



Bhagyanagar Gas Ltd.

(A Government of India Enterprise)

BHAGYANAGAR GAS LIMITED

{A joint venture of M/s GAIL (India) Ltd. and M/s Hindustan Petroleum Corporation Ltd.}

HYDERABAD (INDIA)

CITY GAS DISTRIBUTION PROJECT AT HYDERABAD, VIJAYAWADA AND KAKINADA

**BID DOCUMENT
FOR**

SMART METERING SYSTEM

OPEN INTERNATIONAL COMPETITIVE BIDDING

Bid Document No.: MEC/23R8/01/51/S2/CF/00/0007



VOLUME — II OF II



**PREPARED AND ISSUED BY
MECON LIMITED**



**(A Govt. of India Undertaking)
BENGALURU, India**

NOVEMBER, 2016



 <p>Bhagyanagar Gas Ltd.</p>	<p style="text-align: center;">Bhagyanagar Gas Limited CITY GAS DISTRIBUTION PROJECT AT HYDERABAD, VIJAYAWADA & KAKINADA SUPPLY OF SMART METERING SYSTEM Bid Document No.: MEC/23R8/01/51/S2/CF/00/0007</p>	 <p>मेकॉन ISO 9001 Company</p>
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CONTENT

<u>Sl.No.</u>	<u>Description</u>
SECTION - I	TECHNICAL SPECIFICATION FOR SMART METERS AND ASSOCIATED UNITS
SECTION - II	MATERIAL REQUISITION
	&
	DATA SHEETS OF SMART METERING SYSTEM

 <p>Bhagyanagar Gas Ltd.</p>	<p align="center">Bhagyanagar Gas Limited CITY GAS DISTRIBUTION PROJECT AT HYDERABAD, VIJAYAWADA & KAKINADA SUPPLY OF SMART METERING SYSTEM Bid Document No.: MEC/23R8/01/51/S2/CF/00/0007</p>	 <p>मेकॉन ISO 9001 Company</p>
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SECTION - I
TECHNICAL SPECIFICATION
FOR
SMART METERS AND ASSOCIATED UNITS

 <p>Bhagyanagar Gas Ltd.</p>	<p>Bhagyanagar Gas Limited</p> <p>CITY GAS DISTRIBUTION PROJECT AT HYDERABAD, VIJAYAWADA & KAKINADA</p> <p>SUPPLY OF SMART METERING SYSTEM</p> <p>Bid Document No.: MEC/23R8/01/51/S2/CF/00/0007</p>	 <p>ISO 9001 Company</p>
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1.0 INTRODUCTION

Bhagyanagar Gas Limited (BGL) is a joint venture of M/s GAIL (India) Limited and M/s Hindustan Petroleum Corporation Limited (HPCL) operating CNG & City Gas Distribution in the states of Telangana and Andhra Pradesh.



Presently, Bhagyanagar Gas Limited is expanding the CNG & City Gas Distribution Network (CGDN) to supply Natural Gas to domestic, commercial, industrial and automobile Consumers in the Geographical Area (GA) of Hyderabad, Vijayawada and Kakinada city.

M/s MECON LIMITED, who has been retained by Bhagyanagar Gas Limited, as a consultant for "CGD PROJECT AT HYDERABAD, VIJAYAWADA, KAKINADA", invites sealed bids for the item(s) in complete accordance with the Bid Documents / Attachments on behalf of M/s Bhagyanagar Gas Limited, Hyderabad, for "SMART METERING SYSTEM" from competent suppliers meeting the Bidder's Evaluation Criteria as detailed herein. Sealed bids along with Bid Security should reach MECON Limited, Bengaluru on or before the due date and time at the address given below.

2.0 SCOPE OF WORK

The Bidder shall be responsible for design, engineering, manufacture, supply, inspection, testing and commissioning of the total system for completeness and satisfactory stable operation of the Walk-by/Drive-by type, Fixed/Wireless type, Commercial consumers cardless Prepaid type Smart metering /Automatic Meter Reading (AMR) system. Supplier's scope of work shall include the following:-

1. Design, detail engineering, manufacturing, assembly, factory testing, inspection (as applicable as per bid document), marking & packaging, supply of smart metering system comprising of diaphragm meters, Meter Interface unit (MIU) (with or without integral digital display for fixed and walkby type & with integral digital display for prepaid commercial type) , hand held units/Android or windows Mobile with loaded APP., data concentrator units, SIM cards, engaging third party service providers, servers, networking components, cables, furniture and other associated accessories as required, handling, transportation, loading/ unloading at sites/ designated store, documentation etc. and providing all related services, commissioning spares.
2. Carrying out survey, assessment and recommendation of sites for the most appropriate location for placing data concentrators including manpower, tools and tackles etc.
3. Supply, installation, integration and commissioning of Smart metering /Automatic Meter Reading (AMR) system software including AMR, billing software and system software. Bidder's scope includes supply of any other hardware and/or software than indicated in MR, which is required for successful operation of the Smart Metering System.
4. Erection of Control room equipments like Servers, network components, UPS, printers, console etc. along with cable laying, termination with necessary erection hardware like conduits etc.,.

 <p>Bhagyanagar Gas Ltd.</p>	<p>Bhagyanagar Gas Limited</p> <p>CITY GAS DISTRIBUTION PROJECT AT HYDERABAD, VIJAYAWADA & KAKINADA</p> <p>SUPPLY OF SMART METERING SYSTEM</p> <p>Bid Document No.: MEC/23R8/01/51/S2/CF/00/0007</p>	
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5. Supply of consumables, commissioning & two years operation and maintenance spares. For two years spares, the bidder shall indicate & fill the details as per Annexure -A
6. Providing training to Purchaser's personnel pertaining to handling of meters, Meter Interface Units (MIU), handheld Units/ Android or windows mobile, data concentrators, all associated software at purchaser's place.
7. The supplier shall comply to local statutory regulations of Legal metrology of 2009 and Andhra Pradesh Legal Metrology (Enforcement) rules, 2011 for Vijayawada and Kakinada.
8. The supplier shall comply to local statutory regulations of Legal metrology of 2009 and Telangana Legal Metrology (Enforcement) rules, 2011 for Hyderabad.
9. Supplier shall also specify and include the hardware/software which are not specially mentioned but are required to complete the commissioning/functioning of Smart metering system.

3.0 Exclusions

Erection of the Diaphragm meter/MIU & Data Concentrator.

4.0 CODES AND STANDARDS

Unless otherwise specified, the latest editions of the standards mentioned herein this specification, including all addenda and revisions, shall apply. The vendor 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:



1. Diaphragm Meter:

- a) Meters shall comply to EN 1359: 2006 (or latest)
- b) Meters shall have EU Directive 2004/22/EC (MID) certificate/ conformance certificate for its compliance to the test requirements of EU Directive 2004/22/EC (MID) as per EN 1359 2006 standard (or latest standard). The certificate shall be submitted to BGL/MECON along with Bid.
- c) Type approval certificates
- d) Approval shall be obtained from Weights and measurement department for the diaphragm meters and the certificate shall be produced to BGL/MECON along with Bid.
- e) Availability of importing license for domestic meters to be imported.

2. AMR system:

- a) Equipment type approval from concerned authorities like Wireless Planning & Coordination Wing (WPC) / WEEE / ROHS
- b) ATEX certification Zone 2 for AMR Modules during Detailed Engineering

5.0 DESIGN BASIS

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1. Walk-by/Drive-by type Smart Metering System sending data from Meter Interface Unit to a Handheld Unit/Android mobile through Radio-Frequency and from Handheld Unit/Android or windows mobile to remote server through GSM/GPRS shall be implemented for geographical locations having independent houses and low-rise apartments.
2. Fixed/Wireless type Smart Metering System sending data from Meter Interface Unit to a fixed battery powered Data Concentrator Unit (DCU) through Radio-Frequency and from DCU to remote server through GSM/GPRS shall be implemented for geographical locations having Hi-rise apartment complexes.
3. For Commercial consumers, cardless Prepaid type Smart Metering system with MIU communicating directly with remote server through GSM/GPRS shall be implemented.



6.0 GENERAL SPECIFICATION

A. DIAPHRAGM METER

1. All meters shall be of compact size, confirm long term accuracy and reliability, robust, maintenance free.
2. Domestic gas meters shall be G1.6 Diaphragm type. For commercial consumers, diaphragm meters shall be with integral valve between inlet and outlet for pre-paid type AMR system. The meter capacities shall be as indicated in the technical datasheet.
3. Index shall be compatible for implementing automatic meter system and shall be factory fitted with the same.
4. The meters shall have corrosion resistant powder coated (inside and outside) steel casing. Enclosure protection of all meters shall confirm to IP-55 or better.
5. Metering equipment shall be sealed and have shall be able to prevent & detect tampering.
6. All Meters shall have in-built reverse count restrictor.
7. Meter shall be painted with electrostatic spray epoxy paint or Polyester powder coating and the paint shall be of approved color and quality.
8. The meters shall be supplied with all mounting accessories i.e. metal seal wire, screws, wall-mounting brackets etc. End connection shall be protected by Plastic caps

B. AUTOMATIC METER READING (AMR) SYSTEM

1. The Smart metering system shall comply to open metering system specification. The communication system between Smart metering system & Remote servers shall be on Open protocol in order to ensure communication compatibility between Smart metering unit & server for any addition/replacement of Smart metering system units/components of other makes.
2. All Meter Interface Units (MIU) shall capture the pulses from the Meter Index using Inductive Pulse Technology.
3. Vendor shall guarantee the performance of AMR device over an ambient temperature range of 10°C to 45°C and a relative humidity of 100%. Enclosure protection of all MIU shall confirm to IP-55 or better and shall be suitable for installations in hazardous area classification zone 2 (ATEX category 3). The enclosure protection of DCU shall be IP65 or better.

 <p>Bhagyanagar Gas Ltd.</p>	<p>Bhagyanagar Gas Limited</p> <p>CITY GAS DISTRIBUTION PROJECT AT HYDERABAD, VIJAYAWADA & KAKINADA</p> <p>SUPPLY OF SMART METERING SYSTEM</p> <p>Bid Document No.: MEC/23R8/01/51/S2/CF/00/0007</p>	 <p>ISO 9001 Company</p>
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4. The power shall be supplied to the Meter Interface Unit (MIU) by a lithium battery. Vendor shall warrant that any battery provided and installed in the MIU shall be free from design and manufacture defects for a period of minimum five (05) years. Battery Life should be at least 7 years for MIU from the date of supply. DCU battery lifetime will be dependent on number of MIU devices in range from which data is collected. Minimum battery life for DCU must be 5 years. The MIU/DCU battery shall be replaceable type and shall be encapsulated inside the unit casing to avoid tampering to disconnect power supply. **Vendors shall submit the respective design calculation along with the offer in support of battery design life.**
5. The MIU shall be capable of storing minimum 180 Fixed Data readings.
6. For walk-by and fixed type system, an RF-based end point communication module shall capture the pulses from the Meter Index and transfer the data to Handheld Unit/ Data Concentrator Unit (DCU) installed in the vicinity. No pulser unit connecting MIU with a meter by cable is acceptable.
7. Handheld Unit/ Android or windows mobile/ Data Concentrator Unit device shall be able to communicate and transfer data to end point server over a secure communication mode like GSM/ GPRS network etc.
8. For Prepaid type of system, all AMR devices must have an integral digital display allowing to compare value transferred by AMR and value on mechanical index (legalized value). Valve position, warnings shall also be indicated in the display.
9. The data transmission between MIU to Remote Server shall be encrypted to prevent intruder access.
10. Overall dimensions of AMR device shall be as minimal as possible.

C. HARDWARE PLATFORM FOR CONTROL SYSTEM

Complete set of control room hardware including 1set of redundant servers, operator's work station, parallel redundant UPS, printer, Ethernet switches, routers, firewall, network components, cables required for successful operation of smart metering system shall be supplied.

At present the Smart metering system is planned for number of consumers at each city as indicated in following table. At later stage during future expansion M/s BGL has planned for providing Smart metering system for total 2,40,000 Domestic consumers & 2000 commercial consumers for Hyderabad city, 1,20,000 Domestic consumers & 1000 commercial consumers for Vijayawada city, 1,20,000 Domestic consumers & 1000 commercial consumers for Kakinada city. Accordingly, the bidder shall supply the Hardware/Server system of capacity for catering to the total quantities as indicated in the following table. The Server shall be compatible for integration of any MIU/HHU/DCU at a later stage during future expansion.

	Number of Domestic Consumers	Number of Commercial consumers
Quantity planned at present	15500	800
Server Scalable upto	500000	5000

 <p>Bhagyanagar Gas Ltd.</p>	<p>Bhagyanagar Gas Limited</p> <p>CITY GAS DISTRIBUTION PROJECT AT HYDERABAD, VIJAYAWADA & KAKINADA</p> <p>SUPPLY OF SMART METERING SYSTEM</p> <p>Bid Document No.: MEC/23R8/01/51/S2/CF/00/0007</p>	 <p>ISO 9001 Company</p>
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Bidder shall ensure necessary support from OEM for the Hardware platform/ systems for total three years.

Servers shall have the following minimum design features and shall be identical and interchangeable:



- Quad Core Xeon Processor or latest configuration (2.5GHz or above)
- Minimum 128 GB RAM and shall be expandable
- Minimum 1TB SAS Hard Disk Drives
- SAS RAID 6 Array Controller
- Hard Disk Drives shall be Hot Swappable
- Ports: Serial, Parallel, USB (4nos), DVI, HDMI, PS2, VGA
- Ethernet TCP/IP, 1gbps, 2 network cards with 2 ports each
- QWERTY Keyboard
- Optical Scroll Mouse
- DVD-RW for data backup and installation
- High Resolution 1680x1050, 22" LCD monitor with 32-bit color support
- Video graphics controller with dynamic graphic capability
- Dual chassis fan with effective air circulation
- Windows Server 2012 with license, recovery media, drivers, antivirus
- Operating condition: Temperature: 10° to 35° C; Relative Humidity: 20% to 80% (non-condensing); Voltage: 230V AC

The preferred vendors for server are Dell/ IBM/ HP and for Ethernet switches are CISCO/ Nortel/ Hirschmann/ D-Link.

Operator Workstation shall have following minimum design features and shall be identical and interchangeable:

- Core i5 4core Processor or latest configuration (preferred 2.5GHz or above)
- Minimum 4 GB RAM and shall be expandable
- Minimum 1TB SATA Hard Disk Drives
- Ports: Serial, Parallel, USB (4nos), DVI, HDMI, PS2, VGA
- Ethernet TCP/IP, 1gbps, 2 network cards with 2 ports each
- QWERTY Keyboard
- Optical Scroll Mouse
- DVD-RW for data backup and installation
- High Resolution 1680x1050, 22" LCD monitor with 32-bit color support
- Video graphics controller with dynamic graphic capability
- Dual chassis fan with effective air circulation
- Windows 7 or better with license, recovery media, drivers, antivirus
- Operating condition: Temperature: 10° to 35° C; Relative Humidity: 20% to 80% (non-condensing); Voltage: 230V AC

The preferred vendors for Operator Workstation are HP, Dell, IBM.

 <p>Bhagyanagar Gas Ltd.</p>	<p>Bhagyanagar Gas Limited</p> <p>CITY GAS DISTRIBUTION PROJECT AT HYDERABAD, VIJAYAWADA & KAKINADA</p> <p>SUPPLY OF SMART METERING SYSTEM</p> <p>Bid Document No.: MEC/23R8/01/51/S2/CF/00/0007</p>	 <p>ISO 9001 Company</p>
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UPS shall have the following minimum design features:

Parallel Redundant UPS	:	1 Set
Capacity	:	5 KVA
Incoming power supply system	:	230V, Single ph. AC, 50 Hz.
System neutral	:	Earthed
Insulation level	:	2.5 kV
System short circuit level	:	50 kA for 1 second
Output Voltage	:	230V, Single ph. AC, 50 Hz.

UPS shall be parallel redundant with load sharing mode. UPS shall be provided with SMF (Sealed Maintenance Free) battery with backup time of at least 1 hour for full load. The UPS shall be as per IEC standards. The UPS shall include power input device, rectifier unit, battery unit, inverter unit, automatic by-pass unit with SCVS, and isolation transformer at input & output. Facility shall be provided for manual transfer of load from inverter to bypass. Transient/surge protection circuit shall be provided in the input circuit to rectifiers to protect the UPS from surges and voltage spikes.

The UPS Panel shall be unitized construction, free standing, floor mounted and indoor type designed for bottom entry of cables with enclosure conforming to IP-41. Same shall be with anti vibration Pads of min 15 mm thick. Units shall be provided with redundant cooling fans and louvers, dust and vermin proof. The panel shall be sheet steel clad, Min 1.6 mm thick for panels & for doors and 2.0 mm for load bearing members with illumination with CFL lamps, door switches, space heaters and sockets for soldering. All control block shall be plug-in type with test sockets. Units shall be self contained and serviceable. Paint shade shall be RAL-7035. Lifting hooks or eyebolts on the top at the four corners.

The UPS Distribution board shall be of suitable size considering power supply to control room equipments of walk-by type, fixed type, prepaid type smart metering system. 20% spare feeders shall be considered.



The preferred vendors for UPS are Hirel/ DB Power/Libert/ APC and Wipro/ HP for printer.

D. SOFTWARE

The bidder shall install the licensed copy of SQL/Oracle based AMR software on Centralized Remote Server (Redundant) for remote communication of these equipments. Licensed copy of AMR software and other necessary software for the Smart gas metering shall be provided. All the software licenses shall be in the name of 'BGL'.

The requirements of AMR Software shall include but not limited to those specified hereunder:

- The AMR software shall be user-friendly and easily configurable.
- The AMR system shall be capable of collecting the meter readings data from all the MIU/HHU/Mobiles/DCU units.
- The AMR system (MIU/HHU/Mobiles/DCU units) shall be easily configurable remotely, as per the requirement of BGL.

 <p>Bhagyanagar Gas Ltd.</p>	<p>Bhagyanagar Gas Limited</p> <p>CITY GAS DISTRIBUTION PROJECT AT HYDERABAD, VIJAYAWADA & KAKINADA</p> <p>SUPPLY OF SMART METERING SYSTEM</p> <p>Bid Document No.: MEC/23R8/01/51/S2/CF/00/0007</p>	 <p>ISO 9001 Company</p>
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- The AMR system shall be capable of synchronizing with SAP system or with any other software, as per the requirement of BGL.
- The AMR system shall be capable of scheduling the meter readings as per the requirements of BGL.
- The system shall be able to generate the various exceptional reports on tamper events, consumption data and communication link failure.
- AMR software shall have provision for modifying / adding & configuring at later stage.
- The system will generate an alarm for any tamper of the MIU or DCU installed on the site, for volumes registered by the gas meter above and below the preset threshold values, Meter stopped detection if no consumption over a configurable period, reverse meter detection & backflow volume. The alarm will not be reset unless otherwise being acknowledged, either through remote terminal or on-site by authorized person (in case of RF communication failure). It will be possible to change the preset values by BGL personnel authorized for the same.
- At present the Smart metering system is planned for 15,500 nos. Domestic consumers & 800nos. Commercial consumers. The software system shall be scalable and capable of being expanded & replicated at later stage during future expansion to the quantities as indicated in this technical specification. Accordingly, the bidder shall supply the software & obtain the necessary software licenses for the same capacity.
- The software shall be compatible for integration of any MIU/HHU/DCU at a later stage during future expansion.
- AMR software APP shall be compatible to enable downloading in other android mobile with security feature.

The AMR system shall provide the following alarms as minimum:



- Any tamper events.
- Communication failure.
- No consumption for more than a configurable tenure.
- Low battery
- Unread meter.
- Volume below / above pre-decided threshold values
- Any other unforeseen consumption, etc.

Successful bidder for Group-B shall load the AMR software for prepaid type Smart Metering System into the Server supplied by Successful bidder for Group-A. The successful bidder for Group-A shall provide necessary support required for the same. The successful bidders for each group shall be responsible for successful commissioning of the respective system supplied by them.

7.0 MARKING & PACKAGING:

Each device shall be marked (in legible characters, which are permanently visible) with at least the following information:

- Name and logo of the Manufacturer, along with the model
- The serial number and the year of manufacture
- Maximum Flow Qmax and minimum flow Qmin (For Metering Units)

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- Maximum operating pressure
- Direction of flow

Each device shall be sealed properly before dispatch, such that the factory setting cannot be changed on site. Each meter/HHU/DCU (along with the instruction manual) is to be individually packed in a transparent plastic cover (of adequate thickness) to protect the meter/HHU/DCU from ingress of dirt and water, and the same shall be packed in an individual box. The description of the contents of each of these boxes shall be clearly mentioned on each of the individual box. A set of these individual boxes (5-10 Nos., as the case may be) shall be packed in a larger box; and the description of the contents of the larger box shall also be clearly mentioned on the box. The quantity of the meters/HHU/DCU in the larger box shall be such that the box can be easily handled and stored, and it does not get damaged during the same. The items shall be delivered to BGL stores in respective cities.

8.0 QUALITY ASSURANCE

The Supplier will provide details of their quality assurance procedures during the assembly of the units and for final inspection following testing.



BGL/MECON reserves the right to visit the Supplier's facilities without prior notice, and inspect test records and witness assembly and testing in progress.

9.0 GUARANTEE PERIOD

The devices shall be guaranteed against malfunction and degradation through corrosion or faulty workmanship as per clause no. 14 of SCC (Vol. I of II). BGL/MECON also reserves the right to charge the supplier all costs incurred by BGL for rectifying or replacing defective units within the guarantee period.

10.0 TECHNICAL EVALUATION REQUIREMENTS

- a) The Supplier is required to submit to BGL/MECON the details of the items to be supplied, including the manufacturing standards, model number, performance curve, accuracy specifications and meter sizing along with bid for our technical evaluation of bid. All the technical documents / catalogues, etc., to be submitted along with technical bid shall be in English Language only.
- b) Any deviations from the specification should be highlighted and vendor may also quote advanced / latest models to reduce overall cost as an alternate.
- c) The data sheet should be filled up completely and should be enclosed with the Technical Bid.
- d) Compliance with Technical Specifications will be taken for granted if deviations are not specifically mentioned.



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11.0 INSPECTION PLAN

- i) Testing & Inspection shall be carried out as per the Technical Specifications of BGL/MECON & EN1359, MID, OIML, BS 1359 / BS 4161 for Diaphragm meters at the works of the manufacturer as per approved QAP.
- ii) Equipment type approval shall be obtained for AMR from concerned authorities like Wireless Planning & Coordination Wing (WPC) / WEEE / ROHS.
- iii) BGL/MECON representative or Third party inspection agency appointed by BGL/MECON, if any shall carry out inspection during manufacturing / final inspection at the works of the manufacturer.
- iv) For Foreign bidders and bidders with foreign manufacturing facilities, arranging Third Party Internationally recognized Inspection agencies like Lloyds, ABS, SGS, TUV, DNV, BV, Engineers India Limited, or any other Third Party Inspection agency only with prior approval of BGL/MECON for witnessing inspection and testing, at his workshop and at his sub-vendors workshop as required shall be in bidder's scope.
- v) Vendor shall furnish all the material test certificates, internal test / inspection reports for 100% material at the time of inspection of each supply lot of material.
- vi) Each diaphragm meter shall be calibrated at flow rates Q_{min} , $3Q_{min}$, Q_{max} as minimum and the test results shall be satisfactory in line with EN-1359 (Q_{min} – Minimum flow, Q_{max} , - Maximum flow).
- vii) 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.
- viii) All meters should be wired up and sealed properly by the manufacturer after final inspection clearance and before dispatch. Meters found in an unsealed condition will not be accepted at BGL stores.
- ix) Even after third party inspection, BGL/MECON shall select 1% sample quantity of meter/MIU/HHU/DCU randomly from each manufacturing batch & have these independently tested for compliance with BGL/MECON Technical Specifications like dimensional tolerances, leakage testing, performance, accuracy, etc. Should the results of these tests fall outside the limits specified in BGL/MECON technical specification, then BGL/MECON reserves the rights to reject all production supplied from the batch. The tests shall be in the scope of the tenderer.
- x) If the performance of any of the sample meter/MIU/HHU/DCU is not in compliance with the acceptance norms of the respective standards, then that lot of respective item will be rejected.

12.0 DOCUMENTS TO BE FURNISHED WITH SUPPLY (Minimum 3 sets):

- A. Following is the list of documents required to be sent to BGL/MECON for approval:
 - a) Datasheets of Diaphragm Meter, AMR module, HHU, DCU, Server, Operator Workstation, firewall, router, network components etc.
 - b) GA drawing of Diaphragm meter with AMR module.
 - c) UPS Datasheet, Scheme, SLD, Battery sizing calculation, GA drawing.

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- B. Following is the list of documents required to be sent to BGL/MECON along with the first lot of smart metering system:
- a) Performance specification and test certificates, calibration certificates (100%, for each of the Meter/HHU/DCU).
 - b) GA & Construction drawings, Material specifications and technical data sheets, Testing & Inspection procedures, QAPs. (In English language only)
 - c) Installation, operation, maintenance, recommendations and instruction manual in detail.
 - d) Any other relevant documents required by BGL/MECON.
 - e) Approval documents (issued by reputed third party inspection agency) for establishing conformity to the requirements for installations in hazardous area classification zone 2 (ATEX category 3).
 - f) In case of import the AMR device from the outside of the India, the vendor has to submit the operating license/importing license of the same.
 - g) Any other document required to operate the Smart Metering System successfully.

13.0 SPARE PARTS

A list of spare parts shall be indicated & included with the offer to cover spares requirements for the smart metering system for the first two years of operation as per the Annexure-A. Any items listed must be priced separately as per price schedule format.



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SECTION – II



MATERIAL REQUISITION

&

DATA SHEETS

FOR

SMART METERING SYSTEM

 Bhagyanagar Gas Ltd.	Bhagyanagar Gas Limited CITY GAS DISTRIBUTION PROJECT AT HYDERABAD, VIJAYAWADA & KAKINADA SUPPLY OF SMART METERING SYSTEM Bid Document No.: MEC/23R8/01/51/S2/CF/00/0007	 मेकॉन ISO 9001 Company
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Sl. No.	DESCRIPTION	UNIT	QTY
	Design, detail engineering, manufacturing, assembly, factory testing, Inspection (as applicable as per bid document), supply of Smart Metering System including packing, forwarding & documentation etc. and providing all related services like Carrying out Survey, assessment and recommendation of sites for the most appropriate location for placing data concentrators (as applicable) including manpower, tools and tackles, installation, integration and commissioning of Smart metering /Automatic Meter Reading (AMR) system Software including AMR, billing software and system software, training, erection of control room equipments including cabling & termination with required erection hardware like conduits etc., commissioning spares, including third party inspection charges as per technical specification. (Note: Commissioning spares as required shall be included in the respective supply items and no separate payment is envisaged).		
GROUP-A	<u>DIAPHRAGM METERS AND AUTOMATIC METER READING SYSTEM FOR DOMESTIC SERVICE</u>		
A.1.0	Domestic meter G1.6 (design pressure upto 500mbar), fitted with MIU for Walkby type Smart Metering System		
a)	Hyderabad		
	i) For Left side inlet & Right side outlet	Nos.	4500
	ii) For Right side inlet & Left side outlet	Nos.	2300
b)	Vijayawada		
	i) For Left side inlet & Right side outlet	Nos.	1200
	ii) For Right side inlet & Left side outlet	Nos.	500
c)	Kakinada		
	i) For Left side inlet & Right side outlet	Nos.	1200
	ii) For Right side inlet & Left side outlet	Nos.	500
A.2.0	HandHeld Units for Walkby Smart Metering System along with Android Mobile with loaded APP (as applicable)		
a)	Hyderabad	Nos.	4
b)	Vijayawada	Nos.	2
c)	Kakinada	Nos.	2
A.3.0	Domestic meter G1.6 (design pressure upto 500mbar), fitted with MIU for Fixed type Smart Metering System		
a)	Hyderabad		
	i) For Left side inlet & Right side outlet	Nos.	50
	ii) For Right side inlet & Left side outlet	Nos.	50
A.4.0	Battery powered Data Concentrator Units for Fixed type Smart Metering System at Hyderabad	Nos.	2
A.5.0	Servers in redundant configuration (for domestic as well as commercial Smart Metering System) with necessary hardware including Ethernet switches, firewall, router, cables etc.		





Bhagyanagar Gas Limited
CITY GAS DISTRIBUTION PROJECT AT HYDERABAD,
VIJAYAWADA & KAKINADA



SUPPLY OF SMART METERING SYSTEM
Bid Document No.: MEC/23R8/01/51/S2/CF/00/0007

A.6.0	a) Hyderabad Operator Station with Consoles desks and Chairs	Lot	1
A.7.0	a) Hyderabad Parallel hot redundant UPS of 5KVA rating with 1 Hour battery backup with sealed maintenance free batteries and UPS DB with required no. of feeders considering 20% spare feeders	Nos.	1
A.8.0	a) Hyderabad A4 color laser network printer with printer table	Set	1
A.9.0	a) Hyderabad All software with licenses including System software with Anti-virus & Application software for walkby and fixed type Smart Metering system	No.	1
A.10.0	a) Hyderabad Furniture including 2 nos. chairs for Control Room equipments indicated under item no. A.5.0 to A.8.0 above	Set	1
A.11.0	a) Hyderabad Two years Operation and Maintenance Spares for walkby and fixed type Smart Metering system as per the Annexure-A indicating the detailed breakup of the items, quantities and its price	Lot	1
	b) Vijayawada	Set	1
	c) Kakinada	Set	1
GROUP-B	<u>DIAPHRAGM METERS AND AUTOMATIC METER READING SYSTEM FOR COMMERCIAL SERVICE</u>		
B.1.0	Commercial meter G6 (design pressure upto 500 mbar) with integral valve, fitted with MIU for Prepaid type Smart Metering System		
	a) Hyderabad		
	i) For Left side inlet & Right side outlet	Nos.	20
	b) Vijayawada		
	iii) For Left side inlet & Right side outlet	Nos.	25
	c) Kakinada		
	iii) For Left side inlet & Right side outlet	Nos.	20
B.2.0	Commercial meter G16 (design pressure upto 500 mbar) with integral valve, fitted with MIU for Prepaid type Smart Metering System		
	a) Hyderabad		
	i) For Left side inlet & Right side outlet	Nos.	10
	b) Vijayawada		
	i) For Left side inlet & Right side outlet	Nos.	5
	c) Kakinada		
	i) For Left side inlet & Right side outlet	Nos.	5
B.3.0	Commercial meter G25 (design pressure upto 500 mbar) with integral valve, fitted with MIU for Prepaid type Smart Metering System		
	a) Hyderabad		
	i) For Left side inlet & Right side outlet	Nos.	5

 Bhagyanagar Gas Ltd.	Bhagyanagar Gas Limited CITY GAS DISTRIBUTION PROJECT AT HYDERABAD, VIJAYAWADA & KAKINADA SUPPLY OF SMART METERING SYSTEM Bid Document No.: MEC/23R8/01/51/S2/CF/00/0007	 मेकॉन ISO 9001 Company
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b)	Vijayawada		
	ii) For Left side inlet & Right side outlet	Nos.	5
c)	Kakinada		
	ii) For Left side inlet & Right side outlet	Nos.	5
B.4.0	Application software for prepaid type smart metering system		
a)	Hyderabad	Set	1
B.5.0	Two years Operation and Maintenance Spares for prepaid type smart metering system as per the Annexure-A indicating the detailed breakup of the items, quantities and its price		
a)	Hyderabad	Set	1
b)	Vijayawada	Set	1
c)	Kakinada	Set	1

Note:

- Evaluation will be done as per clause no. 4 of IFB and clause no. 31 of ITB.
- Applicable for Foreign Bidder only:** Third Party Inspection is to be included in the quoted prices. Arranging Third Party Internationally recognized Inspection agencies like Lloyds, ABS, SGS, TUV, DNV, BV, Engineers India Limited, or any other Third Party Inspection agency only with prior approval of BGL/MECON, for witnessing inspection and testing related to item no. A.1.0 to A.10.0 & B.1.0 to B.4.0, Workshop and at his sub-vendors workshop as required.
- Applicable for Indian Bidder only:** BGL/MECON representative or Third party inspection agency appointed by BGL/MECON, if any shall carry out inspection of item no. A.1.0 to A.10.0 & B.1.0 to B.4.0 during manufacturing / final inspection at the works of the manufacturer.



Bhagyanagar Gas Ltd.

Bhagyanagar Gas Limited

CITY GAS DISTRIBUTION PROJECT AT HYDERABAD,
VIJAYAWADA & KAKINADA

SUPPLY OF SMART METERING SYSTEM

Bid Document No.: MEC/23R8/01/51/S2/CF/00/0007



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ISO 9001 Company

SMART METERING SYSTEM FOR DOMESTIC CONSUMERS – WALKBY TYPE/ FIXED TYPE

General	Service	Natural Gas
	Standard	As indicated in Clause 4.0- Codes and Standards
	Installation	Suitable for outdoor/Indoor Installation, tamper proof and corrosion resistant for a life period of 20 years
Process Conditions	Flow/ Service (For item no. A.1.0, A.3.0)	Qmax: 2.5 m ³ /hr, Qmin: 0.016 m ³ /hr, Qty. : As per MR
	Accuracy	Class 1.5
	Rangeability	150:1 or better
	Cyclic Volume	Minimum (Vender to specify)
	Normal Working Pressure	0.02 bar (g)
	Max. Working Pressure	0.038 bar (g)
	Design Pressure	0.5 bar (g)
	Max. Allowable pressure drop	2 mbar
	Density Kg/Sm ³	0.779
	Operating Temperature	0°C to 45°C Design 60 °C
Body	Case work/ Body	Suitable for outdoor/Indoor Installation, tamper proof and corrosion resistant powder coated steel casing
	Corrosion protection	Suitable coating on inside and outside of casing.
	End Connections (Two-pipe version)	20NB NPT(M) inlet and outlet confirming to ANSI B1.20.1 (In case the end connections are differing, bidder to provide suitable adapters of same material of meter and approved quality to meet the specified end connections)
	Fire resistance	As per EN 1359:2007/ BS 4161 or equivalent
Index	Max. Index reading	99999.99 Index with auto reset facility
	Unit	CM (Cubic meter)
	Marking on index dial	BGL
	Ingress protection	IP55 or better
Internals	Diaphragm	Polyester fabric coated with rubber on either side of equipment for an endurance life cycle of 80,000 cum
	Valve between inlet and outlet	NA
	Centre to centre distance between inlet and outlet connections	To be specified by vendor
	Other internals	All meter internals shall be non-metallic to prevent from tampering with magnet
Others	Leak Testing	Meter pressurized with air at 1.5 MAOP of the meter, immersed in water for observance of leakage
	Sealing arrangement	Provision to be made by vendor
	EN/MID marking on the meter	Required
	Reverse flow deterrents	Reverse count restricter to be provided. Reverse rotation of index is not allowed
Automatic Meter Reading (AMR)	Frequency carrier	865-867 MHz OR 433-434 MHz
	Communication between HHU/DCU (Battery powered) and remote Server	Through GSM/GPRS
	Protocol	Open Protocol
	Radiated Power	Vendor to Specify



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CITY GAS DISTRIBUTION PROJECT AT HYDERABAD,
VIJAYAWADA & KAKINADA

SUPPLY OF SMART METERING SYSTEM

Bid Document No.: MEC/23R8/01/51/S2/CF/00/0007



Transmitted Power	Vendor to Specify
Conformity	Equipment Type Approval (ETA) from Wireless Planning & Coordination Wing (WPC) with Test report
Input Pulse characteristics	Inductive/ Magnetic
Operating Temperature	0°C to 45°C Design 60 °C
Ingress Protection (IP)	MIU: IP55 or better, DCU: IP 65 or better
Alarms	As mentioned in Clause 6.0 D
Max. Broadcast Radio Range	Indoor: 50 Meters Outdoor: 150 Meters
MIU/HHU/DC Memory capacity	180 Fixed Data Readings or better
Power Supply	Self-powered by inbuilt replaceable lithium battery MIU Battery Life: Min. 7 years DCU Battery Life: Min 5 years



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**CITY GAS DISTRIBUTION PROJECT AT HYDERABAD,
VIJAYAWADA & KAKINADA**

SUPPLY OF SMART METERING SYSTEM

Bid Document No.: MEC/23R8/01/51/S2/CF/00/0007



SMART METERING SYSTEM FOR COMMERCIAL CONSUMERS – PREPAID TYPE		
General	Service	Natural Gas
	Standard	As indicated in Clause 4.0- Codes and Standards
	Installation	Suitable for outdoor/Indoor Installation, tamper proof and corrosion resistant for a life period of 20 years
Process Conditions	Flow/ Service (For item no. B.1.0)	Qmax: 10 m3/hr, Qmin: 0.1 m3/hr, Qty. : As per MR
	Flow/ Service (For item no. B.2.0)	Qmax: 25 m3/hr, Qmin: 0.2 m3/hr, Qty. : As per MR
	Flow/ Service (For item no. B.3.0)	Qmax: 40 m3/hr, Qmin: 0.25 m3/hr, Qty. : As per MR
	Accuracy	Class 1.5
	Rangeability	150:1 or better
	Cyclic Volume	Minimum (Vender to specify)
	Normal Working Pressure	0.3 bar (g)
	Max. Working Pressure	0.5 bar (g)
	Design Pressure	1 bar (g)
	Max. Allowable pressure drop	2 mbar
	Density Kg/Sm3	0.779
	Operating Temperature	0°C to 45°C Design 60 °C
Body	Case work/ Body	Suitable for outdoor/Indoor Installation, tamper proof and corrosion resistant powder coated steel casing
	Corrosion protection	Suitable coating on inside and outside of casing.
	End Connections (Two-pipe version)	1 ½ " NPT(M) inlet and outlet conforming to ANSI B1.20.1 (In case the end connections are differing, bidder to provide suitable adapters of same material of meter and approved quality to meet the specified end connections)
	Fire resistance	As per EN 1359:2007/ BS 4161 or equivalent
Index	Max. Index reading	99999.99 Index with auto reset facility
	Unit	CM (Cubic meter)
	Marking on index dial	BGL
	Ingress protection	IP55 or better
Internals	Diaphragm	Polyester fabric coated with rubber on either side of equipment for an endurance life cycle of 80,000 cum
	Valve between inlet and outlet	Required
	Power supply to Meter Internal valve	Through MIU battery
	Centre to centre distance between inlet and outlet connections	To be specified by vendor
	Other internals	All meter internals shall be non-metallic to prevent from tampering with magnet
Others	Leak Testing	Meter pressurized with air at 1.5 MAOP of the meter, immersed in water for observance of leakage
	Sealing arrangement	Provision to be made by vendor
	EN/MID marking on the meter	Required
	Reverse flow deterrents	Reverse count restrictor to be provided. Reverse rotation of index is not allowed



Bhagyanagar Gas Ltd.

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CITY GAS DISTRIBUTION PROJECT AT HYDERABAD,
VIJAYAWADA & KAKINADA

SUPPLY OF SMART METERING SYSTEM

Bid Document No.: MEC/23R8/01/51/S2/CF/00/0007



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ISO 9001 Company

Automatic Meter Reading (AMR)	Prepaid AMR type	Cardless
	Communication between MIU and remote server	Through GSM/GPRS
	Protocol	Open Protocol
	Radiated Power	Vendor to Specify
	Transmitted Power	Vendor to Specify
	Conformity	Equipment Type Approval (ETA) from Wireless Planning & Coordination Wing (WPC) with Test report
	Input Pulse characteristics	Inductive/ Magnetic
	Operating Temperature	0°C to 45°C Design 60 °C
	Ingress Protection (IP)	MIU: IP55 or better
	Alarms	As mentioned in Clause 6.0 D
	Max. Broadcast Radio Range	Indoor: 50 Meters Outdoor: 150 Meters
	MIU Memory capacity	180 Fixed Data Readings or better
	Power Supply	Self-powered by inbuilt replaceable lithium battery MIU Battery Life: Min. 7 years
	Meter Internal Valve Operation	From Remote server through GSM/GPRS
Meter Internal Valve reset (Open)	Manual reset on receipt of remote command	