

**ENMET CANADA LTD  
ISA-55R/55RC  
OPERATIONS MANUAL**

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## **THEORY OF OPERATION**

### **1.0**

The ISA-55R and 55RC employ a metallic oxide semiconductor (MOS) sensing element in its detector head. In the presence of gas, an oxidation takes place resulting in a change in sensor resistance. This change is monitored by the instrument and an alarm is activated at a preset gas concentration/resistance level.

## **DESCRIPTION**

### **2.0**

The ISA-55R is a single channel gas detector monitoring for two levels of gas per channel. The control module has two independent adjustable alarm sections. Three LEDs (green, yellow, red) are mounted on the top of the module and are visible through a window in the door. See Sec. 8.0 for details. The ISA-55RC also includes a common 10 amp DPDT relay contact for each gas level. Please note; that the "C" in ISA 55RC denotes one or more relay contacts per gas level.

Although this manual describes the setup and calibration of a single channel system. The ISA-55R may be multiple channeled in one enclosure with remote sensors mounted up to 300 meters from the control panel. The multi-channel system uses the same sensors, control modules and calibration procedures as the single channel.

## **UNPACKING AND INSPECTION**

### **3.0**

Inspect all parts of the gas detector upon receipt for any damage that may have occurred during shipment and that all parts ordered were received. Contact Enmet Canada or your local Representative if there are any discrepancies or if damage is suspected.

## **INSTALLATION**

### **4.0**

This manual includes the necessary drawings to install and service your gas detector. The front page of this manual indicates the Serial Number of the unit and what gases and concentrations the unit has been calibrated for.

#### 4.1

Instruments with integral sensors are factory calibrated and should be installed according to Sec. 4.2. All instruments with remote sensors may have the control panel mounted in a central or convenient location with the remote sensors installed up to 300 meters away and mounted according to Sec. 4.2. All remote sensors require a gas test after installation. See gas test and start-up sections.

#### 4.2

Gases of different densities; some heavier than air and concentrate at the bottom of a space and some will rise.

The following is a general guide. For assistance in sensor location consult your Enmet Representative.

Carbon Monoxide	same as air	place about 4-6' above finished floor
Methane	lighter than air	place near ceiling
Ammonia	lighter than air	place near ceiling
Propane	heavier than air	place about 2' above finished floor
H <sub>2</sub> S	heavier than air	place about 2' above finished floor
Freon	heavier than air	place about 2' above finished floor

**NOTE:** Place sensors in a location that is easily accessible for calibration and testing.

#### 4.3

An ISA-55R/55RC supplied with remote sensors must have them wired back to the control panel with a 4 strand 18 - 20 gauge wire. DO NOT run with any other cables carrying more than 24 VDC. The wiring connections are colour coded for easy installation. The MAXIMUM distance between each sensor and the control panel is 300 meters.

#### 4.4

If you have an unusual or difficult installation problem please contact Enmet Canada or your local Representative.

## START-UP

#### 5.0

This equipment is designed to operate from 115 VAC 60 Hz. Other voltage supplies may seriously damage the circuit and will void the warranty.

#### 5.1

After proper connection to the power supply (see subplate drawing), apply power to the instrument. All instruments with integral sensors have been factory pre-calibrated. Otherwise, the heater voltage must be set.

Measure the voltage with a digital voltmeter between the orange (+) and brown (-) wires at the sensor terminal block (see remote sensor drawing). Adjust HV-1 (control module drawing) so that the voltage is the same as that indicated in the specification sheet (last page of this manual). The unit must now remain energized for 48 hours prior to proceeding with the gas test.

## **GAS TEST**

### 6.0

To properly test the instrument, a standard calibration kit consisting of the following is required: 2 canisters of calibration gas, (see front page of manual for gas levels), a calibration adapter and carrying case.

This calibration kit as well as replacement gas cylinders and parts are available from Enmet Canada or your local Representative. Please specify gas concentration when ordering replacement cylinders.

### 6.1

The ISA-55R/55RC should be checked for proper calibration on a regular basis. Always ensure that the gas detector has been turned on for at least 48 hours prior to the gas test and that the air in the sensor area is clean and free of contaminants. Follow these procedures closely and always allow 15 minutes clearing time between tests on the same sensor.

#### 6.1.1

Connect the calibration adapter to the canister of low level calibration gas. Fill the humidifier bowl with clean water to 1/2" above the bottom of the bubbler tube.

#### 6.1.2

Open the gas valve slowly and adjust the flow so that the flow indicator is at 1.0 SCFH. **DO NOT OPEN THE VALVE FULLY** or you will force water onto the sensor.

#### 6.1.3

Firmly place the calibration cup over the sensor, allowing the gas to pass over the sensor for a period of 3 minutes. If the gas detector is out of calibration, it may alarm prior to or just after the correct time has elapsed. A few seconds either way will make little difference. If the unit does not alarm correctly, adjust L-1 until the yellow LED is illuminated (see Sec. 6.1.5). This indicates that the low alarm level has been activated. Allow 15 minutes clearing time and gas the sensor again to confirm proper setting.

#### 6.1.4

Using the high level gas, follow the same procedure as in 6.1.3 only adjust H-1 until the red LED is illuminated. Both the yellow and red LEDs should be on.

#### 6.1.5

Due to the deadband action of the gas detector, there are approximately three full turns between tripping in and out of alarm. To turn the alarm off, turn the appropriate pot clockwise (C-1,H-1), then while applying calibration gas, turn the pot counterclockwise until the detector trips back into alarm. Adjusting for instantaneous alarm when the gas is first applied, or using excessively high flow rates will result in improper calibration and extremely high sensitivity.

## RECALIBRATION

### 7.0

In the event of a control module or sensor change, a complete recalibration is required. Follow this procedure **ONLY** when necessary and after a 48 hour burn-in.

### 7.1

Adjust the heater voltage (see Sec. 5.1) and then balance the sensor circuit by adjusting SV-1 (control module drawing) so that the voltage across terminals 7 and 8 (control module drawing) is 6.0 volts or as close as possible. This adjustment must be made when the sensor is in **CLEAN AIR**. In contaminated areas it may be necessary to gas the sensor with clean air during this adjustment or wait until the ambient air is clean.

### 7.2

After a minimum 48 hour burn-in follow the gas test as laid out in Sec. 6.0.

## VISUAL ALARMS

### 8.0

The ISA-55R/55RC has two LED alarm lights visible through a window in the door.

#### 8.1 **GREEN:**

Gas concentration is below this setpoint. Control relays are de-energized.

#### 8.2 **YELLOW:**

Gas concentration has reached the lower level and the low level relay is energized. This relay is non-latching and will drop out when the gas concentration drops.

#### 8.3 **RED:**

Gas concentration has now reached high level and LEDs will be on and both relays will be energized.

## 8.4

If the green LED is out and the unit is NOT in alarm check the heater voltages (5.1) and the sensor voltage (7.1), also the sensor and sensor wiring. This indicates a wire break or sensor failure.

## **ALARM CONTACTS**

### 9.0

The ISA-55RC includes one 10 amp. DPDT non-latching relay contact for each level (see subplot drawing). In multi-channeled units there will be one relay per level common to all sensors. Optional 5 amp. time delays relays and additional relays are available.

### 9.1

**TIME DELAY RELAY:** This optional relay may be mounted on the subplate and will delay the relay action in seconds, minutes or hours so as to eliminate momentary alarms or to lock in fans for an adjustable period of time. The time delay may be delay "ON" or delay "OFF" and is specified when ordering.

A time delay relay set for "DELAY ON" cannot be used for "DELAY OFF", nor can a "DELAY OFF" be used as a "DELAY ON" without rewiring the relay. Should this be necessary please call Enmet Canada for details.

If a time delay is supplied (see time delay drawing) it may not be set to the range and scale required. Using a small screwdriver adjust the scale to the one required. i.e. minutes, hours, seconds and adjust the range to 0-10, 0-1, etc.

## **AUDIO ALARMS**

### 10.0

Enmet Canada offers two types of audio alarms as options on the ISA-55R/55RC. They are a door mounted buzzer and a door or top mounted horn. When this optional equipment is provided an audio/off switch is included.

## **FAULT ALARMS**

### 11.0

Should a sensor wire fail, the corresponding green control module light will go out. (see 8.4).

### 11.1

An optional fault alarm module is available. This module will monitor up to five sensors and should a wire break occur, it will activate a yellow LED and a 1 amp. relay. The sensor control module will indicate which sensor has a problem as its green LED will go out as well.

## **SPARE PARTS**

**PART****PART NO.**

Replacement sensor

E90036 (COMB)

Replacement module

E90017

Consisting of:   2 canisters cal gas  
                  1 calibration adapter  
                  1 carrying case

NOTE: Specify gas type and concentration required.