



## USER INSTRUCTIONS FOR ZDZ 420B4 AND 420B4-J with ELECTRIC STARTER

**READ THESE AND ALSO ENGINE INSTRUCTIONS CAREFULLY BEFORE YOU FIRST USE ENGINE AND ELECTRIC STARTER**



### *General Overview:*

This is a very powerful starter unit incorporating a high torque electric starter motor with a Bendix type pinion gear driving a modified prop hub via a large diameter ring gear. The starter motor is attached to the nose of engine by a heavy duty CNC machined clamping block. The hall sensor is fixed to the top of the clamping block and is not adjustable. The hall sensor magnet is mounted within an adjustable ring attached to the backside of the propeller drive hub and secured into position by 4mm set screws. This has been adjusted and set by the factory for the correct timing.

### *Electrical requirements and specifications:*

**Input Voltage:** 12-24V /0,4kW

**Current draw (For engines 420B4/B4-J):** up to 80A(not longer than 2 seconds)

**WARNING!!!! IF STARTER IS BLOCKED AFTER CONNECTION OF VOLTAGE, DISCONNECT IT IMMEDIATELY OTHERWISE IT WILL BE DAMAGED.**

**Recomm. battery(for secure on board start):** 5-6 LiFe cells

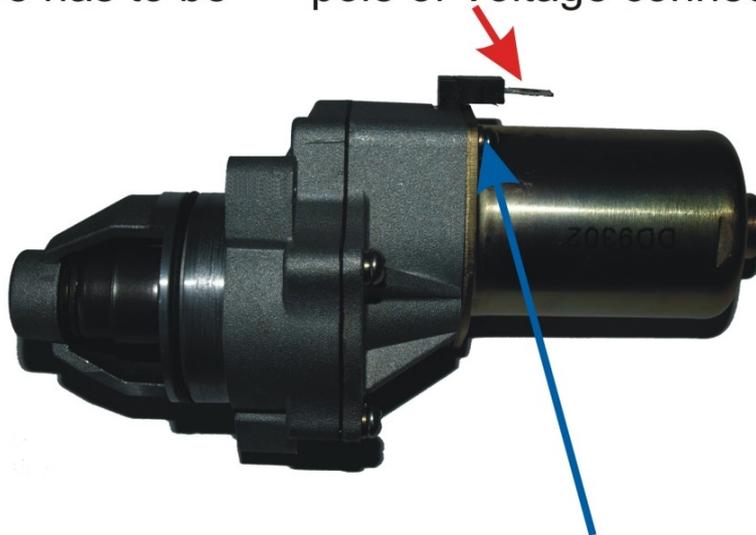
### ***Connection and switching on/starting:***

For remote powered applications using two small lead acid car batteries wired in series, we recommend using 14 gauge multi-strand wiring and a heavy duty high quality 60 amp rated momentary contact switch, push button type, or equivalent LVDC powered relay. Use an in line fuse rated for 50 amps.

For onboard powered setups, a single 2300ma 5-6 cell A123 battery using 14 gauge multi-strand wiring running through a 250V 22Amp servo activated micro switch and a 50amp in-line fuse have been successful.

***Polarity of connection is shown on the picture:***

Here has to be "+" pole of Voltage connected



Here has to be "-" pole(ground) of Voltage connected

For **PLUS** "+" pole of the battery use the contact plug shown on the picture. For **MINUS** "-" (can be connected anywhere on the body of starter onr engine) but as the best solution we recommend to remove shown screw and connect a wire washer connector under it and **tighten** it back.

**NEVER USE SAME BATTERY SET FOR ANY OTHER ONBOARD EQUIPMENT!!!!!!!!!!!!**

## *Starting procedure*

### **1) COOL DRY ENGINE NOT RUNNING FOR A LONG TIME**

- a) close choke, switch OFF the ignition, close throttle lid.
- b) start electric starter and turn the engine for 1-3 seconds **(THIS TIME IS ROUGH ESTIMATION AND DEPENDS ON THE LENGTH OF YOUR FUEL TUBES SO WE RECOMMEND TO FIND OUT EXACTLY WHAT TIME SUITES FOR YOUR INSTALLATION BY CHECKING TUBES FIRST TIME YOU USE THE CONFIGURATION)**
- IF YOU TURN THE ENGINE TOO LONG IT MAY BE OVERFLOWN AND DIFFICULT TO START.**
- c) open choke, switch ON the ignition, open throttle to 5 degrees.
- d) power electric starter until engine runs. **BE AWARE OF BLOCKED STARTER**

### **2) WARM ENGINE UP TO 30 MINUTES SINCE LAST STOP**

- a) open choke, switch ON the ignition, open throttle to 5 degrees.
- b) power electric starter until engine runs. **BE AWARE OF BLOCKED STARTER**
- c) if engine does not start in 5 seconds at max, check all the switches and connectors and follow instructions in point (1)

### **3) OVERFLOWN ENGINE STARTING - if engine was turned with closed choke too long and can not be started.**

- a) open choke, switch OFF ignition **(WARNING IGNITION MUST BE SWITCHED OFF)**, open throttle
- b) power electric starter for 2 seconds. **BE AWARE OF BLOCKED STARTER**
- c) this procedure should release part of the fuel from the engine and then follow point (2)

## *Some problems and their solutions:*

- 1) **PROBLEM:** When you switch on the system, starter does not move forward and does not turn.  
**SOLUTION:** Check all the wirings, connectors, batteries and switches. Starter doesn't receive voltage/current.
- 2) **PROBLEM:** If you see that starter after switch-on moves forward and try to turn, but does not turn the engine over TDC, **IMMEDIATELY switch-off** the system.  
**SOLUTION:** Turn the propeller by hand over stacked position – probably near TDC. Try to start again.
- 3) **PROBLEM:** I turned the propeller over TDC, but it is still the same and starter blocks.

- SOLUTION:** a) Your batteries are too weak – charge batteries or increase number of cells  
(only if it is first time you try to start it.)  
b) Wires maybe too thin and not able to transfer so high current correctly  
(only if it is first time you try to start it).  
c) Switch is not able to transfer high current and therefore starter is not strong enough.

**THE ENGINES PRODUCED BY ZDZ MODELMOTOR s.r.o. ARE NOT TOYS. IMPROPER USE can cause serious injury or death! BE SURE YOU ARE familiar with this entire instruction manual before usage of ZDZ engine. ALL its paragraphs are important and you should REALLY READ AND LEARN them to avoid any misuse of your ZDZ engine and possible troubles as well as warranty cancellation.**

**THE ENGINES PRODUCED BY ZDZ MODELMOTOR, s.r.o.. ARE NOT INTENDED FOR POWERING ANY MANNED MACHINERY OR MANNED MEANS OF TRANSPORT. THE COMPANY IS NOT RESPONSIBLE FOR ANY DAMAGE TO PERSONS OR PROPERTY IF THE ENGINES ARE USED FOR THIS PURPOSE. THE ZDZ ENGINES ARE INTENDED ONLY FOR POWERING RADIO CONTROLLED MODELS, MAINLY MODEL AIRCRAFT AND UNMANNED AERIAL VEHICLES IN WHICH NO PEOPLE ARE TRANSPORTED.**