

Technical Specifications
of
Three Phase Static Multi Function Meter
(SPU301)



Class 1.0S

(with ref. to IS:13779)

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General Specifications

1) GENERAL:

- Meter measures:
 - ✓ Active, Reactive and Apparent energies in all four quadrants in forward and reverse directions
 - ✓ Instantaneous parameters – phase wise voltages and currents, Power, Frequency, Rising Demand, Maximum Demand, Phase sequence, Power Factor, Date and Time.
- Eight Energy accumulators – KWh, KVArh (lag and lead) and KVAh in forward and reverse directions,
- KWh and KVArh pulse output LEDs placed on front panel,
- LCD with backlight feature and LCD segments for indicating presence of voltages and currents in each phase separately is available,
- Front Key to stop and scroll to view display parameter,
- RTC with battery backup is used for time keeping and has a calendar of 100 years,
- Data collection is possible through RS485 Communication with MODBUS RTU to PC and can also be done through Power Line Communication.
- Conforms to standards IS13779 and other relevant standards depending on the configuration.

2) METER FEATURES:

2.1) *Maximum Demand (MD) Registers:*

- MD registers can be programmed for KVA or KW,
- Integration Period is of every 30min,
- At the end of each fixed integration period average power for that period is calculated, If this value is greater than the already existing value then this is stored as the MD.

2.2) Tamper/Failure Record:

2.2.1) Tamper Types – Phase wise:

Parameter	Condition
Voltage Failure	Phase voltage < set threshold value (default - 55% Vn)
Current Failure	Phase Current < set threshold value (default - 2% Ib)
Voltage Unbalance	(Maximum of three phase voltages - any of the other phase voltage) > 30% Vn
Current Unbalance	(Maximum of three phase currents - any of the other phase current) > 20% Ib
Current Reversal	Whenever a phase current is reversed, the meter records a current reversal for that phase.

Vn – Nominal Voltage, Ib – Basic Current.

2.2.2) Tamper Record:

- Cumulative Tamper Count – Total no. of times the tamper occurred since Installation (rolls over 0 to 99)
- Tamper occurrence date/time and duration of tamper

Note: Tamper duration does not include power failure duration, which may occur during the period of any continuing tamper.

2.3) Display Details:

- Liquid Crystal Display (LCD) type – The parameters calculated by the meter are displayed on a custom built LCD.
- Selectable Parameters – Can select any out of 45 parameters.
- Scroll rate – The scroll rate of the display parameter scroll in steps of 4secs.
- A key is provided to stop the scroll to view the particular parameter.

2.3.1) Display Parameters:

- Time,
- Date,
- Meter ID,
- Serial No.,
- Frequency,
- Phase Sequence,
- Cumulative KWh, KVAh, KVArh lag, KVArh lead,
- Import KWh, KVAh, KVArh Lag, KVArh Lead,
- Export KWh, KVAh, KVArh Lag, KVArh Lead,
- Voltages – R ph, Y ph, B ph,
- Current – R ph, Y ph, B ph,
- Power Factor (p.f.) – R ph, Y ph, B ph,

- Total KW,
- KVA_r (R,Y,B),
- Total KVA_r,
- KVA (R,Y,B),
- Total KVA,
- Rising Demand (RD),
- Maximum Demand (MD),
- Voltage Unbalance,
- Voltage Failure,
- Current Unbalance,
- Current Failure,
- Current Reverse.

2.4) Communication:

2.4.1) Communication Interface:

- Through RS485 Communication with MODBUS RTU,
- Baud rate : 9600
- Power Line Communication using Power Line Node and Concentrator.

2.4.2) Data Collection – Energy Accumulators (Records will be in meter):

- Eight energy accumulator records the following energies:
 1. Forward Active Energy,
 2. Forward Lagging (Inductive) Reactive Energy,
 3. Forward Leading (Capacitive) Reactive Energy,
 4. Forward Apparent Energy,
 5. Reverse Active Energy,
 6. Reverse Lagging (Inductive) Reactive Energy,
 7. Reverse Leading (Capacitive),
 8. Reactive Energy Reverse Apparent Energy.
- Cumulative for all energies are available,
- Tamper Data,
- Instantaneous values.

Note:

- (i) Field Programmability of the meter is optional based on the customer requirement,
- (ii) Each meter is given a unique number at the factory.

2.5) Pulse Counting Method:

- KWh and KVA_rh pulse output LEDs are provided on the front panel,
- It shows 3200 pulses/KWh for 3ph 4W 3*240V / 10-60A.

Safety Precautions:

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices.
- Only qualified electrical workers should install this equipment. Such work should be performed only after reading this entire set of instructions.
- If the equipment is not used in a manner specified by the manufacturer, the protection provided by the equipment may be impaired.
- NEVER work alone.
- Before performing visual inspections, tests, or maintenance on this equipment, disconnect all sources of electric power.
- Pay particular attention to the design of the power system.
- Consider all sources of power, including the possibility of back feeding.
- Turn off all power supplying the three phase utility meter and the equipment in which it is installed before working on it.
- Always use a properly rated voltage sensing device to confirm that all power is off.
- Before closing all covers and doors, inspect the work area for tools and objects that may have been left inside the equipment.
- The successful operation of this equipment depends upon proper handling, installation, and operation.
- Neglecting fundamental installation requirements may lead to personal injury as well as damage to electrical equipment or other property.
- High voltage testing may damage electronic components contained in the three phase utility meter.
- Ensure that no wiring strands are straying outside after connecting wires.
- Three phase utility meter should be installed in a suitable electrical enclosure.

Failure to follow these instructions will result in death or serious injury

Technical Specifications

Accuracy	: IS13779 (Class 1.0S)
Nominal Voltage	: 3Ph 4W – 415VAC (-40% to +20%)
Nominal Current	: Whole Current (10-60A)
Starting Current	: 0.2% Ib (Class 1.0)
Power Factor	: 4 quadrant operation
Frequency	: 50Hz, $\pm 5\%$
Meter Constant	: 3200 impulses/KWh
Resolution	: 0.1
Display	: LCD (4x16 – Blue with White character)
Communication	: RS485 with MODBUS RTU
Temperature	: Operating Temp. – (-10 to 55)°C Storage Temp. – (-20 to 70)°C Humidity 5 to 95% RH at 50°C (Non-Condensing)
Dimension	: (190x170x96)mm
Weight	: 1.5Kgs. (app.)