

USER'S GUIDE

Vaisala Telemetry Antenna RM31N



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Vaisala Oyj

Street address: Vanha Nurmijärventie 21, FI-01670 Vantaa, Finland

Mailing address: P.O. Box 26, FI-00421 Helsinki, Finland

Phone: +358 9 8949 1

Fax: +358 9 8949 2227

Visit our Internet pages at www.vaisala.com.

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CHAPTER 1

GENERAL INFORMATION

This chapter provides general notes for the manual and the product.

About This Manual

This manual provides information for installing, operating, and maintaining Vaisala Telemetry Antenna RM31N.

Contents of This Manual

This manual consists of the following chapters:

- Chapter 1, General Information, provides general notes for the manual and the product.
- Chapter 2, Product Overview, provides a general description of Vaisala Telemetry Antenna RM31N.
- Chapter 3, Installation, explains the unpacking and setting up of the antenna.
- Chapter 4, Specifications, provides technical specifications for the antenna system.
- Chapter 5, Parts List, presents the parts list for the antenna.
- Chapter 6, Technical Support, provides contact information for technical support.

Version Information

Table 1 **Manual Revisions**

Manual Code	Description
M211031EN-E	March 2015. Updated information on cable lengths.
M211031EN-D	February 2012. Information on grounding added.
M211031EN-C	May 2011. Added new cover picture and antenna weight to Chapter Specifications.
M211031EN-B	June 2010.
M211031EN-A	First version. Unpublished.

Related Manuals

Table 2 **Related Manuals**

Manual Code	Manual Name
M211069EN	Vaisala MARWIN Sounding System MW32 User's Guide

General Safety Considerations

Throughout the manual, important safety considerations are highlighted as follows:

WARNING

Warning alerts you to a serious hazard. If you do not read and follow instructions very carefully at this point, there is a risk of injury or even death.

CAUTION

Caution warns you of a potential hazard. If you do not read and follow instructions carefully at this point, the product could be damaged or important data could be lost.

NOTE

Note highlights important information on using the product.

ESD Protection

Electrostatic Discharge (ESD) can cause immediate or latent damage to electronic circuits. Vaisala products are adequately protected against ESD for their intended use. However, it is possible to damage the product by delivering electrostatic discharges when touching, removing, or inserting any objects inside the equipment housing.

To make sure you are not delivering high static voltages yourself:

- Handle ESD sensitive components on a properly grounded and protected ESD workbench. When this is not possible, ground yourself to the equipment chassis before touching the boards. Ground yourself with a wrist strap and a resistive connection cord. When neither of the above is possible, touch a conductive part of the equipment chassis with your other hand before touching the boards.
- Always hold the boards by the edges and avoid touching the component contacts.

Recycling



Recycle all applicable material.



Dispose of batteries and the unit according to statutory regulations. Do not dispose of with regular household refuse.

Trademarks

MARWIN® is a registered trademark of Vaisala Oyj.

Windows® is a registered trademark of Microsoft Corporation in the United States and/or other countries.

Warranty

For certain products Vaisala normally gives a limited one-year warranty. Please observe that any such warranty may not be valid in case of damage due to normal wear and tear, exceptional operating conditions, negligent handling or installation, or unauthorized modifications. Please see the applicable supply contract or Conditions of Sale for details of the warranty for each product.

CHAPTER 2

PRODUCT OVERVIEW

This chapter provides a general description of Vaisala Telemetry Antenna RM31N.

General

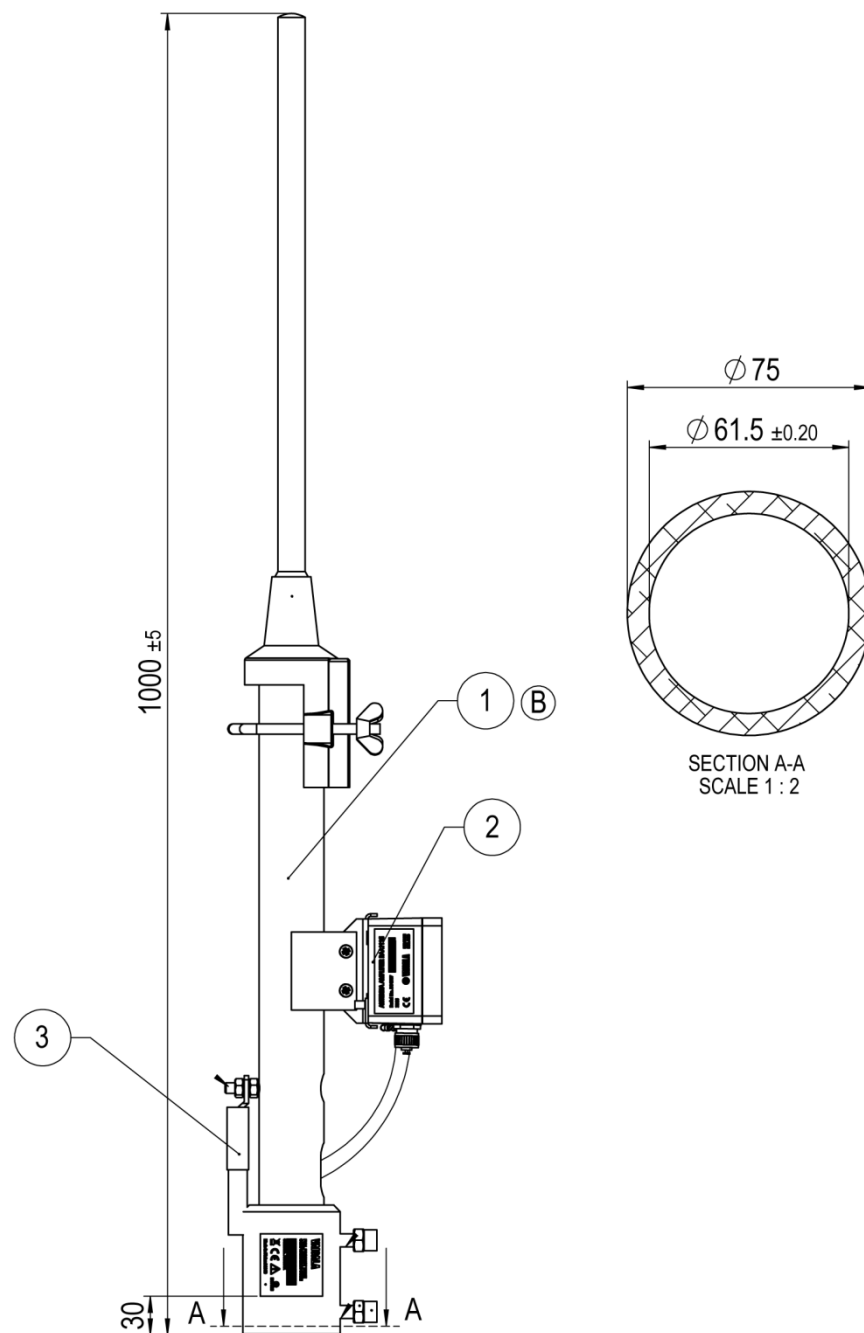
Vaisala Telemetry Antenna RM31N is an omnidirectional UHF antenna used with Vaisala sounding systems to receive radiosonde signals in the 400 MHz meteorological band.

RM31N is well-suited for use with compact, lightweight sounding systems, for example, with portable systems, but it can also be used in fixed installations, where feasible. The antenna's height is only one meter, so it is optimized for naval use.

Antenna Assembly

Vaisala Telemetry Antenna RM31N consists of a vertical antenna, Antenna Amplifier and Switch RAA111G, a tubular antenna mast, and antenna cables.

The antenna is installed on top of the antenna mast with a mounting sleeve, and the amplifier box is mounted on the base of the antenna mast.



1201-032

Figure 1 Telemetry Antenna RM31N

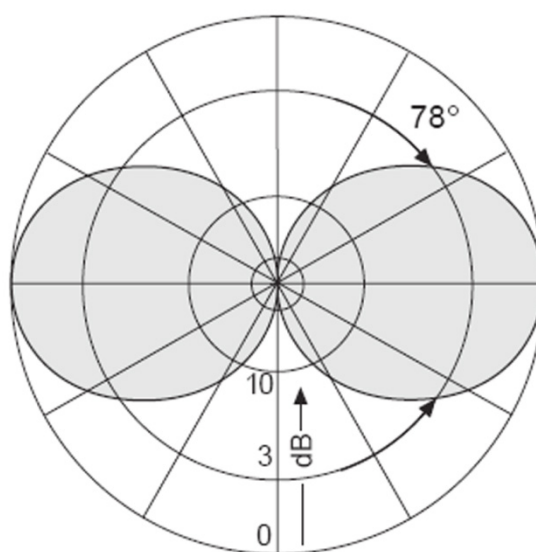
The following numbers refer to Figure 1:

- 1 = Antenna body
- 2 = Antenna Amplifier and Switch RAA111
- 3 = Grounding cable

Vertical Antenna

The vertical antenna is an omnidirectional telemetry antenna for the reception of radiosonde signals in the 403 MHz meteorological band.

The type of the antenna is Kathrein K 75 11 21. For more detailed information on the antenna, see the supplier's manuals.



0312-144

Figure 2 **Radiation Pattern**

Antenna Amplifier and Switch RAA111G

The Antenna Amplifier and Switch RAA111G is an antenna amplifier with a two-position antenna switch.

All the amplifier parts are housed in a watertight box at the base of the antenna mast.

The amplifier runs on +12 VDC voltage, supplied by the UHF receiver.

Antenna Mast

The antenna is installed on top of a 0.5 meter tubular mast and the amplifier box is attached to the base of the mast. A mounting sleeve with a diameter of 61.5 mm is provided for mounting the whole antenna on top of an external mast.

CHAPTER 3

INSTALLATION

This chapter explains the unpacking and setting up of the antenna.

Selecting Location

For best results, select an installation site for the antenna set that is:

- Open, in other words, clear of obstacles such as buildings, dense forests, or high metal masts.
- Even, in other words, the ground is even and relatively firm.

A single tree does not affect signal reception to any significant degree, unless it is exceptionally dense or very close (less than 20 meters from the antenna set). Sparse forest can cause some attenuation but is usually not a real hindrance.

Other antenna masts and metal structures of small diameter do not disturb reception if situated more than 20 meters away from the antenna set. However, metal roofs or other large surfaces may reflect signals, causing short-duration fading. If the antenna set is screened by a large building, reception may be impossible.

Unpacking

Unpack the system, attach it in place and connect the feeder cable. After this, the antenna is ready for use.

Setting Up the Antenna

The antenna is installed on top of a tubular mast. A mounting sleeve with a diameter of 61.5 mm is provided for mounting the whole antenna on top of an external mast.

When necessary, for instance, in case of a rooftop mount, the antenna cable can be extended. The cable is connected to a proper grounding point: a water conduit, a heating pipe or a metal structure.

The antenna systems are delivered ready connected. The vertical antenna is connected to ANT1 connector of the Antenna Amplifier and Switch RAA111G.

The feeder cable is connected to the OUT connector of the Antenna Amplifier and Switch RAA111G.

For connecting the antenna as a part of the sounding system, see the sounding system User's Guide.

Length of the Antenna Cable

The standard length of the antenna cable is 33 meters and the attenuation of the standard cable type (RG 213/U) is 14 dB/100 m at 400 MHz.

Other cable types and lengths are possible, but, for full system performance, the attenuation of the antenna cable should be less than 10 dB. With different cable types this leads to the following approximate maximum cable lengths, see Table 3:

Table 3 Cable Types and Maximum Lengths

Vaisala Code	Cable Length
RARC13SP	33 m
RARC13S	Customer-specific length, max. 75 m

Grounding

Because antennas can act as lightning rods, a separate lightning protection grounding must be taken into consideration according to local lightning protection regulations. To protect structures, equipment and personnel, a low-resistance path to the ground (ground electrode) must be provided for the current of the lightning strike.

A good grounding also protects the personnel against hazardous touch voltages under fault conditions; therefore, the grounding system must get proper attention.

Attach the grounding cable as follows:

1. Attach the grounding cable (= down conductor) separately from the other cables, and secure it firmly at intervals of one meter or less.
2. Make sure the bending radius is not less than 200 mm (eight inches). All bends must be smooth and never over 90 degrees.
3. Route the grounding cable to the ground as directly as possible. Cut any excess cable. Do not let the excess cable form loops.

CAUTION

Never let the excess cable form loops.

Grounding Cable

The grounding cable is weather, UV and ozone-resistant, and also suitable for direct burial.

Table 4 Grounding Cables

Vaisala Part Number	Cable Length	Other Information
CBL210160-4M	4 meters	35 mm ² stranded copper with jacket and M8 tube cable lugs on both cable ends
CBL210160-SPEC	Can be ordered separately at custom length	

Maintenance

Under normal conditions, RM31N needs only a minimal amount of maintenance.

- Clean the antenna set regularly by removing excess dirt and dust.
- Inspect the cables for breaks, cracks in the protective coating or connectors, and bent or damaged pins. Replace broken cables when needed.

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CHAPTER 4

SPECIFICATIONS

This chapter provides technical specifications for the antenna system.

Table 5 Technical Specifications

Property	Value
General	
Frequency range	400 - 406 MHz
Directivity	2 dBi
Polarization	Vertical
Horizontal pattern	Omnidirectional
Telemetry Range	
With Vaisala digital radiosonde	150 km
Amplifier	
Gain	20 dB typical
Noise figure	<2 dB
Power input	+10 ... 12 VDC, typically 130 mA through RF cable
Output impedance	Output impedance 50 ohms, VSWR <1.5
Mechanics	
Antenna cable connector	Coaxial N-type male
Diameter	190 mm
Total height including mast	1 meter
Weight without cable	3.3 kg
Weight with cable	8.4 kg
Inner diameter of mounting sleeve	61.5 mm
Standard cable length	33 m fixed
Environmental conditions	
Operating temperature range	-40 ... 55° C
Operating humidity range	0 ... 100 % RH
Operating precipitation	Unlimited
Maximum wind speed	65 m/s
Storage temperature	-50 ... +100 °C
Storage humidity	0 ... 100 % RH

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CHAPTER 5

PARTS LIST

This chapter presents the parts list for the antenna.

Table 6 Parts List for RM31N

Item Number	Item
12002	Antenna, Kathrein K75 11 21
DRW214802	Amplifier to antenna, interconnect cable
RM45004	Body RM21
RAA111GSP	Antenna amplifier, color gray
RARC13SP	Antenna cable N(m) - N(m), RG 213, 33 m
RARC13S	Antenna cable max. 75 m
CBL210160-4M	Grounding cable, 4 m
CBL210160-SPEC	Can be ordered separately at custom length
234092	Fixing screw set for the grounding cable

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CHAPTER 6

TECHNICAL SUPPORT

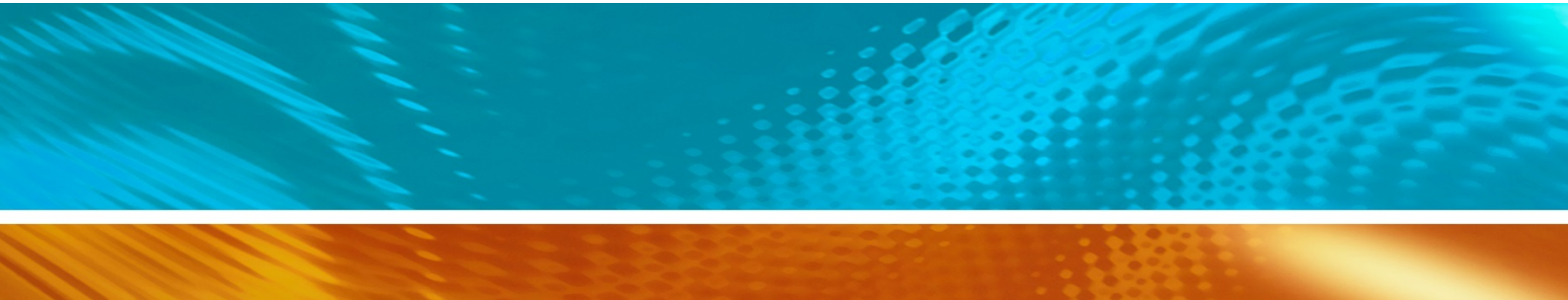
This chapter provides contact information for technical support.

Technical Support

For technical questions, contact the Vaisala technical support by e-mail at helpdesk@vaisala.com. Provide at least the following supporting information:

- Name and model of the product in question
- Serial number of the product
- Name and location of the installation site
- Name and contact information of a technically competent person who can provide further information on the problem.

For Vaisala Service Center contact information, see www.vaisala.com/servicecenters.



www.vaisala.com

