



## SED2 Variable Frequency Drives

### Product Description

SED2 Variable Frequency Drives (VFDs) control pumps and fans in HVAC applications.

### Product Numbers

SED2... Variable Frequency Drives (VFDs)

### Frame Sizes and Power Ratings

SED2 IP20 and NEMA Type 1 frame sizes and power ranges are as follows:

HP	.5	.7	1	1.5	2	3	4	5	7.5	10	15	20	25	30	40	50	60	75	100	125		
kW	.37	.5	.75	1.1	1.5	2.2	3	4	5.5	7.5	11	15	19	22	30	37	45	55	75	90		
240V	A		B			C			D			E		F		/						
480V	A			B			C			D			E		F							
575V	/		C						D			E		F								

SED2 IP54/NEMA Type 12 frame sizes and power ranges are as follows:

HP	.5	.7	1	1.5	2	3	4	5	7.5	10	15	20	25	30	40	50	60	75	100	125	
kW	.37	.5	.75	1.1	1.5	2.2	3	4	5.5	7.5	11	15	19	22	30	37	45	55	75	90	
480V	/		B			C			D			E		F							
575V	/		C						D			E		F							

### Warning/Caution Notations

<b>WARNING:</b>		Personal injury/loss of life may occur if you do not follow the procedures as specified.
<b>CAUTION:</b>		Equipment damage, or loss of data may occur if you do not follow the procedures as specified.

Table 1. SED2 Full Load Amp (FLA) Ratings.

Output Rating		Output Current Max (amps)		
HP	kW	208V and 230V to 240V (3-Phase)	380V to 480V (3-Phase)	500V to 600V (3-Phase)
0.5	0.37	2.3	1.2	—
0.75	0.55	3.0	1.6	—
1.0	0.75	3.9	2.1	1.4
1.5	1.1	5.5	3.0	2.1
2.0	1.5	7.4	4.0	2.7
3.0	2.2	10.4	5.9	3.9
4.0	3.0	13.6	7.7	5.4
5.0	4.0	17.5	10.2	6.1
7.5	5.5	22.0	13.2	9.0
10.0	7.5	28.0	18.4	11.0
15.0	11.0	42.0	26.0	17.0
20.0	15.0	54.0	32.0	22.0
25.0	18.5	68.0	38.0	27.0
30.0	22.0	80.0	45.0	32.0
40.0	30.0	104.0	62.0	41.0
50.0	37.0	130.0	75.0	52.0
60.0	45.0	154.0	90.0	62.0
75.0	55.0	—	110.0	77.0
100.0	75.0	—	145.0	99.0
125.0	90.0	—	178.0	125.0

### Required Tools

See *Mounting and Dimensions* to determine correct tool sizing.

### Expected Installation Time

15 minutes

## Installation

### Prerequisites



#### CAUTION:

On installation of a SED2 after extended storage, see the Extended Storage: Conditioning of Capacitors section in the *SED2 VFD Startup, Operation, and Maintenance Manual* (Document Number 125-3201). If capacitors are not properly recharged, catastrophic damage to the drive can result.

Install the SED2 in a climate-controlled environment that is free of moisture and conductive contaminants, such as condensation and dust. The air entering the unit for ventilation must be clean and free of corrosive materials. The ambient temperature must be between 14°F and 104°F (−10°C and 40°C)

and the relative humidity must be 0% to 95% non-condensing. Do not mount unit in direct sunlight.

### Gland Plate Installation and Conduit Connections

For Frame Sizes A, B, and C, see Figures 1 and 2 for gland plate installation and for conduit connection diameters. Circled numbers indicate the order of assembly.

For Frame Sizes D, E, and F, see Figures 3 and 4 for conduit connection diameters.



#### CAUTION:

- Bonding between conduit connections is not automatic and must be provided as part of the installation.
- Each bonding conductor must be equal or greater in cross-section to the power supply cable.

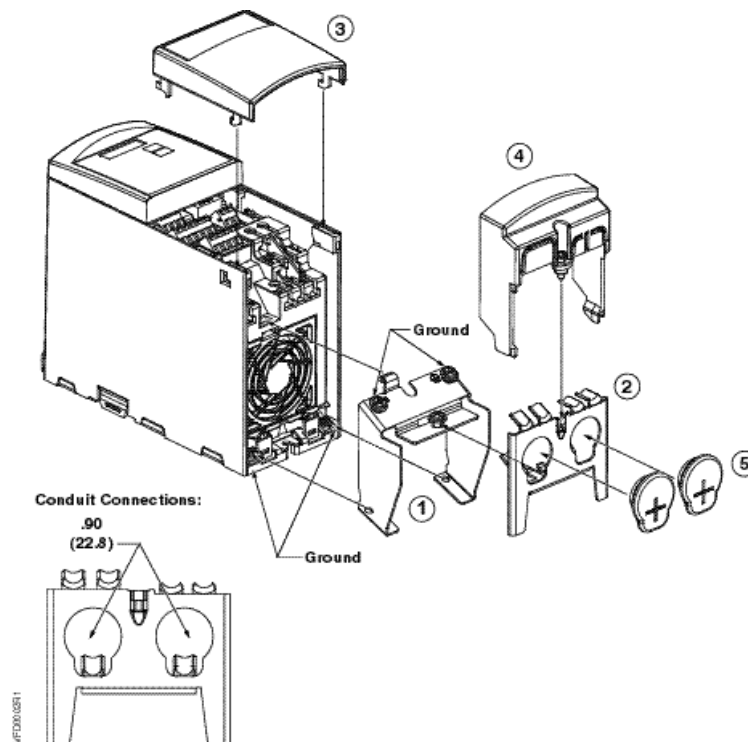


Figure 1. Frame Size A Gland Plate Installation and Conduit Connection Diameters in Inches (Millimeters).

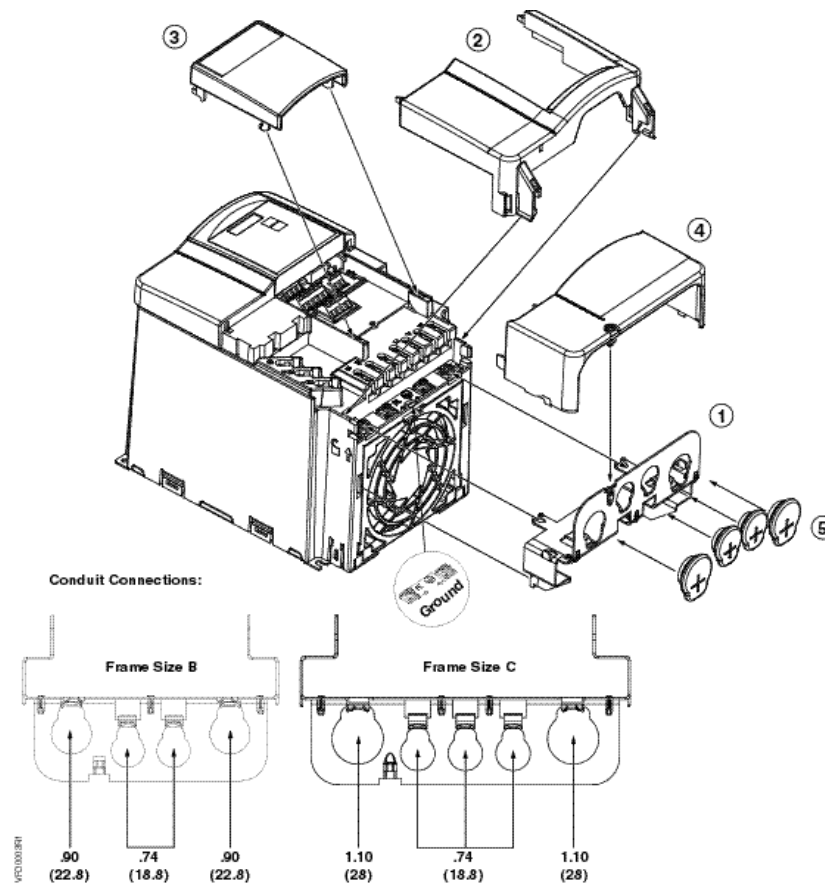


Figure 2. Frame Size B & C Gland Plate Installation and Conduit Connection Diameters in Inches (Millimeters).

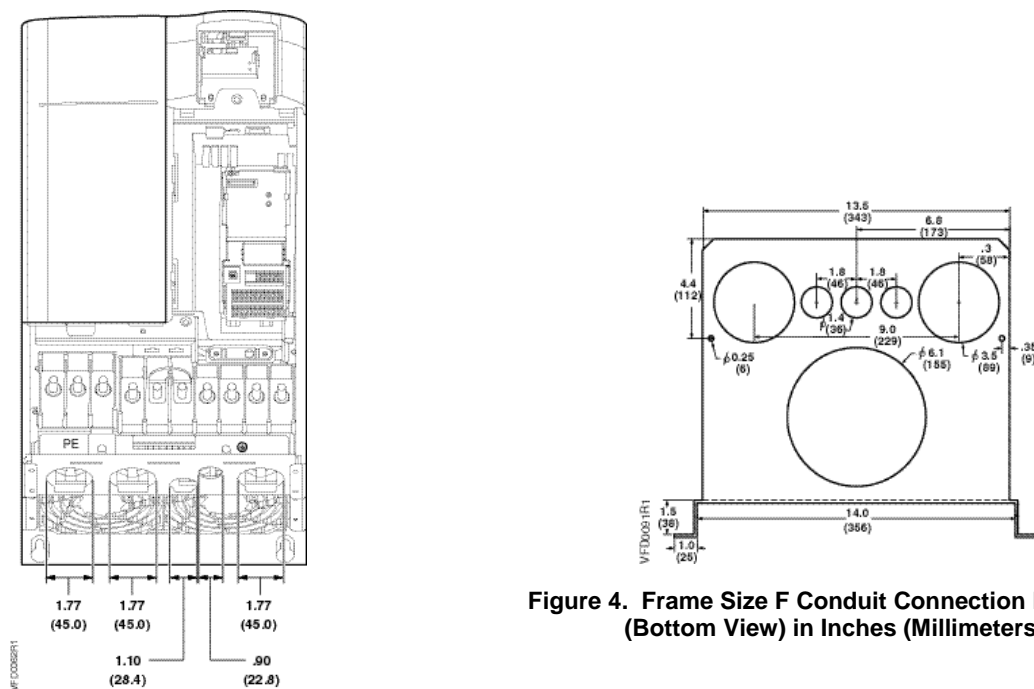


Figure 3. Frame Size D & E Conduit Connection Diameters in Inches (Millimeters).

Figure 4. Frame Size F Conduit Connection Diameters (Bottom View) in Inches (Millimeters).

## Mounting and Dimensions

Mount the SED2 so there is a minimum clearance for ventilation and equipment access.



### CAUTION:

Overheating/Ventilation:  
 Install SED2 vertically for optimum ventilation. Do not obstruct SED2 vents. Additional ventilation may be required if SED2 is mounted horizontally.

### IP20 SED2s

Table 2. IP20 SED2 Overall Dimensions in Inches (Millimeters).

Frame Size	Height x Width x Depth	Mounting Specification	Tightening Torque lb-in (Nm)	Weight lb (kg)
A	6.8 x 2.9 x 5.9 (173 x 73 x 149)	2 x M4 Bolts, nuts, washers, or connecting to DIN rail	22 (2.5)	2.9 (1.3)
B	8.0 x 5.9 x 6.8 (202 x 149 x 172)			7.5 (3.4)
C	9.6 x 7.3 x 7.7 (245 x 185 x 195)	4 x M5 Bolts, nuts, washers	26 (3.0)	12.1 (5.5)
D	20.5 x 10.8 x 9.6 (520 x 275 x 245)	4 x M8 Bolts, nuts, washers	115 (13)	35.3 (16)
E	25.6 x 10.8 x 9.6 (650 x 275 x 245)			44.1 (20)
F	33.5 x 13.8 x 12.6 (850 x 350 x 320)			221 (25)

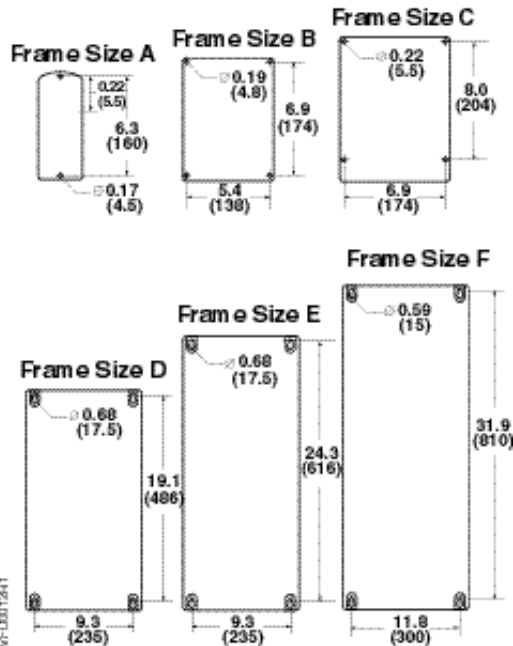
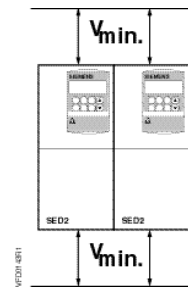


Figure 5. IP20 SED2 Mounting Dimensions in Inches (Millimeters).

Frame Size	V <sub>min</sub> Clearance in Inches (Millimeters)
A, B, C	4 (100)
D, E	11-3/4 (300)
F	13-3/4 (350)

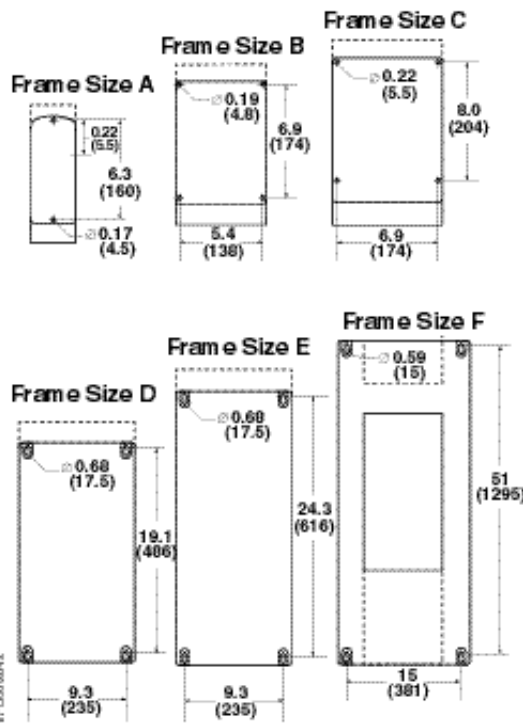


NOTE: When fitted with a protective shield, allow 12-inches (305 mm) of space between each SED2.

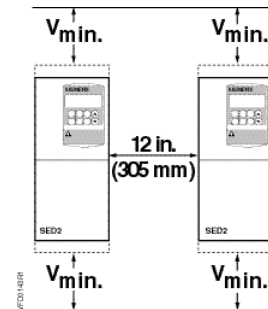
**NEMA Type 1 SED2s**

**Table 3. NEMA Type 1 SED2 Overall Dimensions in Inches (Millimeters).**

Frame Size	Height x Width x Depth	Mounting Specification	Tightening Torque lb-in (Nm)	Weight lb (kg)
A	9.1 x 2.9 x 5.9 (231 x 73 x 149)	2 x M4 Bolts, nuts, washers, or connecting to DIN rail	22 (2.5)	3.2 (1.5)
B	11.8 x 5.9 x 6.8 (300 x 49 x 172)			8.3 (3.8)
C	13.8 x 7.3 x 7.7 (351 x 185 x 195)	4 x M5 Bolts, nuts, washers	26 (3.0)	13.6 (6.2)
D	24.6 x 10.8 x 9.6 (625 x 275 x 245)	4 x M8 Bolts, nuts, washers	115 (13)	37.5 (17.1)
E	29.7 x 10.8 x 9.6 (754 x 275 x 245)			46.4 (21.1)
F	54.5 x 16.0 x 14.0 (1384 x 406 x 356)			221 (25)



Frame Size	V <sub>min</sub> Clearance in Inches (Millimeters)
A, B, C	4 (100)
D, E	11-3/4 (300)
F	13-3/4 (350)

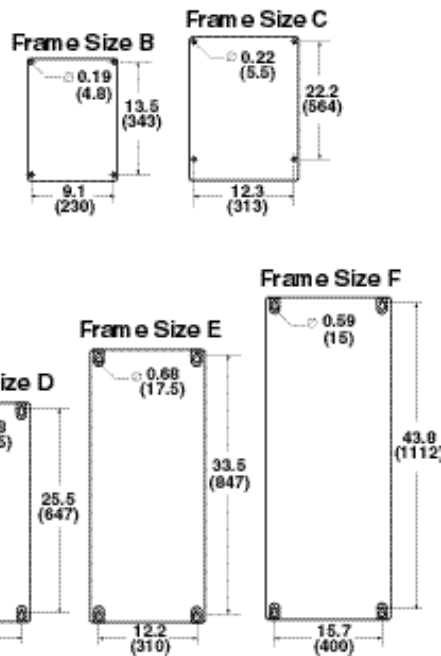


**Figure 6. NEMA Type 1 SED2 Mounting Dimensions in Inches (Millimeters).**

**IP54/NEMA Type 12 SED2s**

**Table 4. IP54/NEMA Type 12 SED2 Overall Dimensions in Inches (Millimeters).**

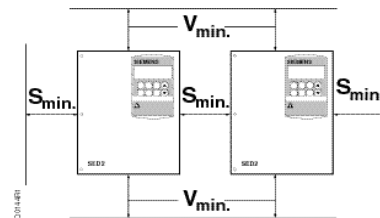
Frame Size	Overall Dimensions Height x Width x Depth	Mounting Clearance Top x Bottom x Sides	Mounting Specification	Tightening Torque lb-in (Nm)	Weight lb (kg)
B	15.2 x 10.6 x 10.6 (385 x 270 x 270)	5.9 x 5.9 x 3.9 (150 x 150 x 100)	4 x M6 Bolts, nuts, washers	44 (5)	22 (10)
C	23.9 x 13.8 x 11.2 (606 x 350 x 284)				42 (19)
D	27.0 x 14.2 x 13.9 (685 x 360 x 200)	7.9 x 7.9 x 5.9 (200 x 200 x 150)	4x M8 Bolts, nuts, washers	115 (13)	77 (35)
E	34.8 x 14.2 x 17.8 (885 x 360 x 453)				105 (48)
F	45.3 x 17.7 x 18.6 (1150 x 450 x 473)				178 (81)



**Figure 7. IP54/NEMA Type 12 SED2 Mounting Dimensions in Inches (Millimeters).**

Frame Size	V <sub>min</sub> Clearance in Inches (Millimeters)
A, B, C	4 (100)
D, E	11-3/4 (300)
F	13-3/4 (350)

**NOTE:** In all cases, S<sub>min</sub> Clearance is 5-7/8 inches (150 millimeters).



**Wiring**

**Tightening Torque for Connection  
 Terminals**

Frame Size	A	B	C	D	E	F
Tightening Torque lb-in (Nm)	9.7 (1.1)	13.3 (1.5)	19.9 (2.25)	88.5 (10) max.	88.5 (10) max.	442 (50)

**Cable Cross-Sections for Power and  
 Motor Cables**

Tables 5 through 7 provide cable cross-sections for input power cables and for motor cables.

**Table 5. Cable Cross-Sections for Input Voltage Range 3Ø AC 208V and 230V through 240V.**

Output Rating kW (hp)	Input Power Cable		Motor Cable	
	Min. Cross-Section AWG (mm <sup>2</sup> )	Max. Cross-Section AWG (mm <sup>2</sup> )	Min. Cross-Section AWG (mm <sup>2</sup> )	Max. Cross-Section AWG (mm <sup>2</sup> )
0.37 (.50)	17 (1)	13 (2.5)	17 (1)	13 (2.5)
0.55 (.75)	17 (1)	13 (2.5)	17 (1)	13 (2.5)
0.75 (1.0)	17 (1)	13 (2.5)	17 (1)	13 (2.5)
1.1 (1.5)	17 (1)	9 (6)	17 (1)	9 (6)
1.5 (2.0)	15 (1.5)	9 (6)	17 (1)	9 (6)
2.2 (3.0)	13 (2.5)	9 (6)	17 (1)	9 (6)
3 (4.0)	11 (4)	7 (10)	15 (1.5)	7 (10)
4 (5.0)	11 (4)	7 (10)	11 (4)	7 (10)
5.5 (7.5)	11 (4)	7 (10)	11 (4)	7 (10)
7.5 (10)	7 (10)	2 (35)	7 (10)	2 (35)
11 (15)	5 (16)	2 (35)	16 (5)	2 (35)
15 (20)	5 (16)	2 (35)	5 (16)	2 (35)
18.5 (25)	3 (25)	2 (35)	5 (16)	2 (35)
22 (30)	2 (35)	2 (35)	2 (35)	2 (35)
30 (40)	0 (50)	-5 (150)	0 (50)	-5 (150)
37 (50)	-2 (70)	-5 (150)	-2 (70)	-5 (150)
45 (60)	-2 (70)	-5 (150)	-3 (95)	-5 (150)

**Table 7. Cable Cross-Sections for Input Voltage Range 3Ø AC 500V through 600V.**

Output Rating kW (hp)	Input Power Cable		Motor Cable	
	Min. Cross-Section AWG (mm <sup>2</sup> )	Max. Cross-Section AWG (mm <sup>2</sup> )	Min. Cross-Section AWG (mm <sup>2</sup> )	Max. Cross-Section AWG (mm <sup>2</sup> )
0.75 (1.0)	17 (1)	7 (10)	17 (1)	7 (10)
1.1 (1.5)	17 (1)	7 (10)	17 (1)	7 (10)
1.5 (2.0)	17 (1)	7 (10)	17 (1)	7 (10)
2.2 (3.0)	17 (1)	7 (10)	17 (1)	7 (10)
3 (4.0)	17 (1)	7 (10)	17 (1)	7 (10)
4 (5.0)	17 (1)	7 (10)	17 (1)	7 (10)
5.5 (7.5)	15 (1.5)	7 (10)	15 (1.5)	7 (10)
7.5 (10)	13 (2.5)	7 (10)	13 (2.5)	7 (10)
11 (15)	11 (4)	7 (10)	11 (4)	7 (10)
15 (20)	9 (6)	2 (35)	9 (6)	2 (35)
18.5 (25)	9 (6)	2 (35)	9 (6)	2 (35)
22 (30)	7 (10)	2 (35)	7 (10)	2 (35)
30 (40)	5 (16)	2 (35)	5 (16)	2 (35)
37 (50)	3 (25)	2 (35)	5 (16)	2 (35)
45 (60)	3 (25)	-5 (150)	3 (25)	-5 (150)
55 (75)	0 (50)	-5 (150)	2 (35)	-5 (150)
75 (100)	-2 (70)	-5 (150)	0 (50)	-5 (150)
90 (125)	-2 (70)	-5 (150)	0 (50)	-5 (150)

**Table 6. Cable Cross-Sections for Input Voltage Range 3Ø AC 380V through 480V.**

Output Rating kW (hp)	Input Power Cable		Motor Cable	
	Min. Cross-Section AWG (mm <sup>2</sup> )	Max. Cross-Section AWG (mm <sup>2</sup> )	Min. Cross-Section AWG (mm <sup>2</sup> )	Max. Cross-Section AWG (mm <sup>2</sup> )
0.37 (.50)	17 (1)	13 (2.5)	17 (1)	13 (2.5)
0.55 (.75)	17 (1)	13 (2.5)	17 (1)	13 (2.5)
0.75 (1.0)	17 (1)	13 (2.5)	17 (1)	13 (2.5)
1.1 (1.5)	17 (1)	13 (2.5)	17 (1)	13 (2.5)
1.5 (2.0)	17 (1)	13 (2.5)	17 (1)	13 (2.5)
2.2 (3.0)	17 (1)	9 (6)	17 (1)	9 (6)
3 (4.0)	17 (1)	9 (6)	17 (1)	9 (6)
4 (5.0)	17 (1)	9 (6)	17 (1)	9 (6)
5.5 (7.5)	13 (2.5)	7 (10)	13 (2.5)	7 (10)
7.5 (10)	11 (4)	7 (10)	11 (4)	7 (10)
0.37 (.50)	17 (1)	13 (2.5)	17 (1)	13 (2.5)
0.55 (.75)	17 (1)	13 (2.5)	17 (1)	13 (2.5)
0.75 (1.0)	17 (1)	13 (2.5)	17 (1)	13 (2.5)
1.1 (1.5)	17 (1)	13 (2.5)	17 (1)	13 (2.5)
1.5 (2.0)	17 (1)	13 (2.5)	17 (1)	13 (2.5)
2.2 (3.0)	17 (1)	9 (6)	17 (1)	9 (6)
3 (4.0)	17 (1)	9 (6)	17 (1)	9 (6)
4 (5.0)	17 (1)	9 (6)	17 (1)	9 (6)
5.5 (7.5)	13 (2.5)	7 (10)	13 (2.5)	7 (10)
7.5 (10)	11 (4)	7 (10)	11 (4)	7 (10)
11 (15)	9 (6)	7 (10)	9 (6)	7 (10)
15 (20)	7 (10)	2 (35)	7 (10)	2 (35)
18.5 (25)	7 (10)	2 (35)	7 (10)	2 (35)
22 (30)	5 (16)	2 (35)	5 (16)	2 (35)
30 (40)	3 (25)	2 (35)	3 (25)	2 (35)
37 (50)	3 (25)	2 (35)	2 (35)	2 (35)
45 (60)	2 (35)	-5 (150)	2 (35)	-5 (150)
55 (75)	-2 (70)	-5 (150)	-2 (70)	-5 (150)
75 (100)	-2 (70)	-5 (150)	-3 (95)	-5 (150)
90 (125)	-2 (70)	-5 (150)	-3 (95)	-5 (150)

### Input Power Connection



**WARNING:**

Use only permanently wired input power connections.

Connect input power to SED2 terminals L1, L2, and L3.

## Motor Cable Length

Maximum motor cable length is 164 ft (50 m). Motor cable length is given to ensure performance of only the SED2, not the suitability of the motor when connected to a SED2 at this distance. See Figure 8 for motor cable installation notes.

## Motor Connection

The motor nameplate indicates the required supply voltage and method of connection (delta,  $\Delta$ , or star/wye, 'Y', configuration). Connect motor wiring to SED2 terminals U, V, and W. See Figure 9.

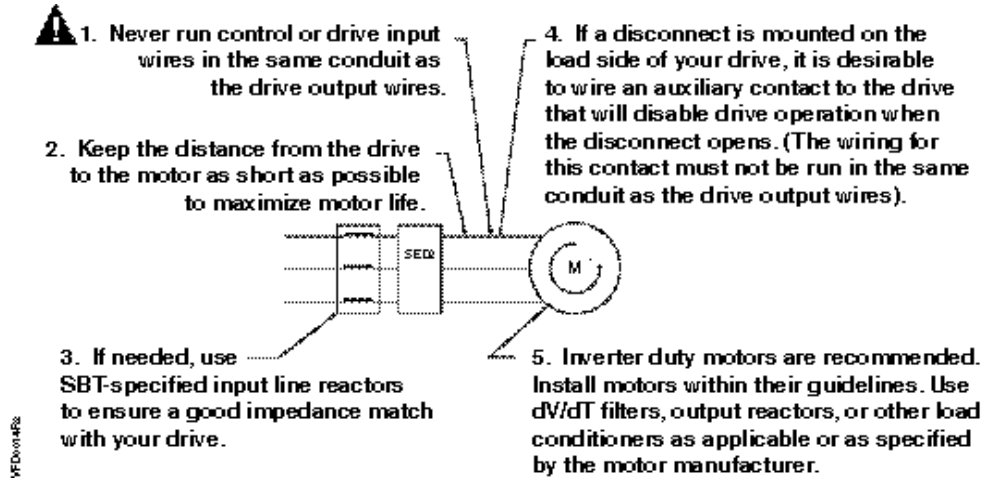


Figure 8. Motor Cable Installation Notes.

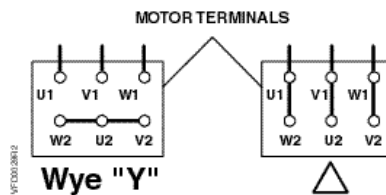


Figure 9. SED2 Motor Connections.

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