



2024-01-17  
Certificate of Security - Flight Stand 150

The object of this *Certificate of Security* is to certify that the products listed below have been designed, developed, tested, and validated by Tyto Robotics to its internal standards of safety. The products respect the provided datasheet, and, when used within their specifications, operating conditions and with the specified protective equipment, are safe. Large propellers rotate at high speed and are inherently dangerous to humans. Tyto Robotics has performed a variety of safety analysis on its products and conducts physical tests to determine their reliability and their safety.

**Manufacturer information**

Manufacturer Name	Tyto Robotics Inc.
Design, final manufacturing, and testing	Canada
Manufacturer Address	B1-80 Adrien-Robert, Gatineau, QC J8Y 3S2, Canada
Product name	Flight Stand 150

**Listed safety analysis and tests**

Overall structural safety factor (FEA)	1.9 minimum
Structural natural frequency	Mode 1: 29.43 Hz; Mode 2: 32.11 Hz; Mode 3: 69.20 Hz Assuming a total mass of motor and propeller of 8 kg
Stand structural static test	Passed test with pulling force of 2101.3 N Passed test with CCW torque of 100 Nm Both loads were applied to the structure for 231.5 hours
Force Measurement Unit fatigue test	Passed test with push/pulling force of 1765 N for 100,000 cycles Passed test with CW/CCW torque of 180 Nm for 100,000 cycles Total duration of fatigue testing: 249.6 hours
System dynamic test	Run tests with 5 powertrain combinations, powered by DC power supply Run tests on the Force Measurement Unit with DA-100 gas engine
System endurance test	Run more than 50 sessions, a total duration of 25 hours of testing with spinning electrical motor and propeller; a total of 10 hours of testing with combustion engine and propeller
Dynamic fatigue cycles	Performed at least 5,000,000 cycles of rotation on the Force Measurement Unit

Important safety instructions:

1. Operators must not stay in the same room when the propeller is spinning
2. All fasteners must be tightened to the specified torque
3. Use all four slots to mount the optical RPM probe on the motor mounting plate
4. Do not use reflective tape as they may block heat transfer and prevent cooling of the motor, or the tape may fly off during a test; use Steelwriter to paint the rotor surface black and white

Confirmed by:



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