Hawkeye™ H11D

Split-Core Current Switch, Auto Calibration With Display

RoHS Compliant c UL us LISTED CE

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Follow safe electrical work practices. See NFPA 70E in the USA, or applicable local codes.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Read, understand and follow the instructions before installing this product.
- Turn off all power supplying equipment before working on or inside the equipment.
- Use a properly rated voltage sensing device to confirm power is off. DO NOT DEPEND ON THIS PRODUCT FOR VOLTAGE INDICATION
- Only install this product on insulated conductors.

Failure to follow these instructions will result in death or serious injury.

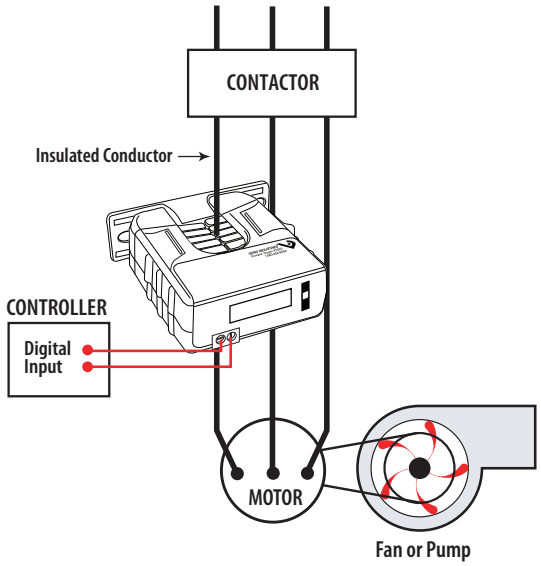
A qualified person is one who has skills and knowledge related to the construction and operation of this electrical equipment and the installation, and has received safety training to recognize and avoid the hazards involved. NEC2009 Article 100

No responsibility is assumed by Veris Industries for any consequences arising out of the use of this material.

NOTICE

- This product is not intended for life or safety applications.
- Do not install this product in hazardous or classified locations.
- The installer is responsible for conformance to all applicable codes.
- Mount this product inside a suitable fire and electrical enclosure.

WIRING EXAMPLE



SPECIFICATIONS

Sensor Power	Induced from monitored current
Amperage Range	60 Hz: 2.5 - 200A max. 50 Hz: 3.0 - 200A max.
Status Output	N.O. when device is unpowered, 1.0A@30VAC/DC not polarity sensitive
Response Time	1 sec.
Accuracy	±2% of full scale
Frequency Range	50/60 Hz
Temperature Range	-15° to 60°C (5° to 140°F)
Humidity Range	10-90% RH non-condensing
LCD Backlight	Off at low currents; illuminates when monitored current exceeds 4.5A; flashes during an alarm state while current remains above 4.5A
On-State Resistance	≤1.0 Ω
Off-State Resistance	≥1.0 MΩ
Setpoint Target Range, Switch Setting A*	±40% of learned nominal current; max. learned current of 142A to enable an upper trip limit at or below 200A
Setpoint Target Range, Switch Setting B*	±60% of learned nominal current; max. learned current of 125A to enable an upper trip limit at or below 200A
Switch Setting C*	On/Off Status; contacts are closed while amperage is above 2.5A
Alarm Reset Range	±5% of learned nominal current **
Setpoint Calibration Learn Period	30 sec.; self-learning, pushbutton reset
Normal-to-Alarm Output Delay	1 sec. maximum
Alarm-to-Normal Output Delay	30 sec. nominal
Insulation Class	600VAC RMS (UL), 300VAC RMS (CE)
Terminal Block Wire Size	24 to 14 AWG (0.2 to 2.1 mm^2)
Terminal Block Torque	3.5 to 4.4 in-lbs (0.4 to 0.5 N-m)
Agency Approvals	CE EN 61010-1:2001, UL508, Installation Category III, pollution degree 2

** Trip point switch positions A and B are not for use in applications where the current will fluctuate by more than 40% (A) or 60% (B) of the nominal current. If the current will fluctuate by more than 60%, use the H11D for on/off status (position C) only.*

*** The upper trip limit alarm resets when the current drops by 5% of the learned nominal current. The lower trip limit alarm resets when the current rises by 5% of learned nominal current.*

Specification Note: For CE compliance, conductor shall be insulated according to IEC 61010-1:2001.

Listed for use with 75°C insulated conductors.

The product design provides for basic insulation only.

Do not use the LCD as evidence of applied voltage.

INSTALLATION

⚠ **Disconnect power to the enclosure containing the conductor to be monitored.**

1. Determine normal operating conditions for the application, and move the slide switch to the best setpoint range (A, B, or C) for these conditions (e.g., if normal operation, including duct opening/closing and filter blockage is 50% of the learned nominal current, then set the slide switch to the B range (±60%), or use the C range (on/off status) to indicate when current falls below 2.5A at 60 Hz). For most blower systems, the 40% (A) setting is appropriate.
2. Locate a mounting surface for the removable mounting bracket that allows the monitored conductor to pass through the center window when it is installed and that keeps the product at least ½" from any uninsulated conductors. Determine cable routing for the controller connection, allowing wiring to reach the mounting location.
3. Drill holes and mount the bracket to the chosen surface using the included screws.
4. Wire the output connections between the sensor and the controller (solid-state contact).
5. Verify that the core mating surfaces are clean. Snap the sensor over the conductor and clip the assembly to the mounting bracket.
6. Secure the enclosure and reconnect power.

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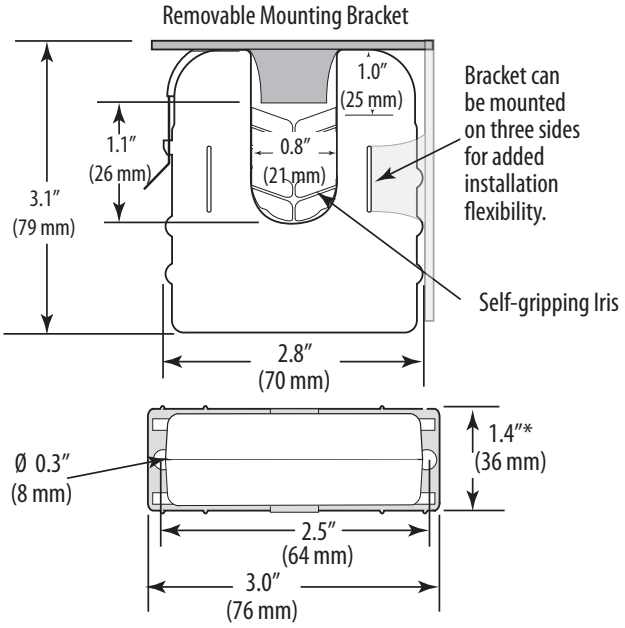
PRODUCT OVERVIEW

The H11D is an over-current and under-current monitor intended for use with HVAC systems (fans, blowers). When the H11D is unpowered, the status output contacts are open. When the device is powered, the contacts close and remain closed during normal operation. The H11D learns the nominal amperage in the conductor, then monitors for amperage changes outside the range chosen using the slide switch. If the amperage goes out of the established range, the contacts open, raising an alarm in the system controller. This alarm state persists until the amperage comes back to within range (5% of learned nominal rate below the upper trip limit or 5% of learned nominal rate above the lower trip limit of the learned nominal conditions) and remains within range for 30 seconds to ensure that the system has truly returned to normal operation. If load conditions change, use the reset button to send the H11D back into learning mode.

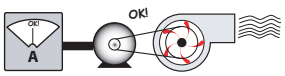
The status output is suitable for connection to system controllers or other data acquisition equipment operating at up to 1 A@30 VAC/DC. The H11D requires no external power supply to generate its output.

DIMENSIONS



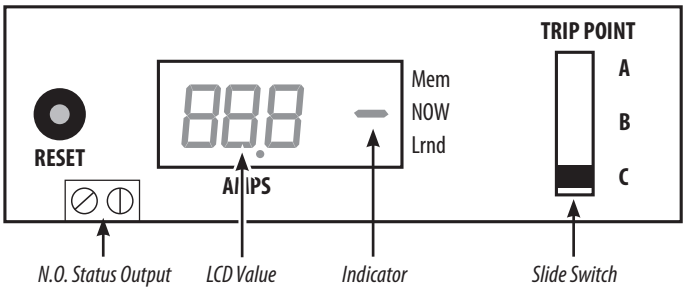
CALIBRATION

The H11D automatically calibrates when first powered and each time it is reset. Before beginning calibration, establish normal load conditions.



1. When amperage flows through the conductor, the H11D automatically enters the learning mode for approximately 30 seconds.
2. When in normal operation (after learning mode is complete), the LCD cycles between the values for the present amperage in the conductor (designated by the indicator adjacent to NOW) and the learned nominal amperage (designated by the indicator adacent to Lrnd).
3. If the nominal load on the conductor changes, the H11D can re-learn the new conditions. Press the reset button to return to the learning mode.

PRODUCT DIAGRAM



Slide Switch Options

A	Standard	±40% of learned nominal amperage. Max. learned nominal current is 142 A to enable an upper trip limit at or below 200 A.
B	Alternate	±60% of learned nominal amperage. Max. learned nominal current is 125 A to enable an upper trip limit at or below 200 A.
C	On/Off Status	Contacts remain closed while amerage is above 2.5 A at 60 Hz. Contacts open when amperage drops below 2.5 A.

Trip limits above the 200 A maximum are not permitted.

LCD Values

If the slide switch is in position A or B, the number shown in the LCD during normal operation cycles among the values listed below. An indicator appears to the right of the number, indicating which value is currently visible (Mem, NOW, or Lrnd)

Mem: the trip memory, or the amperage value above or below range that tripped the switch into alarm mode. This value remains stored in nonvolatile memory until the H11D is reset.*
NOW: the present amperage flowing through the conductor
Lrnd: the nominal amperage conditions established when the H11D is initially powered or reset.

** The LCD only shows the trip memory value (Mem) after a trip event has occurred. If no trip event has occurred, the LCD only cycles between NOW and Lrnd.*

If the slide switch is in position C (on/off status only), the LCD does not cycle. The value displayed is always the present amperage flowing through the conductor, and the indicator remains on NOW.

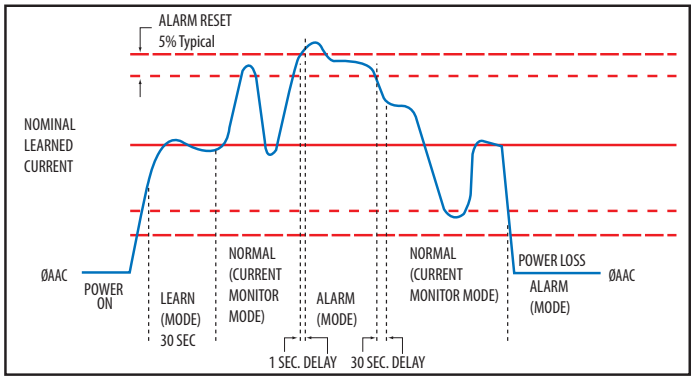
Operation Modes

Mode	Output Status	LCD
Learn (30 sec)	Closed (≤ 1 Ω)	NOW indicator flashes on/off
Normal Operation	Closed (≤ 1 Ω)	Display cycles between NOW and Lrnd
Alarm	Open (≥ 1 MΩ)	Display cycles among all three values: NOW, Lrnd, and Mem *

**The LCD backlight remains off at low currents. It turns on when the current exceeds 4.5 A and flashes during the alarm state while the current remains above 4.5 A.*

Note: In rare instances, status contacts may close momentarily when the unit initially recovers from an extended power off state (typically longer than 10 seconds) to an alarm state.

FUNCTIONAL ILLUSTRATION



Amperage Over-Limit Mode

Regardless of the trip point slide switch position and for any learned nominal current, if the amperage in the conductor exceeds 200 A, the H11D enters the over-limit mode. In this mode, the LCD value for NOW always reads OL (over limit). The H11D returns to normal operation mode when the amperage drops below 200 A. The status output contacts do not change state when the H11D enters over-limit mode.

MEMORY RESET

During setup, the H11D automatically determines the alarm limits according to the switch settings and stores them in nonvolatile memory. The H11D requires a memory reset to clear the nonvolatile memory if any significant system changes occur, such as:

- The sensor is reinstalled on a different motor.
- The motor is re-sheaved.
- The system is air balanced or air duct restrictions change.
- The motor load changes significantly.

To reset the H11D:

1. Establish normal operating conditions for the monitored conductor (e.g. clean air filters, close duct access doors).
2. The reset button has two positions, in and out. Push the button until there is a noticeable click to change the position of this switch. This causes a change of state, which triggers the reset function. The nonvolatile memory is erased and the H11D enters the learning mode.

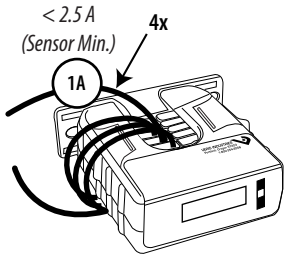
   Note: The reset function can be performed even if the H11D is not installed on a conductor. Pushing the button (changing the state) will clear the nonvolatile memory at the next power-up.

   Note: In normal operation, this button can be in either the in or out position.

NOTES

For load currents less than sensor minimum rating:

Wrap the monitored conductor through the center window and around the sensor body to produce multiple turns. This increases the current measured by the transducer.



Program the controller to account for the extra turns, e.g., if four turns pass through the sensor (as shown), divide the normal controller reading by 4.

The LCD displays the sum current of all the conductors passing through the center window. The trip points and on/off status are established by the total current passing through the center window during the learning mode.

Example: A conductor with a load of 2 A is wrapped through the center window 3 times, with the trip point slide switch in the A (40%) position. The total current detected by the H11D is, therefore, 6 A (2A x 3). This is the value displayed in the LCD. During calibration, the H11D learns the nominal amperage and calculates 40% of that value: 6 A x 40%, or 2.4 A. The trip limit currents are then set at 6A ±2.4, or 8.4 A and 3.6 A.

CAUTION

RISK OF EQUIPMENT DAMAGE

- **Derate the product's maximum current for the number of turns through the sensing window using the following formula.**

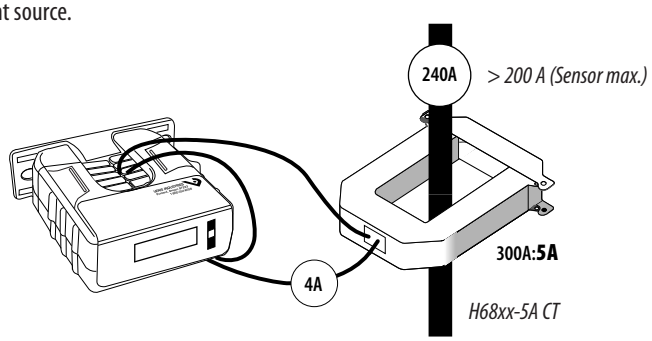
  Rated Max. Amps ÷ Number of Turns = Max. monitored Amps

  e.g. : 100A ÷ 4 Turns = 25 Amps max. in monitored conductor

- **Failure to follow these instructions can result in overheating and permanent equipment damage.**

For load currents greater than sensor maximum rating:

Use a 5 Amp (H68xx series) current transformer (CT) as shown. This technique can be combined with wrapping (see above) to add range for a low current load on a high current source.



DANGER: 5A CTs can present hazardous voltages. Install CTs in accordance with manufacturer's instructions. Terminate the CT secondary before applying current.

TROUBLESHOOTING

Problem	Solution
No Reading at Controller	• Check sensor calibration (see Calibration section) • Check for amperage in monitored conductor (> 2.5 A) • Verify that sensor core mating surfaces are clean and that the core clamp is completely closed

