TIME TO REACT TO THE EXACT VACUUM LEVEL.

Once the vacuum level has stabilized around 2.0mB on both the Labconco LCD display and calibrated standard gauge, the user can use the AUTO and MANUAL keys on the front panel to make adjust the Labconco unit to read higher (Use AUTO) or lower (use MANUAL) to make the Labconco display agree exactly with the connected vacuum standard gauge. Once these two readings agree, the user can exit this calibration point and the value will be recorded as a calibration point. This exit can be done by pressing the VAC key to scroll to the next vacuum calibration point (this saves the 2.0 mB calibration data), and WITHOUT pressing SELECT to actually enter the set point mode, simply press the MENU key for 5 seconds to exit the calibration procedures entirely.

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