TN Operator
Installation & Owner Manual

Attention:

Please read this manual
prior to
installing and operating
your door.

Recheck your work
before operation.

Notice to Installer: This manual must be left with the End User.
Personally deliver to the End User's attention.

TORMAX AUTOMATIC

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(210) 494-3551 • Fax (210) 494-5930 • WWW.TORMAXUSA.COM

4-5-2010
US800918

Safety Rules & Contents

No work should be undertaken of any sort while the power supply is on.

Always switch the Fused Disconnect OFF while working on the control panel or connection cables.

High Voltage

Electric shock can cause serious injury or death Always lock the Main Disconnect Switch in the OFF position during wiring or mechanical work on the door. When uncertain if power is disconnected, always check with a voltmeter.

All electrical wiring must be done by qualified electricians. Wiring must meet all local, state, and federal codes.

NOTICE

This manual and the information therein is the sole property of Chase Industries Inc., and is given solely to individuals who purchase the TN Operator product. Its intent is to instruct the purchaser on the TN Operator's operation. Use of this information without purchasing the TN Operator product or the consent of Chase Industries Inc. is strictly forbidden. Copying of this manual in any way is forbidden without the express consent of Chase Industries Inc.

Training in the use of this door product is ultimately the responsibility of the end user. Chase Industry approved installers will instruct and provide the end user's supervisor with the Manual. It will then become the responsibility of the end user to further instruct each individual in his company using this door with the specifics of its operations.

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Section 1 - TN Operator Packing List

Description

Drive Arm Standard Pivot

Drive Arm Offset Pivot

TN Unit (Master)

TN Unit (Slave)

TN Unit (Master) Extended Shaft 30mm

TN Unit (Slave) Extended Shaft 30mm

Concrete Floor Box (Terrazzo) Extended Shaft 30mm

Control Box

Floor Stop

Concrete Floor Box (Standard)

Construction Cover (Unit)

Construction Cover (Shaft)

Stainless Cover (Unit)

Stainless Cover (Shaft)

Intermediate Pivot

Top Pivot

Actuators _____
(description)

Section 2 - Installation Instructions For TN Operator

Hole in Floor

1. Cut hole in floor according to figures 1 & 2.

2. Should there be a possibility of water getting to the unit, it is necessary to provide an outlet to a lower level (drain or outlet pipe). Such an outlet pipe should be connected to the centering hole in the floor of mounting box.

3. The electrical conduits should be laid out according to the electrician's instructions. Refer to figures 12, 13, 14, 15 and 16 for electrical connections.

NOTE: The center bore in the floor of the mounting box (corresponds with the center of the driving pivot) must coincide exactly with the door axis (plumbed from the upper door bearing).

FLOOR BOX WITH STANDARD PAN OPTION "A"

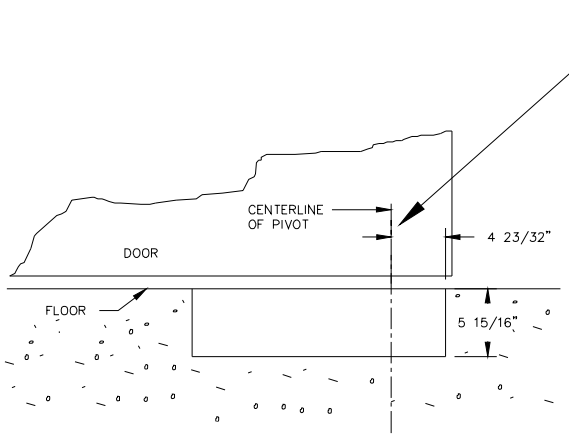


FIGURE 1

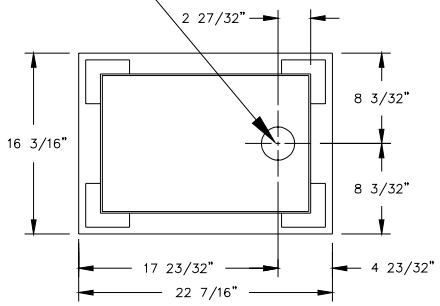


FIGURE 2

FLOOR BOX WITH SPECIAL COVER PLATE OPTION "B"

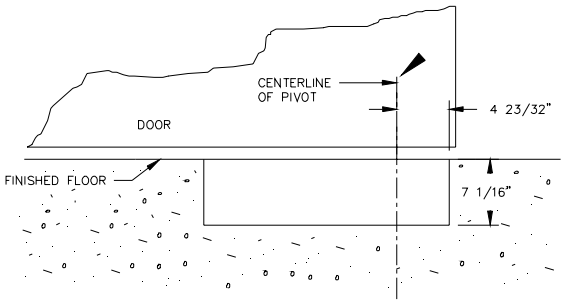


FIGURE 1

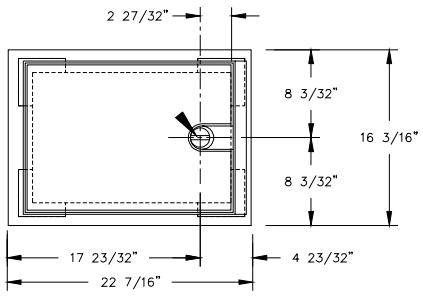


FIGURE 2

Embedding The Mounting Box.

4. If the door or driving unit is not immediately at hand it is still possible to embed the mounting box and finish the floor. It is, however, necessary to observe the following points with utmost care.

a. The upper edge of the mounting box must be exactly horizontal.

b. The upper edges of the mounting box must be exactly flush with the finished floor.

c. The center bore in the floor of the mounting box (corresponds with the center of the driving pivot) must coincide exactly with the door axis (plumbed from the upper door bearing).

d. The long edges of the mounting box must be parallel with the door front.

e. The plastic tube for the electrical connection must be directed exactly to one of the lateral holes.

f. Don't choke the water outlet!

5. It is important that the mounting box be held in the proper position by means of wooden wedges. After the cement has set and after an accurate last check of the above points has been made the door can be finished.

TERRAZZO PAN

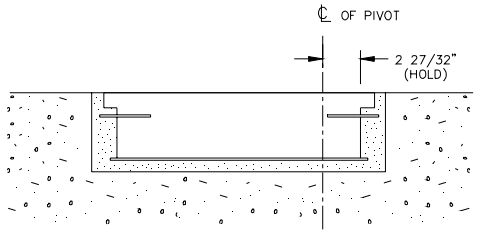


FIGURE 3

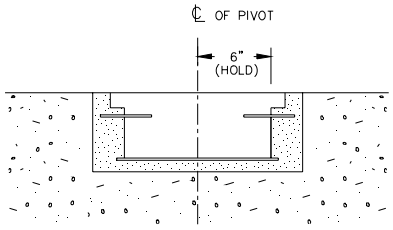


FIGURE 4

STANDARD PAN

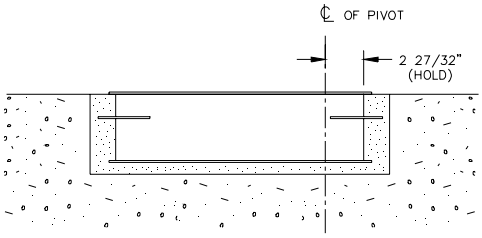


FIGURE 3

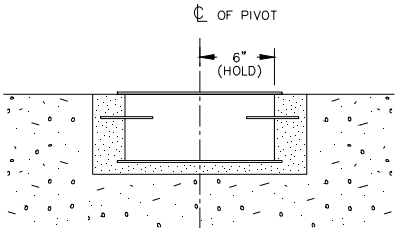


FIGURE 4

Section 2 - Installation Instructions For TN Operator

Installing The Driving Unit:

6. Place the unit beside the embedded mounting box.

7. The two eye bolts delivered with the unit are screwed into the M8 threaded holes in the base plate. A rope is then pulled through these eye bolts and the unit is lowered into the mounting box (weight approx. 77 lbs) see fig 5. Please observe carefully that the electrical cables are not jammed and that the rubber inserts are well attached to the mounting box.

8. Fill up with oil. In order to avoid any damage the unit must be filled up with oil before mounting the door.

Oil:	AeroShell Fluid #4 or Hydraulic oil Shell Tellus 15
Viscosity:	1.65 Engler / 122 F (50 C)
Contents of the Sump:	1 2/5 Imp. Gal. (6.5 Liters) (Reference only. Refer to diagram on page 13 for proper oil level.)

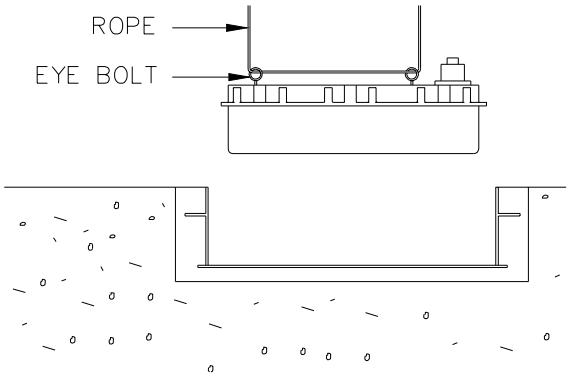


FIGURE 5

9. Utmost care has to be taken when filling up with oil. Drive and the floor around it have to be cleaned thoroughly beforehand. The unit must be fitted immediately after filling.

10. The four clamps in the corners of the mounting box are fitted and screwed on. Check that the rubber parts are properly attached to these clamps. See figure 6.

11. After the unit is fitted correctly, the eye bolts must be removed.

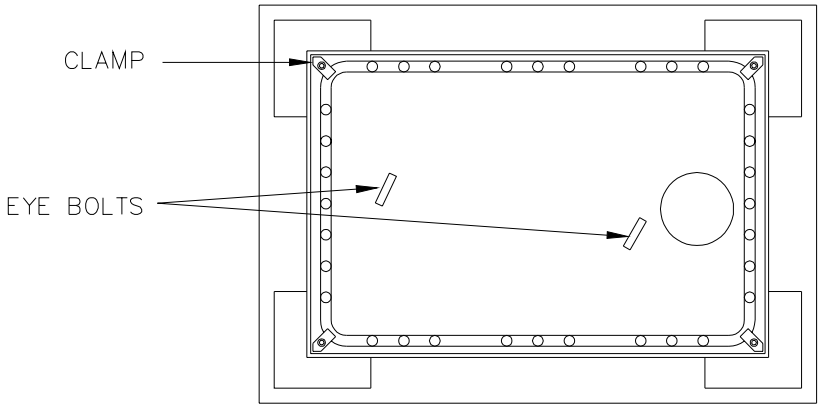
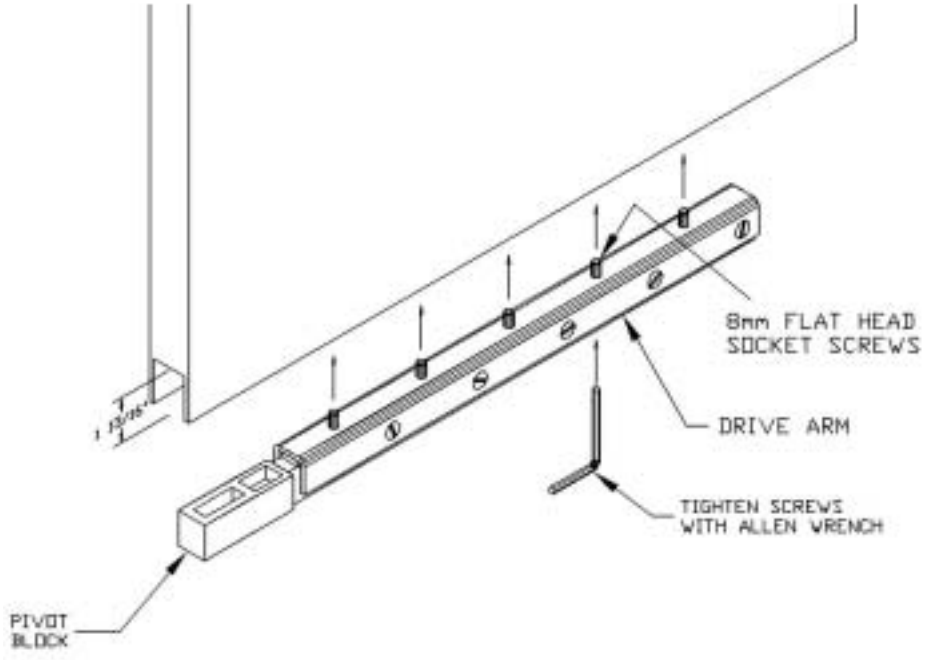


FIGURE 6

Door Driver (Standard)

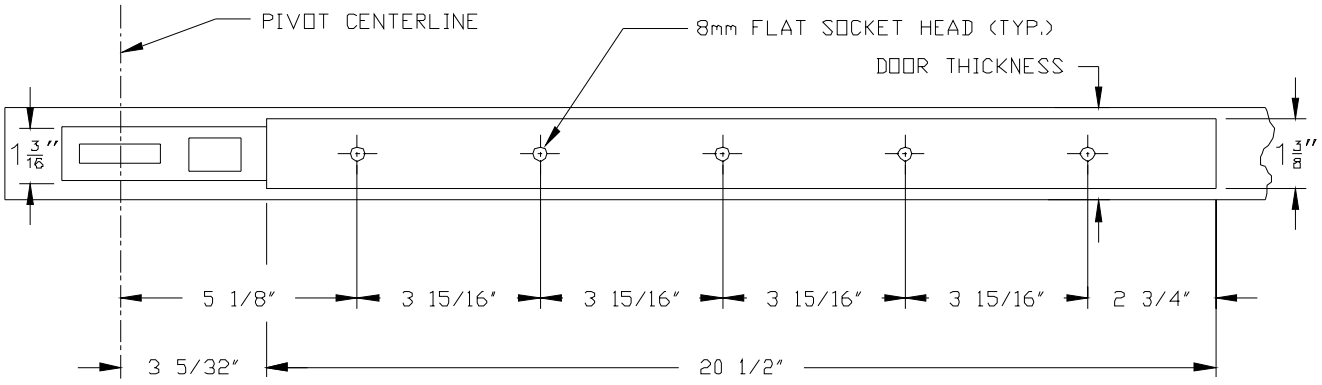


12. Using the drawing below, determine the location of screws in the bottom of the door.

13. Prepare the door to receive 8mm flat socket head screws.

14. Mount arm to bottom of door as shown above.

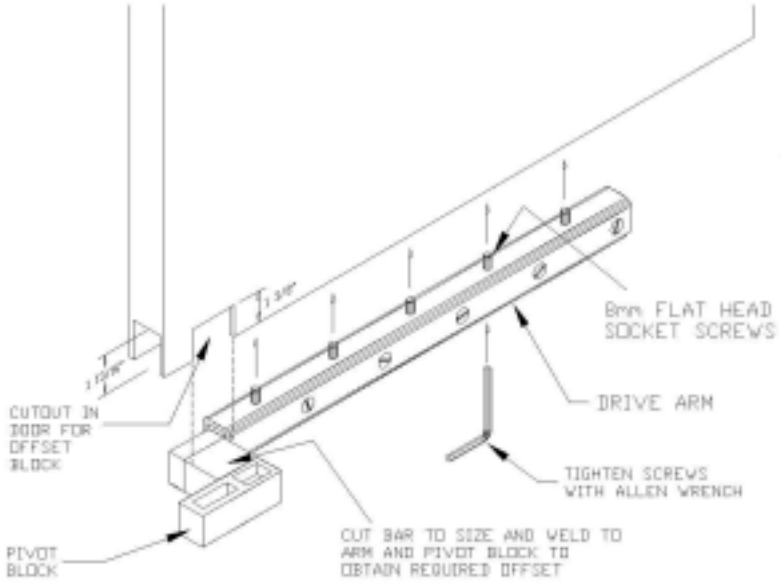
THIS INFORMATION BASED ON 19/32" FLOOR CLEARANCE



BOTTOM VIEW OF DOOR

Section 2 - Installation Instructions For TN Operator

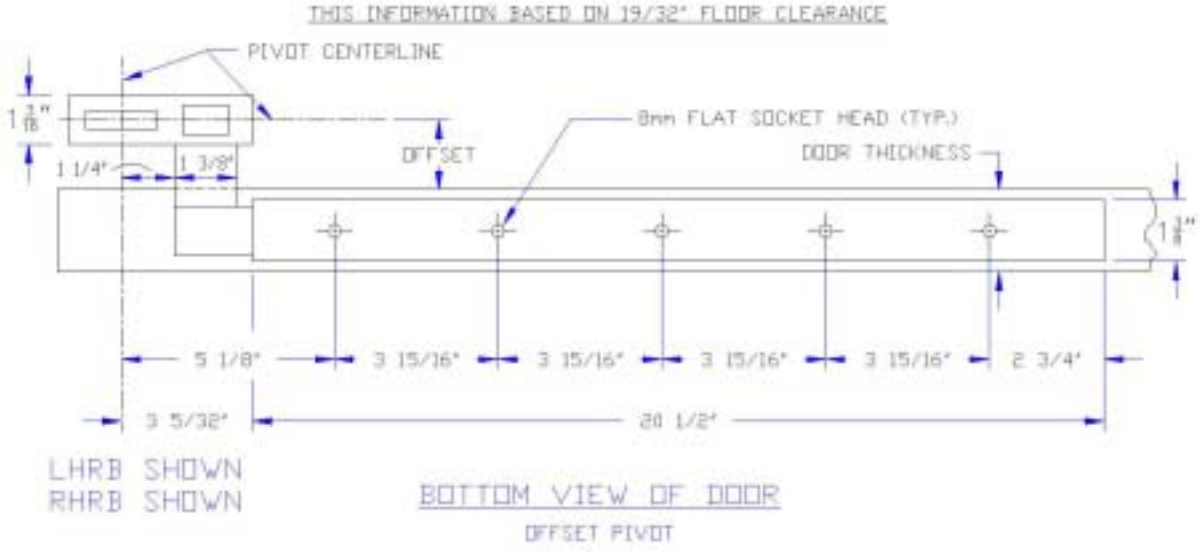
Door Driver (Offset)



12. Using the drawing below, determine the location of screws in the bottom of the door. Prepare the door to receive 8mm flat socket head screws.

13. Weld the required amount of 1 3/8" square bar as shown to the operator arm and pivot block as shown to obtain the required offset.

14. Make a cutout in the face of the door as shown for the arm offset. Mount arm to bottom of door as shown above.



Alignment Of The Door:

15. Should the mounting box not be embedded, it has to be carefully aligned with the driving unit, observing the recommendations in note #4 on page 2. The spirit level must be used here together with wooden wedges to hold the box. After an accurate check that the upper door bearing and driving shaft are exactly in line and the door does not jamb anywhere, make sure all clamping screws are securely tightened.

16. The unit is supplied with two covering plates. During the time of construction, an iron plate is mounted for protecting the unit. Later this is substituted by an aluminum plate.

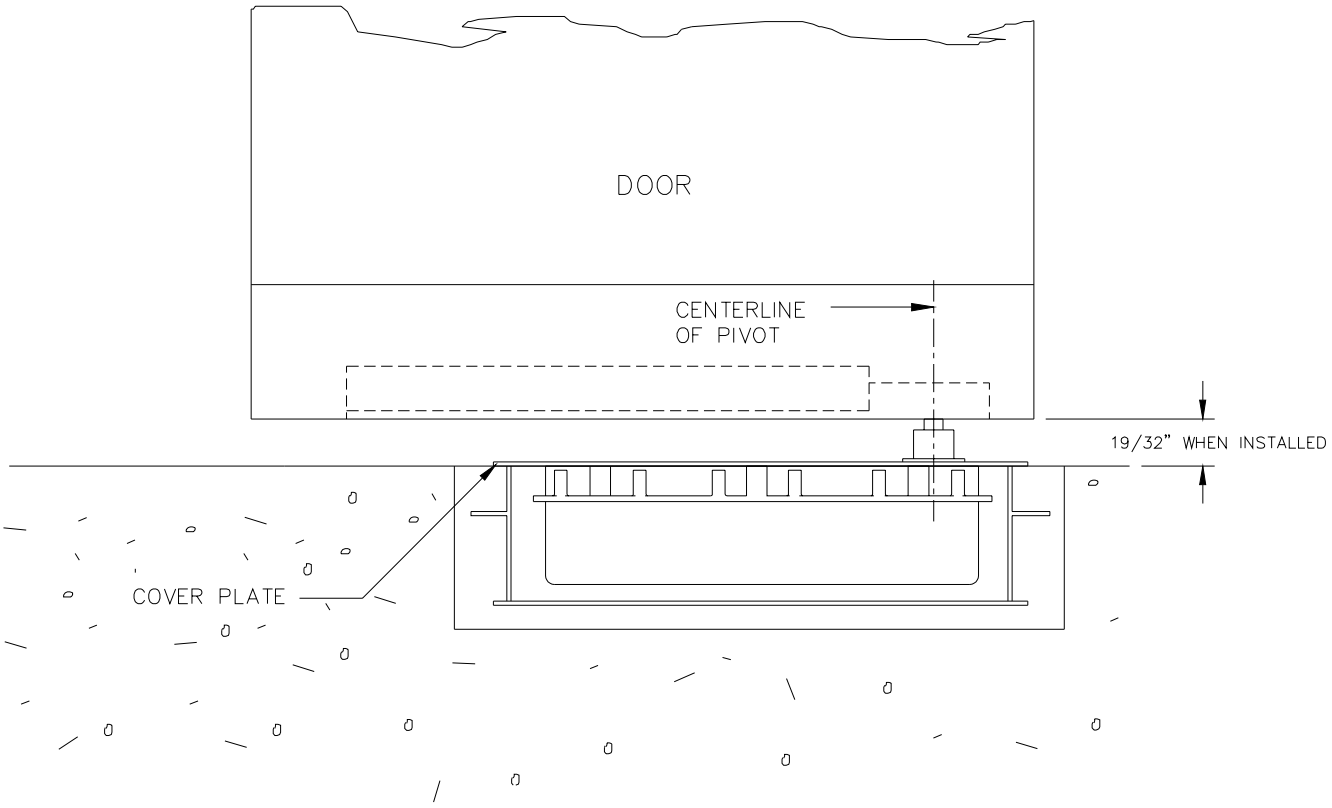


FIGURE 9

NOTE: THE GLAZING MATERIAL MUST MEET ANSI Z97.1–1985 SPECIFICATIONS.

17. Field locate floor door stop to prevent overtravel by door. (See figures 10 & 11)

Arrange floor stop so that the stop will absorb any overtravel if door is manually forced open. Failure to follow this procedure may void warranty

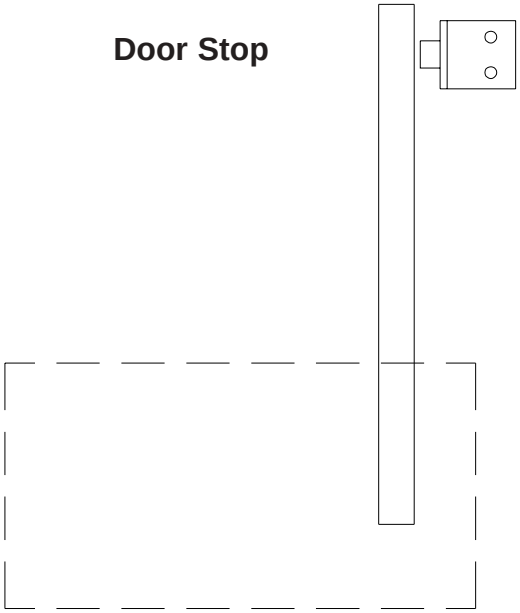


FIGURE 10

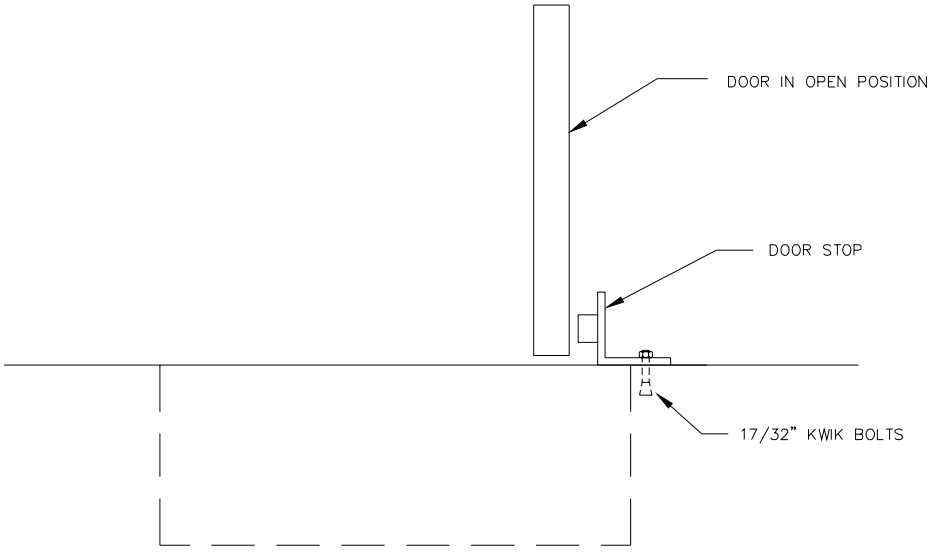


FIGURE 11

Section 3 - Putting The TN Operator Into Service

It is advisable to put the unit into service only when the controls are already functioning or by means of an ordinary hand switch if controls are not yet functioning.

1. Check that unit is filled with oil.

2. Check that all screws are tightened properly. The regulating nut for adjusting the force for holding the door closed must be set to minimum.

3. Deaerate the hydraulic system by opening and closing the door a few times by hand.

4. Check rotation of the motor: Operate the motor shortly. If the door does not start opening, the two leads on the unit or on the contactor can be interchanged.

5. Because the TN units are not engineered for continuous service, the motor contactor must not be equipped with automatic resetting. Manual resetting is required for safety reasons.

6. Deaerate pump and delivery line by switching the motor on and off a few times.

Section 4 - Regulating The TN Operator

When opening the unit, great care must be taken so that no dirt, dust or small stones, etc. fall into the oil basin. For this reason and for avoiding oil splashes, we recommend replacing the cover after every regulating operation. For any damage due to nonobservance of this recommendation, we decline to accept any responsibility whatsoever.

It must be observed that all throttle and regulating screws as well as the safety valve can be set and adjusted independently of each other. At the same time the function of each has a marked influence of the others. When setting the unit it is recommended to proceed in the following sequence.

1. **Force For Holding The Door Closed**
(Regulating nut no. 2) This adjustment will turn the shaft. At the time of delivery the force for holding the door closed is set to minimum. To increase this force, turn the regulating nut no. 2 to the right or to the left by means of the 10mm allen key and the 36mm box spanner. The highest possible force is obtained after turning the nut by 180°. An accurate reading may be obtained only when door is in closed position.

2. **Closing Speed**
(Throttle screw no. 3)
All regulating and throttle screws are equipped with a locking nut. For adjusting, the size 5 screwdriver is pushed into the size 17 box spanner. Then the screwdriver is introduced into the screw slot and the socket wrench is moved onto the lock nut. With the socket wrench the lock nut is loosened and with the screwdriver the throttle screw can be adjusted. Afterwards the lock nut is immediately tightened.

3. **Closing Damping**
(Throttle screw no. 4)
The regulation with throttle screw no. 4 is carried out in the same manner as described above.

4. Opening Pressure
(Relief valve no. 5)
When setting the screws 5, 6, 7, 8 and 9 it is necessary to operate the motor for at least six seconds after each operation so that the accumulator becomes pressurized. The spring loaded safety valve must be set as low as possible but always in such a way that the door is actuated properly. In no case may the pressure be set so high that the number of revolutions of the motor is considerably reduced after pressurizing the accumulator (This effect can be heard quite clearly). Should the unit become to hot due to exceptionally server service, the built-in thermostat switches out and, after cooling, in again. In such a case the opening pressure should be reduced in order to avoid overloads.

5. **Opening Speed**
(Throttle screw no. 6)
The opening speed is set and regulated by means of throttle screw no. 6 If the speed does not reach the desired value it is necessary to increase the opening pressure (relief valve no. 5).

IMPORTANT: In order to avoid accidents the opening speed should not be set higher than necessary. Particularly with heavy doors or when it is possible for persons to stand behind the door, the opening speed should be set as low as possible.

6. **Opening Angle**
The opening angle must be limited by a firm stop so that the end stop in the unit is never reached.

7. **Start Of The Damping Action**
(Plug no. 8)
By moving plug no. 8 the start of the damping action can be set according to the desired angle. With the plug pushed in, the damping action starts to the desired angle. With it pulled out, it starts later. It is always advisable to try to attain a long damping action thereby reducing the braking shock and avoiding excessive use of door and unit. The plug is fixed in position by means of a small spring fitting into one of the six notches. When displacing, the plug should be turned a little. The spring will then easily come out of the notch when in use. After regulating, check carefully that the plug is properly fixed in its new position.

Attention: Never pull the plug out completely while the unit is in operation.

8. **Transition Into Damping Action**
(Relief valve no. 9)
The transition into the damping action can be made softer or harder by means of the overpressure valve no. 9.

9. **Opening Damping**
(Throttle screw no. 7)
If necessary the end speed (i.e. The running up to the door stop) can be regulated by means of throttle screw no. 7.

10. **Internal Stop**
(Regulating unit no. 10)
The door in closed position must be provided with a top as well as bottom stop. Where a bottom stop on the floor is not feasible (e.g. with double wing doors), the internal stop (regulating nut 10) can be used.

NOTE: Special care must be taken when making final adjustments to insure compliance with ANSI 156.19 Standards.

A commercial or residential swinging pedestrian door or either single-leaf or double-leaf construction that is either remotely or automatically actuated, or both shall not close with a force greater than 40 lb. (177.9 N) at the latch side of the closing stile or close through the final 10 degrees in less than 1.5 seconds.

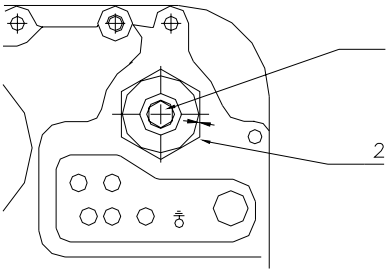


FIG 12

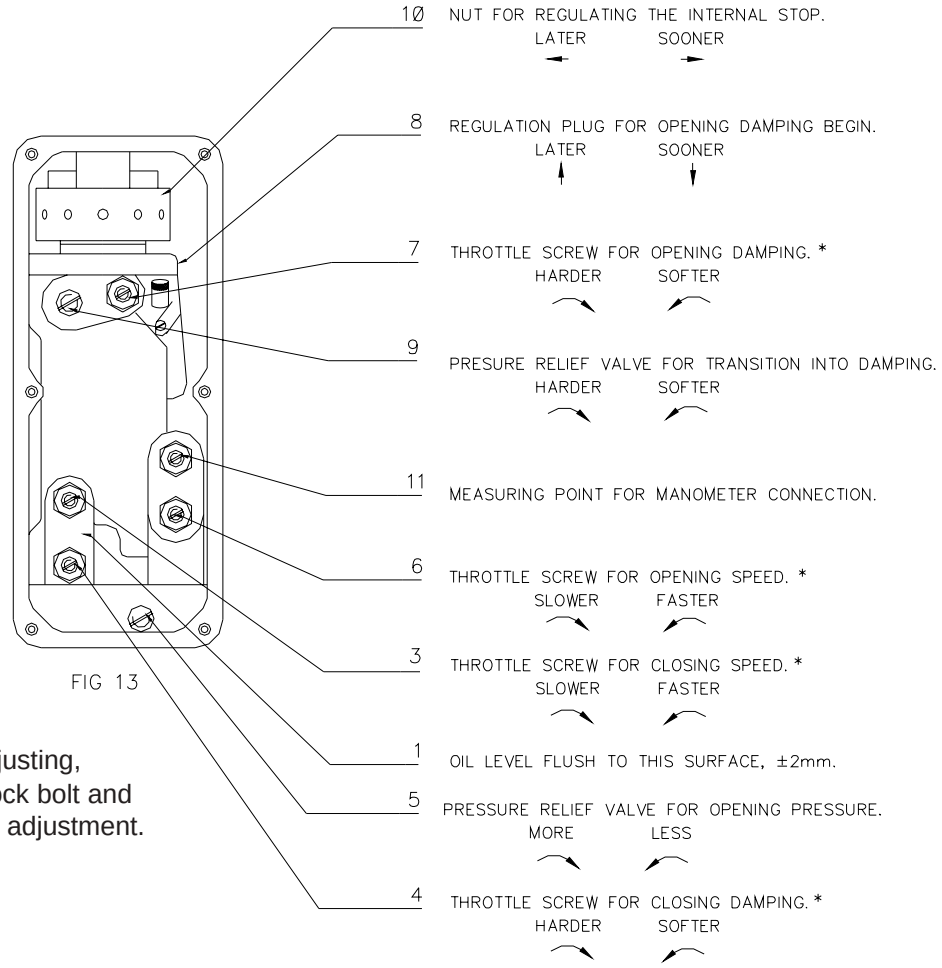


FIG 13

NOTE: Before adjusting, loosen lock nut or lock bolt and then re-tighten after adjustment.

Section 5 - Wiring Diagram of Master

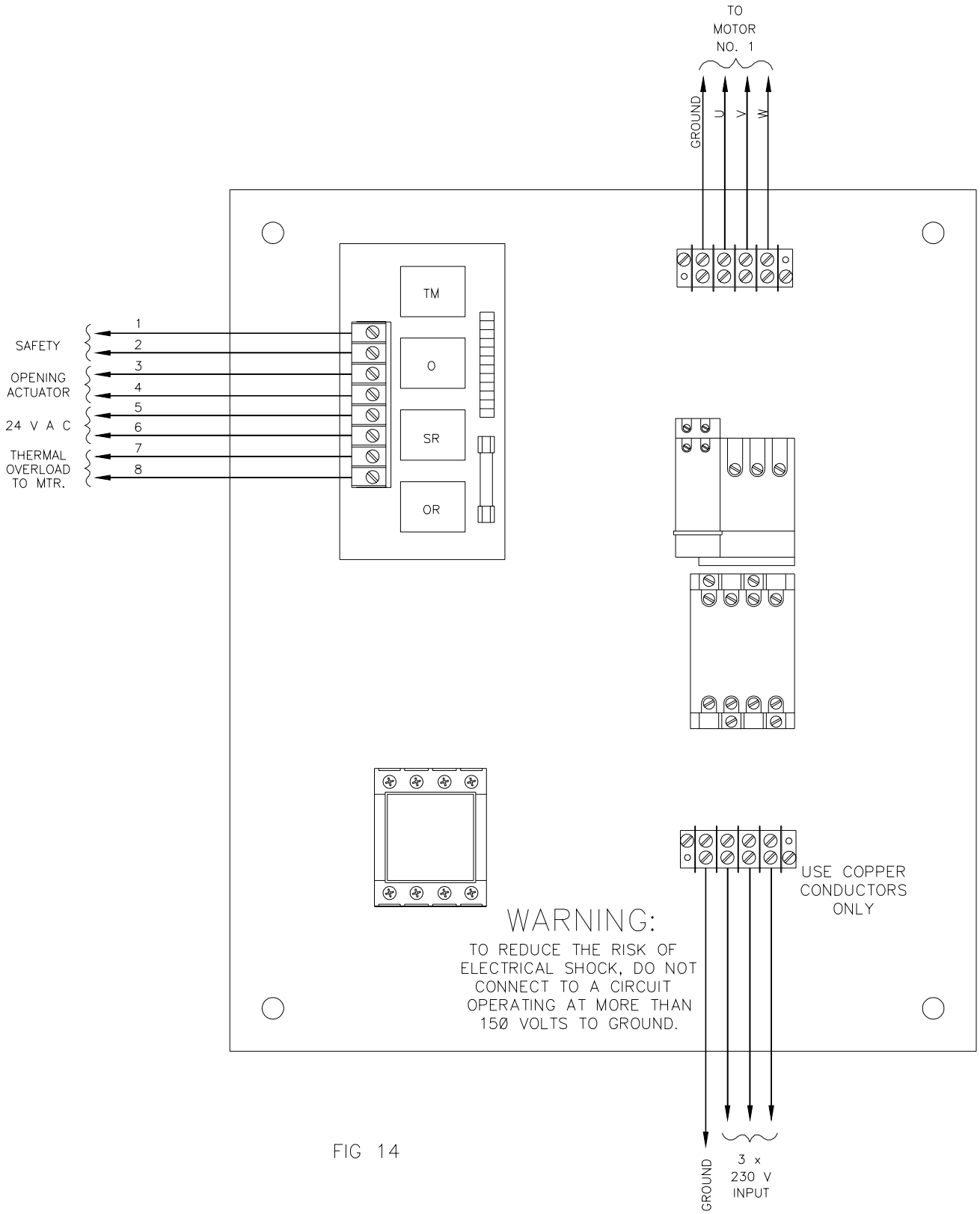


FIG 14

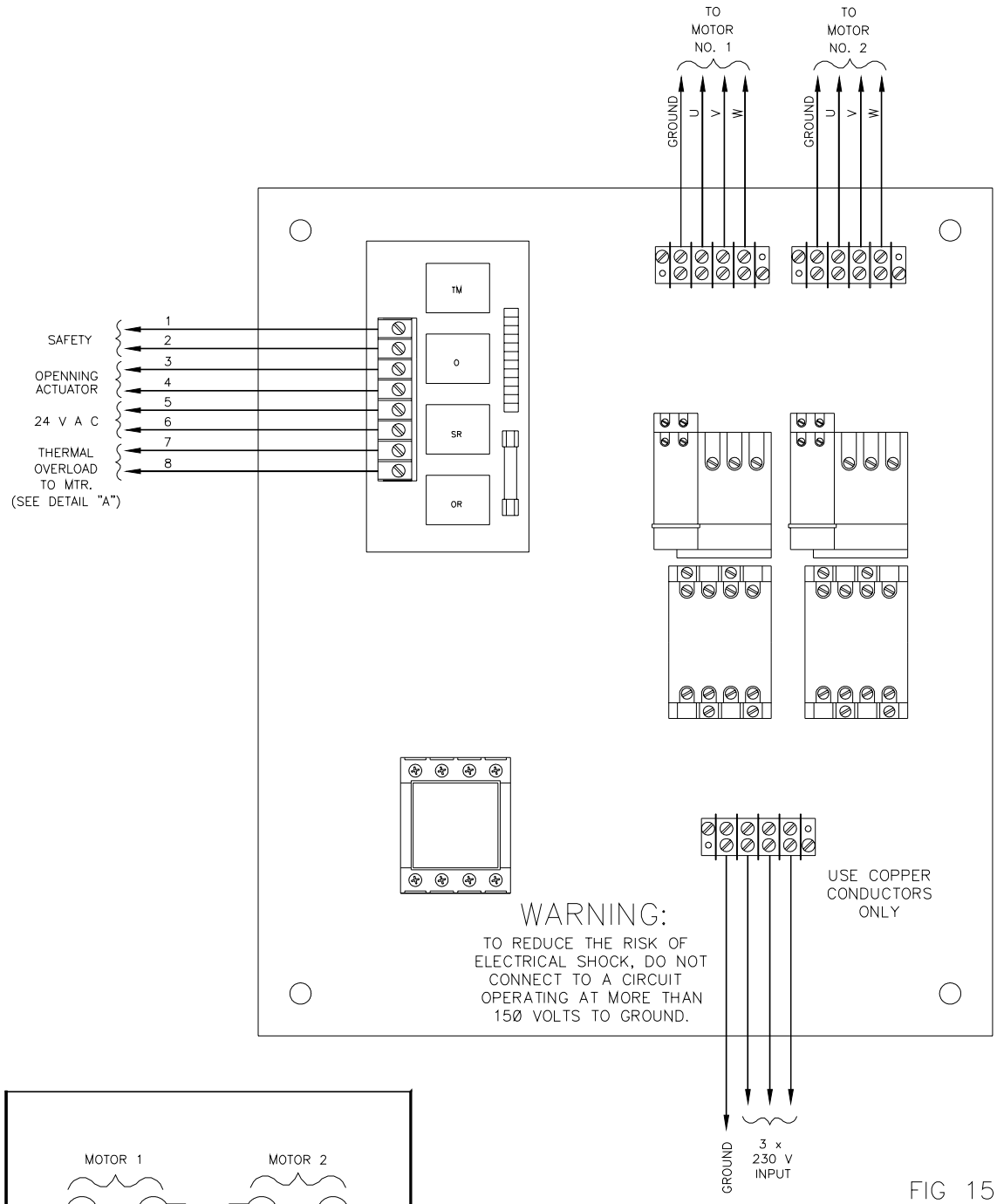
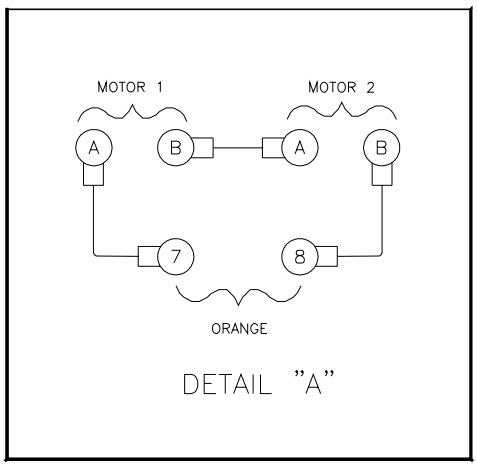
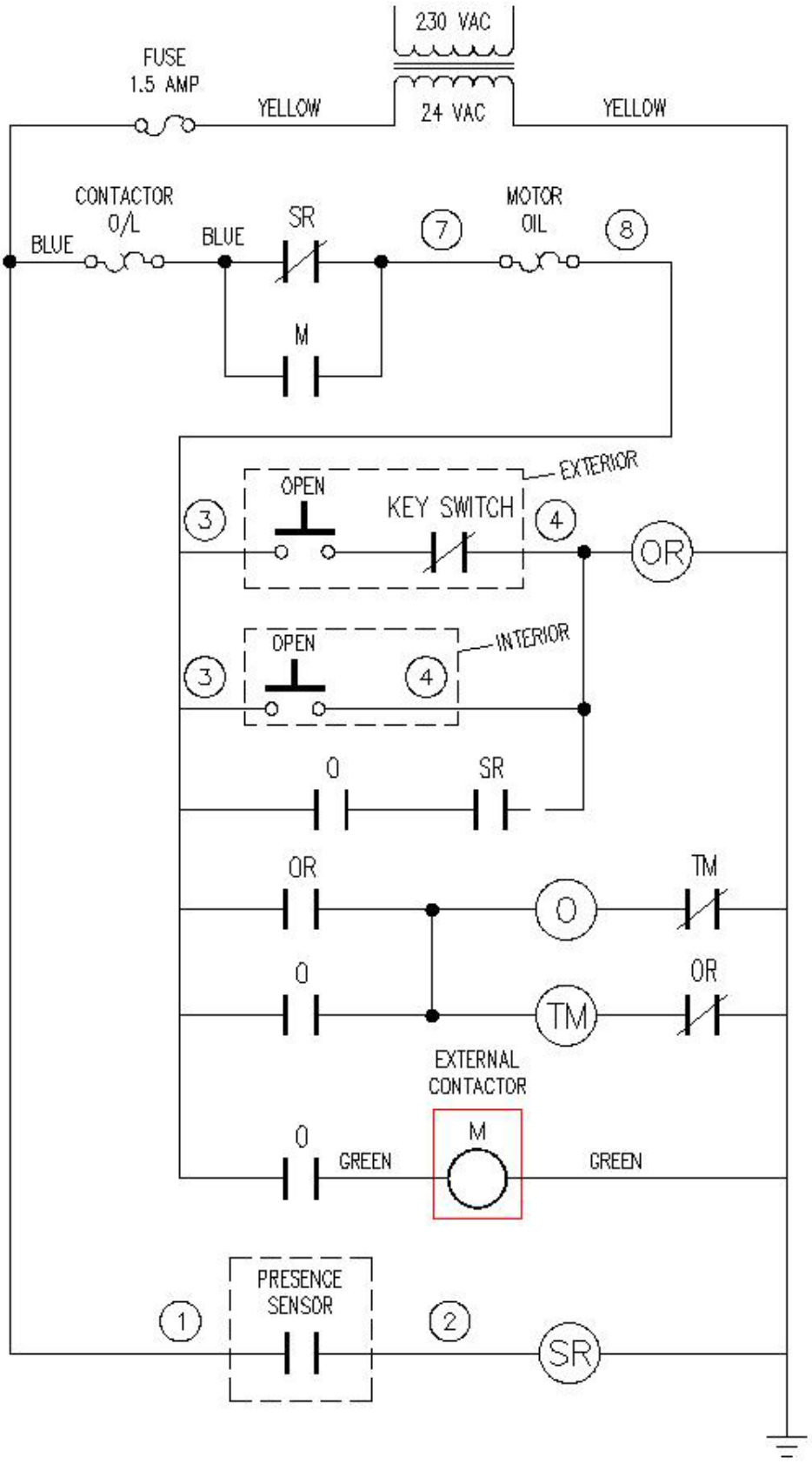

TO MOTOR NO. 1
TO MOTOR NO. 2
GROUND
U
V
W
GROUND
U
V
W
TM
O
SR
OR
SAFETY
OPENNING ACTUATOR
24 V A C
THERMAL OVERLOAD TO MTR. (SEE DETAIL "A")
1
2
3
4
5
6
7
8
USE COPPER CONDUCTORS ONLY
WARNING:
TO REDUCE THE RISK OF ELECTRICAL SHOCK, DO NOT CONNECT TO A CIRCUIT OPERATING AT MORE THAN 150 VOLTS TO GROUND.
GROUND
3 x 230 V INPUT

FIG 15


MOTOR 1
MOTOR 2
A
B
A
B
7
8
ORANGE
DETAIL "A"

Section 7 - TN Ladder Diagram



Section 8 - TN Circuit

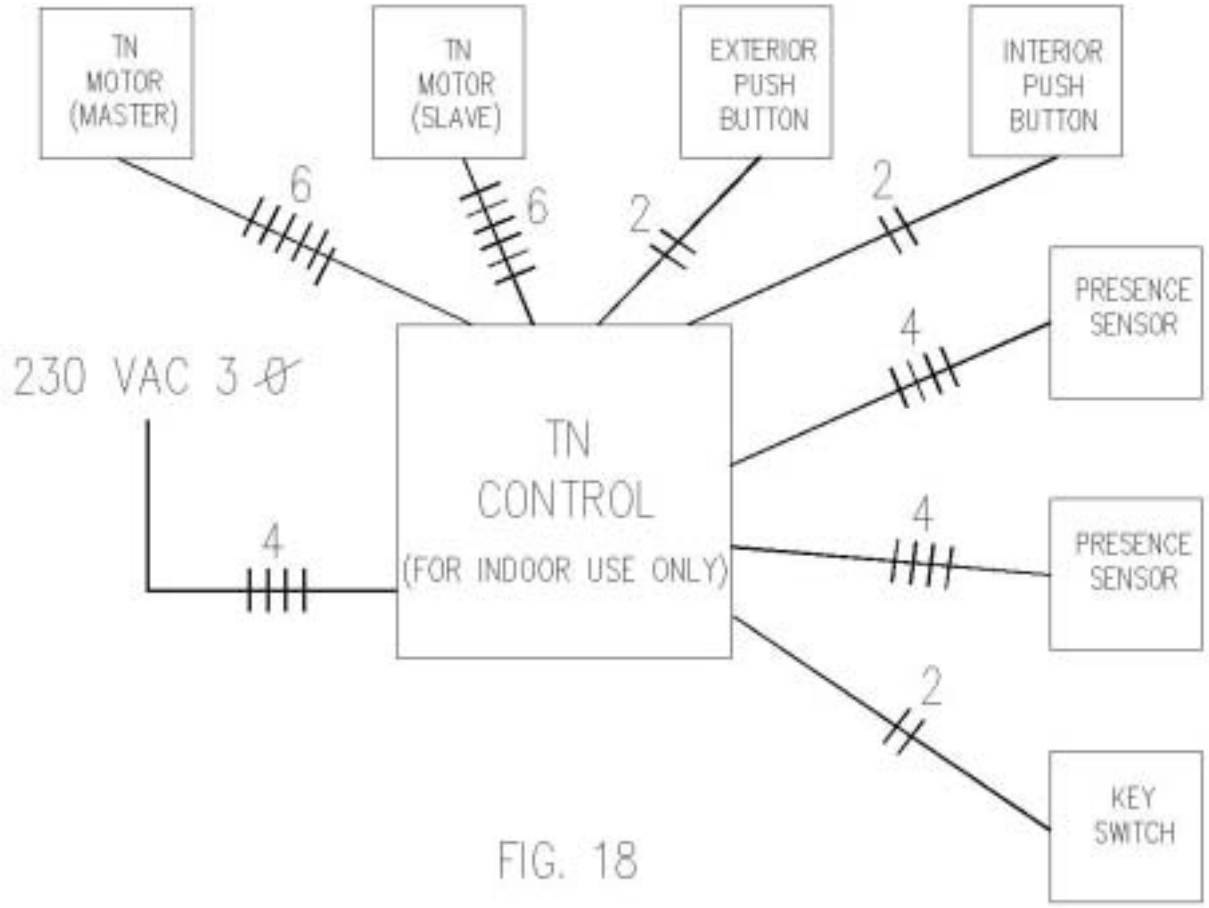


FIG. 18

NOTES:

1. If a pedestrian door is provided with a switch other than a conventional mat switch, proximity indicator, or the like, the said switch is to be installed in a location from which the operation of the door can be observed by the person operating the switch.

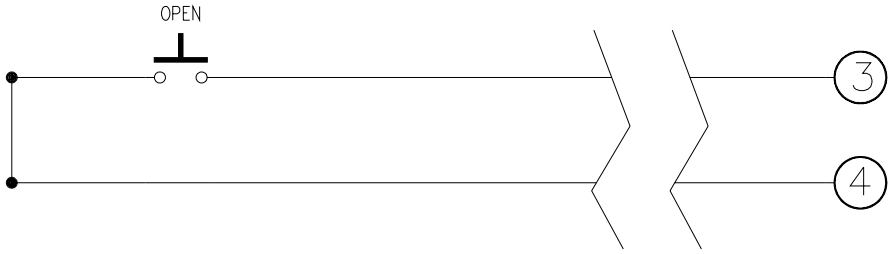
2. **Warning:** To reduce the risk of electrical shock, do not connect to a circuit operating at more than 150 volts to ground.

3. Use copper conductors **ONLY**.

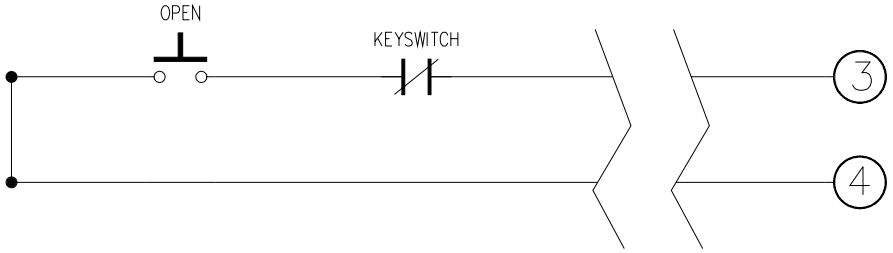
Section 9 - TN Switch Connections

1. Interior Push-button

TN Control



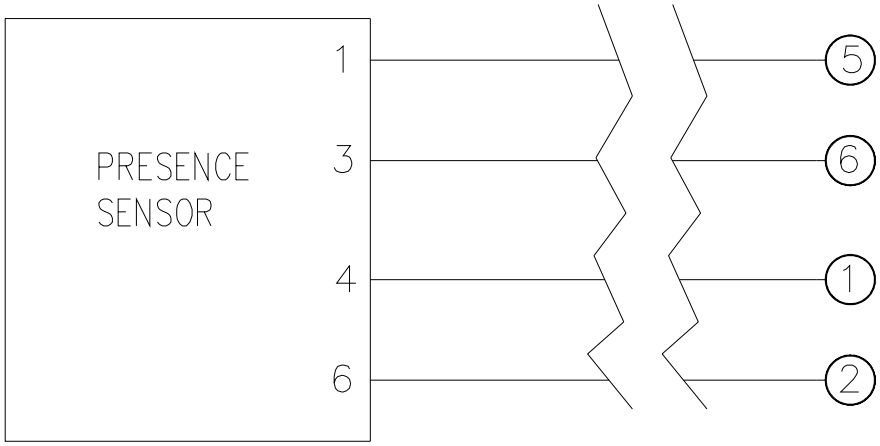
2. Exterior Push Button With Keyswitch



NOTE: Keyswitch will be a two position maintain switch with key removable in both positions.

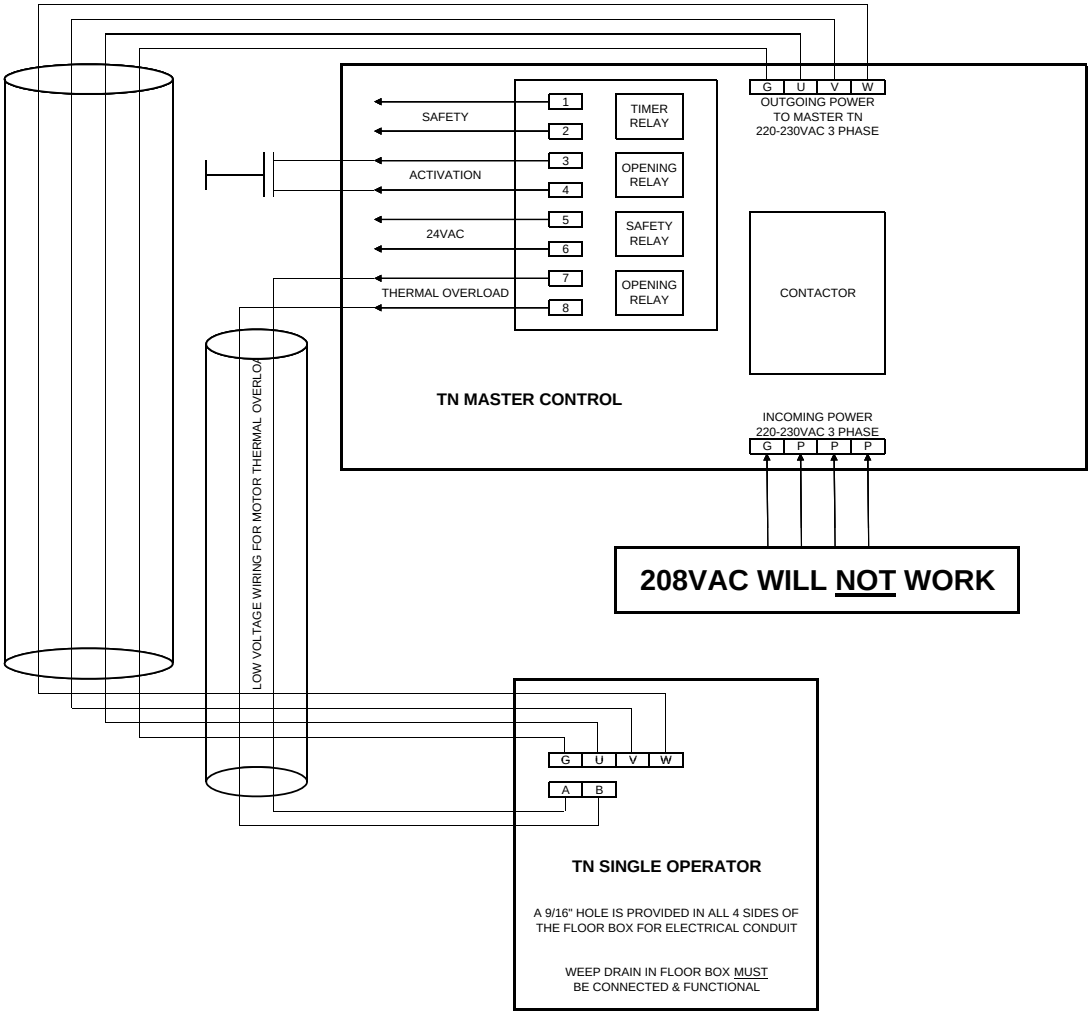
3. Presence Sensor

TN Control



24VAC .5 AMP
External Power
Supply

TN SINGLE WIRING DIAGRAM

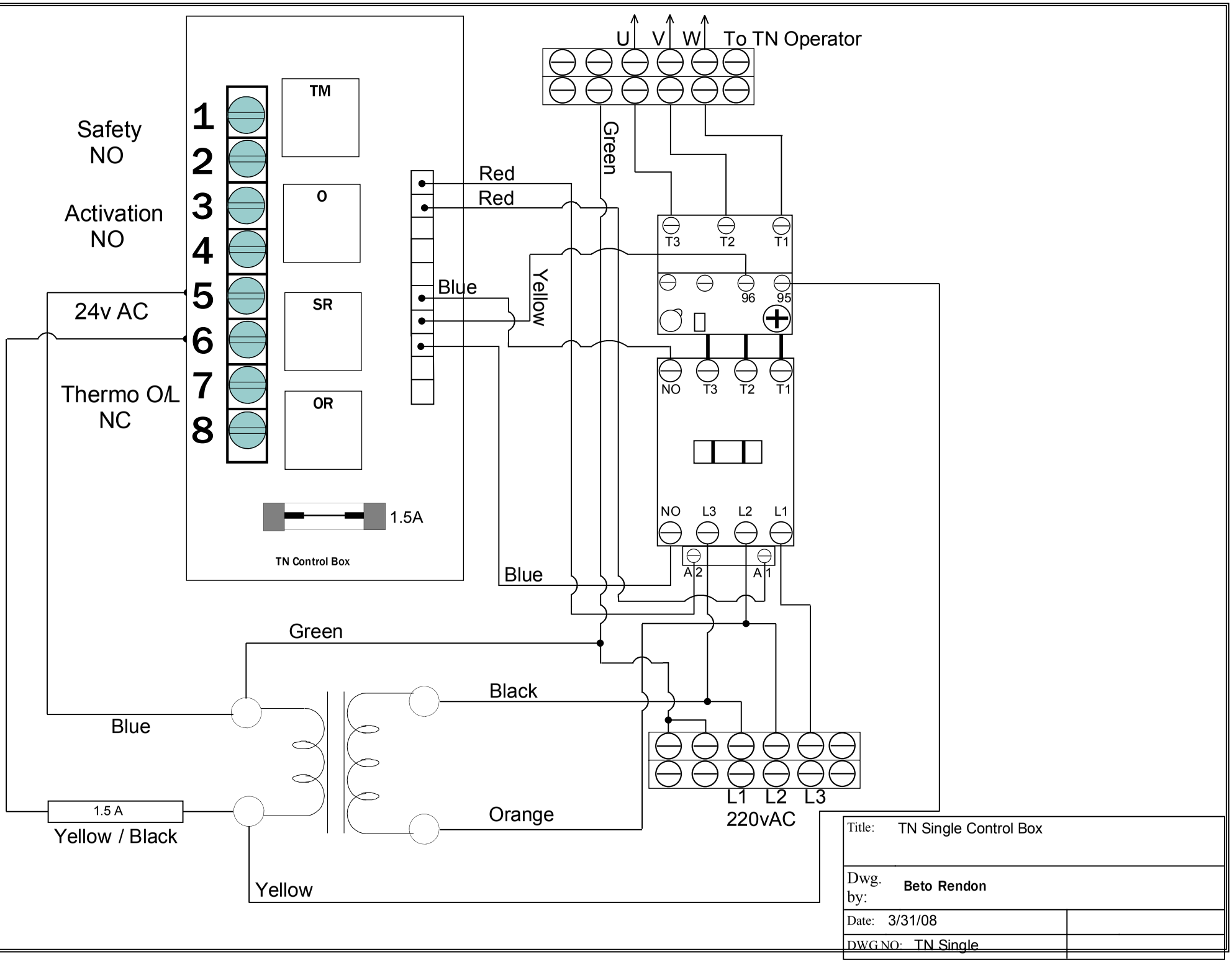


ELECTRICAL SPECIFICATIONS

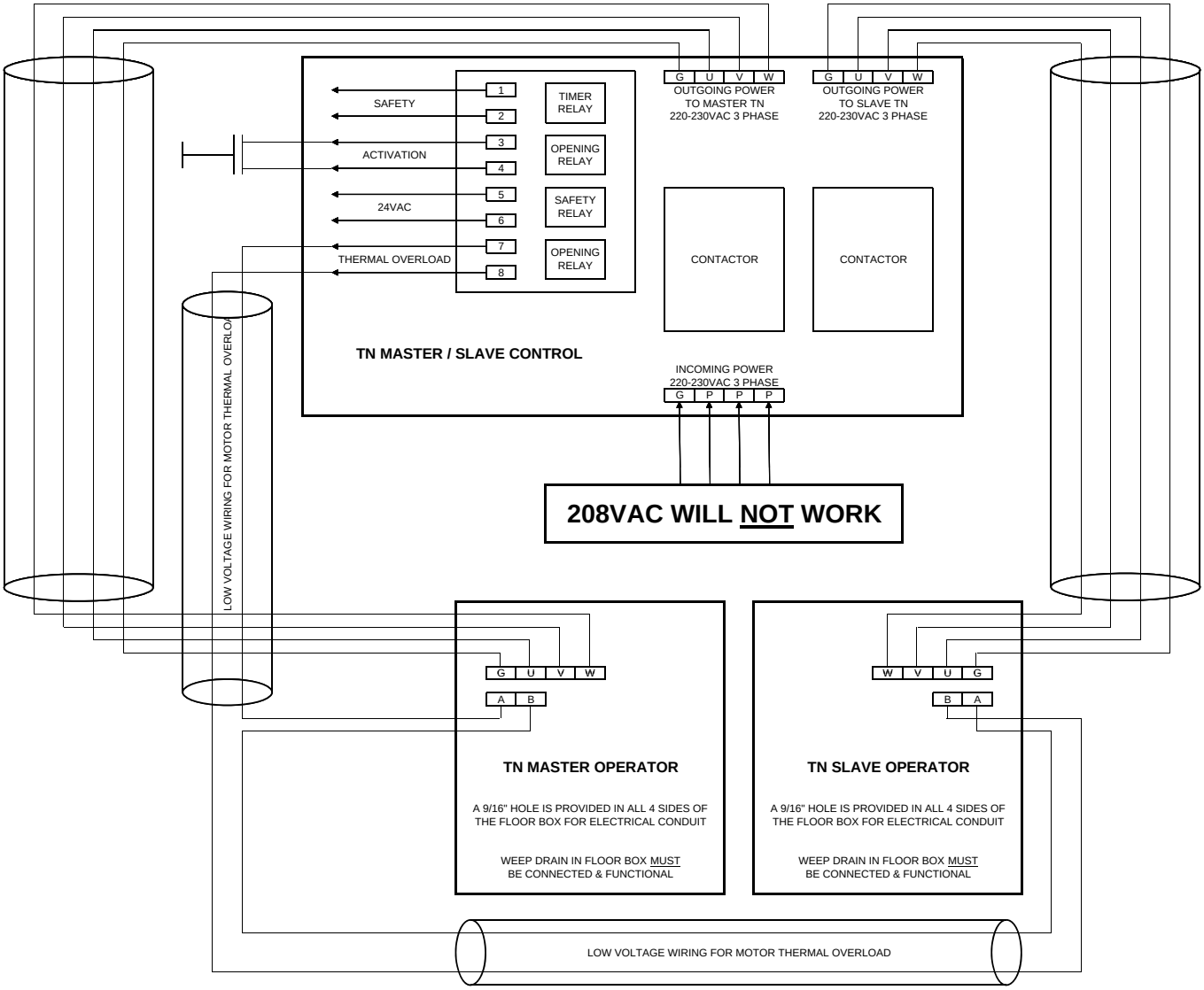
220 - 230VAC, 300 W, 3 PHASE, 60 HZ, 0.4 HP, POWER OPEN, SPRING CLOSED

MAXIMUM POWER CONSUMPTION 300 W, 1 AMP

7/21/04 LW


U V W To TN Operator
Safety NO
Activation NO
24v AC
Thermo O/L NC
1
2
3
4
5
6
7
8
TM
O
SR
OR
1.5A
TN Control Box
Red
Red
Blue
Yellow
Green
T3 T2 T1
96 95
NO T3 T2 T1
NO L3 L2 L1
A2 A1
Blue
Green
Black
Blue
1.5 A
Yellow / Black
Orange
Yellow
L1 L2 L3
220vAC
Title: TN Single Control Box
Dwg. by: Beto Rendon
Date: 3/31/08
DWG NO: TN Single

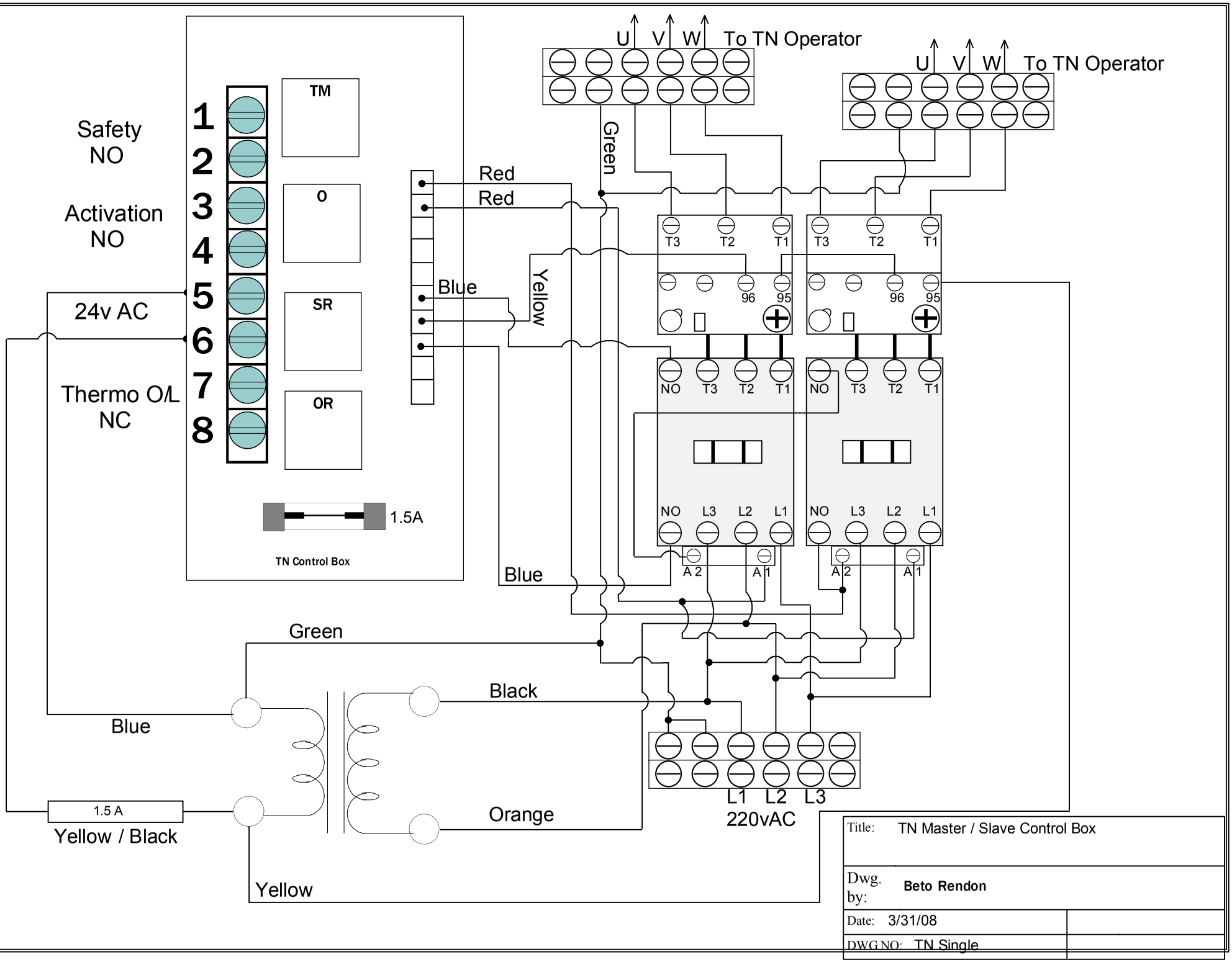
TN MASTER - SLAVE WIRING DIAGRAM



ELECTRICAL SPECIFICATIONS

220 - 230VAC, 300 W, 3 PHASE, 60 HZ, 0.4 HP, POWER OPEN, SPRING CLOSED

MAXIMUM POWER CONSUMPTION 300 W, 1 AMP


Safety
NO
Activation
NO
24v AC
Thermo O/L
NC
1
2
3
4
5
6
7
8
TM
O
SR
OR
1.5A
TN Control Box
U V W To TN Operator
U V W To TN Operator
Green
Red
Red
Blue
Yellow
Blue
T3 T2 T1
96 95
NO T3 T2 T1
NO L3 L2 L1
A 2 A 1
Green
Black
Blue
1.5 A
Yellow / Black
Orange
Yellow
L1 L2 L3
220vAC
Title: TN Master / Slave Control Box
Dwg. by: Beto Rendon
Date: 3/31/08
DWG NO: TN Single

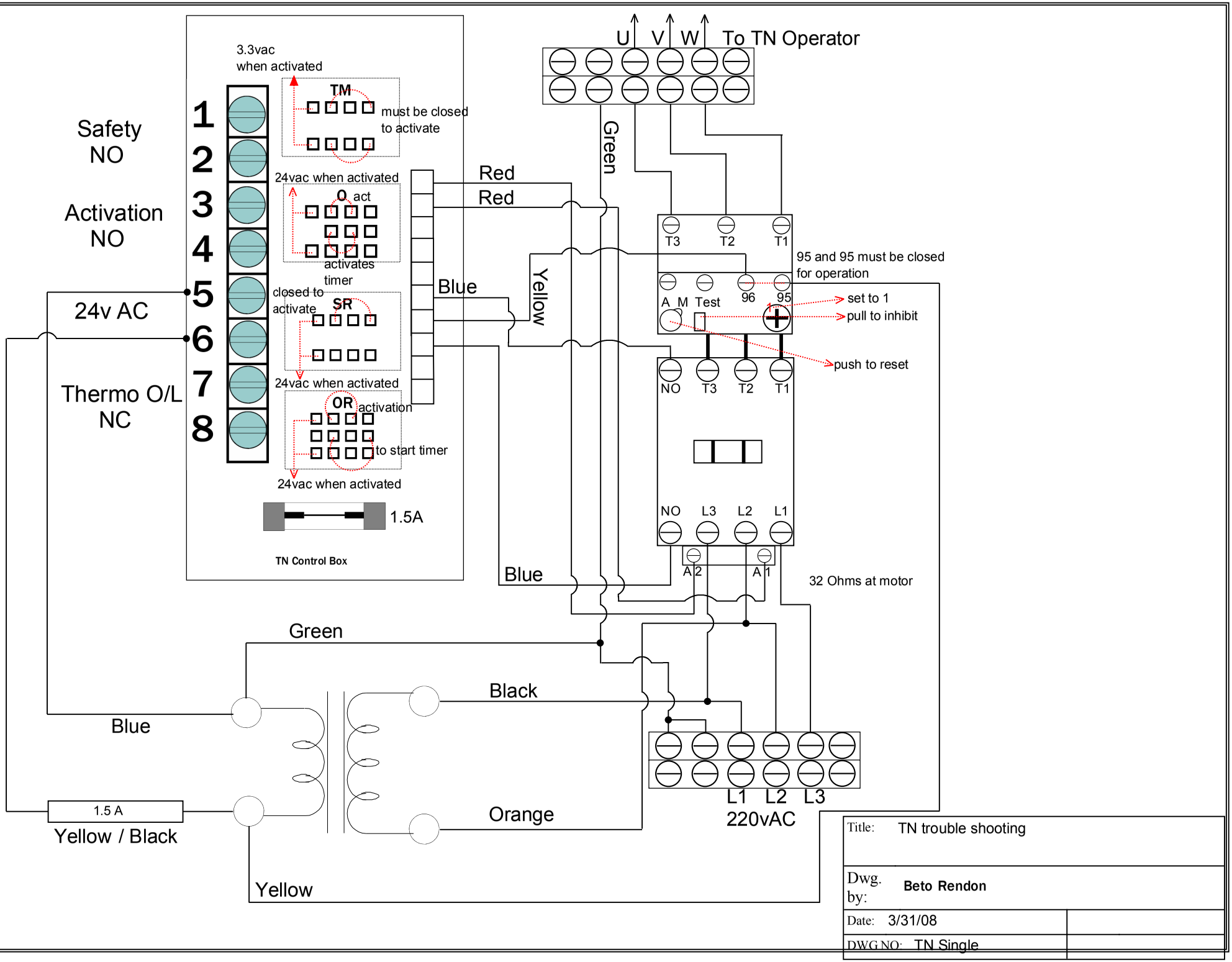
Section 10 - Maintenance Instructions

The following maintenance steps are recommended:

Some weeks after putting the unit into operation.
Afterwards once or twice a year:

1. Check the oil level and fill up if necessary.

2. Set the hydraulic system and if necessary correct it according to the regulating instructions. The oil viscosity does not vary appreciably with the ambient temperature, consequently seasonal adjustment is necessary only in extreme cases.



Title:	TN trouble shooting
Dwg. by:	Beto Rendon
Date:	3/31/08
DWG NO:	TN Single