



# MH, MH III

## *Basic Electrical Troubleshooting Guide*

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Approved  
Company



Specialized Dispensing  
Equipment and Technology

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INSIDE BACK COVER

# SAFETY

## Safe Handling And Use Of Urethane Foam Equipment

### Introduction

Any tool, if used improperly, can be dangerous. Safety is ultimately the responsibility of those using the tool. In like manner, safe operation of polyester processes is the responsibility of those who use such processes and those who operate the equipment. This manual outlines procedures to be followed in conducting polyester operations safely.

All personnel involved in dispensing operations should read and understand this manual. It is most important that equipment operators, maintenance and supervisory personnel understand the requirements for safe operation.

This manual cannot answer every circumstance; each user should examine his own operation, develop his own safety program and be assured that his equipment operators follow correct procedures. Glas-Craft hopes that this manual is helpful to the user and recommends that the precautions in this manual be included in any such program.

Urethane foam systems are comprised of several different chemical compounds, some of which may be hazardous if improperly used.

### CAUTION

*Particular caution must be taken with respect to the vapors released during the use of urethane foam systems.*

Isocyanate compounds are used in urethane foaming operations. The medical history of persons who may be exposed to such isocyanates should be examined. It is recommended that individuals with a history of chronic respiratory ailments should avoid exposure to all isocyanates.

In addition to the manual, Glas-Craft recommends that the user consult the regulations established under the Occupational Safety & Health Act (OSHA), particularly the following sections:

1910.94 Pertaining to ventilation.

1910.106 Pertaining to flammable liquids.

1910.107 Pertaining to spray finishing operations, particularly Paragraph (m) Organic Peroxides and Dual Component Coatings.

Local codes and authorities also have standards to be followed in the operation of your spraying equipment. Chemical manufacturer's recommendations should be obtained and considered. Your insurance carrier will be helpful in answering questions that arise in your development of safe procedures.

## Personnel Safety Equipment

Glas-Craft recommends the following Personal Safety Equipment for conducting safe operations of the Urethane Systems:



EYE PROTECTION



HEARING PROTECTION



BREATHING PROTECTION

Glas-Craft recommends that the user consult the state and local regulations established for all Safety equipment listed.

### Operating Safely

In operating urethane foam equipment safely, user should make every effort to:

1. Handle chemicals safely.
2. Provide adequate ventilation.
3. Provide adequate safety equipment (gloves, respirators, safety glasses, protective clothing, etc.) for operators and all others working in areas where they may be exposed to the chemicals or their vapors.
4. Avoid operating equipment which has given any indication of malfunction.
5. Become fully acquainted with the equipment and chemicals used.

### Handling Chemicals Safely

Storage of polyisocyanates, diamines, and organic solvents should be isolated and restricted to specially constructed storage rooms. Store chemicals in original containers and according to manufacturer's recommendations listed on the container. Maximum ambient temperatures to which such chemicals should be exposed are specified by the manufacturer and **MUST NOT** be exceeded either in the storage area or in the spraying or pouring area.

To avoid moisture contamination, do not open containers until ready for use. After use, the remaining material should be re-sealed in the original container and stored in areas away from moisture.

During clean-up of spilled isocyanate-component, respirators, gloves and eye protection must be worn. Isocyanates which have been spilled can be controlled by covering them with dry saw dust and/or other absorbent inert materials. Care should be taken to avoid skin contact. The absorbent material and the absorbed isocyanate should be collected promptly, placed in an open-top container, and treated with dilute solutions of ammonium hydroxide and/or alcohol. While being treated in this manner, the material should be in an adequately ventilated area. Clothing on which any material has been spilled should be removed immediately, and cleaned before being worn again.

## Clean-Up Solvents

### WARNING

*A hazardous situation may be present in your pressurized fluid system!*

*Halogenated Hydrocarbon Solvents can cause an explosion when used with aluminum or galvanized components in a closed (pressurized) fluid system (pumps, heaters, filters, valves, spray guns, tanks, etc.).*

*The explosion could cause serious injury, death and/or substantial property damage.*

*Cleaning agents, coatings, paints, etc. may contain Halogenated Hydrocarbon Solvents.*

*Some Glas-Craft spray equipment includes aluminum or galvanized components and will be affected by Halogenated Hydrocarbon Solvents.*

### WARNING

*If you are now using Halogenated Hydrocarbon solvents in pressurized fluid systems having aluminum or galvanized wetted parts,*

*IMMEDIATELY TAKE THE FOLLOWING STEPS:*

- > Empty system, shut-off, completely depressurize in accordance with equipment service instructions.*
- > Remove equipment from service, disassemble in accordance with equipment servicing instructions.*
- > Inspect all parts for corrosion and/or wear. Replace any damaged parts.*
- > Thoroughly clean all parts of the equipment with a non-halogenated solvent and reassemble in accordance with equipment servicing instructions.*
- > Flush equipment with non-halogenated solvent.*
- > Do NOT reuse equipment with HHC solvents or with materials containing such solvents.*
- > Material suppliers and/or container labels should be consulted to ensure that the solvents used are compatible with your equipment.*

A. There are three key elements to the Halogenated Hydrocarbon (HHC) solvent hazard.

1. **The presence of HHC solvents.** 1,1,1-Trichloroethane and Methylene Chloride are the most common of these solvents. However, other HHC solvents are suspect if used; either as part of paint or adhesives formulation, or for clean-up or flushing.

2. **Aluminum or Galvanized Parts.** Most handling equipment contains these elements. In contact with these metals, HHC solvents could generate a corrosive reaction of a catalytic nature.

3. **Equipment capable of withstanding pressure.** When HHC solvents contact aluminum or galvanized parts inside a closed container, such as a pump, spray gun, or fluid handling system, the chemical reaction can, over time, result in a build-up of heat and pressure, which can reach explosive proportions.

When all three elements are present, the result can be an extremely violent explosion. The reaction can be sustained with very little aluminum or galvanized metal: **any amount of aluminum is too much.**

B. The reaction is unpredictable. Prior use of an HHC solvent without incident (corrosion or explosion) does **NOT** mean that such use is safe. These solvents can be dangerous alone (as a clean-up or flushing agent) or when used as a component of a coating material. There is no known inhibitor that is effective under all circumstances. Furthermore, the mixing of HHC solvents with other materials or solvents, such as MEK, alcohol, and toluene, may render the inhibitors ineffective.

C. The use of reclaimed solvents is particularly hazardous. Reclaimers may not add any inhibitors, or may add incorrect amounts of inhibitors, or may add improper types of inhibitors. Also, the possible presence of water in reclaimed solvents could feed the reaction.

D. Anodized or other oxide coatings cannot be relied upon to prevent the explosive reaction. Such coatings can be worn, cracked, scratched, or too thin to prevent contact. There is no known way to make oxide coatings or to employ aluminum alloys, which will safely prevent the chemical reaction under all circumstances.

E. Several solvent suppliers have recently begun promoting HHC solvents for use in coating systems. The increasing use of HHC solvents is increasing the risk. Because of their exemption from many State Implementation Plans as Volatile Organic Compounds (VOC's), their low flammability hazard, and their not being classified as toxic or carcinogenic substances, HHC solvents are very desirable in many respects.

### NOTE

*Glas-Craft is aware of NO stabilizers available to prevent Halogenated Hydrocarbon solvents from reaction under all conditions with aluminum components in a closed fluid system.*

**TAKE IMMEDIATE ACTION...**

*Halogenated Hydrocarbon solvents are dangerous when used with aluminum components in a closed fluid system.*

F. Consult your material supplier to determine whether your solvent or coating contains Halogenated Hydrocarbon Solvents.

G. Glas-Craft recommends that you contact your solvent supplier regarding the best non-flammable clean-up solvent with the heat toxicity for your application.

H. If, however, you find it necessary to use flammable solvents, they must be kept in approved, electrically grounded containers.

I. Bulk solvent should be stored in a well-ventilated, separate building, 50 feet away from your main plant.

J. You should allow only enough solvent for one day's use in your work area.

K. "NO SMOKING" signs must be posted and observed in all areas of storage or where solvents and other flammable materials are used.

L. Adequate ventilation (as covered in OSHA Section 1910.94 and NFPA No. 91) is important wherever solvents are stored or used, to minimize, confine and exhaust the solvent vapors.

M. Solvents should be handled in accordance with OSHA Section 1910.106 and 1910.107.

## Toxicity of Chemicals

A. Glas-Craft recommends that you consult OSHA Sections 1910.94, 1910.106, 1910.107 and NFPA No. 33, Chapter 14, and NFPA No. 91.

B. Contact your chemical supplier(s) and determine the toxicity of the various chemicals used, as well as the best methods to prevent injury, irritation and danger to personnel.

C. Also determine the best methods of first aid treatment for each chemical used in your plant.

## First Aid

If chemicals containing isocyanates are splashed on the skin, they can produce ill effects. Steps to counteract such effects should be started immediately.

1. Apply Tincture of Green Soap, full strength, to the contaminated area. If Tincture of Green Soap is not immediately available, wash the exposed area repeatedly with soap and water. Soap and water is not as desirable as using Tincture of Green Soap

because many isocyanate components are not easily dissolved in water. In addition, soap and water does not form a barrier to the isocyanates.

2. After approximately two to four minutes, wash off the Tincture of Green Soap with water. If there is still an indication of isocyanate present, repeat the application. If the isocyanate contamination is on the facial area, care must be taken to avoid getting the Tincture of Green Soap in the eyes.

3. If the person develops breathing difficulties, oxygen should be administered. Quite often the exposed person will experience residual effects such as coughing spells. **CONTACT PHYSICIAN IMMEDIATELY.**

## WARNING

*Contact a doctor immediately in the event of an injury and give him the information you have collected. If your information includes first aid instructions, administer first aid immediately while you are contacting the doctor.*

4. If a person accidentally swallows isocyanates, large amounts of water should be swallowed immediately. Vomiting should then be induced by patient sticking his finger down his throat, or by swallowing large quantities of warm salt water or warm soapy water. After vomiting, more water should be taken to dilute isocyanate further. **CONTACT PHYSICIAN IMMEDIATELY.**

## Ventilation

## WARNING

*Hazardous concentrations of some chemical vapors exist before they can be smelled. Chemical component suppliers should be contacted to determine at what concentrations the vapors of the chemicals they supply become dangerous, and the procedures and equipment needed to detect such dangerous concentrations. Such equipment should be obtained.*

*Adequate ventilation must be provided in any area where foam chemicals are sprayed or poured, and wherever the material containers are opened.*

In industrial applications, foaming operations should be restricted to specific areas, and proper ventilation should be provided in these areas to prevent chemical vapors from spreading. Spray foaming operations **MUST** be restricted to a spray booth where a minimum exhaust of 100 feet per minute at the face of the booth is provided. Special care should be taken to prevent unsuspecting personnel both inside and outside of the plant from being exposed to chemical vapors. The chemical vapors should be exhausted to atmosphere in such a manner and at a sufficiently low concentration that personnel outside the plant are not exposed to dangerous concentrations of chemical vapors. Refer to OSHA Standards, sub-part G, 1910.107 and particularly sub-section (m) for Federal standards. State and local authorities may have applicable statutes or regulations concerning ventilation.

In contractor applications (for example, at a construction site, inside building or other enclosed space), the forced ventilation

normally provided is likely to be inadequate. These applications, therefore, usually **REQUIRE** the use of forced, fresh air respirators for all persons in the areas where foaming operations are conducted or where the chemical vapors are likely to spread.

In industrial and contractor applications, it is advisable to run frequent tests to determine the exact concentration of isocyanate vapor in the air. Industrial equipment is available for making such determinations. Your chemical supplier can recommend such equipment and procedures.

## Proper Safety Equipment

All persons spraying or working in areas where forced air ventilation is not adequate to remove isocyanate vapors from the air **MUST** use an approved (U.S. Bureau of Mines) fresh air supplied respirator.

Respirators should be regularly inspected, cleaned and disinfected according to good practices. Records must be kept of the inspections. The user **MUST** have a medical clearance indicating that he can safely use a respirator.

Respirators must fit securely; beards prevent a tight seal around the face. Eye glasses have to be given special attention and contact lenses are prohibited.

Safety goggles, gloves and other protective devices are suggested for operators of foaming equipment. Refer to OSHA Standards, sub-part 1, 1910.132, 1910.133 and 1910.134 for Federal standards.

**IF YOU HAVE ANY QUESTIONS REGARDING THE ABOVE PRECAUTIONS OR ANY SERVICE OR OPERATION PROCEDURES, CALL YOUR GLAS-CRAFT DISTRIBUTOR OR GLAS-CRAFT, INC.**

## Notice

All statements, information and data given herein are believed to be accurate and reliable but are presented without guaranty, warranty or responsibility of any kind expressed or implied. The user should not assume that all safety measures are indicated or that other measures are not required.

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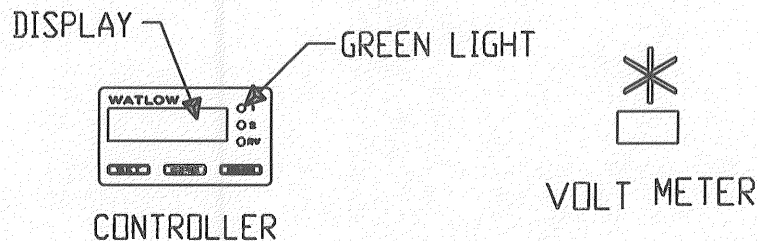
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APRIL 1996

MH & MH3 TROUBLE SHOOTING

ALL VOLTAGE CHECKS SHOULD BE BE DONE, BY A LICENSED ELECTRICIAN.

- (1) SELECT THE MACHINE VOLTAGE, AND START VOLTAGE CHECKS.  
MH SHT. 1A (200 TO 240 VOLTS, 3PH 50/60 HZ)  
MH SHT. 1B (380 VOLTS, 3PH 50 HZ)  
  
MH3 SHT. 1A-A (200 TO 240 VOLTS, 1PH 60 HZ)  
MH3 SHT. 1B-B (200 TO 240 VOLTS, 3PH 50/60 HZ)  
MH3 SHT. 1C-C (380 VOLTS, 3PH 50 HZ)
- (2) IF THERE IS NO POWER TO HEATER CONTROLLERS, OR HOSE CONTROLLER MAKE SURE EMERGENCY STOP RED KNOB IS NOT PUSHED IN. IF THE EMERGENCY STOP IS OK REFER TO MH, MH3 24 VOLTS FROM TRANSFORMER TO CONTROLLER TROUBLE SHOOTING GUIDE. (SHT 2, 2A, & 2B)
- (3) IF THE MOTOR START PUSH BUTTON LIGHT COMES ON, BUT MOTOR WILL NOT START, REFER TO MH MH3 24 VOLT CIRCUITS FOR MOTOR. (SHT3, 3A, & 3B)
- (4) IF THE CONTROLLER DISPLAY, AND THE GREEN LIGHT ON THE CONTROLLER IS ON, BUT HEATERS ARE NOT HEATING REFER TO MH MH3 ISO POLY HEATERS, TROUBLE SHOOTING GUIDE. (SHT 4, & 4A,)



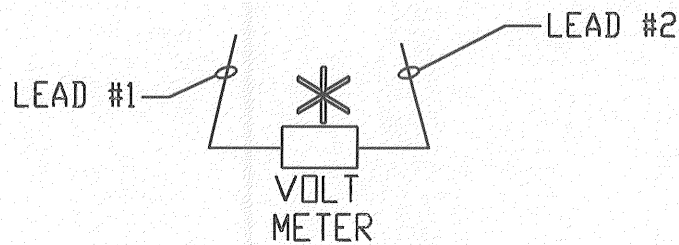
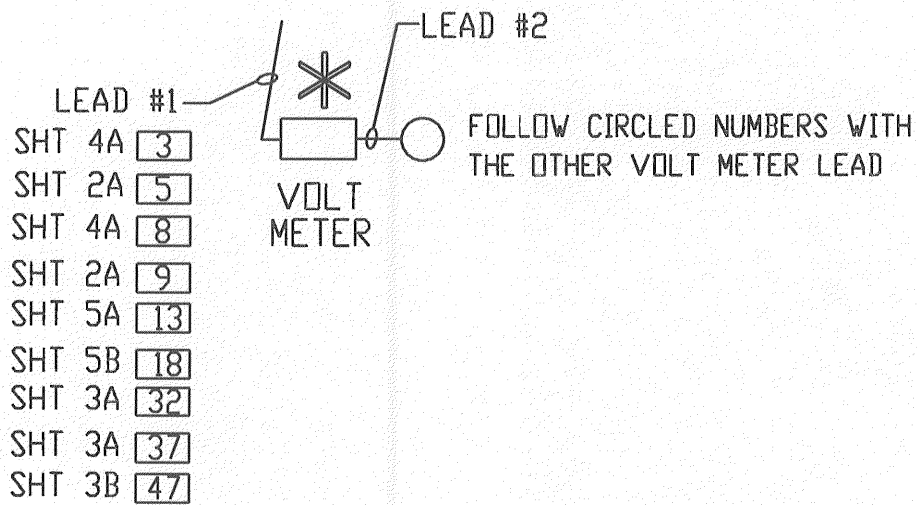
MH MH3 TROUBLE SHOOTING

ALL VOLTAGE CHECKS SHOULD BE DONE, BY A LICENSED ELECTRICIAN.

(6) IF THERE IS POWER TO THE HOSE CONTROLLER, BUT HOSE WILL NOT HEAT REFER TO HIGH VOLTAGE HOSE (SHT 5, & 5A)

SHEET 5B WILL COVER THE SECONDARY SIDE OF THE HOSE TRANSFORMER. IT WILL BE THE LOW VOLTAGE SIDE.

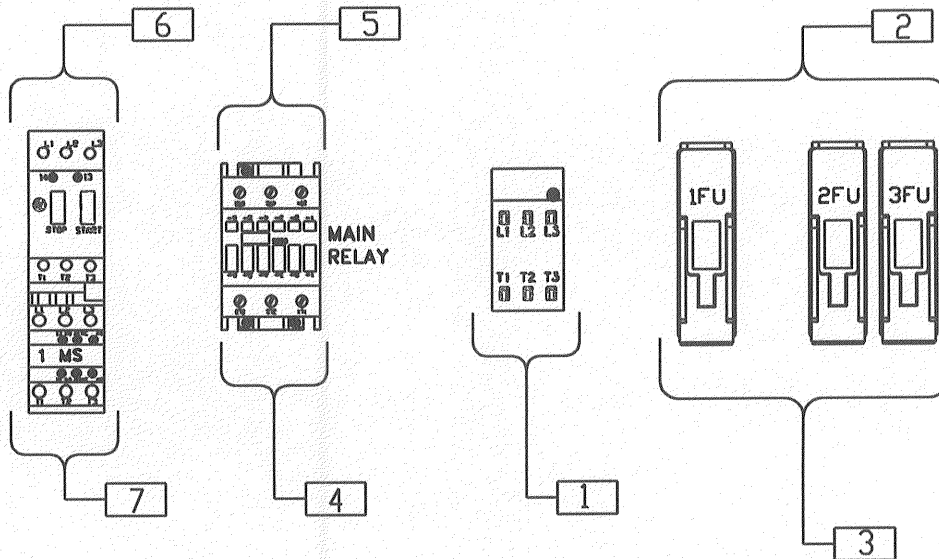
(SHT 5, & 5B)



MH

SHT 1A

MAIN VOLTAGE 200-240 VOLTS 3 PHASE.



CHECK ALL THREE PHASES

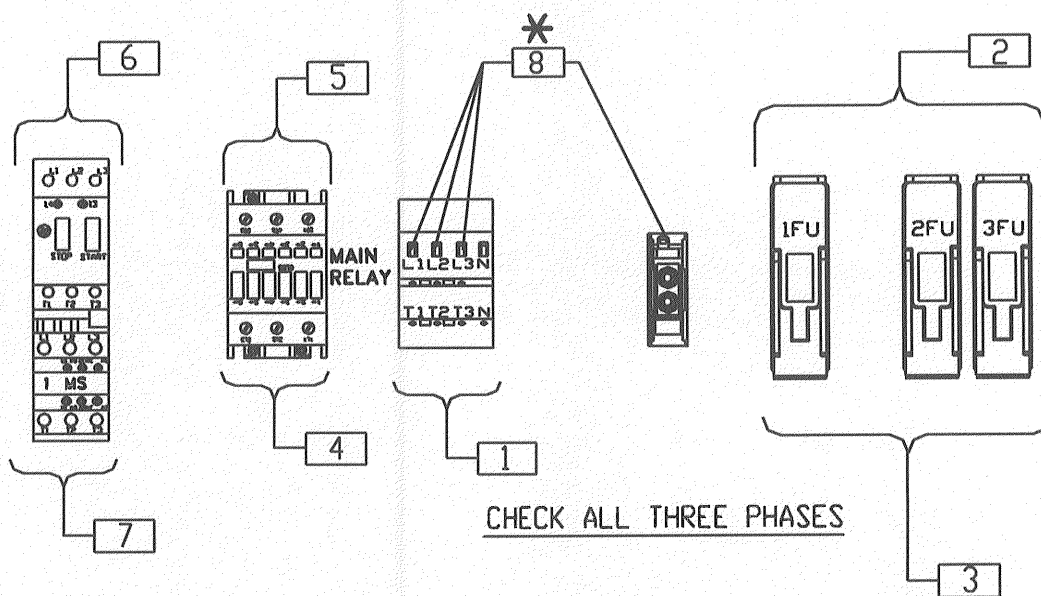
- 1 IF NOT CHECK ON/OFF SWITCH.
- 2 IF NOT CHECK WIRING.
- 3 IF NOT CHECK BREAKER
- 4 IF NOT CHECK WIRING.
- 5 IF NOT CHECK TO SEE IF THERE IS 24 VOLTS AC.  
ON MAIN RELAY A1, AND A2
- 6 IF NOT CHECK WIRING.
- 7 IF NOT CHECK TO SEE IF THERE IS 24 VOLTS AC ON  
IMS- A1, & A2.



MH

SHT 1B

MAIN VOLTAGE 380 VOLTS 3 PHASE 50 HZ.



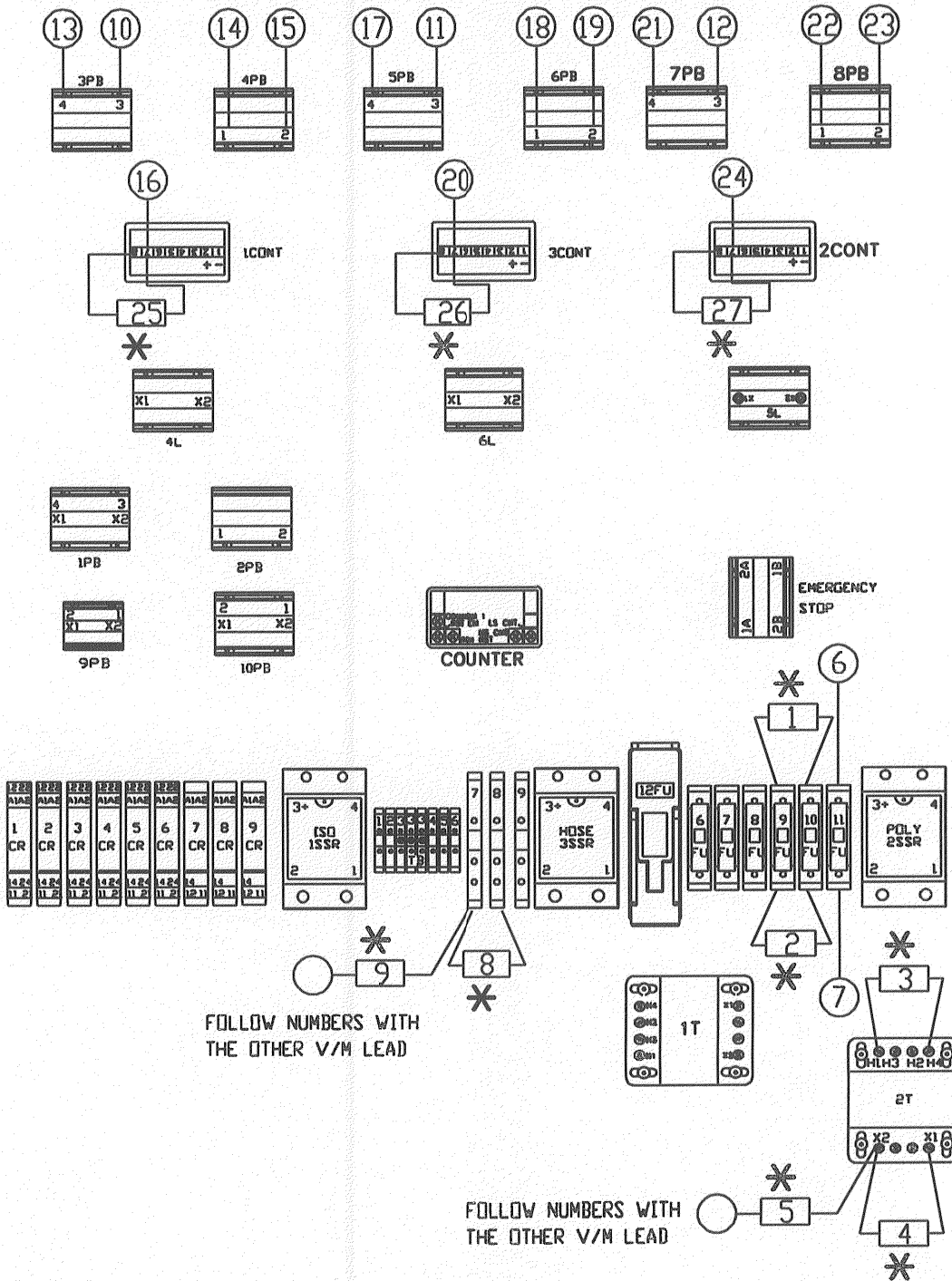
CHECK ALL THREE PHASES

- 1 ALL 3 PHASES SHOULD READ 380 VOLTS, IF NOT CHECK ON/OFF SWITCH.
- 2 ALL 3 PHASES SHOULD READ 380 VOLTS, IF NOT CHECK WIRING.
- 3 ALL 3 PHASES SHOULD READ 380 VOLTS, IF NOT CHECK FUSES.
- 4 ALL 3 PHASES SHOULD READ 380 VOLTS, IF NOT CHECK WIRING.
- 5 ALL 3 PHASES SHOULD READ 380 VOLTS, IF NOT CHECK TO SEE IF THERE IS 24 VOLTS AC ON MAIN RELAY A1, & A2.
- 6 ALL 3 PHASES SHOULD READ 380 VOLTS, IF NOT CHECK WIRING.
- 7 IF NOT CHECK TO SEE IF THERE IS 24 VOLTS AC ON IMS- A1, & A2.
- 8 MEASURE FROM T1, T2, & T3, TO BIG TERMINAL (NEUTRAL) FROM EACH PHASE TO NEUTRAL SHOULD READ 200 TO 240 VOLTS AC.

MH AND MH3

SHT 2

24 VOLTS CIRCUITS FROM TRANSFORMER TO CONTROLLERS.



MH AND MH3

SHT 2A

24 VOLTS CIRCUITS FROM TRANSFORMER TO CONTROLLERS.

NUMBERS 1 THRU 3 SHOULD READ 200 TO 240 VOLTS AC.

- 1 IF NOT CHECK WIRING.
- 2 IF NOT BAD FUSE.
- 3 IF NOT CHECK WIRING.

NUMBERS 4 THRU 27 SHOULD READ 24 VOLTS AC.

- 4 IF NOT BAD TRANSF.
- 5 LEAVE ONE LEAD ON X2, AND FOLLOW CIRCLED NUMBERS WITH OTHER LEAD.
  - ⑥ IF NOT CHECK WIRING.
  - ⑦ IF NOT BAD FUSE.
- 8 IF NOT CHECK WIRING.
- 9 LEAVE ONE LEAD ON TB-7, AND FOLLOW CIRCLED NUMBERS WITH OTHER LEAD.
  - ⑩ IF NOT CHECK WIRE CONNECTIONS.
  - ⑪ IF NOT CHECK WIRE CONNECTIONS.
  - ⑫ IF NOT CHECK WIRE CONNECTIONS.

THE START BUTTON FOR ISO, POLY, & HOSE MUST BE HELD DOWN TO CONTINUE VOLTAGE CHECKS.

- ⑬ IF NOT BAD CONTACT BLOCK.

MH AND MH3

2B

- ⑭ IF NOT CHECK WIRING.
- ⑮ IF NOT BAD CONTACT BLOCK.
- ⑯ IF NOT CHECK WIRING.
- ⑰ IF NOTBAD CONTACT BLOCK.
- ⑱ IF NOT CHECK WIRING.
- ⑲ IF NOTBAD CONTACT BLOCK.
- ⑳ IF NOT CHECK WIRING.
- ㉑ IF NOTBAD CONTACT BLOCK.
- ㉒ IF NOT CHECK WIRING.
- ㉓ IF NOTBAD CONTACT BLOCK.
- ㉔ IF NOT CHECK WIRING.

25 ISO CONTROLLER

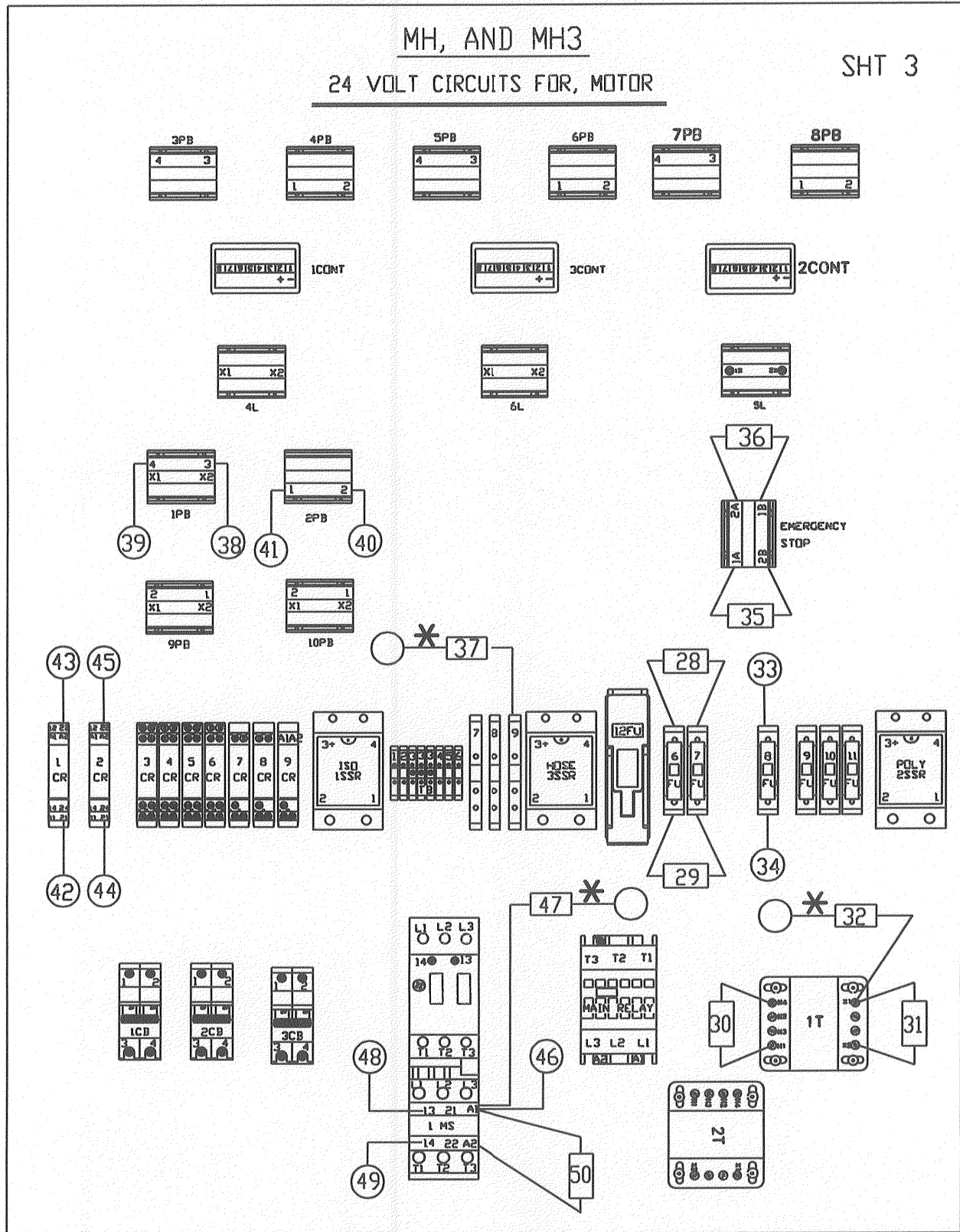
26 POLY CONTROLLER

27 HOSE CONTROLLER

} IF THERE IS 24 VOLTS AC AND DISPLAY IS OFF, IT COULD BE A BAD CONTROLLER.

MH, AND MH3  
24 VOLT CIRCUITS FOR, MOTOR

SHT 3



MH & MH3 MOTOR

SHT 3A

NUMBERS 28 THRU 30 SHOULD READ 200-240 VOLTS AC

- [28] IF NOT CHECK WIRE CONNECTIONS.
- [29] IF NOT BAD FUSE.
- [30] IF NOT CHECK WIRE CONNECTIONS.

NUMBERS 31 THRU 50 SHOULD READ 24 VOLTS AC

- [31] IF NOT BAD TRANSFORMER.
- [32] LEAVE ONE LEAD ON 1T-X1 AND FOLLOW CIRCLED NUMBERS WITH THE OTHER LEAD.
  - ③③ IF NOT CHECK WIRE CONNECTIONS.
  - ③④ IF NOT BAD FUSE.
- [35] IF NOT CHECK WIRE CONNECTIONS.
- [36] IF NOT BAD CONTACT BLOCK.
- [37] LEAVE ONE LEAD ON TB-9 AND FOLLOW CIRCLED NUMBERS WITH THE OTHER LEAD.

- ③⑧ IF NOT CHECK WIRE CONNECTIONS.

THE START BUTTON FOR MOTOR MUST BE HELD DOWN TO CONTINUE VOLTAGE CHECKS.

- ③⑨ IF NOT BAD CONTACT BLOCK.
- ④① IF NOT CHECK WIRE CONNECTIONS.
- ④② IF NOT BAD CONTACT BLOCK.
- ④③ IF NOT CHECK WIRE CONNECTIONS.
- ④④ IF NOT BAD ICR RELAY.

MH & MH3 HOSE

24 VOLT CIRCUITS FOR MOTOR

④④ IF NOT CHECK WIRE CONNECTIONS.

④⑤ IF NOT BAD 2CR RELAY.

④⑥ IF NOT CHECK WIRE CONNECTIONS.

④⑦ LEAVE ONE LEAD ON 1MS-A1 AND FOLLOW CIRCLED NUMBERS WITH THE OTHER LEAD.

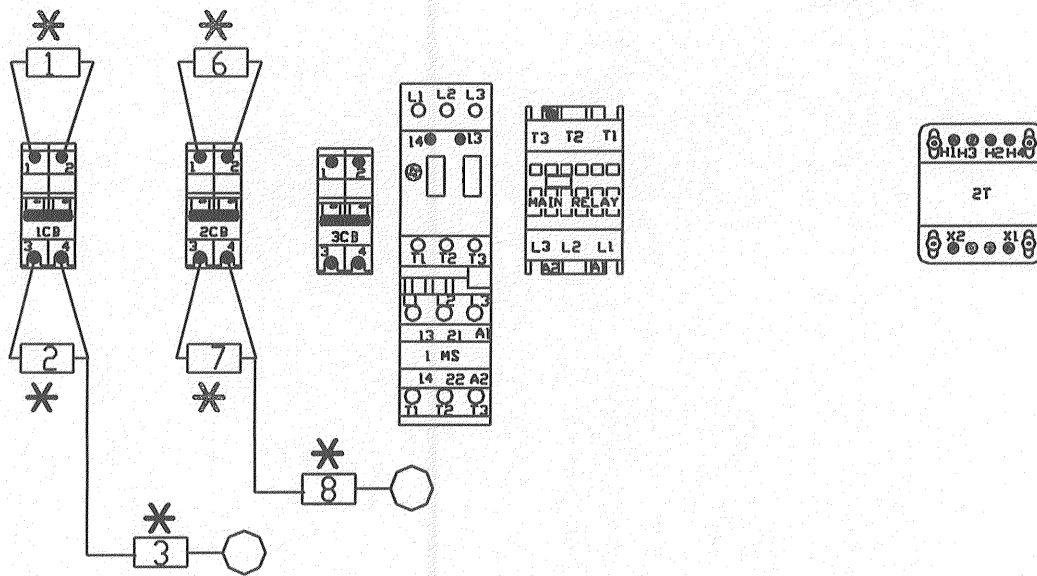
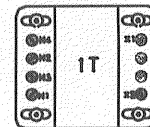
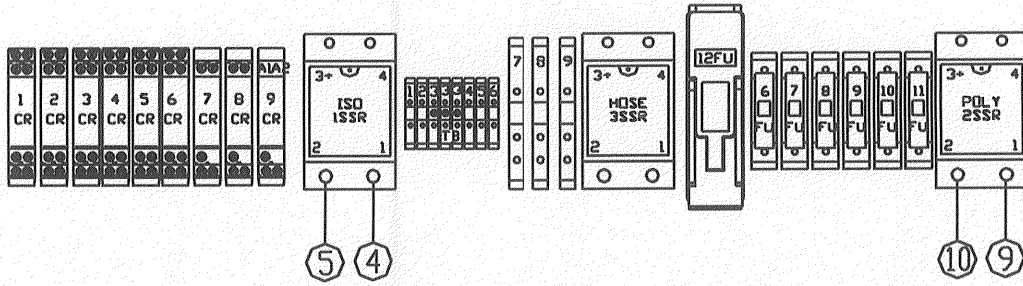
④⑧ IF NOT CHECK WIRE CONNECTIONS.

④⑨ CHECK TO SEE IF OVERLOADS TRIPPED SHUTTING OFF THE MOTOR BREAKER .

④⑩ IF NOT CHECK WIRE CONNECTIONS.

SHT 4

MH, & MH3 ISO, POLY HEATERS  
HIGH VOLTAGE





MH, &MH3 ISO HEATER

NUMBERS 1 THRU 10 SHOULD READ 200-240 VOLTS AC

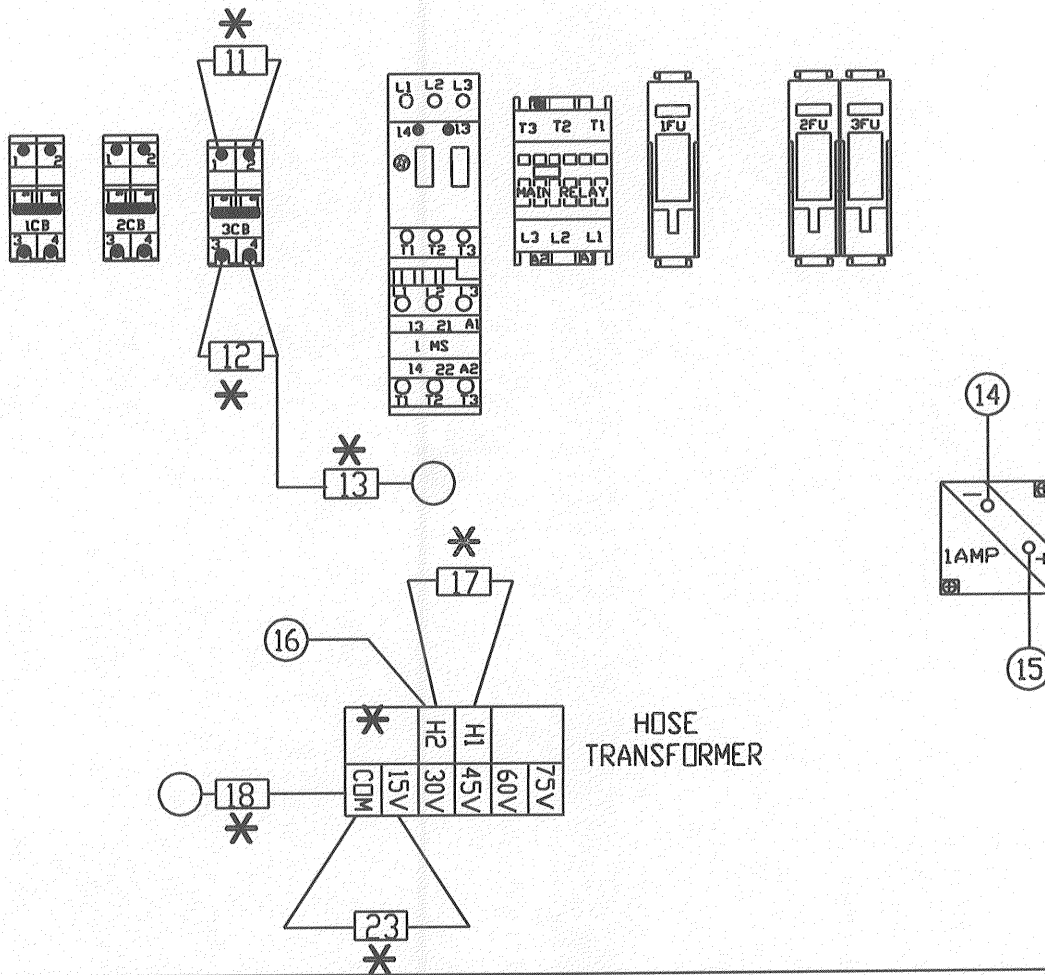
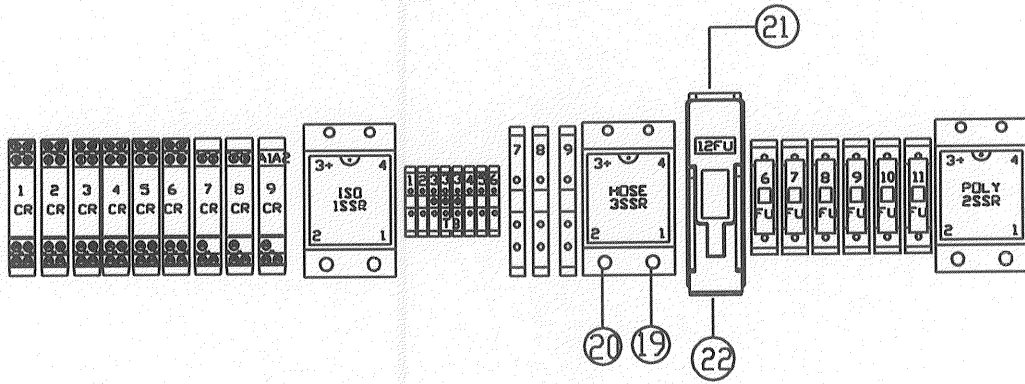
- 1 IF NOT CHECK WIRING.
- 2 IF NOT CHECK BREAKER.
  
- 3 LEAVE ONE LEAD ON 1CB-4, AND FOLLOW CIRCLED NUMBERS WITH OTHER LEAD.
  
- 4 IF NOT CHECK WIRING. WHEN ISO CONTROLLER GREEN
- 5 SHOULD READ 220 VOLTS LIGHT, AND 1SSR GREEN LIGHT IS ON, AND ZERO VOLTS. WHEN GREEN LIGHTS ARE OFF. IF 1 THRU 5 READ 220, GO TO HEATERS, & CHECK WIRE CONNECTIONS

MH, &MH3 POLY HEATER

- 6 IF NOT CHECK WIRING.
- 7 IF NOT CHECK BREAKER.
  
- 8 LEAVE ONE LEAD ON 2CB-4, AND FOLLOW CIRCLED NUMBERS WITH OTHER LEAD.
  
- 9 IF NOT CHECK WIRING.
- 10 SHOULD READ 220 VOLTS WHEN POLY CONTROLLER GREEN LIGHT, AND 2SSR GREEN LIGHT IS ON, AND ZERO VOLTS. WHEN GREEN LIGHTS ARE OFF. IF 1 THRU 5 READ 220, GO TO HEATERS, & CHECK WIRE CONNECTIONS

MH & MH3 HOSE  
HIGH VOLTAGE

SHT 5



SHT 5A

MH & MH3 HOSE

NUMBERS 11 THRU 17 SHOULD READ 200-240 VOLTS AC

11 IF NOT CHECK WIRING.

12 IF NOT CHECK BREAKER.

13 LEAVE ONE LEAD ON 3CB-4, AND FOLLOW CIRCLED NUMBERS WITH OTHER LEAD.

14 IF NOT CHECK WIRING.

15 IF NOT COULD BE BAD METER.

16 IF NOT CHECK WIRING.

17 SHOULD READ 200- 240 VOLTS

IF VOLTAGE IS OK FROM 11 THRU 17 GO TO SHEET 5B LOW VOLTGE.

SHT 5B

MH, & MH3 HOSE LOW VOLTAGE

NUMBERS 18 THRU 22 VOLTAGE READINGS. SEE NOTE.

18 LEAVE ONE LEAD ON COM OF HOSE TRANSFORMER AND FOLLOW NUMBERS WITH OTHER LEAD.

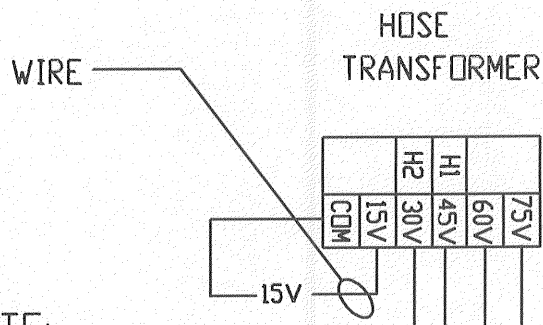
19 IF NOT CHECK WIRING.

20 IF NOT, THEN HOSE 3SSR IS BAD, OR LOOSE WIRES.

21 IF NOT CHECK WIRING.

22 IF NOT BAD FUSE.

23 IF NOT HOSE TRANSFORMER COULD BE BAD.

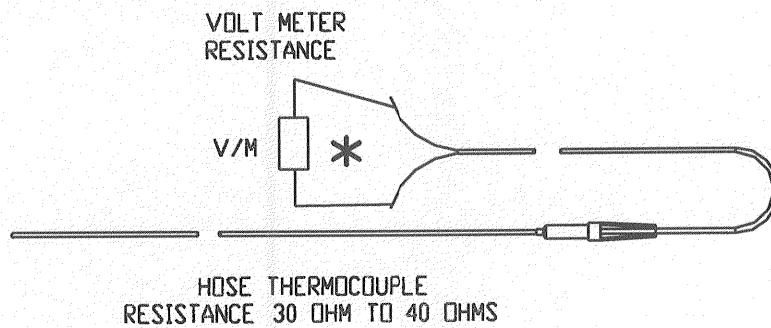
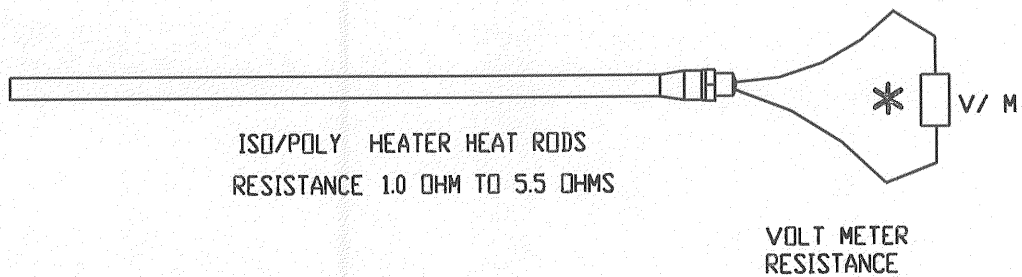
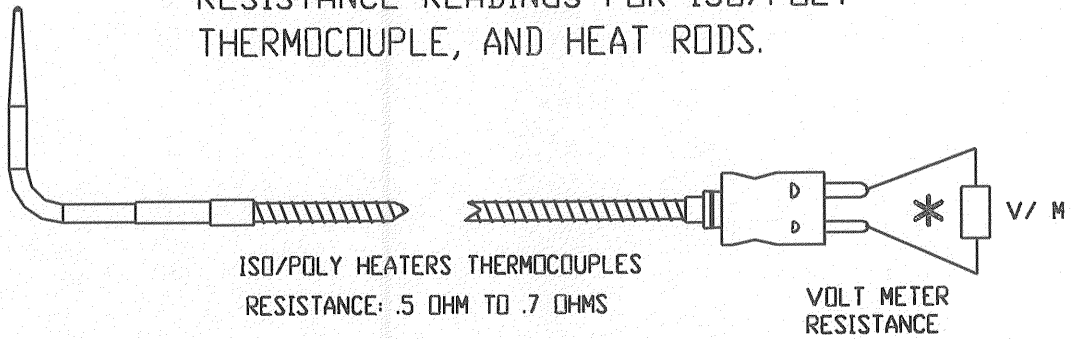


NOTE:

VOLTAGE READINGS WILL BE THE SAME AS THE TAP THE WIRE IS MOVED TO.

MH

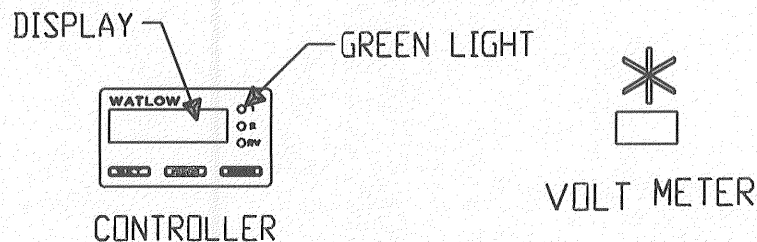
RESISTANCE READINGS FOR ISO/POLY THERMOCOUPLE, AND HEAT RODS.



MH3 TROUBLE SHOOTING

ALL VOLTAGE CHECKS SHOULD BE BE DONE, BY A LICENSED ELECTRICIAN.

- (1) SELECT THE MACHINE VOLTAGE, AND START VOLTAGE CHECKS.  
SHT 1A-A (200 TO 240 VOLTS 1PH 60 HZ),  
SHT. 1B-B (200 TO 240 VOLTS, 3PH 50/60 HZ)  
SHT. 1C-C (380 VOLTS, 3PH 50 HZ)
  
- (2) IF THERE IS NO POWER TO HEATER CONTROLLERS, OR HOSE CONTROLLER MAKE SURE EMERGENCY STOP RED KNOB IS NOT PUSHED IN. IF THE EMERGENCY STOP IS OK REFER TO 24 VOLTS FROM TRANSFORMER TO CONTROLLER TROUBLE SHOOTING GUIDE.  
(SHT 2, 2A, & 2B)
  
- (3) IF THE MOTOR START PUSH BUTTON LIGHT COMES ON, BUT MOTOR WILL NOT START, REFER TO 24 VOLT CIRCUITS FOR MOTOR.  
(SHT3, 3A, & 3B)
  
- (4) IF THE CONTROLLERS DISPLAY, AND THE GREEN LIGHT ON THE CONTROLLER IS ON, BUT HEATERS ARE NOT HEATING REFER TO MH3 ISO POLY HEATERS, TROUBLE SHOOTING GUIDE.  
(SHT 4, & 4A,)



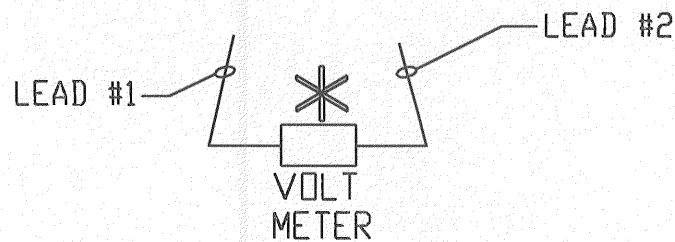
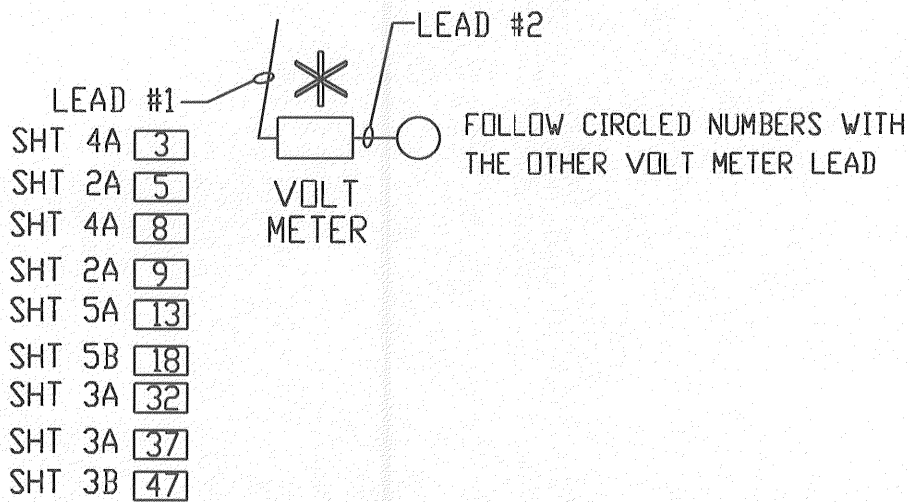
MH3 TROUBLE SHOOTING

ALL VOLTAGE CHECKS SHOULD BE DONE, BY A LICENSED ELECTRICIAN.

(6) IF THERE IS POWER TO THE HOSE CONTROLLER, BUT HOSE WILL NOT HEAT REFER TO HIGH VOLTAGE HOSE (SHT 5, & 5A)

SHEET 5B WILL COVER THE SECONDARY SIDE OF THE HOSE TRANSFORMER. IT WILL BE THE LOW VOLTAGE SIDE.

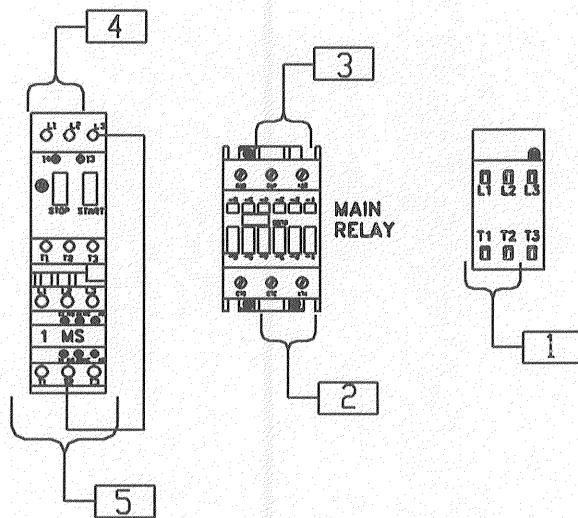
(SHT 5, & 5B)



MH3

SHT 1A-A

MAIN VOLTAGE 200-240 VOLTS 1 PHASE.



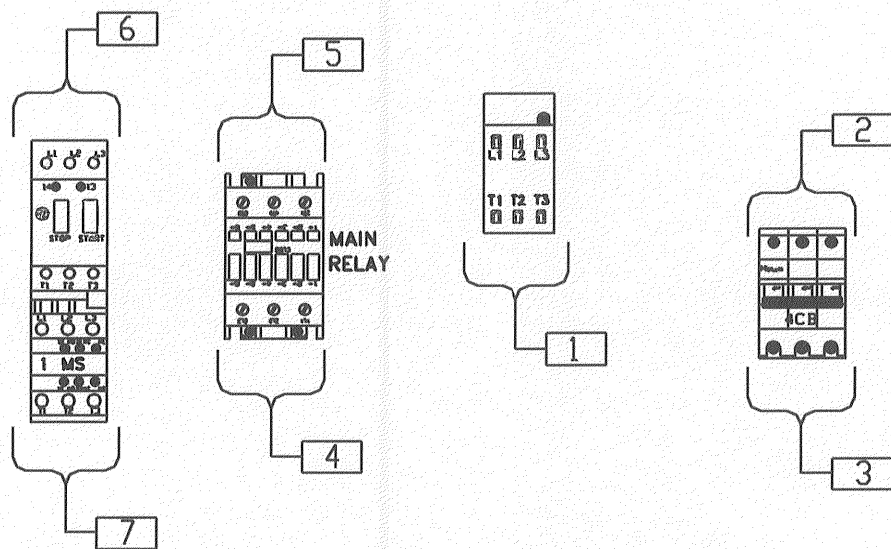
- 1 IF NOT CHECK ON/OFF SWITCH.
- 2 IF NOT CHECK WIRING.
- 3 IF NOT CHECK TO SEE IF THERE IS 24 VOLTS AC. ON MAIN RELAY A1, AND A2.
- 4 IF NOT CHECK WIRING.
- 5 IF NOT CHECK TO SEE IF THERE IS 24 VOLTS AC ON IMS- A1, & A2.



MH3

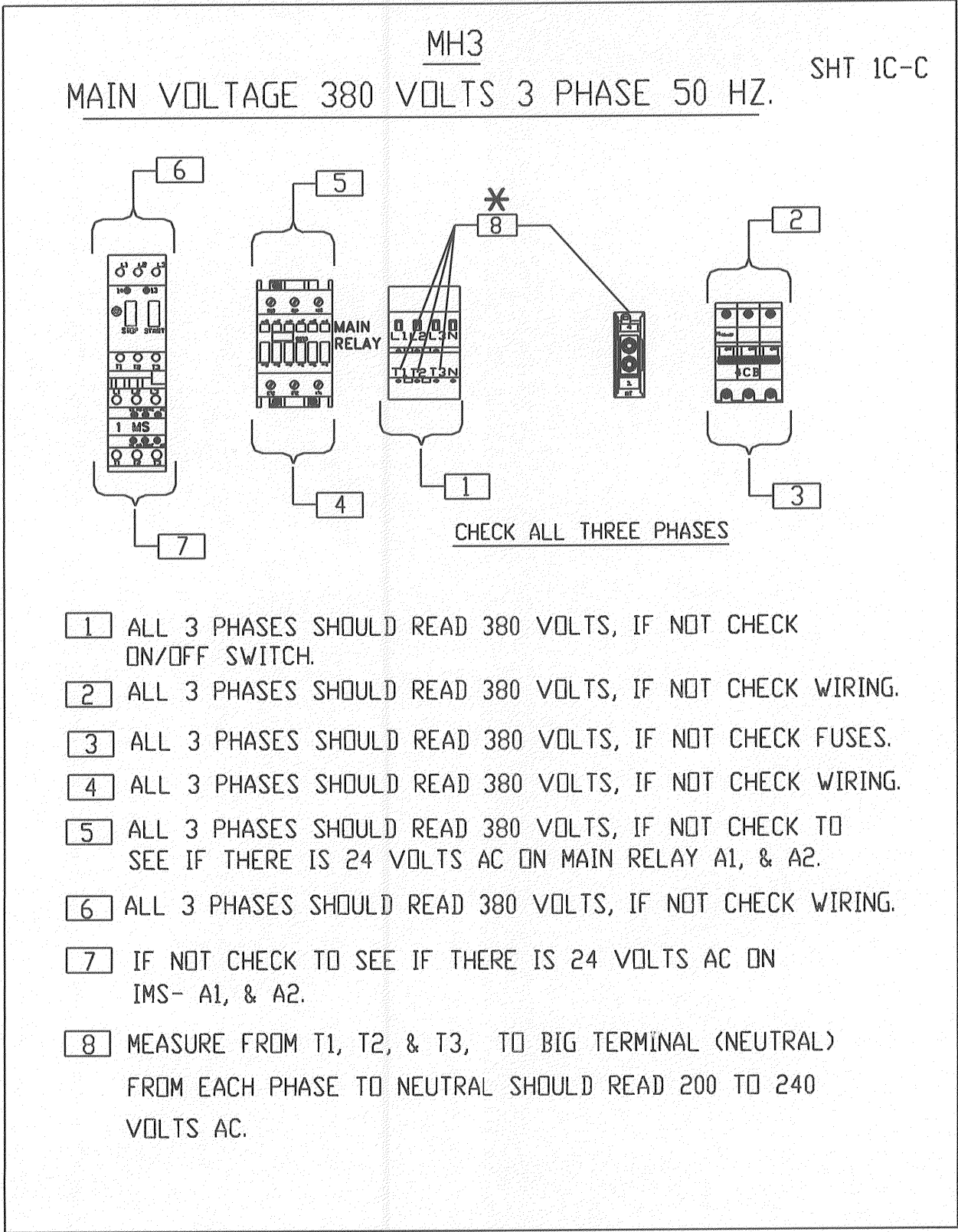
SHT 1B-B

MAIN VOLTAGE 200-240 VOLTS 3 PHASE.



CHECK ALL THREE PHASES

- 1 IF NOT CHECK ON/OFF SWITCH.
- 2 IF NOT CHECK WIRING.
- 3 IF NOT CHECK BREAKER
- 4 IF NOT CHECK WIRING.
- 5 IF NOT CHECK TO SEE IF THERE IS 24 VOLTS AC.  
ON MAIN RELAY A1, AND A2.
- 6 IF NOT CHECK WIRING.
- 7 IF NOT CHECK TO SEE IF THERE IS 24 VOLTS AC ON  
IMS- A1, & A2.

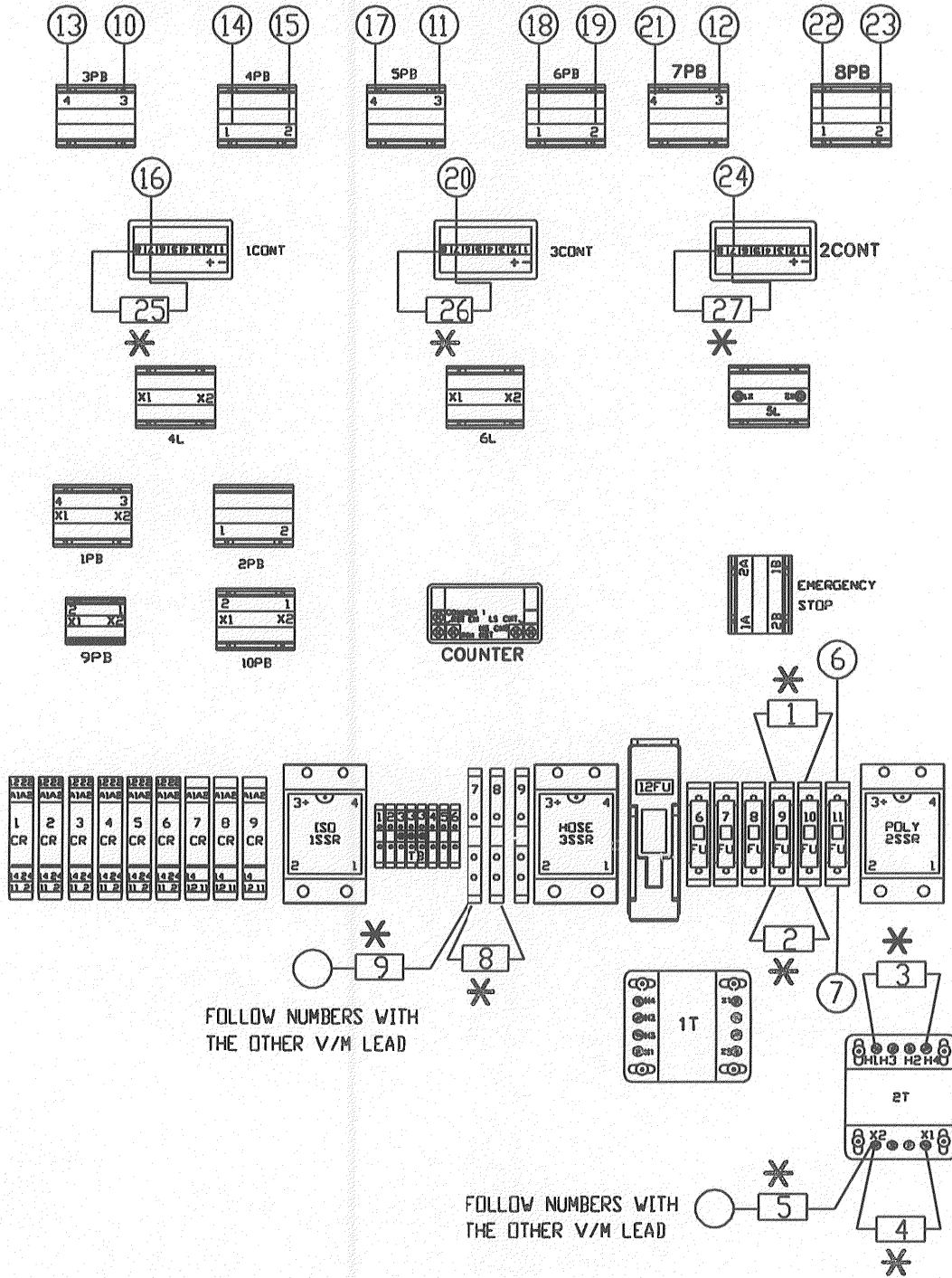


- 1 ALL 3 PHASES SHOULD READ 380 VOLTS, IF NOT CHECK ON/OFF SWITCH.
- 2 ALL 3 PHASES SHOULD READ 380 VOLTS, IF NOT CHECK WIRING.
- 3 ALL 3 PHASES SHOULD READ 380 VOLTS, IF NOT CHECK FUSES.
- 4 ALL 3 PHASES SHOULD READ 380 VOLTS, IF NOT CHECK WIRING.
- 5 ALL 3 PHASES SHOULD READ 380 VOLTS, IF NOT CHECK TO SEE IF THERE IS 24 VOLTS AC ON MAIN RELAY A1, & A2.
- 6 ALL 3 PHASES SHOULD READ 380 VOLTS, IF NOT CHECK WIRING.
- 7 IF NOT CHECK TO SEE IF THERE IS 24 VOLTS AC ON IMS- A1, & A2.
- 8 MEASURE FROM T1, T2, & T3, TO BIG TERMINAL (NEUTRAL) FROM EACH PHASE TO NEUTRAL SHOULD READ 200 TO 240 VOLTS AC.

MH AND MH3

SHT 2

24 VOLTS CIRCUITS FROM TRANSFORMER TO CONTROLLERS.



MH AND MH3

SHT 2A

24 VOLTS CIRCUITS FROM TRANSFORMER TO CONTROLLERS.

NUMBERS 1 THRU 3 SHOULD READ 200 TO 240 VOLTS AC.

- 1 IF NOT CHECK WIRING.
- 2 IF NOT BAD FUSE.
- 3 IF NOT CHECK WIRING.

NUMBERS 4 THRU 27 SHOULD READ 24 VOLTS AC.

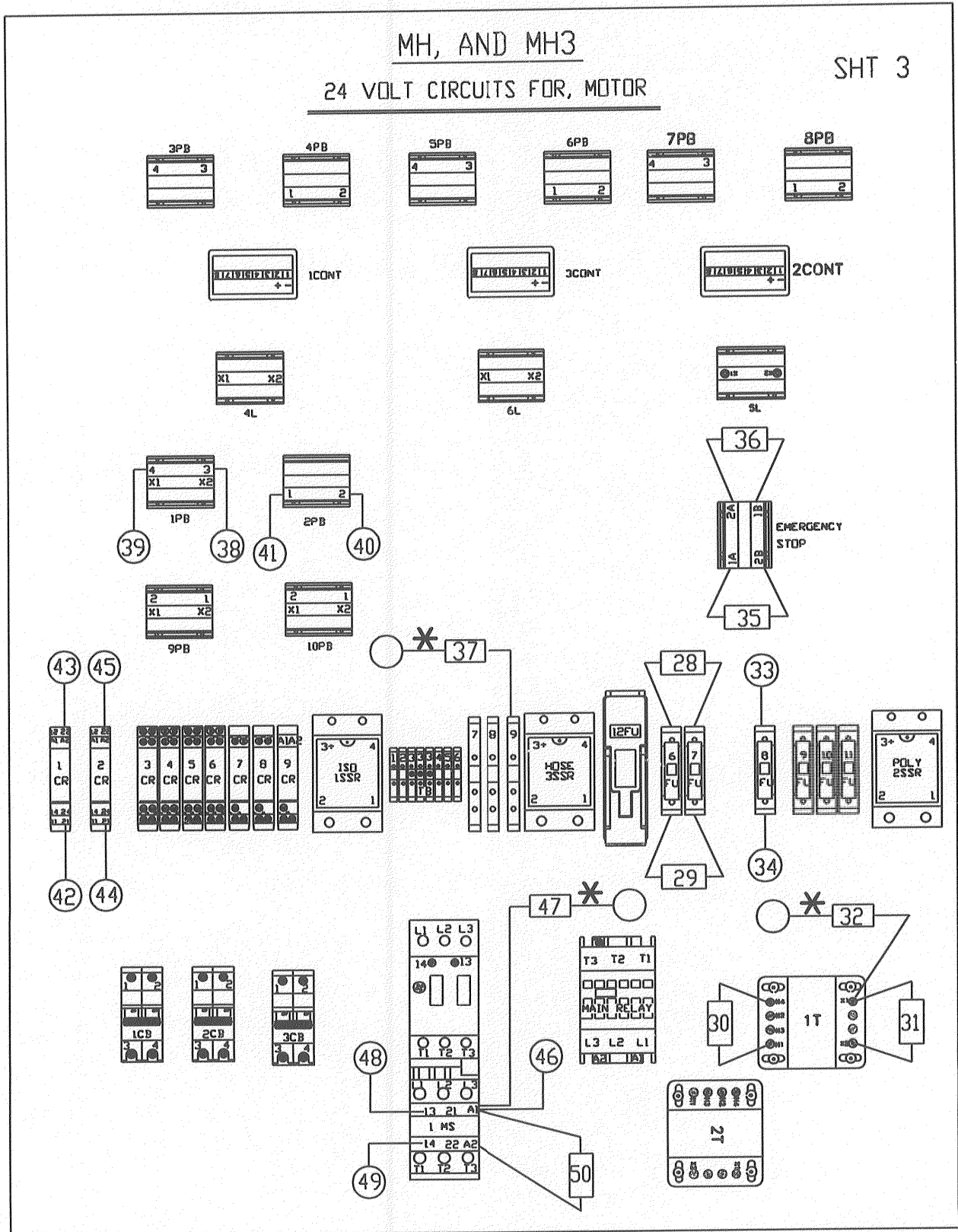
- 4 IF NOT BAD TRANSF.
  - 5 LEAVE ONE LEAD ON X2, AND FOLLOW CIRCLED NUMBERS WITH OTHER LEAD.
    - ⑥ IF NOT CHECK WIRING.
    - ⑦ IF NOT BAD FUSE.
  - 8 IF NOT CHECK WIRING.
  - 9 LEAVE ONE LEAD ON TB-7, AND FOLLOW CIRCLED NUMBERS WITH OTHER LEAD.
    - ⑩ IF NOT CHECK WIRE CONNECTIONS.
    - ⑪ IF NOT CHECK WIRE CONNECTIONS.
    - ⑫ IF NOT CHECK WIRE CONNECTIONS.
- THE START BUTTON FOR ISO, POLY, & HOSE MUST BE HELD DOWN TO CONTINUE VOLTAGE CHECKS.
- ⑬ IF NOT BAD CONTACT BLOCK.

MH AND MH3

2B

- ⑭ IF NOT CHECK WIRING.
- ⑮ IF NOT BAD CONTACT BLOCK.
- ⑯ IF NOT CHECK WIRING.
- ⑰ IF NOTBAD CONTACT BLOCK.
- ⑱ IF NOT CHECK WIRING.
- ⑲ IF NOTBAD CONTACT BLOCK.
- ⑳ IF NOT CHECK WIRING.
- ㉑ IF NOTBAD CONTACT BLOCK.
- ㉒ IF NOT CHECK WIRING.
- ㉓ IF NOTBAD CONTACT BLOCK.
- ㉔ IF NOT CHECK WIRING.

⑮	ISO CONTROLLER	}	IF THERE IS 24 VOLTS AC AND DISPLAY IS OFF, IT COULD BE A BAD CONTROLLER.
⑯	POLY CONTROLLER		
⑰	HOSE CONTROLLER		



MH & MH3 MOTOR

SHT 3A

NUMBERS 28 THRU 30 SHOULD READ 200-240 VOLTS AC

[28] IF NOT CHECK WIRE CONNECTIONS.

[29] IF NOT BAD FUSE.

[30] IF NOT CHECK WIRE CONNECTIONS.

NUMBERS 31 THRU 50 SHOULD READ 24 VOLTS AC

[31] IF NOT BAD TRANSFORMER.

[32] LEAVE ONE LEAD ON 1T-X1 AND FOLLOW CIRCLED NUMBERS WITH THE OTHER LEAD.

③③ IF NOT CHECK WIRE CONNECTIONS.

③④ IF NOT BAD FUSE.

[35] IF NOT CHECK WIRE CONNECTIONS.

[36] IF NOT BAD CONTACT BLOCK.

[37] LEAVE ONE LEAD ON TB-9 AND FOLLOW CIRCLED NUMBERS WITH THE OTHER LEAD.

③⑧ IF NOT CHECK WIRE CONNECTIONS.

THE START BUTTON FOR MOTOR MUST BE HELD DOWN TO CONTINUE VOLTAGE CHECKS.

③⑨ IF NOT BAD CONTACT BLOCK.

④① IF NOT CHECK WIRE CONNECTIONS.

④② IF NOT BAD CONTACT BLOCK.

④③ IF NOT CHECK WIRE CONNECTIONS.

④④ IF NOT BAD 1CR RELAY.

SHT 3B

MH & MH3 HOSE

24 VOLT CIRCUITS FOR MOTOR

④④ IF NOT CHECK WIRE CONNECTIONS.

④⑤ IF NOT BAD 2CR RELAY.

④⑥ IF NOT CHECK WIRE CONNECTIONS.

④⑦ LEAVE ONE LEAD ON 1MS-A1 AND FOLLOW CIRCLED NUMBERS WITH THE OTHER LEAD.

④⑧ IF NOT CHECK WIRE CONNECTIONS.

④⑨ CHECK TO SEE IF OVERLOADS TRIPPED SHUTTING OFF THE MOTOR BREAKER .

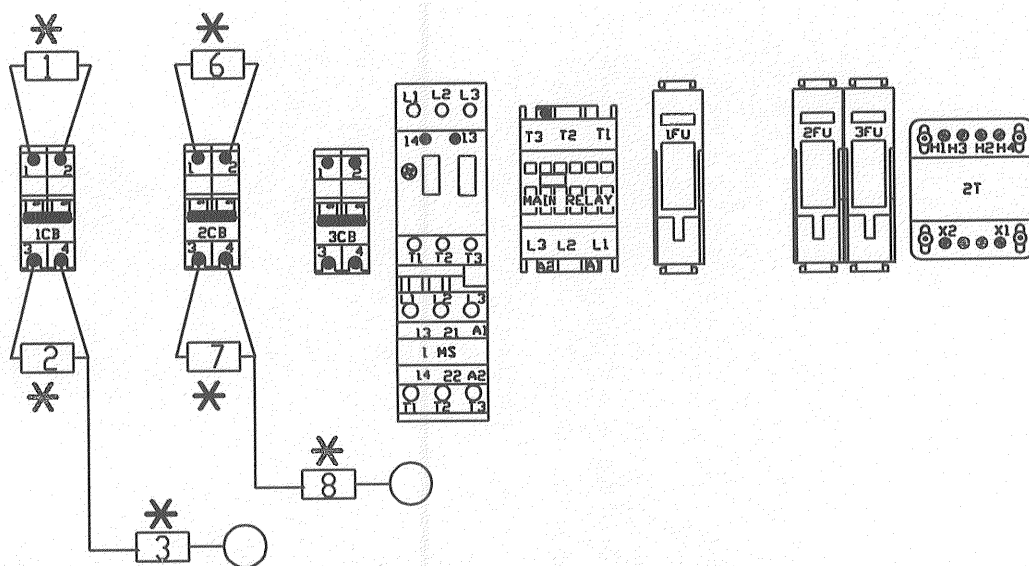
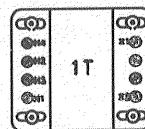
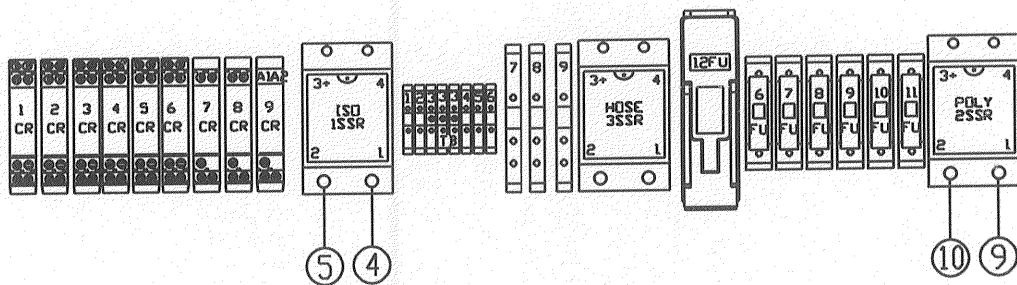
④⑩ IF NOT CHECK WIRE CONNECTIONS.



SHT 4

MH, & MH3 ISO, POLY HEATERS

HIGH VOLTAGE



SHT 4A

MH, &MH3 ISO HEATER

NUMBERS 1 THRU 10 SHOULD READ 200-240 VOLTS AC

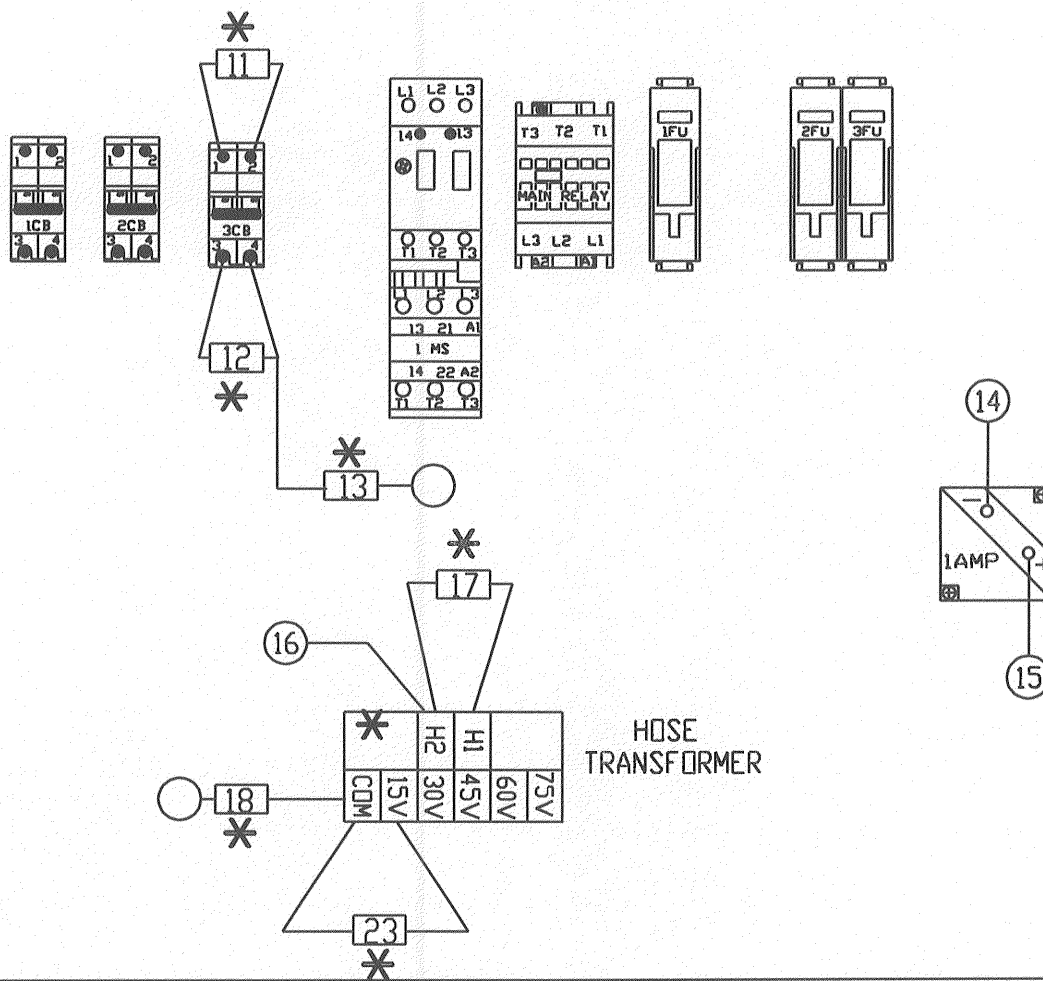
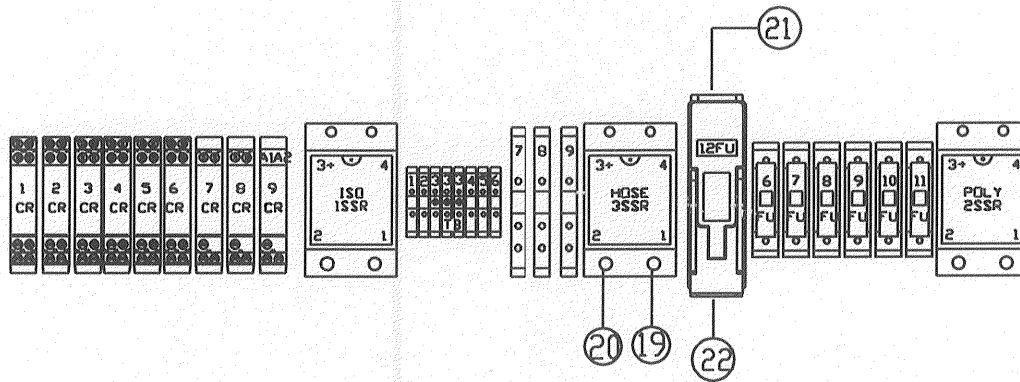
- 1 IF NOT CHECK WIRING.
- 2 IF NOT CHECK BREAKER.
  
- 3 LEAVE ONE LEAD ON 1CB-4, AND FOLLOW CIRCLED NUMBERS WITH OTHER LEAD.
  
- 4 IF NOT CHECK WIRING. WHEN ISO CONTROLLER GREEN
- 5 SHOULD READ 220 VOLTS LIGHT, AND ISSR GREEN LIGHT IS ON, AND ZERO VOLTS. WHEN GREEN LIGHTS ARE OFF. IF 1 THRU 5 READ 220, GO TO HEATERS, & CHECK WIRE CONNECTIONS

MH, &MH3 POLY HEATER

- 6 IF NOT CHECK WIRING.
- 7 IF NOT CHECK BREAKER.
  
- 8 LEAVE ONE LEAD ON 2CB-4, AND FOLLOW CIRCLED NUMBERS WITH OTHER LEAD.
  
- 9 IF NOT CHECK WIRING.
- 10 SHOULD READ 220 VOLTS WHEN POLY CONTROLLER GREEN LIGHT, AND 2SSR GREEN LIGHT IS ON, AND ZERO VOLTS. WHEN GREEN LIGHTS ARE OFF. IF 1 THRU 5 READ 220, GO TO HEATERS, & CHECK WIRE CONNECTIONS

MH & MH3 HOSE  
HIGH VOLTAGE

SHT 5



SHT 5A

MH & MH3 HOSE

NUMBERS 11 THRU 17 SHOULD READ 200-240 VOLTS AC

- 11 IF NOT CHECK WIRING.
- 12 IF NOT CHECK BREAKER.
- 13 LEAVE ONE LEAD ON 3CB-4, AND FOLLOW CIRCLED NUMBERS WITH OTHER LEAD.
  - 14 IF NOT CHECK WIRING.
  - 15 IF NOT COULD BE BAD METER.
  - 16 IF NOT CHECK WIRING.
  - 17 SHOULD READ 200- 240 VOLTS

IF VOLTAGE IS OK FROM 11 THRU 17 GO TO SHEET 5B LOW VOLTGE.

SHT 5B

MH, & MH3 HOSE LOW VOLTAGE

NUMBERS 18 THRU 22 VOLTAGE READINGS. SEE NOTE.

18 LEAVE ONE LEAD ON COM OF HOSE TRANSFORMER AND FOLLOW NUMBERS WITH OTHER LEAD.

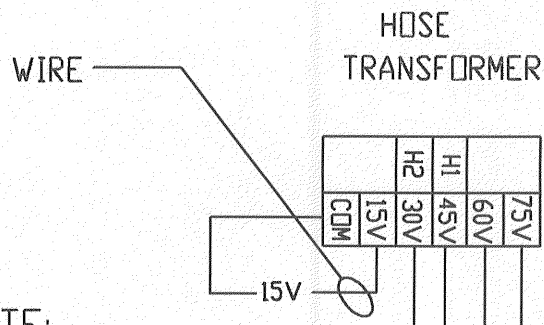
19 IF NOT CHECK WIRING.

20 IF NOT, THEN HOSE 3SSR IS BAD, OR LOOSE WIRES.

21 IF NOT CHECK WIRING.

22 IF NOT BAD FUSE.

23 IF NOT HOSE TRANSFORMER COULD BE BAD.

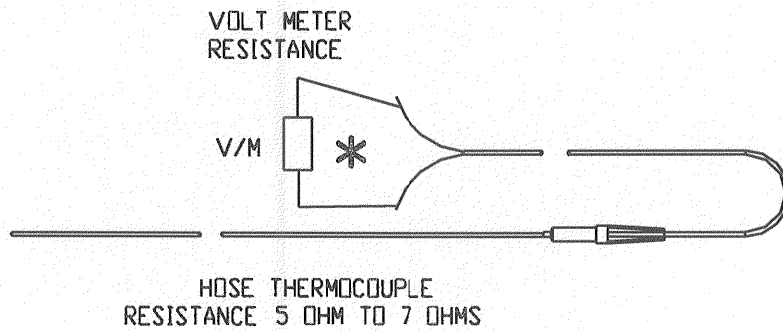
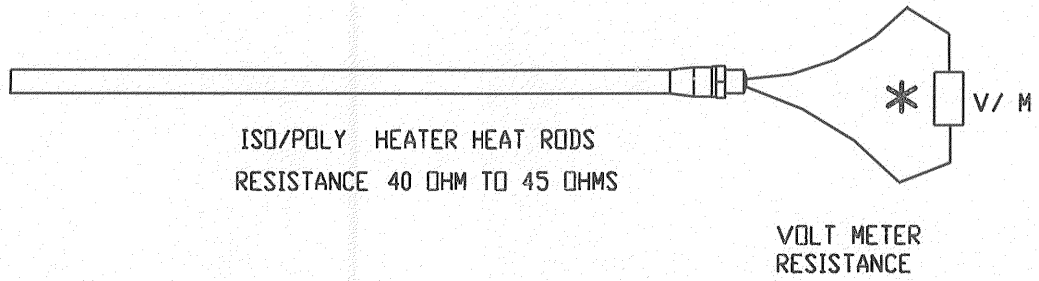
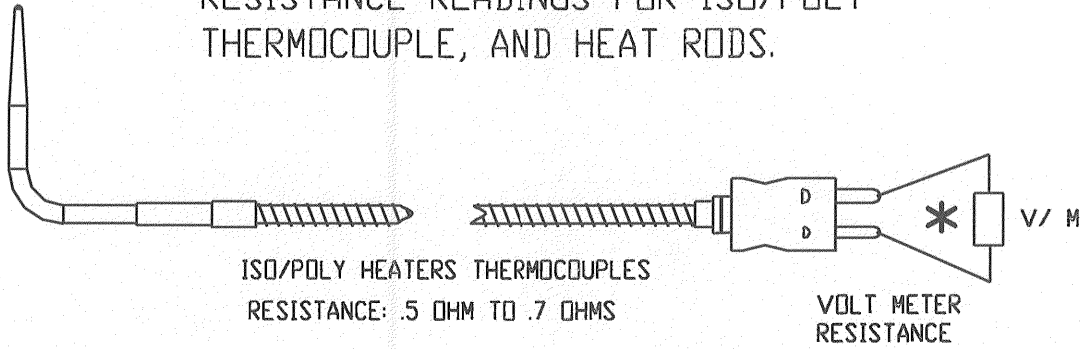


NOTE:

VOLTAGE READINGS WILL BE THE SAME AS THE TAP THE WIRE IS MOVED TO.

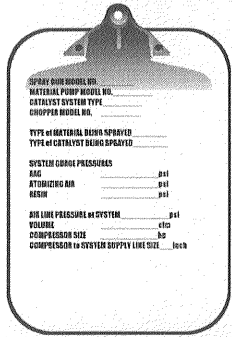
MH 3

RESISTANCE READINGS FOR ISO/POLY  
THERMOCOUPLE, AND HEAT RODS.

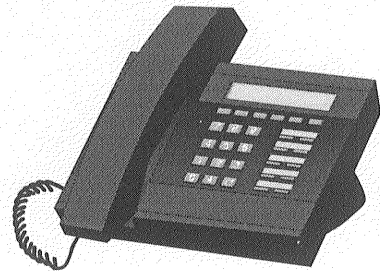




# IF YOU HAVE AN EQUIPMENT PROBLEM...



If you have a problem that requires Distributor or Glas-Craft Service Department help, gather the following information ***BEFORE*** you pick-up the telephone.



	Model No.	Serial No.
SPRAY GUN SYSTEM		
TYPE of MATERIAL BEING SPRAYED		
SYSTEM GAUGE PRESSURES		
ISO HEATER GAUGE		PSI
POLY HEATER GAUGE		PSI
MATERIAL PUMP AIR MOTOR		PSI
MAIN AIR LINE PRESSURE at SYSTEM		PSI
MAIN AIR LINE VOLUME		CFM
COMPRESSOR SIZE		HP
COMPRESSOR to SYSTEM SUPPLY LINE SIZE		INCHES

*Have a general equipment or operation question? You can contact Glas-Craft Service Department via E-Mail at [gciservice@glascraft.com](mailto:gciservice@glascraft.com)*



# FOR YOUR REFERENCE

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*...featuring the patented Probler Spray/Pour Gun*

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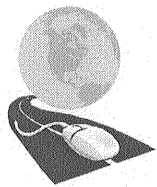
**For more information concerning any of these Glas-Craft products,  
contact your local authorized Glas-Craft distributor, or**

## ***Glas-Craft, Inc.***

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REVISED JUNE 2004