OFFICE OF THE ENGINEER-in- CHIEF /METERING
C-3, SHAKTI VIHAR, P.S.E.B., PATIALA

Expression of interest for supply of 220/132/66/33KV/11KV/110 Volt Trivector, Static, Uni-Directional Energy Meters of Accuracy Class 0.2S

The Punjab State Electricity Board intends to approve the firms for Private Sale of 220/132/66/33KV/11KV/110 Volt Trivector, Static, Uni-Directional (Forwarded) Energy Meters of Accuracy Class 0.2S to consumers of PSEB. Bidders, who are manufacturer of these types of meters are requested to submit 3 no. sample meters (2 no. sample meters without ultrasonic welding and 1 no. sample meter with ultrasonic welding) along with their serial numbers/meter constant upto 15.04.09. The sample meters shall be tested in PSEB Lab in order to examine its acceptability. Further, the short listed firms may be asked to get their sample meters tested from any of the NABL accredited lab at their cost. The detailed technical specification (MQ-99) of the meters is available on PSEB website www.psebindia.org.

Interested parties may obtain further information required, if any, at the address below during office time (09.00 to 17.00 Hrs.) on working days. Sample meters, along with latest type test reports from Govt./ NABL accredited lab, must be delivered to the address given below by 15.04.09.

Engineer-in-Chief/Metering
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TECHNICAL SPECIFICATION FOR SUPPLY OF 220/132/66/33KV/11KV/110 VOLT TRIVECTOR STATIC UNI-DIRECTIONAL (FORWARDED) ENERGY METERS OF ACCURACY CLASS 0.2S TO PROSPECTIVE CONSUMERS OF PSEB (MQ-99).

1. SCOPE : This specification covers requirements for the design, manufacture, supply and delivery of current transformer (CT) -/5Amp.Or -/1Amp., Potential Transformer (PT) operated 220/132/66/33KV/11KV/6.6KV or any other voltage /110V Trivector Static UNI-DIRECTIONAL (FORWARDED) Energy Meters, Tariff and load survey type with initial and sustained accuracy of class ***0.2S*** suitable for three phase three wire/four wire connections, solidly earthed system with balanced and un-balanced loads for a power factor range from zero to unity (lagging and leading). The meter shall be three phase four wire but shall also be suitable for three phase three wire connection.

2. STANDARD : While drafting this specification, reference has been made to the following Indian and International standard specification. In case, certain details are not covered in this specification, the relevant Indian/International standard shall be applicable :

IEC-62052 Static Watt hour meters for class 0.2.
IS -9000 Environmental Testing.
IS -14697 AC static Watt Hour Meters for Active energy (Class-0.2S) and reactive energy class 0.5S
CBIP Tech. Report 111 for common Meter Recording instrument and optical Ports in use.
CBIP Tech.Report No.88 (Revised with Latest amendment) for effect of external magnetic effect.

3. CLIMATIC CONDITIONS : The meters shall be suitable to work satisfactorily under the following climatic conditions :-

i)	Minimum ambient temperature	-2.5°C
ii)	Maximum ambient temperature	55°C
iii)	Minimum relative humidity	26%
iv)	Maximum relative humidity	95%
v)	Altitude	up to 1000 meter above Sea level

4. SUPPLY SYSTEM: The supply shall be through CT & PT connection of each sub station feeder of 220/132KV/66KV/33KV/11KV/6.6KVor any other voltage /110V.

4.1 Rated secondary voltage Vref.	110V Phase to Phase **(110/√3V P.N.)**
4.2 Rated secondary current of CTs Ib.	5Amp. Or 1Amp.
4.3 Voltage variation	V reference + 10% to –35%
4.4 Frequency	50HZ +/- 5%
4.5 Power Factor	Zero to unity (lagging or leading)
4.6 System	Three phase, four wire/three wire.
4.7 Max. continuous current	120% Ib.

5. METERING SYSTEMS :

5.1 Trivector
Electronic meter. -Digital display, optical port for data un-loading & communication.
-Direct recording without multiplying factor. The factor shall be entered depending upon CT & PT ratio with mounting features for installing on/in the feeder panels.

- Integration period shall be 30 minutes
- Billing data shall be recorded in non volatile memory
- Blinking LED corresponding to pulses/per KWH and KVARH

5.2 Interface Unit - In-built RS-232 Suitable for remote monitoring of metering data.

5.3 Remote Monitoring - The meter shall have facility for remote monitoring and the supplier will provide the same without any extra charges.

NOTE : In case, the supplier of Trivector TPT static meters is already supplying or have supplied Trivector TPT static meters to PSEB/customers of PSEB then the protocol detail will be the same and compatible for remote monitoring.

6. QUANTITIES TO BE MEASURED/MONITORED :

The static meters shall be capable of measuring and displaying (with scrolling time 15 sec. Approx.) the following electrical quantities within accuracy requirement 0.2S for poly phase balanced or unbalanced loads:-

Real time clock
Active energy :KWH/MWH
Apparent Energy :KVAH/MVAH
Instantaneous running active load. :KW/MW/KVA/MVA/KVAR
Power factor :P.F.(LAG/LEAD)
Present max. Demand. :KVA/MVA
Rising demand with elapsed time. :KVA/MVA

The remaining parameter i.e. CT ratio of meter, Reactive Energy both import & export (KVARH/MVARH), instant reactive load both import & export (KVAR/MVAR). Frequency (Hz), cumulative demand (KVA/MVA), No. of MD resets count shall be available through Push button.

Various instantaneous quantities e.g. Phase wise detail of voltage/ current/ KVA/Power factor and frequency shall also be displayed on the meter. The meter should have facility to come in Auto scroll mode if push button is not pressed for five minutes.

Meters shall be provided with real time clock (accuracy +/- 3 min./Yr.) which shall have auto-correct/reset feature through CMRI/Lap top once in a year.

Demand should be available for at least seventy (70) Days. All the MDI registers should be with date and time. Also Daily Energy Data at 00.00 Hrs. for audit purpose shall also be available for last seventy days.

7. AUTO DISPLAY : The meter shall have legible LED/LCD of minimum 6 whole digits auto cyclic display with scrolling time 15 sec. The display shall be meet with condition of minimum roll over period stipulated in clause 6.10 of IS:14697:1999. The 2 line display with orange back lit will be appreciated. The following quantities shall be auto-displayed with scrolling time of 15 secs. approximately without any dead time after each scroll.

1. Meter Sr. No.
2. R.T.C.
3. Active Energy (Import & Export) KWH/MWH.
4. Apparent Energy (Import & Export) KWH/MWH
5. Instantaneous load KW/KVA/KVAR.
6. Power factor. Lagging/Leading.

7. Current Max. Demand (Recorded). KVA/MVA.
8. Rising demand with elapsed time.

The size of digit shall be minimum 10mm height. In case a single display is being used to display multiple values, it shall be possible to display the contents of relevant memories. While displaying the memories the identification of each value shall be possible. Display must be electronic. The data retrieved in CMRI should have minimum eight digits for billing and other purposes. The minimum guaranteed life in years of LCD may be clearly specified. The data stored in the meter shall not be lost in the event of power failure. The meter shall have non-volatile Memory (NVM) which does not require any battery backup. The NVM shall have minimum retention period of 10 years.

In case of failure of power supply, the meter shall be capable to display the measured quantities either through an internal rechargeable battery in-built in meter or an external power pack unit using inductive coupling arrangements. Further jack socket shall not be provided. In case of external power pack unit, the firm will supply one set with every meter. The battery provided shall have life of not less than 10 years.

8. COMMUNICATION CAPABILITY

The meter shall have galvanically isolated optical communication port of universal type conforming to relevant standard so that it can be easily connected to a CMRI/MODEM/Lap top for data transfer. The optical port shall be integral part of body and sealable.

Meter shall also have RS-232 Port for remote Monitoring of Metering data and it should be sealable. There should be passwords for data retrieval. DATA shall not be re-programmable through ports.

9. MAXIMUM DEMAND INTEGRATION: The meter shall monitor demand in MVA/KVA during the integration period set and also record and display the maximum registered value. The rising demand under the current integration period shall be displayed along with the elapsed time. The integration period shall be 30 minutes. This maximum demand shall correspond to any consecutive 30 minutes for block interval. The maximum demand shall be recorded daily and data for maximum demand shall be available for minimum 70 days for both import & export. The monthly maximum demand data shall also be available with month, date and time for last twelve months/resets. The meter shall have provision of maximum demand re setting through sealable push button and do not have feature in software for re setting MDI through base computer for on line monitoring/remote monitoring.

10. LOAD SURVEY CAPABILITIES: The meter shall be capable of storing all the following parameters MW/KWH, KVA & KVAH for at least 70 days in tabular form with 30 minutes integration period. The meter shall also store power 'ON' time and power 'OFF' time.

11. HARMONIC ENERGY: The meter display will show total energy. However, the provision shall be made available in the meter for measuring both total energy & fundamental energy through CMRI/Laptop/Remote Monitoring/direct on line monitoring on PC at Grid sub station to derive harmonic energy.

12. Meter software shall have provision for recording reading on 29th Feb. of leap year without manually re setting.

13. SELF DIAGNOSTIC FEATURE: Indications to show the satisfactory performance of the meter shall be provided in the meter. The meter shall have capability to check its circuits for any malfunctioning. If some malfunctioning occurs, the meter should record such malfunctioning with date and time of occurrence. The details of the self diagnostic feature shall be furnished by the manufacturer/supplier. It should be possible to check correctness of CT & PT connection to meter and CT/PT polarity for correct energy recording.

14. TIME OF DAY (TOD) TARIFF:

The meter shall have six different zones for storing TOD consumption and maximum demand. It shall not be possible to change the time period for TOD recording through CMRI or a programmable block installed in the meter itself or manually. The registration of energy consumption shall be in 'KWH' & 'KVAH' and demand in 'KW' & 'KVA'. The timing of TOD zones are as under:-

Zone no.	Timing
1.	00.00- 06.00
2.	06.00 -18.00
3.	18.00 -19.00
4.	19.00 -21.00
5.	21.00 -22.00
6.	22.00 -24.00

15. CONSTRUCTION OF THE METER: The meter shall be made of high quality materials/components to ensure high reliability and long life. The meter shall be compact in design. It shall be immune to vibration and shocks during transportation and handling. It should also be immune to external magnetic /electric fields as per CBIP-88-(latest edition).

Meter shall have a device such as blinking LED which blinks giving indication analogous to the rotation of the disc in an Electro-Mechanical meter.

SMT technology shall mainly be used for assembly of AISC & IC components on PCB. Meter shall be housed in a safe enclosure. Meter shall have extended terminal cover plate with sealing arrangement.

The meter shall conform to degree of protection IP-51 against penetration of dust & water and meter casing shall be of Engineering Plastic conforming to IS-11731.

Meter shall generally comply with the mechanical requirements of IEC-62052/IS-14697.

All the terminals for CTs and PTs connections shall be arranged in a row along the meter in the lower side. The terminals shall be moulded/tight fit constructions with barriers and covers to provide secure and safe connections of CTs and PTs through the stranded copper conductors of 2.5mm size. The terminal cover design shall be pilfer proof & extended type and preferably of transparent polycarbonate. The meter cover shall be continuously ultrasonically welded with meter base from all sides.

16. SEALING OF THE METER: Proper sealing arrangement shall be provided on the meter. At least two seals on the meter body, one seal on the terminal block, one seal on max. Demand resetting device, one seal on optical port & RS-232 port each.

17. ACCURACY: The accuracy of measurement by meter shall be tested in accordance with CBIP report 88 (revised) & IEC-62052/IS-14697). Provision may be made that once the accuracy is brought within limits, the adjustment should be ceased and it shall not be possible to change the calibration of meters at site.

18. TAMPER AND FRAUD DETECTION :The meter shall have the following special features to prevent/detect common ways of tamper and fraud :-

i) **Phase sequence Reversal:** The meter shall keep working accurately irrespective of the phase sequence of supply.

ii) **MISSING POTENTIAL:** The meter shall be capable of recording occurrence of missing of one/two potential. All such occurrence and their duration shall be recorded with date and time.

iii)(a) **CT REVERSAL:**

The meter shall keep recording energy in forward direction irrespective of the CT polarity and shall also record CT polarity reversal tamper phase wise with date and time for occurrence as well as restoration.

(b) **Missing of CT Secondary Terminals:**

"The meter shall be capable of detecting missing of CT secondary terminals. The occurrence and duration of tamper shall be recorded with date and time."

iv) Tamper information and readings should not be changed through CMRI or P.C./Ports.

v) Flashing LED high resolution through CMRI display as per CBIP may be available for checking its accuracy.

vi) At least 350 Nos. tampering events (175 occurrences and 175 restorations) shall be recorded with date and time.

vii) Tampering data should be recorded with date and time on occurrence and on restoration period. It shall also record instantaneous data (each phase) i.e. voltage, current, P.F. etc. The time of at least one of the occurrence/restoration should indicated in the print out. However the total duration of tamper including 5 minutes of restoration time should be indicated in the print out.

viii) The meter shall record as tamper when there is load difference of 25% Ib or above between any two phases (the tamper should be recorded on the phase which has lower value of load) provided minimum 10% of Ib load is flowing.

ix) All tampers should be recorded if the tampers persist for *three* minutes. The restoration period of 5 minutes should be added in the total duration of tamper and it should be indicated in the print out.

x) In case more than one tamper exist simultaneously/then meter shall record all the tempers with date and time of occurrence/duration.

xi) Meter shall record energy accurately under tamper conditions of neutral disturbance when DC voltage is fed to neutral by installing a diode.

xii) Meter shall record the energy accurately under the effect of radiation emitted by mobile phone. The test shall be carried out by bringing a mobile phone in the close proximity of the meter for 10 minutes when there is an incoming call.

19. AFFECT OF ABNORMAL MAGNETIC INDUCTION: (As per CBIP-88)

In the event of logging of presence of abnormal magnetic induction, the meter should record energy equivalent to the product of rated voltage, rated maximum current and unity power factor if temper persists for three minutes or more. The restoration time for magnetic tamper shall be 5 minutes after removal of tamper. Date and time of occurrence of tamper and total duration of the tamper will be recorded by the meter.

Note:

In case of clause no. 18(vii) & 19, a tolerance of (-) 1 minute shall be allowed for verification of total duration of occurrence & restoration of tamper.

20. POWER CONSUMPTION:

The active power consumption in each voltage circuit of the meter at reference voltage, temperature and frequency shall not exceed one watt per phase and total power consumption shall not exceed 3 watt in all the three phases. In the current circuit the VA burden per phase shall not exceed 4VA and total VA burden in all the three phases shall not exceed 12 VA.

21. CALIBRATION AT SITE : It shall not be possible to change calibration of meters at site. Meter shall be factory calibrated. Trim pot for calibration shall not be acceptable.

22. OPERATION MANUALS: The supplier shall supply free of cost detailed operating and maintenance manuals of meters and also shall provide the Memory mapping detail of the Meter for Remote monitoring.

23. NAME PLATE AND MARKING: The letters "Punjab State Electricity Board" shall be indelible and clearly marked at the appropriate place of the meters. The meter shall have marked a name plate clearly visible effectively secured against removal and indelible and distinctly on the name plate indicating Uni-Directional or Bi- Directional in accordance with IEC-62052/IS-14697. In addition, word 'Property of Punjab State Electricity Board' P.O.No. and date shall either be punched or marked indelibly.

24. INSPECTION AND TESTING: The inspection and testing shall be done as per CBIP-88 (Revised) and IEC-62052/IS-14697.

24.1. The bidder shall furnish type tests reports (as per CBIP report or IEC-62052/IS-14697) along with the samples for the model (s) offered by the manufacturer from recognized international/Indian Laboratories of repute and independent nature. The PSEB reserves the right to demand repetition of some or all the type tests in the presence of it's representative free of cost. For any change in the design/type already type tested and the design/type offered against this specification, the PSEB reserves the right to demand repetition of tests free of cost. Samples received without type test certificates may be rejected. Schedule of guaranteed technical particulars, attached as **Annexure-I,** also be submitted with samples.

25. SUPPORT SERVICES : In addition to the supply of meter the supplier would be required to extend support services as under :-

a) The supplier shall provide Sample Meters along with requisite software for data transfer to base computer through CMRI's/Direct down loading of data to lap top computer/direct transmission media i.e. telephone line, cellular phone, wireless etc. for remote monitoring and shall assist in converting the same into data base in the base computer.

b) Based on the data retrieved from the meters to generate and analysis report for the Board so as to reflect on the following parameters for enabling the purchaser to take necessary corrective actions for future :-

i) Load profiles.

ii) Tamper analyses data and any other such useful information.

c) The successful bidder shall be required to impart free of charge practical training to purchaser's staff at the place of installation so as to equip them for use of the meters, CMRI, software including data off loading and report generation.

26. MISCELLANEOUS :

a) Meter should work properly and record accurately in the event of removal of neutral according to electrical conditions and connection in case of 3 phase 4 wire connection and removal of reference phase (Y Phase) in case of 3 phase 3 wire connections.

b) The registration of reactive and apparent energy at leading power factor shall be as follows:-

i) Reactive energy shall be stored in a separate register.

ii) Apparent energy shall be equated to the Active Energy considering the reactive energy as zero.

c) For the real time clock provided in the meter, no facility for adjustment of real time beyond (+/-) 3 minutes per year shall be provided in the meter through lap top/CMRI/PC to adjust the drift in RTC. The adjustment shall be possible only once in a year.

d) The software provided by the meter manufacture for base computer should have the provision for entering Meter CT ratio, meter PT ratio, Line CT ratio & line PT ratio. Also this software shall be capable of multiplying the meter data with whole number or fractional number arising due to none matching of meter CT/PT ratio and line CT/PT ratio.

e) The manufacturer should also submit complete technical write up along with literature of tri-vector meters.

f) Various current/voltage power interruptions should be stamped with 100 events but the events occurred for (1/2) hours and above should be logged in the print out with total number of events occurred.

iii) Provision should be made for recording cumulative daily energy at 00:00 Hours, for the purpose of energy auditing for last seventy days.

iv) Blinking LED/High resolution display through CMRI for testing active and reactive energy should be available and meter constant should be invariably printed on the dial plate. The testing pulse should be homogenous and manufacturer should state necessary number of pulses counts (s) to ensure measurement and accuracy of at least $1/10^{th}$ of class of meters at different test point.

v) The common formats as per sample attached as **Annexure-II** shall be adopted for downloading/transferring the data from meters. However all the parameters required in the DDL formats as per specification can be in any shape in the formats.

vi) Software (BCS) should be capable to read the meter data through remote meter reading with selective options.

27. Abnormal Voltage/ Frequency Device Test

The accuracy of the meter should not be affected with the application of abnormal voltage/ frequency generating device available with PSEB having spark discharge of approximately 35KV. The meter shall be tested by feeding the out put of this device to meter in any of the following manner for 10 minutes:

i. On any of the phase or neutral terminals
ii. On any connecting wires of the meter
iii. Voltage discharge with 0-10mm spark gap
iv. Spark on meter body
v. At any place in load circuit

However this test shall not be conducted inside of RS-232 terminal after removing the sealing cover. The accuracy of the meter shall be checked before and after the application of above device.

The Abnormal Voltage/ Frequency devices are available at ME Lab, Patiala. The meter will be tested with any of the five devices, to be selected randomly, out of total devices available with ME Lab, Patiala.

Dy. Chief Engineer/HCM,
PSEB, Patiala.

Annexure-I

PUNJAB STATE ELECTRICITY BOARD

SCHEDULE OF GUARANTEED TECHNICAL PARTICULARS FOR STATIC ENERGY METERS OF ACCURACY CLASS-0.2S

Specification No. MQ-99/PO(M)/2009-10.

GURANTED TECHNICAL PARTICULARS OF HT TRIVECTOR METERS.

1. Maker's name & Country.
2. Standard to which the meter conforms.
3. Type of meter.
4. Class of Accuracy.
5. Basic Current (A).
6. Max. Continuous Current (A).
7. Standard reference voltage (V).
8. Standard reference frequency (HZ).
9. Power loss in each current circuit at basic current.
10. Power loss in each voltage circuit at reference voltage and frequency.
11. Parameters measured (Provide list).
12. P.F. range.
13. a) Overload Capacity.
    b) Variation of Voltages & frequency at which the meter functions satisfactorily.
14. Minimum starting current (A).
15. Dynamic range.
16. Display of No. of M.D. resets.
17. No. of digits displayed.
18. Parameters read out by CMRI (provide list).
19. a) Non-volatile memory retention time in absence of power.
    b) Memory capacity in data storage (MB).
20. Details of rating
    a) Voltage secondary
    b) Current secondary.
21. Integration period for M.D. (Minutes).
22. Principle of operation (provide details).
23. Maximum error (Accuracy) due to variation in:-
    a) Voltage + 10% - 35%.
    b) Frequency 50 (+/-) 5 HZ.
    c) Temperature –2.5°C + 55°C
    d) Basic Current (1% to 120%)
    e) P.F. (Zero lagging, unity, zero leading).
24. Tamper fraud proof provisions incorporated.
25. Sealing arrangements provided on
    a) Meter body.
    b) Meter Terminal Cover.
    c) M.D. reset push button.
    d) Communication ports. (Optical and RS-232). Data shall not be re-programmable through ports.
26. Facilities included in tariff & load survey meters such as measurements, recording of load V.I.P.F. etc. (provide list).

27. No. of TOD registers.
28. Degree of protection against dust moisture and vermin's.
29. Whether meter carries any certification mark.
30. Details of battery provided for real time clock:
    a) Guaranteed life of battery.
    b) Low battery indication.
    c) Any other.

Signature of Firm
With stamp.

Annexure-II

FORMAT FOR DOWNLOADING / TRANSFERING THE DATA

Punjab State Electricity Board

CURR. METER READING COUNT			DATE DD:MM:YYYY	TIME HH:MM
MRI DOWNLOAD			DATE DD:MM:YYYY	TIME HH:MM
COMPUTER DUMP			DATE DD:MM:YYYY	TIME HH:MM
LAST METER READING COUNT			DATE DD:MM:YYYY	TIME HH:MM
CONSUMER CODE				RECORD NO
MAKE	TYPE	SL.NO	CONT. DM	CONN. LOAD
NAME		PLR KW ALLOWED		OFF DAY
ADDRESS				
METER PT RATIO		METER CT RATIO	METER INST DATE	HH:MM
LINE PT RATIO	KV/110V	LINE CT RATIO	EXT MULTI FACTOR	

INSTANTANEOUS PARAMETERS

VR	KV	VY	KV	VB	KV
IR	AMP	IY AMP		IB	AMP
PFR	LG/LD	PFY LG/LD		PFB	LG/LD
PHASE SEQ NOR / REVERSE		PHASE MATCH NOR/WRONG		FREQUENCY HZ	

CURRENT READINGS(CUMULATIVE)

REGISTERS		
KWH		
KVAH		
KVRAH Lg		
KVRAH Ld		
KW(MD) HH:MM:DD MM YY	HH:MM-DD:MM:YYYY	HH:MM-DD:MM:YYYY
KVA(MD) HH:MM:DD MM YY		

BILLING DATA(CUMULATIVE)

CURR. MD RESET COUNT	AT HH:MM ON DD:MM:YYYY SOURCE	
LAST MD RESET		
REGISTERS		
KWH		
KVAH		
KVA(MD)		
OCC. DATE/TIME	DD:MM:YYYY HH:MM	DD:MM:YYYY HH:MM
SOURCE OF RESETS		

RTC FORCING DATA

CURR. FORCING TIME	FROM	HH:MM	TO	HH:MM	DURATION	HH:MM	
LAST FORCING TIME	FROM	HH:MM	TO	HH:MM	DURATION	HH:MM	

Punjab State Electricity Board

PT/CT AND METER STATUS(General) DATA/EVENTS RECORD

Persistance time 03minutes for occurance & 05 minutes for recovery in respect of PT/CT status data

RECORD NO	CUR. METER READING COUNT	TIME	DATE
CONSUMER NAME		METER SR. NO	

CUMMULATIVE NUMBER OF STATUS/EVENTS LOGGED

STATUS	EVENT	DATE / TIME DD MM YY HH:MM	DUR hh:mm	VR KV	VY KV	VB KV	IR Amp	IY Amp	IB Amp	PFR	PFY	PFB	KWH
RCTR	OCC REC												
YCTS	OCC REC												
YCTR	OCC REC												
BCTS	OCC REC												

Punjab State Electricity Board

PT/CT AND METER STATUS(>30) DATA/EVENTS RECORD

Persistance time 03minutes for occurance & 05 minutes for recovery in respect of PT/CT status data

RECORD NO	CUR. METER READING COUNT	TIME	DATE
CONSUMER NAME		METER SL.NO	

CUMMULATIVE NUMBER OF STATUS/EVENTS LOGGED

STATUS	EVENT	DATE / TIME DD MM YY HH:MM	DUR hh:mm	VR KV	VY KV	VB KV	IR Amp	IY Amp	IB Amp	PFR	PFY	PFB	KWH
YCTS	OCC REC												

Note:

1 In the column of DATE/ TIME, the detail of at least one of occurrence/ restoration of tamper should be indicated.

2 Under the column DURATION, the total time should include restoration time of 5 minutes the print out.

Punjab State Electricity Board

3.1 BILLING DATA HISTORY

RECORD NO XXXX CUR. METER READING COUNT XXX TIME HH:MM DATE DD/MM/YYYY CONSUMER NAME METER SR.NO						
DATA	RS NO xxx DD MM YY SOURCE *	RS NO xxx DD MM YY SOURCE *	RS NO xxx DD MM YY SOURCE *	RS NO xxx DD MM YY SOURCE *	RS NO xxx DD MM YY SOURCE *	RS NO xxx DD MM YY SOURCE *
IMPORT KWH KVAH KVA MD OCC DATE TIME	 DD:MM:YY HH:MM					
3.2 METER READING DATA HISTORY						
DATA	MR NO xxx DD:MM:YY	MR NO xxx DD:MM:YY	MR NO xxx DD:MM:YY	MR NO xxx DD:MM:YY	MR NO xxx DD:MM:YY	MR NO xxx DD:MM:YY

IMPORT KWH
KVAH
KVARH Lg
KVARH Ld
KW MD
OCC
DATE DD:MM:YY
OCC
TIME HH:MM
KVA MD
OCC
DATE DD:MM:YY
OCC
TIME HH:MM

RS : Reseting of MDI, MR: Meter Reading by MRI / Computer
*MDI RESETTING SOURCE : P: Push Button, M:MRI , C:Computer A: Autoset

PUNJAB STATE ELECTRICITY BOARD

TOD ZONE HISTORY

RECORD NO	CUR. METER READING COUNT	TIME	DATE
CONSUMER NAME		METER SR. NO.	

ZONE	PARAMETERS	RST NO.1 PUSH BUTTON	RST NO.2 PUSH BUTTON	RST NO.3 PUSH BUTTON	RST NO. 4 PUSH BUTTON	RST NO. 5 PUSH BUTTON	RST NO. 6 PUSH BUTTON
1	KWH/ KVAH						
	KW MD						
		00/00	00/00				
	DATE/TIME	00:00	00:00				
	KVA MD						
		00/00	00/00				
	DATE/TIME	00:00	00:00				
2	KWH/ KVAH	2.00	38.00				
	KW MD	5.00	49.00				
	DATE/TIME	17/10	09/01				
	KVA MD	11:59	14:00				
		5.00	49.00				
	DATE/TIME	17/10	09/01				
		11:59	14:00				
3	KWH/ KVAH						
	KW MD						
		00/00	00/00				
	DATE/TIME	00:00	00:00				
	KVA MD						
		00/00	00/00				
	DATE/TIME	00:00	00:00				
4	KWH/ KVAH						
	KW MD						
		00/00	00/00				
	DATE/TIME	00:00	00:00				
	KVA MD						
		00/00	00/00				
	DATE/TIME	00:00	00:00				
5	KWH/ KVAH						
	KW MD						
		00/00	00/00				
	DATE/TIME	00:00	00:00				
	KVA MD						
		00/00	00/00				
	DATE/TIME	00:00	00:00				
6	KWH/ KVAH						
	KW MD						
		00/00	00/00				
	DATE/TIME	00:00	00:00				
	KVA MD						
		00/00	00/00				
	DATE/TIME	00:00	00:00				
7	KWH/ KVAH						
	KW MD						

		00/00	00/00				
	DATE/TIME	00:00	00:00				
	KVA MD						
		00/00	00/00				
	DATE/TIME	00:00	00:00				
8	KWH/ KVAH						
	KW MD						
		00/00	00/00				
	DATE/TIME	00:00	00:00				
	KVA MD						
		00/00	00/00				
	DATE/TIME	00:00	00:00				

PUNJAB STATE ELECTRICITY BOARD

POWER INTERRUPTION (ALL POTENTIALMISSING) HISTORY

RECORD NO.	CURRENT METER READING COUNT	DATE
CONSUMER NAME		METER SR. NO

FROM (OCCURRENCE)	TO (RECOVERY)	DURATION	FROM (OCCURRENCE)	TO (RECOVERY)	DURATION

PUNJAB STATE ELECTRICITY BOARD

ENERGY AUDIT DATA

RECORD NO. TIME DATE
CONSUMER NAME METER SR. NO.

DATE	KWH READING	DATE	KWH READING	DATE	KWH READING

PUNJAB STATE ELECTRICITY BOARD

POWER INTERRUPTION(ALL POTENTIAL MISSING) HISTORY
INTERRUPTION FOR 30 MINUTES AND ABOVE

RECORD NO.	CURRENT METER READING COUNT	DATE
CONSUMER NAME		METER SR. NO

FROM (OCCURRENCE)	TO (RECOVERY)	DURATION	FROM (OCCURRENCE)	TO (RECOVERY)	DURATION

PUNJAB STATE ELECTRICITY BOARD

LOAD SURVEY REPORT KW, etc.

RECORD NO	CUR METER READING COUNT	READING TIME	DATE
CONSUMER NAME		METER SR. NO.	
MULTIFACTOR	LOAD SURVEY FROM	OFF DAY	PLV LOAD

TIME	MM/DD/YYYY	MM/DD/YYYY	MM/DD/YYYY	MM/DD/YYYY	MM/DD/YYYY	MM/DD/YYYY
0.00						
0.30						
1.00						
1.30						
2.00						
2.30						
3.00						
3.30						
4.00						
4.30						
5.00						
5.30						
6.00						
6.30						
7.00						
7.30						
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10.30						
11.00						
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