Universal Sales
Tuf-Skin® Valves

92311 Booth Street ~ Junction City, OR 97448 ~ PH: 541-998-9999 ~ FX: 541-998-9998

TUF-SKIN
ELECTRIC ACTUATED
BUTTERFLY VALVE
ASSEMBLY INSTRUCTIONS
AND TECHNICAL BULLETIN

VERSION: 3-1-11

MGO PART NUMBERS

B-XXXX-S
stub end valve

MGO-X-XX-LAV
worm gear with
actuator adaptor

MAR-XX-X-4
electric actuator

B-XXXX-MGO
motorized valve


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BUTTERFLY VALVES – ELECTRICALLY ACTUATED

Also available with
Lug style valve body.

PART#	seconds to open / close		DESCRIPTION	LBS.
B 0200 MGO	30	2”	120 VAC Motorized BFV	32
B 0250 MGO	30	2.5”	120 VAC Motorized BFV	33
B 0300 MGO	30	3”	120 VAC Motorized BFV	33
B 0400 MGO	30	4”	120 VAC Motorized BFV	39
B 0500 MGO	30	5”	120 VAC Motorized BFV	42
B 0600 MGO	30	6”	120 VAC Motorized BFV	59
B 0800 MGO	30	8”	120 VAC Motorized BFV	68
B 1000 MGO	75	10”	120 VAC Motorized BFV	90
B 1200 MGO	75	12”	120 VAC Motorized BFV	105
B 1400 MGO	75	14”	120 VAC Motorized BFV	160
B 1600 MGO	63	16”	120 VAC Motorized BFV	210
B 1800 MGO	63	18”	120 VAC Motorized BFV	255
B 2000 MGO	100	20”	120 VAC Motorized BFV	580
B 2400 MGO	100	24”	120 VAC Motorized BFV	780

WORM GEAR OPERATOR WITH ACTUATOR ADAPTER

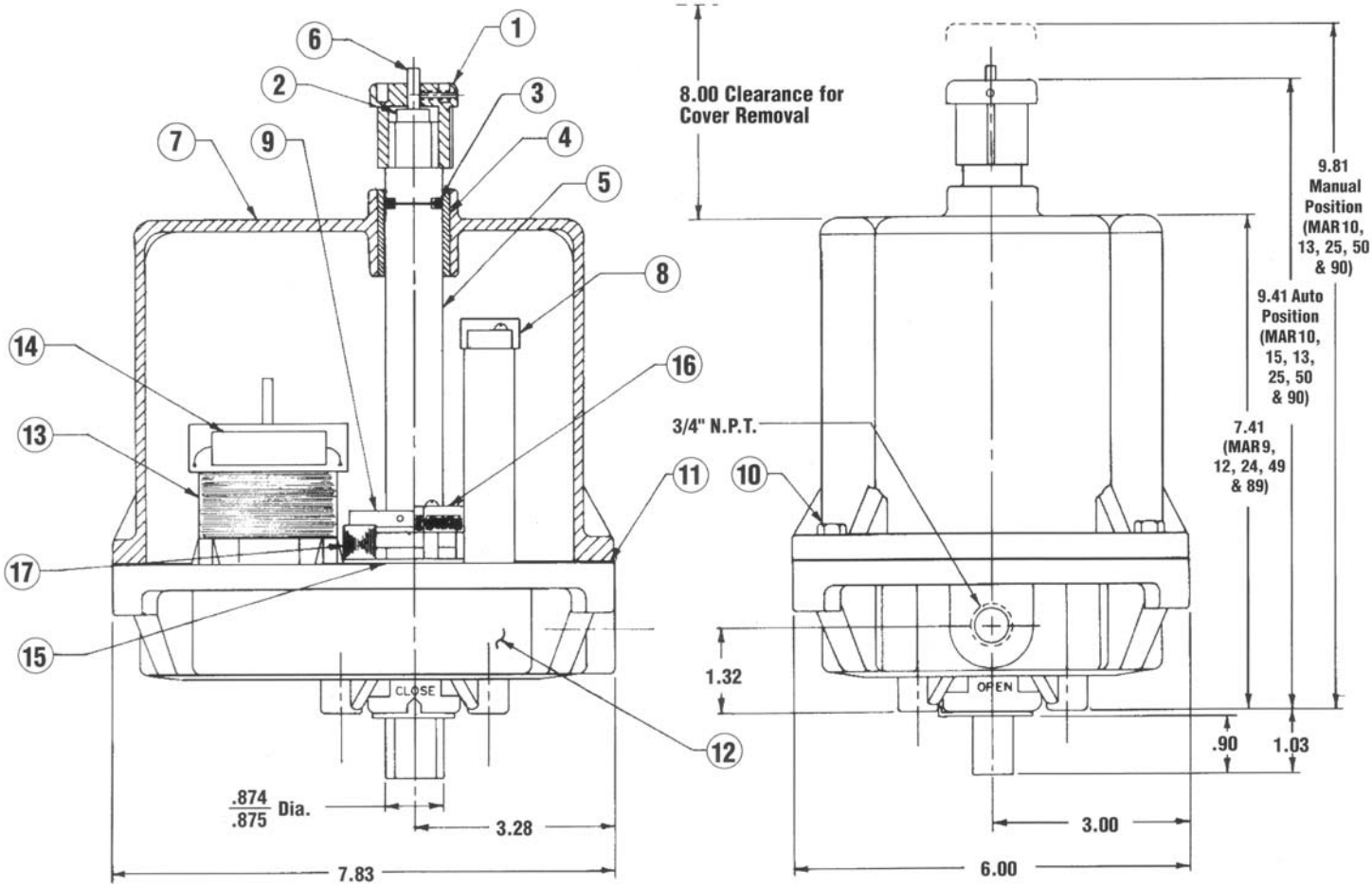
	ratio		
MGO 1 XX LAV	15:1	MGO Operator only for 2” - 5”	13
MGO 1 XX LAV	15:1	MGO Operator only for 6” - 8”	14
MGO 1 XX LAV	15:1	MGO Operator only for 10” - 12”	14
MGO 2 14 LAV	15:1	MGO Operator only for 14”	30
MGO 3 XX LAV	50:1	MGO Operator only for 16” - 18”	40
MGO 4 XX LAV	80:1	MGO Operator only for 20” - 24”	80

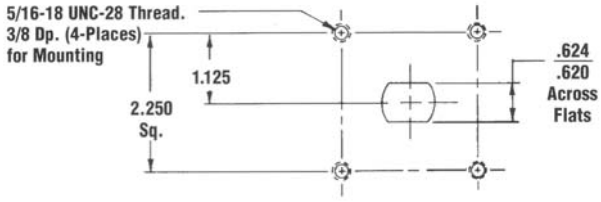
XX = INSERT VALVE SIZE

ELECTRICAL ACTUATORS ONLY - 120 VAC - NEMA 4

	sec to 360^0	#turns	amps	
MAR-10-2-4	8	3.75	0.60	FOR 2” - 5” MGO
MAR-50-2-4	8	3.75	2.20	FOR 6” - 8” MGO
MAR-90-5-4	20	3.75	1.55	FOR 10” - 14” MGO
MAR-120-1.25-4	5	12.5	7.40	FOR 16” - 18” MGO
MAR-120-1.25-4	5	20.0	7.40	FOR 20” - 24” MGO

MAR PARTS LIST





TECHNICAL DATA

Voltage: 115 VAC 60/50 Hz., 1 Phase

Ambient Temp: -40 to +150 degrees Fahrenheit

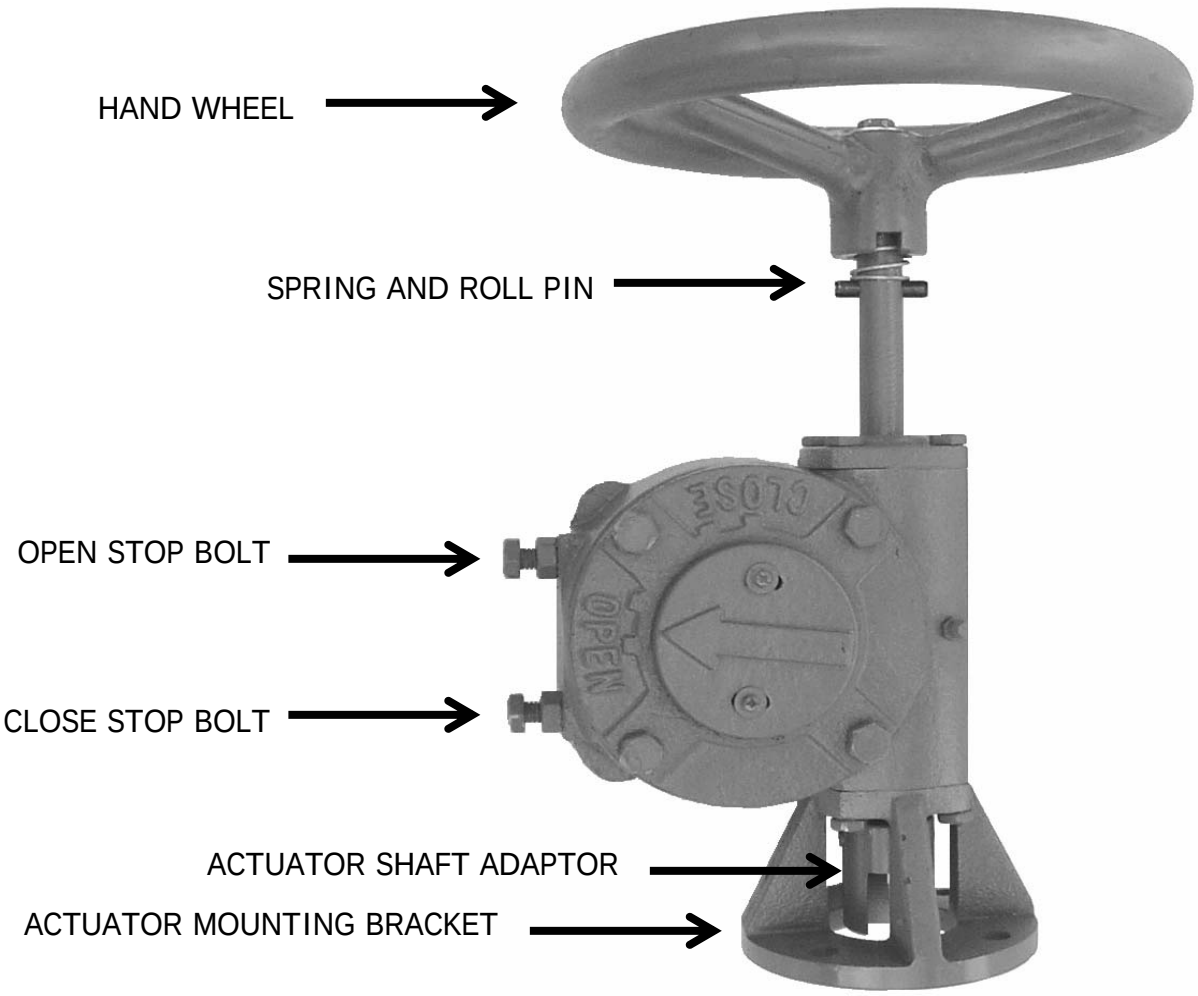
Lubrication: High temperature grease for gears
Self-lubricating bearings

Mounting Positions: Universal

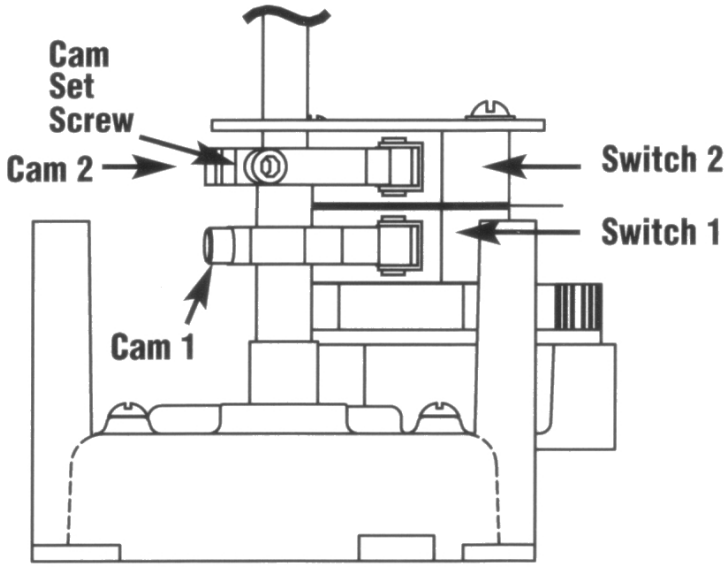
PARTS LIST

#	Description	Qty	Part #
1	Declutching 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 - NEMA4	1	88-93
8	Terminal strip	1	72-01/72-03
9	Cam	2	68-85-10
10	Cover Bolts 1/4-20 x 3/4	4	PO3-025075-3900
11	Gasket	1	16-27
12	Gear case assembly	1	depends on model
13	Motor	1	depends on model
14	Capacitor	1	depends on model
15	Micro adjustment plate	2	65-14
16	Limit switch	2	63-01
17	Micro-adjustment cam	2	68-07

MGO-LAV PART DESCRIPTIONS



MAR LIMIT SWITCHES AND CAMS

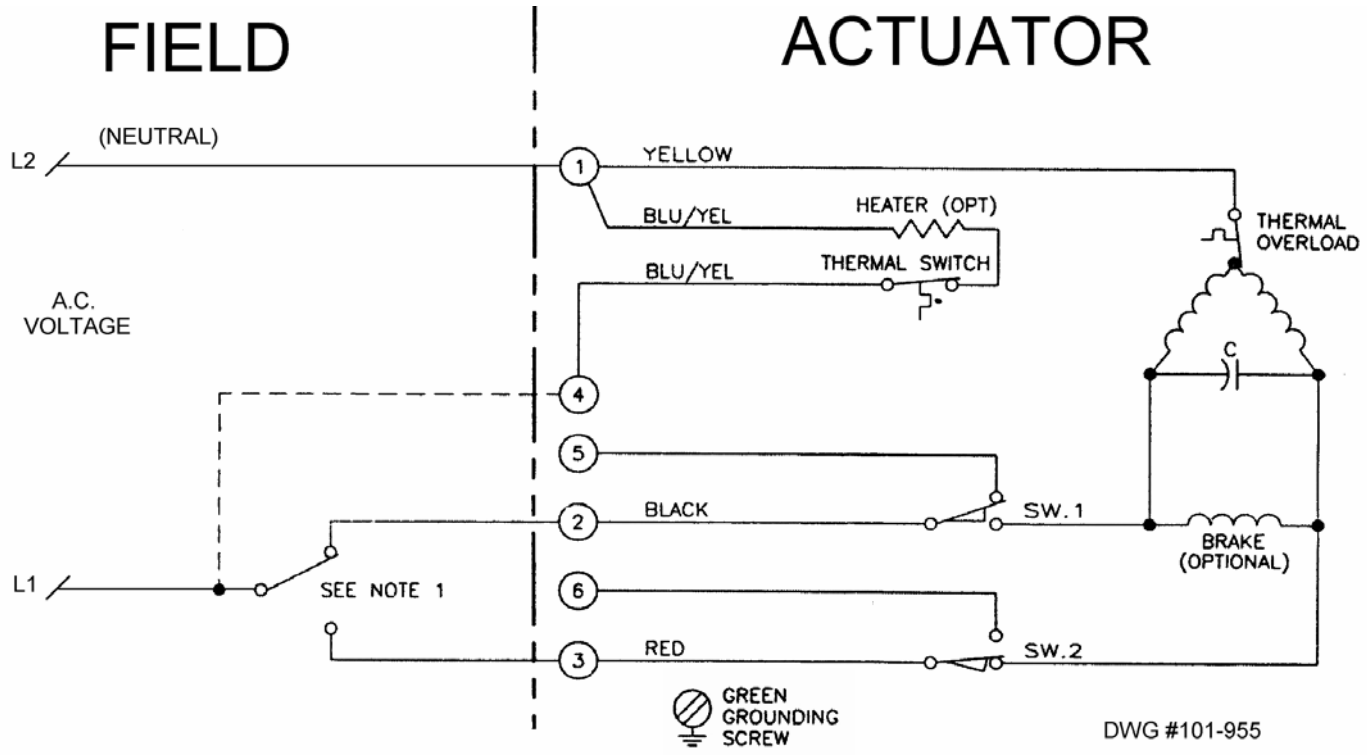


ASSEMBLY INSTRUCTIONS

Universal Sales highly recommends that assembly and testing of
MGO valves be done at our factory.
We will not warrant damage caused from assembly by uncertified personnel.

1) Use only butterfly valves that have been tested for seating torque and fall into the approved torque range for each actuator size.
2) Mount the MGO-LAV to the stub end butterfly valve.
3) Back off both of the stop bolts on the MGO-LAV.
4) Open and close the valve with the hand wheel checking to ensure smooth operation. Lubricate the valve seat at this time (never operate with dry seating area).
5) Using the hand wheel, place the valve in the half open position (the disc should be 45 degrees from closed and open position).
6) Mount the MAR to the actuator mounting bracket on the MGO-LAV. Do not fully tighten the screws at this time.
7) Remove the MAR declutching knob.
8) Remove the MAR actuator cover and connect field wiring per instructions (see wiring diagrams).
9) Loosen the set screws on the adjustable stop cams in the MAR.
10) Carefully apply power to the actuator and actuate the valve disc back and forth a few degrees **(Do not run the MAR against the mechanical stop bolts, or damage will result!)**. This will center the MAR shaft on the MGO shaft adaptor.
11) Fully tighten the MAR mounting bolts that were left loose in step #5.
12) Turn the hand wheel counter-clockwise and close the valve until the disc seals against the valve seat. This will happen before the disc reaches 0 degrees.
13) With the valve in the closed position, adjust the proper Cam in the MAR until it engages the limit switch. You will hear a “click” when the switch engages.
14) Turn the hand wheel clockwise and open the valve until the disc is a few degrees short of fully open.
15) With the valve in the open position, adjust the proper Cam in the MAR until it engages the limit switch. You will hear a “click” when the switch engages.
16) Apply power to the MAR actuating the valve closed. Be sure the Cam engages the limit switch and turns off the MAR when the valve reaches the closed position **and before the MGO-LAV reaches the mechanical stop bolts, or damage will result!**
17) With the valve in the closed position, screw in the MGO-LAV closed stop bolt until you feel it hit the worm gear segment, then back it out 2 full turns.
18) Apply power to the MAR actuating the valve open. Be sure the Cam engages the limit switch and turns off the MAR when the valve reaches the open position **and before the MGO-LAV reaches the mechanical stop bolts, or damage will result!**
19) With the valve in the open position, screw in the MGO-LAV open stop bolt until you feel it hit the worm gear segment, then back it out 2 full turns.
20) Actuate the valve open and closed to check for smooth operation. Again, be sure the MAR is turned off by the limit switches before the MGO-LAV reaches the mechanical stop bolts, or damage will result. Adjust the cams if necessary.
21) Replace the MAR actuator cover.
22) Replace the MAR declutching knob.

MAR Wiring Diagram for 120 VAC Actuators (without internal relay)



Notes:

1. Switch shown for illustration only. Relays and controls are sold separately.

2. Actuator is shown in open position.

3. Power to terminals “1” and “2” operates the unit into the open position.

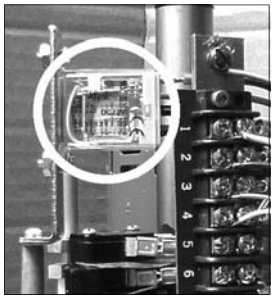
4. Power to terminals “1” and “3” operates the unit into the close position.

5. Thermal overload shown resets automatically and is standard on NEMA 4 enclosures. Heater shown is standard on Tuf-Skin units. Brake shown is optional.

6. Wiring from the normally open contact of the switches is provided for external light indication of valve position (terminals “5” and “6”).

PART# DESCRIPTION

RELAY CONTROL FOR ELECTRICAL ACTUATORS



RELAY 120VAC
RELAY 24VAC
RELAY 12VDC

Mounted inside of actuator.

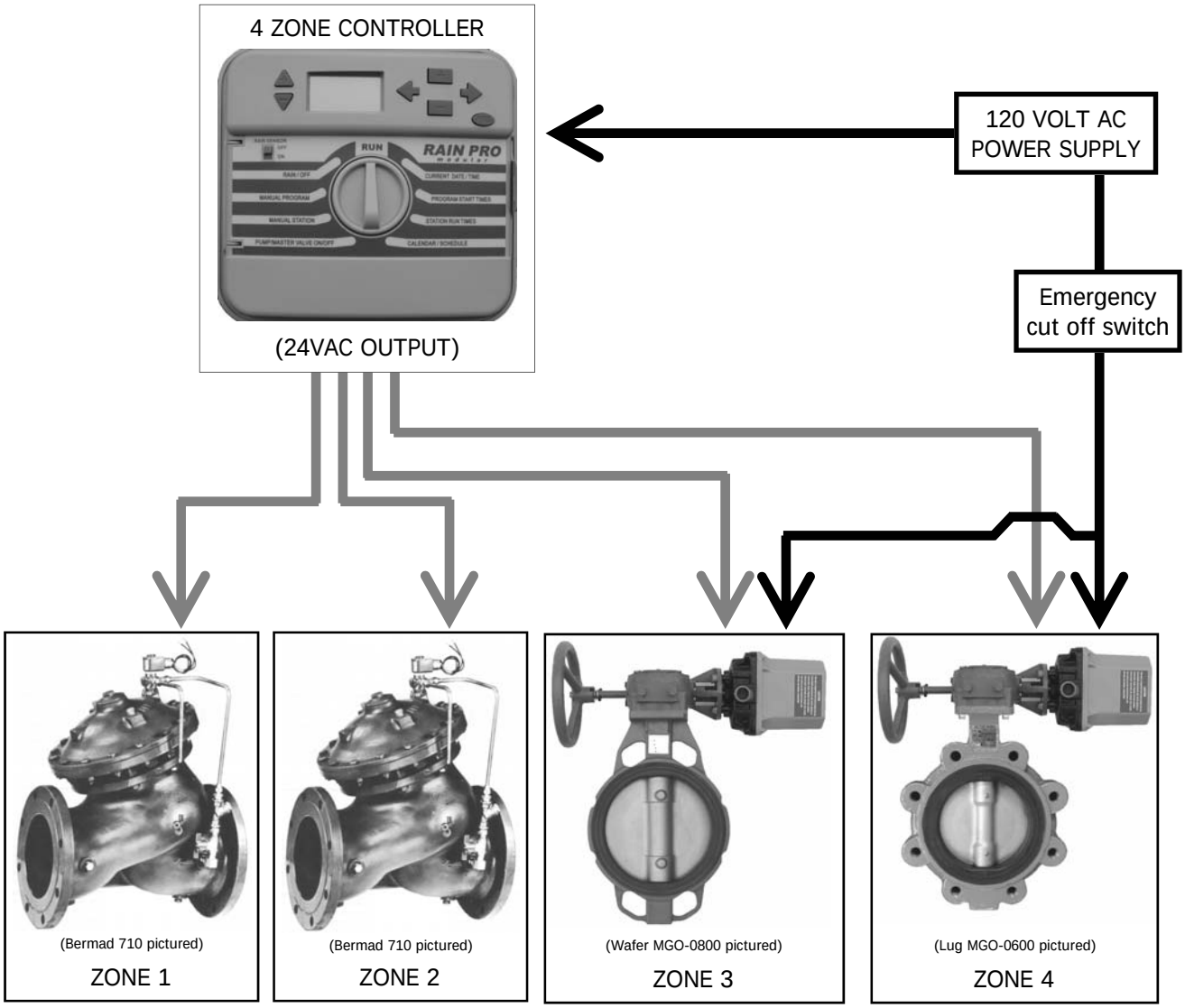
Specify if valve is to be normally open or normally closed.

120 VAC RELAY FOR 120 VAC MGO
24 VAC RELAY FOR 120 VAC MGO
12 VDC RELAY FOR 120 VAC MGO

Other relay voltages available.
Call for availability.

EXAMPLE FOR RELAY USE

When a 24 Volt AC relay is installed inside the actuator, the MGO butterfly valve can be controlled by a standard irrigation controller in the same manner as a solenoid valve. Note that in addition to the control voltage, you must also run the 120 Volt AC power supply to the actuator. The actuator can be set up for normally open or normally closed operation.



Please call for wiring diagrams or more information regarding use of relays.

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MAINTENANCE & TROUBLESHOOTING OF MAR

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 recommended 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°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.
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 MAR100 through MAR400 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.