

Ionization Smoke Detectors

Effective: August 2002

Series CPD-7051

70.51

FENWAL®

FEATURES

- UL 268 and 268A Listed, #S1064, Vol 12/14, Sec 1
- FM Approved #OW3A2-AY (3230)
- CSFM Listed #07271-1076:115
- MEA Accepted #346-92E
- ULC Listed #3810 D19-File CS194
- Dual ionization chamber technology
- In Place Sensitivity (% per foot obscuration)
- Functional Test Capability - Remote and Local
- Input voltage range 10.2 to 36.8 Vdc
- Low Profile Appearance with SMT (Surface Mount Technology)
- Electrically and Mechanically compatible with all Fenwal detectors and bases
- Three year warranty
- Optional 2- and 4-wire relay bases
- Universal relay modules
- Nonpolarized
- Low-current design
- Interchangeable bases
- Flashing LED for visual supervision
- EMI/RFI resistant
- Tamper Resistant, Fine Mesh Insect Screen
- Locking feature for vandal resistance
- Nominal sensitivity 1.3% obscuration/foot

DESCRIPTION

The Series CPD-7051 ionization smoke detector is a dual chamber detector, designed to sense both visible and invisible products of combustion. This detector incorporates advanced solid-state, low-voltage circuitry featuring SMT (Surface Mount Technology) and is designed for 2-wire and 4-wire installation. The 360 degree smoke entry characteristic permits maximum smoke response from any direction. A unique sensing chamber design permits operation in air velocities up to 2000 fpm. The detector is designed for Open Area Protection (UL 268) and Duct Applications (UL 268A). It may be installed in systems intended for Releasing Device Service through use of a compatible control unit.

Detector base options are available to provide for auxiliary test, indication, and/or control functions.

To assure that the detector is functioning, a pulsing LED (approximately once every 4 seconds) allows for visual supervision of the detector. Under alarm condition, the LED lights



continuously at full brilliance. An optional base is available to provide remote LED function. A unique gated output circuit design provides improved stability and transient suppression. Special signal processing techniques verify the presence of smoke before the detector will alarm.

The detector head is installed into the base with a simple twist-lock action. A locking feature is provided for vandal resistant security. A test magnet can provide a full functional test which simulates the effect of smoke (approximately 1.3% obscuration/ft.) entering the sensing chamber.

This magnet test meets the requirements of the UL Sensitivity Test Feature. An optional base is available for remote functional testing.

In addition, the actual sensitivity of the detector may be monitored with a standard voltmeter and a special sensitivity tester (ST-001) that allows direct readout in % obscuration/ft. without the necessity of removing the detector.

A new, improved fine mesh insect screen protecting the chamber area is used to avoid potential nuisance alarms.

Optional bases are available for supplementary 2-wire or 4-wire relay functions.

ELECTRICAL SPECIFICATIONS

These detectors are designed for operation with control units and releasing devices having specific voltage and current characteristics that are compatible with the detector circuitry. The information provided under the heading CONTROL UNITS and Table 3 are intended to assist in proper application of the detector in a system. Reference the UL compatibility listing for other panels listed.

TECHNICAL SPECIFICATIONS

Table 1. Technical Specifications

	IONIZATION DETECTOR MODEL CPD-7051 P/N 70-510000-001	IONIZATION DETECTOR MODEL CPD-7051C P/N 70-510000-011
Detection	Dual Ionization Chambers	
Standby Voltage	2WB: 10.2 to 36.8 Vdc/4WB: 16.8 to 36.8 Vdc	
Maximum Ripple	50% of DC input	
Standby Current	45µA (typical); 100µA peak @ 24 Vdc	
Start-up Current	0.1 mA max.	
Alarm Current	100 mA max.	
Alarm Indicator	LED	
Radioactive Source Material	Ammericium 241 (sealed)	
Radioactive Source Activity	0.7 µC (microcuries)	
Operating Temperature	32°F (0°C) to 100°F (37.8°C) as per UL268	
Operating Relative Humidity	0 to 93% (non-condensing)	
Reset Voltage	3V (typical) min.	
Reset Time	1.0 sec. Max.	
Start-up Time	20 sec. Max.	
Detector Alarm Voltage	5.5V (typical)	
Finish	Smooth, Off White, High-Impact Plastic	
Weight	3.53 oz. (110 g) w/o base	
Approvals	UL 268, FM, CSFM, MEA	ULC, FM, CSFM, MEA
UL Sensitivity Window	0.75 - 1.75%/ft.	
Compatibility ID	I51FE1	
Detector Height	35 mm, 1.38"	
Detector Diameter	99 mm, 3.90" (w/o base)	
Base Height	11 mm, 0.43"	
Base Diameter	150 mm, 5.90"	

ENVIRONMENTAL SPECIFICATIONS

The Series CPD-7051 has been tested by Underwriters Laboratories for environmental stability. Some of the basic conditions that must be met for compliance are listed below and are presented to help serve as application guidelines:

Table 2. Environmental Specifications

Temperature:	
UL Test	32° to 120°F (0°C to 49°C)
Operating	32° to 100°F (0°C to 37.8°C)
Humidity:	0-93% (non-condensing)
Air Velocity:	
CPD-7051	0-2000 ft./min. for open area protection
CPD-7051D	500-2000 ft./min. for duct applications (stand alone)
Altitudes:	For altitudes above 7500 ft., consult factory.

CONTROL UNITS

The CPD-7051 detector is compatible with the Fenwal control units and interface modules listed in Table 3.

Table 3. Control Units

CONTROL UNIT MODEL NUMBER	COMPATIBILITY IDENTIFIER NUMBER	MAX. NUMBER OF DETECTORS PER LOOP
2210	C10FE1	40
2212	C12FE1	40
3210	ZDM01, ZDMD01, VZM01	25
2320	C30FE1	15
3220	C32FE1	40
Contact Fenwal for information on compatibility for other manufacturers' panels or refer to the compatibility cross reference list (DOC. #70.63).		

Table 4. Detector Base Options

UL PART NO./MODEL	COMPATIBILITY IDENTIFIER	DESCRIPTION
ULC PART NO./MODEL		
70-501000-001, 2 WB	FE51A	Connects to 2-wire detection circuit via screw terminals
70-501000-011, 2 WBC		
70-501000-002, 2 WRLT	FE52A	Same as above plus provision for remote LED indicator and remote functional test. Minimum alarm current: 15mA, 24 Vdc.
70-501000-012, 2 WRLTC		
70-501000-005, 2 WRB	FE55A	Connects to 2-wire detection circuit via pigtail leads. Equipped with 2 WRM. Minimum alarm current: 19mA, 24 Vdc. Remote LED and test capable.
70-501000-015, 2 WRBC		
70-501000-101, 4 WRB	N/A	Connects to 4-wire detection circuit via pigtail leads. Equipped with 4 WRM. Minimum alarm current: 19mA, 24 Vdc. Remote LED and test capable.
70-501000-111, 4 WRBC		
70-500000-004, 2 WRM	N/A	SPDT Relay with 2 WRB & 2 WRBC bases. Contacts rated 1A @ 30 Vdc/0.5A @ 125 Vac.
70-500000-102, 4 WRM	N/A	SPDT Relay with 4 WRB & 4 WRBC bases. Contacts rated 1A @ 30 Vdc/0.5A @ 125 Vac.
70-501000-003, MA-001	MAFE1	Mechanical retrofit adapter allows CPD-7051 to physically connect to all Fenwal Series 70 bases.

BASE OPTIONS

Control units in Table 3 can be used with the detector base options in Table 4. Various base options are available to provide auxiliary relay and/or remote indication and remote test feature.

SPACING (OPEN AREA LOCATION)



The following locations should always be avoided: areas with excessive exhaust fumes, kitchen areas, near fireplaces or furnace rooms, within three (3) feet of air supply ducts or air diffusers.

The CPD-7051 is to be installed on maximum 30 foot centers, typically on smooth ceilings up to 15 feet high and will operate with minimum air circulation. Resultant maximum 900 square foot spacing may be used as a reasonable guide for comparable applications. Where special conditions exist (ceiling obstructions, high air exchange rates, etc.), reduced square footage spacing must be used to achieve adequate protection. Computer rooms and other such installations may require spacing with a maximum of 200 square feet due to high air exchange rates. For additional information, consult NFPA 72 and the Fenwal Automatic Fire Detection Application Engineering Manual. For special applications of the CPD-7051, consult your Fenwal technical representative.

Per UL Listing, open area smoke detectors are intended for mounting on a ceiling not less than 6 inches from a wall, or on a wall not less than 4 inches nor more than 6 inches from the ceiling.

TYPICAL WIRING DIAGRAMS

Figures 1 thru 5 are typical wiring diagrams of 2 and 4-wire detector systems. Refer to Installation Sheet 7X.5X.A for detailed instructions.

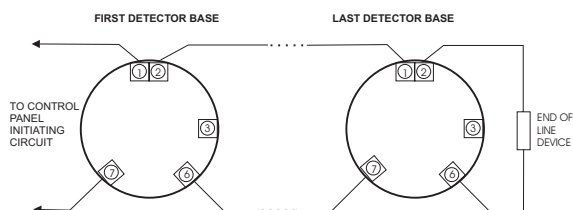


Figure 1. 2WB/2WBC Wiring

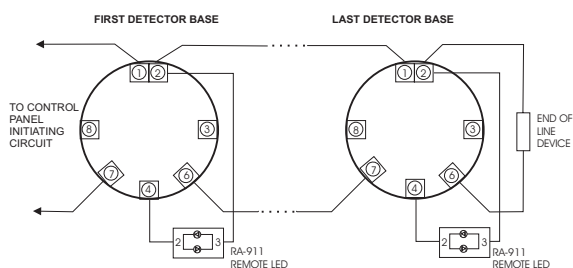


Figure 2. 2WRLT/2WRLTC Wiring with Remote Indicator Option

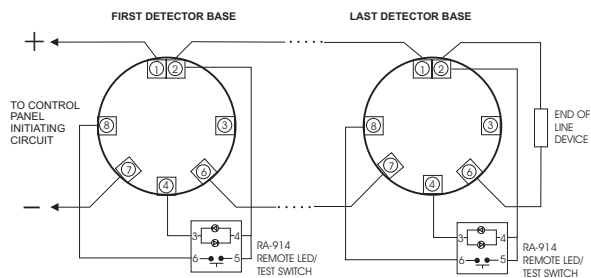


Figure 3. 2WRLT/2WRLTC Wiring with Remote Indicator and Test Switch

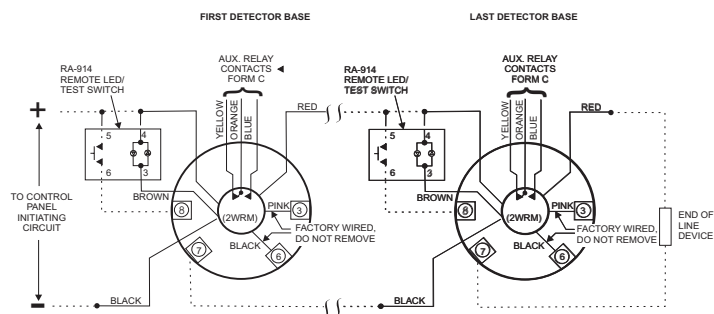


Figure 4. 2WRB/2WRBC Wiring

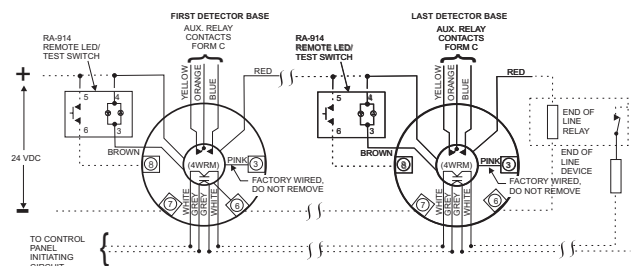


Figure 5. 4WRB/4WRBC Wiring

Note: All relays shown in normal position (power on)

INSTALLATION OF DETECTORS AND BASES

Detector bases are directly mounted on the electrical junction boxes (3, 3.5 and 4 inch octagonal; 3 inch round; 4 inch square) without the need for any mechanical adapter required. Refer to Installation Sheet 7X.5X.A for complete installation details.

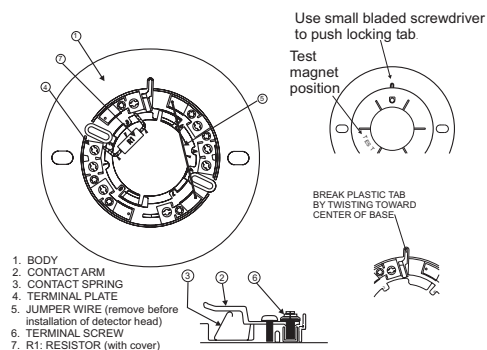


Figure 6. Detector Installation & Removal

These detector bases also include a locking feature that prevents removal of the detector without use of a tool.

TESTING AND MAINTENANCE

Testing shall be performed upon installation of the detector and once a year thereafter as stated in NFPA-72 latest edition. All alarm signal devices, releasing devices, and extinguishing systems should be disengaged while the test is being performed and re-engaged at the conclusion of testing.

Detector sensitivity shall be checked within one year of installation and every alternative year thereafter as stated in NFPA 72. To conduct sensitivity testing a Sensitivity Tester, Model ST-001 (P/N 70-500000-002) is required as shown in Figure 7. (Refer to Data Sheet 70.50.A for details.)

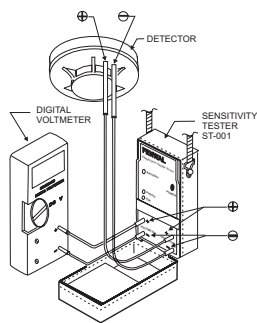


Figure 7. Sensitivity Measurement

If sensitivity readings are out of limits specified on the detector label, contact the Fenwal customer service department for details concerning the detector EXCHANGE PROGRAM.

The detector EXCHANGE PROGRAM offers the customer new product of the latest design as direct replacement for existing detectors. The EXCHANGE PROGRAM is available to all end-users for a nominal fee, regardless of the age of the detector.

The recommended 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 in conformance with NFPA 72.

⚠ CAUTION

Do not attempt disassembly of the factory sealed smoke detector. This assembly is sealed for your protection and is not intended to be opened for servicing. Opening of the detector will void the warranty.

Refer to Installation Sheet 7X.5X for details.

SPARE PARTS

None. Unit is **factory repairable only**. No field repair should be attempted. For service, return detector head intact to Fenwal.

RADIOACTIVE MATERIAL

Total radioactivity is 0.7 microcuries (maximum) Americium 241 shielded by stainless steel housing.

DETECTOR DISPOSAL

The United States Nuclear Regulatory Commission (USNRC) allows the user of Americium 241 filled smoke detectors to dispose of them without obtaining a license.

Under the Code of Federal Regulations, Part 10 (10CFR), Paragraph 30.20, any person receiving, using, owning, etc., by-product material in detectors designed to protect life or property from fires or airborne hazards is automatically granted a general license which, conversely, exempts them from a specific license, thereby allowing them to both receive and dispose of smoke detectors without returning to the manufacturer.

ARCHITECT/ENGINEER SPECIFICATIONS

The contractor shall furnish and install where indicated on the plans, dual-chamber, ionization smoke detectors, Fenwal Series CPD-7051. The combination detector head and twist-lock base shall be UL Listed compatible with a UL Listed fire alarm control unit. PSD-715X series photoelectric detectors and CPD-705X series ionization detectors shall share an interchangeable base.

The Fenwal Smoke Detector shall have a flashing status indicating LED for visual supervision. When the detector is actuated, the flashing LED will latch on steady at full brilliance. The detector may be reset by actuating the control panel reset switch. The vandal-resistant security locking feature shall be used in those areas as indicated on the drawings. The locking feature shall be field removable when not required.

It shall be possible to measure the sensitivity level of the detector without removal from the base. Metering test points shall be accessible on the exterior of the detector head. Measurement shall be accomplished with a commercially available voltmeter and a Fenwal Sensitivity Tester (ST-001) allowing direct measurement in percent per foot obscuration. It shall also be possible to perform a functional test of the detector without the need for generating smoke. The test method must simulate effects of products of combustion in the chamber to ensure testing of all detector circuits. This test can be performed locally and/or remotely.

By using a furnished wire jumper, it shall be possible to check circuit loop continuity prior to installing the detector head. The detector shall be listed and approved for wall and ceiling mounting.

Model CPD-7051 shall operate over an input voltage range from 10.2 to 36.8 Vdc. Voltage and RF transient suppression techniques to withstand up to 20 volt/meter shall be employed to minimize susceptibility to false alarms.

Supplementary SPDT relays, remote test, and/or remote LED alarm indicators shall be installed where indicated.



FENWAL[®]
Protection Systems

LICO Electronics GmbH
400 A-2320 Kledering
TEL: +43 1 706 43 000 FAX: +43 1 706 41 31, office@lico.at
www.mess-regeltechnik.at, h.miksch@lico.at

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If you need more information on this product, or if you have a particular problem or question, contact