



**GREER
SYSTEMS**

Precision Gas Detection
Custom Control Automation

ICES Series Precision Gas Detector Version 1.15
Installation, Operation and Maintenance Manual



Manual 204-0118-15
Revision 1.16
3/26/10

Introduction:

Your IC Series gas detector features service-oriented functions required for dependable operation and field serviceability. Optimized software provides lockout control, dual user selectable contact closures, automated calibration procedures, and sensor swap out and conditioning modes. Onboard serial communications board provides real-time PPM concentration, span and zero values, step-by-step onscreen calibration and sensor change-out procedures, total detector runtime and sensor element PPM exposure, plus much more. The onboard LED's provides visual indication of the detectors status using Greer Systems' VeriCheck™ system. This system provides detector status and current milliamp output at a glance.

Your IC Series gas detector utilizes a solid-state sensor element that is sensitive to the stated gas. This sensitivity manifests itself in a large change in the sensors output in the presence of the target gas. As in any solid-state gas detector product, it is vitally important that the end user or service organization realize that regular checks, re-zeroing and maintenance is an integral part of proper gas detection systems.

Your IC will provide an output signal of 4 to 20 milliamp, representative of the gas concentration it senses. The circuitry is designed so that the output will never rise above 20 milliamp, regardless of the saturation of the sensor by the gas it is detecting. The circuit will also prevent the output from going below 4 milliamp.

Your IC Series gas detector offers serial communications via the on-board DB9 Connector. This feature allows access to the service-oriented functions required for dependable operation and field serviceability by any serial enabled portable device.

Installation

Your IC unit consists of a 5" X 5" X 3" painted aluminum NEMA-4(X)12 rated enclosure with gasketed cover. The electronics are mounted on the base of the enclosure. All wiring is to terminal screws or a removable plug-in style connector.

Your sensor element is mounted in a ¾" inch adapter and installed through a standard ¾ inch hole. A terminal strip is provided on the circuit board for connection of the sensor, power and output signals. The sensor must be installed in a non-condensing environment. The operating temperature of the sensor element and the electronics must be maintained between -40°F and +125°F. A low temperature Heated Enclosure is available (model ASHE 304 and 316 available).

The input power wire connected to the 12-24 Volt AC/DC inputs must provide a minimum of 1.0 amp recommended. Maximum cable lengths are listed below. Greer Systems recommends the use of 2 twisted pairs with a shield whenever possible.

Cable Length	Wire Size
Less than 10'	20 AWG stranded 4 conductor
Less than 1,000'	18 AWG stranded 4 conductor
	2 twisted pairs, shield with drain

Non-Isolated Configuration are internally configured and can be 3-wire hookup

**Under no circumstances should the IC low voltage signal wires be in a common conduit, tray, etc. with power wiring over 48 Volts. If a shielded cable is used, the shield or drain must be terminated only at the monitor's location.*

Multiple IC Detectors may be powered from a common 12-24 Volt AC/DC power supply including Greer Systems controllers. Each unit's input power must be wired with same polarity, If DC supplies are used, all system must have positive on Pin 4 and negative on Pin 3. A field-mounted transformer may be used near the sensor assembly to provide local 12-24 Volt AC/DC power for the unit.

Caution: The power transformer for the IC(s) should not be used to power other devices.

Operation Mode:

Operation mode provides active signaling via the output or optional contact closure when the target gas is detected. In Operation Mode, the LED will illuminate green indicating a functional status and will pulse according to the milliamp output using our VeriCheck™ system.

Serial Communications:

All IC Series gas detectors feature onboard serial communications that provides access to the advanced features of the detector. The features available are:

1. Real-time PPM values
2. Cell reaction, span, and zero values
3. Contact closure state and set points

Establishing Communications

The IC Series gas detector communicates via standard RS-232C serial protocol accessible by any serial communications software, such as HyperTerminal available on all Windows Based computers. Hookup is established by utilizing a 6ft serial cable DB9. Set your serial terminal to the following parameters:

9600 baud

8 bits

no parity

1 stop bit

xon, xoff

Send line ends with line feeds

Echo typed characters locally

After establishing connection with the IC unit, type "?" for a complete list of available commands. NOTE: IC units require statements to have all capitol letters. We recommend turning on your PC's caps lock.

Example: in all caps type **INFO**

Below is an example of the IC units response:

INFO

ZERO = 1023

note: this is cells clean value.

SPAN = 121

note: this is cells exposed value

CELL = 1023

RELAY 1 = 35

note: relay 1 has been set for a trip point of 35ppm.

RELAY 2 = 100

note: relay 2 has been set for a trip point of 100 ppm.

CONFIGURING YOUR DETECTOR

Setting Contact Closures:

The IC detector has two (2) FORM C contact closures with user selectable set points. To alter your contact closures set points type

R1= for relay 1 or

R2= for relay 2 followed by your 3 digit set point.

Example: To set relay 1 to a 50 PPM set point type '**R1=050**'

NOTE: you must use a 3-digit set point. Values under 100 must include a leading zero.

Sensor Element Change-Out Procedures

NOTE: Sensor element change-out requires a replacement solid-state element (PN 010-2100-00). Additionally, calibration requires the use of calibrated span gas and zero gas at a constant flow rate. The Greer Systems' Calibration Kit (PN 010-0122-15) provides all of the required equipment to calibrate your detector.

A 72-hour warm up prior to setting SPAN or ZERO settings required

Calibration Procedures

SPAN

NOTE: Proper calibration requires the use of calibrated span gas and zero gas at a constant flow rate. The Greer Systems' Calibration Kit (PN 010-0122-15) provides all of the required equipment to calibrate your detector.

1. While the detector is in Operation Mode, install the sensor adaptor cup over the sensor element and open the flow regulator to the 1000PPM NH₃ bottle. Expose the sensor element for 2 minutes, and then type "**SPAN**" and press the ENTER key <CR>. The LED will illuminate solid green on SPAN entry

ZERO

NOTE: The ICES series employs an onboard diagnosis of the sensor element during calibration and re-zeroing. Re-Zeroing is a function that allows for field adjustment of the clean air 4-milliamp signal. We highly recommend using a calibrated zero gas (PN 011-0128-15) for calibration and re-zeroing.

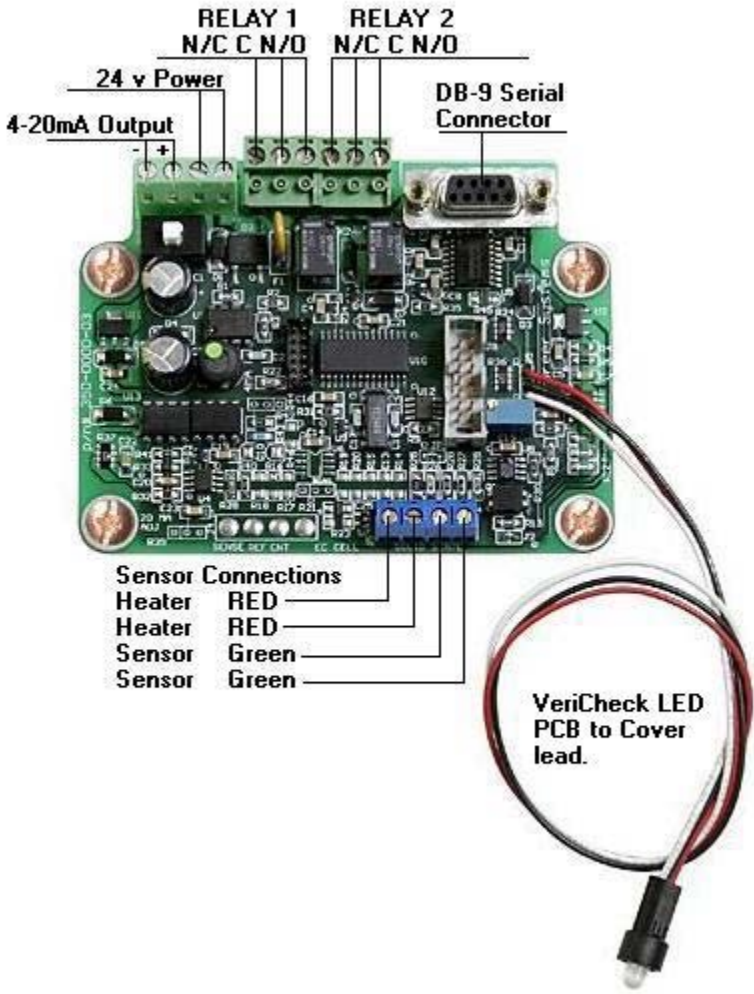
1. Verify the ambient conditions around the detector. Area should clear of any ammonia vapors.
2. While the detector is in Operation Mode, install the calibration cup onto the sensor fitting and open the fixed flow regulator to the Zero-Gas.
3. Wait one minute for the sensor element to clear.
4. Type '**ZERO**' and depress the enter key to set the units zero value
5. The detector is now in operation mode with a new baseline value, as indicated by the green LED illumination indicating a functional status.

If the detector enters a fault mode (indicated by the red LED).

A full calibration of the detector is required to return the detector to operational status.

At any time typing **GAS** and press enter will show actual cell ppm value.

Interior PCB Layout and Designation



SPECIFICATIONS

Sensor Type: Solid State

Sensor Life: 5-8 years continuous operation

Detection range: 0-1000 PPM

Output: 4-20mA, isolated or non-isolated and linear

Output Adjustment: via serial interface

Temperature: -40°F-125°F, Heated enclosure for temps below 32°F available

Humidity: 5-90% non-condensing.

Storage Temp: 32°F-68°F

Respond Speed: < 90 seconds to full scale, typically 60 seconds.

Maximum Loop: 500 Ohms at 12 Volts; 1000 Ohms at 24 Volts

Case: NEMA-4X aluminum enclosure with poured gasketed cover

Case Size: 4¾" X 4¾" X 3¼"

Weight: 3 lb.

Wiring Access: Provided left or right side 1/2" or 3/4"

Power Required: 12-24V AC/DC

Power Consumption: < 1.0amp

Fuse: Onboard auto-reset 1.5 amp

Contact Closure:

Resistive Load: .5amp @ 120vac, 1amp @ 24vac

Inductive Load: .2amp @ 120vac, .4amp @ 24vac

Max Capacity: 62.50va 30watt

Replacement Sensor Kit: Part number 010-2100-10 Specify Gas Type

Serial Communications Kit: Part number 010-0047-50

Calibration Kit: Part Number 000-0700-00kt, Case, Regulator, Teflon Tubing, (no gas)

Test Gas is not necessary to test the reaction of your detector, many First Aid Kits have Ammonia Inhalants that provide convenient and quick "reaction" testing and verification of operation.

This manual is intended to provide the user of the Greer Systems gas sensor systems with necessary information to install and operate the gas detector units. Failure to install or operate the units in accordance with the information in this manual could result in unsatisfactory and/or unreliable operation. The user and installer are advised to read this manual carefully and adhere to the instructions.