

200 Series Electric Actuator

OPERATION AND MAINTENANCE MANUAL

#8655 200 Series Install Maint Manual 09/01/10

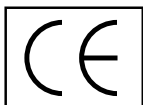
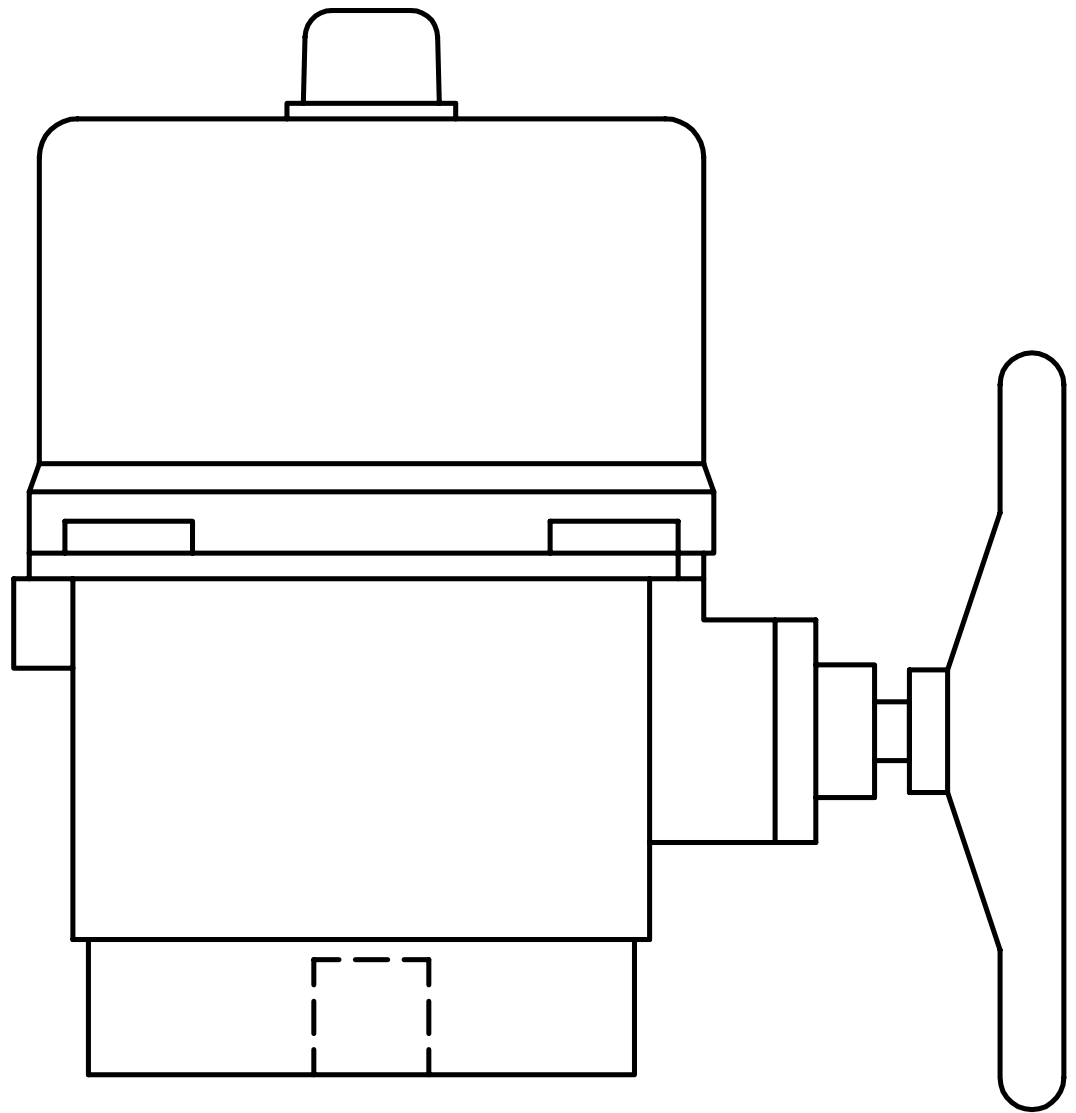


TABLE OF CONTENTS	PAGE
SPECIFICATIONS -----	2
TRAVEL CAM & LIMIT SWITCH ADJUSTMENTS-----	3
MECHANICAL STOPS-----	4
POTENTIOMETER -----	4
MODULATING CONTROL BOARD -----	5
Revised 09/01/10 CJH	
TROUBLE SHOOTING -----	6
LUBRICATION, NOTICE & STORAGE-----	6
PARTS FOR 200 SERIES / 201 SIZE -----	7,8
PARTS FOR 200 SERIES / 202 & 203 SIZES-----	9,10
PARTS FOR 200 SERIES / 204 & 206 SIZES-----	11,12
PARTS FOR 200 SERIES / 207 & 208 SIZES-----	13,14
PARTS FOR 200 SERIES / 210 & 212 SIZES-----	15,16
WIRING DIAGRAM 201E2AXXXX / 201 SIZE 110V/220V AC 1-PH /ON-OFF SERVICE -----	17
WIRING DIAGRAM 201EMAXXXX / 201 SIZE 110V/220V AC 1-PH /MODULATING SERVICE-----	18
WIRING DIAGRAM 202E2AXXXX / 202-212 SIZES 110V/220V AC 1-PH /ON-OFF SERVICE -----	19
WIRING DIAGRAM 202EMAXXXX / 202-212 SIZES 110V/220V AC 1-PH /MODULATING SERVICE -----	20
WIRING DIAGRAM 202EMAXXXX / 202-212 SIZES 110V/220V AC 1-PH / MODULATING SERVICE / LOCAL / REMOTE SELECTOR SWITCH -----	21
WIRING DIAGRAM 202AFBX2/210-212 SIZES 110V/220V AC 1-PH-----	22
WIRING DIAGRAM 202E2AFBX2 / 202-208 SIZES 110V/220V AC 1-PH / ON-OFF SERVICE / 4-20MA OUTPUT SIGNAL -----	23
WIRING DIAGRAM 201E2BXXXX / 201 SIZE 12V/24V AC / ON-OFF SERVICE-----	24
WIRING DIAGRAM 201EMBXXXX / 201 SIZE 24V AC / MODULATING SERVICE-----	25
WIRING DIAGRAM 202E2BXXXX / 202-212 SIZES 12V/24V AC / ON-OFF SERVICE -----	26
WIRING DIAGRAM 202EMBXXXX / 202-212 SIZES 12V/24V AC / MODULATING SERVICE -----	27
WIRING DIAGRAM 201E2EXXXX / 201 SIZE 12V/24V DC / ON-OFF SERVICE-----	28
WIRING DIAGRAM 202E2EXXXX / 202-212 SIZES 24V DC / ON-OFF SERVICE -----	29
WIRING DIAGRAM 201EMCXXXX / 201 SIZE 12V/24V DC / MODULATING SERVICE -----	30
WIRING DIAGRAM 202EMCXXXX / 202-212 SIZES 12V/24V DC / MODULATING SERVICE -----	31
WIRING DIAGRAM 202E2EXXXX / 202-212 SIZES 220V/380V/440V/480V AC 3-PH / ON-OFF SERVICE -----	32
WIRING DIAGRAM 202EMEXXXX / 202-212 SIZES 220V/380V/440V 3-PH / MODULATING SERVICE -----	33
WIRING DIAGRAM 202E2EFBX2 / 202-212 SIZES 220V/380V/440V 3-PH / ON-OFF SERVICE / LOCAL / REMOTE SELECTOR SWITCH -----	34
WIRING DIAGRAM 202E2EFBX2 / 202-212 SIZES 220V/380V/440V 3-PH / ON-OFF SERVICE / LOCAL / REMOTE SELECTOR SWITCH / 4-20MA OUTPUT SIGNAL -----	35
WIRING DIAGRAM 202E2EFBXX / 202-212 SIZES 220V/380V/440V 3-PH / 4-20MA OUTPUT SIGNAL-----	36

FOR INFORMATION ON THIS PRODUCT AND OTHER ULTRAFLO PRODUCTS
PLEASE VISIT US AT OUR WEBPAGE - www.ultraflovalve.com

SPECIFICATIONS

12V / 24V

Model No.	Max Torque Lbs / Nm	Speed (90°)	Motor Power	Motor Speed		12V DC/AC			24V DC/AC		
				12V	24V	Run	Start	Lock	Run	Start	Lock
201	450 / 50	20s	10W	3600/min	3600/min	0.5A	3.0A	3.0A	0.7A	0.8A	1.4A
202	800 / 90	15s	70W	1800/min	1800/min	3.4A	5.0A	8.5A	3.0A	5.0A	13.0A
203	1335 / 150	22s	70W	1800/min	1800/min	3.4A	5.0A	8.5A	3.0A	5.0A	13.0A
204	3560 / 400	16s	180W	1800/min	1800/min	12.0A	8.5A	30.0A	6.0A	8.0A	30.0A
206	5785 / 650	28s	180W	1800/min	1800/min	14.0A	8.5A	30.0A	7.5A	8.0A	30.0A
207	8850 / 1000	46s	220W	—	1800/min	—	—	—	7.0A	8.0A	30.0A
208	13275 / 1500	46s	220W	—	1800/min	—	—	—	7.5A	8.0A	30.0A
210	22125 / 2500	58s	220W	—	1800/min	—	—	—	7.5A	8.0A	30.0A
212	30975 / 3500	58s	300W	—	1800/min	—	—	—	15.0A	15.0A	26.0A

Single Phase

Model No.	Max Torque Lbs / Nm	Speed (90°)		Motor Power	Motor Speed		110V AC			220 - 240V AC		
		60 Hz	50 Hz		60 Hz	50 Hz	Run	Start	Lock	Run	Start	Lock
201	450 / 50	20s	24s	10W	3600/min	3000/min	0.5A	1.5A	0.6A	0.3A	1.0A	0.5A
202	800 / 90	15s	17s	40W	1720/min	1450/min	1.0A	3.0A	1.8A	0.5A	1.5A	0.9A
203	1335 / 150	22s	26s	40W	1720/min	1450/min	1.0A	3.0A	1.8A	0.5A	1.5A	0.9A
204	3560 / 400	16s	18s	120W	1720/min	1420/min	1.3A	3.1A	3.6A	0.6A	1.5A	1.8A
206	5785 / 650	28s	31s	120W	1720/min	1450/min	1.8A	3.0A	3.6A	0.8A	1.5A	1.8A
207	8850 / 1000	46s	55s	180W	1720/min	1450/min	3.2A	12.0A	10.0A	1.6A	4.0A	4.0A
208	13275 / 1500	46s	55s	220W	1720/min	1450/min	4.0A	14.0A	10.0A	2.0A	3.6A	5.0A
210	22125 / 2500	58s	70s	220W	1720/min	1450/min	4.0A	12.0A	6.0A	2.0A	4.0A	3.0A
212	30975 / 3500	58s	70s	300W	1720/min	1420/min	4.0A	14.0A	5.0A	2.2A	4.0A	3.0A

Three Phase

Model No.	Max Torque Lbs / Nm	Speed (90°)		Motor Power	Motor Speed		220V			380V			440V		
		60 Hz	50 Hz		60 Hz	50 Hz	Run	Start	Lock	Run	Start	Lock	Run	Start	Lock
201	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
202	800 / 90	15s	17s	40W	1720/min	1450/min	0.6A	1.8A	1.1A	0.3A	1.0A	0.7A	0.4A	1.3A	0.7A
203	1335 / 150	22s	26s	40W	1720/min	1450/min	0.6A	1.8A	1.1A	0.3A	1.0A	0.7A	0.4A	1.3A	0.7A
204	3560 / 400	16s	18s	120W	1720/min	1450/min	1.0A	3.0A	3.5A	0.7A	2.2A	2.0A	0.8A	2.5A	2.0
206	5785 / 650	28s	31s	120W	1720/min	1450/min	1.0A	3.0A	3.5A	0.7A	2.2A	2.0A	0.8A	2.5A	2.0
207	8850 / 1000	46s	55s	180W	1720/min	1450/min	0.6A	0.8A	1.8A	0.4A	0.6A	1.0A	0.4A	0.6A	1.0A
208	13275 / 1500	46s	55s	220W	1720/min	1450/min	0.8A	1.0A	2.8A	0.6A	0.8A	1.6A	0.6A	0.8A	1.2A
210	22125 / 2500	58s	70s	220W	1720/min	1450/min	0.8A	1.0A	1.5A	0.4A	0.6A	1.0A	0.4A	0.6A	1.0A
212	30975 / 3500	58s	70s	300W	1720/min	1450/min	1.2A	1.4A	2.5A	0.6A	0.8A	1.5A	0.6A	0.8A	1.5A

RUN - Full load running current
START - Initial start-up/surge current
LOCK - Locked rotor/stalled current

DUTY CYCLE RATINGS

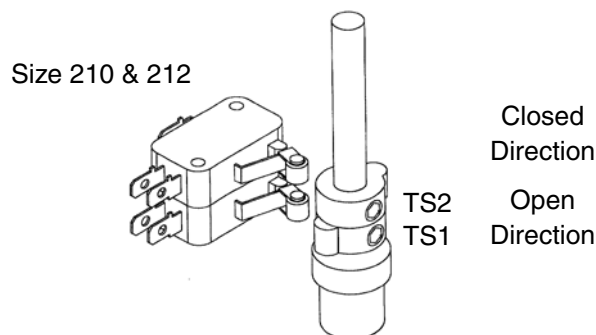
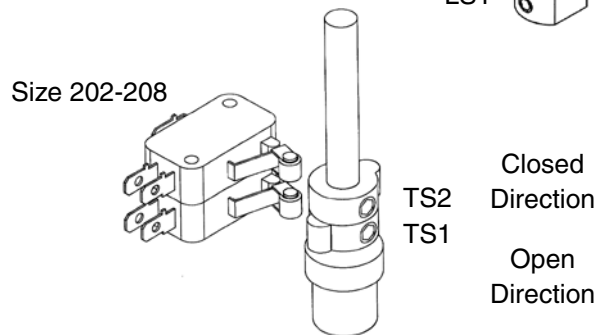
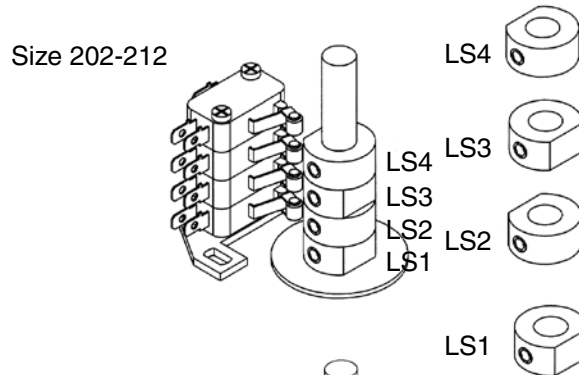
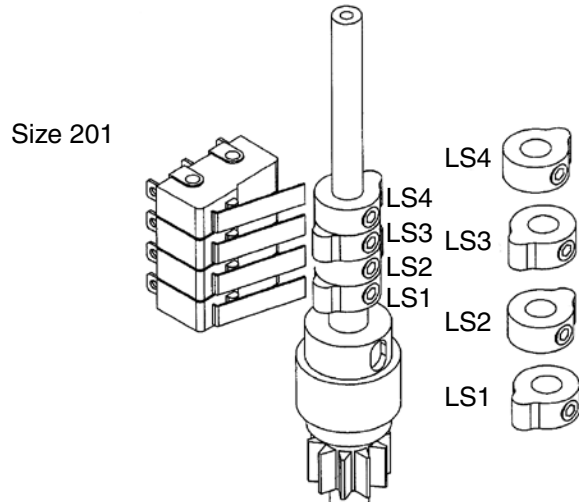
ALL SIZES	ON/OFF	DUTY	30%
200 Series-201 - 208	MOD.	DUTY	75%
200 Series-210 & 212	MOD.	DUTY	50%

TRAVEL CAM & LIMIT SWITCH ADJUSTMENT 201-212

LS1 & LS2 - Open and Close travel switch cams are used to stop the actuator motor in the open (LS1) and closed (LS2) positions. Size 201 actuators use normally closed contacts and the cam depresses the switch lever

to stop the motor at the desired position. Size 201-212 actuators use normally open contacts and the cam depresses the switch lever to allow motor operation and releases to stop the motor.

LS3 & LS4 - Open and Close auxiliary switches are voltage free and are provided for customer use.



200 SERIES - 201 INSTRUCTIONS

- LS4 - Aux. close switch cam factory set at full closed position. Rotate cam clockwise to activate prior to motor stop.
- LS3 - Aux. open switch cam factory set at full open position. Rotate cam counterclockwise to activate prior to motor stop.
- LS2 - Close travel switch cam is factory set at the full closed position, rotate cam clockwise to increase travel and counterclockwise to decrease travel.
- LS1 - Open travel switch cam is factory set at the full closed position, rotate cam counterclockwise to increase travel and clockwise to decrease travel.

200 SERIES - 202-212 INSTRUCTIONS

- LS4 - Aux. switch cam factory set at full closed position. Can be set at an intermediate position if required.
- LS3 - Aux. switch cam factory set at full open position. Can be set at an intermediate position if required.
- LS2 - Close travel switch cam. Rotate cam clockwise to decrease closed position and vice versa.
- LS1 - Open travel switch cam. Rotate cam clockwise to increase full open position and vice versa.

TORQUE CAM ADJUSTMENT (FACTORY SET)

200 SERIES - 202-208

- TS2 - Counterclockwise: Lowers torque value trip setting. Clockwise: Increases torque value trip setting.
- TS1 - Counterclockwise: Lowers torque value trip setting. Clockwise: Increases torque value trip setting.

TORQUE CAM ADJUSTMENT (FACTORY SET)

200 SERIES - 210 & 212

- TS2 - Counterclockwise: Increases torque value trip setting. Clockwise: Lowers torque value trip setting.
- TS1 - Counterclockwise: Decreases torque value trip setting. Clockwise: Increases torque value trip setting.

NOTE: Torque cams are factory set for maximum output torque, increasing the trip value could result in actuator stall and damage to the motor.

NOTE: Cams are adjustable with a 2.5 mm hex key.

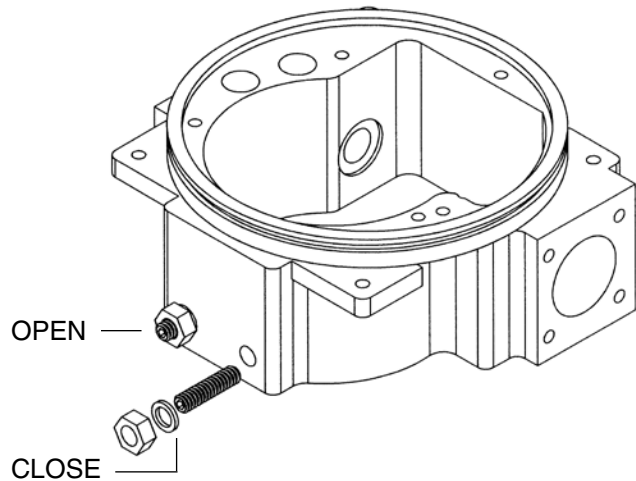
MECHANICAL STOPS

FOR ELECTRIC OPERATION:

Please refer to "Travel Cam & Limit Switch Adjustment"
 The motor should be stopped by the end of travel limit switches (LS1 & 2) being activated by their respective cams.

FOR MANUAL OPERATION:

- 1) Slacken the locknuts & back-out the socket head travel stop bolts.
- 2) Adjust open (LS1) & close (LS2) travel limit switch cams to desired end of travel positions.
- 3) Using handwheel drive actuator to it's fully open position (confirm that open travel position switch is activated). Turn handwheel one half turn opening actuator more. With hex key, screw open travel bolt in until it comes to a stop against internal stop pad.
- 4) Secure bolt by tightening locknut against housing.
- 5) Repeat steps 1 to 4 for close travel bolt.



POTENTIOMETER

Potentiometers turn with transmission shafts, and can provide a feedback signal for position indication.

Potentiometer terminals 1, 2, 3 are wired to terminal blocks 5, 6, 7.

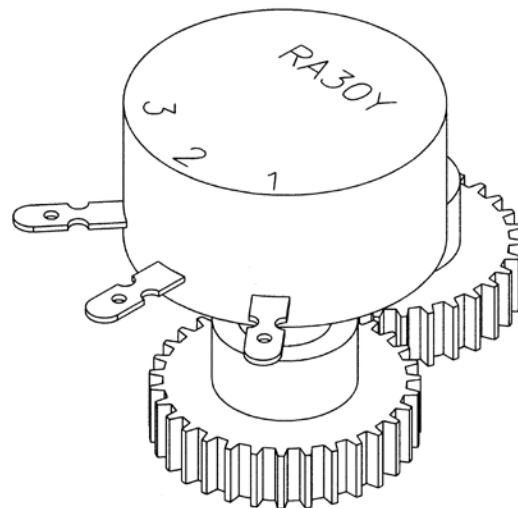
When a valve is closed: 5,6 — 1K Ohm
 6,7 — 0K Ohm

When a valve is opened: 5,6 — 0K Ohm
 6,7 — 1K Ohm

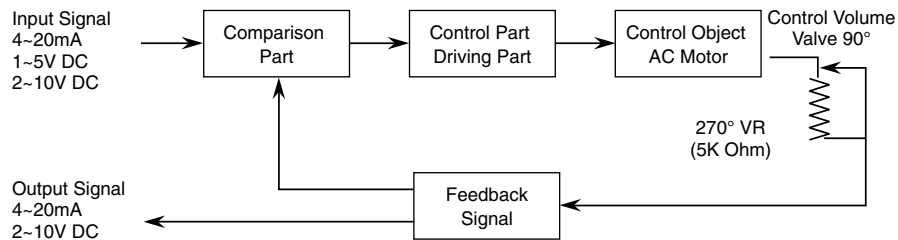
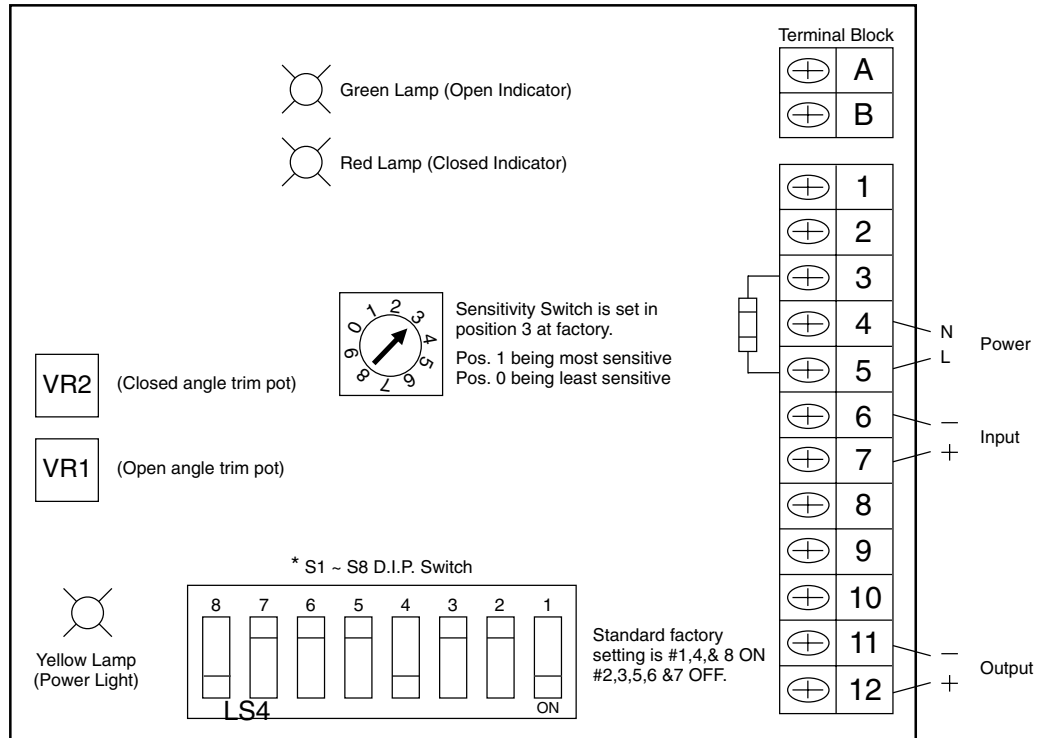
For modulating controllers, potentiometer terminals 1, 2, 3 are wired to terminal blocks 8, 9, 10.

When a valve is closed: 8,9 — 5K Ohm
 9,10 — 0K Ohm

When a valve is opened: 8,9 — 0K Ohm
 9,10 — 5K Ohm



MODULATING CONTROL BOARD: INTERFACE



200 SERIES CONTROL INPUT Revised 09/01/10 CJH

Setting	Switch Number							
	1	2	3	4	5	6	7	8
Input Signal								
4-20 mA	ON	OFF				X		
1-5 vdc	OFF	OFF				X		
2-10 vdc	OFF	ON				X		
Output Signal								
4-20 mA			OFF	ON	OFF			
2-10 vdc			ON	OFF	ON			
Fail Position								
Fail Closed							OFF	ON
Fail Open							ON	OFF
Fail Last							ON	ON

NOTE: Switch number 6 "X" is off for normal operation and on for reverse acting.

VR TRIM POT ADJUSTMENT

VR2 (Close Travel) Turn fully clockwise, provide close signal, then turn pot. counter clockwise 3 to 6 turns until red light stays on.

VR1 (Open Travel) Turn fully counter clockwise, provide open signal, then turn pot. clockwise 3 to 6 turns until green light stays on.

ACTUATOR TROUBLESHOOTING CHART

Problem	Possible cause	Solutions
Motor does not operate	Check supply power and voltage are correct.	Check by meter.
	Any blisters on the capacitor?	If so replace.
	Is the gear train locked-up?	Remove motor to check.
Motor stops running	Is power supply short circuited?	Check wiring.
	Any foreign objects in pipeline?	Check for obstructions.
Unable to fully open/close	Loose/Misaligned cam?	Adjust/Tighten using wrench.
	Bent valve stem?	Replace valve stem.
	Mechanical stop adjustment incorrect?	Check position of stops.
Valve stops operating when motor is running.	Gear worn out?	Replace gear.
	Sleeve adapter worn out or broken?	Replace sleeve adapter.
	Broken valve stem or actuator transmission shaft.	Replace valve stem or actuator transmission shaft?
Abnormal control for operating two or more actuators simultaneously.	Controlling circuit connected in tandem or parallel?	Refer to the wiring diagram.
Motor overheats.	Incorrect voltage?	Check by meter.
	Valve torque too high?	Replace with larger actuator.
	High working frequency?	Check duty cycle.
	Is motor stem or bearing binding?	Replace the binding parts.
Occasional on/off actuator failure.	Simultaneous input power on/off.	Check if the selection switch is normal.

LUBRICATION

The gearbox of the actuator is enclosed, and it has already been lubricated sufficiently with high temperature lubricant at the factory sufficient for use for up to two years.

IMPORTANT NOTICES & MAINTENANCE

Notices:

1. Make sure the voltage is correct before power-up.
2. Turn power off before conducting any maintenance.
3. Seal the casing and conduit entrance after wiring to prevent dust or water contamination.
4. The angle of electric actuator installation must be between 0~180 degree. Do not install upside down or below the horizontal.
5. Do not install when hazardous or explosive gases may be present.

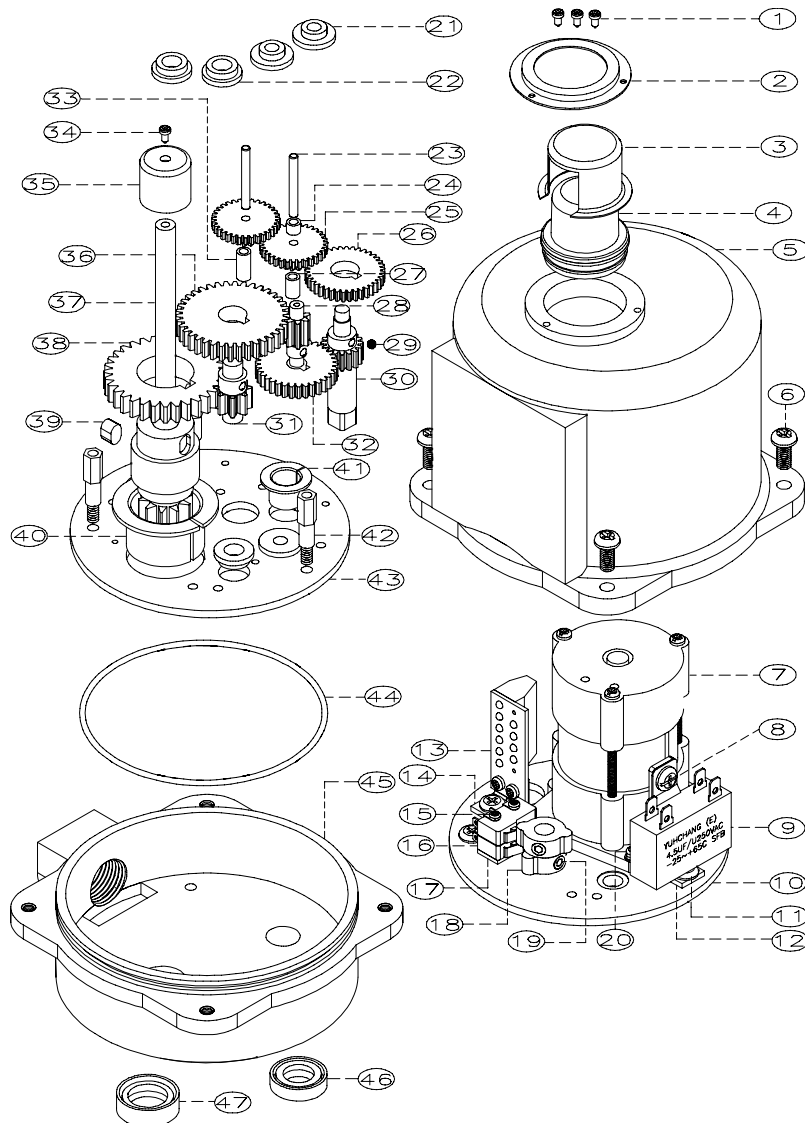
6. The frequency of open and close operation is restricted to every 5 minutes. Avoid too high a cycle frequency.
7. When more than one electric actuator needs to operate simultaneously, please connect with individual cables & not in parallel.
8. Connect the ground wire to PE inside the electric actuator.
9. The warranty period of our product is one year.

Storage:

1. The actuator should be placed in a clean and dry place, and protected from the weather and extreme vibration.
2. If actuator needs to be stored outside, it must be protected from excess moisture, dust, and weather.

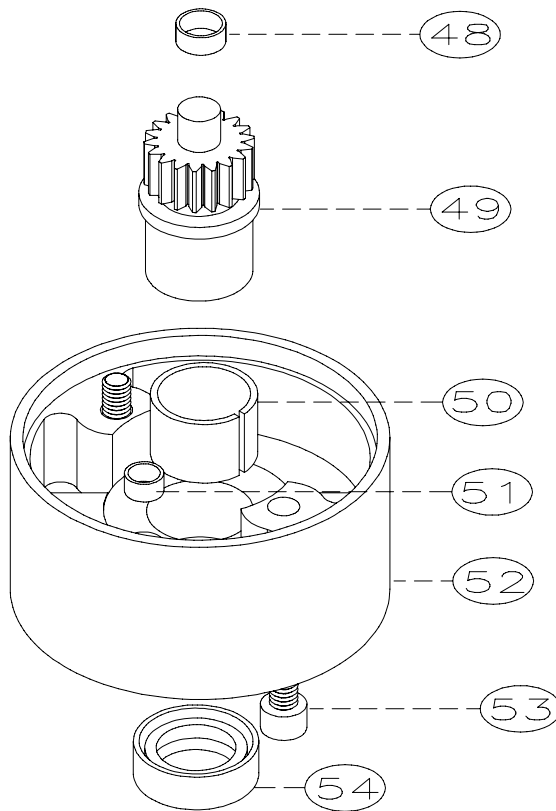
200 SERIES
SIZE: 201 (1 OF 2)

- | | | |
|---------------------------|-------------------------|-----------------------|
| 1 SCREW | 19 SCREW | 37 TRANSMISSION SHAFT |
| 2 MOUNTING PLATE | 20 SCREW | 38 GEAR |
| 3 WINDOW PROTECTION COVER | 21 BUSHING | 39 DRIVE KEY |
| 4 INDICATOR WINDOW | 22 BUSHING | 40 BEARING |
| 5 TOP COVER | 23 SHAFT | 41 BEARING |
| 6 COVER SCREW | 24 SPACER | 42 SCREW |
| 7 MOTOR | 25 GEAR | 43 MOUNTING PLATE |
| 8 SCREW | 26 GEAR | 44 O-RING |
| 9 CAPACITOR | 27 SPACER | 45 BASE |
| 10 MOUNTING PLATE | 28 GEAR | 46 SEAL |
| 11 SCREW | 29 THRUST KEY (GLOBULE) | 47 SEAL |
| 12 MOUNTING BRACKET | 30 GEAR | |
| 13 TERMINAL BLOCK | 31 GEAR | |
| 14 MOUNTING BRACKET | 32 GEAR | |
| 15 SCREW | 33 SPACER | |
| 16 LIMIT SWITCH | 34 SCREW | |
| 17 LIMIT SWITCH MAT | 35 POSITION INDICATOR | |
| 18 TRAVEL CAM | 36 GEAR | |



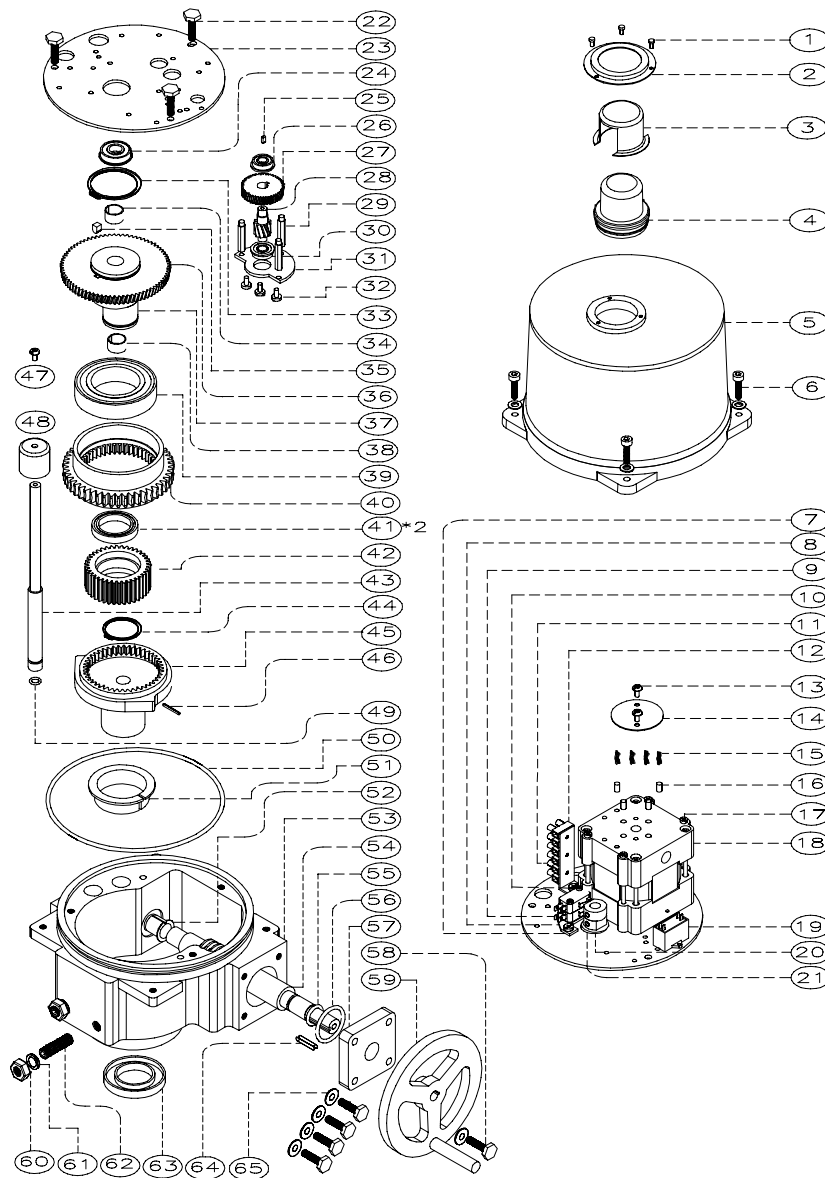
200 SERIES
SIZE: 201 (2 OF 2)

- 48 BEARING
- 49 GEAR
- 50 BEARING
- 51 BEARING
- 52 GEAR BOX
- 53 SCREW
- 54 SEAL



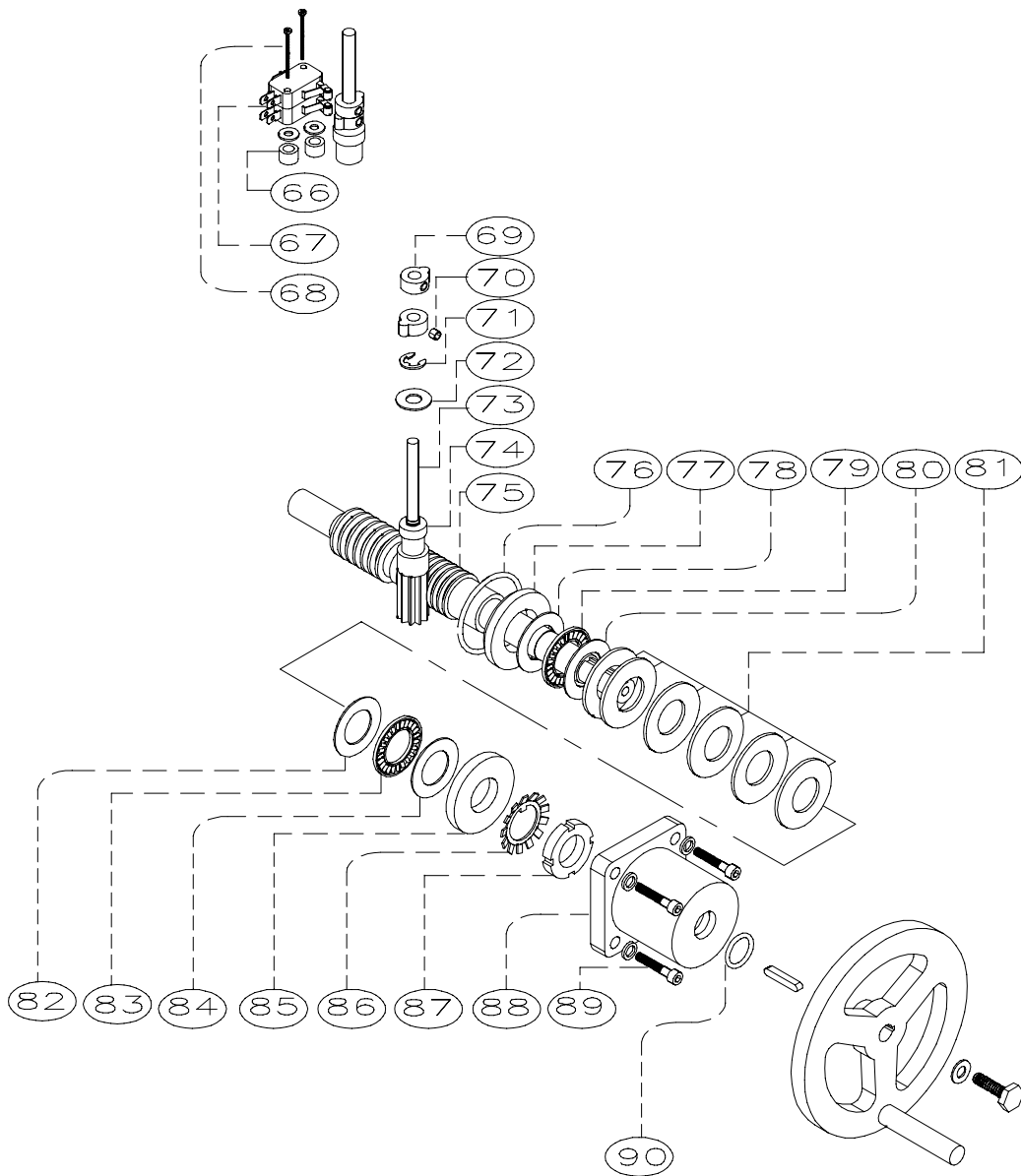
200 SERIES
SIZE: 202 & 203 (1 OF 2)

- | | | | |
|---------------------------|-----------------------|-----------------------|----------------|
| 1 SCREW | 19 CAPACITOR | 37 SHAFT | 55 O-RING |
| 2 MOUNTING PLATE | 20 TRAVEL CAM | 38 BEARING | 56 O-RING |
| 3 WINDOW PROTECTION COVER | 21 SCREW | 39 BEARING | 57 COVER PLATE |
| 4 INDICATOR WINDOW | 22 SCREW | 40 INNER GEAR | 58 SCREW |
| 5 TOP COVER | 23 MTG. PLATE | 41 BEARING | 59 HAND-WHEEL |
| 6 COVER SCREW | 24 BEARING | 42 PLANETARY GEAR | 60 NUT |
| 7 SCREW | 25 DRIVE KEY | 43 DRIVE SHAFT | 61 WASHER |
| 8 MOUNTING BRACKET | 26 BEARING | 44 SNAP RING (C TYPE) | 62 SCREW |
| 9 LIMIT SWITCH | 27 GEAR | 45 TRANSMISSION SHAFT | 63 OIL SEAL |
| 10 SCREW | 28 GEAR | 46 PIN | 64 DRIVE KEY |
| 11 TERMINAL BLOCK | 29 SCREW | 47 SCREW | 65 WASHER |
| 12 TERMINAL BLOCK BRACKET | 30 BEARING | 48 POSITION INDICATOR | |
| 13 SCREW | 31 FIXED PLATE | 49 O-RING | |
| 14 BRAKE SPRING COVER | 32 SCREW | 50 O-RING | |
| 15 BRAKE SPRING | 33 SNAP RING (C TYPE) | 51 BEARING | |
| 16 MOTOR BRAKE (PTFE) | 34 BEARING | 52 BEARING | |
| 17 SCREW | 35 DRIVE KEY | 53 BASE | |
| 18 MOTOR | 36 GEAR | 54 WORM GEAR | |



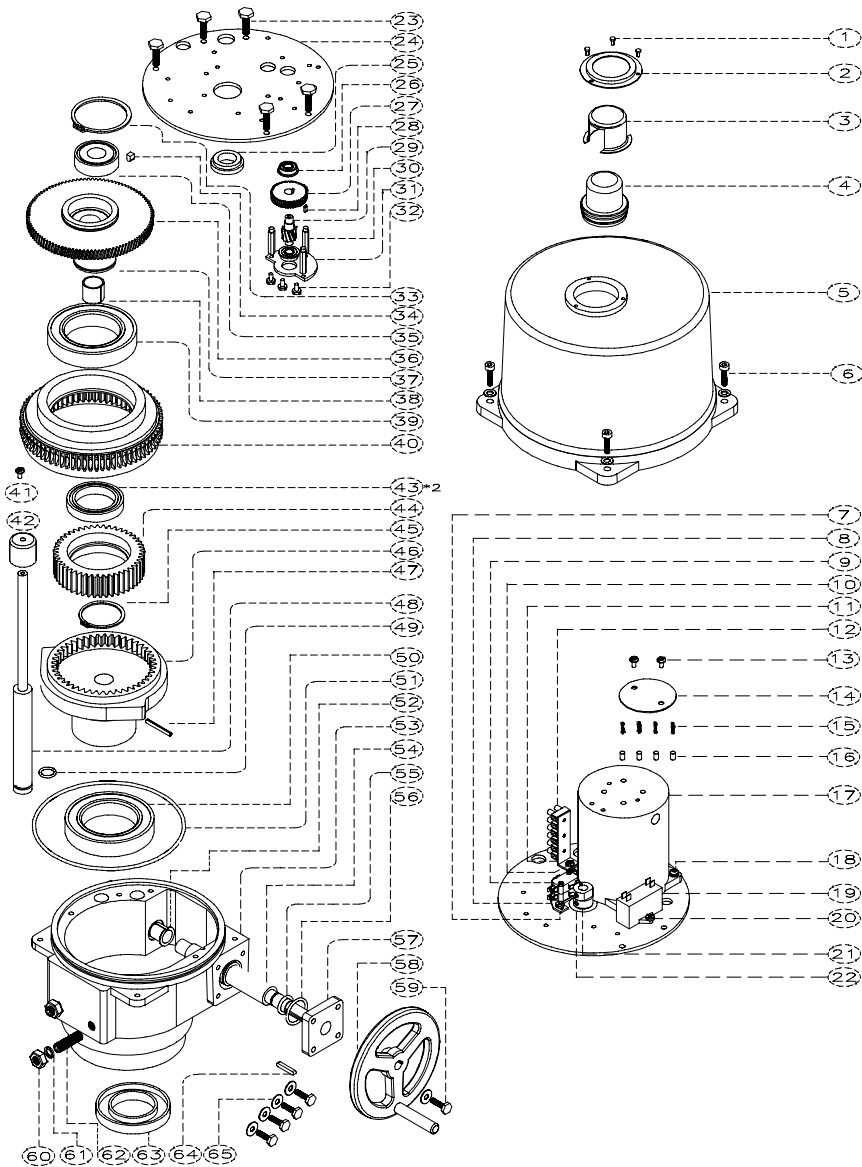
200 SERIES
SIZE: 202 & 203 (2 OF 2)

- | | | | |
|----|--------------------|----|----------------|
| 66 | STAND OFF | 79 | BEARING |
| 67 | TORQUE SWITCH | 80 | BEARING PLATE |
| 68 | SCREW | 81 | SPRING WASHERS |
| 69 | TORQUE CAM | 82 | BEARING PLATE |
| 70 | SCREW | 83 | BEARING |
| 71 | SNAP RING (E TYPE) | 84 | BEARING PLATE |
| 72 | WASHER | 85 | BUSHING |
| 73 | TRANSMISSION SHAFT | 86 | WASHER |
| 74 | BUSHING | 87 | NUT |
| 75 | WORM GEAR SHAFT | 88 | MOUNTING PLATE |
| 76 | O-RING | 89 | SCREW |
| 77 | BUSHING | 90 | O-RING |
| 78 | BEARING PLATE | | |



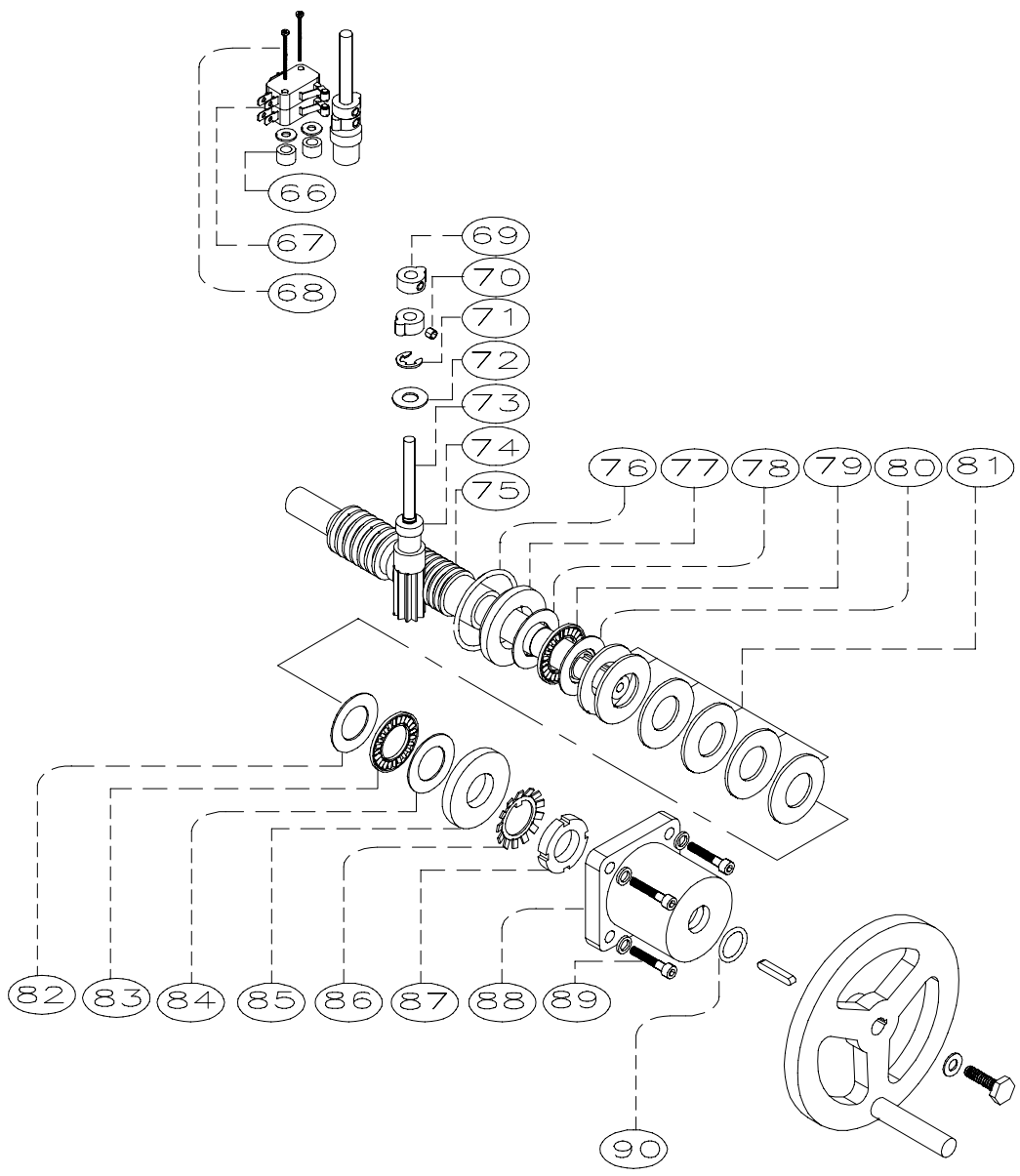
200 SERIES
SIZE: 204 & 206 (1 OF 2)

- | | | | |
|---------------------------|-----------------------|-----------------------|----------------|
| 1 SCREW | 19 CAPACITOR | 37 BEARING | 55 O-RING |
| 2 MOUNTING PLATE | 20 SCREW | 38 BEARING | 56 O-RING |
| 3 WINDOW PROTECTION COVER | 21 TRAVEL CAM | 39 BEARING | 57 COVER PLATE |
| 4 INDICATOR WINDOW | 22 SCREW | 40 INNER GEAR | 58 HAND WHEEL |
| 5 TOP COVER | 23 SCREW | 41 SCREW | 59 SCREW |
| 6 COVER SCREW | 24 MTG. PLATE | 42 POSITION INDICATOR | 60 NUT |
| 7 SCREW | 25 BEARING | 43 BEARING | 61 WASHER |
| 8 FIXED SEAT | 26 BEARING | 44 PLANETARY GEAR | 62 SCREW |
| 9 LIMIT SWITCH | 27 GEAR | 45 SNAP RING (C TYPE) | 63 OIL SEAL |
| 10 SCREW | 28 DRIVE KEY | 46 TRANSMISSION SHAFT | 64 DRIVE KEY |
| 11 TERMINAL BLOCK | 29 GEAR | 47 PIN | 65 WASHER |
| 12 TERMINAL BLOCK BRACKET | 30 SCREW | 48 DRIVE SHAFT | |
| 13 SCREW | 31 FIXED PLATE | 49 O-RING | |
| 14 BRAKE SPRING COVER | 32 SCREW | 50 BEARING | |
| 15 BRAKE SPRING | 33 SNAP RING (C TYPE) | 51 O-RING | |
| 16 MOTOR BRAKE (PTFE) | 34 DRIVE KEY | 52 BEARING | |
| 17 MOTOR | 35 BEARING | 53 BASE | |
| 18 SCREW | 36 GEAR | 54 WORM GEAR | |



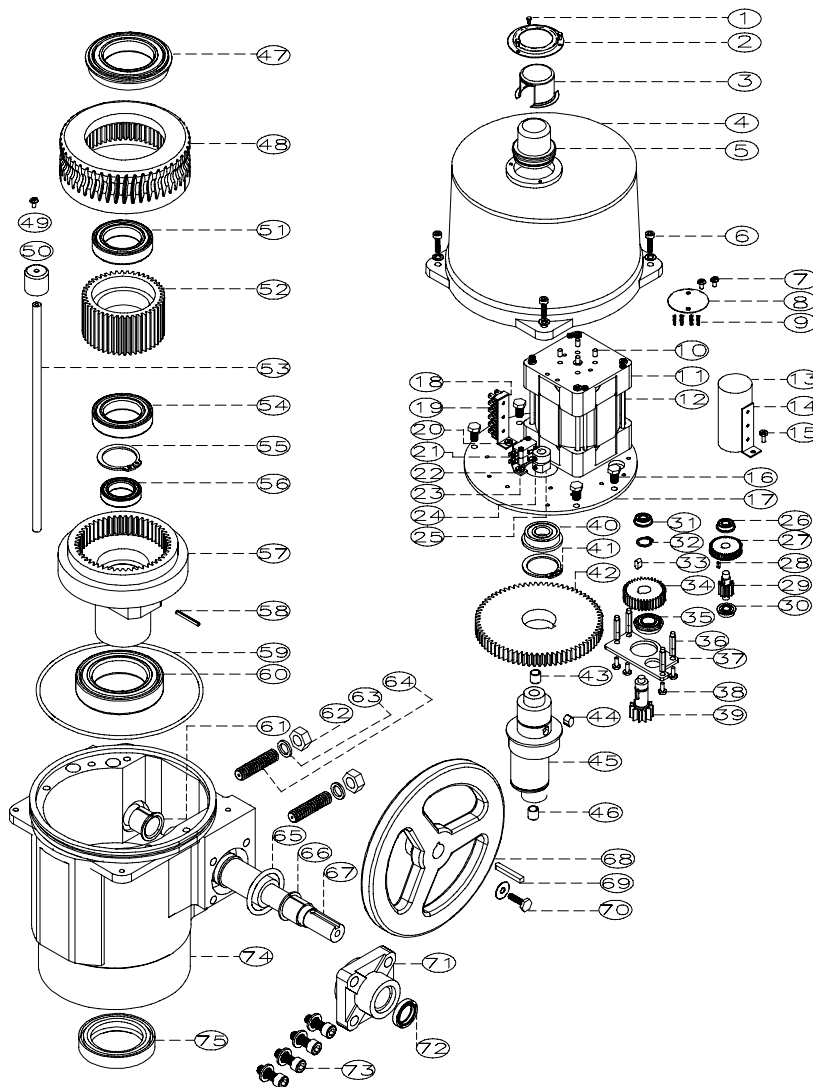
200 SERIES
SIZE: 204 & 206 (2 OF 2)

- | | | | |
|----|--------------------|----|----------------|
| 66 | STAND OFF | 79 | BEARING |
| 67 | TORQUE SWITCH | 80 | BEARING PLATE |
| 68 | SCREW | 81 | SPRING WASHERS |
| 69 | SNAP RING (E TYPE) | 82 | BEARING |
| 70 | WASHER | 83 | BEARING |
| 71 | BEARING | 84 | BEARING PLATE |
| 72 | FIXED SEAT | 85 | BUSHING |
| 73 | BEARING | 86 | WASHER |
| 74 | WORM GEAR SHAFT | 87 | NUT |
| 75 | O-RING | 88 | MOUNTING PLATE |
| 76 | BUSHING | 89 | SCREW |
| 77 | BEARING | 90 | O-RING |
| 78 | BEARING PLATE | | |



200 SERIES
SIZE: 207 & 208 (1 OF 2)

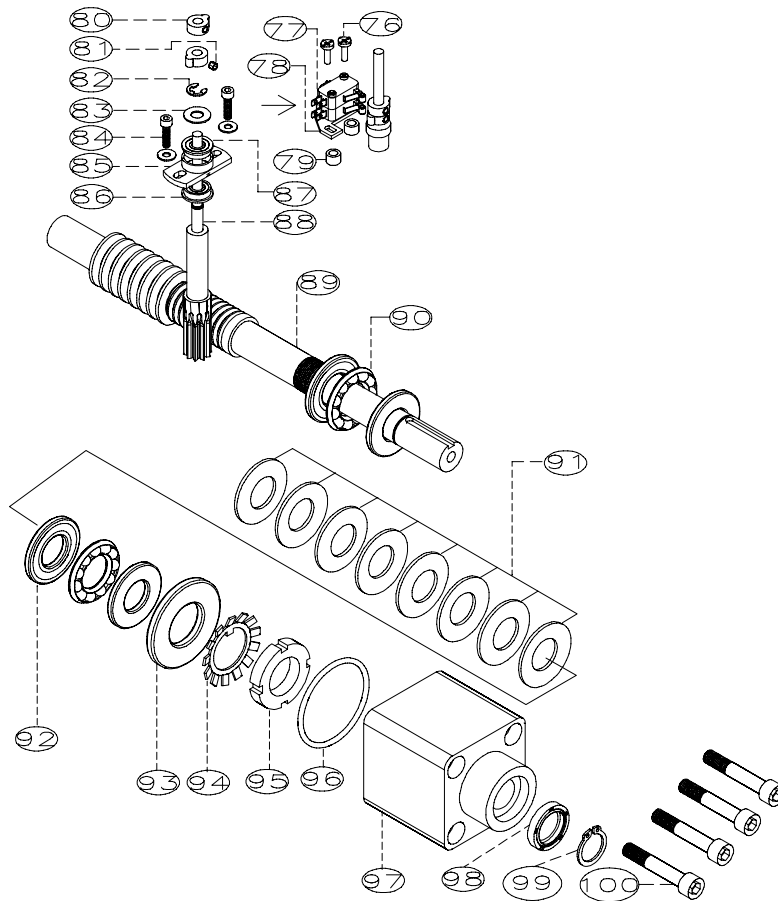
- | | | | |
|---------------------------|-----------------------|-----------------------------|-------------------------|
| 1 SCREW | 20 SCREW | 39 GEAR | 58 SPRING PIN |
| 2 MOUNTING PLATE | 21 LIMIT SWITCH | 40 BEARING | 59 O-RING |
| 3 WINDOW PROTECTION COVER | 22 MOUNTING BRACKET | 41 SNAP RING (C TYPE) | 60 BEARING |
| 4 TOP COVER | 23 SCREW | 42 GEAR | 61 BEARING |
| 5 INDICATOR WINDOW | 24 SET SCREW | 43 BEARING | 62 NUT |
| 6 COVER SCREW | 25 TRAVEL CAM | 44 DRIVE KEY | 63 WASHER |
| 7 SCREW | 26 BEARING | 45 SHAFT | 64 SOCKET END SET SCREW |
| 8 BRAKE SPRING COVER | 27 GEAR | 46 BEARING | 65 O-RING |
| 9 BRAKE SPRING | 28 DRIVE KEY | 47 BEARING | 66 BEARING |
| 10 MOTOR BRAKE (PTFE) | 29 GEAR | 48 INNER GEAR | 67 WORM GEAR SHAFT |
| 11 MOTOR | 30 BEARING | 49 SCREW | 68 HAND WHEEL |
| 12 SCREW | 31 BEARING | 50 POSITION INDICATOR | 69 DRIVE KEY |
| 13 CAPACITOR | 32 SNAP RING (C TYPE) | 51 BEARING | 70 SCREW + WASHER |
| 14 MOUNTING BRACKET | 33 DRIVE KEY | 52 PLANETARY GEAR | 71 COVER PLATE |
| 15 SCREW | 34 GEAR | 53 POSITION INDICATOR SHAFT | 72 OIL SEAL |
| 16 SCREW | 35 BEARING | 54 BEARING | 73 SOCKET HEAD SCREW |
| 17 MOUNTING PLATE | 36 SCREW | 55 SNAP RING (C TYPE) | 74 HOUSING BASE |
| 18 MOUNTING BRACKET | 37 MOUNTING PLATE | 56 BEARING | 75 OIL SEAL |
| 19 TERMINAL BLOCK | 38 SCREW | 57 OUTPUT DRIVE | |



200 SERIES
SIZE: 207 & 208 (2 OF 2)

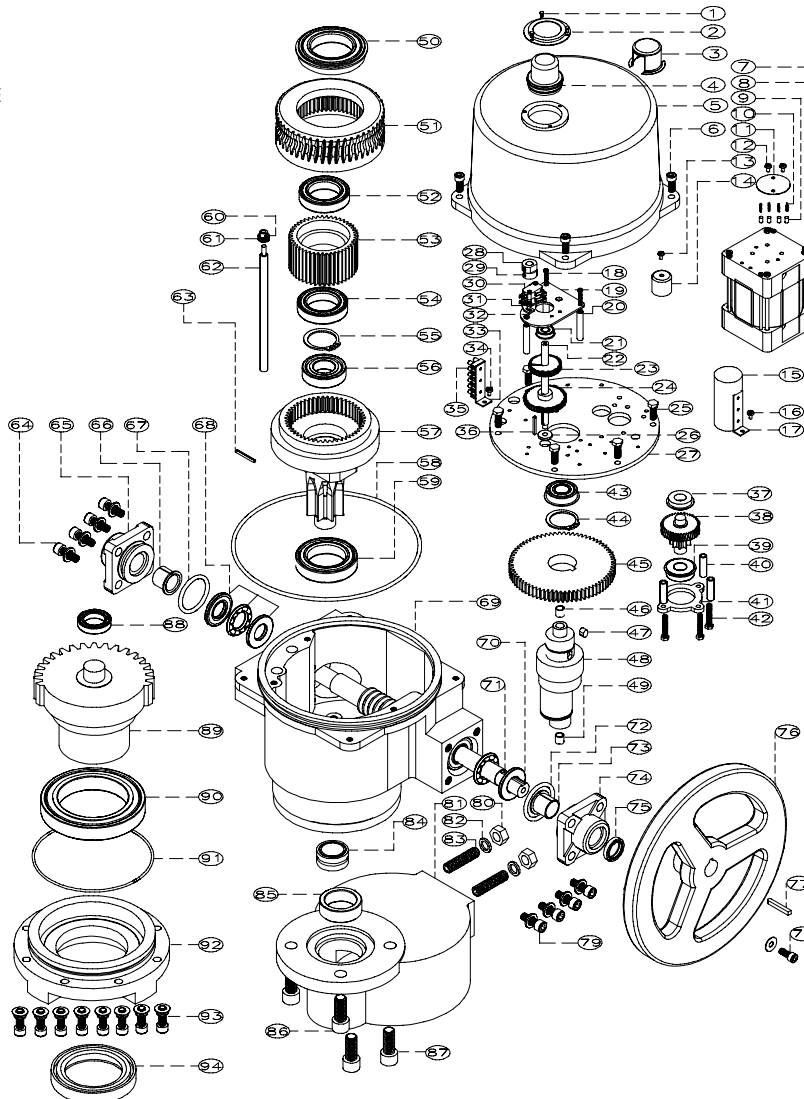
- | | |
|-------------------------|------------------------|
| 76 SCREW* | 89 WORM GEAR SHAFT |
| 77 TORQUE LIMIT SWITCH* | 90 BEARING |
| 78 MOUNTING PLATE* | 91 SPRING WASHER* |
| 79 SPACER* | 92 BEARING* |
| 80 TORQUE CAM* | 93 BUSHING* |
| 81 SCREW* | 94 WASHER* |
| 82 SNAP RING (E TYPE)* | 95 NUT* |
| 83 WASHER* | 96 O-RING* |
| 84 SCREW* | 97 FIXED SEAT* |
| 85 MOUNTING PLATE* | 98 OIL SEAL* |
| 86 BEARING* | 99 SNAP RING (C TYPE)* |
| 87 BEARING* | 100 SOCKET HEAD SCREW* |
| 88 TORQUE DRIVE SHAFT* | |

* OPTIONAL



200 SERIES
SIZE: 210 & 212 (1 OF 2)

- | | | | |
|---------------------------|-----------------------|-----------------------------|-----------------------|
| 1 SCREW | 32 MOUNTING PLATE | 54 BEARING | 75 OIL SEAL |
| 2 MOUNTING PLATE | 33 MOUNTING BRACKET | 55 SNAP RING (C TYPE) | 76 HAND WHEEL |
| 3 WINDOW PROTECTION COVER | 34 SCREW | 56 BEARING | 77 DRIVE KEY |
| 4 INDICATOR WINDOW | 35 TERMINAL BLOCK | 57 OUTPUT GEAR | 78 SCREW + WASHER |
| 5 TOP COVER | 36 DRIVE KEY | 58 O-RING | 79 SCREW |
| 6 COVER SCREW | 37 BEARING | 59 BEARING | 80 NUT |
| 7 MOTOR | 38 GEAR | 60 SCREW | 81 OUTPUT BASE |
| 8 SCREW | 39 BEARING | 61 GEAR | 82 WASHER |
| 9 MOTOR BRAKE (PTFE) | 40 SHAFT | 62 POSITION INDICATOR SHAFT | 83 SCREW |
| 10 BRAKE SPRING | 41 MOUNTING PLATE | 63 PIN | 84 BEARING |
| 11 BRAKE SPRING COVER | 42 SCREW | 64 SCREW | 85 BUSHING |
| 12 SCREW | 43 BEARING | 65 COVER PLATE | 86 SCREW |
| 13 SCREW | 44 SNAP RING (C TYPE) | 66 BEARING | 87 SCREW |
| 14 POSITION INDICATOR | 45 GEAR | 67 O-RING | 88 BEARING |
| 15 CAPACITOR | 46 BEARING | 68 BEARINGS | 89 OUTPUT GEAR |
| 16 SCREW | 47 DRIVE KEY | 69 HOUSING BASE | 90 BEARING |
| 17 MOUNTING BRACKET | 48 BEARING SHAFT | 70 BEARING | 91 O-RING |
| 18 SCREW | 49 BEARING | 71 WORM GEAR SHAFT | 92 OUTPUT BASE FLANGE |
| 19 MOUNTING PLATE | 50 BEARING | 72 O-RING | 93 SCREW |
| 20 SHAFT | 51 INNER GEAR | 73 BEARING | 94 OIL SEAL |
| 21 BEARING | 52 BEARING | 74 MOUNTING PLATE | |
| 22 SHAFT | 53 PLANETARY GEAR | | |



200 SERIES
SIZE: 210 & 212 (2 OF 2)

- | | |
|-------------------------|---------------------|
| 95 SCREW* | 110 BUSHING* |
| 96 TORQUE LIMIT SWITCH* | 111 O-RING* |
| 97 MOUNTING PLATE* | 112 MOUNTING PLATE* |
| 98 SPACER* | 113 SCREW |
| 99 TORQUE CAM* | 114 O-RING |
| 100 SET SCREW* | 115 WASHER |
| 101 SNAP RING (E TYPE)* | 116 WASHER |
| 102 WASHER* | 117 OIL SEAL* |
| 103 SCREW* | 118 WORM GEAR SHAFT |
| 104 MOUNTING PLATE* | 119 COVER PLATE |
| 105 BEARING* | 120 BUSHING |
| 106 BEARING* | 121 BEARING |
| 107 TORQUE DRIVE SHAFT* | 122 SPRING |
| 108 SPRING* | 123 SCREW* |
| 109 BEARING* | |

* OPTIONAL

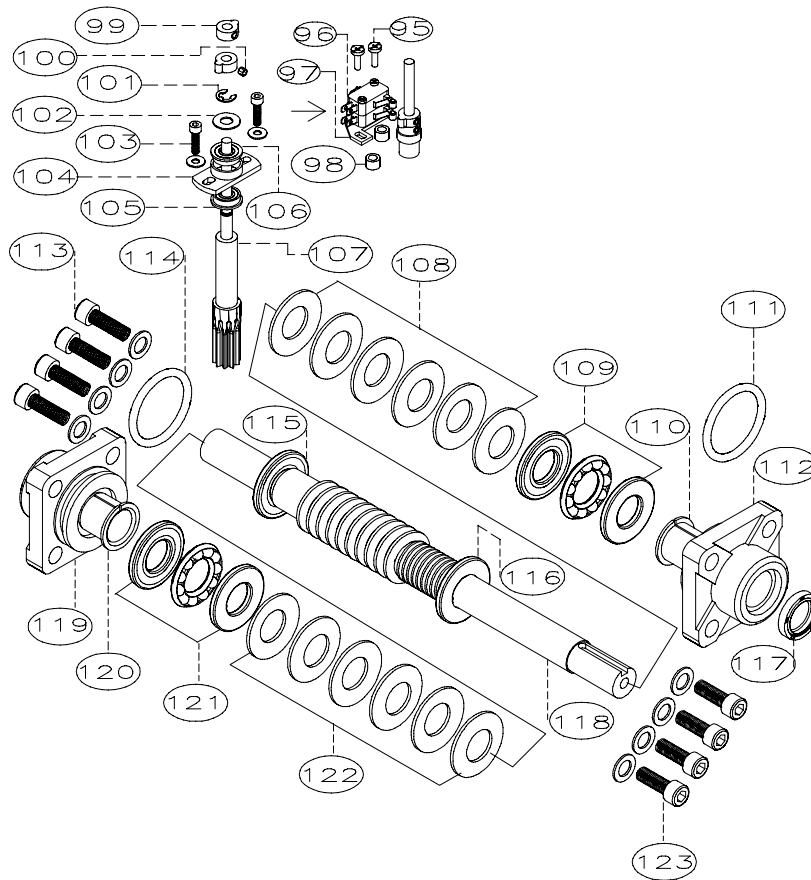
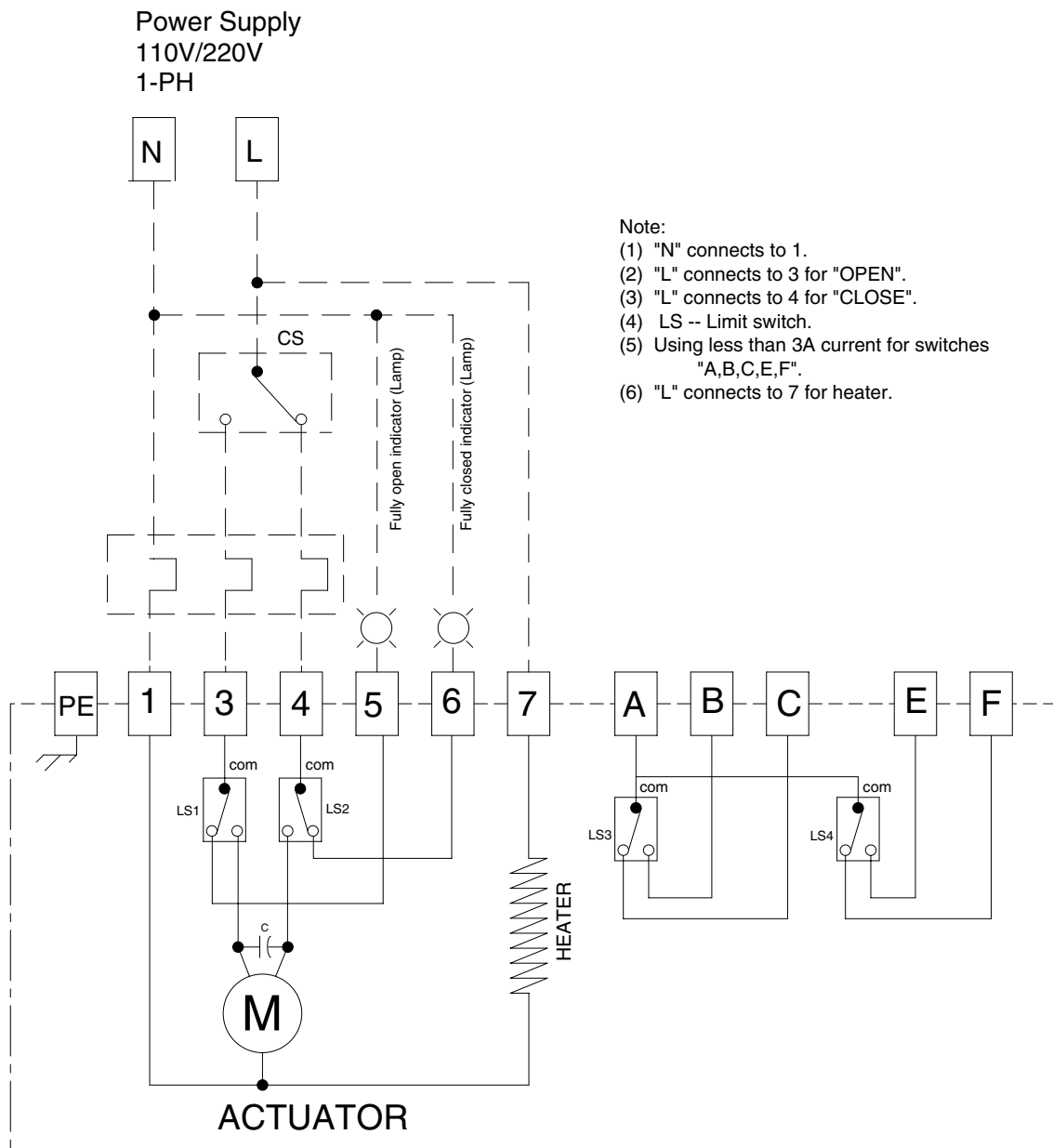


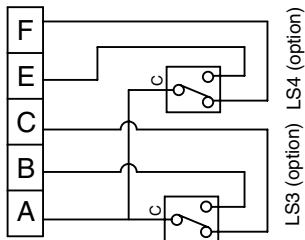
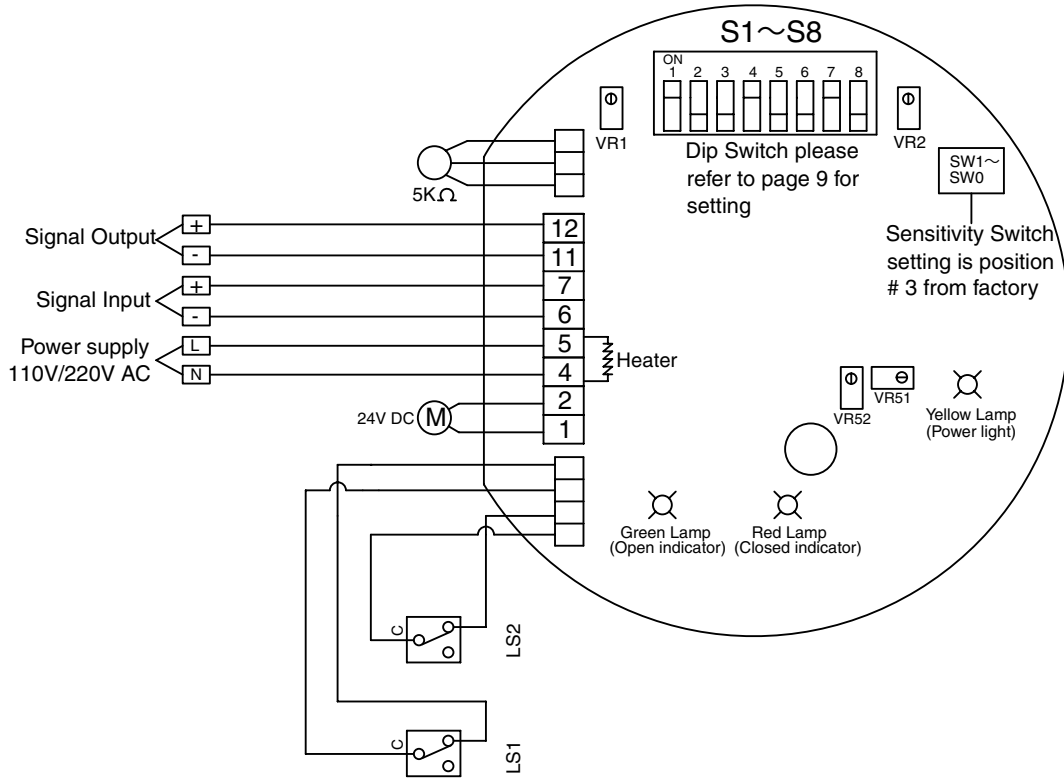
DIAGRAM ABBREVIATIONS

1. MC1 and MC2: Electromagnetic Contactor
2. Duty Cycle: our standard modulating type
200 Series-207 is 75% duty cycle and
200 Series-212 is 50% duty cycle.
3. PE - Actuator grounding connection.
4. LS1 & 2 - Open & Close travel limit switches.
LS3 & 4 - Aux travel indication switches
(voltage free contacts)
5. TS1 & 2 - Open & Close overtorque switches (optional)
6. C.S. - Control Switch (customer supplied)

WIRING DIAGRAM 201E2AXXXX / 200 SERIES / 201 SIZE 110V / 220V AC 1-PH / ON-OFF SERVICE



**WIRING DIAGRAM 201EMAXXXX / 200 SERIES / 201 SIZE 110V/220V AC 1-PH /
 MODULATING SERVICE**

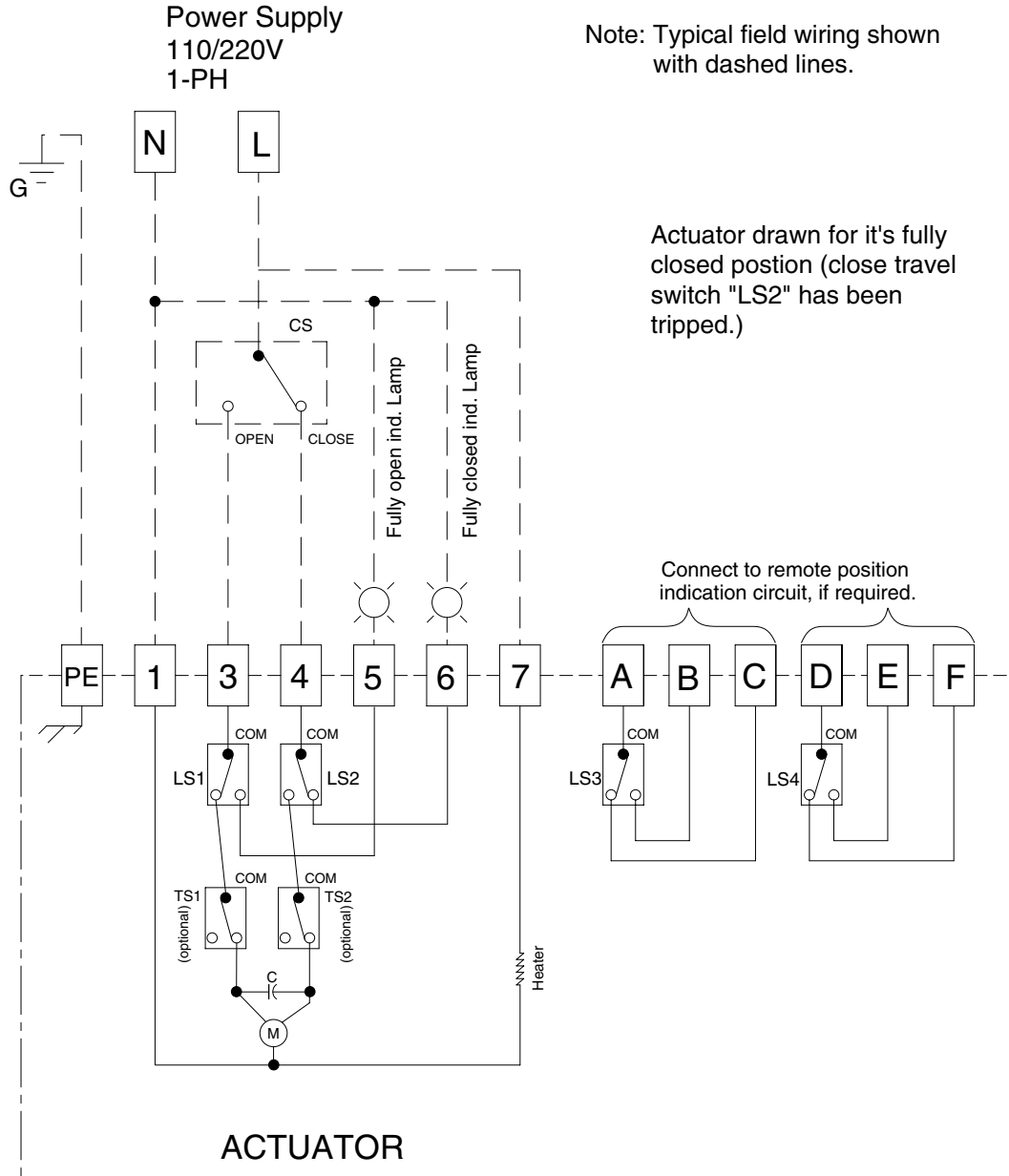


Fully Open	A to B
Fully Close	A to E

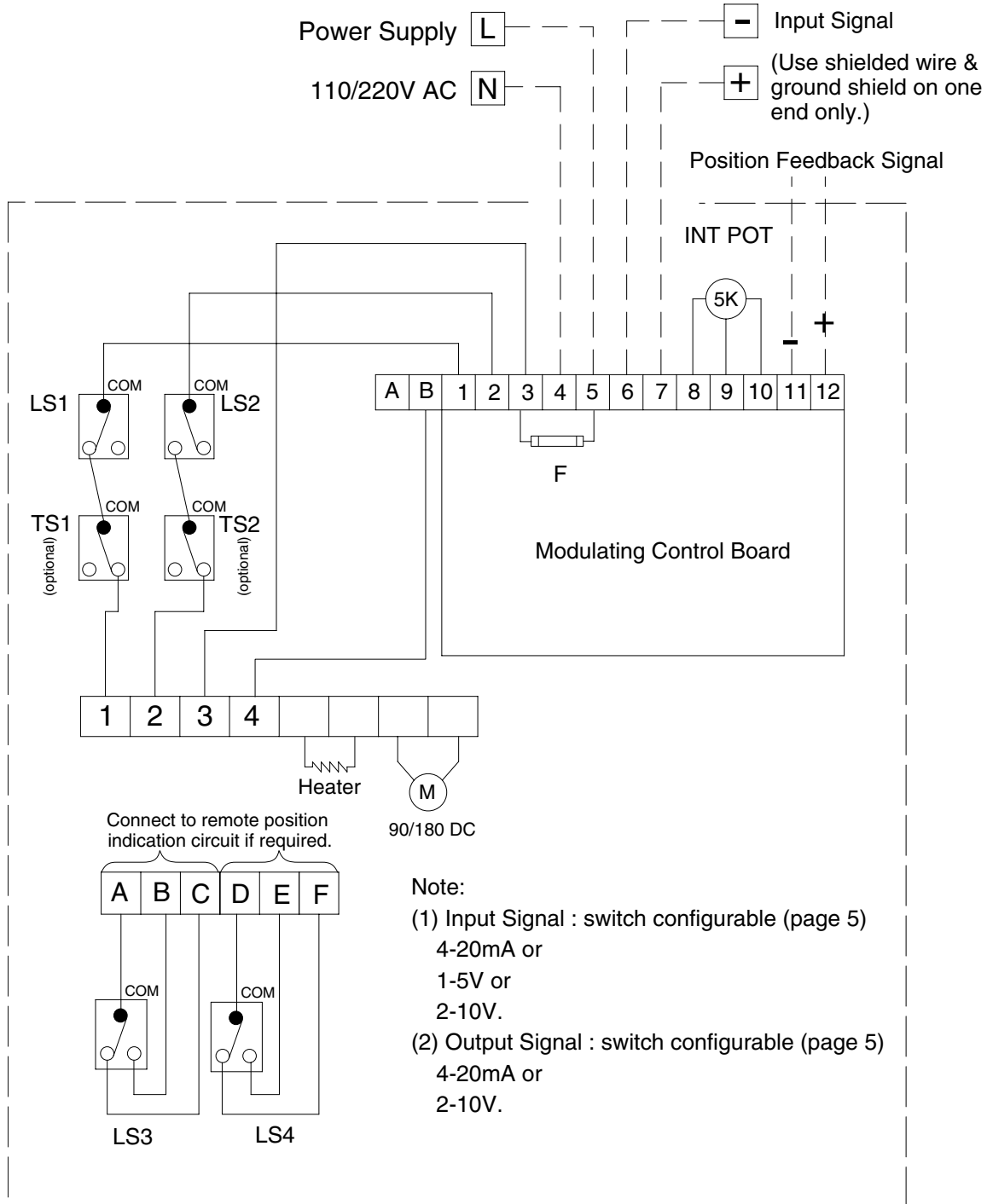
Note:

- (1) Input Signal :
 4-20mA
 1-5V
 2-10V
- (2) Output Signal :
 4-20mA
 2-10V
- (3) Using less than 3A current for switches "A,B,C,E,F".

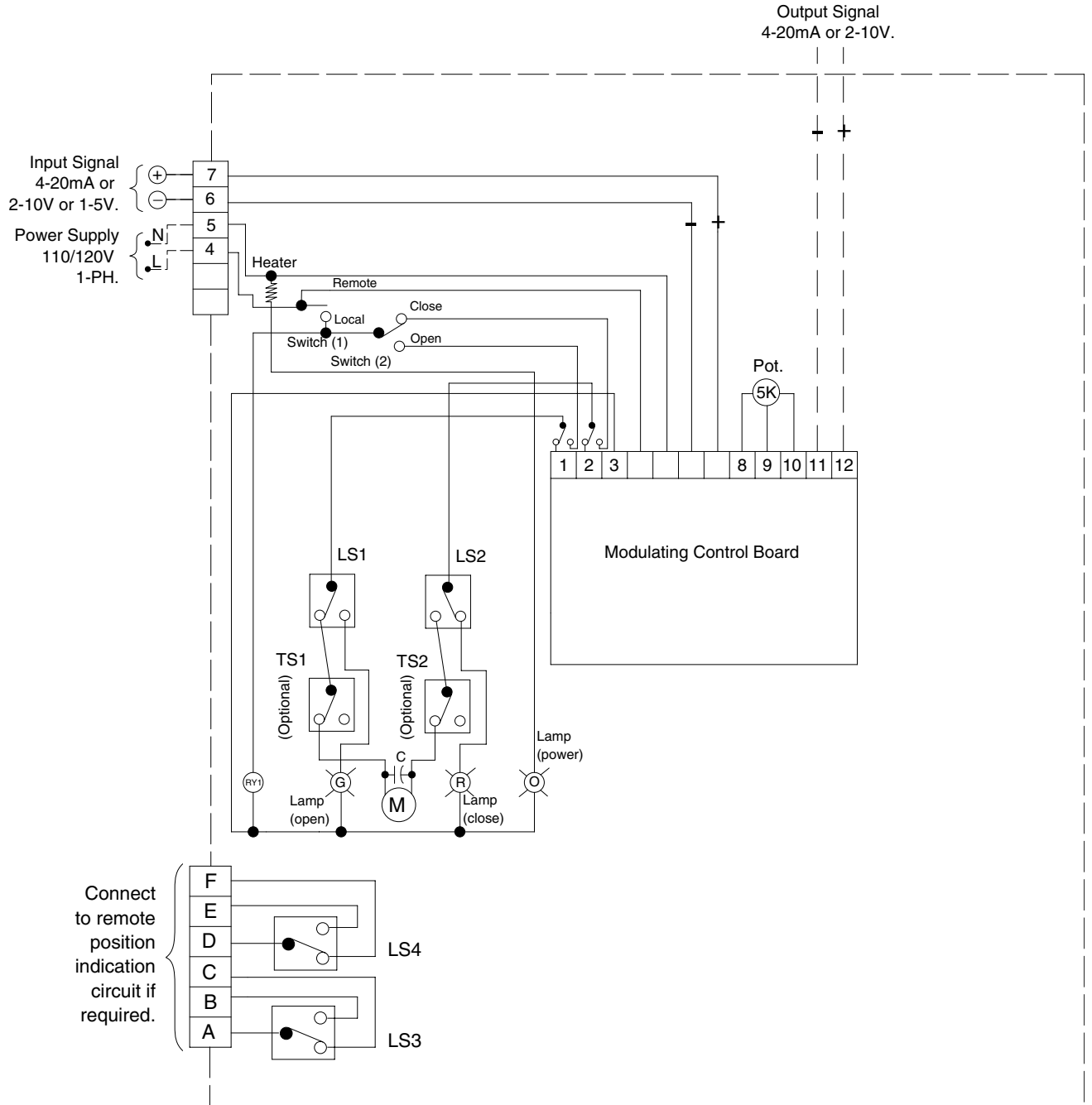
WIRING DIAGRAM 202E2AXXXX / 200 SERIES / 202-212 SIZES 110V/220V AC 1-PH / ON-OFF SERVICE



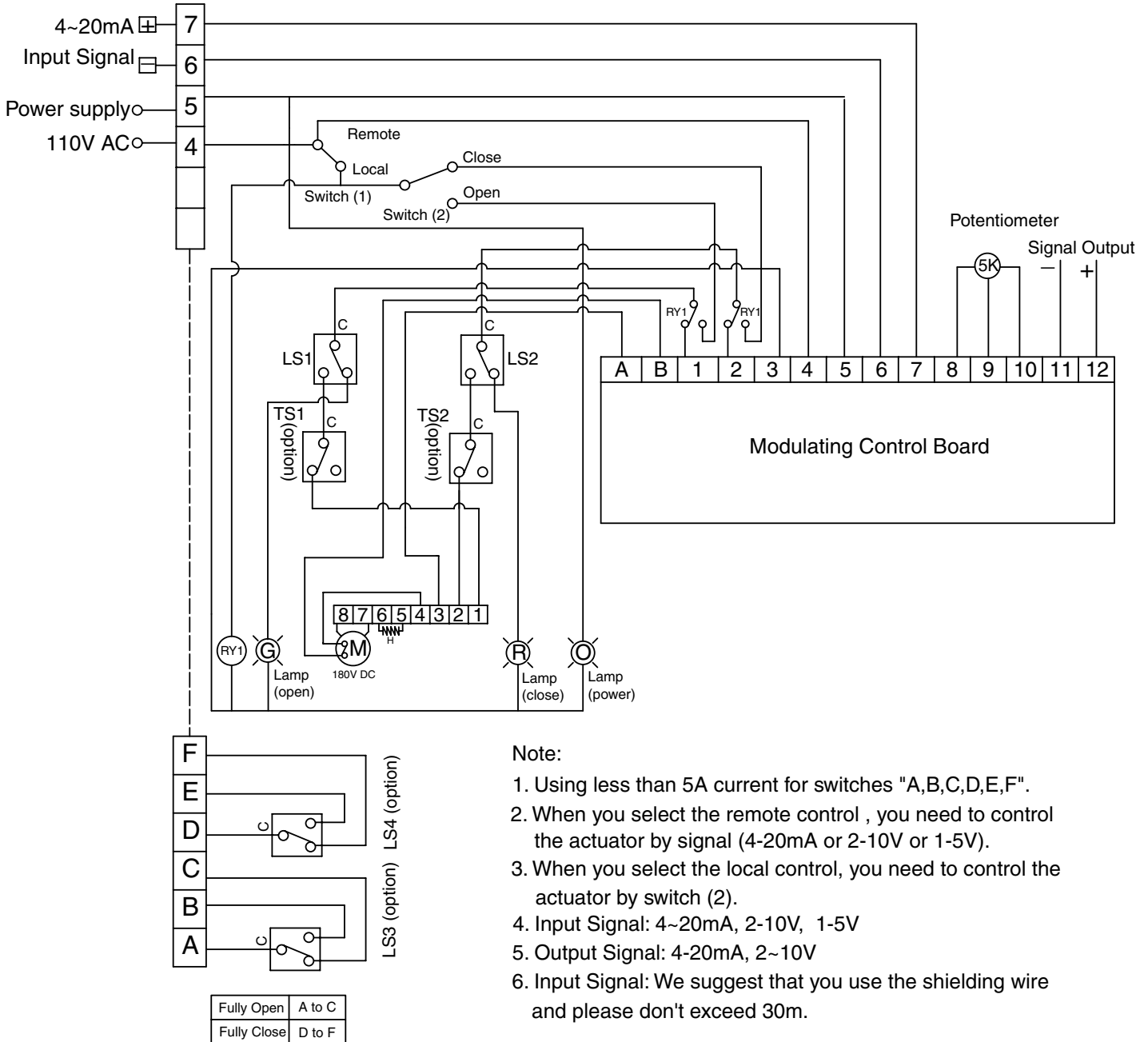
**WIRING DIAGRAM 202EMAXXXX / 200 SERIES / 202-212 SIZES 110V/220V AC 1-PH /
 MODULATING SERVICE**



**WIRING DIAGRAM 202EMAXXX2 / 200 SERIES / 202-208 SIZES 110V/220V AC 1-PH /
MODULATING SERVICE / LOCAL / REMOTE SELECTOR SWITCH**



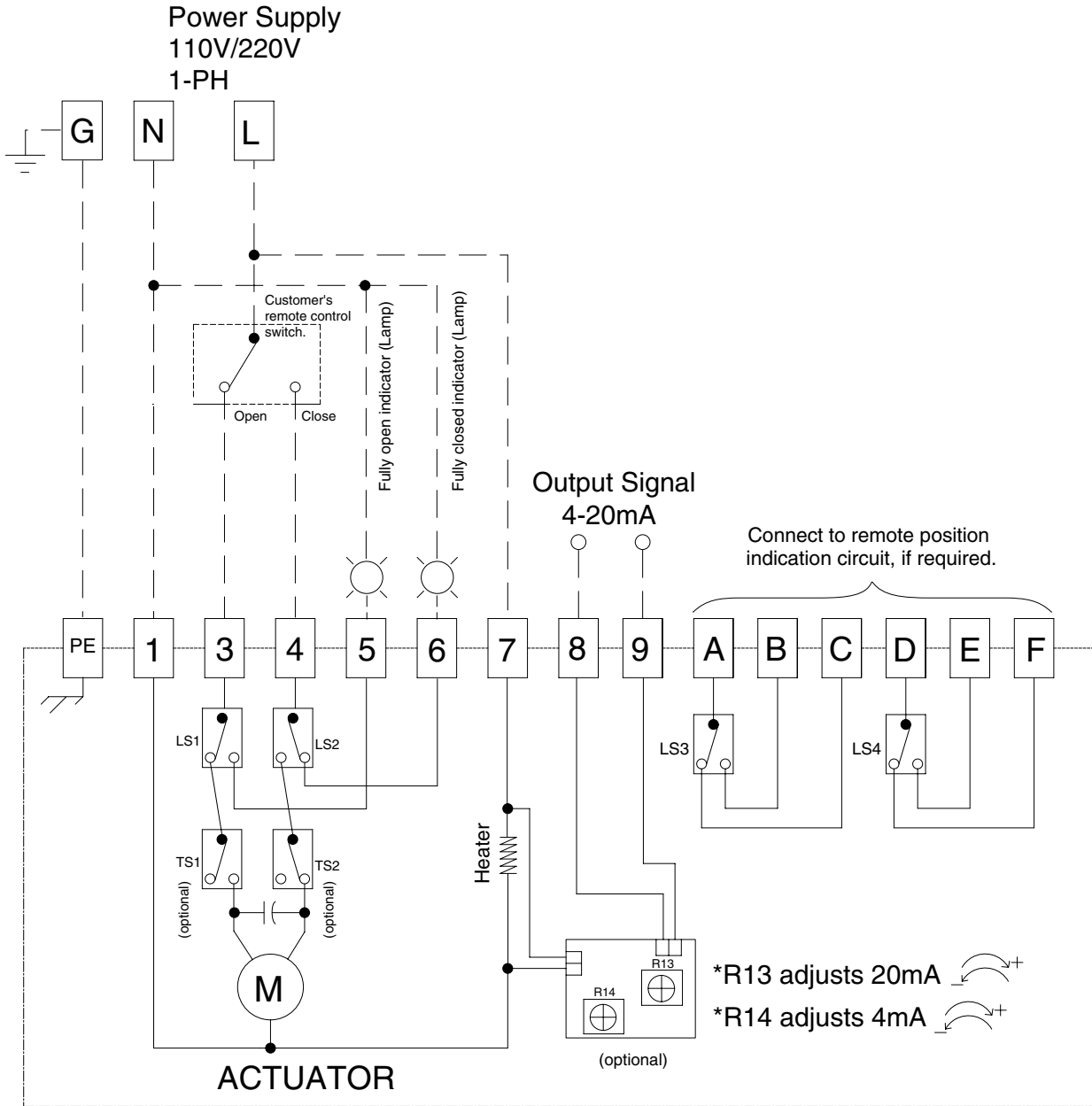
**WIRING DIAGRAM 210EMAXX2 / 200 SERIES / 210-212 SIZES 110V/220V AC 1-PH /
 MODULATING SERVICE / LOCAL / REMOTE SELECTION SWITCH**



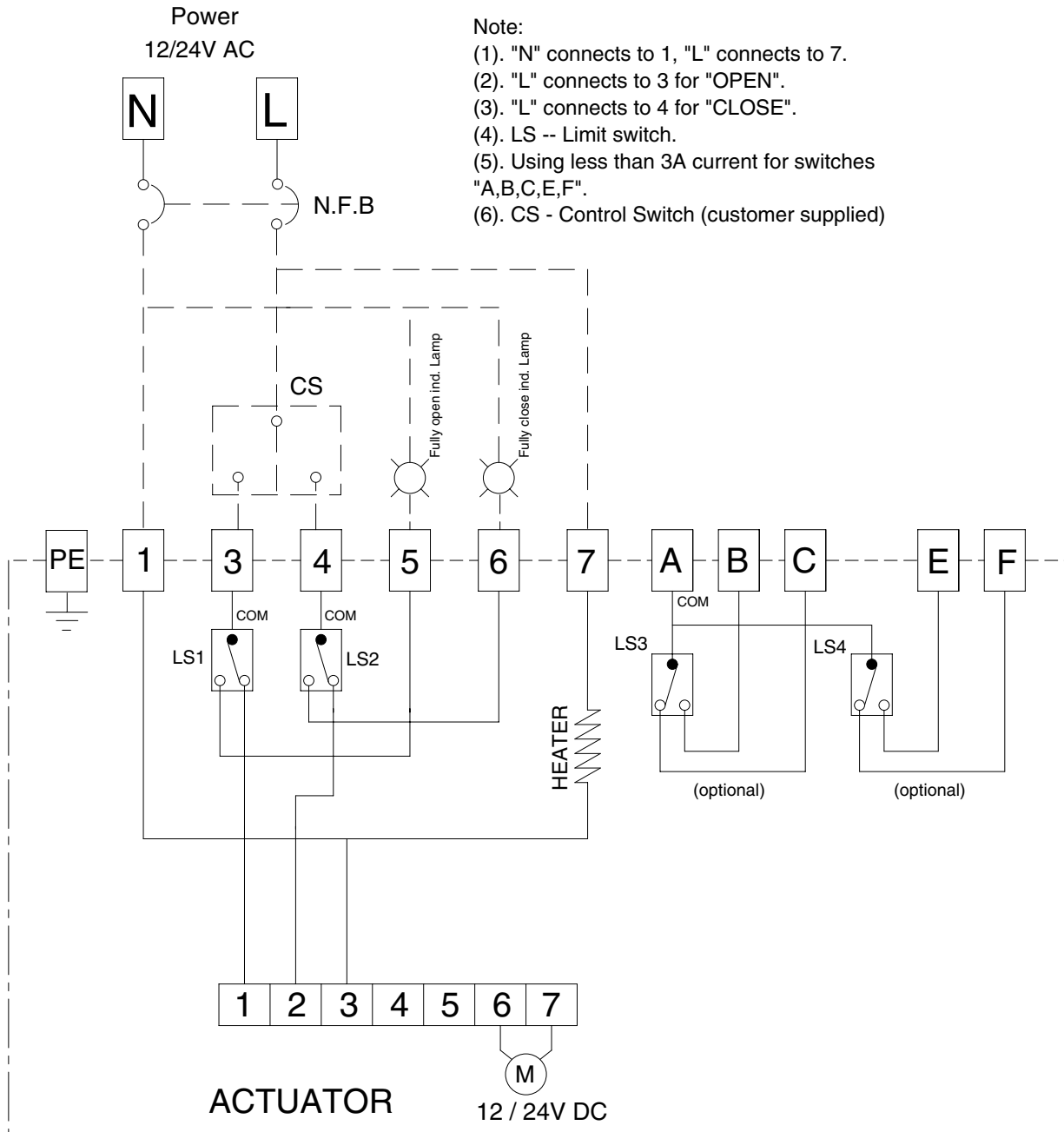
Note:

1. Using less than 5A current for switches "A,B,C,D,E,F".
2. When you select the remote control , you need to control the actuator by signal (4-20mA or 2-10V or 1-5V).
3. When you select the local control, you need to control the actuator by switch (2).
4. Input Signal: 4~20mA, 2-10V, 1-5V
5. Output Signal: 4-20mA, 2~10V
6. Input Signal: We suggest that you use the shielding wire and please don't exceed 30m.

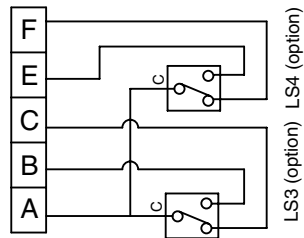
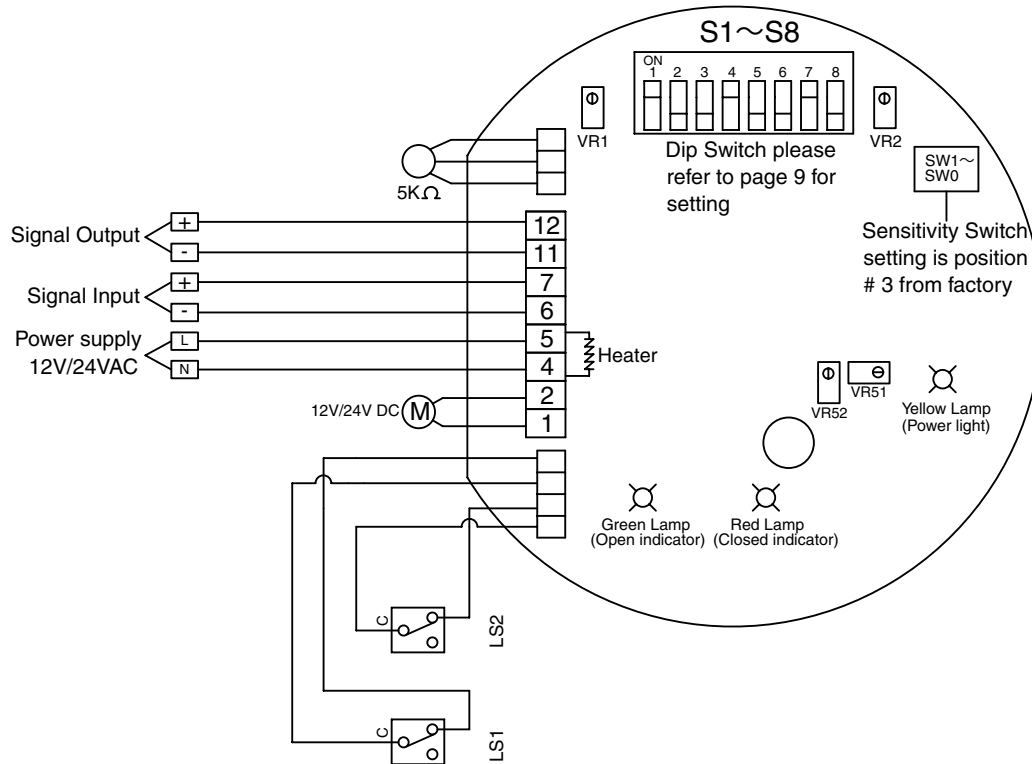
WIRING DIAGRAM 202E2AFBXX / 200 SERIES / 202-212 SIZES 110V/220V AC 1-PH / ON-OFF SERVICE / 4-20mA OUTPUT SIGNAL



WIRING DIAGRAM 201E2BXXXX / 200 SERIES / 201 SIZE 12V/24V AC / ON-OFF SERVICE



WIRING DIAGRAM 201EMAXXXX / 200 SERIES / 201 SIZE 110V/220V AC / MODULATING SERVICE

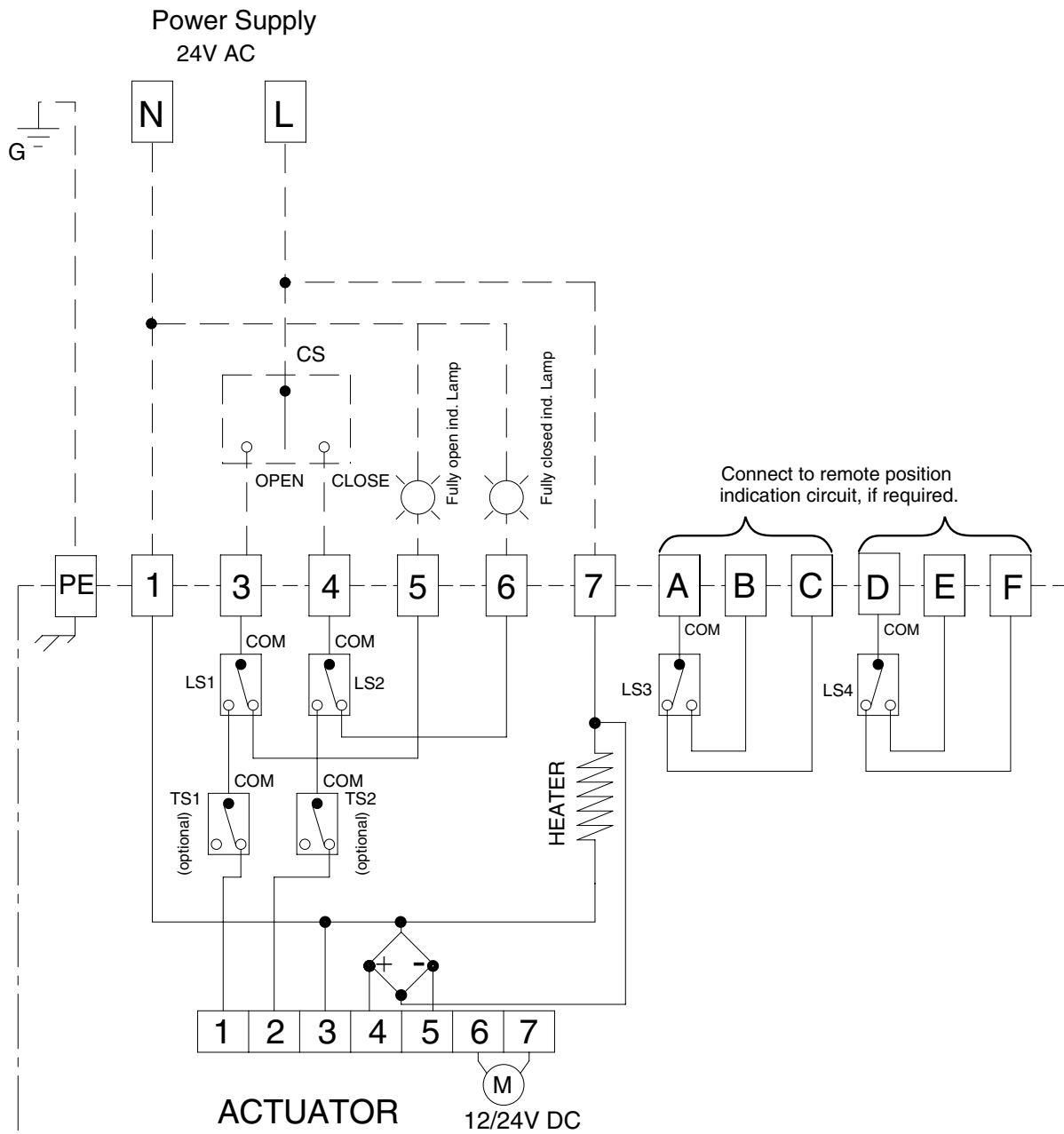


Fully Open	A to B
Fully Close	A to E

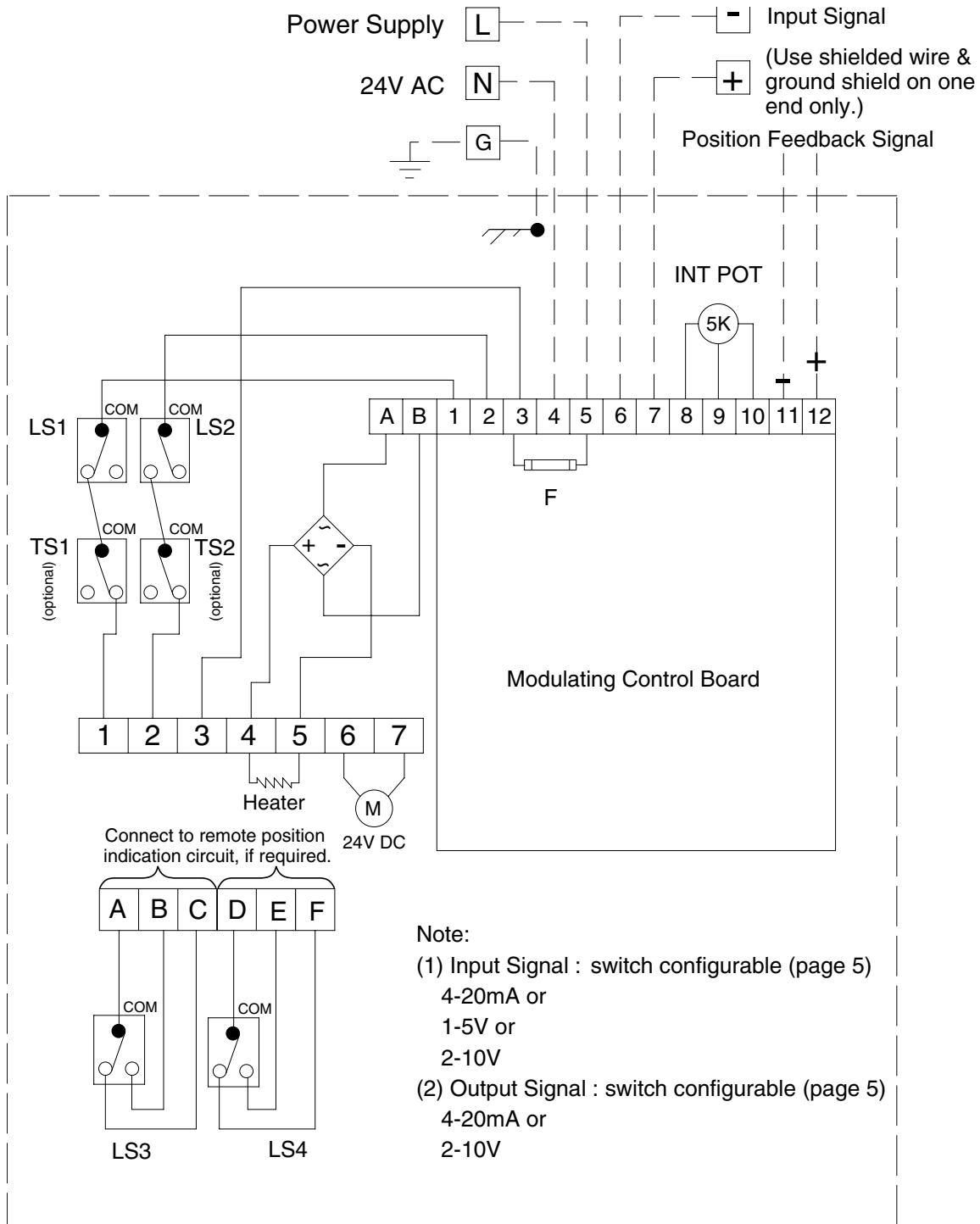
Note:

- (1) Input Signal :
4-20mA
1-5V
2-10V
- (2) Output Signal :
4-20mA
2-10V
- (3) Using less than 3A current for switches "A,B,C,E,F".

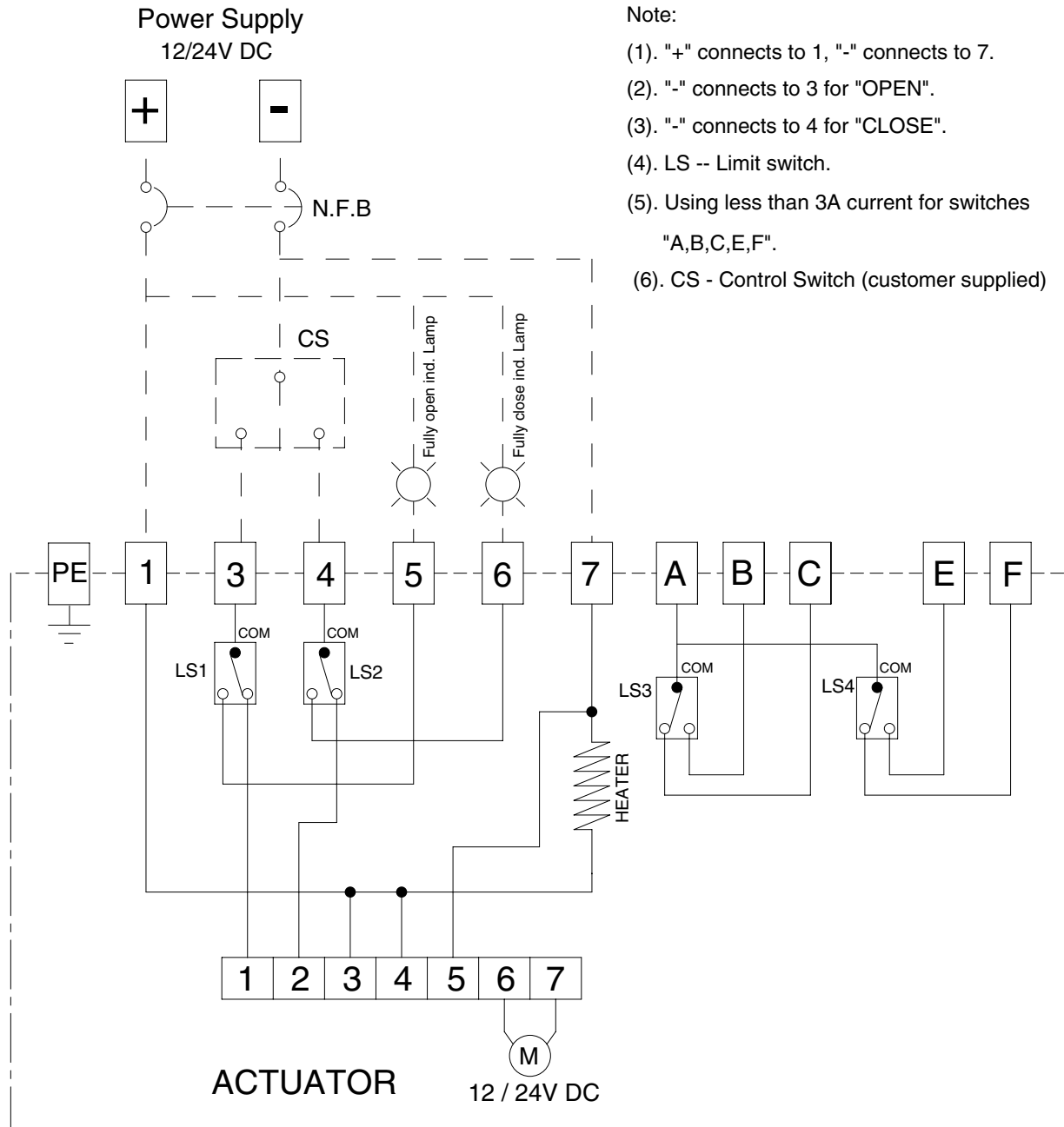
WIRING DIAGRAM 202E2BXXXX / 200 SERIES / 202-212 SIZES 12V/24V AC / ON-OFF SERVICE



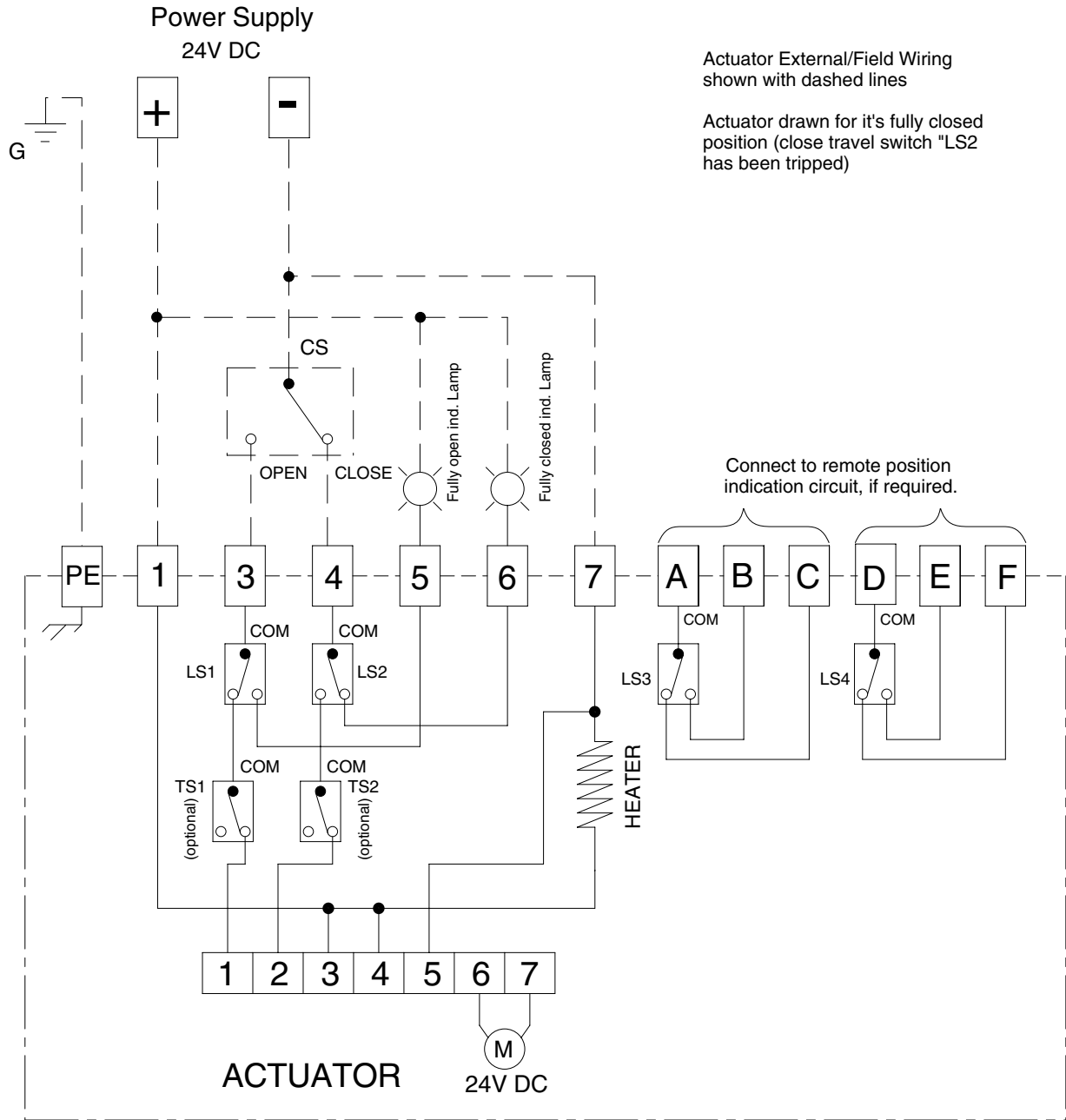
**WIRING DIAGRAM 202EMBXXX / 200 SERIES / 202-212 SIZES 12V/24V AC /
MODULATING SERVICE**



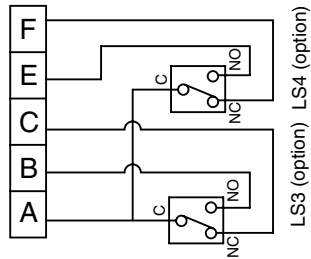
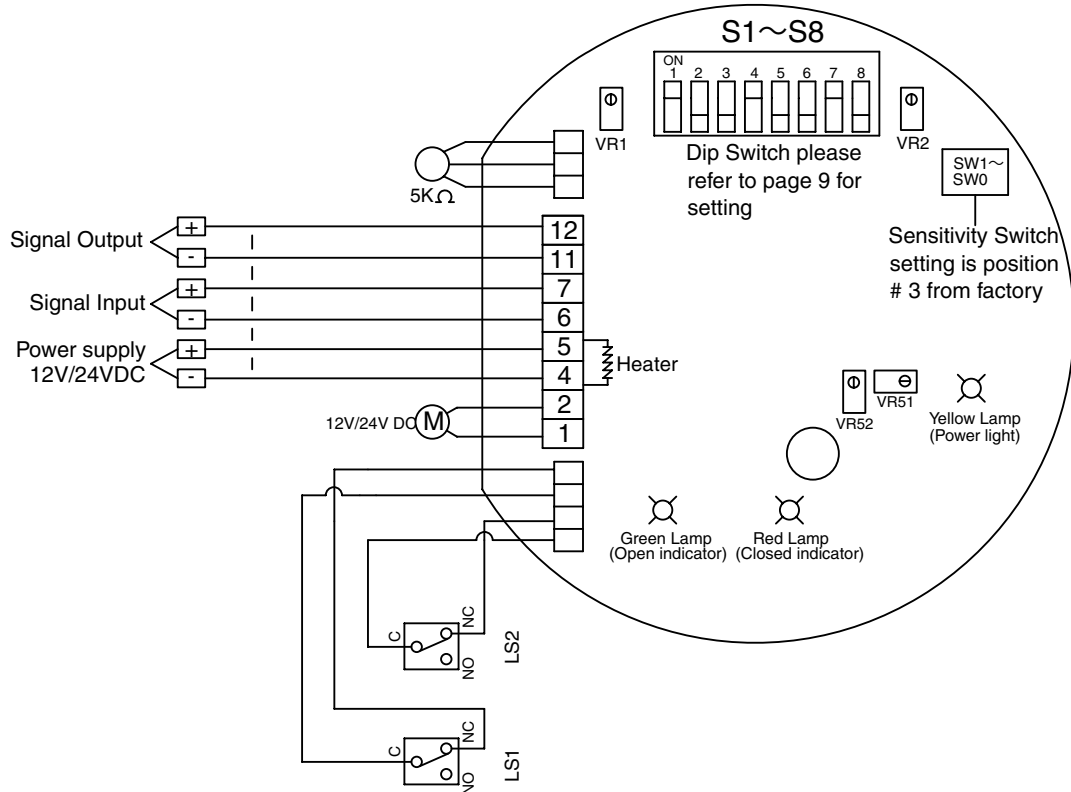
WIRING DIAGRAM 201E2EXXX / 200 SERIES / 201 SIZE 12V/24V DC / ON-OFF SERVICE



WIRING DIAGRAM 202E2EXXXX / 200 SERIES / 202-212 SIZES 24V DC / ON-OFF SERVICE



WIRING DIAGRAM 201EMCXXXX / 200 SERIES / 201 SIZE 12V/24V DC / MODULATING SERVICE

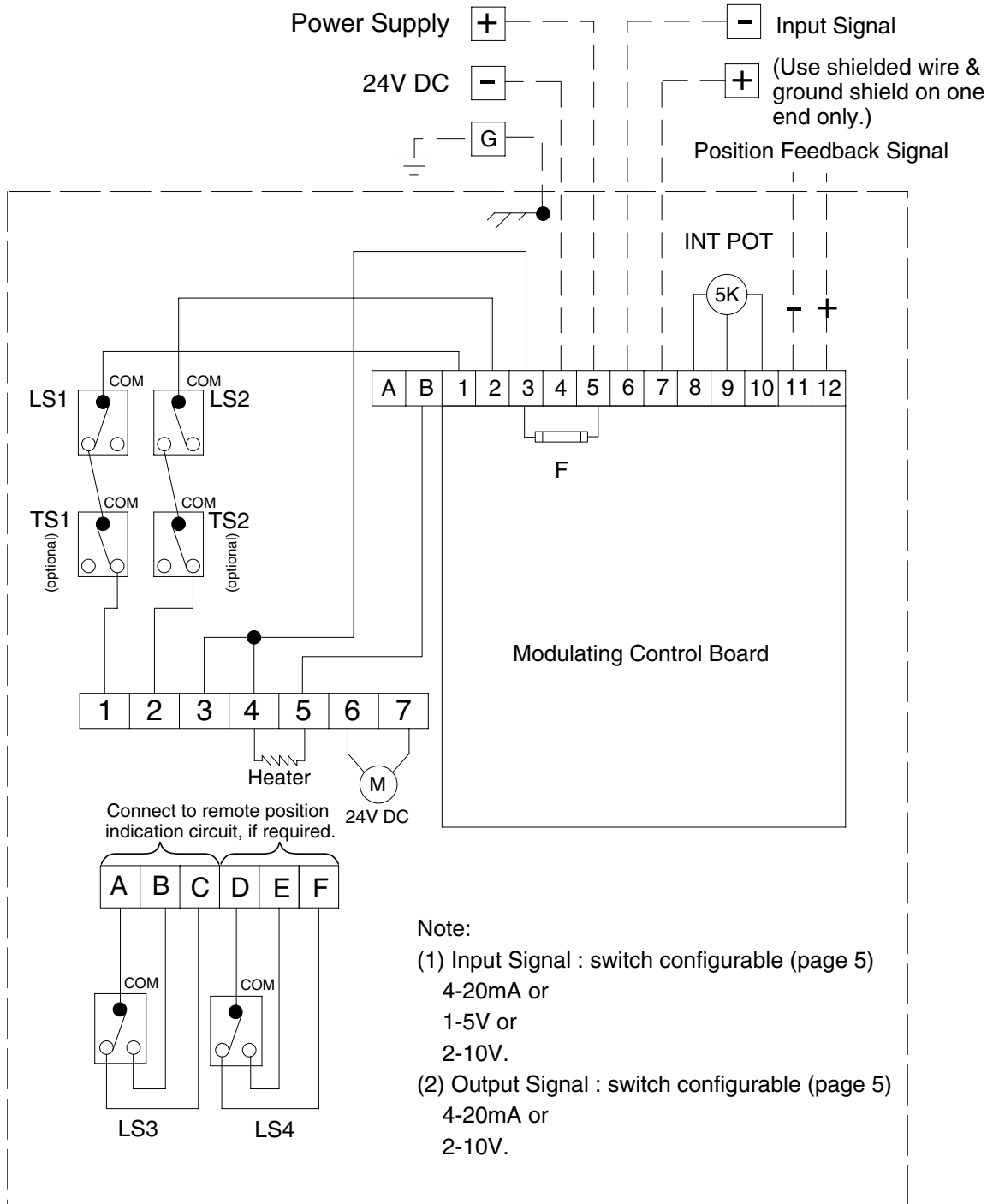


Fully Open	A to B
Fully Close	A to E

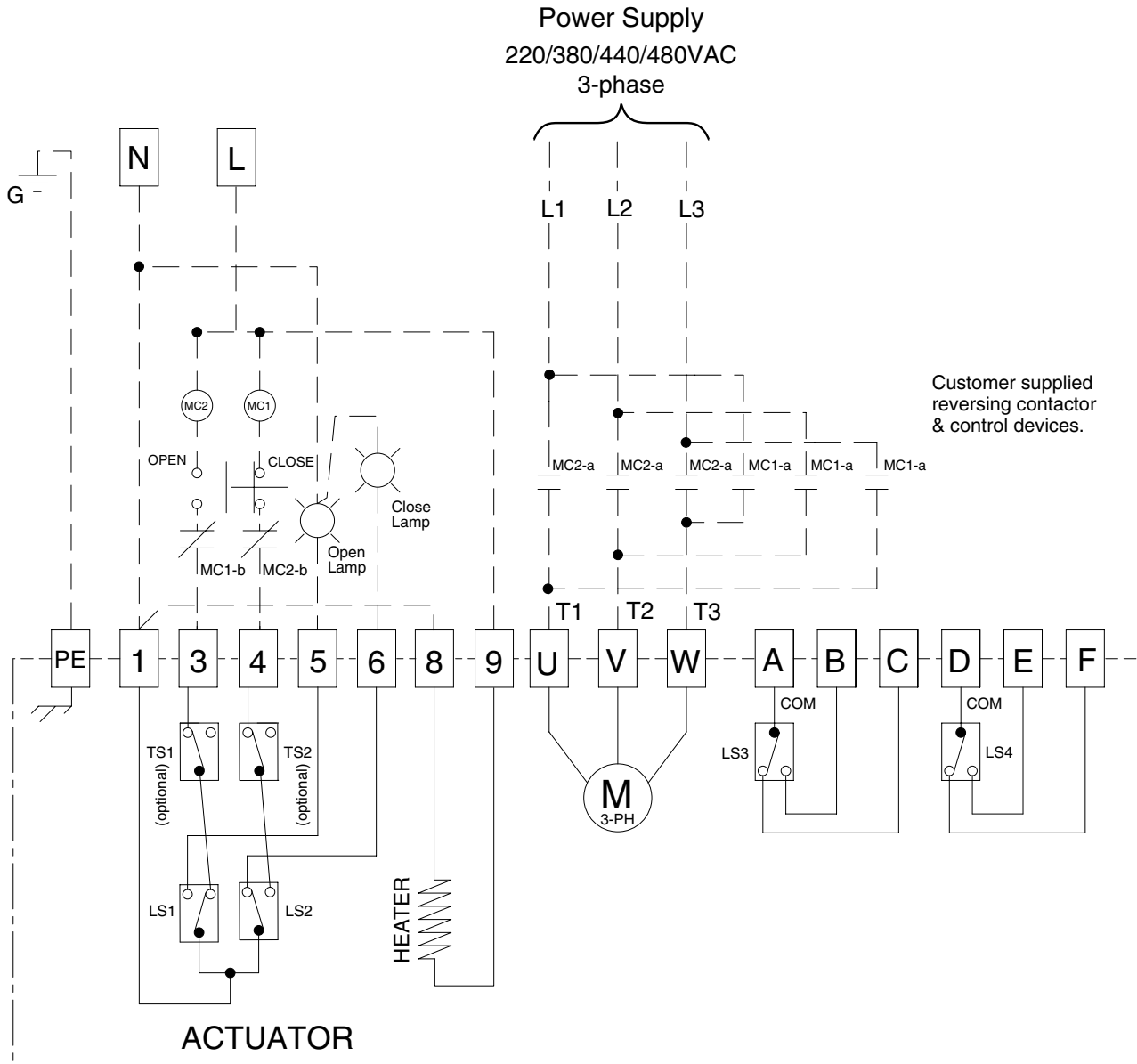
Note:

- (1) Input Signal :
 4-20mA
 1-5V
 2-10V
- (2) Output Signal :
 4-20mA
 2-10V
- (3) Using less than 3A current for switches "A,B,C,E,F".

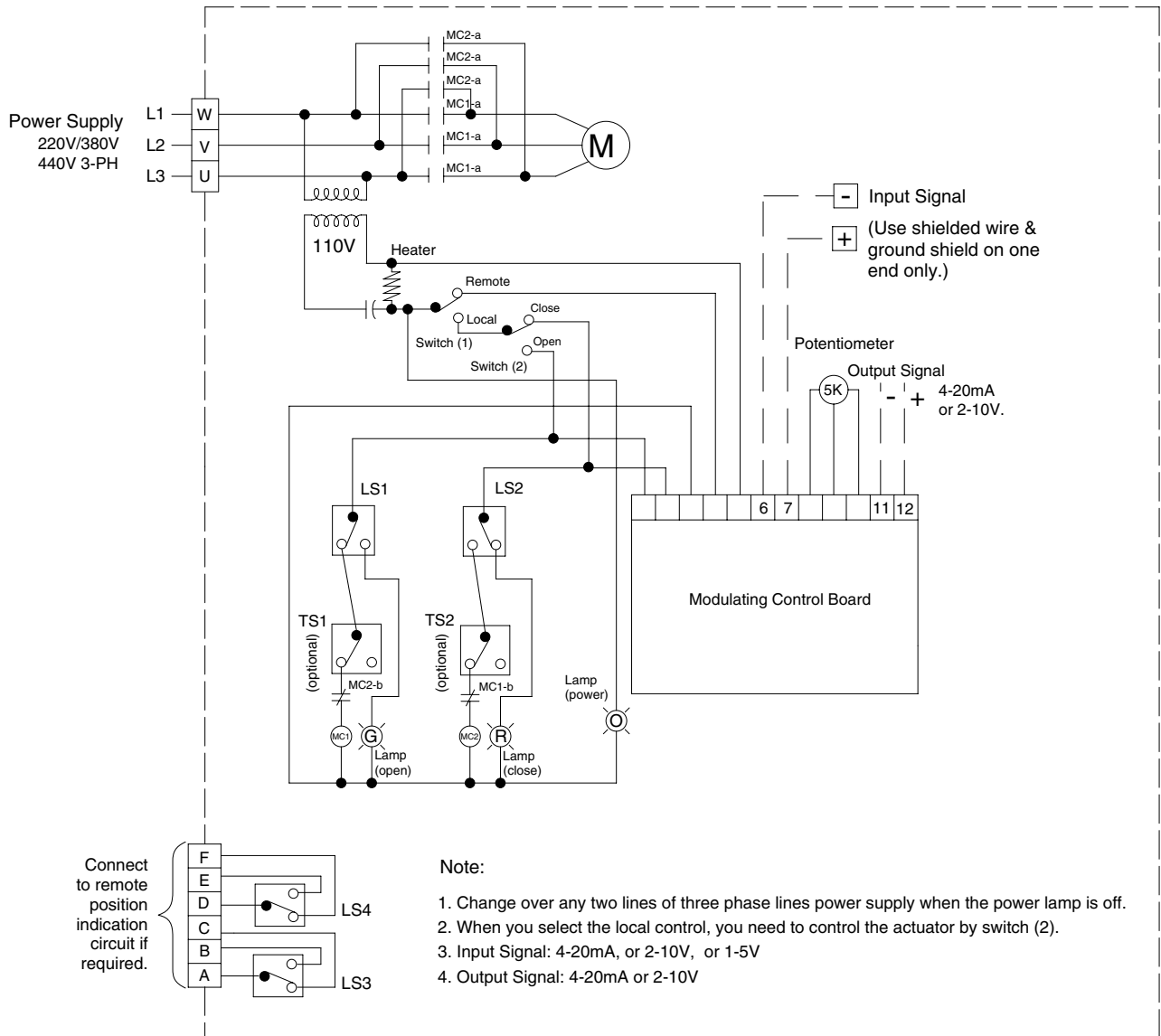
**WIRING DIAGRAM 202EMCXXX / 200 SERIES / 202-212 SIZE 12V/24V DC /
MODULATING SERVICE**



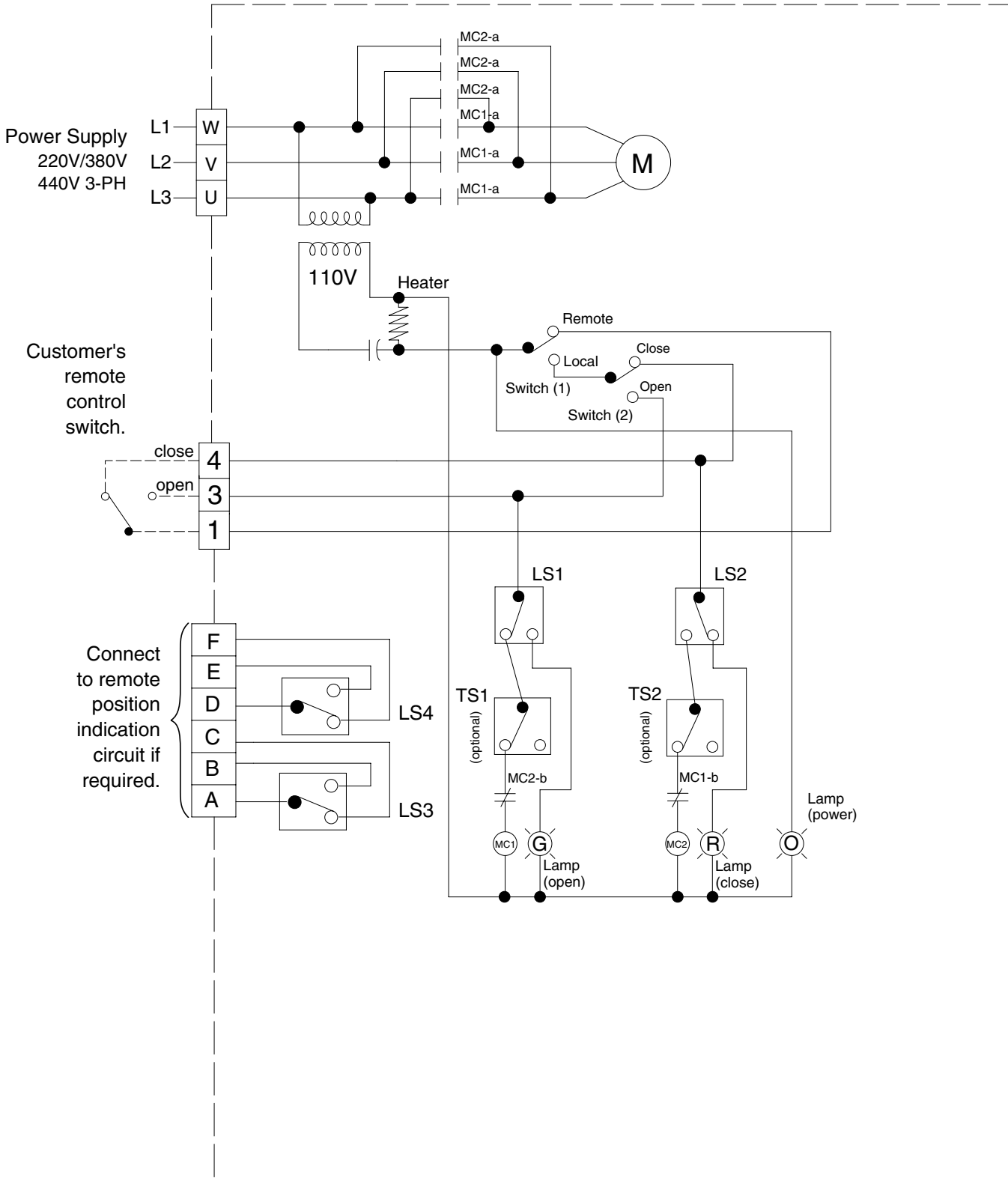
WIRING DIAGRAM 202E2EXXXX / 200 SERIES / 202-212 SIZES 220V/380V/440V/480V AC 3-PH / ON-OFF SERVICE



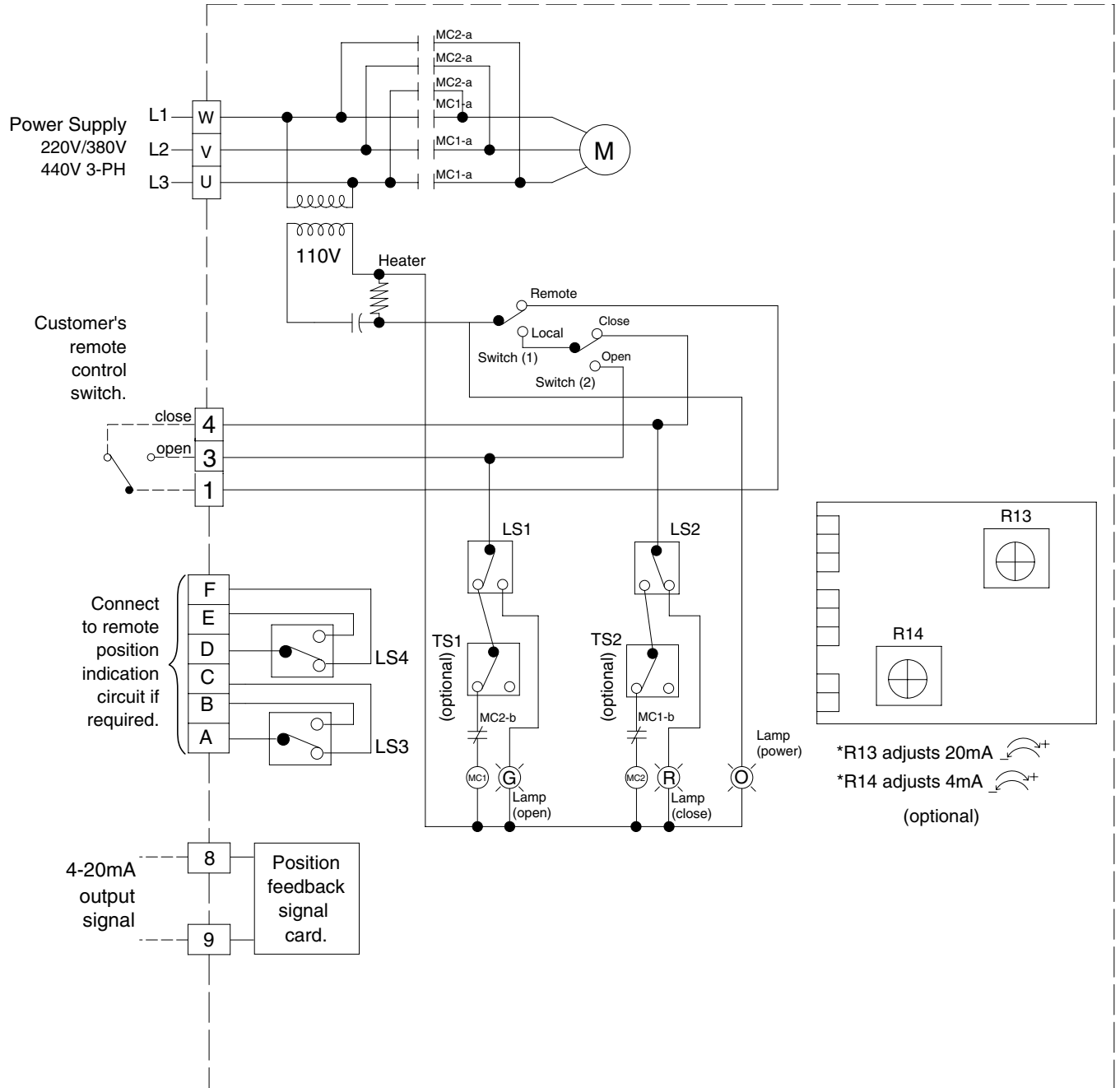
**WIRING DIAGRAM 202EMEXXX / 200 SERIES / 202-212 SIZES 220V/380V/440V 3-PH /
MODULATING SERVICE**



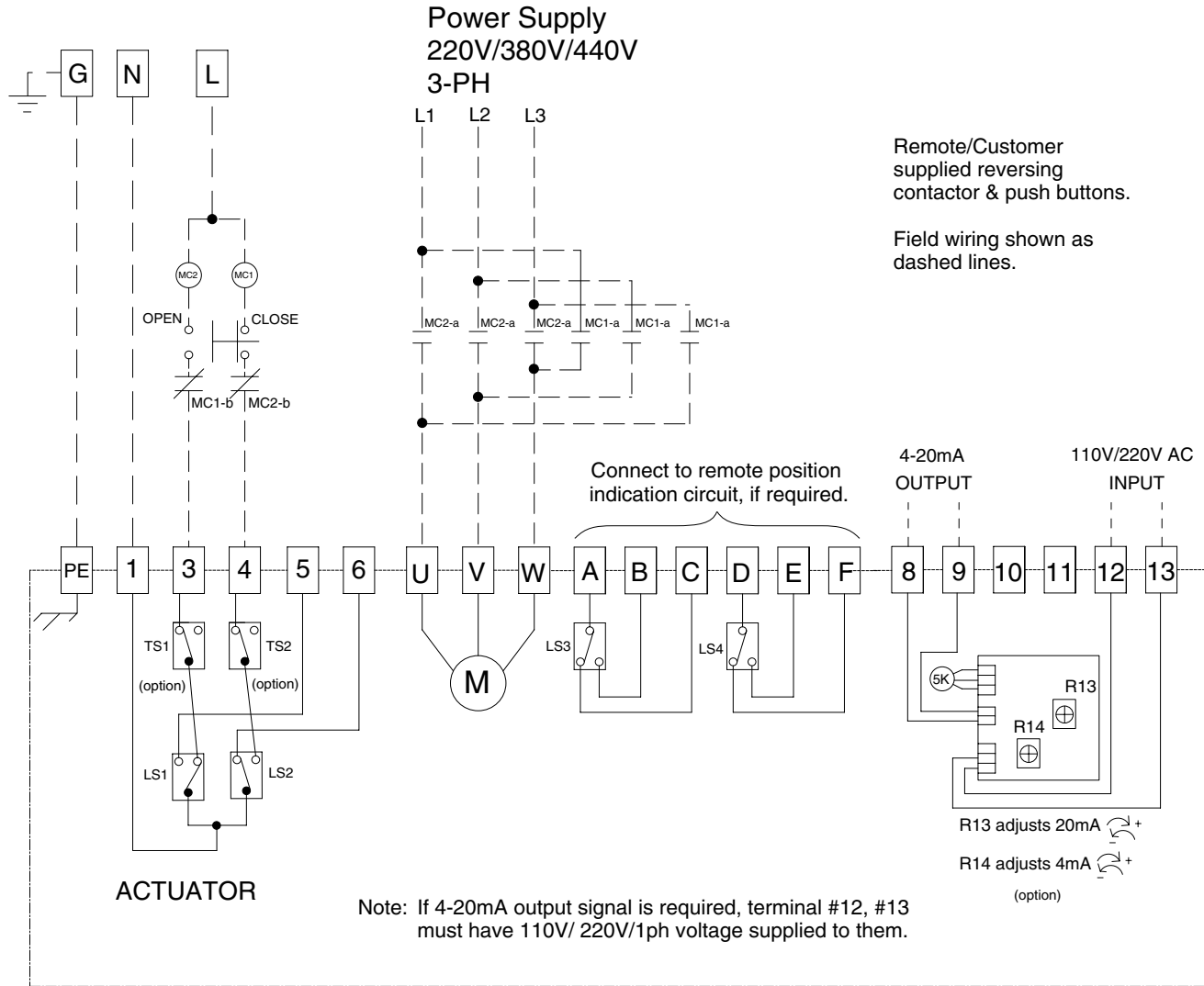
**WIRING DIAGRAM 202E2EFBX2 / 200 SERIES / 202-212 SIZES 220V/380V/440V 3-PH /
 ON-OFF SERVICE / LOCAL / REMOTE SELECTOR SWITCH**



**WIRING DIAGRAM 202E2EFBX2 / 200 SERIES / 202-212 SIZES 220V/380V/440V 3-PH /
ON-OFF SERVICE / LOCAL / REMOTE SELECTOR SWITCH / 4-20mA OUTPUT SIGNAL**



WIRING DIAGRAM 202E2EFBXX / 200 SERIES / 202-212 SIZES 220V/380V/440V 3-PH / 4-20mA OUTPUT SIGNAL

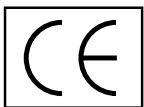


NOTES:



Ultraflo Corporation
A Subsidiary of Bray International, Inc.

8 Trautman Industrial Drive
Ste. Genevieve MO 63670
800.950.1762 Fax 573.883.8882
www.ultraflovalve.com



#8655 200 Series Install Maint Manual 09/01/10

© 2007 Ultraflo Corporation. All rights reserved.