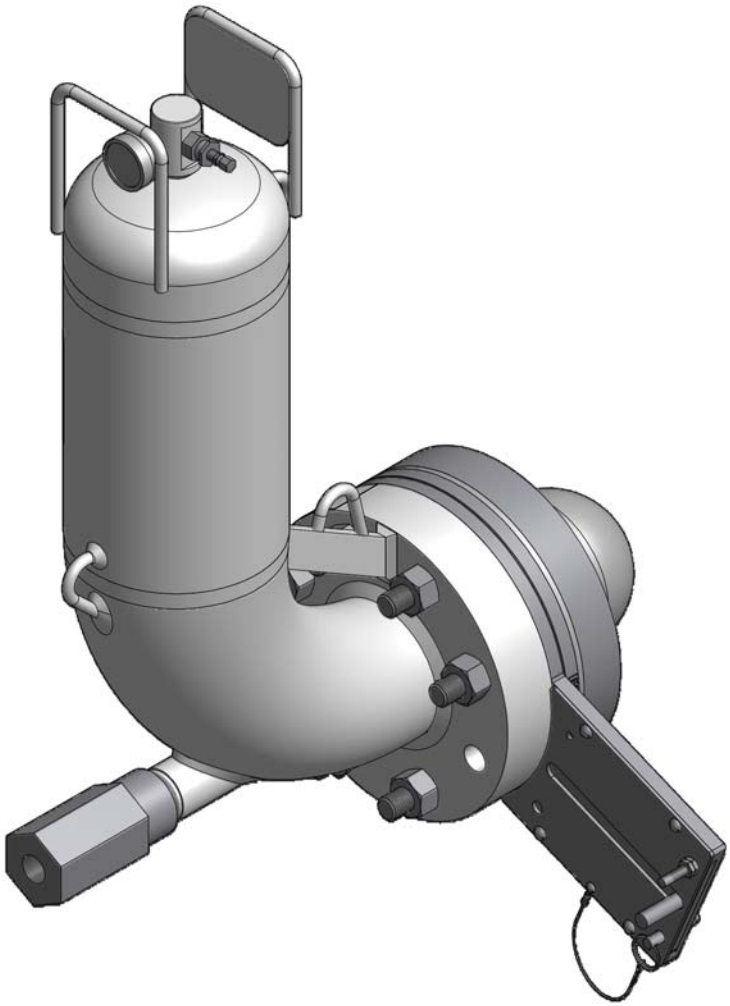
Fike®

INSTALLATION & OPERATION MANUAL

HRD LOCKOUT ASSEMBLY



P/N E06-082-3 (Rev. 1)
October, 2012

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Original Release Date.....September, 2012

Revision / Description of Change	**Revision Date**

Revision 1 .....October, 2012

1) 3 Specifications, Primary and Secondary Sensor Rating and Specifications; changed 02-13579-2 to 02-13579-1, changed Plastic to Stainless Steel.
2) 3 Specifications, Optional and Replacement Parts; added Secondary Sensor 02-13579-1.

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1 INTRODUCTION

This document is intended to provide information and assist with the installation and service of the Fike HRD Lockout Assemblies, and shall be used in conjunction with the field installation drawings provided for the specific application. The field installation drawings are commonly referred to as E08-XXX mechanical installation drawings, E09-XXX electrical installation drawings and E11-XXX mounting details for mechanical and electrical components.

2 GENERAL

The 4" and 6" HRD Lockout Assemblies are designed to provide the user a mechanical barrier preventing discharge into the duct or vessel which would cause physical injury.

With the HRD Lockout in the CLOSED position:

- The primary sensor and magnet will electrically DISABLE the EPC.
- The gate will divert the suppressant and discharge it to atmosphere through the cover/gate area and slow the rate of the discharge. A small amount of suppressant is expected to be discharged into the vessel.

The HRD Lockout is not intended to prevent the HRD container from discharging the suppressant.

The HRD Lockout will provide compliance with the following regulations and standards:

- OSHA requirement 29 CFR 1910.147, The Control of Hazardous Energy (lockout-tagout).
- NFPA 69-2008, 11.3 Personnel Safety.
- EN 14373, 8 Instructions for installation, commissioning and maintenance.

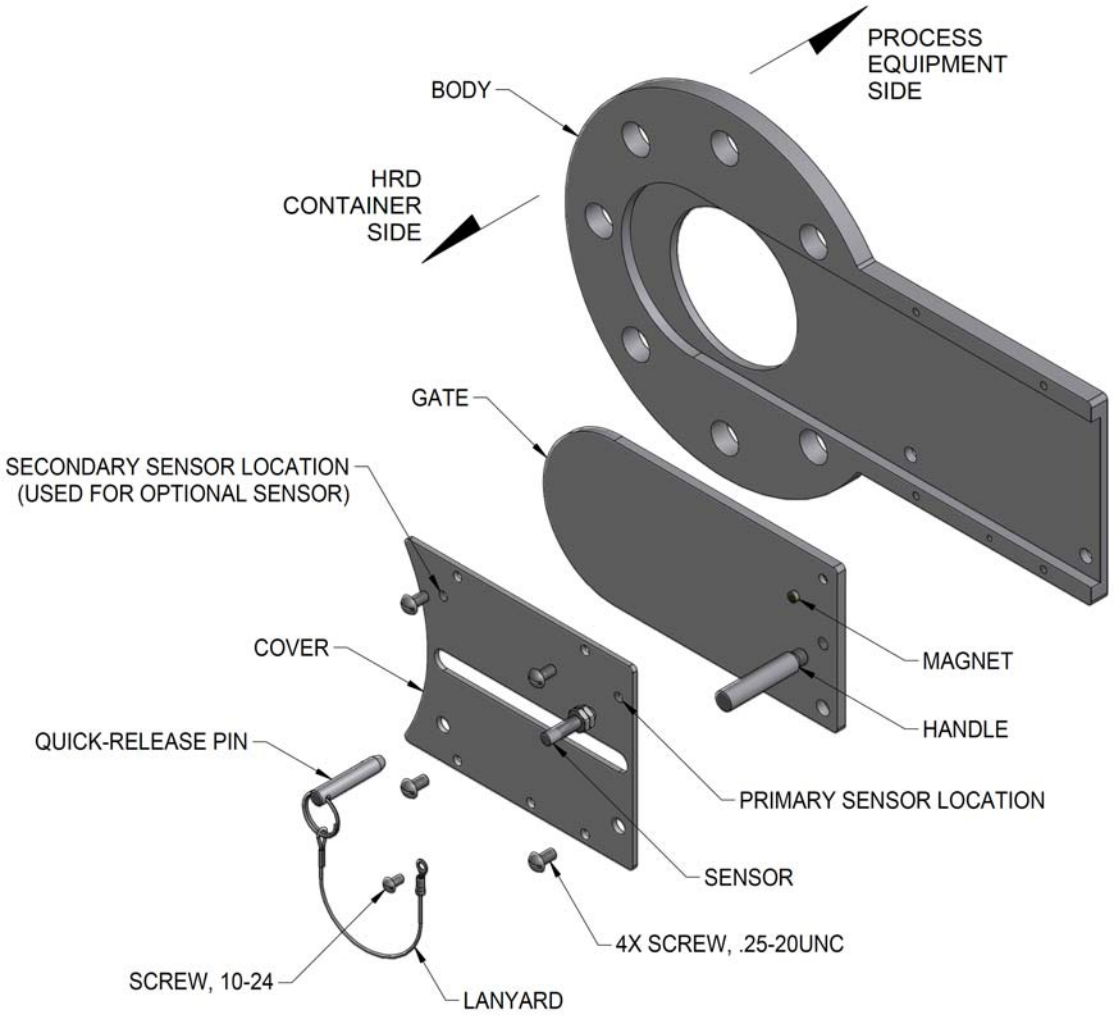

FIGURE 1 – EXPLODED VIEW

3 SPECIFICATIONS

HRD Lockout Rating and Specifications	
Fike P/N's	E70-063 (4"), E70-064 (6")
Sizes	4" (used with the 2.5L, 5L, 10L, 20L and 30L HRD containers) 6" (used with the 50L HRD Ver 1 and Ver 2 containers)
Weight	15 lb / 6.8 kg (4"), 34 lb / 15 kg (6")
Materials	300 Series Stainless Steel Construction

Primary and Secondary Sensor Rating and Specifications	
Fike P/N	02-13579-1
Thread Size	M8 x 1.25
Material	Stainless Steel barrel and retaining nuts
Power	5 W Max
Voltage	175 Vdc Max
Current	0.25 A Max
Operating Temp	-40 to +221°F (-40 to +105°C)
Cable	39" (1m) x 24 AWG, stripped and tinned ends

Intrinsic Safety Barrier Rating and Specifications (Required for Hazardous Locations)	
Fike P/N	02-13775
Operational Voltage	20 to 250 VAC / 20 to 125 VDC
Frequency	≥ 40 to ≤ 70 Hz
Power Consumption	≤ 3 W
Cable Resistance	≤ 50 Ω
Degree of Protection	IP20
Ambient Temperature	-13 to 158°F (-25 to +70°C)
Hazardous Location Approvals (Intrinsically Safe)	
FM C US APPROVED	Class 1, Div 1&2, Group A,B,C,D Class 1, Zone 0,1 or 2 Group IIC, IIB, IIA Class II, Div 1&2, Group E,F,G Class III, Div 1
ATEX	Ex II (1) GD [EEx ia] IIC/IIB Ex II 3 G Ex nA nC [nL] IIC/IIB T4

Optional and Replacement Parts	
Description	**Fike P/N**
Secondary Sensor	02-13579-1
Lanyard/Quick-Release Pin/Screw	E70-0231
Zener Diode	10-2459
Retrofit Shim	E70-0230

Power Consumption per Intrinsic Safety Barrier Battery – 24 VDC Power Consumption with X Sensors	
1 Primary Sensor	40 mA (Normal Operation) 30 mA (Isolated Operation)
1 Primary Sensor & 1 Secondary Sensor	40 mA (Normal Operation) 40 mA (Isolated Operation)
2 Primary Sensors (2 HRDs)	55 mA (Normal Operation) 40 mA (1 HRD Isolated Operation) 30 ma (Both HRDs Isolated Operation)

NOTE: If AC voltage is used to power the intrinsic safety barrier, separate conduit is required to prevent interference with DC circuits.

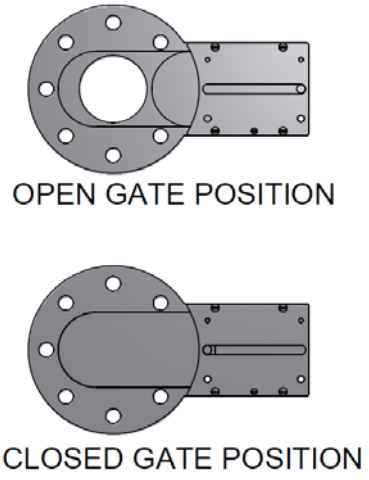

FIGURE 2 – GATE POSITIONS

4 MECHANICAL INSTALLATION

Refer to the E08-XXX, E09-XXX and E11-XXX drawings (supplied with hardware) for proper installation.

4.1 Installation Considerations

The HRD Lockout can be installed in any position under the following condition:

- Installed inside without wash-down.

The HRD Lockout shall be installed for self-draining under the following conditions:

- Installed outside.
- Installed inside with low pressure wash-down.
- Installation where frequent moisture is present.

The HRD Lockout shall not be installed if the application requires high pressure wash-down. The HRD Ball Valve is recommended for these applications.

When installing the studs in the bolting pad, consider the orientation of the HRD lockout.

- The handle and sensor shall face the HRD container.
- The pin lockout holes shall be accessible.
- The sensor shall not be located where it could be damaged.

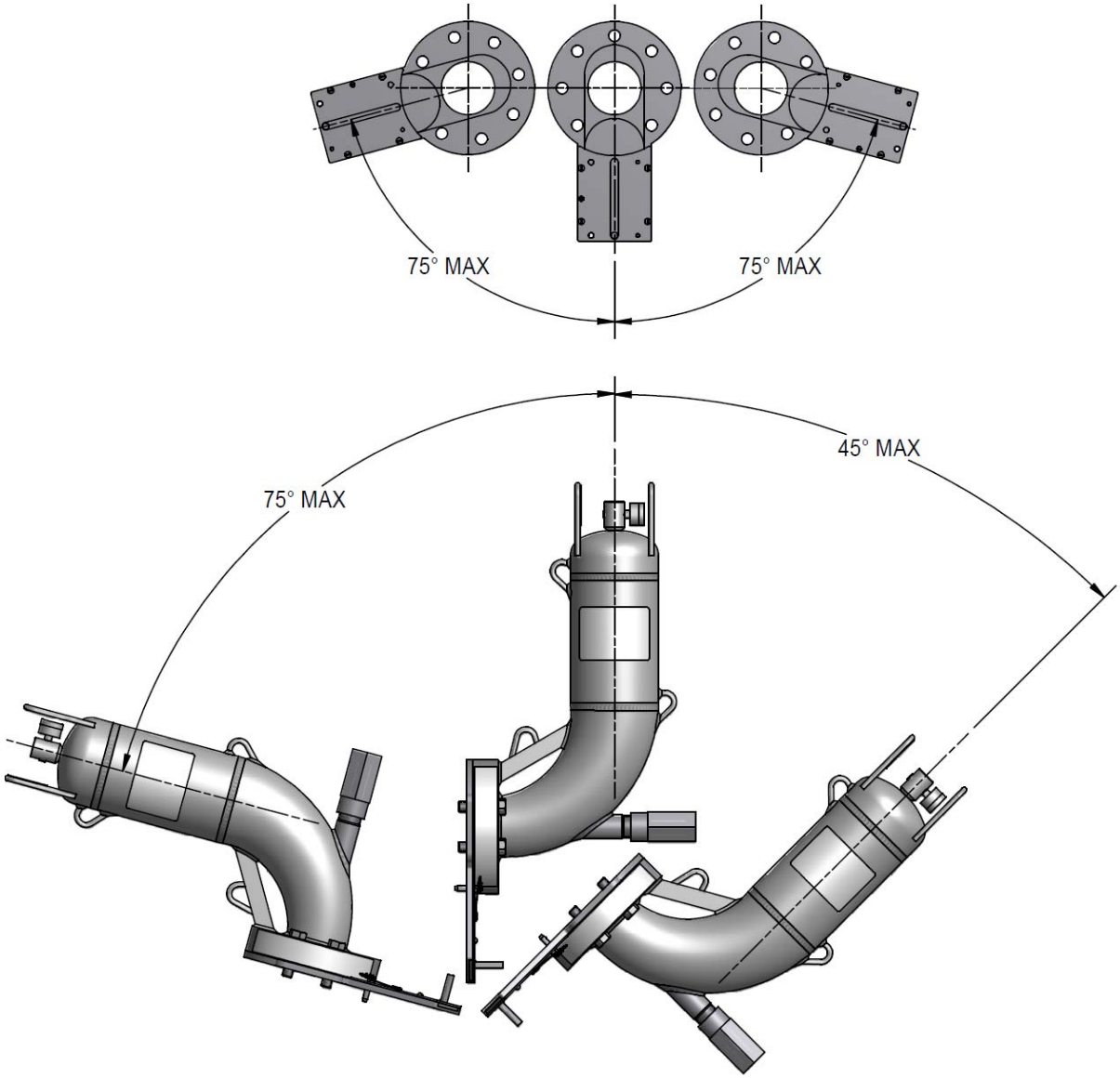

FIGURE 3 –POSITIONS FOR SELF-DRAINING

4.2 Mounting Instructions

- **Stud Length:** The stud length for mounting the HRD container is dependent on the HRD Lockout and HRD nozzle/cover used. New installations are provided with the correct stud length, and the correct quantity of studs and nuts. Adding the HRD Lockout to an existing HRD container will require the removal of studs (1 stud for the 4" HRD Lockout, 2 studs for the 6" HRD Lockout). Also, the existing studs may be too short. Replace with longer studs as necessary (reference Table 1).

TABLE 1 – STUD LENGTH			
Nozzle P/N	**Nozzle Description**	**Stud P/N**	**Stud Length**
E80-011-2	Standard 4” Telescopic Nozzle	02-10695	13”
E80-018-2	Standard 6” Telescopic Nozzle		
E80-0067-2	Hygienic 4” Telescopic Nozzle	02-8957	12”
E80-020-2	3” Nozzle / 4” HRD Standard	E02-0146	6”
E80-052-2	4” Mounting Hardware		
E80-029-2	Hygienic 4” Cover		
E80-025-2	Standard 4” Nozzle		
E80-026-2	Standard 6” Nozzle		

- **Stud Quantity:** The 4” HRD Lockout requires (7) studs. The 6” HRD Lockout requires (10) studs. The missing stud(s) provide clearance for the gate.
- **Retrofit Shim (P/N E70-0230):** The 4” HRD containers (2.5, 5, 10, 20 & 30L) manufactured prior to January 2010 *require* the retrofit shim to prevent the gate from binding. The retrofit shim is installed between the HRD container and HRD lockout (reference Figure 4).

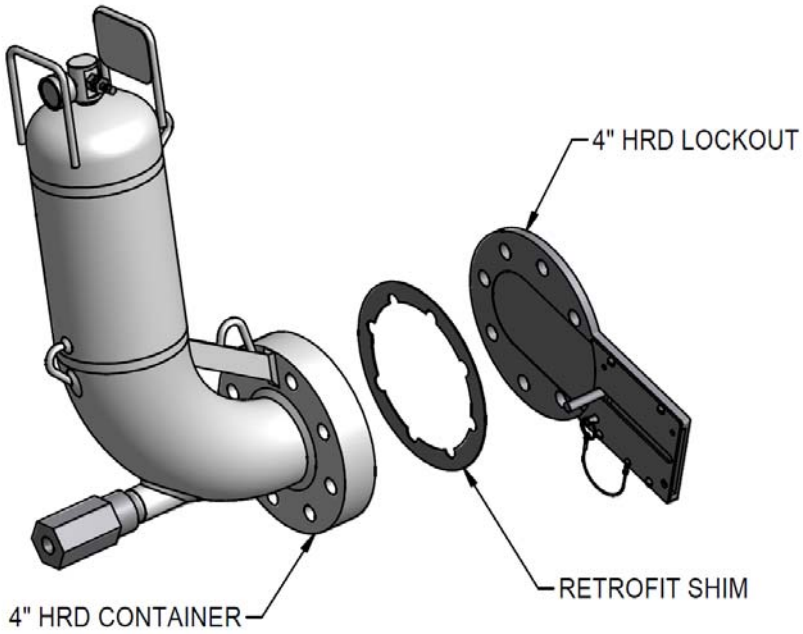

FIGURE 4 – RETROFIT SHIM INSTALLATION

- Install the studs in the bolting pad.
- Install the HRD cover and nozzle assembly.
- Install the HRD lockout on the studs.

CAUTION: The HRD lockout shall be mounted with the handle and sensor facing the HRD container.

- Install the retrofit shim on the studs, if required.
- Install the HRD container on the studs and secure with nuts.
- Refer to the HRD container manual E06-018-1 for additional information.
- Torque nuts uniformly in a star pattern in 1/3 increments. 50 ft-lb for the 4” HRD Lockout. 75 ft-lb for the 6” HRD Lockout.
- The final assembly shall have a minimum of 3 threads exposed on each stud.

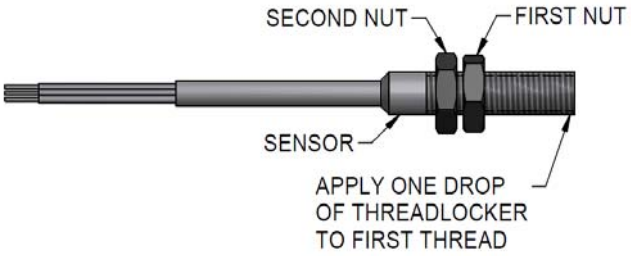

FIGURE 5 – SENSOR WITH NUTS (Primary and Secondary)

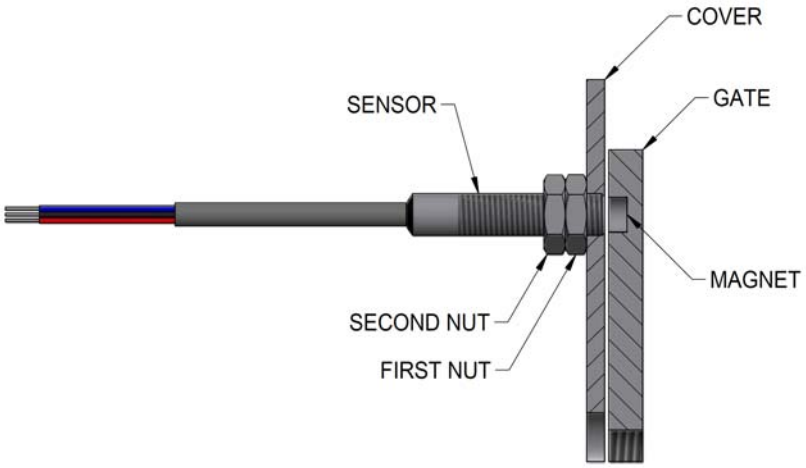

FIGURE 6 – SENSOR INSTALLATION (Primary and Secondary)

4.3 Primary Sensor Installation

- Position the (2) nuts towards the wire end of the sensor.
- Apply one drop of Loctite 242 or 243 (medium strength blue) threadlocker to the first thread.
- Thread the Primary sensor approximately 1.5 turns into cover location marked “A”.
- Position the first nut flush with the cover plate plus 1/8 turn to tighten.
- Verify the gate does not touch the sensor by slowly moving the gate open and closed.
- Position the second nut flush with the first nut plus 1/8 turn to tighten.

CAUTION: Sensor damage will occur if over tightened or if the gate impacts the sensor.

4.4 Secondary Sensor Installation (Optional)

- Position the (2) nuts towards the wire end of the sensor.
- Apply one drop of Loctite 242 or 243 (medium strength blue) threadlocker to the first thread.
- Thread the Primary sensor approximately 1.5 turns into cover location marked “B”.
- Position the first nut flush with the cover plate plus 1/8 turn to tighten.
- Verify the gate does not touch the sensor by slowly moving the gate open and closed.
- Position the second nut flush with the first nut plus 1/8 turn to tighten.

CAUTION: Sensor damage will occur if over tightened or if the gate impacts the sensor.

5 ELECTRICAL INSTALLATION

5.1 Primary Sensor Electrical Installation (Non-Hazardous Area)

The primary sensor will electrically prevent ARMING the EPC when the gate is not in the fully open position.

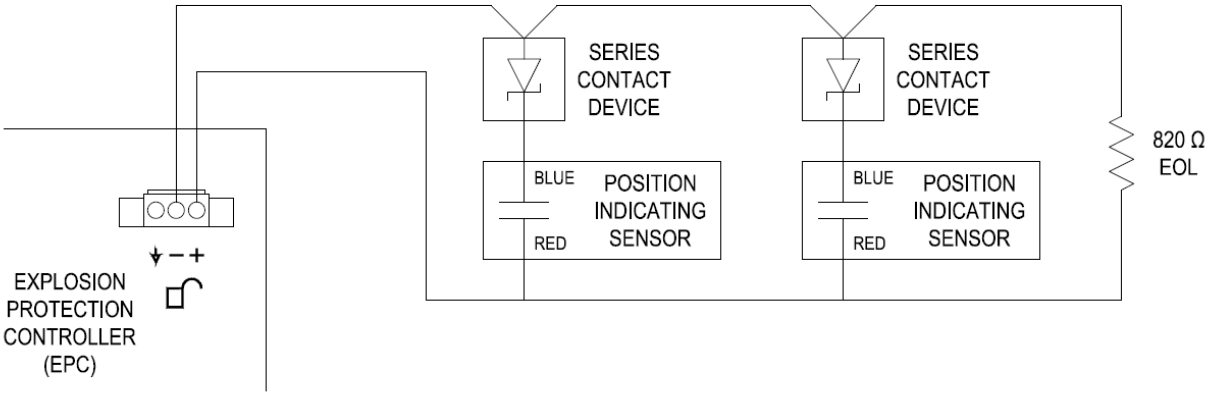

FIGURE 7 – PRIMARY SENSOR WIRING DIAGRAM (Non-Hazardous Area)

[NOTE: The figure represents the sensor in the energized state close to the magnet, gate open.]

5.2 Primary Sensor and Intrinsic Safety Barrier Electrical Installation (Hazardous Area)

Primary Sensor (P/N 02-13579-2);

- Is provided with the HRD Lockout.
- Is designed to electrically prevent ARMING the EPC when the gate is in the closed position.

Intrinsic Safety Barrier (P/N 02-13775);

- Is required when installing the primary sensor in a hazardous location.
- The LED's will detect the state of the primary sensor (i.e. when the gate is open or closed) (reference Table 2).
- Shall be installed outside the explosive hazardous area.
- Can be installed inside a junction box near the sensor or inside the EPC enclosure. NOTE: The junction box must comply with appropriate hazardous area rating.

The way in which the HRD Lockout is interfaced with the EPC and the process is dependent on local process and legislative requirements.

Figures 8 and 9 represent the approved wiring methods. Contact Fike for any other specific requests.

TABLE 2 – INTRINSIC SAFETY BARRIER/SENSOR LED STATE

Lockout Blade Position	PWR LED	LED 1	EPC Condition	Process
Open	On	Yellow	ARMED	Protected
Closed	On	Off	DISARMED	Not Protected
Open	Off	Off	DISARMED	Not Protected

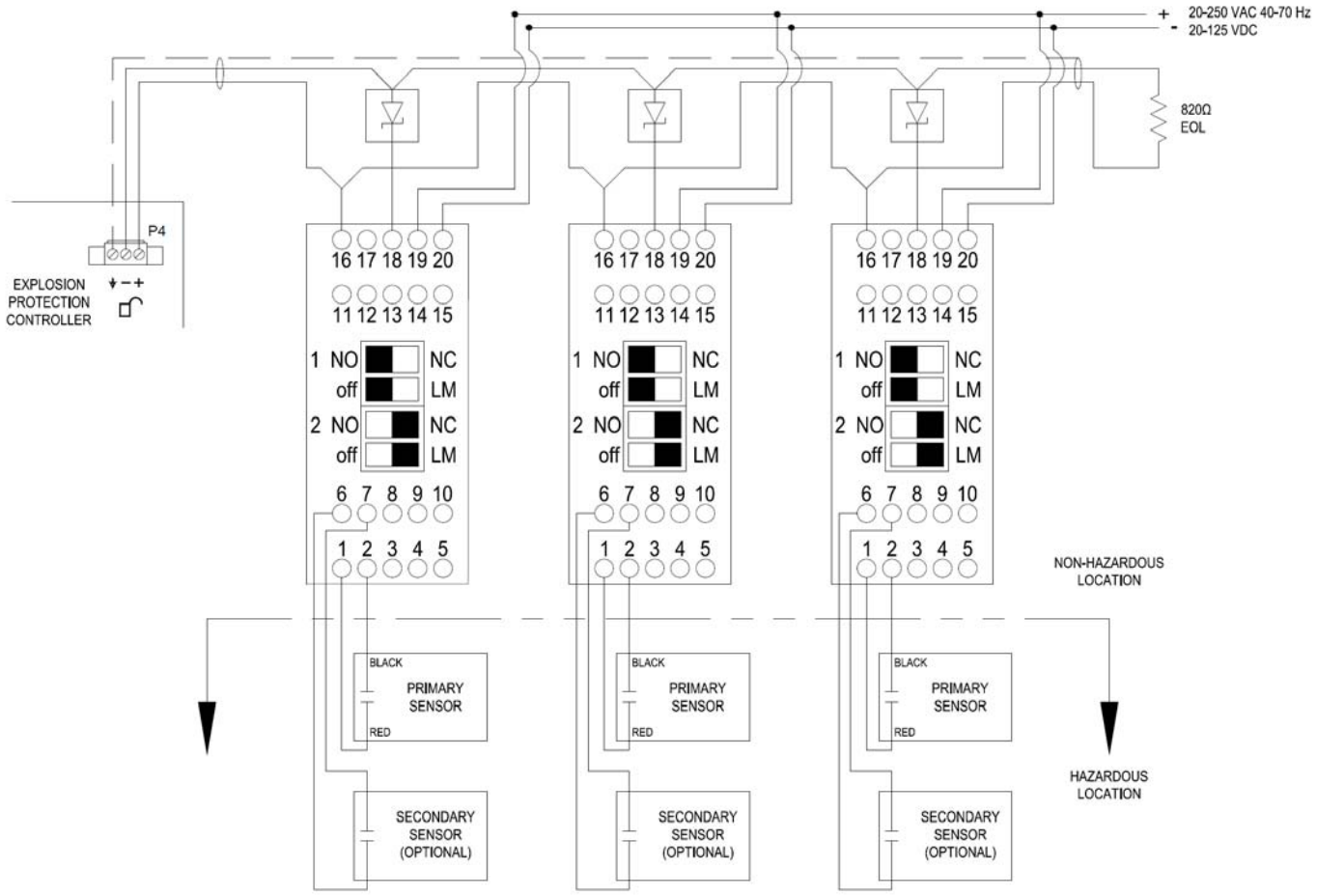

FIGURE 8 – PRIMARY AND SECONDARY SENSOR WIRING DIAGRAM (Hazardous Area)
[NOTE: The figure represents the primary sensor in the energized state close to the magnet, gate open.]

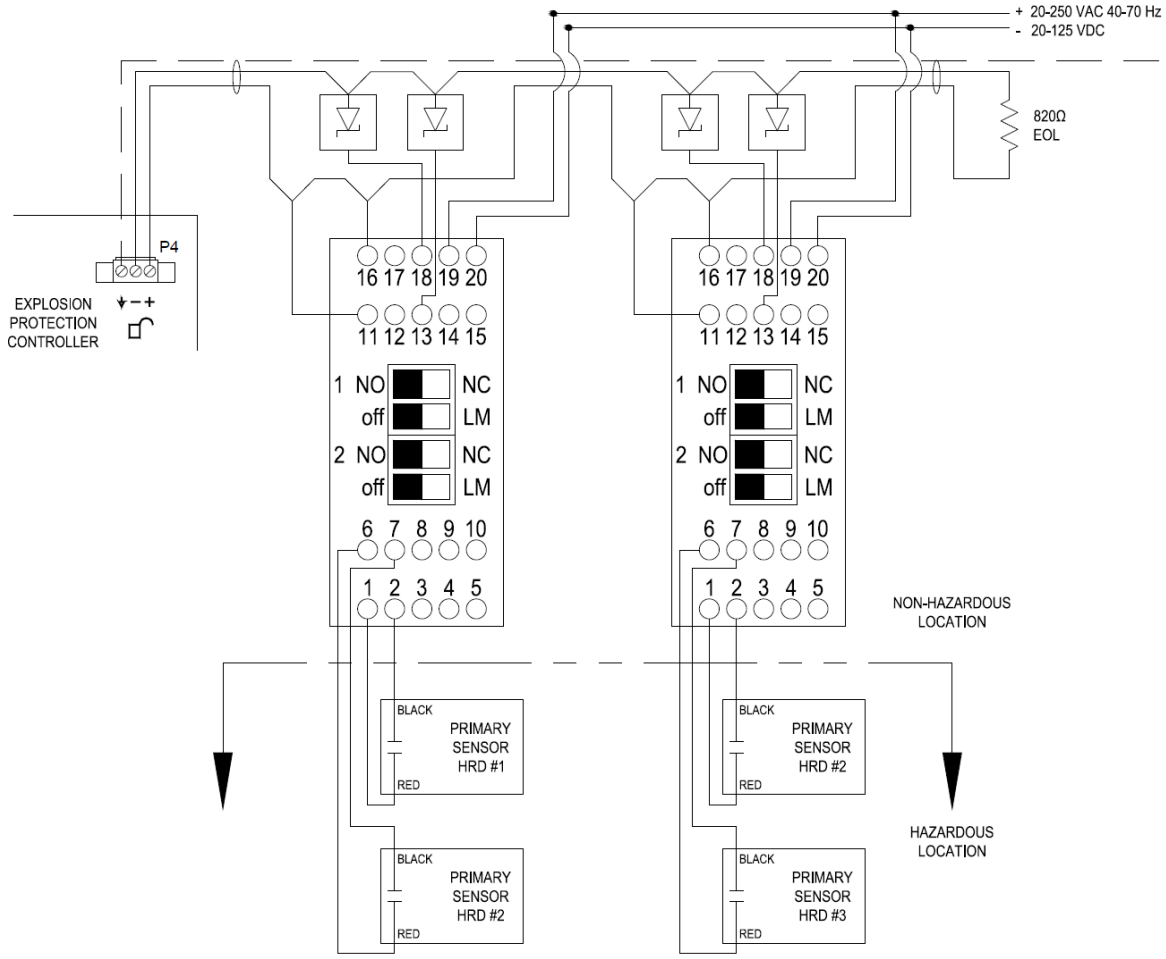

FIGURE 9 – PRIMARY SENSOR WIRING DIAGRAM
w/ 2 HRD CONTAINERS PER INTRINSIC SAFETY BARRIER (Hazardous Area)
[NOTE: The figure represents the primary sensor in the energized state close to the magnet, gate open.]

5.3 Secondary Sensor Electrical Installation (Optional)

The optional secondary sensor is available to provide electrical confirmation the gate is in the fully closed position. The sensor may be wired directly to the plant controls when used in a non-hazardous area or if located in hazardous area the switch must be wired through an intrinsic safety barrier (reference Figure 10). In hazardous locations; the secondary sensor wire colors, intrinsic safety barrier DIP switch settings, and relay contact selection shall be chosen based upon the functionality required for the facility.

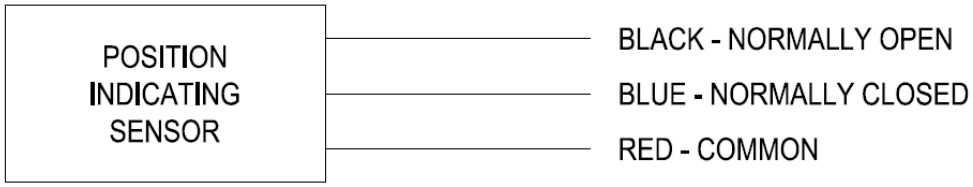

FIGURE 10 – SECONDARY SENSOR WIRING DIAGRAM (OPTIONAL)
[NOTE: The figure represents the sensor in the normal state away from the magnet.]

6 INSPECTION / MAINTENANCE

Maintenance shall be performed during system checkout and a minimum of once a year by a Fike trained and certified technician. All inspection and maintenance shall be completed with the suppression system DISABLED and process shut down.

- Shut down the process and verify the EPC is NORMAL.
- Open and close the gate several times to ensure free movement.
- Verify the EPC is DISABLED when the HRD Lockout is in any position other than fully open. The EPC should DISABLE when the gate is closed more than 3/4".
- Clean the exterior of the HRD Lockout and sensor using a soft brush, dry cloth or vacuum, as necessary.

7 REFURBISHMENT INSTRUCTIONS

Refurbishment shall be performed after the suppression system is activated (performed only by a Fike trained and certified technician).

- Shut down the process and place the EPC in DISABLE.
- Remove the HRD Lockout from the process vessel and clean the interior and exterior of the HRD Lockout using a soft brush, dry cloth or vacuum. Disassembly may be required to thoroughly clean.
- If the gate was in the closed position during the suppression system activation, slight deformation of the gate and body may have occurred. The HRD Lockout is suitable for continued service if the gate has free movement and there are no broken parts. Replace any damaged parts or replace the entire HRD Lockout.
- Reinstall the HRD nozzle, HRD Lockout and HRD container. Verify the HRD Lockout is in good working order (refer to section 5).

8 DECOMMISSIONING (DISPOSAL & RECYCLING)

Decommissioning shall be performed only by a Fike trained and certified technician.

- Shut down the process and place the EPC in DISABLE.
- Place the control panel EPC in DISABLE. Refer to the manual E06-051.
- Disconnect all electrical circuits. Observe the national regulations for disposal and recycling.
- Materials used: 300 Series Stainless Steel

9 OPERATION

Follow all procedures defined in the SRD/HRD Installation and Operation manual E06-018-1. The HRD Lockout can be operated by the well trained personnel at the direction of the facility manager.

9.1 Pressure Isolation

WARNING: Personnel working on equipment protected by SRD/HRD containers shall be made aware of the hazards associated with the container discharge and the precautions that must be taken to eliminate the hazard.

To comply with OSHA vessel entry and NFPA 69, the suppression system shall be provided with a means to prevent the release of stored energy into the protected enclosure. One of the following must be done prior to personnel entering or partially entering the protected enclosure, or exposing themselves to the discharge path of the SRD/HRD containers:

If the SRD/HRD containers are to remain installed on the process; do one of the following:

- de-pressurize the container (performed only by a Fike trained and certified technician).
- block the discharge with the baffle plate/plug.
- **block the discharge with the HRD lockout.**
- block the discharge with the Ball Valve Lockout Assembly.

The method used will depend on the installed equipment.

If the SRD/HRD containers are to be removed from the process; shut down the process and follow the GCA removal procedure (performed only by a Fike trained and certified technician) then do one of the following:

- de-pressurize the container (performed only by a Fike trained and certified technician).
- block the discharge using a baffle plate/plug.

9.2 Vessel Entry and Exit Procedure

Note: The following summarizes the steps for safe vessel entry using the HRD Lockout and is not intended to define every precaution required for every installation or process. Consult with the facility manager for additional safety procedures.

- Shut down the process.
- Place the control panel EPC in DISABLE. Refer to the manual E06-051.
- Remove the pin in the HRD Lockout, move the gate to the closed position, and replace pin to secure in the closed position.
- Verify the lockout-tagout devices have been installed to prevent the start-up of the vessel equipment, and the pressure isolation equipment has been applied to prevent the release of stored energy into the vessel.
- Verify the control panel EPC is not in ALARM.
- Follow the facilities confined spaces procedure.
- The vessel is SAFE FOR ENTRY.
- Perform the maintenance on the vessel and exit the vessel.
- Verify all personnel have evacuated the vessel. Close and secure all vessel openings.
- Remove the lockout-tagout devices.
- Remove the pin in the HRD Lockout, move the gate to the open position, and replace pin to secure in the open position.
- Verify the pressure isolation equipment and lockout-tagout devices have been removed.
- Return the control panel EPC to NORMAL.
- Start the process.

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