MITSUBISHI ELECTRIC Inverter
Sales and Service

No. 673E

# Firmware Upgrade for FR-A800, FR-A800 Plus, and FR-F800 Series Inverters

Thank you for your continued patronage of Mitsubishi Electric drive control products.
The firmware of FR-A800, FR-A800 Plus, and FR-F800 series inverters will be upgraded to improve functionality.

## 1. Products Affected

FR-A800 series (not including the FR-A800-P), FR-A800 Plus series (FR-A800-CRN and FR-A800-LC), and FR-F800 series

## 2. Details of Change

(1) Addition of the emergency drive function (FR-A800 series (standard and IP55 compatible models) and FR-A800 Plus (FR-A800-LC) series)

The inverter can continue driving the motor in case of emergency such as a fire, since protective functions are not activated even if the inverter detects a fault. Using this function may damage the motor or inverter because driving the motor is given the highest priority. Use this function for emergency operation only. The operation can be switched to the commercial power supply operation at the occurrence of a fault which may cause damage of the inverter.

| Pr. | Name | Initial value | | Setting range | Description |
|---|---|---|---|---|---|
| | | FM | CA | | |
| 523<br>H320<br>*1 | Emergency drive mode selection | 9999 | | 100, 111, 112, 121, 122, 123, 124, 200, 211, 212, 221, 222, 223, 224, 300, 311, 312, 321, 322, 323, 324, 400, 411, 412, 421, 422, 423, 424 | Select the operation mode of the emergency drive. |
| | | | | 9999 | Emergency drive disabled. |
| 524<br>H321<br>*1*2 | Emergency drive running speed | 9999 | | 0 to 590 Hz*3 | Set the running frequency in the fixed frequency mode of the emergency drive (when the fixed frequency mode is selected in Pr.523). |
| | | | | 0% to 100%*3 | Set the PID set point in the PID control mode of the emergency drive (when the PID control mode is selected in Pr.523). |
| | | | | 9999*3 | Emergency drive disabled. |
| 515<br>H322<br>*1 | Emergency drive dedicated retry count | 1 | | 1 to 200 | Set the retry count during emergency drive operation. |
| | | | | 9999 | Without retry count excess (no restriction on the number of retries) |
| 1013<br>H323<br>*1 | Emergency drive running speed after retry reset | 60 Hz | 50 Hz | 0 to 590 Hz | Set the frequency for operation after a retry when any of E.CPU, E.1 to E.3, and E.5 to E.7 occurs during emergency drive operation. |



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|---|---|---|---|---|

| Pr. | Name | Initial value FM | Initial value CA | Setting range | Description |
|---|---|---|---|---|---|
| 514<br>H324<br>*1 | Emergency drive dedicated waiting time | 9999 | | 0.1 to 600 s | Set the retry waiting time during emergency drive operation. |
| | | | | 9999 | The Pr.68 setting is applied to the operation. |
| 136<br>A001 | MC switchover interlock time | 1 s | | 0 to 100 s | Set the operation interlock time for MC2 and MC3. |
| 139<br>A004 | Automatic switchover frequency from inverter to bypass operation | 9999 | | 0 to 60 Hz | Set the frequency at which the inverter-driven operation is switched over to the commercial power supply operation when the condition for the electronic bypass is established during emergency drive operation. |
| | | | | 8888, 9999 | Electronic bypass during emergency drive is disabled. |
| 57<br>A702 | Restart coasting time | 9999 | | 0 | Coasting time differs according to the inverter capacity. (Refer to the description of the automatic restart after instantaneous power failure function in the Instruction Manual (Detailed) or the Instruction Manual (Function).) |
| | | | | 0.1 to 30 s | Set the delay time for the inverter to perform a restart after restoring power due to an instantaneous power failure. |
| | | | | 9999 | No restart |

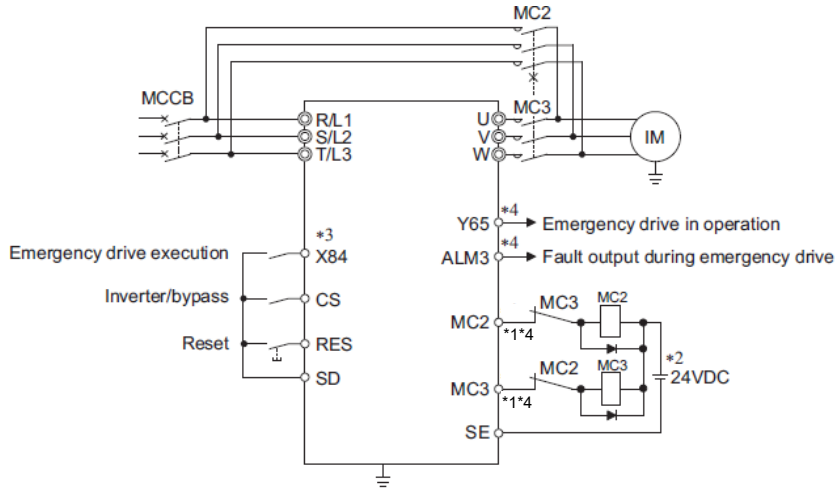
*1 The setting is available for the standard structure model and the IP55 compatible model.

*2 Set Pr.524 after setting Pr.523.

*3 When Pr.523 = "100, 200, 300, or 400", the emergency drive is activated regardless of the Pr.524 setting.

◆ Connection diagram

A connection diagram of the emergency drive (commercial mode) is as follows.




*1 Be careful of the rated specifications of output terminals.

| Output terminal | Rated specification |
|---|---|
| Open collector output of inverter (RUN, SU, IPF, OL, FU) | Permissible load:<br>24 VDC 0.1 A |
| Inverter relay output (A1-C1, B1-C1, A2-C2, B2-C2)<br>Relay output option (FR-A8AR) | Contact capacity:<br>230 VAC 0.3 A<br>30 VDC 0.3 A |

*2 When connecting a DC power supply, insert a protective diode. When connecting an AC power supply, use relay output terminals of the inverter or contact output terminals of the relay output option (FR-A8AR).

*3 The applied terminals differ by the settings of Pr.180 to Pr.189 (Input terminal function selection).

*4 The applied terminals differ by the settings of Pr.190 to Pr.196 and Pr.320 to Pr.322 (Output terminal function selection).

◆ Emergency drive operation selection (Pr.523, Pr.524)

Use Pr.523 Emergency drive mode selection to select the emergency drive operation. Set a value in the hundreds place to select the operation when a valid protective function is activated (critical fault) during emergency drive operation. Set values in the ones and tens places to select the operation method.

<table>
<tr><th>Pr.523 setting</th><th colspan="3">Emergency drive operation mode</th><th>Description</th></tr>
<tr><td>1[][]</td><td colspan="2">Output shutoff mode</td><td rowspan="4">Selecting operation when a critical fault occurs during emergency drive operation</td><td>Output shutoff at a critical fault occurrence.</td></tr>
<tr><td>2[][]</td><td colspan="2">Retry / output shutoff mode</td><td>Retry operation at a critical fault occurrence.<br>The output is shut off when a critical fault for which retry is not permitted occurs or when the retry count is exceeded.</td></tr>
<tr><td>3[][]*1</td><td colspan="2">Retry / commercial mode</td><td>Retry operation at a critical fault occurrence.<br>The operation is switched over to the commercial power supply operation when a critical fault for which retry is not permitted occurs or when the retry count is exceeded.<br>While Pr.515 = "9999", the operation is switched over to the commercial power supply operation when the retry count reaches 200.</td></tr>
<tr><td>4[][]*1</td><td colspan="2">Commercial mode</td><td>The operation is switched over to the commercial power supply operation when a critical fault occurs.</td></tr>
<tr><td>[]00</td><td colspan="2">Normal operation</td><td rowspan="7">Selecting the operation method during emergency drive operation</td><td>The operation is performed with the same set frequency and by the same starting command as those in the normal operation.</td></tr>
<tr><td>[]11</td><td rowspan="2">Fixed frequency mode</td><td>Forward rotation</td><td rowspan="2">The operation is forcibly performed with the frequency set in Pr.524.<br>Even when the motor is stopped, the operation is started by the emergency drive execution.</td></tr>
<tr><td>[]12</td><td>Reverse rotation</td></tr>
<tr><td>[]21</td><td rowspan="4">PID control mode</td><td>Forward rotation</td><td rowspan="2">The operation is performed under PID control using the Pr.524 setting as a set point. The measured values are input in the method set in Pr.128.</td></tr>
<tr><td>[]22</td><td>Reverse rotation</td></tr>
<tr><td>[]23</td><td>Forward rotation (Second PID measured value input)</td><td rowspan="2">The operation is performed under PID control using the Pr.524 setting as a set point. The measured values are input in the method set in Pr.753.</td></tr>
<tr><td>[]24</td><td>Reverse rotation (Second PID measured value input)</td></tr>
<tr><td>9999</td><td colspan="3">Emergency drive disabled.</td><td></td></tr>
</table>

*1 Under PM sensorless vector control, the operation is not switched over to the commercial power supply operation and the output is shut off.

◆ Retry operation during emergency drive (Pr.515, Pr.514)

- Set the retry operation during emergency drive operation. Use Pr.515 Emergency drive dedicated retry count to set the retry count, and use Pr.514 Emergency drive dedicated waiting time to set the retry waiting time.
- The ALM signal output conditions depend on the Pr.67 Number of retries at fault occurrence setting.

◆ Electronic bypass during emergency drive (Pr.136, Pr.139, Pr.57)

For selecting the commercial mode (Pr.523 = "3[][], 4[][]"), setting is required as follows.

- Set Pr.136 MC switchover interlock time and Pr.139 Automatic switchover frequency from inverter to bypass operation and assign MC2 and MC3 signals to output terminals.
- When the CS signal is assigned to an input terminal, set Pr.57 Restart coasting time ≠ "9999" and input the CS signal through the terminal. (In the initial setting, the CS signal is assigned to the terminal CS.)
- Select V/F control, Advanced magnetic flux vector control, or Real sensorless vector control. (Under PM sensorless vector control, the operation is not switched over to the commercial power supply operation the output is shut off.)

CAUTION

When the emergency drive operation is performed, the operation is continued or the retry is repeated even when a fault occurs, which may damage or burn the inverter and motor. Before restarting the normal operation after using this function, make sure that the inverter and motor have no fault. Any damage of the inverter or the motor caused by using the emergency drive function is not covered by the warranty even within the guarantee period.

(2) Specification change of the emergency drive function (FR-F800 series)

Specifications will be changed as follows.

[Before change]

- When the emergency drive is activated in the PID control mode, the operation is automatically switched from the PU operation mode or External/PU combined operation mode to the External operation mode. (When the emergency drive is activated in the fixed frequency mode, the operation is automatically switched to the External operation mode from any operation mode.)
- The inverter retries operation when the protective function (E.13) is activated during emergency drive operation.

[After change]

- When the emergency drive is activated in the fixed frequency mode or in the PID control mode, the operation is automatically switched from the PU operation mode or External/PU combined operation mode to the External operation mode.
- The inverter output is shut off when the protective function (E.13) is activated during emergency drive operation.

* The specifications of the emergency drive function of the FR-A800 series (standard and IP55 compatible models) and FR-A800 Plus (FR-A800-LC) series are the same as those described in [After change] above.

(3) Specification change of the Forward rotation output (Y30) signal and the Reverse rotation output (Y31) signal (FR-A800 series (not including the FR-A800-P) and FR-A800 Plus series (FR-A800-CRN and FR-A800-LC))

The Forward rotation output (Y30) signal and the Reverse rotation output (Y31) signal will become available under encoder feedback control.

Under Vector control or encoder feedback control, the Forward rotation output (Y30) signal or the Reverse rotation output (Y31) signal is output according to the actual rotation direction of the motor.

## 3. Date of Change

| Country of origin | Date of Change |
|---|---|
| MADE IN JAPAN | The change will be sequentially applied to the June 2021 production or later. |
| MADE IN CHINA | The change will be sequentially applied to the July 2021 production or later. |

## 4. Product Identification

The SERIAL (determined by date of production) can be checked on the product's rating plate.

□ 1 6 ○○○○○○
Symbol Year Month Control number

SERIAL

The SERIAL consists of one symbol, two characters indicating the production year and month, and six characters indicating the control number.

The last digit of the production year is indicated as the Year, and the Month is indicated by 1 to 9, X (October), Y (November), or Z (December).