Arc Chamber
Installation Manual
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1 Introduction

1.1 General description

Power Xpert UX Switchgear has an internal arc classification of AFLR according to IEC62271-200 and satisfies all the criteria from 1 to 5. This guarantees the safety of personnel within the switchroom in the event of an internal arc occurring within the switchgear. An integral Arc Chamber collects and exhausts the hot gases and particles. This duct is mounted on the top of the switchgear and is normally extended on either the right or left side.

The recommended solution is to extend the arc chamber to the external environment with arc chamber extension pieces, wall flange and protection grille to vent the gasses outside the switchgear room. If due to special circumstances this is not possible then certain precautions need to be taken into account when designing a safe environment for exhausting the gasses within the switchgear room.

Eaton provides 3 standard solutions:

1. Standard height arc chamber (560mm) with extension pieces (See Figure 1-1 and Figure 1-2).
2. Low-height arc chamber (250mm) with extension pieces (See Figure 1-1 and Figure 1-2).
3. Arc Chamber + Arc Absorber for applications where the IAC requirement up to 31.5kA -1s (See Figure 1-3).

Contact Eaton for recommendations if a non-standard solution is required.

1.2 Using this manual

1.2.1 Structure of the manual

The manual contains 4 chapters.

Chapter 1 contains general information on the arc chamber.

Chapters 2 and chapter 3 contain floor plan drawings for arc chamber installation.

Chapter 4 appendix provides typical drawing for the arc chamber installation.

1.2.2 Safety instructions

Read this user manual carefully before installing the arc chamber. Make sure that you have read and understood all instructions.
2 Floor Plan

2.1 Arc chamber with extension pieces

Floor plans for installations with standard or low height arc chamber with extension pieces are provided in the Operation and Maintenance manual.

Installing extension pieces requires a wall opening to be provided to allow for the end grille and wall flange unit to be installed. An example of the wall opening drawing is provided, as shown Figure 2-1. For other wall openings refer to par. 4.1.

2.2 Arc chamber+arc absorber

Example of a floor plan for arc chamber with arc absorber provided, as shown Figure 2-2.
Typical wall opening drawing

Value of dimension

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1. Wall cut-out for arc-chamber 610 x 1100 mm
2. Wall cut and wall flange
3. Fasten L-profile to the wall via bolts M12 x L (depends on wall thickness)
4. Gap of two flanges can be adjusted from 90-200 mm
5. X-dimension depends on installation requirements.
   Standard extension please are 800 and 1000 mm

Figure 2-1
Typical floor plan

**Front view**

**Side view**

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<td>Min. 100</td>
</tr>
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<td>Dim C</td>
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<td>* Optional</td>
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<tr>
<td></td>
<td>Centre mounting is optional</td>
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1. LV control cable entry
2. Main cable entry
3. Channel steel
4. Second pouring of the concrete
5. First pouring of the concrete
6. Foundation

Figure 2-2  Typical floor plan for bottom cable panel entry panel with arc absorber 17.5kV 630/1250A 25/31.5 kA
3 Arc chamber installation

3.1 Preparation of arc chamber installation

Install arc chamber only when the items below are completed

1. Switchgear is erected and placed in the right position
2. Main busbars are connected correctly
3. Earth busbar is connected correctly
4. Auxiliary cables are connected correctly
5. Main cables are connected correctly
6. All tools are taken away from the switchgear

3.2 Installation of standard or low height arc chamber

Step 1 – Mount L-profile
Mount the L profile to each of the end panels of the switchboard with M8x30 bolts, apply torque 20Nm.

Step 2 – Mount front and rear plates
Starting at one end of the switchboard (left or right), fix the front and rear plates of the arc chamber to the panel with bolts M8x30, apply torque 20Nm. Each arc chamber front and rear plate corresponds to the width of the panel.

Hint: Mount all front and rear plates to the entire length of the switchboard. If working from the front of the switchboard it may be an advantage to mount all the rear plates first, and if working from the rear it may be an advantage to mount all the front plates first.

Step 3 – Mount next front and rear connector plates
Fix the front and rear connector plates of the arc chamber to the next panel with bolts M8x30, apply torque 20Nm.
Arc chamber installation

Step 4 – Mount end cover
The arc chamber can be arranged to exit either from the Left or the Right of the installation.
At the opposite end from the exhaust side the arc chamber is fitted with an end cover.
Fit the end cover using M8x30 bolts apply torque of 20Nm.

Step 5 – Mount top cover plate
Mount the top cover to the side plates with bolts M8x30, apply torque of 20Nm.
Proceed to mount all adjacent top cover plates to each panel.
3.3 Installation of arc chamber with arc absorber

The installation of the arc chamber with arc absorber is exactly the same as for the standard arc chamber, follow steps 1 – 5 above.

The arc absorber replaces the top covers in step 4. An arc absorber top cover is fitted on every 3rd panel with a minimum of 2 arc absorbers per installation.

When arc absorbers are used an End Cover is mounted on each end of the arc chamber.

3.4 Installation of arc chamber extension pieces, end grille and wall flange unit

The arc chamber extension pieces, end grille and wall flange unit are to be mounted together to provide a complete channel to exhaust the gasses outside the switchroom.

The number of arc chamber extension pieces depends on the dimension between the panel and switchgear wall.

First assemble end grille and wall flange unit. See par. 3.4.1 and loosely mount in the opening in the wall.
3.4.1 Assembly of the end grille and wall flange unit

Step 1
End grille and wall flange are to be assembled before arc chamber extension pieces are mounted to the installation.

Step 2
Mount front, rear and bottom plate of end grille with stainless bolts M8x25, apply torque 20Nm.

Step 3
Mount grille bracket to the front and rear plate of end grille with stainless bolts M8x25, apply torque 20Nm.
Step 4
Place grille between front and rear grille bracket.

Step 5
Place plain washer, nut M12 between grille bracket and front or rear plate of end grille.

Insert shaft through front or rear plate of end grille Nut M12, grille bracket, grille.

Apply torque 20Nm for nut M12.

Turn nut M8 to shaft and apply torque 20Nm.

Mount remaining grille to the grille bracket.
Arc chamber installation

Step 6
Fix L profile to the top plate of end grille with stainless bolts M8x25, apply torque 20Nm.

Step 7
Fix top plate to the front and rear plate of end grille with stainless bolts M8x25, apply torque 20Nm.

End grille is assembled.

Step 8
When the wall is reached, insert the pre-assembled extension piece through rectangular hole in the wall. The wall should be prepared to accept the wall flange before inserting the extension piece. Some drilling is necessary to mount the wall flanges to the extension piece.

Wall opening drawings are shown on Figure 2-1.

Step 9
Mount wall flange to the top and bottom plate of end grille with stainless bolts M10x30. Don’t tighten.
3.4.2 Installation of arc chamber extension pieces

**Step 1 – Extension arc chamber supports**

Standard widths of arc chamber extension are 600mm, 800mm and 1000mm.

Supports need to be put in place for the assembly of the extension pieces. Normal support is from above using standard threaded rods (1) and support brackets (2) – not supplied by Eaton.

**Step 2 – Rear plates**

Fix rear plate of arc chamber extension to the panel with bolts M8x30, apply torque 20Nm, and use support bracket previously mounted on Step 1 to support the installation.

**Step 3 – Bottom plates**

Fix bottom plate of arc extension to rear plate, arc chamber and support the arc chamber installation as it is assembled till it reaches the end grille. Use bolts M8x30, apply torque 20Nm.

Continue to assemble the rear plate and bottom plate to adjacent extension piece and ensure the assembly is supported properly until the end grille and wall flange unit is reached.

**Step 4 – Front plates**

Fix all the front plates of arc extension assembly to the bottom plates, Continue until the end grille and wall flange unit is reached. Use bolts M8x30, apply torque 20Nm.
Arc chamber installation

Step 5 – Cover plates
Fix front and rear cover plates to the front and rear of extension pieces and end grille with bolts M8x30, apply torque 20Nm.

Step 6 – Top cover plates
Mount the top cover to the side plates with bolts M8x30, apply torque of 20Nm. Mount remaining top covers to the installation, each top plate corresponds to the width of the panel.
4 Appendix

4.1 Typical wall opening drawing

Value of dimension

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1. Wall cut-out for arc-chamber 610 x 1100 mm
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4. Gap of two flanges can be adjusted from 90-200 mm
5. X-dimension depends on installation requirements.
   Standard extension please are 800 and 1000 mm
### Value of dimension

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1. Wall cut-out for arc-chamber 610 x 1130 mm
2. Fasten L-profile to the wall via bolts M12 x L (depends on wall thickness)
3. Gap of two flanges can be adjusted from 90-200 mm
4. X-dimension depends on installation requirements.

Standard extension please are 800 and 1000 mm

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Figure 4-2

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Appendix

Typical wall opening drawing

Value of dimension

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2. Fasten L-profile to the wall via bolts M12 x L (depends on wall thickness)
3. Gap of two flanges can be adjusted from 90-200 mm
4. X-dimension depends on installation requirements.

Standard extension please are 800 and 1000 mm
4.2 Typical drawing of 600 mm wide Arc Channel

Left hand arc chamber assembly drawing 17.5kV 630/1250A 600 wide

Notes:
Type 1: Arc chamber with integral arc absorber assembly
Type 2: Standard arc chamber

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Figure 4-3
Middle panel arc chamber assembly drawing 17.5kV 630/1250A 600 wide

Notes:
Type 1: Arc chamber with integral arc absorber assembly
Type 2: Standard arc chamber

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Figure 4-4
Right hand arc chamber assembly drawing 17.5kV 630/1250A 600 wide

Notes:
Type 1: Arc chamber with integral arc absorber assembly
Type 2: Standard arc chamber

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Figure 4-5
Eaton’s Electrical Sector is a global leader in power distribution, power quality, control and automation, and monitoring products. When combined with Eaton’s full-scale engineering services, these products provide customer-driven PowerChain™ solutions to serve the power system needs of the data center, industrial, institutional, public sector, utility, commercial, residential, IT, mission critical, alternative energy and OEM markets worldwide.

PowerChain solutions help enterprises achieve sustainable and competitive advantages through proactive management of the power system as a strategic, integrated asset throughout its life cycle, resulting in enhanced safety, greater reliability and energy efficiency. For more information, visit www.eaton.com/electrical.