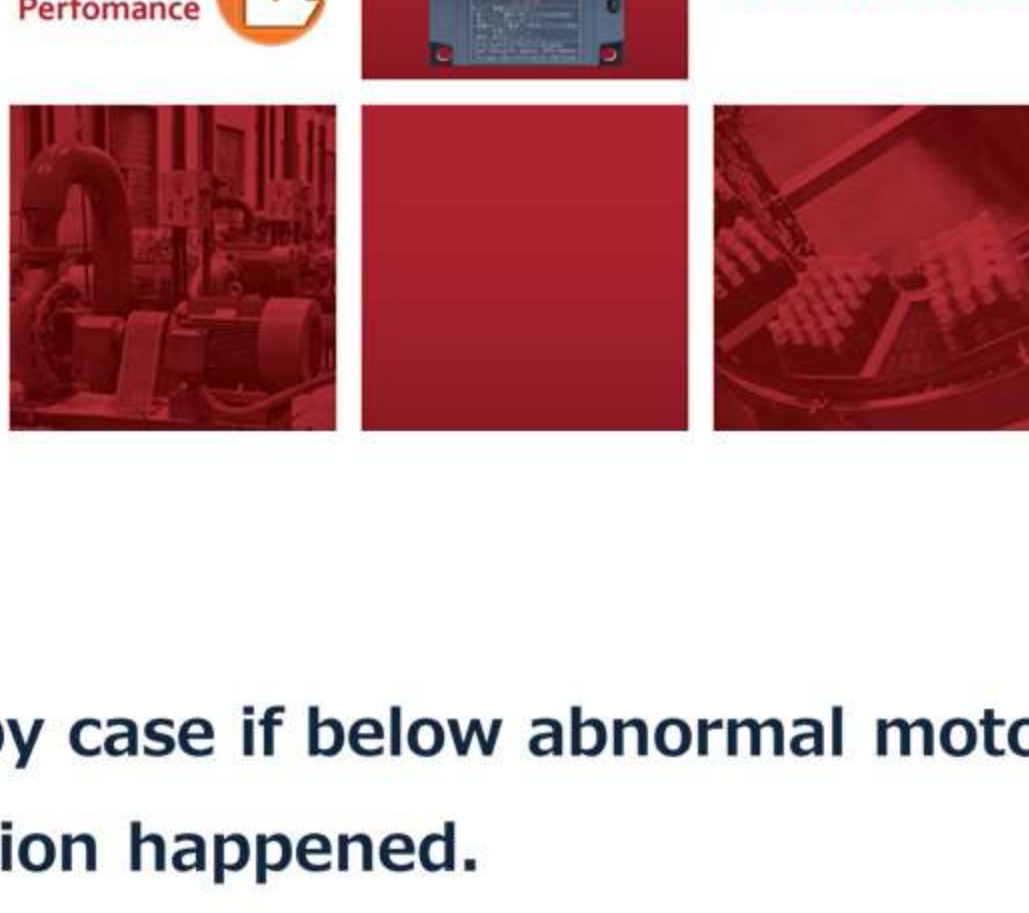


FRENIC-Mini



trouble shooting

document



Contents

Solving problems case by case if below abnormal motor operation happened.

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[1] The motor does not rotate

Possible Causes	What to Check and Suggested Measures
(1) No power supplied to the inverter.	Check the input voltage, output voltage and interphase voltage unbalance. → Turn ON a molded case circuit breaker (MCCB), a residual-current-operated protective device (RCD)/earth leakage circuit breaker (ELCB) (with overcurrent protection) or a magnetic contactor (MCB). → Check for voltage drop, phase loss, poor connections, or poor contacts, and fix them if necessary.
(2) No run forward/reverse command was inputted, or both the commands were inputted simultaneously (external signal operation).	Check the input status of the forward/reverse command with Menu #4 "I/O Checking" using the keypad. → Input a run command. → Set either the forward or reverse operation command to off if both commands are being inputted. → Correct the assignment of commands FWD and REV to function codes E98 and E99. → Connect the external circuit wires to control circuit terminals [FWD] and [REV] correctly. → Make sure that the sink/source jumper switch on the printed circuit board (PCB) is properly configured.
(3) No indication of rotation direction (keypad operation).	Check the input status of the forward/reverse rotation direction command with Menu #4 "I/O Checking" using the keypad. → Input the rotation direction (F02 = 0), or select the keypad operation with which the rotation direction is fixed (F02 = 2 or 3).
(4) The inverter could not accept any run commands from the keypad since it was in Programming mode.	Check which operation mode the inverter is in, using the keypad. → Shift the operation mode to Running mode and enter a run command.
(5) A run command with higher priority than the one attempted was active, and the run command was stopped.	Refer to the block diagram of the drive command generator* and check the higher priority run command with Menu #2 "Data Checking" and Menu #4 "I/O Checking" using the keypad. *Refer to the FRENIC-Mini User's Manual, Chapter 4. → Correct any incorrect function code data settings (H30) or cancel the higher priority run command.
(6) The reference frequency was below the starting or stop frequency.	Check that a frequency command has been entered correctly, using Menu #4 "I/O Checking" on the keypad. → Set the frequency command to the same or higher than that of the starting and stop frequencies (F23 and F25). → Reconsider the starting and stop frequencies (F23 and F25), and if necessary, change them to lower values. → Inspect the external frequency command potentiometers, signal converters, switches, or relay contacts. Replace any ones that are faulty. → Connect the external circuit wires correctly to terminals [13], [12], [11], and [C1].
(7) A frequency command with higher priority than the one attempted was active.	Check the higher priority run command with Menu #2 "Data Checking" and Menu #4 "I/O Checking" using the keypad, referring to the block diagram of the drive command generator*. *Refer to the FRENIC-Mini User's Manual, Chapter 4. → Correct any incorrect function code data (e.g. cancel the higher priority run command).
(8) The upper and lower frequencies for the frequency limiters were set incorrectly.	Check the data of function codes F15 (Frequency limiter (High)) and F16 (Frequency limiter (Low)). → Change the settings of F15 and F16 to the correct ones.
(9) The coast-to-stop command was effective.	Check the data of function codes E01 through E03, E98 and E99 and the input signal status, using Menu #4 "I/O Checking" on the keypad. → Release the coast-to-stop command setting.
(10) Broken wire, incorrect connection or poor contact with the motor.	Check the wiring (Measure the output current). → Repair the wires to the motor, or replace them.
(11) Overload	Measure the output current. → Reduce the load (In winter, the load tends to increase.) Check that any mechanical brake is activated. → Release the mechanical brake, if any.
(12) Torque generated by the motor was insufficient.	Check that the motor starts running if the value of torque boost (F09, A05) is increased. → Increase the value of torque boost (F09, A05) and try to run the motor. Check the data of function codes F04, F05, H50 through H53, A02, and A03. → Change the V/f pattern to match the motor's characteristics. Check that the motor switching signal (selecting motor 2 or 1) is correct and the data of function codes matches each motor. → Correct the motor switching signal. → Modify the function code data to match the connected motor. Check whether the reference frequency signal is below the slip-compensated frequency of the motor. → Change the reference frequency signal so that it becomes higher than the slip-compensated frequency of the motor.
(13) Wrong connection or poor contact of DC reactor (DCR).	Check the wiring. → Connect the DCR correctly. Repair or replace DCR wires.

[2] The motor rotates, but the speed not increase

Possible Causes	What to Check and Suggested Measures
(1) The maximum frequency currently specified was too low.	Check the data of function code F03 or A01 (Maximum frequency). → Correct the F03 or A01 data.
(2) The data of frequency limiter currently specified was too low.	Check the data of function code F15 (Frequency limiter (High)). → Correct the F15 data.
(3) The reference frequency currently specified was too low.	Check the signals for the frequency command entered via the analog input terminals, using Menu #4 "I/O Checking" on the keypad. → Increase the reference frequency. → Inspect the external frequency command potentiometers, signal converters, switches, or relay contacts. Replace any ones that are faulty. → Connect the external circuit wires to terminals [13], [12], [11], and [C1] correctly.
(4) A frequency command (e.g., multistep frequency or via communications link) with higher priority than the one expected was active and its reference frequency was too low.	Check the data of the relevant function codes and what frequency commands are being received, through Menu #1 "Data Setting," Menu #2 "Data Checking" and Menu #4 "I/O Checking," on the keypad, referring to the block diagram of the drive frequency generator*. *Refer to the FRENIC-Mini User's Manual, Chapter 4. → Correct any incorrect data of function code (e.g. cancel higher priority run commands, etc.).
(5) The acceleration time was too long or too short.	Check the data of function codes F07 and E10 (Acceleration time). → Change the acceleration time to match the load.
(6) Overload	Measure the output current. → Reduce the load (Adjust the dumper of the fan or the valve of the pump). (In winter, the load tends to increase.) Check whether any mechanical brake is activated. → Release the mechanical brake.
(7) Mismatch with the characteristics of the motor.	If auto-torque boost or auto-energy saving operation is under way, check whether the data of P02, P03, P06, P07, and P08 (A16, A17, A20, A21, and A22) agrees with the parameters of the motor. → Perform auto-tuning of the inverter for every motor to be used.

[3] The motor runs in the opposite direction to the command

Possible Causes	What to Check and Suggested Measures
(1) Wiring to the motor is incorrect.	Check the wiring to the motor. → Connect terminals U, V, and W of the inverter to the U, V, and W terminals of the motor, respectively.
(2) Incorrect connection and settings for run commands and rotation direction command FWD and REV .	Check the data of function codes E98 and E99 and the connection to terminals [FWD] and [REV]. → Correct the data of the function codes and the connection.
(3) A run command (with fixed rotation direction) from the keypad is active, but the rotation direction setting is incorrect.	Check the data of function code F02 (Run command). → Change the data of function code F02 to "2: $\left(\frac{FWD}{REV}\right)$ / $\left(\frac{REV}{FWD}\right)$ keys on keypad (forward)" or "3: $\left(\frac{FWD}{REV}\right)$ / $\left(\frac{REV}{FWD}\right)$ keys on keypad (reverse)."

[4] Speed fluctuation or current oscillation occurs during running at constant speed

Possible Causes	What to Check and Suggested Measures
(1) The frequency command fluctuates.	Check the signals for the frequency command with Menu #4 "I/O Checking" using the keypad. → Increase the filter constants (C33, C38) for the frequency command.
(2) An external frequency command potentiometer is used.	Check that there is no noise in the control signal wires from external sources. → Isolate the control signal wires from the main circuit wires as far as possible. → Use shielded or twisted wires for control signals. Check whether the frequency command has not failed because of noise from the inverter. → Connect a capacitor to the output terminal of the potentiometer or set a ferrite core on the signal wire. (See Figure 2.7.)
(3) Frequency switching or multistep frequency command was enabled.	Check whether the relay signal for switching the frequency command is chattering. → If the relay contact is defective, replace the relay.
(4) The wiring length between the inverter and the motor is too long.	Check whether auto-torque boost or auto-energy saving operation is enabled. → Perform auto-tuning of the inverter for every motor to be used. → Select constant torque load (F37, A13 = 1) and check for any vibration. → Make the output wires as short as possible.
(5) The machinery is hunting due to vibration caused by low rigidity of the load. Or the current is irregularly oscillating due to special motor parameters.	Once cancel all the automatic control systems--auto torque boost, auto energy saving operation, overload prevention control, current limiter, automatic deceleration (anti-regenerative control), and slip compensation, and then check that the motor vibration comes to a stop. → Cancel the functions causing the vibration. → Readjust the output current fluctuation damping gain (H80, A41). Check that the motor vibration is suppressed if you decrease the level of F26 (Motor sound (Carrier frequency)) or set F27 (Motor sound (Tone)) to "0." → Decrease the carrier frequency (F26) or set the tone to "0" (F27 = 0).

[5] Grating sound is heard from the motor or the motor sound fluctuate

Possible Causes	What to Check and Suggested Measures
(1) The specified carrier frequency is too low.	Check the data of function codes F26 (Motor sound (Carrier frequency)) and F27 (Motor sound (Tone)). → Increase the carrier frequency (F26). → Change the setting of F27 to appropriate value.
(2) The ambient temperature of the inverter was too high (when automatic lowering of the carrier frequency was enabled by H98).	Measure the temperature inside the panel where the inverter is mounted. → If it is over 40°C (104°F), lower it by improving the ventilation. → Lower the temperature of the inverter by reducing the load. (For fans or pumps, decrease the frequency limiter value (F15).) Note: If you disable H98, an \square or \square alarm may occur.
(3) Resonance with the load	Check the machinery mounting accuracy or check whether there is resonance with the mounting base. → Disconnect the motor from the machinery and run it alone, then find where the resonance comes from. Upon locating the cause, improve the characteristics of the source of the resonance. → Adjust the settings of C01 (Jump frequency 1) to C04 (Jump frequency (Hysteresis width)) so as to avoid continuous running in the frequency range causing resonance.

[6] The motor does not accelerate within the specified time

Possible Causes	What to Check and Suggested Measures
(1) The inverter ran the motor with S-curve or curvilinear pattern.	Check the data of function code H07 (Acceleration/deceleration pattern). → Select the linear pattern (H07 = 0). → Shorten the acceleration/deceleration time (F07, F08, E10 and E11).
(2) The current limiting operation prevented the output frequency from increasing (during acceleration).	Make sure that F43 (Current limiter (Mode selection)) is set to "2: Enable during acceleration and at constant speed," then check that the setting of F44 (Current limiter (Level)) is reasonable. → Readjust the setting of F44 to an appropriate value, or disable the function of current limiter with F43. → Increase the acceleration/deceleration time (F07, F08, E10 and E11).
(3) The automatic deceleration (Anti-regenerative control) is enabled during deceleration.	Check the data of function code H69 (Automatic deceleration (Mode selection)). → Increase the deceleration time (F08 and E11).
(4) Overload.	Measure the output current. → Reduce the load (For fans or pumps, decrease the frequency limiter value (F15)). (In winter, the load tends to increase.)
(5) Torque generated by the motor was insufficient.	Check that the motor starts running if the value of the torque boost (F09, A05) is increased. → Increase the value of the torque boost (F09, A05).
(6) An external potentiometer is used for frequency setting.	Check that there is no noise in the control signal wires from external sources. → Isolate the control signal wires from the main circuit wires as far as possible. → Use shielded or twisted wires for control signals. → Connect a capacitor to the output terminal of the external frequency potentiometer or set a ferrite core on the signal wire. (See Figure 2.7.)
(7) The specified acceleration/deceleration time is incorrect.	Check the terminal command RT1 ("Select ACC/DEC time"). → Correct the RT1 setting.

[7] The motor does not restart even after the power recovers from a momentary power failure

Possible Causes	What to Check and Suggested Measures
(1) The data of function code F14 is either "0" or "1."	Check if an undervoltage trip (\square) occurs. → Change the data of function code F14 (Restart mode after momentary power failure (Mode selection)) to "4" or "5."
(2) The run command remains OFF even after the power has been restored.	Check the input signal with Menu #4 "I/O Checking" using the keypad. → Check the power recovery sequence with an external circuit. If necessary, consider the use of a relay that can keep the run command ON. In 3-wire operation, the power to the inverter's control PCB has been shut down once because of a long momentary power failure, or, the HLD terminal command ("Enable 3-wire operation") has been turned OFF once. → Change the design or the setting so that a run command can be issued again within 2 seconds after power has been restored.

[8] The motor does not run as expected

Possible Causes	What to Check and Suggested Measures
(1) Incorrect configuration of function codes	Check that function codes are correctly configured and no unnecessary configuration has been made. → Configure all function codes correctly. Make a note of function code data currently configured and then initialize all function code data (H03). → After initialization, reconfigure the necessary function codes one by one, checking the running status of the motor.