

# SUPPLY OF PRE-PAID AND POST-PAID DOMESTIC DIAPHRAGM METERS

**E-Tender ID - 50724**

**Project No. P.014714**

**Document No. P.014714 G 11031 R008**



**Tender No. P.014714 G 11031 R008**

**CENTRAL UP GAS LIMITED (CUGL)**  
KANPUR | INDIA

**PUBLIC**

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**TECHNICAL DOCUMENTATION**  
Technical , Vol II of II, Rev. 0

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## **CENTRAL U.P. GAS LIMITED (CUGL)**

### **CITY GAS DISTRIBUTION PROJECT AT KANPUR, UNNAO, BAREILLY & JHANSI GA IN THE STATE OF U.P.**

#### INTRODUCTION

0	22.06.2021	Issued for Procurement	Pulkit Mishra	Gunja Gupta	Surendra Dungawat
<b>Rev.</b>	<b>Date</b>	<b>Description</b>	<b>Prepared By</b>	<b>Checked By</b>	<b>Approved By</b>

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   Central U.P. Gas Limited	INTRODUCTION	<b>P.014714</b> <b>G-11033</b> <b>I 601</b>
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## 1.0 INTRODUCTION

Central U.P. Gas Limited (CUGL) is a joint venture company of Gail & BPCL is responsible for distribution of Natural Gas for Domestic, Commercial & Industrial sectors including setting up CNG refuelling stations for vehicles etc. in district of Kanpur, Unnao, Bareilly, Jhansi.


Central U.P. Gas Limited (CUGL) (hereinafter referred as Owner), is supplying piped natural gas (PNG) to domestic, commercial and industrial consumers and compressed natural gas (CNG) to automobiles in above mentioned GAs through its CGD and CNG networks. CUGL intends to develop its CGD and CNG network in above mentioned GA. TRACTEBEL ENGINEERING PVT.LTD is now inviting tenders on Competitive Bidding basis for procurement of ***“Pre-Paid Smart Domestic Gas Meters & Domestic Diaphragm Gas Meter G1.6 (Normal)”*** for this project.

The present document covers the technical specifications for the enquiry.

## 2.0 TECHNICAL SPECIFICATIONS

The technical specifications for this present tender enquiry are as listed in Material Requisition.


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 	 <b>CUGL</b> Central U.P. Gas Limited	MATERIAL REQUISITION	<b>P.014714 - G-11071- I601</b>
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**CENTRAL U.P. GAS LIMITED (CUGL)**  
**CITY GAS DISTRIBUTION PROJECT AT**  
**KANPUR, UNNAO, BAREILLY & JHANSI GA IN THE STATE OF**  
**U.P.**

MATERIAL REQUISITION

0	22.06.2021	Issued for Procurement	Pulkit Mishra	Gunja Gupta	Surendra Dungawat
<b>Rev.</b>	<b>Date</b>	<b>Description</b>	<b>Prepared By</b>	<b>Checked By</b>	<b>Approved By</b>

 	 Central U.P. Gas Limited	MATERIAL REQUISITION	<b>P.014714 - G-11071- I601</b>
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**A. DESCRIPTION OF GOODS AND/OR SERVICES**

Sr. No.	Schedule	Item Description	Total Quantity (Nos.)
1.0	Schedule A	Design, Engineering, Manufacturing, Testing, Supply, preparation for shipment , transportation, loading & unloading, supervision of installation, commissioning, Network charges, service provider connection, integration with client SAP/payment gateway system of <b>PRE-PAID TYPE DIAPHRAGM / THERMAL GAS METER (G1.6)</b> based on GSM/GPRS along with integrated AMR, auto shut off valve, Battery for AMR, SIM cards, cloud server with software, mobile apps facility for customer, unlimited dashboard for client monitoring & controlling, online price change facility, Data hosting, networking components, cables and other associated accessories and documentation etc as per technical requirements/ specification for City Gas Distribution Project.	1,000
2.0	Schedule B	Design, Engineering, Manufacturing, Testing, Supply, preparation for shipment , transportation of <b>POST-PAID TYPE DIAPHRAGM CONVENTIONAL TYPE GAS METER (G1.6)</b> and other associated accessories and documentation etc as per technical requirements/ specification for City Gas Distribution Project.	25,000

   Central U.P. Gas Limited	MATERIAL REQUISITION	P.014714 -G- 11071-I601
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**B. REMARKS / COMMENTS**

**1. GENERAL NOTES**

**Supplier's compliance**

Supplier shall submit his bid offer in compliance with the requirements of this MR and attachments.

Compliance with this material requisition in any instance shall not relieve the Supplier of his responsibility to meet the specified performance.

**2. COMPLIANCE WITH SPECIFICATION**

The SUPPLIER shall be completely responsible for the design, materials, fabrication, testing, inspection, preparation for shipment, loading at your works, unloading at OWNER's stores of the above item strictly in accordance with PTS, Material Requisition and all applicable codes.

Any exception must be highlighted by the vendor at bidding stage and will be considered accepted only after written approval from OWNER / TE.

**3. SUPPLIER'S SCOPE**

Supplier's scope of work includes the equipment with all internals and accessories shown on the data sheets, specifications and all unmentioned parts necessary for a satisfactory operation and testing except those which are indicated to be out of the Supplier's supply.

**4. INSPECTION**

The inspection shall be carried out by TPIA / Owner representative at bidder's works / sub-contractor's works as per approved QAP and inspection charges will be borne by supplier.

The successful vendor shall purpose minimum two (02) Nos. of TPIA's from the below list within (02) weeks from the date of FOA for Owner / Owner's representative approval. Vendor shall appoint approved TPIA for inspection purpose."

- a) AMERICAN BUREAU SERVICES
- b) BUREAU VERITAS
- c) CERTIFICATION ENGINEERS INTERNATIONAL LIMITED (CEIL)
- d) DNV GL
- e) LLOYD REGISTER of INDUSTRIAL SERVICES
- f) MEENAAR GLOBAL CONSULTANTS LLP
- g) SGS
- h) TUV – NORD
- i) TUV – SUD

Apart from inspection by TPIA, inspection shall also be performed by Purchaser / Purchaser's consultant Representative, as set out and specified in the codes and particular documents forming this MR.

**5. APPLICABLE DOCUMENTS**

General descriptions, requirements and information are listed in annex C of this Material Requisition.

**6. SUPPLIER'S DOCUMENTS**

Supplier shall submit the documents as listed under annexure D of this Material Requisition.

All documents shall be submitted in English language.

Vendor shall strictly follow the document numbering procedure in their document as illustrated below:

Document numbering shall consist of Maximum 20 Characters

**Document No. :**



   Central U.P. Gas Limited	MATERIAL REQUISITION	<b>P.014714 -G- 11071-I601</b>
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Project No.	Item	Document Index No.	Serial No.	Revision No.
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Where,

**Project No.** is P.014714;

**Item** is Domestic Diaphragm Meter; / Pre-Paid Smart Domestic Gas Meters

**Document Index No.** will be of three characters as indicated under point D of this MR;

**Serial No.** shall be 5 digit no. ranging from 0001 to 99999

**Revision No.** is Revision of the document starting with R0, R1 .....;

Example: For QCT program, the document no. will be

P.014714	Dom. Meter	QCT	0001	R0
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### C. LIST OF ATTACHMENTS

The table herebelow lists the documents which are integral part of this Material Requisition. The applicable revision index of each document is mentioned in the column below the current Material Requisition revision index.	Material Requisition revision							
When the Material Requisition revision index is "A" or "1", all listed documents are attached. For other Material Requisition revision index, only modified or new documents are attached.	0	1						
<b>Documents</b>	<b>Revision of documents</b>							
<b>Particular Technical Specification for Pre-Paid Smart Domestic Gas Meters &amp; Domestic Meters</b> P.014714 -G-11077 -I601 & P.014714 -G-11077- I602	0							
<b>QCT for Pre-Paid Smart Domestic Gas Meters &amp; Domestic Meters</b> P.014714-G-11013-Q601 & P.014714-G-11013-Q602	0							

 	 Central U.P. Gas Limited	MATERIAL REQUISITION	<b>P.014714 -G- 11071-I601</b>
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#### **D. DOCUMENTS & DATA REQUIREMENTS**

The table hereunder specifies the quantities and the nature of the documents to be submitted by the SUPPLIER/BIDDER to the ENGINEER.-IN-CHARGE (EIC)

The documents required at the inquiry stage and to be included in the bid are listed under **column A**.

The documents required after award of the AGREEMENT and subject to the written approval of the EIC are listed under **column B**.

The final and certified documents are listed under **column C**.

Any document, even when preliminary, shall be binding and therefore duly identified and signed by the SUPPLIER/BIDDER It shall bear the EIC's Project reference, the Material Requisition number and the identification number.

THE DOCUMENTS ARE FULLY PART OF THE SUPPLY WHICH SHALL BE COMPLETE ONLY IF AND WHEN THE DOCUMENTS COMPLYING FULLY WITH THE MATERIAL REQUISITION REQUIREMENTS ARE RECEIVED BY THE ENGINEER –IN- CHARGE.

Item	Documents and Data	A	B		C	
		Number of copies	Number of copies	Required date	Number of copies	Required date
1.	Detailed Design & Data sheet	2	2	1 week	2	To be submitted along with the Bid
2	Certification for specified flow and accuracy from the weights & measurement department of the country of origin.	2	2	1 week	2	Along with despatch/Shipment
3	Valid certificate of type approval issued by Director of Legal Metrology (Government of India) for each of the offered models of diaphragm gas meters.	2	2	1 week	2	Along with despatch/Shipment
4	Bidder shall be registered manufacturer with Director of legal Metrology, Government of India. In case, the bidder is importing the offered model of diaphragm gas meter from overseas (i.e. from outside India), the bidder shall furnish a copy of import registration certificate issued by Director of legal Metrology, Government of India.,	2	2	1 week	2	Along with despatch/Shipment
5	Valid approval certificate for compliance of the offered model of the gas meter to the requirement of latest EN1359 or OIML R 137-1&2 from any recognized agency.	2	2	1 week	2	Along with despatch/Shipment
6	Detailed GA Drawing, meter index format, document submittal schedule, Fabrication, testing and delivery schedule (per item)	-	2	1 week	2	Along with despatch/Shipment




Item	Documents and Data	A	B		C	
		Number of copies	Number of copies	Required date	Number of copies	Required date
7	Compliance certificate to Tender Quality Control Table(QCT)	2			2	Along with despatch/Shipment
8	List of special test equipment/tools required for maintenance (if applicable)	-	2	1 week	2	Along with despatch/Shipment
9	2 years operation Spare part list	2	2	1 week	2	Along with despatch/Shipment
10	Inspection and test procedures	-	2	1 week	2	Along with despatch/Shipment
11	Test / Calibration/Inspection certificates/reports	-			2	Along with despatch/Shipment
12	Installation, operation and maintenance manuals, catalogues with part list for meters.	-	2	2 weeks before shipping	2	Along with despatch/Shipment
13	Painting system description		2	1 week	2	Along with despatch/Shipment
14	Packing/shipping list /weights and dimensions	-	2	2 weeks before shipping	2	-
15	Final technical file(containing all final drawings and documents listed in column 'c')	-	-	2 weeks before shipping	2	-

**NOTES:**

- 1) Documents listed in column A is required to be submitted during bid time (1 original+ 1 copy). Durations in column B (Required date) are weeks after Purchase order / LOA date or as indicated in Table. Durations in column C (Required date) are weeks after document approval or as indicated in Table. Due date of each document may be proposed.
- 2) Latest submittal time for:
 

☐ Test procedure : 2 weeks before test  
☐ Test report : 2 weeks after test
- 3) Final technical file shall be supplied in hard copy as indicated, and in electronic format (.pdf Acrobat files) on 3 (three) CD-ROMs to OWNER.

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   Central U.P. Gas Limited	PTS – DOMESTIC DIAPHRAGM PRE-PAID METER	P.014714 - G-11077 - I601
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## CENTRAL UP GAS LIMITED (CUGL)




### CITY GAS DISTRIBUTION PROJECT IN UP CLUSTER

#### TRACTEBEL ENGINEERING PVT. LTD.

### SUPPLY OF DOMESTIC PRE-PAID AND POST- PAID TYPE GAS METERS AND DATA STORAGE WITH MAINTENANCE SERVICES

#### PTS – DOMESTIC DIAPHRAGM PRE-PAID METER




0	22.06.2021	Issued for Procurement	Pulkit Mishra	Gunja Gupta	Surendra Dungawat
Rev.	Date	Description	Prepared By	Checked By	Approved By

 	 <b>CUGL</b> <small>Central U.P. Gas Limited</small>	<b>PTS – DOMESTIC DIAPHRAGM PRE-PAID METER</b>	<b>P.014714 - G-11077 - I601</b>
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## 1.0 SCOPE

- 1.1. The scope of work shall cover Design, engineering, manufacturing, testing, inspection, supply, preparation for shipment, transportation, loading & unloading, supervision of installation, commissioning, Network charges, service provider connection, integration with client SAP/payment gateway system of PRE-PAID TYPE DIAPHRAGM/THERMAL GAS METER (G1.6) based on GSM/GPRS/LoRa along with integrated AMR, auto shut off valve, Battery for AMR, SIM cards, cloud server with software, mobile apps facility for customer, unlimited dashboard for client monitoring & controlling, online price change facility, Data hosting, networking components, cables and other associated accessories and documentation etc as per technical requirements/ specification for City Gas Distribution Project.

### NOTE

1. AUTO SHUT OFF VALVE IS REQUIRED IN PRE-PAID METER
  2. For LoRa connectivity, Vendor shall ensure availability of communication facility in all the areas. It's vendor's responsibility to arrange the same with all required infrastructure without any cost to client in case of non-availability.
- 1.2. Comprehensive Maintenance Services as per SOR of prepaid type SMART Meters including spare, replacement of faulty meter, battery replacement, data collection etc as per tender specification.
- 1.3. **SUPPLIER'S SCOPE OF WORK & SERVICES**
- 1.3.1. Domestic diaphragm Pre-paid type with AMR meter as per data sheet enclosed herewith along with Battery for AMR, cloud server, Data hosting, Data hosting charges, networking components, cables, etc.
  - 1.3.2. Recharging facility for customer via credit card/ debit card/online/cheque. Customer shall be able to pay through web application or Mobile application. Entire payments shall be made to CLIENT through CLIENT'S payment gateway.
  - 1.3.3. All the required software for bidirectional communication, meter to cloud server, cloud server to client SAP/payment Gateway server and mobile apps will be developed by contractor. All these networks shall be secured from theft, unauthorized intrusion and malwares.
  - 1.3.4. Mobile APPS shall be developed by the contractor for customers to view their own billing details, consume parameters, current parameters, battery status etc. APPS shall be compatible to android and iOS operating system
  - 1.3.5. Gas meters shall be installed by the Client. Contractor to ascertain the suitability of location of meter for data communication purpose. Upon receiving site readiness intimation from CLIENT, the Contractor shall initiate the commissioning of metering system for the given location. Commissioning shall involve geo-tagging of the meter, sync of meter data with CLIENT provided data and establishment of communication in all aspects. Contractor shall capture minimum one photograph of the commissioned meter and shall store in server as per advice of Client up to contract period.
  - 1.3.6. Any damage to meter/AMR/ before handing over of meter to contractor is responsibility of Client. Damage after hand over within contract period shall be in contractor's scope.
  - 1.3.7. Provision of alarm/customer complaint with closure report with BP no. shall be logged for 10 Yrs.
  - 1.3.8. CONTRACTOR shall commission the gas meters within 5 days after CLIENT's intimation of completion of meter installation. Commissioning cost to be included in the meter supply cost, data hosting cost, no separate cost is envisaged for commissioning & and data hosting. Configuration of ASSET ID for each meter after commissioning.

- 1.3.9. Meter index readings need to be stored for every hour and collected at server end every 24 hours or as & when required on real time bases. This data shall be relayed to CLIENT in .csv/.xls or any other format as per requirement of CLIENT.
- 1.3.10. Disconnect Device: Pre paid Smart Meters shall have an in-build disconnect device (Valve) to disconnection of Gas supply on pre-configured events/allocated gas volume/balance (negative). This device shall be mainly used to facilitate functionality like Pre-payment or ON/OFF. The system should be programmed to be user friendly. The system should be configurable to ensure gas supply is not interrupted during out of office hours, weekends or public holidays. Closing event/negative balance/allowance below threshold limit will be discussed with successful bidder during detailed engineering stage. Contractor program meter logic accordingly.
- 1.3.11. Providing training to Purchaser's personnel pertaining to handling of meters, all associated software at purchaser's place.
- 1.3.12. The supplier shall comply with local statutory regulations of Legal metrology and Supplier shall specify and include the hardware/software, which are not specially mentioned but are required to complete the commissioning /functioning of metering system as per specification and statutory requirement.
- 1.3.13. Contractor shall carry out routine checks / inspection of setup and shall prepare report and submit to Client.
- 1.3.14. Contractor shall replace battery in metering unit whenever due before complete drain to ensure uninterrupted gas supply. Its battery shall be replaceable and encapsulated inside the unit casing to avoid tampering. The manufacturer shall apply a physical seal to the battery compartment to prevent the interference from customer. It shall retain all information contained within it during the battery change. Following the battery change, any clock shall maintain the correct time. Contractor shall provide spare batteries support as and when required up to 10 year from the date of last supply under this contract.
- 1.3.15. The gas meter must have the warranty of 10 years towards design, materials, workmanship & quality of process/ manufacturing of gas meters under this contract for due and intended performance of the same, as delivered under this contract. In the event any defect is found by client/contractor up to a period of 120 months from the date of supplies made under the contract, Contractor will be liable to undertake to replace/rectify such defects at its own costs, within 60 days from the date of intimation or mutually agreed time frame
- 1.3.16. Contractor shall replace any component of the unit, which is affecting the performance of the unit.
- 1.3.17. Contractor shall submit the details of O&M plan, which shall be followed throughout the contract period.
- 1.3.18. Contractor shall establish and demonstrate the signal communication between gas meters and contractor's cloud server to CLIENT.
- 1.3.19. Attend to client's demands regarding report abnormality or absence and provide justification / rectification against any mismatch or issue raised within prescribed period.
- 1.3.20. There may be a possibility for relocating the existing meter (10% of total supplied quantity) to different location, this meter shall be reconnected and interface with cloud server at no extra cost to CLIENT.
- 1.3.21. Contractor shall support the supplied software for entire duration of contract. In case any updation of the software/system is required, Contractor will update the same without any additional cost to CLIENT.
- 1.3.22. Supply and installation of required license, software etc for server/cloud server will be in the scope of Contractor.





 	 Central U.P. Gas Limited	<b>PTS – DOMESTIC DIAPHRAGM PRE-PAID METER</b>	<b>P.014714 - G-11077 - I601</b>
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- 1.3.23. CONTRACTOR shall provide facility of viewing and extracting reports according to requirement and in the format desired by CLIENT through dashboards / web-based software. CONTRACTOR to support CLIENT to resolve any issues related in viewing and extracting report and modification of report layout in future as required by CLIENT without any cost implication.
- 1.3.24. Contractor shall submit detailed Functional Design Specification for all software and hardware (e.g., Server specifications and compliances, platform specifications, database etc.) post award within 15 days of LOI for client approval.
- 1.3.25. The system supplied by CONTRACTOR shall be suitable to add or delete consumers as and when required by CLIENT. The changes required for addition/deletion in software/system shall be done by the CONTRACTOR. The modification is to be done seamlessly without disturbing the billing system of CLIENT.
- 1.3.26. SOFTWARE/FIRMWARE: CONTRACTOR shall be responsible to upgrade any software/firmware as and when required for optimum performance of the services without any cost to CLIENT. CONTRACTOR shall take approval from CLIENT before performing such activity. Any interface issue arising due to such activity shall be under scope of Contractor. The software upgrade shall be seamless and shall not hinder the billing process. System shall be restored within 24 hrs of software or firmware upgrade.
- 1.3.27. CODE OF CONDUCT: Good conduct shall be maintained by CONTRACTOR's personnel while having any interface with CUSTOMER/CLIENT. CONTRACTOR personnel shall always carry CLIENT's provided Identification Card and also any Government of India issued ID card (e.g. Adhaar etc.) in support. CLIENT shall not be liable for any misconduct or mal practices adventured by CONTRACTOR's personnel during any operation.
- 1.3.28. System energy usage: All components of the Metering System shall be designed so as to minimize their energy usage. The combined energy usage of components shall have a defined operational life and the same shall be clearly specified in the offer.
- 1.3.29. Tamper Protection: All components of Meters or of Metering Systems should be suitably protected from interference or tamper. This means protected by the seals. Therefore, the use of slots, flaps or hatches that could compromise the physical integrity of the meter is accessible with an appropriate sealing mechanism. In case of low battery/battery failure, the shut off valve shall close.
- 1.3.30. Identification and serial numbers: All components of a Metering System shall be uniquely identifiable both electronically and mechanically. In the case where modular construction is employed, a means to identify individual modules shall be provided.
- 1.3.31. Branding: All components of the Metering System shall be branded as "Property of the asset Client".
- 1.3.32. IDENTIFICATION OF MISHANDLING OF ASSET/EQUIPMENT: contractor shall be responsible to inform the client upon identification of any kind of malpractice or mishandling of ASSET at Customer premises.
- 1.3.33. IDENTIFICATION OF THEFT OF THE ASSET/EQUIPMENT: contractor shall be responsible to inform the client upon identification of theft of the ASSET at Customer premises.
- 1.3.34. SAP INTEGRATION: The contractor's scope for SAP integration (bi-directional) shall include meter data capturing, installation information, commissioning information, Customer details, inserting of meter reading, generation of prepayment receipt.

## **2.0 GENERAL**

### **2.1. Definitions**

Subject to the requirements of the context, the terms (hereafter listed in alphabetical Order) used in this specification are given the following meaning:

 	<b>PTS – DOMESTIC DIAPHRAGM PRE-PAID METER</b>	<b>P.014714 - G-11077 - I601</b>
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AGREEMENT	Designates the agreement concluded between the CLIENT and the CONTRACTOR, under which the latter undertakes to the former the GOODS and/or SERVICES according to the stipulations, which are agreed and specified in the form of an order.
CLIENT	Designates the purchaser of the GOODS and/or SERVICES, which are the subject of the AGREEMENT.
CONTRACTOR/SUPPLIER	Designates the individual or legal entity with whom the order has been concluded by the CLIENT. The term "CONTRACTOR/SUPPLIER" may be used indifferently for a supplier, a manufacturer, an erection CONTRACTOR / SUPPLIER, etc.
DAYS - WEEKS – MONTHS	Specify the number of calendar days, weeks or months and not of working days, weeks or months.
CLIENT'S REPRESENTATIVE	Designates the individual or legal entity to which the CLIENT has entrusted various tasks in relation with the carrying out of his PROJECT
GOODS and/or SERVICES	Designate, depending on the case, all or part of the drawings or documents, substances, materials, materiel, equipment, structures, plant, tools, machinery, to be studied, designed, manufactured, supplied by the CONTRACTOR/SUPPLIER under the AGREEMENT, including all the studies, tasks, works and services specified by the order. The Terms GOODS or SERVICES may be indifferently used one for the other as required by the context.
PROJECT	Designates the aggregate of GOODS and/or SERVICES to be provided by one or more CONTRACTOR/SUPPLIERS.

## 2.2. Review And/Or Approval

Whenever CLIENT and/or CLIENT'S Representative review and/or approval is requested on a document to be submitted by the CONTRACTOR/SUPPLIER or before an action is implemented by the CONTRACTOR/SUPPLIER, such review and/or approval shall always be requested in writing by the CONTRACTOR/SUPPLIER to the CLIENT and/or the CLIENT'S Representative before any action subject of this review and/or approval is taken.

CLIENT and/or CLIENT'S REPRESENTATIVE approval shall always be given in writing.

## 2.3. Codes, Standard and Legal Requirements

- BS EN: 1359:1999+A1 Amendment 2006 or latest.
- ATEX: 94/9/EC/ or 2014/34/EC Directive or latest.
- IEC 60529: Degrees of Protection Provided by Enclosure
- ANSIB1.20.1: Pipe Threads
- ISO 27001: Information security standards.
- PNGRB T4S
- The design, manufacturing, materials, testing of the meters shall be in accordance with the International codes and standards mentioned in the present specification.
- Meters shall be approved to EN 1359:2006(latest) and also with the other applicable codes, standards and legal requirements.

- Meters shall be in compliance of PNGRB/T4S requirement.
- Unless otherwise specified, the latest editions (latest) of the standards mentioned herein this specification, including all addenda and revisions, shall apply. The Contractor shall furnish (along with the technical bid) a copy of the approval documents, certificates (in English language only) for each of the offered model, for compliance to the requirements of following standards:
- Meters shall be approved to EN 1359 latest edition or OIML R137 -1&2 latest edition and also with the other applicable codes, standards and legal requirements.
- The offered meter model shall have certification for specified flow and accuracy from the Weights & Measurement Department of the country of origin. The certificate(s) shall be in English language or in the language of originating country along with English translation. Bidder shall submit the copy of such certificate(s) to along with bid or Vendor to arrange for Weights and Measures approval from Indian Authorities.
- Bidder shall be registered manufacturer with Director of legal Metrology, Government of India. In case, the bidder is importing the offered model gas meter from overseas (i.e., from outside India), the bidder shall furnish a copy of import registration certificate issued by Director of legal Metrology, Government of India.
- Valid approval certificate for compliance of the offered model of the gas meter to the requirement of latest EN1359 or OIML R 137 -1&2 from any recognized agency.
- Valid certificate of type approval issued by Director of Legal Metrology (Government of India) for each of the offered models of gas meters.
- CLIENT allows the Contractors to submit the required approval certificate of Weights and Measurement (W&M) department of India for the meters at the time of supply. In case Contractors are unable to provide the required W&M certificate at that time, CLIENT shall reject their order. Undertaking for this shall be submitted by Contractors along with the bid.
- The electronic index & battery compartment (S) covers shall give protection against the ingress of dust & water as per EN 60529.
- PESO/ ATEX certification Zone 2 for Modules/ electronic/electrical items.
- IP 54 shall be Minimum Protection provided for meter and AMR/MIU shall be of IP 65 class. In case of AMR/MIU is integrated with meter then entire meter shall be IP 65.
- Availability of importing license for meters to be imported.

### 3.0 INFORMATION SYSTEM

- 3.1. Information security threats are global in nature, and indiscriminately target every organisation and individual who owns or uses electronic information. These threats are automated and loose on the internet. In addition, data is exposed to many other dangers, such as acts of nature, external attack, and internal corruption and theft. In addition, as Bidder shall be handling public data on cloud server, necessary encryption standards shall be adhered for data security as per relevant international standards (ISO 270001). Bidder shall provide the list of standards complied along with the bid offer.
- 3.2. To a maximum extent, Bidder shall use and implement the communication system using Open system protocols. Wherever, proprietary protocols are being complied or utilized, bidder shall intimate along with Bid offer and the Bidder shall maintain 100% interoperability at the time of handover of the system to Client at no cost to Client.
- 3.3. It shall be the responsibility of the bidder to provide all necessary software/hardware, which are not specifically mentioned but required for proper functioning of the complete system.
- 3.4. Bidder to ensure the Confidentiality, Integrity and Availability of the information at cloud server. Bidder to

provide information of the cloud server, server specifications and server performance characteristics along with Bid offer.

#### 4.0 TECHNICAL EVALUATION REQUIREMENT

4.1. All the documents submitted along with technical bid shall be in English Language only. If any document from OEM is in different language, bidder shall submit the English translation of the same along with the bid.

4.2. Any deviations from the specification should be submitted in tabular format specifying the clause no with the bid. In case of no deviation bidder should also submit the same mentioning NO DEVIATION. Compliance with technical specifications will be taken for granted if deviations are not specifically mentioned.

#### 4.3. DOCUMENTS TO BE SUBMITTED AT THE TIME OF BIDDING

- Datasheets
- Battery life calculation
- Performance curves
- Technical catalogues for relevant models offered.
- Deviations from technical specification, if any.
- Supplies against major orders for natural gas application (PTR)
- Type approval certificate as per BS EN 1359:1999 + A1 Amendment 2006 or latest

#### 5.0 POST BID DOCUMENTATION

5.1. The bidder shall submit following documents along with the material: (Please refer to Material requisition for exhaustive list)

5.2. Material test certificates for physical properties and chemical composition.

5.3. Calibration certificates. (Hard copy of original with Soft copy (CD) shall be supplied to client and a copy of calibration certificate shall be enclosed within packing box of each supplied meter)

#### 6.0 METER WITH AMR SYSTEM

6.1. The following are in the scope of Contractor:

License from government bodies for use of frequency band.

Equipment type approval from concerned authorities like Wireless Planning & Coordination Wing (WPC)/ WEEE/ ROHS.

Necessary mounting supports shall be supplied by the contractor.

AMR should be OPC compliant and should be shared with CLIENT. AMR should have ability to send the data to server directly using Internet/ Ethernet. If any application is required to be installed at server for accessing the data, it will be in the scope of Contractor.

#### 6.2. DATA STORAGE FACILITY

- Data security through password facility and hardware sealing.
- Parameters and programmed constants shall be stored in memory.
- Data storage facility shall be provided during communication break between server and meter. After recovery of communication backfill shall be done.

- The stored data should be retrievable by using laptops/mobile application/ centralized system.
  - Memory meter data reading as specified by contractor shall have facility to delete on a first in first out basis, wherever required. Priority shall be given to certain events, which shall not be deleted unless the removal is carried out by authorised person. There shall be NO provision to deleted data manually. The contractor shall ensure cumulative basis monthly reading OR as required.
  - Meter shall have time stamp for all stored data. Gas meter shall have the facility to configure the Year wise calendar/holiday list for 10 years in the meter from the factory itself or shall be updated where meter associated device get connected with server in case the same is not configured from factory.
  - System should be capable to store hourly log, Daily log, event logs & battery health for ten year.
- 6.3.** AMR/Meter shall have facility of easily readable LED/LCD display showing battery life remaining/low battery, balance payment/available gas volume limit.
- 7.0 METER READING SERVICES.**
- 7.1.** READING COVERAGE: CONTRACTOR to perform 100% reading collection activity as per client billing cycle for commissioned meters. CONTRACTOR shall be penalized for not providing 100% reading.
- 7.2.** The CONTRACTOR must submit a minimum of 99.98 % readings in every billing cycle through AMR system i.e. without entering the household. The balance subject to a maximum of 0.02% can be submitted through manual mode and for manual readings CONTRACTOR shall provide the photograph for validation purpose and details of portion wise manual reading shall be provided in dashboard.
- 7.3.** CONTRACTOR shall provide the photograph for validation purpose and details of portion wise manual reading shall be provided in dashboard. CONTRACTOR shall be penalized if manual mode reading exceeds 0.02% in each billing cycle.
- 7.4.** Client shall share the MRO's (Meter Reading Order) to be collected by the CONTRACTOR for each Billing cycle and the schedule for submission of readings is as follows:
- For any particular billing cycle if the billing date is Dth day of the month, Client shall provide the MRO to the contractor on D-5th day that is 5 days ahead of the billing day. Contractor to start collecting the meter reading data from Dth day and submit all the meter reading data in the MRO by D+5th day to client complete in all respect. CONTRACTOR shall be penalized in case of failing to submit the reading data complete in all respect by D+5th day.
  - In case urgent meter reading is required for any particular customer (out of portion), the same shall be provided within 1 day.
  - Client shall separately forward cases where "Zero / low consumption" is recorded and manual checking is required to be done. Then the same shall be carried out within 7 days of submission of such cases.
- 7.5.** Client shall conduct audit of the installed meters for a sample size as per client convenience. If it is found that the difference of meter reading between meter index and AMR reading is more than  $\pm 1\text{SCM}$ , CONTRACTOR shall be penalized.
- 7.6.** The CONTRACTOR shall provide the data log of the consumption of PNG of the customers as and when required by client. In case of any loss of meter reading data or software malfunction or any other reason attributable to the CONTRACTOR 98% due to which erroneous invoices of PNG customers are generated, CONTRACTOR needs to recollect and resubmit the meter reading to client within the timelines as mentioned above.
- 7.7.** The CONTRACTOR shall provide the details of the AMR which are not working or are damaged or the software not working properly or any other technical reason due to which the meter reading is not recorded. The CONTRACTOR shall submit the list of exceptions i.e. cases where AMR is not working, list of customers where manual reading is submitted, Temporary disconnection cases, Permanent Disconnection cases etc.

**NOTE:**

The maximum deductions pertaining to above mentioned penalty clauses that can be imposed on the CONTRACTOR shall be capped at 20% monthly invoice value. If the penalty levied on the CONTRACTOR




is 20% of the monthly invoice value for consecutive 3 months period, then it may be considered as a valid ground of poor performance. There after client may exercise the discretion of terminating the contract by serving single notice. In case of termination of contract due to poor performance, client reserves the right to forfeit the CPBG.

7.8. Contractor shall be liable to pay the penalty as described in commercial

## 8.0 SERVER

- 8.1. Cloud server should comply to ISO27001. Cloud Server shall be Tier-3 server with Availability of 98%. A maximum downtime of 12 hours in a 30day cycle shall be allowed for the server due to scheduled maintenance. Server shall be subjected to Audit conditions as prevailed in ISO 27001.
- 8.2. Contractor shall hire a third-party and shall conduct Cloud server audit once in each financial year. Intimation of Audit shall be conveyed to Client and Client may witness of the Audit at its discretion. A random audit shall be conducted by Client once in each financial year, Client shall provide intimation of such a random audit to contractor, 7 days prior to audit. Contractor shall be liable to pay the penalty, when the audit reports indicates non-availability of server more than 12 hours.
- 8.3. The cloud server should have provisions for scalability and shall be capable to store the data for a period of 6 months and shall provide interfaces to client server. The cloud server shall provide secured and encrypted platforms for Owner and their customers through web-services using HTTPS protocols.
- 8.4. CONTRACTOR shall sign a Non-Disclosure Agreement (NDA) with the purchaser at the time of kick off meeting. CONTRACTOR to comply the PCI DSS Requirement (Payment Card Industry Data Security Standard) and WEB Security – SSL (Secure Socket layer) & TLS (Transport Layer Security) Latest Version in case payment gate way belong to contractor
- 8.5. The server/cloud server should be OPC compliant. The Cloud or Physical Server shall be capable to manage 100,000 consumers at the starting point and shall be scalable to accommodate up to 2 Million consumers over next 5 to 7 years
- 8.6. Contractor shall follow the integration approach as suggested by CLIENT's IT team. Contractor shall deploy their IT & SAP team for integration activity in co-ordination with CLIENT SAP & IT Team.
- 8.7. Contractor shall ensure the two-way integration with CLIENT system within the 30 days of issuing the Purchase Order.
- 8.8. The data transfer should be in such a format, which is readily available for processing, access, read and uploaded in SAP and other systems. Data should be saved in compatible formats like csv/txt or any other format as per requirement of CLIENT.
- 8.9. Data shall be provided in common data format (CDF) for integration with General Service platform (GSP)/Business Analytics (BA)
- 8.10. The gas meter internal valve should get closed in case of malfunction/ tampering found with the meter.
- 8.11. Up-gradation of software or cloud must be carried out in lean hours i.e 01:00 – 04:00hrs
- 8.12. The software used should be capable of generating alarms / event. Any updation /modification in reports/formats as per CLIENT requirement shall be done by the Contractor free of cost.
- 8.13. Real time alarms to CLIENT in case of any malfunction/ tampering. The alarm SMS shall be sent to 3 CLIENT designated phone number and simultaneously email to 3 designated email IDs.
- 8.14. The software used should be capable of generating trends, alarms and graphics. Any updation /modification in reports/formats as per CLIENT requirement shall be done by the Contractor free of cost.
- 8.15. Battery life remaining (40%, 25% & 10%) indication shall be visible on meter & same shall reflect as a message on portal which is accessible to CLIENT, Customer & Contractor or as suggested by CLIENT. Contractor to provide battery life calculation.
- 8.16. System shall be capable of generating minimum following MIS (Management information System) reports. Format and contents of each report shall be mutually agreed with CLIENT/ PMC,
  - Average Yearly, Half-yearly, Quarterly, Monthly, Daily Consumption pattern.



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- Cumulative Quantity of Zero consumption meters,
- Cumulative Reading coverage,
- Low/ Peak consumptions,
- Details of portion wise manual reading collected in billing cycles,
- Tamper/Event Log,
- Exception Report,
- Above reports shall be configurable for specific Consumer, Type of installation, GA or Company wise.

## 9.0 SAP/JDE INTEGRATION




- The contractor shall integrate his software system with Client's SAP/JDE so that the meter reading thus collected from gas meter shall be sent to Client's SAP system from the contractor's system through integration. The infrastructure must be capable to integrate to the Client's SAP/JDE infrastructure. Detailed about SAP/JDE system will be provided to successful bidder.
- Development of communication interface module for integration of Contractor' application with SAP /JDE shall be in the scope of contractor. The necessary development for integration at Client's SAP/JDE system for consuming the data of Contractor's system shall be the responsibility of the CLIENT. Contractor shall provide technical assistance to Client's SAP/JDE team for successful integration at both end
- Contractor shall design integration flow and provide detailed document for the integration process detailing all the steps, process flow and architecture with any other technical information.
- Contractor shall submit a detailed report of impact analysis against any developments to be performed on SAP/JDE application, which shall be tested, validated and accepted by concerned Client user before moving into production environment.
- Contractor shall submit technical and functional specifications for establishment of an integrated end-to-end two-way communication.
- Contractor will be responsible for monitoring and resolving meter/server communication with SAP/JDE related issues including but not limited to performing onsite troubleshooting of all post-installation problems during contractual period.
- Contractor will use and maintain a hardware and software backup solution each Business Day to conduct backups of application configuration files and Business Data.
- The network architecture must be secure with support for firewalls and encryption. Any communication of data of third party with client shall be secured and encrypted to avoid any theft or loss of data. contractor to provide detailed description of the same.
- Implementation of anti-virus software and other malicious software prevention tools shall be in the scope of contractor. All support related to software will be in contractor's scope.

## 10.0 CONSUMER INFORMATION THROUGH MOBILE APP/ WEBSITE

**10.1.** Following are the bare minimum information which shall be available/ accessible to the consumer.

- a. Consumer detail,
- b. Total Consumption (INR or SCM) In current billing cycle,
- c. Historical Consumption (INR or SCM) data for past 12 billing/recharge cycles,
- d. Consumption pattern (INR or SCM),
- e. Selected Alarm/ Event data,

## 11.0 EVENT/ALARM LOGS

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- 11.1.** Meter shall provide the following Alarms/Event as a minimum;
- Any tamper events,
  - Low battery,
  - Corruption of data base
- 11.2.** Meter shall provide the following Tamper Events as a minimum;
- Battery replacement,
  - Opening and closing of valve for pre-paid meter
  - Un-authorized Opening of Meter,
  - No communication between Meter
- 11.3.** AMR shall provide the following Other Events as a minimum;
- Change of configuration/ Tariff programme,
  - Change in firmware
  - Change of setting of clock




Note- above are min, this may supplement as per client requirement. So, flexibility shall be available.

## **12.0 DATA ANALYTICS**

Contractor shall provide the following features of data analytics to CLIENT through dashboards / web based software (for web or mobile)

	Number of Concurrent Users of Dashboards	100
1	Types of Dashboards/web-based software.	1. Management dashboard / web based software. 2. Marketing dashboard / web based software 3. Operational team Dashboard/ web based software
2	Data Analytics on Management Dashboard / web based software	1. Hourly consumption 2. Daily report 3. Monthly report 4. Fortnightly report. 5. Same report shall be generated as consolidated reports for all customers.
3	Data Analytics on Marketing Dashboard / web based software.	1. Hourly consumption 2. Daily report 3. Fortnightly report. 4. Monthly report. 5. Same report shall be generated as consolidated reports for all customers.
4	Data Analytics on Operation Dashboard / web based software	1. Hourly consumption 2. Daily report






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		3. Fortnightly report. 4. Monthly report. 5. Same report shall be generated as consolidated reports for all customers.
5	Reports	1. Hourly, weekly, monthly consumption reports as per CLIENT requirement. 2. Daily exception report 3. The software shall be capable of generating alarms / events. 4. Any updation/modification in reports/ formats as per CLIENT requirement should be done by Contractor without any cost implication. 5. Billing summary, cumulative consumption, recharge summary, monthly reconciliation summary,
6	List of Alarms / Events	1. Any tampering of the gas meters. 2. Low battery 3. No flow 4. Zero consumption for 5 consecutive days 5. Low credits 6. Valve closed.
7	Graphical representation.	Bill summary, cumulative consumption, monthly summary.

Information required on each dashboard / web-based software may vary as per requirement of owner and shall be provided by Contractor for entire duration of contract.

### 13.0 TECHNICAL SPECIFICATION

Sr.No	Parameters	Requirement
1.	Gas Type	Natural Gas, Air, Propane, Butane, nitrogen and all non-corrosive gases.
2	Governing Standard	EN 1359:1999 + A1 Amendment 2006 or latest / OIML R 137-1&2 or latest
3	Meter Type	Diaphragm / Thermal type as per T4S, OIML R137 and MID
4	Cyclic volume	Vendor to specify
5	End Connection	3/4"NPTM at both inlet and outlet conforming to ANSI B1.20.1. In case end connections are different, Contractor to provide suitable adaptor (Free Loose Nut type) to meet the required connection size. (Note-1)

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6	Distance between inlet & outlet connection	110 $\pm$ 2 mm
7	Measuring Range	G1.6 Qmin 0.016m <sup>3</sup> /h, Qmax 2.5m <sup>3</sup> /hr
8	Accuracy	Class 1.5 $\pm 3$ % (Qmin. To 0.1Qmax.) $\pm 1.5$ % (0.1Qmax. To Qmax.) as per EN1359/ A1:2006 (Latest)
9	Rangeability	1:150 or better
10	Standard/directives	Directive 2014/34/EU(ATEX) Directive 2014/65/EU RoHS
11	Normal operating pressure	15 – 38 mbar-g
12	Output	LF/HF/UHF
13	Max. operating pressure	0.5 bar (0.1 bar of HTL version), internal valve operation upto 0.15 bar
14	Design Pressure	500mbar-g
15	Specific Gravity	0.6
16.	Operating temperature	-10 to 55 deg C
17.	Storage temperature	-10 to 65 deg C
18.	Pressure Drop	Under 2mbar
19.	ATEX approval	Zone-2, IIB Ex-ic IIA T6
20.	Humidity	Max. 93 % RH at 40deg C
21.	Ingress protection (diaphragm meter)	IP54, minimum protection level (according EN60529)
22.	Casing	Sheet steel with grey white painting (RAL 9002), tamperproof, corrosion resistance.
23	Corrosion protection over Body	Zinc Plated Steel & Suitable coating on inside & outside for corrosion protection
24	Meter Case Sealing	Effective sealing as per governing standard
25	Installation	Suitable for outdoor installation.
26	Other internal	All meter internal shall be non-metallic to prevent from tampering like magnet

27	Connection Orientation	Left side inlet and Right-side outlet type-I quantity as per Client requirement	Right side inlet and Left side outlet type-II quantity as per client requirement
28	Max Index Reading	99999.999 with auto reset facility	
29	Marking	As per governing standard specified above	
30	Type	Meter shall have mechanical / electronic index	
31	Diaphragm material	Polyester fabric coated with rubber on either side of equipment (Material suitable as per governing standard)	
32	Painting	Electrostatic spray epoxy paint or Polyester powder coating and the paint shall be of approved colour and quality	
33	Battery	Replaceable/non-replaceable Lithium-Ion battery with minimum lifetime cycle of 10 years. Battery life calculation to be provided.	
Notes			
1. End connections shall be provided with plastic caps for protection during transportation.			
2. All gas meters internals shall be tampering proof from external magnetic effect.			
3. Reverse rotation of index shall not be allowed. Meter shall be provided with a device to prevent reverse flow of the index.			

#### 14.0 MARKING (AS PER EN1359:2006 LATEST)

14.1. The Gas Meters shall be indelibly marked with details of

- Name of the manufacturer
- Flow – Max (Qmax), Min. (Qmin) -m<sup>3</sup>/h
- Direction of flow,
- Nominal value of cyclic volume
- Ambient temperature range.
- Gas temperature range
- Accuracy class of meter.
- Max. Operating Pressure,
- name of the manufacturer
- Purchaser's name / Logo,
- Model, unique serial number and date of Manufacturing etc.

**Note -**

- Sample of marking details to be provided along with ITP for approval.
- Contractor shall ensure that there is no repetition of serial no. & each meter shall be given unique serial no.

#### 15.0 PACKAGING

Packaging size to be mentioned to ensure uniformity in delivery conditions of the material being procured. SUPPLIER shall submit the packaging details during offer and also complied with at the time of delivery.

The calibration certificate of each item shall be enclosed within the package box. Each package box shall be tagged with the purchase order no. (unique ID is required). The package box shall be suitable for inland transport or seaworthy (if imported). Necessary precautions and pre-requisite shall be considered by supplier for package delivery to the concern client site / location/workshop.

## 16.0 OBSOLESCENCE:

CONTRACTOR to inform client about the any obsolescence in meter /software six months before any up-gradation, client holds the discretion to approve the new model of the product in such an incident. Upon approval from Client, CONTRACTOR can replace the obsolete model with new approved model. This replacement or maintenance will be part of contract and without any cost implication to Client.

## 17.0 INSPECTION AND TESTING




### 17.1. Gas Meters

The SUPPLIER shall provide calibration certificate and accuracy of the Gas Meter for the following flow rates (As per EN 1359:2006(latest))

Q Max.                      Q Min.                      0.2 Q Max.

SUPPLIER shall submit ITP to CLIENT/CLIENT's representatives for approval as per given format and also provide required certifications as mentioned in MR.

- 17.2. TESTING: contractor shall perform testing of the meter at NABL approved labs only. Client shall provide a list of random meters, which shall undergo testing. Testing shall be done in every 12 to 15 months. Testing shall be done for 1 Meter in every lot. Zero tolerance shall be observed, if any meter, which has gone through testing, is found out of range or faulty, it shall be replaced. Contractor shall be liable to pay the penalty.
- 17.3. Inspection shall be carried out as per Technical Specification, Quality Control Table and approved Inspection & Test Procedure.
- 17.4. SUPPLIER shall hire Third Party Inspection Agency (to be approved by the Client) to perform inspection work. This agency shall inspect all the equipment/material and issue all inspection certificates/reports as per specifications and codes.
- 17.5. SUPPLIER shall furnish all the material test certificates, proof of approval/ license from specified authority as per specified standard, if relevant, internal test/ inspection reports, Accuracy test report for individual meter, as per Technical Specification and specified code for 100% material, at the time of final inspection of each supply lot of material. Type test reports shall be submitted for review by Client / Client's Consultant. Also, all above mentioned certificates to be furnished in soft copy to Client.
- 17.6. Review of calibration certificates for all the measuring instruments at the time of inspection, i.e., used for checking and testing, along with the Master calibration certificate of the measuring instruments from which the instruments is calibrated.
- 17.7. All meters should be sealed properly by the manufacturer after final inspection clearance and before dispatch. Meters found in an unsealed condition will not be accepted.
- 17.8. If the performance of any of the sample meter/AMR/MIU is not in compliance with the acceptance norms of the respective standards, then that the lot of respective item will be rejected.
- 17.9. Contractor should furnish QAP in line with EN 1359:1999+A1 2006 or latest format as attached with the tender as minimum.
- 17.10. Even after third party inspection, Client reserves the right to select a sample of Gas Meters randomly from each manufacturing batch and have these independently tested. Should the results of these tests fall outside the limits specified in Technical specification, then Client reserves the rights to reject all production supplied from the batch.

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**17.11. Pressure test (External leak testing):**

Pressurize the case of the meter with air to 1.5 times the maximum working pressure and carry out test by immersing the meter without its index in water. The pressure shall be held for a sufficient period to permit complete examination of the parts under pressure. This period shall not be less than 30 Sec. Any leakage shall result in rejection.

**17.12. Testing and inspection shall be performed on all assemblies, subassemblies and component equipment/materials in accordance with but not be limited to the following list of activities:**

- visual inspection,
- dimensional checking,
- Resistance to internal pressure testing, as per EN 1359:2006(latest)/ performance testing.
- End connections: as per ANSI B.1.20.1, (3/4" NPT Threads), the distance between connections=110mm  $\pm$ 0.2mm.

**18.0 TRAINING**

**18.1.** The Contractor shall be required to hold a training session at site as well as in CLIENT head office initially for approximately 20 personnel and thereafter every year during the contract period to facilitate the operations and to provide hands on training to the dealing staff.

**18.2.** The training shall include commissioning, programming, trouble shooting and analysis of hardware and software component.

**18.3.** The Contractor shall provide requisite information and hard copies of manuals for reference.

**18.4.** CLIENT will not reimburse any charges for the training.

**19.0 MANPOWER**

**19.1.** All manpower including engineers, technicians etc associated with the project shall be required to wear protective gear such as safety shoes, helmets, goggles etc.

**19.2.** All manpower deputed at site for commissioning of equipment shall be covered under statutory government compliances of PF, ESI, accident insurance, death, disability etc.

**19.3.** Contractor shall submit organogram towards the project team that shall be deputed for supervision and commissioning and proposed location of for his project office.

**19.4.** Contractor will not change the project team during the contract without prior consent of CLIENT.

**19.5.** After successful commissioning of the project contractor shall provide dedicated team of engineers (as per engineering in-charge) in shift A, B & C (each shift is of eight hours) for operation and maintenance of the system. The engineers should be available round the clock.




**19.6.** Engineers deployed should be diploma engineers in electrical/electronics/ instrumentation field with minimum experience of 2 years on similar system.

**20.0 ASSET HANDOVER & COMMISSIONING:**

**20.1.** Contractor shall own the primary responsibility of commissioning and the ASSET shall be considered handed-over post NG conversion. Contractor shall ensure commissioning activity is completed within 5 calendar days post installation of the ASSET. Contractor shall be responsible for providing geo-tagging for the ASSET installed in the format provided by CLIENT. Contractor shall provide a report of the geo-tagged ASSETs within 5 calendar days from the time of installation.

**20.2.** Contractor shall submit the minimum one photographs of commissioned meters. Contractor shall retain these photographs at his server for complete duration of contract (i.e. 10 years) and shall provide free access to CLIENT for these photographs as and when required.

**20.3.** Contractor also shall be responsible for re-commissioning of any replaced meters. Contractor shall submit one photograph of the re-commissioning of the meter. Contractor shall retain the photograph at his server for

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complete duration of contract (i.e. 10 years) and shall provide free access to CLIENT for these photographs as and when required. Contractor shall also submit a monthly report for all the re-commissioned meters.

- 20.4.** In case, contractor fails to commission within the time frame, Contractor shall be liable to pay the penalty as described commercial.

## **21.0 SPARE STOCK**

- 21.1.** CLIENT may replace any defective meter supplied by contractor. The defective meters shall be kept at CLIENT store. Contractor shall be informed by CLIENT every month for reconciliation of the entire lot of defective meters with new meters at CLIENT store without any cost implication. Contractor shall refurbish the entire lot within 30 days from the date of reconciliation. Failing to reconcile the lot in 30days the Contractor shall be liable to pay the penalty as described in commercial

## **22.0 ANNUAL COMPREHENSIVE MAINTENANCE CONTRACT (ACMC)**

- 22.1.** The Contractor shall include proposal at the time of bid for providing ACMC from the date of award and provide the total i.e comprehensive operation & maintenance of system/ sub system, which is part of this MR.
- 22.2.** The proposal shall include supply of tools and tackle as required; travel, boarding & lodging of service engineer. The bid shall be made year wise and the price validity shall be available for the entire period of contract.
- 22.3.** Contractor shall maintain at least 5% inventory for gas meters in OK condition. Replace/repair of faulty meter in inventory on quarterly basis to maintain inventory.
- 22.4.** Contractor to provide 24x7 services for customer.
- 22.5.** Update any firmware or software required for the comprehensive maintenance of the complete system.
- 22.6.** In the event of any malfunction of the system hardware/ system software, experienced service engineer shall be made system healthy.
- 22.7.** Maintain communication with CLIENT through reports, provide alarms/event, billing inputs, information with respect to reading, mal-functionality, mal-practices, mishandling or faultiness of the ASSET.

## **23.0 STANDARD OPERATING PROCEDURE**




### **23.1. GENERAL**

The objective of this document is to define the Standard Operating Procedures for AMR Compatibility Test and Tamper Alarm Test in the domestic type gas meter with AMR used in City Gas Distribution Project.

### **23.2. SOP FOR AMR COMPATIBILITY TEST**

After the MIU is installed and wired properly on the meter follow these steps to verify that the AMR is working properly:

- a) Check the mechanical index reading and the reading on the MIU or at the Server are same.
- b) Check the serial number on the meter body, communication device and server are the same.
- c) Now move the meter index by blowing air or with the help of low-pressure instrument air for minimum one-meter cube.
- d) Check the variation on the index, MIU, handheld device and on the server.
- e) If the increments on all the places are same, then it is demonstrated that the communication is established.
- f) Now, place a magnet (up to 0.2 Tesla) on meter index and repeat the steps c & d and check the readings of meter Index, MIU and Server.

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- g) If placement of magnet (0.2 tesla) creates any kind of reading mismatch between meter mechanical index reading and reading at server than the meter shall be considered as technically disqualified.

### 23.3. SOP FOR TAMPER ALARM TEST

Tamper Alarm will be conducted along with the QAP i.e., the Calibration, accuracy, range. Once the meter passes the calibration test at QMIN, QMAX, and at 0.1QMAX flow rate, then the following tests will be conducted on the same apparatus:

- a) Ensure that the communication is established between the MIU of AMR meter with BIDDER's server.
- b) Once the communication is established, bring a magnet (up to 0.2 Tesla) near the meter index and keep it there till at least one-meter cube of air is passed through it.
- c) If meter get stopped with the effect of magnet, meter shall be considered as technically not qualified Or if meter become slow and fails to meet the accuracy class of 1.5 with the effect of magnet on it, the meter shall be considered as technically not qualified and in both the cases, tamper alarm should be generated and if the alarm is not generated meter shall be considered as technically not qualified.
- d) Repeat the step (a) ensure passage of minimum 1-meter cube of gas,
- e) Try to remove the MIU from the meter by breaking the seal on removal of MIU the system shall generate alarm for the same and if the alarm is not generated meter shall be considered as technically not qualified.
- f) Go back to step (a) again, if required.

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**CENTRAL U.P. GAS LIMITED (CUGL)  
CITY GAS DISTRIBUTION PROJECT AT  
KANPUR, UNNAO, BAREILLY & JHANSI GA IN THE  
STATE OF U.P.**

PTS - DOMESTIC DIAPHRAGM METER

0	22.06.2021	Issued for Procurement	Pulkit Mishra	Gunja Gupta	Surendra Dungawat
<b>Rev.</b>	<b>Date</b>	<b>Description</b>	<b>Prepared By</b>	<b>Checked By</b>	<b>Approved By</b>



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## 1.0 SCOPE

The scope of work shall cover Design engineering, manufacturing, testing, inspection, preparation for shipment and transportation, fabrication, packing, insurance, loading and unloading at designated Stores. Domestic Diaphragm meters G 1.6 (Normal) as per technical requirements/specification for City Gas Distribution Project.

## 2.0 GENERAL

### 2.1 Definitions

Subject to the requirements of the context, the terms (hereafter listed in alphabetical Order) used in this specification are given the following meaning:

AGREEMENT	Designates the agreement concluded between the OWNER and the CONTRACTOR/SUPPLIER, under which the latter undertakes to the former the GOODS and/or SERVICES according to the stipulations which are agreed and specified in the form of an order.
OWNER (PURCHASER)	Designates the purchaser of the GOODS and/or SERVICES, which are the subject of the AGREEMENT.
CONTRACTOR/SUPPLIER	Designates the individual or legal entity with whom the order has been concluded by the OWNER. The term "CONTRACTOR/SUPPLIER" may be used indifferently for a supplier, a manufacturer, an erection CONTRACTOR / SUPPLIER, etc.
DAYS - WEEKS – MONTHS	Specify the number of calendar days, weeks or months and not of working days, weeks or months.
OWNER'S REPRESENTATIVE (PMC)	Designates the individual or legal entity to which the OWNER has entrusted various tasks in relation with the carrying out of his PROJECT.
GOODS and/or SERVICES	Designate, depending on the case, all or part of the drawings or documents, substances, materials, materiel, equipment, structures, plant, tools, machinery, to be studied, designed, manufactured, supplied by the CONTRACTOR/SUPPLIER under the AGREEMENT, including all the studies, tasks, works and services specified by the order. The Terms GOODS or SERVICES may by indifferently used one for the other as required by the context.
PROJECT	Designates the aggregate of GOODS and/or SERVICES to be provided by one or more CONTRACTOR/SUPPLIERS.

### 2.2 Review and/or Approval

Whenever OWNER and/or OWNER'S REPRESENTATIVE review and/or approval is requested on a document to be submitted by the CONTRACTOR/SUPPLIER or before an action is implemented by the CONTRACTOR/SUPPLIER, such review and/or approval shall always be requested in writing by the CONTRACTOR/SUPPLIER to the OWNER and/or the OWNER'S REPRESENTATIVE before any action subject of this review and/or approval is taken.

OWNER and/or OWNER'S REPRESENTATIVE approval shall always be given in writing.

### 2.3 Codes, Standard and Legal Requirements

- The design, manufacturing, materials, testing of the meters shall be in accordance with the International codes and standards mentioned in the present specification.

- Meters shall be approved to EN 1359: 1999+A1:2006 Or EN 1359-2017 or the latest edition or OIML R137- 1&2 latest edition for other type of Gas Meters as per PNGRB regulatory requirement and also with the other applicable codes, standards and legal requirements.
- The offered diaphragm flow meter model shall have certification for specified flow and accuracy from the Weights & Measurement Department of the country of origin. The certificate(s) shall be in English language or in the language of originating country along with English translation. Bidder shall submit the copy of such certificate(s) to along with bid. Vendor to arrange for Weights and Measures approval from Indian Authorities.
- Meters shall be in compliance of PNGRB requirement. In case of any contradiction between code/ standard and PNGRB regulations, PNGRB regulations to be followed.
- Type approval issued by Director of Legal Metrology (Government of India) for each of the offered models of diaphragm gas meters, along with the technical bid.
- Bidder shall be registered manufacturer with Director of legal Metrology, Government of India. In case, the bidder is importing the offered model of diaphragm gas meter from overseas (i.e. from outside India), the bidder shall furnish a copy of import registration certificate issued by Director of legal Metrology, Government of India., along with the technical bid.
- Valid approval certificate for compliance of the offered model of the gas meter to the requirement of latest EN 1359: 1999+A1:2006 Or EN 1359-2017 or the latest edition. or OIML R137- 1&2 latest edition for other type of Gas Meters as per PNGRB regulatory requirement from any recognized agency
- All documents submitted by the bidder shall be in English Language Only.

### 3.0 DESCRIPTION OF DOMESTIC DIAPHRAGM METERS

- 3.1. Domestic Gas Meters shall be of Diaphragm type mechanism G -1.6 for Natural gas application.
- 3.2. Connections Orientation for G - 1.6 (Normal) shall be left side inlet and right-side Outlet connections.
- 3.3. Meters shall be suitable for Outdoor/ Indoor Installations, tamper proof and corrosion resistance for a life period of 10 years.
- 3.4. Meter shall have 8 digit (99999.999) mechanical register.
- 3.5. The meter shall be equipped with a mechanism to ensure retrofit of a meter interface unit for future upgrade to Remote/Automated Meter Reading System. For this purpose, provision for pulse generation, compatible with retrofit unit shall be in-built into the meter and shall generate alarm in case of magnetic tempering or shall remain unaffected by an external normal domestic magnetic effect to the best extent possible during the remote meter reading.  
  
Diaphragm meters with magnetic pulse principle with a magnetic tamper alarm are acceptable subject to any tampering event by any capacity magnet; alarm has to be generated and recorded in the system and AMR.
- 3.6. Domestic Gas Meters must be suitable for retrofitting of AMR in future and communication with any technology such as RF(walk-by/fixed)/GPRS/LORA/LPRF or similar meeting the requirement
- 3.7. During the inspection of the gas meters at the works of the manufacturer by owner/ owner's representative, the vendor shall carry out tests to demonstrate that the gas meters are capable of generating pulses, compatible with an AMR system and AMR reading is not affected by external magnet (upto 0.2 Tesla). For demonstration, necessary arrangement requirement shall be made by the vendor during inspection.

#### 4.0 PROCESS REQUIREMENT

Max. Flow	2.5 Cu.M./Hr.
Min. Flow	0.016 Cu.M./Hr.
Max. Operating pressure	500 mbar (g)
Operating Pressure	15 – 38 mbar (g)
Permissible Pressure loss	2 mbar
Ambient temperature	0° C to 60° C
Gas temperature	0° C to 40° C
Accuracy	±3 % (Qmin. To 0.1Qmax.) ±1.5 % (0.1Qmax. To Qmax.)

**Note –**

1. Bidder to ensure that, above given requirement shall be as per (as per EN 1359: 1999+A1:2006 Or EN 1359-2017 or the latest edition.)
2. Meters shall be approved to EN 1359: 1999+A1:2006 or EN 1359-2017 or the latest edition for Diaphragm Gas Meter as per PNGRB regulation with the other applicable codes, standards and legal requirements.
3. The offered diaphragm flow meter model shall have certification for specified flow and accuracy from the Weights & Measurement Department of the country of origin. The certificate(s) shall be in English language or in the language of originating country along with English translation. Bidder shall submit the copy of such certificate(s) to along with bid or Vendor to arrange for Weights and Measures approval from Indian Authorities.
4. Bidder shall be registered manufacturer with Director of legal Metrology, Government of India. In case, the bidder is importing the offered model of diaphragm gas meter from overseas (i.e. from outside India), the bidder shall furnish a copy of import registration certificate issued by Director of legal Metrology, Government of India., along with
5. Valid approval certificate for compliance of the offered model of the gas meter to the requirement of EN 1359: 1999+A1:2006 or EN 1359-2017 or the latest edition for Diaphragm Gas Meter from any recognized agency. "
6. Valid certificate of type approval issued by Director of Legal Metrology (Government of India) for each of the offered models of diaphragm gas meters.

#### 5.0 MATERIAL OF CONSTRUCTION

- 5.1. Casing material shall be of Zinc Plated Steel and suitable coating on inside & outside for corrosion protection of casing or Confirming test as as per EN 1359: 1999+A1:2006 Or EN 1359-2017 or the latest edition.
- 5.2. Enclosure shall be min. IP 54 as per EN 60529
- 5.3. Process connection shall be 3/4" NPT inlet & outlet, conforming to ANSI B 1.20.1 and material shall be brass
- 5.4. In case the end connections are differing, SUPPLIER to provide suitable adopters of approved quality to meet the specified end connections conforming to ANSI B 1.20.1. Adopter material shall be brass.
- 5.5. Fire resistance shall comply with EN 1359: 1999+A1:2006 Or EN 1359-2017 or the latest edition.or equivalent.

	 CUGL Central U.P. Gas Limited	PTS - DOMESTIC DIAPHRAGM METER	<b>P.014714 -          G-11077-          I602</b>
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- 5.6. Diaphragm material shall be Polyester fabric coated with rubber or Nitrile rubber on either side or equivalent for an endurance life cycle of 80, 000 cum.

## 6.0 INSTRUCTIONS TO SUPPLIER

- 6.1. All domestic diaphragm meters internals shall be tampering proof from external magnetic effect.
- 6.2. Reverse rotation of index shall not be allowed. Meter shall be provided with a device to prevent reverse flow of the index.
- 6.3. End connections shall be protected by plastic caps.

## 7.0 PAINTING REQUIREMENTS

The Domestic Diaphragm Meters shall be painted with electrostatic spray epoxy paint or Polyester powder coating and the paint shall be of approved colour and quality.

## 8.0 MARKING

- 8.1. Each meter shall be marked with at least the following information, either on the index or on a separate data plate:
- Instruction manual and Test certificates: soft copy of all required documents in electronic format (.pdf Acrobat files) on CD-ROMs to OWNER.
  - Identification mark or name of the manufacturer,
  - Serial number of the meter shall be as per below description  
 Manufacturer name – Year of manufacturing – Type of meter – serial no. of meter (05 digits). For example: Say XYZ Co., Year is 2020, Domestic Meter we will represent Meter no. as  
 XY-19- 01-01 - 00001  
 Manufacturer name: XY  
 Year of manufacturing: 2021  
 Type of meter: 01-01 (as per manufacturer standard)  
 Serial no. of meter (05 digits) : 00001
  - Tender Condition Prevails Maximum flow rate,  $Q_{max}$ . (m<sup>3</sup>/h)
  - Minimum flow rate,  $Q_{min}$ . (m<sup>3</sup>/h)
  - Maximum Working pressure,  $P_{max}$ . (bar)
  - Nominal value of the cyclic volume,  $v$  (dm<sup>3</sup>)
  - The number and date of this standard i.e EN 1359:199X or OIML R 137 -1&2
  - Ambient temperature range
  - Direction of flow
  - Name and logo of the client name
  - Sticker for safety information on front side of the body of meter
- 8.2. Vendor shall supply safety signage sticker for Safety Signage affix on the body of each Domestic. The final print for safety signage shall be approved by Owner/PMC before supply. Minimum requirement on sticker shall be given at the stage of work order placement.
- 8.3. Each of the boxes of individual gas meter shall be closed / sealed appropriately with a tape, and packing and strength of the box shall be such that same does not get opened or damaged during handling and storing of the same. A set of 4-5 Nos. (Or as deemed suitable by the manufacturer) of individual gas meters shall be

packed in a larger box / carton and contents of (larger) box / carton, viz. Description of the gas meter and total quantity of gas meters (in the box), shall be clearly and specifically mentioned (in English language only) on each of the (larger) box as under:

- a) Name of manufacturer
  - b) Description of material
  - c) Purchase Order No.
  - d) Total quantity (inside the box)
  - e) Date of inspection
- 8.4. The Manufacturer has to ensure that the Inspection Agency apply their mark (stamp / sticker/ embossing applicable as per inspection cum dispatch released certificate) on each box ensuring above mentioned information before dispatch.
- 8.5. In order to facilitate a proper storing of the gas meters, the maximum number of such boxes that are permitted to be stacked one upon the other shall also be clearly and legibly mentioned on the box.
- 8.6. The box containing the individual gas meter shall contain the details of the installation and servicing operating instructions, and the same shall be written in English language. They shall include all relevant information and following in particular:
- a) Instruction manual and Test certificates
  - b) Installation, operation and servicing
  - c) Mounting position & instruction
  - d) The maximum and minimum operating temperatures
  - e) Maximum operating pressure.
- 8.7. Meters found in an unsealed condition will not be accepted at Owner stores.

## 9.0 PACKAGING

Packaging size to be mentioned to ensure uniformity in delivery conditions of the material being procured. The total packaging system shall be such that it will not get damaged/ unintentionally opened during handling, transportation and storage of the boxes. Each device shall be sealed properly before dispatch, such that the factory setting cannot be changed on site. SUPPLIER shall submit the packaging details during offer and also complied with at the time of delivery.

## 10.0 INSPECTION AND TESTING

### Domestic Diaphragm Meters

The SUPPLIER shall provide calibration certificate and accuracy of the Domestic Diaphragm Meter for the following flow rates (As per EN 1359 latest edition):

Q Max.                      Q Min.                      0.2 Q Max.

SUPPLIER shall submit ITP to OWNER/OWNER's representatives for approval as per given format and also provide required certifications as mentioned in MR.

- 10.1 Inspection shall be carried out as per Technical Specification, Quality Control Table and approved Inspection & Test Procedure.
- 10.2 SUPPLIER shall furnish all the material test certificates, proof of approval/ license from specified authority as per specified standard, if relevant, internal test/ inspection reports, Accuracy test report for individual meter, as per Technical Specification and specified code for 100% material, at the time of final inspection of each supply lot of material. Type test reports shall be submitted for review by 'OWNER / OWNER's Consultant. Also, all above mentioned certificates to be furnished in soft copy to M/S. OWNER.
- 10.3 Even after third party inspection, OWNER reserves the right to select a sample of Domestic Diaphragm Meters randomly from each manufacturing batch and have these independently tested. Should the results of these tests fall outside the limits specified in Technical specification, then OWNER reserves the rights to

reject all production supplied from the batch.


10.4 Pressure test (External leak testing):

Pressurize the case of the meter with air to 1.5 times the maximum working pressure and carry out test by immersing the meter without its index in water. The pressure shall be held for a sufficient period to permit complete examination of the parts under pressure. This period shall not be less than 30 Sec. Any leakage shall result in rejection.

10.5 Testing and inspection shall be performed on all assemblies, subassemblies and component equipment/materials in accordance with but not be limited to the following list of activities:




- Visual inspection,
- Dimensional checking,
- Resistance to internal pressure testing, Meters shall have compliance to the test requirements of EN 1359: 1999+A1:2006 Or EN 1359-2017 or the latest edition in force for Domestic Diagram Gas Meter / OIML R 137-1 & 2 for other type of Gas Meters as per PNGRB regulatory requirement
- Functional/performance testing.
- End connections: as per ANSI B.1.20.1, (3/4" NPT Threads), the distance between connections=110mm±0.5 mm

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TRACTEBEL ENGIE		 Central U.P. Gas Limited	QUALITY CONTROL TABLE - PRE-PAID SMART METERS					Project :City Gas Distribution Project					
								Client :CUGL					
								Consultant : Tractebel Engineering Pvt. Ltd.					
								QCT No. P.014714-G-11013-Q601 Rev: 0					
								Prepared By: PM		Chk: GG		Approved: SD	
								Date : 22.06.2021					
S.No	Components & Operations	Description of Test / Type of Test	Category	Extent of Check	Ref. Doc. & CLno.	Acceptance Criteria	Format of Record	Inspection			Remark		
								Manufacturer	TPIA	CA			
1	External Leak Tightness		Test	100%	BS EN 1359:1999, Clause No. 6.2.2	Confirming to CUGL Tender Technical Specifications and BS EN 1359 : 1999	Manufacturer / Inspection Report / Laboratory Test Report	P	W	W	100% Inspection by Manufacturer and 5% Inspection by TPIA		
2	External Soundness Test		Test	100%				P	W	W			
3	Calibration of Test for Accuracy of Registration Testing	At Qmin Flow Rate	Test	100%	BS EN 1359:1999, Clause No. 5.1			P	W	W			
		At Qmax Flow Rate	Test	100%				P	W	W			
		At 0.1 Qmax Flow Rate	Test	100%				P	W	W			
4	Pressure Absorption Test	~	Test	100%	BS EN 1359:1999, Clause No. 5.2			P	W	W			
5	Dimensional Inspection	Centre to Centre of End Connections	Visual	100%	CUGL TECHNICAL TENDER SPECIFICATION			P	W	W			
		Inlet & Outlet End Connection Size and Threading	Visual	100%				P	W	W			
6	Visual Inspection	Pressure Test Point	Visual	100%				P	W	W			
		Fascia Palte Marking	Visual	100%				P	W	W			
		Powder Coating Thickness (Min. 40 micron)	Visual (Use DFT Meter)	100%				P	W	W			
		Index Reading	Visual	100%				P	W	W			
		Arrow Marking	Visual	100%				P	W	W			
		Colour & Apprearance	Visual	100%				P	W	W			
		Marking & Packing	Visual	100%				P	W	W			
7	Mechanical & Chemical Properties of Body Casing				As per manufacturer's MTC			P	W	W			
8	Verification of casing thickness recorded against resistance to internal pressure test (type test report)	Verification to be done by using standard thickness measurment instrument. (tolerance of ± 0.05 mm)		1 No. per each batch of casing material	As per type test approval certification obtained against resistance to internal pressure test			P	W	W			
9	Fire Resistance i.e. Resistance to High Temperature Test	~	Test	BS EN 1359:1999, Clause No. 6.5.5				P	W	W	Review of Test		
10	Calibration Report for all measuring instruments	~	Visual		~			P	W	W	Certificates by TPIA / Client		



11	AMR Compatibility Test	~	Test	One in 1000 Meters.	CUGL Technical Tender Specification, SOP	Confirming to CUGL Tender Technical Specifications and BS EN 1359 : 1999	Manufacturer / Inspection Report / Laboratory Test Report	P	W	W	100% Inspection by Manufacturer and TPIA.
12	Tamper Alarm Test	~	Test	One in 1000 Meters.	CUGL Technical Tender Specification, SOP			P	W	W	100% Inspection by Manufacturer and TPIA.
<b>LEGENDS: R - Review, W - Witness, RW-Random Witness (Minimum 1 % of lot size) P - Perform, TPIA - Third Party Inspection Agency, CA : Control Authority (Owner/Owner's Representative i.e PMC) , SOP - Standard Operating Procedure</b> <b>Single Samplig Plan with 1% AQL Normal Inspection- Level 1 (AS per IS 2500)</b>											
<b>Notes: -</b>											
1	The above mentioned testing and acceptance criteria are minimum requirements , however , supplier shall ensure that the product also comply to the additional requirements as per technical specifications and data sheets.										
2	The supplier shall submit their own detailed ITP prepared on the basis of the above for approval of Owner / Owner's representative and TPIA.										
3	TPIA shall have right to inspect minimum 1 % of all manufacturing activities on each day or as apecified above.										
4	TPIA along with Owner / Owner's representative shall review / approve all the documents related to ITP / Quality manuals Drawings etc. submitted by supplier.										
5	TPIA shall also review the test certificates submitted by the manufacturer.										
6	Supplier shall in coordination with sub vendor issue detailed production and inspection schedule indicating the dates and the locations to facilitate Owner / Owner's representative to organise Inspection.										
7	TPIA shall issue Inspection Release Note on the basis of witness/review of all the stages as per approved ITP.										
8	Test to prove that their meter is compatible for retrofit unit to get it upgrade to a Remote/Automated Meter Reading system.										

  		<div>QUALITY CONTROL TABLE</div> <div>DOMESTIC DIAPHRAGM METERS</div>						<div>Project :City Gas Distribution Project</div> <div>Client :CUGL</div> <div>Consultant : Tractebel Engineering Pvt. Ltd.</div> <div>QCT No. P.014714-G-11013-Q602 Rev: 0</div> <div>Prepared By: PM      Chk: GG      Approved: SD</div> <div>Date : 22.06.2021</div>			
S.No	Components & Operations	Description of Test	Category	Extent of Check	Ref. Doc. & Cl.no.	Acceptance Criteria	Format of Record	Inspection			Remark
								Manufacturer	TPIA	CA	
1	Body & Internal parts	Material of Body	Chemical Analysis/Physical test	1 sample per heat	Approved datasheet	Applicable material standard	Material test Reports	P	R	R	
2	Assembly	Dimension-Size,rating,end connection, Printed Dial Marking, Index reading, Powder coating thickness, arrow marking	visual	100%	Approved drwg/doc/ datasheet	Approved drwg/doc / datasheet	Inspection Format	P	R	R	
		Degree of protection	Test	100%	Approved data sheet	Applicable stdard.	Test Report	P	R	R	
		External leak tight test	Test	100%	EN 1359 Clause no 6.2.2 & 6.2.3	No leakage	Test Report	P	RW	RW / R	
		Calibration, accuracy ,range	Test	100%	EN 1359 Clause 5.1	As per EN 1359 Clause 5.1	Test Report	P	RW	RW / R	
		Total Mean Pressure Loss (pressure absorbtion P.A.)	Test	100%	EN 1359 Clause 5.2	P.A. < 2 mbar	Test Report	P	RW	RW / R	
3	Test for capability of Retrofit unit (Refer Note 8)		Test	one in 1000 nos.	As per PTS	PTS Cl. No. 3	Inspection Report	P	W	W / R	
4	Temper Alarm Test		Test	one in 1000 nos.	As per PTS	PTS Cl. No. 3	Inspection Report	P	W	W / R	
5	Marking		Visual	100%	Approved Signage	PTS Cl. No.8	Inspection Report	P	RW	RW / R	
LEGENDS: R - Review, W - Witness, RW-Random Witness (Minimum 1 % of lot size) P - Perform, TPIA - Third Party Inspection Agency, CA : Control Authority (Owner/Owner's Representative i.e PMC)											
Notes: -											
1	The above mentioned testing and acceptance criteria are minimum requirements , however , supplier shall ensure that the product also comply to the additional requirements as per technical specifications and data sheets.										
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4	TPIA along with Owner / Owner's representative shall review / approve all the documents related to ITP / Quality manuals Drawings etc. submitted by supplier.										
5	TPIA shall also review the test certificates submitted by the manufacturer.										
6	Supplier shall in coordination with sub vendor issue detailed production and inspection schedule indicating the dates and the locations to facilitate Owner / Owner's representative to organise Inspection.										
7	TPIA shall issue Inspection Release Note on the basis of witness/review of all the stages as per approved ITP.										
8	Test to prove that their meter is compatible for retrofit unit to get it upgrade to a Remote/Automated Meter Reading system.										

At the helm of the Energy Transition, Tractebel provides a full range of engineering and advisory services throughout the life cycle of its clients' projects, including design and project management. As one of the world's leading engineering and advisory companies and with more than 150 years of experience, it's our mission to actively shape the world of tomorrow. With about 5,000 experts and presence in more than 70 countries, we are able to offer our customers multidisciplinary solutions in energy, water and urban.

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