



*Powering Business Worldwide*

## NEMA 12 Conversion Kit for 9000X Adjustable Frequency Drive

Installation Manual

New Information  
January 2004





January 2004

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Cover Photo: Cutler-Hammer® 9000X Drives

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**Safety**

**Definitions and Symbols**

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 **WARNING**

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This symbol indicates high voltage. It calls your attention to items or operations that could be dangerous to you and other persons operating this equipment. Read the message and follow the instructions carefully.



This symbol is the “Safety Alert Symbol.” It occurs with either of two signal words: CAUTION or WARNING, as described below.

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 **WARNING**

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Indicates a potentially hazardous situation which, if not avoided, can result in serious injury or death.

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 **CAUTION**

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Indicates a potentially hazardous situation which, if not avoided, can result in minor to moderate injury, or serious damage to the product. The situation described in the CAUTION may, if not avoided, lead to serious results. Important safety measures are described in CAUTION (as well as WARNING).

**Hazardous High Voltage**

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 **WARNING**

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Motor control equipment and electronic controllers are connected to hazardous line voltages. When servicing drives and electronic controllers, there may be exposed components with housings or protrusions at or above line potential. Extreme care should be taken to protect against shock.

Stand on an insulating pad and make it a habit to use only one hand when checking components. Always work with another person in case an emergency occurs. Disconnect power before checking controllers or performing maintenance. Be sure equipment is properly grounded. Wear safety glasses whenever working on electronic controllers or rotating machinery.

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 **WARNING**

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After disconnecting the utility, wait until the unit cooling fan stops and the indicators on the control panel are extinguished (if no keypad is present, check the indicators in the cover). Wait five more minutes before doing any work on the connections. Do not open the cover before this time has run out.



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## Chapter 1 — General

The NEMA Type 12 Kit is used to convert a Cutler-Hammer® 9000X drive by Eaton Electrical® from a NEMA Type 1 to a NEMA Type 12 enclosure. A NEMA Type 12 enclosure may be necessary when the adjustable frequency drive is used in ambient conditions that may contain moisture or dust.

According to standard IEC 60529 (EN 60 529), the NEMA Type 12 adjustable frequency drives enclosure provides protection against dust and water sprayed from all directions. Limited ingress of both is permitted.

**Note:** A NEMA Type 12 enclosure does not protect the adjustable frequency drive against strong jets of water or against the effects of immersion.



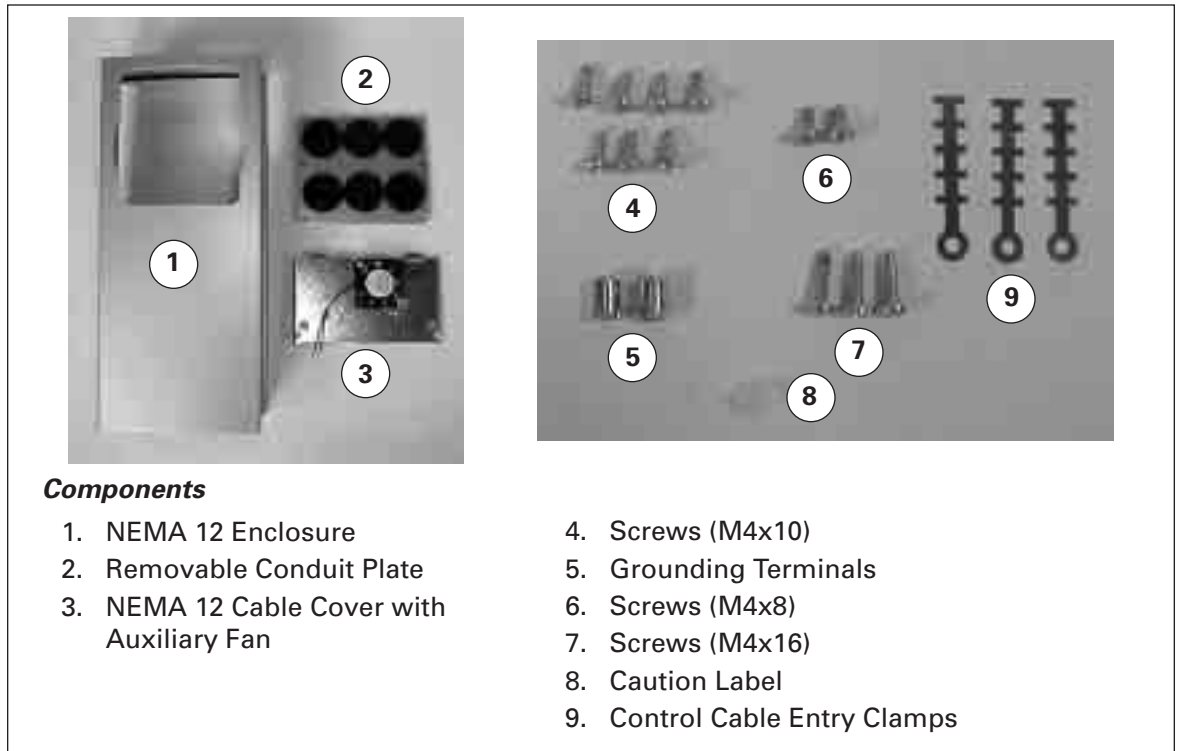


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## Chapter 2 — Contents of Kits

### OPTN12FR4 (Frame 4) and OPTN12FR5 (Frame 5)

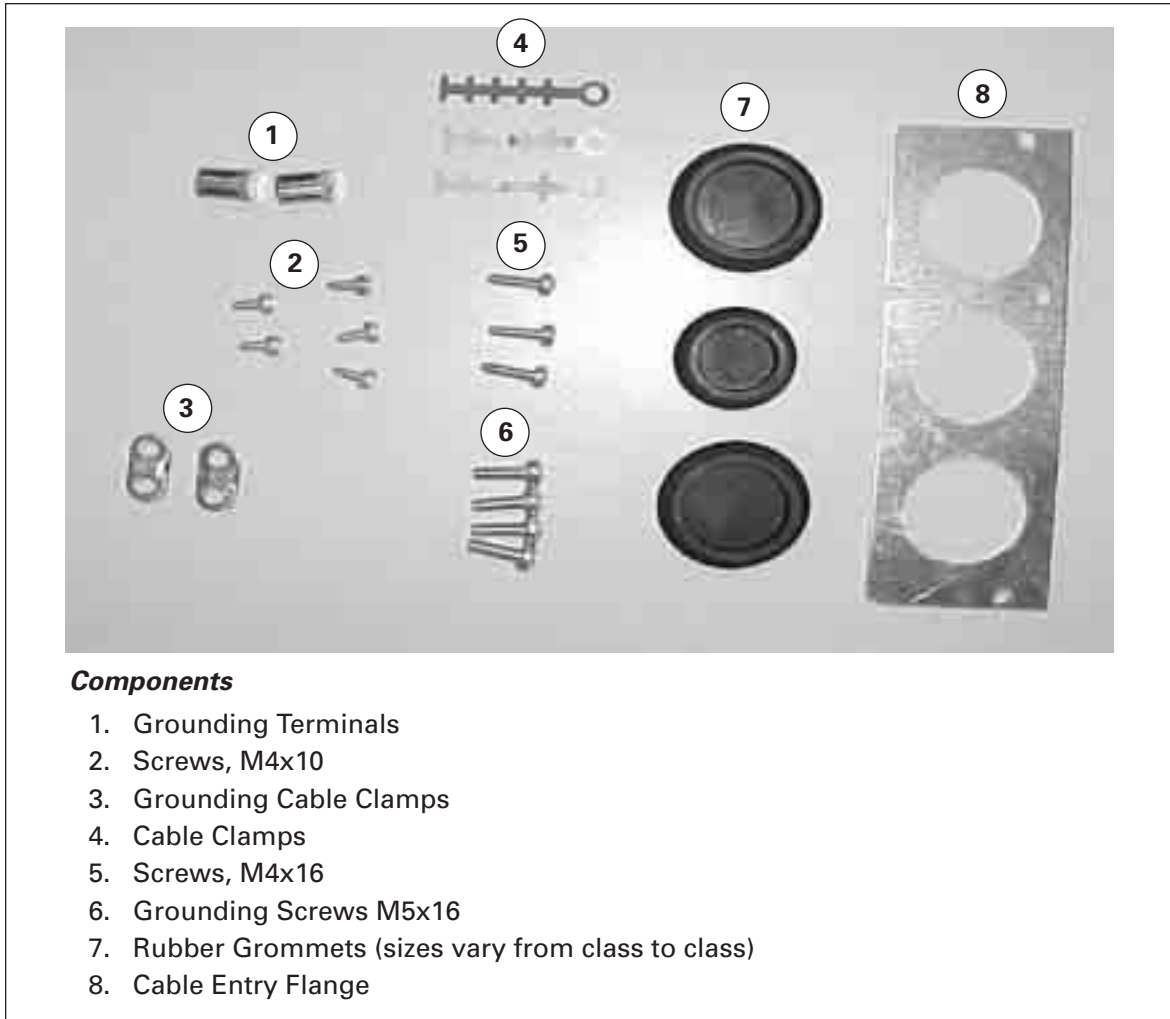
The contents of the NEMA Type 12 Kits for Frames 4 and 5 are shown in **Figure 2-1**.



**Figure 2-1: Contents of NEMA Type 12 Kit for OPTN12FR4 and OPTN12FR5**

**OPTN12FR6 (Frame 6)**

The contents of the NEMA Type 12 Kit for Frame 6 is shown in **Figure 2-2**.



**Figure 2-2: Contents of NEMA Type 12 Kit for OPTN12FR6**

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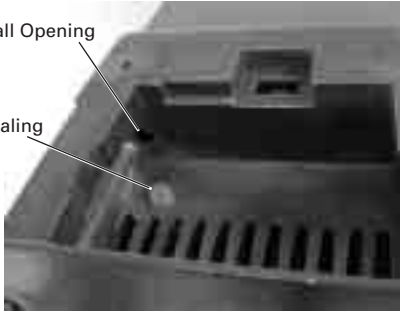

## Chapter 3 — Installation

### Installation Instructions for Frame 4





**⚠ WARNING**

After disconnecting the utility, wait until the unit cooling fan stops and the indicators on the control panel are extinguished (if no keypad is present, check the indicators in the cover). Wait five more minutes before doing any work on the connections. Do not open the cover before this time has run out.

**Table 3-1: Instructions for NEMA Type 12 Kit Installation — Frame 4**





Step	Procedure
1	<p>Detach the fan carefully by pushing into the connector on the side.</p> 
2	<p>Insert the plastic sealing that is shown next to the hole.</p> 
3	<p>Re-install the fan ensuring that the connector clip fits accurately.</p> 

**Table 3-1: Instructions for NEMA Type 12 Kit Installation — Frame 4, continued**

Step	Procedure
4	Remove the cover of the control. 
5	Open the control cable cover and remove the cable cover and detach the grounding rack. 
6	Close the cable entry with the grounding lugs. 
7	Attach the cable cover with fan #2. 

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**Table 3-1: Instructions for NEMA Type 12 Kit Installation — Frame 4, continued**




Step	Procedure	
8	<p>Connect the red wire into terminal 6 and the black wire into terminal 7.</p>	
9	<p>Re-install the grounding rack with cable clamps mounted using (M4x16) screws next to fan (#2).</p>	
10	<p>Install the NEMA 12 conduit plate on the base of the drive.</p>	
11	<p>Tightly screw in the enclosure using the attached screws.</p>	

## Installation Instructions for Frame 5

**⚠ WARNING**





After disconnecting the utility, wait until the unit cooling fan stops and the indicators on the control panel are extinguished (if no keypad is present, check the indicators in the cover). Wait five more minutes before doing any work on the connections. Do not open the cover before this time has run out.

**Table 3-2: Instructions for NEMA Type 12 Kit Installation — Frame 5**





Step	Procedure
1	Remove the cover of the AF Drive. 
2	Open the small lid on the power unit cover, and leave the opening uncovered. 
3	Detach the fan carefully by pushing into the connector on the side. 

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**Table 3-2: Instructions for NEMA Type 12 Kit Installation — Frame 5, continued**

Step	Procedure
4	Insert the rubber sealing as shown for FR5. 
5	Re-install the fan ensuring that the connector clip fits accurately. Do not force. 
6	Open the control cable cover, remove the cable cover, and detach the grounding rack. 
7	Close the cable entry with the screws provided. 

**Table 3-2: Instructions for NEMA Type 12 Kit Installation — Frame 5, continued**


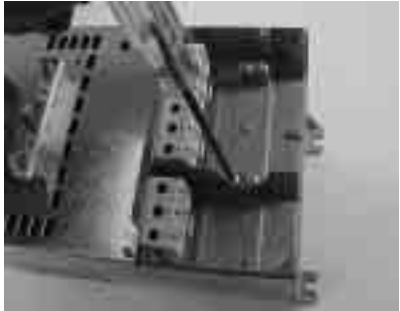


Step	Procedure
8	<p>Attach the #2 cooling fan to the NEMA Type 12 power cable cover.</p> 
9	<p>Connect the red wire into terminal 6 and the black into terminal 7.</p> 
10	<p>Re-install the grounding rack with cable clamps mounted using (M4x16) screws next to fan (#2).</p> 
11	<p>Install the NEMA 12 cable entry flange on the base of the drive.</p> 







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### Installation Instructions for Frame 6

**Table 3-3: Instructions for NEMA Type 12 Kit Installation — Frame 6**

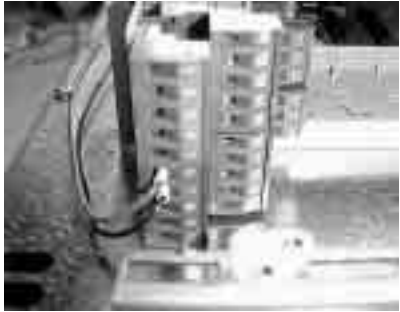



Step	Procedure
1	Remove the cover of the AF Drive. 
2	Remove the cable cover and screw the grounding cable clamps into place. 
3	Re-install the cable cover. 
4	Mount the cable clamps on the grounding rack with the three M4x16 screws. 

**Table 3-3: Instructions for NEMA Type 12 Kit Installation — Frame 6, continued**

Step	Procedure
5	<p>Open the small lid on the power unit cover, and set the screw aside for later use.</p> 
6	<p>Seal the air inlets with the rubber sealing that comes with the kit.</p> 
7	<p>Mount the fan as shown over the closed inlets, and use screws from Step 5.</p> 
8	<p>Connect the red wire into terminal #6 and the black into terminal #7.</p> 

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**Table 3-3: Instructions for NEMA Type 12 Kit Installation — Frame 6, continued**

Step	Procedure
9	Route wiring as shown in the picture at right. 
10	Install the NEMA Type 12 cable entry flange on the base of the drive. 
11	Cover the adjustable frequency drive with the NEMA Type 12 enclosure. 
12	Tightly screw in the enclosure using the attached screws. 



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## Chapter 4 — Specifications

**Table 4-1: NEMA Type 12 Kit — Dimensions and Weight**

Catalog Number	Frame Size	Approximate Dimensions in Inches (mm)			Approximate Weight in Lb. (kg)
		Length	Width	Height	Weight
<b>OPTN12FR4</b>	Fr4	13 (330)	7 (178)	4 (102)	4 (1.8)
<b>OPTN12FR5</b>	Fr5	16 (406)	8 (203)	7 (178)	5 (2.3)
<b>OPTN12FR6</b>	Fr6	21 (533)	10 (254)	5 (127)	7 (3.2)





## Company Information

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