

Eayload-5

User Manual

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Dear User

Thank you for your trust and for choosing our product.

We believe that professionalism creates quality and that customers come first. Continuous investment in product development, a commitment to precision, and efficient, excellent service drive us to innovate and deliver products that satisfy our customers.

This manual explains how to use the Eayload-5 safely and efficiently. Read it carefully before operation and follow all instructions provided herein.

I. Disclaimer

This disclaimer applies to all authorized users of the Eayload-5 supplied by the Company, including purchasers, authorized dealers, distributors, and developers. Read this disclaimer carefully before using the product and make sure that you fully understand and accept all of its contents. By using the product, you acknowledge and accept all terms and conditions herein.

This product is an intelligent lightweight winch system designed to transport suspended items using a UAV platform. Users have specific responsibilities and obligations and must comply with the following requirements:

Users must carefully read and understand the instructions and operate the product accordingly. Users must also ensure a safe operating environment and comply with applicable local laws and regulations.

Users must strictly comply with the user agreement. The product must not be used for illegal activities, malicious attacks, or abuse. Users bear full responsibility for their use of the product and for any resulting legal consequences.

All intellectual property rights in this product belong to the Company. Without prior written authorization, no person may copy, modify, distribute, display, or otherwise use any part or all of the product.

The product may contain third-party software or technology protected by third-party intellectual property rights. Users must comply with the applicable license agreements.

II. Safety Precautions

When using the product for the first time, strictly follow this manual. Contact the Company's professional personnel if operating assistance is required. The Company assumes no liability for product damage or personal injury resulting from failure to follow this manual.

1. Do not use the product in adverse weather, including rain, snow, or strong winds. It is intended only for normal operating scenarios and ranges. Written authorization from the Company is required before using it in other scenarios or outside the specified operating range.
2. Store the product properly. Avoid prolonged exposure to high temperatures, humidity, high pressure, or strong magnetic fields, as these conditions may affect performance and service life.
3. In an emergency, such as when cargo becomes entangled in trees or during mountain rescue operations, use the one-touch cable-cutting function to free the UAV quickly and protect flight safety.
4. During cargo transport:
 - (1) Never allow anyone to stand beneath a suspended load while it is being lowered.
 - (2) Do not perform overloaded or hazardous operations that may damage the equipment or overload the UAV platform.
5. When using the automatic release hook, place the cargo sling at the curved section of the hook to prevent accidental release. Avoid aggressive UAV maneuvers during flight, as temporary weightlessness may cause the cargo to disengage.
6. Inspect all components before use. Replace any aged or damaged component.
7. Operators must not use the product while under the influence of alcohol or sedating medication, or while experiencing dizziness, fatigue, nausea, or any other impaired physical or mental condition.
8. Become proficient with the remote controller before operation. Maintain a safe distance throughout the flight.

III. Product Overview

I> Basic Introduction

The Eayload-5 is a lightweight UAV winch system developed for the DJI M400 platform. It weighs 1.26 kg, excluding the PSDK adapter module and release hook, and supports a maximum

payload of 5 kg. It is suitable for emergency delivery, cargo transport, express delivery, food delivery, and other UAV applications.



FIG 3-1-1 Eayload-5

When equipped with the mechanical automatic release hook, the Eayload-5 supports automatic release when the cargo touches the ground (mechanical version without the safety pin only), automatic stop at ground contact, and one-touch cargo release. Automatic cable spooling and anti-backlash features help prevent improper winding and reverse tangling.

When equipped with the electrically controlled release unit, the Eayload-5 can release cargo in the air and provides a navigation light for nighttime operations.

II> System composition

1.Eayload-5 Components

The Eayload-5 consists of the winch main unit, a release hook, a PSDK adapter module, and a quick-release mounting kit that mechanically connects the system to the UAV platform.



FIG 3-2-1 Eayload-5 Diagram (Mechanical Release Hook)



FIG 3-2-2 Eayload-5 Diagram (Electrically Controlled Release Hook)

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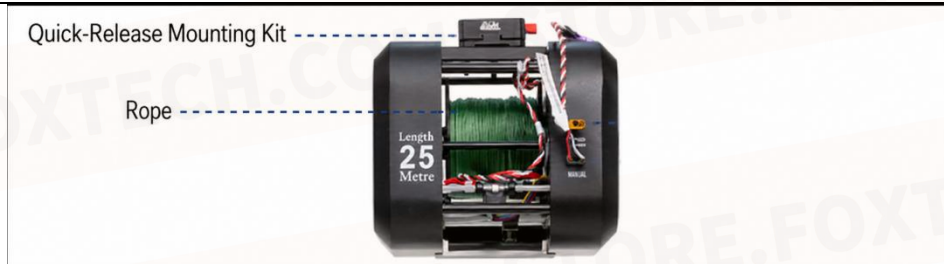


FIG 3-2-3 Lightweight Winch Diagram

*Release Hook: The hook remains closed under the weight of the suspended cargo. When the cargo touches the ground, the hook releases automatically (mechanical version without the safety pin only).

*Counterweight Ring: Features a quick-release design. Install the counterweight ring before lowering the cable without cargo; otherwise, no-load lowering protection will be triggered.

*Electrically Controlled Release Hook: Provides powered opening and closing and a warning/navigation light for nighttime operations.

*Indicator Light

Light Status		Indication
Slow flashing blue		Device operating normally
Fast flashing yellow		Motor fault
Fast flashing red		Motor overload protection
Hovering state	Slow flashing green	Light load
	Slow flashing yellow	Heavy load
	Slow flashing red	Overloaded

Table 3-2-1 Indicator Light Status

2. Release Hooks

Two release-hook options are available. The electrically controlled hook supports one-touch cargo release. The mechanical hook must be lowered to the specified location, where the cargo can be manually removed or released automatically after touching the ground.



FIG 3-2-4 Mechanical Release Hook



FIG 3-2-5 Electrically Controlled Release Hook

3. Smart Release Module (Electrically Controlled Release Hook)

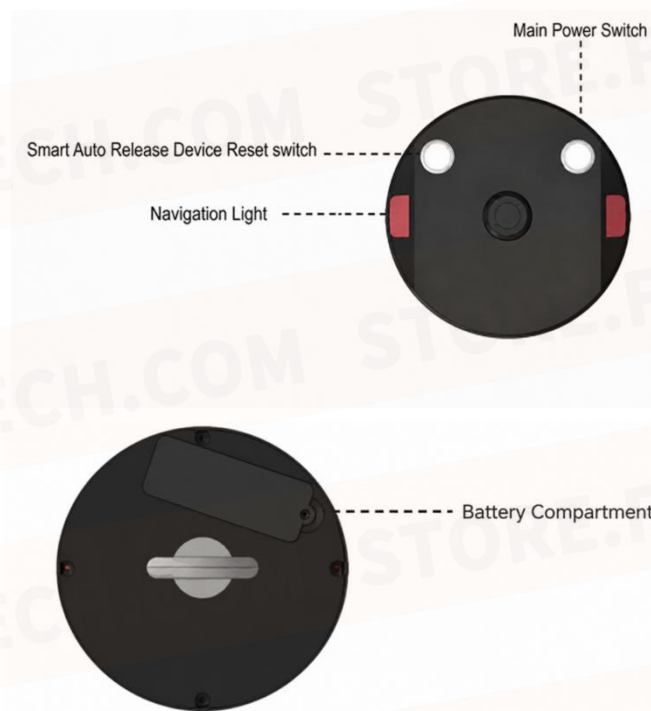


FIG 3-2-6 Smart Release Module Diagram

*Release-Hook Reset Switch: Used by ground personnel when attaching cargo. Press and hold the reset switch for 0.5 seconds to toggle the powered release hook between open and closed.

4. PSDK Adapter Module

The PSDK adapter module provides communication conversion and power between the winch and the DJI M400.

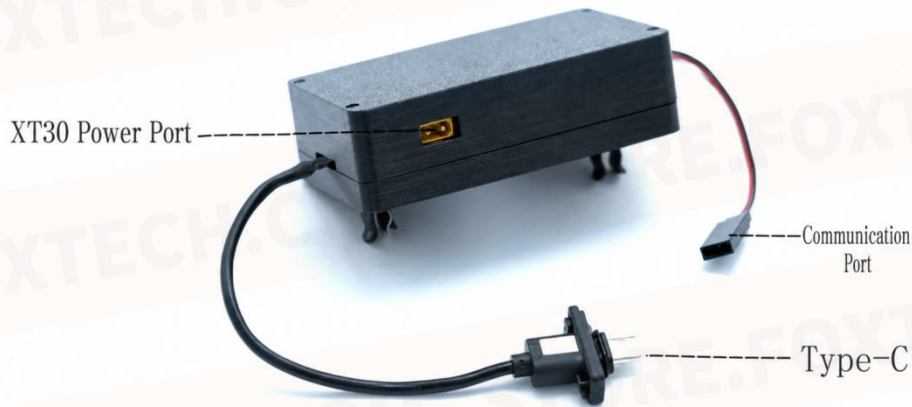


Figure 3-2-7 PSDK Adapter Module Diagram

III>Function Introduction

1.Function

The Eayload-5 provides upper and lower travel limits, automatic cable spooling, automatic release, ground-contact stop, one-touch cargo release, one-touch cable cutting, slow approach to the upper limit, fault alarms, and no-load lowering protection.

- (1) Travel Limits: Supports upper and lower limits.
- (2) Automatic Spooling: The reel automatically arranges the cable.
- (3) Automatic Release: The hook releases automatically after the cargo touches the ground (mechanical version without the safety pin only).
- (4) Powered Release: The electrically controlled version supports one-touch cargo release.
- (5) Ground-Contact Stop: Cable payout stops automatically when the cargo reaches the ground.
- (6) Preset Cable Travel: Supports raising or lowering by a preset cable length.
- (7) One-Touch Cable Cutting: Emergency cable-cutting function.
- (8) Slow Upper-Limit Approach: The cable rises slowly before reaching the upper limit.
- (9) Fault Alarm: The indicator flashes yellow rapidly if a motor fault occurs.
- (10) No-Load Lowering Protection: A lowering command is stopped when no load is detected, preventing reverse cable tangling.
- (11) Cable Length: 25 m.

IV. DJI Pilot Remote Controller Operation

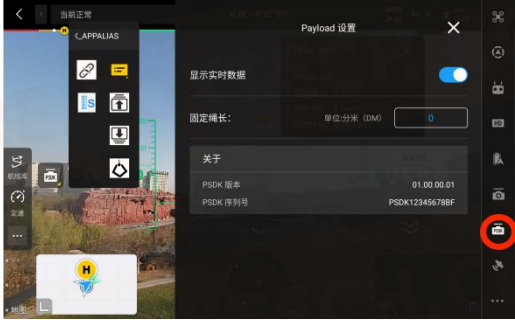
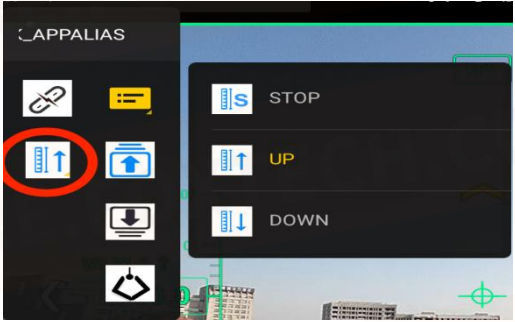


FIG 4-1-1 Control Button Functions (Default Shipping Version)

Button Operation	Corresponding Function
	 Show/Hide Real-Time Information *Displays device status, released cable length, raising/lowering speed, and powered-hook status.
	 Raise Load (Reel In) *Blue indicates that the load is rising; the button turns gray when raising is complete.

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	 Lower Load (Pay Out) *Blue indicates that the load is descending; the button turns gray when lowering is complete.
	 Powered Hook Open/Lock *Check the powered-hook status in the real-time information panel. *Operate with extreme caution to prevent accidental release in the air.
	 Cable-Cutting Check Tests only the cutting mechanism without cutting the cable.  Execute Cable Cutting *Use with extreme caution to prevent accidental activation in the air.

	Preset Raising/Lowering Length *The unit is decimeters (1 m = 10 dm), with 1 dm resolution and ± 0.5 m accuracy.
	   Raise Lower Stop Preset Cable Length

V. Product installation and connection

I>Installing the Quick-Release Mount

Remove the upper section of the quick-release mount (refer to the actual product), install the mounting bracket beneath the UAV, and ensure that it is securely attached to the UAV platform.



FIG 5-1-1 Installing the Quick-Release Mount on the UAV Platform (For Reference Only)

*Select suitable mounting hardware for the UAV platform and ensure a secure, compatible installation.

II> Installing Extended Landing Gear

Install landing-gear extensions to prevent the electrically controlled winch assembly from contacting the ground due to insufficient DJI M400 landing-gear clearance and to ensure safe takeoff and landing.



FIG 5-2-1 Extended Landing Gear Installation

III> Installing the PSDK Adapter Module

Install the PSDK adapter module on the winch support post, connect the RS232 communication interface, and connect the power cable between the module and the winch.

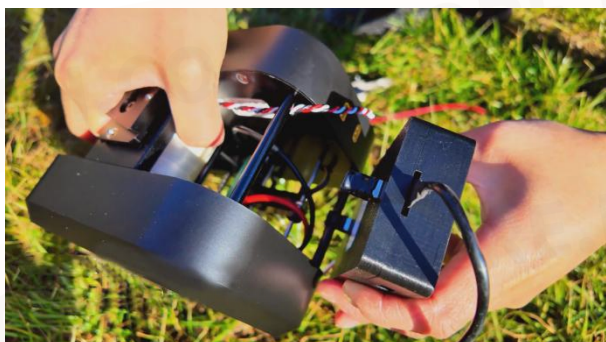


FIG 5-3-1 PSDK Adapter Module Installation

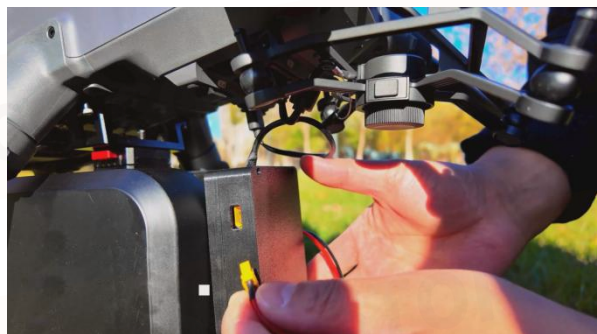


FIG 5-3-2 PSDK Adapter Module Power Cable Installation



FIG 5-3-3 PSDK Adapter Module Communication Cable Installation

IV> Installing the Winch Main Unit on the UAV Platform

Place the UAV platform on level ground. Slide the top connector of the Eayload-5 winch main unit into the quick-release mount and confirm that the winch is securely attached. Then connect the Type-C control connector to the DJI M400 E3 payload control port.



FIG 5-4-1 Installing the Winch Main Unit on the UAV Platform



FIG 5-4-2 Connecting the PSDK Adapter Module to DJI E-Port V2

V> Powering On and Initializing the System

Power on the aircraft and remote controller. After the winch initializes successfully, the indicator flashes green slowly and the remote controller detects the connected payload, displayed as a non-production device.



FIG 5-5-1 Successful Device Initialization and Connection

VI> Resetting the Release Hook

Check that the cable is not wrapped around the limit-switch spring or release hook. Entanglement may prevent the upper limit from operating and damage the device. Execute the Raise command; the cable rises slowly until the release hook reaches the upper limit.



FIG 5-6-1 Checking for Cable Entanglement and Resetting the Release Hook

*After installation, check the limit-switch spring and release hook again to ensure that the cable is not entangled.

*The first raising operation after power-on uses slow-rise protection. Raise the cable to the upper limit to check device status and clear this protection.

VI. Preflight Inspection

After becoming familiar with the winch controls, inspect the connection between the winch and UAV platform before every flight. Evaluate the operating environment and potential safety risks to ensure safe flight.

1. Power on the winch and confirm that all functions operate normally.
2. Voltage Check: Confirm a powered-hook voltage of 7.8 V (electrically controlled version only).
3. Check the one-touch Raise and Lower commands and the powered release-hook Open/Close commands.
4. Test the cable-cutting mechanism using the Cable-Cutting Check command. The mechanism moves but does not cut the cable because the cutting battery is not energized.

***Do not use One-Touch Cable Cutting for a preflight function check. It will sever the cable, and the cutting-battery voltage cannot recover immediately.**

VII. Eayload-5 Cargo Attachment and Inspection

Weigh the cargo before transport to ensure that it is within the safe payload range and that the DJI M400 maximum takeoff weight is not exceeded. The system supports a mechanical release hook and an optional electrically controlled hook; the powered hook supports one-touch release.

I> Attaching Cargo to the Mechanical Release Hook

1. Attaching Cargo Before Takeoff

i> Use a safety pin

Ground Attachment: Remove the safety pin from the mechanical release hook and place the cargo sling in the hook groove. If personnel will receive the cargo at the destination, insert the safety pin to lock the hook and ensure safe transport. Use of the safety pin is recommended.



FIG 7-1-1 Remove the Safety Pin



FIG 7-1-2 Place the Cargo in the Hook Groove



FIG 7-1-3 Insert the Safety Pin

ii>Pull out the cable for mounting

Execute the Lower command while manually applying tension to the cable, and pay out the required length. Remove the safety pin. If the pin is not used, place the cargo in the groove, keep the hook and cargo under tension, and place them on the ground. After takeoff and lifting, visually

confirm that the cargo remains seated in the groove; adjust it manually if necessary.



FIG 7-1-4 Lower the Cable



FIG 7-1-5 Remove the Safety Pin

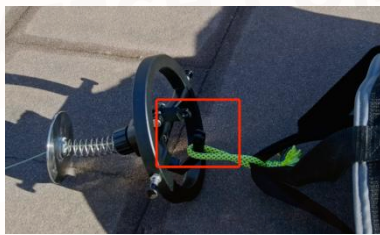


FIG 7-1-6 Place Cargo in the Groove



FIG 7-1-7 UAV Lifts the Cargo

*Using the safety pin is recommended to maximize cargo safety.

2. Attaching Cargo After Takeoff

i> Attachment at the Departure Point

After the UAV reaches the set altitude, lower the cable to the ground. Attach the cargo to the mechanical hook and insert the safety pin. Raise the UAV slowly until the cable is taut, then continue lifting until the upper limit is reached.



FIG 7-1-8 Cargo Attachment at the Departure Point

*If the safety pin is not used, place the cargo in the hook groove while the cable is slack. Raise the UAV until the cable is taut, then execute the Raise command.

ii> Remote-Site Attachment

After the UAV reaches the remote site and descends to a suitable altitude, lower the cable to the ground. Ground personnel attach the cargo while the cable is slack. Execute the Raise command until the cargo is lifted and the hook reaches the upper limit, then depart for the destination.

II> Attaching Cargo to the Electrically Controlled Release Hook

After the UAV reaches the set altitude, lower the cable to the ground. Move the cargo near the electrically controlled hook and press and hold the reset switch for 0.5 seconds to open it. Attach the cargo, then press and hold the switch again for 0.5 seconds to close the hook. Raise the UAV until the cable is taut, then execute the Raise command to lift the cargo to the specified height.



FIG 7-2-1 Lower the Cable

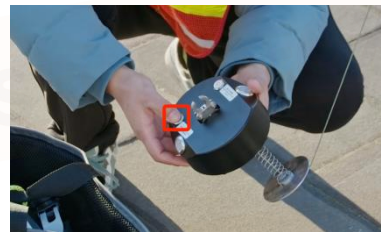


FIG 7-2-2 Open the Hook



FIG 7-2-3 Attach Cargo



FIG 7-2-4 Close the Hook



FIG 7-2-5 Lift the Cargo



FIG 7-2-6 Raise the Winch to the Upper Limit

III> Indicator Light Check

After the system lifts the cargo, observe the indicator. Blue during raising or lowering indicates normal operation. When the cargo reaches the upper limit or hovers, slow flashing green indicates a

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light load, slow flashing yellow indicates a heavy load, and slow flashing red indicates an overload. Stop the operation immediately and reduce the payload if red flashes slowly.

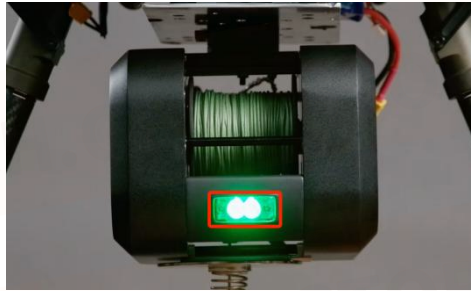


FIG 7-3-1 Indicator Light Status

*Slow flashing red while hovering indicates motor overload and a flight safety hazard. Reduce the payload immediately.

*Fast flashing red during raising indicates that motor overload protection has been activated and the cable will lower automatically. Stop the operation and reduce the payload.

VIII. Eayload-5 Cargo Unloading

I> Mechanical Release Hook

1. With the Safety Pin Installed

Hover the UAV directly above the unloading location and execute the Lower command. The cable lowers automatically and stops at ground contact. Ground personnel remove the safety pin and cargo, then execute the Raise command to retrieve the hook.



FIG 8-1-1 Lower Cargo



FIG 8-1-2 Stop at Ground Contact



FIG 8-1-3 Remove Safety Pin and Cargo



FIG 8-1-4 Retrive Winch

2. Without the Safety Pin

Hover directly above the unloading point and execute the Lower command until the cargo reaches the ground. Slowly raise the UAV and confirm that the hook releases. If it does not, lower the UAV and raise it slowly again until release succeeds. After unloading, execute the Raise command to retrieve the hook to the upper limit.



FIG 8-1-5 Cargo Unloading (Mechanical Release Hook Without Safety Pin)

II> Electrically Controlled Release Hook

1. Lowering Command

Hover directly above the unloading location and start the intelligent lowering command. The cable lowers and stops automatically at ground contact. Open the electrically controlled hook to unload the cargo. After unloading, use One-Touch Raise to retrieve the cable and hook.



FIG 8-2-1 Lowering Command

2. One-Touch Aerial Release

Fly directly above the unloading location, lower the electrically controlled hook to a suitable height, and execute the cargo-release command to release the cargo within the designated area.



FIG 8-2-2 One-Touch Aerial Release

IX. Maintenance

The Eayload-5 is a UAV payload product with strict safety requirements. Follow this manual and all precautions during use. Perform routine inspections before every test and carry out periodic inspection and maintenance to reduce risks and faults, improve reliability, and extend service life.

I> Pre-Use Inspection

For safe operation, complete the following inspection items and procedures before every use.

Step	Item	Inspection Details	Requirement Met
1	Installation	Ensure that the winch is securely mounted with no looseness or deformation. Gently move the winch; reinstall and secure it if any play is detected.	
2	Power-On	Confirm that the indicator flashes green slowly.	
3	Cable	Execute Lower and manually pull out several meters of cable. Replace the cable if severe fraying or visible damage is found.	
4		Confirm that the cable is securely connected to the hook.	
5		Inspect the cable-to-hook connection for wear. Cut off a worn section and refasten it; obtain manufacturer guidance if you are unfamiliar with the fastening method.	
6	Twist shaft	Visually confirm that the twist shaft track is free of sand and other foreign matter.	
7		Execute Lower while manually pulling the cable and listen for abnormal transmission noise from the twist shaft.	
8	Voltage	Confirm that winch input voltage is within the specified range.	
9	Data	Confirm that all monitored data is displayed normally.	
10	Commands	Execute Raise and verify proper operation. Apply suitable manual tension during retrieval so the cable is wound evenly without gaps.	
11		Execute the Cable-Cutting Check command and verify that the cutting servo operates correctly.	

Table 9-1-1 Pre-Use Inspection Checklist

II> Periodic Inspection and Maintenance

Follow the schedule below for periodic inspection and maintenance to keep the equipment in optimal condition and reduce safety risks.

Periodic Inspection & Maintenance Checklist						
No.	Inspection Item	Every use	every installation/removal	100 h/3 months	300 h/1 year	Recommendation
1	UAV/Winch Mounting Screws	√	√	\	\	User inspection

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2	Cable Wear	√	×	√	√	User inspection/replacement
3	Cable Connection	√	×	\	\	User inspection/replacement
4	Foreign Matter in twist shaft	√	×	√	√	User inspection
5	Twist shaft Bushing Screws	×	×	√	√	User inspection/factory replacement
6	Motor Drive Gear	×	×	×	√	Factory service/replacement
7	Tension Sensor Calibration	×	×	×	√	Factory calibration
8	Voltage Sensor Calibration	×	×	×	√	Factory calibration

Table 9-2-1 Periodic Inspection and Maintenance Schedule

* Perform maintenance/inspection when either the specified time or number of tests is reached, whichever occurs first.

* The schedule begins from the date the equipment first leaves the factory.

* Bolt Tightness Check: For threads requiring threadlocker, check the bolt clockwise with a hex key. If it turns easily, remove it, reapply threadlocker, and reinstall it. For threads not requiring threadlocker, simply tighten the bolt.

* See Pre-Use Inspection Steps 6 and 7 for the twist shaft inspection method.

* See Pre-Use Inspection Steps 3, 4, and 5 for the cable inspection method.