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Smart Coil IOM

By Cooney Technologies



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Installation and Maintenance of Cooney Smart Coil System

General Precautions:

Warning:**- Risk of fire or electric shock.**

- The ability to install or perform service on this equipment requires expertise, electrical skills, tools, and equipment. If you do not possess these then do not attempt to service this equipment. Improper installation may result in injury, property Damage and / or death.

Description

The Cooney Smart Coil System is designed to work with Cooney Freeze Block Coils. The purpose of this technology is to provide a real time signal to the Building Automation System whenever the Cooney Freeze Block valve has been deployed.

The primary method of freeze detection involves a leak sensing probe that is inserted below the Freeze Block valve and is connected to an electronic monitoring board. This board has options for a normally open and normally closed circuit that can be connected to the Building Automation System controls. When the Freeze Block Valve senses a freeze condition and deploys fluid across the sensor the monitoring board will sense the fluid and change the position of the switch.

Parts List

- | | |
|------------------|------------------------|
| 1. Flat Clip – | AHU installation |
| 2. Hose Clip – | Duct Coil installation |
| 3. Sensor(s) – | All Installations |
| 4. Control Box – | All Installations |

Additional items required for installation

1. Zip ties – To secure and organize sensor leads between the control box and the valves
2. Fireproof caulk – To fill the gap around the leads penetrating the AHU wall (if applicable).

Parts



Figure 1 (flat clip)



Figure 2 (sensor)



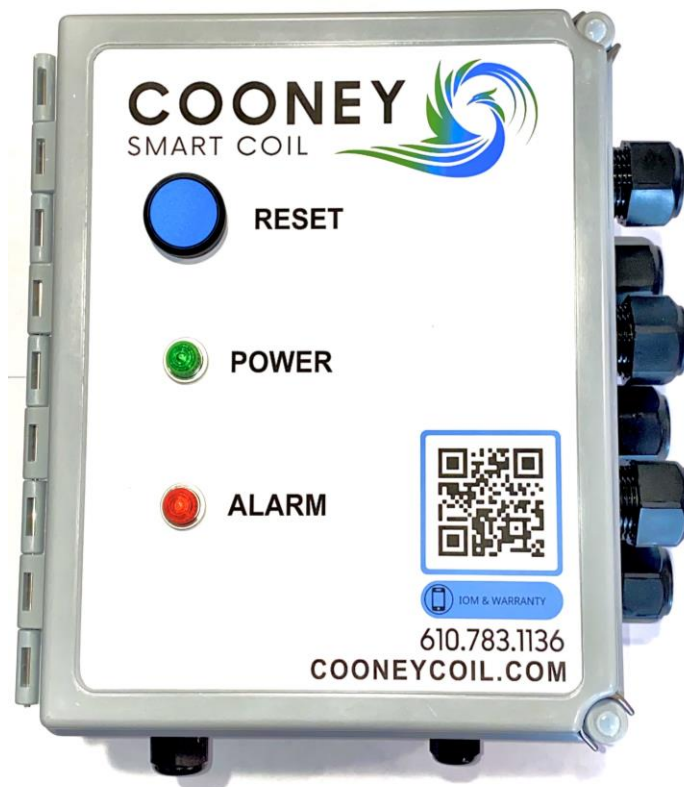
Figure 3 (sensor installed)



Figure 4 (installed top view)

Control Box

The monitoring board is housed in a NEMA 4 enclosure. This enclosure can be mounted anywhere inside or outside of the Air Handler within the reach of the sensor leads. Recommended placement of the control box is on the outside of the air handler door / panel near the coils. The control box has LED lights on the front to show power is supplied to the box (**GREEN**) and a separate light to indicate a freeze event has occurred (**RED**).



Monitoring Board

All probes will be monitored by the electronic circuit board through a direct connection to the terminal strip. This will allow communication with controlling software via a normally open or normally closed switch. When a leak is detected this switch will change positions, thus indicating to your building's management system / controller logic to enact emergency procedures.

Installation Process

****Before starting, ensure the Cooney Freezeblock Valves on the coil(s) have a groove on the hex portion at the bottom. For more information**

1. Attach the clip, (figure 1) to the outlet of each Freeze Block Valve
2. Insert the sensor, (figure 2) into the clip, (figure 3) until it clicks into place, (The sensor is multi-directional so orientation does not matter)
3. Mount the control box in an accessible location, either inside or outside of the air handler, using the provided mounting hardware. Ensure the control box location can be reached by all sensor leads.
 - If you are mounting the control box outside of the air handler, cut hole in air handler wall to run sensor leads through. The hole size will vary based on the number of leads.
4. Run the sensor leads from the valve(s) to the control box
 - Position all sensor wires in a manner that will prevent damage / inference with other equipment.
 - Utilize zip ties to organize the leads along the path from the valve to the control box
5. Insert the leads through the side inlet(s) on the control box and secure to the terminal strip
 - The terminal strip has designated and labeled ports for each sensor. (Figure 6)
 - Each sensor has two wires (black and white) which must be inserted into adjacent ports on the terminal strip. Orientation is non-specific. (Figure 6)
6. Connect 120V power supply in through the bottom opening of the box and attach to the appropriate 'L N G' ports shown at the bottom of Figure 5.
7. Turn the power on. The green LED light on the front of the control box will be on. Pull each sensor out of the clip and test to ensure it was installed correctly.
 - Test each sensor by dipping it in a cup of water. This will cause the red LED light on the box to turn on.
 - Press the reset button to clear the test after each sensor
 - Install sensor(s) into clip(s)

Installation Process, (continued)

8. Run control wiring from Building Management System to the TB8 output ports (figure 5)
9. Program Building Management System to understand switch position and communicate when the switch position changes due to the Freeze Block Valve deployment:
10. Cooney Engineered Solutions Recommends the Sequence of Operations after a valve deployment:
 - Send alarm to technicians
 - Shut down the fan
 - Close dampers
 - Turn on pre-heat coil (if applicable)
 - Turn on re-circulation pump (if applicable)

Technical Notes

Operation:

- Green LED indicator will be on when power is applied and unit is functioning normally.
- Red LED Indicator turns on when a valve is deployed (Alarm State).
- The Red LED will remain on after valve deployment even if the valve stops deployment.
- The valve deployment can be reset by manually pressing the Reset button.
- If the Red LED indicator light is on after a reset button press, a valve is still deploying.

Power Requirement:

- 120VAC 1A connected to TB4.
- TB4 is labeled "L N G" for the power connections. (Live, Neutral, Ground)
- Maximum power consumption is 5W

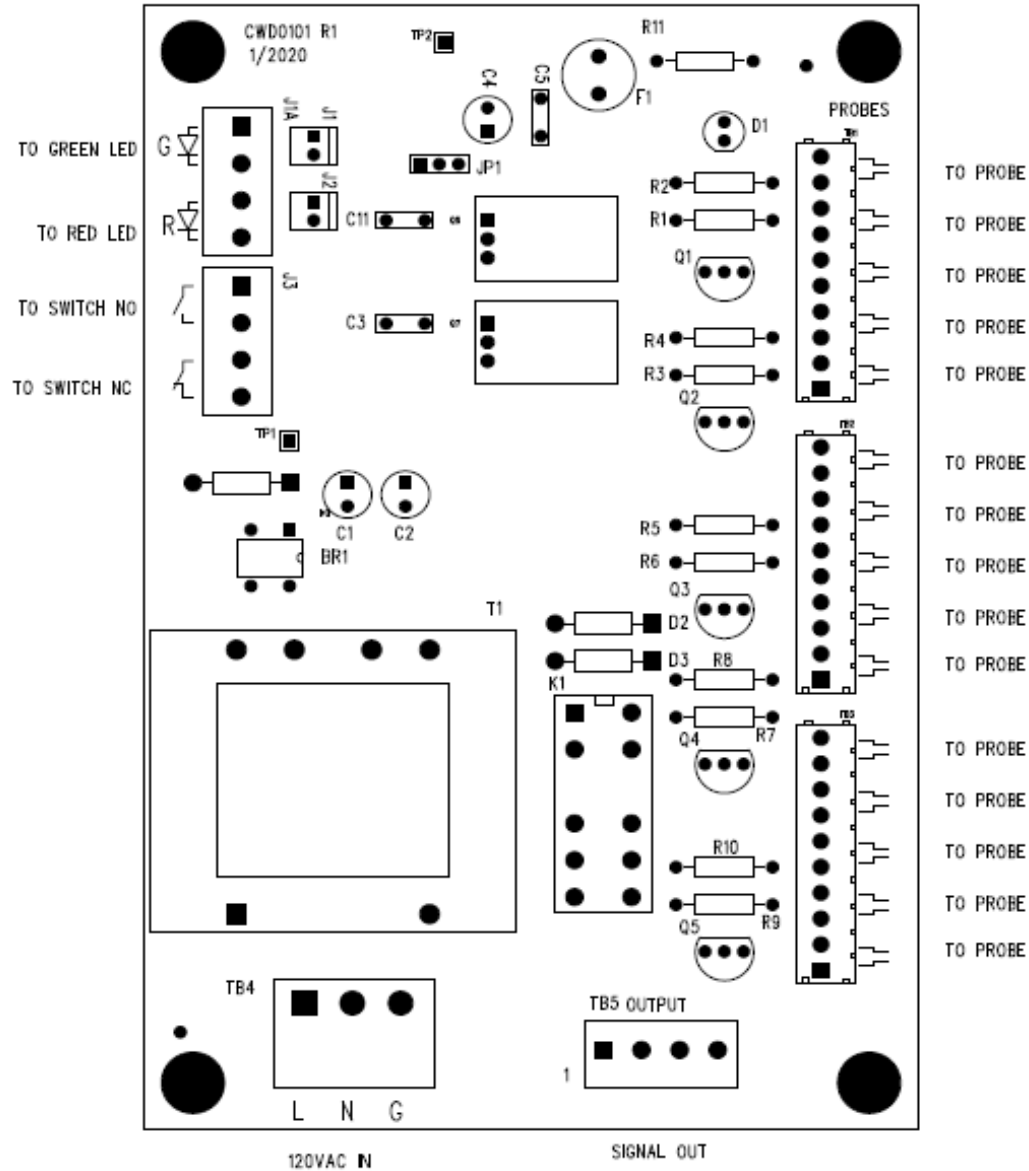
Input:

- Up to 30 sensors can be connected to the unit.
- Sensors connect to terminal blocks TB1, TB2, TB3, TB4, TB5 and TB6.

Output:

- A terminal block (TB8) is provided for external monitoring.
- The terminal block is connected to a double pole single throw (DPST) dry contact relay rated a 3 amp.
- Pins 1 & 2 are normally closed and pins 2 & 3 are open during normal operation (no valve deployment).
- Pins 1 & 2 are open and pins 2 & 3 are close when a valve is deployed (Alarm State).
- The output will remain in the Alarm State until the reset button is manually pressed.

Figure 5 (wiring diagram)



SIGNAL OUTPUT
 NORMAL OPERATION, NO LEAK DETECTED
 PINS 1-2 OF J4 ARE CONNECTED
 PINS 2-3 OF J4 ARE OPEN
 ALARM OPERATION, LEAK DETECTED
 PINS 1-2 OF J4 ARE OPEN
 PINS 2-3 OF J4 ARE CONNECTED

Figure 6 (single sensor installed)

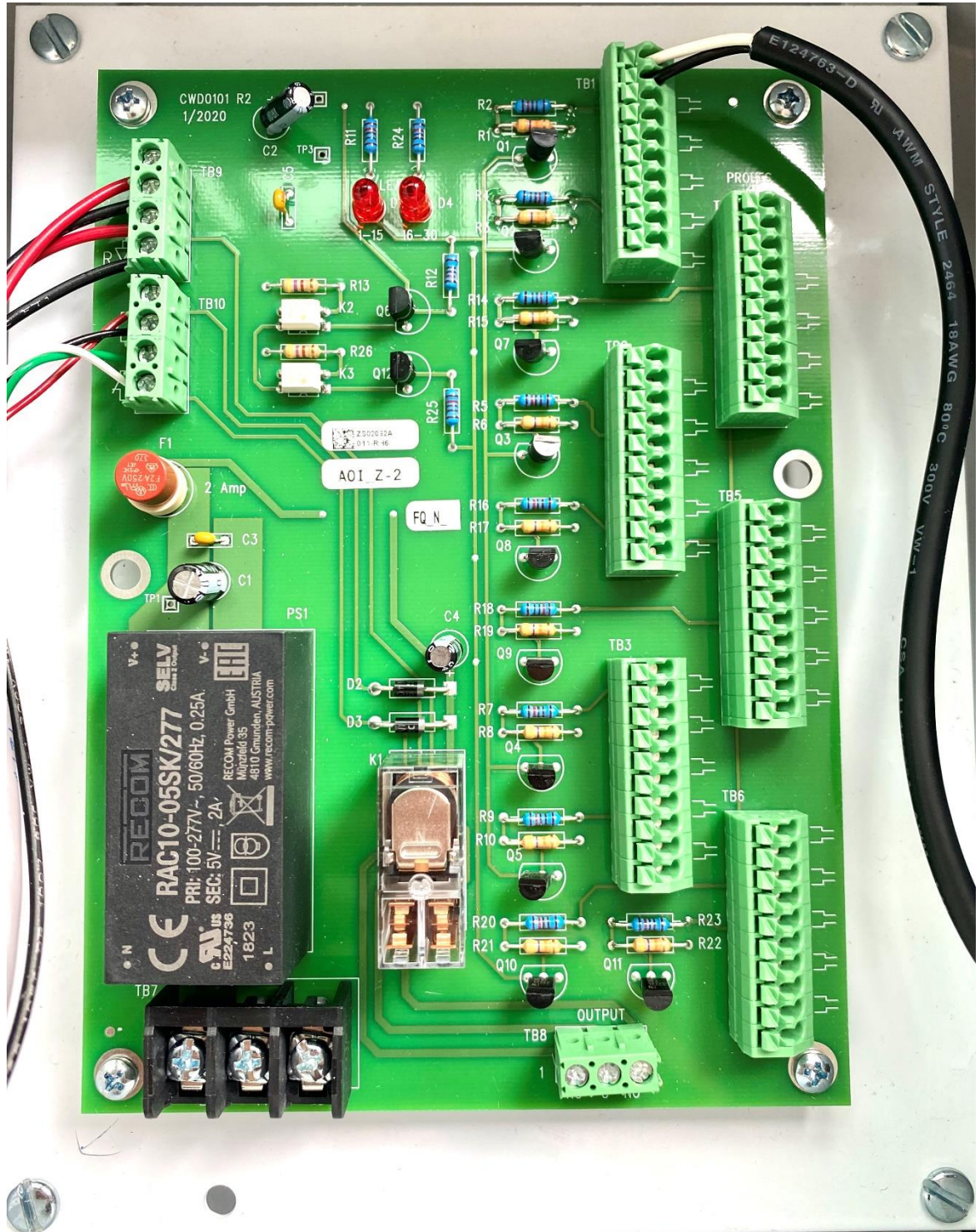


Figure 7 (Control box dimensions)

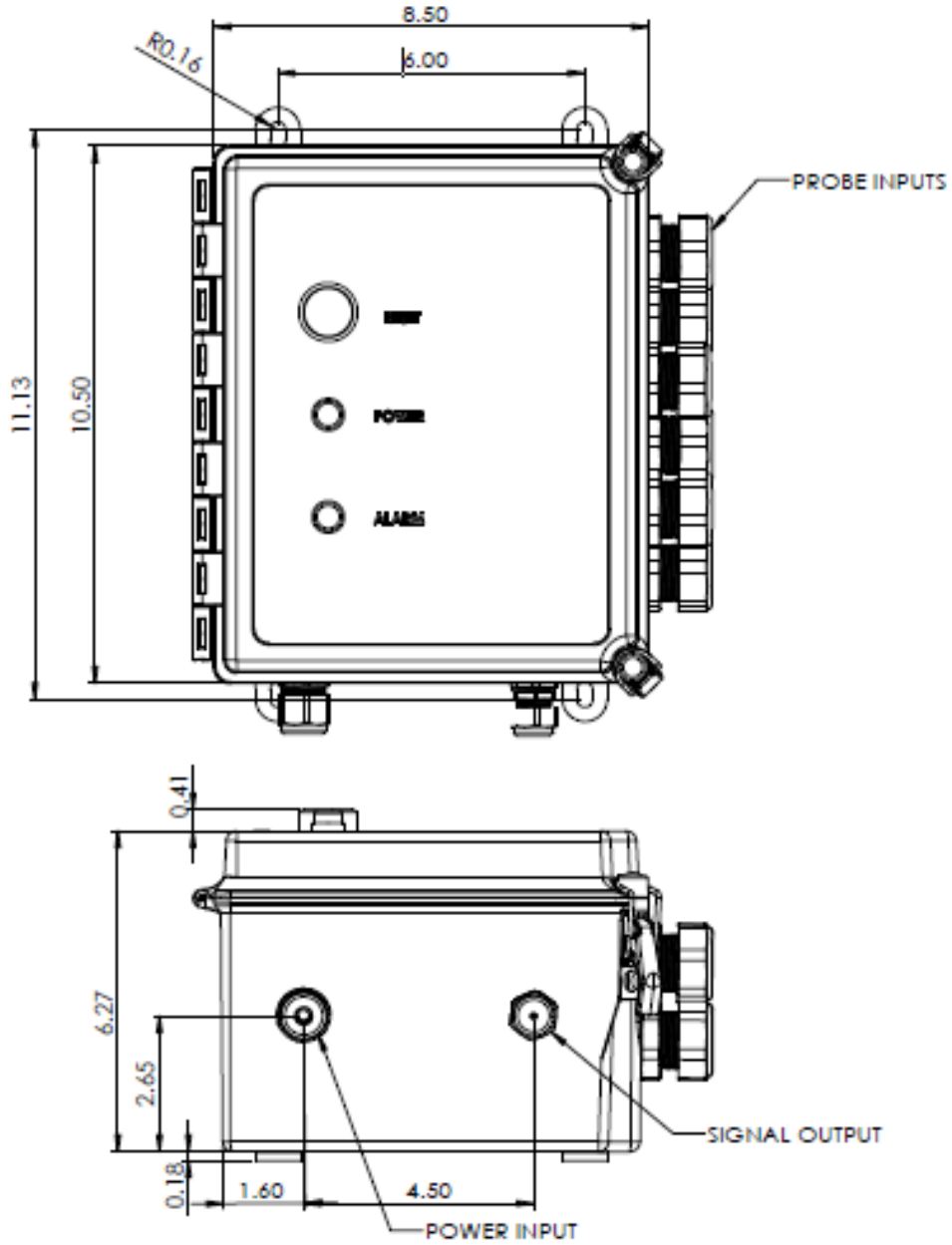


Figure 8 (Cooney Freezeblock Valve)

Beginning in October 2019, all Cooney Freezeblock valves are designed with a groove in the hex portion to accept the clip for the Smart Coil Technology. Older generations of the valve did not have this groove. If the coil was purchased before October 2019 than the valves do not have the groove. To install the Smart Coil Technology, the valves with the groove must be installed as this is required to accept the clip/sensor.

Previous Design (no groove)



New Design (includes groove)



Installation of New Valves

Removal of existing valves

1. Place a wrench on the brass adapter above the valve to hold back the adapter while force is applied to remove the valve.
2. Put a 7/8" crescent wrench or socket on the hex portion at the bottom of the valve
3. Rotate the valve clockwise and remove from the adapter

Installation of new valve

1. Thread the new valve into the adapter by hand first to align threads
2. Tighten valve down with crescent wrench or socket wrench until the valve body meets the adapter. (Note: Do not apply Teflon tape/pipe dope to valve threads and do not torque down the valve)

Maintenance

Inspection:

- Confirm power is supplied to the control box via the green LED light on the cover.
- Open control box to ensure all sensor leads are securely fixed in the terminal strip(s)
- Check sensor leads from the control box to the Cooney Freezeblock valve(s) for rips / tears / discontinuity / exposed wires.
- Clip (Figure 1) must be securely installed onto the valve.
- Sensor must be securely installed into the clip (Figure 4).
- Check output leads for rips / tears / discontinuity / exposed wires.

Repair:

- If sensors, clips, and/or control boxes are found to be damaged in any way, they should be removed and replaced.
- Contact Factory for replacement parts.

Service:

Test each sensor to ensure functionality.

- Step 1: Ensure power is supplied to the control box and the green 'power' LED is lit.
- Step 2: Press reset button on control box to clear any previous alarms.
- Step 3: Remove one sensor from clip to expose the two stainless probes.
- Step 4: Dip stainless probes into a cup of water (both probes must touch the water)
- Step 5: Check control box to see if the red 'alarm' LED lights up.
 - If the red 'alarm' LED is lit, install sensor back into the clip and repeat steps 2 through 5 for all remaining sensors.
 - If the red 'alarm' LED does not light up, remove and reinstall the sensor lead at the terminal strip then repeat steps 2 through 5.

Test air handler sequence of operations during freeze event

- Step 1: Turn air handler on and ensure power is supplied to the Smart Coil Control box.
- Step 2: Remove a single sensor from the clip.
- Step 3: Dip stainless probes into a cup of water (both probes must touch the water).
- Step 4: Ensure Air Handler shuts down per the programmed sequence of operation.