

ATEX

Product Manual



IMPORTANT:

Read manual carefully before installation of product

PROCOM A/S



Read this product manual carefully before installing the antenna. The latest version of this manual can be downloaded at www.procom.dk or requested by contacting sales at sales@procom.dk.

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ATEX Products covered by this manual:

- CXL 130-1-Ex
- CXL 130-1LW-SS-Ex
- CXL 150-1LW-SS-Ex
- CXL 150-3LW-SS-Ex
- CXL 450-1LW-SS-Ex
- CXL 450-3LW-SS-Ex
- CXL 900-1LW-SS-Ex
- CXL 1700-2700LW-SS-Ex
- MA 160-Ex
- MA 450-Ex
- GPS 4-Ex



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1. Introduction

The ATEX certified antennas are developed and produced by PROCOM A/S. The antennas are designed to cover different frequency bands with different gain options. For more details about the specifications please refer to the product datasheets. The antennas are certified for use in zone 2 as group II equipment in atmospheric explosive areas. The antennas can be installed indoor or outdoor.

1.1 Access to the document

Keep this document in the vicinity of the antenna installations. The personnel should be advised on where the manual is kept and have access to it.

1.2 Available PROCOM ATEX Antenna models

The table below shows the available PROCOM ATEX antenna models

Antenna	Frequency	Gain	Type	Operating Temperature Range	Max Power IIC [dBm]*	Max Power IIB [dBm]*	Max Power IIA [dBm]*	Product number
CXL 130-1LW-SS-Ex	118-137MHz	0 dBd	Omni	-30°C - 60°C	30.8	33.3	35.6	11500001
CXL 130-1-Ex	118-137MHz	0 dBd	Omni	-30°C - 60°C	30.8	33.3	35.6	115000026
CXL 150-1LW-SS-Ex/s	138-156MHz	0 dBd	Omni	-30°C - 60°C	30.8	33.3	35.6	115000005
CXL 150-1LW-SS-Ex/l	144-165MHz	0 dBd	Omni	-30°C - 60°C	30.8	33.3	35.6	115000004
CXL 150-1LW-SS-Ex/h	155-175MHz	0 dBd	Omni	-30°C - 60°C	30.8	33.3	35.6	115000003
CXL 150-3LW-SS-Ex	146-174MHz	3 dBd	Omni	-30°C - 60°C	27.8	30.3	32.6	115000006
CXL 450-1LW-SS-Ex/l	380-430MHz	0 dBd	Omni	-30°C - 60°C	30.8	33.3	35.6	115000010
CXL 450-1LW-SS-Ex/h	420-470MHz	0 dBd	Omni	-30°C - 60°C	30.8	33.3	35.6	115000011
CXL 450-3LW-SS-Ex/s	380-410MHz	3 dBd	Omni	-30°C - 60°C	27.8	30.3	32.6	115000013
CXL 450-3LW-SS-Ex/f	406-430MHz	3 dBd	Omni	-30°C - 60°C	27.8	30.3	32.6	115000014
CXL 450-3LW-SS-Ex/l	420-450MHz	3 dBd	Omni	-30°C - 60°C	27.8	30.3	32.6	115000015
CXL 450-3LW-SS-Ex/h	440-470MHz	3 dBd	Omni	-30°C - 60°C	27.8	30.3	32.6	115000016
CXL 900-1LW-SS-Ex/l	824-894MHz	0 dBd	Omni	-30°C - 60°C	30.8	33.3	35.6	115000032
CXL 900-1LW-SS-Ex/h	870-960MHz	0 dBd	Omni	-30°C - 60°C	30.8	33.3	35.6	115000033
CXL 1700-2700LW-SS-Ex	1700-2700MHz	0 dBd	Omni	-30°C - 60°C	30.8	33.3	35.6	115000017
MA 160-Ex	156-161MHz	0 dBd	Omni	-30°C - 60°C	30.8	33.3	35.6	115000027
MA 450-Ex	380-400MHz	0 dBd	Omni	-30°C - 60°C	30.8	33.3	35.6	115000030
MA 450-Ex	440-460MHz	0 dBd	Omni	-30°C - 60°C	30.8	33.3	35.6	115000031
GPS 4-Ex	1575-1650MHz	2 dBic	Omni	-30°C - 60°C	-	-	-	115000029

Table 1: Overview of available ATEX antenna models and maximum RF input power for different ATEX groups. Note that GPS 4-Ex antenna must only be used for receiving and hence no specified Max power.

*Maximum power at the antenna input port with respect to IIA, IIB and IIC gas group



2. Safety Instructions

WARNING:

Never disconnect RF cables or connectors associated with a transmitter in operation.

WARNING:

The maximum input power given in Table 1: at the antenna port must not be exceeded.

WARNING:

Before handling and after installation the antenna must be wiped with a damp cloth.

WARNING:

The absolute minimum distance from the glass fiber radome (radiating part) of the antennas to any metallic surface/wall is 1m.

2.1 Power Limit

Before installations it is necessary to calculate the effective isotropically radiated power (EIRP) of the antenna. The threshold of EIRP of the antenna shall be limited to 2, 3.5 or 6 watt for IIA, IIB and IIC respectively (see EN 60079-0:2012 & EN 60079-14:2014 § 6.7). The example below shows how the power can be calculated. The following formula is used to calculate the transmitting power:

$$P_t = \text{EIRP} + L_c - G_a \quad (1)$$

Where P_t is the transmitter power, L_c is the cable loss and G_a is the antenna gain

2.1.1 Example of RF threshold power calculation

A CXL 450-3LW-SS-Ex antenna is used at zone 2 with group IIC. The maximum EIRP power for group IIC is 2W (33dBm). The gain of the antenna is 3dBd (5.15dBi).

The cable loss from the transmitter to the antenna is 8.25dB.

The maximum allowed transmitted power P_t can be determined as:

$$P_t = \text{EIRP} + L_c - G_a$$

$$P_t = 33 + 8.25 - 5.15 = 36.1\text{dBm}$$

From the above example it is found that the transmitter power in this case should not exceed 36.1dBm.

It is the responsibility of the installer to ensure that the maximum output power from the transmitter is met according to EN 60079-0:2012.

WARNING:

The maximum input power given in Table 1: at the antenna port shall not be exceeded



2.2 Temperature Limit

The antennas are intended to be used within the ambient temperatures stated in the datasheet.

2.3 Electrostatic Hazard

To ensure a long lifespan the radome of the antennas is made of reinforced polyester glass fiber. The radome has a risk of being an electrostatic charge hazard. A label is mounted on the radome of the antennas stating that it is an electrostatic hazard.

WARNING:

Before handling and after installation the antenna must be wiped with a damp cloth.

2.4 Lightning Protection

In the design of installation of the antennas, steps shall be taken to reduce the effects of lightning to safe level in accordance with EN 60079-14:2014.

2.5 Installation Personnel

The installation of the antennas shall be carried out by trained personnel in accordance with the applicable code of practice (EN 60079-14:2014). The personnel must be aware of regulations required for explosion protection.

2.6 Grounding

The antenna must be installed so it has the same electrical potential as the system. This can be obtained for the LW-SS mounting bracket simply through the U-bolts. If the point of installation has a different electrical potential than the system, it's then necessary to install the grounding wire (to be bought separately) to ensure equipotential bonding in accordance with EN 60079-14:2014. See section 4.1 for instructions on how to install the ATEX grounding kit on the LW-SS mounting bracket.

It's only necessary to install the wire on the LW-SS and LW-SS-1" bracket, when the point of installation has a different electrical potential than the system.

Antennas delivered with the LW mounting bracket requires the installation of the grounding kit (included with the antenna) to ensure equipotential bonding in accordance with EN 60079-14:2014. See section 4.4 for instructions on how to install the ATEX grounding kit on the LW mounting bracket.

The 1" fixture is conductive and thereby only needs the ATEX grounding kit if the point of installation has a different electrical potential as the system. In the case where remote grounding is needed to ensure equipotential bonding, the LW-SS-1"-Ex is available as an accessory. See section 4.3 for instructions on how to install the ATEX grounding kit on the LW-SS-1" mounting bracket.

The open end of the wire must be fitted, using the supplied thimble and the two wire locks, and securely fastened to a point with the same electrical potential as the system. The ATEX grounding kit can be ordered separately as an accessory.



Figure 1: Grounding kit for equipotential bonding.

Item	Product number	Note
ATEX grounding kit	115000100	See the above figure
LW-SS-1"-Ex	115000102	For use with 1" fixture. ATEX grounding kit included

Table 2: Overview of accessories.



Figure 2: LW-SS-1"-Ex bracket



2.7 Periodic Inspection

The antennas and associated wiring must be periodically inspected by trained personnel in accordance with the applicable code of practice EN 60079-17:2014.

2.8 Damage

If the antenna or the grounding wire is damaged before installation, do not install it. Contact PROCOM A/S for replacement parts.

2.9 Reparation

Any kind of reparation of the antennas or the grounding wire shall only be carried out by PROCOM A/S.

2.10 Intended Usage

2.10.1 Installation

Read this product manual carefully before installing the antenna. The latest version of this manual can be downloaded at www.procom.dk or requested by contacting the sales@procom.dk.

2.10.2 Operation

PROCOM A/S is not liable for any damage caused by other usage of the antennas. The antennas shall only be used for the intended purpose and in accordance with the standards EN 60079-0:2012 and EN 60079-15:2010. All other usage is regarded as conflicting with the intended purpose. Please also refer to PROCOM A/S Terms and Conditions of sale.

2.11 Mechanical Stress

The antennas shall be transported and stored in a way that they are not subjected to any excessive mechanical stress. The antennas shall not be installed in locations where they may be subjected to damage.

2.12 Distance to metal surfaces or metal wall

The antennas must be mounted at least $\frac{1}{4} \lambda$ and minimum 1m from any metallic surface or metallic wall. Closer distances will degrade the antenna performance considerably.

WARNING:

The absolute minimum distance from the radome (radiating part) of the antennas to any metallic surface/wall is 1m.

2.13 Connection

Before making the antenna cable connection, check that the connectors are undamaged, clean and dry. The tightening torque should be between 0.7- 1.1 Nm for N-connectors.

3. Installation of Cold Shrink

The cable connection must be protected with cold shrink insulator (included with the antenna) or self-vulcanizing tape (not included with the antenna). The tape used must be suitable for outdoor environment and withstand temperatures in the range -30°C to +60°C. The tape must also protect the connection against water ingress according to IP66. Cold shrink insulator as 3M Cold Shrink PST B3 4.5/125/27.2 is used in the following example.

The installation of the Cold Shrink Tube on the connection of the antenna is described in the following steps.

Step1:

Insert the Cold Shrink Tube on the feeding cable (see below figure).



Figure 3: 3M cold shrink PST B3 4.5/125/27.2 inserted on the feeding cable.

Step2:

Position the Cold Shrink Tube on the cable at desired starting point (see below figure).

Step3:

Connect antenna and tighten the connector with a torque of 0.7-1.1 Nm for N-connectors (see below figure).

Step4:

Slide the Cold Shrink Tube against the connection and push on it (see below figure).

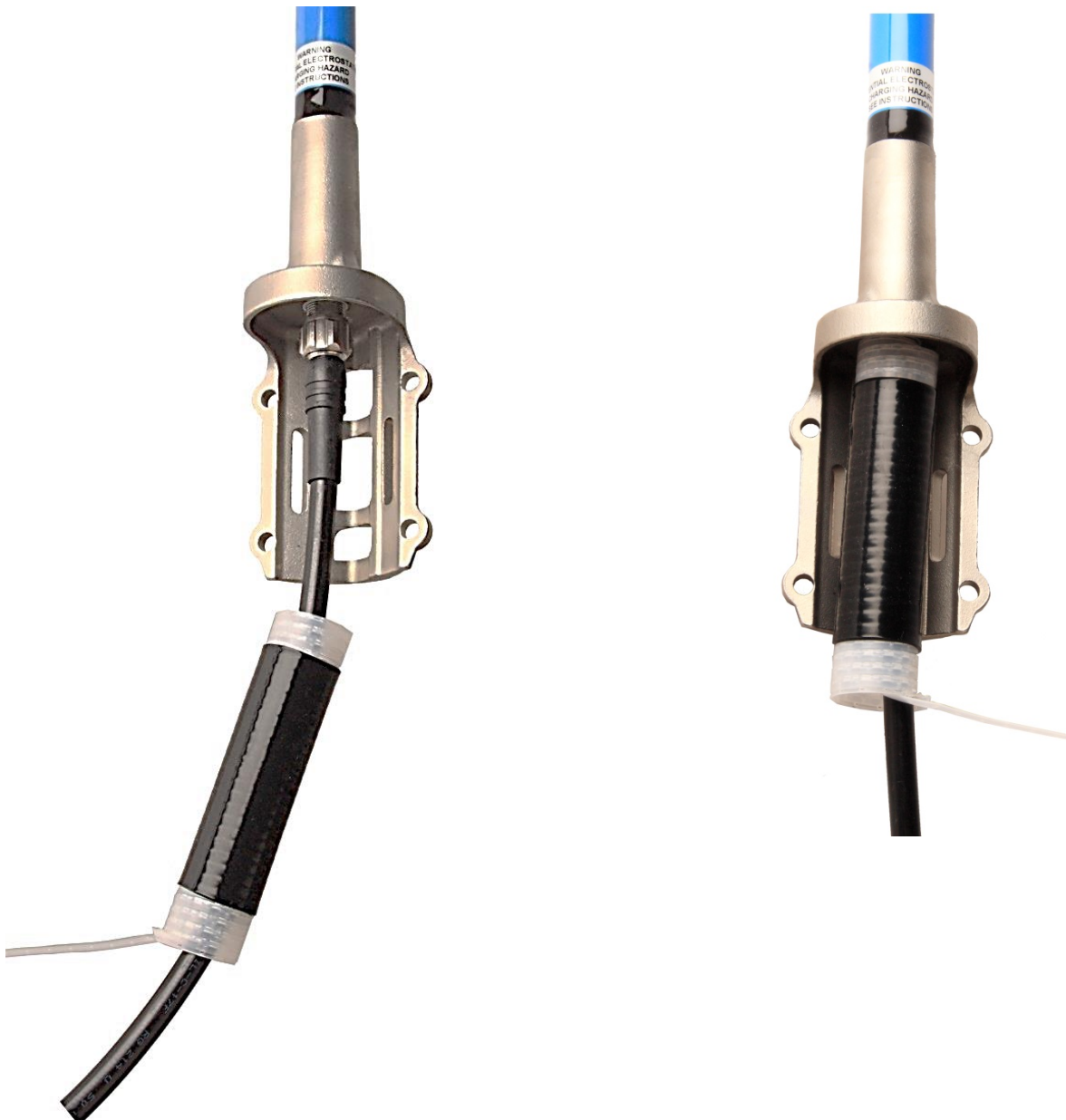


Figure 4: Location of "3M cold shrink PST B3 4.5/125/27.2" on the desired starting point.

Step5:

Pull the tab of the Cold Shrink insulator loose, while gently while unwinding in a counter-clockwise direction. Installation of the Cold Shrink Tube on the connection of the antenna is now complete (see below figure).



Figure 5: Installation of the "3M cold shrink PST B3 4.5/125/27.2" on the connection is complete.

WARNING:

If any mounted antenna is not connected, it must be terminated to avoid accumulation of energy, and the connection must be protected against water ingress according to IP66.

WARNING:

All antenna connection must be protected to avoid ingress of water.



4. Mounting Instructions

In the following sections the different option to mount the antennas are described

4.1 Antennas with LW-SS bracket

There are three ways to mount the antennas with the "LW-SS" bracket. The antennas with LW-SS bracket in this series are:

- CXL 130-1LW-SS-Ex
- CXL 150-1LW-SS-Ex
- CXL 150-3LW-SS-Ex
- CXL 450-1LW-SS-Ex
- CXL 450-3LW-SS-Ex
- CXL 900-1LW-SS-Ex
- CXL 1700-2700LW-SS-Ex

4.1.1 Mounting instruction for antennas located on top of the mast tube

Mount the antennas as shown in the following figures, and if necessary, how to install the ATEX grounding kit. The nuts and the bolt should be tightened with a torque of 2.5-3 Nm.

It's only necessary to install the wire on the LW-SS bracket, when the point of installation has a different electrical potential than the system.

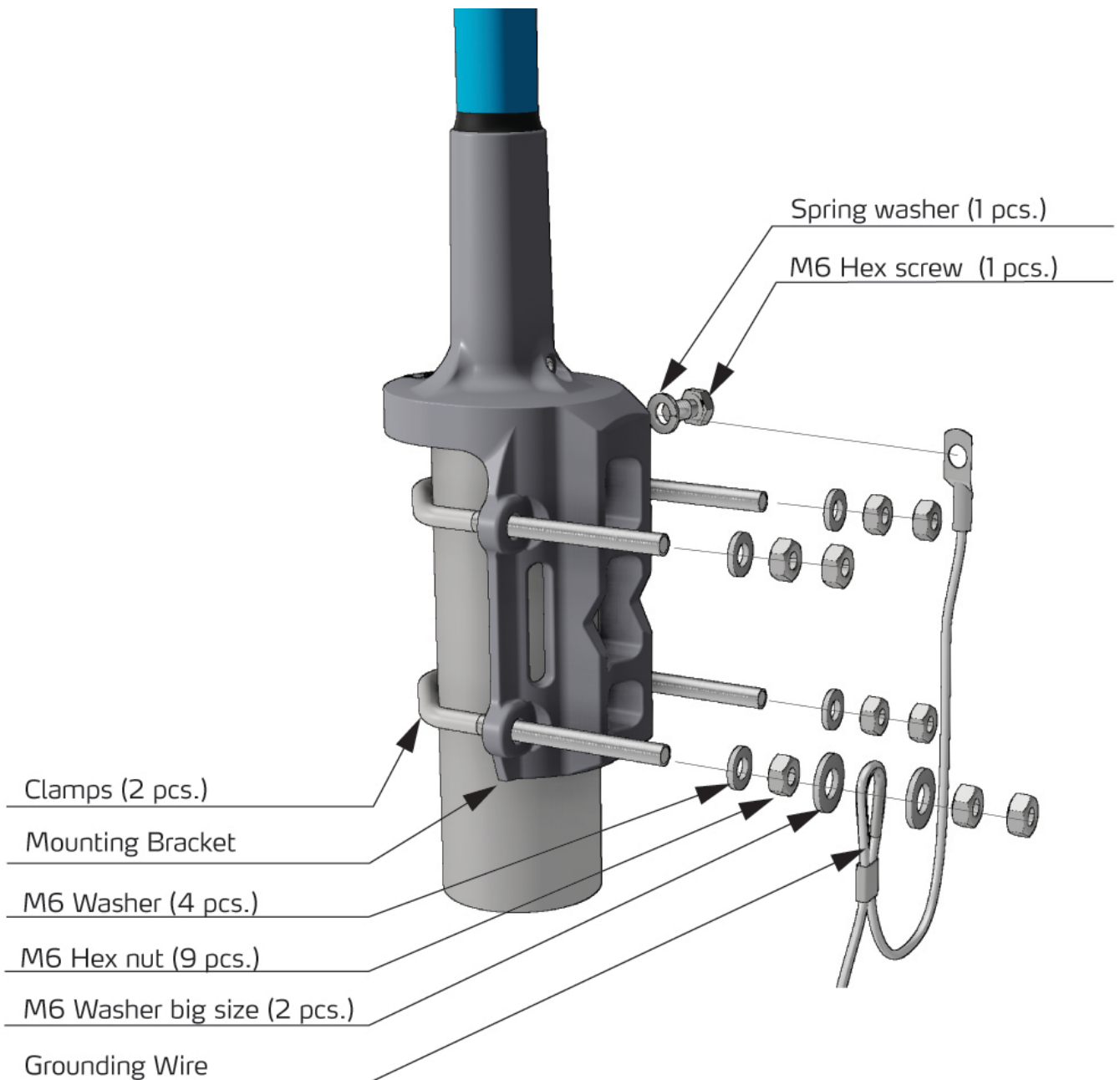


Figure 6: Mounting of the antennas with LW-SS-bracket on the top of the mast.

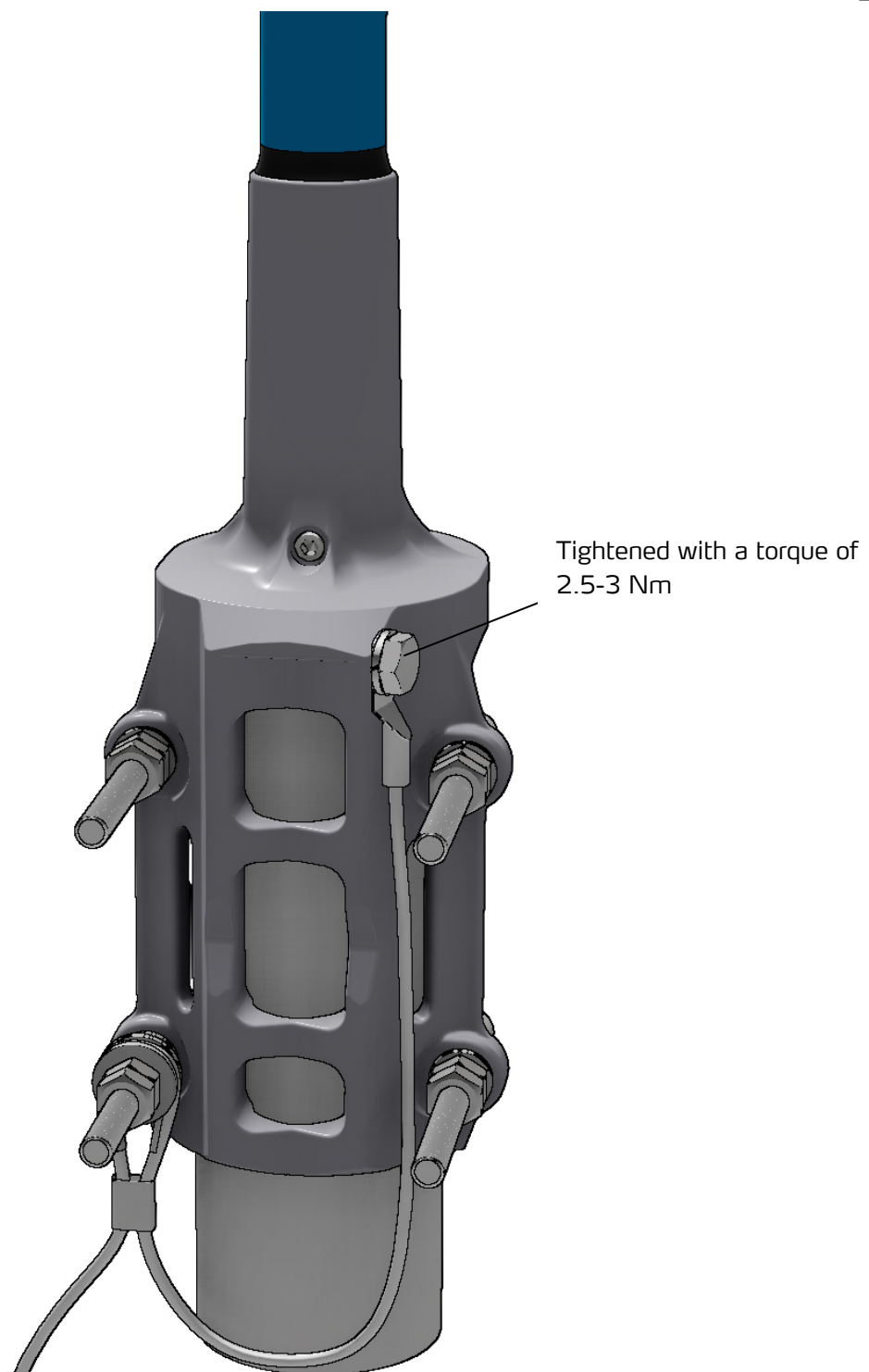


Figure 7: Mounting of the antenna with LW-SS-bracket on the top of the mast. (Viewed from the back)

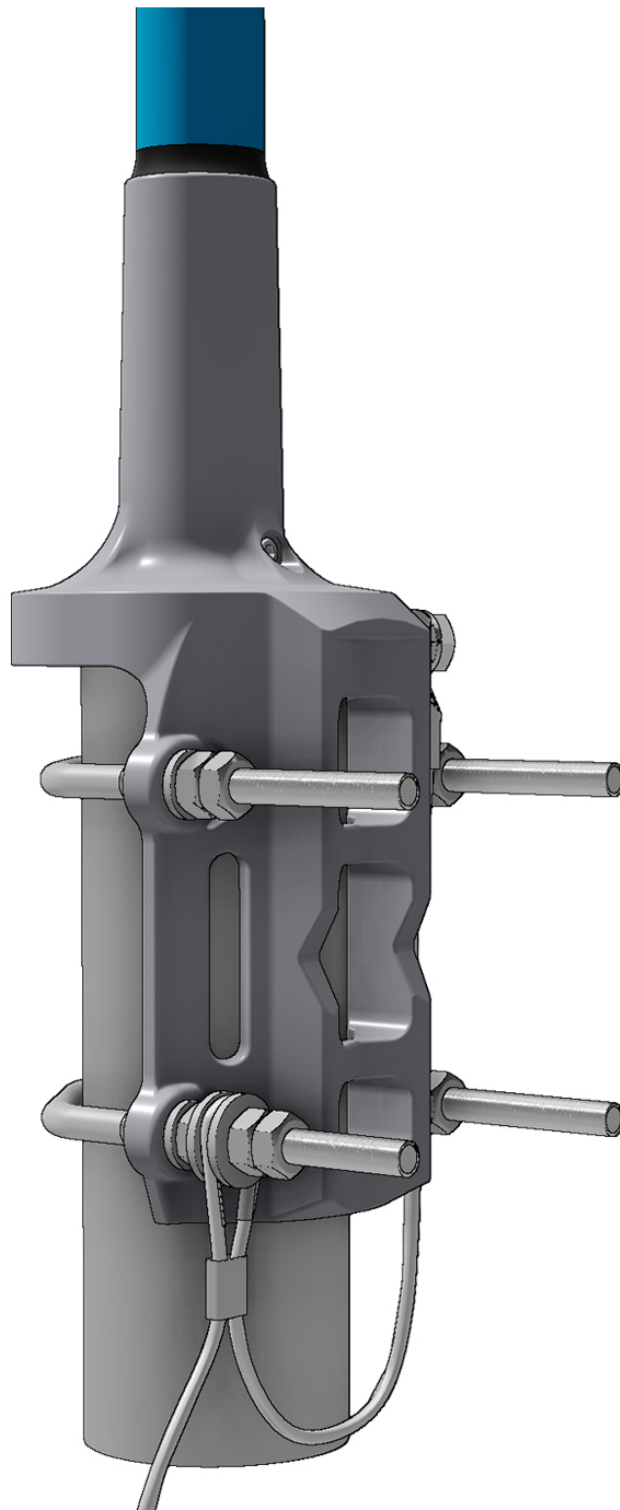


Figure 8: Mounting of the antenna with LW-SS-bracket on the top of the mast. (Viewed from the side)

4.1.2 Mounting instruction for antennas located on the side of the mast tube

Mount the antennas as shown in the following figures, and if necessary, how to install the ATEX grounding kit. The nuts and the bolt should be tightened with a torque of 2.5-3 Nm.

It's only necessary to install the wire on the LW-SS bracket, when the point of installation has a different electrical potential than the system.

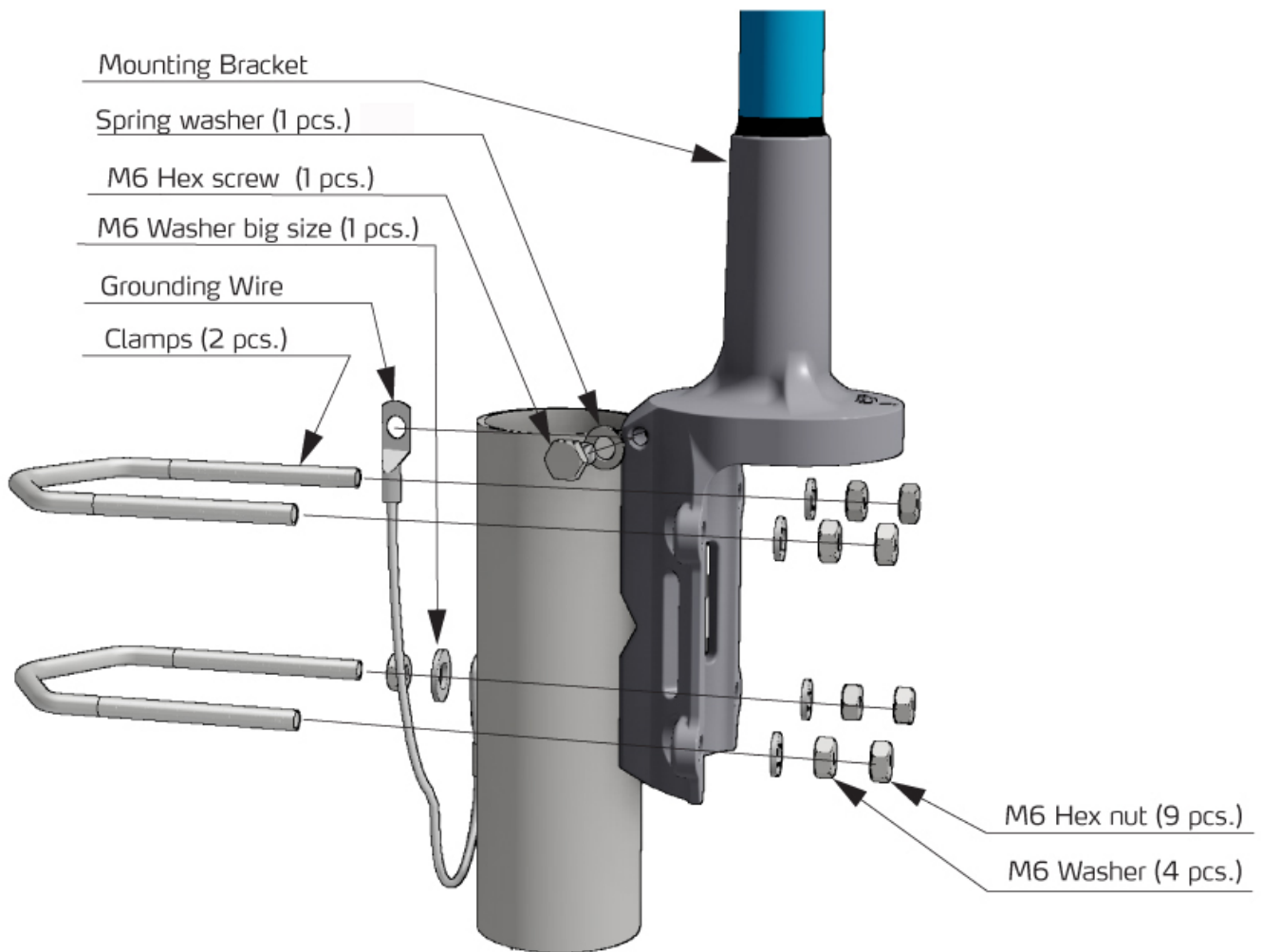


Figure 9: Mounting of the antennas with LW-SS-bracket on the side of the mast.

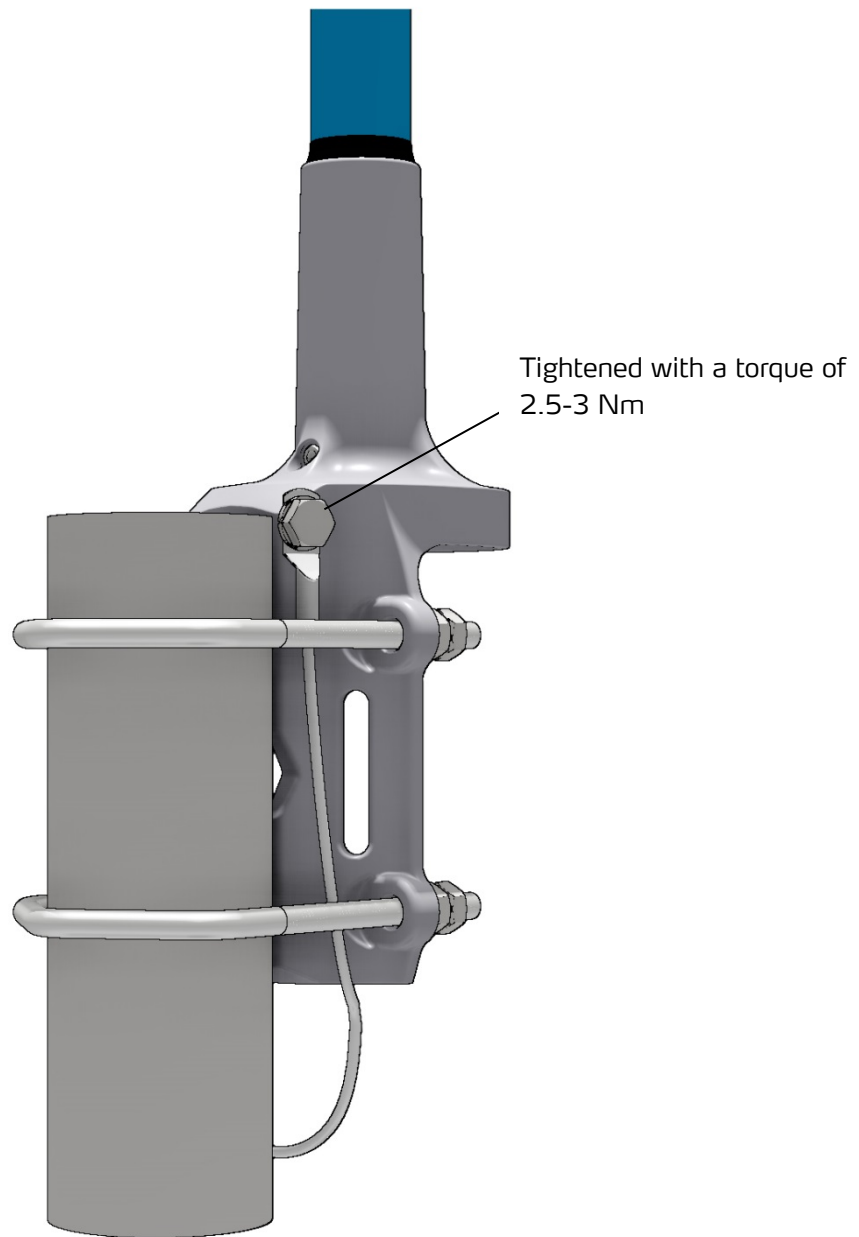


Figure 10: Mounting of the antennas with LW-SS-bracket on the side of the mast.

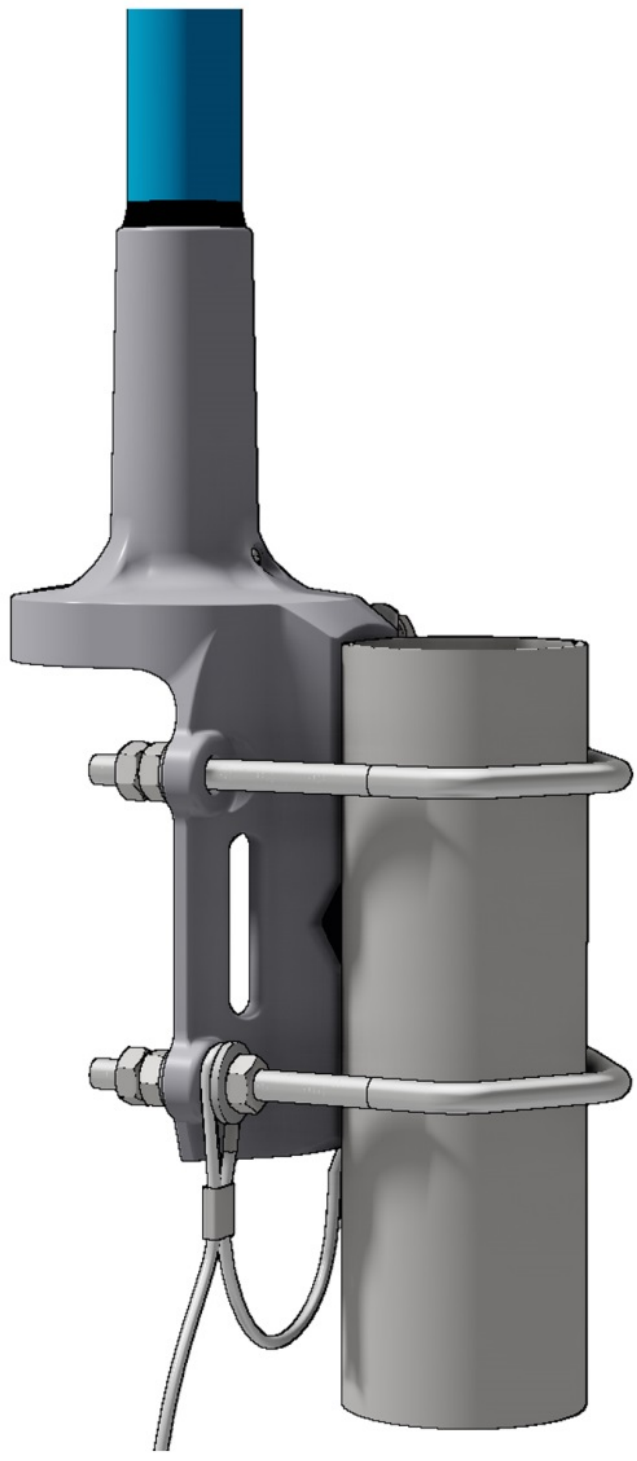


Figure 11: Mounting of the antennas with LW-SS-bracket on the side of the mast.

4.1.3 Instructions for mounting on a horizontal mast tube

Mount the antennas as shown in the following figures, and if necessary, how to install the ATEX grounding kit. The nuts and the bolt should be tightened with a torque of 2.5-3 Nm.

It's only necessary to install the wire on the LW-SS bracket, when the point of installation has a different electrical potential than the system.

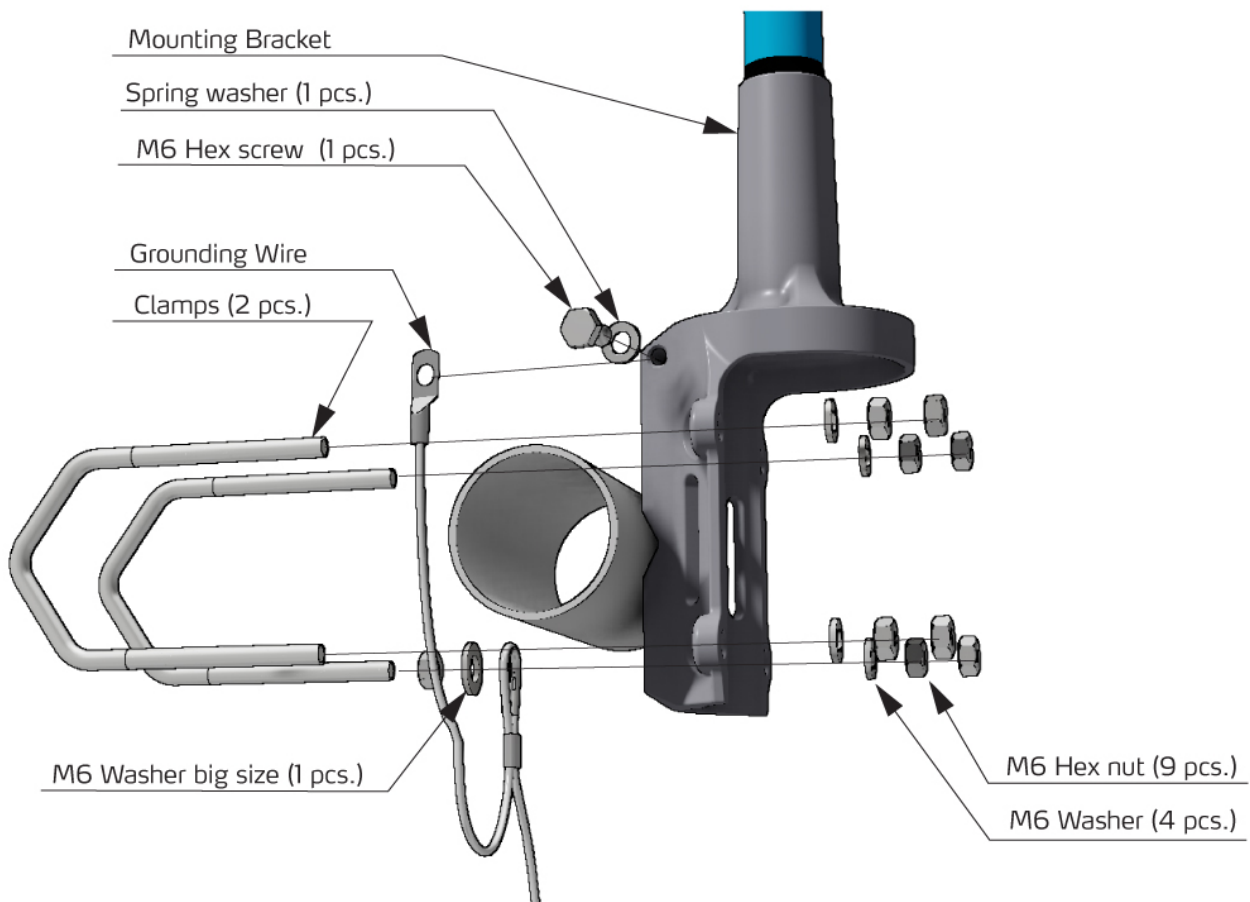


Figure 12: Mounting of the antennas with LW-SS-bracket on the horizontal mast.

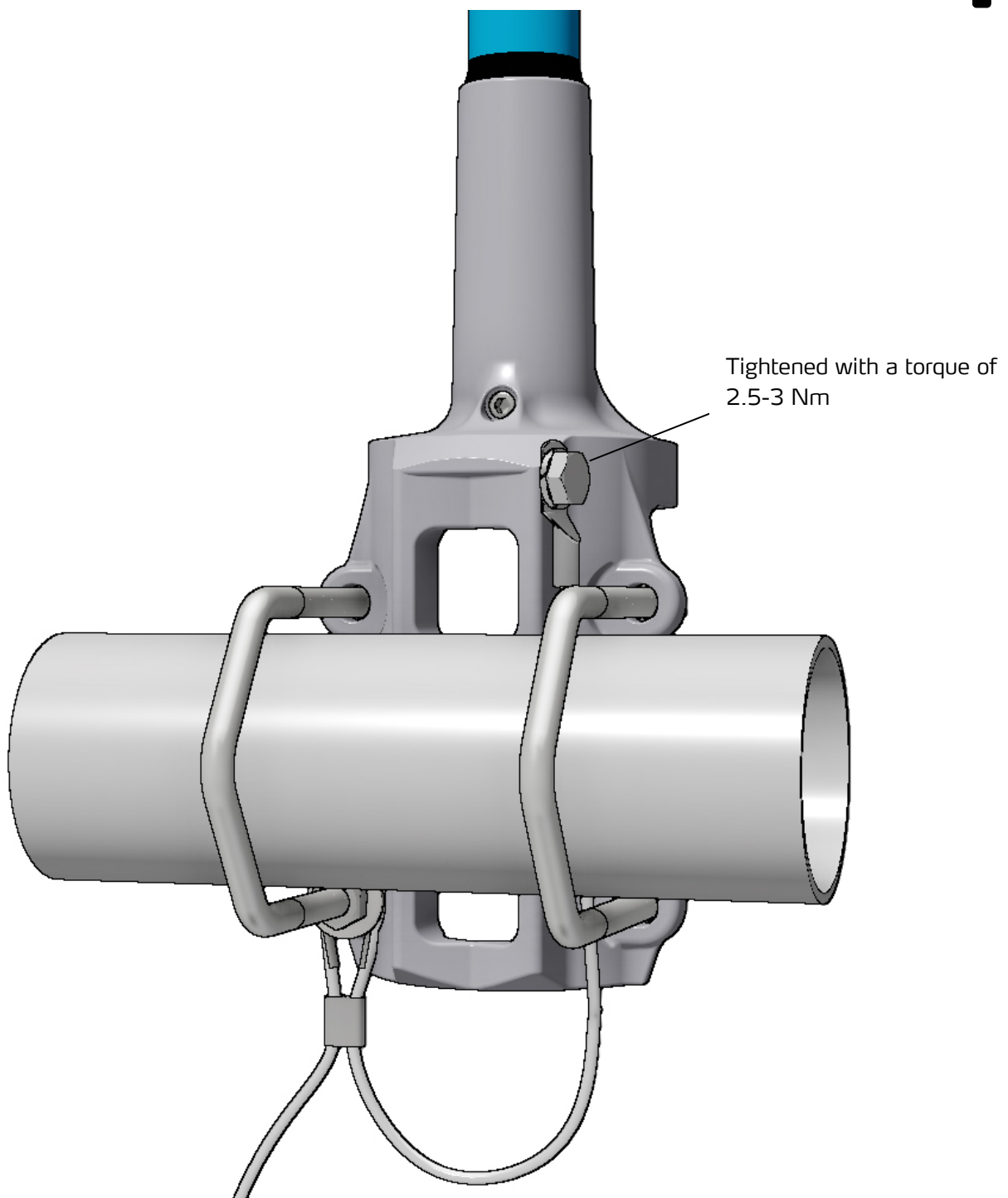


Figure 13: Mounting of the antenna with LW-SS-bracket on a horizontal mast tube. (Viewed from the back)

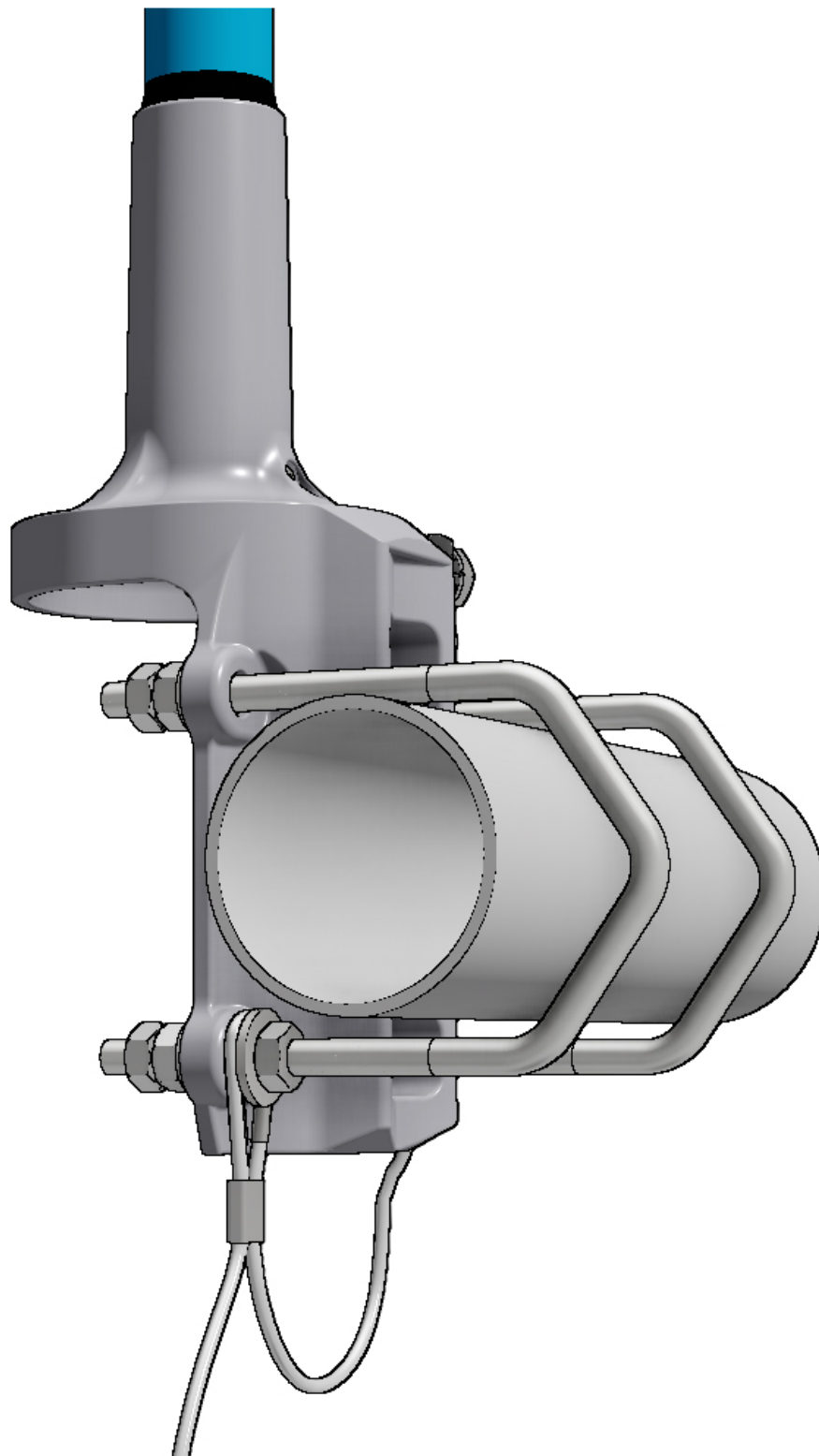


Figure 14: Mounting of the antenna with LW-SS-bracket on a horizontal mast tube. (Viewed from the side)

4.2 Antennas with 1" fixture

Antennas with the 1" fixture should be mounted on top of the mast tube with the connecting cable inside the tube. The coating on the 1" fixture is conductive so there is no need for the grounding kit unless the point of installation has a different electrical potential. If the antenna does need grounding, the LW-SS-1"-Ex bracket is available as an accessory. How to install the antenna is shown in the following figures. The antenna with the 1" fixture in this series is:

- CXL 130-1-Ex
- MA 160-Ex
- MA 450-Ex

4.2.1 Mounting instruction for 1" fixture

The antennas are designed to be mounted on a standard 1" water pipe. The revolving nut should be tightened with a torque of 23-25 Nm.



Figure 15: Mounting of antennas with 1" fixture on a 1" pipe.

4.2.2 Mounting instruction for 1" fixture on LW-SS-1" with ATEX grounding kit

The LW-SS-1"-Ex mounting bracket is ideal if there is a need for remote grounding. The following figures show the installation on the ATEX grounding kit on the LW-SS-1"-Ex.

It's only necessary to install the wire on the LW-SS-1" bracket, when the point of installation has a different electrical potential than the system.

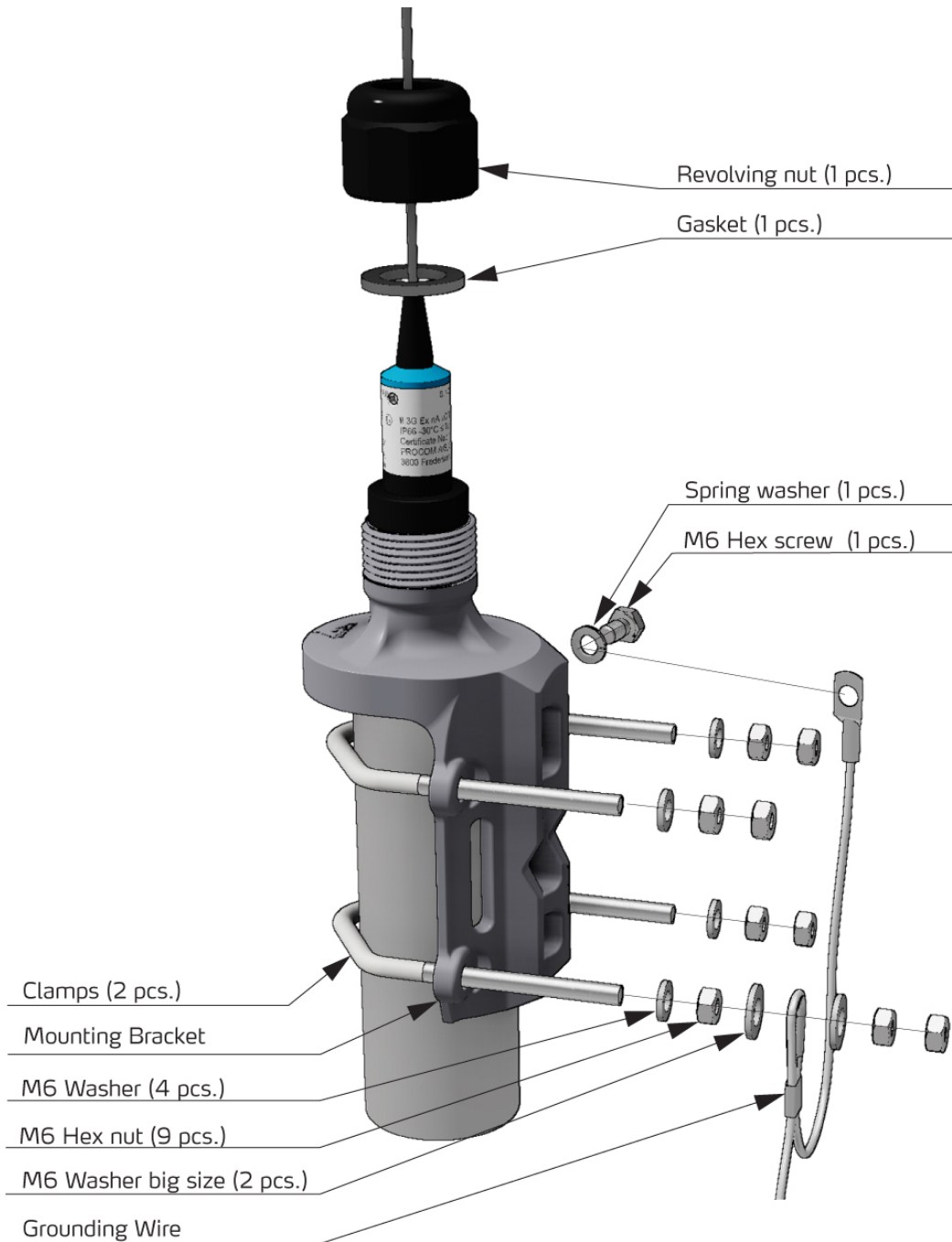


Figure 16: Mounting of antennas with 1" fixture on the LW-SS-1" with an ATEX grounding kit.

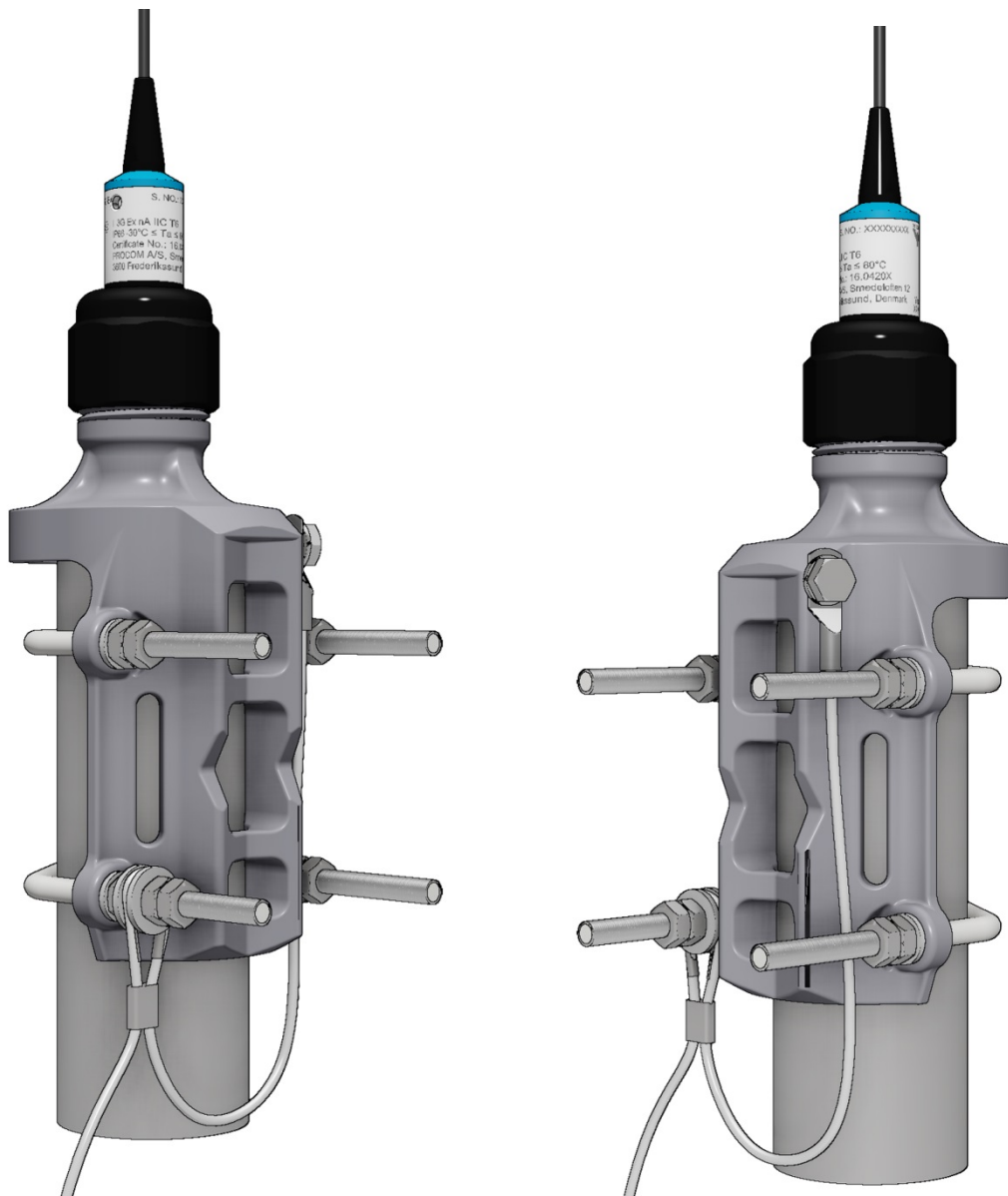


Figure 17: Mounting of antennas with 1" fixture on the LW-SS-1" with an ATEX grounding kit.

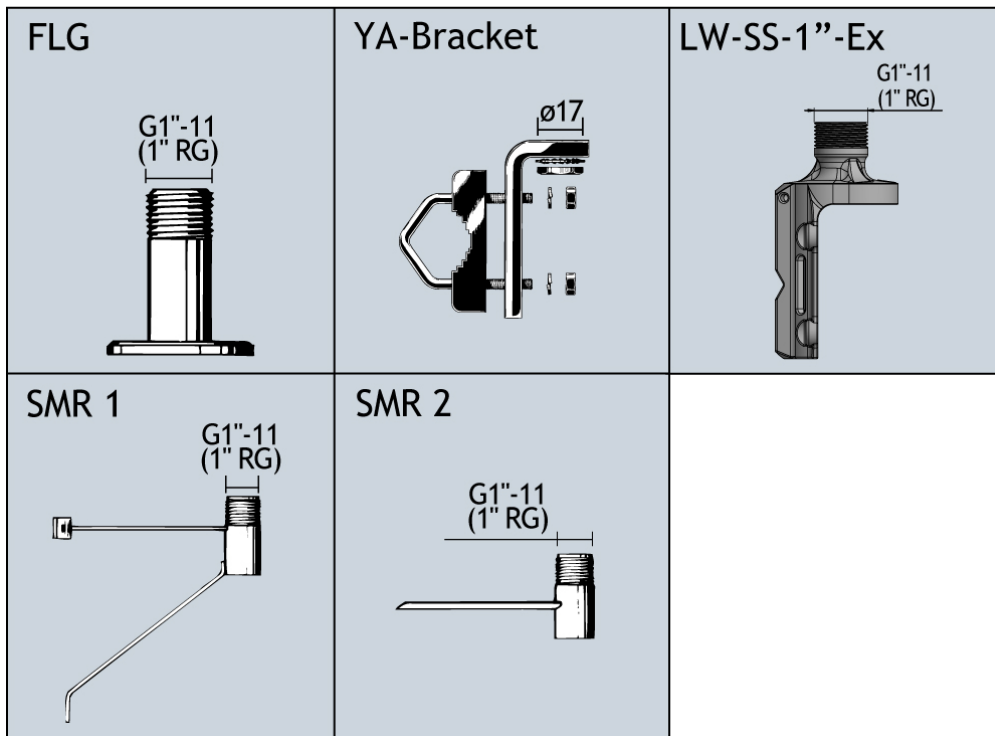


Figure 18: Available accessories for antennas with 1" fixture.

4.3 GPS 4-Ex

The antenna with the SM-MAS bracket in this series is:

- GPS 4-Ex

It's only necessary to install the wire on the SM-MAS bracket, when the point of installation has a different electrical potential than the system.

4.3.1 Mounting instruction for SM-MAS

Mount the antenna as shown in the following figures, and if necessary, how to install the ATEX grounding kit. The M6 nuts and the bolt should be tightened with a torque of 2.5-3 Nm and the M8 nuts and the bolt should be tightened with a torque of 6.5-7 Nm.

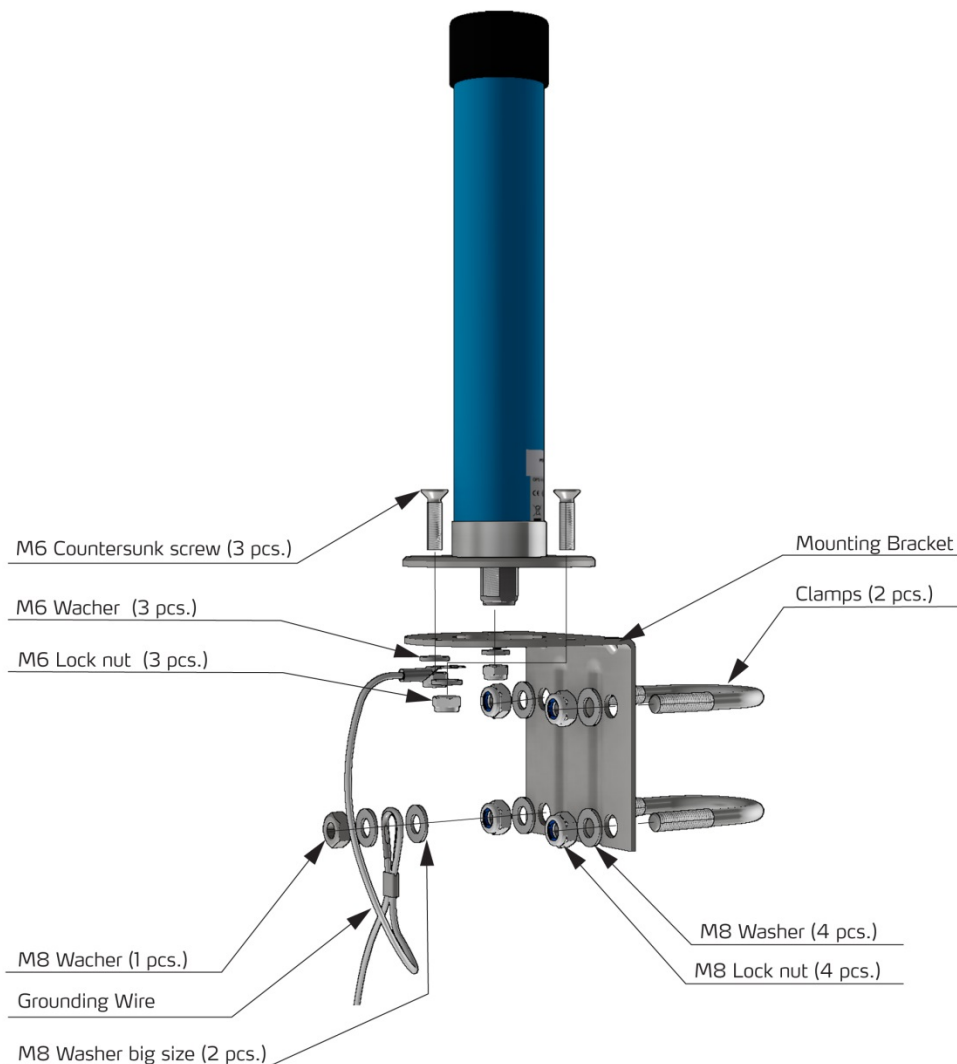


Figure 19: Mounting of antennas with SM-MAS with an ATEX grounding kit.



Figure 20: Mounting of antennas with SM-MAS with an ATEX grounding kit.

4.4 Antennas with LW bracket

There are four ways to mount the antennas with the "LW" bracket. The antennas with LW bracket in this series are:

- CXL 130-1LW-Ex (replaced by CXL 130-1LW-SS-Ex)
- CXL 150-1LW-Ex (replaced by CXL 150-1LW-SS-Ex)
- CXL 150-3LW-Ex (replaced by CXL 150-3LW-SS-Ex)
- CXL 450-1LW-Ex (replaced by CXL 450-1LW-SS-Ex)
- CXL 450-3LW-Ex (replaced by CXL 450-3LW-SS-Ex)
- CXL 2400-1LW-Ex (replaced by CXL 1700-2700LW-SS-Ex)

4.4.1 Mounting instruction for antennas located on top of the mast tube

Mount the antennas as shown in the following figure and remember to install the ATEX grounding kit. The nuts should be tightened with a torque of 2.5-3 Nm.

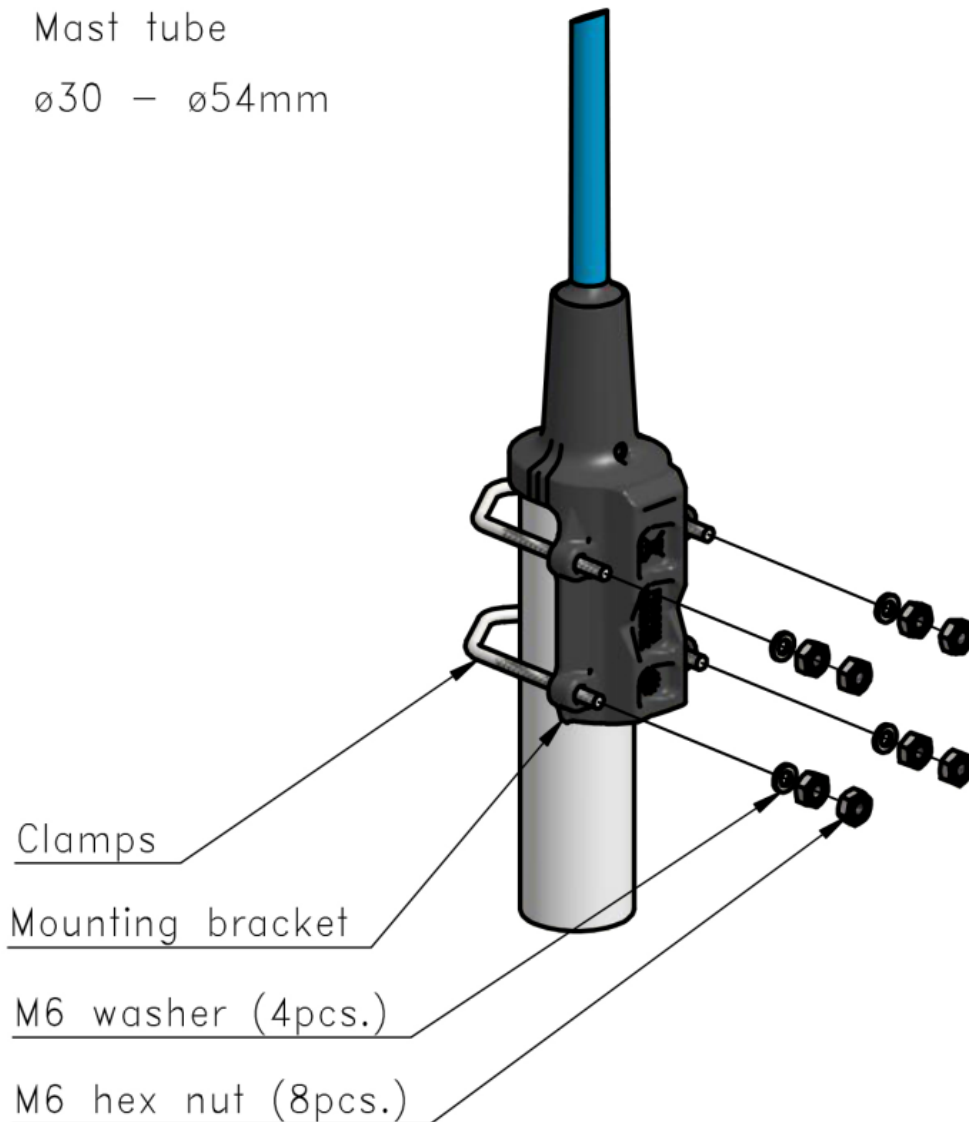


Figure 21: Mounting of the antennas with LW-bracket on the top of the mast.

4.4.2 Mounting instruction for antennas located on the side of the mast tube

Mount the antennas as shown in the following figure and remember to install the ATEX grounding kit. The nuts should be tightened with a torque of 2.5-3 Nm.

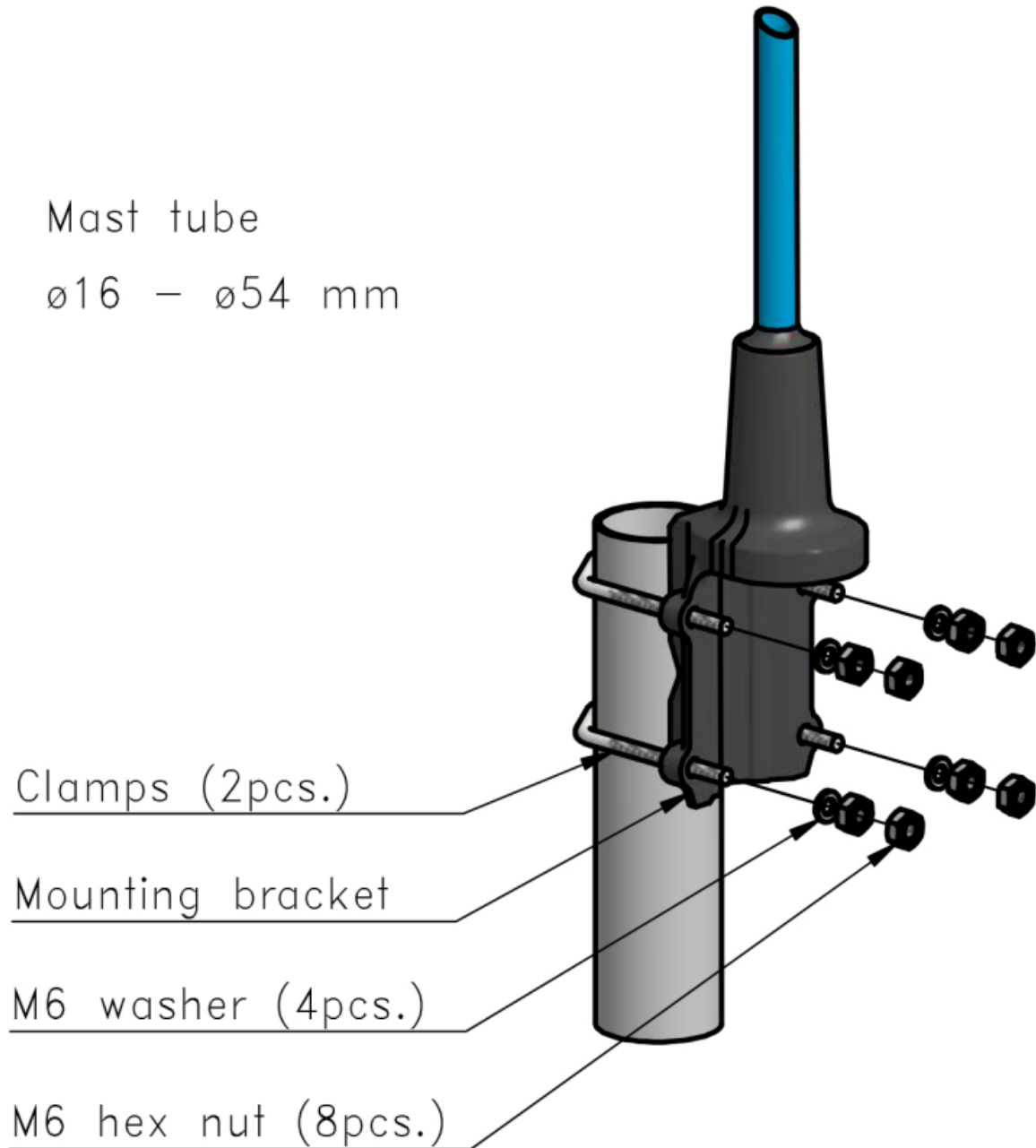


Figure 22: Mounting of the antennas with LW-bracket on the side of the mast.

4.4.3 Instructions for mounting on a horizontal mast tube

Mount the antennas as shown in the following figure and remember to install the ATEX grounding kit. The nuts should be tightened with a torque of 2.5-3 Nm.

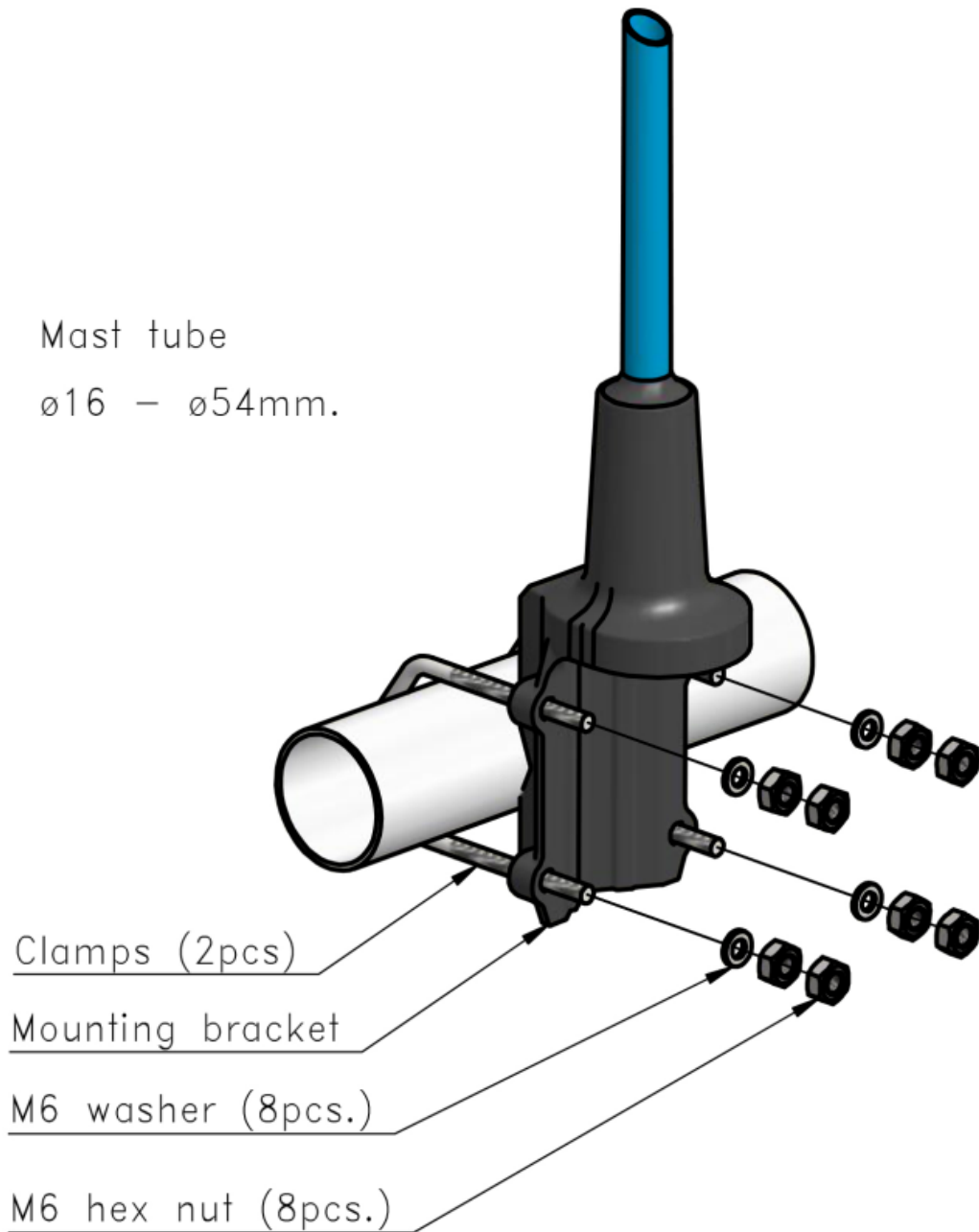


Figure 23: Mounting of the antennas with LW-bracket on the horizontal mast.

4.4.4 Grounding Instruction for LW mount

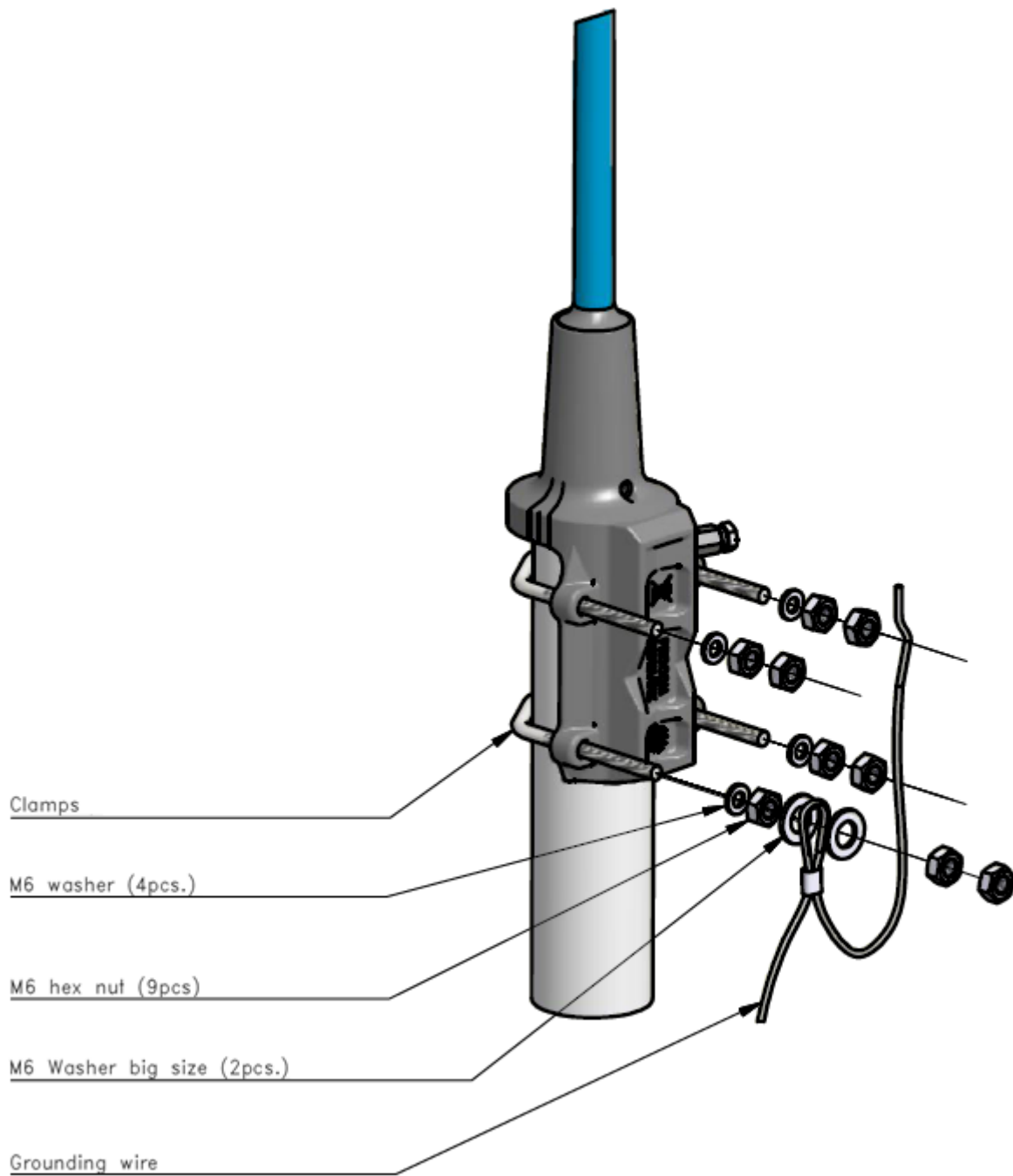


Figure 24: Mounting parts and installation of the grounding kit.

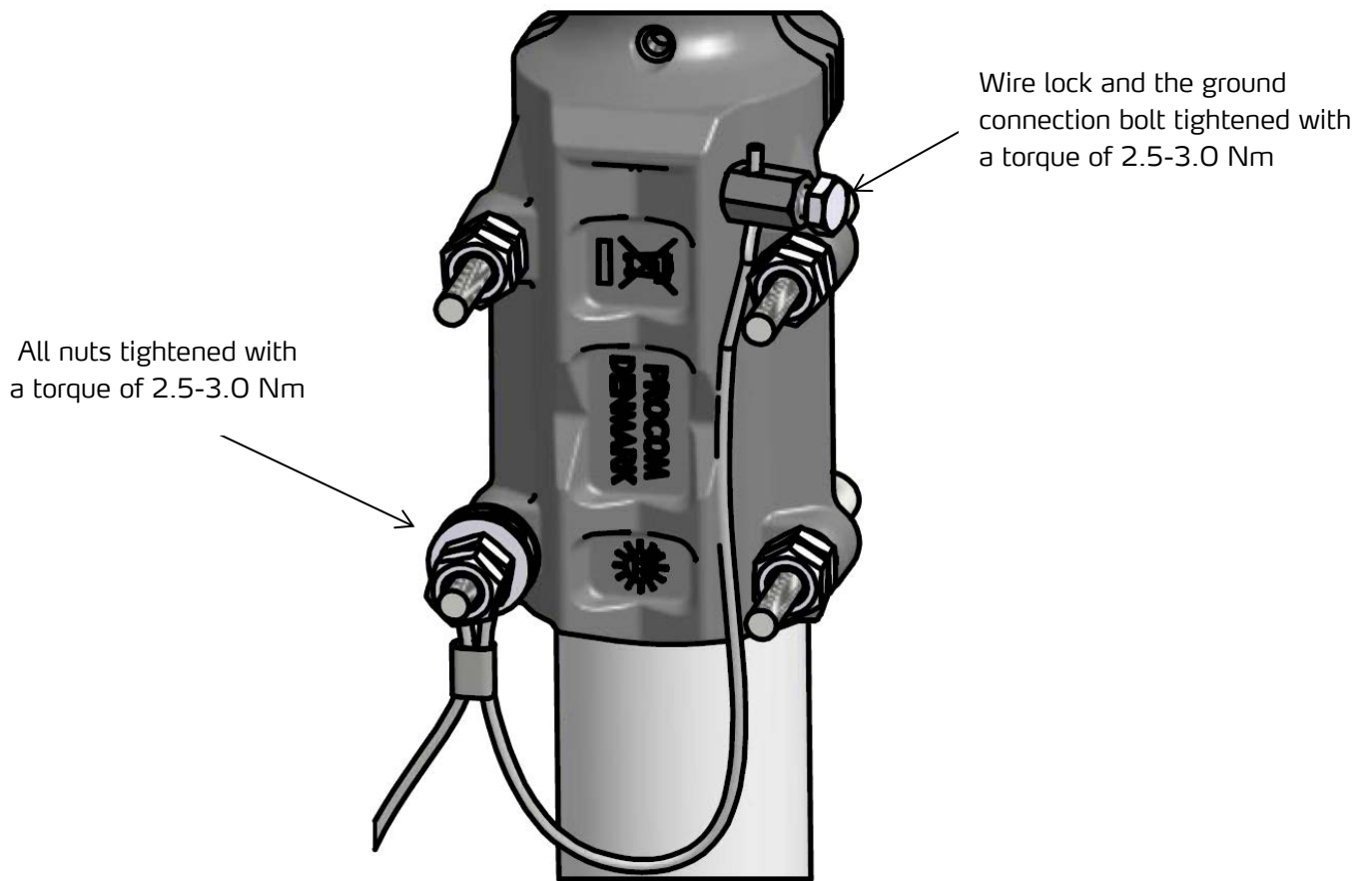


Figure 25: Installation of the grounding kit on the mounting bracket of the antenna.

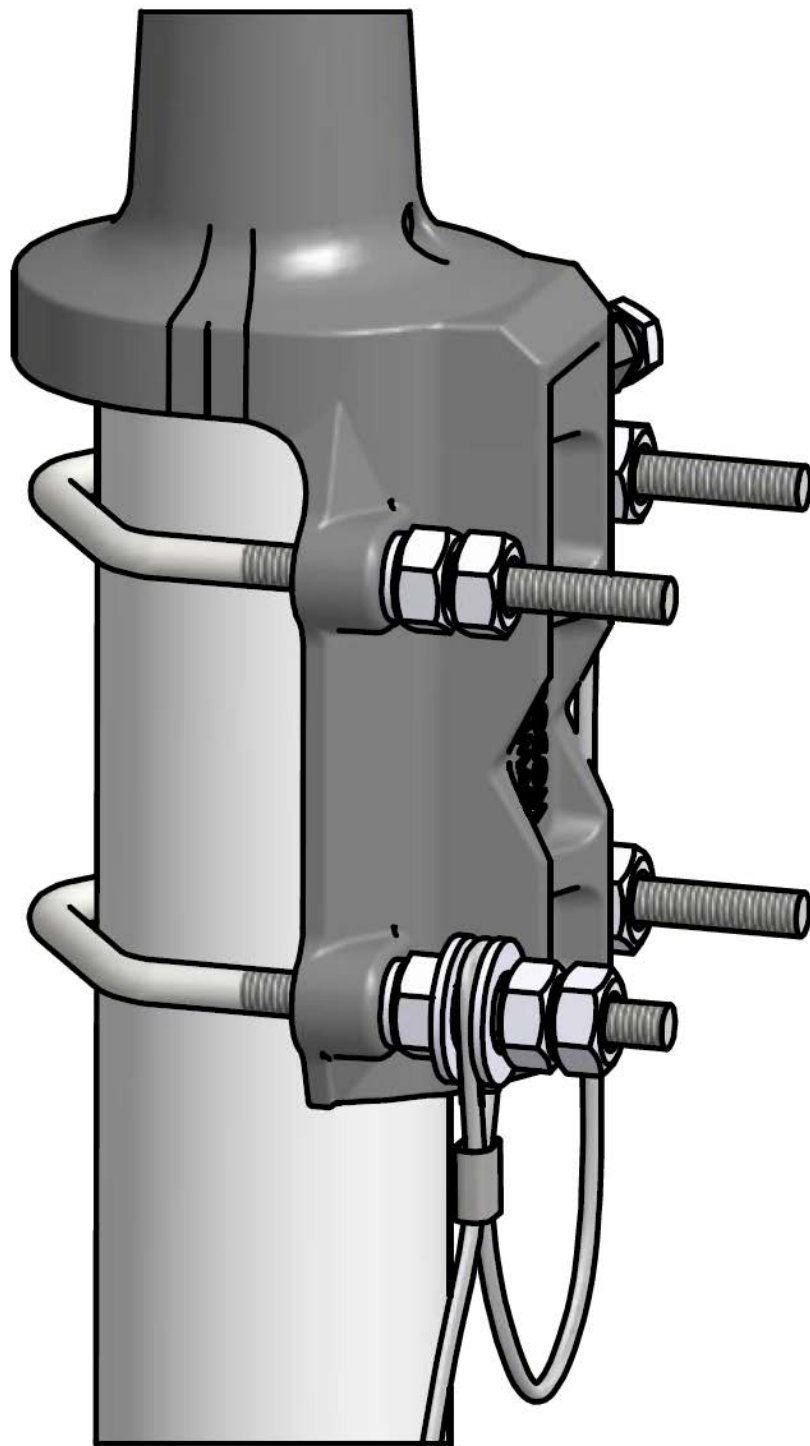


Figure 26: Side view of the grounding kit on the mounting bracket of the antenna.

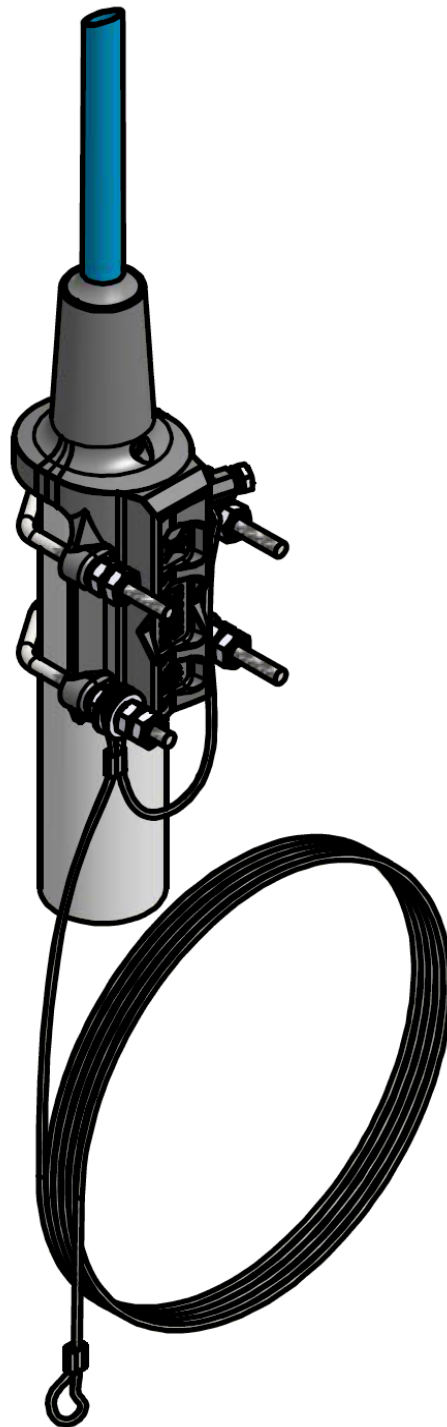


Figure 27: Complete view of the grounding kit on the mounting bracket of the antenna.

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