GG-2 2-CHANNEL GAS DETECTION CONTROL PANEL

CALIBRATION TECHNOLOGIES INC.
GAS DETECTION SPECIALISTS

Installation and Operation Manual

Warning

**Use this product only in the manner described in this manual.
If the equipment is used in a manner not specified by Calibration Technologies, the protection provided by the equipment may be impaired.**

This equipment should be installed by qualified personnel.

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Intertek

Table of Contents

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General Description

The GG-2 control panel is a two-channel controller designed to accept two 4/20 mA input signals. It has a 24 VDC regulated power supply to power all industry standard 4/20 mA gas transmitters and audible/visual devices.

The GG-2 control panel provides continuous real-time monitoring of each sensor.

The backlit LCD display provides an at-a-glance status of gas concentrations and alarms.

The GG-2 control panel is assembled into a wall mounted enclosure designed for non-classified locations. The gas sensors (one or two) are installed at specific locations where gas is to be detected, up to 1,500 feet from the controller. They are electrically connected to the controller via three conductor cables.

The onboard relays have 10 second on/off time delays to prevent unnecessary cycling during a fault, warning or alarm condition.

All operator functions are performed from the keypad on the front of the panel.

Installation

Locating the GG-2 Control Panel

The important consideration when installing GG-2 control panel is that it must be easily accessible for operating personnel.

Installation Guidelines:

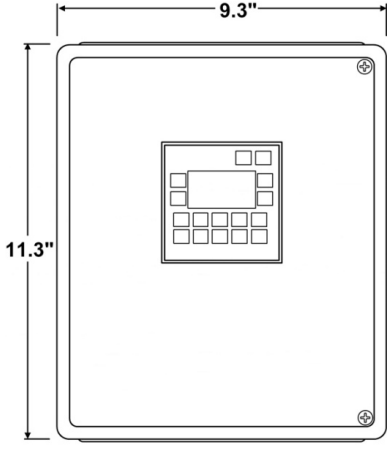
Mount controller on a solid surface with minimal vibration. If mounting on a wall with studs, the mounting screws should be screwed into the studs.

Mount controller thru the holes in the mounting flanges

Mount controller in a general-purpose location only. Do not install in a hazardous environment.

Mount controller away from electromagnetic interference.

Protect controller from physical damage.



Wiring

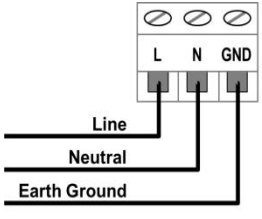
- Electrical wiring must comply with all applicable codes.

Wiring Guidelines:

- Use stranded, copper wire/cable with a minimum of 75°C rating (167°F).
- Always use three-conductor, insulated, stranded, shielded copper cable for all sensor cables.
- Do not pull sensor wiring with AC power cables. This can cause electrical interference.
- Be sure to land the shield conductors of the sensor cables at the shield terminals of the sensor connectors.
- Use only the existing conduit hole for connections to the sensor.
- Bonding between metallic conduit connections is not automatic with the non-conductive enclosure. Separate bonding must be provided.
- During installation, cover conduit holes and close the enclosure cover to prevent debris from falling into the equipment.
- To maintain NEMA 4X / IP 66 rating of the enclosure, conduit fittings of the same rating or better must be used.

AC Power Wiring:

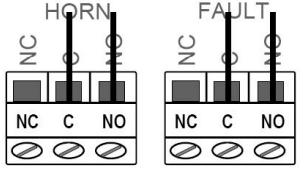
- Power should be provided by a dedicated 15A circuit breaker. It is recommended that the circuit breaker be located near the equipment, and clearly marked as the disconnect for the GG-6 controller.
- 100-240 VAC, 1.3 A, 50/60 HZ



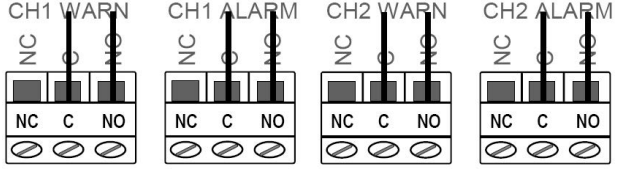
Relay Wiring:

- AC wiring must be run in separate conduit from the sensor cables.
- All relays have Form C dry contacts, and are rated 8 Amps @ 24 VDC or 10 @ 240 VAC (dry contacts require external power).
- Only the fault relay is normally energized. It will de-energize to the alarm state upon sensor fault or loss of power.
- Each relay has a status LED to show the state of the relay. During normal operation, all LEDs are off except for the green Fault LED.

Common Relay Outputs

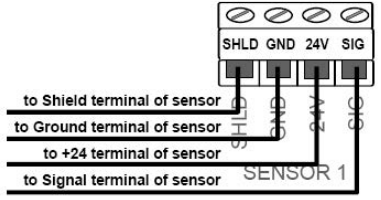


Individual Relay Outputs



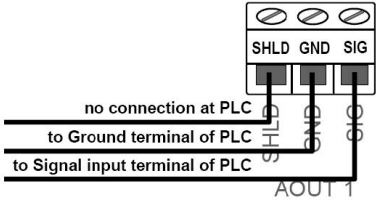
Sensor Wiring: 4/20 mA, 350 Ohm input impedance.

- Refer to sensor manual for cable recommendations.
- Usually 20/3 shielded cable (Belden 8772 or equivalent).
- Length of cable should not exceed 1,500 feet.



Analog Output Wiring:

- The analog output is 4/20 mA signal for monitoring by plant PLC or other analog input equipment. It is powered by the GG-2 Controller.
- Use 2-conductor shielded cable compatible with receiving equipment.



Operation

Start-up

Before applying power, make a final check of all wiring for continuity, shorts, grounds, etc. It is usually best to disconnect external alarms and other equipment from the controller until the initial start-up procedures are completed.

After initial power-up, allow at least 12 hours for the sensors to stabilize before calibrating. Because sensors are normally located at a distance from the controller, the test time required and accuracy of the response checks will be improved if two people perform the start-up procedures and use radio contact.

The GG-2 control panel has a two-minute power-up delay during which the relays are held in their normal non-alarm state, after the application of power or a momentary power loss. This allows the sensors time to stabilize and disables the alarm functions.

Start-Up Test:

1) One person exposes each sensor to target gas.

2) The second person stays at the control unit to determine that each sensor, when exposed to the gas, is connected to the proper input and responds, causing appropriate alarm functions.

Keypad

All operator functions are performed from the membrane switches on the front of the panel.

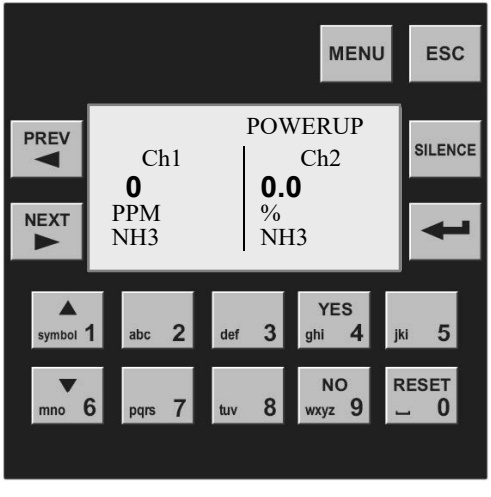
Silence Key: Pressing the Silence key will reset the horn relay and silence the buzzer, until the next event occurs. The horn relay is triggered by a fault or alarm condition, and can be programmed to trigger during a warning condition.

Reset: Pressing the Reset key will attempt to reset any latched relays. Any latched relays will not reset as long as there's an existing warning or alarm condition. The latch-relay function can be enabled for each relay in the Configuration menu.

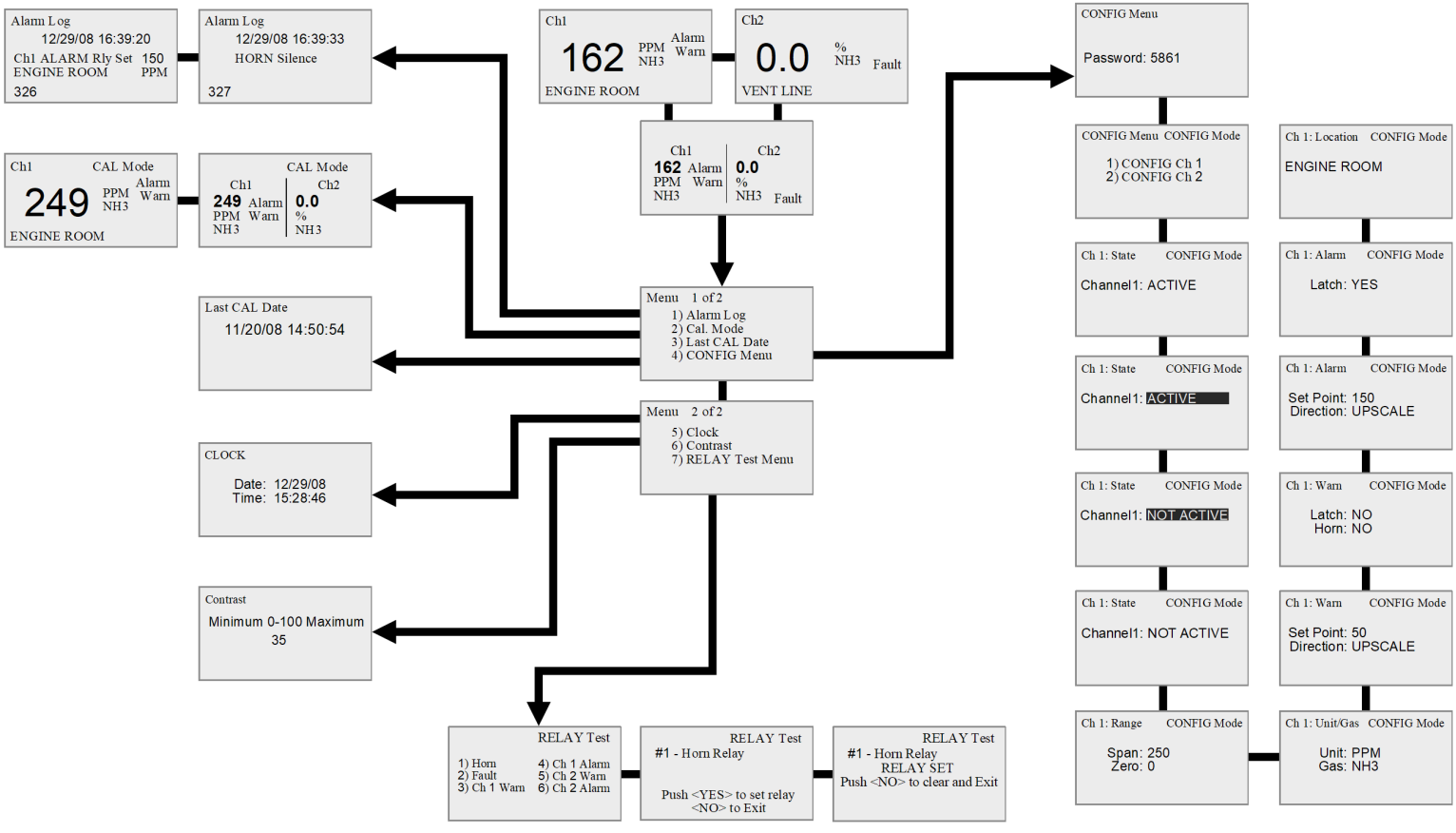
LCD Operator Interface

Key Functions: Below is a list of the common key functions used for the LCD operations:

MENU		to enter main menu
ESC		to go back to previous menu/sub-menu
ENTER	◄┘	to modify the programming fields
PREV	◄	to go back to previous screen
NEXT	►	to advance to next screen
YES/NO		when prompted and to accept configuration changes
Alphanumeric		for menu selections and to enter values and text
Up/Down	▲▼	to navigate drop-down lists during configuration



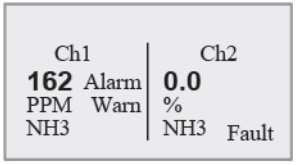
Menu Tree


Alarm Log
12/29/08 16:39:20
Ch1 ALARM Rly Set 150
ENGINE ROOM PPM
326
Alarm Log
12/29/08 16:39:33
HORN Silence
327
Ch1
162 PPM NH3 Alarm Warn
ENGINE ROOM
Ch2
0.0 % NH3 Fault
VENT LINE
Ch1 CAL Mode
249 PPM NH3 Alarm Warn
ENGINE ROOM
CAL Mode
Ch1 249 PPM NH3 Alarm Warn
Ch2 0.0 % NH3
Ch1 Ch2
162 PPM NH3 Alarm Warn
0.0 % NH3 Fault
Last CAL Date
11/20/08 14:50:54
Menu 1 of 2
1) Alarm Log
2) Cal. Mode
3) Last CAL Date
4) CONFIG Menu
Menu 2 of 2
5) Clock
6) Contrast
7) RELAY Test Menu
CLOCK
Date: 12/29/08
Time: 15:28:46
Contrast
Minimum 0-100 Maximum
35
RELAY Test
1) Horn
2) Fault
3) Ch 1 Warn
4) Ch 1 Alarm
5) Ch 2 Warn
6) Ch 2 Alarm
RELAY Test
#1 - Horn Relay
Push <YES> to set relay
<NO> to Exit
RELAY Test
#1 - Horn Relay
RELAY SET
Push <NO> to clear and Exit
CONFIG Menu
Password: 5861
CONFIG Menu CONFIG Mode
1) CONFIG Ch 1
2) CONFIG Ch 2
Ch 1: Location CONFIG Mode
ENGINE ROOM
Ch 1: State CONFIG Mode
Channel1: ACTIVE
Ch 1: Alarm CONFIG Mode
Latch: YES
Ch 1: State CONFIG Mode
Channel1: ACTIVE
Ch 1: Alarm CONFIG Mode
Set Point: 150
Direction: UPSCALE
Ch 1: State CONFIG Mode
Channel1: NOT ACTIVE
Ch 1: Warn CONFIG Mode
Latch: NO
Horn: NO
Ch 1: State CONFIG Mode
Channel1: NOT ACTIVE
Ch 1: Warn CONFIG Mode
Set Point: 50
Direction: UPSCALE
Ch 1: Range CONFIG Mode
Span: 250
Zero: 0
Ch 1: Unit/Gas CONFIG Mode
Unit: PPM
Gas: NH3

Navigating the Menu

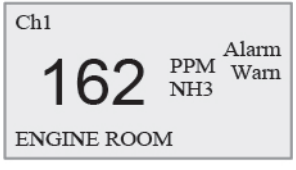
Normal operating mode

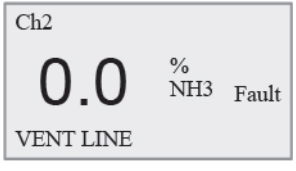
After system power-up, the normal operating screen will be displayed. It provides at-a-glance system status, showing real-time gas concentrations. In this example, channel 1 gas concentration has exceeded the warn and alarm setpoints. Channel 2 indicates a fault due to faulty wiring or a sensor signal less than 1 mA. The Warn, Alarm and Fault indications will flash until the conditions are cleared. PREV or NEXT to go to Channel View screens MENU to go to main menu screen



Channel view

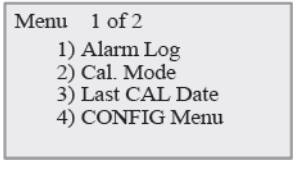
Channel view displays only the status of the channel being viewed. It also displays the room/zone location. Warn, Alarm and Fault indications will flash until the conditions are cleared. PREV or NEXT to view normal operating screen or next channel view screen. MENU to go to main menu screen.
An over-range condition is indicated by flashing of the full-scale reading. This also indicates that the sensor output is over 20 mA.



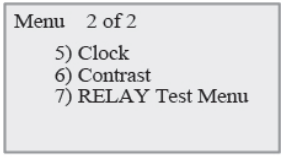


Main Menu

The main menu can be accessed by pressing the menu key at any time. Use the alpha-numeric keys to select a sub-menu, or NEXT to advance to the next menu screen. ESC to return to the normal operating screen.



Main Menu (cont.)

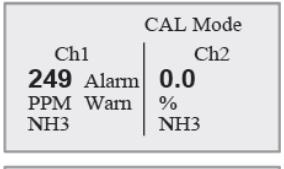


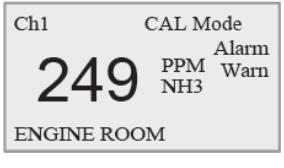
Alarm Log

The alarm log captures every event in chronological order, with the most recent event displayed first. 10,000 events can be stored, with the oldest events being automatically truncated, once the alarm log is full. Time/date stamp and event number are also displayed. PREV or NEXT to scroll. Hold button in for turbo-scroll. ESC to return to normal operating screen. MENU to return to main menu screen.

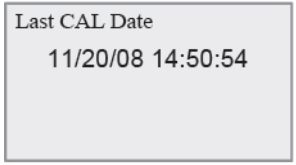
Cal Mode

Calibration mode allows for sensor calibration and maintenance by holding the relays in their normal state, preventing unwanted alarms. If the unit is left in Cal Mode, it will stay active for 48 hours and then return to normal operating mode. Make sure the concentration values have dropped below the warning and alarm setpoints before exiting. ESC to exit from Calibration mode and return to normal operating mode. The analog outputs are not affected by calibration mode and are allowed to increase to full scale.



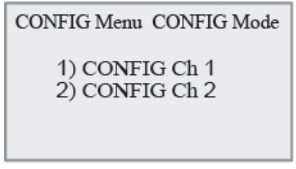


Last CAL Date
The last cal date shows the date and time at which the system was last calibrated. When six months has transpired from the last cal date, a Cal Due flag will appear indicating the sensors need to be calibrated., Holding the 6 key, and then pressing the 7 key will reset the Cal Date, once the sensors are calibrated.



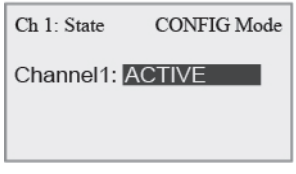
CONFIG Menu
The Configuration menu is password protected to prevent unauthorized personnel from making programming changes to the system. Enter the password (last 4 digits of CTI toll-free phone number) with the alphanumeric keys.

Enter number 1 or 2 to configure that channel (repeat same steps for both channels).

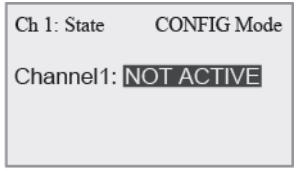


State: Allows for turning on or off a channel. For example, if a sensor is removed from the system, that channel should be changed to NOT ACTIVE.

To change this programming field, press ENTER to highlight the field.

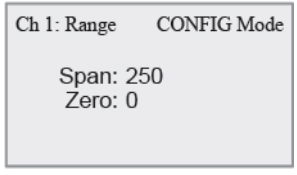


Use up or down arrows to select item.

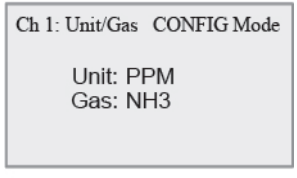


Press ENTER to select item.

Range: Allows adjustment of sensor zero and full scale range. (use alphanumeric keys to enter values)

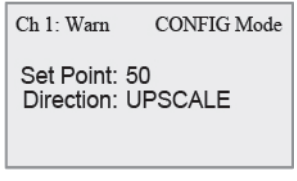


Unit/Gas: Use these fields to change the unit of measurement and gas type.



Warning Setpoint: Use this field to change the default warning setpoint

Direction: Use this field to change the default direction setting. For example, oxygen level monitoring may require downscale alarming.



Latch for Warn Relay: Allows warning relay of channel being programmed to latch. A latched relay must be cleared by pressing the RESET button, once the gas has cleared.

Horn: Allows horn relay and buzzer to activate during a Warn condition.

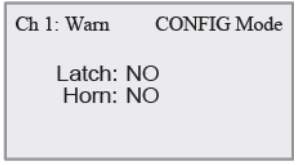
Alarm Setpoint: Use this field to change the default alarm setpoint.

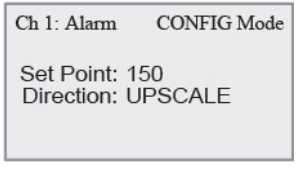
Direction: Use this field to change the default direction setting. For example, oxygen level monitoring may require downscale alarming.

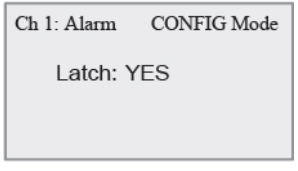
Latch for Alarm Relay: Allows alarm relay of channel being programmed to latch once activated. A latched relay must be cleared by pressing the RESET button, once the gas has cleared.

Location Name: Use this field to name the location of the sensor being programmed. To delete the existing label, ENTER and then PREV to delete characters.

ESC to return to Config menu.





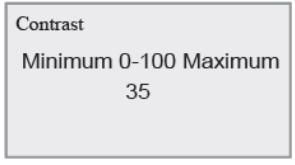


Clock

Set current time and date.

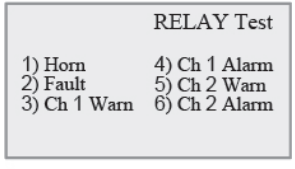
Contrast

Adjust contrast to allow for best viewing of LCD.

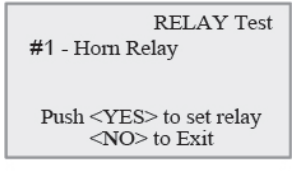


Relay Test

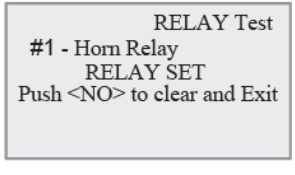
The relay test menu allows the relay outputs to be tested individually for correct output functions. Select the relay to be tested with the alphanumeric keys.



Press YES to Set relay. NO to exit.



Relay has been set. Press NO to clear the relay and exit once the relay output function has been verified.



ESC back to Config main menu. Press YES to save changes. Press ESC again to exit without saving changes.

Maintenance

All gas detection systems should be calibrated with certified calibration gas once every six months. At this interval, all alarm functions and outputs should be tested, verified and documented.

If sensor span or zero cannot be adjusted, the sensor may be approaching its end of life and must be replaced. Keep an operation log of all maintenance, calibrations and alarm events.

To clean the controller, use a mild cleaning solution and soft cloth.

In the unlikely event that the fuse needs to be replaced use a 3A, 250V, 5x20mm, slow-blow type fuse.

The operator interface has a backup lithium coin battery to run the real-time clock and retain configuration memory while the system is powered down. A low battery is indicated by a battery symbol on the display. If a low battery is indicated, replace old battery with a Type CR2450 Li Coin Cell.

Specifications

Input Power Requirements:
100-240 VAC, 1.3 A 50/60 Hz.

Output 24 VDC power available for sensors and audio/visual devices:
1.2A @ 40°C (104°F).
0.8A @ 50°C (122°F).
Dimensions: 11.3" high x 9.3" wide x 7" deep.

Weight: 6 lbs

Enclosure: Fiberglass Reinforced Polyester NEMA 4X, IP 66, with polyurethane gasket. Continuous stainless steel hinge. Captive screws in lid. For non-classified areas.

Temperature Range: 0°F to +122°F

Humidity Range: 0-95% RH condensing (100% intermittent), with proper conduit seals.

Sensor Inputs: (2) 4/20 mA, 350 Ohm input impedance.

Analog Outputs:

(2) Linear 4/20 mA (max input impedance: 700 Ohms).

Relay Outputs:
(6) SPDT, Form C dry contacts.
8 A @ 24 VDC or 10 A @ 240 VAC.

Terminal Block Plugs (Field Wiring):
26-12 AWG, torque 4 lbs-in.

User Interface: LCD illuminated screen. Graphic display screen: 128 x 64 pixels. 8 lines x 22 characters. 16 sealed membrane switches.

Certification:
ETL Listed: Conforms to UL 61010-1
Certified to CSA C22.2 No. 61010-1

Limited Warranty & Limitation of Liability

Calibration Technologies, Inc. (CTI) warrants this product to be free from defects in material and workmanship under normal use and service for a period of 2 years, beginning on the date of shipment to the buyer. This warranty extends only to the sale of new and unused products to the original buyer. CTI's warranty obligation is limited, at CTI's option, to refund of the purchase price, repair, or replacement of a defective product that is returned to a CTI authorized service center within the warranty period. In no event shall CTI's liability hereunder exceed the purchase price actually paid by the buyer for the Product.

This warranty does not include:

a) routine replacement of parts due to the normal wear and tear of the product arising from use;

b) any product which in CTI's opinion, has been misused, altered, neglected or damaged by accident or abnormal conditions of operation, handling or use;

c) any damage or defects attributable to repair of the product by any person other than an authorized dealer or contractor, or the installation of unapproved parts on the product

The obligations set forth in this warranty are conditional on:

a) proper storage, installation, calibration, use, maintenance and compliance with the product manual instructions and any other applicable recommendations of CTI;

b) the buyer promptly notifying CTI of any defect and, if required, promptly making the product available for correction. No goods shall be returned to CTI until receipt by the buyer of shipping instructions from CTI; and

c) the right of CTI to require that the buyer provide proof of purchase such as the original invoice, bill of sale or packing slip to establish that the product is within the warranty period.

THE BUYER AGREES THAT THIS WARRANTY IS THE BUYER'S SOLE AND EXCLUSIVE REMEDY AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. CTI SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, INCLUDING LOSS OF DATA, WHETHER ARISING FROM BREACH OF WARRANTY OR BASED ON CONTRACT, TORT OR RELIANCE OR ANY OTHER THEORY.

CALIBRATION TECHNOLOGIES INC.
GAS DETECTION SPECIALISTS

Intertek

GG2-DOC1-0
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