



FLIGHT SYSTEMS, INC

56-5961-00

User's Manual

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Overview and Features

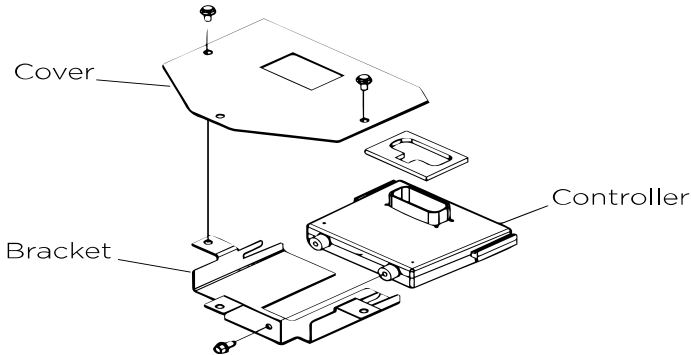
- Exact replacement for Onan© 300-5961 and 327-1501 control modules
- Improved circuit design over OEMs
- Over-sized heatsink for cooler operation
- Encapsulated in automotive grade urethane and fully repairable
- Contains fault code system for easy troubleshooting
- Advanced detection system checks condition of brushes, sliprings, and rotor while cranking. Generator will be prevented from running if damage is likely. (See Page 5)
- Communication port for connection to Flight Systems 327v2 modem. Allows for remote monitoring and remote start, (may not be available upon initial release).

The 56-5961-00, as with all Flight System built devices, comes with a 2-year warranty and a 30-day return policy upon initial purchase of the product.

Unpacking and Inspection

Be careful when unpacking your new controller so that nothing is damaged. Do not expose your controller to static shock prior to or following installation.

Removal and Installation



The controller is accessible through the generator's front access door. The housing for the controller is located in the air intake housing. You may need to unbolt the coolant reservoir to access the control board location. You should not need to disconnect any coolant lines.

- Start by disconnecting the connector cable on the old control board.
- Next, remove the three 10mm hex bolts on the cover of the housing. Once the cover has been removed, the controller and bracket can be lifted from the intake housing.
- Unbolt the single 10mm hex bolt threaded into the plastic mount of the old controller.
- Installation is reverse of removal. Make sure wire connector latches properly into control board mating connector.

AFTER THREADING INTO A PLASTIC MOUNT ON THE 56-5961-00, IT IS CONSIDERED INSTALLED, VOIDING THE 30-DAY RETURN POLICY!

Voltage Adjust (within 20 seconds after startup)

Press start 6 times; the status light will begin blinking to signal the genset is now in voltage adjust mode.

- Short press START to increase voltage
- Long press (more than 2 seconds) START to decrease voltage

Each press will make the voltage adjust by .6v.

Wait for the status light to stop flashing. If the generator goes into alarm before status light times out the voltage setting will not be saved.

If the generator needs to be shut down during this operation, hold stop for two seconds.

Factory Default

To restore all calibrations to factory default:

- Press the stop button ten times while generator is not running and not in a fault condition. The status indicator will come on solid.
- Hold stop button until status indicator turns off.

Troubleshooting

Blinking while Cranking

Causes: normal operation, no issue

Solid Light while Cranking

NEW FEATURE

Causes: open field or high resistance, be sure to check your slip rings and brushes for continuity

No Response at Control Switch

Causes: faulty switch, poor connections, missing connections, or dead battery

Starter Engages and Disengages

Causes: low cranking voltage

Starting Batteries Don't Maintain a Charge

Causes: marginal battery, battery connections, or charging system

No AC Power While Controller is Running

Causes: a circuit breaker is off, tripped or malfunctioning, or there are poor AC harness connections

Engine Surging Without Fault Shutdown

Causes: fuel leaks, restrictions or air bubbles, worn slip rings/brushes, misadjusted or faulty governor, worn generator bearing

Testing the Generator's Windings

This procedure requires an ohmmeter, set on the lowest resistance scale (usually 200-ohm.) On the control board mating connector, with the generator NOT RUNNING, measure these points:

- Pin 1 to Pin 14 – Field winding (rotor) = 20-30 ohms.
- Pin 3 to Pin 13 – Quadrature winding = 1.5-3.0 ohms.
- Pin 33 to Pin 34 – Sense Transformer = 500-600 ohms.
- Circuit breaker 1 (T1 wire) to Ground = .15-.30 ohms.
- Circuit breaker 2 (T4 wire) to Ground = .15-.30 ohms.



Fault Codes

At fault shutdown, the status indicator light will blink to indicate a shutdown issue. Blinking will continue for 5 minutes and then stop. To restore blinking after timeout, press the control switch to STOP briefly, then press STOP 3 times.

No. 1 – Engine Over Temperature

While running, engine coolant temperature was above 239°F/115°C for 10 seconds.

No. 2 – Low Oil Pressure

While running, oil pressure dropped below 14 psi for 3 seconds.

No. 3 – Service Fault

A two-digit second-level fault occurred.

- *Press STOP briefly to activate the two-digit code indication. The two-digit code consists of 1-5 blinks, a brief pause, and then 1-9 blinks. The first set of blinks represents the tens digit and the second set of blinks represents the units digit. For example, shutdown code No. 32 would be: blink-blink-blink -pause- blink-blink -long pause and repeat*

No. 4 – Over Crank

Cranking time exceeded 35 seconds.

No. 12 – Over Voltage

After voltage regulation was enabled, output voltage was higher than 150VAC for 75 milliseconds or higher than 138VAC for 3 seconds.

No. 13 – Under Voltage

After voltage regulation was enabled, output voltage was lower than 108VAC for 5 seconds.

No. 14 – Over Frequency

Frequency was higher than 70Hz for 40 milliseconds or higher than 66Hz for 6 seconds.

No. 15 – Under Frequency

Frequency was less than 54Hz for more than 8 seconds.

No. 19 – Actuator Shorted or Open

Before cranking, the controller sensed an open or shorted governor actuator or wiring.

No. 22 – Actuator Overload

Due to overloaded AC output or poor engine performance, the controller kept the governor actuator at full-duty cycle for 60 consecutive seconds.

No. 24 – Faulty Engine Temperature Sender

After 10 minutes of running, the controller sensed an open temperature sender or wiring.

No. 27 – VAC Sense Lost

While running, the controller lost stator AC sensing voltage even though the field was functioning normally.

No. 29 – High Battery Voltage

Before cranking, the controller sensed that incoming battery voltage was greater than 19.2 volts for 5 milliseconds, or greater than 19.2 volts for 1 second, while running.

No. 32 – Starting Fault

The controller could not detect cranking speed for 12 seconds. Possible open quadrature winding or broken brushes/dirty sliprings.

No. 35 – EE Checksum Fault

During startup, the controller detected an EE memory error.

No. 36 – Mechanical Fault

While running, engine speed fell to less than 1000RPM for .5 seconds, un-commanded by controller. This code can come up when genset runs out of fuel.

No. 38 – Field Overload

While running, field voltage was higher than 180VAC for 10 seconds.

No. 41 – Generator Rotor Short

During cranking, the controller sensed that the field circuit/rotor was shorted to ground.

No. 42 – ROM Fault

During startup, the controller detected a ROM memory error.

No. 43 – RAM Fault

During startup, the controller detected a RAM memory error.

No. 45 – Speed Sense Lost

After crank disconnect, the controller lost speed sense for .25 seconds.

No. 48 – Loss of Field Sense

While running, the field sense circuit on the controller failed, or field voltage dropped to zero.

No. 57 – Over Prime

The local or remote switch was held in the prime/stop position for more than 3 minutes.

Warranty Information

This Flight Systems manufactured replacement controller is warranted to be free from defects in materials and workmanship for a period of two years from the date it was sold.

Flight Systems Limited Warranty covers the repair or replacement of defective products within the warranty period. It does not cover the cost of installation, removal costs incurred, or possible damage to other equipment (including the generator or parts thereof) as a result of this product.

Flight Systems (or its authorized agent) shall reserve the right to determine the cause of malfunction. If we determine that it was due to abuse, misuse, improper installation, acts of nature (such as storm), failure to perform recommended genset maintenance procedure or problems elsewhere in the genset, the warranty claim shall be dissolved and established standard repair rates apply.

Flight Systems 30-Day Return Policy is only valid for 30 days after initial purchase of any Flight Systems product. Installation of any products will result in termination of the 30-Day Return Policy on that product. Refund/Credit issued shall be less a 25% per item restocking and testing fee as long as the product is in new undamaged condition. Shipping charges are non-refundable.

Repair and Technical Support

If this product suffers a failure when out of warranty it can be rebuilt. As with all generator controllers rebuilt by Flight Systems a one-year warranty will be issued upon repair.

Be sure to fill out then print our Repair Shipping Form at FlightSystems.com and include it with any repairs. Repairs can be shipped to:

Flight Systems
207 Hempt Road
Mechanicsburg, PA 17050 – Attn: Repair

Any repairs not sent with proper contact information will be held for no more than 6 months from the date received before being recycled by Flight Systems.

Technical support is also available by phone or online for all Flight Systems products:

Phone: 717-590-7330
Email: techs@flightsystems.com
Open Monday-Friday, 8am-5pm EST

