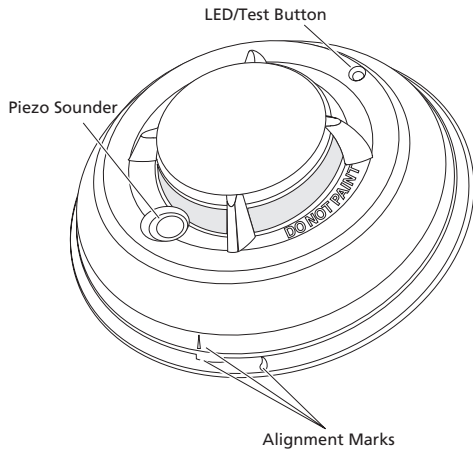# DSC® FSA-410D Series Smoke Alarm
Installation and Operating Instructions

Read this instruction sheet thoroughly before installation and use of the FSA-410D Smoke Alarm

LED/Test Button

Piezo Sounder

DO NOT PAINT

Alignment Marks

Introduction

The FSA-410D is a 4-wire photoelectric smoke alarm with optional: fixed temperature heat detector, auxiliary form C relay, and/or remote LED output.

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 remain on to indicate energization of the unit and the sounder will not sound.

Smoke Alarm

The smoke detector has a nominal fixed alarm sensitivity (refer to *Specifications* on back page) and it will go into alarm when the signal level exceeds the 'alarm' threshold. During an alarm the LED will shut off, the sounder will sound continuous beeps and the alarm relay will be activated.

Remote Alarm - Interconnection

Multiple alarms can be connected using the PRM-4W Polarity Reversal Module. When a fire alarm occurs, the unit 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 Manual for installation details.

Smoke - Drift Compensation

The unit 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 unit 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). During an alarm the LED will shut off. The sounder will sound continuous beeps and the alarm relay will be activated.

Alarm Restore

When the smoke clears from the unit and the heat signal falls below the 'restore' level, the unit will automatically reset itself.

Alarm Indications   *Alarm Aux.*

Condition	LED	Sounder	Relay FormA	Relay FormC
Normal/Sensitivity in Production Range	ON	OFF	D	D
Smoke Alarm	OFF	Steady	See Note	A
Heat Alarm	OFF	Steady	A	See Note
Alarm Restore	ON	OFF	D	D
Remote Alarm	ON	Steady	D	D
Low Power Trouble	ON	OFF	D	D
Other Fault / Trouble	ON	CHIRP 1/50s	D	D
Test Switch - Failed	ON	CHIRP 1/50s	D	D
Test Switch - Pass	OFF	Steady	A	A

A = Activated / D = Deactivated

NOTE: *For models FSA-410DFIS, the relay is deactivated, for all other models the relay is activated during the condition.*

Installer Instructions

1. Smoke Alarm Placement

On smooth ceilings, units may be spaced 9.1m (30 ft) apart as a guide. Other spacing may be required depending on ceiling height, air movement, the presence of joists, uninsulated ceilings, etc. Refer to CAN/ULC-S553-02 for installation recommendations.
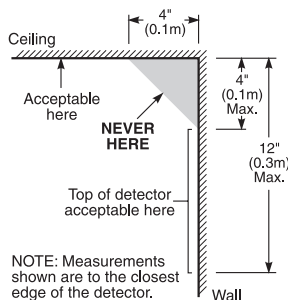

Ceiling

4" (0.1m)

Acceptable here

NEVER HERE

4" (0.1m) Max.

12" (0.3m) Max.

Top of detector acceptable here

NOTE: Measurements shown are to the closest edge of the detector.

Wall

Figure 4

Do **NOT** locate smoke alarms 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 units in areas of high humidity.

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

2. Mount Smoke Alarm Backplate


Locking Tab

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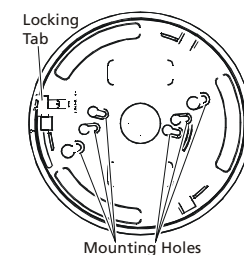
Mount backplate on standard 4" octagonal electrical box using the screws provided.

NOTE: *Power must be supplied from a ULC Listed power supply or alarm control unit auxiliary output. 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.
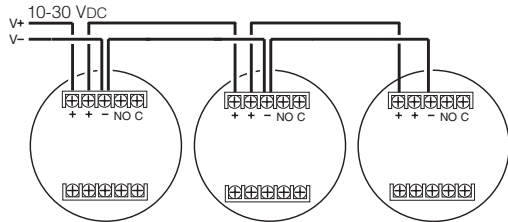
NOTE: Power supply shall be rated for the application. Refer to electrical ratings when calculating the maximum current required for an installation.
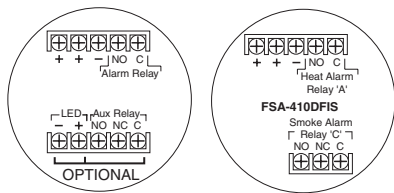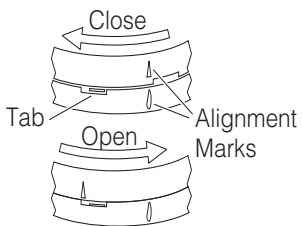

NOTE: Optional Remote LED must have a series resistor. Please see specifications.

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 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 neighbour'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 Alarm

Follow the test procedure described here or contact your smoke alarm 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.

To test the smoke alarm, 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, the LED will shut off and the relay will be activated. When the button is released, the alarm will cease.

Upon completing the functional testing of the smoke alarm, 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 alarm installer or dealer for service.
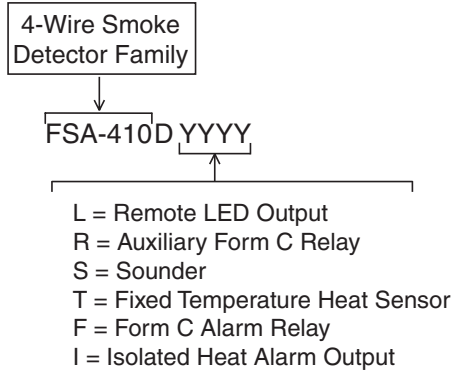
Maintenance

The smoke alarm 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 alarm; 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 alarm installer or dealer.

Testing and maintenance procedures shall be in accordance with the CAN/ULC-S552 standard.

Smoke Detector Family

4-Wire Smoke Detector Family

↓

FSA-410D YYYY

L = Remote LED Output
R = Auxiliary Form C Relay
S = Sounder
T = Fixed Temperature Heat Sensor
F = Form C Alarm Relay
I = Isolated Heat Alarm Output

Model	Heat	Sounder	Aux Relay	LED Output	Current Draw
FSA-410DS	NO	YES	NO	NO	75mA
FSA-410DST	YES	YES	NO	NO	75mA
FSA-410DRS	NO	YES	YES	NO	90mA
FSA-410DRST	YES	YES	YES	NO	90mA
FSA-410DLRST	YES	YES	YES	YES	90mA
FSA-410DFIS	YES	YES	NO	NO	90mA

Specifications

Diameter (base) 5.8in (147mm)
Height (including base) 2.077in (528mm)
Operating Temperature . . . . 32°-100ºF (0°-37.8°C)
Humidity . . . . 5%-93% RH, non-condensing

Operating Voltage Range. . . . . 10-30V$_{DC}$
Maximum Standby Current . . . . 10mA@12 or 24V$_{DC}$
Maximum Alarm Current: 75-90mA
Alarm Sensitivity ULC. . . . . 2% ± 0.5%/ft obscuration
Heat Alarm . . . . 135ºF (57°C)

Sounder Alarm Pattern ULC. . . . . .Continuous beeps
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 @ 30V$_{DC}$ (Resistive)
Alarm Relay Rating (Form A Relay) . . . . 2.0A @ 30V$_{DC}$ (Resistive)