



OPERATING AND MAINTENANCE MANUAL

MODEL: R SERIES

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Revision Changes:

6-5-2020:

- Wiring Diagrams updated (K51525-01 now Rev 7 and K51527-01 now Rev 10)



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Web Address: www.munters.us

Email: dhinfo@munters.com



R-5000 unit shown

MODEL R-Series DEHUMIDIFIERS

with Electric & Direct Fired Gas Reactivation

**Units with Siemens
Programmable Logic
Controller**

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REVISION HISTORY

REV	DATE	REASON FOR CHANGE	APPROVED BY
1	05/15	R15 model added	AMcD
2	011/17	Model numbers updated. Gas train images updated. HMI option added	AMcD

1 - INTRODUCTION

The engineers at Munters have designed the HoneyCombe® dehumidifier using state-of-the-art technology. The unit is durable, simple to operate, and needs very little maintenance.

The R-Series unit can provide years of trouble-free service when the recommendations listed in this manual are followed. It is strongly recommended that this entire manual is read prior to operating the equipment. The manual describes how the dehumidifier works, and how to get the best service from the unit. While a Munters dehumidifier is easy to operate, it is a bit different from most air handling equipment.

The R-Series unit includes a heater which is used to remove moisture from the unit. (The heater is used to “reactivate” the material in the R-Series unit which dries the air.) The R-Series units described in this manual have electric and direct fired gas reactivation. Figure 1-1 shows a typical unit.



Figure 1-1
R-5000 UNIT WITH ELECTRIC AND DIRECT FIRED
GAS REACTIVATION

The table below explains the identification system used for the model number:

R	X X	X	-	X X X	-	X	X	X	-	X	X	X
R SERIES DEHUMIDIFIER	MAX SCFM THRU UNIT	REACTIVATION TYPE		OPERATING VOLTAGE		DUCT CONNECTION	UNIT CAGE	SKID / CAGE FINISH		PROCESS FAN SWITCH	HUMIDISTAT	HMI
	05: 5000 SCFM	D: Dual Fuel		460: 460V~, 3PH, 60HZ		1: 18" Round	0: No	G: Galvanized		0: No	0: No	0: No
	10: 10000 SCFM	E: Electric Only		575: 575V~, 3PH, 60HZ		2: 20" Round	1: Yes	P: Painted		1: Yes	1: Yes	1: Yes
	15: 15000 SCFM	G: Gas Only										

Note: SUFFIXES AER USED TO DESIGNATE FURTHER OPTIONS:

GREY: Grey
SIERRA: Sierra Tan

BELT: Belt Drive
CHN: Chain Drive

C: Modbus TCP Comm Port

Example:

R05D-460-21G-001-SIERRA-BELT-C

R-Series, 5000 SCFM, Dual Fuel, 460V~, 20" connections, cage, galvanized skid / cage, no process fan switch, no humidistat, HMI, sierra tan paint, belt drive, with TCP Communication port.

If any part of this manual is not understood, or there is a question concerning the dehumidifier, call the Service Operations Department of Munters and speak with a Service Operation Technicians at (800) 843-5360.

2 - SAFETY NOTES

Munters is concerned about the safety of anyone who uses or services the R-Series unit. Some of the parts inside the R-Series unit can be dangerous if an untrained person tries to service the unit. Throughout this manual, hazards are pointed out which may occur in the use of the R-Series unit. Precautions are also listed which should be taken to avoid these hazards.

In this manual, different kinds of messages are used to warn of possible hazards:



Immediate hazard which **will** result in severe personal injury or death.



Hazard or unsafe practice which **may** result in severe personal injury or death.



Hazard or unsafe practice which could result in minor personal injury or property damage.



Hazard or unsafe practice which will not result in personal injury, but could result in property damage.

Please keep these points in mind while using or servicing the unit:



The R-Series unit may be wired for up to 575V AC. The unit can produce enough voltage and current to cause serious injury or death. Always turn off and lock out the power before working inside the unit. Only trained electricians should perform work with the electrical parts.



The blowers inside the R-Series unit spin at a high rate of speed. Hands may be badly hurt if put inside the blower while it is turning. Keep hands away from the blowers while the unit is turned on. Before working with the machine, allow enough time for the blowers to come to a complete stop.

The wheel used in a larger R-Series unit can weigh several hundred pounds. Never attempt to lift the wheel without help from a second person. It is usually easier to roll the wheel. When working near the wheel when it is inside the unit, and the wheel is propped up, use blocks to prevent the wheel from moving accidentally.

Units designed for outdoor use are not waterproof and weatherproof unless all covers are secured in place.



During normal operation, do not run the unit with the access panels removed. This can allow moist air to reach parts of the machine which should be dry.

 WARNING

Do not use any kind of filter coating on the reactivation inlet filter. This filter is located just upstream of the electric heating elements. Some filter coatings give off volatile chemicals, which could be pulled into the heating elements. This could create a fire hazard. (If a filter is installed in the process air duct, it is OK to use filter coating on this filter. The process air is not pulled through the heating elements.)

The electric heaters and the solid state power controllers are mounted in an electrical control enclosure. These parts may carry high voltages from 460 to 575V AC. Only trained electricians should perform work on these parts.

 DANGER

On a unit with gas reactivation, take the normal precautions you would take with any gas appliance. Leaking gas can be explosive if it is allowed to collect. In the presence of a gas odor:

- Open the windows.
- Don't touch any electrical switches.
- Extinguish any open flames. Shut off the gas valves to the heater in the R-Series unit.
- Call your gas supplier immediately.

Do not store gasoline or other flammable vapors and liquids in open containers near this appliance. Direct-fired burner units may include an open pilot flame which may ignite flammable vapors.

Any unit which contains a gas flame can generate carbon monoxide gas under certain circumstances. This can happen if the flow of air to the flame is blocked, and the flame cannot burn normally. Carbon monoxide is a colorless, odorless gas which can be deadly in high concentrations. Take particular care when setting up the exhaust for these units. Once a unit has been set up correctly, be careful not to make changes which could restrict the air flow. When the gas is burning correctly, it produces a strong blue flame with small yellow tips. If the air flow is restricted, it produces a smoky blue flame which appears to be "lazy."

Do not use any filter coating on the reactivation air filter. This presents a possible fire hazard.

Do not use the unit to process air which contains solvents or flammable vapors.

PLEASE READ THIS ENTIRE MANUAL. PLEASE FOLLOW THE INSTRUCTIONS CAREFULLY AND COMPLETELY. PLEASE PAY PARTICULAR ATTENTION TO THE SAFETY INSTRUCTIONS AND PRECAUTIONS.

3 - PRINCIPLES OF OPERATION

3.1 DEHUMIDIFIER OPERATING PRINCIPLE

Figure 3-1 shows how the R-Series unit removes moisture from the air. The “heart” of the system is the HoneyCombe® wheel. The detail in Figure 3-1 shows how this wheel is made. The wheel has a series of air passages or channels arranged in a honeycomb pattern. Air can be forced through these channels in either direction.

The passages inside the wheel are impregnated with a special substance called a “desiccant.” When this substance comes into contact with damp air, it soaks up moisture. When the desiccant is heated, it releases the moisture. Figure 3-2 shows how this principle is used in the R-Series unit. An example is using the R-Series unit to dry the air in a storage room. Damp “process” air is pulled into the unit from the storage room. This air is drawn through the channels in the HoneyCombe® wheel, as shown in the detail. The desiccant picks up most of the moisture in the air. Once it has been “dried out,” the process air is ducted back into the storage room. At this point, the moisture has been taken out of the process air, and “stored” in the HoneyCombe® wheel.

The moisture then needs to be removed from the wheel. As previously mentioned, the desiccant will give up moisture when it is heated. Hot air can hold a large amount of moisture. When hot air reaches the desiccant, the moisture is released and the desiccant is “reactivated.” In the R-Series unit, a stream of “reactivation” air is typically taken from the outdoors and heated. The normal temperature range of the reactivation air is from 120° to 300°F. Heat input is provided by either the electric heating elements or the direct fired gas heater.

The heated air is pulled through the channels in the HoneyCombe® wheel. The desiccant releases the moisture into the heated air stream. Finally, the damp reactivation air is vented outside. At this point, the moisture has been moved from the storage room to the wheel, then from the wheel into the outside air. The process continues until the R-Series unit is turned off.

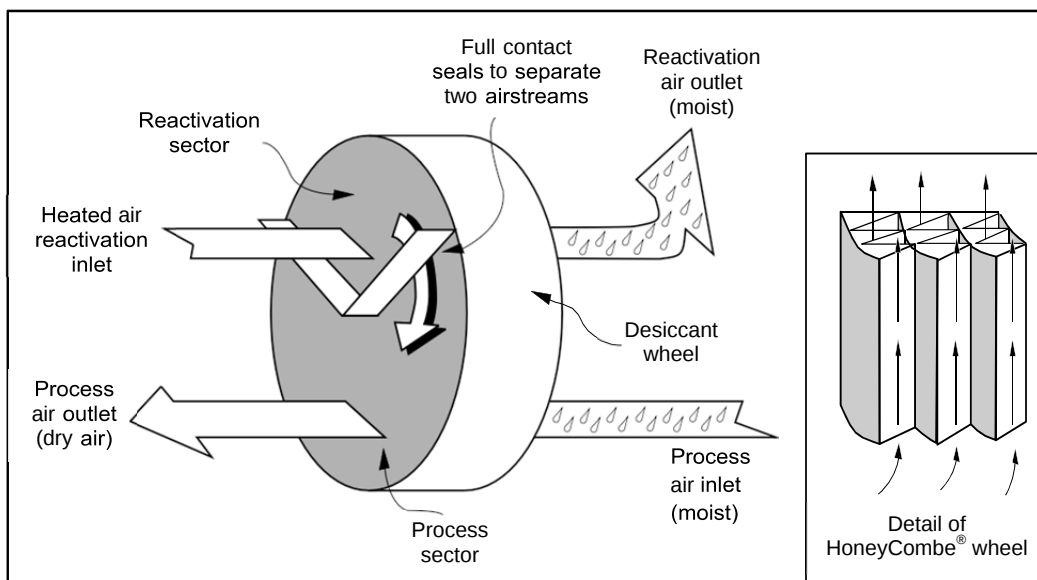


Figure 3-1
DESICCANT DEHUMIDIFIER OPERATING PRINCIPLE

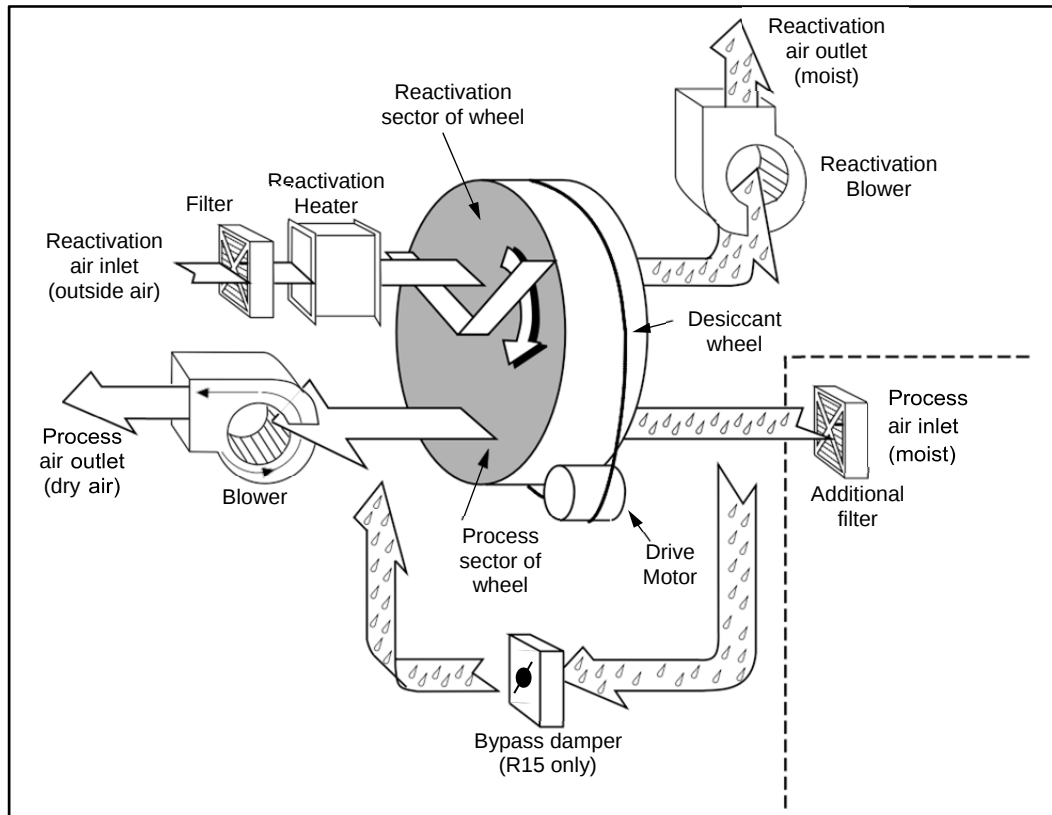


Figure 3-2
COMPLETE OPERATING UNIT

Figure 3-1 and Figure 3-2 show that, at one moment, the wheel is being used to pick up moisture, and a moment later, the wheel is being heated to drive off the moisture. In the R-Series unit, both actions are happening at the same time, on different sections of the wheel. All sections of the wheel go through the following cyclic process:

- At the beginning of the process, this section of the wheel is exposed to the damp “process” air.
- As the wheel turns, this section of the wheel moves under the stream of heated “reactivation” air. This part of the wheel is then dried out by the heated air.
- Finally, the dried part of the wheel turns into the “process” area again so it can pick up more moisture.

During this cycle, the wheel does not stop. One side of the wheel is picking up moisture while the other side is being dried out. The wheel rotates quite slowly – 8 revolutions per hour.

The HoneyCombe® wheel has been carefully designed. The honeycomb material is non-metallic and does not react to bacteria. The desiccant material used in this model is shown in the following table:

<i>Desiccant Type</i>	<i>Color</i>	<i>Marking</i>
Titanium enhanced silica gel	Red	Tigel

A wheel using titanium enhanced silica gel depends on the “adsorption” principle. Each particle of chemical can bond with a large number of water molecules. Each water molecule is attracted to many sites on the outside of the silica gel molecule. The process can be reversed within the wheel by adding heat. As the desiccant is heated, it releases water to the air.

3.2 ABOUT THE R-SERIES UNITS

This is a simplified explanation of the operating principle. Further explanation illustrates how this principle works in the R-Series unit. Figure 3-3 thru Figure 3-8 show most of the important parts of the machine: the HoneyCombe® wheel, process air stream and reactivation air stream. However, additional parts are required for the unit to function. For example, the R-Series unit has two seals, mounted on the wheel plates on each side of the HoneyCombe® wheel. These seals separate the two streams of air – the damp process air, and the heated reactivation air. Notice that the two air streams move through the R-Series unit in opposite directions (“counter flow”). The HoneyCombe® wheel is turned by a small drive motor and chain. The drive mechanism is designed to automatically adjust the chain tension.

The process air is pulled through the wheel by a blower. (Notice that the blower is on the downstream side of the wheel – it “pulls” rather than “pushes.”) A damper is included downstream of the blower. By adjusting this damper, the amount of process air moving through the unit can be changed. This adjustment is important, and it will be discussed again in the section on “Installation.” A filter is included to keep dirt from the process air from plugging the wheel.

The reactivation side of the system has some of the same features. The air is pulled through the wheel by a blower. Again, a damper is included to adjust the reactivation air flow and a filter to keep the wheel from plugging due to contaminants. Just upstream of the wheel, the reactivation system includes an electric heater and a direct fired gas heater. These heaters provide the heat needed to “reactivate” the desiccant. Only one heat source (electric or gas) is activated at any one time. The gas heat may be provided by either natural gas or propane fuel.

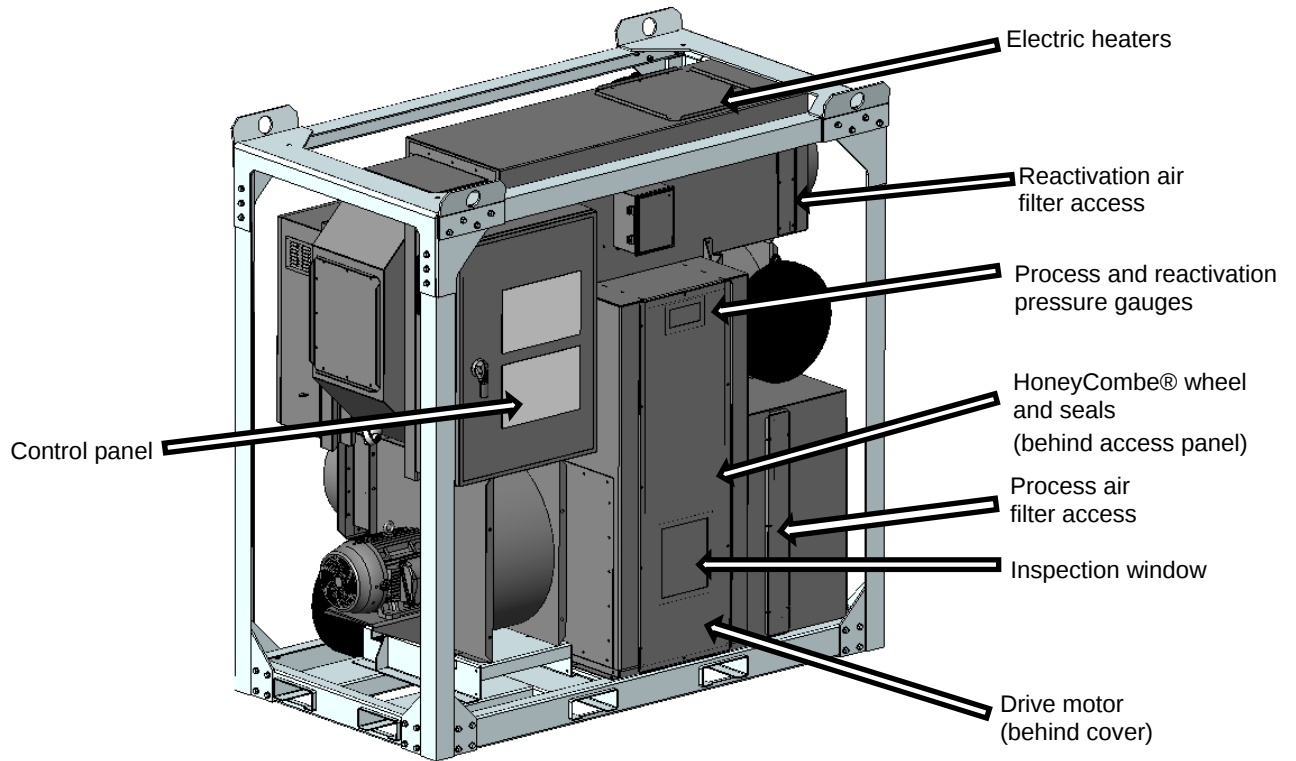


Figure 3-3
R05 UNIT – FRONT VIEW

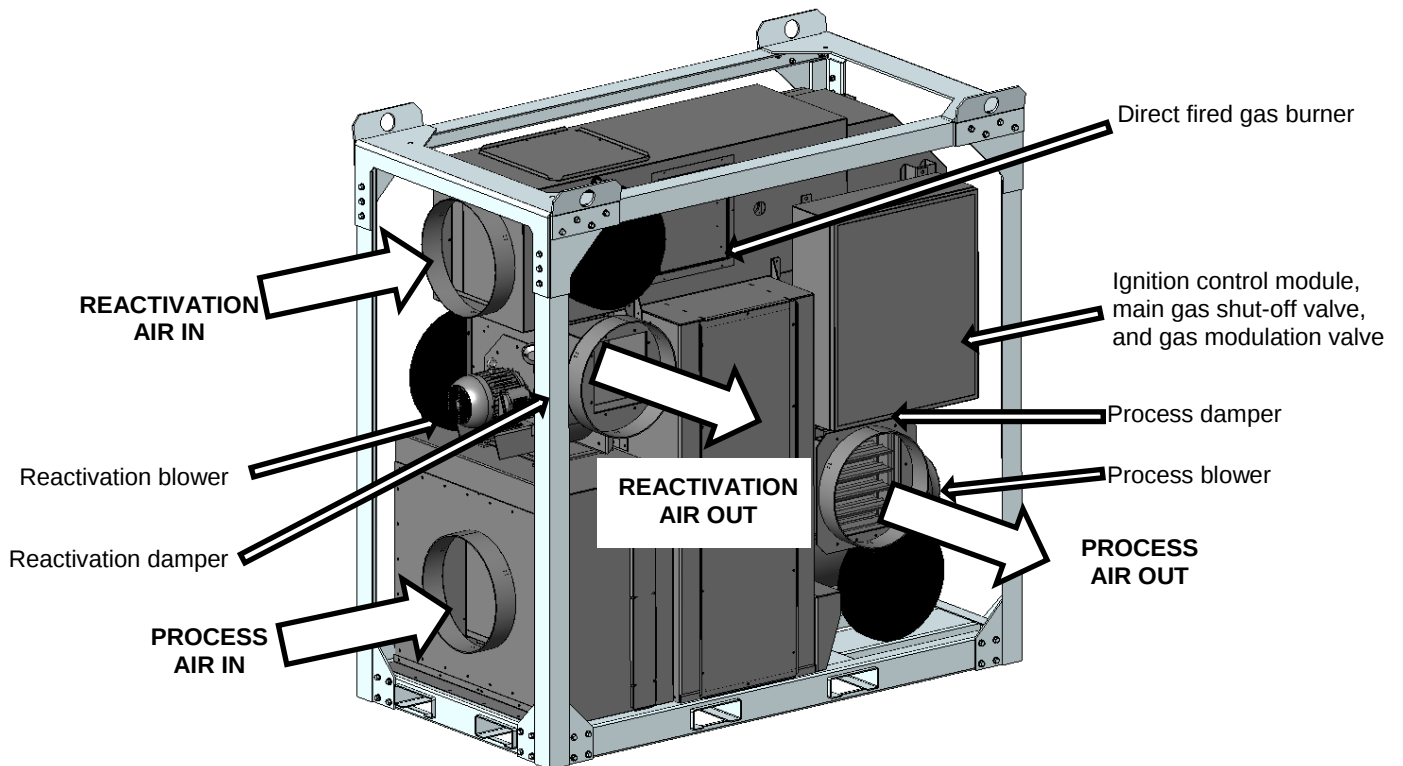


Figure 3-4
R05 UNIT – REAR VIEW

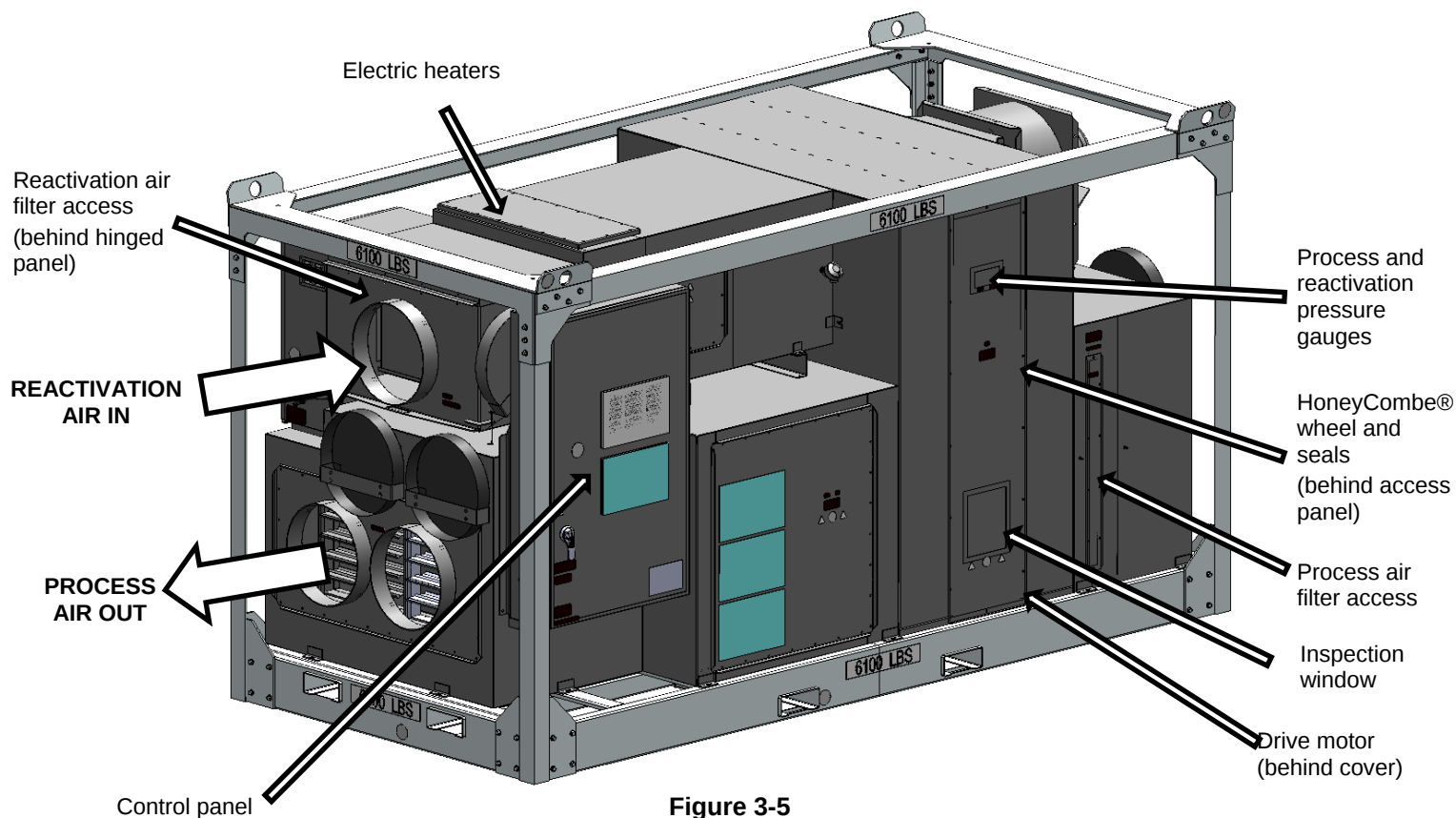


Figure 3-5
R10 UNIT – FRONT VIEW

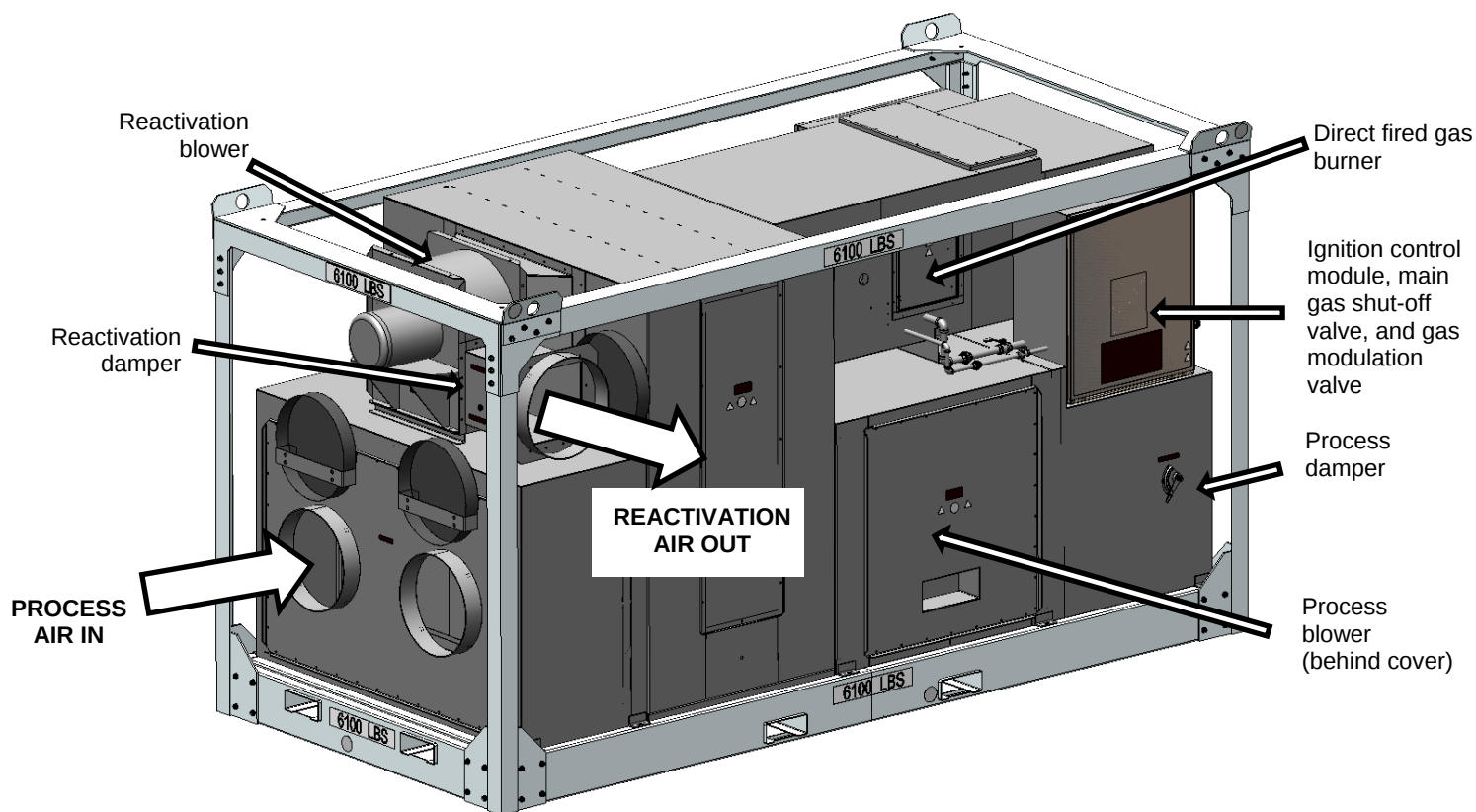


Figure 3-6
R10 UNIT – REAR VIEW

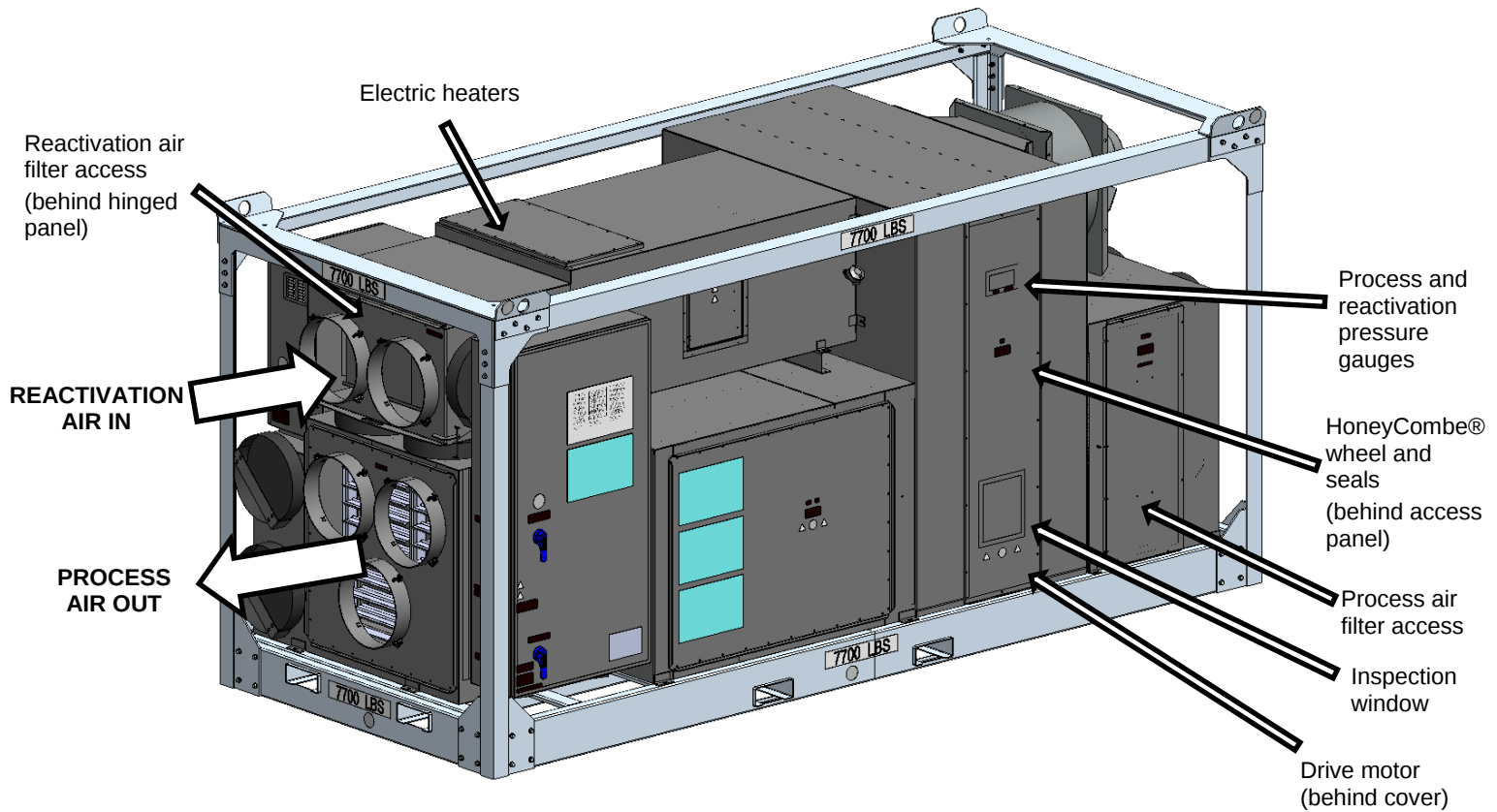


Figure 3-7
R15 UNIT – FRONT VIEW

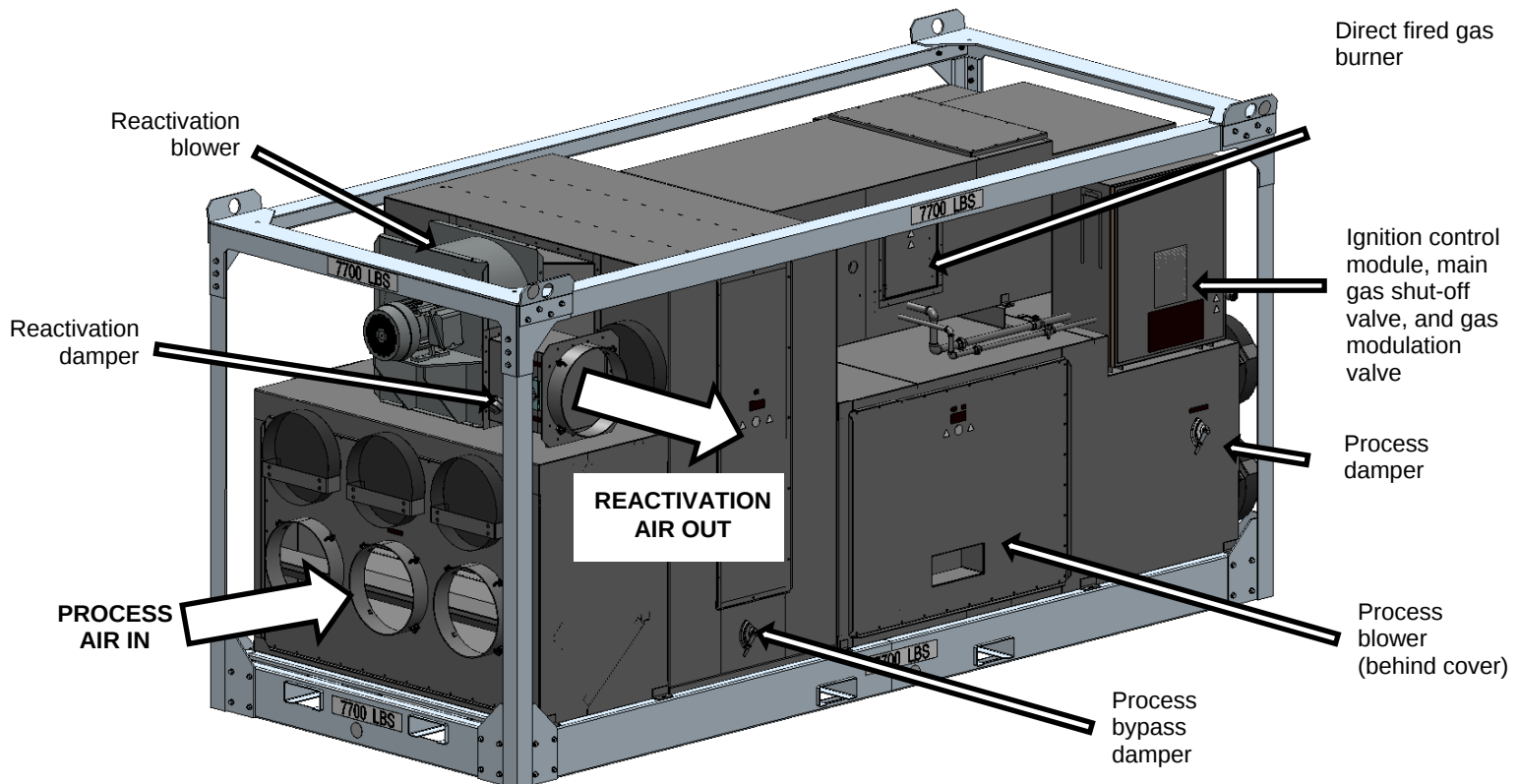


Figure 3-8
R15 UNIT – FRONT VIEW

3.3 CONTROL SYSTEM AND POWER DISTRIBUTION

The R-Series unit is controlled by a “programmable logic controller” or “PLC.” The PLC is a small computer which executes a simple set of commands or “program.” The program is organized as a loop which repeats continuously. LEDs on the front of the PLC show the status of each of the inputs and outputs. For more information on these LEDs, see the section on “Troubleshooting.”

Different variations of the unit operate on either 460V or 575V three-phase AC power. The blowers use this voltage. Motor starters are provided for each of the blower motors. The PLC changes or “modulates” the power going to the heating elements or gas flowing to the burner, depending on the mode of operation. A transformer provides 115V AC, which is used by the controls and indicators in the unit.

If a blower motor is jammed, it will start to draw a large amount of electrical current. Each of the motor starters can detect this condition, and shut down the faulty motor automatically. This will also shut down the rest of the unit. Each motor starter can be reset by pressing the “Reset” button on the starter.

3.4 ENERGY MODULATION

The reactivation heaters and burners are sized to provide enough heat to remove the maximum amount of moisture the unit was designed to handle. The R-Series unit is efficient because the heat input can be changed or “modulated.” The heaters will always supply enough heat to keep the wheel in “equilibrium.” This means that the wheel releases moisture at the same rate it is being absorbed. Because the heat input can be modulated, less energy is used when the moisture load drops.

As the reactivation air passes through the wheel, the air temperature drops (the moisture “cools off” the reactivation air as it evaporates off the wheel.) Tests have shown that when the wheel is in equilibrium, the ideal temperature at the reactivation outlet is 120°F.

There are four factors which affect the temperature at the reactivation outlet:

- Changes in temperature at the reactivation inlet
- Changes in the flow of reactivation air
- Changes in moisture loads in the process air stream
- Changes in the amount of heat provided by the heat source

If the temperature at the reactivation outlet is higher than 120°F, this does not necessarily indicate a problem. A low outlet temperature indicates a potential problem.

There are four possible causes for a low outlet temperature:

- Large drop in temperature at the reactivation inlet
- Large drop in flow of reactivation air
- Large increase in moisture load in the process air stream
- Reduced output from the reactivation heaters

The controller will issue a warning if the machine operates for over 30 minutes with the temperature below 110°F.

The reactivation heaters are designed to produce enough heat to handle the full design moisture load. If the moisture load is less than maximum, the amount of energy input may be reduced. The amount of energy used is controlled or “modulated” to maintain a

constant 120°F (R05, R10) and 130°F (R15) at the output of the reactivation air stream. Less moisture absorbed by the wheel means less evaporative cooling taking place in the reactivation air stream. This means that less heat is required to maintain the temperature at the reactivation outlet. Accurate energy modulation saves energy whenever the unit is handling less than the full load. The reactivation air entering the wheel must never rise above 350°F. High temperatures can damage the wheel.

4 - INSTALLATION

4.1 INSPECTION

1. When the unit arrives, check it immediately for signs of shipping damage. If there is any noticeable damage, report it to the trucking company right away.
2. Check the outside of the unit. Open the damper for the reactivation blower. Try to turn the blower by hand. It should turn easily. Do the same with the process blower. The R10 and R15 process blowers are located within a fan plenum.
3. Remove the access cover on the front of the unit. Check the following items:
 - Check to be sure the HoneyCombe® wheel is in position. The wheel should be evenly supported on four rollers.
 - Check the seals around both faces of the HoneyCombe® wheel for any obvious signs of damage.
 - Check to be sure the drive chain is in place and aligned on its sprocket segments.
 - Check to be sure the reactivation air filter is in place.
4. Check the electrical panels and controls:
 - Check for any signs of damage.
 - Check the tightness of all electrical connections. Carefully check the power wiring terminals.
 - Be sure all control relays are firmly seated in their sockets.

4.2 LIFTING THE UNIT

1. The unit has been provided with fork lift pockets and lifting lugs (cage option only).
2. The weight is shown on each unit. Ensure the crane or fork lift truck has sufficient capacity for the lift.
3. When using a crane, ensure all four lifting lugs are used (cage option only).

4.3 STACKING THE UNITS (CAGE OPTION ONLY)

1. If the cage option has been purchased, the units may be stacked while on a flat, level surface.
 - R05 may be stacked three units high.
 - R10/R15 may be stacked two units high.
2. Ensure that units are stacked in the same orientation, directly on top of each other to spread the load of the upper unit evenly over the cage frame and maintain the overall center of gravity of the units.
3. When stacking units, do not slide one unit on top of the other. Lift all four corners evenly and place the upper unit gently on top of the lower unit.

4.4 POSITIONING THE UNIT

1. Place the unit on a flat, level surface. The General Arrangement drawing is included with this manual and specifies the required space around the machine. Consideration should be given to clearances for the following:

- Air inlets and outlets, process and reactivation. If an air inlet or outlet is operated without ductwork, allow a clearance of at least 24" in front of the inlet.
 - Air filters
 - Electrical control panels
 - Gas train enclosures
 - Damper access
 - Wheel removal
2. Figure 4-1, Figure 4-2, and Figure 4-3 show four different ways of installing the R-Series unit.

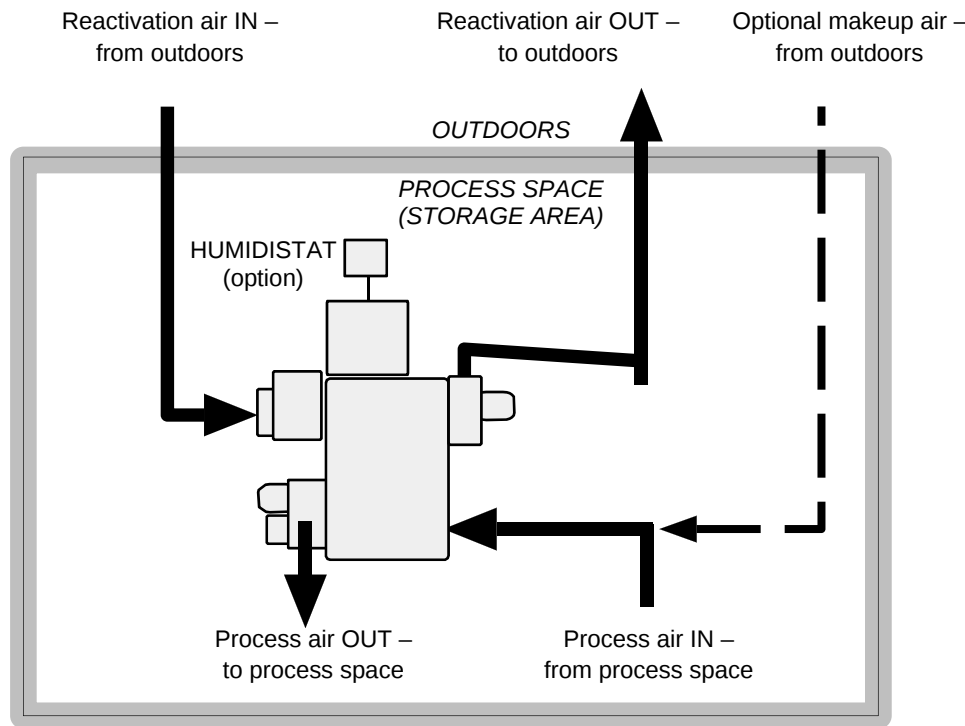


Figure 4-1
INSTALLATION IN PROCESS SPACE

3. To minimize condensation on the outside of the unit when it is not running, the dehumidifier can be placed inside a cool space, rather than outdoors. This will reduce the amount of condensation forming on the outside of the unit. See Figure 4-3.
4. The R-Series unit handles two separate streams of air:
- The process air, which comes from the space which is to be dehumidified
 - The reactivation air, which comes from outside of the space to be dehumidified. This air is used to remove the moisture from the HoneyCombe® wheel inside the unit.

The process air intake should come from the conditioned space, and the process air outlet should be vented to the same space. The process air intake can be quite close to the machine. In fact, it can be operated without any ductwork on the process intake. (The other openings will still need ductwork, however.) If the two process air ducts have different lengths, and one of the ducts must run a long way, the long duct should handle the process output air.

The reactivation air should come from outside of the conditioned space. There is no point using dehumidified air for this purpose. The air at the reactivation outlet is very damp and should be vented to a space where this is not a problem. Even though this air is heated, it is too damp to use for most space heating purposes. Normally, the reactivation air is taken directly from the outdoors, and the damp air is returned outside. The reactivation air can also be taken from and returned to an indoor space where the temperature and humidity levels are not important.

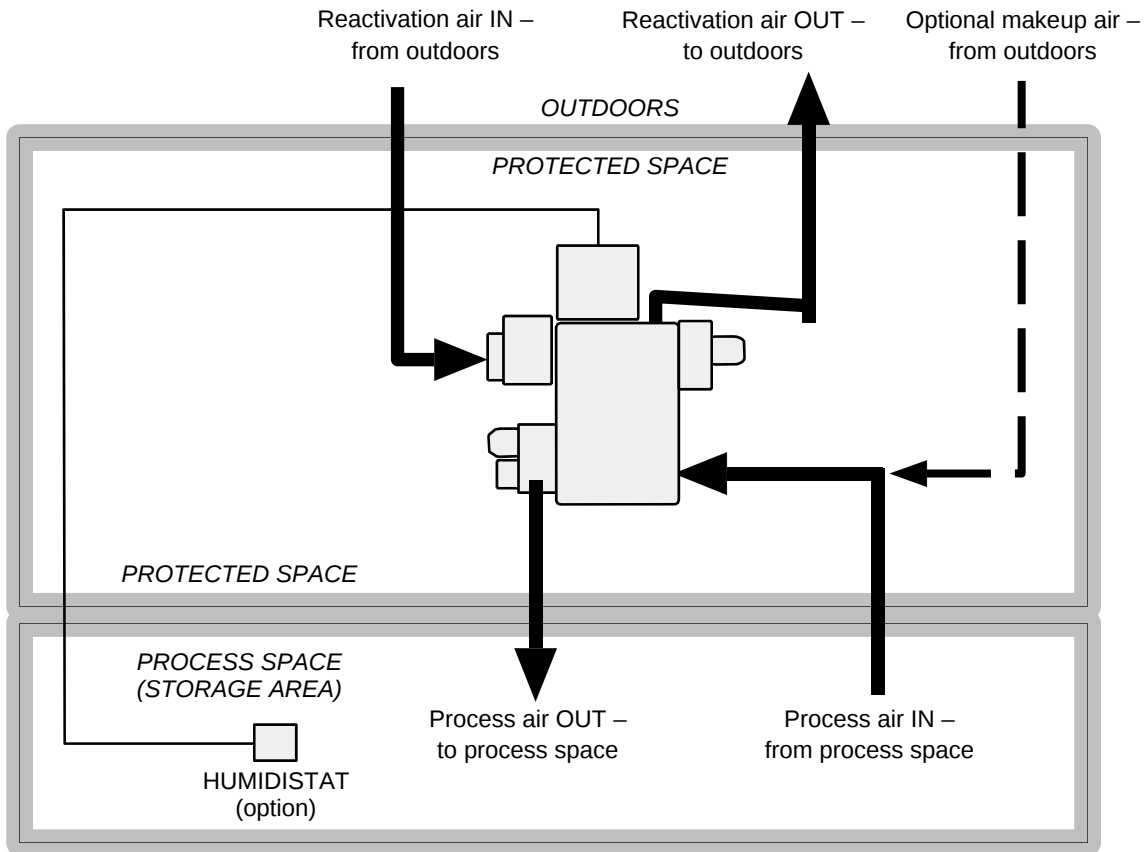


Figure 4-2
INSTALLATION IN PROTECTED SPACE

4.5 CONNECTING THE DUCTWORK

1. Ensure all shipping duct covers are removed from the openings on the unit to allow proper airflow in the unit.
2. The general arrangement drawing shows the details of the duct connections. This drawing is included with this manual and specifies the required space around the machine. If an air inlet or outlet is operated without ductwork, allow a clearance of at least 24".
3. The duct connections have been designed to accommodate layflat ductwork. Connections are for 18" or 20" ductwork (depending on option purchased). Quick release clips have been provided on all connections. The reactivation inlet on the R10 and R15 units has a hinged access cover. This cover can be opened and fixed in the open position if reactivation inlet ducting is not being used.

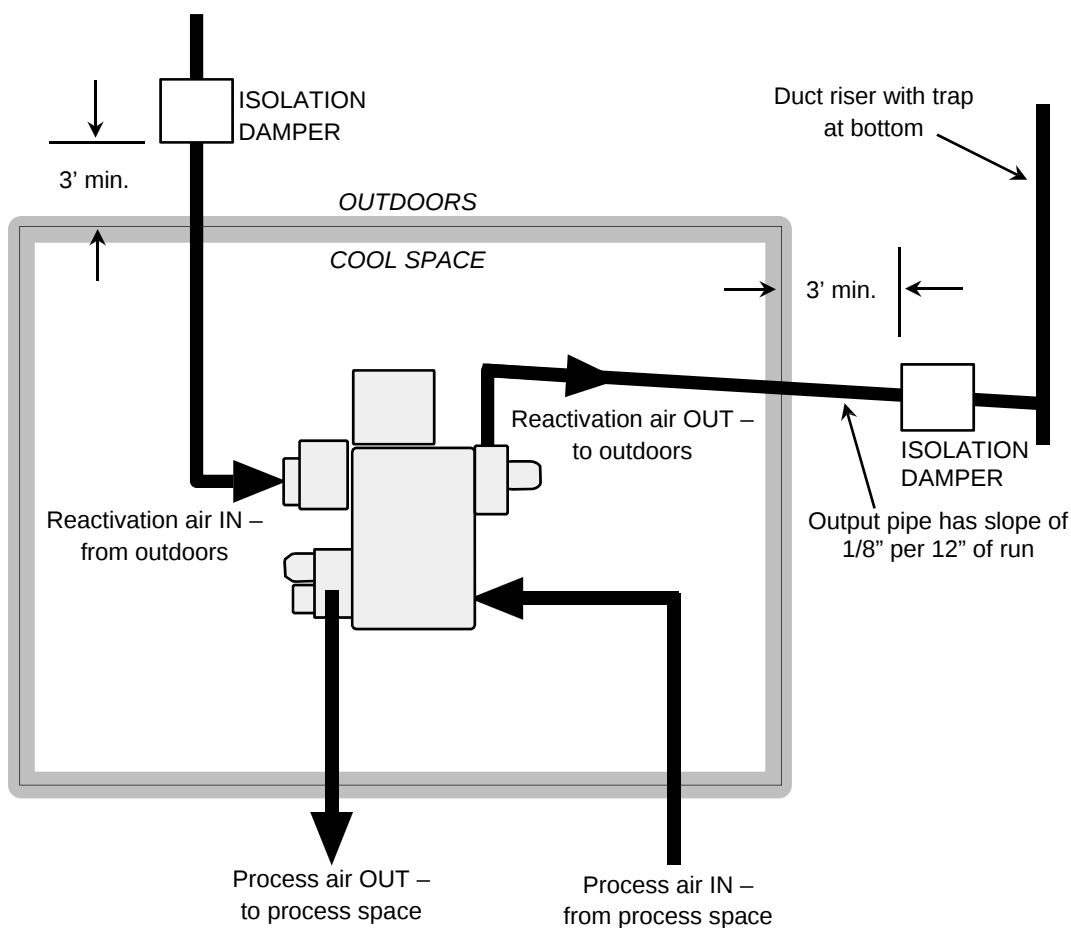


Figure 4-3
INSTALLATION INSIDE COOL SPACE

4. By planning and installing the ductwork carefully, problems with condensation can be avoided inside the ducts. Always place any horizontal runs of ductwork so they slope away from the unit. Allow a slope of 1/8" per 12" of run. Before any vertical run, create a trap which can be drained.

NOTICE

Never allow condensation from the ducts to run back into the HoneyCombe® wheel. This will prevent the unit from operating as it should.

5. If the unit is installed in a cold space, air from the reactivation air stream must not be allowed to flow into the R-Series unit when the unit is turned off. This moist air would condense inside the unit. To prevent this, install isolation dampers at two points in the reactivation air stream – one damper in the intake and the other in the exhaust. The dampers should be installed outside of the conditioned space.
6. It is very important not to allow any leaks on the output side of the process air stream. Leaks can allow the moisture from the process space to move into the process airstream, even though the moisture must move "upstream" against the air flow.

It is also important that the hot, moist reactivation air not be allowed to leak back into the conditioned space. All of the joints for the reactivation ducts must be completely sealed.

7. After the reactivation air passes through the unit, it is very hot and can put a heat load on the conditioned space. If any ductwork for the reactivation output air runs through the conditioned space, insulate these sections. This will help prevent condensation from forming inside the duct. It is also helpful to insulate the ducts for the process output air. Seal the joints on these ducts before adding the insulation.
8. Wherever the intake or outlet ducts open outdoors, protect them from the elements. Install weather hoods and bird screens.
9. Do not locate the intake and outlet for the process air too close together. This would allow the dried process outlet air to be pulled into the process inlet. The machine would be trying to dry air which has just been dehumidified ("short-cycling").

Also allow some distance between the intake and outlet for the reactivation air. The reactivation outlet air is very damp – do not allow it to be pulled into the reactivation inlet. Either condition can make the unit work harder than necessary. The unit handles large volumes of air, so try to maintain a good distance between the inlet and outlet ducts.

4.6 GAS CONNECTIONS

1. The R-Series gas trains have been designed for either natural gas or propane.
2. The R05 units have a single main gas train (pilot-less). The R10 and R15 gas train units have a main and a pilot gas train.
3. The main gas regulator should be adjusted to the natural gas or propane setpoint per the instructions provided inside the gas train enclosure.
4. The R05 gas connection is 1/2" NPT and the R10 and R15 is 1" NPT.
5. The minimum gas pressure required is 15" WC and the maximum gas pressure should not exceed 5 psi.
6. Refer to NFPA 54 for proper gas supply line sizing. Run the gas supply line in accordance with all applicable codes.
7. A sediment trap must be provided upstream of the gas controls. Refer to NFPA 54 for sediment trap sizing.
8. All threaded joints should be coated with piping compound resistant to action of liquefied petroleum gas and natural gas.
9. The appliance and its individual shutoff valve must be disconnected from the gas supply piping during any pressure testing of that system at test pressures in excess of the maximum supply gas pressure as specified on the rating plate.
10. The appliance and its gas connection must be leak tested before placing it in operation.
11. Purge all air from gas lines prior to commissioning the equipment.
12. A 1/8" NPT side tap is located at the gas supply isolation valve, accessible for measuring gas supply pressure.

13. The combination valve includes a regulator. If the diaphragm breaks, gas will vent from the small fitting on top of the regulator. Attach a small gas line to the fitting, and run it outdoors.
14. After the gas connections have been made, check all joints for possible leaks using a solution of soapy water. Do this before applying full gas pressure.

4.7 ELECTRICAL CONNECTIONS

1. The R-Series unit is designed to operate on three-phase AC at up to 575V at 60 Hz. The required voltage is listed on the nameplate on the machine. Be sure the line voltage and frequency match the voltage and frequency required by the machine. A wiring diagram for this unit is included in this manual.



The R-Series unit may be wired for up to 575V AC. The unit can produce enough voltage and current to cause serious injury or death. Always turn off the power before working inside the unit. Follow standard lock-out tag-out procedures. Only trained electricians should perform work with the electrical parts.

Be sure the unit is connected to a source with the correct line voltage and frequency. If a higher voltage is connected than the unit can accept, a shock hazard may be created or damage may be done to the machine. The correct line voltage is listed on the nameplate on the machine.



Do not try to control the humidity by switching the power to the dehumidifier on and off. Use a humidistat to control the unit. The wiring diagram included in this manual shows the contacts for the humidistat.

2. Turn the electrical disconnect handle on the Munters unit to the off position.
3. Color coded Cam-Lok type single pole electrical connectors are mounted to the main electrical enclosure to allow for the quick connection of the main electrical power.
4. The R05 and R10 units have one set of Cam-Lok disconnects. The R15 units have two sets as follows:
 - 70 Amp – main controls and gas reactivation
 - 270 Amps – electric reactivationIf the unit is to be operated with gas reactivation heat, then only the 70 Amp connections are required. If electric reactivation heat is to be used, then both sets of connections are required.
5. Connect the power cables and equipment ground to the Munters unit via the Cam-Lok type connectors. Ensure all connectors are firmly attached.
6. Turn on power to the unit. For a moment, set the Auto/Off/Manual switch to Manual, then back to off. Check the direction of rotation of one of the blower fans. Each fan should turn in the direction shown on the attached label. If a fan is moving the other way, turn off the R-Series unit, disconnect and lock-out the incoming power. Reverse any two of the three leads powering the Munters unit.

NOTICE

Do not operate the unit if the fans are turning backwards. The fans have much lower output when they operate backwards.

NOTICE

Always use the Auto/Off/Manual switch to turn off the machine. Other than emergency situations, do not shut down the system by de-energizing the main power disconnect. De-energizing the main power disconnect will cause all components to immediately shut down and power to be isolated. A hard shut down will damage the system, as the components will not be cooled down in a controlled manner.

4.8 CONNECTING A REMOTE HUMIDISTAT (OPTIONAL)

1. When the mode selector switch is set to Auto, the R-Series unit is controlled by a device called a “humidistat.” The humidistat works much like the thermostat in a home cooling system. When the humidity rises above a preset point, the humidistat turns on the R-Series unit.
2. The humidistat requires no external power and is plugged directly into a port on the side of the unit. It is wired as an “Open-On-Rise” device. On a call for dehumidification the contacts open. When relative humidity is less than the humidistat local set-point the contacts close and the reactivation energy shuts off. The process fan will continue to operate.
3. Mount the humidistat in the space to be dehumidified. For best results, place the humidistat near the process air return duct (the duct returning process air to the dehumidifier). This will provide the most accurate sensing of the relative humidity in the process space. If possible, mount the humidistat away from the floor and ceiling, and do not mount it near any doors and windows. Do not mount the humidistat near the supply duct bringing the process air from the R-Series unit.
4. Make the wiring connections between the humidistat and the R-Series unit. Use a minimum of 18 AWG wire. See the wiring diagram included in this manual.

5 - OPERATING INSTRUCTIONS

5.1 CONTROLS AND INDICATORS

Figure 5-1 shows the controls on the main panel of the machine:

Auto/Off/Manual switch –

The center of the Auto/Off/Manual switch will light whenever the unit is receiving power and is ready to operate. When this switch is set to the Manual position, the unit will run continuously. When the switch is set to the Auto position, the unit will run under the control of a remote sensor, such as a humidistat. Turn the switch to the Off position to stop the unit. If the switch is set to either Manual or Auto, the unit will stop if one of the safety sensors detects a fault.

Main Control Panel -

The flow diagram image shows the status of the machine, and also presents any faults or warnings. The operational status of the unit is determined via indicating LEDs mounted across the flow diagram image as shown in Figure 5-1.

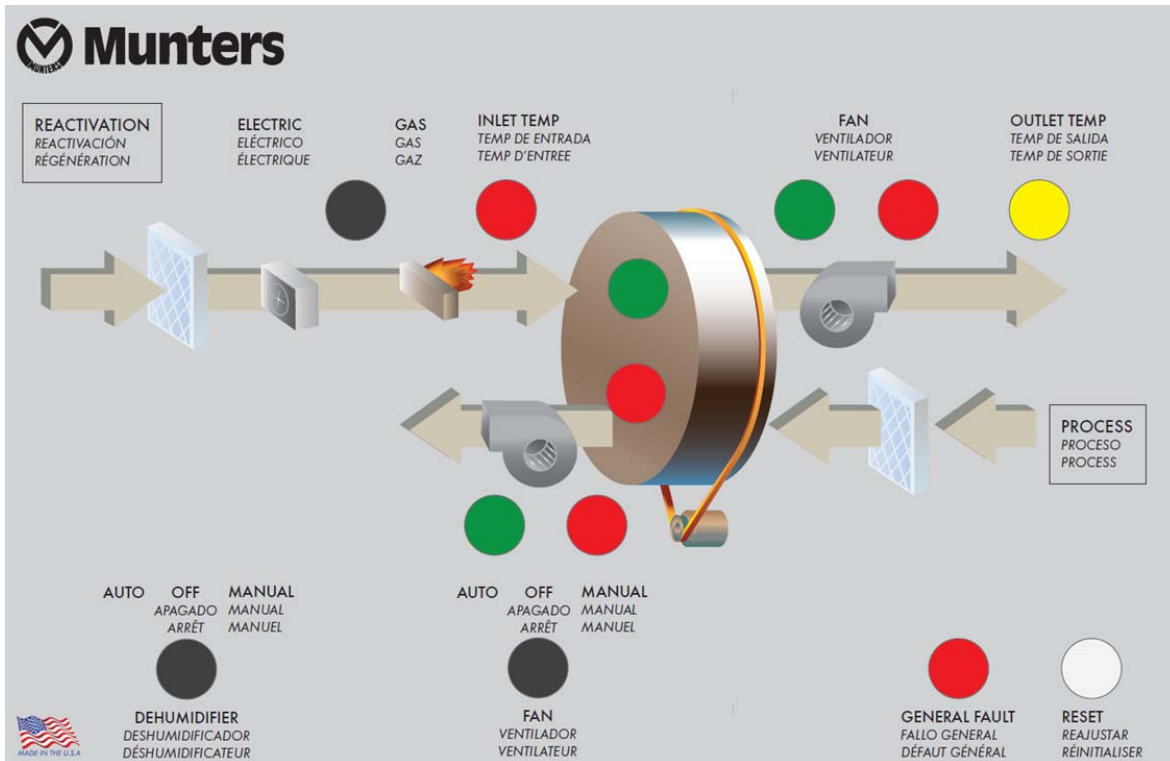


Figure 5-1
MAIN CONTROL PANEL

HMI (Optional) -

If the HMI option has been purchased, this is installed on the front of the electrical enclosure. This panel shows the status of the machine, and also presents any fault or warning messages. Use this display to check the reactivation inlet and outlet temperatures and the machine run time. Note that the operator display just reports information from the machine - it is not a controller. If the display is not working correctly for some reason, the rest of the dehumidifier may continue to operate normally. If there is an alarm, it must be reset on the machine itself and the alarm indication must also be cleared on the HMI display.

5.2 STARTING THE UNIT

1. The units have a disconnect switch on the front panel. Be sure power is available to the Munters unit and this switch is turned on.
2. Check to see that the center of the Auto/Off/Manual switch is lighted. This means the unit has power. The control panel will show that the machine is ready to run.
3. (Optional) Process fan selector switch should be set to auto mode.
This will allow the process fan to cycle with the Dehumidifier Auto/Off/Manual switch.
4. Select the reactivation energy type (electric or gas)
If gas is selected, regulator must be set to correct propane or natural gas setting.
5. Enable the Unit
Select Dehumidifier manual (for continuous dehumidification and process fan operation) or auto (for humidistat operation) mode

All R-Series units are equipped with a run time meter located within the main electrical enclosure. The run time meter records the accumulated operational time of the process blower.

AUTO MODE

If the unit has a remote sensor such as a humidistat, set the Auto/ Off/ Manual switch to Auto. The unit will begin to run, the process blower will begin to run and the reactivation will cycle with the humidistat. The green lights on the control panel will show that the machine is running. (If the reactivation circuit does not run, check the set-point on the humidistat.)

Note: If the humidistat is not installed the unit will operate as if dehumidifying is constantly required.

MANUAL MODE

If the unit does not have a remote sensor, turn the Auto/ Off/ Manual switch to Manual. The unit will begin to run, the process blower will begin to run and the reactivation will be enabled. The green lights on the control panel will show that the machine is running.

6. After the machine is switched on, there will be a normal delay up to 30 seconds before the fans start. As the machine is warming to normal operating temperature (first 30 minutes of machine operation), the unit will not display the Reactivation Low Temperature warning.
7. Reactivation Energy Modulation Control.

ELECTRIC

Reactivation electric heater solid state relays accept a 0-10V modulating signal from the logic controller to control Reactivation inlet air temperature, as sensed by the reactivation air inlet temperature thermocouple (TC01). The reactivation inlet loop temperature set point will be varied based on the reactivation outlet PID loop to maintain required reactivation inlet temperatures over a wide range of DH load conditions. The reactivation outlet temperature thermocouple (TC02) set point is 120°F (R05 and R10) and 130°F (R15).

When the reactivation outlet PID loop output is 0% the reactivation inlet set point will be 120°F/130°F and when the reactivation outlet PID loop output is 100% the reactivation inlet set point will be 300°F.

Electric heater banks are staged as follows:

- The electric heater bank(s) closest to the desiccant wheel is controlled via a set of solid state control relays which proportionally modulates the heat required from this bank based upon heat demand.
- Subsequent heater banks are then staged on individually as required, when the control signal to the solid state relay exceeds 90% full scale for 90 seconds. Upon incrementing a heater bank, the proportional signal will back down to minimize heater temperature overshoot.
- Heater banks are decremented when the control signal to the solid state relay drops to less than 5% for 40 seconds. Upon decrementing a heater bank, the proportional signal will rise to minimize heater temperature undershoot.

GAS

Reactivation heater modulating gas valve accepts a 0-10V modulating signal from the logic controller to control Reactivation inlet air temperature, as sensed by the reactivation air inlet temperature thermocouple (TC01). The reactivation inlet loop temperature set point will be varied based on the reactivation outlet PID loop to maintain required reactivation inlet temperatures over a wide range of DH load conditions. The reactivation outlet temperature thermocouple (TC02) set point is 120°F (R05/R10) or 130°F (R15).

When the reactivation outlet PID loop output is 0% the reactivation inlet set point will be 120°F/130°F and when the reactivation outlet PID loop output is 100% the reactivation inlet set point will be 300°F.

5.3 ADJUSTING THE PROCESS AND REACTIVATION DAMPERS

1. It is very important to provide the correct air flows for the process and reactivation air streams. Dampers are installed in both air streams.
2. Two pressure gauges are installed in the panel on the front of the machine. To

adjust the air flow, the pressure drop must be checked as the air moves through the HoneyCombe® wheel. The left-hand gauge measures the pressure drop as the process air moves through the desiccant wheel. The right-hand gauge measures the pressure drop as the reactivation air moves through the desiccant wheel. The greater the air flow, the greater the pressure drop, and the higher the reading on the gauge.

3. The ideal pressure readings for both the process and reactivation pressure gauges are shown on the flow diagram inside the electrical control panel. Record these values prior to starting the unit. However, it should be noted, that depending on the inlet temperature and volumes, pressure gage readings could be up to 0.25" wc either side of the noted pressure readings.
4. Turn on the unit, using the circuit breaker. Set the Auto/Off/Manual switch to the Manual position.
5. The damper for the reactivation air is located on the reactivation blower. Adjust this damper to get the correct reading on the right-hand pressure gauge.
6. The damper for the process air stream is located on the process blower (rear of the outlet blower plenum on R10 & R15). Adjust this damper to get the correct reading on the left-hand pressure gauge.

5.4 ADJUSTING THE PROCESS BYPASS DAMPER (R15 ONLY)

1. The R15 has a process bypass damper. The R15 can dehumidify up to 15,000 scfm of process air. Most of the air passes through the dehumidifier, but some passes around the wheel and is then blended with the dry air in the fan plenum.
2. The bypass damper is set in the factory. There should be no reason to adjust this damper setting.

NOTICE

At no time should the damper ever be closed. This could cause damage to the wheel and seals, as too high a volume would be passed through the wheel.

5.5 FINAL CHECKS

Do not allow the unit to operate unattended until the following points have been checked:

- Secure electrical connections, including a good earth ground.
- Blower motors turning in correct direction.
- HoneyCombe® wheel rotating 8 rph.
- Ductwork connected and sealed. Reactivation outlet ductwork insulated, as reactivation outlet temperature is near 120°F (R05/R10) and 130°F (R15) $\pm 5^\circ\text{F}$.
- Reactivation damper and process damper set to achieve correct pressure drops across wheel.
- Manual bypass damper (R15 only) set as described in text.
- After unit has stabilized, reactivation outlet temperature is near 120°F/130°F $\pm 5^\circ\text{F}$, and always above 110°F.

5.6 REACTING TO ALARMS

The operational status of the Munters unit is determined via indicating lights mounted on a silkscreened label on the main control panel. Alarms will be annunciated by red, illuminated, LEDs and warnings will be annunciated by yellow, illuminated, LEDs.

To determine the details of the fault or warning, view the illuminated indicating LEDs on the main control panel. Figure 5-2 shows the indicating lights and the faults that cause them.

Fault Chart (Unit will shut down)	
	Inlet Temp
Constant Red	React Heated To Over Temperature
Flashing Red	Electric Heater Over Temperature
	Reactivation Fan
Constant Red	Motor Overload
Flashing Red	React Airflow Switch
	Process Fan
Constant Red	Motor Overload
	Dehumidifier Wheel Fault
Constant Red	Motor Overload
Flashing Red	Rotation Failure
	General Fault
Constant Red	Phase Monitor
1 Flash	Gas Train Pressure Switch
2 Flashes	Burner Gas Pressure Switch
3 Flashes	Burner Flame Failure

Warning Chart (Unit will continue to operate)	
Constant Yellow	React Outlet Temp < 110°F

Figure 5-2
INFORMATION ON FAULT CONDITION

In order to recover from a fault perform the following procedure:

- On the dehumidifier, locate the cause of the problem that caused the fault, and correct it.
- On the main control panel, reset the selector switch (Auto/Off/Manual) by moving the switch to the Off position.
- Press the reset pushbutton on the main control panel.
- Place the selector switch (Auto/Off/Manual) to Auto or Manual as desired.

For more information on clearing the cause of a fault, see Section 7 - TROUBLESHOOTING.

5.7 STOPPING THE UNIT

1. Turn the Auto/Off/Manual switch to Off.
2. After the switch has been set to Off, the unit will continue to run for three minutes. This allows time to cool the reactivation heater. After three minutes, the unit will

stop.

NOTICE

Other than emergency situations, do not shut down the system by de-energizing the main power disconnect. De-energizing the main power disconnect will cause all components to immediately shut down and power to be isolated. A hard shut down will damage the system, as the components will not be cooled down in a controlled manner.

5.8 LONG-TERM SHUTDOWN

If the machine will be turned off for a long period of time, some special precautions must be taken to protect the HoneyCombe® wheel. Even when the machine is shut down, moist air can continue to move through the wheel. This is especially likely if a fan or air moving device is still operating in the system. Eventually, a large amount of moisture can collect in the wheel. This can damage the wheel. For instructions on long-term shutdown, see Section 6 - MAINTENANCE.

5.9 HMI (OPTION)

If the HMI has been purchased, it will be located on the front of the electrical enclosure. Once energized, the display will show that the machine is ready to run. Note there are two lines at the top of the screen. The upper line (React) refers to just the dehumidifier itself. The lower line (Status) refers to the entire system. See Figure below:

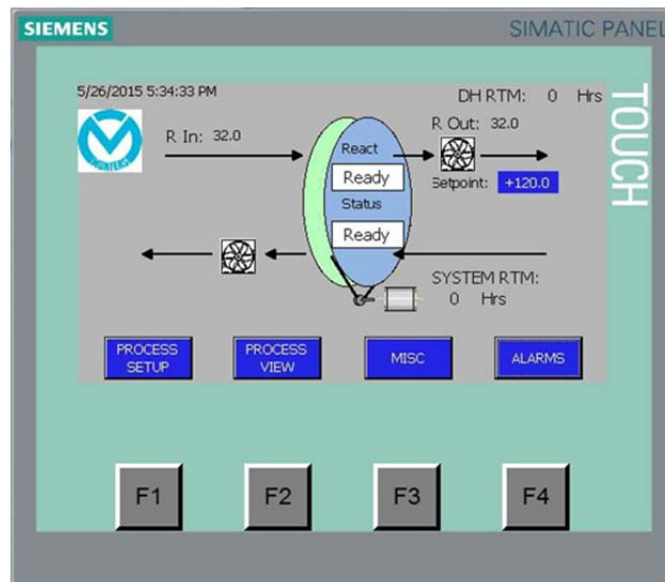


Figure 5-3
HMI DISPLAY

React This refers to just the dehumidifier itself (heater, reactivation fan, drive motor, etc.).

Status This refers to the whole line of equipment.

One the line for "React", there are four possible indications:-

- **RUNNING** The dehumidifier is running.

- PURGING When the selector switch is turned off, or the system stops calling for dehumidification, the dehumidification wheel must continue to turn so it can be "dried out" before it stops. Normally the purge cycle runs for three minutes.
- STANDBY The system is running in AUTO mode and the desired humidity condition is being met without the dehumidifier running.
- FAULTED The dehumidifier is faulted.

On the line for "Status", there are four indications which may appear:

- READY The system has power. There are no alarms or warnings, and the system is ready to run whenever it receives a "start" signal.
- RUNNING The system is running.
- PURGING When the selector switch is turned off, or the system stops calling for dehumidification, the dehumidification wheel must continue to turn so it can be "dried out" before it stops. Normally the purge cycle runs for three minutes.
- FAULTED The system is faulted.

1. HMI - CHECKING THE REACTIVATION TEMPERATURES

- The present value (PV) reactivation inlet and outlet temperatures can be viewed on the Machine Running screen. To view details (CV, SP, and a PV chart) associated with the reactivation inlet and outlet temperatures, press the PROCESS VIEW button. The following screen will appear on the HMI.

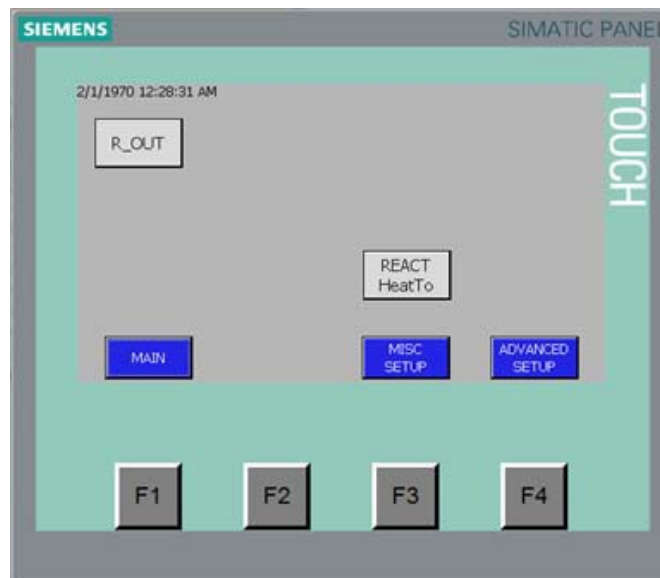


Figure 5-4
PROCESS VIEW

To see the reactivation inlet and outlet temperatures, press the REACT HeatTo or R_OUT buttons respectively. The following screen will show the detailed reactivation temperature info.

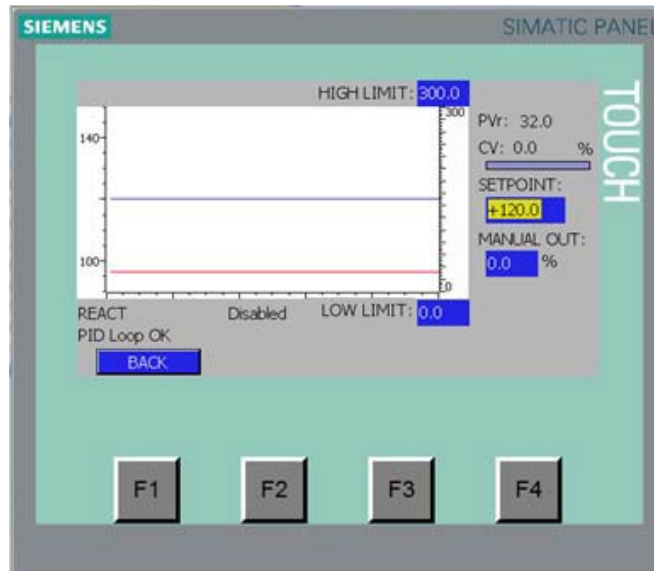


Figure 5-5
DETAILED REACTIVATION TEMPERATURE INFO

Here are the items on this screen:

SETPOINT Setpoint for reactivation outlet temperature

PVr Current reactivation inlet or outlet temperature

CV "Control Variable" - percentage of full reactivation heat output.

Although the temperatures may be displayed in °F or °C, the factory default is °F. To return to the Machine Running display, press the BACK button, followed by the MAIN button.

These values have been set in the factory and should not be changed.

2. HMI - CHECKING THE SYSTEM AND DH RUN TIME

The System and DH run time are displayed on the Machine Running screen. See Figure below.

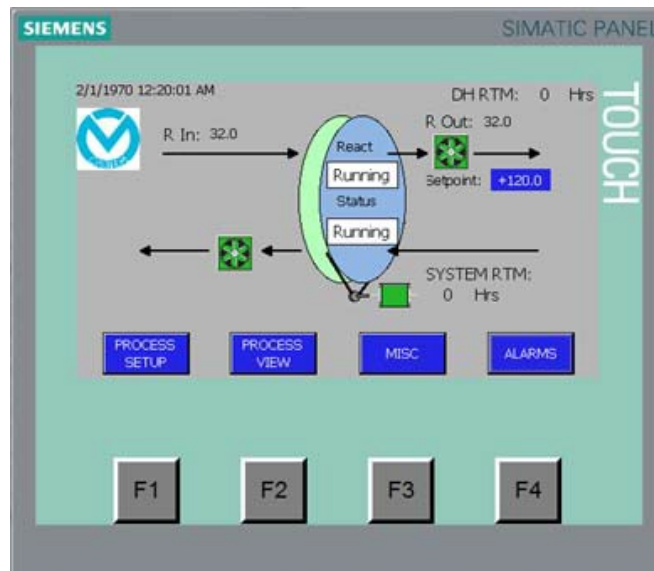


Figure 5-6
CHECKING SYSTEM AND DH RUN TIME

Here are the items on this screen:

SYSTEM RTM Total run time for whole system, including the dehumidifier and any additional equipment mounted upstream or downstream

DH RTM Total run time for dehumidifier only

3. HMI - REACTING TO ALARMS

Note - The operator interface display reports on operating conditions inside the dehumidifier, but they are really two separate units. If an alarm is triggered it must be corrected in two places - on the dehumidifier itself, and also on the operator display.

1. If the unit detects a fault condition, the ALARMS button on the display will blink red and the Fault Light on the control panel will light. For a warning, the ALARMS button on the display will blink yellow and the Warning Light on the control panel will light.

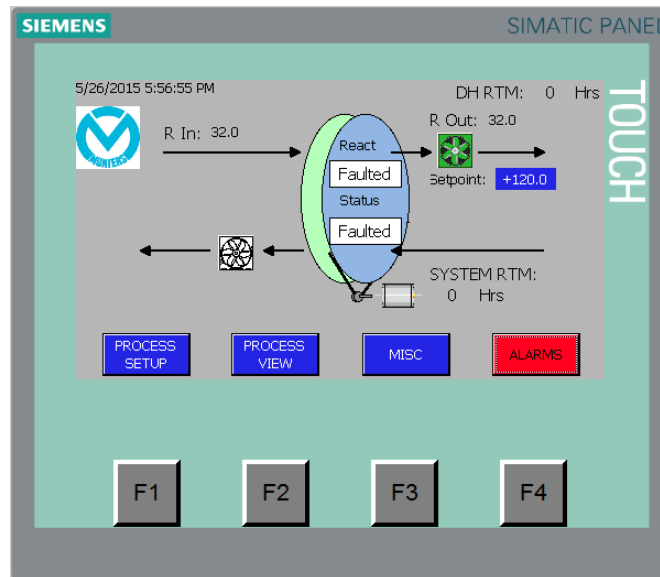


Figure 5-7
TYPICAL FAULT DISPLAY

2. To see the details on the fault or warning, press the ALARMS button. The figure below shows the type of screen that the display might present.

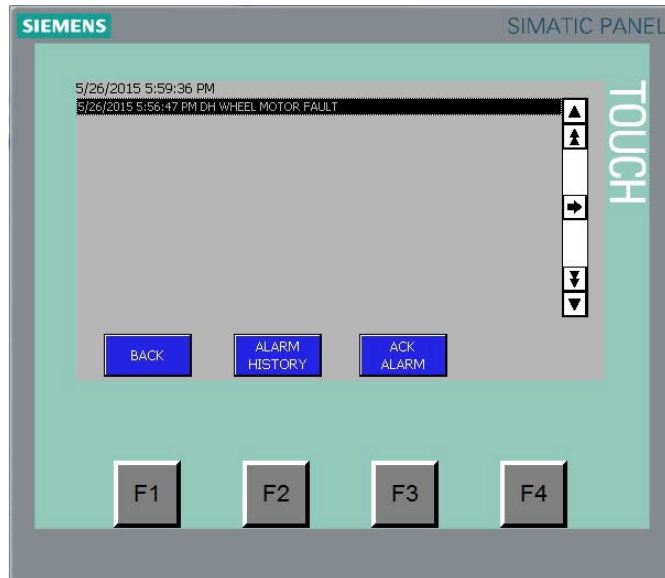


Figure 5-8
INFORMATION ON FAULT CONDITION

3. Recovering from a fault is a three-step process. The fault must be cleared on **both** the dehumidifier and the operator interface display.

- On the dehumidifier, locate the cause of the problem that caused the fault, and correct it.
- On the dehumidifier, reset the selector switch (Auto/Off/Manual) by moving the switch to the Off position, then returning it to Auto or Manual.
- On the operator interface display, press the Acknowledge button (ACK ALARM) to clear the message and alarm symbol.
- After a fault message has been cleared, return to the Main screen by pressing BACK. The display will indicate "Ready."

4. To see a history of past alarm conditions, press the ALARMS button followed by ALARM HISTORY. See figure below.

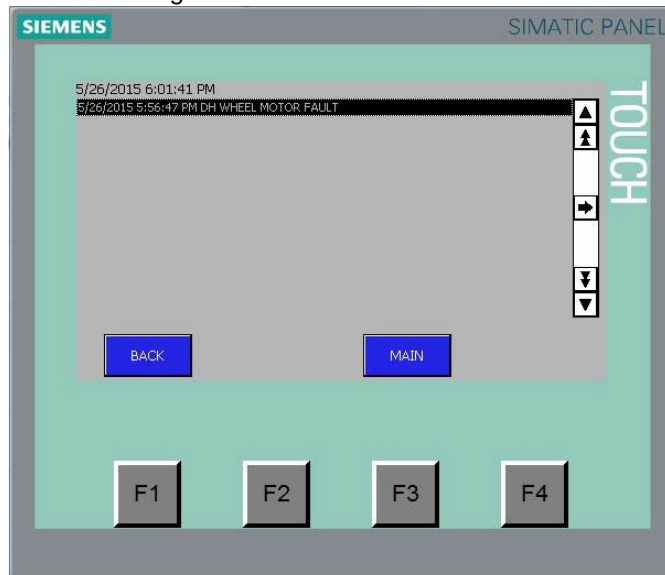


Figure 5-9
ALARM HISTORY DISPLAY

6 - MAINTENANCE

This section includes some suggested maintenance requirements for this unit. This information is offered as a guide and some systems may require more frequent maintenance. For example, a unit used in a very dusty atmosphere should have the air filters changed more often. Use these suggested schedules as a starting point, and modify them to suit the specific installation.

Munters dehumidifiers are designed to be very rugged and reliable. However, this does not mean the maintenance can be skipped completely. Poor maintenance can result in poor performance, increased downtime and additional operating costs.

Munters strongly recommends that a comprehensive maintenance program be followed. This program should include not only the dehumidifier, but any support systems involved in the dehumidification system.

At some installations, downtime can be very expensive. If downtime of a few days is not possible, then it is important to maintain an on-site inventory of spare parts. A listing of recommended spare parts is included in this manual.

6.1 QUICK MAINTENANCE CHECK

As the unit operates, make routine checks of these three basic functions:

- The process air flow and reactivation air flow should be checked to be sure they remain at design levels. If the air flows change, this can change the operation of the machine. A change in air flow may call for maintenance or troubleshooting.
- Check the temperature at the reactivation outlet to be sure it remains near 120°F (R05/R10) and 130°F (R15) $\pm 5^\circ\text{F}$, and always above 110°F. If the temperature drops below this level, check the section on Troubleshooting.
- The wheel must be rotating whenever the unit is operating.

6.2 SUGGESTED MAINTENANCE SCHEDULE

The following table lists the recommended maintenance schedule for this unit. For detailed instructions on each procedure, see the sections which follow.

EVERY 30 DAYS

<i>Check this</i>	<i>Location</i>
Clean / replace the air filters.	Inlet for reactivation air (clean) Inlet for process air (replace)
Inspect the seals around the HoneyCombe® wheel.	Both faces of the HoneyCombe® wheel
Inspect the HoneyCombe® wheel.	Behind access panel, center of unit
Check the temperature at the reactivation outlet	Outlet for reactivation air

Check the reactivation air volume	Readings on reactivation airflow gauge behind front access panel should match the flow diagram located inside the electrical enclosure.
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ADDITIONAL MAINTENANCE, EVERY 60 DAYS

<i>Check this</i>	<i>Location</i>
Inspect the blower fans.	Blower for process air Blower for reactivation air
Inspect the electronic controls.	Cabinet behind control panel
Inspect the wheel drive motor and chain.	Behind front access panel

ADDITIONAL MAINTENANCE, EVERY 6 MONTHS

<i>Check this</i>	<i>Location</i>
Inspect the roller wheels.	Behind access panel, center of unit

ADDITIONAL MAINTENANCE, EVERY 12 MONTHS

<i>Check this</i>	<i>Location</i>
R10 and R15 units only - Change the oil in the bevel gear drive for the wheel. Use Mobil Glygoyle 460 (Munters P/N 94602-01)	Drive unit, behind access panel
Change the flame rod sensor	In the burner. See Figure 6-3.
Check the spark plug gap. Should be 7/64".	In the burner. See Figure 6-3.

6.3 CHECKING THE REACTIVATION OUTLET TEMPERATURE

After the unit has been operating for 30 minutes, the temperature at the outlet of the reactivation air stream should be about 120°F (R05 and R10) or 130°F (R15). Check this outlet temperature with a thermometer. It should be within $\pm 5^\circ\text{F}$. If the outlet temperature falls outside this range, see Section 7 - TROUBLESHOOTING.

6.4 CLEANING THE AIR FILTERS

This unit has an air filter at the intake for the reactivation and process air. It is important to keep all of the air filters clean. If the filters become dirty, the efficiency of the unit will drop off. One symptom of this may be a decreased temperature reading at the outlet for the reactivation air stream. This condition can also cause an overheating fault.

1. Turn off the machine and allow it to cool before changing the filter.

2. The filter at the intake for the reactivation air can be cleaned and reused. The filter is held in place by screws and an access panel (R05), or behind a hinged access panel (R10 and R15). Remove/lift the access panel and remove the filter.
3. Wash the filter using mild soap and water. Allow the filter to air-dry, or use compressed air. When the filter is dry, reinstall it.

 CAUTION

Do not use any kind of filter coating on the reactivation inlet filter. This filter is located just upstream of the electric heating elements. Some filter coatings give off volatile chemicals, which could be pulled into the heating elements. This could create a fire hazard. (It is OK to use filter coating on the filter for the process air, since this air is not pulled through the heating elements.)

6.5 REMOVING AND REPLACING THE HONEYCOMBE® WHEEL

It is important to work carefully when removing and replacing the wheel. The HoneyCombe® section in the center of the wheel can be damaged if it is handled roughly. Some units have been provided with chain drive mechanisms, while others have Munters traditional belt drive system.

1. Turn off the unit. Switch off the power supply to the unit and employ lock out/ tag out procedures.
2. Remove the access panel on the front of the unit. If there is space behind the rear panel, remove this panel also.
3. At the front of the machine, remove the tensioning spring and press down on the idler sprocket. See Figure 6-1 and Figure 6-2. This will release the tension on the chain drive. Remove the chain from the drive sprocket, or the belt from the sheave.
4. On the R05 it will be necessary to remove the rear roller wheels in order for the chain sprocket to clear the roof of the enclosure. Do this while the wheel is supported by the front rollers. Support the wheel with a block of wood, so that it cannot roll backward.

 WARNING

The wheel can be heavy, especially on a larger unit. Allowing the wheel to roll forward suddenly could result in personal injury.

5. If possible, work from the rear of the unit. Remove any braces which run across the wheel opening. Find a strong board which can be used as a ramp for the wheel. Set this in place at the rear of the machine.

 WARNING

Be sure the board is strong enough to support the wheel. Be sure the board is fitted firmly in place.

6. Now it is possible to remove the HoneyCombe® wheel. Roll the wheel out of the rear of the machine.

 CAUTION

Be careful to avoid damage to the seals. Until the wheel is clear of the seals, pull the wheel straight out of the machine. If there is room, place a helper on the opposite side of the machine to guide the wheel and push the seals back. Be especially careful when replacing the wheel.



The wheel assembly is heavy, particularly if it is wet. Use a helper when lifting the HoneyCombe® wheel. It is safe to roll the wheel.

7. To replace the wheel, reverse the steps listed above. It is easiest to work from the rear of the unit. Roll the new wheel carefully into position in the center of the machine.

The wheel includes a metal cam. When viewed from the rear of the machine, this cam should be closest to the left side (process inlet) of the unit. When viewed from the front of the machine (drive assembly side), the cam should be closest to the right side of the machine.

Work carefully to not damage the seals. Do not seat the wheel against the front roller yet.

8. Go to the front of the machine. Slip the end of the drive chain over the end of the shaft for the front wheels. Replace the right end of the shaft in the supporting hole. Move the left-hand collar into position and tighten the set screw. Allow a small amount of side-to-side play on the shaft.
9. For the R05 - lift the front of the motor again, and place the drive chain over the drive sprocket. Allow the drive motor to drop. In belt drive systems, the belt should be aligned with its drive sheave.
10. Ensure the chain is accurately seated on all the sprocket teeth around the wheel circumference
11. Replace the access panels. The unit is now ready to operate.
12. Make a quick check of the airflows and operating temperatures as the machine runs.
13. The new wheel may behave slightly differently from the old one.

6.6 INSPECTING THE HONEYCOMBE® WHEEL

The HoneyCombe® wheel contains a lightweight framework which supports the desiccant chemical. This framework is manufactured in a shape which looks like the honeycomb in a bee hive. The honeycomb pattern includes many small air passages or “flutes” which run through the wheel. These passages are designed to allow air to flow across the desiccant chemical with the least amount of resistance.

Near the seam in the wheel housing there is some engraved text. The text includes the wheel serial number, the date of manufacture, and the manufacturing process used. The following table will help to identify the type of desiccant chemical used in the wheel.

<i>Wheel Chemical</i>	<i>Color</i>	<i>Marking</i>
Titanium enhanced silica gel	Red	Tigel

The HoneyCombe® wheel will generally not foul or plug up unless one of the air streams has not been properly filtered. Plugging is most likely to happen when a unit must operate in a very dusty environment. Problems can be minimized by regular maintenance of the prefilters. If the wheel becomes blocked, this will increase the pressure drop across the wheel for both the process and the reactivation air streams.

Checking the pressure drop is described in Section 4 - INSTALLATION.

To check for moisture damage and plugging, do the following:

1. Shut down the dehumidifier. Turn off the power at the disconnect switch and follow lock out/tag out procedures.
2. Remove the wheel as described in Section 6.5.
3. Check the faces of the HoneyCombe® wheel for signs of softening. Place the palm of your hand flat against the face of the wheel and apply moderate pressure. Run your hand over the entire face of the wheel on both sides. If ends of the flutes are flattened, then the wheel structure is sound. If some of the flutes deform, or the surface depresses under your palm, try the wheel drying procedure listed in Section 7. If, after the drying procedure the wheel is still soft, consult the Service Operations Department and/or the Parts Department at Munters.
4. Also check for damage to the ends of the flutes. This may indicate a problem with the alignment of the wheel. This type of problem is most likely if the support rollers have become worn or misadjusted. Be sure the ends of each roller shaft are pressed down completely in the supporting slots.

Small isolated areas of damage are usually caused by rough handling of the wheel. If the total area of damage is less than 10% of total wheel area, then no action is required. However, if the damaged area is large and equipment performance has deteriorated, the wheel should be replaced.

5. To check for plugging, use a "drop light" with a bulb of at least 60 Watts or higher. Hold the light on the far side of the wheel, facing toward the wheel. The light should be four to six inches from the face of the wheel. By watching the near face of the wheel, look to see if the wheel is plugged. Because the passages are very small, it will not be possible to see the light directly. Instead, there should be a "glow" from the light. If any part of the wheel is plugged, it will appear as a dark area. Scan the entire area of the wheel. Light should be visible at all points on the wheel. If the light is not visible, or if some spots on the wheel are dark, the passages in the wheel are plugged. See the cleaning instructions in Section 6.7.

6.7 CLEANING THE HONEYCOMBE® WHEEL

1. Remove the HoneyCombe® wheel by following the procedure listed earlier.
2. Vacuum both faces of the wheel. Use a "wet/dry" vacuum, and a "dusting brush" attachment with a soft bristle brush.
3. Vacuuming alone may not always remove the blockage. The force of the air can be increased by applying a stream of low-pressure compressed air to one side of the wheel while vacuuming the other. This must be done carefully so as to not damage the wheel. Use dry, oil-free compressed air of no more than 10 PSIG. Do not allow the air jet to come closer than 12" to the face of the wheel. The compressed air will work with the vacuum to clear the blockage.

 CAUTION

Do not use high-pressure air to clean the wheel. Do not hold the air jet near the surface of the wheel. The honeycomb structure inside the wheel may be damaged.

Do not use any other procedure to clean the HoneyCombe[®] wheel. Do not wash the wheel with water or any solvent. The wheel can be easily damaged and make it necessary to buy a replacement.

4. After cleaning, recheck the wheel using the drop light. If the blockage has been removed, reinstall the wheel. If the blockage is still extensive, consult the factory.

6.8 INSPECTING THE SEALS

1. The seals are positioned against each face of the HoneyCombe[®] wheel. One seal is mounted on each side of the wheel. The standard high pressure seal has an outer layer of black Rulon[®], with a red supporting material. The seal is held in place by aluminum pop-rivets.
2. Remove the front and rear access covers. Leave the HoneyCombe[®] wheel in place.
3. Check the clearance between each seal and the face of the wheel. Slide a business card or a feeler gauge of 0.030" between the face of the wheel and the seal face. Check all of the seal area on both sides of the wheel. At each point, there should be a moderate drag or resistance as the card or feeler is slid along the seal.

If at any point on the seal there is little or no resistance, replace the seals with new ones. See Section 6.9.

If there is little or no drag on one side, and excessive drag on the other side, check the rollers which support the wheel. Look for wear on the roller bushings. See Section 6.14.

4. If the HoneyCombe[®] wheel is removed, the surface of each seal can be inspected. On the face of the seal (the portion that comes in contact with the HoneyCombe[®] wheel) is a black coating known as Rulon[®], which is a Teflon[®] material. Inspect the upper surface of each seal for any signs of excess wear. If the red portion of the seal is visible through the black, the seal should be replaced.
5. If a seal is torn, a temporary repair can be made by using high temperature silicone caulking (such as GE RTV[®]). Bond the torn section back together. Avoid getting the silicone on the outer or wearing portion of the seal. This can cause excess drag. Plan to replace the damaged seal as soon as possible.

6.9 CHANGING THE SEALS

 CAUTION

The HoneyCombe[®] seals are delicate, and require extra care during handling. Failure to handle them carefully could result in damage to the seals and/or equipment.

1. Remove the HoneyCombe[®] wheel as outlined earlier.
2. Each seal is held in place by a series of clips. Slide the old seal out of the clips.

 CAUTION

Each HoneyCombe[®] seal must be installed so that the seal joints are not in contact with the seal clips. Failure to install the seal this way could result in damage to the seal and/or equipment.

3. Fit the new seal into the same clips.

6.10 INSPECTING THE BLOWER FANS

1. Turn off the unit before checking the blower fans. Turn off the power at the disconnect switch and follow lock out/tag out procedures.
2. After the unit is turned off, wait three minutes to allow the unit to stop operating.



WARNING

The blowers inside the R-Series unit spin at a high rate of speed. Hands may be badly hurt if put inside the blower while it is turning. Keep hands away from the blowers while the unit is turned on. Turn off the power, using the disconnect switch or circuit breaker, before inspecting the fans. Follow standard lock-out tag-out procedures.

3. The process blower location is shown in Figures 3.3 through 3.8. In the R10 units, the fan is located in a fan plenum. Remove the access panel to gain access to the blower. There is a manual damper connected downstream of each blower. Open the damper. The R05 units also have a protective guard at the blower discharge. The manual damper and guard may need to be removed to gain access to the blower. Reach through the damper opening and touch the fan itself. The fan should spin easily.
4. The reactivation blower location is shown in Figures 3.3 through 3.8. . There is a manual damper and duct adaptor plate connected to each blower discharge. Open the manual damper. The damper and guard may need to be removed to gain access to the blower. Reach through the damper opening and touch the fan itself. The fan should spin easily.
5. If one of the fans is difficult to turn, or there is a noticeable grinding or “gritty” feel, something is wrong. Check for anything which could be rubbing against the fan.
6. If this does not reveal the problem, remove the fan and motor. The blower assembly for the reactivation air is mounted on a plate which is held in place by a number of bolts. Remove the plate, and then remove the assembly. Use an Allen wrench to loosen the fan, and then remove it. This will allow access to the bolts which attach the motor to the plate.
7. The process air blower assembly for the R05 unit is mounted on a plate which is held in place by a number of bolts. Remove the plate, and then remove the assembly. Use an Allen wrench to loosen the fan wheel hub, and then remove it. This will allow access to the bolts which attach the motor to the plate. The R10 and R15 process blowers are floor mounted within the fan plenum.
8. Turn the motor shaft by hand to check the motor bearings. There should be no free play when the motor shaft is tried to move side-to-side. A motor with stiff or gritty bearings must be replaced.
9. Check the blower blades for excessive dirt or corrosion. If dirt is attached to the blades, this can reduce the blower’s performance. If any blades are broken or missing, this will cause an imbalance, and can damage the motor bearings.

6.11 INSPECTING THE ROLLER WHEELS

1. The HoneyCombe® wheel is supported on four wheels. Remove the front and rear

access panels so the wheels can be accessed.

2. Each pair of wheels is supported on a shaft. Each shaft is held in place by two collars. There should be a small side-to-side play on the shaft.
3. If the wheels become worn, excessive play may develop. This can cause uneven support of the HoneyCombe® wheel. Inspect the wheels and check for signs of wear. Replace them if necessary.
4. The wheel assemblies use greaseless bushings made of Delrin®. These bushings do not require lubrication.



Do not lubricate the bushings on the support wheels. The lubricant may damage the plastic material on the outer layer of each wheel.

6.12 INSPECTING THE ELECTRONIC CONTROLS

1. Turn off the power to the machine and follow the lock out/tag out procedure before opening any of the electrical cabinets.
2. Open the cabinet behind the main control panel. Check the contactors for signs of pitting.
3. Make a general check for possible problems – frayed wires, overheated parts, etc.

6.13 INSPECTING THE WHEEL DRIVE MOTOR (CHAIN DRIVE SYSTEMS)

1. The drive motor is located behind the front access panel.
2. Figure 6-1 and Figure 6-2 show how the chain is located on the drive sprocket. When the chain is disconnected, try to turn the drive sprocket by hand. The motor shaft should not be able to move side-to-side. There should not be any significant backlash between the drive gears. If either condition exists, replace the motor.
3. If the drive sprocket is being replaced, mount the sprocket as close as possible to the body of the motor. This will reduce the side load on the shaft and bearings.
4. The idler sprockets on the chain return to the wheel should also be inspected for excessive wear.
5. Check that all hardware and set screws are tight before returning equipment to service.

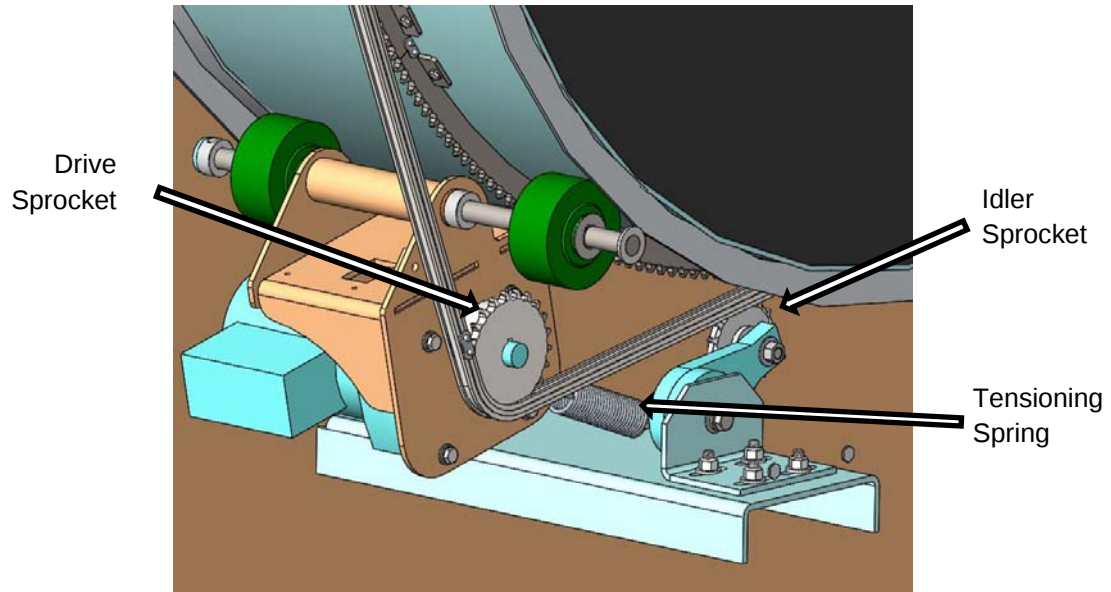


Figure 6-1
R05 CHAIN DRIVE ASSEMBLY

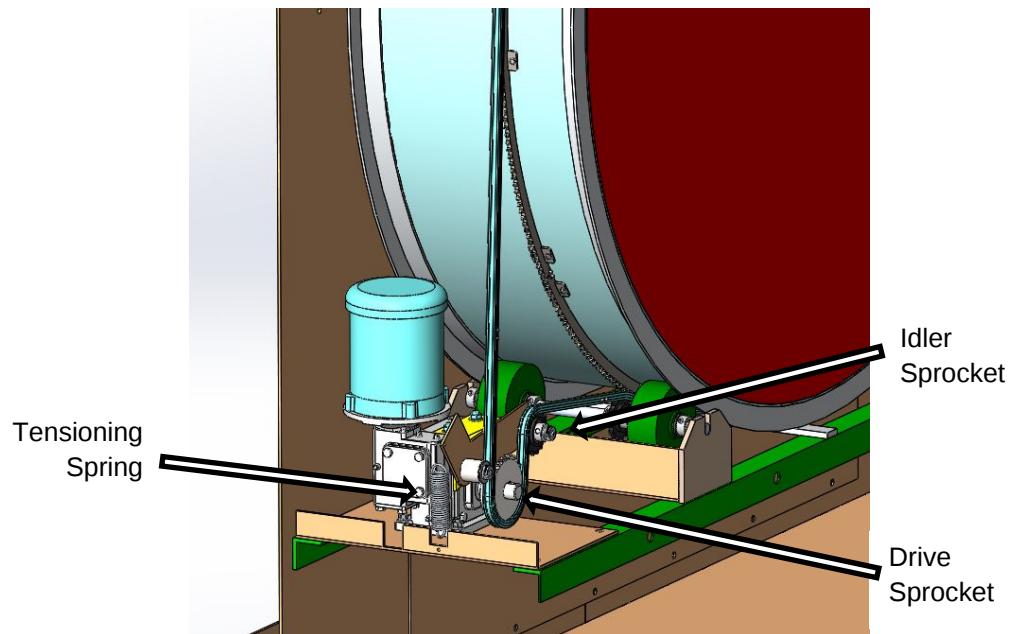


Figure 6-2
R10 & R15 CHAIN DRIVE ASSEMBLY

6.14 INSPECTING AND MAINTAINING THE CHAIN

1. The chain should be inspected every six months for cleanliness, lubrication, alignment, damage, and excessive wear. Replace it if necessary.
2. In order to lubricate the chain, it's best to start with a clean chain. The chain can be cleaned using commonly available cleaning/degreasing products (found at home centers, hardware and automotive stores) and shop rag.
3. Munters recommends lubricating the chain with a dry lubricant spray such as

DuPont Teflon® Mutli-Use Lubricant. Follow “Directions for Use” on the lubricant.

4. Check for alignment and centering of the chain relative to the ring sprocket on the perimeter of the desiccant wheel. Inspection should be performed on the return from the drive motor sprocket to the return of the ring sprocket.
5. Check that all hardware and set screws are tight before returning equipment to service.

6.15 INSPECTING THE WHEEL DRIVE MOTOR AND BELT (BELT DRIVE SYSTEMS)

1. The drive motor is located behind the front access panel.
2. Check the belt for signs of stiffness or cracking. Replace it if necessary. In order to do this, you must remove the wheel.
3. Disconnect the belt from the drive pulley. On the R05, lift the pivot assembly and remove the belt from the drive pulley. On the R10 and R15, press down on the idler to loosen the belt and remove the belt from the pulley. When the belt is disconnected, try to turn the drive pulley by hand. You should not be able to move the motor shaft side-to-side. There should not be any significant backlash between the drive gears. If you notice either condition, replace the motor.
4. If you replace the drive pulley, mount the pulley as close as possible to the body of the motor. This will reduce the side load on the shaft and bearings.
5. When replacing the drive belt, be sure the belt is centered on the drive pulley. If the belt is off-center, the pulley may not be able to provide enough drive to turn the wheel. This can cause the wheel to turn more slowly than it should.

6.16 CHECKING THE HUMIDISTAT (OPTIONAL)

1. Start by adjusting the humidistat to the high end of the scale (close to 100% relative humidity). At this point, the humidistat should not be calling for drying. The contacts inside the humidistat should be closed, and 0VDC should be present across the contacts.

NOTICE

The contacts inside the humidistat carry 24VDC. Shorting of the leads could result in failure of fuses within the electrical enclosure.

2. Next, adjust the humidistat to the low end of the scale (close to 10% or 20% relative humidity). Now the humidistat should be calling for drying, and the contacts inside the humidistat should be opened. 24VDC should be present across the contacts.
3. The wiring between the humidistat and the unit can also be checked. See the wiring diagram included in this manual. When the humidistat is not calling for dehumidification, 0 VDC should be present across the contacts. When the humidistat does call for dehumidification, the voltage across the terminals should be 24VDC.

6.17 BURNER ADJUSTMENT PROCEDURE



WARNING

If the information in this manual is not followed exactly, a fire or explosion may result, causing property damage, personal injury or loss of life.

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

In the presence of a gas odor:

- Do not try to light any appliance.
- Do not touch any electrical switch; do not use any phone in your building.
- Immediately call your gas supplier from a nearby phone.
- Follow the gas supplier's instructions.
- If the gas supplier cannot be reached, call the fire department.
- Installation and service must be performed by a qualified installer, service agency, or gas supplier.

The area in the center of the burner is hot. Move very carefully when working near this area. See Figure 6-3.

Do not try to control the heat output by changing the air flow through the burner. Energy modulation is handled by the gas modulation valve shown in

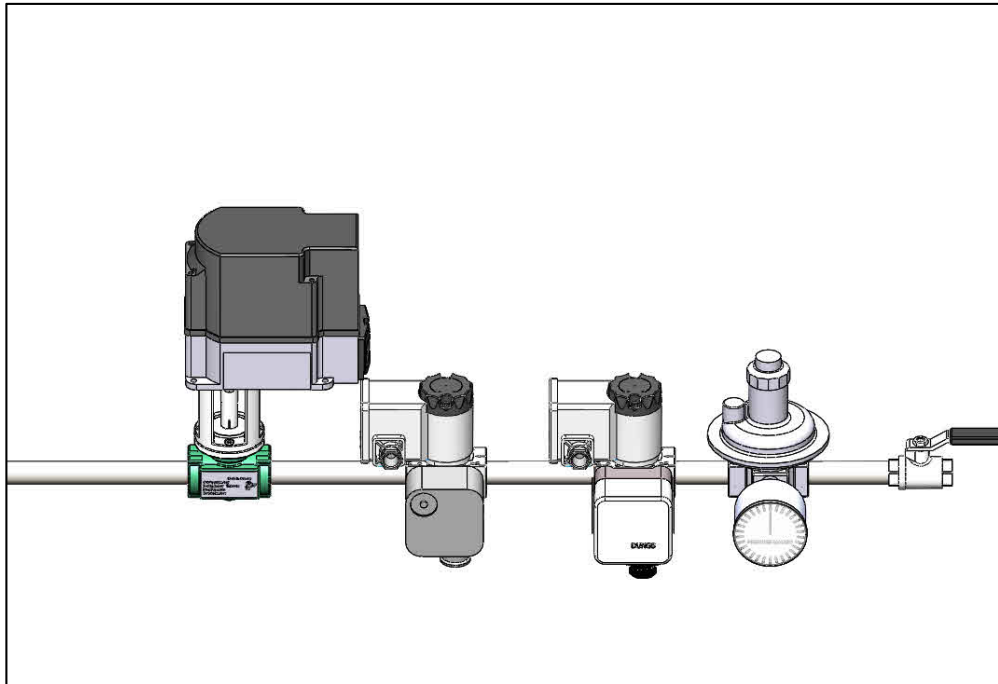


Figure 6-4.



WARNING

Open flame can cause gas to ignite and result in

property damage, severe injury, or loss of life.

The dehumidifier/air handler and all other gas appliances sharing the gas supply line must be firing at maximum capacity to properly measure the inlet supply pressure. The pressure can be measured at the supply pressure port on the inlet manual ball valve. Low gas pressure could be an indication of an undersized gas meter, undersized gas supply lines and/or an obstructed gas supply line. The dehumidifier/air handler unit is equipped with low and high gas pressure switches that are integrally vent limited. These types of devices do not require venting to atmosphere

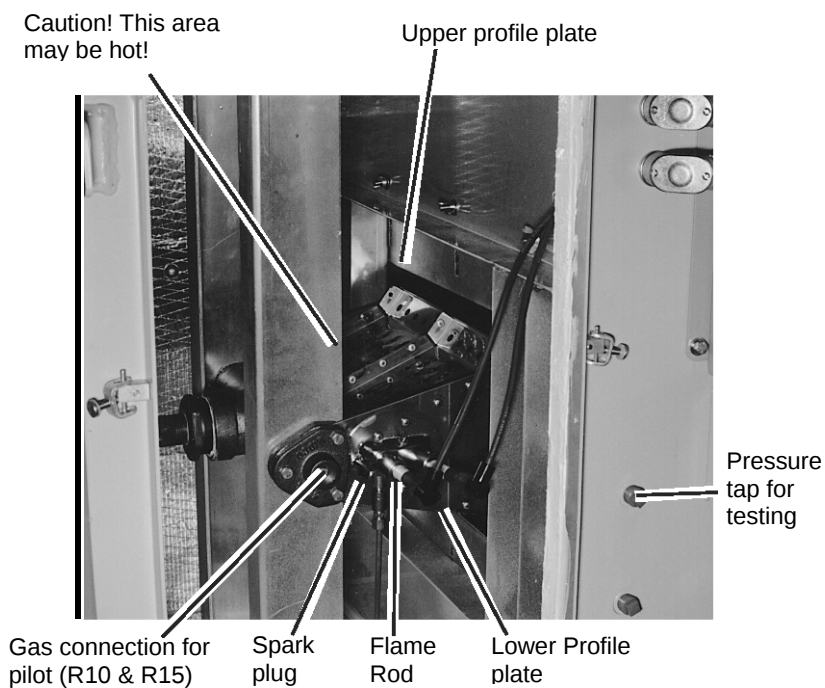


Figure 6-3
DIRECT-FIRED GAS BURNER ASSEMBLY

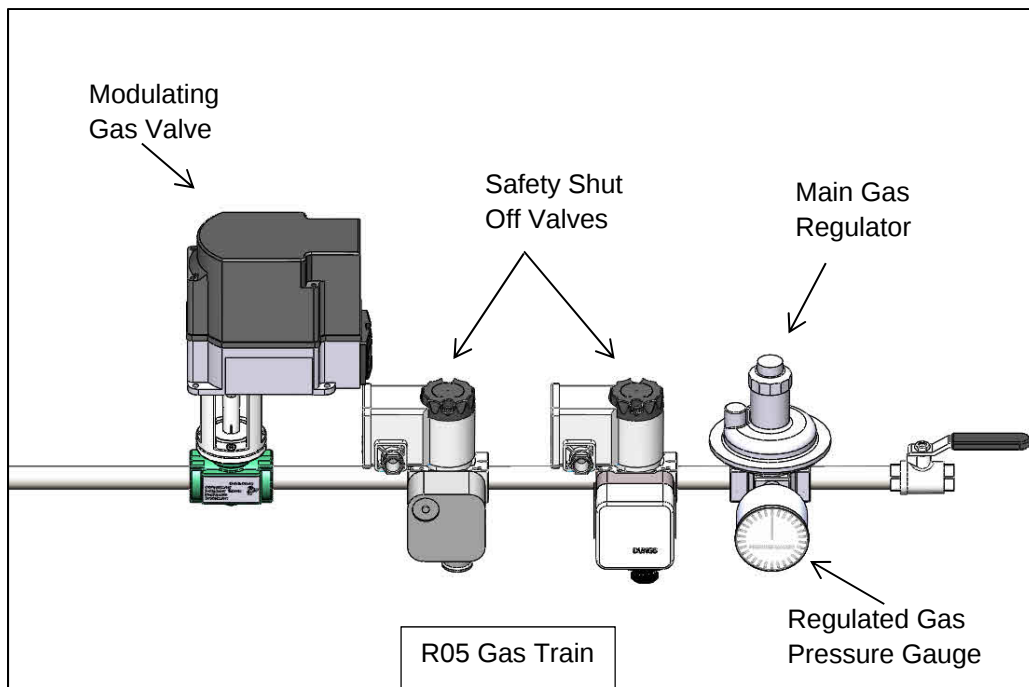
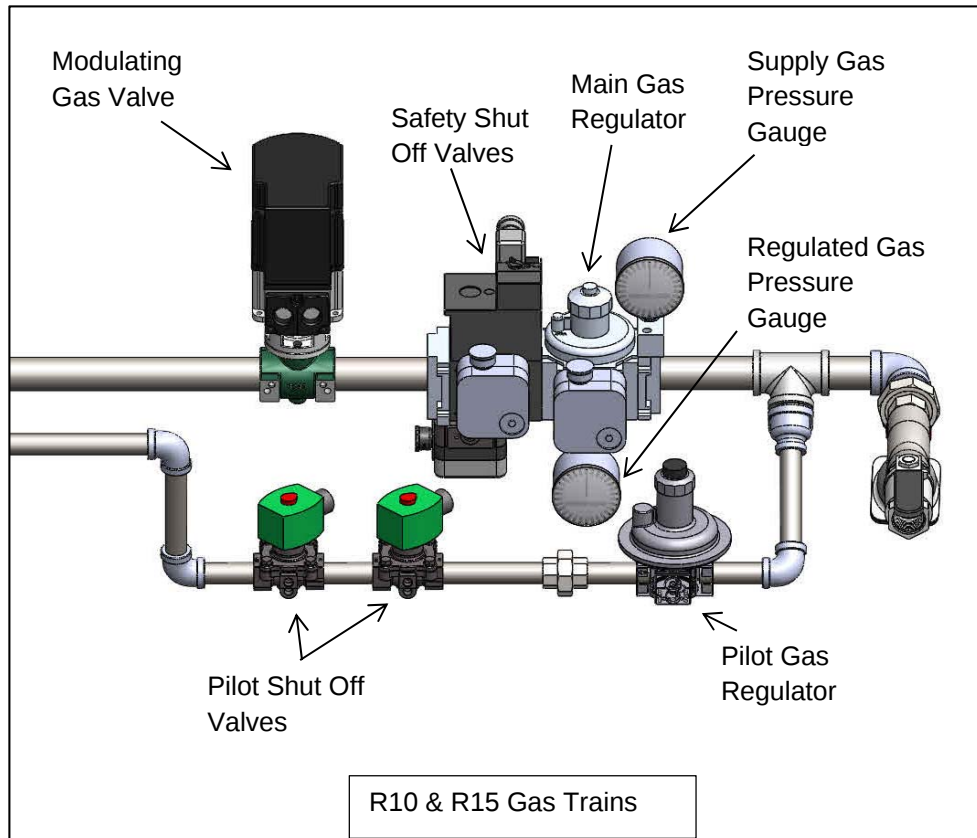


Figure 6-4
GAS TRAIN ARRANGEMENTS

1. Before beginning the test, close the manual gas valve that is located farthest down-stream.

 WARNING

The installation must conform to the requirements of the local jurisdiction having authority, and, in the United States, to the latest edition of the National Fuel Gas Code, ANSI Z223.1/NFPA54. In Canada, the installation must conform to the latest edition of the Natural Gas and Propane Installation Code, GSA B149.1 and/or local codes. Any modifications to the burner, its gas controls, or wiring may void the warranty. If field conditions require modifications, consult the factory representative before initiating such modifications.

2. Inspect the gas system for any leaks using a bubble test with a non-corrosive soapy solution. If leaks are found, isolate the main gas supply from the equipment and correct the leaks.
3. Check the gas supply pressure to the first gas train component on the Munters supplied equipment. Ensure that it is between the minimum and maximum supply pressures listed on the rating plate.

 WARNING

Before trying to light the burner, ensure that there is no power at any of the gas valves when the ignition control is de-energized. Ensure that the main gas valves are closed.

4. Ensure that both the process and reactivation fans are running and that the wheel pressure drop has been adjusted for both. Note that when the burner lights, the pressure drop of the reactivation loop will steadily increase as the air warms. It is good practice to set the air flow low (10- 20%) in the unfired condition to compensate for this effect.
5. Adjust the pilot pressure until the pilot lights reliably (R10 & R15 only). Multiple tries may be necessary to bleed air from the gas line. If the gas pressure to the pilot is too high or too low, the pilot may not light properly. The pilot is adjusted at the factory. If pilot adjustment is necessary in the field, reduce the pilot gas pressure using the pilot regulator, and then gradually increase the pilot gas pressure until the pilot lights. Finally, increase the pilot pressure by 1.5 turns on the pilot regulator. The pilot gas pressure to the pilot should be approximately 3.5" WC. The pilot flame should be a bushy blue flame inside the first 1/4 of the air wings. See Figure 6-5.

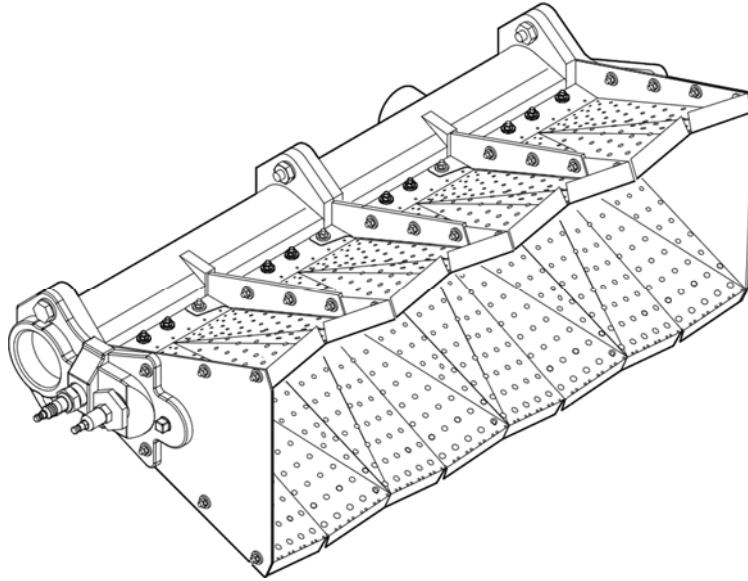


Figure 6-5
AIR WINGS

6. Allow the burner to fire and ensure that the 'heated to' value entering the desiccant wheel does not exceed 300°F.
7. Confirm that when the burner is firing, the supply gas pressure up to the Munters supplied equipment is between the minimum and maximum gas supply pressure values listed on the rating plate.
 - If the gas pressure is not correct, make adjustments to the supply gas pressure until it is within the two values. The equipment must not be operated above or below the gas supply pressure values listed on the rating plate.
 - The supply gas pressure regulator supplying fuel to the Munters equipment must be of the "lock-up" type to prevent excessively high pressure from reaching the Munters equipment when the burner is not firing.
8. Ensure that the profile plates are adjusted to produce a 0.8" WC drop across the plates while the burner is firing. Make sure the reactivation flow air pressure drop is set properly before checking the profile plate pressure drop. Do not adjust the plates while the burner is firing.
9. Use a pressure measuring device capable of measuring pressures up to 13" WC and rated for use with combustible gasses. Attach this between port C and port B shown in Figure 6-6. Port C should be connected to the burner manifold and port B should be downstream of the profile plate.

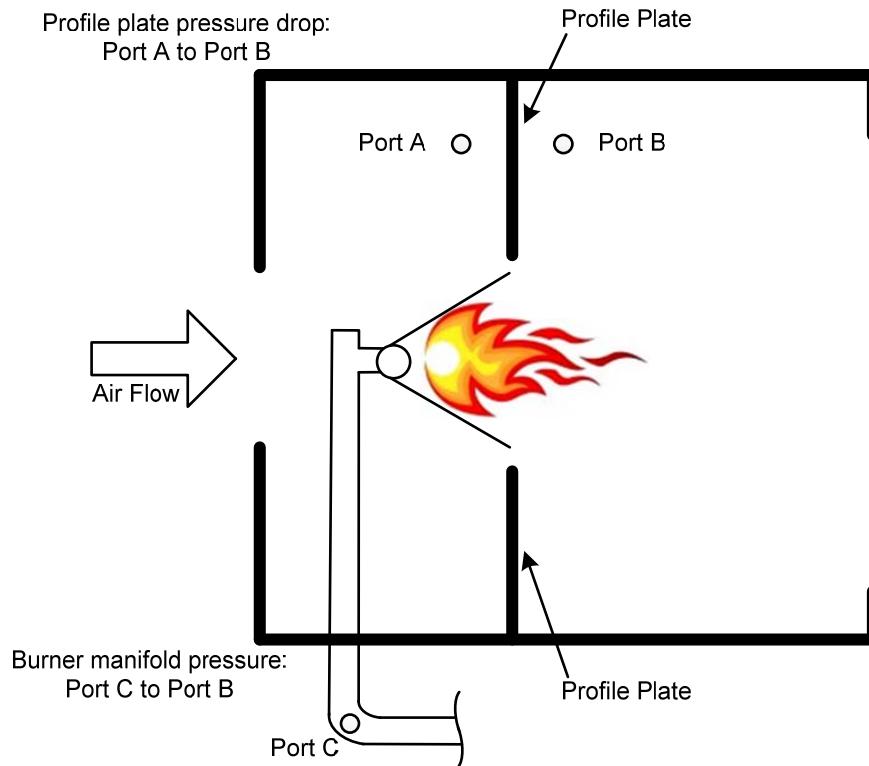


Figure 6-6
AIR WINGS

10. Adjust the burner gas pressure regulator such that when the gas butterfly valve is in its maximum open position (gas heat cv of 100% from the PLC) that the difference in pressure between ports C and B is at the "Full Rate Manifold Pressure" as stated on the Munters rating plate.

The differential pressure switch is set at the factory, and monitors the gas pressure in the gas manifold. This switch limits the minimum firing rate of the burner and should not be field adjusted.

11. If the pressure difference between C and B is higher than the value listed on the rating plate, reduce the gas supply pressure to the butterfly valve by adjusting the gas regulator. If the pressure is less than the number on the rating plate, increase the gas supply pressure to the butterfly valve. To adjust the "Full Rate Manifold Pressure," use the regulator supplied with the Munters equipment gas train, not the supply pressure regulator that is part of the site's gas utilities.
12. Recheck for gas leaks at the end of the test using a bubble test with a non-corrosive soapy solution. If leaks are found, isolate the main gas supply from the equipment and correct the leaks.
13. Verify that when the power is removed from the "call for heat" terminal on the ignition module, the main and pilot gas valves close, and the main and pilot flames extinguish.
14. If this procedure does not result in a properly operating burner, or the maximum firing rate cannot be achieved, consult the factory.

6.18 CHECKING THE FLAME ROD

1. Be sure that the rod is securely mounted. If the outside of the rod is corroded, gently clean it using fine (#0000) steel wool. The rod should be replaced once a year.
2. Check the wiring and replace it if it is dried or cracked.

6.19 CHECKING THE SPARK PLUG

1. Remove the plug and check the gap. This should be 7/64 (0.10) inch.
2. Check the wiring and replace it if it is dried or cracked.

6.20 STORAGE AND LONG-TERM SHUT-DOWN

Turn off all energy inputs to the machine. Turn off all electrical power and the gas supply.

The desiccant in the HoneyCombe® wheel will continue to absorb some moisture after the dehumidifier is shut down. If the wheel is allowed to absorb too much moisture over a period of time, the wheel may not be able to perform normally when the unit is turned on again.

Seal the dehumidifier to prevent the open air from reaching the HoneyCombe® wheel. This can be done by fitting moisture barriers over the openings in the unit:

- Process inlet
- Process outlet
- Reactivation inlet
- Reactivation outlet

To make the moisture barriers, use strong plastic sheeting sealed with duct tape.

7 - TROUBLESHOOTING

There are two parts to this section of the manual. The first part lists each of the fault and warning indicators. In the second part, there are some additional detailed troubleshooting checks.

In order to check these conditions, the R-Series unit must be turned on and operating, or trying to operate.



The R-Series unit is wired for up to 575 VAC. There can be enough voltage and current present at the unit to result in death or cause severe burning. Always turn off the power before working inside the unit. Follow standard lock-out tag-out procedures. Only trained electricians should perform work with the electrical parts.



The blowers inside the R-Series unit spin at a high rate of speed. Hands may be badly hurt if put inside the blower while it is turning. Keep hands away from the blowers while the unit is turned on.

If this documentation does not address a specific issue, call the Technical Support Department at Munters. Technicians are available to answer questions and assist with troubleshooting:

Tel: 1-978-241-1100

Fax: 1-978-241-1217

The control system on this machine is set up to react to problems in two possible ways:

- A "fault" is caused by a condition which might create a danger to personnel or damage to the machine. A fault condition lights a red indicator on the front panel and causes the machine to shut down.
- A "warning" is caused by a condition which might make the machine run less efficiently. A warning condition allows the machine to continue to run, but signals that corrective action is advised.

Refer to section 5.6 for additional information on alarms and recovering from fault / warning conditions.

7.1 TROUBLESHOOTING GUIDE

Problem	Possible Cause	Recommended Remedy
Power turned on, unit does not run, and no indicator lights	No power to the unit or loss of one phase of power.	Check power to the unit.
	Failed fuses	Determine which fuse failed and why. Replace fuses if necessary.
Power turned on, unit does not run, and indicator lights on	Phases of supply power are out of sequence.	Check three phase power monitor and switch two of the incoming phases if necessary.
Unit runs in Manual position but does not run in Auto.	Humidistat (option) failed.	Check humidistat wiring, replace humidistat if necessary.
	Humidistat setpoint is higher than measured value.	Reduce humidistat setpoint.
Humidity is high, dehumidifier performance is poor.	Controlled space is not completely sealed.	Seal all ductwork.
		Make process space vapor-tight.
	Unit is not operating at design conditions.	Consult flow diagram for correct pressure drops across wheel. See "Maintenance"
		Reduce moisture load or temperature to dehumidifier in order to operate at design conditions.
		Check for leakage in air handler outside of dehumidifier.
	Wheel is clogged.	Monitor wheel pressure drop for multiple revolutions, looking for changes in pressure drop readings.
		Visually inspect wheel. See "Maintenance"
	Wheel is not rotating at proper speed (8 rph).	Check wheel drive motor and chain.
Reactivation inlet over temperature fault	Reactivation air flow is low.	Inspect reactivation blower for blockage.
		Inspect reactivation blower damper position.
		Inspect reactivation filters for clogging.
	Gas modulation valve malfunction	Check for correct control signal.
		Check for mechanical problem with valve.
	High gas supply pressure.	Check supply pressure.
		Check gas pressure regulator setting.
	Thermocouple for high over temperature switch has failed.	Inspect sensor and wiring. Replace as necessary.
Blower and / or wheel drive motor is not running	Motor overload has tripped.	Inspect blowers and motors for obstructions, remove obstruction, and reset with button on starter.

		Inspect unit operation for overblowing or closed dampers. Adjust and reset with button on starter.
Low reactivation outlet temperature warning	Reactivation air flow is high.	Inspect reactivation blower damper position.
	Unit is not operating at design conditions.	Consult flow diagram for correct pressure drops across wheel. See "Maintenance" Ensure bypass damper is not fully closed (R15 only).
		Reduce moisture load or temperature to dehumidifier in order to operate at design conditions.
		Check for leakage in air handler outside of dehumidifier.
	Reactivation energy is not operating.	Inspect circuit breaker. Determine cause of trip and reset.
		Control components have failed. Inspect and replace as necessary.
		Control signal is not being sent from PLC. Inspect wiring and control module and replace as necessary.
		Inspect for open heating element. Replace as necessary.
	Reactivation duct and / or filter is blocked.	Inspect duct and filters for clogging. Repair / replace as necessary.
	Thermocouple has failed.	Inspect sensors and wiring. Replace as necessary.
	Low gas supply pressure.	Check supply pressure.
		Check manual isolation valves are fully open.
		Check gas pressure regulator setting.
		Check wiring / signal to shutoff valves.
	Gas modulation valve malfunction	Gas strainer is clogged.
		Check for correct control signal.
DH wheel fault	Chain no longer engaged with wheel sprocket	Check for mechanical problem with valve.
	Cam is not making contact with rotation detector switch (LS01)	Loosen tension on the chain at the drive motor and realign chain on sprocket.
Airflow pressure fault	Reactivation blower is not operating.	Inspect location of cam and correct as necessary.
	Reactivation duct and / or filter is blocked.	See "Blower and / or wheel drive motor is not running."
Burner does not light / maintain flame	Spark plug issue	Inspect duct and filters for clogging. Repair / replace as necessary.
		Check spark plug gap. See Section 6.19.
		Check integrity of spark plug.
	Flame sensor issue	Check wiring to spark plug.
		Check integrity of flame sensor. See Section 6.18.
		Check wiring / grounding of flame sensor.

	Ignition controller system issue	Check power to flame safety controller.
		Check alarm status on flame safety controller.
		Check ignition transformer and connection.
	Insufficient gas supply pressure to main / pilot line	Check supply pressure.
		Check manual isolation valves are fully open.
		Check gas pressure regulator setting.
		Check wiring / signal to shutoff valves.
		Gas strainer is clogged.
Flame issue (ideal flame is strong blue with small yellow tips)	Incorrect gas supply	Check supply pressure.
		Check manual isolation valves are fully open.
		Check gas pressure regulator setting.
		Check wiring / signal to shutoff valves.
		Gas strainer is clogged.
	Incorrect reactivation air flow	Inspect duct and filters for clogging. Repair / replace as necessary.
		Inspect reactivation blower for blockage.
		Inspect reactivation blower damper position.
		Check profile plate pressure drop.
	Main gas valve not functioning	Check for correct control signal.
		Check for mechanical problem with valve.
	Burner is clogged	Inspect and clean the air wings as necessary.

7.2 CHECKING THE POWER DISTRIBUTION SYSTEM

For details of the power distribution system, see the Wiring Diagram.

1. If supplied, the three-phase AC entering the unit is checked by a three-phase power monitor (PMO1). If one of the phases is missing, or if the rotation of the motors is reversed, a red LED on this unit will light. The power monitor is also tied to the E-Stop interlock circuit.
2. The contactor for each of the motors (OLRx) has integral short-circuit and overload protection. An overload will trigger a fault indication on the front panel (3 flashes). A short-circuit will trip the contactor. It can be reset by pressing a button on the front of the unit.
3. A thermocouple (TC01) senses the reactivation outlet temperature.

Based on the input from TC01 and TC02, the PLC uses solid-state relays (SSR1) to control or modulate the output of the first set of heating elements. Each SSR receives an analog input from the PLC, and switches one phase of the AC to the heating elements. When the SSR is receiving the analog input, and is supposed to be turned on, an amber LED on the SSR lights. See Figure 7-1. Whenever the amber LED is on, the SSR should be producing an output.

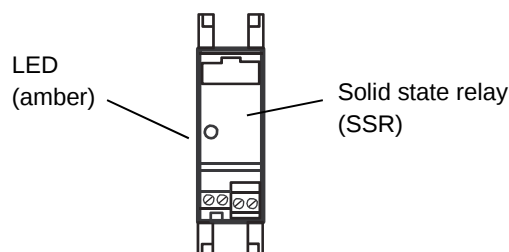


Figure 7-1
SOLID STATE RELAY

Each additional heating zone can be switched on by the PLC via a contactor. As additional heating is required, the PLC turns on these additional zones. The total heat output is still "fine-tuned" by the PLC modulating the first zone via the SSR.

7.3 CHECKING THE HEATING ELEMENTS

1. The heating elements are located in the intake side of the reactivation air stream (upstream of the desiccant wheel).
2. Turn off the power to the unit!



Turn off the power to the R-Series unit before working with the heating elements. These parts carry high voltage and current which can result in death or cause severe burning. Set the Auto/Off/Manual switch to the Off position. Follow standard lock-out tag-out procedures.

3. Remove the cover on the heater element housing.
4. To check the elements, remove the buss bars which connect the individual heating elements. Check the resistance across each of the heating elements using an Ohmmeter. Check inside the heater compartment, on the underside of the cover, to

find the wiring diagram for the heating elements. If an element is operational, there should be a resistance of a few Ohms through the element. An open circuit or a high resistance indicates a failed element.

7.4 CHECKING THE GAS MODULATION VALVE

The gas modulation valve is controlled by the PLC, based on the temperature at the reactivation outlet. The amount of energy required depends on the moisture load and the temperature of the air entering the burner. The gas modulation valve changes the amount of gas input to react to changes in energy demand. When the burner needs less energy, the valve will reduce the gas flow. The modulation valve may be allowed to close completely. Some gas will still flow to the burner.

The simplest way to check this system is to monitor the control output from the PLC, and the position of the modulation valve. To check the output from the PLC, use a DC voltmeter. (The signal should be from 0-10VDC)

1. When the unit is first turned on, the control system should be calling for maximum heat and the voltage supplied to the modulation valve should be rising to 10 Volts.
2. As the demand for heat is reduced, the control system will gradually close the modulation valve.

7.5 CHECKING THE AIRFLOW SWITCH

The airflow switch (AFS1) senses the reactivation air flow. If the reactivation airflow drops below a preset limit, this control will de-energize the burner control circuit. Use a Volt/Ohmmeter to check the 110VAC signal from the switch. See the wiring diagram included in this manual. The table below shows how the switch should behave.

<i>Machine function</i>	<i>Switch behavior</i>
Unit switched off	Contacts normally open, infinite resistance across switch
Unit running	Contacts closed, no voltage drop across switch
Abnormally low reactivation air flow	Contacts open, 110VAC across switch

7.6 CHECKING THE HIGH TEMPERATURE LIMIT SWITCH

The high temperature limit switch (TS01) senses the temperature of the reactivation air entering the dehumidifier. The thermocouple is placed downstream of the reactivation heater, and upstream of the HoneyCombe® wheel. The setpoint is factory set at 350°F and does not require adjustment. (Higher temperatures may damage the wheel.) If the temperature rises above the setpoint, the dehumidifier will shut down and lock into a fault condition. The following table shows how the switch should behave:

<i>Machine function</i>	<i>Switch behavior</i>
Unit switched off	Contacts, normally closed, no resistance across switch
Unit running	Contacts close, no voltage drop across switch
Temperature above temperature switch fault setpoint	Contacts open, 110V AC across switch

7.7 CHECKING THE FLAME ROD SENSOR

1. The flame rod sensor checks for flame during the start-up process. When the gas is turned on, the ignitor begins to spark. If the flame rod does not detect the flame within a few seconds, the gas is shut off. The dehumidifier will shut down and lock into a fault condition.
2. The circuits used with the flame rod are very sensitive to current flow. If the connections in the circuit are loose, or the wires are not grounded properly, the controller may not get the signal from the flame rod. A cracked insulator or a wet wire could cause the same problem. Any of these conditions could prevent the unit from starting.
3. If the outside of the rod is corroded, this could keep the sensor from operating correctly. Use a fine-grade steel wool (#0000) to gently remove any rust.

7.8 CHECKING THE HUMIDISTAT (OPTIONAL)

1. Start by adjusting the humidistat to the high end of the scale (close to 100% relative humidity). At this point, the humidistat should not be calling for drying. The contacts inside the humidistat should be closed, and 0VDC should be present across the contacts.

NOTICE

The contacts inside the humidistat carry 24VDC. Shorting of the leads could result in failure of fuses within the electrical enclosure.

2. Next, adjust the humidistat to the low end of the scale (close to 10% or 20% relative humidity). Now the humidistat should be calling for drying, and the contacts inside the humidistat should be opened. 24VDC should present across the contacts.
3. The wiring between the humidistat and the unit can also be checked. See the wiring diagram included in this manual. When the humidistat is not calling for dehumidification, 0 VDC should be present across the contacts. When the humidistat does call for dehumidification, the voltage across the terminals should be 24VDC.

7.9 CHECKING THE THERMOCOUPLES

R-Series have two thermocouples: TC01 and TC02. Because of the way these parts operate, they cannot be checked with a voltmeter. If a thermocouple fails, it usually does so in an "open-circuit" condition. It is possible to check continuity through the suspect unit with an Ohmmeter. Be sure to turn off the R-Series unit before performing this check. Disconnect one of the leads, so other circuitry will not affect the reading.

7.10 TROUBLESHOOTING USING THE PLC

The R-Series unit is controlled by a "programmable logic controller" or "PLC." The PLC is a small computer which executes a simple set of commands or "program." The program is organized as a loop which repeats continuously.

The PLC is mounted inside the control enclosure. Three LEDs on the front of the PLC show the status of the PLC itself. See Figure 7-2 and the following table.

The following table may help to interpret the three LEDs.

LED	Color	Normal Behavior
Error	Solid Red	Defective hardware
	Flashing Red	PLC error
Run / Stop	Solid Yellow	PLC in Run mode (not program mode)
	Solid Green	PLC in Stop mode
	Alternating Green & Yellow	PLC is in Startup mode
Maintenance (Maint)	Yellow	Flashes whenever a memory card is inserted. The CPU then changes to STOP mode and one of the following functions needs to be performed to initiate the evaluation of the memory card: • Change the CPU to RUN mode • Perform a memory reset (MRES) • – Power-cycle the CPU

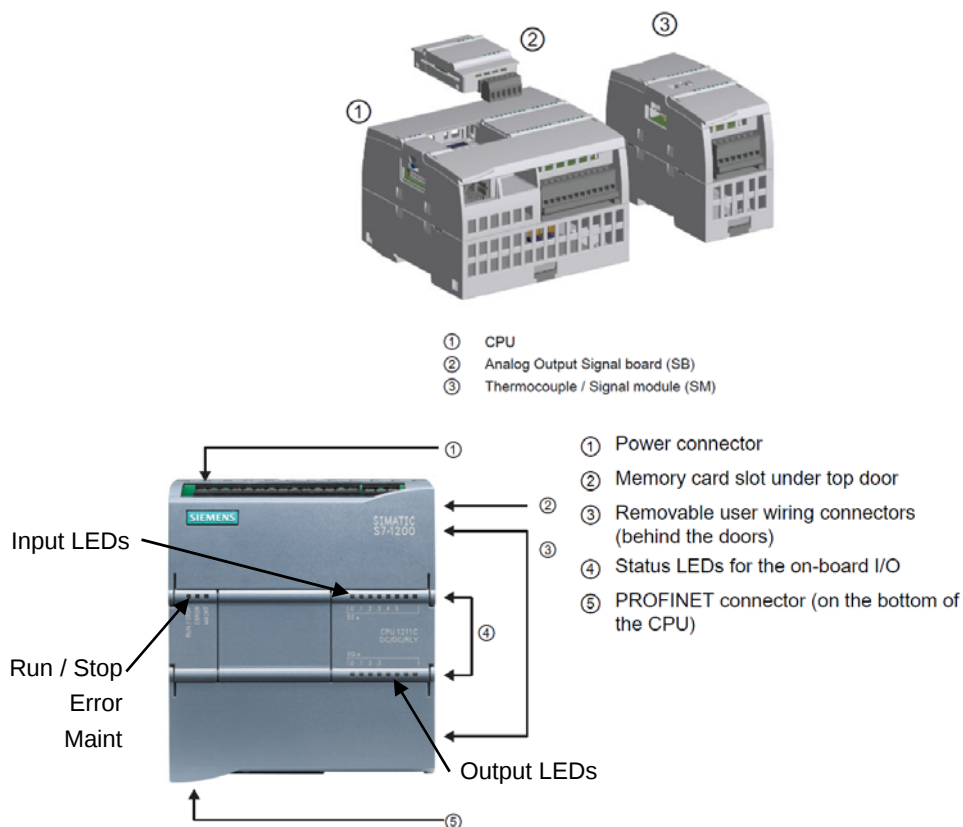


Figure 7-2
PROGRAMMABLE LOGIC CONTROLLER (PLC)

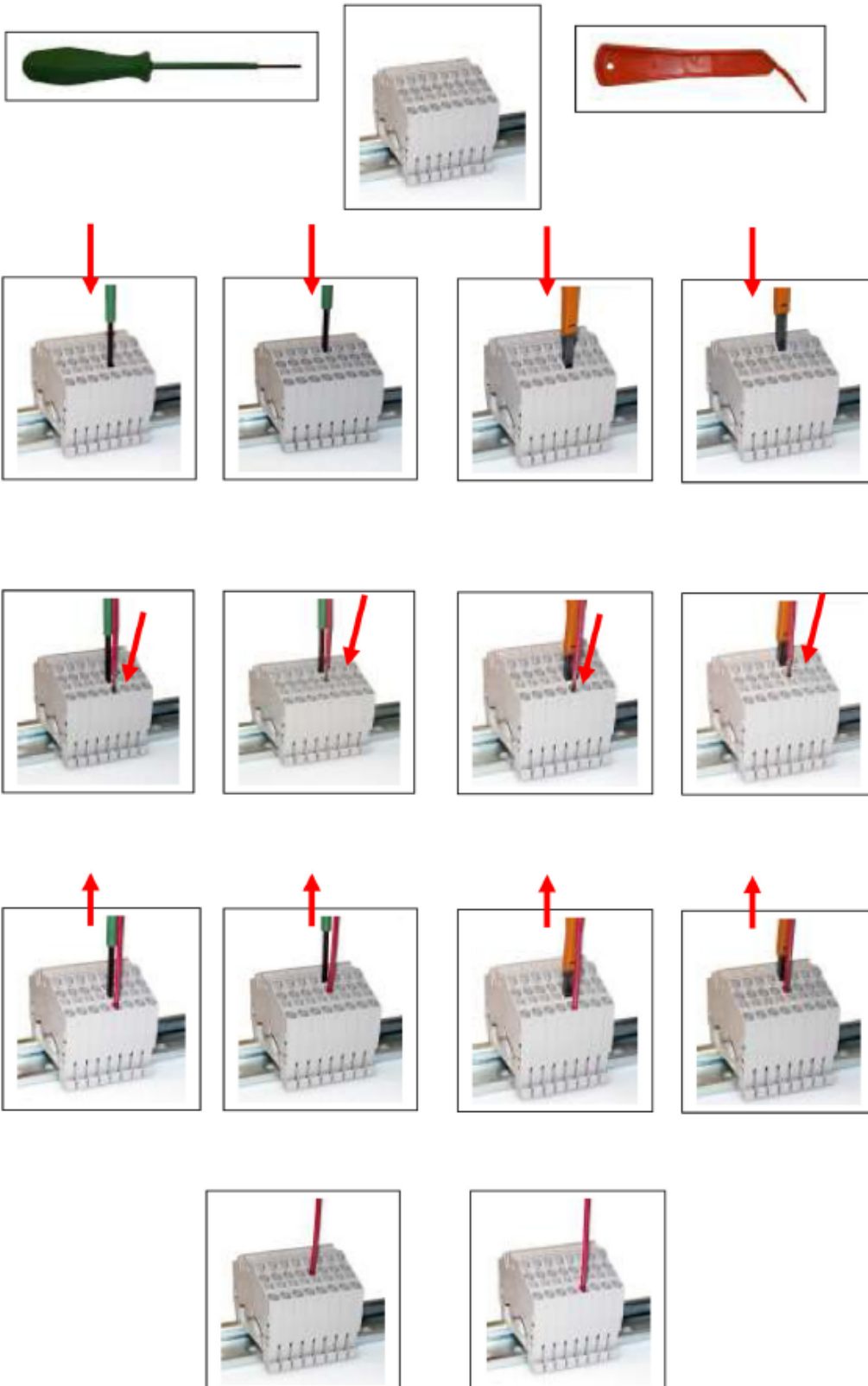
For more information, see the manual supplied by Siemens. This is available online:

<http://www.automation.siemens.com/>

The front panel of the PLC also includes LEDs which show the status of each of the inputs and outputs. These LEDs may be helpful in troubleshooting. For example, to check a switch on the machine, operate the switch and watch the PLC. See if the LED

for that input lights up. These LEDs can be used to quickly check the condition of the whole machine. The Wiring Diagram gives more information on the functions indicated by the LEDs.

7.11 TERMINAL BLOCK WIRING INSTRUCTIONS



Munters Corporation
79 Monroe Street P.O. Box 540
Amesbury, MA 01913-0640
TEL (978) 241-1100 or 1-800-843-5360
FAX (978) 241- 1217

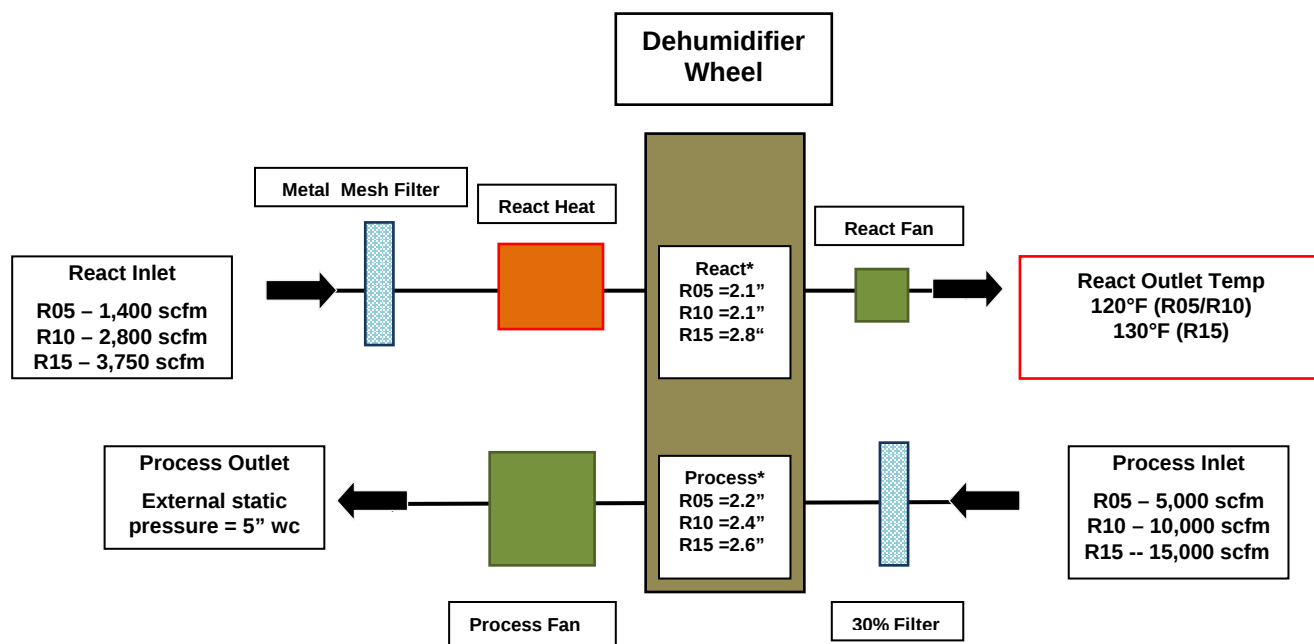


Munters Corporation - Dehumidification Division

Flow Data Sheet – Rental Units

R-5000, R-10000, R-15000 Series

I20694
Rev 1
1/14/15
AMcD



Note: pressures across the wheel will vary (+/- 0.2" wc) depending on the inlet conditions

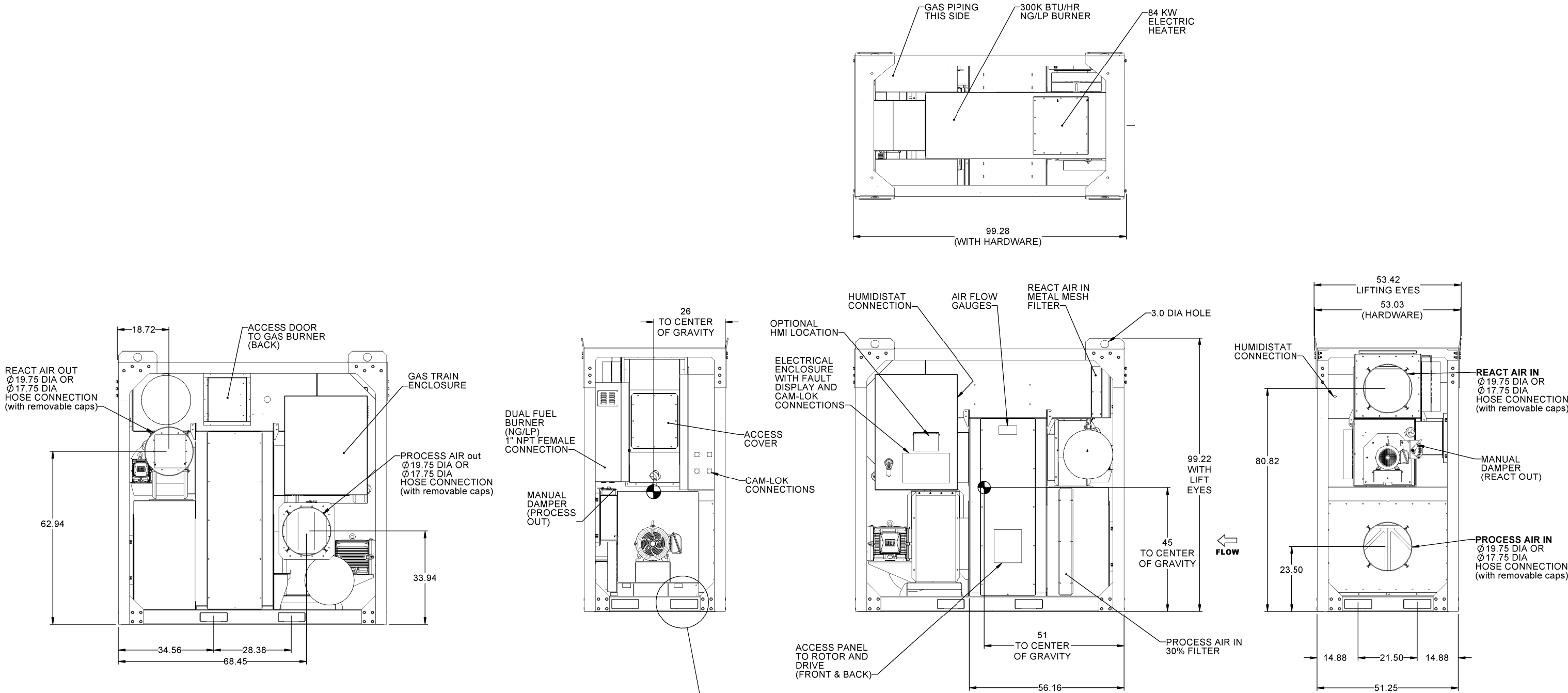
Expected Performance Conditions

Process Inlet Conditions (Same React Inlet)	Process Outlet Conditions		
	R-5000	R-10000	R-15000
80°F at 92 gr/lb	123°F at 43.4 gr/lb	126°F at 40.5 gr/lb	119°F at 49 gr/lb
55°F at 51.5 gr/lb	95°F at 8.9 gr/lb	97°F at 8.0 gr/lb	89°F at 15 gr/lb
95°F at 120 gr/lb	139°F at 71gr/lb	137°F at 73 gr/lb	129°F at 81 gr/lb
73°F at 115 gr/lb	117°F at 63gr/lb	121°F at 60 gr/lb	115°F at 66 gr/lb
60°F at Saturation 77gr/lb	102°F at 29gr/lb	106°F at 27 gr/lb	90°F at 32 gr/lb

Utility Connections

	Duct Connections	React/Process Connections	Electric React (Generator Size)	Gas BTU/hr Capacity (Gas Connection*)	Full Load Amps @460v/3/60
R-5000	18" or 20"	1 x react in/out 1 x process in/out	84kW (100kW)(125kVA)	300,000 (½" NPT)	132
R-10000	18" or 20"	1 x react in/out 2 x process in/out	180kW (225kW)(250kVA)	750,000 (1" NPT)	282
R-15000	18" or 20"	2 x react in 1 x react out 3 x process in/out	252kW (252kW) (280kVA)	1,000,000 (1" NPT)	340 - Elec. React 70 - Gas React

- Minimum Gas Pressure = 15" wc; Maximum Gas Pressure = 5 psi
- Propane or Natural Gas Compatible (simple regulator adjustment required)

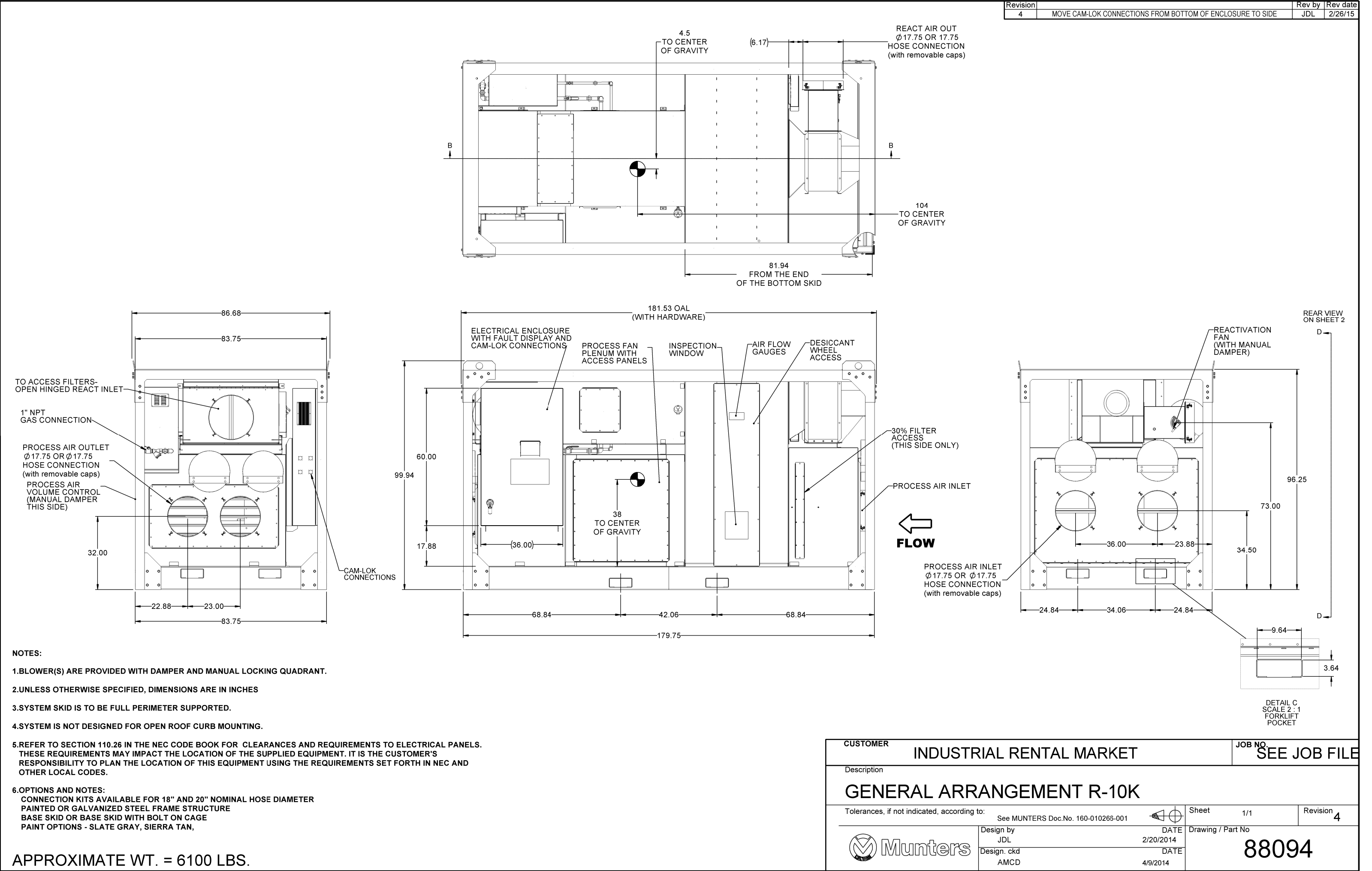


NOTES:

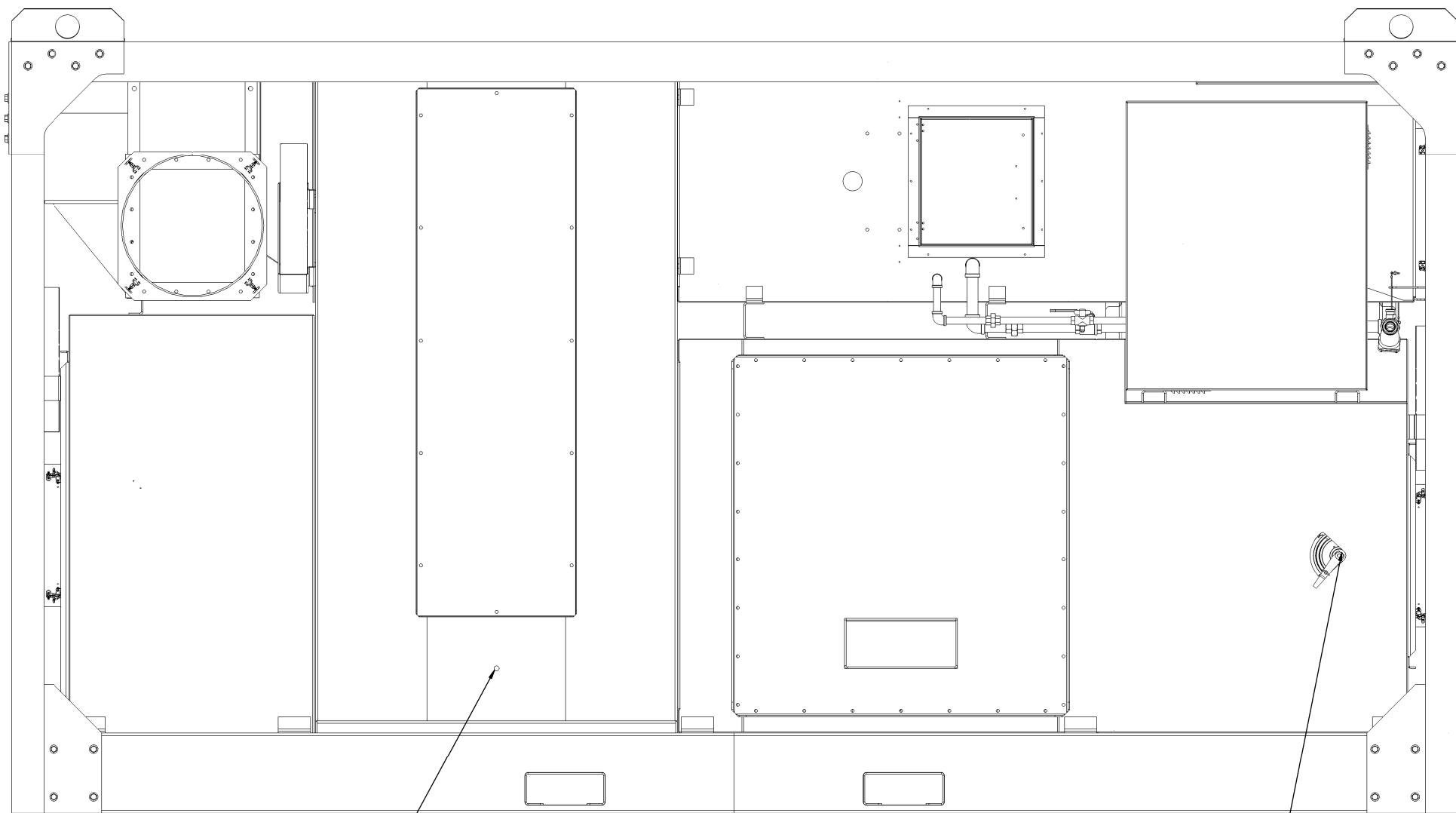
- 1.BLOWER(S) ARE PROVIDED WITH DAMPER AND MANUAL LOCKING QUADRANT.
- 2.UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES
- 3.SYSTEM SKID IS TO BE FULL PERIMETER SUPPORTED (IF SYSTEM SKID IS PROVIDED BY MUNTERS).
- 4.SYSTEM IS NOT DESIGNED FOR OPEN ROOF CURB MOUNTING.
- 5.REFER TO SECTION 110.26 IN THE NEC CODE BOOK FOR CLEARANCES AND REQUIREMENTS TO ELECTRICAL PANELS. THESE REQUIREMENTS MAY IMPACT THE LOCATION OF THE SUPPLIED EQUIPMENT. IT IS THE CUSTOMER'S RESPONSIBILITY TO PLAN THE LOCATION OF THIS EQUIPMENT USING THE REQUIREMENTS SET FORTH IN NEC AND OTHER LOCAL CODES.
- 6.OPTIONS AND NOTES:
CONNECTION KITS AVAILABLE FOR 18" AND 20" NOMINAL HOSE DIAMETER
PAINTED OR GALVANIZED STEEL FRAME STRUCTURE
BASE SKID OR BASE SKID WITH BOLT ON CAGE
PAINT OPTIONS - SLATE GRAY, SIERRA TAN,
7. APPROXIMATE WEIGHT = 3600 LBS (WITH CAGE);
3000 LBS (WITHOUT CAGE)

CUSTOMER INDUSTRIAL RENTAL MARKET		JOB NO. SEE JOB FILE	
Description GENERAL ARRANGEMENT R-5K W/5.5" BASE			
Tolerances, if not indicated, according to: See MUNTERS Doc.No. 160-010266-001		Sheet 1/1	Revision 4
 Munters	Design by JDL	DATE 3/14/2014	Drawing / Part No 88093
	Design. ckd AMCD	DATE 4/9/2014	

Revision		Rev by	Rev date
4	MOVE CAM-LOK CONNECTIONS FROM BOTTOM OF ENCLOSURE TO SIDE	JDL	2/26/15



CUSTOMER		INDUSTRIAL RENTAL MARKET		JOB NO.		SEE JOB FILE			
Description									
GENERAL ARRANGEMENT R-10K									
Tolerances, if not indicated, according to:						Sheet	1/1	Revision	4
See MUNTERS Doc.No. 160-010266-001						Drawing / Part No			88094
 Munters		Design by		DATE					
		JDL		2/20/2014					
		Design. ckd		DATE					
		AMCD		4/9/2014					



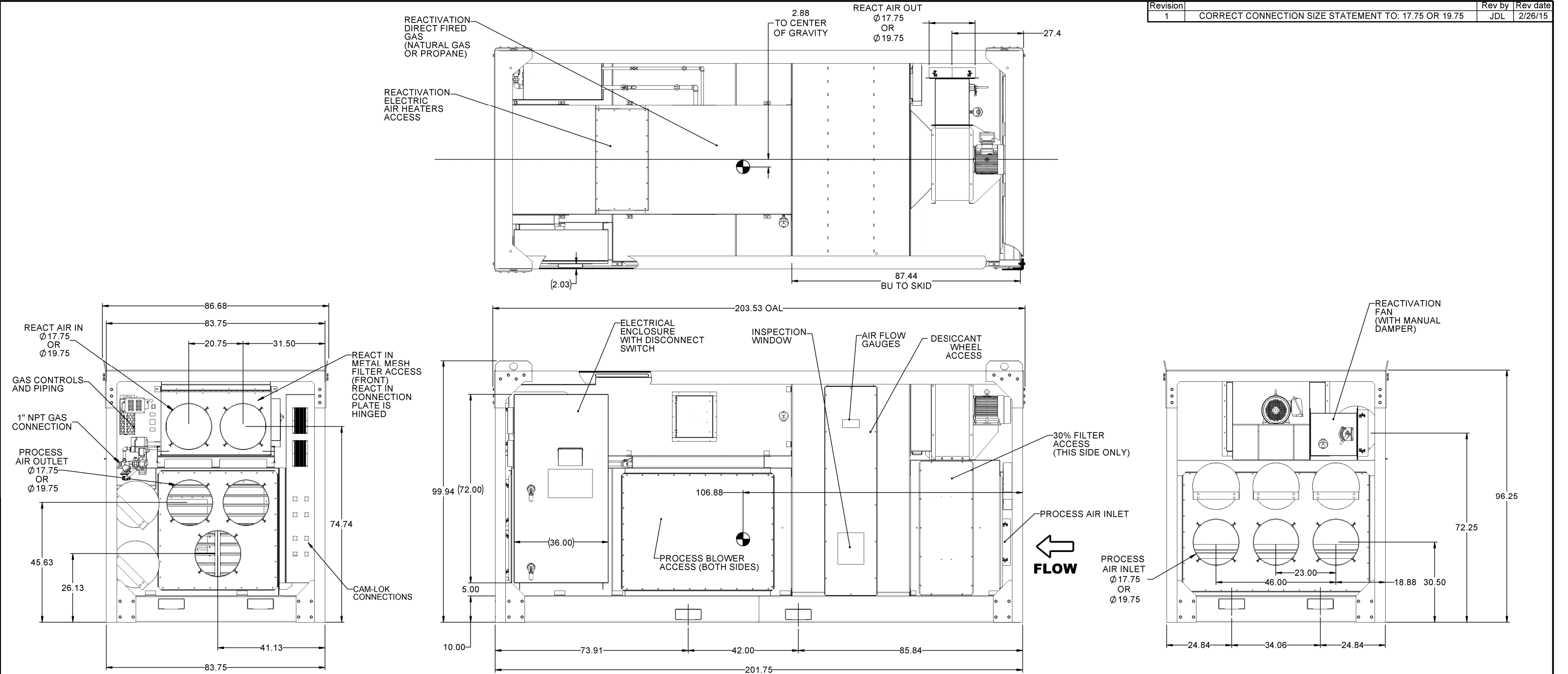
PLUG HOLE

SECTION D-D
SCALE 2 : 1

PROCESS VOLUME MANUAL
DAMPER CONTROL

CUSTOMER		INDUSTRIAL RENTAL MARKET		JOB NO.	SEE JOB FILE
Description					
GENERAL ARRANGEMENT R-10K					
Tolerances, if not indicated, according to:				Sheet	Revision
See MUNTERS Doc.No. 160-010266-001				2/2	4
 Munters	Design by	DATE	Drawing / Part No		
	JDL	2/20/2014			
	Design. ckd	DATE			
	AMCD	4/9/2014	88094		

Revision		Rev by	Rev date
1	CORRECT CONNECTION SIZE STATEMENT TO: 17.75 OR 19.75	JDL	2/26/15

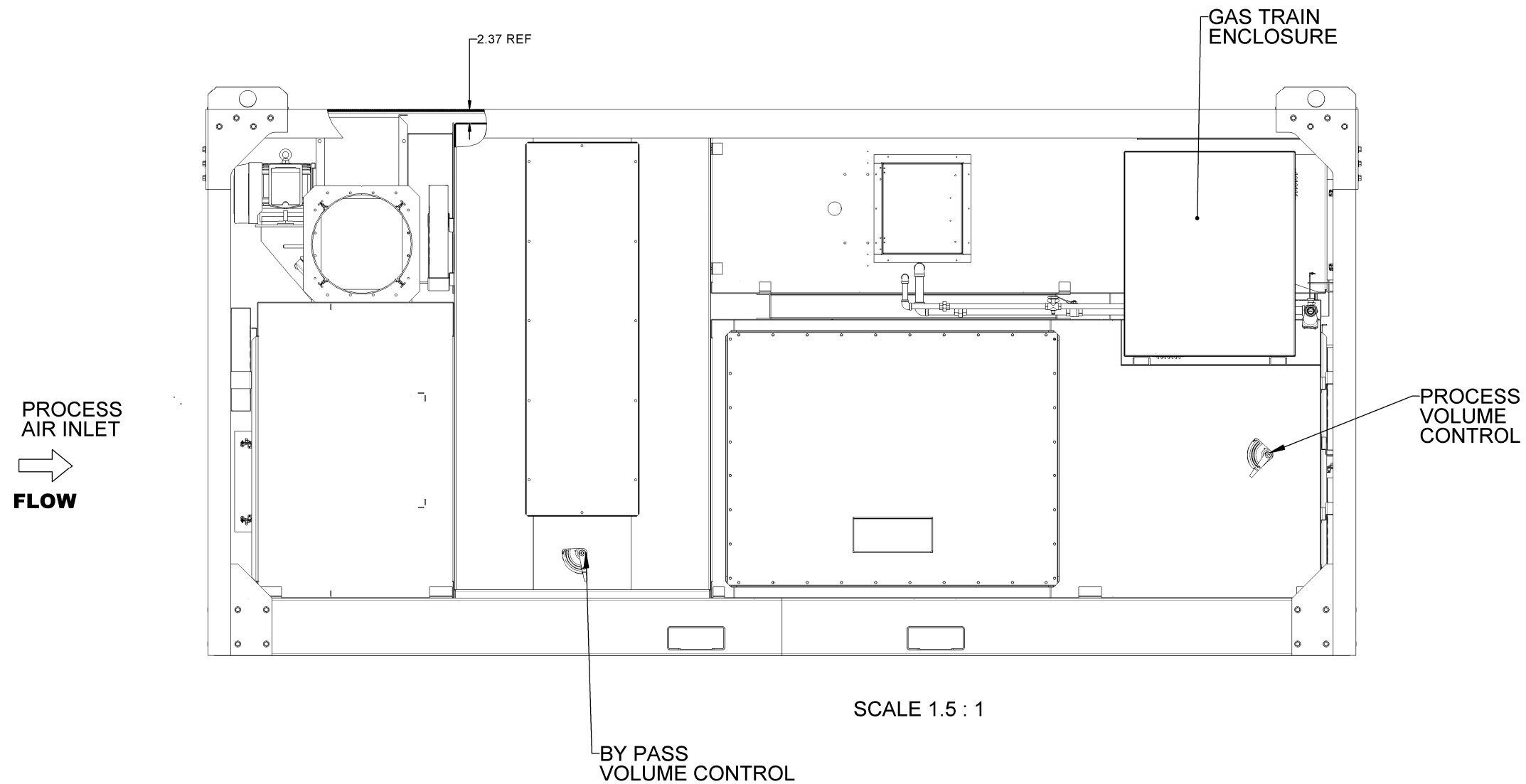


- NOTES:
- 1. CONSULT MANUAL BEFORE INSTALLING OR OPERATING UNIT.
 - 2. PROCESS AND REACT OUTLETS ARE PROVIDED WITH DAMPER AND MANUAL LOCKING QUADRANT.
 - 3. UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES.
 - 4. SYSTEM SKID IS TO BE FULL PERIMETER SUPPORTED.
 - 5. SYSTEM IS NOT DESIGNED FOR OPEN ROOF CURB MOUNTING.
 - 6. REFER TO SECTION 110.26 IN THE NEC CODE BOOK FOR CLEARANCES AND REQUIREMENTS TO ELECTRICAL PANELS. THESE REQUIREMENTS MAY IMPACT THE LOCATION OF THE SUPPLIED EQUIPMENT. IT IS THE CUSTOMER'S RESPONSIBILITY TO PLAN THE LOCATION OF THIS EQUIPMENT USING THE REQUIREMENTS SET FORTH IN NEC AND OTHER LOCAL CODES.
 - 7. OPTIONS AND NOTES:
CONNECTION KITS AVAILABLE FOR 18" AND 20" NOMINAL HOSE DIAMETER
PAINTED OR GALVANIZED STEEL FRAME STRUCTURE
BASE SKID OR BASE SKID WITH BOLT ON CAGE
PAINT OPTIONS - SLATE GRAY, SIERRA TAN,

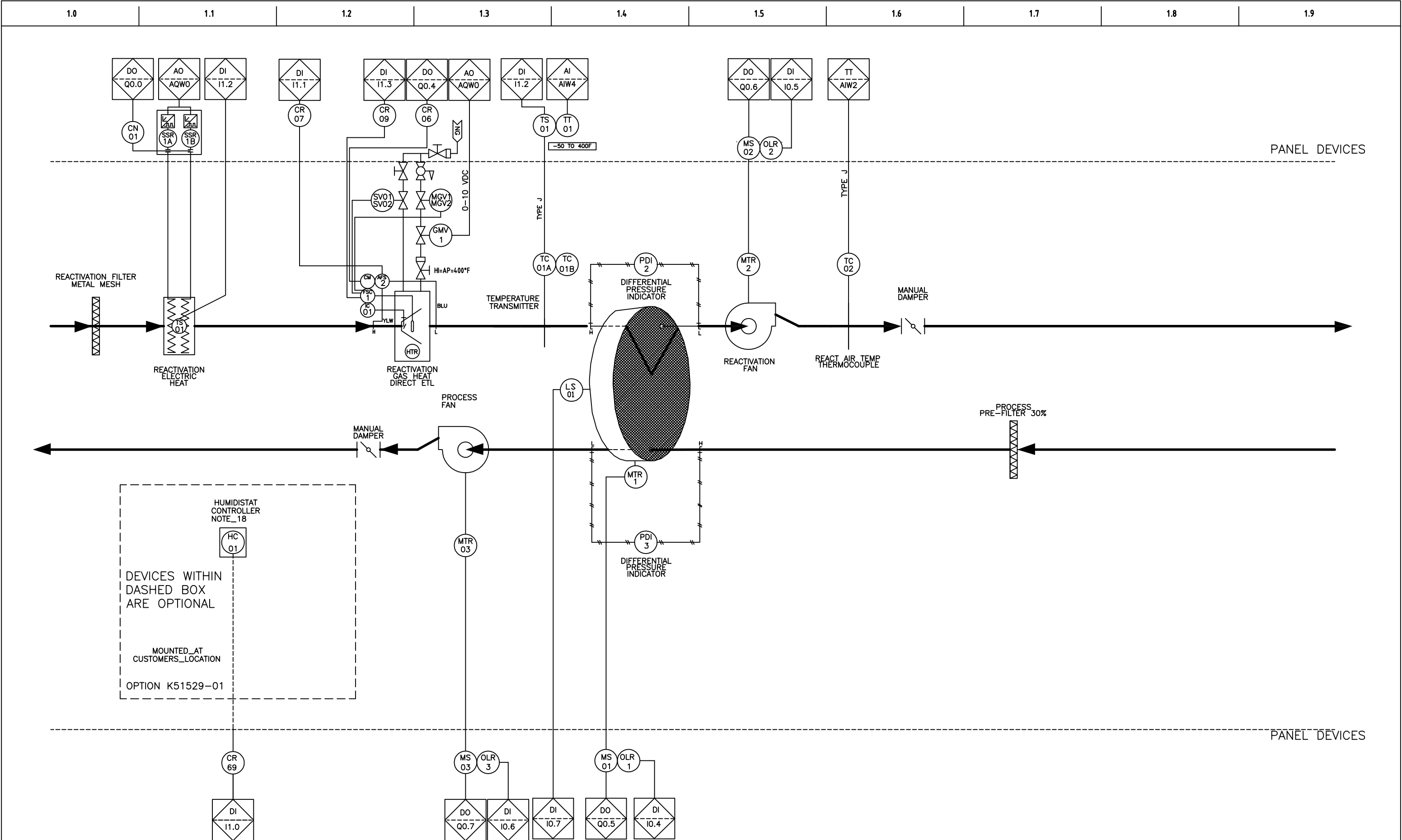
APPROXIMATE WT. = 7700 LBS.

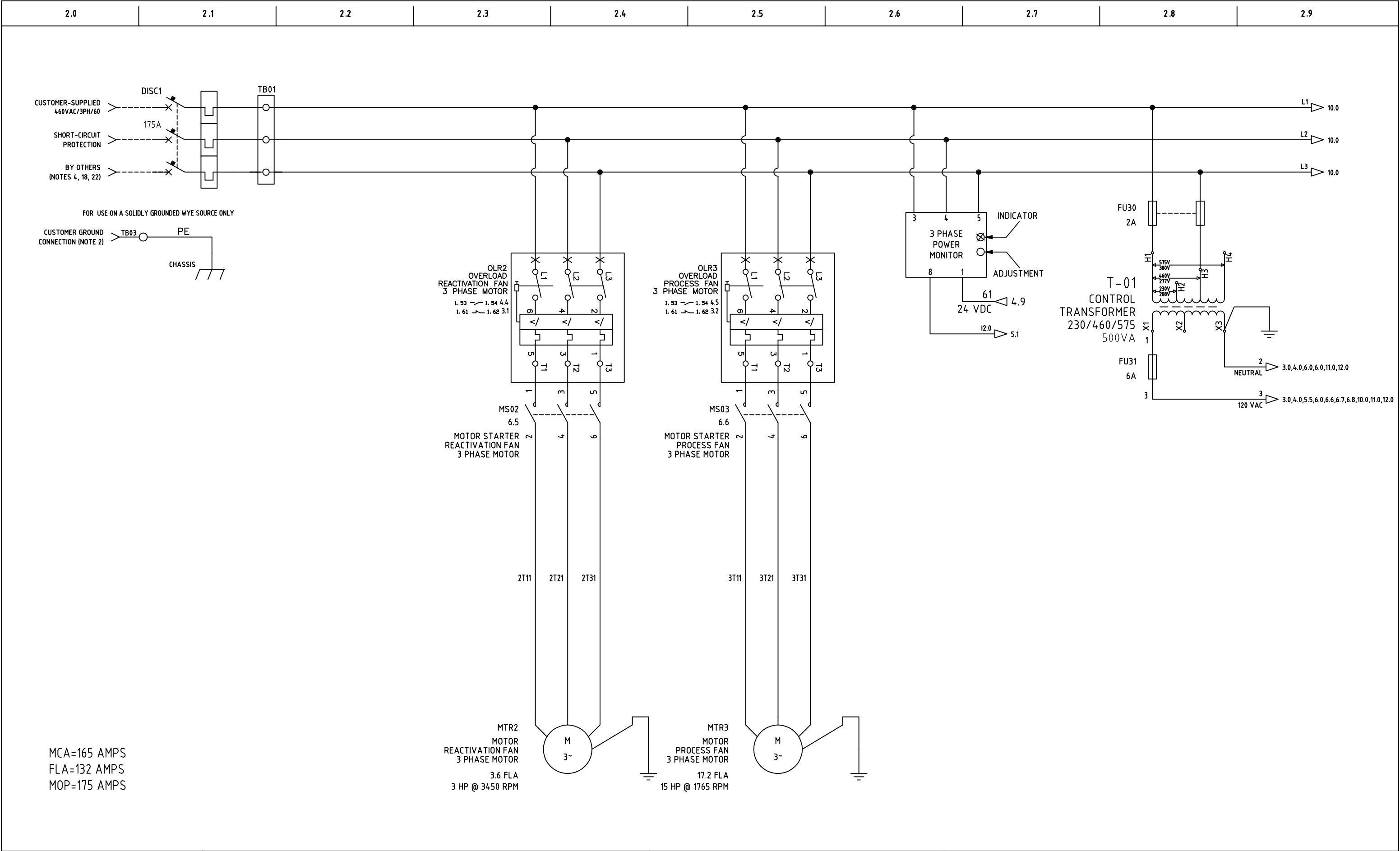
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CUSTOMER		INDUSTRIAL RENTAL MARKET		JOB NO.		SEE JOB FILE			
Description									
GENERAL ARRANGEMENT R-15K									
Tolerances, if not indicated, according to:						Sheet	1/1	Revision	1
See MUNTERS Doc.No. 160-010266-001						Drawing / Part No			88142
 Munters		Design by		DATE					
		JDL		6/10/2014					
		Design. ckd		DATE					
		AMCD		6/10/2014					

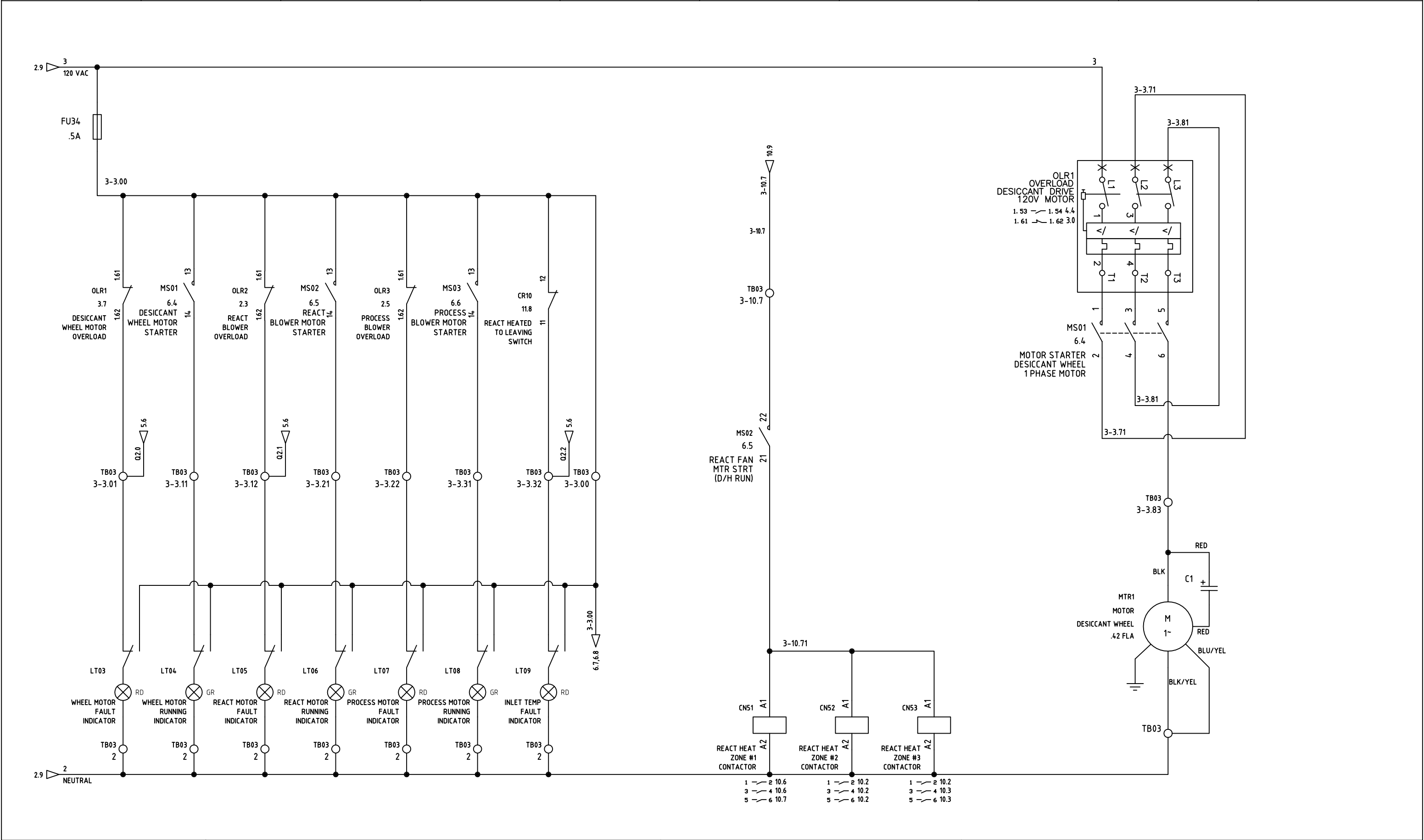


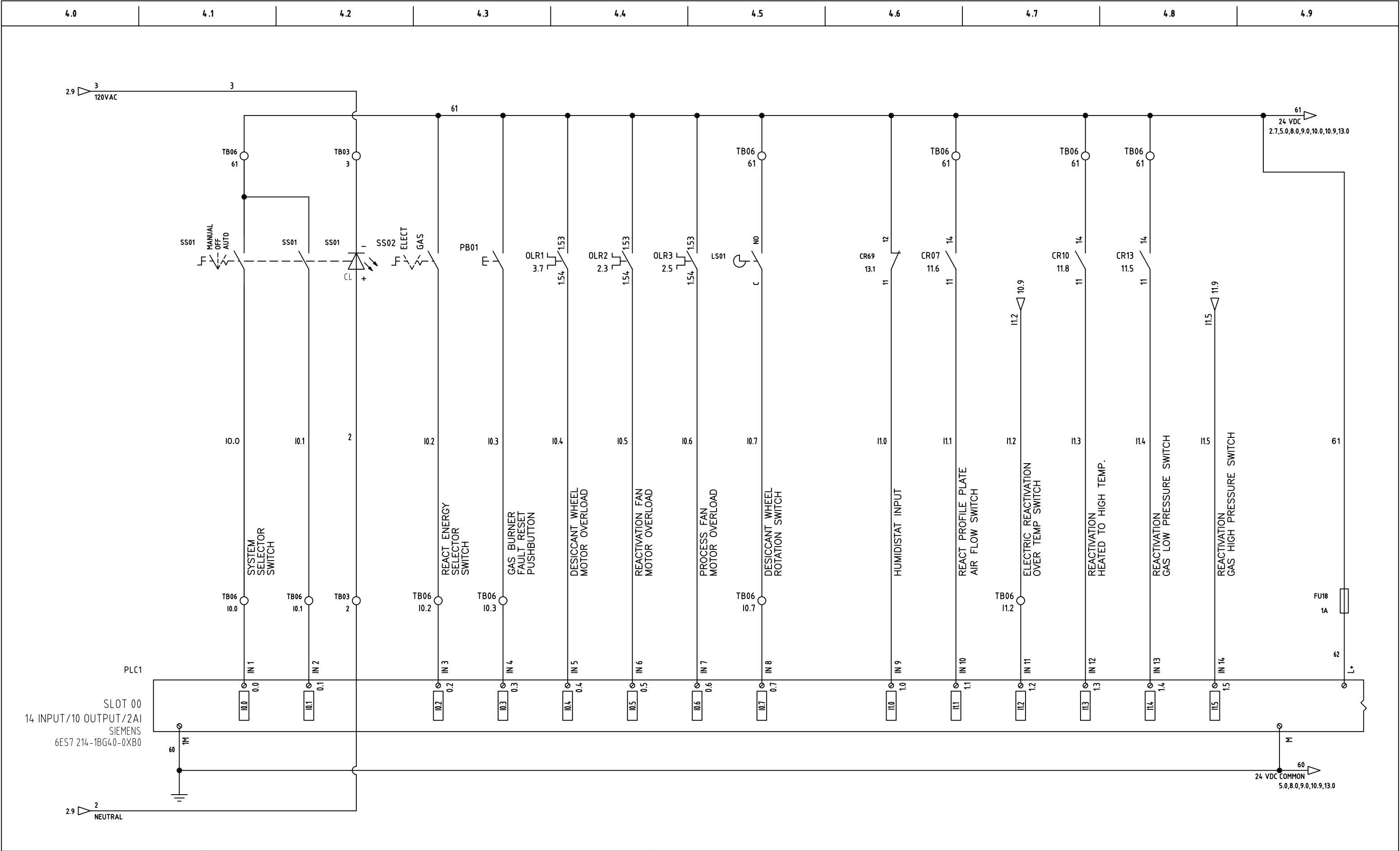
CUSTOMER			INDUSTRIAL RENTAL MARKET			JOB NO.		SEE JOB FILE		
Description										
GENERAL ARRANGEMENT R-15K										
Tolerances, if not indicated, according to:				See MUNTERS Doc.No. 160-010266-001				Sheet	1/1	Revision ₁
 Munters		Design by		DATE		Drawing / Part No				
		JDL		6/10/2014						
		Design. ckd		DATE						
		AMCD		6/10/2014		88142				

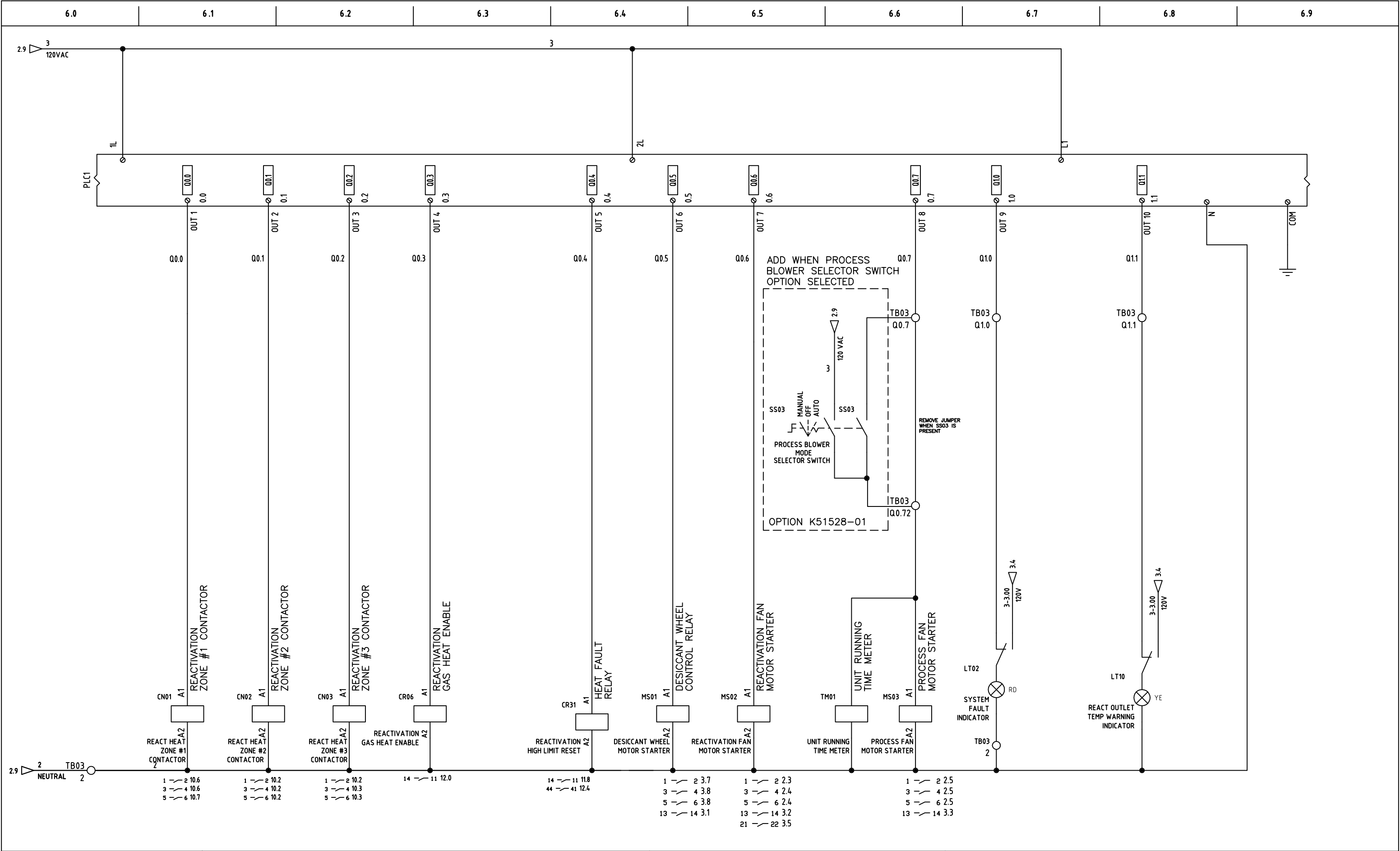


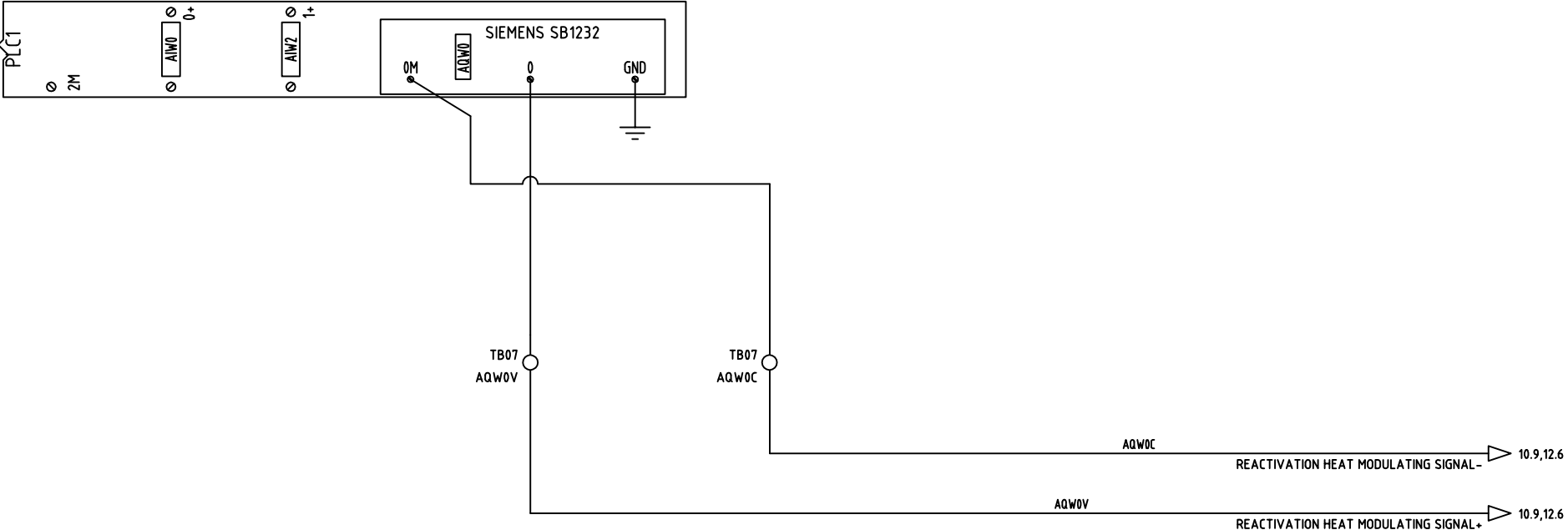


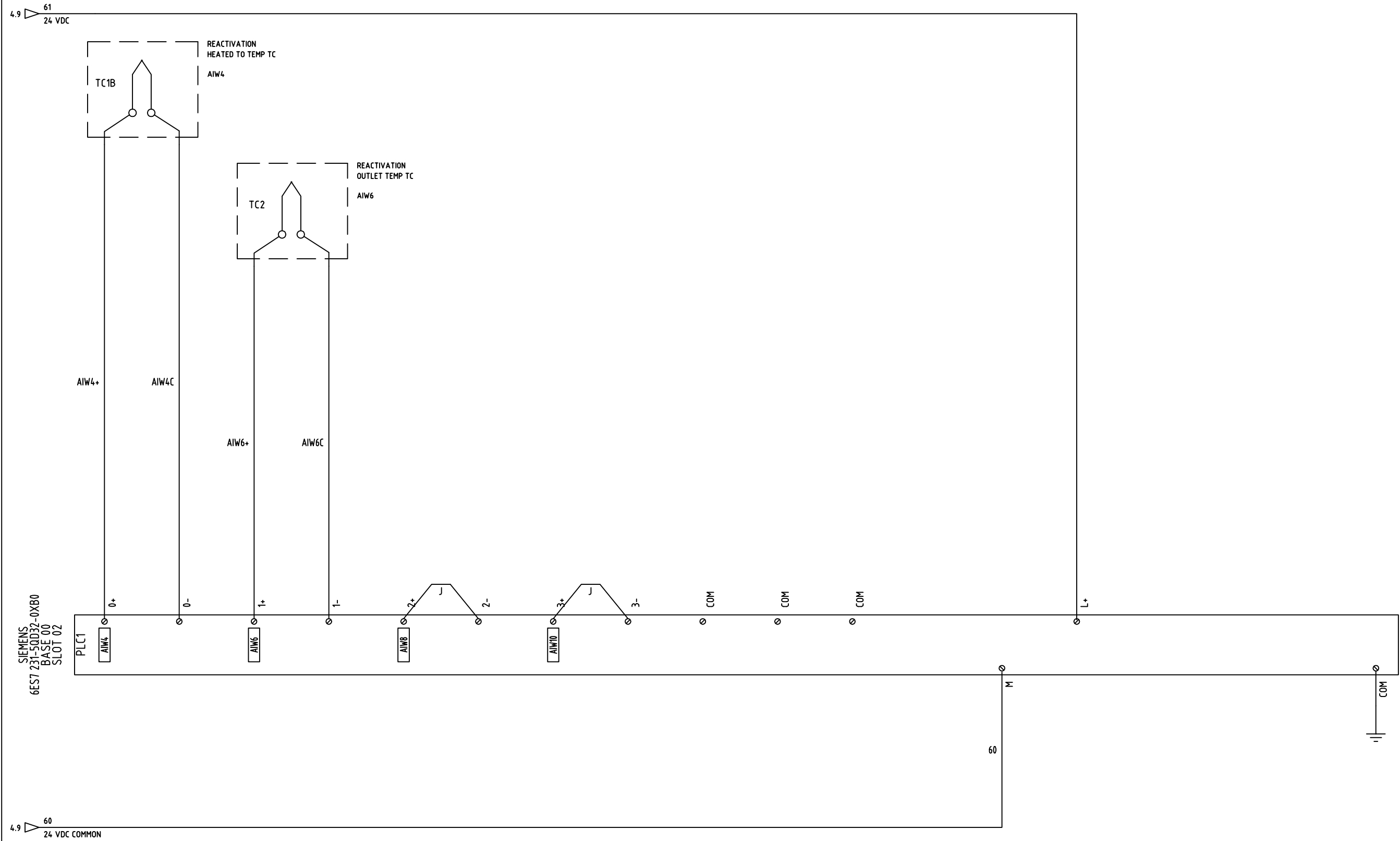
MCA=165 AMPS
FLA=132 AMPS
MOP=175 AMPS

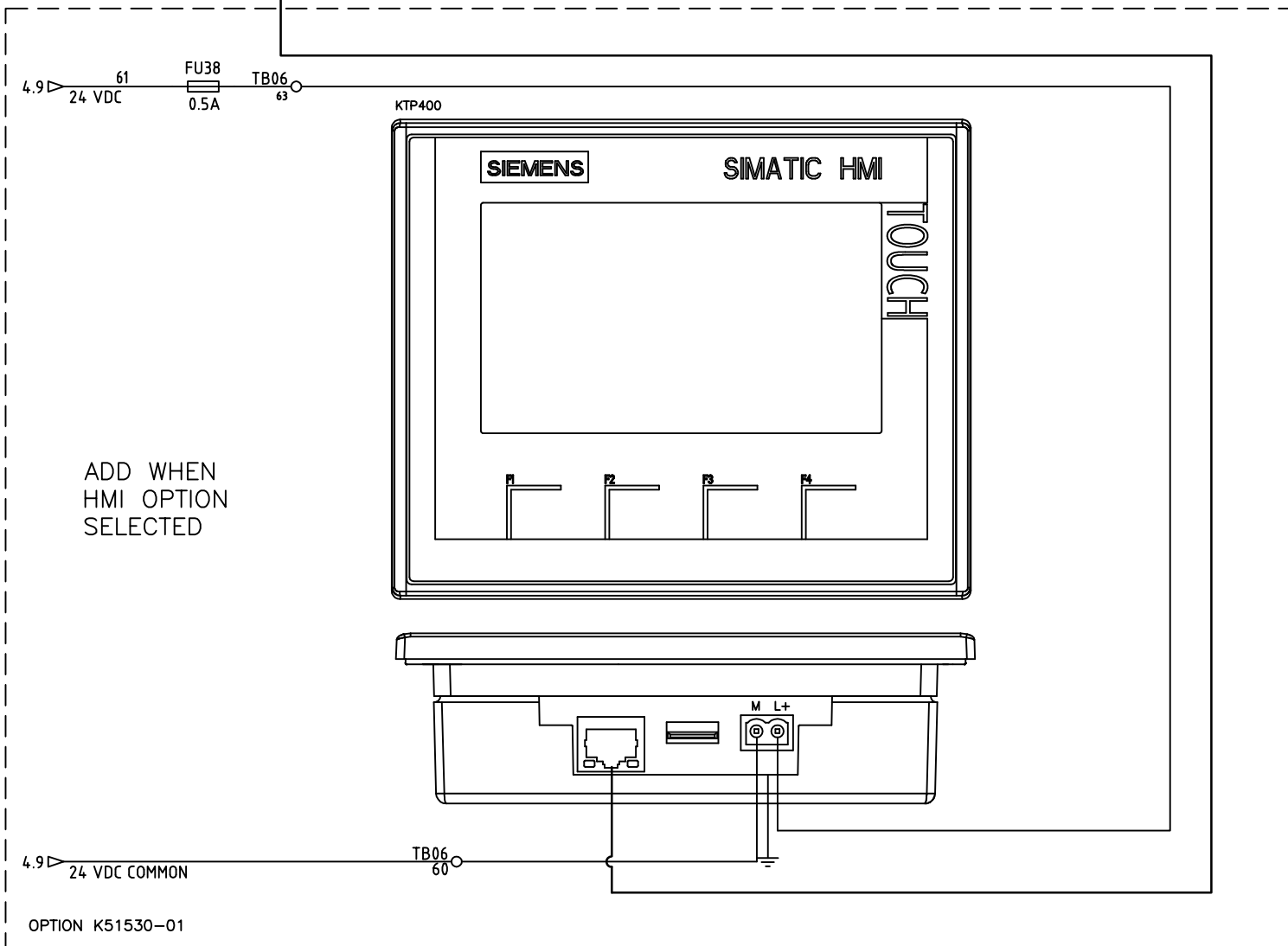
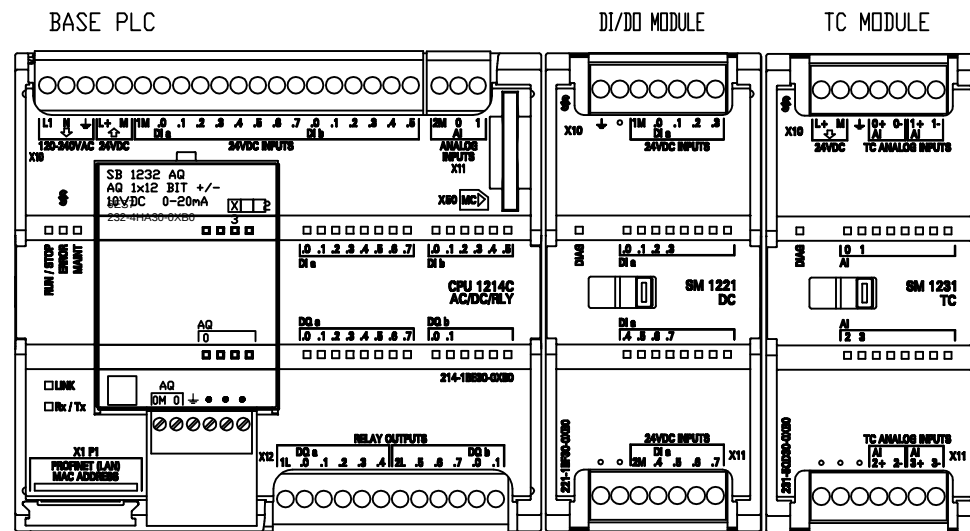


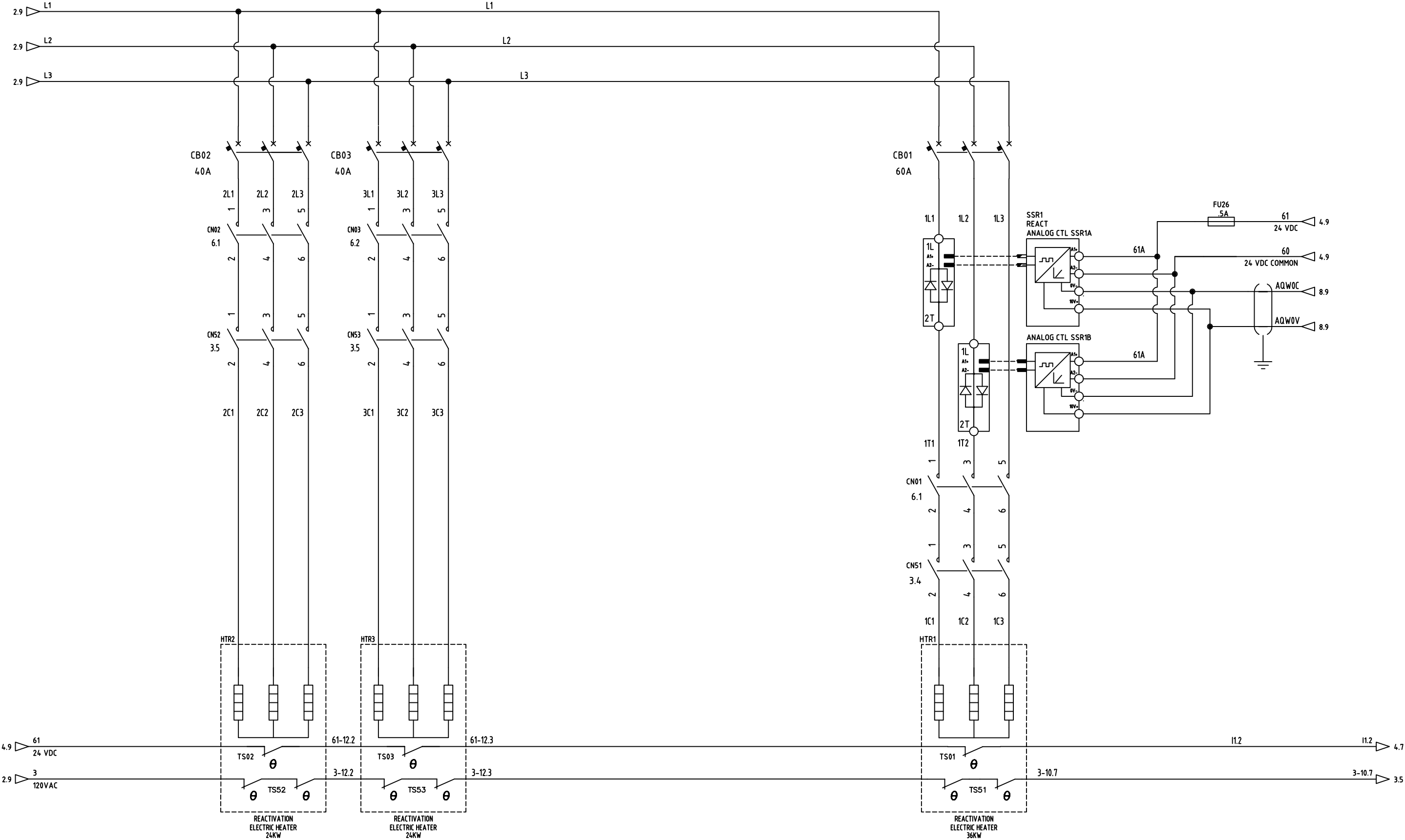


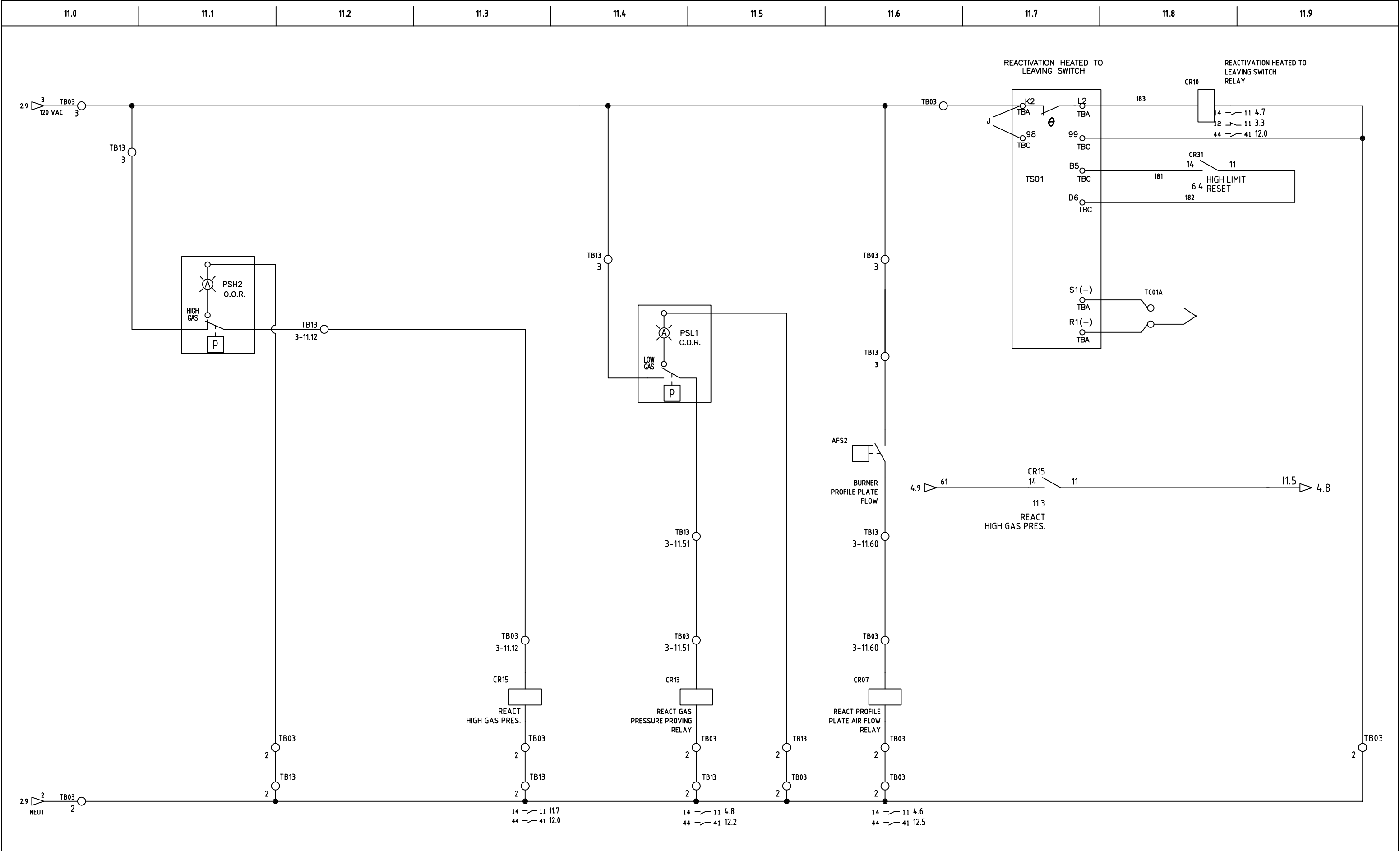


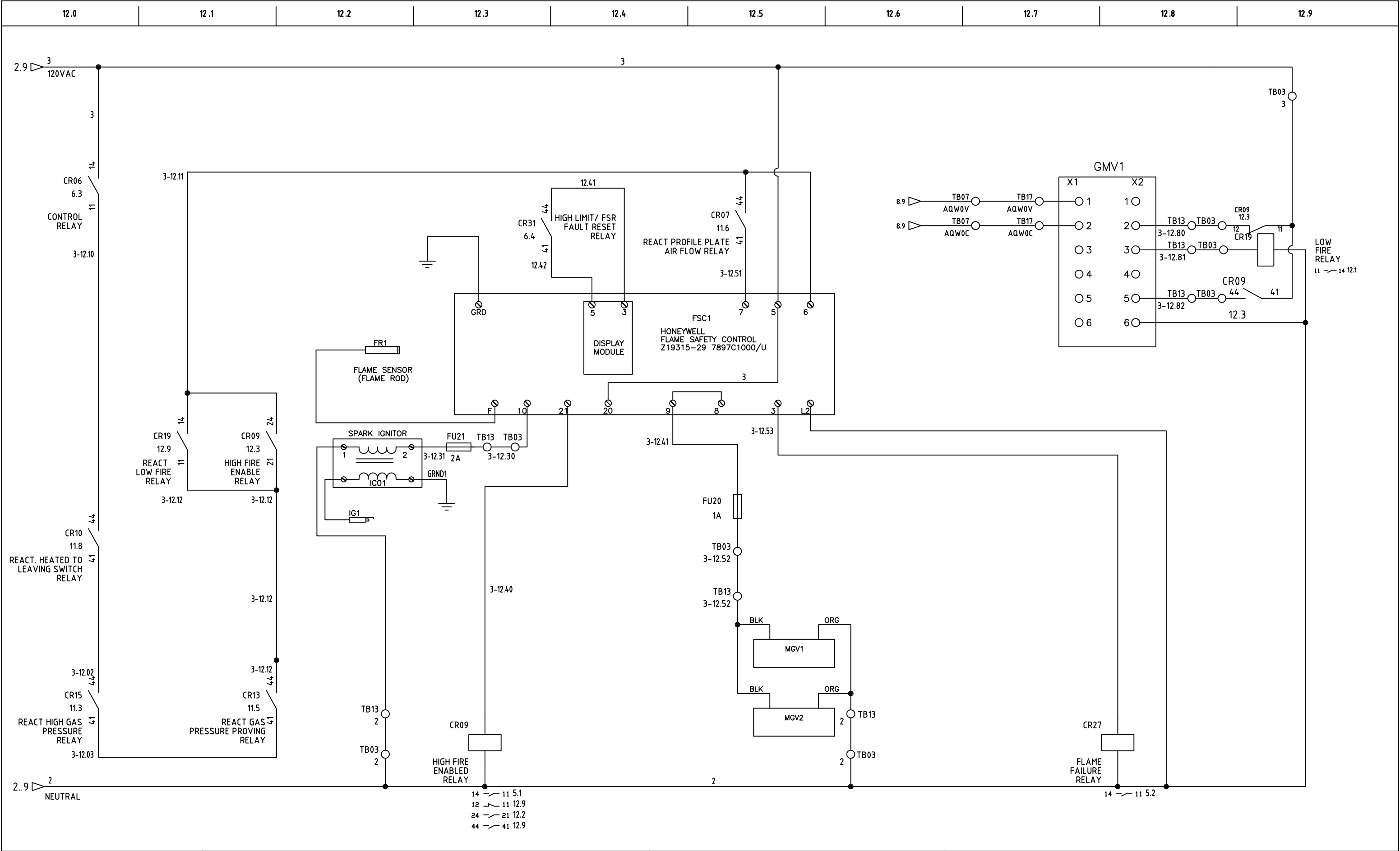


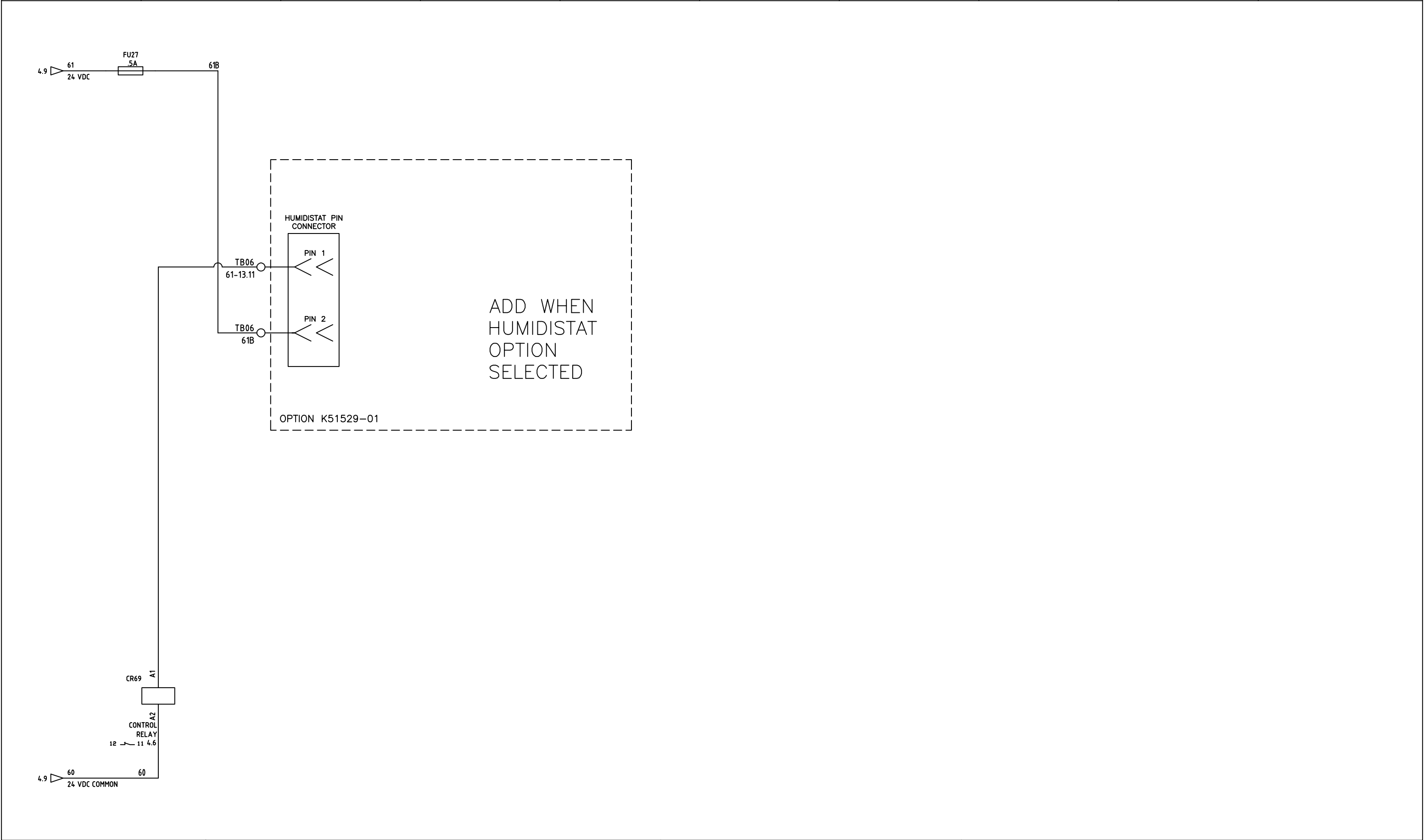


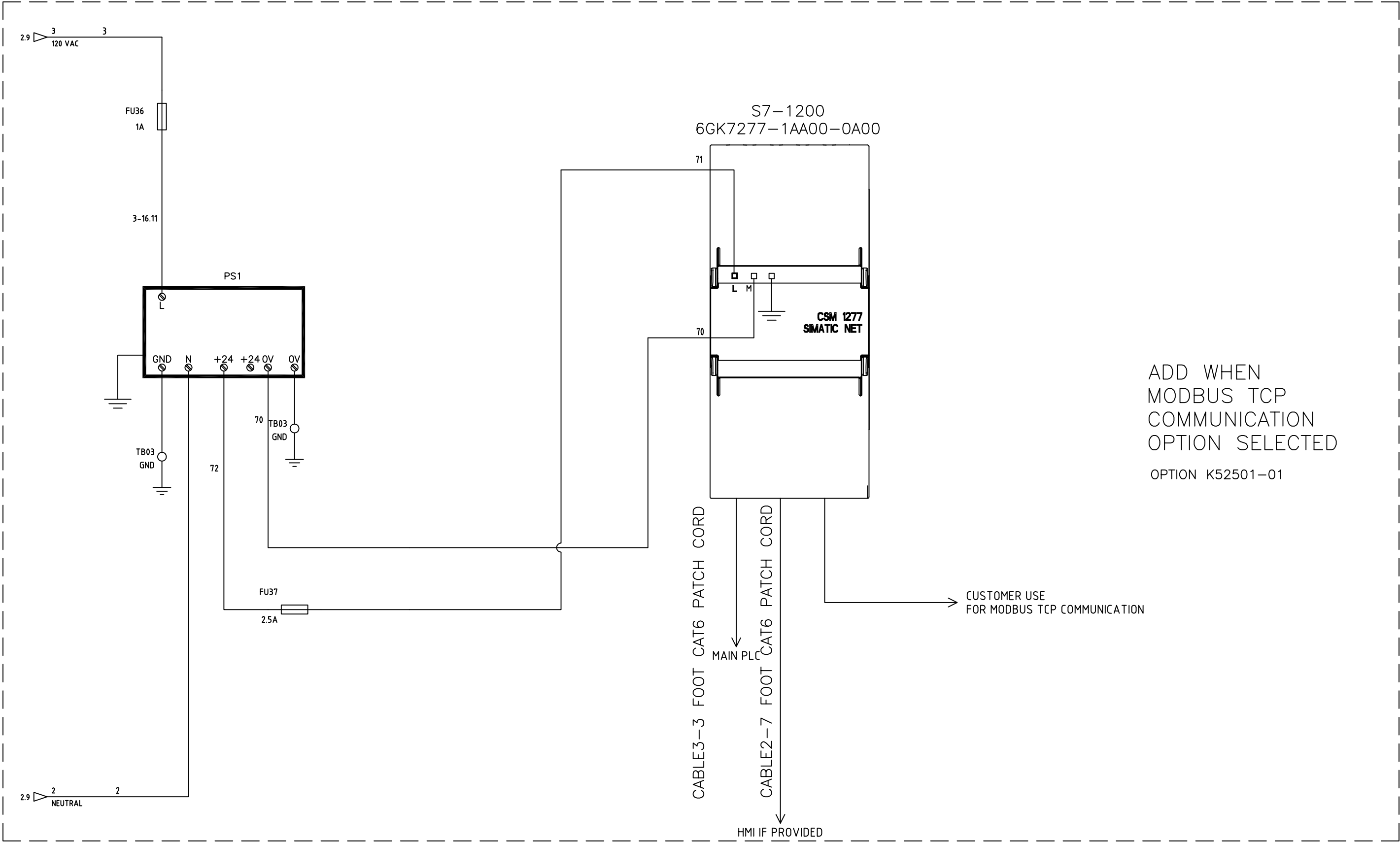


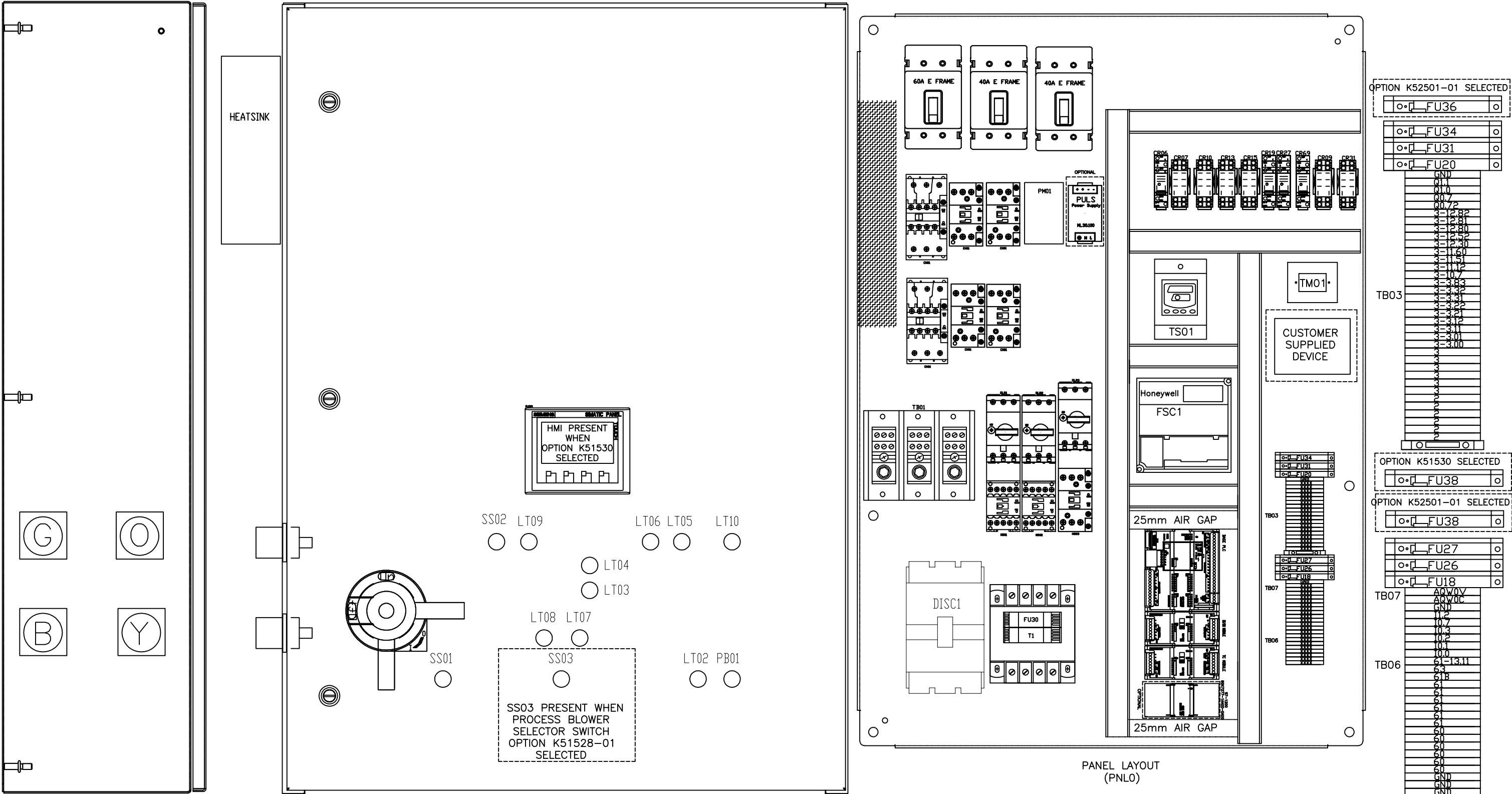




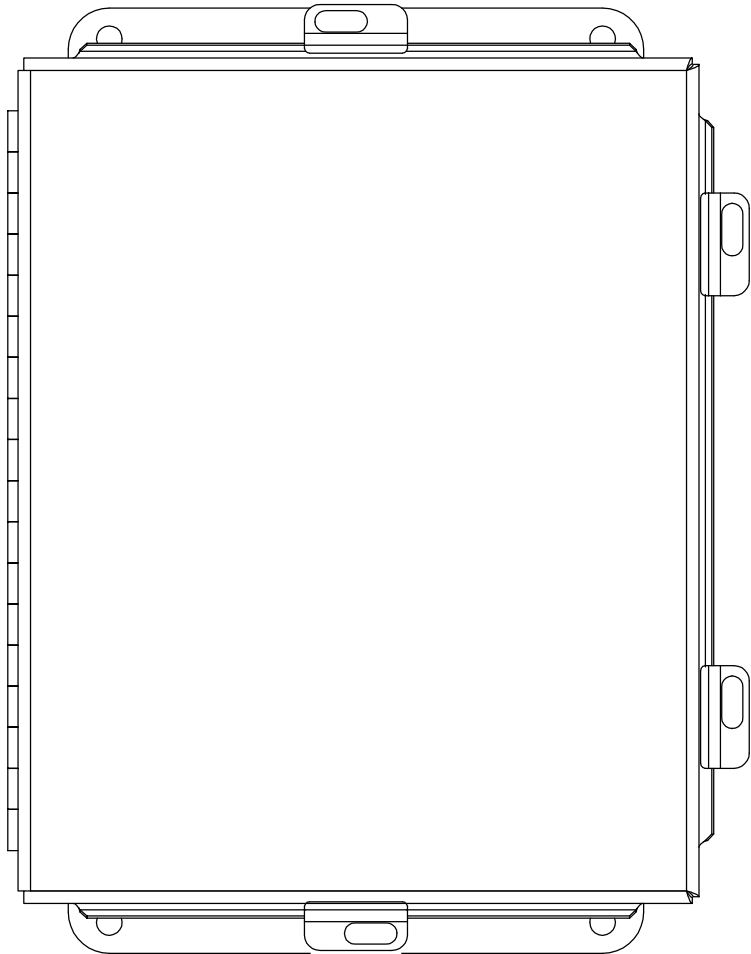




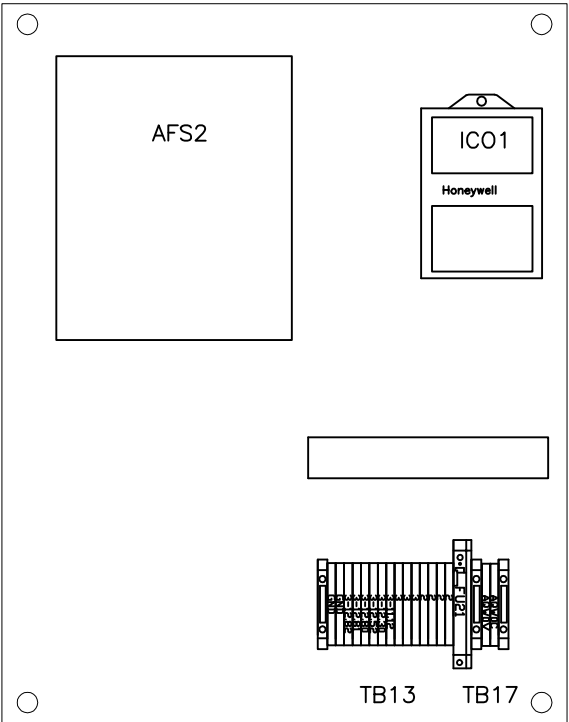




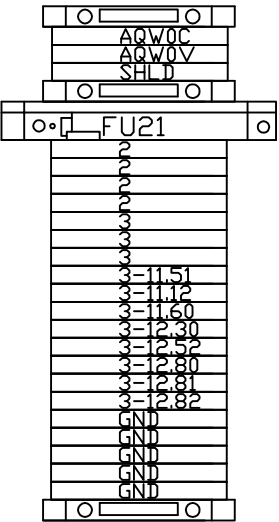
CONTROL ENCLOSURE 42 X 30 X 10 (NEMA 4)
(ENCLO)



REACTIVATION
GAS BURNERS (ENC1)
14x16 CH ENCLOSURE



REACTIVATION
GAS BURNERS (ENC1) PANEL LAYOUT
PANEL



17.0

17.1

17.2

17.3

17.4

17.5

17.6

17.7

17.8

17.9

Conduit #	Conduit Size	Wire #	Color	Size	Voltage	Beginning Location	Ending Location

	REVISIONS				
7	UPDATED PANEL TERMINAL LAYOUTS	DSL	HZ	DSL	5/30/19
6	ADDED SPACE FOR CUSTOMER SUPPLIED DEVICE	HZ	KPW	HZ	07/18/17
5	ADDED MODBUS RTU OPTION	HZ	KPW	HZ	04/10/17
4	REVISED AS BUILT	DSL	AKN	AKN	6/10/16
3	UPDATED GAS TRAIN WIRING	HZ	KPW	HZ	04/19/16
2	AS BUILT	DSL	GDD	GDD	10/8/15
1	COMPONENT CHANGE FROM SIEMENS TO EATON	HZ	AKN	HZ	08/13/15
0	RELEASED FOR MANUFACTURING	RDS	DSL	RDS	7/15/14
REV	DESCRIPTION	DRW	CHK	APR	DATE

NOTES:

1. REVIEW OPERATING & MAINTENANCE MANUAL BEFORE ENERGIZING EQUIPMENT.
2. CUSTOMER–SUPPLIED EARTH GROUND TO BE TERMINATED AT KP LUG OR GROUNDING STRIP PROVIDED.
3. PROTECTIVE DEVICES HAVE BEEN PRESET AND/OR SELECTED AND ARE RECORDED AT FACTORY PER SPECIFICATION 22096/22576.
4. OPTIONAL EQUIPMENT.
5. N/A.
6. ALL WIRING SHOWN WITH SOLID LINES IS INSTALLED AT THE FACTORY.
7. SEE ELECTRICAL PARTS LIST FOR COMPONENT SPECIFICATION.
8. NO = NORMALLY OPEN, OOR = OPEN ON RISE,
NC = NORMALLY CLOSED, OOF = OPEN ON FALL.
10. INTERLOCK WIRING FOR AUTOMATIC START/STOP IS NOT BY MUNTERS.
11. USE SHIELDED CABLE, NOT LESS THAN #18 AWG.
12. REMOVE JUMPERS WHEN INTERLOCKING SAFETIES.
13. ELECTRICAL WIRE SIZING DATA: STANDARD: A72001/CANADIAN: A72011
14. AUXILIARY INTERLOCK IS PROVIDED FOR CUSTOMER INTERLOCKING.
15. SHIPPED REMOTE FROM FACTORY, INSTALLED BY OTHERS.
16. CUSTOMER CONTROLS.
17. N/A.
18. FIELD WIRED, BY INSTALLER.
19. TRANSFORMER VOLTAGES SHOWN COVER ALL STANDARD 50/60Hz APPLICATIONS.
THE ACTUAL TRANSFORMER USED IS DETERMINED BY THE POWER SOURCE.
20. DASHED LINES ARE CUSTOMER WIRED FOR INTERCONNECT.
21. INTERLOCK PROVIDED FOR OPTIONAL HUMIDISTAT OR LIMIT SWITCH ON.
22. MAIN POWER DISCONNECT DEVICE NOT SUPPLIED BY MUNTERS AS STANDARD AND MUST BE PROVIDED BY CUSTOMER. FUSED DISCONNECT OR CIRCUIT BREAKER AVAILABLE AS OPTIONAL EQUIPMENT.
23. ACTUAL MOTOR FLA RATING REFER TO UL TABLE.
24. MOTOR OVERLOAD PROTECTION RATING IS BASED ON ACTUAL MOTOR NAMEPLATE FLA.
25. OPTIONAL SAFETIES FOR "INDOOR" INDIRECT GAS REACTIVATION ONLY. REMOVE JUMPER WHEN INSTALLING POWER VENTOR SAFETIES.
26. N/A.
27. N/A.
28. N/A.



Munters

79 Monroe St. Amesbury, Ma 01913
TEL 800-843-5360 FAX 978-241-1214

CONFIDENTIALITY STATEMENT

THE TECHNICAL INFORMATION AND DESIGN DATA HEREIN CONSTITUTES PROPRIETARY INFORMATION OF THE MUNTERS Corporation AND ARE TO BE MAINTAINED IN STRICT CONFIDENCE. THIS INFORMATION IS FOR THE SOLE USE OF OUR CUSTOMERS AND END USERS OF OUR EQUIPMENT.

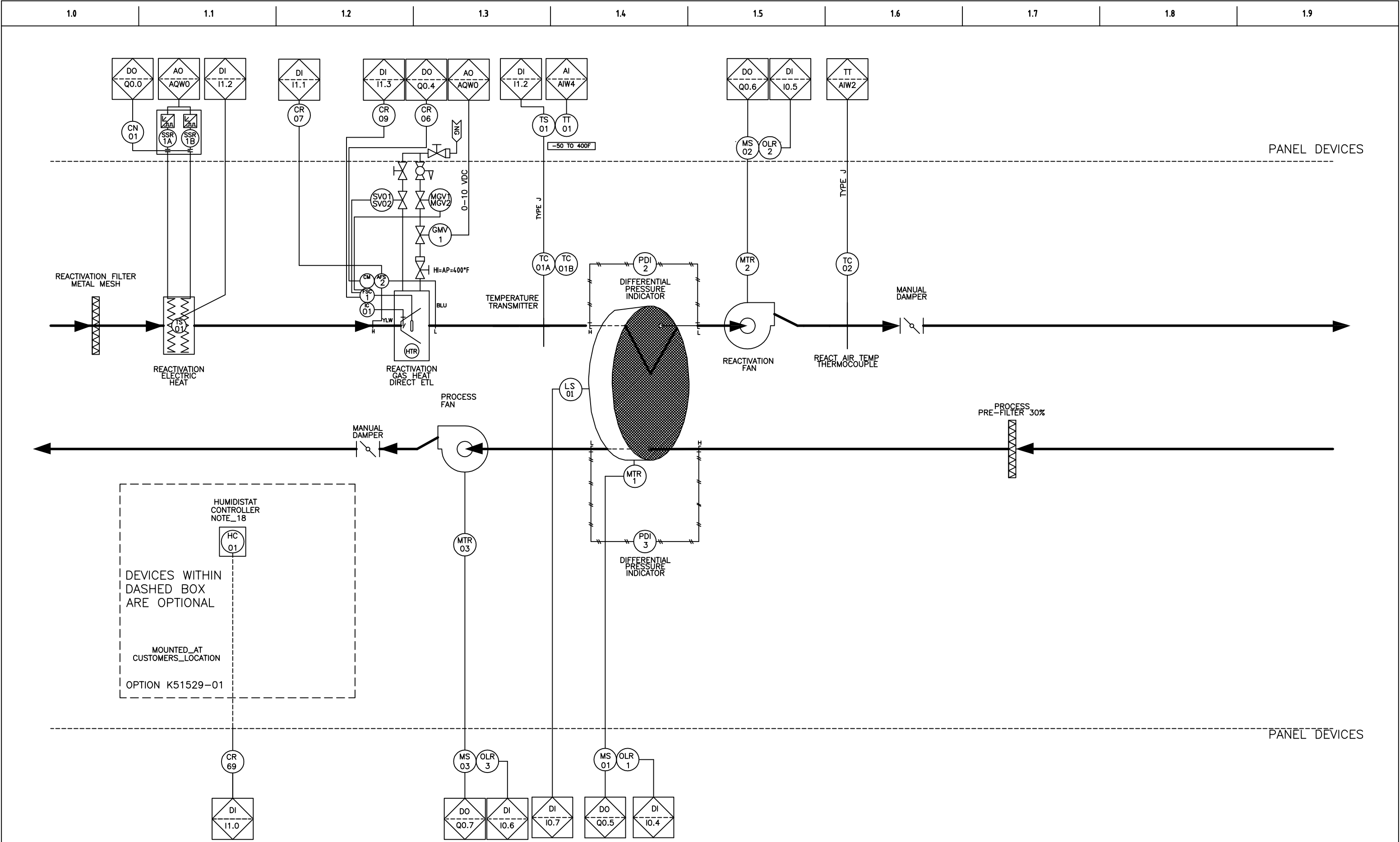
DRAWING DESCRIPTION

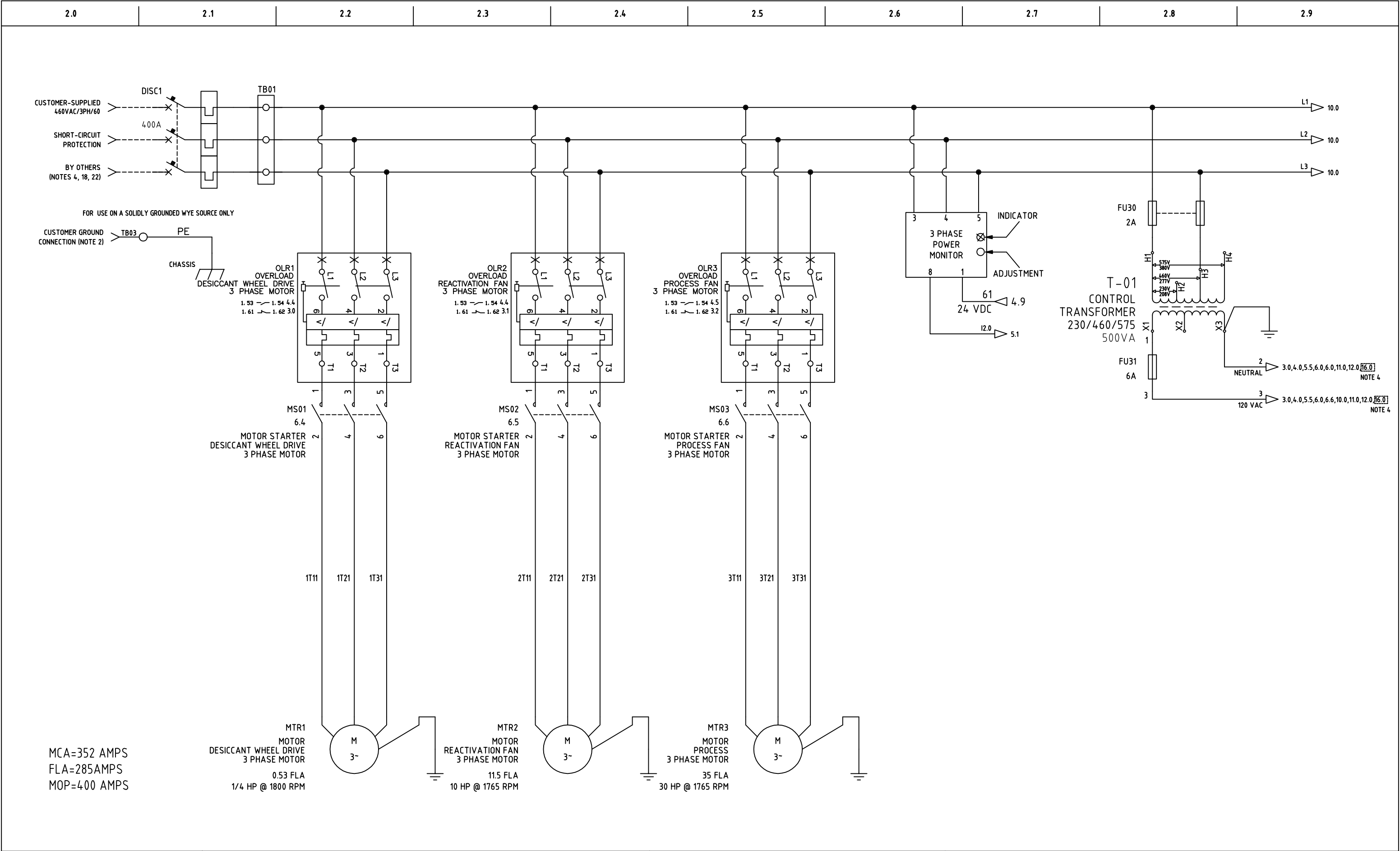
HCD/ICA STANDARD SCHEMATICS,ELEC & DIR GAS HEAT W/O F&BP

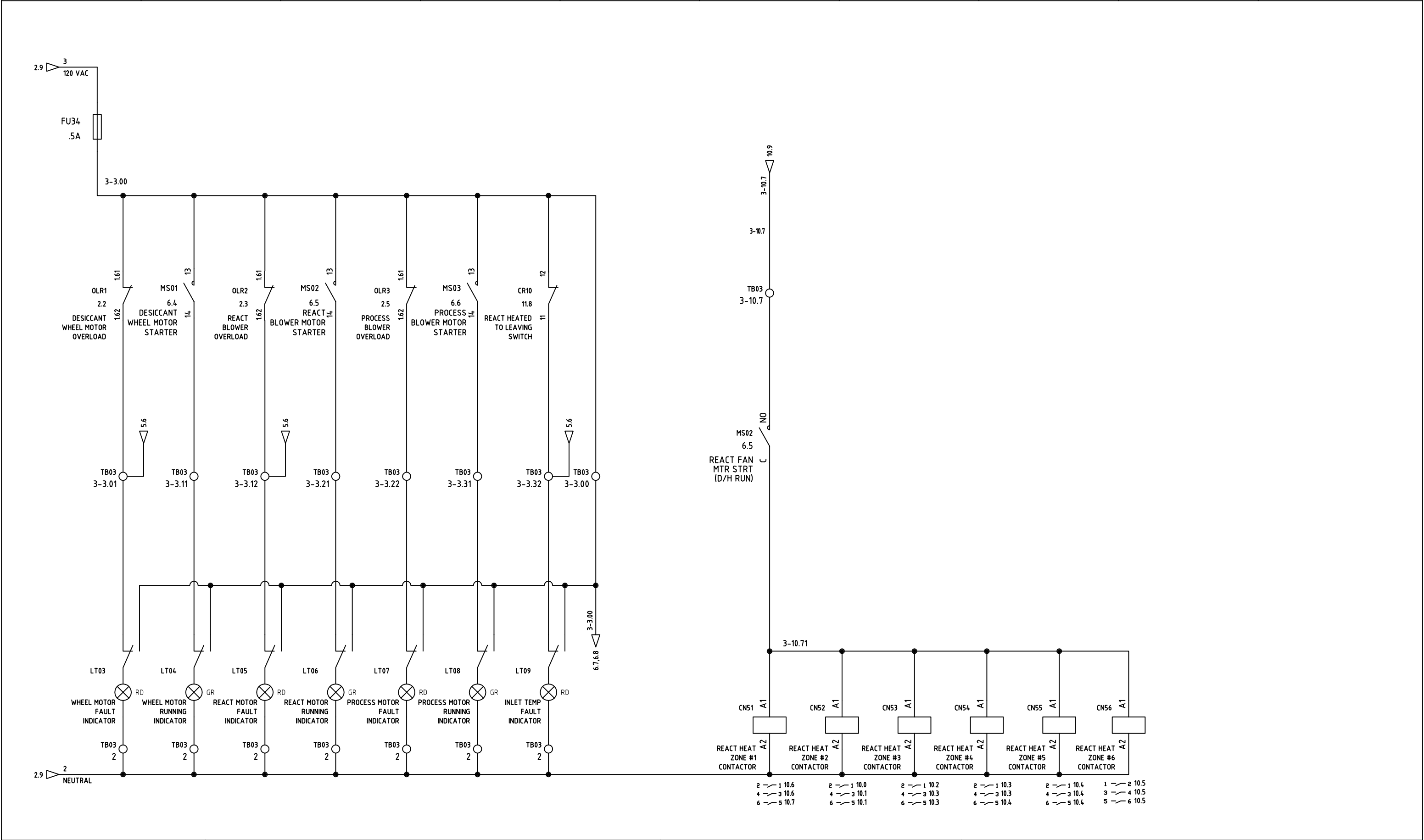
FOR SEQUENCE OF OPERATION, REFER TO O&M

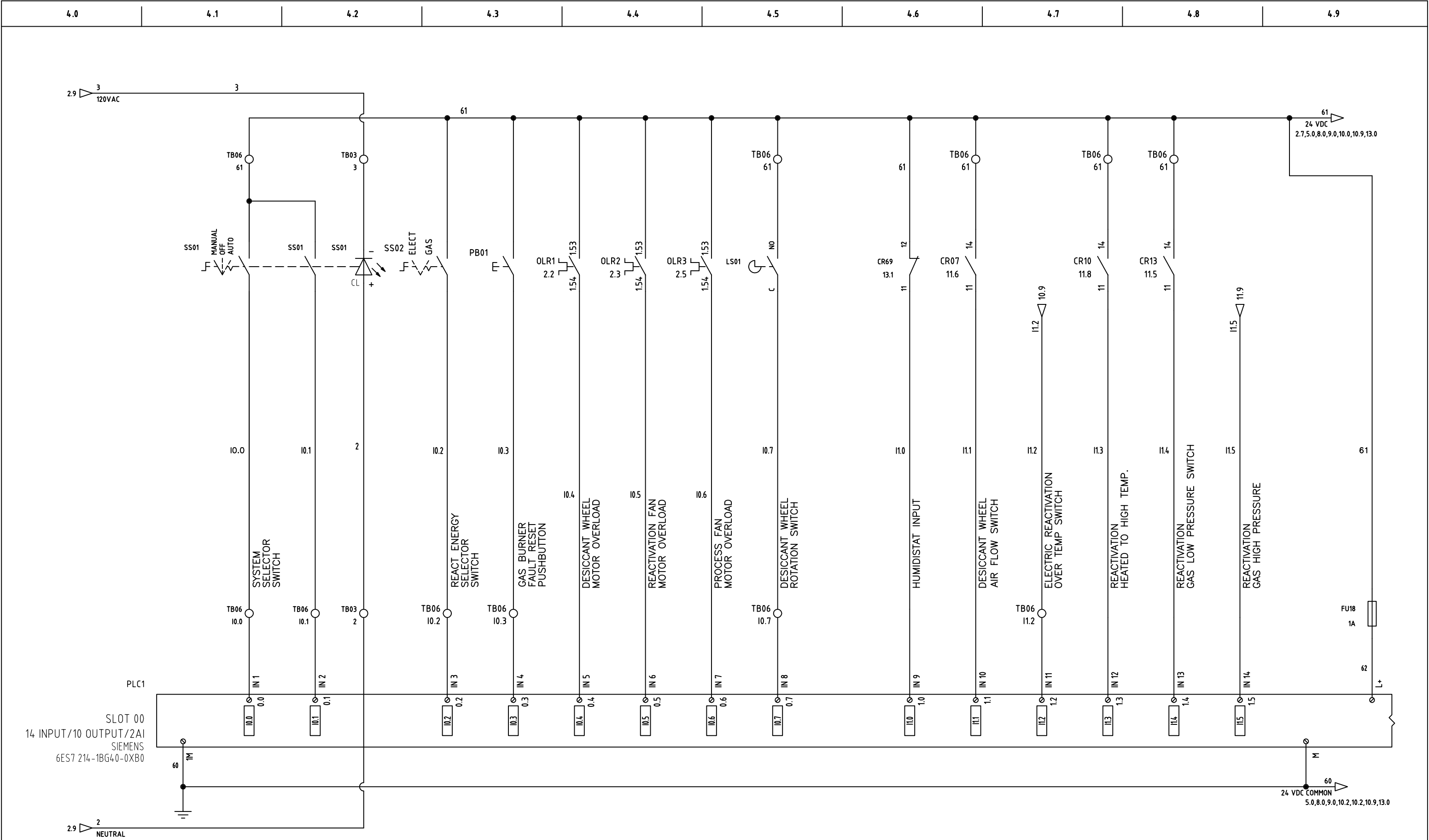
WIRING DIAGRAM R05 RENTAL UNIT DUAL FUEL 460V

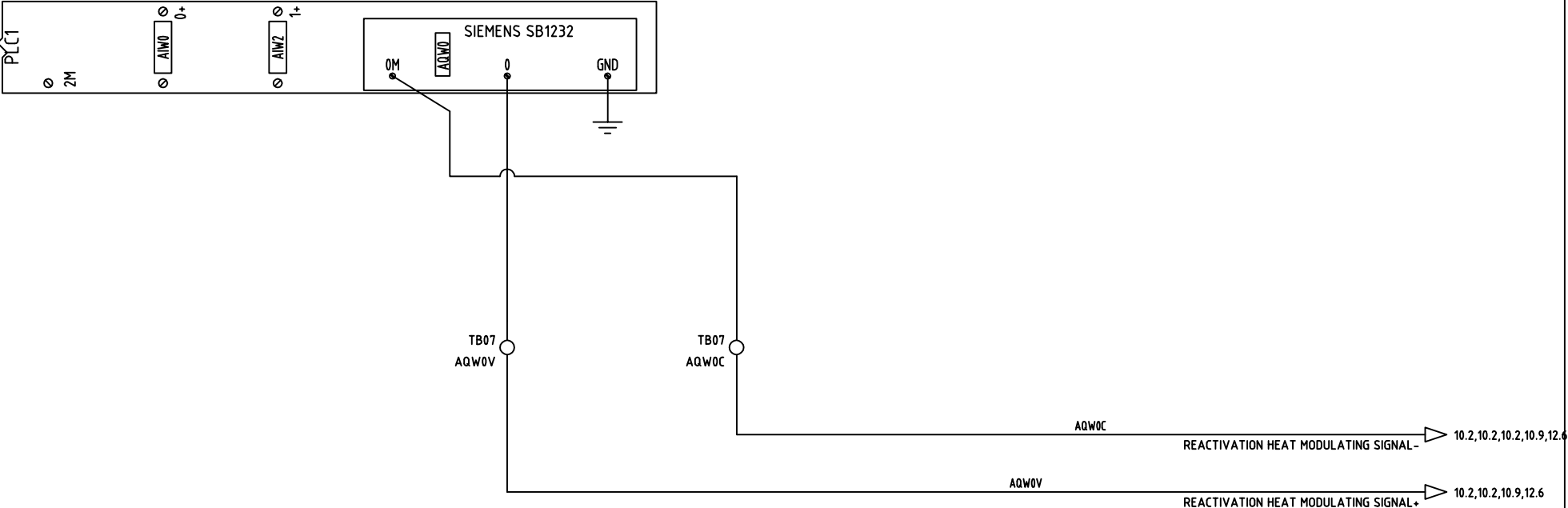
Dr. By	Ck. By	Aprv. By	DATE	Job No.	Customer	SHEET	SIZE	REV
DSL	RDS	RDS	7/15/14	STANDARD	RENTAL UNIT	17 of 17	B	K51525-01 7

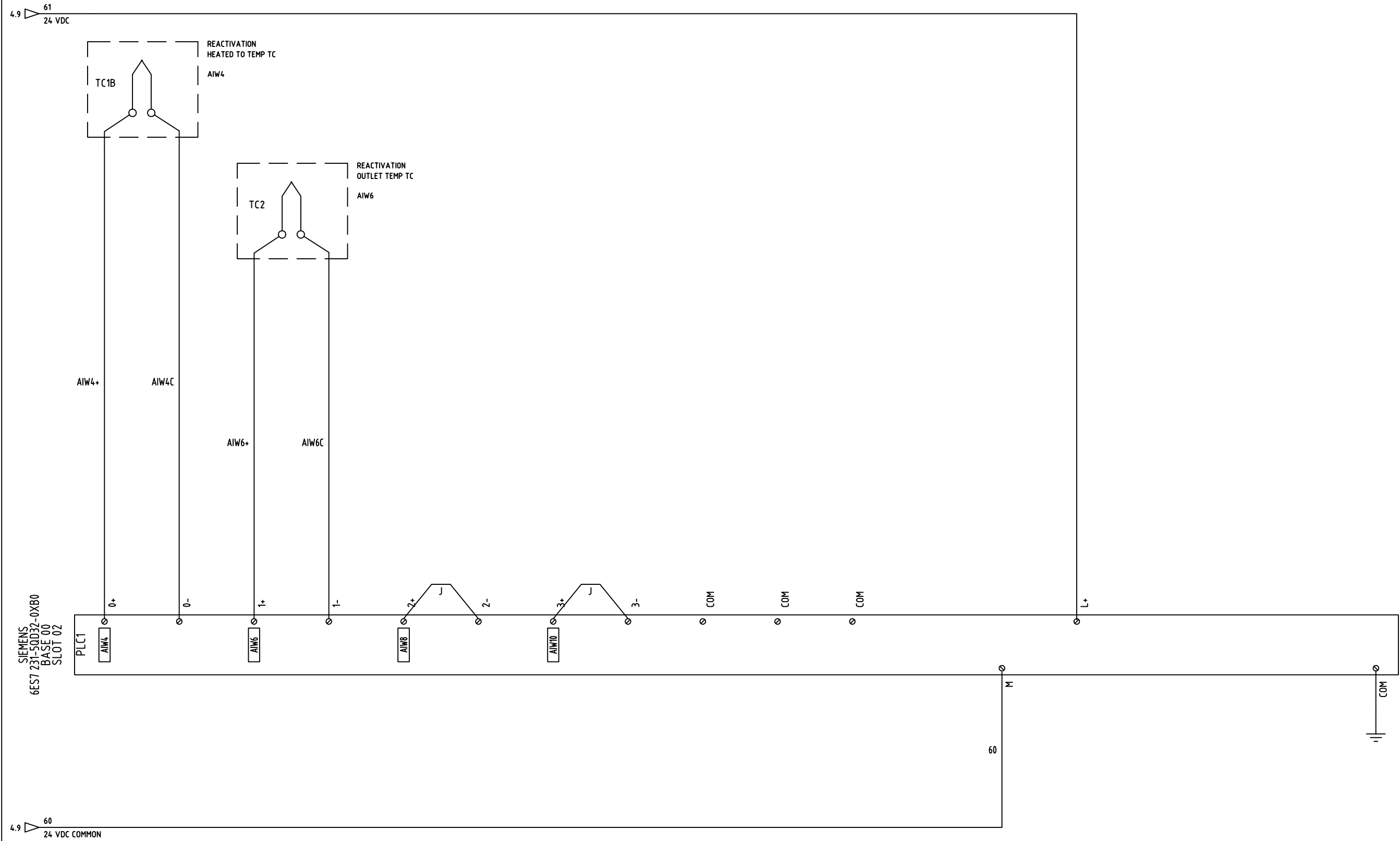


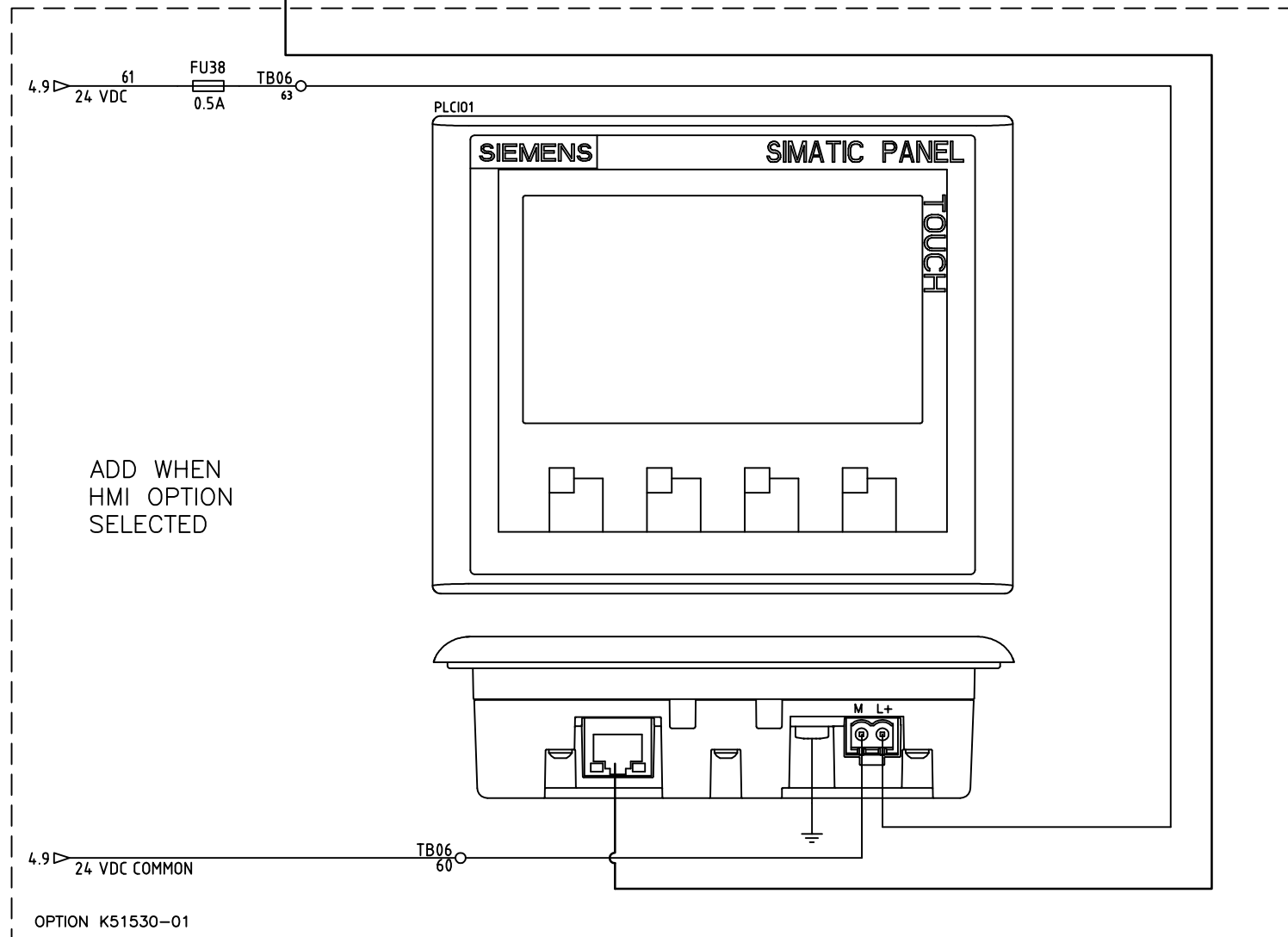
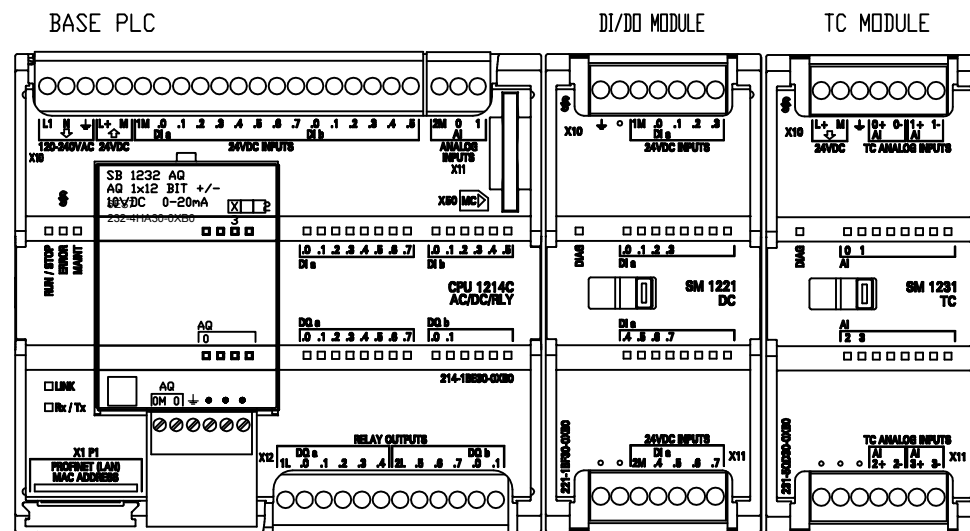


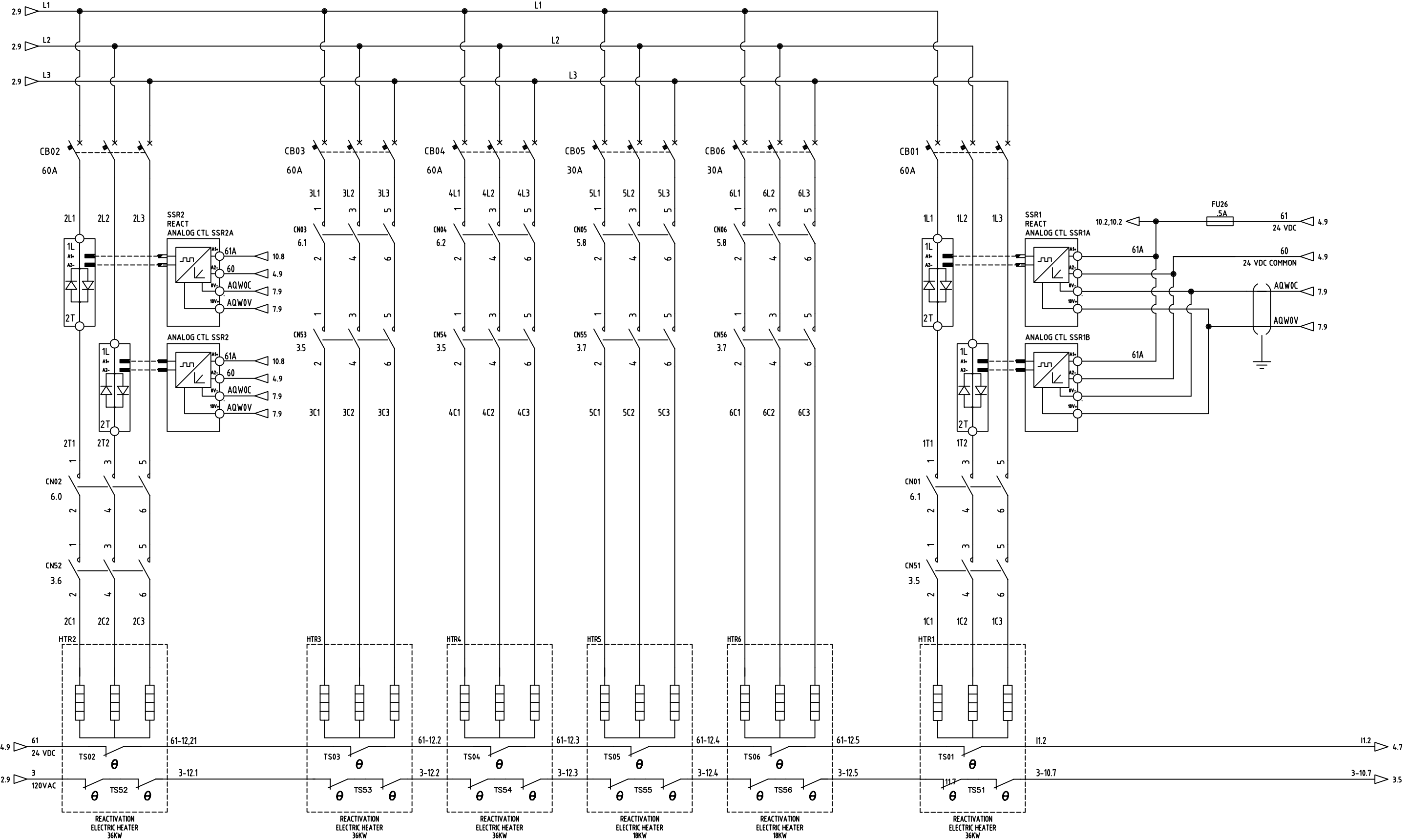


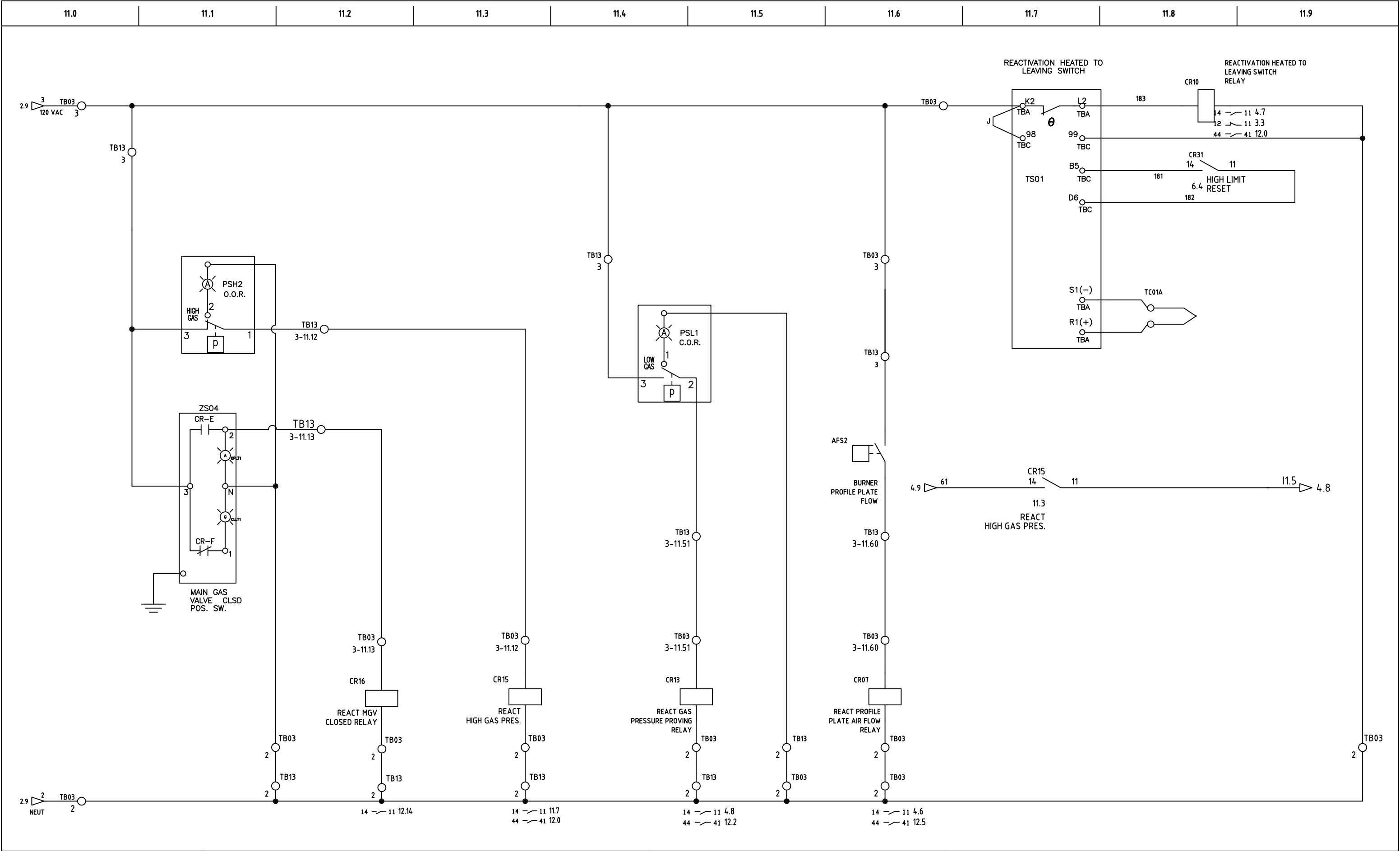


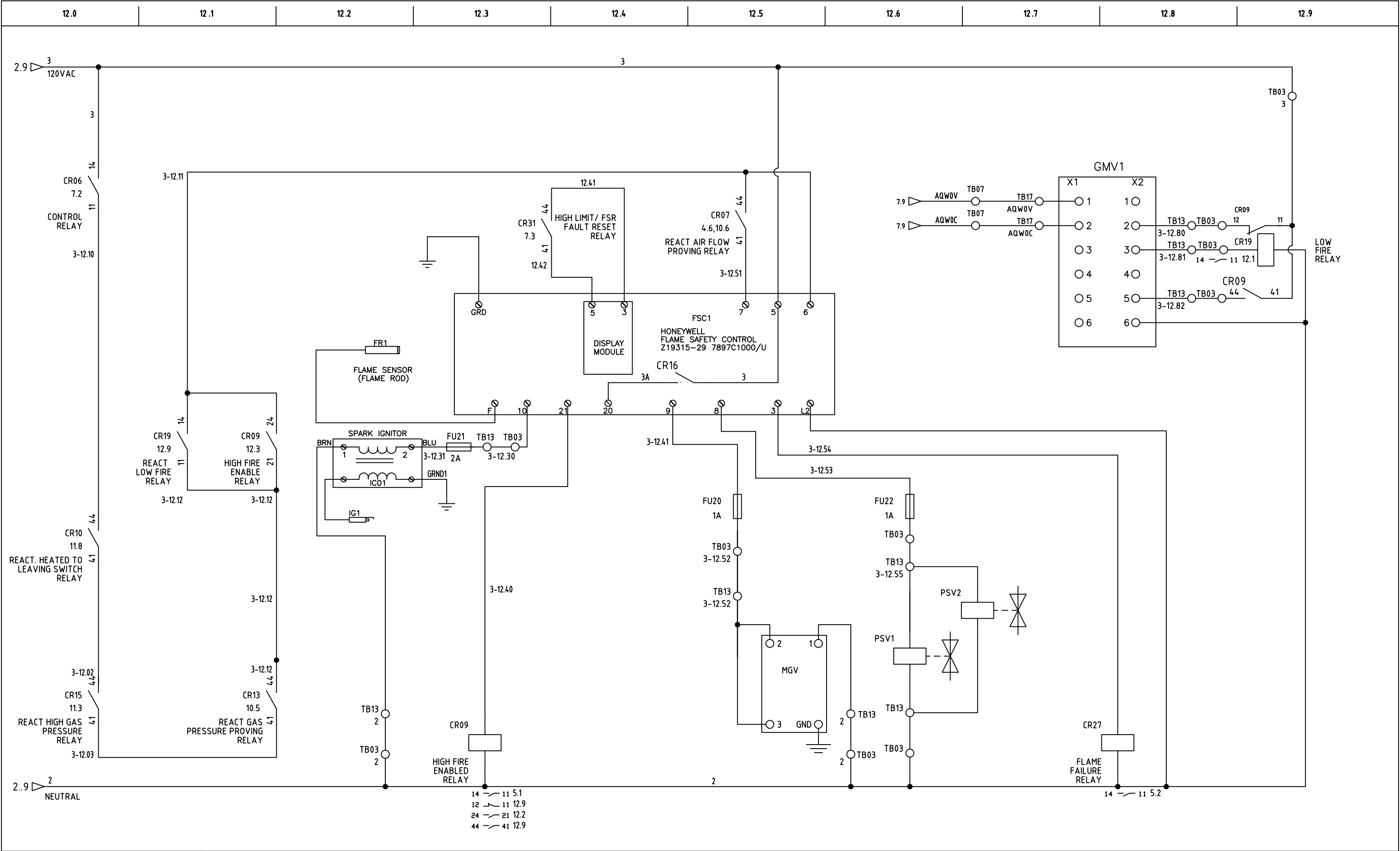


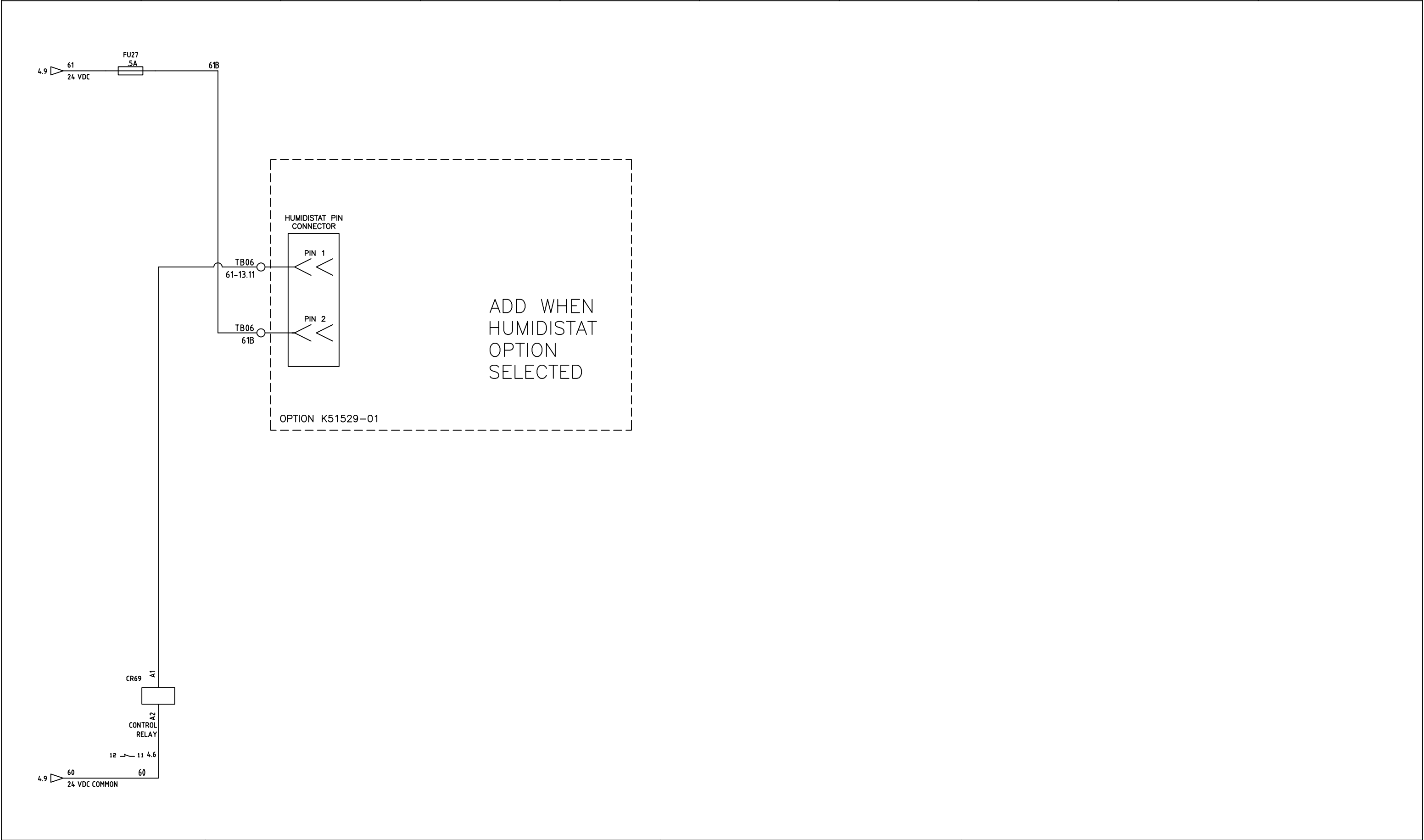


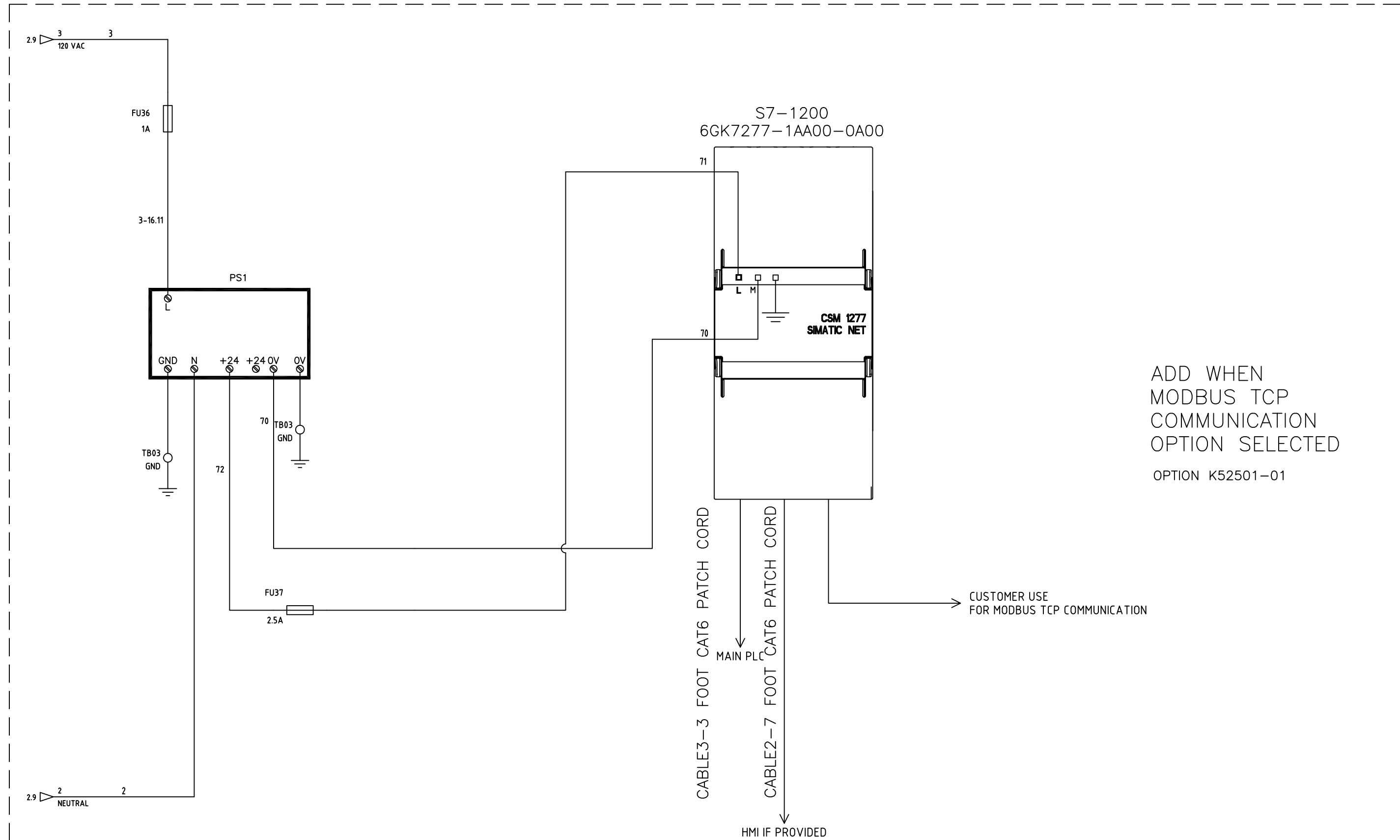


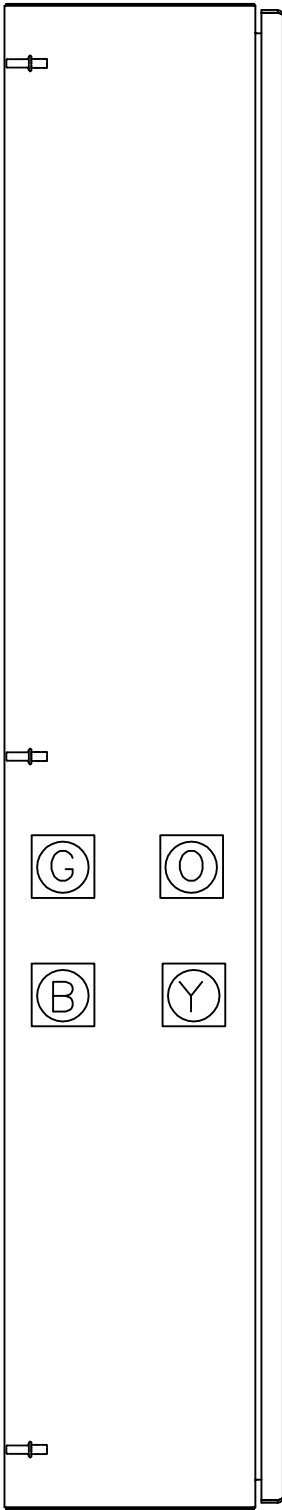




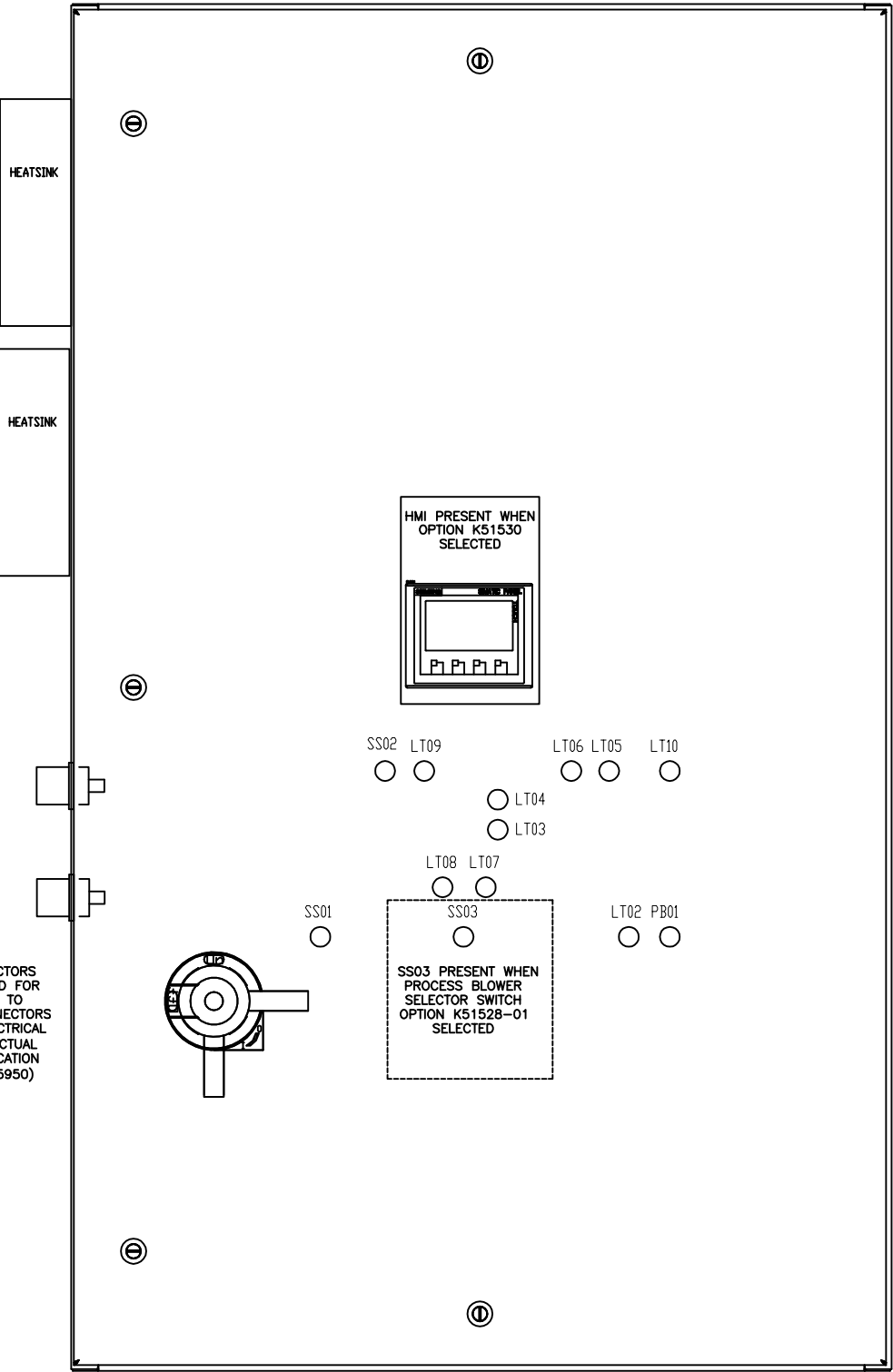




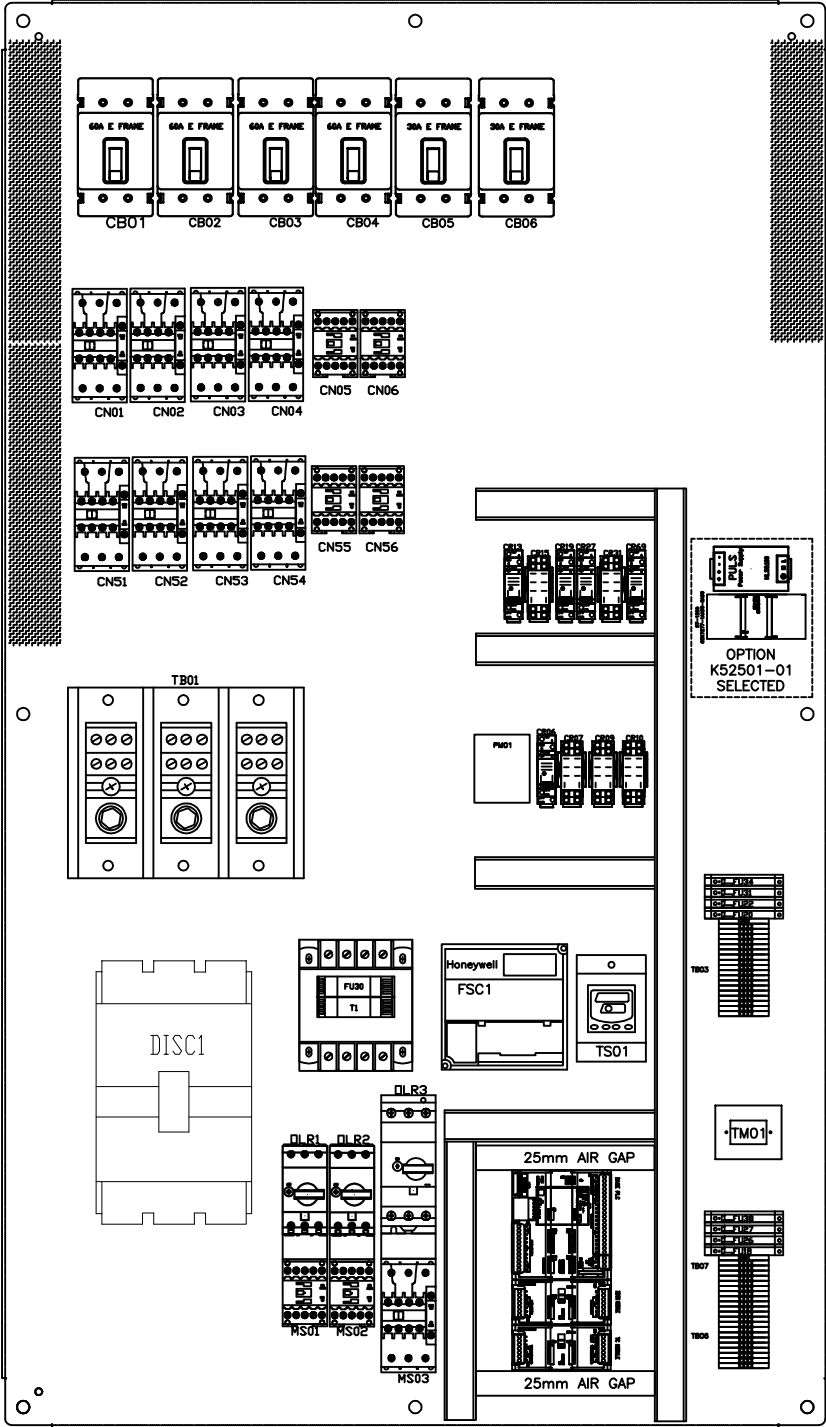




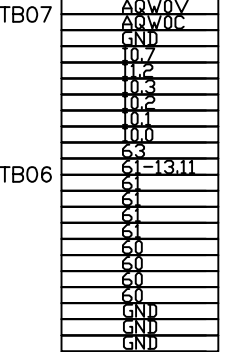
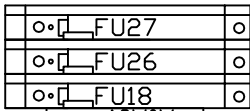
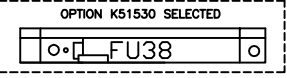
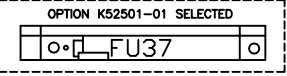
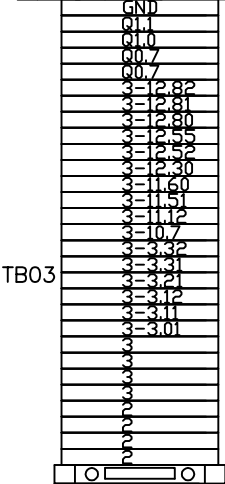
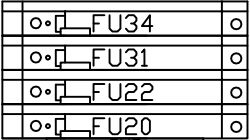
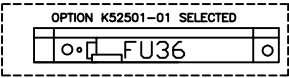
LEFT SIDE
VIEW

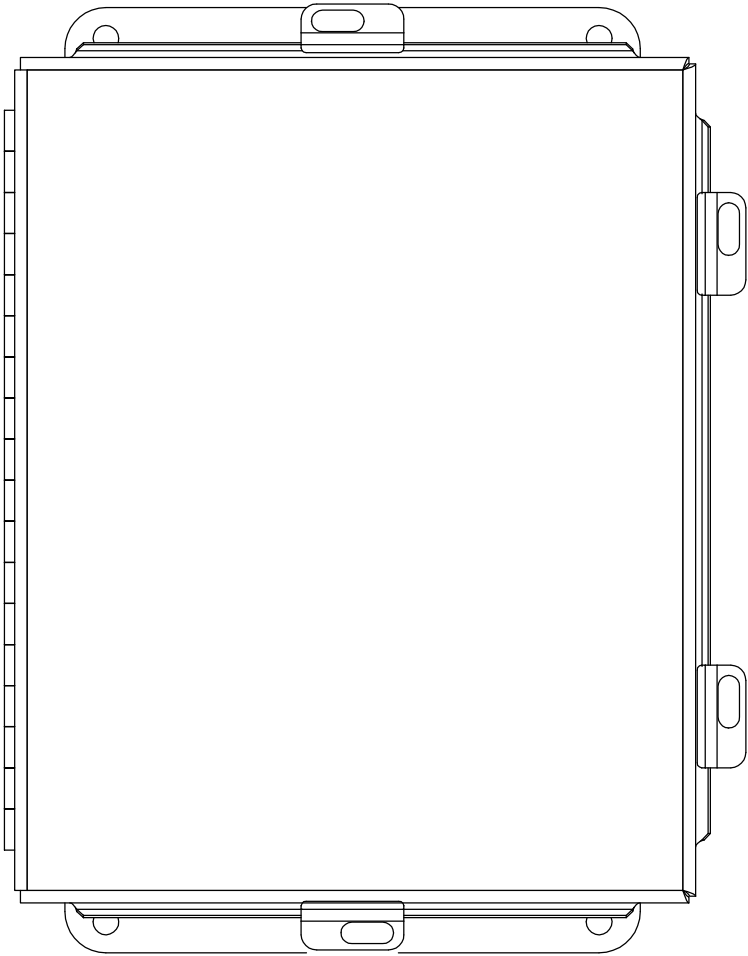


CONTROL ENCLOSURE 60 X 36 X 10 (NEMA 4)
(ENCLO)

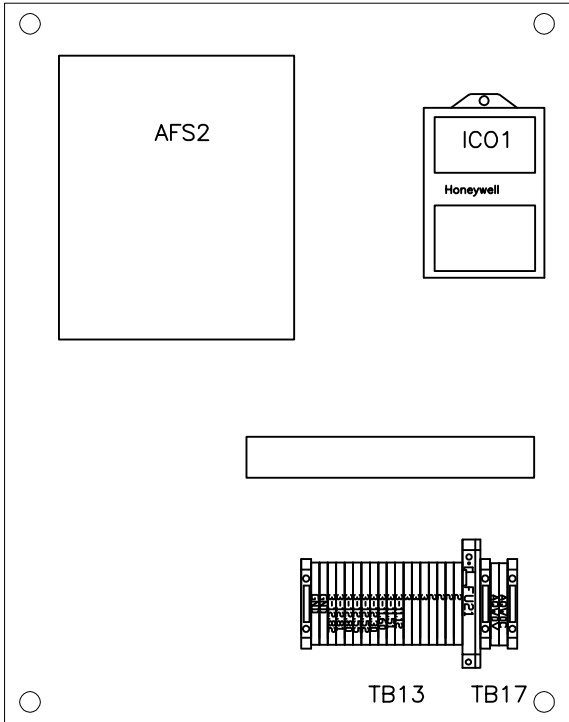


PANEL LAYOUT
(PNLO)

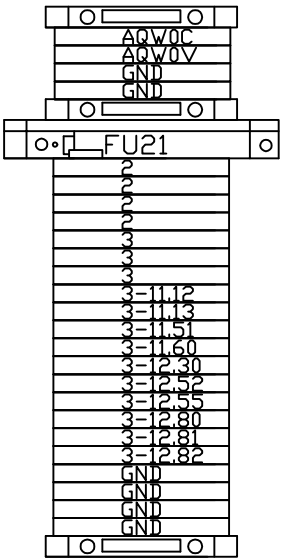




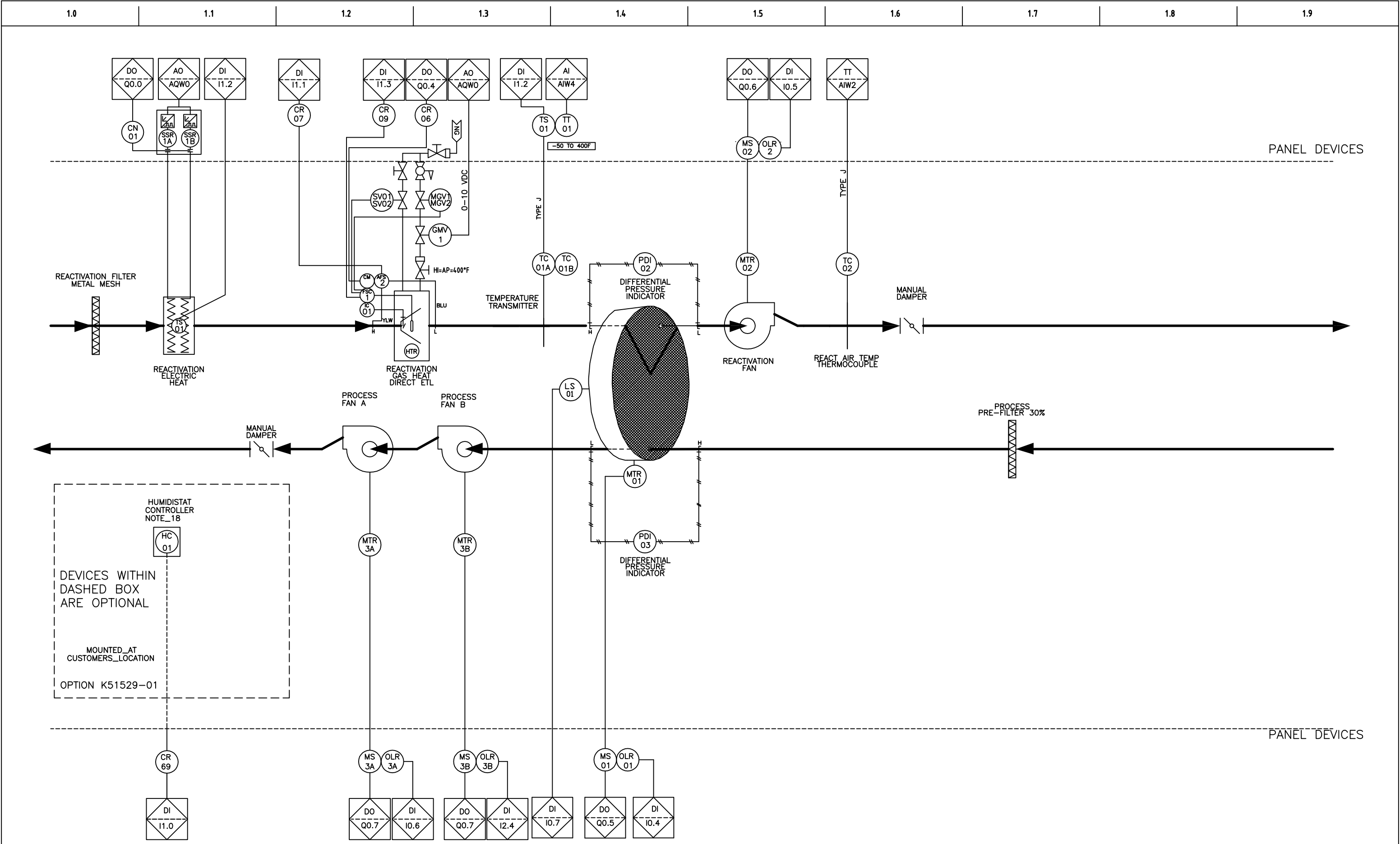
REACTIVATION
GAS BURNERS (ENC1)
14x16 CH ENCLOSURE

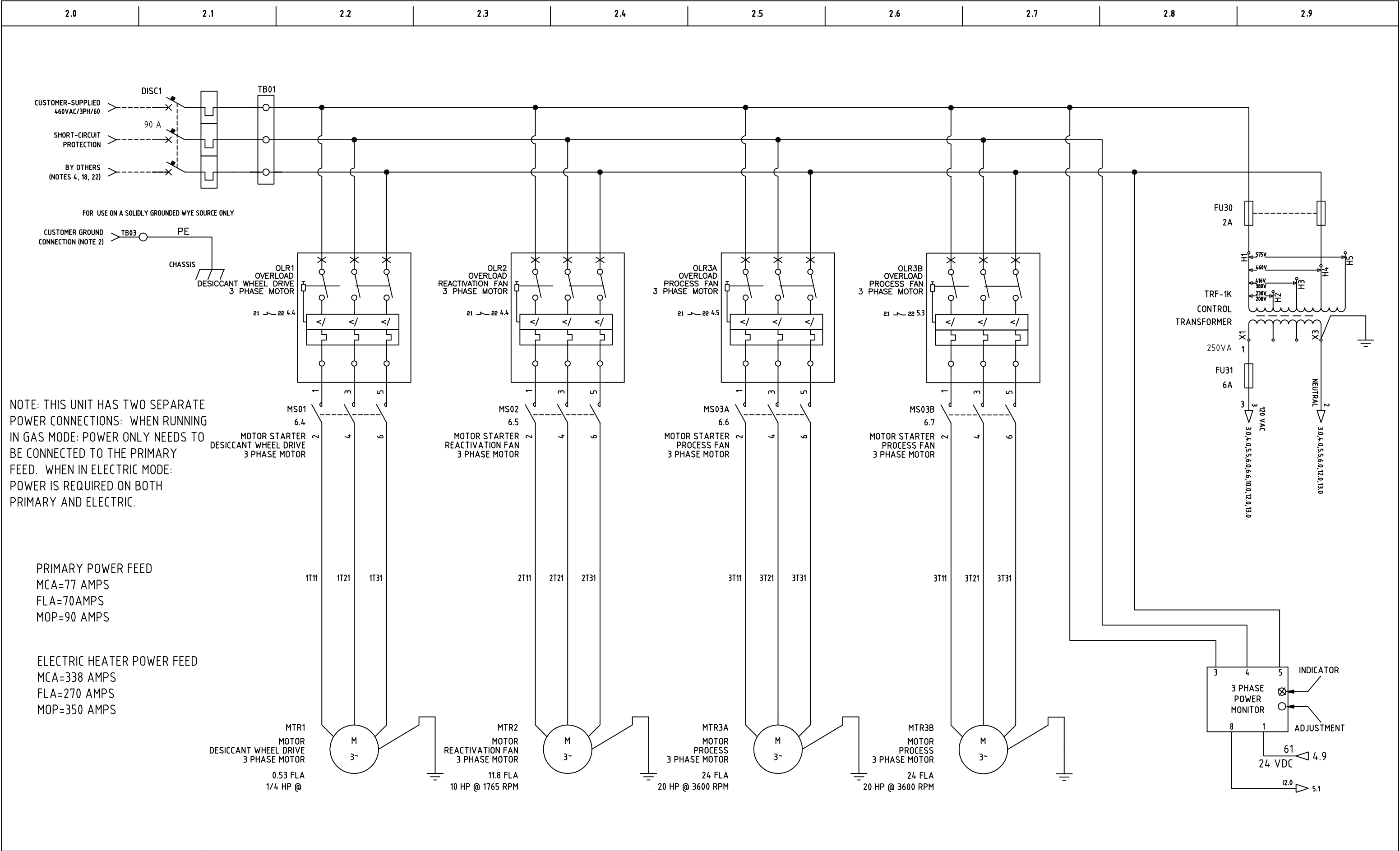


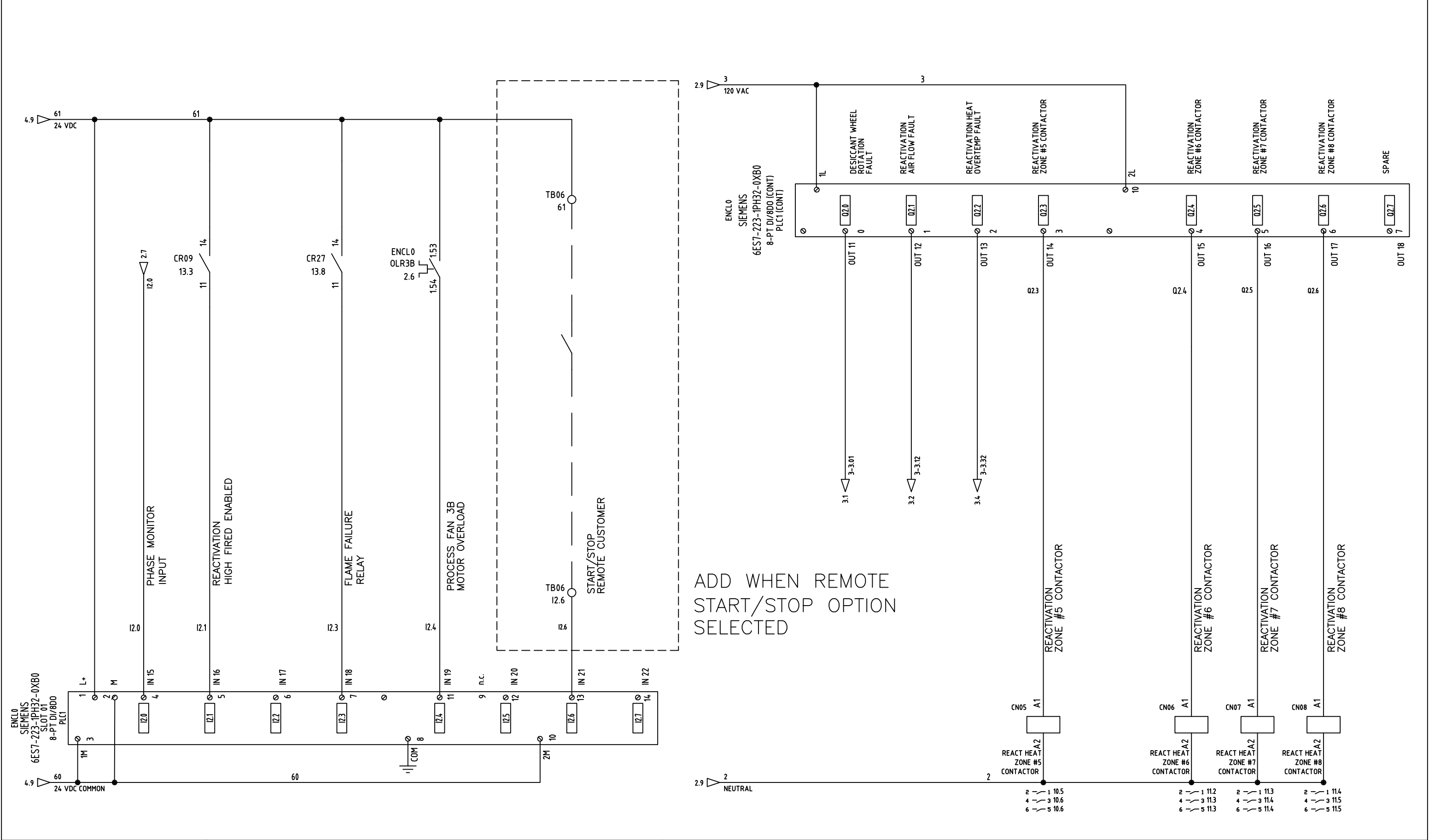
REACTIVATION
GAS BURNERS (ENC1) PANEL LAYOUT
PANEL

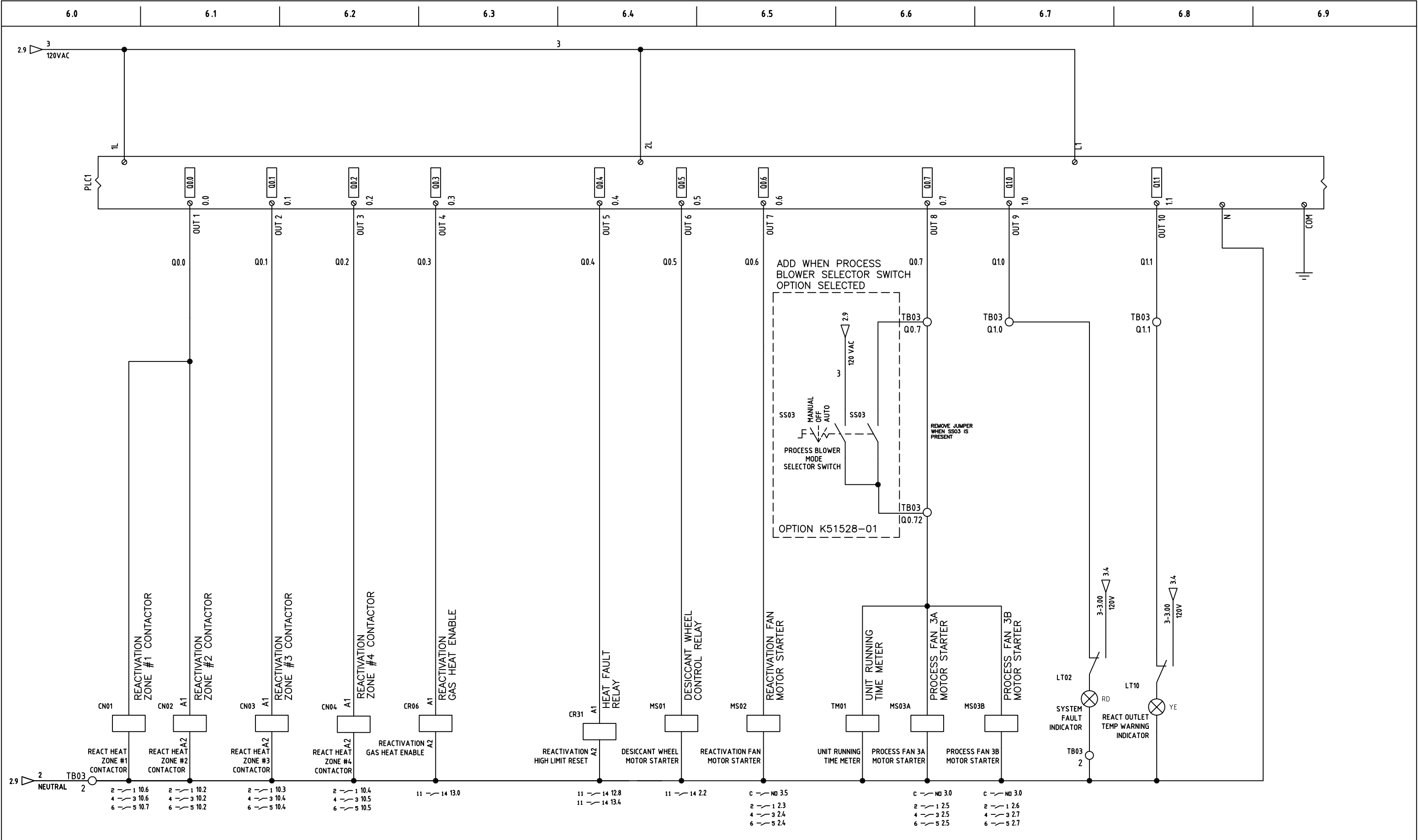


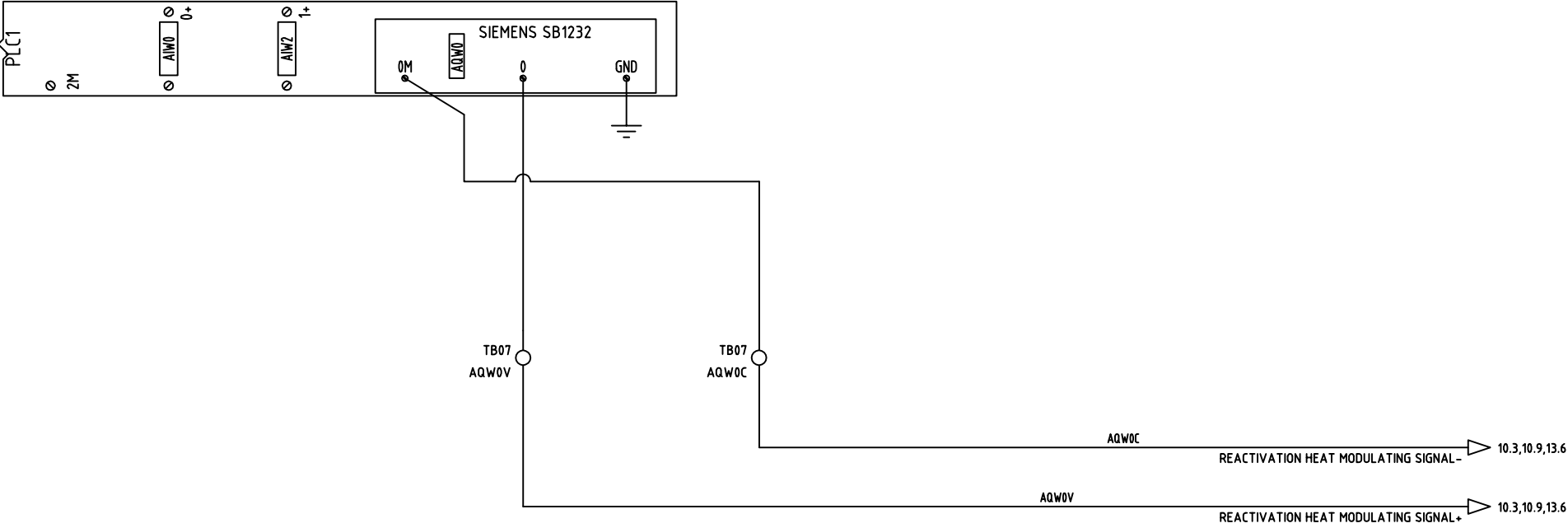
17.0	17.1	17.2	17.3	17.4	17.5	17.6	17.7	17.8	17.9				
							REVISIONS						
						7	AS BUILT– UPDATED TERMINALS			HZ	KPW	HZ	09/18/17
						6	ADDED MODBUS TCP COMMUNICATION OPTION			HZ	KPW	HZ	04/24/17
						5	REVISED AS BUILT			DSL	AKN	AKN	5/20/16
						4	UPDATED GAS TRAIN WIRING AND MOVED CN05,CN06 PLC OUTPUT TO Q2.4,Q2.5			HZ	KPW	HZ	12/07/15
						3	SIEMENS PLC CHANGED FROM V3 TO V4, MOVED CAMLOCK TO SIDE OF ENCLOSURE			HZ	KPW	HZ	09/23/15
						2	AS BUILT			DSL	GDD	GDD	3/2/15
						1	UPDATED HEATER BANKS AND NEW GAS TRAIN WIRING			HZ	DSL	HZ	01/05/15
						0	RELEASED FOR MANUFACTURING			RDS	DSL	RDS	7/15/14
						REV	DESCRIPTION			DRW	CHK	APR	DATE

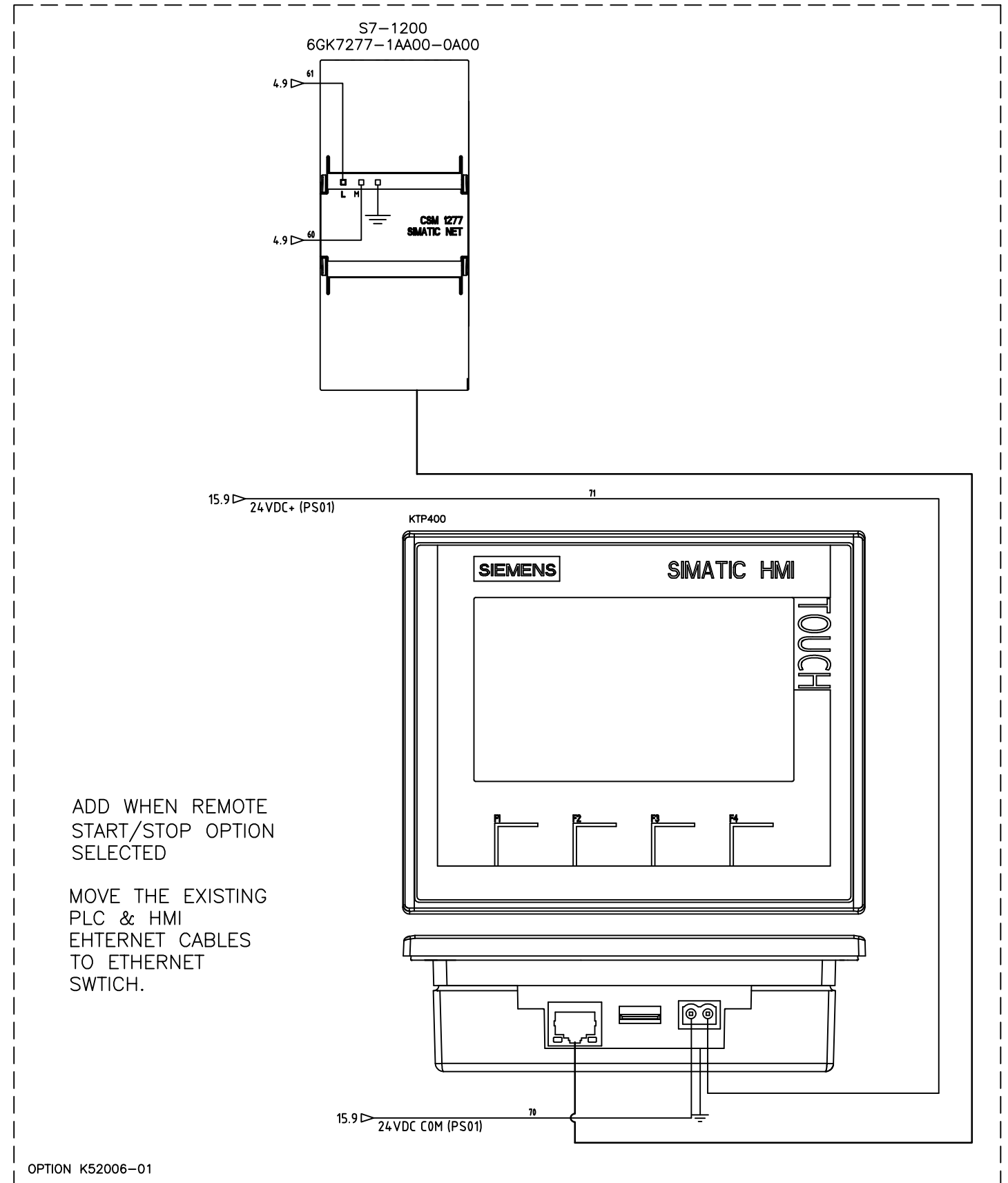
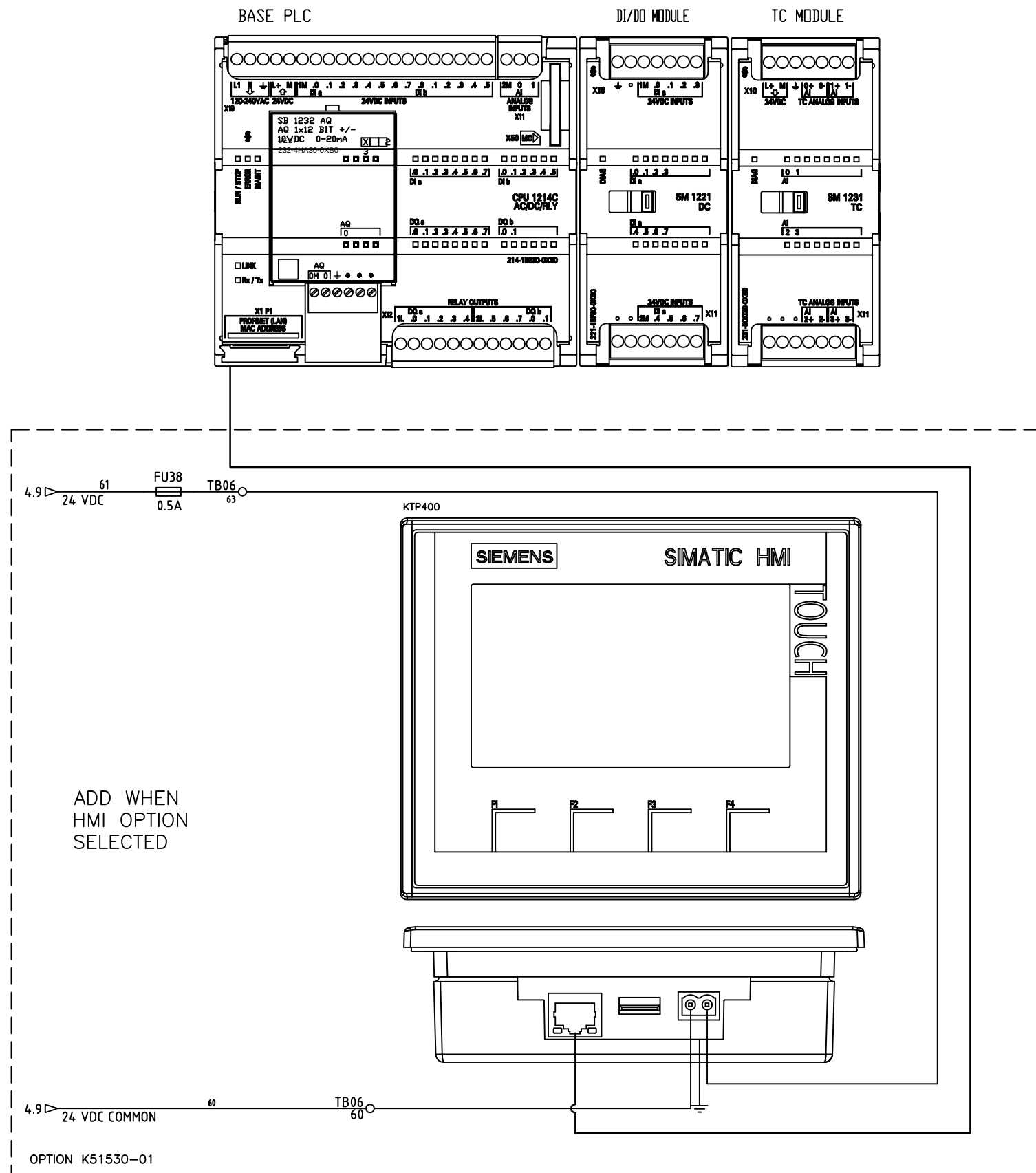


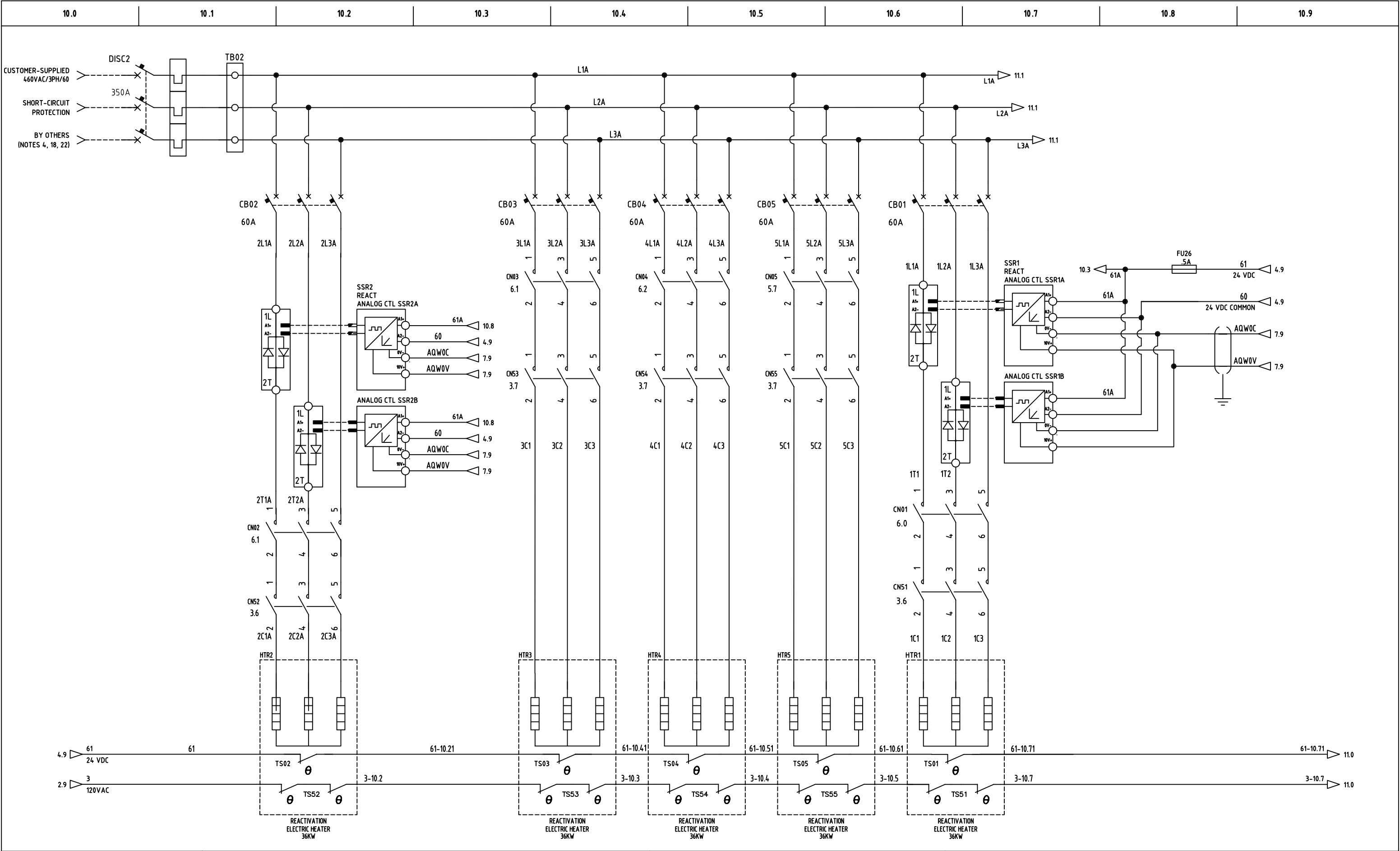


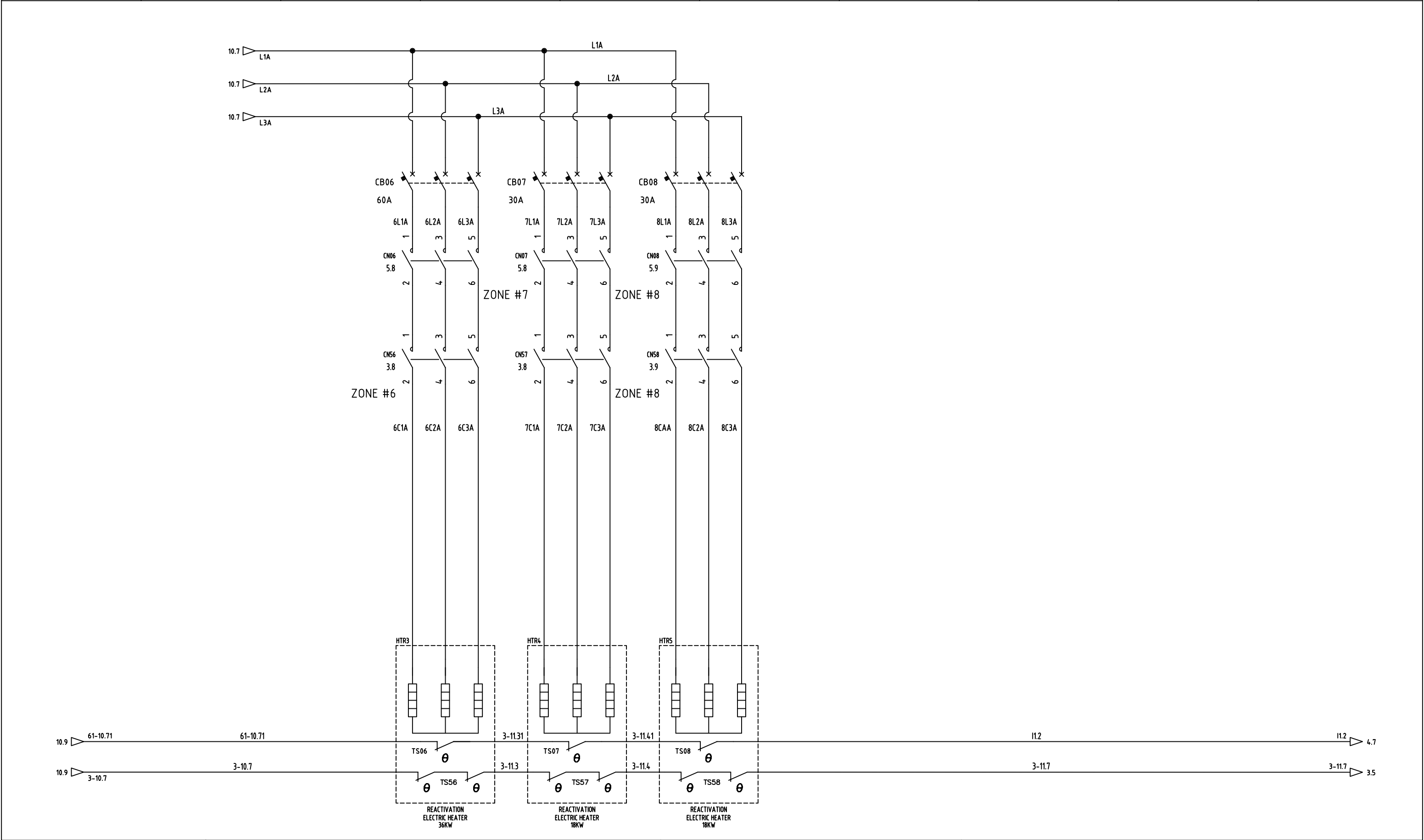


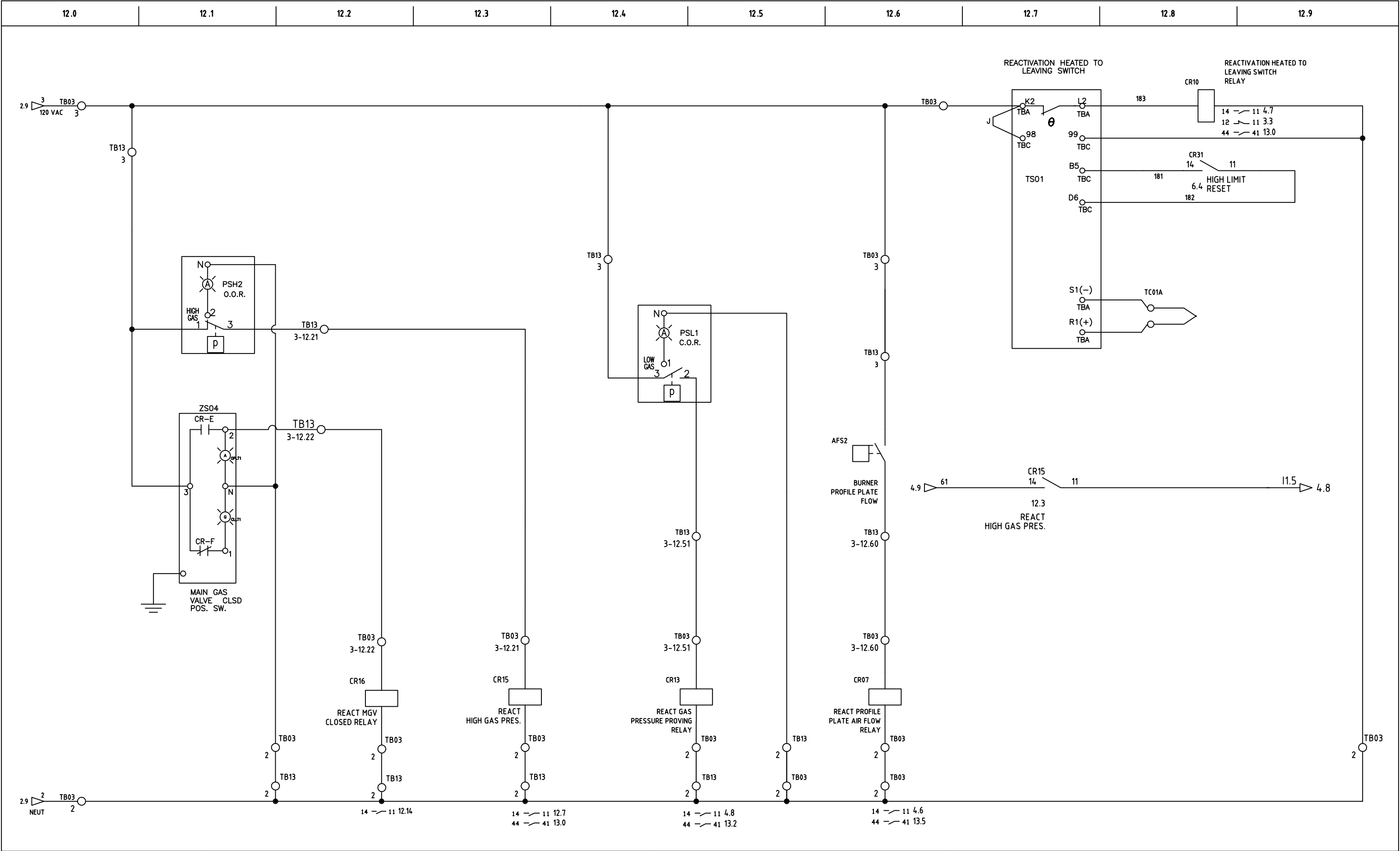


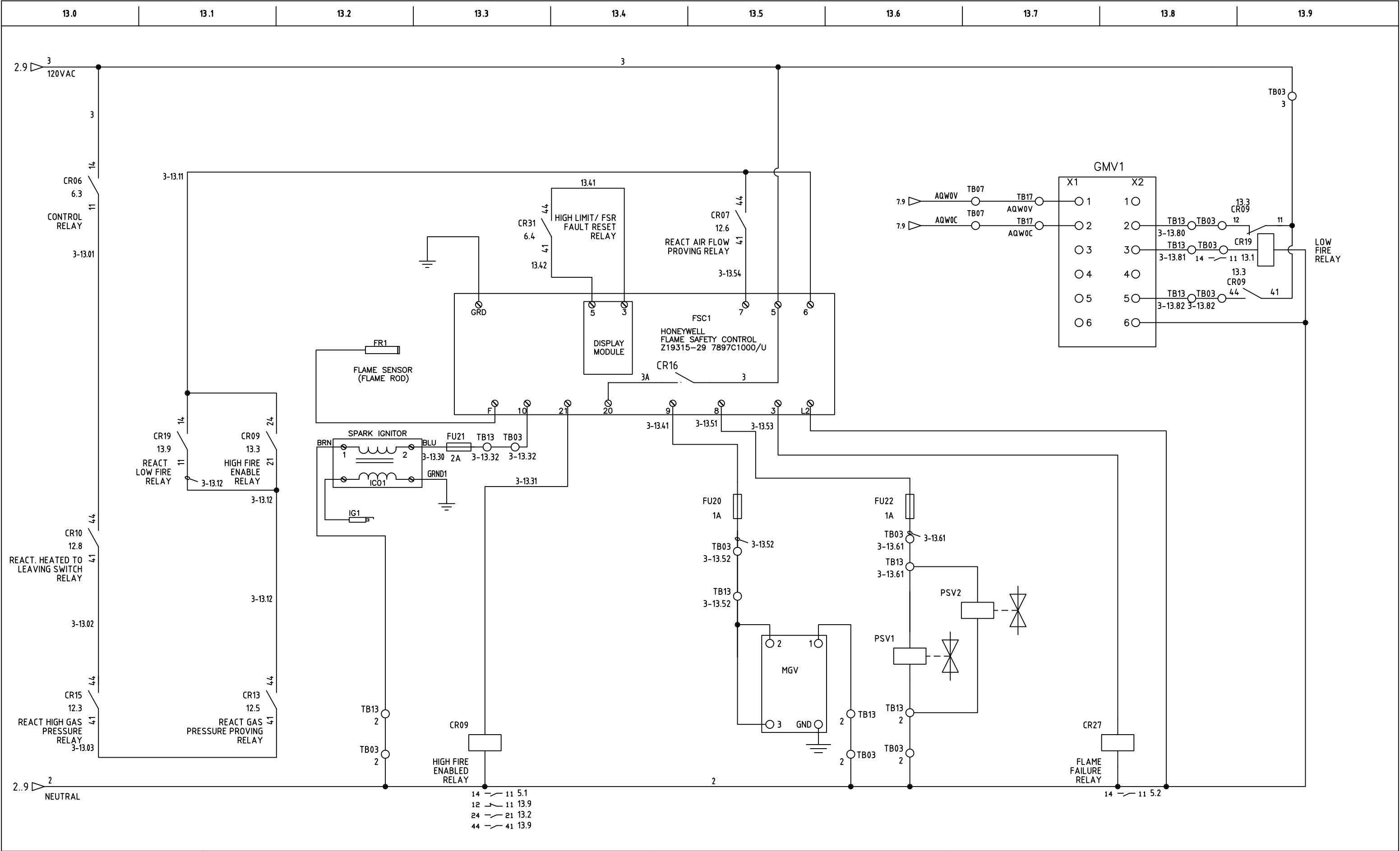


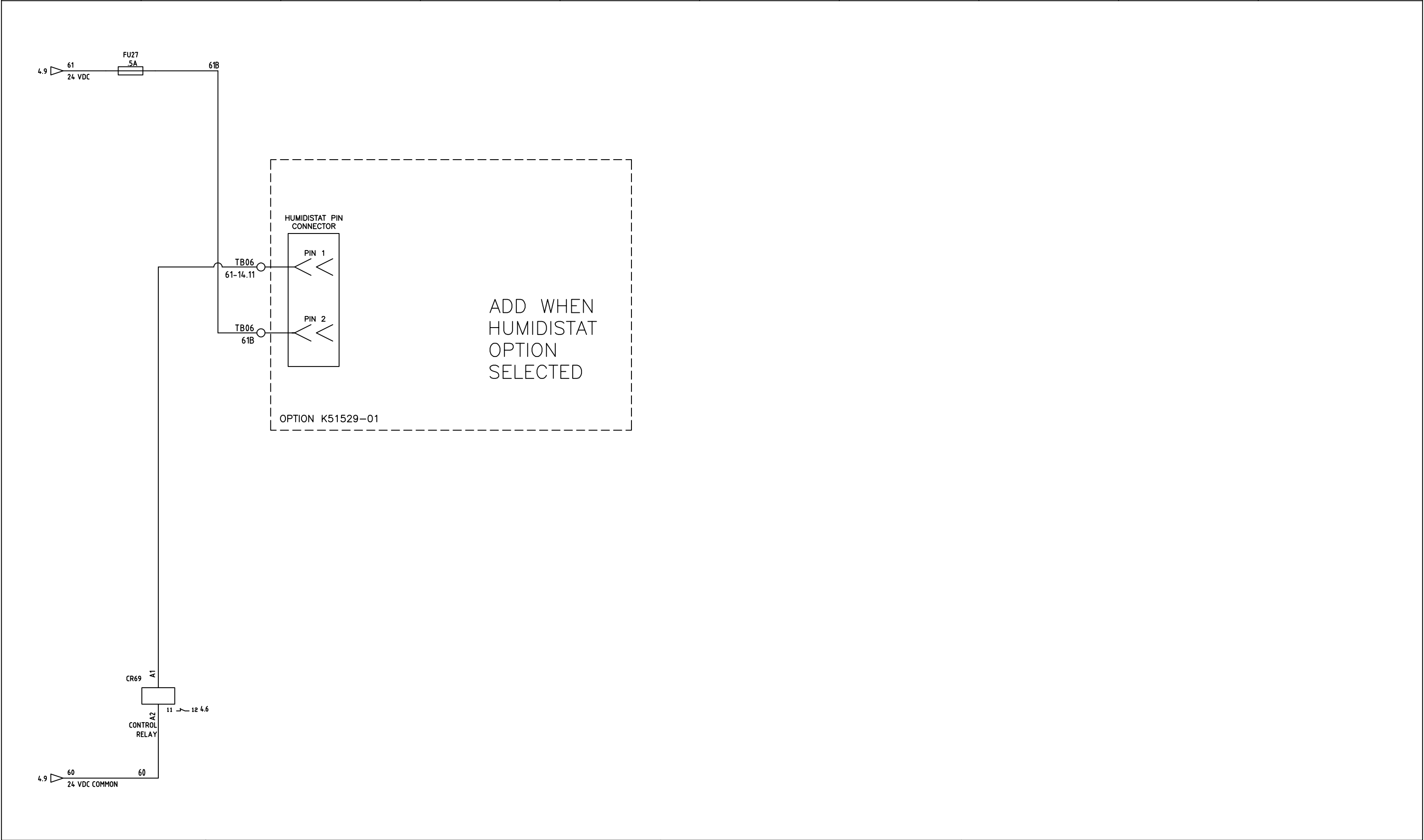


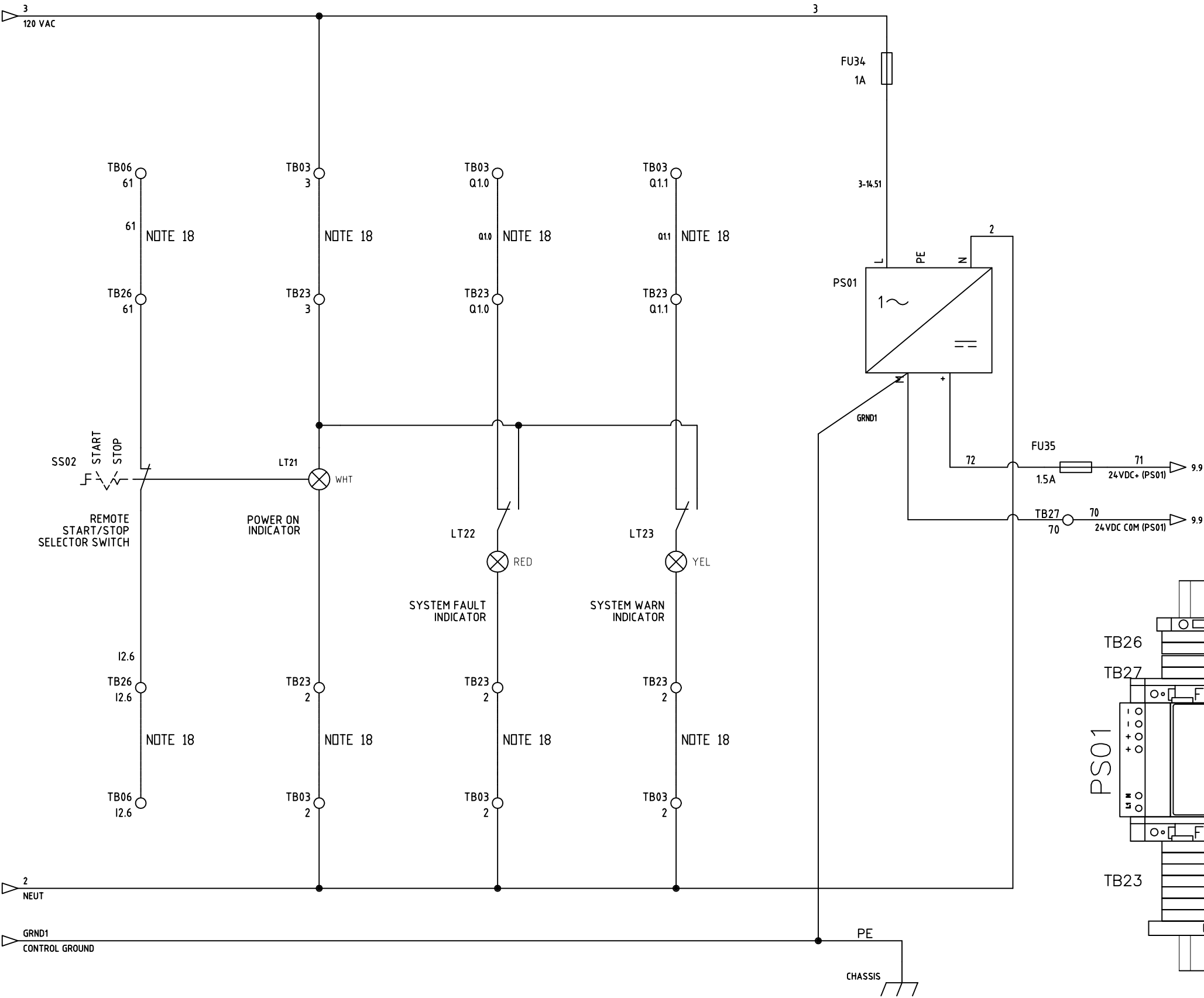




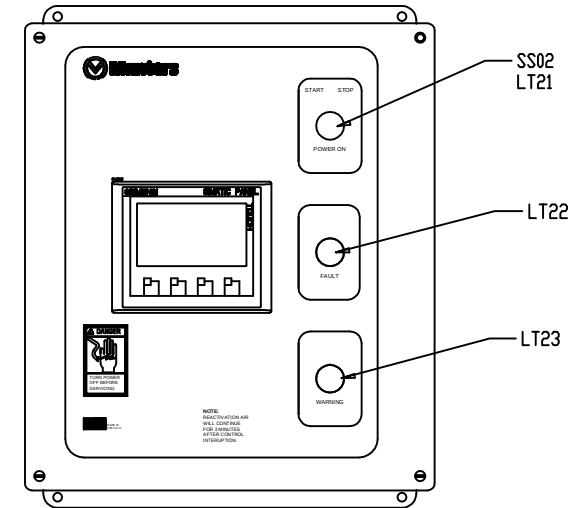




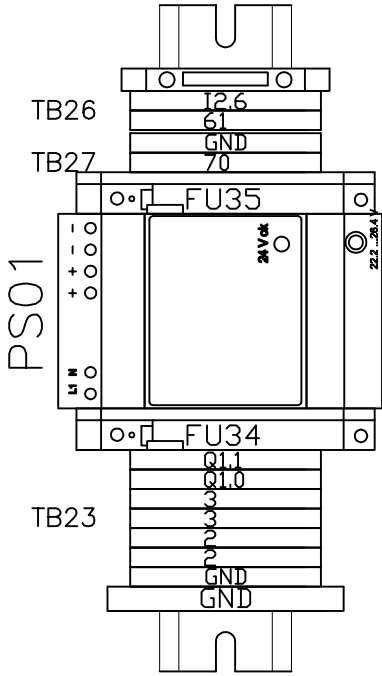
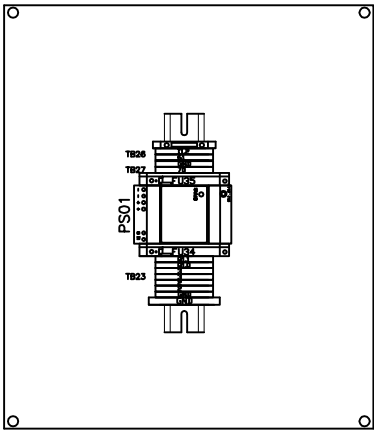


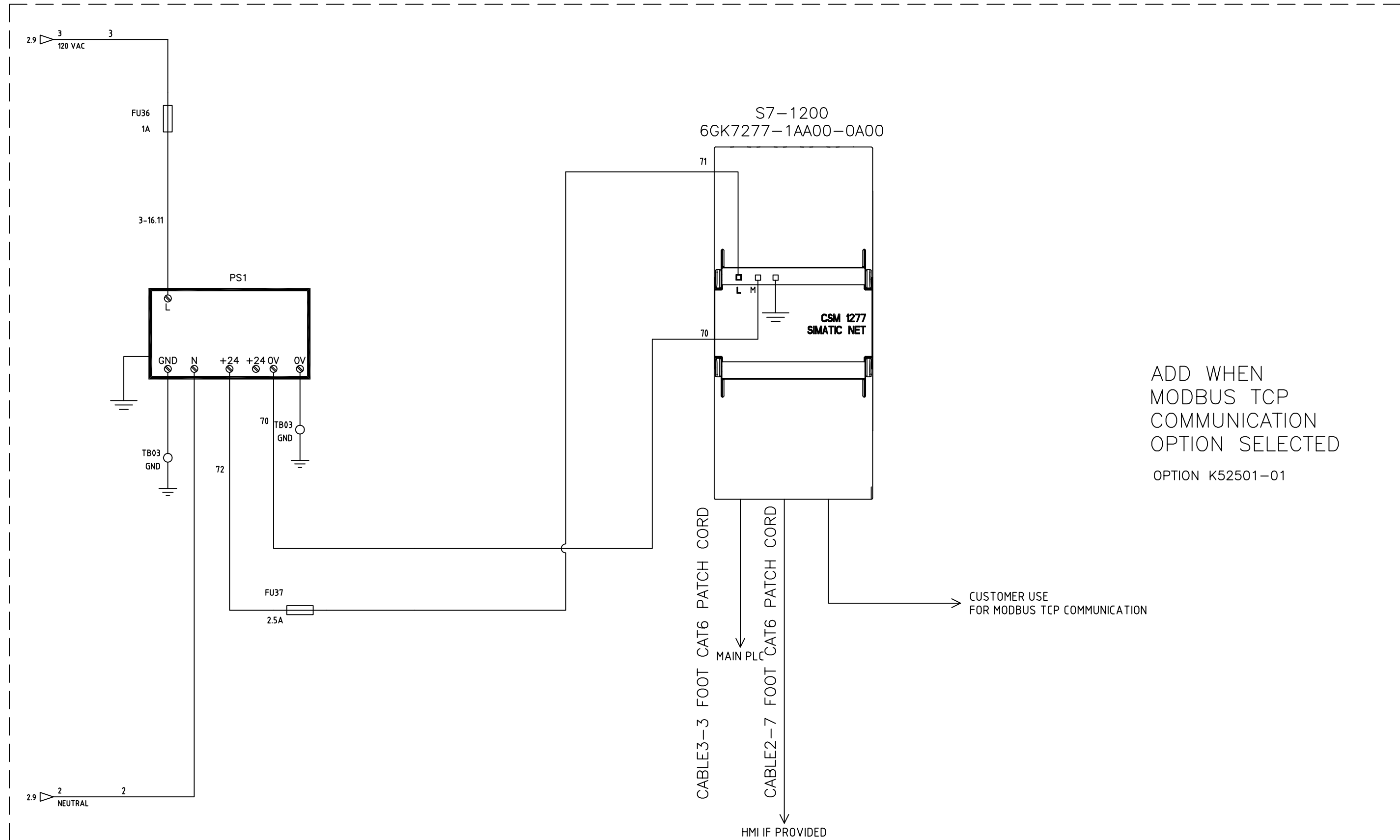


FOR REMOTE HMI COMMUNICATIONS
USE A CAT 6 ETHERNET CABLE
(LENGTH DETERMINED BY INSTALLATION)



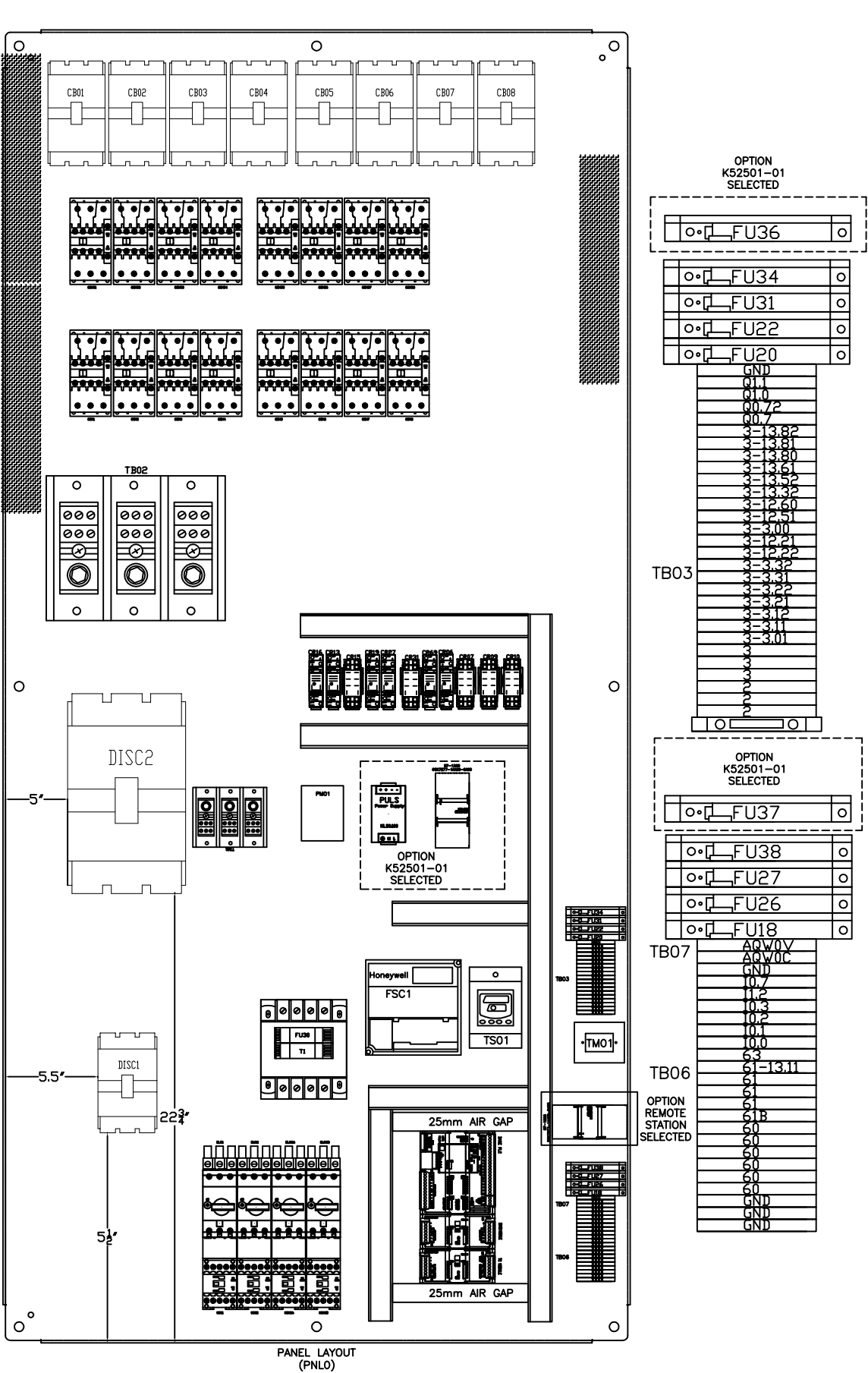
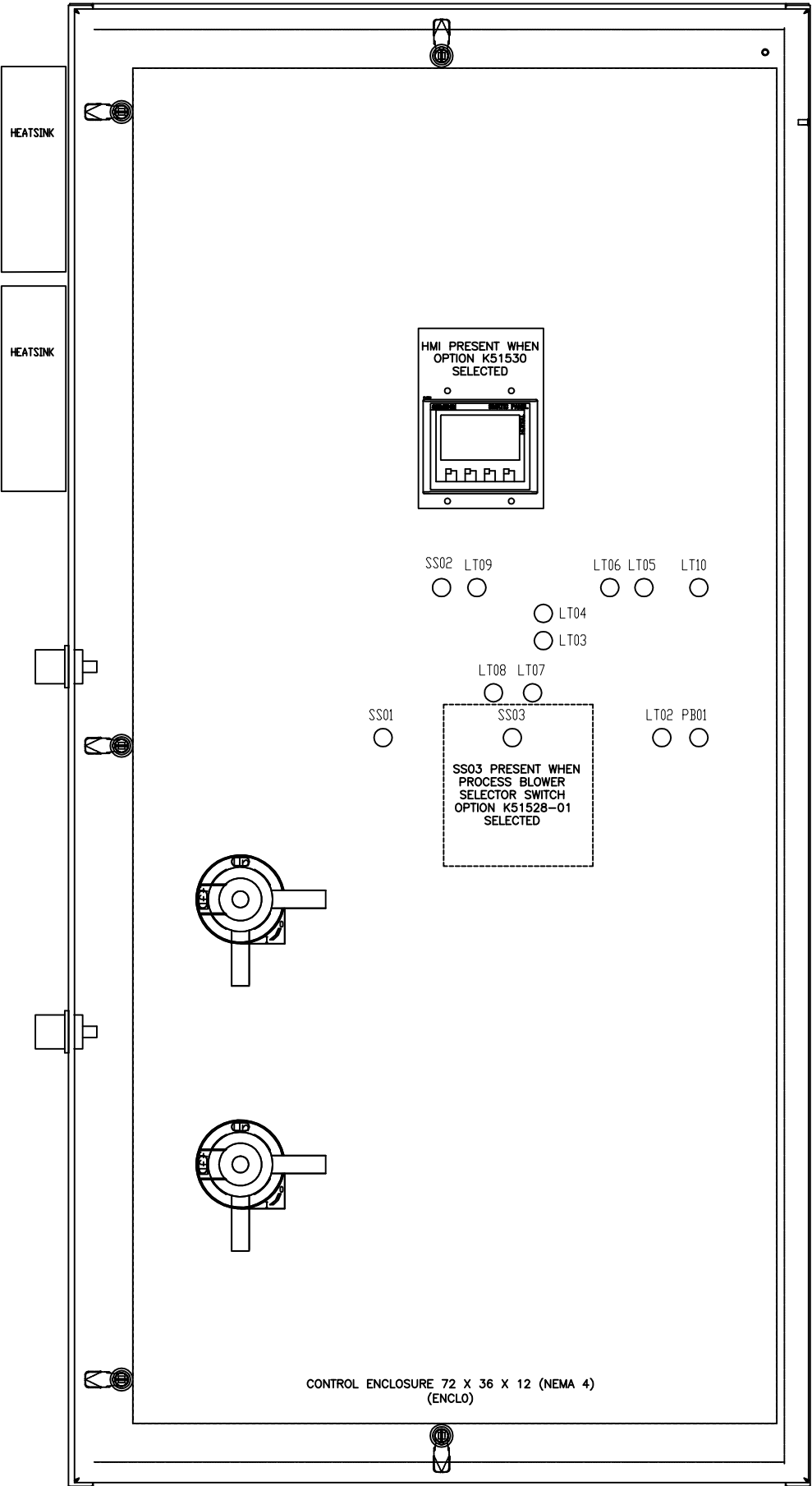
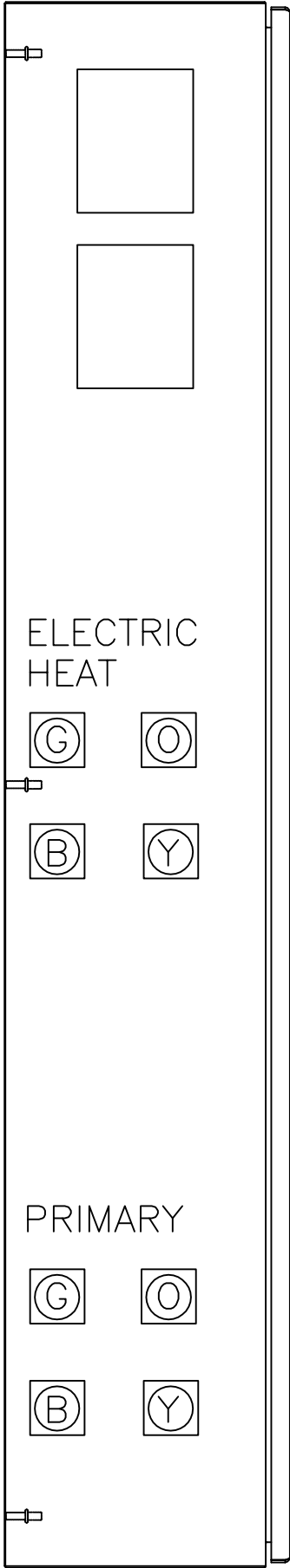
16 X 14 X 8 ENCLOSURE

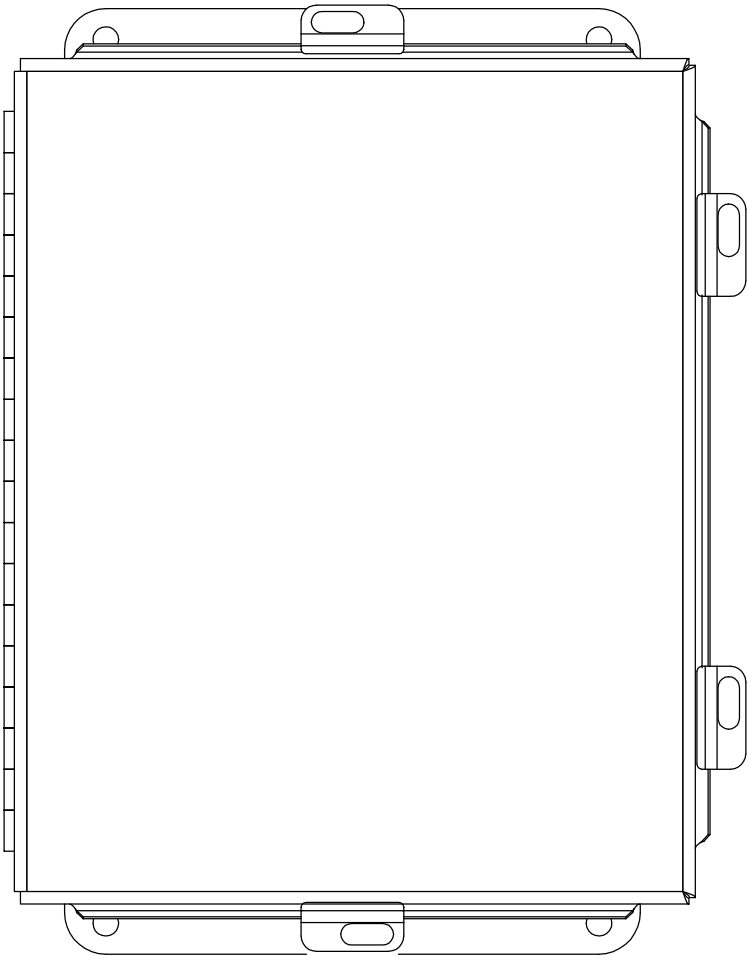
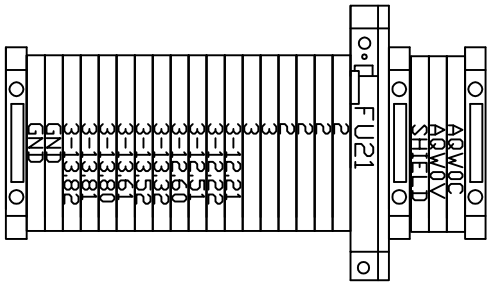




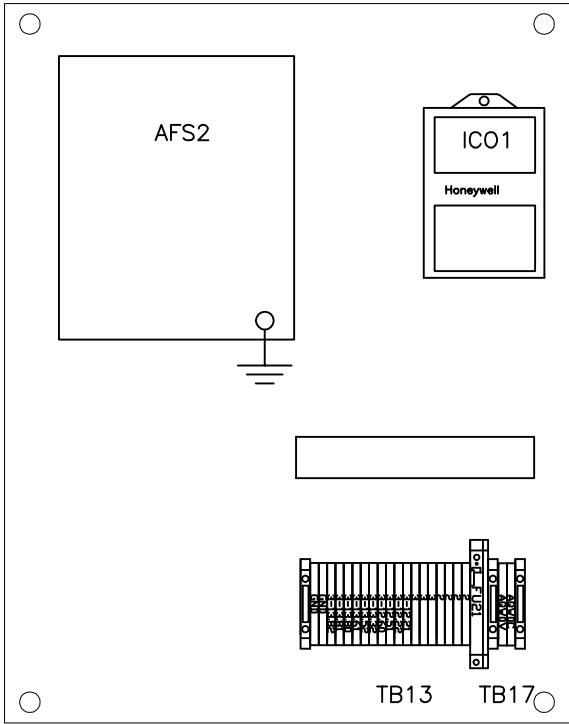
ADD WHEN
MODBUS TCP
COMMUNICATION
OPTION SELECTED

OPTION K52501-01





REACTIVATION
GAS BURNERS (ENC1)
14x16 CH ENCLOSURE



REACTIVATION
GAS BURNERS (ENC1) PANEL LAYOUT
PANEL

- NOTES:
1. REVIEW OPERATING & MAINTENANCE MANUAL BEFORE ENERGIZING EQUIPMENT.
 2. CUSTOMER-SUPPLIED EARTH GROUND TO BE TERMINATED AT KP LUG OR GROUNDING STRIP PROVIDED.
 3. PROTECTIVE DEVICES HAVE BEEN PRESET AND/OR SELECTED AND ARE RECORDED AT FACTORY PER SPECIFICATION 22096/22576.
 4. OPTIONAL EQUIPMENT.
 5. N/A.
 6. ALL WIRING SHOWN WITH SOLID LINES IS INSTALLED AT THE FACTORY.
 7. SEE ELECTRICAL PARTS LIST FOR COMPONENT SPECIFICATION.
 8. NO = NORMALLY OPEN, OOR = OPEN ON RISE,
NC = NORMALLY CLOSED, OOF = OPEN ON FALL.
 10. INTERLOCK WIRING FOR AUTOMATIC START/STOP IS NOT BY MUNTERS.
 11. USE SHIELDED CABLE, NOT LESS THAN #18 AWG.
 12. REMOVE JUMPERS WHEN INTERLOCKING SAFETIES.
 13. ELECTRICAL WIRE SIZING DATA: STANDARD: A72001/CANADIAN: A72011
 14. AUXILIARY INTERLOCK IS PROVIDED FOR CUSTOMER INTERLOCKING.
 15. SHIPPED REMOTE FROM FACTORY, INSTALLED BY OTHERS.
 16. CUSTOMER CONTROLS.
 17. N/A.
 18. FIELD WIRED, BY INSTALLER.
 19. TRANSFORMER VOLTAGES SHOWN COVER ALL STANDARD 50/60Hz APPLICATIONS.
THE ACTUAL TRANSFORMER USED IS DETERMINED BY THE POWER SOURCE.
 20. DASHED LINES ARE CUSTOMER WIRED FOR INTERCONNECT.
 21. INTERLOCK PROVIDED FOR OPTIONAL HUMIDISTAT OR LIMIT SWITCH ON.
 22. MAIN POWER DISCONNECT DEVICE NOT SUPPLIED BY MUNTERS AS STANDARD AND MUST
BE PROVIDED BY CUSTOMER. FUSED DISCONNECT OR CIRCUIT BREAKER AVAILABLE AS
OPTIONAL EQUIPMENT.
 23. ACTUAL MOTOR FLA RATING REFER TO UL TABLE.
 24. MOTOR OVERLOAD PROTECTION RATING IS BASED ON ACTUAL MOTOR NAMEPLATE FLA.
 25. OPTIONAL SAFETIES FOR "INDOOR" INDIRECT GAS REACTIVATION ONLY. REMOVE JUMPER WHEN INSTALLING
POWER VENTOR SAFETIES.

19.0		19.1		19.2		19.3		19.4		19.5		19.6		19.7		19.8		19.9															
#1 Main Enclosure to Wheel and React Motors	1/2" line	1T11	Black	14	460vac	Main Enclosure	Wheel Motor																										
		1T21	Black	14	460vac	Main Enclosure	Wheel Motor																										
		1T31	Black	14	460vac	Main Enclosure	Wheel Motor																										
		Ground	Green	14		Main Enclosure	Wheel Motor																										
		2T11	Black	10	460vac	Main Enclosure	React Motor																										
		2T21	Black	10	460vac	Main Enclosure	React Motor																										
		2T31	Black	10	460vac	Main Enclosure	React Motor																										
		Ground	Green	14		Main Enclosure	React Motor																										
#2 Main Enclosure to Process Motors A,B	1 1/4" line	3T11A	Black	6	460vac	Main Enclosure	Process Motor A																										
		3T21A	Black	6	460vac	Main Enclosure	Process Motor A																										
		3T31A	Black	6	460vac	Main Enclosure	Process Motor A																										
		Ground	Green	10		Main Enclosure	Process Motor A																										
		3T11B	Black	6	460vac	Main Enclosure	Process Motor B																										
		3T21B	Black	6	460vac	Main Enclosure	Process Motor B																										
		3T31B	Black	6	460vac	Main Enclosure	Process Motor B																										
		Ground	Green	10		Main Enclosure	Process Motor B																										
#3 Main Enclosure to Thermocouple 1 Thermocouple 2 and LS01	1/2" line	AIW4+		TYPE J		Main Enclosure	TC1																										
		AIW4C		TYPE J		Main Enclosure	TC1																										
		AIW6+		TYPE J		Main Enclosure	TC2																										
		AIW6C		TYPE J		Main Enclosure	TC2																										
		61	Blue	18	24vdc	Main Enclosure	Wheel Rotation Switch																										
		10.7	Blue	18	24vdc	Main Enclosure	Wheel Rotation Switch																										
#4 Main Enclosure to Gas Panel	3/4" line	3	Red	14	120vac	Main Enclosure	Gas Panel																										
		2	White	14	120vac	Main Enclosure	Gas Panel																										
		Ground	Green	14		Main Enclosure	Gas Panel																										
		3-11.12	Red	14	120vac	Main Enclosure	Gas Panel																										
		3-11.51	Red	14	120vac	Main Enclosure	Gas Panel																										
		3-11.60	Red	14	120vac	Main Enclosure	Gas Panel																										
		3-12.30	Red	14	120vdc	Main Enclosure	Gas Panel																										
		3-12.52	Red	14	120vdc	Main Enclosure	Gas Panel																										
		3-12.55	Red	14	120vac	Main Enclosure	Gas Panel																										
		3-12.80	Red	14	120vac	Main Enclosure	Gas Panel																										
		3-12.81	Red	14	120vac	Main Enclosure	Gas Panel																										
		3-12.82	Red	14	120vdc	Main Enclosure	Gas Panel																										
		61B	BLUE	18	24vdc	Main Enclosure	Gas Panel																										
		61-13.11	BLUE	18	24vdc	Main Enclosure	Gas Panel																										
		AQWOV	CABLE	18		Main Enclosure	Gas Panel																										
		AQWOC	CABLE	18		Main Enclosure	Gas Panel																										
		#7 Main Enclosure to Heater Bank 1,2	1 1/2" line	1C1	Black	6	460vac													Main Enclosure	Heater Bank 1&2												
				1C2	Black	6	460vac													Main Enclosure	Heater Bank 1&2												
1C3	Black			6	460vac	Main Enclosure	Heater Bank 1&2																										
Ground	Green			10		Main Enclosure	Heater Bank 1&2																										
2C1	Black			6	460vac	Main Enclosure	Heater Bank 1&2																										
2C2	Black			6	460vac	Main Enclosure	Heater Bank 1&2																										
2C3	Black			6	460vac	Main Enclosure	Heater Bank 1&2																										
Ground	Green			10		Main Enclosure	Heater Bank 1&2																										
#8 Main Enclosure to Heater Bank 3,4	1 1/2" line	3C1	Black	6	460vac	Main Enclosure	Heater Bank 3&4																										
		3C2	Black	6	460vac	Main Enclosure	Heater Bank 3&4																										
		3C3	Black	6	460vac	Main Enclosure	Heater Bank 3&4																										
		Ground	Green	10		Main Enclosure	Heater Bank 3&4																										
		4C1	Black	6	460vac	Main Enclosure	Heater Bank 3&4																										
		4C2	Black	6	460vac	Main Enclosure	Heater Bank 3&4																										
		4C3	Black	6	460vac	Main Enclosure	Heater Bank 3&4																										
		Ground	Green	10		Main Enclosure	Heater Bank 3&4																										
#9 Main Enclosure to Heater Bank 5,6	1 1/2" line	5C1	Black	6	460vac	Main Enclosure	Heater Bank 5&6																										
		5C2	Black	6	460vac	Main Enclosure	Heater Bank 5&6																										
		5C3	Black	6	460vac	Main Enclosure	Heater Bank 5&6																										
		Ground	Green	10		Main Enclosure	Heater Bank 5&6																										
		6C1A	Black	6	460vac	Main Enclosure	Heater Bank 5&6																										
		6C2A	Black	6	460vac	Main Enclosure	Heater Bank 5&6																										
		6C3A	Black	6	460vac	Main Enclosure	Heater Bank 5&6																										
		Ground	Green	10		Main Enclosure	Heater Bank 5&6																										
#10 Main Enclosure to Heater Bank 7,8	1 1/2" line	7C1A	Black	6	460vac	Main Enclosure	Heater Bank 7&8																										
		7C2A	Black	6	460vac	Main Enclosure	Heater Bank 7&8																										
		7C3A	Black	6	460vac	Main Enclosure	Heater Bank 7&8																										
		Ground	Green	10		Main Enclosure	Heater Bank 7&8																										
		8C1A	Black	6	460vac	Main Enclosure	Heater Bank 7&8																										
		8C2A	Black	6	460vac	Main Enclosure	Heater Bank 7&8																										
		8C3A	Black	6	460vac	Main Enclosure	Heater Bank 7&8																										
		Ground	Green	10		Main Enclosure	Heater Bank 7&8																										
		3	Red	14	120vac	Main Enclosure	Heater Bank 7&8																										
		3-11.7	Red	14	120vac	Main Enclosure	Heater Bank 7&8																										

	Munters 79 Monroe St. Amesbury, Ma 01913 TEL 800-843-5380 FAX 878-241-1214	CONFIDENTIALITY STATEMENT THE TECHNICAL INFORMATION AND DESIGN DATA HEREIN CONSTITUTES PROPRIETARY INFORMATION OF THE MUNTERS Corporation AND ARE TO BE MAINTAINED IN STRICT CONFIDENCE. THIS INFORMATION IS FOR THE SOLE USE OF OUR CUSTOMERS AND END USERS OF OUR EQUIPMENT.	DRAWING DESCRIPTION HCD/ICA STANDARD SCHEMATICS,ELECTRIC HEAT W/O F&BP		WIRING DIAGRAM R15 RENTAL UNIT DUEL FUEL 460V									
					Dr. By	Ck. By	Aprv. By	DATE	Job No.	Customer	SHEET	SIZE	REV	
					RDS	RDS	RDS	10/15/14	STANDARD	RENTAL UNIT	19 of 19	B	K51527-01	10
			FOR SEQUENCE OF OPERATION, REFER TO K71216											



CHICAGO BLOWER CORPORATION

• 1675 Glen Ellyn Road

• Glendale Heights, IL

an ISO 9001 Company
• 60139

Description

Job Description: **Munters**
Reference:
Fan Type: **Square Fans**
Fan Model: **Design 36A SQUAD SW Airfoil Direct Drive**
Fan Size: **16 1/2**
Fan Width: **100%**

CHICAGO BLOWER SALES OF BOSTON
AD (Bert) Jordan
Phone: (603) 425-7979
Fax: (603) 425-7703
e-mail: cbs.boston@comcast.net

Performance

Values are in accordance with AMCA Standard 210

Volume Flow Rate (ACFM) 5500
Static Pressure (IN. WG) 11.3
Density (LB/FT³) 0.068
Temperature (°F) 120
Altitude (FT) 0
Speed (RPM) 3530
Power Required (BHP) 13.8
Static Efficiency (%) 70.6
Outlet Velocity (FT/MIN) 3444
Damper Opening (%) N/A
Control Type N/A
Outlet Area (FT²) 1.6

R05 Process Fan

Sound

Values are in accordance with AMCA Standard 300

External Sound Power Levels (dB):

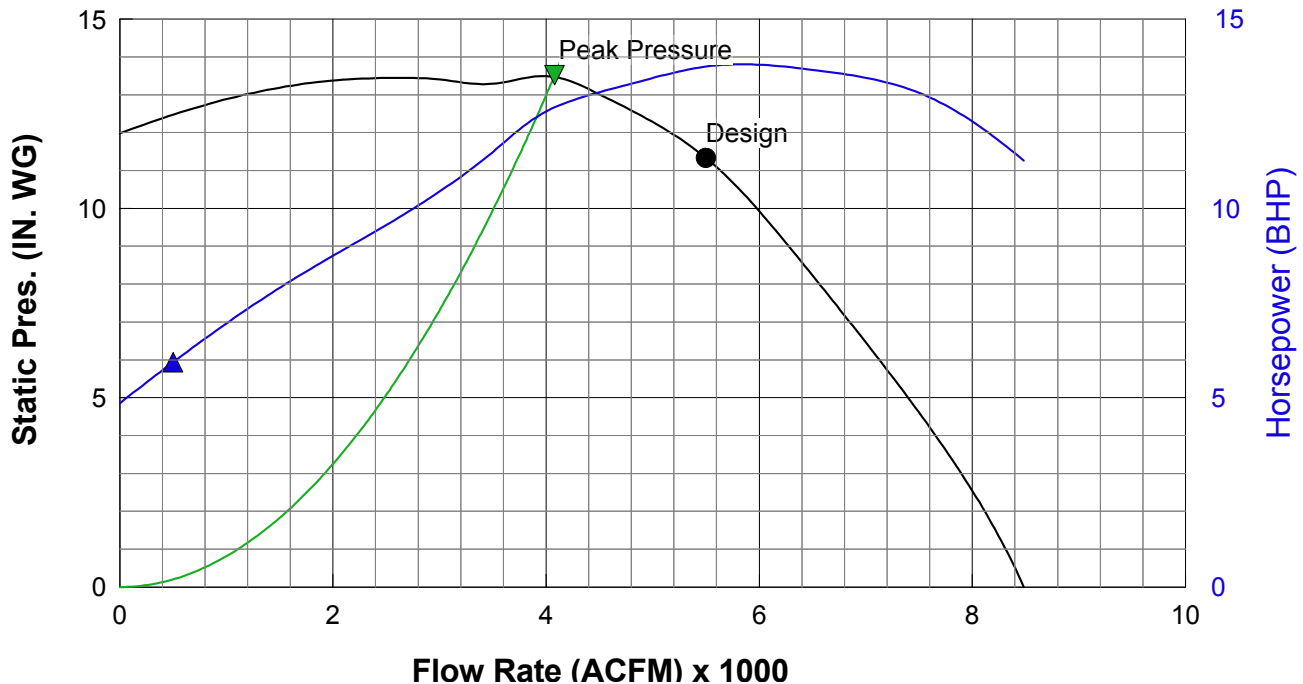
Center Hz	63	125	250	500	1000	2000	4000	8000
L _{wi} Design	88	96	99	95	91	87	85	81
ERC	12	7	3	1				

Sound Pressure 3.0 FT from Fan (dBA) 90

Sound Pressure, Radiated, 3.0 FT from 0.105 housing 67 dBA.

L_{wi} (L_{wo}) is sound power at the fan inlet (outlet)/airstream, less ERC.

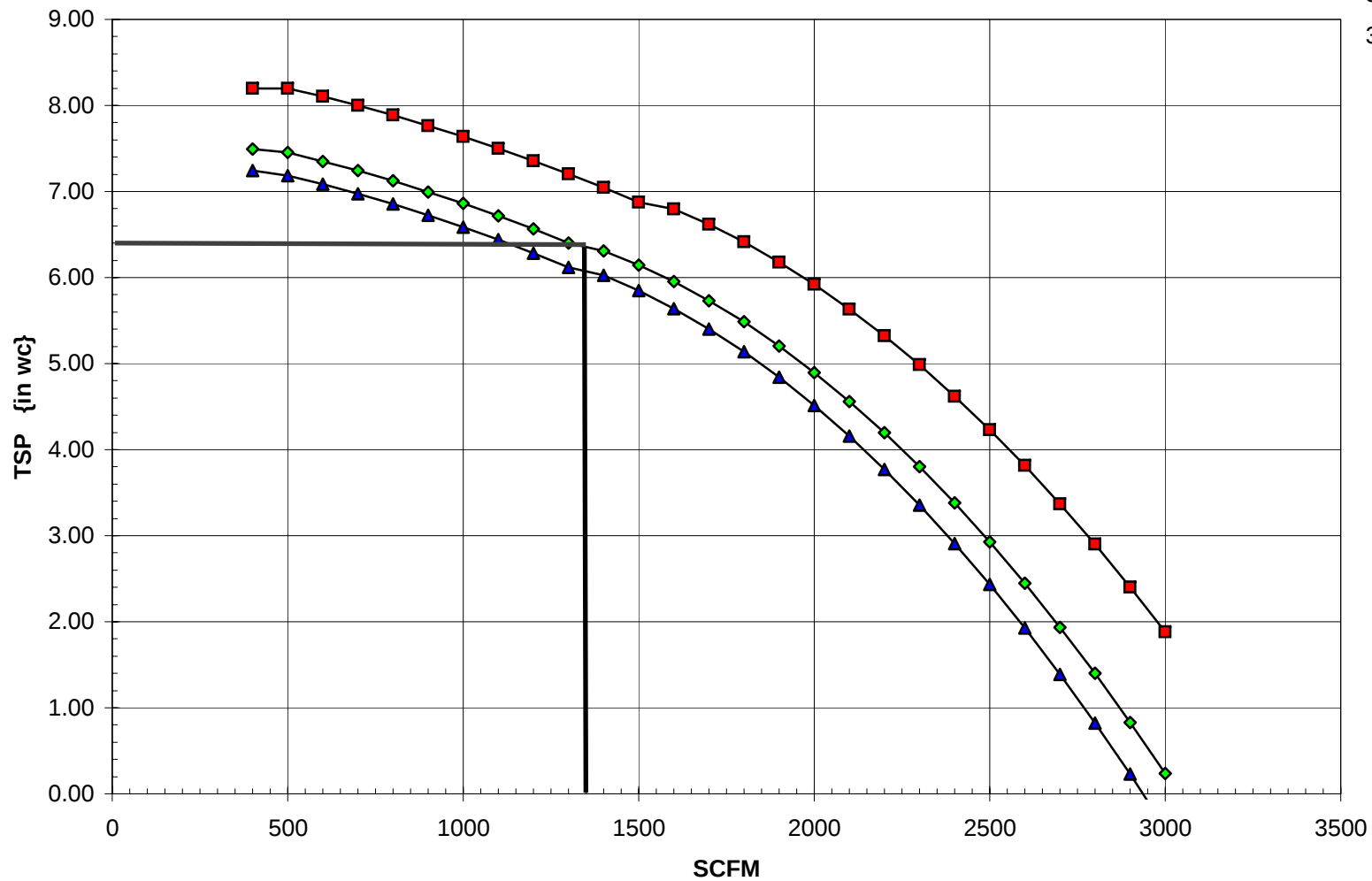
● - Design Point ▼ - Peak Pressure ▲ - Power vs. Vol



12 25
R05 - Reactivation Fan
3 HP Motor

12 1/4 Blower Curves

2 HP < 1200 SCFM
3 HP > 1200 SCFM
3 HP for HCD2250





CHICAGO BLOWER CORPORATION

• 1675 Glen Ellyn Road

• Glendale Heights, IL

an ISO 9001 Company

• 60139

Description

Job Description: **Munters**
Reference: **R-10k Supply Fan**
Fan Type: **Airfoil Centrifugal Fans**
Fan Model: **Design 51 SW**
Fan Size: **222**
Fan Width: **87.1%**

CHICAGO BLOWER SALES OF BOSTON
AD (Bert) Jordan
Phone: (603) 425-7979
Fax: (603) 425-7703
e-mail: cbs.boston@comcast.net

Performance

Values are in accordance with AMCA Standard 210

	Design	Net #1	Net #2	Net #3
Volume Flow Rate (ACFM)	11250	10500	10000	8700
Static Pressure (IN. WG)	9.5	9.2	9	8.5
Density (LB/FT ³)	0.068	0.072	0.075	0.086
Temperature (°F)	125	95	70	0
Altitude (FT)	0	0	0	0
Speed (RPM)	3500	3500	3500	3500
Power Required (BHP)	26.8	28.2	29.4	34.1
Static Efficiency (%)	62.3	53.5	47.6	33.8
Outlet Velocity (FT/MIN)	4191	3912	3726	3241
Damper Opening (%)	100	68	63	54
Control Type	Outlet Damper			
Outlet Area (FT ²)	2.68			
Maximum Speeds at 125 °F (RPM)				
Class 1 Max. RPM	2205			
Class 2 Max. RPM	2868			
Class 3 Max. RPM	3607			

R10 Process Fan

Sound

Values are in accordance with AMCA Standard 300

External Sound Power Levels (dB):

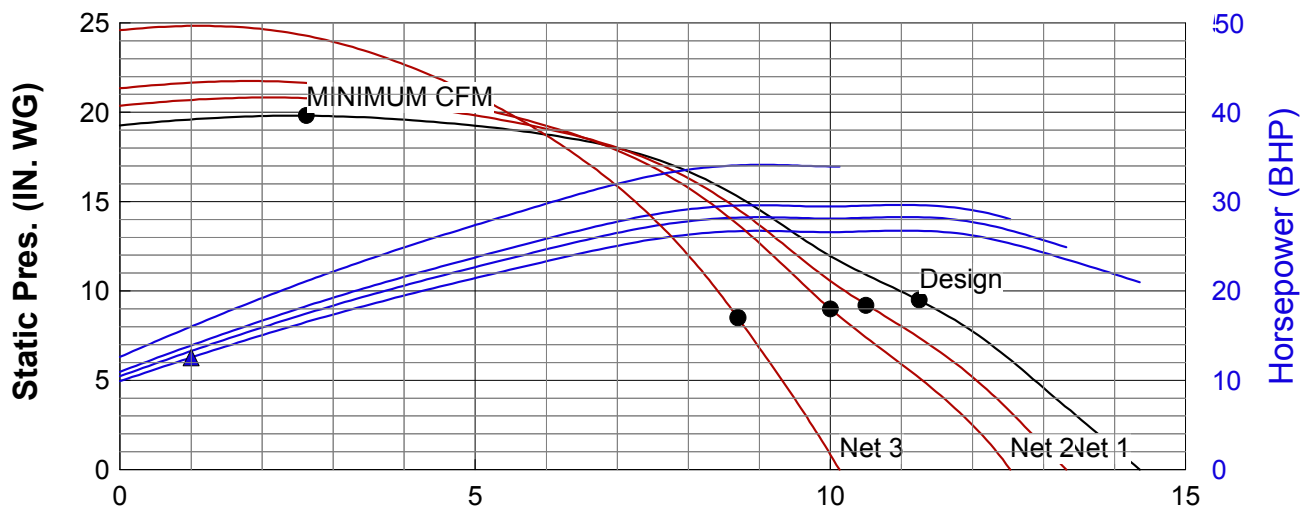
Center Hz	63	125	250	500	1000	2000	4000	8000
L _{wi} Design	99	105	107	105	99	96	94	89
ERC	10	5	2					

Sound Pressure 3.0 FT from Fan (dBA) 99

Sound Pressure, Radiated, 3.0 FT from 0.105 housing 79 dBA.

L_{wi} (L_{wo}) is sound power at the fan inlet (outlet)/airstream, less ERC.

● - Design Point ▲ - Power vs. Vol



Flow Rate (ACFM) x 1000

CAUTION: FAN MUST NOT OPERATE BELOW MINIMUM CFM, EXCEPT FOR START-UP



CHICAGO BLOWER CORPORATION

• 1675 Glen Ellyn Road

• Glendale Heights, IL

an ISO 9001 Company

• 60139

Description

Job Description: **Munters**
Reference: **R-10k Reactivation Air Fan**
Fan Type: **Square Fans**
Fan Model: **Design 36A SQUAD SW Airfoil Direct Drive**
Fan Size: **15**
Fan Width: **99.9%**

CHICAGO BLOWER SALES OF BOSTON
AD (Bert) Jordan
Phone: (603) 425-7979
Fax: (603) 425-7703
e-mail: cbs.boston@comcast.net

Performance

Values are in accordance with AMCA Standard 210

Volume Flow Rate (ACFM) 4000
Static Pressure (IN. WG) 9.09
Density (LB/FT³) 0.067
Temperature (°F) 120
Altitude (FT) 0
Speed (RPM) 3500
Power Required (BHP) 8.07
Static Efficiency (%) 70.8
Outlet Velocity (FT/MIN) 3032
Damper Opening (%) N/A
Control Type N/A
Outlet Area (FT²) 1.32

R10 Reactivation Fan

Sound

Values are in accordance with AMCA Standard 300

External Sound Power Levels (dB):

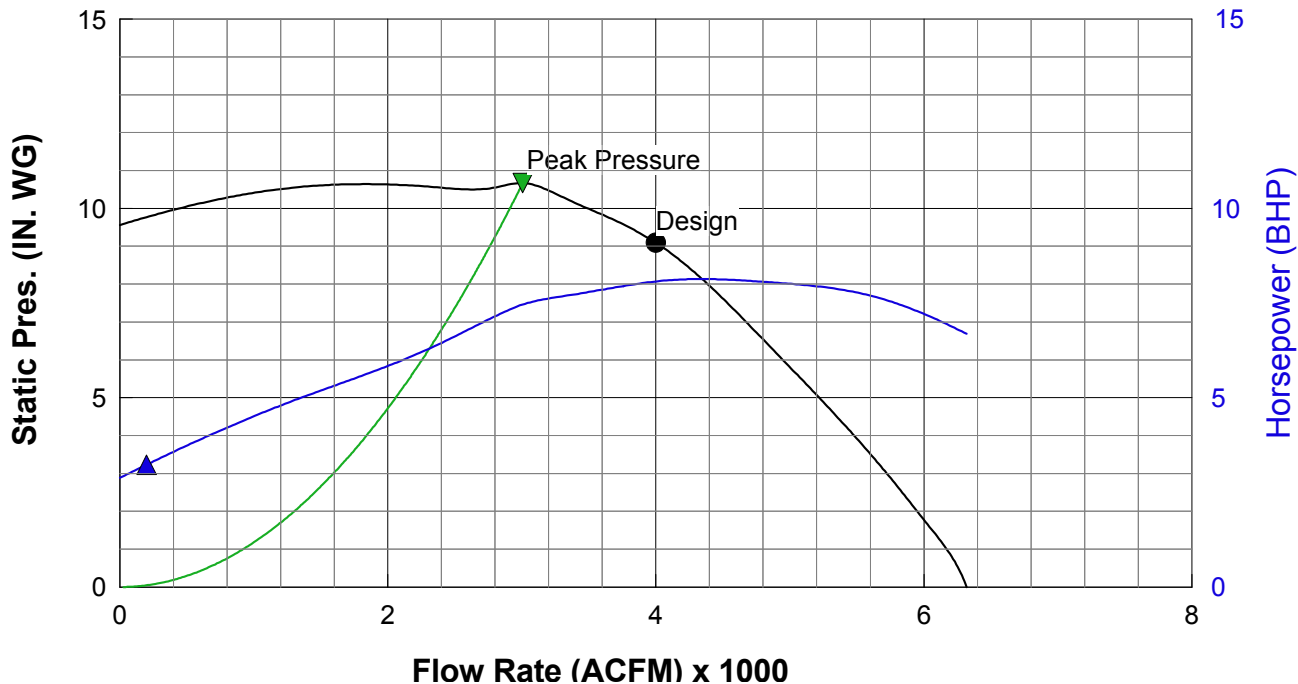
Center Hz	63	125	250	500	1000	2000	4000	8000
L _{wi} Design	84	92	95	92	88	84	81	78
ERC	12	7	3	1				

Sound Pressure 3.0 FT from Fan (dBA) 87

Sound Pressure, Radiated, 3.0 FT from 0.105 housing 63 dBA.

L_{wi} (L_{wo}) is sound power at the fan inlet (outlet)/airstream, less ERC.

● - Design Point ▼ - Peak Pressure ▲ - Power vs. Vol



CAUTION: FAN MUST NOT OPERATE LEFT OF PEAK PRESSURE CURVE, EXCEPT FOR START-UP



CHICAGO BLOWER CORPORATION

• 1675 Glen Ellyn Road

• Glendale Heights, IL

an ISO 9001 Company

• 60139

Description

Job Description: **Munters**
Reference: **R15000 Process Fan, 2 Fans**
Fan Type: **Airfoil Centrifugal Fans**
Fan Model: **Design 51 SW**
Fan Size: **200**
Fan Width: **95.9%**

CHICAGO BLOWER SALES OF BOSTON
AD (Bert) Jordan
Phone: (603) 425-7979
Fax: (603) 425-7703
e-mail: cbs.boston@comcast.net

Performance

Values are in accordance with AMCA Standard 210

	Design	Net #1	Net #2
Volume Flow Rate (ACFM)	8200	7800	7500
Static Pressure (IN. WG)	10.5	10.5	10.5
Density (LB/FT ³)	0.068	0.072	0.076
Temperature (°F)	118	90	65
Altitude (FT)	0	0	0
Speed (RPM)	3500	3500	3500
Power Required (BHP)	18.8	19.8	20.8
Static Efficiency (%)	71.3	64.4	59
Outlet Velocity (FT/MIN)	3565	3392	3261
Damper Opening (%)	100	67	63
Control Type	Outlet Damper		
Outlet Area (FT ²)	2.3		
Maximum Speeds at 118 °F (RPM)			
Class 1 Max. RPM	2355		
Class 2 Max. RPM	3063		
Class 3 Max. RPM	3853		

R15 Process Fan
2 Fans per System

Sound

Values are in accordance with AMCA Standard 300

External Sound Power Levels (dB):

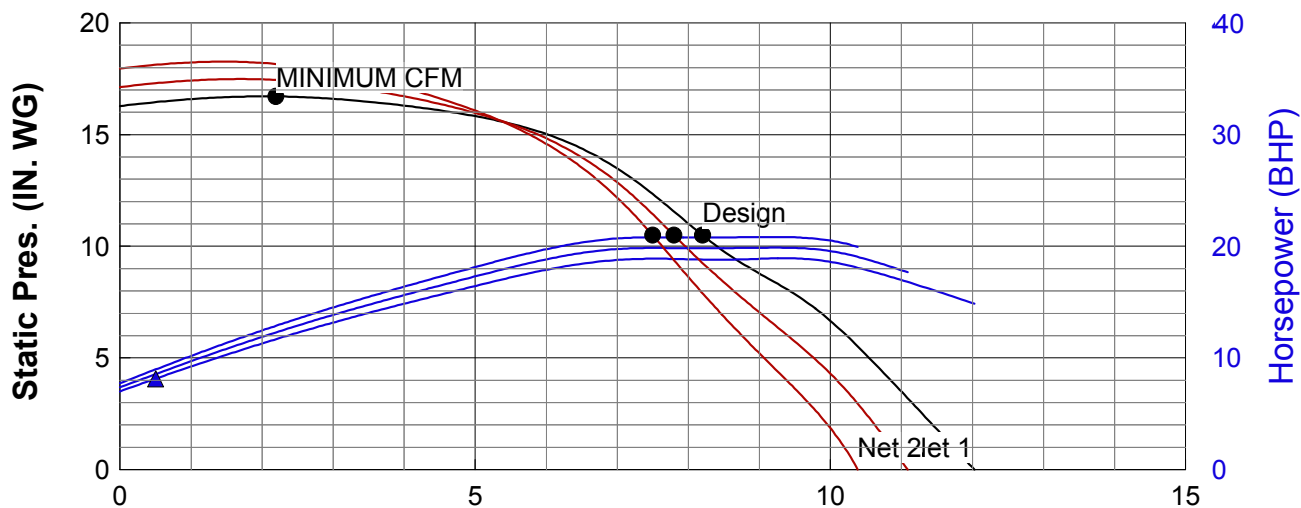
Center Hz	63	125	250	500	1000	2000	4000	8000
L _{wi} Design	96	101	102	100	95	92	90	86
ERC	11	6	2	1				

Sound Pressure 3.0 FT from Fan (dBA) 95

Sound Pressure, Radiated, 3.0 FT from 0.105 housing 74 dBA.

L_{wi} (L_{wo}) is sound power at the fan inlet (outlet)/airstream, less ERC.

● - Design Point ▲ - Power vs. Vol



Flow Rate (ACFM) x 1000

CAUTION: FAN MUST NOT OPERATE BELOW MINIMUM CFM, EXCEPT FOR START-UP



CHICAGO BLOWER CORPORATION

• 1675 Glen Ellyn Road

• Glendale Heights, IL

an ISO 9001 Company

• 60139

Description

Job Description: **R15 React Fan**
Reference: **Munters**
Fan Type: **Square Fans**
Fan Model: **Design 36A SQUAD SW Airfoil Direct Drive**
Fan Size: **16 1/2**
Fan Width: **70%**

CHICAGO BLOWER SALES OF BOSTON
AD (Bert) Jordan
Phone: (603) 425-7979
Fax: (603) 425-7703
e-mail: cbs.boston@comcast.net

Performance

Values are in accordance with AMCA Standard 210

Volume Flow Rate (ACFM) 4275
Static Pressure (IN. WG) 9.92
Density (LB/FT³) 0.066
Temperature (°F) 130
Altitude (FT) 0
Speed (RPM) 3500
Power Required (BHP) 9.12
Static Efficiency (%) 72.5
Outlet Velocity (FT/MIN) 2947
Damper Opening (%) N/A
Control Type N/A
Outlet Area (FT²) 1.45

R15 Reactivation Fan

Sound

Values are in accordance with AMCA Standard 300

External Sound Power Levels (dB):

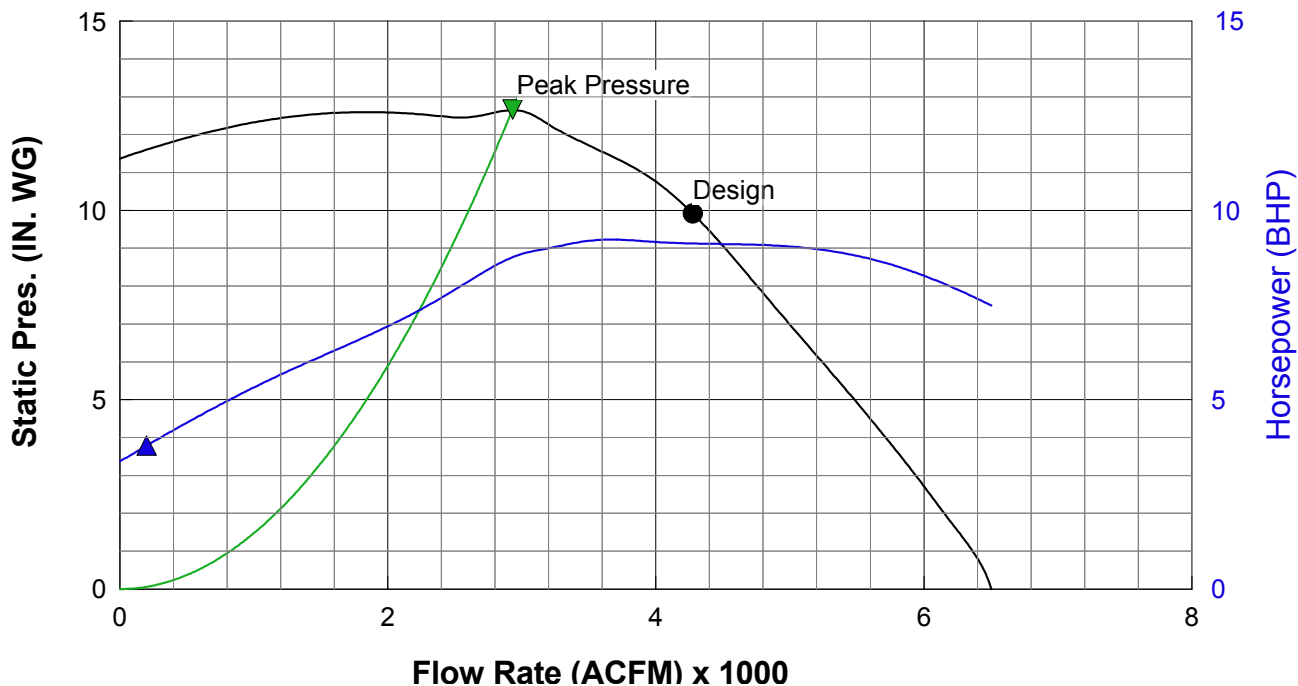
Center Hz	63	125	250	500	1000	2000	4000	8000
L _{wi} Design	86	94	97	94	91	85	83	79
ERC	12	7	3	1				

Sound Pressure 3.0 FT from Fan (dBA) 89

Sound Pressure, Radiated, 3.0 FT from 0.105 housing 66 dBA.

L_{wi} (L_{wo}) is sound power at the fan inlet (outlet)/airstream, less ERC.

● - Design Point ▼ - Peak Pressure ▲ - Power vs. Vol



CAUTION: FAN MUST NOT OPERATE LEFT OF PEAK PRESSURE CURVE, EXCEPT FOR START-UP



Spare Parts List

Desc: R05 460V 5,000 SCFM

REV 1 – EFFECTIVE FOR UNITS SHIPPED AFTER DECEMBER 2014

REV 2 – EFFECTIVE FOR UNITS SHIPPED IN 2017 ONWARDS

REV 3 – EFFECTIVE FOR UNITS SHIPPED IN Q3 2018 ONWARDS

QTY	COMPONENT	DESCRIPTION	BALLOON	REV 2/ REV 3
WHEEL / DRIVE ASSEMBLY / CHAIN				
2.00	15563	GAUGE MINIHILIC 0-3 IN 2-5003		
1.00	40107-01	DETECTOR S/A ROTATION 1125-900		
1.00	43125-05	SEAL KIT HC-4500		
1.00	43431-07	INDICATOR S/A HCD-4500 0-3"WC		
4.00	92022-03	WHEEL ROLLER GREASELESS 3-1/4"		
1.00	92247-01	MOTOR DRIVE 1/100HP 115V		
1.00	94602-01	MOBIL GLYGOYLE 460 GEAR REDUCER		
BELT DRIVE SYSTEMS ONLY				
1.00	30145-28	WHEEL ASSY 42" TIGEL		
1.00	92283-17	BELT TIMING		
CHAIN DRIVE SYSTEMS ONLY				
1.00	30145-28-RC-1	WHEEL ASSY 42" TIGEL		
1.00	94892-03-05K	CHAIN DRIVE		
1.00	94892-05	CHAIN ROLLER SPROCKET		
1.00	94926-01	LUBRICANT FOR CHAIN		
FILTERS				
2.00	90118-01B	Filter 35% 24 x12 FARR 30/30 PROCESS		
2.00	90118-02B	Filter 35% 24x24 FARR 30/30 PROCESS		
1.00	95007-14	FILTER 18 X 18 X 2 91501637 REACT		
ELECTRICAL COMPONENTS				
1.00	90217-17	SWITCH,AIR PRESSURE,CLEVELAND,AFS-442-388	AFS2	
1.00	90437-01	MONITOR PHASE A258B W/8 PIN SK	PM01	
1.00	90476-01	SWITCH LIMIT #BA-2RV2-A2	0003	
2.00	91410-09	FUSE MIDGET TIME DEL ATQR 2	FU30	
3.00	91816-02	BLOCK,FUSE,600V,3P,60A	FU01	
6.00	91816-10	FUSE CLASS J 40 AMP JKS-40	FU02	
1.00	92043-08	PRESS SWITCH 0.4 - 1.6"WC DWYER.....DELETED REV 2 1950G-1-B-120-NA		
1.00	92466-01	FUSE,3AG,TD,250V,2.0AMP	FU21	
1.00	92466-04	FUSE,3AG,TD,250V,6.0AMP	FU31	
1.00	92466-08	FUSE,GLASS, 250V, 0.5AMP	FU34	
2.00	92466-09	FUSE,1AMP MDL GLASS	FU20	
2.00	92706-01	SENSOR STAT PRESS TIP A-301	AFS2	
3.00	93962-02	FUSE, 1/4X1-1/4, CERAMIC, 0.5A	FU38	
1.00	93962-04	FUSE,1A FAST ACTING, ABC-1	FU18	
1.00	93962-07	FUSE,1/4X1-1/4, CERAMIC 2.5 AMP. ABC-2-1/2FU37		
1.00	94100-02	CONN MALE, QUICK DISCONNECT, BROWN, 600V	CONN	
1.00	94100-03	CONN MALE, QUICK DISCONNECT,	CONN	

		ORANGE, 600V	
1.00	94100-04	CONN MALE, QUICK DISCONNECT, YELLOW, 600V	CONN
1.00	94100-05	CONN MALE, QUICK DISCONNECT GREEN 600V	CONN
1.00	94100-12	CAMLOCK BROWN 45 DEGREE.....	ADDED REV 2
1.00	94100-13	CAMLOCK ORANGE 45 DEGREE.....	ADDED REV 2
1.00	94100-14	CAMLOCK YELLOW 45 DEGREE.....	ADDED REV 2
1.00	94100-15	CAMLOCK GREEN 45 DEGREE.....	ADDED REV 2
1.00	94632-03	FLAME CONTROLLER DISPLAY	FSC1
1.00	94632-04	FLAME AMP FOR FLAME ROD	FSC1
1.00	94632-12	FLAME CONTROLLER, 30 SEC PURGE	FSC1
1.00	94887-03	REGULATOR, GAS 0.5IN, 4-12 IN, FRS 705/6 D229595	
1.00	94887-06	TRANSFORMER, IGNITION	
2.00	94887-07	CONNECTOR, WIRE, 90DEG, W/ SPRING FOR SPARK ELECTR	
2.00	94887-08	CAP, TERMINAL, WIRE 90DEG, FOR SPARK ELECTRODE	
1.00	94887-09	CONNECTOR, WIRE, STRAIGHT, OUTPUT FOR IGTRANSFORMER	
1.00	94887-10	CAP, TERMINAL, WIRE, STRAIGHT, FOR IG TRANSFORMER	
2.00	94887-11	VALVE, SAFETY SHUTOFF, DUNGS MVD505/6 W/FLOW ADJUS	
1.00	94887-12	VALVE, ECLIPSE BVPAK	
1.00	94887-13	SWITCH, PRESSURE GAS HIGH/LOW.....	ADDED REV 2
		DUNGS GAO-A4-4-5	
1.00	94887-14	SWITCH, PRESSURE, GAS, HIGH MANUAL DNGS GMH-A4-4-4	
2.00	94891-05	FILTER KIT, SAGINAW 7" X 5"	
1.00	K95050-102	KIT,SEL SW, 3 POS,ILL WHT,120VAC,4 NO, CP, SIEMENS	SS01
5.00	K95050-29	PUSHBUTTON, ILLUM RED, 120VAC, 1 NO/1 NC, SIEMENS	LT02
1.00	K95050-30	YELLOW PB KIT, 120V, 1NO/1NC, PUSH TO TEST,SIEMENS	LT10
3.00	K95050-31	PUSHBUTTON, ILLUM GREEN, 120VAC, 1 NO/1 NC,SIEMENS	LT04
2.00	K95350-01	CONTACTOR, 3HP, 7A(I)18A(R), 120V CNTR,1NO,SIEMENS	MS01.....DELETED REV 2
1.00	K95350-07	CONTACTOR, 15HP, 25A(I)40A(R), 120V CNTR,1NO, S0	MS03.....DELETED REV 2
4.00	K95350-09	CONTACTOR, 25HP, 32A(I)50A(R), 120V CNTR,1NO, S2	CN02.....DELETED REV 2
2.00	K95350-11	CONTACTOR, 40HP, 50A(I)60A(R), 120V CNTR,1NO, S2	CN01.....DELETED REV 2
4.00	K95350-12	AUX SWITCH, TRANSVERSE, 1NO, SCREW CN 3RH19211CA10	OLR2.....DELETED REV 2
1.00	K95350-13	AUX SWITCH, SIDE MOUNT, 1NO/1NC, SCREW CONN. (3RH)	MS03.....DELETED REV 2
1.00	K95350-15	AUX SWITCH, FRONT MOUNT, 2NO/2NC, SCREW CONN (3RH)	MS02.....DELETED REV 2
4.00	K95551-02	CONTROL RELAY, MINI, SPDT, 120VAC,	CR06

4.00	K95551-04	15A, SIEMENS CONTROL RELAY, MINI, DPDT, 120VAC,	CR07
2.00	K95551-06	15A, SIEMENS CONTROL RELAY, MINI, 3PDT, 120VAC,	CR10
1.00	K95551-08	CONTROL RELAY, MINI, 4PDT, 120VAC,	CR09
5.00	K95551-09	15A, SIEMENS RELAY SOCKET, FOR MINI SPDT,	CR06
4.00	K95551-10	PREMIUM LINE, SIEMENS RELAY SOCKET, FOR MINI DPDT,	CR07
2.00	K95551-11	PREMIUM LINE, SIEMENS RELAY SOCKET, FOR MINI 3PDT,	CR10
1.00	K95551-12	PREMIUM LINE, SIEMENS RELAY, SOCKET, 4PDT, SIEMENS	CR09
1.00	K95551-13	CONTROL RELAY, MINI, SPDT, 24VDC, 15A,	CR69
2.00	K95552-04	SIEMENS SS RELAY, 70 AMP, 24V DC	SSR1
2.00	K95552-06	CONVERTER, MODULE 0-10V	SSR1
1.00	K95553-07	COMBO MS/OLR, 2.8 - 4.0AMP, ADJ FLA,	OLR2
1.00	K95553-14	CAGE CLAMP COMBO MS/OLR, 14.0 - 20.0AMP, ADJ FLA,	OLR3
1.00	K95553-30	SCREW CONN. MSP, 0.35 - 0.5 AMP, S00, ADJ FLA, SCREW	OLR1
1.00	K95601-01	CONN. J THERMOCOUPLE 4" PROBE #173935-00	TC2
1.00	K95603-02	J THERMOCOUPLE 8" DUAL ELEMENT, PROBE	TC01A,B
1.00	K95900-03	LINK MODULE, OLR 3RV TO MS 3RT, S0,	OLR3
1.00	K95935-01	SIEMENS S7-1200 CPU	PLC1
1.00	K95935-03	S7-1200 CPU	PLC1.....ADDED REV 2
1.00	K95935-07	S7-1200 IN/OUT MOD	PLC1
1.00	K95935-13	S7-1200 ANALOG INPUT MOD	PLC1
1.00	K95935-24	S7-1200 ANALOG OUTPUT MOD	PLC1
1.00	K95935-26**	S7-1200, COMPACT SWITCH MOD, 4 RJ45 PORTS.....	ADDED REV 2
1.00	K95936-03**	OPER INTERFACE; SIEMENS KTP400 2ND GEN HMI.....	ADDED REV 2
1.00	K95938-01	WATLOW TEMP. LIMIT CONTROLLER	TS01.....ADDED REV 2
1.00	Z19315-07	FLAME CONTROL BASE Q7800A-1005	FSC1
1.00	Z19315-29	BURNER CTRL HWELL RM7897C1000/U	FSC1
1.00	Z19520-06	FLAME ROD	
1.00	Z19520-41	SPARK PLUG	
1.00	Z90170-09	HIGH TEMP LIMIT CONT, 90-264VAC,	TS01.....DELETED REV 2
1.00	K95941-01	DC120L-1172-1000 CONTACTOR, 120V COIL 3HP @ 460V	MS01,02..... ADDED REV 2
4.00	K95941-05	CONTACTOR, 120V COIL 10HP @ 460V	CN02,03,52,53.....ADDED REV 2
1.00	K95941-06	CONTACTOR, 120V COIL 20HP @ 460V	MS03.....ADDED REV 2
1.00	K95941-08	CONTACTOR, 120V COIL 30HP @ 460V	CN01,51....ADDED REV 2; DEL REV 3
1.00	K95941-15	CONTACTOR, 120V COIL 30HP @ 460V	CN01,51.....ADDED REV 3
3.00	K95946-51	AUXILIARY CONTACTS	OLR3
OTHER COMPONENTS			
1.00	92951-02	GAGE, PRESSURE 0-15"WC DWYER LPG5-8142N, REAR CONN	
1.00	92951-05	GAGE, PRESSURE 0-10 PSI DWYER	ADDED REV 2

LPG5-D0042N

2.00	94887-04	VALVE, BALL, BRASS 1/2IN NPT 0.125IN SIDE TAP
4.00	94888-03*	CAP, BLACK ROUND, 20" OD, PLASTIC
4.00	94888-05*	CAP, BLACK ROUND, 18" OD, PLASTIC

*** - SELECT EITHER 18" OR 20" OD CAPS – NOT BOTH**



Spare Parts List

Desc: R10 460V 10,000 SCFM

REV 1 – EFFECTIVE FOR UNITS SHIPPED AFTER DECEMBER 2014

REV 2 – EFFECTIVE FOR UNITS SHIPPED IN 2017 ONWARDS

REV 3 - EFFECTIVE FOR UNITS SHIPPED IN Q3 2018 ONWARDS

QTY	COMPONENT	DESCRIPTION	BALLOON	REV 2/ REV 3
WHEEL / DRIVE ASSEMBLY / CHAIN				
1.00	40107-01	DETECTOR S/A ROTATION 1125-900		
1.00	43125-06	SEAL KIT HC-9000		
1.00	91629-01	MOTOR,1/4HP,230/460V,3PH,		
4.00	92022-02	WHEEL ROLLER 5 X 2		
1.00	92022-03	WHEEL ROLLER GREASELESS 3-1/4"		
1.00	94601-04	REDUCER SPEED 900:1 UL-R NEMA 56C		
1.00	94602-01	MOBIL GLYGOYLE 460		
BELT DRIVE SYSTEMS ONLY				
1.00	30145-29	WHEEL ASSY 60" TIGEL 400mm		
1.00	92283-09	BELT TIMING		
CHAIN DRIVE SYSTEMS ONLY				
1.00	30145-29-RC-1	WHEEL ASSY 60" TIGEL 400mm		
6.00	94892-01	CHAIN ROLLER CONNECTION LINK.....		ADDED REV 2
2.00	94892-02	CHAIN ROLLER CONNECTION LINK		
17.625'	94892-03	CHAIN DRIVE		
1.00	94892-03-10K	CHAIN DRIVE.....		ADDED REV 2
1.00	94892-08	CHAIN ROLLER SPROCKET		
1.00	94892-09	SPROCKET IDLER		
1.00	94926-01	LUBRICANT FOR CHAIN		
FILTERS				
6.00	90118-04B	FILTER 35% 25WX20H FARR 30/30 PROCESS		
1.00	95007-47	FILTER METAL MESH REACT (HINGED ACCESS PANEL)		
ELECTRICAL COMPONENTS				
1.00	90217-17	SWITCH,AIR PRESSURE,CLEVELAND,AFS-442-388	AFS2	
1.00	90437-01	MONITOR PHASE A258B W/8 PIN SK	PM01	
1.00	90476-01	SWITCH LIMIT #BA-2RV2-A2	0003	
2.00	91410-04	FUSE MIDGET TIME DEL ATQR 1	FU30	
2.00	91410-09	FUSE MIDGET TIME DEL ATQR 2	FU30	
1.00	92043-08	PRESS SWITCH 0.4 - 1.6"WC DWYER 1950G-1-B-120-NA		DELETED REV 2
2.00	92466-01	FUSE,3AG,TD,250V,2.0AMP	FU21	
1.00	92466-04	FUSE,3AG,TD,250V,6.0AMP	FU31	
1.00	92466-08	FUSE,GLASS, 250V, 0.5AMP	FU34	
2.00	92466-09	FUSE,1AMP MDL GLASS	FU20	
2.00	92706-01	SENSOR STAT PRESS TIP A-301	AFS2	
3.00	93962-02	FUSE, 1/4X1-1/4, CERAMIC, 0.5A	FU26	
1.00	93962-04	FUSE,1A FAST ACTING, ABC-1	FU18	
1.00	94100-02	CONN MALE, QUICK DISCONNECT, BROWN, 600V	CONN.....	DELETED REV 2
1.00	94100-03	CONN MALE, QUICK DISCONNECT, ORANGE, 600V	CONN.....	DELETED REV 2

[Type here]

[Type here]

I21792 R3

1.00	94100-04	CONN MALE, QUICK DISCONNECT, YELLOW, 600V	CONN.....DELETED REV 2
1.00	94100-05	CONN MALE, QUICK DISCONNECT GREEN 600V	CONN.....DELETED REV 2
1.00	94100-12	CAMLOCK BROWN 45 DEGREE.....	ADDED REV 2
1.00	94100-13	CAMLOCK ORANGE 45 DEGREE.....	ADDED REV 2
1.00	94100-14	CAMLOCK YELLOW 45 DEGREE.....	ADDED REV 2
1.00	94100-15	CAMLOCK GREEN 45 DEGREE.....	ADDED REV 2
1.00	94632-03	FLAME CONTROLLER DISPLAY	FSC1
1.00	94632-04	FLAME AMP FOR FLAME ROD	FSC1
1.00	94632-12	FLAME CONTROLLER, 30 SEC PURGE	FSC1
2.00	94891-05	FILTER KIT, SAGINAW 7" X 5"	
1.00	94902-07	VALVE MOTOR ACTUATOR 1" BVP20.04	
1.00	94902-09	TRANSFORMER, IGNITION	
1.00	94902-12	CAP, TERMINAL FOR SPARK ELECTRODE	
1.00	94902-14	CAP, TERMINAL FOR IGNITION	
1.00	94902-18	REGULATOR, GAS ½"	
2.00	94902-19	VALVE SOLENOID	
1.00	94902-22	VALVE, DUAL SAFETY SHUTOFF, W/ POC AND VI ECLIPSE	
1.00	94902-23	SWITCH, PRESSURE GAS HIGH DUNGS	
1.00	94902-24	KIT ADAPTOR, GAS PRESSURE SWITCH	
1.00	94902-26	REGULATOR, MAIN GAS TRAIN	
1.00	94902-29	SWITCH, PRESSURE LOW, GAS TRAIN, DUNGS.....	ADDED REV 2
1.00	K95050-102	KIT,SEL SW, 3 POS,ILL WHT,120VAC,4 NO, CP, SIEMENS	SS01
5.00	K95050-29	PUSHBUTTON, ILLUM RED, 120VAC, 1 NO/1 NC, SIEMENS	LT02
1.00	K95050-30	YELLOW PB KIT, 120V, 1NO/1NC, PUSH TO TEST,SIEMENS	LT10
3.00	K95050-31	PUSHBUTTON, ILLUM GREEN, 120VAC, 1 NO/1 NC,SIEMENS	LT04
4.00	K95551-02	CONTROL RELAY, MINI, SPDT, 120VAC, 15A, SIEMENS	CR06
4.00	K95551-04	CONTROL RELAY, MINI, DPDT, 120VAC, 15A, SIEMENS	CR07
2.00	K95551-06	CONTROL RELAY, MINI, 3PDT, 120VAC, 15A, SIEMENS	CR09
4.00	K95551-09	RELAY SOCKET, FOR MINI SPDT, PREMIUM LINE, SIEMENS	CR06
4.00	K95551-10	RELAY SOCKET, FOR MINI DPDT, PREMIUM LINE, SIEMENS	CR07
2.00	K95551-11	RELAY SOCKET, FOR MINI 3PDT, PREMIUM LINE, SIEMENS	CR10
1.00	K95551-13	CONTROL RELAY, MINI, SPDT, 24VDC, 15A, SIEMENS	CR69
1.0	K95552-04	SS RELAY, 70 AMP, 24VDC CNTRL, 600V	SSR1,2
1.0	K95552-06	CONVERTER, MODULE, 0-10V TO PULSE, 24VAC/DC PLUG-IN	SSR1,2
1.00	K95601-01	J THERMOCOUPLE 4" PROBE #173935-00	TC02
1.00	K95603-03	J THERMOCOUPLE 18"	TC01
1.00	K95350-01	CONTACTOR, 3HP, 7A(I)18A(R), 120V CNTR,1NO,SIEMENS	MS01.....DELETED REV 2
1.00	K95350-06	CONTACTOR, 10HP, 17A(I)40A(R), 120V CNTR,1NO, S0	MS02.....DELETED REV 2
1.00	K95350-10	CONTACTOR, 30HP, 40A(I)50A(R), 120V CNTR,1NO, S2	MS03.....DELETED REV 2

10.00	K95350-11	CONTACTOR, 40HP, 50A(I)60A(R), 120V CNTR,1NO, S2	CN01-55.....DELETED REV 2
3.00	K95350-12	AUX SWITCH, TRANSVERSE, 1NO, SCREW CN 3RH19211CA10	OLR1.....DELETED REV 2
3.00	K95350-13	AUX SWITCH, SIDE MOUNT, 1NO/1NC, SCREW CONN. (3RH)	MS03.....DELETED REV 2
1.00	K95935-01	S7-1200 CPU	PLC1
1.00	K95935-03	S7-1200 CPU	PLC1.....ADDED REV 2
1.00	K95935-07	S7-1200 IN/OUT MOD	PLC1
1.00	K95935-13	S7-1200 ANALOG INPUT MOD	PLC1
1.00	K95935-24	S7-1200 ANALOG OUTPUT MOD	PLC1
1.00	K95935-26**	S7-1200, COMPACT SWITCH MOD, 4 RJ45 PORTS.....	ADDED REV 2
1.00	K95936-01**	OPER INTERFACE; SIEMENS KTP400	HMI
1.00	K95936-03**	OPER INTERFACE; SIEMENS KTP400 2ND GEN HMI.....	ADDED REV 2
1.00	Z19315-07	FLAME CONTROL BASE Q7800A-1005	FSC1
1.00	Z19315-29	BURNER CTRL HWELL RM7897C1000/U	FSC1
1.00	Z19520-06	FLAME ROD	
1.00	Z19520-41	SPARK PLUG	
1.00	K95938-01	WATLOW TEMP. LIMIT CONTROLLER	TS01
1.00	K95941-01	CONTACTOR, 120V COIL 3HP @ 460V	MS01.....ADDED REV 2
1.00	K95941-04	CONTACTOR, 120V COIL 10HP @ 460V	MS02.....ADDED REV 2
4.00	K95941-07	CONTACTOR, 120V COIL 20HP @ 460V	CN05-56.....ADDED REV 2
1.00	K95941-08	CONTACTOR, 120V COIL 30HP @ 460V	MS03.....ADDED REV 2
8.00	K95941-09	CONTACTOR, 120V COIL 40HP @ 460V	CN01-54...ADDED REV2, DEL REV 3
8.00	K95941-16	CONTACTOR, 120V COIL 40HP @ 460V	CN01-54.....ADDED REV 3
4.00	K95946-51	AUXILIARY CONTACTS	OLR

**** - OPTIONAL; NOT ALL UNITS SUPPLIED WITH THIS.**

OTHER COMPONENTS

2.00	92213-09	GAUGE MINIHASIC 0-5 IN 2-5005	0001
1.00	92951-02	GAGE, PRESSURE 0-15"WC DWYER LPG5-8142N, REAR CONN	
1.00	92951-04	GAGE, PRESSURE 0-5 PSI DWYER LPG5-D9922N	
1.00	92951-06	GAGE, PRESSURE 0-10 PSI DWYER	ADDED REV 2
		LPG5-D0022N	
6.00	94888-03*	CAP, BLACK ROUND, PLASTIC 20" OD	
6.00	94888-05*	CAP, BLACK ROUND, PLASTIC 18" OD,	
2.00	94902-08	VALVE, BALL 1" WITH SIDE TAP	

*** - SELECT EITHER 18" OR 20" OD CAPS – NOT BOTH**



Spare Parts List

Desc: R15 460V 15,000 SCFM

REV 1 – EFFECTIVE FOR UNITS SHIPPED IN 2017 ONWARDS

REV 2 - EFFECTIVE FOR UNITS SHIPPED IN Q3 2018 ONWARDS

QTY	COMPONENT	DESCRIPTION	BALLOON	REV 2/ REV 3
WHEEL / DRIVE ASSEMBLY / CHAIN				
1.00	40107-01	DETECTOR S/A ROTATION 1125-900		
1.00	43125-06	SEAL KIT HC-9000		
1.00	91629-01	MOTOR, 1/4HP, 230/460V, 3PH,		
4.00	92022-02	WHEEL ROLLER 5 X 2		
2.00	92022-03	WHEEL ROLLER GREASELESS 3-1/4"		
1.00	94601-04	REDUCER SPEED 900:1 UL-R NEMA 56C		
1.00	94602-01	MOBIL GLYGOYLE 460		
BELT DRIVE SYSTEMS ONLY				
1.00	30145-29	WHEEL ASSY 60" TIGEL 400mm		
1.00	92283-09	BELT TIMING		
CHAIN DRIVE SYSTEMS ONLY				
1.00	30145-29-RC-1	WHEEL ASSY 60" TIGEL 400mm		
6.00	94892-01	CHAIN ROLLER CONNECTION LINK		ADDED REV 2
2.00	94892-02	CHAIN ROLLER CONNECTION LINK		
17.625'	94892-03	CHAIN DRIVE		
1.00	94892-03-10K	CHAIN DRIVE.....		ADDED REV 2
1.00	94892-08	CHAIN ROLLER SPROCKET		
1.00	94892-09	SPROCKET IDLER		
1.00	94926-01	LUBRICANT FOR CHAIN		
FILTERS				
9.00	90118-04B	FILTER 35% 25WX20H FARR 30/30 PROCESS		
1.00	95007-47	FILTER METAL MESH REACT (HINGED ACCESS PANEL)		
ELECTRICAL COMPONENTS				
1.00	90217-17	SWITCH, AIR	AFS2	
		PRESSURE, CLEVELAND, AFS-442-388		
1.00	90437-01	MONITOR PHASE A258B W/8 PIN SK	PM01	
1.00	90476-01	SWITCH LIMIT #BA-2RV2-A2	0003	
2.00	91410-04	FUSE MIDGET TIME DEL ATQR 1	FU30	
2.00	91410-09	FUSE MIDGET TIME DEL ATQR 2	FU30	
1.00	92043-08	PRESS SWITCH 0.4 - 1.6"WC DWYER		DELETED REV 2
		1950G-1-B-120-NA		
1.00	92466-01	FUSE, 3AG, TD, 250V, 2.0AMP	FU21	
1.00	92466-04	FUSE, 3AG, TD, 250V, 6.0AMP	FU31	
1.00	92466-08	FUSE, GLASS, 250V, 0.5AMP	FU34	
2.00	92466-09	FUSE, 1AMP MDL GLASS	FU20	
2.00	92706-01	SENSOR STAT PRESS TIP A-301	AFS2	
3.00	93962-02	FUSE, 1/4X1-1/4, CERAMIC, 0.5A	FU26	
1.00	93962-04	FUSE, 1A FAST ACTING, ABC-1	FU18	
1.00	93962-07	FUSE, 1/4X1-1/4, CERAMIC 2.5 AMP. ABC-2-1/2	FU37	
2.00	94100-12	CAMLOK BROWN 45 DEGREE,		

2.00	94100-13	CAMLOK ORANGE 45 DEGREE	
2.00	94100-14	CAMLOK YELLOW, 45 DEGREE	
2.00	94100-15	CAMLOK GREEN 45 DEGREE	
1.00	94632-03	FLAME CONTROLLER DISPLAY	FSC1
1.00	94632-04	FLAME AMP FOR FLAME ROD	FSC1
1.00	94632-12	FLAME CONTROLLER, 30 SEC PURGE	FSC1
2.00	94891-05	FILTER KIT, SAGINAW 7" X 5"	
1.00	94902-07	VALVE MOTOR ACTUATOR 1" BVP20.04	
1.00	94902-09	TRANSFORMER, IGNITION	
2.00	94902-12	CAP, TERMINAL FOR SPARK ELECTRODE	
1.00	94902-14	CAP, TERMINAL FOR IGNITION	
1.00	94902-18	REGULATOR, GAS ½"	
2.00	94902-19	VALVE SOLENOID	
1.00	94902-22	VALVE, DUAL SAFETY SHUTOFF, W/ POC AND VI ECLIPSE	
1.00	94902-23	SWITCH, PRESSURE GAS HIGH DUNGS	
1.00	94902-24	KIT ADAPTOR, GAS PRESSURE SWITCH	
1.00	94902-26	REGULATOR, MAIN GAS TRAIN	
1.00	94902-29	SWITCH, PRESSURE LOW, GAS TRAIN, DUNGS.....	ADDED REV 2
1.00	K95050-102	KIT,SEL SW, 3 POS,ILL WHT,120VAC,4 NO, CP, SIEMENS	SS01
5.00	K95050-29	PUSHBUTTON, ILLUM RED, 120VAC, 1 NO/1 NC, SIEMENS	LT02
1.00	K95050-30	YELLOW PB KIT, 120V, 1NO/1NC, PUSH TO TEST,SIEMENS	LT10
3.00	K95050-31	PUSHBUTTON, ILLUM GREEN, 120VAC, 1 NO/1 NC,SIEMENS	LT04
5.00	K95551-02	CONTROL RELAY, MINI, SPDT, 120VAC, 15A, SIEMENS	CR19
4.00	K95551-04	CONTROL RELAY, MINI, DPDT, 120VAC, 15A, SIEMENS	CR07
2.00	K95551-06	CONTROL RELAY, MINI, 3PDT, 120VAC, 15A, SIEMENS	CR09
6.00	K95551-09	RELAY SOCKET, FOR MINI SPDT, PREMIUM LINE, SIEMENS	CR19
4.00	K95551-10	RELAY SOCKET, FOR MINI DPDT, PREMIUM LINE, SIEMENS	CR07
2.00	K95551-11	RELAY SOCKET, FOR MINI 3PDT, PREMIUM LINE, SIEMENS	CR09
1.00	K95551-13	CONTROL RELAY, MINI, SPDT, 24VDC, 15A, SIEMENS	CR69
1.0	K95552-04	SS RELAY, 70 AMP, 24VDC CNTRL, 600V	SSR1,2
1.0	K95552-06	CONVERTER, MODULE, 0-10V TO PULSE, 24VAC/DC PLUG-IN	SSR1,2
1.00	K95601-01	J THERMOCOUPLE 4" PROBE #173935-00	TC02
1.00	K95603-03	J THERMOCOUPLE 18"	TC01
1.00	K95935-01	S7-1200 CPU	PLC1
1.00	K95935-03	S7-1200 CPU	PLC1.....ADDED REV 2
1.00	K95935-07	S7-1200 IN/OUT MOD	PLC
1.00	K95935-13	S7-1200 ANALOG INPUT MOD	PLC1
1.00	K95935-24	S7-1200 ANALOG OUTPUT MOD	PLC1
1.00	K95936-01**	OPER INTERFACE; SIEMENS KTP400	HMI
1.00	K95936-03**	OPER INTERFACE; SIEMENS KTP400 2ND GEN HMI.....	ADDED REV 2
1.00	K95936-26**	S7-1200, COMPACT SWITCH MOD, 4 RJ45 PORTS.....	ADDED REV 2
1.00	Z19315-07	FLAME CONTROL BASE Q7800A-1005	FSC1

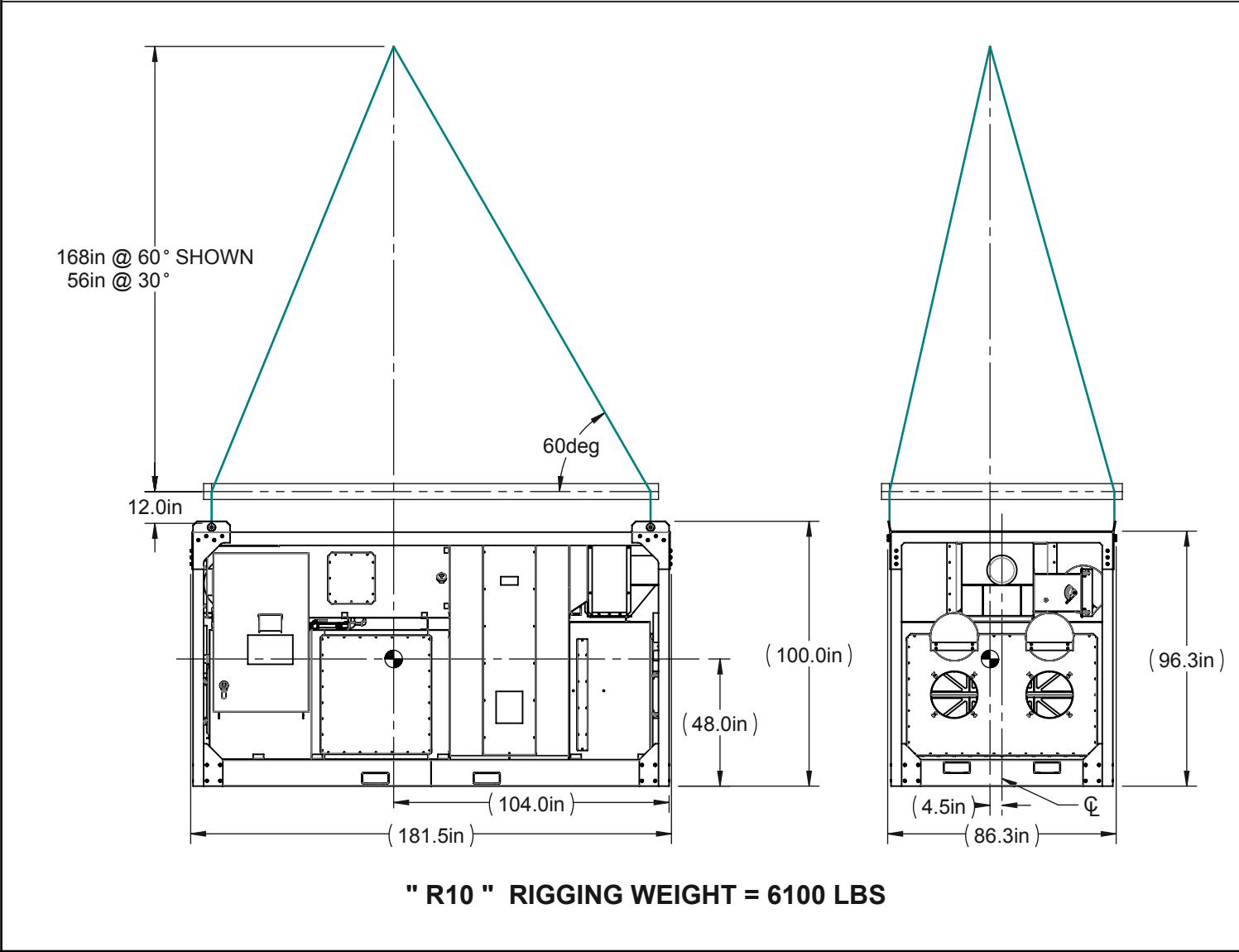
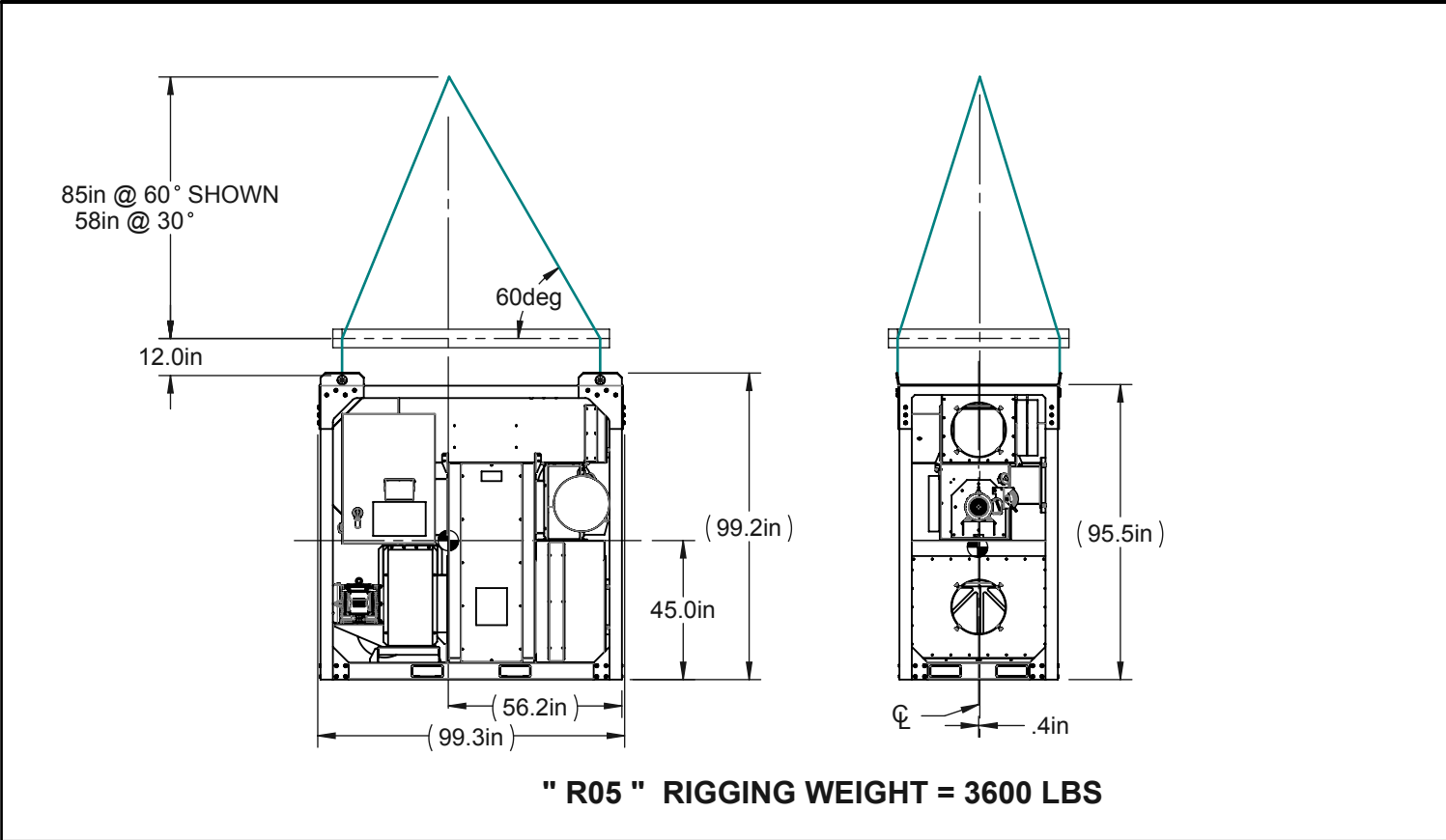
1.00	Z19315-29	BURNER CTRL HWELL RM7897C1000/U	FSC1
1.00	Z19520-06	FLAME ROD	
1.00	Z19520-41	SPARK PLUG	
1.00	K95938-01	WATLOW TEMP. LIMIT CONTROLLER	TS01
1.00	K95941-01	CONTACTOR, 120V COIL 3HP @ 460V	MS01.....ADDED REV 2
1.00	K95941-04	CONTACTOR, 120V COIL 10HP @ 460V	MS02.....ADDED REV 2
4.00	K95941-05	CONTACTOR, 120V COIL 10HP @ 460V	CH78, 578.....ADDED REV 2
2.00	K95941-07	CONTACTOR, 120V COIL 20HP @ 460V	MS3AB.....ADDED REV 2
12.00	K95941-09	CONTACTOR, 120V COIL 40HP @ 460V	CN01-6,56.ADDED REV 2; DEL REV 3
12.00	K95941-16	CONTACTOR, 120V COIL 40HP @ 460V	CN01-6,56.....ADDED REV 3
4.00	K95946-51	AUXILIARY CONTACTS	OLR

**** - OPTIONAL; NOT ALL UNITS SUPPLIED WITH THIS.**

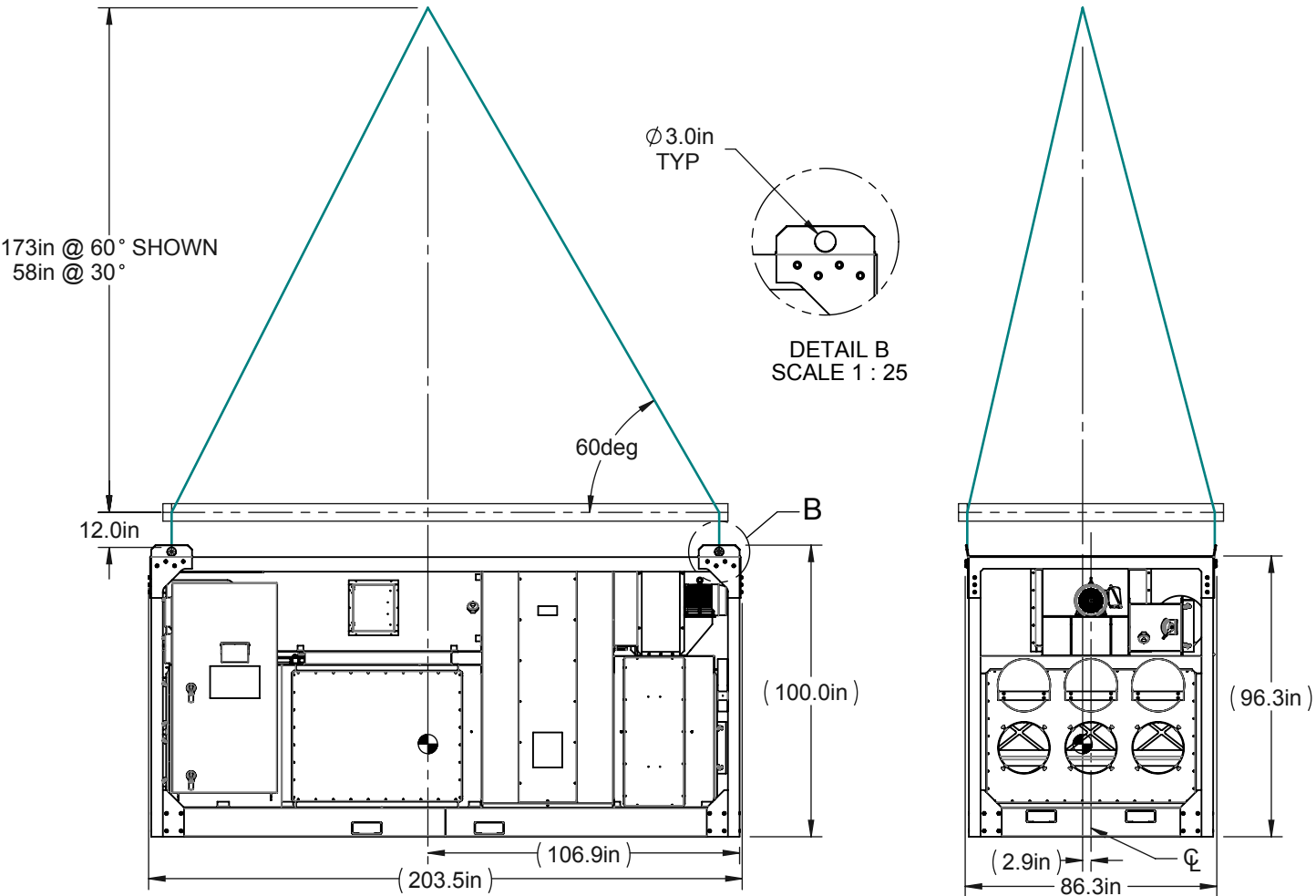
OTHER COMPONENTS

2.00	92213-09	GAUGE MINIHHELIC 0-5 IN 2-5005	0001
1.00	92951-02	GAGE, PRESSURE 0-15"WC DWYER LPG5-8142N, REAR CONN	
1.00	92951-04	GAGE, PRESSURE 0-5 PSI DWYER LPG5-D9922N	
1.00	92951-06	GAGE, PRESSURE 0-10 PSI DWYERADDED REV 2 LPG5-D0022N	
9.00	94888-03*	CAP, BLACK ROUND, PLASTIC 20" OD	
9.00	94888-05*	CAP, BLACK ROUND, PLASTIC 18" OD,	
2.00	94902-08	VALVE, BALL 1" WITH SIDE TAP	

*** - SELECT EITHER 18" OR 20" OD CAPS – NOT BOTH**



REV	CHANGE NOTES	DWN BY	DWN DATE	APRVD BY	APRVD DATE
-	-	-	-	-	-



" R15 " RIGGING WEIGHT = 7700 LBS

- NOTES:**
RIGGING INSTRUCTIONS FOR CAGED MOUNTED SYSTEMS (TOP LIFT SPREADER)
1. WHEN LIFTING WITH A HOOK AT A SINGLE POINT, A LIFTING/SPREADING DEVICE SIMILAR TO THE ONE SHOWN IS REQUIRED.
 2. THE LIFTING/SPREADING DEVICE AND LIFTING BARS MUST BE FURNISHED BY THE RIGGING CONTRACTOR AND MUNTERS ASSUMES NO RESPONSIBILITY OR LIABILITY FOR METHODS OR MATERIAL USED. LIFTING/SPREADER DEVICE MUST BE CAPABLE OF LIFTING THE TOTAL SYSTEM WEIGHT.
 3. A LIFTING/SPREADING DEVICE IS ESSENTIAL TO PREVENT CRUSHING SYSTEM SIDES AND DAMAGE TO SENSITIVE CONTROL COMPONENTS.
 4. RIGGING MUST BE DESIGNED SO THAT THE LOAD REMAINS LEVEL AT ALL TIMES WHEN LIFTING.
 5. AN ANGLE BETWEEN 30 DEGREES THROUGH 60DEGREES FROM THE HORIZONTAL PLANE TO THE LIFT POINT AT THE CENTER OF MASS OF THE UNIT SHALL BE MAINTAINED AT ALL TIMES.
 6. SAFETY LINES SHOULD BE ATTACHED TO SKID AT NO LESS THAN TWO POINTS TO PREVENT SWINGING OR TWISTING DURING LIFTING.
 7. LIFTING SHOULD BE ACCOMPLISHED USING THE SAFEST SPEED OF LIFT BASED ON CONDITIONS AT TIME OF OPERATION.
 8. PRIOR TO LIFTING, CHECK THAT ALL ACCESS PANELS ARE SECURED IN PLACE, THAT CORNERS ALONG TOP SURFACES ARE PROTECTED FROM POSSIBLE DAMAGE BY SLINGS AND THAT ALL EXPOSED COMPONENTS ARE FULLY PROTECTED.

Description		Sheet		Revision	
LIFTING INSTRUCTIONS FOR RENTAL UNITS R05,R10,R15		1 / 1		0	
Tolerances, if not indicated, according to:		See MUNTERS Doc.No. 160-027139-001		DATE	
Design by		JDL		4/13/2018	
Design. ckd		AMCD		4/13/2018	
Munters		Drawing / Part No		127080-01	