ICM CONTROLS ICM870-32A Soft Start Series Built In Start Capacitor User Guide

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ICM870-32A Soft Start Series Built In Start Capacitor

Product Information

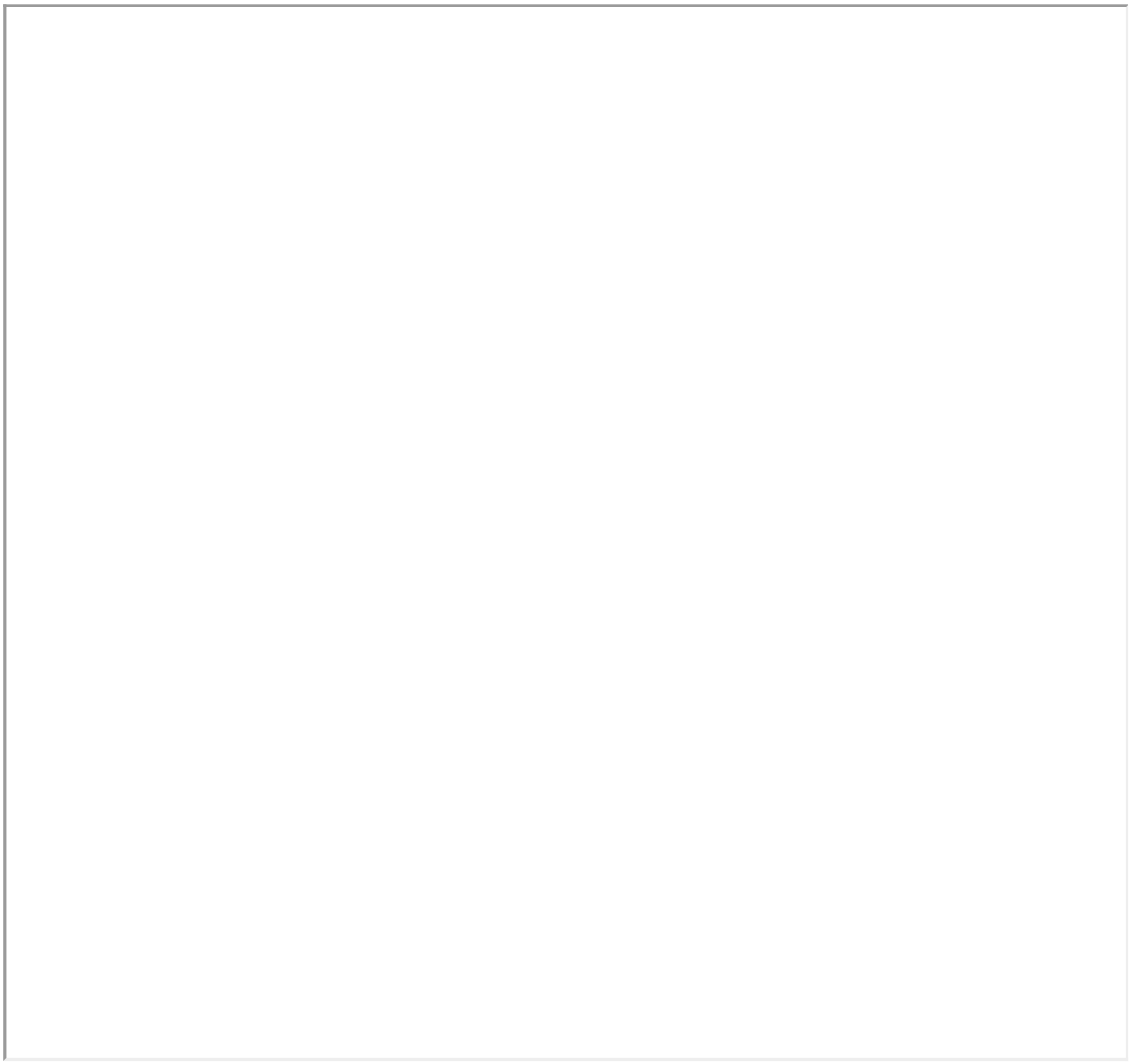
The ICM870-32A Soft Start is a semi-conductor soft-start motor controller used for reducing starting current and over-current protection of the compressor in residential A/Cs, RVs, and marine A/Cs. It features a built-in start capacitor, over/under voltage monitoring, and diagnostic indicators. The soft start is 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. The soft start has a sealed enclosure and must be installed in an area where it will not be exposed to water or the elements to avoid failure of the control and potential electrical safety hazards.

Product Usage Instructions

1. Installation of the ICM870-32A soft start must be done by a certified HVAC technician or licensed electrician in accordance with local, state, and national electrical codes.
2. Disconnect the factory installed compressor run wire from the contactor terminal (T2/L2) and remove the compressor run winding wire from Common (C) of the run capacitor.
3. Splice the ICM870 Brown Wire to the compressor run wire previously disconnected in Step 2A and connect the ICM870 Red Wire to the run capacitor terminal (c/common/T2).
4. Connect the ICM870 Blue Wire to the run capacitor terminal (herm/hermetic/start) and connect or splice the ICM870 Black Wire to the contactor terminal (T1).
5. If there is a Start Capacitor and/or PTCR already in place,

additional steps will be required to disconnect them.

View Fullscreen



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

ICM870-32A Soft Start
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 ICM87032A 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.

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

· Pollution degree 3

· Ui = 240 VAC

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 = 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: 7.94″ x 4.20″ x 2.10″ · Screw hole center points: 7.36″ x 2.97″

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)

STANDARD AND TEST RESULTS

· UL 60947-1

· IP65

· UL 60947-4-2

· CSA C22.2 NO. 60947-1

· Altitude: 2000 m

· CSA C22.2 NO. 60947-4-2

LED INDICATORS START = Green · RUN = Green · FAULT = Red (flashing)

FAULT CODES
Fault Code 1 2 3 4 5

Fault Condition High or low voltage Compressor not sensed or open fuse
High current Compressor start error Invalid operating frequency

FOR RESIDENTIAL A/C’s

FOR RV & MARINE A/C’s

WIRING DIAGRAM (GENERAL LAYOUT)

Control Voltage

Softstart

Black Red Blue Brown

Coil

Line Voltage
L1 L2

Compressor Contactor

T1

T2
! NOTE (Step 2A)

Remove the Compressor

Run Winding Wire from T2

of the Contactor and Splice

to the ICM870 Brown Wire

OL

Legend:

S = Start

! Splice

C = Common

(Step 2B)

H = Hermetic

R = Run

OL = Overload Switch

C RS
Compressor

HC
Run Cap

WIRING DIAGRAM (GENERAL LAYOUT)

L1

L2

Black

Red

Softstart

Blue Brown

OL

! Splice (Step 1B)
Legend: S = Start C = Common H = Hermetic R = Run OL = Overload Switch

C RS
Compressor

Step 1A
HC Run Cap

! NOTE Remove the Compressor Run Winding Wire from
Common (C) of the Run Capacitor and Splice to the Brown Wire of the ICM870 Soft Start

Special attention should be made with respect to the termination of the field wiring leads. When these leads are terminated at a terminal, they shall terminate only at a terminal suitable for minimum 90°C wire.

INSTALLATION
Step #1 Connect the (ICM870 RED WIRE) > to the run capacitor terminal (c/common/T2)
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)

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)

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.

Air Conditioning & Heat Pump Loads Average

Size
1 Ton 2 Ton 3 Ton 4 Ton 5 Ton 6 Ton

BTU
12,000 24,000 36,000 48,000 60,000 72,000

RLA

ICM870 Model

6

9A

12

16A

16

16A

22

32A

26

32A

32

32A

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Documents / Resources

	ICM CONTROLS ICM870-32A Soft Start Series Built In Start Capacitor [pdf] User Guide ICM870-32A, ICM870-32A Soft Start Series Built In Start Capacitor, Soft Start Series Built In Start Capacitor, Built In Start Capacitor, Start Capacitor, Capacitor

References

- ICM CONTROLS - Engineering, Manufacturing, Innovation.