

INSTALLATION, OPERATION & APPLICATION GUIDE

For more information on our complete range of American-made products – plus wiring diagrams, troubleshooting tips and more, visit us at www.icmcontrols.com



FEATURES

- Starting current reduction and self-learning algorithm
- Built-in start capacitor
- Over-current protection
- Over/under voltage monitoring
- Diagnostic indicators
- Sealed enclosure

SPECIFICATIONS

Semi-Conductor Soft-Start Motor Controller, Form 2, Bypassed Controller

- SCCR: 5kA
- Uimp = 4kv
- Ue = 240 VAC
- FCC 47 CFR Part 15 Subpart B: 2021, Class B
- Ui = 240 VAC
- Pollution degree 3

Input (L1, L2) – 100-240 VAC 50/60Hz

- Over voltage limits:** 115 VAC nominal = 140 VAC, 240 VAC nominal = 264 VAC
- Under voltage limits:** 115 VAC nominal = 95 VAC, 240 VAC nominal = 195 VAC

Outputs: Compressor

- Solid state/relay**
- Current:** Max. nominal = 9 FLA for ICM870-9A, 16 FLA for ICM870-16A
- Over current limits:** ICM870-9A = 11.25A, ICM870-16A = 20A

Environmental:

- Ambient temperature:**
40°C @ 16 FLA, 8 h duty
50°C @ 16 FLA, Temporary duty –
F = 30% (3 mins ON and 7 mins OFF); S = 6 (6 cycles per hour)

- Storage temperature:** -40°F to 149°F (-40°C to 65°C)

- Humidity:** 0-95% non-condensing

- Enclosure:** IP65

- Dimensions:** 7.60" x 3.20" x 2.10"

- Screw hole center points:** 7.00" x 1.97"

IMPORTANT SAFETY INFORMATION



HIGH VOLTAGE WARNING – Always turn off power at the main service panel before installing.

CAUTION: The ICM870 must be mounted in an area where it will not be exposed to water or the elements. Exposure of the ICM870 soft start to water can cause failure of the control and is a risk for fire or other electrical safety hazards.

Suitable for use on a circuit capable of delivering not more than 5,000 rms symmetrical Amperes, 240 V maximum when protected by a circuit breaker having not more than 40 A, 240 volts maximum

Installation of any ICM870 soft start must be done by a certified HVAC technician or licensed electrician. All installations are to be done in accordance with local, state, and national electrical codes.

APPLICATION

The ICM870 is intended for Marine, Recreational Vehicle, and commercial applications. The ICM870 integrates compressor in-rush current over startup time, thus reducing peak current demand on a power supply source (generator or other). The ICM870 will monitor system health including voltage, current, compressor startup and self integrity. Upon a fault condition, the ICM870 will halt operation and initiate a 3 minute anti-short cycle routine while providing diagnostic fault information by means of an LED indicator.

ICM870 COMPARABLE AMPERAGE CROSSES

The ICM870-9A and 16A models cross to the comparable amperage models from the following manufacturer's:

- Micro-Air** (Easy Start)
- Network RV** (Soft Start)
- Dometic** (Smart Start)
- Hyper Engineering** (Sure Start)

STANDARD AND TEST RESULTS

- UL 60947-4-2
- IEC 60947-4-2: 2020
- CAN ICES-003(B) / NMB-003(B)
- IEC 61000-4-2, Class 3 air, Class 2 contact
- IEC 61000-4-3, Class 3
- IEC 61000-4-4, Class 3
- IEC 61000-4-5, Class 3
- IEC 61000-4-6, Class 3
- IEC 61000-4-8, Class 4
- IEC 61000-4-11, Class 2
- Altitude: 2000 m
- 9A: AC-58b: 9-180: 420
- 16 A: AC-58b: 16-180: 420
- IP65

LED INDICATORS

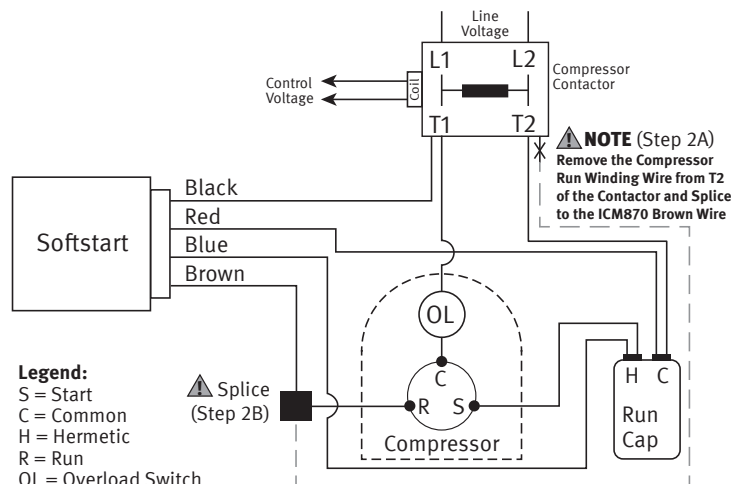
START = Green • RUN = Green • FAULT = Red (flashing)

FAULT CODES

Fault Code	Fault Condition
1	High or low voltage
2	Compressor not sensed or open fuse
3	High current
4	Compressor start error
5	Invalid operating frequency

FOR RESIDENTIAL A/C's

WIRING DIAGRAM (GENERAL LAYOUT)



INSTALLATION

- Step #1** Connect the (**ICM870 RED WIRE**) > to the run capacitor terminal (c/common/L2)
- Step #2** a) Disconnect factory installed compressor run wire from the contactor terminal (T2/L2)
 b) Splice the (**ICM870 BROWN WIRE**) > to the compressor run wire previously disconnected in (Step 2A)
If there is a Start Capacitor and or PTCR already in place, additional steps will be required to disconnect.
- Step #3** Connect the (**ICM870 BLUE WIRE**) > to the run capacitor terminal (herm/hermetic/start)
- Step #4** Connect or splice the (**ICM870 BLACK WIRE**) > to the contactor terminal (T1/L1)

WHICH MODEL DO I NEED?

ICM870-9A: For AC's with a Compressor Load Amp Rating (RLA) of up to 9A

ICM870-16A: For AC's with a Compressor Load Rating (RLA) of 9.1-16A

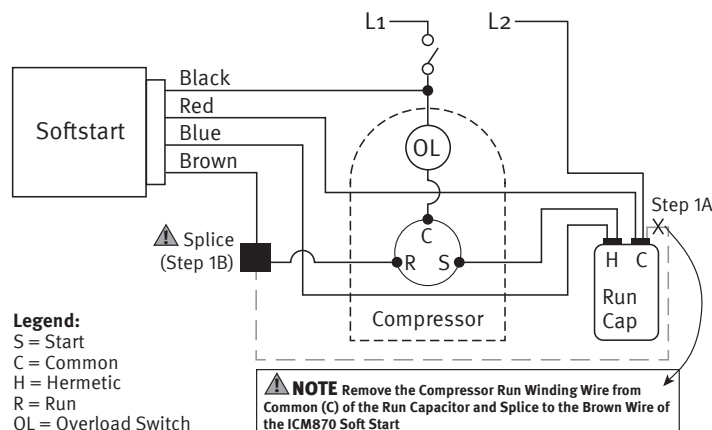
This chart reflects average conversions of Single-Phase Air Conditioning and Heat Pump Tonnage, BTU's, HP, and RLA. Please refer to you user manual or service panel to determine your actual RLA before deciding which model ICM870 you need.

Air Conditioning & Heat Pump Loads – Average

Size	BTU	HP	RLA	ICM870 Model
1 Ton	12,000	1	5	9A
2 Ton	24,000	2	10	16A
3 Ton	36,000	3	15	16A
4 Ton	48,000	4	20	Coming Soon
5 Ton	60,000	5	25	Coming Soon

FOR RV & MARINE A/C's

WIRING DIAGRAM (GENERAL LAYOUT)



INSTALLATION

- Step #1** a) Disconnect factory installed compressor run wire from the common run capacitor / L2 terminal
 b) Splice the **ICM870 BROWN WIRE** > to the factory installed compressor run wire previously disconnected in step #1A.
If there is a Start Capacitor and or PTCR already in place, additional steps will be required to disconnect them.
- Step #2** **ICM870 RED WIRE** > to the run capacitor (c/common/L2) terminal
- Step #3** Connect the **ICM870 BLUE WIRE** > to the run capacitor (herm/hermetic/start) terminal
- Step #4** Splice the **ICM870 BLACK WIRE** > with the factory install compressor Overload Switch wire (OL/L1)