

SIEMENS

Installation/Wiring Instructions

Smoke and Fire Detector Models DI-3, DI-3H, DI-3IS*, DI-A3, and DI-A3H

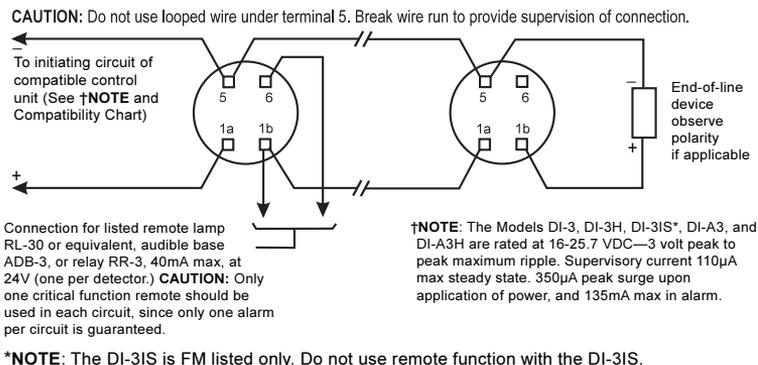


Figure 1 **SIEMENS** Models DI-3, DI-3H, DI-3IS, DI-A3, AND DI-A3H
Installation And Wiring Diagram

P/N 315-081882, Rev. 2

These instructions are written in accordance with the installation guidelines of NFPA 72, National Fire Alarm Code, and CAN/ULC-S524, The Installation of Fire Alarm Systems.

DETECTOR PLACEMENT

Although no specific spacings have been allocated for the detectors used for the 0 to 300 ft/min clean air velocity application, use 30 foot center spacing (900 sq ft) from NFPA Standard 72 Chapter 5 and CAN/ULC-S524, if practical, as a guide or starting point for a detector installation layout. This spacing, however, is based on ideal conditions — smooth ceiling, no air movement, and no physical obstructions. In some applications, therefore, considerably less area is protected adequately by each smoke detector. This is why it is mandatory to closely follow the installation drawings. In all installations (except in special circumstances, such as in computer room underfloors where the velocity may be between 300 and 1200 ft/min) the detector should be located on the ceiling, a minimum of 6 inches from a side wall, or on a wall, 6 inches from the ceiling.

Should questions arise regarding detector placement, drawings provided or approved by Siemens Industry, Inc., or by its authorized distributors should be followed. This is extremely important! The detector placements shown on these drawings have been chosen after a careful evaluation

of all facets of the area being protected. Such factors as air currents, temperature, humidity, pressure, and the nature of the load have been carefully considered. Especially noted have been the room or area configuration and the type of ceiling (sloped or flat, smooth or beamed). Siemens Industry, Inc.'s extensive experience in the design of the system assures the optimum detector placement and is reflected in these drawings. Sound engineering judgment by qualified personnel must prevail.

TO AVOID NUISANCE ALARMS:

DO NOT locate the DI-3, DI-3H, or DI-3IS detectors where excessive smoke concentrations exist under normal conditions or in areas of prolonged high relative humidity where condensation will occur.

DO NOT locate the DI-3, DI-3H, or DI-3IS detectors adjacent to an oil burner, kitchen, or garage where exhaust fumes could trigger an alarm. Other causes of false alarms are dust accumulation, high wind velocity, heavy concentrations of steam, heavy pipe or cigar smoke, and certain aerosol sprays.

DO NOT locate the DI-A3 or DI-A3H detectors in an area of prolonged high relative humidity when condensation will occur or adjacent to oil burners or in garages, where exhaust fumes could trigger an alarm.

AIR CURRENTS

Before a detector can sense a fire, the products of combustion or smoke must travel from the fire to the detector. Since their travel is especially influenced by air currents, the movement of air must be considered in the design of the system. While combustion products tend to rise, drafts from hallways, air diffusers, fans, etc., may aid or hinder the travel of combustion products to the detector. When positioning a detector at a particular location, consideration must be given to windows and doors, both open and closed, and to influencing air movement. A detector should never be installed in the air stream of a room air supply diffuser. It may be advantageous to position a detector closer to an air return.

The distance that products of combustion or smoke travel from a fire to the detector is not usually the shortest linear route. Combustion products or smoke usually rise to the ceiling, then spread out. With average ceiling height (8 to 10 feet), this will not be an abnormal factor. Height should be taken into account, however, for high ceilings such as in churches, warehouses, auditoriums, etc.

SPECIAL CEILING CONSTRUCTION FACTORS

Ceiling obstructions can change the natural movement of air and combustion products. Depending on the direction of smoke travel, joists and beams can slow the movement of heated air and smoke, while pockets between them can contain a reduced level of smoke. Take obstructions created by girders, joists, beams, air conditioning ducts, or architectural design into consideration when determining area protection. Refer to the Initiating Devices chapter of NFPA Standard 72 for Location and Spacing requirements for specific types of construction; e.g. beam, suspended, level, sloped and peaked ceilings.

TEMPERATURE AND HUMIDITY

The temperature range for Models DI-3, DI-3H, DI-3IS, DI-A3, and DI-A3H is 32°F (0°C) to 100°F (37.8°C). The four models can each be used in environments where the humidity does not exceed 93% (non-condensating).

PRESSURE

Normal changes of atmospheric pressure due to changes in weather have a negligible effect on detector sensitivity. However, the lower air pressure at higher altitudes does have some effect on the sensitivity of ionization type detectors. Refer to the following table.

APPLICATIONS

Model	Velocity Rand (ft/min)	Altitude Rande (feet)	Application
DI-3	0-300	0-4000	Open area
DI-3H	0-300	3000-8000	Open area
DI-3IS	0-3000	0-4000	Open area
DI-A3	0-1200	0-4000	Open area/Computer facilities/Air duct spots
DI-A3H	300-1200	3000-8000	Air duct spots only

SPECIAL NOTE - HIGH STOCKPILING

In general, detector placement for high stockpiling requires closer spacing, depending on the nature of the stock, its stored height, and the height of the building. Newer technologies recommend additional detector locations at tiered, lower levels. Detector placement for this type hazard requires a judgment factor that can only be provided by experienced, qualified personnel.

DI-3IS ONLY—Use in hazardous atmospheres. The DI-3IS is approved by Factory Mutual to protect areas identified as Class I, Division 1, Groups A, B, C, and D. The intrinsically safe operation requires the use of a diode shunt barrier for System 3 applications or a DC Isolator for MXL CZM-1/-1B6 applications. For System 3 applications refer to the *Model 515-180238 Installation Instructions*, P/N 315-091465. For MXL CZM-1/-1B6 applications, refer to the *CZM-1 Installation Instructions*, P/N 315-090725 or the *CZM-1B6 Installation Instructions*, P/N 315-095355, as applicable.

DETECTOR WIRING

Siemens Industry, Inc., detectors should be interconnected as shown in Figure 1 and wired to the control panel by following the Wiring Connection drawing installed on the inside face of each control panel cover. Duplicate wiring information is also contained in the Installation, Operation, and Maintenance manual provided with every control panel. Note should be made of any limitations on the number of detectors permitted on each circuit. Quantities may vary, based on the specific type of response designed into the system (fan shutdown, door closing, external relay tie-in, extinguishing system discharge, etc.).

DETECTOR MOUNTING

The detector is provided with a separate base which attaches to a standard 4 inch square, 4 inch octagonal, or single gang outlet electrical box. The depth of the box is determined by the National Electrical Code for the number and size of the conductors used.

TO MOUNT:

- Route all wires outward from outlet box.
- When the alarm LED viewing is critical, position the LED mark in the base in the intended direction. (See Figure 2.)
- Mount base to outlet box and route wires through the hole in the center of the base. Make connections directly to the base terminals. Refer to Figure 1 for details.

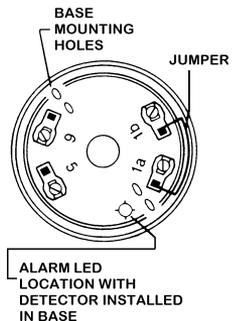


Figure 2

- After all bases are installed, including the end-of-line device, check loop continuity. (Refer to system operation manual for procedure.) To make the continuity check, a jumper is furnished in every base (between terminals 1a and 1b) to complete the loop (See Figure 2). An open circuit condition exists until the jumper or detector is installed in the base.

- If loop continuity is acceptable, remove jumper at each detector location and proceed with detector head installation.

NOTE: To insure proper installation of the detector head into the base, be sure wires are properly dressed at installation.

- Position all wires flat against the base.
- Take up all slack in the outlet box.
- Route wires away from connector terminals.

CAUTION
Detection Device Storage

DO NOT install this detection device until all construction is completed.
DO NOT store this detection device where it can be contaminated by dirt, dust, or humidity.

INSTALLATION OF DETECTOR HEAD

- Align notch in detector cover to raised surface on outer ring of base (See Figure 3).

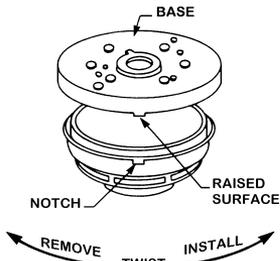


Figure 3

- Push detector head into base and rotate clockwise to engage electrical connections. The detector will automatically stop and lock into place.
- To remove, push detector head up into the base while rotating the detector head counterclockwise. Continue to rotate counterclockwise until stop is reached. Then pull downward to disengage from base.

DETECTOR SENSITIVITY

The normal sensitivity range of each Siemens Industry, Inc., detector can be found on the back of the detector. In general, any condition which causes the detector sensitivity to decrease to a value outside its normal sensitivity range is approaching alarm and indicates that (a) a detector requires cleaning, (b) a change in ambient or environmental conditions has occurred, or (c) the detector is faulty.

The DI-3, DI-3H, and DI-3IS sensitivities are field adjustable. Access to the sensitivity adjustment potentiometer is through a hole located on the detector head face. The DI-3, DI-3H, and DI-3IS sensitivity is adjustable ± 0.50 VDC of the nominal factory setting. Adjustment towards " + " increases detector sensitivity. Adjustment towards " - " decreases detector sensitivity. Refer to Figure 4. The sensitivity of the DI-A3 and DI-A3H detectors is factory set and is not field adjustable.

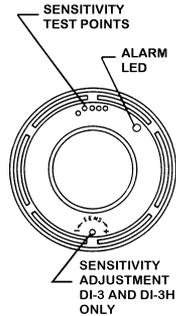


Figure 4

TESTING

Testing should be performed by qualified personnel. To ensure that the DI-3, DI-3H, DI-3IS, DI-A3, and DI-A3H are within factory-specified sensitivity limits, a sensitivity jack test is provided to directly measure the sensitivity of the detector in its mounted position while powered by the system. Access to the sensitivity test jack is obtained through five holes located on the front face of the detector (See Figure 4). Use sensitivity tester Model TM-13 to test. Refer to the sensitivity test **OPERATION MANUAL** for Model TM-13, P/N 315-086641. Test frequency should be in accordance with installation and test guidelines of NFPA Standard 72.

NOTE: To test for GO/NO GO operation, use **SIEMENS Test Gas**, P/N 315-282747, following the instructions on the label.

MAINTENANCE

Dust accumulations may cause a shift in detector sensitivity. For this reason, it is important that each unit be given a periodic check and a light cleaning if necessary. The minimum test schedule may be found in the current edition of NFPA 72, Chapter 7 for installations in the U.S., and CAN/ULC-S537, The Verification of Fire Alarm Systems, for installations in Canada. Cleaning program intervals should be geared to the individual detector environment.

Clean a detector by lightly brushing all open slots. You can also clean a detector with the suction of a vacuum cleaner, but the suction may cause the detector to alarm; therefore, it is recommended that power be disconnected during cleaning.

The detectors are not designed for thorough cleaning in the field. When the detector sensitivity falls outside the acceptable limits for that detector, and cannot be brought back with sensitivity adjustment (where applicable), replace the detector head with an acceptable head. Send the removed head to the nearest Siemens Industry, Inc. Authorized Service Center for servicing.

CAUTION: UNDER NO CIRCUMSTANCES IS THE DETECTOR HEAD TO BE DISASSEMBLED. NO FIELD REPAIRS SHOULD BE ATTEMPTED. THE DETECTORS ARE FACTORY REPAIRABLE ONLY.

**NONINTRINSICALLY SAFE
MODELS DI-3, DI-3H, DI-A3, AND DI-A3H
COMPATIBLE CONTROL EQUIPMENT**

EQUIPMENT COMPATIBILITY IDENTIFIER	INSTALLATION/WIRING INSTRUCTIONS
CP-2ER	P/N 315-093523-6
CP-35 (System 3)	P/N 315-084902-20
* CZM-1 (MXL/MXL-IQ System)	P/N 315-090725-8
* CZM-1B6 (MXL/MXL-IQ System)	P/N 315-095355-5
CZM-4 (MXL/MXL-IQ System)	P/N 315-090726-8
PXL	P/N 315-094131-4
PZC-4D (PXL)	P/N 315-094164-2
PZE-4B (PXL)	P/N 315-094065-4
* SXL	P/N 315-092419-10
SXL-EX	P/N 315-095997-5
* SZE-4R (SXL)	P/N 315-092430-4
SZE-4X (SXL-EX)	P/N 315-096018-4
SZE-8AX (SXL-EX)	P/N 315-096022-4
ZNX-3 (XL3 System)	P/N 315-088562B
ZU-35 (System 3)	P/N 315-083222-14

The detector model number is the compatibility identifier.

- * **Control Equipment does not support remote accessories; e.g. lamps or relays.**

**INTRINSICALLY SAFE (FM APPROVED ONLY)
MODEL DI-IS ONLY**

EQUIPMENT COMPATIBILITY IDENTIFIER	INSTALLATION/WIRING INSTRUCTIONS
ZS-30 with Diode Shunt Barrier	P/N 315-024056-16
CZM-1 with D.C. Isolator	P/N 315-090725-8
CZM-1B6 with D.C. Isolator	P/N 315-095355-5

The detector model number is the compatibility identifier.