



**Assembly instruction**



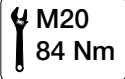
Zinc oxide surge arresters

PEXLIM R, PEXLIM Q, PEXLIM P and  
PEXLINK transmission line arrester

# 1. Introduction

## Safety information

### Key to the signs

	This sign is a visual notice to avoid mistakes which can result in damage of the material and/or no function of the surge arrester. Read the text carefully and if you don't understand do not proceed.
	Serious material damage, severe personal injury and/or death can be the result of not following the information given at this sign. Read the text carefully and if you don't understand do not proceed.
	The bolt of the given size shall be tightened with a torque wrench to the specified value.



### Important

The following instruction is valid for PEXLIM R, Q, P-X, P-Y and PEXLINK transmission line arresters including non-catalogue arresters with the following additional suffix letters:

E = Non-standard electrical data

H = Inverted mounting

L = Line surge arrester

Serious material damage, severe personal injury and/or death can be the result of not following this instruction. Therefore, the personnel responsible for the installation of the equipment **shall read and follow the instruction carefully**.

Handling and maintenance of all the surge arresters described in this instruction must be done by personnel trained for this type of work.

### **WARNING!**

**All work related to the surge arresters shall be made with disconnected and earthed conductors. Follow all regulations and rules stated by international and national safety regulations.**

**Normally, surge arresters operate at a high voltage. Therefore, they must be handled and installed by qualified personnel.**

### Storage

In all cases and with consideration to specific local conditions, appropriate steps must be taken to ensure the equipment and packaging is stored in such a way as to protect it from damage or deterioration.

# Introduction

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This manual covers both PEXLIM and PEXLINK surge arresters. An X in the respective column above indicates which section should be followed for each type. An (X) in brackets indicates the section to be followed when an accessory is to be installed.

## Introduction

### 1.1 Sequence of assembly

The respective procedure in the tables below should be followed for safe and correct installation of the surge arresters.

#### PEXLIM

Order	Procedure	Section
1	Inspection upon arrival.	1.2
2	Prepare before installation	1.3 - 1.4
3	Lift out the surge arrester from the case.	3
4	Adjust the line terminals.	4
5	Assemble the grading rings.	5.1 - 5.2
6	Assemble the grading ring on the surge arrester. Lift the top unit on the second unit if there is a two-unit surge arrester.	6.1 - 6.3
7	Lift the surge arrester on structure and anchored it. If a insulating base and/or EXCOUNT-II should be assembled see section 7.2 instead.	7.1 (7.2)
8	Connect the line and earth conductors. If a surge counter (EXCOUNT-C or other) should be installed see section 8.5.	8.1 - 8.4 (8.5)

#### PEXLINK

Order	Procedure	Section
1	Inspection upon arrival.	1.2
2	Prepare before installation	1.3
3	Lift out the surge arrester from the case.	3
5	Assemble the grading rings.	5.1 - 5.2
6	Assemble the grading ring on the PEXLINK surge arrester. Lift the top unit on the second unit if there is a two-unit surge arrester.	6.1 - 6.3
7	Assembly the terminal and links.	9.1
8	Assembly of disconnecting device. If a EXCOUNT-II should be installed see section 9.3 instead.	9.2 (9.3)
9	Install the PEXLINK surge arrester on the transmission line.	-

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Multi-unit arresters must be erected with their units in correct order, see section 2.2 on page 6 and 6.1 on page 12.



The instruction must be followed in correct order to prevent problems during assembly. In the case where an arrester is not supplied with an insulating base and/or surge counter, the paragraphs dealing with these accessories may be disregarded.

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### 1.2 Inspection upon arrival

Upon arrival it is important that the cases are inspected and the contents checked against the packing list which is attached to each case. Any shortage or damage should be reported immediately to the insurance and/or ABB representative; latest within 30 days from the arrival of goods at site. ABB cannot take responsibility for shortages or damages not reported within this time period.

If the contents are to be stored for a long period of time prior to installation they must be repacked and preferably stored dry and indoors. However, outdoor storage is acceptable for the arresters themselves.

### 1.3 Tools for assembly

Special instruments or tools are not required for assembly and erection of the surge arrester. It is recommended to assemble all details of a complete arrester before mounting it on the structure.

# Introduction

## 1.4 Vertical or inverted installation

Surge arresters have an insulator with an alternating shed profile, see figure 1.4.1. The surge arrester shall be mounted such that the shed form points downwards so that water can easily run off the insulator.

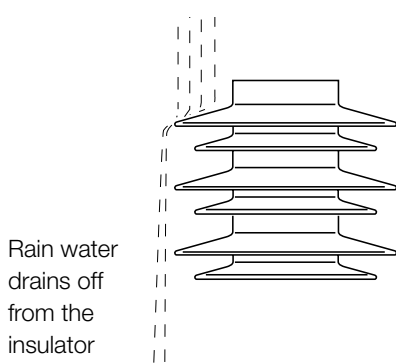


Should the surge arrester be incorrectly mounted upside down, then rainwater will collect in the inverted sheds, leading to a risk for flashover and subsequent short-circuit.

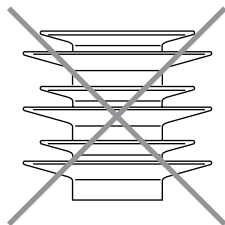
Surge arresters specifically intended for inverted mounting have a "H" at the end of the type designation, see the below example, and must always be inverted mounted, see figure 1.4.4.

### PEXLIM Q192-XV245H

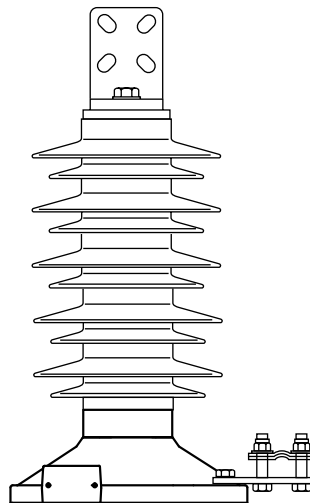
Surge arresters without "H" in the type designation must always be upright mounted, see figure 1.4.3.



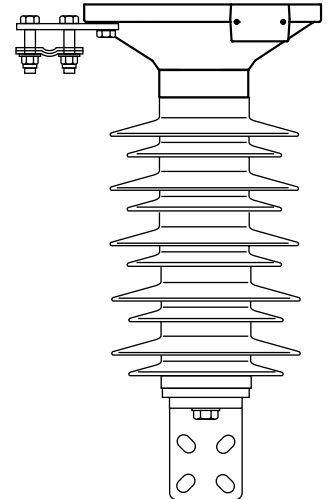
**Figure 1.4.1**  
Ensure that shed profile points downwards to avoid collection of rainwater on the insulator.



**Figure 1.4.2**  
**WARNING!**  
Incorrect direction of the sheds



**Figure 1.4.3**  
Surge arrester for upright mounting (note direction of sheds)



**Figure 1.4.4**  
Surge arrester for inverted mounting (note direction of sheds)

## 2. Rating plates

### 2.1 Location of rating plate

See figure 2.1.1 to 2.1.3 for location of the rating plate on respective surge arrester types.

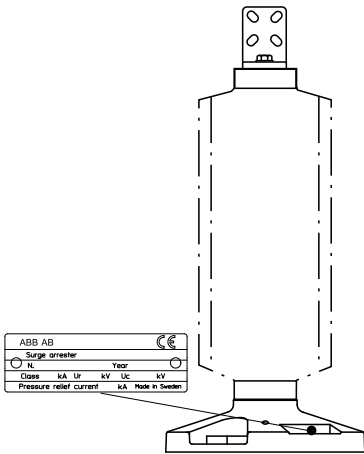


Figure 2.1.1  
PEXLIM P-Y and R  
surge arrester

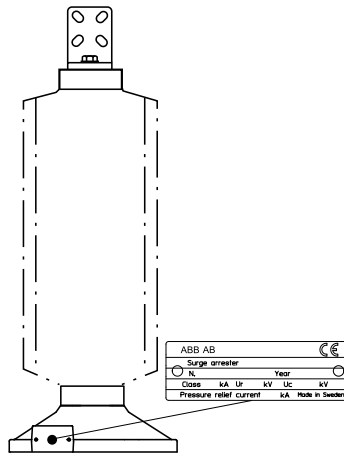


Figure 2.1.2  
PEXLIM Q and P-X  
surge arrester

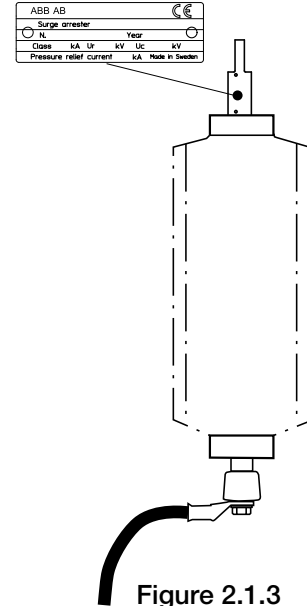


Figure 2.1.3  
PEXLINK surge arrester

### 2.2 Relative position of arrester units



Two-unit arresters must be erected with their units in the correct order. All units in one arrester have the same serial number with a consecutive suffix number to identify their position, i.e. top unit = N. XXXXXXX/1, bottom unit = N. XXXXXXX/2.

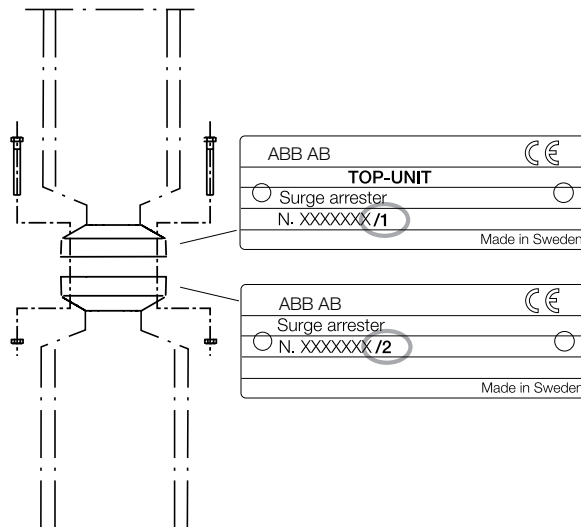


Figure 2.2.1  
Plate with serial  
number on the flanges

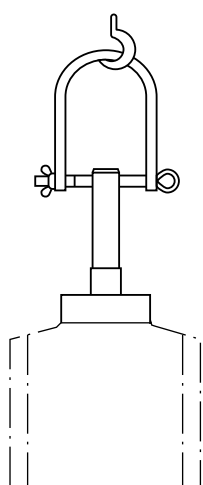
## 3. Lifting

### 3.1 Lifting the surge arrester

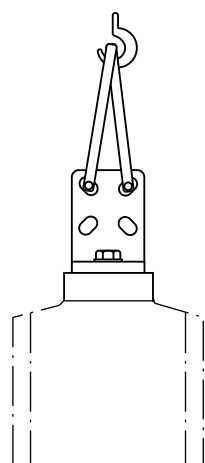
Lift the surge arrester by the line terminal or the flange. Use of shackles or lifting eye bolts is recommended. See figure 3.1 to 3.4 (for PEXLINK see figure 3.5).

**Table 3.1**

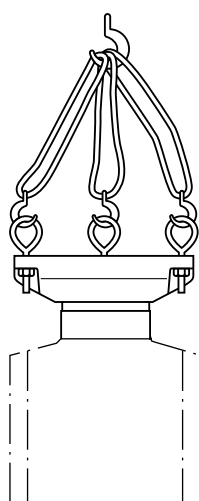
Typical weight of the smallest to the largest surge arrester.	PEXLIM R	PEXLIM Q-X	PEXLIM Q-Y	PEXLIM P-X	PEXLIM P-Y	PEXLINK
	15 to 33 kg	17 to 126 kg	18 to 129 kg	19 to 148 kg	54 to 247 kg	14 to 130 kg



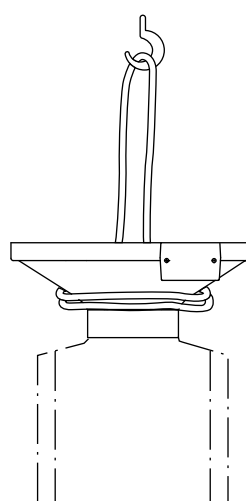
**Figure 3.1**  
Lifting with shackles mounted on the line terminal



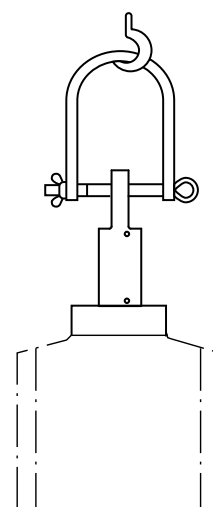
**Figure 3.2**  
Lifting with slings mounted on the line terminal



**Figure 3.3**  
Lifting the joint flange with lifting eye bolts and lifting slings



**Figure 3.4**  
Lifting the base with lifting slings (preferred lifting arrangement for inverted mounting)



**Figure 3.5**  
Lifting the PEXLINK surge arrester with shackles mounted on the line terminal



**Do NOT lift the surge arrester by its insulator!**

**Be careful so that the arrester units do not hit anything during lifting!**

**Keep the lifting slings in place until the completely assembled arrester is securely anchored to the structure.**

## 4. Line terminal

### 4.1 Adjusting the pre-assembled line terminals

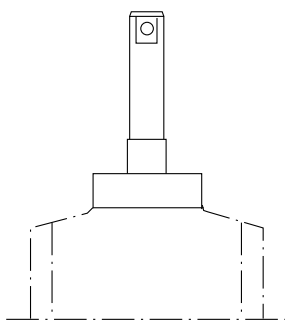
Adjust the line terminal to desired position. Recommended tightening torque is: PEXLIM R 100 Nm, PEXLIM Q, P 150 Nm (M20). See figure 4.2.

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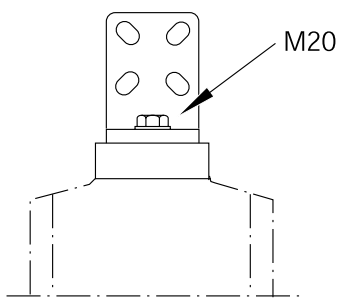
Ensure that metal contact surfaces on the arrester unit, line terminal and holder for grading ring (when applicable) are free from dirt and grease.

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**Line terminal with clamp:** when the line conductor is to be connected, assemble the clamp according to the assembly instruction delivered with it.



**Figure 4.1**  
Adjustment of  
1HSA410 000-N, -P



**Figure 4.2**  
Adjustment of  
1HSA410 000-L, -M

PEXLIM R



PEXLIM Q, P

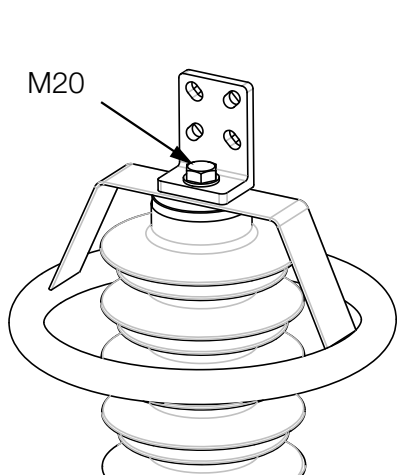


### 4.2 Orientation of line terminal

When grading ring A (see page 9 and 10) is used: The orientation of grading ring with its holder in relation to the line terminal shall be in accordance with figure 4.3.

Recommended tightening torque is: PEXLIM R 100 Nm, PEXLIM Q, P 150 Nm (M20).

**NOTE:** This is not applicable to PEXLINK surge arresters.

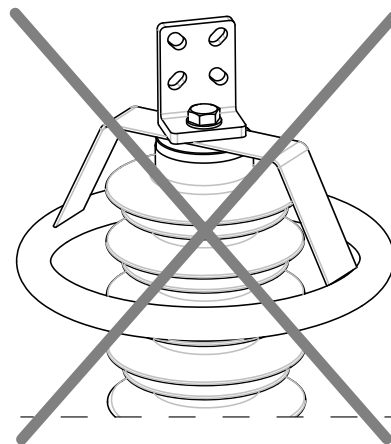
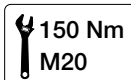


**Figure 4.3**  
Correct orientation  
of line terminal and grading ring

PEXLIM R



PEXLIM Q, P



**Figure 4.4**  
**WARNING!**  
Incorrect orientation



## 5. Grading ring




### 5.1 Grading ring arrangement



When a grading ring is supplied, it **must** be fitted to the arrester. **Otherwise the correct performance is not guaranteed.** If the surge arrester has a grading ring, assemble the stays with the ring/rings according to the table 5.1.1 and the figures in paragraph 5.2. The recommended tightening torque for M10 screws is 33 Nm.

For inverted installation, the surge arrester has a "H" added to the end of the type designation shown in the table below.

**Table 5.1.1 Grading ring arrangement. The letters in the table refer to the figures on the next page. Types where grading rings are included.**

Type designation	 See 5.2	Type designation	 See 5.2	Type designation	 See 5.2
<b>PEXLIM R-Y</b>		<b>PEXLIM P-X</b>		<b>PEXLINK</b>	
R090-YH123	A	P216-XV300 — P276-XV300	B	Q180-XH245L — Q228-XH245L	B
R090-YV123 — R096-YV123	A	P258-XH362 — P288-XH362	C	Q216-XH300L — Q264-XH300L	B
R108-YH145	A	P258-XV362 — P288-XV362	C	Q258-XH362L — Q288-XH362L	C
R108-YV145	A	P330-XH420 — P360-XH420	C	Q330-XH420L — Q360-XH420L	C
R132-YH170 — R144-YH170	A	<b>PEXLIM P-Y</b>		P180-XH245L — P228-XH245L	A
<b>PEXLIM Q-X</b>		P228-YH300 — P276-YH300	B	P216-XH300L — P264-XH300L	B
Q132-XH170 — Q150-XH170	A	P228-YV300 — P276-YV300	B	P258-XH362L — P288-XH362L	C
Q132-XV170 — Q192-XV170	A	P258-YM362 — P276-YM362	C	P330-XH420L — P360-XH420L	C
Q192-XM245	B	P258-YH362 — P288-YH362	C		
Q180-XH245 — Q228-XH245	B	P258-YV362 — P288-YV362	C		
Q180-XV245 — Q198-XV245	B	P330-YH420 — P396-YH420	C		
Q210-XV245 — Q228-XV245	B	P330-YV420 — P396-YV420	C		
Q216-XH300 — Q276-XH300	B	P396-YH550 — P444-YH550	C/D		
Q216-XV300 — Q276-XV300	B	<b>PEXLINK</b>			
Q258-XH362 — Q288-XH362	C	R090-YH123L	A		
Q258-XV362 — Q288-XV362	C	R108-YH145L	A		
Q330-XH420 — Q360-XH420	C	R132-YH170L — R144-YH170L	A		
<b>PEXLIM Q-Y</b>		R150-YV170L — R192-YV170L	A		
Q180-YH245 — Q228-YH245	A	R180-YH245L — R216-YH245L	B		
Q180-YV245 — Q228-YV245	B	R108-ZH145L	A		
Q216-YH300 — Q276-YH300	B	R108-ZV145L	A		
Q216-YV300 — Q240-YV300	C	R132-ZH170L — R144-ZH170L	A		
Q258-YV300 — Q276-YV300	B	R132-ZV170L — R144-ZV170L	B		
Q258-YH362 — Q288-YH362	C	R150-ZV170L — R192-ZV170L	A		
Q258-YV362 — Q288-YV362	C	R192-ZM245L	B		
Q330-YH420 — Q360-YH420	C	R180-ZH245L — R228-ZH245L	B		
Q330-YV420 — Q396-YV420	C	R180-ZV245L — R228-ZV245L	B		
<b>PEXLIM P-X</b>		R216-ZH300L	C		
P132-XH170 — P150-XH170	A	R240-ZH300L — R276-ZH300L	B		
P132-XV170 — P192-XV170	A	R216-ZV300L	C		
P180-XM245 — P192-XM245	A	R240-ZV300L — R276-ZV300L	B		
P180-XH245 — P228-XH245	A	R258-ZH362L — R288-ZH362L	C		
P180-XV245 — P228-XV245	B	R330-ZH420L — R342-ZH420L	C		
P210-XV245 — P228-XV245	B	Q132-XH170L — Q150-XH170L	A		
P216-XH300 — P276-XH300	B	Q162-XV170L — Q192-XV170L	A		

# Grading ring

## 5.2 Grading ring assembly

Assemble the grading ring according to the applicable arrester type designation in table 5.1.1. See also paragraph 5.3 on next page for orientation of grading ring with drainage holes.

<b>A</b>		<p>M20 Washer</p>	PEXLIM R	 100 Nm M20			
<b>B</b>		<p>M10 x 40 Washer</p>	<b>I</b>	 33 Nm M10			
<b>C</b>		<p>M10 x 40 Washer</p>	<b>I</b>	 33 Nm M10	<b>II</b>	<p>M10 x 40 Washer</p>	
<b>D</b>		<p>M10 x 40 Washer</p>	<b>I</b>	 33 Nm M10			

## Grading ring

### 5.3 Grading rings with drainage holes

Assemble the grading ring with drainage holes oriented downwards, see also table 5.3.1

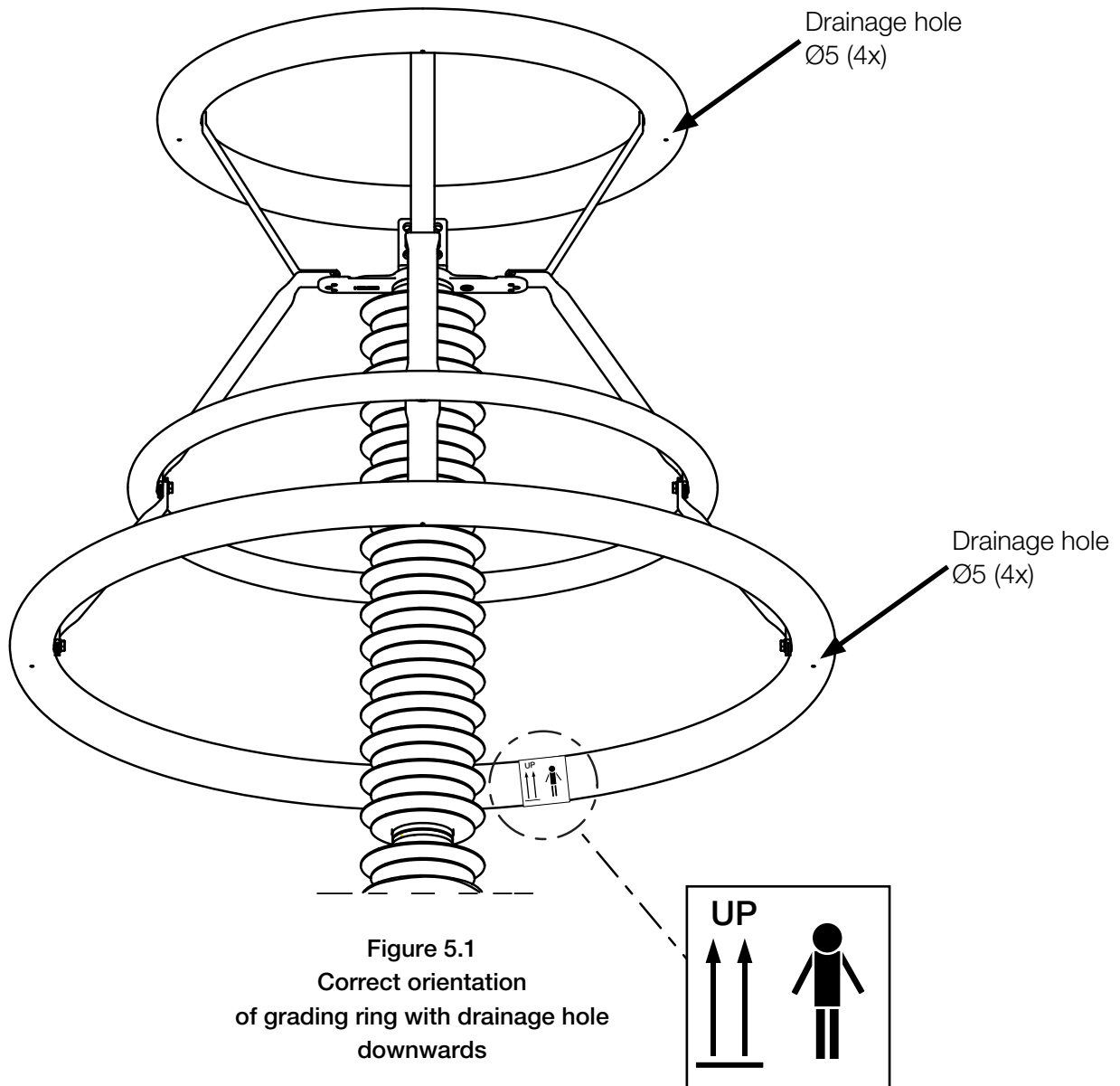


Figure 5.1  
Correct orientation  
of grading ring with drainage hole  
downwards



**NOTE!** Surge arrester with grading ring arrangement C and D: drainage hole must always be oriented downwards.

Table 5.3.1 The letters refer to the figures on page 10

Grading ring arrangement	View	Drainage hole	View	Drainage hole
C	Ⓘ	-	Ⓜ	x
D	Ⓘ	x	Ⓜ	-

## 6. Assembly of units and grading rings

### 6.1 Find your surge arrester

Standard PEXLIM and PEXLINK surge arresters are built up of either one unit (table 6.1.1) or two units (table 6.1.2). Find your arrester from the respective table below and follow the reference located at the bottom of the table.

For inverted installation the surge arrester has a "H" added to the end of the type designation shown in the tables below.

**Table 6.1.1**

#### SINGLE-UNIT SURGE ARRESTERS

PEXLIM R		PEXLIM Q-X		PEXLIM Q-Y		PEXLIM P-X	
Rxxx-YV024	Rxxx-YN123	Qxxx-XV024	Qxxx-XH145	Qxxx-YV024	Qxxx-YV170	Pxxx-XV012	Pxxx-XN123
Rxxx-YV036	Rxxx-YH145	Qxxx-XV036	Qxxx-XV145	Qxxx-YV036	Qxxx-YH245	Pxxx-XV024	Pxxx-XH145
Rxxx-YV052	Rxxx-YV145	Qxxx-XV052	Qxxx-XN145	Qxxx-YV052	Qxxx-YV245	Pxxx-XV036	Pxxx-XV145
Rxxx-YN052	Rxxx-YN145	Qxxx-XN052	Qxxx-XH170	Qxxx-YV072	Q216-YH300	Pxxx-XV052	Pxxx-XN145
Rxxx-YH072	Rxxx-YH170	Qxxx-XV072	Qxxx-XV170	Qxxx-YH100	Q240-YH300	Pxxx-XN052	Pxxx-XH170
Rxxx-YV072	Rxxx-YN170	Qxxx-XN072	Qxxx-XN170	Qxxx-YV100		Pxxx-XV072	Pxxx-XV170
Rxxx-YN072	Rxxx-ZV072	Qxxx-XV100	Qxxx-XM245	Qxxx-YH123		Pxxx-XN072	Pxxx-XN170
Rxxx-YV100	Rxxx-ZV100	Qxxx-XN100	Qxxx-XH245	Qxxx-YV123		Pxxx-XV100	Pxxx-XM245
Rxxx-YN100	Rxxx-ZV123	Qxxx-XH123	Qxxx-XN245	Qxxx-YH145		Pxxx-XN100	Pxxx-XH245
Rxxx-YH123	Rxxx-ZV145	Qxxx-XV123		Qxxx-YV145		Pxxx-XH123	Pxxx-XN245
Rxxx-YV123		Qxxx-XN123		Qxxx-YH170		Pxxx-XV123	
PEXLIM P-Y		PEXLINK					
P228-YH300	P240-YH300	Qxxx-XV072L	Qxxx-YH145L	Rxxx-YH170L	Rxxx-ZM245L		
		Qxxx-XH123L	Qxxx-YV170L	Rxxx-YV245L	Rxxx-ZH245L		
		Qxxx-XV145L	Pxxx-XH245L	Rxxx-ZH145L			
		Qxxx-XV170L	Rxxx-YV052L	Rxxx-ZV145L			
		Qxxx-YV072L	Rxxx-YV100L	Rxxx-ZH170L			
		Qxxx-YH123L	Rxxx-YH145L	Rxxx-ZV170L			

For assembly of grading rings, please refer to section 6.2 on page 13.

**Table 6.1.2**

#### TWO-UNIT SURGE ARRESTERS

PEXLIM R	PEXLIM Q-X	PEXLIM Q-Y	PEXLIM P-X
-	Qxxx-XV024	Q258-YH300 - Q276-YH300	Pxxx-XV245
	Qxxx-XV036	Qxxx-YV300	Pxxx-XH300
	Qxxx-XV052	Qxxx-YH362	Pxxx-XV300
	Qxxx-XN052	Qxxx-YV362	Pxxx-XH362
	Qxxx-XV072	Qxxx-YH420	Pxxx-XV362
	Qxxx-XN072	Qxxx-YV420	Pxxx-XH420
PEXLIM P-Y	PEXLINK		
P258-YH300 - P276-YH300	Qxxx-XH300L	Pxxx-XH420	
Pxxx-YV300	Qxxx-XH362L	Rxxx-ZV245L	
Pxxx-YM362	Qxxx-XH420L	Rxxx-ZH300L	
Pxxx-YH362	Qxxx-YH300L	Rxxx-ZV300L	
Pxxx-YV362	Qxxx-YH362L	Rxxx-ZH362L	
Pxxx-YH420	Qxxx-YH420L	Rxxx-ZH420L	
Pxxx-YV420	Pxxx-XH300L		
Pxxx-YH550	Pxxx-XH362L		

For assembly of grading rings and units, please refer to section 6.3 on page 14.

# Assembly of units and grading rings

## 6.2 Assembly of one-unit surge arrester

### PEXLIM

4 x M12x25  
4 x Washer

57 Nm  
M12

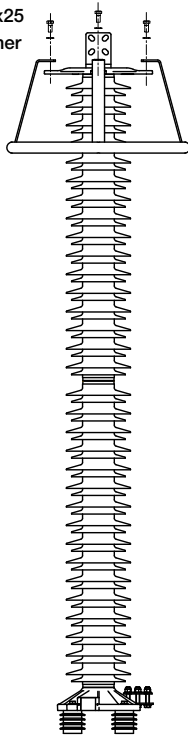


Figure 6.2.1

PEXLIM surge arrester for vertical upright mounting

### PEXLINK

4 x M12x25  
4 x Washer

57 Nm  
M12

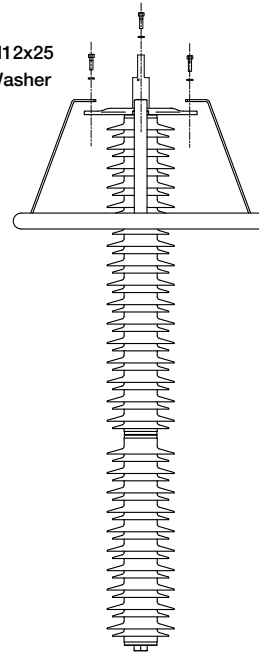


Figure 6.2.3

PEXLINK surge arrester with pre-assembled coupling at bottom

57 Nm  
M12

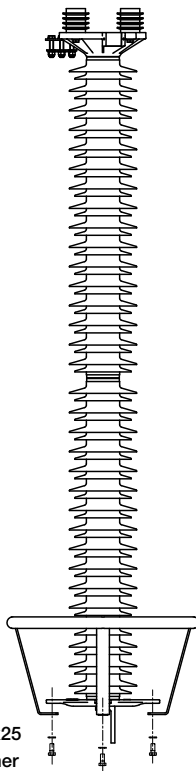


Figure 6.2.2

PEXLIM surge arrester for inverted mounting

# Assembly of units and grading rings

## 6.3 Assembly of two-unit surge arrester

### PEXLIM

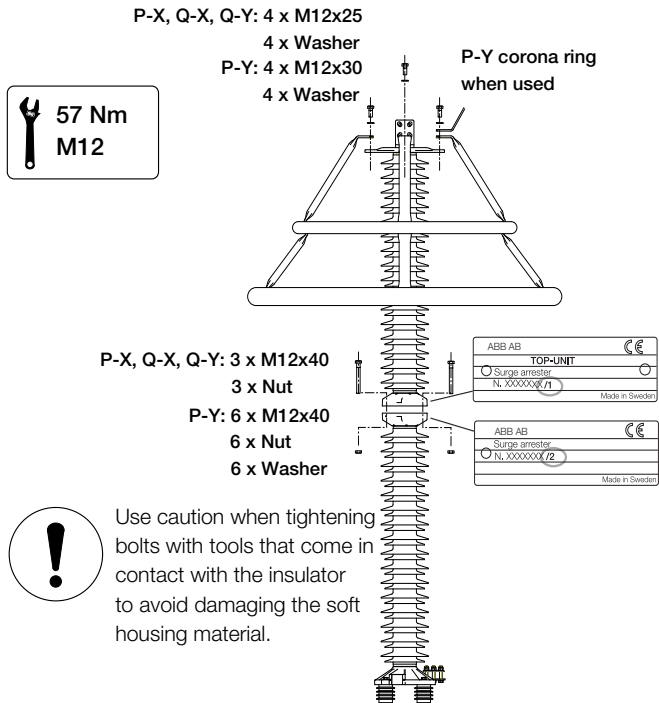


Figure 6.3.1  
PEXLIM surge arrester for vertical upright mounting

### PEXLINK

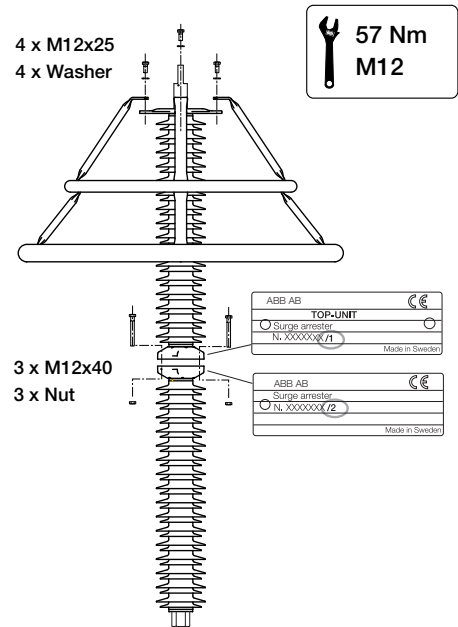


Figure 6.3.3  
PEXLINK surge arrester with pre-assembled coupling at bottom

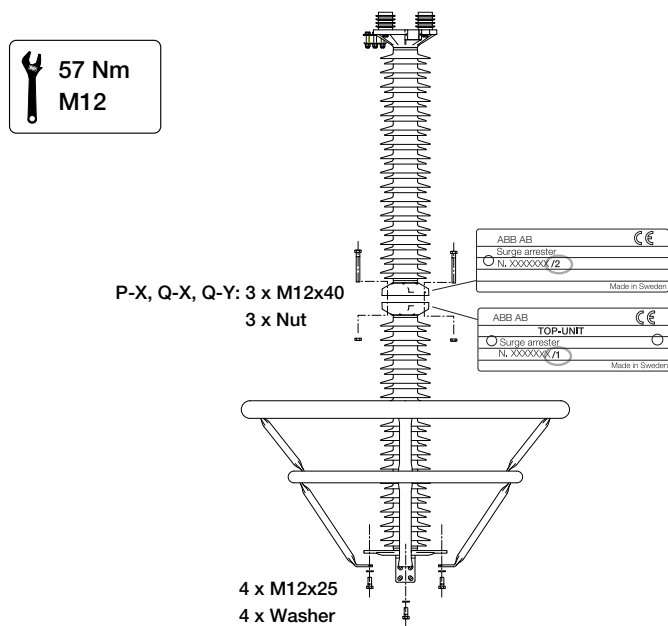


Figure 6.3.2  
PEXLIM surge arrester for inverted mounting

## 7. Installation on structure

### 7.1 Installation on structure without insulating base

This section covers installation of PEXLIM surge arrester on a structure without insulating base. For installation on a structure with insulating base see paragraph 7.2.

Ensure that the distances between the drilling holes in the structure are according to the corresponding figure below. PEXLIM R has the possibility to use two different drilling plans; either the drilling plan in figure 7.1.2 or the alternative drilling plan in figure 7.1.1. PEXLIM Q and PEXLIM P-X have only the drilling plan in figure 7.1.1. PEXLIM P-Y has the possibility to use two different drilling plans, either the drilling plan in figure 7.1.3 or the alternative drilling plan in figure 7.1.4.

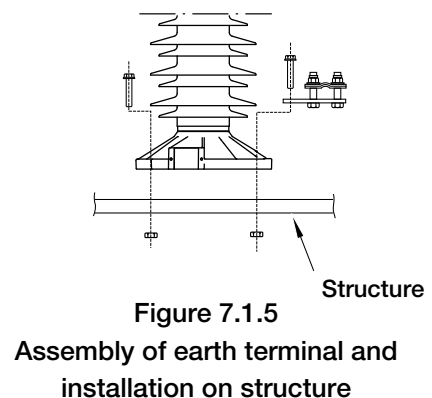
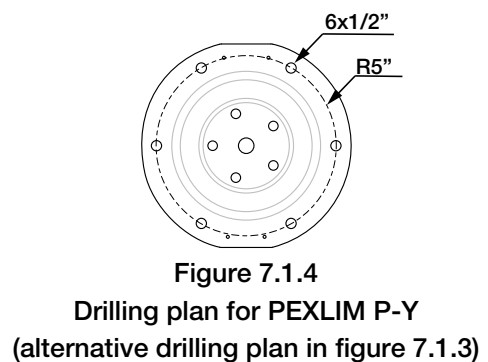
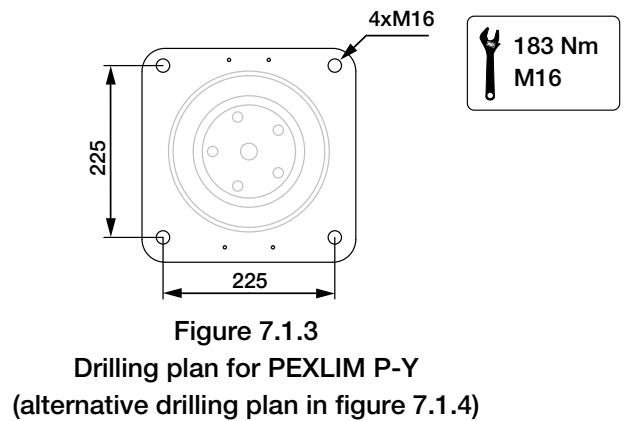
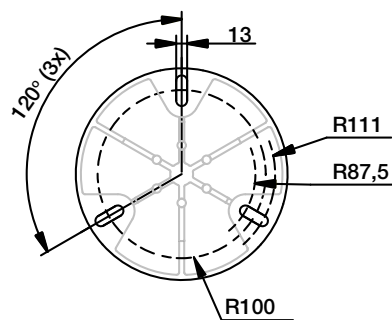
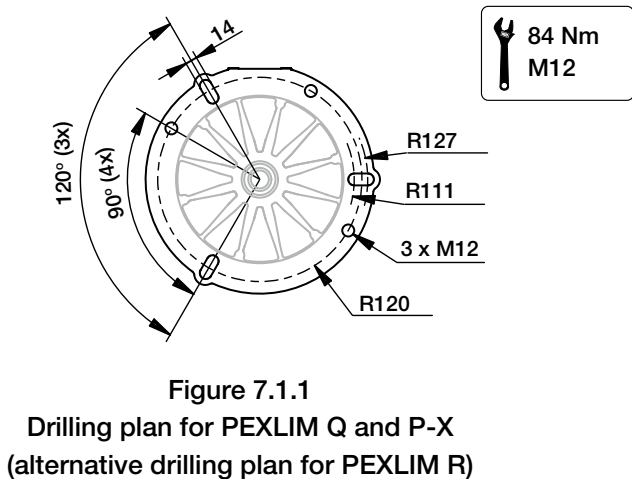


Note the lifting instructions in section 3 on page 7 before undertaking installation.

Anchoring bolts and nuts are **not** provided with the arrester.

Ensure that the chosen bolts have sufficient mechanical strength, to handle the loads described in paragraph 8.1 on page 18.

Fit the arrester to the structure and the earth terminal to the flange according to figure 7.1.5



## Installation on structure

### 7.2 Installation on structure with insulating base

This instruction covers insulating base 1HSA430 000-A, -B, -C, -D -H and -J. See separate instruction for other types. 1HSA430 000-B is identical to -A and 1HSA430000-D is identical to -C, respectively, except that the bolts used are UNC-type. If you have purchased -B or -D, please use the bolts size indicated in brackets. Insulating base 1HSA430 000-H is for use with the standard PEXLIM R and includes three insulating blocks instead of four.

#### Insulating base from other manufacturer

In the case where another insulating base is to be fitted, the installation instructions included with the delivery shall be followed.

#### Drilling plan

Ensure that the distances between the drilling holes in the structure are according the corresponding figure below. PEXLIM R has the possibility to use two different drilling plans; either the drilling plan in figure 7.2.2 or the alternative drilling plan in figure 7.2.1. PEXLIM Q and PEXLIM P-X only have the drilling plan in figure 7.2.1. PEXLIM P-Y has the possibility to use two different drilling plans, either the drilling plan in figure 7.2.3 or the alternative drilling plan in figure 7.2.4

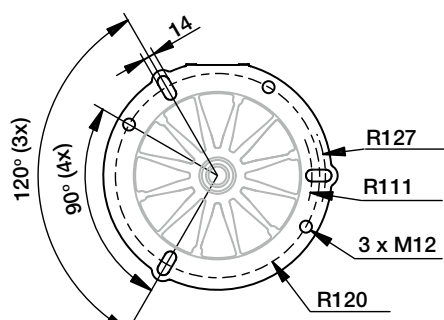


Figure 7.2.1  
Drilling plan for  
PEXLIM Q and P-X  
(alternative drilling plan for PEXLIM R)

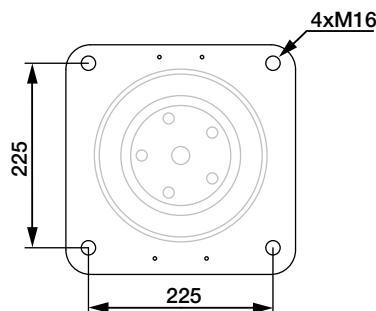


Figure 7.2.3  
Drilling plan for PEXLIM P-Y  
(alternative drilling plan in figure 7.2.4)

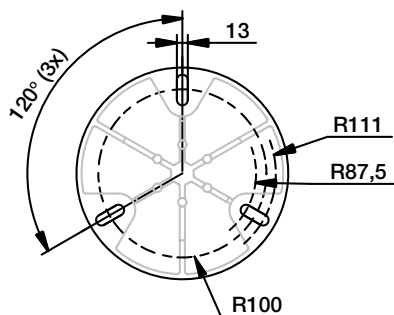


Figure 7.2.2  
Drilling plan for PEXLIM R  
(alternative drilling plan in figure 7.2.1)

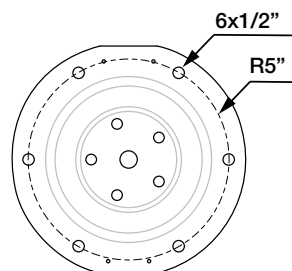


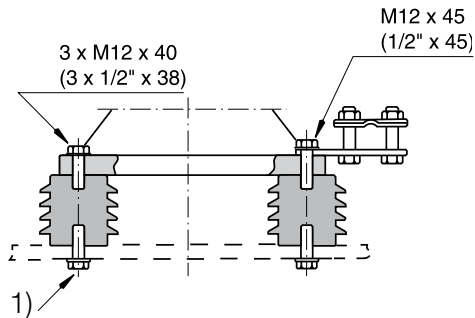
Figure 7.2.4  
Drilling plan for PEXLIM P-Y  
(alternative drilling plan in figure 7.2.3)



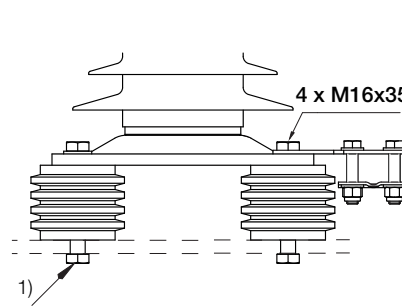
## Installation on structure

### Earth terminal or EXCOUNT-II

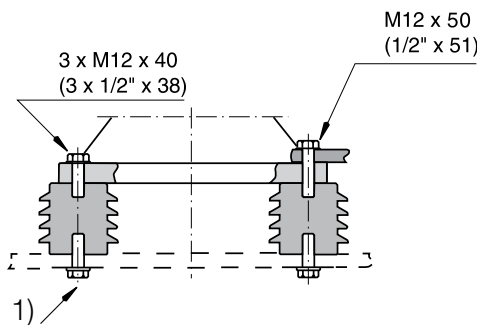
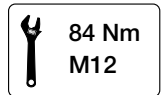
As per the below figures, a longer bolt may be used to fix the earth terminal or mount the surge arrester monitor EXCOUNT-II on the flange. Since the bolt sets are used for different applications sometimes not all bolts are used. Recommended tightening torque is as indicated.



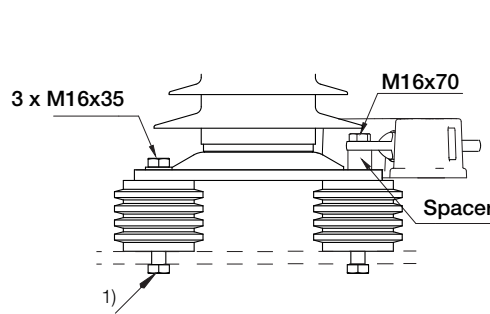
**Figure 7.2.5**  
PEXLIM R, Q and P-X with earth terminal and/or surge counter EXCOUNT-C and EXCOUNT-I



**Figure 7.2.7**  
PEXLIM P-Y with earth terminal and/or surge counter EXCOUNT-C and EXCOUNT-I



**Figure 7.2.6**  
PEXLIM R, Q and P-X with diagnostic indicator EXCOUNT-II



**Figure 7.2.8**  
PEXLIM P-Y with diagnostic indicator EXCOUNT-II

#### 1) Requirements on M16 / M12 (1/2") bolts for installation to structure:

- These bolts are not supplied with the arrester.
- Recommended tightening torque: Acc. to strength class.
- Strength class: 8.8 or higher
- Material: Hot dip galvanized steel or waxed stainless steel.
- Required threaded grip length: 15 to 20 mm.
- A washer shall be placed under the bolts head.

## 8. Connection of conductors

### 8.1 Mechanical load of the surge arrester

The bending moment (in Nm) acting at the base of a surge arrester is that resulting from the vector sum of all possible loads (eg. line conductor load, wind load, arrester weight, earthquake, etc) in the direction perpendicular to the arrester axis.

PEXLIM surge arresters are dimensioned to withstand bending moments according to table 8.1.1. To obtain the best protection performance, **the arresters must be connected with as short connectors as possible to both line and earth.** However the mechanical aspects must be taken into consideration. Terminals with clamps accept conductors of diameter in the range 8-34 mm.

The PEXLIM design may present a visible deflection at normal load. It is recommended to connect the line conductor vertically to further reduce the mechanical stresses.

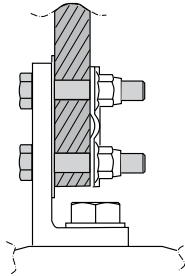
**Table 8.1.1**

Service loading	PEXLIM R-Z	PEXLIM R-Y	PEXLIM Q and PEXLIM P-X	PEXLIM P-Y
Specified long-term load (SLL)	800 Nm	1000 Nm	2500 Nm	6000 Nm
Specified short-term load (SSL)	1300 Nm	1600 Nm	4000 Nm	9000 Nm
Definitions as per IEC 60099-4				

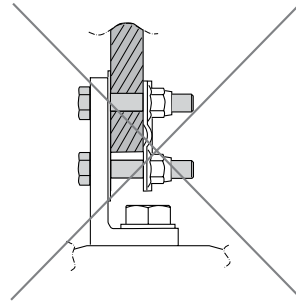
## Connection of conductors

### 8.2 Connection of the conductor

Connection of the conductor must be done correctly. The conductor must be fixed edge to edge with the clamp, see figure 8.2.1 and 8.2.2 below.



**Figure 8.2.1**  
Correct  
installation



**Figure 8.2.2**  
Warning!  
Faulty connection

#### Compatible conductor material

All earth terminals are compatible with both copper and aluminium conductors.



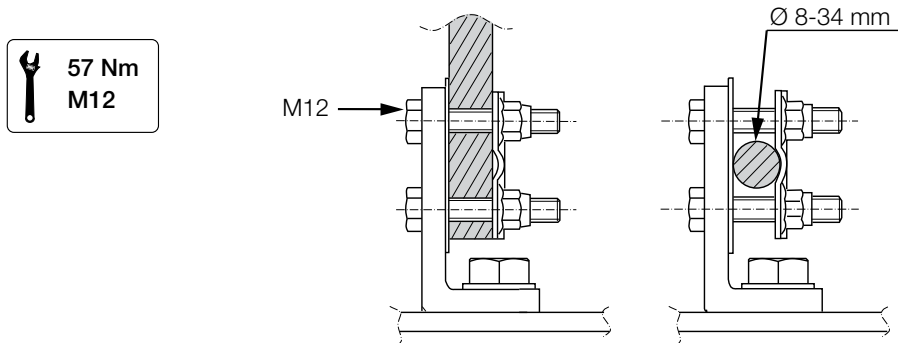
Line terminal 1HSA410 000-P is manufactured from stainless steel and 1HSA410 000-M is aluminium together with a stainless steel clamp and spacer. These terminals are thus suitable for use with both aluminium and copper conductors.

Line terminals 1HSA410 000-L and -N are manufactured of aluminium. In the case where these are used together with copper conductors, preventative measures must be taken to avoid direct contact between aluminium and copper which could lead to bi-metallic corrosion.

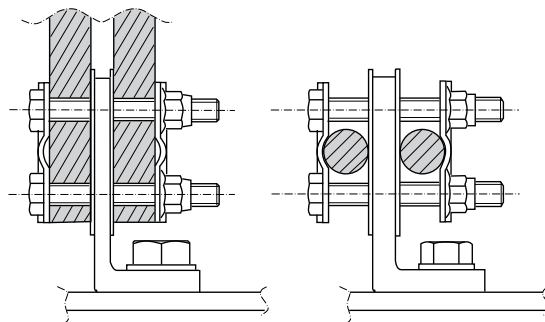
## Connection of conductors

### 8.3 Connection of the conductor to the line terminal

Connect the line conductor to the line terminal in such way that the permissible static loading together with steady wind load does not exceed the maximum value according to table 8.1.1 on page 18.



**Figure 8.3.1**  
Connection of single line conductor  
can be done from top or side.



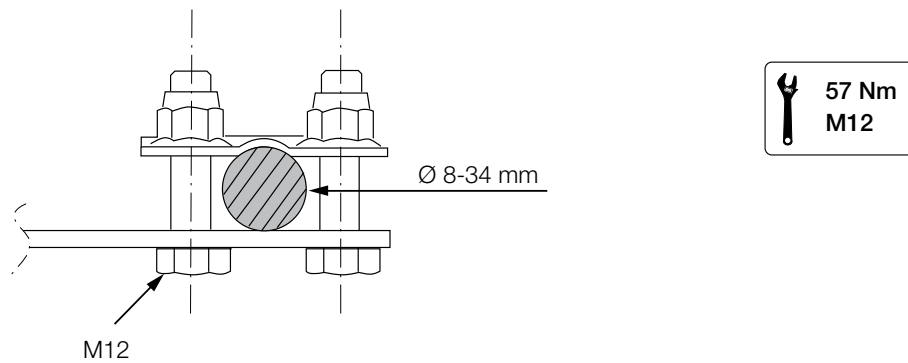
**Figure 8.3.2**  
Connection of double line conductor  
can be done from top or side.

## Connection of conductors

### 8.4 Connection of the conductor to the earth terminal

For installation of surge counter in series with the earth conductor, please see paragraph 8.5 on page 22.

The earth conductor cross section shall be chosen in accordance with local regulations and earth fault current requirements. For assembly of earth terminal to flange, see figure 7.1.5 on page 15. For assembly of clamp see figure 8.4.1.



**Figure 8.4.1**  
**Earth terminal**

## Connection of conductors

### 8.5 Installation of surge counter

For installation of surge arrester monitor EXCOUNT-II, see section 7.2 on pages 16/17 together with the separate assembly instruction included with the delivery.

For installation of a surge counter EXCOUNT-C, EXCOUNT-I or surge counter from another manufacturer, ensure that:

- The arrester is insulated from the structure by an insulating base with a LIWL of at least 15 kV or equal to that of the conductor between the surge arrester and the surge counter (see below), whichever is the greater.
- The length of the conductor between the arrester and the surge counter is to be minimum 0,5 m when a clip-on CT is to be used for control measurements of leakage current. The maximum length shall not exceed 3 m in the case of the insulating base and conductor having a LIWV of 15 kV. Longer lengths up to 10 m could be used with an insulating base having suitably higher LIWV. The insulated base and conductor shall then be insulated for  $5 \times L$  kV (LIWV), where L is the conductor length in meters as shown in figure 8.5.1. Note that connection leads should always be kept as short as possible as longer leads result in a disadvantage from a protection point of view since inductance is added in series with the arrester.
- The conductor from the earth terminal of the counter to connection with the grounded support stand (point A in figure 8.5.1) on to which the counter is attached (or similar support) shall not exceed 0,5 m. For example, length B as shown in figure 8.5.1. The earth conductor may be extended from the connection point at the support to any "earth point" if the support itself, due to local requirements, is not considered as sufficiently grounded. However a flashover of the arrester base may occur if the length (L+B in figure 8.5.1) results in the LIWV as described above being exceeded and the counter may be damaged if the length B exceeds 0.5 m.
- The surge counter is to be installed according to the included assembly instruction.

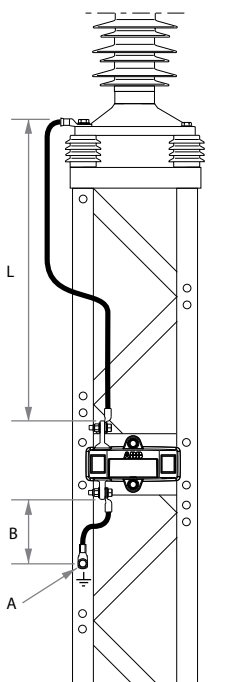


Figure 8.5.1

Standard ABB insulated base	Maximum length L *)
1HSA430 000-A, -B	10 m
1HSA430 000-C, -D	10 m
1HSA430 000-H, -J	10 m
1HSA430 000-P	3 m

\*) On the condition the connecting conductor has at least  $LIWV = 5 \times L$  kV

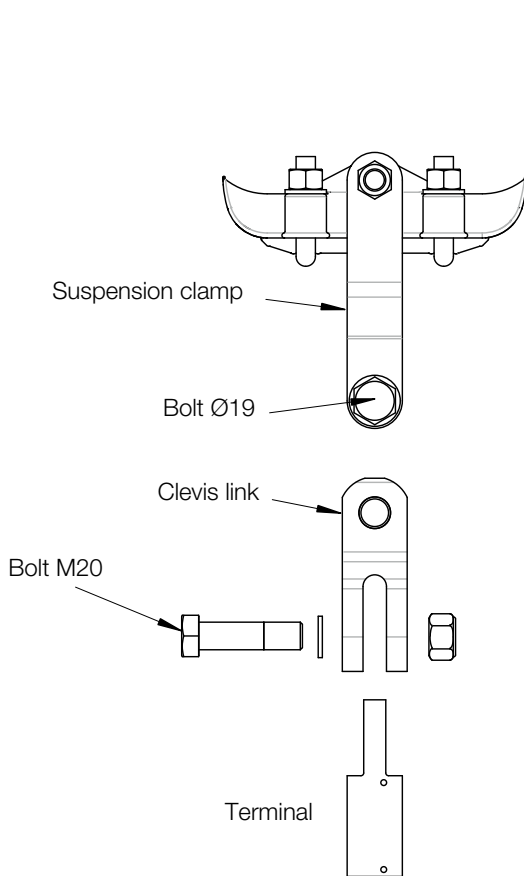
## 9. Assembly of PEXLINK

### 9.1 Assembly of terminal and links

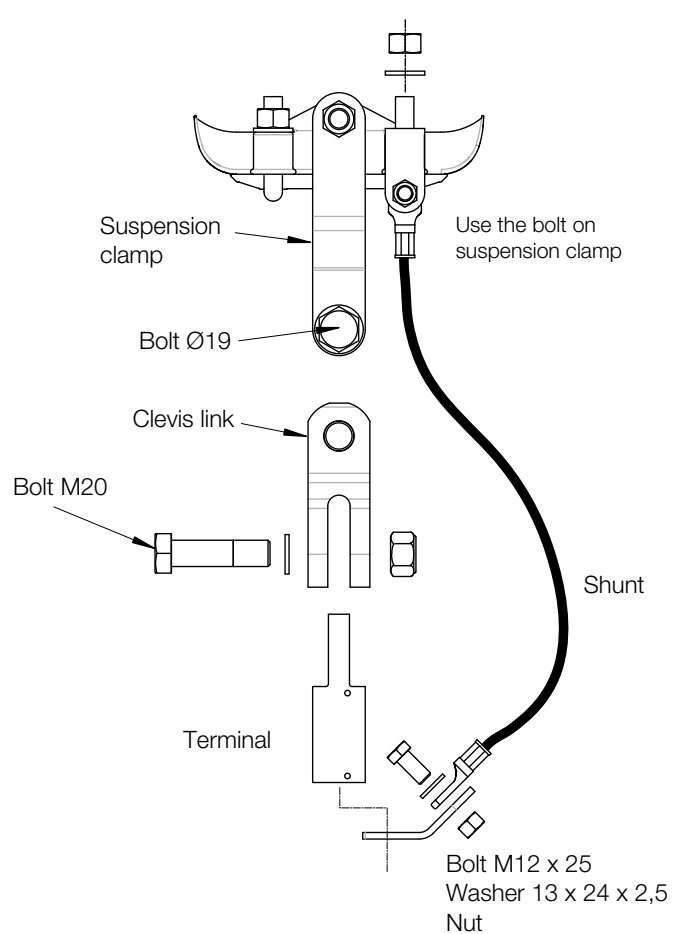


The following details for assembly of PEXLINK applies to the common installation alternatives and is included here for information only unless otherwise stated. In the event that a separate installation instruction is supplied with the actual delivery, this shall always take precedence.

The terminal is pre-assembled from the factory. Fit the suspension clamp and the clevis link together with the terminal, see figure 9.1.1. If a shunt should also be installed, follow figure 9.1.2 instead.



**Figure 9.1.1**  
Terminal link without shunt



**Figure 9.1.2**  
Terminal link with shunt



**When tightening the bolt in clevis link the following conditions shall be met:**

Bolt and nut M20 in clevis link shall be firmly fastened in clevis link, but shall allow the clevis link to rotate in the line terminal.

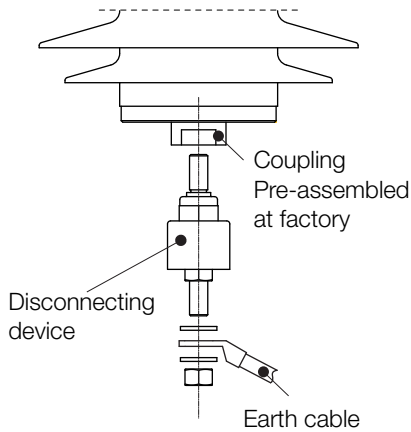
# Assembly of PEXLINK

## 9.2 Assembly of disconnecting device

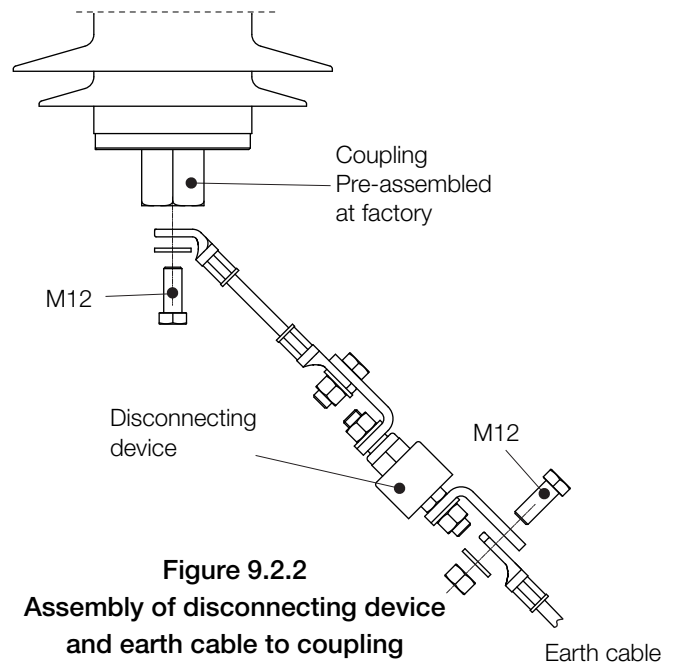
If the PEXLINK transmission line arrester should be installed with EXCOUNT-II, please also refer to the instructions according to section 9.3 on the next page.

Assemble the disconnecting device to the pre-assembled coupling, figure 9.2.1, or figure 9.2.2, as appropriate to the type of PEXLINK transmission line arrester. For details of assembly for the disconnecting device, see figure 9.2.3. Maximum load of the disconnecting device is given in the table 9.2.1.

The dimension of the earth cable is recommended to be at least 70 mm<sup>2</sup> (flexible copper).



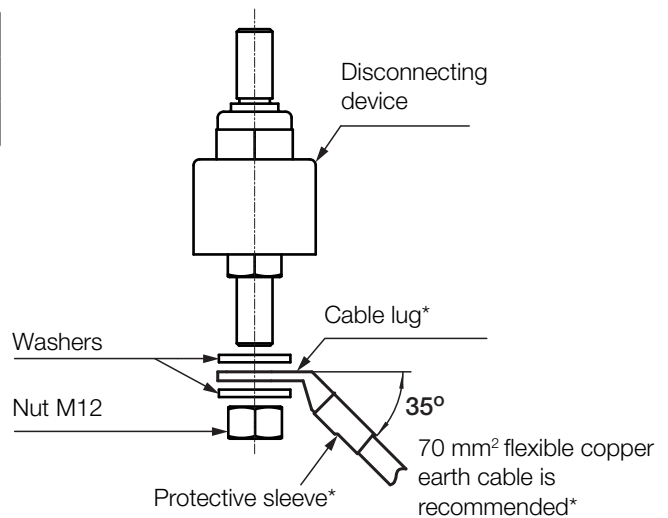
**Figure 9.2.1**  
Assembly of disconnecting device and earth cable to coupling



**Figure 9.2.2**  
Assembly of disconnecting device and earth cable to coupling

**Table 9.2.1**

Maximum load allowed for disconnecting device:	
Max. bending force:	1000 N
Max. tensile force:	2400 N



**Figure 9.2.3**  
Detail of disconnecting device

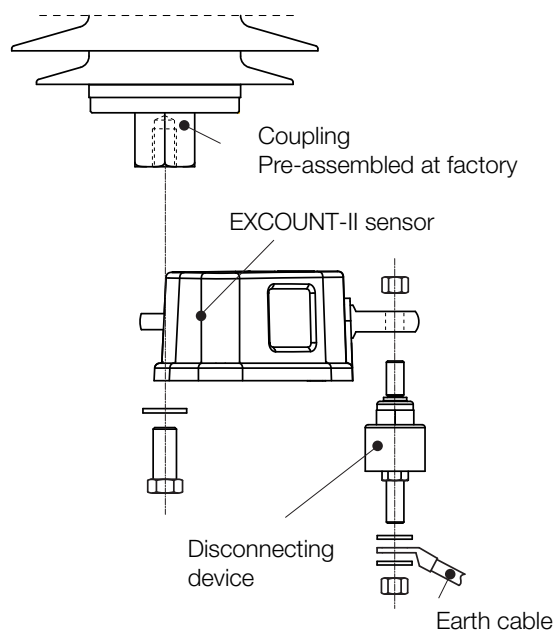
\* Items not supplied unless specifically stated at order



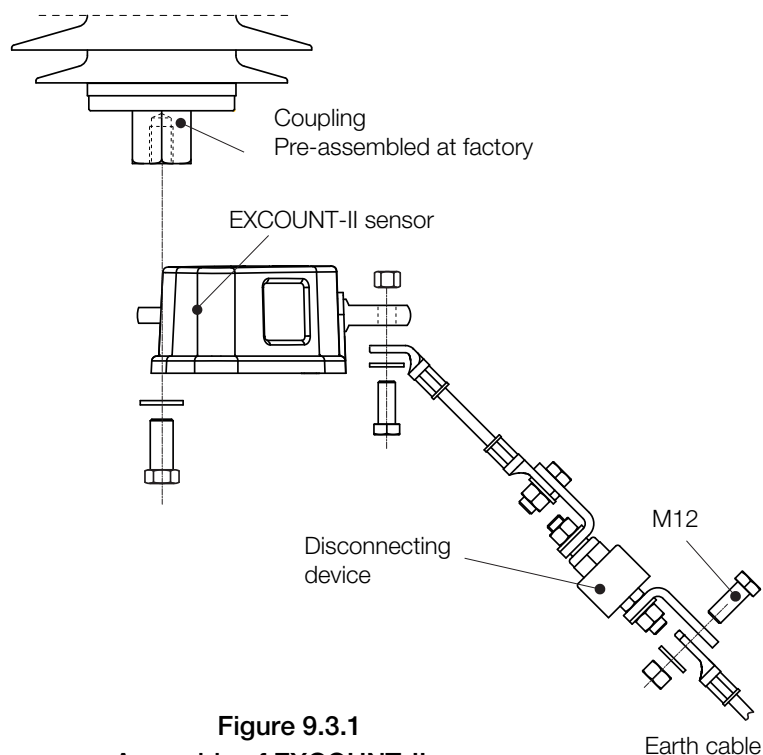
## Assembly of PEXLINK

### 9.3 Assembly of EXCOUNT-II

Assemble the EXCOUNT-II sensor to the pre-assembled coupling, figure 9.3.1 or figure 9.3.2, as appropriate to the type of PEXLINK transmission line arrester. For more information about assembly of the disconnecting device, please also refer to the instructions according to section 9.2 on the previous page.



**Figure 9.3.1**  
Assembly of EXCOUNT-II on  
PEXLINK with coupling



**Figure 9.3.1**  
Assembly of EXCOUNT-II on  
PEXLINK with coupling

## 10. Maintenance

### 10.1 Maintenance and checking

A properly chosen and installed PEXLIM surge arrester is maintenance free during its lifetime, when operating under normal operating conditions. However, the tightening torques on terminals shall be checked and, if necessary, adjusted to the correct value at inspections of the plant. A properly chosen arrester means that both its electrical capability as well as its mechanical design correspond to the service conditions of the actual network.

#### Cleaning

PEXLIM arresters do not require any cleaning of the external surfaces for their lifetime. The surface may appear to be dirty, but this is of no significance.

Should, for any reason, the arresters be subjected to live washing observe the following in addition to normal precautions for live washing:

- Arrester insulators usually have shorter flashover distances than other insulators for the same system voltage, which means higher risk for external flashover during washing.
- Arresters must be spray-washed evenly in order to avoid overheating.
- Do not use water under high pressure, otherwise the soft silicone housing may be damaged.

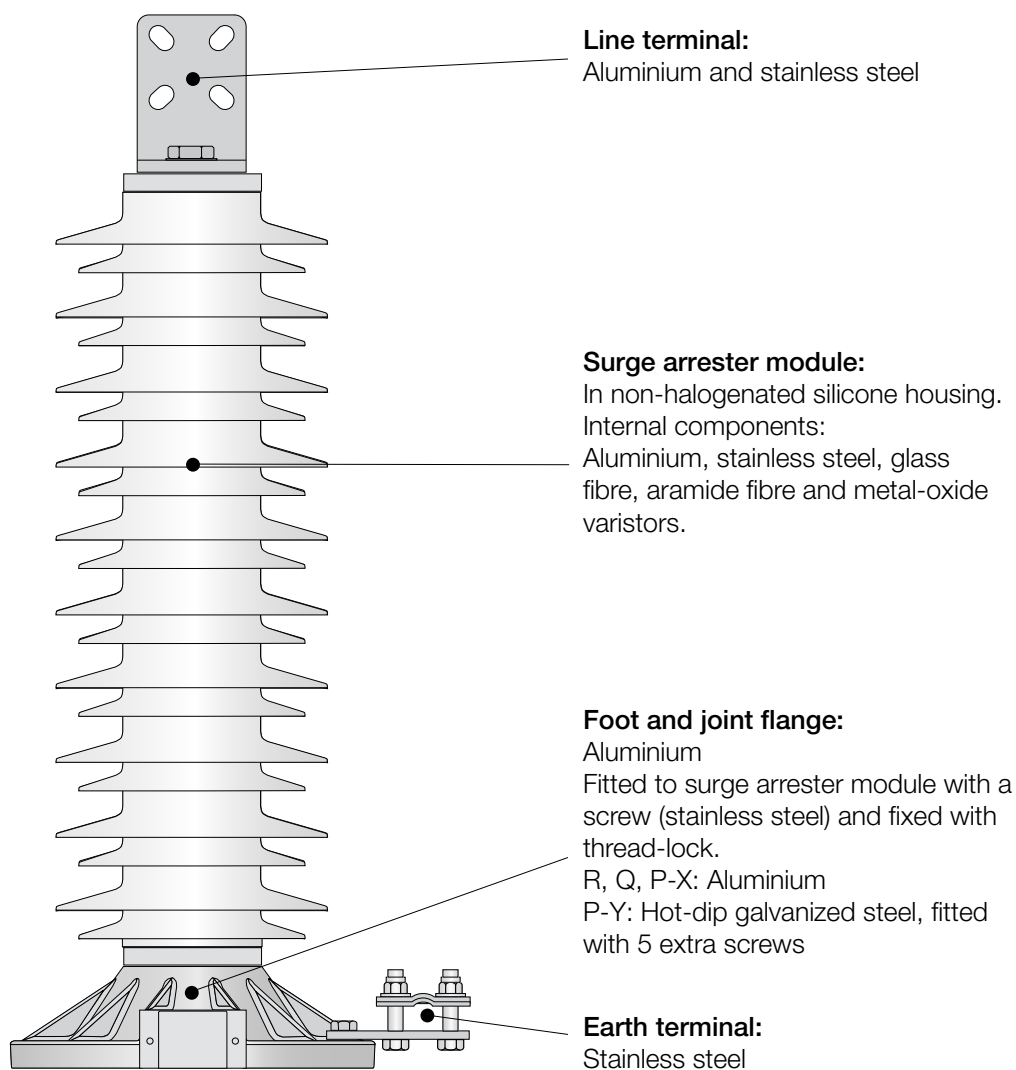
#### General

Should a routine check be desired, the only reliable method is to periodically measure the resistive component of the leakage current. For this purpose, use of Leakage Current Monitor, LCM, or ABB surge arrester monitor, EXCOUNT-II is recommended. For description of the LCM/EXCOUNT-II and measurement procedures, please refer to the relevant catalogues.

## 11. Disposal

### 11.1 Disposal of the surge arrester

When the surge arrester is taken out of service due to age or in case of an arrester overload, its components shall be disposed of according to local regulations. Each surge arrester module is moulded in a silicone housing which is completely bonded to the internal components. This makes full disassembly difficult for separate disposal. The composition of the arrester is shown in the figure below.



# Contact us

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