INSTALLATION, OPERATION AND MAINTENANCE MANUAL

FOR

DUAL SPECTRUM® FLAME DETECTORS

MODELS PM-6M AND PM-6MX

September 1996

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INTRODUCTION

The SANTA BARBARA Dual Spectrum (SBDS) Models PM-6M and PM-6MX are Factory Mutual Research Corporation listed (approval pending) infrared flame detectors designed to provide long range detection of a variety of fires. The PM-6M (P/N 411945; Figure 1 and Appendix A) is a long-range flame detector with a typical response time of 5 seconds designed for use in petrochemical processing facilities, aircraft hangers, fuel storage areas or other large, open areas where detection of hydrocarbon-fueled fires or class ABC fires is desired. The PM-6MX (P/N 411900; and Appendix B) has the same long range flame response as the PM-6M plus a response time to explosive fires of typically fifty milliseconds or less.

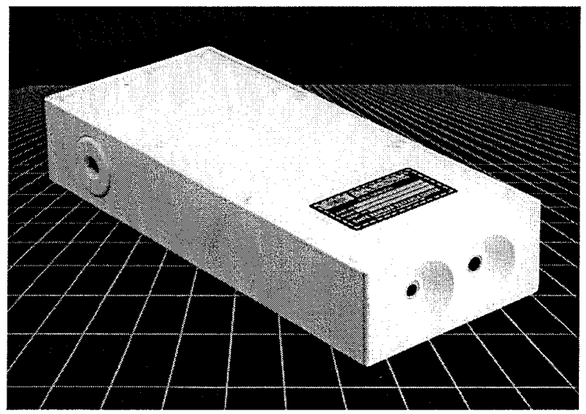


Photo No. 94-5-88

Figure 1. PM-6M and PM-6MX Detectors (See Appendix A, drawing number 411945 and Appendix B, drawing number 411900 for detailed information. Drawing number 409000, Appendix C, is a detailed drawing of the optional mounting bracket.)

The PM-6M and PM-6MX will detect a 1 ft^2 gasoline fire from 100 feet away, and have a 90° conical field-of-view. The detectors are encapsulated and sealed providing a rugged assembly that is rated NEMA 4X.

Factory Mutual has certified the performance of the PM-6M and PM-6MX flame detectors, the compliance with National Fire Protection Association (NFPA) Standard 72 and the installation described in this document. The PM-6M and PM-6MX are listed for use in hazardous (classified) locations as described below.

The PM-6M and PM-6MX are enclosed in a cast aluminum housing approximately 8 x 3.5 x 1.6 inches. A bracket assembly (P/N 409000; Appendix C) for mounting the detector is available that allows adjustment on two axes. The detector housing has an integral junction box with three 3/4 inch conduit ports, available for connecting to hard or flexible conduit. Electrical connections are made via a terminal block mounted inside the junction box at the rear of the detector. A partition is installed in the junction box to separate the power and initiating-device circuits in an intrinsically safe installation.

NOTE: The detector range to fires not described in this manual will vary and should be verified by fire tests using the fuel in question. Please contact Santa Barbara Dual Spectrum for further information.

DETECTOR USE IN HAZARDOUS AREAS

The SBDS Dual Spectrum® Models PM-6M and PM-6MX flame detectors are Factory Mutual Approved flame detectors suitable for use in Class I, Division 1, Groups C-D, Class I, Division 2, Groups A-D, Class II, Division 1, Groups E-G; Class II, Division 2, Groups F-G; and Class III, Division 1 and 2 hazardous (classified) locations. This certification depends on proper installation which is described in this Installation Manual. See the following sections and Control Drawing Configuration (Drawing 409664, Appendix D) for installation and component selection criteria.

ELECTRICAL CHARACTERISTICS

The PM-6M and PM-6MX are designed to interface to an NFPA 72 compatible fire alarm control panel. Normally-open, dry-relay contacts provide the alarm signal. The alarm contacts latch closed when a fire is detected and remain closed until the detector is powered down or the detector junction box cover is removed and replaced. An internal supervision-status relay

closes when the detector powers up and opens if a detector fault, such as loss of power, low power supply voltage, or a detector malfunction, is detected. In NFPA class A or B circuits (Appendices D to F), such a fault condition is indicated at the control panel as a trouble signal.

A built-in-test (BIT) is performed at power up and approximately every 15 minutes to verify proper detector operation. The BIT test checks all the detector hardware and program integrity. If the detector fails the BIT then the supervision relay will open, generating a trouble signal.

Supply voltage:	20 to 28 VDC (Observe Polarity) Including line drops and ripple

NOTE: Detector output is not guaranteed below 20 VDC and is locked out below 19 VDC. The supervision relay will reflect this condition.

Input Current:	30 milliamps at +24 VDC quiescent 40 milliamps at +24 VDC in alarmed state
Alarm Output:	Relay contacts latch closed.
Trouble Output:	Opening of normally-closed relay contacts. Closes 0.5 seconds after power up.
Relay Contact Ratings:	1 Amp, 30 VDC 0.5 Amp, 125 VAC
Reset:	After detector is powered down and up or after junction cover is removed and replaced.
Stabilization Time:	Approximately 10 seconds after power up

TABLE I. PM-6M and PM-6MX Terminal Block Identification.

Terminal A	Dual	+24 VDC
Terminal B	Dual	DC return
Terminal C	Single	Supervision Relay Contact, Trouble Signal
Terminal D	Single	Normally Closed
Terminal E	Dual	Alarm Relay Contact
Terminal F	Dual	Normally Open

ENVIRONMENTAL CHARACTERISTICS

TEMPERATURE AND HUMIDITY

Operating and Storage Temperature Range: -40° F to +158° F
-40° C to +70° C

Relative Humidity: 0% to 99%, non-condensing

Enclosure Rating: NEMA 4X

VIBRATION

The PM-6M and PM-6MX are designed to withstand severe vibration and shock as defined in FM Approval Standard 3260.

ELECTROMAGNETIC INTERFERENCE

The PM-6M and PM-6MX are designed to be highly immune to radiated and conducted Electromagnetic Interference (EMI). The detector is immune to radiated fields of five volts per meter including amplitude and frequency modulated (AM & FM) signals in the frequency range of 1 MHz to 1 GHz. The detector can operate in the presence of conducted noise levels up to 1.0 VRMS in the frequency range of 30 Hz to 250 kHz. Both detectors meet or exceed the requirements for conducted and radiated emissions, per FCC Regulations, Part 15, Subpart J, for Class A computing devices.

DETECTOR PERFORMANCE

DETECTION RANGE AND RESPONSE TIME

Best performance of the PM-6M and PM-6MX detectors is achieved when the detectors are mounted so that the protected area is within the range, or detection-threshold distance, given in Table II for various flammable hazards, and within the 90° field-of-view of the detector. The step-response time of the PM-6M to the threats shown in Table II is typically five seconds. The explosion response time of the PM-6MX is less than fifty milliseconds with a seven foot detection threshold to a 1 ft explosion. An explosion is defined as a fuel oil fireball that grows from less than or equal to one inch, to greater than or equal to one foot in diameter instantaneously. The detectors respond most quickly to closer or larger fires and more slowly to smaller fires or fires that are further away.

TABLE II. PM-6M and PM-6MX Detection-Threshold Distances
For 5 Second Typical Response Time.

Flame Fuel	Range (ft)
1 sq. ft. Gasoline	100 ft.
1 sq. ft. JET-A	75 ft.
1 sq. ft. Isopropyl Alcohol	50 ft.
1 sq. ft. No. 2 Diesel	50 ft.
1 sq. ft. Methanol	25 ft.
30 in. Methane Flare	25 ft.
30 in. Hydrogen Flare	15 ft.

The range is reduced no more than 50% when sources are close to the edge of the ±45° field-of-view of the detector.

Mounting detectors so that they do not view very brightly illuminated areas will help ensure optimum sensitivity. For example, mounting locations where the detectors look out doors or windows should be avoided where possible. The detectors may be used outdoors but their sensitivity could be reduced by bright sun or artificial light.

> **NOTE**: The detector range to fires not listed in Table II will vary and should be verified by fire tests using the fuel in question. Please contact Santa Barbara Dual Spectrum for further information.

FALSE-ALARM IMMUNITY

The PM-6M and PM-6MX are extremely false-alarm immune. However, no flame detector is perfect — a fire-alarm output due to non-fire stimuli is possible. Tables III and IV, for PM-6M and PM-6MX respectively, list common sources and the false-alarm immunity distance for those sources; no false alarms occur for larger distances in laboratory measurements.

TABLE III. PM-6M False-Alarm Immunity Distances.

Stimulus (Chopped or Unchopped)	Range (ft)
Sunlight	No Response
Brightly Colored Clothing	No Response
Flash Light (3 D-Cell Maglite)	No Response
Fluorescent Light (40 W)	No Response
Vehicle Head Lights	2
Incandescent Light (100 W Frosted)	2
Electronic Flash (Sunpak 411)	1/2
Flood Light (Sungun-II, 650 W)	2
Arc Welding (5/32" Steel Rod, 140 A)	10
Sodium or Mercury Vapor Lamp (70 W)	No Response
Radiation Heater (1500 W)	3
Lighted Cigar Or Cigarette	1/2
Large Wooden Match Flare-Up	3
Aircraft Running Lights	2
Aircraft Strobe Lights	No Response

TABLE IV. PM-6MX False-Alarm Immunity Distances.

Stimulus (Chopped or Unchopped)	Range (ft)
Sunlight	No Response
Brightly Colored Clothing	No Response
Flash Light (3 D-Cell Maglite)	No Response
Fluorescent Light (40 W)	No Response
Vehicle Head Lights	2
Incandescent Light (100 W Frosted)	2
Electronic Flash (Sunpak 411)	1/2
Flood Light (Sungun-II, 650 W)	2
Arc Welding (5/32" Steel Rod, 140 A)	10
Sodium or Mecury Vapor Light (70 W)	No Response
Radiation Heater (1500 W)	3
Lighted Cigar Or Cigarette	2
Large Wooden Match Flare-Up	3
Aircraft Running Lights	2
Aircraft Strobe Lights	2

For best performance, the detector should be mounted so that any exposure to these sources occurs at distances larger than those given in Tables III and IV. In addition, to ensure optimum performance, detectors should be mounted so that they do not view very brightly illuminated areas. For example, mounting locations where the detectors look out doors or windows should be avoided where possible. The PM-6M and PM-6MX may be used outdoors but their sensitivity could be reduced by bright sun or artificial light.

DETECTOR INSTALLATION

PHYSICAL MOUNTING

The PM-6M and PM-6MX detectors must be installed in conformance with the proper Control Drawing, as described in the next section, NFPA 72, the NEC, and all local codes for the hazard classification of the location to be protected.

The PM-6M and PM-6MX detectors can be mounted on an optional bracket assembly (SBDS P/N 409000; Appendix B), or equivalent, mounted to any solid surface. The bracket assembly can be adjusted on two axes and, once correctly positioned, can be locked in place.

The detectors have three 3/4 inch conduit ports which can be used to connect to rigid or flexible conduit. Torque conduit connectors between 70 and 80 inch pounds. Two ports are plugged with the supplied conduit plugs using Teflon tape on the threads. The rear junction-box cover can be removed to connect the wiring to the terminal block.

CAUTION

THE FACTORY SEALED FRONT COVER IS ESSENTIAL TO THE CERTIFICATIONS OF THE DETECTOR. REMOVING THIS COVER WILL COMPROMISE THE PERFORMANCE OF THE DETECTOR.

The rear cover has a built-in gasket which provides a seal for the rear-junction box. Make sure the gasket is undamaged when re-installing the cover. Hand tighten all six cover screws to 8 in-lb to insure a good seal.

WARNING

SUBSTITUTION OF COMPONENTS IN THE JUNCTION BOX MAY IMPAIR INTRINSIC SAFETY.

The number of detectors required to protect a given area will depend upon the size of the area, the distance from the detector, unavoidable obstructions and the size and type of the threat fire. Certain factors need to be considered when designing an installation:

1. The detectors should be mounted so that objects do not block their field-of-view. This includes glass, plexiglas and other visibly transparent materials.
2. Whenever possible, detectors should be mounted so their ranges and fields-of-view overlap.
3. Detectors should be mounted so they will not be blocked by moving machinery or human operators during normal operations within the area.
4. To ensure optimum sensitivity and performance, detectors should be mounted so they do not look at brightly illuminated areas.
5. The detectors should be mounted so that they are easily and safely accessible for inspection and maintenance.
6. If mechanical or high-temperature damage, or window contamination is likely in the installed location, then the detectors should be protected. However, the protection method cannot obstruct the detectors field-of-view with any material, including visibly transparent materials, such as glass and Plexiglas.
7. The detectors can be mounted in any orientation, so long as the manufactured mounting point is the point of support.
8. Mounting the detectors so that they point below horizontal is recommended as this normally results in minimized window contamination.

ELECTRICAL WIRING CONNECTION

An approved installation of the PM-6M and PM-6MX flame detectors should be in accordance with the approved SBDS Control Drawings included as appendices to this manual. The required Control Drawing for specific hazardous (classified) or non-hazardous locations can be determined from the Control Drawing Configuration (Drawing 409664; Appendix D). Detectors may be wired in a standard NFPA 72 class B, style B configuration or in a Class A, Style D configuration. Approved initiating device circuits may be either intrinsically safe or nonincendive as required.

WARNING

DO NOT REMOVE THE PM-6M OR PM-6MX JUNCTION BOX COVERS WHILE THE CIRCUIT IS ALIVE UNLESS THE AREA IS KNOWN TO BE NON-HAZARDOUS

INTRINSICALLY SAFE CIRCUITS

Intrinsically safe installations require the use of suitable and approved barriers, an approved fire alarm control panel that is compatible with the barriers, and wiring methods consistent with ANSI/ISA-RP12.6 and other code. The Control Drawing 409458 (Appendix E) calls out the type and quantity of barriers required for installation in hazardous (classified) locations and show the electrical interconnection to an NFPA compliant fire alarm control panel. Wiring that passes from the non-hazardous location to the hazardous location should pass through a seal appropriate for the type of hazard. All control room instrumentation must operate at less than 250 VRMS.

The barriers may be located in the main control panel, or in a separate enclosure, but adequate separation between intrinsically safe and non-intrinsically safe wiring must be observed as defined by ANSI/ISA-RP12.6. Barrier grounds should be connected separately to

the same grounding location. All interconnecting wiring should be run in conduit or raceways and kept separate from non-barrier wiring.

All flame detector wiring should be run in its own separate conduit or raceway using the minimum wire sizes and maximum distances shown in Table V. Each detector contains two separate intrinsically-safe circuits which must be separated per ANSI/ISA-RP 12.6. This can be accomplished by using shielded cables or running the initiating device and power circuits in separate conduit that terminates on the appropriate side of the junction box partition. Figure 2 illustrates a proper wiring method for intrinsically safe circuits in the PM-6M or PM-6MX as described in Appendix E.

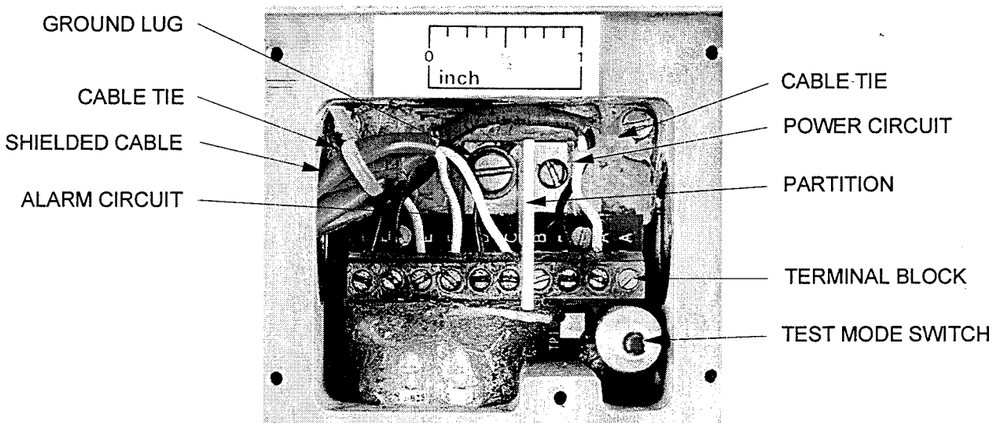


Photo No. 94-7-81

Figure 2. PM-6M or PM-6MX Junction Box Connections.

TABLE V. Maximum Wiring Distances.

AWG Solid #	Maximum One-Way Wiring Distance (ft)
14	2500
16	1500
18	1000
20	600
22	400

The power and initiating-device circuits use shielded UL 2464 power limited fire-protection signaling circuit cables with the shields grounded at the source. The installed partitions in the junction box of the PM-6M or PM-6MX must be in place to provide separation of the power and initiating device circuits in their junction boxes.

CIRCUITS WITH NONINCENDIVE DETECTORS

In Class I, Division 2 Group A-D, Class II, Division 2, Group F-G, or Class III , Division 1 & 2 hazardous (classified) or non-hazardous locations the NEC allows less stringent wiring methods. The PM-6M and PM-6MX flame detectors are nonincendive and where allowed by the NEC and local code may be installed in otherwise incendive circuits in the preceding hazardous locations. In this case the terminal strip partition must be removed from the detectors to allow unobstructed wiring of power and initiating device circuits. Installations require the use of an approved fire alarm control panel that is compatible with the Class B, Style B and/or Class A, Style D initiating device circuits.

SYSTEM TEST

After the fire protection system is installed it should be tested for correct operation. The detectors may be tested with live fires, or by using the hand-held SBDS model PSS-X or PSS-LC test sets (Drawing 409027; Appendix H and Drawing 412157: Appendix I). The details of this sequence will vary with particular installations, but the procedure must include the following steps:

WARNING

A FULL SYSTEM TEST RESULTS IN AN ALARM OUTPUT. THIS WILL RESULT IN THE AUTOMATIC SUPPRESSION SYSTEM BEING ACTIVATED IF IT IS NOT DISABLED PRIOR TO PROCEEDING.

- **PSS-X Test Procedure.**

1. Suppression system. Disable the suppression system if its activation is not desired during this test.

WARNING

DO NOT USE THE PSS-X TEST SET UNLESS THE AREA IS KNOWN TO BE NON-HAZARDOUS

2. PSS-X Test Set. Check the battery condition of the PSS-X test set by pressing the start button. A green "in progress" indicator signifies that the battery is good. A red indicator signifies that the battery is weak and should be replaced. Do not change the battery in hazardous (classified) locations. For valid test results, the PSS-X test set and the PM-6M(X) detector under test must be at approximately the same temperature. Under some circumstances it may be necessary to hold the test set against the front of the detector for 15 seconds to allow the detector to stabilize before testing. See Appendix G, Drawing 409027 for more detailed information.

WARNING

DO NOT REMOVE THE PM-6M OR PM-6MX JUNCTION BOX COVER WHILE THE CIRCUIT IS ALIVE UNLESS THE AREA IS KNOWN TO BE NON-HAZARDOUS.

3. Enter Test Mode. The PM-6M(X) detectors can be placed in test mode in two ways. The PM-6M(X) can be placed in test mode by touching the Test Magnet P/N 411906 (Appendix J) to the front face of the detector as shown in Figure 3. The result, in an approved wiring scheme, will be a trouble-signal indication at the control panel. The PM-6M(X) will remain in test mode for 1 minute then automatically reset. The PM-6M(X) can also go into the test mode by removing the junction cover at the rear of the detector housing. Again the result, in an approved wiring scheme, will be a trouble-signal indication at the control panel.

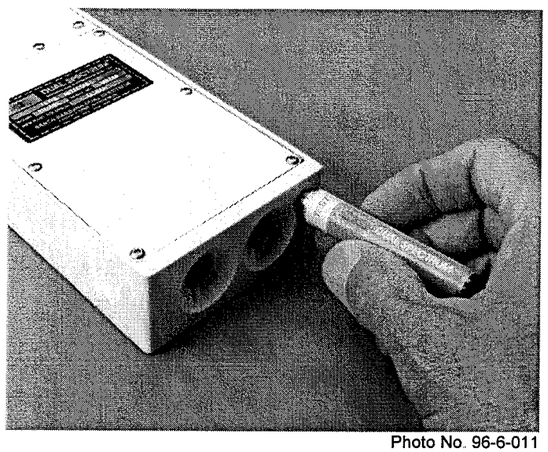


Photo No. 96-6-011

Figure 3. Correct alignment of test magnet with the PM-6M or PM-6MX.

4. False-alarm Immunity. Correct Dual Spectrum® system operation can be verified by using a properly aligned SBDS PSS-X set in the "FAR" mode. See Figure 4 for correct alignment. The control panel should not indicate an alarm condition. Repeat this test with the PSS-X set in the "NEAR" mode. If a test fails, wait 15 seconds and repeat the test. More than two failures usually indicates a problem. Consult Troubleshooting Guide.

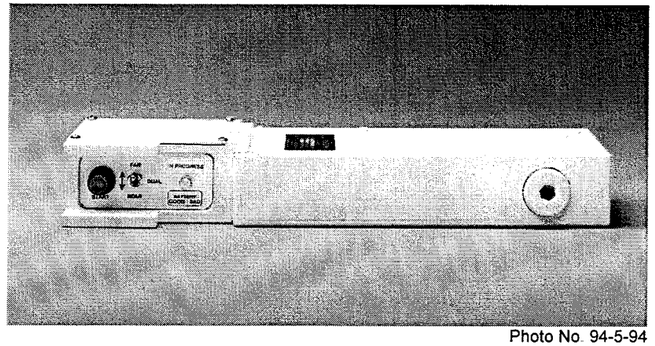


Photo No. 94-5-94

Figure 4. Correct Alignment of PSS-X Test Set with the PM-6M or PM-6MX.

5. Fire Response. Expose the detector under test to a properly aligned SBDS PSS-X set in the "DUAL" mode. The control panel should indicate an alarm condition for the position or zone corresponding to the detector. If a test fails, wait 15 seconds and repeat the test. More than two failures usually indicates a problem. Consult Troubleshooting Guide.

6. Leave Test Mode. The PM-6M(X) will automatic exit test mode after 1 minute if initiated with the Test Magnet P/N 411906. If the test mode was initiated by removing the junction box cover replace the cover to exit test mode. In either case the trouble-signal indication at the control panel will cease when the detector leaves test mode.

7. Interconnection Wiring. Correct interconnection wiring should be checked by removing any wire attached to the detector terminal block and replacing the PM-6M(X) junction cover. The result, in an approved wiring scheme, should be a trouble-signal indication at the control panel.

8. Restore fire protection system. Restore the system to an operational condition after all tests have been completed.

- **PSS-LC Test Procedure.**

WARNING
A FULL SYSTEM TEST RESULTS IN AN ALARM OUTPUT.
THIS WILL RESULT IN THE AUTOMATIC SUPPRESSION
SYSTEM BEING ACTIVATED IF IT IS NOT DISABLED PRIOR TO PROCEEDING.

1. Suppression System. Disable the suppression system if its activation is not desired during this test.

WARNING
DO NOT USE THE PSS-LC TEST SET UNLESS
THE AREA IS KNOW TO BE NON-HAZARDOUS

2. Enter Test Mode. The PM-6M(X) detectors can be placed in test mode in two ways. The PM-6M(X) can be placed in test mode by touching the Test Magnet P/N 411906 (Appendix J) to the front face of the detector as shown in Figure 3. The result, in an approved wiring scheme, will be a trouble-signal indication at the control panel. The PM-6M(X) will remain in test mode for 1 minute then automatically reset. The PM-6M(X) can also go into the test mode by removing the junction cover at the rear of the detector housing. Again the result, in an approved wiring scheme, will be a trouble-signal indication at the control panel.

3. Operation of PSS-LC Test Set. Turn on PSS-LC, wait at least 15 seconds. Sweep the infrared beam across the front of the detector to cause an alarm output. Hold the PSS-LC so that the infrared filter is less than 1 inch from the front of the flame detector to be tested.

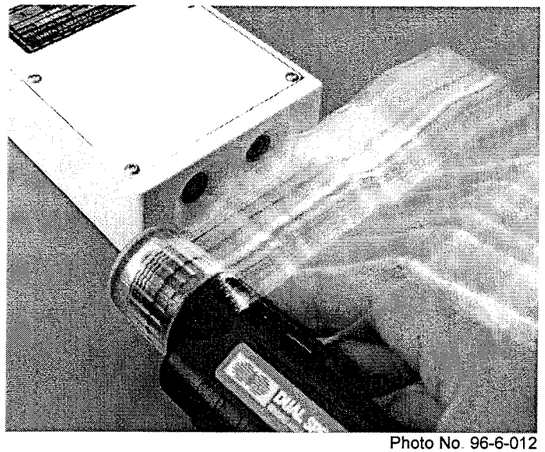


Photo No. 96-6-012

Figure 5. Testing a PM-6M(x) with the PSS_LC Test Set.

4. Fire Response. Expose the sensor under test to a SBDS PSS-LC as described in Step 3. The control panel should indicate an alarm condition for the position or zone corresponding to the sensor.

6. Leave Test Mode. The PM-6M(X) will automatic exit test mode after 1 minute if initiated with the Test Magnet P/N 411906. If the test mode was initiated by removing the junction box cover replace the cover to exit test mode. In either case the trouble-signal indication at the control panel will cease when the detector leaves test mode.

6. Interconnection Wiring. Correct interconnection wiring should be checked by removing any wire attached to the sensor terminal block and replacing the PM-6M(X) junction cover. The result, in an approved wiring scheme, should be a trouble-signal indication at the control panel.

7. Restore Fire Protection System. Restore the system to an operational condition after all tests have been completed.

OPTIONAL TEST METHOD:

With the detector in operational mode, i.e., junction cover installed, the following tests can be done. False-alarm immunity can be checked using stimuli and distances shown in Table III. Fire response can be check by exposing the detector under test to a live fire source.

Momentarily turn off power to reset the alarm output of the detector. Follow all required precautions when testing in this manner.

TABLE VI. TROUBLESHOOTING GUIDE

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Trouble light on at fire alarm control panel.	Incorrect wiring.	Check circuit installation.
	Junction box cover not installed.	Install junction box cover to fully depress Test Mode Switch.
	Low or no voltage to detector	Check voltage at pin A with respect to pin B. Should be 20-28 VDC.
	Detector malfunction.	Replace detector.
Detector does not alarm during FIRE RESPONSE test.	Incorrect wiring.	Check circuit installation.
	PSS-X or PSS-LC temperature different from detector.	Allow detector and Test Set temperatures to stabilize.
	Low batteries in PSS-LC.	Remove and replace batteries in PSS-LC.
	Detector not in test mode.	Remove junction box cover or activate test mode with test magnet. Trouble light will light at panel.
	Detector malfunction.	Replace detector.
Detector alarms during NEAR and FAR test (PSS-X only).	PSS-X source not recovered.	Wait 15 seconds and retest at least twice.
	PSS-X temperature different from detector.	Allow detector and PSS-X temperatures to stabilize.
	Detector malfunction.	Replace detector.

MAINTENANCE

ROUTINE VISUAL INSPECTION

A properly installed Dual Spectrum® detector system is highly resistant to being blinded by contamination build-up on the detector front face windows. However, a thick enough build-up will begin to reduce the performance of the detectors. This can be prevented by periodically inspecting installed detectors visually for contamination build-up on the detector front face. If such a build-up is observed, it should be removed by cleaning the detector front face windows with a soft cloth or lens tissue. The minimum inspection period should be compatible with appropriate regulating agency requirements.

PERIODIC SYSTEM TEST

The authority having jurisdiction and internal facility requirements generally call for routine testing of safety systems at defined intervals, which, at a minimum, should conform to the requirements of NFPA 72. These tests should include visual inspections and the steps listed in the System Test section above.

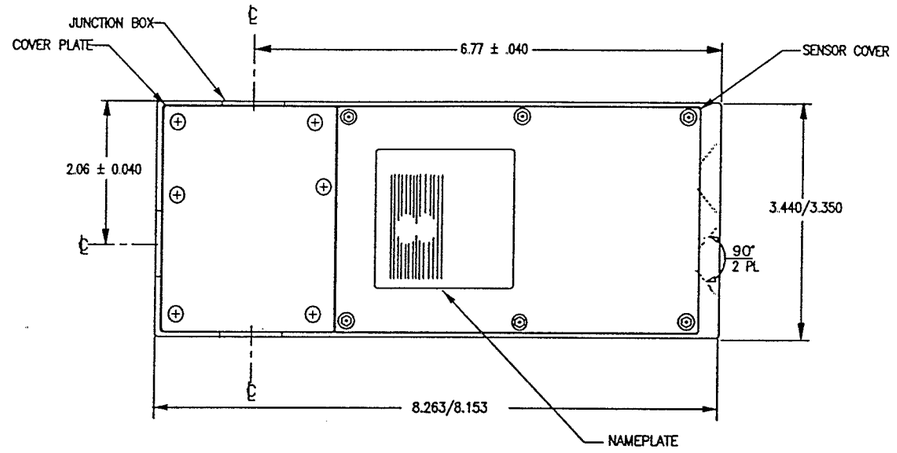
WARNING

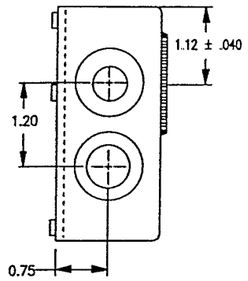
A FULL SYSTEM TEST RESULTS IN AN ALARM OUTPUT. THIS WILL RESULT IN THE SUPPRESSION SYSTEM BEING ACTIVATED IF IT IS NOT DISABLED PRIOR TO TESTING.

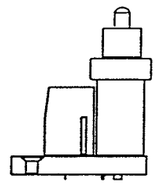
DUAL SPECTRUM®
SENSING AND SUPPRESSION SYSTEMS

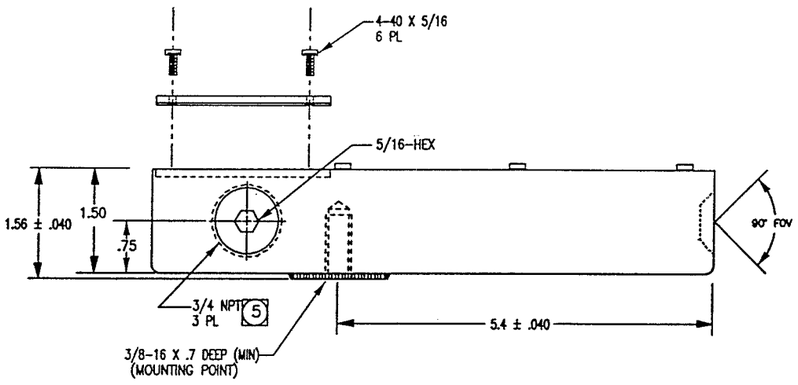
APPENDIX A

PM-6M FLAME DETECTOR



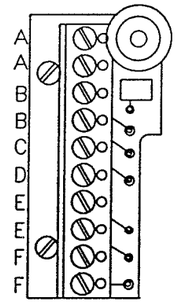






2 FIRE SENSOR
3 ELECTRICAL INTERFACE
P/N-409536

A	V+
A	V+
B	POWER_RTN
B	POWER_RTN
C	TROUBLE +
D	TROUBLE -
E	ALARM+
E	ALARM+
F	ALARM-
F	ALARM-



TERMINAL BLOCK
INTERCONNECTION BOARD ASSEMBLY
DETAIL A 3

SCALE NONE

5 APPLY TWO TURNS (OR MORE AS REQUIRED) OF TEFLON TAPE AROUND THE PLUG(S) AND/OR CONDUIT CONNECTOR(S) BEFORE INSTALLING. TORQUE TO 70 - 80 IN-LBS.

4. PERFORMANCE RATINGS:
PERFORMANCE RATINGS ARE DEFINED IN SBDS DOCUMENT 411899.

3 SEE TABULATION AND DETAIL A FOR ELECTRICAL INTERFACE.

2 INDICATED PART NUMBER IS A TERMINAL BLOCK INTERCONNECTION BOARD ASSEMBLY P/N 409536.

1. INTERPRET DRAWING IAW ANSI Y14.5.

NOTES: UNLESS OTHERWISE SPECIFIED.

NOTE: NO REVISIONS SHALL BE MADE WITHOUT PRIOR FACTORY MUTUAL APPROVAL

CAD PREPARED DRAWING USING AUTOCAD R13
NOT TO BE MANUALLY ALTERED.

REVISIONS				
MODEL SPECIFICITY	SYM	DESCRIPTION	DATE	APPROVED

WARNING

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SANTA BARBARA

MAY 1 1996

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INTERFACE CONTROL DRAWING

QTY REQD	CAGE CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.
LIST OF MATERIAL				

	411899	PM-6M
PART NO.	NEXT ASSY	USED ON
APPLICATION		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND PER ASME Y14.5M - 1982
XX ± .03 XXX ± .010 ANGLES ± 2°
MATERIAL

DUAL SPECTRUM SENSING AND SUPPRESSION SYSTEMS
SANTA BARBARA DUAL SPECTRUM
A DIVISION OF KIDDE Technologies, Inc.

DRN T. BRIDGER
CHK
APD
APD

FIRE SENSOR
PM-6M

SIZE	CAGE CODE	NUMBER
D	05BU0	411945

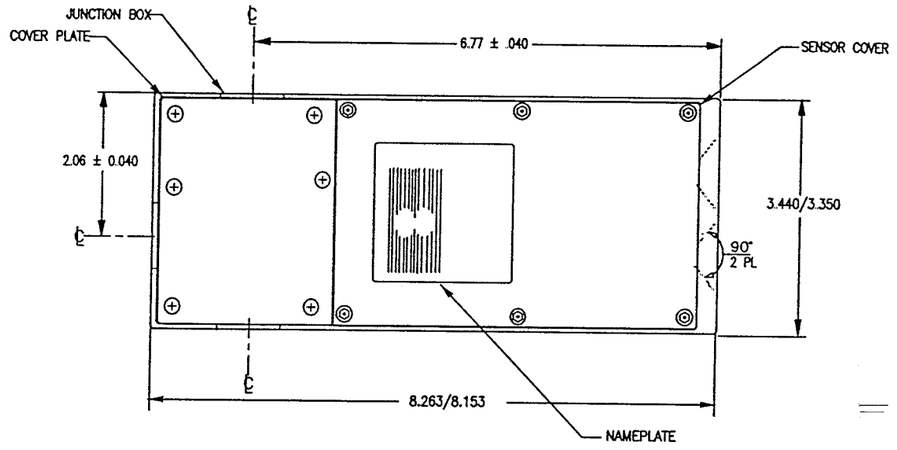
SCALE SHEET

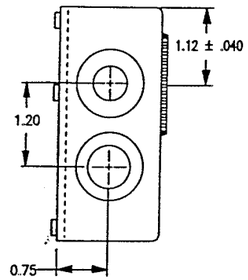
411945

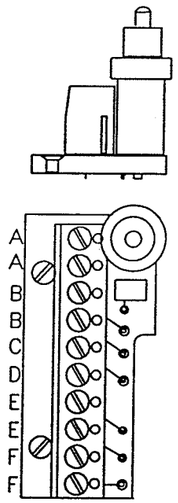
APPENDIX B

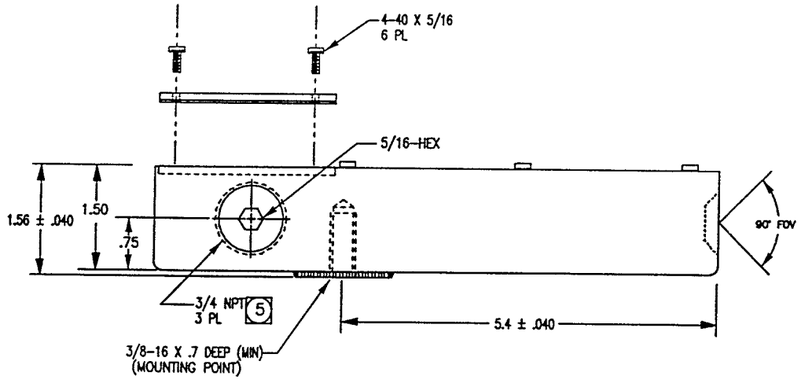
PM-6MX FLAME DETECTOR

REVISIONS				
MODEL SYSTEM/KIT	SYM	DESCRIPTION	DATE	APPROVED









2 FIRE SENSOR
3 ELECTRICAL INTERFACE
P/N-409536

A	V+
A	V+
B	POWER_RTN
B	POWER_RTN
C	TROUBLE +
D	TROUBLE -
E	ALARM+
E	ALARM+
F	ALARM-
F	ALARM-

TERMINAL BLOCK
INTERCONNECTION BOARD ASSEMBLY
DETAIL A [3]
SCALE NONE

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INTERFACE CONTROL DRAWING

[5] APPLY TWO TURNS (OR MORE AS REQUIRED) OF TEFLON TAPE AROUND THE PLUG(S) AND/OR CONDUIT CONNECTOR(S) BEFORE INSTALLING. TORQUE TO 70 - 80 IN-LBS.

4. PERFORMANCE RATINGS:
PERFORMANCE RATINGS ARE DEFINED IN SBDS DOCUMENT 411899.

[3] SEE TABULATION AND DETAIL A FOR ELECTRICAL INTERFACE.

[2] INDICATED PART NUMBER IS A TERMINAL BLOCK INTERCONNECTION BOARD ASSEMBLY P/N 409536.

1. INTERPRET DRAWING IAW ANSI Y14.5.

NOTE: NO REVISIONS SHALL BE MADE WITHOUT PRIOR FACTORY MUTUAL APPROVAL

NOTES: UNLESS OTHERWISE SPECIFIED.

CAD PREPARED DRAWING USING AUTOCAD R13
NOT TO BE MANUALLY ALTERED.

PART NO.	NEXT ASSY	USED ON
	411899	PM-6M
APPLICATION		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND PER ANSI Y14.5M - 1982
XX ±.03 XXX ±.010 ANGLES ±2°
MATERIAL
?

QTY REQD	CAGE CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.
			LIST OF MATERIAL	

DUAL SPECTRUM
SENSING AND SUPPRESSION SYSTEMS
SANTA BARBARA DUAL SPECTRUM
A DIVISION OF KIDDE Technologies, Inc.

T. BRIDGER

FIRE SENSOR
PM-6MX

SIZE	CAGE CODE	NUMBER
D	05BU0	411900

SCALE SHEET

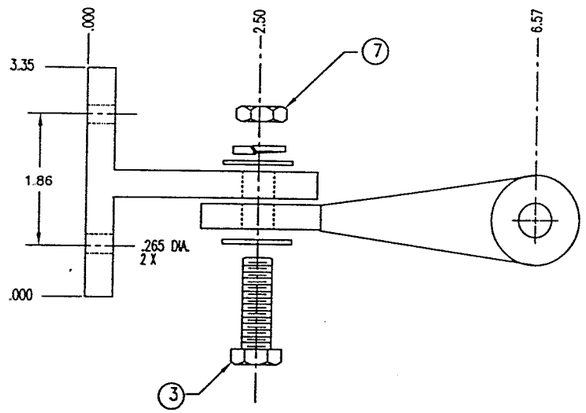
411900

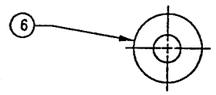
APPENDIX C

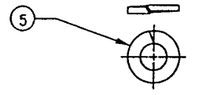
BRACKET ASSEMBLY

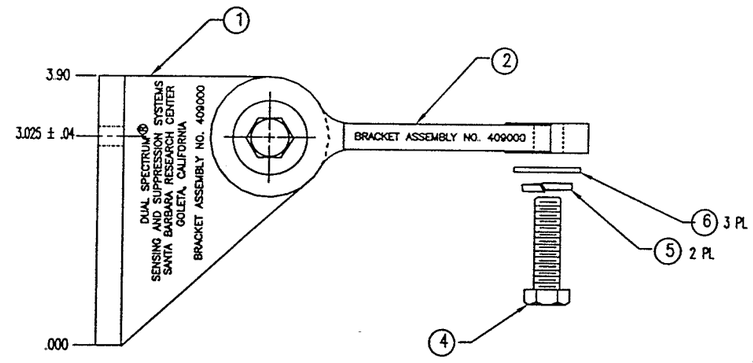
Dave Ready to make ECR for Kiddie rev.

MODEL EFFECTIVITY	REVISIONS				
	SYM	DESCRIPTION	DATE	APPROVED	
	A	IS: I.D.=.406/.395 T=.07/.04 ITEM NO. 3=1 3/8 LONG DELETE--ITEM NO. 5&6 "SEASTROM OR EDUV" SHOW VERBIAGE ON BRACKET ASSY. ECR # 883 WAS: I.D.=.406 T=.08 ITEM NO. 3=1 1/2 LONG	94-08-29	GRH AH	SEH CSC
	B	REVISED AND REDRAWN AS REQUESTED BY ECR000X. INCORPORATED NEW COMPANY FORMAT.		TJB	









SANTA BARBARA

MAY 1 1996

Dual Spectrum

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NOTE: NO REVISIONS SHALL BE MADE WITHOUT PRIOR FACTORY MUTUAL APPROVAL

QTY REQD	CAGE CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.
1			NUT, CRES, 3/8-16	7
3			WASHER, FLAT, CRES	6
2			WASHER, SPLIT, CRES	5
1			BOLT, HEX, CRES, 3/8-16 X 1 1/4 LG	4
1			BLOT, HEX, CRES, 3/8-16 X 1 1/2 LG	3
1		409417-02	MOUNT, HOUSING	2
1		409417-01	MOUNT, WALL	1

LIST OF MATERIAL

PART NO.	NEXT ASSY	USED ON
408858		PM6
408550		PM5-SXJ

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND PER ANSI Y14.5M - 1982
XX ± .06 XXX ± .010 ANGLES ±
MATERIAL

DUAL SPECTRUM SENSING AND SUPPRESSION SYSTEMS
SANTA BARBARA DUAL SPECTRUM
A DIVISION OF KIDDE Technologies, Inc.

PROJ	G.R.HEMPEL	3/11/94
CHKR	H.SEGAL	4/4/94
APVD	S.E.HODGES	4/5/94
APVD	D.R.LEDBETTER	4/5/94

BRACKET ASSEMBLY

SIZE D | CAGE CODE 05BU0 | NUMBER 409000
SCALE | SHEET

1. INTERPRET DRAWING PER DOO-STD-100

NOTES: UNLESS OTHERWISE SPECIFIED.

CAD PREPARED DRAWING USING AUTOCAD R13
NOT TO BE MANUALLY ALTERED.

FSS-PPL

409000 B

APPENDIX D

CONTROL DRAWING CONFIGURATION

MODEL EFFECTIVITY	REVISIONS SYM	DESCRIPTION	DATE	APPROVED
	A	REVISED AND REDRAWN AS REQUESTED BY ECR 942. INCORPORATED NEW COMPANY FORMAT. ADDED PM–6M & PM–6MX TO CONFIGURATION.		TJB

TABULATION

PM–6, PM–6M, PM–6MX CONTROL DRAWING CONFIGURATION

HAZARDOUS (CLASSIFIED) LOCATION	NPFA 72 INITIATING DEVICE CIRCUIT, CLASS & STYLE	INSTALLATION TYPE	CONTROL DWG NO.
CLASS I, DIV 1, GRP C,D	CLASS B, STYLE B	INTRINSICALLY SAFE	409458
CLASS II, DIV 1, GRP E,F,G	CLASS B, STYLE B	INTRINSICALLY SAFE	409458
CLASS I, DIV 2, GRP A,B,C,D	CLASS B, STYLE B	INTRINSICALLY SAFE	409458
CLASS II, DIV 2, GRP F,G	CLASS B, STYLE B	INTRINSICALLY SAFE	409458
CLASS III, DIV 1	CLASS B, STYLE B	INTRINSICALLY SAFE	409458
CLASS III, DIV 2	CLASS B, STYLE B	INTRINSICALLY SAFE	409458
CLASS I, DIV 2, GRP A,B,C,D	CLASS B, STYLE B	NONINCENDIVE	409528
CLASS II, DIV 2, GRP F,G	CLASS B, STYLE B	NONINCENDIVE	409528
CLASS III, DIV 1	CLASS B, STYLE B	NONINCENDIVE	409528
CLASS III, DIV 2	CLASS B, STYLE B	NONINCENDIVE	409528
NON–HAZARDOUS (UNCLASSIFIED)	CLASS B, STYLE B	NONINCENDIVE	409528
CLASS I DIV 2, GRP A,B,C,D	CLASS A, STYLE D	NONINCENDIVE	409460
CLASS II, DIV 2, GRP F,G	CLASS A, STYLE D	NONINCENDIVE	409460
CLASS III, DIV 1	CLASS A, STYLE D	NONINCENDIVE	409460
CLASS III, DIV 2	CLASS A, STYLE D	NONINCENDIVE	409460
NON–HAZARDOUS (UNCLASSIFIED)	CLASS A, STYLE D	NONINCENDIVE	409460

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FOLD 2

REV A
DWG NO 409664

1. NO REVISIONS SHALL BE MADE WITHOUT PRIOR FACTORY MUTUAL APPROVAL

NOTES: UNLESS OTHERWISE SPECIFIED

CAD PREPARED DRAWING USING AUTOCAD R13 NOT TO BE MANUALLY ALTERED.

PART NO.	NEXT ASSY	USED ON
411900		PM–6MX
411945		PM–6M
		PM–6

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
AND PER ANSI Y14.5M – 1982
XX ± XXX ± ANGLES ±
MATERIAL

QTY REQD	CAGE CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.

LIST OF MATERIAL

DUAL SPECTRUM® SENSING AND SUPPRESSION SYSTEMS
SANTA BARBARA DUAL SPECTRUM
A DIVISION OF KIDDE Technologies, Inc.

PREP	A. HANNON	14SEPT94
CHKR	G. SIMPSON	9–14–94
APVD	JOHN WETZORK	9/16/94
APVD	S.E.HODGES	16SEPT94
	D.R. LEDBETTER	16SEPT94

FIRE SENSOR
CONTROL DRAWING CONFIGURATION
PM–6, PM–6M, PM–6MX

SIZE	CAGE CODE	NUMBER
C	05BU0	409664

SCALE | SHEET

FOLD 1

APPENDIX E

INTRINSICALLY SAFE

CLASS B, STYLE B CONTROL DRAWING

Hazardous (Classified) Locations:

Class I, Division 1, Group C, D

Class I, Division 2, Group A, B, C, D

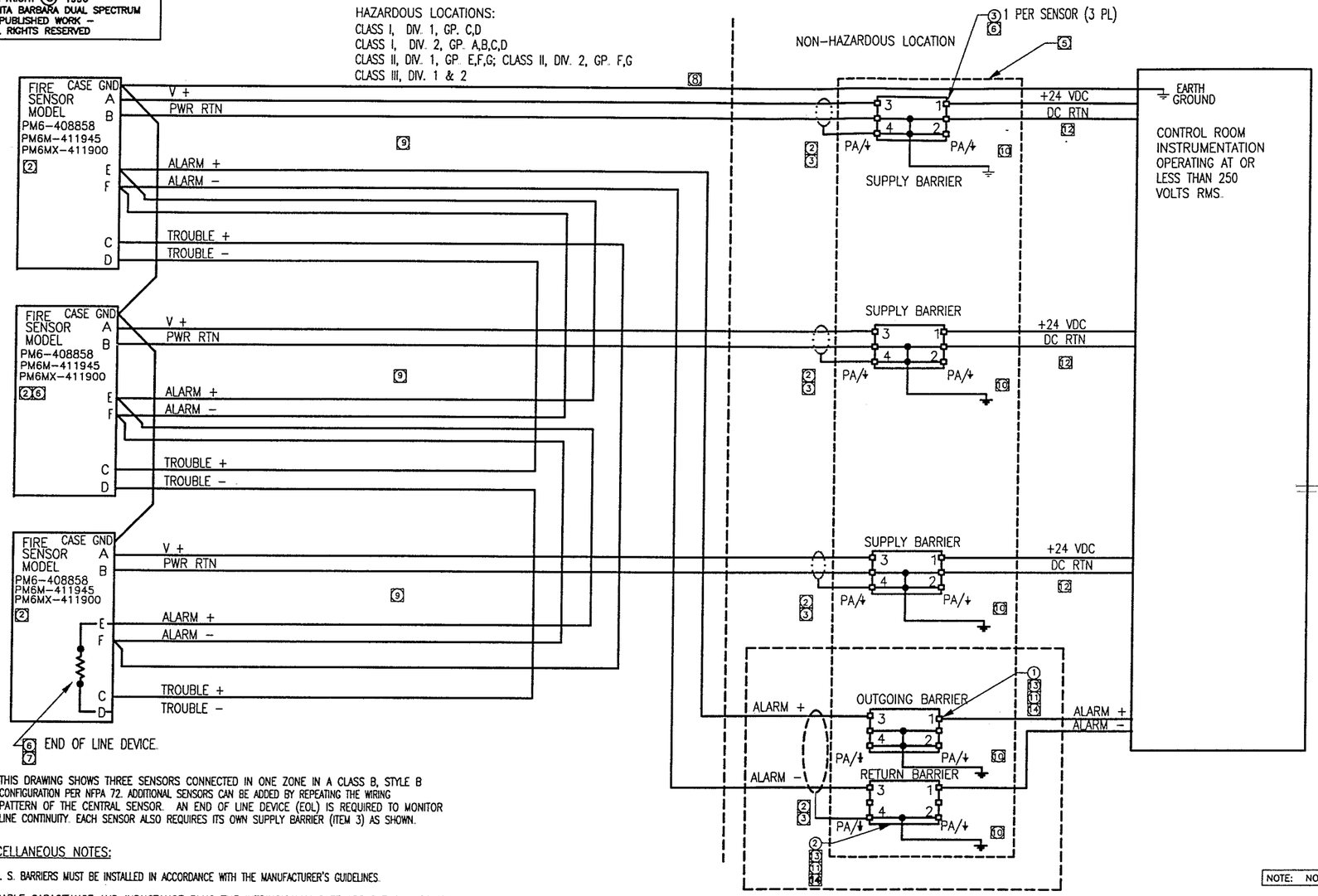
Class II, Division 1, Group E, F, G

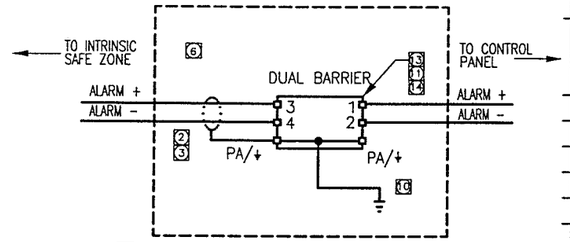
Class II, Division 2, Group F, G

Class III, Division 1 and 2

HAZARDOUS LOCATIONS:
CLASS I, DIV. 1, GP. C,D
CLASS I, DIV. 2, GP. A,B,C,D
CLASS II, DIV. 1, GP. E,F,G; CLASS II, DIV. 2, GP. F,G
CLASS III, DIV. 1 & 2

NON-HAZARDOUS LOCATION





13 FIGURE 1. DUAL CHANNEL BARRIER CONFIGURATION

6 THIS DRAWING SHOWS THREE SENSORS CONNECTED IN ONE ZONE IN A CLASS B, STYLE B CONFIGURATION PER NFPA 72. ADDITIONAL SENSORS CAN BE ADDED BY REPEATING THE WIRING PATTERN OF THE CENTRAL SENSOR. AN END OF LINE DEVICE (EOL) IS REQUIRED TO MONITOR LINE CONTINUITY. EACH SENSOR ALSO REQUIRES ITS OWN SUPPLY BARRIER (ITEM 3) AS SHOWN.

MISCELLANEOUS NOTES:

5 I. S. BARRIERS MUST BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S GUIDELINES.

4. CABLE CAPACITANCE AND INDUCTANCE PLUS THE INTRINSICALLY SAFE APPARATUS UNPROTECTED CAPACITANCE (Ci) AND INDUCTANCE (Li) MUST NOT EXCEED THE ALLOWED CAPACITANCE (Ca) AND INDUCTANCE (La) INDICATED ON THE ASSOCIATED APPARATUS.

NOTES ON ASSOCIATED APPARATUS:

3 CABLE SHIELDS MUST BE TIED TO INTRINSIC SAFETY GROUND AT THE BARRIERS.

2 THE POWER CIRCUIT AND ALARM CIRCUIT ARE TWO SEPARATE INTRINSICALLY SAFE CIRCUITS AND MUST BE PHYSICALLY SEPARATED. WIRES MUST BE SHIELDED-PAIR, POWER-LIMITED, FIRE-PROTECTIVE SIGNAL CABLES PER UL 1424 OTHERWISE POWER AND ALARM CIRCUITS MUST RUN IN SEPARATE CONDUITS WITH SPACING AS REQUIRED BY NEC, ISA-RP12.6 AND LOCAL CODES. SEE INSTALLATION NOTES ON SHEETS 2 AND 3 OF THIS DRAWING.

1. SUITABLE FOR INTRINSICALLY SAFE INSTALLATION IN CL. I, DIV. 1, GP. C, D; CL. I, DIV. 2, GP. A, B, C, D; CL. II, DIV 1, GP. E, F & G; CL. II, DIV 2, GP. F & G; CL. III, DIV 1 & 2, HAZARDOUS LOCATIONS. WIRING METHODS MUST CONFORM TO THE NEC, NFPA 72 AND LOCAL CODES.

NOTES ON INTRINSICALLY SAFE APPARATUS:

NOTES: UNLESS OTHERWISE SPECIFIED.

14 SEE SHEET 3 OF THIS DRAWING FOR ACCEPTABLE BARRIER PART NUMBERS.

13 WHEN USED WITH COMPATIBLE CONTROL PANELS AN ACCEPTABLE ALTERNATE IS A DUAL CHANNEL BARRIER . SEE FIGURE 1 DIAGRAM FOR DUAL CHANNEL BARRIER CONFIGURATION.

12 THE DC RTN OF EACH FIRE SENSOR IS TIED TO EARTH GROUND BY THE SUPPLY BARRIER. A SEPARATE BATTERY BACKED-UP POWER SUPPPLY THAT ISOLATES THE CONTROL PANEL GROUND MUST BE USED. OTHERWISE A GROUND SUPERVISION FAULT MAY OCCUR.

11 THE INTERCONNECTION(S) OF THE OUTGOING BARRIER(S) TO THE FIRE ALARM CONTROL PANEL MUST BE PROTECTED BY METAL CONDUIT AND BE AS SHORT AS PRACTICAL.

10 RESISTANCE BETWEEN BARRIER GROUND AND EARTH GROUND MUST NOT EXCEED ONE (1) OHM.

9 CABLE WIRING IN HAZARDOUS LOCATIONS MUST BE CONTINUOUS AND UNBROKEN EXCEPT FOR SPLICES IN THE JUNCTION BOXES SHOWN IN SHEETS OF THIS DRAWING.

8 SENSOR HOUSINGS SHOULD BE TIED TO EARTH GROUND USING THE GROUNDING SCREW IN THE JUNCTION BOX.

7 END OF LINE DEVICE VALUE PLUS BARRIER RESISTANCE MUST PROVIDE ADEQUATE SUPERVISION CURRENT FOR FIRE ALARM CONTROL PANEL

CAD PREPARED DRAWING USING AUTOCAD R13
NOT TO BE MANUALLY ALTERED.

REVISIONS				
MODEL EFFECTIVITY	SYM	DESCRIPTION	DATE	APPROVED
	E	REVISED AND REDRAWN AS REQUESTED BY ECR 939. INCORPORATED NEW COMPANY FORMAT. ADDED PM-6M AND PM-6MX TO CONFIGURATION.		TJB

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	QTY REQD	CAGE CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.
12	6	0GXY0	9004/01-280-050-00	SUPPLY BARRIER (STAHL ONLY)	3
13	1	0GXY0	14	RETURN BARRIER (STAHL ONLY)	2
13	1	0GXY0	14	OUTGOING BARRIER(STAHL ONLY)	1

LIST OF MATERIAL

PART NO.	NEXT ASSY	USED ON
		PM-6MX
		PM-6M
		PM-6

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND PER ANSI Y14.5M - 1982
XX ± * XXX ± * ANGLES ±
MATERIAL

DUAL SPECTRUM SENSING AND SUPPRESSION SYSTEMS
SANTA BARBARA DUAL SPECTRUM
A DIVISION OF KIDDE Technologies, Inc.

PREP	R. MAYER	6/9/94
CHKR	JOHN WETZORK	6/1/94
APVD	G. SIMPSON	6/1/94
APVD	S. E. HODGES	2JUN94
	D. R. LEDBETTER	3JUN94

CONTROL DRAWING
INTRINSICALLY SAFE CIRCUIT
FIRE SENSOR MODEL
PM-6, PM-6M, PM-6MX
CLASS B, STYLE B

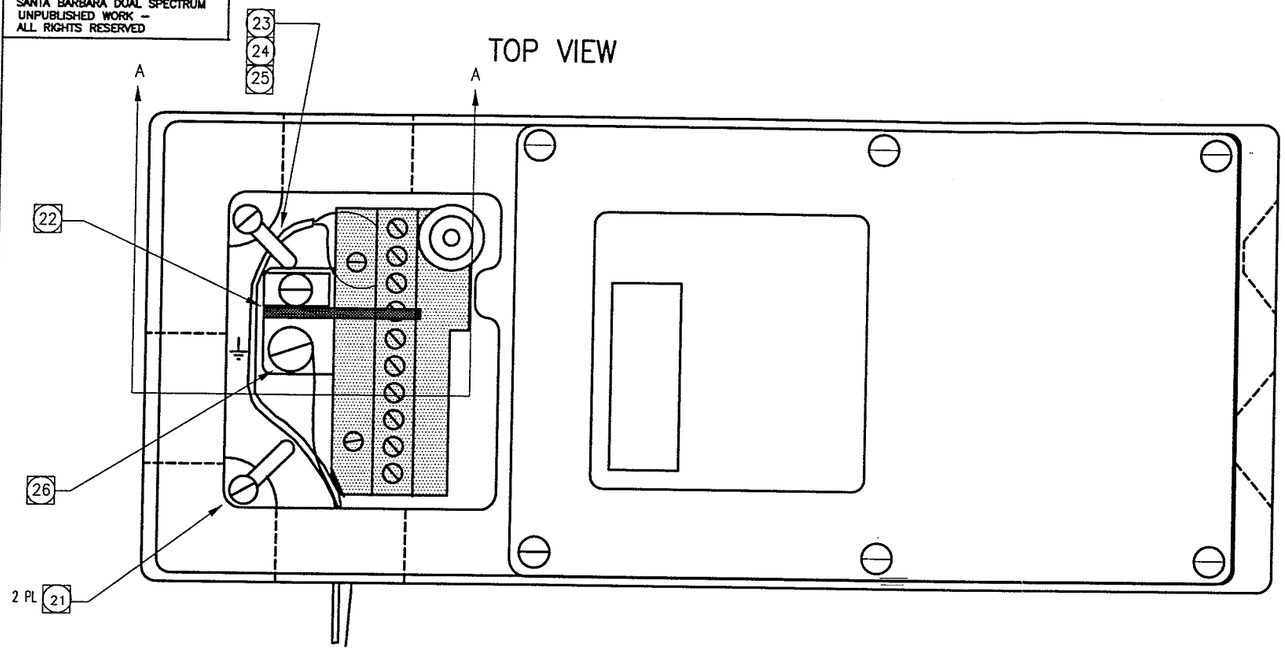
SIZE D | CAGE CODE 05BU0 | NUMBER 409458
SCALE —— | SHEET 1 of 3

409458 E

FSS-PPL

MODEL SYSTEMS	REVISIONS			
	SYM	DESCRIPTION	DATE	APPROVED
	E	SEE SHEET 1		TJB

TOP VIEW



21 WIRE LIST

NODE	TERMINAL	DESCRIPTION
A	DUAL	V+
A	DUAL	V+
B	DUAL (22)	POWER_RTN
B	DUAL (22)	POWER_RTN
C	SINGLE	TROUBLE +
D	SINGLE	TROUBLE –
E	DUAL	ALARM+
E	DUAL	ALARM+
F	DUAL	ALARM–
F	DUAL	ALARM–

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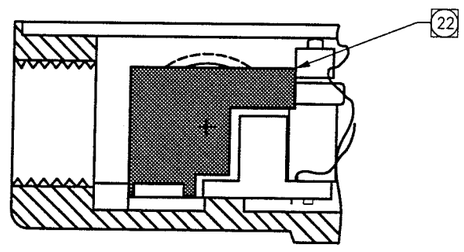
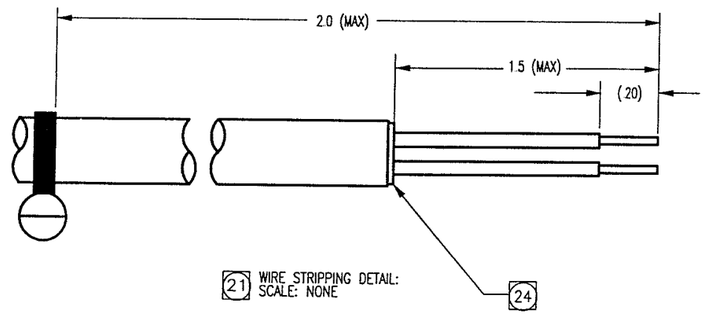


VIEW A–A



21 WIRE STRIPPING DETAIL:
SCALE: NONE

SANTA BARBARA

SEP 2 0 1996

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26 CASE GROUND SCREW. CASE MUST BE TIED TO GROUND PER NATIONAL ELECTRICAL CODE.

25 EXAMPLE WIRE INSTALLATION SHOWING SHIELD STRIP LENGTH AND CABLE TIE DOWN.

24 THE INDIVIDUAL WIRE SHIELDS MUST NOT BE TRIMMED SO FAR BACK AS TO ALLOW UNSHIELDED WIRES TO BE PULLED BACK AROUND THE PARTITION.

23 WIRES THAT CROSS THE PARTITION MUST BE SECURED ON THE SIDE THAT THEY TERMINATE USING THE PROVIDED FASTENER(S).

22 PARTITION MUST BE INSTALLED FOR INTRINSICALLY SAFE INSTALLATIONS TO SEPARATE THE ALARM AND POWER CIRCUITS.

21 LENGTH IS GIVEN FROM CABLE TIE TO TERMINAL BLOCK CONNECTION. STRIP SHIELD TO ALLOW CONNECTION OF WIRES TO TERMINAL BLOCK. STRIP WIRE APPROXIMATELY 0.2 INCHES FROM THE END.

CAD PREPARED DRAWING USING AUTOCAD R13
NOT TO BE MANUALLY ALTERED.

NOTE: NO REVISIONS SHALL BE MADE WITHOUT PRIOR FACTORY MUTUAL APPROVAL

QTY REQD	CAGE CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.

LIST OF MATERIAL

PART NO.	NEXT ASSY	USED ON
APPLICATION		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND PER ANSI Y14.5M – 1982
XX ± | XXX ± | ANGLES ±
MATERIAL

DUAL SPECTRUM® SENSING AND SUPPRESSION SYSTEMS
SANTA BARBARA DUAL SPECTRUM
A DIVISION OF KIDDE Technologies, Inc.

CONTROL DRAWING
INTRINSICALLY SAFE CIRCUIT
FIRE SENSOR MODEL
PM–6, PM–6M, PM–6MX
CLASS B, STYLE B

SIZE	CAGE CODE	NUMBER
D	05BU0	409458

SCALE —— SHEET 2 OF 3

FSS–PPL

409458 E

MODEL EFFECTIVITY	REVISIONS			
	SYM	DESCRIPTION	DATE	APPROVED
	E	SEE SHEET 1		TJB

COMBINATION	OUTGOING BARRIER	RETURN BARRIER	COMMENTS
#1	9001/01-280-075-10 (32)	9002/33-280-000-00 (33)	DUAL RETURN BARRIER
#2	9001/01-280-075-10 (32)	9001/00-086-270-10	
#3	9002/77-280-094-00 (34)	9002/77-280-094-00 (34)	DUAL CHANNEL BARRIER

(31) (35) TABLE I. BARRIER-COMBINATION TABLE

(35) WARNING: THE OUTGOING AND RETURN BARRIERS SHOWN IN THIS TABLE MUST BE USED IN THE COMBINATIONS SHOWN. INTERCHANGING BARRIERS IN DIFFERENT COMBINATIONS WILL RESULT IN CIRCUITS THAT ARE NOT INTRINSICALLY SAFE.

(34) BARRIER P/N 9002/77-280-094-00 IS A DUAL CHANNEL BARRIER. SEE SHEET 1 OF THIS DRAWING FOR PROPER CONNECTION.

(33) ACCEPTABLE ALTERNATE IS 9002/33-280-000-10. THIS IS A SINGLE CHANNEL VERSION OF P/N 9002/33-280-000-00.

(32) ACCEPTABLE ALTERNATE IS 9001/01-280-050-10.

(31) ALL BARRIER PART NUMBERS ARE R. STAHL ONLY. SEE SHEET 1 OF THIS DRAWING FOR PROPER CONNECTION.

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SEP 2 0 1996

Dual Spectrum

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CAD PREPARED DRAWING USING AUTOCAD R13
NOT TO BE MANUALLY ALTERED.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND PER ANSI Y14.5M – 1982
XX ± | XXX ± | ANGLES ±
MATERIAL
PART NO. | NEXT ASSY | USED ON
APPLICATION

QTY REQD | CAGE CODE | PART OR IDENTIFYING NO. | NOMENCLATURE OR DESCRIPTION | ITEM NO.
LIST OF MATERIAL

DUAL SPECTRUM® SENSING AND SUPPRESSION SYSTEMS
SANTA BARBARA DUAL SPECTRUM
A DIVISION OF KIDDE Technologies, Inc.

CONTROL DRAWING
INTRINSICALLY SAFE CIRCUIT
FIRE SENSOR MODEL
PM-6, PM-6M, PM-6MX
CLASS B, STYLE B

SIZE D | CAGE CODE 05BU0 | NUMBER 409458
SCALE —— | SHEET 3 OF 3

409458 E

FSS-PPL

APPENDIX F

NONINCENDIVE

CLASS B, STYLE B CONTROL DRAWING

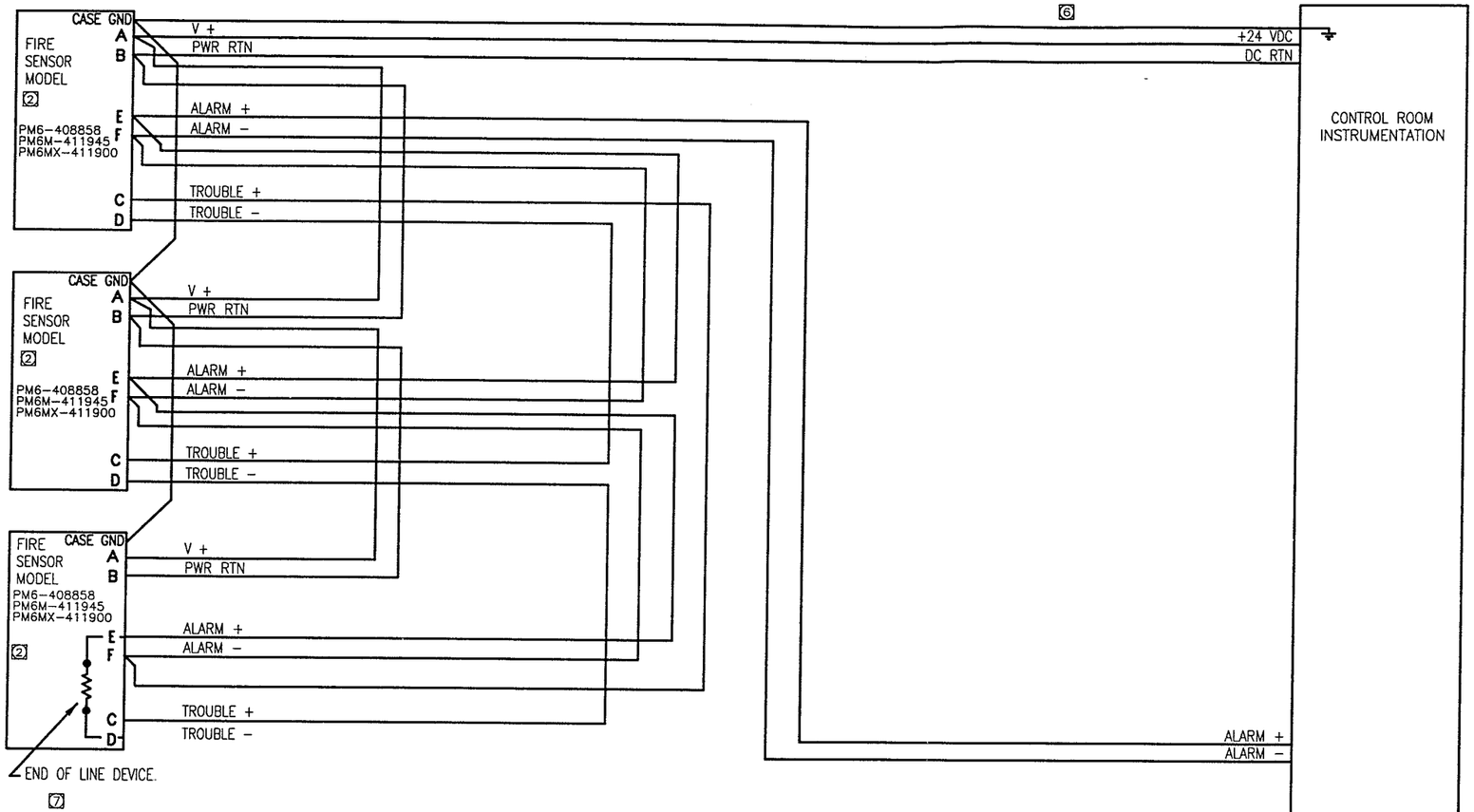
Hazardous (Classified) Locations:

Class I, Division 2, Group A, B, C, D

Class II, Division 2, Group F, G

Class III, Division 1 and 2

Non-hazardous (Non-classified) Locations:



REVISIONS				
MODEL EFFECTIVITY	SYM	DESCRIPTION	DATE	APPROVED
	B	REVISED AND REDRAWN AS REQUESTED BY ECR 981. INCORPORATED NEW COMPANY FORMAT. ADDED PM-6M, PM-6MX TO CONFIGURATION.		TJB

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FIRE SENSOR
ELECTRICAL INTERFACE

A	V+
A	V+
B	POWER_RTN
B	POWER_RTN
C	TROUBLE +
D	TROUBLE –
E	ALARM+
E	ALARM+
F	ALARM–
F	ALARM–

[7] END OF LINE DEVICE, AS REQUIRED BY THE FIRE ALARM CONTROL PANEL, IS USED TO MONITOR LINE CONTINUITY.

[6] SENSOR HOUSINGS SHOULD BE TIED TO EARTH GROUND USING THE GROUNDING SCREW IN THE JUNCTION BOX.

5. STRIP 0.2 INCHES OF INSULATION FROM WIRE TO ALLOW INSERTION INTO TERMINAL STRIP.

4. IMPORTANT:
FOR THE NON-INTRINSIC SAFE APPLICATION INDICATED BY THIS DRAWING AND THE SENSOR INDICATED: PM-6, PM-6M, PM-6MX --- REMOVE THE JUNCTION BOX PARTITION.

3. ELECTRICAL REQUIREMENT; 20 TO 28VDC AND 40 MILLIAMPS (MAX) PER SENSOR.

[2] THIS DRAWING SHOWS THREE SENSORS CONNECTED IN ONE ZONE IN A CLASS B, STYLE B CONFIGURATION PER NFPA 72. ADDITIONAL SENSORS CAN BE ADDED BY REPEATING THE WIRING PATTERN OF THE CENTRAL SENSOR.

1. FOR INSTALLATION IN NONINCENDIVE, CLASS I, DIVISION 2, GP. A, B, C & D; CLASS II, DIVISION 2, GP. F & G, OR CLASS III, DIVISION 1 AND 2 HAZARDOUS (CLASSIFIED) LOCATIONS, OR NON-HAZARDOUS LOCATIONS ONLY. WIRING METHODS MUST CONFORM TO THE NEC, NFPA72 AND LOCAL CODES.

NOTE: NO REVISIONS SHALL BE MADE WITHOUT PRIOR FACTORY MUTUAL APPROVAL

CAD PREPARED DRAWING USING AUTOCAD R13
NOT TO BE MANUALLY ALTERED.

PART NO.	NEXT ASSY	USED ON
		PM-6MX
		PM-6M
		PM-6

APPLICATION

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
AND PER ANSI Y14.5M – 1982
.XX ± .XXX ± ANGLES ±
MATERIAL

QTY REQD	CAGE CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.

LIST OF MATERIAL

DUAL SPECTRUM SENSING AND SUPPRESSION SYSTEMS
SANTA BARBARA DUAL SPECTRUM
A DIVISION OF KIDDE Technologies, Inc.

DRW	R. MAYER	6/1/94
CHK	JOHN WETZORK	6/1/94
APVD	G. SIMPSON	6/1/94
APVD	S. E. HODGES	2JUN94
	D. R. LEDBETTER	3JUN94

CONTROL DRAWING
FIRE SENSOR MODEL
PM-6, PM-6M, PM-6MX
CLASS B, STYLE B

SIZE	CAGE CODE	NUMBER
D	05BU0	409528

SCALE NONE SHEET

409528 B

FSS-PPL

APPENDIX G

NONINCENDIVE

CLASS A, STYLE D CONTROL DRAWING

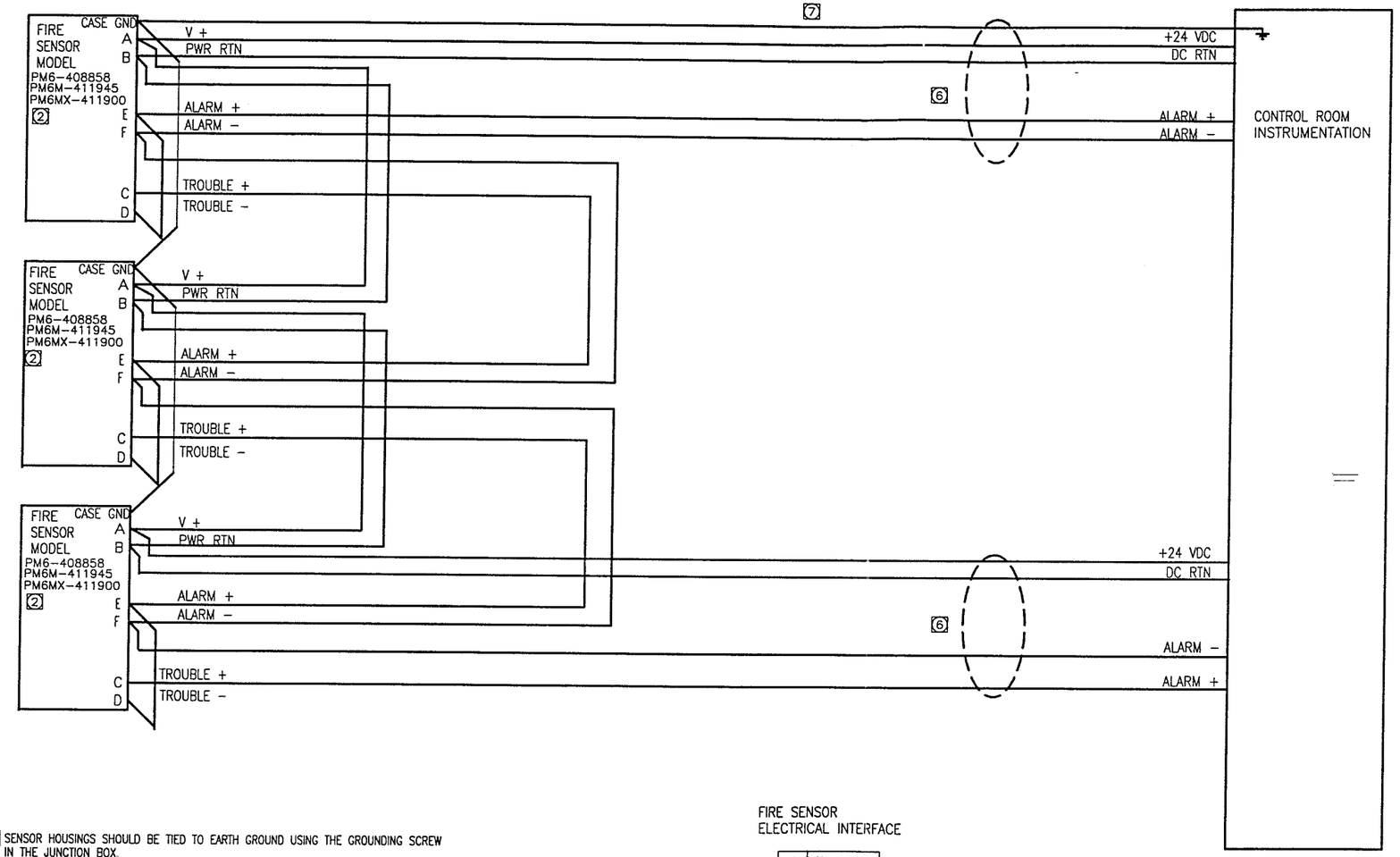
Hazardous (Classified) Locations:

Class I, Division 2, Group A, B, C, D

Class II, Division 2, Group F, G

Class III, Division 1 and 2

Non-hazardous (Non-classified) Locations:



MODEL EFFECTIVITY	REVISIONS			
	SYM	DESCRIPTION	DATE	APPROVED
	B	REVISED AND REDRAWN AS REQUESTED BY ECR 941. INCORPORATED NEW COMPANY FORMAT. ADDED PM–6M, PM–6MX TO CONFIGURATION.		TJB

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[7] SENSOR HOUSINGS SHOULD BE TIED TO EARTH GROUND USING THE GROUNDING SCREW IN THE JUNCTION BOX.

[6] THE OUTGOING AND RETURN (REDUNDANT) CIRCUIT CONDUCTORS SHALL NOT BE RUN IN THE SAME CABLE ASSEMBLY, ENCLOSURE, OR RACEWAY PER NFPA 72.

5. STRIP 0.2 INCHES OF INSULATION FROM WIRE TO ALLOW INSERTION INTO TERMINAL STRIP.

4. IMPORTANT:
FOR THE NON–INTRINSIC SAFE APPLICATION INDICATED BY THIS DRAWING AND THE SENSOR INDICATED: PM–6, PM–6M, PM–6MX ––– REMOVE THE JUNCTION BOX PARTITION TO ALLOW FULL ACCESS TO THE TERMINAL BLOCK.

3. ELECTRICAL REQUIREMENT; 20 TO 28VDC AND 40 MILLIAMPS (MAX) PER SENSOR.

[2] THIS DRAWING SHOWS THREE SENSORS CONNECTED IN ONE ZONE IN A CLASS A, STYLE D CONFIGURATION PER NFPA 72. ADDITIONAL SENSORS CAN BE ADDED BY REPEATING THE WIRING PATTERN OF THE CENTRAL SENSOR.

1. FOR INSTALLATION IN NONINCENDIVE, CLASS I, DIVISION 2, GP. A, B, C & D; CLASS II, DIVISION 2, GP. F & G, OR CLASS III, DIVISION 1 AND 2 HAZARDOUS (CLASSIFIED) LOCATIONS, OR NON–HAZARDOUS LOCATIONS ONLY. WIRING METHODS MUST CONFORM TO THE NEC, NFPA72 AND LOCAL CODES.

NOTES: UNLESS OTHERWISE SPECIFIED.

FIRE SENSOR
ELECTRICAL INTERFACE

A	V+
A	V+
B	POWER_RTN
B	POWER_RTN
C	TROUBLE +
D	TROUBLE –
E	ALARM+
E	ALARM+
F	ALARM–
F	ALARM–

NOTE: NO REVISIONS SHALL BE MADE WITHOUT PRIOR FACTORY MUTUAL APPROVAL

CAD PREPARED DRAWING USING AUTOCAD R13
NOT TO BE MANUALLY ALTERED.

PART NO.	NEXT ASSY	USED ON
		PM–6MX
		PM–6M
		PM–6
APPLICATION		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND PER ANSI Y14.5M – 1982
XX ± | XXX ± | ANGLES ±
MATERIAL

QTY REQD	CAGE CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.

LIST OF MATERIAL

DUAL SPECTRUM® SENSING AND SUPPRESSION SYSTEMS
SANTA BARBARA DUAL SPECTRUM
A DIVISION OF KIDDE Technologies, Inc.

PREP	R. MAYER	5/24/94
CHKD	JOHN WETZORK	6/1/94
APVD	G. SIMPSON	6/1/94
APVD	S.E. HODGES	2JUN94
	D.R. LEDBETTER	3JUN94

CONTROL DRAWING
FIRE SENSOR MODEL
PM–6, PM–6M, PM–6MX
CLASS A, STYLE D

SIZE	CAGE CODE	NUMBER
D	05BU0	409460

SCALE | SHEET

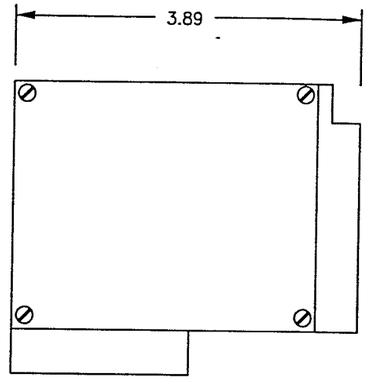
FSS–PPL 1

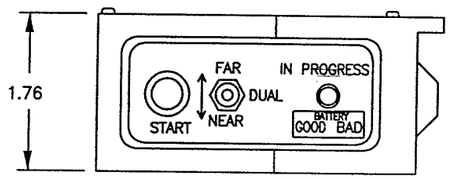
409460 B

APPENDIX H

PSS-X TEST SET

MODEL EFFECTIVITY	REVISIONS				
	SYM	DESCRIPTION	DATE	APPROVED	
	—	INITIAL RELEASE	94–09–27		CSC
	A	REVISED AND REDRAWN AS REQUESTED BY ECRXXX. INCORPORATED NEW COMPANY FORMAT.		TJB	





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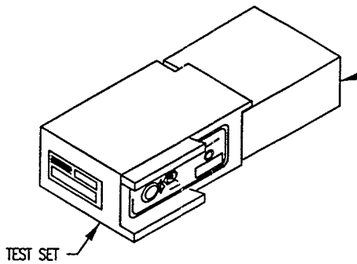

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INTERFACE CONTROL DRAWING

WARNING
DO NOT OPERATE THIS UNIT IN ANY HAZARDOUS (CLASSIFIED) LOCATION.

WARNING
A FULL SYSTEM TEST RESULTS IN AN ALARM OUTPUT. THIS WILL RESULT IN THE AUTOMATIC SUPPRESSION SYSTEM BEING ACTIVATED IF IT IS NOT DISABLED PRIOR TO PROCEEDING.

OPERATION:
PLACE THE FRONT OF THE PSS–X TEST SET FIRMLY AGAINST THE FRONT OF THE SENSOR TO BE TESTED. SELECT THE DESIRED OPERATION (FAR, DUAL, OR NEAR) WITH THE TOGGLE SWITCH. PRESS THE "START" BUTTON. THE "IN PROGRESS" INDICATOR SHOULD ILLUMINATE, INDICATING THAT THE TESTING IS IN PROGRESS. DO NOT REMOVE THE TEST SET UNTIL THE "IN PROGRESS" INDICATOR IS EXTINGUISHED.

NOTE:
FOR VALID TEST RESULTS, THE TEST SET AND THE SENSOR UNDER TEST MUST BE AT APPROXIMATELY THE SAME TEMPERATURE.

BATTERY REPLACEMENT:
THE COLOR OF THE "IN PROGRESS" INDICATOR IS DEPENDENT UPON THE BATTERY CONDITION. GREEN SIGNIFIES THAT THE BATTERY IS GOOD. RED SIGNIFIES THAT THE BATTERY IS WEAK AND SHOULD BE REPLACED

CAUTION
USE ONLY DURACELL ○ 9 VOLT ALKALINE BATTERY, PART NUMBER MN1604

WARNING
CHANGE BATTERY IN NON–HAZARDOUS LOCATION ONLY.

TO REPLACE THE BATTERY, REMOVE THE TOP COVER HELD ON BY FOUR RETAINING SCREWS. REMOVE THE OLD BATTERY AND REPLACE IT WITH A NEW ONE. RE–INSTALL THE TOP COVER WITH THE FOUR RETAINING SCREWS. FASTEN THE SCREWS TAKING PROPER PRECAUTION NOT TO STRIP THE THREADS. TEST THE TEST SET BY PRESSING THE "START" BUTTON. THE "IN PROGRESS" INDICATOR SHOULD ILLUMINATE GREEN.

NOTES: UNLESS OTHERWISE SPECIFIED

CAD PREPARED DRAWING USING AUTOCAD R13 NOT TO BE MANUALLY ALTERED.

NOTE: NO REVISIONS TO BE MADE WITHOUT PRIOR FACTORY MUTUAL APPROVAL

BSC	——	FSS
PART NO.	NEXT ASSY	USED ON
APPLICATION		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
AND PER ANSI Y14.5M – 1982

.XX	.XXX	ANGLES
± .06	± .015	±

MATERIAL

QTY REQD	CAGE CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.

LIST OF MATERIAL

DUAL SPECTRUM® SENSING AND SUPPRESSION SYSTEMS

SANTA BARBARA DUAL SPECTRUM
A DIVISION OF KIDDE Technologies, Inc

PREP	A. HANNON	94–05–24
CHKR	G. SIMPSON	27SEPT94
APVD	G. R. HEMPEL	9/27/94
APVD	S. E. HODGES	27SEPT94
	D. R. LEDBETTER	27SEPT94

PSS–X TEST SET
FOR PM–5SX, PM–5SXJ, AND PM–6

SIZE	CAGE CODE	NUMBER
C	05BU0	409027

SCALE 1:1 | SHEET

FSS–PPL

REV A
DWG NO 409027

FOLD 1
FOLD 2

APPENDIX I

PSS-LC TEST SET

MODEL EFFECTIVITY	REVISIONS			
	SYM	DESCRIPTION	DATE	APPROVED

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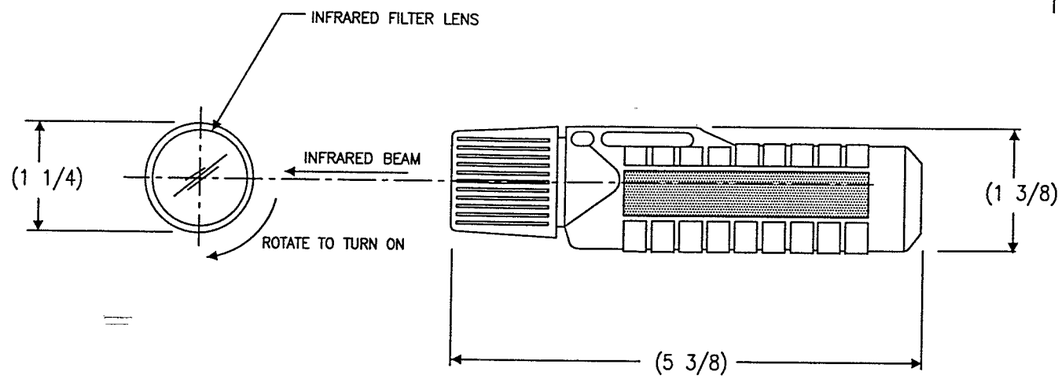

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MAY 17 1996

INTERFACE CONTROL DRAWING

WARNING

THIS UNIT IS NOT RATED FOR USE IN HAZARDOUS (CLASSIFIED) LOCATIONS

CAUTION

A FULL SYSTEM TEST RESULTS IN AN ALARM OUTPUT. THIS WILL RESULT IN THE AUTOMATIC SUPPRESSION SYSTEM BEING ACTIVATED IF IT IS NOT DISABLED PRIOR TO PROCEEDING.

OPERATION

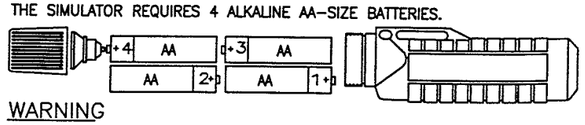
TURN ON PSS–LC, WAIT 15 SECONDS. TO CAUSE AN ALARM SLOWLY SWEEP THE INFRARED BEAM ACROSS THE FRONT OF FLAME DETECTOR FROM RIGHT TO LEFT. HOLD PSS–LC SO THAT THE INFRARED FILTER LENS IS LESS THAN 1 INCH FROM THE FRONT OF THE FLAME DETECTOR TO BE TESTED.

NOTE

FOR VALID TEST RESULTS, THE TEST SET AND THE SENSOR UNDER TEST MUST BE AT APPROXIMATELY THE SAME TEMPERATURE.

BATTERY REPLACEMENT

THE SIMULATOR REQUIRES 4 ALKALINE AA–SIZE BATTERIES.



WARNING

CHANGE BATTERY IN NON–HAZARDOUS LOCATION ONLY

NOTES: UNLESS OTHERWISE SPECIFIED

CAD PREPARED DRAWING USING AUTOCAD R13 NOT TO BE MANUALLY ALTERED.

BSC	—	FSS
PART NO.	NEXT ASSY	USED ON
APPLICATION		

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
AND PER ANSI Y14.5M – 1982

XX ±	XXX ±	ANGLES ±

MATERIAL

QTY REQD	CAGE CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.

LIST OF MATERIAL

DUAL SPECTRUM
SENSING AND SUPPRESSION SYSTEMS

SANTA BARBARA DUAL SPECTRUM
A DIVISION OF KIDDE *Technologies, Inc.*

PREP	T BRIDGER	2 FEB 96
CHKR		
APVD		
APVD		

PSS–LC TEST SET

SIZE	CAGE CODE	NUMBER
C	05BU0	412157

SCALE NONE | SHEET

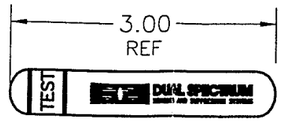
REV –
DWG NO 412157

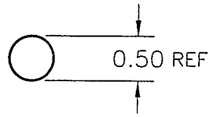
FOLD 1 FOLD 2

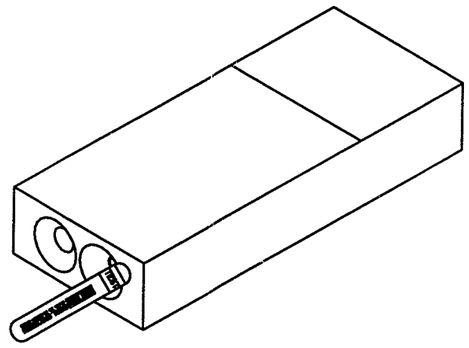
APPENDIX J

TEST MAGNET

MODEL EFFECTIVITY	REVISIONS SYM	DESCRIPTION	DATE	APPROVED







DETAIL A

SANTA BARBARA

MAY 1 3 1996

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INTERFACE CONTROL DRAWING

3. WHEN THE SENSOR IS IN TEST MODE, A TROUBLE INDICATION SHOULD BE DISPLAYED ON THE FIRE ALARM PANEL. THE SENSOR WILL BE IN TEST MODE FOR ONE MINUTE.
2. TEST MAGNET IS USED TO PLACE THE PM-6M OR PM-6MX INTO THE TEST MODE PRIOR TO TESTING WITH TEST SET PSS-LC OR PSS-X. TOUCH THE SENSOR WITH THE TEST MAGNET AS SHOWN IN DETAIL A.
1. INTERPRET DRAWING PER DOD-STD-100

NOTES: UNLESS OTHERWISE SPECIFIED

CAD PREPARED DRAWING USING AUTOCAD R13 NOT TO BE MANUALLY ALTERED.

PART NO.	NEXT ASSY	USED ON
APPLICATION		

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND PER ANSI Y14.5M – 1982
XX ± | XXX ± | ANGLES ±
MATERIAL

QTY REQD	CAGE CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.
LIST OF MATERIAL				

DUAL SPECTRUM SENSING AND SUPPRESSION SYSTEMS
SANTA BARBARA DUAL SPECTRUM
A DIVISION OF KIDDE Technologies, Inc.

PREP	E.EVERSON	5/9/96
CHKR		
APVD		
APVD		

TEST MAGNET

SIZE	CAGE CODE	NUMBER
C	05BU0	411906

SCALE NONE SHEET

REV
DWG NO 411906

FOLD 1
FOLD 2