

D250A/D253/D261AW/D280A/D290 Series



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Installation Instructions

12 VDC/24 VDC

Smoke/Heat Detector
Bases

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Notice

Use these instructions when installing the D253/D261AW/D280A Series 12 VDC/24 VDC Smoke Detector Bases. These bases are compatible with the Bosch 2000, 7000, 8000, and 9000 Series Fire Alarm Control Panels (FACP).

Devices covered by these instructions have two components: a detector base and a detector head. All devices have an LED indicator.

Install, test, and maintain the D253/D261AW/D280A Series according to these instructions, NFPA 72, local codes, and the authority having jurisdiction (AHJ).



Follow the procedures in these instructions to avoid personal injury or damage to the equipment. Failure to follow these instructions can result in the detector not initiating an alarm condition.

Bosch Security Systems, Inc. (Bosch) is not responsible for improperly installed, tested, or maintained D253/D261AW/D280A Series Smoke Detector Bases.

1.0 Mounting Box

The diameter of each D250A, D253, D261AW, D280A, and D290 Smoke Detector Base is 6 in. (15.2 cm). These bases fit on standard 4 in. (10.2 cm) octagonal mounting boxes, and 4 in. (10.2 cm) square mounting boxes.

2.0 Installation Standards



Seal all field wire openings with a nonflammable sealing compound such as 3M™ Weatherban™ Acrylic Sealant 606-NF.



Mount the detectors on walls between 4 in. and 12 in. (10.2 cm and 30.5 cm) from the ceiling or on the ceiling at least 4 in. (10.2 cm) from the wall.

Ensure the installations conform to the specifications listed in *Table 2* on page 7.

The D253/D261AW/D280A Series determines the alarm current. Refer to *Table 3* on page 7 for more information.

Wire the detectors as shown in *Figure 1* through *Figure 4* on pages 3 through 5.

3.0 Testing Instructions

Test the D253/D261AW/D280A Series at installation and every two years thereafter according to NFPA 72. Test using the D1000 Calibrated Smoke Detector Tester or the D1001 Magnetic Calibrated Test Pole.

4.0 12 VDC Smoke Detector Bases

4.1 Installing 12 VDC Smoke Detectors

When using the 12 VDC smoke detectors with Bosch control panels, you can power the detectors from the control panel's auxiliary power supply. The Alarm LED, located on the D265AW 12 VDC/24 VDC Smoke Detector Head, flashes to indicate power to the detector. This LED lights steadily to indicate an alarm condition.

4.2 12 VDC Two-Wire Operation Wiring

Connect the D261AW wiring as shown in *Figure 1* on page 3.



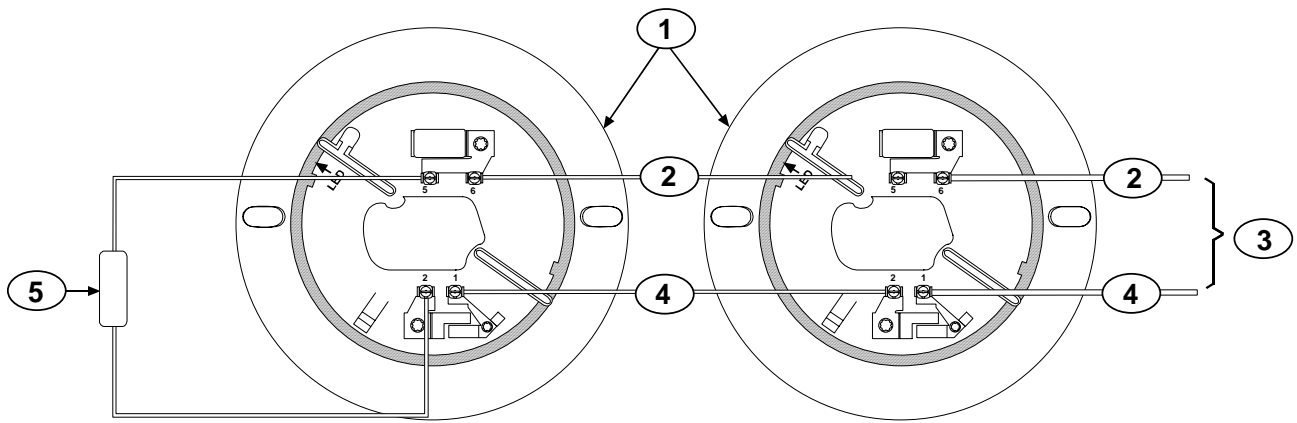
For proper detector system supervision, do not loop wires around the screw terminals. Cut the wire and make individual in and out connections.

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Figure 1: D261AW Smoke Detector Base Wiring



- | | |
|---|---------------------------------|
| 1 - D261AW Smoke Detector Base | 4- Initiating loop positive (+) |
| 2 - Initiating loop negative (-) | 5 - End-of-line resistor |
| 3 - From the previous smoke detector base or FACP | |

When using the D125B Powered Loop Interface Module, there are a maximum number of 40 smoke detectors per loop. You can install up to five smoke detectors on the D2000 Series Control Panel. Refer to the appropriate detector manufacturer's installation guide for EOL resistor values.



The D261AW Detector Base does not have Terminals 3 and 4.

5.0 24 VDC Smoke Detector Bases

5.1 Installing the 24 VDC Smoke Detectors

The Alarm LEDs are located on the D281A, D282A, and D283A 24 VDC Smoke Detector Heads. These LEDs flash to indicate power to the detector and light steadily to indicate an alarm condition.



Do not loop wires around the terminals. Cut the wire and make individual in and out connections.

5.2 24 VDC Two-Wire Operation Wiring

Connect the D280A wiring as shown in *Figure 2* on page 4.

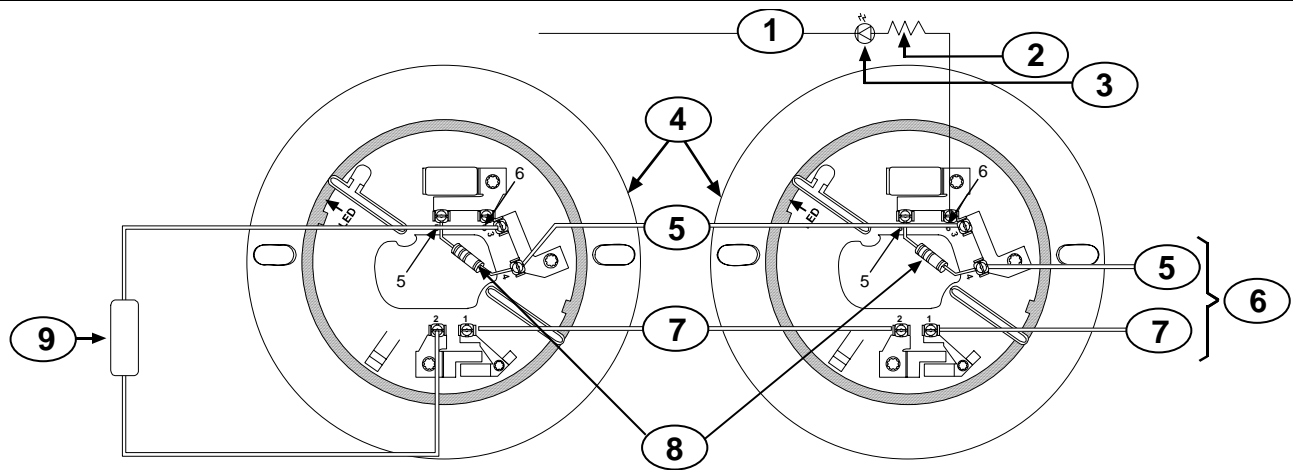


The current for the optional LED must be limited to 20 mA or the detector might be damaged or might not initiate alarms.

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Figure 2: D280A Smoke Detector Base Wiring



- | | |
|---|--|
| 1 - To control panel power supply (-) | 6- From the previous smoke detector base or FACP |
| 2 - 1.5 kΩ, ½ W current-limiting resistor | 7 - Initiating loop positive (+) |
| 3 - Optional LED | 8 - Current limiting resistor* |
| 4 - D280A Smoke Detector Base | 9 - EOL resistor |
| 5 - Initiating loop negative (-) | |

*The current-limiting resistor is only an example. Not all of the annunciators have in-line resistance. The annunciator must be current-limited to 20 mA at 24 VDC maximum.

5.3 24 VDC Four-Wire Operation Wiring

Generally, four-wire detectors are connected to an un-powered detection loop. The D275 Power Supervision Relay supervises the power to the detectors. Connect the detector loop to an appropriate initiation loop when using a D9412GV2, D9412G, D9412, D7412GV2, D7412G, D7412, D7212, D8112, D9112, or D9124 FACP.

Connect the D290 wiring (refer to *Figure 3* on page 5).

6.0 12 VDC/24 VDC Heat Detector Bases



Do not loop wires around the terminals. Cut the wire and make individual in and out connections.

The D250A is a non-current limited, non-latching detector base without an LED indicator. This base is used in 12 VDC and 24 VDC modes, and in two-wire applications. Connect the D290 wiring (refer to *Figure 4* on page 5).

The D253 is a 24 VDC, two-wire latching detector base with an LED indicator.

The D254 and D255 12 VDC/24 VDC Fixed Temperature Heat Detector heads are compatible with the D250A and D253 Detector Bases.

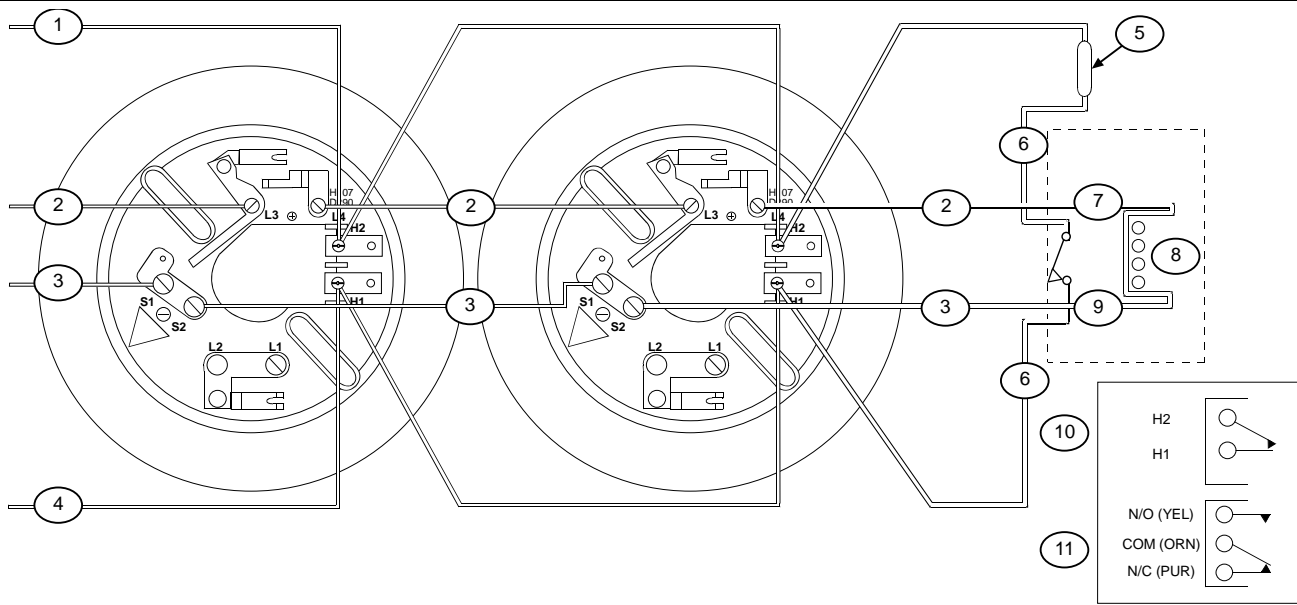
The D256A and D257 24 VDC Fixed Temperature Head Detector heads are compatible with the D250A and D253 Detector Base.

Refer to *Table 1* on page 6 for smoke detector and base listings.

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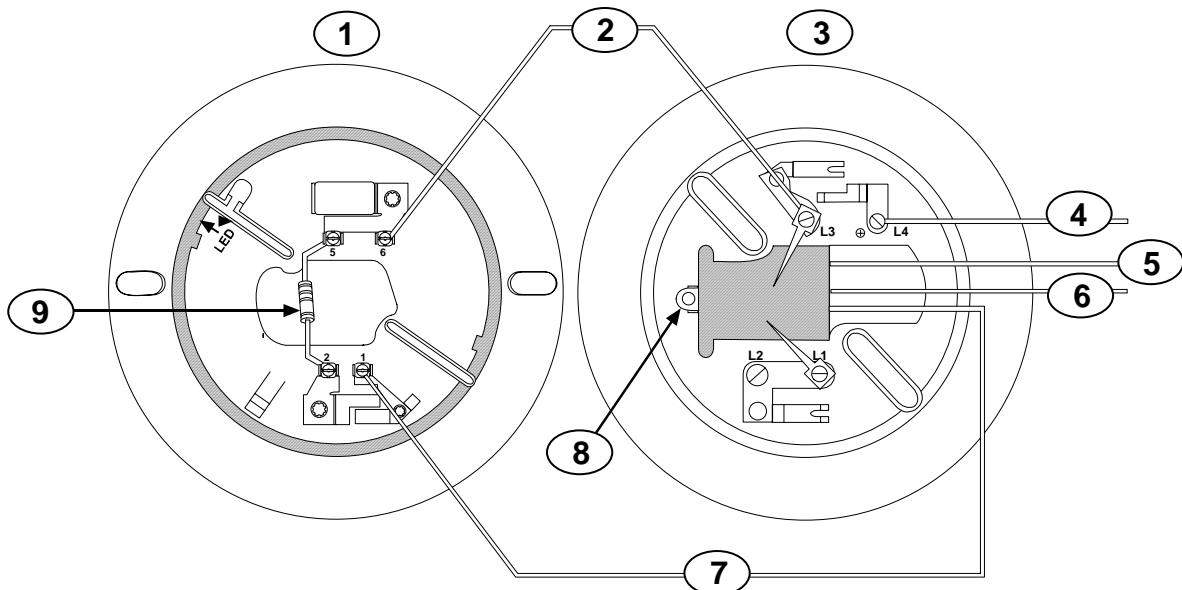


Figure 3: D290 Smoke Detector Base Wiring



- | | | |
|---|--------------------|----------------------------------|
| 1 - Initiating loop positive (+) | 5- EOL resistor | 9 - Black wire |
| 2 - 24 VDC positive (+) from UL Listed supply | 6 - Blue wire | 10 - Initiating form "A" contact |
| 3 - 24 VDC negative (-) from UL Listed supply | 7 - Yellow wire | 11 - Auxiliary form "C" contact |
| 4 - Initiating loop negative (-) | 8 - D275 EOL Relay | |

Figure 4: D250A Heat Detector Base and D253 Heat Detector Base Wiring



- | | | |
|-------------------------------|---|---------------------------|
| 1 - D250A Smoke Detector Base | 4- 24 VDC heat detector circuit (red lead) | 7 - 24 VDC (-) black lead |
| 2 - 24 VDC (+) red lead | 5 - 24 VDC (-) heat detector circuit (black lead) | 8 - Latching red LED |
| 3 - D253 Heat Detector Base | 6 - To remote annunciator/LED (blue lead) | 9 - EOL resistor |

Table 1: Smoke Detector and Base Listings

| Model | Application | Voltage | Wiring | Base Diameter | Features | Color |
|--------|------------------------------|---------------|-----------|-----------------|---|------------|
| D261W | Base | 12 VDC/24 VDC | Two-wire | 6 in. (15.2 cm) | N/A | White |
| D261AW | Base | 12 VDC/24 VDC | Two-wire | 6 in. (15.2 cm) | LED latches steady on alarm | White |
| D280A | Base | 24 VDC | Two-wire | 6 in. (15.2 cm) | N/A | Bone white |
| D290 | Base | 24 VDC | Four-wire | 6 in. (15.2 cm) | N/A | White |
| D250A | Heat base | 12 VDC/24 VDC | Two-wire | 6 in. (15.2 cm) | N/A | Bone white |
| D253 | Heat base | 24 VDC | Two-wire | 6 in. (15.2 cm) | LED latches for power, latches steady on alarm | Bone white |
| D254 | Heat head | 12 VDC/24 VDC | N/A | N/A | Fixed +135°F (+57°C) | Bone white |
| D255 | Heat head | 12 VDC/24 VDC | N/A | N/A | Fixed +190°F (+88°C) | Bone white |
| D256A | Heat head | 24 VDC | N/A | N/A | Fixed Rate-of-rise +135°F (+57°C) | Bone white |
| D257A | Heat head | 24 VDC | N/A | N/A | Fixed Rate-of-rise +190°F (+88°C) | Bone white |
| D265AW | Photoelectric smoke head | 12 VDC/24 VDC | N/A | N/A | LED latches for power, latches steady on alarm | White |
| D282A | Photoelectric smoke head | 24 VDC | N/A | N/A | LED latches for power, latches steady on alarm | Bone white |
| D281A | Ionization head | 24 VDC | N/A | N/A | LED latches for power, latches steady on alarm | Bone white |
| D283A | Photoelectric smoke head | 24 VDC | N/A | N/A | LED latches for power, latches steady with fixed +135°F (+57°C) heat detector | Bone white |
| D275 | EOL power supervision module | 12 VDC/24 VDC | N/A | N/A | N/A | N/A |

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7.0 Specifications

Table 2: Smoke Detector Head Specifications

| Detector Head | D281A | D282A/D283A | D265AW | D254/D255 | D256A/D257A |
|---|---|---|---|--|--|
| Detector Type | Ionization | Photo (D282A)/P Photo with Heat (D283A) | Photoelectric | Fixed Temp/Rate- of-Rise Heat Detector | Fixed Temp/Rate-of- Rise Heat Detector |
| Fixed Temp/Rate- of-rise | | | | D254: +135°F (+57°C) D255: +190°F (+88°C) | D256A: +135°F (+57°C) D257A: +190°F (+88°C) |
| Working Voltage (two-wire) | 15.0 VDC to 33.0 VDC | 15.0 VDC to 33.0 VDC | 8.0 VDC to 35.0 VDC | | 15.0 VDC to 33.0 VDC |
| Rated Voltage (four-wire) | 17.7 VDC to 30.0 VDC | 17.7 VDC to 30.0 VDC | 8.7 VDC to 35.0 VDC | | 17.7 VDC to 30.0 VDC |
| Maximum Alarm Current* | The alarm current is determined by the detector base. Refer to <i>Table 2</i> for more information. | | | | |
| Surge Current | 200 µA | 160 µA | 200 µA | | 160 µA |
| Standby Current | 40 µA | 45 µA | 38 µA at 12 VDC / 55 µA at 24 VDC | | 40 µA |
| Heat Element Rating | N/A | +135°F (+57°C) for the D283A | N/A | D254: +135°F (+57°C) D255: +190°F (+88°C) | D256A: +135°F (+57°C) D257A: +190°F (+88°C) |
| Compatibility Identifier | HD3 | HD3 | HD3 | | |
| UL Calibrated Magnetic Test | Yes | Yes | Yes | | |
| Fire Alarm Control Panel | | | | | |
| D2112 | N/A | N/A | N/A | N/A | N/A |
| D2212 | N/A | N/A | N/A | N/A | N/A |
| D7212 with D125B | 40 detectors per loop | 40 detectors per loop | 40 detectors per loop | | |
| D9112, D9412GV2, D9412G, D9412, D7412GV2, D7412G, D7412 with D125B | 40 detectors per loop | 40 detectors per loop | 40 detectors per loop | | |

Table 3: Detector Base Specifications

| Base | Diameter | Wiring | Alarm Current | Operating Voltage |
|--------|-----------------|-----------|---------------|----------------------|
| D250A | 6 in. (15.2 cm) | Two-wire | N/A | 8.0 VDC to 36.3 VDC |
| D253 | 6 in. (15.2 cm) | Two-wire | 54 mA maximum | 15.0 VDC to 36.3 VDC |
| D261AW | 6 in. (15.2 cm) | Two-wire | N/A | 8.0 VDC to 36.3 VDC |
| D280A | 6 in. (15.2 cm) | Two-wire | 70 mA maximum | 15.0 VDC to 36.3 VDC |
| D290 | 6 in. (15.2 cm) | Four-wire | 58 mA maximum | 15.0 VDC to 36.3 VDC |

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