

MSPDCL

1 –Phase, 5 – 30 Amps Import –Export (NET) Meter

[Technical Specification]

Standards Applicable

Sl. No	Standard No	Title
1.	IS 13779/1999	Specification of AC Static Watt hour meters, class 1.0
2.	IS 12346 (1999)	Specification for testing procedure for electrical and electronic items
3.	IS 11000 (1984)	Fire Hazard testing
4	IEC 62052-11 (2003)	Electricity Requirement (AC) General requirements test and Test conditions for A.C. Static Watt hour meter for active energy Class 1.0
5.	IEC 62053-21 / 2003	A.C. Static Watt hour meter for active energy Class 1.
6.	IEC 61036-1996	Specification A.C. static Watt hour meters, Class 1.
7.	CBIP Technical Report No. 304 & any amendment thereof	Specification A.C. static Electrical Energy meter.
8.	IS 15959	Data exchange for electricity meter, reading, tariff and load control – companion specification.
9.	IS: 14772/2000	General requirement for enclosures for accessories for household and similar fixed electrical installation specification.
10.	IS 15707(2006):	Testing Evaluation Installation and maintenance of AC electricity code of practice.
11	CEA Regulation 2006	Installation & Operation of Meters Dated:17/03/2006

Rated Electrical Parameters

The meter is rated for the following input conditions:

S. No.	Items	Specified Range	Operating	Limit Operating Range
1.	Connection type	Single phase 2 wire direct connected		
2.	Voltage	230 volts P-N		+20% to -40% V_{Ref}
3.	Current	5 - 30 A		Withstands 120% I_{Max}
4.	Starting Current	0.2% of basic current		For both circuit phase & Neutral for Import & Export mode

5.	Power Variation	Supply	0.8 to 1.1 V _{ref}	0.6 to 1.2 V _{ref}
6.	Frequency		50Hz	±5% (47.5 to 52.5)Hz
7.	Power Factor		0 to 360 degree or Zero(lag)-Unity-Zero(Lead)	
8.	Accuracy		1.0	20% to -30% V _{Ref}
9.	Withstand Voltage		440V up-to 5 minutes between Phase – Phase	
10.	Burden Voltage Circuit		1W/4VA	
11.	Burden Current Circuit		<1VA	

Functional Specifications

Sr.No	Function/Feature	Details
1.	Measured Instantaneous Parameters	<p>The meter computes the Electrical parameters on real time basis. Parameters are:</p> <ul style="list-style-type: none"> • • /Time • Voltage • Current (with import - export sign) • Power Factor with Lead/Lag sign • Frequency • Active demand with sign /Apparent Demand
2.	Measured Energy Parameters	<p>The meter measures total energy consisting of 50 Hz energy and harmonic energy. Total displayed energy include harmonic energy i.e. kWh = Fundamental + Harmonics.</p> <p>The meter correctly measures the energy within permissible accuracy limits at all power factor range from 0 to 360 degree, 1 to -1. Following Energy parameters are measured</p> <ul style="list-style-type: none"> • Active Energy (KWh) Import

		<ul style="list-style-type: none"> • Active Energy (KWh) Export • Apparent Energy (KVAh) <p>KVAH is vector sum of Kwh, KVArh (Lag) and KVArh(Lead) .</p>
3.	MD Registration	<p>The meter continuously monitors the demand (KW) and update the Maximum Demand for the month.</p> <p>Meter stores MD in every 30 minute period along with date & time. At the end of every demand integration period, new MD will be computed & compared with previous MD and store whichever is higher and the same will be displayed.</p>
4.	MD Reset	<p>The MD will reset automatically at predefined Date & Time (Default last day of every month at 24:00hrs).</p> <p>MD can be reset manually by MD Reset Button or through CMRI with proper password based security.</p>
5.	Billing Data	<p>At billing date/time ,meter stores following details as billing data :</p> <ul style="list-style-type: none"> • Billing date and Time • Cumulative Active Energy • Cumulative Apparent Energy • Maximum demand (KW) • Average Power Factor • Power on hours • Tamper Counts
6.	Load Survey data	<p>The meter has NVM (Non Volatile memory) to store load survey data for 30-minutes block interval for 60 days.</p> <p>Available Load survey parameters are:</p> <ul style="list-style-type: none"> • Phase voltages • Phase current • Active Demand (KW)(import & Export both) • Active Energy (KWH) (import & Export both)
7.	TOD Metering(optional)	Meter is capable of doing TOD metering for KWH and MD in

		KW with 8 configurable time zones.
8.	Midnight Energy snaps	<p>Last 30 days midnight Kwh energy stamps are stored in meter.</p> <p>Power on duration for the day also logged at midnight.</p>
9.	Events/Tampers	<p>Meter has provision to detect & log tampering conditions with instantaneous electrical parameters snap Shot details.</p> <p>It has provision to log 50 no. Of events with data, updated on FIFO basis. It has compartments to store various tamper data in different blocks. The visual alert/indication is also provided on meter display for present status.</p> <p>Different tamper condition monitored and logged are:</p> <ul style="list-style-type: none"> • Voltage Failure • Low Voltage • Neutral Disturbance • High Voltage/High Frequency <p>Meter detects & log the change in configurations i.e. RTC setting, TOD parameters.</p>
10	Compatibility for external influencing signals	<p>The meter is designed in such a way that conducted or radiated electromagnetic disturbance as well as electrostatic discharge do not damage or substantially influence the meter and its performance.</p> <p>The disturbance to be considered are:-</p> <p>23.5.1. Harmonics</p> <p>23.5.2. Voltage dips and short interruptions</p> <p>23.5.3. Conducted transients</p> <p>23.5.4. D.C. and AC magnetic fields</p> <p>23.5.5. Electromagnetic fields</p> <p>23.5.6. Electrostatic discharges</p> <p>23.5.7. High voltage sparks</p> <p>23.5.8. High frequency</p>
11	Self Diagnostics feature	Meter has Self Diagnostic facility i.e. RTC, Memory & Display check (on LCD only). The same can be viewed on the BCS.

12	RTC	The meter has a built-in calendar & clock, having an accuracy of +/-5 minutes per year or better. A separate internal Lithium battery back-up is provided for continuous operation of meter RTC for at least two years under meter un-powered conditions.
13	LCD	The meter has a 7-segment Liquid Crystal Display with backlit to clear visualization of parameters. It has (6+1) total 7 digits to display the Energy & Demand values including decimal values. The right most digits are clearly distinguishable from other digits (small in size from others). The values on Display have proper indication/Unit of Measures to identify. Enunciate to show PF (Lag/Lead), Current direction, Phase/current availability, present Tamper status, and Magnetic influence are provided on LCD.
14	Display Modes	<p><u>Push Mode</u> : This will activate when push button is pressed. Display parameters will scroll on pressing up -down button. The display will be switched to Auto mode if no button is pressed for 5 minutes.</p> <p><u>Auto mode</u> : The meter will scroll the display parameters automatically on its LCD in auto mode.</p>
15	Display Parameters	<p>Required parameters can be configured on display.</p> <p>Auto display Mode parameters :</p> <ul style="list-style-type: none"> • LCD Display Segment Test (for 3 Seconds) • Cumulative Active Energy-Kwh (Import) • Cumulative Active Energy-Kwh (Export) <p>Manual Display Mode parameters :</p> <ul style="list-style-type: none"> • Display test • Meter serial no. • Real Date • Real Time • Cumulative Active Energy-Kwh (6 + 1) (Import) • Cumulative Active Energy-Kwh (6 + 1) (Export) • Cumulative Active Energy-Kwh history -1 (most recent) (Import) • Cumulative Active Energy-Kwh history -1 (most recent) (Export) • Current Maximum Demand in KW (2 + 3 digits) (Import) • Current Maximum Demand in KW (2 + 3 digits) (Export) • History-1 Maximum Demand (KW) (2 +3 digits) (

		<p>Import){Lag/Lead}},</p> <ul style="list-style-type: none"> • History-1 Maximum Demand (KW) (2 +3 digits) (Export) • Net Instantaneous Active Power in KW (2 +3 digits) • Instantaneous Voltage (Volts) (3 + 1 digits) • Instantaneous Current in phase circuit (Amps) (2 + 3 digits) • Instantaneous Current in neutral circuit (Amps) (2 + 3 digits) • Instantaneous power factor (1 + 3 digits) • Instantaneous Frequency • MD reset count • Cumulative tamper count • Cumulative tamper count –magnet • Current related Tamper status • Other Tamper status <p>Parameters on display are configurable.</p>
16	LED	RED calibration LED pulsed/Kwh is given on meter front
17	Memory	The meters have non-volatile memory, so that the registered parameters will not be affected by loss of power. The non-volatile memory has a minimum retention time of 10 years.
18	Communication facilities	The meter is provided with a galvanically isolated optical communication port (IEC 1107) with removable cover and with locking arrangement so that it can be easily connected to a HHT (Hand Held Unit) / laptop for data transfer. The optical communication port will also have a sealing provision.
19	BCS(Base Computer Software)	Downloaded data by HHT will be uploaded in Base computer software. Using BCS data can be downloaded directly by laptop. Facilities in BCS are: <ol style="list-style-type: none"> 1. All stored data like billing, load survey, tampers, Events, transactions can be viewed in BCS. 2. Load survey parameters are available in matrix and in graphically format (weekly, monthly or day wise). 3. Data can be exported in excel files and required reports can be generated by BCS

