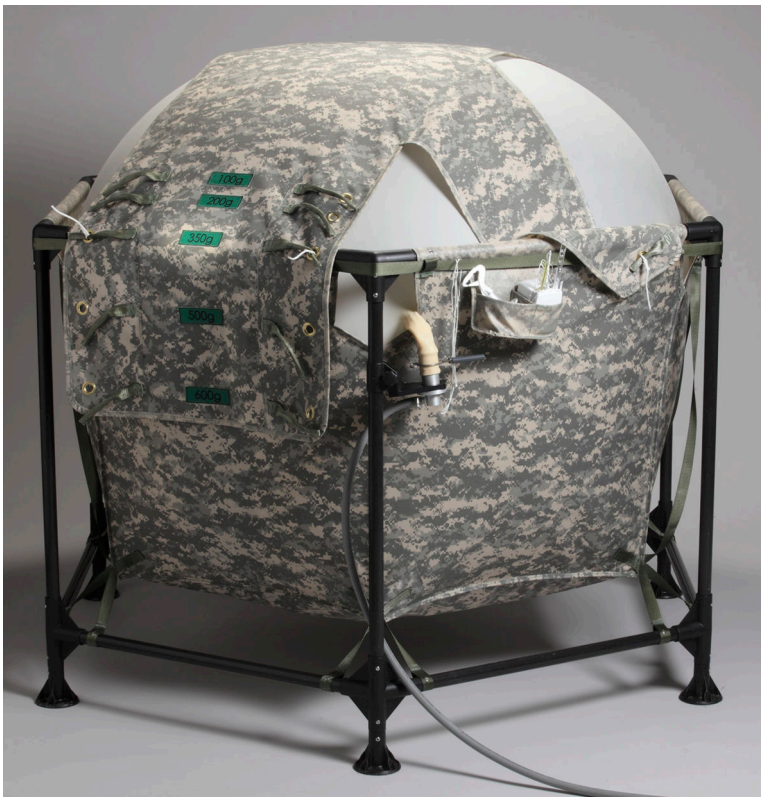
M210980EN-C

User Guide

Vaisala Balloon Launcher

FB32



VAISALA

PUBLISHED BY

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1. About This Document

1.1 Version Information

This manual provides information for installing and operating Vaisala Balloon Launcher FB32.

Table 1 Document Versions

Document Code	Date	Description
M210980EN-C	September 2018	Updated the assembling instructions. New template.
M210980EN-B	February 2015	Updated for Radiosonde RS41.
M210980EN-A	April 2014	This manual. First version.

1.2 Related Manuals

Table 2 Related Manuals

Document Code	Name
M210843EN	*Vaisala Portable Antenna Set CG31 User Guide*
M210843EN	*Vaisala MARWIN® Sounding System MW32 User Guide*
	User Guides for Vaisala Radiosondes

1.3 Documentation Conventions

WARNING! Warning alerts you to a serious hazard. If you do not read and follow instructions 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 highlights important information on using the product.

Tip gives information for using the product more efficiently.

Lists tools needed to perform the task.

Indicates that you need to take some notes during the task.

1.4 Trademarks

MARWIN® is a registered trademark of Vaisala Oyj.

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

All other product or company names that may be mentioned in this publication are trade names, trademarks, or registered trademarks of their respective owners.

2. Product Overview

2.1 Introduction to Vaisala Balloon Launcher

Vaisala Balloon Launcher FB32 is a manually operated set for launching meteorological balloons. Designed for one-man operations, the lightweight balloon launcher is made of fiberglass tube and canvas. The launch bag is made of camouflage material suitable for field use.

The balloon launcher is completely mechanical. The launch bag cover holds the balloon down in the launcher. The balloon is launched by releasing the cover.

The balloon launcher is secured to the ground with pegs driven into the ground and two straps with hooks.

The balloon launcher folds compactly into its transportation case. The transport case is made of cellular polypropene and it is equipped with wheels for easy transportation.

The balloon launcher is applicable for both RS92 and RS41 radiosondes.

Figure 1 Balloon Launcher FB32 Overview

1 Launch bag cover for holding the balloon down
2 Closing strap and eyelets for different balloon sizes
3 Band tightened around the balloon launcher
4 Gas nozzle
5 Gas hose
6 Top horizontal tube
7 Plugs for attaching the tubes together at the frame corners
8 Holders for radiosonde RS92 and RS41
9 Vertical tube
10 Bottom horizontal tube

CAUTION! When you operate the balloon launcher, observe the standard safety rules for inflammable gases.

3. Installation

3.1 Launching Site Requirements

When selecting the launching site, consider the following:

- No power lines, trees, or other obstructions must be close by.
- The minimum distance to any obstruction depends on the wind speed and direction.
- The ground must be even and relatively firm.
- In marine operation, you must install the balloon launcher so that the balloon is launched on the lee side.

3.2 Assembling the Balloon Launcher

One person can assemble the balloon launcher.

1. Remove the balloon launcher parts from the transport case and place them on the ground.

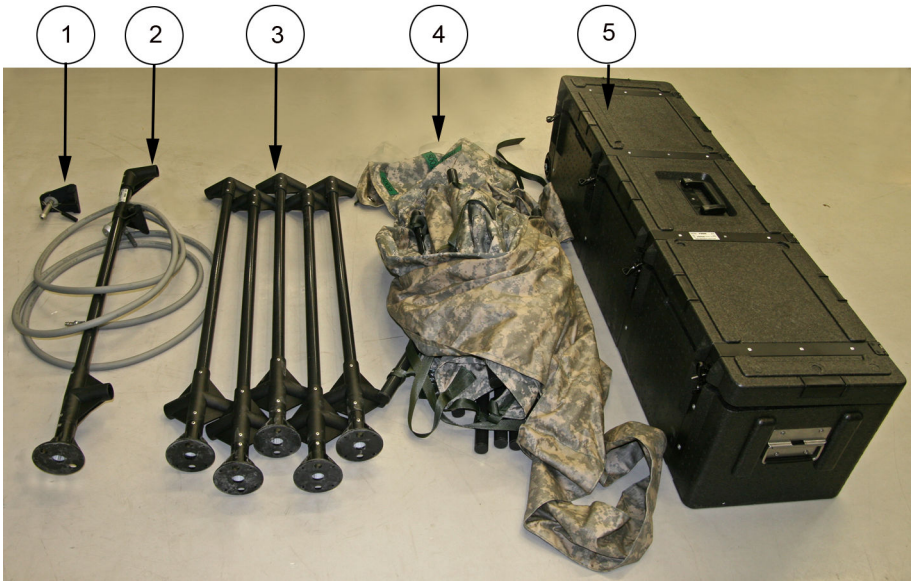


Figure 2 FB32 Parts Placed on the Ground

1 Gas nozzle (15 mm) and hose clamp (15 mm)
2 Vertical leg with a gas hose. The gas nozzle (35 mm) and the hose clamp (42 mm) are attached to the leg.
3 Vertical legs with plugs, 5 pieces
4 Launch bag with top and bottom tubes
5 Transportation case

Gas nozzles and hose clamps are provided in two sizes. Gas nozzles are available in sizes 35 mm (for 200 ... 600 g Totex balloons) and 15 mm (for 100 g Totex balloon), and clamps in sizes 15 mm and 42 mm. The 35 mm gas nozzle is attached to the vertical leg.

The transportation case also includes a tool bag with a set of ground pegs and a hammer for attaching the balloon launcher to the ground.

Figure 3 FB32 Tool Bag

1 Bag for the tools
2 Hammer
3 Ground pegs

2. Start assembling the launcher from the vertical leg with the gas nozzle: Attach the launch bag horizontal top and bottom tubes (the radiosonde holder section) to the leg. The radiosonde holder should be on the right side of the leg.

Make sure that the radiosonde holder is always on the right side of the vertical leg with the gas nozzle.

Figure 4 Gas Nozzle (1) and Radiosonde Holder (2)

3. Attach the remaining five vertical legs to the launch bag's horizontal top and bottom tubes.

4. Tighten the band around the balloon launcher. Make sure that the band passes under the radiosonde holder.

Figure 5 Tightening the Band around the Balloon Launcher

Figure 6 Band Tightened

5. Fasten the balloon launcher to the ground using the pegs and the straps hanging on the sides of the balloon launcher. Hammer the pegs to the ground and attach the hooks to the pegs.

Figure 7 Straps for Fastening the Balloon Launcher to the Ground with Pegs

In marine use, carefully fasten the launcher to the ship's superstructure with the straps.

3.3 Packing the Launcher for Transportation

After use, the balloon launcher can be compactly packed for transportation.

1. Remove the balloon launcher straps from the ground pegs and hang them to the loops on the sides of the balloon launcher. Pack the ground pegs to the tool bag.
2. Loosen the band around the frame of the balloon launcher.
3. Detach the vertical tubes from the horizontal tubes.

4. Fold the launch bag with the horizontal tubes attached.

Figure 8 FB32 Launch Bag Folded on the Ground

5. Clean and pack all the parts in the transport case in the following order:
   a. Put the three vertical tubes on the bottom of the case.

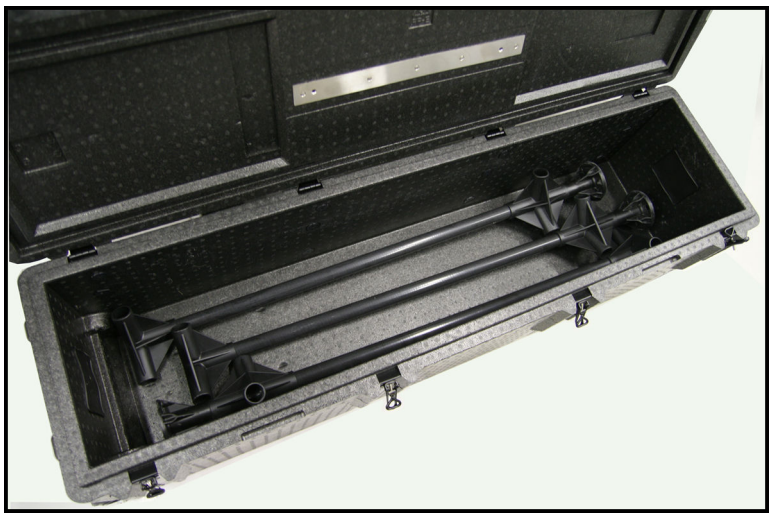


Figure 9 Three Tubes on the Bottom of the Transportation Case

   b. Pack the folded launch bag.

Figure 10 Launch Bag Folded on Top of Three Tubes

   c. Pack the vertical tube with the gas nozzle and two other vertical tubes on top of the folded launch bag. Pack the tool bag on top of the case.

Figure 11 Three Tubes and the Gas Hose On Top of the Transportation Case

The balloon launcher is now ready for transportation.

CAUTION! It is not recommended to store the balloon launcher assembled outdoors for longer periods of time. UV radiation, salt spray, and high winds may damage the launch bag. Keep the balloon launcher inside or disassembled when not in use.

4. Operation

4.1 Operation overview

After you have installed the balloon launcher, operating the balloon launcher consists of the following procedures:

1. Aligning and securing the balloon launcher.
2. Filling the balloon.
3. Preparing the radiosonde and the balloon launcher.
4. Launching the balloon.

CAUTION! When you operate the balloon launcher, observe the standard safety rules for inflammable gases.

4.2 Aligning and Securing the Balloon Launcher

1. Turn the balloon launcher so that the radiosonde holder is on the lee side.
2. Secure the launcher by hammering the pegs to the ground and attaching the balloon launcher straps to the pegs.

You can launch the balloon with a difference of approximately 45 degrees between wind directions. If the difference exceeds 45 degrees, you must reposition the balloon launcher.

4.3 Filling the Balloon

1. Remove any debris, snow or ice from inside the balloon launcher.
2. Make sure that the launching belt lies flat at the bottom of the balloon launcher. This belt is used in case the balloon does not lift off by itself when the launch bag cover is lifted.
3. Insert the empty balloon into the balloon launcher and place the launch bag cover over the balloon.

4. Insert the closing straps on the launch bag into the eyelets according to the balloon size.

Figure 12 Closing Strap in the Launch Bag Eyelet

5. Attach also the launch bag side cover by inserting the closing strap to the eyelet.

Figure 13 Strap in the Eyelet on the Launch Bag Side Cover

6. Attach the balloon neck to the gas nozzle. Secure the balloon with a clamp.

Figure 14 Balloon Attached to the Gas Nozzle with Clamp

7. Make sure that the balloon is not twisted and can be inflated unhindered.
8. Inflate the balloon following the balloon manufacturer's inflation instructions. Do not leave the balloon launcher unattended while inflating the balloon.
9. Close the gas valve when the launch bag cover is taut.
   The balloon is now sufficiently filled. The side cover remains loose.

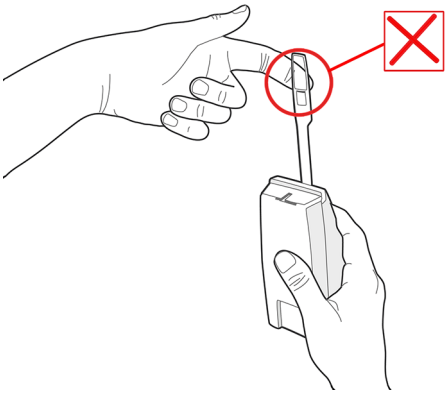
Figure 15 Balloon Sufficiently Filled

10. Close the neck of the balloon tightly by tying it with a string and remove the balloon neck from the gas nozzle.

Figure 16 Tying the Neck of the Balloon

4.4 Setting Up the Radiosonde and the Balloon Launcher

CAUTION! Do not touch the radiosonde sensors, they are fragile and can be easily contaminated.



4.4.1 Preparing Radiosonde RS92 for Launch

1. Bend the radiosonde sensor boom so that the plastic clips on both sides of the sensor boom click.

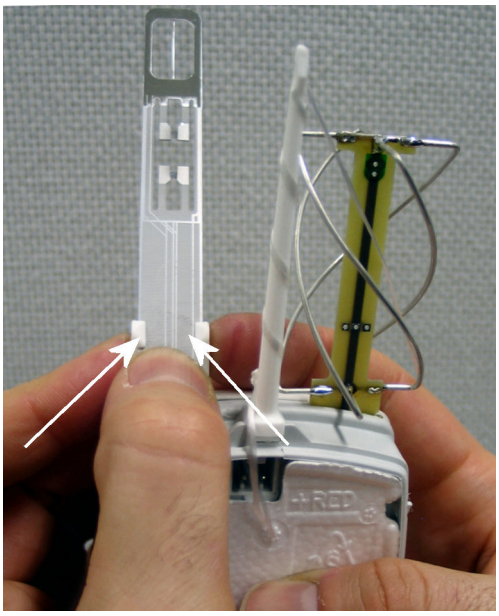


Figure 17 Placing the Radiosonde Sensor Boom into Flight Position

2. Remove the small plastic rubber wire from the unwinder and release approximately one meter of string from the unwinder.

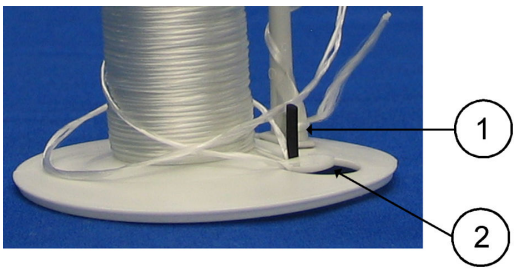


Figure 18 Unwinder Details

1 Rubber wire
2 Unwinder clip

3. To prevent the unwinder string from getting tangled in the bottom plate clip, make sure the round plastic clip is level with the unwinder bottom plate. If the lip is bent upwards, bend it gently back to level position.

Figure 19 Unwinder Clip Is Level with the Bottom Plate

4.4.2 Preparing Radiosonde RS41 for Launch

1. Bend the sensor boom to the correct sounding position by pushing the unwinder stick to its position at the end of the radiosonde.

2. As you push, the unwinder stick pushes the sensor boom to the bent position and the unwinder snap lock clicks into place. Make sure that the unwinder is firmly attached to the radiosonde.

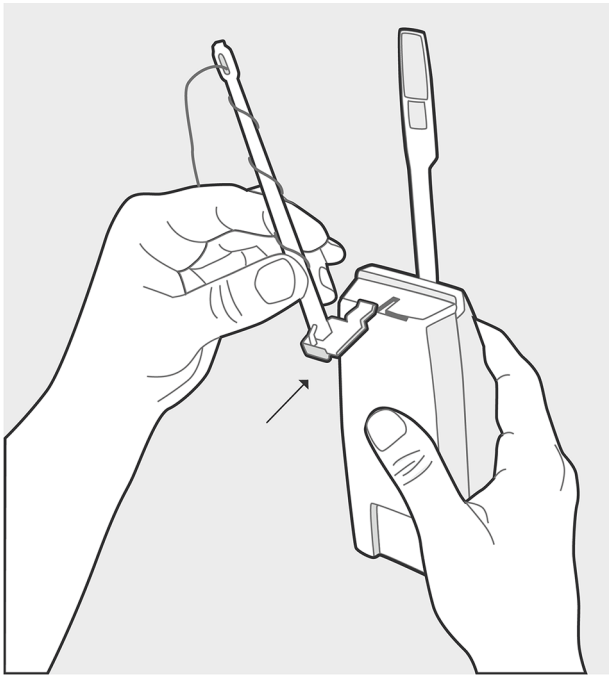


Figure 20 Pushing the Unwinder to Place

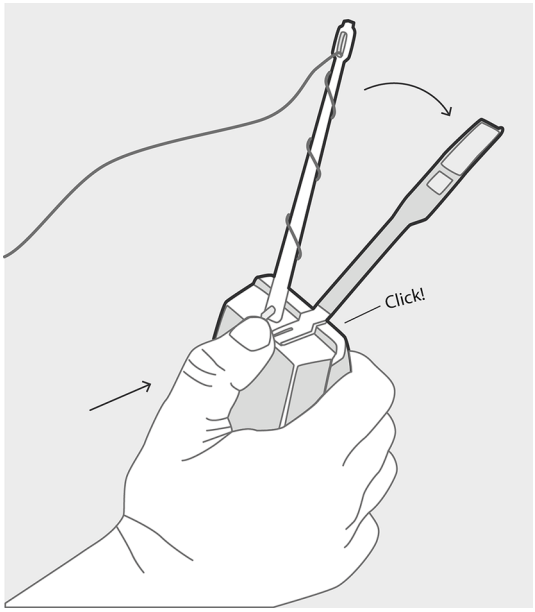


Figure 21 Unwinder Stick Locking into Place

3. To prevent the unwinder string from getting tangled in the bottom plate clip, make sure the round plastic clip is level with the unwinder bottom plate. If the lip is bent upwards, bend it gently back to level position.

Figure 22 Unwinder Clip Is Level with the Bottom Plate

4.4.3 Launching the Radiosonde

1. Set the ready-for-launch radiosonde in the correct radiosonde holder.

Figure 23 Radiosonde RS92 in the Holder

Figure 24 Radiosonde RS41 in the Holder

2. Attach the unwinder to the balloon neck.
   The unwinder must be attached firmly, so that it is not able to twist freely, or the suspension string might unwind at too high a speed and the radiosonde hit the ground during the launch. However, the unwinder must be able to swing slightly during the sounding.

   a. Pass the unwinder string inside the launcher and attach the unwinder to the balloon neck. Fold the neck around the unwinder and tie it firmly using the same string as before.

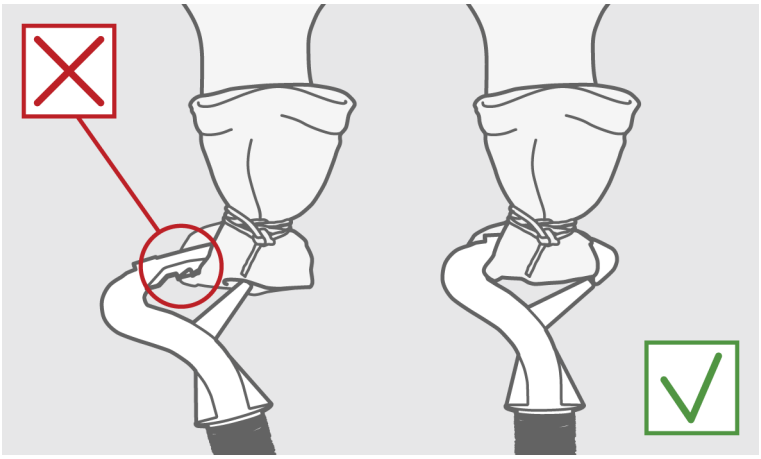


Figure 25 Unwinder Attached to the Balloon Neck

   b. Pass the unwinder hook through the loop created by the tied balloon neck.

   c. Make sure that the hook comes out the other side, as shown in the following figure.

Figure 26 Unwinder Attached to Balloon Neck

   The unwinder is now firmly attached to the balloon.

For more detailed information on preparing the radiosonde for the sounding, see the appropriate radiosonde User Guide.

4.4.4 Launching the Balloon

1. Launch the balloon by lifting off the launch bag cover. Do not touch the balloon. It lifts out of the balloon launcher by itself.
   If the launch bag is wet, the balloon may cling to the walls of the launcher. In that case, release the balloon with the launching belt inside the bag by pulling the belt from under the balloon and over the edge of the launcher.

Figure 27 Releasing the Balloon with the Launching Strap

The balloon will pull the radiosonde from the holder and the sounding starts.

5. Writing Problem Report

When troubleshooting the product, write a problem report including:

- What failed (what worked / did not work)?
- Where did it fail (location and environment)?
- When did it fail (date, immediately / after a while / periodically / randomly)?
- How many failed (only one defect / other same or similar defects / several failures in one unit)?
- What was done when the failure was noticed?
- What was connected to the product and to which connectors?
- Input power source type, voltage, and list of other items (such as lighting, heaters, and motors) that were connected to the same power output.
- Are all parts connected and grounded properly? Take a photo to help the troubleshooting.

6. Technical Data

6.1 Specifications

Table 3 FB32 Mechanical Specifications

Property	Description/Value
Width (assembled)	1760 mm (maximum)
Height (assembled)	1270 mm (maximum)
Internal diameter	1600 mm (maximum)
Weight (with transportation case)	26 kg
Gas hose	Glassfiber reinforced PVC hose Ø 16/10 Length 5 m
Transportation case dimensions	1380 × 335 × 385 mm
Transportation case weight	10 kg

Table 4 FB32 Operating Environment

Property	Description/Value
Operating temperature	–40 °C ... + 55 °C
Operating humidity	0 ... 100 %RH
Operating precipitation	Unlimited
Maximum wind speed	20 m/s
Storage temperature	–50 °C ... +71 °C
Storage humidity	0 ... 95 %RH

The balloon launcher is dimensioned for the following balloon sizes. The table also shows the approximate burst altitudes for high-quality balloons.

Table 5 Recommended Balloon Weight and Approximate Burst Altitudes

Balloon Weight	Burst Altitude
100 g	16 km
200 g	22 km
350 g	26 km
500 g	30 km
600 g	31 km

6.2 Parts List

Table 6 FB32 Spare Parts

Part	Quantity	Order Code
Launch bag, sewed Cordura 1000 D	1	DRW228973SP
Tool bag containing ground pegs and hammer	1	QMY102MSP
Hose assembly 5 m and hose clips	1	ASM210011SP
Frame corner assembly	6	DRW228445SP
Horizontal tube assembly	12	DRW228473SP
Gas nozzle 15 mm	1	DRW230603SP
Gas nozzle 35 mm	1	DRW229919SP
Balloon clamp 15 mm	1	DRW230610SP
Balloon clamp 42 mm	1	FB4146SP
Transportation case	1	QTR80LSP

Appendix A. Safety Instructions for Balloon Operators

Photocopy these instructions and place the list in clear view in the balloon filling shed and in the sounding compartment.

WARNING! New operator! Carefully study the instructions for using the hydrogen generator and for the correct method of inflation.

1. No smoking or naked flame allowed.
2. If possible, avoid wearing clothing made of nylon or other synthetic fibers to prevent a build-up of static charges. Do not wear shoes with rubber soles.
3. Wear protective glasses.
4. Regularly check that the gas tube fits securely to the gas cylinder or generator nozzle and to the balloon inflation nozzle.
5. Take care to prevent a gas leak in the shed when interrupting inflation to replace a gas cylinder.
6. Never use a repaired balloon.
7. Should a leak develop in the balloon during inflation, do not let gas escape from the balloon inside the shed if possible. Instead, release the defective balloon without load. It is not advisable to deflate the balloon, even outside the shed.
8. Do not touch the balloon with bare hands except when holding it by the neck. Wear soft cotton gloves.
9. Ensure that there are no pointed objects in the shed. Nails, hooks, hinges, padlocks, etc., are dangerous as they might scratch the inflated balloon. The balloon film is only 0.05 ... 0.1 mm thick upon launch; the slightest scratch could cause the balloon to burst prematurely.
10. Keep the doors of the shed shut while inflating the balloon on a windy day. However, ensure that the shed is properly ventilated.
11. No unauthorized person shall be allowed admittance to the shed while the hydrogen generator is in operation or balloon inflation is going on.
12. Ensure that all tools and other implements not essential for balloon inflation have been removed from the shed.
13. Do not take any electrical devices (cell phone etc.) to the balloon filling shed or close to the balloon inflated with hydrogen. Safe distance when outdoors is typically 1.5 meters.

14. Always keep the radiosonde at least 50 cm below the level of the gas nozzle and the inflated balloon, and at least 1.5 meters away from the gas cylinder/hydrogen generator, connectors, and tubing. Avoid taking the radiosonde inside the balloon filling shed, if possible.
15. Follow all regulations concerning hydrogen safety.

Technical Support

Contact Vaisala technical support at helpdesk@vaisala.com. Provide at least the following supporting information:

- Product name, model, and serial number
- Name and location of the installation site
- Name and contact information of a technical person who can provide further information on the problem

For more information, see www.vaisala.com/support.

Warranty

For standard warranty terms and conditions, see www.vaisala.com/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.

Recycling

Recycle all applicable material.

Follow the statutory regulations for disposing of the product and packaging.

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