

APPENDIX E

NOTE: All areas indicated in field notes are not required to be addressed during each inspection

INDUSTRIAL/ACADEMIC/RESEARCH INSPECTION FIELD NOTES

Region _____

Inspection Report No. 95-001

License No. 20-15285-01
80-15285-03E

Licensee (Name & Address):
Kidde-Fenwal, Inc
400 MAIN Street
Ashtand, MASS 01721

Docket No. 030-08864
030-32498

Licensee Contact John Ronayne, RSO

Telephone No. _____

Last Amendment No. 02
02

Date of Amendment 8/4/94
11/2/92

Priority: E3
E5
Program Code 3024
3265

Date of Last Inspection 06 25 92
Date of This Inspection 06 08 95

Type of Inspection: () Announced () Unannounced
() Routine () Special
() Initial () Reinspection

Next Inspection Date 06 2000 () Normal () Reduced () Extended

Summary of Findings and Action:
() No violations cited, Clear 591 issued
() Violation(s), 591 issued
() Violation(s), Regional letter issued
() Followup on Previous Violations

Were non-cited violations identified during this inspection? () Y () N

Was proprietary information reviewed by or received by the inspector? () Y () N

Inspector: Jess Hall Duda
(Signature)

Date 6/8/95

Approved: M. Stankaly

Date 7/14/95

Issue Date: XX/XX/XX
(RI rec'd 03/10/94)

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(Signature)

1. INSPECTION HISTORY

() N/A - Initial inspection

- A. Violations were identified during any of the last two inspections or two years, whichever is longer () Y () N
- B. Response letter(s) or 591(s) dated _____
- C. Open violations from previous inspections:

<u>Requirement</u>	<u>Violation</u>	<u>Corrective Action Taken (Y/N)</u>	<u>Status</u> <u>Open/Closed</u>

D. Explain any previous violation(s) not corrected or repeated () N/A

2. ORGANIZATION AND SCOPE OF PROGRAM

A. Organizational Structure

*Smoke detector manufactured
4 people work with R&D
H&C*

- + Individuals contacted during inspection
- * Individuals present at exit meeting

- 1. Meets license requirements [L/C] () Y () N
- 2. Multiple authorized locations of use and/or laboratories
If yes, may use ATTACHMENT A as a guide for location(s) or lab(s) inspected and note lab numbers where violations are found. () Y () N
- 3. Briefly describe scope of activities, including types and quantities of use involving byproduct material, frequency of use, staff size, etc. () N/A

** John Ronayne RSH
* Robert A Mc Nutt*

Sources fabricated by Dupont/Berk & NED are placed into detectors by one of three designated individuals & products

B. Radiation Safety Committee required [L/C] NA () Y () N

- 1. RSC fulfills license requirements [L/C] () Y () N
- 2. Records maintained [L/C] () Y () N

C. Radiation Safety Officer

- 1. Authorized on license [L/C] (✓) Y () N
- 2. Fulfills duties as RSO (✓) Y () N

- D. Use by authorized individuals [L/C] (✓) Y () N

Remarks:

3. TRAINING, RETRAINING, AND INSTRUCTIONS TO WORKERS

- A. Instructions to workers/students per [10 CFR 19.12] (✓) Y () N
- B. Training program required [L/C] () Y (✓) N

1. If so, briefly describe training program:

- 2. Training program implemented (✓) Y () N
- 3. Periodic training program required () Y (✓) N
- 4. Periodic training program implemented *Annually* (✓) Y () N
- 5. Records maintained () Y (✓) N

- C. Individuals understanding of procedures and Regulations is adequate (✓) Y () N

- 1. Current operating procedures (✓) Y () N
- 2. Emergency procedures (✓) Y () N
- 3. Use of survey instrumentation (✓) Y () N

D. Revised Part 20

Workers cognizant of requirements for:

- 1. Radiation Safety Program [20.1101] (✓) Y () N
- 2. Annual dose limits [20.1301, 1302] (✓) Y () N
- 3. New forms 4 and 5 () Y () N () N/A
- 4. 10% monitoring threshold [20.1502] () Y () N
- 5. Dose limits to embryo/fetus and declared pregnant worker [20.1208] (✓) Y () N
- 6. Grave Danger Posting [20.1902] () Y () N () N/A
- 7. Procedures for opening packages [20.1906] (✓) Y () N () N/A
- 8. Sewer disposal limits [20.2003] () Y () N () N/A

NOTE: Deficiencies in this area, while not always a violation, should be brought to the attention of licensee management at the exit meeting and in the cover letter transmitting the inspection report or NOV.

Remarks:

4. INTERNAL AUDITS, REVIEWS OR INSPECTIONS

- A. Audits are required [L/C] Y N
B. Audits or inspections are conducted Y N
(1) Audits conducted by RSO reviews
(2) Frequency _____
C. Content and implementation of the radiation protection program reviewed annually by the licensee [20.1101(c)] Y N
D. Records maintained [20.2102] Y N

5. FACILITIES

- A. Facilities as described in license application [L/C] Y N
B. Describe any Self-contained dry-source-storage irradiators [Part 36] and/or survey instrument calibrators (model, radionuclide, activity, use, etc.) N/A
1. Maintenance of safety-related components performed by authorized persons [L/C] Y N
2. Access to keys and/or material controlled [20.1801, 1802, L/C] Y N
3. Access to high/very high radiation areas controlled [20.1601, 1602, L/C] Y N
4. Adequate protection of shield integrity, fire protection [L/C] Y N

Remarks:

6. MATERIALS

- A. Isotope, chemical form, quantity and use as authorized [L/C] *Am 241 only* Y N
B. Licensed materials secured to prevent unauthorized removal or access [20.1801, 1802] Y N
C. Leak tests and Inventories [L/C]
1. Performed as required Y N N/A
2. Adequate analysis methodology and sensitivity Y N N/A
3. Records maintained [L/C] Y N

Remarks:

7. RADIATION SURVEYS

A. Instruments and equipment:

- 1. Appropriate operable survey instrumentation possessed and readily accessible [L/C] Y () N
- 2. Calibrated as required [20.1501, L/C] Y () N
- 3. Calibration records maintained [20.2103(a)] Y () N

B. Briefly describe area survey requirements [20.1501(a), L/C]:

*Weekly surveys - when operations are occurring
RSD generally performs them more frequently*

C. Performed as required [20.1501(a), L/C] Y () N

- 1. Contamination found Y () N
- 2. Corrective action taken and documented Y () N

D. Records maintained [20.2103, L/C] Y () N

E. Protection of members of the public

- 1. Licensee made adequate surveys to demonstrate either (1) that the TEDE to the individual likely to receive the highest dose does not exceed 100 mrem in a year, or (2) that if an individual were continuously present in an unrestricted area, the external dose would not exceed 2 mrem in any hour and 50 mrem in a year [20.1301(a)(1), 1302(b)] Y () N
- 2. Unrestricted area radiation levels do not exceed 2 mrem in any one hour [20.1301(a)(2)] Y () N
- 3. Records maintained [20.2103, 2107] Y () N

Remarks:

8. RADIOACTIVE WASTE

- A. Disposal N/A
Waste has not been a problem, all licensed material can be returned to source manufacturer

Interim Waste Storage

- 1. Decay-in-storage () N/A
 - a. Procedures approved [20.2001(a)(2), L/C] () Y () N
 - b. In accordance with [L/C] () Y () N
 - c. Labels removed or defaced [20.1904(b)] () Y () N
- 2. Special procedures performed as required [L/C] () Y () N
- 3. Liquid scintillation (LS) media and animal carcasses per [20.2005] () Y () N () N/A
- 4. Improper/unauthorized disposals [20.2001] () Y () N
- 5. Records maintained [20.2103(a), 2108, L/C] () Y () N

B. Effluents () N/A

- 1. Release into sanitary sewer [20.2003] () Y () N () N/A
 - a. Material is readily soluble or readily dispersible [20.2003(a)(1)] () Y () N
 - b. Monthly average release concentrations do not exceed Appendix B values [20.2003] () Y () N
 - c. No more than 5 Ci of H-3, 1 Ci of C-14 and 1 Ci of all other radionuclides combined released in a year [20.2003] () Y () N
 - d. Procedures to ensure representative sampling and analysis properly implemented [20.1501(a)(2), L/C] () Y () N
- 2. Release to septic tanks [20.2003] () Y () N () N/A
 - a. Within unrestricted limits [App B, Table 2] () Y () N
- 3. Waste incinerated () Y () N () N/A
 - a. License authorizes [20.2004(a)(3)] () Y () N
 - b. Licensee directly monitors exhaust () Y () N
 - c. Airborne releases evaluated and controlled [20.1501, 1701] () Y () N
- 4. Control of effluents and ashes [20.1201, 1301, 1501, 2001, L/C] {See also IP 87102, RG 8.37} () Y () N

C. Waste Management () N/A

- 1. Waste compacted [L/C] () Y () N
- 2. Storage area(s) () N/A
 - a. Protection from elements and fire [L/C] () Y () N
 - b. Control of waste maintained [20.1801] () Y () N
 - c. Containers properly labeled and area properly posted [20.1902, 1904] () Y () N
 - d. Package integrity maintained [L/C] () Y () N
- 3. Packaging, Control and Tracking [App. F.III] [20.2006(d)]:

Note: The licensee's waste is likely to be Class A.

- a. Not packaged for disposal in cardboard or fiberboard boxes [61.56(a)] Y N
 - b. Liquid wastes solidified, i.e., less than 1% freestanding liquid, and void spaces minimized [61.56(a), (b)] Y N
 - c. Does not generate harmful vapors [61.56] Y N
 - d. Structurally stable (will maintain its physical dimensions and form under expected disposal conditions) [61.56(b)] Y N
 - e. Packages properly labeled [App. F.III.A.2] Y N
 - f. Licensee conducts a QC program to ensure compliance with [61.55, 56] and includes management evaluation of audits [App. F.III.A.3] Y N
 - g. Shipments not acknowledged within 20 days after transfer are investigated and reported [App. F.III.A.8] Y N N/A
4. Transfers to land disposal facilities N/A
- a. Transferred to person specifically licensed to receive waste [30.41, 20.2001(b)] Y N
 - b. Each shipment accompanied by a manifest prepared as specified in Section I of Appendix F [20.2006(b), App. F.III.A.4] Y N
 - c. Manifests certified as specified in Section II of Appendix F [20.2006(c)] Y N
- D. Records of surveys and material accountability are maintained [20.2103, 2108] Y N

Remarks:

9. RECEIPT AND TRANSFER OF RADIOACTIVE MATERIAL

- A. Describe how packages are received and by whom: N/A
*Received in Shipping & Receiving
QSO is notified*
- B. Written package opening procedures established and followed [20.1906(e)] Y N
- C. All incoming packages with DOT labels wiped, unless exempted (gases and special form) [20.1906(b)(1)] Y N
- D. Incoming packages surveyed per [20.1906(b)(2)] Y N
- E. Monitoring in (c) and (d) performed within time

- specific [20.1906(c)] () Y () N
- F. Transfer(s) between licensees performed per [30.41] () Y () N
- G. All sources surveyed before shipment and transfer [20.1501(a), 49 CFR 173.475(i), L/C] () Y () N
- H. Records of surveys and receipt/transfer maintained [20.2103(a), 30.51] () Y () N
- I. Transfers within licensee's authorized users or locations performed as required [L/C] () Y () N () N/A
- J. Arrangements made for Type A packages [20.1906(a)] () Y () N
- K. Package receipt/distribution activities evaluated for compliance with 20.1301 [20.1302] () Y () N () N/A

Remarks:

10. TRANSPORTATION (10 CFR 71.5(a) and 49 CFR 170-189) () N/A

A. Licensee shipments are:

- () delivered to common carriers
- () transported in licensee's own private vehicle
- () both
- () no shipments since last inspection

B. HAZMAT training [172.700-704] () Y () N

C. Packages () N/A

1. Authorized packages used [173.415, 416(b)] () Y () N
2. Performance Test records on file () N/A
- a. Special Form Sources [173.476(a)] () Y () N
- b. DOT-7A packages [173.415(a)] () Y () N

3. COCs on file with NRC for Type B [71.12(c)(1)] () Y () N
4. Two labels (White-I, Yellow-II, Yellow-III) with TI, Nuclide, Activity, and Hazard Class [172.403, 173.441] () Y () N
5. Properly marked (Shipping Name, UN Number, Package Type, RQ, "This End Up" (liquids), Name and Address of consignee) [172.301, 306, 310, 312, 324] () Y () N
6. Closed and sealed during transport [173.475(f)] () Y () N

D. Shipping Papers () N/A

1. Prepared and used [172.200(a)] () Y () N
2. Proper {Shipping name, Hazard Class, UN Number, Quantity, Package Type, Nuclide, RQ, Radioactive Material, Physical and chemical form, Activity, Category of label, TI, Shipper's Name, Certification and Signature, Emergency Response Phone Number, "Limited Quantity" (if applicable), "Cargo Aircraft Only" (if applicable)} [172.200-204] () Y () N

3. Readily accessible during transport [177.718(e)] () Y () N
- E. Vehicles (✓) N/A
1. Placarded [172.504] () Y () N
2. Cargo blocked and braced [177.842(d)] () Y () N
3. Proper overpacks (shipping name, UN Number, labeled, statement indicating that inner package complies with specification packaging) [173.25] () Y () N
- F. Any incidents reported to DOT [171.15, 16] () Y () N

Remarks:

11. PERSONNEL RADIATION PROTECTION

- A. Licensee performed exposure evaluation [20.1501] () Y () N
- B. Licensee incorporated ALARA considerations in the Radiation Protection Program [20.1101(b)] (✓) Y () N
- C. External Dosimetry () N/A
1. Licensee monitors workers [20.1502(a), L/C] (✓) Y () N
2. External exposures account for contributions from airborne activity [20.1203] () Y () N (✓) N/A
3. Supplier Lundauer Frequency monthly
4. Supplier is NVLAP-approved [20.1501(c)] (✓) Y () N
5. Dosimeters exchanged at required frequency [L/C] () Y () N
- D. Internal Dosimetry (✓) N/A
1. Licensee monitors workers [20.1502(b), L/C] () Y () N
2. Briefly describe licensee's program for monitoring and controlling internal exposures [20.1701, 1702, L/C]:
3. Air sampling performed () Y (✓) N
4. Monitoring/controlling program implemented () Y (✓) N
5. Respiratory protection equipment [20.1703, L/C] () Y (✓) N
- E. Reports () N/A
1. Reviewed by RSO Frequency monthly
2. Inspector reviewed personnel monitoring records for period 6/1992 to 4/95

N/A All doses totals are below 100 mR major

- 3. Prior dose determined for individuals likely to receive doses [20.2104] () Y () N
- 4. Maximum exposures TEDE _____ Other _____
- 5. Maximum CDEs _____ Organs _____
- 6. Maximum CEDE _____
- 7. Licensee sums internal and external [20.1202] () Y () N
- 8. TEDEs and TODEs within limits [20.1201] () Y () N
- 9. NRC Forms or equivalent [20.2104(d), 2106(c)]
 - a. NRC-4 () Y () N Complete: () Y () N
 - b. NRC-5 () Y () N Complete: () Y () N
- 10. Worker declared her pregnancy in writing during inspection period (review records) () Y () N (✓) N/A *during the inspection period*
 If yes, licensee in compliance with [20.1208] () Y () N
 and records maintained [20.2106(e)] () Y () N

- F. Who performed PSEs at this facility (number of people involved and doses received) [20.1206, 2104, 2105, 2204] (✓) N/A
- G. Records of exposures, surveys, monitoring, and evaluations maintained [20.2102, 2103, 2106, L/C] (✓) Y () N

Remarks:

12. NRC INDEPENDENT MEASUREMENTS

- A. Survey instrument Serial No. Last calibration
- B. Inspector's measurements were compared to licensee's () Y (✓) N
- C. Describe the type, location, and results of measurements:

13. NOTIFICATION AND REPORTS () N/A

- A. Licensee in compliance with [19.13, 30.50] (reports to individuals, public and occupational, monitored to show compliance with Part 20) (✓) Y () N () N/A
- B. Licensee in compliance with [20.2201, 30.50] (theft or loss) (✓) Y () N (✓) None
- C. Licensee in compliance with [20.2202, 30.50] (incidents) (✓) Y () N (✓) None
- D. Licensee in compliance with [20.2203, 30.50] (overexposures and high radiation levels) () Y () N (✓) None
- E. Licensee aware of NRC Ops Center phone number (✓) Y () N

14. POSTING AND LABELING

- A. NRC-3 "Notice to Workers" is posted [19.11] Y () N
- B. Parts 19, 20, 21, Section 206 of Energy Reorganization Act, procedures adopted pursuant to Part 21, and license documents are posted or a notice indicating where documents can be examined is posted [19.11, 21.6] Y () N
- C. Other posting and labeling per [20.1902, 1904] and the licensee is not exempted by [20.1903, 1905] Y () N

Remarks:

15. RECORDKEEPING FOR DECOMMISSIONING

N/A

- A. Records of information important to the safe and effective decommissioning of the facility maintained in an independent and identifiable location until license termination [30.35(g)] () Y () N
- B. Records include all information outlined in [30.35(g)] () Y () N

Remarks:

16. BULLETINS AND INFORMATION NOTICES

- A. Bulletins, Information Notices, NMSS Newsletters, etc., received by the Licensee Y () N
- B. Licensee took appropriate action in response to Bulletins, Generic Letters, etc. Y () N

Remarks:

17. SPECIAL LICENSE CONDITIONS OR ISSUES

N/A

- A. Special license conditions or issues to be reviewed:
- B. Evaluation:

18. CONTINUATION OF REPORT ITEMS

N/A

19. VIOLATIONS, NCvs. AND OTHER ISSUES

✓ N/A

Note: Briefly state (1) the requirement and (2) how and when the licensee violated the requirement. For non-cited violations, indicate why the violation was not cited.

20. PERFORMANCE EVALUATION FACTORS

Licensee (name & location)

Inspector _____

Inspection Date _____

- A. Lack of senior management involvement with the radiation safety program and/or Radiation Safety Officer (RSO) oversight () Y (✓) N
- B. RSO too busy with other assignments () Y (✓) N
- C. Insufficient staffing () Y (✓) N
- D. Radiation Safety Committee fails to meet or functions inadequately () Y () N (✓) N/A
- E. Inadequate consulting services or inadequate audits () Y (✓) N () N/A

Remarks (consider above assessment and/or other pertinent PEFs):

Regional follow-up on above PEFs citations:

END

ATTACHMENT A
LABORATORY INSPECTION FIELD NOTES

1. Date _____ Authorized User(s) _____

2. Location(s) Building _____ Room(s) _____

3. Person(s) Contacted _____

4. Describe scope of lab use (Nuclides, form, frequency, purpose, etc):

5. Training

A. Frequency: _____ Conducted by: _____ () Y () N
B. Individuals interviewed understand safety practices () Y () N

Remarks:

6. Surveys

A. Types of surveys performed (daily, weekly, monthly, etc.)

B. Instrumentation properly calibrated and used () Y () N
C. Efficiency of counting system determined () Y () N
D. Hood airflow adequate and checked as required () Y () N () N/A
E. Records maintained: trigger levels established, area diagram, instrument used, individual performing survey, results in proper units, decontamination performed as necessary, etc.) () Y () N
F. Inspector surveyed () Y () N
Results satisfactory () Y () N () N/A

Remarks:

7. Receipt and Transfer

A. Incoming packages properly surveyed () Y () N
B. Interlaboratory transfers performed as specified in the license () Y () N () N/A
C. Records maintained () Y () N

Remarks:

8. Personnel Dosimetry

A. Appropriate dosimetry assigned and worn () Y () N () N/A

- B. Results available to lab personnel () Y () N
 C. Bioassays performed () Y () N () N/A
 Remarks:

9. Handling Waste
 A. Procedures followed () Y () N
 B. Proper storage (area, containers, labeling, etc.) () Y () N
 C. Liquid/solid waste disposal () Y () N
 D. Incineration () Y () N () N/A
 E. Compaction () Y () N () N/A
 F. Sewer discharge () Y () N () N/A
 G. Records maintained () Y () N
 Remarks:

10. Inventory conducted () Y () N () N/A
 Records Maintained () Y () N
 Remarks:

11. Storage and use of RAM
 A. Adequate method to prevent unauthorized access () Y () N
 B. Condition of areas acceptable () Y () N
 C. Personnel wear disposable gloves and protective clothing while handling material () Y () N
 D. Hands monitored after procedures or before leaving () Y () N
 E. ~~No~~ eating, drinking, or smoking in use/storage areas () Y () N
 F. ~~No~~ food, drink, or personal items stored in use/storage areas () Y () N
 G. Use of shielding/distance while using/storing material () Y () N
 H. RAM is under surveillance and control when not in storage in an unrestricted area () Y () N
 Remarks: *All Areas are restricted*

12. Posting and Labeling
 A. NRC-3 "Notice to Workers" () Y () N
 B. Parts 19, 20, 21, Section 206 of Energy Reorganization Act, procedures for Part 21, and license documents or a notice indicating where documents can be examined () Y () N
 C. Other posting and labeling requirements met () Y () N
 Remarks:

13. Violations Observed

None

Issue Date: XX/XX/XX
(RI rec'd 03/10/94)

E-15

87100, Appendix E

03E

V distribution from facility

32.29(c) Reports

BASE WIRING INFORMATION (P/N 70-400001-000)

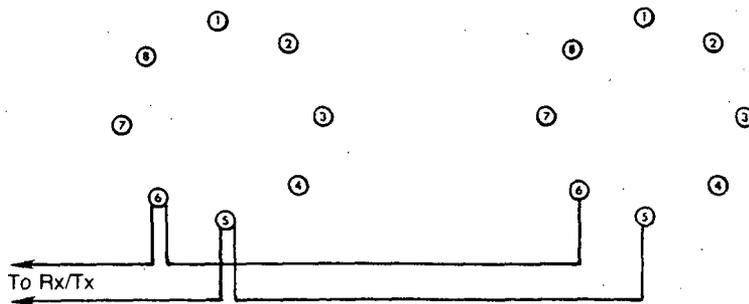


Figure 1
Wiring for units without optional integral relay

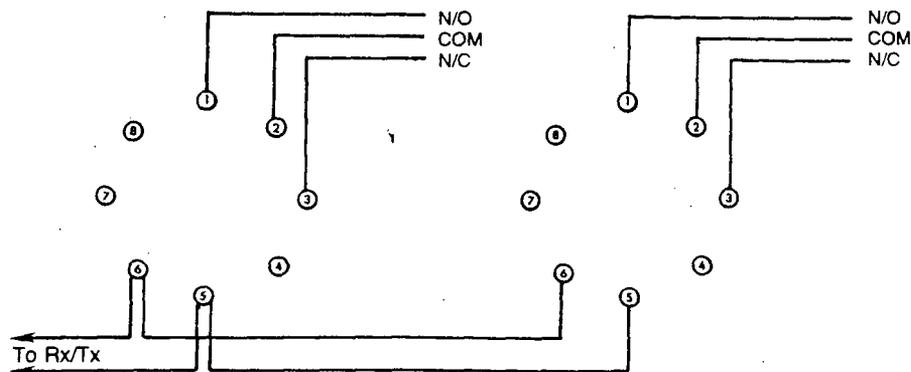


Figure 2
Wiring for units with optional integral relay

WARNING: TO PREVENT DETECTOR CONTAMINATION AND SUBSEQUENT WARRANTY CANCELLATION, SMOKE DETECTORS MUST REMAIN COVERED UNTIL AREA IS CLEAN AND DUST FREE.

GENERAL NOTES:

- No. E.O.L. device is needed for photoelectric and ionization smart detectors.
- "T" tapping wiring method is acceptable for Class "B" wiring.
- Detector optional relay contact state shown in normal state. Rating is 2A @ 30VDC resistive.
- To ensure proper installation of the detector head to the base, be sure wires are properly dressed at installation.
 - Position all wires flat against the base.
 - Take up all slack in outlet box.
 - Route wires away from the connector terminals.

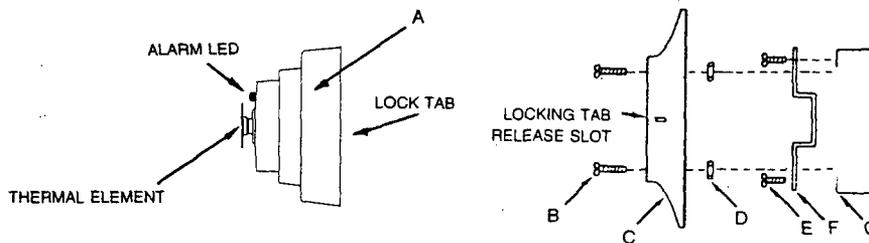


Figure 3
Mounting configuration

NOTE: To install detector head on base, twist clockwise. To remove twist counterclockwise.

- Detector Head
- Base Mounting Bolts - 2 provided with Accessory Kit
- Base
- Bolt Retainer - 2 provided with Accessory Kit
- Junction Box Cover Bolts - part of junction box
- Offset Adaptor - Part of Accessory Kit
- Junction Box - installer supplied (for surface mounting, use Wiremold #5739 Adaptor)

NOTES:

- When using 4" octagonal box, items B D and F are not required.
- Order Accessory Kit P/N 70-200000-022 when installing base on 4" square junction box.

TESTING

Refer to FENWALNET 4000/1000 Owners Manual for Testing Procedures

NOTE: Factory settings of detectors are as follows:

Photoelectric detectors - Alarm 2.5%/ft., Prealarm 1.5%/ft.

Ionization detectors - Alarm 1.0%/ft., Prealarm 0.8%/ft.

Programming is done via an ASCII keyboard at the jobsite or may be accomplished remotely via a modem. To avoid tampering, three levels of security are provided to program or alter the program. A PC is required for programming of the FN1000.

The system will reject attempts to program alarm and prealarm set point levels exceeding the Underwriters Laboratories designated smoke window.

Alarm Test By Command

Any or all detectors can be tested by

DETECTOR IDENTIFICATION

Part Number	Description
70-400001-000	Common Mounting Base
70-401001-000	Ionization Detector
70-401004-000	Ionization Type w/2A, 24VDC Relay
71-401001-000	Photoelectric Detector
71-401004-000	Photoelectric Type w/2A, 24VDC Relay
70-200000-022	Accessory Kit for Mounting to 4" Square Junction Boxes

SPECIFICATIONS

Input Voltage: - 16.5 - 27.5VDC

Standby Current: - 350 μ A, typical

Alarm Current: - 425 μ A, typical

Optional Relay Rating - 2A @ 24VDC

Max. No. of Detectors per Channel: - 255 (all can be in alarm)

Max. No. of Detectors per System: - 1024 (all can be in alarm)

LED Pulse Modes:

Normal: - 9 second interval

Trouble: - LED is off

Alarm: - 2.0 second interval

Operating Temperature: - 32 - 100°

EMI Immunity - Meets UL 268

NOTE: These detectors are compatible only with FENWALNET 4000/1000 fire alarm systems, utilizing a Transmitter/Receiver Module, P/N30-402001-000.

INSTALLATION

Detector bases are mounted directly to a 4" octagonal box. Accessory kits for adapting bases to 4" square boxes are available (See HOW TO ORDER). For surface mounting use Wiremold #5739 Adaptor Box. Please refer to NFPA 72E and Fenwal's "Applications Engineering Manual" (MC-402) for spacing, location of detectors and other guidelines.

WARNING: TO PREVENT DETECTOR CONTAMINATION AND SUBSEQUENT WARRANTY CANCELLATION, SMOKE DETECTORS MUST REMAIN COVERED UNTIL AREA IS CLEAN AND DUST FREE.

The detector base is equipped with an integrally molded locking tab to prevent unauthorized removal. Once locked into place, the detector can be removed only by inserting a screwdriver blade into the slot while simultaneously turning the detector head counterclockwise. If the detector is to be mounted to a ceiling high

enough to cause access difficulty, it is recommended that the locking tab be removed prior to installation. To remove locking tab, bend outward until it breaks off.

Communication Verification

When a detector reaches its prealarm or alarm set point, it conducts a verification procedure with the Central Control Panel which repeats the communication cycle four separate times before the system accepts its change of status. The maximum time for this verification procedure is a rapid 2.5 seconds.

APPLICATION DATA

The smart photoelectric or ionization smoke detector is compatible only with FENWALNET 4000 control equipment which utilizes the Receiver Transmitter Module (RX/TX). Each RX/TX can communicate to 255 smart or addressable devices. The circuitry may be either Class "A" or Class "B" utilizing No. 18 twisted pair. Class "A" requires a series loop circuitry with the loop returning to the RX/TX, Class "B" does not require this return to the RX/TX and permits unlimited T Tapping.

Smart photoelectric and smart ionization detector utilizes the same base and may be interchanged. (Changing detector types, however, requires a change in system programming.) Installation is both simple and fast because of screw type connections and the nonpolarized detector feature. The detector is fitted to the base by a twist-to-lock action. A removable locking tab secures the head to the base to provide a degree of vandal resistance.

Smart Ionization Smoke Detector

Models CPD 704X are dual chamber ionization type detectors which sense both visible and invisible smoke. A unique sensing chamber design permits 360° smoke entry and response.

Smart Photoelectric Smoke Detector

Model PSD 714X are smart photoelectric smoke detectors. These detectors will respond to a broad range of flaming and smoldering fire conditions. Improved long-term stability is achieved through the use of a custom integrated circuit that features multi-stage amplification.

WARNING: Operation outside specifications could result in failure of the Fenwal product and other equipment with injury to people and property. Specifications subject to change without notice. Contact Fenwal before relying on above specifications. The information herein is to assist customers in determining whether our products are suitable for their applications. We request that customers inspect and test our products before use and satisfy themselves as to contents and suitability. NOTHING HEREIN SHALL CONSTITUTE A WARRANTY, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

MAINTENANCE

The minimal requirement for detector maintenance consists of an annual cleaning of dust from the detector head by using the suction of a vacuum cleaner. Cleaning programs should be geared to the individual environment.

RADIOACTIVE MATERIAL

Less than 1.0 microcuries Americium 241 in ionization detector. Shielded by stainless steel housing.

CAUTION: Do not attempt disassembly of the factory sealed sensing chamber. This assembly is sealed for your protection and is not intended to be opened for servicing.

FENWAL

00-MC4520-100

Photoelectric and Ionization Smoke Detectors

Installation Instructions / Technical Data

FEATURES

- ANALOG PHOTOELECTRIC & IONIZATION TYPES
- TRUE DISTRIBUTED INTELLIGENCE
- FIELD PROGRAMMABLE ALARM AND PREALARM SET POINTS
- INTERNAL SUPERVISION
- FAIL SOFT OPERATION
- ALARM VERIFICATION
- CALIBRATED ALARM TEST BY COMMAND
- DRIFT COMPENSATION
- STATUS LED
- NON POLARIZED
- SUPERVISED OPTIONAL RELAY
- UL LISTED TO STANDARD 268

DESCRIPTION

These unique Smart detectors provide true distributed intelligence to the FENWALNET 4000™ fire alarm system by storing and analyzing calibration data and prealarm and alarm values. The detector head continuously makes on-location decisions and reports its status, as required, to the central control panel.

This distributed intelligence architecture, featuring an intrinsic microprocessor with 4K of non-volatile memory in each individual detector, analyzes data and makes decisions within the monitored area. This unique utilization of processing makes possible a system with greater capacity and flexibility than a conventional centralized system.

As an example, up to 255 detectors can be connected on a single pair of wires and up to 1,020 detectors can be connected to one control unit.

Two Programmable Alarm Set Points

The detector alarm and prealarm set point levels are factory-set in units of percent obscuration/foot and may be changed by the operator. Both set points, however, can only be set within the UL allowable limits which are stored in the control panel's non-volatile memory. The prealarm set point typically is used as an early warning signal. On receipt of a prealarm signal, the operator may, in addition to sending someone to investigate, request actual percent obscuration levels from that, or any other, detector. To disable the prealarm function, the set point must be programmed the same as or higher than the alarm set point.

The alarm and prealarm setting of each detector in a FENWALNET 4000 system may be changed either manually or

from the Central Control Panel Real Time Clock. For example, a detector located in a cafeteria can be programmed to desensitize automatically every lunch hour except weekends and holidays.

Drift Compensation

Each detector is self-monitoring for drift from alarm set point caused by long-term environmental conditions, contamination or electronic component aging. Using a carefully designed algorithm, the detector measures and averages 30 days of "normal" smoke level. This data then is used in the drift compensation algorithm to maintain the proper set point as programmed for the unit. If the detector cannot compensate, a trouble signal is sent to the Central Control Panel identifying the affected detector and the state: "Drift Error."

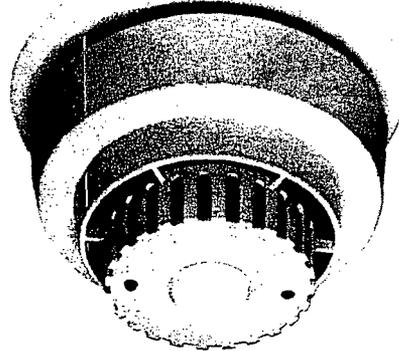
Internal Supervision

The weakest link in a conventional or standard addressable system is the inability to monitor the operating condition of the smoke detector. The smart smoke detector constantly monitors its own status by supervising and reporting a trouble condition when a fault occurs in one of the following items:

1. Internal Power Supply Voltage
2. Improper line voltage from the control panel
3. Faulty writing of data into memory
4. An opening in the relay coil or operation failure of the intrinsic optional relay
5. Uncompensatable drift

Fail Soft Operation

Should there be a failure in the communications link between the RX/TX



and a detector, the detector will operate as a standard unit. That is, it will cause a general alarm by channel when smoke density reaches the alarm point. It will not, however, report its status. An intrinsic relay, if included, will change status on alarm.

If the Central Control Module communications were to fail, the detector, again, will function as a standard unit. However, the intrinsic relay will not function.

Upon reestablishment of communications with central control, the detector will return to its prior program without further action.

Status LED

A LED is provided on the smoke detector to indicate status of the smoke detector. A high flash rate indicates alarm; a slow rate normal; when a trouble exists, the LED is off.

Programming Information

Each detector is field programmed with its own location message (location of the detector in the building or on the site), its system address (a four digit code), prealarm set point and alarm set point (if different from factory settings). In addition, the detector type, either photoelectric or ionization, and proper calibration are stored into the memory at the factory. This permits the Central Control Panel to verify that the proper type detector and correct address is installed in the system.

If an optional intrinsic relay is included, the setting of the relay is programmable and the relay coil and contact setting are supervised.

Lic. No.
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20-15285-03E

LANDAUER

STATPRT

02/22/95

ANNUAL STATISTICAL SUMMARY OF EXPOSURES FOR THE YEAR 1994

ACCOUNT NAME
KIDDE-FENWAL INC
ATTN J RONAYNE
400 MAIN STREET
ASHLAND

074489

MA01721 RANGE OF EXPOSURE IN REM * NO MEASURABLE EXPOSURE	NUMBER OF INDIVIDUALS 14
0.0-0.1	0
0.1-0.25	0
0.25-0.5	0
0.5-0.75	0
0.75-1.0	0
1.0-2.0	0
2.0-3.0	0
3.0-4.0	0
4.0-5.0	0
5.0-6.0	0
6.0-7.0	0
7.0-8.0	0
8.0-9.0	0
9.0-10.0	0
10.0-11.0	0
11.0-12.0	0
12.0 +	0
TOTAL	14

*EXPOSURES REFLECT DEEP DOSE FROM INDIVIDUALS "WHOLE BODY" DOSIMETER.
INDIVIDUAL VALUES EXACTLY EQUAL TO THE VALUES SEPARATING EXPOSURE RANGES
SHALL BE REPORTED IN THE HIGHER RANGE.

PREPARED BY LANDAUER, INC. GLENWOOD, IL 60425-1586