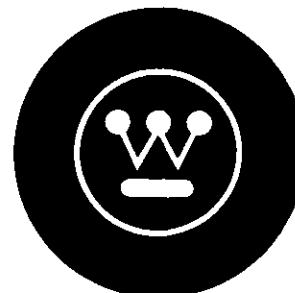


**Instructions for
Type DS
Metal-Enclosed Low-Voltage
Power Circuit Breaker Switchgear
With
Types DS and DSL Breakers
For
Seismic Applications**



Westinghouse Electric Corporation

Switchgear Division, East Pittsburgh, Pa. 15112
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All possible contingencies which may arise during installation, operation, or maintenance, and all details and variations of this equipment do not purport to be covered by these instructions. If further information is desired by purchaser regarding his particular installation, operation or maintenance of his equipment, the local Westinghouse Electric Corporation representative should be contacted.

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1. PURPOSES

1.1 The purpose of this instruction book is to acquaint the user with the modifications made to the standard Type DS Metal-Enclosed Low-Voltage Switchgear with Type DS and DSL Power Circuit Breakers for use in seismic applications.

1.2 This book supplements the latest editions of Type DS and DSL Power Circuit Breaker Instruction Book I.B. 33-790-1 and Type DS Metal-Enclosed Low-Voltage Switchgear Instruction Book I.B. 32-690 and other instruction leaflets located in the Order Instruction Book.

1.3 This instruction book does not supersede, change or alter any CAUTIONS, PRECAUTIONS, or INSTRUCTIONS set forth in the above instruction books unless specifically stated.

1.4 This instruction book does not apply to Class 1E Switchgear for nuclear power plants. A separate instruction book is available for these applications.

2. DESCRIPTION

Type DS Metal-Enclosed Low-Voltage Switchgear for use in seismic applications has been modified to meet these conditions. The purpose of the modifications is to prevent damage to the equipment during a seismic event. These modifications are described below.

2.1 Seismic Positioner

To resist sideways motion of the Type DS Breaker due to a seismic event, and thus protect the secondary contacts from damage, a seismic positioner is mounted on the top right rear of the breaker pole unit frame. See Fig. 26b of Instruction Book 33-790-1E. It engages a cooperating member in the enclosure. The seismic positioner is engaged in the breaker connected position only.

2.2 Special Bracing

In order to maintain the seismic integrity of the switchgear, several stiffeners and positioners have been added to the standard switchgear units. If any of these items are removed for any reason, they must be replaced before returning the equipment to service.

2.2.1 Corner Reinforcing in End Units

In every switchgear line-up, the two end units have special reinforcing inserts added at the four bottom corners. The

bolts attaching the switchgear to the mounting surface must pass through these reinforcements.

2.2.2 Spacer Under Fixed Meter Panel

On all Types DS-632 and DS-840 Breaker units, a spacer which acts as a vertical restraint has been added under the fixed meter panel to hold the breaker down.

2.2.3 Instrument Compartment Stiffeners

Stiffener braces are added to the top right side of all instrument compartments.

2.2.4 Cable Compartment Stiffeners

Additional stiffeners have been added in the cable compartment for bracing any bus risers, current transformer mountings, BYZ transformers, etc., that are used.

2.2.5 Top Cable Entry Plate

The top cable entry plates on all units have been increased to 0.179-inch thick from the 0.0747-inch thick plates used on standard units.

2.3 Special Components

Some components such as meters, relays, etc., may have been selected to meet the seismic requirements of the application. Any replacements for these items must be equivalent.

3. INSTALLATION

In addition to the normal installation instructions stated in the breaker and switchgear instruction books, there are several items which must be given special attention in order for the equipment to operate satisfactorily in a seismic environment.

3.1 Clearance to Walls, Pillars, Posts, Adjacent Equipment, etc.

A minimum clearance of six inches between the switchgear and adjacent equipment, walls, columns, etc., must be maintained. There are no exceptions.

3.2 Attachment to Mounting Surface

Special care must be taken when attaching the switchgear to the mounting surface. The following instructions must be followed precisely.

3.2.1 Indoor DS Switchgear

Indoor Type DS Metal-Enclosed Switchgear must be attached to the mounting surface as outlined on DS Floor Plan and Foundation Information Drawing 685C940. The switchgear may be attached by bolting or welding.

3.2.1.1 Bolting

Six 0.56 x 1.12-inch slots are provided in the base of each switchgear unit in a line-up. See Floor-Plan Drawing 685C940. The mounting surface must be drilled and tapped or weld nuts must be installed by the purchaser to match these slots. Special steel reaction washers, six per unit, are supplied with the switchgear. These washers must be used along with 0.375-16 SAE Grade 5 bolts that are to be supplied by the purchaser to fasten the switchgear to the mounting surface.

NOTE

All six bolts and six reaction washers are required in each unit in the line-up to meet the seismic requirements.

3.2.1.2 Welding

When the switchgear is welded to the mounting surface, the welding must be equivalent to the effect of 6-0.375-16 hex head bolts with reaction washers for each unit. Refer to Floor Plan Drawing 685C940.

3.2.2 Outdoor DSO Switchgear

Outdoor Type DSO Metal-Enclosed Switchgear must be attached to the mounting surface as outlined in the Outdoor Seismic Drawing 9235D99. The switchgear may be attached by bolting or welding.

3.2.2.1 Bolting

Special 0.25-inch thick hold-down plates are provided with the switchgear for use with 0.625-inch diameter bolts supplied by the purchaser for attaching the switchgear base to the mounting surface. As indicated on Drawing 9235D99, for each 21-inch nominal-width unit two hold-down plates and bolts are required to fasten the front, center and rear channels of the switchgear base to the mounting surface (6 plates and bolts per unit). For each 30 and 34-inch nominal width unit, three hold-down plates and bolts are required to fasten the front, center and rear channels of the switchgear base to the mounting surface (9 plates and bolts per unit).

An additional hold-down is also required on the side of each end unit, approximately 45 inches from the rear as indicated on the drawing.

3.2.2.2 Welding

If the switchgear line-up is to be welded to the mounting surface, the following welding procedure as outlined on Drawing 9235D99 must be followed.

1. Weld continuously along outer edge of front and rear base angles and inside each slot.
2. Weld continuously along outer edge of center hold-down angles over foundation steel.

3.2.3 Outdoor DSOA Switchgear

Outdoor aisle-less Type DSOA Metal-Enclosed Switchgear must be attached to the mounting surface as outlined in the Outdoor Seismic Foundation Drawing 9235D30. The switchgear may be attached by bolting or welding.

3.2.3.1 Bolting

Special 0.25-inch thick hold-down plates are provided with the switchgear for use with 0.625-inch diameter bolts supplied by the purchaser. As indicated in Drawing 9235D30, two hold-down plates and two bolts are required at the front and rear of each 21-inch nominal-width unit (4 plates and bolts per unit). Three hold-down plates and bolts are required at the front and rear of each 34-inch nominal-width unit (6 plates and bolts per unit).

An additional hold-down is also required at the approximate center of the two end units as indicated on the drawing.

3.2.3.2 Welding

If the switchgear line-up is to be welded to the mounting surface, the following welding procedure as outlined on Drawing 9235D30 must be followed.

1. Weld continuously along outer edge of front and rear base angles and inside each slot.
2. Weld continuously around three edges of short center hold-down angle clip.
3. Weld continuously along outer edge of long center hold-down angle clip over foundation steel.

3.3 Attachment to Transformer or Bus Run

If a transformer or bus run is to be attached to the switchgear, special care must be exercised in the alignment and placement of the adjoining units so that the required flexibility between units is maintained. Refer to the installation drawings, particularly the floor plan and the front elevation, so that the special throat and flexible connectors will permit the expected relative motion as indicated on these drawings.

4. OPERATION

All operating instructions given in the Order Instruction Book apply to all equipment used in seismic applications. However, there are some areas which require special attention.

4.1 Breaker Positions

The Type DS Breaker has four normal positions in its compartment as determined by the levering-in device and described in Instruction Book 33-790-1E. These positions are:

1. Connected
2. Test
3. Disconnected
4. Remove

The equipment is capable of withstanding seismic conditions with the breaker in the CONNECTED and DISCONNECTED positions ONLY. In a seismic environment the breaker must NOT be left in the TEST or REMOVE position. In addition, the breaker must not be left on the extension rails after inspection or maintenance has been performed. It must be returned to the DISCONNECTED or CONNECTED position.

If a breaker is to be removed from service, it must be left in the DISCONNECTED position in its compartment or removed from the unit and placed in storage.

4.2 Latches and Knobs

All Type DS Breaker compartments have one or two door latches depending on the breaker size. All instrument panels have one, two or three securing knobs depending on the panel height. All of these latches and knobs must be fully secured at all times except during maintenance and inspection.

5. MAINTENANCE

In order for the equipment to perform its required functions, regular inspection and maintenance is required.

5.1 Normal

Inspection and maintenance schedules as set forth in the Order Instruction Book should be strictly adhered to. Failure to follow these instructions could significantly shorten the life of the equipment or lead to equipment failure.

CAUTION

In order to maintain the seismic integrity of the switchgear, several stiffeners and positioners have been added to the standard switchgear units. Refer to Section 2.2 - Special Bracing. If any of these items are removed for any reason, they must be replaced before returning the equipment to service. In addition, breakers must be left in either the CONNECTED or DISCONNECTED positions or damage could result to the equipment during a seismic event.

5.2 Special

In addition to the normal maintenance as indicated above, certain items of peripheral equipment may require special maintenance as indicated in the Order Instruction Book. If any of these items are replaced during the life of the equipment, their replacements must be selected to match the seismic requirements of the application.