OPERATION MANUAL

1. INTRODUCTION

1.1. Foreword

Thank you for purchasing an aixro 4-stroke rotary engine. We are pleased that the many advantages of this proven engine concept have convinced you.

! But before getting started, please read and understand the instructions and procedures outlined in this operator manual!

You will obtain important safety advice and information about the correct installation, first launch and service of the engine.

We wish you lots of fun with your aixro engine!

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1.2. General Safety Instructions

- **! Depending on the application aixro engines require a particular fine tuning. If you have purchased your aixro engine to install it into an application yourself, a technical review and extensive testing are recommended.**
- **! Note that aixro engines are not certified aircraft engines. They have not received safety and durability testing specified by aircraft standards. They may only be used in non-certified experimental aircraft or vehicles and only when an engine failure is not a safety risk. Never use an aixro engine in circumstances or in areas, in weather conditions or in altitudes where you need to rely on the engine.**
- **! The user takes all risk resulting from the use of an engine, and he is aware of the possibility of sudden functional disturbances.**
- **! The exhaust can become very hot, over 1000°C! Avoid any contact when hot.**
- **! Always keep your engine in a good, clean condition. This helps detect defects earlier and avoid dangerous accidents.**
- **! You will find further (safety) advice in this manual, marked by "!". Please read each of these tips carefully. If you have any questions, please contact your dealer or ourselves BEFORE you use the engine.**

1.3. Development Stage

The operation manual is based on the state of knowledge at the time of publication. It was produced to best knowledge, however excluding any liability. The specifications may deviate from the actual performance due to production-related and external conditions.

The information presented in this manual is subject to change without notice.

1.4. Copyright, Circulation, Date of Issue

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3. FUNCTION OF AIXRO ENGINES

Each aixro engine is a rotary engine based on the Wankel principle. Its main components are

- Rotor with seals (equivalent to the piston with rings of a reciprocating piston engine)
- Eccentric shaft (equivalent to the crankshaft)
- Housing, also called trochoid due to its oval-like epitrochoid shape
- Side Plates, closing the sides of the housing

The engine is a 4-stroke suction engine. Its rotor has a triangular shape, and the edges of the rotor are in permanent contact with the trochoid through the apex seals. This creates three separate combustion chambers along the flanges of the rotor and allows three 4-stroke processes to run simultaneously. The rotor only rotates at 1/3 of the speed of the eccentric shaft, so with every rotation of the shaft a different combustion chamber passes the spark plug.
The processes within the engine, especially the long timings, lead to favourable emissions, which can be as low as 1% of comparable 2-stroke engines and reach best 4-stroke level in the driving cycle. The engine can be operated with a catalytic converter.
The engine uses a carburettor and fuel lubrication at a ratio of 50:1. Contrary to a two-stroke engine the oil burns almost without residues.
To access the combustion chamber the fresh gases first flow though one side plate. Then they flow through the rotor and the eccentric shaft in axial direction to reach the opposing side plate. From there they access the combustion chamber. This cools and lubricates the rotor, main bearing and eccentric shaft. A separately controlled butterfly valve can open a second channel of the split inlet port to allow additional gases to flow directly into the combustion chamber. These cold fresh gases allow an additional power boost.
The particular advantages an aixro engine are its lack of vibration due to balanced rotating masses, its very compact design, the extreme performance with a very flat torque curve, as well as very low emissions. In addition the lifetime is enormous for a performance engine, and it has long times between overhauls.

4. ASSEMBLY

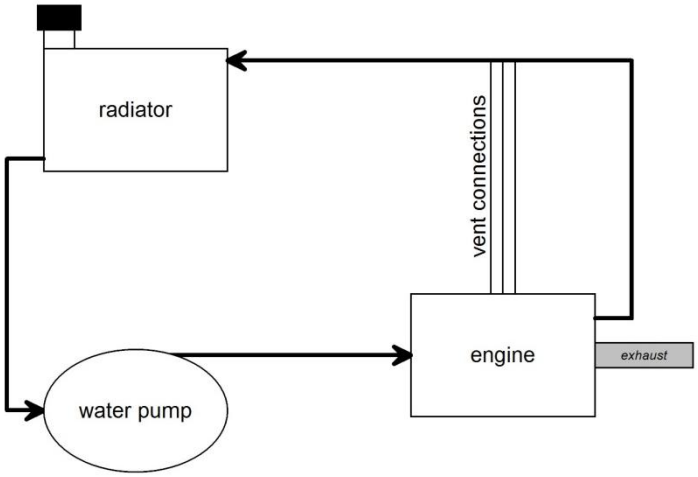
4.1. Cooling System

The dimension and position of the water cooling system depends on the application. The cooling system should be tested extensively in every new application. The water connectors are made for hoses sized ⅔" (16.5mm).
If the radiator is equipped with a filler and mounted above the engine, it can be connected with the engine as described in section 4.1.1. If the radiator is mounted below the engine, a separate overflow tank is required as described in section 4.1.2.
XF40 and XH40 are equipped with vent connectors for 6mm hoses on the trochoid (=centre housing) and the side plates. These are required to vent the engine's water channels if the engine is mounted upside-down, i.e. with the four attachment points upwards. If the engine is mounted with its attachment points downwards, the vent connectors can be blocked.

4.1.1. Radiator above the engine

If you mount the radiator above the engine, please do the following:

1. Mount the engine on its 4 attachment points (M8 thread).
2. The water pump can be mounted in two different positions. Make sure that the radial outlet points upwards when the engine is mounted, so air can escape from the pump and the pump is properly vented.
3. Connect the engine, radiator and water pump as shown in the diagramme below:

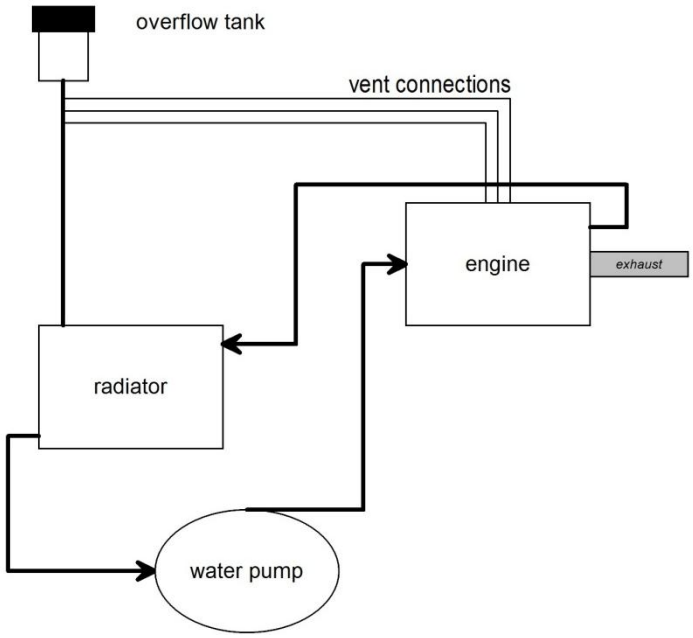


4. Note the positions of the in- and outlets, route and attach the hoses properly and ensure that there are no kinks or sharp bends in the hoses.
5. Attach all hoses with hose clamps.
6. If the engine is mounted upside-down, connect the three 6mm vent connectors with an inline coupling above the engine.

4.1.2. Radiator below the engine

If the radiator is mounted below the engine, proceed as follows.

1. Mount the engine on its 4 attachment points (M8 thread).
2. The water pump can be mounted in two different positions. Make sure that the radial outlet points upwards when the engine is mounted, so air can escape from the pump and the pump is properly vented.
3. Connect the engine, radiator and water pump as shown in the diagramme below:



4. Note the positions of the in- and outlets, route and attach the hoses properly and ensure that there are no kinks or sharp bends in the hoses.
5. Attach all hoses with hose clamps.
6. If the engine is mounted upside-down, connect the three 6mm vent connectors with an inline coupling above the engine.

! If you want to mount the engine in a different position, this is possible, but needs to be verified to ensure proper venting and even water flow through the engine.

! Check whether the hoses are positioned far enough away from the exhaust to avoid melting or cooking, and secure them with tie wraps if necessary.

! Make sure that there are no kinks or sharp bends in the hoses, and that they do not touch any moving parts or the ground.

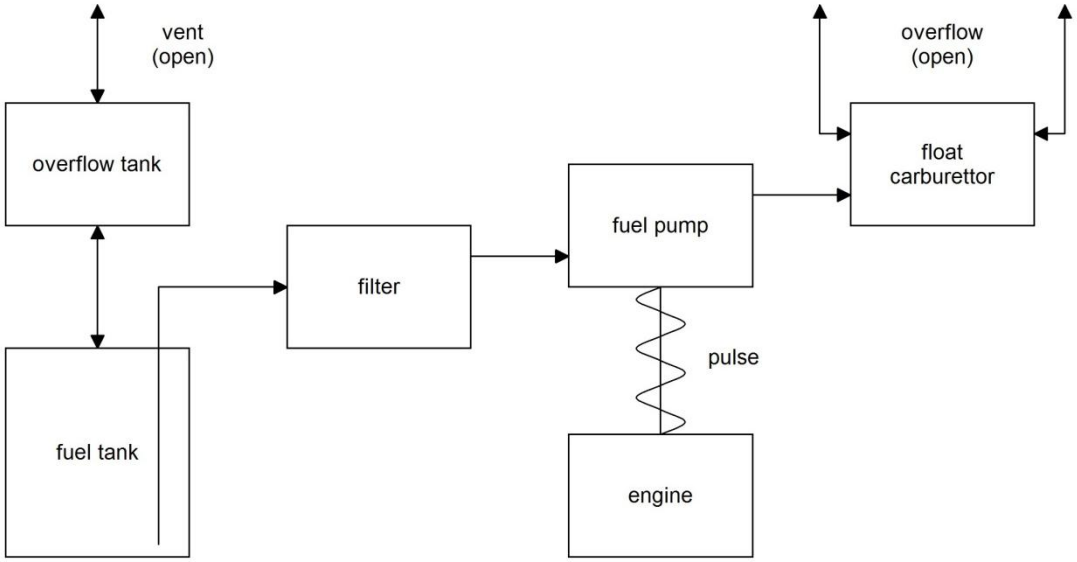
4.2. Carburettor / Fuel Supply

Aixro XF40 and XH40 are equipped with a float carburettor. To accommodate different packaging requirements, two different inlet manifolds are available. One is parallel with the engine's eccentric main shaft, the other is radial to the engine.
First attach the carburettor to the inlet manifold:

1. When using the radial inlet manifold, slide the rubber carburettor connector over the inlet manifold, so it snaps into the grove of the manifold, and attach it with a hose clamp.
1. When using the parallel manifold, attach the rubber connector flange with two M8 bolts.
2. Push the carburettor into the connector, so it snaps as well, and attach it with another hose clamp.
3. The fuel tank should have two connectors. One connector needs to have a line on the backside, which leads to the bottom of the tank, or it needs to be located right at the bottom of the tank (fuel supply). The other connector must be at the top of the tank, and it must not be connected with any fuel lines inside the tank (vent). If the fuel tank

should have a third connection, it should be blocked off or connected to a separate line, which has an open end secured above the level of the overflow tank.

4. The overflow tank itself must be attached above the fuel tank, and it must be open to allow decompression.
5. Connect the carburettor, fuel pump, fuel tank and overflow tank as shown in the diagramme below:



! Ensure that the carburettor is in an upright position.

! The fuel lines must be made from fuel-resistant rubber.

! Attach the fuel lines using tie wraps or tape, making sure they are not touching the exhaust, the engine, moving parts or the ground

! Ensure that the fuel lines are not restricted by the attachment (kinks or sharp bends), as this can damage the engine.

☝ *If the fuel tank is mounted higher than the carburettor, the fuel supply is supported and the operation safety is increased. Inversely the required pump performance increases the further the fuel tank is located below the carburettor.*

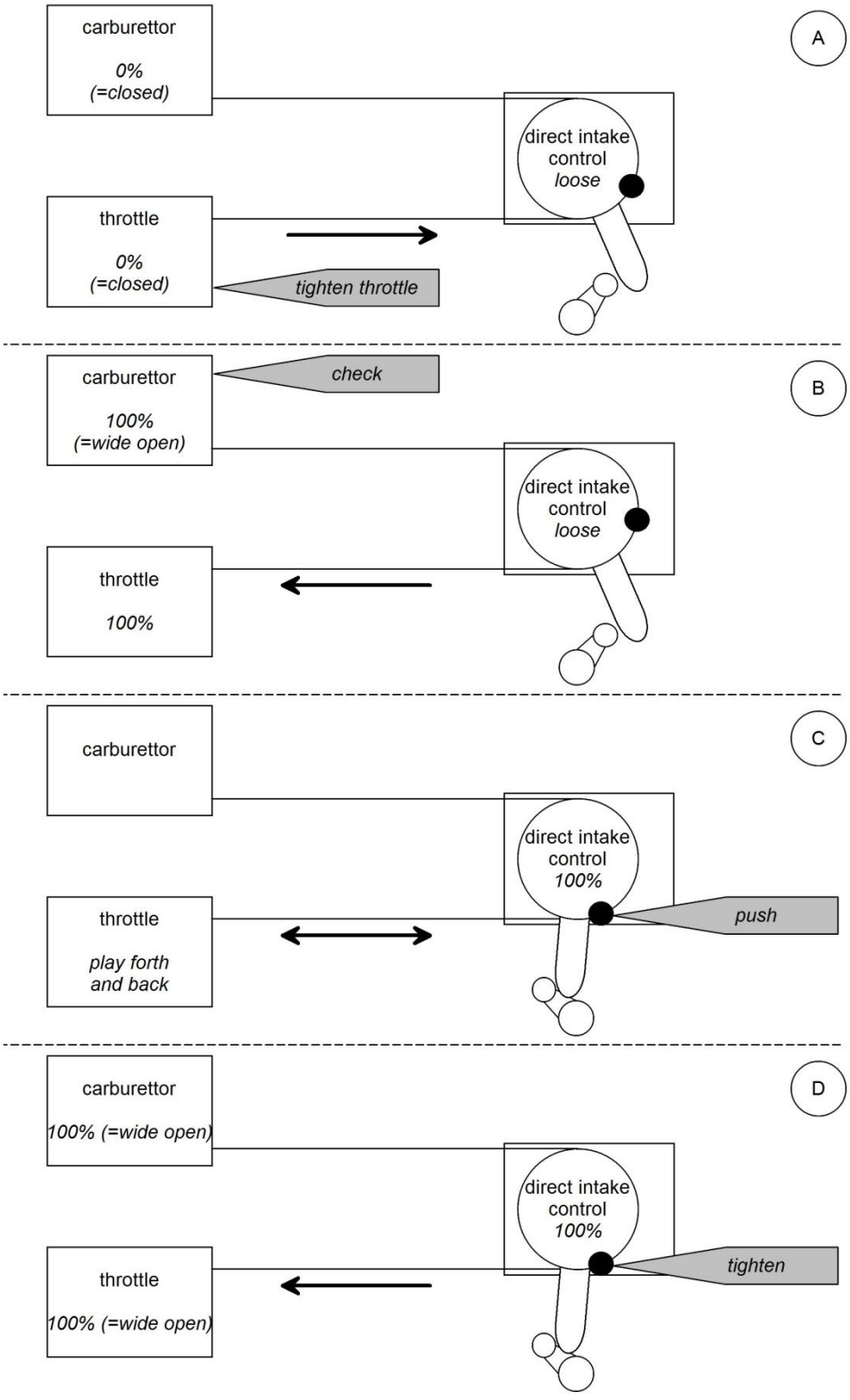
! If the fuel tank is mounted above the carburettor, the fuel line must be equipped with a shut-off valve. Otherwise the carburettor can be flooded when the engine is not in use.

4.3. Throttle Cable

The engine is equipped with a device to control the admission of air directly into the combustion chamber, which is attached to the inlet manifold. It is designed so it only opens when maximum engine power is required. The throttle cable controls both the carburettor and the direct intake control.

1. Remove the cover of the direct intake control, which is attached with 3 bolts.
2. Loosen the hex bolt underneath, but do not fully remove it.
3. Loosen the nut of the elbow section at the top of the carburettor, so its direction can be adjusted.
4. The direct intake control has two cable adjusters. One is closer to the lever, which protrudes from the mechanism. Lay an outside throttle cable from this cable adjuster to the throttle.
5. Now lay an outside throttle cable from the other cable adjuster of the direct intake control to the carburettor's elbow section.
6. Make sure the outside throttle cables have a good length, so they don't distort (too long) or kink (too short) the throttle cable. Check the ends of the outside throttle cables making sure they are round and have no sharp edges.
7. Align the elbow to the external cable and secure the position by re-tightening the nut on the carburettor.

8. Pull the throttle cable through the first outside cable, then through the direct intake control, and then through the second outside cable.
9. Pull the throttle cable tight and attach it to the throttle. The throttle cable should still have a bit of play, so the carburettor will be fully closed in idle position (throttle 0%, see picture A).
10. After this, check if the carburettor fully opens in full throttle position (100%) and adjust the cable adjusters if necessary (picture B).
11. Now move the throttle forth and back and push against the direct intake control's hex bolt until the lever is in block position. (picture C).
12. Tighten the hex bolt in this position (picture D).



13. Tighten down the throttle cable at the throttle as well as all throttle cable adjusters and counter nuts and double-check the throttle adjustments.
14. Attach all outer throttle cables, so they cannot make contact with moving parts or the ground.
15. Attach the air filter to the flange of the carburettor and secure it with a hose clamp.

! The throttle cable should be properly cut to length when the installation is finished. Otherwise the throttle might get stuck.

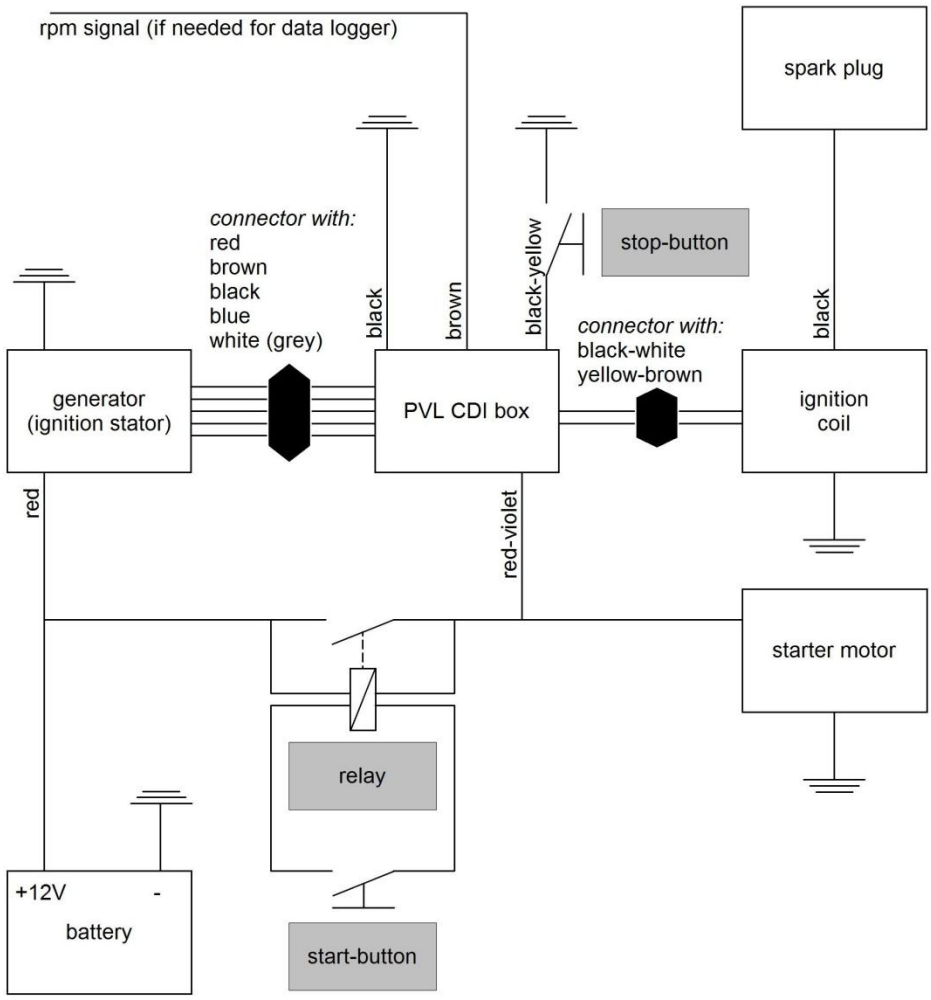
! Check the throttle cable for smooth operation. A sticking cable may result in injuries or engine damage.

! Check that tie wraps used to attach the throttle cable cannot move in operation. Otherwise the throttle cable might get stuck. In case of doubt it is better to use tape.

4.4. Ignition/Starter

XF40 and XH40 are equipped with a light magneto ignition system, which supplies approx. 50W alternator current to charge the starter battery and potentially supply further components. The integrated voltage regulator maintains an even voltage of 12V.
In addition the ignition has an integrated start support, which uses battery current to produce an ignition spark from 100rpm in the starting phase.
The timing curve is pre-installed, and the engine speed is limited to 7000rpm. Still the engine should be set up to reach a maximum of 6500rpm in operation.
Use a maintenance-free (MF type) lead-acid battery (no gel) with min. 7,2Ah and temporary 100A. Though the ignition has an integrated charging function, make sure the battery is always charged sufficiently.
Depending on the engine configuration the ignition will normally come partially or fully assembled. If it should come unassembled, or you want to integrate the components in a different way, connect the components as shown on the diagramme below.

1. Attach the CDI box in a protected area without any stress on the wires.
2. Attach the ignition coil either directly on the engine or on rubber mounts, which protect the coil from vibration. If the ignition coil is not mounted directly to the engine, use a sufficient ground cable to connect the coil's mounting plate with the engine (ground).
3. Connect the black and yellow wire with the stop button (kill switch). The stop button should always be visible and within reach of the operator, and it should be market to be easily visible. By connecting the stop switch's circuit with the engine (ground), the ignition will be cut off, and the engine will stop immediately.
4. Attach the battery in an upright position with a suitable bracket.
5. Connect – of the battery (ground) with the engine, preferably with one of the mounting links of the starter motor.
6. Connect the ignition coil with the spark plug. If the cable should be too long, remove the spark plug cap, cut the cable to length and firmly re-install the spark plug cap.



- *Use sufficiently big cables for the conductive circuit between battery, relay and starter motor (10mm² / AWG8). 1.5mm² / AWG16 cables are sufficient for the control circuits.*

! Note that the red/violet wire should only be supplied when the onboard starter is running. If it is permanently supplied with +12V, it can get damaged thus potentially causing an ignition failure.

! Make sure all wires are properly routed and attached to avoid damage in operation.

! Ensure that (especially the stop button wires) cannot wear or make contact with moving parts or the ground. Otherwise the engine might not start, it might not be possible to turn it off, or it could stop in operation.

4.5. Exhaust

The exhaust should be specially adapted to each application. Therefore a modular system of straight tubes, 90° L-bows, a silencer and a silencer support are available.
Make sure that the exhaust is attached without stress or tension to avoid cracks or other potential damage.
When making your own exhaust you should only use stainless steel or titanium due to the high exhaust temperatures.

! Make sure that the exhaust has a sufficient distance to heat-sensitive components, such as electronics, fuel supply and carburettor. In doing so please also consider potential heat conduction and outside influences in use, as well as hot exhaust gases from the exhaust outlet.

4.6. Reduction Drive

The standard aixro XF40 is equipped with a pulley for a V-belt (PJ profile, 16 stripes, Ø59mm). If you intend to use this for a reduction drive, make sure that the engine and the reduction drive are precisely aligned. Ensure that the belt is tightened by manufacturer recommendations, and that the pulleys are absolutely flush.
The same also applies to the XH40, which is equipped with an additional centrifugal clutch. The clutch is designed to decouple the engine in the starting phase. As soon as the engine reaches idle rpm, the clutch will be engaged in order to reduce wear and friction in the clutch. In addition the clutch is designed like a freewheel, so it will disengage as soon as the engine rotates more slowly than the drivetrain.

4.7. Data Acquisition

It is recommended to monitor and record different engine parameters in operation. There are many good and very refined systems available nowadays. The most important parameters are:

4.7.1. Engine Speed

The engine speed is relevant for the performance and temperatures in the engine. It also allows to draw conclusions about the chosen reduction drive. The range of operation should not exceed 6500rpm and not reach the (limited) maximum of 7000rpm.

1. Use the ignition's rpm output (brown wire), or connect a wire to the ignition cable if using an inductive system.
2. Though the aixro is a 4-stroke engine, it ignites with every engine revolution like a 2-stroke engine. Therefore your system should be set to "2-stroke".

4.7.2. Water Temperature

The water temperature provides information on the engine load and the capacity of the cooling system. The sensor should be installed near the engine in the connection between the engine and the radiator.

1. Use an adapter suiting the sensor and the hose.
2. Cut the hose, which connects the engine with the radiator, close to the engine.
3. Insert the adapter, and secure it with hose clamps.
4. Insert the sensor in the adapter and secure it, making sure that there are no leaks.

4.7.3. Main Bearing / Transfer Port Temperature

It is possible to measure the temperature of the fuel-air-mixture in the transfer port of the side inlet behind the main bearing. This provides the most valuable information about the engine, especially the main bearing. You will discover that the temperature increases with engine speed and load. This means you get very quick feedback on the engine load and the strain of the main bearing.
Use a quickly responding temperature sensor (K-type) with a M5 thread.

1. Ensure that the engine is absolutely clean in the area of the screw, which is located next to the inlet manifold in the ignition side plate (engine housing).
2. Remove the screw and insert the sensor.
3. Connect the sensor as described by the manufacturer.

! Double-check that the position of the sensor is right. If it protrudes the thread much more than 10mm, it can make contact with the rotor. If it does not stick out far enough, you will not get feasible results.

! Make sure the attachment is airtight. If the engine can pull air from the sensor area, it will run too lean and can get damaged.

5. FIRST LAUNCH

5.1. Water

1. Remove the cap from the radiator, and fill the cooling system with (distilled) water and aluminium compatible antifreeze.
2. Let air ascend from the system and add water until the system is really full.
3. Tighten the radiator cap to close the system.

! Make sure the system is watertight (especially the hose connections).

☝ *Antifreeze prevents corrosion and prevents engine damage especially in the wintertime.*

5.2. Fuel

Premium unleaded brand name pump fuel (ROZ 95) is recommended. Standard unleaded fuel (ROZ 91) can also be used without problems. The engine must be operated with a fuel-oil-mixture at a 50:1 ratio, i.e. 100ml per 5l (US: 2.56fl.oz per 1gal / UK: 3.2fl.oz per 1gal). Use pre-diluted fully synthetic 2-stroke racing oil only.

☝ *We recommend only to use the oil **Mobil 1 Racing 2T**.*

! If you use the wrong oil or mixing ratio, this can cause damage or total loss of the engine – even if damage is not immediately apparent.

! Ensure that fuel and oil are pre-mixed properly in a petrol can.

5.3. Refuel / System Fill

In order to protect the engine, you should never start or run the engine without sufficient fuel supply. Before starting the engine, the fuel tank should always be at least ¾ full, and all fuel lines should be full as well.

1. Fill the fuel tank with pre-mixed fuel.
2. Blow air into the overflow tank until the fuel line to the carburettor is completely full (a few air bubbles will stay in the line – this is no problem).

! Make sure all fuel lines are properly secured and do not leak.

5.4. Control

! Double-check the assembly and the steps for first launch.

5.5. Start Preparation

Make sure that the starter battery is fully charged.

! Normally the engine will start immediately. If it should not start right away, you should look for errors instead of trying again.

! Never run the starter for more than 5 seconds without interruption.

5.6. Engine Start / Test Run

When testing the engine for the first time, you should only let it run briefly and maybe without load. Only use the throttle very carefully, and never play with the throttle (as some do to keep 2-stroke engines running). Always be prepared to switch off the engine.

! The engine is equipped with a rev limiter. For safety reasons you should not accelerate the engine to the rev limiter though.

1. Pull the carburettor's choke lever and leave the throttle in idle or just very slightly above idle (no half or full throttle).
2. Do not play with the throttle.
3. Start the engine.
4. Let the engine run in idle for approx. 20 seconds.
5. Switch the choke off and leave the engine in idle.
6. Let the engine run in idle for about 10 seconds.
7. Switch off the engine.
8. Let the engine cool down.
9. Check the water level in the cooling system and refill if necessary.
10. The engine is now ready for operation.

! Never make any adjustments while the engine is running.

! The exhaust becomes very hot and can cause severe burns.

! If the engine should not switch off, cover the air filter with your hands or pull off the air filter to cover the carburettor inlet.

6. Operation

6.1. Preparation / Control

Check the engine before running it:

1. Is the engine in a good condition and free from damage?
2. Are the radiator and the cooling system still completely filled and leak proof?
3. Does the fuel contain the right oil in the right ratio?
4. Is the fuel tank at least ¾ full?
5. Are the fuel lines to the carburettor filled and in good condition?
6. Are the carburettor and the air filter attached properly?
7. Does the throttle cable operate smoothly and without sticking?
8. Does the throttle cable slightly slack in idle position?
9. Is the throttle cable tight in full throttle position?
10. Does the throttle touch a limit (screw) in full throttle position?
11. Is the off-switch properly connected with the engine?
12. Is the off-switch cable in good condition?
13. Is the exhaust properly attached without strain or tension?
14. Is the battery of the starter fully charged?
15. Are all engine bolts tight?
16. When using a belt drive, is the belt in good condition?
17. Is the belt properly aligned?
18. Is the belt tension correct?

6.2. Starting

1. Start the engine as described previously. When the engine is warm, it still helps in most cases to apply the choke.
2. Let the engine warm up, if necessary with light load, until the water temperature has reached its operation level.

6.3. Running In

The engine should be run in once. Let it run with light load (3000rpm) in the first hour of operation, and after that slowly apply full load when necessary.
The engine has very good emergency running properties, and it will also withstand running on full load immediately, but running the engine in reduced internal friction and thus facilitates power output.

6.4. Operation

Make sure that you to run the engine within its optimum operation parameters:

6.4.1. Engine Speed

XF40 and XH40 are intended to run at a maximum engine speed of 6500rpm. The programmed rev limit in the CDI system is 7000rpm. Still you should operate the engine below the limiter rpm as this is only intended as a safety device.

! Make sure that you don't or hardly don't hit the rev limiter.

6.4.2. Water Temperature

After heating up the engine, the water temperature should be between 60°C and 80°C (140°F to 175°F). If the water temperature should deviate a bit from this, it is not an immediate issue, but should be corrected when possible.

☝ *If the water temperature is too low, you can mask part of the radiator with tape. If it is too high, the radiator may have too little capacity, or there may be a problem.*

! Do not run the engine with too high water temperature, as this may lead to engine damage.

! If you observe a strange water temperature (e.g. significantly lower than usual), the cooling system may have a leak. In such a case stop the engine as quickly as possible and check the cooling system when the engine has cooled down.

6.4.3. Main Bearing / Transfer Port Temperature

The transfer port temperature swings significantly while you are driving. It should never exceed 140°C (285°F).

! If the temperature exceeds 140°C (285°F), you should reduce the load as soon as possible. If the temperature then should continue to increase, this can indicate a problem in the area of the main bearing.

6.4.4. Emergency Operation

A rotary engine has very good emergency running properties. It can be operated beyond its limits without necessarily failing immediately. Still an operation outside the recommended parameters can cause damage to the engine.
Therefore you should reduce the load on the engine and switch it off as soon as possible when noticing too high temperatures (water and especially main bearing). After that you should check the engine or have it checked to avoid damage that may not yet be apparent.

6.5. Shut Down

1. Let the engine run briefly with light load if the radiator can still cool properly.
2. Then turn off the engine.
3. Let the engine cool down.

! The exhaust becomes very hot. Caution! It will cause severe burns!

! Before using the engine again, review the checklist to make sure that everything is in good condition and fully operational.

It is normal to see the water temperature increase after stopping the engine, because the water pump is not running any more, and the radiator is not cooled by any wind.

6.6. Storage

If you do not want to use the engine for a longer period, fully drain the fuel system. After longer downtimes you should remove fuel remains from the carburettor, fuel pump and fuel tank before refilling the system.
It can also be sensible to drain the cooling system when longer downtimes are expected. If doing so, mark the engine so you will remember to refill the system before the next use.

! If you remove ancillary engine parts, such as the carburettor and the exhaust, all engine openings should be covered airtight.

7. SERVICE AND MAINTENANCE

It should be self-evident that the engine is always kept free from dirt and oil, that the function of moving parts is verified regularly, and that the engine is checked per the checklist in section 6.1.
The only part requiring regular maintenance in normal use is the air filter.

! Always keep your engine clean. This makes it easier to discover defects.

7.1. Air Filter

Only use the original air filter and keep it clean.

! Avoid risks of fire and explosion. Do not use flammable liquids, fluids, aerosols (WD40, brake cleaner, etc.) or fuels to clean the air filter.

7.1.1. K&N Air Filter

Clean the air filter as described in the manual of the K&N Recharger Filter Care Service Kit. Oiling the filter is usually not necessary.

7.1.2. Aixro Red Filter

1. Remove the air filter from the carburettor.
2. Wash the filter carefully with a proven, non-inflammable cleaning agent (e.g. K&N, alternatively also soap water).
3. Dry the filter carefully with compressed air.
4. Attach the filter as it was mounted before.

7.2. Service

The maintenance interval depends much on the application, so there is no uniform maintenance interval. An engine service should at least be executed once per year though. Have the engine serviced by a certified dealer to maintain warranty on the engine.
In service the main operation is to check and review the condition of the engine's components. Also the main bearing is usually replaced. Depending on the condition and use of the engine it can also be necessary to exchange bearings or shaft seals and to execute further labour on the engine.

8. FINE TUNING / TROUBLESHOOTING

Problems can also occur with aixro engines. Some can be resolved directly with basic knowledge, while others should only be handled by an expert. Generally you should only do work you are comfortable with. If you feel overwhelmed or unsure, your dealer will be available to help you or to contact aixro for support.

! If the engine suddenly runs differently, there will be a reason for this, so don't just keep going. Try to find the problem and solve it. While doing so, keep a particularly close eye on the water and bearing temperature. If you should be uncertain, you should rather contact your dealer directly.

8.1. Engine Dropout

The root cause for dropouts is normally an issue of fuel supply. If the carburettor does not get enough fuel, a fuel line may be blocked, or the depression line between the engine and the fuel pump can be damaged. Especially if the fuel tank is not in an upright position or g-force is applied to the system, it might also just be an empty fuel tank that causes the problem.

! If you experience dropouts, you should reduce the engine speed. Otherwise the engine can get damaged due to insufficient lubrication.

8.2. Engine Stutters

The engine tends to run rich with a dirty air filter. If the engine does not run smoothly, or if it stutters at 4000 to 6000rpm, check the air filter and clean it if necessary.
If the vent pipes of the carburettor have sharp bends, the carburettor function may be constricted as well.

8.3. No Engine Start

If the engine will not start despite a fully charged starter battery, clean air filter and sufficient fuel supply, the spark plug may be the problem (although this is unlikely). To check, remove the spark plug from the engine. If it is wet and oily with excessive soot, you should replace it and properly dispose the old spark plug.

! Only use the original Denso U22ETR spark plug. Failure to do so can result in engine damage, as a too long spark plug could collide with the apex seals.

If the engine should not start, the reason could also be the off-switch. Check the switch and wiring for damage.

8.4. Dripping Carburettor / Overflow

If the carburettor loses fuel at the top of the float bowl, the gasket of the float bowl may be damaged. In this case remove the float bowl and replace the gasket.
Fuel can also leak from the overflow lines if these are leaking. In this case replace the overflow lines.

8.5. Engine Suddenly Lean

! If the engine suddenly develops a lean condition, or the idle speed is higher than normal, you should reduce the engine speed immediately and stop the engine as soon as possible. Failure to do so could lead to excessive wear and engine damage from lack of lubrication.

The most simple cause for this issue is a damage of the rubber carburettor connection. Check it thoroughly for cracks, and replace it if any damage is visible.

! If you notice a crack or emersion of oil in the area of the eccentric shaft or the engine housing, you should have the engine checked by an expert.

8.6. Wet Conditions

No particular changes are necessary to run the engine in wet conditions (rain). Just the air filter should be covered, so the engine does not absorb too much water.

8.7. Carburettor Setup

The carburettor setup works in most conditions. If you want to optimise the engine's performance by changing the carburettor jetting, you should be very careful and closely observe engine temperatures. Below is the standard setup of the Bing carburettor.

Main Jet:	156
Idle Jet:	35
Jet Needle:	8M1
Needle Jet:	2,74
Vent Screw:	¼..½ turns open
Slide Screw:	2,5 turns from slide's bottom dead centre
Air Filter:	K&N

! Note that a lean jetting can cause engine damage.

! Never use an air duct to the inlet or a karting airbox around the carburettor filter. This can even lead to engine damage if the jetting is on the rich side, because the engine may run too lean at high engine speed.

9. TECHNICAL SPECIFICATIONS

9.1. Engine Data

type:	4-stroke single rotor rotary engine
power:	26 kW at 6.500rpm
torque:	>35 Nm from 4.500rpm
chamber volume:	294 ccm
max. rpm:	7.000rpm
ignition:	magnet CDI ignition with variable ignition timing
spark plug:	Denso U22ETR
starter	12V / 0,4kW
battery	min. 12V / 7,2Ah / temporary 100A / type MF (=maintenance free)

9.2. Fastening Torque

spark plug:	M10x1	12Nm
exhaust nuts:	M8	22Nm
engine mounts:	M8	26Nm

9.3. Operating Fluids

fuel:	min. premium unleaded ROZ 95
approved oil:	Mobil 1 Racing 2T
mixing ratio:	50:1 (fuel:oil)
coolant:	water (recommendation: distilled water with 3 % antifreeze)

10. WARRANTY / LIABILITY

10.1. Liability

Aixro engines may only be operated at the user's own and unlimited risk. This includes personal and material damage, injury, loss of wages, etc.
Note that aixro engines are not certified aircraft engines. They have not received safety and durability testing specified by aircraft standards. They may only be used in non-certified experimental aircraft or vehicles and only when an engine failure is not a safety risk. Never use an aixro engine in circumstances or in areas, in weather conditions or in altitudes where you need to rely on the engine.

10.2. Warranty Grant

Only aixro GmbH is authorized to covenant warranty grants. Aixro guarantees the faultless function of the engine if it is used and maintained properly as described in this manual.
Warranty claims can only be made if the sealing of the engine is not damaged and the engine has been overhauled regularly by an approved dealer.
It is the duty of the customer to provide evidence for the date of purchase, the hours of operation, proper maintenance, proper adherence to overhaul intervals and proper use of the engine.

10.3. Warranty Procedure

In case of a warranty claim the claim should please be made in writing, if possible with picture documentation, to the e-mail address claim@woelfle-engineering.com.
Upon request the complete engine must then be made available through the dealer, RENNtech, or directly to Aixro GmbH. After inspection of the engine, defective parts (as determined by Aixro GmbH) will be repaired or replaced if a warranty claim is applies.
The engine can be assembled by a dealer, RENNtech or in the Aixro factory. If assembled in the factory, an assembly cost of € 100 will be invoiced. The engine will be shipped at the customer's expense. Parts replaced free of charge remain the property of aixro GmbH.