D296 Long-range beam smoke detector 24V

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Invented for life

- Operates over distances between 30 ft (9 m) and 350 ft (107 m)
- Six levels of switch-selectable sensitivity
- Built-in alignment sights and tamper protection
- Automatic range adjustment, signal synchronization, and contamination adjustment
- Remote indicator plate annunciates detector status and provides test points for voltage monitoring

The D296 Long-range beam smoke detector (24V) is used in clear open structures. Arenas, atriums, auditoriums, ballrooms, churches, factories, museums, and warehouses are typical areas. Each detector consists of a transmitter, a receiver, and a remote indicator plate. The transmitter and receiver typically mount on the ceiling or high on walls or columns. They provide an effective and unobtrusive means of supervising public areas for fire protection.
The remote indicator plate, included with the detector, provides a convenient means of verifying detector status. Install it anywhere within 500 ft. (152 m) of the beam receiver using 18 AWG (ISO 0.75 mm$^{2)}$ wire. Three LEDs indicate normal, trouble, and alarm conditions, and test points monitor the detector circuit.

Functions

Aim Mode
When the cover is removed from the receiver, the receiver goes into aim mode. When the cover is removed from the transmitter, the transmitter stops transmitting. Pressing the Aim Mode button on the transmitter allows transmission while the cover is off. For fine tuning which requires a measurable voltage at the receiver, remove both covers and enable transmission.

Alarm Operation
The transmitter emits a pulsed infrared beam. The receiver compares the intensity of the beam over a period of time with an alarm threshold. Select one of six levels of sensitivity for the alarm threshold through a switch on the receiver.
If signal strength is below the preset threshold for longer than the alarm period, the receiver signals an alarm.

Signal Loss Compensation
The receiver automatically compensates for the gradual loss of signal due to dust and dirt build-up on the cover. The receiver measures the intensity of the pulsed infrared beam emitted by the transmitter over a period of time. The receiver compares this data with a preset trouble threshold. The receiver sends a trouble signal to the control panel when:

- 50% of the signal is lost or
- the signal gains 20%

When the dust and dirt build-up is cleaned or the blockage is removed, the detector automatically resets.

Tamper Detection
If the covers to the transmitter or receiver are removed, the detector sends a trouble signal to the panel.

Trouble Detection
The receiver compares the transmitter's infrared beam intensity over a period of time with a preset trouble threshold. When an object blocks the beam, ≥90% of the signal can be lost for more than 20 seconds. If this condition happens, the receiver sends a trouble signal to the control panel.

Certifications and approvals

Region	Certification	
USA	UL	UROX: Smoke - Automatic Fire Detectors (UL268 and A), UROX7: Smoke - Automatic Fire Detectors Certified for Canada (ULC529)
	FM	see the FM Approval Guide
	CSFM	see our website
Hong Kong	HKFSD	J-005/C/024

Installation/configuration notes

Mounting considerations
The transmitter and receiver mount on standard 3.5-inch or 4-inch square or octagonal back boxes or European Beza boxes. The indicator plate mounts on a standard single-gang back box.
The distance between the transmitter and receiver can range from 30 ft (9 m) to 350 ft (107 m). When using 18 AWG (ISO 0.75 mm²) wire within conduit, the indicator plate must be within 500 ft (152 m) of the receiver.
Mount the detectors directly to the ceiling or to side walls. Do not mount the units so that the beam runs closer than 4 in. (10.2 cm) to the intersection of the wall and the ceiling. Otherwise, place and space the detectors according to NFPA 72.

Notice
The beam path should be clear of moving objects. Avoid areas subject to normal smoke concentrations such as kitchens and garages. Do not install units where normal ambient temperatures are below -22°F (-30°C) or above +130°F (+54°C).

Spacing between systems
For adequate coverage, the lateral spacing between adjacent detector systems must not exceed 60 ft (18 m).

Wiring
System wire terminals accept 18 AWG to 12 AWG (ISO 0.75 mm² to 4 mm²) solid wires.

Parts included

Quantity	Component
1	D296 Transmitter
1	D296 Receiver
1	D344-RL Remote indicator plate
1	D308 Field test kit
1	D1005 Test cable
1	Hardware pack
1	Literature pack

Technical specifications

Electrical

Alarm Current (Receiver)	70 mA maximum at 24 VDC
Standby Current	Receiver: 45 mA at 24 VDC Transmitter: 20 mA at 24 VDC
Operating Voltage	18.0 VDC to 32.0 VDC
Alarm contacts	Normally Open (N/O) contacts rated 1 A, 60 VDC maximum for DC resistive loads, do **not** use with capacitive or inductive loads
Auxiliary alarm contacts	Normally Open (N/O) contacts rated 1 A, 60 VDC maximum for DC resistive loads, do **not** use with capacitive or inductive loads
Trouble contacts	Normally Closed (N/C) contacts rated 1 A, 60 VDC maximum for DC resistive loads, do **not** use with capacitive or inductive loads

Environmental

Environment	Indoor, dry
Relative humidity	0% to 95%, non-condensing
Temperature (storage and operating)	-22°F to +130°F (-30°C to +54°C) *For UL Listed installations, the range is +32°F to +130°F (0°C to +54°C)*

Mechanical

Dimensions	7 in. x 5.5 in. x 5.5 in. (17.8 cm x 14 cm x 14 cm)
Mounting	Mount to 3.5 in. or 4-in. square or octagonal electrical boxes or European Beza boxes
Adjustability	Internally adjustable optics for ±90° horizontal, and ±10° vertical adjustment

Sensitivity	Field selectable for 20%, 30%, 40%, 50%, 60%, or 70% beam obscuration
System Signaling	Conventional four-wire system, do **not** use with systems incorporating an alarm verification feature
Signal Delay	Fire: Selectable 30 sec or 5 sec Trouble: 20 ± 2 sec
Spacing (distance between systems)	60 ft. (18 m) maximum, spacing confirmed by Underwriters Laboratories (UL) testing
Transmission range	30 ft. (9 m) to 350 ft. (107 m)
Tamper	Receiver: Access door tamper switch in series with trouble contacts. Transmitter: When the cover is removed, the cover tamper switch interrupts transmission

Ordering information

D296 Long-range beam smoke detector 24V
The D296 provides an effective and unobtrusive means of supervising public areas for fire protection. It consists of a transmitter and receiver that typically mount on the ceiling or high on walls or columns. Typically, a remote indicator plate is mounted at eye level.
Order number **D296**

Accessories

D344-RL Remote Indicator Plate
Use with a D340/D341/D342 or D343 (legacy product) Duct smoke housing or D296/D297 Long-range beam smoke detector.
Order number **D344-RL**

D344-RT Remote Test/Indicator Plate
Use with a D340/D341/D342 or D343 (legacy product) Duct smoke housing or D296/D297 Long-range beam smoke detector.
Order number **D344-RT**

D308 Field test kit for D296/D297
Allows testing the calibration of the D296 and D297 Beam Smoke Detectors
Order number **D308**

D1005 Test cable, 3ft
Connects a digital voltmeter to the detector's calibration pin for verifying that the detector is within its calibration range
Order number **D1005**

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