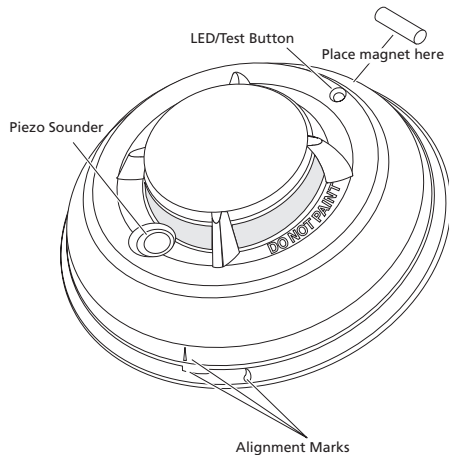


DSC® FSA-410 Series Smoke Detector

Installation and Operating Instructions

Read this instruction sheet thoroughly before installation and use of the FSA-410 4-Wire Smoke Detector



Introduction

The FSA-410 is a 4-wire photoelectric smoke detector with optional: fixed temperature heat detector, internal piezoelectric alarm, auxiliary form C relay, and/or remote LED output. Three versions are available: US UL, Canadian ULC and International (EU).

Operation

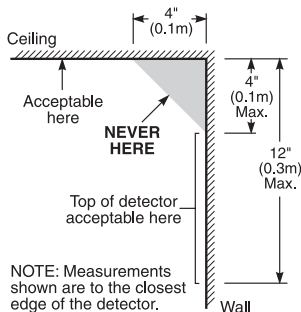
Approximately every 7 to 8 seconds the unit tests for a smoke or heat alarm condition. During this sequence the unit also performs self diagnostics, and checks for faults. During normal operation the LED will flash every 50 seconds and the sounder will not sound.

Smoke Alarm

The smoke detector has a nominal fixed alarm sensitivity (refer to the *Specifications* on the last page) and it will go into alarm when the signal level exceeds the 'alarm' threshold and activate the alarm relay to send the alarm signal to the control panel. During an alarm the LED will flash 1/second and the sounder will sound the the evacuation temporal pattern.

Installer Instructions

1. Smoke Detector Placement



On smooth ceilings, detectors may be spaced 9.1M (30 feet) apart as a guide. Other spacing may be required depending on ceiling height, air movement, the presence of joists, uninsulated ceilings, etc. Consult National Fire Alarm Code NFPA 72, Chapter 11 or other appropriate national standards for installation recommendations.

Do **NOT** locate smoke detectors at the top of peaked or gabled ceilings; the dead air space in these locations may prevent the unit from detecting smoke. Avoid areas with turbulent air flow, such as near doors, fans or windows. Rapid air movement around the detector may prevent smoke from entering the unit.

Do **NOT** locate detectors in areas of high humidity.

Remote Alarm - Interconnection

Multiple detectors (with sounders) can be connected using the PRM-4W Polarity Reversal Module. When a fire alarm occurs, the panel will signal the PRM-4W to reverse the polarity of the 4-wire loop. This will activate the sounders of all units connected on the loop. Refer to the PRM-2W/4W Installation Instructions for installation details.

Smoke - Drift Compensation

The detector automatically compensates for long-term environmentally induced changes to maintain a constant smoke sensitivity. When the drift compensation has reached its high or low limit of adjustment, the detector will go into the trouble state.

Heat Alarm

The heat detector will go into alarm when the heat signal level exceeds the heat alarm threshold (135°F/57°C); and send the alarm signal to the control panel. During an alarm the LED will flash 1/second and the sounder will sound the evacuation temporal pattern.

Alarm Indications

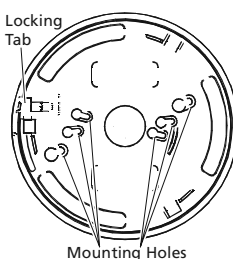
Condition	LED	Sounder	Relay
Normal/Sensitivity in Production Range	Flash 1/50s	OFF	Deactivated
Alarm Smoke/Heat	Flash 1/1s	Beep	Activated
Alarm Restore	Flash 1/1s	Beep	Activated
Remote Alarm	Flash 1/50s	Beep	Deactivated
Low Power Trouble	OFF	OFF	Deactivated
Other Fault / Trouble	OFF	CHIRP 1/50s	Deactivated
Test Switch - Failed	OFF	CHIRP 1/50s	Deactivated
Test Switch - Pass	Flash 1/1s	Beep	Activated

Do **NOT** locate detectors in areas where the temperature rises above 38°C (100°F) or falls below 5°C (41°F).

Install Smoke detectors in accordance with NFPA 72, Chapter 11.

"Smoke detectors shall be installed outside of each sleeping area in the immediate vicinity of the bedrooms and on each additional story of the family living unit, including basements and excluding crawl spaces and unfinished attics. In new construction, a smoke detector also shall be installed in each sleeping room".

2. Mount Smoke Detector Backplate



Mount backplate on standard 4" octagonal electrical box using the screws provided.

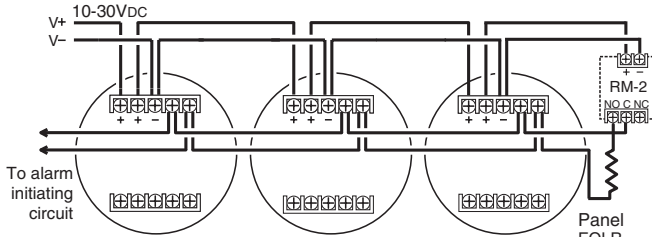
NOTE: Power supply must be supplied from a UL/IULC Listed alarm control unit. Install wiring in accordance with the appropriate national and local electrical codes.

CAUTION: The dust cover protects the unit when not in service. Remove the dust cover before use.

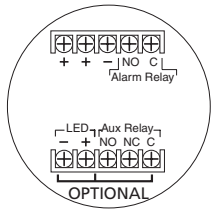
3. Wiring

Refer to the wiring diagrams in this installation sheet and those provided in the Installation Manual of the alarm control panel being used with the unit.

Before connecting the unit, prepare the wires from the electrical box for connection; Do not use frayed or bent wire.



CAUTION: Do NOT use looped wire under terminals for system supervision. Break the wire run, to provide supervision of connections.

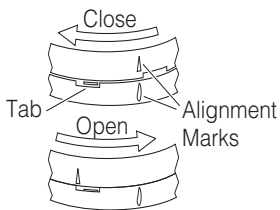


NOTE: Optional Remote LED must have a series resistor. Please see specifications.

When wiring is completed, inspect the wiring and correct any errors before applying power to the unit. When the wiring has been thoroughly reviewed, neatly insert the wires into the electrical box and secure the unit to the mounting plate.

4. Mounting

Detector Installation:



Position the detector on to the base plate using the detector and base plate alignment marks. Press the detector gently in place while rotating the detector clockwise until the detector snaps into place. Remove the side tab from the locking tab to lock in place (optional).

REMOVAL: If the side tab is removed to lock the detector, depress tab with a small flat blade screwdriver and rotate detector counter-clockwise until the alignment marks line up. Remove detector.

5. Test Unit

Initiate test for units without a sounder by placing a magnet near the LED/Test Button for greater than 5 seconds. Initiate test for units with a sounder by pressing the test button for greater than 5 seconds.

Alarm activation is indicated by the LED, the sounder, and the alarm reporting to the control panel. If the smoke detectors are inter-connected using model PRM-4W and a detector is tested, then all detectors will sound. The detector restores to normal when the test button is released or when the magnet is removed.

NOTE: Allow a minimum of 20 seconds between test activations.

NOTE: If the detector is in one of the following states when a test is initiated; it will not enter an alarm state.

1. Compensation trouble.
2. Failure of heat or smoke detector.
3. Other internal faults that could prevent a smoke or heat alarm.

NOTE: Smoke sensitivity of installed detectors can be measured without removal or an alarm being generated using the **FSD-100 Smoke Detector Test Meter**.

Test Unit with FSD-100 Smoke Detector Test Meter

To test the unit using the FSD-100, set the test meter up to read devices as per the instructions supplied with the test instrument. Depress the test button (or place the FSD-100 on the outside edge of the plastics beside the test button to activate the reed switch on units without sounder) on the smoke detector for 1 second and release.

NOTE: If the test button is held for 5 seconds or longer, an alarm will be generated.

Move the test meter over the center of the detector, wait until you hear the test meter beep, remove the unit and the information can be immediately reviewed. Please see the instructions supplied with the FSD-100 Smoke Detector Test Meter for more information.

6. Compensation Reset

Cleaning, replacement of the smoke sensor, or other changes may change the background signal/noise of the detector; this requires the drift compensation be reset. Compensation trouble is one of the faults indicated when the LED indicator is OFF while the sounder is chirping.

1. Remove power from the unit, then press and hold the test button for 30 seconds to power down unit.
2. Power up unit while pressing the test button. The LED will flash; when 5 seconds has elapsed. Release the test button within 1 second after the fifth LED flash.
3. The LED will flash every 8 seconds for 1 minute. When the detector stops flashing test the detector to verify normal operation.

Owners Instructions

Fire Safety In The Home

Most fires occur in the home, and to minimize this danger, it is recommended that a household fire safety audit be conducted and a family escape plan be developed.

Household Fire Safety Audit

1. Are all electrical appliances and outlets in safe condition? Check for frayed cords, overloaded lighting circuits, etc. If you are uncertain about the condition of your electrical appliances or household service, have a professional evaluation.
2. Are all flammable liquids safely stored in closed containers, and in a cool and well ventilated area? Avoid cleaning the unit with flammable liquids.
3. Are hazardous materials such as matches out of the reach of children?
4. Are furnaces and wood burning appliances properly installed, clean, and in good working order? If in doubt, have a professional evaluation.

Family Escape Planning

There is often very little time between the detection of a fire and the time it becomes deadly. Because of this, it is very important that a family escape plan be developed and rehearsed.

- Include every family member when developing the escape plan.
- Study the possible escape routes from each location within the house. Since many fires occur at night, give special attention to the escape routes from sleeping quarters.
- It is essential that escape from a bedroom be possible without opening the interior door. Consider the following when making your escape plans:
 - Ensure that doors and windows that open to the outside are easily opened. Ensure that they are not painted shut and that the locking mechanisms operate smoothly.
 - Develop specific rescue plans if opening the exit or using the exit is too difficult for children, the elderly or handicapped. This plan includes making sure that those who are to perform the rescue can promptly hear the fire warning signal.
 - If the exit is above the ground level, provide an approved fire ladder or rope, as well as training in its use.
 - Keep exits on the ground level clear. Be sure to remove snow from exterior patio doors in the winter and that outdoor furniture or equipment does not block exits.
 - Have a predetermined assembly point where everyone can be accounted for; for example, across the street or at a neighbor's house.
 - Once everyone is out of the house, call the Fire Department.
- A good plan emphasizes a quick escape. Do not investigate first or attempt to fight the fire, and do not attempt to rescue belongings or valuables as this takes up time. Once outside, do not re-enter the house; wait for the Fire Department.
- Write the plan down and rehearse it frequently so that should an emergency ever arise, everyone will know what to do. Revise the plan as conditions change; for example, when there are more or fewer family members in the home or if there are changes to the house.
- Make sure your fire warning system is operational by conducting weekly tests. If you are unsure about system operation, contact your smoke detector installer or dealer.
- DSC recommends that you contact your local Fire Department and request further information on home fire safety and escape planning. If available, have your local fire prevention officer conduct an in-house fire safety inspection.

Testing Your Smoke Detector

Follow the test procedure described here or contact your smoke detector dealer or installer for testing instructions.

DSC recommends that you test the entire alarm system at least once a week to verify the operation of all system functions.

Units with Sounder - Pushbutton switch

To test the smoke detector, press and hold the test button on the front of the unit for 5 seconds minimum, the sounder initiates a clicking noise during this time. When the button is pressed, the unit's alarm will sound and an alarm will be sent to the control panel. When the button is released, the alarm will cease.

Units without Sounder - Magnet activated switch

To test the smoke detector, place a magnet adjacent to the test button on the front of the unit (see Fig. 1) and hold in place for 5 seconds minimum. When the magnet is in place, the internal reed switch will activate and an alarm will be sent to the control panel. When the magnet is removed, the alarm will cease.

Upon completing the functional testing of the smoke detector, check the unit's sensing chamber to ensure proper operation. To test the sensing chamber, wave a lit cotton wick or punk stick around the outside of the unit until a generous amount of smoke enters the sensing chamber or the unit alarms. If the smoke detector does not function properly, call your smoke detector installer or dealer for service.

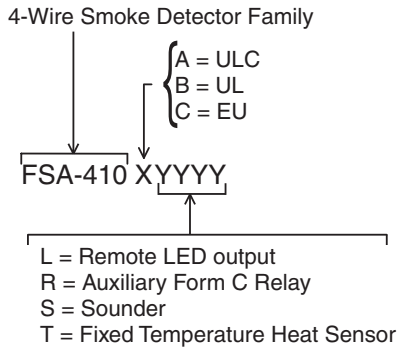
Maintenance

The smoke detector is designed to require minimum maintenance. If the case becomes dusty, vacuum with a small brush attachment. If the case is greasy, wipe the case gently with a soft cloth slightly dampened with soapy water.

Never disassemble the smoke detector; there are no user serviceable parts inside the unit. Never paint the unit. Paint may prevent smoke from entering the unit. If you are planning renovations or repainting, contact your installer and ask that the unit be temporarily removed until work is complete.

If the unit is located in an area where it is exposed to high levels of dust or insects and causes false alarms, it may require service; contact your smoke detector installer or dealer.

Smoke Detector Family



Model	Heat	Sounder	Aux Relay	LED Output	Max. Alarm Current Draw
FSA-410A, FSA-410B, FSA-410C	NO	NO	NO	NO	25mA
FSA-410AT, FSA-410BT, FSA-410CT	YES	NO	NO	NO	25mA
FSA-410AR, FSA-410BR, FSA-410CR	NO	NO	YES	NO	40mA
FSA-410ART, FSA-410BRT, FSA-410CRT	YES	NO	YES	NO	40mA
FSA-410AS, FSA-410BS, FSA-410CS	NO	YES	NO	NO	75mA
FSA-410AST, FSA-410BST, FSA-410CST	YES	YES	NO	NO	75mA
FSA-410ARS, FSA-410BRS, FSA-410CRS	NO	YES	YES	NO	90mA
FSA-410ARST, FSA-410BRST, FSA-410CRST	YES	YES	YES	NO	90mA
FSA-410ALST, FSA-410BLST, FSA-410CLST	YES	YES	NO	YES	75mA
FSA-410ALRST, FSA-410BLRST, FSA-410CLRST	YES	YES	YES	YES	90mA

Specifications

Diameter (base)	5.8in (147mm)
Height (including base)	2.077in (528mm)
Operating Temperature	32°-100°F (0°-37.8°C)
Humidity	5%-93% RH, non-condensing
Operating Voltage Range	10-30 Vdc
Maximum Standby Current	20µA@12 or 24Vdc
Maximum Alarm Current	25mA-90mA
Smoke Sensitivity ULC	2% ± 0.5%/ft obscuration
Smoke Sensitivity UL	3% ± 0.8%/ft obscuration
Heat Alarm	135°F (57°C)
Sounder Alarm Pattern ULC	Continuous Beeps
Sounder Alarm Pattern UL	Evacuation Temporal Pattern
Minimum Remote LED Resistance:	
12V system	500 Ohm
24V system	1000 Ohm
Maximum Remote LED output (if equipped)	25mA
Auxiliary Relay Rating (Form C Relay)	2A @ 30Vdc (Resistive)
Alarm Relay Rating (Form A Relay)	2.0A @ 30Vdc (Resistive)

Limited Warranty

Digital Security Controls Ltd. warrants that for a period of twelve months from the date of purchase, the product shall be free of defects in materials and workmanship under normal use and that in fulfillment of any breach of such warranty, Digital Security Controls Ltd. shall, at its option, repair or replace the defective equipment upon return of the equipment to its repair depot. This warranty applies only to defects in parts and workmanship and not to damage incurred in shipping or handling, or damage due to causes beyond the control of Digital Security Controls Ltd. such as lightning, excessive voltage, mechanical shock, water damage, or damage arising out of abuse, alteration or improper application of the equipment.

The foregoing warranty shall apply only to the original buyer, and is and shall be in lieu of any and all other warranties, whether expressed or implied and of all other obligations or liabilities on the part of Digital Security Controls Ltd. Digital Security Controls Ltd. neither assumes responsibility, nor authorizes any other person purporting to act on its behalf to modify or to change this warranty, nor to assume for it any other warranty or liability concerning this product.

In no event shall Digital Security Controls Ltd. be liable for any direct, indirect or consequential damages, loss of anticipated profits, loss of time or any other losses incurred by the buyer in connection with the purchase, installation or operation or failure of this product.

Smoke Detectors

Smoke detectors that are a part of this system may not properly alert occupants of a fire for a number of reasons, some of which follow. The smoke detectors may have been improperly installed or positioned. Smoke may not be able to reach the smoke detectors, such as when the fire is in a chimney, walls or roofs, or on the other side of closed doors. Smoke detectors may not detect smoke from fires on another level of the residence or building.

Every fire is different in the amount of smoke produced and the rate of burning. Smoke detectors cannot sense all types of fires equally well. Smoke detectors may not provide timely warning of fires caused by carelessness or safety hazards such as smoking in bed, violent explosions, escaping gas, improper storage of flammable materials, overloaded electrical circuits, children playing with matches or arson. Even if the smoke detector operates as intended, there may be circumstances when there is insufficient warning to allow all occupants to escape in time to avoid injury or death.

WARNING: Digital Security Controls Ltd. recommends that the entire system be completely tested on a regular basis. However, despite frequent testing, and due to, but not limited to, criminal tampering or electrical disruption, it is possible for this product to fail to perform as expected.

Important Information: Changes or modifications not expressly approved by Digital Security Controls Ltd. could void the user's authority to operate this equipment.

FCC Compliance Statement

CAUTION: Changes or modifications not expressly approved by DSC could void your authority to use this equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/television technician for help.

The user may find the following booklet prepared by the FCC useful: "How to Identify and Resolve Radio/Television Interference Problems". This booklet is available from the U.S. Government Printing Office, Washington D.C. 20402, Stock # 004-000-00345-4.

Industry Canada Compliance Statement

This Class B digital apparatus meets all requirements of the Canadian interference-causing equipment regulations.

Cet appareil numérique de la Classe B respecte toutes les exigences de règlement sur le matériel brouilleur du Canada.



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