

Gas Monitoring Alarm System

## Manning GM-JR Feed-Through Configuration Instruction and Installation Manual

10/06

Release C

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# About This Document

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## World Wide Web

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Corporate	<a href="http://www.honeywell.com">www.honeywell.com</a>
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Manning Gas Detection	<a href="http://www.manningsystems.com">www.manningsystems.com</a>

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Contact us by telephone at the numbers listed below.

Organization		Phone Number
United States / Canada	Honeywell Analytics Inc. Lincolnshire, IL	1-800-538-0363
Service		1-800-321-6320
Asia Pacific	Honeywell Asia Pacific Inc. Hong Kong	(852) 23 31 9133
Europe	Honeywell PACE Brussels, Belgium	{32-2} 728-2711
Latin America	Honeywell International Inc. Lincolnshire, IL	1-847-955-8200






## Sales Information

Contact us at [detectgas@honeywell.com](mailto:detectgas@honeywell.com)

# Symbol Definitions

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The following table lists those symbols used in this document to denote certain conditions.

Symbol	Definition
	<b>ATTENTION:</b> Identifies information that requires special consideration.
	<b>TIP:</b> Identifies advise or hints for the user, often in terms of performing a task.
	<b>REFERENCE-EXTERNAL:</b> Identifies an additional source of information outside of this bookset.
	<b>REFERENCE-INTERNAL:</b> Identifies an additional source of information within this bookset.
	<b>CAUTION:</b> Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices. <b>CAUTION</b> symbol on the equipment refers the user to the product manual for additional information. The symbol appears next to required information in the manual.

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## Introduction

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This manual has been prepared to help in the use and installation of the Manning GM-JR Gas Monitoring Alarm System. This manual will convey the operating details of the alarm system, ensure proper installation, and demonstrate start-up and routine maintenance procedures.



**ATTENTION: This manual must be carefully followed by all individuals who have or will have the responsibility for using or servicing the sensor.** Warranties made by Honeywell Analytics with respect to this equipment will be voided if the equipment is not used and serviced in accordance with the instructions in this manual. If in doubt about a procedure, please contact Honeywell Analytics before proceeding.

# 1 System Description

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The Manning GM-JR is designed to accept a single 4/20 mA current input signal and provide a 20 segment vertical LED bargraph display which gives a visual indication of the gas concentration.

The unit has one relay which will trip when a field-adjustable gas concentration setpoint is exceeded, allowing the user to incorporate functions such as ventilation control, remote horns, security system monitoring, and automatic shutdown.

Designed to be highly reliable when properly installed, the relay is energized during normal operation, and a sensor fault monitoring circuit will indicate a fault and trip the relay if the signal falls below 1.4 mA.

The unit has a power-up delay feature that places the output in a normal condition for one minute to allow for sensor stabilization.

The Manning GM-JR will support all Manning sensors, including oxygen, which requires a down-scale alarm.

## Monitoring Options:

The Manning GM-JR can be mounted in its own NEMA 1 enclosure or in the door of most Manning sensor enclosures.

In the “Feed-Through Configuration,” the Manning GM-JR can operate anywhere between the sensor and the readout unit, including either a Manning readout or a customer-supplied computer. In this configuration, the Manning GM-JR is powered by the same cable which powers the sensor.

If ordered in the “Stand-Alone Configuration,” the Manning GM-JR requires a regulated 24 VDC power supply provided by the installer. Honeywell Analytics can supply a 120 VAC plug-in DC power supply to power the Manning GM-JR and associated sensor. In this case, ask for the “[Stand-Alone Configuration](#)” instruction manual.



**Attention: The Manning GM-JR is for use in non-classified areas only.**

# 1 System Description continued

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## System Specifications

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**Electrical Power:** 15-24 VDC regulated

**Signal Input:** 4/20 mA precision differential input allows this unit to be mounted remotely and powered from sensor power (internal resistance drop is 100 ohms).

**Maximum Current Draw:** 300 mA  
(In standard configuration and no upscale indication, the standby current draw is 100 mA)

**Display:** 20-segment LED bargraph, with a bottom segment that flashes to indicate power up delay, and lights continuously to indicate that the power is on

**Trip Setting:** 5% increments by use of shorting tab

**Alarm Indication:** Red LED

**Fault Indication:** White LED (at 1.4 mA or below)

**Accuracy:** LED readout provides 5% of full scale resolution. Trip accuracies at these 5% increments are within  $\pm 1\%$  of set point.

**Time Delays:** Alarm relay is 10 second delay on, 30 second delay for reset after alarm condition clears

**Power Up Time Delay:** On application of power the alarm relay will be held in the normal state for one (1) minute to allow the sensor to stabilize.

**Relay Alarm Output:** Relay is rated at 0.5 amp at 24 VDC or 24 VAC, 0.25 amp at 120 VAC. Relay will trip on Alarm and Fault conditions.



**Note: The relay is normally energized and monitored by a green LED for ease of troubleshooting.**

**Operating Ambient Temperature Range:** 0° F to +120° F

**Storage Temperature Range:** -40° F to +160° F

**Operating Humidity:** 5–95% Relative Humidity, non-condensing

**Enclosure:** NEMA 1, gasketed, 16-gauge steel

**Weight:** 3 lbs.

**Dimensions:** 6" high x 4" wide x 3.5" deep

**Cable Requirements:** #18/3 shielded cable (Belden #8770) for runs up to 1,000 feet. High current draw sensors may require larger cable. Contact Honeywell Analytics for details.



**Note: The Manning GM-JR is for use only in non-classified areas.**

# 2 Installation

## A Locating Manning GM-JR

When unpacking the unit, inspect all boxes and contents for shipping damage. If any screws or other metal parts are missing, they must be found to ensure that the printed circuit boards will not be damaged when power is applied.

The control unit is designed to be mounted on a solid (non-vibrating) wall through four holes in the two mounting flanges. While the physical location must be determined in part by local conditions, it is important to consider the following:

- Protect the Manning GM-JR from rain, snow, water sprays, cleaning crews, and physical damage.
- Mount the unit on a solid wall (non-vibrating) at eye level for convenience in taking readings, servicing, etc.
- The Manning GM-JR is **NOT** explosion proof. **DO NOT MOUNT** in a hazardous atmosphere.
- Operating temperature for the Manning GM-JR is 0° F to +120° F.
- Pre-punched holes are provided in the bottom of the enclosure for cable access. **DO NOT** drill holes in the top of the cabinet as this will void the warranty.
- If hole drilling is required, be sure to remove all metal filings.
- Mounting dimensions for the NEMA 1 enclosure are shown in Figure 1.



## B Wiring

Electrical wiring must comply with all applicable codes. Plant equipment that may be involved and operating conditions should be discussed with local operating personnel to determine if any special needs should be considered.

Nearly all start-up problems are due to improper wiring or monitor configuration. Please follow these guidelines carefully. Figure 2 presents a wiring diagram for the Manning GM-JR in the feed-through configuration.

### Relay Wiring:

The relay has Form C, dry contacts. Any required power source must be within the amp rating and fused or current limited to keep from damaging the contacts.

Relay wiring must be run in separate conduit from the sensor cable if the relay circuit is AC.

The maximum relay rating is 0.5 amp at 24 VDC or 24 VAC, or 0.25 amp at 120 VAC.

### Sensor Wiring:



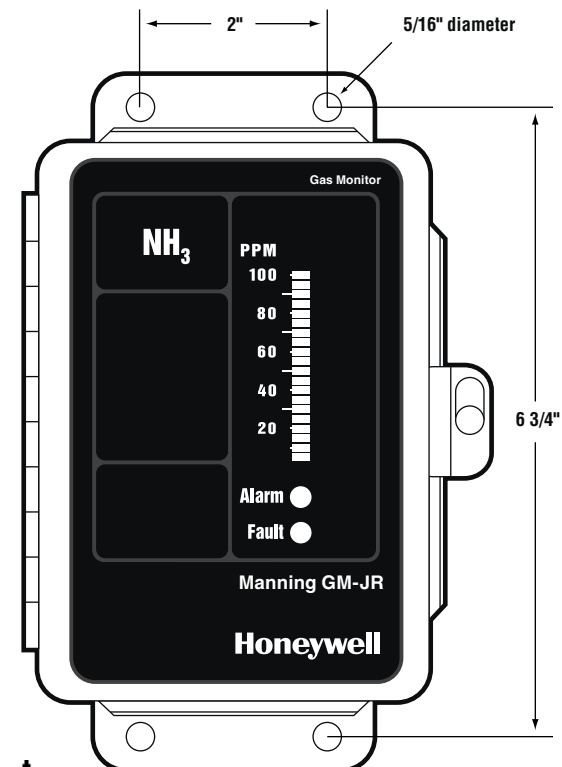
Respect minimum voltage requirements.

- See sensor manual for proper sensor cable.
- See sensor manual for proper sensor location.
- Never run AC circuits in the same conduit as the sensor cable.



**Note: Relays are energized in a non-alarmed condition so that a power loss in the Manning GM-JR will result in an alarm.**

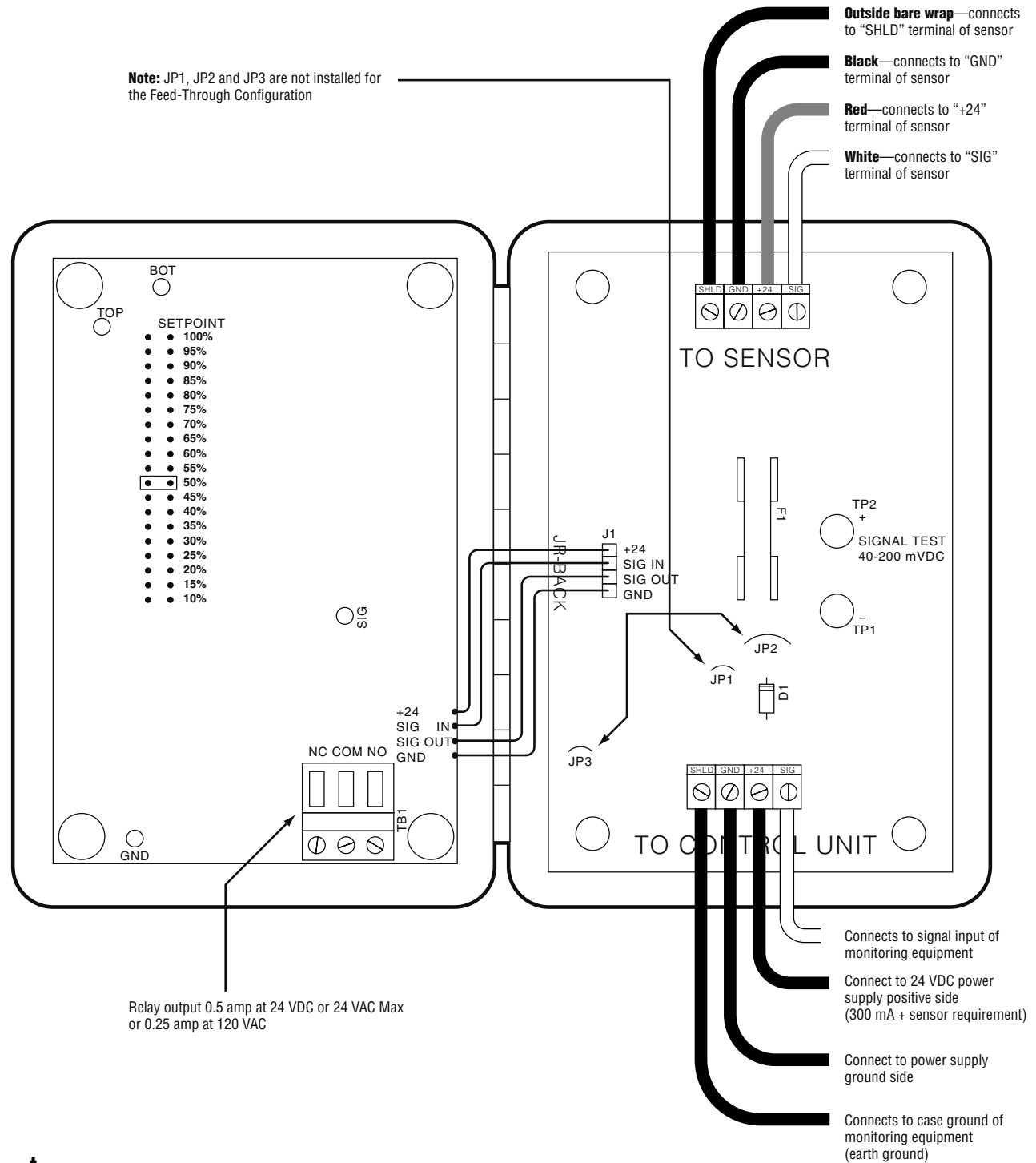
Figure 1: NEMA 1 enclosure mounting dimensions



Risk of electrical shock.

# 2 Installation continued

**Figure 2: Wiring diagram for the Manning GM-JR Gas Monitoring Alarm System – Feed-Through Configuration**



Risk of electrical shock.

**Note:** If the GM-JR is mounted in the sensor enclosure, the display board will be connected directly into the sensor pre-amp. The sensor terminal block will function the same as the bottom terminal block shown.



# 3 Operation

## A Display Panel

A 20-segment *Bargraph Display* indicates the gas concentration level. The bottom LED is always lit to indicate power to the display.

The bottom LED will flash during the one-minute power up delay, indicating that the relay is held in the normal condition to allow for sensor stabilization upon power up.

When flashing, the *Alarm* LED indicates the alarm level, as determined by the alarm setpoint, has been exceeded. An alarm condition will trip the relay after a 10 second time delay.

The *Fault* LED indicates a signal input of less than 1.4 mA. A fault condition will also trip the relay after a 10 second time delay.

## B Signal and Setpoints

The voltage between *TP1* and *TP2* indicates the current signal received from the sensor. The normal range is 40 mV to 200 mV, which corresponds with 4 mA to 20 mA (see Figure 3, Note 1).

The setpoint can be adjusted from 10% to 100% full scale in 5% increments using the shorting tab and jumper block on the back of the display circuit board as

shown in Figure 3, Note 2. If the shorting tab is not installed, the unit will go into alarm.

After setpoint adjustment, always expose sensor to the gas being monitored and verify that the alarm light triggers at the desired concentration as displayed by the bargraph.

## c Start-Up Procedures

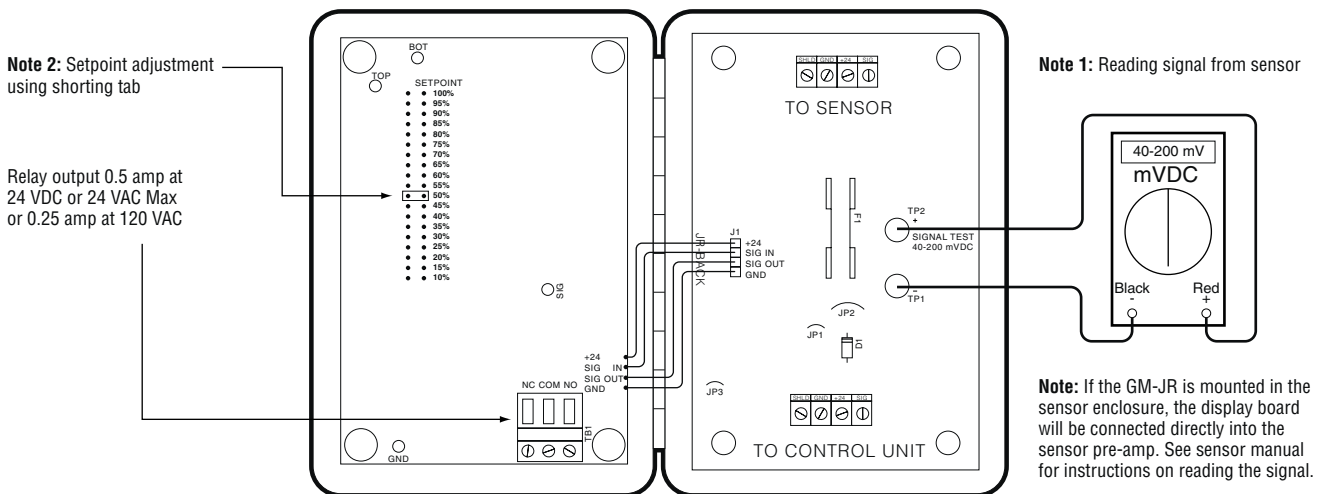
Before applying power, make a final check of all wiring for continuity, shorts, grounds, etc. It is usually best to disconnect external alarms and other equipment from the unit until the initial start-up procedures are completed.



After power-up, allow 24 hours for the system to stabilize before testing the sensor. Because sensors are normally located at a distance from the monitoring unit, 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.

**Start-Up Test:** One person exposes the sensor to a small amount of the gas that is being monitored. The second person stays at the monitoring unit to determine that the sensor, when exposed to the gas fumes, is connected to the proper input, responds, and causes appropriate alarm functions.

**Figure 3: Setpoint adjustment and signal reading on the Manning GM-JR**



Risk of electrical shock.

# 3 Operation continued

## D Troubleshooting



Risk of electrical shock.

The unit will indicate a fault if the signal is less than 14 mV between *TP1* and *TP2* (see Figure 4, Note 1). A signal greater than 20 mA (200 mV) must be considered a high gas concentration.

Some Manning sensors are configured to send a signal of 0.5 mA if a sensor fault exists. If the voltage between *TP1* and *TP2* = 5 mV, this indicates a properly wired sensor is in a fault condition. Proceed to investigate the sensor.

If the voltage between *TP1* and *TP2* = 0.0 V, this indicates no signal current is flowing. Check monitoring equipment connections and configuration. Input impedance must be 250 ohms or less.

The relay has a green LED in series with its coil (see Figure 4, Note 2). If this LED is on, this indicates that the relay is energized and contacts will be in the normal position. If this LED is off, the contacts will be in the tripped condition.

Power supply voltage should be checked at +24 on the control unit input terminal block (see Figure 4, Note 3). The voltage should be 15–24 VDC.

The Manning GM-JR and the connected sensor are powered from the same supply. The supply must be capable of supplying 300 mA at 24 VDC for the Manning GM-JR in addition to the sensor current requirement (see sensor manual).



The setpoint shorting tab must be installed (see Figure 4, Note 4). If it is removed, the unit will go into an alarm condition after the 10 second delay.

If questions arise, call Honeywell Analytics.

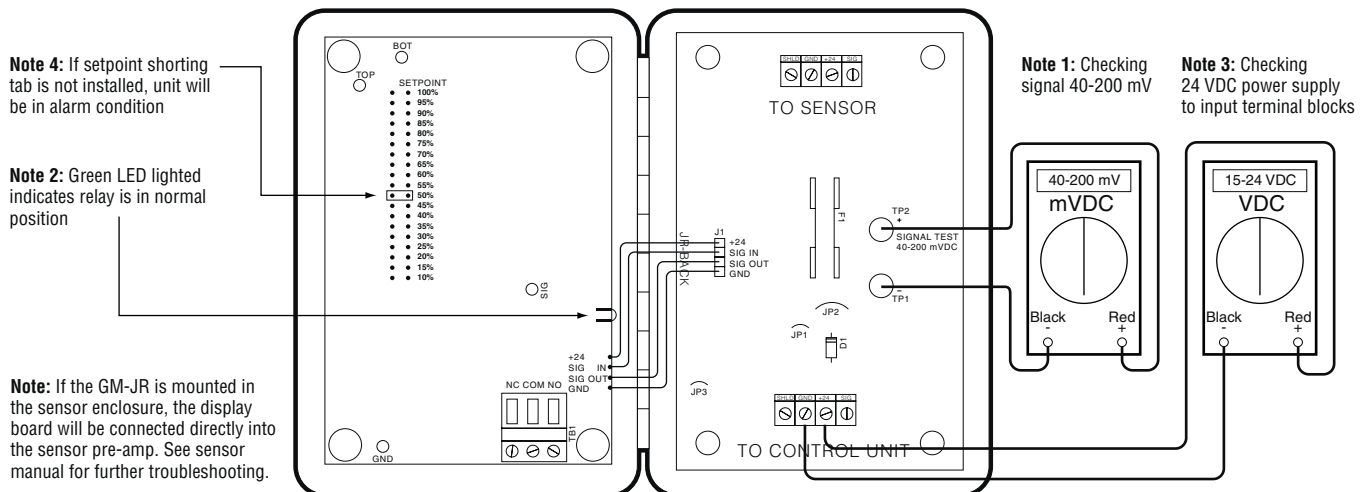
## E Maintenance

The Manning GM-JR is designed for long life and high reliability. Honeywell Analytics recommends checking signal voltages monthly and logging them. Additionally, the sensor being monitored should be exposed to the target gas on a monthly basis while all alarm functions are verified at the Manning GM-JR. This will test the sensor and any equipment connected to the relays in addition to the Manning GM-JR.

## F Replacement Parts

For replacement parts, contact Honeywell Analytics. Be sure to give serial number and model number of unit.

**Figure 4: Troubleshooting the Manning GM-JR Gas Monitoring Alarm System**



# 4 Limited Warranty

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## 1. Limited Warranty

Honeywell Analytics, Inc. warrants to the original purchaser and/or ultimate customer ("Purchaser") of Manning products ("Product") that if any part thereof proves to be defective in material or workmanship within eighteen (18) months of the date of shipment by Honeywell Analytics or twelve (12) months from the date of first use by the purchaser, whichever comes first, such defective part will be repaired or replaced, free of charge, at Honeywell Analytics' discretion if shipped prepaid to Honeywell Analytics at 405 Barclay Blvd., Lincolnshire, IL 60069, in a package equal to or in the original container. The Product will be returned freight prepaid and repaired or replaced if it is determined by Honeywell Analytics that the part failed due to defective materials or workmanship. The repair or replacement of any such defective part shall be Honeywell Analytics' sole and exclusive responsibility and liability under this limited warranty.

## 2. Exclusions

- A. If gas sensors are part of the Product, the gas sensor is covered by a twelve (12) month limited warranty of the manufacturer.
- B. If gas sensors are covered by this limited warranty, the gas sensor is subject to inspection by Honeywell Analytics for extended exposure to excessive gas concentrations if a claim by the Purchaser is made under this limited warranty. Should such inspection indicate that the gas sensor has been expended rather than failed prematurely, this limited warranty shall not apply to the Product.
- C. This limited warranty does not cover consumable items, such as batteries, or items subject to wear or periodic replacement, including lamps, fuses, valves, vanes, sensor elements, cartridges, or filter elements.

## 3. Warranty Limitation and Exclusion

Honeywell Analytics will have no further obligation under this limited warranty. All warranty obligations of Honeywell Analytics are extinguishable if the Product has been subject to abuse, misuse, negligence, or accident or if the Purchaser fails to perform any of the duties set forth in this limited warranty or if the Product has not been operated in accordance with instructions, or if the Product serial number has been removed or altered.

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