

MAR/DCR Models: 10, 50, 90, 100, 120, 160, 250, 800, 1600, & 4000 Installation Manual

Safety First

In the maintenance and operation of mechanical equipment, SAFETY is the basic factor which must be considered at all times. Through the use of the proper clothes, tools and methods of handling, serious accidents causing injury to you or your fellow worker can be prevented.

Throughout this manual are listed a number of safety precautions. Study them carefully and follow them; also insist upon those working for you do the same. Remember, an accident is usually caused by someone's carelessness, neglect or oversight.

CAUTION

To prevent ignition of hazardous atmospheres, do not remove actuator cover while circuits are live.

Installation

1. Operate valve manually before installing actuator and place into open position.
2. If valve is equipped with mechanical position stops they should be removed, but care should be taken not to damage or remove necessary parts from the valve.
3. When actuator is supplied separately from valve, actuator will be shipped in valve open position and care should be taken to maintain proper alignment between the actuator and valve shafts. If actuator and valve shafts are not in correct alignment repeat operation number one (1) with correction as required. Direction of rotation is defined as the direction the actuator output shaft rotates (CW or CCW) as viewed from above the top of the actuator.
4. Mount the actuator to the valve. The actuator is usually mounted parallel to the run of the pipe. Tighten all bolts and nuts evenly, taking care to center the actuator on the valve stem. It is often a good idea to manually cycle the actuator while the mounting bolts are somewhat loose. This will allow the unit to center itself.
5. Loosen socket set screw and remove the manual declutching knob (Models MAR/DCR10, 50 & 90 only).
6. Remove the hex bolts located around the enclosure of the actuator.
7. Wire per diagram, or if actuator is of special design, wiring diagram is included with unit. Wiring diagram is drawn with the actuator in the open position. Use #18AWG stranded wire or better, for field hook-up.

8. Manually operate the actuator from one extreme to the other several times.

To Manually Operate:

Models MAR10, 50 & 90:

- Pull the black declutching knob (A) all the way up and hold. Gently rock shaft back and forth with wrench to disengage, and rotate to desired position as indicated by the arrows.
- Actuator will automatically re-engage when "knob" is released and electrical power is applied.
- Avoid turning beyond normal open/close travel.

Models MAR100, 120, 160, 250, 800, 1600 & 4000:

- Depress and rotate handwheel slowly until detent is felt to engage.
- Turn handwheel in desired direction (note markings on wheel and check position by indicator located on output shaft).
- Avoid turning beyond normal open/close travel.
- When handwheel is returned to raised position, electrical operation is restored (see manual cut-off switch).

Manual cut-off switch:

When handwheel is depressed for manual operation, an integral cut-off switch prevents injury due to unexpected restoration of electrical power and is automatically reset when handwheel is returned to raised position. (Models MAR100, 160, 250, 800, 1600 & 4000 only)

Manual Declutching Knob
MAR10, 50 & 90 Only



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Cam Adjustment–Group 9: MAR/DCR10, 50, 90–Part Turn Models (old style)

Cam adjustments (if required), as follows:

Open (counter-clockwise) direction of travel:

- Loosen setscrew on Cam 7 (and Cam 9 for auxiliary switches) to give the cam(s) a finger tight grip on the shaft. Rotate cam (s) in a clockwise direction away from the switch.
- Manually move the actuator to the full “open” (CCW) position.
- Rotate Cam 7 (and Cam 9) counter-clockwise until it engages the switch roller and the switch just “breaks”. You should hear a light click.
- Tighten the setscrew on Cam 7.
- If auxiliary switches were provided, rotate Cam 9 about 2 degrees in the counter-clockwise direction. Then tighten the setscrew. This will ensure that Switch 9 “makes” when the actuator reaches the full open position.
- If travel is not correct, repeat steps (a) through (e).

Close (clockwise) direction of travel:

- Loosen setscrew on Cam 2 (and Cam 4 for auxiliary switches) to give the cam(s) a finger tight grip on the shaft. Rotate cam(s) in a counter-clockwise direction away from the switch.
- Manually move the actuator to the full “close” (CW) position.
- Rotate Cam 2 (and Cam 4) clockwise until it engages the switch roller and the switch just “breaks”. You should hear a light click.
- Tighten the setscrew on Cam 2.
- If auxiliary switches were provided, rotate Cam 4 about 2 degrees in the clockwise direction. Then tighten the setscrew. This will ensure that Switch 4 “makes” when the actuator reaches the full open position.
- If travel is not correct, repeat steps (a) through (e).

Replace the cover and tighten all flange bolts.

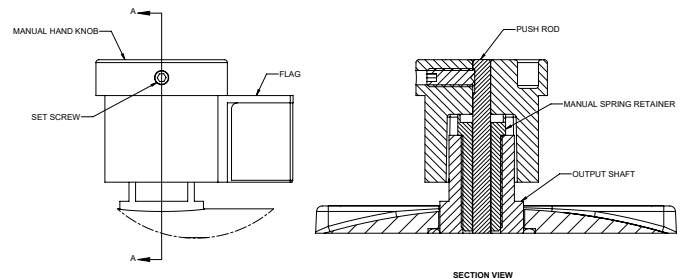
Replace manual de-clutching knob and tighten setscrew.

Reset pushrod to engage the gear train.

Re-engaging the gear train Grp 9

- Replace the manual knob (15-01) back on the output shaft (21-86).
- Make sure the set screw in the manual knob is located on the flat machined area on the pushrod (21-93). Visually looking at the knob (15-01), when placed back over the output shaft (21-86) and pushrod (21-93), The knob (15-01) should be almost flush with the top of the pushrod (21-93).

- Make sure the set screw in the manual knob (21-86) it tightened down on the flat – milled surface of the pushrod (21-93)
 - If the pushrod (21-93) extending through the manual knob (15-01) too much (about ¼”), the pushrod (21-93) will not be able to re-set itself to allow the gear train to reset for proper operation using the motor. This will cause the motor to continually run without moving the output shaft.
 - Once the knob (15-01) is properly installed, apply power to the actuator and let the motor run until the pushrod (21-93) drops down into the output shaft (21-86).
 - At that time, the gear train should start turning the output shaft (21-86) to where you can visually see the output shaft (21-86) starting to turn either in the CCW or CW direction depending on the signal being sent.
- The actuator is now ready for electrical operation.



Note: In the event that the above procedure does not give the necessary travel control, the micro-adjustment cam must be repositioned as follows:

To set the open (counter-clockwise) direction of travel by adjusting the switch plate:

- Loosen Pivot and Micro-adjustment screws on Switch 7.
- If the actuator has not reached the full open (CCW) position, rotate the micro-adjustment cam to swing the switch outward (away) from Cam 7.
- If the actuator has over-traveled, move the switch inward (toward) Cam 7.
- Tighten pivot and micro-adjustment screws on Switch 7.

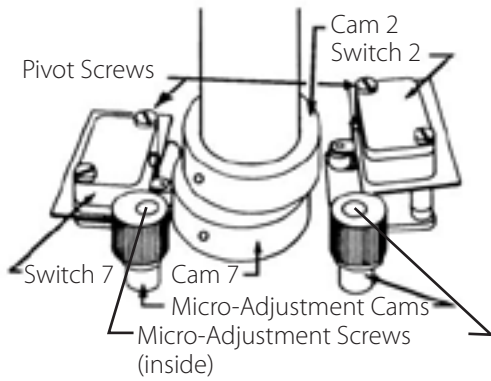
To set the close (clockwise) direction of travel by adjusting the switch plate:

- Loosen Pivot and Micro-adjustment screws on Switch 2.
- If the actuator has not reached the full close (CW) position, rotate the micro-adjustment cam to swing the switch outward (away) from Cam 2.
- If the actuator has over-traveled, move the switch inward (toward) Cam 2. Tighten pivot and micro-adjustment screws on Switch 2.

Replace the cover and tighten all flange bolts.

Replace manual de-clutching knob and tighten setscrew.

The actuator is now ready for electrical operation.



Cam Adjustment–Group 9: MAR/DCR10, 50, 90–Part Turn Models (new style)

Cam adjustments (if required), as follows:

Open (counter-clockwise) direction of travel:

- Loosen setscrew on Cam 2 (and Cam 4 for auxiliary switches) to give the cam(s) a finger tight grip on the shaft. Rotate cam(s) in a clockwise direction away from the switch.
- Manually move the actuator to the full “open” (CCW) position.
- Rotate Cam 2 (and Cam 4) counter-clockwise until it engages the switch roller and the switch just “breaks”. You should hear a light click.
- Tighten the setscrew on Cam 4.
- If auxiliary switches were provided, rotate Cam 4 about 2 degrees in the counter-clockwise direction. Then tighten the setscrew. This will ensure that Switch 4 “makes” when the actuator reaches the full open position.
- If travel is not correct, repeat steps (a) through (e).

Close (clockwise) direction of travel:

- Loosen setscrew on Cam 1 (and Cam 3 for auxiliary switches) to give the cam(s) a finger tight grip on the shaft. Rotate cam(s) in a counter-clockwise direction away from the switch.
- Manually move the actuator to the full “close” (CW) position.
- Rotate Cam 1 (and Cam 3) clockwise until it engages the switch roller and the switch just “breaks”. You should hear a light click.
- Tighten the setscrew on Cam 1.
- If auxiliary switches were provided, rotate Cam 3 about 2 degrees in the clockwise direction. Then tighten the setscrew. This will ensure that Switch 3 “makes” when the actuator reaches the full open position.
- If travel is not correct, repeat steps (a) through (e).

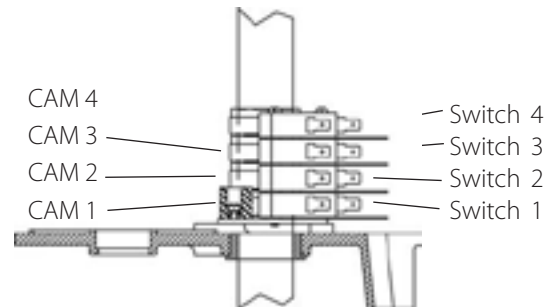
Replace the cover and tighten all flange bolts.

Replace manual de-clutching knob and tighten setscrew.

The actuator is now ready for electrical operation

CAUTION

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Cam Adjustment–Group 9: MAR/DCR10, 50, 90–Multi-Turn Models

Cam adjustments (if required), as follows:

Open (counter-clockwise) direction of travel:

- Manually operate the actuator in the “open” (CCW) direction of travel and note the direction of rotation of the cams: either clockwise or counter-clockwise as view from above the cam stack.
- Loosen setscrew on Cam 1 (and Cam 3 for auxiliary switches) to give the cam(s) a finger tight grip on the shaft.
- Rotate Cam 1 (and Cam 3) in the same direction as noted in step (a) until it engages the switch roller and the switch just “breaks”. You should hear a light click.
- Tighten the setscrew on Cam 1.
- If auxiliary switches were provided, continue to rotate Cam 3 about 2 degrees in the same direction. Then tighten the setscrew. This will ensure that Switch 3 “makes” when the actuator reaches the full open position.
- If travel is not correct, repeat steps (a) through (e).

Close (clockwise) direction of travel:

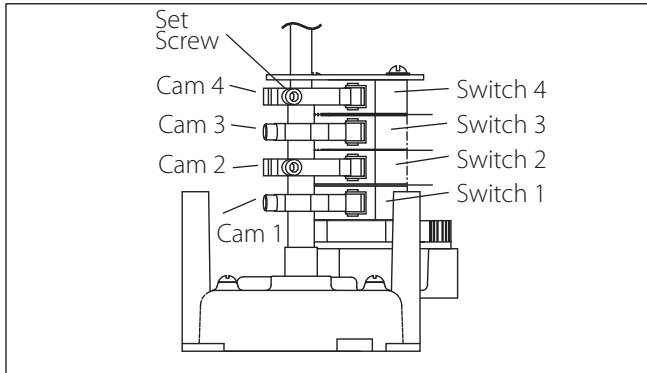
- Manually operate the actuator in the “close” (CW) direction of travel and note the direction of rotation of the cams: either clockwise or counter-clockwise as view from above the cam stack.
- Loosen setscrew on Cam 2 (and Cam 4 for auxiliary switches) to give the cam(s) a finger tight grip on the shaft.
- Rotate Cam 2 (and Cam 4) in the same direction as noted in step (a) until it engages the switch roller and the switch just “breaks”. You should hear a light click.
- Tighten the setscrew on Cam 2.

- e. If auxiliary switches were provided, continue to rotate Cam 4 about 2 degrees in the same direction. Then tighten the setscrew. This will ensure that Switch 4 “makes” when the actuator reaches the full open position.
- f. If travel is not correct, repeat steps (a) through (e).

Replace the cover and tighten all flange bolts.

Replace manual de-clutching knob and tighten setscrew.

The actuator is now ready for electrical operation.



- f. If travel is not correct, repeat steps (a) through (e).

Close (clockwise) direction of travel:

- a. Loosen setscrew on Cam 1 (and Cam 3 for auxiliary switches) to give the cam(s) a finger tight grip on the shaft. Rotate cam(s) in a counter-clockwise direction away from the switch.
- b. Manually move the actuator to the full “close” (CW) position.
- c. Rotate Cam 1 (and Cam 3) clockwise until it engages the switch roller and the switch just “breaks”. You should hear a light click.
- d. Tighten the setscrew on Cam 1.
- e. If auxiliary switches were provided, rotate Cam 3 about 2 degrees in the clockwise direction. Then tighten the setscrew. This will ensure that Switch 3 “makes” when the actuator reaches the full open position.
- f. If travel is not correct, repeat steps (a) through (e).

Replace the cover and tighten all flange bolts.

Replace manual handwheel, pin, washer and bolt.

The actuator is now ready for electrical operation.

CAUTION

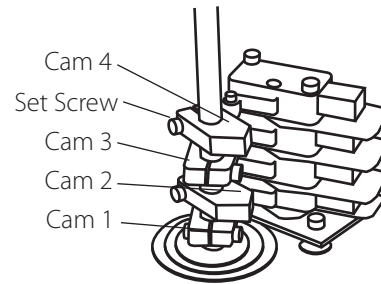
To prevent ignition of hazardous atmospheres, do not remove actuator cover while circuits are live.

Cam Adjustment—Groups 12/16: MAR100, 120, 160, 250 & 800; DCR100, 160, 250 & 800—Part Turn Models (new style)

Cam adjustments (if required), as follows:

Open (counter-clockwise) direction of travel:

- a. Loosen setscrew on Cam 2 (and Cam 4 for auxiliary switches) to give the cam(s) a finger tight grip on the shaft. Rotate cam(s) in a clockwise direction away from the switch.
- b. Manually move the actuator to the full “open” (CCW) position.
- c. Rotate Cam 2 (and Cam 4) counter-clockwise until it engages the switch roller and the switch just “breaks”. You should hear a light click.
- d. Tighten the setscrew on Cam 2.
- e. If auxiliary switches were provided, rotate Cam 4 about 2 degrees in the counter-clockwise direction. Then tighten the setscrew. This will ensure that Switch 4 “makes” when the actuator reaches the full open position.



CAUTION

To prevent ignition of hazardous atmospheres, do not remove actuator cover while circuits are live.

Cam Adjustment—Groups 12 & 16: MAR100, 120, 160, 250 & 800 plus DCR100, 160, 250 & 800—Part Turn Models (old style)

Cam adjustments (if required), as follows:

Open (counter-clockwise) direction of travel:

- a. Loosen setscrew on Cam 7 (and Cams 9 & 11 for auxiliary switches) to give the cam(s) a finger tight grip on the shaft. Rotate cam(s) in a clockwise direction away from the switch.

- Manually move the actuator to the full "open" position.
- Rotate Cam 7 (and Cams 9 & 11) counter-clockwise until it engages the switch roller and the switch just "breaks". You should hear a light click.
- Tighten the setscrew on Cam 7.
- If auxiliary switches were provided, rotate Cams 9 & 11 about 2 degrees in the counter-clockwise direction. Then tighten the setscrew. This will ensure that Switches 9 & 11 "makes" when the actuator reaches the full open position.
- If travel is not correct, repeat steps (a) through (e).

Close (clockwise) direction of travel:

- Loosen setscrew on Cam 2 (and Cams 4 & 6 for auxiliary switches) to give the cam(s) a finger tight grip on the shaft. Rotate cam(s) in a counter-clockwise direction away from the switch.
- Manually move the actuator to the full "close" position.
- Rotate Cam 2 (and Cams 4 & 6) clockwise until it engages the switch roller and the switch just "breaks". You should hear a light click.
- Tighten the setscrew on Cam 2.
- If auxiliary switches were provided, rotate Cams 4 & 6 about 2 degrees in the clockwise direction. Then tighten the setscrew. This will ensure that Switches 4 & 6 "makes" when the actuator reaches the full open position.
- If travel is not correct, repeat steps (a) through (e).

Replace the cover and tighten all flange bolts.

Replace manual handwheel, pin, washer and bolt.

The actuator is now ready for electrical operation.

Note: In the event that the above procedure does not give the necessary travel control, the micro-adjustment cam must be repositioned as follows:

To set the open (counter-clockwise) direction of travel by adjusting the switch plate:

- Loosen Pivot and Micro-adjustment screws on the open switch stack (switches 7, 9 and 11).
- If the actuator has not reached the full open position, rotate the micro-adjustment cam to swing the switches outward (away) from the cams.
- If the actuator has over-traveled, move the switch stack inward (toward) the cams.
- Tighten pivot and micro-adjustment screws.

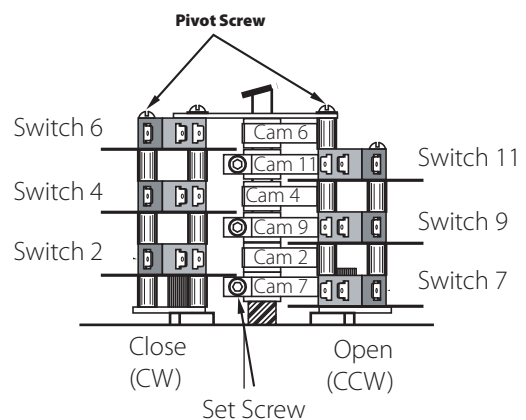
To set the close (clockwise) direction of travel by adjusting the switch plate:

- Loosen Pivot and Micro-adjustment screws on the close switch stack (switches 2, 4 and 6).
- If the actuator has not reached the full open position, rotate the micro-adjustment cam to swing the switches outward (away) from the cams.
- If the actuator has over-traveled, move the switch inward (toward) the cams.
- Tighten pivot and micro-adjustment screws.

Replace the cover and tighten all flange bolts.

Replace manual handwheel, pin, washer and bolt.

The actuator is now ready for electrical operation.



CAUTION

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Cam Adjustment—Groups 25 & 40: MAR1600 & 4000—Part Turn Models

Cam & Stop adjustments (if required), as follows:

Open (counter-clockwise) direction of travel:

- Loosen setscrew on Cam 1 (and Cam 3 for auxiliary switches) to give the cam(s) a finger tight grip on the shaft. Rotate cam(s) in a counter-clockwise direction away from the switch.
- Loosen both manual stop bolts on the worm gear assembly by rotating both counter-clockwise 3 to 4 full turns.
- Manually move the actuator to the full "open" (CCW) position.

- d. Rotate Cam 1 (and Cam 3) clockwise until it engages the switch roller and the switch just “breaks”. You should hear a light click.
- e. Tighten the setscrew on Cam 1.
- f. If auxiliary switches were provided, rotate Cam 3 about 2 degrees in the clockwise direction. Then tighten the setscrew. This will ensure that Switch 3 “makes” when the actuator reaches the full open position.
- g. Rotate the Open Stop Bolt clockwise until it “bottoms out” against the worm segment inside the worm gear assembly. Then rotate 1 full turn counter-clockwise.
- h. If travel is not correct, repeat steps (a) through (e).

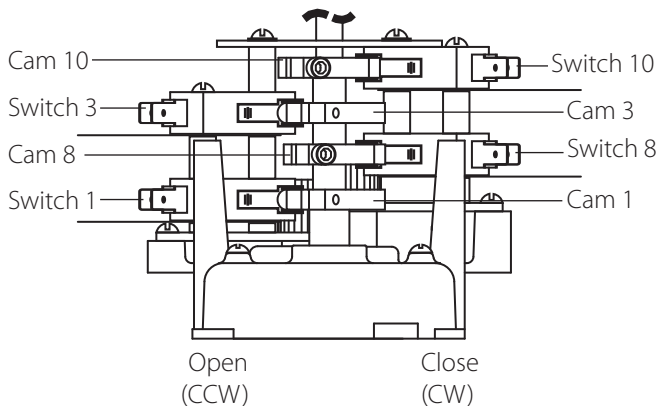
Close (clockwise) direction of travel:

- a. Loosen setscrew on Cam 8 (and Cam 10 for auxiliary switches) to give the cam(s) a finger tight grip on the shaft. Rotate cam(s) in a clockwise direction away from the switch.
- b. Manually move the actuator to the full “closed” (CW) position.
- c. Rotate Cam 8 (and Cam 10) counter-clockwise until it engages the switch roller and the switch just “breaks”. You should hear a light click.
- d. Tighten the setscrew on Cam 8.
- e. If auxiliary switches were provided, rotate Cam 10 about 2 degrees in the counter-clockwise direction. Then tighten the setscrew. This will ensure that Switch 10 “makes” when the actuator reaches the full open position.
- f. Rotate the Close Stop Bolt clockwise until it “bottoms out” against the worm segment inside the worm gear assembly. Then rotate 1 full turn counter-clockwise.
- g. If travel is not correct, repeat steps (a) through (e).

Replace the cover and tighten all flange bolts.

Replace manual handwheel, pin, washer and bolt.

The actuator is now ready for electrical operation.



Note: In the event that the above procedure does not give the necessary travel control, the micro-adjustment cam must be repositioned as follows:

To set the open (counter-clockwise) direction of travel by adjusting the switch plate:

- a. Loosen Pivot and Micro-adjustment screws on the close switch stack (switches 8 and 10).
- b. If the actuator has not reached the full open position, rotate the micro-adjustment cam to swing the switch outward (away) from the cams.
- c. If the actuator has over-traveled, move the switch inward (toward) the cams.
- d. Tighten pivot and micro-adjustment screws on.

To set the close (clockwise) direction of travel by adjusting the switch plate:

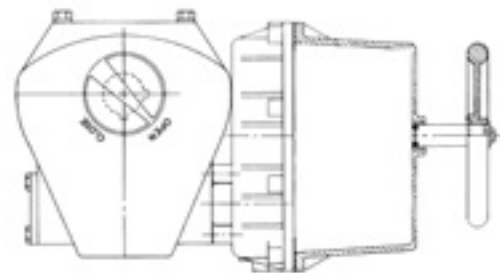
- a. Loosen Pivot and Micro-adjustment screws on the open switch stack (switches 1 and 3).
- b. If the actuator has not reached the full open position, rotate the micro-adjustment cam to swing the switch outward (away) from the cams.
- c. If the actuator has over-traveled, move the switch inward (toward) the cams.
- d. Tighten pivot and micro-adjustment screws.

Replace the cover and tighten all flange bolts.

Replace manual handwheel, pin, washer and bolt.

The actuator is now ready for electrical operation.

Close Stop Bolt Open Stop Bolt



Actuator Shown in Full Open Position

CAUTION

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Cam Adjustment—Group 12 Multi-Turn Models: MAR120 & 250–5, 8, 13 & 50 Turn Models

Cam adjustments (if required), as follows:

Open (counter-clockwise) direction of travel:

- Loosen setscrew on Cam 8 (and Cam 10 for auxiliary switches) to give the cam(s) a finger tight grip on the shaft. Rotate cam(s) in a clockwise direction away from the switch.
- Manually move the actuator to the full “open” (CCW) position.
- Rotate Cam 8 (and Cam 10) counter-clockwise until it engages the switch roller and the switch just “breaks”. You should hear a light click.
- Tighten the setscrew on Cam 8.
- If auxiliary switches were provided, rotate Cam 10 about 2 degrees in the counter-clockwise direction. Then tighten the setscrew. This will ensure that Switch 10 “makes” when the actuator reaches the full open position.
- If travel is not correct, repeat steps (a) through (e).

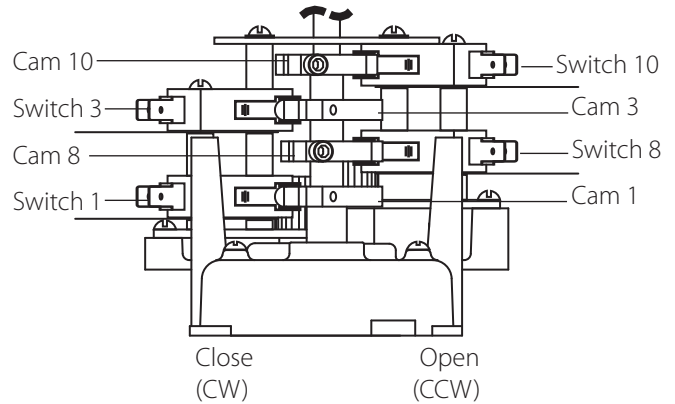
Close (clockwise) direction of travel:

- Loosen setscrew on Cam 1 (and Cam 3 for auxiliary switches) to give the cam(s) a finger tight grip on the shaft. Rotate cam(s) in a counter-clockwise direction away from the switch.
- Manually move the actuator to the full “close” (CW) position.
- Rotate Cam 1 (and Cam 3) clockwise until it engages the switch roller and the switch just “breaks”. You should hear a light click.
- Tighten the setscrew on Cam 1.
- If auxiliary switches were provided, rotate Cam 3 about 2 degrees in the clockwise direction. Then tighten the setscrew. This will ensure that Switch 3 “makes” when the actuator reaches the full open position. If travel is not correct, repeat steps (a) through (e).

Replace the cover and tighten all flange bolts.

Replace manual handwheel, pin, washer and bolt.

The actuator is now ready for electrical operation.



Note: In the event that the above procedure does not give the necessary travel control, the micro-adjustment cam must be repositioned as follows:

To set the open (counter-clockwise) direction of travel by adjusting the switch plate:

- Loosen Pivot and Micro-adjustment screws on the open switch stack (switches 8 and 10).
- If the actuator has not reached the full open position, rotate the micro-adjustment cam to swing the switch outward (away) from the cams.
- If the actuator has over-traveled, move the switch inward (toward) the cams.
- Tighten pivot and micro-adjustment screws.

To set the close (clockwise) direction of travel by adjusting the switch plate:

- Loosen Pivot and Micro-adjustment screws on the close switch stack (switches 1 and 3).
- If the actuator has not reached the full open position, rotate the micro-adjustment cam to swing the switch outward (away) from the cams.
- If the actuator has over-traveled, move the switch inward (toward) the cams.
- Tighten pivot and micro-adjustment screws.

Replace the cover and tighten all flange bolts.

Replace manual handwheel, pin, washer and bolt.

The actuator is now ready for electrical operation.

CAUTION

To prevent ignition of hazardous atmospheres, do not remove actuator cover while circuits are live.

Cam Adjustment—Group 12 Multi-Turn Models: MAR120 & 250–18 & 26 Turn Models

Cam adjustments (if required), as follows:

Open (counter-clockwise) direction of travel:

- Loosen setscrew on Cam 1 (and Cam 3 for auxiliary switches) to give the cam(s) a finger tight grip on the shaft. Rotate cam(s) in a counter-clockwise direction away from the switch.
- Manually move the actuator to the full “open” (CCW) position.
- Rotate Cam 1 (and Cam 3) clockwise until it engages the switch roller and the switch just “breaks”. You should hear a light click.
- Tighten the setscrew on Cam 1.
- If auxiliary switches were provided, rotate Cam 3 about 2 degrees in the clockwise direction. Then tighten the setscrew. This will ensure that Switch 3 “makes” when the actuator reaches the full open position.
- If travel is not correct, repeat steps (a) through (e).

Close (clockwise) direction of travel:

- Loosen setscrew on Cam 8 (and Cam 10 for auxiliary switches) to give the cam(s) a finger tight grip on the shaft. Rotate cam(s) in a clockwise direction away from the switch.
- Manually move the actuator to the full “close” (CW) position.
- Rotate Cam 8 (and Cam 10) counter-clockwise until it engages the switch roller and the switch just “breaks”. You should hear a light click.
- Tighten the setscrew on Cam 8.
- If auxiliary switches were provided, rotate Cam 10 about 2 degrees in the counter-clockwise direction. Then tighten the setscrew. This will ensure that Switch 10 “makes” when the actuator reaches the full open position.
- If travel is not correct, repeat steps (a) through (e).

Replace the cover and tighten all flange bolts.

Replace manual handwheel, pin, washer and bolt.

The actuator is now ready for electrical operation.

Note: In the event that the above procedure does not give the necessary travel control, the micro-adjustment cam must be repositioned as follows:

To set the open (counter-clockwise) direction of travel by adjusting the switch plate:

- Loosen Pivot and Micro-adjustment screws on the open switch stack (switches 1 and 3).
- If the actuator has not reached the full open position, rotate the micro-adjustment cam to swing the switch outward (away) from the cams.
- If the actuator has over-traveled, move the switch inward (toward) the cams.
- Tighten pivot and micro-adjustment screws.

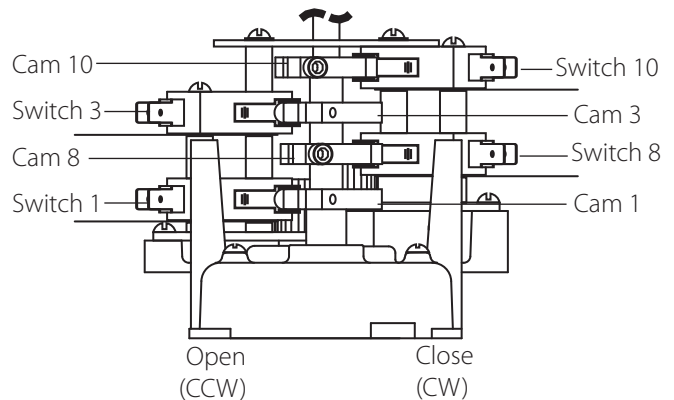
To set the close (clockwise) direction of travel by adjusting the switch plate:

- Loosen Pivot and Micro-adjustment screws on the close switch stack (switches 8 and 10).
- If the actuator has not reached the full open position, rotate the micro-adjustment cam to swing the switch outward (away) from the cams.
- If the actuator has over-traveled, move the switch inward (toward) the cams.
- Tighten pivot and micro-adjustment screws.

Replace the cover and tighten all flange bolts.

Replace manual handwheel, pin, washer and bolt.

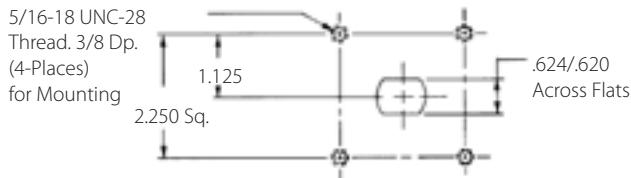
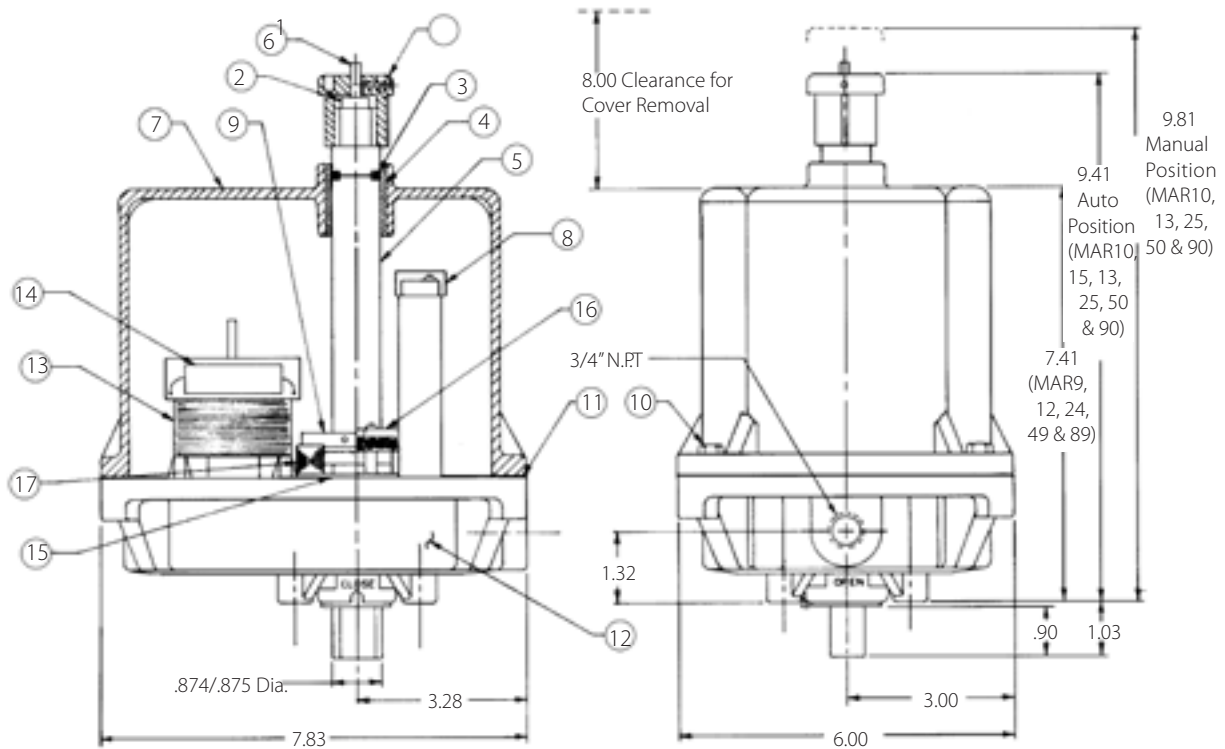
The actuator is now ready for electrical operation.



CAUTION

To prevent ignition of hazardous atmospheres, do not remove actuator cover while circuits are live.

MAR10, 50 & 90 Parts List & Technical Data



Technical Data

Voltage: 115 Vac 60/50 Hz., 1 Phase—Standard

Operation: Standard Reversible (Unidirectional upon request)

Limit Switches: UL & CSA Listed—15 Amps & 1/3 HP, 125 or 250 Vac; 1/2 Amp, 125 Vdc; 1/4 Amp, 250 Vdc; 5 Amps, 120 Vac “L” (Lamp Load)

Ambient Temperature: -40°F to +150°F*

Lubrication: High temperature grease for gears; Self-lubricating bearings

Mounting positions: Universal

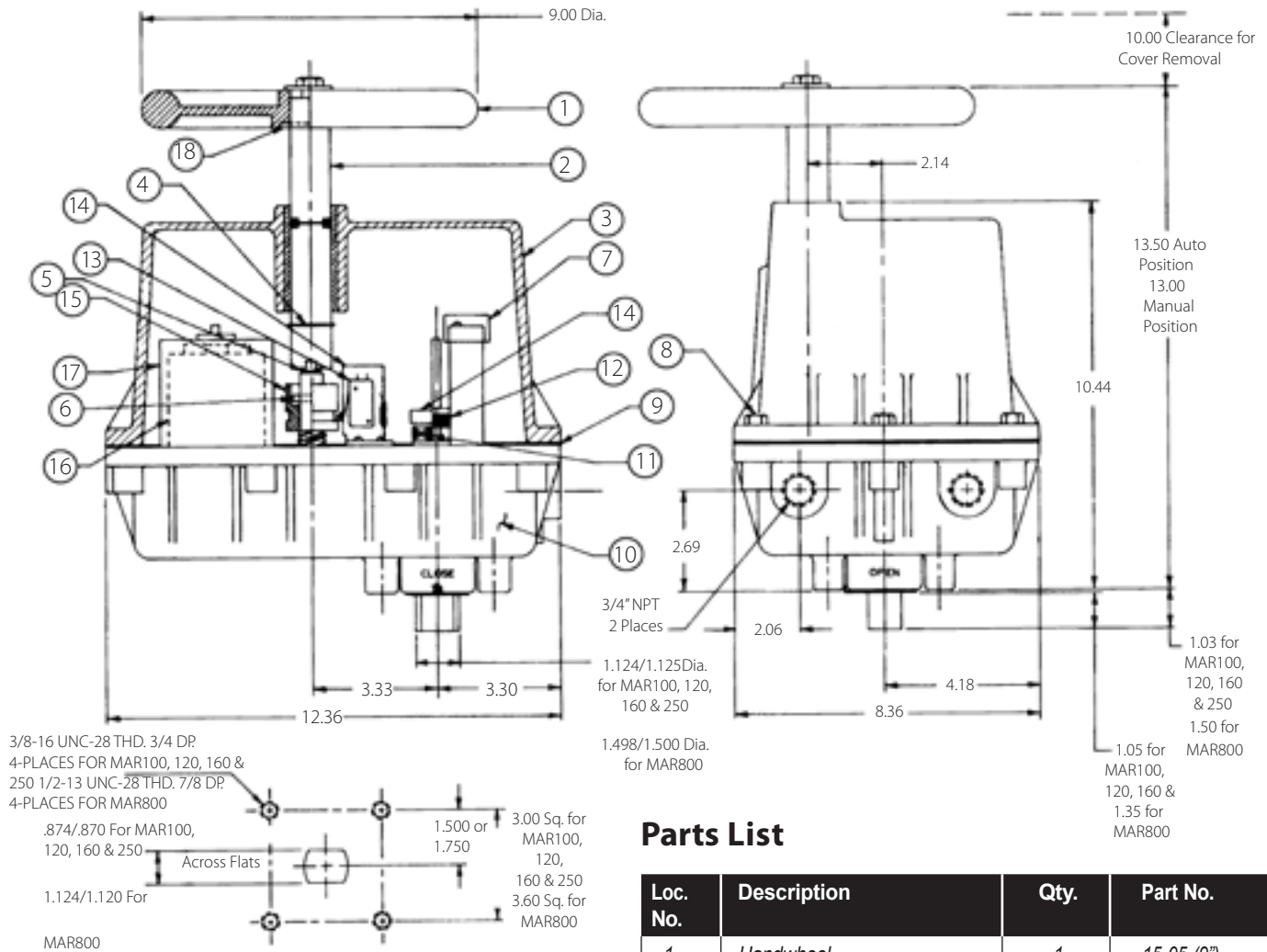
Weight: 12.5 to 14.5 lbs. (depending on model)

*The addition of a heater is recommended for all outdoor installations and for all applications that are exposed to high humidity or temperatures below 32°F. (Consult factory)

Parts List

Loc. No.	Description	Qty.	Part No.
1	Knob – Manual	1	15-01-10
2	Retainer – Spring	1	25-11
3	O-Ring	1	14-78
4	Bushing	1	22-83
5	Shaft – Output	1	21-86
6	Push Rod – Declutching	1	21-93
7	Control Cover – NEMA 4	1	88-93
8	Terminal Strip	1	72-01/72-03
9	Cam	2	68-95-10
10	Cover Bolts 1/4-20 x 3/4	4	PO3-025075-3900
11	Gasket	1	16-27
12	Gear Case Assembly	1	As Required
13	Motor	1	As Required
14	Capacitor	1	As Required
15	Micro-Adjustment Plate		65-14
16	Limit Switch	2	63-01
17	Micro-Adjustment Cam	2	68-07

MAR100, 160, 250 & 800 Parts List & Technical Data



Parts List

Loc. No.	Description	Qty.	Part No.
1	Handwheel	1	15-05 (9")
2	Shaft - Manual	1	21-19
3	Control Cover - NEMA 4	1	88-91
4	Stop Ring	1	25-03
5	Spring - Manual	1	30-04
6	Drive Pin - Manual (.187 Dia. x 7/8 LG.)	1	850X24-58
7	Terminal Strip	1	72-10
8	Screws (5/16-18 x 1LG.)	10	P03-031100-3900
9	Gasket	1	16-03
10	Gear Case Assembly	1	As Required
11	Limit Switch	4	63-01
12	Cam	4	68-48-10
13	Electrical Lockout Switch	1	63-01
14	Mtg. Bracket-Lockout Switch	1	62-09
15	Clutch Collar (For MAR-100, 120, 160 & 250) (For MAR-800)	1	28-07 28-24
16	Motor	1	As Required
17	Capacitor	1	As Required
18	Dowel Pin (.250 Dia. x 2LG.)	1	300W80-28

Technical Data

Voltage: 115 Vac 60/50 Hz, 1 Phase—Standard

Operation: Standard Reversible (Unidirectional upon request)

Limit Switches: UL & CSA Listed—15 Amps & 1/3 HP, 125 or 250 Vac, 1/2 Amp, 125 Vdc, 1/4 Amp, 250 Vdc, 5 Amps, 120 Vac "L" (Lamp Load)

Ambient Temperature: -40°F to +150°F*

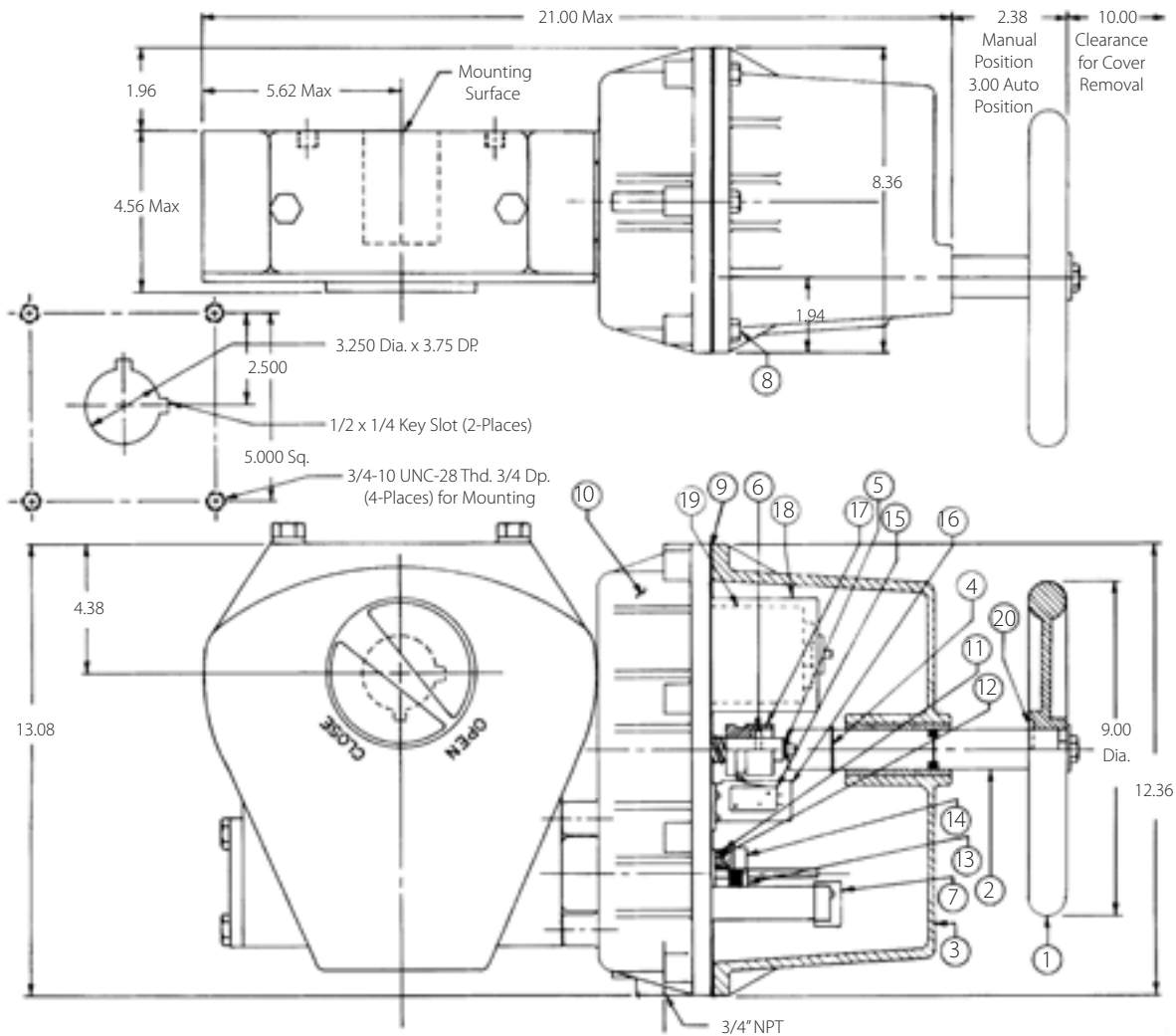
Lubrication: High temperature grease for gears; Self-lubricating bearings

Mounting positions: Universal

Weight: 34 lbs.

* The addition of a heater is recommended for all outdoor installations and for all applications that are exposed to high humidity or temperatures below 32°F. (Consult factory)

MAR1600 & 4000 Parts List & Technical Data



Technical Data

Voltage: 115 Vac 60/50 Hz., 1 Phase—Standard

Operation: Standard Reversible (Unidirectional upon request)

Limit Switches: UL & CSA Listed—15 Amps & 1/3 HP, 125 or 250 Vac, 1/2 Amp, 125 Vdc, 1/4 Amp, 250 Vdc, 5 Amps, 120 Vac “L” (Lamp Load).

Ambient Temperature: -40°F to +150°F.*

Lubrication: High temperature grease for gears; Self-lubricating bearings

Mounting positions: Universal

Weight: MAR1600 – 93 lbs., MAR4000 – 120 lbs.

* The addition of a heater is recommended for all outdoor installations and for all applications that are exposed to high humidity or temperatures below 32°F. (Consult factory)

Parts List

Loc. No.	Description	Qty.	Part No.
1	Handwheel	1	15-05 (9")
2	Shaft – Manual	1	21-19
3	Control Cover – NEMA 4	1	88-91
4	Stop Ring	1	25-03
5	Spring – Manual	1	30-04
6	Drive Pin – Manual (.187 Dia. x 7/8 LG.)	1	850X24-58
7	Terminal Strip	1	72-10
8	Screws (5/16-18 x 1LG.)	10	117-125
9	Gasket	1	16-03
10	Gear Case Assembly	1	As Required
11	Micro-Adjustment Cam	2	68-07
12	Micro-Adjustment Plate	2	65-14
13	Limit Switch	4	63-01
14	Cam	4	68-48-10
15	Electrical Lockout Switch	1	63-01
16	Mtg. Bracket–Lockout Switch	1	62-09
17	Clutch Collar	1	28-07
18	Motor	1	As Required
19	Capacitor	1	As Required
20	Dowel Pin (.250 Dia. x 2LG.)	1	300W80-28

Maintenance

The actuator is constructed with an adequately lubricated gear-case section, this lubricant need never be changed. However, through disassembly, etc., should it become necessary to refill, we recommend use of Lubriplate Mag-1 (Temperature range: -60°F to +300°F)

Thermal Overload

A thermal protective device is provided integral to every motor. This device will disable the motor control circuit to protect the motor from damage due to overheating. When the temperature drops to a safe level, the thermal overload will automatically reset. All RCS motors are supplied with Class B insulation. The trip points are as follows: AC motors: 248°F; DC motors: 194°F.

Duty Cycle

The maximum duty-cycle to be expected without interruption by thermal cut-off at an ambient temperature of 100 degrees F is 50%.

Storage

The Electripowr actuator must be stored in a clean, dry, temperature controlled building, that is protected from the weather. Precautions shall be taken to prevent condensation inside or outside the actuator. If there is insufficient external temperature and humidity control, internal heaters must be installed and energized to protect the unit against condensation from extreme temperature variations. The actuators shall be stored off the floor on suitable pallets and must be covered with an unsealed dust protector allowing side and bottom ventilation.

Troubleshooting

Problem 1: Actuator is receiving electric power but the motor does not respond.

Instructions:

- 1a. Check actuator nameplate to insure correct model and voltage type is in use.
- 1b. Check all wiring against installation wiring diagram.
- 1c. Measure live voltage to insure that actuator is receiving full rated voltage.



RCS

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- 1d. Check cam/travel limit switch position to insure that one switch is not made and that the actuator is within its normal open-close rotation limits. This check can be made using a volt meter connected between one side of the incoming line (common) and one leg of the motor or capacitor. This check should show power between common and one leg only. Power at the common and both legs or no power at all, would indicate cam and/or wiring adjustment(s) are required.
- 1e. Check to insure that manual handwheel on Models MAR-100 through MAR-400 is in automatic operation (disengaged-up position).

Problem 2: Actuator is receiving electric power but the motor only hums.

Instructions:

- 2a. Perform steps 1a through 1d listed above.
- 2b. If actuator is equipped with motor brake, check to insure brake is completely disengaged when power is applied.

Problem 3: Actuator runs but its operation is erratic.

Instructions:

- 3a. Check ambient temperature. Standard Electripowr actuators have a maximum ambient operating temperature rating of 150°F.
- 3b. Check duty cycle (frequency of operation). Standard Electripowr actuators have a maximum duty cycle of 50% (one "ON" operation followed by an equal "off" period).
- 3c. Check to insure actuator is not running into a continuous stall condition.

NOTE: All Electripowr actuators are manufactured with built-in thermal overload motor protectors. Should any of the above cause the protector to open, it will automatically reset when the motor temperature is lowered to a safe level.

Locating and Ordering Parts

For ease and accuracy in identifying and ordering spare or replacement parts, use parts drawings and part lists on the preceding pages.

Data required from parts drawings and list are:

- Part number
- Name of part

To obtain replacement parts, submit the following information from the actuator nameplate:

- Serial Number
- Model Number
- Voltage

