



Three-way Timed Split Charging Unit, ALT13

26th February, 2009

Overview

The ABELTRONICS Three-way Timed Split Charging Unit is designed to actively control the charging of three independent batteries from one alternator. The unit switches the charging voltage, provided by the engine's alternator, to one of three batteries connected to the device, and can switch up to 80A continuous. When the engine is started, the charging voltage from the alternator is supplied to the starting battery for 15 minutes. After this delay, the starting battery is disconnected, and Accessory Battery 1 is charged for a further 30 minutes. After this time, Accessory Battery 1 is disconnected, and Accessory Battery 2 is charged for 30 minutes. The unit then charges Accessory Battery 1 for 30 minutes, then back to 2, then back to 1, and so on until the engine is stopped. None of the batteries are ever connected together at any time – all batteries remain completely isolated from each other at all times.

This timed arrangement ensures each battery in the three-way system is given a charge, with priority given to the Starting Battery, then Acc. 1, then Acc. 2. This system maintains an even charge distribution across the three batteries unlike in a 3-way diode splitter arrangement. The unit can be used with either Battery Sensed or Machine Sensed alternators, and a sense output is provided on the ALT13 for Battery Sensed systems. (Leave this output unconnected for Machine Sensed alternators).

The unit is sealed inside an IP54 rated ABS enclosure, encased fully in epoxy potting compound. This level of sealing ensures ultimate water-proofing and resistance to oils, solvents and salt. Temperature rating is limited by the enclosure itself – the unit can be mounted in the engine bay, but should not be situated near a source of excessive heat, such as an exhaust manifold, engine head/block, water cooling pipes or the radiator. In addition, the module is fully protected against transient voltages and reverse-polarity connection.

Specifications

Notes: 1. Measured at Ignition Input connection 2. Rating of internal switching devices.

	Parameter	ALT13	Unit	Comment
Electrical	Nominal Operating Voltage ¹	14.4	V DC	
	Sustained Operating Voltage Range ¹	9 – 18	V DC	
	Peak Operating Voltage	20	V DC	<1min max
	Operating Current ¹	500	mA	Max
	Start Battery Charge Duration	15	Minutes	±1 Minute
	Accessory Battery 1 Charge Duration	30	Minutes	±2 Minutes
	Accessory Battery 2 Charge Duration	30	Minutes	±2 Minutes
	Continuous Switching Current	80	A	Max
	Peak Switching Current ²	120	A	<10msec at nominal operating voltage
Mechanical	Operating Temperature Range	-5 – 70 (23 – 160)	°C (°F)	
	Dimensions	185×120×80 (7.3×4.7×3.2)	mm (in)	L×W×H, excl. connection protrusion
	Mechanical Fixing	4× 4.5mm		Remove top cover for access
	Electrical Connections	4× M6 thread, 3× M4 thread		See below for connection details

Mounting and Connection Guidelines

An electrical connection diagram of the ALT13 module, viewed from above, is shown in Figure 1.

Electrical connections are as follows:

1. Alternator input (M6 thread)
2. Starting Battery Output (M6 thread)
3. Accessory Battery 1 Output (M6 thread)
4. Accessory Battery 2 Output (M6 thread)
5. Battery Sense connection for Battery Sensed alternators (M4 thread)
6. Earth (M4 nickel-plated thread)
7. Ignition input (M4 thread)

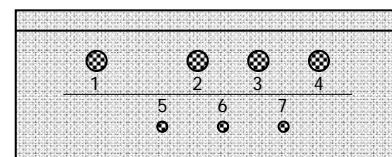


Figure 1 – ALT13 Viewed from top

Pin 1 should be connected directly to the alternator. Pin 2 should be connected directly to the Starting Battery (or to the starter solenoid). Pin 3 should be connected directly to Accessory Battery 1. Pin 4 should be connected directly to Accessory Battery 2. Pin 5 is the Battery Sense connection for Battery Sensed alternators – connect this pin to the sense wire of a Battery Sensed alternator, or leave unconnected for Machine Sensed alternators. Pin 6 should be connected to chassis Earth. Pin 7 should be connected to the ignition feed (preheat on a Diesel engine). This connection can be made to any ignition feed, but be aware that a maximum current of 500mA (see specifications above) is drawn by the module from this connection.

Use good quality thick cable, capable of handling well in excess of the alternator output current, for connections to pins 1 to 4. Pins 5 to 7 are less critical, but use of cable rated at 6A or more is advised for ruggedness.