



A Division of A-T Controls

SP[®] Approved

E Series Electric Actuators



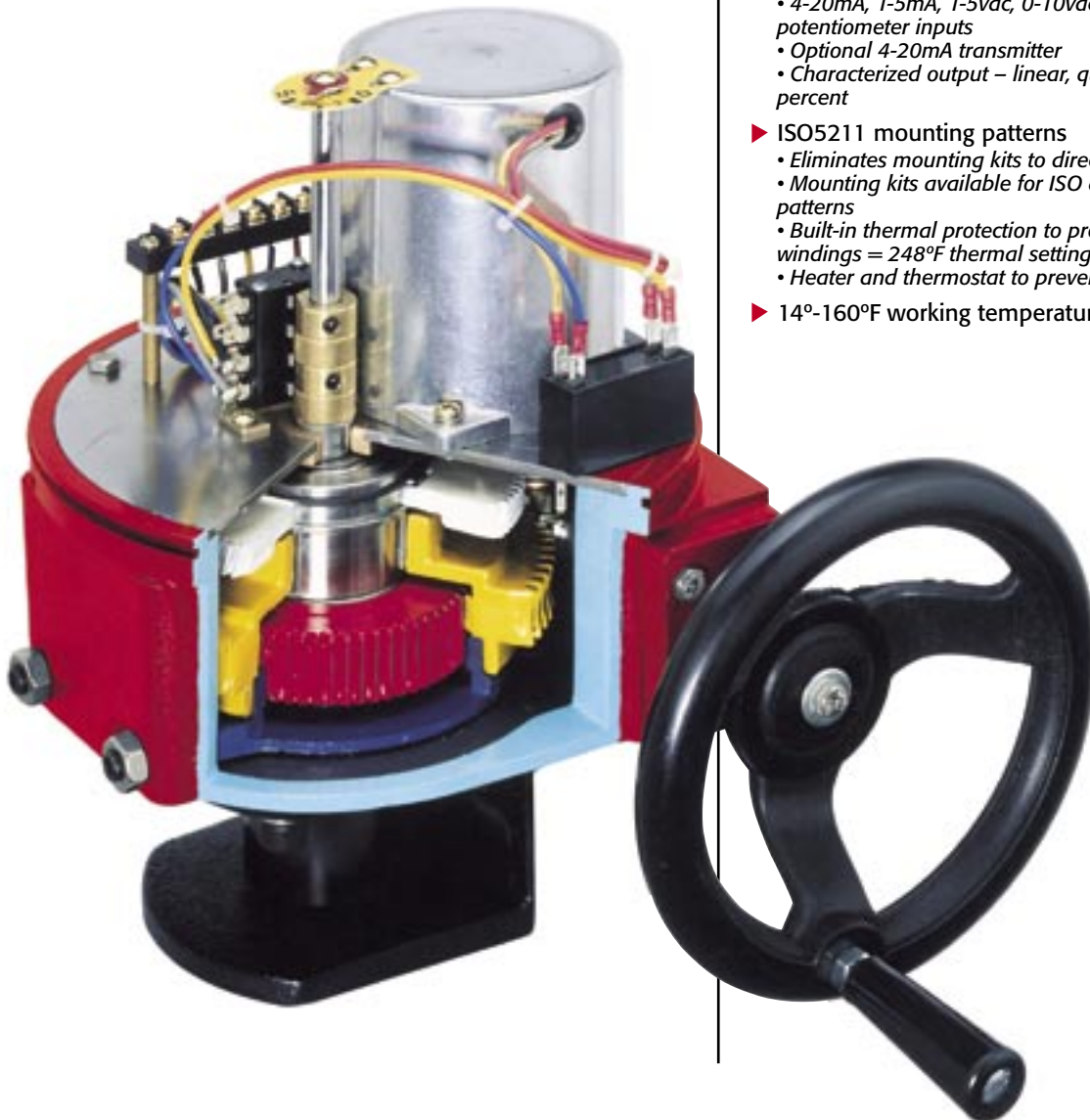
On-Off and Modulating Electric Actuators

Torques to 30,000 in. lbs.

Weatherproof Construction

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
 - ETI-300/ETI-400 features self-locking motor with spur gears.
- ▶ Standard manual override with handwheel
 - Not available on ETI-300/ETI-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 (10amp at 120VAC)
- ▶ Torque switches (2) standard on models ETI-8600 and larger
 - Optional on models ETI-700 through ETI-4300
- ▶ Optional servo card for modulating service
 - 4-20mA, 1-5mA, 1-5vdc, 0-10vdc, 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
 - Heater and thermostat to prevent condensation buildup
- ▶ 14°-160°F working temperature

Torque and Performance Data

BASE MODEL	TORQUE (in lbs) (nm)		SPEED (sec.) (per 90 degrees)	LOCKED ROTOR AMPS								DUTY CYCLE	MANUAL OVERRIDE
				1 PHASE MOTORS			3 PHASE MOTORS			DC MOTORS			
				24VAC	115VAC	220VAC	220VAC	380VAC	440VAC	12VDC	24VDC		
ETI-300	300	34	12	1.8	0.60	0.50	N/A	N/A	N/A	3	1.8	30%	N/A
ETI-400	400	49	20	1.8	0.60	0.50	N/A	N/A	N/A	3	1.8	30%	N/A
ETI-700	700	78	15	5	1.80	0.90	1.10	0.70	0.70	8.5	5	50%	Standard
ETI-1300	1300	147	23	5	1.80	0.90	1.10	0.70	0.70	8.5	5	50%	Standard
ETI-2600	2600	294	16	6	3.60	1.80	3.50	2.00	2.00	10	6	50%	Standard
ETI-3500	3500	392	22	6	3.60	1.80	3.50	2.00	2.00	10	6	50%	Standard
ETI-4300	4300	490	28	6	3.60	1.80	3.50	2.00	2.00	10	6	50%	Standard
ETI-8600	8600	981	46	N/A	10.00	4.00	1.80	1.00	1.00	N/A	N/A	50%	Standard
ETI-13000	13000	1471	46	N/A	10.00	5.00	2.80	1.60	1.20	N/A	N/A	50%	Standard
ETI-17000	17000	1961	58	N/A	6.00	4.00	2.00	1.00	1.00	N/A	N/A	50%	Standard
ETI-21000	21000	2452	58	N/A	6.00	3.00	1.50	1.00	1.00	N/A	N/A	50%	Standard
ETI-26000	26000	2942	58	N/A	5.00	3.00	3.00	1.50	1.50	N/A	N/A	50%	Standard
ETI-30000	30000	3433	58	N/A	5.00	3.00	2.50	1.50	1.50	N/A	N/A	50%	Standard

- NOTE: 1. Operating speeds is nominal at rated torques. Final operating speed may vary depending on actual service.
 2. Actuators with 12 Vdc motors will have an operating speed of approximately 40% longer (slower) than that shown.
 3. Duty Cycle= Effective uninterrupted motor run period versus cool down period
 50% Duty Cycle=One period of motor run followed by one period at rest to cool down
 4. Call factory for extended duty applications

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 Boxes

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



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.



Two Wire Control

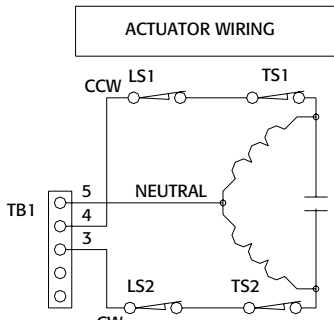
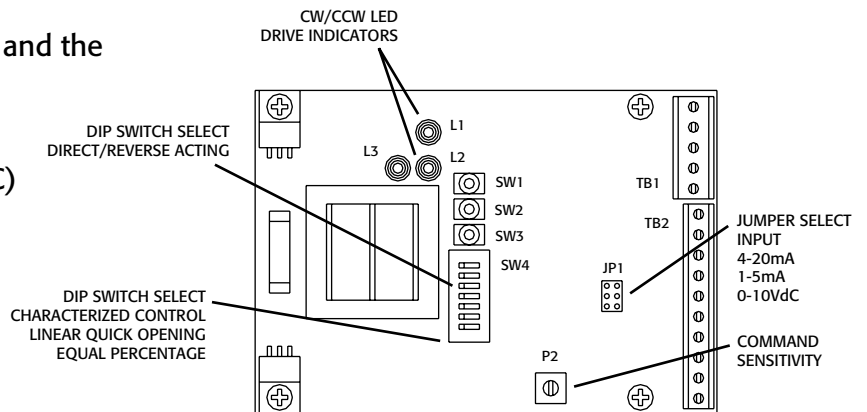
When using the optional two wire control, the E Series (2) position electric actuator can be controlled with a low voltage signal. When the voltage is present, the spring loaded relay will trip, energizing the actuator to rotate clockwise or counter-clockwise. When the voltage is removed, the spring will untrip the relay, energizing the actuator to rotate in the opposite direction.



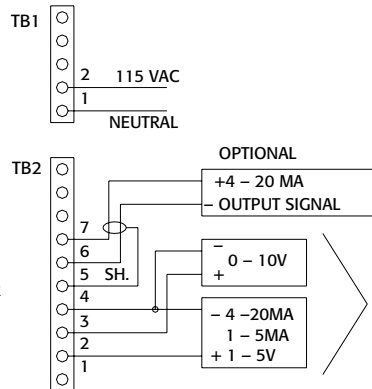
TMC2 Electronic Modulating Card

Features and Benefits

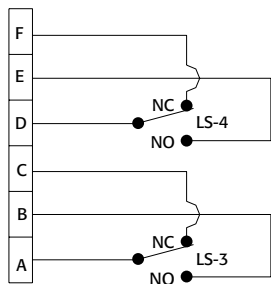
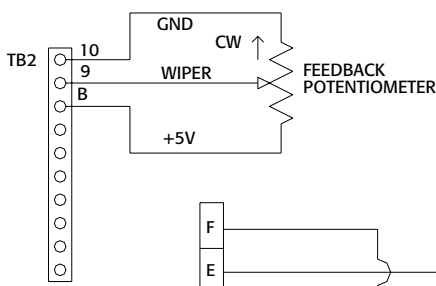
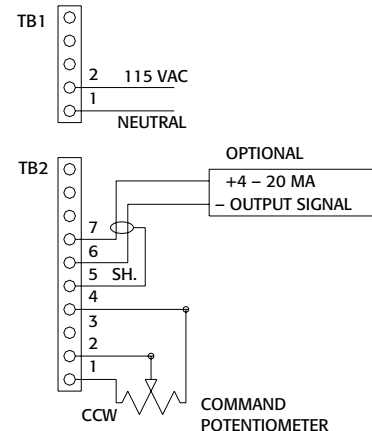
- ▶ 10 bit Microprocessor Controller for precise positioning - eliminates the need for an external deadband control.
- ▶ Programming of the controller is accomplished by a combination of push buttons and seven position DIP switch without the need for a command signal.
- ▶ Input signals can be 4-20mA, 0-10VDC, 1-5VDC, 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)
- ▶ For other voltages (24VDC, 24VAC, 220VAC) consult factory.



CUSTOMER CONNECTIONS (STANDARD INPUTS)



CUSTOMER CONNECTIONS (COMMAND POTENTIOMETER)

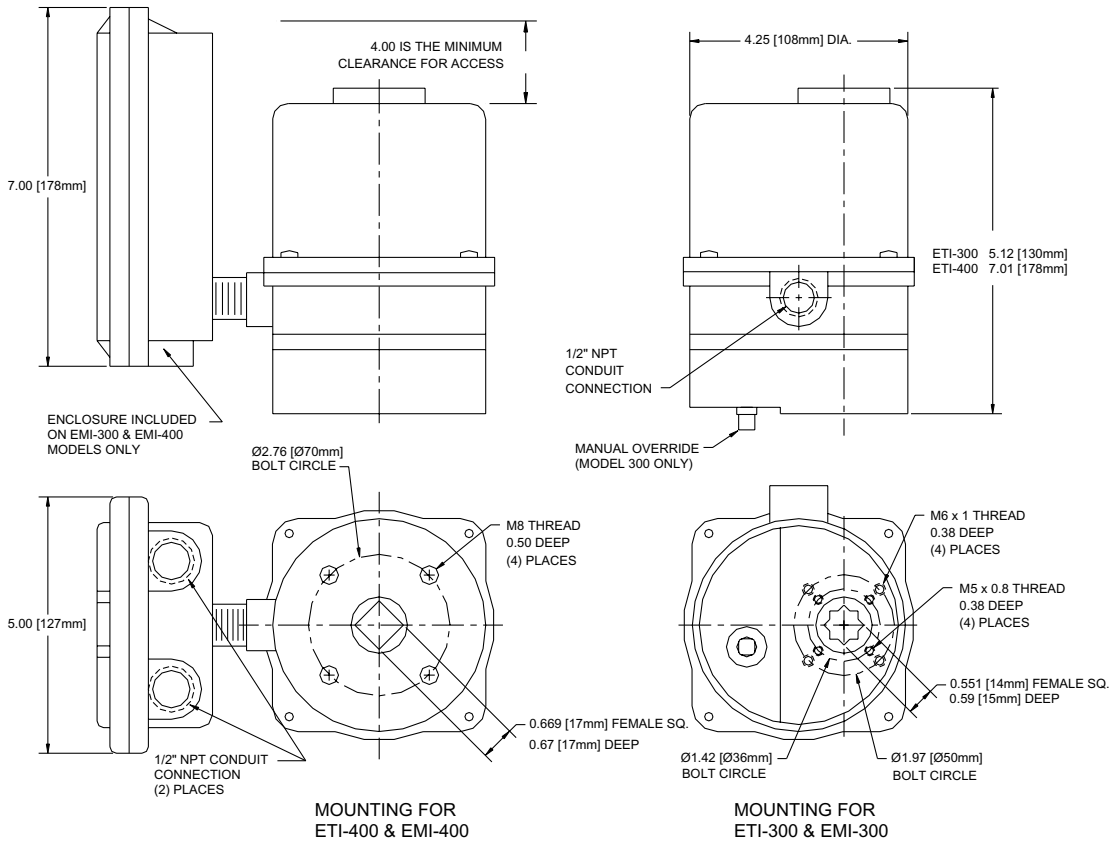


- NOTES:
1. FIELD WIRING IS SHOWN FOR REFERENCE ONLY AND IS NOT SUPPLIED WITH ACTUATOR.
 2. SWITCHES ARE FROM BOTTOM TO TOP. (i.e. switch 1 is on the bottom, switch 2 is the next one up, etc.)
 3. ROTATION IS VIEWED FROM THE MOTOR SIDE.
 4. THERMAL OVERLOAD RESETS AUTOMATICALLY.
 5. TS-1 AND TS-2 ARE TORQUE SWITCHES. (optional on models 700 - 4300) (standard on models 8600 - 30000)
 6. THE COMMONS FROM SWITCH LS-3 AND LS-4 ARE CONNECTED TO TERMINAL A ON MODELS 300 AND 400.
 7. FOR COMPLETE INSTALLATION INSTRUCTIONS REFER TO IOM5004.

Dimensional Data

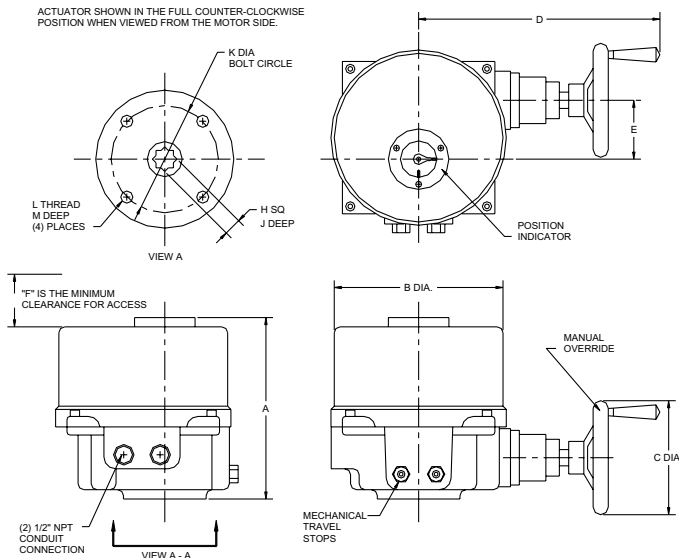
ETI-300/400 On-Off EMI-300/400 Modulating

WEIGHTS (LBS.)	
ETI-300	4.5
ETI-400	6.6



ETI-700/4300 On-Off EMI-700/4300 Modulating

WEIGHTS (LBS.)	
ETI-700	20
ETI-1300	20
ETI-2600	39
ETI-3500	39
ETI-4300	39



DIMENSIONS - MM

ACTUATOR	A	B	C	D	E	F	H	J	K	L	M
700 ~ 1300	206	200	125	230	62	125	22	30	70	M8 x 1.25	17
2600 ~ 4300	276	234	195	263	88	175	35	40	102	M10 x 1.5	21

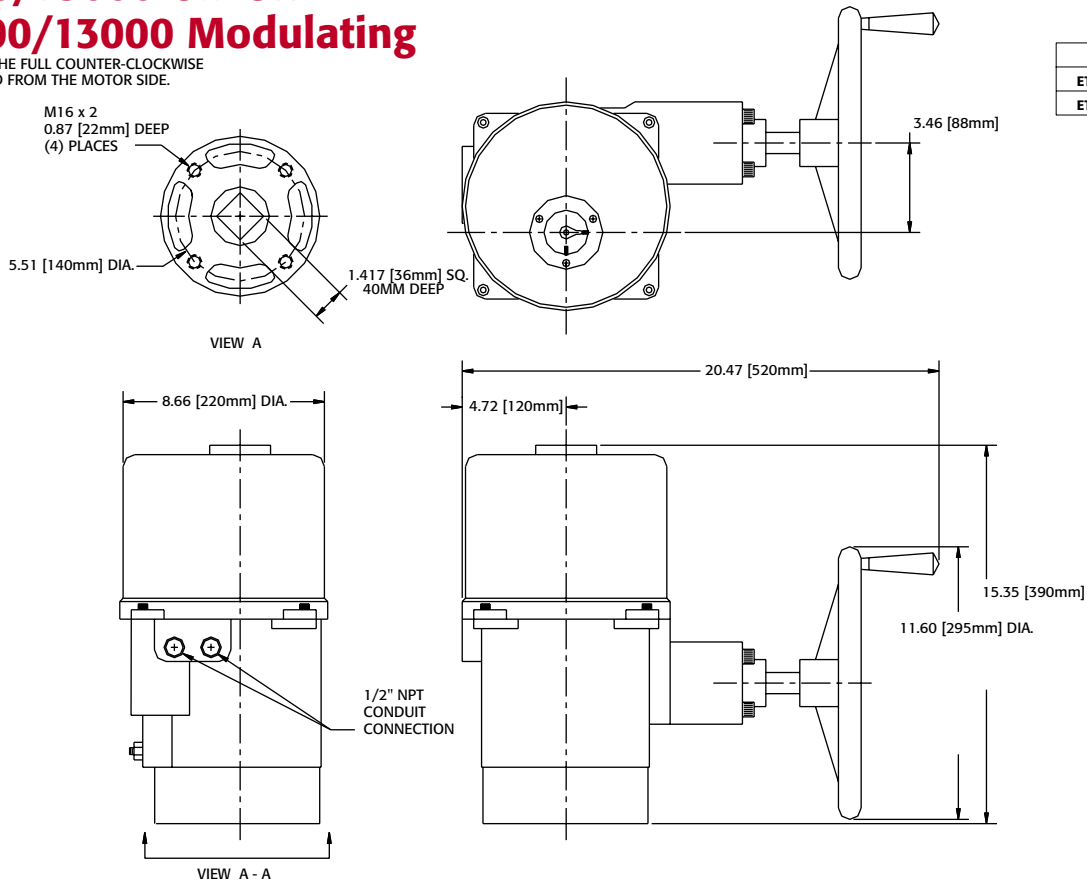
DIMENSIONS - INCHES

ACTUATOR	A	B	C	D	E	F	H	J	K	L	M
700 ~ 1300	8.11	7.87	4.92	9.06	2.44	4.92	0.87	1.18	2.76	M8 x 1.25	0.67
2600 ~ 4300	10.87	9.21	7.68	10.35	3.46	6.89	1.38	1.57	4.02	M10 x 1.5	0.83

Dimensional Data

ETI-8600/13000 On-Off EMI-8600/13000 Modulating

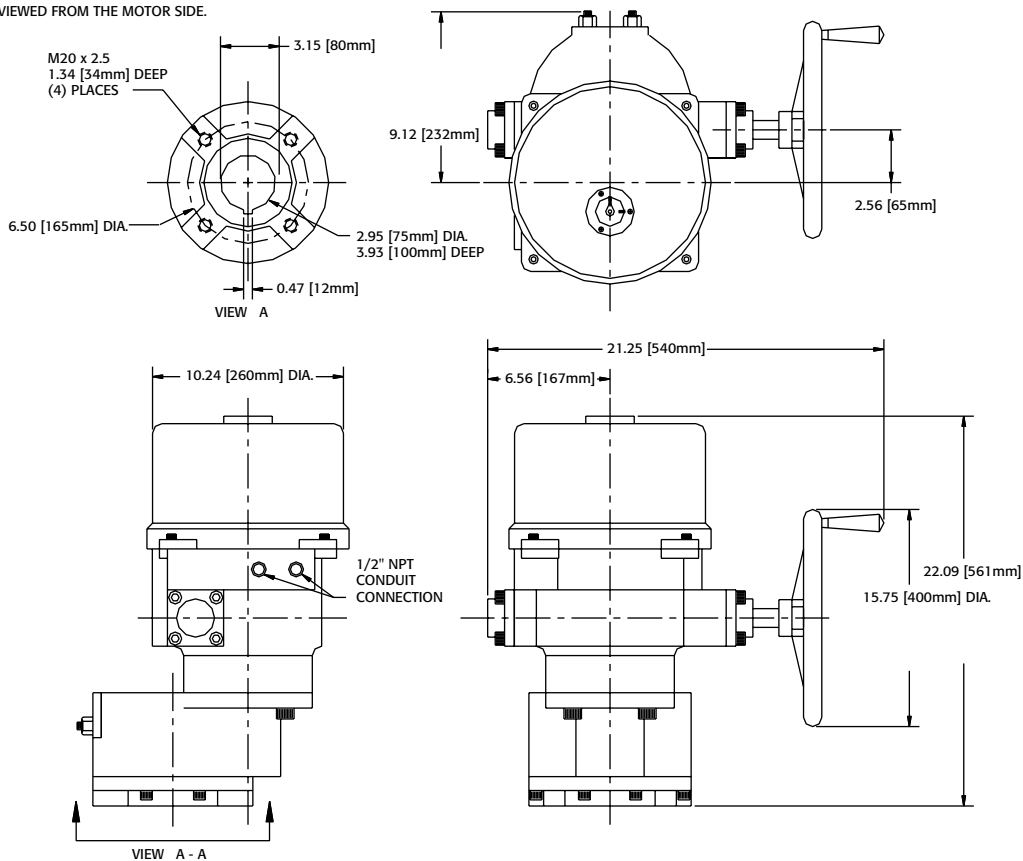
ACTUATOR SHOWN IN THE FULL COUNTER-CLOCKWISE POSITION WHEN VIEWED FROM THE MOTOR SIDE.



WEIGHTS (LBS.)	
ETI-8600	79
ETI-13000	79

ETI-17000-30000 On-Off EMI-17000-30000 Modulating

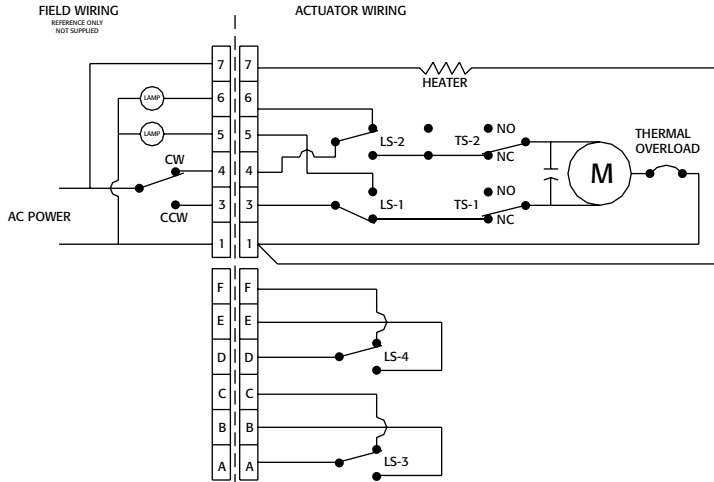
ACTUATOR SHOWN IN THE FULL COUNTER-CLOCKWISE POSITION WHEN VIEWED FROM THE MOTOR SIDE.



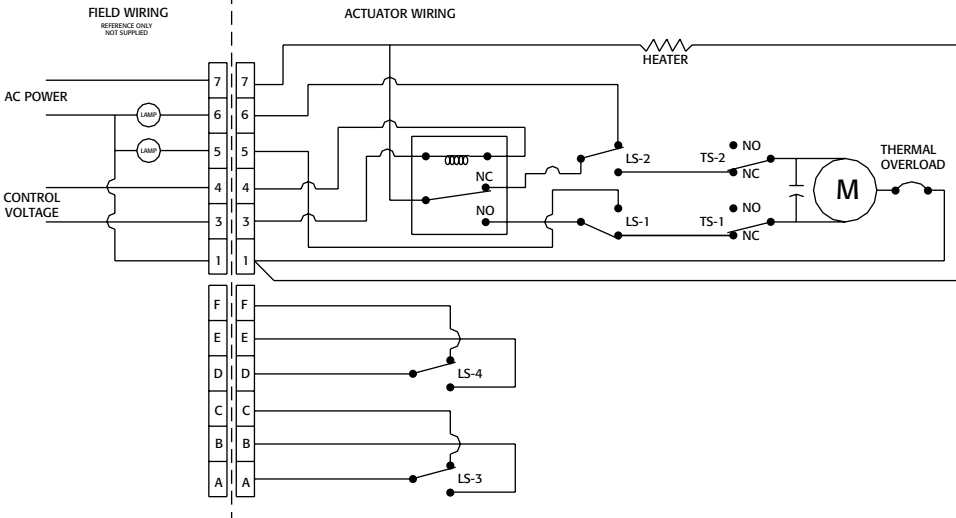
WEIGHTS (LBS.)	
ETI-17000	124
ETI-21000	124
ETI-26000	124
ETI-30000	124

Wiring Diagrams

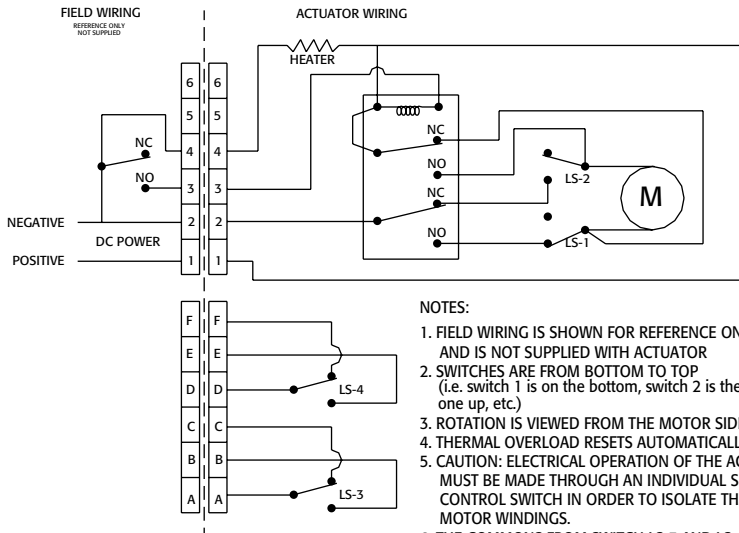
DRAWING TO5426
Reversible VAC Actuator
120VAC/1ph/50-60Hz



DRAWING TO5427
2-Wire Control
120VAC/1ph/50-60Hz



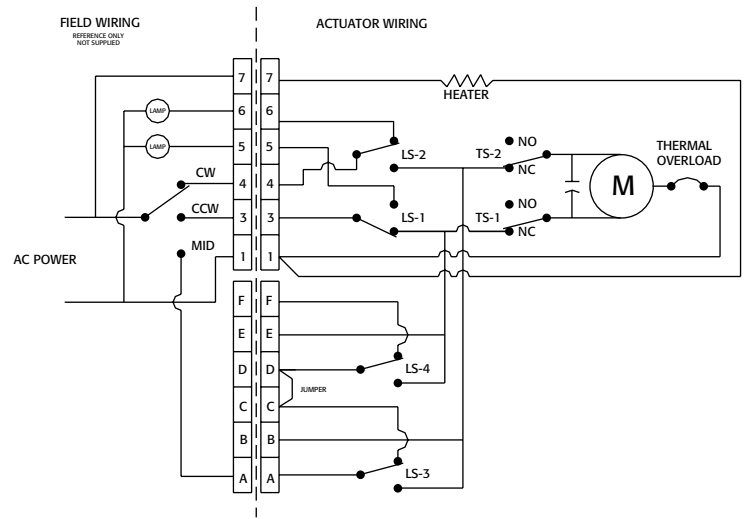
DRAWING TO5425
Reversible VDC Actuator
12VDC/24VDC



- NOTES:**
1. FIELD WIRING IS SHOWN FOR REFERENCE ONLY AND IS NOT SUPPLIED WITH ACTUATOR
 2. SWITCHES ARE FROM BOTTOM TO TOP (i.e. switch 1 is on the bottom, switch 2 is the next one up, etc.)
 3. ROTATION IS VIEWED FROM THE MOTOR SIDE.
 4. THERMAL OVERLOAD RESETS AUTOMATICALLY.
 5. CAUTION: ELECTRICAL OPERATION OF THE ACTUATOR MUST BE MADE THROUGH AN INDIVIDUAL SINGLE POLE CONTROL SWITCH IN ORDER TO ISOLATE THE UNUSED MOTOR WINDINGS.
 6. THE COMMONS FROM SWITCH LS-3 AND LS-4 ARE CONNECTED TO TERMINAL A ON MODELS 300 AND 400.

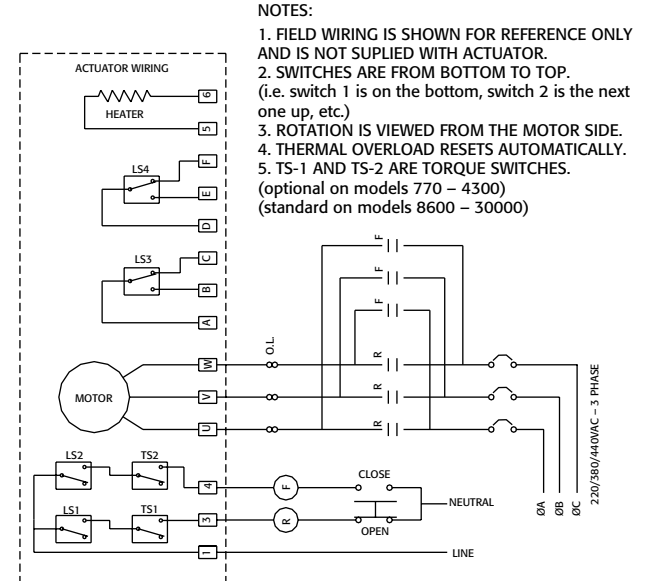
DRAWING TO5429
3-Position Control
120VAC/1ph/50-60Hz

SHOWN IN THE FULL CW POSITION



- NOTES:**
1. FIELD WIRING IS SHOWN FOR REFERENCE ONLY AND IS NOT SUPPLIED WITH ACTUATOR
 2. SWITCHES ARE FROM BOTTOM TO TOP (i.e. switch 1 is on the bottom, switch 2 is the next one up, etc.)
 3. ROTATION IS VIEWED FROM THE MOTOR SIDE.
 4. THERMAL OVERLOAD RESETS AUTOMATICALLY.
 5. TS-1 AND TS-2 ARE TORQUE SWITCHES (optional on models 700 ~ 4300) (standard on models 8600 ~ 30000)
 6. CAUTION: ELECTRICAL OPERATION OF THE ACTUATOR MUST BE MADE THROUGH AN INDIVIDUAL SINGLE POLE CONTROL SWITCH IN ORDER TO ISOLATE THE UNUSED MOTOR WINDINGS.
 7. THE COMMONS FROM SWITCH LS-3 AND LS-4 ARE CONNECTED TO TERMINAL A ON MODELS 300 AND 400.

DRAWING TO5428
Reversible 3 Phase Actuator
220VAC/380VAC/440VAC
(3 phase/50-60Hz)



- NOTES:**
1. FIELD WIRING IS SHOWN FOR REFERENCE ONLY AND IS NOT SUPPLIED WITH ACTUATOR.
 2. SWITCHES ARE FROM BOTTOM TO TOP. (i.e. switch 1 is on the bottom, switch 2 is the next one up, etc.)
 3. ROTATION IS VIEWED FROM THE MOTOR SIDE.
 4. THERMAL OVERLOAD RESETS AUTOMATICALLY.
 5. TS-1 AND TS-2 ARE TORQUE SWITCHES. (optional on models 770 ~ 4300) (standard on models 8600 ~ 30000)

Triac E Series Electric Actuators

Enclosures & Control

ETI - Aluminum (CSA Approved)
EMI - 4-20mA Modulating Service

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)

EXAMPLE: EMI-1300-T1

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

Other A-T Controls products include



TRIAC
Rack & Pinion
Pneumatic Actuators



ACUTROL
Electric
Fail-Safe Actuators



A-T Controls
Gear Operators



TRIAC
Automated Ball Valve
Packages

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