Dronavia

MADE IN FRANCE

USER'S MANUAL & INSTRUCTIONS

UNIVERSAL PARACHUTE RECOVERY SYSTEM KRONOS NANO

PRS KRONOS NANO

WWW.DRONAVIA.COM | +33 (0) 354 400 078 | VERSION 1.0

SUMMARY

universal parachute recovery system (-1.5KG)

INTRODUCTION
by our CEO

"At Dronavia, we've been developing a wide, innovative range of accessories to secure your professional drones since 2015. Based in France, we think up all our products in our design office, before bringing them to life in our workshop, with unique technological know-how.

The fruit of more than 8 years of research and innovation, our new range of Kronos parachutes and FTS has been developed and tested in accordance with the standards imposed by the EASA and the DGAC, to comply with MOC2511 and the MOC M2.

Thanks to its standardised safety accessories, Dronavia ensures that remote pilots have the best risk management and safety measures at their disposal during their flying missions. You'll be flying in complete safety thanks to the Kronos Nano parachute.

Thank you for your confidence & enjoy your flight!

Ludovic Pelletey, Dronavia's CEO.

GENERAL presentation

Dear customer,

Congratulations on the purchase of your new Kronos Nano autonomous deployment parachute system.

You have chosen what we are sure is the best performing system of its kind. Extensive research and testing have gone into making it as safe and effective as possible.

Based in Remiremont, France, DRONAVIA is at your service to advise you on the purchase of your Kronos Nano rescue parachute and to answer any questions of a technical or commercial nature.

GENERAL presentation

The Kronos Nano parachute has been designed for aircraft weighing less than 2 kg, such as DJI (Mavic 2 / 3 / Zoom / Pro / Air / Enterprise) , Autel (Evo II), Parrot (Anafi USA & Anafi Ai). It has been developed with the aim of being deployed as quickly as possible while keeping the crash rate to a minimum.

Multi-rotor drones, even when properly used and maintained, can sometimes find themselves in a critical emergency situation where immediate rescue is required, due to severe weather conditions, radio transmission failure, technical failure of the propulsion system, loss of GPS signal, and so on.

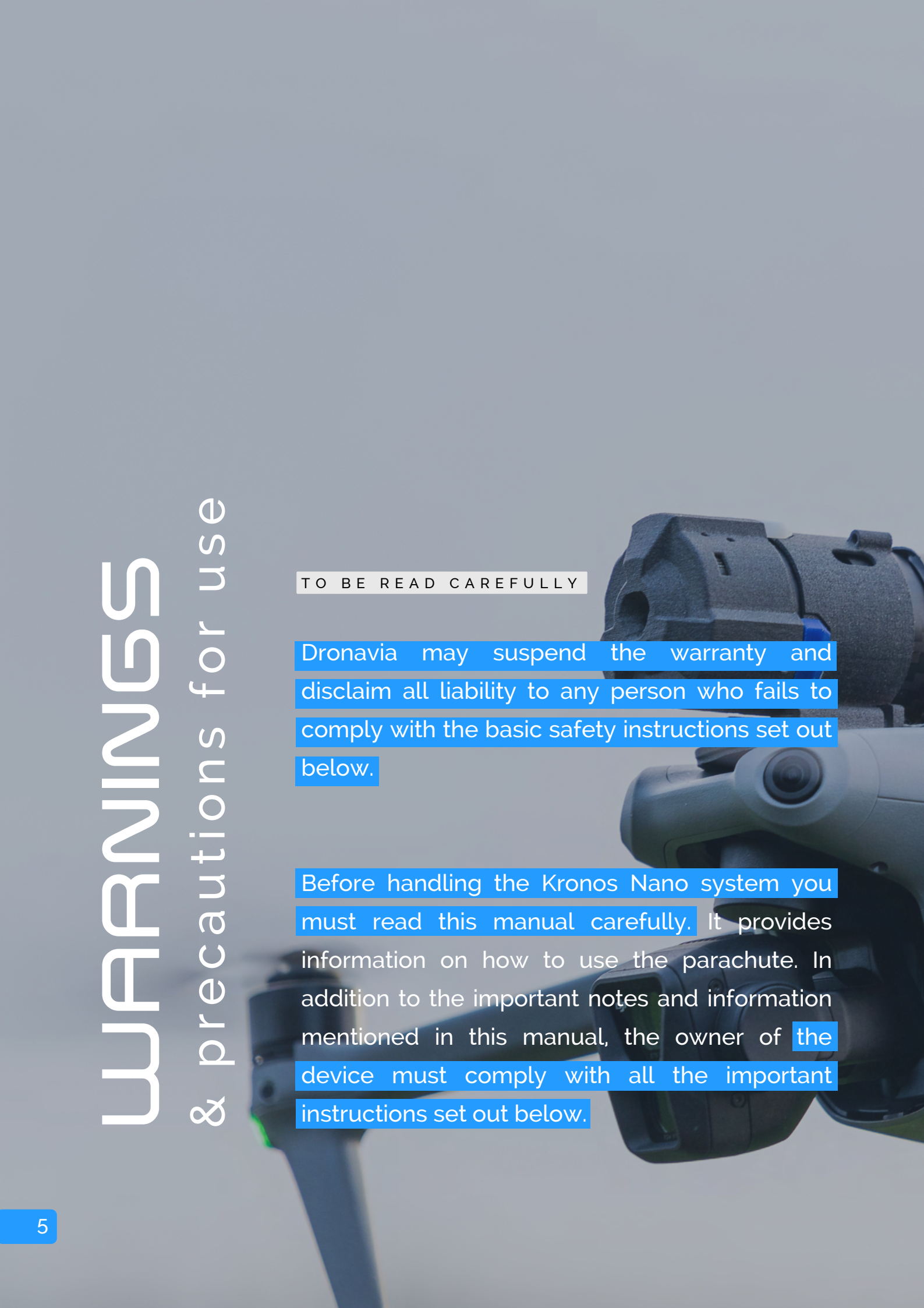
In such situations, parachute rescue systems with autonomous deployment can make the difference between a simple scare and a more serious accident. The Kronos Nano parachute can be activated and deployed automatically in less than a second, keeping your drone safe.

GENERAL
presentation

TO BE READ CAREFULLY

These emergency devices do not protect the integrity of the equipment or prevent damage to property or persons; they are a safety feature that complements other safety features. Neither DRONAVIA nor its distributors may be held responsible for any malfunction or operation deemed insufficient or even ineffective.

WARNINGS & precautions for use

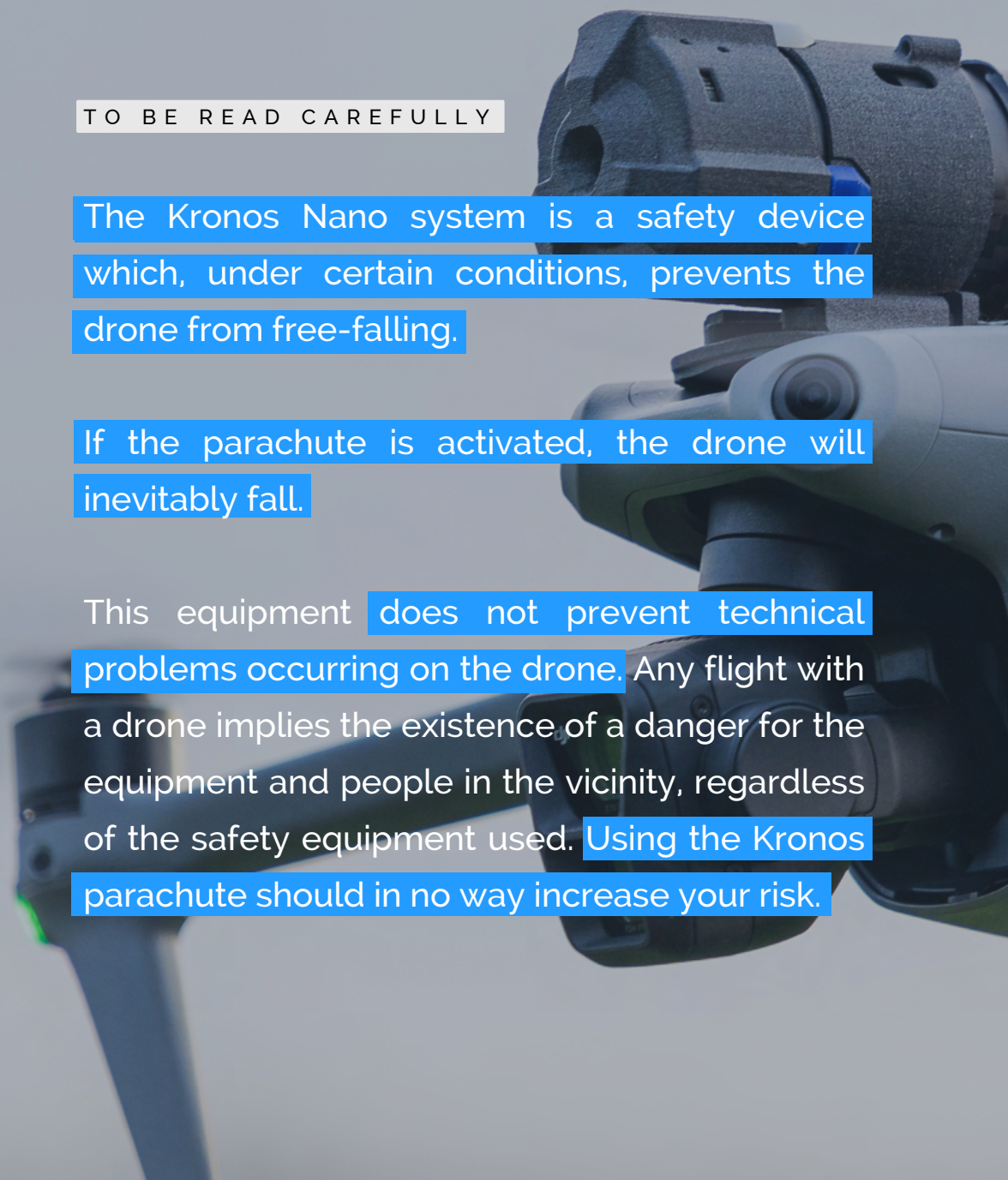


TO BE READ CAREFULLY

Dronavia may suspend the warranty and disclaim all liability to any person who fails to comply with the basic safety instructions set out below.

Before handling the Kronos Nano system you must read this manual carefully. It provides information on how to use the parachute. In addition to the important notes and information mentioned in this manual, the owner of the device must comply with all the important instructions set out below.

WARNINGS & precautions for use



TO BE READ CAREFULLY

The Kronos Nano system is a safety device which, under certain conditions, prevents the drone from free-falling.

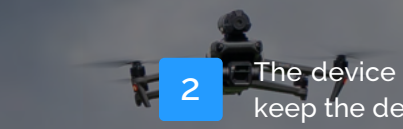
If the parachute is activated, the drone will inevitably fall.

This equipment does not prevent technical problems occurring on the drone. Any flight with a drone implies the existence of a danger for the equipment and people in the vicinity, regardless of the safety equipment used. Using the Kronos parachute should in no way increase your risk.

15 INSTRUCTIONS

to follow

1. It is forbidden to carry out any manipulations other than those specified in the manual.



2. The device should only be used by or under the supervision of a responsible adult. Always keep the device out of the reach of children. Do not let them play with it.

3. Do not under any circumstances dismantle the various parts of the device, except when resetting it in accordance with the instructions in this manual.

4. Do not place the device in a damp or wet environment and keep it out of direct sunlight.

5. Do not expose the system to high temperatures, strong shocks, shock hazards, contact with chemicals or acids, or long-term storage in a high-humidity or dusty environment. The maximum operating temperature is 40°C and the Nanomum operating temperature is -5°C.

6. Check that the Kronos Nano parachute system is in good condition before each use. Do not use the device if it is damaged. If necessary, contact your reseller.

7. The Kronos Nano parachute system cannot prevent the drone from malfunctioning.

8. Any flight with a drone implies the existence of a risk for the equipment and people in the vicinity, with or without the Kronos Nano safety system.

TO BE READ CAREFULLY

15 INSTRUCTIONS
to follow

9 Using a Kronos Nano parachute system should never increase your risk-taking.

10 The Kronos Nano parachute system attempts to prevent a drone suffering a malfunction from free-falling. However, there are fall situations in which the effectiveness of the Kronos Nano parachute system may be limited or impeded.

11 The Kronos Nano parachute system can be actively activated by the user. Regular training is necessary to be able to react correctly in an emergency.

12 The spring ejection system only works once. You can recharge the system yourself by following the instructions in this manual. It is your responsibility to ensure that the system is under warranty.

13 When reloading, it is forbidden to do so with people nearby, and especially with the barrel pointing in their direction. You must take the same precautions as when handling a loaded rifle. In the event of accidental firing during this stage or mishandling, the spring could be ejected and cause serious injury. Safety glasses must be worn.

14 After the device has been triggered, it is advisable to inspect each component carefully to ensure its integrity. If in doubt, contact your reseller.

15 After switching on the system, if the LED changes to a steady red, do not use it and contact your dealer for assistance.

TO BE READ CAREFULLY

KRONOS SYSTEMS

UNIVERSAL PARACHUTE RECOVERY SYSTEMS FOR DRONE

COMPONENTS

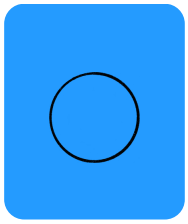
presentation

ADDITIONAL ACCESSORIES SUPPLIED

Micro USB cable

Adhesive fixing support

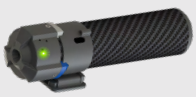
Universal fixing support



Fixing elastic

THE STATES
system

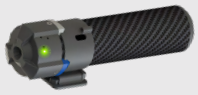
STARTING



RAPID FLASHING

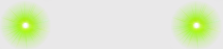
System initialisation

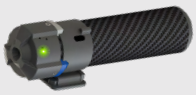
CONNECTION



SLOW FLASHING

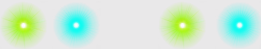
FTS only connected

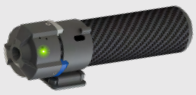




SLOW FLASHING

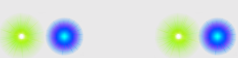
FTS & parachute connected

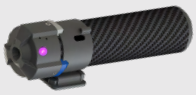




SLOW FLASHING

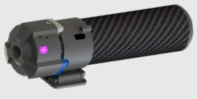
FTS & parachute connected with autonomous deployment





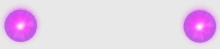
LED STEADY

Search for activation of autonomous deployment



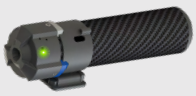
SLOW FLASHING

Disabling autonomous deployment



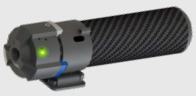
THE STATES
system

TRIGGERING



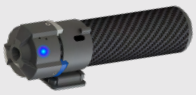
RAPID FLASHING

Single FTS triggered



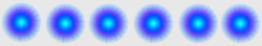
RAPID FLASHING

FTS & parachute triggered

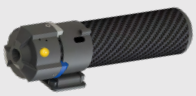


RAPID FLASHING

FTS & autonomous parachute deployment

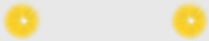


SYSTEM & BATTERY ALERT



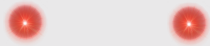
SLOW FLASHING

No remote control signal



SLOW FLASHING

Low battery

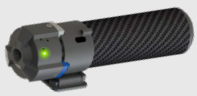


LED STEADY

System error

LED STEADY

Battery charging



LED STEADY

Battery charged

KRONOS NANO

Technical specifications

TOTAL WEIGHT	110 GRAMMES
EJECTION DEVICE	SPRING PRESTRESSED
NANOMUM HEIGHT EFFICIENCY	FROM 20 METERS
PARACHUTE AUTONOMY	5 HOURS
ENERGY GROUND IMPACT	< 4 JOULES
OPERATING TEMPERATURE	-5°C À 40°C

INSTRUCTIONS

adhesive support installation

To install the adhesive support supplied with the Kronos Nano parachute, follow the instructions below in order:

Instructions

1. Make sure that the support allows the battery to be changed and that no sensor has its field of vision obstructed.

2. Apply adhesive fixings at least 24 hours before use. Adhesive fixings should only be installed on smooth surfaces. Porous or textured surfaces will not provide sufficient adhesion. When applying the fastener, apply sufficient pressure to ensure full contact over the entire surface.

3. Apply adhesive fixings only to clean, dry surfaces. Wax, oil, dirt or other debris will reduce adhesion and may cause the mount and camera to fall off.

4. Install the adhesive fixings at room temperature.

5. The adhesive in the fixings will not adhere properly if applied in cold or damp environments or on cold or damp surfaces.

INSTALLATION
of the parachute system

1 Install the adhesive parachute fixing support on the front and centre of the drone.

Warning

Make sure that the support allows no sensor to have its field of vision obstructed.

INSTALLATION
of the parachute system

2 Install the parachute assembly on the drone, sliding the parachute fixing clip into the adhesive fixing support installed earlier.

3 Pass the main parachute sling under the front right arm of the drone.

4 Pass the main parachute sling under the front left arm of the drone.

INSTALLATION
of the parachute system

5 Hook the carabiner to the main sling by passing it under the canopy ejection tube. Then pass the elastic around the tube and the main sling. Move the elastic forward until the main sling is taut.

Warning

Make sure that the parachute's main attachment sling is correctly attached to the drone's body and that there is no play that could cause it to come into contact with the propellers.

6 Your Kronos Nano parachute is operational.

INSTALLATION

of the parachute system with accessories

1 A universal mounting bracket is supplied. It can be installed wherever you like and allows you to use the parachute and the drone with one or more accessories. The installation procedure remains the same.

Advice

A cover is also supplied to obstruct the upper sensors of the DJI Mavic 2 Enterprise drone. It ensures optimum operation of the drone with the Kronos Mini parachute.

2 Your Kronos Nano parachute is now operational.

ACTIVATION
of the parachute system

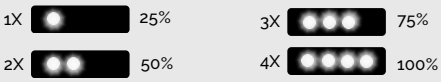
To activate the parachute, follow these instructions in order:

Instructions

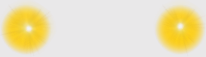
1 Switch on the parachute by holding down the black ignition button for 1 second. The LED indicates start-up by a sequence of colours and the audible alarm beeps 3 times to indicate that it is operating correctly. The LED then indicates the battery level. The LED then flashes yellow to indicate that the parachute is powered up.

The different LED states

System initialisation



Battery level indicator



Parachute on, waiting to be activated

ACTIVATION
of the parachute system

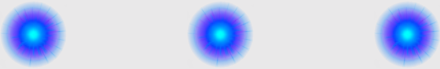
2 Double-click the parachute start button. The parachute LED turns a steady purple during the activation phase before turning blue. Autonomous deployment of your parachute is now activated.

Warning

Do not touch the drone or the parachute during the calibration phase, as this may trigger the parachute.

The different LED states

Search for activation of autonomous deployment



Autonomous deployment activated

4 Your Kronos Nano parachute is active.

DISABLE
of the parachute system

To deactivate the autonomous deployment of the parachute, follow the instructions below in order:

Instructions

1 To deactivate the parachute's autonomous deployment function, double-click on the parachute's ignition button. The LED will flash purple twice to confirm deactivation.

Warning

Do not touch the drone or the parachute during the calibration phase, as this may trigger the parachute.

2 The LED flashes yellow to indicate that the parachute is powered up.

The different LED states

Disabling autonomous deployment

Parachute on, waiting to be activated


YOUR PARACHUTE IS
ACTIVE AND
OPERATIONAL!

TRIGGERING
of the parachute system

To activate the Kronos Nano parachute system, observe the following safety instructions:

Warning

1. Never attempt to activate the parachute on the ground.

2. The Kronos Nano parachute is designed to be activated at a Nanomum height of 20 m from the ground in standard atmospheric conditions.

3. For a fall from a height of 20 m, the impact on the ground is less than 4 joules with the Kronos Nano parachute system, compared with 226 joules without any device.

This data may vary according to altitude above sea level, relative wind and many other external factors. That's why we recommend a Nanomum height of 20 m above ground level to trigger the Kronos Nano parachute system and sufficiently limit the impact of your drone on the ground.

STOP

& resetting the parachute system

To stop, switch off and reset the parachute, follow the instructions below in order:

Instructions

1 Press and hold (3 seconds) the ignition button, the LED indicates the battery level and then goes out. the system is switched off.

Warning

Any manipulation of the parachute while it is still switched on (moving the drone on foot or in a car) may result in false autonomous deployment and triggering of the parachute. If the drone is stationary for more than 10 minutes, the parachute will automatically switch off.

DISASSEMBLY

the complete parachute system

To dismantle the whole parachute system, follow the installation instructions in reverse order.

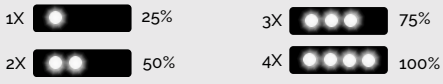
CHECKING
of the parachute system battery

To check the battery status of the parachute system, follow the instructions below in order:

Instructions

1 Press the parachute ignition button quickly. The number of flashes indicates the remaining charge level.

The different LED states



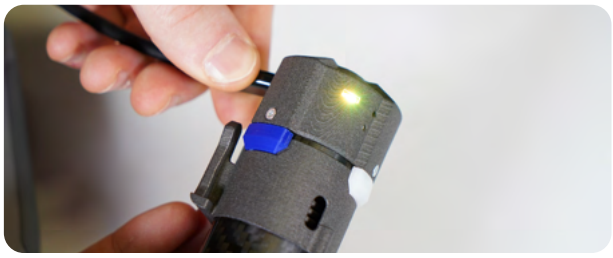
Battery level indicator

CHARGING
of the parachute system battery

To charge the parachute battery, follow the instructions below in order:

Instructions

1 To recharge the parachute battery, simply connect the supplied micro-USB cable to the parachute's micro-USB socket located near the ignition button. Then plug the USB socket into a computer.



The different LED states

Battery charging

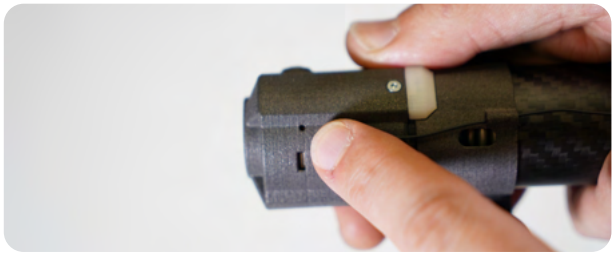
Battery charged

RESETTING
of the parachute system

In the event of a malfunction or any other bug, follow the instructions below in order:

Instructions

1 To reset the parachute system, there is a small hole in the back of the parachute. Slide a paper clip or other thin object through the hole, and a short press will reset the entire parachute system.

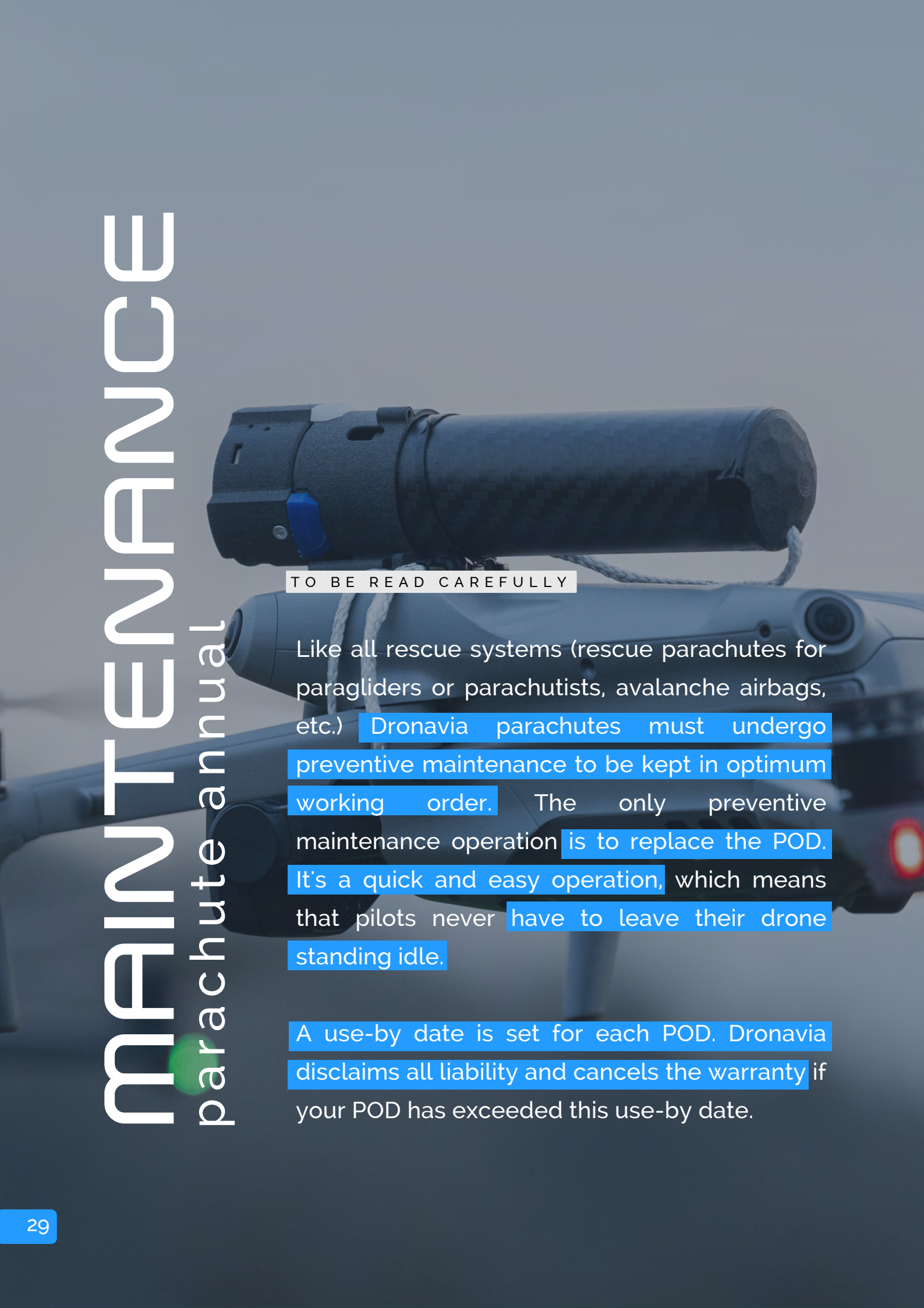


Warning

If the malfunction persists, contact Dronavia customer service or your reseller.

MAINTENANCE

parachute annual



TO BE READ CAREFULLY

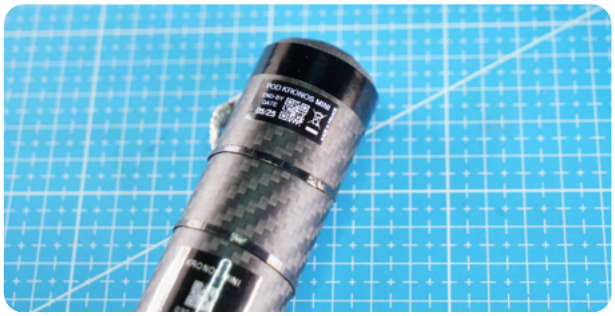
Like all rescue systems (rescue parachutes for paragliders or parachutists, avalanche airbags, etc.) Dronavia parachutes must undergo preventive maintenance to be kept in optimum working order. The only preventive maintenance operation is to replace the POD. It's a quick and easy operation, which means that pilots never have to leave their drone standing idle.

A use-by date is set for each POD. Dronavia disclaims all liability and cancels the warranty if your POD has exceeded this use-by date.

USE-BY DATE
for the POD

Each POD has a use-by date to ensure that it remains in optimum working order:

The optimum life of a POD is 1 year. The use-by date is shown on the label on the back of the parachute.



A new use-by date label is supplied inside the new POD to replace the original label on the parachute.

Warnings

If a POD is used after its use-by date, Dronavia accepts no liability for partial or slower activation of the parachute system.

PROCEDURE

return of the POD for maintenance

There are several options for exchanging your POD that is past (or close to) its use-by date:

Buy 99€

1 Buy a POD in advance from your reseller. You'll be able to continue flying during the annual maintenance of your first POD.

Exchange 49€

2 Return your POD to a reseller and receive a new one at a special price.

Warning

Please plan in advance how long it will take to contact your reseller (order, delivery time, etc.) so as not to exceed the use-by date and jeopardise your flight missions.

DISASSEMBLY

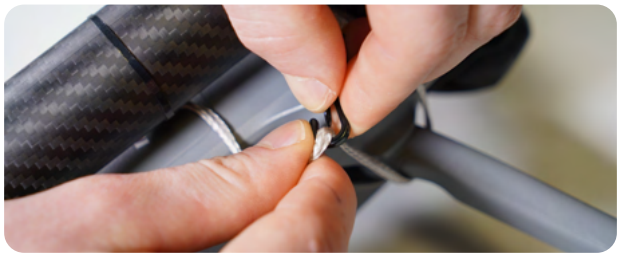
of the POD system for maintenance

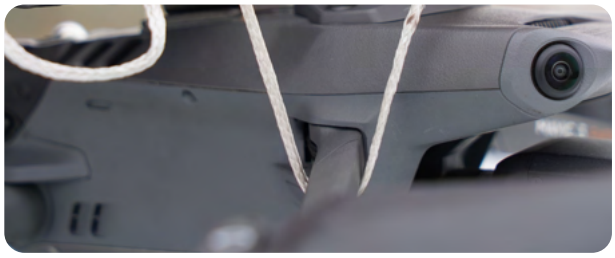
To remove the POD from the parachute system, follow the instructions below in order:

Instructions

1 Switch off your drone, then remove the parachute from its mounting.

2 Remove the carabiner, then remove the main sling from around the two front arms of the drone.





DISASSEMBLY
of the POD system for maintenance

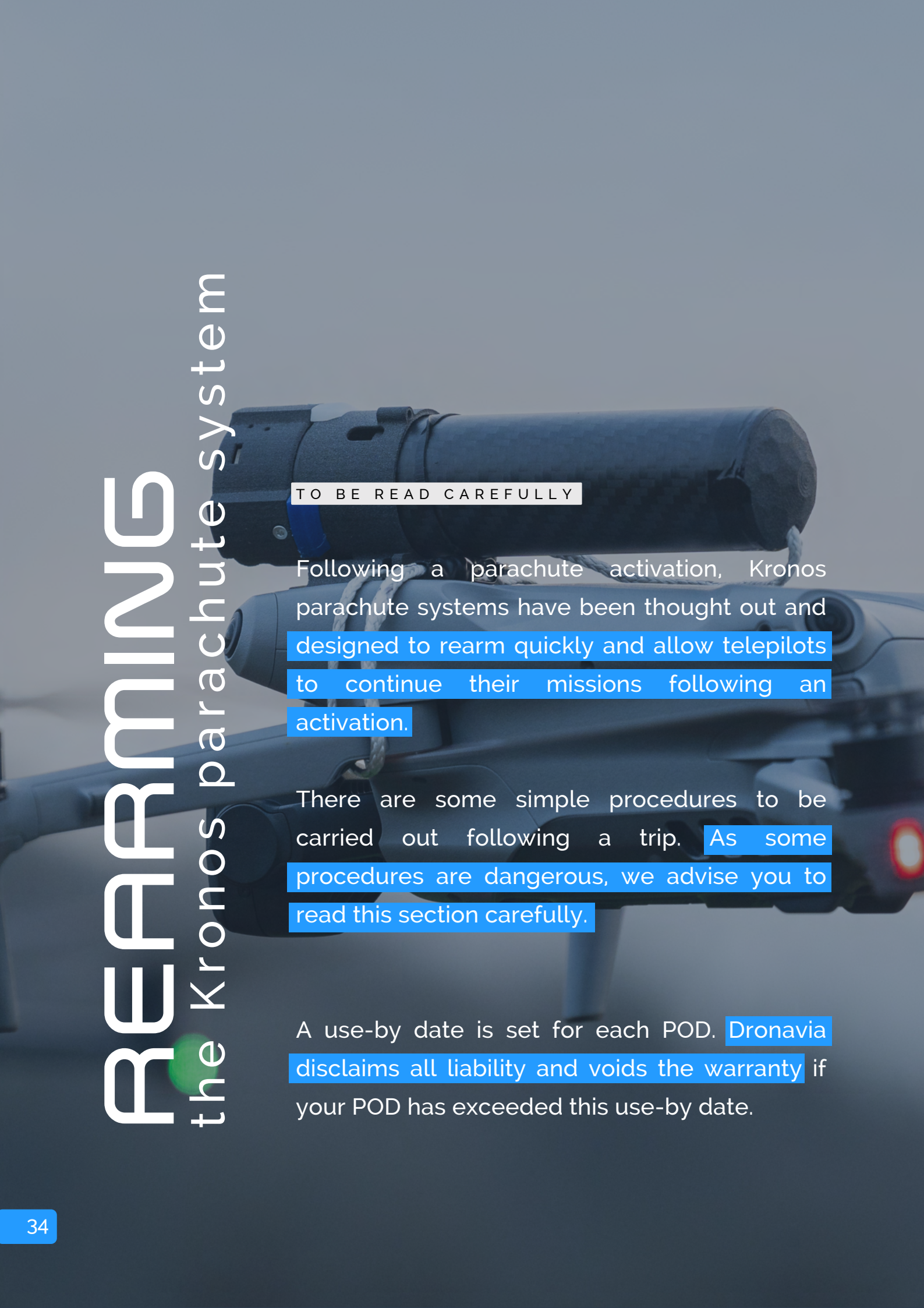
3 Remove the adhesive tape from the back of the parachute, then remove the capsule.

4 Remove the canopy from the ejector tube.

5 Send the used POD to Dronavia or your dealer.

REARMING

the Kronos parachute system



TO BE READ CAREFULLY

Following a parachute activation, Kronos parachute systems have been thought out and designed to rearm quickly and allow telepilots to continue their missions following an activation.

There are some simple procedures to be carried out following a trip. As some procedures are dangerous, we advise you to read this section carefully.

A use-by date is set for each POD. Dronavia disclaims all liability and voids the warranty if your POD has exceeded this use-by date.

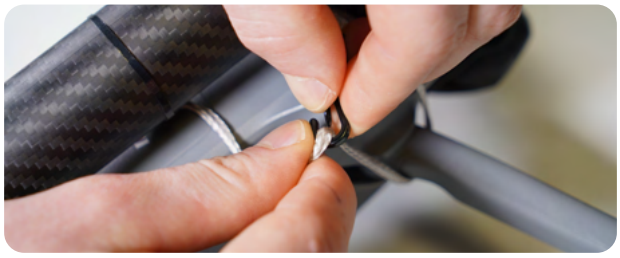
REARMING
of the parachute system

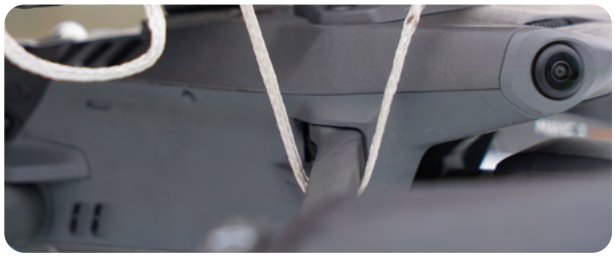
To rearm your parachute system, follow the instructions below in order:

Instructions

1 Switch off your drone, then remove the parachute from its fixing support.

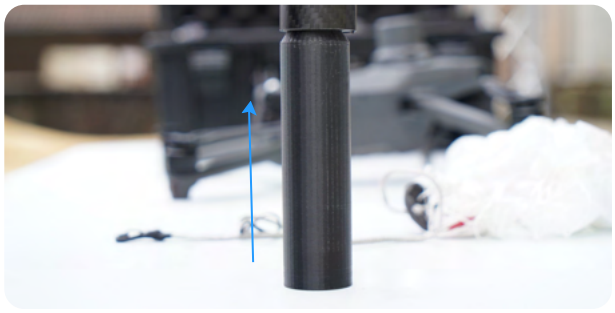
2 Remove the carabiner, then remove the main sling from around the two front arms of the drone.





REARMING
of the parachute system

3 Push back the parachute piston using the tool provided.



4 Take your new POD and remove the adhesive tape to gain access to the canvas.

REARMING
of the parachute system

5 Remove the adhesive from the new POD, then pull the canvas out of the new POD.

REARMING
of the parachute system

6 Press the new canopy into the bottom of the tube of your Kronos Nano parachute.



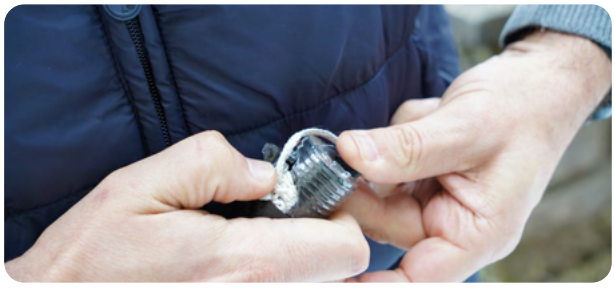

Warning

Be sure to keep the main sling in line with the canopy when inserting it.

REARMING
of the parachute system

7 Maintain pressure while pulling the main sling out of the parachute.

8 Press down on the top part of the new POD to exert additional pressure and free up space for your thumb.

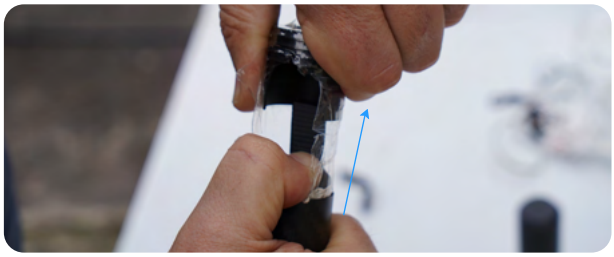


Warning

Remember to maintain firm pressure throughout.

REARMING
of the parachute system

9 Remove the plastic sleeve surrounding the new fabric by pulling it outwards.



10 While continuing to exert pressure on the inserted cloth, remove the top part of the new POD.

REARMING
of the parachute system

11 Position the capsule and close the parachute with it.

Warning

Check that none of the canopy lines are blocked by the capsule.

12 Stick the adhesive tape provided around the flat edge of the capsule.

Warning

Position the adhesive tape only on the flat edge of the capsule. If the tape supplied covers too much of the capsule, there is a risk that the parachute will not release or will release more slowly.

REARMING
of the parachute system

13 Install the parachute assembly on the drone, sliding the parachute fixing clip into the adhesive fixing support installed earlier.

14 Pass the main parachute sling under the front right arm of the drone.

15 Pass the main parachute sling under the front left arm of the drone.

REARMING
of the parachute system

16 Attach the carabiner to the main sling. Then pass the elastic around the tube and the main sling. Pull the elastic forward until the main sling is taut.




Warning

Make sure that the parachute's main attachment sling is correctly attached to the drone's body and that there is no play that could cause it to come into contact with the propellers.


YOUR PARACHUTE IS
REARMED!

PROCEDURE

for returning a used POD

There are several options for returning your used POD:

Buy 99€

1 Buy a POD from your dealer. Then carry out maintenance on your used POD.

Exchange 49€

2 Return your used POD to a dealer and receive a new POD at a special price.

Warning

Please plan in advance how long it will take to contact your dealer (order, delivery time, etc.) so as not to exceed the use-by date and jeopardise your flight missions.

MAINTENANCE & guarantees

STORAGE

Store the Kronos Nano parachute system in a dry place, at a temperature between 10°C and 30°C, clean and protected from UV light.

GUARANTEE

Dronavia takes great care in the design and production of its products. We guarantee our parachute systems for one year from the date of purchase against any defect or design fault that may arise during normal use of the product. Any abusive or incorrect use, or exposure to aggressive factors (high humidity, excessively high temperatures, etc.) that could lead to damage will invalidate this warranty.

NOTICE OF LIABILITY

Flying a drone, whether manual or automatic, is an activity that requires attention, specific knowledge and good judgement. Be cautious, get trained in appropriate structures, take out insurance and comply with the requirements defined by the DGAC decrees of 11 April 2012 and 17 December 2015 and the EASA.

Ask our sales team your questions

LINKS to know

For France, we recommend that you consult the website of the Nanostry of Ecology, Sustainable Development and Energy if you have any doubts or questions. For Europe, we recommend that you consult the EASA website. Remember that you are flying under your own responsibility.

Website of the Nanostry of Ecological Transition and Territorial Cohesion

Details of MOC 2511 published by EASA :

The IGn map of restricted areas for drones

Details of the M2 MOC published by EASA :

The French Civil Aviation Authority (DGAC)

European Union Aviation Safety Agency (EASA)

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