



INSTRUMENTS

**65-2300RK/65-2301RK
Toxic Detector
Operator's Manual**

Part Number: 71-0146RK

Revision: H

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www.rkiinstruments.com

WARNING

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

Periodic calibration and maintenance of the detector is essential for proper operation and correct readings. Please calibrate and maintain this detector regularly! Frequency of calibration depends upon the type of use you have and the sensor types. Typical calibration frequencies for most applications are between 3 and 6 months, but can be required 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:

- a) Absorbent cartridges
- b) Pump diaphragms and valves
- c) Fuses
- d) Batteries
- e) 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.

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Overview

This manual describes the 65-2301RK toxic detector. This manual also describes how to install, start up, maintain, and calibrate the toxic detector when used with a gas monitoring controller. A parts list at the end of this manual lists replacement parts and accessories for the toxic detector.

The 65-2301RK toxic detector includes the 65-2300RK toxic detector and a junction box. This manual may also be used for the 65-2300RK toxic detector which does not include a junction box and is normally mounted in one of a controller's conduit hubs. If you are using a 65-2300RK toxic detector, disregard all references to the junction box and junction box terminal strip.

The 65-2300RK and 65-2301RK detectors can be used for various target gases which are listed in Table 1 below. For a particular target gas, the part number of the toxic detector will be of the format 65-2300RK-XXX or 65-2301RK-XXX. For example, 65-2301RK-NH₃ is for ammonia (NH₃) detection.

Specifications

WARNING: Do not use this product in a manner not specified in this instruction manual.

Table 1 lists specifications for the various 65-2300RK/65-2301RK toxic detectors.

Table 1: Specifications

Target Gas	65-2300RK-ASH ₃ /65-2301RK-ASH ₃ : Arsine (AsH ₃) 65-2300RK-CL ₂ /65-2301RK-CL ₂ : Chlorine (Cl ₂) 65-2300RK-CL-10/65-2301RK-CL-10: Chlorine (Cl ₂) 65-2300RK-HCN/65-2301RK-HCN: Hydrogen Cyanide (HCN) 65-2300RK-NH ₃ /65-2301RK-NH ₃ : Ammonia (NH ₃) 65-2300RK-SO ₂ /65-2301RK-SO ₂ : Sulphur Dioxide (SO ₂) 65-2300RK-PH ₃ /65-2301RK-PH ₃ : Phosphine (PH ₃)
Sampling Method	Diffusion
Detection Range	AsH ₃ : 0 - 1.50 ppm Cl ₂ : 0 - 3.00 ppm Cl ₂ : 0 - 10.0 ppm HCN: 0 - 15.0 ppm NH ₃ : 0 - 75.0 ppm SO ₂ : 0 - 6.00 ppm PH ₃ : 0 - 1.00 ppm
Accuracy	± 10% of reading or ± 5% of full scale (whichever is greater)
Response Time	<ul style="list-style-type: none">• Cl₂ and NH₃: T₉₀ in 90 seconds• All others: T₉₀ in 45 seconds

Table 1: Specifications

Operating Temperature & Humidity	<ul style="list-style-type: none">• 14°F to 104°F (-10°C to 40°C)• 20% to 90% Relative Humidity
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WARNING: When using the 65-2300RK/65-2301RK, you must follow the instructions and warnings in this manual to assure proper and safe operation of the 65-2300RK/65-2301RK and to minimize the risk of personal injury. Be sure to maintain and periodically calibrate the 65-2300RK/65-2301RK as described in this manual.

Description

This section describes the components of the 65-2300RK and 65-2301RK. The 65-2301RK includes the 65-2300RK toxic detector and a junction box. The 65-2300RK does not include a junction box. Figure 1 below shows the components of the 65-2301RK.

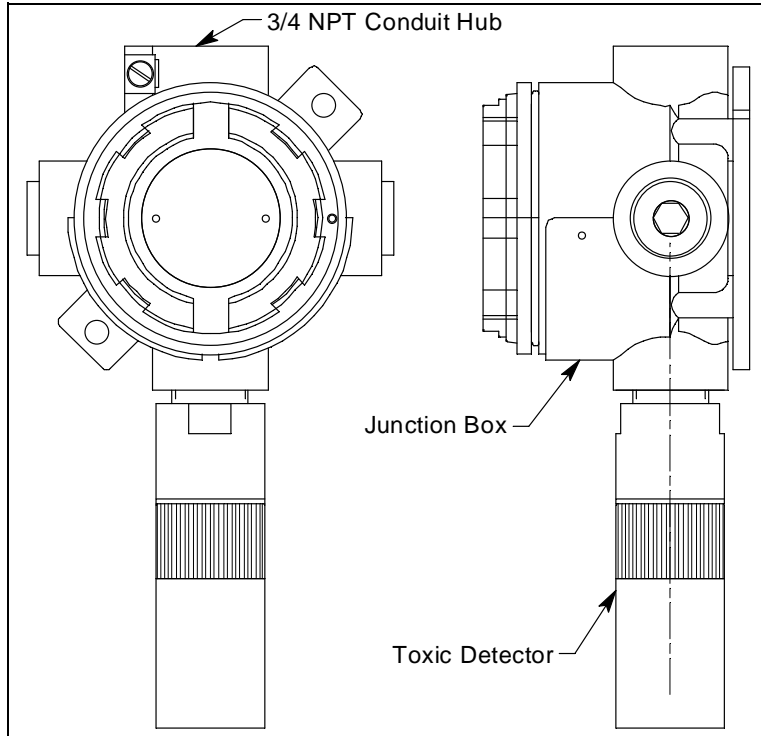


Figure 1: 65-2301RK Component Location

65-2300RK Toxic Detector

The 65-2300RK toxic detector consists of the detector housing body, detector housing cap, splashguard, cap gasket, and the plug-in sensor.

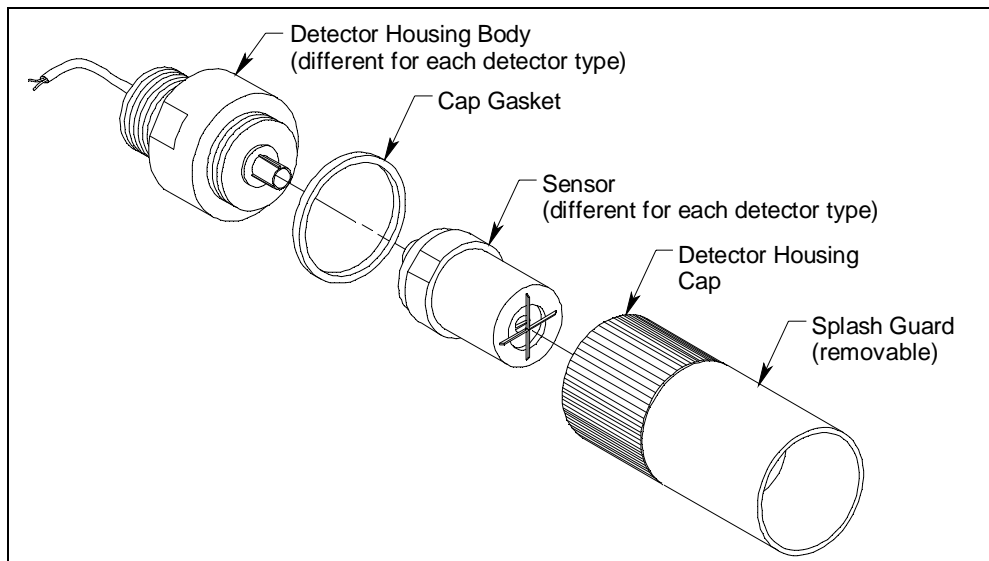


Figure 2: 65-2300RK Toxic Detector Component Location

Detector Housing Body

The detector housing body protects the electronic components within the housing. Use the mounting threads at the top of the housing to screw the toxic detector into a 3/4 NPT hub. Two wires extend from the top of the detector housing body. Use these wires to connect the toxic detector to a controller. One of the wires is black and one of the wires is color coded depending on the detector type. See Figure 4 on page 11 for the color code assignments. The housing body includes a 12 position connector at the bottom of the housing body. The plug-in sensor mates to this connector. A pre-amplifier located between the connector and the two interconnect wires conditions the sensor's signal before the signal reaches the controller.

Housing Cap, Cap Gasket, & Splashguard

The housing cap screws onto the detector housing. It retains the sensor and protects it from damage. A removable splashguard is screwed onto the detector cap to protect the sensor from impact damage, direct water spray, and splashing. Unscrew the detector cap to access the sensor for maintenance or replacement. A cap gasket seals the interface between the housing and cap.

Plug-in Sensor

The plug-in sensor is secured in the detector assembly by the housing cap. There is a different sensor for each target gas. Through a series of chemical and electrical reactions, the sensor produces an electrical output that corresponds to the detection range of the sensor.

Junction Box

The junction box allows you to install the toxic detector at a mounting site that is remote from a controller and protects the detector wiring connections. Two conduit hubs allow you to mount the toxic detector to the junction box and connect the wiring from the detector to a controller. Two mounting holes allow for easy installation to a mounting surface. A terminal block within the junction box facilitates the wiring connections. A cover on the front of the junction box allows access to the interior of the junction box.

Installation

This section describes procedures to mount the toxic detector in the monitoring environment and wire the detector to a controller.

Mounting the Toxic Detector

NOTE: If you are installing a 65-2300RK, it does not include a junction box and is usually factory installed in one of a controller's conduit hubs or may be field installed using the 3/4 NPT threads on the end with the wires. The 65-2301RK includes a junction box as shown in Figure 3 below.

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 detector 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.

NOTE: If your application does not require a specific mounting site, mount the detector at approximately breathing level.

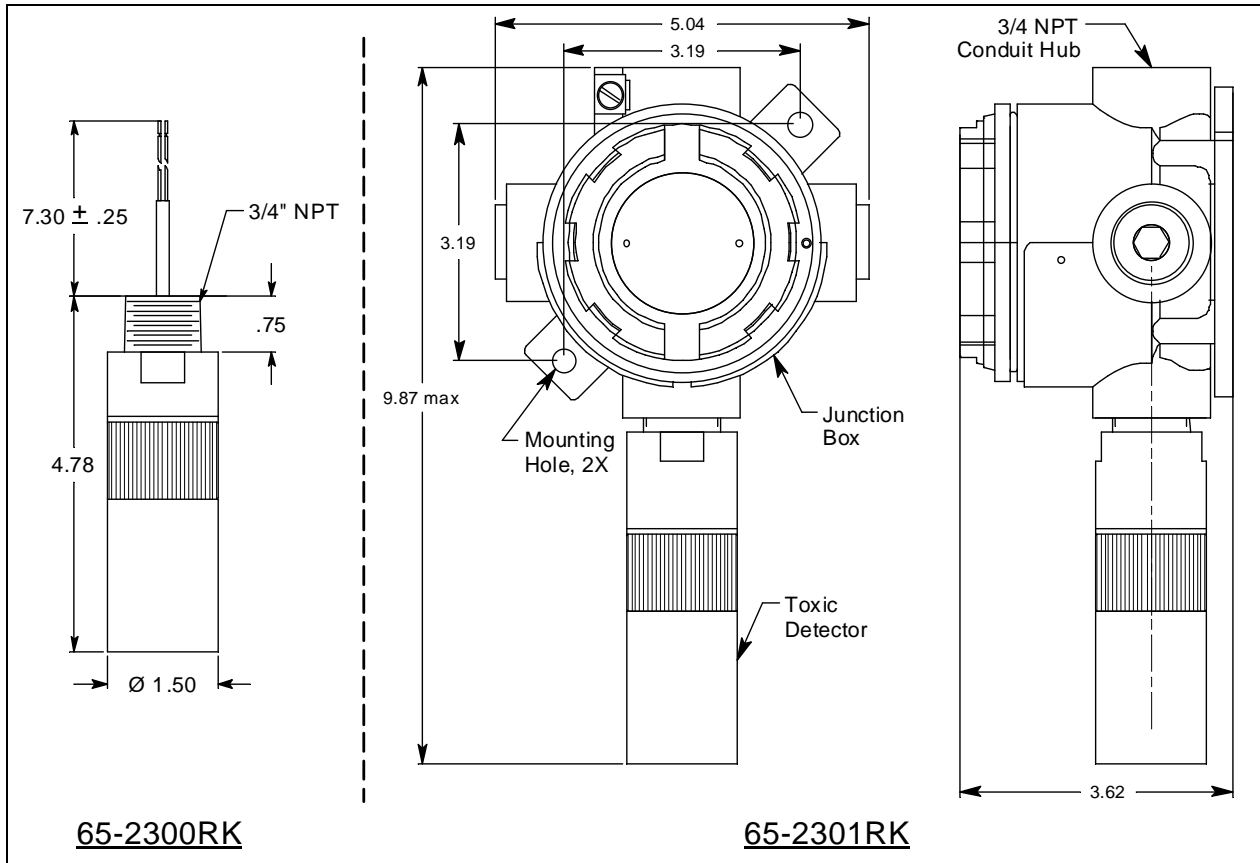


Figure 3: Outline & Mounting Dimensions, 65-2300RK & 65-2301RK

2. At the mounting site you select, use two screws to mount the junction box using the mounting holes. Be sure the detector is facing down (see Figure 3).

CAUTION: Mount the toxic detector with the detector facing down (see Figure 3.)

Wiring the Toxic Detector to a Controller

WARNING: Always verify that 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. If the detector is mounted remotely from a controller using the junction box, proceed to step 4.

If the detector is mounted directly to a controller, connect the detector's color coded and black wires to the appropriate controller detector terminals (see Figure 4 for the color coding of the non-black wire) and skip to the Startup Section.

4. Remove the junction box cover.
5. Guide a two-conductor, shielded cable or two wires in conduit through the unused conduit hub of the junction box.
6. Connect the two wires to the detector using the terminal block.

CAUTION:*If using shielded cable, leave the drain wire insulated and disconnected at the detector. You will connect the opposite end of the cable's drain wire at the controller.*

7. Secure the junction box cover to the junction box.
8. Route the cable or wires leading from the toxic detector through one of the conduit hubs at the controller housing. Use appropriate conduit fittings and construction technique for the environmental rating of the controller. RKI controllers are typically rated NEMA 4X.

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

- Connect the wires to the applicable controller terminal strip. See the controller operator's manual and the controller's detector head specification sheet for the 65-2300RK or 65-2301RK detector.

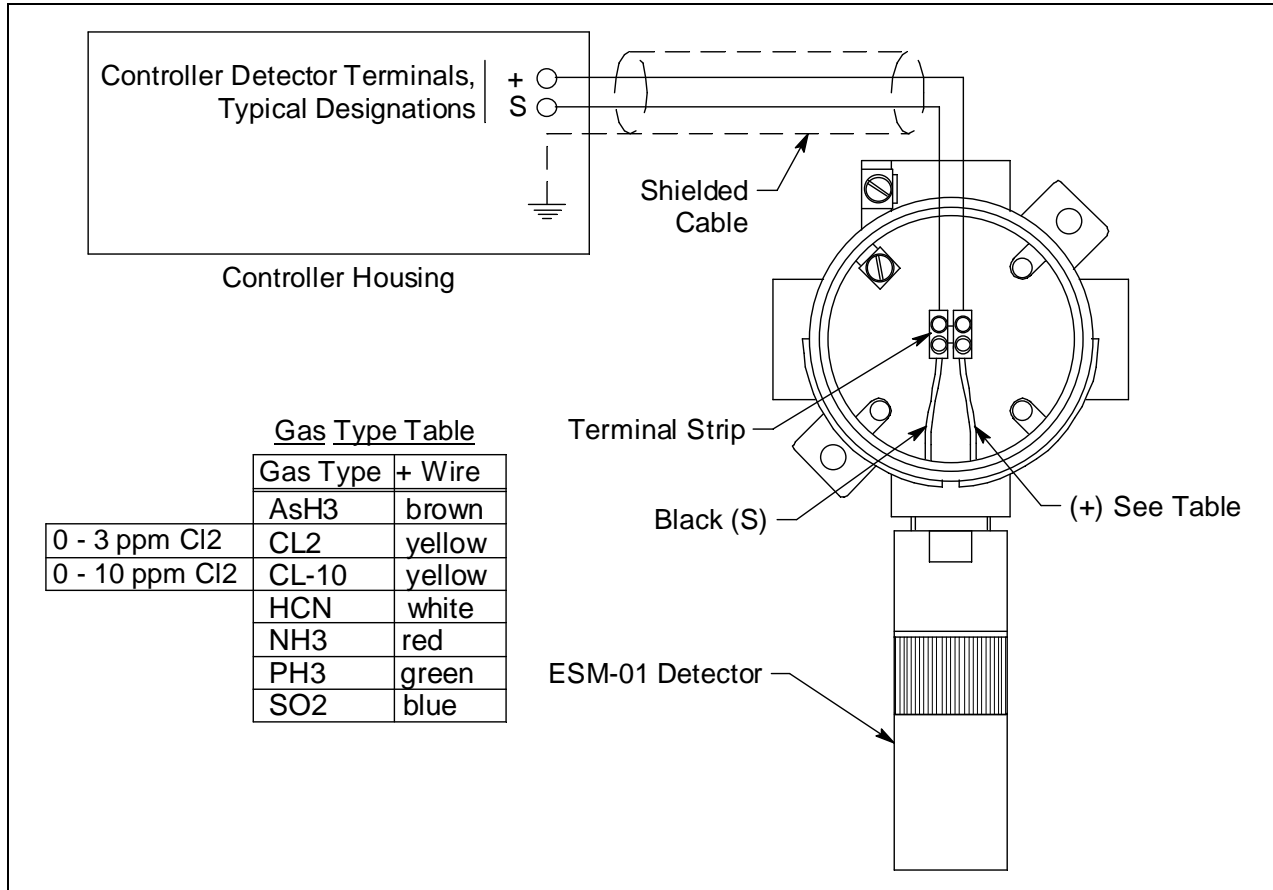


Figure 4: Wiring the Toxic Detector to a Controller

- If using shielded cable, connect the cable's drain wire to an available chassis ground at the controller. RKI controllers typically have a ground stud that is a convenient grounding location.
- Reinstall the junction box cover.

Start Up

This section describes procedures to start up the toxic detector and place the detector into normal operation.

Introducing Incoming Power

- Complete the installation procedures described earlier in this manual.
- Verify that the power wiring to the controller is correct and secure. Refer to the controller operator's manual.
- Turn on or plug in the incoming power, then turn on the controller.

4. Verify that the controller is on and operating properly. Refer to the controller operator's manual.

CAUTION: Allow the detector to warm up for 5 minutes before you continue with the next section, "Setting the Zero Reading".

Setting the Zero (Fresh Air) Reading

CAUTION: If you suspect the presence of the target gas in the monitoring environment, use the calibration kit and a zero air calibration cylinder to introduce "fresh air" to the toxic detector and verify an accurate zero setting. See "Calibration" on page 16 for instructions to introduce zero air to the detector.

1. Verify that the detector is in a fresh air environment (environment known to be free of toxic and combustible gases, and of normal oxygen content, 20.9%).
2. Verify a reading of 0 ppm at the controller.

If the display reading is 0 ppm, start up is complete. The toxic detector is in normal operation. If the display reading is not 0 ppm, continue with step 3.

3. Perform a zero (fresh air) adjustment operation at the controller. See the controller operator's manual for instructions.

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 toxic detector. It includes daily and quarterly procedures.

Daily

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

Quarterly

Calibrate the toxic detector as described in "Calibration" on page 16.

Troubleshooting

The troubleshooting guide describes symptoms, probable causes, and recommended action for problems you may encounter with the toxic detector.

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

Fail Condition

Symptoms

- The controller indicates a fail condition.

Probable causes

- The detector wiring is disconnected or misconnected.
- The plug-in sensor is not properly plugged into the socket in the detector housing body.
- The detector's zero reading is low enough to cause a fail condition.
- The detector is malfunctioning.

Recommended action

- Verify that the detector wiring is correct and secure.
- Confirm that the plug-in sensor is installed properly.
- Perform a zero (fresh air) adjustment. A full calibration is recommended.
- If the fail condition continues, replace the plug-in sensor as described later in this section.
- If the fail condition continues, contact RKI for further instruction.

Slow or No Response/Difficult or Unable to Calibrate

Symptoms

- Unable to accurately set the zero or response reading during the calibration procedure.
 - The detector requires frequent calibration.
-

NOTE: Under “normal” circumstances, the detector requires calibration once every three months. Some applications may require a more frequent calibration schedule. See “Calibration Frequency” on page 16 for a discussion of the calibration frequency.

Probable causes

- The calibration cylinder is low, out-dated, or defective.
- The incorrect calibration cup or regulator is being used.
- The plug-in sensor face is blocked with dirt or some other particulate contamination.
- The detector is malfunctioning.

Recommended action

1. Verify that the calibration cylinder contains an adequate supply of a fresh test sample.
2. Confirm that you are using the correct calibration cup and regulator for your detector type. See Table 2 on page 16 for a list of the required calibration cups and regulators.
3. Check the plug-in sensor face and remove any particulate contamination if necessary.
4. If the calibration/response difficulties continue, replace the plug-in sensor as described later in this section.
5. If the calibration/response difficulties continue, contact RKI Instruments, Inc. for further instruction.

Replacing Components of the Toxic Detector

This section includes a procedure to replace the plug-in toxic sensor and one to replace the entire toxic detector assembly. In most cases, it is not necessary to replace the entire detector assembly.

Replacing The Plug-in Toxic Sensor

CAUTION: The plug-in sensor contains electrolyte which is a dilute acid. Do not disassemble the sensor when replacing it with a new one. If sensor electrolyte comes in contact with your skin, wash affected area thoroughly with soap and water.

1. Turn off the controller.
2. Turn off or unplug power to the controller.
3. Unscrew the detector housing cap with the splashguard from the detector housing body. Make sure not to lose the cap gasket.
4. Unplug and remove the toxic sensor.
5. Remove the black plug from the top of the replacement sensor.
6. Carefully plug the replacement sensor into the connector that is located in the detector housing body.

WARNING: You must replace the plug-in sensor with the same type of sensor that is installed. A detector cannot be converted from one type of detector to another by using a different plug-in sensor. For example, if you are replacing a Cl₂ sensor, you must replace it with a Cl₂ sensor.

7. Make sure the cap gasket is in place and screw the detector housing cap with the splashguard back onto the detector housing body.
8. Turn on power to the controller.
9. Turn on the controller.

CAUTION: Allow the replacement sensor to warm up for 5 minutes before you continue with the next step.

10. Calibrate the detector as described in “Calibration” on page 16.

Replacing the Toxic Detector

NOTE: In most cases, it is only necessary to replace the plug-in sensor.

1. Turn off the controller.
2. Turn off or unplug incoming power to the controller.
3. If the detector is installed directly on a controller, open the controller door.
If the detector is installed remotely from a controller in a junction box, remove the junction box cover.
4. If the detector is installed directly on a controller, disconnect the detector leads from the detector terminal strip in the controller. Note the position of the color-coded leads as you remove them.
If the detector is installed remotely from a controller in a junction box, disconnect the detector leads from the terminal block in the junction box. Note the position of the color-coded leads as you remove them.
5. Unscrew the detector from the controller conduit hub or junction box conduit hub.
6. Guide the detector leads of the replacement detector through the controller conduit hub or junction box conduit hub, then screw the mounting threads of the detector into the hub. If necessary for environmental conditions, apply thread sealant or Teflon tape to the hub and/or detector threads to seal them.
7. If the detector is installed directly on a controller, connect the detector leads to the appropriate detector terminal strip terminals. See Figure 4 on page 11 for wiring to a generic controller. See the controller operator’s manual and the controller’s detector head specification sheet for the 65-2300RK or 65-2301RK detector for wiring specific to your controller.
If the detector is installed remotely from a controller in a junction box, connect the detector leads to the terminal block the same way the old detector was wired (see Figure 4 on page 11). See the controller operator’s manual and the controller’s detector head specification sheet for the 65-2300RK or 65-2301RK to verify the connections to the controller are correct.
8. If the detector is installed remotely from a controller in a junction box, reinstall the junction box cover.
9. Turn on or plug in power to the controller.
10. Turn on the controller.

CAUTION: Allow the replacement detector to warm up for 5 minutes before you continue with the next step.

11. Calibrate the replacement detector as described in “Calibration” on page 16.

Calibration Frequency

Although there is no particular calibration frequency that is correct for all applications, a calibration frequency of every 3 months is adequate for most toxic detector applications. Unless experience in a particular application dictates otherwise, RKI Instruments, Inc. recommends a calibration frequency of every 3 months for the toxic detector.

If an application is not very demanding, for example detection in a clean, temperature controlled environment where toxic gas is not normally present, and calibration adjustments are minimal at calibration, then a calibration frequency of every 6 months is adequate.

If an application is very demanding, for example if the environment is not well controlled or if toxic gas is often present, then more frequent calibration than every 3 months may be necessary.

Calibration

This section describes how to calibrate the toxic detector. It includes procedures to prepare for calibration, set the fresh air reading, set the response reading, and return to normal operation. It describes calibration using a calibration kit that includes a calibration cup, calibration gas, sample tubing, and a fixed flow regulator with an on/off knob. The required sample flow rate and calibration cup depend on the detector being calibrated. Table 2 below lists the required calibration cups and regulators for the various toxic detectors.

Table 2: Required Calibration Cups and Flow Rates

Detector Type	Required Calibration Cup	Required Regulator/ Flowrate for Calibration Gas	Flow Direction Specified on Calibration Cup
Arsine (AsH ₃)	81-1138RK	81-1051RK, 0.5 LPM (liters per minute)	Yes
Chlorine (Cl ₂), 0 - 3.00 ppm and 0 - 10.0 ppm	81-1138RK-CL2	81-1051RK, 0.5 LPM	No
Hydrogen Cyanide (HCN)	81-1138RK	81-1051RK, 0.5 LPM	Yes
Ammonia (NH ₃)	81-1138RK-NH3	81-1051RK-25, 0.25 LPM	No
Phosphine (PH ₃)	81-1138RK	81-1051RK, 0.5 LPM	Yes
Sulphur Dioxide (SO ₂)	81-1138RK	81-1051RK, 0.5 LPM	Yes

WARNING: *RKI Instruments, Inc. recommends that you dedicate a regulator for use with chlorine (Cl₂) gas and that you do not use that dedicated regulator for any other gases, particularly hydrogen sulfide (H₂S).*

WARNING: *Not using the recommended calibration cup, sample flowrate, and specified flow direction (for 81-1138RK calibration cup only) will result in an inaccurate calibration. Make sure to use the calibration cup and sample flow rate listed in Table 2 for your target gas when performing a calibration. Also make sure to connect the sample tubing to the calibration cup port that results in the specified flow direction for the 81-1138RK calibration cup.*

Preparing for Calibration

1. Unscrew the splashguard from the detector housing cap. Make sure the cap remains securely screwed onto the housing body.
2. Push the calibration cup onto the plug-in sensor that sticks through the housing cap. The calibration cup seals to the sensor with an O-ring.
3. Screw the regulator into the zero air calibration cylinder.
4. Use the sample tubing to connect the regulator to the calibration cup. Make sure to connect the tube to the inlet side of the calibration cup if using the 81-1138RK calibration cup which is marked on the outside bottom to show the required flow direction through the cup.

NOTE If you can verify that the toxic detector is in a fresh air environment, you do not need to apply zero air to the detector before adjusting the fresh air reading.

5. Put the controller into its calibration program. See the controller operator's manual for instructions to enter the calibration program.

Setting the Zero (Fresh Air) Reading

1. Follow the instructions in the controller operator's manual for setting the zero reading.
2. When the instructions call for applying zero air to the detector, turn the regulator's on/off knob counterclockwise to open it. Gas will begin to flow.
3. Allow the gas to flow for two minutes.
4. Set the fresh air reading according to the controller operator's manual.
5. Turn the regulator's on/off knob clockwise to close it.
6. Unscrew the regulator from the zero air calibration cylinder. Leave the sample tubing connected to the regulator and the calibration cup.

NOTE: Depending on the size of your zero air cylinder, it is possible that you will have a different regulator for the zero air cylinder and toxic gas cylinder. If necessary to fit the calibration toxic gas cylinder, change the regulator.

Setting the Response Reading (Span)

1. Follow the directions in the controller operator's manual for setting the response (span) reading.
2. For toxic gas cylinders (like Cl₂, NH₃, etc.), it is important to vent the regulator while installing it onto the cylinder. Venting the regulator during installation helps prevent air from getting into the cylinder and degrading the gas. When the directions call for exposing the detector to gas, open the regulator by turning the knob counterclockwise and then install it onto the cylinder.
3. Allow the gas to flow to the detector for 2 minutes.
4. Set the response reading according to the controller operator's manual.
5. After setting the response reading, turn the regulator's on/off knob clockwise to turn it off.
6. Unscrew the regulator from the cylinder and gently pull the calibration cup off of the plug-in sensor.

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

7. Allow about 45 seconds for the gas reading to decrease below the alarm points and then return the controller to normal operation.

NOTE: If you do not allow the gas reading to decrease below the alarm points, then unwanted alarms may occur.

8. Verify that the controller display reading decreases and stabilizes at 0 ppm.
9. Store the components of the calibration kit in a safe and convenient place.

Parts List

Table 3 lists replacement parts and accessories for the toxic detector.

Table 3: Parts List

Part Number	Description
06-1283RK	Calibration kit sample tubing, 3 foot Teflon w/flexible tubing on ends
07-0125RK	Detector housing cap gasket
18-0435	Junction box
65-2300RK-ASH3	Replacement detector assembly, AsH ₃ (includes plug-in sensor)
65-2300RK-CL2	Replacement detector assembly, Cl ₂ , 0 - 3.00 ppm range (includes plug-in sensor)
65-2300RK-CL-10	Replacement detector assembly, Cl ₂ , 0 - 10.0 ppm range (includes plug-in sensor)
65-2300RK-HCN	Replacement detector assembly, HCN (includes plug-in sensor)
65-2300RK-NH3	Replacement detector assembly, NH ₃ (includes plug-in sensor)
65-2300RK-PH3	Replacement detector assembly, PH ₃ (includes plug-in sensor)
65-2300RK-SO2	Replacement detector assembly, SO ₂ (includes plug-in sensor)
71-0146RK	65-2300RK/65-2301RK Operator's Manual (this document)
81-0076RK	Zero air calibration cylinder, 17 liter
81-0076RK-01	Zero air calibration cylinder, 34 liter steel
81-0076RK-03	Zero air calibration cylinder, 103 liter
81-0170RK-02	Calibration cylinder, 5 ppm SO ₂ in nitrogen, 58 liter
81-0170RK-04	Calibration cylinder, 5 ppm SO ₂ in nitrogen, 34 liter aluminum
81-0176RK-02	Calibration cylinder, 25 ppm NH ₃ in nitrogen, 58 liter
81-0176RK-04	Calibration cylinder, 25 ppm NH ₃ in nitrogen, 34 liter aluminum
81-0185RK-02	Calibration cylinder, 0.5 ppm PH ₃ in nitrogen, 58 liter, used to calibrate PH ₃ and AsH ₃ detectors, see conversion factor on AsH ₃ plug-in sensors
81-0185RK-04	Calibration cylinder, 0.5 ppm PH ₃ in nitrogen, 34 liter aluminum, used to calibrate PH ₃ and AsH ₃ detectors, see conversion factor on AsH ₃ plug-in sensors
81-0190RK-02	Calibration cylinder, 5 ppm Cl ₂ in nitrogen, 58 liter
81-0190RK-04	Calibration cylinder, 5 ppm Cl ₂ in nitrogen, 34 liter aluminum
81-0192RK-02	Calibration cylinder, 2 ppm Cl ₂ in nitrogen, 58 liter
81-0192RK-04	Calibration cylinder, 2 ppm Cl ₂ in nitrogen, 34 liter aluminum
81-0196RK-02	Calibration cylinder, 10 ppm HCN in nitrogen, 58 liter

Table 3: Parts List

Part Number	Description
81-0196RK-04	Calibration cylinder, 10 ppm HCN in nitrogen, 34 liter aluminum
81-1050RK	Regulator with gauge and knob, 0.5 LPM, for 17 liter and 34 liter steel calibration cylinders (cylinders with external thread), used for 34 liter zero air cylinder only
81-1051RK	Regulator with gauge and knob, 0.5 LPM, for 34 liter aluminum, 58 liter, and 103 liter calibration cylinders (cylinders with internal threads)
81-1051RK-25	Regulator with gauge and knob, 0.25 LPM, for 34 liter aluminum, 58 liter, and 103 liter calibration cylinders (used to calibrate NH₃ toxic detector only)
81-1138RK	Calibration cup, general (SO ₂), for ESM-01, use 0.5 LPM flow
81-1138RK-CL2	Calibration cup, for ESM-01 Cl ₂ , use 0.5 LPM flow
81-1138RK-NH3	Calibration cup, for ESM-01 NH ₃ , use 0.25 LPM flow
81-F503RK	Calibration kit, includes regulator, calibration cup, and a 58 liter 10 ppm NH ₃ in nitrogen aluminum calibration cylinder
81-F503RK-LV	Calibration kit, includes regulator, calibration cup, and a 34 liter 10 ppm NH ₃ in nitrogen aluminum calibration cylinder
81-F603RK	Calibration kit, includes regulator, calibration cup, and 58 liter 2 ppm CL ₂ in nitrogen aluminum calibration cylinder
81-F603RK-LV	Calibration kit, includes regulator, calibration cup, and 34 liter 2 ppm CL ₂ in nitrogen aluminum calibration cylinder
81-F702RK	Calibration kit, includes regulator, calibration cup, and a 58 liter 5 ppm SO ₂ in nitrogen aluminum calibration cylinder
81-F702RK-LV	Calibration kit, includes regulator, calibration cup, and a 34 liter 5 ppm SO ₂ in nitrogen aluminum calibration cylinder
81-F811RK	Calibration kit, includes regulator, calibration cup, and a 58 liter 0.5 ppm PH ₃ in nitrogen aluminum calibration cylinder
81-F811RK-LV	Calibration kit, includes regulator, calibration cup, and a 34 liter 0.5 ppm PH ₃ in nitrogen aluminum calibration cylinder
ESM-01DH-ASH3	ESM-01 plug-in sensor, 0 - 1.50 ppm arsine
ESM-01DH-D-HCN	ESM-01 plug-in sensor, 0 - 15.0 ppm hydrogen cyanide
ESM-01DH-D-SO2	ESM-01 plug-in sensor, 0 - 6.00 ppm sulphur dioxide, diffusion type only
ESM-01DH-PH3	ESM-01 plug-in sensor, 0 - 1.00 ppm phosphine
ESM-01R-D-NH3	ESM-01 plug-in sensor, 0 - 75.0 ppm ammonia, diffusion type only
ESM-K01-D-CL2	ESM-01 plug-in sensor, 0 - 3.00 ppm chlorine, diffusion type only
ESM-K01D-CL2-10	ESM-01 plug in sensor, 0 - 10.0 ppm chlorine, diffusion type only