

5.1 Communications Dedicated Function Codes

5.1.1 About communications dedicated function codes

Communications dedicated function codes are available to monitor the operation and status of the inverter via communications. They are classified into the groups shown in Table 5.1 below:

Table 5.1 Types of communications dedicated function codes

Communications dedicated function code group	Function
S	Command data
M	Monitor data (for reading only)
W	Monitor data out of keypad display information (for reading only)
X	Alarm information out of keypad display information (for reading only)
Z	

The sections that follow describe communications dedicated function codes of each group.

5.1.2 Command data

[1] List of command data

The table below shows the function codes (S code) for the command data. The "Support" column indicates whether the function code is supported or not. The symbol "O" means that the code is supported and the symbol "X" means that the code is not supported.

Table 5.2 List of command data

Code	Name	Function	Permissible setting range	Min. step	Unit	R/W *	Support		
							Mini	Eco	Multi
S01	Frequency command (p.u.)	Frequency command issued through communication (the reference value for maximum frequency)	-32768 to 32767 (Max frequency: at +/- 20000)	1	-	R/W	○	○	○
S05	Frequency command	Frequency command issued through communication (in units of 0.01 Hz)	0.00 to 655.35	00.1	Hz	R/W	○	○	○
S06	Operation command	Operation command issued through communication [general input terminal functions (X1 to X5, XF (FWD), R (REV)) and FWD, REV, RST only through communication]	0000 _H to FFFF _H	1	-	R/W	○	○	○
S07	Universal DO	Command issued to DO terminal through communication	0000 _H to FFFF _H	1	-	R/W	×	○	×
S08	Acceleration time F07	Each data is set with the code or communication format common to all the inverter types.	0.0 to 3600.0	0.1	s	R/W	○	○	○
S09	Deceleration time F08		0.0 to 3600.0	0.1	s	R/W	○	○	○
S10	Torque limit level 1 F40		20 to 200,999	1	%	R/W	×	×	○
S11	Torque limit level 2 F41		20 to 200,999	1	%	R/W	×	×	○
S12	Universal AO	Command issued to AO terminal through communication	-32768 to 32767 (Full scale: at +/- 20,000)	1	-	R/W	×	○	○
S13	PID command	PID command issued through communication	-32768 to 32767 (+/- 20000 corresponds to +/- 100%)	1	-	R/W	○	○	○
S14	Alarm reset command	Alarm reset command issued through communication	0 or 1	1	-	R/W	○	○	○

* Legends in R/W column...R: Readable, W: Write-enable, R/W: Read/write possible

[2] Frequency and PID command data

Table 5.3 Function codes for frequency and PID command data

Code	Name	Function	Permissible setting range	Min. step	Unit	R/W *
S01	Frequency command (p.u.)	Frequency command via communications (value based on the maximum frequency)	-32768 to 32767 ($\pm 20,000 =$ maximum frequency)	1	–	R/W
S05	Frequency command	Frequency command from communications (by 0.01Hz)	0.00 to 655.35	0.01	Hz	R/W
S13	PID command	PID command from communications	-32768 to 32767 ($\pm 100\%$ at $\pm 20,000$)	1	–	R/W

* R: Read only, W: Write only, R/W: Read/Write

- 1) When both S01 and S05 are set and S01 is not 0, the command of S01 has precedence over that of S05.
- 2) The actual operation specified by each command is limited by internal processing of the inverter. For example, a value over 20,000 can be written to S01, but the actual frequency is limited to the maximum frequency or to the upper limit frequency set with another function code. (The FRENIC-Mini/Eco treats negative data of S13 as 0.)
- 3) When an attempt is made to read the command data shown here, the data previously directed by communications, not the command value for actual operation, will be read. (Obtain the latest command value by reading the M code.)
- 4) At S01, set a value based on $\pm 20,000$ as the maximum frequency. For example, when the maximum frequency is 60Hz, set 20,000 at S01 with a set frequency of 60Hz, or 10,000 with a set frequency of 30Hz.

[3] Operation command data

Table 5.4 Function codes for operation command data

Code	Name	Function	Permissible setting range	Min. step	Unit	R/W *
S06	Operation command	Operation command via communications (general-purpose input terminal functions (X1 – X5, XF (FWD), XR (REV)) and communications dedicated command (FWD, REV, RST))	0000 _H to FFFF _H	1	–	R/W
S14	Alarm reset command	Alarm reset command via communications	0 or 1	1	–	R/W

* R: Read only; W: Write only; R/W: Read/Write

- 1) To make alarm resetting with S06, bit 15 must be set to 1 and then set back to 0. Alarm resetting is impossible unless the communications side is made valid by the settings of function codes H30 and y99 and the "LE" assigned terminal.
- 2) S14 does not require the operation described in 1) above, and writing 1 permits alarm resetting (because writing the value once turns ON the reset command that will be turned OFF after a specific period of time). This command is 0 whenever it is read, and is always valid, irrespective of function codes H30 and y99 and the status of the "LE" assigned terminal.
- 3) X1 – X5, XF (FWD), and XR (REV) operate according to the functions set with function codes E01 – E05, E98, and E99.
General-purpose input terminals X4 and X5 and function codes E04 and E05 are not supported by FRENIC-Mini.
- 4) When giving operation command S06 via communications, the relation between S06 and the inverter terminal (external signal input) command is shown in Table 5.4 on the next page. The "Support" column of the table indicates whether each function is supported by the respective models or not. ○ indicates the function is supported, and × indicates the function is not supported.

 **WARNING**

If alarm resetting is performed with the operation command (S06) uncleared, the inverter will start to operate just upon alarm resetting. Before alarm resetting, confirm that the operation command is cleared.

Otherwise, an accident may result.

Table 5.5 Relation between operation command (S06) and inverter terminal command (external signal input)

Type	Function			When not assigned (positive logic)	Command		Support			
	Assignment number	Internal operation command symbol	Name		Com-Munications	Terminal block	Mini	Eco	Multi	
Fixed function	-	FWD	Forward operation/stop command	-	Valid	Invalid	○	○	○	
		REV	Reverse operation/stop command	-			○	○	○	
		RST	Alarm reset	-			○	○	○	
General-purpose input	0	SS1	Multistep frequency 1	OFF	Valid	Invalid	○	○	○	
	1	SS2	Multistep frequency 2	OFF			○	○	○	
	2	SS4	Multistep frequency 4	OFF			○	○	○	
	3	SS8	Multistep frequency 8	OFF			×	×	○	
	4	RT1	Acceleration/deceleration time selection	OFF			○	×	○	
	6	HLD	3-wire operation stop command	OFF	Invalid		○	○	○	
	7	BX	Coast-to-stop command	OFF	Valid		○	○	○	
	8	RST	Alarm reset	OFF			○	○	○	
	9	THR	Trip command (External fault)	ON	Invalid	Valid	○	○	○	
	10	JOG	Jogging operation	OFF	Invalid		○	×	○	
	11	Hz2/Hz1	Frequency setting 2/1 switching command	OFF	Valid	Invalid	○	○	○	
	X1	12	M2/M1	Motor 2 /motor 1			OFF	×	×	○
	X2	13	DCBRK	DC braking command			OFF	×	○	○
	X3	14	TL2/TL1	Torque limit 2/torque limit 1			OFF	×	×	○
	X4	15	SW50	Switching to commercial power supply (50Hz)			OFF	×	○	×
	X5	16	SW60	Switching to commercial power supply (60Hz)			OFF	×	○	×
	XF (FWD)	17	UP	UP command			OFF	Invalid	Valid	×
	XR (REV)	18	DOWN	DOWN command	OFF	Valid		×	○	○
		19	WE-KP	Write enable for keypad	ON	Valid		○	○	○
		20	Hz/PID	PID control cancel	OFF	Valid	Invalid	○	○	○
		21	IVS	Normal/Inverse mode changeover	OFF			○	○	○
		22	IL	Interlock	OFF	Invalid	Valid	×	○	×
		24	LE	Link operation enable	ON			○	○	○
		25	U-DI	Universal DI	OFF			×	○	○
		26	STM	Start characteristic selection	ON	Valid		×	○	×
				OFF	Valid		×	×	○	
		30	STOP	Forced stop	ON	Valid		×	○	○
		33	PID-RST	PID integration/differential reset	OFF	Valid	Invalid	○	○	○

(X4, X5: not supported by FRENIC-Mini)

Table 5.5 Relation between operation command (S06) and inverter terminal command (external signal input)
(Continued)

Type	Function			When not assigned (positive logic)	Command		Support			
	Assignment number	Internal operation command symbol	Name		Com-Munications	Terminal block	Mini	Eco	Multi	
General-purpose input	34	PID-HLD	PID integration hold	OFF	Valid	Invalid	○	○	○	
	35	LOC	Local (keypad) command selection	OFF	Invalid	Valid	×	○	×	
	38	RE	Run enable	ON	Valid	Invalid	×	○	×	
	39	DWP	Condensation protection	OFF			×	○	×	
	40	ISW50	Switching to commercial power supply incorporated sequence (50Hz)	OFF			×	○	×	
	X1	41	ISW60	Switching to commercial power supply incorporated sequence (60Hz)			OFF	×	○	×
	X2	42	LS	Zero limit switch			OFF	×	×	○
	X3	43	S/R	Start/reset			OFF	×	×	○
	X4	44	SPRM	Serial pulse receive mode			OFF	×	×	○
	X5	45	RTN	Return mode			OFF	×	×	○
	XF (FWD)	87	FR2/FR1	Run command 2/run command 1			OFF	×	○	×
	XR (REV)	88	FWD2	Forward run/stop command 2			OFF	×	○	×
		89	REV2	Reverse run/stop command 2			OFF	×	○	×
		98	FWD*	Forward operation/stop command			OFF	○	○	○
99		REV*	Reverse operation/stop command	OFF			○	○	○	

(X4, X5: not supported by FRENIC-Mini)

* Terminals FWD/REV only

[4] Function data

Table 5.6 Function code and data (S08, S09, S10, S11)

Code	Name	Function	Permissible setting range	Min. step	Unit	R/W
S08	Acceleration time F07	Set data with common code numbers and in common communications formats to models.	0.0 to 3600.0	0.1	s	R/W
S09	Deceleration time F08		0.0 to 3600.0	0.1	s	R/W
S10	Torque limit level 1 F40		20 to 200,999	1	%	R/W
S11	Torque limit level 2 F41		20 to 200,999	1	%	R/W

- 1) When an attempt is made to enter a value out of the appropriate permissible setting range, an out-of-range error will result.
- 2) The acceleration/deceleration times specified with S08, S09 are set to F07 (Acceleration time 1) and F08 (Deceleration time 1). The torque limit levels specified with S10 and S11 are set to F40 (Torque limit level 1 for driving) and F41 (Torque limit level 1 for controlling). If the function codes are changed through the keypad, etc., the changes are also reflected to S08 to S11.
- 3) The figures below the fourth place figure of the S08 acceleration time and the S09 deceleration time are omitted within the inverter. (If, for example, 123.4s is written, 123.0s is entered.)

[5] Universal DO and universal AO

(Not supported by FRENIC-Mini)

Table 5.7 Function code and data (S07, S12)

Code	Name	Function	Permissible setting range	Min. step	Unit	R/W
S07	Universal DO	Command from communications function to terminal DO	0000 _H to FFFF _H	1	–	R/W
S12	Universal AO	Command from communications function to terminal AO	-32768 to 32767 (Full scale by ± 20000)	1	–	R/W

- 1) A host can control the output terminal of the inverter through the communications function to issue commands to peripheral devices.
- 2) When universal DO and universal AO are assigned to the following signals, the signals operate as simple output regardless of inverter's operation.
 Universal DO: Transistor output (Y1, Y2, Y3), relay output (Y5A/C, 30A/B/C)
 Universal AO: Analog output (FMA), pulse output (FMP)

5.1.3 Monitor data

Function codes for monitor data (M codes) are described in the four tables (1 to 4) below. These function codes are for reading only.

These function codes are for reading only. The "Support" column of the table indicates whether each function is supported by the respective models or not. ○ indicates the function is supported, and × indicates the function is not supported.

Table 5.8 Monitor data function codes (1)

Code	Name	Description	Monitor range	Min. step	Unit	Support		
						Mini	Eco	Multi
M01	Frequency command (p.u.) (final command)	Frequency command based on the maximum frequency	-32768 to 32767 (±20,000 = maximum frequency)	1	–	○	○	○
M05	Frequency command (final command)	Frequency command with min. step 0.01Hz	0.00 to 655.35	0.01	Hz	○	○	○
M06	Output frequency 1 (p.u.)	Output frequency based on the maximum frequency (before slip compensation)	-32768 to 32767 (±20,000 = maximum frequency)	1	–	○	○	○
M07	Output torque	Motor output torque based on the motor's rated torque (100%)	-327.68 to 327.68	0.01	%	×	○	○
M09	Output frequency 1	Output frequency with min. step 0.01Hz	FGI: -655.35 to 655.35 RTU: 0.00 to 655.35	0.01	Hz	○	○	○
M10	Input power	Power consumption value based on the "nominal applicable motor output" (100%)	0.00 to 399.99	0.01	%	○	○	○
M11	Output current effective value	Output current effective value based on the inverter rated current	0.00 to 399.99 (100% = inverter rated current)	0.01	%	○	○	○
M12	Output voltage effective value	Output voltage effective value (min. step: 1.0V)	0.0 to 1000.0	0.1 *1	V	○	○	○
M13	Operation command (final command)	Displays the final command created by information from the keypad, terminal block, and communications, and transmitted to the inverter inside.	0000 _H to FFFF _H	–	–	○	○	○
M14	Operation status	Displays the operation status in bit signal.	0000 _H to FFFF _H	–	–	○	○	○
M15	General-purpose output terminal information	General-purpose output terminal information is monitored.	0000 _H to FFFF _H	–	–	○	○	○

*1 Since M12 does not have any data after the decimal point, the minimum step is 1.0.

Table 5.8 Monitor data function codes (2)

Code	Name	Description	Monitor range	Min. step	Unit	Support		
						Mini	Eco	Multi
M16	Latest alarm contents	Display alarm contents in the form of code.	0 to 127	-	-	○	○	○
M17	Last alarm contents							
M18	Second last alarm contents							
M19	Third last alarm contents							
M20	Cumulative operation time	-	0 to 65535	1	h	○	○	○
M21	DC link circuit voltage	Displays the DC link circuit voltage of the inverter.	0 to 1000	1	V	○	○	○
M23	Model code	Displays the series, generation, model, and voltage series in four-digit HEX data.	0000 _H to FFFF _H	-	-	○	○	○
M24	Capacity code	Displays the capacity of the inverter.	0 to 65535	1	-	○	○	○
M25	ROM version	Displays the ROM version used in the inverter.	0 to 9999	1	-	○	○	○
M26	Transmission error transaction code	Communications error code of RS-485	0 to 127	-	-	○	○	○
M27	Frequency command on alarm (p.u.) (final command)	Data equivalent to M01 on alarm	-32768 to 32767 (±20,000 = maximum frequency)	1	-	○	○	○
M31	Frequency command on alarm (final command)	Data equivalent to M05 on alarm	0.00 to 655.35	0.01	Hz	○	○	○
M32	Output frequency 1 on alarm (p.u.)	Data equivalent to M06 on alarm	-32768 to 32767 (±20,000 = maximum frequency)	1	-	○	○	○
M33	Output torque on alarm	Data equivalent to M07 on alarm	-327.68 to 327.67	0.01	%	×	○	○
M35	Output frequency 1 on alarm	Data equivalent to M09 on alarm	FGI: -655.35 to 655.35 RTU: 0.00 to 655.35	0.01	Hz	○	○	○
M36	Input power on alarm	Data equivalent to M10 on alarm	0.00 to 399.99	0.01	%	○	○	○
M37	Output current effective value on alarm	Data equivalent to M11 on alarm	0.00 to 399.99 (100% = inverter rated current)	0.01	%	○	○	○
M38	Output voltage effective value on alarm	Data equivalent to M12 on alarm	0.0 to 1000.0	1.0	V	○	○	○

Table 5.8 Monitor data function codes (3)

Code	Name	Description	Monitor range	Min. step	Unit	Support		
						Mini	Eco	Multi
M39	Operation command on alarm	Data equivalent to M13 on alarm	0000 _H to FFFF _H	–	–	○	○	○
M40	Operation status on alarm	Data equivalent to M14 on alarm	0000 _H to FFFF _H	–	–	○	○	○
M41	General-purpose output terminal information on alarm	Data equivalent to M15 on alarm	0000 _H to FFFF _H	–	–	○	○	○
M42	Cumulative operation time on alarm	Data equivalent to M20 on alarm	0 to 65535	1	h	○	○	○
M43	DC link circuit voltage on alarm	Data equivalent to M21 on alarm	0 to 1000	1	V	○	○	○
M44	Inverter internal air temperature on alarm	Air temperature inside the inverter on alarm	0 to 255	1	°C	×	○	×
M45	Heat sink temperature on alarm	Data equivalent to M62 on alarm	0 to 255	1	°C	○	○	○
M46	Life of main circuit capacitor	The capacity of the main circuit capacitor is 100% when delivered from the factory	0.0 to 100.0	0.1	%	○	○	○
M47	Life of PC board electrolytic capacitor	Cumulative operation time of the capacitor packaged on the PC board	0 to 65535	1	h	○	○	○
M48	Life of heat sink	Cumulative operation time of the heat sink	0 to 65535	1	h	○	○	○
M49	Input terminal voltage ([12])	Input voltage of terminal [12] (-20,000/-10V, 20,000/10V)	-32768 to 32767	1	–	○	○	○
M50	Input terminal current ([C1])	Input current of terminal [C1] (0/0mA, 20,000/20mA)	0 to 32767	1	–	○	○	○
M54	Input terminal voltage ([V2])	Input voltage of terminal [V2] (-20000/10V to 20000/10V)	-32768 to 32767	1	–	×	○	○
M61	Inverter internal air temperature	Current temperature inside the inverter	0 to 255	1	°C	×	○	×
M62	Heat sink temperature	Current temperature of the heat sink within the inverter	0 to 255	1	°C	○	○	○
M63	Load rate	Load rate based on the motor rating	-327.68 to 327.67	0.01	%	×	○	○
M64	Motor output	Motor output based on the motor's rated output (kW)	-327.68 to 327.67	0.01	%	×	○	○
M65	Motor output on alarm	Data equivalent to M64 on alarm	-327.68 to 327.67	0.01	%	×	○	○

Table 5.8 Monitor data function codes (4)

Code	Name	Description	Monitor range	Min. step	Unit	Support		
						Mini	Eco	Multi
M68	PID final command	$\pm 20000/\pm 100\%$	-32678 to 32767	1	-	○	○	○
M69	Inverter rated current	FGI	0.00 to 9999	Variable	A	○	○	○
		RTU (inverter capacity 30HP (22kW) or less)	0.00 to 655.35	0.01	A	○	○	○
		RTU (inverter capacity 40HP (30kW) or more)	0.0 to 5000.0	0.1	A	×	○	-
M70	Operation status 2	Displays the operation status in the form of a bit signal.	0000 _H to FFFF _H	1	-	○	○	○
M71	Input terminal information	Operation command information from the terminal block and communications	0000 _H to FFFF _H	1	-	○	○	○
M72	PID feedback	PID feedback based on 100% of analog input ($\pm 20000/100\%$)	-32768 to 32767	1	-	×	○	○
M73	PID output	PID output based on the maximum frequency (F03) ($\pm 20000/100\%$)	-32768 to 32767	1	-	×	○	○

5.1.4 Information displayed on the keypad

The function codes used to read, via RS-485, information displayed on the keypad are classified into W codes, X codes, and Z codes. All of these function codes are for read only.

The function codes shown in Tables 5.9 to 5.11 correspond to the menu numbers displayed on the LEDs on the keypad shown in the "LED display" field. The "Support" column of the table indicates whether each function is supported by the respective models or not. ○ indicates the function is supported, and × indicates the function is not supported.

For details about the keypad display, see "Chapter 3 OPERATION USING THE KEYPAD" in the instruction manual of each inverter type.

RTU and FGI in the Remarks field represent the Modbus RTU protocol and the Fuji general-purpose inverter protocol, respectively.

Table 5.9 Keypad-related function code (W codes)

Code	Name	Monitor range	Min step	Unit	LED display	Support			Remarks
						Mini	Eco	Multi	
W01	Operation status	0000 _H to FFFF _H	1	–	3.07	○	○	○	
W02	Frequency command	0.00 to 655.35	0.01	Hz	3.05	○	○	○	
W03	Output frequency (before slip compensation)	0.00 to 655.35	0.01	Hz	3.00	○	○	○	
W04	Output frequency (after slip compensation)	0.00 to 655.35	0.01	Hz	3.01	○	×	○	
W05	Output current	0.00 to 9999	Variable	A	3.02	○	○	○	FGI RTU (inverter capacity 30HP or less) ^{a)}
		0.00 to 655.35	0.01	A	3.02	○	○	○	
		0.0 to 5000.0	0.1	A	3.02	×	○	–	RTU (inverter capacity 40 HP or more) ^{b)}
W06	Output voltage	0.0 to 1000.0	0.1	V	3.03	○	○	○	
W07	Torque operation value	-999 to 999	1	%	3.04	×	○	○	
W08	Motor speed	0.00 to 99990	Variable	r/min	3.08	×	○	○	
W09	Load rotation speed	0.00 to 99990	Variable	r/min	3.09	○	○	○	
W10	Line speed	0.00 to 99990	Variable	m/min	3.09	○	×	○	
W11	PID process command	-999 to 9990	Variable	–	3.10	○	○	○	PID process command or PID feedback value converted to the physical quantity of the control target by E40 and E41
W12	PID feedback value	-999 to 9990	Variable	–	3.11	○	○	○	
W13	Torque limit level 1	0 to 1000	1	%	3.12	×	×	○	
W14	Torque limit level 2	0 to 1000	1	%	3.13	×	×	○	
W16	Motor speed set value	0.00 to 99990	Variable	r/min	Speed monitor	×	○	○	
W17	Load speed set value	0.00 to 99990	Variable	r/min	Speed monitor	○	○	○	
W18	Line speed set value	0.00 to 99990	Variable	r/min	Speed monitor	○	×	○	
W19	Constant feed time set value	0.00 to 999.9	Variable	min	Speed monitor	○	×	○	
W20	Constant feed time	0.00 to 999.9	Variable	min	Speed monitor	○	×	○	
W21	Input power	0.00 to 9999	Variable	kW	Operation status monitor	○	○	○	
W22	Motor output power	0.00 to 9999	Variable	kW	Operation status monitor	×	○	○	
W23	Load factor	-999 to 999	1	%	Operation status monitor	×	○	○	
W27	Timer operation remaining time	0 to 9999	1	s	Operation status monitor	○	×	○	
W28	Operation command source	0 to 22	1	–	–	○	○	○	*1
W29	Frequency, PID command source	0 to 35	1	–	–	○	○	○	*2

a) FRENIC-Eco : 25HP(208V), 30HP (460V) or less

b) FRENIC-Eco : 30HP(208V), 40HP (460V) or more

Table 5.9 Keypad-related function code (W codes) (Continued)

Code	Name	Monitor range	Min step	Unit	LED display	Support			Remarks
						Mini	Eco	Multi	
W30	Speed (unit: %)	0.00 to 100.00	0.01	%	Speed monitor	×	○	○	
W31	Speed setting (unit: %)	0.00 to 100.00	0.01	%	Speed monitor	×	○	○	
W32	PID output	0 to 150.0	0.1	%	Operation status monitor	×	○	○	PID output expressed by a percentage with setting the maximum frequency (F03) to 100%
W33	Analog input monitor	-999 to 9990	Variable	–	Operation status monitor	×	○	×	Inverter's analog input converted by E40 and E41
W40	Control circuit terminal (input)	0000 _H to FFFF _H	1	–	4_00	○	○	○	
W41	Control circuit terminal (output)	0000 _H to FFFF _H	1	–	4_00	○	○	○	
W42	Communications control signal (input)	0000 _H to FFFF _H	1	–	4_01	○	○	○	
W43	Communications control signal (output)	0000 _H to FFFF _H	1	–	4_01	○	○	○	
W44	Terminal [12] input voltage	0.0 to 12.0	0.1	V	4_02	○	○	○	

*1 Operation command source code

Indicates the current source of operation commands.

For FRENIC-Mini, this code is 20 when operation commands from the loader are effective.

Code	Description	Mini	Eco	Multi
0	Run by the keypad (rotation direction: depends on the terminal input)	○	○	○
1	Run by the terminals	○	○	○
2	Run by the keypad (forward rotation)	○	○	○
3	Run by the keypad (reverse rotation)	○	○	○
4	Run command 2 (when FR2/FR1 is ON)	×	○	×
20	RS-485 channel 1 *3	○	○	○
21	RS-485 channel 2 *3	×	○	○
22	Bus option	×	○	○
23	Loader	×	○	○

*2 Frequency command source/PID command source code

FRENIC-Mini : Indicates a frequency command source even if PID is effective.

This code is 20 when the frequency command from the loader is effective.

FRENIC-Eco/Multi : Indicates a PID command source if PID is effective (code 30 or later).

Indicates a frequency command source if PID is not effective (code 29 or less).

Code	Description	Mini	Eco	Multi
0	Keypad key operations	○	○	○
1	Voltage input (terminal 12)	○	○	○
2	Current input (terminal C1)	○	○	○
3	Voltage input (terminal 12) + current input (terminal C1)	○	○	○
4	Inverter volume	○	×	×
5	Voltage input (terminal V2)	×	○	○
7	UP/DOWN	×	○	○
20	RS-485 channel 1*3	○	○	○
21	RS-485 channel 2*3	×	○	○
22	Bus option	×	○	○
23	Loader (20 for FRENIC-Mini)	×	○	○
24	Multi-step frequency	×	○	○
30	PID keypad command	×	○	○
31	PID analog command 1	×	○	○
33	PID UP/DOWN command	×	○	○
34	PID communications process command	×	○	○
36	PID multi-step command	×	○	○

*3 RS-485 channel

	FRENIC-Mini	FRENIC-Eco/Multi
RS-485 channel 1	RS-485 communications card (option)	Keypad connection connector on the inverter
RS-485 channel 2	–	RS-485 communications card (option)

Table 5.9 Keypad-related function code (W codes) (Continued)

Code	Name	Monitor range	Min step	Unit	LED display	Support			Remarks
						Mini	Eco	Multi	
W45	Terminal [C1] input current	0.0 to 30.0	0.1	mA	4_03	○	○	○	
W46	FMA output voltage	0.0 to 12.0	0.1	V	4_04	○	○	○	
W47	FMP output voltage	0.0 to 12.0	0.1	V	4_05	×	○	×	
W48	FMP output frequency	0 to 6000	1	-	4_06	×	○	○	The output pulse rate of terminal FMP expressed by (p/s)
W49	Terminal [V2] input voltage	0.0 to 12.0	0.1	V	4_07	×	○	○	
W50	FMA output current	0.0 to 30.0	0.1	MA	4_08	×	○	×	
W51	DIO optional terminal input status	0	1	-	4_10	×	×	○	
W52	DIO optional terminal output status	0	1	-	4_10	×	×	○	
W53	Number of pulses detected by PG (A/B-phase on command)	-327.68 to 327.67	0.01	-	4_15	×	×	○	
W54	Number of pulses detected by PG (Z-phase on command)	0 to 999	1	p/s	4_15	×	×	○	
W55	Number of pulses detected by PG (A/B-phase on feedback)	-327.68 to 327.67	0.01	-	4_17	×	×	○	Unit: kp/s
W56	Number of pulses detected by PG (Z-phase on feedback)	0 to 999	1	p/s	4_18	×	×	○	
W57	Position control: Current position with pulse high-order digit	-999 to 999	1	-	3_12	×	×	○	
W58	Position control: Current position with pulse low-order digit	0 to 9999	1	-	3_12	×	×	○	
W59	Position control: Target stop position with pulse high-order digit	-999 to 999	1	-	3_13	×	×	○	
W60	Position control: Target stop position with pulse low-order digit	0 to 9999	1	-	3_13	×	×	○	
W61	Position control: Positional deviation with pulse high-order digit	-999 to 999	1	-	3_14	×	×	○	
W62	Position control: Positional deviation with pulse low-order digit	0 to 9999	1	-	3_14	×	×	○	
W63	Position control-Control status monitor	0 to 10	1	-	3_12	×	×	○	
W65	Terminal [FM1] output current	0.0 to 30.0	0.1	mA	4_09	×	○	×	
W67	Cumulative operation time of electrolytic capacitor on PC board	0 to 9999	1	-	5_06	×	×	○	
W68	Cumulative operation time of cooling fan	0 to 9999	1	-	5_07	×	×	○	
W70	Cumulative operation time	0 to 65535	1	h	5_00	○	○	○	
W71	DC link circuit voltage	0 to 1000	1	V	5_01	○	○	○	
W72	Maximum temperature of internal air	0 to 255	1	°C	5_02	×	○	×	
W73	Maximum temperature of heat sink	0 to 255	1	°C	5_03	○	○	○	
W74	Maximum effective current value	0.00 to 9999	Variable	A	5_04	○	○	○	

Table 5.9 Keypad-related function code (W codes) (Continued)

Code	Name	Monitor range	Min step	Unit	LED display	Support			Remarks
						Mini	Eco	Multi	
W75	Capacitor of the DC bus capacitor	0.00 to 100.0	0.1	%	5_05	○	○	○	
W76	Cumulative operation time of electrolytic capacitor on PC board	0 to 65535	1	h	5_06	○	○	○	
W77	Cumulative operation time of cooling fan	0 to 65535	1	h	5_07	○	○	○	
W78	Number of startups	0 to 65535	1	Times	5_08	○	○	○	
W79	Cumulative operation time of motor	0 to 65535	1	h	5_23	×	○	○	
W80	Standard fan life	0 to 65535	1	h	–	×	○	×	
W81	Integral electric power consumption	0.001 to 9999	Variable	–	5_09	×	○	○	Value calculated by assuming an integral power consumption of 100kWh as one (100kWh when W81=1)
W82	Integral electric power consumption data	0.001 to 9999	Variable	–	5_10	×	○	○	Value calculated as integral power consumption (kWh) multiplied by function code E51
W83	Number of RS-485 Ch1 errors	0 to 9999	1	Times	5_11	○	○	○	
W84	Contents of RS-485 Ch1 error	0 to 127	1	–	5_12	○	○	○	
W85	Number of RS-485 Ch2 errors	0 to 9999	1	Times	5_17	×	○	○	
W87	Inverter's ROM version	0 to 9999	1	–	5_14	○	○	○	
W89	Remote/multi-function keypad ROM version	0 to 9999	1	–	5_16	○	○	○	
W90	Option ROM version	0 to 9999	1	–	5_19	×	○	○	
W94	Content of RS-485 Ch2 error	0 to 127	1	–	5_18	×	○	○	
W95	Number of option communications errors	0 to 9999	1	Times	5_13	×	○	○	
W96	Content of option communications error	0 to 9999	1	–	–	×	○	○	*

* Indicates the content of a communications error between the inverter and an option card. For details, see the manual of each option.

Table 5.10 Keypad-related function codes (X codes)

Code	Name	Monitor range	Min step	Unit	LED display	Support			Remarks
						Mini	Eco	Multi	
X00	Alarm history (latest)	0000 _H to FFFF _H	1	–	E_FL	○	○	○	Contents of 1 in alarm list (example: 1. LL)
X01	Multiple alarm 1 (latest)	0000 _H to FFFF _H	1	–	E_15	○	○	○	
X02	Multiple alarm 2 (latest)	0000 _H to FFFF _H	1	–	E_17	○	○	○	
X03	Sub-code	0 to 9999	1	–	–	×	○	○	
X05	Alarm history (last)	0000 _H to FFFF _H	1	–	E_FL	○	○	○	Contents of 2 in alarm list (example: 2. LL)
X06	Multiple alarm 1 (last)	0000 _H to FFFF _H	1	–	E_15	○	○	○	
X07	Multiple alarm 2 (last)	0000 _H to FFFF _H	1	–	E_17	○	○	○	
X08	Sub-code	0 to 9999	1	–	–	×	○	○	
X10	Alarm history (second last)	0000 _H to FFFF _H	1	–	E_FL	○	○	○	Contents of 3 in alarm list (example: 3. LL)
X11	Multiple alarm 1 (second last)	0000 _H to FFFF _H	1	–	E_15	○	○	○	
X12	Multiple alarm 2 (second last)	0000 _H to FFFF _H	1	–	E_17	○	○	○	
X13	Sub-code	0 to 9999	1	–	–	×	○	○	
X15	Alarm history (third last)	0000 _H to FFFF _H	1	–	E_FL	○	○	○	Contents of 4 in alarm list (example: 4. LL)
X16	Multiple alarm 1 (third last)	0000 _H to FFFF _H	1	–	E_15	○	○	○	
X17	Multiple alarm 2 (third last)	0000 _H to FFFF _H	1	–	E_17	○	○	○	
X18	Sub-code	0 to 9999	1	–	–	×	○	○	
X20	Latest information on alarm (output frequency)	0.00 to 655.35	0.01	Hz	E_00	○	○	○	
X21	(output current)	0.00 to 9999	Variable	A	E_01	○	○	○	FGI
		0.00 to 655.35	0.01	A	E_01	○	○	○	RTU (inverter capacity 30HP or less) ^{a)}
		0.0 to 5000.0	0.1	A	E_01	×	○	–	RTU (inverter capacity 40HP or more) ^{b)}
X22	(output voltage)	0 to 1000	1	V	E_02	○	○	○	
X23	(torque operation value)	-999 to 999	1	%	E_03	×	○	○	
X24	(set frequency)	0.00 to 655.35	0.01	Hz	E_04	○	○	○	
X25	(operation status)	0000 _H to FFFF _H	1	–	E_05	○	○	○	
X26	(cumulative operation time)	0 to 65535	1	h	E_07	○	○	○	
X27	(number of startups)	0 to 65535	1	Times	E_08	○	○	○	
X28	(DC link circuit voltage)	0 to 1000	1	V	E_09	○	○	○	
X29	(internal air temperature)	0 to 255	1	°C	E_10	×	○	×	
X30	(heat sink temperature)	0 to 255	1	°C	E_11	○	○	○	

^{a)} FRENIC-Eco : 25HP(208V), 30HP (460V) or less

^{b)} FRENIC-Eco : 30HP(208V), 40HP (460V) or more

Table 5.10 Keypad-related function codes (X codes) (Continued)

Code	Name	Monitor range	Min step	Unit	LED display	Support			Remarks
						Mini	Eco	Multi	
X31	(control circuit terminal (input))	0000 _H to FFFF _H	1	–	<i>5_12</i> <i>5_13</i>	○	○	○	
X32	(control circuit terminal (output))	0000 _H to FFFF _H	1	–	<i>5_12</i> <i>5_14</i>	○	○	○	
X33	(communications control signal (input))	0000 _H to FFFF _H	1	–	<i>5_18</i> <i>5_19</i>	○	○	○	
X34	(communications control signal (output))	0000 _H to FFFF _H	1	–	<i>5_18</i> <i>5_20</i>	○	○	○	
X35	Power consumption during alarm	0.00 to 9999	0.01	kW	–	×	○	○	
X60	Last information on alarm (output frequency)	0.00 to 655.35	0.01	Hz	<i>5_00</i>	○			
X61	(output current)	0.00 to 9999	Variable	A	<i>5_01</i>	○	○	○	FGI
		0.00 to 655.35	0.01	A	<i>5_01</i>	○	○	○	RTU (inverter capacity 30HP or less) ^{a)}
		0.0 to 5000.0	0.1	A	<i>5_01</i>	×	○	–	RTU (inverter capacity 40HP or more) ^{b)}
X62	(output voltage)	0 to 1000	1	V	<i>5_02</i>	○	○	○	
X63	(torque operation value)	-999 to 999	1	%	<i>5_03</i>	×	○	○	
X64	(set frequency)	0.00 to 655.35	0.01	Hz	<i>5_04</i>	○	○	○	
X65	(operation status)	0000 _H to FFFF _H	1	–	<i>5_05</i>	○	○	○	
X66	(cumulative operation time)	0 to 65535	1	h	<i>5_07</i>	○	○	○	
X67	(number of startups)	0 to 65535	1	Times	<i>5_08</i>	○	○	○	
X68	(DC link circuit voltage)	0 to 1000	1	V	<i>5_09</i>	○	○	○	
X69	(internal air temperature)	0 to 255	1	°C	<i>5_10</i>	×	○	×	
X70	(heat sink temperature)	0 to 255	1	°C	<i>5_11</i>	○	○	○	
X71	(control circuit terminal (input))	0000 _H to FFFF _H	1	–	<i>5_12</i> <i>5_13</i>	○	○	○	
X72	(control circuit terminal (output))	0000 _H to FFFF _H	1	–	<i>5_12</i> <i>5_14</i>	○	○	○	
X73	(communications control signal (input))	0000 _H to FFFF _H	1	–	<i>5_18</i> <i>5_19</i>	○	○	○	
X74	(communications control signal (output))	0000 _H to FFFF _H	1	–	<i>5_18</i> <i>5_20</i>	○	○	○	

^{a)} FRENIC-Eco : 25HP(208V), 30HP (460V) or less

^{b)} FRENIC-Eco : 30HP(208V), 40HP (460V) or more

Table 5.11 Keypad-related function codes (Z codes)

Code	Name	Monitor range	Min step	Unit	LED display	Support			Remarks
						Mini	Eco	Multi	
Z00	Second last information on alarm (output frequency)	0.00 to 655.35	0.01	Hz	5.00	○	○	○	
Z01	(output current)	0.00 to 9999	Variable	A	5.01	○	○	○	FGI
		0.00 to 655.35	0.01	A	5.01	○	○	○	RTU (inverter capacity 30HP or less) ^{a)}
		0.0 to 5000.0	0.1	A	5.01	×	○	–	RTU (inverter capacity 40HP or more) ^{b)}
Z02	(output voltage)	0 to 1000	1	V	5.02	○	○	○	
Z03	(torque operation value)	-999 to 999	1	%	5.03	×	○	○	
Z04	(set frequency)	0.00 to 655.35	0.01	Hz	5.04	○	○	○	
Z05	(operation status)	0000 _H to FFFF _H	1	–	5.05	○	○	○	
Z06	(cumulative operation time)	0 to 65535	1	h	5.07	○	○	○	
Z07	(number of startups)	0 to 65535	1	Times	5.08	○	○	○	
Z08	(DC link circuit voltage)	0 to 1000	1	V	5.09	○	○	○	
Z09	(internal air temperature)	0 to 255	1	°C	5.10	×	○	×	
Z10	(heat sink temperature)	0 to 255	1	°C	5.11	○	○	○	
Z11	(control circuit terminal (input))	0000 _H to FFFF _H	1	–	5.12 5.13	○	○	○	
Z12	(control circuit terminal (output))	0000 _H to FFFF _H	1	–	5.12 5.14	○	○	○	
Z13	(communications control signal (input))	0000 _H to FFFF _H	1	–	5.18 5.19	○	○	○	
Z14	(communications control signal (output))	0000 _H to FFFF _H	1	–	5.18 5.20	○	○	○	
Z50	Third last information on alarm (output frequency)	0.00 to 655.35	0.01	Hz	5.00	○	○	○	
Z51	(output current)	0.00 to 9999	Variable	A	5.01	○	○	○	FGI
		0.00 to 655.35	0.01	A	5.01	○	○	○	RTU (inverter capacity 30HP or less) ^{a)}
		0.0 to 5000.0	0.1	A	5.01	×	○	–	RTU (inverter capacity 40HP or more) ^{b)}
Z52	(output voltage)	0 to 1000	1	V	5.02	○	○	○	
Z53	(torque operation value)	-999 to 999	1	%	5.03	×	○	○	
Z54	(set frequency)	0.00 to 655.35	0.01	Hz	5.04	○	○	○	
Z55	(operation status)	0000 _H to FFFF _H	1	–	5.05	○	○	○	
Z56	(cumulative operation time)	0 to 65535	1	h	5.07	○	○	○	
Z57	(number of startups)	0 to 65535	1	Times	5.08	○	○	○	
Z58	(DC link circuit voltage)	0 to 1000	1	V	5.09	○	○	○	
Z59	(internal air temperature)	0 to 255	1	°C	5.10	×	○	×	
Z60	(heat sink temperature)	0 to 255	1	°C	5.11	○	○	○	
Z61	(control circuit terminal (input))	0000 _H to FFFF _H	1	–	5.12 5.13	○	○	○	
Z62	(control circuit terminal (output))	0000 _H to FFFF _H	1	–	5.12 5.14	○	○	○	
Z63	(communications control signal (input))	0000 _H to FFFF _H	1	–	5.18 5.19	○	○	○	
Z64	(communications control signal (output))	0000 _H to FFFF _H	1	–	5.18 5.20	○	○	○	

^{a)} FRENIC-Eco : 25HP(208V), 30HP (460V) or less

^{b)} FRENIC-Eco : 30HP(208V), 40HP (460V) or more

5.2 Data Formats

5.2.1 List of data format numbers

The following table shows the communications data format numbers for function code data. Create data according to the data format specifications described below. For the data setting range and setting unit, see "Chapter 9 Function Codes" in the User's Manual of each inverter type. The "Support" column of the table indicates whether each function is supported by the respective models or not. ○ indicates the function is supported, and × indicates the function is not supported.

RTU and FGI in the Format number field mean the Modbus RTU protocol and the Fuji general-purpose inverter protocol, respectively.

Table 5.12 List of data format numbers (F codes)

Code	Name	Format number	Support		
			Mini	Eco	Multi
F00	Data Protection	[1]	○	○	○
F01	Frequency Command 1	[1]	○	○	○
F02	Operation Method	[1]	○	○	○
F03	Maximum Frequency	[3]	○	○	○
F04	Base Frequency	[3]	○	○	○
F05	Rated Voltage (at the base frequency)	[1]	○	○	○
F06	Maximum Output Voltage	[1]	×	×	○
F07	Acceleration Time 1	[12]	○	○	○
F08	Deceleration Time 1	[12]	○	○	○
F09	Torque Boost	[3]	○	○	○
F10	Electronic Thermal Simulator (Overload Detection for Motor Protection) (Selection of motor cooling fan property)	[1]	○	○	○
F11	Electronic Thermal Simulator (Overload Detection for Motor Protection) (Level)	[24] (FGI)	○	○	○
		[19] (RTU)	○	○	○
		[24] (BUS) *3	×	○	○
F12	Electronic Thermal Simulator (Overload Detection for Motor Protection) (Thermal time constant)	[3]	○	○	○
F14	Restart Mode after momentary Power Failure	[1]	○	○	○
F15	Frequency Limiter (High)	[3]	○	○	○
F16	Frequency Limiter (Low)	[3]	○	○	○
F18	Bias (for Frequency command 1)	[6]	○	○	○
F20	DC Braking (Starting frequency)	[3]	○	○	○
F21	DC Braking (Braking level)	[1]	○	○	○
F22	DC Braking (Braking time)	[5]	○	○	○
F23	Starting Frequency	[3]	○	○	○
F24	Starting Frequency (Continuous Time)	[5]	×	×	○
F25	Stopping Frequency	[3]	○	○	○
F26	Motor Sound (Carrier frequency)	[1] *1	○	○	○
F27	Motor Sound (Sound tone)	[1]	○	○	○
F29	Terminal [FMA] (Function selection)	[1]	×	○	×
	Terminal [FM] (Function selection)	[1]	×	×	○
F30	Terminal [FMA] (Gain to output voltage)	[1]	○	○	×
	Terminal [FM] (Gain to output voltage)	[1]	×	×	○
F31	Terminal [FMA] (Function Selection)	[1]	○	○	×
	Terminal [FM] (Function Selection)	[1]	×	×	○
F33	Terminal [FMP] (Pulse Rate)	[1]	×	○	×
	Terminal [FM] (Pulse Rate)	[1]	×	×	○

Table 5.12 List of data format numbers (F codes) (- to be continued -)

Code	Name	Format number	Support		
			Mini	Eco	Multi
F34	Digital Output signal Selection for [FMP] (Voltage adjust)	[1]	×	○	×
F35	Digital Output Signal Selection for [FMP] (Function)	[1]	×	○	×
F37	Load Selection/Auto Torque Boost/Auto Energy Saving Operation	[1]	○	○	○
F39	Stopping Frequency (Continuous Time)	[5]	×	×	○
F40	Torque Limit 1 (Driving)	[1]	×	×	○
F41	Torque Limit 1 (Braking)	[1]	×	×	○
F42	Control System Selection	[1]	×	×	○
F43	Current Limiter (Operation condition)	[1]	○	○	○
F44	Current Limiter (Limiting level)	[1]	○	○	○
F50	Electronic Thermal Overload Relay (for braking resistor) (Discharging capability)	[1] *2	○	×	○
F51	Electronic Thermal Overload Relay (for braking resistor) (Allowable average loss)	[7] *2	○	×	○

*1 The frequency of 0.75kHz will be treated as 0.

*2 The value of 999 will be treated as 7FFF_H.

*3 BUS: The field bus option format is selected. For details about the field bus option, see the instruction manual for each field bus option.

Table 5.13 List of data format numbers (E codes)

Code	Name	Format number	Support		
			Mini	Eco	Multi
E01	Terminal Command Assignment to: [X1]	[1]	○	○	○
E02	Terminal Command Assignment to: [X2]	[1]	○	○	○
E03	Terminal Command Assignment to: [X3]	[1]	○	○	○
E04	Terminal Command Assignment to: [X4]	[1]	×	○	○
E05	Terminal Command Assignment to: [X5]	[1]	×	○	○
E10	Acceleration Time 2	[12]	○	×	○
E11	Deceleration Time 2	[12]	○	×	○
E16	Torque Limit 2 (Driving)	[1]	×	×	○
E17	Torque Limit 2 (Braking)	[1]	×	×	○
E20	Status signal Assignment to: [Y1]	[1]	○	○	○
E21	Status signal Assignment to: [Y2]	[1]	×	○	○
E22	Status signal Assignment to: [Y3]	[1]	×	○	×
E24	Relay Contact Output [Y5A/C]	[1]	×	○	×
E27	Relay Contact Output [30A/B/C]	[1]	○	○	○
E29	Frequency Arrival Delay (FAR2)	[5]	×	×	○
E30	Frequency Arrival Detection Width (FAR, FAR2)	[3]	×	×	○
E31	Frequency Detection (FDT) (Detection level)	[3]	○	○	○
E32	Frequency Detection (FDT) (Hysteresis width)	[3]	×	×	○
E34	Overload Early Warning/Current Detection (Level)	[24] (FGI)	○	○	○
		[19] (RTU)	○	○	○
		[24] (BUS) *3	×	○	○
E35	Overload Early Warning/Current Detection (Timer)	[5]	○	○	○
E37	Current Detection 2 (Detecting level)	[24] (FGI)	×	×	○
		[19] (RTU)	×	×	○
		[24] (BUS) *3	×	○	○
E38	Current Detection 2 (Timer)	[5]	×	×	○
E39	Coefficient for Constant Feeding Rate Time	[7]	○	×	○

Table 5.13 List of data format numbers (E codes) (Continued)

Code	Name	Format number	Support		
			Mini	Eco	Multi
E40	PID Display Coefficient A	[12]	○	○	○
E41	PID Display Coefficient B	[12]	○	○	○
E42	Display Filter	[5]	×	×	○
E43	LED Monitor (Function)	[1]	○	○	○
E45	LCD Monitor (Item selection)	[1]	×	○	○
E46	LCD Monitor (Language selection)	[1]	×	○	○
E47	LCD Monitor (Contrast control)	[1]	×	○	○
E48	LED Monitor (Speed monitor item)	[1]	○	○	○
E50	Coefficient for Speed Indication	[5]	○	○	○
E51	Display Coefficient for Input Watt-hour Data	[45]	×	○	○
E52	Keypad (Menu display mode)	[1]	○	○	○
E59	Terminal [C1] (Function selection) (C1/V2 function)	[1]	×	×	○
E60	Built-in Potentiometer (Function selection)	[1]	○	×	×
E61	Analog Input Signal Selection for: [12]	[1]	○	○	○
E62	Terminal [C1] (Extended function selection)	[1]	○	○	×
	Terminal [C2] (C1 function) (Extended function selection)	[1]	×	×	○
E63	Terminal [V2] (Extended function selection)	[1]	×	○	×
	Terminal [C1] (V2 function) (Extended function selection)	[1]	×	×	○
E64	Saving of the Digital Set Frequency	[1]	×	○	×
E65	Command Loss Detection (Level)	[1] *1	×	○	○
E80	Detect Low Torque (Detection level)	[1]	×	○	×
E81	Detect Low Torque (Timer)	[5]	×	○	×
E98	Terminal Command Assignment to: [FWD]	[1]	○	○	○
E99	Terminal Command Assignment to: [REV]	[1]	○	○	○

*1 999 is handled as 7FFF_H.

*3 BUS: The field bus option format is selected. For details about the field bus option, see the instruction manual for each field bus option.

Table 5.14 List of data format numbers (C codes)

Code	Name	Format number	Support		
			Mini	Eco	Multi
C01	Jump Frequency 1	[3]	○	○	○
C02	Jump Frequency 2	[3]	○	○	○
C03	Jump Frequency 3	[3]	○	○	○
C04	Jump Frequency (Hysteresis)	[3]	○	○	○
C05	Multistep Frequency Settings 1	[5]	○	○	○
C06	Multistep Frequency Settings 2	[5]	○	○	○
C07	Multistep Frequency Settings 3	[5]	○	○	○
C08	Multistep Frequency Settings 4	[5]	○	○	○
C09	Multistep Frequency Settings 5	[5]	○	○	○
C10	Multistep Frequency Settings 6	[5]	○	○	○
C11	Multistep Frequency Settings 7	[5]	○	○	○
C12	Multistep Frequency Settings 8	[5]	×	×	○
C13	Multistep Frequency Settings 9	[5]	×	×	○
C14	Multistep Frequency Settings 10	[5]	×	×	○
C15	Multistep Frequency Settings 11	[5]	×	×	○
C16	Multistep Frequency Settings 12	[5]	×	×	○
C17	Multistep Frequency Settings 13	[5]	×	×	○
C18	Multistep Frequency Settings 14	[5]	×	×	○
C19	Multistep Frequency Settings 15	[5]	×	×	○

Table 5.14 List of data format numbers (C codes) (Continued)

Code	Name	Format number	Support		
			Mini	Eco	Multi
C20	Jogging Frequency	[5]	○	×	○
C21	Timer Operation	[1]	○	×	○
C30	Frequency Command 2	[1]	○	○	○
C31	Analog Input Adjustment (Offset for terminal input [12])	[4]	×	×	○
C32	Analog Input Adjustment (Gain for terminal input [12])	[5]	○	○	○
C33	Analog Input Adjustment (Filter time constant)	[5]	○	○	○
C34	Analog Input Adjustment (Gain base point)	[5]	○	○	○
C35	Analog Input Adjustment (Polarity selection for terminal input [12])	[1]	×	×	○
C36	Analog Input Adjustment (Terminal [C1]) (C1 function) (Offset)	[4]	×	×	○
C37	Analog Input Adjustment (Gain for terminal input [C1])	[5]	○	○	×
	Analog Input Adjustment (Terminal [C1]) (C1 function) (Gain)	[5]	×	×	○
C38	Analog Input Adjustment (Filter for terminal input [C1])	[5]	○	○	×
	Analog Input Adjustment (Terminal [C1]) (C1 function) (Filter)	[5]	×	×	○
C39	Analog Input Adjustment (Terminal [C1]) (Gain base point)	[5]	○	○	×
	Analog Input Adjustment (Terminal [C1]) (C1 function) (Gain base point)	[5]	×	×	○
C41	Analog Input Adjustment (Terminal [C1]) (V2 function) (Offset)	[4]	×	×	○
C42	Analog Input Adjustment (Gain for terminal input [V2])	[5]	×	○	×
	Analog Input Adjustment (Terminal [C1]) (V2 function) (Gain)	[5]	×	×	○
C43	Analog Input Adjustment (Filter for terminal input [V2])	[5]	×	○	×
	Analog Input Adjustment (Terminal [C1]) (V2 function) (Filter)	[5]	×	×	○
C44	Analog Input Adjustment (Terminal [V2]) (Gain base point)	[5]	×	○	×
	Analog Input Adjustment (Terminal [C1]) (V2 function) (Gain base point)	[5]	×	×	○
C50	Bias (Frequency command 1) (Bias base point)	[5]	○	○	○
C51	Bias (PID command 1) (Bias value)	[6]	○	○	○
C52	Bias (PID command 1) (Bias base point)	[5]	○	○	○
C53	Selection of Normal/Inverse Operation for the Frequency Command 1	[1]	×	○	○

Table 5.16 List of data format numbers (H codes) (Continued)

Code	Name	Format number	Support		
			Mini	Eco	Multi
H50	Non-linear V/f Pattern (Frequency)	[3]	○	○	○
H51	Non-linear V/f Pattern (Voltage)	[1]	○	○	○
H52	Non-linear V/f 2 (Frequency)	[3]	×	×	○
H53	Non-linear V/f 2 (Voltage)	[1]	×	×	○
H54	ACC/DEC Time (Jogging operation)	[12]	○	×	○
H56	Deceleration Time for Forced Stop	[12]	×	○	○
H61	UP/DOWN Control Initial Value Selection	[1]	×	×	○
H63	Low Limiter (Select)	[1]	×	○	○
H64	Low Limiter (Specify the lower limiting frequency)	[3]	○	○	○
H68	Slip Compensation (Function selection)	[1]	×	×	○
H69	Automatic Deceleration	[1]	○	○	○
H70	Overload Prevention Control (Frequency drop rate)	[5] *1	○	○	○
H71	Deceleration Characteristics	[1]	×	○	○
H76	Torque Limit (Braking) (Increased frequency limiter)	[3]	×	×	○
H80	Gain for Suppression of Output Current Fluctuation for Motor	[5]	○	○	○
H86	Reserved. *2	[1]	×	○	×
H87	Reserved. *2	[3]	×	○	×
H88	Reserved. *2	[1]	×	○	×
H89	Reserved. *2	[1]	×	○	○
H90	Reserved. *2	[1]	×	○	○
H91	Reserved. *2	[1]	×	○	○
H92	Continue to Run (P component: gain)	[7] *1	×	○	×
H93	Continue to Run (I component: time)	[7] *1	×	○	×
H94	Accumulated Run Time of Motor	[1]	×	○	○
H95	DC Braking (Braking response mode)	[1]	×	○	○
H96	STOP Key Priority/Start Check Function	[1]	○	○	○
H97	Clear Alarm Data	[1]	○	○	○
H98	Protection/Maintenance Function (Specify operation)	[1]	○	○	○

*1 The value of 999 will be treated as 7FFF_H.

*2 The H86 through H91 are displayed, but they are reserved for particular manufacturers. Unless otherwise specified, do not access these function codes.

Table 5.17 List of data format numbers (A codes)

Code	Name	Format number	Support		
			Mini	Eco	Multi
A01	Maximum Frequency 2	[3]	×	×	○
A02	Base Frequency 2	[3]	×	×	○
A03	Rated Voltage 2 (at base frequency)	[1]	×	×	○
A04	Maximum Voltage 2	[1]	×	×	○
A05	Torque Boost 2	[3]	×	×	○
A06	Electronic Thermal Overload 2 for motor protection (Select the property)	[1]	×	×	○
A07	Electronic Thermal Overload 2 for motor protection (Overload detection level)	[24] (FGI)	×	×	○
		[19] (RTU)	×	×	○
		[24] (BUS) *3	×	○	○
A08	Electronic Thermal Overload 2 for motor protection (Thermal time constant)	[3]	×	×	○
A09	DC Braking 2 (Starting frequency)	[3]	×	×	○
A10	DC braking 2 (Braking level)	[1]	×	×	○
A11	DC braking 2 (Braking time)	[5]	×	×	○
A12	Starting frequency 2	[3]	×	×	○
A13	Load Selection/Auto Torque Boost/Auto Energy Saving Operation 2	[1]	×	×	○
A14	Control System Selection 2	[1]	×	×	○
A15	Motor 2 Poles	[1]	×	×	○
A16	Motor 2 Capacity	When A39 = 0, 3, 4 [11]	×	×	○
		When A39 = 1 [25]	×	×	○
A17	Rated Motor 2 Capacity	[24] (FGI)	×	×	○
		[19] (RTU)	×	×	○
		[24] (BUS) *3	×	○	○
A18	Motor 2 (Auto-tuning)	[21]	×	×	○
A19	Motor 2 (Online-tuning)	[1]	×	×	○
A20	Motor 2 (No-load current)	[24] (FGI)	×	×	○
		[19] (RTU)	×	×	○
		[24] (BUS) *3	×	○	○
A21	Motor 2 (%R1)	[5]	×	×	○
A22	Motor 2 (%X)	[5]	×	×	○
A23	Motor 2 (Slip compensation gain (Driving))	[3]	×	×	○
A24	Motor 2 (Slip compensation response time)	[5]	×	×	○
A25	Motor 2 (Slip compensation gain (Braking))	[3]	×	×	○
A26	Motor 2 (Rated slip)	[5]	×	×	○
A39	Motor 2 Selection	[1]	×	×	○
A40	Slip Compensation 2 (Function selection)	[1]	×	×	○
A41	Gain for Suppression of Output Current Fluctuation 2	[5]	×	×	○
A45	Cumulative Motor Run Time 2	[1]	×	×	○
A46	Number of Starting Times	[1]	×	×	○

*3 BUS: The field bus option format is selected. For details about the field bus option, see the instruction manual for each field bus option.

Table 5.18 List of data format numbers (J codes)

Code	Name	Format number	Support		
			Mini	Eco	Multi
J01	PID Control	[1]	○	○	○
J02	PID Control (Remote process command)	[1]	○	○	○
J03	PID Control P (Gain)	[7]	○	○	○
J04	PID Control I (Integration time)	[3]	○	○	○
J05	PID Control D (Differentiation time)	[5]	○	○	○
J06	PID Control (Feedback filter)	[3]	○	○	○
J10	PID Control (Anti reset windup)	[1]	×	○	○
J11	PID Control (Select alarm output)	[1]	×	○	○
J12	PID Control (High limit alarm (AH))	[2]	×	○	○
J13	PID Control (Low limit alarm (AL))	[2]	×	○	○
J15	PID Control (Stop frequency for slow flowrate)	[1]	×	○	×
J16	PID Control (Elapsed stop time for slow flowrate)	[1]	×	○	×
J17	PID Control (Starting frequency)	[1]	×	○	×
J18	PID Control (Upper limit of PID process output)	[2]	×	○	○
J19	PID Control (Lower limit of PID process output)	[2]	×	○	○
J21	Dew Condensation Protection (Duty)	[1]	×	○	×
J22	Commercial Line Switching Sequence	[1]	×	○	×
J56	PID Control (PID speed command filter)	[5]	×	×	○
J57	PID Control (Dancer reference position)	[2]	×	×	○
J58	PID Control (Dancer reference position detecting width)	[1]	×	×	○
J59	PID Control (Gain)	[7]	×	×	○
J60	PID Control (Integral time)	[3]	×	×	○
J61	PID Control (Differential time)	[5]	×	×	○
J62	PID Control (PID control block selection)	[1]	×	×	○
J63	Overload Stopping Function (Detected value)	[1]	×	×	○
J64	Overload Stopping Function (Detection level)	[1]	×	×	○
J65	Overload Stopping Function (Function selection)	[1]	×	×	○
J66	Overload Stopping Function (Function mode)	[1]	×	×	○
J67	Overload Stopping Function (Timer)	[5]	×	×	○
J68	Brake Signal (Release current)	[1]	×	×	○
J69	Brake Signal (Release frequency)	[3]	×	×	○
J70	Brake Signal (Release timer)	[3]	×	×	○
J71	Brake Signal (Putting on frequency)	[3]	×	×	○
J72	Brake Signal (Putting on timer)	[3]	×	×	○
J73	Position Control (Start timer)	[3]	×	×	○
J74	Position Control (Start point: High-order digit)	[73]	×	×	○
J75	Position Control (Start point: Low-order digit)	[1]	×	×	○
J76	Position Control (Z point: High-order digit)	[73]	×	×	○
J77	Position Control (Z point: Low-order digit)	[1]	×	×	○
J78	Position Control (Low-speed operation distance: High-order digit)	[73]	×	×	○
J79	Position Control (Low-speed operation distance: Low-order digit)	[1]	×	×	○
J80	Position Control (Command speed at low speed operation)	[1]	×	×	○
J81	Position Control (Target stop point: High-order digit)	[73]	×	×	○
J82	Position Control (Target stop point: Low-order digit)	[1]	×	×	○
J83	Position Control (Target stop point tolerance)	[1]	×	×	○
J84	Position Control (End timer)	[3]	×	×	○
J85	Position Control (Coasting compensation)	[1]	×	×	○
J86	Position Control (Serial pulse signal state)	[1]	×	×	○
J87	Position Control (Z-point compensation direction)	[1]	×	×	○

Table 5.18 List of data format numbers (J codes) (Continued)

Code	Name	Format number	Support		
			Mini	Eco	Multi
J88	Position Control (Pulse polarity at current position)	[1]	×	×	○
J90	Hit-and-stop control Function Torque Limit P (Gain)	[7]	×	×	○
J91	Hit-and-stop control Function Torque Limit I (Integral time)	[3]	×	×	○
J92	Hit-and-stop control Function (Current control command coefficient)	[3]	×	×	○

Table 5.19 List of data format numbers (y codes)

Code	Name	Format number	Support		
			Mini	Eco	Multi
y01	RS-485 Communication (Standard) (Station address)	[1]	○	○	○
y02	RS-485 Communication (Standard) (Mode selection on no response error)	[1]	○	○	○
y03	RS-485 Communication (Standard) (Timer)	[3]	○	○	○
y04	RS-485 Communication (Standard) (Baud rate)	[1]	○	○	○
y05	RS-485 Communication (Standard) (Data length)	[1]	○	○	○
y06	RS-485 Communication (Standard) (Parity check)	[1]	○	○	○
y07	RS-485 Communication (Standard) (Stop bits)	[1]	○	○	○
y08	RS-485 Communication (Standard) (No response error detection time)	[1]	○	○	○
y09	RS-485 Communication (Standard) (Response interval)	[5]	○	○	○
y10	RS-485 Communication (Standard) (Protocol selection)	[1]	○	○	○
y11	RS-485 Communication (Option) (Station address)	[1]	×	○	○
y12	RS-485 Communication (Option) (Mode selection on no response error)	[1]	×	○	○
y13	RS-485 Communication (Option) (Timer)	[3]	×	○	○
y14	RS-485 Communication (Option) (Baud rate)	[1]	×	○	○
y15	RS-485 Communication (Option) (Data length)	[1]	×	○	○
y16	RS-485 Communication (Option) (Parity check)	[1]	×	○	○
y17	RS-485 Communication (Option) (Stop bits)	[1]	×	○	○
y18	RS-485 Communication (Option) (No response error detection time)	[1]	×	○	○
y19	RS-485 Communication (Option) (Response interval)	[5]	×	○	○
y20	RS-485 Communication (Option) (Protocol selection)	[1]	×	○	○
y98	Bus Link Function	[1]	×	○	○
y99	Loader Link Function	[1]	○	○	○

Table 5.20 List of data format numbers (S codes)

Code	Name	Format number	Support		
			Mini	Eco	Multi
S01	Frequency command (p.u.)	[29]	○	○	○
S05	Frequency command	[22]	○	○	○
S06	Operation command	[14]	○	○	○
S07	Universal DO	[15]	×	○	×
S08	Acceleration time	[3]	○	○	○
S09	Deceleration time	[3]	○	○	○
S10	Torque limit level 1	[1]	×	×	○
S11	Torque limit level 2	[1]	×	×	○
S12	Universal AO	[29]	×	○	○
S13	PID command	[29]	○	○	○
S14	Alarm reset command	[1]	○	○	○

Table 5.21 List of data format numbers (M codes)

Code	Name	Format number	Support		
			Mini	Eco	Multi
M01	Frequency command (p.u.) (final command)	[29]	○	○	○
M05	Frequency command (final command)	[22]	○	○	○
M06	Output frequency 1 (p.u.)	[29]	○	○	○
M07	Output torque	[6]	×	○	○
M09	Output frequency 1	[23] (FGI)	○	○	○
		[22] (RTU)	○	○	○
		[24] (BUS) *3	×	○	○
M10	Input power	[5]	○	○	○
M11	Output current effective value	[5]	○	○	○
M12	Output voltage effective value	[3]	○	○	○
M13	Operation command (final command)	[14]	○	○	○
M14	Operation status	[16]	○	○	○
M15	General-purpose output terminal information	[15]	○	○	○
M16	Latest alarm contents	[10]	○	○	○
M17	Last alarm contents	[10]	○	○	○
M18	Second last alarm contents	[10]	○	○	○
M19	Third last alarm contents	[10]	○	○	○
M20	Cumulative operation time	[1]	○	○	○
M21	DC link circuit voltage	[1]	○	○	○
M23	Model code	[17]	○	○	○
M24	Capacity code	[11]	○	○	○
M25	ROM version	[35]	○	○	○
M26	Transmission error transaction code	[20]	○	○	○
M27	Frequency command on alarm (p.u.) (final command)	[29]	○	○	○
M31	Frequency command on alarm (final command)	[22]	○	○	○
M32	Output frequency 1 on alarm (p.u.)	[29]	○	○	○
M33	Output torque on alarm	[6]	×	○	○
M35	Output frequency 1 on alarm	[23] (FGI)	○	○	○
		[22] (RTU)	○	○	○
		[24] (BUS) *3	×	○	○
M36	Input power on alarm	[5]	○	○	○
M37	Output current effective value on alarm	[5]	○	○	○
M38	Output voltage effective value on alarm	[3]	○	○	○
M39	Operation command on alarm	[14]	○	○	○

*3 BUS: The field bus option format is selected. For details about the field bus option, see the instruction manual for each field bus option.

Table 5.21 List of data format numbers (M codes) (Continued)

Code	Name	Format number	Support		
			Mini	Eco	Multi
M40	Operation status on alarm	[16]	○	○	○
M41	General-purpose output terminal information on alarm	[15]	○	○	○
M42	Cumulative operation time on alarm	[1]	○	○	○
M43	DC link circuit voltage on alarm	[1]	○	○	○
M44	Inverter internal air temperature on alarm	[1]	×	○	×
M45	Heat sink temperature on alarm	[1]	○	○	○
M46	Life of main circuit capacitor	[3]	○	○	○
M47	Life of PC board electrolytic capacitor	[1]	○	○	○
M48	Life of heat sink	[1]	○	○	○
M49	Input terminal voltage ([I2])	[29]	○	○	○
M50	Input terminal current ([C1])	[29]	○	○	○
M54	Input terminal voltage ([V2])	[29]	×	○	○
M61	Inverter internal air temperature	[1]	×	○	×
M62	Heat sink temperature	[1]	○	○	○
M63	Load rate	[6]	×	○	○
M64	Motor output	[6]	×	○	○
M65	Motor output on alarm	[6]	×	○	○
M68	PID final command	[29]	○	○	○
M69	Inverter rated current	[24] (FGI)	○	○	○
		[19] (RTU)	○	○	○
		[24] (BUS) *3	×	○	○
M70	Operation status 2	[44]	○	○	○
M71	Input terminal information	[14]	○	○	○
M72	PID feedback	[29]	×	○	○
M73	PID output	[29]	×	○	○

*3 BUS: The field bus option format is selected. For details about the field bus option, see the instruction manual for each field bus option.

Table 5.22 List of data format numbers

Code	Name	Format number	Support		
			Mini	Eco	Multi
W01	Operation status	[16]	○	○	○
W02	Frequency command	[22]	○	○	○
W03	Output frequency (before slip compensation)	[22]	○	○	○
W04	Output frequency (after slip compensation)	[22]	○	×	×
W05	Output current	[24] (FGI)	○	○	○
		[19] (RTU)	○	○	○
		[24] (BUS) *3	×	○	○
W06	Output voltage	[3]	○	○	○
W07	Torque operation value	[2]	×	○	○
W08	Motor speed	[37]	×	○	○
W09	Load rotation speed	[37]	○	○	○
W10	Line speed	[37]	○	×	○
W11	PID process command	[12]	○	○	○
W12	PID feedback value	[12]	○	○	○
W13	Torque limit level 1	[1]	×	×	○
W14	Torque limit level 2	[1]	×	×	○
W16	Motor speed set value	[37]	×	○	○
W17	Load speed set value	[37]	○	○	○
W18	Line speed set value	[37]	○	×	×
W19	Constant feed time set value	[37]	○	×	×
W20	Constant feed time	[37]	○	×	×
W21	Input power	[24]	○	○	○
W22	Motor output power	[24]	×	○	○
W23	Load factor	[2]	×	○	○
W27	Timer operation remaining time	[1]	○	×	×
W28	Operation command source	[1]	○	○	○
W29	Frequency, PID command source	[1]	○	○	○
W30	Speed (unit: %)	[5]	×	○	○
W31	Speed setting (unit: %)	[5]	×	○	○
W32	PID output	[4]	×	○	○
W33	Analog input monitori	[12]	×	○	×
W40	Control circuit terminal (input)	[43]	○	○	○
W41	Control circuit terminal (output)	[15]	○	○	○
W42	Communications control signal (input)	[14]	○	○	○
W43	Communications control signal (output)	[15]	○	○	○
W44	Terminal [12] input voltage	[4]	○	○	○
W45	Terminal [C1] input current	[4]	○	○	○
W46	Terminal [FMA] output voltage	[3]	○	○	○
W47	Terminal [FMP] output voltage	[3]	×	○	×
W48	Terminal [FMP] output frequency	[1]	×	○	○
W49	Terminal [V2] input voltage	[4]	×	○	○
W50	Terminal [FMA] output current	[3]	×	○	×
W51	DIO optional terminal input status	[1]	×	×	○
W52	DIO optional terminal output status	[1]	×	×	○
W53	Detected pulse number (AB-phase on command)	[6]	×	×	○
W54	Detected pulse number (Z-phase on command)	[1]	×	×	○
W55	Detected pulse number (AB-phase on feedback)	[6]	×	×	○
W56	Detected pulse number (Z-phase on feedback)	[1]	×	×	○

*3 BUS: The field bus option format is selected. For details about the field bus option, see the instruction manual for each field bus option.

Table 5.22 List of data format numbers (Continued)

Code	Name	Format number	Support		
			Mini	Eco	Multi
W57	Position control: Current position with pulse high-order digit	[73]	×	×	○
W58	Position control: Current position with pulse low-order digit	[1]	×	×	○
W59	Position control: Target stop position with pulse high-order digit	[73]	×	×	○
W60	Position control: Target stop position with pulse low-order digit	[1]	×	×	○
W61	Position control: Positional deviation with pulse high-order digit	[73]	×	×	○
W62	Position control: Positional deviation with pulse low-order digit	[1]	×	×	○
W63	Position control-Control status monitor	[1]	×	×	○
W65	Terminal [FMI] output current	[3]	×	○	×
W67	Cumulative operation time of electrolytic capacitor on PC board	[1]	×	×	○
W68	Cumulative operation time of cooling fan	[1]	×	×	○
W70	Cumulative operation time	[1]	○	○	○
W71	DC link circuit voltage	[1]	○	○	○
W72	Maximum temperature of internal air	[1]	×	○	×
W73	Maximum temperature of heat sink	[1]	○	○	○
W74	Maximum effective current value	[24] (FGI)	○	○	○
		[19] (RTU)	○	○	○
		[24] (BUS) *3	×	○	○
W75	Capacitor of the DC bus capacitor	[3]	○	○	○
W76	Cumulative operation time of electrolytic capacitor on PC board	[1]	○	○	○
W77	Cumulative operation time of cooling fan	[1]	○	○	○
W78	Number of startups	[1]	○	○	○
W79	Cumulative operation time of motor	[1]	×	○	○
W80	Standard fan life	[1]	×	○	×
W81	Integral electric power consumption	[45]	×	○	○
W82	Integral electric power consumption data	[45]	×	○	○
W83	Number of RS-485 Ch1 errors	[1]	○	○	○
W84	Contents of RS-485 Ch1 error	[20]	○	○	○
W85	Number of RS-485 Ch2 errors	[1]	×	○	○
W87	Inverter's ROM version	[35]	○	○	○
W89	Remote/multi-function keypad ROM version	[35]	○	○	○
W90	Option ROM version	[35]	×	○	○
W94	Content of RS-485 Ch2 error	[20]	×	○	○
W95	Number of option communications errors	[1]	×	○	○
W96	Content of option communications error	[1]	×	○	○

*3 BUS: The field bus option format is selected. For details about the field bus option, see the instruction manual for each field bus option.

Table 5.23 List of data format numbers (X codes)

Code	Name	Format number	Support		
			Mini	Eco	Multi
X00	Alarm history (latest)	[41]	○	○	○
X01	Multiple alarm 1 (latest)	[40]	○	○	○
X02	Multiple alarm 2 (latest)	[40]	○	○	○
X03	Sub-code	[1]	×	○	○
X05	Alarm history (last)	[41]	○	○	○
X06	Multiple alarm 1 (last)	[40]	○	○	○
X07	Multiple alarm 2 (last)	[40]	○	○	○
X08	Sub-code	[1]	×	○	○
X10	Alarm history (second last)	[41]	○	○	○
X11	Multiple alarm 1 (second last)	[40]	○	○	○
X12	Multiple alarm 2 (second last)	[40]	○	○	○
X13	Sub-code	[1]	×	○	○
X15	Alarm history (third last)	[41]	○	○	○
X16	Multiple alarm 1 (third last)	[40]	○	○	○
X17	Multiple alarm 2 (third last)	[40]	○	○	○
X18	Sub-code	[1]	×	○	○
X20	Latest information on alarm (output frequency)	[22]	○	○	○
X21	(output current)	[24] (FGI)	○	○	○
		[19] (RTU)	○	○	○
		[24] (BUS) *3	×	○	○
X22	(output voltage)	[1]	○	○	○
X23	(torque operation value)	[2]	×	○	○
X24	(set frequency)	[22]	○	○	○
X25	(operation status)	[16]	○	○	○
X26	(cumulative operation time)	[1]	○	○	○
X27	(number of startups)	[1]	○	○	○
X28	(DC link circuit voltage)	[1]	○	○	○
X29	(internal air temperature)	[1]	×	○	×
X30	(heat sink temperature)	[1]	○	○	○
X31	(control circuit terminal (input))	[43]	○	○	○
X32	(control circuit terminal (output))	[15]	○	○	○
X33	(communications control signal (input))	[14]	○	○	○
X34	(communications control signal (output))	[15]	○	○	○
X35	(Power consumption during alarm)	[24]	×	○	○
X60	Last information on alarm (output frequency)	[22]	○	○	○
X61	(output current)	[24] (FGI)	○	○	○
		[19] (RTU)	○	○	○
		[24] (BUS) *3	×	○	○
X62	(output voltage)	[1]	○	○	○
X63	(torque operation value)	[2]	×	○	○
X64	(set frequency)	[22]	○	○	○
X65	(operation status)	[16]	○	○	○
X66	(cumulative operation time)	[1]	○	○	○
X67	(number of startups)	[1]	○	○	○
X68	(DC link circuit voltage)	[1]	○	○	○
X69	(internal air temperature)	[1]	×	○	×
X70	(heat sink temperature)	[1]	○	○	○
X71	(control circuit terminal (input))	[43]	○	○	○
X72	(control circuit terminal (output))	[15]	○	○	○
X73	(communications control signal (input))	[14]	○	○	○
X74	(communications control signal (output))	[15]	○	○	○

*3 BUS: The field bus option format is selected. For details about the field bus option, see the instruction manual for each field bus option.

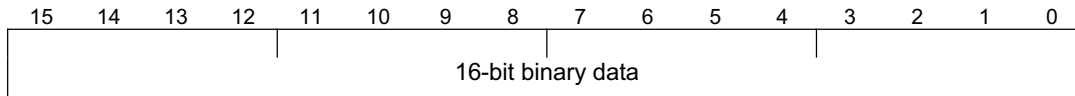
Table 5.24 List of data format numbers (Z codes)

Code	Name	Format number	Support		
			Mini	Eco	Multi
Z00	Second last information on alarm (output frequency)	[22]	○	○	○
Z01	(output current)	[24] (FGI)	○	○	○
		[19] (RTU)	○	○	○
		[24] (BUS) *3	×	○	○
Z02	(output voltage)	[1]	○	○	○
Z03	(torque operation value)	[2]	×	○	○
Z04	(set frequency)	[22]	○	○	○
Z05	(operation status)	[16]	○	○	○
Z06	(cumulative operation time)	[1]	○	○	○
Z07	(number of startups)	[1]	○	○	○
Z08	(DC link circuit voltage)	[1]	○	○	○
Z09	(internal air temperature)	[1]	×	○	×
Z10	(heat sink temperature)	[1]	○	○	○
Z11	(control circuit terminal (input))	[43]	○	○	○
Z12	(control circuit terminal (output))	[15]	○	○	○
Z13	(communications control signal (input))	[14]	○	○	○
Z14	(communications control signal (output))	[15]	○	○	○
Z50	Third last information on alarm (output frequency)	[22]	○	○	○
Z51	(output current)	[24] (FGI)	○	○	○
		[19] (RTU)	○	○	○
		[24] (BUS) *3	×	○	○
Z52	(output voltage)	[1]	○	○	○
Z53	(torque operation value)	[2]	×	○	○
Z54	(set frequency)	[22]	○	○	○
Z55	(operation status)	[16]	○	○	○
Z56	(cumulative operation time)	[1]	○	○	○
Z57	(number of startups)	[1]	○	○	○
Z58	(DC link circuit voltage)	[1]	○	○	○
Z59	(internal air temperature)	[1]	×	○	×
Z60	(heat sink temperature)	[1]	○	○	○
Z61	(control circuit terminal (input))	[43]	○	○	○
Z62	(control circuit terminal (output))	[15]	○	○	○
Z63	(communications control signal (input))	[14]	○	○	○
Z64	(communications control signal (output))	[15]	○	○	○

*3 BUS: The field bus option format is selected. For details about the field bus option, see the instruction manual for each field bus option.

5.2.2 Data format specifications

The data in the data fields of a communications frame are 16 bits long, binary data, as shown below.



For the convenience of description, 16-bit data is expressed in hexadecimal with one upper-order byte (eight bits from 15 to 8) and one lower-order byte (eight bits from 7 to 0).

For example, the following data is 1234H in hexadecimal and expressed as

12 _H	34 _H
-----------------	-----------------

.

0	0	0	1	0	0	1	0	0	0	1	1	0	1	0	0
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Data format [1] Integer data (positive): Minimum step 1

(Example) When F05 (base) frequency voltage = 200V

200 = 00C8_H Consequently \Rightarrow

00 _H	C8 _H
-----------------	-----------------

Data format [2] Integer data (positive/negative): Minimum step 1

(Example) When the value is -20

-20 = FFEC_H Consequently, \Rightarrow

FF _H	EC _H
-----------------	-----------------

Data format [3] Decimal data (positive): Minimum step 0.1

(Example) When F17 (gain frequency set signal) = 100.0%

100.0 x 10 = 1000 = 03E8_H Consequently, \Rightarrow

03 _H	E8 _H
-----------------	-----------------

Data format [4] Decimal data (positive/negative): Minimum step 0.1

(Example) When C31 (analog input offset adjustment) = -5.0%

-5.0 x 10 = -50 = FFCE_H Consequently, \Rightarrow

FF _H	CE _H
-----------------	-----------------

Data format [5] Decimal data (positive): Minimum step 0.01

(Example) C05 (multistep frequency) = 50.25Hz

50.25 x 100 = 5025 = 13A1_H Consequently, \Rightarrow

13 _H	A1 _H
-----------------	-----------------

Data format [6] Decimal data (positive/negative): Minimum step 0.01

(Example) When M07 (actual torque value) = -85.38%

-85.38 x 100 = -8538 = DEA6_H Consequently, \Rightarrow

DE _H	A6 _H
-----------------	-----------------

Data format [7] Decimal data (positive): Minimum step 0.001

(Example) When F51(electronic thermal (permissible loss)) = 0.105kW

$$0.105 \times 1000 = 105 = 0069_{\text{H}} \quad \text{Consequently,} \quad \Rightarrow \quad \boxed{00_{\text{H}}} \quad \boxed{69_{\text{H}}}$$

Data format [8] Decimal data (positive/negative): Minimum step 0.001

(Example) When the data is -1.234

$$-1.234 \times 1000 = -1234 = \text{FB}2\text{E}_{\text{H}} \quad \text{Consequently,} \quad \Rightarrow \quad \boxed{\text{FB}_{\text{H}}} \quad \boxed{2\text{E}_{\text{H}}}$$

Data format [10] Alarm codes

Table 5.25 List of alarm codes

Code	Description		Code	Description	
0	No alarm	---	22	Braking resistor overheat	<i>dBH</i>
1	Overcurrent (during acceleration)	<i>OL1</i>	23	Motor overload	<i>OL1</i>
2	Overcurrent (during deceleration)	<i>OL2</i>	25	Inverter overload	<i>OLU</i>
3	Overcurrent (during constant speed operation)	<i>OL3</i>	31	Memory error	<i>Er1</i>
5	Ground fault	<i>EF</i>	32	Keypad communications error	<i>Er2</i>
6	Overvoltage (during acceleration)	<i>OU1</i>	33	CPU error	<i>Er3</i>
7	Overvoltage (during deceleration)	<i>OU2</i>	34	Option communications error	<i>Er4</i>
8	Overvoltage (during constant speed operation or stopping)	<i>OU3</i>	35	Option error	<i>Er5</i>
10	Undervoltage	<i>LU</i>	36	Run operation error	<i>Er6</i>
11	Input phase loss	<i>L in</i>	37	Tuning error	<i>Er7</i>
14	Fuse blown	<i>FUS</i>	38	RS-485 Ch1 communications error	<i>Er8</i>
16	Charging circuit fault	<i>PCF</i>	46	Output phase loss	<i>OPL</i>
17	Heat sink overheat	<i>OH1</i>	51	Data save error on insufficient voltage	<i>ErF</i>
18	External alarm	<i>OH2</i>	53	RS-485 Ch2 communications error	<i>ErP</i>
19	Internal air overheat	<i>OH3</i>	54	LSI error (power PCB)	<i>ErH</i>
20	Motor protection (PTC thermistor)	<i>OH4</i>	254	Simulated error	<i>Err</i>

(Example) In the case of overvoltage (during acceleration) (*OU1*)

$$6 = 0006_{\text{H}} \quad \text{Consequently,} \quad \Rightarrow \quad \boxed{00_{\text{H}}} \quad \boxed{06_{\text{H}}}$$

Data format [11] Capacity code (unit: kW)

As shown in the table below, the capacity (kW) is multiplied by 100.

Table 5.26 Capacities and data

Capacity (kW)	Data	Capacity (kW)	Data	Capacity (kW)	Data
0.06	6	22	2200	280	28000
0.1	10	30	3000	315	31500
0.2	20	37	3700	355	35500
0.4	40	45	4500	400	40000
0.75	75	55	5500	450	45000
1.5	150	75	7500	500	50000
2.2	220	90	9000	550	55000
3.7	370	110	11000	600	60000
5.5	550	132	13200	650	60650
7.5	750	160	16000	700	60700
11	1100	200	20000	750	60750
15	1500	220	22000	800	60800
18.5	1850	250	25000	1000	61000

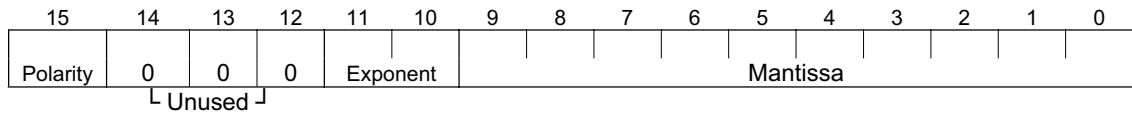
(Example) When the capacity is 2.2 kW

$$2.20 \times 100 = 220 = 00DC_H \quad \text{Consequently,}$$

⇒

00 _H	DC _H
-----------------	-----------------

Data format [12] Floating point data (accel./decal. time, PID display coefficient)



Polarity: 0 → Positive (+), 1 → Negative (-) Exponent: 0 to 3 Mantissa: 1 to 999

Value expressed in this form = (polarity) Mantissa x (Exponent - 2) power of 10

Value	Mantissa	Exponent	(Exponent - 2) power of 10
0.01 to 9.99	1 to 999	0	0.01
10.0 to 99.9	100 to 999	1	0.1
100 to 999	100 to 999	2	1
1000 to 9990	100 to 999	3	10

(Example) When F07 (acceleration time 1) = 20.0 seconds

$$20.0 = 200 \times 0.1 \Rightarrow 0000\ 0100\ 1100\ 1000_b = 04C8_H$$

Consequently,

⇒

04 _H	C8 _H
-----------------	-----------------

Data format [14] Operation command

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
RST	XR (REV)	XF (FWD)	0	0	0	0	0	0	X5	X4	X3	X2	X1	REV	FWD
↑ Alarm reset	General-purpose input		Unused			General-purpose input						FWD: Forward command REV: Reverse command			

(All bits are turned ON when set to 1.)

(Example) When S06 (operation command) = FWD, X1 = ON

0000 0000 0000 0101_b = 0005_H Consequently, ⇒

00 _H	05 _H
-----------------	-----------------

Data format [15] General-purpose output terminal

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	0	0	0	0	0	0	30	0	0	0	Y5	0	Y3	Y2	Y1
Unused							↑ Alarm (general-purpose output)	Unused			General-purpose output				

(All bits are turned ON when set to 1.)

(Example) When M15 (general-purpose output terminal) = Y1 = ON

0000 0000 0000 0001_b = 0001_H Consequently, ⇒

00 _H	01 _H
-----------------	-----------------

Data format [16] Operation status

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
BUSY	0	0	RL	ALM	DEC	ACC	IL	VL	0	NUV	BRK	INT	EXT	REV	FWD

(All bits are turned ON or become active when set to 1.)

Bit	Symbol	Description	Support			Bit	Symbol	Description	Support		
			Mini	Eco	Multi				Mini	Eco	Multi
0	FWD	During forward rotation	○	○	○	8	IL	During current limiting	○	○	○
1	REV	During reverse rotation	○	○	○	9	ACC	During acceleration	○	○	○
2	EXT	During DC braking (or during pre-exciting)	○	○	○	10	DEC	During deceleration	○	○	○
3	INT	Inverter shut down	○	○	○	11	ALM	Alarm relay (for any fault)	○	○	○
4	BRK	During braking (fixed to 0 for FRENIC-Mini)	×	○	○	12	RL	Communications effective	○	○	○
5	NUV	DC link circuit voltage established (0 = undervoltage)	○	○	○	13	0	–	×	×	×
6	TL	During torque limiting	×	×	○	14	0	–	×	×	×
7	VL	During voltage limiting	○	○	○	15	BUSY	During function code data writing	○	○	○

* The "Support" column indicates whether each inverter type supports the corresponding bit or not. The symbol "O" means the code is supported and the symbol "X" means that the code is not supported (fixed to 0).

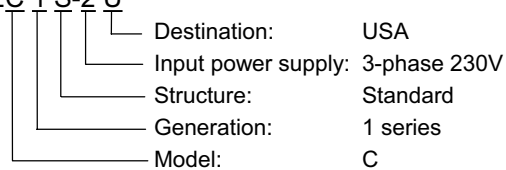
Data format [17] Model code

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Model				Generation				Destination				Input power supply			

Table 5.27 List of model codes

Code	1	2	3	4	5	6	7	8	9	A	B
Model	VG	G	P	E	C	S	DPS	DGS	H (1667Hz)	H (3000Hz)	F
Generation	11 series	7 series	1 series								
Destination	Japan (standard)	Asia	China	Europe	USA						
Input power supply	Single-phase 115V	Single-phase 230V	Three-phase 230V	Three-phase 460V							

(Example) When the inverter type is FRN002C 1 S-2 U



Since "model ":C is represented by code 5, "generation": 1 series by code 3, "destination": Japan (standard) by 1, and "input power supply": 3-phase 230V by 3, the model code is 5313_H.

Data format [19] Current value

Current values are decimal data (positive). The minimum step is 0.01 for an inverter capacity of 30HP (22kW) or less and 0.1 for an inverter capacity of 40HP (30kW) or more.

When inverter capacity is 30HP (22kW) or less, any data higher than 655A cannot be written. No correct value can be read out when a direction for write data higher than 655A is issued.

Current data is rounded down on and after the fifth digit inside the inverter. (Ex.: When a writing direction of 107.54A is issued to an inverter with a capacity of 30HP (22kW), 107.5A is written.)

(Ex.) When F11 (electronic thermal operation level) = 107.0A (40HP)

$$107.0 \times 10 = 1070 = 042E_H, \text{ consequently} \Rightarrow \begin{array}{|c|c|} \hline 04_H & 2E_H \\ \hline \end{array}$$

(Ex.) When F11 (electronic thermal operation level) = 3.60A (1HP)

$$3.60 \times 10 = 360 = 0168_H, \text{ consequently} \Rightarrow \begin{array}{|c|c|} \hline 01_H & 68_H \\ \hline \end{array}$$

Data format [20] Communications error

Table 5.28 Communications error codes (common to both protocols)

Code	Description	Code	Description
71	Checksum error, CRC error ⇒ No response	73	Framing error, overrun error, buffer full ⇒ No response
72	Parity error ⇒ No response		

Table 5.29 Communications error codes (for Fuji general-purpose inverter protocol)

Code	Description	Code	Description
74	Format error	78	Function code error
75	Command error	79	Write disabled
76	Link priority error	80	Data error
77	Function code data write right error	81	Error during writing

Table 5.30 Communications error codes (for RTU protocol)

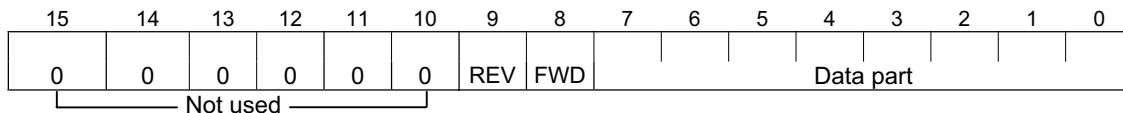
Code	Description	Code	Description
1	Improper 'FC'	3	Improper data (range error)
2	Improper address (function code error)	7	NAK (link priority, no right, write disabled)

(Example) In case of an improper address

2 = 0002_H Consequently, ⇒

00 _H	02 _H
-----------------	-----------------

Data format [21] Auto tuning (not supported by FRENIC-Mini)



When FWD is 1, this data is the forward rotation command. When REV is 1, this data is the reverse rotation command. However, if both FWD and REV are 1, the command is not effective. Both FWD and REV are 0 for reading.

(Ex.) When P04 (motor 1 automatic tuning) = 1 (forward rotation),

0000 0001 0000 1001_b = 0101_H Consequently, ⇒

01 _H	01 _H
-----------------	-----------------

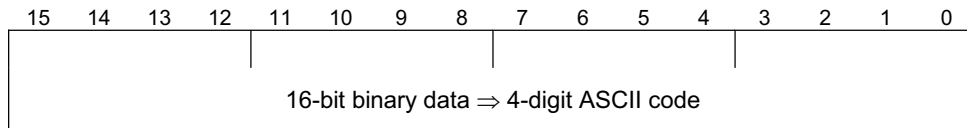
Data format [22] Frequency data

Decimal data (positive): Resolution 0.01Hz

Data format [23] Polarity + decimal data (positive)

(for Fuji general-purpose inverter protocol)

Decimal data (positive): Resolution 0.01Hz



For reverse rotation, add a negative sign (-) (ASCII) to the special additional data in the standard frame, or for forward rotation, enter a space (ASCII).

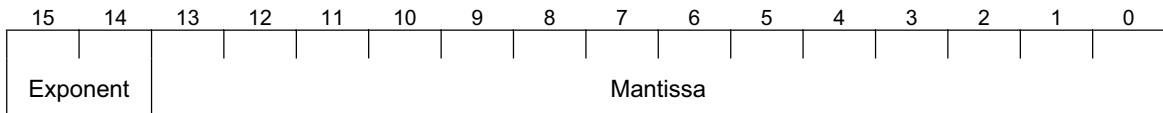
(Example) When maximum frequency = 60Hz and M09 (output frequency) = 60.00Hz (forward rotation)

$60.00 \times 100 = 6000 = 1770_{\text{H}}$ Consequently, \Rightarrow

	1	7	7	0
--	---	---	---	---

(Positive data is in the same data format as data format [5].)

Data format [24] Floating point data



Exponent: 0-3 Mantissa: 1 to 9999

The value expressed by this format = the mantissa $\times 10^{(\text{exponent}-2)}$

Numeric value	Mantissa	Exponent	$10^{(\text{exponent}-2)}$
0.01 to 99.99	1 to 9999	0	0.01
100.0 to 999.9	1000 to 9999	1	0.1
1000 to 9999	1000 to 9999	2	1
10000 to 99990	1000 to 9999	3	10

Data format [25] Capacity code (for HP)

As shown in the table below, the capacity (HP) is multiplied by 100.

Table 5.31 Capacities and data (for HP)

Code	Capacity (HP)	Code	Capacity (HP)	Code	Capacity (HP)
7	0.07 (reserved)	3000	30	40000	400
15	0.15 (reserved)	4000	40	45000	450
25	0.25	5000	50	50000	500
50	0.5	6000	60	60000	600
100	1	7500	75	60700	700
200	2	10000	100	60750	750
300	3	12500	125	60800	800
500	5	15000	150	60850	850
750	7.5	17500	175	60900	900
1000	10	20000	200	60950	950
1500	15	25000	250	61000	1000
2000	20	30000	300	61050	1050
2500	25	35000	350		

(Example) When the capacity is 3HP

$3 \times 100 = 300 = 012C_H$ Consequently,

\Rightarrow

01 _H	2C _H
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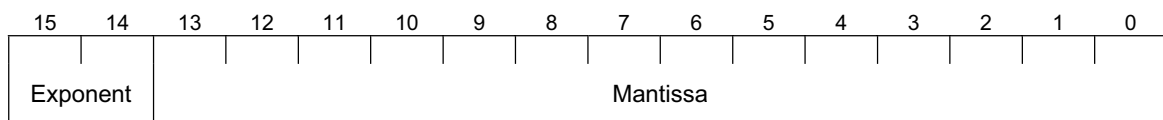
Data format [29] Positive/Negative data of values converted into standard (p.u.) with 20,000

(Example) Speed (frequency) Data of $\pm 20,000/\pm$ maximum speed (frequency)

Data format [35] ROM version

Range: 0 to 9999

Data format [37] Floating point data (load rotation speed, etc.)



Exponent: 0-3 Mantissa: 1 to 9999

The value expressed by this format = the mantissa $\times 10^{(\text{exponent}-2)}$

Numeric value	Mantissa	Exponent	$10^{(\text{exponent}-2)}$
0.01 to 99.99	1 to 9999	0	0.01
100.0 to 999.9	1000 to 9999	1	0.1
1000 to 9999	1000 to 9999	2	1
10000 to 99990	1000 to 9999	3	10

Data format [41] Alarm history

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Number of serial occurrences of same alarm								Alarm code (See Table 5.25.)							

Indicates the content of an alarm that has occurred and the number of serial occurrence times of the alarm.

Data format [43] Operation command (for I/O check)

15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	0	0	0	0	0	0	0	0	X5	X4	X3	X2	X1	REV	FWD
Unused							General-purpose input							General-purpose input	

(All bits are turned ON when set to 1.)

Data format [44] Operation status 2

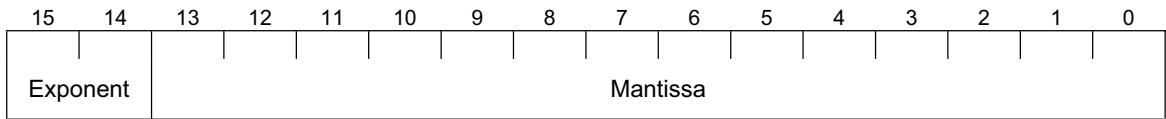
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
0	0	IDL	ID	OLP	LIFE	OH	TRY	FAN	KP	OL	IPF	0	RDY	FDT	FAR

(All bits are turned ON or become active when set to 1.)

Bit	Symbol	Description	Support			Bit	Symbol	Description	Support		
			Mini	Eco	Multi				Mini	Eco	Multi
0	FAR	Frequency arrival signal	○	○	○	8	TRY	Retry in operation	○	○	○
1	FDT	Frequency level detection	○	○	○	9	OH	Heat sink overheat early warning	×	○	○
2	RDY	Inverter ready to run	×	○	○	10	LIFE	Lifetime alarm	○	○	○
3	SWM2	2nd motor is selected	×	×	○	11	OLP	Overload prevention control	○	○	○
4	IPF	Auto-restarting after recovery of power	○	○	○	12	ID	Current detection	○	○	○
5	OL	Motor overload early warning	○	○	○	13	IDL	Low level current detection	○	○	○
6	KP	Running per keypad	×	×	×	14	ID2	Current detection 2	×	×	○
7	FAN	Cooling fan in operation	×	○	○	15	0	—	×	×	×

* The "Support" column indicates whether each inverter type supports the corresponding bit or not. The symbol "O" means the code is supported and the symbol "X" means that the code is not supported (fixed to 0).

Data format [45] Floating point data



Exponent: 0-3 Mantissa: 1 to 9999

The value expressed by this format = the mantissa $\times 10^{(\text{exponent}-3)}$

Numeric value	Mantissa	Exponent	$10^{(\text{exponent}-3)}$
0.001 to 9.999	1 to 9999	0	0.001
10.0 to 99.9	1000 to 9999	1	0.01
100.0 to 999.9	1000 to 9999	2	0.1
1000 to 9999	1000 to 9999	3	1

Data format [73] Integer data (positive/negative sign bit)

Resolution 1 (The high-order digit of position control data)

