

PRODUCT APPLICATION AND INSTALLATION INSTRUCTIONS DSDN (HS-100-P) NO FLOW DUCT SMOKE DETECTORS

DEFINITION

The DSDN (No Flow Duct Smoke Detector) is designed for use with Ruskin UL555S classified smoke dampers. The device detects the presence of smoke in the airstream of ductwork in HVAC systems without a minimum operating velocity.

DSDN are factory mounted for "single point field power connection" to a standard Ruskin electronic fuse link (EFL) or optional firestat (TS150).

The DSDN factory mounted with a smoke rated damper is intended to close the damper only. Consult Ruskin prior to ordering if DSDN is to be wired back to a UL listed fire alarm panel.

APPROVAL

Underwriter's Laboratories, Inc. does not have a separate Product Category for factory mounted smoke detectors. The smoke detector and the damper have been individually evaluated by their applicable UL standards.

The local authority having jurisdiction should be consulted prior to installation of the damper and smoke detector.

APPLICATION

National and local safety standards and codes recognize the ability of air duct systems to transfer smoke, toxic gases and flame from area to area. Smoke can be a serious hazard to life safety unless blowers are shut down and dampers are actuated. **The primary purpose of duct smoke detection is to prevent injury, panic and property damage by reducing the spread of smoke.** Duct smoke detection can also serve to protect the air conditioning system itself from fire and smoke damage, and can be used to assist in equipment protection applications.

When presence of smoke in the duct is sensed, or when loss of power occurs the damper will fail close. **Consult NFPA90A, NFPA72 documents and local codes to determine where smoke detectors are required.**

DAMPERS

The DSDN can be factory mounted on any of the following Ruskin combination fire/smoke and smoke dampers: FSD60, 60-II, 60-3, 60-V, 37, 36, 35, 34, SD60, 60-II, 37, 36, 35, 34.

DSDN DESCRIPTION/SPECIFICATION

Model: Air Products and Controls HS-100-P

Type: Photoelectric.

Velocity: 0 to 3,000 fpm.

Dimensions (Dia.): 6"

Weight: 1.0 lb.

Operating Temperature Range: 32°F to 140°F (0° to 60°C).

Operating Humidity Range: 0% to 85% Relative Humidity.

Operating Voltages: 24 VAC/VDC, 120 VAC or 230 VAC.

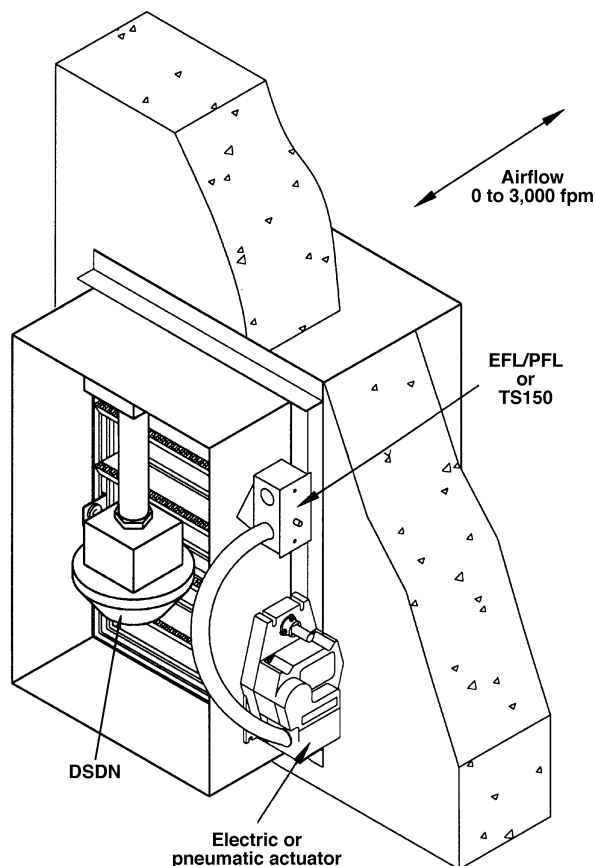
Contact Ratings: Refer to information provided with detector.

LISTINGS OF DSDN

- UL Listed, file 52829.
- CSFM Listing, 3240-1004:118.
- New York MEA-73-92-E

ACCESSORIES

Consult Ruskin for the availability of annunciators, remote test and reset stations, sounders, strobes, etc.

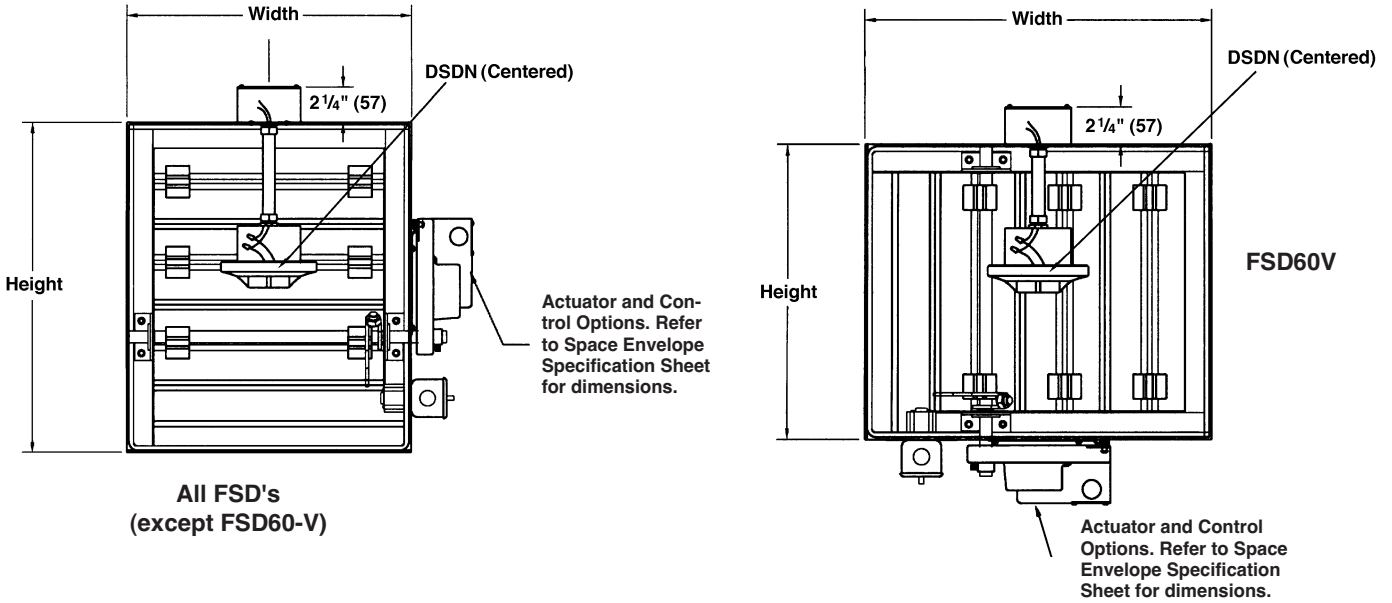


SEE COMPLETE MARKING
ON PRODUCT

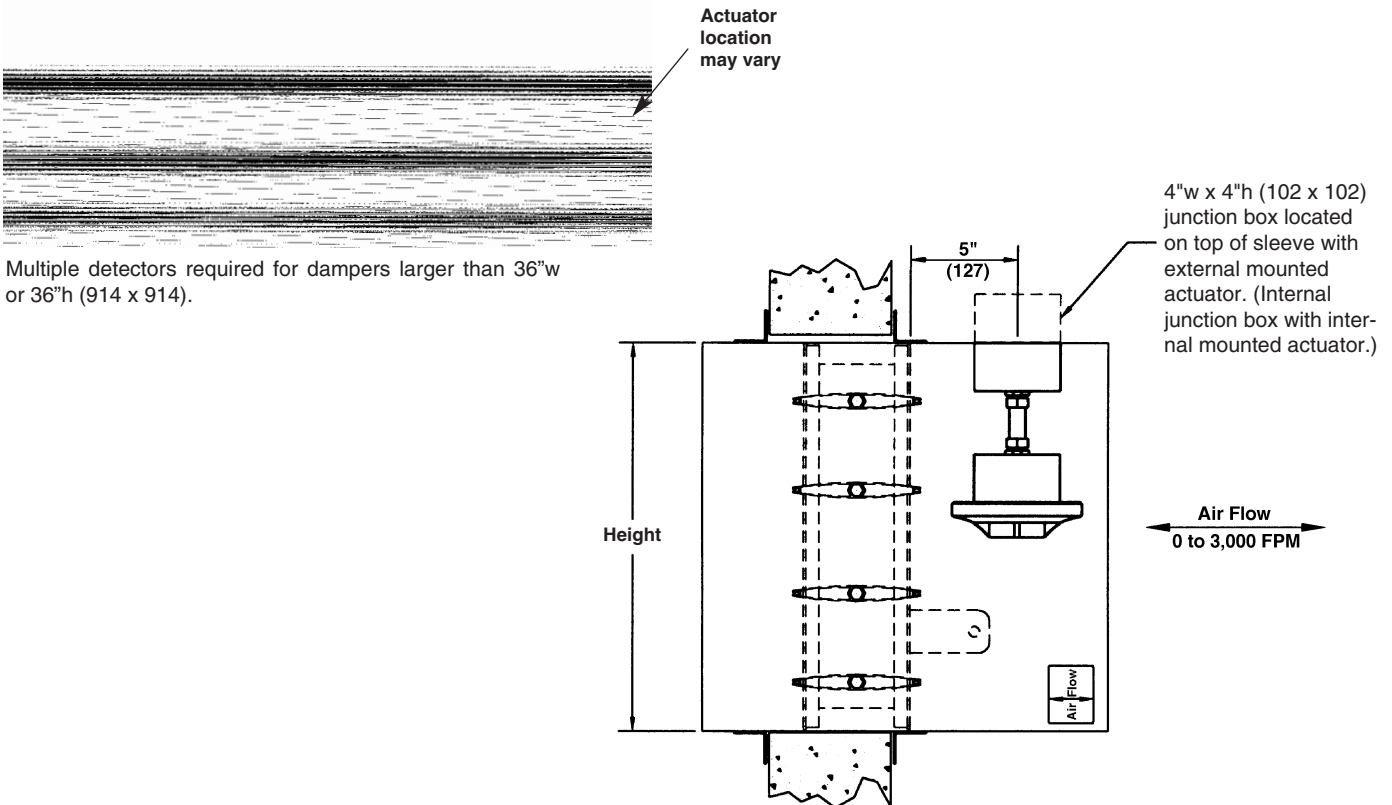
FACTORY MOUNTING DETAILS

NOTES:

- 1) Minimum damper size is 8" w x 8" h (203 x 203).
- 2) Multiple detectors required for dampers larger than 36" w or 36" h (914 x 914).



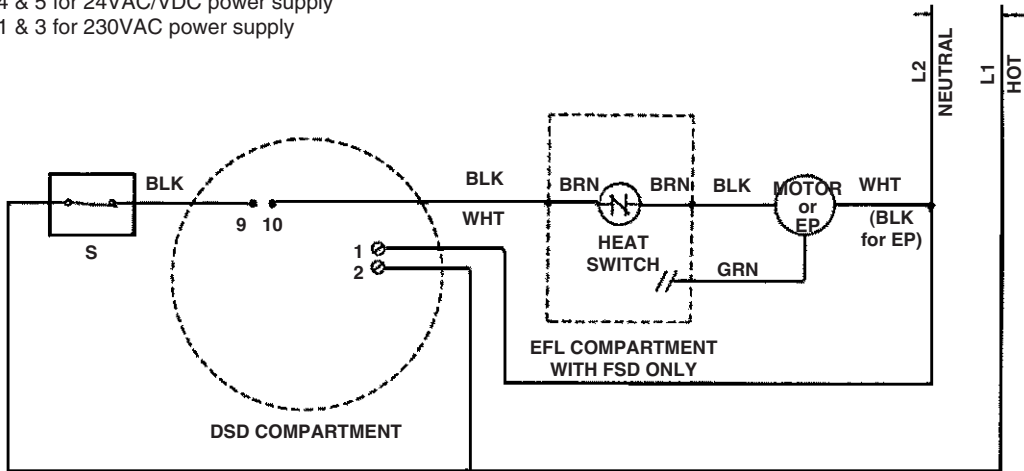
TYPICAL INSTALLATION DETAILS FOR FSD with DSDN



FACTORY WIRING DIAGRAMS

DSDN FACTORY WIRED TO FSD WITH EFL

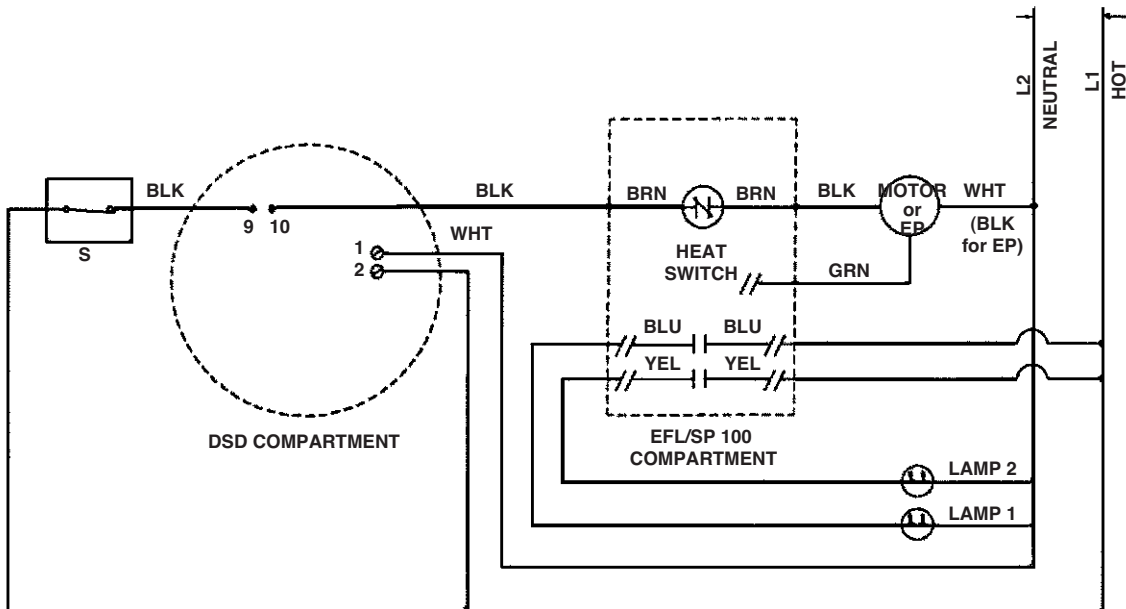
Use terminals 1 & 2 for 120VAC power supply (shown)
 Use terminals 4 & 5 for 24VAC/VDC power supply
 Use terminals 1 & 3 for 230VAC power supply



FOR 120 VAC POWER SUPPLY

DSDN FACTORY WIRED TO FSD WITH EFL/SP-100

Use terminals 1 & 2 for 120VAC power supply (shown)
 Use terminals 4 & 5 for 24VAC/VDC power supply
 Use terminals 1 & 3 for 230VAC power supply



FOR 120 VAC POWER SUPPLY

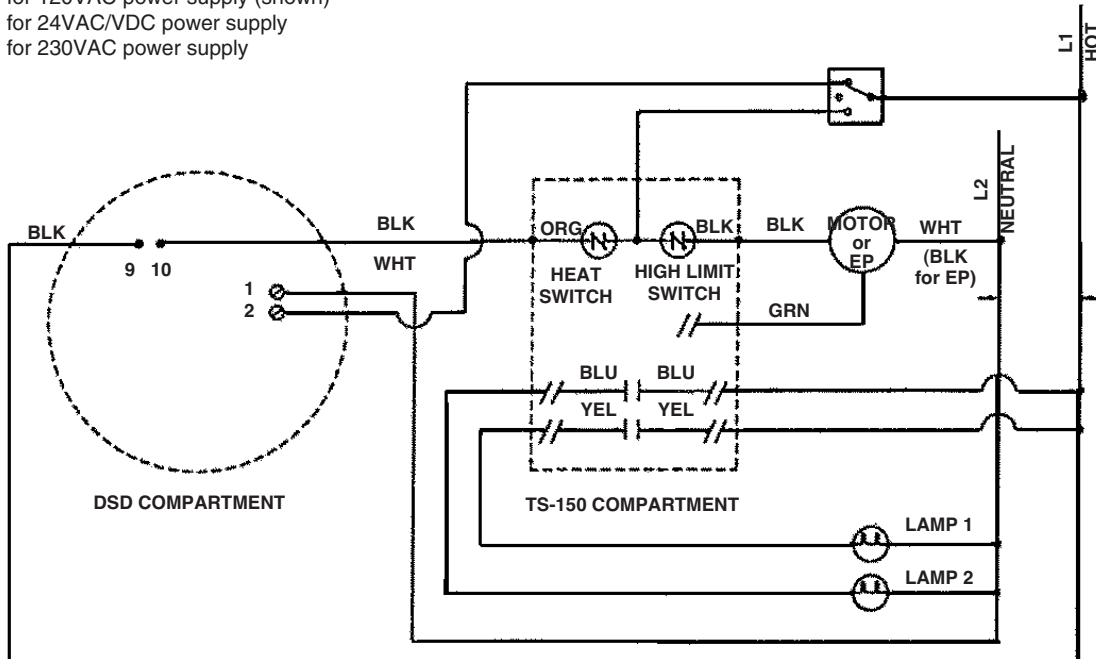
NOTES

1. Not all screw terminals \emptyset in the DSDN compartment are shown, for clarity.
2. Switch "S" by others.
3. // Indicated connections needed to be made in the field by qualified electrician.

FACTORY WIRING DIAGRAMS

DSDN FACTORY WIRED TO FSD WITH TS-150

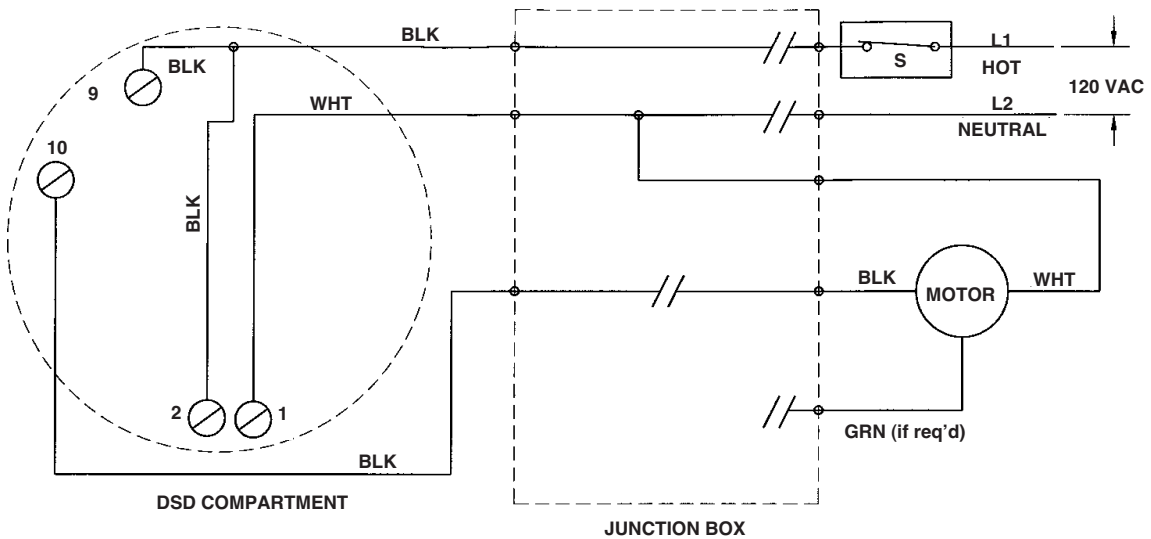
Use terminals 1 & 2 for 120VAC power supply (shown)
 Use terminals 4 & 5 for 24VAC/VDC power supply
 Use terminals 1 & 3 for 230VAC power supply



FOR 120 VAC POWER SUPPLY

DSDN FACTORY WIRED TO SMOKE DAMPER

Use terminals 1 & 2 for 120VAC power supply (shown)
 Use terminals 4 & 5 for 24VDC power supply
 Use terminals 1 & 3 for 230VAC power supply



NOTES

1. Not all screw terminals \emptyset in the DSDN compartment are shown, for clarity.
2. Switch "S" by others.
3. // Indicated connections needed to be made in the field by qualified electrician.

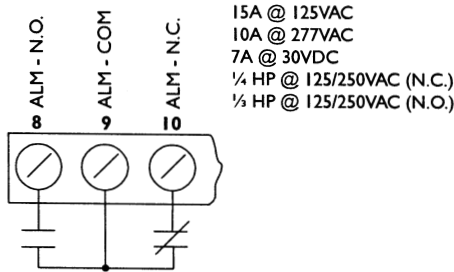
ADDITIONAL ELECTRICAL CONNECTIONS

Prior to connecting input power to the duct unit, determine the correct input voltage/current availability and ensure it is connected to the correct terminals.

CAUTION: Do not use looped wire under terminals. Break wire run to provide for proper supervision of connections.

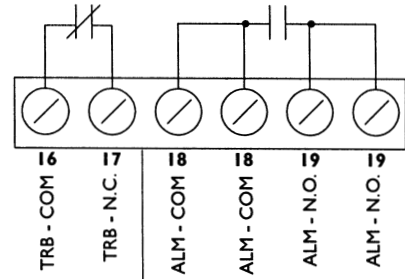
DRY CONTACT OUTPUTS

ALARM



FACP

* Trouble contacts shown in "normal" unit energized state

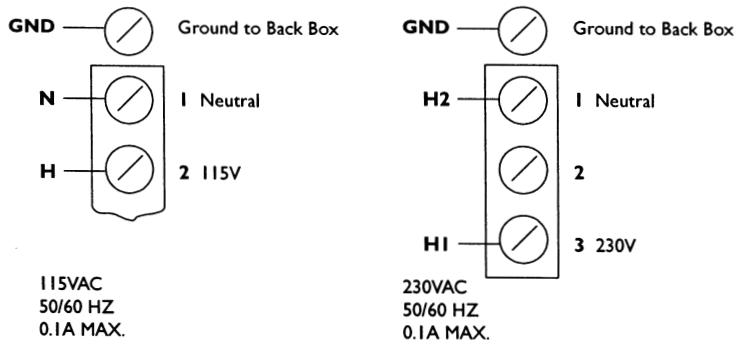


15A @ 125VAC • 10A @ 277VAC • 7A @ 30VDC
1/4 HP @ 125/250VAC

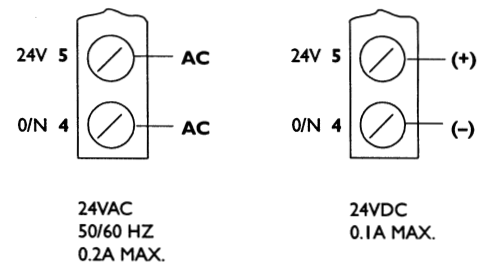
1.0A @ 30VDC

OPERATING POWER INPUTS

HIGH VOLTAGE

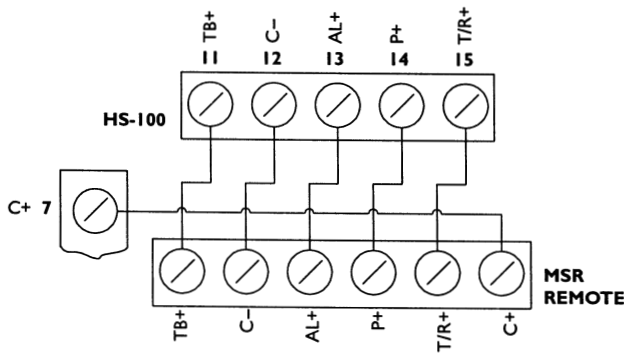


LOW VOLTAGE

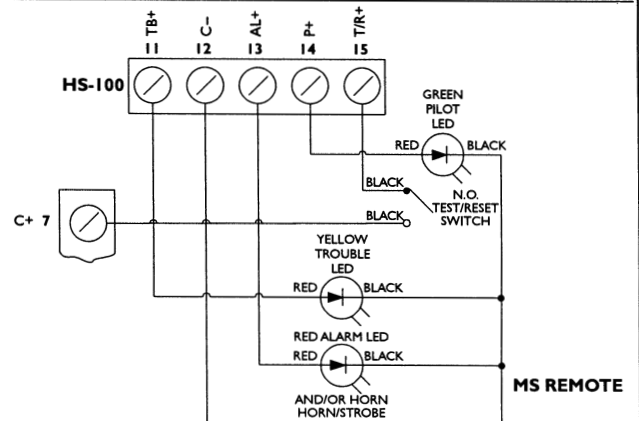


REMOTE ACCESSORY OUTPUTS

MSR-SERIES



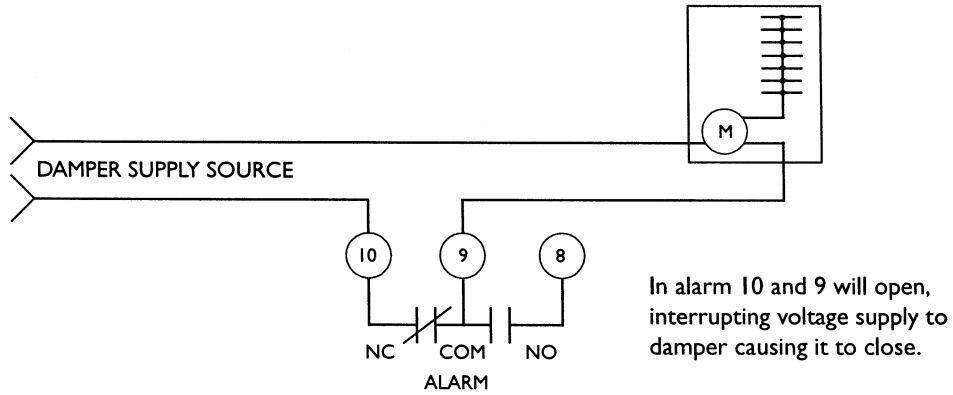
MS-SERIES



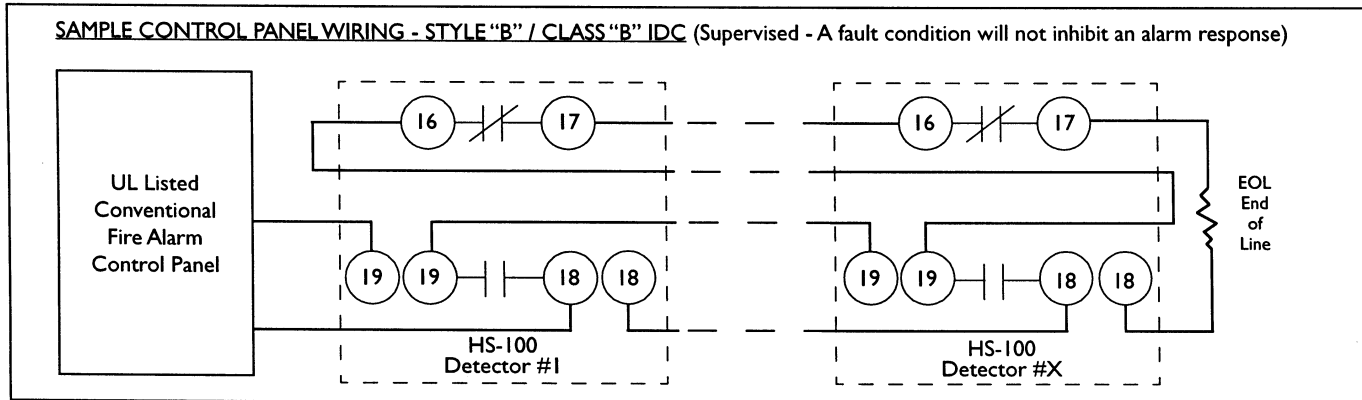
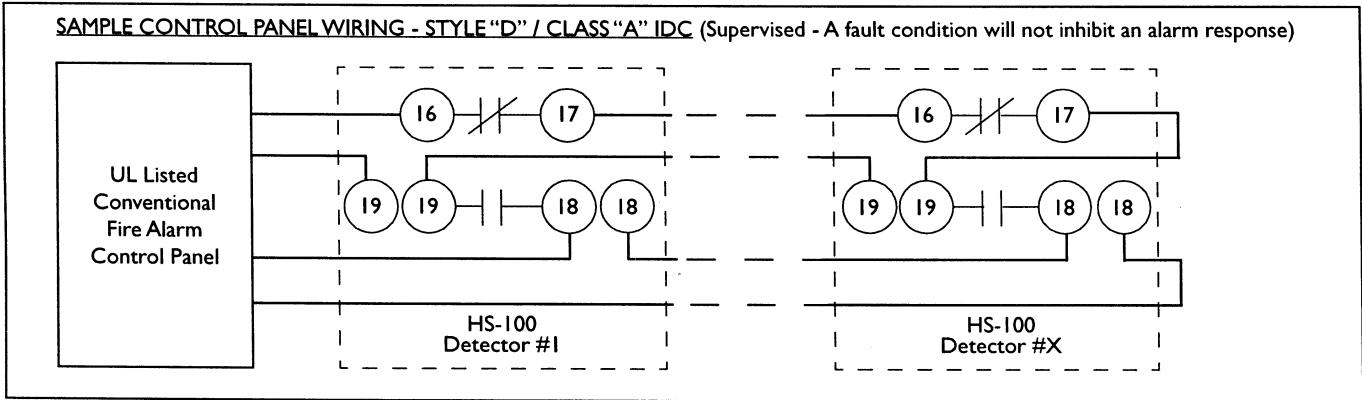
WIRING:

In the event of a fire alarm, certain equipment may be required to be shut down. For example, shut down may be achieved by interrupting the supply source to that particular piece of equipment when wired as indicated on the next page.

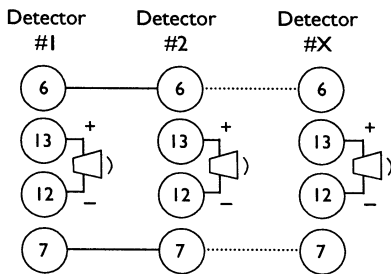
ADDITIONAL ELECTRICAL CONNECTIONS



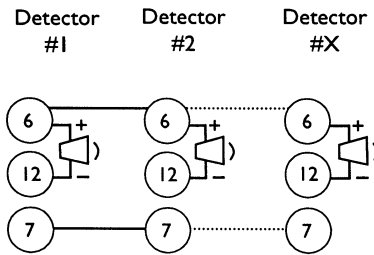
FIRE ALARM CONTROL PANEL WIRING



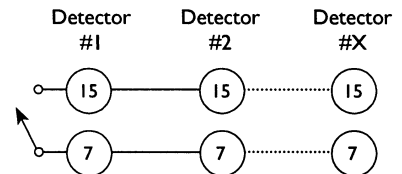
INTERCONNECTION WIRING FOR COMMON FUNCTIONS



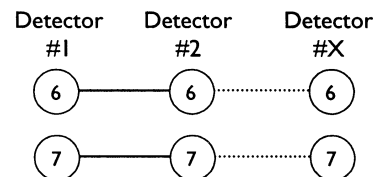
All alarm relays operate with single alarm. Individual horn/strobe units operate on alarmed detector only. 30 detectors max.



All alarm relays operate with single alarm. All horn/strobe units operate on any single alarm. 10 detectors max.



Common test/reset. 30 detectors max. (Use normally open test/reset switch)



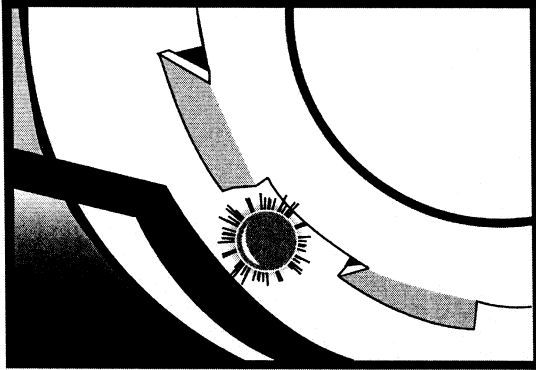
All alarm relays operate with single alarm. 30 detectors max.

NOTE: A common power supply must be used for all interconnected detectors.

TESTING AND MAINTENANCE

OPERATIONAL TESTING

To determine the correct operation of the HS-100 Series duct smoke detector, ensure input power is connected and the LED on the detector head of both the ionization and photoelectric models is flashing while the unit is in standby mode. The LED on the smoke detector head will be permanently illuminated when smoke is detected and the head is in alarm.



Above: The LED will be permanently illuminated when the unit is in alarm.

Cause a detector alarm via magnet or smoke testing procedures detailed under functional testing below with the air handling unit shut down (not connected). The red alarm LED on the detector will be illuminated and the alarm relay outputs will change state. Using a multimeter set to OHMS (or continuity buzzer function on the meter) place the meter probes on the following terminals, and ensure the contacts are closed (continuity) (19-18) and (8-9). When removing the magnet or clearing the detector chamber of test gas and twisting the head loose manually and locking it back into position these contacts will again open and the unit will be back in the normal standby state.

The trouble contacts (16,17) on the HS-100 detector will not change state in the event of a fire alarm, operational, or functional testing. The trouble contacts can be tested by rotating the smoke detector head counter-clockwise or completely removing the detector head. This action will extinguish the flashing red LED and cause the trouble contacts to change state, and (16-17) will be open circuit. Replacing the detector head and rotating it clockwise until it locks will cause the red LED to be illuminated flashing and the unit will be operational; terminals (16-17) will be closed (continuity).

FUNCTIONAL TESTING

Once operational testing is concluded the unit requires functional testing to determine the correct operation of the detector head.

MAGNET TESTING: Place the magnet provided with the installation kit on top of the shroud or detector head roughly opposite the LED. Allow at least five seconds for alarm initiation. Remove magnet and reset detector.

SMOKE TESTING: Using smoke test canister with spray testing nozzle (available from Air Products and Controls Inc. part number TG-1000), spray the test gas into the detector.

CAUTION. DO NOT SPRAY GAS FOR MORE THAN 1/2 SECOND. OVERUSE OF TEST GAS FACILITY MAY RESULT IN DETECTOR CONTAMINATION.

After 15 to 20 seconds the detector head will go into alarm, illuminating the detector head LED and causing the duct unit functions to operate, alarm relays will change state, and the alarm related remote accessories, if attached, will function.

If no test gas is available to conduct functional testing, blow smoke from a cotton wick or punk directly at the head to cause an alarm. The alarm indicator should illuminate within one minute.

Should additional testing also be required for simulated fire conditions, smoke bombs placed in the duct may not be suited for the particular detector head (photoelectric or ionization) selected and installed. Consult the smoke bomb data for proper use and compatibility with detector type.

The S65A ionization detector head (55000-225) utilizes a radioactive source as its means of detection and will detect smoke particles of between .1 and 1 micron in size.

The S65A photoelectric detector head (55000-328) operates on the principle of light scatter and will detect smoke particles of between 1 and 10 microns in size.

When purchasing smoke bombs for additional required functional testing, ensure smoke particle sizes comply with the criteria as described above.

NOTE: In situations that require a duct smoke detector to be held in an alarm condition for an extended period of time, the magnet test or smoke test methods should be used to ensure the detector is locked into alarm.

MAINTENANCE

Each installation location must be assessed on its own merits. If the protected area is of a very dirty nature then the HS-100 duct unit(s) will have to be checked and cleaned on a quarterly basis or when cleaning is required.

As a guideline the smoke detector head should be cleaned every six months or as required. The best methods of cleaning are to vacuum the detector head thoroughly or to blow the detector head out using clean, dry compressed air.

Do not use chemicals or non-conforming air to clean the detector head housing as this could contaminate the detector head and damage the casing.

Consult your local code and AHJ requirements for required maintenance schedules.

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