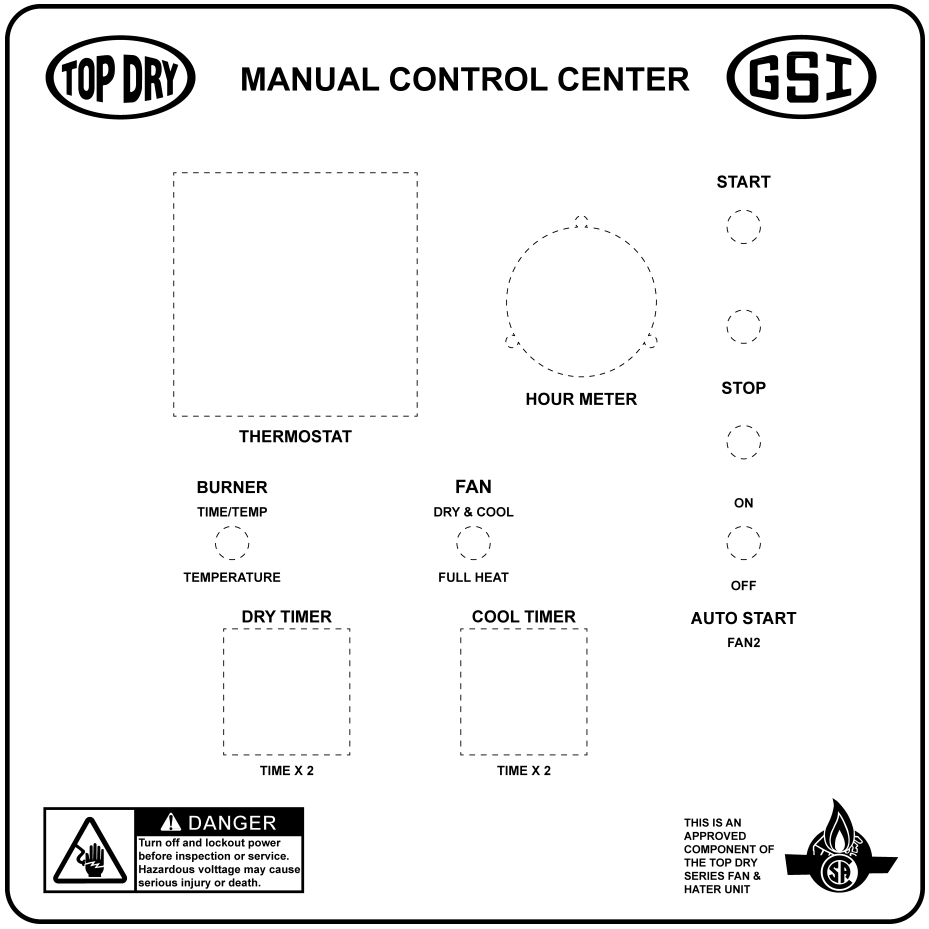


TopDry Manual Control Center

Models:

TF-1195

Owner's Manual

PNEG-166

Version: 3.**1**

Date: **09-27-20**

PNEG-166

All information, illustrations, photos and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

Contents

Safety Guidelines

Safety guidelines are general-to-specific safety rules that must be followed at all times. This manual is written to help you understand safe operating procedures and problems that can be encountered by the operator and other personnel when using this equipment. Read and save these instructions.

As owner or operator, you are responsible for understanding the requirements, hazards, and precautions that exist and to inform others as required. Unqualified persons must stay out of the work area at all times.

Alterations must not be made to the equipment. Alterations can produce dangerous situations resulting in SERIOUS INJURY or DEATH.

This equipment must be installed in accordance with the current installation codes and applicable regulations, which must be carefully followed in all cases. Authorities having jurisdiction must be consulted before installations are made.

When necessary, you must consider the installation location relative to electrical, fuel and water utilities.

Personnel operating or working around equipment must read this manual. This manual must be delivered with equipment to its owner. Failure to read this manual and its safety instructions is a misuse of the equipment.

ST-0001-4

Cautionary Symbols Definitions

Cautionary symbols appear in this manual and on product decals. The symbols alert the user of potential safety hazards, prohibited activities and mandatory actions. To help you recognize this information, we use the symbols that are defined below.

DANGER This symbol indicates an imminently hazardous situation which, if not avoided, **will result in serious injury or death.**

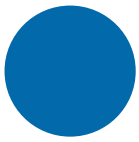
WARNING This symbol indicates a potentially hazardous situation which, if not avoided, **can result in serious injury or death.**

CAUTION This symbol indicates a potentially hazardous situation which, if not avoided, **can result in minor or moderate injury.**

NOTICE This symbol is used to address practices not related to personal injury.

This symbol indicates a general hazard.

This symbol indicates a prohibited activity.



This symbol indicates a mandatory action.

ST-0005-2

Safety Cautions

Use Personal Protective Equipment

- Use appropriate personal protective equipment:

Eye Protection

Respiratory Protection

Foot Protection

Hearing Protection

Head Protection

Fall Protection

Hand Protection

- Wear clothing appropriate to the job.
- Remove all jewelry.
- Tie long hair up and back.

ST-0004-1

Follow Safety Instructions

- Warning: If the information in the manual is not followed exactly, a fire or explosion can result, causing property damage, personal injury or loss of life.
- Carefully read all safety messages in this manual and safety signs on your machine. Keep signs in good condition. Replace missing or damaged safety signs. Be sure new equipment components and repair parts include the current safety signs. Replacement safety signs are available from the manufacturer.
- Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.
- If you do not understand any part of this manual or need assistance, contact your dealer.
- Retain these instructions for future reference.

ST-0025-3

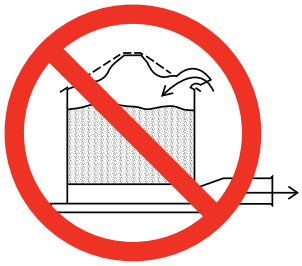
Maintain Equipment and Work Area

- Understand service procedures before doing work.
- Keep area clean and dry.
- Do not service equipment while it is operating. Disconnect and lock-out power and fuel supply before entering equipment or before performing maintenance.
- Keep your equipment in proper working condition. Replace worn or broken parts immediately.
- Depressurize the fuel train before disassembling for service.
- Allow the fan to operate for 20 minutes with the burner off to purge products of combustion and to cool the components before entering.
- Check regularly for any developing gas plumbing leaks. Do not operate the dryer if any gas leak is detected. Shut down and repair before further operation.

ST-0030-2

Prevent Roof Damage Due to Vacuum Pressure

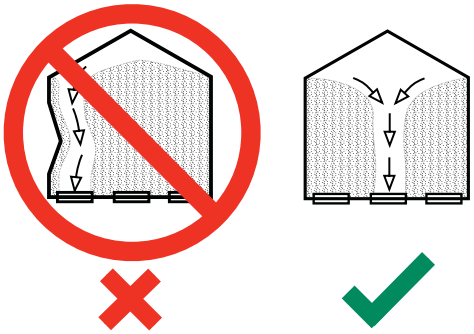
- Roof damage can result from excessive vacuum or internal pressure from fans or other air moving systems. The manufacturer does not warrant this type of roof damage.
- Adequate ventilation or “makeup air” devices must be provided for all powered air handling systems.
- The manufacturer does not recommend the use of downward flow systems (suction).
- Severe roof damage can result from any blockage of air passages.
- Operating fans during high humidity or cold weather conditions can cause air exhaust or intake ports to freeze.



ST-0028-2

Unload the Bin Correctly

- Use CENTER FLOOR OUTLET ONLY until NO grain remains above this outlet.
- Side floor outlets to be used ONLY when above condition is satisfied.
- Lock all side floor outlets to avoid accidental premature use.
- See manufacturers instructions for proper use of factory supplied sidedraw (wall) discharge systems.



ST-0060-1

Handle and Use Equipment Properly

- Equipment is intended for the use of grain drying only. Any other use is a misuse of this equipment.
- The operating instructions in this manual pertain to the common cereal grains as indicated. When drying any other grain, contact GSI for additional recommendations.
- On LP fired units, set pressure regulator to avoid excessive gas pressure applied to the burner during ignition and operation. Do not exceed maximum recommended drying temperatures.
- Equipment has sharp edges that may cause serious injury. To avoid injury, handle sharp edges with caution and use proper protective clothing and equipment at all times.
- All guards must be in place before and during operation. Images of guards removed in this manual are for illustration purposes only.
- Use caution when working around high-speed fans, gas burners, augers and auxiliary conveyors which can start automatically.
- Keep hands, feet, and clothing away from moving parts.
- Do not bypass any safety device or interlock.
- Do not enter the dryer/bin while it is operating.
- Do not operate in an area where combustible material will be drawn into the dryer.

ST-0029-2

Stay Clear of Hoisted Equipment

- Always use proper lifting or hoisting equipment when assembling or disassembling equipment.
- Do not walk or stand under hoisted equipment.
- Always use sturdy and stable supports when needed for installation. Not following these safety precautions creates the risk of falling equipment, which can crush personnel and cause serious injury or death.

ST-0047-1

Do Not Enter Bin

- Rotating flighting will kill or dismember.
- Flowing material will trap and suffocate.
- Crusted material will collapse and suffocate.

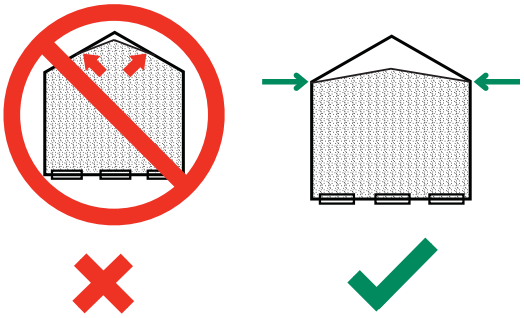
    - If you must enter the bin:

        1. Shut off and lock out all power sources.
        2. Use a safety harness and safety line.
        3. Station another person outside the bin.
        4. Avoid the center of the bin.
        5. Wear proper breathing equipment or respirator.

ST-0061-1

Do Not Overfill the Bin

- Do not overfill bin. Stored grain must be no higher than the roof eaves at the outer edge.
- Filling the bin above this point creates excessive internal pressure and can cause swelling and eventual roof failure. The over filling of a bin can also cause the blockage of roof vents and eaves, which will lead to a build-up of air pressure causing roof damage.



ST-0050-1

Install and Operate Equipment Properly

- Make sure grain chutes are empty by performing a manual dump before entering the bin.
- Before attempting to remove and reinstall the fan blade, contact GSI for the recommended procedure.

ST-0031-2

Exercise Caution When Drying Flammable Grains

- Be aware that some grains are highly flammable including, but not limited to, rapeseed, canola, linseed, sunflower and milo.
- All grain and seed must be whole (minimal cracking or crushing), clean, and dust free before drying.
- Avoid dust and chaff from being drawn into the fan and heater.
- To reduce risk of fire, keep the fan, heater, drying plenum, and ducts clean at all times.
- In the event of a fire (or suspected fire):
  1. Shut down the entire dryer.
  2. Turn off the fuel at the tank or supply valve.
  3. Shut off and lock electrical power.
  4. Evacuate the area.
  5. Call the fire department.

ST-0032-1

For Your Safety

- If you smell gas:
  - Do not try to light any appliance.
  - Extinguish any open flames.
  - Do not touch any electrical switch.
  - Immediately call your gas supplier. Follow the gas supplier's instructions.
  - If you cannot reach your gas supplier, call the fire department.
- The use and storage of gasoline and other flammable vapors and liquids in open containers in the vicinity of this appliance is hazardous.
- Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment. Installation and service must be performed by a qualified installer, service agency or the gas supplier.

ST-0024-1

Confined Space Hazards and Entry Procedures

- Note that the interior of this equipment is considered a confined space. Maintenance of this equipment can require access to the confined space.
- Access doors must be shut and locked except when access is required.
- Doors giving access to dangerous equipment must be safety interlocked.
- The following entry procedures must be followed:
  - Be aware of all possible hazards present inside the confined space and wear personal protective equipment (PPE) as needed.
  - Complete a permit to work and follow all permit required confined space entry procedures defined by the site manager.
  - Make sure that the area has been purged of any hazardous products or gases. Check the atmosphere for harmful gases or vapors with a suitable gas analyzer and make sure levels are safe before entering.
  - Do not smoke or use naked flames.
  - Lock out and tag out power supplies and fuel supplies to all equipment.
  - Do not work alone. Work in teams of at least three so that help is immediately available in the event of an emergency.
  - Confirm that all personnel have safely exited the equipment and tools have been recovered once work is complete.

ST-0055-1

Install and Operate Equipment Properly

- This product is intended for the use of grain storage only. Any other use is a misuse of the product.

ST-0057-1

Store Bin Sheets Properly

- Sidewall bundles or sheets must be stored in a safe manner. The safest method of storing sidewall bundles is by laying them horizontally with the arch of the sheet upward, like a dome.
- Sidewall sheets stored on edge must be secured so that they cannot fall over and cause injury.
- Use care when handling and moving sidewall bundles.

ST-0058-2

Safety Sign-Off Sheet

Below is a sign-off sheet that can be used to verify that all personnel have read and understood the safety instructions. This sign-off sheet is provided for your convenience and personal record keeping.

Date	*Employee Name*	*Supervisor Name*

ST-0007

The TopDry Manual Control Center, Model TF-1195, is the modern method of controlling the drying and cooling cycles of the TopDry dryer. The control center is a very practical and labor-saving device. It not only eases the starting and stopping of the TopDry fan and heater but it also regulates and monitors the drying and cooling cycles.The control center may be used in several different modes of operation as follows:

1. Temperature Drying and Time Cooling
2. Temperature/Time Drying and Time Cooling
3. Temperature Drying and No Cooling
4. Temperature/Time Drying and No Cooling
5. Manual Operation

Thermostat

The thermostat is used to regulate the drying temperature of the TopDry system. It operates in the time/temperature mode and the temperature mode. The thermostat has temperature indicator that is functional in the manual mode as well as in the time/temperature and temperature modes. The thermostat senses the temperature through the temperature sensor which is mounted inside the grain chamber. The thermostat is located on the upper left hand corner of the sub-panel.

Dry Timer

The dry timer is used to regulate the drying time of the TopDry system. It operates only in the time/temperature mode. The dry timer has a progress indicator that shows the remaining amount of time to dry. The dry timer is located on the lower left hand corner of the sub-panel.

Cool Timer

The cool timer is used to regulate the cooling time of the TopDry system. It operates only in the dry and cool mode. The cool timer has a progress indicator that shows the remaining amount of time to cool. The cool timer is located immediately to the right of the dry timer.

Hour Meter

The hour meter records the accumulated time the TopDry system has been operated. It operates in time/temperature mode, temperature mode, as well as manual mode. The hour meter is located to the immediate right of the thermostat.

Start Switch

The start switch starts the TopDry fan/heater from a remote position. It also initiates the TopDry Manual Control Center(s) operation. The start switch is located on the upper right hand corner of the sub-panel.

Indicator Light

The indicator light provides a visual indication when power is being applied to the fan/heater. The light will also illuminate whenever the control center is receiving power. The indicator light is located directly below the start switch.

Stop Switch

The stop switch shuts down the TopDry fan/heater as well as the TopDry Manual Control Center. The switch allows stopping of the entire system when the control center is used in manual mode or when it is desired to stop the drying process. The stop switch is located in the middle of the right hand side of the control center sub-panel.

NOTE: *When the system is shut down, the timers in the control center are automatically reset to their set times.*

Burner Switch

The burner switch allows the selection of the drying modes. The available modes of drying are time/temperature, temperature and manual. When the switch is in the time/temperature mode, the heater(s) will shut off when the grain chamber has reached the temperature set on the thermostat or when the dry timer has totally timed down. When the switch is in the temperature mode, the heater(s) will shut off when the grain chamber has reached the temperature set on the thermostat. When the switch is in manual mode, the heater(s) must be started and stopped manually. The burner switch is located on the middle left side of the sub-panel.

Fan Switch

The fan switch allows the grain chamber to be cooled prior to dumping. The options are dry, cool and full heat. When the switch is in the dry and cool position, the fan(s) will continue to run after the thermostat or the dry timer shuts off the heater(s). When the switch is in the full heat position, the fan(s) will shut off with the heater(s). The fan switch is located between the burner switch and the stop switch.

NOTE: *Read the appropriate instructions entirely prior to installation.*

Single Crop Dryer Installation

1. Mount the TopDry Manual Control Center on the side of the bin. Position the control center in a location that is approximately eye level and that allows the operator to see the fan and heater unit start. Locate and drill the appropriate holes for mounting the control center. Mount the control center with four 5/16" bin bolts and nuts provided.
2. Run two 16 gauge wires (either use wires in conduit or use a two lead power cord) from the TopDry Manual Control Center to the drying chamber. Connect the temperature probe to the two wires (one wire per probe lead) with the connectors provided. Mount the temperature probe assembly in the drying chamber in the TopDry bin. *(See Figure 4A.)* Connect the wires to the thermostat with the one wire going to terminal 7 on terminal strip and the other wire going to terminal 8.

   NOTE: *The conduit should be mounted approximately 21" off of the drying floor.*
3. Remove the jumper wires between terminals 2 and 3, and terminals 4 and 5 on the terminal strip in the TopDry Crop Dryer box.
4. Run six 16 gauge wires (either in conduit or use a six lead power cord) from the TopDry Manual Control Center to the TopDry Crop Dryer. Connect the wires so that the terminal numbers 1 through 6 in the crop dryer box correspond with the terminal numbers 1 through 6 in the control center.

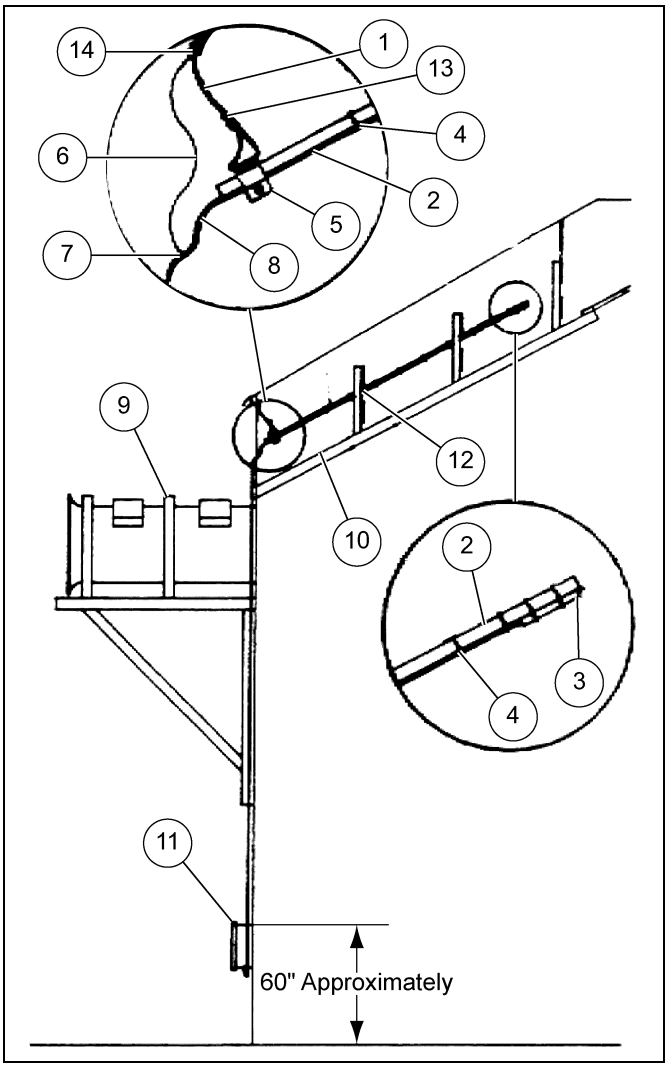


Figure 4A

Ref #	Description
1	Perforated Hanger Strap
2	1/2" x 10' Conduit (Not Included with Control)
3	Temperature Probe
4	Wire Ties
5	1/2" Conduit Clamp
6	Bin Wall
7	Rubber Grommet (Drill 1/2" Hole)
8	Temperature Sensor Wire
9	Fan and Heater Unit
10	Approximately 21" Off of the Drying Floor
11	TopDry Manual Control Center
12	Use Self-Drilling Screws and 1/2" Conduit Clamps to Secure Conduit to Leveling Band Uprights
13	1/4" Bolt, Nut and Lock Washer
14	5/16" Bin Bolt and Nut

Dual Crop Dryer Installation

NOTE: *Multiple crop dryer control kit is required to complete two unit and wiring. See appropriate diagram on Pages 24-29 for control kit part number.*

1. Mount the TopDry Manual Control Center on the side of the bin. Position the control center in a location that is approximately eye level and that allows the operator to see the fan and heater unit start. Locate and drill the appropriate holes for mounting the control center. Mount the control center with four 5/16" bin bolts and nuts provided.
2. Run two 16 gauge wires (either use wires in conduit or use a two lead power cord) from the TopDry Manual Control Center to the drying chamber. Connect the temperature probe to the two wires (one wire per probe lead) with the connectors provided. Mount the temperature probe assembly in the drying chamber in the TopDry bin. *(See Figure 4A on Page 16.)* Connect the wires to the thermostat with one wire going to terminal 7 on terminal strip and the other wire going to terminal 8.

   NOTE: *The conduit should be mounted approximately 21" off of the drying floor.*
3. Remove the jumper wires between terminals 2 and 3, terminals 4 and 5 on the terminal strip in the TopDry fan box.
4. Run six 16 gauge wires (either in conduit or use a six lead power cord) from the TopDry Manual Control Center to the TopDry fan. Connect the wires so that the terminal numbers 1 through 6 in the fan box correspond with the terminal numbers in the control center.
5. Install the toggle switch in the 1/2" hole in the control center sub-panel.
6. Drill a 1/8" hole in the back panel of the TopDry Manual Control Center and use a #8-32 x 1-1/4" self-tapping screw to mount the time delay relay.

   NOTE: *Do not overtighten the screw.*
7. Run two 16 gauge wires (either in conduit or use a two lead power cord) from the TopDry Manual Control Center to the second fan/heater.
8. Run a 16 gauge wire from terminal number 4 in the control center to one side of the toggle switch. On the same side, connect one of the wires coming from the second fan/heater.
9. Connect a 16 gauge wire from the un-used side of the toggle switch to the input terminal on the time delay relay. On the load terminal on the time delay relay, connect the other wire coming from the second fan/heater.
10. Connect the wire coming from the time delay relay to terminal number 1 in second fan box.
11. Remove the wire coming from the safety circuit board in the second unit to the access door switch. Connect the other wire coming from the TopDry Manual Control Center to the access door switch terminal where the wire was previous removed.
12. Run nine 16 gauge wires (either in conduit or use a nine lead power cord) from the first fan/heater to the second fan/heater.
13. The crop dryer control circuits should be wired as shown in the wiring diagrams *on Pages 24-29*. Note that the overload circuits are wired in series with the contactor coil in unit number 1. The contactor coil in unit number 2 should be wired so that it will only get power if unit number 1 is started. *See Pages 22-29* for complete wiring diagrams.

Single Crop Dryer

The TopDry Manual Control Center is very simple to operate. By following some basic rules, the control center will accurately control the TopDry fan and heater. The following instructions are provided for operation in the time/temperature mode and the temperature mode. In the manual mode, the crop dryer unit(s) are started and stopped either at the control center or at the electrical box on the crop dryer. The following instructions are provided as guidelines only.

Time/Temperature Mode

The time/temperature mode of operation is recommended for a wide variety of grain and various moisture contents of grain. The time/temperature mode is recommended when the drying time is less than twelve hours. In the time/temperature mode, the grain thermostat as well as the dry timer control the crop dryer unit. Once the grain has reached the desired temperature, the heater shuts off and the fan shuts off after 60 seconds or longer if cooling is desired in the drying chamber. (See the cooling mode section for more details about cooling in the drying chamber.) If the time set on the dry timer expires before the temperature in the drying chamber reaches temperature, the dry timer will shut off the heater and the fan, if cooling is not desired in the drying chamber. The time/temperature mode allows the thermostat to decrease drying times when the temperature rises rapidly while the dry timer never allows the drying chamber to exceed the maximum drying time. See the cooling mode section *on Page 19* for more details about cooling in the drying chamber. Use the following steps to operate the TopDry system in time/temperature mode.

Operating Procedure for Time/Temperature Mode

1. Determine the initial moisture content of the first batch to be dried.
2. Find the estimated drying time for the applicable TopDry system in the TopDry drying tables and set the dry timer.

   NOTE: *Ambient conditions will affect these drying times. Refer to the table on Page 32 for the conditions that the drying rates were based upon.*
3. Set the burner switch and the fan switch to the desired positions and, if applicable, set the cool timer at the desired cooling time.
4. Set the thermostat to a temperature at a very high setting.
5. Start the crop dryer unit via the start switch in the TopDry Manual Control Center.
6. Once the crop dryer has been shut off by the dry timer, restart the unit. With burner switch in time/temperature mode, slowly turn back the thermostat until the crop dryer, shut off and depress the stop switch to stop entire system if necessary.
7. After the batch has been dumped and cooled, determine the final moisture content. The sample of grain should be taken from the batch after it has been dumped. If the batch is within one percent of desired moisture content, all the controls are set properly. If the moisture content is too high or too low, adjust the dry timer and/or the thermostat accordingly.

Temperature Mode

The temperature mode of operation is recommended for drying grain that has a medium to high (25% to 35%) initial moisture content. Grain that has medium to high moisture content undergoes a temperature change that is easily detected by the grain thermostat. In the temperature mode, the grain thermostat is the only method of shutting the crop dryer off, besides the stop switches. Once the grain has reached the desired temperature, the burner shuts off and the fan shuts off after 60 seconds or longer if cooling is desired in the drying chamber. See the cooling mode section *below* for more details about cooling in the drying chamber. Use the following steps to operate the TopDry system in temperature mode.

Operating Procedure for Temperature Mode

1. Determine the initial moisture content of the first batch to be dried.
2. Find the estimated drying time for the applicable TopDry system in the TopDry drying tables.

   NOTE: *Ambient conditions will affect these drying times. Refer to the table on Pages 32-33 for the conditions that the drying rates were based upon.*
3. Set the burner switch and the fan switch to the desired positions and, if applicable, set the cool timer at the desired cooling time.
4. Set the thermostat to a temperature at a very high setting.
5. Start the crop dryer via the start switch in the TopDry Manual Control Center. Allow the batch to dry the estimated drying time found in *Step 2 on Page 18*. It may be desired to reduce the drying time by ten percent if the ambient conditions are not identical as found in the drying tables to ensure the grain is not over dried.
6. Once the time has elapsed, slowly turn back the thermostat until the crop dryer shuts off.
7. After the batch has been dumped and cooled, determine the final moisture content. The sample of grain should be taken from the batch after it has been dumped. If the batch is within one percent of desired moisture content, leave the thermostat at the present setting. If the moisture content is too high or too low, adjust the drying time accordingly and re-adjust the thermostat.

Cooling Mode

When the fan switch is placed in the dry and cool position, the fan will continue to run after the heater shuts off until the cool timer time expires. Cooling in the drying chamber is normally done only when rapid cooling of the grain is needed. Most cooling is done in the bottom of the TopDry bin for more efficient drying and higher quality grain. The cooling cycle (when the fan switch is in the dry and cool position) is controlled by the cool timer. When the fan switch is in the full heat position, the fan will shut off 60 seconds after with the burner shuts off allowing the fan to cool the burner prior to total shut down.

Dual Crop Dryer Units

For controlling a dual crop dryer system, the TopDry Manual Control Center operates identically to a single crop dryer system except as described as follows.

Operating Procedure for Dual Crop Dryer

1. The second unit toggle switch is placed in the ON position.
2. Start the crop dryer unit via the start switch in the TopDry Manual Control Center. The second unit will start after the first unit has run for a short while. When the second unit toggle switch is in the OFF position, the second unit may be started after the first unit has started.

When the second unit toggle switch is in the ON position, the stop switch on the second unit is disabled. The second fan must be stopped by stopping the first fan.

Theory of Operation

The theory of operation describes the actual operation of components inside the TopDry Manual Control Center. The following operation will occur provided that the components are set as described in the previous sections. In the following section, the individual component operation is described as they would operate in the various modes.

1. With the burner switch in the time/temperature mode and the fan switch in the dry and cool position, the following operations occur:
    a. When either start switch (in the control center or in the fan box) is depressed, the fan starts. Ten seconds later, the burner ignites. The hour meter, thermostat and indicator lamp will be energized. The dry timer motor and clutch are energized also.
    b. The burner will continue burning until either the thermostat has sensed that the grain has reached the present temperature or the time has expired on the dry timer. The thermostat contacts will close thus applying power to the time delay relay. The time delay relay contacts will close and energize the relay and cool timer motor. The dry timer contacts will open to turn the dry timer motor off and close to energize the relay and cool timer.
    c. The relay is energized and thus the relay contacts change state. The relay contacts open to de-energize the burner. Another set of contacts will close to allow the relay and cool timer to be energized.
    d. When the time has expired on the cool timer, the fan will be de-energized. The cool timer contacts will open thus breaking the circuit and de-energizing the fan as well as the TopDry Manual Control Center.
2. With the burner switch in the temperature mode and the fan switch in the dry and cool position, the following operations occur:
    a. When either start switch (in the control center or in the fan box), the fan starts. Ten seconds later, the burner ignites. The hour meter, thermostat and indicator lamp will be energized.
    b. The burner will continue burning until the thermostat has sensed that the grain has reached the preset temperature. The thermostat contacts will close thus, applying power to the time delay relay. The time delay relay contacts will close and energize the relay and cool timer motor.
    c. The relay is energized and thus the relay contacts change state. The relay contacts open to de-energize the burner. Another set of contacts will close to allow the relay and cool timer to be energized.
    d. When the time has expired on the cool timer, the fan will be de-energized. The cool timer contacts will open thus breaking the circuit and de-energizing the fan as well as the TopDry Manual Control Center.

3. With the burner switch in the time/temperature mode and the fan switch in the full heat position, the following operations occur:

   a. When either start switch (in the control center or in the fan box), the fan starts. Ten seconds later, the burner ignites. The hour meter, thermostat and indicator lamp will be energized. The dry timer motor and clutch are energized also.

   b. The burner will continue burning until either the thermostat has sensed that the grain has reached the preset temperature or the time has expired on the dry timer. The thermostat contacts will close thus applying power to the time delay relay. The time delay relay contacts will close and energize the relay and cool timer motor. The dry timer contacts will open to turn the dry timer motor off and close to energize the relay and cool timer.

   c. The relay is energized and thus the relay contacts change state. The relay contacts open to de-energize the burner. Another set of contacts will close to allow the relay and cool timer to be energized. The relay and cool timer are temporarily energized.

   d. The relay contacts open and thus breaking the circuit and shutting off the burner and 60 seconds later the fan as well as the TopDry Manual Control Center.

4. With the burner switch in the temperature mode and the fan switch in the full heat position, the following operations occur:

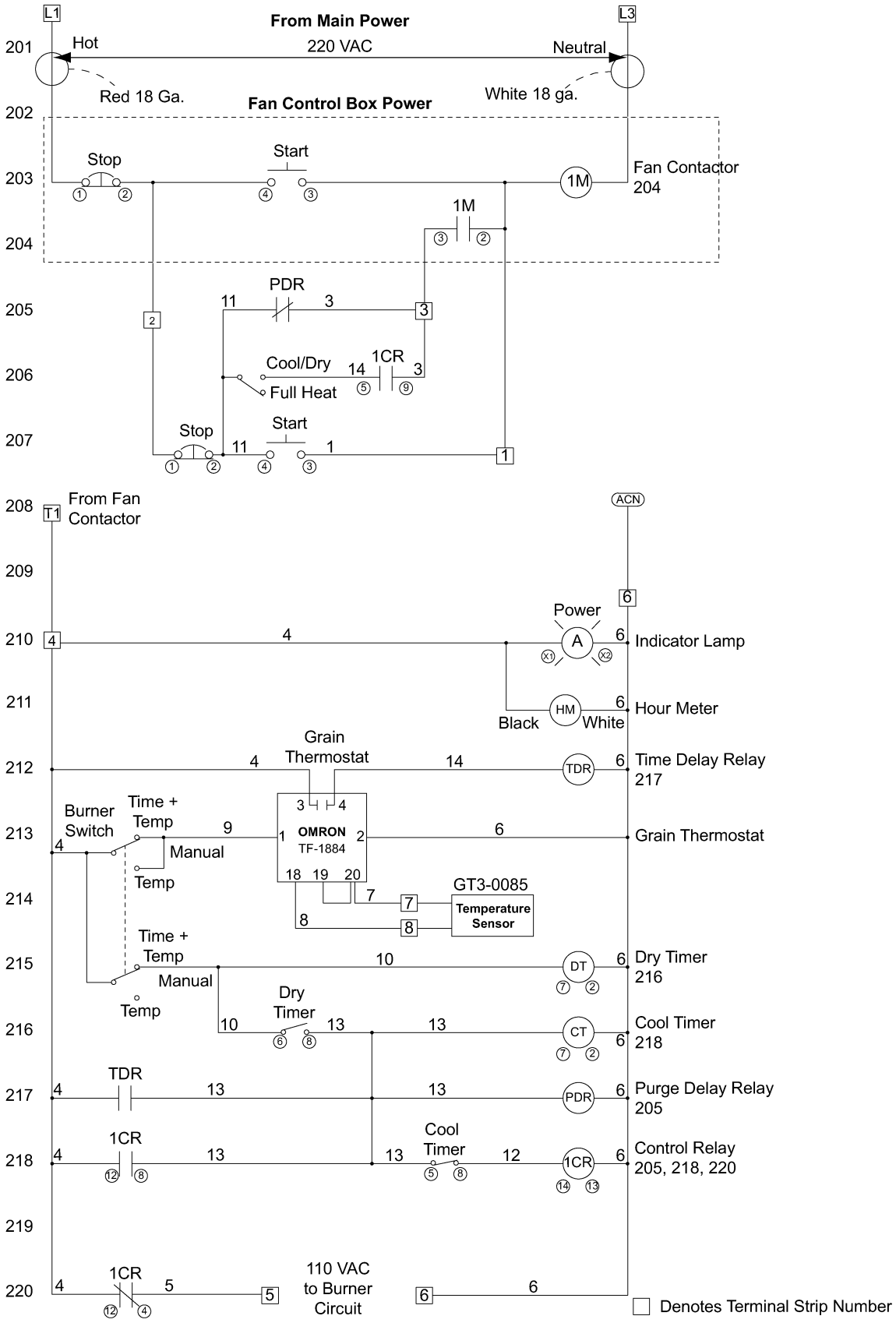
   a. When either start switch (in the control center or in the fan box), the fan starts. Ten seconds later, the burner ignites. The hour meter, thermostat and indicator lamp will be energized.

   b. The burner will continue burning until the thermostat has sensed that the grain has reached the preset temperature. The thermostat contacts will close thus applying power to the time delay relay. The time delay relay contacts will close and energize the relay and cool timer motor.

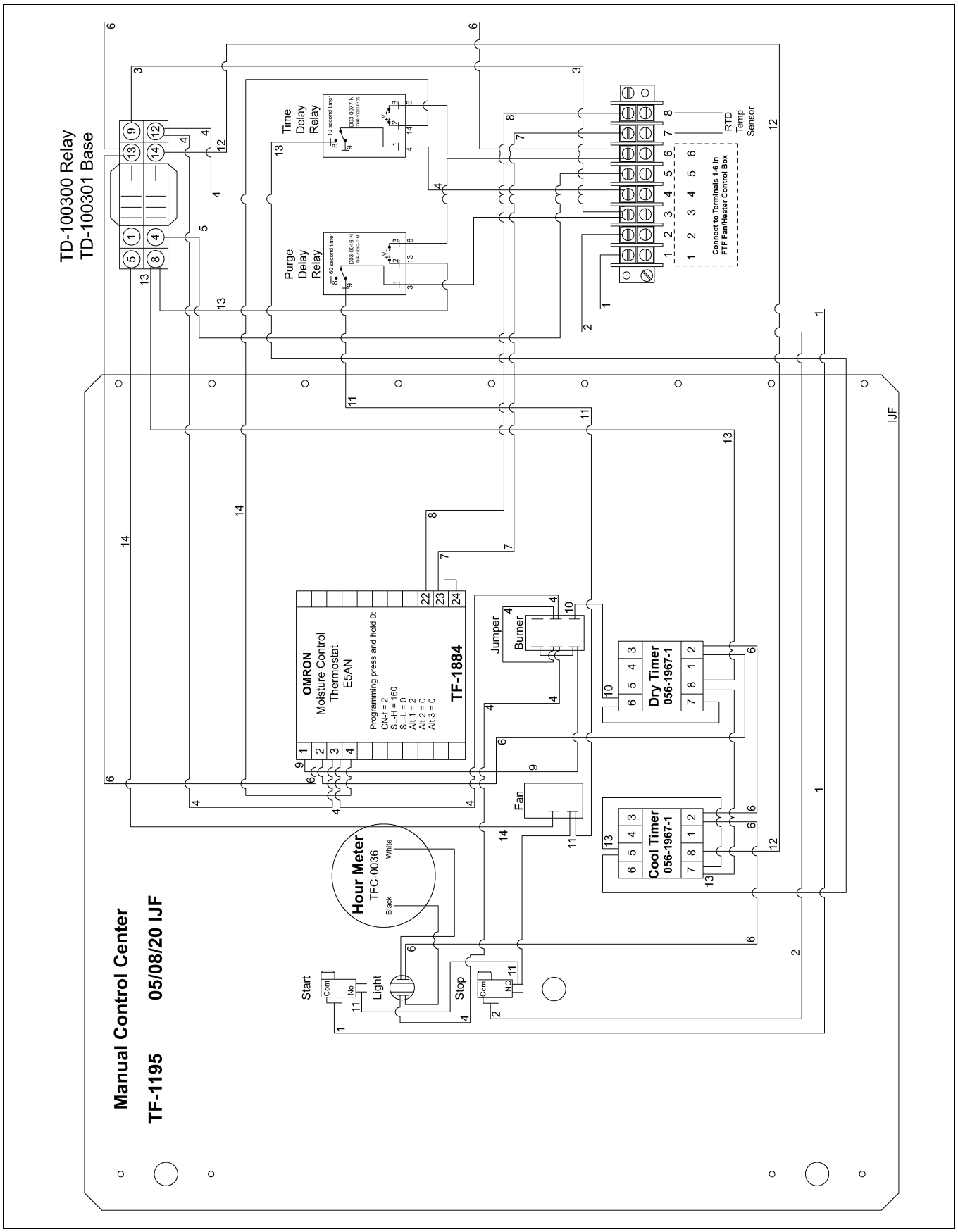
   c. The relay is energized and thus the relay contacts change state. The relay contacts open to de-energize the burner. Another set of contacts will close to allow the relay and cool timer to be energized. The relay and cool timer are temporarily energized.

   d. The relay contacts open and thus breaking the circuit and shutting off the heater and 60 seconds later the fan as well as the TopDry Manual Control Center.

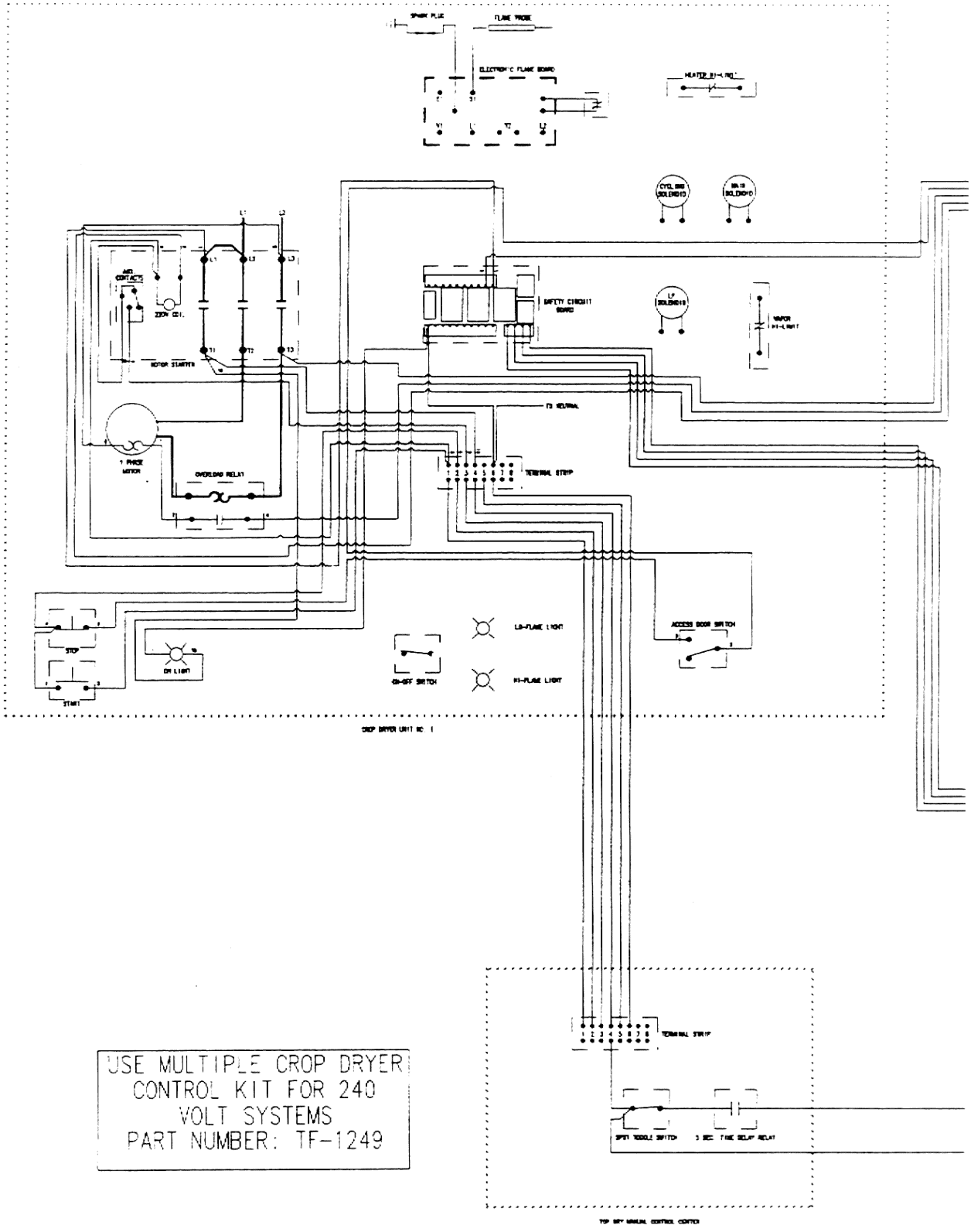
TopDry Manual Control Center Schematic



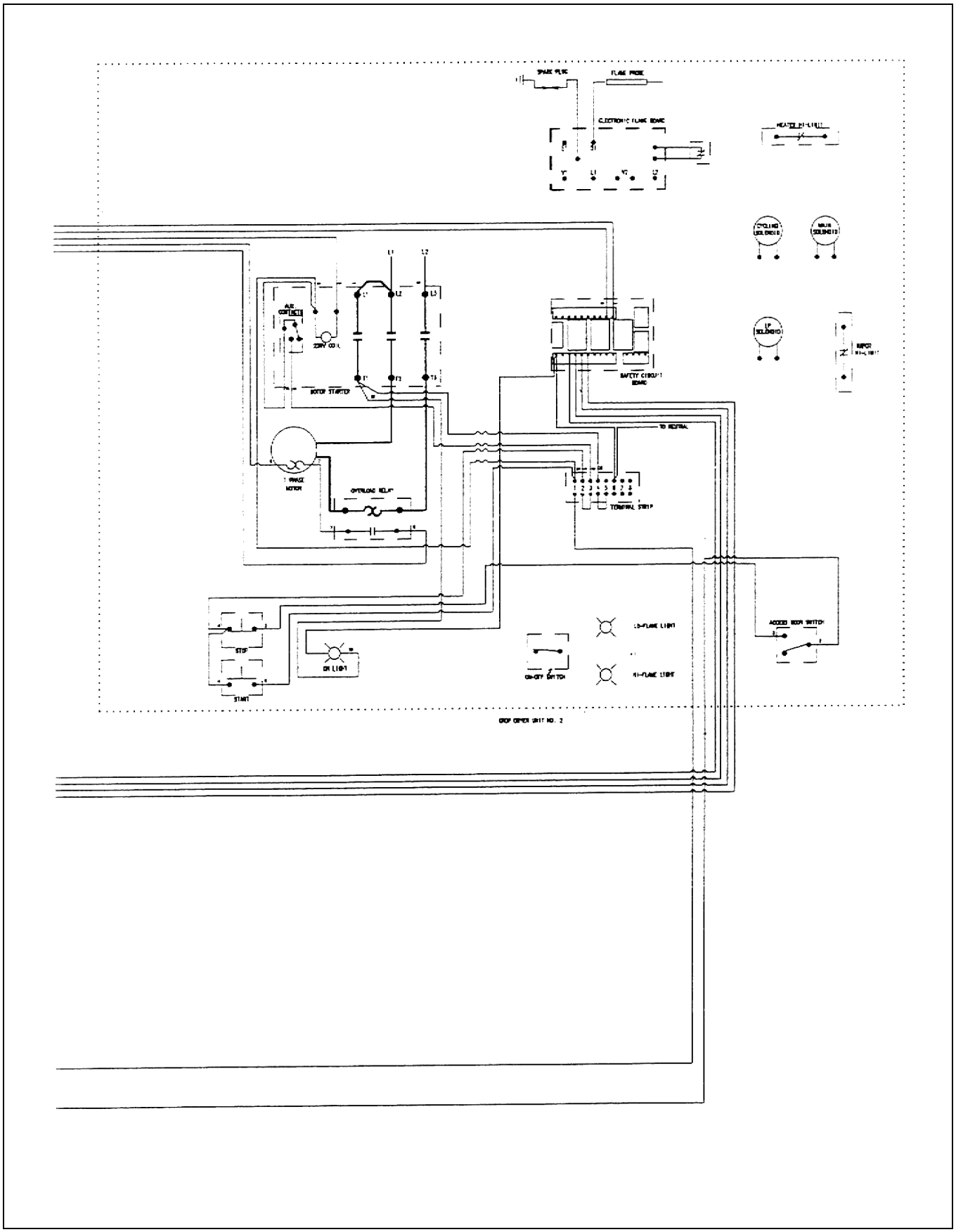
TopDry Manual Control Center Wiring



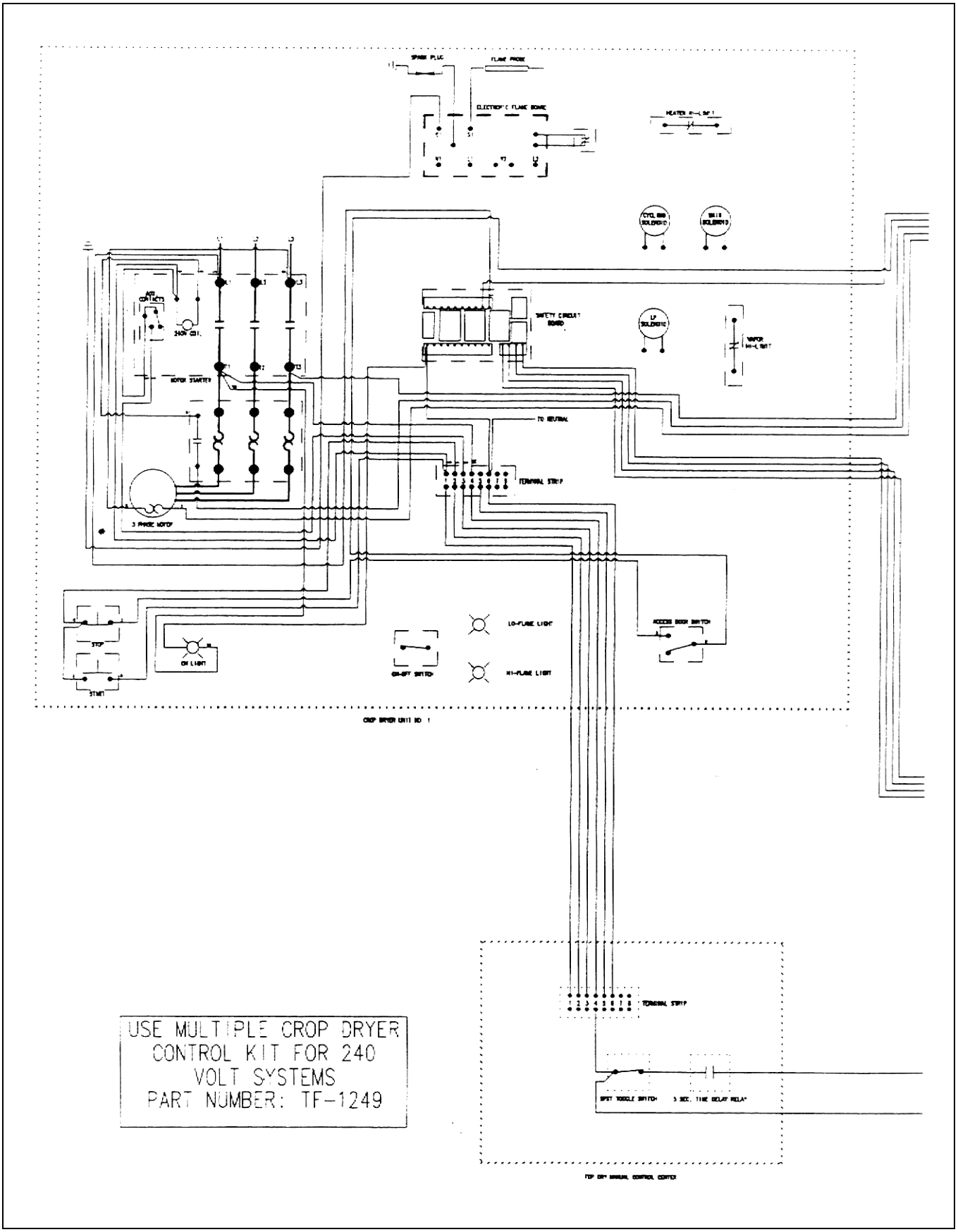
Multiple Crop Dryer Connection for 240V 1 Phase Motor



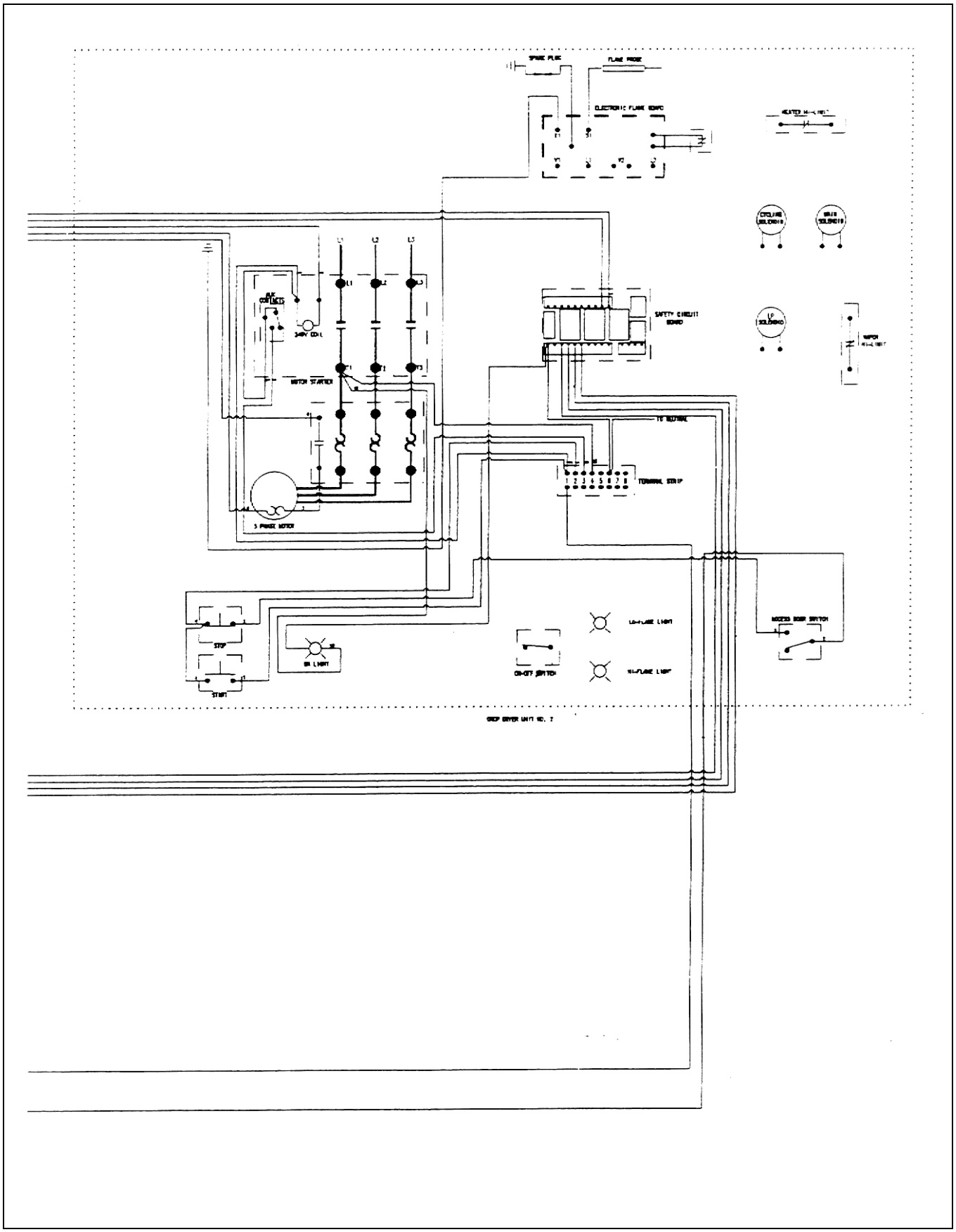
Multiple Crop Dryer Connection for 240V 1 Phase Motor (Continued)



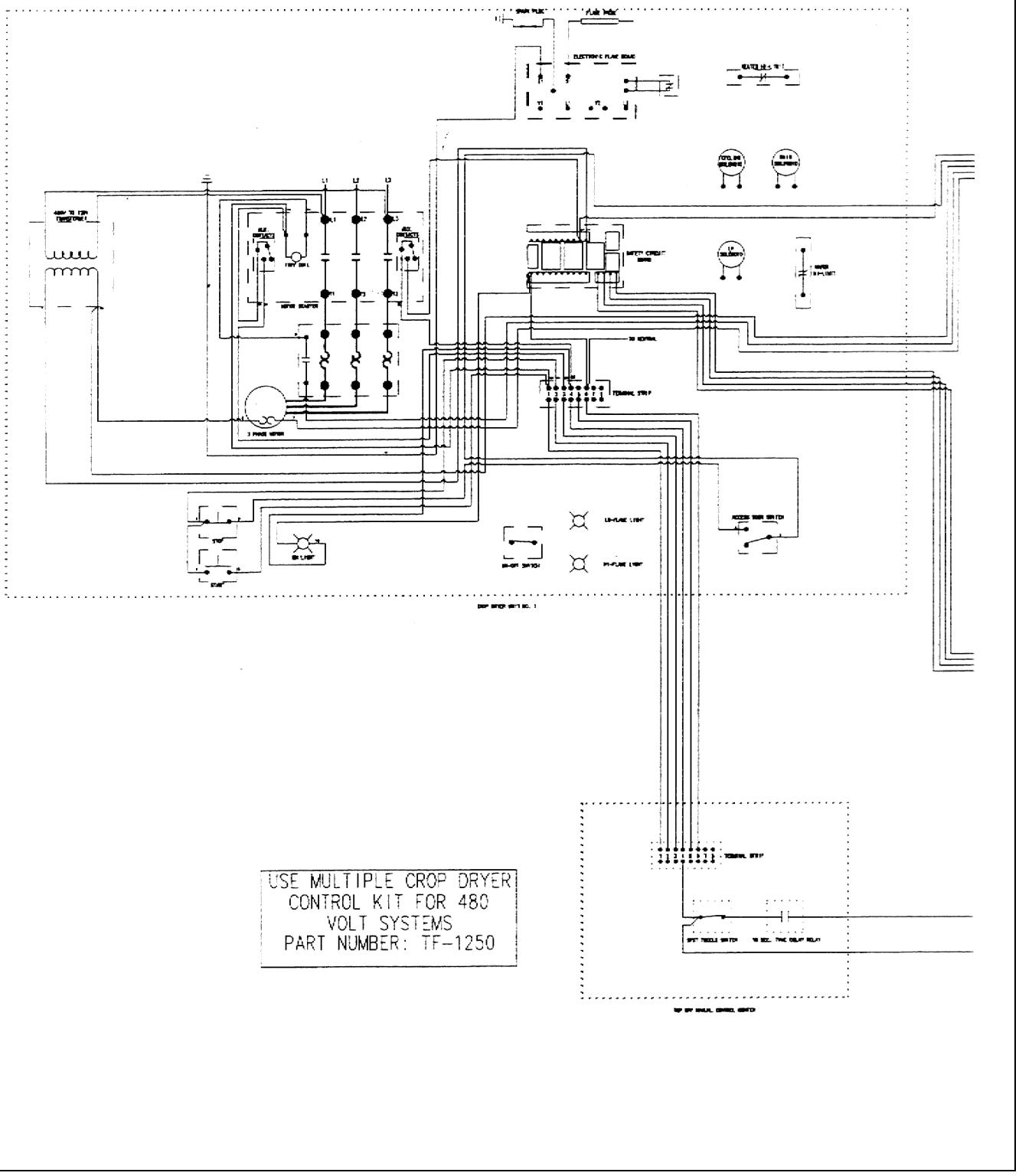
Multiple Crop Dryer Connection for 240V 3 Phase Motor



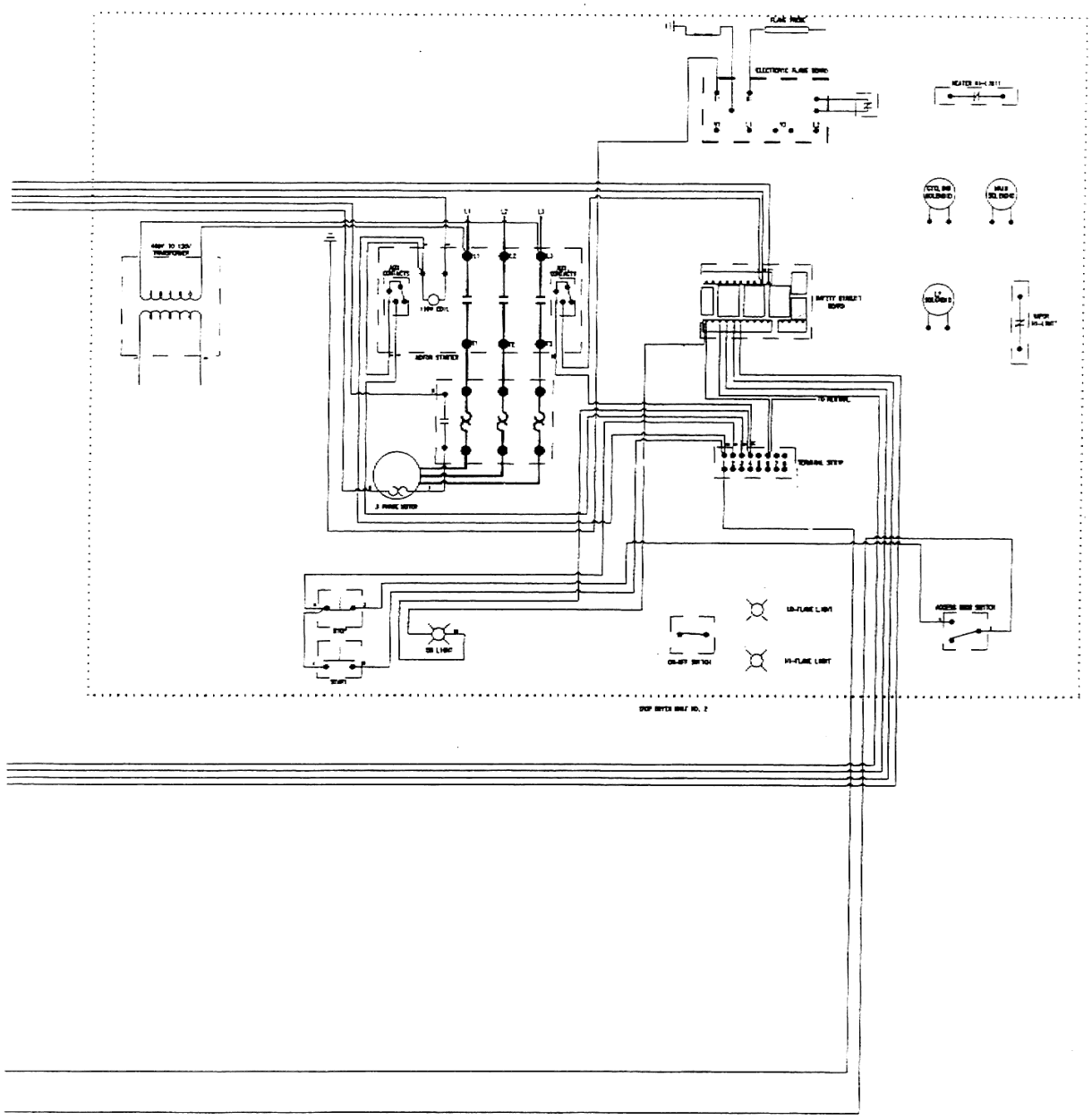
Multiple Crop Dryer Connection for 240V 3 Phase Motor (Continued)



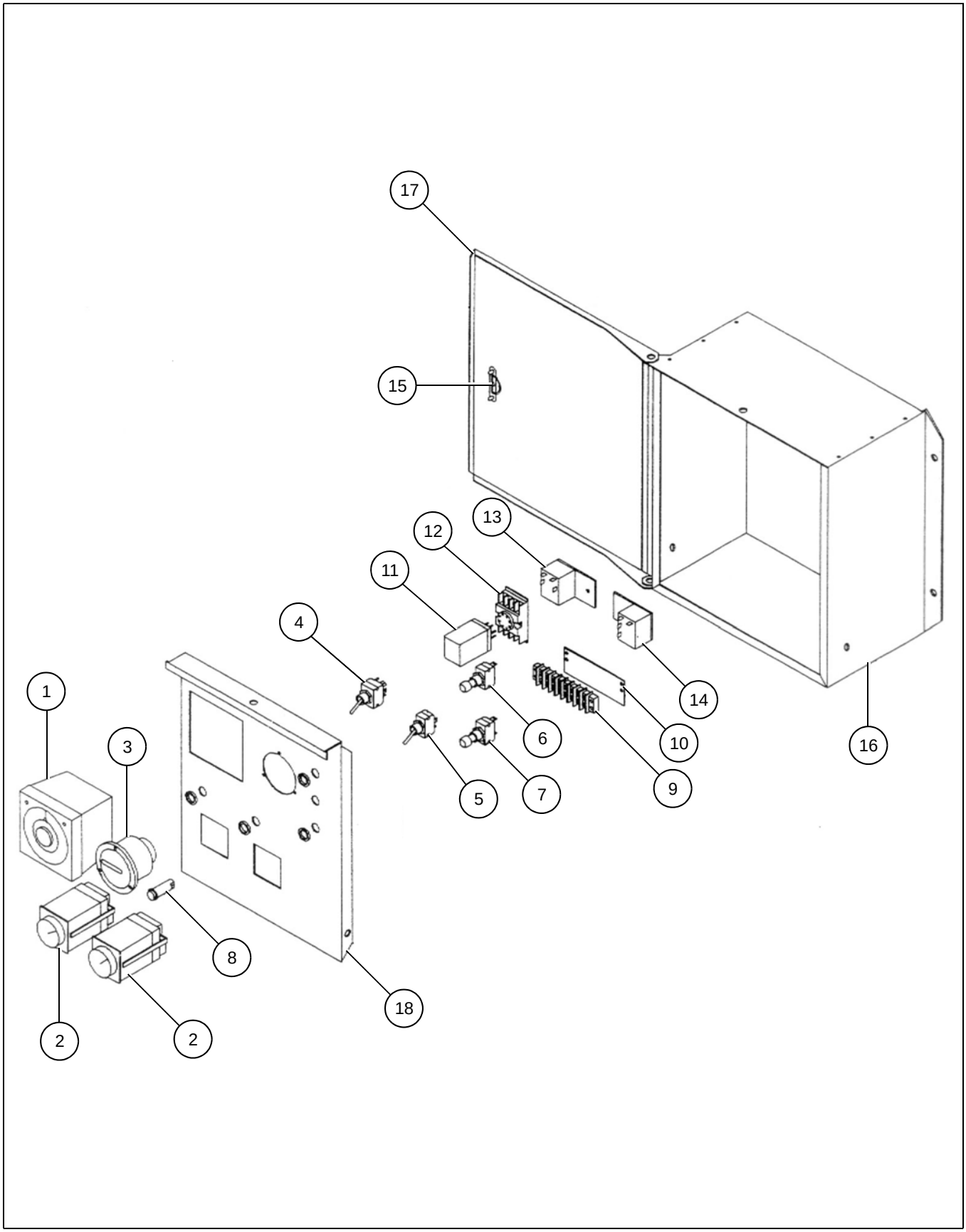
Multiple Crop Dryer Wiring Diagram for 480V 3 Phase Motor



Multiple Crop Dryer Wiring Diagram for 480V 3 Phase Motor (Continued)



TopDry Manual Control Center Control Panel with Box (TF-1195)



TopDry Manual Control Center Control Panel with Box (TF-1195) Parts List

Ref #	Part #	Description	Qty
1	TF-1884	Thermostat	1
2	056-1967-1	Timer, 6 Seconds/60 Minutes/12 Hours (8 Pin)	2
3	TFC-0036	Hour Meter	1
4	TFC-0013	3-Position Toggle Switch	1
5	HH-1442	SPST Toggle Switch	1
6	FH-999	Start Switch	1
7	FH-1000	Stop Switch	1
8	TFH-2021	Red Light Lamp (No Leads)	1
9	TFH-2013	8 Conductor Terminal Strip	1
10	TFH-2052	Terminal Strip Marker	1
11	TD-100300	Coil, Relay 2PDT 120 VAC	1
12	TD-100301	Base, Relay 2PDT	1
13	D03-0046-N	Timer, Delay 60 Seconds N.C. Time 115V - THR-10262-F1M	1
14	D03-0077-N	Timer, Delay 10 Seconds N.O. Time 115V - THR-10262-F10S	1
15	TF-1519	Spring Latch	1
16	TF-1492	Manual Control Center Box Body	1
17	TF-1498	Monitor Control Box Door	1
18	TF-1258	Dummy Panel for Control Center	1
N/S	D03-0045	Grain Temperature Sensor	1
N/S	DC-526	Decal, TopDry Manual Control Center	1

Drying Rate for Shelled Corn (18', 21', 24' and 27')

Fan and Heater Unit(s)	Plenum Temperature (Fahrenheit)	Initial Moisture Content Wet Basis	18' Diameter 1-Fan		21' Diameter 1-Fan		24' Diameter 1-Fan		27' Diameter 1-Fan	
			BU/HR	Batch Time Hours	BU/HR	Batch Time Hours	BU/HR	Batch Time Hours	BU/HR	Batch Time Hours
TF-2024 24" Fan 9.75 H.P. THF-4024 2 Million BTU/HR	120	20%	192	2.8	199	3.7	212	4.7		
		25%	100	5.4	103	7.1	111	9.0		
		30%	68	7.9	70	10.4	75	13.2		
	140	20%	257	2.1	268	2.7	285	3.5		
		25%	135	4.0	139	5.2	149	6.7		
		30%	91	5.9	94	7.8	102	9.8		
	160	20%	317	1.7	328	2.2	344	2.9		
		25%	163	3.3	170	4.3	181	5.5		
		30%	112	4.8	115	6.3	125	8.0		
TF-2028 28" Fan 10-15 H.P. THF-4028 3 Million BTU/HR	120	20%	216	2.5	234	3.1	256	3.9	254	4.7
		25%	112	4.8	121	6.0	133	7.5	132	9.1
		30%	77	7.0	82	8.9	90	11.0	89	13.5
	140	20%	284	1.9	314	2.3	344	2.9	342	3.5
		25%	154	3.5	163	4.5	178	5.6	117	6.8
		30%	103	5.2	110	6.6	121	8.2	120	10.0
	160	20%	360	1.5	385	1.9	416	2.4	419	2.9
		25%	186	2.9	200	3.7	217	4.6	217	5.6
		30%	128	4.2	134	5.4	149	6.7	147	8.2
TF-2036 36" Fan 10-16 H.P. THF-4036 4 Million BTU/HR	120	20%			302	2.4	344	2.9	355	3.4
		25%			156	4.7	181	5.5	184	6.6
		30%			106	6.9	123	8.1	124	9.7
	140	20%			406	1.8	454	2.2	477	2.5
		25%			210	3.5	243	4.1	247	4.9
		30%			142	5.1	166	6.0	167	7.2
	160	20%			498	1.5	555	1.8	585	2.1
		25%			258	2.8	294	3.4	303	4.0
		30%			174	4.2	204	4.9	205	5.9
	180	20%			595	1.2	666	1.5		
		25%			308	2.4	356	2.8		
		30%			208	3.5	243	4.1		
TF-2042 42" Fan 10-16 H.P. THF-4042 5 Million BTU/HR	120	20%					400	2.5	426	2.8
		25%					212	4.7	221	5.5
		30%					144	6.9	149	8.0
	140	20%					555	1.8	572	2.1
		25%					285	3.5	297	4.0
		30%					196	5.1	201	6.0
	160	20%					666	1.5	701	1.7
		25%					344	2.9	364	3.3
		30%					238	4.2	246	4.9
	180	20%					769	1.3	838	1.5
		25%					416	2.4	435	2.8
		30%					285	3.5	294	4.1

1. Drying rates are estimated using 45°F and 85% R.H. ambient air conditions.
2. Grain dried to 15% final moisture.
3. 1/5 CFM per bushel aeration system recommended.
4. Drying charts are for shelled corn. Charts are to be used only as a guide since ambient conditions will vary.

Drying Rate for Shelled Corn (18', 21', 24' and 27') (Continued)

Fan and Heater Unit(s)	Plenum Temperature (Fahrenheit)	Initial Moisture Content Wet Basis	18' Diameter 1-Fan		21' Diameter 1-Fan		24' Diameter 1-Fan		27' Diameter 1-Fan	
			BU/HR	Batch Time Hours	BU/HR	Batch Time Hours	BU/HR	Batch Time Hours	BU/HR	Batch Time Hours
TF-2042-33 42" Fan 30 H.P. THF-4042 6 Million BTU/HR	140	20%							743	1.6
		25%							544	2.2
		30%							260	4.6
	160	20%							910	1.3
		25%							472	2.5
		30%							319	3.8
	180	20%							1088	1.1
		25%							564	2.1
		30%							382	3.2

Drying Rate for Shelled Corn (30' and 36')

Fan and Heater Unit(s)	Plenum Temperature (Fahrenheit)	Initial Moisture Content Wet Basis	30' Diameter 1-Fan		30' Diameter 2-Fans		36' Diameter 1-Fan		36' Diameter 2-Fans	
			BU/HR	Batch Time Hours	BU/HR	Batch Time Hours	BU/HR	Batch Time Hours	BU/HR	Batch Time Hours
TF-2036 36" Fan 10-16 H.P. THF-4036 4 Million BTU/HR	120	20%	375	4.0	625	2.4	378	5.7	696	3.1
		25%	194	7.7	326	4.6	200	10.8	366	5.9
		30%	132	11.3	220	6.8	135	15.9	251	8.6
	140	20%	500	3.0	833	1.8	514	4.2	939	2.3
		25%	258	5.8	428	3.5	266	8.1	490	4.4
		30%	178	8.4	294	5.1	181	11.9	337	6.4
	160	20%	600	2.5	1000	1.5	617	3.5	1136	1.9
		25%	319	4.7	535	2.8	327	6.6	600	3.6
		30%	217	6.9	365	4.1	222	9.7	407	5.3
	180	20%			1153	1.3			1350	1.6
		25%			625	2.4			720	3.0
		30%			428	3.5			490	4.4
TF-2042 42" Fan 10-16 H.P. THF-4042 5 Million BTU/HR	120	20%	483	3.1			502	4.3	830	2.6
		25%	245	6.1			266	8.1	440	4.9
		30%	168	8.9			181	11.9	300	7.2
	140	20%	641	2.3			675	3.2	1136	1.9
		25%	333	4.5			354	6.1	583	3.7
		30%	227	6.6			295	7.3	400	5.4
	160	20%	786	1.9			830	2.6	1350	1.9
		25%	408	3.7			432	5.0	720	3.0
		30%	278	5.4			295	7.3	490	4.4
	180	20%	939	1.6			981	2.2	1661	1.3
		25%	488	3.1			514	4.2	864	2.5
		30%	332	4.5			354	6.1	583	3.7
TF-2042-33 42" Fan 30 H.P. THF-4042 6 Million BTU/HR	140	20%	750	2.0			800	2.7	1350	1.6
		25%	405	3.7			423	5.1	744	2.9
		30%	272	5.5			288	7.5	502	4.3
	160	20%	937	1.6			981	2.2	1661	1.3
		25%	483	3.1			514	4.2	900	2.4
		30%	333	4.5			354	6.1	617	3.5
	180	20%							1963	1.1
		25%							1080	2.0
		30%							744	2.9

1. Drying rates are estimated using 45°F and 85% R.H. ambient air conditions.
2. Grain dried to 15% final moisture.
3. 1/5 CFM per bushel aeration system recommended.
4. Drying charts are for shelled corn. Charts are to be used only as a guide since ambient conditions will vary.

Batch Drying Log

Batch No.	Date	Time	Ambient Temp.	Humidity	Grain to be Dried	Plenum	Initial Moisture Content	Burner Switch Setting	Fan Switch Setting	Grain Thermostat Setting	Dry Timer Setting	Cool Timer Setting	Final Moisture Setting
Example	9/25/88	1:30 PM	45°F	85%	Corn	160°F	24.8%	Time/ Temp	Dry and Cool	110°F	3.5 Hrs.	1/2 Hr.	15.5%

Batch No.	Comments

NOTE: *These charts are provided for the convenience of the operator. The use of these charts is purely voluntary.*

NOTE: *The reason for using these charts is to provide the operator with information to assist in the initial set-up of the system every year.*

Limited Warranty — N.A. Grain Products

The GSI Group, LLC. (“GSI”) warrants products which it manufactures, to be free of defects in materials and workmanship under normal usage and conditions for a period of 12 months from the date of shipment (or, if shipped by vessel, 14 months from the date of arrival at the port of discharge). If, in GSI’s sole judgment, a product is found to have a defect in materials and/or workmanship, GSI will, at its own option and expense, repair or replace the product or refund the purchase price. This Limited Warranty is subject to extension and other terms as set forth below.

Warranty Enhancements: The warranty period for the following products is enhanced as shown below and is in lieu of (and not in addition to) the above stated warranty period. (Warranty Period is from date of shipment.)

	Product	Warranty Period
Storage	Grain Bin Structural Design ▪ Sidewall, roof, doors, platforms and walkarounds ▪ Flooring (when installed using GSI specified floor support system for that floor) ▪ Hopper tanks (BFT, GHT, NCHT, and FCHT)	5 Years
Conditioning	Dryer Structural Design – (Tower, Portable and TopDry) ▪ Includes (frame, portable dryer screens, ladders, access doors and platforms)	5 Years
	All other Dryer parts including: ▪ Electrical (controls, sensors, switches and internal wiring)	2 Years
	All Non-PTO Driven Centrifugal and Axial Fans	3 Years
	Bullseye Controllers	2 Years
Material Handling	Bucket Elevators Structural Design	5 Years
	Towers Structural Design	5 Years
	Catwalks Structural Design	5 Years
	Accessories (stairs, ladders and platforms) Structural Design	5 Years

Conditions and Limitations:

THERE ARE NO WARRANTIES THAT EXTEND BEYOND THE LIMITED WARRANTY DESCRIPTION SET FORTH HEREIN; SPECIFICALLY, GSI DISCLAIMS ANY AND ALL OTHER WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR USE IN CONNECTION WITH: (I) ANY PRODUCT MANUFACTURED OR SOLD BY GSI, OR (II) ANY ADVICE, INSTRUCTION, RECOMMENDATION OR SUGGESTION PROVIDED BY AN AGENT, REPRESENTATIVE OR EMPLOYEE OF GSI REGARDING OR RELATED TO THE CONFIGURATION, INSTALLATION, LAYOUT, SUITABILITY FOR A PARTICULAR PURPOSE, OR DESIGN OF SUCH PRODUCTS.

The sole and exclusive remedy for any claimant is set forth in this Limited Warranty and shall not exceed the amount paid for the product purchased. This Warranty only covers the value of the warranted parts and equipment, and does not cover labor charges for removing or installing defective parts, shipping charges with respect to such parts, any applicable sales or other taxes, or any other charges or expenses not specified in this Warranty. GSI shall not be liable for any other direct, indirect, incidental or consequential damages, including, without limitation, loss of anticipated profits or benefits. Expenses incurred by or on behalf of a claimant without prior written authorization from the GSI warranty department shall not be reimbursed. This warranty is not transferable and applies only to the original end-user. GSI shall have no obligation or responsibility for any representations or warranties made by or on behalf of any dealer, agent or distributor. Prior to installation, the end-user bears all responsibility to comply with federal, state and local codes which apply to the location and installation of the products.

This Limited Warranty extends solely to products sold by GSI and does not cover any parts, components or materials used in conjunction with the product, that are not sold by GSI. GSI assumes no responsibility for claims resulting from construction defects, unauthorized modifications, corrosion or other cosmetic issues caused by storage, application or environmental conditions. Modifications to products not specifically delineated in the manual accompanying the product at initial sale will void all warranties. This Limited Warranty shall not extend to products or parts which have been damaged by negligent use, misuse, alteration, accident or which have been improperly/inadequately maintained.

Notice Procedure:
In order to make a valid warranty claim a written notice of the claim must be submitted, using the RMA form, within 60 days of discovery of a warrantable nonconformance. The RMA form is found on the OneGSI portal.

Service Parts:
GSI warrants, subject to all other conditions described in this Warranty, Service Parts which it manufactures for a period of 12 months from the date of purchase unless specified in Enhancements above.

(Limited Warranty - N.A. Grain Products_ revised 01 October 2020)

This equipment shall be installed in accordance with the current installation codes and applicable regulations, which should be carefully followed in all cases. Authorities having jurisdiction should be consulted before installations are made.

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