Quick Start and Operations Manual OM 1294

Group: **Applied Air Handling**
Part Number: **OM 1294**
Date: **September 2019**

Maverick® II
Packaged Rooftop Systems 15 – 75 Tons

Model MPS

The following is a quick start guide for your new super-efficient Daikin MPS rooftop unit. Follow these step-by-step procedures for getting the rooftop unit started in the most efficient way. Read IM 991 and OM 920 before operating the unit and adhere to procedures/hazard identifications within the manuals.

IM 991 and IM 1058 warranty registration form includes initial start-up, fan, mechanical cooling, and heating start-up procedures that must be followed with this quick start guide.)

Operational, Installation and Maintenance Resources (read before operation)

- Installation & Maintenance Manual . . . . . IM 991
- Installation & Maintenance Manual . . . . . IM 1058
- MicroTech® III Unit Controller for Rooftop . . . . . OM 920
- MicroTech® III Controller Options . . . . . IM 1244
- BACnet® & LonWorks® Integration . . . . . .ED 15112
- Daikin System Manager . . . . . IM 1253

Unit Inspection (perform before operation)

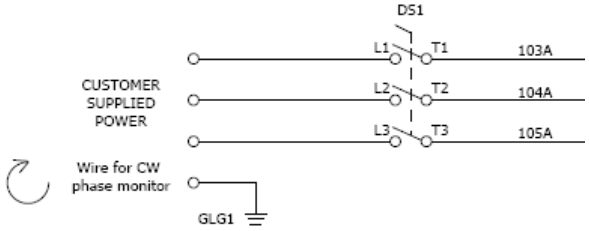
1. Visually inspect unit for damage outside and inside unit. Note any damage. Claims for freight damage must be filed by the consignee.
2. Confirm unit location meets ventilation and service clearance recommendations as stated in IM 1058 “Unit Clearances”.
3. Confirm unit condensate drain has been installed per IM 1058 “Unit Piping – Condensate Drain Connection”.
4. On VAV units, confirm that the duct static pressure sensor tubing and/or building static pressure tubing has been installed per IM 1058 “Installing Duct Static Pressure Taps”.
5. Confirm the discharge air sensor in the supply duct

NOTE: Remove power when making field connections. Damage to the controller could result in making connections with the power applied.

Main Power Supply

STEP 1 Confirm that the electrical power wiring lugs are tight. Check for proper voltage as per submittal and the wiring diagram included with unit.

NOTE: Incoming power is not to exceed a voltage imbalance of 2%



STEP 2 Using a phase sequencing tester confirm power source or sources if multiple are all phase correctly for clockwise rotation.

Passwords

STEP 3 Various menu functions are accessible or inaccessible, depending on the access level of the user, and the password they enter, if any. There are four access levels, including no password, Level 2, Level 4, and Level 6, with Level 2 having the highest level of access. Without entering a password, the user has access only to basic status menu items. Entering the Level 6 password (**5321**) allows access to the Alarm Lists Menu, Quick Menu, and the View/Set Unit Menus group. Entering the Level 4 password (**2526**) allows similar access as Level 6 with the addition of the Commission Unit Menu, Manual Control, and Service Menu groups. Entering the Level 2 password (**6363**) allows similar access as Level 4 with the addition of the Unit Configuration Menu. The main password page is displayed when the keypad/display is first accessed, the Home Key is pressed, the Back Key is pressed multiple times, or if the keypad/display has been idle longer than the Password Timeout (default 10 minutes).The main password page provides access to enter a password, access the Quick Menu, view the current Unit State, access the alarm lists or view information about the unit. Alarms can be acknowledged without entering a password.

Temperature Control Set up / DAT Control with Space Temp

STEP 4 For DAT control using a field wired wall sensor check all wiring, connections and wire used should be shielded cable.

Please refer to the supplemental information at the back of this manual for correct wiring connections for field installed components

STEP 5 Navigate to the **Commission Unit** menu, enter and scroll down to "**Htg/Clg ChgOvr Set Up**" and enter. If you want the unit to control to the space sensor select under "**Control Temp Source**" select "**Space**". If you want the space sensor to be in control of the thermostat settings to control the unit, scroll down to "**Use Tstat Spt**", and change the default value of no to yes, then scroll up to "**Apply Tstat Chg**" and change the "**No**" to Yes and enter. The control will cycle off to make the necessary changes to the programming.

NOTE: If there is no space sensor you cannot select space as your control temperature source.

When DAT is selected as control type in the configuration menu you may select the control temp source as Space Temperature, Return Temperature, Outdoor Air Temperature, Mixed Air Temperature, or None. The control temperature source is the temperature sensor that will make the decision to call for heat or cooling. If the Thermostat was not selected to control you could proceed to step 6, navigate to the "**View Set Unit**" menu, then scroll down to cooling and enter. Set your occupied and unoccupied set points as well as the DAT in the cooling menu then proceed to the heating menu and enter the set points for heating.

NOTE: it is a good practice to have a three to four degree spread between the cooling and heating setpoints.

Item Display Name	Default Setting	Range	Password Level
Ctrl Temp Src=	RAT	RAT	4
		Space	
		MAT	
		OAT	
		None	
Use Tstat Spt=	No	No, Yes	4

Cooling Commissioning

STEP 6

Navigate to the "**View/Set Unit/ Cooling Menu**" scroll down to **Occ Clg Spt** (Occupied cooling setpoint) change this setpoint to what the customer wants to see at the control temp source location.

Example if you want a 72°F space temp and space is the choice for the control temperature source you would set the Occ Clg Spt to 72°F. When the space temp reached 73°F (set point plus half the dead band one degree) cooling would be enabled. Under these settings whenever the cooling is activated the unit will strive to deliver 55°F when in cooling. If there is not a large load on the space the DAT can be adjusted to limit short cycling, ranges of all three setpoints are shown to the right. When the space temperature reaches 71°F (setpoint minus half the dead band one degree) the cooling cycle will be terminated.

Item Display Name	Default Setting	Range	Password Level
Occ Htg Spt=	72.0°F	0.0–100.0°F	6
Unocc Htg Spt=	85.0°F	40.0–100.0°F	6
DAT Htg Spt=	55.0°F	40.0–140.0°F	6

Heating Commissioning

STEP 7

Navigate to the "**View/Set Unit/ Heating Menu**" scroll down to **Occ Htg Spt** (Occupied heating setpoint) change this setpoint to what the customer wants to see at the control temp source location.

Example if you want a 72°F space temp and space temperature is the choice for the control temperature source you would set the Occ Htg Spt to 70°F. When the space drops to 69°F (setpoint plus half the dead band heating would be enabled. Under these settings whenever the heating is activated the unit will strive to deliver 85°F when in heating. If there is not a large load on the space the DAT can be adjusted to limit short cycling, ranges of all three setpoints are shown to the right. When the space temperature reaches 71°F (setpoint plus half the dead band) the heating cycle will be terminated.

If the set points given in the above examples are entered and the default dead band is 2°F the unit would enter a fan only state between 71°F and 73°F

NOTE: The occupied heating set point must be equal to or less that the occupied cooling set point. If a conflict occurs from values entered via the keypad, thermostat or network the occupied heating set point is automatically adjusted down to the cooling set point.

Item Display Name	Default Setting	Range	Password Level
Occ Htg Spt=	68.0°F	0.0–100.0°F	6
Unocc Htg Spt=	55.0°F	40.0–100.0°F	6
MWU Spt=	70.0°F	40.0–100.0°F	6
DAT Htg Spt=	85.0°F	40.0–140.0°F	6

Minimum Outdoor Air Damper Position

STEP 8

Navigate to the "**View/Set Unit>Min OA Damper**" menu. Select **Vent Lmt=** (ventilation limit) and adjust the ventilation limit to the jobsite conditions. The ventilation limit is the required outdoor airflow when fan operation is at full speed. The balancing contractor will need to advise what the percent open the damper should be in order to take in the required ventilation outdoor air. Ventilation limits are typically determined by the engineer of design and local codes. Ranges of adjustment are shown to the right. Select **LoFlo V Lmt=** (also known as "low flow ventilation limit") and set the damper position when the supply fan is running at low speed. When the supply fan slows down the outdoor air damper must open further in order to maintain the correct amount of ventilation air. The damper position at fan low speed must also be verified by *the balancing contractor*.

Item Display Name	Default Setting	Range	Password Level
Min OA Pos=	—	0–100%	6
Vent Limit=	20%	0–100%	6
LoFlo V Lmt=	30%	0–100%	6
DCV Limit=	10%	0–100%	6

Economizer Commissioning

STEP 9

Navigate to the **Commission Unit>Econo Set-up** menu. Economizer operation has a change-over temperature just like the cooling and heating mode. Select **Chgover Temp=** (also known as “change-over temperature”) to change the default value (“70.0°F”) to jobsite conditions. The changeover temperature is a dry-bulb temperature at which economizer operation is allowed. The default value of 70.0°F allows free cooling economizer operation when the outdoor temperature is below 70.0°F.

The unit may also be equipped with comparative enthalpy control. If this optional control method is furnished on your rooftop unit, the MicroTech III controller will compare the return air enthalpy, as well as the outdoor air enthalpy, to determine if the outdoor air enthalpy is suitable for free cooling. This enthalpy comparison is allowed only when the outdoor air temperature is below the **Chgover Temp=** setpoint value entered above.

Item Display Name	Default Setting	Range	Password Level
Clg Stage Time	5min	5–60min	4
Chgover Temp	70.0°F	0.0–100.0°F	6

Supply Fan Commissioning

STEP 10

Navigate to the **Commission Unit/SAF Set-Up**, scroll down to **SAF Ctrl** (supply air fan control) select what type of control is desired according to the job site.

The default is **DSP** (duct static pressure) which allows the supply fan to seek and maintain the duct static pressure set point.

Spd/ Net (speed Net) is another choice this selection typically is used with a building management system which will write a speed command to the controller.

1Zn VAV will raise or lower the fan speed in relationship to the temperature set point, the closer to setpoint the temperature is will allow the fan to slow down, the farther from setpoint the faster the fan will operate.

CO2 selection controls the speed of the fan in relation to the CO2 ppm in the space varying the fan speed between a user adjustable range. CFM selection will control the fan speed as selected by minimum and maximum CFM set points.

NOTE: If 1ZVAV is selected one must scroll down further into the SAF Set-up menu and enter information for min and max heating and cooling speeds recommendations would be:

Cooling minimum 60%, Maximum 90/100%

Heating minimum 60%, Maximum 90/100%.

If CO2 was selected visit the Co2 control section under SAF Setup menu, and verify the default settings for the PPM is what is needed for the job site

Item Display Name	Default Setting	Range	Password Level
SAF Ctrl=	DSP	DSP	6
		Spd/Net	
		1Zn VAV	

Optional Return/Exhaust Fan Commissioning

STEP 11

Your Daikin unit may be equipped with a power exhaust or return fan. Check the configuration menu to see how this fan was intended to be controlled. In the configuration menu spot 16 would give you the correct fan type and spot 17 would give the control method.

Navigate to the **Commission Unit** menu, enter and scroll down to **RF/EF Set-Up** menu. The exhaust fans can be controlled by building pressure or as a percentage of supply fan speed, or percent of outside air damper opening or Speed Net option (communications from the BMS.) The intended control method should be selected in this menu.

Tracking, the Return or exhaust fan will track the supply fan as a percentage of speed. (5% to 100%)

BldgP (Building static pressure) requires an input from a static pressure transducer and will adjust the fan speed in relation to the static pressure set point.

Spd/Net typically used when a building management system is in place and writing a speed to the controller for the fan.

OA Damper will operate the exhaust fan ON or OFF in relation to the outside damper position. Adjustable setting of 40% is default, If the damper position is above this setting it turns the exhaust fan ON.

Item Display Name	Default Setting	Range	Password Level
RF/EF Ctrl=	BldgP	None	6
		BldgP	
		Spd/Net	
		OAD	

Item Display Name	Default Setting	Range	Password Level
RF/EF Speed=	—	0–100%	6
Speed Cmd=	—	0–100%	6
Bldg Press=	—	-0.25–0.25in	6
BldgSP Spt=	0.05in	-0.25–0.25in	6

Optional Dehumidification Control Commissioning

STEP 12

Your Daikin unit may include the option of operating dehumidification control when the humidity or dewpoint in the space is above the setpoint value.

To set up dehumidification control navigate to the **View/Set Unit** menu and scroll down to **Dehumidification**. The default value is "**None**" change that to either **Relative Humidity** or **Dew Point**. selecting the method that you will be using to control the dehumidification system.

Further down in the menu please enter the desired setpoint in the appropriate spot dependent on if it is humidity or dewpoint.

NOTE: You will need to verify there is a humidity sensor or enthalpy sensor wired up to the controller. Check the wiring diagram for the proper terminals for proper connection points.

NOTE: If you have gas heating available you may be able to use the gas heating for re-heat during dehumidification.

This is possible if:
Configuration position 28 is set to ModHG (2)

Configuration position 10 is set to 7 or 8.

To enable this process navigate to the commission unit menu, enter and scroll down to **Dehum** set-up, enter and scroll down to **Backup RH Enable**, and select "**Yes**".

For the gas burner to assist in getting the discharge air temperature up to the re-heat setpoint, the re-heat must be on and at 100% for a minimum of 5 minutes.

Item Display Name	Default Setting	Range	Password Level
Dehum Method=	—	None	6
		Rel Hum	
		DewPt	
		0–100%	
RH Setpoint	50%	0–100%	6

Start-Up of the Supply and Return Fans for Air Balancing

It is typical that the fans are started prior to the functional startup of the unit. The VFD's in the unit are shipped with parameters pertaining to the proper operation of the fans during normal operation. If these parameters are changed by air balance personnel or others just trying to get the fans to operate this could cause extra time for the startup technician. If fan operation is required there are some easy steps to accomplish this without altering drive parameters.

- Enter level 4 or 6 password, 2526 / 6363
- Scroll down to Manual Control, enter.
- Change the Manual control from Normal to Manual
- Scroll down on step and change the Supply fan from OFF to ON.
- Scroll down one more step and change the SAF SPD Cmd from 0% to a percent you want the fan to run from 0 to 100%

You would follow the same procedure to activate the return or exhaust fans.

When finished running fans simply go to the top of the Manual Control menu and change the Manual control back to Normal The Unit will now shut down and be ready to except an operational run command.

Start-Up

After all the set points and operational information have been entered, the unit is now ready to be started up. Confirm all doors are closed, filters are installed, traps are installed and no personnel are around moving parts prior to proceeding. Unit power should have been on for a minimum of 24 hours prior to start-up of the refrigerant system.

From the main menu after you have put in your password scroll down to, Occ Mode (occupied mode) and select one of the following modes:

- Occupied, Unit will start and run until it is commanded OFF 24/7.
- Unoccupied, Unit will remain off but in the ready state for operation.
- Auto unit will respond to a command from the BMS or a contact closure to the main control or the internal schedule.

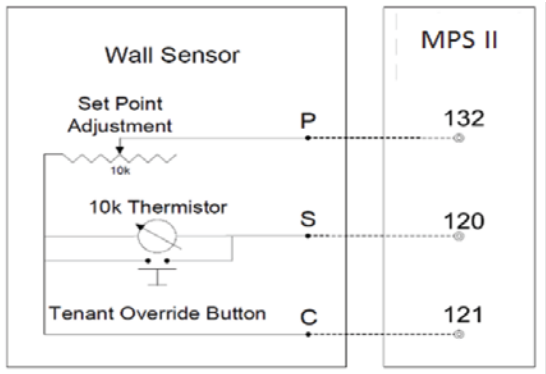
Then scroll up one spot to Ctrl mode (control mode) and select one of the options:

- Heat only if you want the unit to run and supply heating only.
- Cool only, if you want the unit to run and supply cooling only.
- Fan only, if you want the fan to run only.
- Heat Cool, if you want the unit to run providing air and heating and cooling dependent on setpoints.
- Auto, if you want the unit to provide heating or cooling as determined by the building management system.

When the unit begins to start, it will perform a 180 second "Start-Up" procedure in which the unit controller confirms all temperature sensors are functional. Next, the fan will start and perform a 180 second recirculation mode in which the unit begins moving air around the occupied space for an adequate representation of the space conditions at the space temperature sensor. After the recirculation mode, the unit will perform the heating/cooling mode of operation if the "control" temperature is above/below the occupied setpoint values entered in Steps 6 & 7. If the "control" temperature is at the setpoint, then the unit will operate in the "fan only" state of operation

Space Sensor with Setpoint and Tenant Override

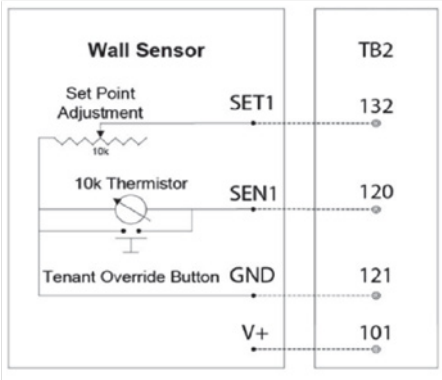
Part Number: 113117801



NOTE: Shield wire is to be grounded at the RTU chassis only.

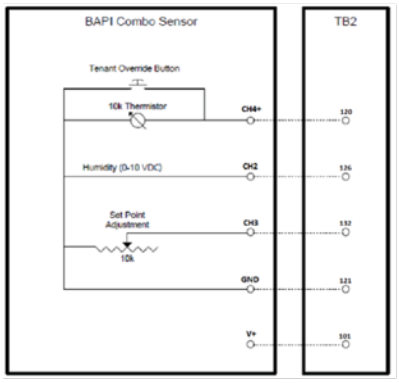
Space Sensor with Setpoint and Tenant Override

Part Number: 910143408



Combination Relative Humidity and Temperature Sensor

Part Number: 91019161



NOTE: Shielded cable must be used to connect all sensors, the ground or drain wire is to be connected at the controller end only.

The next seven pages contain wiring diagrams for the Maverick II product line.

Figure 1 is typical of Maverick II units with three fixed speed comperssors, energy wheel, HGRH, and gas heating.

Figure 2 represents the typical wiring diagrams for Maverick II units with fixed speed and variable speed compressors.

Figure 1: Typical MPS Electrical Diagram with Fixed Speed Compressors

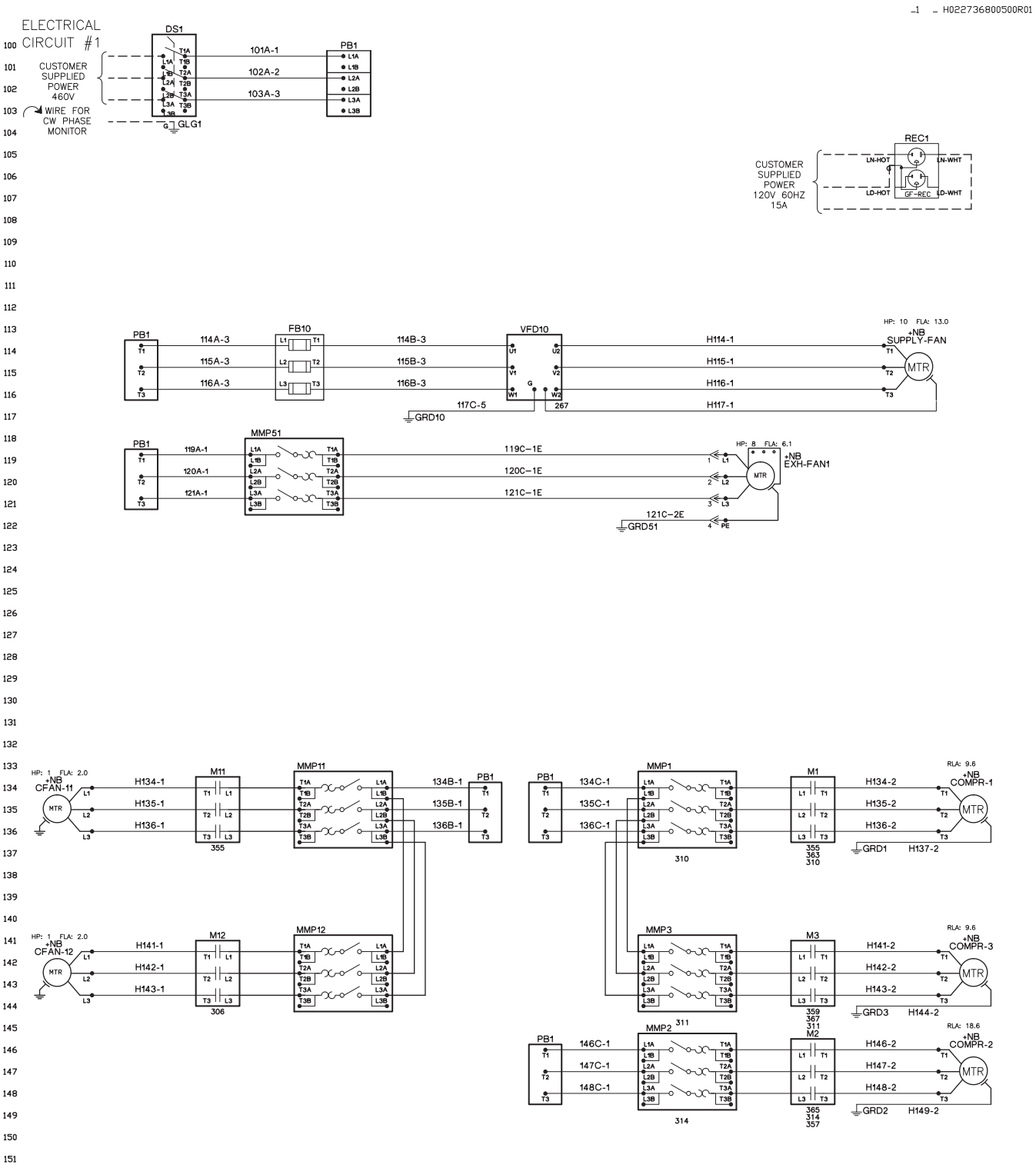


Figure 1 continued: Typical MPS Electrical Diagram with Fixed Speed Compressors

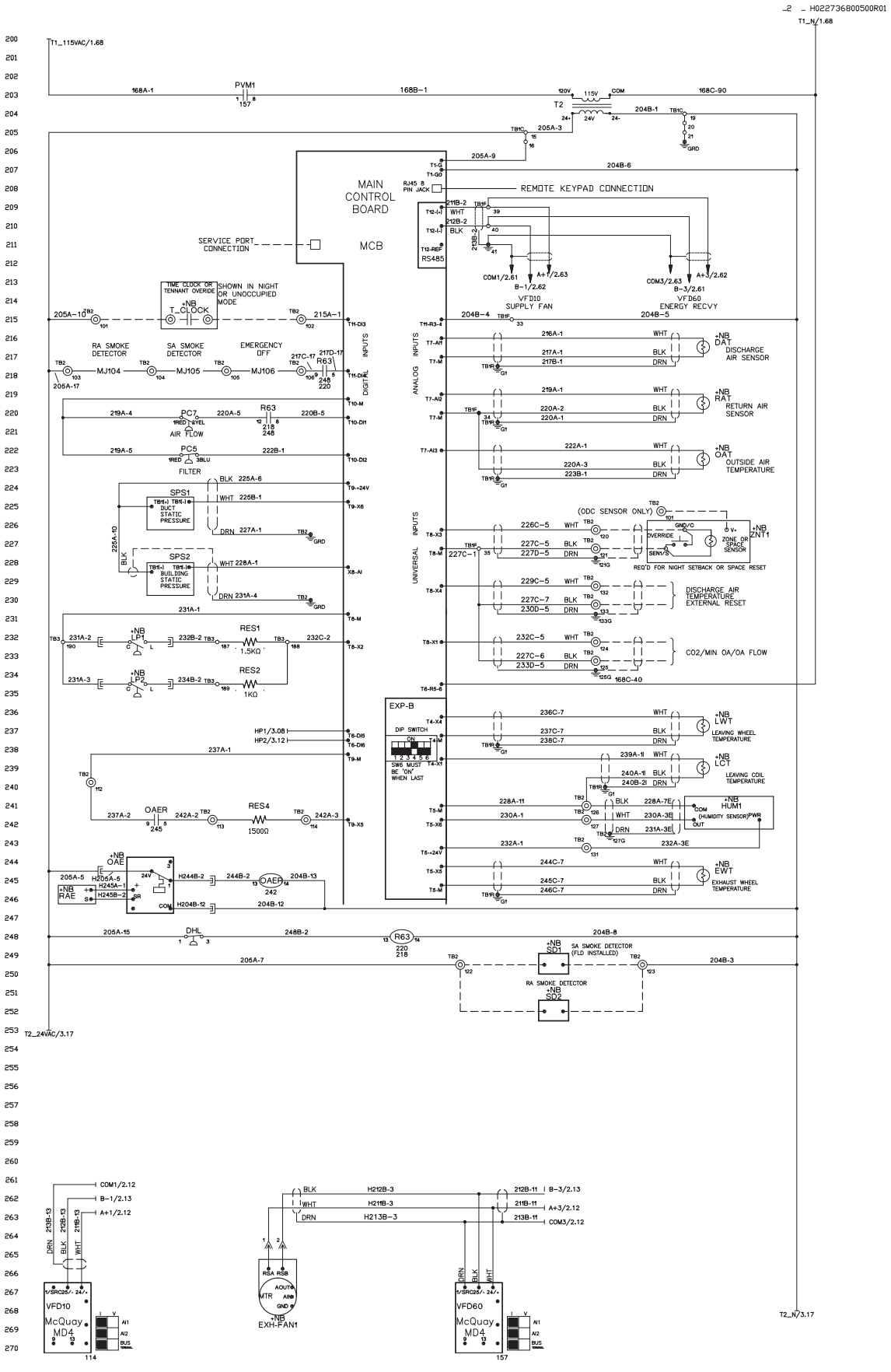


Figure 1 continued: Typical MPS Electrical Diagram with Fixed Speed Compressors

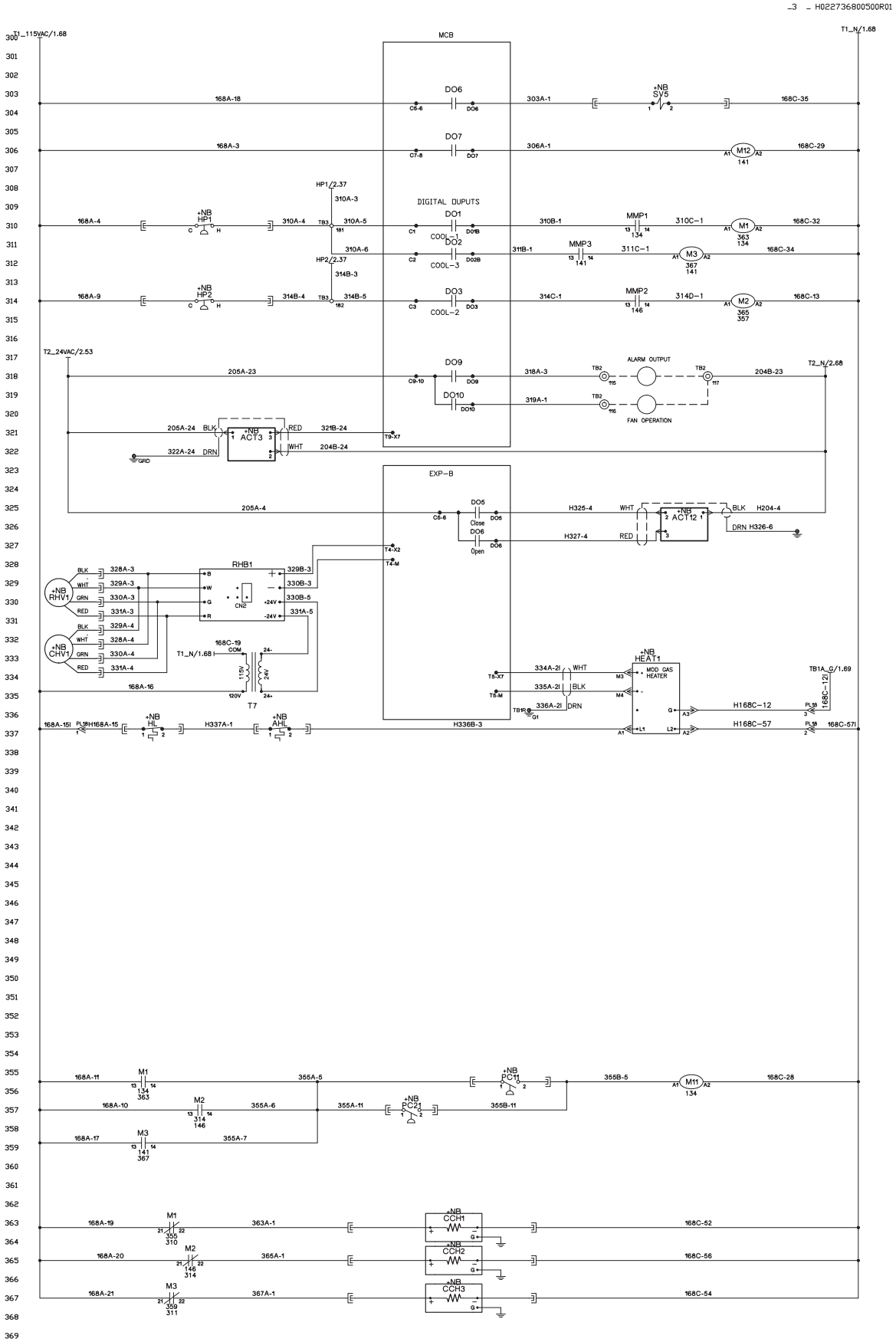


Figure 2: Typical MPS Electrical Diagram with Fixed and Variable Speed Compressors

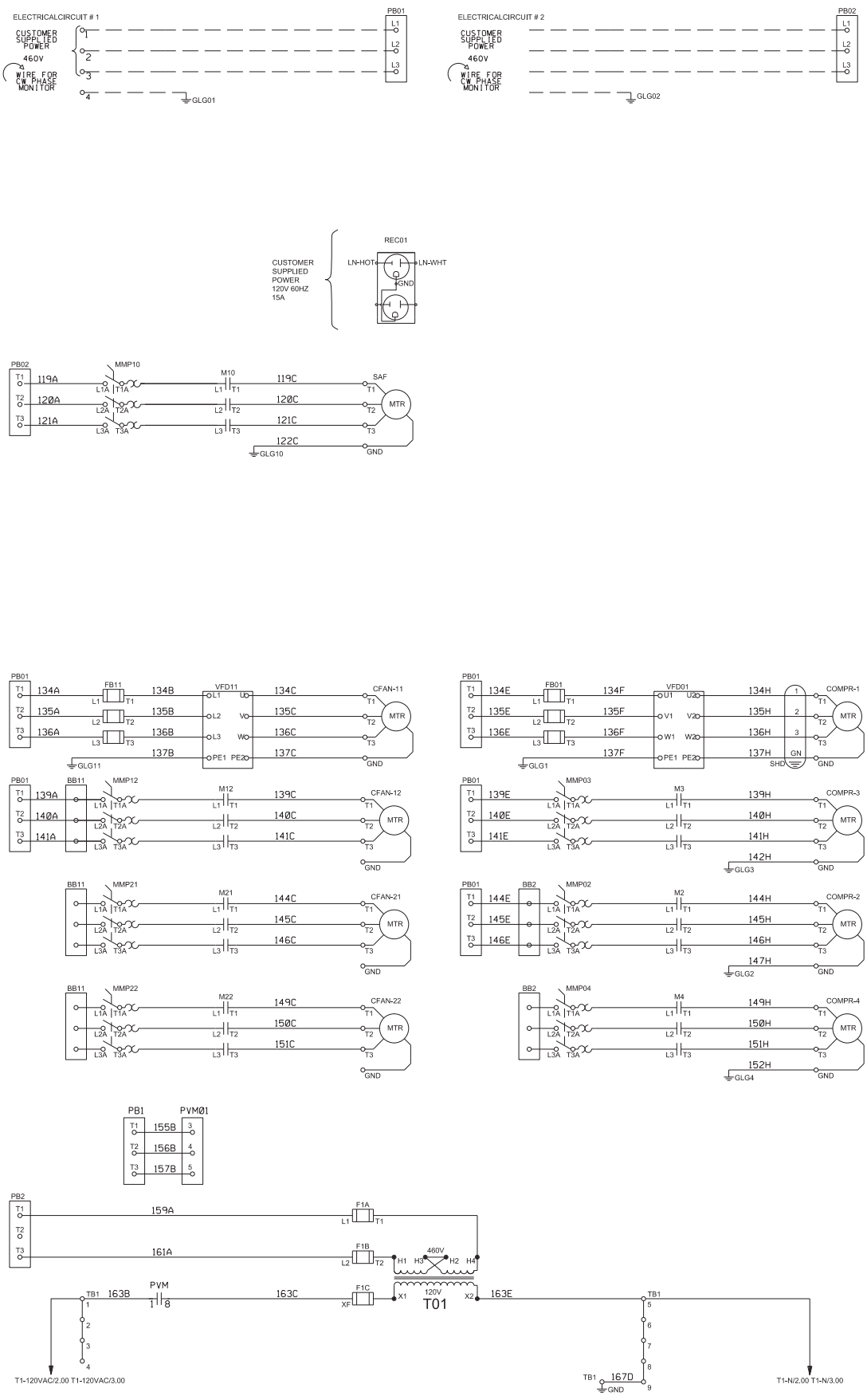


Figure 2 continued: Typical MPS Electrical Diagram with Fixed and Variable Speed Compressors

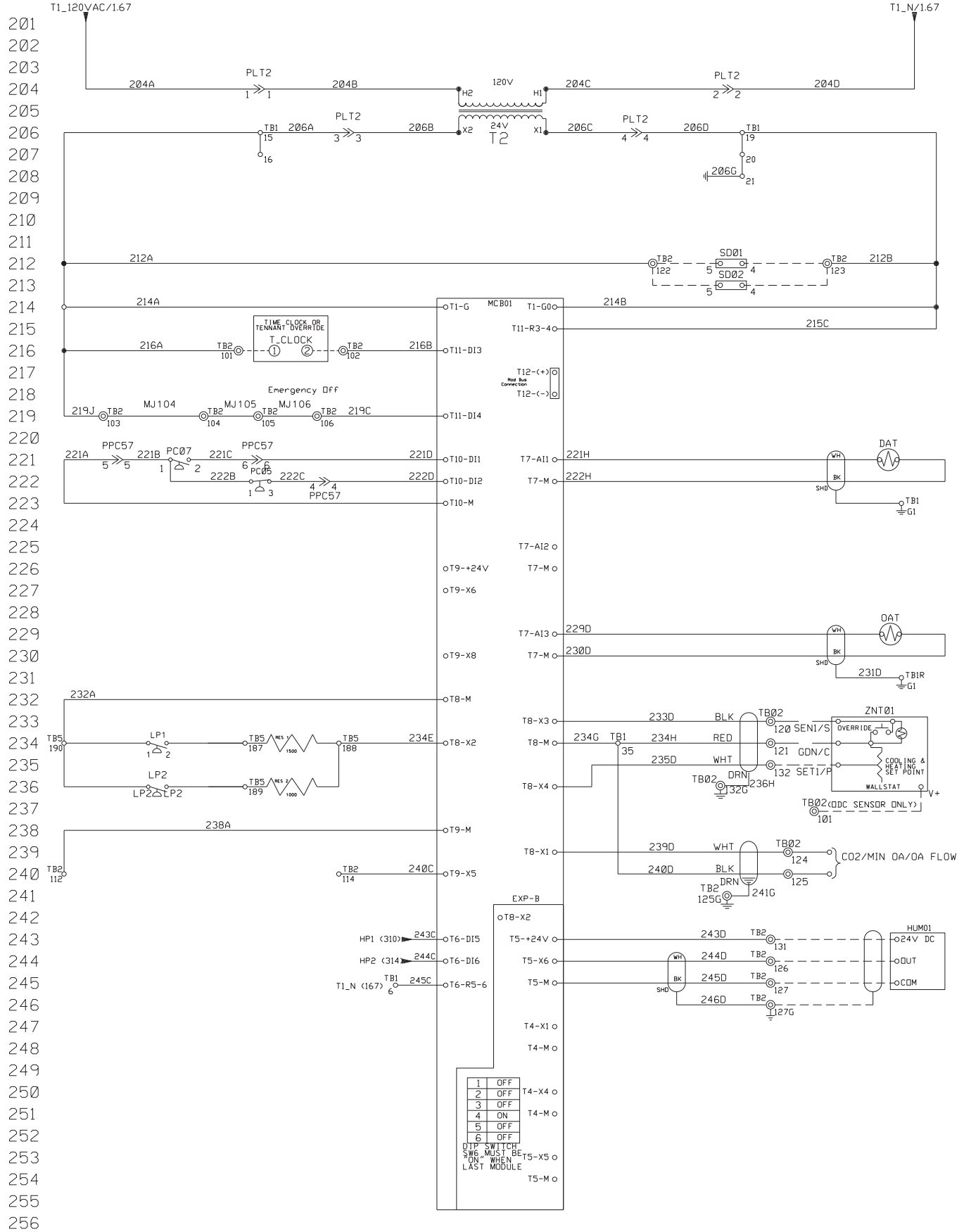


Figure 2 continued: Typical MPS Electrical Diagram with Fixed and Variable Speed Compressors

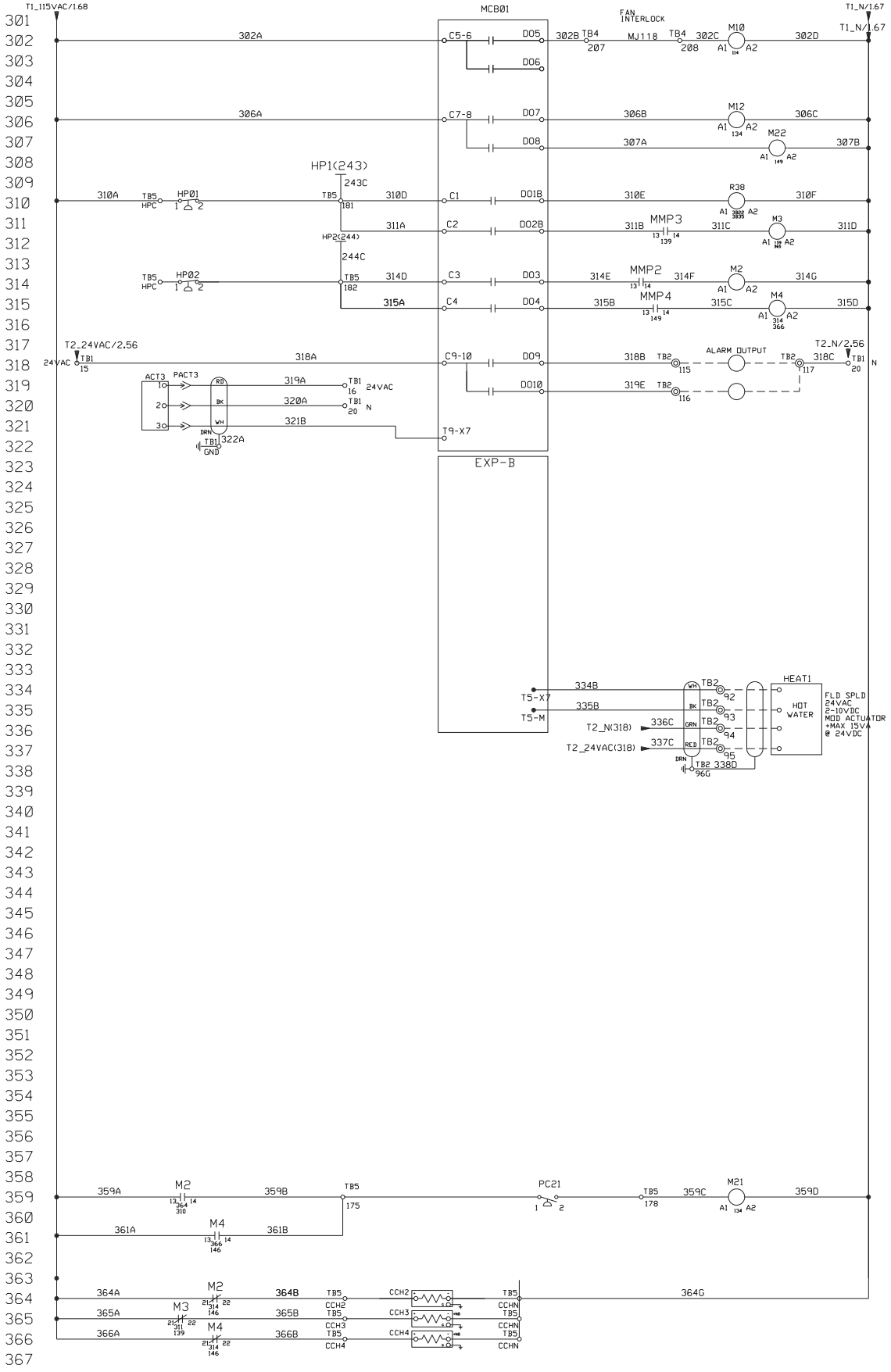
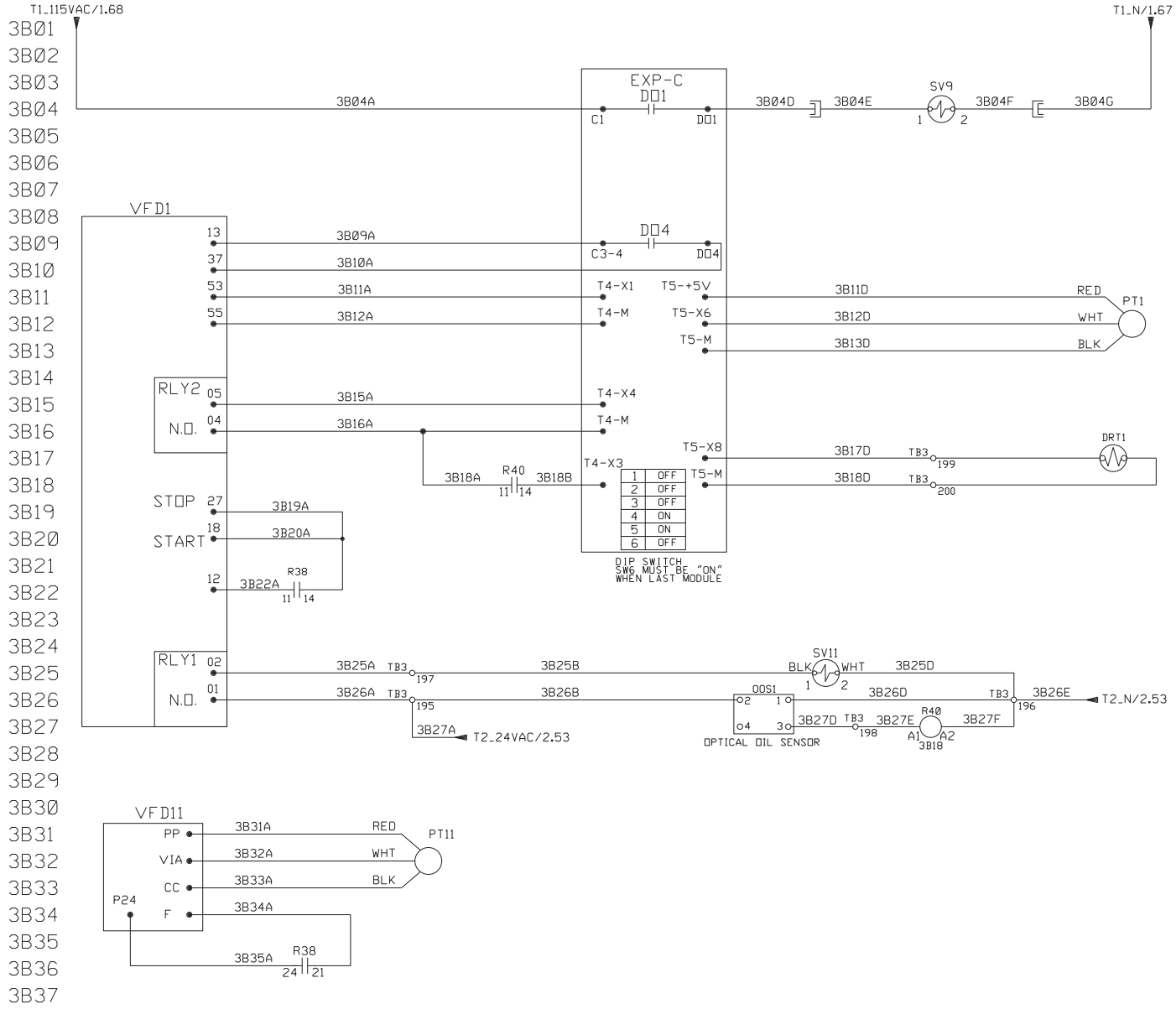


Figure 2 continued: Typical MPS Electrical Diagram with Fixed and Variable Speed Compressors



Daikin Applied Training and Development

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Warranty

All Daikin equipment is sold pursuant to its standard terms and conditions of sale, including Limited Product Warranty. Consult your local Daikin Applied Representative for warranty details. To find your local Daikin Applied Representative, go to www.DaikinApplied.com.

Aftermarket Services

To find your local parts office, visit www.DaikinApplied.com or call 800-37PARTS (800-377-2787). To find your local service office, visit www.DaikinApplied.com or call 800-432-1342.

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