

## TECHNICAL INFORMATION

The TURBO Easy-Start is a combination multiple-value, thin film, metallized polypropylene, high microfarad capacitor (ranging up to 324 MFD) with a potential relay, both encapsulated in our patented viscous fluid with an aluminum housing.

The TES5 uses a UL810 recognized safety interrupter (as used in all Am Rad fluid-filled motor-run capacitors).

The metallized film capacitor meets, and far exceeds, both EIA standards (No. 456 for metallized film capacitors and No. 463 for electrolytic capacitors).

The TES5 "film" capacitors have been tested per EIA463, paragraph 16, Table A for Type 1 Heavy-Duty capacitors for motor starting applications and have exceeded over 400,000 cycles. [NOTE: This standard only requires a maximum of 40,000 cycles.]

The potential relay is UL/CSA approved (File No. E251539) and has been tested well beyond 1,000,000 cycles under load. [NOTE: Capacitor/relay combination.]

The simple Two-Wire (one black, one white) connection from the TES to the terminals of a motor-run capacitor provides voltage feedback to the relay. As the compressor motor reaches an optimum running range, the internal contacts of the relay "open" and (electrically) remove the high microfarad TES capacitor element from the circuit. Later, when the compressor motor shuts off, the contacts close and reconnect the two parts of the TES (relay and capacitor), thereby making it immediately available for the next restart of the compressor.

**IMPORTANT NOTE:** Metallized film capacitors can sustain high "in-rush" currents and are capable of being energized multiple times for a continuous period without failure (unlike electrolytic start-capacitors which are designed for intermittent-duty only).

The TES utilized ALL BRASS terminals which have been plated and will never rust or corrode!



## TURBO™ Easy-Start®

### INSTRUCTION GUIDE



**ONE UNIVERSAL EASY-START**  
can be used in place of any one  
of the **FOUR** commonly used  
Hard-Start kits on the market today!

*Can be used in over 90% of refrigeration  
and air conditioning applications.*



Exclusive  Distributor

For technical questions, please contact AmRad at 1.800.445.6033  
or [www.amradmanufacturing.com](http://www.amradmanufacturing.com)

# AMRAD'S UNIVERSAL TURBO EASY-START® WIRING INSTRUCTIONS

**IMPORTANT NOTE: IF THE EXISTING MOTOR-RUN CAPACITOR HAS RUSTED TERMINALS, IT SHOULD BE REPLACED PRIOR TO INSTALLING THE TURBO EASY-START.**

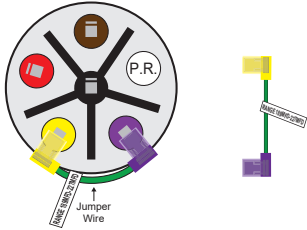
## STEP 1: PREPARE VALUE

**Up to 1 Ton  
(108 to 130 mfd)**



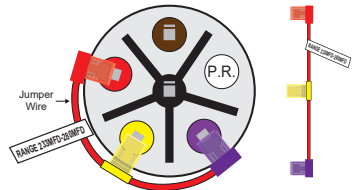
No jumper wires required on the Easy-Start®.

**1 to 2 Ton  
(189 to 227 mfd)**



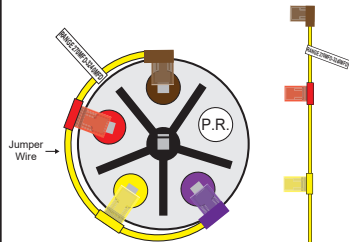
Using the green jumper wire, connect the purple and yellow terminals to the corresponding colored terminals on the Easy-Start® as shown.

**2.5 to 3 Ton  
(233 to 280 mfd)**



Using the red jumper wire, connect the purple, yellow and red terminals to the corresponding colored terminals on the Easy-Start® as shown.

**3.5 to 5 Ton  
(270 to 324 mfd)**



Using the yellow jumper wire, connect the purple, yellow, red and brown terminals to the corresponding colored terminals on the Easy-Start® as shown.

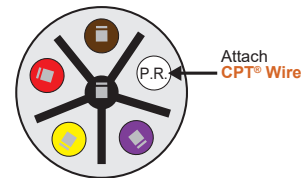
## STEP 2: ATTACH CPT® WIRE

**Up to 1 Ton  
(108 to 130 mfd)**



Attach the solid orange CPT® Wire to the indicated terminal of the TES5 or TES5EXT

**Attaching CPT Wire to TES5**



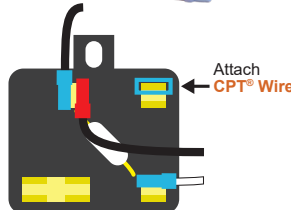
Attach the CPT® Wire to the white terminal of the TES5.

**1.5 to 5 Ton  
(189 to 324 mfd)**



Attach the black striped orange CPT® Wire to the indicated terminal of the TES5 or TES5EXT

**Attaching CPT Wire to TES5EXT**

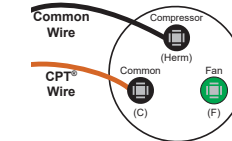


Attach the CPT® Wire to the indicated terminal on the external relay of the TES5EXT.

## STEP 3: WIRE TO MOTOR-RUN CAPACITOR

The following diagrams do **NOT SHOW** the wires from the compressor and the fan to the motor-run capacitor

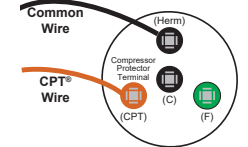
**Attaching to a Capacitor WITHOUT CPT**



Connect the black wire (common) from the Turbo Easy-Start® to the Herm Compressor (HERM) terminal of the standard motor-run capacitor.

Connect the CPT® Wire from the Turbo Easy-Start® to the Common (C) terminal of the standard motor-run capacitor.

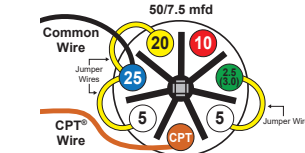
**Attaching to an AmRad Capacitor WITH CPT**



Connect the black wire (common) from the Turbo Easy-Start® to the Herm Compressor (HERM) terminal of the AmRad motor-run capacitor.

Connect the CPT® Wire from the Turbo Easy-Start® to the Compressor Protector Terminal® (CPT®) of the AmRad motor-run capacitor.

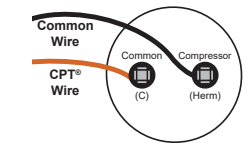
**Attaching to an AmRad Turbo 200 Universal Capacitor WITH CPT**



Connect the black wire (common) from the Turbo Easy-Start® to the highest value Herm Compressor (HERM) terminal being used on the Turbo capacitor (the 25 mfd in this example).

Connect the CPT® Wire from the Turbo Easy-Start® to the Compressor Protector Terminal® (CPT®) of the Turbo capacitor.

**Attaching to Single-Value Capacitor WITHOUT CPT**  
(Typical Commercial Refrigeration Application)



Connect the black wire (common) from the Turbo Easy-Start® to either of the terminals of the motor-run capacitor.

Connect the CPT® Wire from the Turbo Easy-Start® to either of the terminals of the motor-run capacitor.