



INSTRUMENTS

65-2380 Molecular Property Spectrometer™ Combustible Gas Detector Operator's Manual

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WARNING

Read and understand this instruction manual before operating transmitter. Improper use of the transmitter could result in bodily harm or death.

Periodic calibration and maintenance of the transmitter is essential for proper operation and correct readings. Please calibrate and maintain this transmitter regularly! Frequency of calibration depends upon the type of use you have and the sensor types. For most applications, typical calibration frequencies are between 6 and 12 months but can be more often or less often based on your usage.

Product Warranty

RKI Instruments, Inc. warrants gas alarm equipment sold by us to be free from defects in materials, workmanship, and performance for a period of one year from date of shipment from RKI Instruments, Inc. Any parts found defective within that period will be repaired or replaced, at our option, free of charge. This warranty does not apply to those items which by their nature are subject to deterioration or consumption in normal service, and which must be cleaned, repaired, or replaced on a routine basis. Examples of such items are:

- Absorbent cartridges
- Pump diaphragms and valves
- Fuses
- Batteries
- Filter elements

Warranty is voided by abuse including mechanical damage, alteration, rough handling, or repair procedures not in accordance with the operator's manual. This warranty indicates the full extent of our liability, and we are not responsible for removal or replacement costs, local repair costs, transportation costs, or contingent expenses incurred without our prior approval.

THIS WARRANTY IS EXPRESSLY IN LIEU OF ANY AND ALL OTHER WARRANTIES AND REPRESENTATIONS, EXPRESSED OR IMPLIED, AND ALL OTHER OBLIGATIONS OR LIABILITIES ON THE PART OF RKI INSTRUMENTS, INC. INCLUDING BUT NOT LIMITED TO, THE WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT SHALL RKI INSTRUMENTS, INC. BE LIABLE FOR INDIRECT, INCIDENTAL, OR CONSEQUENTIAL LOSS OR DAMAGE OF ANY KIND CONNECTED WITH THE USE OF ITS PRODUCTS OR FAILURE OF ITS PRODUCTS TO FUNCTION OR OPERATE PROPERLY.

This warranty covers instruments and parts sold to users by authorized distributors, dealers, and representatives as appointed by RKI Instruments, Inc.

We do not assume indemnification for any accident or damage caused by the operation of this gas monitor, and our warranty is limited to the replacement of parts or our complete goods.

Table of Contents

Overview	5
Specifications	5
Applications	6
Description	7
MPS Detector	8
Junction Box	8
Amplifier	8
Installation	10
Mounting the Combustible Gas Transmitter	10
Wiring the Combustible Gas Transmitter	11
Startup	13
Introducing Incoming Power	13
Setting the Zero Reading	13
Maintenance	14
Preventive Maintenance	14
Troubleshooting	15
Replacing the MPS LEL Sensor	16
Calibration Frequency	18
Calibration	18
Materials	18
Preparing for Calibration	19
Setting the Zero Reading	20
Setting the Response Reading	20
Returning to Normal Operation	21
Parts List	22

Overview

This manual describes the 65-2380 MPS combustible gas detector. This manual also describes how to install, start up, maintain, and calibrate the detector when used with a gas monitoring controller. A parts list at the end of this manual lists replacement parts and accessories for the combustible gas detector.

Specifications

Table 1 specifies the detection ranges and accuracy for each target gas the MPS sensor can detect.

Table 1: Detection Ranges and Accuracy

Target Gas	Formula	Detection Range	Accuracy at 50% LEL
Butane	C ₄ H ₁₀	0 - 100% LEL	± 5% LEL
Ethane	C ₂ H ₆	0 - 100% LEL	± 5% LEL
Hydrogen	H ₂	0 - 100% LEL	± 5% LEL
Isobutane	HC(CH ₃) ₃	0 - 100% LEL	± 5% LEL
Isobutylene	C ₄ H ₈	0 - 100% LEL	± 5% LEL
Isopropanol	C ₃ H ₈ O	0 - 100% LEL	± 10% LEL
Methane	CH ₄	0 - 100% LEL	± 3% LEL
Methyl Ethyl Ketone	C ₄ H ₈ O	0 - 100% LEL	± 5% LEL
Octane	C ₈ H ₁₈	0 - 100% LEL	± 5% LEL
Pentane	C ₅ H ₁₂	0 - 100% LEL	± 5% LEL
Propane	C ₃ H ₈	0 - 100% LEL	± 6% LEL
Propylene	C ₃ H ₆	0 - 100% LEL	± 5% LEL
Toluene	C ₇ H ₈	0 - 100% LEL	± 12% LEL
Xylene	C ₈ H ₁₀	0 - 100% LEL	± 12% LEL

NOTE: The MPS sensor will respond to other combustible gases, but the accuracy has only been determined for these 14 gases.

Table 2: Specifications

Area Classification	Explosion-proof for Class I, Groups B, C, and D
Operating Temperature Range	-20°C to +50°C (-4°F to +122°F)
Humidity Range	0 - 100% RH (non-condensing)
Pressure Range	80 - 120 kPa
Sampling Method	Diffusion
Response Time	T90 in 25 seconds
Dead Bands	<ul style="list-style-type: none">• Methane (CH₄): 3% LEL• All other gases: 5% LEL <p>NOTE: If the connected controller's dead band setting is 2% LEL for an MPS channel, a reading will not be displayed until it has exceeded the MPS sensor's internal dead band.</p>

WARNING: When using the 65-2380, you must follow the instructions and warnings in this manual to assure proper and safe operation of the 65-2380 and to minimize the risk of personal injury. Be sure to maintain and periodically calibrate the 65-2380 as described in this manual.

Applications

The MPS combustible detector is most effective in the following applications:

- High concentrations of hydrogen sulfide (H₂S) or silicones present where sensor poisoning is a common problem
- High-humidity environments where catalytic or IR sensors may not hold up
- Environments more likely to have mixtures of hydrocarbons present

Description

The 65-2380 combustible gas transmitter utilizes a Molecular Property Spectrometer (MPS) sensor. The MPS sensor is immune to poisons, can be used in high humidity, and does not require calibration as often as catalytic combustible sensors. It also responds accurately to 14 different combustible gases.

This section describes the components of the combustible gas transmitter. The transmitter is a 4 - 20 mA type detector head. It consists of the combustible gas detector, amplifier, and junction box.

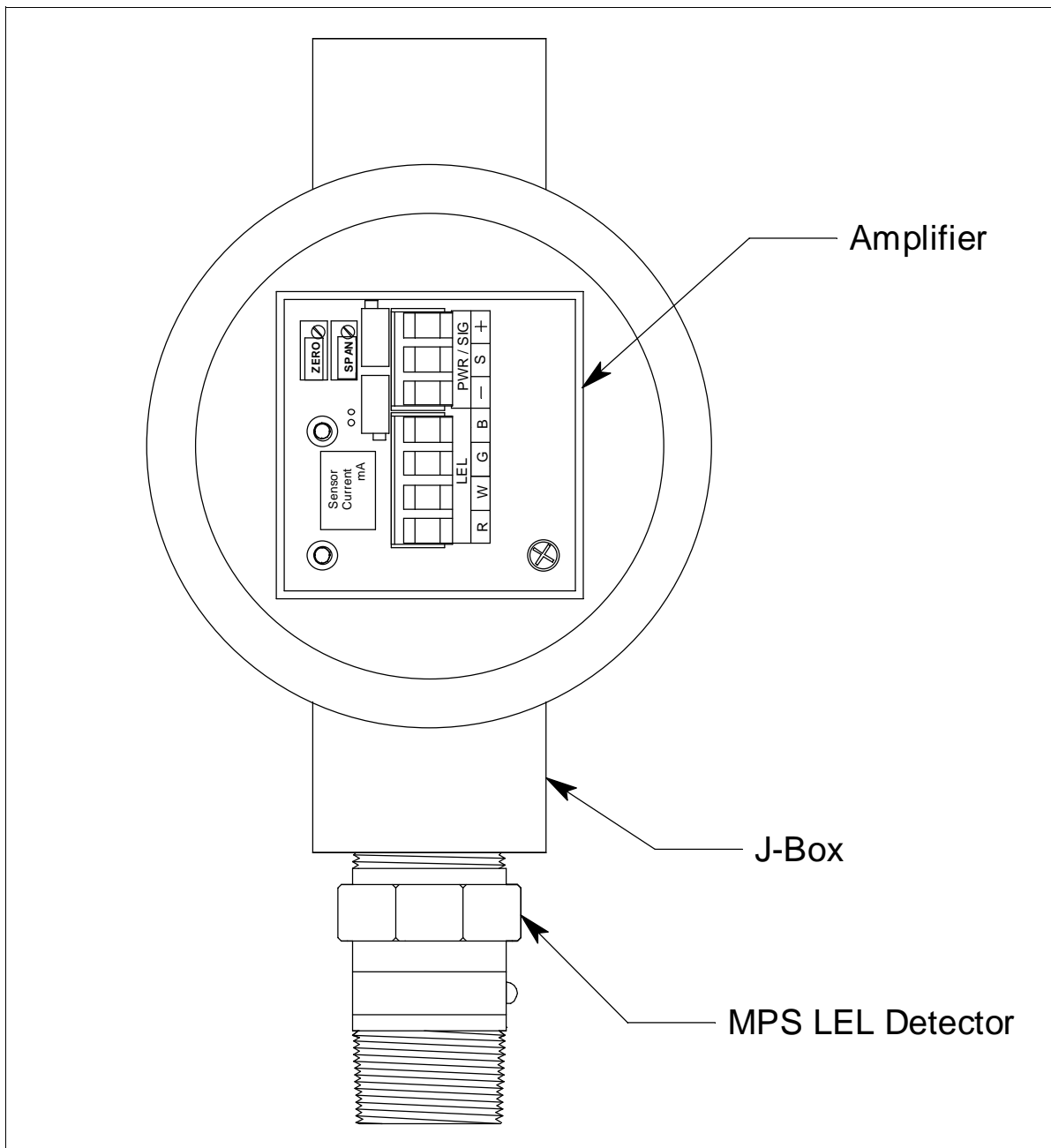


Figure 1: Component Locations

MPS Detector

The MPS LEL detector is made up of the MPS combustible gas LEL detector housed and encapsulated in a pipe nipple. The pipe nipple has 3/4 NPT threads on each end and a 1-1/4 inch hex that allows removal or installation of the detector with a wrench. A porous flame arrestor coated with a hydrophobic film that repels liquids is on one end of the detector and allows sample gas to enter the detector. Four color coded leads, red, white, green, and black, extend from the other end of the detector. Use the leads when connecting the detector to the terminal block in the junction box.

Junction Box

Use the junction box to install the transmitter at a mounting site that is remote from the controller. The junction box protects the amplifier and wiring connections made to the amplifier. Use the top 3/4 NPT conduit hub to connect wiring from the amplifier to the controller. Use the cover on the front of the junction box to access the interior of the junction box. The detector and amplifier are factory installed in the junction box. Three spacers installed on the back of the junction box control the distance of the junction box from a mounting surface and ensure that there is enough room to install a calibration cup on the detector during calibration.

Amplifier

The amplifier converts the electrical output from the detector to a 4 - 20 mA signal that corresponds to the detection range and transmits the signal to a gas monitoring controller. A foam gasket that orients the amplifier and keeps it from rotating is installed on the bottom of the amplifier. A label on the amplifier indicates the detector drive current. The amplifier includes the detector terminal strip, controller terminal strip, span pot, zero pot, and test points (see Figure 2).

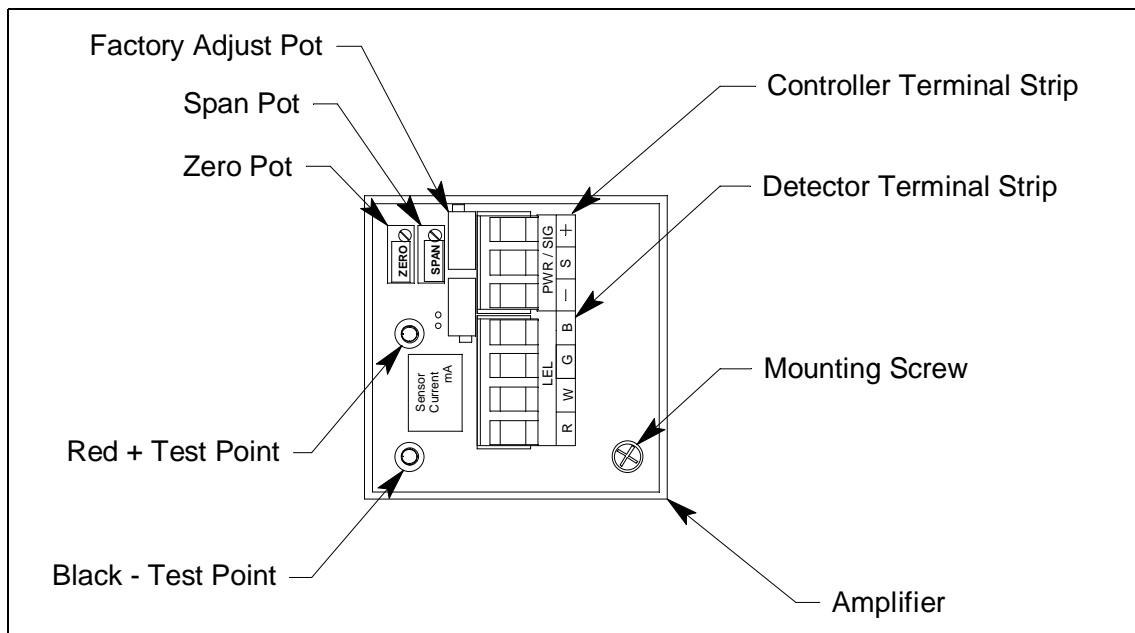


Figure 2: Amplifier Component Location

Controller Terminal Strip

The controller terminal strip is a three position plug-in style terminal strip located near the top of the amplifier. Use the controller terminal strip to wire the combustible gas transmitter to a controller.

Detector Terminal Strip

The detector terminal strip is a four position plug-in style terminal strip located below the controller terminal strip. Use the detector terminal strip to connect the MPS LEL detector to the amplifier.

NOTE: The MPS LEL detector is factory-wired to the detector terminal strip. See “Wiring the Combustible Gas Detector to a Controller” on page 11 for all wiring procedures related to the transmitter.

Zero Pot

The zero pot is located in the upper left corner of the amplifier (see Figure 2). Use a small flat blade screwdriver to turn the zero pot’s adjustment screw and adjust the amplifier’s zero (fresh air) output during the start-up and calibration procedures. Turn the adjustment screw clockwise to increase the zero output and counterclockwise to decrease the zero output.

Span Pot

The span pot is located to the right of the zero pot (see Figure 2). Use a small flat blade screwdriver to turn the span pot’s adjustment screw and adjust the amplifier’s gas response output during the calibration procedure. Turn the adjustment screw clockwise to increase the gas response and counterclockwise to decrease the gas response.

CAUTION: *The amplifier includes two additional potentiometers. They are factory-set. Do not adjust them.*

Test Points

The test points are on the left side of the amplifier (see Figure 2). The test points produce a 100 mV to 500 mV output that corresponds to the transmitter’s 4 to 20 mA output. Use the test points and a voltmeter to measure the amplifier’s output during the start-up and calibration procedures. The black test point in the lower left corner is the negative (-) test point and the red test point below the zero pot is the positive (+) test point.

Installation

This section describes procedures to mount the combustible gas transmitter in the monitoring environment and wire the transmitter to a controller.

Mounting the Combustible Gas Transmitter

1. Select a mounting site that is representative of the monitoring environment. Consider the following when you select the mounting site.
 - Select a site where the transmitter is not likely to be bumped or disturbed. Make sure there is sufficient room to perform start-up, maintenance, and calibration procedures.
 - Select a site where the target gas is likely to be found first. For lighter gases, mount the detector near the ceiling; for heavier gases, mount the detector near the floor.

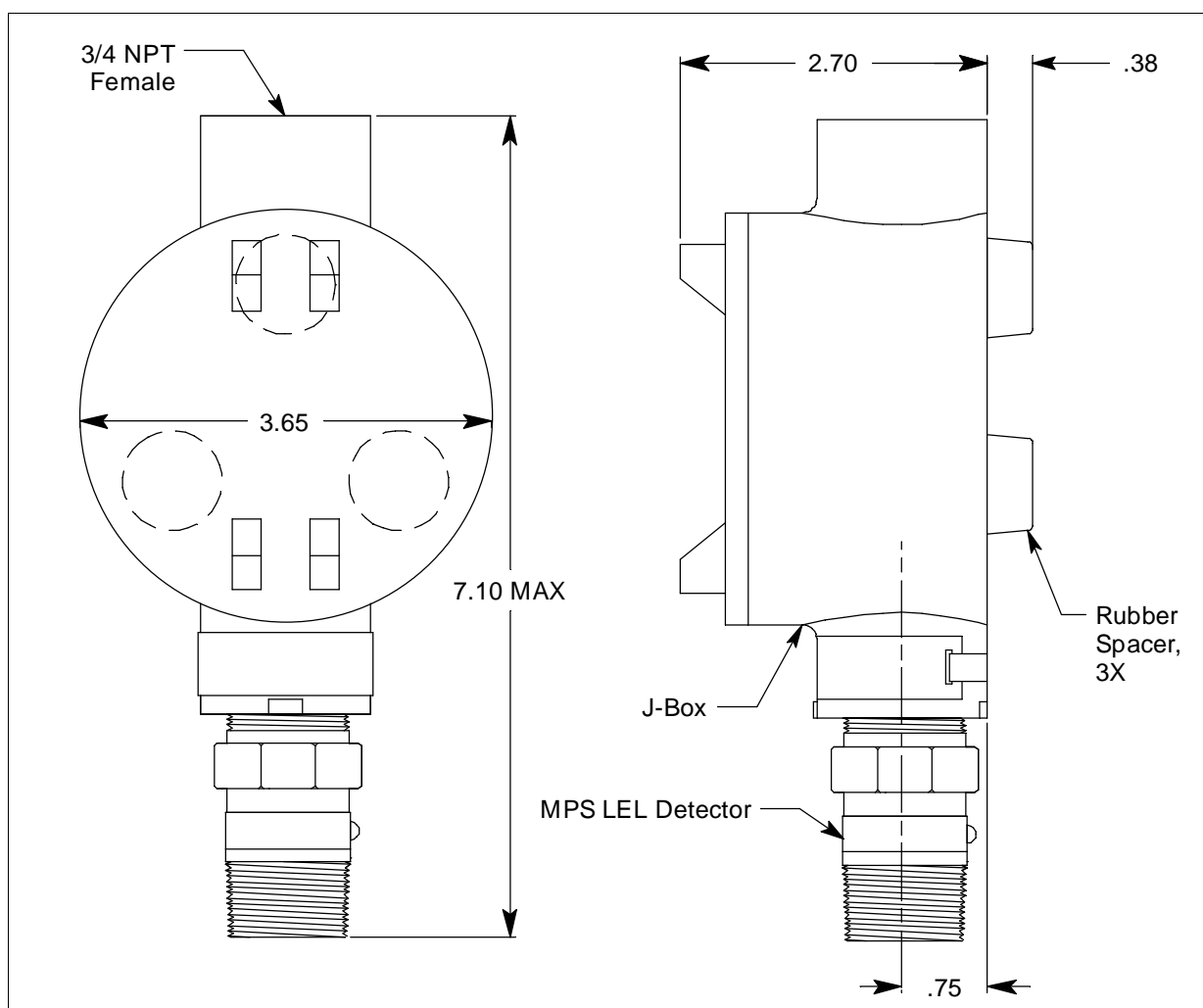


Figure 3: Mounting the Combustible Gas Transmitter

2. At the monitoring site you select, hang or mount the junction box with the detector facing down (see Figure 3).

Wiring the Combustible Gas Detector to a Controller

WARNING: *Always verify that the power to the controller is off before you make wiring connections.*

1. Turn off the controller.
2. Turn off or unplug power to the controller.
3. Remove the junction box cover.
4. The detector leads are factory wired. Verify that the detector leads are wired to the amplifier's detector terminal strip as shown in Figure 11.
5. To gain access to a plug-in terminal strip for wiring, pull it out of its socket by grasping the terminal strip and pulling. The detector strip is keyed so that the controller and detector terminal strips cannot be reversed inadvertently.
6. Guide a three-conductor, shielded cable, or three wires in conduit through the top conduit hub of the junction box.
7. Pull out the controller terminal strip, and connect the three wires to the terminal strip as follows (see Figure 11).
 - Connect the positive wire to the **PWR/SIG “+”** terminal.
 - Connect the signal wire to the **PWR/SIG “S”** terminal.
 - Connect the negative wire to the **PWR/SIG “-”** terminal.

CAUTION: *If shielded cable is used, leave the cable shield's drain wire disconnected and insulated at the transmitter. You will connect the opposite end of the cable's drain wire to the controller's chassis (earth) ground.*

8. Reinstall the controller terminal strip into its socket.
9. Secure the junction box cover to the junction box.
10. Route the cable or wires leading from the combustible gas transmitter through one of the conduit hubs at the controller housing.

CAUTION: *Do not route power and transmitter wiring through the same controller conduit hub. The power cable may disrupt the transmission of the transmitter signal to the controller.*

11. Connect the wires to the applicable detector/transmitter terminal strip at the controller as shown in Figure 11.

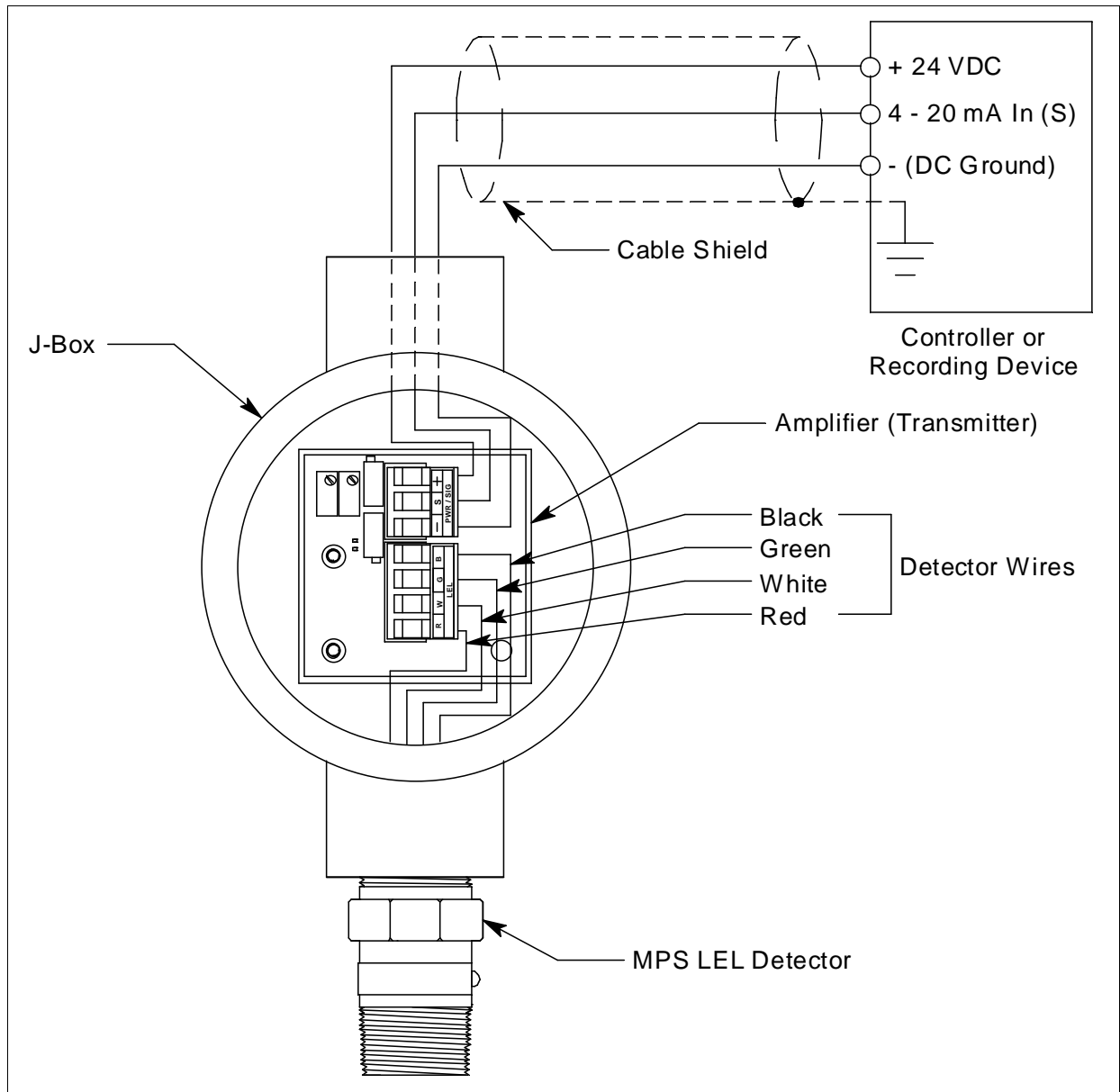


Figure 4: Wiring the Combustible Gas Transmitter to a Controller

12. If shielded cable is used, connect the cable's drain wire to an available chassis (earth) ground at the controller. RKI controllers typically have a ground stud that can be used to ground the cable's drain wire.

Start Up

This section describes procedures to start up the combustible gas transmitter and place the transmitter into normal operation.

NOTE: Ensure the detector starts up in the background gas it will operate in (e.g. fresh air or N₂).

Introducing Incoming Power

1. Complete the installation procedures described earlier in this manual.
2. Verify that the power wiring to the controller is correct and secure. Refer to the controller operator's manual.
3. Turn on or plug in power to the controller, then turn on the controller.
4. Verify that the controller is on and operating properly. Refer to the controller operator's manual.
5. Allow the combustible detector to warm up for at least 2 minutes before proceeding to the next section, "Setting the Zero Reading".

CAUTION: *Do not expose the sensor to combustible gas during the 2-minute warmup period. Exposing the sensor to gas during this period will result in a failure condition.*

Setting the Zero Reading

WARNING: *Do not remove the junction box cover while the circuits are energized unless the area is determined to be non-hazardous. Keep the junction box cover tightly closed during operation.*

WARNING: *This manual assumes the MPS sensor is operating in a background of fresh air. If the MPS sensor is not operating in a fresh air background (e.g. a monitoring background of nitrogen or argon), consult RKI Instruments Inc. before calibrating the sensor.*

The procedure below describes setting the detector's zero reading using a calibration kit that includes a calibration cup, zero air calibration gas, sample tubing, and a fixed flow regulator with an on/off knob. RKI Instruments, Inc. recommends using a 0.5 LPM (liters per minute) fixed flow regulator.

1. Unscrew and remove the junction box cover from the junction box.
2. Set a voltmeter to measure in the millivolt (mV) range.

3. Plug the voltmeter leads into the test points on the amplifier. Plug the positive lead into the red (+) test point; plug the negative lead into the black (-) test point.
4. Screw the calibration cup onto the bottom of the MPS LEL detector.
5. Screw the zero air cylinder onto the regulator.

NOTE: If you can verify that the combustible gas transmitter is operating in a fresh air environment (environment with a normal oxygen content of 20.9% and free of combustible and toxic gases), you do not need to apply zero air before adjusting the zero reading.

6. Use the calibration kit sample tubing to connect the regulator to the calibration cup.
7. Turn the regulator's on/off knob counterclockwise to open it.
8. Allow the gas to flow for 1 minute.
9. Verify a voltmeter reading of 100 mV (± 2 mV).
10. If necessary, use a small flat-blade screwdriver to adjust the zero pot until the voltmeter reading is 100 mV (± 2 mV).
11. Turn the regulator's on/off knob clockwise to close it.
12. Unscrew the calibration cup from the detector.
13. Unscrew the regulator from the zero air calibration cylinder. For convenience, leave the sample tubing connected to the regulator and the calibration cup.
14. Store the components of the calibration kit in a safe and convenient place.
15. Remove the voltmeter leads from the test points.
16. Secure the junction box cover to the junction box.

Maintenance

This section describes maintenance procedures. It includes preventive maintenance, troubleshooting, and component replacement procedures.

Preventive Maintenance

This section describes a preventive maintenance schedule to ensure the optimum performance of the combustible gas transmitter. It includes daily and biannual procedures.

Daily

Verify a display reading of 0% LEL at the controller. Investigate significant changes in the display reading.

Biannually

Calibrate the combustible gas transmitter as described in "Calibration" on page 18 of this manual.

Troubleshooting

The troubleshooting guide describes symptoms, probable causes, and recommended action for problems you may encounter with the combustible gas transmitter.

NOTE: This troubleshooting guide describes transmitter problems only. See the controller operator's manual for problems you may encounter with the controller.

Table 3: Troubleshooting the Combustible Gas Transmitter

Condition	Symptom(s)	Probable Causes	Recommended Action
Fail Condition	<ul style="list-style-type: none"> Controller indicates a fail condition. 	<ul style="list-style-type: none"> The transmitter wiring is disconnected or misconnected. The transmitter's zero reading is low enough to cause a fail condition. The detector was exposed to gas during its 2 minute warmup period. The transmitter is malfunctioning. 	<ol style="list-style-type: none"> Verify that the transmitter wiring is correct and secure. Calibrate the transmitter. Restart the controller and ensure that the detector's environment is free of combustible gas during the warmup period.* If the fail condition continues, replace the detector. If the fail condition continues, contact RKI for further instruction.
Slow or No Response/Difficult or Unable to Calibrate	<ul style="list-style-type: none"> Unable to accurately set the zero or response reading during calibration. Transmitter requires frequent calibration. <p>NOTE: Under "normal" circumstances, the transmitter requires calibration once every 6 months.</p> <p>NOTE: Some applications may require a more frequent calibration schedule.</p>	<ul style="list-style-type: none"> The calibration cylinder is low, out-dated, or defective. The calibration gas flow rate is too low. The calibration gas is not an appropriate concentration. The transmitter is malfunctioning. 	<ol style="list-style-type: none"> Verify that the calibration cylinder contains an adequate supply of a fresh test sample. Verify that the regulator used for calibration is a 0.5 LPM regulator. Verify that the calibration gas concentration is appropriate for the transmitter. The concentration should be in the detection range, preferably about half of the detection range. If the calibration/response difficulties continue, replace the detector. If the calibration/response difficulties continue, contact RKI for further instruction.

* If a fresh air environment cannot be guaranteed, apply zero air during the warmup period.

Replacing the MPS LEL Detector

1. Turn off the controller.
2. Turn off or unplug power to the controller.
3. Remove the junction box cover.
4. Remove the detector terminal strip from its socket.
5. Disconnect the detector leads from the detector terminal strip. Note the position of the color-coded leads as you remove them.
6. Unscrew the detector from the junction box.
7. Guide the detector leads of the replacement detector through the bottom conduit hub of the junction box, then screw the mounting threads of the detector into the conduit hub. If necessary for environmental conditions, apply thread sealant or Teflon tape to the hub and/or detector threads to seal them.
8. Connect the detector leads to the detector terminal strip as shown in Table 4 below and Figure 11 on page 12 of this manual.

Table 4: Reconnecting the Combustible Gas Detector to the Amplifier

Detector Lead	Detector Terminal Strip
Red	LEL “R”
White	LEL “W”
Green	LEL “G”
Black	LEL “B”

9. Reinstall the detector terminal strip into its socket.
10. Reinstall the junction box cover.
11. Turn on or plug in power to the controller.
12. Turn on the controller and place it into normal operation.

CAUTION: *Allow the replacement detector to warm up for at least 2 minutes before you continue with the next step.*

13. Calibrate the transmitter as described in “Calibration” on page 18 of this manual.

Replacing the Amplifier

1. Turn off the controller.
2. Turn off or unplug power to the controller.
3. Remove the junction box cover.
4. Unplug the detector terminal strip and controller terminal strip from their sockets. You may leave the wires connected to the terminal strips.
5. Unscrew and remove the screw with the flat and lock washers that secures the amplifier to the junction box.
6. Remove the old amplifier.
7. Place the new amplifier in the same position as the old amplifier. A foam gasket that orients the amplifier and keeps it from rotating is installed on the bottom of the amplifier. Make sure the amplifier is seated flat in the junction box.
8. Install the new amplifier into the junction box with the screw, lock washer, and flat washer you removed in Step 5 above.
9. Install the detector and controller terminals strips into their sockets on the new amplifier as shown in Figure 11 on page 12 of this manual. If controller leads or detector leads were removed during this procedure, refer to Table 5 and Table 6 below.

Table 5: Reconnecting the Amplifier to the Controller

Amplifier Controller Terminal Strip	Controller Transmitter Terminal Strip (typical)
PWR/SIG “-”	- (DC -)
PWR/SIG “S”	S (4 - 20 mA In)
PWR/SIG “+”	+ 24V

Table 6: Reconnecting the LEL Detector to the Amplifier

Amplifier Detector Terminal Strip	Detector Lead
DETECTOR “R”	RED
DETECTOR “W”	WHT
DETECTOR “G”	GREEN
DETECTOR “B”	BLK

NOTE: When a transmitter is first powered up with a new amplifier, the initial output may be either high or below zero depending on the setting of the zero pot. Be sure to make arrangements so that this does not cause unwanted alarms.

10. Turn on power to the controller.
11. Turn on the controller and place it into normal operation.
12. Allow the transmitter to warm-up for 5 minutes.
13. Calibrate the transmitter as described in “Calibration” on page 18 of this manual.

Calibration Frequency

Although there is no particular calibration frequency that is correct for all applications, a calibration frequency of every 6 months is adequate for most MPS combustible gas transmitter applications. Unless experience in a particular application dictates otherwise, RKI Instruments, Inc. recommends a calibration frequency of every 6 months.

If an application is not very demanding, for example detection in a clean, temperature controlled environment where calibration adjustments are minimal at calibration, then a calibration frequency of every 9 to 12 months is adequate.

If an application is very demanding, for example if the environment is not well controlled, then more frequent calibration than every 6 months may be necessary.

Calibration

This section describes how to calibrate the combustible gas transmitter. It includes procedures to prepare for calibration, set the zero reading, set the response reading, and return to normal operation.

WARNING: *The controller is not an active gas monitoring device during the calibration procedure.*

NOTE: During calibration, the detector must be calibrated with a cylinder of methane in a background of real air containing argon and CO₂. Only use the RKI-provided calibration cylinder 81-9070RK-03.

Materials

The following items are required for detector calibration:

- a CH₄ calibration cylinder (in a background of **real air** which contains argon and CO₂)
- a 0.5 LPM fixed flow regulator with an on/off knob
- a calibration cup for the detector
- a short piece of sample tubing to connect the regulator to the calibration cup
- a voltmeter
- a zero air cylinder (required for fresh air environments where there may be a temporary presence of combustible or toxic gas)

Preparing for Calibration

1. Unscrew and remove the junction box cover.
2. Set a voltmeter to measure in the millivolt (mV) range.
3. Plug the voltmeter leads into the test points on the amplifier. Plug the positive lead into the red (+) test point; plug the negative lead into the black (-) test point.
4. Use the following formula to determine the correct test points output for the calibrating sample.

$$\text{Output (mV)} = (\text{calibrating sample/fullscale}) \times 400 + 100$$

For example, with a calibrating sample of 50% LEL and a fullscale setting of 100% LEL, the correct output is 300 mV.

$$300(\text{mV}) = (50/100) \times 400 + 100$$

5. Screw the calibration cup onto the detector housing.
6. Use the sample tubing to connect the regulator to the calibration cup.
7. Place the controller into its calibration mode or disable external alarms.

NOTE: Calibrating the combustible gas transmitter may cause alarms. Be sure to put the controller into its calibration mode or disable external alarms before continuing.

8. Allow the combustible detector to warm up for at least 2 minutes before proceeding to the next section, "Setting the Zero Reading".

CAUTION: *Do not expose the sensor to combustible gas during the 2-minute warmup period. Exposing the sensor to gas during this period will result in a failure condition.*

Setting the Zero Reading

WARNING: *This manual assumes the MPS sensor is operating in a background of fresh air. If the MPS sensor is not operating in a fresh air background (e.g. a monitoring background of nitrogen or argon), consult RKI Instruments Inc. before calibrating the sensor.*

WARNING: *Do not remove the junction box cover while the circuits are energized unless the area is determined to be non-hazardous. Keep the junction box cover tightly closed during operation.*

1. Screw the regulator into the zero air calibration cylinder.

NOTE: If you can verify that the combustible gas transmitter is operating in a fresh air environment (environment with a normal oxygen content of 20.9% and free of combustible and toxic gases), you do not need to apply zero air before adjusting the zero reading.

2. Use the calibration kit sample tubing to connect the regulator to the calibration cup.
3. Turn the regulator's on/off knob counterclockwise to open the regulator.
4. Allow the gas to flow for one minute and verify a reading of 100 mV (± 2 mV). If necessary, use the zero pot on the amplifier to adjust the reading to 100 mV (± 2 mV).
5. Turn the regulator's on/off knob clockwise to close the regulator.
6. Unscrew the regulator from the zero air calibration cylinder.
7. Leave the sample tubing connected to the regulator and the calibration cup.

Setting the Response Reading

1. When the directions call for exposing the detector to gas, screw the regulator into the **methane in real air** cylinder provided by RKI Instruments Inc.
2. Turn the regulator's on/off knob counterclockwise to open the regulator.
3. Allow the calibration gas to flow for one minute and verify that the reading matches the response reading (± 2 mV) you determined earlier. If necessary, use the span pot on the amplifier to adjust the reading to match the correct response reading.
4. Turn the regulator's on/off knob clockwise to close the regulator.
5. Unscrew the regulator from the calibration cylinder.

Returning to Normal Operation

1. Remove the voltmeter leads from the amplifier test points.
2. Unscrew the calibration cup from the detector.

NOTE: For convenience, leave the regulator and calibration cup connected by the sample tubing.

3. Secure the junction box cover to the junction box.
4. When the controller display reading falls below the alarm setpoints, return the controller to normal operation.
5. Verify that the controller display reading decreases and stabilizes at 0% LEL.
6. Store the components of the calibration kit in a safe and convenient place.

Parts List

Table 7 lists replacement parts and accessories for the combustible gas transmitter.

Table 7: Parts List

Part Number	Description
06-1248RK	Sample tubing (3/16 in. x 5/16 in.; specify length when ordering)
18-0400RK-01	Junction box with spacers
57-1053RK	Amplifier with gasket (specify detector part number when ordering)
61-0230	MPS LEL detector
65-2380	MPS transmitter (includes detector, junction box, and amplifier)
71-0595	<i>65-2380 Combustible Gas Detector Operator's Manual</i> (this document)
81-1051RK	Regulator with gauge and knob, 0.5 LPM, for 103 liter calibration cylinders (cylinders with internal threads)
81-1103RK	Calibration cup
81-9070RK-03	Calibration cylinder, 50% LEL methane in real air, 103 liter
81-F076RK	Cal kit: 103 liter cylinder of 50% LEL CH ₄ in real air, 0.5 LPM fixed flow regulator with gauge and knob, calibration cup, and 3 feet of calibration tubing
82-0006RK	Pot adjust screwdriver, for calibration