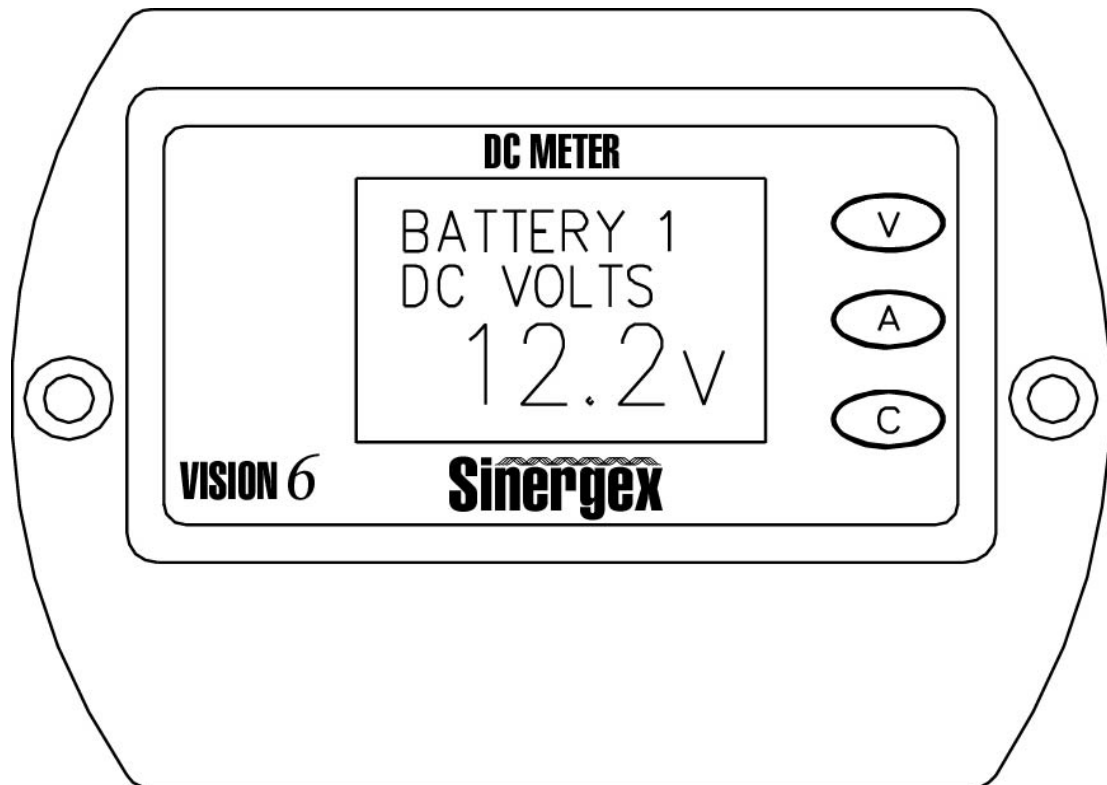




**Sinergex VISION 6
DC MONITOR**

**INSTALLATION
AND
OPERATING INSTRUCTIONS**



INDEX

<u>FEATURES</u>	<u>3</u>
<u>DIMENSIONS</u>	<u>3</u>
<u>WIRING DIAGRAM</u>	<u>4</u>
<u>OPERATION</u>	<u>6</u>
<u>NOTES</u>	<u>7</u>
<u>ALARMS AND ALARMS MUTE</u>	<u>10</u>
<u>PROGRAMMING MENU FLOW CHART</u>	<u>10</u>
<u>SET UP AND PROGRAMMING</u>	<u>11</u>
<u>SET UP</u>	<u>11</u>

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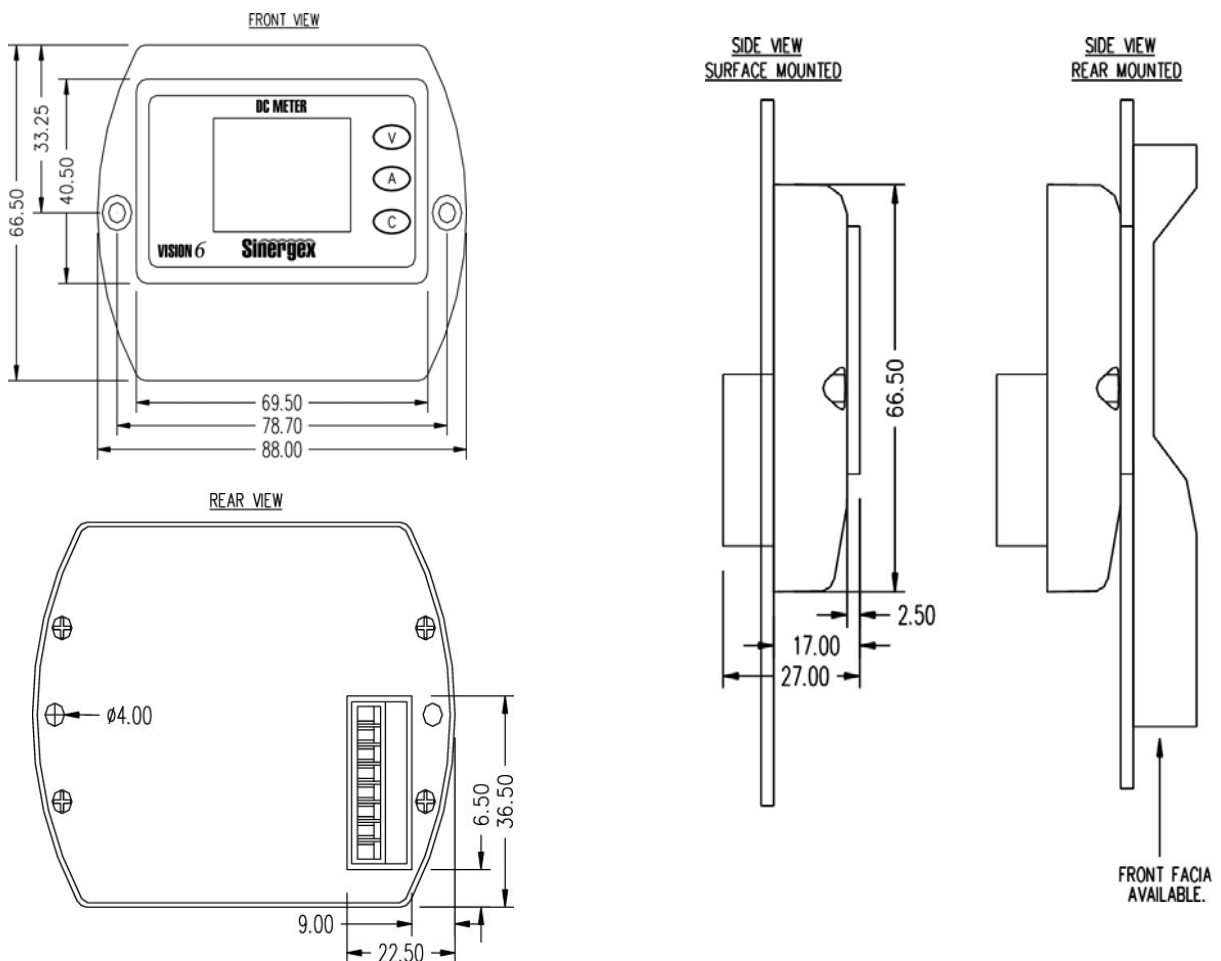
FEATURES

The VISION 6 Battery Monitor offers the following features-

- The VISION Monitors use a dot matrix LCD allowing for Full screen information on Function selected.
- Voltage monitoring on up to 3 battery banks.
- Charge and Discharge Amps (House bank only).
- Capacity remaining in Amp Hours 60-3000AH (House bank only).
- High and Low Voltage alarm on 3 battery banks.
- Low amp hour alarm (House bank only).
- Alarm mute function.
- Decimal point for current under 10 amps.
- Software includes Peukerts law.
- Can display percentage of Amp Hours remaining.
- Supplied with 450A-50mV shunt, accuracy +/-0.25%.
- Can be either surface or recess mounted.

The VISION 6 is designed to be surface mounted or recessed into a 2.5mm panel

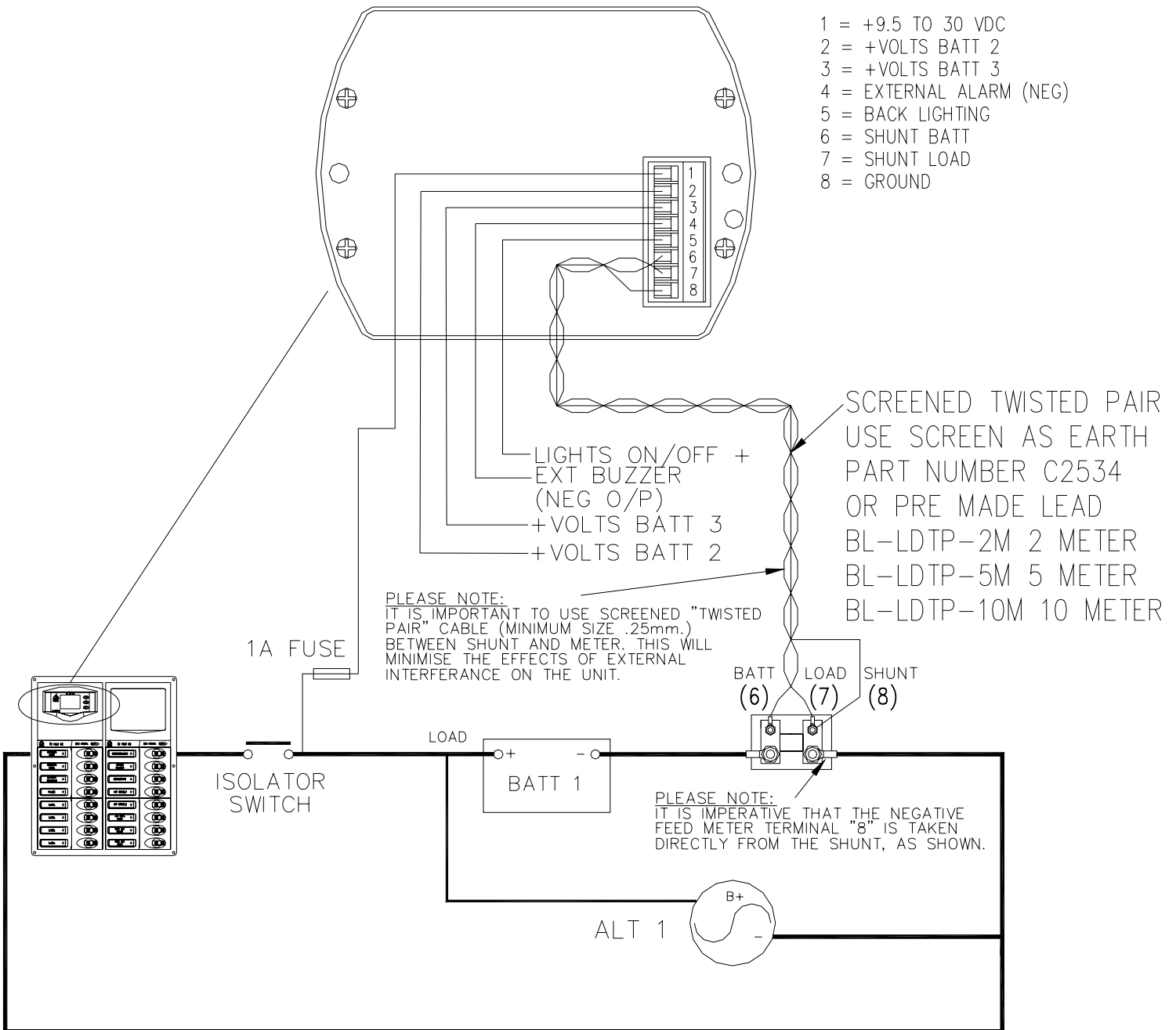
DIMENSIONS



WIRING DIAGRAM

REAR VIEW OF METER.

- 1 = +9.5 TO 30 VDC
- 2 = +VOLTS BATT 2
- 3 = +VOLTS BATT 3
- 4 = EXTERNAL ALARM (NEG)
- 5 = BACK LIGHTING
- 6 = SHUNT BATT
- 7 = SHUNT LOAD
- 8 = GROUND



NOTE:
ABOVE CHARGING AND LOAD CIRCUIT IS ONLY A SIMULATED EXAMPLE, ITS' ONLY PURPOSE IS TO SHOW METER CONNECTIONS.

PLUG INFORMATION

1. **POWER SUPPLY / BATTERY BANK 1**
+9.5V to +30V DC supply from battery bank 1 through a 1A fuse (for meter protection).
2. **BATTERY BANK 2**
+Volts from Battery bank 2 through a 1A fuse.
3. **BATTERY BANK 3**
+Volts from Battery bank 3 through a 1A fuse.
4. **EXTERNAL ALARM**
Can be wired to an external alarm (negative signal).
5. **BACK LIGHTING**
Can be connected to a +9.5V to +30V DC supply to bring the back lighting on constantly.
6. **SHUNT BATTERY**
One core of Screened twisted pair to the battery side of the shunt.
7. **SHUNT LOAD**
The other core of Screened twisted pair to the load side of the shunt.
8. **GROUND**
Use the screen of the twisted pair to go back to the load side of the shunt.

NOTE: Pins 1,2&3 must be connected to prevent the low volts alarms from sounding. For example; When only monitoring one battery bank, pins 2 & 3 must be looped back into pin 1.

OPERATION

Apply Power

Power-up screen will show for 5 seconds

After 5 seconds

First screen shows the Supply Battery Volts.

Press button V

The second screen shows 2nd Battery volts.

Press button V again

The third screen shows the 3rd battery volts.

Press button A

This screen shows either charging
OR discharging Amps.

Press button C

This screen shows Capacity Remaining in
Amp Hours. This will count down when
Discharging. And count up when Charging.

Press button C again while viewing Capacity

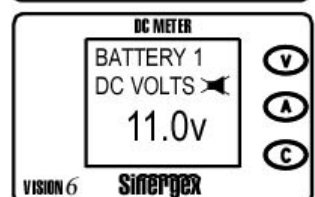
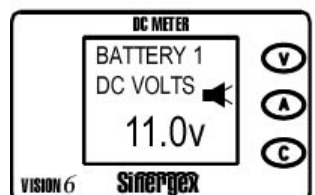
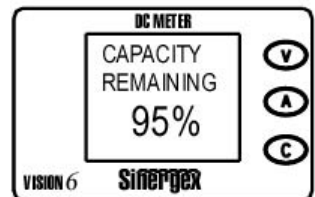
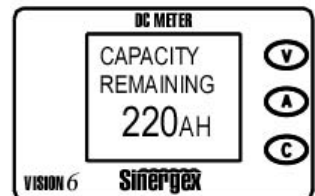
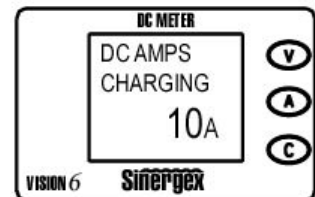
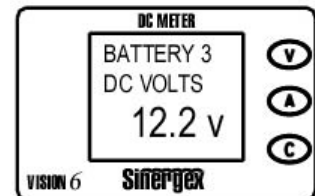
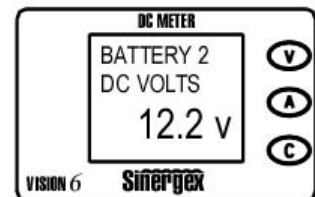
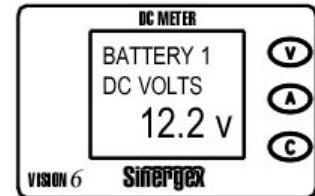
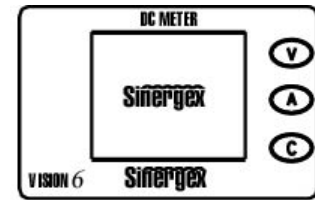
This screen will display the remaining
Amp hours in percentage.

Alarm Enabled

When alarms are enabled in the monitor
set up the alarm symbol will display as shown.

To permanently mute an alarm

Press the A button for 2 seconds, the display
will show the mute symbol as shown, repeat to
reactivate the alarm.



NOTES

The VISION 6 is factory preset with the following settings

- Battery Capacity 220AH
- Charge Efficiency 85%
- High Volts Alarm 15.00V
- Low Amp Hours 80AH
- Low Volts Alarm 11.00V
- Peukerts Exponent 1.25
- Reset capacity 5 amps

Amp Hours display is battery capacity remaining

Peukerts Discharge Rates Calculation

This is an exponent, which changes the discharge current to an effective discharge related to battery capacity.

Most marine batteries are Capacity rated at the 20-hour rate. Ie: A battery discharged for 20 hours to a terminal voltage of 10.5v = Amp hours.

$$C = A \times T_{20} \quad C = 5 \times 20 = 100 \text{ Amp Hours.}$$

$$C = \text{Battery capacity} \quad A = \text{Amps discharge} \quad T_{20} = \text{Time 20 hours}$$

$$\text{Peukerts Equation} \quad A^n \times T = C$$

C = is battery capacity at 20hrs discharge

A = is discharge current in Amps

T = is discharge time in hours

n = is related to battery construction & is relatively constant for any given battery with in a similar discharge time.

Exponent “n” can be calculated for any given battery bank by comparing two discharge cycles.

First fully charge battery bank from shore power/genset & discharge at 50% of expected average load (Note time & amps) to 10.5volt terminal voltage (12v system). Recharge fully & discharge at 150% of expected average load. Use the following equation.

$$n = \frac{\text{Log } t_2 - \text{Log } t_1}{\text{Log } A_1 - \text{Log } A_2} \quad n = \text{Exponent}$$

$t_1 = \text{The hours of first discharge at amps } A_1$
 $t_2 = \text{The hours of 2nd discharge at amps } A_2$

Example: 8G4D 180A/Hr
 Discharge 1 = 24 hours @ 7.8 Amps

Discharge 2 = 8 hours @ 20.7 Amps

$$n = \frac{\text{Log } t_2 - \text{Log } t_1}{\text{Log } A_1 - \text{Log } A_2} = \frac{\text{Log } 8 - \text{Log } 24}{\text{Log } 7.8 - \text{Log } 20.7} = \frac{0.9 - 1.38}{0.89 - 1.32} = \frac{0.48}{0.43} = 1.11$$

Program this exponent in to Peukerts.

NB: 0.01 change to Peukerts can make a reasonable change to calculated discharge. Alter in small steps.

For example, 100 Amps for 1 hour = 100Amp hours. Using Peukerts exponent of 1.25, $A^n \times T$, $100^{1.25} \times 1 = 316$ Amp hours.

A 25% exponent change makes 316% change.

Calculating exponent “n” from discharge cycles is the only way to achieve an accurate discharge exponent. This meter comes with a factory set exponent of 1.25, which is a “rough average for deep cycle flooded lead acid.

If you do not wish to calculate “n” use the tables below to select a typical “n” for your battery type.

VALVE REGULATED GELLED BATTERIES			
Model	Volts	20 Hr rating	"n"
8GGC	6	180	1.14
8GU1	12	43	1.20
8GU24	12	70	1.13
8GU27	12	86	1.12
8GU30H	12	95	1.12
84D	12	180	1.11
8G8D	12	225	1.10

ENDURANT (US BATTERIES) FLOODED BATTERIES			
Model	Volts	20 Hr rating	"n"
R220	6	225	1.24
L16	6	350	1.28
US105	12	85	1.23
US130	12	130	1.24
US240	12	216	1.17

Full charge analysis sheet					
Type	Absorb	Amps	Float	Amps	A/Hrs (NZ)
L16	14.47	11.00	13.50	3.00	350
R220	14.53	6.60	13.50	3.10	220
US105	14.60	3.00	13.60	1.60	90
148/17	14.58	3.30	13.60	1.60	90
US130	14.50	3.00	13.80	2.00	115
US240	14.40	7.40	13.80	4.40	210
"A/Hrs NZ" -means estimated A/Hrs in NZ conditions					

If after some time or use (6-12months) the accuracy seems to be degrading (possibly due to battery condition, temperature, age – charging regime) it will be time to recalculate “n”.

Amp hour capacity reset

Amp Hour Capacity reading is reset to Max Battery Capacity when the following conditions occur.

1. The Battery Voltage is greater than 13.5V (factory default).
2. The Charge Current is less than 5A (factory default).

See note (a)

3. Conditions 1 & 2 must be met for 5 minutes.

(a). This should be changed to 4% of amp/hour rating of battery bank ie 220amp/hour bank = $220 \times 4\% = 8.8$ use 9amps

Charge efficiency

Charging Efficiency is set at 85% (factory default) ie the battery will only accept 85% of the charge current.

This is a difficult parameter to set as after 75% recharge the efficiency will fall off to 0% at full charge. The overall efficiency will change with temperature, battery condition, charging current/voltage and discharge level. Trial and error with general usage is the only way find this efficiency.

Actual capacity

Actual capacity is the present state of charge of Battery bank 1 when the monitor is installed/set up.

Voltage calibration

Factory set, this should not need to be changed.

Amps Calibration

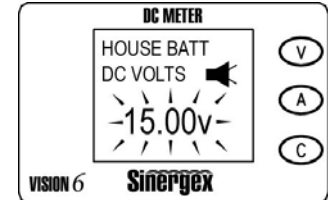
Factory set, Amps Calibration if necessary should be performed under maximum possible load after zeroing amps at no load.

Reset capacity

Reset capacity provides the option to reset the capacity to the programmed value (YES) or to leave it at the current monitored level (NO)

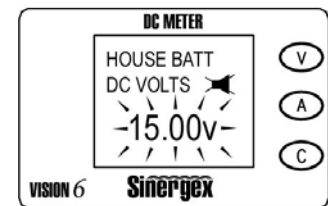
ALARMS AND ALARMS MUTE

When an alarm condition occurs, the alarm will sound and the corresponding display will flash.

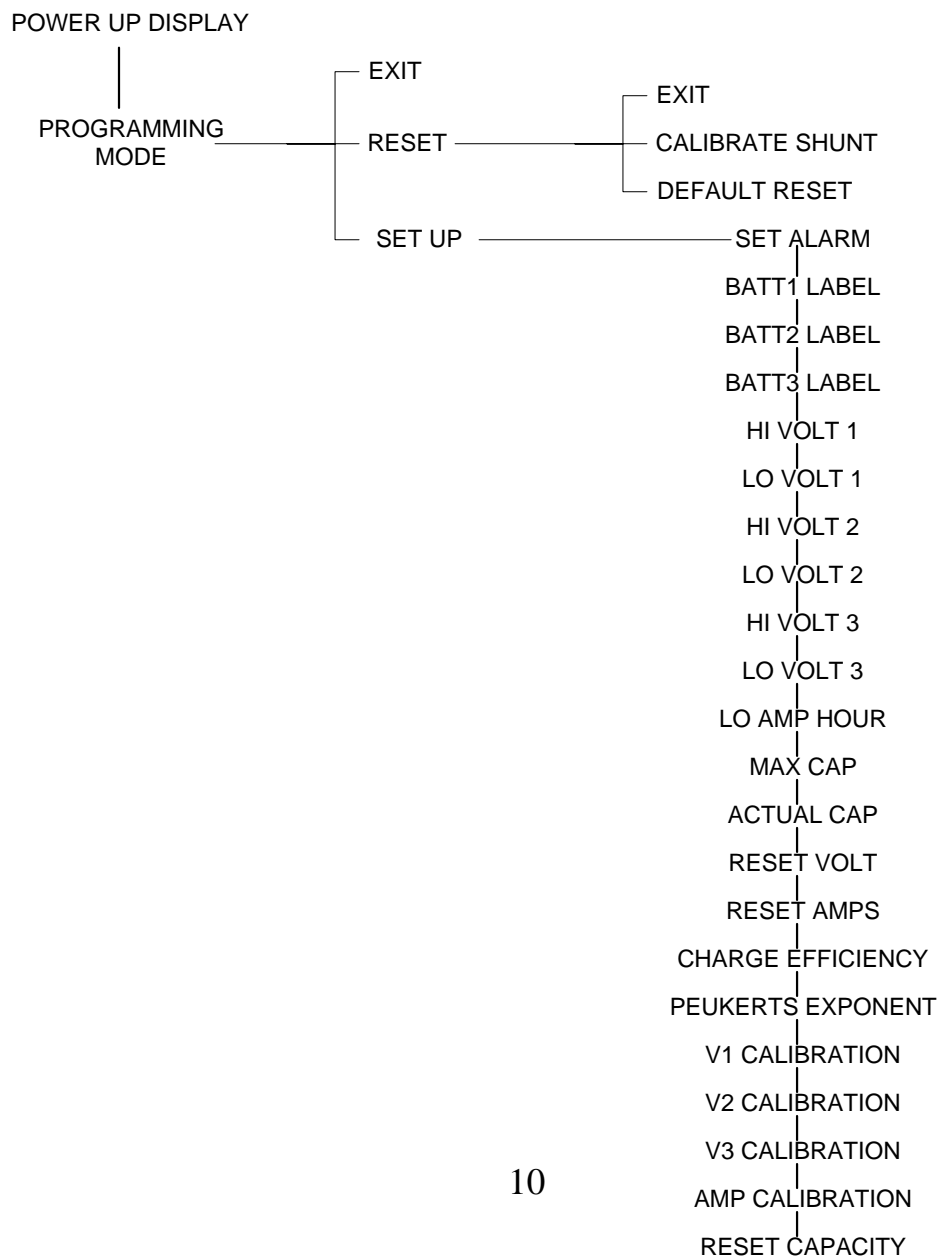


To permanently mute any alarm, press the A button for 2 seconds. The display will show the alarm mute symbol.

The alarm mute mode will remain set even when the power is removed.



PROGRAMMING MENU FLOW CHART



SET UP AND PROGRAMMING

To enter programming mode

Hold buttons V & C down simultaneously for approx. 3 seconds

the display will read

EXIT
RESET
SETUP

Press V to exit programming mode.

(Returns to normal operating mode)

Press A to enter amps zero and reset mode
(calibrate Shunt and Reset unit to
factory default values)

Press C to enter Set up mode.



Amps Zero/Reset mode

Press V to exit

Press A and hold until display flashes to
calibrate shunt for zero amps

Press C for 5 seconds to Reset unit to
Default Values



Set up Mode

Press V for UP (Increase value)

Press A for Down (Decrease Value)

Press C to Enter (Next screen)



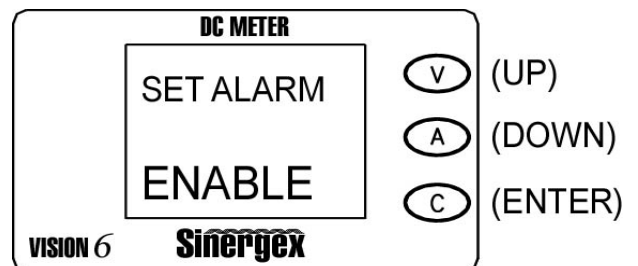
SET UP MODE

Use Up (V)/Down (A) buttons to change value then press C to proceed to
the next set up screen.

Set Alarm

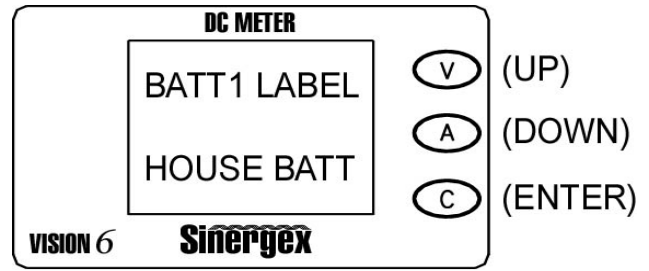
Enable/Disable all alarms

Default: Enabled



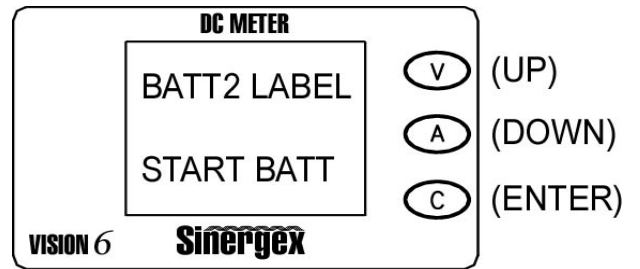
Battery 1 label

Label battery bank 1 options are House Batt, House 1, House 2, Start Batt, Stbd Start, Port Start, Aux Batt, Radio, Genset



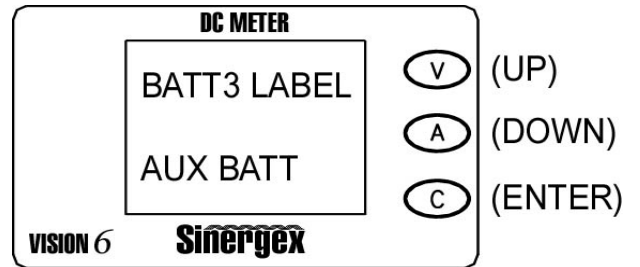
Battery 2 label

Label battery bank 2 options are House Batt, House 1, House 2, Start Batt, Stbd Start, Port Start, Aux Batt, Radio, Genset



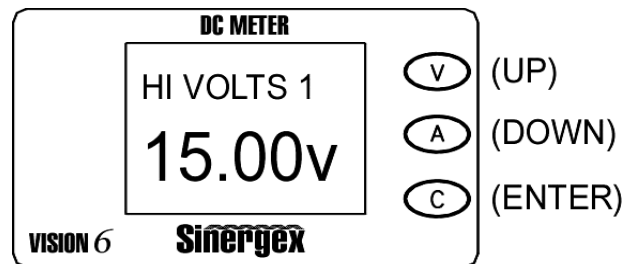
Battery 3 label

Label battery bank 3 options are House Batt, House 1, House 2, Start Batt, Stbd Start, Port Start, Aux Batt, Radio, Genset



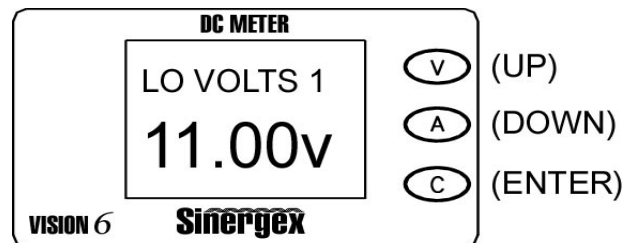
High voltage 1 alarm

Default: 15.0 Volts
Up/Dn to select value, 0.1V steps
Range: 10.0-32.0 Volts



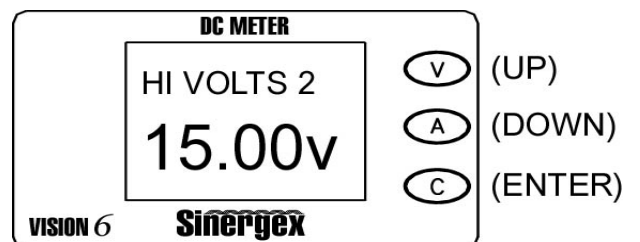
Low voltage 1 alarm

Default: 11.0 Volts
Up/Dn to select value, 0.1V steps
Range: 0.0-32.0 Volts



High voltage 2 alarm

Default: 15.0 Volts
Up/Dn to select value, 0.1V steps
Range: 10.0-32.0 Volts

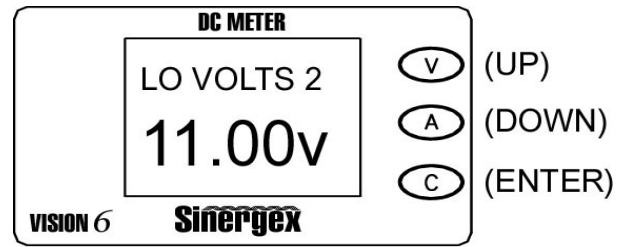


Low voltage 2 alarm

Default: 11.0 Volts

Up/Dn to select value, 0.1V steps

Range: 0.0-32.0 Volts

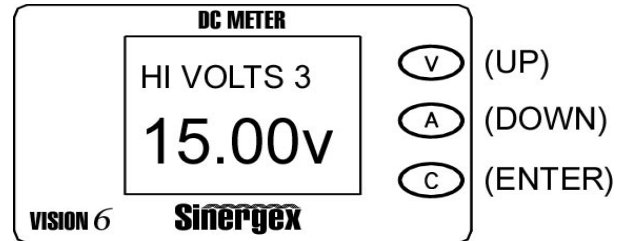


High voltage 3 alarm

Default: 15.0 Volts

Up/Dn to select value, 0.1V steps

Range: 10.0-32.0 Volts

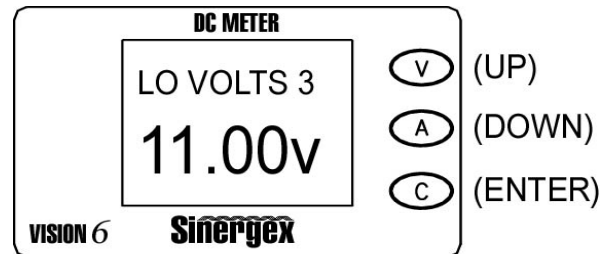


Low voltage 3 alarm

Default: 11.0 Volts

Up/Dn to select value, 0.1V steps

Range: 0.0-32.0 Volts

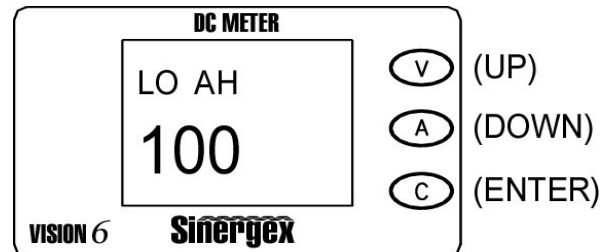


Low amp hours alarm

Default: 100 Amp Hours

Up/Dn to select value, 10AH steps

Range: 0-1000AH

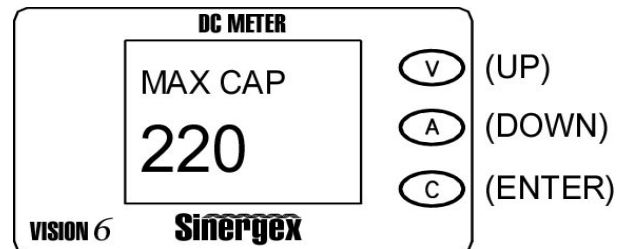


Maximum capacity

Default: 220 Amp Hours

Up/Dn to select value, 10AH steps

Range: 60-3000AH

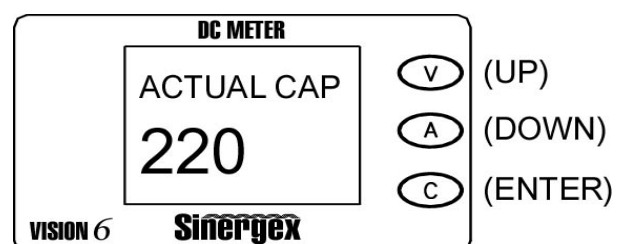


Actual capacity

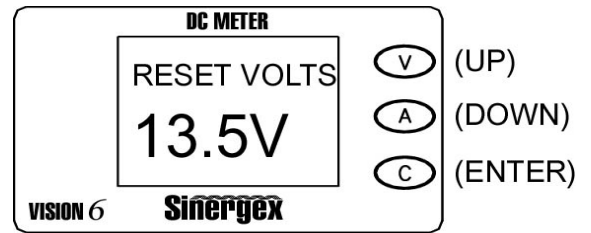
Up/Dn to select value, 1AH steps

Range: 0-3000AH

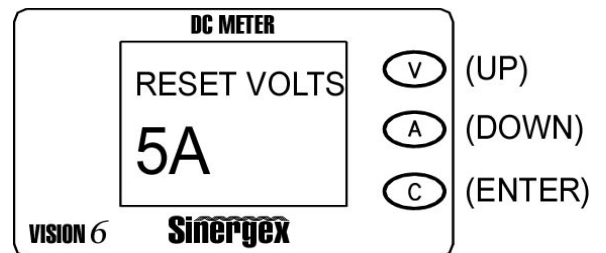
Refer to page 9



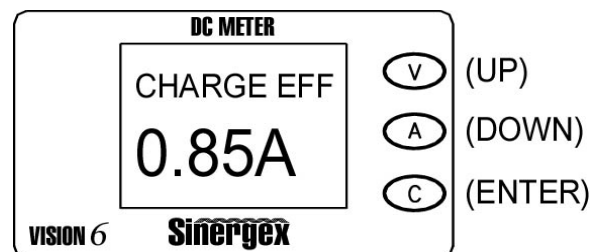
Amp hour capacity reset voltage
Default: 13.5V
Up/Dn to select value, 0.1V steps
Range: 10.0-24.0V
Refer to page 9



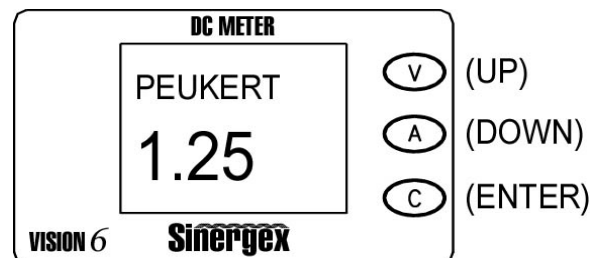
Amp hour capacity reset amps
Default: 5A
Up/Dn to select value, 1A steps
Range: 0-50AH
Refer to page 9



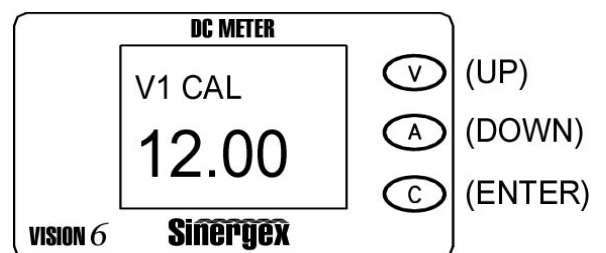
Charge efficiency
Default: 85% flooded lead acid
Use 90% for Valve regulated gel
Up/Dn to select value, 0.01AH steps
Range: 0-1.0 (multiple by 100%)
Refer to page 9



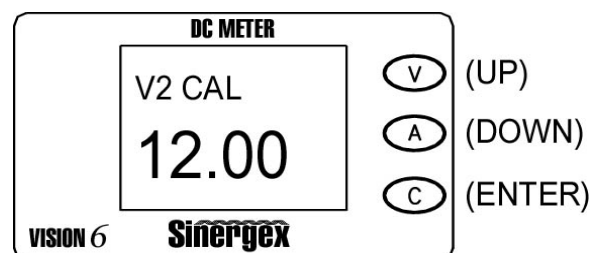
Peukerts exponent
Default: 1.25
Up/Dn to select value, 0.01 steps
Range: 1.00-1.50
Refer to page 7



Voltage 1 calibration
Adjust this setting to actual battery Voltage. To calibrate
Up/Dn to select value, 0.01V steps
Range: 0-32V
Refer to page 9

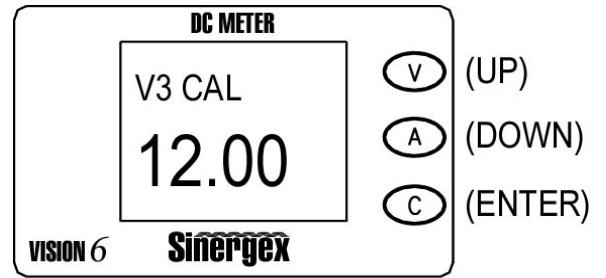


Voltage 2 calibration
Adjust this setting to actual battery Voltage. To calibrate
Up/Dn to select value, 0.01V steps
Range: 0-32V



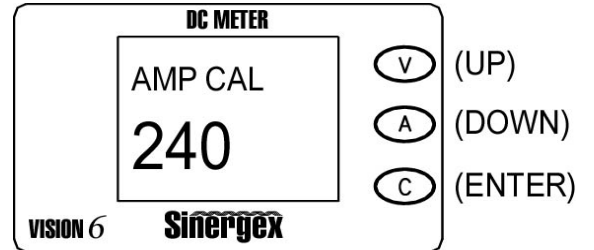
Voltage 3 calibration

Adjust this setting to actual battery Voltage. To calibrate Up/Dn to select value, 0.01V steps
Range: 0-32V



Amp calibration

Adjust this setting to maximum load amps. To calibrate measure load with known ammeter and adjust to read the same. Up/Dn to select value, 1A steps
Range: +/-240A
Refer to page 9



Reset Capacity

NO

YES

Refer to page 9

