Annexure – C1

Technical Specification Three Phase Programmable Meter

Standard	:	The meter shall be designed construction and tested in accordance with IEC 62052-11, IEC 62053-21 and IEC 62053-31 or equivalent standard unless otherwise specifically mentioned.
General	:	
Installation	:	Outdoor housed in a weatherproof box to be mounted in poles.
Type	:	Solid state programmable type.
Application	:	Registration of kWhr, kVArh, kVAh, kW, kVAr, kVA, volts. On poly phase supplied for balanced/ unbalanced bi– directional load.
Connection	:	3-Phase, 4-wire.
Numbers of Element	:	3 (three) element.
System Frequency	:	50 Hz.
Rated voltage	:	415 volts (Phase to Phase)
Maximum System Voltage		460 volts (Phase to Phase)
Rated Current	:	Basic Current ≤ 10A, Maximum Current ≥ 100A.
Staring Current	:	≤ 40mA as per IEC
Register	:	Solid State types register, Double Tariff. The display shall have the following registers: - Time & Date - Instantaneous phase voltages. - Total Voltage breakdowns counter register

Energy Register:

The Energy Register shall have 7 (seven) digits with 1 (one) decimal digit. High resolution energy register shall also be provided for dial testing (accuracy testing in field). The following Register should be composed at least:

- Register 1: Active Energy forward direction plus Active Energy reverse direction (i.e. forward energy registration)
- Register 2: Reactive Energy leading part forward direction.
- Register 3: Reactive Energy lagging part forward direction.

To facilitate dial testing, the meter shall be capable to lock a parameter (Such as high resolution active energy register in case) on the display of the longer duration through long duration press of push button. The same parameter shall get unlocked Esther at midnight automatically or through next long duration push button press manually.

The Energy registered values shall be stored in to theirs Energy value stores every end of the months controlled by an internal calendar clock.

Maximum Demand (MD) Register:

The MD Register shall have minimum 4 digits. Each MD resister shall have an instantaneous rising demand, maximum demand and maximum cumulative demand register.

The following MD register should be composed at least:

- Register 1: Active power forward direction plus Active power reverse direction (i.e. forward energy registration)
- Register 2: KVAR max. leading part forward direction.
- Register 3: KVAR max. lagging part forward direction.

Number of Maximum Demand (MD). The MD values shall be stored into theirs MD registers and into their stores every end of the months controlled by an internal calendar clock (cumulating).

- Integration period of maximum demand: 30 minutes.
- Error in registration of maximum demand in KW must not exceed +/- 1% of the rating over effective range.
- Display of the register has to be LCD solid state display type.
- The LCD shall be in a bezel casing and shall sustain operation at temperature minimum 70°C.
- It shall be automatic and shows consecutively and continuously the register described above in the auto-scrolling mode.

It shall also be possible to configure the meter, at factory premises only, for an additional display list which goes activated on pressing the push button. Display of the meters shall be durable in climatic conditions as mentioned above

Memory Storage:

Memory shall be readable through IEC 1107 Mode A, B, C the meters shall be able to execute the following formatted commands.

- Carry out reset
- Set identification number
- Set time and date
- Read time and date
- Erase stored values
- Read load profile

The reading of memorized load profile data should be paramaterizable or determined via a formatted command.

Memory reading:

The power supply of the Meter shall be from all three phases. If one or two phases are disconnected from the supply side, the meter shall still function with satisfactorily as per prevailing electrical conditions.

Meter itself power:

As per IEC or equivalent standard for alternating current solid states meters. Class 1.0 for active energy and maximum demand register. Class 2.0 for reactive energy.

Accuracy Class:

The Time Switch shall be Built-in Type and shall be designed to perform a preset cycle of operation. The Time Switch shall reset MD at the predefined date and time of each calendar month automatically and MD of the last 6 (six) previous months shall be stored in the meter memory. In the event of failure of power supply and battery, at the same time set memory shall not be lost i.e. the set program shall be recorded in non-volatile memory. Time switch shall have protection against manual overriding of the programmed setting. The maximum error shall be kept within +/- 2 seconds per day. Time error adjustment facility shall be provided.

Time Switch:

Each meter must be provided with a non-rechargeable battery, which maintains the internal real time clock (RTC) of the meter for proper functioning of all RTC dependent features. The guaranteed life of the battery should not be less than 5 (five) years and shall have provision for easy replacement at factory premises.

Battery reserve:

Memory shall be readable through IEC 1107 Mode A, B, C the meters shall be able to execute the following formatted commands.

- Carry out reset
- Set identification number
- Set time and date
- Read time and date
- Erase stored values
- Read load profile

The reading of memorized load profile data should be paramaterizable or determined via a formatted command.

Construction:

The meter housing shall be made of steel or die cast aluminium. ABS Resin/polycarbonate toughened glass/stamped metal for the meter case may also be acceptable.

Identification of material:

The class of material of the housing related parts shall be identified according to the international standard.

Terminal:

Non-symmetrical, bottom entry, front connection, and connection type with extended terminal cover: Minimum 8 Terminals to accommodate with an internal diameter of 9.5mm to accommodate 35 sq. mm size of cable. The terminal cover for the offered energy meter shall be extended type, and which can be sealed independently. The terminal cover shall be provided with suitable cut/holes to allow easy connection/termination of cables. There shall be minimum 60 mm free space between bottom of the terminal and the bottom of the terminal cover.

Service life:

Shall be minimum 15 (fifteen) years.

Visual Indication of Operation:

The Meter shall be provided with a Visual Indications of its operation i.e. (LED) or (LCD) for
-Voltage indication for every phase
-indicator for active energy flow
-indicator for reactive energy flow

Communication Port:

The Meter shall provide with a communication port to allow down loading of desired information stored in the meter to a PC via HHU (HHU/Data Logger).

Hardware Lock:

Meter shall provide an additional security through an internal hardware lock which prevents resetting of energy registers. the same shall be possible through software command only once the relevant pins in the main circuit board are shorted. Shorting of these pins shall not be accessible only alter opening of meter front cover.

Ultrasonic welding:

Meter front cover and base shall be ultrasonically welded so as to avoid unauthorized opening of meter front cover.

Technical Features:

The Meter cover shall be provided with a window of toughened glass/transparent hard plastic, through which meter reading can be observed. Each programmable meter shall have the provision for adjustment of loads by programming. The terminal cover shall be screwed having sealing facility. The hole of sealing screw shall be 2mm minimum in diameter. The terminal cover shall have connection diagram inside. The case shall have provision for earthing, if necessary.

The meter shall have nameplate, distinctly marked with the following in addition to all standard data.

(i) The word "TSS" with monogram of TSS;
(ii) Voltage and current rating;
(iii) Frequency: 50 Hz;
(iv) Accuracy class: 1.0;
(v) Year of manufacture;
(vi) Serial number;
(vii) Meter constant (if any);
(viii) Type of Meter: 3 P, 4 W.

Battery Reserve:

Each meter must be provided with a non-rechargeable battery, which maintains the internal real time clock (RTC) of the meter for proper functioning of all RTC dependent features. The guaranteed life of the meter shall not be less than 5 (five) years and shall have provision for easy replacement.

External Sealing:

Provision shall be made to enable the meter to be sealed externally to prevent unauthorized entry. The sealing screw holes must be 2mm diameter to accommodate a twist tight wire seal.

Special Condition:

The factory adjustment shall be calibrated at rated voltage with PF 0.5 (lag) and to unity to have a maximum error limit of +/- 1% at 10% to 100% of rated current**.**

Documentation:

The followings to be submitted along with the bid, without which the bid shall be considered for non-responsive.

(i) Technical Specification of the item(s) bided;
(ii) Schematic wiring diagram of offered equipment;
(iii) Outline dimension of offered equipment;
(iv) Printed catalogue of the offered LT Whole Current Meter etc. clearly identifying with red pen the types, values, performance curves, wiring diagrams, dimensions etc.
(v) Printed catalogues of offered meters must contain all major technical information's such as accuracy class, power loss, insulation strength, voltage class, test data, fixing details, weight schematic diagram etc. All performance curves such as error curves due to variation of voltages, frequencies, temperature, load, powers range 10% to 120% of the rated value, power factors range 0.5 lagging to unity shall also be included.

(vi) A declaration on sustaining of LCD display operating temperature minimum 70°C shall accompany the bid.

(vii) Type test report as per relevant standard in English along with the test results of the offered Meters shall be from the following Independent Testing Laboratories:

a) KEMA, The Nederland,
b) Essef, France,
c) Office of the Gas and Electricity Market, UK,
d) Under Writer's Laboratory, USA,
e) MET Laboratories, USA.

The bidder shall also submit the type test reference number and contact person at the independent test laboratory to verify the test report.

(viii) At least 2 (two) samples from each category of offered type Meters shall be submitted along with the bid. Failure to pass the required test of samples will cause the rejection of bid.

(ix) ISO Certification on manufacturing process.

Data Schedule

(To be filled up by the bidder otherwise the bid will not be considered for evaluation)

Sl. No.	Description	Unit	Required Specification	Manufacturer's Particulars
01	Reference standard		IEC or Equivalent Standard	
02	Mfg's Name and Address		Shall be mentioned	
03	Mfg's Type/ Model		Shall be mentioned	
04	Connection		3-Phase, 4-Wire, CT& PT Operated.	
05	Installation		Outdoor type	
06	Number of Element		3	
07	Rated Voltage	Volt.	400	
08	Rated frequency	Hz.	50	
09	Variation of Voltage	%	+ 10 to - 40	
10	Accuracy Class		1.0	
11	Rated Current - Basic Current - Maximum Current	 A A	 ≤10 ≥100	
12	KWh Register Type For Type-A: For Type-B:		Shall be mentioned	
13	Number of Digit (Integral & Decimal)	7	Shall be mentioned	
14	Losses at nominal load.	Watt & VA	Shall be mentioned	
15	Starting Current.	MA or 0.4% basic current	Shall be mentioned	

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Sl. No.	Description	Unit	Required Specification	Manufacturer's Particulars
16	Maximum Demand Register - Type of Register - Integration period. - Cumulating Time - Class of Accuracy - Resetting period - Cumulative MD transfer Cycle - Timing Devices - No. of Digit(Integral & Decimal)		Shall be mentioned	
17	Size of Digit of Display	W x H	4 x 8 mm	
18	No. of Terminal	Nos.	10 (ten)	
19	Battery Reserve and life	Hours and Years.	150 hours and 10 (ten) yrs.	
20	Time of interval for calibration	Year.	5 (five)	
21	Service life	Year	10 (ten)	
22	Weight of Meter	Kgs.	Shall be mentioned	
23	Terminal size of connector for using conductor	Sq.mm.	35	
24	Dimension	(mm x mm x mm)	Shall be mentioned	
25	Outlined Drawing/Leaflets		Shall be mentioned	
26	Warrantee	Year.	One year after installation or 1.5 year after the delivery, which ever concludes earlier.	
27	Year of Manufacture		Shall be mentioned	
28	Type Test Report		Shall be mentioned	
29	Performance curve for balanced and unbalanced load.		Shall be mentioned	
30	Country of Origin/ Place of Manufacturer/ Place of Testing.		Shall be mentioned.	

Signature of the Bidder **Signature of the Manufacturer**