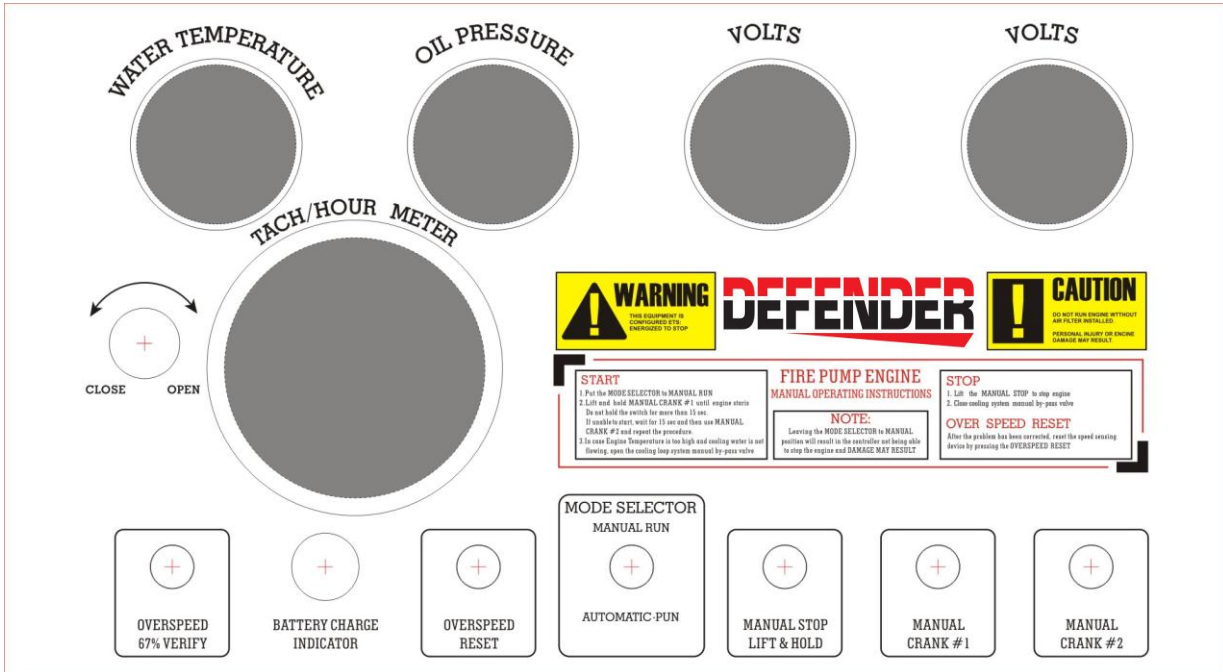


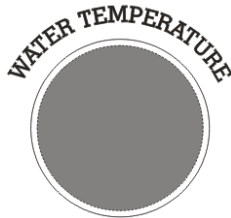
Manual of Fire Water Pump Control Box FPEC100

Ver1.0

1. Configuration



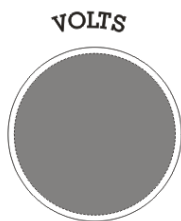
2. Panel Introduction



- 1) Water Temperature meter: it must match with the sensor we offered in order to check the coolant water temperature.

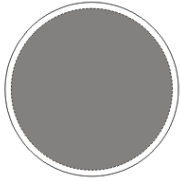


- 2) Oil pressure meter: it must match with the sensor we offered in order to check the lube oil pressure.

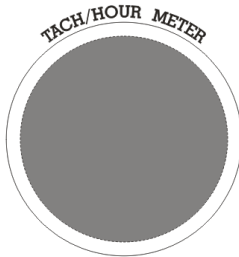


- 3) Voltage Meter: it is used for checking the battery voltage(No.1), 12V/24V both available.

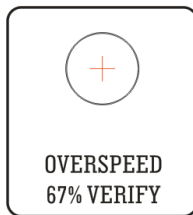
VOLTS



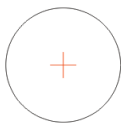
- 4) Voltage Meter: it is used for checking the battery voltage (No.2),12V/24V both available.



- 5) Tachometer: it must match with the RPM sensor we offered. Please set the flywheel teeth according to the tachometer operation manual, or the RPM may be not accurate. This tachometer contains the function of hour counting with LCD digital display, which will record the total working hours and never clear back.



- 6) Overspeed-verification switch: it is used for checking if the overspeed function in normal status. Once the switch is changed into the up position, then the overspeed value is set as 67% of the default of control box, formula: overspeed verification value= overspeed protection value*67%



BATTERY CHARGE
INDICATOR

- 7) Battery charger indicator: the light is on when charging in normal status.

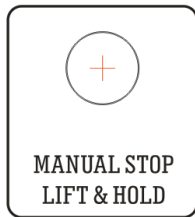


- 8) Overspeed reset switch: it must be pressed once the stop occurs because of overspeed in order to clear alarms and re-start engine.

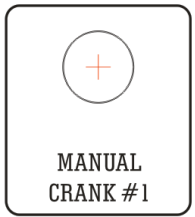


- 9) Mode selector: when the switch is changed into up position, the control box is in the manual mode. When the switch is changed into down position, the control box is in the auto mode.

Note: Manual Mode-----manually choose Battery 1 or Battery 2 to start engine;
Auto Mode-----remote running (+)signal input



- 10) Manual Stop: when the switch is changed into the up position, stop signal will be transferred to stop solenoid in order to stop engine.

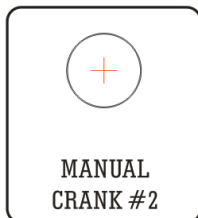


- 11) Crank Switch by Battery No.1: it is used for starting the engine through Battery No.1 and motor relay No.1 when the switch is changed into the up position, the motor No.1 is active and the engine is started.

Notes: 1,Please check the engine status under start procession. Please loosen this switch once engine is started, or it may damage the parts.

2,Please don't dial this switch during engine running, or it may damage the engine.

3,Operation procession:Battery NO.1→ start relay 1→ start motor.



- 12) Crank Switch by Battery No.2: it is used for starting the engine through Battery No.2 and the motor relay No.2. when the switch is changed into the up position, the motor No.2 is active and the engine is started.

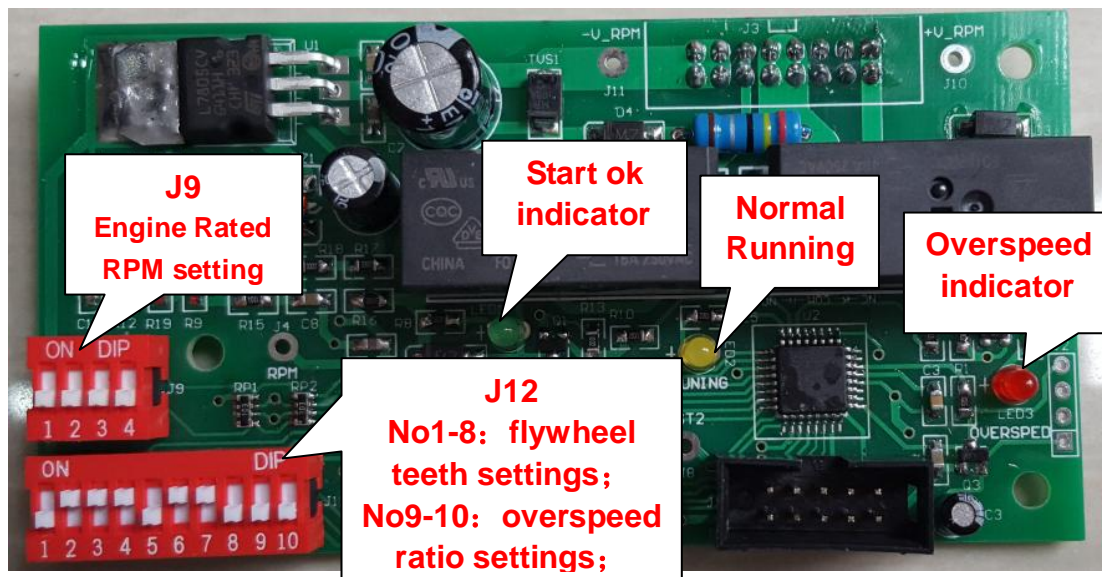
Notes: 1,Please check the engine status under start procession. Please loosen this switch once engine is started, or it may damage the parts.

2,Please don't dial this switch during engine running, or it may damage the engine.

3,Operation procession:Battery NO.2→ start relay 2→ start motor.

3. Parameters setting

1. Control Panel design and introduction



2. Engine Rated RPM Setting: the users can set through the dial switch on the J9. When dialing it to ON, it means (1) is valid; when dialing it to OFF, it means (0) is not valid.

Parameters

4 Units dial switch (Code J9)	Rated RPM Options				RATED RPM
	1	2	3	4	
1	0	0	0	0	1500
2	0	0	0	1	1600
3	0	0	1	0	1700
4	0	0	1	1	1800
5	0	1	0	0	1900
6	0	1	0	1	2000
7	0	1	1	0	2100
8	0	1	1	1	2200
9	1	0	0	0	2300
10	1	0	0	1	2400
11	1	0	1	0	2500
12	1	0	1	1	2600
13	1	1	0	0	2700
14	1	1	0	1	2800
15	1	1	1	0	2900
16	1	1	1	1	3000

3. Flywheel teeth setting: the users can set it through the dial switch from No.1 to No.8 on the board J12; when dialing it to ON, it means (1) is valid; when dialing it to OFF, it means (0) is not valid. flywheel teeth can be accumulated through the 8 units switch, it is valid if the position is ON.

- a) No.1 means value 128;
- b) No.2 means value 64;
- c) No.3 means value 32;
- d) No.4 means value 16;
- e) No.5 means value 8;
- f) No.6 means value 4;
- g) No.7 means value 21;
- h) No.8 means value 1;

EG: if you are going to set the teeth as 118, then you should dial like this:

No1:0, No2:1, No3:1, No4:1, No5:0, No6:1, No7:1, No8:0

Formula: $0 \times 128 + 1 \times 64 + 1 \times 32 + 1 \times 16 + 0 \times 8 + 1 \times 4 + 1 \times 2 + 0 \times 1 = 118$

Flywheel teeth settings

teeth	Switch status	teeth	Switch status	teeth	Switch status	teeth	Switch status	teeth	Switch status
	12345678		12345678		12345678		12345678		
1	00000001	52	00110100	103	01100111	154	10011010	205	11001101
2	00000010	53	00110101	104	01101000	155	10011011	206	11001110
3	00000011	54	00110110	105	01101001	156	10011100	207	11001111
4	00000100	55	00110111	106	01101010	157	10011101	208	11010000
5	00000101	56	00111000	107	01101011	158	10011110	209	11010001
6	00000110	57	00111001	108	01101100	159	10011111	210	11010010
7	00000111	58	00111010	109	01101101	160	10100000	211	11010011
8	00001000	59	00111011	110	01101110	161	10100001	212	11010100
9	00001001	60	00111100	111	01101111	162	10100010	213	11010101
10	00001010	61	00111101	112	01110000	163	10100011	214	11010110
11	00001011	62	00111110	113	01110001	164	10100100	215	11010111
12	00001100	63	00111111	114	01110010	165	10100101	216	11011000
13	00001101	64	01000000	115	01110011	166	10100110	217	11011001
14	00001110	65	01000001	116	01110100	167	10100111	218	11011010
15	00001111	66	01000010	117	01110101	168	10101000	219	11011011
16	00010000	67	01000011	118	01110110	169	10101001	220	11011100
17	00010001	68	01000100	119	01110111	170	10101010	221	11011101
18	00010010	69	01000101	120	01111000	171	10101011	222	11011110
19	00010011	70	01000110	121	01111001	172	10101100	223	11011111
20	00010100	71	01000111	122	01111010	173	10101101	224	11100000
21	00010101	72	01001000	123	01111011	174	10101110	225	11100001
22	00010110	73	01001001	124	01111100	175	10101111	226	11100010
23	00010111	74	01001010	125	01111101	176	10110000	227	11100011
24	00011000	75	01001011	126	01111110	177	10110001	228	11100100

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25	00011001	76	01001100	127	01111111	178	10110010	229	11100101
26	00011010	77	01001101	128	10000000	179	10110011	230	11100110
27	00011011	78	01001110	129	10000001	180	10110100	231	11100111
28	00011100	79	01001111	130	10000010	181	10110101	232	11101000
29	00011101	80	01010000	131	10000011	182	10110110	233	11101001
30	00011110	81	01010001	132	10000100	183	10110111	234	11101010
31	00011111	82	01010010	133	10000101	184	10111000	235	11101011
32	00100000	83	01010011	134	10000110	185	10111001	236	11101100
33	00100001	84	01010100	135	10000111	186	10111010	237	11101101
34	00100010	85	01010101	136	10001000	187	10111011	238	11101110
35	00100011	86	01010110	137	10001001	188	10111100	239	11101111
36	00100100	87	01010111	138	10001010	189	10111101	240	11110000
37	00100101	88	01011000	139	10001011	190	10111110	241	11110001
38	00100110	89	01011001	140	10001100	191	10111111	242	11110010
39	00100111	90	01011010	141	10001101	192	11000000	243	11110011
40	00101000	91	01011011	142	10001110	193	11000001	244	11110100
41	00101001	92	01011100	143	10001111	194	11000010	245	11110101
42	00101010	93	01011101	144	10010000	195	11000011	246	11110110
43	00101011	94	01011110	145	10010001	196	11000100	247	11110111
44	00101100	95	01011111	146	10010010	197	11000101	248	11111000
45	00101101	96	01100000	147	10010011	198	11000110	249	11111001
46	00101110	97	01100001	148	10010100	199	11000111	250	11111010
47	00101111	98	01100010	149	10010101	200	11001000	251	11111011
48	00110000	99	01100011	150	10010110	201	11001001	252	11111100
49	00110001	100	01100100	151	10010111	202	11001010	253	11111101
50	00110010	101	01100101	152	10011000	203	11001011	254	11111110
51	00110011	102	01100110	153	10011001	204	11001100	255	11111111

4. Overspeed ratio setting: the users can set it through the dial switch from No.9 to No.10 on the board J12; when dialing it to ON, it means (1) is valid; when dialing it to OFF, it means (0) is not valid.

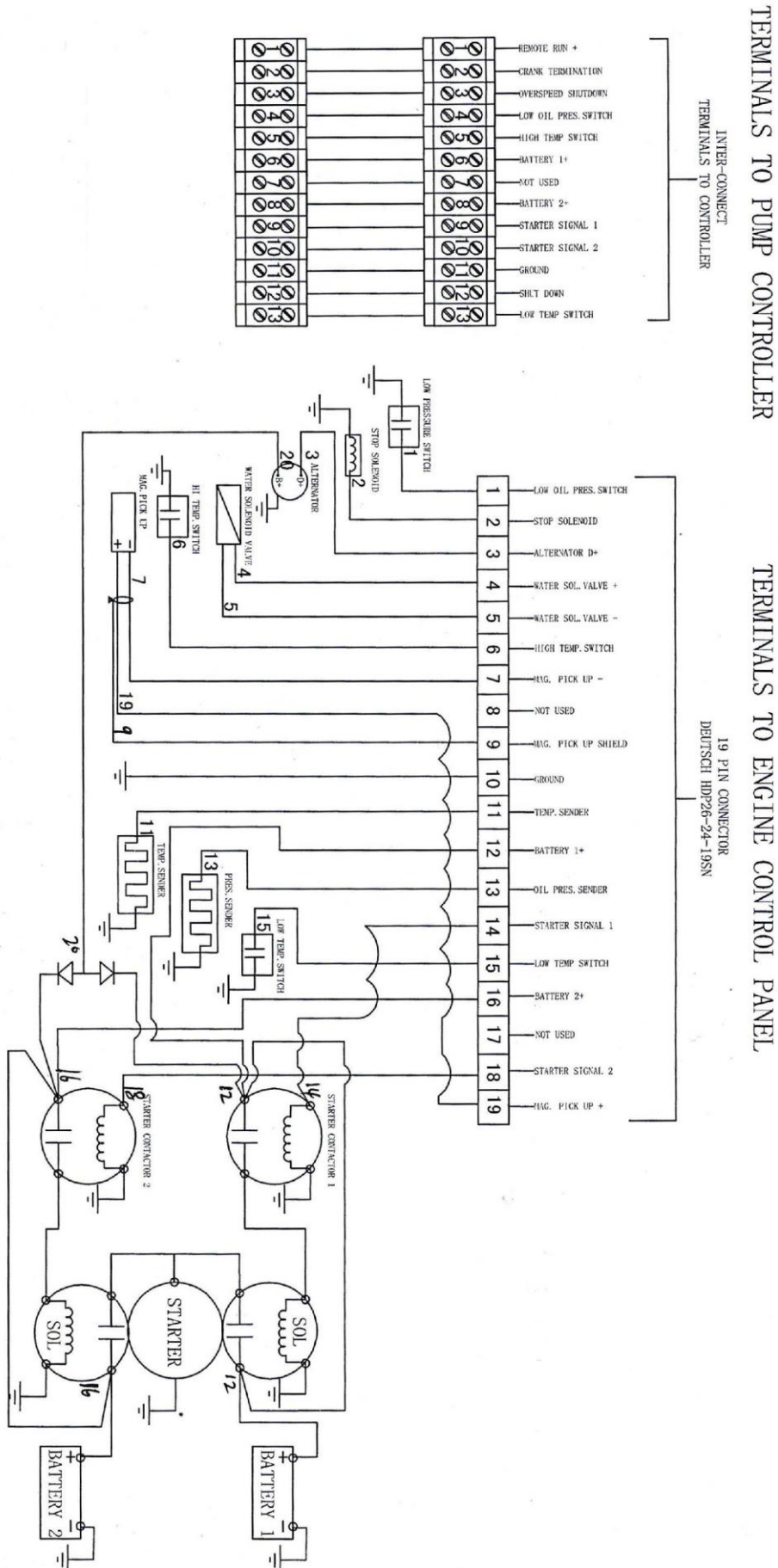
formula: overspeed protection value= rated RPM* overspeed ratio

Parameters

J12 switch status		OVERSPEED RATIO
No.9	No.10	
0	0	105%
0	1	110%
1	0	115%
1	1	120%

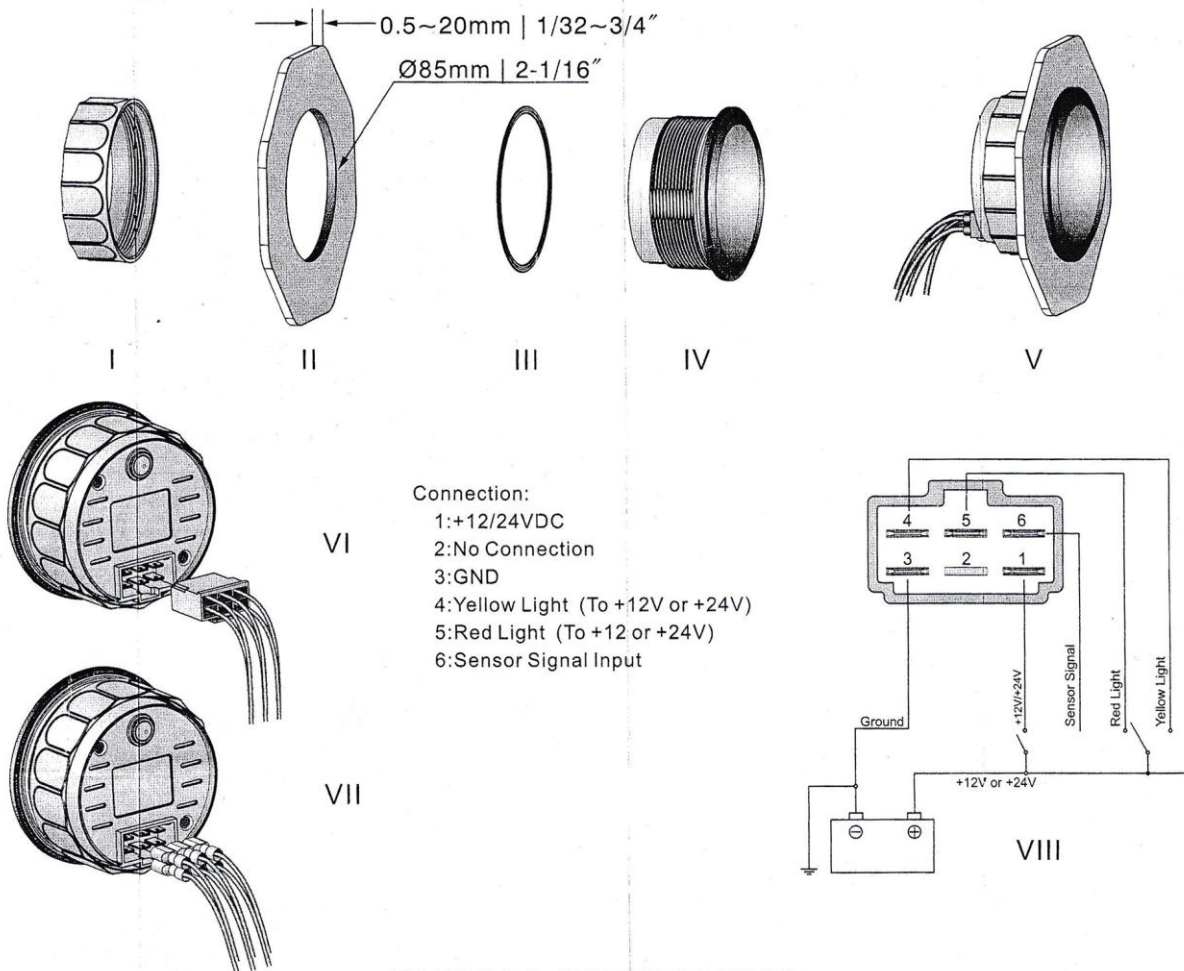
Note: please cut off the power to control box in 10 sec when all the parameters are set well.

4. Diagrams



5. Tachometer Installation Instructions

INSTALLATION INSTRUCTIONS



INSTALLATION STEPS

- Cut a $\Phi 85$ mm (3 3/8") hole (II) on the panel, and ensure there is enough space behind the panel to fit the gauge and wire harness.
- Mount the sealing ring ((# III) on the gauge ((# IV), and put the gauge ((# IV) in the hole on the panel ((# II), fasten it with a fixing ring.
- Connect the wires according to the wire connection diagram ((# VIII). If power supply is 12V, please connect power cord to terminal 1; If power supply is 24V, please connect power cord to terminal 2; If there is no terminal 2, it means terminal 1 can directly connect with 10-32V. Attention: Wrong connection may get the gauge damaged.
- If you prefer red backlight, connect terminal 5 to +12V/ +24V power supply, terminal 4 disconnected; Conversely, you can get yellow backlight;
- Dimension of the terminal: 6.3x0.8mm. Matched female terminal shall be chosen, see VII.
If the connection needs to be with connector as VI shows, you can get the terminal from retailer.
- After correct connection, power on and adjust to the appropriate speed ratio according to revolving speed of the measured device.
- Speed ratio adjustment:
 - Press the rubber button on gauge back for 3s, it enters the setting mode; Release the button for 3s, it exits the setting mode.
 - Press the button without stop, the values keep increasing; Release and press it again, the values keep decreasing. The longer you press the button, the faster it counts. The minimum counting step value is 0.5, adjustment range: 0.5 ~ 250.
 - Release the button after you get the speed ratio you want, and the result you set will be saved automatically after 3s. You can reset the speed ratio value as you want.
 - Speed ratio indicates the number of impulses engine outputs per rotation. If the impulse is 25 per rotation of your engine, the value needs to be adjust to 25.0, see picture below:

Outboard		Inboard & Gas engine		
poles	speed ratio	cylinder	cycle	speed ratio
4	2	4	4	2
6	3	6	4	3
8	4	8	4	4
10	5	10	4	5
12	6			

Speed ratio setting :

General settings of marine engine:

If your engine is not in line with the specification in the table, the speed ratio needs to be set according to the number of impulse output per rotation.