



# ICM CONTROLS ICM870-32A Soft Starter User Guide

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**ICM CONTROLS ICM870-32A Soft Starter**



## Product Information

The ICM870-32A Soft Start is a motor controller designed for use in HVAC systems. It features starting current reduction and a self-learning algorithm to optimize performance. The soft start also includes a built-in start capacitor for smooth motor startup, over-current protection to prevent damage, over/under voltage monitoring for safety, diagnostic indicators for troubleshooting, and a sealed enclosure for durability.

It is suitable for use on a circuit capable of delivering not more than 5,000 rms symmetrical Amperes at a maximum voltage of 240V. It should be protected by a circuit breaker with a maximum rating of 40A, 240 volts.

Installation of the ICM870-32A soft start must be done by a certified HVAC technician or licensed electrician, following local, state, and national electrical codes.

## Product Usage Instructions

1. **Step 1:** Disconnect the factory-installed compressor run wire from the common run capacitor / L2 terminal.
2. **Step 2:** 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.
3. **Step 3:** Connect the ICM870 RED WIRE to the run capacitor (c/common/L2) terminal.
4. **Step 4:** Connect or splice the ICM870 BLUE WIRE to the run capacitor terminal (herm/hermetic/start).
5. **Step 5:** Connect or splice the ICM870 BLACK WIRE to the contactor terminal (T1).

Please follow these steps carefully to ensure proper installation and operation of the ICM870-32A soft start. If you have any questions or need further assistance, please consult a certified HVAC technician or licensed electrician.

## 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
- $U_{imp} = 4kv$
- $U_e = 240\text{ VAC}$
- Pollution degree 3
- $U_i = 240\text{ VAC}$

### Input

(L1, L2) – 100-240 VAC 50/60Hz

- **Overvoltage 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

- UL 60947-1
- UL 60947-4-2
- Altitude: 2000 m
- IP65
- CSA 2 NO. 60947-1
- CSA C22.2 60947-4-2

### Solid state/relay

- **Current:** nominal = 32A
- **Over-current limits:** ICM870-32A = 40A

### Environmental:

- **Ambient temperature:** 40°C @ 32 FLA, 8 hour duty
- **Storage temperature:** -40°F to 149°F (-40°C to 65°C)
- **Humidity:** 0-95% non-condensing
- **Enclosure:** IP65

- **Dimensions:** 94" x 4.20" x 2.10"
- **Screw hole center points:** 36" x 2.97"

## IMPORTANT SAFETY INFORMATION



### HIGH VOLTAGE

**WARNING:** Always turn off power at the main service panel before installing.

**CAUTION:** The ICM870-32A must be mounted in an area where it will not be exposed to water or the elements. Exposure of the ICM870- 32A 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 ICM870-32A 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 **ICM870-32A** is intended for Marine, Recreational Vehicle, HVAC and commercial applications. The **ICM870-32A** integrates compressor in-rush current over startup time, thus reducing peak current demand on a power supply source (generator or other). The **ICM870-32A** will monitor system health including voltage, current, compressor startup and self integrity. Upon a fault condition, the **ICM870-32A** will halt operation and initiate a 3 minute anti-short cycle routine while providing diagnostic fault information by means of an LED indicator.

## ICM870-32A COMPARABLE AMPERAGE CROSSES

The **ICM870-32A** model crosses 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)
- **Carlo Gavazzi** (Smooth Starter) – SS230V1P16-32

## STANDARD AND TEST RESULTS

- UL 60947-1
- UL 60947-4-2
- Altitude: 2000 m
- IP65
- CSA 2 NO. 60947-1
- CSA C22.2 60947-4-2

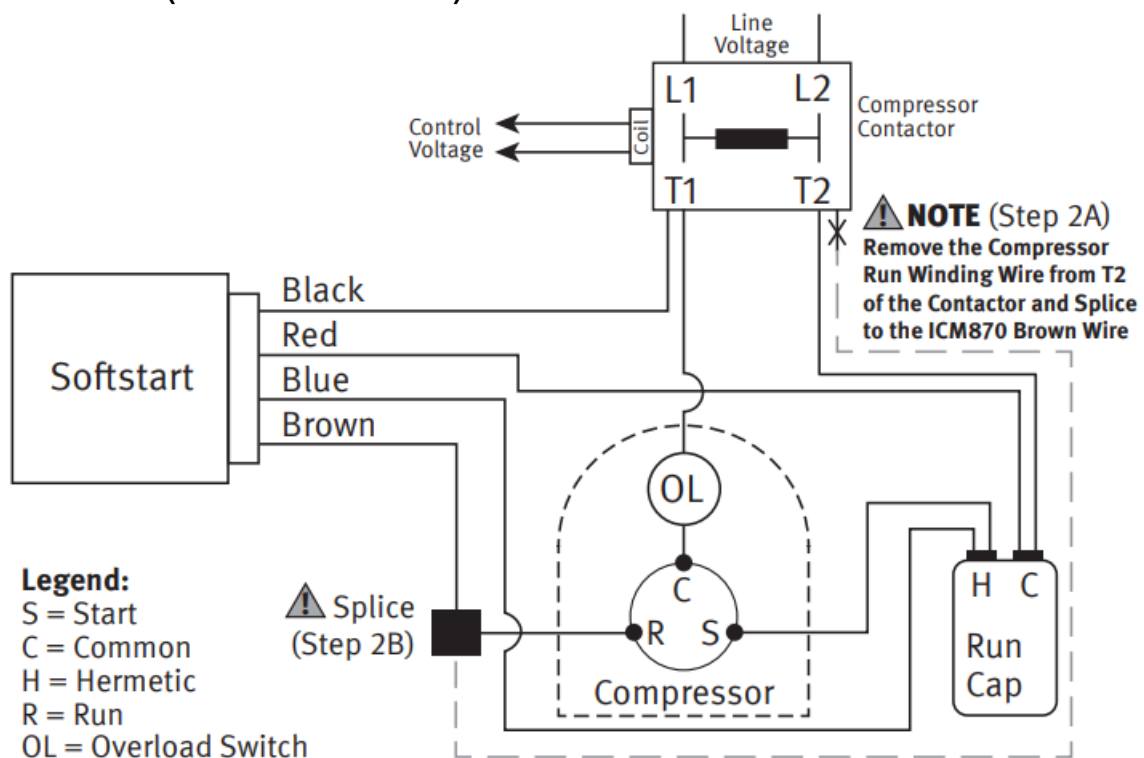
## LED INDICATORS

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

## FLASH CODES

Flashes	Flash Conditions
1	High or low voltage
2	Compressor not sensed or open fuse
3	High current
4	Compressor start error
5	Invalid operating frequency
Rapid	Normal start delay active

## WIRING DIAGRAM (GENERAL LAYOUT)



## INSTALLATION

- **Step #1** Connect the (ICM870 RED WIRE) > to the run capacitor terminal (c/common/T2)
- **Step #2**
  - Disconnect factory installed compressor run wire from the contactor terminal (T2/L2)
  - 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)

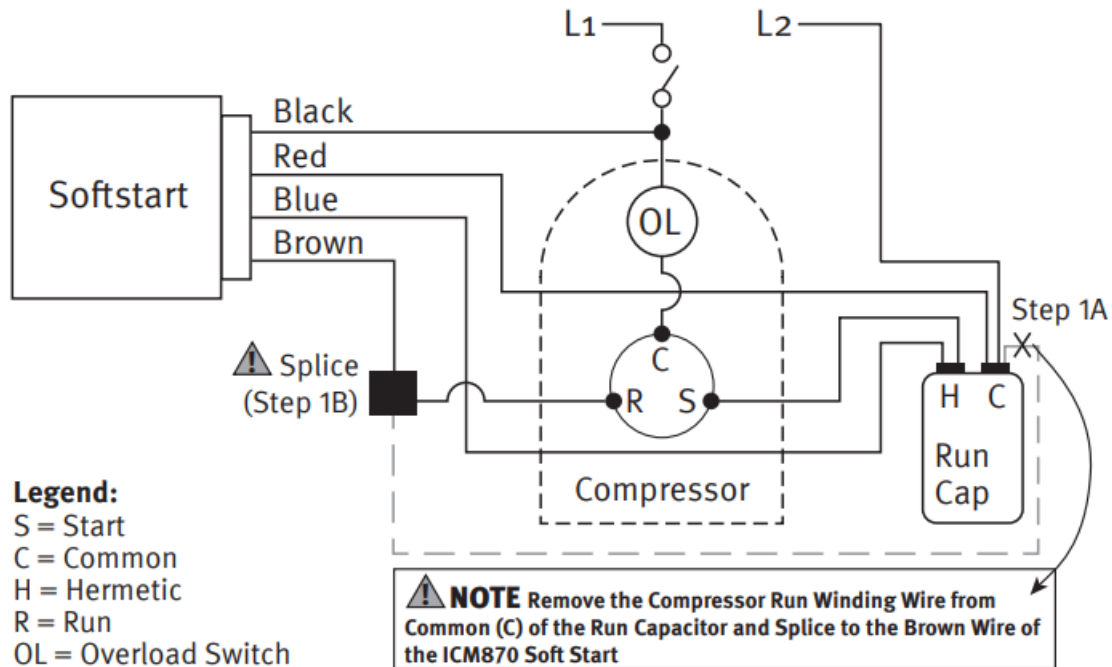
## WHICH MODEL DO I NEED?

- **ICM870-9A:** For AC's with a Compressor Rated Load Amps (RLA) of up to 9A
- **ICM870-16A:** For AC's with a Compressor Rated Load Amps (RLA) of 9.1-16A

- **ICM870-32A:** For AC's with a Compressor Rated Load Amps (RLA) of 16.1-32A

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.

#### WIRING DIAGRAM (GENERAL LAYOUT)



#### INSTALLATION

- **Step #1**
  - Disconnect factory installed compressor run wire from the common run capacitor / L2 terminal
  - 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)

#### Air Conditioning & Heat Pump Loads – Average

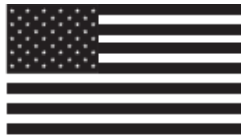
Size	BTU	RLA	ICM870 Model
3 Ton *	36,000	16	16A
4 Ton	48,000	22	32A
5 Ton	60,000	26	32A
6 Ton	72,000	32	32A

**NOTE:** for 3-ton units, use ICM870-32A if RLA exceeds 16A

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**MADE IN CHINA**



**E340301**



## Documents / Resources



[ICM CONTROLS ICM870-32A Soft Starter](#) [pdf] User Guide  
ICM870-32A, ICM870-32A Soft Starter, Soft Starter

## References

- [ICM Controls](#) | ISO certified Electronics Manufacturing Company

[Manuals+](#)