



UTC Aerospace Systems

# **OPERATION & MAINTENANCE MANUAL**

## **FOR NFI 40FT CNG BUSES AT BC TRANSIT**

**(SR2033, SR2087 & SR2156)**

**Manual No: 181922**

**Revision B: Oct 25, 2017**

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## INTRODUCTION

This manual describes the operation and maintenance of the Kidde Automatic Fire Detection and Suppression System (AFSS) and Gas Leak Detection System (GDS) as installed on the NFI 40ft CNG buses at BC Transit.

The AFSS system is of a 1 Zone, 1 Shot type configuration. The fire detection system provides fire detection coverage for the engine compartment and consist of:

- Three (3) spot thermal detectors in the engine compartment

The suppression system provides extinguisher coverage for the engine compartment and consist of:

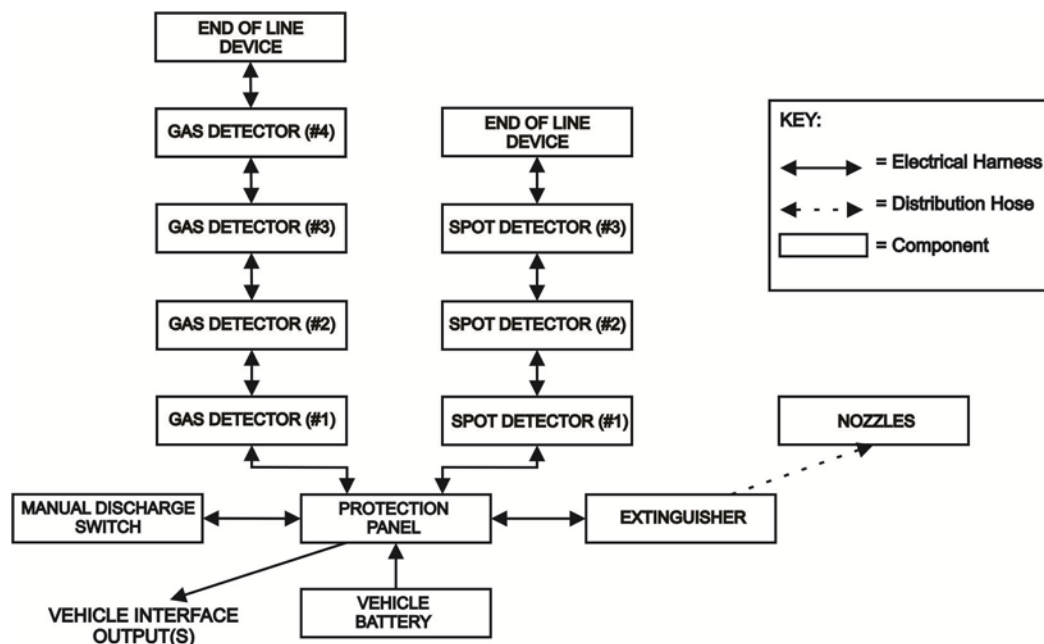
- A single fire extinguisher
- A four (4) nozzle distribution system

The GDS provides gas leak detection coverage for vehicle. Four (4) gas detectors are installed:

- Two (2) in the roof tank area
- One (1) in the area above the CNG fill
- One (1) in the engine compartment

## BLOCK DIAGRAM

A system block diagram is shown in Figure 1.



**FIGURE 1 – SYSTEM BLOCK DIAGRAM**

## SYSTEM OPERATION

The state of the system is constantly monitored and is displayed to the driver via the protection panel. The system provides visual and audial indicators to the driver when the state of the system changes.

### NORMAL CONDITION

During normal operating conditions (appropriate system power applied and no fault conditions present), the protection panel's system "OK" indicator is illuminated solid green.

### FIRE SCENARIO

When a fire sensor detects a fire in the engine compartment, the Protection Panel's FIRE ALARM and the DELAY ENGINE STOP indicators illuminate, an audio alarm sounds, and the HVAC shuts down immediately. Fifteen (15) seconds later the engine automatically shuts down and the fire extinguisher automatically discharges.

Engine shutdown and extinguisher discharge may be delayed an additional fifteen (15) seconds by depressing the Protection Panel's DELAY ENGINE STOP indicator/switch.

The Manual Activation Switch may be activated to immediately discharge the Fire Extinguisher and shutdown the engine and HVAC.

The system must be reset and the extinguisher removed and replaced in accordance with the System Reset portion of this manual.

**WARNING! THE ENGINE WILL STOP 15 SECONDS AFTER THE FIRE ALARM STARTS. THE OPERATOR MUST BE PREPARED TO BRING THE VEHICLE TO A SAFE STOP AS SOON AS THE ALARM SOUNDS. STEERING MAY BECOME DIFFICULT AFTER ENGINE SHUTDOWN. IF MORE TIME IS REQUIRED, THE "DELAY ENGINE STOP" SWITCH MAY BE PRESSED AND RELEASED FOR AN ADDITIONAL 15 SECOND DELAY.**

**WARNING! THE EXTINGUISHER DISCHARGE MAY CAUSE AN OBSCURING CLOUD BEHIND AND NEAR THE VEHICLE.**

### GAS TRACE LEAK (20% LEL) SCENARIO

When a gas sensor detects a trace leak, the Protection Panel's GAS LEAK indicator illuminates (blinking).

The system will reset itself and indications will clear when the gas dissipates below the trace leak threshold.

## **GAS SIGNIFICANT LEAK (50% LEL) SCENARIO**

When a gas sensor detects a significant leak, the Protection Panel's GAS LEAK indicator illuminates (steady-on) and an audio alarm sounds. The gas LEAK indicator and the audible alarm warnings will stay on until the TEST/RESET button on the Protection Panel is pressed. The status indicator on the individual Gas Leak Detector that detected the significant gas leak will remain illuminated solid red until the system is reset in accordance with system reset portion of this manual.

## **SYSTEM FAULT SCENARIO**

The Protection Panel continuously monitors system integrity and displays the status via the SYSTEM OK, FIRE TROUBLE, and GAS TROUBLE indicators. Refer to the Component Description, Protection Panel portion of this manual for the operational description of the indicators.

## **COMPONENT DESCRIPTION**

### **PROTECTION PANEL (413484-1345)**

The protection panel is located in the driver's area and displays the current system status. The Protection panel comprises the following:

- **SYSTEM OK indicator**
  - Illuminates solid green when appropriate power is applied to the system and no trouble conditions exists
  - Illuminates blinking green when power is low (under 22VDC)
  - Off when power is insufficient
  - Off when TROUBLE indicator is illuminated
- **FIRE TROUBLE indicator**  
Illuminates blinking yellow when a fault exists in the fire detection and suppression circuits
- **Fire ALARM indicator**
  - Illuminates solid red when a fire is detected
  - Illuminates blinking red when the MANUAL DISCHARGE switch is activated
- **Gas TROUBLE indicator**  
Illuminates solid yellow when a fault exists in the gas detection circuit
- **Gas ALARM indicator**
  - Illuminates blinking red when trace gas is detected (greater than 20%, but less than 50%)
  - Illuminates solid red when significant gas is detected (greater than 50%)
- **Audible alarm**
  - Intermittent sound indicates fault condition when SYSTEM OK indicator is extinguished
  - Intermittent sound indicates low power condition when SYSTEM OK indicator is blinking
  - Continuous sound indicates fire alarm, manual discharge, or significant gas alarm

- ALARM SILENCE switch
  - Use to silence the audible alarm
- TEST/RESET switch with DELAY ENGINE STOP indicator
 

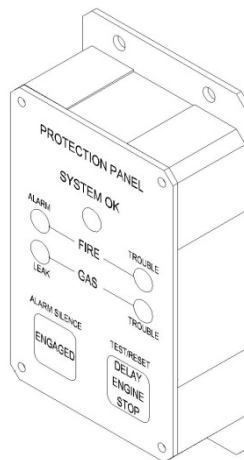
During normal “System OK” state:

  - Allows testing of indicators and audible alarm during standby operation

During Fire Event:

  - Illuminates solid red when fire event is detected
  - Illuminates blinking red when pressed and released for a 15 second additional delay.
  - Returns to solid red illumination after additional time delay had elapsed
  - Turns off when the shutdown signal has been activated
  - Resets protection panel when pressed and released after a fire event or significant gas leak
- Early warning signal output
- Engine shutdown signal output
- Manual activation switch signal input

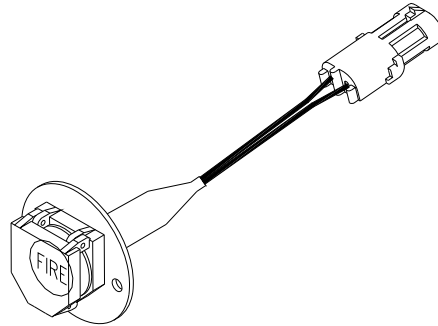
<b>Operating Temperature Range</b>	-40°F to 158°F (-40°C to 70°C)
<b>Quiescent Current</b>	50mA (Nominal) @ 24V
<b>Operating Voltage</b>	9 to 32Vdc



**FIGURE 2 - PROTECTION PANEL**

## MANUAL ACTIVATION SWITCH (421317)

The Manual Activation Switch allows immediate system activation (extinguisher discharge and engine shutdown) by the vehicle operator at any time. Activation of the switch is accomplished by twisting and pulling the tamper seal (not shown) to remove, lifting the cover and pressing the red “FIRE” button for more than half a second. After the Manual Activation Switch has been activated, the Protection Panel’s FIRE ALARM indicator will blink until power has been cycled to the system.

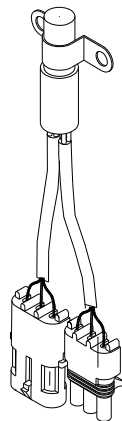


**FIGURE 3 – MANUAL ACTIVATION SWITCH**  
(Depicted without Tamper Seal)

## SPOT THERMAL DETECTOR (420419-350)

Spot Thermal detectors are point thermal switches which work by contact closure to initiate an alarm when the temperature of the area surrounding the detector exceeds its pre-set alarm temperature. The detectors reset themselves automatically once the temperature falls below the pre-set alarm temperature.

<b>Operating Temperature Range</b>	-40°F to 257°F (-40°C to 125°C)
<b>Quiescent Current</b>	0mA (Nominal) @ 24V
<b>Operating Voltage</b>	9 to 32Vdc
<b>Alarm Temperature</b>	280°F (Blue bodied sensor) 350°F (Red bodied sensor) 450°F (Green bodied sensor)
<b>Response Time</b>	Within 60 seconds of exposure to flame



**FIGURE 4 – SPOT THERMAL DETECTOR**



## GAS LEAK DETECTOR (420473-2050)

The PM-MDS Gas Leak Detector utilizes a temperature compensated metal-oxide sensing element to detect combustible gases including CNG and LNG. The detector contains two preset detection thresholds:

- Trace alarm (20% LEL of Methane)
- Significant alarm (50% LEL of Methane)

The PM-MDS Gas Leak Detector contains a Bi-colored status LED which indicates:

Status LED	Indication
<b>Solid Green</b>	Sensor operational
<b>Flashing Red</b>	Trace Gas level detected (between 20% and 50% LEL)
<b>Solid Red</b>	Significant Gas level detected (50% LEL or higher)
<b>Flashing Red/Green</b>	Sensor Fault
<b>No LED</b>	Sensor without power

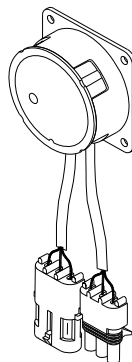
NOTE: The status LED illuminates blinking green for the first 30 seconds after power-up.

After a significant gas leak is detected, power to the detector must be cycled to reset the status LED.

**CAUTION! CARE SHOULD BE TAKEN WHEN CLEANING THE COMPARTMENTS WHICH HOUSE GAS LEAK DETECTORS; AVOID EXPOSURE TO SILICONES OR SOLVENTS AND AVOID DIRECTLY HITTING WITH HIGH-PRESSURE STEAM CLEANING OR PRESSURE WASHING SPRAY.**

The gas sensing element inside the detector is a consumable item with a limited service life dependent on environmental conditions. The sensing element is field replaceable and is included in the Combustible Gas Detector Rebuild Kit (P/N 420483).

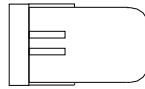
<b>Operating Temperature Range</b>	-40°F to 185°F (-40°C to 85°C)
<b>Quiescent Current</b>	40mA
<b>Operating Voltage</b>	9 to 32Vdc
<b>Response Time</b>	Within 90 seconds of exposure to alarm level concentration
<b>Field Calibration</b>	Not Required



**FIGURE 5 - PM-MDS GAS LEAK DETECTOR**

### **END-OF-LINE DEVICE (420241)**

The End-of-Line device is required for supervision of the fire and gas detection circuits. It consists of a resistor installed into a connector and is environmentally sealed with potting compound. The End-of-Line device is installed on the last detector in each series of detectors.

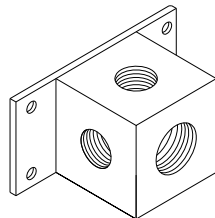


**FIGURE 6 – END-OF-LINE DEVICE**

### **DISTRIBUTION BLOCK (420588)**

The distribution block is a manifold that is used as part of the distribution system to direct the flow of dry chemical fire extinguishing agent from the extinguisher to individual nozzles.

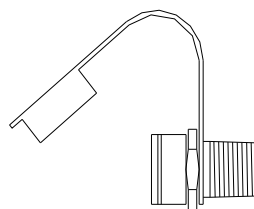
The distribution block is constructed of plated steel and contains an integral mounting flange. It has one  $\frac{3}{4}$ " NPT female inlet port and four  $\frac{1}{2}$ " NPT female outlet ports.



**FIGURE 7 – DISTRIBUTION BLOCK**

### **NOZZLE (474946)**

This nozzle is constructed of plated steel and contains a 45° steel cone, causing the nozzle to disperse a cone shaped spray of dry chemical. The nozzle has a silicone rubber protective cap that is blown off by the dry chemical discharge.



**FIGURE 8 – NOZZLE**

**FIRE EXTINGUISHER (421220-22)**

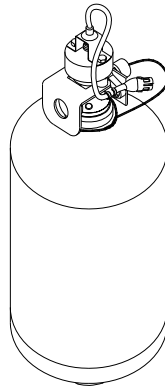
The Fire Extinguisher is an electrically operated, stored pressure type extinguisher that contains 25 pounds of BC rated 'Purple K' dry chemical extinguishing agent pressurized with nitrogen.

A fast opening valve is mounted on a DOT certified cylinder. The extinguisher is installed horizontally in the bottle-mounting bracket (421222) with the gauge right.

**CAUTION! THE EXTINGUISHER WILL NOT FUNCTION AS INTENDED IF ORIENTED INCORRECTLY**

**WARNING! THE ANTI-RECOIL PLUG SHALL BE INSTALLED ON THE VALVE OUTLET PORT AT ALL TIMES EXCEPT WHEN THE EXTINGUISHER IS CONNECTED TO THE DISTRIBUTION PIPING OR WHILE THE EXTINGUISHER IS BEING FILLED.**

<b>Operating Temperature Range</b>	-65°F to 200°F (-53°C to 93°C)
<b>Pressure</b>	360 psi
<b>Mounting Bracket</b>	421222



**FIGURE 9 – FIRE EXTINGUISHER**  
 (DEPICTED IN VERTICAL MOUNT ORIENTATION)

**ELECTRICAL INTERCONNECTIONS**

The vehicle harness connects the components that make up the fire and gas system together. The vehicle harness also connects the fire and gas system's vehicle interface outputs to the vehicle's multiplex system allowing the activation of features such as HAVC shutdown and engine shutdown. Refer to the System schematic, 475921, for more information.

## SYSTEM RESET

### FIRE:

After a fire, the system is restored to operational status as follows:

1. Disconnect system power by removing the system fuses. The system has two fuses.
2. Remove the Fire Extinguisher:
  - a. Disconnect the electrical connector on the extinguisher valve from the vehicle harness.
  - b. Install a shorting plug to the electrical connector on the extinguisher valve.
  - c. Remove the distribution piping from the valve outlet port and install the anti-recoil plug.

**WARNING! THE ANTI-RECOIL PLUG SHALL BE INSTALLED ON THE VALVE OUTLET PORT AT ALL TIMES EXCEPT WHEN THE EXTINGUISHER IS CONNECTED TO THE DISTRIBUTION PIPING OR WHILE THE EXTINGUISHER IS BEING FILLED.**

- d. Loosen the mounting clamps and remove the extinguisher.

**CAUTION! DO NOT ATTEMPT TO REBUILD THE EXTINGUISHER. HAVE THE FIRE EXTINGUISHER REBUILT BY A QUALIFIED FIRE PROTECTION EQUIPMENT COMPANY FAMILIAR WITH KIDDE DUAL SPECTRUM EQUIPMENT. REBUILD SHALL INCLUDE SQUIB, VALVE SEALS, AND DRY CHEMICAL REPLACEMENT.**

3. Blow out the distribution tubing with dry compressed air to insure the tubing is dry and free of debris and/or residual agent.
4. Replace any damaged or missing nozzle blow-off caps.

**CAUTION! NOT INSTALLING ALL OF THE NOZZLE BLOW-OFF CAPS BEFORE PREFORMING A DRY CHEMICAL CLEANUP CAN RESULT IN COMTAMINATES GETTING IN THE DISTRIBUTION SYSTEM WHICH COULD RESULT IN COMPROMISED PREFORMAMCE OF THE SUPRESSION SYSTEM.**

5. Clean up dry chemical agent according to “Dry Chemical Clean-Up Procedure”, R9866.
6. Repair and/or replace any damaged detection devices and/or electrical harnessing.
7. Replace the fire extinguisher:
  - a) Inspect the new extinguisher; verify it is the correct part number to ensure it is the correct configuration for the application and verify the anti-recoil plug and the shorting plug are installed.
  - b) Install the extinguisher in the mounting bracket and oriented per the instructions on the extinguisher nameplate. Tighten the mounting clamps. Do NOT connect the electrical connector at this time.

**CAUTION! THE EXTINGUISHER WILL NOT FUNCTION AS INTENDED IF ORIENTED INCORRECTLY**

- c) Remove the anti-recoil plug and immediately connect the distribution piping.
- d) Connect system power by replacing the system fuses and verify the red fire ALARM indicator on the Protection Panel is NOT on.

**NOTE:** A FIRE TROUBLE INDICATOR WILL BE ON BECAUSE THE ELECTRICAL CONNECTOR ON THE EXTINGUISHER VALVE IS NOT CONNECTED.

**CAUTION!** IF THE PROTECTION PANEL IS IN ALARM CONDITION, THE EXTINGUISHER MAY DISCHARGE IF IT IS CONNECTED TO THE SYSTEM. BE SURE THE RED FIRE 'ALARM' INDICATOR ON THE PROTECTION PANEL IS **NOT** ILLUMINATED BEFORE PROCEEDING FURTHER.

- e) Remove the shorting plug from the electrical connector on the extinguisher valve.
  - f) Attach the vehicle harness to the electrical connector on the extinguisher valve.
7. Verify the green SYSTEM OK indicator on the Protection Panel is on.

### **TRACE GAS LEAK:**

The system will automatically reset itself and indications will clear when the gas dissipates below the trace leak threshold.

### **SIGNIFICANT GAS LEAK:**

After a significant gas leak, the system is restored to operational status as follows:

1. Disconnect system power by removing the system fuses. The system has two fuses.
2. The system and all of the fire and gas detectors will reset.

**NOTE:** IF ONLY THE TEST/RESET BUTTON ON THE PROTECTION PANEL IS PRESSED AFTER A SIGNIFICANT GAS LEAK ALARM THE SYSTEM WILL RESET, HOWEVER THE STATUS INDICATOR ON THE INDIVIDUAL GAS LEAK DETECTOR THAT DETECTED THE SIGNIFICANT GAS LEAK WILL REMAIN ILLUMINATED SOLID RED. POWER MUST BE CYCLED TO RESET DETECTOR STATUS INDICATORS.

## PERIODIC MAINTENANCE

### PRE-TRIP

- Verify the Protection Panel's green 'SYSTEM OK' indicator is illuminated and that all other indicators are OFF.
- Press the TEST/RESET Switch. The following should occur:
  - All indicators and switches on the Protection Panel should illuminate.
  - An audible alarm should sound.

### EVERY 3000 MILES OR MONTHLY (WHICHEVER OCCURS FIRST)

#### General

- Verify neither the protected equipment nor the hazard has changed
- Verify no obvious physical damage or condition exists that might prevent system operation

#### Protection Panel

- Verify all warning indicators and the audible alarm are operational by pressing the 'TEST/RESET' button

#### Manual Activation Switch

- Verify tamper seal is intact and access to switch is unobstructed

#### Fire Detectors

##### Spot Thermal Detector

- Verify there is no obvious physical damage and the device is free of excess contamination (dirt, oil, grease, etc). If necessary, clean using water soaked non-abrasive towel.

#### Gas Leak Detectors

- Verify status indicator on the detector is on solid green
- Verify there is no obvious physical damage and that unit is free of excess contamination (dirt, oil, grease, etc) - if necessary, clean using water soaked non-abrasive towel.

#### **CAUTION: DO NOT USE CHEMICAL CLEANERS**

- Verify no silicone based materials have been used near detector

#### Electrical Harness

- Verify electrical connectors and electrical wiring have no visible damage and all connectors are securely seated

### **Extinguisher & Distribution System**

- Verify the extinguisher is oriented correctly.
- Verify the extinguisher pressure gauge pointer is in the green arc at room temperature.
- Verify distribution piping and nozzles are intact, unobstructed, and that nozzle blow-off caps are in place.
- Visually inspect the extinguisher for damage such as pits, gouges, dents, or corrosion. If a pit, gouge, or cut exceeds a depth of 0.08 inches; if the depth of a dent exceeds 0.25 inches or one-tenth of the average diameter of the dent; or corrosion exceeds a depth of 0.05 inches or a coverage area larger than 15% of the extinguisher's outer surface, have the extinguisher evaluated by a qualified fire protection equipment company familiar with Kidde equipment.

### **EVERY 18000 MILES OR SEMI-ANNUALLY (WHICHEVER OCCURS FIRST)**

- Perform a comprehensive fire system test according to KAD Generic AFSS Checkout Procedure, R10027 using a Kidde Fire System Test Set (Thermal Detection Test Kit P/N 4208971-1)
- Perform a comprehensive gas leak system test using the KAD Gas Sensor Test Kit, P/N 420756, for CNG, LNG, and Propane.

### **EVERY SIX YEARS**

Have the fire extinguisher assembly rebuilt and inspected by a qualified fire protection equipment company familiar with Kidde equipment. The date of manufacture of the extinguisher assembly is stamped (MM/YY) on the top neck of the cylinder. This is the date that should be used to determine the 6 year service interval date.

### **EVERY TWELVE YEARS**

Have the fire extinguisher cylinder hydrostatically tested by a qualified fire protection equipment company familiar with Kidde equipment. The date of manufacture of the cylinder is stamped (MM/YY) on the neck of the cylinder. This is the date that should be used to determine the 12 year service interval date.

### **ADDITIONAL INSPECTIONS**

A thorough inspection should be performed after any major engine work is done to ensure components have not been damaged or relocated.

## TROUBLESHOOTING GUIDE

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
All Protection Panel indicators off.	No power to protection panel	Check protection panel fuse (15A). Check power and ground connections & voltage to protection panel. (NOTE: Below 9 volts the system will not function.) If the power (~24Volts) and ground are present at the protection panel, replace it.
Protection Panel green SYSTEM OK indicator blinking.	Low battery voltage	Check connections & voltage to system. Below 22 volts the system will provide low voltage indication.
Protection Panel green SYSTEM OK indicator off, yellow fire TROUBLE indicator on, red fire ALARM indicator on solid and audible alarm on.	System automatically discharged	Correct the cause of the system activation and reset the system as described in the system reset portion of this manual
Protection Panel green SYSTEM OK indicator off, yellow fire TROUBLE indicator on, red fire ALARM indicator on blinking and audible alarm on.	System manually discharged	Correct the cause of system activation and reset the system as described in the system reset portion of this manual



SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Protection Panel green SYSTEM OK lamp off, yellow fire TROUBLE lamp on solid and audible alarm beeping.	Component not connected or damaged harness in the extinguisher circuit	Check the harness connection at the extinguisher  Use a value simulator and starting at the first connection in the extinguisher circuit systematically check the voltage at each connection until the section where the fault exists is identified.  NOTE: The valve circuit voltage should measure in the millivolts.
Protection Panel green SYSTEM OK indicator off, yellow fire TROUBLE indicator on blinking and audible alarm beeping.	Component not working, not connected, or damaged harness in the fire detection or extinguisher circuits	Check Fire sensors.  Check harness connections at fire sensors.  Check EOL connections  Check for the correct voltage values on each of the fire circuits. (Pin A: 22-26 volts, Pin B: Ground, Pin C: 11-15 volts  If the voltage at Pin A or C is low, use an EOL and starting at the first connection in the Fire circuit systematically check the voltage at each connection until the section where the fault exists is identified.
Protection Panel green SYSTEM OK indicator off, yellow gas TROUBLE indicator on solid and audible alarm beeping.	Gas leak detector fault	Check gas detectors' LED indicators.  If a gas detector's LED indicator is blinking red/green, refurbish with p/n 420483 refurbishment kit or replace sensor.

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
	Component not connected or damaged harness in gas detection circuit	Check gas detectors' LED indicators. If any are not illuminated this is an indication that power is not being received.  Check harness connections at the gas detectors.  Check for the correct voltage values on the gas circuit. (Pin A: 22-26 volts, Pin B: Ground, Pin C: 11-15 volts).  NOTE: The gas detectors will not be powered if Pin B is not equal to Ground.  If the voltage at Pin A or C is low, use an EOL and starting at the first connection in the gas circuit systematically check the voltage at each connection until the section where the fault exists is identified.
Protection Panel green SYSTEM OK indicator on solid, red gas LEAK indicator blinking.	Trace gas leak present	Correct the cause of the leak. System will reset itself when trace gas leak dissipates below detection threshold.
Protection Panel green SYSTEM OK indicator on solid, red gas "LEAK" indicator on solid and audible alarm on.	Significant gas leak alarm has occurred and may or may not still be present.	Locate gas sensor that initiated alarm by checking sensor status indicators. Correct the cause of the leak. Reset system as described in the system reset portion of this manual and monitor for alarm.
Status indicator on gas sensor blinking green	Power up period	Allow 30 seconds after power-up for indicator to turn solid green

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Extinguisher pressure gauge reading is low	Extinguisher cold	Let extinguishers warm up to room temperature (about 70°F) and recheck the gauge. If the pointer is then within the green arc no corrective action is required
	Extinguisher leaking or discharged	Have the fire extinguisher serviced by a fire protection equipment company familiar with Kidde equipment

## REPLACEMENT PARTS LIST

Part Number	Description
413484-1345	CONTROL PANEL, FIRE & GAS ICD
421317-1	Manual Activation Switch
421317-2	Manual Activation Switch Tamper Seal
420419-350	350°F Spot Thermal Detector
420473-2050	Methane Gas Sensor
420483	Methane Detector Rebuild Kit
420241	EOL, End of Line
421220-22	Extinguisher, 25Lbs, PK, Gauge Right
421222	Bracket, Extinguisher, 25Lb.
420588	Distribution Block
474946	Nozzle, Dry Chemical
475922	HARNESS, MAIN, CNG, NFI
475839	Hrns Assy - Power Lead
476713	Hrns-Eng Compt Fire Supn D/S
475852-4	Hrns-Roof Gas Det DS 4' TWR
475851-8	Hrns-Roof, Gas Det DS 8' Shrd.
447352-3	INTERCONNECT HARNESS HI-TEMP 3FT
447352-6	INTERCONNECT HARNESS HI-TEMP 6FT
447333-8	INTERCONNECT HARNESS SHIELDED 8FT
475974-3	INTERCONNECT HARNESS STD 3FT
420871-1	Fire System Test Kit (Linear)
420756	Gas Sensor Test Kit

## CONTACT INFORMATION

Any questions concerning the information presented in this manual should be addressed to:

Kidde Aerospace & Defense  
Attn: Commercial Ground Vehicle Group  
4200 Airport Dr. N.W.  
Wilson, NC, 27896

Phone: 252 237 7004 - Ask to speak to someone in the Commercial Ground Vehicle Group

## REVISION HISTORY

Revision	Date	Description	Authored By:
A	March 1, 2017	Initial Release	ACR
B	Oct. 25, 2017	Updated to include SR2156	ACR