

Information for Replacement of FR-S500 (S500E) Series with FR-D800 Series

Size, connection, and parameters concerning replacement are stated on the following pages.

1. Size

When the FR-S500 (S500E) series is replaced with the FR-D800 series, check the installation size.

For more information about the product size, refer to the outline dimension drawings on the following pages.

Power supply voltage	Existing inverter ^{*1}	Replacing inverter	Installation size (Unit: mm)
Three-phase 200 V	FR-S520(E)-0.1K	FR-D820-0.1K-008	Same
	FR-S520(E)-0.2K	FR-D820-0.2K-014	Same
	FR-S520(E)-0.4K	FR-D820-0.4K-025	Same
	FR-S520(E)-0.75K	FR-D820-0.75K-042	Same
	FR-S520(E)-1.5K	FR-D820-1.5K-070	Same
	FR-S520(E)-2.2K	FR-D820-2.2K-100	Same
	FR-S520(E)-3.7K	FR-D820-3.7K-165	W1: 158 → 96
Three-phase 400 V	FR-S540(E)-0.4K	FR-D840-0.4K-012	W1: 96 → 56
	FR-S540(E)-0.75K	FR-D840-0.75K-022	W1: 96 → 56
	FR-S540(E)-1.5K	FR-D840-1.5K-037	W1: 96 → 56
	FR-S540(E)-2.2K	FR-D840-2.2K-050	Same
	FR-S540(E)-3.7K	FR-D840-3.7K-081	Same
Single-phase 200 V ^{*2}	FR-S520S(E)-0.1K	FR-D820S-0.1K-008	Same
	FR-S520S(E)-0.2K	FR-D820S-0.2K-014	Same
	FR-S520S(E)-0.4K	FR-D820S-0.4K-025	Same
	FR-S520S(E)-0.75K	FR-D820S-0.75K-042	Same
	FR-S520S(E)-1.5K	FR-D820S-1.5K-070	Same
Single-phase 100 V ^{*3}	FR-S510W(E)-0.1K	FR-D810W-0.1K-008	Same
	FR-S510W(E)-0.2K	FR-D810W-0.2K-014	Same
	FR-S510W(E)-0.4K	FR-D810W-0.4K-025	Same
	FR-S510W(E)-0.75K	FR-D810W-0.75K-042	Same

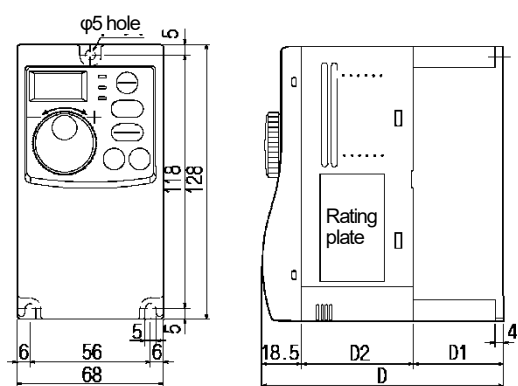
*1 The installation size is the same for inverters of the same capacity between the FR-S500E series and the FR-S500 series.

*2 The output of the single-phase 200 V input model is three-phase 200 V.

*3 The output of the single-phase 100 V input model is three-phase 200 V.

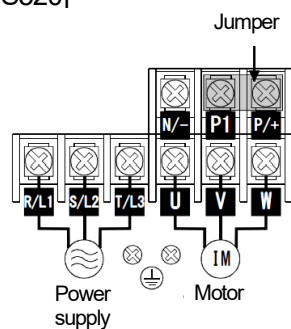
Outline dimension drawings (Unit: mm)

■ FR-S520(E)-0.1K to 0.75K

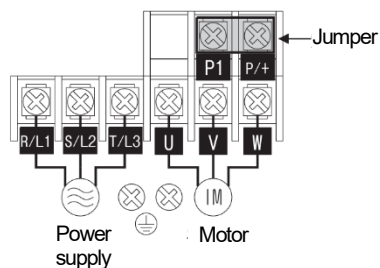


Inverter model	D	D1	D2
FR-S520(E)-0.1K FR-S520(E)-0.2K	80.5	10	52
FR-S520(E)-0.4K	112.5	42	52
FR-S520(E)-0.75K	132.5	62	52

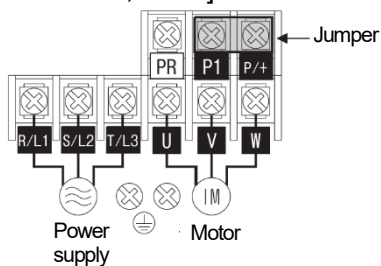
[FR-S520]



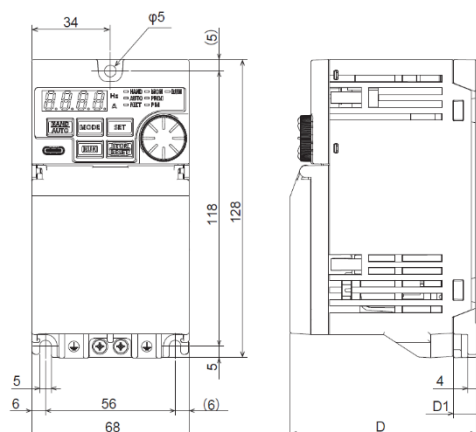
[FR-S520E-0.1K, 0.2K]



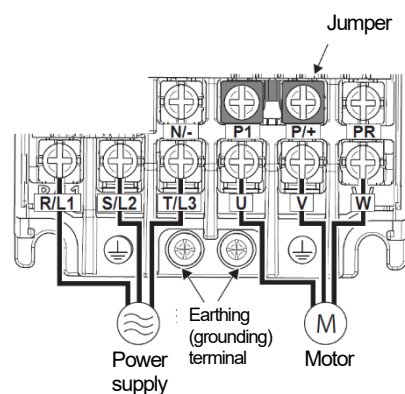
[FR-S520E-0.4K, 0.75K]



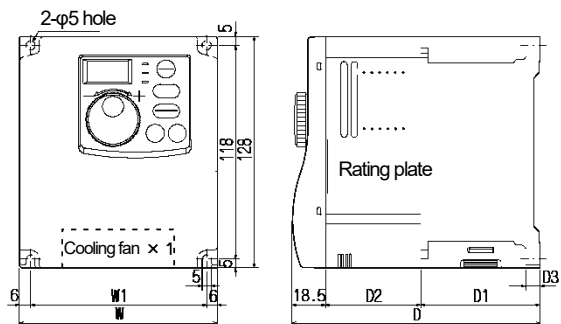
■ FR-D820-0.1K-008 to 0.75K-042



Inverter model	D	D1
FR-D820-0.1K-008 FR-D820-0.2K-014	80.5	10
FR-D820-0.4K-025	102.5	32
FR-D820-0.75K-042	132.5	42



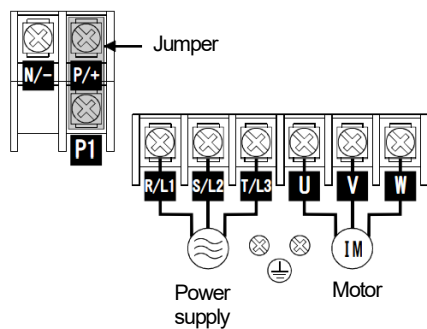
■ FR-S520(E)-1.5K to 3.7K



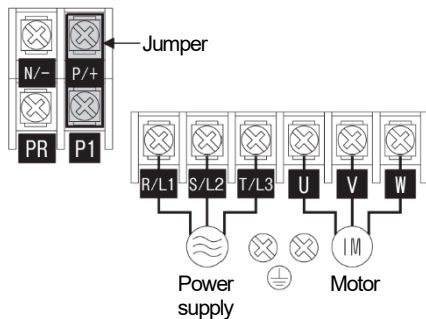
Inverter model	W	W1
FR-S520(E)-1.5K FR-S520(E)-2.2K	108	96
FR-S520(E)-3.7K	170	158

Inverter model	D	D1	D2	D3
FR-S520(E)-1.5K FR-S520(E)-2.2K	135.5	65	52	8
FR-S520(E)-3.7K	142.5	72	52	5

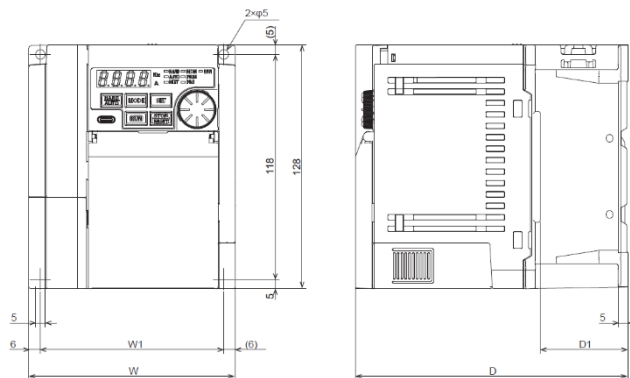
[FR-S520-1.5K to 3.7K]



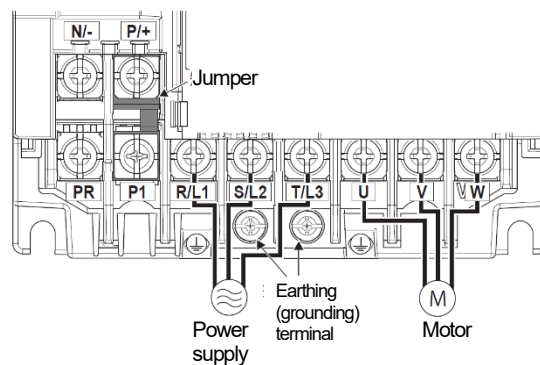
[FR-S520E-1.5K to 3.7K]



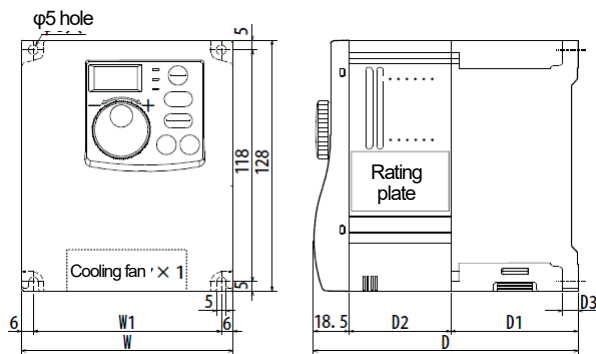
■ FR-D820-1.5K-070 to 3.7K-165



Inverter model	W	W1	D	D1
FR-D820-1.5K-070 FR-D820-2.2K-100	108	96	132.5	36
FR-D820-3.7K-165			142.5	46



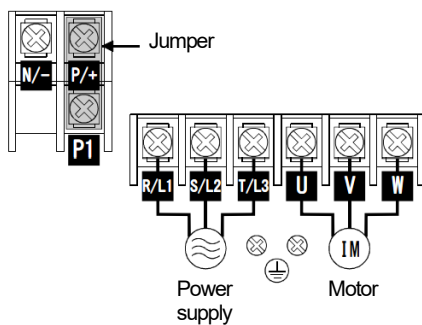
■ FR-S540(E)-0.4K to 3.7K



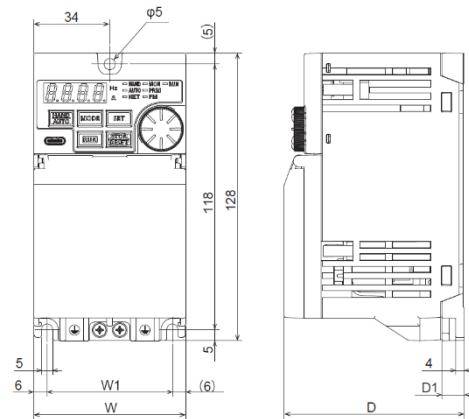
(Note) The 0.4K and 0.75K inverters do not have cooling fans.

Inverter model	W	W1
FR-S540(E)-0.4K	108	96
FR-S540(E)-0.75K		
FR-S540(E)-1.5K		
FR-S540(E)-2.2K		
FR-S540(E)-3.7K		

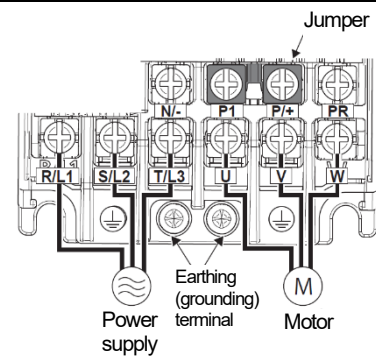
Inverter model	D	D1	D2	D3
FR-S540(E)-0.4K	129.5	59	52	5
FR-S540(E)-0.75K				
FR-S540(E)-1.5K	135.5	65	52	8
FR-S540(E)-2.2K	155.5	65	72	8
FR-S540(E)-3.7K	165.5	65	82	8



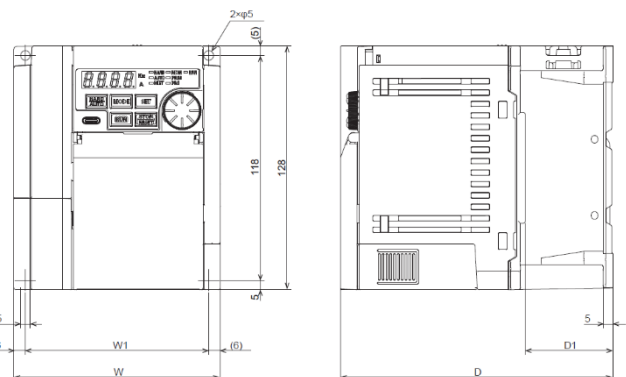
■ FR-D840-0.4K-012 to 1.5K-037



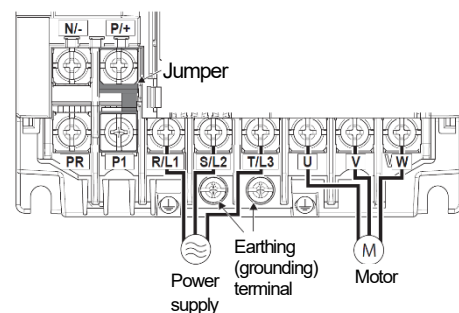
Inverter model	W	W1	D	D1
FR-D840-0.4K-012	68	56	129.5	42
FR-D840-0.75K-022			167.5	62
FR-D840-1.5K-037				



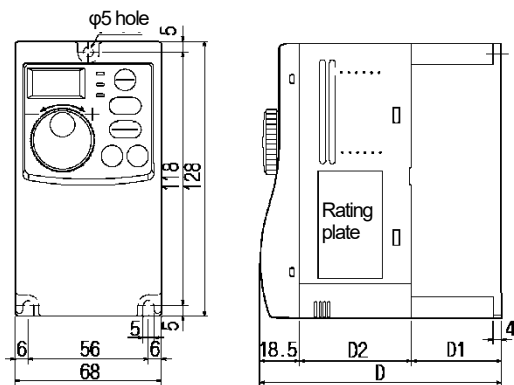
■ FR-D840-2.2K-050, 3.7K-081



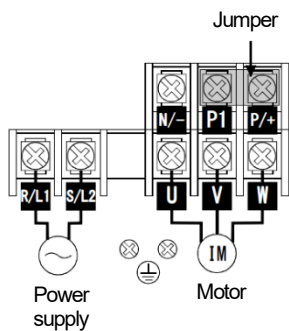
Inverter model	W	W1	D	D1
FR-D840-2.2K-050	108	96	155.5	36
FR-D840-3.7K-081				



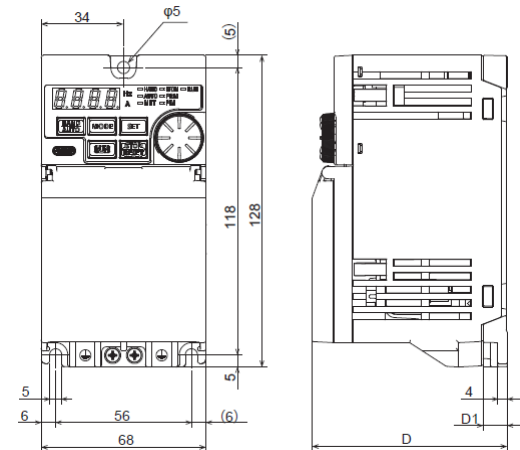
■ FR-S520S(E)-0.1K to 0.75K



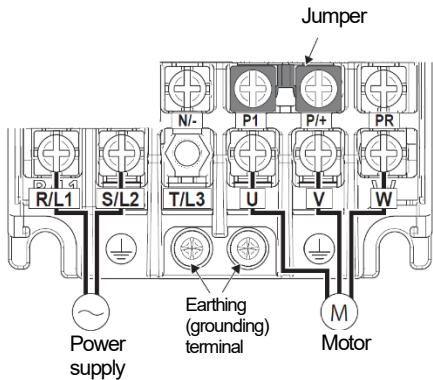
Inverter model	D	D1	D2
FR-S520S(E)-0.1K	80.5	10	52
FR-S520S(E)-0.2K			
FR-S520S(E)-0.4K	142.5	42	82
FR-S520S(E)-0.75K	162.5	62	82



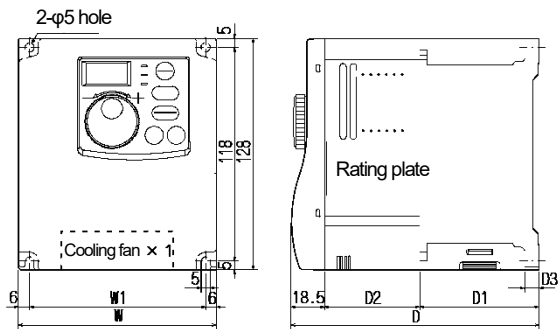
■ FR-D820S-0.1K-008 to 0.75K-042



Inverter model	D	D1
FR-D820S-0.1K-008	80.5	10
FR-D820S-0.2K-014		
FR-D820S-0.4K-025	132.5	32
FR-D820S-0.75K-042	142.5	42

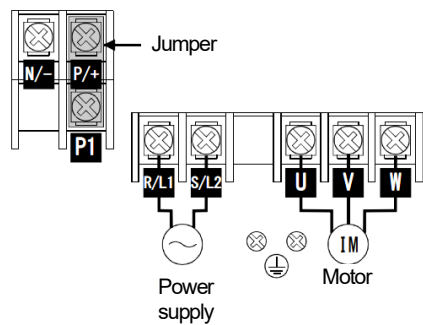


■ FR-S520S(E)-1.5K

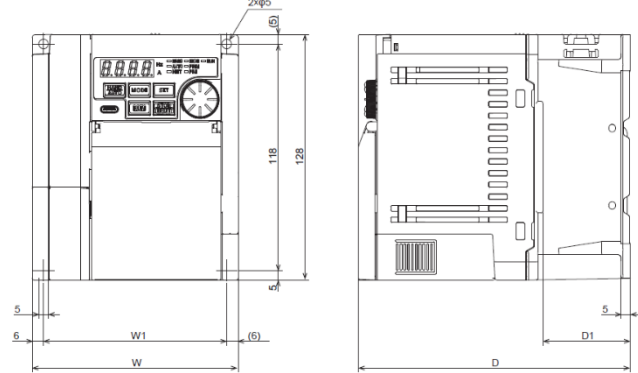


Inverter model	W	W1
FR-S520S(E)-1.5K	108	96

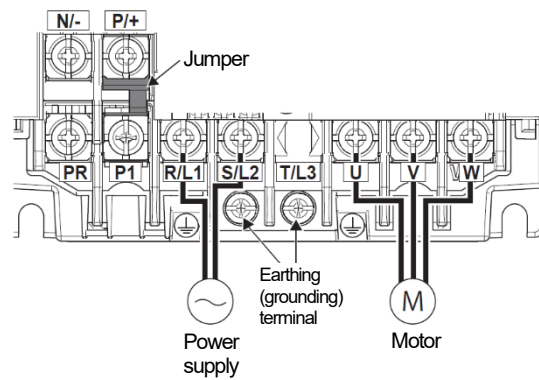
Inverter model	D	D1	D2	D3
FR-S520S(E)-1.5K	155.5	65	72	8



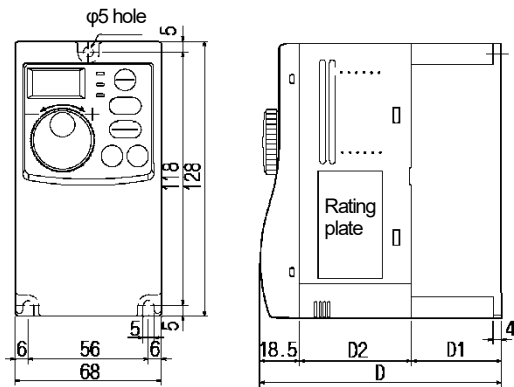
■ FR-D820S-1.5K-070



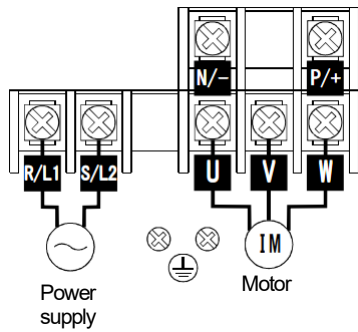
Inverter model	W	W1	D	D1
FR-D820S-1.5K-070	108	96	145	36



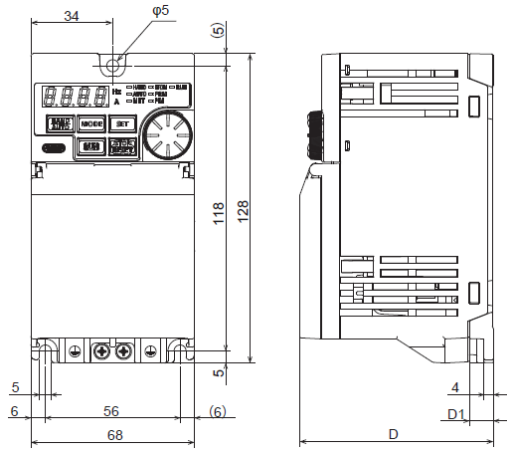
■ FR-S510W(E)-0.1K to 0.4K



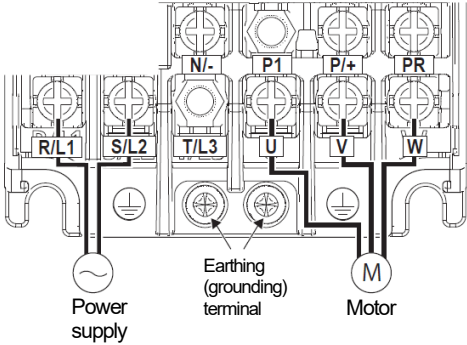
Inverter model	D	D1	D2
FR-S510W(E)-0.1K	80.5	10	52
FR-S510W(E)-0.2K	110.5	10	82
FR-S510W(E)-0.4K	142.5	42	82



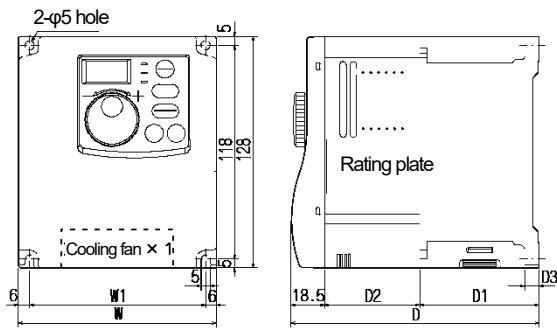
■ FR-D810W-0.1K-008 to 0.4K-025



Inverter model	D	D1
FR-D810W-0.1K-008	80.5	10
FR-D810W-0.2K-014	110.5	10
FR-D810W-0.4K-025	132.5	32

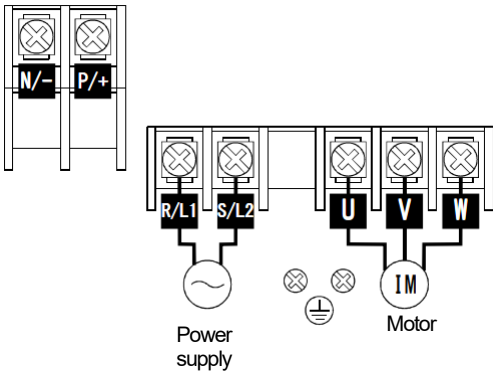


■ FR-S510W(E)-0.75K

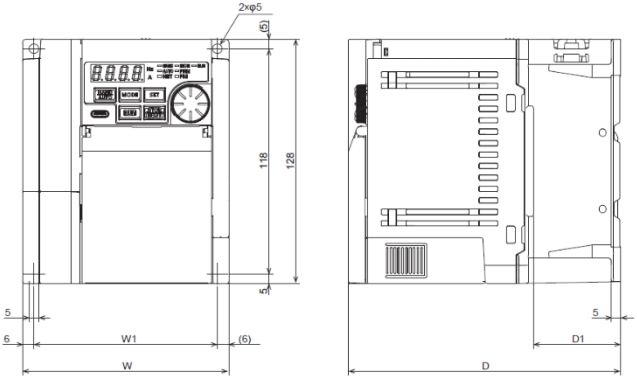


Inverter model	W	W1
FR-S510W(E)-0.75K	108	96

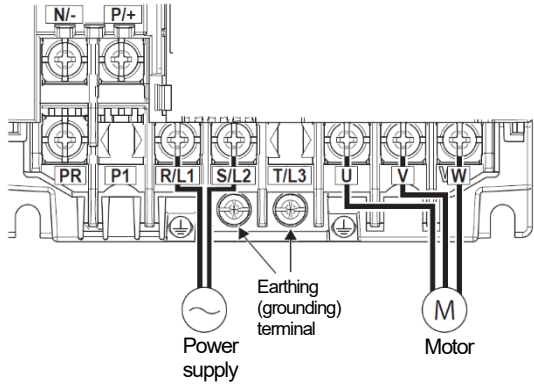
Inverter model	D	D1	D2	D3
FR-S510W(E)-0.75K	149.5	59	72	5



■ FR-D810W-0.75K-042



Inverter model	W	W1	D	D1
FR-D810W-0.75K-042	108	96	145	36



2. Wiring

The terminal names are basically the same. Connect the terminals according to their names.
For the terminal screw size, refer to pages 11 to 13.

[Standard inverter]

Type		FR-S500 terminal name	FR-S500E terminal name	FR-D800 terminal name	Remarks
Main circuit		R, S, T	R, S, T	R/L1, S/L2, T/L3	- The FR-S520S(E) and FR-S510W(E) do not have terminal T. - The FR-D820S and FR-D810W do not have terminal T/L3.
		U, V, W	U, V, W	U, V, W	
			P/+, PR	P/+, PR	Terminal PR is not provided for the FR-S500 series inverters. For the FR-S500E series, terminal PR is provided for the FR-S520E-0.4K to 3.7K only.
		P, N	P/+, N/-	P/+, N/-	Terminal N/- is not provided for the FR-S520E-0.1K to 0.75K.
		P, P1	P/+, P1	P/+, P1	The single-phase 100 V power input model does not have terminal P1.
					
Control circuit input signal	Contact	STF	STF	STF	
		STR	STR	STR	
		RH	RH	RH	
		RM	RM	RM	
		RL	RL	RL	
		SD	SD	SD	Isolated from terminals 5 and SE.
		PC	PC	PC	Used for the safety stop function in the FR-D800. *1
Analog	Frequency setting	10	10	10	
		2	2	2	
		5	5	5	Isolated from terminals SD and SE.
		4	4	4	
Control circuit output signal	Relay	A, B, C	A, B, C	A, B, C	
	Open collector	RUN	RUN	RUN	
		SE	SE	SE	Isolated from terminals 5 and SD.
	Pulse	FM	FM	-	Terminal FM is not provided for the FR-D800. To use an analog frequency meter, use terminal AM instead. For details, refer to the Technical News MF-S-200 .
Communication	RS-485	PU connector (-R type only)	PU connector	PU connector Terminal block for RS-485 communication	Provided for the FR-S500-□K-R and FR-S500E among the FR-S500 series.

*1 When using terminal PC as the external transistor common terminal, refer to the FR-D800 Instruction Manual.

Terminal size

[Main circuit terminal]

Voltage class	Capacity	FR-S500				FR-S500E				FR-D800			
		R, S, T ^{*1}	U, V, W	P, N, P1 ^{*5}	⊥	R, S, T ^{*1}	U, V, W	P/+, N/- ^{*2} P1 ^{*5} , PR ^{*3}	⊥	R/L1, S/L2, T/L3 ^{*1}	U, V, W	P/+, N/- P1 ^{*5} , PR ^{*4}	⊥
Three-phase 200 V	0.1K to 0.75K	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
	1.5K to 3.7K	M4	M4	M4	M4	M4	M4	M4	M4	M4	M4	M4	M3.5
Three-phase 400 V	0.4K to 1.5K	M4	M4	M4	M4	M4	M4	M4	M4	M3.5	M3.5	M3.5	M3.5
	2.2K, 3.7K	M4	M4	M4	M4	M4	M4	M4	M4	M4	M4	M4	M3.5
Single-phase 200 V	0.1K to 0.75K	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
	1.5K	M4	M4	M4	M4	M4	M4	M4	M4	M4	M4	M4	M3.5
Single-phase 100 V	0.1K to 0.4K	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5	M3.5
	0.75K	M4	M4	M4	M4	M4	M4	M4	M4	M4	M4	M4	M3.5

*1 Terminals T and T/L3 are not provided for the FR-S520S(E), FR-S510W(E), FR-D820S, and FR-D810W.

*2 Terminal N/- is not provided for the FR-S520E-0.1K to 0.75K.

*3 Terminal PR is provided for the FR-S520E-0.4K to 3.7K only.

*4 For the FR-D820-0.1K-008, FR-D820-0.2K-014, FR-D820S-0.1K-008, FR-D820S-0.2K-014, FR-D810W-0.1K-008, and FR-D810W-0.2K-014, a brake resistor cannot be connected across terminals P/+ and PR.

*5 Terminal P1 is not provided for the single-phase 100 V power input model.

[Control circuit terminal]

FR-S500 (S500E)		FR-D800
Control circuit		Control circuit
Other than A, B, C	A, B, C	
M2 Insertion type ⊖ screw terminal	M3 Insertion type ⊖ screw terminal	Spring clamp terminal

Note 1: When our authorized ferrules manufactured by Phoenix Contact GmbH & Co. KG are used for the FR-S500/S500E inverters, they cannot be used for the FR-D800 series inverters since they are not compatible with the spring clamp terminal block.

(Even other crimp terminals, they may not be used for the FR-D800 series inverters due to differences in size.)

To use the existing wires, disconnect the existing crimp terminal at the end of each wire, and strip wires or use crimp terminals shown below. Check the applicable wire gauge.

Table: Applicable wire gauge (stripped wire) for the FR-D800 control terminal block

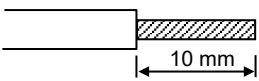
Wire strip length		Applicable stripped wire gauge
		Single wire (mm ²)
 Twist the stripped end of wires to prevent them from fraying. Do not solder them.		0.3 to 0.75

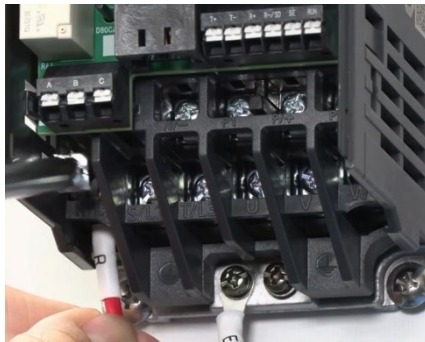
Table: Applicable wire gauge (crimped terminal) for the FR-D800 control terminal block

Ferrule part No. (Phoenix Contact GmbH & Co. KG)		Applicable stripped wire gauge (mm ²)
With insulation sleeve	Without insulation sleeve	
AI 0,34-10TQ	-	0.3 to 0.5
AI 0,5-10WH	-	
AI 0,75-10GY	A 0,75-10	0.75
AI 1-10RD	A 1-10	1
AI 1,5-10BK	A 1,5-10	1.25, 1.5
AI-TWIN 2×0,75-10GY	-	0.75 (two-wire product)

Blade terminal part No. (NICHIFU Co., Ltd.)		Applicable stripped wire gauge (mm ²)
Blade terminal part No.	Insulation cap part No.	
BT 0.75-11	VC 0.75	0.3 to 0.75

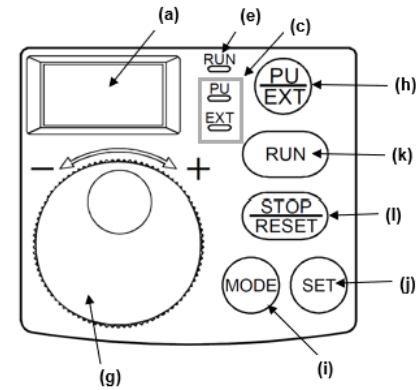
* The length of applicable crimp terminals differs between the FR-D800 series inverters and the FR-S500 (S500E) series inverters.
(FR-D800: 10 or 11 mm, FR-S500 (S500E): 6 mm)

3. Front cover and wiring cover

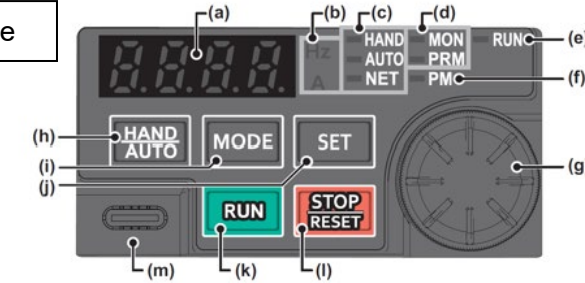
	Description										
Front cover	The flip-type front cover has been adopted. This reduces the screw tightening work for the front cover. In addition, indication of the model name and SERIAL number is printed directly on the front upper-left corner of the product. 										
Wiring cover	The wiring cover is integrated into the inverter, reducing removal and reinstallation work. <table><tr><td>Capacity</td><td>Three-phase 200 V class</td><td>0.75K or lower</td><td>Single-phase 100 V</td><td>0.4K or lower</td></tr><tr><td></td><td>Three-phase 400 V class</td><td>1.5K or lower</td><td>Single-phase 200 V</td><td>0.75K or lower</td></tr></table> 	Capacity	Three-phase 200 V class	0.75K or lower	Single-phase 100 V	0.4K or lower		Three-phase 400 V class	1.5K or lower	Single-phase 200 V	0.75K or lower
Capacity	Three-phase 200 V class	0.75K or lower	Single-phase 100 V	0.4K or lower							
	Three-phase 400 V class	1.5K or lower	Single-phase 200 V	0.75K or lower							

4. Operation panel

FR-S500 (S500E) operation panel appearance

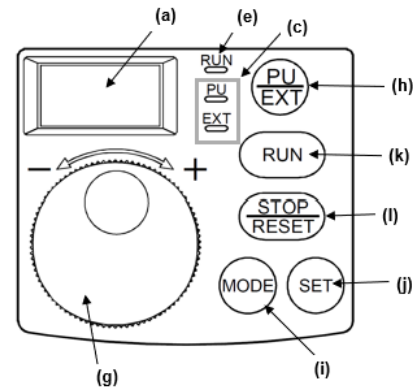


FR-D800 operation panel appearance

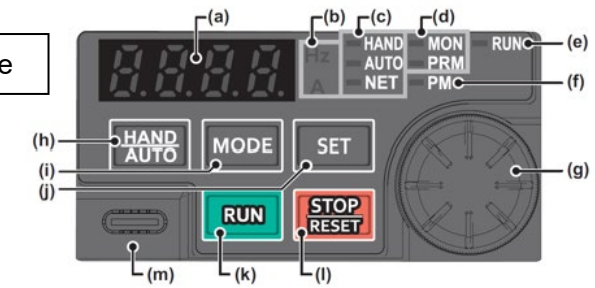


FR-S500 (S500E)			FR-D800		
Symbol	Name	Description	Symbol	Name	Description
(a)	3-digit monitor LED	Shows a numeric value (readout) of a monitor item such as the frequency or a parameter number.	(a)	Monitor (4-digit LED)	Shows a numeric value (readout) of a monitor item such as the frequency or a parameter number. (The monitor item can be changed according to the settings of Pr.52, Pr.774 to Pr.776.)
(b)	-	-	(b)	Unit indication	Hz: ON when the actual frequency is monitored. (Blinks when the set frequency is monitored.) A: ON when the current is monitored. (Both "Hz" and "A" are OFF to indicate a value other than the frequency or the current.)
(c)	PU indication, EXT indication	PU: ON when the inverter is in the PU operation mode. EXT: ON when the inverter is in the External operation mode.	(c)	Inverter operation mode LED indicator	HAND: ON when the inverter is in the PU operation mode. AUTO: ON when the inverter is in the External operation mode. (ON when the inverter in the initial setting is powered ON.) NET: ON when the inverter is in the Network operation mode. Both HAND and AUTO are ON when the inverter is in the External/PU combined operation mode 1 or 2.
(d)	-	-	(d)	Operation panel mode LED indicator	MON: ON only when the first, second, or third monitor is displayed. PRM: ON when the operation panel is in the parameter setting mode. The indicator blinks when the inverter is in the easy setting mode.
(e)	RUN indication	ON or blinks during operation. ON: During forward rotation operation. Blinks slowly (1.4-second cycle): During reverse rotation operation. Blinks quickly (0.2-second cycle): Operation is disabled although the start command is given.	(e)	Operating status indicator	ON or blinks during inverter running. ON: During forward rotation operation. Blinks slowly (1.4-second cycle): During reverse rotation operation. Blinks quickly (0.2-second cycle): Operation is disabled although the start command is given.
(f)	-	-	(f)	Controlled motor type LED indicator	ON when the PM sensorless vector control is selected. The indicator blinks during test operation. The indicator is OFF when the inverter controls the induction motor.
(g)	Setting dial	The setting dial of the Mitsubishi Electric inverters. Turn the setting dial to change the setting of frequency or parameter, etc.	(g)	Setting dial	The setting dial of the Mitsubishi Electric inverters. Turn the setting dial to change the setting of frequency or parameter, etc. Press the setting dial to perform the following operations: · To display a set frequency on the LED display in the monitor mode. (The monitor item shown on the display can be changed by using Pr.992.) · To display the present setting during calibration.
(h)	PU/EXT key	Switches between the PU operation mode and the External operation mode. To use the External operation mode (operation using separately connected frequency setting potentiometer and start signals), press this key to turn ON the EXT indicator. (To use the combined operation mode, change the Pr.79 setting.) PU: PU operation mode EXT: External operation mode	(h)	HAND/AUTO key	Switches between the PU operation mode, the PUJOG operation mode, and the External operation mode. The easy setting of the inverter operation mode is enabled by pressing this key simultaneously with the MODE key. Also cancels the PU stop warning. HAND: PU operation mode AUTO: External operation mode

FR-S500 (S500E) operation panel appearance



FR-D800 operation panel appearance



FR-S500 (S500E)			FR-D800		
Symbol	Name	Description	Symbol	Name	Description
(i)	MODE key	Switches the setting mode.	(i)	MODE key	Switches the operation panel to a different mode. The easy setting of the inverter operation mode is enabled by pressing this key simultaneously with the HAND/AUTO key. Every key on the operation panel becomes inoperable by holding this key for two seconds. The key lock function is disabled when Pr.161 = "0 (initial setting)".
(j)	SET key	Confirms each selection.	(j)	SET key	Confirms each selection. When this key is pressed during inverter operation, the monitor item changes. (The monitor item can be changed according to the settings of Pr.52, Pr.774 to Pr.776.) Example: Initial setting in the monitor mode Output frequency → Output current → Output voltage ↑
(k)	RUN key	Gives the forward rotation command. For reverse rotation, set Pr.17.	(k)	RUN key	Start command The direction of motor rotation depends on the Pr.40 setting. When Pr.40 = "0 (initial value)", the motor starts forward rotation.
(l)	STOP/RESET key	Stops the operation or resets an alarm.	(l)	STOP/RESET key	Stops the operation commands. Used to reset the inverter when the protective function is activated.

5. Parameters

Although most parameter numbers are the same, some setting values differ. Refer to the following table to set the parameters.

List of FR-D800 series parameters compatible with the FR-S500 (S500E) series

The following table shows the parameter settings required when replacing FR-S500 (S500E) series inverters with FR-D800 series inverters.
When an FR-S500 (S500E) series parameter is set to a value other than the initial value, set the corresponding FR-D800 series parameter according to the following table.
When an FR-S500 (S500E) series parameter is set to an initial value, it is usually not necessary to change the corresponding FR-D800 series parameter setting.

The parameter number of the parameters differs from that of the FR-S500 (S500E) series inverter.

Setting

⊙: Set the same value as FR-S500 (S500E).
△: Setting needs to be changed from FR-S500 (S500E).
×: Adjust and set on FR-D800.

FR-S500 (S500E) parameter list				FR-D800 compatible parameter					Parameter setting	
Pr.	Name	Setting range	Initial value	Pr.	Name	Setting range	Initial value		Setting	Remarks
							Gr.1	Gr.2		
0	Torque boost	0 to 15%	Other than the below: 6% S540-1.5K, 2.2K: 5% S540E-1.5K, 2.2K: 5% S540-3.7K: 4% S540E-3.7K: 4%	0	Torque boost	0 to 30%	0.75K or lower: 6% 1.5K to 3.7K: 4% 5.5K, 7.5K: 3% 11K or higher: 2%		△	The initial value differs by the capacity. After replacement with the FR-D800, adjust the setting as required.
1	Maximum frequency	0 to 120 Hz	60 Hz	1	Maximum frequency	0 to 120 Hz	120 Hz		⊙	The initial values for both series differ. If the initial value for the FR-S500 is set for the FR-D800, the upper frequency of the FR-D800 is decreased, which affects the operation of the FR-D800.
2	Minimum frequency	0 to 120 Hz	0 Hz	2	Minimum frequency	0 to 120 Hz	0 Hz		⊙	
3	Base frequency	0 to 120 Hz	60 Hz	3	Base frequency	0 to 590 Hz	60 Hz	50 Hz	⊙	The initial value differs depending on the parameter initial value group (Gr.).
4	Multi-speed setting (high speed)	0 to 120 Hz	60 Hz	4	Multi-speed setting (high speed)	0 to 590 Hz	60 Hz	50 Hz	⊙	The initial value differs depending on the parameter initial value group (Gr.).
5	Multi-speed setting (middle speed)	0 to 120 Hz	30 Hz	5	Multi-speed setting (middle speed)	0 to 590 Hz	30 Hz		⊙	
6	Multi-speed setting (low speed)	0 to 120 Hz	10 Hz	6	Multi-speed setting (low speed)	0 to 590 Hz	10 Hz		⊙	
7	Acceleration time	0 to 999 s	5 s	7	Acceleration time	0 to 3600 s	3.7K or lower: 5 s 5.5K, 7.5K: 10 s 11K or higher: 15 s		⊙	
8	Deceleration time	0 to 999 s	5 s	8	Deceleration time	0 to 3600 s	3.7K or lower: 5 s 5.5K, 7.5K: 10 s 11K or higher: 15 s		⊙	
9	Electronic thermal O/L relay	0 to 50 A	Rated output current	9	Electronic thermal O/L relay	0 to 500 A	Rated output current		⊙	Set the rated motor current.
10	DC injection brake operation frequency	0 to 120 Hz	3 Hz	10	DC injection brake operation frequency	0 to 120 Hz	3 Hz		⊙	
11	DC injection brake operation time	0 to 10 s	0.5 s	11	DC injection brake operation time	0 to 10 s	0.5 s		⊙	
12	DC injection brake voltage	0 to 15%	6%	12	DC injection brake operation voltage	0 to 30%	0.2K or lower: 6% 0.4K to 7.5K: 4% 11K or higher: 2%		△	The initial value differs by the capacity. After replacement with the FR-D800, adjust the setting as required.
13	Starting frequency	0 to 60 Hz	0.5 Hz	13	Starting frequency	0 to 60 Hz	0.5 Hz		⊙	
14	Load pattern selection	0 to 3	0	14	Load pattern selection	0 to 3	0		⊙	
15	Jog frequency	0 to 120 Hz	5 Hz	15	Jog frequency	0 to 590 Hz	5 Hz		⊙	
16	Jog acceleration/deceleration time	0 to 999 s	0.5 s	16	Jog acceleration/deceleration time	0 to 3600 s	0.5 s		⊙	
17	RUN key rotation direction selection	0, 1	0	40	RUN key rotation direction selection	0, 1	0		⊙	
19	Base frequency voltage	0 to 1000 V, 888, -	-	19	Base frequency voltage	0 to 1000 V, 8888, 9999	9999	8888	⊙	The initial value differs depending on the parameter initial value group (Gr.).
20	Acceleration/deceleration reference frequency	1 to 120 Hz	60 Hz	20	Acceleration/deceleration reference frequency	1 to 590 Hz	60 Hz	50 Hz	⊙	The initial value differs depending on the parameter initial value group (Gr.).
21	Stall prevention function selection	0 to 31, 100	0	156	Stall prevention operation selection	0 to 31, 100, 101	0		⊙	
22	Stall prevention operation level	0 to 200%	150%	22	Stall prevention operation level (Torque limit level)	0 to 400%	150%		⊙	

FR-S500 (S500E) parameter list				FR-D800 compatible parameter				Parameter setting		
Pr.	Name	Setting range	Initial value	Pr.	Name	Setting range	Initial value		Setting	Remarks
							Gr.1	Gr.2		
23	Stall prevention operation level compensation factor at double speed	0 to 200%, -	-	23	Stall prevention operation level compensation factor at double speed	0 to 200%, 9999	9999		⊙	
24	Multi-speed setting (speed 4)	0 to 120 Hz, -	-	24	Multi-speed setting (speed 4)	0 to 590 Hz, 9999	9999		⊙	
25	Multi-speed setting (speed 5)	0 to 120 Hz, -	-	25	Multi-speed setting (speed 5)	0 to 590 Hz, 9999	9999		⊙	
26	Multi-speed setting (speed 6)	0 to 120 Hz, -	-	26	Multi-speed setting (speed 6)	0 to 590 Hz, 9999	9999		⊙	
27	Multi-speed setting (speed 7)	0 to 120 Hz, -	-	27	Multi-speed setting (speed 7)	0 to 590 Hz, 9999	9999		⊙	
28	Stall prevention operation reduction starting frequency	0 to 120 Hz	60 Hz	66	Stall prevention operation reduction starting frequency	0 to 590 Hz	60 Hz	50 Hz	⊙	The initial value differs depending on the parameter initial value group (Gr.).
29	Acceleration/deceleration pattern	0 to 2	0	29	Acceleration/deceleration pattern selection	0 to 2	0		⊙	
30	Extended function display selection	0, 1	0	160	User group read selection	0, 1, 9999	0		△	To display extended parameters, set "0".
31	Frequency jump 1A	0 to 120 Hz, -	-	31	Frequency jump 1A	0 to 590 Hz, 9999	9999		⊙	
32	Frequency jump 1B	0 to 120 Hz, -	-	32	Frequency jump 1B	0 to 590 Hz, 9999	9999		⊙	
33	Frequency jump 2A	0 to 120 Hz, -	-	33	Frequency jump 2A	0 to 590 Hz, 9999	9999		⊙	
34	Frequency jump 2B	0 to 120 Hz, -	-	34	Frequency jump 2B	0 to 590 Hz, 9999	9999		⊙	
35	Frequency jump 3A	0 to 120 Hz, -	-	35	Frequency jump 3A	0 to 590 Hz, 9999	9999		⊙	
36	Frequency jump 3B	0 to 120 Hz, -	-	36	Frequency jump 3B	0 to 590 Hz, 9999	9999		⊙	
37	Speed display	0, 0.1 to 999	0	37	Speed display	0.01 to 9998	1800		⊙	
38	Frequency setting voltage gain frequency	1 to 120 Hz	60 Hz	125	Terminal 2 frequency setting gain frequency	0 to 590 Hz	60 Hz	50 Hz	△	The initial value differs depending on the parameter initial value group (Gr.). The frequency at 5 V (10 V) input is set for the FR-S500. The frequency at input of the voltage set in Pr.C4 (Terminal 2 frequency setting gain) is set for the FR-D800. If the frequency deviates, calibrate again.
39	Frequency setting current gain frequency	1 to 120 Hz	60 Hz	126	Terminal 4 frequency setting gain frequency	0 to 590 Hz	60 Hz	50 Hz	△	The initial value differs depending on the parameter initial value group (Gr.). The frequency at 20 mA input is set for the FR-S500. The frequency at the input of the current set in Pr.C7 (Terminal 4 frequency setting gain) is set for the FR-D800. If the frequency deviates, calibrate again.
40	Start-time ground fault detection selection	0, 1	0	249	Earth (ground) fault detection at start	0, 1	0	1	⊙	
41	Up-to-frequency sensitivity	0 to 100%	10%	41	Up-to-frequency sensitivity	0 to 100%	10%		⊙	
42	Output frequency detection	0 to 120 Hz	6 Hz	42	Output frequency detection	0 to 590 Hz	6 Hz		⊙	
43	Output frequency detection for reverse rotation	0 to 120 Hz, -	-	43	Output frequency detection for reverse rotation	0 to 590 Hz, 9999	9999		⊙	
44	Second acceleration/deceleration time	0 to 999 s	5 s	44	Second acceleration/deceleration time	0 to 3600 s	3.7K or lower: 5 s 5.5K, 7.5K: 10 s 11K or higher: 15 s		⊙	
45	Second deceleration time	0 to 999 s, -	-	45	Second deceleration time	0 to 3600 s, 9999	9999		⊙	
46	Second torque boost	0 to 15%, -	-	46	Second torque boost	0 to 30%, 9999	9999		△	For the FR-D800, the setting is available when Pr.160 = "0". Adjust the setting again as required.
47	Second V/F (base frequency)	0 to 120 Hz, -	-	47	Second V/F (base frequency)	0 to 590 Hz, 9999	9999		⊙	
48	Output current detection level	0 to 200%	150%	150	Output current detection level	0 to 400%	150%		⊙	
49	Output current detection signal delay time	0 to 10 s	0 s	151	Output current detection signal delay time	0 to 10 s	0 s		⊙	
50	Zero current detection level	0 to 200%	5%	152	Zero current detection level	0 to 400%	5%		⊙	
51	Zero current detection time	0.05 to 1 s	0.5 s	153	Zero current detection time	0 to 10 s	0.5 s		⊙	
52	Control panel display data selection	0, 1, 100	0	52	Operation panel main monitor selection	0, 5 to 14, 17, 18, 20, 23 to 25, 32, 33, 37, 38, 44, 50 to 55, 61, 62, 64, 67, 68, 91, 97, 98, 100	0		⊙	The increment of the cumulative energization time and actual operation time displayed on the monitor (when Pr.52 = "20 or 23") is 1 hour.
-	-	-	-	53	Frequency / rotation speed unit switchover	0, 1, 4	0		×	Switch the display units for frequency-related monitoring and parameter settings. 0: Frequency (Hz), 1: Rotation speed (r/min), 4: Machine speed
53	Frequency setting operation selection	0, 1	0	161	Frequency setting/key lock operation selection	0, 1, 10, 11	0		△	Refer to the replacement from Pr.n17 on page 22.

FR-S500 (S500E) parameter list				FR-D800 compatible parameter					Parameter setting	
Pr.	Name	Setting range	Initial value	Pr.	Name	Setting range	Initial value		Setting	Remarks
							Gr.1	Gr.2		
54	FM terminal function selection	0, 1	0	-	-	-	-		×	Terminal FM is no longer provided.
55	Frequency monitoring reference	0 to 120 Hz	60 Hz	55	Frequency monitoring reference	0 to 590 Hz	60 Hz	50 Hz	◎	
56	Current monitoring reference	0 to 50 A	Rated output current	56	Current monitoring reference	0 to 500 A	Rated output current		◎	
57	Restart coasting time	0 to 5 s, -	-	57	Restart coasting time	0, 0.1 to 30 s, 9999	9999		△	The coasting time when Pr.57 = "0" is different. Basically, setting Pr.57 = "0" does not cause problems. For the same time setting as the FR-S500, set 0.5 s for 1.5K or lower inverters, or 1.0 s for 2.2K or higher inverters.
58	Restart cushion time	0 to 60 s	1.0 s	58	Restart cushion time	0 to 60 s	1.0 s		◎	
59	Remote setting function selection	0, 1, 2	0	59	Remote function selection	0 to 4	0		◎	
60	RL terminal function selection	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 14, 16, -	0	180	RL terminal function selection	0 to 5, 7, 8, 10, 12, 14, 16, 18, 23 to 25, 27, 30, 37, 46, 47, 62, 64 to 67, 72, 84, 9999	0		△	• When "5" (STOP) is set for the FR-S500, set "25" (STOP) for the FR-D800. • When "6" (MRS) is set for the FR-S500, set "24" (MRS) for the FR-D800. • When "10" (RES) is set for the FR-S500, set "62" (RES) for the FR-D800.
61	RM terminal function selection		1	181	RM terminal function selection		1		△	
62	RH terminal function selection		2	182	RH terminal function selection		2		△	
63	STR terminal function selection		-	179	STR terminal function selection	0 to 5, 7, 8, 10, 12, 14, 16, 18, 23 to 25, 27, 30, 37, 46, 47, 61, 62, 64 to 67, 72, 84, 9999	61		△	
64	RUN terminal function selection	0, 1, 3, 4, 11, 12, 13, 14, 15, 16, 98, 99	0	190	RUN terminal function selection	0, 1, 3, 4, 7, 8, 11 to 16, 18, 19, 25, 26, 33, 34, 40, 41, 44 to 48, 57, 64 to 66, 70, 79 to 81, 90 to 93, 95, 96, 98, 99, 100, 101, 103, 104, 107, 108, 111 to 116, 125, 126, 133, 134, 140, 141, 144 to 148, 157, 164 to 166, 170, 179 to 181, 190 to 193, 195, 196, 198, 199, 206, 207, 211 to 213, 306, 307, 311 to 313, 9999	0		◎	
65	A, B, C terminal function selection		99	192	ABC terminal function selection	0, 1, 3, 4, 7, 8, 11 to 16, 18, 19, 25, 26, 33, 34, 40, 41, 44 to 48, 57, 64 to 66, 70, 79 to 81, 90, 91, 95, 96, 98, 99, 100, 101, 103, 104, 107, 108, 111 to 116, 125, 126, 133, 134, 140, 141, 144 to 148, 157, 164 to 166, 170, 179 to 181, 190, 191, 195, 196, 198, 199, 206, 207, 211 to 213, 306, 307, 311 to 313, 9999	99		◎	
66	Retry selection	0 to 3	0	65	Retry selection	0 to 5	0		◎	
67	Number of retries at alarm occurrence	0 to 10, 101 to 110	0	67	Number of retries at fault occurrence	0 to 10, 101 to 110	0		◎	
68	Retry waiting time	0.1 to 360 s	1 s	68	Retry waiting time	0.1 to 600 s	1 s		◎	
69	Retry count display erase	0	0	69	Retry count display erase	0	0		◎	
70	Soft-PWM setting	S500: 0, 1 S500E: 0, 1, 10, 11	1	240	Soft-PWM operation selection	0, 1	1		△	When "10" is set for the FR-S500E, set "0" for the FR-D800. When "11" is set for the FR-S500E, set "1" for the FR-D800.
71	Applied motor	S500: 0, 1 S500E: 0, 1, 100, 101	0	71	Applied motor	0, 3, 5, 6, 10, 13, 15, 16, 20, 23, 40, 43, 50, 53, 70, 73, 1140, 8090, 8093, 9090, 9093	0		△	• When "100" is set for the FR-S500E, set "0" for the FR-D800. • When "1 or 101" is set for the FR-S500E, set "10" for the FR-D800.
				450	Second applied motor	0, 10, 9999	9999		×	

FR-S500 (S500E) parameter list				FR-D800 compatible parameter				Parameter setting		
Pr.	Name	Setting range	Initial value	Pr.	Name	Setting range	Initial value		Setting	Remarks
							Gr.1	Gr.2		
72	PWM frequency selection	0 to 15	1	72	PWM frequency selection	0 to 15	1		⊙	
73	0-5V/0-10V selection	0, 1	0	73	Analog input selection	0, 1, 6, 10, 11, 16	1		△	• When "0" is set for the FR-S500 or FR-S500E, set "1" for the FR-D800. • When "1" is set for the FR-S500 or FR-S500E, set "0" for the FR-D800.
74	Input filter time constant	0 to 8	1	74	Input filter time constant	0 to 8	1		△	After replacement with the FR-D800, adjust the setting as required.
75	Reset selection/PU stop selection	0, 1, 14, 15,	14	75	Reset selection/disconnected PU detection/PU stop selection	0 to 3, 14 to 17	14		⊙	
76	Cooling fan operation selection	0, 1	1	244	Cooling fan operation selection	0, 1	1		⊙	
77	Parameter write disable selection	0, 1, 2	0	77	Parameter write selection	0 to 2	0		⊙	
78	Reverse rotation prevention selection	0, 1, 2	0	78	Reverse rotation prevention selection	0 to 2	0		⊙	
79	Operation mode selection	0 to 4, 7, 8	0	79	Operation mode selection	0 to 4, 6, 7	0		△	When "8" is set for the FR-S500, set Pr.79 = "7" and Pr.182 = "16" for the FR-D800.
80	Multi-speed setting (speed 8)	0 to 120 Hz, -	-	232	Multi-speed setting (speed 8)	0 to 590 Hz, 9999	9999		⊙	
81	Multi-speed setting (speed 9)	0 to 120 Hz, -	-	233	Multi-speed setting (speed 9)	0 to 590 Hz, 9999	9999		⊙	
82	Multi-speed setting (speed 10)	0 to 120 Hz, -	-	234	Multi-speed setting (speed 10)	0 to 590 Hz, 9999	9999		⊙	
83	Multi-speed setting (speed 11)	0 to 120 Hz, -	-	235	Multi-speed setting (speed 11)	0 to 590 Hz, 9999	9999		⊙	
84	Multi-speed setting (speed 12)	0 to 120 Hz, -	-	236	Multi-speed setting (speed 12)	0 to 590 Hz, 9999	9999		⊙	
85	Multi-speed setting (speed 13)	0 to 120 Hz, -	-	237	Multi-speed setting (speed 13)	0 to 590 Hz, 9999	9999		⊙	
86	Multi-speed setting (speed 14)	0 to 120 Hz, -	-	238	Multi-speed setting (speed 14)	0 to 590 Hz, 9999	9999		⊙	
87	Multi-speed setting (speed 15)	0 to 120 Hz, -	-	239	Multi-speed setting (speed 15)	0 to 590 Hz, 9999	9999		⊙	
88	PID action selection	20.21	20	128	PID action selection	0, 20, 21, 1000, 1001, 1010, 1011, 2000, 2001, 2010, 2011, 40 to 43	0		△	To perform PID control, set the same value as the value set in the FR-S500. When PID control is not used, set "0".
89	PID proportional band	0.1 to 999%, -	100%	129	PID proportional band	0.1 to 1000%, 9999	100%		⊙	
90	PID integral time	0.1 to 999 s, -	1 s	130	PID integral time	0.1 to 3600 s, 9999	1 s		⊙	
91	PID upper limit	0 to 100%, -	-	131	PID upper limit	0 to 100%, 9999	9999		⊙	
92	PID lower limit	0 to 100%, -	-	132	PID lower limit	0 to 100%, 9999	9999		⊙	
93	PID action set point for PU operation	0 to 100%	0%	133	PID action set point	0 to 100%, 9999	9999		△	When the value of terminal 2 is used as a set point for the FR-D800, set "9999".
94	PID differential time	0.01 to 10 s, -	-	134	PID differential time	0.01 to 10 s, 9999	9999		⊙	
95	Rated motor slip	0 to 50%, -	-	245	Rated slip	0 to 50%, 9999	9999		⊙	
96	Slip compensation time constant	0.01 s to 10 s	0.5 s	246	Slip compensation time constant	0.01 to 10 s	0.5 s		⊙	
97	Constant-output region slip compensation selection	0, -	-	247	Constant output range slip compensation selection	0, 9999	9999		⊙	
98	Automatic torque boost selection (Motor capacity)	0.1 to 3.7 kW	-	80	Motor capacity	0.1 to 18.5 kW, 9999	9999		⊙	When the automatic torque boost function is used in the FR-S500, select Advanced magnetic flux vector control in the FR-D800. Set the same motor capacity of the FR-S500 in Pr.80 in the FR-D800, and perform auto tuning after setting Pr.71, Pr.83, Pr.84, and Pr.800. To select Advanced magnetic flux vector control, set "20" in Pr.800, a value other than "9999" in Pr.80 and Pr.81, and a value for induction motor in Pr.71.
-	-	-	-	81	Number of motor poles	2, 4, 6, 8, 10, 12, 9999	9999		×	
-	-	-	-	82	Motor excitation current	0 to 500 A, 9999	9999		×	
-	-	-	-	83	Rated motor voltage	0 to 1000 V	200/400 V		×	
-	-	-	-	84	Rated motor frequency	10 to 400 Hz, 9999	9999		×	
99	Motor primary resistance	0 to 50 Ω, -	-	90	Motor constant (R1)	0 to 50 Ω, 9999	9999		×	
-	-	-	-	96	Auto tuning setting/status	0, 1, 11	0		×	

FR-S500 (S500E) parameter list				FR-D800 compatible parameter					Parameter setting	
Pr.	Name	Setting range	Initial value	Pr.	Name	Setting range	Initial value		Setting	Remarks
							Gr.1	Gr.2		
C1 (900)	FM terminal calibration	-	-	-	-	-	-		×	
C2 (902)	Frequency setting voltage bias frequency	0 to 60 Hz	0 Hz	C2 (902)	Terminal 2 frequency setting bias frequency	0 to 590 Hz	0 Hz		△	For the calibration method, refer to the FR-D800 Instruction Manual (Function) .
C3 (902)	Frequency setting voltage bias	0 to 300%	0%	C3 (902)	Terminal 2 frequency setting bias	0 to 300%	0%		△	For the calibration method, refer to the FR-D800 Instruction Manual (Function) .
-	-	-	-	125 (903)	Terminal 2 frequency setting gain frequency	0 to 590 Hz	60 Hz	50 Hz	△	For the calibration method, refer to the FR-D800 Instruction Manual (Function) .
C4 (903)	Frequency setting voltage gain	0 to 300%	96%	C4 (903)	Terminal 2 frequency setting gain	0 to 300%	100%		△	For the calibration method, refer to the FR-D800 Instruction Manual (Function) .
C5 (904)	Frequency setting current bias frequency	0 to 60 Hz	0 Hz	C5 (904)	Terminal 4 frequency setting bias frequency	0 to 590 Hz	0 Hz		△	For the calibration method, refer to the FR-D800 Instruction Manual (Function) .
C6 (904)	Frequency setting current bias	0 to 300%	20%	C6 (904)	Terminal 4 frequency setting bias	0 to 300%	20%		△	For the calibration method, refer to the FR-D800 Instruction Manual (Function) .
-	-	-	-	126 (905)	Terminal 4 frequency setting gain frequency	0 to 590 Hz	60 Hz	50 Hz	△	For the calibration method, refer to the FR-D800 Instruction Manual (Function) .
C7 (905)	Frequency setting current gain	0 to 300%	100%	C7 (905)	Terminal 4 frequency setting gain	0 to 300%	100%		△	For the calibration method, refer to the FR-D800 Instruction Manual (Function) .

FR-S500 (S500E) parameter list (The following parameters are available for the FR-S500E.)				FR-D800 compatible parameter				Parameter setting		
Pr.	Name	Setting range	Initial value	Pr.	Name	Setting range	Initial value		Setting	Remarks
							Gr.1	Gr.2		
H1 (503)	Maintenance timer	0 to 999	0	503	Maintenance timer	0 to 9998	0		-	Read only.
H2 (504)	Maintenance timer alarm output set time	0 to 999, -	36	504	Maintenance timer warning output set time	0 to 9998, 9999	9999		△	To achieve the same setting as the FR-S500E in the FR-D800, multiply the FR-S500E setting value by 10.
H3 (555)	Current average time	0.1 to 1 s	1 s	555	Current average time	0.1 to 1 s	1 s		⊙	
H4 (556)	Data output mask time	0 to 20 s	0 s	556	Data output mask time	0 to 20 s	0 s		⊙	
H5 (557)	Current average value monitor signal output reference current	0.1 to 999 A	1 A	557	Current average value monitor signal output reference current	0 to 500 A	Inverter rated current		△	Set the same value as the value set in the FR-S500E.
H6 (162)	Automatic restart after instantaneous power failure selection	0, 1, 10	1	162	Automatic restart after instantaneous power failure selection	0, 1, 10, 11	0		⊙	
H7 (559)	Second electronic thermal O/L relay	0 to 50 A, -	-	51	Second electronic thermal O/L relay	0 to 500 A, 9999	9999		△	For the FR-D800, this function is enabled when the RT signal is ON.
b1 (560)	Regenerative function selection	0, 1	0	30	Regenerative function selection	0 to 2	0		⊙	
b2 (561)	Special regenerative brake duty	0 to 30%	0%	70	Special regenerative brake duty	0 to 100%	0%		⊙	

FR-S500 (S500E) parameter list (The following parameters are available for the FR-S500-[]K-R and FR-S500E.)				FR-D800 compatible parameter				Parameter setting																									
Pr.	Name	Setting range	Initial value	Pr.	Name	Setting range	Initial value		Setting	Remarks																							
							Gr.1	Gr.2																									
n1 (331)	Communication station number	0 to 31	0	117	RS-485 communication station number	0 to 31	0		⊙																								
n2 (332)	Communication speed	48, 96, 192	192	118	RS-485 communication speed	48, 96, 192, 384, 576, 768, 1152	192		⊙																								
n3 (333)	Stop bit length	0, 1, 10, 11	1	119	RS-485 communication stop bit length / data length	0, 1, 10, 11	1		⊙																								
n4 (334)	Parity check presence/absence	0, 1, 2	2	120	RS-485 communication parity check	0 to 2	2		⊙																								
n5 (335)	Number of communication retries	0 to 10, -	1	121	RS-485 communication retry count	0 to 10, 9999	1		⊙																								
n6 (336)	Communication check time interval	0 to 999 s	-	122	RS-485 communication check time interval	0 to 999.8 s, 9999	0		⊙																								
n7 (337)	Wait time setting	0 to 150 ms, -	-	123	RS-485 communication waiting time setting	0 to 150 ms, 9999	9999		△																								
n8 (338)	Operation command write	0, 1	0	338	Communication operation command source	0, 1	0		⊙																								
n9 (339)	Speed command write	0, 1	0	339	Communication speed command source	0 to 2	0		⊙																								
n10 (340)	Link start mode selection	0, 1	0	340	Communication startup mode selection	0, 1, 10	0		⊙																								
n11 (341)	CR/LF selection	0, 1, 2	1	124	RS-485 communication CR/LF selection	0 to 2	1		⊙																								
n12 (342)	E2PROM write selection	0, 1	0	342	Communication EEPROM write selection	0, 1	0		⊙																								
n13 (145)	PU display language	0 to 7	0	145	PU display language selection	0 to 7	-		⊙																								
n14 (990)	PU buzzer sound control	0, 1	1	990	PU buzzer control	0, 1	1		⊙																								
n15 (991)	PU contrast adjustment	0 to 63	58	991	PU contrast adjustment	0 to 63	58		⊙																								
n16 (992)	PU main display screen data selection	0, 100	0	-	-	-	-		-	In the FR-D800, this function is set by the setting of Pr.52.																							
n17 (993)	PU disconnection detection/PU setting lock	0, 1, 10	0	75	Reset selection/disconnected PU detection/PU stop selection	0 to 3, 14 to 17	14		△	When Pr.75 = "0, 1, 14, or 15", the PU disconnection detection function is disabled. When "2, 3, 16, or 17" is set, the PU disconnection detection function is enabled. Check the reset selection and PU stop selection settings, and then configure the setting.																							
				161	Frequency setting/key lock operation selection	0, 1, 10, 11	0	△	Check the combination of the values set in Pr.53 and Pr.n17 in the FR-S500 (S500E), and then set Pr.161. <table><tr><th colspan="2">FR-S500 (S500E)</th><th>FR-D800</th></tr><tr><th>Pr.53</th><th>Pr.n17</th><th>Pr.161</th></tr><tr><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>0</td></tr><tr><td>0</td><td>10</td><td>10</td></tr><tr><td>1</td><td>0</td><td>1</td></tr><tr><td>1</td><td>1</td><td>1</td></tr><tr><td>1</td><td>10</td><td>11</td></tr></table>	FR-S500 (S500E)		FR-D800	Pr.53	Pr.n17	Pr.161	0	0	0	0	1	0	0	10	10	1	0	1	1	1	1	1	10	11
										FR-S500 (S500E)		FR-D800																					
										Pr.53	Pr.n17	Pr.161																					
										0	0	0																					
										0	1	0																					
										0	10	10																					
										1	0	1																					
1	1	1																															
1	10	11																															

6. Options

The following table shows which FR-S500 (S500E) series options are compatible with the FR-D800 series inverters and their corresponding D800 series options.

Name		Option	
		For FR-S500 (S500E)	For FR-D800
Stand-alone type	Parameter unit	FR-PU04	Not compatible. Use FR-PU07(BB) or FR-PA07.
	Parameter unit connection cable	FR-CB201,203,205	Compatible.
	Brake resistor	MRS□□, MYS□□	Compatible.
		FR-ABR-(H)□□K	Compatible.
	Brake unit	BU-1500 to 15K, H7.5K, H15K	Not compatible. Use FR-BU2.
	Discharging resistor	GZG□□, GRZG□□	Compatible.
	Power factor improving AC reactor	FR-BAL-(H)□□K	Not compatible. Use FR-HAL.
	Power factor improving DC reactor	FR-BEL-(H)□□K	Not compatible. Use FR-HEL.
	Radio noise filter	FR-BIF-(H)	Compatible.
	Line noise filter	FR-BSF01, FR-BLF	Compatible.
	FR-CV power regeneration common converter	FR-CV-(H)7.5K(-AT)	Compatible. * The successor model is FR-XC.
	Dedicated stand-alone reactor	FR-CVL-(H)7.5K	Compatible. * The successor model is FR-XCL.
	FR-HC high power factor converter	FR-HC-(H)7.5K	Not compatible. Use FR-HC2.
Manual controller / speed controller	Surge voltage suppression filter	FR-ASF-H□□K	Compatible.
	Manual controller	FR-AX	Not compatible.
	DC tach. follower	FR-AL	Not compatible.
	Three speed selector	FR-AT	Compatible.
	Remote speed setter	FR-FK	Compatible.
	Ratio setter	FR-FH	Compatible.
	Speed detector	FR-FP	Compatible.
	Master controller	FR-FG	Compatible.
	Soft starter	FR-FC	Compatible.
	Deviation detector	FR-FD	Compatible.
	Preamplifier	FR-FA	Compatible.
Others	Pilot generator	QVAH-10	Compatible.
	Deviation sensor	YVGC-500W-NS	Compatible.
	Frequency setting potentiometer	WA2W 1 kΩ	Compatible.
	Frequency meter	YM206NRI 1 mA	To use the option, refer to the Technical News MF-S-200 .
	Calibration resistor	RV24YN 10 kΩ	Compatible.
	Inverter setup software	FR-SW1-SETUP-WJ	Not compatible. Use SW1DND-FRC2.

7. Major differences from the FR-S500 (S500E)

Item		FR-S500 (S500E)	FR-D800
Model	Three-phase 200 V class	FR-S520(E)-0.1K to 3.7K (7 models)	FR-D820-0.1K-008 to FR-D820-15K-580 (11 models)
	Three-phase 400 V class	FR-S540(E)-0.4K to 3.7K (5 models)	FR-D840-0.4K-012 to FR-D840-15K-295 (9 models)
	Single-phase 200 V class	FR-S520S(E)-0.1K to 1.5K (5 models)	FR-D820S-0.1K-008 to D820S-2.2K-100 (6 models)
	Single-phase 100 V class	FR-S510W(E)-0.1K to 0.75K (4 models)	FR-D810W-0.1K-008 to FR-D810W-0.75K-042 (4 models)
Control method		Soft-PWM control / High carrier frequency PWM control (Selectable between V/F control and automatic torque boost control) Long wiring mode is available.	Soft-PWM control / High carrier frequency PWM control (Selectable among V/F control, Advanced magnetic flux vector control, PM sensorless vector control, and Optimum excitation control) Long wiring mode is not available (not supported due to no necessity).
Starting torque		Automatic torque boost control (150% at 6 Hz)	Advanced magnetic flux vector control (200% at 0.5 Hz (3.7K or lower), 150% at 0.5 Hz (5.5K or higher)) PM sensorless vector control (50%)
Output frequency range		0.5 to 120 Hz	0.2 to 590 Hz (induction motor) 0.2 to 400 Hz (PM motor)
Permissible load		150% 60 s, 200% 0.5 s (inverse-time characteristics)	ND rating (initial setting): 150% 60 s, 200% 0.5 s (inverse-time characteristics) SLD rating: 110% 60 s, 120% 3 s (inverse-time characteristics)
Frequency setting signal	Analog input	Terminal 2: Selectable from 0 to 10 V / 0 to 5 V Terminal 4: 4 to 20 mA	Terminal 2: 0 to 10 V / 0 to 5 V / 0 to 20 mA. Selectable using SW1 and SW2. Terminal 4: 0 to 10 V / 0 to 5 V / 4 to 20 mA. Selectable using SW1 and SW2.
	Digital input	Input using the setting dial on the operation panel or parameter unit	Input using the setting dial on the operation panel or parameter unit
Monitor function	Pulse train output	Terminal FM: 1440 pulses/s, 1 mA	Not available
	Analog output	Not available	Terminal AM: 0 to 10 VDC / 12 bits
Communication function	RS-485 (Mitsubishi inverter protocol)	Available (RS-485 connector is equipped.)	Available (PU connector, dedicated terminal block)
	RS-485 (MODBUS®RTU)	Not available	Available (PU connector, dedicated terminal block)
Functional safety	Function of ISO 61800-5-2	Not available	STO
	Safety level	Not available	SIL2, PLd, Cat.3
Input signal	Terminal function	Low-speed operation command (RL), Middle-speed operation command (RM), High-speed operation command (RH), Second function selection (RT), Current input selection (AU), Start self-holding selection (STOP), Output stop (MRS), External thermal relay input (OH), 15 multi-speed selection (REX), Jog operation selection (JOG), Reset (RES), PID control valid terminal (X14), PU operation/external operation switching (X16), Reverse rotation start (STR) (assignable to terminal STR only)	Low-speed operation command (RL), Middle-speed operation command (RM), High-speed operation command (RH), Second function selection (RT), Terminal 4 input selection (AU), Start self-holding selection (STOP), Output stop (MRS), External thermal relay input (OH), 15-speed selection (REX), Jog operation selection (JOG), Inverter reset (RES), PID control valid (X14), PU/External operation switchover (X16), Reverse rotation command (STR) (assignable to terminal STR only), Inverter run enable (X10), PU operation external interlock (X12), V/F switchover (X18), Pre-excitation (LX), Torque limit selection (TL), Jog operation selection 2 (JOG2), Traverse function selection (X37), Trace trigger input (TRG), Trace sampling start/end (TRC), Forward rotation command (STF), PID forward/reverse action switchover (X64), PU/NET operation switchover (X65), External/NET operation switchover (X66), Command source switchover (X67), PID P control switchover (X72), Emergency drive execution command (X84)
	Terminal function selection	Pr.60 to Pr.63 (Input terminal function selection)	Pr.178 to Pr.182 (Input terminal function selection)
	Contact input	5 (The terminal functions can be changed for 4 points other than STF.)	5
	Pulse train input	Not available	100k pulses/s

Item		FR-S500 (S500E)	FR-D800
Output signal	Terminal function	Inverter running (RUN), Up-to-frequency (SU), Overload warning (OL), Output frequency detection (FU), Operation ready (RY), Output current detection (Y12), Zero current detection (Y13), PID lower limit (FDN), PID upper limit (FUP), PID forward/reverse rotation (RL), Minor failure output (LF), Alarm output (ABC)	Inverter running (RUN), Up to frequency (SU), Overload warning (OL), Output frequency detection (FU), Inverter operation ready (RY), Output current detection (Y12), Zero current detection (Y13), PID lower limit (FDN), PID upper limit (FUP), PID forward/reverse rotation output (RL), Alarm (LF), Regenerative brake prealarm (RBP), Electronic thermal O/L relay pre-alarm (THP), Electronic bypass MC2 (MC2), Electronic bypass MC3 (MC3), Fan fault output (FAN), Heat sink overheat pre-alarm (FIN), Operation ready 2 (RY2), Low speed detection (LS), Trace status (Y40), Speed detection (FB), Inverter running 2 (RUN2), During deceleration at occurrence of power failure (Y46), During PID control activated (PID), PID deviation limit (Y48), During PM sensorless vector control (PM), During retry (Y64), Emergency drive in operation (Y65), Fault output during emergency drive (ALM3), PID output interruption (SLEEP), Pulse train output of output power (Y79), Safety monitor output (SAFE), Safety monitor output 2 (SAFE2), Life alarm (Y90), Fault output 3 (Y91), Energy saving average value updated timing (Y92), Current average monitor (Y93), Maintenance timer (Y95), Remote output (REM), Alarm (LF), Fault (ALM), Cooling fan operation command (Y206), Control circuit temperature (Y207), Upper limit warning detection (LUP), Lower limit warning detection (LDN), During load characteristics measurement (Y213) * Negative logic has become available.
	Output signal for indicator	Output frequency, motor current	For the FR-D800, the output frequency [Hz] can be displayed using the rotation speed [r/min]. Output frequency, output current, output voltage, fault indication, set frequency / motor speed setting, operation speed, motor torque, converter output voltage, regenerative brake duty, electronic thermal O/L relay load factor, output current peak value, converter output voltage peak value, input power, output power, load meter, motor excitation current, cumulative energization time, actual operation time, motor load factor, cumulative energy, torque command, torque current command, heat sink temperature, trace status, station number (RS-485 communication), energy saving effect, cumulative energy saving, PID set point, PID measured value, PID deviation, input terminal status, output terminal status, motor thermal load factor, inverter thermal load factor, PTC thermistor resistance, PID measured value 2, emergency drive status, 32-bit cumulative energy (lower 16 bits), 32-bit cumulative energy (upper 16 bits), 32-bit cumulative energy (lower 16 bits), 32-bit cumulative energy (upper 16 bits), PID manipulated amount, dancer main set speed, control circuit temperature
	Terminal function selection	Pr.64 and Pr.65 (Output terminal function selection)	Pr.190 to Pr.192 (Output terminal function selection)
	Open collector output	1	2
	Contact output	1	1

Item	FR-S500 (S500E)	FR-D800
Protective/warning function	[Warning] Stall prevention (overcurrent), stall prevention (overvoltage), PU stop, undervoltage, write disable error, write-while-running error/mode designation error, calibration error [Alarm] Fan failure [Fault] Overcurrent cut-off during acceleration, overcurrent cut-off during constant speed, overcurrent cut-off during deceleration, regenerative overvoltage cut-off during acceleration, regenerative overvoltage cut-off during constant speed, regenerative overvoltage cut-off during deceleration or stop, motor overload cut-off (electronic thermal overcurrent protection), inverter overload cut-off (electronic thermal overcurrent protection), fan overheat, stall prevention (overload), communication error, parameter error, PU disconnected, retry count, CPU error	[Warning] Stall prevention (overcurrent), stall prevention (overvoltage), regenerative brake pre-alarm, electronic thermal relay function pre-alarm, PU stop, maintenance timer, continuous operation during communication fault, safety stop, load fault warning, incorrect parameter setting, undervoltage, emergency drive in operation [Alarm] Fan alarm [Fault] Overcurrent trip during acceleration, overcurrent trip during constant speed, overcurrent trip during deceleration or stop, regenerative overvoltage trip during acceleration, regenerative overvoltage trip during constant speed, regenerative overvoltage trip during deceleration or stop, inverter overload trip (electronic thermal relay function), motor overload trip (electronic thermal relay function), heat sink overheat, undervoltage, input phase loss, stall prevention stop, loss of synchronism detection, upper limit fault detection, lower limit fault detection, brake transistor alarm detection, output side earth (ground) fault overcurrent, output phase loss, external thermal relay operation, PTC thermistor operation, internal storage device fault, parameter storage device fault (control circuit board), PU disconnection, retry count excess, parameter storage device fault (main circuit board), CPU fault, abnormal output current detection, inrush current limit circuit fault, analog input fault, USB communication fault, safety circuit fault, overspeed occurrence, PID signal fault, CPU fault, inverter output fault, internal circuit fault

Item		FR-S500 (S500E)	FR-D800			
Outline dimensions (width, height, and depth) Refer to Chapter 1 Size.		The installation size is not compatible for the following replacements.				
		Existing inverter	Replacing inverter	Outline dimensions FR-S500(E) → FR-D800		
				Width	Height	Depth
		FR-S520(E)-0.4K	FR-D820-0.4K-025	-	-	112.5 → 102.5
		FR-S520(E)-1.5K	FR-D820-1.5K-070	-	-	135.5 → 132.5
		FR-S520(E)-2.2K	FR-D820-2.2K-100	-	-	135.5 → 132.5
		FR-S520(E)-3.7K	FR-D820-3.7K-165	170 → 108	-	-
		FR-S540(E)-0.4K	FR-D840-0.4K-012	108 → 68	-	-
		FR-S540(E)-0.75K	FR-D840-0.75K-022	108 → 68	-	-
		FR-S540(E)-1.5K	FR-D840-1.5K-037	108 → 68	-	135.5 → 167.5
		FR-S540(E)-3.7K	FR-D840-3.7K-081	-	-	165.5 → 155.5
		FR-S520S(E)-0.4K	FR-D820S-0.4K-025	-	-	142.5 → 132.5
		FR-S520S(E)-0.75K	FR-D820S-0.75K-042	-	-	162.5 → 142.5
		FR-S520S(E)-1.5K	FR-D820S-1.5K-070	-	-	155.5 → 145
		FR-S510W(E)-0.4K	FR-D810W-0.4K-025	-	-	142.5 → 132.5
FR-S510W(E)-0.75K	FR-D810W-0.75K-042	-	-	149.5 → 145		
Installation size (Width 1 and Height 1)		The installation size is not compatible for the following replacements.				
		Existing inverter	Replacing inverter	Installation size FR-S500(E) → FR-D800		
				Width 1	Height 1	
		FR-S520(E)-3.7K	FR-D820-3.7K-165	158 → 96	-	
		FR-S540(E)-0.4K	FR-D840-0.4K-012	96 → 56	-	
		FR-S540(E)-0.75K	FR-D840-0.75K-022	96 → 56	-	
FR-S540(E)-1.5K	FR-D840-1.5K-037	96 → 56	-			
Main circuit terminal block		Refer to Chapter 2 Wiring.				
Control circuit terminal block and screw size		Fixed to the insertion terminal block ○ M3 screw: terminal ABC ○ M2 screw: Other than terminal ABC		Spring clamp terminal		
Control terminal cable size (when crimp terminals used)		0.3 to 0.75 mm ²		0.3 to 0.75 mm ²		
Built-in brake transistor		Built-in for three-phase 200 V 0.4K to 3.7K and single-phase 200 V 0.4K to 1.5K		Built-in for 0.4K to 15K		
Cooling fan location		Installed at the bottom of the inverter.		FR-D820-2.2K-100 or higher, FR-D840-2.2K-050 or higher, and FR-D820S-2.2K-100: Installed at the top of the inverter. For replacing the cooling fan, a space is necessary at the top of the inverter		
Operation panel		Not removable since it is integrated into the inverter.		Not removable.		
Parameter (function)		Compatible with the conventional models (some functions are changed or removed).				
Parameter unit	FR-PU07	Compatible.		Compatible.		
	FR-PU04	Compatible.		Not compatible.		
	FR-PU03/ FR-ARW03	Not compatible.		Not compatible.		
	FR-DU01					
	FR-PU02/ FR-ARW					
PU connection cable	FR-CB2□□	Compatible.		Compatible.		
	FR-CBL□□	Not compatible.		Not compatible.		

Item		FR-S500 (S500E)	FR-D800
Circuit board coating (conforming to IEC 60721-3-3:1994 3C2/3S2)		Without	Only the models with a suffix "-60": With circuit board coating
Surrounding air temperature		-10°C to +50°C (non-freezing) (-10°C to +40°C for totally enclosed structure type)	-20°C to +60°C (non-freezing) * SLD rating: Derating is required for the temperature above 40°C. ND rating: Derating is required for the temperature above 50°C.
Surrounding air humidity		90% RH or less (non-condensing)	With circuit board coating (models with a suffix "-60"): 95% RH or less (non-condensing) Without circuit board coating: 90% RH or less (non-condensing)
Altitude		Maximum 1000 m	Maximum 3000 m * For the installation at an altitude above 1000 m, consider a 3% reduction in the rated current per 500 m increase in altitude.
USB		Not available	Type-C (With USB bus power connection, parameters can be set using FR Configurator2.)
FR Configurator2		Not compatible.	Compatible.
Plug-in option		Not compatible.	Not compatible.
Inrush current limit circuit		Equipped with inverters of any capacities.	Equipped with inverters of any capacities.
Design life	Cooling fan	2 to 3 years	10 years
	Electrolytic capacitor	5 years	10 years
Stand-alone option (noise filter, reactor, etc.)		Refer to Chapter 6 Options.	

Item		FR-S500 (S500E)	FR-D800																																																														
Standard	UL, cUL	UL 508C (200/100 V class) UL 840 (400 V class)	UL 61800-5-1, CSA C22.2 No. 274 For selection of branch circuit protection devices, refer to the Technical News MF-S-197 .																																																														
	EMC Directive	To make the FR-D800 compliant with IEC 61800-3 category C3, 2nd environment, use the following EMC filters. <table><tr><th>Inverter</th><th>EMC filter</th></tr><tr><td>FR-D820-0.1K-008</td><td>FN3288-10-44-C21-R65</td></tr><tr><td>FR-D820-0.2K-014</td><td>FN3288-10-44-C21-R65</td></tr><tr><td>FR-D820-0.4K-025</td><td>FN3288-10-44-C21-R65</td></tr><tr><td>FR-D820-0.75K-042</td><td>FN3288-10-44-C21-R65</td></tr><tr><td>FR-D820-1.5K-070</td><td>FN3288-16-44-C21-R65</td></tr><tr><td>FR-D820-2.2K-100</td><td>FN3288-25-33-C21-R65</td></tr><tr><td>FR-D820-3.7K-165</td><td>FN3288-40-33-C21-R65</td></tr><tr><td>FR-D820-5.5K-238</td><td>FN3288-50-53-C21-R65</td></tr><tr><td>FR-D820-7.5K-318</td><td>FN3288-63-53-C21-R65</td></tr><tr><td>FR-D820-11K-450</td><td>FN3288-80-34-C21-R65</td></tr><tr><td>FR-D820-15K-580</td><td>FN3288-100-35-C21-R65</td></tr><tr><td>FR-D840-0.4K-012</td><td>FN3288-10-44-C34-R65</td></tr><tr><td>FR-D840-0.75K-022</td><td>FN3288-10-44-C34-R65</td></tr><tr><td>FR-D840-1.5K-037</td><td>FN3288-10-44-C34-R65</td></tr><tr><td>FR-D840-2.2K-050</td><td>FN3288-16-44-C35-R65</td></tr><tr><td>FR-D840-3.7K-081</td><td>FN3288-20-33-C35-R65</td></tr><tr><td>FR-D840-5.5K-120</td><td>FN3288-25-33-C35-R65</td></tr><tr><td>FR-D840-7.5K-163</td><td>FN3288-40-33-C35-R65</td></tr><tr><td>FR-D840-11K-230</td><td>FN3288-40-33-C35-R65</td></tr><tr><td>FR-D840-15K-295</td><td>FN3288-50-53-C35-R65</td></tr><tr><td>FR-D820S-0.1K-008</td><td>FN3288-10-44-C21-R65</td></tr><tr><td>FR-D820S-0.2K-014</td><td>FN3288-10-44-C21-R65</td></tr><tr><td>FR-D820S-0.4K-025</td><td>FN3288-10-44-C21-R65</td></tr><tr><td>FR-D820S-0.75K-042</td><td>FN3288-16-44-C21-R65</td></tr><tr><td>FR-D820S-1.5K-070</td><td>FN3288-25-33-C21-R65</td></tr><tr><td>FR-D820S-2.2K-100</td><td>FN3288-25-33-C21-R65</td></tr><tr><td>FR-D810W-0.1K-008</td><td>FN3288-10-44-C21-R65</td></tr><tr><td>FR-D810W-0.2K-014</td><td>FN3288-10-44-C21-R65</td></tr><tr><td>FR-D810W-0.4K-025</td><td>FN3288-10-44-C21-R65</td></tr><tr><td>FR-D810W-0.75K-042</td><td>FN3288-25-33-C21-R65</td></tr></table>		Inverter	EMC filter	FR-D820-0.1K-008	FN3288-10-44-C21-R65	FR-D820-0.2K-014	FN3288-10-44-C21-R65	FR-D820-0.4K-025	FN3288-10-44-C21-R65	FR-D820-0.75K-042	FN3288-10-44-C21-R65	FR-D820-1.5K-070	FN3288-16-44-C21-R65	FR-D820-2.2K-100	FN3288-25-33-C21-R65	FR-D820-3.7K-165	FN3288-40-33-C21-R65	FR-D820-5.5K-238	FN3288-50-53-C21-R65	FR-D820-7.5K-318	FN3288-63-53-C21-R65	FR-D820-11K-450	FN3288-80-34-C21-R65	FR-D820-15K-580	FN3288-100-35-C21-R65	FR-D840-0.4K-012	FN3288-10-44-C34-R65	FR-D840-0.75K-022	FN3288-10-44-C34-R65	FR-D840-1.5K-037	FN3288-10-44-C34-R65	FR-D840-2.2K-050	FN3288-16-44-C35-R65	FR-D840-3.7K-081	FN3288-20-33-C35-R65	FR-D840-5.5K-120	FN3288-25-33-C35-R65	FR-D840-7.5K-163	FN3288-40-33-C35-R65	FR-D840-11K-230	FN3288-40-33-C35-R65	FR-D840-15K-295	FN3288-50-53-C35-R65	FR-D820S-0.1K-008	FN3288-10-44-C21-R65	FR-D820S-0.2K-014	FN3288-10-44-C21-R65	FR-D820S-0.4K-025	FN3288-10-44-C21-R65	FR-D820S-0.75K-042	FN3288-16-44-C21-R65	FR-D820S-1.5K-070	FN3288-25-33-C21-R65	FR-D820S-2.2K-100	FN3288-25-33-C21-R65	FR-D810W-0.1K-008	FN3288-10-44-C21-R65	FR-D810W-0.2K-014	FN3288-10-44-C21-R65	FR-D810W-0.4K-025	FN3288-10-44-C21-R65	FR-D810W-0.75K-042	FN3288-25-33-C21-R65
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