Dosing Unit PCR

6.3033.150

Product information

8.0108.8008EN / 2017-08-16

Metrohm

Metrohm AG
Ionenstrasse
CH-9100 Herisau
Switzerland
Phone +41 71 353 85 85
Fax +41 71 353 89 01
info@metrohm.com
www.metrohm.com

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zst

Technical Communication
Metrohm AG
CH-9100 Herisau
techcom@metrohm.com

This documentation has been prepared with great care. However, errors can never be entirely ruled out. Please send comments regarding possible errors to the address above.

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1 Overview

1.1 Dosing Unit PCR – Brief description

The dosing unit is used for the accurate dosing of liquid volumes in an IC analysis system. Driven by a 800 Dosino, the Dosing Unit PCR provides the liquid volume required for the analysis.

The Dosing Unit PCR is equipped with a distributor with four ports.

1.2 Dosing Unit PCR – Overview

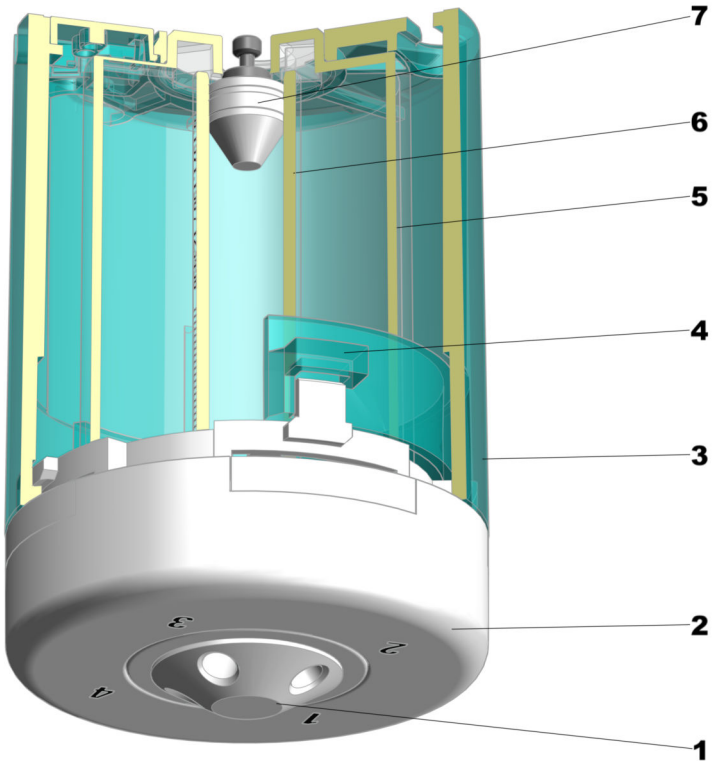


Figure 1 Dosing Unit PCR – Overview

1	**Distributor** With four ports for solutions.	**2**	**Cylinder cap**
3	**Housing**	**4**	**Unlocking button**

5 **Glass cylinder unit PCR (6.1578.150)**

6 **Cylinder**
Part of 6.1578.150

7 **Piston**
Part of 6.1578.150

NOTE

The Dosing Unit PCR works with the dedicated glass cylinder unit PCR **6.1578.150** only.

The standard 5 mL glass cylinder unit (6.1574.150) does not fit into the Dosing Unit PCR.

1.3 Additional information

1.3.1 Accessories

Up-to-date information on the scope of delivery and optional accessories for your product can be found on the Internet. You can download this information using the article number as follows:

Downloading the accessories list

1. Type *http://partslists.metrohm.com* into your Internet browser.
   The **Parts lists** web page will be displayed.
2. Select the desired output language.
3. Enter the article number (e.g., **6.3033.150**) and click on the **Generate PDF** command.
   The PDF file with the accessories data will be created in the language selected.

NOTE

When you receive your new product, we recommend downloading the accessories list from the Internet, printing it out and keeping it together with the manual for reference purposes.

2 Safety

2.1 Product safety

This product exhibited no flaws in terms of technical safety at the time it left the factory. To preserve this status and ensure non-hazardous operation of the product, the following instructions must be observed carefully.

2.2 Hazard levels

The following warning messages indicate the severity of the hazard and its possible effects.

DANGER

Immediate danger of life

Irreversible injuries that will result in death.

Warns of dangerous situations or unsafe actions that will most certainly cause severe injuries or death.

Lists measures to avoid hazard.

WARNING

Severe health hazards

Serious injuries that could result in death.

Warns of dangerous situations or unsafe actions that could result in serious injuries or death.

Lists measures to avoid hazard.

CAUTION

Health hazards or severe property damage

Warns of dangerous situations or unsafe actions that could result in moderate injuries or considerable property damage.

Lists measures to avoid hazard.

NOTE

Warning symbols

The warning symbols may be selected individually, depending on the situation.

2.3 Warning symbols

Make sure that any additional hazard symbols are marked on the product for your operation of the product.

The following warning symbols in the documentation and at hazard areas of the product point out hazard potentials:

 – Warning of a hazard area

NOTE

Warning symbol on the product

If this warning symbol is on the product, read the respective documentation prior to installation and initial start-up.

 – Warning of electric shock from electrical potential

 – Warning of danger of fire and explosion from highly flammable substances and gases

 – Warning of danger of poisoning and chemical burns from chemical hazardous substances

 – Warning of danger of infection and poisoning from biological hazardous substances

 – Warning of risk of injury from high temperatures

 – Warning of cut injuries from pieces of broken glass and/or sharp edges

 – Warning of risk of injury by laser radiation

 – Warning of dangerous optical radiation

2.4 Intended use

Metrohm products are used for the analysis and handling of chemicals.

Usage therefore requires the user to have basic knowledge and experience in handling chemicals. Knowledge regarding the application of fire prevention measures prescribed for laboratories is also mandatory.

Adherence to this technical documentation and compliance with the maintenance specifications make up an important part of intended use.

Any utilization in excess of or deviating from the intended use is regarded as misuse.

Specifications regarding the operating values and limit values of individual products are contained in the "Technical specifications" section, if relevant.

Exceeding and/or not observing the mentioned limit values puts people and components at risk. The manufacturer assumes no liability for damage due to non-observance of these limit values.

The EU declaration of conformity loses its validity if modifications are carried out on the instruments and/or the components.

2.5 Residual risks

2.5.1 General dangers at the workplace

Generally, the regulations and provisions of the regulatory institutions and authorities in the field of work apply.

The instructions regarding the following areas have to be followed when using the products:

- Work safety
- Handling mechanical installations
- Handling electricity
- Handling hazardous and environmentally damaging substances
- Disposing hazardous and environmentally damaging substances

If they are not followed, this may result in:

- Disturbing, injuring and/or killing of people
- Malfunction and/or damage to instruments and infrastructure
- Damage and/or contamination of the environment

WARNING

General dangers at workplace

If the safety measures are not followed, working in a laboratory bears a high risk of injury, which can endanger your life and health.

- Only professionally trained and qualified specialist personnel may operate the instruments.
- Follow the applicable provisions concerning work safety and all regulations on wearing protective clothing.
- Use suitable tools to perform your work.
- Use protective grounding when working with highly flammable substances and gases.

2.5.2 Danger from highly flammable substances

WARNING

Danger of fire and explosion from highly flammable substances and gases

Burns from fire and/or injuries from explosions.

- Avoid ignition sources.
- Use protective grounding.
- Use exhaust equipment.

2.6 Responsibility of the operator

- Eliminate defects or damage which impair operating safety without delay.
- Eliminate malfunctions which could impair safety without delay.
- The rules, regulations and instructions listed in the present document are not the only valid ones. Comply with the applicable statutory rules, government agency directives and regulations.
- Unauthorized modification of the products excludes any and all liability on the part of the manufacturer for any damage resulting from this as well as for any consequential damage. No modifications, attachments or conversions which could impair safety may be carried out on the products without the approval of the manufacturer.
- Spare parts must meet the technical requirements established by the manufacturer. Original spare parts always meet these requirements.
- Personnel must be familiar with this safety-relevant information and it must be available for consultation at all times.

2.7 Personnel requirement

Only qualified personnel may operate the present product.

Qualified personnel are people authorized by the safety responsible to carry out the necessary operations. They are capable of recognizing and avoiding possible dangers. These people are qualified due to their professional training, experience and/or instruction. They know the relevant standards, laws, provisions, accident prevention regulations and the company conditions.

3 Maintenance

3.1 General maintenance

The products require appropriate care. Excess contamination of the products may result in functional disruptions and a reduction in the service life of the mechanics and electronics.

Only perform maintenance work that is described in this instruction. Contact your Metrohm service for further maintenance and repairing works.

Remove spilled chemicals and solvents immediately.

NOTE

The product is protected by design measures from being penetrated by liquids.

3.2 Maintenance agreement

Maintenance of the product is best carried out as part of an annual service performed by specialist personnel from Metrohm. Shorter maintenance intervals may be necessary if you frequently work with caustic and corrosive chemicals.

Metrohm Service offers every form of technical advice for maintenance and service of all Metrohm products.

3.3 Cleaning the product

WARNING

Danger of poisoning and chemical burns from chemical hazardous substances

Poisoning and/or chemical burns by contact with aggressive chemical substances.

- Use only detergents that do not cause any unwanted side reactions with the materials to be cleaned.
- Clean contaminated surfaces.
- Wear protective equipment.
- Use exhaust equipment when working with vaporizing hazardous substances.
- Dispose of chemically contaminated materials (e.g. cleaning material) properly.

Cleaning the surfaces of the product

1 Clean the surfaces with a damp cloth.

NOTE

Water or ethanol can be used as a cleaning medium.

3.4 Disassembling the Dosing Unit PCR

Disassemble the Dosing Unit PCR as follows:

Disassembling the Dosing Unit PCR

Prerequisite

The Dosing Unit PCR has been removed from the Dosino.

CAUTION

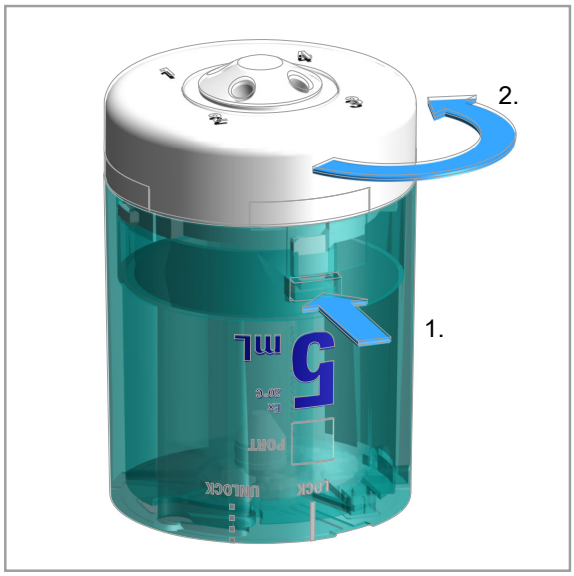
Jammed Dosing Unit PCR

If you disassemble a jammed Dosing Unit PCR the dosing unit will be damaged and it has to be replaced.

- Do not apply force if the cylinder cap cannot be rotated easily.
- Follow the instructions *(see "Fixing the jamming", page 12)*.

Accessories

- Piston tongs (6.1546.030)

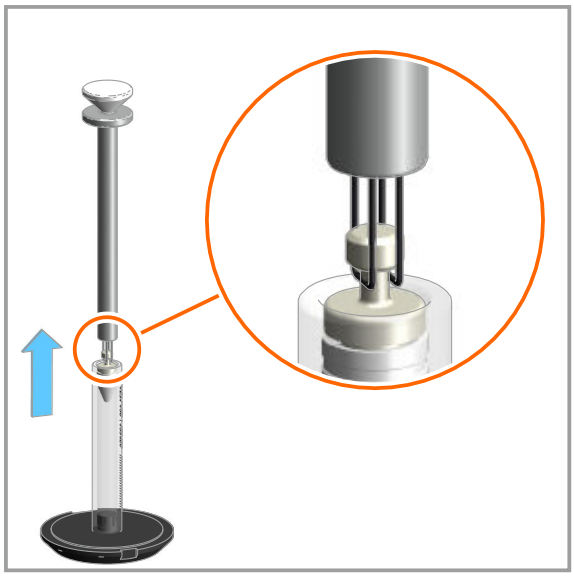


1. Press the unlocking button and hold it down.
2. Rotate the cylinder cap to the right until it stops.

Remove the cylinder cap. Set it aside.

Remove the cylinder element.

Hold the black cylinder base. Pull the cylinder together with the piston out of the centering tube.



Position the piston tongs at the piston stopper of the piston. Lift the piston out of the cylinder.

NOTE

Do not disconnect the cylinder from the cylinder base.

Fixing the jamming

The Dosing Unit PCR can jam if the valve disk and the distributor disk stick together.

A jamming can occur when:

- problematic reagents have been used.
- the Dosing Unit PCR was not used for a prolonged period.

A jamming of the Dosing Unit PCR is displayed by error messages in the software.

While disassembling a Dosing Unit PCR, you can recognize a jamming by the difficulty of removing the cylinder cap.

Fixing the jamming of the Dosing Unit PCR

1. Remove the tubings and the stoppers.
2. Fill every port with deionized water or another corresponding solvent with a pipette.
3. Allow the Dosing Unit PCR to stand for several hours or overnight.
4. Pour the water or the solvent out of the ports.
5. Reassemble the Dosing Unit PCR.

If error persists, call Metrohm Service or replace the entire Dosing Unit PCR.

3.5 Cleaning the Dosing Unit PCR

Cleaning the housing and the centering tube

Prerequisites:

The Dosing Unit PCR is disassembled.

1 Clean the Dosing Unit PCR housing with water.

2 Clean the centering tube with water.

Cleaning the cylinder and piston

Prerequisites:

The Dosing Unit PCR is disassembled.

1 **Cleaning the piston**

- Use a cloth to gently degrease the piston.
- Clean the piston with liquid cleaning agent.
- Rinse the piston thoroughly with deionized water.

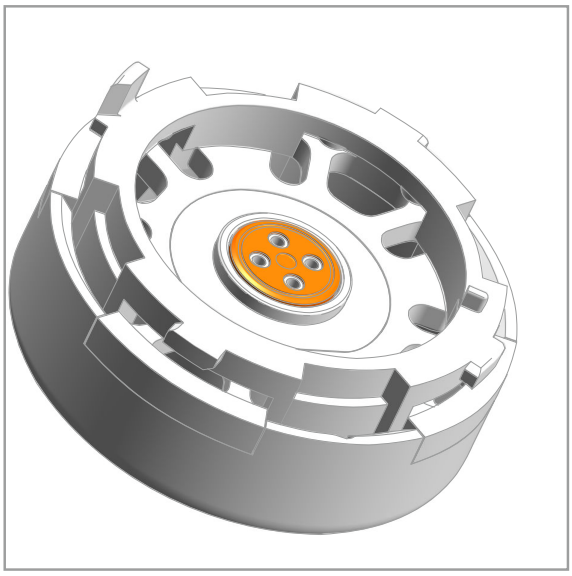
2 **Cleaning the cylinder**

- Clean the cylinder with liquid cleaning agent.
- Rinse the cylinder thoroughly with deionized water.

Cleaning the valve disk and distributor disk

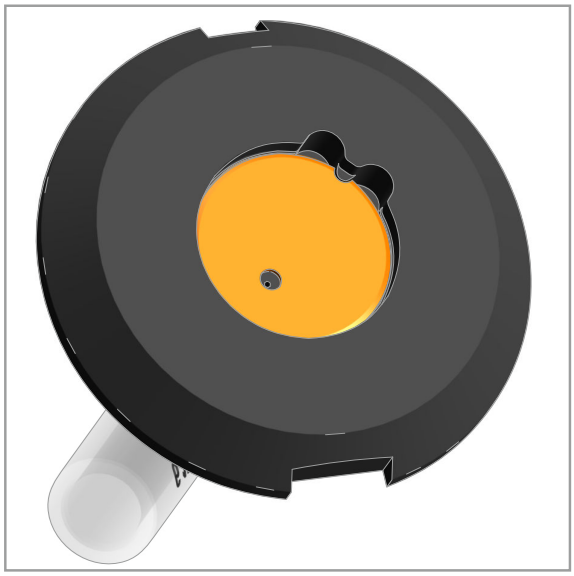
NOTE

Do not remove the valve disk and the distributor disk!



The distributor disk is located in the bottom of the cylinder cap and has 4 openings.

1. Clean the cylinder cap with water.
2. Clean the contact surface of the distributor disk with ethanol.



The valve disk is positioned in the cylinder base and has only 1 opening.

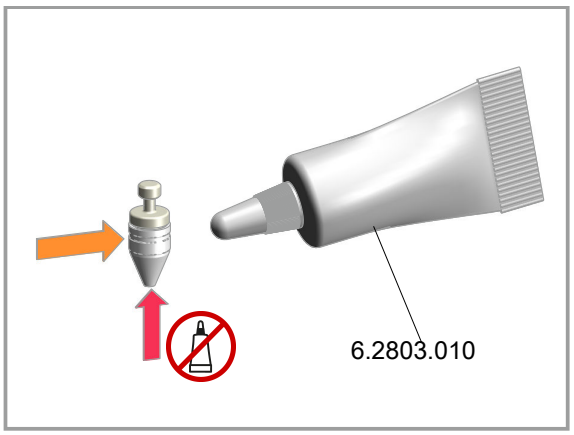
1. Clean the contact surface of the valve disk with ethanol.

3.6 Assembling the Dosing Unit PCR

Greasing and inserting the piston

Prerequisites:

- The cylinder and the piston are clean and in impeccable status.



Greasing the piston

NOTE

Grease only the edge of the piston.

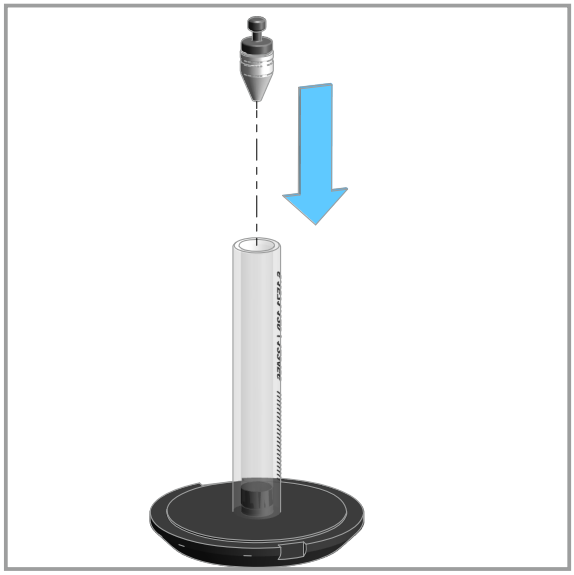
The tip of the piston must not be greased.

NOTE

Always wear gloves when greasing the piston.

Using your finger, carefully apply a trace of paraffin grease (6.02803.010) to the exterior of the sealing lips of the piston.

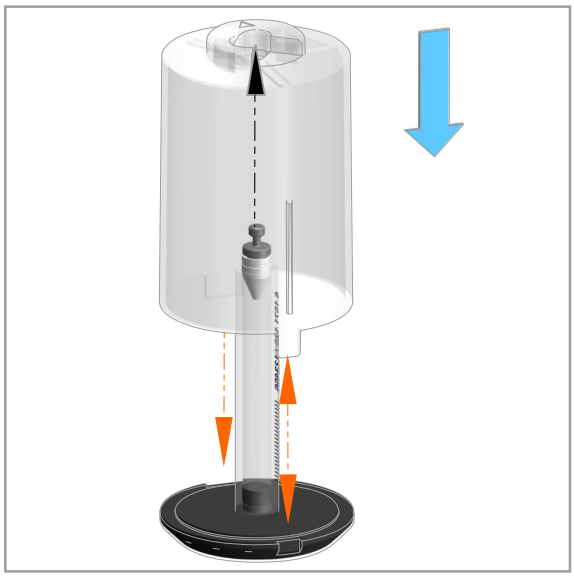
Wipe off excess grease with a soft, lint-free cloth.



Inserting the piston

1. Place the cylinder base on the countertop.
2. Set the piston down loosely on the cylinder.

Assembling the cylinder element



Attach the centering tube on the cylinder base. Observe the following while doing so:

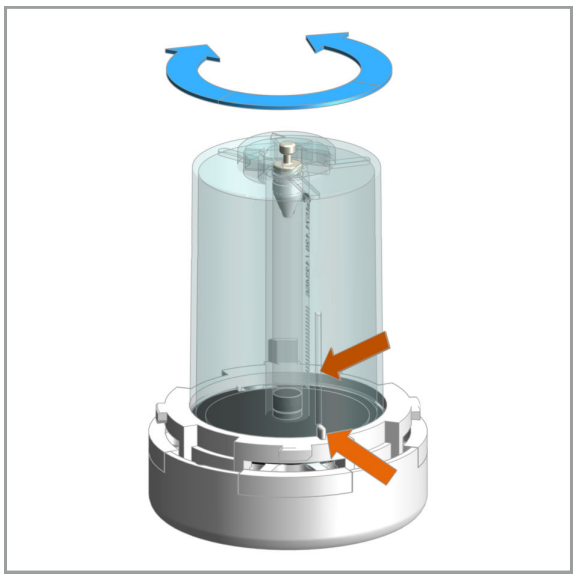
- The piston stopper must fit through the small opening.
- The protrusions of the centering tube must fit into the recesses of the cylinder base.

Press the centering tube onto the cylinder base.

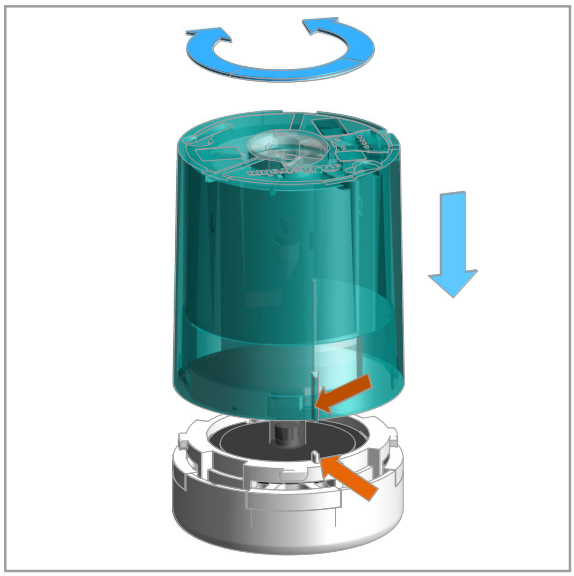
The piston is pressed into the cylinder in a centered position.

Mounting the housing

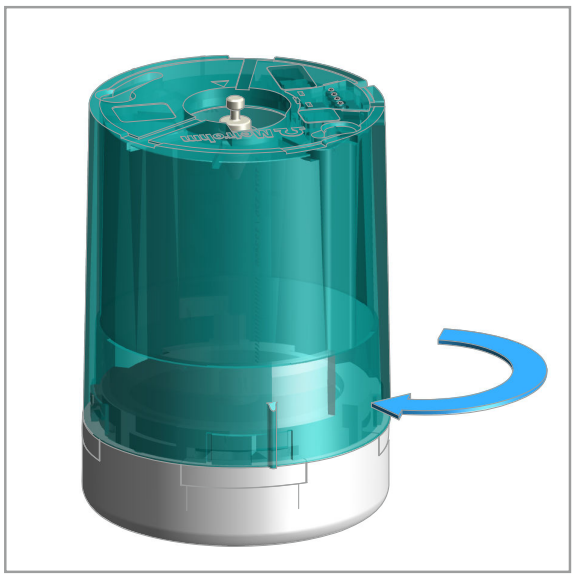
- Place the cylinder cap on the countertop with the ports facing downwards.
- Place the cylinder element on the cylinder cap.



1. Rotate cylinder element in such a way that the markings on the centering tube and on the cylinder cap are positioned above one another.



1. Attach the green housing. Observe the following while doing so:
   The markings on the housing, on the centering tube and on the cylinder cap must be positioned above one another.
   The housing must rest flush on the cylinder cap.



Press the housing down and rotate it to the left until the unlocking lever snaps into place.

Turn the Dosing Unit PCR over and press it firmly against the countertop.

The piston is pressed into the correct position.

4 Malfunctions and troubleshooting

4.1 Troubleshooting

Problem	Cause	Remedy
Visible crystallization	*Solidified liquids in the glass cyilder.*	This crystallization is not critical for the PCR applications. Information on how to clean the Dosing Unit PCR can be found in the Maintenance section *(see Chapter 3, page 8)*.
The cylinder top piece cannot be removed	*The cylinder unit is jammed because the valve disk and the distributor disk stick together.*	Fix the jamming *(see "Fixing the jamming", page 12)*.

5 Technical specifications

5.1 Ambient conditions

Nominal function range	+5 - +45 °C, at a maximum of 85% humidity
Storage and transport	–20 - +70 °C
Altitude / Pressure range	max. 2,000 m.a.s.l. / min. 780 mbar