

## Product Overview

The 40AA, 41AA, and 42AA series electronic motor protection modules combine high performance and function consolidation in order to provide reliable, cost effective protection for your motor needs. Used with Positive Temperature Coefficient (PTC) sensors the 40/41/42AA modules protect against locked rotor conditions, running overload and high ambient temperature. The innovative design offers additional functions as well, such as minimum off time delay, low voltage cutout and bearing temperature protection. Also the device is very safe and easy to calibrate for voltage (no jumper is required).

Thermal protection is achieved by monitoring the temperature of the motor windings with PTC sensors. These sensors can be the Klixon BA series or any other compatible PTC sensor rated Mark A or B. If the windings exceed the rated trip temperature the sensor undergoes a rapid change in resistance relative to the change in temperature. As a result of this change, the 40/41/42AA modules' internal relays de-energize the control coil of the external line break contactor.



As the motor cools and acceptable motor winding temperatures have been restored the sensor resistance decreases to the reset level. At this point the module will reset itself automatically unless it was set up for manual reset. In this case the user is required to remove power from the system for a minimum of 5 seconds.

The 40/41/42AA series modules are

ideal for many applications in the HVAC/R industry as well as for industrial systems. Some applications include global commercial rooftop A/C, global chiller applications, industrial pumps, material handlers, elevators, escalators, air compressors and industrial systems.

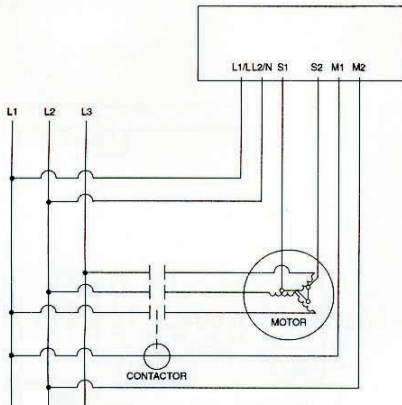
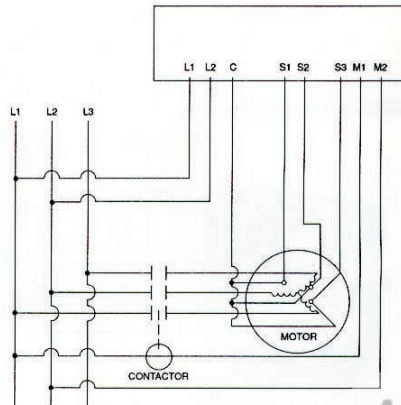
## Product Specifications

Maximum	Number Channels	Sensors/Channels	Line Voltage	Sensor Type	Time Delay	Low Voltage	Auto/Man Reset
40AA110E	1	3	120/240	Mark A	None	None	Automatic
40AA115E	1	3	120/240	Mark A	5 min.	None	Automatic
41AA1105A	3	1	24	Mark B	4 min.	None	Automatic
41AA1500E	3	1	120/240	Mark B	None	None	Manual
41AA1600A	3	1	24V	Mark B	2 min.	Yes	Automatic
41AA1600E	3	1	120/240	Mark B	2 min.	Yes	Automatic
41AA1606E	3	1	120/240	Mark B	4 min.	Yes	Automatic
42AA100E	1	3	120/240	Mark B	None	None	Manual
40AA100E	1	3	120/240	Mark B	None	None	Automatic
40AA300E	1	3	120/240	Mark B	4 min.	Yes	Automatic
41AA1504E	3	1	120/240	Mark B	None	Yes	Manual
40AA200E	1	3	120/240	Mark B	4min.	None	Automatic
40AA100A	1	3	24V	Mark B	None	None	Automatic
40AA200A	1	3	24V	Mark B	4 min.	None	Automatic
40AA102A	1	2	24V	Mark B	None	None	Automatic

## General Specifications

	Units	Min.	Typical	Max.
Operating Temperature Range	°C	-40		+70
Supply Voltage 24 or 115-230 (±15%)	VAC			
Rated Line Frequency	Hz	45	50/60	62
Low Voltage Cut-Out Trip (24V Input)	VAC	15	16	17
Low Voltage Cut-In Reset	VAC			18
Low Voltage Cut-Out Trip (120V Input)	VAC	79.5	85	90.5
Low Voltage Cut-In Reset	VAC			94.5
Low Voltage Cut-Out Trip (240V Input)	VAC	160	170	180
Low Voltage Cut-In Reset	VAC			184

### Electrical Schematic

**40AA, 42AA Series**

**41AA Series**


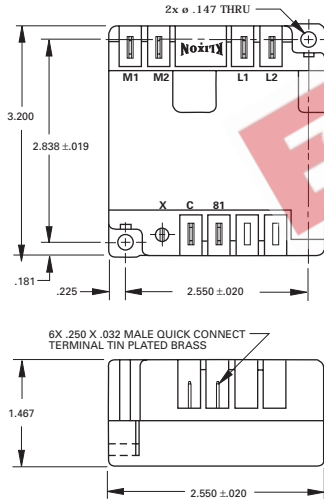
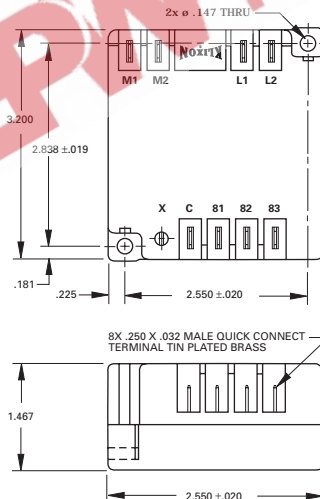
### Protected Conditions

- Locked Rotor
- Running Overload
- High Motor Ambient
- Blocked Ventilation
- Single Phasing
- Loss of Hermetic Compressor Charge

### Summary of Protection Features

- Thermal overload of Windings
- Low Voltage Cutout
- Electrically - Isolated Power Supply
- Power Off Manual Resaet
- Automatic Reset with Minimum Off Delay Timer
- UL File Number SA3745 (41AA)
- UL/CSA/CE pending on all other ratings

### Envelope Drawing

**40AA, 42AA Series**

**41AA Series**


### Thermal Motor Specification\*

**40AA Single Channel Ratings (Series Sensors)**

Sensor Trip Resistance  
 Sensor Reset Resistance  
 Sensor Resistance @ 25°C

**Nominal Resistance**

28.0 KΩ  
 11.0 KΩ  
 1.5 - 7.5 KΩ

**41AA Three Channel Ratings (Parellel Sensors)**

Sensor Trip Resistance  
 Sensor Reset Resistance  
 Sensor Resistance @ 25°C

**Nominal Resistance**

14.0 KΩ  
 3.25 KΩ  
 0.5 - 2.5 KΩ

**42AA Single Channel Ratings (Series Sensors)**

Sensor Trip Resistance  
 Sensor Reset Resistance  
 Sensor Resistance @ 25°C

**Nominal Resistance**

20.0 KΩ  
 Manual Reset  
 1.5 - 7.5 KΩ

\*Resistance measurement with analog meter instrument on Mark B sensors.

### Specifications

Supply Voltages..... 24VAC or  
 115-230 VAC (±15%)  
 Frequency..... 50/60 Hz  
 Control Circuit..... 2.5A, 600VA, 250V Max.  
 Minimum Permissible Load..... 5VDC, 100mA  
 Maximum Load..... 30VDC  
 Cycle Life..... 250k Cycles Min.  
 Weight..... 290 Grams

Important Notice: Texas Instruments (TI) reserves the right to make changes to or discontinue any product or service identified in this publication without notice. TI advises its customers to obtain the latest version of the relevant information to verify, before placing any orders, that the information being relied upon is current. TI assumes no responsibility for infringements of patents or rights of others based on TI applications assistance or product specifications since TI does not possess full access concerning the use or application of customers' products. TI also assumes no responsibility for customers' product designs.

### For further information write or call:

**Texas Instruments Incorporated**  
 34 Forest St., MS 2-3  
 Attleboro, MA 02703-0964  
 Phone: (508) 236-3617  
 Fax: (508) 236-1949