

# Installation and Operating Instructions

Part Numbers 33CSAS--01 (Fan Status Switch)  
 and 33CSFS--01 (Filter Status Switch)

→ **FIELD SUPPLIED COMPONENTS**

QUANTITY	ITEM
1	Screw
1	Vinyl or Rubber Control Tube (16 in. long, 1/8-in. or 3/16-in. ID)
1	Vinyl or Rubber Control Tube (32 in. long, 1/8-in. or 3/16-in. ID)
1	Wiring (18 gage, stranded, 600 V insulation)

**IMPORTANT:** Read these instructions completely before attempting to install the accessory fan/filter status switch.

## INSTALLATION

**NOTE:** The fan status switch can be installed to monitor indoor fan status (ON/OFF). The filter status switch can monitor filter status (CLEAN/DIRTY). Follow the procedure below and perform the steps necessary to install the switch for the desired application (a fan status switch or a filter status switch). To sense both filter and fan status, two separate sensors are needed.

**NOTE:** The filter switch cannot be installed on a thermostat which already has a relative humidity sensor installed.

**NOTE:** These sensors are intended for use with 33CS series TEMP and VVT® thermostats and controls.

**⚠ WARNING**

Turn off unit power. Electrical shock and personal injury could result.

### Mounting the Sensor

1. Remove the unit filter access door. Save door.
- 2. Remove the pressure switch assembly from the carton. Attach the 32-in. plastic control tube to the pressure switch on the port nearest to the electrical connections. See Fig. 1 and 2.
- 3. Attach the 16-in. plastic control tube to the pressure switch on the port nearest to the mounting bracket. See Fig. 1 and 2.
4. Attach the pressure switch assembly to the uppermost portion of the inner flange of the corner post with 1 screw. See Fig. 1.

**NOTE:** To ensure proper operation of the switch, the switch must be installed vertically with the pneumatic ports pointed down.

→ 5. Fan Switch

Insert unattached end of 32-in. tube into the supply air duct or compartment, so that the end of the tube is at a 90 degree angle to the airflow. Do not position end of tube in parallel with airflow or in the same direction as airflow.

Place unattached end of 16-in. tube in the return air or supply fan compartment.

Filter Switch

Suspend the 16-in. tube over the return air opening. See Fig. 1. Hang the loose end of the 32-in. tube between the unit filter and coil in filter area..

### Wiring the Sensor

1. Connect the 2 gray wires routed with the economizer wiring harness assembly to the COM and NO terminals on the pressure switch. See Fig. 2.

**NOTE:** For applications using both fan and filter status switches (2 switches required), an additional pair of field-supplied gray wires (18 gage, stranded, 600 V insulation) must be installed and wired to the economizer.

2. If a relay pack is not being used on the unit, connect the 2 gray wires in the low voltage compartment of the control box to the digital indicator wires coming from the thermostat.

3. Filter Switch

If a relay pack is used on the unit, connect the 2 gray wires in the low voltage compartment of the control box to the no. 10 and 11 pins of the relay pack.

Fan Switch

If a relay pack is used on the unit, connect the 2 gray wires in the low voltage compartment of the control box to the no. 8 and 9 pins of the relay pack.

4. Return power to unit.

5. To configure switch, perform the following:

Filter switch

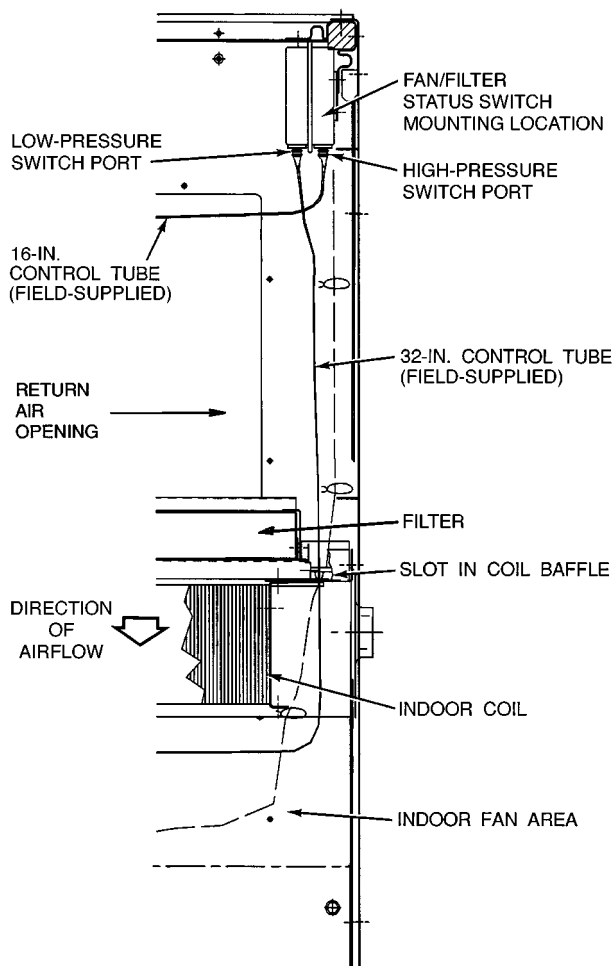
Place the unit in Fan Only mode. The unit return air filter should be clean or new. Using a flat head screwdriver, rotate the adjustment screw until the pressure switch opens (see Fig. 2). Rotate the adjustment screw in the same direction another 1/4 turn.

→ Fan Switch

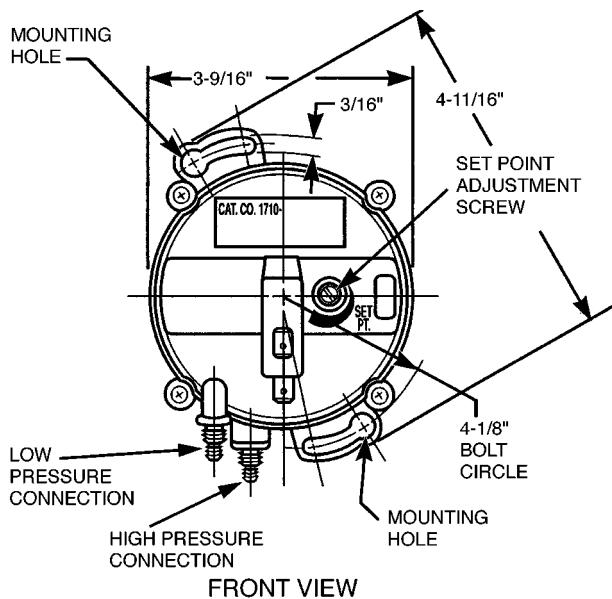
Using a flat head screwdriver, rotate the adjustment screw until the pressure switch closes. Rotate the adjustment screw two full turns.

**NOTE:** If pressure drop across clean filter is less than 0.17 in. wg, then insert 32-in. tube on other side of DX coil to increase the pressure drop and repeat adjustment procedure.

6. Reinstall unit filter access panel.



→ Fig. 1 — Filter Status Switch Installation (Top View of Typical Rooftop Unit Shown)



→ Fig. 2 — Fan/Filter Status Switch

## OPERATION

**Fan Status Alarm** — Refer to Table 1 for the Fan Status Alarm specifications.

**Table 1 — Fan Status Alarm**

FUNCTION	DESCRIPTION
<b>Controllers</b>	Monitor Thermostat
<b>Sensor Required</b>	Airflow, 33CSAS--01, Digital Input
<b>Sensor Wiring</b>	Terminals no. 8 and 9 of 33CSUCE-06 Relay Pack or Wire to Damper Board
<b>Input</b>	Open contacts at sensor from lack of airflow
<b>Output</b>	Alarm SE-06, Cannot Detect Fan ON Alarm SE-12, Cannot Detect Fan OFF
<b>Category/Option</b>	5.10 (Fan Status)
<b>Configuration Values</b>	Default OFF, Min OFF, Max ON
<b>Configuration Increments</b>	None
<b>Associated Functions</b>	Fan Operation for Heat

## OPERATION

The detecting or verifying fan is running. The fan relay is ON or Heat 1 relay is ON.

When the monitor thermostat indicates commanded state of FAN (relay) is on, but flow switch indicates no airflow after 30-second time delay (sensor contacts still open), an alarm condition is initiated (heat or cool or ventilation mode).

When the monitor thermostat indicates commanded state of HEAT 1 (relay) is ON, but flow switch indicates no airflow after 120-second delay time (sensor contacts still open), an alarm condition is initiated. This delay time allows for units having internal control of heat, versus thermostat control of heat.

When an alarm condition is initiated:

- system mode (either heat or cool) is dropped
- alarm SE-06, Cannot Detect Fan ON, is issued
- a manual reset is required to reset the alarm

→ Detecting or verifying fan is OFF. Fan Relay is OFF and Heat 1 Relay OFF.

When the monitor thermostat indicates commanded state of FAN (relay) is OFF, but flow switch indicates that airflow still exists after 120-second delay time from fan off command (sensor contacts still closed), an alarm condition is initiated.

When alarm condition is initiated:

- the monitor thermostat will continue to operate the system. This allows future calls for heat or cool to be initiated.
- alarm SE-12, Cannot Detect Fan OFF, is issued
- a manual reset is required to reset the alarm

**CONFIGURATION TO ACTIVATE ALARM** — To activate the alarm, configure the Fan Status Switch option to ON. Leave the Fan Operation For Heat option ON.

**CONFIGURATION TO NORMALIZE ALARM** — To normalize the alarm, no is configuration required. Follow the procedure below to clear the alarm.

**CONFIGURATION EXAMPLE** — The Fan Status Switch option is set to ON.

At the start of a cooling mode, the fan relay is switched on by the monitor thermostat. Fan operation is initiated and the fan has 30 seconds to generate sufficient airflow to close the normally-open fan-status flow switch. If the sensor contacts are closed within 30 seconds, the system operates normally and no Fan Status alarm is generated. If, however, the sensor contacts are not closed within 30 seconds, an alarm is generated. The thermostat display will not indicate “fan” until fan operation is verified by the fan-status flow switch.

The alarm will cause the system to shut down. No cooling, heating, or ventilation is available until a reset of the system is initiated.

In a heat mode, the same sequence is followed, except that the delay time is increased to 120 seconds. If the Fan Operation for Heat option is configured OFF, no alarm is generated in the heat mode.

**CLEARING THE ALARM FROM THE THERMOSTAT** — Fan status alarms are cleared or erased from the system in three ways using a manual reset:

1. Cycle power to the thermostat off, then on.
2. Initiate a reset by switching the Unit Reset option to the ON configuration.
3. Switch the configuration value for the Fan Status Switch option to OFF then ON.

**Filter Status Alert** — Refer to Table 2 for the Filter Status alert specifications.

**Table 2 — Filter Status Alert**

FUNCTION	DESCRIPTION
<b>Controllers</b>	Monitor Thermostat
<b>Sensor Required</b>	Filter, 33CSFS--01, Digital Input
<b>Sensor Wiring</b>	Terminals no. 10 and 11 of 33CSUCE-06 Relay Pack or Wire to Damper Board
<b>Input</b>	Closed contacts from high pressure drop
<b>Output</b>	Alarm (SE-09), Dirty Filter
<b>Category/Option</b>	5.11 (Humidity Sensor/Filter Status Switch)
<b>Configuration Values</b>	Default 0, Min 0, Max 2 to activate
<b>Configuration Increments</b>	None
<b>Associated Functions</b>	None

**OPERATION** — This alert is used to indicate the status of the filters in the HVAC unit. The Dirty Filter alert indicates a high pressure drop across the filters, caused by collection of excessive particles and debris on the filter media.

Pressure drop across the filters in the unit increases until it reaches the Filter Status sensor’s set point. This causes the contacts of the sensor to close. The contact closure of the sensor is detected by a discrete input. If the contacts remain closed for 10 minutes, a Dirty Filter alert is initiated.

A manual reset is required to clear this alert.

**CONFIGURATION TO ACTIVATE ALERT** — To activate the alert, configure the Humidity Sensor/Fan Filter Switch option to position 2. The monitor thermostat will use the sensor as a Filter Status Switch.

**CONFIGURATION TO NORMALIZE ALERT** — An SE-09 alarm (alert) will not stop operation of the system. A manual reset is required to clear this alert.

**CONFIGURATION EXAMPLE** — The Filter Status sensor will close contacts (alert) when differential pressure increases from zero (clean filter, no restriction or pressure drop across filter) to the sensor set point (dirty filter with restriction across filter). The Humidity Sensor/Fan Filter Switch option is set to the value of 2 to specify the filter status switch.

During operation of the unit over a period of time, an SE-09 error is declared. This indicates that the differential pressure across the filters has increased beyond the set point value of the sensor. The Alternate Information “Dirty Filter Status” (information item 10) will read ON, also indicating a dirty filter.

After the dirty filters are changed, the Dirty Filter Status must be manually reset. The system then returns to normal operation and will not alert until the differential pressure set point of the Filter Status sensor is again reached.

**CLEARING THE ALERT FROM THE THERMOSTAT** — Dirty Filter Alerts are cleared or erased from the system in three ways using a manual reset:

1. Cycle power to the thermostat off, then on.
2. Initiate a reset by switching the Unit Reset option to the ON configuration.
3. Switch the configuration value for Fan Status Switch option to OFF then ON.

