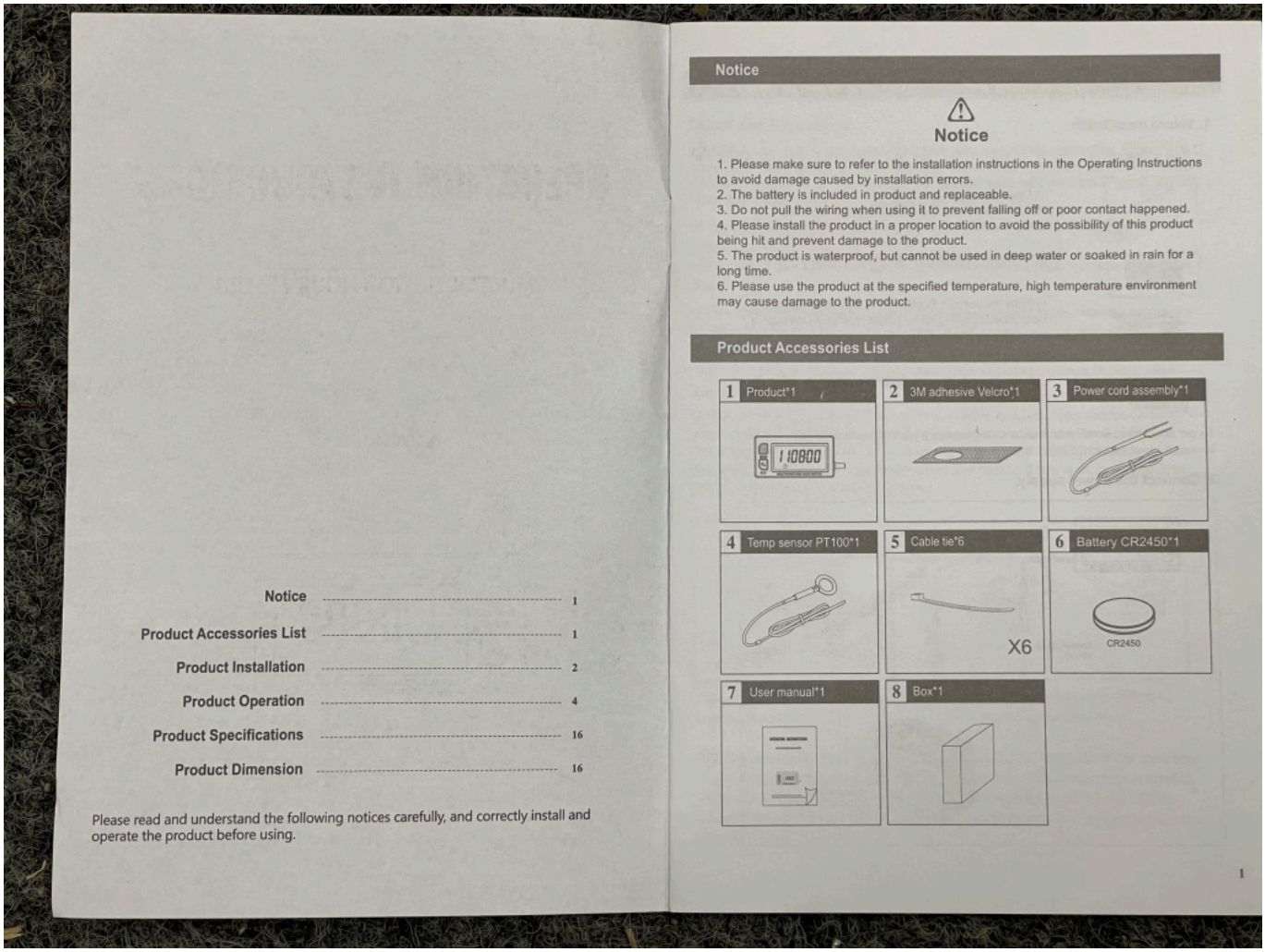
Fitting, Electrics – MB Multi gauge

If you've lost the instructions for our MB Digital Multi gauge then you can read and print them out here.



Please read and understand the following notices carefully, and correctly install and operate the product before using.

Notice

Notice

1. Please make sure to refer to the installation instructions in the Operating Instructions to avoid damage caused by installation errors.
2. The battery is included in product and replaceable.
3. Do not pull the wiring when using it to prevent falling off or poor contact happened.
4. Please install the product in a proper location to avoid the possibility of this product being hit and prevent damage to the product.
5. The product is waterproof, but cannot be used in deep water or soaked in rain for a long time.
6. Please use the product at the specified temperature, high temperature environment may cause damage to the product.

Product Accessories List

1 Product*1

2 3M adhesive Velcro*1

3 Power cord assembly*1

4 Temp sensor PT100*1

5 Cable tie*6

X6

6 Battery CR2450*1

CR2450

7 User manual*1

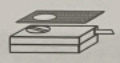
8 Box*1

Product Installation

1. Velcro installation.

a) Clean properly the surfaces.
Note: Make sure the surface is flat and the oil is clean enough.

b) Paste the velcro hook side in the installation position.

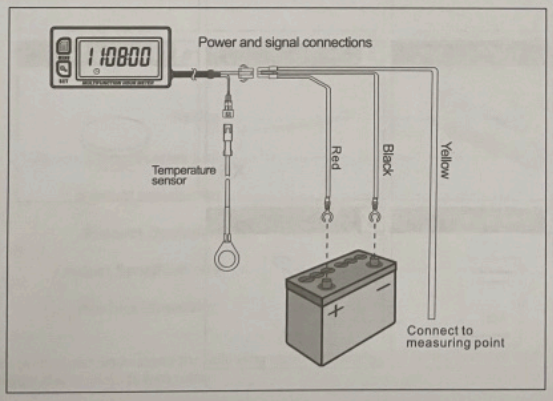


c) Paste the velcro fluffy side on the back of the product.
Note: Before pasting velcro, please make sure the back of the product is clean and tidy, no moisture or oil.

d) Paste the product on the hook side of the velcro and press it tight.

Proper position requirement: no moisture, no grease, is a plane, no violent vibration, and the temperature not exceed 125°F.

2. Connect the power supply.



Product Installation

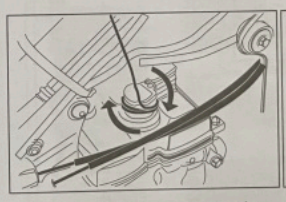
Signal wire installation:

Ⓐ Signal wire connection: wrap the signal wire around the spark plug, wrap it 4 to 5 turns, and fasten it with a cable tie to ensure it is effectively fixed and will not loosen. **(If the connection is not strong, the tachometer will get insufficient signal, then the RPM and Hour values will be inaccurate.)**

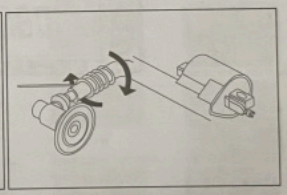
a) For traditional ignition modes, wrap signal wire 4 to 5 turns tightly around the engine spark plug wire.
b) For "pencil coil" ignition, wrap signal wire around the plastic coil above the spark plug.

c) The spark plug signal generated by different engine types has the difference of strength and weakness. By adjusting the turns of winding, the appropriate adjustment can be made to improve the accuracy of the rpm and timing data. This is a skill that different degree spark plug signal that allows the induction wire to acquire.

Under normal condition, if the rpm is a little low, you can increase the winding turns, if the rpm is a little high, you can reduce the winding turns. For example, wrap 6-10 turns, if the rpm is a little high, you can reduce the winding turns. For example, wrap 2-4 turns, if the rpm is a little low, you can increase the winding turns.



4 stroke installation,wrap pickup wire around head of coil.



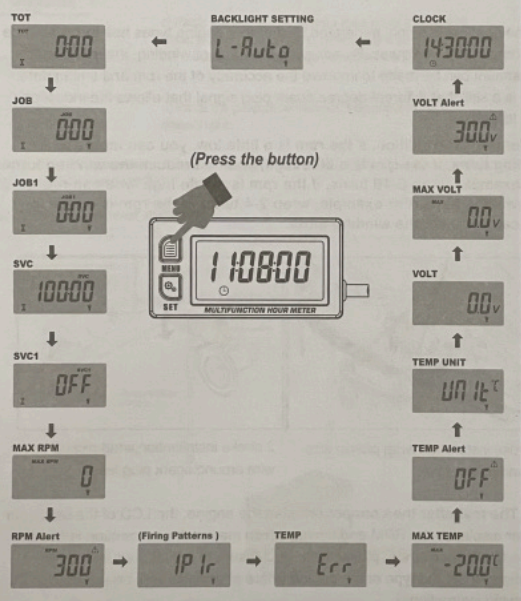
2 stroke installantion,wrap pickup wire around spark plug lead.

Ⓑ **The test after the connection:** start the engine, the LCD of the tach hour meter displayed the RPM and timing, which means the connection is correct. If the rpm is inaccurate, please refer to clause A to adjust the turns of the winding, or set the type of the engine (more information will be provided in the following instructions).

1 Product operating system introduction.

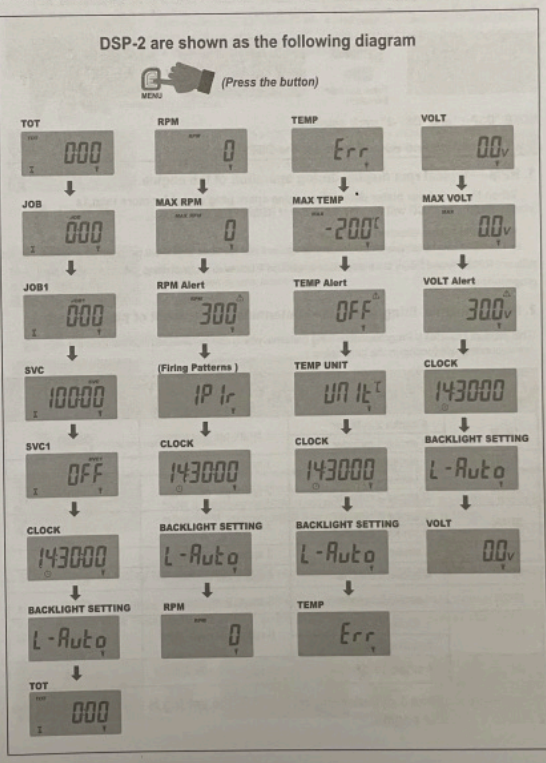
❶ In order to meet the usage habits of different users, the program of this product has 2 sets of use systems (just like after the WINDOWS system can be used on the Apple computer, the user can switch to use the WINDOWS system and the IOS system), respectively, DSP-1 and DSP- 2, the default system of the product is DSP-1.

DSP-1 are shown as the following diagram



❷ The difference between DSP-1 and DSP-2 is that the display mode is different. All functions of DSP-1 are directly displayed, while the function of DSP-2 distinguishes between time module and RPM mode. These two modules can be called separately for display.

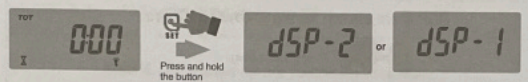
DSP-2 are shown as the following diagram



2 Selectionof product system

a) Push"MEUN"button continuously until display the"TOT"interface.

b) Press and hold"SET"button continuously until display the "DSP-1"or "DSP-2"icon, release the "SET" button, and it will automatic return to "TOT" interface, and you have selected the system needed in this way.



NOTE:"DSP-1" and "DSP-2" cycle selection.

3 The function and operation under the DSP-1 system

1. RPM----Typical rpm display during operation of the engine.

When the tach hour meter detect the engine spark plug signal for more than 1s continuously, the LCD will display the current RPM of the engine.

a) The RPM will be refreshed every 0.5s.

b) The RPM can be programmed for different pulses per revolution;Different programming setting will get different RPM; Please follow the instructions in section 2 below to programming setting for accurate programming.

2. Programmable firing patterns----Determined the amount of pluses(sparks).

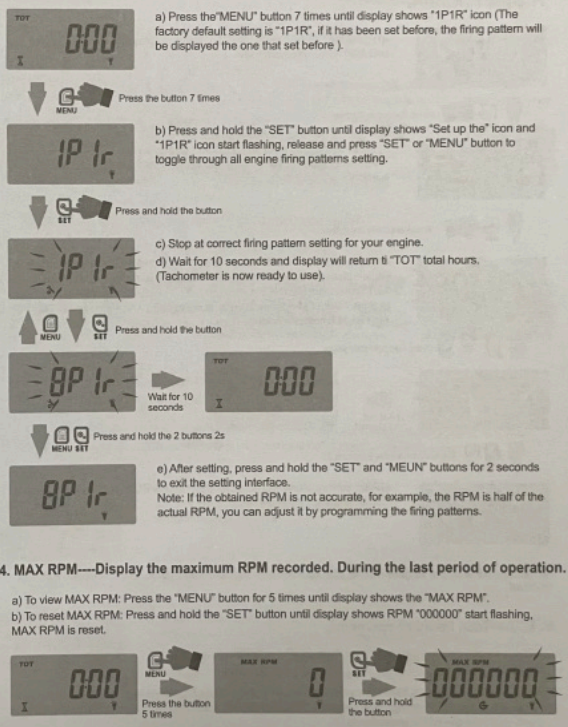
This product provides 9 Programmable firing patterns, which can be selected according to the corresponding relationship in the form below.

Engine firing patterns	Engine type	Spark plug firing and engine rotate laps	RPM Capacity
1P1R	4 stroke 2 cylinder 2 stroke 1 cylinder	1 spark per revolution	25000
1P2R	4 stroke 1 cylinder	1 spark 2 revolution	25000
2P1R	4 stroke 4 cylinder 2 stroke 2 cylinder	2 spark per revolution	12500
3P1R	4 stroke 6 cylinder 2 stroke 3 cylinder	3 spark per revolution	8000
3P2R	4 stroke 3 cylinder	3 spark 2 revolution	16000
4P1R	4 stroke 8 cylinder	4 spark per revolution	6250
5P2R	4 stroke 5 cylinder	5 spark 2 revolution	10000
6P1R	4 stroke 12 cylinder 6 stroke 2 cylinder	6 spark per revolution	4000
8P1R	4 stroke 16 cylinder	8 spark per revolution	3125

Note: Some 4 stroke 1 cylinder engine is 1P1R, the setting is the same way as the 2 stroke 1 cylinder engine.

3. To set the tachometer (Spark plug firing revolution).

Selectionof product system



4. MAX RPM----Display the maximum RPM recorded. During the last period of operation.

a) To view MAX RPM: Press the "MENU" button for 5 times until display shows the "MAX RPM".

b) To reset MAX RPM: Press and hold the "SET" button until display shows RPM "000000" start flashing, MAX RPM is reset.

5. Alert RPM----The setting value of the warning reminder.

When the RPM of the engine during the operation exceeds the set value, the meter will flash to remind.

Programming Alert RPM

a) Press the "MENU" button for 6 times until display shows "RPM" icon and Alert RPM numerical value.

Press the button 6 times

b) Press and hold the "SET" button until display shows "SET" icon, "RPM" icon and Alert RPM numerical value starts flashing, the backlight turns red.

Press and hold the button

c) Press "SET" or "MENU" button until you get desired Alert RPM numerical value, release the button, the LCD will flash for 10 seconds and return to TOT (Total hours).

d) If the Alert RPM numerical value is set to OFF, which means that the Alert RPM function is closed.

Press and hold the button

Press and hold the 2 buttons 2s

e) After setting, press and hold the "SET" and "MEUN" buttons for 2 seconds to exit the setting interface.

When the RPM of the engine during the operation exceeds the set value, the meter will flash to remind.

6. TOT----Total hours of operation.

a) This is always displayed when engine is off. (DSP-1 SYSTEM) .

b) TOT time can not reset.

c) MAX Timing Range is 999999H; When timing value between range 0.0~99999H and 59Min, the timing resolution is 1Min, When timing value between 10000~99999.9H, the timing resolution is 0.1H; When timing value ≥100000H, the timing resolution is 1H.

d) When the total hours exceeds 999999 hours, the timing will restart from 0.

7. JOB ----Hours of operation since the timer was reset.

a) To view "JOB" time: Press the "MENU" button once.

b) To reset "JOB" time: Press and hold the "SET" button until display shows 0000:00 starts flashing, then release the "SET" button, the "JOB" display will reset to "0:00", and you will begin to record the next job interval.

8. JOB1---- Hours of operation since the timer was reset.

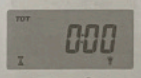
a) To view "JOB1" time: Press the "MENU" button 2 times.

9. SVC---- Maintenance interval time.

Note: Timing is countdown.

When the maintenance interval time is reached, and the LCD display will flashing, backlight turns red. Then press the "SET" or "MENU" button to clear the status, the next maintenance interval time starts timing.

Programming SVC time



a) Press the "MENU" button 3 times until display shows "SVC" icon and maintenance interval time.

Press the button 3 times

b) Press and hold the "SET" button until display shows "SET" "SVC" icon and maintenance interval time starts flashing, the backlight turns red.

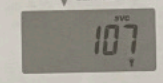
c) Press "SET" or "MENU" button until you get desired hours, release the button, the LCD will flash for 10 seconds and return to TOT (Total hours).

Press and hold the button

d) When the maintenance interval time is reached 0, the"SVC" icon will flash and backlight turns red. The SVC time setting range is 0-250H. If the SVC set to OFF, which means the SVC function is closed.

Press and hold the button

Press and hold the 2 buttons 2s



e) After setting, press and hold the "SET" and "MEUN" buttons for 2 seconds to exit the setting interface.

10. SVC1---- Maintenance interval time.Note: timing is countdown.

*SVC 1 " operates in the same way as "SVC".

11. TEMP---- Get accurate temperature readings from your engine.

a) Universal fits any motor with spark plug.
b) Capable of measuring cylinder head temperature.
c) Temperature measurement range is -20 - 300ºC (-4 - 572ºF).

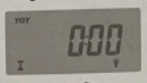
12. MAX TEMP---- Display the maximum temperature recorded. During the last period of operation.

a) To view "MAX TEMP" : Press the "MENU" button 9 times.
b) To reset "MAX TEMP" : Press and hold the "SET" button until display shows "0000 C " and "Reset" icon starts flashing, then release the "SET" button, the "MAX TEMP" display will reset to "0 C", MAX TEMP is reset.

13. TEMP Alert---- The setting temperature value of the warning reminder.

When the temperature of the engine during the operation exceeds the set value ,the meter will flash to remind.

Programming Alert TEMP

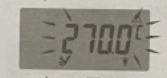


a) Press the "MENU" button for 10 times until display shows "TEMP" icon and Alert TEMP numerical value.

Press the button 10 times

b) Press and hold the "SET" button until display shows "SET" icon, "TEMP" icon and Alert TEMP numerical value starts flashing, the backlight turns red

Press and hold the button



c) Press "SET" or "MENU" button until you get desired Alert TEMP numerical value, release the button, the LCD will flash for 10 seconds and return to TOT (Total hours).

Press and hold the button

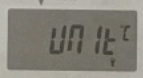
Press and hold the 2 buttons 2s

d) If the Alert TEMP numerical value is set to OFF, which means that the Alert TEMP function is closed.
e) After setting, press and hold the "SET" and "MEUN" buttons for 2 seconds to exit the setting interface.

14. TEMP unit---- Settable Fahrenheit or Celsius unit.

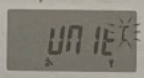
a) Press the "MENU" button for 11 times until display shows "UNIT C" icon.

Press the button 11 times



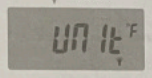
b) Press and hold the "SET" button until display shows "SET" icon, and the "C" icon start flashing.

Press and hold the button



c) Press "SET" or "MENU" button until you get desired temperature unit , release the button, the LCD will flash for 10 seconds and return to TOT (Total hours).

Press and hold the button



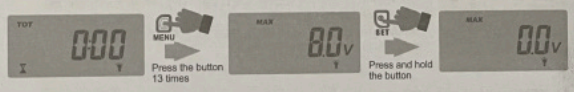
d) After setting, press and hold the "SET" and "MEUN" buttons for 2 seconds to exit the setting interface.

15. VOLT---- Get accurate voltage readings from your battery.

Voltage measurement range is 8-30V.

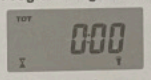
16. MAX VOLT----Display the maximum voltage recorded.

To view "MAX VOLT" : Press the "MENU" button 13 times.
To reset "MAX VOLT" : Press and hold the "SET" button until display shows current voltage and "Reset" icon starts flashing, then release the "SET" button, the "MAX VOLT" display will reset to "0.0 V", MAX VOLT is reset.



17. VOLT Alert----The setting voltage value of the warning reminder.

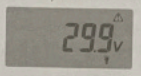
Programming Alert VOLT



a) Press the "MENU" button for 14 times until display shows "ALERT" icon and Alert VOLT numerical value.

b) Press and hold the "SET" button until display shows "SET" icon and Alert VOLT numerical value starts flashing, the backlight turns red

c) Press "SET" or "MENU" button until you get desired Alert VOLT numerical value, release the button, the LCD will flash for 10 seconds and return to TOT (Total hours). backlight turns red.



d) If the Alert VOLT numerical value is set to OFF, which means that the Alert VOLT function is closed.

e) After setting, press and hold the "SET" and "MEUN" buttons for 2 seconds to exit the setting interface.

18. Setting the clock

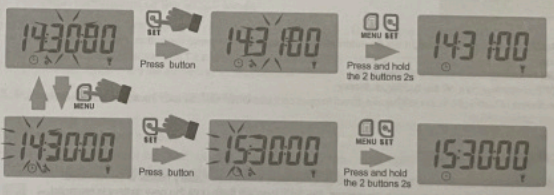
a) Press the "MENU" button for 15 times until display shows default clock.

b) Press and hold the "SET" button until display shows "SET" icon and minute number of the clock starts flashing.

c) Press "SET" button until you get desired minute numerical value, press the "MUNU" button the hour number of the clock starts flashing; then press "SET" button until you get desired hour numerical value; release the button, the LCD will flash for 10 seconds and return to TOT (Total hours).

d) The default number of seconds for the clock is 00 and cannot be set.

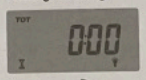
e) After setting, press and hold the "SET" and "MEUN" buttons for 2 seconds to exit the setting interface.



19. Backlight Choice

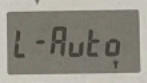
When the voltage of the battery during the operation exceeds the set value, the meter will flash to remind.

Backlight Settings



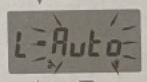
a) Press the "MENU" button for 16 times until display shows "L-AUTO" icon.

Press the button 16 times



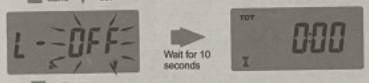
b) Press and hold the "SET" button until display shows "SET" icon and the"L-AUTO" icon starts flashing.

Press and hold the button

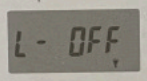


c) Press the "MENU" button or "SET" key, select the required backlight mode, the LCD flashes for 10 seconds, and return TOT(total hours).

Press and hold the button



Press and hold the 2 buttons 2s



d) After setting, press and hold the "SET" and "MEUN" buttons for 2 seconds to exit the setting interface.

L-AUTO meaning: the backlight will be automatically turned off, when press the button, the backlight will be on.
L-ON meaning: the backlight is always on.
L-OFF meaning: turn off the backlight display.
The choice of backlight mode will have a direct impact on battery life, and the L-ON mode is the largest power consumption.

20. Battery replacement

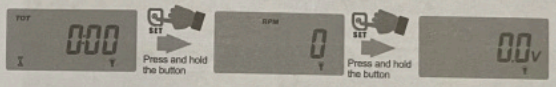
a) When the LCD displays the "LO" icon flashing, it indicates that a new battery needs to be replaced.
b) When no external power supply is connected, the "LO" icon will flash until the new battery is replaced under the TOT interface.

4 The function and operation under the DSP-2 system

1. The selection of the Hours Mode and RPM Mode.

HOURS MODE: TOT→JOB→JOB1→SVC→SVC1→CLOCK→BACKLIGHT SETTING
RPM MODE: RPM→MAX RPM→RPM Alert→1P1R(Firing Patterns)→CLOCK→BACKLIGHT SETTING
TEMP MODE: TEMP→MAX TEMP→TEMP Alert→TEMP UNIT→CLOCK→BACKLIGHT SETTING
VOLT MODE: VOLT→MAX VOLT→VOLT Alert→CLOCK→BACKLIGHT SETTING

a) When entering the DSP-2 system, the first entry is the Hours Mode.
b) At the Hours Mode interface, press and hold the "MENU" button until display the icon "RPM" and "0" on the screen, which means enter into the RPM Mode; Similarly, under the RPM Mode interface, press and hold the "MENU" button to enter into the VOLT Mode;



c) Under the Hours Mode、RPM Mode or VOLT Mode interface, only the functions contains in the mode can be used. The functions in the mode are relatively independent.

2. Function circulation of the Hours Mode

a) Hours Mode contains TOT function、JOB&JOB1 function、SVC&SVC1 function、Clock and Backlight select function.
b) The use and settings of the TOT function、JOB&JOB1 function、SVC&SVC1 function、Clock and Backlight select function are the same as described in DSP-1.

3. Function circulation of the RPM Mode

a) RPM Mode contains RPM function、Alert RPM function、MAX RPM function、Firing Patterns choice 、Clock and Backlight select function.
b) The usage and setting of the RPM function、Alert RPM function、MAX RPM function、Firing Patterns choice、Clock and Backlight select function are the same way as described in DSP-1.

4. Function circulation of the VOLT Mode

a) VOLT Mode contains VOLT function、Alert VOLT function、MAX VOLT function、Clock and Backlight select function.
b) The usage and setting of the VOLT function、Alert VOLT function、MAX VOLT function、Clock and Backlight select function are the same way as described in DSP-1.

5. Function circulation of the TEMP Mode

a) TEMP Mode contains TEMP function、Alert TEMP function、MAX TEMP function、TEMP UNIT 、Clock and Backlight select function.

b) The usage and setting of the TEMP function、Alert TEMP function、MAX TEMP function、TEMP UNIT 、Clock and Backlight select function are the same way as described in DSP-1.

5 Other

1. To shut down LCD display

a) Press the "MENU" and "SET" button at the same time until the "OFF" icon displayed on the screen, then release the button and the LCD display will shut down automatically.
b) The LCD will be displayed when the engine signal is detected again or press the "MENU" or "SET" button.
c) When LCD screen is closed, the historical Vdata will be retained and will not be cleared.

Parameter&Introduction

Item	Parameter&Introduction
TOT/JOB Timing range	0-999999H
Timing accuracy	1MIN/0.1H/1H
RPM range	0-25000RPM
MAX RPM range	0-25000RPM
ALERT RPM	0-25000RPM & OFF
RPM accuracy	10RPM
RPM refresh	0.5S
Firing Patterns	1P1R 1P2R 2P1R 3P1R 3P2R 4P1R 5P2R 6P1R 8P1R
SVC setting range	0-250H & OFF
Temperature range	-20 - 300℃
Temperature unit	℃/℉ (The default ℃)
Warning range of over temperature	-20 - 300℃
Display mode	LCD
Display window size(visible)	51.3X23.3mm
Product size	79X41X21.4mm
Battery type	CR2450 540mAh, Replaceable
Waterproof	IP65

Product Dimension