**Highlights**

1. Input: true value single/three phase measure (bandwidth: up to 2.5KHz) more than 32 parameters, such as AC DC voltage/ampere/power/power factor/frequency/electrical degree/reactive power/power frequency, etc, mini power is 1mW, apply to energy-saving equipment, motor, lab, production line for electrical parameters integrated measurement.

2. Features: voltage/ampere ratio set freely, input isolation among phases, single/three phase three-wire three-factors, three-phase three wire two factors, three phase four-wire selectable;

3. Output: 3-line alarm output configurable, up to 8 segment output control, parameters: under-voltage/under-ampere/over voltage/over ampere/power/power factors selectable, analog output 4-20mA;

4. RS485 interface, MODBUS RTU protocol, connect directly to various equipment, computer and PLC;

5. Widescope power supply: regular: 80-265V AC/DC, 12-30V indicate when ordering;

6. Case class: IP65;

7. Widely used in automatical control of power system, factory power distribution, building automation, eg., single/three phase, voltage/current/power, three phase voltage/ampere integrated display control or up to 6 lines voltage/ampere display control; and power factor compensation control.

**Descriptions**

The instrument is to measure any range of AC/DC voltage or current set by user. It can be available for data reserve or top value reserve function. To measure or display true value of voltage/ampere/watt/power factor/frequency/energy consumption. Up to 3 alarm output. This instrument is widely applied to power system, factory power distribution, building automation etc. With RS485 for remote control.
3 Phase Power meter

Specifications

<table>
<thead>
<tr>
<th>Power supply</th>
<th>90-260V AC/DC 50/60Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measured objects</td>
<td>True value, simple/three phases/voltage/current/Watt/Power factor/frequency/energy consumption/reactive power</td>
</tr>
<tr>
<td>Direct input range</td>
<td>Voltage: 0-600V Current: 0-5A</td>
</tr>
<tr>
<td>P/T,C/T</td>
<td>P/T,C/T free set by software</td>
</tr>
<tr>
<td>Measured frequency range</td>
<td>0-400Hz</td>
</tr>
</tbody>
</table>
| Accuracy             | Voltage: ±0.2% ±0.1% F.S  
                        | Current: ±0.2% ±0.1% F.S  
                        | Watt: ±0.3% ±0.2% F.S  
                        | Power factor: ±0.01  
                        | Frequency: Display 0-400Hz ±1Hz |
| Analog               | 0-10V or 4-20mA selectable by software |
| Alarm                | RELAY: NO 250V AC 3A or 30V DC 3A COS ø=1 |
| Communication        | RS232 or RS485 with MODBUS RTU protocol |

Dimensions

[Dimensions diagram]
1. Simple phase connections (3 phase 4 wires simple connection, without PT, without CT)

Note:

Values are 8 digit LED display in total, each 4 in UP and DOWN. Normally displays DOWN 4 digits. Press the lamp flashes, then display the UP values.
2.3 phase 4 wires
without P/T, CT connections:

with P/T, CT connections:
3.3 phase 3 wires (power for A/B phase, c phase for display only, without PT)

Notes:

When there is no transformer, please connect voltage/amperage in series directly, e.g., the connection of 3 phase 4 wires without P/T, C/T connections.
4.3 phase 3 wires 3 phase (A/B phase, C phase for display only, with PT)

1. Check the connection and wiring if correct. Specially pay attention to the power supply terminals and signal input terminals, please do not wrong connect. As well pay attention to do not short the output terminals by strong current.

2. If the measurement is incorrect, please check if the connection is contrary.

3. Check input mode setting, especially 3 phase connection. The parameter is

**Malfunction Estimate:**

1. Check the connection and wiring if correct. Specially pay attention to the power supply terminals and signal input terminals, please do not wrong connect. As well pay attention to do not short the output terminals by strong current.

2. If the measurement is incorrect, please check if the connection is contrary.

3. Check input mode setting, especially 3 phase connection. The parameter is
3 Phase Power meter

Name of parts

1. 3 phase KW/Var/PF/Kwh/MW/Hz display window
2. Phase voltage measured value/parameter display window
3. 3 phase current measured value/parameter modified display window
4. Convert/Set/Confirm key
5. Shift/Clear key
6. Up key/Down key
7. Indication lamps
   - Hz: Frequency unit
   - MW: 3 phase A/B/C/∑ watt
   - KW: 3 phase A/B/C/∑ watt
   - PF: Var: 3 phase A/B/C/∑ watt power factor
   - Var: 3 phase A/B/C/∑ watt VAR
   - Kwh: 3 phase A/B/C/∑ watt energy consumption
   - Inactive power displays when Var&Kwh lamps on at the same time UA/UB/UC+ Phase A/B/C/∑ running value
   - ∑: Aummation of the phase
   - Al1/AL2/AL3: Alarm1/@/3
   - On: output Off: No alarm

Notes:
The instrument can measure both simple phase and 3 phase. Factory setting is 600V, 5A AC, P/T rate free set by software. Measure AC voltage more than 600V, please use the instrument with C/T. Measure AC current more than 5A, please use the instrument with P/T. Three phase different voltage/current input need.
Parameter setting

1. In the measuring estate, press and hold SET key for more than 3 seconds, enter control parameter setting menu. Press <</RST key, LED flashes, press ≈/≈ key to modify, and then press SET key to confirm. Press SET key to read the following parameters one by one.
2. The instrument will return to the measuring estate without any operation for 25 seconds.
3. Convert display (Frequency input is displayed in A phase only and voltage > 80V).
   A. Window A is mainly used to display KW/VAR/PF/Kwh of one of phase A/B/C/UC will show the present selected phase or summation. Press SET key can convert displaying KW/VAR/PF/Kwh.
   B. Window B is mainly used to display voltage of phase A/B/C, indicated by UA/UB/Uc lamps.
   C. Window B is mainly used to display current of phase A/B/C, indicated by UA/UB/Uc lamps.
4. Kwh value clear. Press SET key, and let the indication lamp Kwh is on, press «/CLR key to select the phase that you want to clear UA/UB/Uc, then press «/CLR key for two seconds till the window A display “0” or “0.000”
5. Power fail protection. Only for phase total Kwh value.
6. Window A power on display value setting: SET by thr parameter “DIS”

Operation process

Power On

Self-check
All LED on

Displays measured voltage range for phase A

Displays measured current range for phase A

Watt display
Voltage display
Current display

SET>3S
Enter parameter setting menu

Control parameter setting

SET>3S
Password setting, range 0-200,
LCK=100 means the parameter can be modified,
LCK=010 means the parameter can be read only,
but cannot be modified.

AI alarm value setting, range: -1999-1999

AI hysteresis value setting, range: 50.00
3 Phase Power meter

Al1 alarm value mode: There are, qwh,qwl,PFH,PFL,KwH,KwL,VAH,VAL,AAH,AAL,VBH,VBL,ABH,ABL,VCH,VCL,ACH,ACL stands for the high or low limit of Var, power factor, watt, phase A voltage, phase A current, phase B voltage, phase B current, phase C voltage, phase C current.

Al2 alarm value setting, range: -1999-1999

Al2 hysteresis value setting, range: 50.00

Al2 alarm mode: same as AM1

Al3 alarm value setting, range: -1999-1999

Al3 hysteresis value setting, range: 50.00

Al3 alarm mode: same as AM1

QW, PF, KW, VA, AA, VB, VA, VC, AC stands for Var, power factor, watt, phase A voltage, phase A current, phase B voltage, phase B current, phase C voltage, phase C current

Analog low limit setting value 4mA

Analog high limit setting value 20mA

Phase B P/T rate setting, (the same value for 3 phase)

Phase AC/T rate setting, (for simple phase 3 phase)

Phase B P/T rate setting, (the same value for 3 phase)

Phase A Voltage shift value, Display value = Measured value + PSV shift value, (for simple phase)

Phase B C/T rate setting, (for 3 phase only)

Phase C C/T rate setting, (for 3 phase only)

Decimal point setting for 3 phase current.
0:0000, 1:0000, 2:00.00, 3:000.0

Window A display selection:
0: KW 1: PF 2: Var 3: Kwh

Bit rate setting, the factory setting is 9.6k bit/s, if need other value, please mention when order

Communication address setting range 0-255

Single phase/3 phase terminal connection selection:
0: Single phase 1.3 phase 2 wire
2:3 phase 3 wire 2:3 phase 4 wire

Return to LCK menu

The parameters showed are factory setting
Warning

Please do not turn the power supply until all of the wiring is completed. Otherwise electrical shock, fire or malfunction may result.
Do not wire when the power is on.
Do not connect the unused terminals.
Do not turn on the power supply when cleaning this instrument.
Do not disassemble, repair or modify the instrument. This may cause electrical shock, fire or malfunction.
Use this instrument in the scope of its specifications.
Otherwise fire or malfunction may result.
The use life of the output relay is quite different according to its capacity and conditions. If use out of its scope, fire or malfunction may result.

Caution

This instrument should be installed in a domestic environment. Otherwise electrical shock, fire or malfunction may result. The operating temperature environment should be between 0(32°F) to 50(122°F).
To avoid using this instrument in environment full of dust or caustic gas.
To avoid using this instrument in environment of strong shock or concussion.
To avoid using this instrument in environment of overflow water or explosive oil.
In case the instrument is used in environment of nuclear control, medical equipment, auto, train, airplane or security equipment that need protections, please contact the manufacturer for details.
When it's for 8 digitals colorimeter, it displays in 2 windows 4 digits each. B window displays the high 4 digits, and C the low 4 digits. Unit: WH/KWH available for user’s choice.
Power Meter Modbus User Instructions

1. The instrument RS485 communication BPS is fixed at 9600 bits/s, start bit = 1, data bit = 8, stop bit = 1, starting and ending time > 5ms.
2. The format of the data reading and writing is same as standard Modbus protocol. Definition as follows:
   **Request:** (eg: send order to read AI current, 01 03 00 B9 00 02 15 EE)
   
   | 01 | 03 | 0185(00B9H) | 0002 | (15EE) |
   | ADD | COM | PV1 | Counts | CRC |
   
   **Response:** (eg: 01 03 04 6D 96 49 F3 71 66)

   | 01 | 03 | 04 | 6D96 49F3 | 7166 |
   | ADD | COM | Counts | PV1 | CRC |
   
   Return Power: 2 WORD
   PV1 = 6D96.49F3 = 6D96H + POINT 49F#H = 28054 + 18931/65536 = 28054.2888 (49F3H = 18931 6D96H = 28054)
   
   When Max bits is 1, means negative, viz. sign bit.
   Ed96 bit 15 = 1 is negative, viz. -6D96H
   
3. When setting parameters, can read multi-parameters: when writing, can write 1 parameter only every time
4. Commands:
   - 02H: read digital value/discrete I/O parameters
   - 03H: read holding registers parameters
   - 06H: write single holding register parameter value
   - 10H: write multi holding registers parameters value

**DW9 meter reading and writing parameter**

<table>
<thead>
<tr>
<th>Parameters address</th>
<th>Parameter type</th>
<th>COUNT numbers</th>
<th>Function</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>B4H(0180)</td>
<td>∑PF</td>
<td>2</td>
<td>3phase power factor</td>
<td>Read only</td>
</tr>
<tr>
<td>B7H(0183)</td>
<td>∑KW</td>
<td>2</td>
<td>3phase power</td>
<td>Read only</td>
</tr>
<tr>
<td>BAH(0186)</td>
<td>∑Q</td>
<td>2</td>
<td>3phase reactive power meter</td>
<td>Read only</td>
</tr>
<tr>
<td>BEH(0190)</td>
<td>∑KWH</td>
<td>2</td>
<td>3phase degree</td>
<td>R/W</td>
</tr>
<tr>
<td>55H(085)</td>
<td>∑QWH</td>
<td>2</td>
<td>3phase toyal inactive power</td>
<td>R/W</td>
</tr>
<tr>
<td>C2H(0194)</td>
<td>A-V</td>
<td>2</td>
<td>A phase voltage</td>
<td>Read only</td>
</tr>
<tr>
<td>C5H(0197)</td>
<td>A-I</td>
<td>2</td>
<td>A phase current</td>
<td>Read only</td>
</tr>
<tr>
<td>C8H(0200)</td>
<td>A-PF</td>
<td>2</td>
<td>A phase Power factor</td>
<td>Read only</td>
</tr>
<tr>
<td>CBH(0203)</td>
<td>A-KW</td>
<td>2</td>
<td>A phase power</td>
<td>Read only</td>
</tr>
<tr>
<td>CEH(0206)</td>
<td>A-VAR</td>
<td>2</td>
<td>A phase power rective power</td>
<td>Read only</td>
</tr>
<tr>
<td>D2H(0210)</td>
<td>A-KWH</td>
<td>2</td>
<td>A phase degree</td>
<td>Read only</td>
</tr>
<tr>
<td>D6H(0214)</td>
<td>B-V</td>
<td>2</td>
<td>B phase voltage</td>
<td>Read only</td>
</tr>
<tr>
<td>D9H(0217)</td>
<td>B-I</td>
<td>2</td>
<td>B phase current</td>
<td>Read only</td>
</tr>
<tr>
<td>DCH(0220)</td>
<td>B-PF</td>
<td>2</td>
<td>B phase power factor</td>
<td>Read only</td>
</tr>
<tr>
<td>Address</td>
<td>Description</td>
<td>Value</td>
<td>Type</td>
<td>Notes</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
<td>-------</td>
<td>------</td>
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</tr>
<tr>
<td>DFH(0223)</td>
<td>B-KW</td>
<td>2</td>
<td>B phase power</td>
<td>Read only</td>
</tr>
<tr>
<td>E2H(0226)</td>
<td>B-VAR</td>
<td>2</td>
<td>B phase rective power</td>
<td>Read only</td>
</tr>
<tr>
<td>E6H(0230)</td>
<td>B-KWH</td>
<td>2</td>
<td>B phase degree</td>
<td>Read only</td>
</tr>
<tr>
<td>EAH(0234)</td>
<td>C-V</td>
<td>2</td>
<td>C phase voltage</td>
<td>Read only</td>
</tr>
<tr>
<td>EDH(0237)</td>
<td>C-I</td>
<td>2</td>
<td>C phase current</td>
<td>Read only</td>
</tr>
<tr>
<td>F0H(0240)</td>
<td>C-PF</td>
<td>2</td>
<td>C phase power factor</td>
<td>Read only</td>
</tr>
<tr>
<td>F3H(0243)</td>
<td>C-KW</td>
<td>2</td>
<td>C phase power</td>
<td>Read only</td>
</tr>
<tr>
<td>F6H(0246)</td>
<td>C-VAR</td>
<td>2</td>
<td>C phase rective power</td>
<td>Read only</td>
</tr>
<tr>
<td>FAH(0250)</td>
<td>C-KWH</td>
<td>2</td>
<td>C phase degree</td>
<td>Read only</td>
</tr>
<tr>
<td>03H(0003)</td>
<td>Add</td>
<td>1</td>
<td>Communication address</td>
<td>R/W</td>
</tr>
<tr>
<td>04H(0004)</td>
<td>AL1</td>
<td>2</td>
<td>AL1 alarm value</td>
<td>R/W</td>
</tr>
<tr>
<td>08H(0008)</td>
<td>HY1</td>
<td>2</td>
<td>deviation alarm setting</td>
<td>R/W</td>
</tr>
<tr>
<td>0BH(0011)</td>
<td>AM1</td>
<td>1</td>
<td>Alarm mode</td>
<td>R/W</td>
</tr>
<tr>
<td>0CH(0012)</td>
<td>AL2</td>
<td>2</td>
<td>Alarm 2 value</td>
<td>R/W</td>
</tr>
<tr>
<td>10H(0016)</td>
<td>HY2</td>
<td>2</td>
<td>AL2 deviation alarm setting</td>
<td>R/W</td>
</tr>
<tr>
<td>13H(0019)</td>
<td>AM2</td>
<td>1</td>
<td>AL2 Alarm mode</td>
<td>R/W</td>
</tr>
<tr>
<td>14H(0020)</td>
<td>AL3</td>
<td>2</td>
<td>Alarm 3 value AL3</td>
<td>R/W</td>
</tr>
<tr>
<td>18H(0024)</td>
<td>HY3</td>
<td>2</td>
<td>AL3 deviation alarm setting</td>
<td>R/W</td>
</tr>
<tr>
<td>1BH(0027)</td>
<td>AM3</td>
<td>1</td>
<td>AL3 Alarm mode</td>
<td>R/W</td>
</tr>
<tr>
<td>1CH(0028)</td>
<td>BSL</td>
<td>2</td>
<td>Current output parameter setting</td>
<td>R/W</td>
</tr>
<tr>
<td>20H(0032)</td>
<td>BRL</td>
<td>2</td>
<td>Current output low limit setting</td>
<td>R/W</td>
</tr>
<tr>
<td>24H(0036)</td>
<td>BRH</td>
<td>2</td>
<td>Current output high limit setting</td>
<td>R/W</td>
</tr>
<tr>
<td>28H(0040)</td>
<td>PTA</td>
<td>2</td>
<td>3 phase voltage PT ratio setting</td>
<td>R/W</td>
</tr>
<tr>
<td>2CH(0044)</td>
<td>CTA</td>
<td>2</td>
<td>A phase current CT ratio setting</td>
<td>R/W</td>
</tr>
<tr>
<td>38H(0056)</td>
<td>CTB</td>
<td>2</td>
<td>B phase current CT ratio setting</td>
<td>R/W</td>
</tr>
<tr>
<td>3CH(0060)</td>
<td>CTC</td>
<td>2</td>
<td>C phase current CT ratio setting</td>
<td>R/W</td>
</tr>
<tr>
<td>3FH(0063)</td>
<td>ADP</td>
<td>1</td>
<td>Decimal point of current display setting</td>
<td>R/W</td>
</tr>
<tr>
<td>40H(0064)</td>
<td>DIS</td>
<td>1</td>
<td>Parameter display setting when power on</td>
<td>R/W</td>
</tr>
<tr>
<td>43H(0067)</td>
<td>LIN</td>
<td>1</td>
<td>3 phase wire-connection type setting</td>
<td>R/W</td>
</tr>
</tbody>
</table>