Instruction Manual

Battery Condition Meters

BCM-312/524/536/748

Contents

1. Introduction

4QD's battery condition meters are small circuit boards using a line of light emitting diodes (LEDs) to indicate the battery voltage.

For 24v (or 36v) battery systems 5 LEDs are used whilst the 12v version uses 3 LEDs.

For higher voltages (48v or 60v), 7 LEDs are used.

Each LED fades over a range of voltages.

2. Operation

At full battery voltage all LEDs are on. As the voltage falls the LEDs fade one by one and go off, starting with the end green LED.

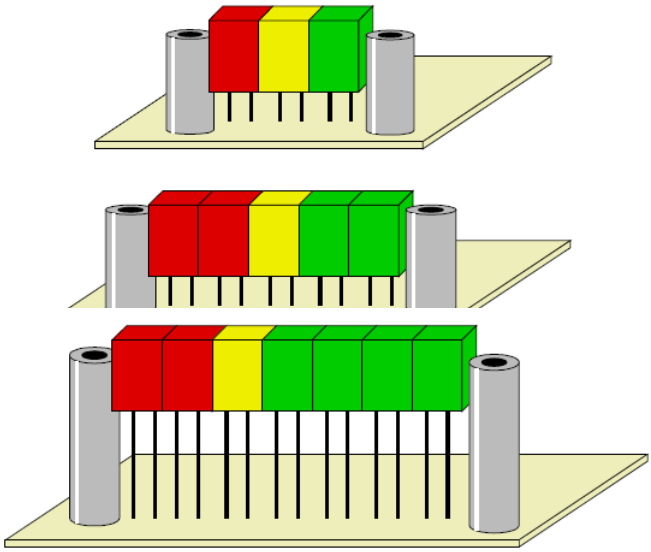
If the Green LEDs are all off when the motor is not in use, then the battery needs recharging. Red alone indicates there is a danger of over-discharging the battery: discharging a 24v battery below 21v (10.5v for 12v batteries) can permanently damage the cells.

The LEDs operate at approximately the voltages shown in the table overleaf.

The meter says nothing about the battery during charging: the voltage during charging is usually 27.6v (13.8v) and all LEDs will normally be on.

When the battery is under load the voltage will be lower than when off load, so during heavy loading you can expect some of the LEDs to go out, but if the battery charge is still OK they should come on again as soon as the load is reduced.

Once you have become familiar with the way a particular battery behaves you should be able to tell by the off load and on load LED indication how the battery is ageing.



3. Indicated Voltages

	7 LED (48v)	5 LED (36v)	5 LED (24v)	3 LED (12v)
Green	53.4 - 55.0			
Green	51.2 - 53.0			
Green	49.0 - 50.8	36.5 – 37.0	25.3 — 27.0	
Green	46.8 - 48.6	34.5 – 35.0	23.4 — 24.8	13.1 - 13.5
Yellow	44.8 - 46.6	33.5 – 34.0	21.5 — 23.0	10.0 - 12.9
Red	42.8 - 44.6	32.5 – 33.0	19.5 — 21.4	9.4 - 10.4
Red	41.5 - 42.6	31.5 – 32.0	18.2 — 19.2	

The LEDs fade between the voltages indicated in the table above.

4. Dimensions

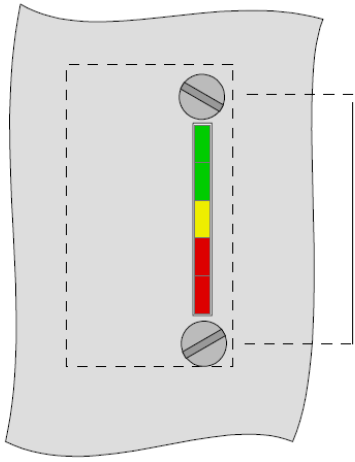
All dimension in millimetres.

Board	Length	Width	Height
3 LED	29	21	20
5 LED	41	21	20
7 LED	51	21	33

5. Mounting

All boards require a 2.2mm wide slot, length as in the table, with two 3.5 mm fixing holes at centres indicated.

Board	Slot	Hole Spacing
3 LED	15.5	23
5 LED	25.5	33
7 LED	35.5	44.5



6. Water Resistance

The BCMs are not water resistant, and when mounting you should make sure water cannot run down the leads onto the circuit board. If the mounting panel is exposed to the elements it is a good idea to seal the LEDs to the rear of the mounting panel with silicon.

7. Connections

The BCMs are supplied with wires attached. The positive and negative wire colours for each model are shown in the table below. The meter should connect directly across the battery supply, usually via the ignition switch.

	+ Positive	- Negative
BCM-312	White	Green
BCM-536	White	Green
BCM-524	Red	Blue
BCM-748	Yellow	Black

Fault finding tip: if the BCM is connected to the B+ & B- terminals of the controller it can indicate if any degradation of the battery, wiring, or joints has occurred.

8. Service

The LED meters are very reliable and there is little to go wrong with them. Even reversing the battery connections will not usually damage them, though we can't guarantee this with the 36V and 48V versions.

If the BCM does become faulty we unfortunately cannot offer an economical repair service. If the item is not under warranty it is advisable to replace it.

Warranty

All our products have a warranty against defective manufacturing for 12 months from the date of shipment. The warranty doesn't cover damage caused by incorrect installation.