

# AE SERIES ACTUATORS

## Electric Actuators

**Standard Voltages**  
110/240/380/480V  
24VAC/24VDC

**Modulating Capable**



**100% Duty Cycle Models**  
**Fast Acting Models**



TRU - F L O   M A D E   B Y   Q S M

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# PART NUMBER BUILDER



## PART NUMBER BUILDER

1 MODEL	2 VOLTAGE	3 OPTIONAL FEATURES
<ul style="list-style-type: none"> <li>AE01</li> <li>AE02</li> <li>AE03</li> <li>AE03H</li> <li>AE04H</li> <li>AE05H</li> <li>AE06H</li> <li>AE01A</li> <li>AE02A</li> <li>AE03A</li> <li>AE03HA</li> <li>AE04HA</li> <li>AE01FA-M1</li> <li>AE01FA-M2</li> <li>AE03FA-M1</li> <li>AE03FA-M2</li> <li>AE03FA</li> <li>AEM01A</li> <li>AEM02A-M1</li> <li>AEM02A-M2</li> <li>AEM03A-M1</li> <li>AEM03A-M2</li> <li>AEM03HA</li> <li>AEM03HA-M1</li> <li>AEM03HA-M2</li> <li>AEM04HA</li> <li>AEM05HA</li> <li>AEM06HA</li> </ul> <p>See page 3 for details.</p>	<ul style="list-style-type: none"> <li>120VAC</li> <li>220VAC</li> <li>220VAC-3PH</li> <li>380VAC-3PH</li> <li>460VAC-3PH</li> <li>24VAC/24VDC</li> </ul> <p>See page 3 for details.</p>	<ul style="list-style-type: none"> <li>ALS</li> <li>SPH</li> <li>IER</li> <li>LED</li> </ul> <p>See page 3 for details.</p>

**Example Part Numbers - Coding of Features**

<b>AE01</b>	-	<b>120VAC</b>
Standard Duty Cycle		
<b>AE01FA-M2</b>	-	<b>120VAC</b>
"FA" Fast Acting)	"M2" Motor 2	Voltage
<b>AEM01A-M1</b>	-	<b>120VAC</b>
"A" 100% Duty	"M1" Motor 1	Voltage
<b>AE03HA</b>	-	<b>120VAC</b>
"H" Handwheel)	"A" 100% Duty Cycle	

# TECHNICAL DATA

## 1 Select desired model

### Standard On/Off Models

Model No.	Torque	Duty	Cycle	Description
AE01-XXXVAC-YY	301	25%	10s	Standard On/Off Electric Quarter-Turn Actuator, Manual Override
AE02-XXXVAC-YY	434	25%	10s	Standard On/Off Electric Quarter-Turn Actuator, Manual Override
AE03-XXXVAC-YY	1478	50%	8s	Standard On/Off Electric Quarter-Turn Actuator, Manual Override
AE03H-XXXVAC-YY	1797	50%	10s	Standard On/Off Electric Quarter-Turn Actuator, with HW Override
AE04H-XXXVAC-YY	3292	50%	30s	Standard On/Off Electric Quarter-Turn Actuator, with HW Override
AE05H-XXXVAC-YY	4355	50%	30s	Standard On/Off Electric Quarter-Turn Actuator, with HW Override
AE06H-XXXVAC-YY	5293	50%	30s	Standard On/Off Electric Quarter-Turn Actuator, with HW Override

Note - The definition of DUTY CYCLE is in accordance with IEC60034-S4 duty type. Torques shown in inch-lbs.

### 100% Duty Cycle On/Off Models - 120VAC/240VAC

Model No.	Torque	Duty	Cycle	Description
AE01A-XXXVAC	283	100%	16s	100% Duty Cycle On/Off Electric Quarter-Turn Actuator, Manual Override
AE02A-XXXVAC	443	100%	36s	100% Duty Cycle On/Off Electric Quarter-Turn Actuator, Manual Override
AE03HA-XXXVAC	867	100%	65s	100% Duty Cycle On/Off Electric Quarter-Turn Actuator, Manual Override

Note - The definition of DUTY CYCLE is in accordance with IEC60034-S4 duty type. Torques shown in inch-lbs.

### 100% Duty Cycle Models - DUAL VOLTAGE 24VAC/24VDC

Model No.	Torque	Duty	Cycle	Description
AE01A-24VAC/24VDC	310	100%	11-16s	100% Duty Cycle On/Off Electric Quarter-Turn Actuator, Manual Override
AE02A-24VAC/24VDC	443	100%	12-18s	100% Duty Cycle On/Off Electric Quarter-Turn Actuator, Manual Override
AE03A-24VAC/24VDC	1239	100%	8-18s	100% Duty Cycle On/Off Electric Quarter-Turn Actuator, Manual Override
AE03HA-24VAC/24VDC	1381	100%	10-15s	100% Duty Cycle On/Off Electric Quarter-Turn Actuator, with HW Override
AE04HA-24VAC/24VDC	2434	100%	27-47s	100% Duty Cycle On/Off Electric Quarter-Turn Actuator, with HW Override

Note - The definition of DUTY CYCLE is in accordance with IEC60034-S4 duty type. Torques shown in inch-lbs.

### Fast Acting On/Off Models - 120VAC/240VAC

Model No.	Torque	Duty	Cycle	Description
AE01FA-M1-XXXVAC	78	100%	1s	Fast Acting On/Off Electric Quarter-Turn Actuator, Manual Override
AE01FA-M2-XXXVAC	221	100%	3s	Fast Acting On/Off Electric Quarter-Turn Actuator, Manual Override
AE03FA-M1-XXXVAC	310	100%	1s	Fast Acting On/Off Electric Quarter-Turn Actuator, Manual Override
AE03FA-M2-XXXVAC	885	100%	5s	Fast Acting On/Off Electric Quarter-Turn Actuator, Manual Override

Note - The definition of DUTY CYCLE is in accordance with IEC60034-S4 duty type. Torques shown in inch-lbs.

### Fast Acting On/Off Models - 24VAC/24VDC

Model No.	Torque	Duty	Cycle	Description
AE01FA-M1-24VAC/24VDC	89	100%	1-3s	Fast Acting On/Off Electric Quarter-Turn Actuator, Manual Override
AE01FA-M2-24VAC/24VDC	221	100%	3-8s	Fast Acting On/Off Electric Quarter-Turn Actuator, Manual Override
AE03FA-24VAC/24VDC	443	100%	3-7s	Fast Acting On/Off Electric Quarter-Turn Actuator, Manual Override

Note - The definition of DUTY CYCLE is in accordance with IEC60034-S4 duty type. Torques shown in inch-lbs.

### Modulating Models - 120VAC/240VAC

Model No.	Torque	Duty	Board	Description
AEM01A-XXXVAC-AMD	221	100%	AMD	Modulating Electric Quarter-Turn Actuator, Manual Override, 0-10V/4-20mA
AEM02A-M1-XXXVAC-AMD	319	100%	AMD	Modulating Electric Quarter-Turn Actuator, Manual Override, 0-10V/4-20mA
AEM02A-M2-XXXVAC-AMD	443	100%	AMD	Modulating Electric Quarter-Turn Actuator, Manual Override, 0-10V/4-20mA
AEM03A-M1-XXXVAC-AMD	885	100%	AMD	Modulating Electric Quarter-Turn Actuator, Manual Override, 0-10V/4-20mA
AEM03A-M2-XXXVAC-AMD	1062	100%	AMD	Modulating Electric Quarter-Turn Actuator, Manual Override, 0-10V/4-20mA
AEM03HA-XXXVAC-AMD	867	100%	AMD	Modulating Electric Quarter-Turn Actuator, w/ HW Override, 0-10V/4-20mA
AEM03HA-M1-XXXVAC-BMD	1478	100%	BMD	Modulating Electric Quarter-Turn Actuator, w/ HW Override, 0-10V/4-20mA
AEM03HA-M2-XXXVAC-BMD	1797	100%	BMD	Modulating Electric Quarter-Turn Actuator, w/ HW Override, 0-10V/4-20mA
AEM04HA-XXXVAC-BMD	2673	100%	BMD	Modulating Electric Quarter-Turn Actuator, w/ HW Override, 0-10V/4-20mA
AEM05HA-XXXVAC-BMD	4355	100%	BMD	Modulating Electric Quarter-Turn Actuator, w/ HW Override, 0-10V/4-20mA
AEM06HA-XXXVAC-BMD	5293	100%	BMD	Modulating Electric Quarter-Turn Actuator, w/ HW Override, 0-10V/4-20mA

Note - The definition of DUTY CYCLE is in accordance with IEC60034-S4 duty type. Torques shown in inch-lbs.

## 2 Select desired voltage

120 VAC	240 VAC	240-3PH VAC	380-3PH VAC	480-3PH VAC
√	√	-	-	-
√	√	-	-	-
√	√	√	√	√
√	√	√	√	√
√	√	√	√	√
√	√	√	√	√
√	√	√	√	√

120 VAC	240 VAC
√	√
√	√
√	√

24VAC/24VDC
√
√
√
√

120 VAC	240 VAC
√	√
√	√
√	√
√	√

24VAC/24VDC
√
√
√

120 VAC	240 VAC
√	√
√	√
√	√
√	√
√	√
√	√
√	√
√	√
√	√

\*12 VDC available as special order only.

## 3 Select desired accessory

Accessory No.	Description
-/ALS	2 Additional Limit Switches (total of 4)
-/SPH	Internal Space Heater
-/IER	Integral Electrical Relay / 2 wire control
-/LED	Position Indicator

**Standard On/Off Models** - For "XXXVAC-YY", choose either 120, 240, 240-3PH, 380-3PH, or 480-3PH for required voltage. Only use "-YY" for 3 Phase Voltage Option.

**100% Duty Cycle On/Off Models - 120VAC/240VAC** - For "XXX", choose either 120 or 240 for required voltage.

**Modulating Models - 120VAC/240VAC** - For "XXX", choose either 120 or 240 for required voltage. M1 motors are synchronous type motors providing relatively high electrical efficiency, M2 motors are inductive type motors and provide higher torque and speed in the same motor size.

**Fast Acting On/Off Models - 120VAC/240VAC** - For "XXX", choose either 120 or 240 for required voltage. M1 motors are synchronous type motors providing relatively high electrical efficiency, M2 motors are inductive type motors and provide higher torque and speed in the same motor size.

# TECHNICAL DATA

## Standard On/Off Control Series, 120VAC/240VAC & 240VAC/380VAC/480VAC-3PHASE

Model No.	Torque (in-lbs)	Torque (NM)	Weight (lbs)	Weight (Kg)	Duty	Power <sup>1</sup>	90 Degree Cycle Time	Amps 120VAC @ 60Hz <sup>2</sup>	Amps 240VAC @ 60Hz <sup>2</sup>
AE01-XXXVAC-YY	301	34	3.7	1.7	25%	10W	10s	0.7A	0.38A
AE02-XXXVAC-YY	434	49	4.0	1.8	25%	15W	10s	0.9A	0.5A
AE03-XXXVAC-YY	1478	167	9.7	4.4	50%	25W	8s	1.2A	0.72A
AE03H-XXXVAC-YY	1797	203	17.4	7.9	50%	25W	10s	1.2A	0.72A
AE04H-XXXVAC-YY	3292	372	19.0	8.6	50%	25W	30s	1.2A	0.72A
AE05H-XXXVAC-YY	4355	492	19.4	8.8	50%	40W	30s	2.0A	0.75A
AE06H-XXXVAC-YY	5293	598	20.1	9.1	50%	60W	30s	2.4A	0.8A

Note - "H" in the part number indicates hand-wheel manual override. The definition of DUTY CYCLE is in accordance with IEC60034-S4 duty type. For "XXXVAC-YY", choose either 120, 240, 240-3PH, 380-3PH, or 480-3PH for required voltage. Only use "-YY" for 3 Phase Voltage Option.

## 100% Duty Cycle On/Off Control Series, 120VAC/240VAC

Model No.	Torque (in-lbs)	Torque (NM)	Weight (lbs)	Weight (Kg)	Duty	Power <sup>1</sup>	90 Degree Cycle Time	Amps 120VAC @ 60Hz <sup>2</sup>	Amps 240VAC @ 60Hz <sup>2</sup>
AE01A-XXXVAC	283	32	3.7	1.7	100%	25W	16s	0.3A	0.15A
AE02A-XXXVAC	443	50	4.0	1.8	100%	25W	36s	0.2A	0.10A
AE03HA-XXXVAC	867	98	19.4	8.8	100%	25W	65s	0.2A	0.10A

Note - "H" in the part number indicates hand-wheel manual override. The definition of DUTY CYCLE is in accordance with IEC60034-S4 duty type. For "XXX", choose either 120 or 240 for required voltage.

## 100% Duty Cycle On/Off Control Series, DUAL VOLTAGE 24VAC/24VDC

Model No.	Torque (in-lbs)	Torque (NM)	Weight (lbs)	Weight (Kg)	Duty	Power <sup>1</sup>	90 Degree Cycle Time	DUAL VOLTAGE Amps @ 60Hz 24VAC/24VDC <sup>2</sup>	
AE01A-24VAC/24VDC	310	35	4.4	2	100%	7W	11 to 16s	1.5A	
AE02A-24VAC/24VDC	443	50	4.9	2.2	100%	7W	12 to 18s	1.5A	
AE03A-24VAC/24VDC	1239	140	9.7	4.4	100%	25W	8 to 18s	3.0A	
AE03HA-24VAC/24VDC	1381	156	17.4	7.9	100%	25W	10 to 15s	3.0A	
AE04HA-24VAC/24VDC	2434	275	19.0	8.6	100%	25W	27 to 47s	3.0A	

Note - "H" in the part number indicates hand-wheel manual override. The definition of DUTY CYCLE is in accordance with IEC60034-S4 duty type.

## MODULATING Control Series, 120VAC/240VAC

Model No.	Torque (in-lbs)	Torque (NM)	Weight (lbs)	Weight (Kg)	Duty	Power <sup>1</sup>	90 Deg. Cycle Time	Amps 120VAC @ 60Hz <sup>2</sup>	Amps 240VAC @ 60Hz <sup>2</sup>
AEM01A-XXXVAC-AMD	221	25	4.9	2.2	100%	25W	16s	0.2A	0.10A
AEM02A-M1-XXXVAC-AMD	319	36	5.5	2.5	100%	25W	16s	0.3A	0.15A
AEM02A-M2-XXXVAC-AMD	443	50	5.5	2.5	100%	25W	35s	0.2A	0.10A
AEM03A-M1-XXXVAC-AMD	885	100	7.1	3.2	100%	25W	36s	0.3A	0.15A
AEM03A-M2-XXXVAC-AMD	1062	120	8.8	4	100%	25W	54s	0.3A	0.15A
AEM03HA-XXXVAC-AMD	867	98	14.3	6.5	100%	25W	65s	0.2A	0.10A
AEM03HA-M1-XXXVAC-BMD	1478	167	10.6	4.8	100%	25W	8s	1.2A	0.72A
AEM03HA-M2-XXXVAC-BMD	1797	203	18.3	8.3	100%	25W	10s	1.2A	0.72A
AEM04HA-XXXVAC-BMD	2673	302	19.8	9	100%	25W	30s	1.2A	0.72A
AEM05HA-XXXVAC-BMD	4355	492	20.3	9.2	100%	40W	30s	2.0A	0.75A
AEM06HA-XXXVAC-BMD	5293	598	20.9	9.5	100%	60W	30s	2.4A	0.80A

Note - "H" in the part number indicates hand-wheel manual override. The definition of DUTY CYCLE is in accordance with IEC60034-S4 duty type. For "XXX", choose either 120 or 240 for required voltage. M1 motors are synchronous type motors providing relatively high electrical efficiency, M2 motors are inductive type motors and provide higher torque and speed in the same motor size.

## FAST ACTING On/Off Control Series, 120VAC/240VAC

Model No.	Torque (in-lbs)	Torque (NM)	Weight (lbs)	Weight (Kg)	Duty	Power <sup>1</sup>	90 Degree Cycle Time	Amps 120VAC @ 60Hz <sup>2</sup>	Amps 240VAC @ 60Hz <sup>2</sup>
AE01FA-M1-XXXVAC	78	8.8	3.7	1.7	100%	15W	1s	0.7A	0.38A
AE01FA-M2-XXXVAC	221	25	3.7	1.7	100%	15W	3s	0.8A	0.60A
AE03FA-M1-XXXVAC	310	42	9.7	4.4	100%	25W	1s	1.2A	0.72A
AE03FA-M2-XXXVAC	885	100	9.7	4.4	100%	25W	5s	1.2A	0.72A

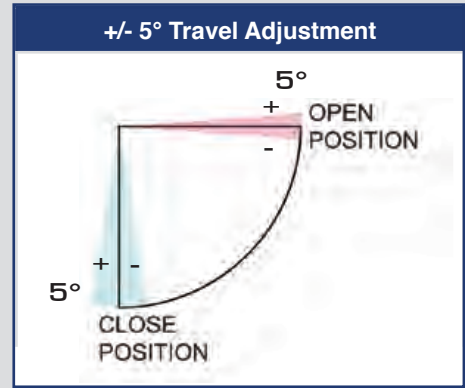
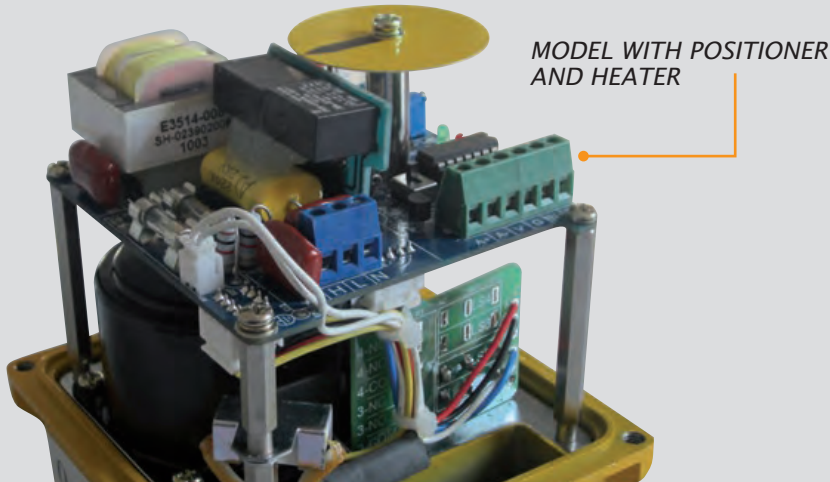
Note - The definition of DUTY CYCLE is in accordance with IEC60034-S4 duty type. For "XXX", choose either 120 or 240 for required voltage. M1 motors are synchronous type motors providing relatively high electrical efficiency, M2 motors are inductive type motors and provide higher torque and speed in the same motor size.

## FAST ACTING On/Off Control Series, DUAL VOLTAGE 24VAC/24VDC

Model No. - Voltage	Torque (in-lbs)	Torque (NM)	Weight (lbs)	Weight (Kg)	Duty	Power <sup>1</sup>	Cycle Time	24VAC @ 60 Hz <sup>2</sup>	24VDC Direct <sup>2</sup>
AE01FA-M1-24VAC/24VDC	89	10	3.7	1.7	100%	7W	1 to 3s	2.0A	2.0A
AE01FA-M2-24VAC/24VDC	221	25	3.7	1.7	100%	7W	3 to 8s	1.6A	1.6A
AE03FA-24VAC/24VDC	443	50	9.7	4.4	100%	25W	3 to 7s	3.5A	3.5A

Note - The definition of DUTY CYCLE is in accordance with IEC60034-S4 duty type. 1) Power is consumption at "no load". 2) Amps are based on "full load" at rated torque. M1 motors are synchronous type motors providing relatively high electrical efficiency, M2 motors are inductive type motors and provide higher torque and speed in the same motor size.

# FEATURES & BENEFITS



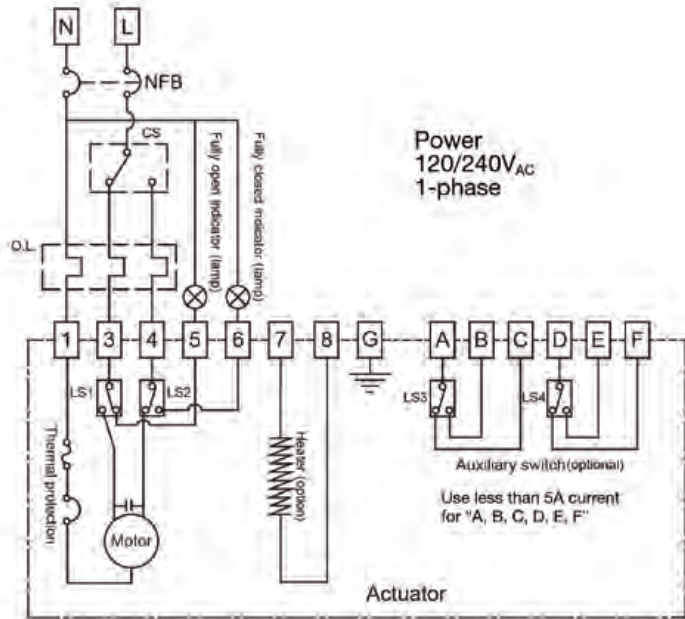
Features	Benefits
INDUSTRY APPLICATIONS	<ul style="list-style-type: none"> <li>• Water Treatment</li> <li>• Drinking Water</li> <li>• Chemical Industry</li> <li>• Food Industry</li> <li>• Pharmaceutical</li> <li>• HVAC</li> <li>• Wastewater</li> <li>• General Industrial</li> </ul>
COMPACT DESIGN	AE series features a compact design, minimizing the complete valve package envelope size and its weight and therefore eliminating the need for pipe supports.
AVAILABLE RANGE	6 different models from 8.8 Nm to 598 Nm (78 in-lbs to 5293 in-lbs); available on request with proportional control, fast acting motor, and 100% duty cycle.
PROTECTION DEGREE	Water and dust proof IP67 according to IEC60529.
ISO 5211	AE series has standard multiple mounting patterns according to ISO 5211 for easy automation.
ELECTRO MECHANICAL SWITCHES	All AE actuators are equipped as standard with n° 2 auxiliary limit switches, 2 additional ones can be added on request.
GEARS	All gears are made of sintered material.
MANUAL OVERRIDE	Manual Override is standard on all AE units allowing for emergency operation in case of power outage.
THERMAL PROTECTION	Standard on all AE actuators to prevent motor overheating and possible damages.
VOLTAGE OPTIONS	AE actuators are available as: Monophase: (only AE01 and AE02); 24 VDC/AC (AE01 - AE04H); 120 VAC; 240 VAC (AE01A - AE04HA) Three Phase: 240 VAC, 380 VAC, 480 VAC (only for AE03 - AE06H)
WORKING CONDITIONS	Ambient Temperature: -10 °C to +60 °C (14 - 140 °F) Relative Humidity Range: 30% to 95%
AVAILABLE OPTIONS	<ul style="list-style-type: none"> <li>• Heater/Thermostat</li> <li>• Additional 2 switches</li> <li>• Built-In ON/OFF LED Indicator</li> <li>• Proportional controller (for 120 VAC or 240 VAC only): modulating control is used when application requires the actuator to position the valve using an analog control signal. The following input signals can be used: 4-20 mA • 0-10 V • 1-5 V</li> <li>• Potentiometers: These optional devices are used to provide continuous electric signal in relation to valve position. Resistance value of 5kΩ is standard.</li> </ul>

Technical Data	
OPERATION VOLTAGE	Standard Type, 120 / 240 / 380 / 480 VAC Standard Type, 12 VAC , 24 VDC , and 24 VAC / VDC "100% Duty Cycle" Type 120 / 240 VAC "Fast Acting" Type 120 / 240 VAC
POWER CONSUMPTION	7 to 60 watts (depending on model)
PROTECTION CLASS	IP 67 according to STD. IEC60529
RATED TORQUE	(78 to 5293 in-lbs) 8.8 Nm to 598 Nm
TEMPERATURE RANGE	-10 to 60 °C (14 to 140 °F)
ROTATION ANGLE	90° (±5°)
CASE MATERIAL	Aluminum alloy
COVER MATERIAL	Polycarbonate
CERTIFICATION / TEST	Comply with CE directives of - The LOW Voltage Directive, 73/23/EEC, 93/68 EEC - The EMC Directive, 89/336/EEC

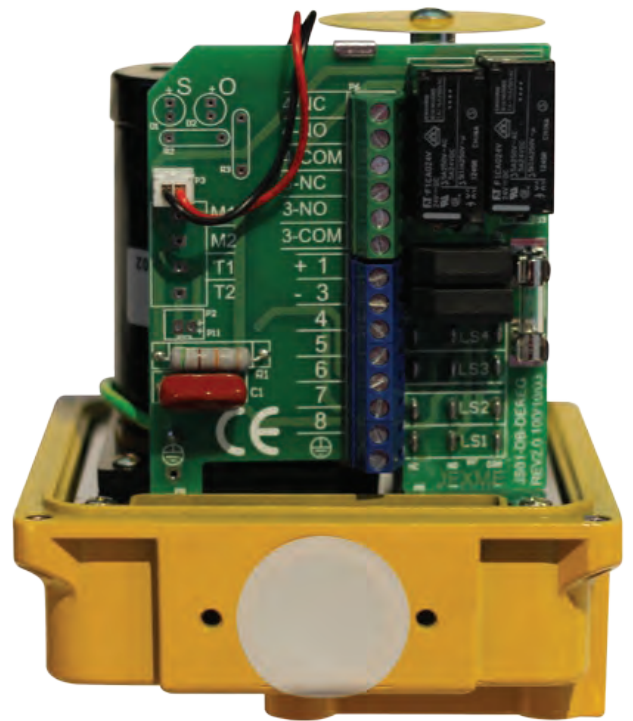
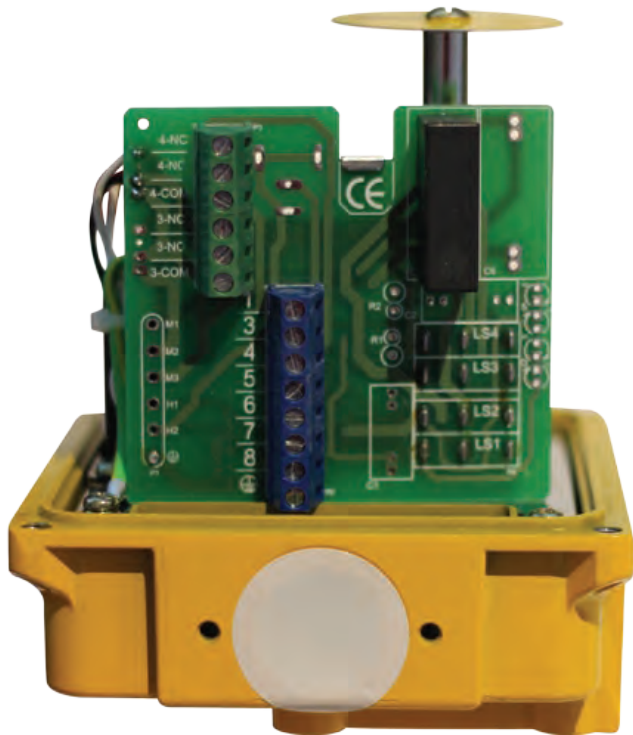
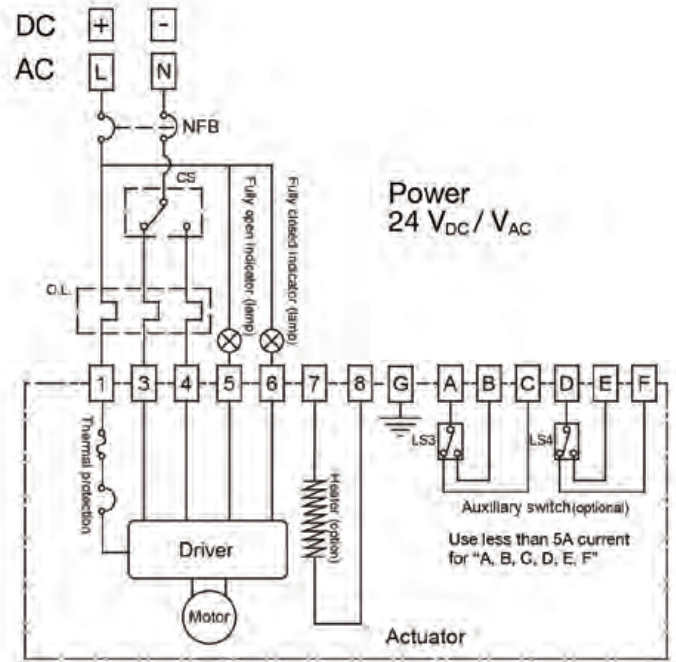
# WIRING DIAGRAM

## ON/OFF TYPE FOR 120/240 VAC

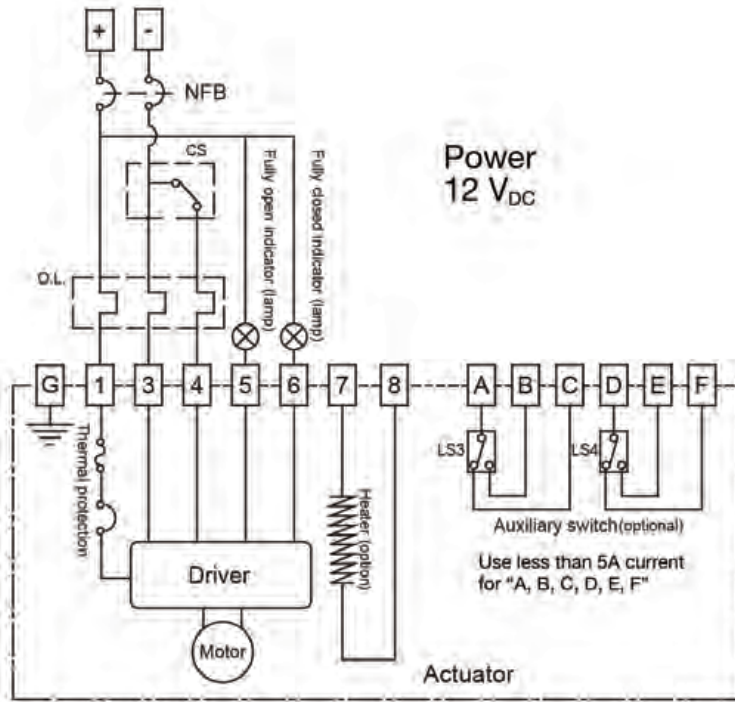
### Single Phase



## ON/OFF TYPE FOR 24VDC/VAC

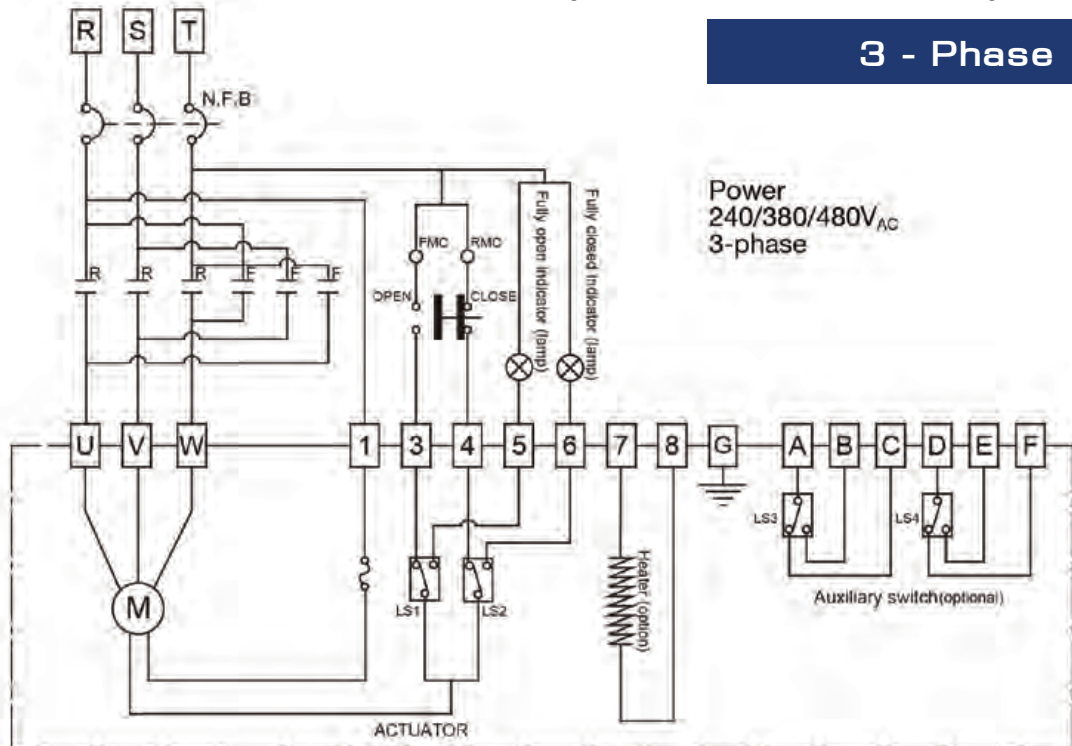


## ON/OFF TYPE FOR 12/24VDC



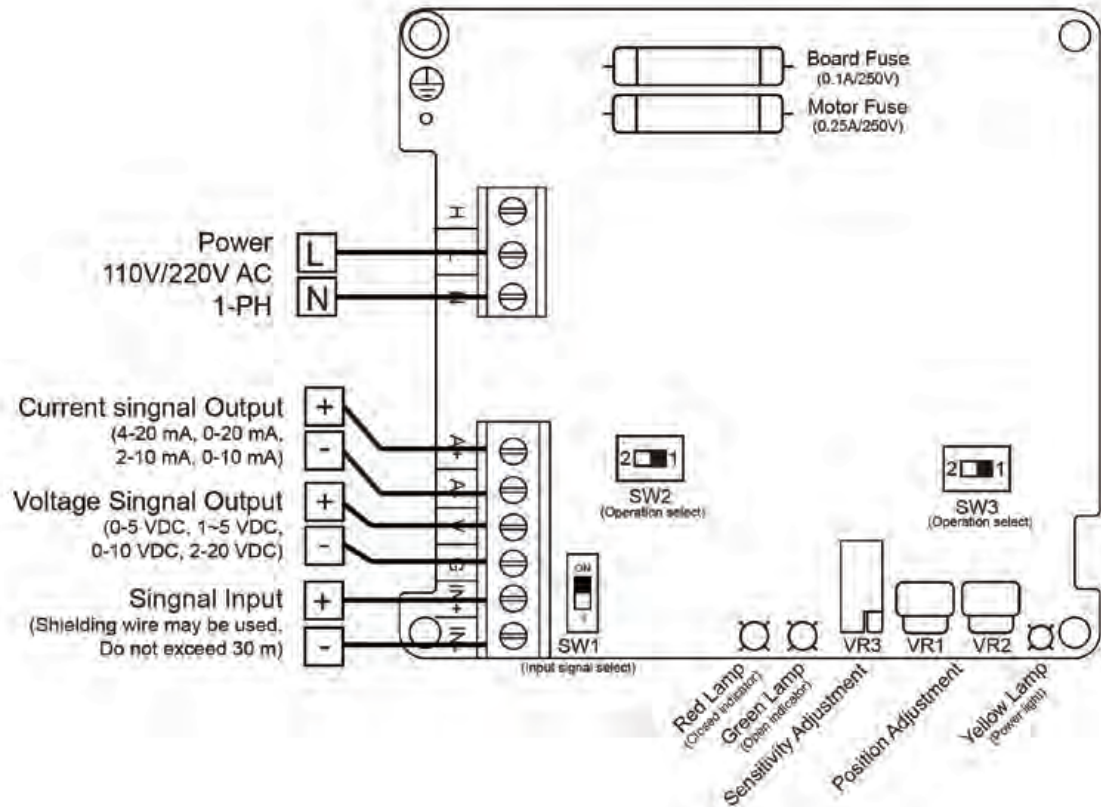
## ON/OFF TYPE FOR 120/240 VAC

3 - Phase

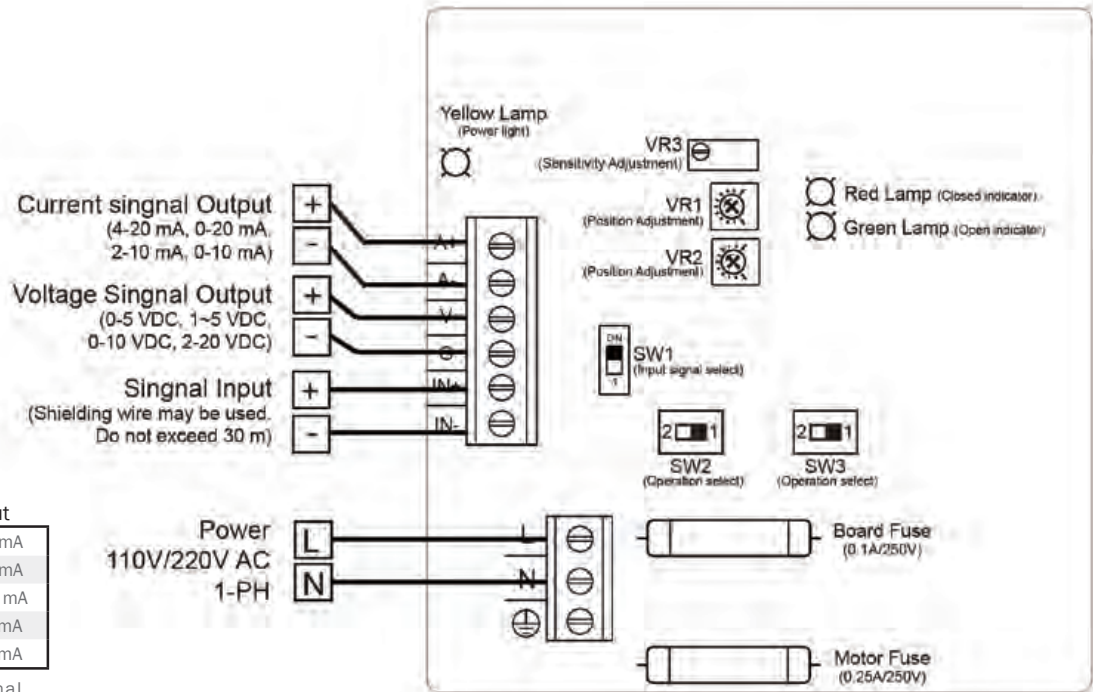


# CONNECTION DIAGRAM

## AMD BOARD



## BMD BOARD



Signal Input	Signal Output
4 ~ 20 mA	2 ~ 10 V, 4~20 mA
2 ~ 10 V	2 ~ 10 V, 4~20 mA
0 ~ 10 V	0 ~ 10 V, 0 ~ 20 mA
1 ~ 5 V	1 ~ 5 V, 2 ~ 10 mA
0 ~ 5 V	0 ~ 5 V, 0 ~ 10 mA

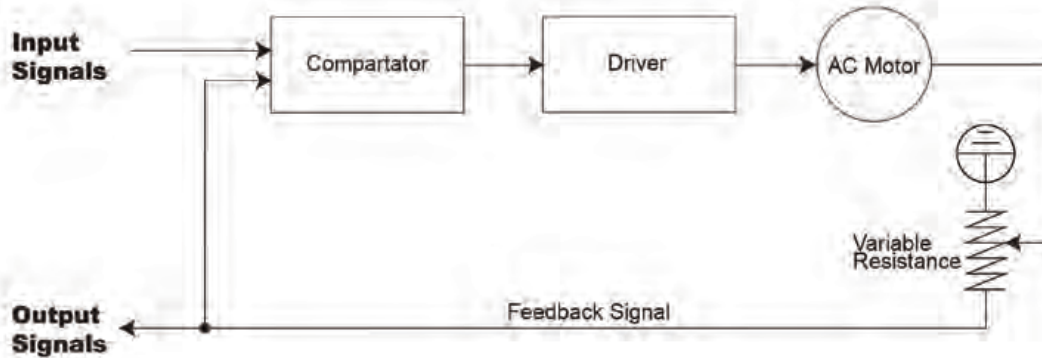
Note - When using current signal, external resistant is under 500 Ω.

### Differences between AMD and BMD:

BMD units should be used for higher torques and faster operating speeds. AMD units provide power usage efficiencies and should be used when power savings are a concern.



## SIGNAL FLOW OF MODULATION TYPE

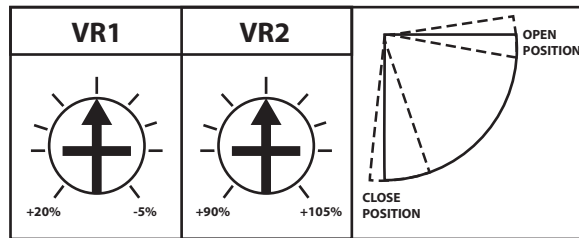


## SWITCH & ADJUSTMENT SETTINGS

### SW1 Input Signal Selection

	ON	OFF (1)
	Current Input Signal	Voltage Input Signal
SW1	4 ~ 20 mA	2~10 V 0~10 V 1~5 V 0~5 V

### VR1 & VR2 Position Adjustment



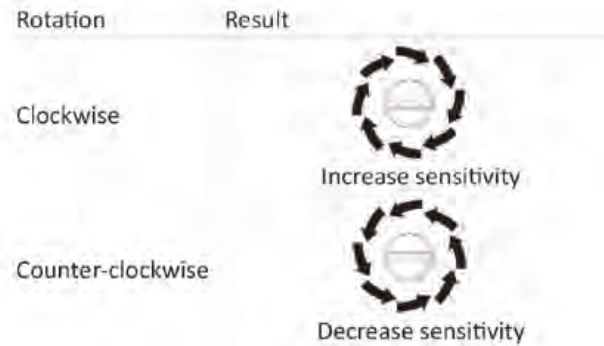
### SW2 & SW3 Operation Selection

	SW2	
	1	2
SW3	1	X
	2	X

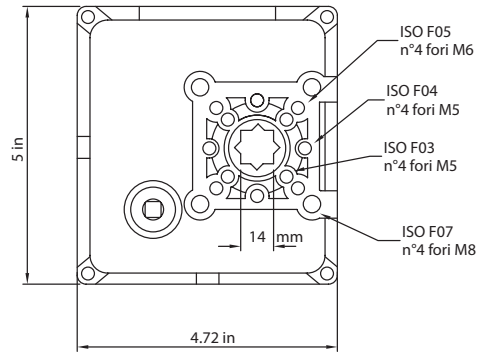
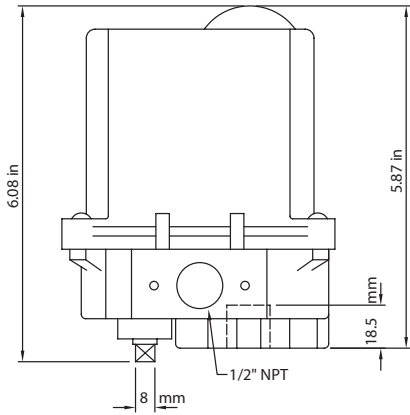
**MODE A**  
Valve is fully closed when the input signal is 4mA, 2V, 1V, or 0V

**MODE B**  
Valve is fully opened when the input signal is 4mA, 2V, 1V, or 0V

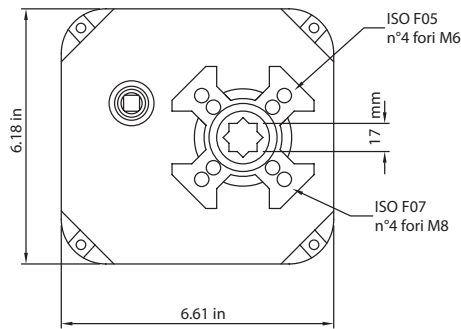
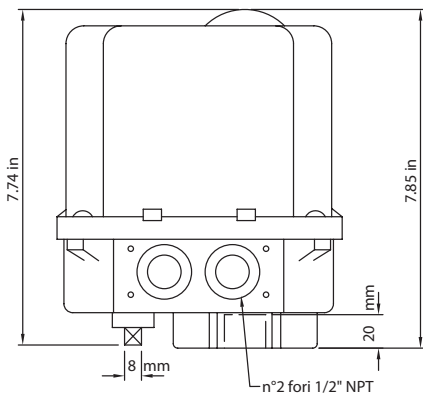
### VR3 Sensitivity Adjustment



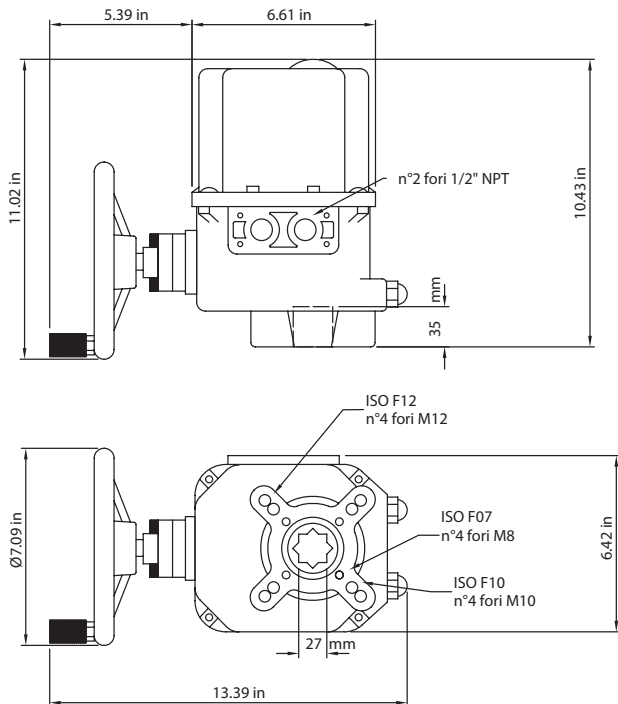
## AE01 - AE02



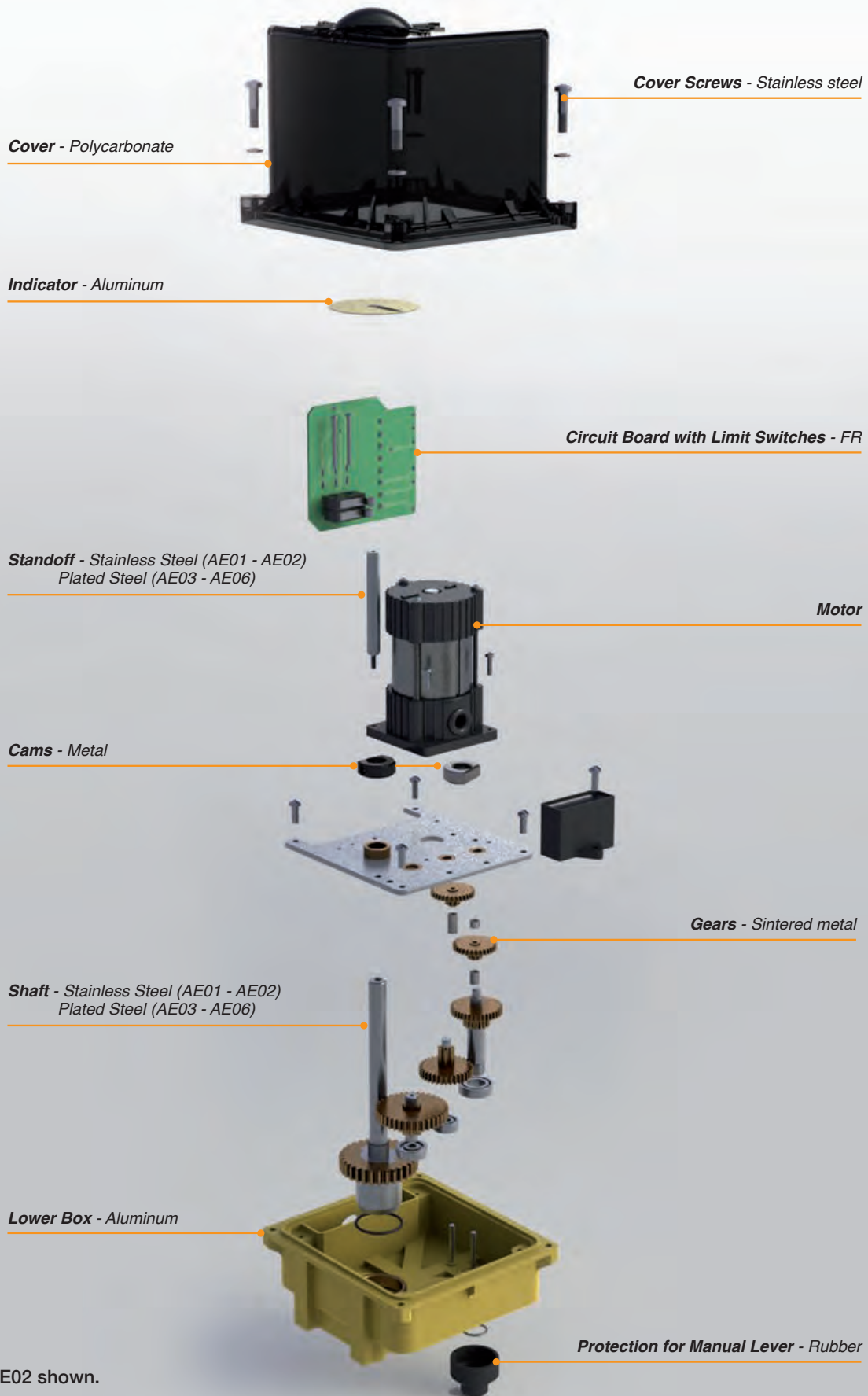
## AE03



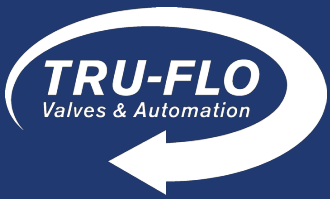
## AE03H - AE06H



# EXPLODED VIEW



\* NOTE: AE01/AE02 shown.

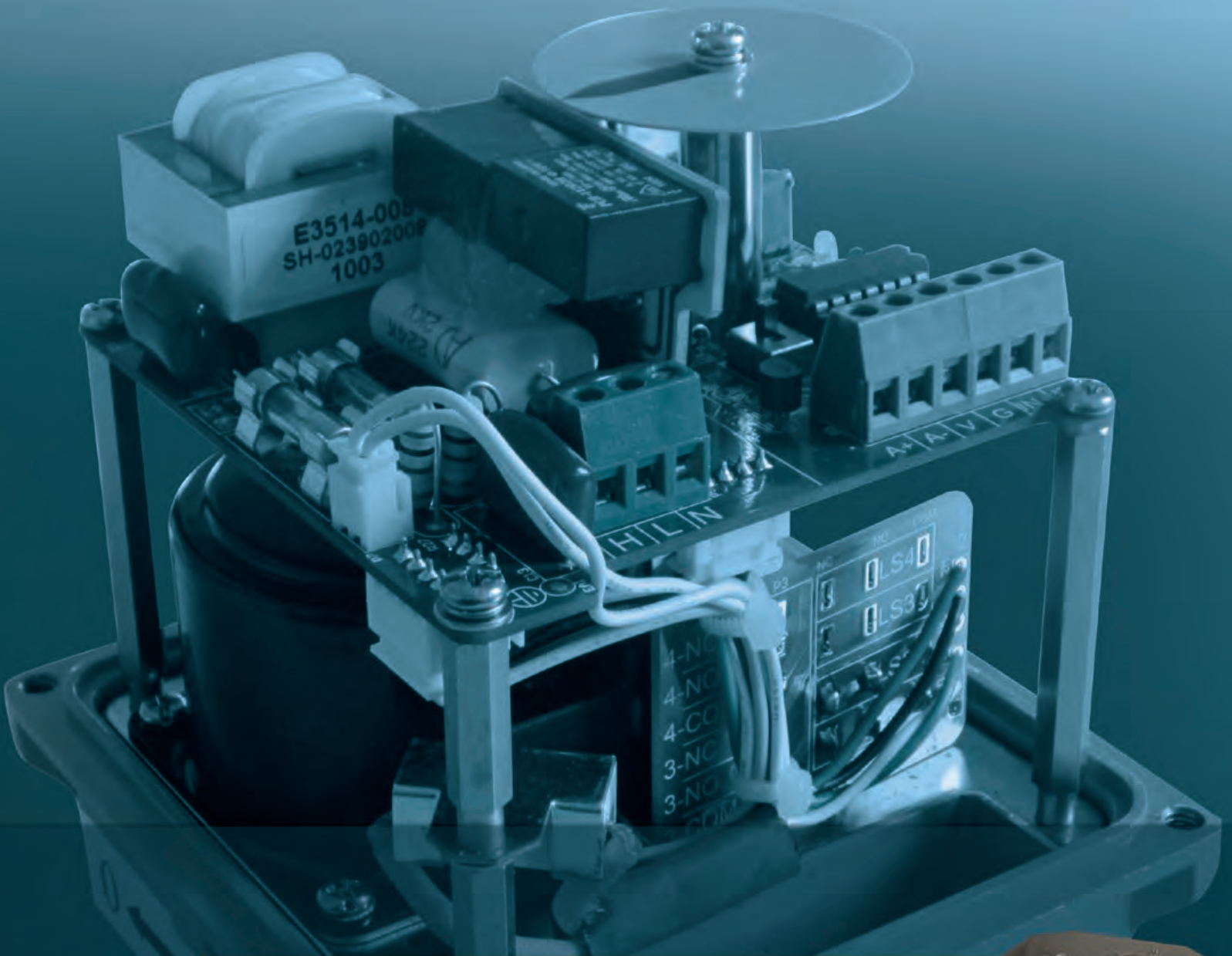


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