

# MACURCO GAS DETECTORS

## ND1-FCK FIELD CALIBRATION KIT

### CONTENTS OF THE KIT:

1. Gas Cylinder of nitrogen dioxide.
2. Gas regulator with white cap fitting.
3. These instructions.

### GENERAL INFORMATION:

The heart of the ND-1 is a microcomputer. It constantly monitors various internal operating parameters, the ambient temperature, and the Nitrogen Dioxide (NO<sub>2</sub>) reading. The NO<sub>2</sub> reading is determined by measuring the voltage across an electro-chemical cell whose chemistry responds to NO<sub>2</sub>. The microcomputer takes the NO<sub>2</sub> data, compensates it for temperature, and then compares this data to the alarm set point.

All ND-1 NO<sub>2</sub> Detectors are factory calibrated when they are shipped to the customer. This calibration should be within specifications for 6 months to a year. Some jurisdictions, local standards, or customer preferences require periodic recalibrations. This Kit provides the means to fit those requirements. Macurco recommends checking the operation of the ND-1 every six months, either through use of the procedures given in the operating instructions or this Field Calibration Kit.

### WHERE TO DO THE CALIBRATION?

The ND-1 will need to be partially disassembled for this procedure. It will be easiest to do this on a bench in a work area. However, if two people are available, it can be done at the actual working location of the ND-1.

### FIELD CALIBRATION PROCEDURE:

**NOTE:** The ND-1 must have been power continuously for a minimum of 72 hours before proceeding.

1. Open the access door of the ND-1 case.
2. Remove the two bottom screws that secure the interior faceplate, and swing the faceplate up.
3. Ensure that the digital display is "ON" before starting.
4. Turn both the "FAN" and "ALARM" adjustments fully clockwise before proceeding.
5. Connect a multimeter across R27 (directly left of the large chip), with the positive lead connected to the lead-end with the loop.
6. Adjust RA5 "ZERO" potentiometer (multiturn type) until the voltmeter reading is 0.00 +/- 0.10 Vdc.
7. Wait for the multimeter display to stabilize. Repeat steps 6 and 7 until the meter reading remains stable.
8. Assemble the gas cylinder to the regulator and the rest of the tubing. Turn-on the NO<sub>2</sub> regulator, and ensure that the tank pressure is sufficient to complete the calibration.
9. Place the white applicator attached to the regulator hose over the electrochemical cell, applying NO<sub>2</sub> to the sensor.
10. Wait for the meter reading and the display to respond - this may take several minutes.

11. Wait 30 minutes, and then adjust the RA4 "GAIN" potentiometer (multiturn-type).
12. Note the gas mixture value in parts-per-million that is located on the label of the gas cylinder. Adjust the potentiometer (RA4) until the display reading matches the gas mixture being used to calibrate the unit.
13. Remove the NO<sub>2</sub> gas from the sensor, and remove the gas regulator from the cylinder.
14. Wait at least 1 hour on the first adjustment cycle. On subsequent adjustment cycles, this delay may be shortened to 15 minutes.
15. Repeat steps 6 through 14 until the "ZERO" adjustment maintains 0.00 +/- 0.10 Vdc, **and** the "GAIN" adjustment reflects the contents of the gas cylinder +/- 0.1 ppm of NO<sub>2</sub>.
16. If a problem occurs while performing this procedure, contact the factory.
17. Set the "FAN" and "ALARM" adjustments to the desired activation levels.
18. Swing the interior faceplate down, and secure it with the screws removed in step 2. Close the exterior door.

**NOTE:** Two to three ND-1s may be calibrated with one FCK. The only limitation is the amount of gas contained in the cylinder. Replacement cylinders are available.

**RETURN INSTRUCTIONS:**

The calibration kit should be carefully packed (well padded) and returned to:

**Macurco**  
**3946 South Mariposa Street**  
**Englewood, Colorado 80110**

**Please include a note advising the nature of the problem.**