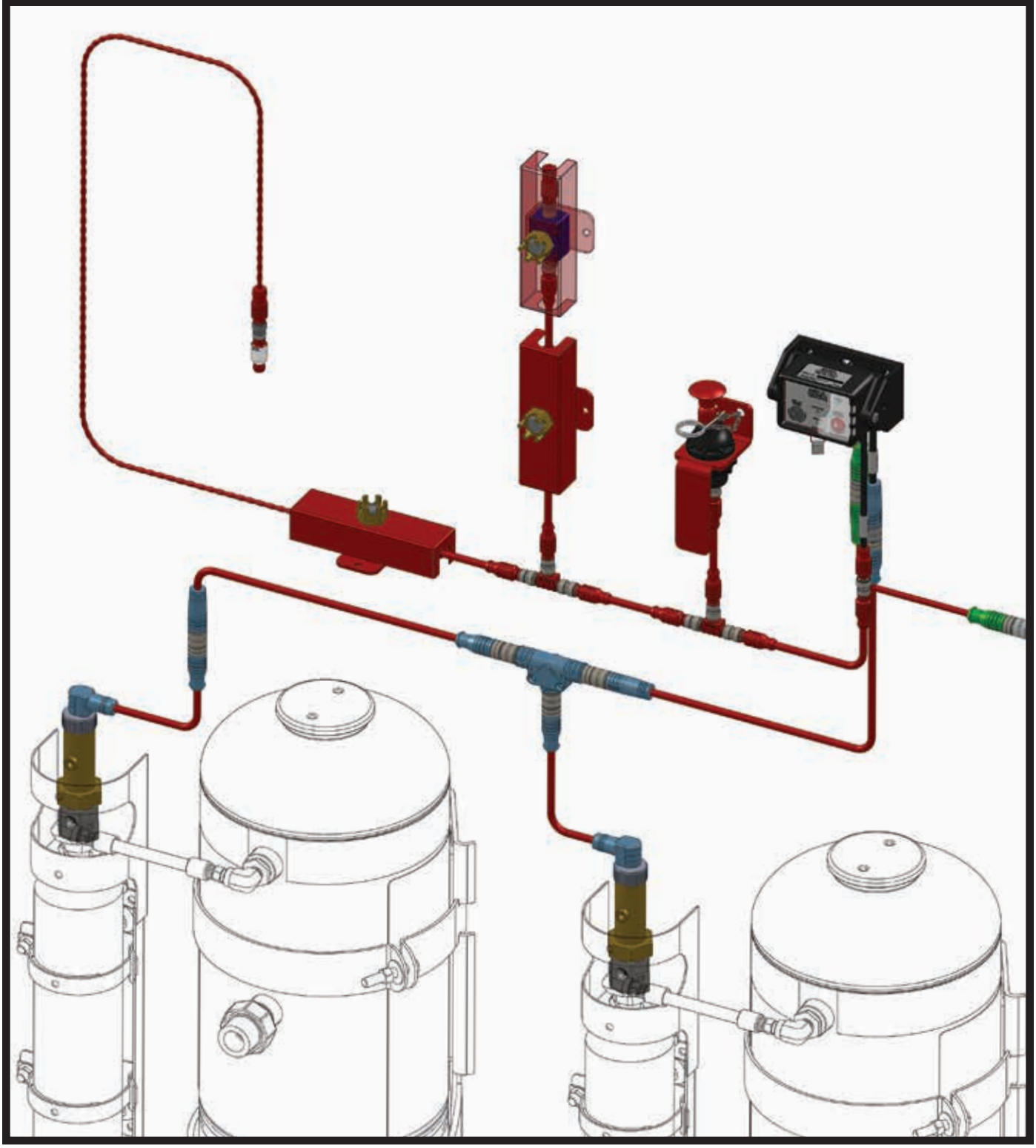
CHECKFIRE 110 DETECTION AND ACTUATION SYSTEM

ANSUL®

PLANNING, INSTALLATION, OPERATION, AND MAINTENANCE MANUAL



tyco Fire Protection Products

One Stanton Street / Marinette, WI 54143-2542, USA / +1-715-735-7411 / www.ansul.com
 / Part No. 440391-03

This manual is intended for use with the ANSUL® CHECKFIRE 110 Detection and Actuation System. This system is specifically engineered for monitoring and release of vehicle fire suppression systems. Planning, installation, recharge, and maintenance of the system must conform to the limitations detailed in this manual. Installation and maintenance shall be performed by an individual holding current ANSUL Certification from an ANSUL CHECKFIRE 110 Training Program with training to plan, install, recharge, and maintain the CHECKFIRE 110 System(s). Individuals must also hold current ANSUL Certification from an ANSUL A-101 or LVS training program.

Those who plan, install, operate, reset, program, inspect, or maintain these systems should read this entire manual. Specific sections will be of particular interest depending upon one's responsibilities.

As with all electro-mechanical-pneumatic equipment, the system needs periodic care to provide maximum assurance that it will operate effectively and safely. Inspection frequency shall be performed consistently, depending on operating and/or environmental conditions. Maintenance shall be performed semi-annually, or more frequently, depending on operating and/or environmental conditions.

The application and use of the CHECKFIRE 110 System is limited to the applications and uses described in this manual. For other applications, contact your Authorized ANSUL Distributor, Territory Manager, or Tyco Fire Protection Products – Technical Services Department, Marinette, Wisconsin 54143-2542, USA.

Note: The converted metric values in this manual are provided for dimensional reference only and do not reflect an actual measurement.

▸ Part Number: 440391-03

▸ Date: 2014-AUG-28

⚠ DANGER

Indicates a hazardous situation in which a person ***will*** **experience serious personal injury or death** if the situation is not avoided.

⚠ WARNING

Indicates a hazardous situation in which a person ***could*** **experience serious personal injury or death** if the situation is not avoided.

⚠ CAUTION

Indicates a hazardous situation in which a person **could experience minor or moderate personal injury** if the situation is not avoided.

CAUTION

Addresses practices not related to personal injury, such as a system part malfunctioning, property damage, or system failure.

NOTICE

Addresses general practices or observations related to system function that are *not* related to personal injury.

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2014-MAY-01	2-4	01		2014-MAY-08	10-1	02
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LEGEND FOR MANUAL PAGE REVISION INDICATORS:

- ▸ Indicates revised information.
- ■ Indicates no change to text – change in page sequence only.

NOTES:

SYSTEM DESCRIPTION

The CHECKFIRE 110 Detection and Actuation System is typically used with an ANSUL A-101 or LVS Vehicle Fire Suppression System for 24-hour protection of equipment. The system is designed for vehicles in extreme environmental and physical conditions.

Industries Where Vehicles Use CHECKFIRE 110 Systems:

- Forestry
- Agriculture
- Construction
- Public transportation
- Public utilities
- Land fills
- Waste disposal
- Mining

The automatic detection and actuation system provides monitored input/output circuits to activate an ANSUL fire suppression system. On detecting a fire condition, the control module activates the release circuit resulting in the discharge of an expellant gas cartridge initiating fire suppression system operation. Optional pneumatic actuation is available.

CHECKFIRE 110 Features

- Supervised power, detection, and release circuits
- External primary power with an internal reserve power source
- Selectable release time delay
- Electric “DELAY/Reset/Silence” button
- “PUSH To Activate / Alarm When Lit” electric manual activation button
- Color-coded “Plug and Play” connections
- 85 dB Internal Sounder
- System isolate feature
- Dust and water tight (IP67 rated)

CHECKFIRE 110 Specifications

CONTROL MODULE POWER (24 HOUR OPERATION)

12/24 VDC vehicle primary power source

Internal 72 hour reserve power source

SYSTEM CURRENT DRAW

Nominal < 6 mA @ 10.2 – 28 VDC

- Maximum < 100 mA @ 10.2 – 28 VDC

OPERATING TEMPERATURE LIMITS

– 40 °F to 140 °F (– 40 °C to 60 °C)

APPROVALS

FM Approved and CE Marked

CHECKFIRE 110 Connectivity

The modular cable harness system includes four color-coded leads for Detection, Release, External Power, and Alarm Output. See Figure 1-1.

DETECTION INITIATING / MANUAL ACTIVATION CIRCUIT

Detection circuit lead - 33 in. (838 mm) with **Red** color-coded connector

Connects to:

- Detection Circuit Cable
  - Electric Manual Actuator
  - Linear Detector
  - Spot Thermal Detector

RELEASE CIRCUIT

Release circuit lead – 27 in. (686 mm) with **Blue** color-coded connector

Connects to:

- Release Circuit Cable
  - Release Circuit Drop Cable

EXTERNAL POWER CIRCUIT

Power circuit lead – 21 in. (533 mm) with **Green** color-coded connector

Connects to:

- Power Circuit Cable
  - Fused Power Circuit Cable

ALARM OUTPUT CIRCUIT (Optional)

Alarm circuit lead – 16 in. (406 mm) with **Yellow** color-coded plug

Connects to:

- Vehicle electronics (digital 3.3 VDC output)

FIGURE 1-1
CHECKFIRE 110 CONTROL MODULE LEADS
009150

TYPICAL SYSTEM CONNECTIONS

Four leads with corresponding color-coded connectors provide easy CHECKFIRE 110 System installation, see Figure 1-2.

Detection Circuit Lead: Permits multiple-detection options using Detection Circuit Cable and Tees for the main detection trunk and branch lines.

- Electric Manual Actuators (EMA)
- Linear Detectors
- Spot Thermal Detectors

Release Circuit Lead: Connects to a maximum of 2 Electric-Pneumatic Actuators installed on agent tank expellant gas cartridges using Release Circuit Cable(s), Tee (needed on second tank), and Release Circuit Drop Cable(s).

External Power Circuit Lead: Provides a direct connection to the vehicle power source using Power Circuit Cable(s) and a single Fused Power Circuit Cable.

Alarm Output Lead: Connects to vehicle electronics (by others) as needed (connection line not shown).

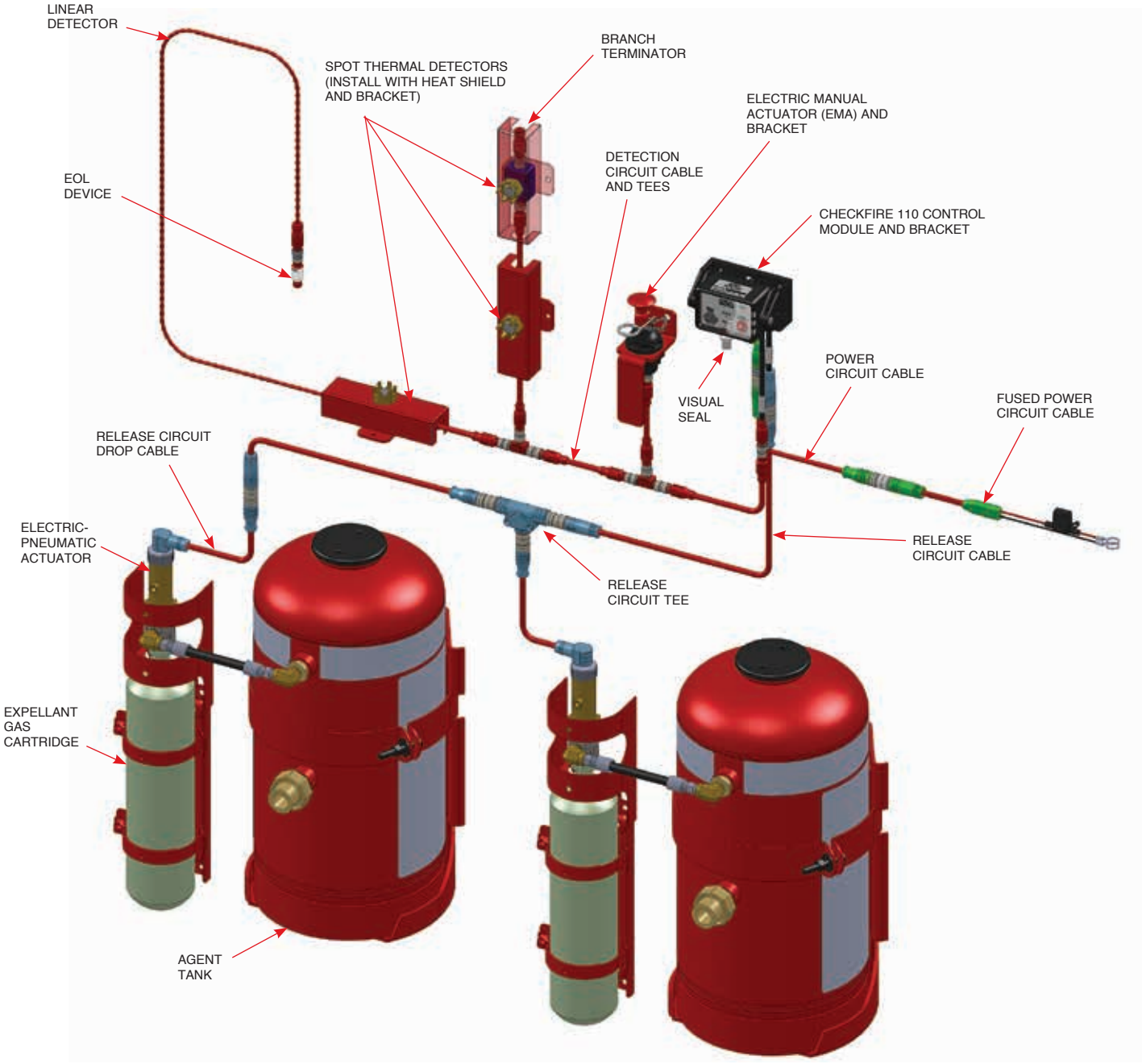

FIGURE 1-2
SYSTEM CONNECTIONS
009149

CHECKFIRE 110 CONTROL MODULE
Part No. 439559

Provides communication and control of input/output components. See Figure 2-1.

- Dust and water tight (IP67 rated)
- Durable high-strength glass-filled nylon material
- UL94 Flame rating
- Surface or bracket mounted
- Two index pins on back for secure mounting
- Ambient temperature range: –40 °F to 140 °F (–40 °C to 60 °C)
- LED indicators provide notification of system status (Internal Sounder matches LED pulse rate)
- "PUSH To Activate / Alarm When Lit" manual-activation Button and LED
  - o Provides manual operation (immediate release)
  - o Indicates Alarm Condition
- Guard door with visual seal to protect manual-activation button
- "DELAY/Reset/Silence" Button
  - o Restarts Time DELAY sequence when initiated before release function activates
  - o Resets control module
  - o Silences audible notifications during fault conditions

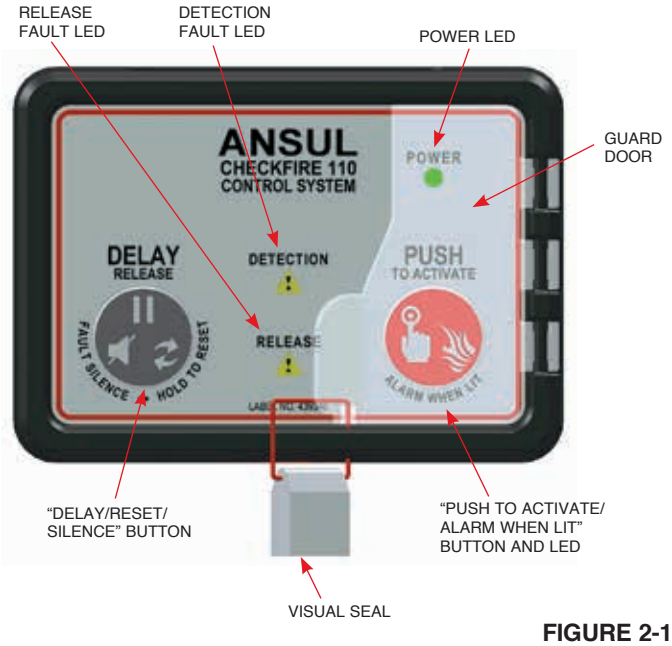

FIGURE 2-1
CHECKFIRE 110 CONTROL MODULE
009151

CHECKFIRE 110/210 MOUNTING BRACKET
Part No. 439564

Provides flexible bracket mounting of Control Module at various viewing angles. See Figure 2-2.

- Constructed with same high-strength glass-filled nylon material as the Control Module
- Multi-position bracket for securing module in a variety of configurations; use 1/4 in. fasteners of appropriate length with lock washers to secure bracket base to mounting surface
- Dimensions for bracket base, see Figure 2-3

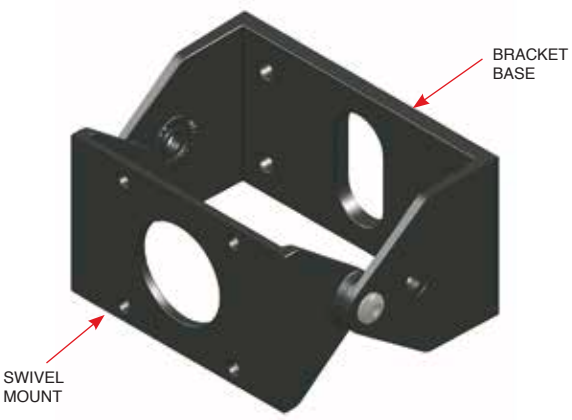

FIGURE 2-2
MOUNTING BRACKET
009152

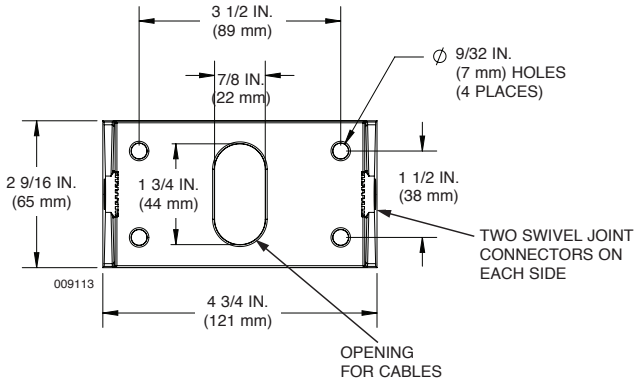

FIGURE 2-3
BRACKET BASE FRONT VIEW
009113

ELECTRIC MANUAL ACTUATOR (EMA)
Part No. 439400

Provides electrical activation of the fire suppression system; typically accessible from ground level and/or in a path of egress. See Figure 2-4.

- Electronic signal sent to Control Module immediately activates fire suppression system
- Temperature range: — 40 °F to 185 °F (– 40 °C to 85 °C)

FIGURE 2-4
ELECTRIC MANUAL ACTUATOR (EMA)
009153

ELECTRIC MANUAL ACTUATOR BRACKET
Part No. 440537

Constructed of 3/16 in. (4.8 mm) painted steel. Weld or bolt with appropriate fasteners. See Figure 2-5.

FIGURE 2-5
ELECTRIC MANUAL ACTUATOR BRACKET
009154

OPTIONAL PNEUMATIC MANUAL ACTUATOR
Part No. See system manuals

Provides pneumatic actuation of the fire suppression system from a remote location typically accessible from ground level and/or in a path of egress.

Note: If plans include an optional pneumatic manual actuator in the operator's compartment, refer to detailed components, planning, design and installation guidelines, in the appropriate fire suppression system manual (latest edition).

System Manuals:

LT-A-101-10/20/30 Manual	(Part No. 24327)
LT-A-101-50/125/250 Manual	(Part No. 427865)
LVS Manual	(Part No. 427109)

▸ SPOT THERMAL DETECTOR
Part No. See Temperature Selections Table

Provides spot thermal detection in the protected area(s). See Figure 2-6.

- Color-coded fixed-temperature design
- Temperature rating stamped on detector
- Includes retaining nut to secure detector in bracket and heat shield

Temperature Selections

Rated Operating Temperature °F	(°C)	Maximum Continuous Temperature °F	(°C)	Color	Spot Thermal Detector Part No.
250	(121)	210	(99)	Blue	438280
350	(177)	256	(125)	Red	438281

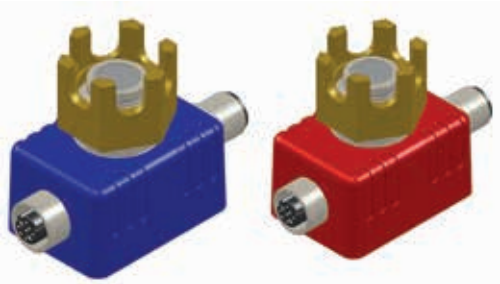

FIGURE 2-6
SPOT THERMAL DETECTORS
009280

▸ SPOT THERMAL DETECTOR BRACKET AND HEAT SHIELD
Part No. 440905

Supports and protects Spot Thermal Detector. See Figure 2-7

- Detector bracket provides secure mounting
- Heat shield provides additional protection for detector body and detection circuit connectors
- Retrofitable to existing style detector bracket (Part No. 416221)

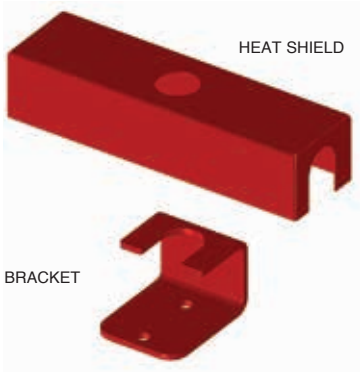

FIGURE 2-7
DETECTOR BRACKET AND HEAT SHIELD
009156

▸ LINEAR DETECTOR
Part No. See table

Provides fire detection in the protected area; connects to the CHECKFIRE 110 Control Module via the Detection Circuit Cable. See Figure 2-8.

- Red color-coded connectors
- Two twisted spring steel conductors separated by a heat-sensitive insulator
- Activation temperature rating of 356 °F (180 °C)
- Minimum bend radius, 2 1/2 in. (64 mm)
- Maximum installed continuous operating temperature: 250 °F (121 °C)

Linear Detector Part Number	Length ft	(m)
439406	2	(0.61)
439478	5	(1.53)
439480	10	(3.05)
439408	20	(6.10)
439410	30	(9.15)
440765	50	(15.24)

FIGURE 2-8
LINEAR DETECTOR
009157

DETECTION CIRCUIT CABLE
Part No. See table

Connects to CHECKFIRE 110 Control Module, Electric Manual Actuator(s) (EMA), and detection input components. See Figure 2-9.

- IP67 connectors
- Red color-coded, anti-vibration connectors
- Temperature rating: 302 °F (150 °C)
- Integral connectors on each end of cable
- Multiple lengths for versatility
- Maximum main trunk length: 50 ft (15.24 m)
- Minimum bend radius: 2 1/2 in. (64 mm)

Detection Circuit Cable Part Number	Length ft	(m)
439384	2	(0.61)
439386	5	(1.53)
439388	10	(3.05)
439390	20	(6.10)
440759	30	(9.15)
440762	50	(15.24)

FIGURE 2-9
DETECTION CIRCUIT CABLE
009158

DETECTION CIRCUIT BULKHEAD CONNECTOR
Part No. 439404

Provides feedthrough protection and support for detection circuit cable. See Figure 2-10.

- IP67 connectors
- Nickel plated brass construction
- Dimensions: see chart in Appendix
- Plastic isolators for each side of hole

FIGURE 2-10
DETECTION CIRCUIT BULKHEAD CONNECTOR
009159

DETECTION CIRCUIT TEE
Part No. 439394

Connects individual Electric Manual Actuator(s) or Spot Thermal Detector(s) to main detection circuit trunk. See Figure 2-11.

- Red color-coded connectors
- Connector temperature rating: 221 °F (105 °C)

FIGURE 2-11
DETECTION CIRCUIT TEE
009160

DETECTION CIRCUIT EOL (End-of-Line) DEVICE
Part No. 439396

Provides circuit supervision and termination point for main detection circuit. See Figure 2-12.

- Red color-coded connector
- Connector temperature rating: 221 °F (105 °C)

FIGURE 2-12
DETECTION CIRCUIT EOL
009161

DETECTION CIRCUIT BRANCH TERMINATOR
Part No. 439398

Indentifies branch termination point in the detection circuit. See Figure 2-13.

FIGURE 2-13
DETECTION BRANCH TERMINATOR
009162

RELEASE CIRCUIT CABLE
Part No. See table

Connects to CHECKFIRE 110 Control Module, Release Circuit Tee, and/or Release Circuit Drop Cable(s). See Figure 2-14.

- IP67 connectors
- Blue color-coded, anti-vibration connectors
- Temperature rating: 302 °F (150 °C)
- Multiple lengths for versatility
- Maximum circuit length: 50 ft (15.24 m)
- Minimum bend radius: 2 1/2 in. (64 mm)

Release Circuit Cable Part Number	Length ft	(m)
439418	2	(0.61)
439420	5	(1.53)
439422	10	(3.05)
439424	20	(6.10)
439426	30	(9.15)
439428	50	(15.24)

FIGURE 2-14
RELEASE CIRCUIT CABLE
009163

RELEASE CIRCUIT TEE
Part No. 439434

Connects to Release Circuit Cable and Release Circuit Drop Cable. See Figure 2-15.

- Blue color-coded connectors
- Connector temperature rating: 221 °F (105 °C)

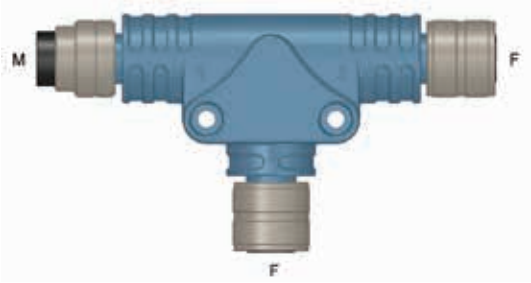

FIGURE 2-15
RELEASE CIRCUIT TEE
009164

RELEASE CIRCUIT DROP CABLE
Part No. See table

Provides connectivity between Release Circuit Cable and Electric-Pneumatic Actuator. See Figure 2-16.

- IP67 connectors
- Blue color-coded, anti-vibration connectors
- Temperature rating: 302 °F (150 °C)
- Two lengths for versatility
- Minimum bend radius: 2 1/2 in. (64 mm)

Release Circuit Drop Cable Part Number	Length in.	(m)
439430	30	(0.76)
439432	38	(0.97)

FIGURE 2-16
RELEASE CIRCUIT DROP CABLE
009165

RELEASE AND POWER CIRCUITS BULKHEAD CONNECTOR
Part No. 439405

Provides feedthrough protection and support for either release or power circuit cable. See Figure 2-17.

- IP67 connectors
- Nickel plated brass construction
- Dimensions: see chart in Appendix

FIGURE 2-17
RELEASE CIRCUIT BULKHEAD CONNECTOR
009166

RELEASE CIRCUIT TERMINATOR
Part No. 439436

Indentifies termination point in the release circuit. See Figure 2-18.

FIGURE 2-18
RELEASE CIRCUIT TERMINATOR
009167

ELECTRIC-PNEUMATIC ACTUATOR
Part No. 439569 (normally supplied with agent tanks or expellant gas cartridge/bracket assemblies)

Attaches to agent tank expellant gas cartridge and provides release of gas into agent tank. See Figure 2-19.

For electrical actuation install Release Circuit Drop Cable (with PAD), see Figure 2-22. On system activation, Electric-Pneumatic Actuator punctures a seal in the expellant gas cartridge allowing expellant gas to flow into the agent tank.

The actuator includes a Preventor to reduce the possibility of installing actuator with the puncture pin not completely retracted. **Note:** Do not bend or remove the Preventor; it is required for correct operation of the actuator.

The actuator includes optional pneumatic actuation hose ports.

Temperature range:

Electrically with PAD	– 40 °F to 185 °F (– 40 °C to 85 °C)
Pneumatic only	– 65 °F to 221 °F (– 54 °C to 105 °C)

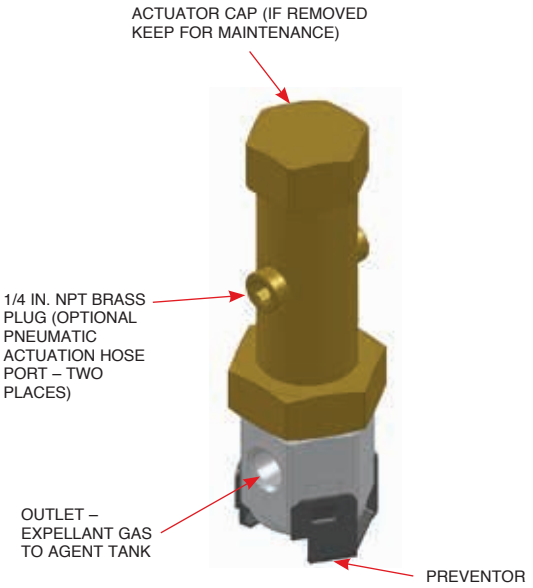

FIGURE 2-19
ELECTRIC-PNEUMATIC ACTUATOR
009168

PROTRACTING ACTUATION DEVICE (PAD)
Part No. 439448

Provides electrical activation of the fire suppression system. See Figure 2-20 and 2-21.

⚠ CAUTION

When handling the PAD, always point actuating end away from yourself and others. On electrical initiation, PAD operates very quickly and a small brass disk forcefully separates from actuating end. Physical injury may occur from contact with the actuating pin and/or the detaching disk.

PROTRACTING ACTUATION DEVICE (PAD) (Continued)

- Generates force to drive the Electric-Pneumatic Actuator puncture pin through an expellant gas cartridge seal, allowing the expellant gas to flow into agent tank.
- Integral spade connectors easily field-install into the Release Circuit Drop Cable. See Figure 2-20.

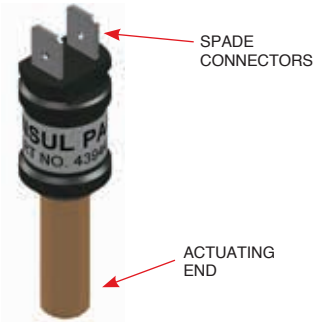

FIGURE 2-20
PAD
009169

FIGURE 2-21
PAD FIELD INSTALLED IN RELEASE CIRCUIT DROP CABLE
009170

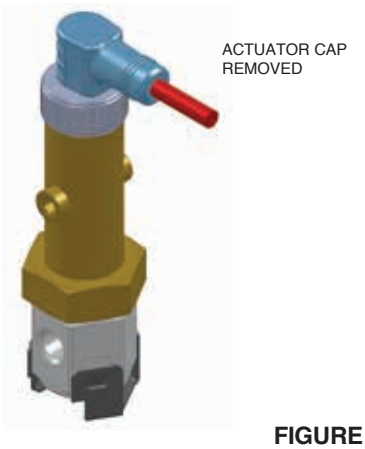

FIGURE 2-22
ELECTRICAL ACTUATION FOR ELECTRIC-PNEUMATIC ACTUATOR
009171

POWER CIRCUIT CABLE
Part No. See table

Connects CHECKFIRE 110 Control Module to Fused Power Circuit Cable. See Figure 2-23.

- IP67 connectors
- Green color-coded, anti-vibration connectors
- Temperature rating: 302 °F (150 °C)
- Multiple lengths for versatility
- Maximum circuit length: 50 ft. (15.24 m); Excludes 3 ft (0.9 m) Fused Power Circuit Cable
- Minimum bend radius: 2 1/2 in. (64 mm)

Power Circuit Cable Part Number	Length ft	(m)
439438	2	(0.61)
439440	5	(1.53)
439442	10	(3.05)
439444	20	(6.10)
439446	30	(9.15)
440187	50	(15.24)

FIGURE 2-23
POWER CIRCUIT CABLE
009172

FUSED POWER CIRCUIT CABLE
Part No. 439492

Connects Power Circuit Cable to the 12/24 VDC vehicle power source. See Figure 2-24.

- IP67 connector
- Green color-coded, anti-vibration connector
- Minimum bend radius: 2 1/2 in. (64 mm)
- 3 amp inline ATO/ATC blade style automotive fuse
- 1/2 in. ring terminals for power source connection

FIGURE 2-24
FUSED POWER CIRCUIT CABLE
009173

RELEASE AND POWER CIRCUITS BULKHEAD CONNECTOR
Part No. 439405

Provides feedthrough protection and support for either release or power circuit cable. See Figure 2-25.

- IP67 connectors
- Nickel plated brass construction
- Dimensions: see chart in Appendix

FIGURE 2-25
POWER CIRCUIT BULKHEAD CONNECTOR
009166