ASP101, ASP201

ALTERNATOR SYSTEM OVER-VOLTAGE (OV) PROTECTION For 50A, 12VDC AND 24VDC

DESCRIPTION

The ASP101 (12 Vdc) and ASP201 (24 Vdc) OV protection system protect aircraft electrical system from alternator generated OV condition. Each package contains: An OV protection relay, a Line Contactor Relay, and a C-EMF diode.

OV conditions in the aircraft that come from an alternator with internal voltage regulator are:

1. A shorted voltage regulator. That means the control device which regulates the controlled grounding of one leg of the alternator field may be shorted.
2. The field wire may be externally or internally shorted to ground.

In the type A regulator that most alternators with built in voltage regulators have, either of the two conditions identified above will cause OV condition for which the standard OV protection schemes used for the type A or type B system will not work. The internally regulated alternator requires a Line Contactor Relay (LCR) between the output of the alternator and the Bus.

With the LCR in place, if over-voltage occurs in the system, the OV Relay will open thus removing power from the internal regulator and the LCR.

OVER VOLTAGE SENSOR/RELAY (OVR)

The OVR monitors the bus voltage and supplies the control current to the internal Voltage Regulator and LCR. If the bus voltage exceeds the preset OV level, the OVR opens the current path between the system Bus and Voltage Regulator and LCR. Power may be restored to the Voltage Regulator and LCR by turning the Alt switch on and off. To prevent tripping due to noise or transient voltage spikes, the OVR has built-in time delay.

C-EMF DIODE (CED)

The counter EMF, C-EMF, diode protects the LCR contacts against severe arcing when they open or close, thus prolonging the relay's life. See **D1 for more.*

	FEATURES / PART NUMBER	V1510A	V2510A
OVR	OverVoltage (OV) Sensor Trip	16V at 5A	32V at 5A
	OV Relay Counter EMF Protection	Yes	Yes
	OV time delay	Yes	Yes

	FEATURES / PART NUMBER	KLC101	KLC201
LCR	Normal system voltage	14V	28V
	System Load, Max	50A	50A

	FEATURES / PART NUMBER	ZLC101	ZLC201
CED	Voltage, Max	18V	33V

	FEATURES / PART NUMBER	SAGLD1	SAGLD2
AOI	Voltage, Max @ 15mA	18V	36V

OV Protection for (Type C system) "One wire" Alternator with internal type A Voltage Regulator.

Each package comes with:

1. **OV Protection Relay (OVR)**
2. **Line Contactor Relay (LCR)**
3. **C-EMF Diode (CED)**
4. **Alternator On Indicator (AOI)**

The Alt On Indicator is optional. Must specify with order.

For 12V system, order the ASP101 Kit.
For 24V system, order the ASP201 Kit.

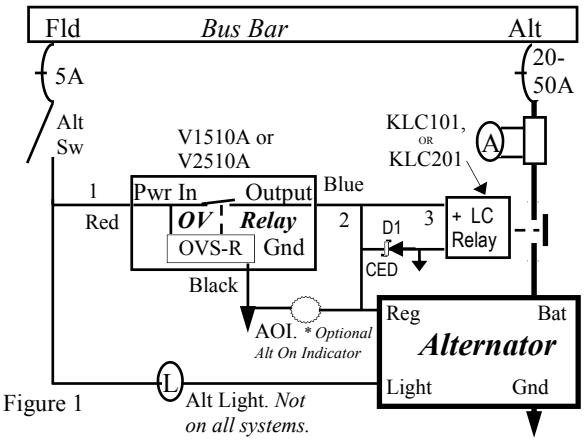


Figure 1

TROUBLE-SHOOTING THE SYSTEM: REFER TO FIGURE 1

Turn on the Battery and alternator switches. At *1, 2*, or *3* you should measure battery voltage. If AOI is used, it should be on.

With the Bat and Alt switches on, if the voltage at *1* is not battery voltage, look for defective Alt switch, circuit breaker, open wire, loose/bad connection in the wiring between the bus and *1*.

If there is battery voltage at *1* but not at *2*, verify that the resistance between the input and the output of the OV Relay (OVR) is less than 0.1Ω. If it is greater, replace the OVR.

The voltage at *2* is the same as that of the input of the Voltage Regulator (VR). If there is voltage at *2* but not at the VR input of the alternator, look for an open (broken) or grounded wire between *2* and the VR input.

If there is voltage at *2* but not at the LCR's +coil (marked *D*), look for an open (broken) or grounded wire between *2* and the +coil (*D*).

If the 5A breaker "pops" when the Alt & Bat switches are on, look for a short circuit between *L, 1, 2, 3* and ground, or a shorted D1*.

**D1 also serves as a redundant OV protection device. If the bus voltage as seen on the OV Relay output exceeds about 18V, D1 will short to ground, thus removing power from LCR and disconnecting the alternator from the system. A shorted D1 means the OVR and D1 must be replaced.*

We manufacture Alternator Controllers that combine Voltage Regulation with OV (Relay) Protection and other functions.

Electrical Charging Systems Solutions ™

By Femi G. Ibitayo 12/11/03 Rev A

1622 E. Whaley St., Longview, TX 75601. USA
Ph: 903-758-6661; Fax: 903-236-9766. E-mail: ECSS@zeftronics.com
Ph: 1-800-362-8985. Web Site: www.zeftronics.com

ZEFTRONICS
Electrical Charging Systems Solutions

ASP102, ASP202

ALTERNATOR SYSTEM OVER-VOLTAGE (OV) PROTECTION For 100A, 12VDC & 24VDC

DESCRIPTION

The ASP102 (12 Vdc) and ASP202 (24 Vdc) OV protection system protect aircraft electrical system from alternator generated OV condition. Each package contains: An OV protection relay, a Line Contactor Relay, and a C-EMF diode.

OV conditions in the aircraft that come from an alternator with internal voltage regulator are:

1. A shorted voltage regulator. That means the control device which regulates the controlled grounding of one leg of the alternator field may be shorted.
2. The field wire may be externally or internally shorted to ground.

In the type A regulator that most alternators with built in voltage regulators have, either of the two conditions identified above will cause OV condition for which the standard OV protection schemes used for the type A or type B system will not work. The internally regulated alternator requires a Line Contactor Relay (LCR) between the output of the alternator and the Bus.

With the LCR in place, if over-voltage occurs in the system, the OV Relay will open thus removing power from the internal regulator and the LCR.

OVER VOLTAGE SENSOR/RELAY (OVR)

The OVR monitors the bus voltage and supplies the control current to the internal Voltage Regulator and LCR. If the bus voltage exceeds the preset OV level, the OVR opens the current path between the system Bus and Voltage Regulator and LCR. Power may be restored to the Voltage Regulator and LCR by turning the Alt switch on and off. To prevent tripping due to noise or transient voltage spikes, the OVR has built-in time delay.

C-EMF diode (CED)

The counter EMF, C-EMF, diode protects the LCR contacts against severe arcing when they open or close, thus prolonging the relay's life. See **D1 for more.*

	FEATURES / PART NUMBER	V1510A	V2510A
OVR	OverVoltage (OV) Sensor Trip	16V at 5A	32V at 5A
	OV Relay Counter EMF Protection	Yes	Yes
	OV time delay	Yes	Yes

	FEATURES / PART NUMBER	KLC102	KLC202
LCR	Normal system voltage	14V	28V
	System Load, Max	100A	100A

	FEATURES / PART NUMBER	ZLC101	ZLC201
CED	Voltage, Max	18V	33V

	FEATURES / PART NUMBER	SAGLD1	SAGLD2
AOI	Voltage, Max @ 15mA	18V	36V

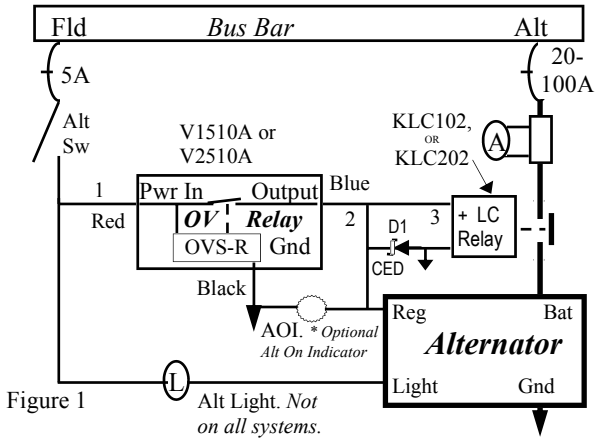
OV Protection for (Type C system) "One wire" Alternator with internal type A Voltage Regulator.

Each package comes with:

1. **OV Protection Relay (OVR)**
2. **Line Contactor Relay (LCR)**
3. **C-EMF Diode (CED)**
4. **Alternator On Indicator (AOI)**

The Alt On Indicator is optional. Must specify with order.

For 24V system, order the ASP202 Kit.
For 12V system, order the ASP102 Kit.



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If there is battery voltage at *1* but not at *2*, verify that the resistance between the input and the output of the OV Relay (OVR) is less than 0.1Ω. If it is greater, replace the OVR.

The voltage at *2* is the same as that of the input of the Voltage Regulator (VR). If there is voltage at *2* but not at the VR input of the alternator, look for an open (broken) or grounded wire between *2* and the VR input.

If there is voltage at *2* but not at the LCR's +coil (marked *D*), look for an open (broken) or grounded wire between *2* and the +coil (*D*).

If the 5A breaker "pops" when the Alt & Bat switches are on, look for a short circuit between *L, 1, 2, 3* and ground, or a shorted D1*.

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