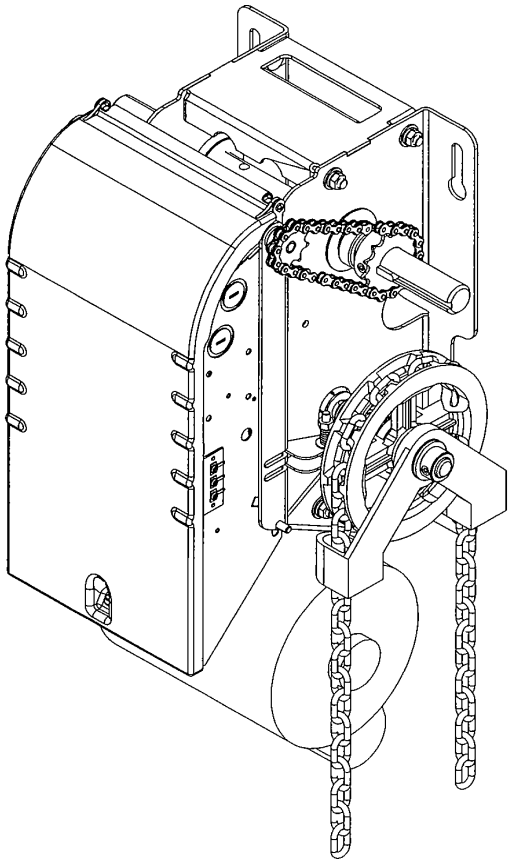
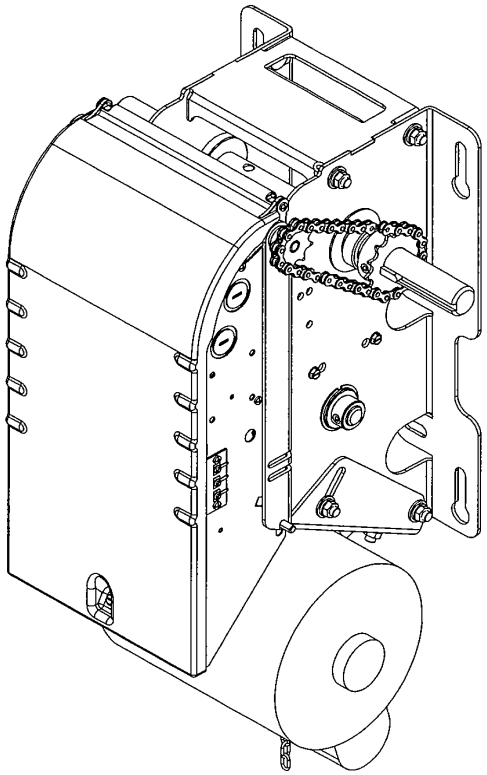
Installation & Instruction Manual





Opera-H

Opera-J

Note: Read this manual carefully before installing the operator and place this installation manual in an accessible place near the operator. For future reference record:

Model # _____

Date _____

Wiring Diagram # _____

Model # _____

Project No. _____

Project Name _____

Door No. # _____

Manaras

Somfy international

IMPORTANT SAFETY INSTRUCTIONS

WARNING

TO REDUCE THE RISK OF SEVERE INJURY OR DEATH, READ AND FOLLOW ALL INSTRUCTIONS.

1. Never allow children to operate or play with or near door.
2. Check to see that the operator is correct for the type, size of door and frequency of use per the operator specifications.
3. If the door system is near a residential area, or pedestrian traffic is expected near the door system, additional equipment such as electric reversing edges, photocells, or similar devices must be installed as part of the system to prevent entrapment.
4. Reversing devices appropriate to the application must be installed as part of the system.
5. Outdoor or easily accessible controls must be of the security type to prevent unauthorized use of the system.
6. Place controls far enough from the door so that a user cannot touch the door when operating the controls.
7. Controls should be placed so the user has full view of the door when operating.
8. Always keep moving door in sight and away from people or vehicles until it is completely opened or closed. NO ONE SHOULD CROSS THE PATH OF THE MOVING DOOR.
9. If a person is trapped under the door, push the "OPEN" control button.
10. Do not overtighten a clutch to compensate for a damaged door.
11. Test door and service monthly. After adjusting the limit travel, retest the door opener. Failure to adjust the door may cause death or injury.
12. KEEP DOORS PROPERLY BALANCED. See door owner's manual. An improperly balanced door could cause severe injury. Have a qualified service person make repairs to cables, spring assemblies and other hardware.
13. If possible, use the emergency release only when the door is closed. Use caution when using this release with the door open. Weak or broken springs may cause the door to fall rapidly, causing injury or death.
14. You are responsible for assuring that the owner of the door system understands its basic operation and safety. In particular, be sure the owner/end-user understands the location and operation of the manual disconnect.
15. Point out to the owner/end-user of the door system that children or pets should not be allowed to play on or near the door or any part of the system, and that the safety instructions supplied with this operator are the responsibility of the owner/end-user.
16. Leave the installation and maintenance manual for this operator as well as any additional information supplied with this operator or other components of the door system with the owner/end-user.
17. If you have any question about the safety of the door operating system, do not install the operator, contact us.

WARNING

DO NOT CONNECT POWER SUPPLY WHILE INSTALLING, SERVICING OR ADJUSTING THE ELECTRIC OPERATOR

WARNING

NOT APPLICABLE FOR RESIDENTIAL USE. ONLY FOR INDUSTRIAL AND COMMERCIAL APPLICATIONS

TABLE OF CONTENTS

Page

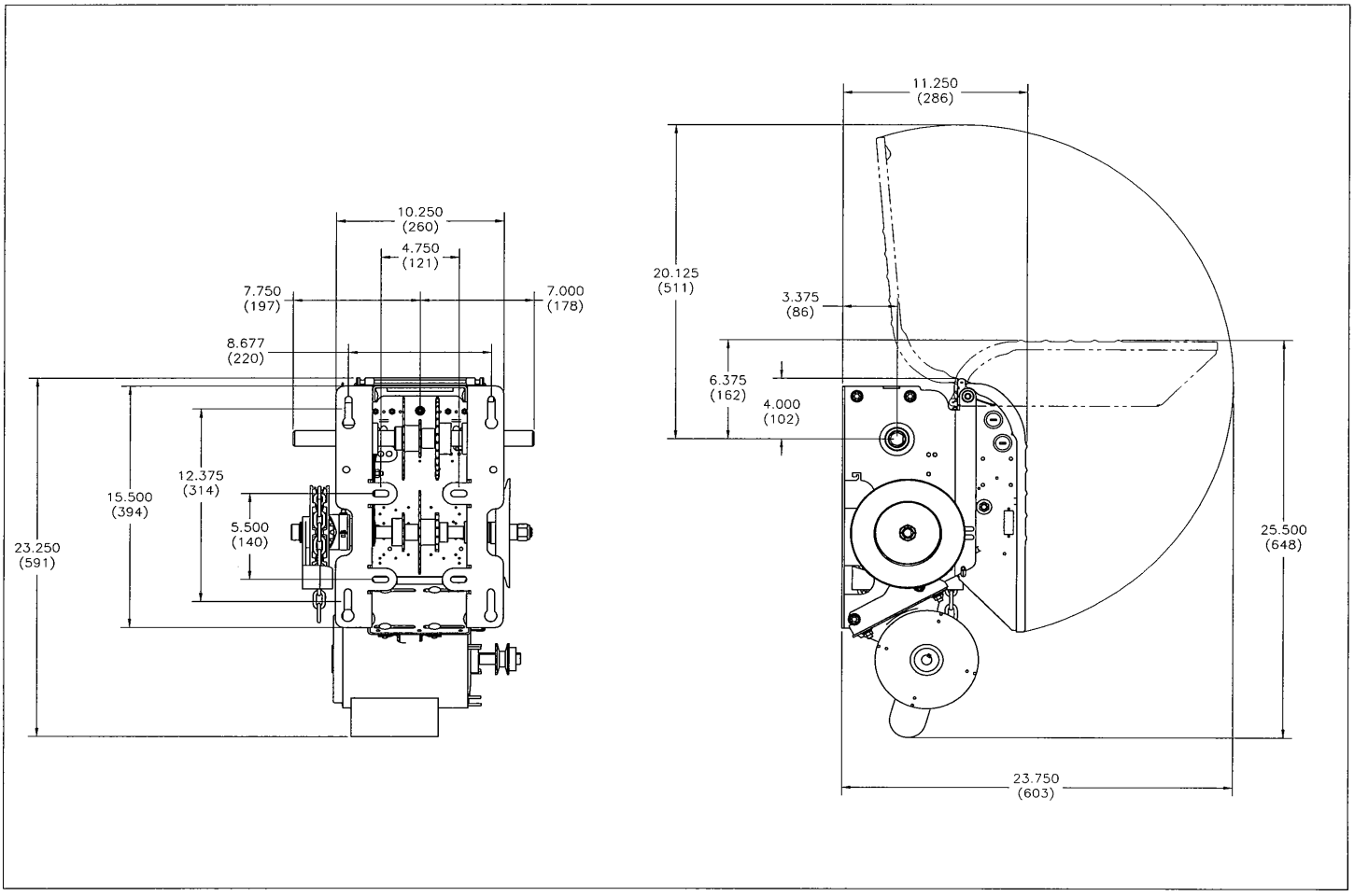
SPECIFICATIONS

GENERAL

SUPPLY VOLTAGE…….	115, 230 VAC single phase, 208, 460, 575VAC three phase
CONTROL VOLTAGE……	24VAC class II transformer 2 amp fuse type AC
MOTOR……..	Continuous duty 1/3, 1/2, 3/4, 1 Horsepower
OPERATOR OUTPUT SPEED……	41 RPM
NET WEIGHT (Operator only)…….	58 Lbs (27 Kg) for 1/2HP 115V Opera-H model
STANDARD WIRING TYPE……..	C2-momentary contact to open and stop and constant pressure to close.

DIMENSIONS
(Opera-H)

In compliance with **UL325**



OPERA: HEAVY DUTY JACKSHAFT OPERATOR

IMPORTANT: UPON COMPLETION OF OPERATOR INSTALLATION THIS MANUAL MUST BE GIVEN TO THE END-USER.

1. PRODUCT APPLICATION

The model OPERA heavy-duty jackshaft operator is designed for use on commercial or industrial doors of all types provided that the door has a shaft as basic driving element (doors with high lift, vertical lift, rolling doors and grilles). All OPERA door operators are designed and constructed in accordance with UL325 Standard, and certified by CSA Laboratories.

2. DELIVERY OF OPERATOR

Upon delivery of your heavy-duty jackshaft operator OPERA, inspect the unit immediately for shipping damage. Verify that you have received all the hardware parts mentioned in TABLE 1 and shown in *Figure 1*. Other items may be present, such as radio controls or other types of optional equipment, if ordered. If any item is missing or if there is evidence of damage, call the transport company first.

* Check to make sure that the available power supply to be connected to the operator is of the same voltage, frequency, phase and amperage as indicated on the nameplate of the operator.

3. HARDWARE

TABLE 1 STANDARD PARTS LIST FOR OPERA JACKSHAFT OPERATOR

PART #	QTY	DESCRIPTION
1	1	Pocket wheel hand chain (2X door shaft less 4 ft. (1.2m))for Opera-H or disconnect chain (14') for Opera-J
2	1	3-button open/close/stop push-button station
3	1	#50 connecting link
4	1	#50 roller chain x 4'(1.2m) or x 5' when sprocket is 42 teeth or more.
5	1	** Sprocket 50B___ x ∅__" c/w set screws for door shaft
6	1	Sprocket 50B12 x ∅1,0 " c/w set screws for OPERA™ output shaft
7	1	Square shaft key 1/4" x 1-1/2" L for OPERA™ output shaft
8	1	Chain keeper for Opera-J only
9	4	3/8" x 1-1/4" bolts
10	4	3/8" washers
11	4	3/8" lock washers
12	4	3/8" nuts
13	1	Chain keeper for Opera-H only

** See SPECIFICATIONS, DOOR SPEED AND AVAILABLE DOOR ADJUSTMENT

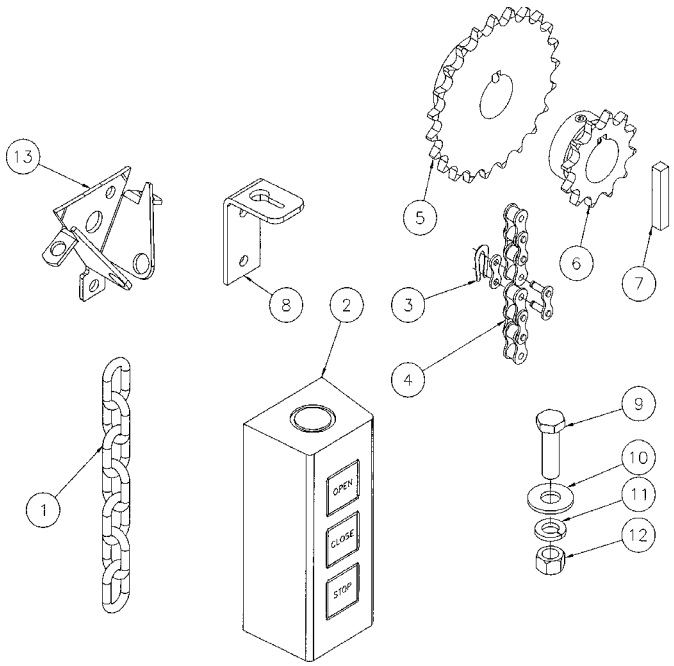


Figure 1 Hardware

4. INSTALLATION

All heavy-duty OPERA jackshaft operators are tested and adjusted at the factory. When installing your unit, please note that the cams are resting in the center of the cam-shaft.

The OPERA operator has a dual output shaft and may be mounted on either the left or right hand side of a sectional door (see Figure 2 and Figure 3). Place sprocket on either the right or the left end of the output shaft according to the desired handing.

The **Opera-H** comes with a chain hoist located on the right of the operator. If handing requires the chain hoist to be on the left (rolling doors, left operator hood mounting for ex.), it must be requested at the time of ordering. Do not attempt to change handing of the chain yourself.

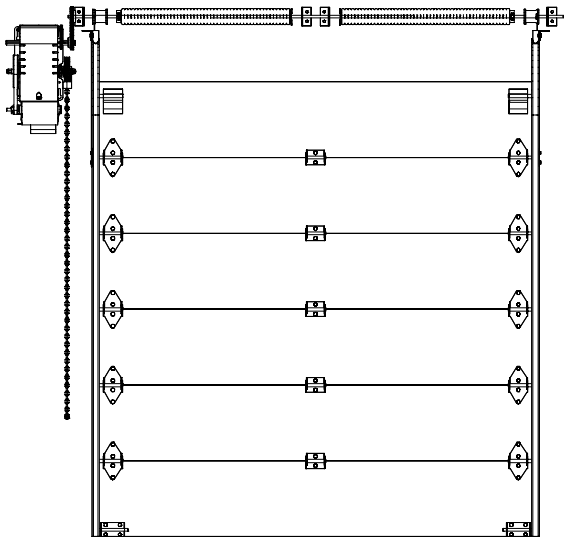


Figure 2 Left side mount

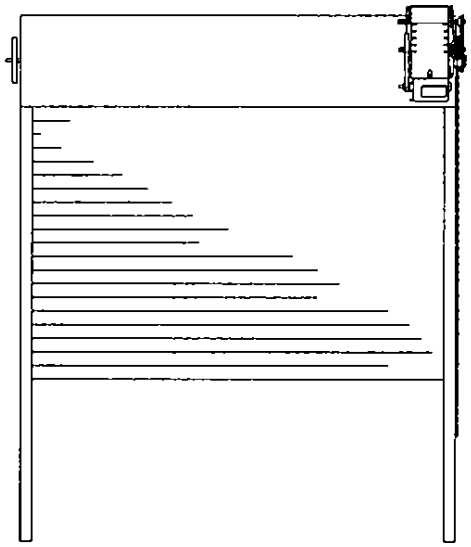


Figure 3 Right side hood mount

4.1 IMPORTANT INSTALLATION INSTRUCTIONS

⚠ WARNING

TO REDUCE THE RISK OF SEVERE INJURY OR DEATH, READ AND FOLLOW ALL INSTALLATION INSTRUCTIONS.

1. Installation of this door operator must be done by a qualified installer.
2. Insure that the door is properly installed and works freely in both directions. Do not install the operator until all door problems have been corrected. If necessary, oil all moving parts (chains, rollers, guides, etc.).
3. Remove all old accessories (locks, bolts, etc.) before installing door operator.
4. Do not connect the operator to a source of power until instructed to do so.
5. Locate control push-button station within sight of the door, at a minimum height of 5 ft. (1.5 m) so small children cannot reach it, and away from all moving parts of the door.

4.2 INSTALLATION OF OPERA OPERATOR

IMPORTANT NOTE: THIS OPERATOR MUST BE INSTALLED A MINIMUM OF 8 FT. (2.4 m) ABOVE FLOOR.

The OPERA has two sets of mounting holes: outside the frame for wall mounting and inside the frame for hood mounting. To access inside mounting holes, lift control enclosure as shown in Figure 4.
- Pull on the holding rod,
- Lift completely and push up on the holding arm to lock it into place.

To unlock, simply lift control enclosure, pull arm and lower enclosure. Snap enclosure so as to have the rod engaging on both sides of the frame.
Verify the correct position of the lever on Disconnect Switch.

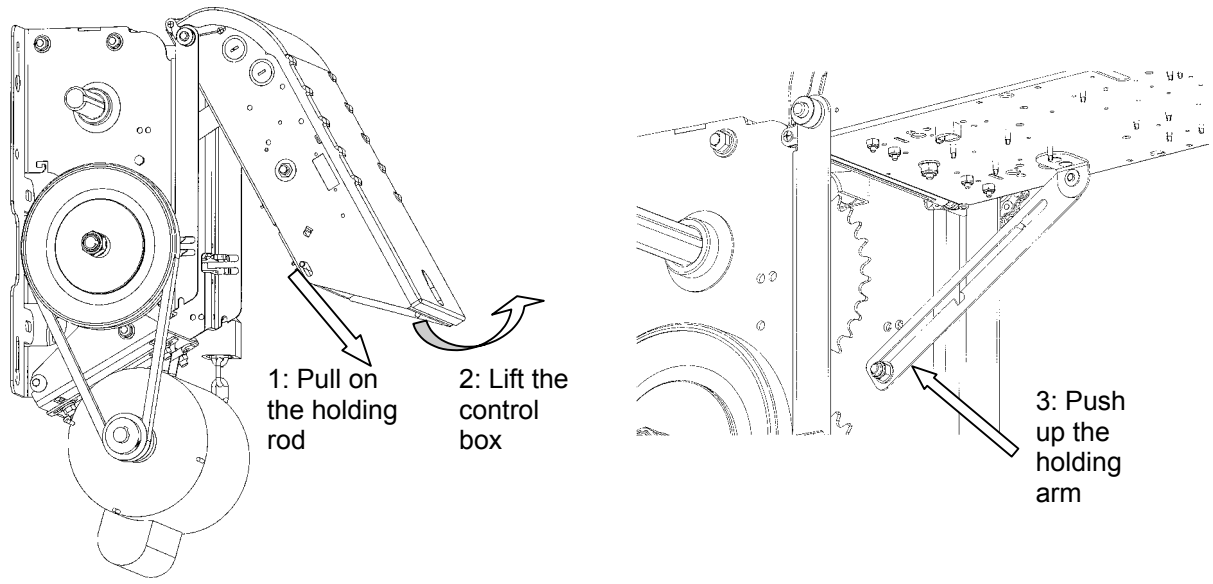


Figure 4 Access to inside of frame

To open the control box cover, loosen the screw at the base of the cover. If the cover cannot be fully opened, the retaining cam may be used to hold the cover in other positions.

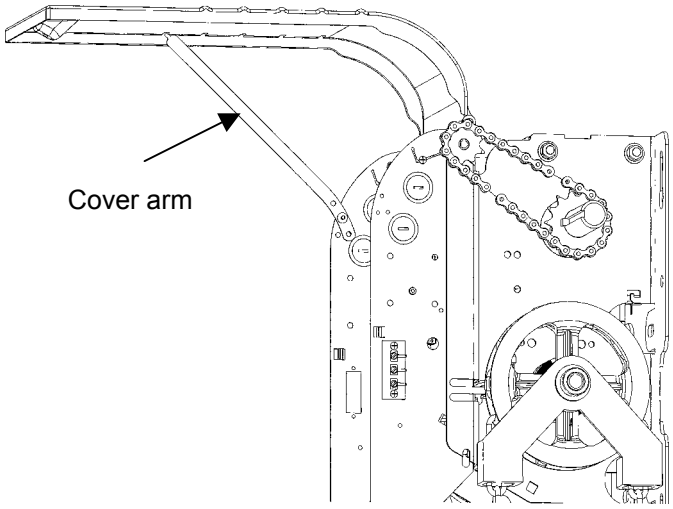


Figure 5 Control box cover opening

After installation, verify that there is no obstacle in the way when opening the control box cover. If so, it is possible to remove the cover by unscrewing it from the box before putting the operator on the wall or hood (see Figure 6).

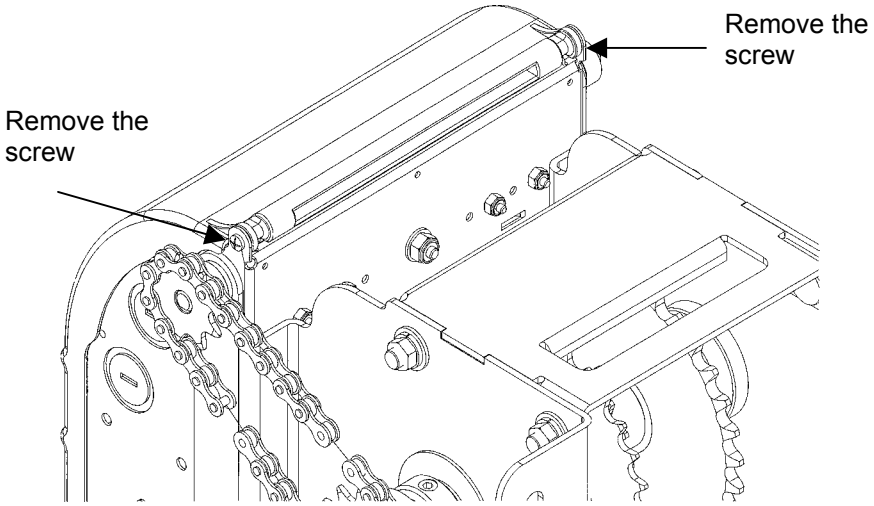


Figure 6 Unscrewing control box

Locate the four mounting holes. The optimum distance between the door shaft and operator drive shaft is between 12" and 15". Mount the OPERA unit by fastening it to the wall, bench or hood with 3/8" or 1/2" thru-bolts or if the wall is of such construction so as to prohibit use of thru-bolts, lag bolts and shields of sufficient size may be used. Do not tighten.

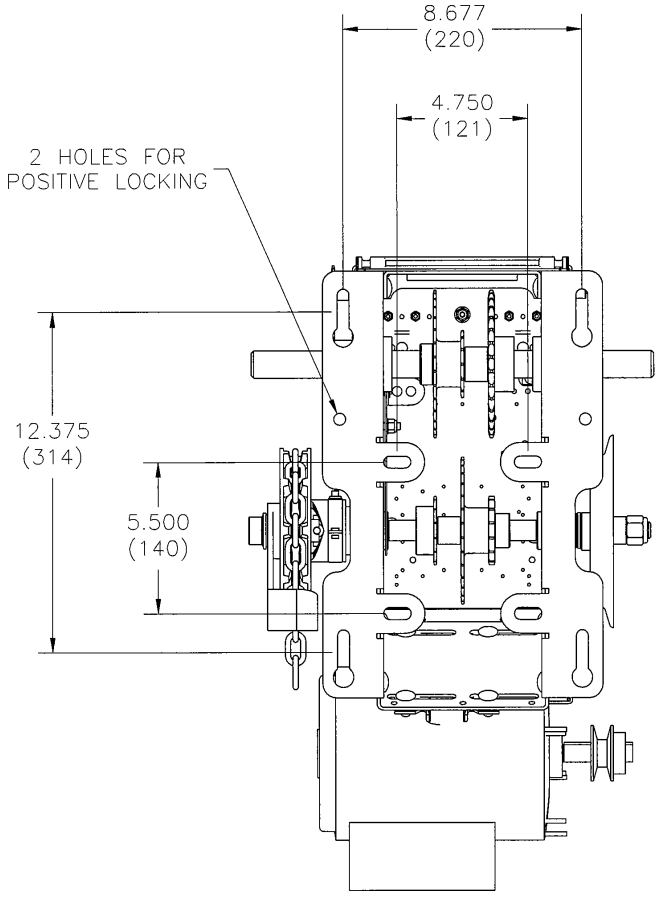


Figure 7 Mounting dimensions for wall or hood

Once the operator is fixed by using the 4 standard mounting holes already provided on the frame, the Positive Locking Holes (Ø 7/16”) can also be used to prevent the operator from moving during the operation (due to vibrations or if any fixing bolt becomes loose). Using these holes will also keep the drive chain alignment straight and will avoid abusive wear to the sprockets.

CAUTION
MAKE CERTAIN THAT OPERATOR IS PERFECTLY ALIGNED WITH DOOR SHAFT OTHERWISE DAMAGE CAN OCCUR

1. Place the driven sprocket on the door shaft loosely and align it with the drive sprocket of the operator.

   NOTE: If a chain spreader has been ordered along with your operator, see Figure 8 and Figure 9 below for installation.

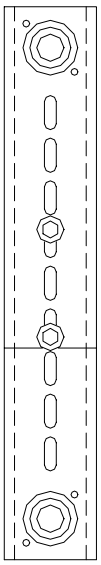


Figure 8 Chain spreader

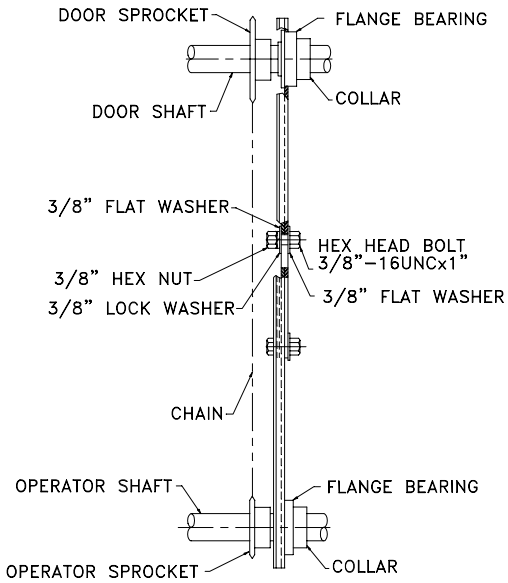


Figure 9 Chain spreader mounted on door and operator shafts

2. Lock the drive and driven sprockets in place by inserting the keys and tightening their respective set screws.

3. Connect the sprockets with the drive chain, shorten to a suitable length and join together with the chain link provided in the hardware bag. To shorten the chain, punch out the pin that will leave an inside link nearest to the desired length. Connect the chain around the sprockets using the chain link (Figure 10).

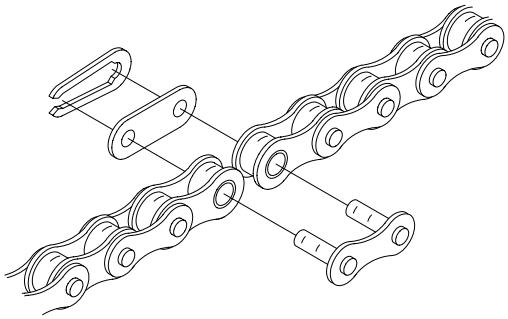


Figure 10 Chain link

4. Slide the operator to tighten the drive chain and then firmly tighten the mounting bolts. Check the tension on the chain and the set screws on the sprockets (there should be no more than 1/4" slack when chain is depressed between sprockets

5. **Opera-H**: run hand chain through the pocket wheel and through the chain guide outside the frame (Figure 11A), allow both ends to hang down toward the ground and cut hand chain, if necessary, so that both ends are approximately 2 feet (0.6 m) from floor. Connect both ends of hand chain.

6. **Opera-J**: link the disconnect chain at the key ring or hook located at the extremity of the disconnect pull cable (Figure 11B) Place the Opera-J chain keeper so that, when pulled and engaged, the disconnect chain keeps the machine ‘’disconnected’’ and in the manual position.

CAUTION

BEFORE PULLING HAND CHAIN THROUGH POCKET WHEEL OR LIFTING THE DOOR DIRECTLY BY HAND, PULL CAM PLATE AND SPIN CAM NUTS TO CENTER OF LIMIT SHAFT SO AS TO BE SURE THE CAMS ARE NOT BEING MECHANICALLY DRIVEN THROUGH THEIR NORMAL LIMIT SWITCH END POSITIONS.

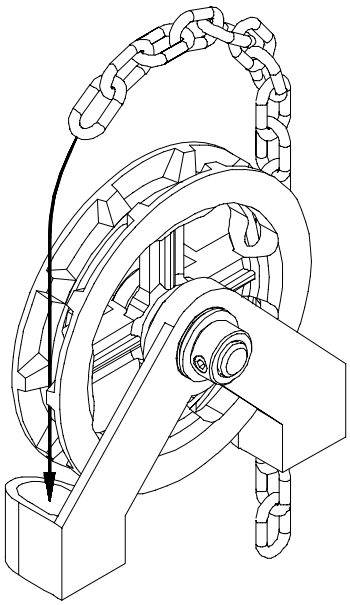


Figure 11 A Installing hand chain on Opera-H

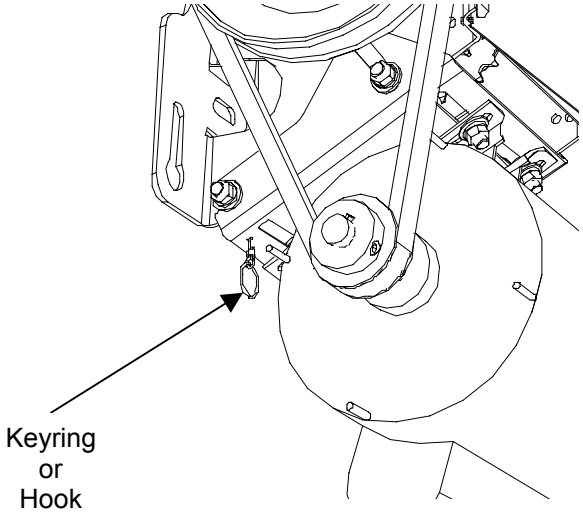


Figure 11 B Installing disconnect chain on Opera-J

4.3 CLUTCH ADJUSTMENT

1. Adjustment of clutch is done by rotating the nut located at the end of the input shaft where the pulley 7" is located (Figure 12).
2. Rotate the nut counter-clockwise until there is insufficient tension to permit clutch to drive door.
3. Rotate the nut clockwise gradually until there is just enough tension on clutch to permit operator to move door smoothly, but to allow clutch to slip if door is obstructed.
4. When clutch is properly adjusted it should be possible to stop door by hand during travel.

WARNING

THE FRICTION CLUTCH IS DESIGNED TO PROTECT VEHICLES AND DOOR HARDWARE AGAINST DAMAGE. IT IS NOT INTENDED TO PROTECT PEOPLE. ALL DOORS SERVING PERSONNEL ARE TO BE FITTED WITH AN APPROPRIATE REVERSING DEVICE OR REVERSING EDGE TO PREVENT INJURY OR DEATH.
We strongly recommend the use of an automatic reversing device. Several types are available as accessories. Consult your dealer for a recommendation

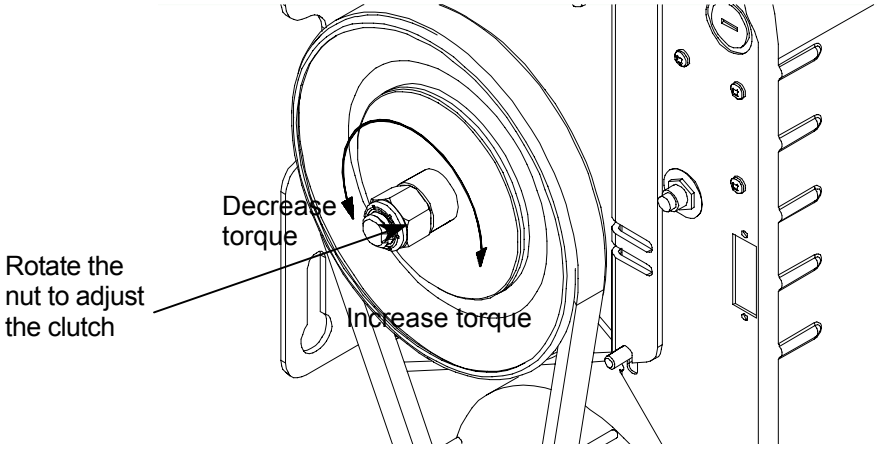


Figure 12 Clutch adjustment

4.4 ADJUSTMENT OF LIMIT SWITCHES

WARNING
NEVER PLACE HANDS OR TOOLS INSIDE OPERATOR OR NEAR DRIVE MECHANISM UNLESS POWER IS OFF

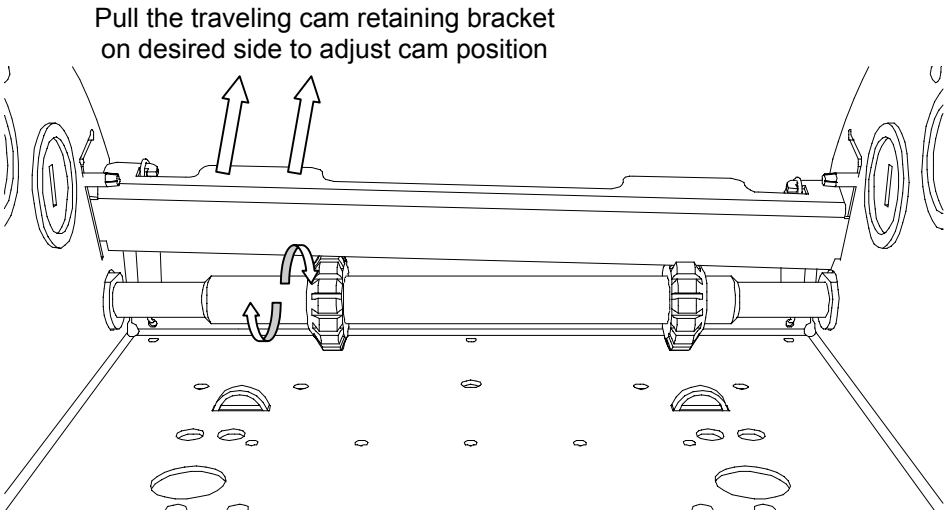


Figure 13 Adjusting the limit cams

1. Open the cover of the electrical enclosure.
2. Manually raise the door to a nearly opened position
3. Pull the travelling cam retaining bracket on the *Open Position cam* side and rotate the *Open Position* cam (Figure13).

   Note: Turning the cam towards the center of the shaft increases door travel.

   Turning the cam towards the switch decreases door travel.
4. Manually rotate the *Open Position* cam until the lever activates the *Open* limit switch sufficiently so as to hear the switch click.
5. Release and engage the retaining bracket. Make sure that the bracket engages in the slots **of both limit cams** after each adjustment.
6. Manually lower the door to a nearly closed position and repeat steps 3 through 5 with the *Close Position* cam.
7. Upon completion of all wiring connections, repeat steps 2 through 6 using the "Stop" button for adjustments of limit switches to their final, exact positions.

4.5 MINIMUM SUGGESTED WIRE SIZE FOR CONTROL CIRCUIT

The control circuit operates at 24 VAC. Due to the resistance in the wire used to carry the control circuit voltage, it is important to use the appropriate wire size with respect to the distance between the operator and the push-button station.

The chart (TABLE 2) indicating the minimum recommended wire size with respect to the total distance between the operator and the push-button station. DO NOT exceed the maximum distance. If there are several push-button stations in series you must ADD all these distances before selecting the appropriate wire gauge for your operator.

If the wire gauge is not suitable for the distance, problems in operation will be encountered such as chattering relays and contactor, premature wear of the contacts and possible tripping of the motor's thermal protection.

If a greater distance is required, a long distance interface module is suggested (consult factory).

When large gauge wire is used, a separate junction box will be needed for operator power connection (not supplied).

All power wiring to the operator should be installed by a qualified electrician and may vary with respect to conduit size and type as specified in the National Electrical Code, Article 430, allowing 5% voltage drop. Power must also be connected in accordance with local codes.

TABLE 2 WIRE SIZE v/s DISTANCE

24 VAC CONTROL WIRING	
Minimum suggested Wire gauge (AWG)	**Maximum distance between operator and all Push-button stations** feet (meters)
22	50 (15)
20	100 (30)
18	150 (45)
16	250 (75)
14	350 (105)
12	450 (135)

4.6 ADJUSTMENT AND MANUAL OPERATION OF OPERATORS

- **Opera-H**

The Opera-H operator is equipped with an automatic emergency chain hoist disconnect mechanism to operate the door manually, no floor disconnect is required.
In one simple step

- Control circuit interrupted.
- Coupling and hoist engaged.
- Manual operations.

are successively completed by pulling the hand chain in the desired direction:

1. Simply pull on the hand chain in the desired direction. The first foot pulled will engage the hoist mechanism and open the electrical circuit.
2. Continue the traction movement to move the door. If it doesn't run in the desired direction, repeat actions 1 and 2 by pulling the chain in the other direction (See Figure 14).
3. The automatic hoist engagement system is adjusted in the factory. It may require adjustment in the field. Adjustment is necessary if no door movement occurs after two fetes of pulled hand chain. Turn the adjusting nut clockwise (see figure 15) by ¼ turn until the hoist engages after pulling one foot of chain. If the nut is too tight, the manual torque on the chain will be too heavy.
4. Return to the standard electrical operation.

- **Opera-J**

1- Pull on the disconnect chain until feel a resistance.
2- Engage the chain in the chain keeper. The door is disconnected from the electrical motor and ready to be manually operated.
3- Just make free the disconnect chain from the chain keeper to ''reconnect'' the operator and return the standard electrical operation.

IMPORTANT : To return to electrical operation merely pull slightly on the opposite direction of the chain.

WARNING

DO NOT ATTEMPT TO DISENGAGE THE OPERATOR WHILE OPERATOR IS RUNNING. DO NOT ATTEMPT TO MANUALLY FORCE A MALFUNCTIONING DOOR TO OPEN OR CLOSE. THIS IS AN EMERGENCY DEVICE AND IS NOT DESIGNED TO OPERATE A DOOR WITH SERIOUS MECHANICAL PROBLEMS.

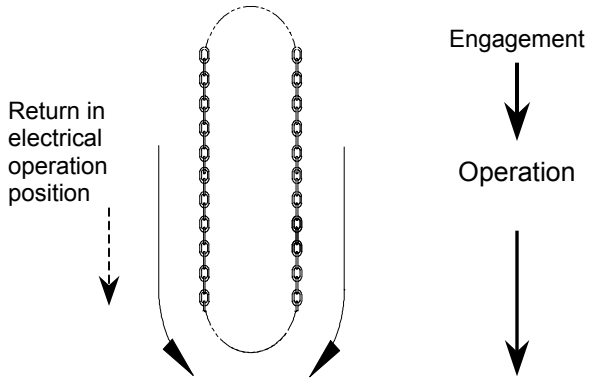


Figure 14 Operating chain to open and close door

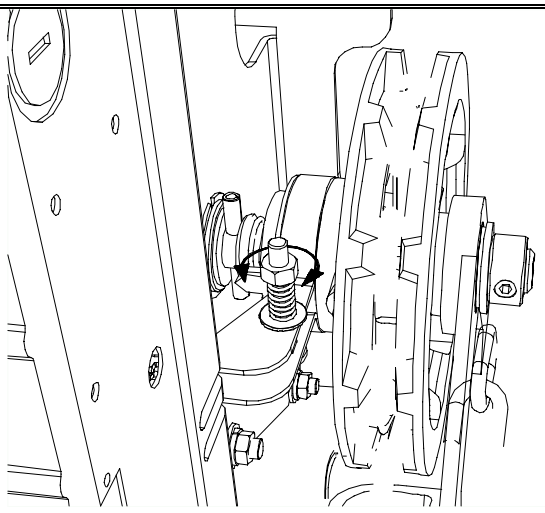


Figure 15 Manual operation system adjustment

5 SCHEDULED MAINTENANCE

Maintenance and supervision should be performed by qualified persons only.
Inspection and service should be performed anytime a malfunction is observed or suspected.

⚠ WARNING
WHEN SERVICING - ALWAYS DISCONNECT OPERATOR FROM POWER SUPPLY

5.1 MECHANICAL

The door area should always be kept clear of dirt, rocks or any other substance to insure proper operation.

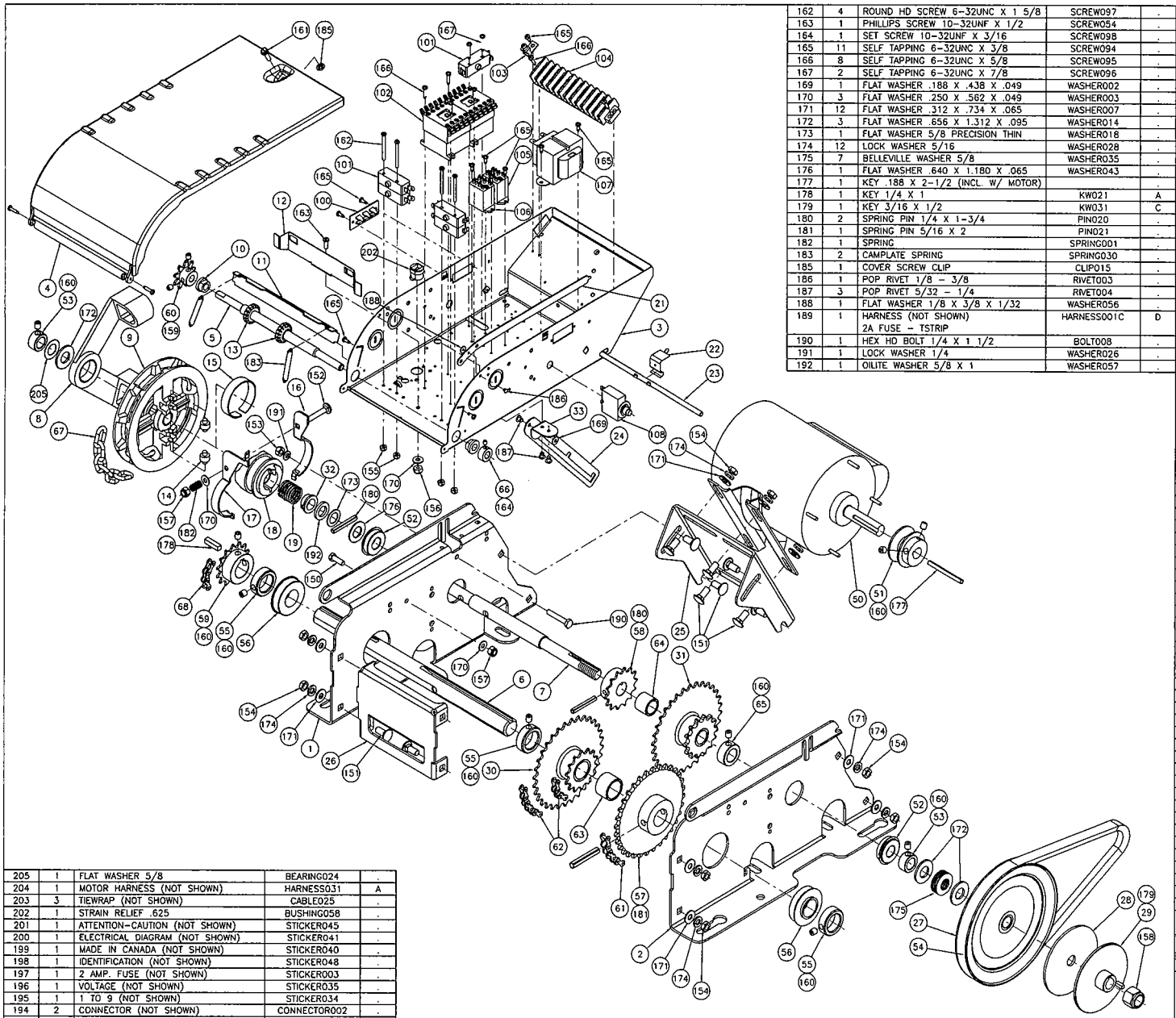
EVERY 3 MONTHS	- Check and adjust the clutch, if necessary.
EVERY 6 MONTHS	- Lubricate all moving parts, Bushing are oil impregnated and are lubricated for life. - Verify that all mechanical parts function properly. - Inspect the V-belt and adjust or replace if necessary. - Manually operate the door. If the door does not open or close freely, correct the cause of the malfunction.
ONCE A YEAR	- Inspect all bolts and screws and tighten if necessary. - Check for any excessive slack in chains and adjust or replace them if necessary. The limit switches may have to be reset after a chain adjustment. - Inspect the door for wear and damage. - Run the operator a few cycles: Make sure that the door rollers are rolling smoothly on the track. Listen to the motor: The motor should hum quietly and smoothly. Verify that the limit operates quietly and smoothly: investigate any unusual noise. - Verify that the mooring bolts are holding the unit securely. - Inspect the unit for evidence of corrosion.

5.2 ELECTRICAL

⚠ WARNING
BEFORE OPENING THE CONTROL BOX COVER, DISCONNECT OPERATOR FROM POWER SUPPLY

- Inspect the unit for evidence of corrosion.
- Inspect the wiring compartment and remove any dirt from the control units.
- Check all the grounding wires and terminations for corrosion. Be particularly careful to check the ground wires.
- Check the terminal strip to insure that all the screws are tight.
- Verify that the safety edge or other safety devices installed on the operator are fully operational.
- Check the voltage at the input terminals while the operator is running. The voltage must not drop more than 10% momentarily. If the voltage drop is too deep when running, the relays may chatter, the contact points will wear prematurely and may eventually weld. Check the power terminations for corrosion.
- Check the current consumption of the unit with an amp-meter. The value of current should be consistent with the nameplate specifications. Investigate any anomaly.

6. Opera-H exploded view



#	QTY	DESCRIPTION	#MANARAS	REV
1	1	LEFT HAND SIDE FRAME	FRAME037	J
2	1	RIGHT HAND SIDE FRAME	FRAME038	J
3	1	CONTROL BOX	CBOX025	AB
4	1	COVER	COVER047	E
5	1	LIMIT SHAFT	SHAFT103	E
6	1	OUTPUT SHAFT	SHAFT102	E
7	1	INPUT SHAFT	SHAFT104	F
8	1	CHAIN GUIDE	GUIDE012	.
9	1	HAND CHAIN PULLEY	POCKETWHEEL005	.
10	2	LIMIT SHAFT BUSHING	BUSHING055	.
11	1	CAMPLATE	CAMPLATE015	D
12	1	LIMIT SWITCH LEVER	LEVER070	F
13	2	LIMIT CAM	CAM011	B
14	2	ROLLER	CAM012	.
15	1	FRICTION BAND	SHOE011	.
16	1	SIMPLE SHOE	SHOE009	E
17	1	SWITCH SHOE	SHOE010	D
18	1	CAM DISCONNECT	CAM010	E
19	1	DISCONNECT SPRING	SPRING040	B
21	1	COVER ARM	ARM025	C
22	1	CBOX ROD SPRING	SPRING039	E
23	1	CBOX ROD	ROD019	A
24	1	CBOX ARM	ARM024	E
25	1	MOTOR PLATE	PLATE078	H
26	1	HANDLE	HANDLE005	G
27	1	DRIVEN PULLEY 5L X 7"	PULLEY020	C
28	1	FRICTION DISC	CLUTCHPAD001	B
29	1	TORQUE LIMITER PLATE	CLUTCHPLATE006	A
30	1	DOUBLE SPROCKET	SPR410B14A32X1	B
31	1	DOUBLE SPROCKET	41B14A410B32X.75	A
32	1	DISCONNECT SPRING BUSHING	BUSHING056	B
33	1	CBOX ARM L-BRACKET	BRACKET181	C
50	1	MOTOR	.	.
51	1	MOTOR PULLEY 5L X 2"	PULLEY014	.
52	2	SEALED FLANGED BRG 5/8 PRECISION	BEARING006	.
53	2	COLLAR 5/8	COLLAR004	.
54	1	V-BELT 5L 320	V-BELT5L320	.
55	3	COLLAR 1"	COLLAR007	.
56	2	FLANGED BEARING 1"	BEARING007	.
57	1	32 TOOTH 41 SPROCKET	SPR41B32X1PH5/16	A
58	1	14 TOOTH 410 SPROCKET	SPR410B14X.75	.
59	1	14 TOOTH 410 SPROCKET	SPR410B14X1	.
60	1	9 TOOTH 410 SPROCKET	SPR410B9X.375	.
61	1	CHAIN 41 48P (WITH CHAIN LINK)	CHAIN059	.
62	2	CHAIN 410 48P (WITH CHAIN LINK)	CHAIN058	.
63	1	SPACER	SPACER009	A
64	1	SPACER	SPACER008	A
65	1	COLLAR 3/4	COLLAR005	.
66	1	COLLAR 3/8	COLLAR002	.
67	.	HAND CHAIN (WITH HARDWARE)	CHAIN002	.
68	1	CHAIN 410 32P (WITH CHAIN LINK)	CHAIN006	.
100	1	RADIO CONTROL TERMINAL STRIP	TSTRIP005	.
101	5	LIMIT SWITCH	LIMIT015	.
102	1	CONTACTOR	CONTACTOR041	.
103	1	GROUND LUG	CONNECTOR039	.
104	1	TERMINAL STRIP	TSTRIP001	.
105	1	RELAY 120V OR 240V DPDT	RELAY026-027	.
106	1	RELAY 24V DPDT	RELAY024	.
107	1	TRANSFORMER	TRANSF0005-037	.
108	1	RESET	.	.
150	1	HEX HD .250-20UNC X .75	BOLT002	.
151	12	CARRIAGE BOLT 5/16-18UNC X 3/4	BOLT093	.
152	1	CARRIAGE BOLT	BOLT094	.
153	1	HEX NUT 1/4-20UNC	NUT006	.
154	12	HEX NUT 5/16-18UNC	NUT007	.
155	4	NYLON LOCK NUT 6-32UNC	NUT018	.
156	1	NYLON LOCK NUT 10-32UNF	NUT019	.
157	2	NYLON LOCK NUT 1/4-20UNC	NUT020	.
158	1	NYLON LOCK NUT 5/8-18UNF	NUT024	.
159	2	SET SCREW 1/4-20UNC X 5/16	SCREW001	.
160	9	SET SCREW 5/16-18UNC X 5/16	SCREW003	.
161	1	SELF TAPPING 10-24UNC X 3/4	SCREW023	.
162	4	ROUND HD SCREW 6-32UNC X 1 5/8	SCREW097	.
163	1	PHILLIPS SCREW 10-32UNF X 1/2	SCREW054	.
164	1	SET SCREW 10-32UNF X 3/16	SCREW098	.
165	11	SELF TAPPING 6-32UNC X 3/8	SCREW094	.
166	8	SELF TAPPING 6-32UNC X 5/8	SCREW095	.
167	2	SELF TAPPING 6-32UNC X 7/8	SCREW096	.
169	1	FLAT WASHER .188 X .438 X .049	WASHER002	.
170	3	FLAT WASHER .250 X .562 X .049	WASHER003	.
171	12	FLAT WASHER .312 X .734 X .065	WASHER007	.
172	3	FLAT WASHER .656 X 1.312 X .095	WASHER014	.
173	1	FLAT WASHER 5/8 PRECISION THIN	WASHER018	.
174	12	LOCK WASHER 5/16	WASHER028	.
175	7	BELLEVILLE WASHER 5/8	WASHER035	.
176	1	FLAT WASHER .640 X 1.180 X .065	WASHER043	.
177	1	KEY .188 X 2-1/2 (INCL. W/ MOTOR)		.
178	1	KEY 1/4 X 1	KW021	A
179	1	KEY 3/16 X 1/2	KW031	C
180	2	SPRING PIN 1/4 X 1-3/4	PIN020	.
181	1	SPRING PIN 5/16 X 2	PIN021	.
182	1	SPRING	SPRING001	.
183	2	CAMPLATE SPRING	SPRING030	.
185	1	COVER SCREW CLIP	CLIP015	.
186	1	POP RIVET 1/8 - 3/8	RIVET003	.
187	3	POP RIVET 5/32 - 1/4	RIVET004	.
188	1	FLAT WASHER 1/8 X 3/8 X 1/32	WASHER056	.
189	1	HARNESS (NOT SHOWN) 2A FUSE - TSTRIP	HARNESS001C	D
190	1	HEX HD BOLT 1/4 X 1 1/2	BOLT008	.
191	1	LOCK WASHER 1/4	WASHER026	.
192	1	OILITE WASHER 5/8 X 1	WASHER057	.
205	1	FLAT WASHER 5/8	BEARING024	.
204	1	MOTOR HARNESS (NOT SHOWN)	HARNESS031	A
203	3	TIEWRAP (NOT SHOWN)	CABLE025	.
202	1	STRAIN RELIEF .625	BUSHING058	.
201	1	ATTENTION-CAUTION (NOT SHOWN)	STICKER045	.
200	1	ELECTRICAL DIAGRAM (NOT SHOWN)	STICKER041	.
199	1	MADE IN CANADA (NOT SHOWN)	STICKER040	.
198	1	IDENTIFICATION (NOT SHOWN)	STICKER048	.
197	1	2 AMP. FUSE (NOT SHOWN)	STICKER003	.
196	1	VOLTAGE (NOT SHOWN)	STICKER035	.
195	1	1 TO 9 (NOT SHOWN)	STICKER034	.
194	2	CONNECTOR (NOT SHOWN)	CONNECTOR002	.
193	2	WIRE NUT (NOT SHOWN)	WIRENUT001	.

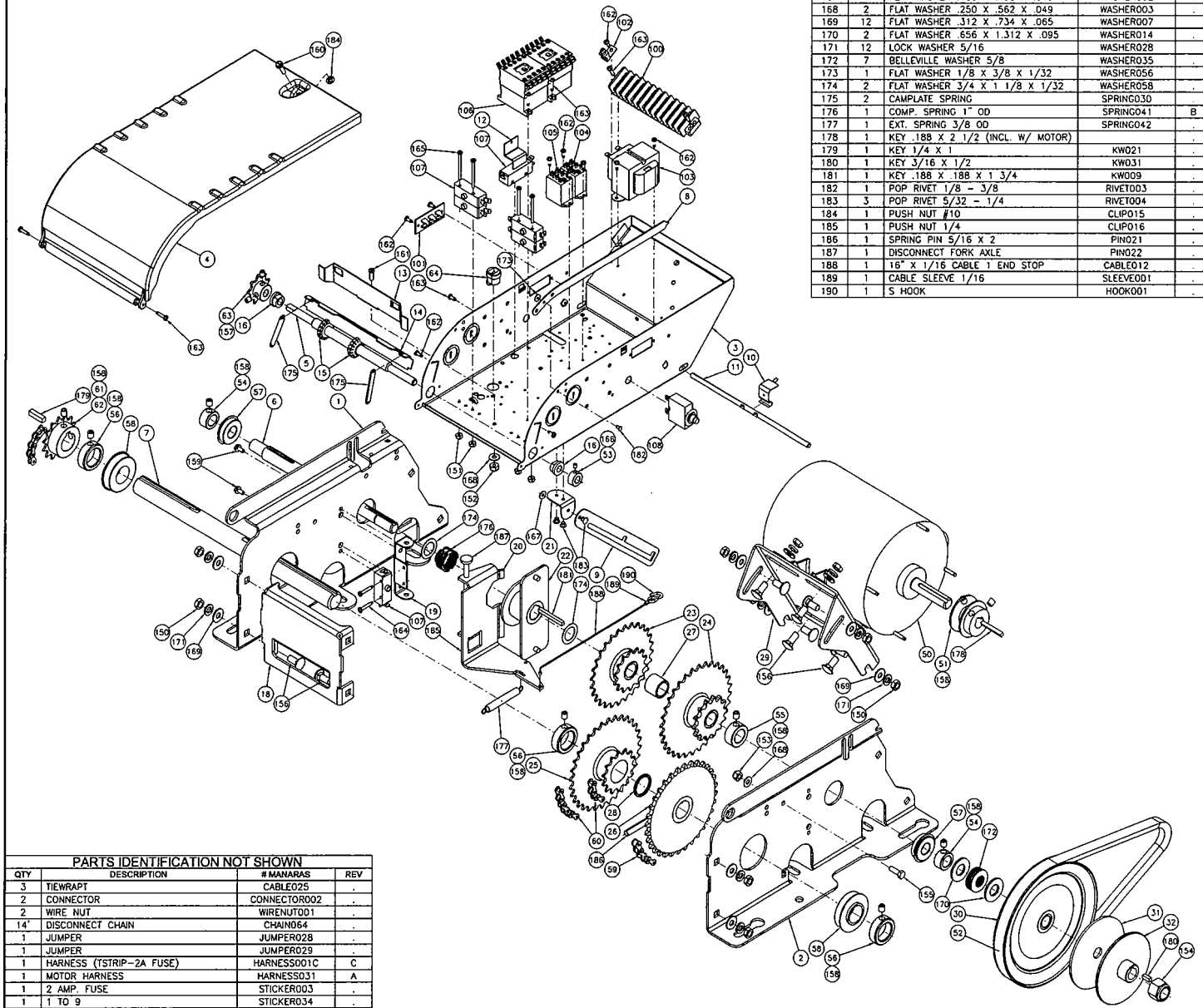
TITLE: OPERA-H SINGLE PHASE

DRAWN BY:	DATE:	DWG FILE:	REV	DATE:
MARTINE BEAUCHEMIN	00.11.15	OPERA-H-X	-	2004.03.09

MANARAS AUTO DOORS INC.
136 ONEIDA DRIVE
POINTE-CLAIRE, QC H9R 1A8
TEL.: 514.426.1332
FAX: 514.426.1171

Manaras
• Somfy International

6.1 Opera-J exploded view



PARTS IDENTIFICATION NOT SHOWN			
QTY	DESCRIPTION	# MANARAS	REV
3	TIEWRAPT	CABLE025	.
2	CONNECTOR	CONNECTOR002	.
2	WIRE NUT	WIRENUT001	.
14'	DISCONNECT CHAIN	CHAIN064	.
1	JUMPER	JUMPER028	.
1	JUMPER	JUMPER029	.
1	HARNESS (TSTRIP-2A FUSE)	HARNESS001C	C
1	MOTOR HARNESS	HARNESS031	A
1	2 AMP. FUSE	STICKER003	.
1	1 TO 9	STICKER034	.
1	MADE IN CANADA	STICKER040	.
1	ELECTRICAL DIAGRAM	STICKER041	.
1	ATTENTION-CAUTION	STICKER045	.
1	IDENTIFICATION	STICKER048	.

167	1	FLAT WASHER .188 X .438 X .049	WASHER002	.
168	2	FLAT WASHER .250 X .562 X .049	WASHER003	.
169	12	FLAT WASHER .312 X .734 X .065	WASHER007	.
170	2	FLAT WASHER .656 X 1.312 X .095	WASHER014	.
171	12	LOCK WASHER 5/16	WASHER028	.
172	7	BELLEVILLE WASHER 5/8	WASHER035	.
173	1	FLAT WASHER 1/8 X 3/8 X 1/32	WASHER056	.
174	2	FLAT WASHER 3/4 X 1 1/8 X 1/32	WASHER058	.
175	2	CAMPLATE SPRING	SPRING030	.
176	1	COMP. SPRING 1" OD	SPRING041	B
177	1	EXT. SPRING 3/8 OD	SPRING042	.
178	1	KEY .188 X 2 1/2 (INCL. W/ MOTOR)		.
179	1	KEY 1/4 X 1	KW021	.
180	1	KEY 3/16 X 1/2	KW031	.
181	1	KEY .188 X .188 X 1 3/4	KW009	.
182	1	POP RIVET 1/8 - 3/8	RIVET003	.
183	3	POP RIVET 5/32 - 1/4	RIVET004	.
184	1	PUSH NUT #10	CLIP015	.
185	1	PUSH NUT 1/4	CLIP016	.
186	1	SPRING PIN 5/16 X 2	PIN021	.
187	1	DISCONNECT FORK AXLE	PIN022	.
188	1	16" X 1/16 CABLE 1 END STOP	CABLE012	.
189	1	CABLE SLEEVE 1/16	SLEEVE001	.
190	1	S HOOK	HOOK001	.

PARTS IDENTIFICATION				
#	QTY	DESCRIPTION	# MANARAS	REV
1	1	LEFT HAND SIDE FRAME	FRAME037	J
2	1	RIGHT HAND SIDE FRAME	FRAME038	J
3	1	CONTROL BOX	CBOX025	AB
4	1	COVER	COVER047	E
5	1	LIMIT SHAFT	SHAFT103	E
6	1	INPUT SHAFT	SHAFT107	A
7	1	OUTPUT SHAFT	SHAFT102	E
8	1	COVER ARM	ARM025	C
9	1	CBOX ARM	ARM024	E
10	1	CBOX ROD SPRING	SPRING039	E
11	1	CBOX ROD	ROD019	A
12	1	CBOX SWITCH SUPPORT	BRACKET193	A
13	1	LIMIT SWITCH LEVER	LEVER070	F
14	1	CAMPLATE	CAMPLATE015	D
15	2	LIMIT CAM	CAM011	B
16	2	LIMIT SHAFT BUSHING	BUSHING055	.
18	1	HANDLE	HANDLE005	G
19	1	DISC. SWITCH SUPPORT	BRACKET192	.
20	1	DISCONNECT FORK	FORK001	D
21	1	CBOX ARM L-BRACKET	BRACKET181	C
22	1	COUPLING 3/4 2 PINS 1/4	COUPLING014	A
23	1	DOUBLE SPROCKET	SPR410B14A28X3/4	A
24	1	DOUBLE SPROCKET	41B14A410B32X3/4	A
25	1	DOUBLE SPROCKET	SPR410B14A32X1	B
26	1	32 TOOTH 41 SPROCKET	SPR41B32X1PH5/16	A
27	1	SPACER 3/4	SPACER008	A
28	1	SPACER	SPACER011	.
29	1	MOTOR PLATE	PLATE078	H
30	1	PULLEY	PULLEY020	C
31	1	FRICTION DISC	CLUTCHPAD001	B
32	1	TORQUE LIMITER PLATE	CLUTCHPLATE006	A
50	1	MOTOR	MOTOR	.
51	1	MOTOR PULLEY 5L X 2	PULLEY014	.
52	1	V-BELT 5L	V-BELT 5L	.
53	1	COLLAR 3/8	COLLAR002	.
54	2	COLLAR 5/8	COLLAR004	.
55	1	COLLAR 3/4	COLLAR005	.
56	3	COLLAR 1"	COLLAR007	.
57	2	SEALED FLANGED BRG 5/8 PRECISION	BEARING006	.
58	2	FLANGED BEARING 1"	BEARING007	.
59	1	CHAIN 41 48P (WITH CHAIN LINK)	CHAIN059	.
60	2	CHAIN 410 48P (WITH CHAIN LINK)	CHAIN058	.
61	1	CHAIN 410 32P (WITH CHAIN LINK)	CHAIN006	.
62	1	14 TOOTH 410 SPROCKET	410B14X1	.
63	1	9 TOOTH 410 SPROCKET	SPR410B9X.375	.
64	1	CABLE STRAIN RELIEF	BUSHING058	.
100	1	TERMINAL STRIP	TSTRIP001	.
101	1	RADIO CONTROL TERMINAL STRIP	TSTRIP005	.
102	1	GROUND LUG	CONNECTOR039	.
103	1	TRANSFORMER	TRANSF005-037	.
104	1	RELAY 120V OR 240V DPDT	RELAY026-027	.
105	1	RELAY 24V DPDT	RELAY024	.
106	1	CONTACTOR	CONTACTOR041	.
107	6	LIMIT SWITCHES	LIMIT015	.
108	1	RESET		.
150	12	HEX NUT 5/16-18UNC	NUT007	.
151	4	NYLON LOCK NUT 6-32UNC	NUT018	.
152	1	NYLON LOCK NUT 10-32UNF	NUT019	.
153	1	NYLON LOCK NUT 1/4-20UNC	NUT020	.
154	1	NYLON LOCK NUT 5/8-18UNF	NUT024	.
155	1	HEX HD 1/4-20UNC X 3/4	BOLT002	.
156	12	CARRIAGE BOLT 5/16-18UNC X 3/4	BOLT093	.
157	2	SET SCREW 1/4-20UNC X 5/16	SCREW001	.
158	9	SET SCREW 5/16-18UNC X 5/16	SCREW003	.
159	2	SELF TAPPING 10-24UNC X 3/8	SCREW022	.
160	1	SELF TAPPING 10-24UNC X 3/4	SCREW023	.
161	1	PHILLIPS SCREW 10-32UNF X 1/2	SCREW054	.
162	13	SELF TAPPING 6-32UNC X 3/8	SCREW094	.
163	7	SELF TAPPING 6-32UNC X 5/8	SCREW095	.
164	2	SELF TAPPING 6-32UNC X 7/8	SCREW096	.
165	4	ROUND HD SCREW 6-32UNC X 1 5/8	SCREW097	.
166	1	SET SCREW 10-32UNF X 3/16	SCREW098	.

TITLE: OPERA-J SINGLE PHASE

Drawn By:	Date:	CAD FILE:	REV	Date:
MARTINE BEAUCHEMIN	02.01.29	OPERA-J-X	-	2004.03.09

MANARAS AUTO DOORS INC.
136 ONEIDA DRIVE
POINTE-CLAIRE, QC H9R 1A8
TEL.: 514.426.1332
FAX: 514.426.1171

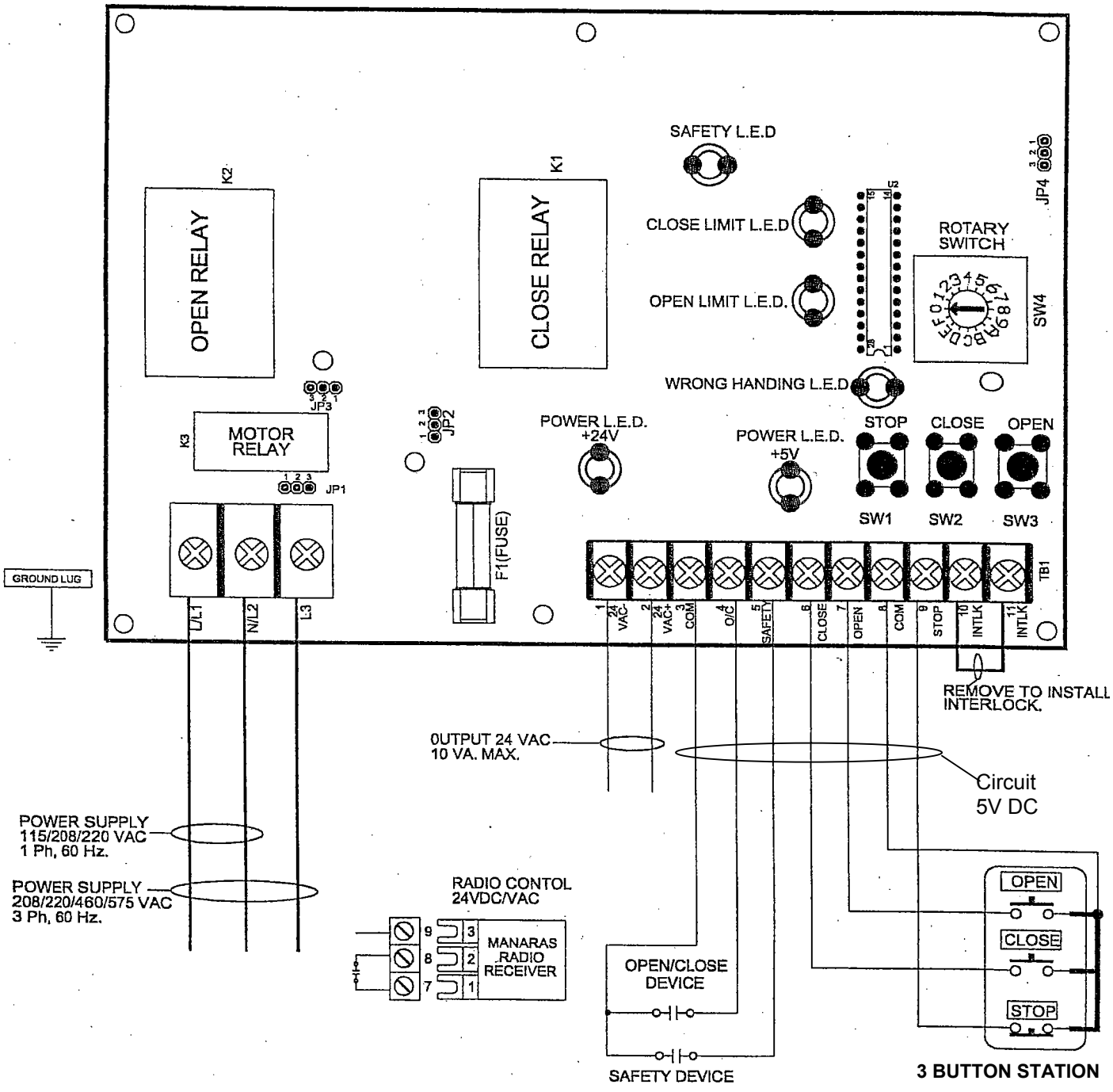
Manaras
Safety International

7. Specific section for operators supplied with

ELECTRONIC CONTROL BOARD

NOTE: Please refer to page 27 for hardwired operators.

7.1 POWER AND CONTROL WIRING DIAGRAM



NOTE: **If no push button is used a jumper must be placed between #8 & #9**

WARNING (replacing an ECB)
Four jumpers (JP1, JP2, JP3 & JP4) used for the configuration of the ECB according to the line voltage are supplied separately in a plastic bag. Please refer to the instruction manual supplied with the ECB before setting it according to the appropriate voltage.

Please refer to Accessories Wiring diagrams (TN005E) before connecting any external accessories

7.2 ELECTRONIC CONTROL BOARD

LED MONITORING STATUS

LED's on the ECB help will wiring and making troubleshooting diagnoses. Every LED states the actual position of the door. The board has a non-volatile memory and all the LED return to their initial state after a power interruption.

L.E.D	Color	STATUS
24 V	Green	When ON indicates the presence of power on the Logic Board
5 V	Green	When ON indicates the presence of 5VDC power in the Control Circuit
Open Limit Switch	Red	When ON indicates door position, completely open.
Close Limit Switch	Red	When ON indicates door position, completely close.
O Limit (Safety)	Red	Light ON only when safety devices are activated.
LIM (Wrong Handling)**	Red	Flashes only when motor runs in opposite direction and activates the wrong limit switch.
		Stay ON only when the Stop button is wrongly connected or if the Hoist is not properly engaged.

WRONG HANDLING

Wrong handling protection prevents the operator from over passing the limits when incoming 3-phase power or a single-phase motor are incorrectly connected.

When the operator turns in the opposite direction and reaches the wrong limit switch, the LED indicator flashes-on and all the external commands are ignored by the electronic board.

To correct the problem when:

- LED is flashing, cut off the power and inter change any 2 power lines on the terminal strip (L1, L2 and L3) for 3-phase motor and for single-phase motor inter change T13 and T14 on the Electronic Board. Switch on the power and check the door motion.
- LED stay ON (solid), check if the stop button is properly connected on #8 and #9 or pull the hand chain slightly in both directions to bring the operator into electrical mode.

EXTERNAL CONTROLS

Refer to the wiring diagram on page 15 before connecting power or any external device to the ECB. Neglecting to use the proper terminals will result in complete damage to the ECB. If you are not certain about procedures, please consult Manaras for assistance.

NOTE: Do not attempt correction by reversing wires on control station.

⚠ WARNING

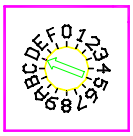
WHEN REPLACING AN ELECTRONIC CONTROL BOARD DO CHECK THAT ALL JUMPERS ARE POSITIONED AS INDICATED IN THE WIRING DIAGRAMS ON PAGE 25 FOR SINGLE PHASE AND ON PAGE 26 FOR 3-PHASE.

7.3 PROGRAM SETTING

Programming ability and door control at electrical box are provided by open / close / stop buttons and rotary switch located on the Electronic Control Board. If no 3 push button station is connected a jumper must be placed between #8 & #9 to be able to use the test buttons.

RUN TIMER

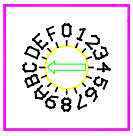
The Run Timer stops automatically the operator after an adjustable time delay either travelling upwards or downwards. The Run Timer is designed to protect the door and the operator by preventing the motor over running much longer than the normal time.



Set Maximum Run Timer: start with door in closed position and set the **rotary switch on D.** Check that the down limit is activated. The red LED 'Close Limit Switch' lights up when the door is closed (If not, no time is recorded). Press the open button to allow the door to open. Once the upper limit is activated the full travel time plus ten (10) seconds is registered and becomes the maximum run time. Now the switch can be set on desired operating mode (B2, C2, D1, E1, T or TS)
Clear: Pressing the stop button while in this mode will set the timer to 90 seconds (default time).

MID-STOP

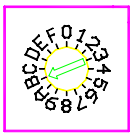
Mid-Stop function will, when active, move the door from the down position to a predetermined Mid-stop position when the open button or Open/Close device is activated. Once at Mid-Stop, subsequent Open/close commands will close the door. To move the door to full open position, the open button must be pressed again.



Set Mid-Stop: start with door in closed position and set the **rotary switch on C**. Check that the down limit is activated. Press the open button to drive the door up and then press the stop button at the desired Mid-Stop location. This will record the time of travel (Mid-Stop). Now the switch can be set on desired operating mode (B2, C2, D1, E1, T or TS).
Clear: Switch on C, door in closed position; press the close button to deactivate the Mid-stop function.

TIMER TO CLOSE

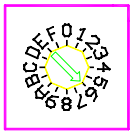
Timer to Close is a function that, when active, will close the door after an adjustable time delay once the door has reached its fully open and mid-stop position. The timer to close function works only in T and TS modes.



Set Timer to Close: start with door in closed position and set **rotary switch on B**. Press the Open button to add 15 seconds or the Close button to add 1 second each time, up to 4 minutes and 30 seconds (maximum total time)
Clear: Switch on B, press the Stop button, timer to close gets reset to 0 seconds, but is still active. To defeat the timer completely set the switch on desired position (0, 1, 2 or 3).

TIMER TO CLOSE FROM FULLY OPEN POSITION ONLY

Option used in conjunction with MID STOP function. When activated, Timer to Close is active from the fully open position only and not from the mid-stop position.



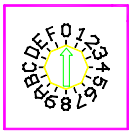
Set timer to close from fully open position: Bring the door to the close position and set the **rotary switch on 6.** First press the close button and then the stop button to activate; now the switch can be set on operating mode T or TS.
Clear: Switch on 6, press the close button to deactivate. Now the Timer to Close works from fully open and Mid-Stop positions.

7.4 MODE SETTING

For any mode setting the door should be on fully close position.

WIRING TYPE

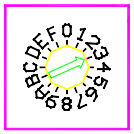
C2 Set the SWITCH on 0, factory Preset.
Function: Momentary contact to open and stop, constant pressure to close with 3 buttons station. Activation of safety devices will reverse the door during closing. Auxiliary devices function as an Open control and to reverse door during closing.



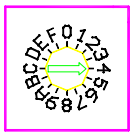
B2 Set the SWITCH on 1.
Function: Momentary contact to Open/Close and Stop with 3 buttons station. Activation of safety devices will reverse the door during closing. Auxiliary devices function as Open/Close control and reverse the door during closing.

D1 Set the SWITCH on 2.
Function: Constant pressure to Open and constant pressure to Close. Activation of safety devices will stop the door during closing

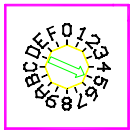
E2 Set the SWITCH on 3
Function: Momentary contact to open and constant pressure to Close. Release of Close button activates the door upwards. Activation of safety devices will reverse door motion to fully open position.



T Set the SWITCH on 4.
Function: Momentary contact to Open / Close and Stop. Timer to Close if programmed, safety devices reverse upon activation but will disable Timer to Close. Timer to Close will also be disabled if there is a power outage, a chain is hoist engaged or a stop button is pressed before elapsed time. The timer resumes its normal operation, once the close cycle is completed.



TS Set the SWITCH on 5.
Function: Momentary contact to Open / Close and Stop. Timer to Close if programmed, safety devices reverse upon activation and will refresh Timer to Close. Timer to Close also gets refreshed, if there is a power outage, a chain hoist is engaged or a stop button is pressed before elapsed time



IMPORTANT NOTES: Whenever there is a combination of timer to close and any door opening device (Loops, Photocell etc), that opening device should be connected on terminal #3 and #4 and NOT on #7 and #8 Any safety device must be connected on #3 & #5

WARNING

MOTORIZED DOORS CAN CAUSE SEVERE INJURY OR DEATH. WE STRONGLY RECOMMEND THE USE OF ENTRAPMENT PROTECTION SYSTEMS, ESPECIALLY IN THE CASES OF MOMENTARY CONTACT TO CLOSE (B2 WIRING) AND TIMER TO CLOSE (T & TS).

7.5 CONNECTION OF A REVERSING EDGE DEVICE

IMPORTANT NOTE: If the door is controlled by any device other than a constant pressure push-button station, a reversing edge must be connected.
CAUTION: **Connect reversing device appropriate to installation.**

Connection and installation of a reversing edge device is provided with the edge (also refer to page 18). Any such device that uses a normally open contact may be connected to terminals **3 and 5** on the low voltage terminal block. When the door comes in contact with an object during downward travel, the circuit will cause the motor to reverse the door to the fully open position. In addition, there is a cut-off limit switch (*advance close* limit switch) that will de-activate the reversing edge during the last few inches of the door's downward travel.

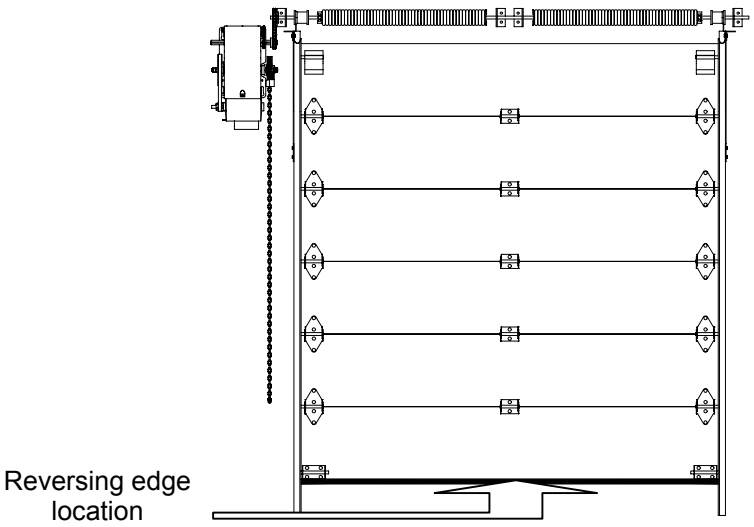


Figure 16 Reversing Edge

7.6 DOOR LOCK SENSOR & FRICTION CLUTCH

Please read carefully prior to installing this operator

All operators supplied with an electronic control board are equipped with the "DOOR LOCK SENSOR" feature.

The DOOR LOCK SENSOR prevents any damage to the door when the door lock hasn't been removed prior to electronic operation. It eliminates the need of expensive external interlock wiring.
This feature can only be used on operators equipped with a FRICTION CLUTCH.
When the lock stops the door, the clutch slips and in less than 1 second, the door will reverse a fraction of a second to release the lock.

WARNING

<u>IN ORDER NOT TO DAMAGE</u> THE DOOR WHEN THE LOCK IS ON, THE FRICTION CLUTCH HAS TO BE ADJUSTED PROPERLY ACCORDING TO THE INSTRUCTIONS PROVIDED ON PAGE 10

7.7 LIMIT SWITCHES

⚠ WARNING
TO AVOID THE DANGER OF POSSIBLE DAMAGE TO THE DOOR AND OPERATOR, TRAVELLING CAMS MUST BE ADJUSTED TO THEIR APPROXIMATE POSITIONS BEFORE MANUALLY OPERATING THE DOOR OR BEFORE APPLYING POWER TO THE OPERATOR.

There are 3 limit switches. Two are used as end of travel and one is for reversing devices. These switches are activated by the rotary cams travelling on a threaded shaft (Figure 17).

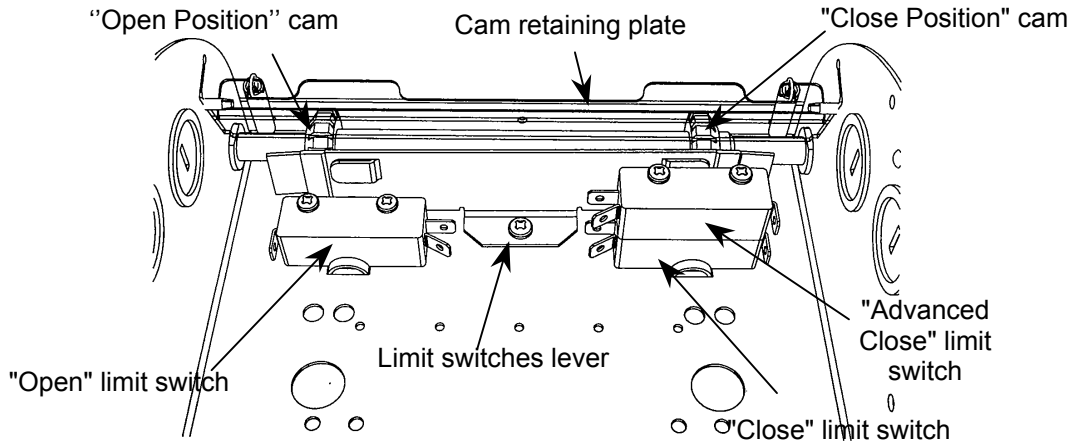


Figure 17 Limit switches

7.8 DESCRIPTION LIMIT SWITCHES

- The “Open” limit switch is the end of travel in the open position. Adjust the cam so that the door stops in the open position at the desired location.
- The “Close” limit switch is the end in the close position. Adjust the cam so that the door stops in the closed position at the desired position.
- The “Advanced Closed” limit switch is used in the operation of the reversing edge or other reversing devices. This limit switch prevents a signal from a reversing edge or device to reverse the door when it is almost fully closed

7.9 TROUBLE SHOOTING AN OPERATOR WITH ECB

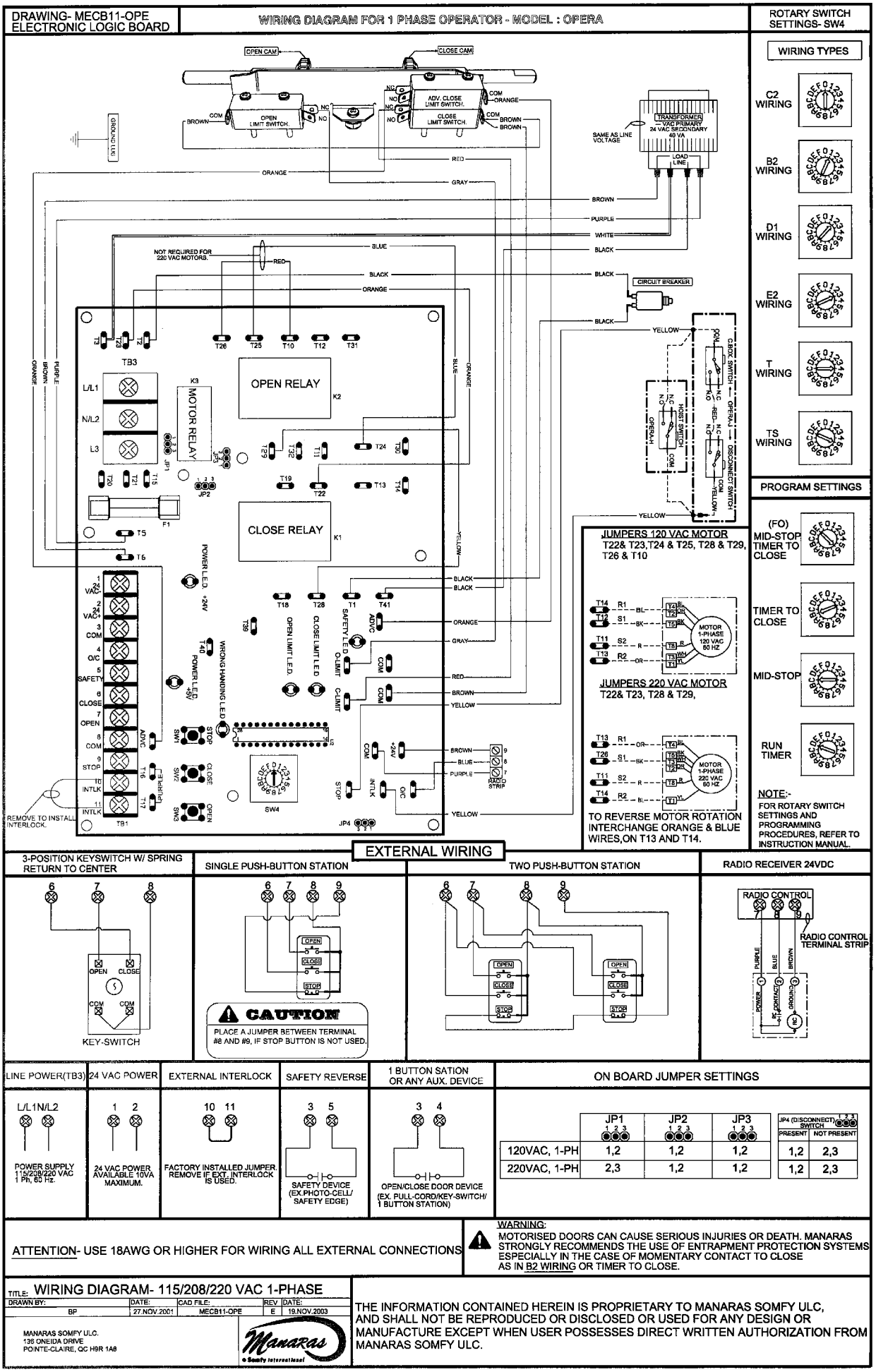
Troubleshooting an operator with an ECB is easier since the result of tests which have to be done on an electro mechanical circuit is provided by the status Monitoring LED’s

Easy fix	**Check the followings that may prevent the operator from starting before coming to any conclusion**
Check the operating modes	Review the operating modes: B2, C2, D1, T or TS
Check the programming	A wrong programming on Timer to Close or Mid Stop will stop the door to an improper position.
Check the presence of stop jumper	If the 3 test buttons are being used without the stop jumper between #8 & #9, the operator will respond to the 3 buttons command

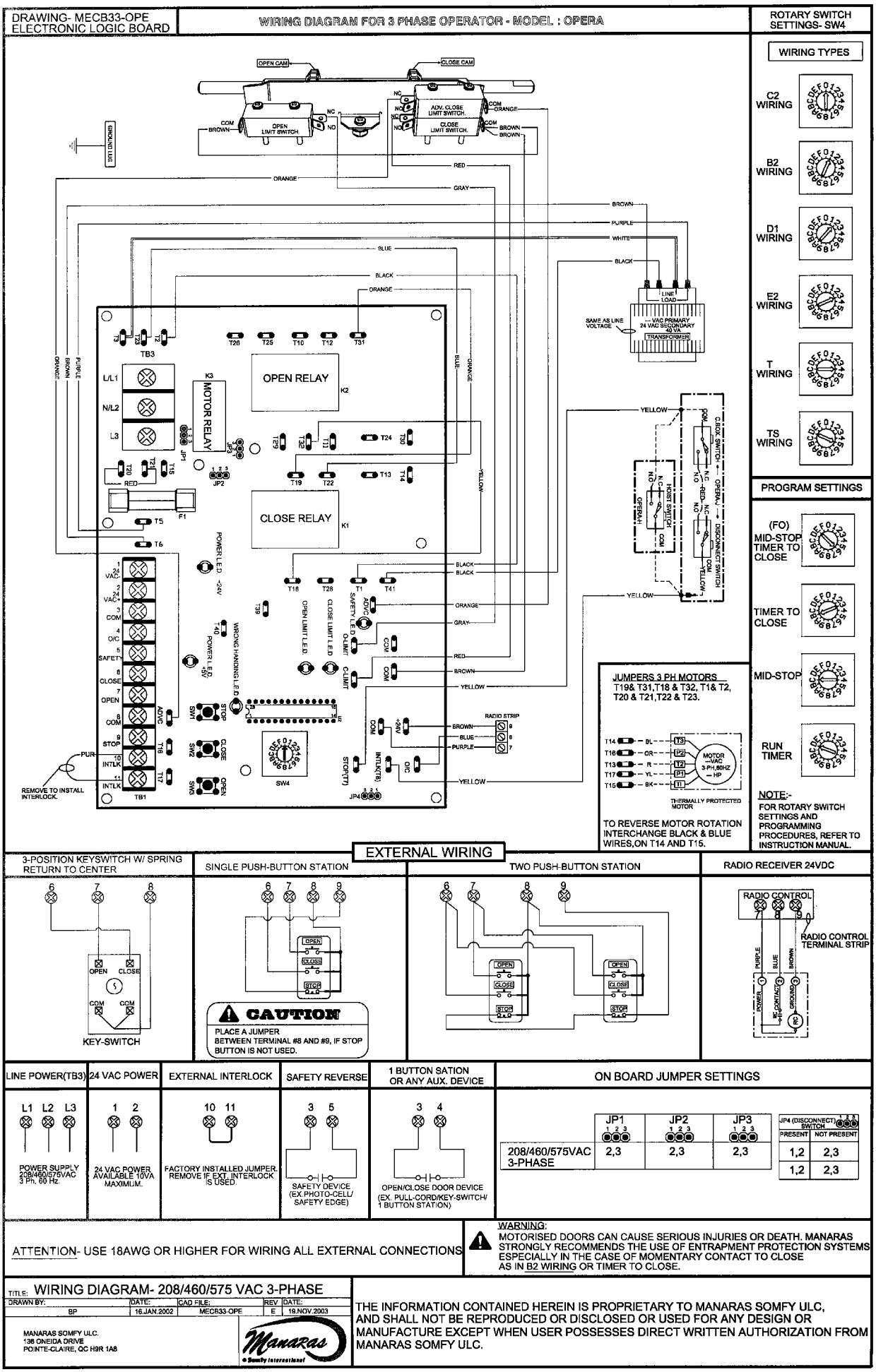
TROUBLE SHOOTING GUIDE

SYMPTOM	PROBABLE CAUSE	SUGGESTED ACTION
Door will not respond to « open » or « close » push buttons	Transformer defective	Replace
	Defective “stop” push button	Replace
	Loose connection in one of the push buttons	Verify, tighten or replace
	Defective “open” or “close” push button	Replace
Door will not respond to “open” command, but will respond to “close” command	Defective “open” push button	Replace
	Defective “open” limit switch	Replace
	Loose wire on “open” push button, “open” limit switch	Verify, tighten or replace
Door won’t respond to “close” command, but will respond to “open” command	Defective “close” push button	Replace
	Defective “close” limit switch	Adjust
	Loose wire on close push button, close limit switch	Verify, tighten or replace
Door moves in wrong direction with a three phase motor	Incorrect phasing	Interchange any two power leads
Stop button doesn’t stop the door	Two push button station	Correct wiring
	Bad stop button	Check and replace
Sensing edge does not reverse door	Pneumatic hose broken	Check and adjust
	Bad advanced close limit switch	Check and replace
	Bad air switch	Check and adjust
	Bad wiring	Check and correct wiring
Reversing devices will open the door when the door is closed	The advanced close limit switch is defective	Check and replace
	The advanced close limit switch is not getting engaged by traveling cam	The advanced close limit switch needs to be adjusted just slightly ahead or the end of travel close limit switch
When door closes it reverses to fully open after it hits the floor	The advanced close limit switch is defective	Replace
	The advanced close limit switch is not being engaged by traveling cam	The advanced close limit switch needs to be adjusted just slightly ahead or the end of travel close limit switch
	A “close” command is not given	Check “close” push button or any closing device for short-circuit
Motor hums, starts when spun	Capacitor defective	Replace
Motor fails to shut off at fully closed or opened position	Defective limit switch	Operate limit switch manually while door is moving. If door does not stop, replace switch
	Limit cams are not adjusted	Verify and adjust
	Limit drive chain broken	Replace
	Loose sprocket on limit shaft	Tighten set screw
	Limit shaft does not rotate	Verify and replace accordingly
Motor turns but door does not move	Sprocket key is missing	Replace
	Drive chain broken	Replace
	Limit shaft does not rotate	Adjust clutch tension
Limit switches do not hold their setting	Loose drive or limit chain allows chain to jump sprocket teeth	Adjust chain to proper tension
	Limit cam retainer not engaging slots in limit cams	Be sure retainer is in slots of BOTH cams
	Limit cams are binding on shaft threads which allows them to jump position on retainer	Lubricate shaft threads. Limit cams should turn freely
	Limit shaft have a light	Verify and adjust

7.10 Single phase ECB wiring diagram



7.11 3 phase ECB wiring diagram



8. Specific section for operators supplied with

ELECTROMECHANICAL CIRCUIT

(Contactor Circuit)

NOTE: Please refer to page 17 for hardwired operators.

8.1 WIRING OF THE OPERA OPERATOR

Do NOT connect any accessory controls until the limit switch adjustments have been completed and the operator is functioning properly.

Refer to the electrical diagrams on pages 36 and 37, the wiring specifications in TABLE 2 and the terminal input connections of Figure 24.

⚠ WARNING

EXERCISE CAUTION WHEN OPERATING MACHINE. THE DRIVE CHAIN AND LIMIT CHAIN, WHEN EXPOSED AND TURNING, COULD CAUSE SEVERE INJURY.

NOTE: Wiring diagrams are glued on the inside the control box cover. If the diagram is faded or damaged, call the factory for a replacement. DO NOT INSTALL ANY WIRING OR ATTEMPT TO RUN THIS OPERATOR WITHOUT CONSULTING THE WIRING DIAGRAM.

Main Power Supply

Power to the operator is of the permanent connection type. Connect according to local electrical code. Ground the unit using the ground lug inside the control box.

IMPORTANT: Be aware of the dimension of the power supply cables pipe (BX for ex.) It must not limit the control box movement to access the mechanical reduction parts. It is recommended **to add 7 or 8 inches**.

For single phase operators, connect the power supply to terminals L (line) and N (neutral) on the main terminal strip.

For three phase operators, connect the power supply to terminals L1, L2 and L3 on the main terminal strip.

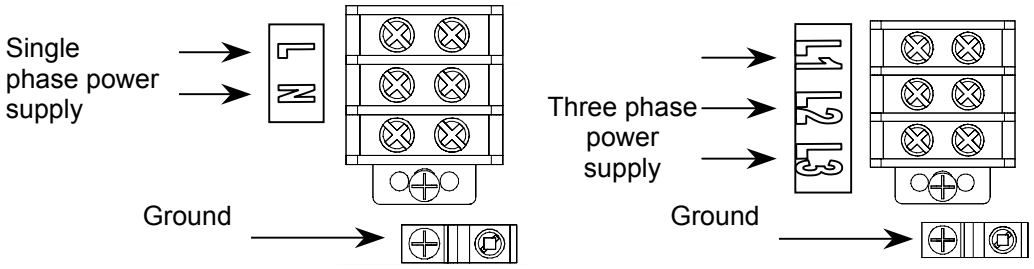


Figure 18 Power supply connection

⚠ WARNING

GROUND THE UNIT CORRECTLY USING THE COPPER GROUND LUG LOCATED INSIDE THE OPERATOR CONTROL BOX.

NOTE: All other connections on the terminal strip (1 to 9) are low voltage class II 24 VAC.

1. External interlock between terminals 1 and 2. A jumper is factory installed between these two terminals. If an external interlock is used (such as interlocking between two doors), remove the jumper between 1 and 2 and wire the interlock between these two terminals.

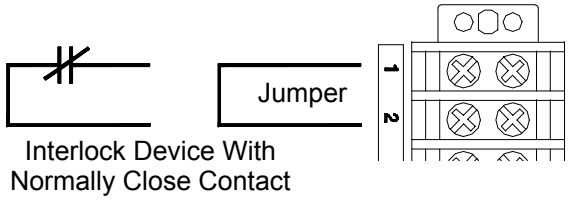


Figure 19 External interlock

2. A 3 button push-button station (open/close/stop) can be wired to terminals 2, 3, 4 and 5. Two push-button stations can be wired to these same terminals by following the wiring diagrams on pages 36 and 37.

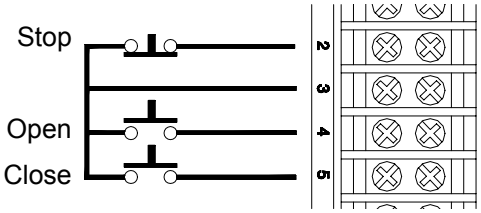
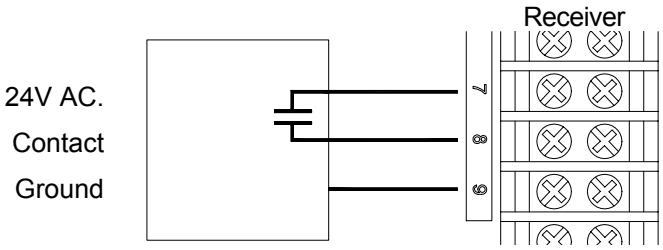


Figure 20 Three button push-button station

3. Three terminals are provided for the wiring of a radio-control receiver. Terminal #9 is Ground, #7 is 24 VAC (common) and #8 is the relay contact provided by the radio-control receiver to activate the door to open or close. Furthermore, terminals 7, 8 and 9 are doubly available on the terminal strip inside and on a separate small terminal strip located on the side of the unit. This terminal makes it convenient to wire-up a standard single button radio receiver on the side of the unit. When the transmitter is activated, the door will open to the fully open position. From the fully open position, the door will close. If transmitter is activated while closing, the door will reverse to the fully open position.

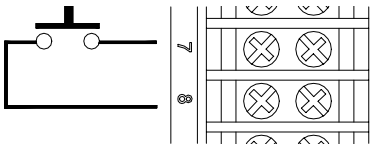
NOTE: It may be required to reverse connections to 7 and 9 for other types or radio receivers (Allstar, Linear, Pulsar ...).



<u>NOTE</u>: (select B2)
Radio Control = B2 wiring
Momentary contact to open, close and stop with a 3 buttons station.

Figure 21 Radio-control

4. A single button open/close door device can be wired to terminals 7 and 8 to behave in the same way as the radio control receiver.



<u>NOTE</u>: (select B2)
<u>Open/Close</u> = Radio Control
Momentary contact to open and close with single button station.

Figure 22 Single button device

NOTE: If several control devices are to be used, connect one and check for proper operation before connecting the next device.

5. A reversing edge can be wired up to terminals 3 and 6. These terminals can also be used for any other reversing devices such as loop detectors and photocells.

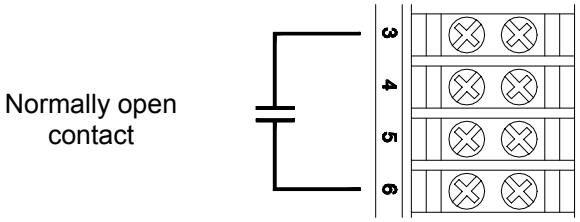


Figure 23 Reversing edge or other device

IMPORTANT: Upon completion of all wiring connections, readjust limits as mentioned in section 8.1 using "Open", "Close" and "Stop" buttons.

8.2 TECHNICAL NOTE

Please read carefully prior to installing this operator

B2 AND C2 WIRING

For Safety reasons Manaras has decided to propose its standard operators with C2 wiring.

B2 can be set very easily by moving wires. This operation can be performed by the installer as shown below or by Manaras when requested on the order.

⚠ WARNING:

MOTORIZED DOORS CAN CAUSE SERIOUS INJURIES OR DEATH. MANARAS STRONGLY RECOMMENDS THE USE OF ENTRAPMENT PROTECTION SYSTEMS, ESPECIALLY IN THE CASES OF MOMENTARY CONTACT TO CLOSE AS IN B2 WIRING OR TIMER TO CLOSE.

Wiring types description

C2 wiring: momentary contact to open and stop, constant pressure to close with 3 push button station. Activation of safety device will reverse the door during closing. Auxiliary devices to function as an open/control and to reverse the door during closing.

B2 wiring: momentary contact to open, close and stop with 3 push button station. Activation of safety device will reverse the door during closing. Auxiliary devices to function as an open/close control and to reverse the door during closing.

How to change the wiring type :

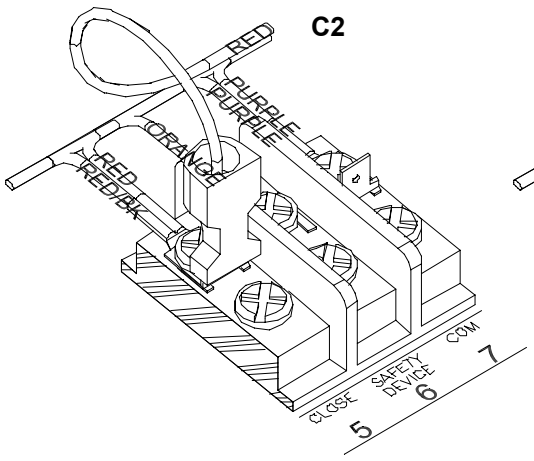
- **C2 ⇨ B2**

REMOVE THE SINGLE RED WIRE WITH RAPID CONNECTOR FROM TERMINAL #5 AND TRANSFER IT TO TERMINAL #7.

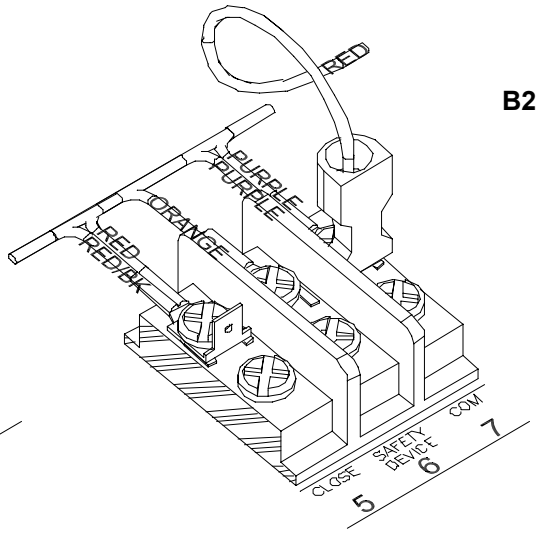
- **B2 ⇨ C2**

REMOVE THE SINGLE RED WIRE WITH RAPID CONNECTOR FROM TERMINAL #7 AND TRANSFER IT TO TERMINAL #5.

C2



B2



8.3 OPTIONAL CONTROL ACCESSORIES

- **Radio Controls:** Consists of a radio receiver unit and remote transmitters. These controls consist of an RF signal being emitted on a "pulse" basis to a mated receiver tuned to the same "pulse" rate. Once the receiver accepts the code, a relay is activated closing a set of contacts.

- **Photo-electric units:** Can be used as opening and reversing devices. An infra-red light is emitted from the control to a reflector and back. If, during closing travel of the door, the light beam is broken, the door will reverse to the fully open position.

- **Digital Keypad:** Consists of a control head which is pedestal mounted. Similar to a telephone touch pad it allows the selective coding of a four number series. Once the programmed series of numbers is received in their set order, a relay closes and completes a circuit.

- **Card Reader:** A magnetic-mechanical device which accepts sealed and coded cards. The cards trigger magnets to raise in the cartridge head, releasing a lock mechanism which allows a deeper insertion of the card. The card then contacts a switch that closes the circuit.

- **Key Switch:** Momentary contacts will open door. Can be wall or post mounted for interior or exterior use.

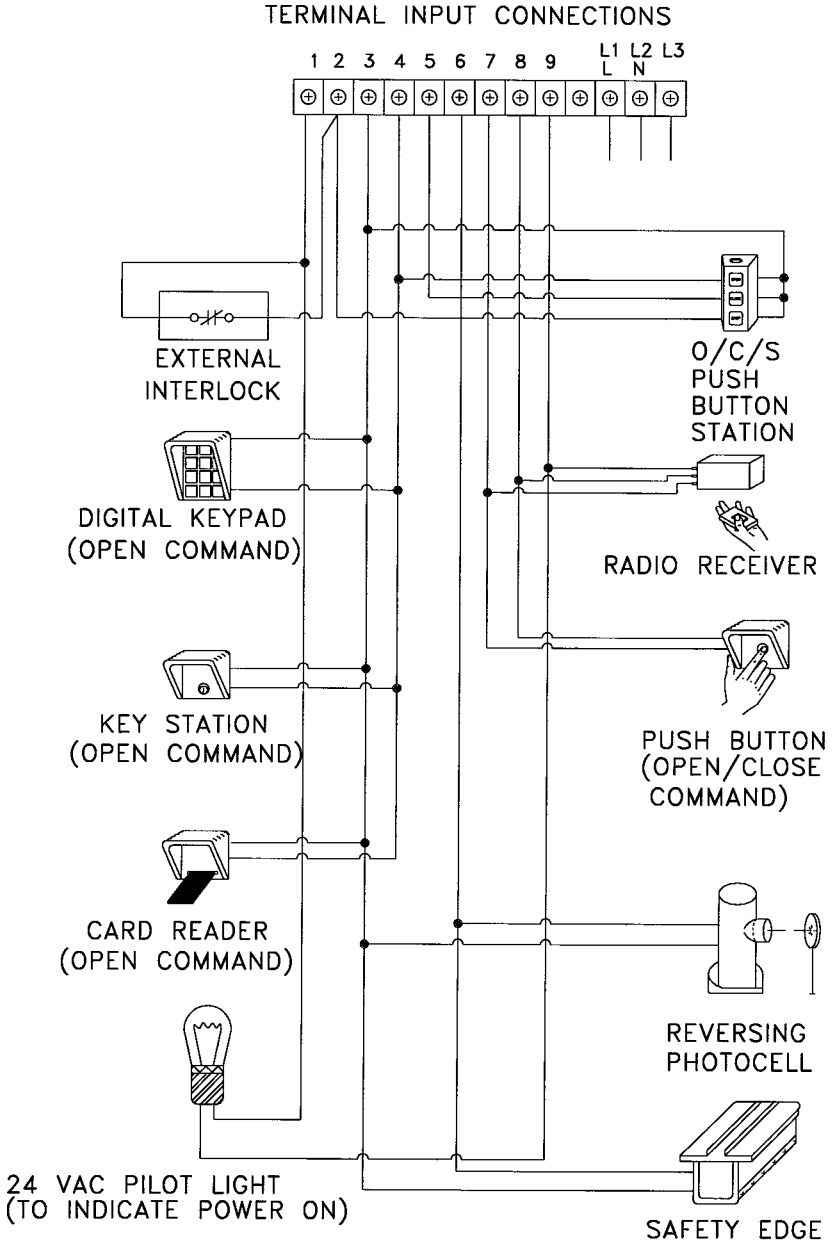


Figure 24 Terminal Input Connections

8.4 CONNECTION OF A REVERSING EDGE DEVICE

IMPORTANT NOTE: If the door is controlled by any device other than a constant pressure push-button station, a reversing edge must be connected.

CAUTION:
CONNECT REVERSING DEVICE APPROPRIATE TO INSTALLATION.

Connection and installation of a reversing edge device is provided with the edge (also refer to Figure 24). Any such device that uses a normally open contact may be connected to terminals **3 and 6** on the low voltage terminal block. When the door comes in contact with an object during downward travel, the circuit will cause the motor to reverse the door to the fully open position. In addition, there is a cut-off limit switch (*advanced close* limit switch) that will de-activate the reversing edge during the last few inches of the door's downward travel.

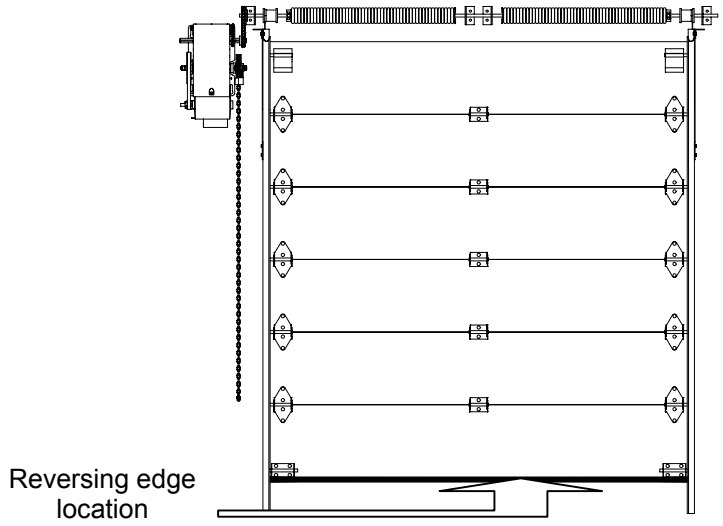


Figure 25 Reversing Edge

8.5 LIMIT SWITCHES

WARNING

TO AVOID THE DANGER OF POSSIBLE DAMAGE TO THE DOOR AND OPERATOR, TRAVELLING CAMS MUST BE ADJUSTED TO THEIR APPROXIMATE POSITIONS BEFORE MANUALLY OPERATING THE DOOR OR BEFORE APPLYING POWER TO THE OPERATOR.

There are 4 limit switches. Two are used as end of travel, one is for radio-control or one-button operation and one is for reversing devices. These switches are activated by the rotary cams travelling on a threaded shaft (Figure 26).

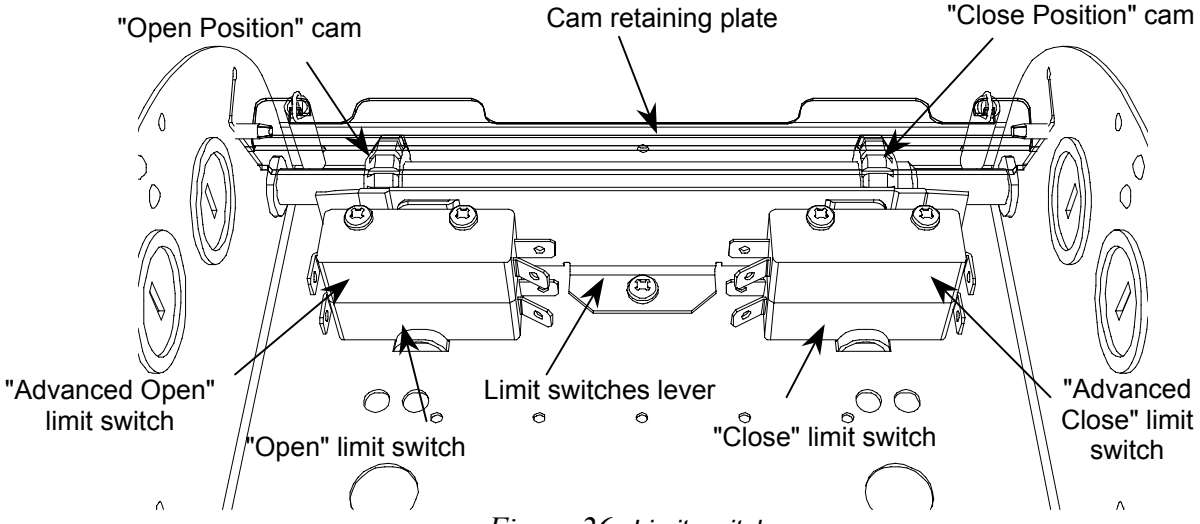


Figure 26 Limit switches

8.6 DESCRIPTION LIMIT SWITCHES

- The “Open” limit switch is the end of travel in the open position. Adjust the cam so that the door stops in the open position at the desired location.
- The “Advanced Open” limit switch is used for radio control (open/close) feature and to activate the timer to close the door if a timer is used
- The “Close” limit switch is the end in the close position. Adjust the cam so that the door stops in the closed position at the desired position.
- The “Advanced Closed” limit switch is used in the operation of the reversing edge or other reversing devices. This limit switch prevents a signal from a reversing edge or device to reverse the door when it is almost fully closed.

8.7 OPERATOR START-UP AND TESTING GUIDE

This guide is a procedure you can follow to test every feature of your door operator.

If a 3 button push-button station is wired to the operator, disconnect it and then place a normally-closed contact between terminals 2 and 3 to simulate a "Stop" push-button (use a spare limit switch or any such device). Interrupting the power between these terminals will stop the operator.

Using a small wire jumper, momentarily jump (short-circuit) the following terminals:

A. Momentarily jump terminals 3 and 4.
   The door will open instantly. Allow it open completely.
B. Momentarily jump terminals 3 and 5.
   The door will close instantly. Allow it close completely.
C. Momentarily jump terminals 7 and 8.
   The door will open instantly. Allow it to open completely.
D. Momentarily jump terminals 7 and 8.
   The door will close instantly. While closing, go to step E.
E. Momentarily jump terminals 7 and 8 again.
   The door will reverse to open. Allow it to open completely.
F. Momentarily jump terminals 7 and 8.
   The door will close. While closing, go to step G.
G. Momentarily jump terminals 3 and 6.
   The door will reverse to open. Allow it to open completely.
H. Momentarily jump terminals 7 and 8 again.
   The door will close. Allow it to close completely.
I. Momentarily jump terminals 3 and 6.
   The door should remain still.

This procedure can be repeated using the radio-control terminal strip located on the outside of the control box by using terminals "24VAC" and "CONTACT" instead of terminals 7 and 8.

8.8 TROUBLE-SHOOTING GUIDE

All operators are thoroughly tested and adjusted before shipping. In most cases, it is after installation and hook-up to external devices that a problem will arise.

If after connecting external devices to the operator, you encounter problems, the trouble often lies in the external devices or in the wiring leading to the external devices. Verify all external wiring making certain that there are no wires pinched anywhere shorting to ground and that there are no voltages being sent into the control circuit. The operator functions ONLY with dry contacts: all voltages necessary for proper functioning are generated by the operator transformer.

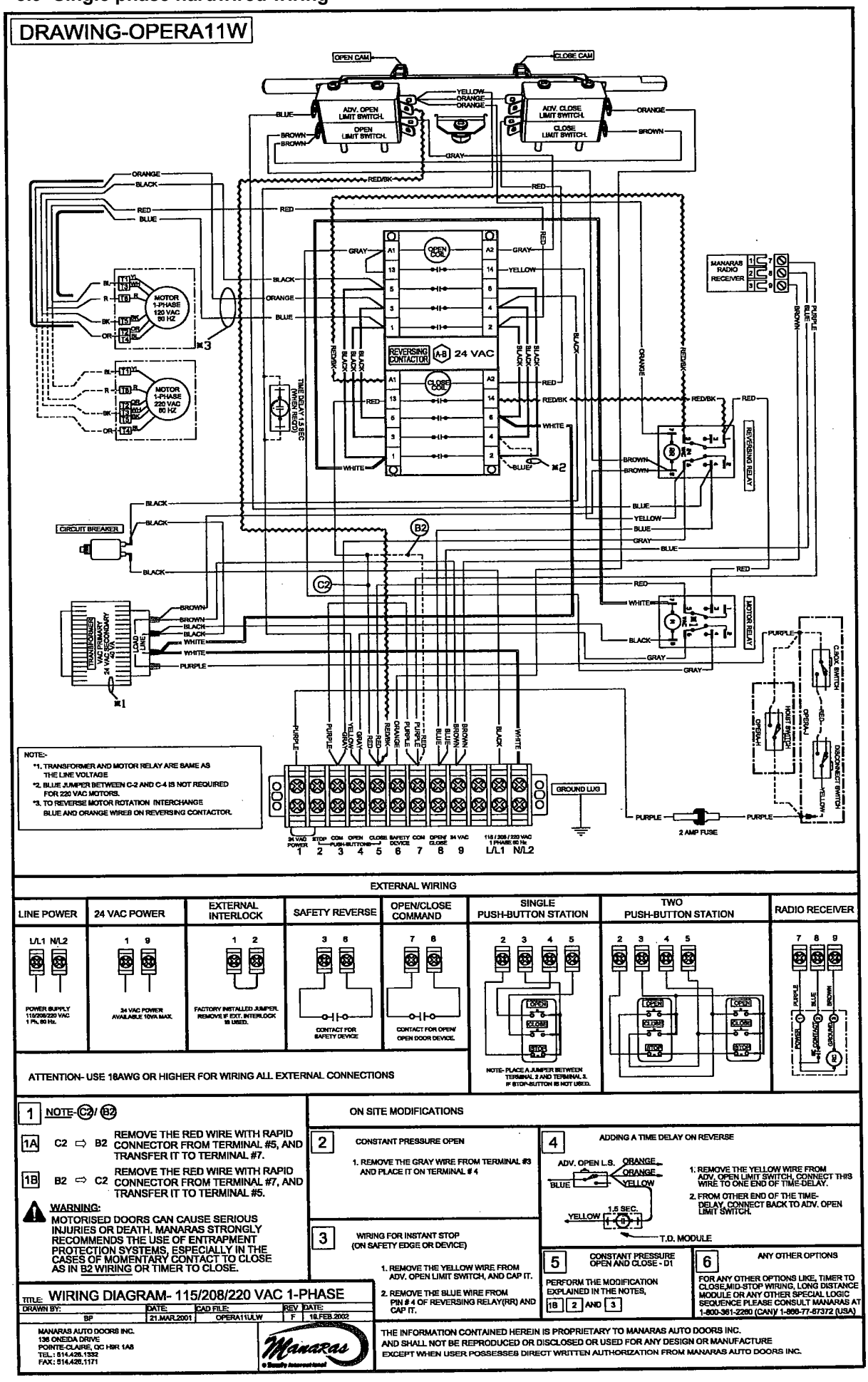
The following trouble-shooting guide (TABLE 2) will help you identify the source of the problem given a particular symptom.

TABLE 2 TROUBLE-SHOOTING GUIDE

SYMPTOM	PROBABLE CAUSE	SUGGESTED ACTION
Door will not respond to "open" or "close" push-buttons.	Machine is in disconnect position (Opera-J).	Make free the disconnect chain from the Opera-J chain keeper.
	Chain hoist is engaged which activated the disconnect switch (Opera-H)	Pull on chain slightly in each direction in order to disengage the chain hoist and return the operator to electrical operation. Check switch otherwise.
	Motor has overworked and the overload thermal protection has tripped.	Reset the overload protection: press reset button located on the side of the unit for a single phase operator. For a three phase operator, the thermal switch is inside the motor, let motor cool and restart operator. Is the door unbalanced?
	Circuit breaker tripped (if used).	Reset circuit breaker.
	Fuse is blown.	Replace fuse. If control circuit fuse keeps blowing: Disconnect all external devices. Leave power terminals connected. Run the operator artificially by using jumpers and shorting out the appropriate terminals as indicated in the Start-Up and Testing Guide. Then reconnect the various external devices one by one until you find the one causing the short to ground. **OR:** If you have an ohm-meter, use it to check all incoming wires for continuity to ground. The meter should read infinity in all instances. If there is conduction between any control circuit wire and ground, this indicates a leak to ground and this is why the control circuit fuse blows when power is applied. In some cases, the trouble is intermittent: i.e. the fuse only blows at certain times. This problem is more difficult to detect, but again: disconnect all wires going to external devices, and run the operator: if the fuse does not blow, this indicates that the trouble resides outside the operator.
	Transformer defective.	Replace.
	Defective "stop" push-button.	Replace.
	Loose connection in one of the push-buttons.	Verify, tighten or replace.
	Defective "open" or "close" push-button.	Replace.
Door will not respond to "open" command, but will respond to "close" command.	Defective "open" push-button.	Replace.
	"Open" cam has been overdriven.	Reinsert cam back onto the threaded shaft and readjust *Open* position.
	Defective "open" limit switch.	Replace
	Loose wire on "open" push-button, "open" limit switch or coil of open contactor.	Verify, tighten or replace.
Door will not respond to "close" command, but will respond to "open" command.	Defective "close" push-button.	Replace.
	"Close" cam has been overdriven.	Reinsert cam back onto the threaded shaft and readjust *Close* position.
	Defective “close” limit switch .	Adjust.
	Loose wire on close push-button, close limit switch or coil of close contactor.	Verify, tighten or replace.
Door moves in wrong direction.	Incorrect phasing on a three phase operator.	Interchange any two power leads.
	Wrongly connected on a single phase operator.	Interchange Black and White motor leads on contactor.
Door closes and operator does not shut-off at the end of closing travel.	"close" contactor is defective.	Verify and replace.
	"close" limit switch defective	Verify and replace.
Door opens and operator does not shut-off at the end of opening travel.	"open" contactor is defective.	Verify and replace.
	"open" limit switch is defective.	Verify and replace.
Sensing edge does not reverse door.	Pneumatic hose broken, electrical wiring not connected.	Contact a qualified installer.

SYMPTOM	PROBABLE CAUSE	SUGGESTED ACTION
Reversing devices will open the door when the door is closed.	The *advanced close* limit switch is defective.	Replace.
	The *advanced close* limit switch is not being engaged by travelling cam.	The *advanced close* limit switch needs to be adjusted just slightly ahead of the end of travel *Close* limit switch.
When door closes it reverses to fully open after it hits the floor.	The *advanced close* limit switch is defective.	Replace.
	The *advanced close* limit switch is not being engaged by travelling cam.	The *advanced close* limit switch needs to be adjusted just slightly ahead of the end of travel *Close* limit switch.
	A "Close" command is being given.	Check "Close" push-button or any closing device for short-circuit.
Radio-control does not function or hesitates for 10 seconds before working.	It is normal for a radio receiver to take up to 10 seconds to "warm-up" before being fully operational. Therefore, when applying power for the first time, the radio-control will take 10 seconds before becoming fully operational.	Check protocol code pins of the transmitter and receiver: they must be the same. Press on the transmitter and listen to the receiver: you should hear a faint click. The transmitter battery may be dead or your receiver may need servicing. To test for radio-control function, short out momentarily terminals 7 and 8 on the terminal strip. Operator should function normally. Have the radio-control verified: the mini-relay inside the receiver may be defective.
Motor hums, starts when spun.	Capacitor defective. (single phase only)	Replace
Motor fails to shut off at fully closed or opened positions.	Defective limit switch.	Operate limit switch manually while door is moving. If door does not stop, replace switch.
	Limit cams are not adjusted.	Verify and adjust.
	Limit drive chain broken.	Replace.
	Loose sprocket on limit shaft.	Tighten set screw.
	Limit shaft does not rotate.	Verify and replace accordingly.
Motor turns but door does not move.	Sprocket key is missing.	Replace.
	Drive chain is broken.	Replace.
	One of the reduction chains is broken	Replace.
	Clutch is slipping.	Adjust clutch tension.
Motor hums or does not run.	Door locked or jammed.	Verify manual operation of door.
	Dead phase (three phase supply).	Check power supply, fuses on each phase.
Limit switches do not hold their setting.	Loose drive or limit chain allows chain to jump sprocket teeth.	Adjust chain to proper tension
	Limit cam retainer not engaging slots in limit cams.	Be sure retainer is in slots of BOTH cams.
	Limit cams are binding on shaft threads which allows them to jump position on retainer.	Lubricate shaft threads. Limit cams should turn freely.
Radio-control opens and reverses the door, but when the door is fully opened, will close the door a little and bounce back to the open position again. Door cannot be closed except by the "close" push-button.	The *Advanced Open* limit switch is insufficiently advanced from the full *Open* limit switch. The contact of the radio-control receiver is maintained for 1.5 seconds when a command is issued by the radio transmitter. Therefore, when the door is fully opened, and a pulse is sent from the transmitter, the receiver maintains the contact closed for 1.5 seconds. If the door has closed and the *Advanced Open* limit switch has returned to its normal state, the reversing relay will be activated, and the door bounces back to the open position.	Adjust the *Advanced Open* limit switch by bending the limit switch lever punch away from the travelling cam and more towards the *Open* limit switch.

8.9 Single phase hardwired wiring



EXTERNAL WIRING

LINE POWER	24 VAC POWER	EXTERNAL INTERLOCK	SAFETY REVERSE	OPEN/CLOSE COMMAND	SINGLE PUSH-BUTTON STATION	TWO PUSH-BUTTON STATION	RADIO RECEIVER
L/L1 N/L2	1 9	1 2	3 6	7 8	2 3 4 5	2 3 4 5	7 8 9
POWER SUPPLY 115/208/220 VAC 1 PH, 60 Hz.	24 VAC POWER AVAILABLE 10VA MAX.	FACTORY INSTALLED JUMPER. REMOVE IF EXT. INTERLOCK IS USED.	CONTACT FOR SAFETY DEVICE	CONTACT FOR OPEN/ OPEN DOOR DEVICE.	NOTE- PLACE A JUMPER BETWEEN TERMINAL 2 AND TERMINAL 3. IF STOP-BUTTON IS NOT USED.		

ATTENTION- USE 18AWG OR HIGHER FOR WIRING ALL EXTERNAL CONNECTIONS

1 NOTE- C2 / B2

1A C2 ⇨ B2 REMOVE THE RED WIRE WITH RAPID CONNECTOR FROM TERMINAL #5, AND TRANSFER IT TO TERMINAL #7.

1B B2 ⇨ C2 REMOVE THE RED WIRE WITH RAPID CONNECTOR FROM TERMINAL #7, AND TRANSFER IT TO TERMINAL #5.

WARNING:
MOTORISED DOORS CAN CAUSE SERIOUS INJURIES OR DEATH. MANARAS STRONGLY RECOMMENDS THE USE OF ENTRAPMENT PROTECTION SYSTEMS, ESPECIALLY IN THE CASES OF MOMENTARY CONTACT TO CLOSE AS IN B2 WIRING OR TIMER TO CLOSE.

ON SITE MODIFICATIONS

2 CONSTANT PRESSURE OPEN

1. REMOVE THE GRAY WIRE FROM TERMINAL #3 AND PLACE IT ON TERMINAL # 4

3 WIRING FOR INSTANT STOP (ON SAFETY EDGE OR DEVICE)

1. REMOVE THE YELLOW WIRE FROM ADV. OPEN LIMIT SWITCH, AND CAP IT.
2. REMOVE THE BLUE WIRE FROM PIN # 4 OF REVERSING RELAY(RR) AND CAP IT.

4 ADDING A TIME DELAY ON REVERSE

ADV. OPEN L.S. ORANGE, ORANGE, YELLOW, BLUE, YELLOW, 1.5 SEC., T.D. MODULE

1. REMOVE THE YELLOW WIRE FROM ADV. OPEN LIMIT SWITCH, CONNECT THIS WIRE TO ONE END OF TIME-DELAY.
2. FROM OTHER END OF THE TIME-DELAY, CONNECT BACK TO ADV. OPEN LIMIT SWITCH.

5 CONSTANT PRESSURE OPEN AND CLOSE - D1

PERFORM THE MODIFICATION EXPLAINED IN THE NOTES, 1B AND 2 AND 3

6 ANY OTHER OPTIONS

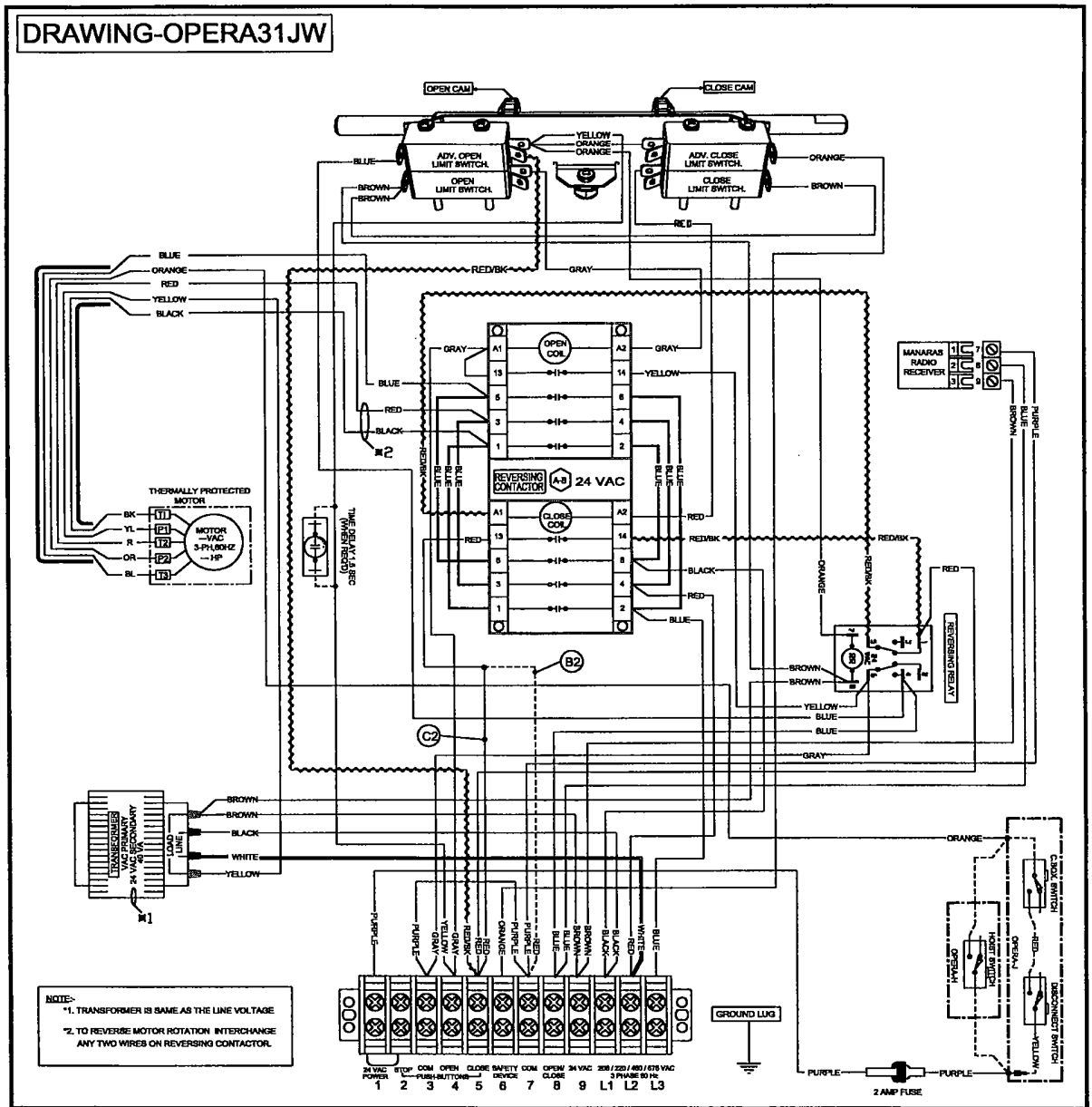
FOR ANY OTHER OPTIONS LIKE, TIMER TO CLOSE,MID-STOP WIRING, LONG DISTANCE MODULE OR ANY OTHER SPECIAL LOGIC SEQUENCE PLEASE CONSULT MANARAS AT 1-800-361-2260 (CAN)/ 1-866-77-67372 (USA)

TITLE: WIRING DIAGRAM- 115/208/220 VAC 1-PHASE

DRAWN BY:	DATE:	CAD FILE:	REV	DATE:
BP	21.MAR.2001	OPERA11ULW	F	18.FEB.2002

MANARAS AUTO DOORS INC.
136 ONEIDA DRIVE
POINTE-CLAIRE, QC H9R 1A8
TEL.: 514.426.1332
FAX: 514.426.1171

8.10 3 phase hardwired wiring



EXTERNAL WIRING

LINE POWER	24 VAC POWER	EXTERNAL INTERLOCK	SAFETY REVERSE	OPEN/CLOSE COMMAND	SINGLE PUSH-BUTTON STATION	TWO PUSH-BUTTON STATION	RADIO RECEIVER
L1 L2 L3	1 9	1 2	3 8	7 8	2 3 4 5	2 3 4 5	7 8 9
POWER SUPPLY 208/460/575 VAC 3 Ph, 60 Hz.	24 VAC POWER AVAILABLE 10VA MAX.	FACTORY INSTALLED JUMPER. REMOVE IF EXT. INTERLOCK IS USED.	CONTACT FOR SAFETY DEVICE	CONTACT FOR OPEN/ OPEN DOOR DEVICE.	NOTE- PLACE A JUMPER BETWEEN TERMINAL 2 AND TERMINAL 3, IF STOP-BUTTON IS NOT USED.		

ATTENTION- USE 18AWG OR HIGHER FOR WIRING ALL EXTERNAL CONNECTIONS

1 NOTE- C2 / B2

1A C2 ⇨ B2 REMOVE THE SINGLE RED WIRE FROM TERMINAL #5, AND TRANSFER IT TO TERMINAL #7.

1B B2 ⇨ C2 REMOVE THE SINGLE RED WIRE FROM TERMINAL #7, AND TRANSFER IT TO TERMINAL #5.

WARNING

MOTORISED DOORS CAN CAUSE SERIOUS INJURIES OR DEATH. MANARAS STRONGLY RECOMMENDS THE USE OF ENTRAPMENT PROTECTION SYSTEMS, ESPECIALLY IN THE CASES OF MOMENTARY CONTACT TO CLOSE AS IN B2 WIRING OR TIMER TO CLOSE.

ON SITE MODIFICATIONS

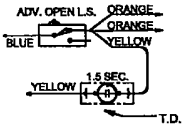
2 CONSTANT PRESSURE OPEN

1. REMOVE THE GRAY WIRE FROM TERMINAL #3 AND PLACE IT ON TERMINAL # 4

3 WIRING FOR INSTANT STOP (ON SAFETY EDGE OR DEVICE)

1. REMOVE THE YELLOW WIRE FROM ADV. OPEN LIMIT SWITCH, AND CAP IT.
2. REMOVE THE BLUE WIRE FROM PIN # 4 OF REVERSING RELAY(RR) AND CAP IT.

4 ADDING A TIME DELAY ON REVERSE



1. REMOVE THE YELLOW WIRE FROM ADV. OPEN LIMIT SWITCH, CONNECT THIS WIRE TO ONE END OF TIME-DELAY.
2. FROM OTHER END OF THE TIME-DELAY, CONNECT BACK TO ADV. OPEN LIMIT SWITCH.

5 CONSTANT PRESSURE OPEN AND CLOSE - D1

PERFORM THE MODIFICATION EXPLAINED IN THE NOTES, 1B 2 AND 3

6 ANY OTHER OPTIONS

FOR ANY OTHER OPTIONS LIKE, TIMER TO CLOSE,MID-STOP WIRING, LONG DISTANCE MODULE OR ANY OTHER SPECIAL LOGIC SEQUENCE PLEASE CONSULT MANARAS AT 1-800-361-2260 (CAN)/ 1-866-77-67372 (USA)

TITLE: WIRING DIAGRAM- 208/460/575 VAC 3-PHASE

DRAWN BY:	DATE:	CAD FILE:	REV	DATE:
BP	05.FEB.2001	OPERA31JW	D	10.FEB.2002

MANARAS AUTO DOORS INC.
136 ONEIDA DRIVE
POINTE-CLAIRE, QC H9R 1A8
TEL.: 514.426.1332
FAX: 514.426.1171

NOTES

NOTES

Customer Service and Technical Support

US Toll Free Number: 1-866-776-7372

CAN Toll Free Number: 1-800-361-2260

www.manaras.com