Firmware Update for the FR-E800 Series General-Purpose Inverters

Thank you for your continued patronage of Mitsubishi Electric drive control products.
The firmware of the FR-E800 series general-purpose inverters will be updated to improve functionality.

1. Products Affected

FR-E800 series

2. Details of Change

(1) Enhanced offline auto-tuning function

The following functions will be added.

1) Offline auto tuning with the motor rotating

2) Offline auto tuning in consideration of the magnetic saturation characteristics of the motor
Performing offline auto tuning by setting Pr.96 = "131" can improve the drive performance in the low-speed range under Real sensorless vector control.

Pr. (Pr. group)	Name	Initial value	Setting range	Description
96 (C110) 463 (C210)	Auto tuning setting/status	0	0	No offline auto tuning
			1	Offline auto tuning is performed without the motor rotating. (Advanced magnetic flux vector control, Real sensorless vector control, Vector control, or PM sensorless vector control (except when driving the MM-GKR or EM-A))
			11	Offline auto tuning is performed without the motor rotating.
			101	Offline auto tuning is performed with the motor rotating. (Advanced magnetic flux vector control, Real sensorless vector control, or Vector control)
			131	Offline auto tuning is performed with the motor rotating. (With magnetic saturation L tuning) (Real sensorless vector control)
			301	Position accuracy compensation gain tuning is performed. (PM sensorless vector control (only when driving the EM-A))

* The setting range of Pr.463 is "0, 1, 11, or 101".

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(2) Adjustment of the excitation current low-speed scaling factor

During speed control under Advanced magnetic flux vector control or Real sensorless vector control, the excitation current scaling factor in the low-speed range can be adjusted. Excitation current in the low-speed range can be increased to improve torque.

Pr. (Pr. group)	Name	Initial value	Setting range	Description
85 (G201)	Excitation current break point	9999	0 to 400 Hz	Set the frequency at which increased excitation is started.
			9999	SF-PR/SF-HR/SF-HRCA motor: The predetermined frequency is applied. Other than the above or 575 V class: 10 Hz is applied.
86 (G202)	Excitation current low-speed scaling factor	9999	0% to 300%	Set an excitation current scaling factor at 0 Hz.
			9999	SF-PR/SF-HR/SF-HRCA motor: The predetermined scaling factor is applied. Other than the above or 575 V class: 130% is applied.
565 (G301)	Second motor excitation current break point	9999	0 to 400 Hz	Set an excitation current break point when the RT signal is ON.
			9999	SF-PR/SF-HR/SF-HRCA motor: The predetermined frequency is applied. Other than the above or 575 V class: 10 Hz is applied.
566 (G302)	Second motor excitation current low-speed scaling factor	9999	0% to 300%	Set an excitation current low-speed scaling factor when the RT signal is ON.
			9999	SF-PR/SF-HR/SF-HRCA motor: The predetermined scaling factor is applied. Other than the above or 575 V class: 130% is applied.

* During torque control under Real sensorless vector control, an excitation current low-speed scaling factor is 70% regardless of the Pr.86 or Pr.566 setting.

(3) Addition of Pr.221 to Pr.228 (excitation current compensation points and inductance compensation rates)

The inductance compensation rates 1 to 4 can be automatically set by offline auto tuning (Pr.96 = "131").

Pr. (Pr. group)	Name	Initial value	Setting range	Description
221 (C161)	Excitation current compensation point 1	25%	25% to 200%	Set the excitation current command value for inductance compensation.
222 (C162)	Inductance compensation rate 1	9999	0% to 200%	Set the inductance compensation rate.
			9999	Inductance compensation rate 1 disabled.
223 (C163)	Excitation current compensation point 2	50%	25% to 200%	Set the excitation current command value for inductance compensation.
224 (C164)	Inductance compensation rate 2	9999	0% to 200%	Set the inductance compensation rate.
			9999	Inductance compensation rate 2 disabled.
225 (C165)	Excitation current compensation point 3	75%	25% to 200%	Set the excitation current command value for inductance compensation.
226 (C166)	Inductance compensation rate 3	9999	0% to 200%	Set the inductance compensation rate.
			9999	Inductance compensation rate 3 disabled.
227 (C167)	Excitation current compensation point 4	125%	25% to 200%	Set the excitation current command value for inductance compensation.
228 (C168)	Inductance compensation rate 4	9999	0% to 200%	Set the inductance compensation rate.
			9999	Inductance compensation rate 4 disabled.

* Pr.221 to Pr.228 (excitation current compensation points and inductance compensation rates) cannot be displayed on some parameter units (FR-PU07, FR-PU07BB, and FR-PU04).

(4) Addition of a protective function

The fault display of encoder phase error will be added as the protective function.

Operation panel indication	
Name	Encoder phase error
Description	The rotation command of the inverter differs from the actual rotation direction detected from the encoder during offline auto tuning.

3. Date of Change

The firmware for this change will only be available on the Mitsubishi Electric FA Global Website.
When the firmware is installed on mass production inverters, we will notify you in a follow-up Sales and Service.

4. Firmware Version

The inverter firmware version to which the change described will be applied is as follows:

Series	Firmware version
FR-E800	15 or later

For how to install the firmware, refer to the FR Configurator2 (SW1DND-FRC2-E) Instruction Manual (IB-0600516ENG).