



E-PROPS PROPELLERS for UAV / DRONES INSTRUCTIONS MANUAL



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Table of Contents

1. INSTRUCTIONS.....	4
1.1. The propeller is not an "accessory".....	4
1.2. Certifications.....	5
1.3. Required Tools.....	5
2. PROPELLERS GENERAL DESCRIPTION.....	6
3. 2-PALE PROPELLER.....	7
3.1. Description.....	7
3.2. Position of the blades feet in the 2-blade hub.....	8
4. 3-BLADE PROPELLER.....	9
4.1. Description.....	9
4.2. 3-blade propeller hub drawing.....	10
5. 4-BLADE PROPELLER.....	11
5.1. Description.....	11
5.2. 4-blade propeller hub drawing.....	12
6. 5-BLADE PROPELLER.....	13
6.1. Description.....	13
6.2. 5-blade assembly drawing.....	14
7. PROPELLER ASSEMBLY.....	15
8. PROPELLER SETTINGS.....	18
9. SPINNER ASSEMBLY.....	24
10. DRILLING ADAPTERS.....	27
10.1. Drilling adapter 6M8d100.....	27
10.2. Drilling adapter 6M8d75.....	29
10.3. Drilling adapter 6M8d100 L12.....	30
11. PROPELLER DISASSEMBLY.....	32
12. TIGHTENING / PITCH CONTROL.....	32

13. PROPELLER MAINTENANCE.....	33
14. REPAIRS.....	34
14.1. Small impacts.....	34
14.2. Major repairs.....	34

E-PROPS

Light is Right

1. INSTRUCTIONS

1.1. The propeller is not an "accessory"

Read carefully manuals and instructions published by the E-PROPS company and strictly follow the instructions. Contact our team for any question.

This document is to be kept for the entire life of the propeller.

The owner of the propeller is obliged to inform himself of the latest version of this document at the E-PROPS company.

- x Never cut any E-Props parts: blades, hub, spacer, adapter, spinner, plate.
- x Always use the screws and bolts supplied by E-Props. The quality, length and threading of the screws are essential to ensure correct assembly and tightening.
- x Never cut and/or re-thread screws for aircraft use.
- x Never use threadlocker (Loctite), otherwise it would not be possible to check the tightening torque.
- x Use a calibrated torque wrench to apply the correct tightening torque.
- x Screw tightening torques depend on the quality and diameter of the screws. Incorrect tightening of the propeller fastening screws can be dangerous: follow the E-Props instructions.
- x Do not remove the labels on the E-Props parts.
Never change the balance of an E-Props propeller.

The user assumes the risks of using such propellers, and acknowledges that his engine/propeller set is subject to sudden stop.

1.2. Certifications

The range of 3-blade model CW rotation sense is certified by EASA, **Type Certificate EASA.P.512** dated 02 March 2023, under CS-22 Subpart J (range ref EPGU3).



E-Props propellers comply with **ASTM F2506-13 (LSA)**.

Their use on an aircraft is the sole responsibility of the aircraft owner.

ASTM F2506-13 establishes minimum requirements for the design, testing, and quality assurance of fixed-pitch or ground adjustable pitch propellers for light aircraft (LSA). Tensile tests, mechanical strength measurements, fatigue tests, endurance tests, and teardown inspections must be performed to meet the prescribed requirements.



1.3. Required Tools

- 13 mm screwing sleeve
- 5 mm hexagonal tip
- flat screwdriver
- cardan shaft and extension
- torque wrench (torques : 1.5 / 11 / 24 N.m)
- plastic mallet
- E-Props pitch adjustment tool



2. PROPELLERS GENERAL DESCRIPTION

E-Props ground adjustable pitch models	Clockwise CW rotation sense Counterclockwise CCW rotation sense
Models	2-blade, 3-blade, 4-blade, 5-blade
Material	100% Carbon + epoxy resin + Titanium leading edge protection
Accessories	Carbon spinners: 15 different models Carbon spacers: 38 different lengths
TBO	3-blade CW rotation sense : 4000 hrs Other models : 2000 hrs
Tightening torque	M6 screw = 11 N.m M8 screw = 24 N.m Do not use Loctite
Checking screw tightening	Every 100 h and/or every 6 months for standard screws Every 200 h and/or every 12 months for Titanium screws
Max pitch tolerance	Max 0,3° between blades
Certifications	3-blade CW rotation sense : ASTM F2506-13 & EASA CS-22 J Other models : ASTM F2506-13
Design & Manufacturing	Made in France (Sisteron) since 2008

3. 2-PALE PROPELLER

3.1. Description

10 diameters : 145, 150, 155, 160, 165, 170, 175, 180, 185, 190 cm

Weight : 1,5 kg [dia 170 cm]

Moment of inertia : 1.800 kg.cm² [dia 170 cm]

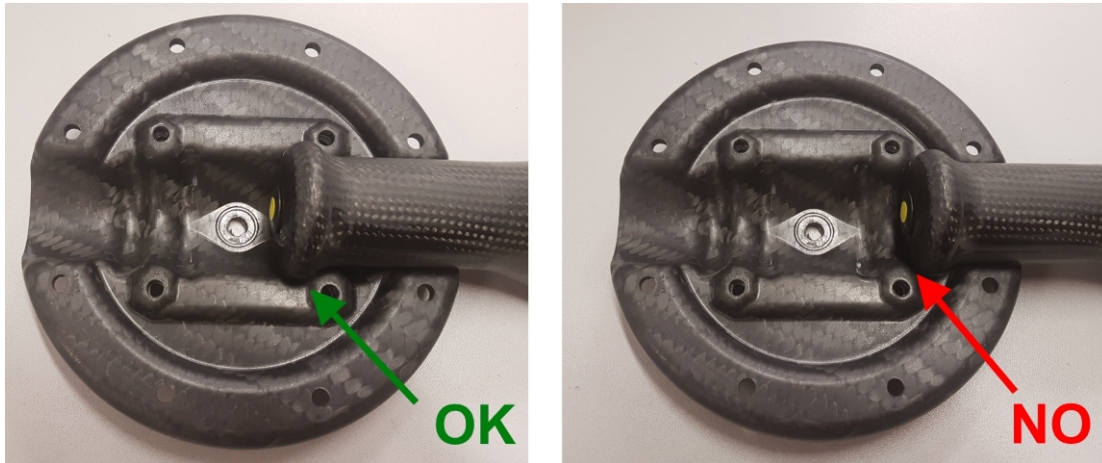
Propeller Max Power = 105 hp

Propeller RPM max : 2.950 rpm [for dia 170 cm – depends on the diameter]

- x 2 Carbon blade with Titanium Leading Edge Protection
- x 1 hub composed of 2 carbon parts (HHU)
- x 1 carbon spacer to mount the propeller on the gearbox flange (ESU)
- x Screws & Bolts :
 - 6 screws M8 quality 10.9, length 30 mm, threading 30 mm
 - 6 Nylstop flange nuts M8
 - 14 screws M6 quality 10.9, length 25 mm, fully threaded
 - 14 Nylstop nuts M6
 - 14 special washers M6
 - (option : Titanium screws)
- x Propeller spinner :
 - Carbon Spinner
 - Carbon Plate with 6 screws M5x12, 6 Nylstop nuts M5
 - 9 stainless steel screws slotted head M5 x 16 mm

3.2. Position of the blades feet in the 2-blade hub

The good position of the blades feet in the 2-blade hub is as follow :



A resin locator is positioned in the groove where the blade foot should not be placed.

4. 3-BLADE PROPELLER

4.1. Description

13 diameters : 145, 150, 155, 160, 165, 170, 175, 180, 185, 190, 195, 200, 205 cm

Weight : 2 kg [dia 170 cm]

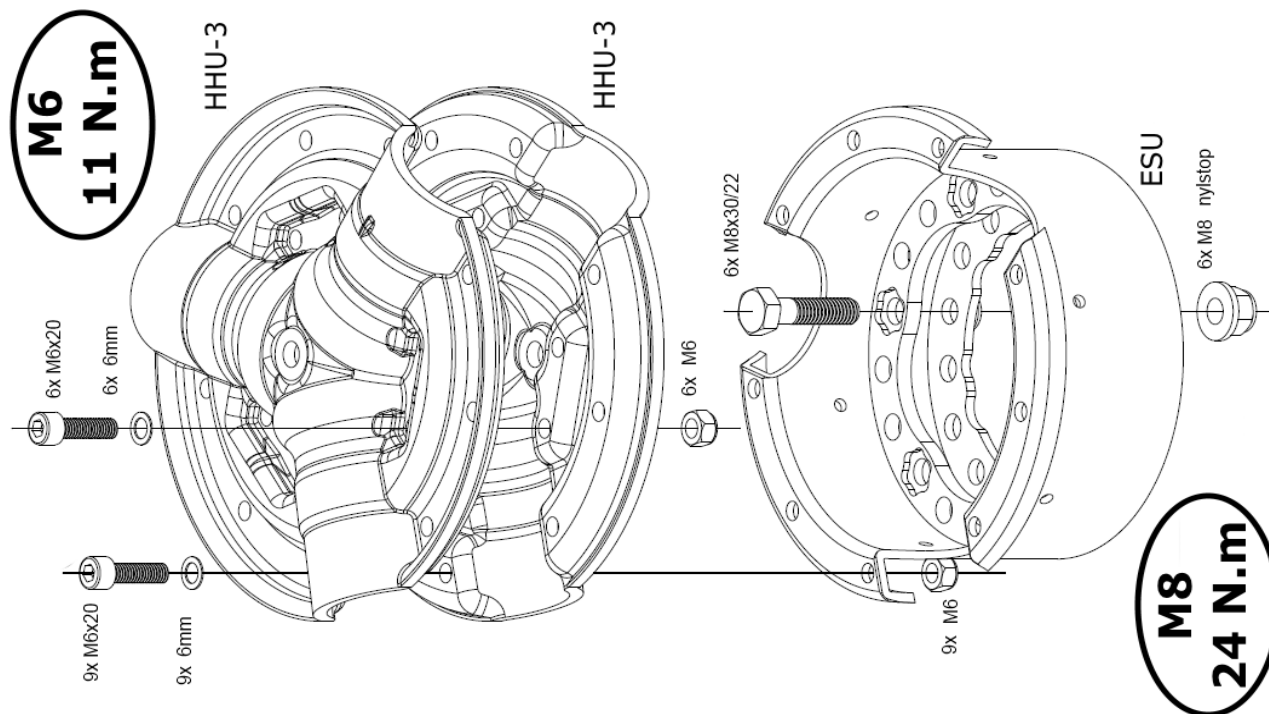
Moment of inertia : 2.100 kg.cm² [dia 170 cm]

Propeller Max Power = 157 hp

Propeller RPM max : 2.950 rpm [for dia 170 cm – depends on the diameter]

- x 3 Carbon blade with Titanium Leading Edge Protection
- x 1 hub composed of 2 carbon parts (HHU)
- x 1 carbon spacer to mount the propeller on the gearbox flange (ESU)
- x Screws & Bolts :
 - 6 screws M8 quality 10.9, length 30 mm, threading 30 mm
 - 6 Nylstop flange nuts M8
 - 15 screws M6 quality 10.9, length 25 mm, fully threaded
 - 15 Nylstop nuts M6
 - 15 special washers M6
 - (option : Titanium screws)
- x Propeller spinner :
 - Carbon Spinner
 - Carbon Plate with 6 screws M5x12, 6 Nylstop nuts M5
 - 9 stainless steel screws slotted head M5 x 16 mm

4.2. 3-blade propeller hub drawing



5. 4-BLADE PROPELLER

5.1. Description

15 diameters : 147, 152, 157, 159, 162, 167, 172, 175, 177, 182, 187, 192, 198, 203, 208 cm

Weight : 2,5 kg [dia 170 cm]

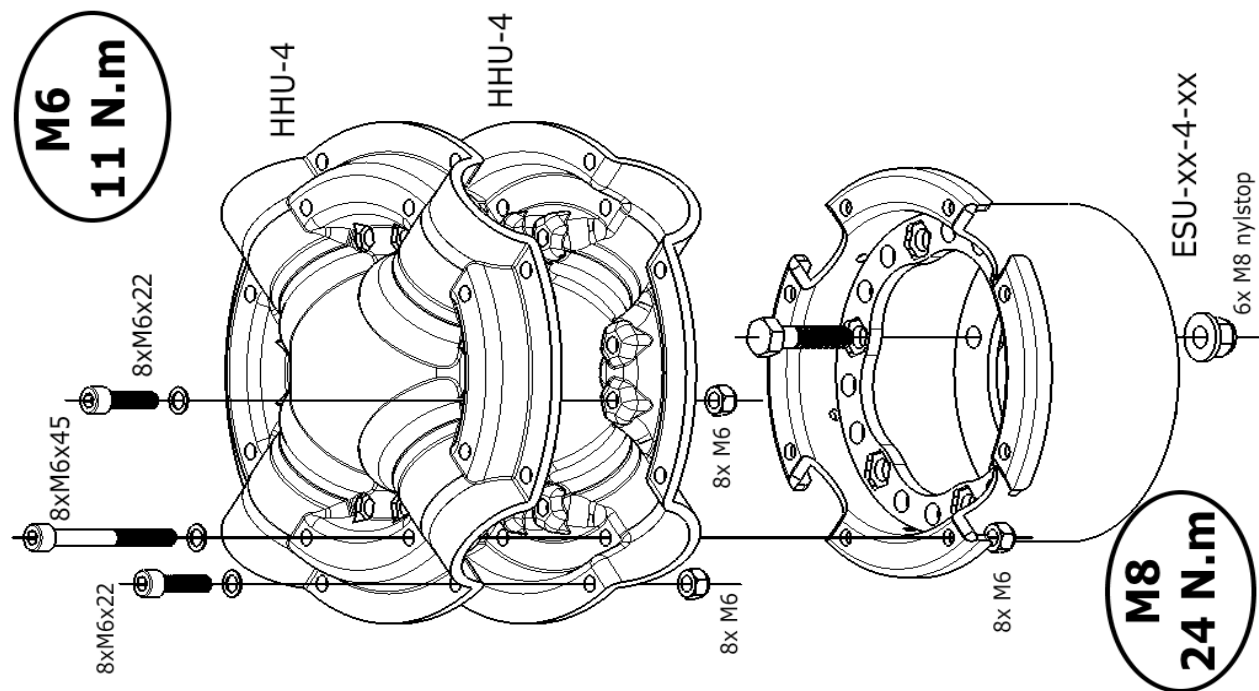
Moment of inertia : 3.100 kg.cm² [dia 170 cm]

Propeller Max Power = 210 hp

Propeller RPM max : 2.950 rpm [for dia 170 cm – depends on the diameter]

- x 4 Carbon blade with Titanium Leading Edge Protection
- x 1 hub composed of 2 carbon parts (HHU)
- x 1 carbon spacer to mount the propeller on the gearbox flange (ESU)
- x Screws & Bolts :
 - 6 screws M8 quality 10.9, length 30 mm, threading 30 mm
 - 6 Nylstop flange nuts M8
 - 16 screws M6 quality 10.9, length 25 mm, fully threaded
 - 8 screws M6 quality 10.9, length 45 mm, fully threaded
 - 24 Nylstop nuts M6
 - 24 special washers M6
- x Propeller spinner :
 - Carbon Spinner
 - Carbon Plate with 6 screws M5x12, 6 Nylstop nuts M5
 - 9 stainless steel screws slotted head M5 x 16 mm

5.2. 4-blade propeller hub drawing



6. 5-BLADE PROPELLER

6.1. Description

14 diameters : 149, 154, 159, 164, 169, 174, 176, 179, 184, 189, 194, 199, 204, 209 cm

Weight : 3,2 kg [dia 170 cm]

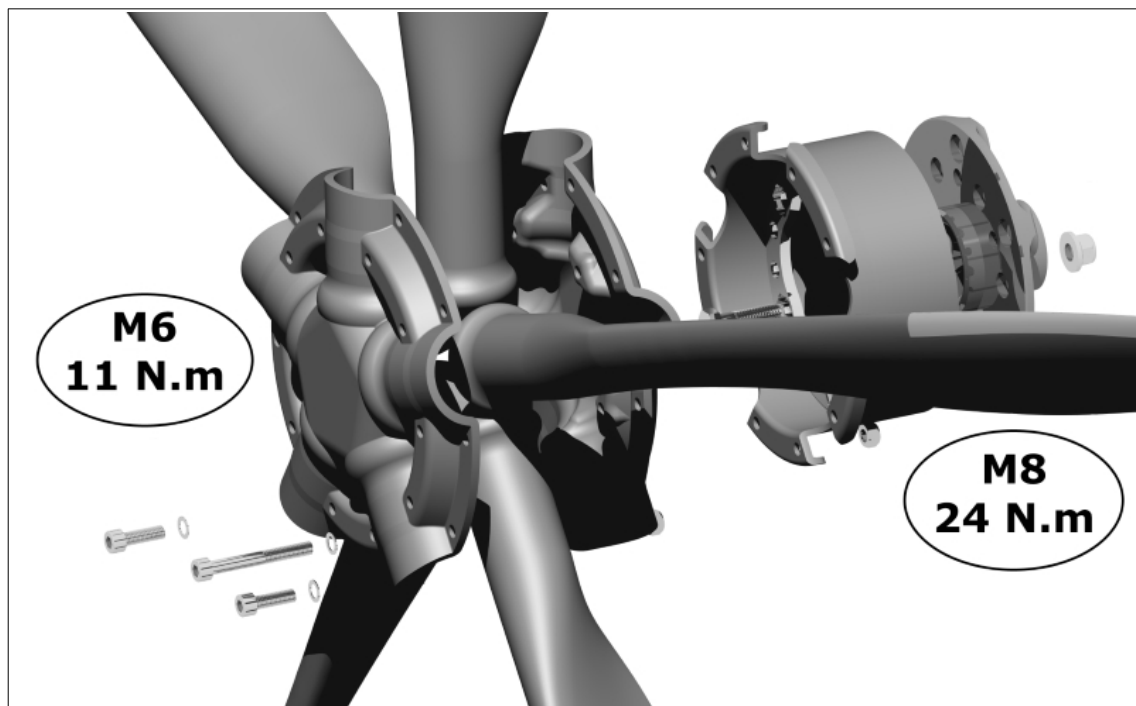
Moment of inertia : 3.900 kg.cm² [dia 170 cm]

Propeller Max Power = 225 hp

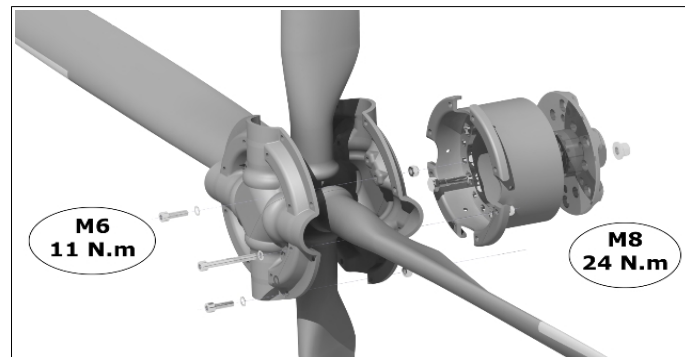
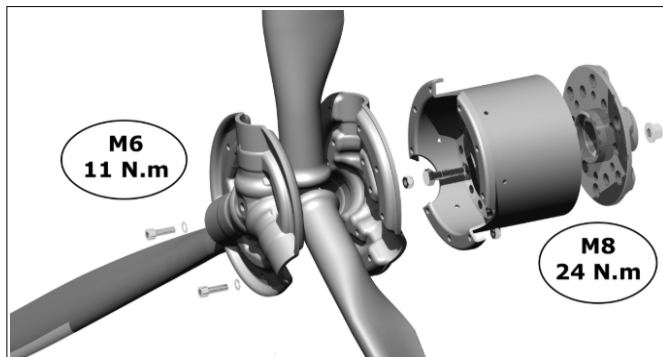
Propeller RPM max : 2.950 rpm [for dia 170 cm – depends on the diameter]

- x 5 Carbon blade with Titanium Leading Edge Protection
- x 1 hub composed of 2 carbon parts (HHU)
- x 1 carbon spacer to mount the propeller on the gearbox flange (ESU)
- x Screws & Bolts :
 - 6 screws M8 quality 10.9, length 30 mm, threading 30 mm
 - 6 Nylstop flange nuts M8
 - 15 screws M6 quality 10.9, length 25 mm, fully threaded
 - 10 screws M6 quality 10.9, length 50 mm, fully threaded
 - 25 Nylstop nuts M6
 - 25 special washers M6
- x Propeller spinner :
 - Carbon Spinner
 - Carbon Plate with 6 screws M5x12, 6 Nylstop nuts M5
 - 9 stainless steel screws slotted head M5 x 16 mm

6.2. 5-blade assembly drawing



7. PROPELLER ASSEMBLY



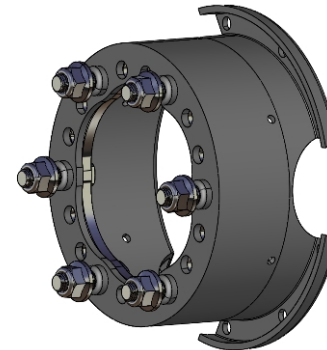
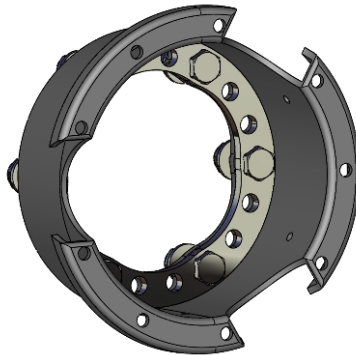
Assemble the components: blades, hub, spacer, screws (spinner and plate, see below).

Assemble the propeller on the ground or on a work surface:

- x Locate the HHU half hub with the fixing nuts and place it underneath.
- x Put the blade feet in the half hub following the marking with the colored stickers.
- x Put the second half-hub HHU on top always following the colored stickers.
- x Tighten the 6 middle screws M6x22 without using force with the 5mm hexagonal bit.
- x Place the blades + hub assembly on the spacer (equipped with the spinner plate if necessary)
- x Approach the 9 external screws M6x22

Once the propeller is assembled, screws not fully tightened, mount it on the gearbox flange:

- x Approach the 6 Nylstop flange nuts with a 13mm bushing (use a cardan joint and an extension to slide along the gearbox).
- x Never put threadlocker (Loctite) on the screws, otherwise it would not be possible to check the tightening torque.
- x Take a torque wrench set at 24 N.m and tighten the 6 nuts to the right torque.



ESU with internal aluminium counterplate / Centering drive lugs integrated in the ESU

There should be no drive lugs on the gearbox flange.

If you have trouble removing them, E-Props offers a drive lugs extractor.

8. PROPELLER SETTINGS

Using the E-Props Pitch Adjustment Tool :

Digital propeller pitch adjustment tool (accuracy: $\pm 0.1^\circ$), with a spirit level to position the blade horizontally and a hook to be clipped on the right or left. Measures the relative precision between the blades.

Do not redo the tare between the measurements of each blade, otherwise the initial reference of the tool will be lost.

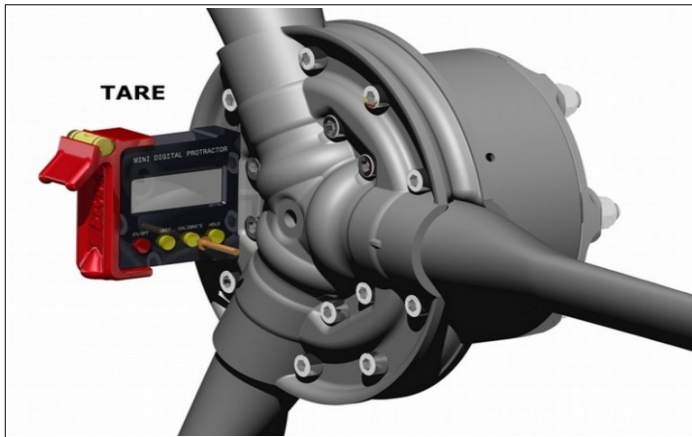
Move the tool regularly while adjusting the blades to prevent the tool from turning off. A good solution is to keep it in your pocket between measures : that way, as it continues to move, it won't switch OFF.

The displayed value may be slightly different between two measurements (when the tool is switched off in between).

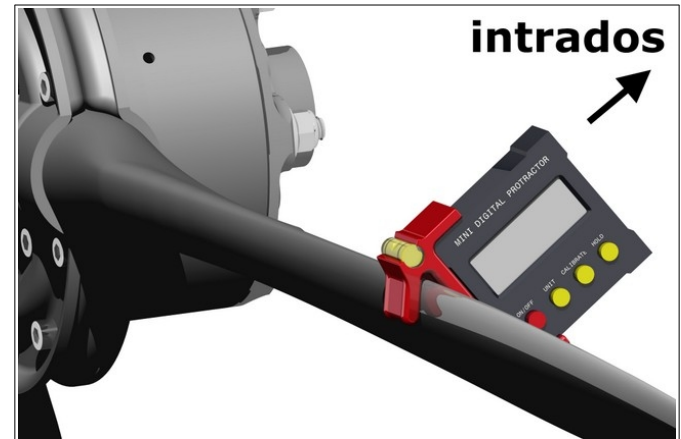


Unit = degree

TRACTOR PROPELLERS : position of the protractor



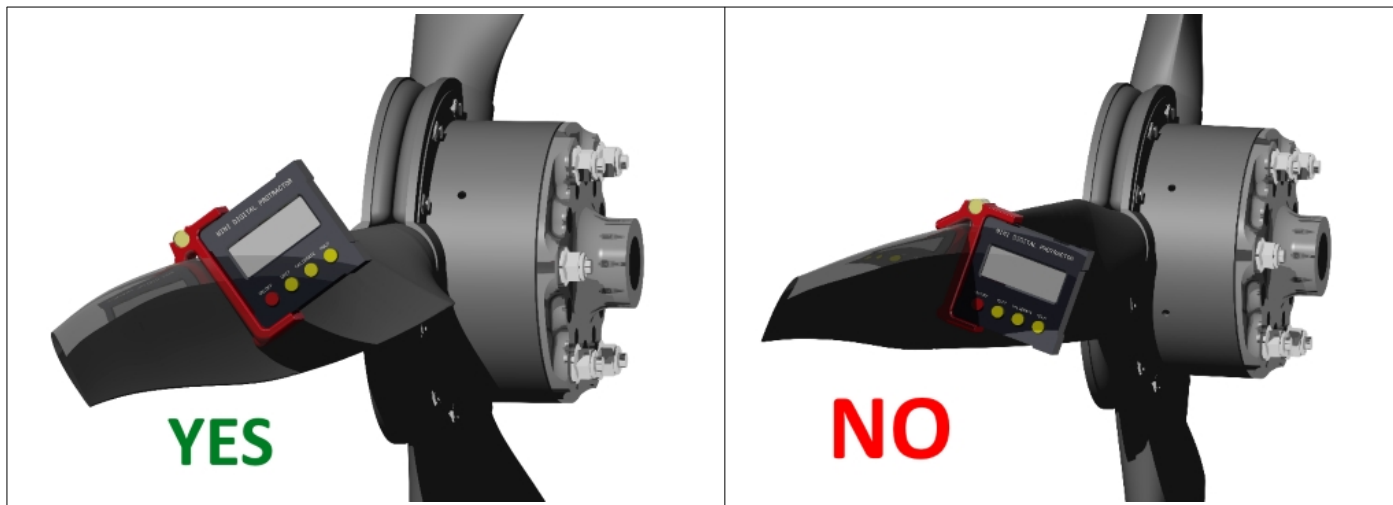
*Calibrate = tare (zero setting)
to be done on a flat part of the hub*



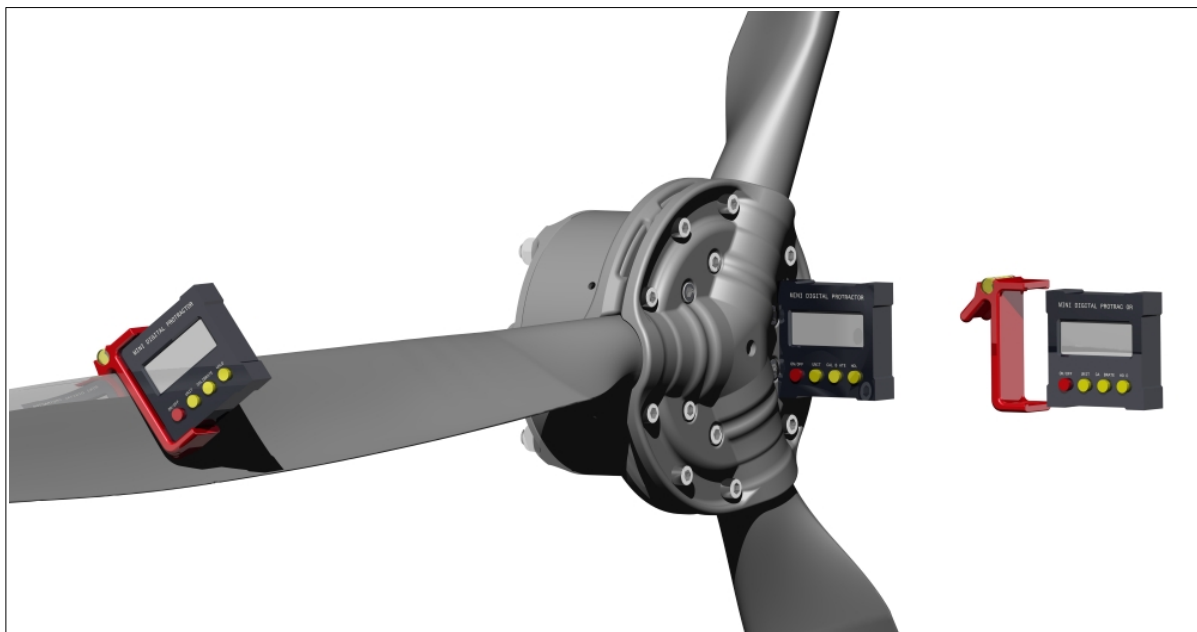
*place the hook on the leading edge of the blade,
on the intrados, on the Titanium leading edge
protection, just on the edge of the Carbon*

Max. blade pitch tolerance: **0.3° between blades** (otherwise there may be vibrations)

TRACTOR PROPELLERS : position of the blade



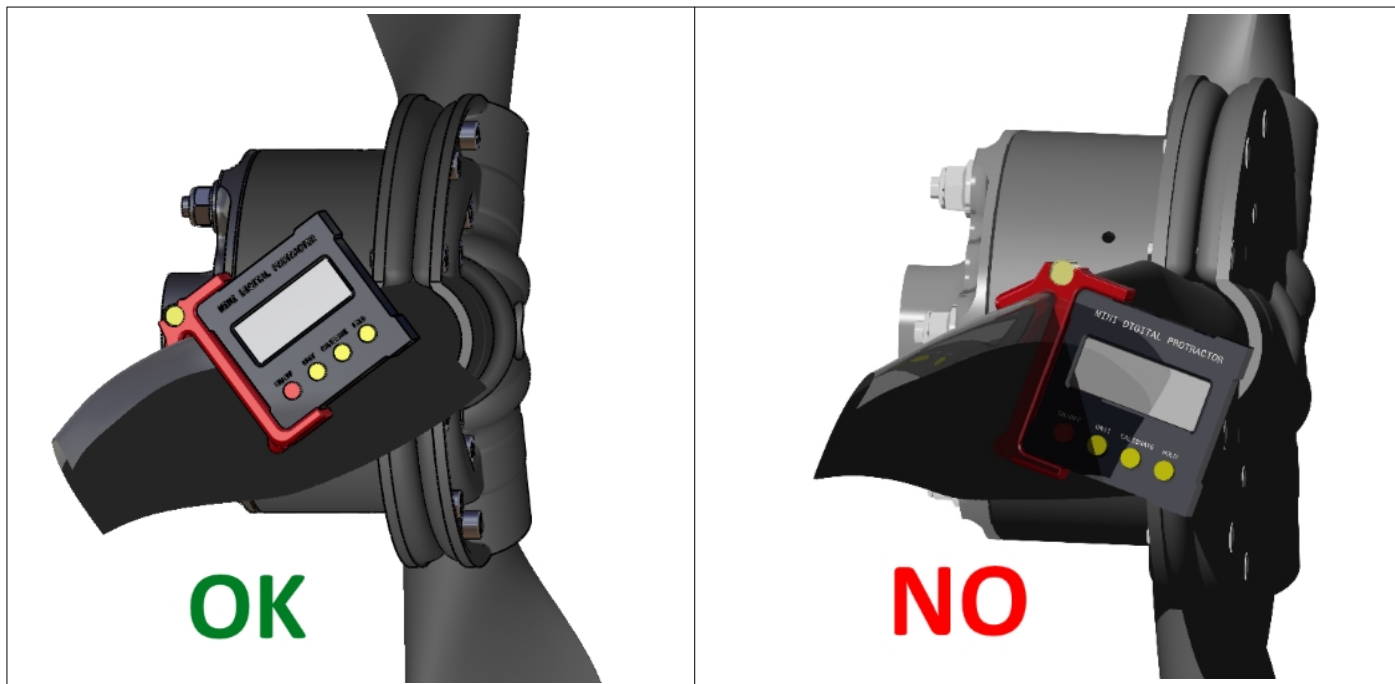
PUSHER PROPELLERS : position of the protractor



Calibrate (= zero setting) on the hub without the hook, then place the hook again to position the tool on the lower surface of the blade, on the Titanium, just at the edge of the Carbon

Max. blade pitch tolerance: **0.3° between blades** (otherwise there may be vibrations)

PUSHER PROPELLERS : position of the blade



Set the first blade to the correct pitch with the pitch adjustment tool. Refine with the plastic mallet.

x Tighten the outer screws of the hub without forcing. Tightening the screw on the leading edge side first = the pitch will decrease slightly, thus achieving the desired precise pitch.

x Proceed to the next blade. Do not touch the already adjusted blade: take the next blade and rotate the propeller very gently, avoiding jerks, so that the blade setting is not changed until the screws are fully tightened.

x Tightening the hub screws to the torque: to be done progressively => first 6 N.m. Two rules: never make more than 1/4 turn on a screw and never exceed 6 N.m (release the torque wrench). Distribute the tightening of the screws evenly in a crosswise pattern.

x Check the pitch of all the blades, and if it has moved a little, repeat it if necessary.

x Same operation at 9 N.m, then at the final torque of 11 N.m

x Mount the spinner with the flat screwdriver. Approach the screws loosely during assembly, then tighten the screws to 1.5 N.m

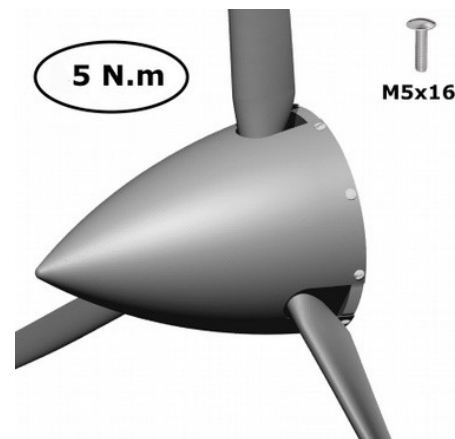
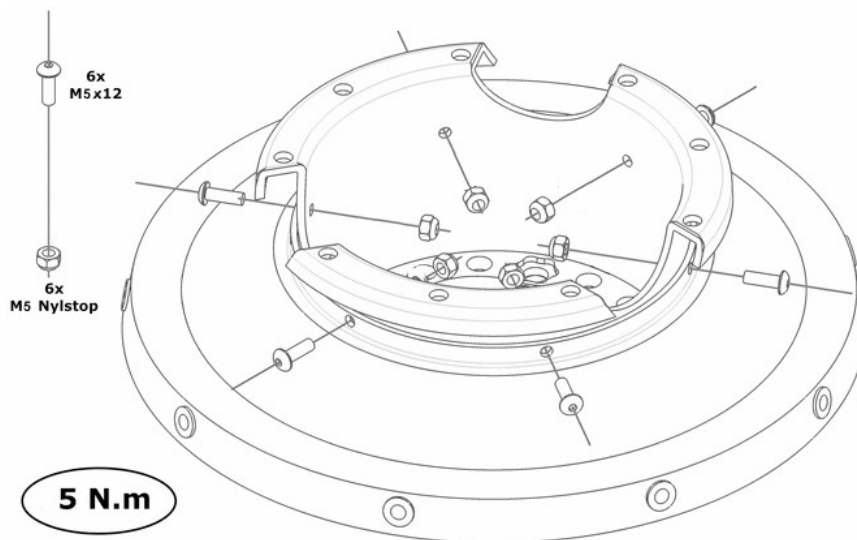
9. SPINNER ASSEMBLY



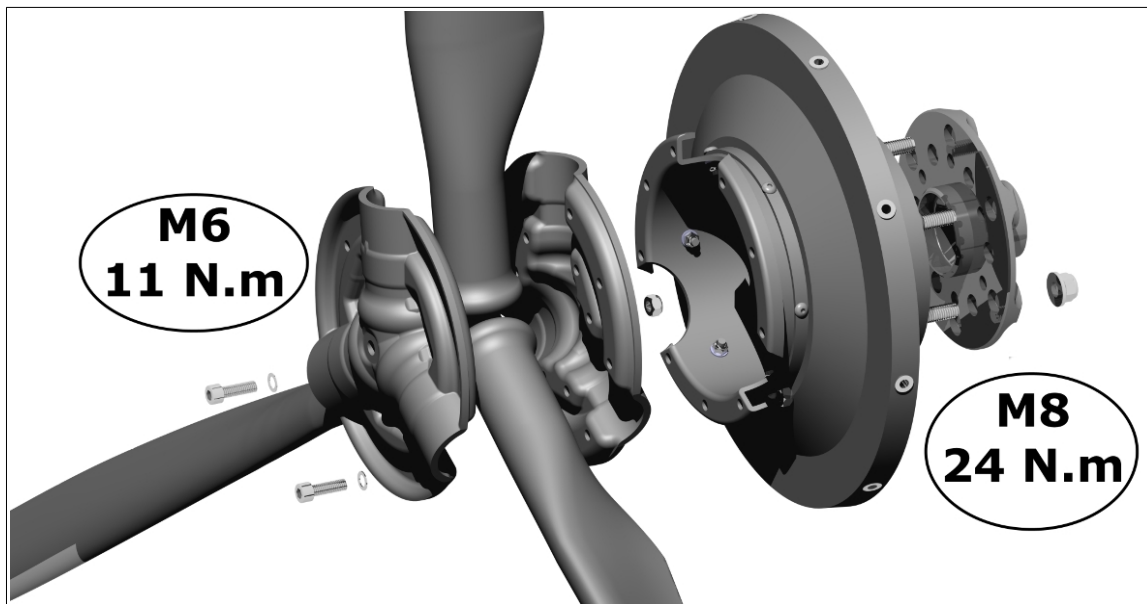
E-Props V20 range : the spinner plate is placed around the spacer.

1/ Adjusting the correct pitch of the blades

2/ Only then mount the spinner, otherwise in some cases the unadjusted blades can touch the edge of the spinner.



Spinner mounting plate: mounts on ESU spacer



10. DRILLING ADAPTERS

Some assemblies require a drilling adapter.

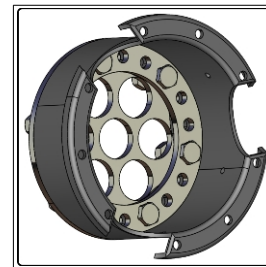
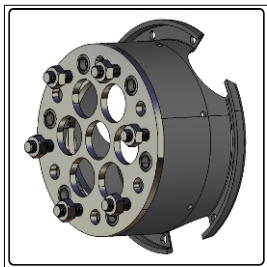
E-PROPS adapters are designed and manufactured for E-PROPS propellers. Mounting, adjustment and maintenance of these adapters must be done according to E-PROPS specifications.

10.1. Drilling adapter 6M8d100

Drilling adapter 6M8d100

E-Props propellers V20 range for engines :

- Rotax 582, gearbox C & E [2.62 / 3 / 3.47 / 4] (warning : not adapted to gearbox B [2 / 2.24/ 2.58])
- HKS gearbox 3.47
- some HIRTH engines etc...



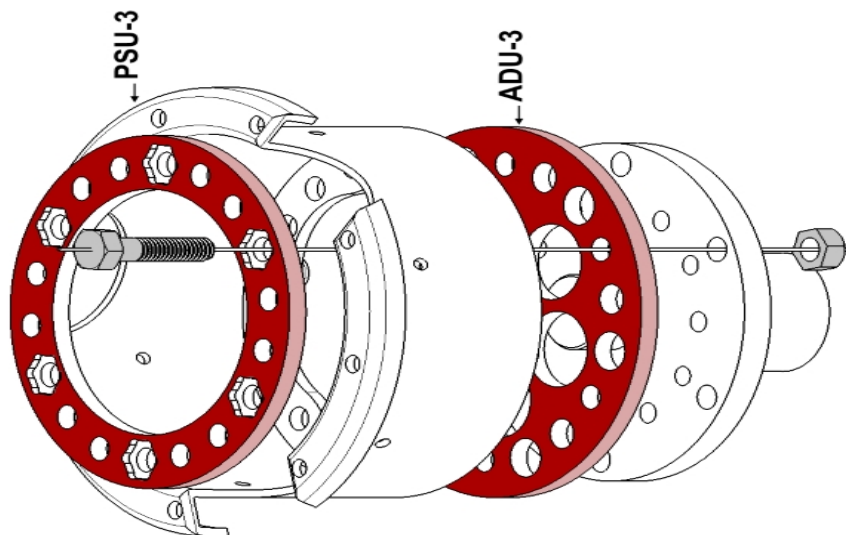
In black anodized 6061 aluminum

Weight = 97 g / Outer diameter = 125 mm / Thickness = 5 mm / Drilling = 6M8d100

Adapter delivered with : :

- an internal clamping plate inside the hub, specific for this drilling / E-Props ref: **PSU-3** (replace the standard plate ref PSU-1)
- 6 TH screws quality 10.9 M8x30/22 (M8 screw length 30 mm threaded on 22 mm)
- 6 nuts Nylstop M8 quality 10.9

Check the tightness of the screws of this adapter every 100 hours. Screw tightening torque = 24 N.m



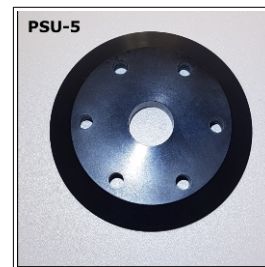
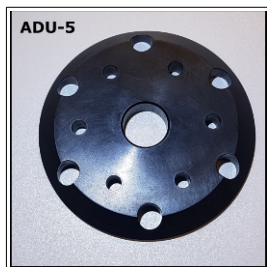
10.2. Drilling adapter 6M8d75

Drilling adapter 6M8d75

E-Props propellers V20 range for engines :

- Rotax 582, gearbox B [2 / 2.24/ 2.58]
- HKS gearbox 2.58
- etc...

E-Props ref : ADU-5 & PSU-5



In black anodized 7075 aluminum

Total weight (ADU-5 & PSU-5) = 735 g / Outer diameter = 125 mm / Drilling = 6M8d75

Adapter delivered with :

- an internal clamping plate inside the hub, specific for this drilling / E-Props ref: PSU-5 (replace the standard plate ref PSU-1)
- 6 nuts Nylstop M8 quality 10.9 (excepted on threaded flange)
- 6 lock washers (Heico)
- if the holes of the gearbox flange are threaded : 6 screws TH quality 10.9 M8x50/50 (M8 screw length

50 mm fully threaded)

- if the holes of the gearbox flange are smooth : 6 screws TH quality 10.9 M8x60/22 (M8 screw length 60 mm thread 22 mm)

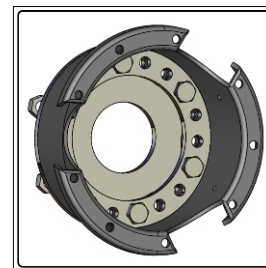
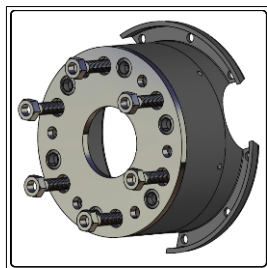
Check the tightness of the screws of this adapter every 100 hours. Screw tightening torque = 24 N.m

10.3. Drilling adapter 6M8d100 L12

E-Props ref : ADU-4 & PSU-3

Drilling adapter 6M8d100 L12

E-Props propellers V20 range for Rotax 912 engines old generation



In black anodized 7075 aluminum

Mass = 125 g / Outer diameter = 125 mm / Thickness = 5 mm / Drilling = 6M8d100 L12

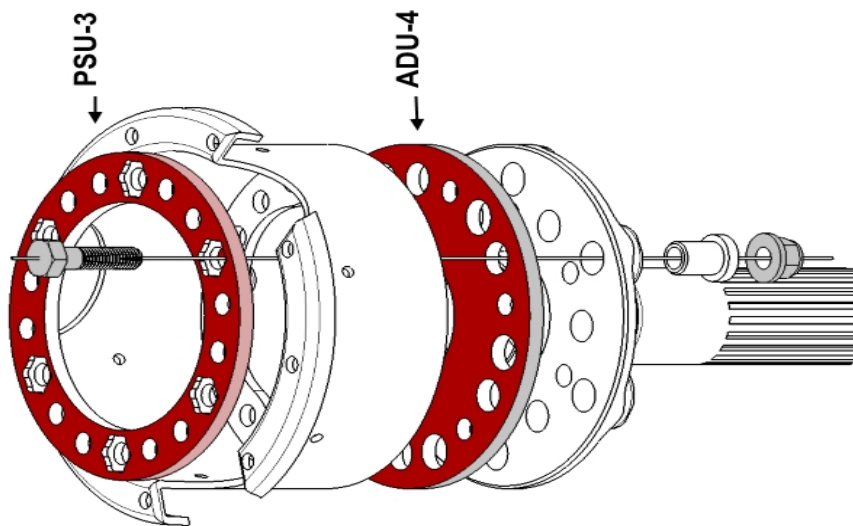
Adapter delivered with :

- an internal clamping plate inside the hub, specific for this drilling 6M8d100 L12 / E-Props ref: PSU-3 (replace the standard plate ref PSU-1)

- 6 TH screws quality 10.9 M8x35/22 (M8 screw length 35 mm threaded on 22 mm)
- 6 nuts Nylstop M8 quality 10.9

Please note: the smooth 12 mm drives lugs required for assembly are not supplied.

Check the tightness of the screws of this adapter every 100 hours. Screw tightening torque = 24 N.m



11. PROPELLER DISASSEMBLY

The propeller can be removed from the engine by loosening the 6 M8 quality 10 Nylstop nuts (flange side of the engine).

Then, loosen all the screws (in reverse order to the assembly) to remove the blades from the hub.

12. TIGHTENING / PITCH CONTROL

Tightening torque and blade pitch must be checked:

- **10 minutes** after the first assembly
- then after the **1st hour of flight**
- then **every 100 hours** and/or **every 6 months** for standard screws
- or **every 200 hours** and/or **every 12 months** for Titanium screws

To check the tightening, it is not necessary to loosen the screws. Just check the tightening with a torque wrench.

13. PROPELLER MAINTENANCE

Cleaning after each flight with a sponge: water + soap, window cleaner
TBO : **2000 or 4000 hours**

Tightening of screws and blade adjustment : every 100 hours and/or every 6 months for standard screws / every 200 hours and/or every 12 months for Titanium screws

Screw M6= 11 N.m

Screw M8= 24 N.m

Never put threadlocker (Loctite) on the screws, otherwise it would not be possible to check the tightening torque.

14. REPAIRS

14.1. Small impacts

Small impacts on the carbon + epoxy parts of the blades can be easily repaired, with for example the repair kit available on the E-PROPS website.

Small impacts on the Titanium leading edge can be repaired in the E-PROPS workshops. The Titanium part of the blades can be completely replaced.

14.2. Major repairs

If an incident or shock requires a major repair of the propeller, this must be carried out by E-PROPS in its workshops, or by a specialist after discussion with the E-PROPS team.

A major repair made without E-PROPS approval would void all warranty.

Beware of propellers repaired without approval: a propeller rotates at maximum speeds of more than 600 km/h at the blade tip. A major repair must be done according to the rules of the art.

Mastering the major repair of a composite part requires knowledge that often goes beyond simply implementing instructions correctly.