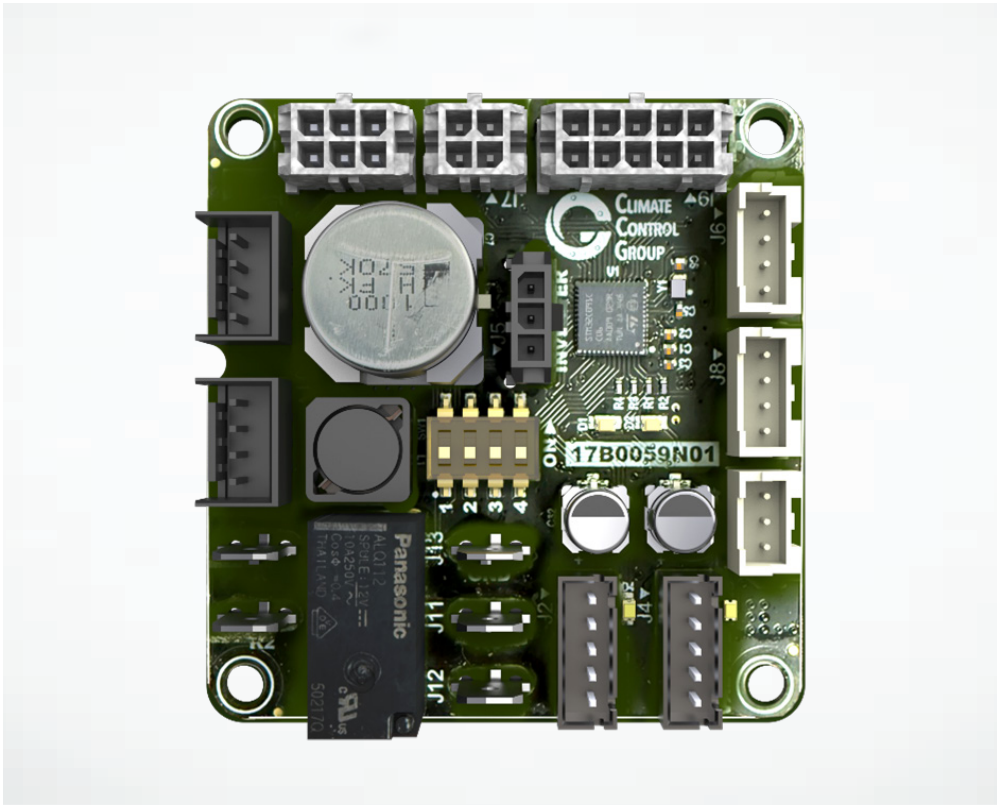
ADVANCED REFRIGERANT CONTROL

APPLICATION, OPERATION & MAINTENANCE MANUAL

Part#: 97B0191N01 | Revised: May 8, 2026

For Factory-Installed and Replacement HGRH Controls



Models:
Advanced
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Overview

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GENERAL INFORMATION

The Advanced Refrigerant Control is an accessory control responsible for monitoring refrigerant sensors and controlling refrigerant valves. The control includes multiple refrigerant sensor inputs, two stepper outputs for modulating refrigerant valves, and an output relay with normally open and closed contacts for various uses, such as enabling a refrigerant bleed valve. The control uses non-volatile flash memory for storing configuration and operational information.

GENERAL OPERATING PARAMETERS

The following are general operating parameters for the Advanced Refrigerant Control:

- **Operating Environment:** -40°F to 176°F (-40°C to 80°C) and up to 95% relative humidity, non-condensing.
- **Storage Environment:** -40°F to 185°F (-40°C to 85°C) and up to 95% relative humidity, non-condensing.

POWER REQUIREMENTS

Control power draw:

- Normally 12VA draw at 24VAC
- Maximum 24VA draw at 24VAC.

Control power draw with two valves:

- Normally 24VA draw at 24VAC
- Maximum 36VA draw at 24VAC.

FIELD SELECTABLE SWITCHES

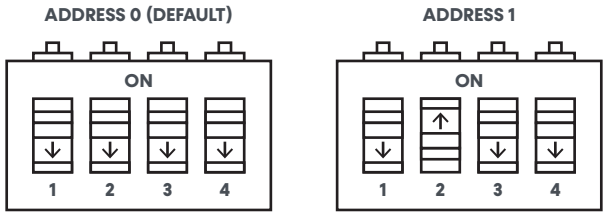
DIP Switches

- **DIP 1 – End of Line Termination (Modbus network):** Provides end of line termination for Modbus communication network.
- **DIPs 2 and 3 (DIP Switch Addressing):** Provides address selection for operation in a communicating system. The control may operate as a communication follower with the following address options:
- **DIP 4 - Unused**

DIP Switch Addressing

Board Configuration	Circuit 1/Board 1		Circuit 2/Board 2	
	Switch 2	Switch 3	Switch 2	Switch 3
Single Board	0	0		
Multi-Board	0	0	1	0

DIP Switch Address Configuration



Legend and Glossary of Abbreviations

Abbreviation	Description
CDP	Compressor Discharge Pressure
CDT	Compressor Discharge Temperature
CSP	Compressor Suction Pressure
CST	Compressor Suction Temperature
HGRH	Hot Gas Reheat

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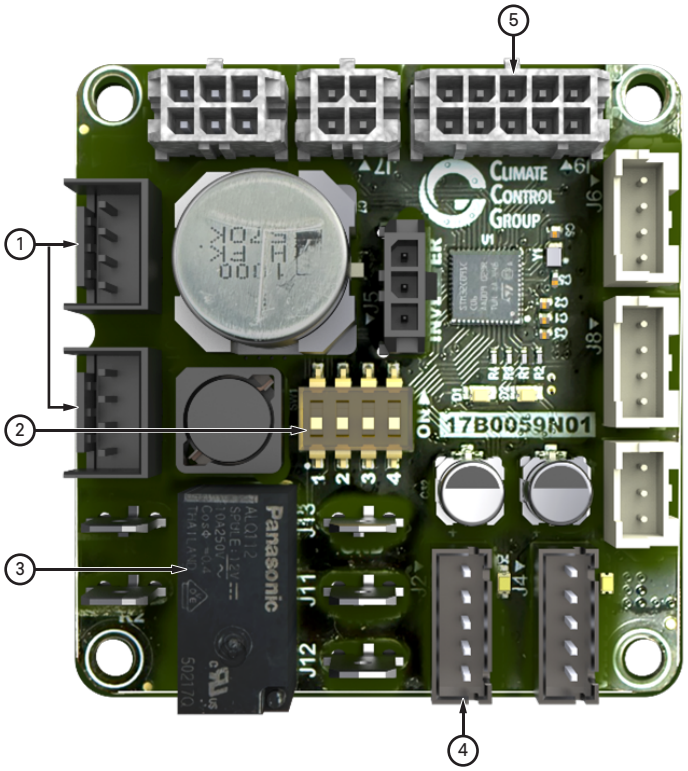
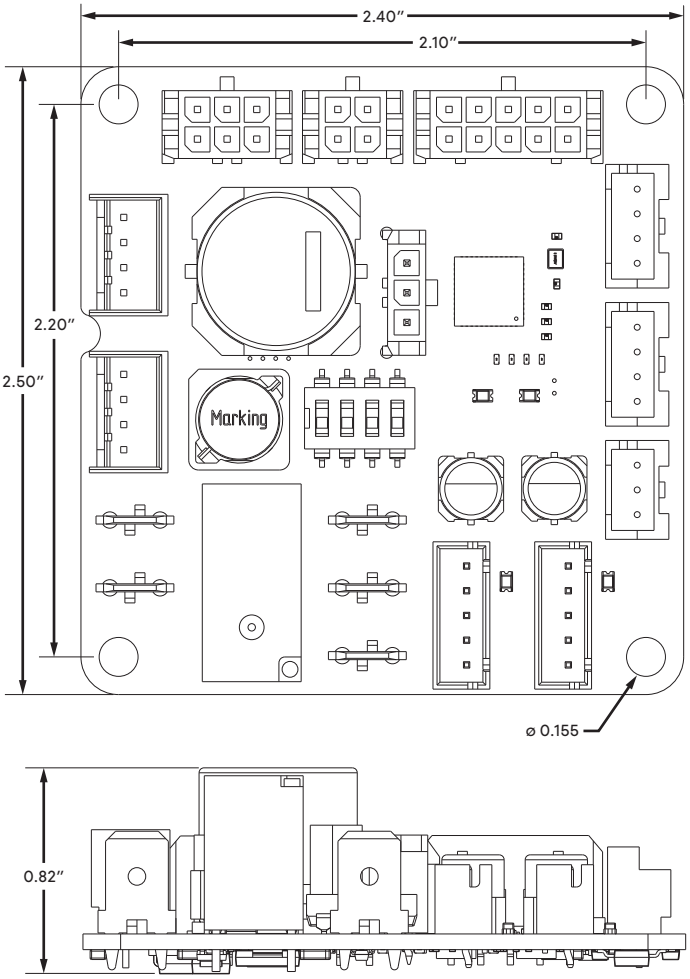
Layout and Physical Dimensions

Layout



ID Number	Description
1	Modbus Communications Ports
2	EoL Termination/Modbus Address settings
3	Accessory Relay
4	Stepper Motor Valve
5	Refrigerant Temperature and Pressure Sensors

Physical Dimensions



Fault Codes

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LED AND FAULT CODES

In Lockout mode, the Fault LED fast flashes. The valve and relay outputs are turned off immediately. To soft reset Lockout mode, remove the call for demand at the thermostat. Disconnect power to the control to hard reset Lockout mode.

The fault data is stored in non-volatile memory on the unit control. You can view fault data in the Wireless Service Tool web application.

Advanced Refrigerant Control Fault Codes

Code	Warning Descriptions	Fault LED	Status LED
--	Control is Non-functional	Off	Off
--	No Active Communications	On	On
--	Normal Operation	Very Slow Flash	On
--	Control is currently in lockout	Fast Flash	On
--	Control is in a warning	Slow Flash	On
2	High Discharge Pressure Warning (>600 psi)	Slow flash	On
3	Low Suction Pressure Warning (<50 psi)	Slow flash	On
4	Suction Temperature Sensor Out of Range (< -30°F or > 300°F)	Slow flash	On
5	Discharge Temperature Sensor Out of Range (< -30°F or > 300°F)	Slow flash	On
7	Low Discharge Superheat (<10°F)	Slow flash	On
8	Low Suction Superheat (<2°F)	Slow flash	On
9	High Suction Superheat (>20°F)	Slow flash	On
10	Stepper Motor Stuck	Fast flash	On
11	Stepper Motor Overcurrent	Fast flash	On
12	Stepper Motor Mis-wire	Fast flash	On
14	High Discharge Temperature Warning (>250°F)	Slow flash	On
15	Discharge Pressure Sensor Out of Range (< 0psi or > 650psi)	Slow flash	On
16	Suction Pressure Sensor Out of Range (< 0 psi or > 250 psi)	Slow flash	On
19	Low Refrigerant Differential Pressure (<20 psi)	Slow flash	On

- Fast Flash = 5 flashes every 1 second
- Slow Flash = 1 flash every 2 seconds
- Very Slow Flash = 1 flash every 5 seconds

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Troubleshooting

GENERAL

To properly configure and troubleshoot advanced control features, and to aid in troubleshooting basic control features, use a communicating thermostat or diagnostic tool with similar capabilities.

TROUBLESHOOTING TABLE

LED/Warning/Fault/Symptom	Mode	Possible Cause	Solution
Main Power Problems	All	Red (Fault and Green (Status) LEDs OFF	• Check the line voltage circuit breaker and disconnect • Check for line voltage between L1 and L2 on the contactor • Check for 24VAC between R and C on the control • Check primary/secondary voltage on the transformer
Code 2 High Pressure	All	Reference Unit Control AOM	
Code 3 Low Pressure	All	Reference Unit Control AOM	
Code 4 Suction Temperature OOR	All	Bad Thermistor	Check temperature vs resistance curve per calculator
		Bad Wiring Harness	Check wiring harness continuity
		Bad control	If the wiring harness and sensor are functional, replace the unit control
Code 5 Discharge Temperature OOR	All	Bad Thermistor	Check temperature vs resistance curve per calculator
		Bad Wiring Harness	Check wiring harness continuity
		Bad control	If the wiring harness and sensor are functional, replace the unit control
Code 7 Low Discharge Superheat	All	Bad Discharge Pressure Transducer	Troubleshoot the transducer
		Bad Discharge Temperature Sensor	Check temperature vs resistance curve per calculator
		Improperly Installed Discharge Temperature Sensor	Check the location and position of the temperature sensor
		Faulty Expansion Valve	Check TXV operation
Code 8 Low Suction Superheat	All	Bad Suction Pressure Transducer	Troubleshoot the transducer
		Bad Suction Temperature Sensor	Check temperature vs resistance curve per calculator
		Improperly Installed Suction Temperature Sensor	Check the location and position of the temperature sensor
Code 9 High Suction Superheat	All	Bad Check Valve	Check the temperature across check valve in the unused circuit to determine if there is leakage
		Bad Suction Pressure Transducer	Troubleshoot the transducer
		Bad Suction Temperature Sensor	Check temperature vs resistance curve per calculator
		Improperly Installed Suction Temperature Sensor	Check the location and position of the temperature sensor
		Faulty Expansion Valve	Check TXV operation
		Insufficient Refrigerant Charge	Check system charge levels

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LED/Warning/Fault/Symptom	Mode	Possible Cause	Solution
Code 10 Stepper Motor Stuck	All	Bad Wiring Harness	Check the wiring harness continuity
		Bad Control	Replace the control
		Bad Refrigerant Valve	Replace the HGRH valve
Code 11 Stepper Motor Overcurrent	All	Bad Wiring Harness	Check the wiring harness continuity
Code 12 Stepper Motor Improperly Wired	All	Bad Wiring Harness	Check the wiring harness continuity
Code 14 High Discharge Temperature	All	Faulty Expansion Valve	Check TXV operation
		Insufficient Refrigerant Charge	Check system charge levels
	Cool	Water Temperature Out of Range	Bring water temperature within design parameters
	Heat	Air temperature out of range	Bring air temperature within design parameters
Code 15 Discharge Pressure Sensor	All	Bad Discharge Pressure Transducer	If the supply voltage at BLK and GND wires reads 4.5-5.5VDC but signal at GND and RED is not between 0.5-4.5VDC, replace the sensor.
		Bad Wiring Harness	Check the wiring harness continuity
		Bad Control	If supply voltage across 5V0 (pin 1) and GND (pin 5) doesn't read 4.5-5.5VDC, replace control.
		Bad Control	If supply voltage across DP (pin 3) and GND (pin 5) doesn't read 0.5-4.5VDC, replace control.
Code 16 Suction Pressure Sensor	All	Bad Suction Pressure Transducer	If the supply voltage at BLK and GND wires reads 4.5-5.5VDC but signal at GND and RED is not between 0.5-4.5VDC, replace the sensor.
		Bad Wiring Harness	Check the wiring harness continuity
		Bad Control	If supply voltage across 5V0 (pin 2) and GND (pin 6) doesn't read 4.5-5.5VDC, replace control.
		Bad Control	If supply voltage across DP (pin 4) and GND (pin 6) doesn't read 0.5-4.5VDC, replace control.
Code 19 Low Refrigerant Differential	All	Stuck Reversing Valve	Replace faulty reversing valve
		Bad Compressor	Check compressor to ensure it is operating
Unit Doesn't Operate in Reheat	Dehum	Board Configuration	Verify that HGRH is enabled via the WST

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Revision History

Date	Section	Description
05/8/26	All	Created

We work continually to improve our products. As a result, the design and specifications of each product at the time of order may be changed without notice and may not be as described herein. Please contact our Customer Service Department at 800-299-9747 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely our opinion or commendation of its products.

Engineered and assembled in the USA.