



03-020B  
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**HOW TO PERFORM A MANUAL DAC CALIBRATION ON “E” SERIES MACHINES**

**I. PURPOSE:**

The purpose of this service note is to give instructions on how to perform a manual Digital to Analog Calibration (D/A Calibration) on “E” series analyzers.

**II. TOOLS:**

Digital Voltmeter

**III. PARTS:**

None

**IV. PROCEDURE:**

Please follow the appropriate procedure below for either VOLTAGE or CURRENT output.

**VOLTAGE OUTPUT**

1. From the main menu press SETUP-MORE-DIAG-ENTR-NEXT until ANALOG I/O CONFIGURATION press ENTR.
2. Press SET> until it reads read A/IN CALIBRATED:
3. Press CAL to calibrate the analog inputs.
4. Press <SET until the top line reads CONC\_OUT\_1 and press EDIT
  - a. If this is the output voltage you desire then go to step 7
  - b. If this voltage is incorrect press EDIT and change to the output voltage desired, press ENTR and go to step 7.
5. Press EDIT, Press SET>. The top line should read CONC\_OUT\_1: REC OFFSET: 0mv
  - a. If you don't want a recorder offset go to step 8.
  - b. If you want a recorder offset press EDIT. Enter the OFFSET value and press ENTR. Go to step 8.
6. Press SET>. The top line should read CONC\_OUT\_1: AUTO CAL: ON
  - a. If this says AUTO CAL ON press EDIT and turn it OFF.
  - b. If this says AUTO CALL OFF go to step 9.
7. Press SET>. The top line should read CONC\_OUT\_1: CALIBRATED: YES
8. Now place your meter on pins 1 and 2 on the rear panel analog output connector and set your meter to read mvDC.
9. Press CAL on the front panel.
10. You should have some DN and UP buttons. And the top line should be say ZERO ADJUST or something similar.

11. The output on the meter should be as close as possible to 0mV  $\pm$ 0.3mV.

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- a. If it is not then press DN or UP until the meter reads as close as possible to 0mv
- b. If it does go to step 14
12. Press ENTR.
13. The top line should now say GAIN ADJUST and you should have DN and UP buttons again. The meter should now read your full-scale voltage (i.e. 1V, 5V, 10V) you will have to change the range on the meter to read Volts instead of Mili-volts.
14. Press the DN and UP buttons until the output on the meter reads your full-scale voltage  $\pm 1\text{mV}$ .
15. Press ENTR
16. That channel is now calibrated.
17. Do this for all channels and ensure that you move the meter on the output connector to the proper pins.

## CURRENT OUTPUT

1. From the main menu press SETUP-MORE-DIAG-ENTR-NEXT until ANALOG I/O CONFIGURATION press ENTR.
2. Press SET> 5 times.
3. The top line should read A/IN CALIBRATED: YES
4. Press CAL to calibrate the analog inputs.
5. Press <SET 4 times.
6. The top line should read CONC\_OUT\_1: CURRENT
  - a. If you desire Current output then go to step 7
  - b. If you do not desire Current output press EDIT and change to the output voltage desired, press ENTR and follow the steps in the Voltage Output procedure.
7. Press EDIT, Press SET>. The top line should read CONC\_OUT\_1: AUTO CAL: ON
  - a. If this says AUTO CAL ON press EDIT and turn it OFF.
  - b. If this says AUTO CALL OFF go to step 8.
8. Press SET>. The top line should read CONC\_OUT\_1: CALIBRATED: YES
9. Now place your meter on pins 1 and 2 on the rear panel analog output connector and set your meter to read mA.
10. Press CAL on the front panel.
11. You should have some DN and UP buttons. And the top line should be say ZERO ADJUST or something similar.
12. The output on the meter should be as close as possible to 0ma  $\pm 0.01\text{ma}$  (if 0-20ma output), 4ma  $\pm 0.01\text{ma}$  (if 4-20ma output).
  - a. If not then press DN or UP until the meter reads as close as possible to 0ma or 4ma.
  - b. If it does go to step 13
13. Press ENTR.
14. The top line should now say GAIN ADJUST and you should have DN and UP buttons again. The meter should now read your full-scale current output 20ma.
15. If it doesn't press the DN and UP buttons until the output on the meter reads your full-scale current output of 20ma  $\pm 0.01\text{ma}$ .
16. Press ENTR
17. That channel is now calibrated.
18. Do this for all remaining channels that contain the Current option and ensure that you move the meter on the output connector to the proper pins for that channel.

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