INSTALLATION, OPERATION AND MAINTENANCE MANUAL

FOR

DUAL SPECTRUM® FIRE SENSORS MODELS PM-5CXJ AND PM-5CX

November 1996

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INTRODUCTION

The SANTA BARBARA Dual Spectrum® (SBDS) fire sensors, models PM-5CXJ and PM-5CX, are Factory Mutual Research Corporation listed infrared fire sensors designed to provide high-speed detection of hydrocarbon-fueled fires and explosions both indoor and outdoors. They will also provide protection against class A, B and C fires, have a 90° field-of-view, and are suitable for use in hazardous locations as described below. The sensor response to explosive fires is typically six milliseconds. The PM-5CXJ and PM-5CX sensors are encapsulated and sealed, resulting in rugged assemblies that are rated NEMA 4X.

The PM-5CXJ, P/N 411925, (Figure 1 and Appendix A) and PM-5CX, P/N 411938, (Figure 2 and Appendix C) have identical performance. Their different packaging increases the flexibility of their installation: The PM-5CXJ is wired via an electrical junction box that is part of its housing. The PM-5CX has an extremely compact housing that is wired via a circular connector which can be easily adapted to standard electrical conduit fittings.

The PM-5CXJ is enclosed in a cast aluminum housing approximately 5.9 x 3.5 x 1.6 inches in size. A bracket assembly for mounting the sensor is available that allows adjustment on two axes, P/N 409000; (Appendix B). The junction box with three 3/4 inch conduit ports, available for connecting to hard or flexible conduit, is part of the sensor housing. Electrical connections are made via a terminal block mounted inside the junction box at the rear of the sensor. A partition is installed in the junction box to separate the power and initiating-device circuits in an intrinsically safe installation.

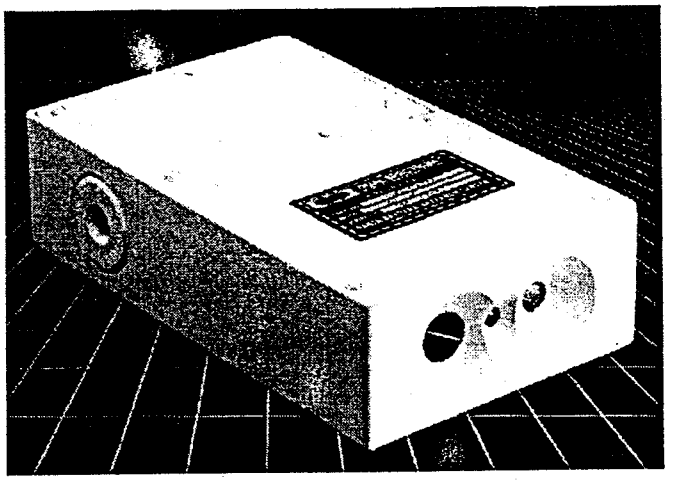


Photo No. 94-5-90

Figure 1. PM-5CXJ Sensor.

(See Appendix A, drawing number 411925 for detailed information. Drawing number 409000, Appendix B, is a detailed drawing of the optional mounting bracket.)

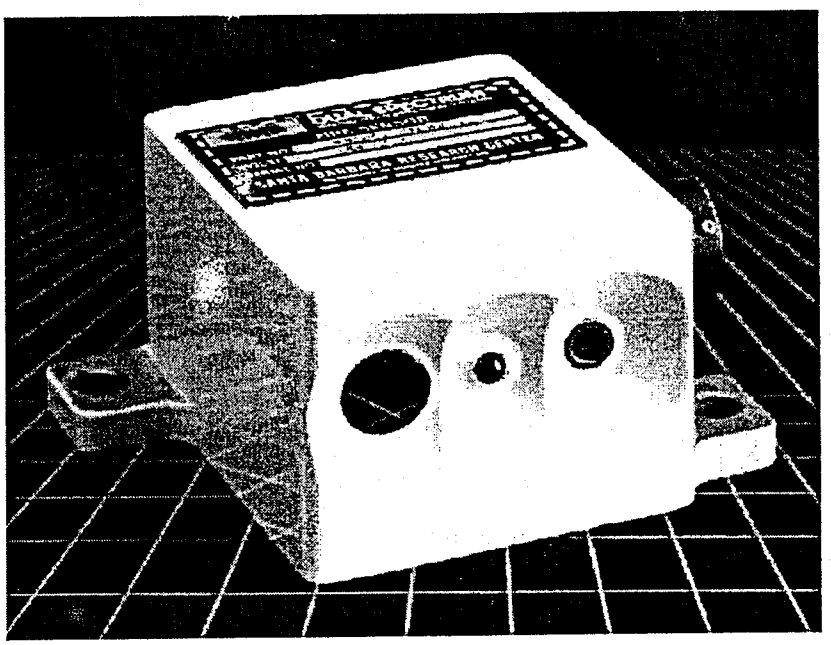


Photo No. 94-5-86

Figure 2. PM-5CX Sensor.

(See Appendix C, drawing number 411938 for detailed information. Drawing number 408917, Appendix D, is a detailed drawing of the Harness/Junction Box Adapter.)

The PM-5CX is enclosed in a smaller cast aluminum housing approximately 2.7 x 2.3 x 1.7 inches in size. It is intended for mounting in locations where space is at a premium. The PM-5CX housing has two mounting feet that allow it to be bolted to a bracket or other flat surface.

A Harness/Junction Box Adapter, P/N 408917; (Appendix D) is available that connects to the PM-5CX with liquid tight flexible metal conduit and includes an integral junction box. Conduit lengths are available from one to six feet. The Harness/Junction Box Adapter, P/N 408917 is required for intrinsically safe installations.

Factory Mutual (FM) has certified: 1) the performance of the PM-5CXJ and PM-5CX fire sensors, 2) the compliance with National Fire Protection Association (NFPA) Standard 72 of the sensors and the installation described in this document, and 3) the suitability of the installation described here for use in hazardous (classified) locations.

NOTE: These sensors are specifically tuned and tested to respond to fires as described in this manual. The sensor response to other fuel sources not described in this manual may vary. Please contact DUAL SPECTRUM® for further information.

APPLICATIONS

The PM-5CXJ and PM-5CX are intended for high-speed detection of hydrocarbon-fueled fires. These sensors will also provide high-speed detection in areas where propellants and munitions are manufactured and handled. The sensors are suitable for indoor and outdoor

applications. This requires proper installation and choice of components which are described in this installation manual. See the following sections and Control Drawing number 409459.

SENSOR USE IN HAZARDOUS AREAS

The SBDS Dual Spectrum® fire sensors, Models PM-5CXJ and PM-5CX, are Factory Mutual-approved flame detectors suitable for intrinsically safe use in Class I, Division 1, Groups C-D; Class I, Division 2, Group A-D; Class II, Division 1, Groups E-G; and Class III, Division 1 and 2 hazardous (classified) locations. For use in Class I, Division 2, Groups A-D; Class II, Division 2, Group F-G; and Class III, Division 1 and 2 hazardous (classified) locations the PM-5CXJ and PM-5CX are approved in nonincendive circuits. This certification depends on proper installation and choice of components which are described in this installation manual. See the following sections and Control Drawing Configuration number 409665 (Appendix E) for installation and component selection criteria.

ELECTRICAL CHARACTERISTICS

The PM-5CXJ and PM-5CX are designed to interface to an NFPA-type fire alarm control panel. A normally-open, dry-relay contact is provided for an alarm signal. The alarm contacts close for one to ten seconds when a fire is detected and are automatically reset after a fire. An internal supervision relay closes when the sensor powers up and opens if a sensor fault, such as loss of power, low power supply voltage, or a sensor malfunction is detected. In NFPA 72, Class A or B circuits (see Appendix F to H), such a fault condition is indicated at the control panel as a trouble signal. An illuminated green LED on the front of the housing indicates that the sensor status is good.

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

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

Input Current:	30 milliamps at +24 VDC quiescent 40milliamps at +24 VDC in alarmed state
Alarm Output:	Relay contact closure for 1 to 10 seconds.
Trouble Output:	Opening of normally-closed relay contacts.
Relay Contact Ratings:	1 Amp, 30 VDC 0.5 Amp, 125 VAC
Reset Time:	Automatic after 1 to 10 seconds.
Stabilization Time:	Maximum 0.5 second after power up.

TABLE I. PM-5CXJ and PM-5CX Harness/Junction Box Adapter Terminal Block Identification.

A Terminal	Dual	Power +24 VDC
B Terminal	Dual	Power return
C Terminal	Single	Supervision Relay Contact, Trouble + Signal
D Terminal	Single	Supervision Relay Contact, Trouble - Signal
E Terminal	Dual	Alarm + Relay Contact
F Terminal	Dual	Alarm - Relay Contact

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-5CXJ and PM-5CX are designed to withstand severe vibration and shock as defined in FM Approval Standard 3260.

ELECTROMAGNETIC INTERFERENCE

The PM-5CXJ and PM-5CX are designed to be highly immune to radiated and conducted Electromagnetic Interference (EMI). The sensors are 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 sensors can operate in the presence of conducted noise levels up to 1.0 VRMS in the frequency range of 30 Hz to 250 kHz.

SENSOR PERFORMANCE

DETECTION RANGE AND RESPONSE TIME

Best performance of the PM-5CXJ and PM-5CX sensors is achieved when the sensors 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 sensors. The step-response time of the PM-5CXJ and PM-5CX sensors is six milliseconds. Actual detection times of fires depends on the source of fuel ignition and other aspects of the initial fire stages. The sensors can respond most quickly to closer or larger fires but are unlikely to detect the fires specified in Table II when they are further away than shown. The range is smaller for sources when they are close to the edge of the field-of-view of the sensor. At the edge, ±45°, the range is reduced no more than 50%.

NOTE: The sensor 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.

TABLE II. PM-5CXJ and PM-5CX Detection-Threshold Distances.

Flame Fuel		Range (Ft.)
1 Sq. Ft. Gasoline		5
1 Sq. Ft. Diesel		3
30 Grams Black Powder		12
1 Sq. Ft. Isopropyl Alcohol		4
1 Sq. Ft. Lacquer Thinner		4

FALSE-ALARM IMMUNITY

The PM-5CXJ and PM-5CX, are extremely false-alarm immune. However, no fire sensor is perfect — a fire-alarm output due to non-fire stimuli is possible. Table III lists common stimuli and the false-alarm immunity distance for those stimuli; as tested by Factory Mutual Research, no false alarms occur for larger distances in laboratory measurements.

For best performance, the sensor should be mounted so that any exposure to these sources occurs at distances greater than those given in Table III. In addition, to ensure optimum performance, sensors should be mounted so that they do not view very brightly illuminated areas. For example, indoor mounting locations where the sensors look out doors or windows should be avoided wherever possible.

TABLE III. PM-5CXJ and PM-5CX False-Alarm Immunity Distances.

Stimulus (Chopped Or Unchopped)	Range (in)
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	4
Incandescent Light (100 W Frosted)	8
Electronic Flash (Sunpak 411)	No Response
Flood Light (Sungun-II, 650 W)	20
Arc Welding (5/32" Steel Rod, 140 A)	30
Sodium -Vapor (70 W)	No Response
Radiation Heater (1500 W)	6
Lighted Cigar Or Cigarette	1
Large Wooden-Match Flare-Up	4
Aircraft Running Lights	No Response
Aircraft Strobe Lights	No Response

SENSOR INSTALLATION

PHYSICAL MOUNTING

The PM-5CXJ and PM-5CX 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-5CXJ 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 in two axes and, once correctly positioned, can be locked in place.

The PM-5CXJ has 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 SENSOR. REMOVING THIS COVER WILL COMPROMISE THE PERFORMANCE OF THE SENSOR.

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 compact package of the PM-5CX is of great benefit in applications where space is a limiting factor. It has two mounting feet that can be mounted directly to a flat, solid surface. This sensor does not have a built-in junction box. A Harness/Junction Box adapter is required for intrinsically safe installations (SBDS P/N 408917; Appendix D). The junction box should be mounted close enough to allow connection to the sensor via the Harness/Junction Box adapter liquid tight conduit. The conduit on the Harness/Junction Box adapter (P/N 408917) can be ordered from one to six feet in length, in one foot increments. In nonincendive circuits, electrical connection to the sensor may be via a PT06A-12-10S or equivalent connector, if desired.

The number of sensors required to protect a given area will depend on the size of the area, the distance from the sensor and the size and type of the threat fire. Certain factors need to be considered when designing an installation:

1. The sensors should be mounted so that objects do not block their field-of-view. This includes glass, plexiglass and other visibly transparent materials.
2. Whenever possible, sensors should be mounted so their ranges and fields-of-view overlap.
3. Sensors 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, sensors should be mounted so they do not look at brightly illuminated areas.
5. The sensors 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 sensors should be protected. However the protection method cannot obstruct the sensors field-of-view with any material, including visibly transparent materials, such as glass and plexiglass.
7. The sensors can be mounted in any orientation, so long as the manufactured mounting point is the point of support.
8. Mounting the sensors so that they point below horizontal is recommended as this generally results in minimal window contamination.

ELECTRICAL WIRING CONNECTION

An approved installation of the PM-5CXJ and PM-5CX fire sensors must be in accordance with the FM-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 409665; Appendix E). Sensors may be wired in a standard NFPA 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 DISCONNECT THE PM-5CX CONNECTOR OR REMOVE 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 409459 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 raceway and kept separate from non-barrier wiring.

All fire sensor wiring should be run in its own separate conduit or raceway using the minimum wire sizes and maximum distances shown in Table IV. Each sensor 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 3 illustrates a proper wiring method for intrinsically safe circuits in the PM-5CXJ as described in Appendix F.

TABLE IV. Maximum Wiring Distances.

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

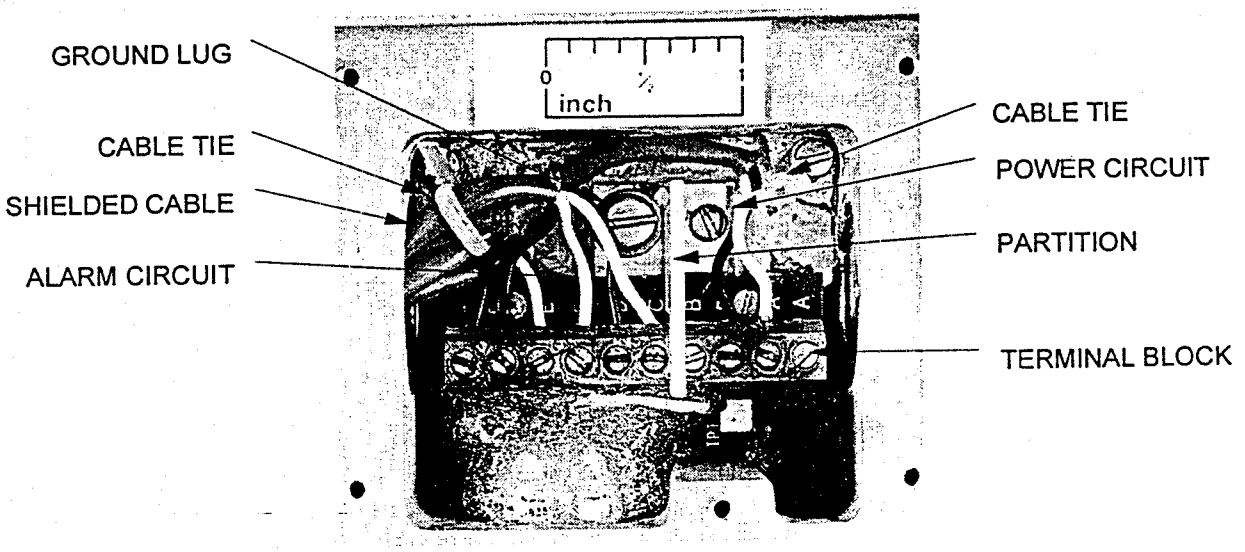


Photo No. 94-7-81

Figure 3. PM-5CXJ Junction Box Connections.

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-5CXJ and the Harness/Junction Box adapter, P/N 408917, used with the PM-5CX, must be in place to provide separation of the power and initiating device circuits in their junction boxes.

CIRCUITS WITH NONINCENDIVE SENSORS

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-5CXJ and PM-5CX fire sensors 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 PM-5CXJ 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 sensors may be tested with live fires or by using the hand-held SBDS, model PSS-CX Test Set P/N 413123. 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 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-CX TEST SET UNLESS THE AREA IS KNOWN TO BE NON-HAZARDOUS

2. PSS-CX Test Set. For valid test results, the PSS-CX Test Set and the sensor 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 sensor for 15 seconds to allow the sensor to stabilize before testing.

3. False-alarm Immunity. Correct Dual Spectrum® system operation can be verified by using a properly aligned SBDS PSS-CX set in the "FAR" mode. The control panel should not indicate an alarm condition. Repeat this test with the PSS-CX 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 Table V, Troubleshooting Guide.

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

WARNING

DO NOT DISCONNECT THE PM-5CX CONNECTOR OR REMOVE JUNCTION BOX COVERS WHILE THE CIRCUIT IS ALIVE UNLESS THE AREA IS KNOWN TO BE NON-HAZARDOUS.

5. Interconnection Wiring. Correct interconnection wiring should be checked by removing any wire attached to the sensor terminal block. The result, in a supervised NFPA wiring scheme, should be a trouble-signal indication at the control panel.

6. Test Faults. Abnormal results in the preceding tests can be due to incorrect wiring, a sensor fault, or a problem with the test set. Check the circuits for faults. If the integrity of the circuit is certain a sensor is probably defective.

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

Optional Test Method:

With the sensor powered up, the following tests can be done. False-alarm immunity can be checked using stimuli and distances shown in Table II. Fire response can be checked by exposing the sensor under test to a live fire source. Follow all required precautions when testing in this manner.

TABLE V, TROUBLESHOOTING GUIDE

SYMPTOM	PROBABLE CAUSE	CORRECTIVE ACTION
Trouble signal at fire alarm control panel.	Incorrect wiring.	Check circuit installation.
	Low or no voltage to sensor.	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-CX temperature different from Detector.	Allow Detector and PSS-CX temperatures to stabilize.
	Detector Malfunction.	Replace Detector.
Detector alarms during NEAR or FAR test.	PSS-CX source not recovered.	Wait 15 seconds and retest at least twice.
	PSS-CX temperature different from Detector.	Allow Detector and PSS-CX temperatures to stabilize.
	Detector malfunction.	Replace Detector.
Green LED out.	Incorrect wiring, incorrect power to the Detector.	Check circuit installation.
	Detector malfunction.	Replace Detector.

MAINTENANCE

ROUTINE VISUAL INSPECTION

A properly installed SBDS Dual Spectrum® sensor system is highly resistant to being blinded by contamination build-up on the sensor front face windows. However, a thick enough build-up will begin to reduce the performance of the sensors. This can be prevented by periodically inspecting installed sensors visually for contamination build-up on the sensor front face. If such a build-up is observed, it should be removed by cleaning the sensor 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.

APPENDIX A

PM-5CXJ FIRE SENSOR

APPENDIX B

BRACKET ASSEMBLY

APPENDIX C

PM-5CX FIRE SENSOR

APPENDIX D

PM-5CX HARNESS/JUNCTION BOX ADAPTER

APPENDIX E

CONTROL DRAWING CONFIGURATION

APPENDIX F

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, Divison 2, Group F, G
Class III, Division 1 and 2

APPENDIX G

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:

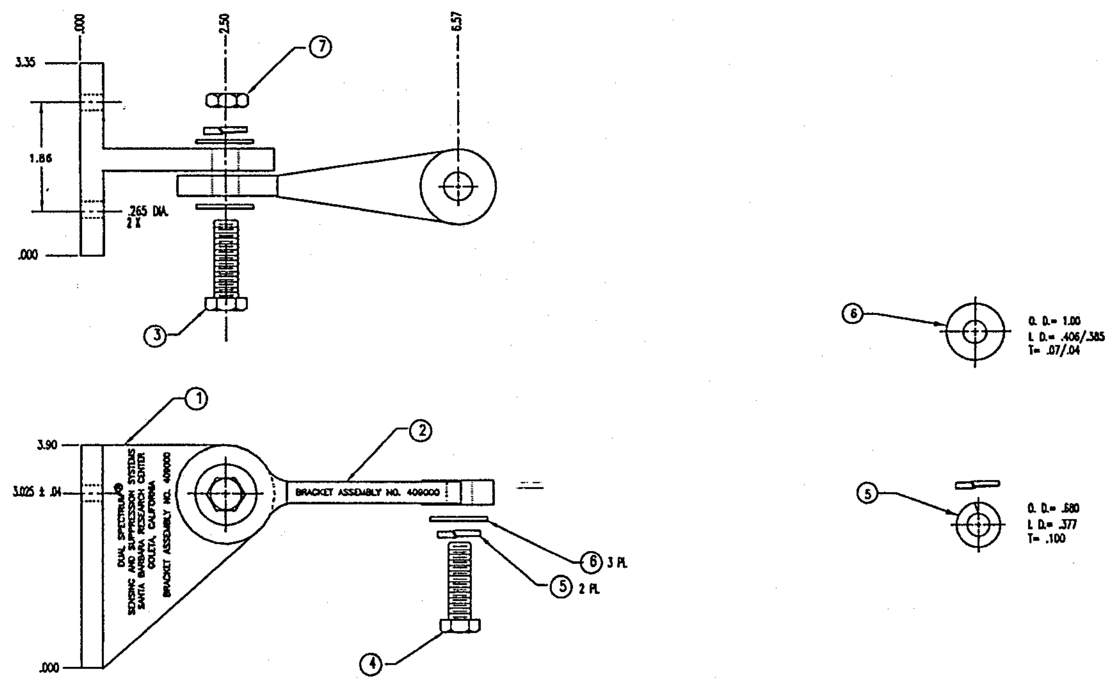
APPENDIX H

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:

REVISIONS				
SYM	DESCRIPTION	DATE	APPROVED	
A	IS: I.D.=.406/.385, T=.07/.04, ITEM NO. 3=1 3/8 LONG; WAS: ID=.406, T=.06, ITEM NO. 3=1 1/2 LONG; DELETE–ITEM NO. 8 "SEASTROM OR EQUIV"; SHOW VERBIAGE ON BRACKET ASSY. ECR # 863	94-08-29	GRH / AH	SCM / CSC
B	REVISED AND REDRAWN AS REQUESTED BY ECR000. INCORPORATED NEW COMPANY FORMAT.		TJB	



WARNING

THIS DRAWING IS A PRELIMINARY PRINT DO NOT USE FOR PRODUCTION UNLESS YOUR ORDER OR INSTRUCTIONS SPECIFY THE REVISION LEVEL COPIES ISSUED PRIOR TO APRIL 4, 1996 ARE OBSOLETE.

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			BOLT, 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

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

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
408858		PM6
408860		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.

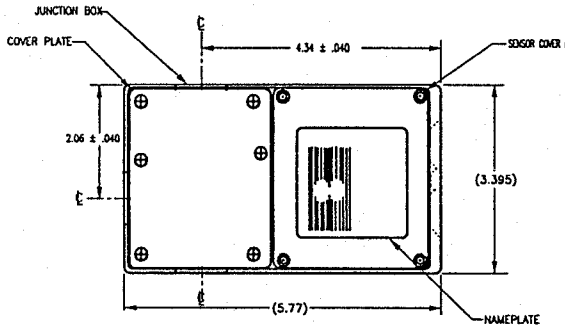
DRAWN	G.R.HEMPEL	3/11/94
CHECKED	H.SEGAL	4/4/94
ENG	S.E.HODGES	4/5/94
ENG	D.R.LEDBETTER	4/5/94

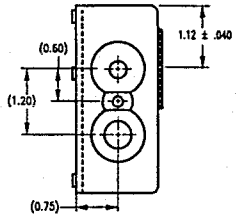
BRACKET ASSEMBLY

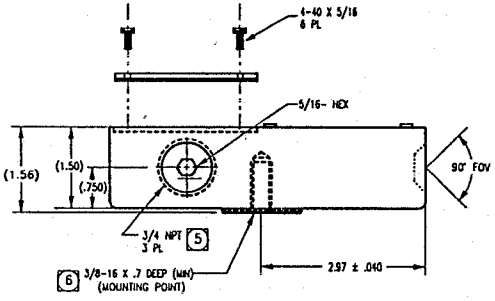
SIZE D | CAGE CODE 05BU0 | NUMBER 409000

409000 B

FSS-PPL

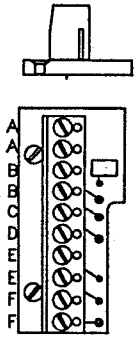






2 3 FIRE SENSOR ELECTRICAL INTERFACE P/N-409535

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 2 3
SCALE: NONE

REVISIONS				
SYM	DESCRIPTION	DATE	APPROVED	

411925

INTERFACE CONTROL DRAWING

6 MOUNT SENSOR ONLY AT MOUNTING POINT.

5 APPLY TWO TURNS 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 411924.

3 SEE TABULATION AND DETAIL A FOR ELECTRICAL INTERFACE.

2 INDICATED PART NUMBER IS A TERMINAL BLOCK INTERCONNECTION BOARD ASSEMBLY P/N 409535.

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.

QTY REQD	ONE DOC	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.
			LIST OF MATERIAL	

PART NO.	NEXT ASSY	USED ON
APPLICATION		PM-5CXJ

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

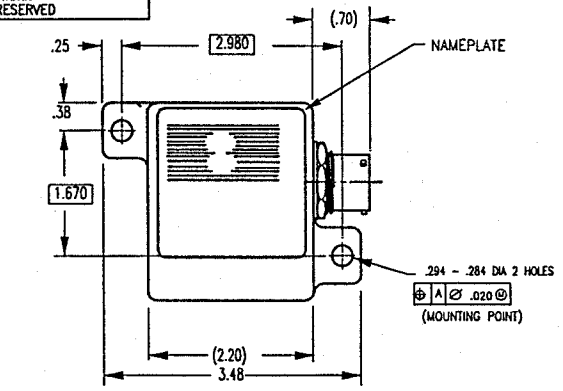
DUAL SPECTRUM® SENSING AND SUPPRESSION SYSTEMS
SANTA BARBARA DUAL SPECTRUM A DIVISION OF KIDDE Technologies, Inc.

T. BRIDGER

FIRE SENSOR
PM-5CXJ

SIZE	CAGE CODE	NUMBER
D	05BU0	411925

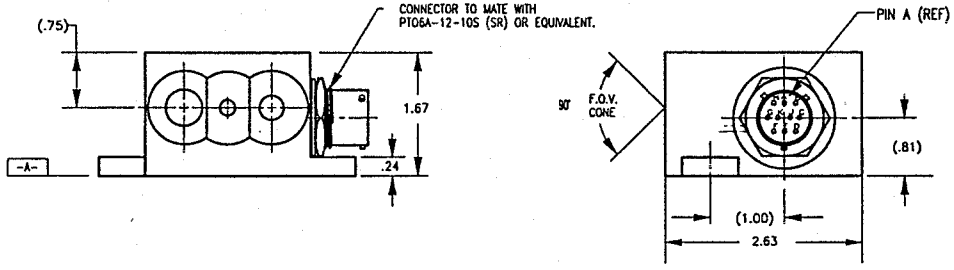
SCALE | SHEET



FIRE SENSOR
ELECTRICAL INTERFACE

[2] CONNECTOR
P/N-81054-12-10PN

A	V+
B	POWER_RETURN
C	TROUBLE +
D	TROUBLE –
E	ALARM +
F	ALARM –
G	CASE GROUND
H	SPARE
J	SPARE
K	SPARE



REVISIONS				
MODEL EFFECTIVITY	SYM	DESCRIPTION	DATE	APPROVED

INTERFACE CONTROL DRAWING

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

3. PERFORMANCE RATINGS:
PERFORMANCE RATINGS ARE DEFINED IN SBDS DOCUMENT 411924.

[2] CONNECTOR IS A PTO7C-12-10P TYPE WITH INTERNAL EMI PROTECTION.

1. INTERPRET DRAWING PER ANSI Y14.5

NOTES: UNLESS OTHERWISE SPECIFIED

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

PART NO.	NEXT ASSY	USED ON
		PM-5CX

APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND PER ANSI Y14.5M – 1982
.XX ± .04 | .XXX ± .010 | ANGLES ± 2°
MATERIAL

CITY 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	V.MARIN	4/30/96
CHKR		
APVD		
APVD		

FIRE SENSOR
PM-5CX

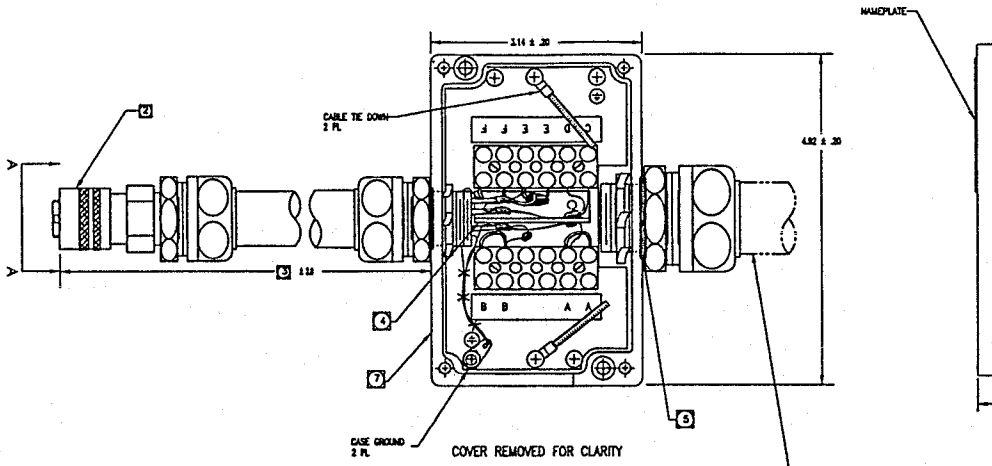
SIZE	CAGE CODE	NUMBER
C	05BU0	411938

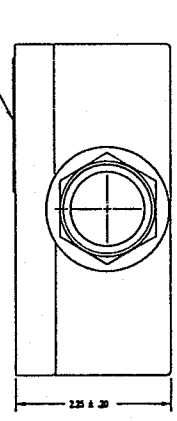
SCALE | SHEET

DWG NO 411938 REV

FOLD 1

REVISIONS				
SHEET SPECIFIC	ZONE	DESCRIPTION	DATE	APPROVED
FIRST USE	A	REPLACED INITIAL RELEASE WITH CHANGE AS REQUESTED EDR 844. CHANGES TO EXTENSIVE TO LIST FOR "AS-IS" CONDITION. SEE PREVIOUS COPY RETAINED IN EDOC. THIS IS AVAILABLE ON SCANNED THROUGH MICROFILM AND CHANGE RECORD.	04/08/26	
	B	REVISED AND REDRAWN AS REQUESTED BY EDR 1001. INCORPORATED NEW COMPANY FORMAT.		





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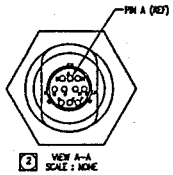


HARNESS ELECTRICAL INTERFACE

TERMINAL A	DUAL	POWER +24 VDC
TERMINAL B	DUAL	POWER RETURN
TERMINAL C	SINGLE	TROUBLE +
TERMINAL D	SINGLE	TROUBLE –
TERMINAL E	DUAL	ALARM +
TERMINAL F	DUAL	ALARM –

3 TABULATION

PART NUMBER	LENGTH (INCHES)
408917-1	12

6 MOUNTING HARDWARE NOT SHOWN.

7 AFTER WIRING INSTALL COVER AND GASKET WITH PROVIDED SCREWS.

8. ENCLOSURE UL LISTED, FILE NO. E64472, NEMA 4X.

5 O-RING SHALL BE INSTALLED FOR DUST TIGHT SEAL.

4 PARTITION SHALL BE INSTALLED FOR INTRINSICALLY SAFE CIRCUITS. SUBSTITUTION OF COMPONENTS IN JUNCTION BOX MAY IMPAIR INTRINSIC SAFETY.

3 SEE TABULATION FOR HARNESS LENGTH AND PART NUMBER.

2 CONNECTOR TO MATE WITH FIRE SENSOR MODEL PM-5SX (408088).

1. INTERPRET DRAWING PER ANSI Y14.5

INTERFACE CONTROL DRAWING

ITEM	QTY	PART NUMBER	DESCRIPTION (MOD.)
6	1	10052032-00	MOUNTING HARDWARE

CAD PREPARED DRAWING USING AUTOCAD R13
NOT TO BE MANUALLY ALTERED

DUAL SPECTRUM
SANTA BARBARA DUAL SPECTRUM
A DIVISION OF KIDDE

DRAWN	R. MAYER	1/24/94
CHECKED	JOHN WETZORK	4/1/94
ENG APPR.	R. MYERS	4/2/94
MFG APPR.	S.L. HODGES	7 JAN 94
QUAL APPR.	D.R. LEDBETTER	3 JAN 94

ADAPTER HARNESS WITH JUNCTION BOX
PM-5SX

SIZE F | CAGE CODE 05BU0 | DRAWING NO. 408917 | REV
SCALE NONE | WEIGHT | SHEET

408917

REVISIONS				
MODIFICATION EFFECTIVITY	SYM	DESCRIPTION	DATE	APPROVED
	A	REVISED AND REDRAWN AS REQUESTED BY ECR 943. INCORPORATED NEW COMPANY FORMAT. ADDED PM-5CX, PM-5CXJ TO CONFIGURATION.		TJB

TABULATION

PM-5SX/SXJ AND PM-5CX/CXJ CONTROL DRAWING CONFIGURATION

HAZARDOUS (CLASSIFIED) LOCATION	NFPA 72 INITIATING DEVICE CIRCUIT, CLASS & STYLE	INSTALLATION TYPE	CONTROL DWG NO.
CLASS I, DIV 1, GRP C,D	CLASS B, STYLE B	INTRINSICALLY SAFE	409459
CLASS II, DIV 1, GRP E,F,G	CLASS B, STYLE B	INTRINSICALLY SAFE	409459
CLASS I, DIV 2, GRP A,B,C,D	CLASS B, STYLE B	INTRINSICALLY SAFE	409459
CLASS II, DIV 2, GRP F,G	CLASS B, STYLE B	INTRINSICALLY SAFE	409459
CLASS III, DIV 1	CLASS B, STYLE B	INTRINSICALLY SAFE	409459
CLASS III, DIV 2	CLASS B, STYLE B	INTRINSICALLY SAFE	409459
CLASS I, DIV 2, GRP A,B,C,D	CLASS B, STYLE B	NONINCENDIVE	409529
CLASS II, DIV 2, GRP F,G	CLASS B, STYLE B	NONINCENDIVE	409529
CLASS III, DIV 1	CLASS B, STYLE B	NONINCENDIVE	409529
CLASS III, DIV 2	CLASS B, STYLE B	NONINCENDIVE	409529
NON-HAZARDOUS (UNCLASSIFIED)	CLASS B, STYLE B	NONINCENDIVE	409529
CLASS I, DIV 2, GRP A,B,C,D	CLASS A, STYLE D	NONINCENDIVE	409521
CLASS II, DIV 2, GRP F,G	CLASS A, STYLE D	NONINCENDIVE	409521
CLASS III, DIV 1	CLASS A, STYLE D	NONINCENDIVE	409521
CLASS III, DIV 2	CLASS A, STYLE D	NONINCENDIVE	409521
NON-HAZARDOUS (UNCLASSIFIED)	CLASS A, STYLE D	NONINCENDIVE	409521

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
411938		PM-5CX
411925		PM-5CXJ
408860		PM-5SXJ
409089		PM-5SX

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-5SX, PM5-SXJ
PM-5CX, PM-5CXJ

SIZE	CAGE CODE	NUMBER
C	05BU0	409665

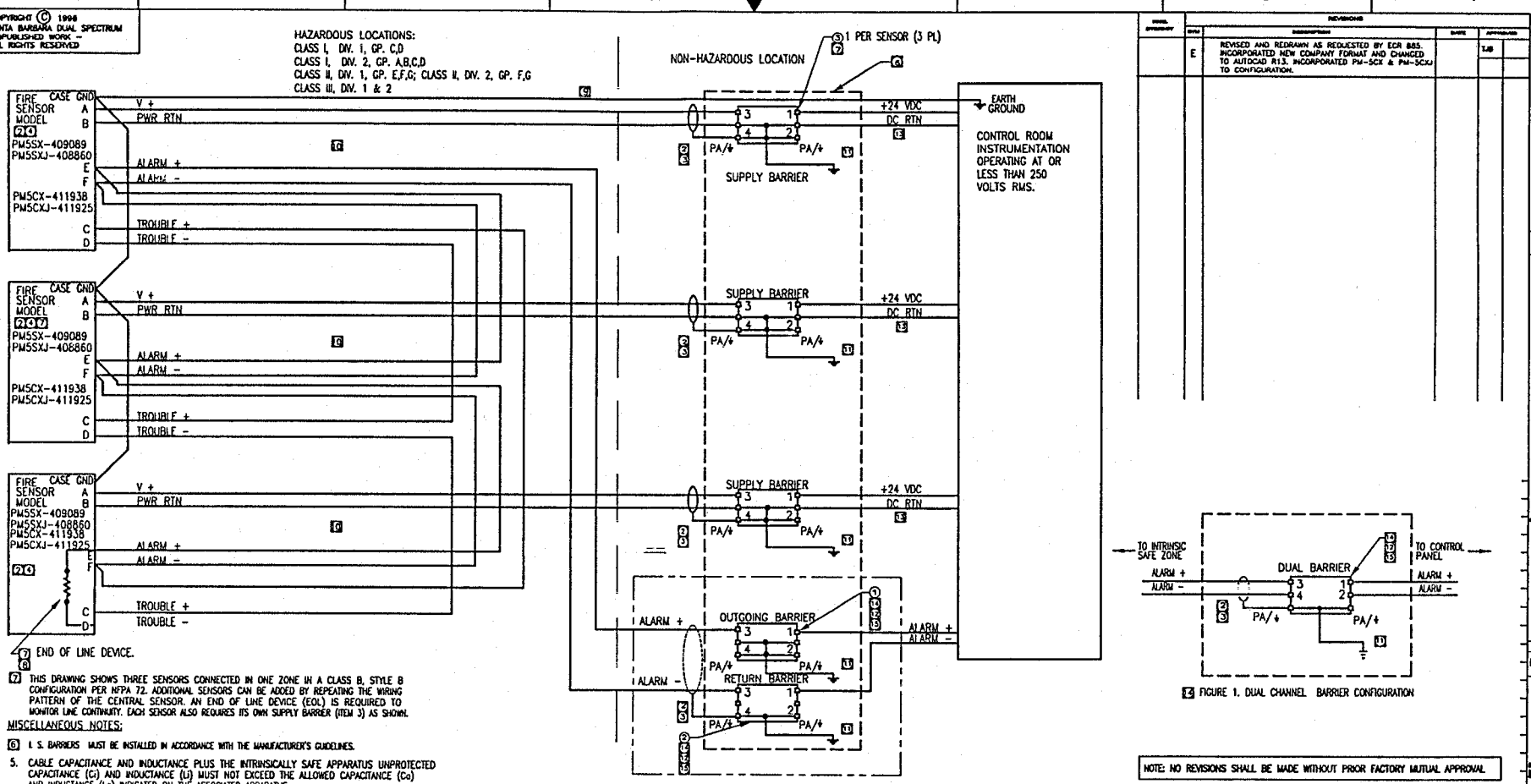
SCALE | SHEET

FSS-PPL

DWG NO 409665 REV A

FOLD

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



14 FIGURE 1. DUAL CHANNEL BARRIER CONFIGURATION

7 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:

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

5. CABLE CAPACITANCE AND INDUCTANCE PLUS THE INTRINSICALLY SAFE APPARATUS UNPROTECTED CAPACITANCE (Ci) AND INDUCTANCE (Li) MUST NOT EXCEED THE ALLOWED CAPACITANCE (Co) AND INDUCTANCE (Lo) INDICATED ON THE ASSOCIATED APPARATUS.

NOTES ON ASSOCIATED APPARATUS:

4 PM-5SX, PM-5CX HARNESS/JUNCTION BOX ADAPTER P/N 408917. PM-5SXJ, PM-5CXJ USES A BUILT IN JUNCTION BOX AND TERMINAL STRIP. ELECTRICAL CHARACTERISTICS ARE IDENTICAL.

5 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:

NOTICE: UNLESS OTHERWISE SPECIFIED

15 SEE SHEET 4 OF THIS DRAWING FOR ACCEPTABLE BARRIER PART NUMBERS.

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

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

13 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.

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

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

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

8 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			
	E	REVISED AND REDRAWN AS REQUESTED BY ECR 885. INCORPORATED NEW COMPANY FORMAT AND CHANGED TO AUTOCAD R13. INCORPORATED PM-5CX & PM-5CXJ TO CONFIGURATION.	

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

QTY REQD	ONE CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.
7	OGXYO	9004/01-240-050-00	SUPPLY BARRIER (STAHL ONLY)	3
1	OGXYO	13	RETURN BARRIER (STAHL ONLY)	2
1	OGXYO	15	OUTGOING BARRIER (STAHL ONLY)	1

LIST OF MATERIAL

PART NO.	NEXT ASSY	USED ON
		PM-5SXJ
		PM-5CX
		PM-5SXJ
		PM-5SX

APPLICATION

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

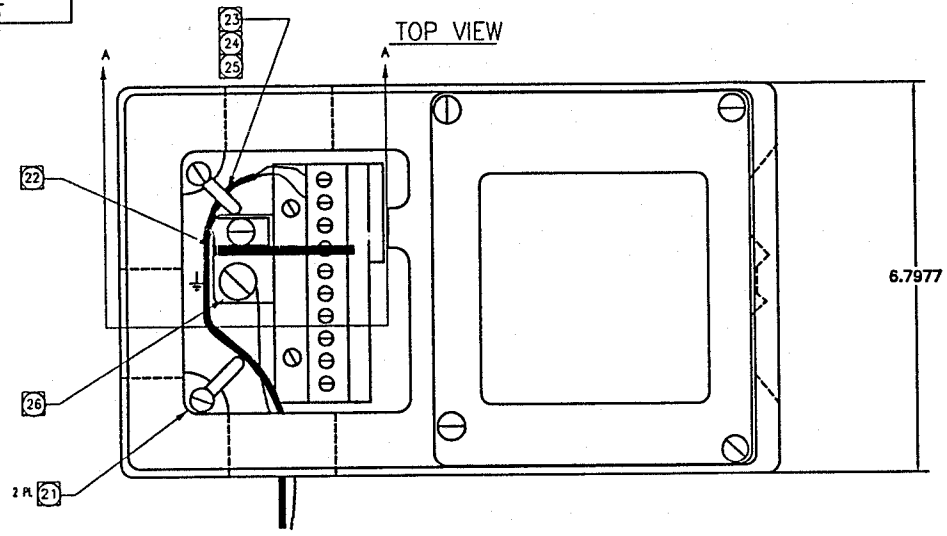
DRWN	R. MAYER	5/9/94
CHKD	JOHN WETZORK	6/1/94
ENGR	G. SIMPSON	5/1/94
APVD	S.E.HODGES	2JUN94
	D. R. LEDBETTER	3JUN94

CONTROL DRAWING
INTRINSICALLY SAFE CIRCUIT
FIRE SENSOR MODEL
PM-5SX, PM-5SXJ, PM-5CX, PM-5CXJ
CLASS B, STYLE B

SIZE D | CAGE CODE 05BU0 | DRAWING NO. 409459
SCALE —— | SHEET 1 OF 4

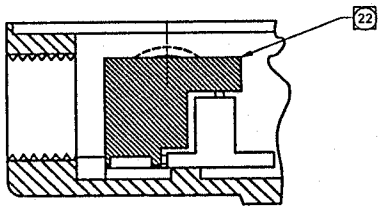
409459

FSS-PPL

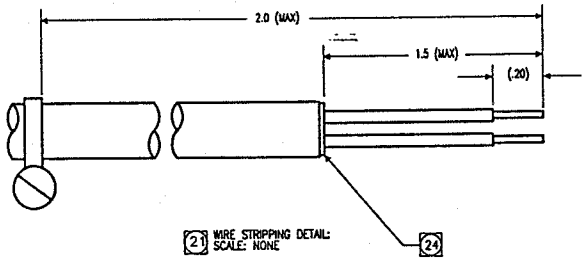


21 WIRE LIST

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



VIEW A-A



21 WIRE STRIPPING DETAIL:
SCALE: NONE

REVISIONS				
ZONE	DESCRIPTION	DATE	APPROVED	
E	SEE SHEET 1		TJB	

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.

NOTES: UNLESS OTHERWISE SPECIFIED.

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

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

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

LIST OF MATERIAL

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

PART NO.	NEXT ASSY	USED ON
APPLICATION		

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-5SX, PM-5SXJ, PM-5CX, PM-5CXJ
CLASS B, STYLE B

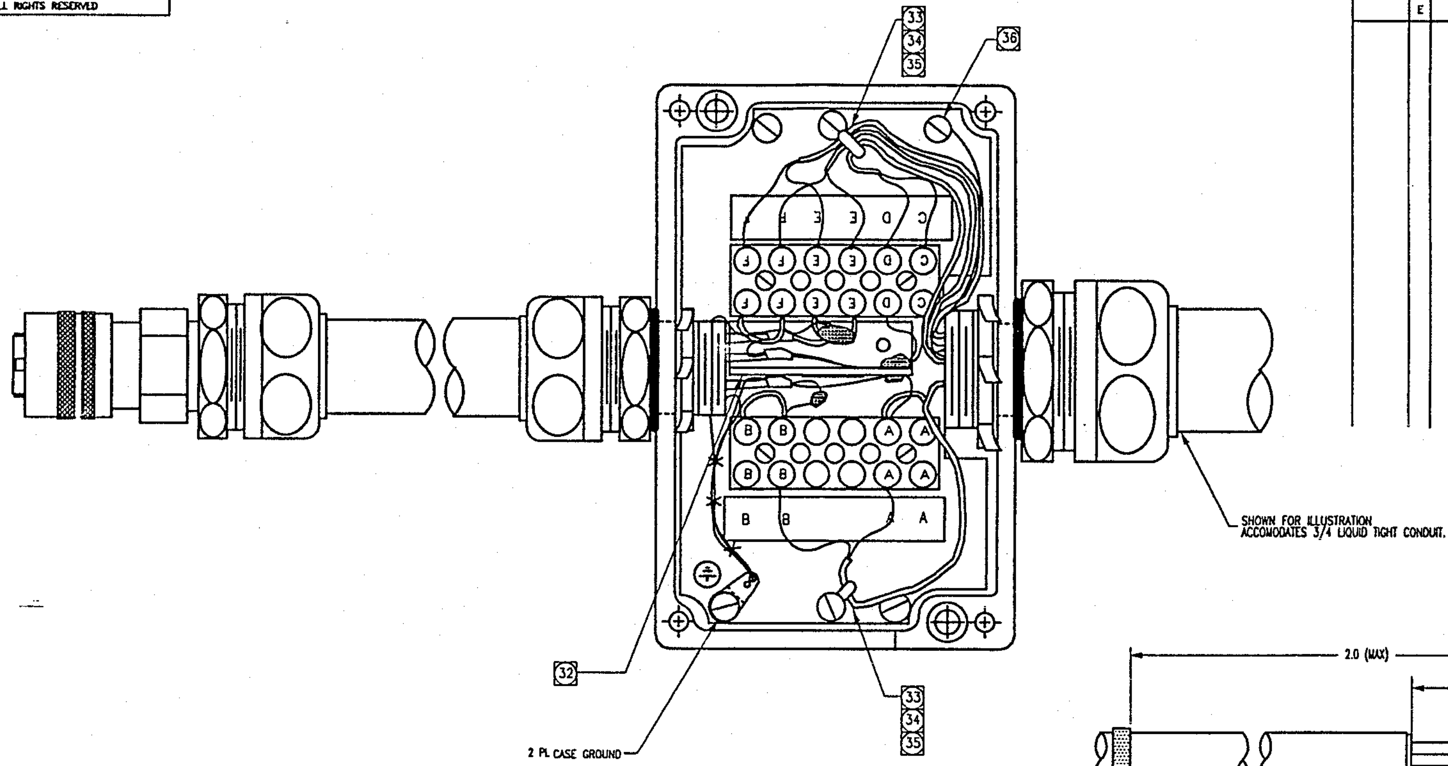
SIZE	SHEET NUMBER	REVISION
D	05BU0	409459

SCALE —
SHEET 2 OF 4

409459 E

FSS-PPL

SYM	DESCRIPTION	DATE	APPROVED
E	SEE SHEET 1		



COVER REMOVED FOR CLARITY

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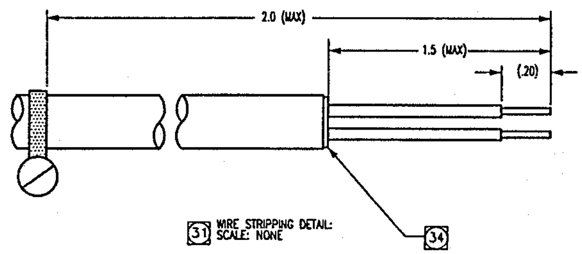

31 WIRE STRIPPING DETAIL:
SCALE: NONE

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

31 WIRE LIST

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

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

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

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

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

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

31 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.

NOTES: UNLESS OTHERWISE SPECIFIED.

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

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

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-5SX, PM-5SXJ, PM-5CX, PM-5CXJ
CLASS B, STYLE B

D | 05BU0 | 409459

SHEET 3 OF 4

FSS-PPL

REVISIONS

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	E	SEE SHEET 1		

COMBINATION	OUTGOING BARRIER	RETURN BARRIER	COMMENTS
#1	9001/01-280-075-10 (42)	9002/33-280-000-00 (43)	DUAL RETURN BARRIER
#2	9001/01-280-075-10 (42)	9001/00-066-270-10	
#3	9002/77-280-094-00 (44)	9002/77-280-094-00 (44)	DUAL CHANNEL BARRIER

(41) (45) TABLE I. BARRIER COMBINATION TABLE

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JUNE 13, 1996 ARE OBSOLETE.

(45) 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.

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

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

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

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

NOTES: UNLESS OTHERWISE SPECIFIED.

NOTE: NO REVISION 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
APPLICATION		

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

LIST OF MATERIAL

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

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-5SX, PM-5SXJ, PM-5CX, PM-5CXJ
CLASS B, STYLE B

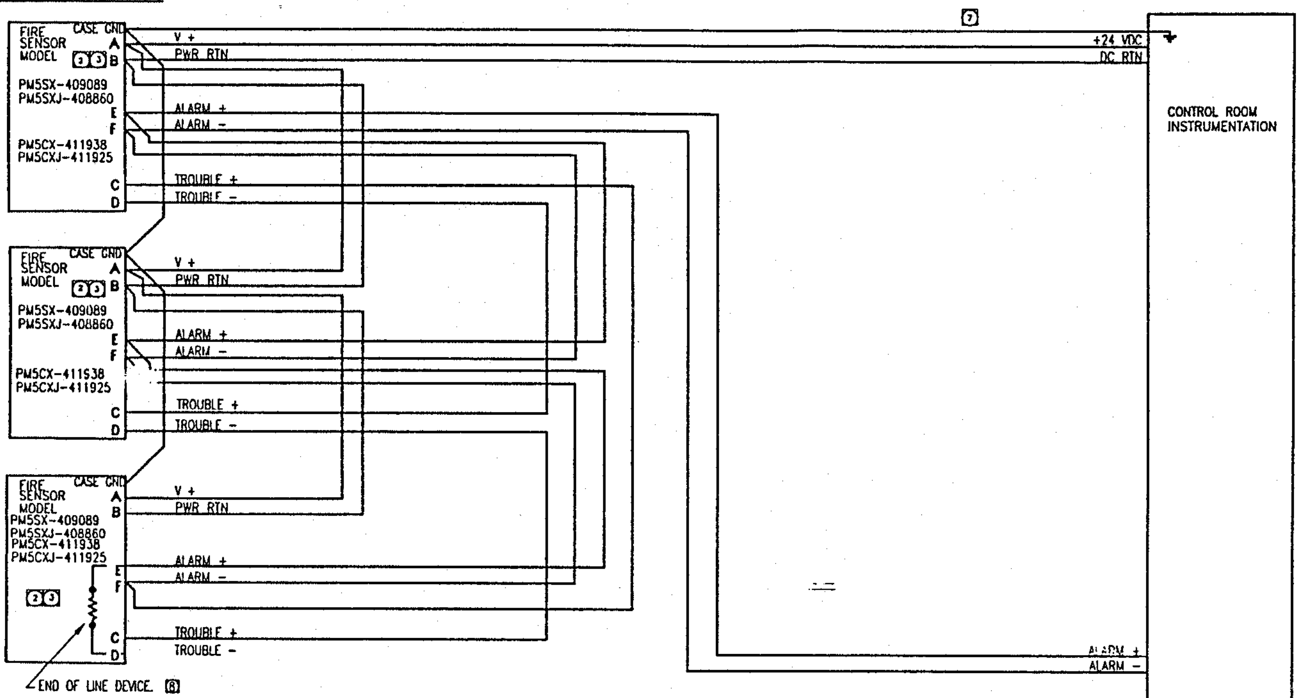
SIZE D CAGE CODE 05BU0 NUMBER 409459

SHEET 4 OF 4

FSS-PPL

409459 E

REV	DESCRIPTION	DATE	APPROVED
B	REVISED AND REDRAWN AS REQUESTED BY ECR 986. INCORPORATED NEW COMPANY FORMAT. ADDED PM-5CX AND PM-5CXJ TO CONFIGURATION. NOTE 2 WAS ..."BY PARALLELING ALARM OUTPUTS."		TJB



WARNING

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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–

8 AN END OF LINE DEVICE, AS REQUIRED BY THE FIRE ALARM CONTROL PANEL, IS USED TO MONITOR LINE CONTINUITY.

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

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

5. IMPORTANT:
FOR THE NON-INTRINSIC SAFE APPLICATION INDICATED BY THIS DRAWING AND THE SENSOR INDICATED: PM-5SXJ & PM-5CXJ --- REMOVE THE JUNCTION BOX PARTITION TO ALLOW FULL ACCESS TO THE TERMINAL BLOCK.

4. ELECTRICAL REQUIREMENT: 20 TO 28 VDC AND 40 MILLIAMPS (MAX) PER SENSOR.

3 PM-5SX & PM-5CX MAY USE HARNESS/JUNCTION BOX ADAPTER P/N 408917 OR DEUTSCH CONNECTOR P/N 81054-12-10PN. PM-5SXJ & PM-5CXJ USES A HOUSING WITH A BUILT IN JUNCTION BOX AND TERMINAL STRIP. ELECTRICAL CHARACTERISTICS ARE IDENTICAL.

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.

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.

PART NO.	NEXT ASSY	USED ON
		PM-5CXJ
		PM-5CX
		PM-5SXJ
		PM-5SX

APPLICATION

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

LIST OF MATERIAL

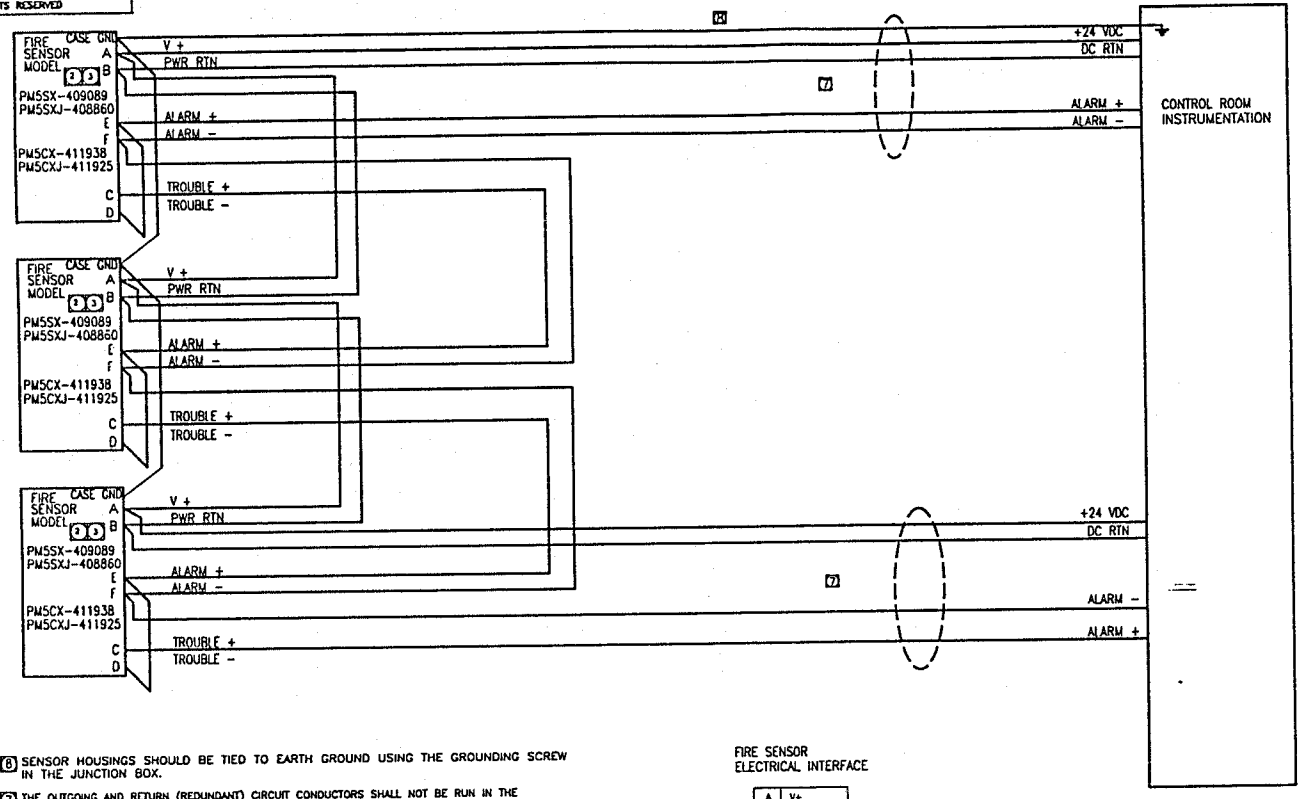
DUAL SPECTRUM® SENSING AND SUPPRESSION SYSTEMS
SANTA BARBARA DUAL SPECTRUM
A DIVISION OF KIDDE Technologies, Inc.

R. MAYER	6/1/94	CONTROL DRAWING
JOHN WETZORK	6/1/94	FIRE SENSOR MODEL
G. SIMPSON	6/1/94	PM-5SX, PM-5SXJ, PM-5CX, PM-5CXJ
S. E. HODGES	2JUN94	CLASS B, STYLE B
D. R. LEDBETTER	3JUN94	

D 05BU0 409529

FSS-PPL

409529 B



REVISIONS				
ZONE	DESCRIPTION	DATE	APPROVED	
B	REVISED AND REDRAWN AS REQUESTED BY ECR 940. INCORPORATED NEW COMPANY FORMAT. ADDED PM-5CX AND PM-5CXJ TO CONFIGURATION. NOTE 2 WAS ..."BY PARALLELING ALARM OUTPUTS."		TJB	

WARNING

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

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

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

5. IMPORTANT:
FOR THE NON-INTRINSIC SAFE APPLICATION INDICATED BY THIS DRAWING AND THE SENSOR INDICATED: PM-5SXJ & PM-5CXJ --- REMOVE THE JUNCTION BOX PARTITION TO ALLOW FULL ACCESS TO THE TERMINAL BLOCK.

4. ELECTRICAL REQUIREMENT: 20 TO 28VDC AND 40 MILLIAMPS (MAX) PER SENSOR.

[3] PM-5SX & PM-5CX MAY USE HARNESS/JUNCTION BOX ADAPTER P/N 408917 OR DEUTSCH CONNECTOR P/N BTC 6-12-10PN. PM-5SXJ & PM-5CXJ USES A HOUSING WITH A BUILT IN JUNCTION BOX AND TERMINAL STRIP. ELECTRICAL CHARACTERISTICS ARE IDENTICAL.

[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.

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-5CXJ
		PM-5CX
		PM-5SXJ
		PM-5SX

APPLICATION

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

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

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

DRAWN	R. MAYER	5/24/94
CHECKED	JOHN WETZORK	6/1/94
ENGR APPR.	G. SIMPSON	6/1/94
MFG APPR.	S. E. HODGES	2JUN94
QUALITY APPR.	D. R. LEDBETTER	3JUN94

CONTROL DRAWING
FIRE SENSOR MODEL
PM-5SX, PM-5SXJ, PM-5CX, PM-5CXJ
CLASS A, STYLE D

SIZE	CAGE CODE	DRAWING NO.
D	05BU0	409521

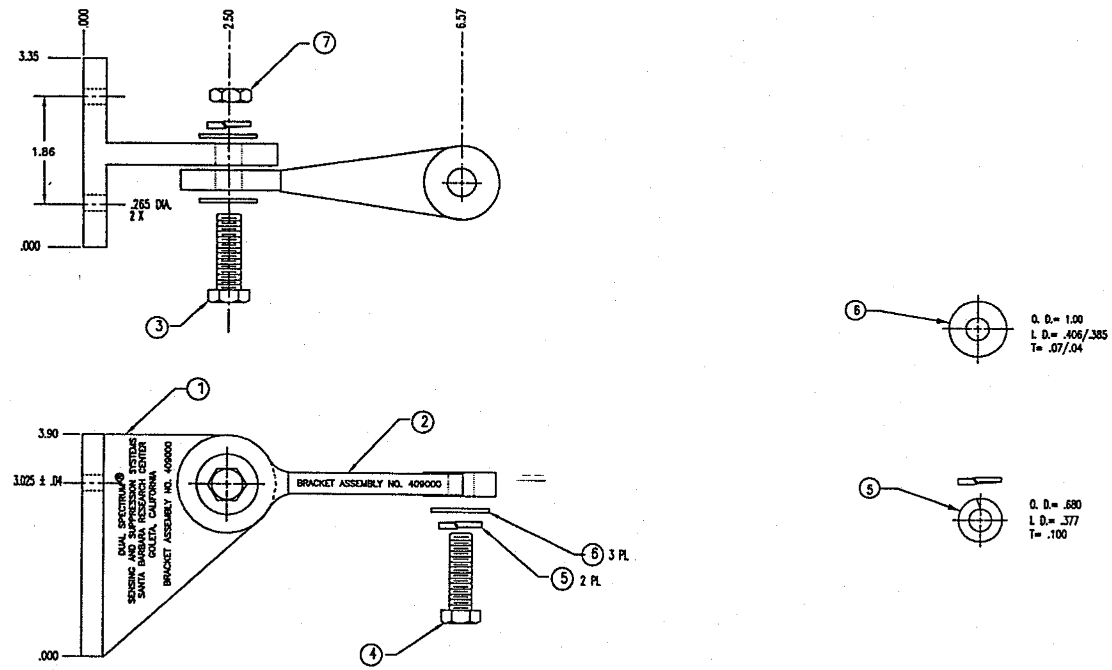
SCALE: NONE SHEET 1

409521 B

FSS-PPL

REVISIONS

SYM	DESCRIPTION	DATE	APPROVED	
A	IS: I.D.=.406/.385, T=.07/.04, ITEM NO. 3=1 3/8 LONG; WAS: ID=.406, T=.08, ITEM NO. 3=1 1/2 LONG; DELETE–ITEM NO. 9&6 "SEASTROM OR EQUIV"; SHOW VERBAGE ON BRACKET ASSY. ECR # 863	94-08-29	CRK / AH	SEH / CSC
B	REVISED AND REDRAWN AS REQUESTED BY ECRXXX. INCORPORATED NEW COMPANY FORMAT.		TJB	



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COPIES ISSUED PRIOR TO
APRIL 4, 1996 ARE OBSOLETE.

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

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

PART NO.	NEXT ASSY	USED ON
408858		PM6
408860		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.

DRN	G.R.HEMPEL	3/11/94
CHK	H.SEGAL	4/4/94
APPD	S.E.HODGES	4/5/94
APPD	D.R.LEDBETTER	4/5/94

BRACKET ASSEMBLY

SIZE D | CAGE CODE 05BU0 | NUMBER 409000 | REV B

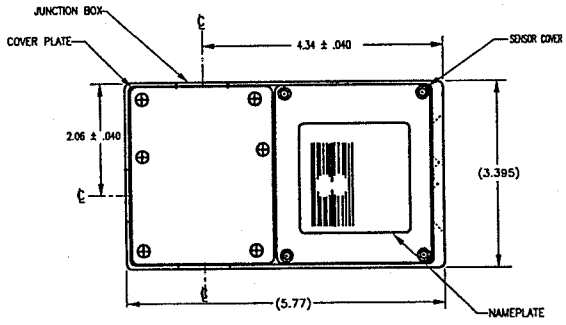
SCALE | SHEET

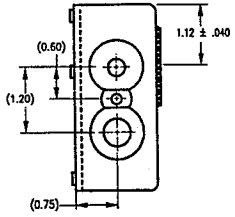
1. INTERPRET DRAWING PER DOD-STD-100

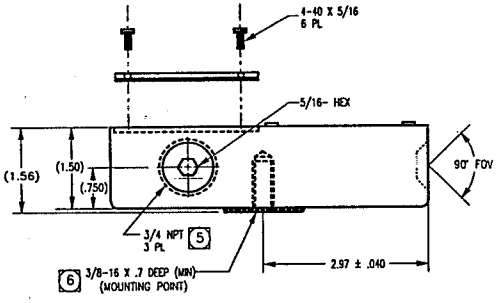
NOTES: UNLESS OTHERWISE SPECIFIED.

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

FSS–PPL

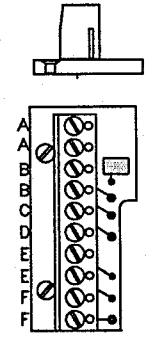






2 FIRE SENSOR
3 ELECTRICAL INTERFACE
P/N-409535

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 2 3
SCALE: NONE

REVISIONS				
SERIAL EFFECTIVITY	SYM	DESCRIPTION	DATE	APPROVED

6 MOUNT SENSOR ONLY AT MOUNTING POINT.

5 APPLY TWO TURNS 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 411924.

3 SEE TABULATION AND DETAIL A FOR ELECTRICAL INTERFACE.

2 INDICATED PART NUMBER IS A TERMINAL BLOCK INTERCONNECTION BOARD ASSEMBLY P/N 409535.

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.

INTERFACE CONTROL DRAWING

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

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

PART NO.	NEXT ASSY	USED ON
		PM-5CXJ
APPLICATION		

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

T. BRIDGER

FIRE SENSOR
PM-5CXJ

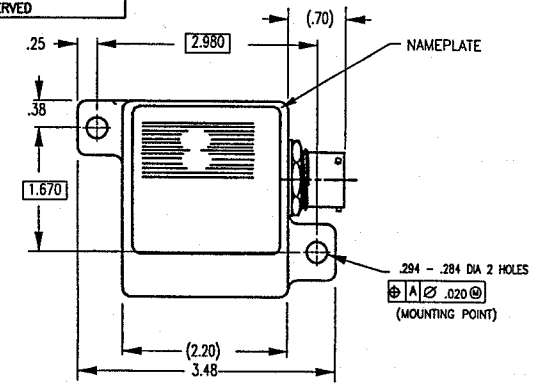
SIZE	CAGE CODE	NUMBER
D	05BU0	411925

SCALE | SHEET

411925

23

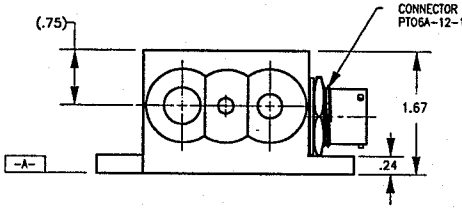
REVISIONS				
MODEL EFFECTIVITY	SYM	DESCRIPTION	DATE	APPROVED

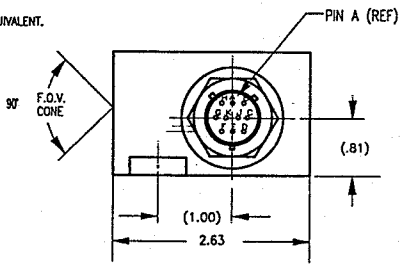


FIRE SENSOR
ELECTRICAL INTERFACE

[2] CONNECTOR
P/N-81054-12-10PN

A	V+
B	POWER_RETURN
C	TROUBLE +
D	TROUBLE –
E	ALARM +
F	ALARM –
G	CASE GROUND
H	SPARE
J	SPARE
K	SPARE





INTERFACE CONTROL DRAWING

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

3. PERFORMANCE RATINGS:
PERFORMANCE RATINGS ARE DEFINED IN SBDS DOCUMENT 411924.

[2] CONNECTOR IS A PT07C-12-10P TYPE WITH INTERNAL EMI PROTECTION.

1. INTERPRET DRAWING PER ANSI Y14.5

NOTES: UNLESS OTHERWISE SPECIFIED

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

PART NO.	NEXT ASSY	USED ON
		PM-5CX
APPLICATION		

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

.XX	XXX	ANGLES
± .04	± .010	± 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.

PREP	V.MARIN	4/30/96
CHKR		
APVD		
APVD		

FIRE SENSOR
PM-5CX

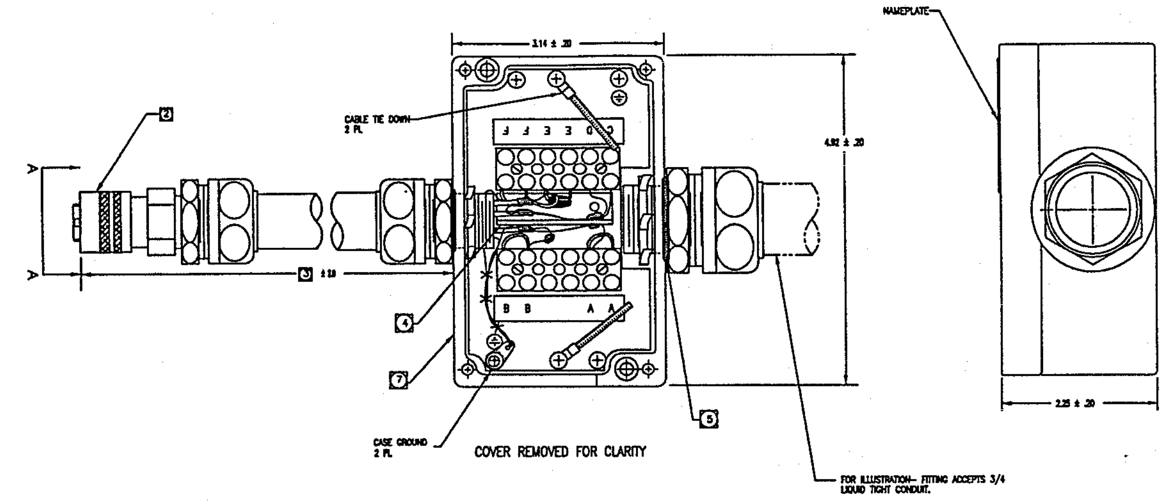
SIZE	CAGE CODE	NUMBER
C	05BU0	411938

SCALE | SHEET

DWG NO 411938

FOLD

	REVISIONS			
USED ON	SYM	DESCRIPTION	DATE	APPROVED
FIRST USE	A	REPLACES INITIAL RELEASE WITH CHANGE AS REQUESTED ECR 895, CHANGES TO EXTENSIVE TO LIST. FOR "WAS" CONDITION SEE PREVIOUS COPY RETAINED IN EDOC. THIS IS AVAILABLE ON DEMAND THROUGH MICROFILM AND CHANGE RECORD.	94/06/28	
	B	REVISED AND REDRAWN AS REQUESTED BY ECR XXX. INCORPORATED NEW COMPANY FORMAT.		



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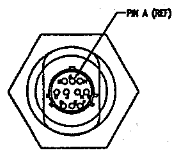


VIEW A–A
SCALE : NONE

HARNESS ELECTRICAL INTERFACE

TERMINAL A	DUAL	POWER +24 VDC
TERMINAL B	DUAL	POWER RETURN
TERMINAL C	SINGLE	TROUBLE +
TERMINAL D	SINGLE	TROUBLE –
TERMINAL E	DUAL	ALARM +
TERMINAL F	DUAL	ALARM –

3 TABULATION

PART NUMBER	LENGTH (INCHES)
408917–1	12
–2	24
–3	36
–4	48
–5	60
–6	72

INTERFACE CONTROL DRAWING

8 MOUNTING HARDWARE NOT SHOWN.

7 AFTER WIRING INSTALL COVER AND GASKET WITH PROVIDED SCREWS.

6. ENCLOSURE UL LISTED, FILE NO. E66473, NEMA 4X.

5 O–RING SHALL BE INSTALLED FOR DUST TIGHT SEAL.

4 PARTITION SHALL BE INSTALLED FOR INTRINSICALLY SAFE CIRCUITS. SUBSTITUTION OF COMPONENTS IN JUNCTION BOX MAY IMPAIR INTRINSIC SAFETY.

3 SEE TABULATION FOR HARNESS LENGTH AND PART NUMBER.

2 CONNECTOR TO MATE WITH FIRE SENSOR MODEL PM–5SX (409059).

1. INTERPRET DRAWING PER ANSI Y14.5

CAD PREPARED DRAWING USING AUTOCAD R13
NOT TO BE MANUALLY ALTERED

8	1	10052033–00	MOUNTING HARDWARE (ROSE)	1

LIST OF MATERIAL

BSC		PM–5SX
PART NO.	NEXT ASSY	USED ON

APPLICATION

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

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

R. MAYER	5/24/94
JOHN WETZORK	6/1/94
R. MYERS	6/2/94
S.E. HODGES	2 JUN 94
D.R. LEDBETTER	3 JUN 94

ADAPTER HARNESS WITH JUNCTION BOX
PM–5SX

F 05BU0 408917

SCALE NONE

408917

REVISIONS				
MODEL EFFECTIVITY	SYM	DESCRIPTION	DATE	APPROVED
	A	REVISED AND REDRAWN AS REQUESTED BY ECR 943. INCORPORATED NEW COMPANY FORMAT. ADDED PM-5CX, PM-5CXJ TO CONFIGURATION.		TJB

TABULATION

PM-5SX/SXJ AND PM-5CX/CXJ CONTROL DRAWING CONFIGURATION

HAZARDOUS (CLASSIFIED) LOCATION	NFPA 72 INITIATING DEVICE CIRCUIT, CLASS & STYLE	INSTALLATION TYPE	CONTROL DWG NO.
CLASS I, DIV 1, GRP C,D	CLASS B, STYLE B	INTRINSICALLY SAFE	409459
CLASS II, DIV 1, GRP E,F,G	CLASS B, STYLE B	INTRINSICALLY SAFE	409459
CLASS I, DIV 2, GRP A,B,C,D	CLASS B, STYLE B	INTRINSICALLY SAFE	409459
CLASS II, DIV 2, GRP F,G	CLASS B, STYLE B	INTRINSICALLY SAFE	409459
CLASS III, DIV 1	CLASS B, STYLE B	INTRINSICALLY SAFE	409459
CLASS III, DIV 2	CLASS B, STYLE B	INTRINSICALLY SAFE	409459
CLASS I, DIV 2, GRP A,B,C,D	CLASS B, STYLE B	NONINCENDIVE	409529
CLASS II, DIV 2, GRP F,G	CLASS B, STYLE B	NONINCENDIVE	409529
CLASS III, DIV 1	CLASS B, STYLE B	NONINCENDIVE	409529
CLASS III, DIV 2	CLASS B, STYLE B	NONINCENDIVE	409529
NON-HAZARDOUS (UNCLASSIFIED)	CLASS B, STYLE B	NONINCENDIVE	409529
CLASS I, DIV 2, GRP A,B,C,D	CLASS A, STYLE D	NONINCENDIVE	409521
CLASS II, DIV 2, GRP F,G	CLASS A, STYLE D	NONINCENDIVE	409521
CLASS III, DIV 1	CLASS A, STYLE D	NONINCENDIVE	409521
CLASS III, DIV 2	CLASS A, STYLE D	NONINCENDIVE	409521
NON-HAZARDOUS (UNCLASSIFIED)	CLASS A, STYLE D	NONINCENDIVE	409521

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
411938		PM-5CX
411925		PM-5CXJ
408860		PM-5SXJ
409089		PM-5SX

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	9/15/94
APVD	S. E. HODGES	15SEPT94
	D. R. LEDBETTER	16SEPT94

FIRE SENSOR
CONTROL DRAWING CONFIGURATION
PM-5SX, PM5-SXJ
PM-5CX, PM-5CXJ

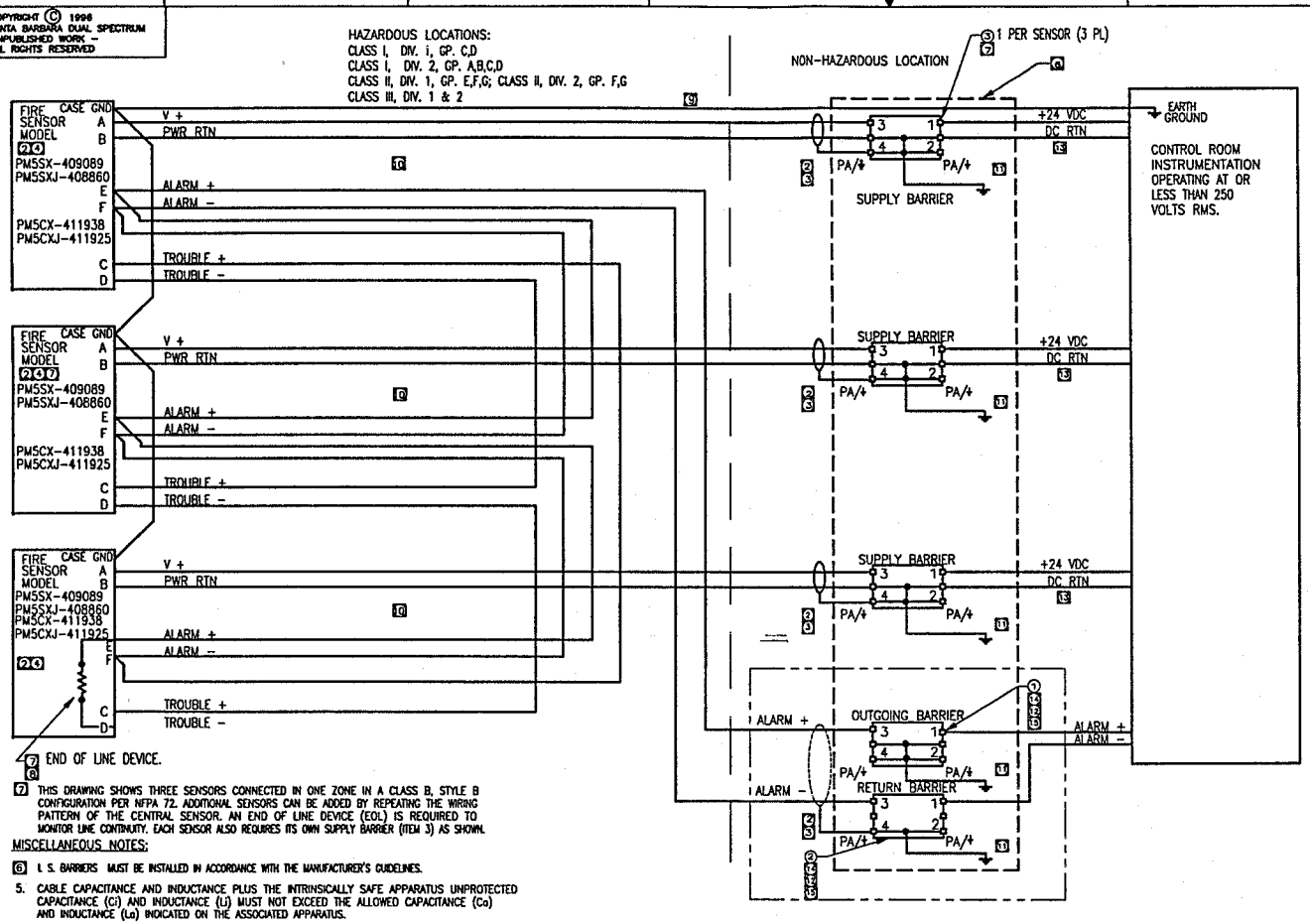
SIZE	CAGE CODE	NUMBER
C	05BU0	409665

SCALE | SHEET

FSS-PPL

FOLD

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



7 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:

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

5. CABLE CAPACITANCE AND INDUCTANCE PLUS THE INTRINSICALLY SAFE APPARATUS UNPROTECTED CAPACITANCE (Ci) AND INDUCTANCE (Li) MUST NOT EXCEED THE ALLOWED CAPACITANCE (Co) AND INDUCTANCE (Lo) INDICATED ON THE ASSOCIATED APPARATUS.

NOTES ON ASSOCIATED APPARATUS:

4 PM-5SX, PM-5CX HARNESS/JUNCTION BOX ADAPTER P/N 408917. PM-5SXJ, PM-5CXJ USES A BUILT IN JUNCTION BOX AND TERMINAL STRIP. ELECTRICAL CHARACTERISTICS ARE IDENTICAL.

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.

15 SEE SHEET 4 OF THIS DRAWING FOR ACCEPTABLE BARRIER PART NUMBERS.

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

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

12 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.

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

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

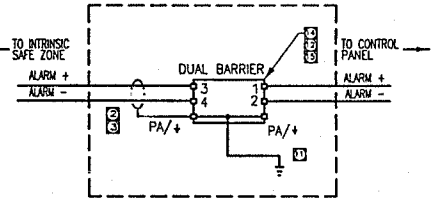
9 SENSOR HOUSINGS SHOULD BE TIED TO EARTH GROUND USING THE GROUNDING SCREW IN THE JUNCTION BOX.

8 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.

PART NO.	NEXT ASSY	USED ON
		PM-5SXJ
		PM-5CX
		PM-5SXJ
		PM-5SX

APPLICATION



12 FIGURE 1. DUAL CHANNEL BARRIER CONFIGURATION

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

ITEM NO.	QTY REQD	DGE CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
3	1	DGXY0	9004/01-280-050-00	SUPPLY BARRIER (STAHL ONLY)
2	1	DGXY0	13	RETURN BARRIER (STAHL ONLY)
1	1	DGXY0	13	OUTGOING BARRIER (STAHL ONLY)

LIST OF MATERIAL

REVISIONS				
SYM	DESCRIPTION	DATE	APPROVED	
E	REVISED AND REDRAWN AS REQUESTED BY ECR 885. INCORPORATED NEW COMPANY FORMAT AND CHANGED TO AUTOCAD R13. INCORPORATED PM-5CX & PM-5CXJ TO CONFIGURATION.		TJB	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND PER ANSI Y14.5M – 1982
XX ± .03 XXX ± .010 ANGLES ± 1°
MATERIAL

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

DRAWN	R. MAYER	5/9/94
ENGR	JOHN WETZORK	6/1/94
APVD	G. SIMPSON	6/1/94
QA	S.E.HODGES	2JUN94
	D. R. LEDBETTER	3JUN94

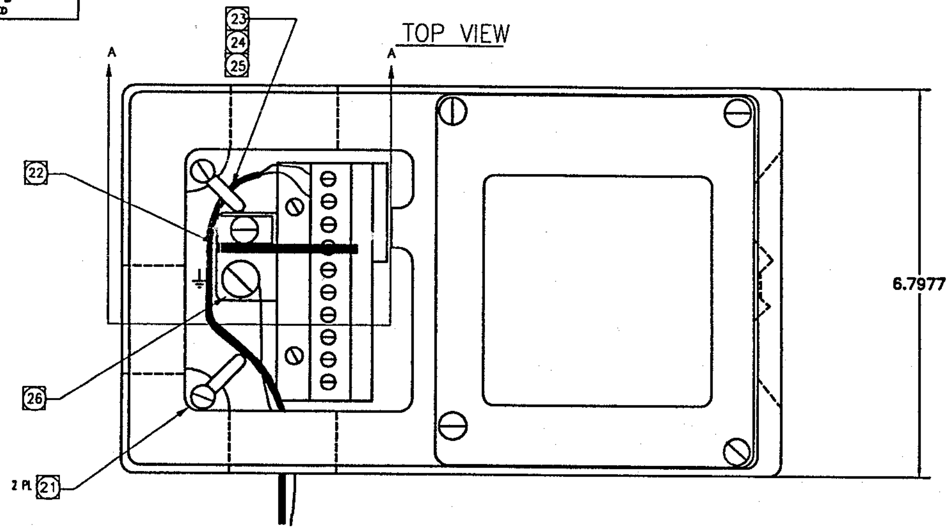
CONTROL DRAWING
INTRINSICALLY SAFE CIRCUIT
FIRE SENSOR MODEL
PM-5SX, PM-5SXJ, PM-5CX, PM-5CXJ
CLASS B, STYLE B

SIZE D | CAGE CODE 05BU0 | NUMBER 409459
SCALE —— SHEET 1 OF 4

409459

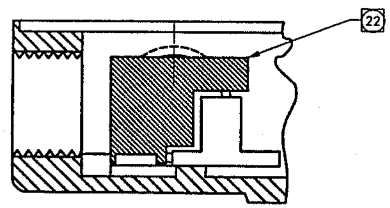
FSS-PPL

TOP VIEW

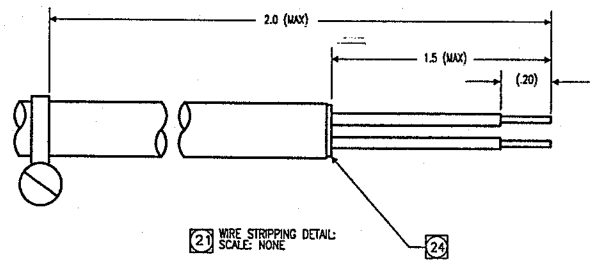


21 WIRE LIST

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



VIEW A–A



21 WIRE STRIPPING DETAIL:
SCALE: NONE

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.

NOTES: UNLESS OTHERWISE SPECIFIED.

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

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

REVISIONS: E — SEE SHEET 1

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

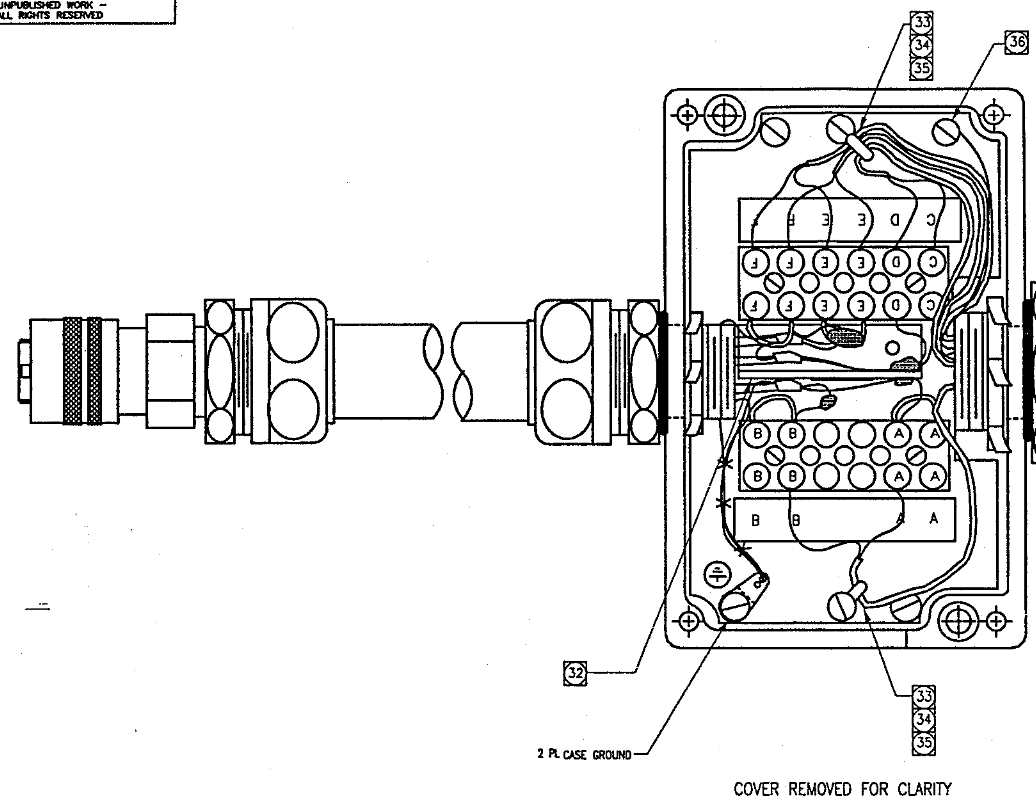
DUAL SPECTRUM® SENSING AND SUPPRESSION SYSTEMS — SANTA BARBARA DUAL SPECTRUM, A DIVISION OF KIDDE Technologies, Inc.

CONTROL DRAWING
INTRINSICALLY SAFE CIRCUIT
FIRE SENSOR MODEL
PM-5SX, PM-5SXJ, PM-5CX, PM-5CXJ
CLASS B, STYLE B

D 05BU0 409459

SHEET 2 OF 4

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
E	SEE SHEET 1		



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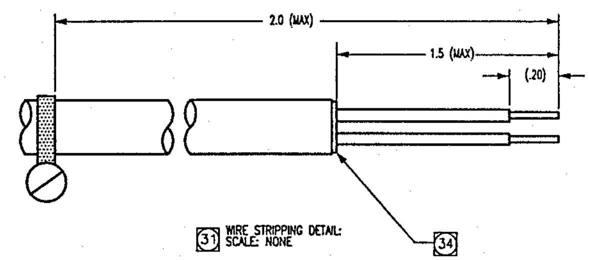
SHOWN FOR ILLUSTRATION
ACCOMODATES 3/4 LIQUID TIGHT CONDUIT.



31 WIRE STRIPPING DETAIL:
SCALE: NONE

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

31 WIRE LIST

NODE	TERMINAL	DESCRIPTION
A	DUAL	V+
A	DUAL	V+
B	DUAL	POWER_RTN
B	DUAL	POWER_RTN
C	SINGLE	TROUBLE +
D	SINGLE	TROUBLE −
E	DUAL	ALARM+
E	DUAL	ALARM+
F	DUAL	ALARM−
F	DUAL	ALARM−

NOTES: UNLESS OTHERWISE SPECIFIED.

31 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.

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

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

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

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

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

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

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

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-5SX, PM-5SXJ, PM-5CX, PM-5CXJ
CLASS B, STYLE B

SIZE D | CAGE CODE 05BU0 | NUMBER 409459
SHEET 3 OF 4

FSS-PPL

409459

REVISIONS				
ZONE	DESCRIPTION	DATE	APPROVED	
E	SEE SHEET 1		TJB	

COMBINATION	OUTGOING BARRIER	RETURN BARRIER	COMMENTS
#1	9001/01-280-075-10 (42)	9002/33-280-000-00 (43)	DUAL RETURN BARRIER
#2	9001/01-280-075-10 (42)	9001/00-086-270-10	
#3	9002/77-280-094-00 (44)	9002/77-280-094-00 (44)	DUAL CHANNEL BARRIER

(41) (45) TABLE I. BARRIER COMBINATION TABLE

WARNING

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(45) 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.

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

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

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

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

NOTES: UNLESS OTHERWISE SPECIFIED.

CAD PREPARED DRAWING USING AUTOCAD R13
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QTY REQD	CAGE CODE	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	ITEM NO.

LIST OF MATERIAL

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

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

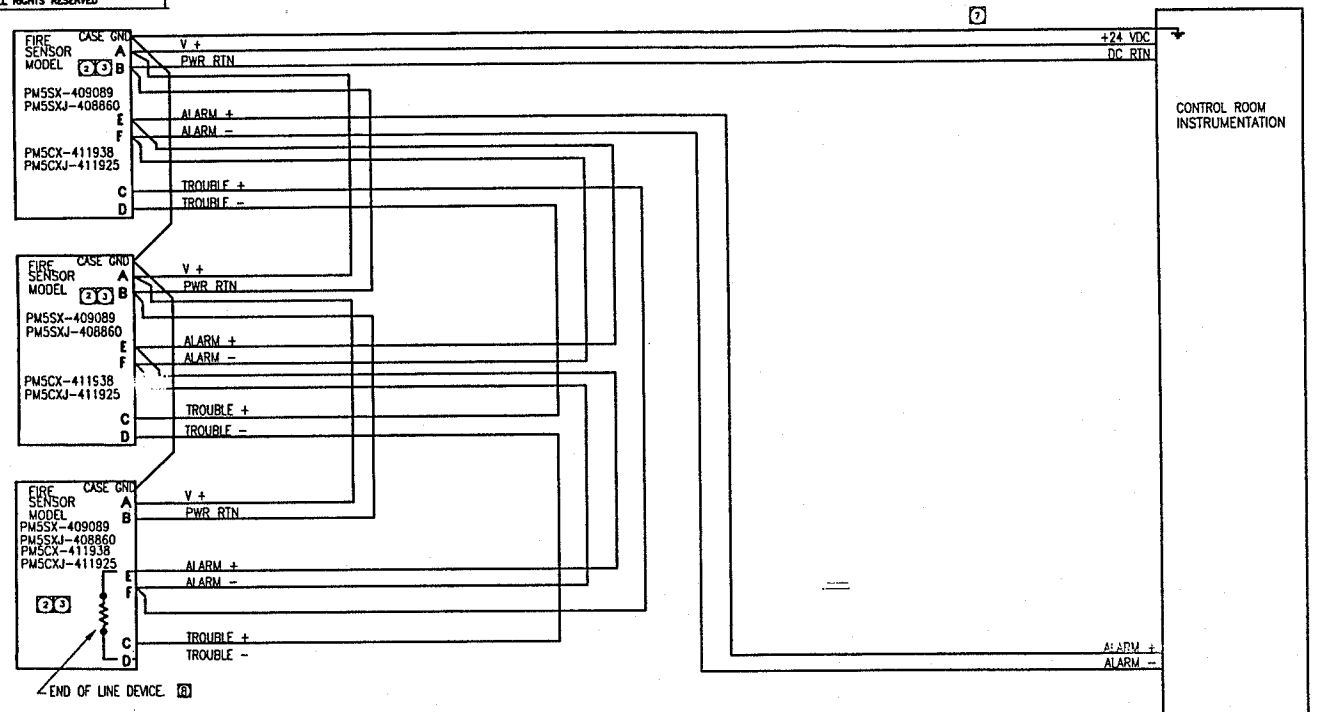
CONTROL DRAWING
INTRINSICALLY SAFE CIRCUIT
FIRE SENSOR MODEL
PM-5SX, PM-5SXJ, PM-5CX, PM-5CXJ
CLASS B, STYLE B

SIZE	CAGE CODE	NUMBER
D	05BU0	409459

SCALE —— SHEET 4 OF 4

FSS-PPL

409459 E



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

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

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

5. IMPORTANT:
FOR THE NON-INTRINSIC SAFE APPLICATION INDICATED BY THIS DRAWING AND THE SENSOR INDICATED: PM-5SXJ & PM-5CXJ ---- REMOVE THE JUNCTION BOX PARTITION TO ALLOW FULL ACCESS TO THE TERMINAL BLOCK.

4. ELECTRICAL REQUIREMENT: 20 TO 28 VDC AND 40 MILLIAMPS (MAX) PER SENSOR.

[3] PM-5SX & PM-5CX MAY USE HARNESS/JUNCTION BOX ADAPTER P/N 408917 OR DEUTSCH CONNECTOR P/N 81054-12-10PN. PM-5SXJ & PM-5CXJ USES A HOUSING WITH A BUILT IN JUNCTION BOX AND TERMINAL STRIP. ELECTRICAL CHARACTERISTICS ARE IDENTICAL.

[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.

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-5CXJ
		PM-5CX
		PM-5SXJ
		PM-5SX

APPLICATION

REVISIONS			
SYM	DESCRIPTION	DATE	APPROVED
B	REVISED AND REDRAWN AS REQUESTED BY ECR 986. INCORPORATED NEW COMPANY FORMAT. ADDED PM-5CX AND PM-5CXJ TO CONFIGURATION. NOTE 2 WAS ....."BY PARALLELING ALARM OUTPUTS."		TJB

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LIST OF MATERIAL

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

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.

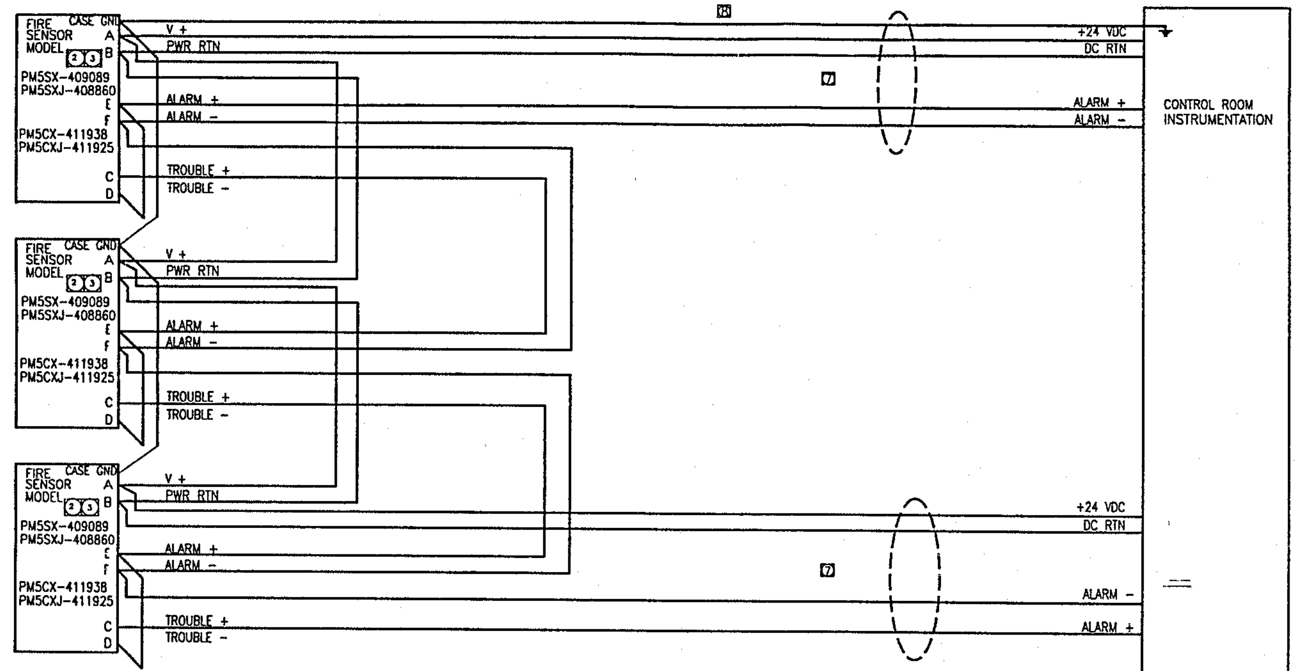
DRAWN	R. MAYER	6/1/94
CHECKED	JOHN WETZORK	6/1/94
ENGR	G. SIMPSON	6/1/94
MFG	S. E. HODGES	2JUN94
APPD	D. R. LEDBETTER	3JUN94

CONTROL DRAWING
FIRE SENSOR MODEL
PM-5SX, PM-5SXJ, PM-5CX, PM-5CXJ
CLASS B, STYLE B

SIZE D | CAGE CODE 05BU0 | DRAWING NO. 409529
SCALE —— | SHEET

409529 B

FSS-PPL



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

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

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

5. IMPORTANT:
FOR THE NON-INTRINSIC SAFE APPLICATION INDICATED BY THIS DRAWING AND THE SENSOR INDICATED:
PM-5SXJ & PM-5CXJ --- REMOVE THE JUNCTION BOX PARTITION TO ALLOW FULL ACCESS TO THE TERMINAL BLOCK.

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

3 PM-5SX & PM-5CX MAY USE HARNESS/JUNCTION BOX ADAPTER P/N 408917 OR DEUTSCH CONNECTOR P/N 81[illegible]4-12-10PN. PM-5SXJ & PM-5CXJ USES A HOUSING WITH A BUILT IN JUNCTION BOX AND TERMINAL STRIP. ELECTRICAL CHARACTERISTICS ARE IDENTICAL.

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.

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–

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

REVISIONS

ZONE	SYM	DESCRIPTION	DATE	APPROVED
	B	REVISED AND REDRAWN AS REQUESTED BY ECR 940. INCORPORATED NEW COMPANY FORMAT. ADDED PM-5CX AND PM-5CXJ TO CONFIGURATION. NOTE 2 WAS ..."BY PARALLELING ALARM OUTPUTS."		TJB

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PART NO.	NEXT ASSY	USED ON
		PM-5CXJ
		PM-5CX
		PM-5SXJ
		PM-5SX

APPLICATION

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

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.

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

CONTROL DRAWING
FIRE SENSOR MODEL
PM-5SX, PM-5SXJ, PM-5CX, PM-5CXJ
CLASS A, STYLE D

SIZE D | CAGE CODE 05BU0 | DRAWING NO. 409521

409521 B

FSS-PPL