TEXAS INSTRUMENTS

KLIXON®
2ACE Series
ELECTRONIC
MOTOR PROTECTION

Product Overview

The solid state 2ACE module is an economical and reliable protection platform which combines current and thermal overload protection for large three phase motors.

These UL recognized motor protection modules are used with positive temperature coefficient (PTC) thermistors installed in the motor windings. These thermistors exhibit low resistance until their temperature increases to a pre-determined trip point. A unique feature of the steep slope PTC is an increased resistance of several orders of magnitude at the trip point. This exponential rise in resistance results in the opening of the 2ACE control relay, which can be wired in series with a starter/contactor coil.

Where locked rotor conditions cause rapid current overload, the response time of thermal protection may not be adequate. The 2ACE module employs a proprietary design with one current sensor per phase that responds to changes in current. By utilizing the control relay, the module can be calibrated for

individual applications with a "Must Hold" current range from 25 - 225 Amps. The trip curves allow for starting inrush currents normally seen in Y-delta , part winding, and double delta wound motors without nuisance tripping.

The current transducers allow the module to offer added features of phase loss protection, unbalance, and improper phase sequence conditions.

The current tranducer can also be used as an accurate, stable device to measure AC current. The 2ACE output is linear over its full scale range of 0-225 Amps, and is independent of load. This low ripple output is achieved by full scale signal conditioning of the transducer, and can be directly connected to a control microprocessor without added filter conditioning.

General Specification

	Units	Minimum	Typical	Maximum
Operating Temperature Range	°C	-40		+70
Supply Voltage (Rated 24 VAC at 0.240A Load)	Vac	18	24	30
Rated Line Frequency (Utility Regulation)		45 56	50 60	55 64
Rated Line Frequency	hZ	45	50/60	62
Low Voltage Cut-Out Trip	V ac	15	16	17
Low Voltage Cut-In Reset	V ac			18
Low Voltage Response Time (Supply 100% to 50%)	SEC	0.150	0.200	0.250

Thermal Motor Specification

	Units	
Sensor Trip Resistance	KΩ	13 ±3
Sensor Reset Resistance	KΩ	3.25 ±0.5
Sensor Response Time	SEC	0.50 Typical

Current Transducer and Protection Specification

	Units	
Sensed Output at B & G Terminal	Vdc mA	0 to 5 Full Scale 4 - 20 Full Scale
Accuracy		±3% Full Scale
Response (10 to 90%)	SEC	0.150 Typical
Shorted Current Sensor Protection	Ω	<10 Typical
Repeatability		±1% Full Scale
Current Phase/Unbalance Detection	Load 17% Partial 25% Unload 50%	
Must Hold Calibration Range	A ac	25 to 225
Overload Current Trip Time		MH x 400%: 1.5 Sec.
Phase Miswire Response Time (Improper Sequence)	SEC	1.1 Max.
Phase Loss Response Time	SEC	1.0 Max.

MC3S001 Printed in U.S.A. 5/99 1K

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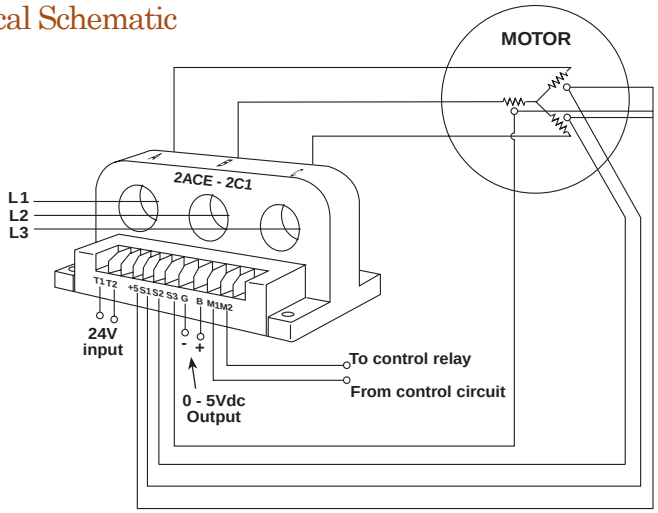
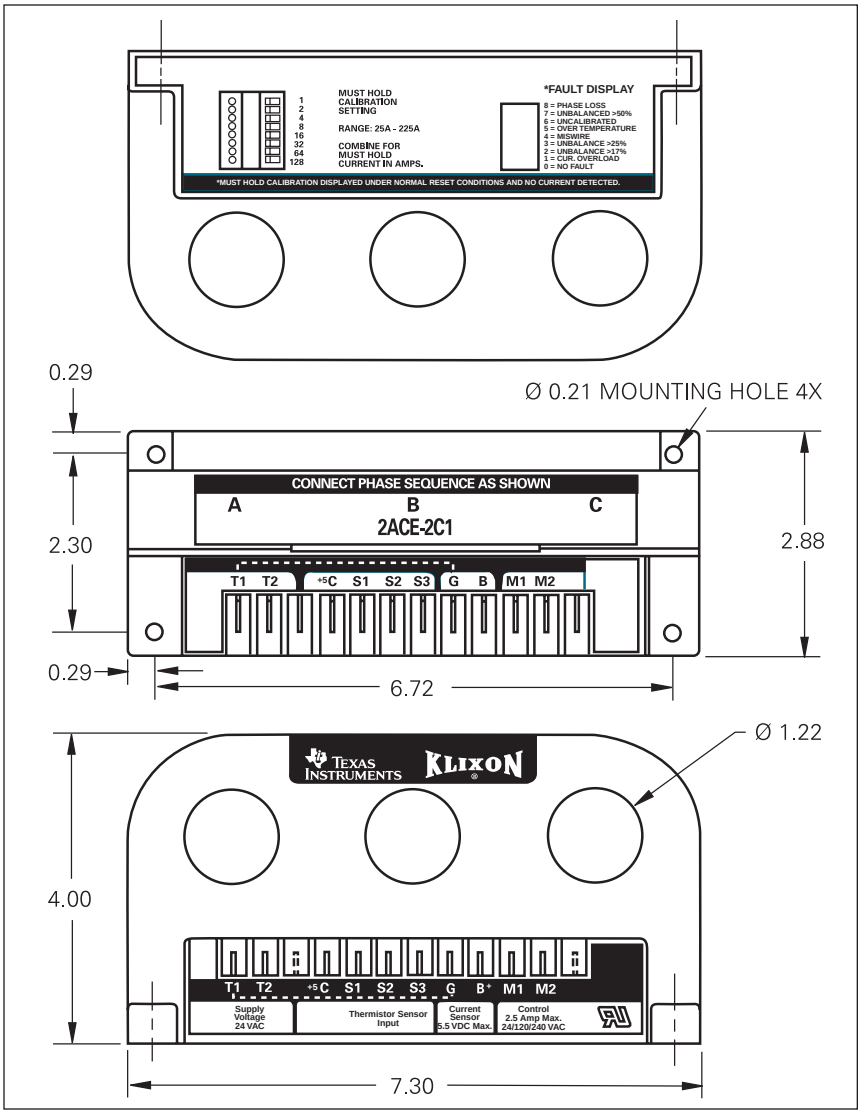
Electrical Schematic



"T1" is electrically same potential as "G"; "G" is analog ground

2ACE Envelope Drawing



Ordering Information

TYPE **2ACE - 2 C1**

PRODUCT FAMILY

THERMISTOR COMPATIBILITY

1 = NTC
2 = PTC
3 = RTD

COMMUNICATIONS

N1 = No Communications
C1 = 0 - 5V Output
C2 = 4 - 20mA Output
R1 = RS 485

Protection / Measurement Features

- Programmable "Must Hold" Level
- **Current Overload** Trip Curve
- **Miswire** / Reverse Rotation
- **Current Unbalance** (load, partial, unload)
- **Phase Loss**
- **Thermal Overload** of Windings
- Low Voltage Cut-Out
- Microcontroller Compatible **Current Transducer** Output
- Visual **Fault Diagnostic** Display
- Short Sensor Protection
- **UL Approved**
- **CE Pending**

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