Seismic Restraints for Electrical Equipment

An Online Continuing Education Course for Engineers

Course Number: E-4024

Credit: 4 Hours / 4 PDH / 4 CPD

TABLE OF CONTENTS

INTRODUCTION

This course shows equipment installers how to attach electrical equipment to a building to minimize earthquake damage. Many attachment examples are presented, including anchors and the use of special devices called *seismic restraint devices.*

Seismic restraint devices include vibration isolation systems, cable or strut suspension systems, roof attachment systems, and steel shapes.

An electrical danger instruction chart is provided (page 160) as a basic guideline. Follow all safety requirements as required by code, including those listed below:

- Printed instructions shipped with the equipment.
- Instructions in construction drawings and specifications. Use approved construction documents.
- Code-required, industry-accepted practice
- Electrical safety guidelines and practices.

This course does not replace any of the above referenced materials.

Please note that this course does not cover:

- Fire protection sprinkler, smoke and fire stops, or fire detection governed by local codes and the National Fire Protection Association.
- Framing design required to elevate equipment above the floor.

This course contains the following sections:

- *Equipment:* Arranged according to different kinds of electrical equipment such as computer racks, control panels, lighting, substations, etc.
- *Raceways/Conduits/Cable Trays:* Covers the different ways to install raceways, conduits, and cable trays.
- *Attachment Types:* Gives instructions on installing equipment in different arrangements known as *attachment types.*
- *Anchors:* Shows many different types of anchors used to connect equipment to a building.
- *Special Cases:* Covers housekeeping pads, and other unique applications.

To use this course:

1. Use the Table of Contents to find the Equipment section that best represents the equipment you are installing.
2. Using the table (see example below) in the Equipment section, find the:
   - type of equipment you are installing in column 1
   - method of installing the equipment in column 2
   - attachment type in column 3.

column 1	column 2	column 3
Typical Equipment	*How is equipment to be installed?*	*Attachment Type*
Any type of unit	Connected to angles mounted to the floor	Rigid with angles *Go to page 53*

3. Turn to the page referenced in column 3 for the equipment/attachment type you have selected.
4. Follow the instructions for the attachment type you have selected. These instructions will refer you to the correct anchor section so you can make the connection to the building structure.

NOTE: All instructions in this course are arranged in order using numbered steps. Please follow every step in the sequence shown.

Special precautions are marked:

A flag means you should take special care before continuing. Read all the information next to a flag before attaching the equipment.

A warning sign means you can cause serious damage to the building, the device, or the equipment if you do not follow the instructions exactly.

A book means you should refer to the manufacturer's printed instructions before continuing.

Note that a Glossary and an Index are also available to facilitate use of this course.

EQUIPMENT

Automatic Transfer Switches

Be sure to refer to approved construction documents and specifications, seismic restraint submittals, and manufacturer's instructions.

Step 1: Identify the equipment

Figure 1: Automatic transfer switch (surface wall-mounted).

Figure 2: Au
switch (floor-

Figure 3: Automatic transfer and bypass-isolation switch (floor-mounted).

Figure 4: Service entrance with transfer switch (floor-mounted).

Step 2: Select the type of attachment

Using the following table, select how the equipment is to be installed, select the attachment type that best matches the installation you have selected, then turn to the page under the attachment type.

	How is equipment to be installed?	*Attachment Type*
	Mounted directly to the floor	Rigid *Go to page 51*
	Connected to angles mounted to the floor	Rigid with angles *Go to page 55*
	Directly to the wall	Wall-mounted *Go to page 98*
	Mounted to the wall with angles	Wall-mounted with angles *Go to page 100*

ic transfer switch installation types.

he Electrical Danger Instruction Chart
60.