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Manual
for Propeller Type
H30F

Propeller Type:

Propeller Serial No.:

Date of Sale:

Seal and Signature of Manufacturer:

Index

1 List of Modifications

Version (Date)	Chapter	Description	Name
Version 02/2009		First Edition	TKU
01.08.2011	1 List of Modifications	Insert the Chapter "List of Modifications"	TKU
12.08.2011	8 Warranty	paragraph	TKU
21.05.2012	5 Installation	Torque; bolt retaining device	TKU
13.11.2015	5 Installation	Thickness of pressure plate	NVK
	3 Specification of propeller type	New overview	

2 Description

HELIX propellers have been built since 1990 using composite materials such as carbon fibre, epoxy-resin, epoxy resin foam and aluminium.

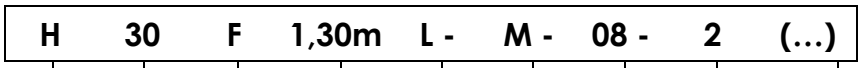
This combination of materials provides:

- High Thrust
- Low Noise
- Durability

Figure 1 and 2: 2-blade and 3-blade propeller of type H30F

The propeller blades are made from several layers of woven carbon fibre, reinforced with different sorts of carbon fibre tapes. They are bonded with epoxy resin foam reinforced by glass fibre. This method of construction ensures that the load is distributed throughout the whole surface of the blade and dissipates vibration.

3 Specification of Propeller Type



Helix

Strength Category

25 = 1 - 10 kW
30 = 5 - 25 kW
40 = 10 - 47 kW
45 = 10 - 55 kW
50 = 20 - 85 kW
60 = 40 - 133 kW

Model for H30F

F = Fixpitch

Diameter in [m] (Meter)

Rotating Direction

L = Left
R = Right

Profile and Shape for H30F

ES = Straight shape with very small profile-depth and very small-thickness
EZ = Straight shape with small profile-depth and -thickness
Z = Straight shape with small profile-depth and -thickness
M = Straight shape with medium profile-depth and -thickness
NJ = Straight shape with small profile-depth and –thickness plus extra cooling device
NM = Straight shape with medium profile-depth and –thickness plus extra cooling device
NL = Straight shape with large profile-depth and –thickness plus extra cooling device
L = Straight shape with large profile-depth and -thickness

Fixpitch in [°] (degree)

Number of Blades

Customer Specific Modifications	

Table 1: Specification of the Propeller Type
Structure of the Helix Propeller Name

4 Operating Limitations

HELIX Propellers are constructed for giving thrust to aircrafts with an engine output of between 1 and 100 kW using 2-stroke, 4-stroke, rotary- or electric engine.

The operating limitations for the here described propeller types of **H30F** as 2-, 3- and 4-Blade-Version in clockwise and anti-clockwise rotation are for diameters from <1,00m to 1,55m.

There is to distinguish:

For propeller of size from **1,00m - 1,25m**:

- Maximum propeller-rpm: **4.300 rpm**
- Maximum engine power: **25 kW**

For propeller of size from **1,30m - 1,55m**:

- Maximum propeller-rpm: **3.000 rpm**
- Maximum engine power: **25 kW**

Warning:

If the maximum operating values are exceeded the propeller, engine or gearbox may be damaged. If the propeller becomes damaged its balance will be affected which can cause failure of the engine mountings.

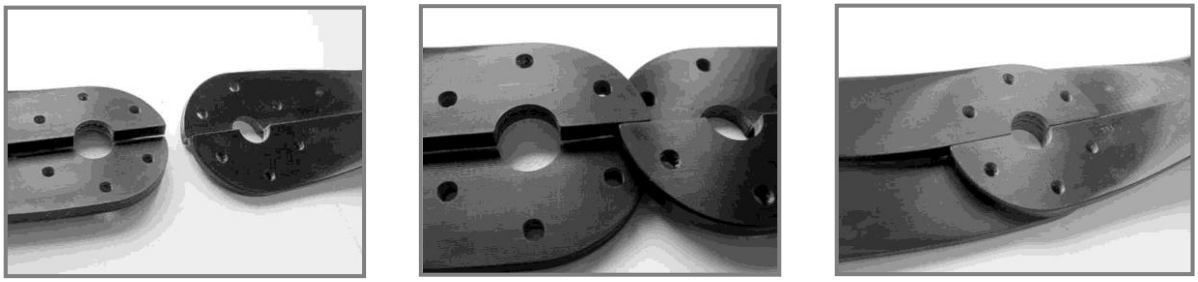
Before starting the engine, the pilot must ensure that the area around the propeller is free from debris to avoid any impacts on the blades by foreign objects.

The engine can only be hand started by qualified personnel.

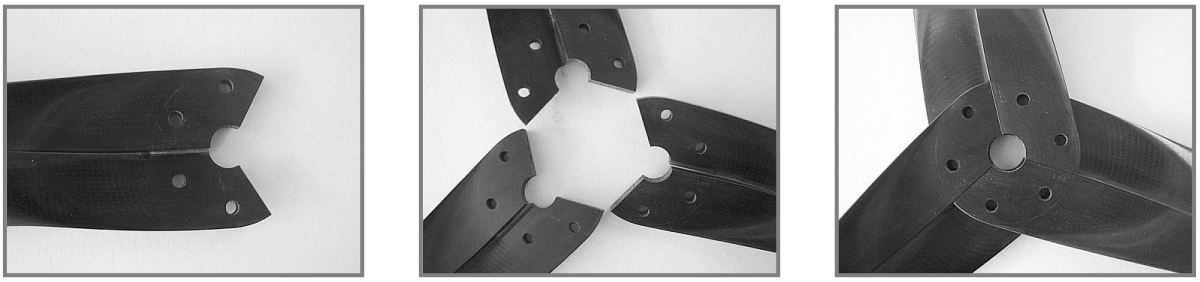
5 Installation

To mount the propeller blades together, at first the blades are placed onto a table, where they will be aligned and adjusted. Then the blades will be fitted into each other.

2-blade propeller:



3-blade propeller:



4-blade propeller:

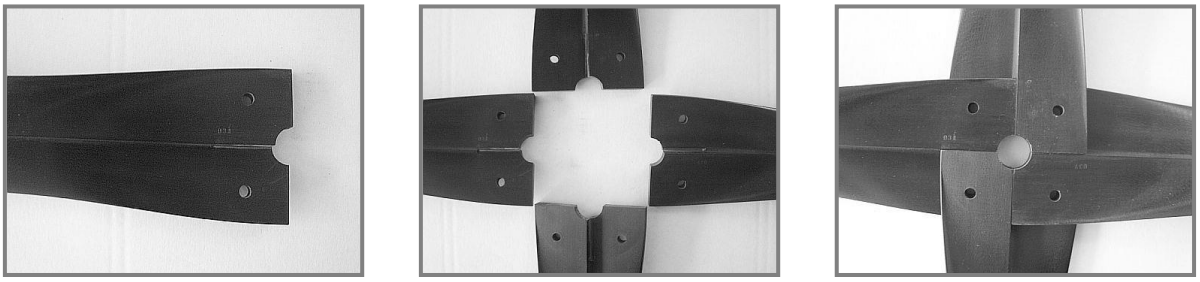


Figure 3 to 11: Adjustment of the blades

Please note: The Blades for the 4-Blade Propeller have to be adjusted according to the label; the paired Blades have to be opposite!

Warning: **At this point it has to be checked that the tailing edge of all Blades is in right position in turning direction – backside aligned.**

Further, the propeller front plate (pressure disc) with a minimum thickness of 5mm needs to be adjusted with the bolts at the root part area.

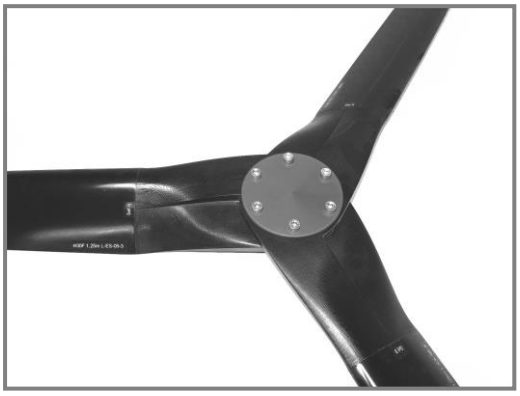


Figure 12: 3-blade Propeller ex. H30F

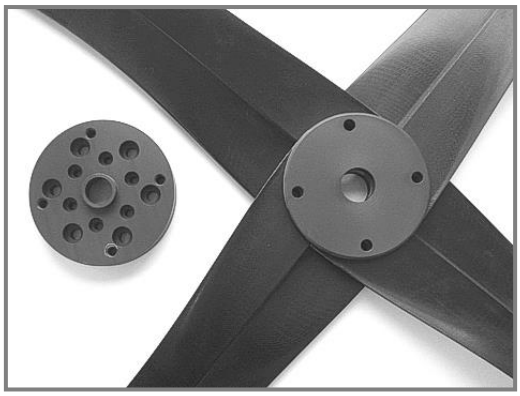


Figure 13: 4-blade Propeller ex. H40F

Finally, the propeller is to be mounted onto the propeller flange of the engine.

Screw dimension and tightening torque are to be taken from the manual of the airplane manufacturer and to check.

The nominal tightening torque of retaining screws

- M8 – 8.8 amounts 23 Nm in suitable nuts
- M6 – 8.8 amounts 11 Nm in suitable nuts

The Propeller can be certainly pursued with a tightening torque in the range of

- 19 Nm to 25 Nm for M8 – 8.8 screws
- 8 Nm to 12 Nm for M6 – 8.8 screws

However, the nominal tightening torque for your application is influenced substantially by the used screws and its flange thread.

For the application in aluminium components 8 Nm are to be intended for M6 – 8.8 screws and 20 Nm for M8 – 8.8 screws.

Generally, the following alternatives available to retain the screws:

- the preferred solution is to use a wire as bolt retaining device
- for propeller flanges with through holes self locking nuts can be used
- if the first alternatives are not possible loctite 243 can be used instead

After 3 working hours the mounting of the propeller has to be checked and the screws retightened.

6 Pre-Flight Checks

Before every flight the following has to be controlled:

- Check engine / Gearbox bearings for excessive play.
- All blades are fixed
- Check bolts for tightness and security of wire locking
- No play of propellertip
- Blades are not damaged and have no cracks

Slight resin-flakings by debris can be accepted, but should be repaired shortly. The repair can be done with economical application of special resin. If the check is not satisfactorily the handling has to be stopped and the propeller repaired.

Warning:

A propeller failure has more serious consequences than an engine failure! As consequence of a damaged propeller serious vibrations are possible. This unbalanced mass can tear the engine out of the engine bracket and lead to serious balance point shiftment with serious consequences to stay in a save flight attitude!!!

7 Maintenance

The propeller should be cleaned at the end of each day's operation.

This prevents the built up of dried grass and insects etc. on the blades. Cleaning of the blades should be carried out with a soft sponge using a weak detergent solution.

Annually, the propeller should be polished professionally. It is recommended that this is carried out by a respected coachbuilder or similar facility.

8 Warranty

HELIX Carbon GmbH warrants the propeller for two years from the date of purchase (according to European law). The guarantee covers material defects but does not cover subsequent losses.

The operator flying with this propeller does so at his/her own risk.

Any claim will only be considered if the propeller has been installed and used in accordance with this manual.