

**TRIAQ**  
CONTROLS  
A Division of A-T Controls, Inc.

SP<sup>®</sup> Approved

## ***E Series Electric Actuators***

***On-Off and Modulating Electric Actuators***

***Torques to 30,000 in. lbs.***

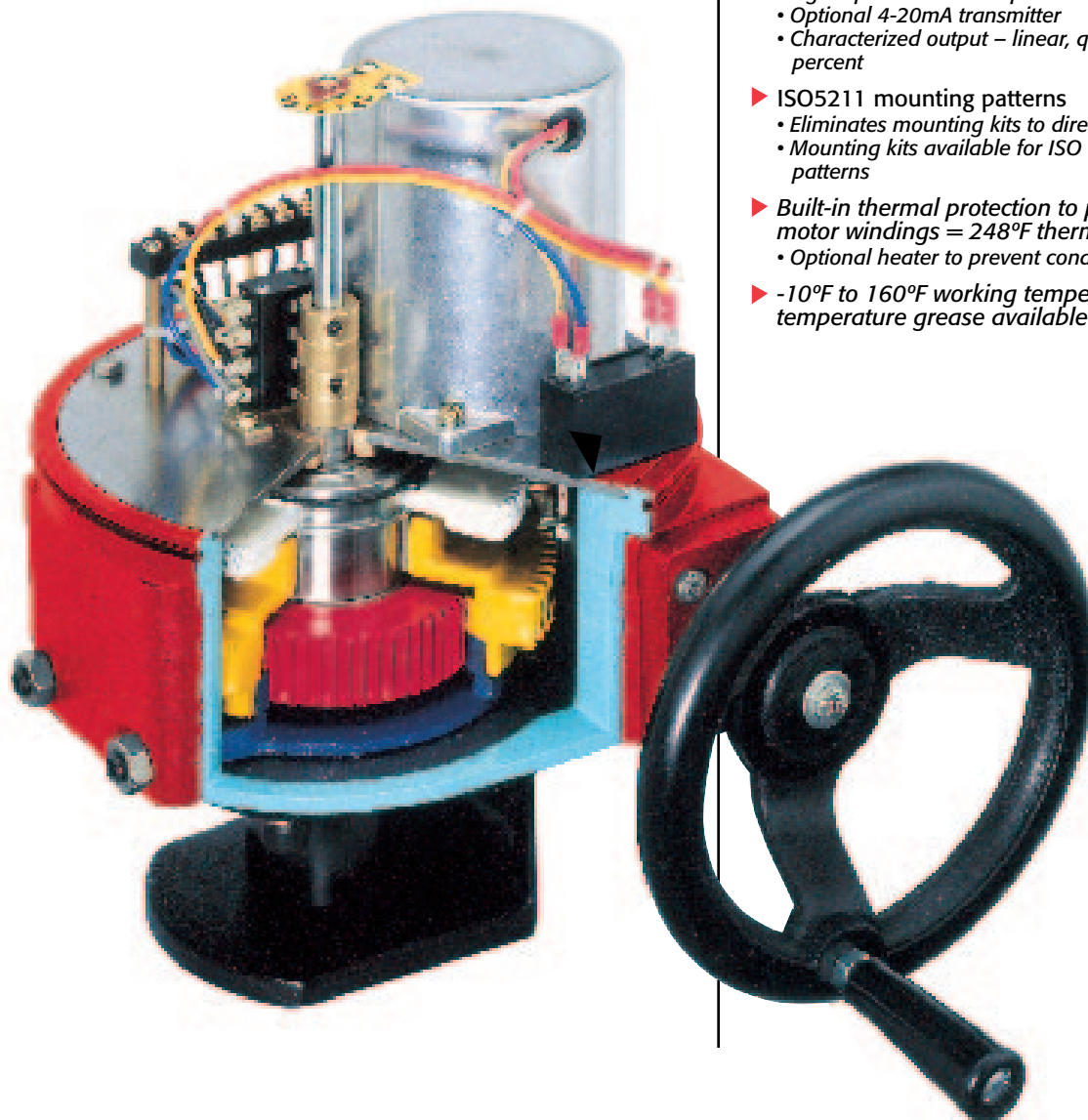
***Weatherproof Construction***



**TRIAQ**

Triac Controls line of electric actuators offers a broad range of torques from 300 to 30,000 in. lbs. and numerous features including manual overrides, auxiliary switches, 4-20ma modulating control, several voltage options including 1-phase 24/120V/220V – 12 and 24VDC, 3-phase 220v, 380v, and 440v. The units feature EPI-CYCLICAL gear trains and a unique manual override with handwheel.

All actuators are NEMA 4x and are designed for maximum cycle life due to our rugged motors and gear trains. As with all Triac actuators, our E Series electrics are available with mounting kits on most ball, butterfly and plug valves. The actuators are ideal for use on butterfly and louver dampers with the increased benefit of self-locking EPI-CYCLICAL gears, eliminating the need for unreliable solenoid brakes.



## Features

- ▶ Corrosion resistant NEMA 4,4x construction
  - Die cast aluminum housing and cover
  - Powder polyurethane coated
  - Stainless steel fasteners
- ▶ CSA and CE Approved
  - CSA certification No. 211860
  - CE regulation No. AN985455101
- ▶ Self-locking EPI-CYCLICAL gear train
  - No brake required
  - E-300/400 features self-locking motor with spur gears.
- ▶ Standard manual override with handwheel
  - Not available on E-300/400
  - Manual override can be operated without any lever, clutch or brake upon power outage.
  - When actuator is operating, handwheel is stationary assuring safety to personnel.
- ▶ Visual position indicator
- ▶ Standard two auxiliary limit switches
- ▶ Standard two torque switches on models E-8600 and larger
  - Optional on models E-700 through E-4300
- ▶ Optional servo card for modulating service
  - 4-20mA, 1-5mA, 1-5vdc, 0-10vdc, 0-135 OHM command signal potentiometer inputs
  - Optional 4-20mA transmitter
  - Characterized output – linear, quick opening, equal percent
- ▶ ISO5211 mounting patterns
  - Eliminates mounting kits to direct mount valves
  - Mounting kits available for ISO and other valve mounting patterns
- ▶ Built-in thermal protection to prevent overheating motor windings = 248°F thermal setting
  - Optional heater to prevent condensation buildup
- ▶ -10°F to 160°F working temperature (lower temperature grease available on application)

## Torque and Performance Data

### ETI, EMI Series - AC Voltages

Actuator Size	Torque In-Lbs    NM		Duty Cycle	SPEED (Sec.) (Per 90 Degs)    Motor Power 60HZ    Watts		1 Phase Motors				3 Phase Motors					
						115VAC		220VAC		220VAC		380VAC		440VAC	
						Amp Draw	Amp Draw	Amp Draw	Amp Draw	Amp Draw	Amp Draw				
Run	Lock	Run	Lock	Run	Lock	Run	Lock	Run	Lock						
300	310	35	25%	12	10	0.5	0.8	0.3	0.5	N/A	N/A	N/A	N/A	N/A	N/A
400	443	50	25%	20	10	0.5	0.8	0.3	0.5	N/A	N/A	N/A	N/A	N/A	N/A
700	797	90	50%	15	40	1.0	1.8	0.5	0.9	0.6	1.1	0.3	0.7	0.4	0.7
1300	1328	150	50%	22	40	1.0	1.8	0.5	0.9	0.6	1.1	0.3	0.7	0.4	0.7
2600	3540	400	50%	16	120	1.5	3.6	0.8	1.8	1.0	3.5	0.7	2.0	0.8	2.0
3500	4426	500	50%	22	120	1.5	3.6	0.8	1.8	1.0	3.5	0.7	2.0	0.8	2.0
4300	5753	650	50%	28	120	1.5	3.6	0.8	1.8	1.0	3.5	0.7	2.0	0.8	2.0
8600	8851	1000	50%	46	180	3.2	6.0	1.6	4.0	0.6	2.0	0.4	1.0	0.4	1.0
13000	13277	1500	50%	46	220	4.0	6.0	2.0	5.0	0.8	2.5	0.6	1.5	0.6	1.2
17000	17702	2000	35%	58	180	3.2	6.0	1.6	4.0	0.6	2.0	0.4	1.0	0.4	1.0
21000	22128	2500	35%	58	220	4.0	6.0	2.0	3.0	0.8	2.5	0.6	1.5	0.6	1.2
26000	26553	3000	35%	58	250	3.2	6.0	1.6	3.0	1.2	3.0	0.6	1.5	0.6	1.5
30000	30979	3500	35%	58	300	4.0	6.0	2.2	3.0	1.2	3.0	0.6	1.5	0.6	1.5

### ETE, EME Series - AC Voltage Extended Duty Motors

Actuator Size	Torque In-Lbs    NM		Duty Cycle	SPEED (Sec.) (Per 90 Degs)    Motor Power 60HZ    Watts		24VAC	115VAC
						Amp Draw Rated	Amp Draw Rated
700	797	90	75%	15	70	3.0	0.7
1300	1328	150	75%	22	70	3.0	1.0
2600	3540	400	75%	16	180	7.0	1.0
3500	4426	500	75%	22	180	7.0	1.0
4300	5753	650	75%	28	180	7.0	1.0
8600	8851	1000	75%	46	180	7.0	1.5
13000	13277	1500	75%	46	180	7.0	1.5
17000	17702	2000	50%	58	180	7.0	1.5
21000	22128	2500	50%	58	180	7.0	1.5
26000	26553	3000	50%	58	240	10.0	2.5
30000	30979	3500	50%	58	360	15.0	2.5

### ETI and EMI Series – DC Voltage

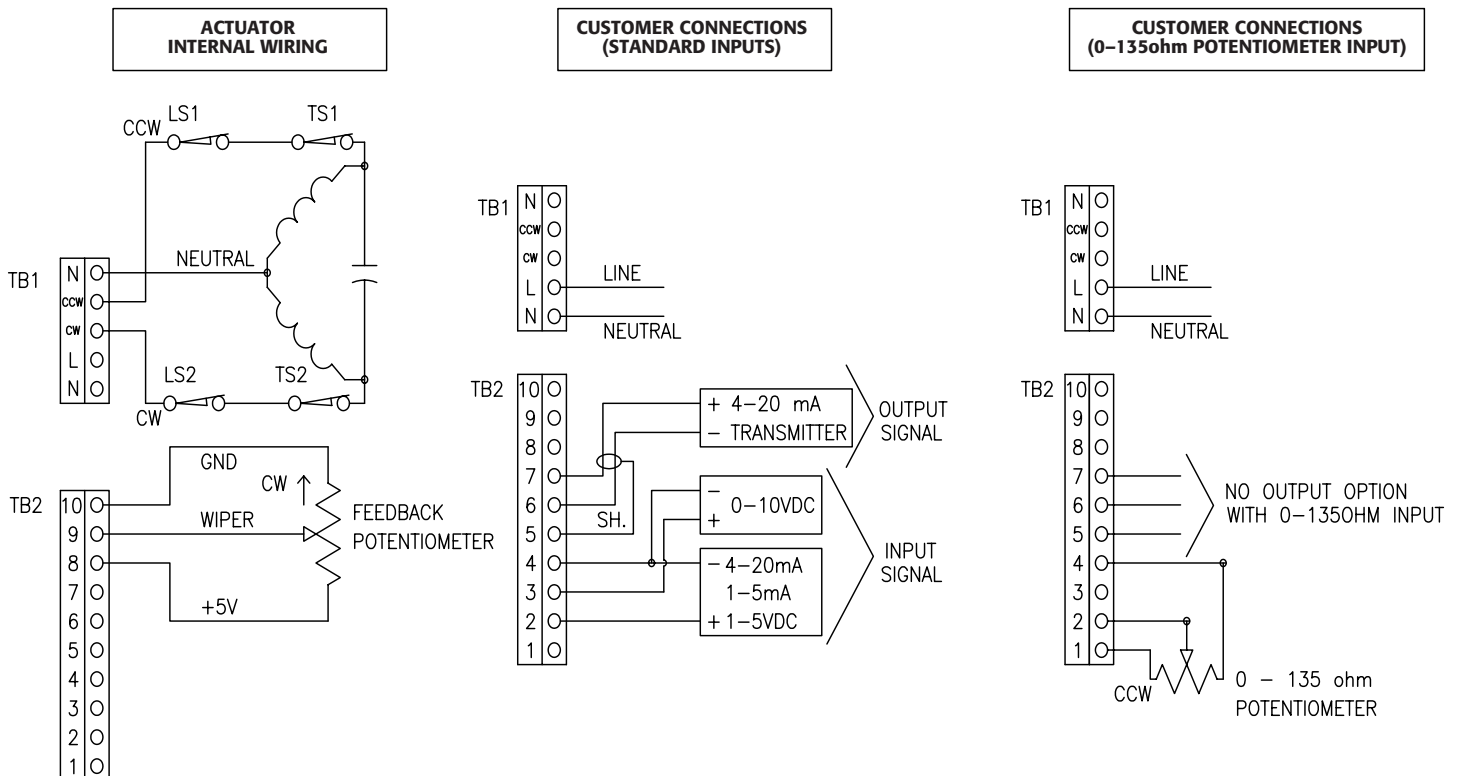
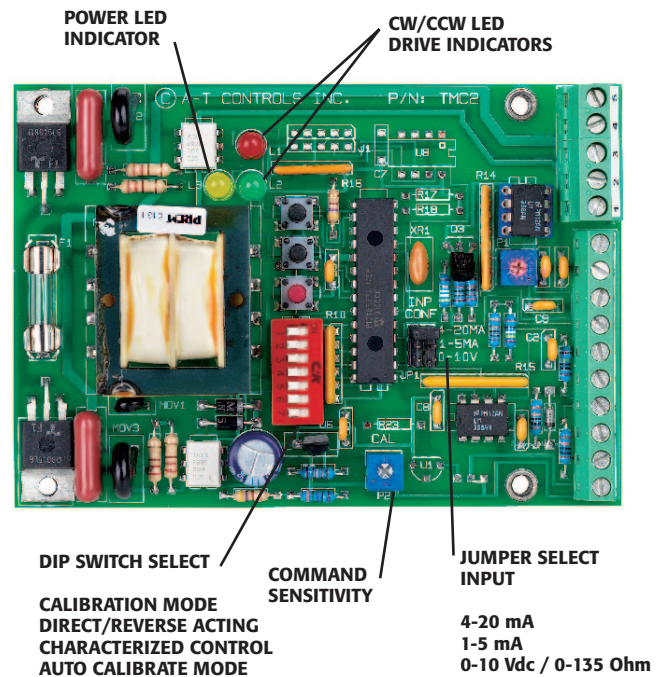
Actuator Size	Torque In-Lbs    NM		Duty Cycle	SPEED (Sec.) (Per 90 Degs)    Motor Power Watts		DC Motors			
						12VDC		24VDC	
						Amp Draw	Amp Draw	Amp Draw	Amp Draw
Run	Lock	Run	Lock						
300	310	35	75%	15	10	0.5	3.0	0.7	1.4
400	443	50	75%	20	10	0.5	3.0	0.7	1.4
700	797	90	75%	15	70	3.4	8.5	3.0	13.0
1300	1328	150	75%	22	70	3.4	8.5	3.0	13.0
2600	3540	400	75%	16	180	14.0	30.0	7.0	30.0
3500	4426	500	75%	22	180	14.0	30.0	7.0	30.0
4300	5753	650	75%	28	180	14.0	30.0	7.0	30.0
8600	8851	1000	75%	46	180	N/A	N/A	7.0	30.0
13000	13277	1500	75%	46	180	N/A	N/A	7.0	30.0
17000	17702	2000	50%	58	180	N/A	N/A	7.0	30.0
21000	22128	2500	50%	58	180	N/A	N/A	7.0	30.0
26000	26553	3000	50%	58	240	N/A	N/A	10.0	30.0
30000	30979	3500	50%	58	360	N/A	N/A	15.0	30.0

# TMC2 Electronic Modulating Card

## Features and Benefits

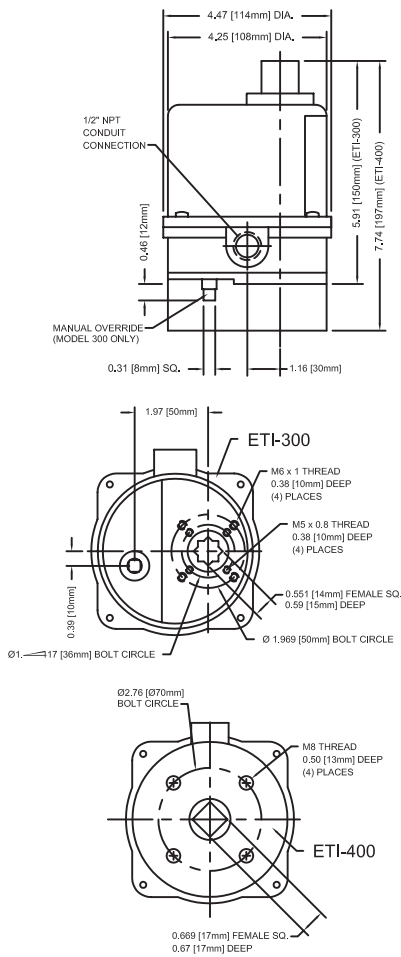
- ▶ Automatic calibration for easy setup - eliminates setting zero and span manually
- ▶ 10 bit microprocessor controller for precise positioning and control
- ▶ Programming of the controller is accomplished by a combination of push buttons and seven-position DIP switch without the need for a command signal
- ▶ Input signals can be 4-20mA, 1-5mA, 0-10 VDC, 1-5 VDC, 0-135 OHM or command signal potentiometer
- ▶ The TMC2 can be programmed to fail in-place, fail clockwise or fail counter-clockwise on loss of command signal
- ▶ Characterize control – Linear, quick opening (square root) or equal percentage (square) relationship between the actuator position and the command signal
- ▶ On board – 4-20mA transmitter (optional)
- ▶ TMC2 is available for the following voltages:  
 120VAC/1PH/50-60HZ  
 220VAC/1PH/50-60HZ  
 24VAC/1PH/50-60HZ

*For other voltages, consult factory.*

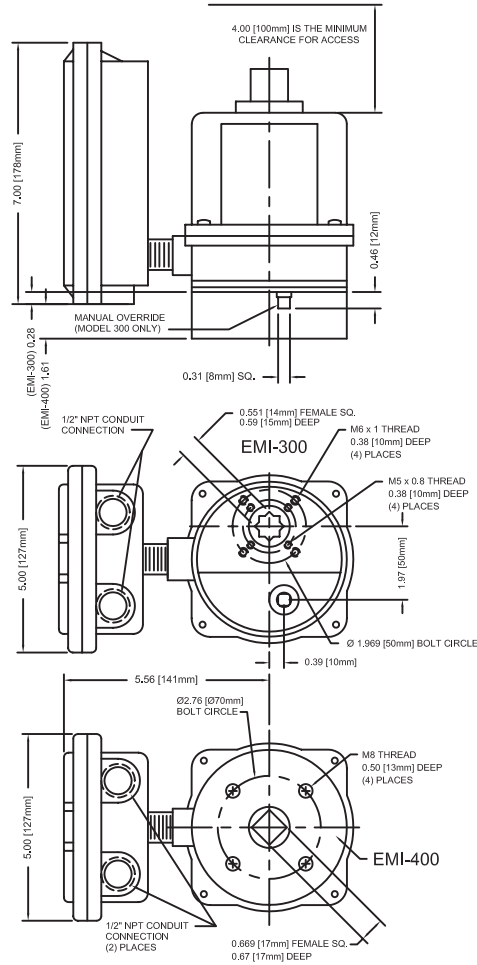


# Dimensional Data

## ETI-300/400 On-Off

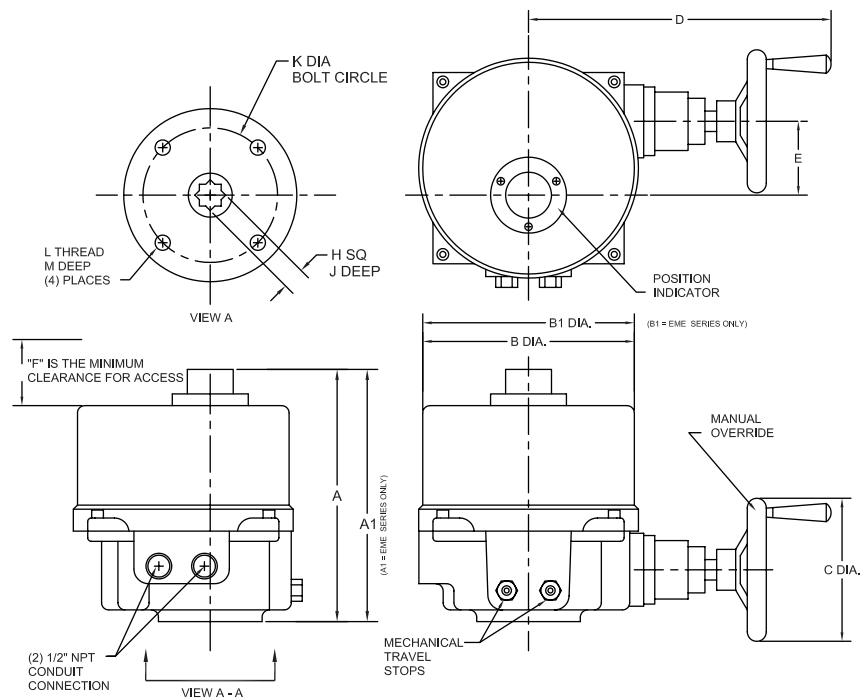


## EMI-300/400 Modulating



WEIGHTS	
ETI-EMI	#
300	4.5
400	6.6
700	20
1300	20
2600	39
3500	39
4300	39
8600	79
13000	79
17000	124
21000	124
26000	124
30000	124

## ETI-700/4300 On-Off | EMI-700/4300 Modulating | EME-700/4300 Extended Duty Modulating



### DIMENSIONS - MM

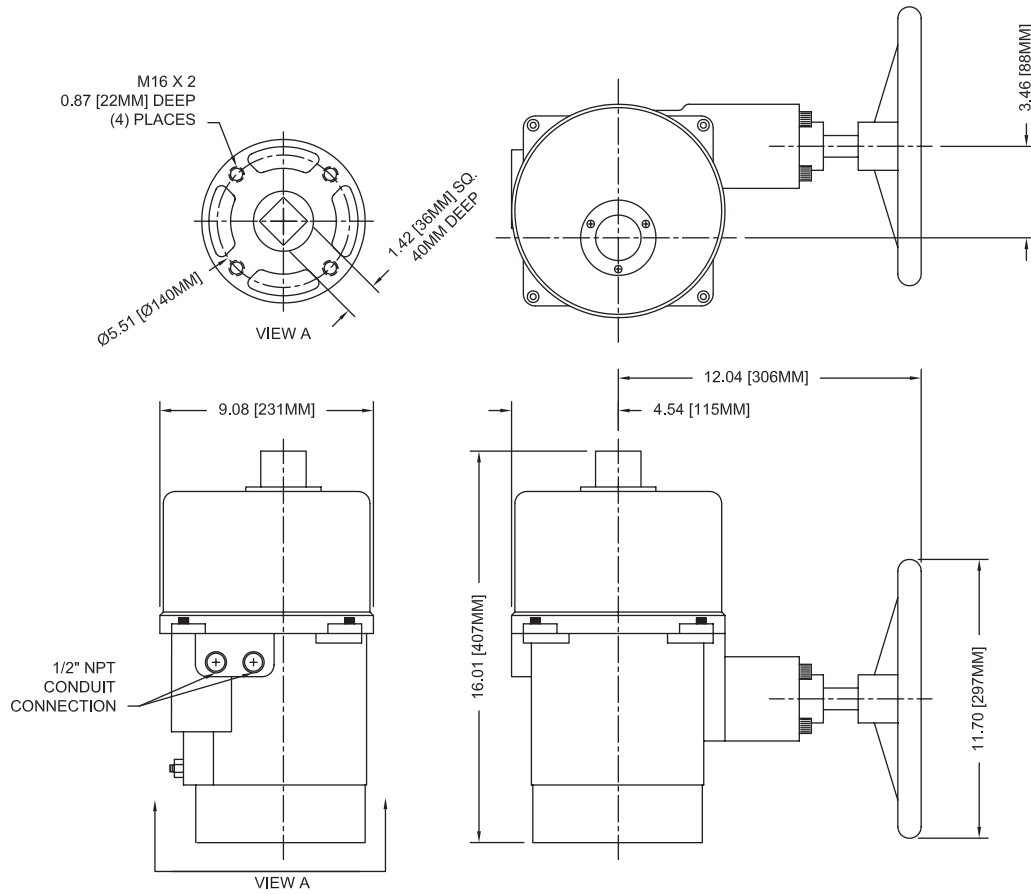
ACTUATOR	A	A1	B	B1	C	D	E	F	H	J	K	L	M
700, 1300	256	288	191	188	123	222	79	168	22	30	70	M8 x 1.25	17
2600, 3500, 4300	319	319	234	230	194	267	117	218	36	40	102	M10 x 1.5	21

### DIMENSIONS - IN

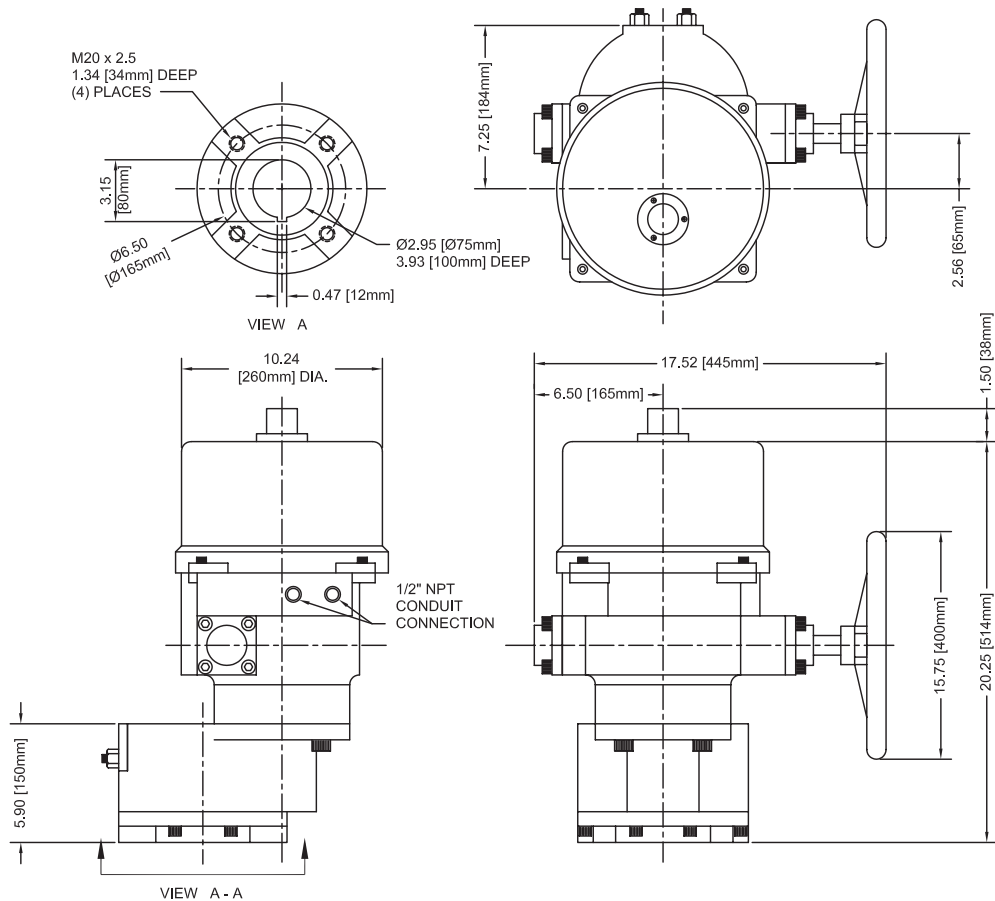
ACTUATOR	A	A1	B	B1	C	D	E	F	H	J	K	L	M
700, 1300	10.08	11.34	7.52	7.40	4.84	8.74	3.11	6.61	0.866	1.18	2.756	M8 x 1.25	0.669
2600, 3500, 4300	12.56	12.56	9.21	9.06	7.64	10.51	4.61	8.58	1.417	1.57	4.016	M10 x 1.5	0.827

# Dimensional Data

## ETI-8600/13000 On-Off | EMI-8600/13000 Modulating | EME-8600/13000 Extended Duty Modulating



## ETI-17000-30000 On-Off | EMI-17000-30000 Modulating | EME-17000/30000 Extended Duty Modulating

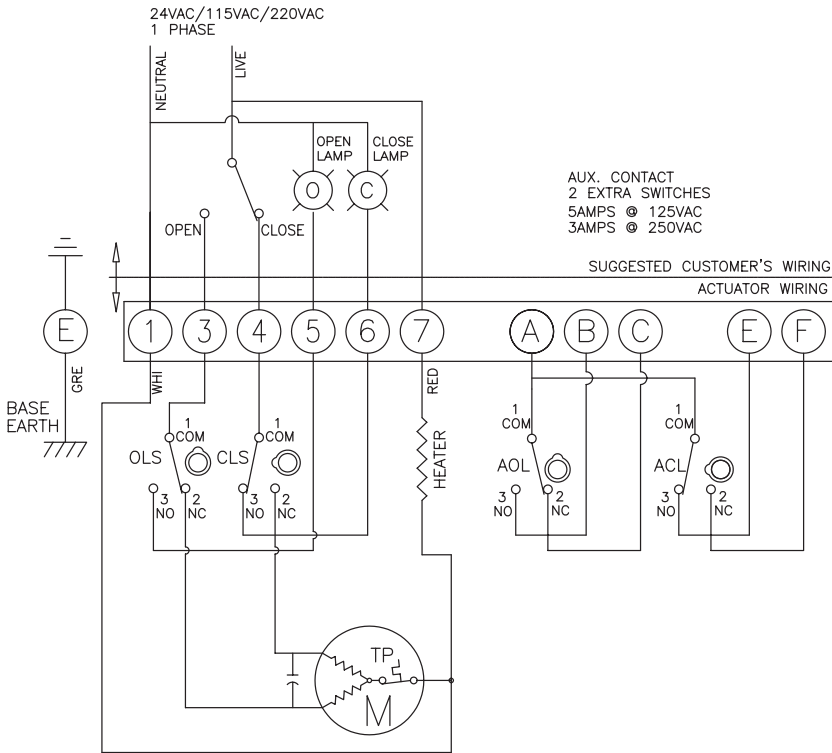




# Wiring Diagrams

DRAWING SE1017

## ETI-300/400 Series Actuators Reversible Two Position Control 24VAC/120VAC/220VAC/1 Phase/50-60HZ

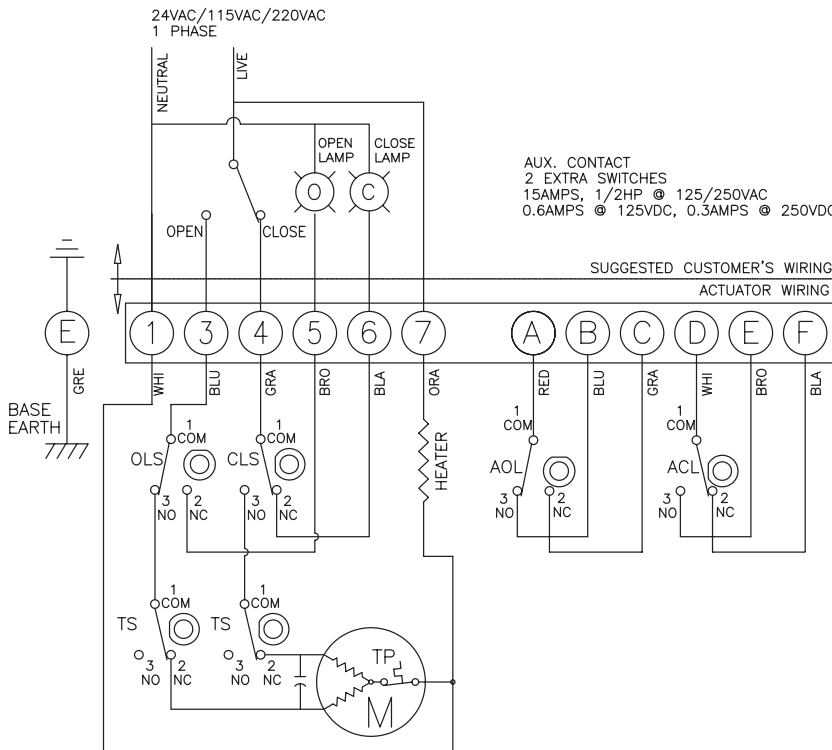


LIMIT SWITCH OPERATION			
SWITCH	CLOSE ←	INTERMEDIATE	→ OPEN
ACL 1-2			
ACL 1-3			
AOL 1-2			
AOL 1-3			
CLS 1-2			
CLS 1-3			
OLS 1-2			
OLS 1-3			
SYMBOL	DESCRIPTION	RATING	
CLS	CLOSE LIMIT SWITCH	250VAC 3A	
OLS	OPEN LIMIT SWITCH	250VAC 3A	
ACL	AUX. CLOSE LIMIT SWITCH	250VAC 3A	
AOL	AUX. OPEN LIMIT SWITCH	250VAC 3A	
TP	THERMAL PROTECTOR	250VAC 10A	

\*EACH ACTUATOR SHOULD BE POWERED THROUGH ITS OWN INDIVIDUAL SWITCH OR RELAY CONTACTS TO PREVENT CROSS FEED BETWEEN TWO OR MORE ACTUATORS.

DRAWING SE1014

## ETI-700/3000 Series Actuators Reversible Two Position Control 24VAC/120VAC/220VAC/1 Phase/50-60HZ



LIMIT SWITCH OPERATION			
SWITCH	CLOSE ←	INTERMEDIATE	→ OPEN
ACL 1-2			
ACL 1-3			
AOL 1-2			
AOL 1-3			
CLS 1-2			
CLS 1-3			
OLS 1-2			
OLS 1-3			
SYMBOL	DESCRIPTION	RATING	
CLS	CLOSE LIMIT SWITCH	250VAC 15A	
OLS	OPEN LIMIT SWITCH	250VAC 15A	
ACL	AUX. CLOSE LIMIT SWITCH	250VAC 15A	
AOL	AUX. OPEN LIMIT SWITCH	250VAC 15A	
TP	THERMAL PROTECTOR	250VAC 10A	
TS	OPTIONAL TORQUE SWITCHES	250VAC 15A	

\*EACH ACTUATOR SHOULD BE POWERED THROUGH ITS OWN INDIVIDUAL SWITCH OR RELAY CONTACTS TO PREVENT CROSS FEED BETWEEN TWO OR MORE ACTUATORS.

## Triac E Series Electric Actuators

### Enclosures & Control

**ETI** - Two Position Control  
**EMI** - Modulating Control  
**ETE** - Two Position Control (Extended Duty Motor)  
**EME** - Modulating Control (Extended Duty Motor)

### Size

**300** - 300 in-Lbs  
**400** - 400 in-Lbs  
**700** - 700 in-Lbs  
**1300** - 1300 in-Lbs  
**2600** - 2600 in-Lbs  
**3500** - 3500 in-Lbs  
**4300** - 4300 in-Lbs  
**8600** - 8600 in-Lbs.  
**13000** - 13000 in-Lbs  
**17000** - 17000 in-Lbs  
**21000** - 21000 in-Lbs  
**26000** - 26000 in-Lbs  
**30000** - 30000 in-Lbs

### Motor Voltages

**Blank** - 115VAC/1PH\*  
**B** - 12 VDC  
**C** - 24VDC  
**D** - 24VAC/1PH\*  
**E** - 220VAC/1PH\*  
**F** - 220VAC/3PH\*  
**G** - 380VAC/3PH\*  
**H** - 440VAC/3PH\*

\*50HZ and 60HZ

### Switch Options

**Blank** - Two auxiliary limit switches (Standard on 300-4300)  
**2T** - Two auxiliary limit switches with torque switch (Standard on 8600-30000)  
**3N** - Three auxiliary limit switches  
**3T** - Three auxiliary limit switches with torque switch

### Feedback Options

**Blank** - No option  
**T1** - 4-20mA output Transmitter  
**P1** - 0-1000 Ohm Potentiometer  
**P2** - 0-5K Ohm Potentiometer  
**P3** - 0-10K Ohm Potentiometer  
**P4** - 0-135 Ohm Potentiometer

### Accessories

**Blank** - Manual Wormgear Override (standard on 700-30000) (No manual override available for model 300 & 400)  
**R1** - 2 Wire Relay (115VAC Control Voltage)  
**R2** - 2 Wire Relay (24VAC Control Voltage)  
**R3** - 2 Wire Relay (24VDC Control Voltage)  
**R4** - 2 Wire Relay (12VDC Control Voltage)  
**S1** - Electronic Speed Control Module  
**D1** - Time Delay (Same delay in both directions)  
**D2** - Time Delay (different delay on both directions)  
**LR** - Integral Local/Remote Control

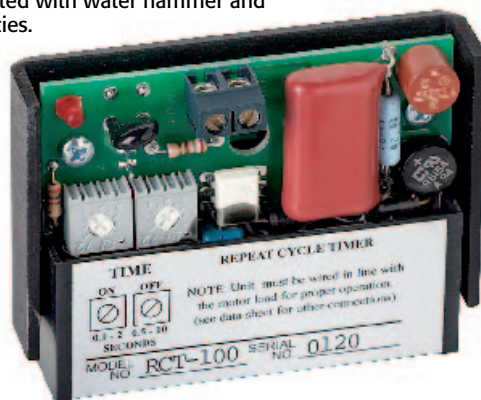
### EXAMPLE: EME-1300-T1

Triac Extended Duty Electric Modulating Actuator, 1300 in-Lbs., 4-20mA, 0-10VDC, 1-5VDC or 0-135OHM input signal, 120VAC/1 Phase, (2) auxiliary limit switches, 4-20mA transmitter, manual override with handwheel

## Options

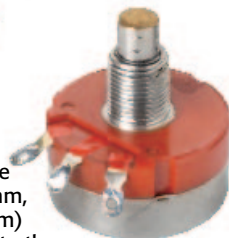
### Speed Control

The Triac Speed Control is a compact module that extends the operating time of the E Series AC powered actuator by pulsing the motor on and off. Extending the cycle time of an actuator can avoid problems associated with water hammer and control system instabilities.



### Control Station

For manual local electrical operation of the actuator. The Control Station flush mounts to the actuator and features a local and remote control switch, an open-stop-close switch, and two lights which locally indicate open and closed position. The enclosure is aluminum and weatherproof.



### Potentiometer

An optional potentiometer can provide a resistance (0-135ohm, 0-1Kohm, 0-5Kohm, 0-10Kohm) signal proportional to the actuator's position. The potentiometer can give continuous feedback to control panels and other closed loop devices.



### Control Boxes

Control boxes are available for a variety of local control options, such as local/remote open-off-close and jogging control. NEMA 4 housings are used as standard, but other housings are available upon request.



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