Uniswitch     Medium Voltage Switchgear

Installation Manual for Pressure Relief Ducts
# TABLE OF CONTENTS

1 Summary ............................................................................................................................... 1  
2 Transportation and storage.................................................................................................... 2  
  2.1 Condition on delivery ....................................................................................... 2  
  2.2 Unpacking at installation site ........................................................................ 2  
  2.3 Observing the pressure relief ducts at installation site ............................................. 3  
    2.3.1 General ............................................................................................. 3  
    2.3.2 Instructions....................................................................................... 3  
  2.4 Temporary storage ............................................................................................... 4  
    2.4.1 General warnings ........................................................................ 4  
  2.5 Delivery responsibilities ................................................................................... 4  
3 Installing the pressure relief ducts into cubicles ............................................................... 5  
  3.1 General warnings ............................................................................................. 5  
  3.2 Preparations ....................................................................................................... 5  
  3.3 Dimensions ......................................................................................................... 5  
    3.3.1 Dimensions of pressure relief ducts .................................................... 5  
      3.3.1.1 Examples of duct dimensioning for switchgears equipped  
          with fixed furnishing ........................................................................... 5  
      3.3.1.2 Examples of duct dimensioning for switchgears equipped  
          with withdrawable circuit-breaker cubicles ......................................... 6  
  3.4 Installing the pressure relief ducts into cubicles ..................................................... 8  
    3.4.1 Cubicles equipped with fixed furnishing ............................................. 8  
    3.4.2 Installing the pressure relief duct into circuit-breaker cubicles .......... 9  
    3.4.3 Installing the spacer ......................................................................... 12  
  3.5 Connecting the pressure relief ducts ................................................................. 12  
    3.5.1 Connecting the ducts from their rear and bottom edges ......................... 12  
    3.5.2 Fastening the top and front joints of the ducts ...................................... 13  
4 Installing the pressure relief flaps ........................................................................... 14  
  4.1 Installing the pressure relief duct and pressure relief flap ................................... 14  
    4.1.1 Pressure relief outwards from the switchgear ..................................... 14  
    4.1.2 The pressure relief flap mounted to the outer wall of the building ....... 15
Your safety first – at all times!

WARNING!

This manual only applies to the installation of pressure relief ducts of Uniswitch switchgear. In addition to this manual, the installation manual of the switchgear must also be available.

Always follow the instructions provided in the manual and respect the rules of good engineering practice!

Hazardous voltages may cause serious injury or death!

Contact us!

If you have any further questions about this manual, the members of our field organization will be pleased to provide you with the required information.
1 Summary

Uniswitch product family
- Uniswitch switchgears are metal-enclosed switchgears equipped with either a fixed furnishing or a withdrawable circuit-breaker. The switchgear is available in two different heights, 1635 mm and 1885 mm. Switchgears equipped with a withdrawable circuit-breaker are always of the higher model.

Technical documentation

Critical messages
User-critical messages are marked as follows:
- …for Danger
- …for Warning
- …for Caution
- …for Note
2 Transportation and storage

2.1 Condition on delivery

Delivery package The switchgear pressure relief ducts are delivered as a separate transportation unit packed in plastic film.

2.2 Unpacking at installation site

Storage and inspection The Uniswitch switchgear with its pressure relief ducts should only be installed indoors. Therefore it is important to store the pressure relief ducts in their transportation packages as long as possible.

The packaging should only be opened to inspect for possible damage that may have occurred during transportation. After inspection, the packaging should be restored to its original condition.

Any transportation damage should be reported immediately to the carrier/forwarder. If the installation of the switchgear is to be made immediately after the delivery, the transportation packaging can be removed.

General Cubicle-specific pressure relief ducts (Figure 2.3) and pressure relief flaps (Figure 2.4) have been pre-assembled.
Assembled pressure relief duct for a 500 mm wide cubicle.

Pressure relief duct and pressure relief flap that is to be mounted on the outer wall.

**Instructions**

Remove the plastic film from the pressure relief ducts.

### 2.3 Observing the pressure relief ducts at installation site

#### 2.3.1 General

- **Install the pressure relief ducts into the cubicles before moving the cubicles into their final locations. When installing the ducts, there must be sufficient clearance for installation (approximately 1 m) behind the cubicle.**

- **Check the locations of the switchgear’s pressure relief ducts. If the cubicle is to be equipped with a pressure relief at the rear side, select a duct with 260x315 mm (h x w) opening for these cubicles.**

#### 2.3.2 Instructions

**Duct installation**

Mount the collars for pressure relief openings into the ducts that have been equipped with backwards-directed pressure relief openings.

Install the pressure relief ducts into the cubicles while being as near to the final operating site as possible, because the ducts will increase the height of the cubicles and thus make it more difficult to, for example, lift them.

**Transfer instructions**

The cubicles equipped with pressure relief ducts may be transferred by a manual forklift or a forklift truck, and moved into the final location by means of rolling tubes (using at least four tubes).
2.4 Temporary storage

2.4.1 General warnings

! The pressure relief ducts should be stored in the same room with the switchgears.

2.5 Delivery responsibilities

Responsibilities

The responsibilities of the consignee when the pressure relief ducts arrive at site include, but are not limited to, the following:

- Check the consignment for completeness and lack of any damage (including moisture and its detrimental effects). In case of doubt, the packaging must be opened and then properly resealed.
- Always take photographs to document any major damage!
- If any quantities are short, or defects or transport damage are detected, these must be:
  - documented on the respective shipping document
  - immediately notified to the relevant carrier or forwarding agent in accordance with the applicable liability regulations.
3 Installing the pressure relief ducts into cubicles

3.1 General warnings

! When the final construction documents are compiled, the binding data supplied by ABB must always be taken into account!

3.2 Preparations

Prior to installation

Prior to commencing the installation on site, the switchgear room must be completely finished. The room must be provided with lighting and electricity supply, be lockable, dry, and furnished with proper heating.

3.3 Dimensions

3.3.1 Dimensions of pressure relief ducts

Detailed drawings of the pressure relief openings to be implemented in the building, as well as dimension drawings of the ducts, will be provided separately.

3.3.1.1 Examples of duct dimensioning for switchgears equipped with fixed furnishing

Figure 3.1
An example of room layout for switchgear that only contains cubicles equipped with fixed furnishing. Pressure relief backwards from the switchgear.

Dimension 1 = 2300 mm high model and 2050 mm low model
Dimension 2 = 2080 mm high model and 1830 mm low model
Dimension 4 = 270 x 326 mm (h x w), dimension of the pressure relief duct
3.3.1.2 Examples of duct dimensioning for switchgears equipped with withdrawable circuit-breaker cubicles

Figure 3.2
An example of room layout for switchgear that only contains cubicles equipped with fixed furnishing. Pressure relief from the end of the switchgear.

Dimension 1 = 2300 mm high model and 2050 mm low model
Dimension 2 = 2095 mm high model and 1845 mm low model
Dimension 4 = 356 x 228 mm (h x w), dimension of the pressure relief duct

Figure 3.3
An example of room layout for switchgear that includes withdrawable circuit-breaker cubicle(s). Pressure relief behind the switchgear.

Dimension (4) = 270 x 326 mm (h x w), dimension of the pressure relief duct
Figure 3.4
An example of room layout for switchgear that includes withdrawable circuit-breaker cubicle(s). Pressure relief from the end of the switchgear.

Dimension (3) = 356 x 283 mm, dimension of the pressure relief duct
3.4 Installing the pressure relief ducts into cubicles

3.4.1 Cubicles equipped with fixed furnishing

General
If pressure relief ducts (90.2) are to be added into the switchgear, a cube-specific pressure relief duct has already been installed on the back of the cubicles (90.1). The pressure relief ducts of the switchgear will be installed on top of this duct.

Duct installation
Lift the duct (90.2) on top of the back end of the vertical duct (90.1) and push the duct forward so that the top edge of the vertical duct fits into the groove in the bottom edge of the duct (Figure 3.6).

Figure 3.5
Pressure relief duct lifted on top of the back end of the vertical duct.

Figure 3.6
Pressure relief duct groove.

Figure 3.7
Pressure relief duct installed.
Mount the pressure relief duct to the vertical duct of the cubicle using screws.

Figure 3.8
Mounting the duct using screws.

3.4.2 Installing the pressure relief duct into circuit-breaker cubicles

Instructions
Circuit-breaker cubicles do not have a vertical duct at the back of the cubicle. Instead, the pressure relief duct is installed on top of a frame that is attached to the roof.

The lifting lugs on the back of the cubicle must be bent forward before installing the pressure relief duct. Use, for example, a lead sledgehammer or large hammer to bend the lugs.

Figure 3.9
Lifting lug of the cubicle bent forward.
Installing the foundation of the pressure relief duct

Install the crossbar of the pressure relief duct's foundation (90.4) into the front edge of the pressure relief opening (10.3). To mount the bar, use the same screw as with the flap of the pressure relief opening. Lift the foundation frame of the pressure relief duct (90.3) into place (Figure 3.12).

![Figure 3.10](image1.jpg)  
**Figure 3.10**  
Crossbar of the pressure relief duct foundation

![Figure 3.11](image2.jpg)  
**Figure 3.11**  
Mounting the crossbar.

![Figure 3.12](image3.jpg)  
**Figure 3.12**  
Foundation frame lifted into place.

Mount the frame (90.3) to the roof frame of the cubicle with screws, and, from the back, to the back wall of the cubicle. Self-threading screws should be used for the back wall mounting. Drill Ø 5mm holes into the back wall of the cubicle.
Figure 3.13
Mounting the frame to the cubicle.

The duct is installed on top of the frame in the same way as with other cubicle types, see section 3.4.1.

Figure 3.14
The pressure relief duct of a withdrawable circuit-breaker cubicle, furnished with a pressure relief collar.
3.4.3 Installing the spacer

**Instruction**

If the switchgear includes both fixed furnishing cubicles and withdrawable circuit-breaker cubicles, the respective depths of the pressure relief ducts may vary. Due to depth difference, the clearance must be covered by a spacer.

Fasten the spacers as applicable.

Figure 3.15
Spacer.

3.5 Connecting the pressure relief ducts

! Install the cubicles on their operating site in accordance with the installation instructions. The pressure relief ducts will be connected to each other in the last phase.

3.5.1 Connecting the ducts from their rear and bottom edges

The pressure relief ducts will be connected to each other from their rear and bottom edge using a profile bar. Fit the connection bars at the rear joint (90.8) into place. Use a hammer if needed.

Correspondingly, fit the connection bars at the bottom joint (90.9) into place.

The end plates of the duct are mounted to the front and the back in the same way as the ducts are mounted to each other.
3.5.2 Fastening the top and front joints of the ducts

The ducts are fastened to each other from their top and front joints by means of a bolted joint. The fastening screws and nuts (M6) are included in the delivery.

Figure 3.18
Bolted joints of the ducts and ends.
4 Installing the pressure relief flaps

4.1 Installing the pressure relief duct and pressure relief flap

4.1.1 Pressure relief outwards from the switchgear

Instructions

Most of the pressure relief ducts delivered consist of two parts: a collar mounted to the pressure relief duct of the cubicles (90.5) and a bushing collar mounted to the outer wall of the building (90.6).

The collars are to be shortened as needed depending on the thickness of the wall construction. The bushing collars must be inserted within 70 mm of each other.

Mount the collar (90.6) to the wall construction in a way appropriate to the wall material.

Pressure relief ducts directed to the side from the end of the switchgear contain constructions in which no separate collar is used (90.6). Instead, the actual duct passes directly through the wall.

Figure 4.1
Parts of a pressure relief duct implemented by means of a collar.
4.1.2 The pressure relief flap mounted to the outer wall of the building

Instructions

The pressure relief flap (90.7) contains a pre-installed heat insulation plate. If required, insulate the space between the collar and bushing collar (90.5) with insulation wool before mounting the outward collar (90.6) into place.

The pressure relief flap opens from its upper edge, and the opening angle is restricted to 45 degrees by means of a chain installed inside the flap.

![Important Notice]

Ensure the correct positioning of the flap. The flap is fastened from its upper edge so that the flap's edge is only partially inserted under the screw's head, and the bottom edge has holes that make the opening easier.

Mount the flap (90.7) tightly to the outer wall using fasteners that have been selected in accordance with the wall construction.

![Important Notice]

When mounting the pressure relief flap it should be taken into account that in the event of a possible malfunction, a considerable pressure shock is directed towards the flap. If the flap has not been securely mounted, it may come off, and cause a dangerous situation.

Figure 4.2
Structural drawing of a pressure relief duct equipped with a collar.
Figure 4.3
Pressure relief flap viewed from the outside.

Figure 4.4
Pressure relief flap viewed from the inside.

Figure 4.5
Pressure relief flap mounted on a brick wall.
The information provided in this publication is generally applicable to the equipment described. The manufacturer reserves the right to make changes in the future without a prior notice.