# DAIKIN

## Quick Start and Operations Manual    OM 1318

# Rebel Applied™
# Packaged Rooftop Systems

## Model DPSA

The following is a quick start guide for your new super-efficient Rebel Applied rooftop unit. Follow these step-by-step procedures for getting the rooftop unit started in the most efficient way. **Read IM 1287 and OM 1288 before operating the unit and adhere to procedures/ hazard identifications within the manuals. IM 1287's warranty registration form includes initial start-up, fan, mechanical cooling, and heating start-up procedures that must be followed with this quick start guide.** NOTE: Refrigerant pressures, subcooling, and superheat can be checked from the MicroTech® 4 unit controller. Refrigerant gauges are not required when doing start-up. Schrader fittings are for evacuation and charging purposes only except it there is a problem that would require conformation of transducer readings.

## Operational, Installation and Maintenance Resources (read before operation)

- Rebel Applied Installation/Startup Manual . . . . . IM 1287
- MicroTech® 4 Unit Controller . . . . . . . . . . . . . . OM 1288
- Rebel Applied Unit Controller Protocol Info . . . . ED 19117

## 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 1287 "Unit Clearances".

3. Confirm unit condensate drain has been installed per IM 1287 "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 1287 "Installing Duct Static Pressure Taps".

5. Confirm the discharge air sensor in the supply duct

6. Confirm all field wiring is complete.

**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 Phased Correctly For Clockwise Rotation.
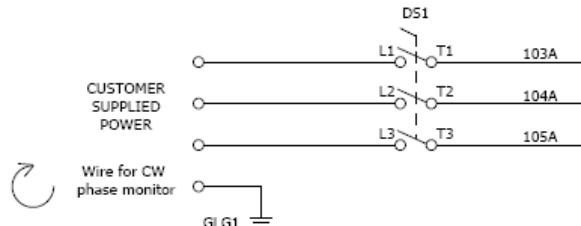
## Passwords

**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 Controls Set Up / DAT Control with Space Temp

**STEP 4**  For Rebel Applied units 30 to 52 ton, confirm that the space sensor is installed and connected to the terminal block **TBLV2** at terminals: **Sen1/s to 210, GDN/C to 236, Set/P to 212** and that the wire shielded ground is connected to a ground terminal.

**STEP 5**  With the unit in an off state, navigate to the commission unit menu, enter and scroll down to **Htg/Clg ChgOvr Set Up** and enter. (**CtrlTempSrc**) there are four choices; default is **RAT**, the other three are **Space, OAT,** and **None**.

The control Temp Source is the sensor that will determine if the unit will just run the fan only or switch into heating or cooling. If it is desired to have the unit respond to the space sensor under **CtrlTempSrc,** select "**Space**".

**NOTE:** If there is no space sensor connected up as directed in step 4, "Space" cannot be selected as the control temperature source.

If it is desired the set points be controlled by the space sensor, scroll down to **RemSptSrc** and select **AI**.  The occupied heating and cooling set points will then be determined by the setting of the Sensor AI.  .

**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 | |
| | | OAT | |
| | | None | |
| REMSptSrc= | None | Non3 | 4 |
| | | AI1 | |
| | | QMX1 | |
| | | QMX2 | |
| | | QMX3 | |

## Cooling Commissioning

**STEP 6**  If in step 5 the Space sensor was not selected to control the set points, then navigate to the **Commission Unit / Cooling Set-Up** and enter. Scroll down to **Occ Clg Spt** and select the temperature you wish the temperature to be at the control temperature source. The default for the cooling temperature dead band is 2°. 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** (Discharge Air Temperature) 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.

In this menu (cooling set up), the **Occupied** set point, **Unoccupied** set point, and **DAT** set point are available to set at the desired temperatures. Typical temperature settings are:

| Item Display Name | Default Setting | Range | Password Level |
|---|---|---|---|
| Occ Clg Spt= | 72.0°F | 0.0–100.0°F | 4 |
| UnOcc Clg Spt= | 85.0°F | 40.0–100.0°F | 4 |
| DAT Clg Spt= | 55.0°F | 40.0–250.0°F | 4 |

## Heating Commissioning

**STEP 7**  Navigate to **Commission Unit/ Heating Set-Up** and enter. Scroll down to **Occ Htg Spt** (Occupied heating setpoint) and enter the desired temperature. Also, enter the **Unocc Htg Spt** and **DAT Htg Spt** as was done in the **Cooling Set Up** menu.

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 **Commission Unit / OA Damper Set-Up** menu. Select **Vent Lmt=** (ventilation limit) and adjust the ventilation limit to the jobsite conditions. The ventilation limit is the damper position for the required 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% | 4 |
| Vent Limit= | 20% | 0–100% | 4 |
| LoFlo V Lmt= | 30% | 0–100% | 4 |
| DCV Limit= | 10% | 0–100% | 4 |

## 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 4 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 **CAV** (constant air volume). This selection will operate the supply fan or fans at a constant design speed.

**DSP** controls the speed of the supply fan or fans in relation to the duct static pressure maintaining the duct static pressure set point. A duct static pressure sensor or signal from a network will be needed for this operation.

**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. **Note:** Writing a discrete CFM value is not a supported means of controlling the SAF.

**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 $CO_2$ 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**

**Flow** selection will control the speed of the supply fan in accordance to desired CFM measurement readings

| Item Display Name | Default Setting | Range | Password Level |
|---|---|---|---|
| SAF Ctrl | CAV | DSP | 4 |
| | | Spd/Net | |
| | | 1ZnVAV | |
| | | BSP | |
| | | Co2 | |
| | | Flow | |
| | | CAV | |

## 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.

**CAV** will operate the RF/EF fan or fans at a constant speed (MaxRF/EF Cap).

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

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

**DSP** (return duct static pressure) is intended to be used with modulating relief damper control and will operate to control and maintain specific return duct static pressure.

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

**Flow** RF/EF capacity is controlled by air flow measured by an Air Flow measuring station.

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

**Flow Diff,** when equipped, will control in relation to the supply air flow and the RE/EF flow to maintain a predetermined differential between them.

| Item Display Name | Default Setting | Range | Password Level |
|---|---|---|---|
| RF/EF Ctrl | CAV | CAV | 4 |
| | | BSP | |
| | | Tracking | |
| | | DSP | |
| | | Spd/Net | |
| | | Flow | |
| | | OAD | |
| | | Flow Diff | |

## 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 **Commission unit/Dehum Set-Up** menu. The first entry in this menu will be **Dehum Method**. The default value is "**None**" which needs to change to either **Relative Humidity 1** or **Dew Point 1** for selecting the method that you will be using to control the dehumidification system.

Further down in the menu, 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 wired up to the controller.

Check the wiring diagram for the proper terminals for proper connection points.

## 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**
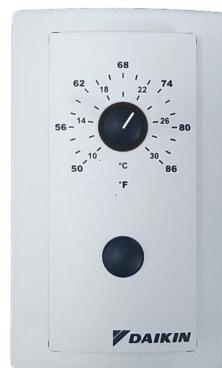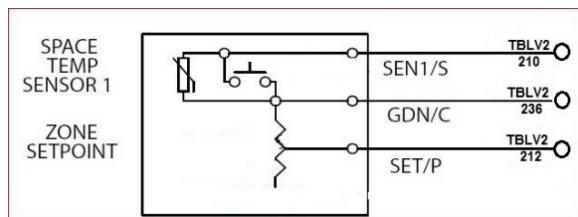


## Space Sensor with Setpoint and Tenant Override

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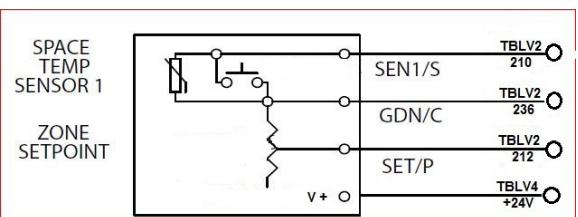


## Combo Sensor for Humidity

**Part Number: 910191961**
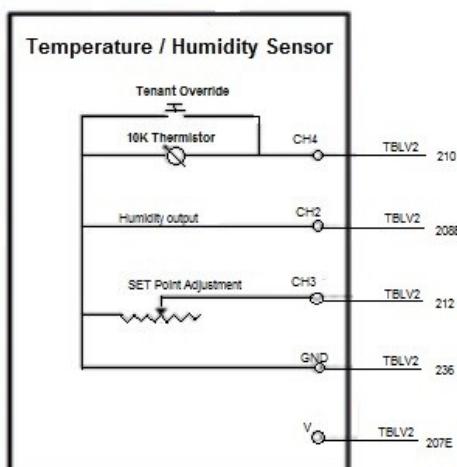
# Wiring Diagram Example:

This wiring diagram is for reference only. Actual unit wiring diagram will vary based on the features equipped.

*Figure 1: Typical Rebel Wiring Diagram*
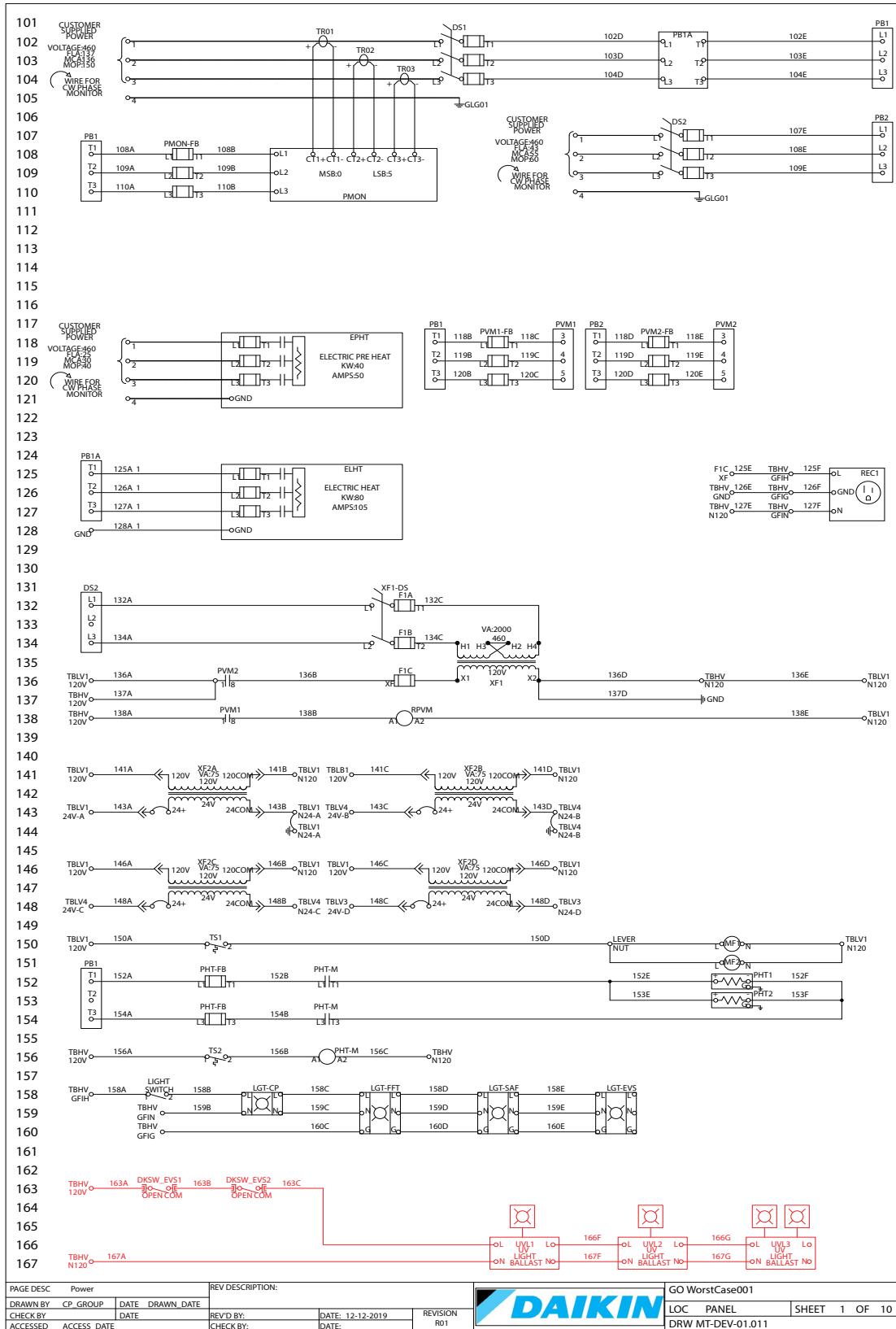
*Figure 2: Typical Rebel Wiring Diagram (continued)*
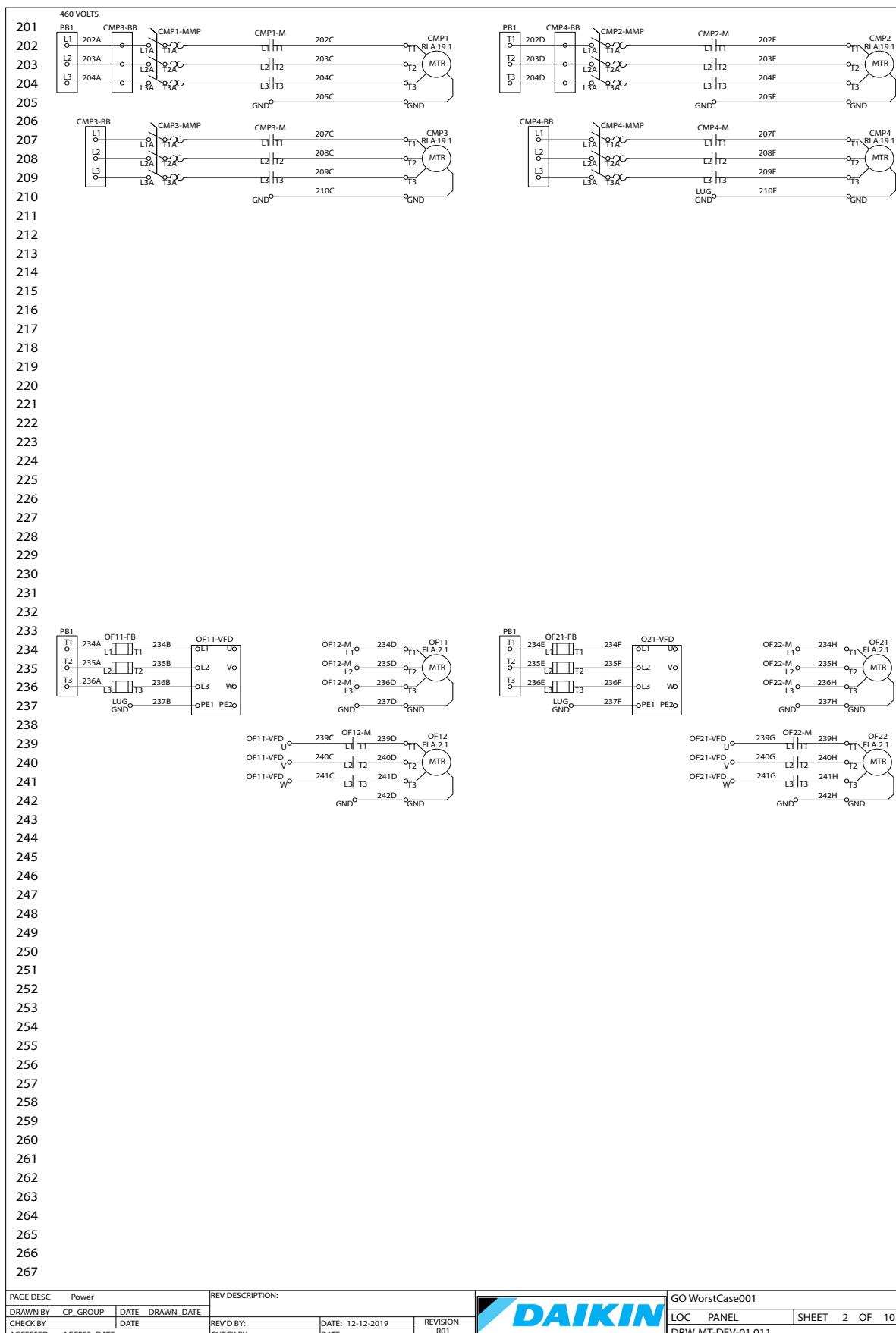
*Figure 3: Typical Rebel Wiring Diagram (continued)*
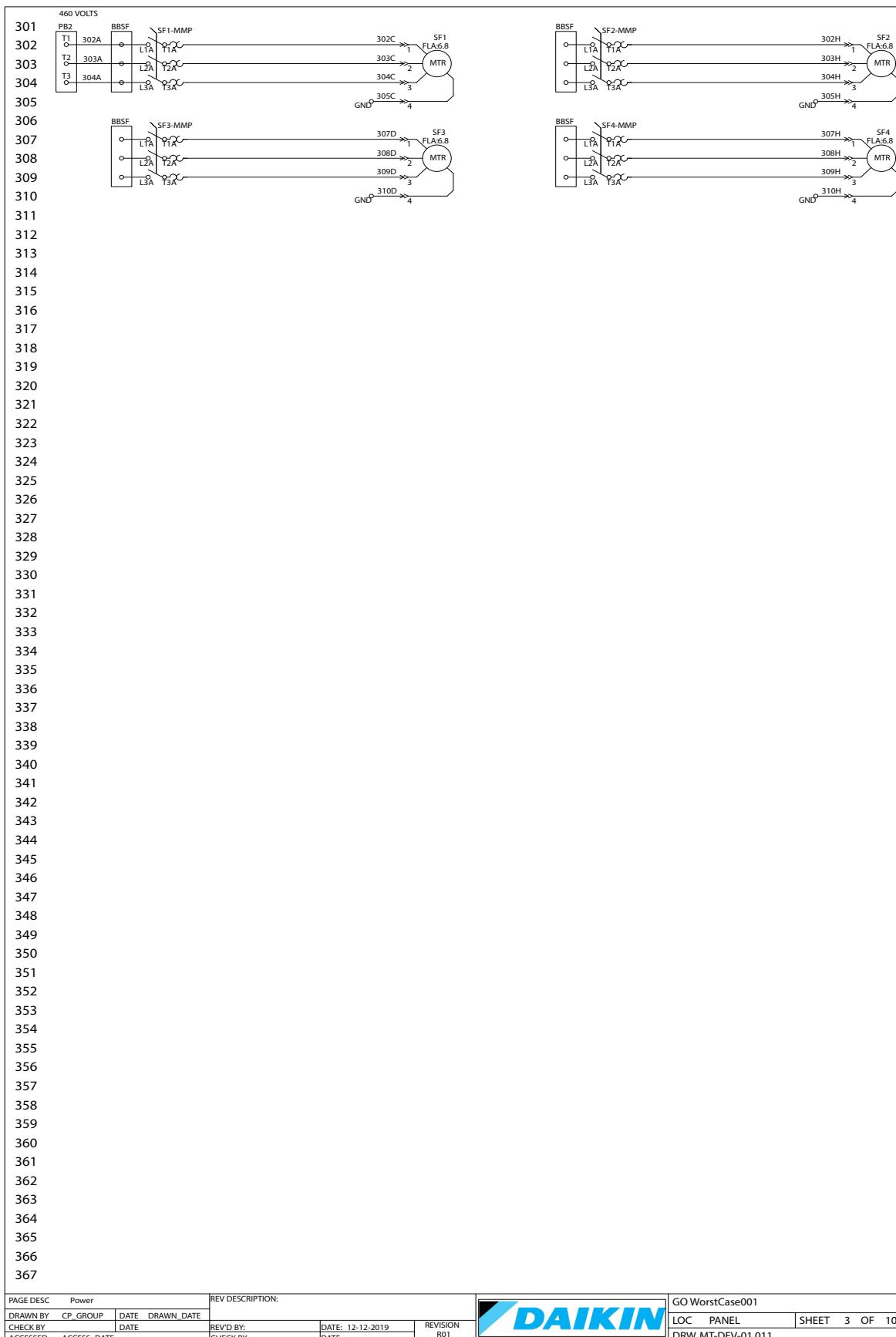
*Figure 4: Typical Rebel Wiring Diagram (continued)*



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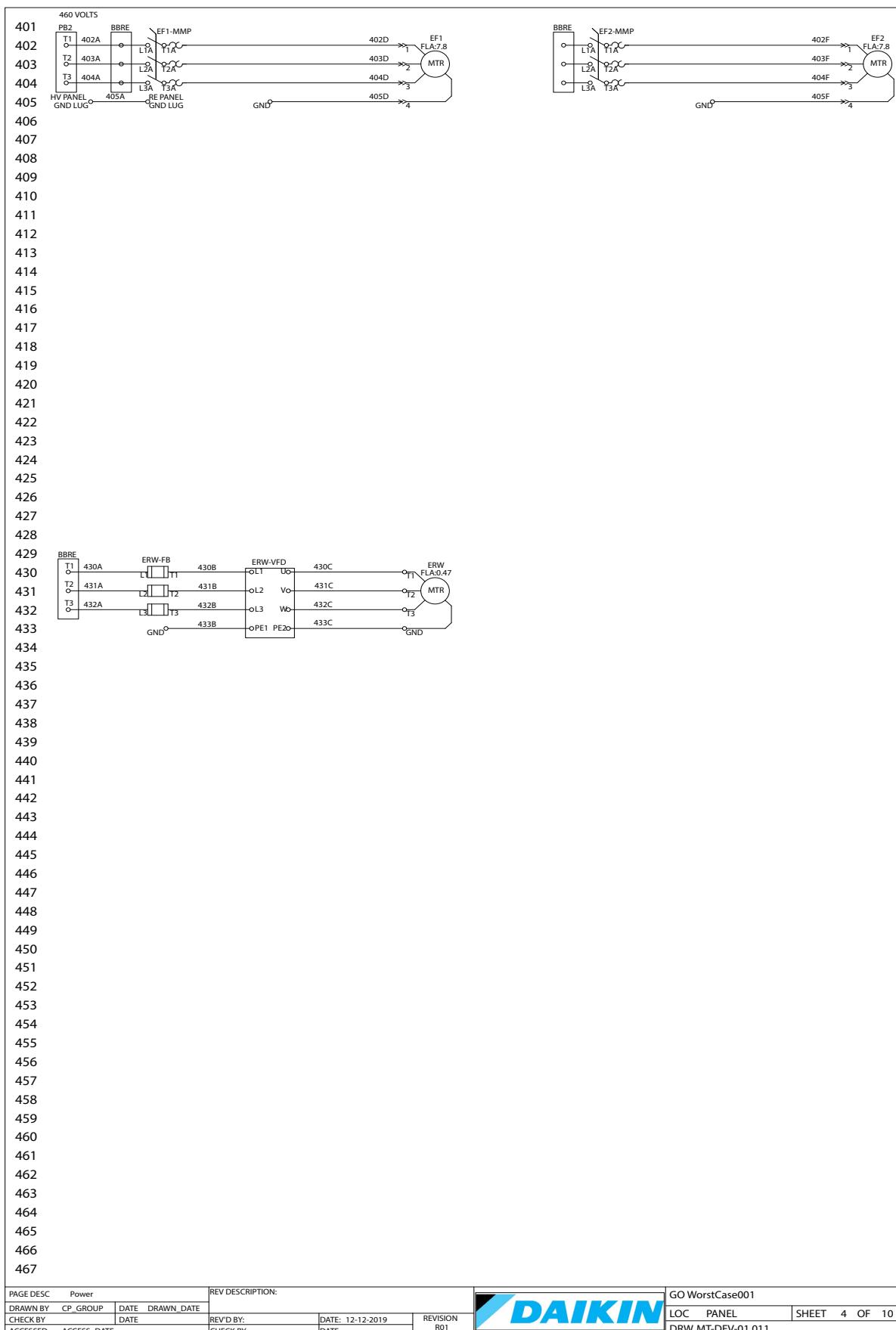
## Figure 5: Typical Rebel Wiring Diagram (continued)
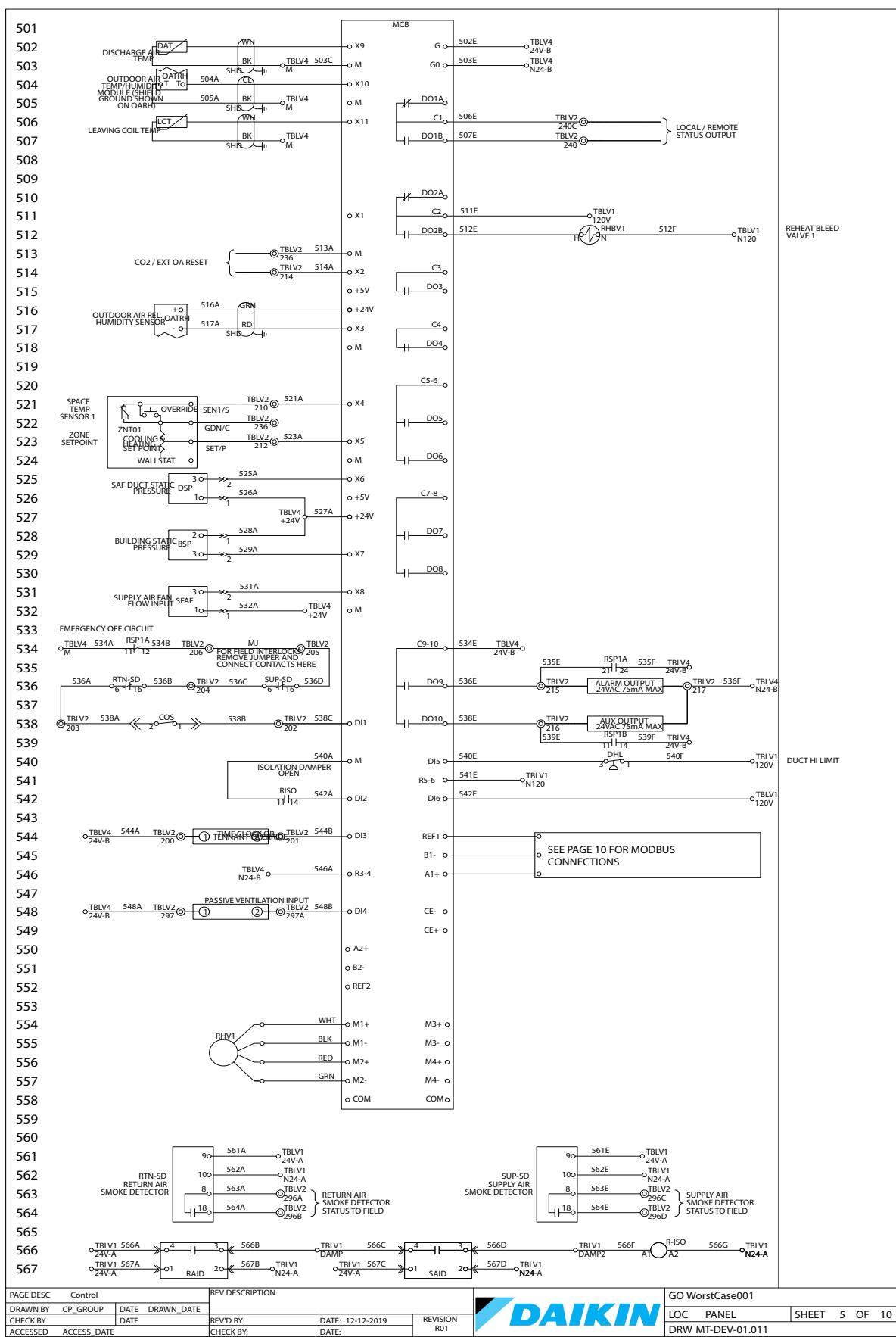
*Figure 6: Typical Rebel Wiring Diagram (continued)*



| PAGE DESC | Control | | REV DESCRIPTION: | | | | GO WorstCase001 | | |
|---|---|---|---|---|---|---|---|---|---|
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| CHECK BY | | DATE | REV'D BY: | DATE: 12-12-2019 | REVISION R01 | | DRW MT-DEV-01.011 | | |
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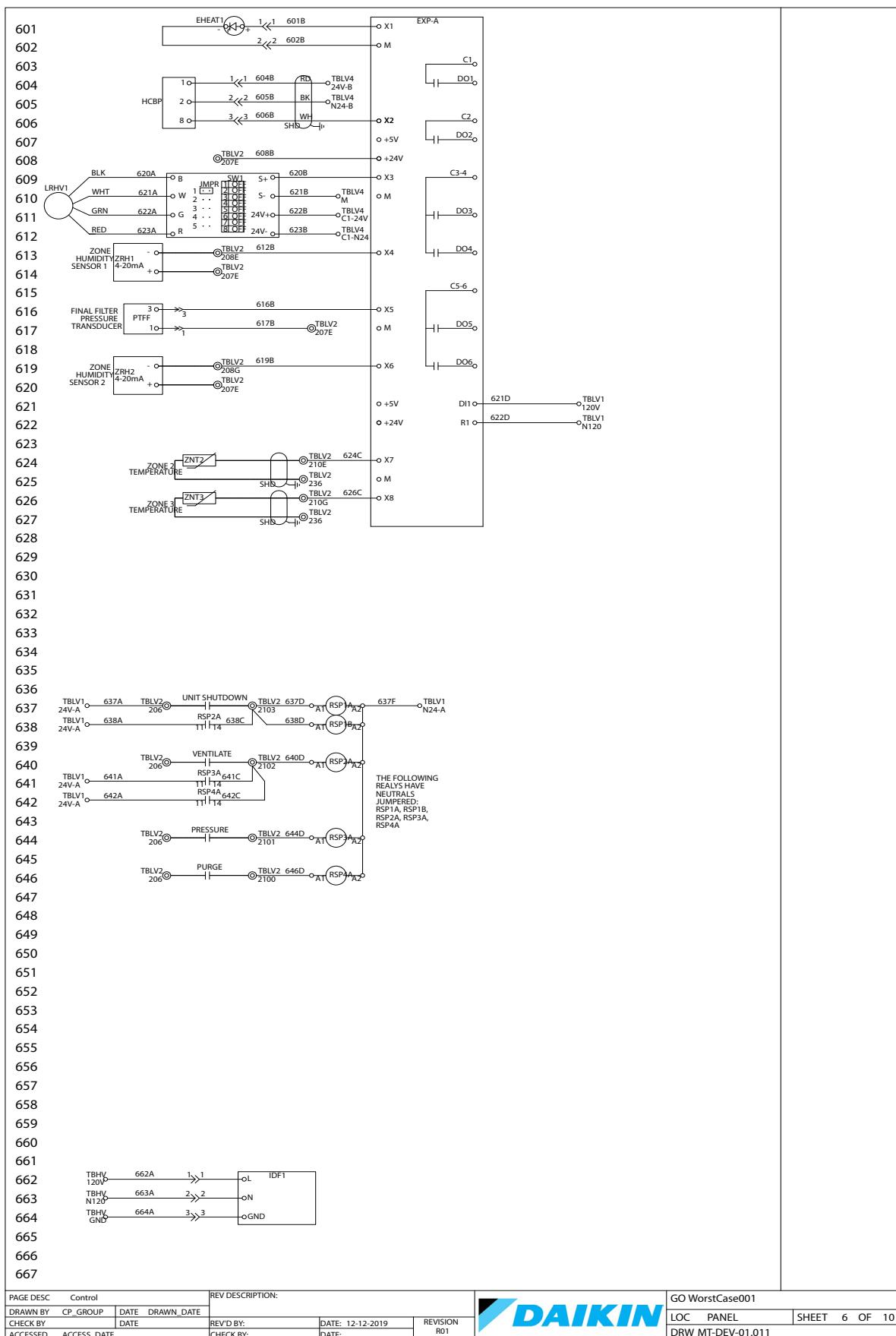
*Figure 7: Typical Rebel Wiring Diagram (continued)*
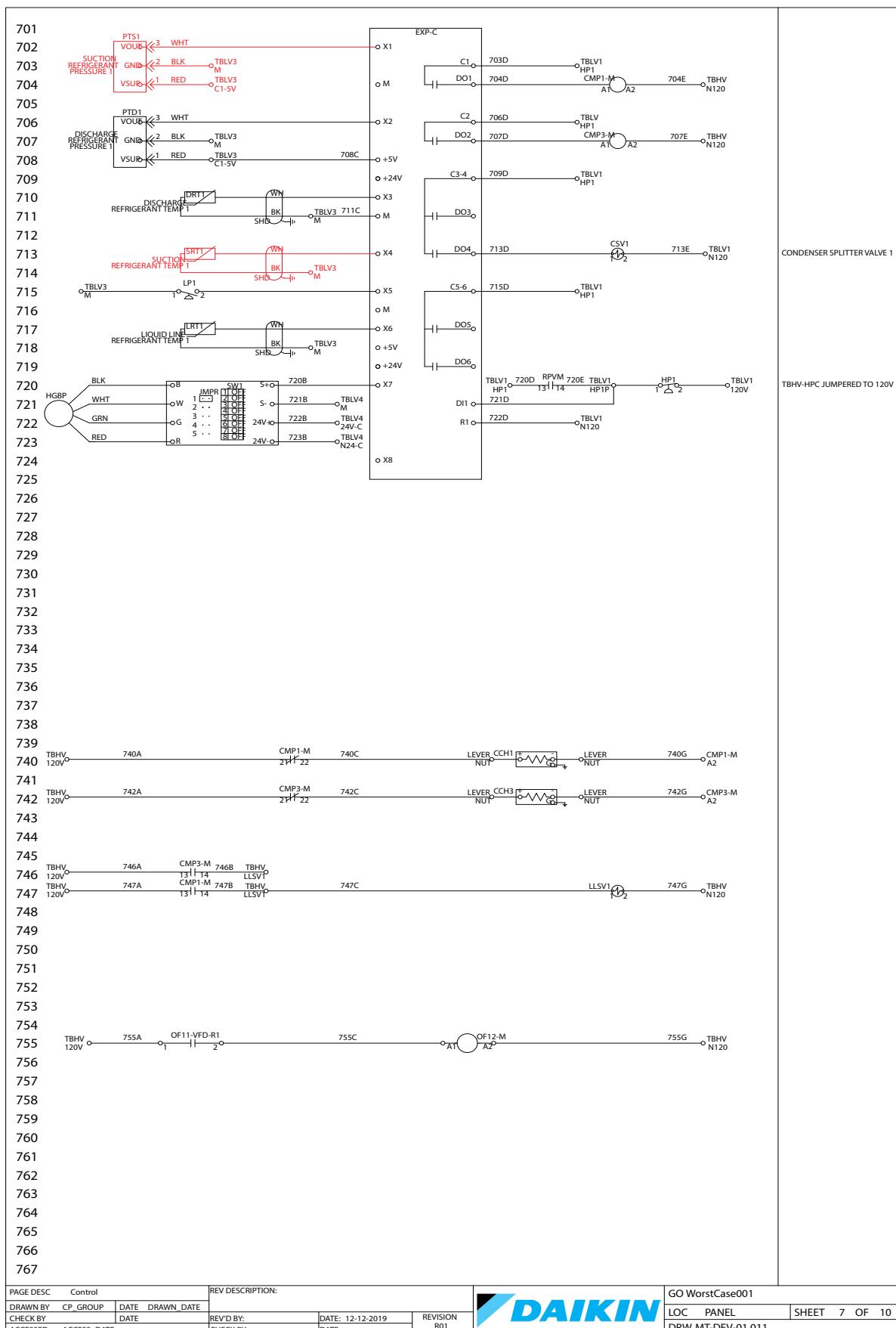
*Figure 8: Typical Rebel Wiring Diagram (continued)*
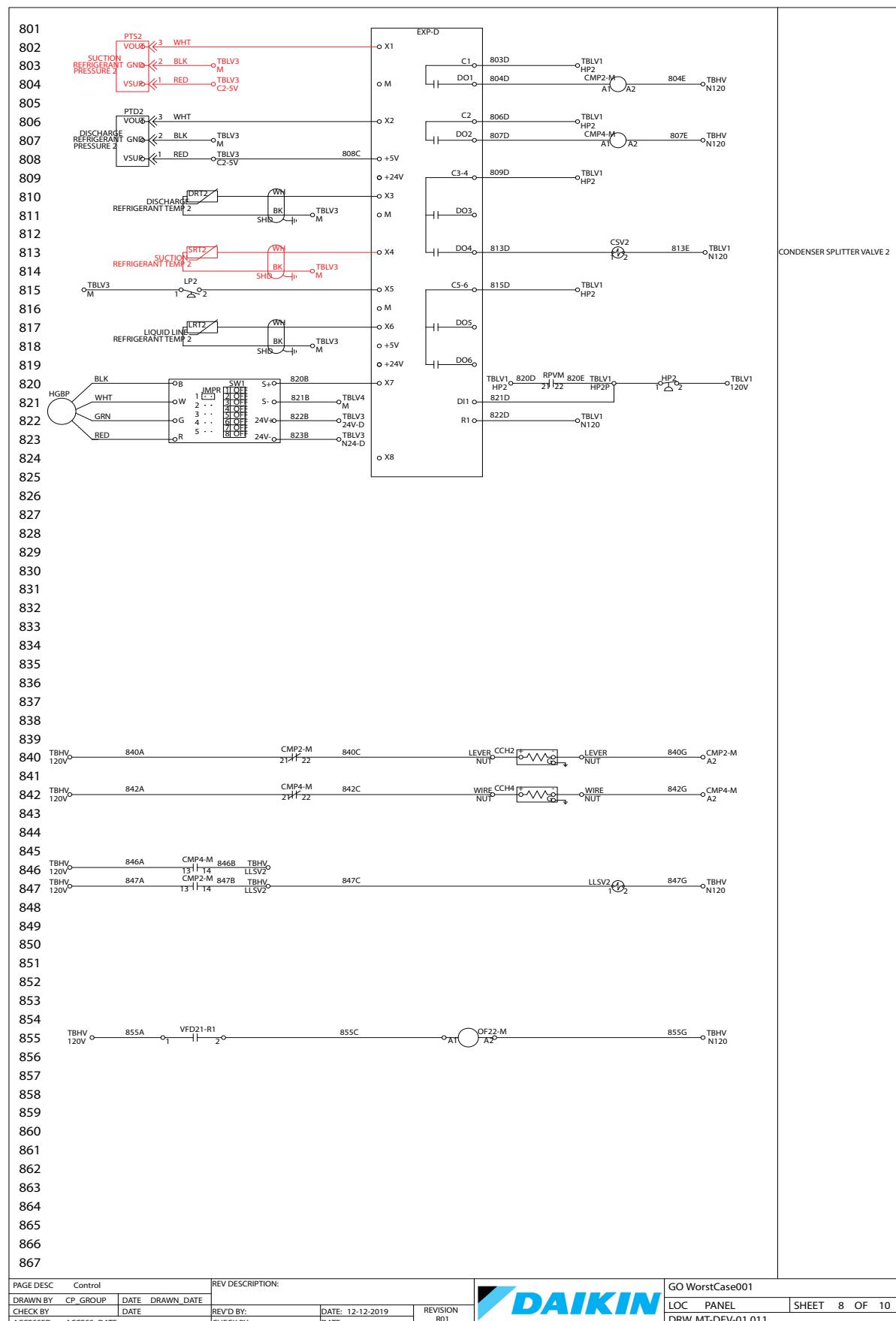
*Figure 9: Typical Rebel Wiring Diagram (continued)*
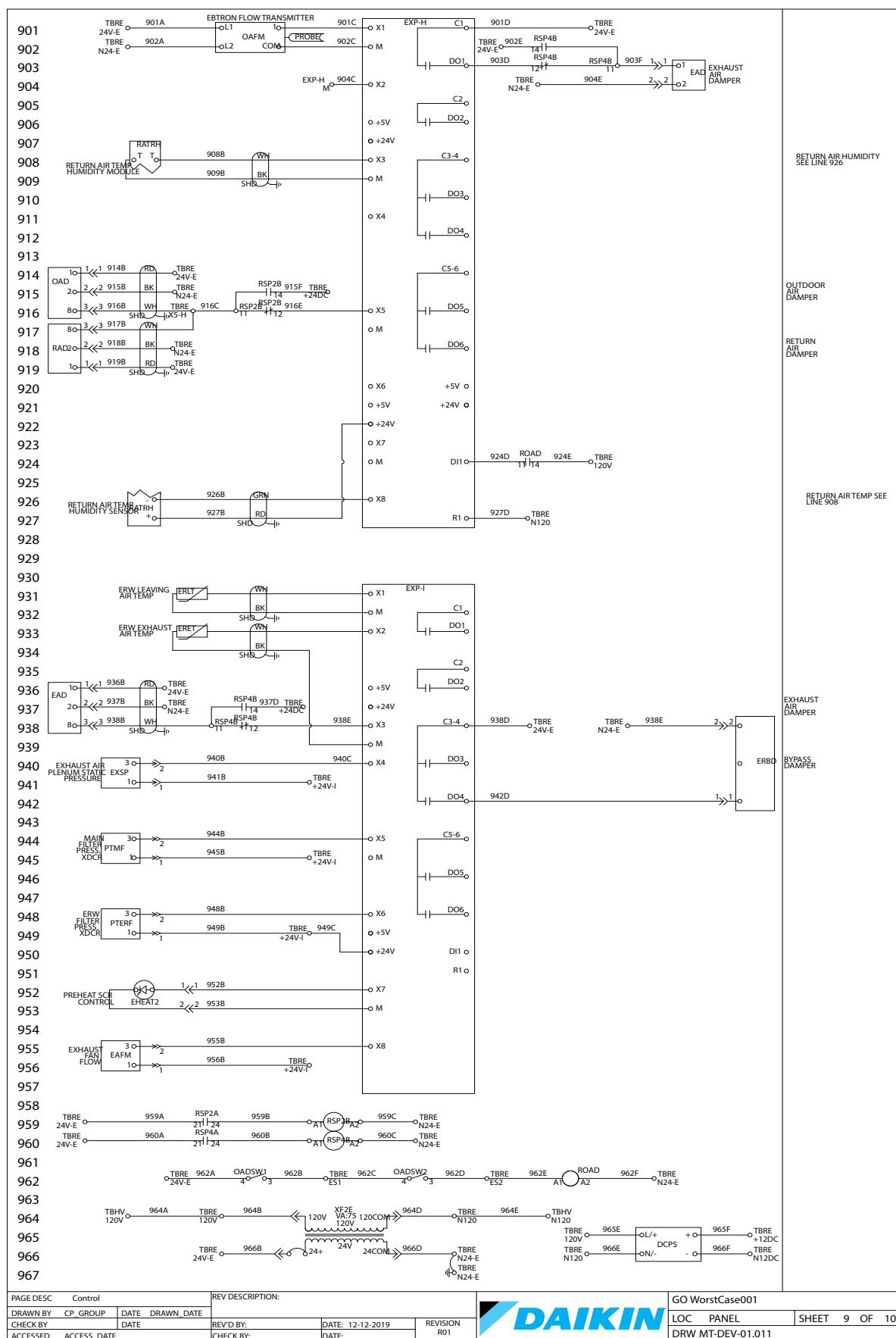
*Figure 10: Typical Rebel Wiring Diagram (continued)*

## DIP SWITCHES: ON IS IN THE UP POSITION - THE LAST MODULE IN LINE MUST HAVE DIP SWITCH 6 IN THE ON POSITION



NOTE: SPLICE SHIELDS TOGETHER BUT ONLY TERMINATE ON MCB
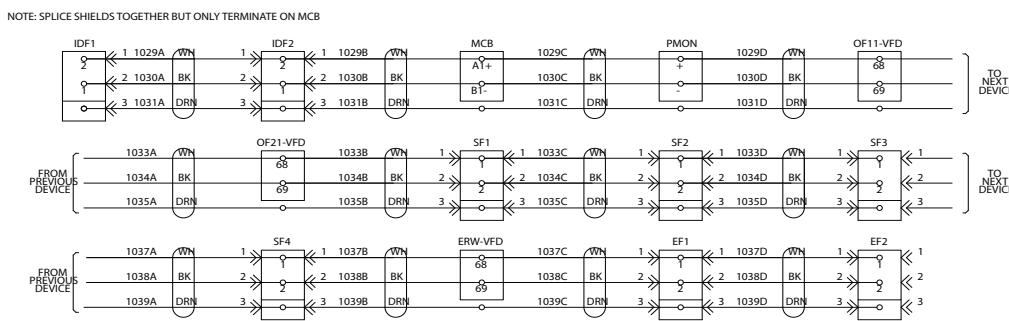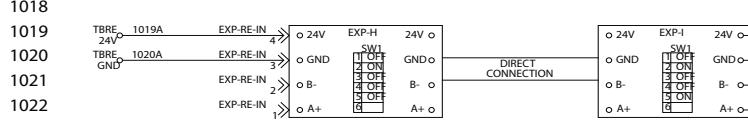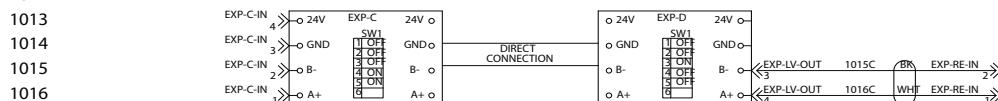
## MODBUS DEVICE ADDRESSES

| IDF1 : 81 | OF21-VFD : 52 | ERW-VFD : 41 |
|---|---|---|
| IDF2 : 82 | SF1 : 11 | EF1 : 21 |
| MCB : 01 | SF2 : 12 | EF2 : 22 |
| PMON : 05 | SF3 : 13 | |
| OF11-VFD : 51 | SF4 : 14 | |

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*Figure 11: Typical Rebel Wiring Diagram (continued)*
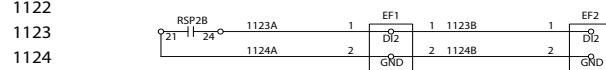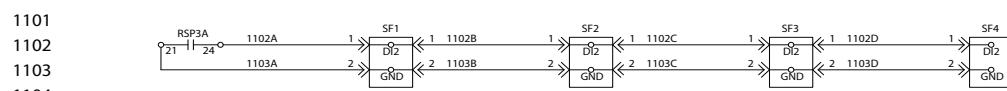
*Figure 12: Typical Rebel Wiring Diagram (continued)*
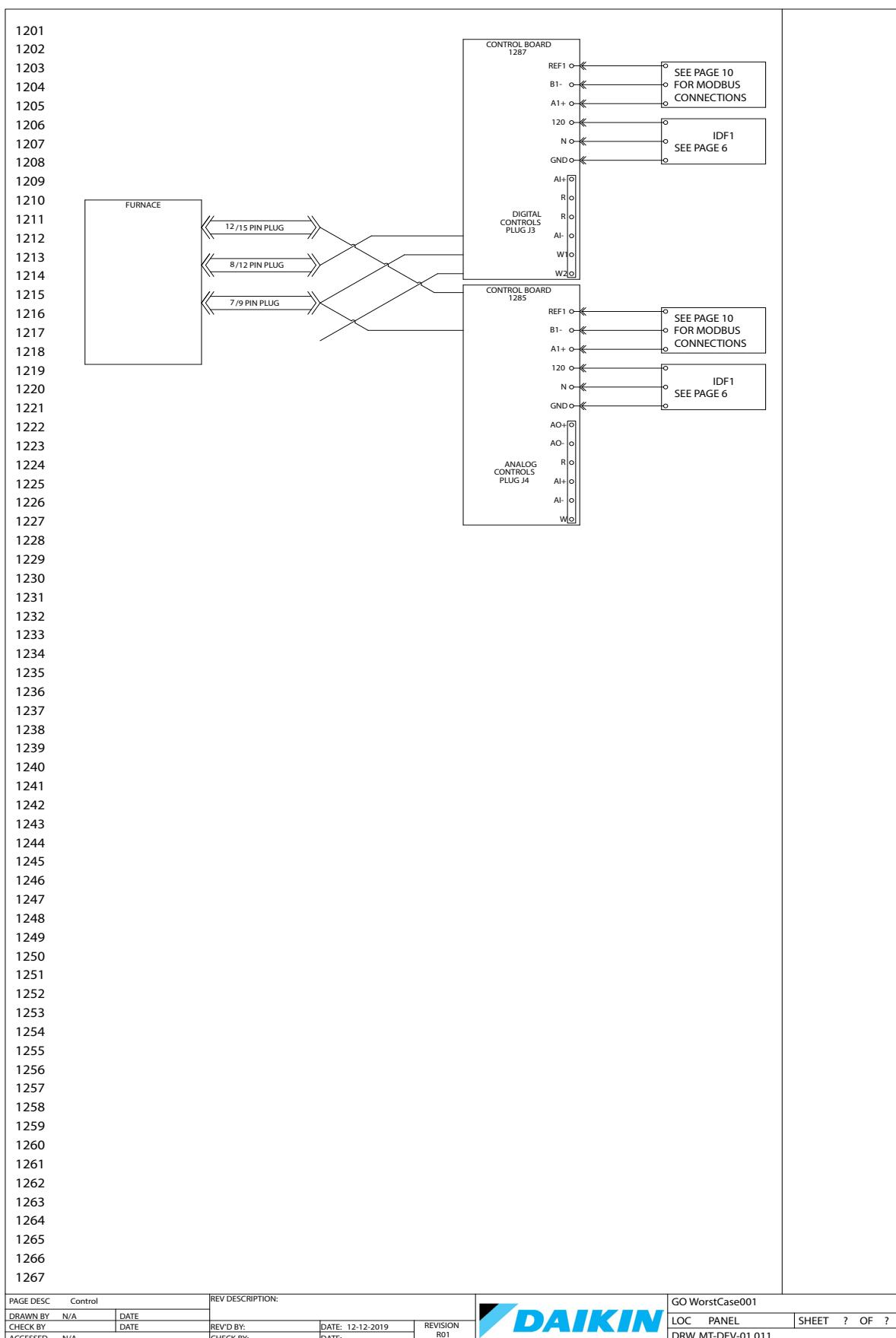
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***Daikin Applied Training and Development***

Now that you have made an investment in modern, efficient Daikin equipment, its care should be a high priority. For training information on all Daikin HVAC products, please visit us at www.DaikinApplied.com and click on Training, or call 540-248-9646 and ask for the Training Department.

***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.

This document contains the most current product information as of this printing. For the most up-to-date product information, please go to www.DaikinApplied.com.

Products manufactured in an ISO Certified Facility.