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# Manual for Propeller Type H30F

Propeller Type:

Propeller Serial No.:

Date of Sale:

Seal and Signature of Manufacturer:

## Index

1	Description .....	3
2	Specification of Propeller Type .....	4
3	Operating Limitations .....	5
4	Installation .....	6
5	Pre-Flight Checks .....	8
6	Maintenance .....	8
7	Warranty .....	8

## 1 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:** 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.

## 2 Specification of Propeller Type

	H	30	F	1,30m	L -	M -	08 -	3	(...)
Helix									
Strength Category									
25 = 1 - 10 kW									
30 = 5 - 25 kW									
40 = 10 - 35 kW									
50 = 20 - 100 kW									
Model									
F = Fixpitch									
V = Variable Pitch									
Diameter in [m] (Meter)									
Rotating Direction									
L = Left									
R = Right									
Profile and Shape for H30									
Z = Straight Shape with small profile-depth and -thickness									
M = Straight Shape with medium profile-depth and -thickness									
L = Straight Shape with large profile-depth and -thickness									
NJ = Straight Shape with small profile-depth for engine cooling									
NM = Straight Shape with medium profile-depth for engine cooling									
FC = Scimitar 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

### 3 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.

## 4 Installation

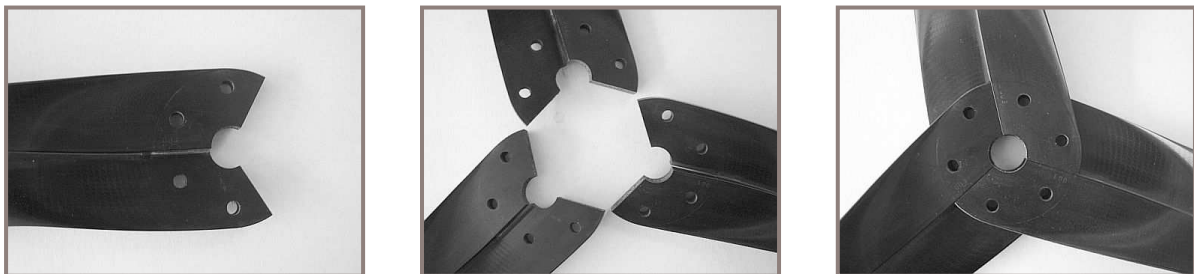
To mount the propeller blades together, at first the blades are placed onto a table, where they are straightened and adjusted.

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

2-blade propeller:



3-blade propeller:



4-blade propeller

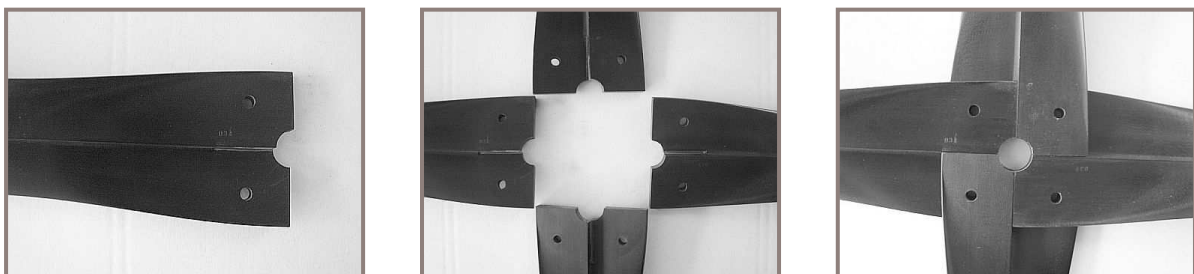
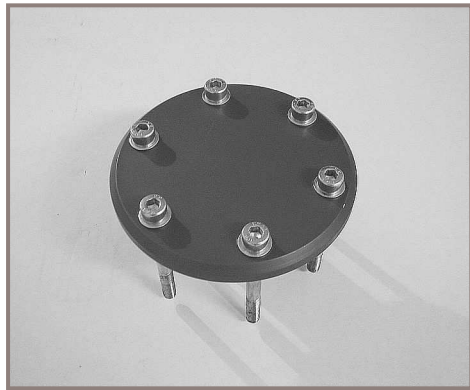


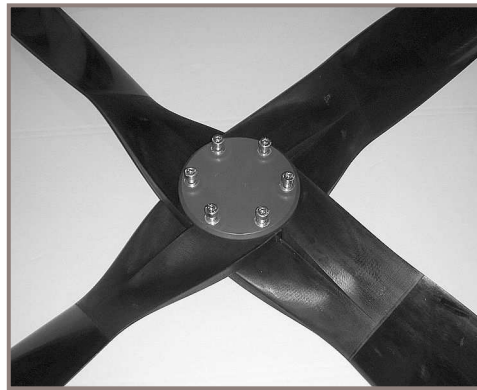
Figure 2 to 10: Mounting of the blades

**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.

Afterwards the propeller front plate (pressure disc) is aligned and the bolts are placed.



**Figure 11:** Front plate with screws



**Figure 12:** Propeller (e.g. H50F) with mounted front plate

At least the propeller is mounted onto the propeller flange of the engine.

Please check and follow the specifications of screw dimensions and breakaway torque of engine manual.

In general the following breakaway torques are obtained:

For screws of M6 torque of 12 Nm and M8 torque of 25 Nm.

The mounting of the propeller has to be checked (retightening of screws) after 3 working hours.

To retain the screws there are the following alternatives possible:

- 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 also loctite 372 can be used

## 5 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 safe flight attitude!!!

## 6 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.

## 7 Warranty

HELIX Carbon GmbH warrants the propeller for two years from the date of purchase (according to German 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.