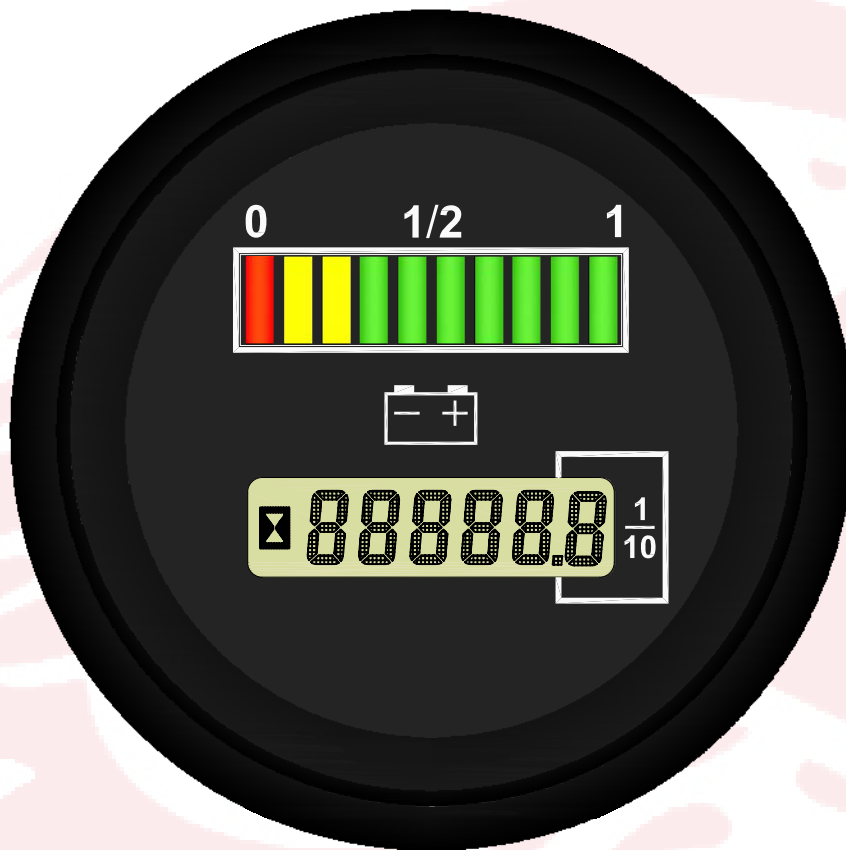




紹興華臻電子有限公司
SHAOXING HUA ZHEN ELECTRONIC CO., LTD

MODEL R8867A
Battery/Hour Meter



Model R8867A is a combination of an adjustable battery 'fuel' gauge and a solid state hour meter housed in a single 52mm diameter case. Without moving parts in the compact structure, the two-in-one unit provides exceptional reliability even in severe operating conditions.



Read instructions first!

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1. Model Encodement & Technical Specifications

R8867A-LYB Series combines in one instrument an adjustable LED battery indicator of dual-volts & an LCD hour meter.

P/N	Norminal Voltage	Operating Current			Power Consumption			Normal Voltage	Precision		Relay
		Min.	Nom.	Max.	Min.	Nom.	Max.		BDI	HM	
R8867A	12V: B+ to Red wire (Pin 7)	15mA	25mA	30mA	0.18W	0.30W	0.36W	DC9-15V	±0.13V	±0.1% Amperage: 1Amp	normally closed,lockout @ empty battery (<20%). Rated
-12/24	24V: B+ to Brown wire (Pin 8)	15mA	25mA	30mA	0.36W	0.60W	0.72W	DC18-30V	±0.25V		
R8867A	24V: B+ to Red wire (Pin 7)	15mA	25mA	30mA	0.36W	0.60W	0.72W	DC18-30V	±0.25V		
-24/48	48V: B+ to Brown wire (Pin 8)	15mA	25mA	30mA	0.72W	1.20W	1.44W	DC36-60V	±0.50V		
R8867A	36V: B+ to Red wire (Pin 7)	15mA	25mA	30mA	0.54W	0.90W	1.08W	DC27-45V	±0.40V		
-36/48	48V: B+ to Brown wire (Pin 8)	15mA	25mA	30mA	0.72W	1.20W	1.44W	DC36-60V	±0.50V		
R8867A	48V: B+ to Red wire (Pin 7)	15mA	25mA	30mA	0.72W	1.20W	1.44W	DC36-60V	±0.50V		
-48/72	72V: B+ to Brown wire (Pin 8)	12mA	18mA	22mA	0.864W	1.296W	1.584W	DC54-90V	±0.75V		
R8867A	72V: B+ to Red wire (Pin 7)	12mA	18mA	22mA	0.864W	1.296W	1.584W	DC54-90V	±0.75V		
-72/80	80V: B+ to Brown wire (Pin 8)	12mA	18mA	22mA	0.96W	1.44W	1.76W	DC60-100V	±0.80V		

2. Mechanical

Display:

Battery state-of-charge indicator:

10-bar, tri-color LED, #1-10 from left to right

Hour meter: 6-digit LCD, 5mm high numerals,

Resolution: 0.1 hours, Max: 99,999.9 hours

Case:

Round, step type bezel, glass lens, 8 terminals

connector, with calibrating screw.

Panel Cutout: \varnothing 52mm, 2-1/16"

Hardware kits:

U-shape mounting bracket -- 1 pc

Nuts & washers -- 2 sets

Cable Harnesses -- 1 pc

3. Environmental

Operating Temperature:-35°C to 80°C

Storage Temperature:-50°C to 90°C

Humidity: Max 95% RH (Non condensing) @ 38°C

Mechanical Shock--SAE J 1378, 55g

Mechanical Vibration--SAE J 1378, 20g

Complies to SAE J1455

4. Installation

1) Connecto positive(Terminal 7 or 8) & negative port(Terminal 5), battery meter works but not show via LED, and LCD hour meter shows recorded hours, but does not count hours.

⚠ Choose the right terminal to energize the insitument according to the battery voltage.

Using higher voltage system, connect B+ to the brown wire (Terminal 8). Using lower voltage system, connect B+ to the red wire (Terminal 7).

Notes:

✓ Unused wire of the 2 positive ports should be well protected.

✗ Long time input high voltage to the low positive port will burn out the circuit.

2) Connect Terminal 2,LED battery meter displays battery state of discharge, and LCD hour meter gets ready to work.

3) Connect Terminal 3 & 4 to the device to be locked out. When battery is empty(<20%), the relay contacts are open.

4) Under condition that Terminal 2 is connected, connect either Terminal 1 to low level or Terminal 6 to high level enables counting.

5. Operation

Battery State-of-charge Indicator

1) As battery's state-of-charge decreases, successive LED lights up, one at a time, 160sec. after detecting lower voltage state.

2) The Led (#3, yellow) flashes, indicating "Energy reserve" (30%).

3) The left most two LEDs (#1) flash by turns, indicating "Empty" (20%).

4) When battery discharges, no LED will increase to any higher level.

5) Battery indicator reset: LED switch to the right most LED #10

A) Only when battery is properly charged (volts over HVR) and keep at high state for over 6 minutes, will the battery indicator resets to full state.

B) When battery sets are swapped, and the new battery volt is over than OCR, LED shows recorded state for a second and resets to full state.

LCD Hour Meter

1) When energized, hour meter checks itself showing all digits for 1 sec. and displays recorded hours.

2) When there's input into Terminal 1 or 6, hour meter begins counting, and sandglass flashes at 1Hz.

3) When input is cut off, hour meter stops, records the data into EEPROM, and displays memorized hours.

4) When hour meter is completely powered off, memorized data is kept in EEPROM and will be shown next time when it's powered on.

6. Adjustment

The empty state of the battery indicator in the instrument can be recalibrated from 1.6VPC to 1.86VPC [See Table 1] via the potentiometer on the rear of the case. The default setting is 1.74V(N).



Table 1

Marks	L	M	N	O	P	Q	R
EVPC	1.60	1.68	1.73	1.78	1.81	1.84	1.86
OCRV	2.063	2.061	2.060	2.059	2.058	2.057	2.057
HVR	2.356	2.302	2.268	2.234	2.214	2.194	2.180

- * EVPC: empty voltage per cell
- ** OCRV: open circuit reset voltage
- *** HVR: high voltage reset

When the default settings doesn't match the battery state, try the following methods to recalibrate the BDI:

1) Battery is empty, but BDI doesn't show empty alarm:

BDI Disp.	#2 LED flashes	#3 LED lighted	#4 LED lighted	#5 LED lighted
Turn Pot.	Clockwise	Clockwise	Clockwise	Clockwise
	Between N & O	N --> O	N --> P	Between Q & R

2) Battery is not empty, but BDI shows empty alarm:

BDI	#1&2 LED flash by turns	
Battery State	70% discharge 30% remaining	60% discharge 40% remaining
Turn Pot.	Anti-clockwise N --> M	Anti-clockwise N --> L

7. Troubleshooting

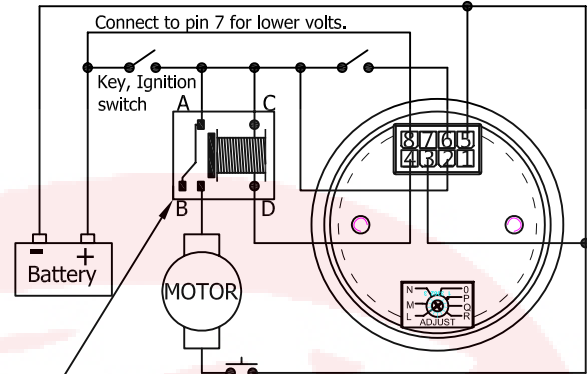
To maximize the life of the instrument, please read all instructions in the manual carefully. Most minor problems can be resolved by removing all power for at least 10 seconds and then reconnecting. The following checklist should help you to troubleshoot problems with the instrument.

8. Limited Warranty

Shaoxing Huazhen Electronic Co., Ltd will warranty all products against defect in workmanship for a period of 12 months from the date of original delivery. The Shaoxing Huazhen limited warranty applies only to the products that are installed and operating according to the purposes for which they were intended and designed, in accordance with Shaoxing Huazhen written instructions. This warranty will not cover those items that are misused, abused or misapplied by the customer. If any product is found to be defective upon examination by Shaoxing Huazhen, Shaoxing Huazhen will repair, replace, or issue credit, at its own discretion, through the original selling dealer or directly to the purchasing customer. Shaoxing Huazhen will not assume responsibility for labor costs (or any other additional costs) associated with the removal of defective product, cost of equipment downtime, or any other costs associated with the failure of the product (s).

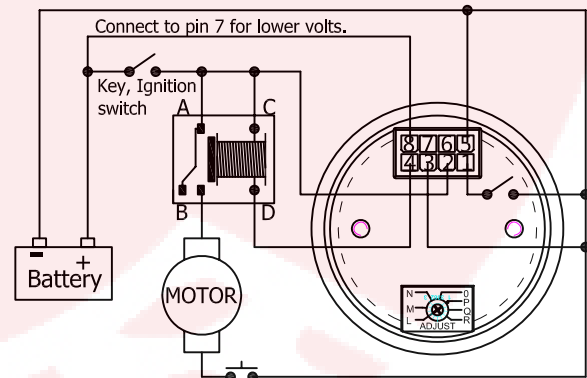
Wiring diagram

1. Hour Meter High level input, low battery lockout:



Relay to control large load: Terminal C & D are 2 ends of the coil which are controlled by Terminal 3 & 4 of the instrument. Thus, the relay controls open or close of contacts A & B to lock out large load when the battery is empty.

2. Hour meter Low level input, low battery lockout:



Pin	Wire color	Functions	Connect to
1	WHITE	Hour meter counting enable	LOW LEVEL
2	YELLOW	LED display enable	POWER+
3&4	GREEN	Relay contacts, normally closed, 1Amp	Lockout device
5	BLACK	Instrument negative	BATTERY-
6	BLUE	Hour meter counting enable	HIGH LEVEL
7	RED	Instrument positive (Low volts)	BATTERY+ (Low rating volts)
8	BROWN	Instrument positive (High volts)	BATTERY+ (High rating volts)

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