

Data in these instructions is for use on the controller and provides brief operation guidelines, for greater details please refer to the standard operation Manual

I、 Controller size:

| Module Dimensions     | Panel Cutout  |
|-----------------------|---------------|
| W264mm×H198mm×D41.5mm | W220mm×H160mm |

II、 Parameter setting method:

1、 Primary key

IOI



Used to opening and closing for power generation in manual mode

IOI



Used to opening and closing for Mains in manual mode



Generator start button/LED



Shutdown / Reset / LED



AUTO Mode Button / LED



MAN Mode Button / LED




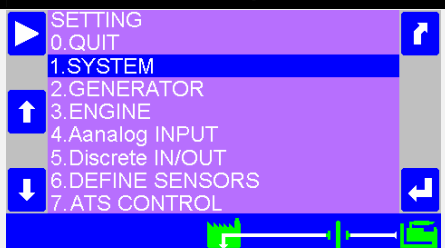








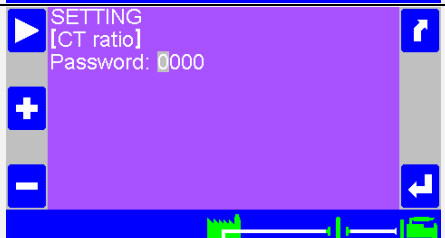
TEST Mode Button / LED









Scroll Button /Parameter settings enter and exit Button

2、 Setting method:

FOR EXAMPLE: (SETTING CT RATIO AT 500: 5, THEN CT SHOULD BE CONFIGURED AS 500)

| Operation                                                                                                                                                                                                                                                                                                                                                                                                                                  | Description                                                                          |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Press and hold  2sec, enter into parameters setting menu, then LCD displays                                                                                                                                                                                                                                                                             |  |
| Press  once, press  6 times again, then press  once, LCD displays:                                                                                                                |  |
| Press  or  prompted enter password, the modify password is: 1111, press  or  button to modify: |  |

|                                                                                                                                                                                                                                                                                                                                                              |                                                                                    |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <p>Press “” or “” to change parameters, this time modified to 500, LCD then display:</p>                                                                                                   |  |
| <p>Press “” to confirm, then press “” button to return, or press and hold “” 2sec quit settings mode.</p> |                                                                                    |

### III、 Parameters Setting:

#### 1、 SYSTEM

| NO.  | Items                | Preset   | NO.  | Items              | Preset     |
|------|----------------------|----------|------|--------------------|------------|
| 1.1  | Language             | 0        | 1.14 | Display brightness | 5          |
| 1.2  | Password             |          | 1.15 | Saving brightness  | 1          |
| 1.3  | Pressure unit        | 0        | 1.16 | Auto scroll time   | Not used   |
| 1.4  | Temperature unit     | 0        | 1.17 | Starting alarm     | 0          |
| 1.5  | Comm. address        | 1        | 1.18 | Mutual standby     | Not used   |
| 1.6  | Startup mode         | 0        | 1.19 | Mutual-S time      | Not used   |
| 1.7  | CT ratio             | 1000:5   | 1.20 | CB close pulse     | Continuous |
| 1.8  | PT ratio             | 1.0:1    | 1.21 | Reset to MAN       | 0          |
| 1.9  | Rated voltage        | 230 V    | 1.22 | Clear event log    |            |
| 1.10 | Rated current        | 1000 A   | 1.23 | Default settings   |            |
| 1.11 | Rated active power   | 500 kW   | 1.24 | Firmware Update    |            |
| 1.12 | Rated reactive power | 400 Kvar |      |                    |            |
| 1.13 | Voltage type         | 1        |      |                    |            |

#### 2、 GENERATOR

| NO.  | Items              | Preset | NO.  | Items             | Preset |
|------|--------------------|--------|------|-------------------|--------|
| 2.1  | GEN V-monitor type | 1      | 2.14 | Reverse Power 1   | -5%    |
| 2.2  | GEN-V under 1      | 90%    | 2.15 | Reverse Power 2   | -10%   |
| 2.3  | GEN-V under 2      | 85%    | 2.16 | Phase rotation    | CW     |
| 2.4  | GEN-V over 1       | 115%   | 2.17 | Lagging PF        | +0.90  |
| 2.5  | GEN-V over 2       | 120%   | 2.18 | Leading PF        | -0.90  |
| 2.6  | GEN-Hz under 1     | 48.0Hz | 2.19 | GCB close         | 否      |
| 2.7  | GEN-Hz under 2     | 45.0Hz | 2.20 | GCB open          | 否      |
| 2.8  | GEN-Hz over 1      | 55.0Hz | 2.21 | GEN. loading Volt | 90%    |
| 2.9  | GEN-Hz over 2      | 57.0Hz | 2.22 | GEN. loading Hz   | 48.0Hz |
| 2.10 | GEN-I over 1       | 110%   | 2.23 | GEN. on delay     | 5S     |
| 2.11 | GEN-I over 2       | 115%   | 2.24 | Test mode         | Unload |
| 2.12 | GEN-KW over 1      | 110%   | 2.25 | Soft unload time  | 1S     |
| 2.13 | GEN-KW over 2      | 120%   |      |                   |        |

**3、ENGINE**

| NO.  | Items              | Preset   | NO.  | Items             | Preset   |
|------|--------------------|----------|------|-------------------|----------|
| 3.1  | Engine type        | 1        | 3.24 | Pre-heat mode     | 1        |
| 3.2  | ECU type           | 4        | 3.25 | Pre-heat time     | 3 S      |
| 3.3  | Engine rated speed | 1500 RPM | 3.26 | Safety-on delay   | 10 S     |
| 3.4  | MPU input          | NO       | 3.27 | Cool down mode    | Idle     |
| 3.5  | Fly wheel teeth    | 120      | 3.28 | Cool down time    | 300S     |
| 3.6  | Set pickup now     | /        | 3.29 | Stop time         | 20S      |
| 3.7  | Pair of poles      | 2        | 3.30 | EX. Crank permit  | NO       |
| 3.8  | Fuel mode          | N.C      | 3.31 | Charge failure    | 8.0 V    |
| 3.9  | Start delay        | 10S      | 3.32 | Pickup signal     | 2        |
| 3.10 | Crank attempts     | 3        | 3.33 | Overspeed level1  | 1600 RPM |
| 3.11 | Critical C-attempt | 6 times  | 3.34 | Overspeed level2  | 1710 RPM |
| 3.12 | Crank time         | 5S       | 3.35 | Underspeed level1 | 1440RPM  |
| 3.13 | Crank time add     | Not used | 3.36 | Underspeed level2 | 1350 RPM |
| 3.14 | Crank pause time   | 15S      | 3.37 | Start failure     | 6        |
| 3.15 | Ignition speed     | 200 RPM  | 3.38 | Stop failure      | 3        |
| 3.16 | Ignition start DLY | 5S       | 3.39 | Batt. Overvolt    | 35.0 V   |
| 3.17 | Gas valve on DLY   | 5S       | 3.40 | Batt. Undervolt   | 8.0 V    |
| 3.18 | Crank cutout RPM   | 300 RPM  | 3.41 | Maintenance hours | 1000     |
| 3.19 | Crank cutout volt  | 85%      | 3.42 | Maintenance days  | 2        |
| 3.20 | Crank cutout ALT-V | Not used | 3.43 | ECU Data fail     | 2        |
| 3.21 | Crank cutout Oil-P | 2.2      | 3.44 | ECU Warning       | 2        |
| 3.22 | Crank cutout P-DLY | Not used | 3.45 | ECU Shutdown      | 6        |
| 3.23 | Idle time          | Not used | 3.46 | Water in fuel     | 2        |

**4、Analog INPUT**

| NO.  | Items             | Preset | NO.  | Items              | Preset |
|------|-------------------|--------|------|--------------------|--------|
| 4.1  | P-sensor type     | 4      | 4.17 | Fuel pump OFF      | 70%    |
| 4.2  | Oil-P low level1  | 1.4Bar | 4.18 | AUX sensor1 use    | 1      |
| 4.3  | Oil-P low level2  | 1.1Bar | 4.19 | AUX sensor1 type   | 4      |
| 4.4  | T-sensor type     | 3      | 4.20 | AUX1 low P level1  | 1.4Bar |
| 4.5  | High temp. level1 | 92℃    | 4.21 | AUX1 low P level2  | 1.1Bar |
| 4.6  | High temp. level2 | 100℃   | 4.22 | AUX1 high P level1 | 7.0Bar |
| 4.7  | Heater on level   | 50℃    | 4.23 | AUX1 high P level2 | 8.0Bar |
| 4.8  | Heater off level  | 60℃    | 4.24 | AUX1 low T level1  | 60℃    |
| 4.9  | Cooler on level   | 80℃    | 4.25 | AUX1 low T level2  | 50℃    |
| 4.10 | Cooler off level  | 70℃    | 4.26 | AUX1 high T level1 | 90℃    |
| 4.11 | Fuel sensor1 type | 3      | 4.27 | AUX1 high T level2 | 100℃   |
| 4.12 | Low fuel level1   | 20%    | 4.28 | Heater1 on level   | 50℃    |
| 4.13 | Low fuel level 2  | 10%    | 4.29 | Heater1 off level  | 60℃    |
| 4.14 | High fuel level1  | 90%    | 4.30 | Cooler1 on level   | 80℃    |
| 4.15 | High fuel level2  | 100%   | 4.31 | Cooler1 off level  | 70℃    |
| 4.16 | Fuel pump ON      | 20%    |      |                    |        |

**5、Discrete IN/OUT**

| NO.  | Items            | Preset | NO.  | Items           | Preset   |
|------|------------------|--------|------|-----------------|----------|
| 5.1  | D-Input 1 config | 6      | 5.11 | Relay 3 Config  | Not used |
| 5.2  | D-Input 2 config | 2      | 5.12 | Relay 4 Config  | Not used |
| 5.3  | D-Input 3 config | 3      | 5.13 | Relay 5 Config  | Not used |
| 5.4  | D-Input 4 config | 4      | 5.14 | Relay 6 Config  | Not used |
| 5.5  | D-Input 5 config | 1      | 5.15 | Relay 9 Config  | Not used |
| 5.6  | D-Input 6 config | 1      | 5.16 | Relay 10 Config | Not used |
| 5.7  | D-Input 7 config | 1      | 5.17 | Relay 11 Config | Not used |
| 5.8  | D-Input 8 config | 1      | 5.18 | Relay 12 Config | Not used |
| 5.9  | Relay 1 Config   | 2      |      |                 |          |
| 5.10 | Relay 2 Config   | 1      |      |                 |          |

**7、ATS CONTROL**

| NO.  | Items            | Preset | NO.  | Items            | Preset |
|------|------------------|--------|------|------------------|--------|
| 7.1  | M V-monitor type | 1      | 7.14 | MCB open         | 5S     |
| 7.2  | M V low alarm    | 90%    | 7.15 | Current type     | 0      |
| 7.3  | M V low Return   | 95%    | 7.16 | Prohibit return  | 0      |
| 7.4  | M V High alarm   | 115%   | 7.17 | M fail G to load | 0      |
| 7.5  | M V High Return  | 110%   | 7.18 | M KW over alarm  | 120%   |
| 7.6  | M Hz low alarm   | 45.0Hz | 7.19 | M KW o-ALM.delay | 5S     |
| 7.7  | M Hz low Return  | 48.5Hz | 7.20 | M KW o-ALM.ACT.  | 0      |
| 7.8  | M Hz High ALM    | 57.0Hz | 7.21 | M A over alarm   | 115%   |
| 7.9  | M Hz High Return | 52.0Hz | 7.22 | M A o-ALM.delay  | 5S     |
| 7.10 | M alarm delay    | 5S     | 7.23 | M A o-ALM.ACT.   | 0      |
| 7.11 | M on delay       | 5S     | 7.24 | M normal type    | 0      |
| 7.12 | Transfer time    | 0S     | 7.25 | AMF mode         | 1      |
| 7.13 | MCB close        | 5S     |      |                  |        |

**8、SCHEDULER**

| NO.  | Items              | Preset | NO.  | Items              | Preset   |
|------|--------------------|--------|------|--------------------|----------|
| 8.1  | DATE/ TIME         |        | 8.13 | 2nd Scheduler mode | Unload   |
| 8.2  | Scheduler period   | 1      | 8.14 | 2nd Start time     | HH:MM    |
| 8.3  | 1st Scheduler mode | Unload | 8.15 | 2nd Run duration   | 60       |
| 8.4  | 1st Start time     | HH:MM  | 8.16 | 2nd MON active     | 0        |
| 8.5  | 1st Run duration   | 60     | 8.17 | 2nd TUE active     | 0        |
| 8.6  | 1st MON active     | 0      | 8.18 | 2nd WED active     | 0        |
| 8.7  | 1st TUE active     | 0      | 8.19 | 2nd THU active     | 0        |
| 8.8  | 1st WED active     | 0      | 8.20 | 2nd FRI active     | 0        |
| 8.9  | 1st THU active     | 0      | 8.21 | 2nd SAT active     | 0        |
| 8.10 | 1st FRI active     | 0      | 8.22 | 2nd SUN active     | 0        |
| 8.11 | 1st SAT active     | 0      | 8.23 | Data log period    | Not used |
| 8.12 | 1st SUN active     | 0      |      |                    |          |

**10、SPEED CONTROL**

| NO.  | Items             | Preset | NO.  | Items              | Preset |
|------|-------------------|--------|------|--------------------|--------|
| 10.1 | Proportional gain | 10.0   | 10.5 | Time pulse minimum | 0.2    |
| 10.2 | Intergral gain    | 1.0    | 10.6 | Raise rate         | 5      |
| 10.3 | Derivative ratio  | 1.0    | 10.7 | Lower rate         | 5      |
| 10.4 | Deadband          | 0.2    |      |                    |        |

**Menu descriptions:****I Voltage input type**

| Code | Define Voltage type | Code | Define Voltage type | Code | Define Voltage type |
|------|---------------------|------|---------------------|------|---------------------|
| 1    | "Y" 3P4W            | 2    | "△" 3P4W            | 3    | 3P3W                |
| 4    | 2P3W                | 5    | 1P2W                |      |                     |

## I Sensor type definition

| Code | Temperature sensor Type                                                                      | Oil sensor type                                                                              |
|------|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| 1    | Close for HET switch (low level is active)                                                   | Close for LOP (low level is active)                                                          |
| 2    | Open for HET switch (high level is active)                                                   | Open for LOP (high level is active)                                                          |
| 3    | VDO120°C                                                                                     | VDO 5 bar                                                                                    |
| 4    | VDO150°C                                                                                     | VDO 10 bar                                                                                   |
| 5    | Datcon                                                                                       | Datcon 7 bar                                                                                 |
| 6    | Murphy                                                                                       | Murphy 7 bar                                                                                 |
| 7    | Pt100                                                                                        | Note: 7-13 is defined and a custom project, details please refer to the instruction for use. |
| 8    | Note: 8-14 is defined and a custom project, details please refer to the instruction for use. |                                                                                              |
| 14   | 0-5V                                                                                         |                                                                                              |
| 15   | 0-5V                                                                                         | 4-20mA                                                                                       |
| 16   | 4-20mA                                                                                       |                                                                                              |
| 17   | PT100-850                                                                                    | Only in AIN2 / AIN3<br>Port input                                                            |
| 18   | K- Galvanic                                                                                  |                                                                                              |
| 19   | J- Galvanic                                                                                  |                                                                                              |

## I D-input definition

| Code | Config output type     | Code | Config output type    | Code | Config output type | Code  | Config output type |
|------|------------------------|------|-----------------------|------|--------------------|-------|--------------------|
| 0    | Not used               | 8    | GEN closed auxiliary  | 16   | Alarm mute         | 24    | Stop button        |
| 1    | User configured        | 9    | Low fuel switch       | 17   | Alarm reset        | 25    | Start button       |
| 2    | Oil pressure switch    | 10   | Lamp test             | 18   | Prohibit return    | 26    | Reserve            |
| 3    | Temp. high switch      | 11   | Lower speed limit     | 19   | Mutual standby     | 27    | Reserve            |
| 4    | Emergency stop         | 12   | Raise speed limit     | 20   | Panel lock         | 28    | Reserve            |
| 5    | Remote start off load  | 13   | Air-flap Closed       | 21   | Activate AUTO mode | 29    | Reserve            |
| 6    | Remote start with      | 14   | Pre-heat temp. switch | 22   | Activate MAN mode  | 30    | Reserve            |
| 7    | Mains closed auxiliary | 15   | Critical mode         | 23   | Activate TEST mode | 31    | Inhibit Genset     |
|      |                        |      |                       |      |                    | 32-41 | User configured    |

## I Relay output definition

| Code | Config output type | Code | Config output type | Code | Config output type  | Cod | Config output type |
|------|--------------------|------|--------------------|------|---------------------|-----|--------------------|
| 0    | Not used           | 31   | Underspeed level1  | 62   | Loss of pickup      | 93  | Reserve            |
| 1    | Crank              | 32   | Underspeed level2  | 63   | Scheduled run       | 94  | Reserve            |
| 2    | Fuel               | 33   | Overspeed level1   | 64   | Blinds control      | 95  | Reserve            |
| 3    | Gas valve          | 34   | Overspeed level2   | 65   | Cooler control      | 96  | Reserve            |
| 4    | Ignition           | 35   | Oil-P low level1   | 66   | Cooler1 control     | 97  | ECU water in fuel  |
| 5    | Shutdown alarm     | 36   | Oil-P low level2   | 67   | Reserve             | 98  | D-Input 1 alarm    |
| 6    | Warning            | 37   | High temp. level1  | 68   | Heater control      | 99  | D-Input 2 alarm    |
| 7    | Idle               | 38   | High temp. level2  | 69   | Heater1 control     | 100 | D-Input 3 alarm    |
| 8    | Preheat output     | 39   | Fuel low level1    | 70   | Reserve             | 101 | D-Input 4 alarm    |
| 9    | Speed raise        | 40   | Fuel low level2    | 71   | GCB open            | 102 | D-Input 5 alarm    |
| 10   | Speed lower        | 41   | GEN-V under 1      | 72   | MCB open            | 103 | D-Input 6 alarm    |
| 11   | Fuel pump control  | 42   | GEN-V under 2      | 73   | Mains V low alarm   | 104 | D-Input 7 alarm    |
| 12   | Genset running     | 43   | GEN-V over 1       | 74   | Mains V high alarm  | 105 | D-Input 8 alarm    |
| 13   | Auto mode          | 44   | GEN-V over 2       | 75   | Mains Hz low alarm  | 106 | Reserve            |
| 14   | Test mode          | 45   | GEN-Hz under 1     | 76   | Mains Hz high alarm | 107 | Reserve            |
| 15   | Man mode           | 46   | GEN-Hz under 2     | 77   | Mains alarm         | 108 | Reserve            |
| 16   | Maintenance        | 47   | GEN-Hz over 1      | 78   | Mains overload      | 109 | Reserve            |
| 17   | MCB fail to close  | 48   | GEN-Hz over 2      | 79   | Mains overcurrent   | 110 | Reserve            |
| 18   | GCB fail to close  | 49   | GEN-I over 1       | 80   | Soft unload         | 111 | Reserve            |
| 19   | Fail to start      | 50   | GEN-I over 2       | 81   | Off load            | 112 | Reserve            |
| 20   | Fail to stop       | 51   | GEN-KW over 1      | 82   | Reserve             | 113 | Reserve            |
| 21   | Mains              | 52   | GEN-KW over 2      | 83   | Reserve             | 114 | Mains power supply |
| 22   | GEN close/open     | 53   | Idle 1             | 84   | Emergency stop      | 115 | Reserve            |
| 23   | Audible alarm      | 54   | Idle 2             | 85   | Reserve             | 116 | Reserve            |
| 24   | Cooling down       | 55   | Reserve            | 86   | Reserve             | 117 | Reserve            |
| 25   | CAN data fail      | 56   | Reserve            | 87   | Reserve             | 118 | Reserve            |
| 26   | ECU warming        | 57   | Reserve            | 88   | Reserve             | 119 | Fuel high level1   |
| 27   | ECU alarm          | 58   | Reserve            | 89   | AUX1 low level1     | 120 | Fuel high level2   |
| 28   | Charge failure     | 59   | Reserve            | 90   | AUX1 low level2     |     |                    |
| 29   | Batt over volt     | 60   | Mutual standby     | 91   | AUX1 high level1    |     |                    |
| 30   | Batt under volt    | 61   | Oil-P sensor open  | 92   | AUX1 high level2    |     |                    |

IV、 Typical Wiring Diagram:

