Wiring a Sensor Pressure Sensor Switch

How To Guides

Wiring a Sensor Pressure Sensor Switch

Figure 1. Typical ECE air handling unit. Sensors provide critical feedback to the AHU control system for monitoring and controlling temperature, pressure, differential pressure and airflow conditions.

Video Duration: 8 minutes 19 seconds
Applies to: Temperature sensors, pressure sensors, differential pressure switches, and similar field devices connected to the AHU control system.
Document Status: Controlled technical instruction

1. Purpose

This booklet accompanies the video demonstrating the safe removal, wiring, installation, and commissioning of a replacement sensor connected to the Trend control system.

The procedure shows how to safely isolate the system, install the sensor, terminate wiring correctly, and confirm correct operation via the controller.

Sensors provide critical feedback to the AHU control system for monitoring and controlling:

- Air temperature
- Air pressure
- Differential pressure
- Airflow conditions

Correct wiring and configuration ensure the controller receives accurate data and the AHU operates safely.

2. Important AHU Information

- ECE AHUs are bespoke. Do not assume that information, access arrangements, terminal numbers, wiring colours, component selections or controls logic from another AHU applies to the AHU being reviewed or worked on.
- The certified drawing and current project-specific documentation are the primary sources for the AHU arrangement and component technical information.
- Where component technical information is checked, it must be checked against the certified drawing and related manufacturer data for the exact AHU.

IMPORTANT: Always use the project-specific asset information, certified drawing, relevant ECE product-range IOM, quotation scope and component information for the exact AHU being reviewed or worked on.

3. Safety and Competency Requirements

- Only competent and authorised personnel should carry out this procedure. The required competency depends on the task being undertaken.
- Before starting, confirm the correct AHU, asset tag, certified drawing, relevant ECE product-range IOM and any applicable wiring diagram, controls description, component technical information or manufacturer data sheet.
- Follow all site-specific RAMS, permits, PPE, isolation and access requirements.
- Where the task requires physical access to the AHU, do not open access doors, remove panels or work inside the AHU unless fans and relevant equipment are isolated, stationary and safe to access.
- Do not bypass safety devices, interlocks, alarms or controls.
- Stop and escalate if the AHU identity, current technical information, safe isolation, access condition or required competency cannot be confirmed.

Figure 2. Site personnel in PPE reviewing the certified drawing. Confirm the wiring diagram, terminal numbers and device data sheet before working on any sensor circuit.

Task-specific requirements:

- Only electrically competent and authorised personnel should install, terminate, modify or test AHU electrical wiring, controls wiring, fan wiring, field wiring or external device connections.
- Electrical work must be carried out in accordance with current BS 7671 / IET Wiring Regulations, site requirements, the project specification and the AHU wiring diagram.
- Before working on any circuit, isolate the relevant supply, apply lock-off/tag-out where required, and prove dead using an approved test method.
- Be aware that external systems, including BMS, fire alarm, smoke detection, heat pump controls and third-party devices, may introduce voltages into AHU terminals.
- Do not bypass safety interlocks, fire/smoke inputs, airflow proving, fault circuits or protective devices.
- Stop and escalate if terminal numbers, cable references, wiring colours, control signals or device functions do not match the wiring diagram or certified information.

4. Before You Begin

- Access the AHU asset information via the ECE Client Portal using the asset tag or 18-digit reference number where available.
- Confirm the AHU reference, project name, location and latest document revision.
- Review the certified drawing, relevant ECE product-range IOM, quotation scope, component schedule and manufacturer data sheets where applicable.
- Review the wiring diagram, controls description and commissioning information where the task involves electrical, controls or BMS interfaces.
- Confirm the required personnel, tools, PPE, access equipment, permits and isolation method before starting work.

Figure 3. Asset Tag plate carrying the unique 18-digit reference number used to retrieve AHU technical information from the ECE Client Portal.

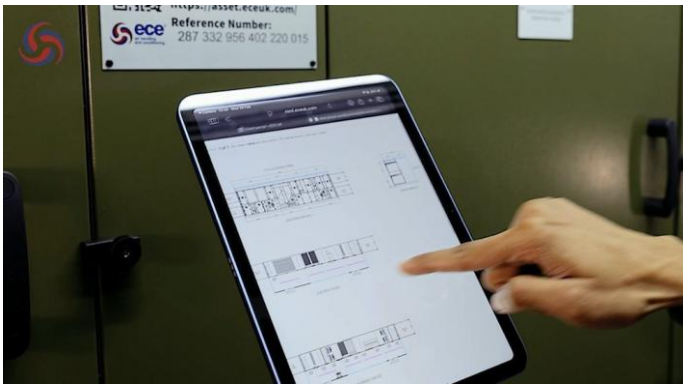

Figure 3b. AHU technical information opened on a device via the Asset Tag link, used to confirm AHU reference, drawing revision and fan information before starting work.

5. Required Tools, Equipment, PPE and Information

- Project-specific wiring diagram or interface drawing
- Certified drawing and controls description
- Manufacturer data sheet for the device or component
- Approved cable, glands, ferrules and labels
- Multimeter / approved voltage indicator and proving unit
- Electrical test equipment required by site procedure
- Commissioning or test record
- Correct sensor and data sheet
- Cable and ferrules
- Small screwdriver
- Multimeter
- Controller/HMI access

6. Procedure

Before carrying out any electrical work:

- Isolate the AHU at the control panel isolator.
- Confirm that electrical power to the sensor circuit is removed.
- Follow lock-off/tag-out procedures if required by site policy.

> **WARNING:** Never work on control wiring while the system is energised.

6.1 Obtaining the Replacement Sensor

- Obtain the correct replacement sensor.
- Confirm that the model matches the specification required for the AHU.
- Review the manufacturer's data sheet to identify terminal functions and wiring requirements.

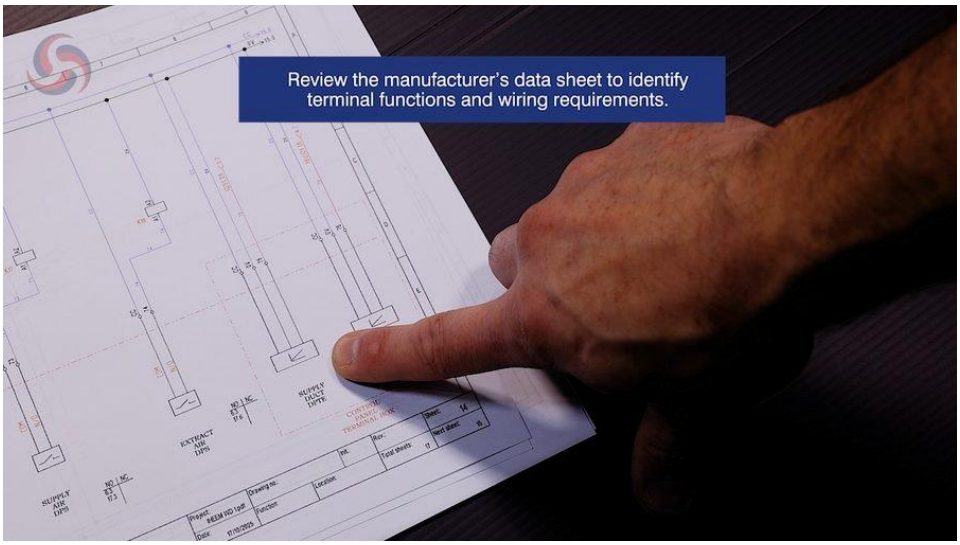

Figure 4. Reviewing the manufacturer's data sheet to identify terminal functions and wiring requirements for the replacement sensor.

6.2 Selecting the Correct Control Cable

- Select the appropriate multi-core control cable.
- Confirm cable type matches the wiring diagram.
- Ensure cable length allows correct routing without strain.

6.3 Numbering the Cable Cores

- Refer to the AHU wiring diagram.
- Identify the correct terminal numbers for the sensor.
- Number each cable core using cable markers.

Correct numbering ensures accurate termination and future maintenance identification.

Figure 5. Referring to the AHU wiring diagram to identify the correct terminal numbers for the sensor.

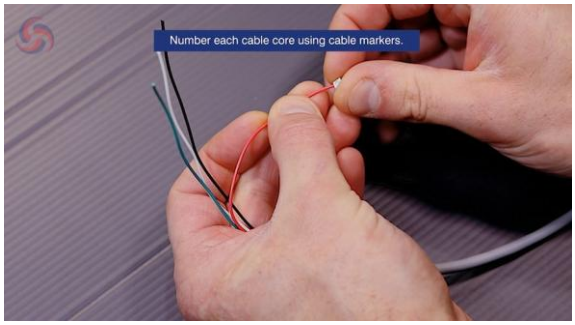

Figure 6. Numbering each cable core using cable markers to ensure accurate termination and future identification.

6.4 Preparing the Cable

Step 1 – Strip Cable Ends

- Carefully strip insulation from each cable core.
- Ensure copper conductors are not damaged.

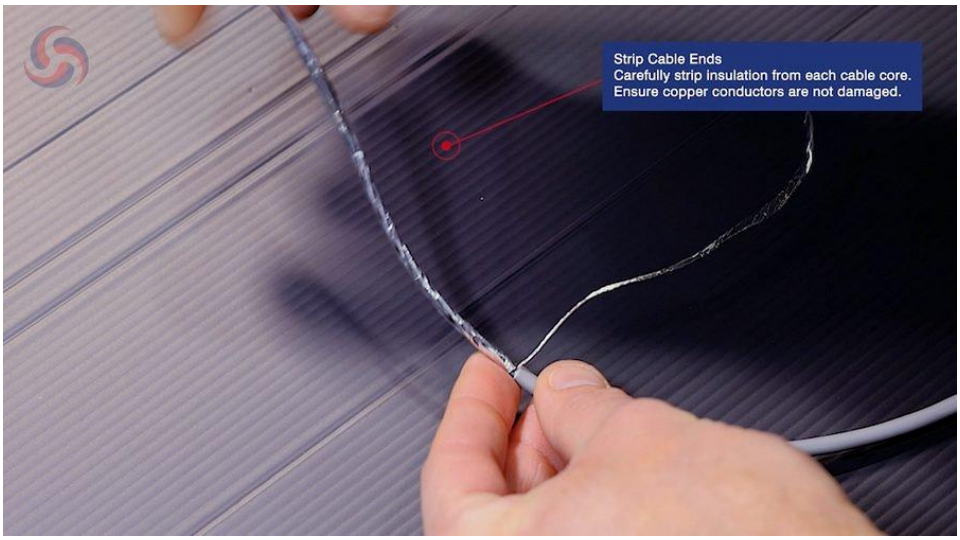

Figure 7. Stripping insulation from each cable core — ensure copper conductors are not damaged.

Step 2 – Fit Ferrules

- Fit correctly sized ferrules to each cable core.
- Crimp ferrules securely using an appropriate crimping tool.

Ferrules provide secure connections and prevent loose strands.

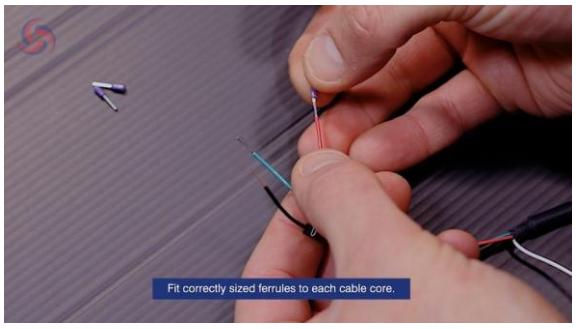

Figure 8. Fitting correctly sized ferrules to each cable core.

Figure 9. Crimping ferrules securely using an appropriate crimping tool.

6.5 Earthing Requirements

- Identify the earth core within the cable.
- Fit green/yellow earth sleeving where required.
- Terminate the earth connection securely to the appropriate earth terminal.

Proper earthing ensures safe operation and compliance with wiring regulations.

6.6 Wiring the Sensor

Using the manufacturer's data sheet and AHU wiring diagram:

- Identify the sensor terminals (e.g., power, signal, common).
- Insert each numbered cable core into the correct terminal.
- Tighten terminal screws securely.

Typical sensor terminals may include:

- Power supply (+24V or similar)
- Signal output (e.g., 0–10V)
- Common reference
- Earth (if applicable)

Always verify terminal identification before final tightening.

Figure 10. Sensor housing opened ready for termination — verify terminal identification before insertion.

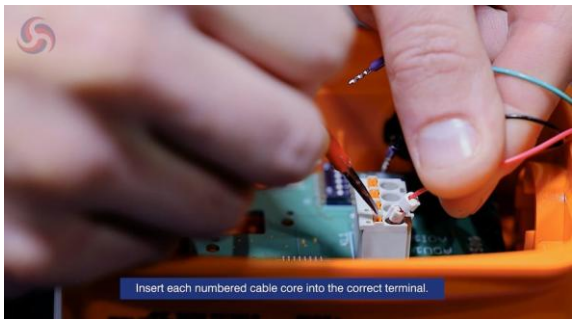

Figure 11. Inserting each numbered cable core into the correct terminal and tightening securely.

6.7 Securing the Sensor Housing

- Check that all wiring is correctly seated.
- Ensure no exposed conductors remain.
- Arrange cables neatly inside the housing.
- Secure the sensor lid or cover in place.

Ensure the enclosure seal is intact to protect against dust and moisture.

Figure 12. Arranging cables neatly inside the sensor housing and confirming no exposed conductors remain.

Figure 13. Securing the sensor lid or cover in place. Ensure the enclosure seal is intact.

6.8 Restoring Power to the AHU

- Remove lock-off devices if applied.
- Restore power at the AHU isolator.
- Allow the control system to initialise.

Confirm that:

- The sensor is communicating with the controller.
- The displayed value is within the expected range.
- The value updates correctly with changing conditions.

Confirm:

- Sensor securely mounted
- Wiring correctly terminated
- Cable properly supported
- Sensor enclosure closed and sealed
- Controller reading stable

7. Verification / Functional Test

- Supply voltage, polarity, protective earth and protection arrangement are verified where applicable.
- Terminal numbers, cable identifiers and signal types match the wiring diagram.
- Control signal, enable, status, fault, interlock or sensor value is verified at the controller, HMI or BMS where applicable.
- No exposed conductors, loose strands, unsealed glands, damaged insulation or unsecured cables remain.
- Sensor engineering value is visible on the controller/HMI and is reasonable for the measured condition.

Additional Verification Notes

- Access the Trend controller interface.
- Navigate to the relevant sensor input.
- Observe the live value being reported.

8. Stop-and-Escalate Conditions

STOP: Stop work or stop the review and escalate to the responsible ECE/project technical contact if any of the following apply:

- The AHU reference, asset tag, certified drawing or document revision cannot be confirmed.
- The information found does not match the physical AHU, installed component or project scope.
- Safe access, safe isolation or required site permits cannot be confirmed.
- A required component technical detail, wiring detail, control signal or manufacturer data sheet is missing.
- The task would block or compromise AHU maintenance access, withdrawal routes, isolators, terminal boxes or emergency access.
- The circuit cannot be isolated or proved dead.
- Terminal numbers, cable colours or signal types differ from the wiring diagram.
- A backfeed or unexpected voltage is present.
- The device technical information or signal type cannot be confirmed.
- Sensor type, range, polarity or terminal allocation cannot be confirmed.
- The controller value does not change or does not match the expected engineering range after wiring.

9. Final Checks

- Confirm the AHU, component, wiring, control function or approval item has been left in the intended safe and complete condition.
- Confirm access doors, panels, terminal boxes, covers, guards, isolators and labels are secure where applicable.
- Confirm no tools, temporary materials, loose items, debris or packaging remain in or around the AHU.

- Confirm any alarms, faults, abnormal indications or unresolved comments have been recorded and escalated.

Additional Final Checks

10. Records to Complete

Record enough evidence to prove that the task, review or test has been completed using the correct AHU information and by competent personnel.

- Isolation and prove-dead completed
- Terminal numbers and cable IDs recorded
- Signal/function verified
- Panel/terminal box closed and secured
- Test result recorded

Evidence item	Required entry
AHU reference / asset tag	To be completed
Certified drawing revision / document revision	To be completed
Person completing task / review	To be completed
Date completed	To be completed
Result / status	Pass / fail / comment / not applicable
Outstanding actions	To be completed or marked none

11. Completion Checklist

[ ] Correct AHU and guide number confirmed.
[ ] Latest asset information and certified drawing checked.
[ ] Relevant IOM, wiring diagram, controls description or manufacturer data checked where applicable.
[ ] Safety and competency requirements confirmed.
[ ] Procedure completed or approval review completed.
[ ] Verification / functional test completed.
[ ] Stop-and-escalate conditions checked and no unresolved stop condition remains.
[ ] Records to Complete section completed.
[ ] AHU returned to safe condition or review status recorded.

12. Task-Specific Completion Checks

[ ] Replacement sensor obtained
[ ] AHU safely isolated
[ ] Correct cable selected
[ ] Cable cores numbered
[ ] Cable ends stripped
[ ] Ferrules fitted
[ ] Earth core sleeved and terminated
[ ] Sensor wired per data sheet
[ ] Sensor lid secured
[ ] Power restored
[ ] Controller value verified

13. Learning Outcome

After completing this procedure, viewers will understand:

- How to safely isolate the AHU before electrical work
- How to prepare and terminate sensor wiring correctly
- How to install and secure a replacement sensor
- How to verify sensor operation within the Trend controller system

This ensures the sensor is installed safely and provides accurate data to the AHU control system.