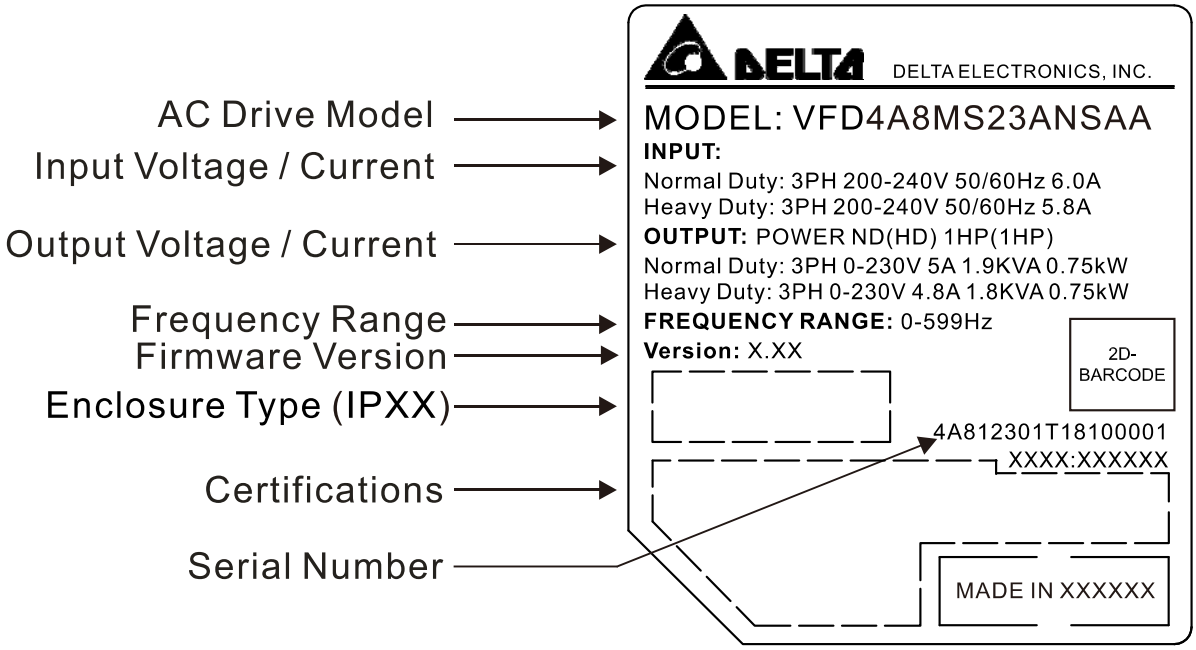
Chapter 1 Introduction

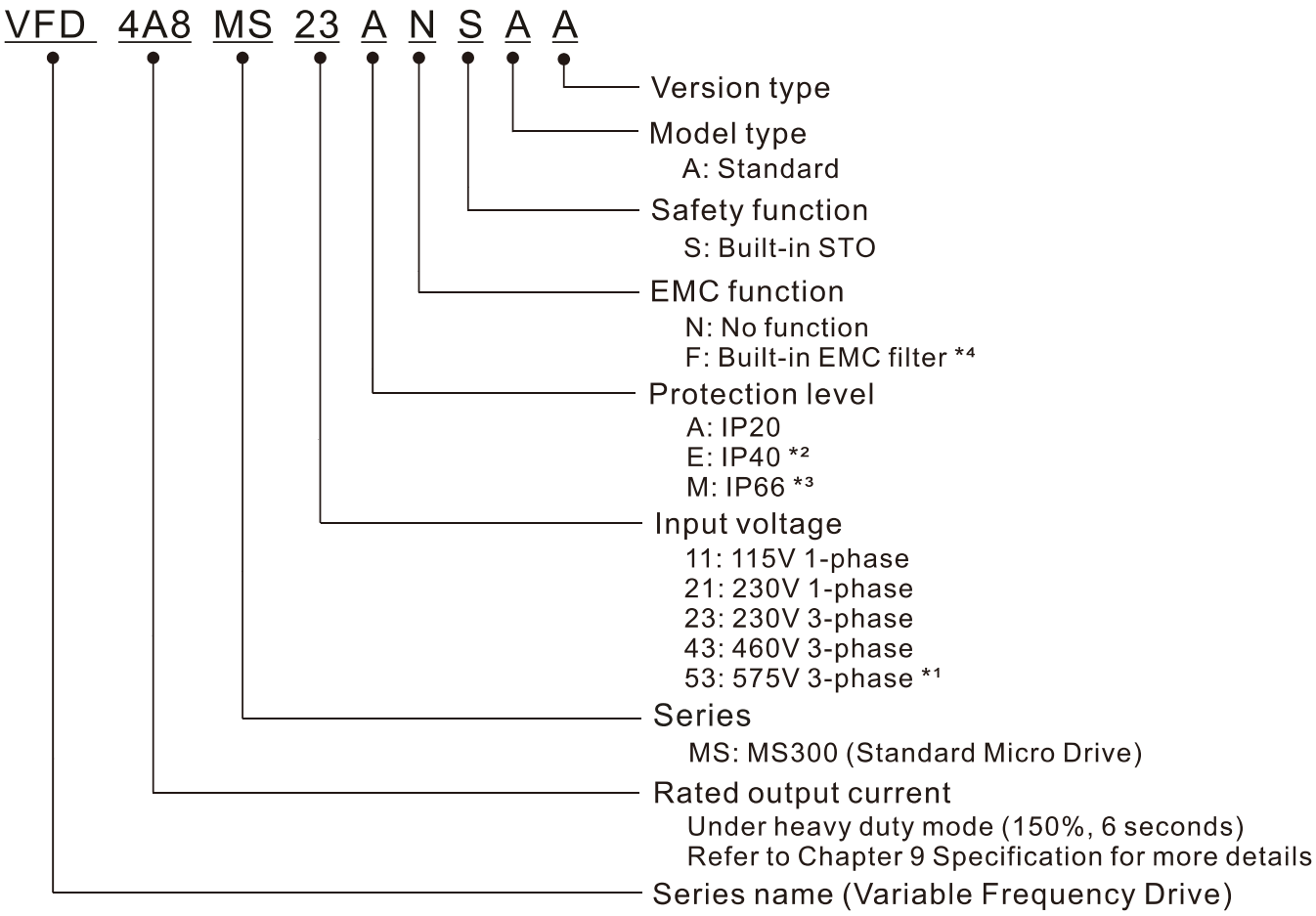
After receiving the AC motor drive, check for the following:

1. Inspect the unit after unpacking to ensure that it was not damaged during shipment. Make sure that the part number printed on the package matches the part number indicated on the nameplate.
2. Make sure that the mains voltage is within the range indicated on the nameplate. Install the AC motor drive according to the instructions in this manual.
3. Before applying power, make sure that all devices, including mains power, motor, control board and digital keypad, are connected correctly.
4. When wiring the AC motor drive, make sure that the wiring of input terminals “R/L1, S/L2, T/L3” and output terminals “U/T1, V/T2, W/T3” are correct to prevent damage to the drive.
5. When power is applied, use the digital keypad (KPMS-LE01) to select the language and set parameters. When executing a trial run, begin with a low speed and then gradually increase the speed to the desired speed.

1-1 Nameplate Information



1-2 Model Name



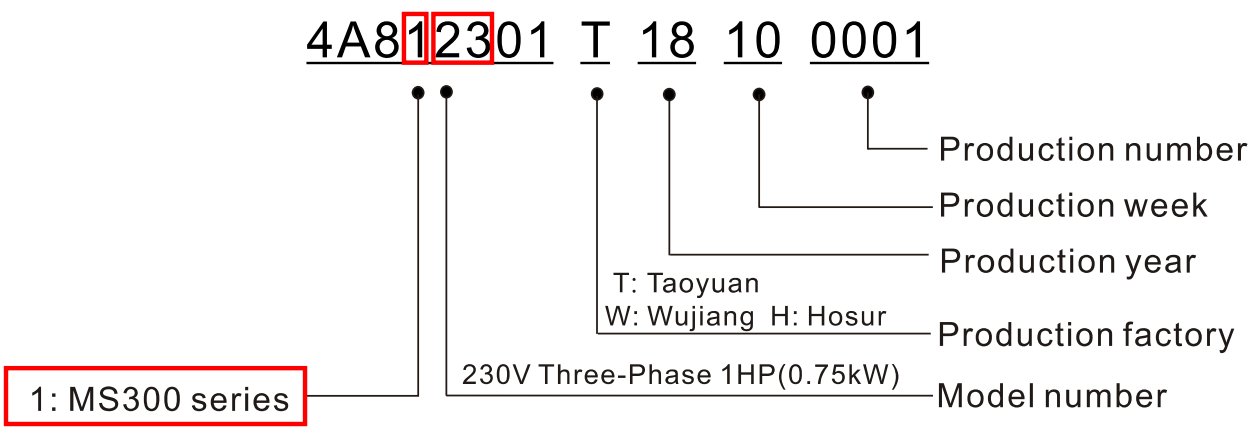
*1. For IP20 models only.

*2. Not applicable for models of 575V input voltage.

*3. Not applicable for models of 115V and 575V input voltage.

*4. For 230V input voltage (one-phase) and 460V input voltage (three-phase) models only.

1-3 Serial Number

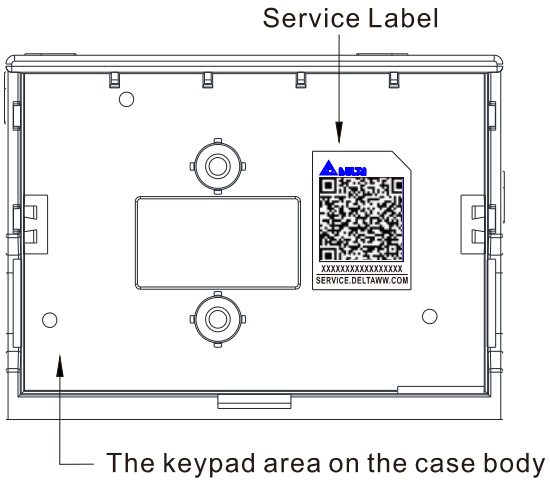


1-4 Apply After Service by Mobile Device

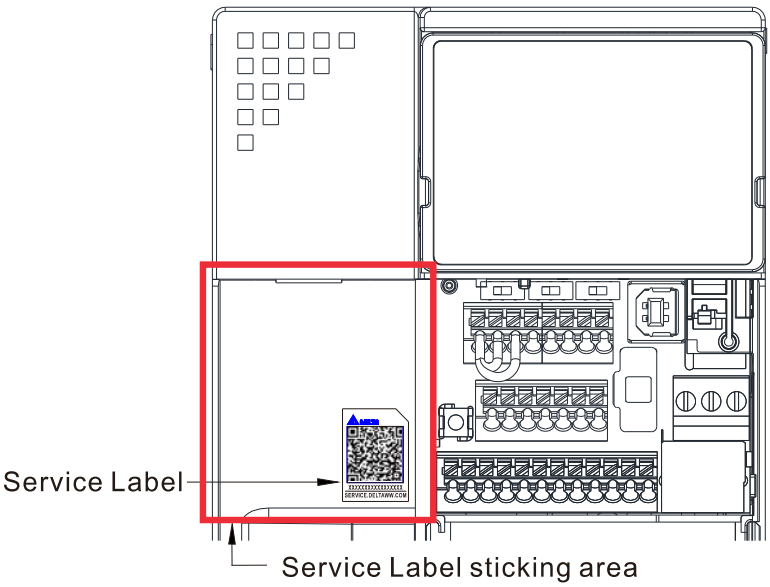
1-4-1 Location of Service Link Label

Service link label (Service Label) is pasted on the area as the drawing below shows.

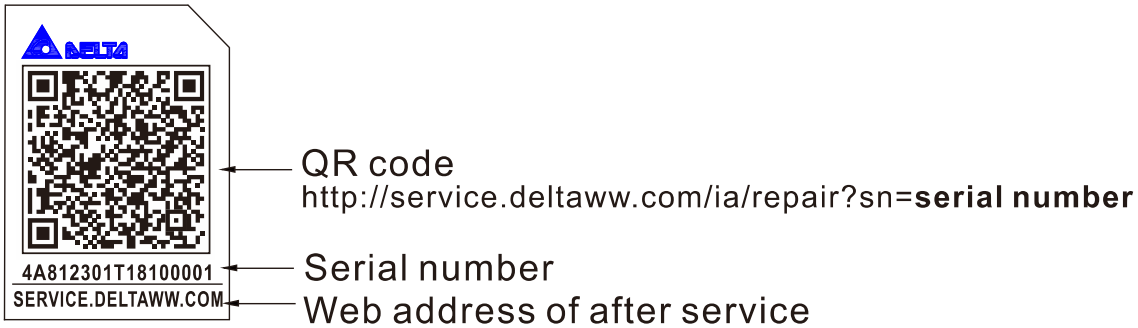
Frame A, B



Frame C–F



1-4-2 Service Link Label



Scan QR Code to request service

1. Find the QR code sticker (as shown above).
2. Use a smartphone to run a QR Code reader APP.
3. Point your camera at the QR Code. Hold your camera steady until the QR code comes into focus.
4. Access the Delta After Service website.
5. Fill your information into the column marked with an orange star.
6. Enter the CAPTCHA and click “Submit” to complete the application.

Cannot find the QR Code?

1. Open a web browser on your computer or smartphone.
2. Enter https://service.deltaww.com/ia/repair in browser address bar and press the Enter key.
3. Fill your information into the columns marked with an orange star.
4. Enter the CAPTCHA and click “Submit” to complete the application.

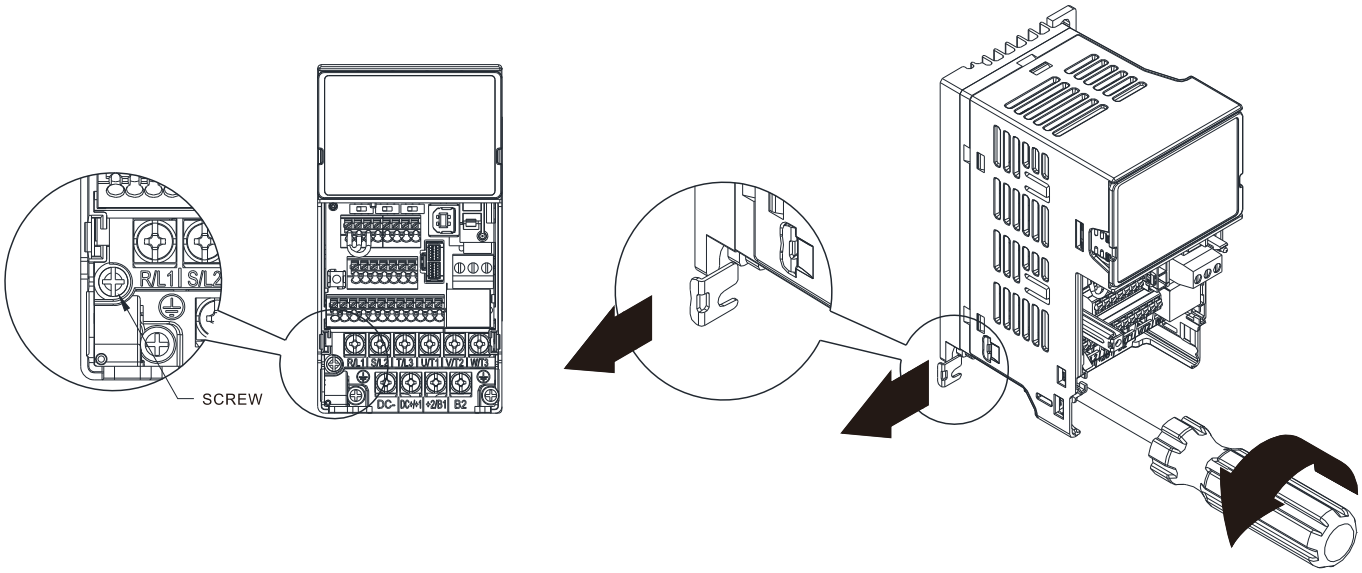
1-5 RFI Jumper

1 The drive contains Varistors / MOVs that are connected from phase to phase and from phase to ground to prevent the drive from unexpected stop or damage caused by mains surges or voltage spikes. Because the Varistors / MOVs from phase to ground are connected to ground with the RFI jumper, removing the RFI jumper disables the protection.

2 In models with a built-in EMC filter, the RFI jumper connects the filer capacitors to ground to form a return path for high frequency noise in order to isolate the noise from contaminating the mains power. Removing the RFI jumper strongly reduces the effect of the built-in EMC filter. Although a single drive complies with the international standards for leakage current, an installation with several drives with built-in EMC filters can trigger the RCD. Removing the RFI jumper helps, but the EMC performance of each drive is no longer guaranteed.

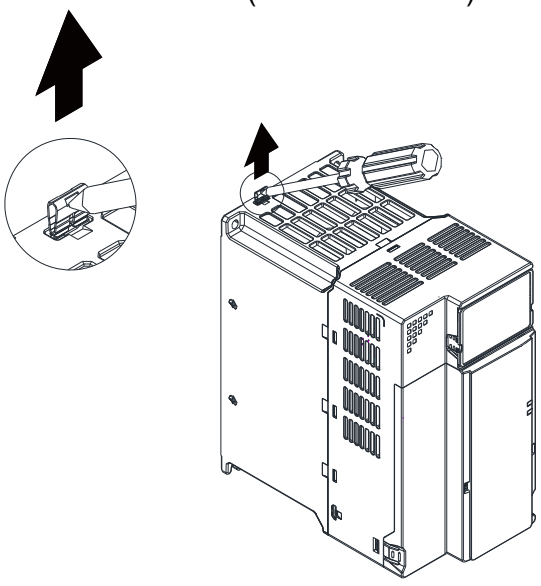
Frame A–F Screw Torque: 4–6 kg-cm / [3.5–5.2 lb-in.] / [0.39–0.59 Nm]

Loosen the screw and remove the RFI jumper (as shown below).
Tighten the screw again after you remove the RFI jumper.



Frame B–F (model with built-in EMC filter)

Remove the RFI jumper with a slotted screwdriver (as shown below).

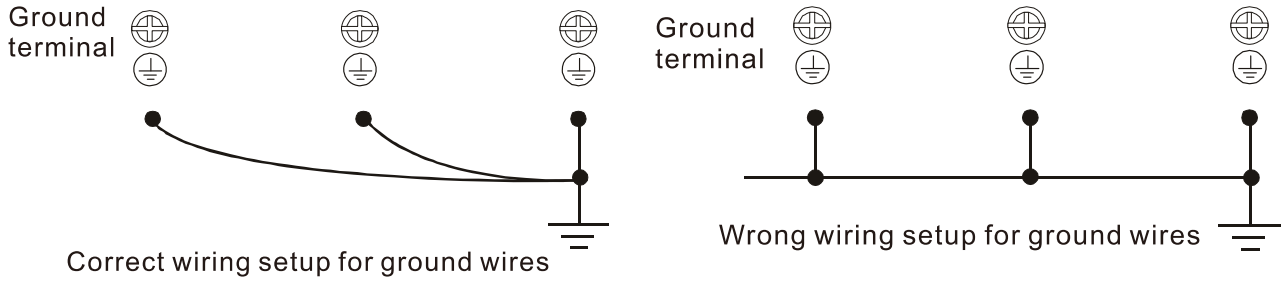


Isolating main power from ground:

When the power distribution system for the drive is a floating ground system (IT Systems) or an asymmetric ground system (Corner Grounded TN Systems), you must remove the RFI jumper. Removing the RFI jumper disconnects the internal capacitors from ground to avoid damaging the internal circuits and to reduce the ground leakage current.

Important points regarding ground connection

- ☑ To ensure the safety of personnel, proper operation, and to reduce electromagnetic radiation, you must properly ground the motor and drive during installation.
- ☑ The diameter of the grounding cables must comply with the local safety regulations.
- ☑ You must connect the shielded cable to the motor drive's ground to meet safety regulations.
- ☑ Only use the shielded cable as the ground for equipment when the aforementioned points are met.
- ☑ When installing multiple drives, do not connect the grounds of the drives in series but connect each drive to ground. The following pictures show the correct and wrong ways to connect the grounds.



Pay particular attention to the following points:

- ☑ Do not remove the RFI jumper while the power is on.
- ☑ Removing the RFI jumper also cuts the capacitor conductivity of the surge absorber to ground and the built-in EMC filter capacitors. Compliance with the EMC specifications is no longer guaranteed.
- ☑ Do not remove the RFI jumper if the mains power is a symmetrical grounded power system in order to maintain the efficiency for EMC circuit.
- ☑ Remove the RFI jumper when conducting high voltage tests. When conducting a high voltage test to the entire facility, disconnect the mains power and the motor if the leakage current is too high.

Floating Ground System (IT Systems)

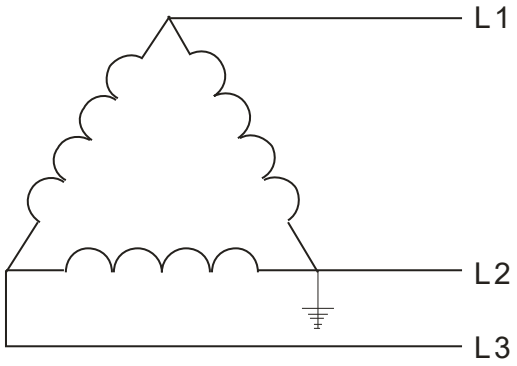
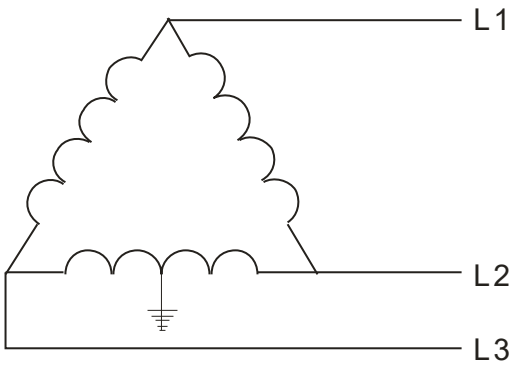
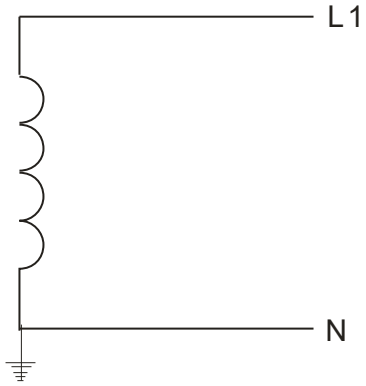
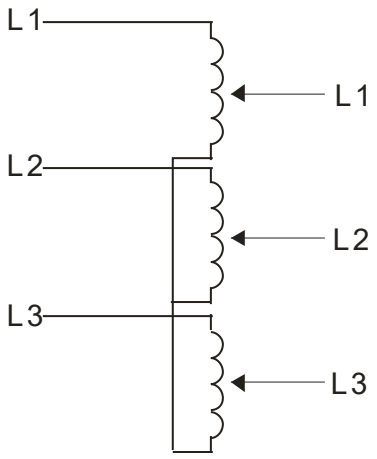
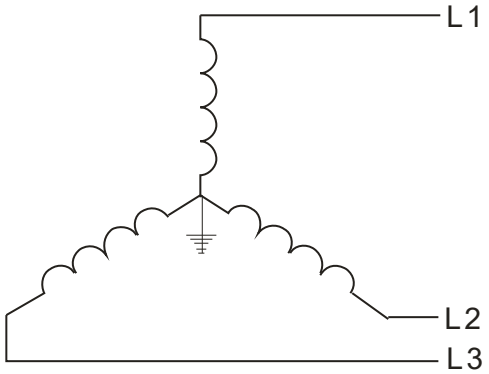
A floating ground system is also called an IT system, an ungrounded system, or a high impedance/ resistance (greater than 30 Ω) grounded system.

- ☑ Remove the RFI jumper to disconnect the ground cable from the internal filter capacitor and surge absorber.
- ☑ Do not install an external RFI/EMC filter. The external EMC filter passes through a filter capacitor and connects power input to the ground. This is very dangerous and damages the motor drive.
- ☑ In situations where EMC is required, use an EMC filter specifically for IT system if necessary. Disconnecting the ground cable from the filter prevents damage to the motor drive but compliance with EMC is no longer guaranteed.
- ☑ In situations where EMC is required, check for excess electromagnetic radiation affecting nearby low-voltage circuits. In some situations, the adapter and cable naturally provide enough suppression. If in doubt, install an extra electrostatic shielded cable on the power supply side between the main circuit and the control terminals to increase shielding.

Asymmetric Ground System (Corner Grounded TN Systems)

Caution: Do not remove the RFI jumper while power to the input terminal of the drive is ON.

In the following four situations, you must remove the RFI jumper. This is to prevent the system from grounding through the RFI and filter capacitors and damaging the drive.

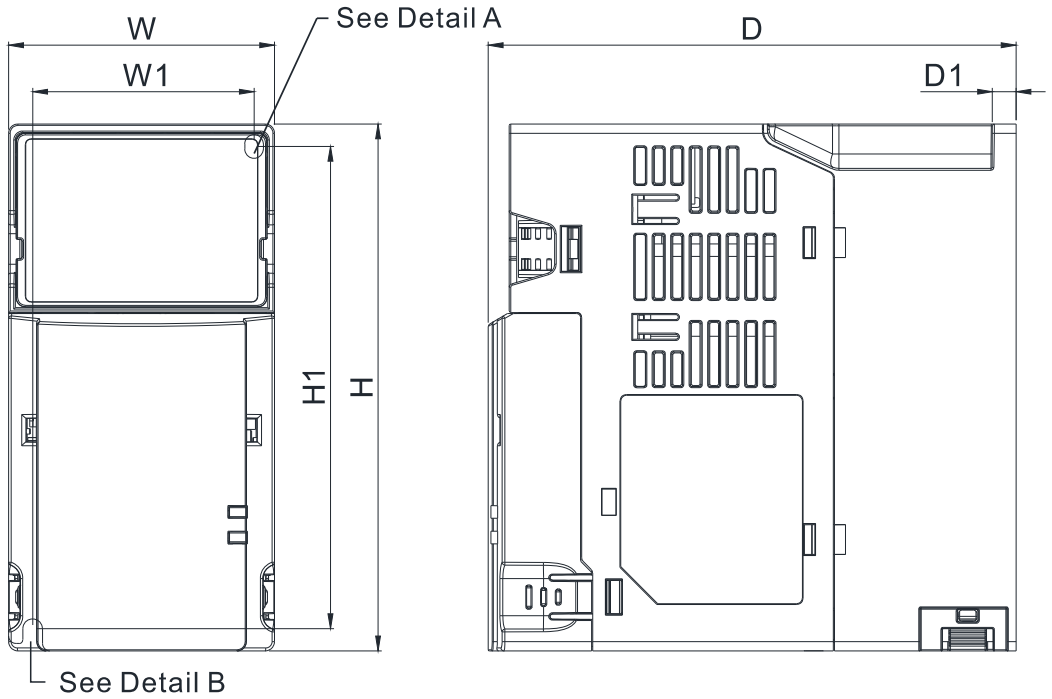
You must remove the RFI jumper for an asymmetric ground system	
1. Grounding at a corner in a triangle configuration  	2. Grounding at a midpoint in a polygonal configuration 
3. Grounding at one end in a single-phase configuration  	4. No stable neutral grounding in a three-phase autotransformer configuration 
You can use the RFI jumper for a symmetrical grounding power system	
In a situation with a symmetrical grounding power system, you can use the RFI jumper to maintain the effect of the built-in EMC filter and surge absorber. For example, the diagram on the right is a symmetrical grounding power system.	

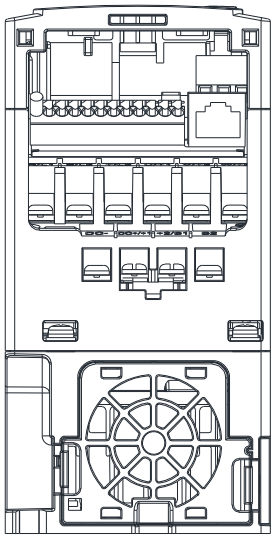
2-2 Frame B

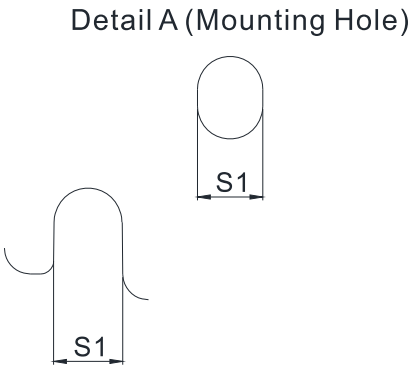
B1: VFD7A5MS23ANSAA; VFD7A5MS23ENSAA; VFD4A2MS43ANSAA; VFD4A2MS43ENSAA; VFD3A0MS53ANSAA

B2: VFD4A8MS21ANSAA; VFD4A8MS21ENSAA

B3: VFD1A6MS21AFSAA; VFD2A8MS21AFSAA; VFD4A8MS21AFSAA; VFD1A5MS43AFSAA; VFD2A7MS43AFSAA; VFD4A2MS43AFSAA







Unit: mm [inch]

Frame	W	H	D	W1	H1	D1	S1
B1	72.0 [2.83]	142.0 [5.59]	143.0 [5.63]	60.0 [2.36]	130.0 [5.63]	6.4 [0.25]	5.2 [0.20]
B2	72.0 [2.83]	142.0 [5.59]	143.0 [5.63]	60.0 [2.36]	130.0 [5.63]	3.0 [0.12]	5.2 [0.20]
B3	72.0 [2.83]	142.0 [5.59]	159.0 [6.26]	60.0 [2.36]	130.0 [5.63]	4.3 [0.17]	5.2 [0.20]

3-2 Airflow and Power Dissipation

Frame	Airflow Rate for Cooling			Power Dissipation for AC Motor Drive		
	Model No.	Flow Rate (Unit: cfm)	Flow Rate (Unit: m^3 / hr)	Loss External (Heat sink, unit: W)	Internal (Unit: W)	Total (Unit: W)
A	VFD1A6MS11ANSAA VFD1A6MS11ENSAA	0.0	0.0	8.0	10.0	18.0
	VFD2A5MS11ANSAA VFD2A5MS11ENSAA			14.2	13.1	27.3
	VFD1A6MS21ANSAA VFD1A6MS21ENSAA			8.0	10.3	18.3
	VFD2A8MS21ANSAA VFD2A8MS21ENSAA			16.3	14.5	30.8
	VFD1A6MS23ANSAA VFD1A6MS23ENSAA			8.6	10.0	18.6
	VFD2A8MS23ANSAA VFD2A8MS23ENSAA			16.5	12.6	29.1
	VFD4A8MS23ANSAA VFD4A8MS23ENSAA			31.0	13.2	44.2
	VFD1A5MS43ANSAA VFD1A5MS43ENSAA			17.6	11.1	28.7
	VFD2A7MS43ANSAA VFD2A7MS43ENSAA			30.5	17.8	48.3
	VFD1A7MS53ANSAA			23.5	12.5	36
B	VFD1A6MS21AFSAA	0.0	0.0	8.0	10.3	18.3
	VFD2A8MS21AFSAA	10.0	16.99	16.3	14.5	30.8
	VFD4A8MS21ANSAA VFD4A8MS21ENSAA	0.0	0.0	29.1	20.1	49.2
	VFD4A8MS21AFSAA	10.0	16.99	29.1	20.1	49.2
	VFD7A5MS23ANSAA VFD7A5MS23ENSAA			50.1	24.2	74.3
	VFD1A5MS43AFSAA			17.6	11.1	28.7
	VFD2A7MS43AFSAA			30.5	17.8	48.3
	VFD4A2MS43ANSAA VFD4A2MS43ENSAA VFD4A2MS43AFSAA			45.9	21.7	67.6
	VFD3A0MS53ANSAA			38.1	19	57.1
C	VFD4A8MS11ANSAA VFD4A8MS11ENSAA	16.0	27.2	29.1	23.9	53.0
	VFD7A5MS21ANSAA VFD7A5MS21ENSAA VFD7A5MS21AFSAA			46.5	31.0	77.5
	VFD11AMS21ANSAA VFD11AMS21ENSAA VFD11AMS21AFSAA			70.0	35	105
	VFD11AMS23ANSAA VFD11AMS23ENSAA			76.0	30.7	106.7
	VFD17AMS23ANSAA VFD17AMS23ENSAA			108.2	40.1	148.3

Frame B

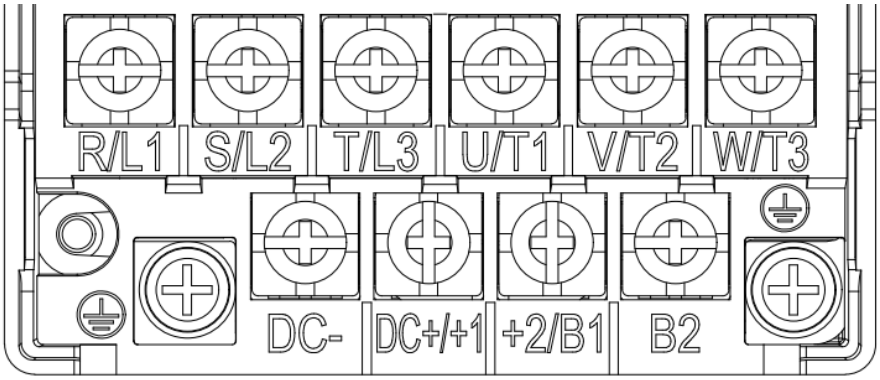


Figure 5-9

- If you install at Ta 50˚C above environment, use copper wires that have a voltage rating of 600 V and are temperature resistant to 90˚C or above.
- If you install at Ta 50˚C environment, use copper wires that have a voltage rating of 600 V and are temperature resistant to 75˚C or 90˚C.
- To be UL installation compliant, you must use copper wires when installing. The wire gauge is based on a temperature resistance of 75˚C, in accordance with UL requirements and recommendations. Do not reduce the wire gauge when using high-temperature resistant wires.

Models	Main Circuit Terminals R/L1, S/L2, T/L3, U/T1, V/T2, W/T3, DC-, DC+/+1, +2/B1, B2			Grounding Terminals ⏚		
	Max. Wire Gauge	Min. Wire Gauge	Screw Size & Torque (±10%)	Max. Wire Gauge	Min. Wire Gauge	Screw Size & Torque (±10%)
VFD1A6MS21AFSAA	4 mm² [12 AWG]	1.5 mm² [16 AWG]	M4 15 kg-cm [13.0 lb-in.] [1.47 Nm]	2.5 mm² [14 AWG]	2.5 mm² [14 AWG]	M4 15 kg-cm [13.0 lb-in.] [1.47 Nm]
VFD2A8MS21AFSAA		2.5 mm² [14 AWG]				
VFD4A8MS21AFSAA VFD4A8MS21ANSAA VFD4A8MS21ENSAA		4 mm² [12 AWG]		4 mm² [12 AWG]	4 mm² [12 AWG]	
VFD7A5MS23ANSAA VFD7A5MS23ENSAA						
VFD1A5MS43AFSAA		0.75 mm² [18 AWG]		2.5 mm² [14 AWG]	2.5 mm² [14 AWG]	
VFD2A7MS43AFSAA						
VFD4A2MS43ANSAA VFD4A2MS43ENSAA VFD4A2MS43AFSAA		2.5 mm² [14 AWG]				
VFD3A0MS53ANSAA		0.75 mm² [18 AWG]		2.5 mm² [14 AWG]	2.5 mm² [14 AWG]	

Table 5-4

7-2 Magnetic Contactor / Air Circuit Breaker and Non-fuse Circuit Breaker

Magnetic Contactor (MC) and Air Circuit Breaker (ACB)

It is recommended the surrounding temperature for MC should be ≥ 60°C and that for ACB should be ≥ 50°C. In the meanwhile, consider temperature derating for components with ON / OFF switch in accordance with the ambient temperature of the on-site distribution panel.

115V Models

Frame	Model	Heavy Duty Output Current [A]	Heavy Duty Input Current [A]	MC/ACB Selection [A]
A	VFD1A6MS11ANSAA	6	1.6	11
	VFD2A5MS11ANSAA	9.4	2.5	18
C	VFD4A8MS11ANSAA	18	4.8	32

Table 7-2-1

230V Models

Frame	Model	Heavy Duty Output Current [A]	Heavy Duty Input Current [A]	MC/ACB Selection [A]
A	VFD1A6MS21ANSAA	5.1	1.6	9
	VFD2A8MS21ANSAA	7.3	2.8	13
	VFD1A6MS23ANSAA	1.9	1.6	9
	VFD2A8MS23ANSAA	3.4	2.8	9
	VFD4A8MS23ANSAA	5.8	4.8	11
B	VFD1A6MS21AFSAA	5.1	1.6	9
	VFD2A8MS21AFSAA	7.3	2.8	13
	VFD4A8MS21AFSAA	10.8	4.8	18
	VFD4A8MS21ANSAA	10.8	4.8	18
	VFD7A5MS23ANSAA	9	7.5	18
C	VFD7A5MS21ANSAA	16.5	7.5	32
	VFD11AMS21ANSAA	24.2	11	40
	VFD7A5MS21AFSAA	16.5	7.5	32
	VFD11AMS21AFSAA	24.2	11	40
	VFD11AMS23ANSAA	13.2	11	22
	VFD17AMS23ANSAA	20.4	17	32
D	VFD25AMS23ANSAA	30	25	55
E	VFD33AMS23ANSAA	39.6	33	65
	VFD49AMS23ANSAA	58.8	49	105
F	VFD65AMS23ANSAA	78	65	130

Table 7-2-2

Non-fuse Circuit Breaker

Comply with the UL standard: Per UL 508, paragraph 45.8.4, part a.

The rated current of the non-fuse circuit breaker should be 1.6–2.6 times the drive's rated input current. The recommended current values are shown in the table below. Compare the time characteristics of the non-fuse circuit breaker with those of the drive's overheated protection to ensure that there is no tripping.

Model	Voltage / One-phase (Three-phase)	Breaker Rated Input Recommended Current [A]
VFD1A6MS11ANSAA VFD1A6MS11ENSAA	115V / One-phase	20
VFD2A5MS11ANSAA VFD2A5MS11ENSAA		25
VFD4A8MS11ANSAA VFD4A8MS11ENSAA		50
VFD1A6MS21ANSAA VFD1A6MS21ENSAA VFD1A6MS21AFSAA	230V / One-phase	15
VFD2A8MS21ANSAA VFD2A8MS21ENSAA VFD2A8MS21AFSAA		20
VFD4A8MS21ANSAA VFD4A8MS21ENSAA VFD4A8MS21AFSAA		30
VFD7A5MS21ANSAA VFD7A5MS21ENSAA VFD7A5MS21AFSAA		45
VFD11AMS21ANSAA VFD11AMS21ENSAA VFD11AMS21AFSAA		70
VFD1A6MS23ANSAA VFD1A6MS23ENSAA	230V / Three-phase	15
VFD2A8MS23ANSAA VFD2A8MS23ENSAA		15
VFD4A8MS23ANSAA VFD4A8MS23ENSAA		15
VFD7A5MS23ANSAA VFD7A5MS23ENSAA		25
VFD11AMS23ANSAA VFD11AMS23ENSAA		40
VFD17AMS23ANSAA VFD17AMS23ENSAA		60
VFD25AMS23ANSAA VFD25AMS23ENSAA		63
VFD33AMS23ANSAA VFD33AMS23ENSAA		90
VFD49AMS23ANSAA VFD49AMS23ENSAA		125
VFD65AMS23ANSAA VFD65AMS23ENSAA		160

7-3 Fuse Specification Chart

☑ Fuse specifications lower than the table below are allowed.

☑ For installation in the United States, branch circuit protection must be provided in accordance with the National Electrical Code (NEC) and any applicable local codes. Use UL classified fuses to fulfill this requirement.

☑ For installation in Canada, branch circuit protection must be provided in accordance with Canadian Electrical Code and any applicable provincial codes. Use UL classified fuses to fulfill this requirement.

Model	Voltage / One-phase (Three-phase)	Branch Circuit Fuses Output [A]
VFD1A6MS11ANSAA VFD1A6MS11ENSAA	115V / One-phase	7.2 Class T JJS-10 600 V_{AC}
VFD2A5MS11ANSAA VFD2A5MS11ENSAA		10.8 Class T JJS-10 600 V_{AC}
VFD4A8MS11ANSAA VFD4A8MS11ENSAA		22 Class T JJS-25 600 V_{AC}
VFD1A6MS21ANSAA VFD1A6MS21ENSAA VFD1A6MS21AFSAA	230V / One-phase	7.2 Class T JJS-10 600 V_{AC}
VFD2A8MS21ANSAA VFD2A8MS21ENSAA VFD2A8MS21AFSAA		12.8 Class T JJS-15 600 V_{AC}
VFD4A8MS21ANSAA VFD4A8MS21ENSAA VFD4A8MS21AFSAA		20 Class T JJS-20 600 V_{AC}
VFD7A5MS21ANSAA VFD7A5MS21ENSAA VFD7A5MS21AFSAA		34 Class T JJS-35 600 V_{AC}
VFD11AMS21ANSAA VFD11AMS21ENSAA VFD11AMS21AFSAA		50 Class T JJS-50 600 V_{AC}
VFD1A6MS23ANSAA VFD1A6MS23ENSAA	230V / Three-phase	7.2 Class T JJS-10 600 V_{AC}
VFD2A8MS23ANSAA VFD2A8MS23ENSAA		12.8 Class T JJS-15 600 V_{AC}
VFD4A8MS23ANSAA VFD4A8MS23ENSAA		20 Class T JJS-20 600 V_{AC}
VFD7A5MS23ANSAA VFD7A5MS23ENSAA		32 Class T JJS-35 600 V_{AC}
VFD11AMS23ANSAA VFD11AMS23ENSAA		50 Class T JJS-50 600 V_{AC}
VFD17AMS23ANSAA VFD17AMS23ENSAA		78 Class T JJS-80 600 V_{AC}
VFD25AMS23ANSAA VFD25AMS23ENSAA		59.4 Class T JJS-60 600 V_{AC}
VFD33AMS23ANSAA VFD33AMS23ENSAA		79.2 Class T JJS-80 600 V_{AC}
VFD49AMS23ANSAA VFD49AMS23ENSAA		112.2 Class T JJS-110 600 V_{AC}
VFD65AMS23ANSAA VFD65AMS23ENSAA		151.8 Class T JJS-150 600 V_{AC}

230V, 50–60 Hz / One-phase - Normal Duty

Model	Rated Current [Arms]	Saturation Current [Arms]	Input / DC Reactor [mH]	Input / DC Reactor Delta Part #	Output Reactor [mH]	Output Reactor Delta Part #
VFD1A6MS21ANSAA VFD1A6MS21ENSAA VFD1A6MS21AFSAA	1.8	2.7	5.857	DR005D0585	2.54	DR005L0254
VFD2A8MS21ANSAA VFD2A8MS21ENSAA VFD2A8MS21AFSAA	3.2	4.8	3.66	DR008D0366	2.54	DR005L0254
VFD4A8MS21ANSAA VFD4A8MS21ENSAA VFD4A8MS21AFSAA	5	7.5	2.66	DR011D0266	2.54	DR005L0254
VFD7A5MS21ANSAA VFD7A5MS21ENSAA VFD7A5MS21AFSAA	8.5	12.75	1.72	DR017D0172	1.15	DR011L0115
VFD11AMS21ANSAA VFD11AMS21ENSAA VFD11AMS21AFSAA	12.5	18.75	1.17	DR025D0117	0.746	DR017LP746

Table 7-4-3

230V, 50–60 Hz / One-phase - Heavy Duty

Model	Rated Current [Arms]	Saturation Current [Arms]	Input / DC Reactor [mH]	Input / DC Reactor Delta Part #	Output Reactor [mH]	Output Reactor Delta Part #
VFD1A6MS21ANSAA VFD1A6MS21ENSAA VFD1A6MS21AFSAA	1.6	3.2	5.857	DR005D0585	2.54	DR005L0254
VFD2A8MS21ANSAA VFD2A8MS21ENSAA VFD2A8MS21AFSAA	2.8	5.6	3.66	DR008D0366	2.54	DR005L0254
VFD4A8MS21ANSAA VFD4A8MS21ENSAA VFD4A8MS21AFSAA	4.8	9.6	2.66	DR011D0266	2.54	DR005L0254
VFD7A5MS21ANSAA VFD7A5MS21ENSAA VFD7A5MS21AFSAA	7.5	15	1.72	DR017D0172	1.59	DR008L0159
VFD11AMS21ANSAA VFD11AMS21ENSAA VFD11AMS21AFSAA	11	22	1.17	DR025D0117	1.15	DR011L0115

Table 7-4-4

230V, 50–60 Hz / Three-phase - Normal Duty

Model	Rated Current [Arms]	Saturation Current [Arms]	Input / Output Reactor [mH]	Input Reactor Delta Part #	Output Reactor Delta Part #	DC Reactor [mH]	DC Reactor Delta Part #
VFD1A6MS23ANSAA VFD1A6MS23ENSAA	1.8	2.7	2.536	DR005A0254	DR005L0254	5.857	DR005D0585
VFD2A8MS23ANSAA VFD2A8MS23ENSAA	3.2	4.8	2.536	DR005A0254	DR005L0254	5.857	DR005D0585
VFD4A8MS23ANSAA VFD4A8MS23ENSAA	5	7.5	2.536	DR005A0254	DR005L0254	5.857	DR005D0585
VFD7A5MS23ANSAA VFD7A5MS23ENSAA	8	12	1.585	DR008A0159	DR008L0159	3.66	DR008D0366
VFD11AMS23ANSAA VFD11AMS23ENSAA	12.5	18.75	0.746	DR017AP746	DR017LP746	2.662	DR011D0266
VFD17AMS23ANSAA VFD17AMS23ENSAA	19.5	29.25	0.507	DR025AP507	DR025LP507	1.722	DR017D0172
VFD25AMS23ANSAA VFD25AMS23ENSAA	27	40.5	0.32	DR033AP320	DR033LP320	1.172	DR025D0117

230V One-phase Drive Model	Normal Duty Rated Current [Arms]	Without an AC Output Reactor		With an AC Output Reactor	
		Shielded Cable [meter]	Non-shielded Cable [meter]	Shielded Cable [meter]	Non-shielded Cable [meter]
VFD4A8MS21ANSAA VFD4A8MS21ENSAA VFD4A8MS21AFSAA	5	50	75	75	115
VFD7A5MS21ANSAA VFD7A5MS21ENSAA VFD7A5MS21AFSAA	8.5				
VFD11AMS21ANSAA VFD11AMS21ENSAA VFD11AMS21AFSAA	12.5				

Table 7-4-27

230V Three-phase Drive Model	Normal Duty Rated Current [Arms]	Without an AC Output Reactor		With an AC Output Reactor	
		Shielded Cable [meter]	Non-shielded Cable [meter]	Shielded Cable [meter]	Non-shielded Cable [meter]
VFD1A6MS23ANSAA VFD1A6MS23ENSAA	1.8	50	75	75	115
VFD2A8MS23ANSAA VFD2A8MS23ENSAA	3.2				
VFD4A8MS23ANSAA VFD4A8MS23ENSAA	5				
VFD7A5MS23ANSAA VFD7A5MS23ENSAA	8				
VFD11AMS23ANSAA VFD11AMS23ENSAA	12.5				
VFD17AMS23ANSAA VFD17AMS23ENSAA	19.5				
VFD25AMS23ANSAA VFD25AMS23ENSAA	27				
VFD33AMS23ANSAA VFD33AMS23ENSAA	36	100	150	150	225
VFD49AMS23ANSAA VFD49AMS23ENSAA	51				
VFD65AMS23ANSAA VFD65AMS23ENSAA	69				

Table 7-4-28

460V Three-phase Drive Model	Normal Duty Rated Current [Arms]	Without an AC Output Reactor		With an AC Output Reactor	
		Shielded Cable [meter]	Non-shielded Cable [meter]	Shielded Cable [meter]	Non-shielded Cable [meter]
VFD1A5MS43ANSAA VFD1A5MS43ENSAA VFD1A5MS43AFSAA	1.8	35	50	50	90
VFD2A7MS43ANSAA VFD2A7MS43ENSAA VFD2A7MS43AFSAA	3				
VFD4A2MS43ANSAA VFD4A2MS43ENSAA VFD4A2MS43AFSAA	4.6				
VFD5A5MS43ANSAA VFD5A5MS43ENSAA VFD5A5MS43AFSAA	6.5	50	75	75	115

7-6 EMC Filter

Use EMC filters to enhance the EMC performance for the environment and machines and to comply with EMC regulations, further reducing EMC problems. If you purchase a motor drive without a built-in EMC filter, it is recommended that you select the EMC filters as shown below. For some motor drive models, you need to work with zero phase reactors to be compliant with EMC regulations. Refer to the table and figure below for the recommended model, setting method, and maximum motor cable length of the EMC filter and zero phase reactor.

Frame	Motor Drive Model #	Input Current (A)	Filter Model #	Recommended Model of Zero Phase Reactors		Conducted Emission Maximum Motor Cable Length				Radiated Emission Maximum Motor Cable Length		
						C1 30 m			C2 100 m	C2 100 m		
						Position to install a zero phase reactor						
				DELTA	VAC®	*1	*2	*3	N/A	*1	*2	*3
A	VFD1A6MS11ANSAA	6.8	EMF11AM21A	RF008X00A	T60006L2040W453				NA			
A	VFD1A6MS21ANSAA	3.8	EMF11AM21A	RF008X00A	T60006L2040W453		✓	✓	NA		✓	✓
A	VFD2A8MS21ANSAA	6.7	EMF11AM21A	RF008X00A	T60006L2040W453		✓	✓	NA		✓	✓
A	VFD1A6MS23ANSAA	2.2	EMF10AM23A	RF008X00A	T60006L2040W453		✓	✓	NA		✓	✓
A	VFD2A8MS23ANSAA	3.8	EMF10AM23A	RF008X00A	T60006L2040W453		✓	✓	NA		✓	✓
A	VFD4A8MS23ANSAA	6	EMF10AM23A	RF008X00A	T60006L2040W453		✓	✓	NA		✓	✓
A	VFD1A5MS43ANSAA	2.5	EMF6A0M43A	RF008X00A	T60006L2040W453			✓	NA			✓
A	VFD2A7MS43ANSAA	4.2	EMF6A0M43A	RF008X00A	T60006L2040W453			✓	NA			✓
A	VFD1A7MS53ANSAA	2.4	EMF6A0M63B	RF008X00A	T60006L2040W453				NA*			
A	VFD2A5MS11ANSAA	10.1	EMF11AM21A	RF008X00A	T60006L2040W453				NA			
B	VFD4A8MS21ANSAA	10.5	EMF11AM21A	RF008X00A	T60006L2040W453		✓	✓	NA		✓	✓
B	VFD7A5MS23ANSAA	9.6	EMF10AM23A	RF008X00A	T60006L2040W453		✓	✓	NA		✓	✓
B	VFD3A0MS53ANSAA	4.2	EMF6A0M63B	RF008X00A	T60006L2040W453				NA*			
B	VFD4A2MS43ANSAA	6.4	EMF6A0M43A	RF008X00A	T60006L2040W453			✓	NA			✓
C	VFD4A8MS11ANSAA	20.6	EMF27AM21B	RF008X00A	T60006L2040W453				NA			
C	VFD7A5MS21ANSAA	17.9	EMF27AM21B	RF008X00A	T60006L2040W453			✓	NA			✓
C	VFD11AMS21ANSAA	26.3	EMF27AM21B	RF008X00A	T60006L2040W453			✓	NA			✓
C	VFD11AMS23ANSAA	15	EMF24AM23B	RF008X00A	T60006L2040W453		✓	✓	NA		✓	✓
C	VFD17AMS23ANSAA	23.4	EMF24AM23B	RF008X00A	T60006L2040W453		✓	✓	NA		✓	✓
C	VFD5A5MS43ANSAA	7.2	EMF12AM43B	RF008X00A	T60006L2040W453				NA			
C	VFD4A2MS53ANSAA	5.8	EMF16AM63B	RF008X00A	T60006L2040W453				NA*			
C	VFD6A6MS53ANSAA	9.3	EMF16AM63B	RF008X00A	T60006L2040W453				NA			
C	VFD7A3MS43ANSAA	8.9	EMF12AM43B	RF008X00A	T60006L2040W453		✓	✓	NA		✓	✓
C	VFD9A0MS43ANSAA	11.6	EMF12AM43B	RF008X00A	T60006L2040W453		✓	✓	NA		✓	✓
D	VFD25AMS23ANSAA	32.4	EMF33AM23B	RF008X00A	T60006L2050W565	✓	✓		NA	✓	✓	
D	VFD13AMS43ANSAA	17.3	EMF23AM43B	RF008X00A	T60006L2050W565	✓	✓	✓	NA	✓	✓	✓
D	VFD9A9MS53ANSAA	13.4	EMF16AM63B	RF008X00A	T60006L2040W453				N/A			
D	VFD9A9MS53ANSAA	17.5	EMF16AM63B	RF008X00A	T60006L2040W453				N/A			
D	VFD17AMS43ANSAA	22.6	EMF23AM43B	RF008X00A	T60006L2050W565	✓	✓	✓	NA	✓	✓	✓
E	VFD33AMS23ANSAA	43.2	B84143D0075R127	RF008X00A	T60006L2050W565		✓	✓	NA		✓	✓
E	VFD49AMS23ANSAA	61.2	B84143D0075R127	RF008X00A	T60006L2050W565		✓	✓	NA		✓	✓
E	VFD25AMS43ANSAA	30.8	B84143D0050R127	RF008X00A	T60006L2050W565				NA			
E	VFD32AMS43ANSAA	39.6	B84143D0050R127	RF008X00A	T60006L2050W565		✓	✓	NA		✓	✓
F	VFD65AMS23ANSAA	82.8	B84143D0090R127	RF008X00A	T60006L2050W565		✓	✓	NA		✓	✓
F	VFD38AMS43ANSAA	45.7	B84143D0075R127	RF008X00A	T60006L2050W565		✓	✓	NA		✓	✓
F	VFD45AMS43ANSAA	53.9	B84143D0075R127	RF008X00A	T60006L2050W565		✓	✓	NA		✓	✓

Note 1: It is not necessary to add a zero phase reactor for passing the C2 conducted emission test.

The maximum motor cable length of the conducted emission C2 class for VFD1A7MS53ANSAA, VFD3A0MS53ANSAA and VFD4A2MS53ANSAA is 75 m, others are 100 m.

Table 7-6-1