Operation and Maintenance Manual OM 844-6

Group: **Applied Air Systems**
Part Number: **OM 844**
Date: **July 2019**

MD2 Variable Speed Drive Controllers

Commercial Packaged Rooftop Units—MPS 015 to 075 Tons
Indoor and Outdoor Air Handler Units—LAH, CAC, CAH, OAC, and OAH
Packaged Rooftop Units—MPS, RPS, RFS, RDT, RPE, and RDE
Rooftop Air Handler Units—RDS and RAH
Vertical Self-Contained Units—SWP and SWT

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Modifying or changing parameters whose function is not described in this manual will affect drive controller operation. Some register changes will take effect as soon as they are entered.
- Do not modify or change parameters whose function is not described in this instruction manual.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

Applications with MicroTech® II and MicroTech® III Controls

The variable speed drive has been selected and coordinated with the Daikin air conditioning equipment's unit controller. The drive that is installed on the Daikin packaged equipment has the parameters modified for the HVAC application. For the standard HVAC system design, no further modifications should need to be made to the drive.

Applications without MicroTech II and MicroTech III Controls

The Daikin variable speed drive has been selected and coordinated with the Daikin air conditioning equipment's unit controller. The drive that is installed on the Daikin packaged equipment has the parameters modified for the HVAC application. For the standard HVAC system design, no further modifications should need to be made to the drive. Information for MicroTech II applications can be found in Appendix sections G, H, J & K. Information for MicroTech II applications for the Maverick II equipment can be found in Appendix section H. Information for MicroTech III applications are located in the Appendix G, H, J & K sections of this manual.

Replacement VFD

When replacing a VFD, the owner/installer must determine which of the above listed applications applies and follow the appropriate procedures within this manual.

Hazardous Information Messages

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

⚠ CAUTION

Cautions indicate potentially hazardous situations, which can result in personal injury or equipment damage if not avoided.

⚠ WARNING

Warnings indicate potentially hazardous situations, which can result in property damage, severe personal injury, or death if not avoided.

⚠ WARNING

Warning indicates potentially hazardous situations for PVC (Polyvinyl Chloride) and CPVC (Clorinated Polyvinyl Chloride) piping in chilled water systems. In the event the pipe is exposed to POE (Polyolester) oil used in the refrigerant system, the pipe can be chemically damaged and pipe failure can occur.

⚠ DANGER

Dangers indicate a hazardous electrical situation which will result in death or serious injury if not avoided.

⚠ DANGER

Dangers indicate a hazardous gas situation which will result in death or serious injury if not avoided.

⚠ NOTICE

Notices give important information concerning a process, procedure, special handling or equipment attributes.

Before You Begin

Read and understand these instructions before performing any procedure on this drive controller.

⚠ DANGER

HAZARDOUS VOLTAGE

- Read and understand this manual before installing or operating the MD2 drive controller. Installation, adjustment, repair, and maintenance must be performed by qualified personnel.
- The user is responsible for compliance with all international and national electrical code requirements with respect to grounding of all equipment.
- Many parts of this drive controller, including the printed circuit boards, operate at the line voltage. DO NOT TOUCH. Use only electrically insulated tools.
- Before servicing the drive controller:
  - Disconnect all power.
  - Place a "DO NOT TURN ON" label on all power disconnects.
  - Lock all power disconnects in the open/off position.
- DO NOT touch unshielded components or terminal strip screw connections with voltage present.
- DO NOT short across terminals PA/+ and PC/- or across the DC bus capacitors.
- Install and close all covers before applying power or starting and stopping the drive controller.
- Disconnect all power, including external control power that may be present, before servicing the drive controller. WAIT 15 MINUTES to allow the DC bus capacitors to discharge. Then follow the DC bus voltage measurement procedure on page 6 to verify that the DC voltage is less than 45 V. The drive LEDs are not accurate indicators of the absence of DC bus voltage.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

⚠ CAUTION

IMPROPER DRIVE CONTROLLER OPERATION

- If the drive controller is de-energized for a prolonged period, the performance of the electrolytic capacitors will be reduced.
- Once a year, apply power to the drive controller for at least 5 hours to restore the performance of the capacitors, then check its operation.
- If the drive has not been powered for more than a year, do not connect the drive controller to the line voltage. Gradually increase the voltage using an adjustable AC source.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

⚠ DANGER

AUTOMATIC RESTART ENABLED

- This drive controller can restart under fault conditions.
- Equipment must be shut down, locked out and tagged out to perform servicing or maintenance.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

Bus Voltage Measurement Procedure

⚠ DANGER

HAZARDOUS VOLTAGE

Read and understand the precautions in "Before You Begin" on page 5 before performing this procedure.

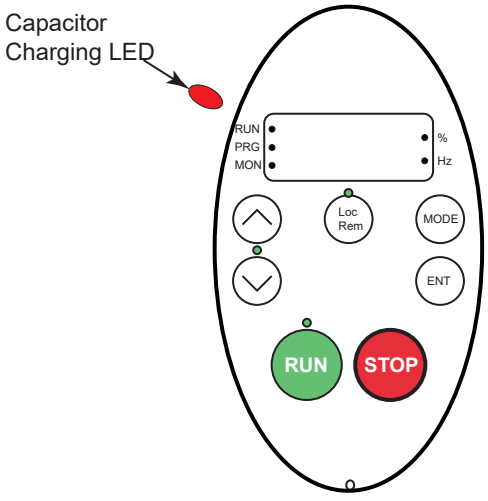
Failure to follow this instruction can result in death, serious injury, or equipment damage.

Before working on the drive controller, turn it OFF and wait 15 minutes to allow the DC bus to discharge and then measure the DC bus voltage.

The DC bus voltage can exceed 1000 Vdc. Use a properly rated voltage-sensing device when performing this procedure. To measure the DC bus voltage:

1. Disconnect all power and wait 15 minutes to allow the DC bus to discharge.
2. Measure the voltage of the DC bus between the PA/+ and PC/– terminals to ensure that the voltage is less than 45 Vdc.
3. If the DC bus capacitors do not discharge completely, contact your local Daikin Representative. Do not repair or operate the drive controller.

Figure 1: Capacitor Charging LED



Initial Start-Up

Before providing power to the VFD, refer to the appropriate unit installation/maintenance manual(s) listed below:

- IM 487 for rooftop air handlers (RDS and RAH)
- IM 708 for one-piece self-contained units
- IM 709 for modular self-contained units
- IM 738 for RoofPak® packaged rooftops with air-cooled condensers (RPS, RFS, and RDT)
- IM 791 for packaged rooftops with evaporative condensers (RPE and RDE)
- IM 843 for Maverick® II commercial rooftop units

Perform the following (MicroTech III example) general procedures on the specific unit purchased (yours may differ slightly depending on the unit)

1. Before closing (connecting) the power disconnect switch, open (disconnect) the following unit control circuit switches:
    a. Turn system switch S1 to OFF
    b. Turn system switch S7 to OFF
2. Confirm duct static pressure sensor SPS1 is connected to the ductwork.
3. Confirm the VFD lugs for the line voltage are tight.
4. Confirm the horsepower (hp) of the drive matches that of the motor.

Before Starting the Fan and VFD

1. Close the unit disconnect switch. With the control system switch S1 in the OFF position, power should be available only to the control circuit transformer (TI) and the compressor crankcase heaters.
2. Turn the Switch S1 to ON. Power should now be supplied to the control panel.
3. Verify all duct isolation dampers are open. Unit mounted isolation dampers may be mounted in the supply or return sections.
4. Place the unit into the “Fan Only” mode through the keypad menu *Standard Menu\System\Ctrl Mode= Fan Only*.
5. Confirm the power supply matches the setting of the … parameter.
6. Confirm the power supply frequency matches that of the … parameter.
7. Confirm the thermal protection level, … (or amps), matches that of the motor.

NOTE: All of the above parameters can be quickly found in the AUF Quick menu.

Start the Fan and VFD

1. Turn Switch S7 to ON. The controller should enter the “Startup” operating state. If the fan does not run at the completion of the startup mode:
    a. Check fuses F1 and F3.
    b. Check that the manual motor protectors or circuit breakers have not tripped.
    c. Check the optional phase monitor.
2. If the fans are equipped with optional spring isolators, check the fan spring mount adjustment. When the fans are running they should be level.
3. Verify the rotation is correct.
4. Verify the DHL safety is opening at a pressure compatible with duct working pressure limits.

NOTE: Refer to the unit IMs for additional non-VFD instructions.

⚠ DANGER

UNINTENDED EQUIPMENT OPERATION

- The accidental grounding of logic inputs configured for Sink Logic can result in unintended activation of drive controller functions.
- Protect the signal conductors against damage that could result in unintentional conductor grounding.
- Follow NFPA 79 and EN 60204 guidelines for proper control circuit grounding practices.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

⚠ WARNING

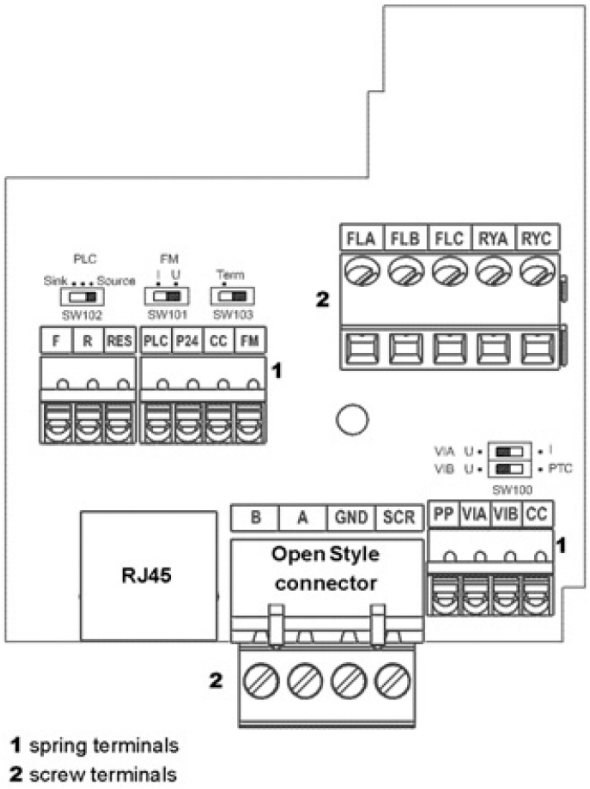
RISK OF IMPROPER OPERATION

The MD2 logic input selector switch (SW4) is factory-set to the source position. The switch should never be moved to the PLC or sink position.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

The control terminals are illustrated in Figure 2 (for more details refer to specific wiring schematics and parameter settings in the appropriate Appendix section located at the back of this manual).

Figure 2: Control Terminals



1 spring terminals
2 screw terminals

Switch	Factory Setting
SW100 VIA voltage/current selection VIB voltage/PTC selection (1)	 Voltage (U) Voltage (U)
SW101 (FM voltage/ current selection)	 Voltage (U)
SW102 Selection of logic type	 Source
SW103 Selection of communication terminal resistor (2)	 Term no resistor

Control terminal wire size and torque:
Applicable wire size:
- Screw terminals : 0.75 to 2.5 mm² (AWG 18 to 14)
- Spring terminals : 0.2 to 1 mm² (AWG 24 to 16)

Tightening torque:
0.5 to 0.6 N·m (4.4 to 5.3 lb-in)

(1) When SW100 is set to PTC, VIB is configured as PTC input connected to the 3.3 kΩ internal resistor. Connect the PTC probe between CC and VIB terminals.
If the 3.3 kΩ internal resistor does not suit the installation, regarding to the PTC resistor value, set SW100 to VIB, connect the PTC probe between CC and VIB terminals and add an external resistor between PP and VIB terminals.

(2) When SW103 is set to Term, internal 120 Ω termination resistor is connected between A and B terminals.

Table 1: Control Terminal Characteristics

Terminals	Function	Characteristics
PLC	External power supply input	Input for external power supply for logic inputs Max. permissible voltage: 50 Vac
P24	Internal supply	Short-circuit and overload protection: supply (_), maximum current: 200 mA
CC	Common	0 V common (2 terminals)
FLA, FLB, FLC	Configurable relay outputs	One relay logic output, one N/C contact, and one N/O contact with common point Minimum switching capacity: Maximum switching capacity: • On resistive load: 5 A for 250 Vac or 30 Vdc • On inductive load: 2 A for 250 Vac or 30 Vdc Max. response time: 7 ms ± 0.5 ms Electrical service life: 100,000 operations
RY, RC		One relay logic output, one N/O contact Minimum switching capacity: Maximum switching capacity: • On resistive load: 5 A for 250 Vac or 30 Vdc • On inductive load: 2 A for 250 Vac or 30 Vdc Max. response time: 7 ms ± 0.5 ms Electrical service life: 100,000 operations
F, R, RES	Logic inputs	Three programmable logic inputs, compatible with level 1 PLC, IEC 65A-68 standard Impedance: 3.5 kΩ Maximum voltage: 30 V Max. sampling time: 2 ms ± 0.5 ms Multiple assignment makes it possible to configure several functions on one input
		Positive logic (Source): State 0 if ≤ 5 V or logic input not wired, state 1 if ≥ 11 V
		Negative logic (Sink): State 0 if ≥ 16 V or logic input not wired, state 1 if ≤ 10 V
FM	Analog output	One switch-configurable voltage or current analog output: • Voltage analog output 0–10 Vdc, minimum load impedance 470Ω • Current analog output X–Y mA by programming X and Y from 0 to 20 mA, maximum load impedance: 500Ω Max. sampling time: 2 ms ± 0.5 ms Resolution: 10 bits Accuracy: ± 1% for a temperature variation of 60°C Linearity: ± 0.2%
PP	Internal supply available	Short-circuit and overload protection: One 10.5 Vdc ± 5% supply for the reference potentiometer (1 to 10 k.), maximum current: 10 mA
VIA	Analog/logic input	dc +/- 3 Vdc
VIB	Analog input	dc

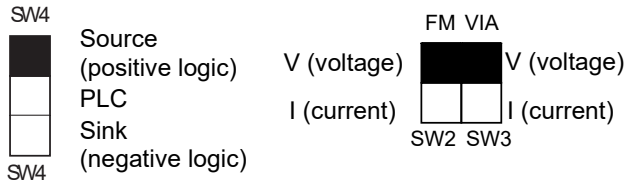
⚠ DANGER

UNINTENDED EQUIPMENT OPERATION

- The accidental grounding of logic inputs configured for Sink Logic can result in unintended activation of drive controller functions.
- Protect the signal conductors against damage that could result in unintentional conductor grounding.
- Follow NFPA 79 and EN 60204 guidelines for proper control circuit grounding practices.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

Figure 3: Switches



NOTE: Refer to specific wiring schematics and parameter settings in the appropriate Appendix section located at the back of this manual for HVAC application and switch settings.

The logic input switch SW4 is set to the source position. The switch should never be moved to the PLC or sink position.

Table 2: Drive Controller Default Terminal Function Assignments

Terminal	Function
FLA-FLB-FLC relay	De-energized in the event of a fault or when the power supply is disconnected
RY-RC relayspeed (ﾚ. ﾚ.)	Energized when the speed is greater than or equal to low
F	Forward (2-wire control)
R	Preset speed
RES	Fault reset
VIA	Speed reference 0-10 Vdc
VIB	Not assigned
FM	Output frequency

⚠ DANGER

STOP BUTTON CAN CAUSE MOTOR RESTART

- The Stop Button on this drive controller can reset faults and restart the motor if an active run command is present.
- Disable all run commands and inspect the drive system for the cause of the fault before activating a fault reset.
- Disable the panel reset operation (F 735) to remove this hazard.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

The LEDs and keys on the integrated display terminal are illustrated in Figure 4.

NOTE: Display terminal functions described above reflect VFD default settings.

Figure 4: Description of Display Terminal

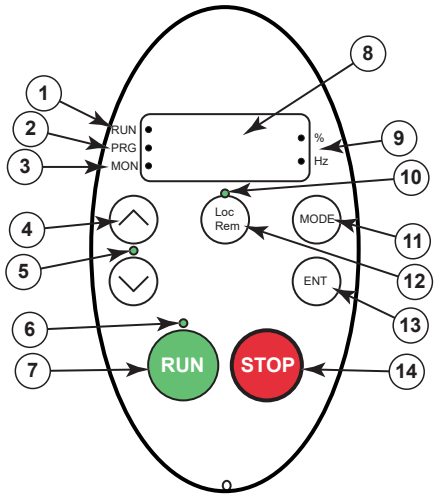


Table 3: Display Terminal Features

	LED/Key	Characteristics
1	Display RUN LED	• Illuminates when a Run command is applied to the drive controller. • Flashes when there is a speed reference present with a Run command.
2	Display PRG LED	• Illuminates when Programming mode is active. • Flashes in AUF - Gru modes.
3	Display MON LED	• Illuminates when Monitoring mode is active. • Flashes in Fault History Display mode.
4	Up/Down Keys	Depending on the mode, you can use the arrows to: • Navigate between the menus • Change a value • Change the speed reference when the Up/Down LED (5) is illuminated
5	Up/Down LED	Illuminates when the navigation arrows are controlling the speed reference.
6	Run LED	Illuminates when the Run key is enabled.
7	Run Button	Pressing this button/key when the Run LED is illuminated starts the drive controller.
8	Display	4-digit, 7-segment LED display
9	Units LEDs	• The % LED illuminates when the display numeric value is in percentage. • The Hz LED illuminates when the display numeric value is in Hertz.
10	Loc/Rem LED	• Local/Remote mode indicator. Illuminates when Local mode is selected.
11	Mode Button	Press to select the Mode • Display mode (default) • Adjustment mode • Monitoring mode Can also be used to go back to the previous menu
12	Loc/Rem Button	Switches between Local and Remote modes
13	ENT Button	Press to display a parameter's value or to save a changed value
14	Stop Button	• In Local mode (12), pressing the STOP key decelerates the drive to a stop • In Remote mode (see table item #10), while the VFD is being controlled by the unit controller, pressing the STOP key will allow the drive to freewheel stop (drive display will indicate a flashing "E") • If F 735 is set to 0 (default setting), pressing the stop key twice will reset the flashing "E" fault and other resettable faults if the fault condition has been resolved

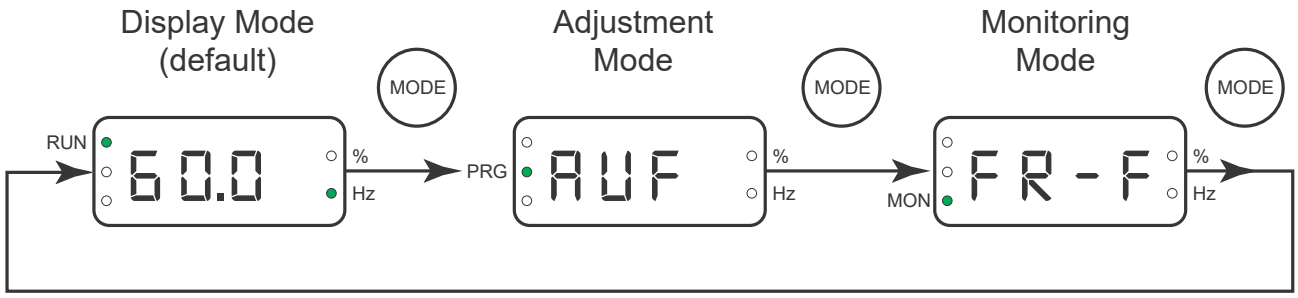
Mode Access

MD2 drive controllers have three modes of operation described in Table 4. Figure 5 illustrates how to access the modes with the display terminal MODE key.

Table 4: Mode Descriptions

Display mode (default)	• Active when power is applied to the drive controller • Use to display drive controller parameters, alarms, and faults
Adjustment mode	• Use to modify drive controller parameters
Monitoring mode	• Use to monitor drive controller status

Figure 5: Mode Access



Parameter Groups

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Any parameter values altered from the VFD control panel will affect the operation of the drive.
- If parameter "tYP" is selected and changed, altered parameters will be transferred into the VFD memory and may affect safe operation of the equipment.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

MD2 drive controllers are factory programmed per your HVAC application (refer to specific wiring schematics and parameter settings in the appropriate Appendix section located at the back of this manual for application options and settings).To restore Daikin factory settings, use parameter "PYt" (see Default Setting on page 17).

Table 5: MD2 Parameter Groups

Parameter Type	Description
Basic parameters	Parameters that need validation before using the drive controller.
Extended Parameters (menu F - - -)	Parameters for special settings and applications.
User Parameters (menu gr_U_)	Subset of Basic and Extended parameters whose values have changed from the VFD default settings.
Quick menu (menu AUF)	Subset of Basic and Extended parameters frequently used.
History Parameters (menu AUH)	Subset of Basic and Extended parameters displaying the five parameters that were last changed, displayed in reverse chronological order.

Access to Menus and Parameters

Figure 6: Menu Access

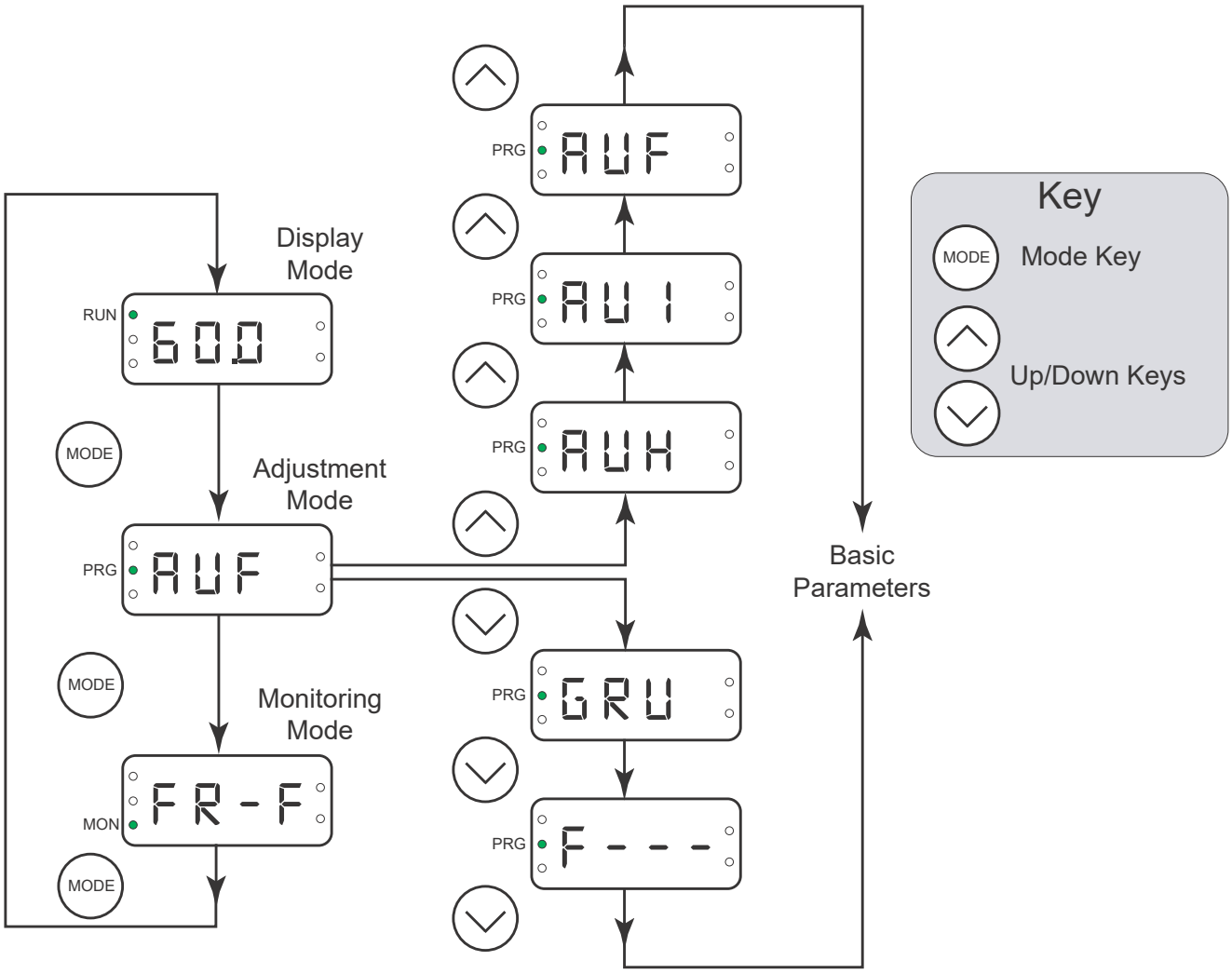
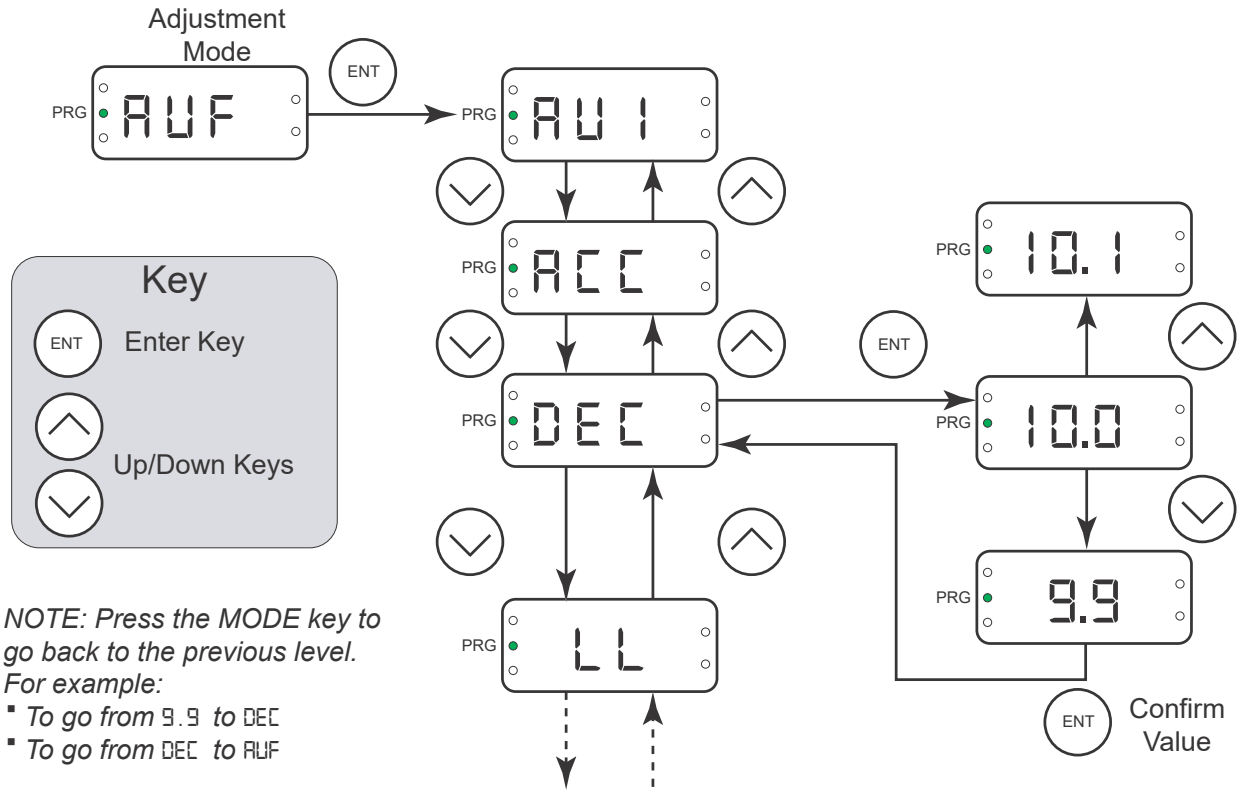


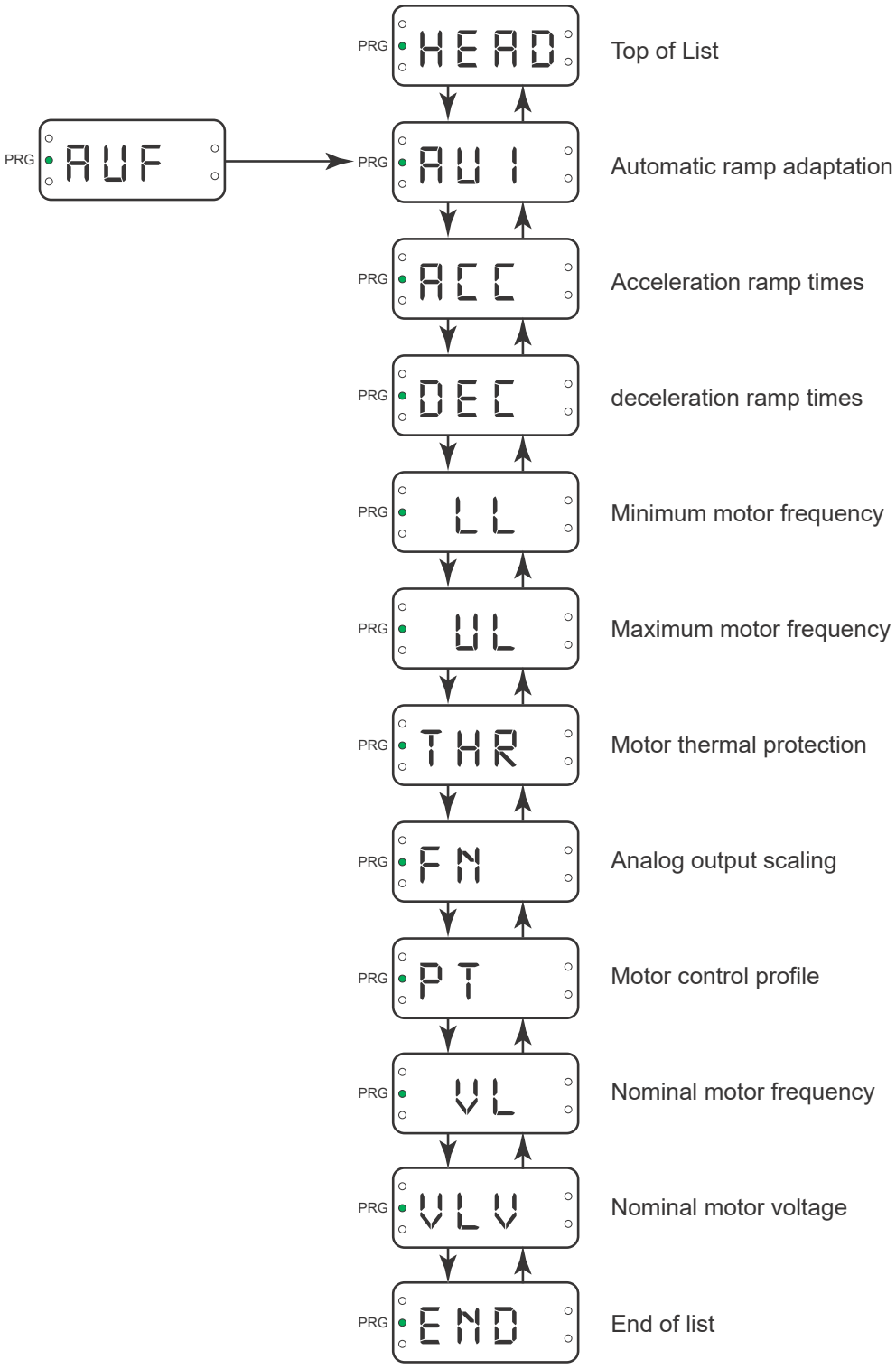
Figure 7: Access to Parameters



AUF Quick Menu

Figure 8 illustrates the parameters accessible from the AUF Quick menu.

Figure 8: AUF Quick Menu Parameters



AUF Quick Menu Parameters

Table 6 describes the parameters that can be accessed from the AUF Quick menu. With the exception of ACC and dEC, the parameters cannot be modified while the drive controller is running.

NOTE: With the exception of ACC and dEC, the parameters cannot be modified while the drive controller is running.

Table 6: AUF Quick Menu Parameters

Code	Description	Unit	Adjustment Range
ACC	Acceleration time	Seconds	0.0 to 3200
dEC	Deceleration time	Seconds	0.0 to 3200
LL	Frequency lower limit (minimum motor frequency)	Hz	0.0 to . .
UL	Frequency upper limit (maximum motor frequency)	Hz	0.5 to 200.0
tHr	Motor electronic thermal protection level in amperes. Adjust tHr to the nominal current value which appears on the motor nameplate.	A	0.1 to 1 times In[1]
Fn	Analog output scaling	—	Do not use
Pt	Selection of Volts/Hz control mode (motor control profile)	—	0: V/Hz profile constant torque 1: V/Hz profile variable torque 2: Automatic voltage boost 3: Flux vector control 4: Energy saving 6: Permanent magnet synchronous motor
uL	Base frequency (nominal motor frequency)	Hz	25 to 200.0
uLu	Voltage at base frequency (nominal motor voltage)	V	50 to 330 (230 V drive controllers) 50 to 660 (460 V drive controllers)

[1] In is the nominal drive current shown on the drive controller nameplate.

Setting the Acceleration/ Deceleration Ramp Times

AU 1 Acceleration/deceleration ramp adaptation. Automatically adjusts the acceleration/deceleration ramp times to match the inertia of the load.

ACC Programs the time it takes for the drive controller output frequency to go from 0 Hz to the maximum frequency (parameter FH).

dEC Programs the time it takes for drive controller output frequency to go from maximum frequency (parameter FH), to 0 Hz.

Refer to specific wiring schematics and parameter settings in the appropriate Appendix section located at the back of this manual for application options and settings.

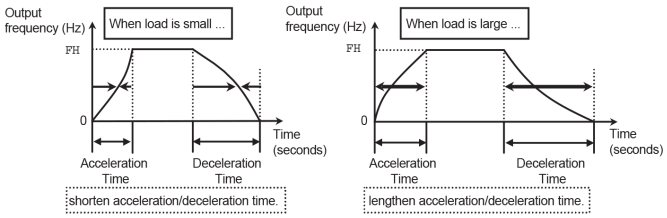
Table 7: Setting Ramp Time Parameters

Parameter	Name	Range
AU 1	Automatic Acceleration/Deceleration Ramp Adaptation	0: Disabled 1: Automatic 2: Automatic acceleration only (Do not use)
ACC	Acceleration Time 1	0.0 to 3200 s
dEC	Deceleration Time 1	0.0 to 3200 s

Acceleration/Deceleration Ramp Adaptation

- AU 1 = 0: Function is disabled.
- AU 1 = 1: Automatically adjusts the acceleration and deceleration ramp times from 1/8–8 times the value set in the ACC or dEC parameters, depending on the current rating of the drive controller.
- AU 1 = 2: Do not use.

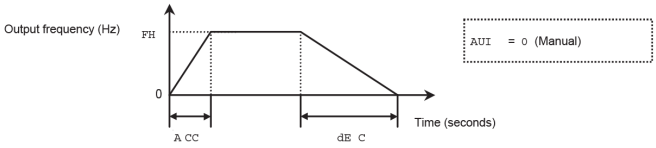
Figure 9: Automatic Ramp Adaptation



Manually Setting Acceleration/ Deceleration Ramp Times

During startup, confirm parameters ACC and dEC match the parameters in the appropriate Appendix section located at the back of this manual for specific HVAC application.

Figure 10: Manually Setting the Acceleration/Deceleration Ramp Times



Setting the Macro Function

Sets the drive controller to one of four macro configurations. The macro configuration selection automatically determines the settings of the following parameters: CMOd, FMOd, F110–F113, and F201.

NOTE: The current setting of this parameter is shown on the left side of the display. The number 0 is always displayed on the right. For example, 1 0 indicates that the freewheel stop setting is enabled.

Setting the Mode of Operation

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Modifying or changing parameters whose function is not described in this manual will affect drive controller operation. Some register changes will take effect as soon as they are entered.
- Do not modify or change parameters whose function is not described in this instruction bulletin.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

In Remote mode, start and stop commands and the frequency are determined by the settings of CMOd (Command mode) and FMOd (Frequency Setting mode).

When Local mode is selected with the LOC REM key, start/stop commands and frequency settings can only be made from the display terminal. The Local LED illuminates while Local mode is selected. See page 11 for Local/Remote key operation and Local LED.

When service is complete, return the VFD to the remote mode.

Table 8: Parameter AU4

Parameter	Name	Range
AU4	Macro Function	0: Disabled 1: Freewheel stop 2: 3-wire operation 3: + - speed from logic input(s) 4: 4–20 mA current input operation

Command Mode Selection

Specifies which command source has priority in issuing Start and stop commands.

NOTE: You must stop the drive controller before changing the setting of CMOd.

- CMOd = 0: Start and stop commands via the logic inputs on the control terminal board.
- CMOd = 1: The and keys on the display terminal start and stop the drive controller.
- CMOd = 2: The serial link sends start and stop commands to the drive controller.

Some functions, when assigned to an input terminal, are commanded by the input terminal even if CMOd is set to 1 (display terminal).

Priority commands via a serial link can take precedence over the setting of CMOd.

Table 9: Parameter CMOd

Parameter	Name	Range
CMOd	Command Mode Selection	0: Terminal board 1: Display terminal 2: Serial communication

Frequency Mode Selection

FMOd Specifies which input device has priority in issuing a speed reference command.

NOTE: You must stop the drive controller before changing the setting of FMOd Preset speed operation is allowed with all settings of FMOd

- FMOd = 1: Speed Reference command via analog input terminal VIA (0-10 Vdc or 4-20 mAdc).
- FMOd = 2: Speed Reference command via analog input terminal VIB (0-10 Vdc) - not used with Daikin controls.
- FMOd = 3: Speed reference via the and arrow keys on the display terminal or the optional remote keypad.
- dOnF = 4: Speed reference via serial communication link - not used with Daikin controls.
- FMOd = 5: Speed reference from +/- speed from logic input(s)

Table 10: Parameter FnOd

Parameter	Name	Range
FnOd	Frequency Mode Selection	1: VIA 2: VIB (not used with Daikin controls) 3: Display terminal 4: Serial communication (not used with Daikin controls) 5: +/- speed from logic input(s)

Default Setting

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Drive controller default parameter settings will be substituted for the present settings when value 3 (standard default settings) of the tYP parameter is selected.
- Drive controller default parameter settings may not be compatible with the application.
- Contact Daikin product support before initiating standard default settings.

Failure to follow these instructions can result in death, serious injury, or equipment damage

tYP This parameter provides a variety of functions to reset, restore and save parameter settings.

NOTE: You must stop the drive controller before changing the setting of tYP

The following parameters are not affected by settings 1, 2, and 3: Fn, FnSL, F109, F470-F473, and F880.

The setting display of this parameter contains two numbers. The left-most number displays the last operation performed. The right-most number indicates the pending operation and should be adjusted for the action desired.

Table 11: Parameter tYP

Parameter	Name	Range
tYP	Default Setting	0: 1: 50 Hz default 2: 60 Hz default 3: Standard default settings (Initialization) 4: Clear the fault record 5: Clear the cumulative operation time 6: Initialize the type information 7: Save the user-defined parameters (do not use) *8:Recalls your Daikin defined parameters 9: Clear the cumulative fan operation time

* You may replace Daikin parameters if this is used.

Forward/Reverse Run Selection

Fr Programs the direction of motor rotation when starting the drive from the keypad display.

Table 12: Parameter Fr

Parameter	Name	Range
Fr	Forward/Reverse Run Selection	0: Forward run 1: Reverse run (do not use) 2: Forward run with forward/reverse switching (do not use) 3: Reverse run with forward/reverse switching (do not use)

NOTE: For more information, contact your Daikin Representative.

Maximum Frequency

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Do not use above 60Hz.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

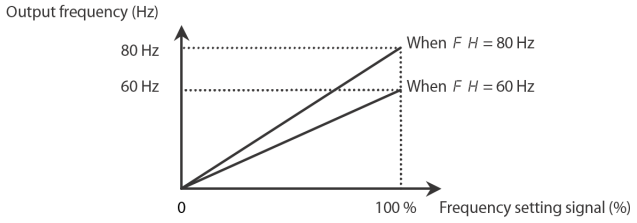
FH Programs the maximum output frequency of the drive controller. This value is used as the maximum frequency reference for the acceleration and deceleration ramps.

Table 13: Parameter FH

Parameter	Name	Range
FH	Maximum Frequency	30–200 (Hz)

NOTE: You must stop the drive controller before changing the setting of FH.

Figure 11: Maximum Frequency



NOTE: FH can not be adjusted during operation, UL value can not exceed FH value.

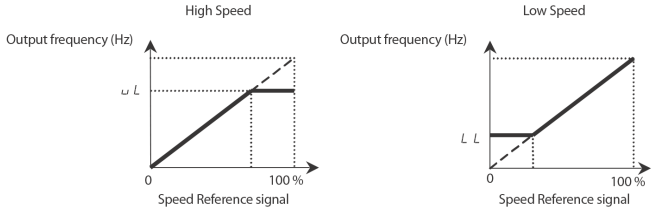
High Speed and Low Speed

UL Programs the high speed. LL Programs the low speed.

Table 14: Parameters UL and LL

Parameter	Name	Range
UL	High Speed	0.5 – FH (Hz)
LL	Low Speed	0.0 – UL (Hz)

Figure 12: High Speed and Low Speed



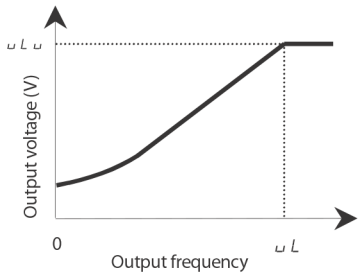
Nominal Motor Frequency and Voltage Settings

UL , ULU Use these parameters to set the nominal motor frequency (UL) and voltage settings (ULU) to the motor nameplate values.

Table 15: Parameters UL and ULU

Parameter	Name	Range
UL	Nominal Motor Frequency	25.0 – 200.0 Hz
ULU	Voltage Setting	50.0 – 330 V: 200 V Class 50.0 – 660 V: 400 V Class

Figure 13: Nominal Motor Frequency and Voltage Settings



V/Hz Control Mode Selection

PE Use this parameter to set the V/Hz control mode.

Table 16: Parameter PE

Parameter	Name	Range
PE	V/Hz Control Mode Selection	0: V/Hz constant (do not use) 1: Variable torque 2: Automatic voltage boost control 3: Vector control (do not use) 4: Energy saving (do not use) 5: No assignment (do not use) 6: PM motor control (do not use)

Voltage Boost (Energy Recovery Application Only)

Ub Use this parameter to increases the voltage boost rate. This function is useful for applications where the torque is not adequate at low speeds.

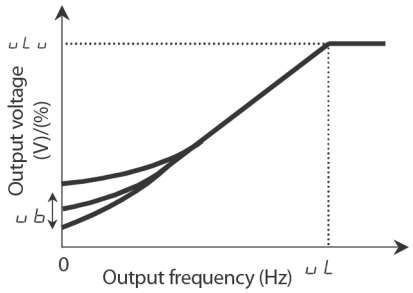
V/Hz Control Mode (PE) must be set to 0 (V/Hz constant) or 1 (variable torque) to use this function.

The optimum setting for Voltage Boost depends on the drive controller capacity. Increasing Voltage Boost too much can cause the drive controller to fault on an overcurrent at start up.

Table 17: Parameter Ub

Parameter	Name	Range
Ub	Voltage Boost	0.0 – 30.0%

Figure 14: Voltage Boost



Electronic Motor Overload Protection

⚠ CAUTION

MOTOR OVERHEATING

This drive controller does not provide direct thermal protection for the motor. Use of a thermal sensor in the motor may be required for protection at all speeds and load conditions. Consult the motor manufacturer for thermal capability of the motor when operated over the desired speed range.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

tHr Motor rated current value (FLA), ULn Electronic motor overload characteristics, and F632 Electronic motor overload memory

These parameters must be set to match the rating and characteristics of the motor (refer to the motor nameplate, full load amps).

Table 18: Electronic Thermal Protection Parameter Settings

Parameter	Name	Adjustment Range			
tHr	Motor Electronic Thermal Protection	0.1–1.0 In.[1] Set to the rated current indicated on the motor nameplate.			
OLn	Electronic Thermal Protection Characteristic	**Setting Value**		**Overload Protection**	**Overload Stall**
		0	Self Cooled Motor	Enabled	Disabled
		1		Enabled	Enabled
		2		Disabled	Disabled
		3		Disabled	Enabled
		4 (do not use)	Forced Cooled Motor	Enabled	Disabled
		5 (do not use)		Enabled	Enabled
		6 (do not use)		Disabled	Disabled
		7 (do not use)		Disabled	Enabled
F632	Electronic Motor Thermal State Memory	0: Disabled 1: Enabled			

[1] "In." corresponds to the drive rated current indicated on the drive controller nameplate.

Setting tHr, and OLn

Use electronic thermal protection characteristics (OLn) to enable or disable the motor overload fault function (OL2) and the overload stall function.

While the drive controller overload fault (OL 1, see page 25) is always enabled, motor overload fault (OL2) can be selected using parameter OLn.

Overload stall is used with variable torque loads such as fans, pumps, and blowers, in which the load current decreases as the operating speed decreases. When the drive controller detects an overload, overload stall automatically lowers the output frequency before the motor overload fault, OL2, is activated. This function maintains the motor at frequencies that allow the load current to remain balanced so that the drive controller can continue operation without tripping.

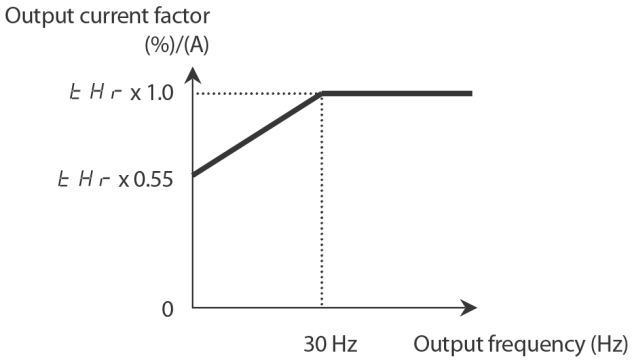
NOTE: Do not use overload stall with constant torque loads such as conveyor belts in which load current is fixed with no relation to speed.

Self Cooled Motors

To set electronic thermal protection characteristics, .OLn, for a self-cooled motor, refer to Table 18.

If the capacity of the motor is smaller than the capacity of the drive controller, or the rated current of the motor is smaller than the rated current of the drive controller, set the electronic thermal protection level, tHr , to the motor's nominal rated current value.

Figure 15: Motor Electronic Thermal Protection – Self-Cooled Motor



Motor Electric Thermal Protection Retention, F632

The setting of this parameter determines whether electric thermal calculation values are retained when power is removed. Enabling the parameter (F632 = 1) causes the electric thermal calculation values to be retained when power is removed.

NOTE: For installations to meet Article 430 of the National Electric Code, parameter F632 must be set to 1.

Input Signal Selection

⚠ DANGER

UNINTENDED EQUIPMENT OPERATION

- The accidental grounding of logic inputs configured for Sink Logic can result in unintended activation of drive controller functions.
- Protect the signal conductors against damage that could result in unintentional conductor grounding.
- Follow NFPA 79 and EN 60204 guidelines for proper control circuit grounding practices.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

F109 VIA terminal function selection

This parameter allows you to select an analog or digital input for the VIA terminal.

When using the VIA terminal as a digital input terminal, set the VIA slide switch to the V position. For switch location see Figure 2.

Table 19: Parameter F109

Parameter	Name	Range
F109	Analog/Digital Input Function Selection (VIA Terminal)	0: Analog input 1: Do not use (sinking input assignment) 2: Digital (sourcing) input

Terminal Function Selection

Modifying Input Terminal Functions

The functions selected with parameters F110 are always active.

Table 20: Parameters F10, F111, F112, F113, and F118

Terminal Symbol	Parameter	Name	Range
—	F110	Always-Active Function (the control input function assigned to this parameter will always be active)	0–71 (refer to appropriate Appendix for specific parameter settings)
F	F111	Logic Input	
R	F112	Logic Input	
RES	F113	Logic Input	
VIA	F118	Input Terminal	

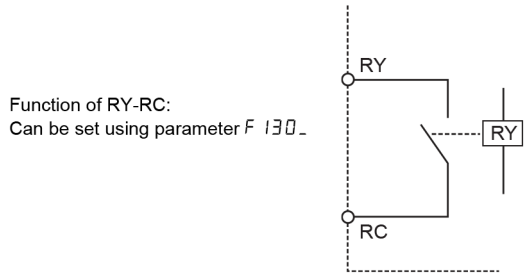
Modifying Output Terminal Functions

F130 Output terminal selection 1A (RY-RC)

Table 21: Assigning One Function to an Output Terminal

Terminal Symbol	Parameter	Name	Range
RY-RC	F130	Output Terminal Selection 1A	0–255 (refer to appropriate Appendix for specific parameter settings)

Figure 16: Application Example



Jump Frequency (Jumping Resonant Frequencies)

F270 Jump Frequency 1, F271 Jumping Width 1

F272 Jump Frequency 2, F273 Jumping Width 2

F274 Jump Frequency 3, F275 Jumping Width 3

Resonance due to the natural frequency of the mechanical system can be avoided by jumping the resonant frequency during operation.

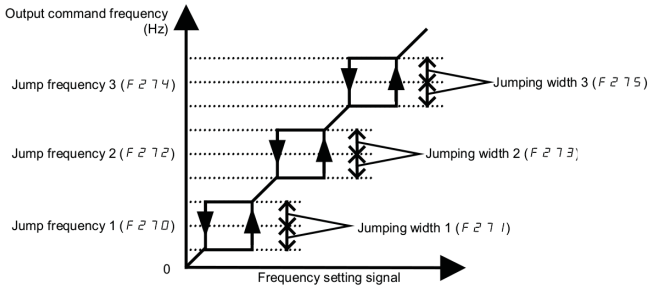
Table 22: Jump Frequency Parameter Setting

Parameter	Name	Range
F270	Jump Frequency 1	0.0 – FH (Hz)
F271	Jump Width 1	0.0 – 30.0 (Hz)
F272	Jump Frequency 2	0.0 – FH (Hz)
F273	Jump Width 2	0.0 – 30.0 (Hz)
F274	Jump Frequency 3	0.0 – FH (Hz)
F275	Jump Width 3	0.0 – 30.0 (Hz)

NOTE:
The jump frequency plus jump width may not overlap another jump frequency plus jump width.

During acceleration or deceleration, the jumping function is disabled for the operation frequency.

Figure 17: Jump Frequency Timing Diagram



Switching Frequency

F300 Switching Frequency, F312 Random Mode

The F300 parameter allows the audible noise from the motor to be changed by altering the switching frequency.

In addition, the F300 parameter reduces the electromagnetic noise generated by the drive controller. Decrease the switching frequency to reduce electromagnetic noise.

The 312 parameter (random mode) reduces motor electromagnetic and acoustic noise by changing the pattern of the switching frequency.

NOTE: Although the electromagnetic noise level is reduced when decreasing switching frequency, the acoustic noise of the motor is increased.

Table 23: Parameters F300, F312

Parameter	Name	Range
F300	Switching Frequency	6.0 – 16.0 (kHz)
F312	Random Mode	0: Disabled 1: Enabled

Auto Restart

⚠ DANGER

AUTOMATIC RESTART ENABLED

- This drive controller can restart under fault conditions.
- Equipment must be shut down, locked out and tagged out to perform servicing or maintenance.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

⚠ CAUTION

MOTOR OVERHEATING

- Repeated reset of the thermal overload can result in thermal stress to the motor.
- When faults occur, promptly inspect the motor and driven equipment for problems such as locked shaft and mechanical overload before restarting. Also check the power supplied to the motor for abnormal conditions such as phase loss and phase imbalance.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

F303 Select the number of restarts.

This parameter resets the drive controller automatically if it is in an alarm state.

Table 24: Parameter F303

Parameter	Name	Range
F303	Number of Restarts	0: Disabled 1–10: 1 to 10 restarts

Table 25: Causes of Tripping and Corresponding Restart Processes

Cause of Tripping	Restart Process	Canceling Conditions
Momentary power failure Overcurrent Overvoltage Overload Overheating	Up to 10 restarts in succession 1st restart: 1 second after tripping 2nd restart: 2 seconds after tripping 3rd restart: 3 seconds after tripping 10th restart: About 10 seconds after tripping	Auto restart is possible only after the following faults: momentary power failure, overcurrent, overvoltage, or overload. The restart function will be canceled if restarting is not successful within the specified number of times.

Restart is disabled when the faults or errors listed in Table 26 occur.

Table 26: Faults Which Cannot Be Automatically Reset

OCA	Motor overcurrent at start up
OCL	Overcurrent on load side at start up
EPHO	Output phase loss
OH2	External thermal fault
OL	Overtorque fault
E	External fault stop
UC	Low-current operation fault
UP1	Undervoltage fault (main circuit)
EF2	Ground fault
EPH1	Input phase loss
EtyP	Drive controller error
Err2	Main unit RAM fault
Err3	Main unit ROM fault
Err4	CPU fault
Err5	Remote control error
Err7	Current detector fault
Err8	Control circuit board format error
EEP1	EEPROM fault 1
EEP2	EEPROM fault 2
EEP3	EEPROM fault 3
Etn1	Auto-tuning error
E-18	VIA input detection error
E-19	Main unit CPU communication error
E-20	Excessive voltage boost
E-21	CPU fault 2

When using Auto Restart, observe the following:

- By default, protective operation detection relay signals (FLA-FLB-FLC terminal signals) are not sent during an auto restart process. To allow a signal to be sent to the protective operation detection relay (FLA-FLB-FLC terminals) during an auto restart process, assign value 36 or 37 to parameter F132
- A calculated cooling time is provided for overload tripping (OL1, OL2, OLr). In this case, the auto restart function operates after the calculated cooling time and the restart time
- In the event of an overvoltage fault (OP1 – OP3), the auto restart function is not activated until the voltage in the DC section comes down to a normal level
- In the event of an overheating fault (OH), the auto restart function is not activated until the drive controller temperature is low enough to restart operation
- When F601 is set to 1 (fault retained), the restart function is not performed, regardless of the setting of F303
- During an auto restart process, the display alternates between "rtry" and the setting specified by display mode selection parameter F710
- The number of auto restarts is cleared if the drive controller does not fault for the specified period of time after a successful restart. A successful restart means that the drive controller output frequency reaches the command frequency without causing the drive controller to fault again

Drive Controller Fault Retention

F606 Drive controller fault retention

This parameter can be set to retain fault information for display after power has been cycled.

The causes of up to four trips can be displayed in status monitor mode.

Table 27: Parameter F606

Parameter	Name	Range
F606	Drive Controller Fault Retention Selection	0: Clear the fault information when power is removed 1: Retain the fault information when the power is removed

Output Phase Loss Detection

F605 Output phase loss detection mode

The setting of this parameter determines how the drive controller responds after detecting an output phase loss. If the phase loss status persists for one second or more, the drive controller will fault, the FL relay will be activated, and fault code EPH0 will be displayed.

Table 28: Parameter F605

Parameter	Name	Range
F605	Output Phase Loss Detection (one second or greater)	0: Disabled 1: At start-up (only one time after power is turned ON) 2: At start-up (each time) 3: During operation 4: At start-up and during operation 5: Detection of cutoff on output side

If the drive controller detects an all-phase loss (i.e. contactor opening), it will restart on completion of recondition. The drive controller does not check for output phase loss when restarting after a momentary power loss.

Input Phase Loss Detection

F608 Input phase loss detection mode selection

Setting this parameter to 1 (default) enables Input Phase Loss Detection. During a complete input phase loss event the drive controller will fault (code EPH 1) and the FL relay will be activated.

Input phase loss nuisance tripping on low source impedance power systems may indicate the need to install an AC input line reactor.

Setting F608 to 0 (input phase loss detection disabled) may result in damage to the drive controller if operation is continued under a heavy load during an input phase loss.

NOTE: The drive controller may not fault on all input phase imbalance conditions.

Table 29: Parameter F608

Parameter	Name	Range
F608	Input Phase Loss Detection	0: Disabled 1: Enabled

Avoiding Overvoltage Tripping

⚠ CAUTION

MOTOR OVERHEATING

- Repetitive braking can cause motor overheating and damage if the Quick Deceleration or Dynamic Quick Deceleration features are active.
- Use of a thermal sensor in the motor is recommended to protect the motor during repetitive braking.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

F305 Overvoltage limit operation, F626 Overvoltage stall protection level

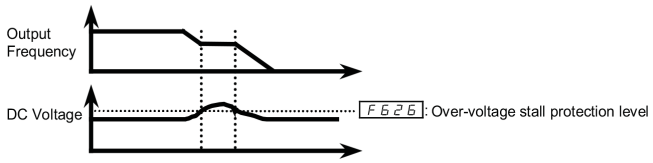
Use these parameters to keep the output frequency constant, or to increase it to prevent overvoltage tripping should the voltage in the DC section rise during deceleration or varying speed operation. The deceleration time during overvoltage limit operation may increase above the designated time. Overvoltage stall protection level sets the percentage of the nominal DC bus level where the drive will modify the output frequency to prevent an Overvoltage fault.

Table 30: Parameters F305, F626

Parameter	Name	Range
F305	Overvoltage Limit Operation	0: Enabled 1: Disabled 2: Enabled (quick deceleration - do not use) 3: Enabled (dynamic quick deceleration - do not use)
F626	Overvoltage Stall Protection Level	100 – 150%*

* Daikin setting = 140%. If power transients are more common than normal, increase toward 150%.

Figure 18: Overvoltage Limit Operation Level



If F305 is set to 2 (quick deceleration), the drive controller will increase the voltage to the motor (over-excitation control) to increase the amount of energy consumed by the motor when the voltage reaches the overvoltage protection level. The motor can therefore be decelerated more quickly than with normal deceleration.

If F305 is set to 3 (dynamic quick deceleration), the drive controller will increase the voltage to the motor (over-excitation control) to increase the amount of energy consumed by the motor as soon as the motor begins to slow down. The motor can therefore be decelerated even more quickly than with quick deceleration.

Undervoltage Fault

F627 Undervoltage fault/alarm selection.

The setting of this parameter determines how the drive controller responds when it detects an undervoltage. The fault code displayed is UP 1.

Table 31: Parameter F627

Parameter	Name	Range
F627	Undervoltage Fault/Alarm Selection	0: Alarm only (input voltage level below 60%) The drive controller stops but does not fault (the FL relay is not activated). 1: Fault (detection level below 60%) The drive controller stops and faults when the input voltage is less than 60% of it's rating. 2: Alarm only (input voltage level below 50%, input reactor needed) The drive controller stops but does not fault when the input voltage is less than 50% of it's rating. A line reactor must be used with this setting.

Changing the Display Parameter

F710 Display selection

When power is applied to the drive controller, it is in display mode. The display terminal shows operation frequency as the default setting.

Table 32: Parameter F710

Parameter	Name	Range
F710	Display Selection	0: Operation frequency (Hz/free unit/step) 1: Frequency command (Hz/free unit/step) 2: Output current (%/A) 3: Drive controller rated current (A) 4: Drive controller load factor (%) 5: Output power 6: Frequency command after PID control (Hz/free unit/step) 7: Optional item specified from an external control unit 8: Output speed of fan motor 9: Communication counter 10: Normal state communication counter

When an alarm or fault occurs, use Table 33 and Table 34 to diagnose and resolve the problem.

If the problem cannot be resolved by any of the actions described in the tables, refer to the programming guide or contact your Daikin Representative.

Drive Controller Fault Conditions

Table 33: Fault Codes

Error Code	Failure Code	Problem Possible Causes	Remedies	
OC 1, OC 1P	0001 0025	Overcurrent during acceleration Transistor overcurrent	• The acceleration time . . . is too short • The V/Hz setting is improper • A restart signal is input to the rotating motor after a momentary stop, etc • A special motor (e.g. motor with a small impedance) is used • Possible ground fault	• Increase the acceleration time, ACC • Check the V/Hz parameter • Use F301 (auto-restart) and F302 (ride-through control) • Adjust the switching frequency F300 • Set the switching frequency control mode selection parameter F316 to 1 or 3 (switching frequency decreased automatically)
OC2, OC2P	0002 0026	Overcurrent during deceleration Transistor overcurrent	• The deceleration time dEC is too short • Possible ground fault	• Increase the deceleration time dEC • Set the switching frequency control mode selection parameter F316 to 1 or 3 (switching frequency decreased automatically)
OC3, OC3P	0003 0027	Overcurrent during constant speed operation Transistor overcurrent	• The load fluctuates abruptly • Mechanical blockage	• Reduce the load fluctuation • Check the load (operated machine) • Set the switching frequency control mode selection parameter F316 to 1 or 3 (switching frequency decreased automatically)
OC 1P, OC2P, OC3P	0025 0026 0027	Ground fault Motor overcurrent at start-up (for 15 and 20 hp models only)	• A current leaked from an output cable or the motor to ground • A main circuit elements is defective	• Contact your Daikin Representative • Check the cables connecting the drive controller to the motor, and check the motor insulation • Reduce the switching frequency • Connect output filters in series with the motor
OCL	0004	Overcurrent (an overcurrent on the load side at start-up)	• The insulation of the output main circuit or motor is defective • Motor impedance is too low • Current is leaked from an output cable or the motor to ground	• Check the cables and wires for defective insulation • Check cables, connectors, and so on for ground faults
OCA	0005	Motor overcurrent at start-up	• A main circuit elements is defective • Possible ground fault	• Check the cables connecting the drive controller to the motor, and check the motor insulation • Reduce the switching frequency • Connect output filters in series with the motor • Contact your Daikin Representative
EPH 1*	0008	Input phase loss	• Input phase loss, blown fuse • Three-phase drive controller used on a single phase line supply • Input phase imbalance • Transient phase fault	• Check the main circuit input line for phase loss • Enable F608 (input phase loss detection)

* You can select a trip ON/OFF by parameters.

Error Code	Failure Code	Problem Possible Causes	Remedies	
EPH2*	0009	Output phase loss	• Loss of phase at drive controller output • Downstream contactor open • Motor not connected • Instability in the motor current • Drive controller oversized for motor	• Check the main circuit output line, motor, etc. for phase loss • Enable F605 (output phase loss detection)
OP1	000A	Overvoltage during acceleration	• Line voltage too high • Line supply transients • A restart signal is input to the rotating motor after a momentary stop, etc. • There is possibility of output phase loss	• Check the line voltage • Compare with the drive controller nameplate rating • Reset the drive controller • Install a line reactor • Use F301 (auto-restart) and F302 (ride-through control) • Check the main circuit output line, motor, etc. for phase loss
OP2	000B	Overvoltage during deceleration	• The deceleration time dEC is too short (regenerative energy is too large) • F305 (overvoltage limit operation) is OFF • The input voltage fluctuates abnormally: – Overhauling load – There is possibility of output phase loss	• Increase the deceleration time dEC • Enable F305 (overvoltage limit operation) • Check the main circuit output line, motor, etc. for phase loss
OP3	000C	Overvoltage during constantspeed operation	• The input voltage fluctuates abnormally • The motor is in a regenerative state because the load causes the motor to run at a frequency higher than the drive controller output frequency • There is possibility of output phase loss	• Check the main circuit output line, motor, etc. for phase loss.
OL1	000D	Drive controller overload	• The acceleration time ACC is too short • The DC braking level is too large • The V/Hz setting is improper • A restart signal is input to the rotating motor after a momentary stop, etc. • The load is too large	• Increase the acceleration time ACC • Reduce the DC braking amount F251 and the DC braking time F252 parameter setting • Use F301 (auto-restart) and F302 (ride-through control) • Use an drive controller with a larger rating
OL2	000E	Motor overload	• The V/Hz setting is improper • The motor is locked • Low-speed operation is performed continuously • An excessive load is applied to the motor during operation	• Check the V/Hz parameter setting • Check the load (operated machine) • Adjust OLnA to the overload that the motor can withstand during operation in a low speed range
OT*	0020	Over-torque fault	• Over-torque during operation	• Enable F615 (overtorque fault selection) • Check system error
OH	0010	Drive controller over temperature	• The cooling fan does not rotate • The ambient temperature is too high • The vent is blocked • A heat generating device is installed close to the drive controller • The thermistor in the unit is broken	• Restart the operation by resetting the drive controller after it has cooled down • The fan requires replacement if it does not rotate during operation • Ensure sufficient space around the drive controller • Do not place any heat generating device near the drive controller • Contact your Daikin Representative
OH2	002E	External thermal fault	• External thermal fault • External PTC probe fault	• Check the external thermal input • Check the PTC in the motor
E	0011	Emergency stop	• During automatic operation or remote operation, a stop command is entered from the operation panel or a remote input device	• Reset the drive controller
EEP1	0012	EEPROM fault 1	• Data writing error	• Turn OFF the drive controller, then turn it again. If it does not recover from the error, contact your Daikin Representative

* You can select a trip ON/OFF by parameters.

Error Code	Failure Code	Problem Possible Causes	Remedies	
EEP2	0013	EEPROM fault 2	• Power supply is cut OFF during tYP operation and data writing is aborted	• Turn the power OFF temporarily and turn it back on, and then try tPY operation again
EEP3	0014	EEPROM fault 3	• A data reading error occurred	• Turn OFF the drive controller, then turn it again. If it does not recover from the error, contact your Daikin Representative
Err2	0015	Main unit RAM fault	• The control RAM is defective	• Contact your Daikin Representative
Err3	0016	Main unit ROM fault	• The control ROM is defective	• Contact your Daikin Representative
Err4	0017	CPU fault 1	• The control CPU is defective	• Contact your Daikin Representative
Err5*	0018	Communication error	• An error arises during serial communication	• Check the remote control device, cables, etc.
Err7	001A	Current detector fault	• The current detector is defective	• Contact your Daikin Representative
Err8	001B	Network error	• The error has occurred during Network communication	• Check the Network device and wiring
UC*	001D	Low-current operation fault	• The output current decreased to a low current detection level during operation	• Enable F610 (low-current detection) • Check the suitable detection level for the system (F611, F612)
UP1*	001E	Undervoltage fault (main circuit)	• The input voltage (in the main circuit) is too low	• Check the input voltage • Enable F627 (undervoltage fault selection) • To cope with a momentary stop due to undervoltage, enable F302 (ride-through control) and F301 (autorestart)
EF2	0022	Ground fault	• A ground fault occurs in the output cable or the motor	• Check the cable and the motor for ground faults
Etn*	0054	Auto-tuning error	• Check the motor parameter F401 to F494 • The motor with the capacity of 2 classes or less than the drive controller is used • The output cable is improperly sized • The motor is rotating • The drive controller is used for loads other than those of three-phase induction motors	
EtYP	0029	Drive controller type error	• Circuit board is changed (or main circuit/ drive circuit board)	• Contact your Daikin Representative
E-17	HMI error		• A graphic display option key has been held down for more than 20 seconds. • A graphic display option key may not be operating properly.	• Release the graphic display option key. • If this does not clear the error, replace the drive.
E-18*	0032	Break in analog signal cable	• The signal input via VIA is below the analog signal detection level set with F633	• Check the cables for breaks. And check the setting of input signal or setting value of F633
E-19	0033	CPU communication error	• A communications error occurs between control CPUs	• Contact your Daikin Representative
E-20	0034	Excessive voltage boost	• The voltage boost parameter F402 is set too high • Impedance of the motor is too low	• Decrease the setting of the voltage boost parameter F402
E-21	0035	CPU fault 2	• The control CPU is defective	• Contact your Daikin Representative
SOUt	002F	Step-out (for PM motor only)	• The motor shaft is locked • One output phase is open • An impact load is applied	• Unlock the motor shaft • Check the interconnect cables between the drive controller and the motor

* You can select a trip ON/OFF by parameters.

Drive Controller Alarm Conditions

Alarms do not cause the drive controller to fault.

Table 34: Alarm Codes

Error Code	Problem	Possible Causes	Remedies
OFF	ST terminal OFF	• The ST-CC circuit is opened	• Close the ST-CC circuit
nOFF	Undervoltage in main circuit	• The supply voltage between R, S and T is under voltage	• Measure the main circuit supply voltage. If the voltage is at a normal level, the drive controller requires repairing
rtry	Restart in process	• The drive controller is in the process of restart • A momentary stop occurred	• The drive controller is operating normally if it restarts after several tens of seconds
Err 1	Frequency point setting error alarm	• The frequency setting signals at points 1 and 2 are set too close to each other	• Set the frequency setting signals at points 1 and 2 apart from each other
CLr	Clear command acceptable	• This message is displayed when pressing the STOP key while an error code is displayed	• Press the STOP key again to clear the fault
EOFF	Emergency stop command acceptable	• The operation panel is used to stop the operation in automatic control or remote control mode	• Press the STOP key for an emergency stop. To cancel the emergency stop, press any other key.
H i/LO	Setting error alarm/an error code and data are displayed alternately twice each	• An error is found in a setting when data is reading or writing	• Check whether the setting is made correctly
HERd/End	Display of first/last data items	• The first and last data item in the data group is displayed	• Press MODE key to exit the data group
db	DC braking	• DC braking in process	• The message goes off in several tens of seconds if no problem occurs
E 1	Flowing out of excess number of digits	• The number of digits such as frequencies is more than 4 (The upper digits have a priority)	• Lower the frequency free unit magnification F702
StOP	Momentary power failure slowdown stop prohibition function activated	• The slowdown stop prohibition function set with F302 (momentary power failure ridethrough operation) is activated	• To restart operation, reset the drive controller or input an operation signal again
LStP	Auto-stop because of continuous operation at the lowerlimit frequency	• The automatic stop function selected with F256 was activated	• To deactivate the automatic stop function, increase the frequency command above the lower-limit frequency (LL) + 0.2 Hz or turn OFF the operation command
In It	Parameters in the process of initialization	• Parameters are being initialized to default values	• Normal if the message disappears after a while (several seconds to several tens of seconds
E- 17	Operation panel key fault	• The RUN or STOP key is held down for more than 20 seconds • The RUN or STOP key is faulty	• Check the operation panel
Atn 1	Auto-tuning	• Auto-tuning in process	• Normal if it the message disappears after a few seconds
h999	Integral input power	• Integral input power is more than 999.99 kWh	• Press and hold down the key for 3 seconds or more when power is OFF or when the input terminal function CKWH is turned ON or displayed.
H999	Integral output power	• Integral output power is more than 999.99 kWh	• Press and hold down the key for 3 seconds or more when power is OFF or when the input terminal function CKWH is turned ON or displayed.

Pre-Alarm Displays

⚠ CAUTION

MOTOR OVERHEATING

• Repeated reset of the thermal state after a thermal overload can result in thermal stress to the motor.

• When faults occur, promptly inspect motor and driven equipment for problems (locked shaft, mechanical overload, etc.) before restarting. Also check power supplied to the motor for abnormal conditions (phase loss, phase imbalance, etc.).

Failure to follow this instruction can result in death, serious injury, or equipment damage.

The pre-alarms are displayed, blinking, in the following order from left to right: C , P , L , H .

If two or more problems arise simultaneously, one of the following alarms appears and blinks: CP , PL , CPL .

Table 35: Pre-alarm codes

C	Overcurrent alarm	Same as OC (overcurrent)
P	Overvoltage alarm	Same as OP (overvoltage)
L	Overload alarm	Same as OL 1 and OL 2 (overload)
H	Overheating alarm	Same as OH (overheating)

Resetting the Drive Controller after a Fault Condition

Do not reset the drive controller when faulted because of a failure or error before eliminating the cause of the fault. Resetting the tripped drive controller before eliminating the problem causes it to fault again.

The drive controller can be reset after a fault with any of the following operations:

1. Turning OFF the power.
2. Using external signal.
3. Using the Stop key on the display terminal:
   a. Press the STOP key and make sure that CLr is displayed.
   b. Eliminate the cause of the fault.
   c. Press the STOP key again to reset the drive controller.
4. Inputting a fault clear signal from a remote communication device.

With the Graphic/Embedded Display Terminals

The StOP key can be used to clear a drive detected fault if parameter [Command mode sel] (CMod) is set to 1. To clear a drive detected fault, press the StOP key. If it is possible to reset the drive, it will display CLr . To clear the detected fault, press the StOP key a second time. If the cause of the interruption is still present, the CLr display will not appear. Diagnose and clear the detected fault before attempting to reset the drive. The use of the StOP key as a clear detected fault can be managed by parameter [HMI reset button] (F735).

When any overload function (OL 1 or OL 2) is active, the drive controller cannot be reset by inputting a reset signal from an external device or with the Stop key on the display terminal if the calculated cooling time has not expired. Calculated cooling time:

- OL 1: 30 seconds after the fault has occurred
- OL 2: 120 seconds after the fault has occurred

The input terminals F, R, and RES can be configured with the settings in Table 36.

Table 36: Input Terminal Functions

Function No.	Code	Function	Action
0	—	No function is assigned	Disabled
1*	ST	Standby terminal	ON: Ready for operation OFF: Coast stop (gate off)
2	F	Forward run command	ON: Forward run OFF: Slowdown stop
3	R	Reverse run command	ON: Reverse run OFF: Slowdown stop
5	AD2	Acceleration/deceleration 2 pattern selection	ON: Acceleration/deceleration 2 OFF: Acceleration/deceleration 1 or 3
6	SS1	Preset-speed command 1	Selection of 7-speed with SS1 to SS3 (3 bits)
7	SS2	Preset-speed command 2	
8	SS3	Preset-speed command 3	
10*	RES	Reset command	ON: Acceptance of reset command ON → OFF: Fault reset
11*	EXT	Fault stop command from external input device	ON: E Fault stop
13	DB	DC braking command	ON: DC braking
14	PID	PID control prohibited	ON: PID control prohibited OFF: PID control permitted
15	PWENE	Permission of parameter editing	ON: Parameter editing permitted OFF: Parameter editing prohibited (If F 700 = 1)
16*	ST+RES	Combination of standby and reset commands	ON: Simultaneous input from ST and RES
20	F+AD2	Combination of forward run and acceleration/deceleration 2	ON: Simultaneous input from F and AD2
21	R+AD2	Combination of reverse run and acceleration/deceleration 2	ON: Simultaneous input from R and AD2
22	F+SS1	Combination of forward run and preset-speed command 1	ON: Simultaneous input from F and SS1
23	R+SS1	Combination of reverse run and preset-speed command 1	ON: Simultaneous input from R and SS1
24	F+SS2	Combination of forward run and preset-speed command 2	ON: Simultaneous input from F and SS2
25	R+SS2	Combination of reverse run and preset-speed command 2	ON: Simultaneous input from R and SS2
26	F+SS3	Combination of forward run and preset-speed command 3	ON: Simultaneous input from F and SS3
27	R+SS3	Combination of reverse run and preset-speed command 3	ON: Simultaneous input from R and SS3
30	F+SS1+AD2	Combination of forward run, preset-speed command 1 and acceleration/deceleration 2	ON: Simultaneous input from F, SS1 and AD2
31	R+SS1+AD2	Combination of reverse run, preset-speed command 1 and acceleration/deceleration 2	ON: Simultaneous input from R, SS1 and AD2
32	F+SS2+AD2	Combination of forward run, preset-speed command 2 and acceleration/deceleration 2	ON: Simultaneous input from F, SS2 and AD2
33	R+SS2+AD2	Combination of reverse run, preset-speed command 2 and acceleration/deceleration 2	ON: Simultaneous input from R, SS2 and AD2
34	F+SS3+AD2	Combination of forward run, preset-speed command 3 and acceleration/deceleration 2	ON: Simultaneous input from F, SS3 and AD2

* When function 1, 10, 11, 16, 38, 41, 42, 43, 44, 45, 46, 47, 51, 52, 53, 54, 55, 62, or 64 is assigned to an input terminal board, the input terminal board is enabled even if the parameter command mode selection Cmod is set at 1 (panel).

Function No.	Code	Function	Action
35	R+SS3+AD2	Combination of reverse run, preset-speed command 3 and acceleration/ deceleration 2	ON: Simultaneous input from R, SS3 and AD2
38*	FCHG	Frequency command forced switching	ON: F200 (if F200 = 0) OFF: FnOd
39	VF2	No.2 Switching of V/Hz setting	ON: No.2 V/Hz setting (Pt=0, F170, F171, F172, F173) (Set value of Pt, UL, ULU, Ub, tHr)
40	MOT2	No.2 motor switching (VF2 + AD2 + OCS2)	ON: No.2 motor (Pt=0, F170, F171. F172, F173, F185, FF500, FF501, F503) OFF: No.1 motor (set value of Pt, UL, ULU, Ub, tHr, ACC, dEC, F502, F601)
41*	UP	Frequency UP signal input from external contacts	ON: Increase in frequency
42*	DOWN	Frequency DOWN signal input from external contacts	ON: Reduction in frequency
43*	CLR	Frequency UP/DOWN cancellation signal input from external contacts	OFF → ON: Resetting of UP/DOWN frequency by means of external contacts
44*	CLR+RES	Combination of frequency UP/DOWN cancellation and reset by means of external contacts	ON: Simultaneous input from CLR and RES
45*	EXTN	Inversion of fault stop command from external device	OFF: E Fault stop
46*	OH	Thermal fault stop signal input from external device	ON: OH2 Fault stop
47*	OHN	Inversion of thermal fault stop command from external device	OFF: OH2 Fault stop
48	SC/LC	Forced switching from remote to local control	Enabled when remote control is exercised ON: Local control (setting of CnOd, FnOd and F207) OFF: Remote control
49	HD	Operation holding (stop of 3-wire operation)	ON: F (forward run)/R: (reverse run) held, 3-wire operation OFF: Slowdown stop
51*	CKWH	Display cancellation of the cumulative power amount (kWh)	ON: Monitor display cancellation of the cumulative power amount (kWh)
52*	FORCE	Forced operation (factory configuration required)	ON: Forced operation mode in which operation is not stopped in the event of the occurrence of a soft fault (preset speed operation frequency 15) To use this function, the inverter needs to be so configured at the factory. OFF: Normal operation
53*	FIRE	Fire-speed control	ON: Fire-speed operation (F244) Forced fire speed setting frequency OFF: Normal operation
54*	STN	Freewheel stop (gate off)	ON: Freewheel stop (gate off)
55*	RESN	Inversion of RES	ON: Acceptance of reset command OFF → ON: Fault reset
56	F+ST	Combination of forward run and standby	ON: Simultaneous input from F and ST
57	R+ST	Combination of reverse run and standby	ON: Simultaneous input from R and ST
61	OCS2	Forced switching of stall prevention level 2	ON: Enabled at the value of F185 OFF: Enabled at the value of F601
62*	HDRY	Holding of RY-RC terminal output	ON: Once turned ON, RY-RC are held ON. OFF: The status of RY-RC changes in real time according to conditions
64*	PRUN	Cancellation (clearing) of operation command from panel	0: Operation command cancelled (cleared) 1: Operation command retained
65	ICLR	PID control integral value clear	ON: PID control integral value always zero OFF: PID control permittedTable 36: Input Terminal Functions (continued)
66	ST+F+SS1	Combination of standby, forward run and preset speed command 1	ON: Simultaneous input from ST, F and SS1
67	ST+R+SS1	Combination of standby, reverse run and preset speed command 1	ON: Simultaneous input from ST, R and SS1
68	ST+F+SS2	Combination of standby, forward run and preset speed command 2	ON: Simultaneous input from ST, F and SS2

* When function 1, 10, 11, 16, 38, 41, 42, 43, 44, 45, 46, 47, 51, 52, 53, 54, 55, 62, or 64 is assigned to an input terminal board, the input terminal board is enabled even if the parameter command mode selection CnOd is set at 1 (panel).

Function No.	Code	Function	Action
69	ST+R+SS2	Combination of standby, reverse run and preset speed command 2	ON: Simultaneous input from ST, R and SS2
70	ST+F+SS3	Combination of standby, forward run and preset speed command 3	ON: Simultaneous input from ST, F and SS3
71	ST+R+SS3	Combination of standby, reverse run and preset speed command 3	ON: Simultaneous input from ST, R and SS3

* When function 1, 10, 11, 16, 38, 41, 42, 43, 44, 45, 46, 47, 51, 52, 53, 54, 55, 62, or 64 is assigned to an input terminal board, the input terminal board is enabled even if the parameter command mode selection CnOd is set at 1 (panel).

The output terminals FLA, FLB, FLC, RY, and RC can be configured with the settings in Table 37.

Table 37: Output Terminal Functions

Function No.	Code Function	Action	
0	**LL**	Low speed	ON: The output frequency is above the LL set value OFF: The output frequency is equal to or less than the LL set value
1	**LLN**	Inversion of low speed Inversion of LL setting	
2	**UL**	High speed	ON: Output frequency is equal to or higher than UL value OFF: Output frequency is lower than UL value
3	**ULN**	Inversion of high speed	Inversion of UL setting
4	**LOW**	Low-speed detection signal	ON: Output frequency is equal to or higher than F100 value OFF: Output frequency is lower than F100 value
5	**LOWN**	Inversion of low-speed detection signal	Inversion of LOW setting
6	**RCH**	Designated frequency attainment signal (completion of acceleration/deceleration)	ON: The output frequency is equal to or less than the specified frequency ± frequency set with F102 OFF: The output frequency is above the specified frequency ± frequency set with F102
7	**RCHN**	Inversion of designated frequency attainment signal (inversion of completion of acceleration/deceleration)	Inversion of RCH setting
8	**RCHF**	Set frequency attainment signal	ON: The output frequency is equal to or less than the frequency set with F101 ± F102 OFF: The output frequency is above the frequency set with F101 ± F102
9	**RCHFN**	Inversion of set frequency attainment signal	Inversion of RCHF setting
10	**FL**	Failure signal (fault output)	ON: When inverter is tripped OFF: When inverter is not tripped
11	**FLN**	Inversion of failure signal (inversion of fault output)	Inversion of FL setting
12	**OT**	Over-torque detection	ON: Torque current is equal to or larger than set value and longer than F618 set time OFF: The torque current is equal to or less than (F616 set value – F619 set value)
13	**OTN**	Inversion of over-torque detection	Inversion of OT
14	**RUN**	Start/Stop	ON: When operation frequency is output or during (db) OFF: Operation stopped
15	**RUNN**	Inversion of RUN/STOP	Inversion of RUN setting
16	**POL**	OL pre-alarm	ON: 50% or more of calculated value of overload protection level OFF: Less than 50% of calculated value of overload protection level
17	**POLN**	Inversion of OL pre-alarm	Inversion of POL setting
20	**POT**	Over-torque detection pre-alarm	ON: Torque current is equal to or larger than 70% of F616 set value OFF: The torque current is below (F616 set value × 70% – F619 set value)
21	**POTN**	Inversion of over-torque detection pre-alarm	Inversion of POT setting
22	**PAL**	Pre-alarm	One of the following is turned on: ON POL, POHR, POT, MOFF, UC, OT, LL, stop, COT, and momentary power failure slowdown stop Or E, P, or H issues an alarm All the following are turned OFF: OFF POL, POHR, POT, MOFF, UC, OT, LL, stop, COT, and momentary power failure slowdown stop Or E, P, or H issues no alarm
23	**PALN**	Inversion of pre-alarm	Inversion of PAL setting
24	**UC**	Low-current detection	ON: The output current is equal to or less than F611 (set value) for F612 (set time)
26	**UCN**	Inversion of low-current detection	Inversion of UC setting

Function No.	Code Function	Action	
27	**HFL**	Significant failure	ON: OCA, OCL, OL, E, EEP 1, EtN, EPHO, Err2–5, OH2, UP 1, EF2, UC, EtYP, or EPH 1) OFF: Failure other than the above
27	**HFLN**	Inversion of significant failure	Inversion of HFL setting
28	**LFL**	Insignificant failure	ON: (OC 1–3, OP 1–3, OH, OL 1–2, OLr) OFF: Failure other than the above
29	**LFLN**	Inversion of insignificant failure	Inversion of LFL setting
30	**RDY1**	Ready for operation (including ST/RUN)	ON: Ready for operation (ST and RUN are also ON) OFF: Others
31	**RDY1N**	Inversion of ready for operation (including ST/RUN)	Inversion of RDY1 setting
32	**RDY2**	Ready for operation (excluding ST/RUN)	ON: Ready for operation (ST and RUN are not ON) OFF: Others
33	**RDY2N**	Inversion of ready for operation (excluding ST/RUN)	Inversion of RDY2
34	**FCVIB**	Frequency VIB selection	ON: VIB selected as frequency command OFF: Terminal other than VIB selected as frequency command
35	**FCVIBN**	Inversion of frequency VIB selection	Inversion of FCVIB
36	**FLR**	Fault signal (put out also at the time of a restart)	ON: When inverter trips or restarts OFF: When inverter does not trip or restart
37	**FLRN**	Inversion of failure signal (put out also at the time of a restart)	Inversion of FLR
38	**OUT0**	Specified data output 1	ON: Specified data from remote control FA50: BIT0= 1 OFF: Specified data from remote control FA50: BIT0= 0
39	**OUT0N**	Inversion of specified data output 1	Inversion of OUT0 setting
42	**COT**	Cumulative operation time alarm	ON: Cumulative operation time is equal to or longer than F621 OFF: Cumulative operation time is shorter than F621
43	**COTN**	Inversion of cumulative operation time alarm	Inversion of COT
44	**LTA**	Parts replacement alarm	ON: Calculation for parts replacement time is equal to or longer than the preset time ON: Calculation for parts replacement time is shorter than the preset time
45	**LTAN**	Inversion of replacement alarm	Inversion of LTA
48	**LI1**	F terminal input signal	ON: The signal input to F terminal is ON OFF: The signal input to F terminal is OFF
49	**LI1N**	Inversion of F terminal input signal	Inversion of LI1
50	**LI2**	R terminal input signal	ON: The signal input to R terminal is ON OFF: The signal input to R terminal is OFF
51	**LI2N**	Inversion of R terminal input signal	Inversion of LI2
52	**PIDF**	Signal in accordance of frequency command (VIA)	ON: Frequency commanded by FnOd or F207 and that by VIA show the same value OFF: Frequency commanded by FnOd or F207 and that by VIA show different values
53	**PIDFN**	Inversion of signal in accordance of frequency command (VIA)	Inversion of PIDF setting
54	**MOFF**	Undervoltage detection	ON: Undervoltage detected OFF: Other than undervoltage
55	**MOFFN**	Inversion of undervoltage detection	Inversion of MOFF
56	**LOC**	Local/remote switching	ON: Local mode OFF: Remote mode
57	**LOCN**	Inversion of local/remote switching	Inversion of LOC
58	**PTC**	PTC thermal alarm	ON: 60% and over the protection level by PTC OFF: Normal condition
59	**PTCN**	Inversion of PTC thermal alarm	Inversion of PTC
60	**PIDFB**	Signal in accordance of frequency command (VIB)	ON: Frequency commanded by FnOd or F207 and that by VIB show the same value OFF: Frequency commanded by FnOd or F207 and that by VIB show different values
61	**PIDFBN**	Inversion of signal in accordance of frequency command (VIB)	Inversion of PIDFB setting
62–253	**Disabled**	Invalid settings, always OFF (ignored)	Invalid settings, always OFF (ignored)
254	**AOFF**	Always OFF	Always OFF
255	**AON**	Always ON	Always ON

⚠ WARNING

DAMAGED PACKAGING

If the packaging appears damaged, it can be dangerous to open it or handle it.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

⚠ WARNING

DAMAGED EQUIPMENT

Do not operate or install any drive controller that appears damaged.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

⚠ WARNING

HANDLING AND LIFTING HAZARD

Keep the area below any equipment being lifted clear of all personnel and property. Use the lifting method illustrated in the figure.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

⚠ WARNING

RISK OF TOPPLING

- Do not stand the drive upright.
- Keep the drive on pallet until ready to install.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

⚠ DANGER

UNINTENDED EQUIPMENT OPERATION

Before turning on the drive controller or upon exiting the configuration menus, ensure that the inputs assigned to the Run command are in a state that will not cause the drive controller to run. Otherwise, the motor can start immediately

Failure to follow this instruction can result in death, serious injury, or equipment damage.

⚠ CAUTION

INCOMPATIBLE LINE VOLTAGE

Before turning on and configuring the drive controller, ensure that the line voltage is compatible with the line voltage range specified on the drive controller nameplate. The drive controller can be damaged if the line voltage is not compatible.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

This appendix only applies to replacing VFD drives on existing equipment. Before installing the drive controller, read this manual thoroughly and follow all precautions.

Before removing the drive controller from its packaging, verify that the carton is not damaged from shipping. Damage to the carton usually indicates improper handling. If any damage is found, notify the carrier and your Daikin Representative.

Storing and Shipping

If the drive controller is not immediately installed, store it in a clean, dry area where the ambient temperature is between -25.F and +158.F (-32.C and +70.C). If the drive controller must be shipped to another location, use the original shipping material and carton to protect the drive controller.

Lifting and Handling

- MD2 drive controllers up to 25 hp can be removed from their packaging and installed without a handling device.
- A hoist must be used for handling and lifting drive controllers of higher ratings.
- After removing the drive controller from its packaging, inspect it for damage. If any damage is found, notify the carrier and your sales representative.
- Verify that the drive controller nameplate and label conform to the packing slip and corresponding purchase order.

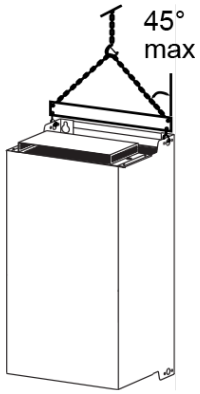


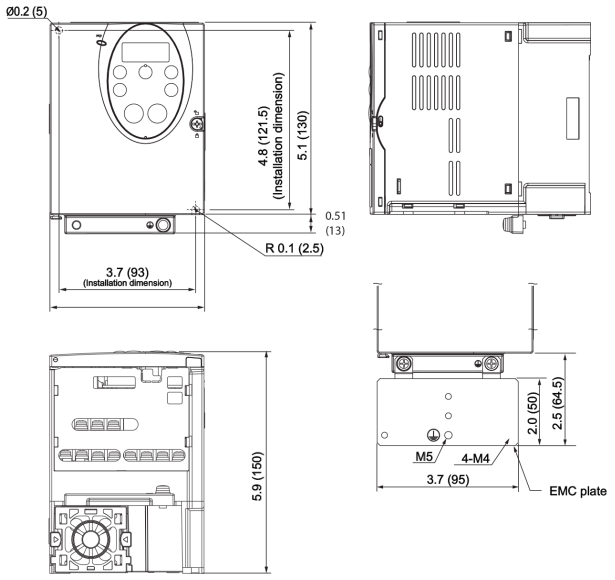
Table 38: Outside Dimensions and Weight

The symbols used in Table 38 are as follows:
- W: Width
- H: Height
- D: Depth
- W1: Mounting dimension (horizontal)
- H1: Mounting dimension (vertical)
- H2: Height of EMC plate mounting area

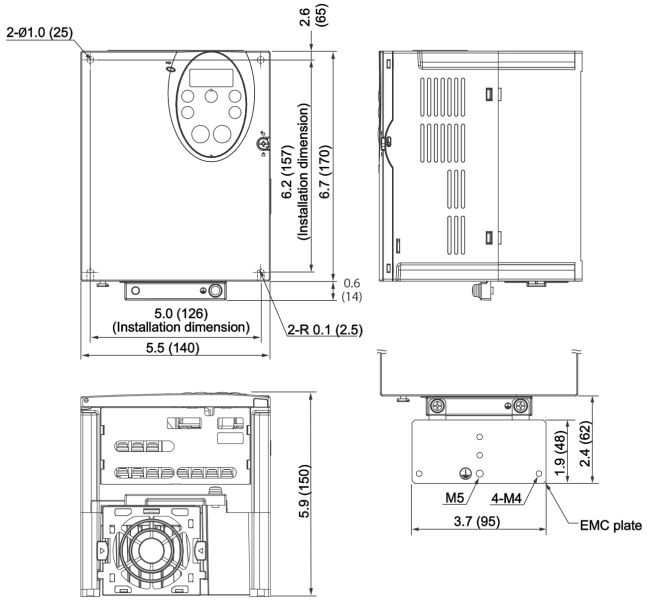
Voltage class	Applicable motor hp	Dimensions in. (mm)						Refer to drawing:	Approx. weight lb (kg)
		W	H	D	W1	H1	H2		
3-phase 230 V	1	4 (105)	5.6 (143)	5.9 (150)	3.6 (93)	4.7 (121.5)	2 (50)	A	4.0 (1.8)
	2								
	3								
	4	5.5 (140)	7.2 (184)	5.9 (150)	4.9 (126)	6.1 (157)	1.8 (48)	B	6.7 (3.1)
	5								
	7.5	7 (180)	9.1 (232)	6.7 (170)	6.3 (160)	8.2 (210)	2.95 (75)	C	13.5 (6.1)
	10								
	15	9.6 (245)	13 (329.5)	7.5 (190)	8.8 (225)	11.6 (295)	2.95 (75)	D	25.4 (11.5)
	20								
	25								
	30	9.4 (240)	16.5 (420)	8.4 (214)	8.1 (206)	15.8 (403)	4.8 (122)	E	60.6 (27.4)
	40	12.5 (320)	24.8 (630)	11.4 (290)	11 (280)	23.8 (604.5)	4.7 (118)	F	85.3 (38.7)
3-phase 460 V	1	4 (105)	5.6 (143)	5.9 (150)	3.6 (93)	4.7 (121.5)	2 (50)	A	4.4 (2.0)
	2								
	3								
	4	5.5 (140)	7.2 (184)	5.9 (150)	4.9 (126)	6.1 (157)	1.8 (48)	B	7.4 (3.4)
	5								
	7.5								
	10	7 (180)	9.1 (232)	6.7 (170)	6.3 (160)	8.2 (210)	2.95 (75)	C	14.3 (6.5)
	15								
	20	9.6 (245)	13 (329.5)	7.5 (190)	8.8 (225)	11.6 (295)	2.95 (75)	D	25.75 (11.7)
	25								
	30	9.4 (240)	16.5 (420)	8.4 (214)	8.1 (206)	15.8 (403)	4.8 (122)	E	51.81 (23.5)
	40								
	50	9.4 (240)	21.7 (550)	11.4 (290)	8.1 (206)	20.8 (529)	5.29 (113)	G	58.3 (26.4)
	60								
	75	12.5 (320)	24.8 (630)	11.4 (290)	11.0 (280)	23.8 (604.5)	4.7 (118)	G	87.5 (39.7)
	100								

NOTE: In the following figures, dimensions common to all drive controllers are shown with numeric values, not with symbols. The model shown in Drawing A is fixed at two points: in the upper left and lower right corners.

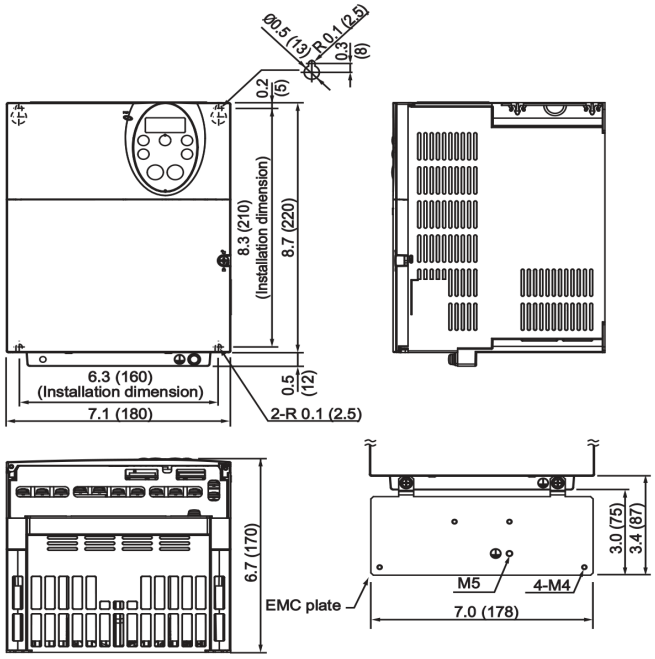
Drawing A



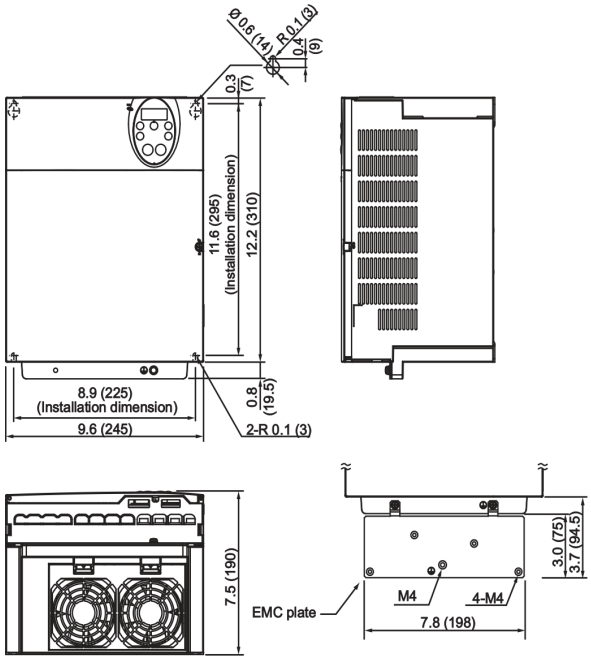
Drawing B



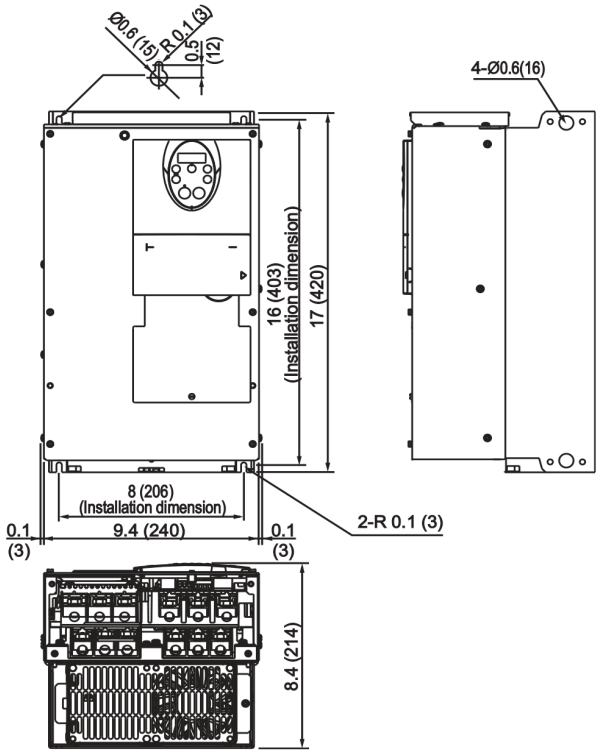
Drawing C



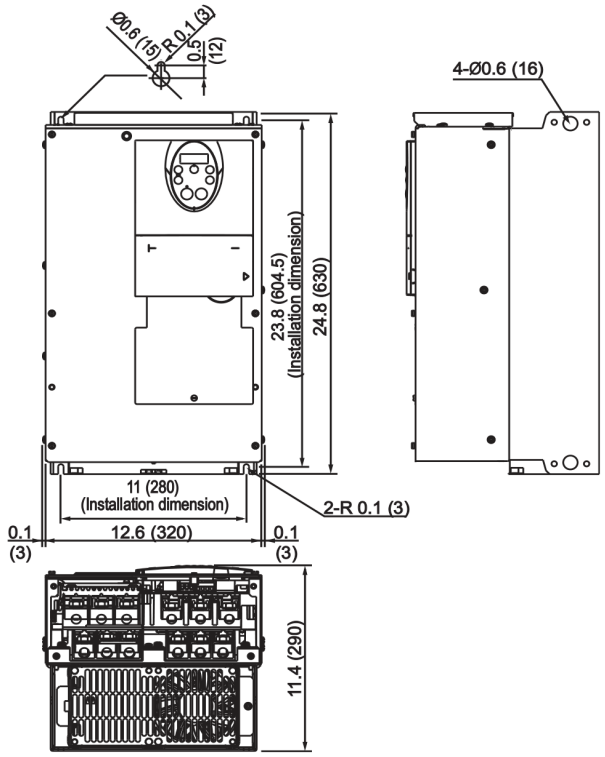
Drawing D



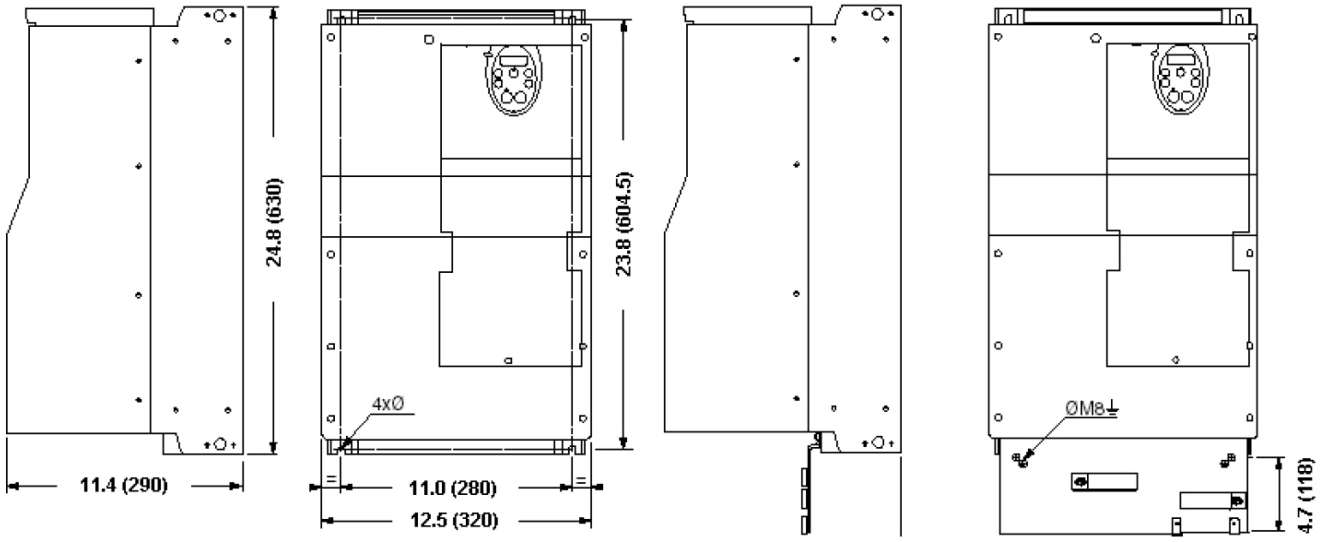
Drawing E



Drawing F



Drawing G



⚠ WARNING

IMPROPER WIRING PRACTICES

- Follow the wiring practices described in this document in addition to those already required by the National Electrical Code and local electrical codes.
- The drive controller will be damaged if input line voltage is applied to the output terminals (U/T1, V/T2, W/T3).
- Check the power connections before energizing the drive controller.
- If replacing another drive controller, verify that all wiring connections to the MD2 drive controller comply with all wiring instructions in this manual.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

⚠ WARNING

INADEQUATE OVERCURRENT PROTECTION

- Overcurrent protective devices must be properly coordinated.
- The National Electrical Code and the Canadian Electricity Code require branch circuit protection. Use the fuses recommended on the drive controller nameplate to achieve published fault withstand current ratings.
- Do not connect the drive controller to a power feeder whose short circuit capacity exceeds the drive controller withstand fault rating listed on the drive controller nameplate.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

⚠ DANGER

HAZARDOUS VOLTAGE

Ground the equipment using the provided ground connecting point as shown in Figure 19. The drive controller panel must be properly grounded before power is applied.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

No field wiring is required except in the following instances:

Controls by others – Daikin provides examples of typical control wiring (see Controls by Others for SAF, RAF, and EAF Applications on page 61), but control wiring ultimately is the customer's responsibility. All power wiring is factory installed and must not be changed.

Replacing a drive in an existing unit – Any replacement VFD must be wired exactly as the original VFD. This applies to power and control wiring. Carefully examine the original wiring and the wiring schematic before removing the original VFD.

Field Control Wiring and General Background for Reconnecting Wiring to a Replacement VFD

Good wiring practice requires the separation of control wiring from all power (line) wiring. In addition, power wiring to the motor must have the maximum possible separation from all other power wiring, whether from the same drive controller or other drive controllers. **Do not run power and control wiring, or multiple power wiring, in the same conduit.** This separation reduces the possibility of coupling electrical transients from power circuits into control circuits or from motor power wiring into other power circuits.

Follow the practices below when wiring MD2 drive controllers:

- Verify that the voltage and frequency of the input supply line and the voltage, frequency, and current of the motor match the rating on the drive controller nameplate
- Use metallic conduit for all drive controller wiring. Do not run control and power wiring in the same conduit
- Separate the metallic conduits carrying power wiring or low-level control wiring by at least 76 mm (3 in.)
- Separate the non-metallic conduits or cable trays carrying power wiring from the metallic conduit carrying control wiring by at least 305 mm (12 in.)
- Whenever power and control wiring cross, the metallic conduits and non-metallic conduits or trays must cross at right angles
- Equip all inductive circuits near the drive (such as relays, contactors, and solenoid valves) with noise suppressors, or connect them to a separate circuit

Branch Circuit Protection and General Background for Reconnecting a Replacement VFD

Daikin factory installed all necessary branch circuit protection and grounding wires for the original VFD and fan motor. No further wiring is required except for field control wiring on Controls by Others for SAF, RAF, and EAF Applications on page 61 applications.

Factory branch circuit protection, ground wiring, or any factory wiring, must not be changed.

The motor size must not be changed and any replacement motor nameplate amps must not exceed the original motor nameplate amps.

Refer to NEC Article 430 for sizing of branch circuit conductors. Ensure that all branch circuit components and equipment (such as transformers, feeder cables, disconnect devices, and protective devices) are rated for the input current of the MD2 drive controller, or for the rated output current, whichever value is larger. Rated input and output current values are shown on the drive controller nameplate.

NOTE: Ensure that the branch circuit feeder protection rating is not less than the rated output current of the drive controller.

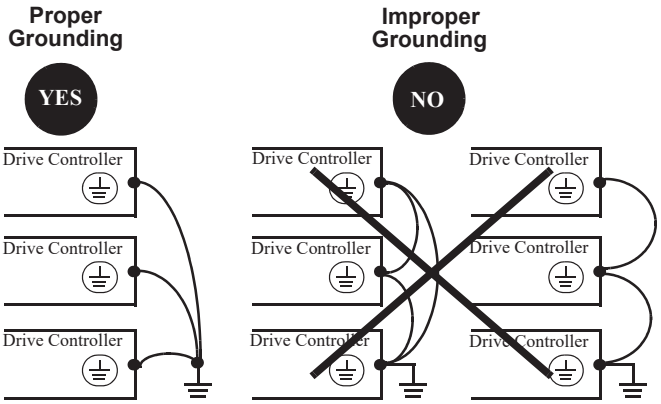
Grounding

For safe, dependable operation, ground the drive controller according to the National Electrical Code and all local codes.

- To comply with current regulations concerning high leakage currents (above 3.5 mA), use at least a 10 mm² (6 AWG) protective conductor, or two protective conductors with the same cross-section as the power section AC supply conductors
- Verify that resistance to ground is one ohm or less. Improper grounding causes intermittent and unreliable operation

Make certain Daikin factory installed grounding is maintained (see “Proper Grounding” in Figure 19). Do not loop the ground cables or connect them in series (see “Improper Grounding” in Figure 19).

Figure 19: Grounding Multiple Drive Controllers



208 – 230 Volt, 7.5 – 10 HP VFDs

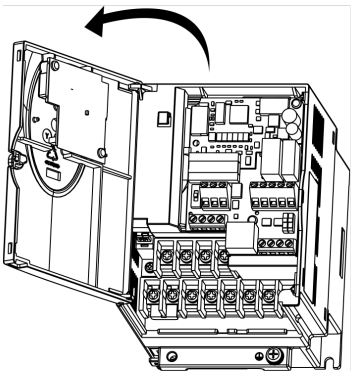
208 – 230 V, 7.5 – 10 HP VFD nameplate amps may be rated 1 amp less than the motor nameplate amps. Amp disparity between VFD and motor nameplates is normal for this application.

Power Terminals

To access the power terminals, open the cover using one of the methods illustrated in Figure 20.

Figure 20: Power Terminal Access

Example MD2, 2 hp



Example MD2, 30 hp

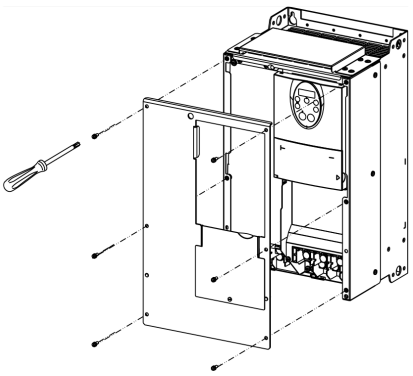


Table 39: Power Terminal Functions

Terminals	Function
⏚	Ground terminal
R/L1 S/L2 T/L3	Power supply
U/T1 V/T2 W/T3	Outputs to the motor
PO	DC bus (+) polarity (do not use)
PA/+	DC bus (+) polarity
PB	DC bus connection (do not use)
PC/-	DC bus (–) polarity

NOTE: The PA/+, and PC/- terminals can only be used to measure the DC bus voltage. Do not remove the jumper between PA/+ and PO.

Table 40: Power Terminal Characteristics

MD2H		Maximum Wire Size		Tightening Torque
Voltage	hp	mm²	AWG	Nm (lb-in)
230 V	1 – 3	6	10	1.3 (10.7)
	4	6	10	1.3 (10.7)
	5	6	10	1.3 (10.7)
	7.5	16	6	2.5 (22.3)
	10	16	6	2.5 (22.3)
	15	25	3	4.5 (40.1)
	20	25	3	4.5 (40.1)
	25	25	3	2.5 (22.3)
	30	50	1/0	12 (106.2)
	40	150	300 kcmil	41 (362.9)
460 V	1 – 7.5	6	10	1.3 (10.7)
	10	16	6	2.5 (22.3)
	15	16	6	2.5 (22.3)
	20	25	3	4.5 (40.1)
	25	25	3	4.5 (40.1)
	30	50	1/0	12 (106.2)
	40	50	1/0	12 (106.2)
	50	50	1/0	12 (106.2)
	60	50	1/0	12 (106.2)
	75 – 100	150	300 kcmil	41 (360)

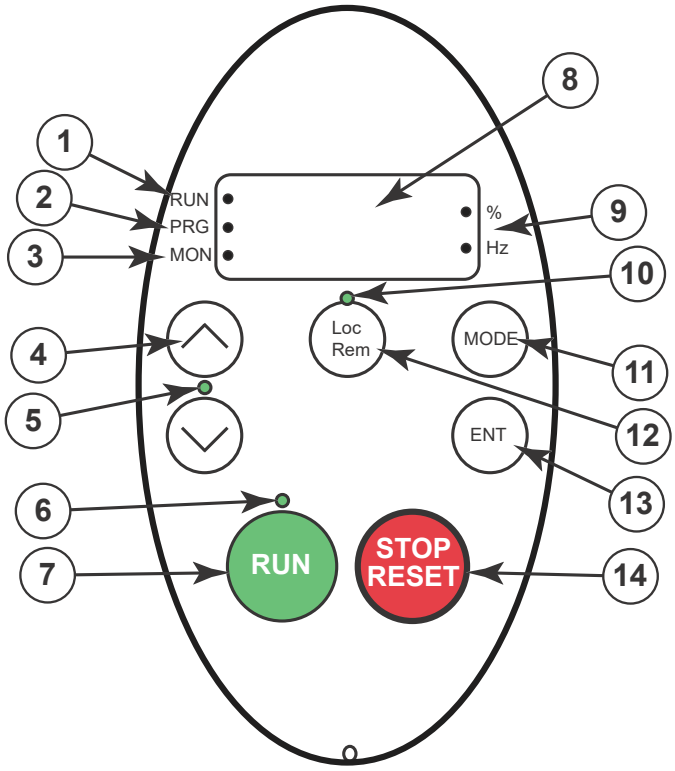
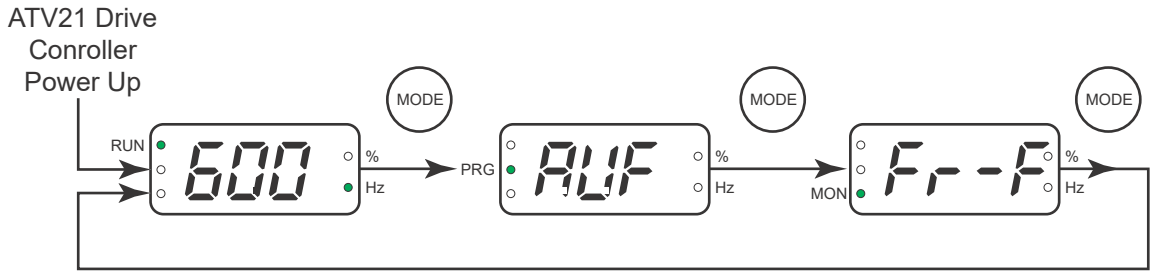


Table 41: Display Terminal Description

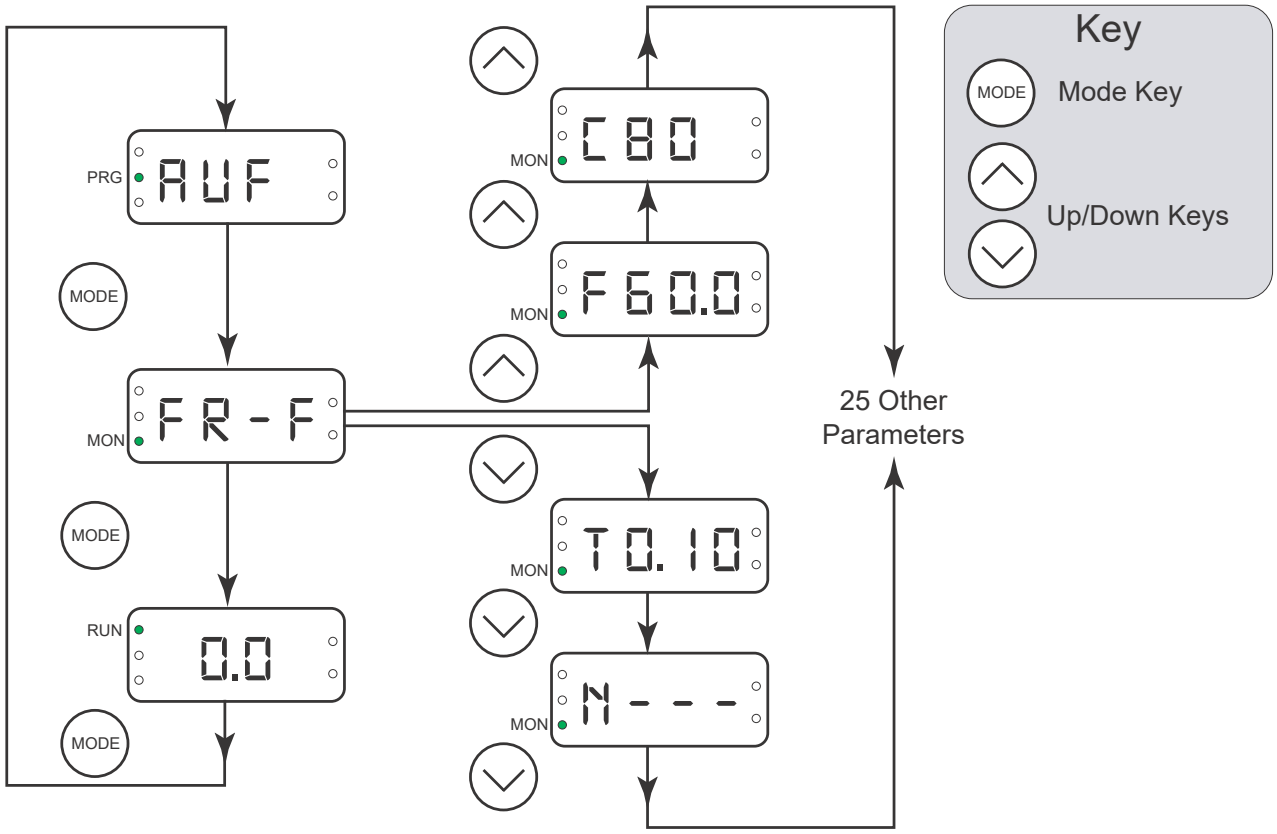
Item	LED/Key	Characteristics
1	Display RUN LED	• Illuminates when a Run command is applied to the drive controller • Flashes when there is a speed reference present with a Run command
2	Display PRG LED	• Illuminates when Programming mode is active • Flashes in AUF - GrU modes.
3	Display MON LED	• Illuminates when Monitoring mode is active • Flashes in Fault History Display mode
4	Up/Down Keys	Depending on the mode, you can use the arrows to: • Navigate between the menus • Change a value • Change the speed reference when the Up/Down LED (5) is illuminated
5	Up/Down LED	• Illuminates when the navigation arrows are controlling the speed reference
6	Run LED	• Illuminates when the Run key is enabled
7	Run Button	• Pressing this button/key when the Run LED is illuminated starts the drive controller
8	Display	• 4-digit, 7-segment LED display
9	Units LEDs	• The % LED illuminates when the display numeric value is in percentage • The Hz LED illuminates when the display numeric value is in Hertz
10	Loc/Rem LED	• Local/Remote mode indicator. Illuminates when Local mode is selected
11	Mode Button	Press to select the Mode: • Display mode (default) • Adjustment mode • Monitoring mode Can also be used to go back to the previous menu
12	Loc/Rem Button	• Switches between Local and Remote modes
13	ENT Button	• Press to display a parameter's value or to save a changed value
14	Stop Button	• In Local mode (12), pressing the STOP key decelerates the drive to a stop • In Remote mode (see table item #10), while the VFD is being controlled by the unit controller, pressing the STOP key will allow the drive to freewheel stop (drive display will indicate a flashing "E") • If F735 is set to 0 (default setting), pressing the stop key twice will reset the flashing "E" fault and other resettable faults if the fault condition has been resolved

Mode Navigation



Monitoring Mode

The Monitoring mode displays drive controller operational data in real time. To access the Monitoring mode, press the MODE key until the MON LED is illuminated. Then press the UP and Down keys to view up to 30 different types of data.



Menu Navigation

Figure 21 illustrate how to navigate through the programming menus and submenus.

Figure 21: Menu Navigation

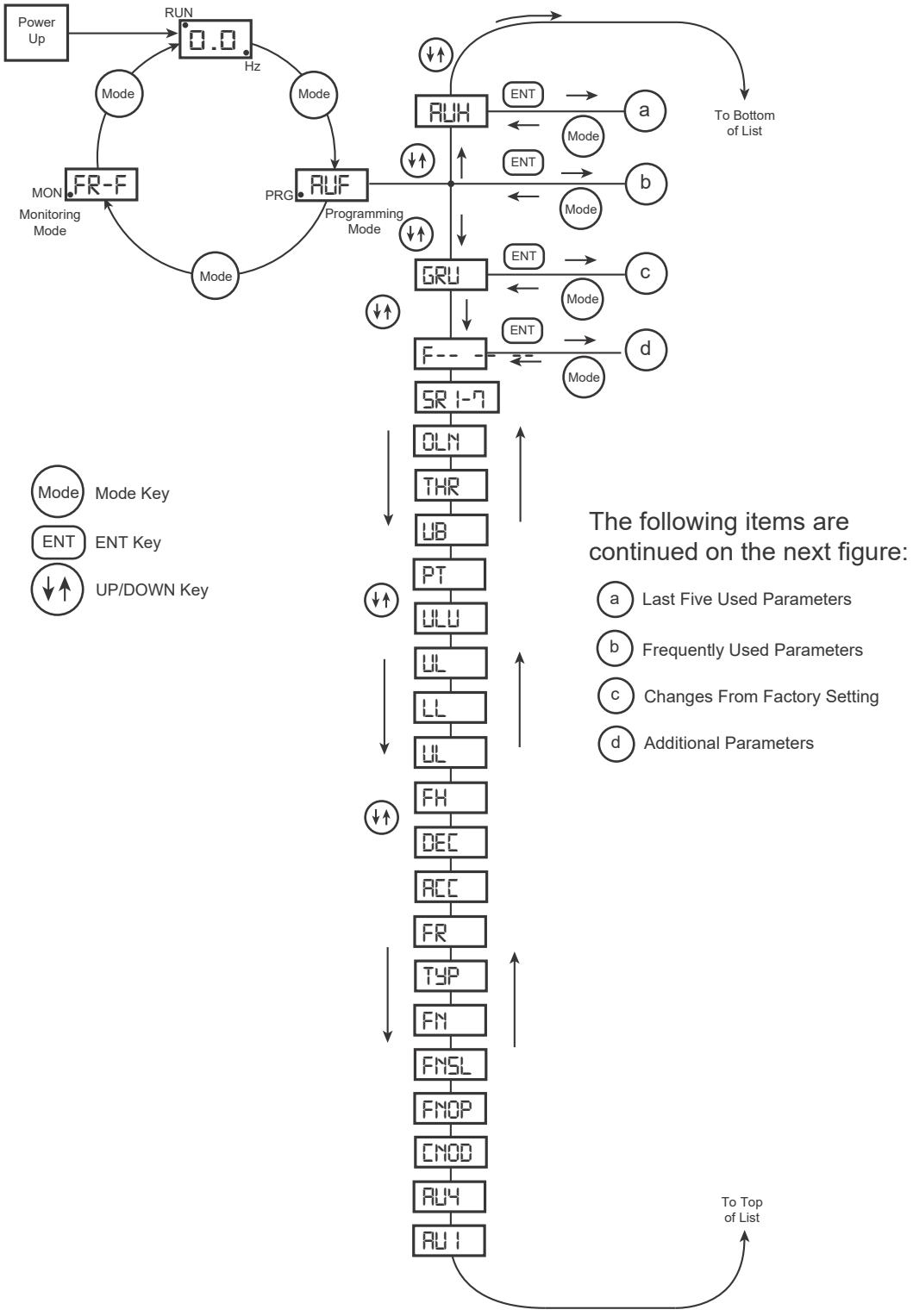
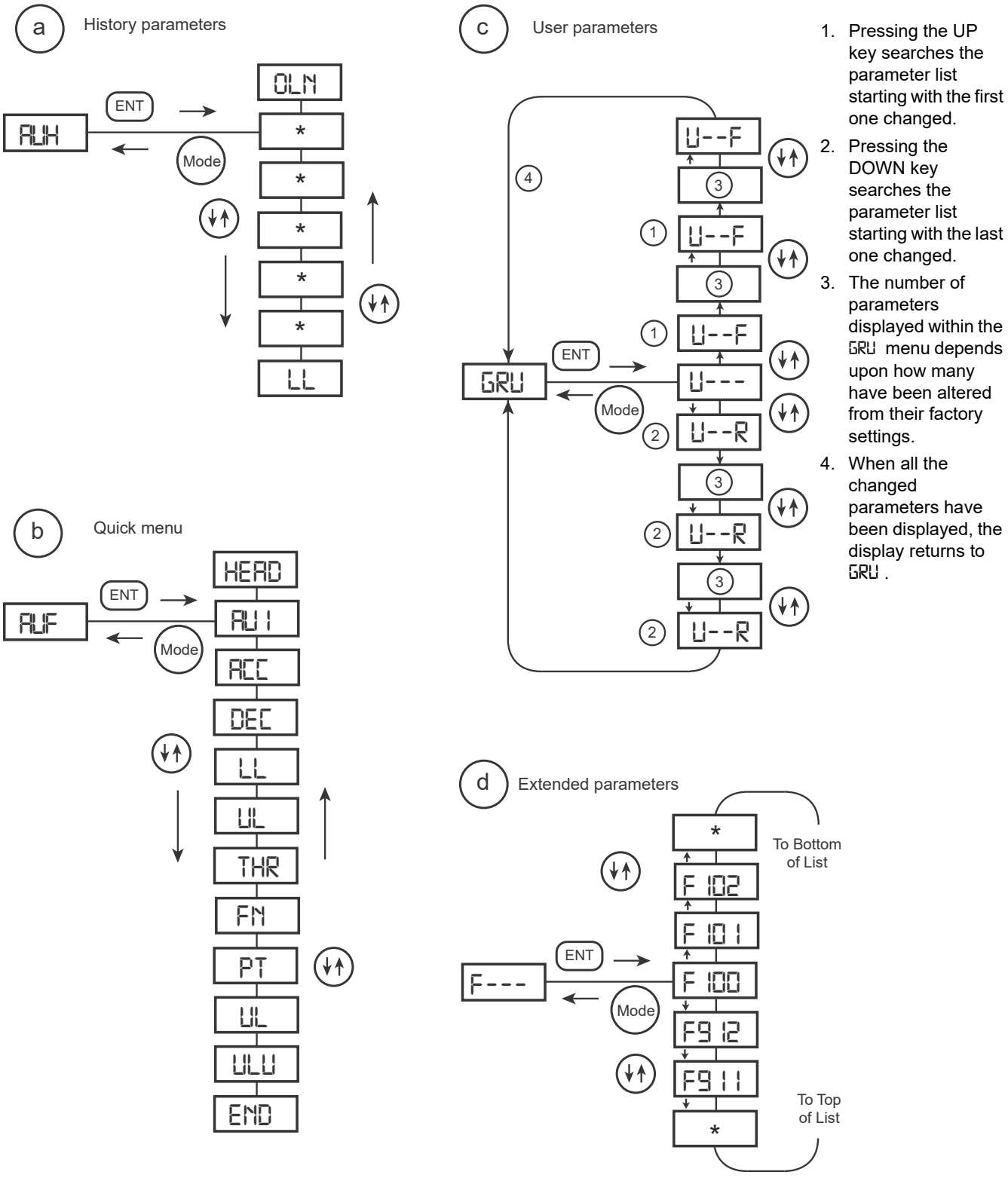


Figure 21 continued: Menu Navigation



1. Pressing the UP key searches the parameter list starting with the first one changed.
2. Pressing the DOWN key searches the parameter list starting with the last one changed.
3. The number of parameters displayed within the GRU menu depends upon how many have been altered from their factory settings.
4. When all the changed parameters have been displayed, the display returns to GRU .

The MD2 drive controller offers three options to return parameters to their factory default settings:

- Factory reset: set parameter tYP to 3
- 50 Hz reset: set parameter tYP to 1
- 60 Hz reset: set parameter tYP to 2

NOTE: To restore the MD2 drive to 60Hz Factory default setting you would first set parameter PYt to 3, press enter followed by setting parameter PYt to 2 and pressing enter again. The operation specific Daikin parameters would then need to be changed for proper unit operation.

tYP: Default Setting

Function

Allows setting of all parameters to the standard default setting, etc. at one time.

Note that Fn, FnSL, F109, F470 - F473, F669, and F880 will not be reset to their factory default settings.

- The function will be displayed as 0 during reading on the right. This previous setting is displayed.

  Example: 3 0

- tYP cannot be set while the inverter is operating. Always stop the inverter first and then program.

Title	Function	Adjustment Range	Default Setting
tYP	Default Setting	0: — 1: 50Hz default setting 2: 60 Hz default setting 3: Standard default setting (initialization) 4: Trip record clear 5: Cumulative operating time clear 6: Initialization of type information 7: Save user-defined parameters 8: Call user-defined parameters 9: Cumulative fan operation time record clear	0

Programmed Value

- 50 Hz default setting (tYP = 1)

  Setting tYP at 1 causes the following parameters to e set for operation using a base frequency of 50 Hz (this does not change the setting of any other parameters).

  Parameter FH, UL, uL, F170, F204, F213, F814: 50 Hz

  Parameter F417: According to model

- 60 Hz default setting (tYP = 2)

  Setting tYP at 2 causes the following parameters to e set for operation using a base frequency of 60 Hz (this does not change the setting of any other parameters).

  Parameter FH, UL, uL, F170, F204, F213, F814: 60 Hz

  Parameter F417: According to model

- Default setting (tYP = 3)

  Setting tYP to . will return all parameters to the standard values that were programmed at the factory.

  When tYP is set to 3, In It will be displayed for a short time after the setting and will then be erased and the original indication 0_0 will be displayed. Trip history data will be cleared at this time.

- Trip clear (tYP = 4)

  Setting tYP to 4 initializes the past four sets of recorded error history data.

  The parameter does not change.

- Cumulative operation time clear (tYP = 5)

  Setting tYP to 5 resets the cumulative operation time to the initial value of zero.

- Save user setting parameters (tYP = 7)

  Setting tYP to 7 saves the current settings of all parameters.

- Load user setting parameters (tYP = 8)

  Setting tYP to 8 loads parameter settings to (calls up) those saved by setting tYP to 7

  By setting tYP to 7 or 8, you can use parameters as your own default parameters.

- Cumulative fan operation time record clear (tYP = 9)

  Setting tYP to 9 resets the fan cumulative operation time to the initial value of zero.

  Set this parameter when replacing the cooling fan.

NOTE: You must stop the drive controller before changing the setting of tYP.

The following parameters are not affected by . . . setting of 1, 2, and 3: Fn, FnSL, F109, F470 through F473, and F880.

The setting display of this parameter contains two numbers. The left-most number displays the last operation performed. The right-most number indicates the pending operation and should be adjusted for the action desired.

When changing parameters the last parameter to save is "tYP" After making the changes necessary go to tYP and select "save" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank.

NOTE: **Remember to do this last!**

When changing parameters the last parameter to save is "tYP" After making the changes necessary go to tYP and select "SAuE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Table 42: Parameters whose values do not change if a reset is performed

Parameter	Description	Unit	Min.Value	Max.Value	Default Value
FM	Meter adjustment	1	1	1280	145
FMSL	Meter selections	1	0	19	0
F109	Analog/contact input function selection (VIA/VIB)	1	0	2	0
F470	VIA bias	1	0	225	128
F471	VIA gain	1	0	255	148
F472	VIB bias	1	0	255	128
F473	VIB gain	1	0	255	148
F880	Free notes	1	0	65535	0

NOTE: A 60 Hz reset on a 460V drive controller sets the rated voltage (UL U and F471) to 400V.

Table 43: Default Parameters

Code	Function Description	Unit	Min. Value	Max. Value	Default Value
AU1	Automatic acceleration/deceleration	1	0	2	1
AU4	Automatic function setting	1	0	4	0
CNOd	Command mode selection	1	0	2	0
FnOd	Frequency setting mode selection 1	1	1	1	5
FMSL	Meter selection	1	0	19	0
FM	Meter adjustment	1	1	1280	145
tYP	Default setting	1	0	9	0
Fr	Forward/reverse run selection (Operation panel)	1	0	3	0
ACC	Acceleration time 1	0.1sec	0	3200	10
dEC	Deceleration time 1	0.1sec	0	3200	10
FH	Maximum frequency	0.01Hz	30	200	50
UL	Upper limit frequency	0.01Hz	1	80	50
LL	Lower limit frequency	0.01Hz	0	60	0
uL	Base frequency 1	0.01Hz	25	200	50
uLu	Base frequency voltage 1	0.1V	50	660	—
Pt	V/F control mode selection 1	1	1	0	6
ub	Torque boost 1	0.10%	0	30	5
tHr	Motor electronic-thermal protection level 1	1%	10	100	100
OLM	Electric-thermal protection characteristic selection	1	0	7	0
Sr1	Preset-speed operation frequency 1	0.01Hz	0	60	15
Sr2	Preset-speed operation frequency 2	0.01Hz	0	60	20
Sr3	Preset-speed operation frequency 3	0.01Hz	0	60	25
Sr4	Preset-speed operation frequency 4	0.01Hz	0	60	30
Sr5	Preset-speed operation frequency 5	0.01Hz	0	60	35
Sr6	Preset-speed operation frequency 6	0.01Hz	0	60	40
Sr7	Preset-speed operation frequency 7	0.01Hz	0	60	45
F100	Low-speed signal output frequency	0.01Hz	0	80	0
F101	Speed reach setting frequency	0.01Hz	0	80	0
F102	Speed reach detection band	0.01Hz	0	80	2.5
F108	2nd always-active function selection	1	0	71	0
F109	Analog/contact input function selection (VIA/VIB)	1	0	2	0
F110	Always-active function selection	1	0	71	1
F111	Input terminal selection1 (F)	1	0	71	2
F112	Input terminal selection 2 (R)	1	0	71	6
F113	Input terminal selection 3 (RST)	1	0	71	10
F118	Input terminal selection 8 (VIA)	1	0	71	7
F130	Output terminal selection 1A (RY-RC)	1	0	255	4

Code	Function Description	Unit	Min. Value	Max. Value	Default Value
F132	Output terminal selection 3 (FL)	1	0	255	11
F137	Output terminal selection 1B (RY-RC)	1	0	255	255
F139	Output terminal logic selection (RY-RC/OUT-NO)	1	0	1	0
F167	Frequency command agreement detection range	0.01Hz	0	80	2.5
F170	Base frequency 2	0.01Hz	25	200	50
F171	Base frequency voltage 2	0.1V	50	660	—
F172	Torque boost 2	0.10%	0	30	5
F175	Motor electronic-thermal protection level 2	1%	10	100	100
F185	Stall prevention level 2	1%	10	111	110
F200	Frequency priority selection	1	0	1	0
F201	VIA input point 1 setting	1%	0	100	0
F202	VIA input point 1 frequency	0.01Hz	0	200	0
F203	VIA input point 2 setting	1%	0	100	100
F204	VIA input point 2 frequency	0.01Hz	0	200	50
F207	Frequency setting mode selection 2	1	1	5	2
F210	VIB input point 1 setting	1%	0	100	0
F211	VIB input point 1 frequency	0.01Hz	0	200	0
F212	VIB input point 2 setting	1%	0	100	100
F213	VIB input point 2 frequency	0.01Hz	0	200	50
F240	Starting frequency setting	0.01Hz	1	10	0.5
F241	Operation starting frequency	0.01Hz	0	80	0
F242	Operation starting frequency hysteresis	0.01Hz	0	80	0
F250	DC braking starting frequency	0.01Hz	0	80	0
F251	DC braking current	1%	0	100	50
F252	DC braking time	0.1sec	0	20	1
F256	Time limit for lower-limit frequency operation	0.1sec	0	600	0
F264	Input from external contacts-UP response time	0.1sec	0	10	0.1
F265	Input from external contacts-UP frequency step width	0.01Hz	0	80	0.1
F266	Input from external contacts-DOWN response time	0.1sec	0	10	0.1
F267	Input from external contacts-DOWN freq step width	0.01Hz	0	80	0.1
F268	nitial value of UP/DOWN frequency	0.01Hz	0	60	0
F269	Saving of changed value of UP/DOWN frequency	1	0	1	1
F270	Jump frequency 1	0.01Hz	0	80	0
F271	Jump width 1	0.01Hz	0	30	0
F272	Jump frequency 2	0.01Hz	0	80	0
F273	Jump width 2	0.01Hz	0	30	0
F274	Jump frequency 3	0.01Hz	0	80	0
F275	Jump width 3	0.01Hz	0	30	0
F294	Preset-speed operation frequency 15	0.01Hz	0	60	50
F295	Selection of bump-less	1	0	1	1
F300	PWM carrier frequency	0.1kHz	6	16	—
F301	Auto-restart control selection	1	0	4	3
F302	Regeneration power ride-through control (Deceleration stop)	1	0	2	0
F303	Retry selection (number of times)	1	0	10	3
F305	Over-voltage limit operation (Slowdown stop mode selection)	1	0	3	2
F307	Supply voltage correction (limitation of output voltage)	1	0	3	3
F311	Reverse-run prohibition	1	0	2	1
F312	Random mode	1	0	1	0
F316	Carrier frequency control mode selection	1	0	3	1
F320	Drooping gain	1%	0	100	0
F323	Drooping insensitive torque band	1%	0	100	10
F359	PID control waiting time	1sec	0	2400	0
F360	PID control	1	0	2	0

Code	Function Description	Unit	Min. Value	Max. Value	Default Value
F362	Proportional gain	0.01	0	100	0.3
F363	Integral gain	0.01	0	100	0.2
F366	Differential gain	0.01	0	3	0
F400	Auto-tuning	1	0	2	0
F401	Slip frequency gain	1%	0	150	50
F402	Motor constant #1 (primary resistance)	0.10%	0	30	—
F415	Motor rated current	0.1A	0	200	—
F416	Motor no-load current	1%	10	100	—
F417	Motor rated speed	1min-1	100	15000	—
F418	Speed control response coefficient	1	1	150	40
F419	Speed control stability coefficient	1	1	100	20
F470	VIA bias	1	0	255	128
F471	VIA gain	1	0	255	148
F472	VIB bias	1	0	255	128
F473	VIB gain	1	0	255	148
F480	Exciting strengthening coefficient	1%	100	130	100
F481	Factory adjustment1	1	0	9999	0
F482	Factory adjustment2	1	0	9999	442
F483	Factory adjustment3	0.1	0	300	100
F485	Stall cooperation gain at field weakening zone 1	1	10	250	100
F492	Stall cooperation gain at field weakening zone 2	1	50	150	100
F494	Motor adjustment factor	1	0	200	70
F495	Maximum voltage adjustment factor	1%	90	120	104
F496	Carrier change adjustment factor	0.1kHz	0	14	14
F500	Acceleration time 2	0.1sec	0	3200	20
F501	Deceleration time 2	0.1sec	0	3200	20
F502	Acceleration/deceleration 1 pattern	1	0	2	0
F503	Acceleration/deceleration 2 pattern	1	0	2	0
F504	Acceleration/deceleration selection (1/2/3)	1	1	2	1
F505	Acceleration/deceleration 1 and 2 switching frequency	0.01Hz	0	60	0
F506	S-pattern lower-limit adjustment amount	1%	0	50	10
F507	S-pattern upper-limit adjustment amount	1%	0	50	10
F601	Stall prevention level 1	1%	10	111	110
F602	Inverter trip retention selection	1	0	1	0
F603	Emergency stop selection	1	0	2	0
F604	Emergency DC braking time	0.1sec	0	20	1
F605	Output phase failure detection mode selection	1	0	5	3
F607	Motor 150%-overload time limit	1sec	10	2400	300
F608	Input phase failure detection mode selection	1	0	1	1
F609	Hysteresis for small current detection	1%	1	20	10
F610	Low current trip/alarm	1	0	1	0
F611	Small current detection current	1%	0	100	0
F612	Small current detection time	1sec	0	255	0
F613	Detection of output short-circuit during start-up	1	0	3	0
F615	Over-torque trip/alarm selection	1	0	1	0
F616	Over-torque detection level	1%	0	250	130
F618	Over-torque detection time	0.1sec	0	10	0.5
F619	Over-torque detection level hysteresis	1%	0	100	10
F621	Cumulative operation time alarm setting	0.1	0	1000	610
F626	Over-voltage stall protection level	1%	100	150	140
F627	Under-voltage trip/alarm selection	1	0	2	0
F632	Thermal memory selection	1	0	1	0
F633	Trip at VIA low level input mode	1%	0	100	0

Code	Function Description	Unit	Min. Value	Max. Value	Default Value
F634	Annual avg ambient temp (calculation for life alarms)	1	1	6	3
F645	Selection of PTC thermal	1	0	2	0
F646	Detection level of PTC	1ohm	100	9999	3000
F650	Forced/Fire-speed control selection	1	0	1	0
F691	Inclination characteristic of analog output	1	0	1	1
F692	Meter bias	1%	0	100	0
F700	Prohibition of change of parameter settings	1	0	1	0
F701	Unit selection	1	0	1	1
F702	Free unit selection	0.01	0	200	0
F705	Inclination characteristic of free unit display	1	0	1	1
F706	Free unit display bias	0.01Hz	0	80	0
F707	Free step 1 (pressing a panel key once)	0.01Hz	0	80	0
F708	Free step 2 (panel display)	1	0	255	0
F710	Standard monitor display selection	1	0	10	0
F721	Panel stop pattern	1	0	1	0
F730	Prohibition of freq. setting on the operation panel (FC)	1	0	1	0
F732	Panel operation prohibition (Local/Remote keys)	1	0	1	0
F733	Panel operation prohibition (RUN/STOP keys)	1	0	1	0
F734	Prohibition of panel emergency stop operation	1	0	1	0
F735	Prohibition of panel reset operation	1	0	1	0
F738	Selection of AUF	1	0	1	0
F748	Selection of watt hour memory	1	0	1	1
F749	Display unit selection of watt hour	1	0	3	0
F800	Communication band speed	1	0	1	1
F801	Parity	1	0	2	1
F802	Inverter number; SAF=1;RAF=2;HW=3	1	0	247	1
F803	Communication error trip time	1sec	0	100	3
F805	Communication waiting time	0.01sec	0	2	0
F806	Setting master & slave for comm between inverters	1	0	4	0
F811	Communication input point 1 setting	1%	0	100	0
F812	Communication input point 1 frequency	0.01Hz	0	200	0
F813	Communication input point 2 setting	1%	0	100	100
F814	Communication input point 2 frequency	0.01Hz	0	200	0
F829	Selection of communication protocol	1	0	4	1
F851	Inverter action at network & communication break	1	0	4	0
F856	Number of motor poles for comm speed calculation	1	1	8	2
F870	Block write data 1	1	0	6	0
F871	Block write data 2	1	0	6	0
F875	Block read data 1	1	0	11	0
F876	Block read data 2	1	0	11	0
F877	Block read data 3	1	0	11	0
F878	Block read data 4	1	0	11	0
F879	Block read data 5	1	0	11	0
F880	Free notes	1	0	65535	0
F890	Parameter for option 1	1	0	65535	0
F891	Parameter for option 2	1	0	65535	0
F892	Parameter for option 3	1	0	65535	0
F893	Parameter for option 4	1	0	65535	0
F894	Parameter for option 5	1	0	65535	0
F895	Parameter for option 6	1	0	65535	0
F896	Parameter for option 7	1	0	65535	0
F897	Parameter for option 8	1	0	65535	0
F898	Parameter for option 9	1	0	65535	0

Code	Function Description	Unit	Min. Value	Max. Value	Default Value
F899	Parameter for option 10	1	0	65535	0
F910	Step-out detection current level (for PM motors)	1%	10	150	100
F911	Step-out detection time (for PM motors)	0.1sec	0	25	0.0
F912	q-axis self-inductance (for PM)	0.01mH	0	650	0.00

Rooftop and Self-Contained with MicroTech III Controls for SAF, RAF, and EAF Applications

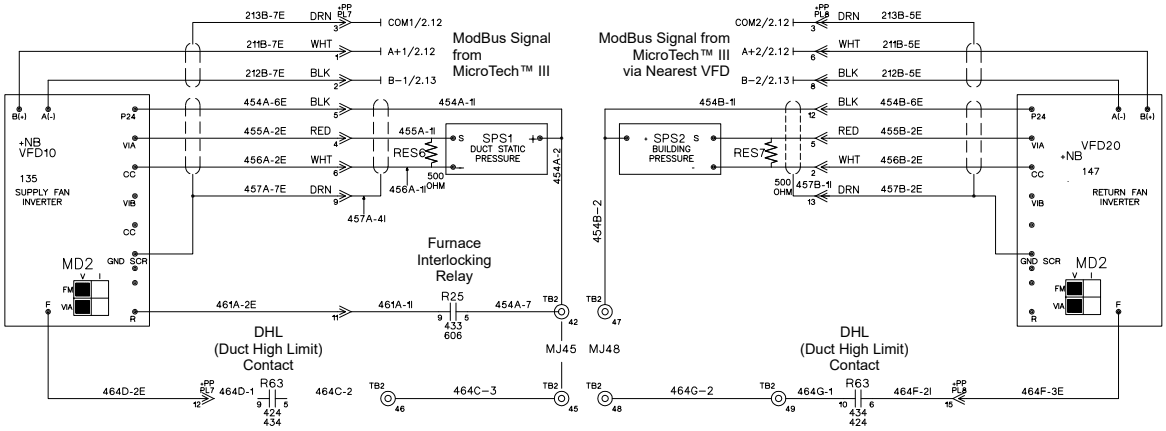
⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Modifying or changing parameters whose function is not described in this manual will affect drive controller operation. Some register changes will take effect as soon as they are entered.
- Do not modify or change parameters whose function is not described in this instruction bulletin.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

Figure 22: VFD 10 and 20 Wiring Diagram



NOTE: Contacts and terminations are in the unit control panel.

Switch Settings

Switch Label	Switch Function	Proper Switch Position
SW 100	Voltage	Left
SW 101	Voltage	Right
SW 102	Source	Right

Some early MicroTech III installations used the RJ45 comm connections which require a different settings for parameter F807 dependent on the connection will determine the setting for parameter F807.
RJ45 = 0
Two terminal A(-) & B(+) = 1

Parameter Settings:

The MD2 VFD has been made to Daikin specifications. All factory installed MD2 VFDs with MicroTech III controls are also factory configured and started. Table 44 lists the parameters that have been specifically configured for Daikin or else may need owner adjustment as described in this manual.

- "VFD Default" settings are the vendor defaults.
- "Daikin Settings" are the recommended settings for Daikin units.
- No other parameters should be needed or adjusted.

NOTE: To restore the MD2 drive to 60Hz Factory default setting you would first set parameter PYt to 3, press enter followed by setting parameter PYt to 2 and pressing enter again. The operation specific Daikin parameters would then need to be changed for proper unit operation.

NOTE: **Remember to do this last!**

When changing parameters the last parameter to save is "tYP" After making the changes necessary go to tYP and select "SAvE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Table 44: Parameter Settings

Code	Comm #	Function	Default Value	Daikin Value
AU1	0	Automatic acceleration/deceleration	1	0
AU4	40	Automatic function setting	0	1
CMOd	3	Command mode selection	0	2
FMOd	4	Frequency setting mode selection 1	1	4
tYP	7	Default setting	0	7
FM	6	Meter adjustment	145	318
ACC	9	Acceleration time 1	10	60
dEC	10	Deceleration time 1	10	60
FH	11	Maximum frequency	50	60
UL	12	Upper limit frequency	50	60
LL	13	Lower limit frequency	0	20
uL	14	Base frequency 1	50	60
uLu	409	Base frequency voltage 1	—	Motor
OLM	17	Electric-thermal protection characteristic selection	0	1
F111	111	Input terminal selection1 (F)	2	45
F112	112	Input terminal selection 2 (R)	6	0
F130	130	Output terminal selection 1A (RY-RC)	4	14
F170	170	Base frequency 2	50	60
F268	268	Initial value of UP/DOWN frequency	0	20
F303	303	Retry selection (number of times)	3	5
F605	605	Output phase failure detection mode selection	3	5
F732	732	Panel operation prohibition (Local/Remote keys)	0	1
F801	801	Parity	1	1
F802	802	Inverter number; SAF=1;RAF=2;HW=3	1	=1; Daikin[1]
F803	803	Communication error trip time	3	10
F814	814	Communication input point 2 frequency	0	=60; Daikin
F821	821	Parity	1	0; Daikin
F851	851	Inverter action at communication break	4	0
F880	880	Free notes	0	321

[1] F802 parameter setting will vary depending on application. 1= Supply Air Fan, 2= Return Air Fan, 3= Heat Wheel.

Maverick II with MicroTech III Controls for SAF and EAF Applications

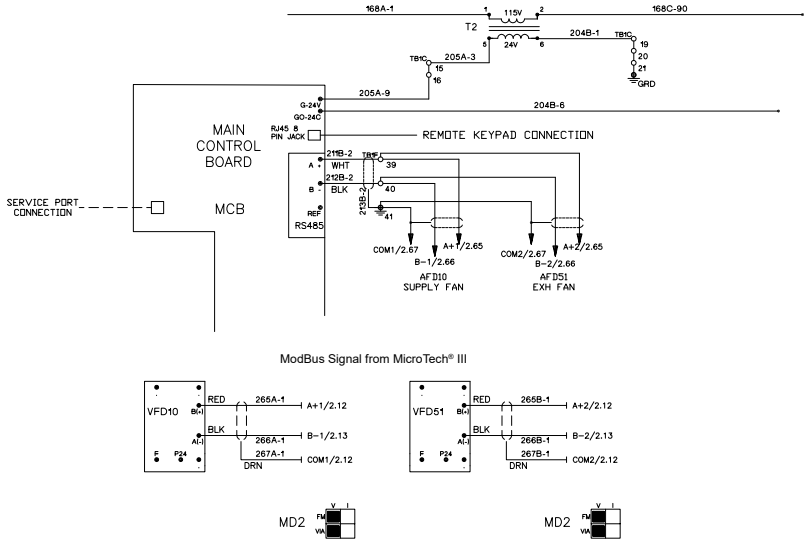
⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Modifying or changing parameters whose function is not described in this manual will affect drive controller operation. Some register changes will take effect as soon as they are entered.
- Do not modify or change parameters whose function is not described in this instruction bulletin.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

Figure 23: AF (10) and EAF (51) Wiring Diagram



NOTE: Contacts and terminations are in the unit control panel.

Switch Settings

Switch Label	Switch Function	Proper Switch Position
SW 100	Voltage	Left
SW 101	Voltage	Right
SW 102	Source	Right

Parameter Settings:

The MD2 VFD has been made to Daikin specifications. All factory installed MD2 VFDs with MicroTech III controls are also factory configured and started. Table 45 lists the parameters that have been specifically configured for Daikin or else may need owner adjustment as described in this manual.

- "VFD Default" settings are the vendor defaults.
- "Daikin Settings" are the recommended settings for Daikin units.
- No other parameters should be needed or adjusted.

NOTE: To restore the MD2 drive to 60Hz Factory default setting you would first set parameter PYt to 3, press enter followed by setting parameter PYt to 2 and pressing enter again. The operation specific Daikin parameters would then need to be changed for proper unit operation.

NOTE: **Remember to do this last!**

When changing parameters the last parameter to save is "tYP" After making the changes necessary go to tYP and select "SAvE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Table 45: MPS Parameter Settings

Code	Comm #	Function	Default Value	Daikin Value
AU1	0	Automatic acceleration/deceleration	1	0
AU4	40	Automatic function setting	0	1
CMOd	3	Command mode selection	0	2
FMOd	4	Frequency setting mode selection 1	1	4
FM	6	Meter adjustment	145	318
tYP	7	Default setting	0	7
ACC	9	Acceleration time 1	10	60
dEC	10	Deceleration time 1	10	60
FH	11	Maximum frequency	50	60
UL	12	Upper limit frequency	50	60
uL	14	Base frequency 1	50	60
uLu	409	Base frequency voltage 1	—	Motor volts
Pt	15	V/F control mode selection 1	1	0
tHr	600	Motor electronic-thermal protection level 1	100	Motor FLA
OLM	17	Electric-thermal protection characteristic selection	0	1
F130	130	Output terminal selection 1A (RY-RC)	4	14
F303	303	Retry selection (number of times)	3	5
F605	605	Output phase failure detection mode selection	3	5
F632	632	Thermal memory selection	0	1
F732	732	Panel operation prohibition	0	1
F801	801	Parity	1	1
F802	802[1]	Inverter number	1	1, 2, 3
F803	803	Communication error trip time	3	10
F807	807	Comm Port	1	See note[2]
F821	821	Parity	1	0: Daikin
F829	829	Selection of communication protocol	1	1
F851	851	Inverter action at communication break	4	0
F880	880	Free notes	0	207

1. 802 parameter setting will vary depending on application. 1= Supply Air Fan, 2= Return Air Fan, 3= Heat Wheel.
2. F807 = 0 if RJ45 plug used for communications port, 1 if terminals A & B used for Modus connections

Rooftop and Self-Contained with MicroTech III Controls for Speedtrol Condenser Fan Control

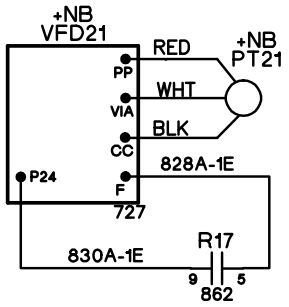
⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Modifying or changing parameters whose function is not described in this manual will affect drive controller operation. Some register changes will take effect as soon as they are entered.
- Do not modify or change parameters whose function is not described in this instruction bulletin.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

Figure 24: SpeedTrol Wiring Diagram



PT21 is a refrigerant pressure sensing transducer

R17 is a compressor intelocking relay

NOTE: Contacts and terminations are in the unit control panel.

Switch Settings

Switch Label	Switch Function	Proper Switch Position
SW 100	Voltage	Left
SW 101	Voltage	Right
SW 102	Source	Right

Parameter Settings:

The MD2 VFD has been made to Daikin specifications. All factory installed MD2 VFDs with MicroTech III controls are also factory configured and started. Table 46 lists the parameters that have been specifically configured for Daikin or else may need owner adjustment as described in this manual.

- "VFD Default" settings are the vendor defaults.
- "Daikin Settings" are the recommended settings for Daikin units.
- No other parameters should be needed or adjusted.

NOTE: To restore the MD2 drive to 60Hz Factory default setting you would first set parameter PYt to 3, press enter followed by setting parameter PYt to 2 and pressing enter again. The operation specific Daikin parameters would then need to be changed for proper unit operation.

NOTE: **Remember to do this last!**

When changing parameters the last parameter to save is "tYP" After making the changes necessary go to tYP and select "SAvE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Table 46: Parameter Settings

Code	Comm #	Function	Default Value	Daikin Setting
AU1	0	Automatic acceleration/deceleration	1	0
AU4	40	Automatic function setting	0	1
tYP	7	Default setting	0	7
ACC	9	Acceleration time 1	10	10
dEC	10	Deceleration time 1	10	30
FH	11	Maximum frequency	50	60
UL	12	Upper limit frequency	50	60
LL	13	Lower limit frequency	0	23
uL	14	Base frequency 1	50	60
uLu	409	Base frequency voltage 1	—	Daikin to set at Factory
tHr	600	Motor electronic thermal protection level in amperes. Adjust thr to the nominal current value which appears on the motor nameplate.	100	Daikin to set at Factory
OLN	17	Electric-thermal protection characteristic selection	0	2
F110	110	Always-active function selection	1	0
F111	111	Input terminal selection1 (F)	2	56
F112	112	Input terminal selection 2(R)	6	0
F113	113	Input terminal selection 3 (RST)	10	0
F118	118	Input terminal selection 8 (VIA)	7	0
F130	130	Output terminal selection 1A (RY-RC)	4	14
F132	132	Output terminal selection 3 (FL)	11	5
F170	170	Base frequency 2	50	60
F201	201	VIA input point 1 setting	0	10
F202	202	VIA input point 1 frequency	0	23
F203	203	VIA input point 2 setting	100	50
F204	204	VIA input point 2 frequency	50	60
F213	213	VIB input point 2 frequency	50	60
F240	240	Starting frequency	0.5	10
F300	300	PWM carrier frequency	—	6
F496	496	Carrier change adjustment factor	14	1
F821	821	Parity	1	0; Daikin
F880	880	Free notes	0	119

Rooftop Energy Recovery Wheel Speed Control MicroTech III

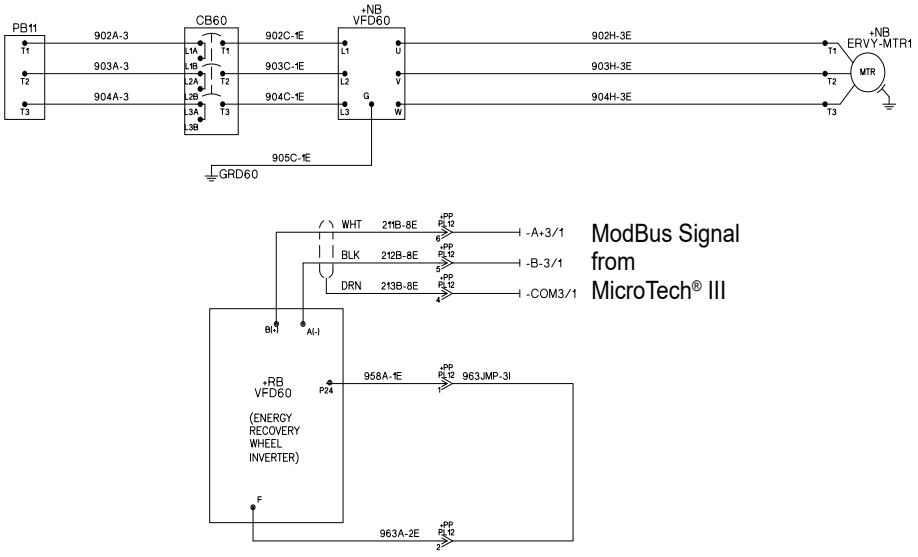
⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Modifying or changing parameters whose function is not described in this manual will affect drive controller operation. Some register changes will take effect as soon as they are entered.
- Do not modify or change parameters whose function is not described in this instruction bulletin.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

Figure 25: ERW Wiring Diagram



NOTE: Contacts and terminations are in the unit control panel.

Switch Settings

Switch Label	Switch Function	Proper Switch Position
SW 100	Voltage	Left
SW 101	Voltage	Right
SW 102	Source	Right

Parameter Settings:

The MD2 VFD has been made to Daikin specifications. All factory installed MD2 VFDs with MicroTech III controls are also factory configured and started. Table 47 lists the parameters that have been specifically configured for Daikin or else may need owner adjustment as described in this manual.

- "VFD Default" settings are the vendor defaults.
- "Daikin Settings" are the recommended settings for Daikin units.
- No other parameters should be needed or adjusted.

NOTE: To restore the MD2 drive to 60Hz Factory default setting you would first set parameter PYt to 3, press enter followed by setting parameter PYt to 2 and pressing enter again. The operation specific Daikin parameters would then need to be changed for proper unit operation.

NOTE: **Remember to do this last!**

When changing parameters the last parameter to save is "tYP" After making the changes necessary go to tYP and select "SAuE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Table 47: Parameter Settings

Code	Comm #	Function	Default	Daikin Setting
AU1	0	Automatic acceleration/deceleration	1	0
AU4	40	Automatic function setting	0	1
CMOd	3	Command mode selection	0	2
FMOd	4	Frequency setting mode selection 1	1	4
FM	6	Meter adjustment	145	318
tYP	7	Default setting	0	7
ACC	9	Acceleration time 1	10	60
dEC	10	Deceleration time 1	10	60
FH	11	Maximum frequency	50	60
UL	12	Upper limit frequency	50	60
LL	13	Lower limit frequency	0	6; Daikin
uL	14	Base frequency 1	50	60
uLu	409	Base frequency voltage 1	—	Daikin to set at Factory
OLM	17	Electric-thermal protection characteristic selection	0	1
F109	109	Analog/contact input function selection (VIA/VIB)	0	2
F110	110	Always-active function selection	1	0
F111	111	Input terminal selection1 (F)	2	0
F112	112	Input terminal selection 2 (R)	6	0
F130	130	Output terminal selection	4	14
F170	170	Base frequency 2	50	60
F268	268	Initial value of UP/DOWN frequency	0	15
F303	303	Retry selection (number of times)	3	5
F605	605	Output phase failure	3	5
F732	732	Panel operation prohibition (local/remote)	0	1
F801	801	Parity	1	1
F802	802	Inverter number, SAF=1, RAF=2	1	=3, Daikin
F803	803	Communication trip time	3	10
F814	814	Communication input point 2 frequency	0	=60, Daikin
F821	821	Parity	1	0; Daikin
F851	851	Inverter action at communication break	4	0
F880	880	Free notes	0	321

Table 48: VFD Parameter Settings

Code	Logical Address	Function Description	Default Value	Revised Value Rev -01
AU1	0	Automatic acceleration/deceleration	1	0
FMOd	4	Frequency setting mode selection 1	1	4
tYP	7	Default setting	0	2
ACC	9	Acceleration time 1	10	20
dEC	10	Deceleration time 1	10	20
FH	11	Maximum frequency	50	60
UL	12	Upper limit frequency	50	60
LL	13	Lower limit frequency	0	29.9
uL	14	Base frequency 1	50	60
uLu	409	Base frequency voltage 1	—	208, 230, 460
tHr	600	Motor electronic thermal protection level in amperes. Adjust thr to the nominal current value which appears on the motor nameplate.	100	100
Sr1	18	Preset-speed operation frequency 1	15	30
Sr2	19	Preset-speed operation frequency 2	20	30
Sr3	20	Preset-speed operation frequency 3	25	30
F111	111	Input terminal selection1 (F)	2	56
F112	112	Input terminal selection 2 (R)	6	0
F113	113	Input terminal selection 3 (RST)	10	0
F118	118	Input terminal selection 8 (VIA)	7	0
F130	130	Output terminal selection 1A (RY-RC)	4	14
F170	170	Base frequency 2	50	60
F202	202	VIA input point 1 frequency	0	60
F204	204	VIA input point 2 frequency	50	60
F213	213	VIB input point 2 frequency	50	60
F268	268	Initial value of UP/DOWN frequency	0	30
F300	300	PWM carrier frequency	—	8
F732	732	Panel operation prohibition (Local/Remote keys)	0	1
F800	800	Communication band speed (RJ45)	1	1
F801	801	Parity (RJ45)	1	1
F802	802	Inverter number	1	5
F803	803	Communication error trip time	3	0
F807	807	Communication channel choice	1	1
F820	820	Communication band speed (screw terminal)	1	0
F821	821	Parity (screw terminal)	1	0
F829	829	Selection of communication protocol	0	1
F851	851	Inverter action at network & communication break	0	1
F856	856	Number of motor poles for communication speed calc	2	4

uLu (Base frequency voltage 1) is factory set to 230 or 460V and must be adjusted for 208V operation.

Controls by Others for SAF, RAF, and EAF Applications

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Modifying or changing parameters whose function is not described in this manual will affect drive controller operation. Some register changes will take effect as soon as they are entered.
- Do not modify or change parameters whose function is not described in this instruction bulletin.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

The MD2 has been made to Daikin's specifications. However, Daikin assumes no responsibility for field installed controls. Commonly used control connections and switch positions are shown in Figure 26 and Figure 27. Table 49 lists parameters settings that are often used with analog control or often require field adjustment. The user or installer should consult the OEM vendor's operation and maintenance manual for more details at www.us.schneider-electric.com.

Switch Settings

Switch Label	Switch Function	Proper Switch Position
SW 100	Voltage	Left
SW 101	Voltage	Right
SW 102	Source	Right

NOTE: To restore the MD2 drive to 60Hz Factory default setting you would first set parameter PYt to 3, press enter followed by setting parameter PYt to 2 and pressing enter again. The operation specific Daikin parameters would then need to be changed for proper unit operation.

The parameters listed above are used to factory test run the drive only. Additional parameter changes may be required to meet field application requirements.

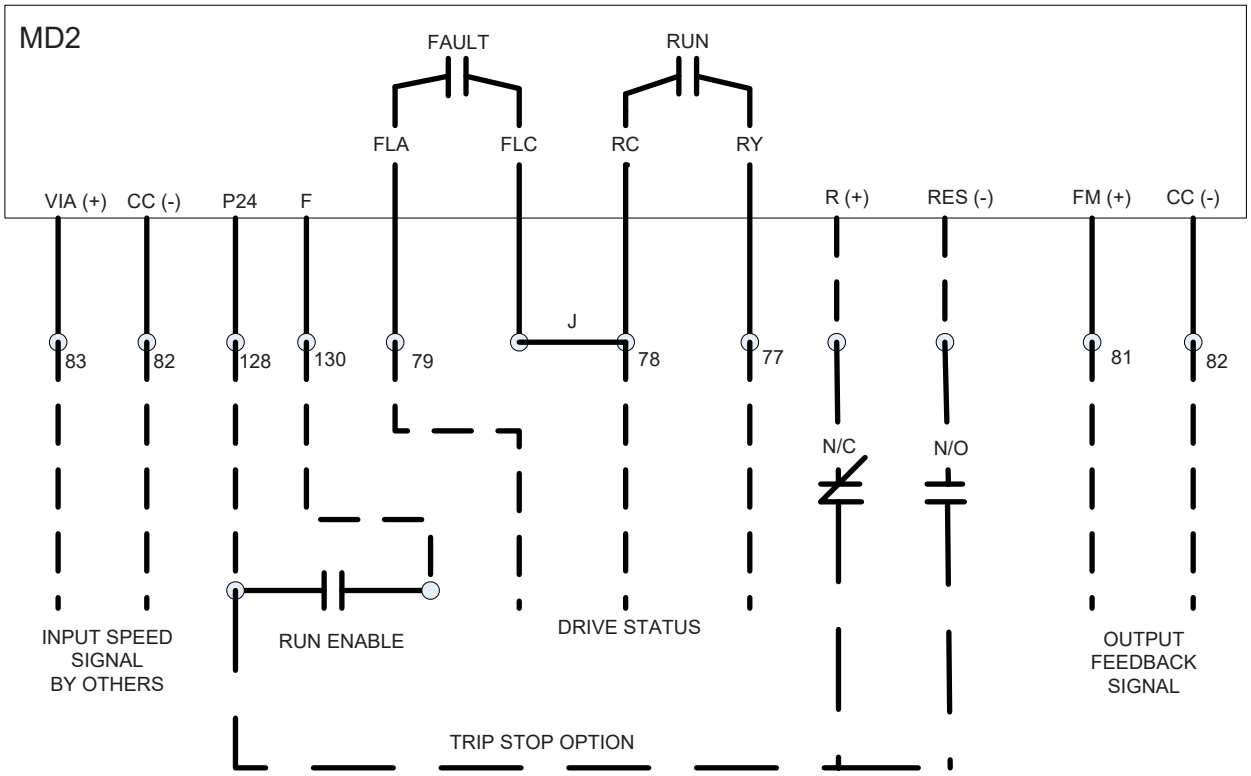
NOTE: **Remember to do this last!**

When changing parameters the last parameter to save is "tYP" After making the changes necessary go to tYP and select "SAvE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Table 49: Parameter Settings

Code	Comm #	Function Description	Default Value	Daikin Value
AU1	0	Automatic acceleration/deceleration	1	0
Fn	6	Meter Adjustment	0	318
tYP	7	Default setting	0	2
ACC	9	Acceleration time 1	10	60
dEC	10	Deceleration time 1	10	60
FH	11	Maximum frequency	50	60
UL	12	Upper limit frequency	50	60
LL	13	Lower limit frequency	0	20
uL	14	Base frequency 1	50	60
uLu	409	Base frequency voltage 1	—	Daikin to set at Factory
tHr	600	Motor electronic-thermal protection level 1	100	Daikin to set at Factory
F108	108	Second always active function	50	0
F111	111	Input terminal selection 1 (F)	60	56
F112	112	Input terminal selection 2 (R)	6	0

Figure 26: Typical Example of Controls by Others Wiring (Trip Stop)



NOTE: Contacts and wire terminations are in the unit control panel. Terminal numbers designations are not applicable to Vision, Skyline, and Destiny units.

Typical Example of programming (IN THIS ORDER)

Set "tYP" = 3 (factory defaults)

Set "tYP" = 2 (60Hz defaults)

Set "AU 1" = 0 (analog control)

Set "LL " = 20 (for a 20Hz minimum speed)

Set "ULU" = motor nominal voltage

Set "tHr " = motor FLA

Set "OL " = 0

Set "F 109" = 0 (VIA to be speed reference terminal)

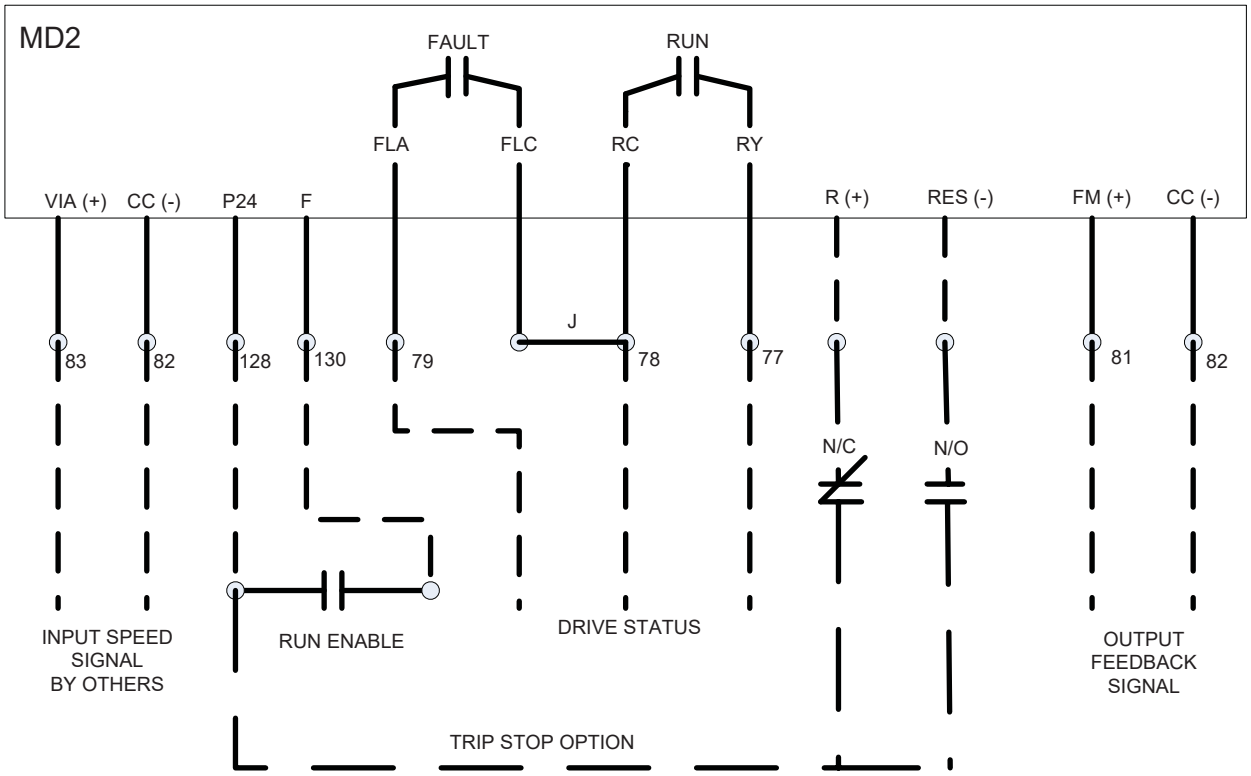
Set "F 111" = 56 (F terminal standby + forward run command)

Additional settings required for Trip Stop option

Set "F 112" = 45 (inverse trip selection for terminal R)

Set "F 113" = 10 (RES to clear trip stop at transition from ON to OFF)

Figure 27: Typical Example of Controls by Others Wiring (Run Permissive)



NOTE: Contacts and wire terminations are in the unit control panel. Terminal numbers designations are not applicable to Vision, Skyline, and Destiny units.

Typical Example of programming (IN THIS ORDER)

Set "tYP" = 3 (factory defaults)

Set "tYP" = 2 (60Hz defaults)

Set "AU 1" = 0 (analog control)

Set "LL " = 20 (for a 20Hz minimum speed)

Set "ULU" = motor nominal voltage

Set "tHr " = motor FLA

Set "F 108" = 0 (always-active function selection 1)

Set "F 109" = 0 (VIA to be speed reference terminal)

Set "F 110" = 0 (always-active function selection 2)

Set "F 111" = 56 (F terminal standby + forward run command)

Set "F 112" = 1 (input terminal selection 2 (R))

Table 50 contains a list of drawings that reference the most current parameter settings for the MD-2 Drive.

Table 50: Parameter List Drawing Reference

Drawing Reference	Description	Application
170637000	CONTROL BY OTHERS	ROOF
170636***	MAVERICK II	MAVERICK
170636700	208V R410A SPEEDTROL	ROOF
170636800	230V R410A SPEEDTROL	ROOF
170636900	460V R410A SPEEDTROL	ROOF
170636300	MTIII, SAF	SWP/ROOF
170636400	MTIII, RAF/EXHAUST	ROOF
170636500	MTIII, ENG REC WHEEL	ROOF
170636600	MTIII, EVAP COND SPEEDTROL	ROOF

NOTE: Contact the Daikin Warranty Service Group to request the most current parameter list drawing.

One analog output is supplied with the drive controller. Terminal FM located on the bottom right terminal strip of the main unit control board is the analog output. FM is a multifunctional programmable analog output supplying an output frequency signal as the factory default.

The FM terminal can output a voltage or current signal:

- When the red switch 2 (SW2) is set to V (voltage), FM outputs a 0-10 VDC signal at 1 mA
- When SW2 is set to I (current), FM outputs a 0-20 mA signal up to 24 VDC

The specific type of signal that the FM terminal will output can be adjusted through parameter FnSL. There are 19 different values that can be programmed through parameter FnSL that effect what type of signal the FM terminal will output.

Scaling of the analog output through the FM terminal can be done in order to output a specific range of analog signal. The FM terminal will output a default 0-10 VDC signal if SW2 is set to V. The FM terminal will output a 0-20 mA signal if SW2 is set to I. In order to output any range other than the drive default, the following procedure must be carried out.

1. Set SW2 to the desired output, V (Voltage) or I (Current).
2. Change parameter FnSL to either 15 or 17 depending on the desired output. For current output, select 15; for voltage output, select 17.
3. Go to parameter Fn on the VFD display. Press Enter. 100 should be displayed.
4. Disconnect all control wiring at terminal FM on the main unit control board.
5. With a digital multimeter measure the voltage or current at the FM terminal. For a voltage measurement, measure across FM and any common (CC) terminal.
6. Use the Up or Down keys to adjust the desired output range while measuring the value at the FM terminal with a digital multimeter. Notice that 100 is flashing on the display of the keypad even while voltage or current readings on the digital multimeter change.
7. Once the desired range has been set, press Enter on the drive keypad. Fn and 100 should flash back and forth on the screen. This means that the desired output value has been locked in or set within the drive controller.
8. Go back to parameter FnSL on the drive display. Set it back to the desired type of output (output frequency, output current, etc.). Parameter Fn has an adjustable range of 1 – 1280 and is a unit less parameter. To find out what value was set at parameter Fn (to achieve the desired output) in steps 1 through 8, follow steps 9 through 11. This procedure is not necessary, but sometimes beneficial to record the actual value that was set at parameter Fn for future reference in case this parameter would happen to be changed, or set back to default at any point in the future.
9. Change parameter FnSL to 19. This setting displays the set value at parameter Fn.
10. Go to parameter Fn on the VFD display. Press Enter. The true value that was locked or set at parameter Fn in steps 1 through 8 should be displayed.
11. Go back to parameter FnSL on the drive display. Set it back to the desired type of output (output frequency, output torque, etc.).

Table 51: Analog Output Function Selection (Meter Selection)

Parameter	Factory Setting	Value	Function	Maximum Signal
FM5L	0	0	Output frequency	Maximum frequency (FH)
		1	Output current	150% of drive controller's rated current
		2	Speed reference	Maximum frequency (FH)
		3	DC bus voltage	150% of drive controller's rated current
		4	Output motor voltage	150% of drive controller's rated current
		5	Input power	185% of drive controller's rated current
		6	Output power	185% of drive controller's rated current
		7	Estimated motor torque	250% of rated motor torque
		8	Motor torque current	Current at 250% of rated motor torque
		9	Motor thermal state	100% of motor's rating
		10	Drive controller thermal state	100%
		11	**DO NOT USE**	
		12	Internal speed reference (after PID)	Maximum frequency (FH)
		13	VIA input value	Maximum input value
		14	VIB input value	Maximum input value
		15	Fixed output – 100% signal (Selection 1 – output current)	
		16	Fixed output – 50% signal (Selection 1 – output current)	
		17	Fixed output – 100% signal (Selections 0, 2, 3, 4, 5, 6, 7, 8, 9,10, 12, 13, 14, 18)	
		18	Serial communication data	FA51 = 1000
		19	**DO NOT USE**	

MPS 30-35 VFD Compressor with MicroTech III Controls for Speedtrol Condenser Fan Control

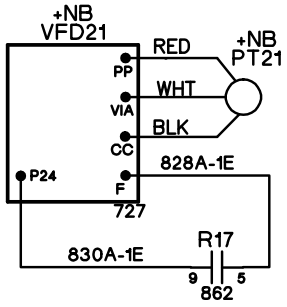
⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Modifying or changing parameters whose function is not described in this manual will affect drive controller operation. Some register changes will take effect as soon as they are entered.
- Do not modify or change parameters whose function is not described in this instruction bulletin.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

Figure 28: SpeedTrol Wiring Diagram for MPS 30–35



PT21 is a refrigerant pressure sensing transducer

R17 is a compressor intelocking relay

NOTE: Contacts and terminations are in the unit control panel.

Switch Settings

Switch Label	Switch Function	Proper Switch Position
SW 100	Voltage	Left
SW 101	Voltage	Right
SW 102	Source	Right

Parameter Settings:

The MD2 VFD has been made to Daikin specifications. All factory installed MD2 VFDs with MicroTech III controls are also factory configured and started. Table 52 lists the parameters that have been specifically configured for Daikin or else may need owner adjustment as described in this manual.

- "VFD Default" settings are the vendor defaults.
- "Daikin Settings" are the recommended settings for Daikin units.
- No other parameters should be needed or adjusted.

NOTE: To restore the MD2 drive to 60Hz Factory default setting you would first set parameter PYt to 3, press enter followed by setting parameter PYt to 2 and pressing enter again. The operation specific Daikin parameters would then need to be changed for proper unit operation.

NOTE: **Remember to do this last!**

When changing parameters the last parameter to save is "tYP" After making the changes necessary go to tYP and select "SAuE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Table 52: Parameter Settings – MPS 30–35 VFD Compressor

Code	Description	Unit	Minimum Value	Maximum Value	Default Value	New Value	Logical Address	Decimal Address	Value to Enter
AU1	Automatic acceleration/deceleration	1	0	2	1	0	0	0	0
AU4	Automatic function setting	1	0	4	0	1	40	64	1
CNOd	Command mode selection	1	0	2	0		3	3	
FNOd	Frequency setting mode selection	1	1	5	1		4	4	
FNSL	Meter selection	1	0	19	0		5	5	
FN	Meter adjustment	1	1	1280	145		6	6	
tYP	Default setting	1	0	9	0	7	7	7	7
Fr	Forward/reverse run selection (Operation panel)	1	0	3	0	8	8		
ACC	Acceleration time 1	0.1sec	0,0	3200,0	10	5	9	9	50
dEC	Deceleration time 1	0.1sec	0,0	3200,0	10	30	10	16	300
FH	Maximum frequency	0.01Hz	30,00	200,00	50	60	11	17	6000
UL	Upper limit frequency	0.01Hz	0,50	80,00	50	60	12	18	6000
LL	Lower limit frequency	0.01Hz	0,00	60,00	0	23	13	19	2300
uL	Base frequency 1	0.01Hz	25,00	200,00	50	60	14	20	6000
uLu	Base frequency voltage 1	0.1V	50,0	660,0		208	409	1033	2080
Pt	V/F control mode selection 1	1	0	6	1		15	21	
ub	Torque boost 1	0.10%	0,0	30,0			16	22	
tHr	Motor electronic-thermal protection level 1	1%	10	100	100	100	600	1536	100
OLM	Electric-thermal protection characteristic selection	1	0	7	0	2	17	23	2
Sr1	Preset-speed operation frequency 1	0.01Hz	0,00	60,00	15		18	24	
Sr2	Preset-speed operation frequency 2	0.01Hz	0,00	60,00	20		19	25	
Sr3	Preset-speed operation frequency 3	0.01Hz	0,00	60,00	25		20	32	
Sr4	Preset-speed operation frequency 4	0.01Hz	0,00	60,00	30		21	33	
Sr5	Preset-speed operation frequency 5	0.01Hz	0,00	60,00	35		22	34	
Sr6	Preset-speed operation frequency 6	0.01Hz	0,00	60,00	40		23	35	
Sr7	Preset-speed operation frequency 7	0.01Hz	0,00	60,00	45		24	36	
F100	Low-speed signal output frequency	0.01Hz	0,00	80,00	0		100	256	
F101	Speed reach setting frequency	0.01Hz	0,00	80,00	0		101	257	
F102	Speed reach detection band	0.01Hz	0,00	80,00	2.5		102	258	
F108	2nd always-active function selection	1	0	71	0		108	264	
F109	Analog/contact input function selection (VIA/VIB)	1	0	2	0		109	265	
F110	Always-active function selection	1	0	71	1	0	110	272	0
F111	Input terminal selection1 (F)	1	0	71	2	56	111	273	56
F112	Input terminal selection 2 (R)	1	0	71	6	0	112	274	0
F113	Input terminal selection 3 (RST)	1	0	71	10	0	113	275	0
F118	Input terminal selection 8 (VIA)	1	0	71	7	0	118	280	0
F130	Output terminal selection 1A (RY-RC)	1	0	255	4	14	130	304	14
F132	Output terminal selection 3 (FL)	1	0	255	11	5	132	306	5
F137	Output terminal selection 1B (RY-RC)	1	0	255	255		137	311	
F139	Output terminal logic selection (RY-RC/OUT-NO)	1	0	1	0		139	313	
F167	Frequency command agreement detection range	0.01Hz	0,00	80,00	2.5		167	359	
F170	Base frequency 2	0.01Hz	25,00	200,00	50	60	170	368	6000
F171	Base frequency voltage 2	0.1V	50,0	660,0			171	369	
F172	Torque boost 2	0.10%	0,0	30,0	5		172	370	
F173	Motor electronic-thermal protection level 2	1%	10	100	100		173	371	
F185	Stall prevention level 2	1%	10	111	110		185	389	
F200	Frequency priority selection	1	0	1	0		200	512	
F201	VIA input point 1 setting	1%	0	100	0	10	201	513	10
F202	VIA input point 1 frequency	0.01Hz	0,00	200,00	0	23	202	514	2300
F203	VIA input point 2 setting	1%	0	100	100	50	203	515	50
F204	VIA input point 2 frequency	0.01Hz	0,00	200,00	50	60	204	516	6000
F207	Frequency setting mode selection 2	1	1	5	2		207	519	
F210	VIB input point 1 setting	1%	0	100	0		210	528	
F211	VIB input point 1 frequency	0.01Hz	0,00	200,00	0		211	529	
F212	VIB input point 2 setting	1%	0	100	100		212	530	
F213	VIB input point 2 frequency	0.01Hz	0,00	200,00	50	60	213	531	6000
F240	Starting frequency setting	0.01Hz	0,50	10,00	0.5	10	240	576	1000
F241	Operation starting frequency	0.01Hz	0,00	80,00	0		241	577	
F242	Operation starting frequency hysteresis	0.01Hz	0,00	80,00	0		242	578	
F250	DC braking starting frequency	0.01Hz	0,00	80,00	0		250	592	
F251	DC braking current	1%	0	100	50		251	593	

NOTE: Remember to do this last!

When changing parameters the last parameter to save is "tYP" After making the changes necessary go to tYP and select "SAvE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Code	Description	Unit	Minimum Value	Maximum Value	Default Value	New Value	Logical Address	Decimal Address	Value to Enter
F252	DC braking time	0.1sec	0,0	20,0	1		252	594	
F256	Time limit for lower-limit frequency operation	0.1sec	0,0	600,0	0		256	598	
F264	Input from external contacts-UP response time	0.1sec	0,0	10,0	0.1		264	612	
F265	Input from external contacts-UP frequency step width	0.01Hz	0,00	80,00	0.1		265	613	
F266	Input from external contacts-DOWN response time	0.1sec	0,0	10,0	0.1		266	614	
F267	Input from external contacts-DOWN frequency step width	0.01Hz	0,00	80,00	0.1		267	615	
F268	Initial value of UP/DOWN frequency	0.01Hz	0,00	60,00	0		268	616	
F269	Saving of changed value of UP/DOWN frequency	1	0	1	1		269	617	
F270	Jump frequency 1	0.01Hz	0,00	80,00	0		270	624	
F271	Jump width 1	0.01Hz	0,00	30,00	0		271	625	
F272	Jump frequency 2	0.01Hz	0,00	80,00	0		272	626	
F273	Jump width 2	0.01Hz	0,00	30,00	0		273	627	
F274	Jump frequency 3	0.01Hz	0,00	80,00	0		274	628	
F275	Jump width 3	0.01Hz	0,00	30,00	0		275	629	
F294	Preset-speed operation frequency 15	0.01Hz	0,00	60,00	50		294	660	
F295	Selection of bumpless	1	0	1	1		295	661	
F300	PWM carrier frequency	0.1kHz	6,0	16,0		6	300	768	60
F301	Auto-restart control selection	1	0	4	3		301	769	
F302	Regeneration power ride-through control (Deceleration stop)	1	0	2	0		302	770	
F303	Retry selection (number of times)	1	0	10	3		303	771	
F305	Over-voltage limit operation (Slowdown stop mode selection)	1	0	3	2		305	773	
F307	Supply voltage correction (limitation of output voltage)	1	0	3	3		307	775	
F311	Reverse-run prohibition	1	0	2	1		311	785	
F312	Random mode	1	0	1	0		312	786	
F316	Carrier frequency control mode selection	1	0	3	1		316	790	
F320	Drooping gain	1%	0	100	0		320	800	
F323	Drooping insensitive torque band	1%	0	100	10		323	803	
F359	PID control waiting time	1sec	0	2400	0		359	857	
F360	PID control	1	0	2	0		360	864	
F362	Proportional gain	0.01	0,01	100,00	0.3		362	866	
F363	Integral gain	0.01	0,01	100,00	0.2		363	867	
F366	Differential gain	0.01	0,00	2,55	0		366	870	
F400	Auto-tuning	1	0	2	0		400	1024	
F401	Slip frequency gain	1%	0	150	50		401	1025	
F402	Motor constant #1 (primary resistance)	0.10%	0,0	30,0			402	1026	
F415	Motor rated current	0.1A	0,1	200,0		13.7	415	1045	137
F416	Motor no-load current	1%	10	100			416	1046	
F417	Motor rated speed	1min-1	100	15000			417	1047	
F418	Speed control response coefficient	1	1	150	40		418	1048	
F419	Speed control stability coefficient	1	1	100	20		419	1049	
F470	VIA bias	1	0	255	128		470	1136	
F471	VIA gain	1	0	255	148		471	1137	
F472	VIB bias	1	0	255	128		472	1138	
F473	VIB gain	1	0	255	148		473	1139	
F480	Exciting strengthening coefficient	1%	100	130	100		480	1152	
F481	Factory adjustment 1	1	0	9999	0		481	1153	
F482	Factory adjustment 2	1	0	9999	442		482	1154	
F483	Factory adjustment 3	0.1	0,0	300,0	100		483	1155	
F485	Stall cooperation gain at field weakening zone 1	1	10	250	100		485	1157	
F492	Stall cooperation gain at field weakening zone 2	1	50	150	100		492	1170	
F494	Motor adjustment factor	1	0	200			494	1172	
F495	Maximum voltage adjustment factor	1%	90	120	104		495	1173	
F496	Carrier change adjustment factor	0.1kHz	0,1	14,0	14	1	496	1174	10
F500	Acceleration time 2	0.1sec	0,0	3200,0	20		500	1280	
F501	Deceleration time 2	0.1sec	0,0	3200,0	20		501	1281	
F502	Acceleration/deceleration 1 pattern	1	0	2	0		502	1282	
F503	Acceleration/deceleration 2 pattern	1	0	2	0		503	1283	
F504	Acceleration/deceleration selection (1/2/3)	1	1	2	1		504	1284	
F505	Acceleration/deceleration 1 and 2 switching frequency	0.01Hz	0,00	60,00	0		505	1285	
F506	S-pattern lower-limit adjustment amount	1%	0	50	10		506	1286	
F507	S-pattern upper-limit adjustment amount	1%	0	50	10		507	1287	
F601	Stall prevention level 1	1%	10	111	110		601	1537	
F602	Inverter trip retention selection	1	0	1	0		602	1538	

NOTE: Remember to do this last!

When changing parameters the last parameter to save is "END" After making the changes necessary go to END and select "SAVE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Code	Description	Unit	Minimum Value	Maximum Value	Default Value	New Value	Logical Address	Decimal Address	Value to Enter
F603	Emergency stop selection	1	0	2	0		603	1539	
F604	Emergency DC braking time	0.1sec	0,0	20,0	1		604	1540	
F605	Output phase failure detection mode selection	1	0	5	3		605	1541	
F607	Motor 150%-overload time limit	1sec	10	2400	300		607	1543	
F608	Input phase failure detection mode selection	1	0	1	1		608	1544	
F609	Hysteresis for small current detection	1%	1	20	10		609	1545	
F610	Low current trip/alarm	1	0	1	0		610	1552	
F611	Small current detection current	1%	0	100	0		611	1553	
F612	Small current detection time	1sec	0	255	0		612	1554	
F613	Detection of output short-circuit during start-up	1	0	3	0		613	1555	
F615	Over-torque trip/alarm selection	1	0	1	0		615	1557	
F616	Over-torque detection level	1%	0	250	130		616	1558	
F618	Over-torque detection time	0.1sec	0,0	10,0	0.5		618	1560	
F619	Over-torque detection level hysteresis	1%	0	100	10		619	1561	
F621	Cumulative operation time alarm setting	0.1	0,0	999,9	610		621	1569	
F626	Over-voltage stall protection level	1%	100	150	140		626	1574	
F627	Under-voltage trip/alarm selection	1	0	2	0		627	1575	
F632	Thermal memory selection	1	0	1	0		632	1586	
F633	Trip at VIA low level input mode	1%	0	100	0		633	1587	
F634	Annual average ambient temperature (calculation for life alarms)	1	1	6	3		634	1588	
F645	Selection of PTC thermal	1	0	2	0		645	1605	
F646	Detection level of PTC	1ohm	100	9999	3000		646	1606	
F650	Rorced/Fire-speed control selection	1	0	1	0		650	1616	
F691	Inclination characteristic of analog output	1	0	1	1		691	1681	
F692	Meter bias	1%	0	100	0		692	1682	
F700	Prohibition of change of parameter settings	1	0	1	0		700	1792	
F701	Unit selection	1	0	1	1		701	1793	
F702	Free unit selection	0.01	0,00	200,00	0		702	1794	
F705	Inclination characteristic of free unit display	1	0	1	1		705	1797	
F706	Free unit display bias	0.01Hz	0,00	80,00	0		706	1798	
F707	Free step 1 (pressing a panel key once)	0.01Hz	0,00	80,00	0		707	1799	
F708	Free step 2 (panel display)	1	0	255	0		708	1800	
F710	Standard monitor display selection	1	0	10	0		710	1808	
F721	Panel stop pattern	1	0	1	0		721	1825	
F730	Prohibition of frequency setting on the operation panel (FC)	1	0	1	0		730	1840	
F732	Panel operation prohibition (Local/Remote keys)	1	0	1	0		732	1842	
F733	Panel operation prohibition (RUN/STOP keys)	1	0	1	0		733	1843	
F734	Prohibition of panel emergency stop operation	1	0	1	0		734	1844	
F735	Prohibition of panel reset operation	1	0	1	0		735	1845	
F738	Selection of AUF	1	0	1	0		738	1848	
F748	Selection of watt hour memory	1	0	1	1		748	1864	
F749	Display unit selection of watt hour	1	0	3	0		749	1865	
F800	Communication band speed	1	0	1	1		800	2048	
F801	Parity	1	0	2	1		801	2049	
F802	Inverter number	1	0	247	1		802	2050	
F803	Communication error trip time	1sec	0	100	3		803	2051	
F805	Communication waiting time	0.01sec	0,00	2,00	1		805	2053	
F806	Setting of master and slave for communication between inverters	1	0	4	4		806	2054	
F807	Communication Channel Choice	1	0	1	1		807	2055	
F811	Communication input point 1 setting	1%	0	100	2		811	2065	
F812	Communication input point 1 frequency	0.01Hz	0,00	200,00	0		812	2066	
F813	Communication input point 2 setting	1%	0	100	0		813	2067	
F814	Communication input point 2 frequency	0.01Hz	0,00	200,00	0		814	2068	
F820	Communication band speed (screw terminal)	1	0	1	1		820	2080	
F821	Parity (screw terminal)	1	0	2	1	0	821	2081	0
F829	Selection of communication protocol	1	0	4	0		829	2089	
F851	Inverter action at network & communication break	1	0	4	0		851	2129	
F856	Number of motor poles for communication speed calculatioon	1	1	8	0		856	2134	
F870	Block write data 1	1	0	6	0		870	2160	
F871	Block write data 2	1	0	6	0		871	2161	
F875	Block read data 1	1	0	11	0		875	2165	

NOTE: Remember to do this last!

When changing parameters the last parameter to save is "tYP" After making the changes necessary go to tYP and select "SAvE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Code	Description	Unit	Minimum Value	Maximum Value	Default Value	New Value	Logical Address	Decimal Address	Value to Enter
F876	Block read data 2	1	0	11	0		876	2166	
F877	Block read data 3	1	0	11	0		877	2167	
F878	Block read data 4	1	0	11	0		878	2168	
F879	Block read data 5	1	0	11	0		879	2169	
F880	Free notes	1	0	65535	0	119	880	2176	119
F890	Parameter for option 1	1	0	65535	0		890	2192	
F891	Parameter for option 2	1	0	65535	0		891	2193	
F892	Parameter for option 3	1	0	65535	0		892	2194	
F893	Parameter for option 4	1	0	65535	0		893	2195	
F894	Parameter for option 5	1	0	65535	0		894	2196	
F895	Parameter for option 6	1	0	65535	0		895	2197	
F896	Parameter for option 7	1	0	65535	0		896	2198	
F897	Parameter for option 8	1	0	65535	0		897	2199	
F898	Parameter for option 9	1	0	65535	0		898	2200	
F899	Parameter for option 10	1	0	65535	0		899	2201	
F910	Step-out detection current level (for PM motors)	1%	10	150	100		910	2320	
F911	Step-out detection time (for PM motors)	0.1sec	0,0	25,0	0.0		911	2321	
F912	q-axis self-inductance (for PM)	0.01mH	0,00	650,00	0.00		912	2322	

NOTE: Remember to do this last!

When changing parameters the last parameter to save is "tYP" After making the changes necessary go to tYP and select "SAvE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

MPS 40–50 VFD Compressor with MicroTech III Controls for Speedtrol Condenser Fan Control

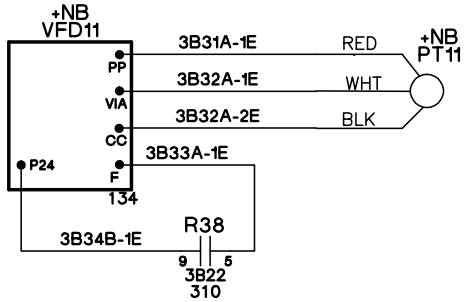
⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- Modifying or changing parameters whose function is not described in this manual will affect drive controller operation. Some register changes will take effect as soon as they are entered.
- Do not modify or change parameters whose function is not described in this instruction bulletin.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

Figure 29: SpeedTrol Wiring Diagram for MPS 40–50



PT11 is a refrigerant pressure sensing transducer

R38 is a compressor intelocking relay

NOTE: Contacts and terminations are in the unit control panel.

Switch Settings

Switch Label	Switch Function	Proper Switch Position
SW 100	Voltage	Left
SW 101	Voltage	Right
SW 102	Source	Right

Parameter Settings:

The MD2 VFD has been made to Daikin specifications. All factory installed MD2 VFDs with MicroTech III controls are also factory configured and started. Table 53 lists the parameters that have been specifically configured for Daikin or else may need owner adjustment as described in this manual.

- "VFD Default" settings are the vendor defaults.
- "Daikin Settings" are the recommended settings for Daikin units.
- No other parameters should be needed or adjusted.

NOTE: To restore the MD2 drive to 60Hz Factory default setting you would first set parameter PYt to 3, press enter followed by setting parameter PYt to 2 and pressing enter again. The operation specific Daikin parameters would then need to be changed for proper unit operation.

NOTE: **Remember to do this last!**

When changing parameters the last parameter to save is "tYP" After making the changes necessary go to tYP and select "SAvE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Table 53: Parameter Settings – MPS 40–50 VFD Compressor

Code	Description	Unit	Minimum Value	Maximum Value	Default Value	New Value	Logical Address
AU1	Automatic acceleration/deceleration	1	0	2	1	0	0
AU4	Automatic function setting	1	0	4	0	1	40
CNOd	Command mode selection	1	0	2	0		3
FNOd	Frequency setting mode selection 1	1	1	5	1		4
FNSL	Meter selection	1	0	19	0		5
FM	Meter adjustment	1	1	1280	145		6
tYP	Default setting	1	0	9	0	7	7
Fr	Forward/reverse run selection (Operation panel)	1	0	3	0		8
ACC	Acceleration time 1	0.1sec	0,0	3200,0	10	5	9
dEC	Deceleration time 1	0.1sec	0,0	3200,0	10	30	10
FH	Maximum frequency	0.01Hz	30,00	200,00	50	60	11
UL	Upper limit frequency	0.01Hz	0,50	80,00	50	60	12
LL	Lower limit frequency	0.01Hz	0,00	60,00	0	10	13
uL	Base frequency 1	0.01Hz	25,00	200,00	50	60	14
uLu	Base frequency voltage 1	0.1V	50,0	660,0		208	409
Pt	V/F control mode selection 1	1	0	6	1		15
ub	Torque boost 1	0.10%	0,0	30,0			16
tHr	Motor electronic-thermal protection level 1	1%	10	100	100	100	600
OLN	Electric-thermal protection characteristic selection	1	0	7	0	2	17
Sr1	Preset-speed operation frequency 1	0.01Hz	0,00	60,00	15		18
Sr2	Preset-speed operation frequency 2	0.01Hz	0,00	60,00	20		19
Sr3	Preset-speed operation frequency 3	0.01Hz	0,00	60,00	25		20
Sr4	Preset-speed operation frequency 4	0.01Hz	0,00	60,00	30		21
Sr5	Preset-speed operation frequency 5	0.01Hz	0,00	60,00	35		22
Sr6	Preset-speed operation frequency 6	0.01Hz	0,00	60,00	40		23
Sr7	Preset-speed operation frequency 7	0.01Hz	0,00	60,00	45		24
F100	Low-speed signal output frequency	0.01Hz	0,00	80,00	0		100
F101	Speed reach setting frequency	0.01Hz	0,00	80,00	0		101
F102	Speed reach detection band	0.01Hz	0,00	80,00	2.5		102
F108	2nd always-active function selection	1	0	71	0		108
F109	Analog/contact input function selection (VIA/VIB)	1	0	2	0		109
F110	Always-active function selection	1	0	71	1	0	110
F111	Input terminal selection1 (F)	1	0	71	2	56	111
F112	Input terminal selection 2 (R)	1	0	71	6	0	112
F113	Input terminal selection 3 (RST)	1	0	71	10	0	113
F118	Input terminal selection 8 (VIA)	1	0	71	7	0	118
F130	Output terminal selection 1A (RY-RC)	1	0	255	4	14	130
F132	Output terminal selection 3 (FL)	1	0	255	11	5	132
F137	Output terminal selection 1B (RY-RC)	1	0	255	255		137
F139	Output terminal logic selection (RY-RC/OUT-NO)	1	0	1	0		139
F167	Frequency command agreement detection range	0.01Hz	0,00	80,00	2.5		167
F170	Base frequency 2	0.01Hz	25,00	200,00	50	60	170
F171	Base frequency voltage 2	0.1V	50,0	660,0			171
F172	Torque boost 2	0.10%	0,0	30,0	5		172
F173	Motor electronic-thermal protection level 2	1%	10	100	100		173
F185	Stall prevention level 2	1%	10	111	110		185
F200	Frequency priority selection	1	0	1	0		200
F201	VIA input point 1 setting	1%	0	100	0	10	201
F202	VIA input point 1 frequency	0.01Hz	0,00	200,00	0	10	202
F203	VIA input point 2 setting	1%	0	100	100	50	203
F204	VIA input point 2 frequency	0.01Hz	0,00	200,00	50	60	204
F207	Frequency setting mode selection 2	1	1	5	2		207
F210	VIB input point 1 setting	1%	0	100	0		210
F211	VIB input point 1 frequency	0.01Hz	0,00	200,00	0		211
F212	VIB input point 2 setting	1%	0	100	100		212

NOTE: Remember to do this last!

When changing parameters the last parameter to save is "tYP" After making the changes necessary go to tYP and select "SAuE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Code	Description	Unit	Minimum Value	Maximum Value	Default Value	New Value	Logical Address
F213	VIB input point 2 frequency	0.01Hz	0,00	200,00	50	60	213
F240	Starting frequency setting	0.01Hz	0,50	10,00	0.5	10	240
F241	Operation starting frequency	0.01Hz	0,00	80,00	0	15	241
F242	Operation starting frequency hysteresis	0.01Hz	0,00	80,00	0	5	242
F250	DC braking starting frequency	0.01Hz	0,00	80,00	0		250
F251	DC braking current	1%	0	100	50		251
F252	DC braking time	0.1sec	0,0	20,0	1		252
F256	Time limit for lower-limit frequency operation	0.1sec	0,0	600,0	0		256
F264	Input from external contacts-UP response time	0.1sec	0,0	10,0	0.1		264
F265	Input from external contacts-UP frequency step width	0.01Hz	0,00	80,00	0.1		265
F266	Input from external contacts-DOWN response time	0.1sec	0,0	10,0	0.1		266
F267	Input from external contacts-DOWN frequency step width	0.01Hz	0,00	80,00	0.1		267
F268	Initial value of UP/DOWN frequency	0.01Hz	0,00	60,00	0		268
F269	Saving of changed value of UP/DOWN frequency	1	0	1	1		269
F270	Jump frequency 1	0.01Hz	0,00	80,00	0		270
F271	Jump width 1	0.01Hz	0,00	30,00	0		271
F272	Jump frequency 2	0.01Hz	0,00	80,00	0		272
F273	Jump width 2	0.01Hz	0,00	30,00	0		273
F274	Jump frequency 3	0.01Hz	0,00	80,00	0		274
F275	Jump width 3	0.01Hz	0,00	30,00	0		275
F294	Preset-speed operation frequency 15	0.01Hz	0,00	60,00	50		294
F295	Selection of bumpless	1	0	1	1		295
F300	PWM carrier frequency	0.1kHz	6,0	16,0		6	300
F301	Auto-restart control selection	1	0	4	3		301
F302	Regeneration power ride-through control (Deceleration stop)	1	0	2	0		302
F303	Retry selection (number of times)	1	0	10	3		303
F305	Over-voltage limit operation (Slowdown stop mode selection)	1	0	3	2		305
F307	Supply voltage correction (limitation of output voltage)	1	0	3	3		307
F311	Reverse-run prohibition	1	0	2	1		311
F312	Random mode	1	0	1	0		312
F316	Carrier frequency control mode selection	1	0	3	1		316
F320	Drooping gain	1%	0	100	0		320
F323	Drooping insensitive torque band	1%	0	100	10		323
F359	PID control waiting time	1sec	0	2400	0		359
F360	PID control	1	0	2	0		360
F362	Proportional gain	0.01	0,01	100,00	0.3		362
F363	Integral gain	0.01	0,01	100,00	0.2		363
F366	Differential gain	0.01	0,00	2,55	0		366
F400	Auto-tuning	1	0	2	0		400
F401	Slip frequency gain	1%	0	150	50		401
F402	Motor constant #1 (primary resistance)	0.10%	0,0	30,0			402
F415	Motor rated current	0.1A	0,1	200,0		4.6	415
F416	Motor no-load current	1%	10	100			416
F417	Motor rated speed	1min-1	100	15000			417
F418	Speed control response coefficient	1	1	150	40		418
F419	Speed control stability coefficient	1	1	100	20		419
F470	VIA bias	1	0	255	128		470
F471	VIA gain	1	0	255	148		471
F472	VIB bias	1	0	255	128		472
F473	VIB gain	1	0	255	148		473
F480	Exciting strengthening coefficient	1%	100	130	100		480
F481	Factory adjustment 1	1	0	9999	0		481

NOTE: Remember to do this last!

When changing parameters the last parameter to save is "tYP" After making the changes necessary go to tYP and select "SAvE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Code	Description	Unit	Minimum Value	Maximum Value	Default Value	New Value	Logical Address
F482	Factory adjustment 2	1	0	9999	442		482
F483	Factory adjustment 3	0.1	0,0	300,0	100		483
F485	Stall cooperation gain at field weakening zone 1	1	10	250	100		485
F492	Stall cooperation gain at field weakening zone 2	1	50	150	100		492
F494	Motor adjustment factor	1	0	200			494
F495	Maximum voltage adjustment factor	1%	90	120	104		495
F496	Carrier change adjustment factor	0.1kHz	0,1	14,0	14	1	496
F500	Acceleration time 2	0.1sec	0,0	3200,0	20		500
F501	Deceleration time 2	0.1sec	0,0	3200,0	20		501
F502	Acceleration/deceleration 1 pattern	1	0	2	0		502
F503	Acceleration/deceleration 2 pattern	1	0	2	0		503
F504	Acceleration/deceleration selection (1/2/3)	1	1	2	1		504
F505	Acceleration/deceleration 1 and 2 switching frequency	0.01Hz	0,00	60,00	0		505
F506	S-pattern lower-limit adjustment amount	1%	0	50	10		506
F507	S-pattern upper-limit adjustment amount	1%	0	50	10		507
F601	Stall prevention level 1	1%	10	111	110		601
F602	Inverter trip retention selection	1	0	1	0		602
F603	Emergency stop selection	1	0	2	0		603
F604	Emergency DC braking time	0.1sec	0,0	20,0	1		604
F605	Output phase failure detection mode selection	1	0	5	3		605
F607	Motor 150%-overload time limit	1sec	10	2400	300		607
F608	Input phase failure detection mode selection	1	0	1	1		608
F609	Hysteresis for small current detection	1%	1	20	10		609
F610	Low current trip/alarm	1	0	1	0		610
F611	Small current detection current	1%	0	100	0		611
F612	Small current detection time	1sec	0	255	0		612
F613	Detection of output short-circuit during start-up	1	0	3	0		613
F615	Over-torque trip/alarm selection	1	0	1	0		615
F616	Over-torque detection level	1%	0	250	130		616
F618	Over-torque detection time	0.1sec	0,0	10,0	0.5		618
F619	Over-torque detection level hysteresis	1%	0	100	10		619
F621	Cumulative operation time alarm setting	0.1	0,0	999,9	610		621
F626	Over-voltage stall protection level	1%	100	150	140		626
F627	Under-voltage trip/alarm selection	1	0	2	0		627
F632	Thermal memory selection	1	0	1	0		632
F633	Trip at VIA low level input mode	1%	0	100	0		633
F634	Annual average ambient temperature (calculation for life alarms)	1	1	6	3		634
F645	Selection of PTC thermal	1	0	2	0		645
F646	Detection level of PTC	1ohm	100	9999	3000		646
F650	Rorced/Fire-speed control selection	1	0	1	0		650
F691	Inclination characteristic of analog output	1	0	1	1		691
F692	Meter bias	1%	0	100	0		692
F700	Prohibition of change of parameter settings	1	0	1	0		700
F701	Unit selection	1	0	1	1		701
F702	Free unit selection	0.01	0,00	200,00	0		702
F705	Inclination characteristic of free unit display	1	0	1	1		705
F706	Free unit display bias	0.01Hz	0,00	80,00	0		706
F707	Free step 1 (pressing a panel key once)	0.01Hz	0,00	80,00	0		707
F708	Free step 2 (panel display)	1	0	255	0		708
F710	Standard monitor display selection	1	0	10	0		710
F721	Panel stop pattern	1	0	1	0		721
F730	Prohibition of frequency setting on the operation panel (FC)	1	0	1	0		730
F732	Panel operation prohibition (Local/Remote keys)	1	0	1	0		732
F733	Panel operation prohibition (RUN/STOP keys)	1	0	1	0		733
F734	Prohibition of panel emergency stop operation	1	0	1	0		734

NOTE: Remember to do this last!

When changing parameters the last parameter to save is "EYP" After making the changes necessary go to EYP and select "SAVE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Code	Description	Unit	Minimum Value	Maximum Value	Default Value	New Value	Logical Address
F735	Prohibition of panel reset operation	1	0	1	0		735
F738	Selection of AUF	1	0	1	0		738
F748	Selection of watt hour memory	1	0	1	1		748
F749	Display unit selection of watt hour	1	0	3	0		749
F800	Communication band speed	1	0	1	1		800
F801	Parity	1	0	2	1		801
F802	Inverter number	1	0	247	1		802
F803	Communication error trip time	1sec	0	100	3		803
F805	Communication waiting time	0.01sec	0,00	2,00	1		805
F806	Setting of master and slave for communication between inverters	1	0	4	4		806
F807	Communication Channel Choice	1	0	1	1		807
F811	Communication input point 1 setting	1%	0	100	2		811
F812	Communication input point 1 frequency	0.01Hz	0,00	200,00	0		812
F813	Communication input point 2 setting	1%	0	100	0		813
F814	Communication input point 2 frequency	0.01Hz	0,00	200,00	0		814
F820	Communication band speed (screw terminal)	1	0	1	1		820
F821	Parity (screw terminal)	1	0	2	1	0	821
F829	Selection of communication protocol	1	0	4	0		829
F851	Inverter action at network & communication break	1	0	4	0		851
F856	Number of motor poles for communication speed calculatioon	1	1	8	0		856
F870	Block write data 1	1	0	6	0		870
F870	Block write data 2	1	0	6	0		871
F875	Block read data 1	1	0	11	0		875
F876	Block read data 2	1	0	11	0		876
F877	Block read data 3	1	0	11	0		877
F878	Block read data 4	1	0	11	0		878
F879	Block read data 5	1	0	11	0		879
F880	Free notes	1	0	65535	0	119	880
F890	Parameter for option 1	1	0	65535	0		890
F891	Parameter for option 2	1	0	65535	0		891
F892	Parameter for option 3	1	0	65535	0		892
F893	Parameter for option 4	1	0	65535	0		893
F894	Parameter for option 5	1	0	65535	0		894
F895	Parameter for option 6	1	0	65535	0		895
F896	Parameter for option 7	1	0	65535	0		896
F897	Parameter for option 8	1	0	65535	0		897
F898	Parameter for option 9	1	0	65535	0		898
F899	Parameter for option 10	1	0	65535	0		899
F910	Step-out detection current level (for PM motors)	1%	10	150	100		910
F911	Step-out detection time (for PM motors)	0.1sec	0,0	25,0	0.0		911
F912	q-axis self-inductance (for PM)	0.01mH	0,00	650,00	0.00		912

NOTE: Remember to do this last!

When changing parameters the last parameter to save is "tYP" After making the changes necessary go to tYP and select "SAvE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Digital Compressor with MicroTech III Controls for Speedtrol Condenser Fan Control

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

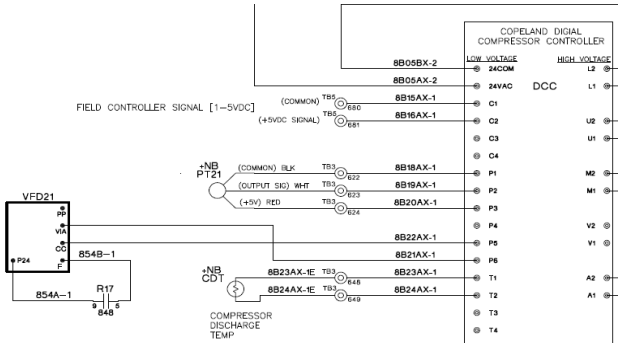
- Modifying or changing parameters whose function is not described in this manual will affect drive controller operation. Some register changes will take effect as soon as they are entered.
- Do not modify or change parameters whose function is not described in this instruction bulletin.

Failure to follow this instruction can result in death, serious injury, or equipment damage.

Figure 30: SpeedTrol Wiring Diagram for Digital Compressors

PT 21 is a refrigerant pressure transducer, the speed signal is transmitted out of the digital controller to the VFD.

R17 is the enable relay for circuit 2



NOTE: Contacts and terminations are in the unit control panel.

Switch Settings

Switch Label	Switch Function	Proper Switch Position
SW 100	Voltage	Left
SW 101	Voltage	Right
SW 102	Source	Right

Parameter Settings:

The MD2 VFD has been made to Daikin specifications. All factory installed MD2 VFDs with MicroTech III controls are also factory configured and started. Table 53 lists the parameters that have been specifically configured for Daikin or else may need owner adjustment as described in this manual.

- "VFD Default" settings are the vendor defaults.
- "Daikin Settings" are the recommended settings for Daikin units.
- No other parameters should be needed or adjusted.

NOTE: To restore the MD2 drive to 60Hz Factory default setting you would first set parameter PYt to 3, press enter followed by setting parameter PYt to 2 and pressing enter again. The operation specific Daikin parameters would then need to be changed for proper unit operation.

NOTE: **Remember to do this last!**

When changing parameters the last parameter to save is "tYP" After making the changes necessary go to tYP and select "SAuE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Table 54: Parameter Settings – Digital Compressor

Code	Description	Unit	Minimum Value	Maximum Value	Default Value	New Value	Logical Address
AU1	Automatic acceleration/deceleration	1	0	2	1	0	0
AU4	Automatic function setting	1	0	4	0	1	40
CMOd	Command mode selection	1	0	2	0		3
FMOd	Frequency setting mode selection 1	1	1	5	1		4
FMSL	Meter selection	1	0	19	0		5
FM	Meter adjustment	1	1	1280	145		6
tYP	Default setting	1	0	9	0	7	7
Fr	Forward/reverse run selection (Operation panel)	1	0	3	0		8
ACC	Acceleration time 1	0.1sec	0,0	3200,0	10	5	9
dEC	Deceleration time 1	0.1sec	0,0	3200,0	10	30	10
FH	Maximum frequency	0.01Hz	30,00	200,00	50	60	11
UL	Upper limit frequency	0.01Hz	0,50	80,00	50	60	12
LL	Lower limit frequency	0.01Hz	0,00	60,00	0	10	13
uL	Base frequency 1	0.01Hz	25,00	200,00	50	60	14
uLu	Base frequency voltage 1	0.1V	50,0	660,0		460	409
Pt	V/F control mode selection 1	1	0	6	1		15
ub	Torque boost 1	0.10%	0,0	30,0			16
tHr	Motor electronic-thermal protection level 1	1%	10	100	100	100	600
OLM	Electric-thermal protection characteristic selection	1	0	7	0	2	17
Sr1	Preset-speed operation frequency 1	0.01Hz	0,00	60,00	15		18
Sr2	Preset-speed operation frequency 2	0.01Hz	0,00	60,00	20		19
Sr3	Preset-speed operation frequency 3	0.01Hz	0,00	60,00	25		20
Sr4	Preset-speed operation frequency 4	0.01Hz	0,00	60,00	30		21
Sr5	Preset-speed operation frequency 5	0.01Hz	0,00	60,00	35		22
Sr6	Preset-speed operation frequency 6	0.01Hz	0,00	60,00	40		23
Sr7	Preset-speed operation frequency 7	0.01Hz	0,00	60,00	45		24
F100	Low-speed signal output frequency	0.01Hz	0,00	80,00	0		100
F101	Speed reach setting frequency	0.01Hz	0,00	80,00	0		101
F102	Speed reach detection band	0.01Hz	0,00	80,00	2.5		102
F108	2nd always-active function selection	1	0	71	0		108
F109	Analog/contact input function selection (VIA/VIB)	1	0	2	0		109
F110	Always-active function selection	1	0	71	1	0	110
F111	Input terminal selection1 (F)	1	0	71	2	56	111
F112	Input terminal selection 2 (R)	1	0	71	6	0	112
F113	Input terminal selection 3 (RST)	1	0	71	10	0	113
F118	Input terminal selection 8 (VIA)	1	0	71	7	0	118
F130	Output terminal selection 1A (RY-RC)	1	0	255	4	14	130
F132	Output terminal selection 3 (FL)	1	0	255	11	5	132
F137	Output terminal selection 1B (RY-RC)	1	0	255	255		137
F139	Output terminal logic selection (RY-RC/OUT-NO)	1	0	1	0		139
F167	Frequency command agreement detection range	0.01Hz	0,00	80,00	2.5		167
F170	Base frequency 2	0.01Hz	25,00	200,00	50	60	170
F171	Base frequency voltage 2	0.1V	50,0	660,0			171
F172	Torque boost 2	0.10%	0,0	30,0	5		172
F173	Motor electronic-thermal protection level 2	1%	10	100	100		173
F185	Stall prevention level 2	1%	10	111	110		185
F200	Frequency priority selection	1	0	1	0		200
F201	VIA input point 1 setting	1%	0	100	0	15	201
F202	VIA input point 1 frequency	0.01Hz	0,00	200,00	0	10	202
F203	VIA input point 2 setting	1%	0	100	100	28	203
F204	VIA input point 2 frequency	0.01Hz	0,00	200,00	50	60	204
F207	Frequency setting mode selection 2	1	1	5	2		207
F210	VIB input point 1 setting	1%	0	100	0		210
F211	VIB input point 1 frequency	0.01Hz	0,00	200,00	0		211
F212	VIB input point 2 setting	1%	0	100	100		212
F213	VIB input point 2 frequency	0.01Hz	0,00	200,00	50	60	213
F240	Starting frequency setting	0.01Hz	0,50	10,00	0.5	10	240
F241	Operation starting frequency	0.01Hz	0,00	80,00	0	15	241
F242	Operation starting frequency hysteresis	0.01Hz	0,00	80,00	0	5	242
F250	DC braking starting frequency	0.01Hz	0,00	80,00	0		250
F251	DC braking current	1%	0	100	50		251

NOTE: Remember to do this last!

When changing parameters the last parameter to save is "tYP" After making the changes necessary go to tYP and select "SAvE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Code	Description	Unit	Minimum Value	Maximum Value	Default Value	New Value	Logical Address
F252	DC braking time	0.1sec	0,0	20,0	1		252
F256	Time limit for lower-limit frequency operation	0.1sec	0,0	600,0	0		256
F264	Input from external contacts-UP response time	0.1sec	0,0	10,0	0.1		264
F265	Input from external contacts-UP frequency step width	0.01Hz	0,00	80,00	0.1		265
F266	Input from external contacts-DOWN response time	0.1sec	0,0	10,0	0.1		266
F267	Input from external contacts-DOWN frequency step width	0.01Hz	0,00	80,00	0.1		267
F268	Initial value of UP/DOWN frequency	0.01Hz	0,00	60,00	0		268
F269	Saving of changed value of UP/DOWN frequency	1	0	1	1		269
F270	Jump frequency 1	0.01Hz	0,00	80,00	0		270
F271	Jump width 1	0.01Hz	0,00	30,00	0		271
F272	Jump frequency 2	0.01Hz	0,00	80,00	0		272
F273	Jump width 2	0.01Hz	0,00	30,00	0		273
F274	Jump frequency 3	0.01Hz	0,00	80,00	0		274
F275	Jump width 3	0.01Hz	0,00	30,00	0		275
F294	Preset-speed operation frequency 15	0.01Hz	0,00	60,00	50		294
F295	Selection of bumpless	1	0	1	1		295
F300	PWM carrier frequency	0.1kHz	6,0	16,0		6	300
F301	Auto-restart control selection	1	0	4	3		301
F302	Regeneration power ride-through control (Deceleration stop)	1	0	2	0		302
F303	Retry selection (number of times)	1	0	10	3		303
F305	Over-voltage limit operation (Slowdown stop mode selection)	1	0	3	2		305
F307	Supply voltage correction (limitation of output voltage)	1	0	3	3		307
F311	Reverse-run prohibition	1	0	2	1		311
F312	Random mode	1	0	1	0		312
F316	Carrier frequency control mode selection	1	0	3	1		316
F320	Drooping gain	1%	0	100	0		320
F323	Drooping insensitive torque band	1%	0	100	10		323
F359	PID control waiting time	1sec	0	2400	0		359
F360	PID control	1	0	2	0		360
F362	Proportional gain	0.01	0,01	100,00	0.3		362
F363	Integral gain	0.01	0,01	100,00	0.2		363
F366	Differential gain	0.01	0,00	2,55	0		366
F400	Auto-tuning	1	0	2	0		400
F401	Slip frequency gain	1%	0	150	50		401
F402	Motor constant #1 (primary resistance)	0.10%	0,0	30,0			402
F415	Motor rated current	0.1A	0,1	200,0		5.1	415
F416	Motor no-load current	1%	10	100			416
F417	Motor rated speed	1min-1	100	15000			417
F418	Speed control response coefficient	1	1	150	40		418
F419	Speed control stability coefficient	1	1	100	20		419
F470	VIA bias	1	0	255	128		470
F471	VIA gain	1	0	255	148		471
F472	VIB bias	1	0	255	128		472
F473	VIB gain	1	0	255	148		473
F480	Exciting strengthening coefficient	1%	100	130	100		480
F481	Factory adjustment 1	1	0	9999	0		481
F482	Factory adjustment 2	1	0	9999	442		482
F483	Factory adjustment 3	0.1	0,0	300,0	100		483
F485	Stall cooperation gain at field weakening zone 1	1	10	250	100		485
F492	Stall cooperation gain at field weakening zone 2	1	50	150	100		492
F494	Motor adjustment factor	1	0	200			494
F495	Maximum voltage adjustment factor	1%	90	120	104		495
F496	Carrier change adjustment factor	0.1kHz	0,1	14,0	14	1	496
F500	Acceleration time 2	0.1sec	0,0	3200,0	20		500
F501	Deceleration time 2	0.1sec	0,0	3200,0	20		501
F502	Acceleration/deceleration 1 pattern	1	0	2	0		502
F503	Acceleration/deceleration 2 pattern	1	0	2	0		503
F504	Acceleration/deceleration selection (1/2/3)	1	1	2	1		504
F505	Acceleration/deceleration 1 and 2 switching frequency	0.01Hz	0,00	60,00	0		505
F506	S-pattern lower-limit adjustment amount	1%	0	50	10		506
F507	S-pattern upper-limit adjustment amount	1%	0	50	10		507
F601	Stall prevention level 1	1%	10	111	110		601
F602	Inverter trip retention selection	1	0	1	0		602

NOTE: Remember to do this last!

When changing parameters the last parameter to save is "EXP" After making the changes necessary go to EXP and select "SAVE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Code	Description	Unit	Minimum Value	Maximum Value	Default Value	New Value	Logical Address
F603	Emergency stop selection	1	0	2	0		603
F604	Emergency DC braking time	0.1sec	0,0	20,0	1		604
F605	Output phase failure detection mode selection	1	0	5	3		605
F607	Motor 150%-overload time limit	1sec	10	2400	300	607	
F608	Input phase failure detection mode selection	1	0	1	1		608
F609	Hysteresis for small current detection	1%	1	20	10		609
F610	Low current trip/alarm	1	0	1	0		610
F611	Small current detection current	1%	0	100	0		611
F612	Small current detection time	1sec	0	255	0		612
F613	Detection of output short-circuit during start-up	1	0	3	0		613
F615	Over-torque trip/alarm selection	1	0	1	0		615
F616	Over-torque detection level	1%	0	250	130		616
F618	Over-torque detection time	0.1sec	0,0	10,0	0.5		618
F619	Over-torque detection level hysteresis	1%	0	100	10		619
F621	Cumulative operation time alarm setting	0.1	0,0	999,9	610		621
F626	Over-voltage stall protection level	1%	100	150	140		626
F627	Under-voltage trip/alarm selection	1	0	2	0		627
F632	Thermal memory selection	1	0	1	0		632
F633	Trip at VIA low level input mode	1%	0	100	0		633
F634	Annual average ambient temperature (calculation for life alarms)	1	1	6	3		634
F645	Selection of PTC thermal	1	0	2	0		645
F646	Detection level of PTC	1ohm	100	9999	3000		646
F650	Rorced/Fire-speed control selection	1	0	1	0		650
F691	Inclination characteristic of analog output	1	0	1	1		691
F692	Meter bias	1%	0	100	0		692
F700	Prohibition of change of parameter settings	1	0	1	0		700
F701	Unit selection	1	0	1	1		701
F702	Free unit selection	0.01	0,00	200,00	0		702
F705	Inclination characteristic of free unit display	1	0	1	1		705
F706	Free unit display bias	0.01Hz	0,00	80,00	0		706
F707	Free step 1 (pressing a panel key once)	0.01Hz	0,00	80,00	0		707
F708	Free step 2 (panel display)	1	0	255	0		708
F710	Standard monitor display selection	1	0	10	0		710
F721	Panel stop pattern	1	0	1	0		721
F730	Prohibition of frequency setting on the operation panel (FC)	1	0	1	0		730
F732	Panel operation prohibition (Local/Remote keys)	1	0	1	0		732
F733	Panel operation prohibition (RUN/STOP keys)	1	0	1	0		733
F734	Prohibition of panel emergency stop operation	1	0	1	0		734
F735	Prohibition of panel reset operation	1	0	1	0		735
F738	Selection of AUF	1	0	1	0		738
F748	Selection of watt hour memory	1	0	1	1		748
F749	Display unit selection of watt hour	1	0	3	0		749
F800	Communication band speed	1	0	1	1		800
F801	Parity	1	0	2	1		801
F802	Inverter number	1	0	247	1		802
F803	Communication error trip time	1sec	0	100	3		803
F845	Communication waiting time	0.01sec	0,00	2,00	1		805
F806	Setting of master and slave for communication between inverters	1	0	4	4		806
F807	Communication Channel Choice	1	0	1	1		807
F811	Communication input point 1 setting	1%	0	100	2		811
F812	Communication input point 1 frequency	0.01Hz	0,00	200,00	0		812
F813	Communication input point 2 setting	1%	0	100	0		813
F814	Communication input point 2 frequency	0.01Hz	0,00	200,00	0		814
F820	Communication band speed (screw terminal)	1	0	1	1		820
F821	Parity (screw terminal)	1	0	2	1	0	821
F829	Selection of communication protocol	1	0	4	0		829
F851	Inverter action at network & communication break	1	0	4	0		851
F856	Number of motor poles for communication speed calculatioon	1	1	8	0		856
F870	Block write data 1	1	0	6	0		870
F861	Block write data 2	1	0	6	0		871
F875	Block read data 1	1	0	11	0		875
F876	Block read data 2	1	0	11	0		876
F877	Block read data 3	1	0	11	0		877

NOTE: Remember to do this last!

When changing parameters the last parameter to save is "EYP" After making the changes necessary go to EYP and select "SAVE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

Code	Description	Unit	Minimum Value	Maximum Value	Default Value	New Value	Logical Address
F878	Block read data 4	1	0	11	0		878
F879	Block read data 5	1	0	11	0		879
F880	Free notes	1	0	65535	0	119	880
F890	Parameter for option 1	1	0	65535	0		890
F891	Parameter for option 2	1	0	65535	0		891
F892	Parameter for option 3	1	0	65535	0		892
F893	Parameter for option 4	1	0	65535	0		893
F894	Parameter for option 5	1	0	65535	0		894
F895	Parameter for option 6	1	0	65535	0		895
F896	Parameter for option 7	1	0	65535	0		896
F897	Parameter for option 8	1	0	65535	0		897
F898	Parameter for option 9	1	0	65535	0		898
F899	Parameter for option 10	1	0	65535	0		899
F910	Step-out detection current level (for PM motors)	1%	10	150	100		910
F911	Step-out detection time (for PM motors)	0.1sec	0,0	25,0	0.0		911
F912	q-axis self-inductance (for PM)	0.01mH	0,00	650,00	0.00		912

NOTE: Remember to do this last!

When changing parameters the last parameter to save is "tYP" After making the changes necessary go to tYP and select "SAvE" #7 the drive will then save all the parameters, cycle power to the drive, you can re-apply power after the screen goes blank. When drive is up and running again cycle power to the entire unit. All parameters are saved and functional after the final power cycling.

To incorporate a smoke purge function into the MicroTech III controls the following changes are required.

1. Change parameter F 1 13 which is the input terminal selection. To 52, which is a forced function, meaning; ON: Forced operation mode in which operation is not stopped in the event of the occurrence of a soft fault (preset speed operation frequency15) To use this function, the inverter needs to be so configured at the factory.
2. Change parameter F 2 9 4 which is the forced fire-speed setting frequency, typically 60 htz.
3. Parameter F 6 5 0 which is the forced fire-speed selection to 1.

Use an isolation relay DP/DT we will call this relay FS1 that resides in the fireman's panel, upon activation of the purge cycle the relay will close a normally open set of contacts between P24 and Res on the drive terminal strip. At the same time it will open the circuit that provides power to the MicroTech III Digital input 4. This action will put the MicroTech III controller into an emergency shut down mode and will activate the return fan to exhaust the smoke from the facility through the gravity relief dampers.

Figure 31: Return Fan Wiring Diagram

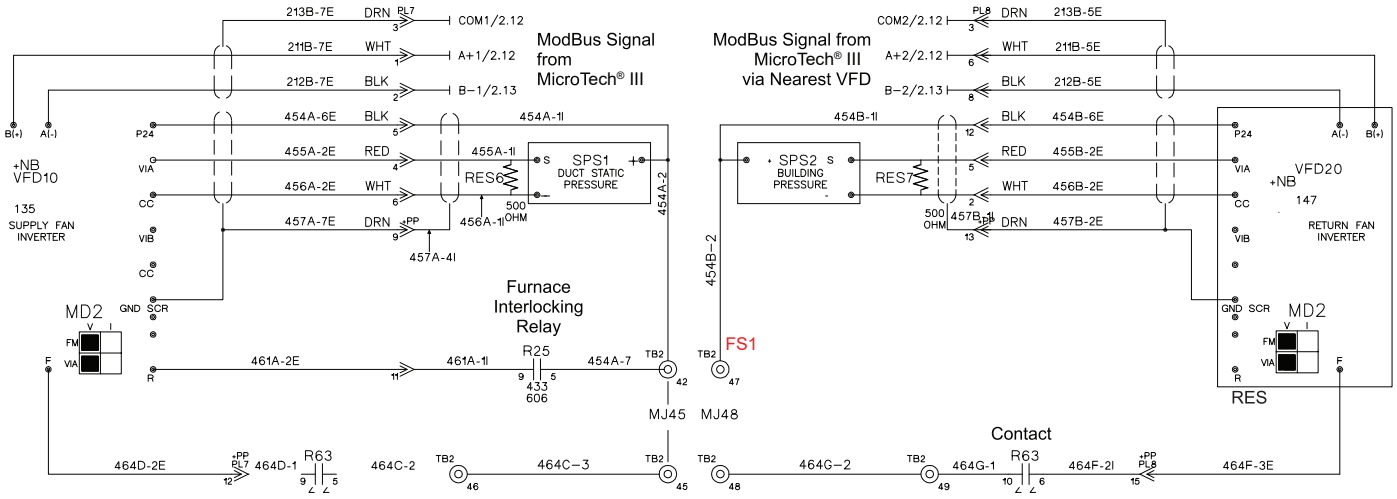
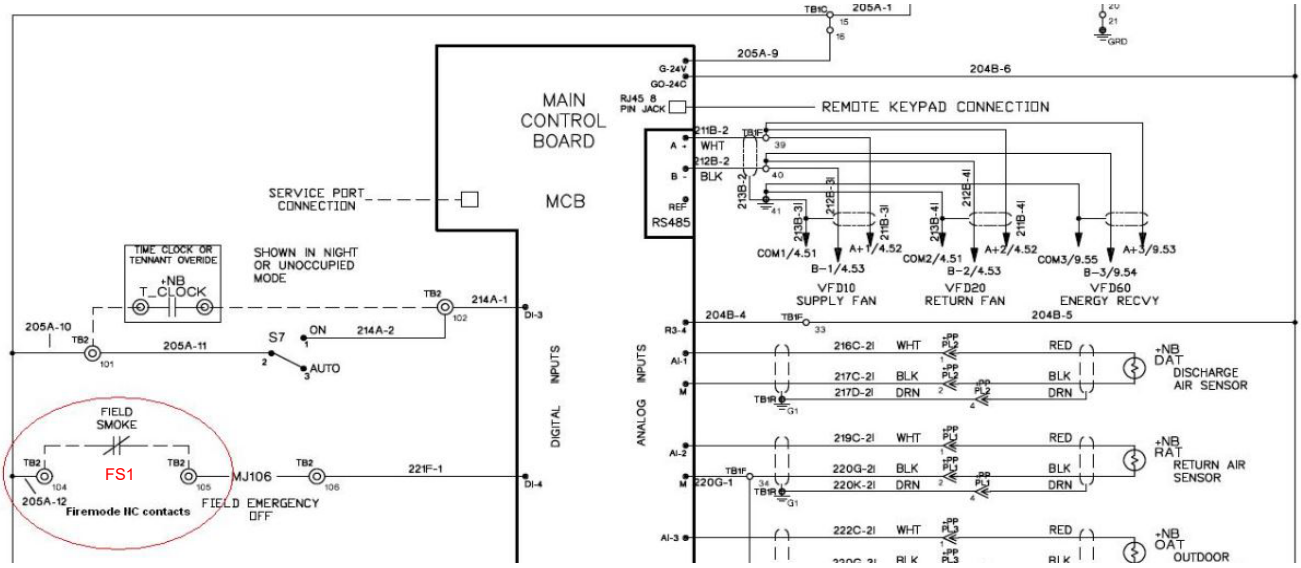


Figure 32: Smoke Purge Wiring Diagram



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