



BHAGYANAGAR GAS LIMITED
(A JOINT VENTURE OF HPCL & GAIL)

BID DOCUMENT FOR

**TENDER FOR PROCUREMENT OF MASS FLOW METERS
(MFM) FOR CNG STATIONS IN HYDERABAD**

**UNDER LIMITED DOMESTIC
COMPETITIVE BIDDING**

Bid Document No.: BGL/234/2013-14

VOLUME-II of II

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MATERIAL REQUISITION

MATERIAL REQUISITION

BGL/MR-MFM

Sl. No.	Description	UOM	Qty	Delivery Location
1	Design, Manufacture, testing, Loading at Vendor's works, Supply & Transportation, Unloading at Project site of Coriolis CNG-Series Sensor; 1/2-inch (15mm); 316L stainless steel with Coriolis MVD Flow & density transmitter with detailed specification of Sensor and transmitter as per the technical specification and data sheet attached.	NO	3	Hyderabad: 3

Note:

1. The Rates should be in INR only.
2. Bidder should quote all the items in the group.
3. Exact delivery location will be intimated after placement of PO.

SECTION – 8

SPECIAL CONDITIONS OF CONTRACT (SCC)

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SPECIAL CONDITIONS OF CONTRACT (SCC)

1.0 GENERAL

- 1.1 Special Conditions of Contract shall be read in Conjunction with the General Conditions of Contract, Specification of work, Drawing and any other documents forming part of this Contract wherever the context so requires.
- 1.2 Notwithstanding the sub-division of the documents into these separate sections and volumes every part of each shall be deemed to be supplementary to and complementary of every other part and shall be read within the Contract so far as it may be practicable to do so.
- 1.3 Where any portion of the General Conditions of Contract is repugnant to or at variance with any provisions of the Special Conditions of Contract, unless a different intention appears, the provisions of the Special Conditions of Contract shall be deemed to over-ride the provisions of the General Conditions of Contract and shall be the extent of such repugnancy, or variations, prevail.
- 1.4 Wherever it is mentioned in the specification that the Contractor shall perform certain work or provide certain facilities, it is understood that the Contractor shall do so at his cost and the Value of Contract shall be deemed to have include cost of such performance and provisions, so mentioned.
- 1.5 The materials, design, and workmanship shall satisfy the relevant Indian Standard, the Job Specifications contained herein and Codes referred to. Where the job specification stipulate requirements in addition to those contained in the standard codes and specifications, these additional requirements shall also be satisfied.
- 1.6 In case of an irreconcilable conflict between Indian or other applicable standards, General Conditions of Contract, Special Conditions of Contract, Specification, Drawings or Schedule of Rates, the following shall prevail to the extent of such irreconcilable conflict in order of precedence:
 - i. Letter of Acceptance/ LOI along with Statement of Agreed Variations.
 - ii. Schedule of Rates as enclosures to Letter of Acceptance
 - iii. Special Conditions of Contract
 - iv. Drawings
 - v. Technical/ Material Specifications
 - vi. Instruction to Bidder
 - vii. General Conditions of Contract
 - viii. Indian Standards
 - ix. Other applicable standards
- 1.7 It will be the Contractor's responsibility to bring to the notice of Engineer-in-charge any irreconcilable conflict in the contract documents before starting the work(s) or making the supply with reference which the conflict exists.
- 1.8 In the absence of any Specifications covering any material, design of work(s) the same shall be performed/ supplies/ executed in accordance with Standard Engineering Practice as per the instructions/ directions of the Engineer-in-charge, which will be binding on the Contractor.

2.0 SCOPE OF SUPPLY

2.1 General

This Specification covers, supply of MRS / MRS Metering Skids to be used in City Gas Distribution for Hyderabad City in the state of Andhra Pradesh.

The scope of supply covers design, engineering, manufacture, inspection, testing, supply & supervision of installation and commissioning, shipment and documentation requirements of these items in accordance with the requirements of this Requisition.

Sl. No.	Description	UOM	Qty	Delivery Location
1	Design, Manufacture, testing, Loading at Vendor's works, Supply & Transportation, Unloading at Project site of Coriolis CNG-Series Sensor; 1/2-inch (15mm); 316L stainless steel with Coriolis MVD Flow & density transmitter with detailed specification of Sensor and transmitter as per the technical specifications and data	NO	3	Hyderabad: 3

2.2 The Scope of Supply shall be as set out at Material Requisition, Data Sheets and Technical Specifications given in Volume-II of tender document and supplemented by all stipulation in the total tender document.

2.3 REMARKS

2.3.1 Supplier's Compliance

Supplier shall submit his bid in full compliance with the requirements of this MR and attachments. Bidder shall include the following statement in his bid:

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

2.3.2 Compliance with Specification

The supplier shall be completely responsible for the design, materials, fabrication, testing, and inspection, preparation for shipment & transfer of above material to nominated delivery point strictly in accordance with the MR & all attachments thereto.

3.0 SPECIAL INSTRUCTIONS TO BIDDERS

3.1 Suitable for the use with natural gas of specific gravity 0.6

3.2 BGL reserves the right to increase or decrease the quantity of supply item.

4.0 INFORMATION/ DOCUMENTS / DRAWINGS TO BE SUBMITTED BY SUCCESSFUL BIDDER

Successful Bidder shall submit six copies unless noted otherwise, each of the following:

- 4.1 Inspection & test reports for all mandatory tests as per the applicable code as well as test reports for any supplementary tests, in nicely bound volumes.
- 4.2 Material test certificates (physical property, chemical composition, make, heat treatment report, etc.) as applicable for items in nicely bound volumes.
- 4.3 Statutory test certificates, as applicable.
- 4.4 Filled in Quality Assurance Plan (QAP) for Purchaser's approval. These QAPs shall be submitted in four copies within 15 days from LOI/ FOI.
- 4.5 All approved drawings/ design calculation/ maintenance/ operating manual documents as well as inspection and test reports for Owner's record in nicely category-wise bound volumes separately.
- 4.6 A list of documents to be furnished along with supply.

5.0 GUARANTEE:

24 months from date of delivery or 12 months from date of commissioning, whichever is earlier, should be provided.

Note: All drawings, instructions, catalogues, etc., shall be in English language and all dimensions shall be metric units.

5.1 Security Deposit / Contract Performance Guarantee

The successful bidder shall deposit security deposit @ 10% of the contract value excluding taxes & duties within 10 days of LOI/PO. The Security deposit shall be submitted in the form of an unconditional irrevocable Bank Guarantee for Warranty from any Indian Nationalised Bank/ Scheduled bank/ reputed foreign bank having office in India and registered with Reserve Bank of India acceptable to BGL for a sum equivalent to 10% of the total contract value on the name of M/s Bhagyanagar Gas Limited, Hyderabad. Alternatively the bidder can also submit the security deposit in the form of crossed Demand Draft in favour of M/s Bhagyanagar gas Limited, Hyderabad.

6.0 TERMS OF PAYMENTS

The Payment shall be made progressively against the receipt of each MFM at site in the following manner.

- a) 100% of order value will be paid progressively by owner within 15 days against the receipt of materials at site and the following documents duly accepted by EIC : -
 - i) Invoice in triplicate.
 - ii) Inspection Release note by Owner or his appointed or approved agency.
 - iii) GR/ LR.

- iv) Packing List.
- v) Insurance cover note covering transit insurance.
- vi) Final technical file having documents as per Technical Specifications/ Material Requisition, Volume-II of II of the Bid Document including all test certificates
- vii) Performance Bank Guarantee(s) of 10% of Contract Value. (If already submitted, a copy of the same).

6.1 INLAND TRANSIT INSURANCE FOR PROCUREMENT OF GOODS

Bidder shall arrange Transit Insurance and the cost of which shall be borne by bidder. Quoted price shall be inclusive of the same. Bidder will be required to submit documentary proof for the transit insurance before dispatch.

7.0 PRICE ESCALATION:

The Contract price shall be deemed to be FIRM and valid for the entire duration of the contract till the completion of work and shall not be subjected to any adjustment due to increase in price of material, utilities or any other input for performance of work and the contract except for increase/decrease in taxes and duties on account of subsequent legislation.

8.0 DIVISION OF ORDER:

BGL reserves the right to divide the quantity among more than one bidder at BGL's sole discretion

9.0 QUALITY ASSURANCE / QUALITY CONTROL

- 9.1 The Contractor shall "prepare a detailed quality assurance plan for the execution of Contract for various facilities, which will be mutually discussed and agreed to.
- 9.2 The Contractor shall establish document and maintain an effective quality assurance outlined in recognized codes.
- 9.3 The purchaser while agreeing to a quality assurance plan shall mark the stages where they would like to witness the tests, review any or all stages of work at shop/site as deemed necessary for quality assurance.

10.0 QUANTITY VARIATION:

The tendered quantity may vary depending upon the project requirement. BGL reserves the right to decrease/increase the quantity depending upon its requirement.

11.0 INSPECTION

BGL reserves the right to engage their own personnel and or BGL's Inspection agency. All the charges towards all kinds of tests shall be included in the quoted rates. No additional payment to this effect will be made.

12.0 DISPATCH INSTRUCTIONS

- 12.1 Seller shall obtain dispatch clearance from Purchaser prior to each dispatch.
- 12.2 Copy of Inspection Release Certificate, Dispatch Clearance and Statement showing the LR, packing list and weight of material and shipping marks etc. to be submitted along with the dispatch document.

13.0 REJECTION

- 13.1 Any materials/goods covered under the scope of supply, which during the process of Inspection, at any stage of manufacture/fabrication, and subsequent stages, prior to dispatch is found not conforming to the requirements/specifications of the Purchase Order, shall be liable for immediate rejection.
- 13.2 Supplier shall be responsible and liable for immediate replacement of such material with acceptable material at no extra cost to BGL and no extra on the delivery schedule to Employer.

14.0 PRICE REDUCTION SCHEDULE / LIQUIDATED DAMAGES

The price reduction schedule shall be @ 0.5% per week of delay or part thereof subject to maximum of 5% of total undelivered portion of contract value.

Price reduction for failure to meet technical parameters as mentioned in technical specification shall be separately applicable and shall be in addition to price reduction on account of failure of completion of supply.

15.0 REPEAT ORDER

BGL reserves the right to place a repeat order within eight months of expiry of order on same rate, terms and conditions.

16.0 DELIVERY

The delivery of the MFMs shall be at Hyderabad. The exact location of the site/store shall be informed before dispatch of MFM from factory.

17.0 VALIDITY OF OFFER

The offer shall be valid for a period of three months from the receipt of the offer.

SECTION – 9

TIME SCHEDULE

TIME SCHEDULE

Sl. No.	Description	UOM	Qty	Delivery Location	Delivery Period
1	Design, Manufacture, testing, Loading at Vendor's works, Supply & Transportation, Unloading at Project site of Coriolis CNG-Series Sensor; 1/2-inch (15mm); 316L stainless steel with Coriolis MVD Flow & density transmitter with detailed specification of Sensor and transmitter as per the technical specifications and data sheet attached.	NO	3	Hyderabad : 3	18 weeks from the date of PO/LOI

Note:

- **Price Reduction Schedule (PRS) will be based on contract value for the item covered under this schedule.**

SECTION – 10

**TECHNICAL SPECIFICATION
FOR
MASS FLOW METER (MRS)**

Technical Specification for Mass Flow Meter:

- 1.0 Mass flow meter shall be based on Coriolis principle. Installation and manufacturing of mass flow meter shall be as per ASME B31.1. While installing special care shall be taken to isolate the mass flow meter from piping vibration.
- 1.1 Each Mass Flow meter shall include a sensor with integral transmitter i.e. meter electronics certified intrinsically safe/explosion proof by statutory authority suitable for the required hazardous area as per IS-2148 /IEC-79. Also the offered sensor and the transmitter shall be weatherproof to IP65 as per IS-2147/IEC-529. Statutory authority for local installation is CCOE.
- 1.2 Offered mass flow meter shall be necessary for Custody Transfer application but not exceeding 0.5% of span.
- 1.3 Calibration for the offered mass flow meter shall be in Kg/hr, cumulative flow. MFM with head mounted integral local display to indicate flow rate (Kg/hr), cumulative gas (in Kgs) etc.; inbuilt totalizer non-volatile & non-resettable type; suitable for hazardous area classification.
- 1.4 Flying lead type electrical termination is not acceptable. All electrical connections shall be ½”NPTF. Cable glands shall be provided for electrical power, signal and control connections. Cable glands shall be double compression type and certified weatherproof and explosion proof for the required area classification as per IS-2147 and IS-2148.
- 1.5 Offered Mass flow meter shall be completely free from corrosion of measuring tube due to alternating stresses continuously occurring in the tube. Also measuring tube shall be completely free from erosion, which may result due to fluid velocity.
- 1.6 The design of meter electronics shall be in compliance with the electromagnetic compatibility requirements as per IEC-801.
- 1.7 Meter Electronics shall include all the associated pre-amplifiers converters line riser etc. and shall have enough diagnostic facility to correct live zero, variation, meter factor etc with help of Laptop. Output of the mass flow meter RS485 type to PLC shall be utilized.
- 1.8 Installation details like straight run requirements, recommendation for horizontal/vertical installation, minimum distance between upstream and downstream pipe bends from Mass flow meter to be provided.
- 1.9 Vendor shall calibrate each Mass Flow meter at this shop or any recognized test house with the fluid (Use design process conditions) for which it is to be used as per Clause no.9 of MPMS (Draft standard Nov.2000). In case it is not possible to calibrate the Mass Flow meter with actual fluid. Vendor must indicate.

- a) Fluid used for calibration
- b) Correction factor/Adjustment required for actual process fluid .In any case, in accuracy when extended to actual process shall not exceed the specified limits (as per manufacturer's standard).

1.10 Vendor shall submit the following test certificates and test reports for purchaser's review:-

- a) Material test certificate with detailed chemical analysis from foundry (MIL Certificate).
- b) Certificate of radiography/ x-ray for any welded joint.
- c) Hydrostatic test report with pressure of 1.5 times the design pressure.
- d) Calibration report including calibration factors for each Mass flow meter certificate from statutory body for offered sensor and transmitter for required area classification.

1.11 CERTIFICATION:

The requirement of statutory approvals for usage of equipment/ instruments/ system in electrically hazardous areas shall be as follows:

- a) The vendor shall be responsible for obtaining all statutory approvals, as applicable for all instruments and control systems.
- b) Equipment's/ instruments/ systems located in electrically hazardous areas shall be certified for use by statutory authorities for their use in the area of their installation. In general, the following verification shall be provided by the vendor.
 - Bidder shall provide certificates (from BASEEFA FM, UL, PTB, LCIE etc.) from country of origin for all intrinsically safe / flameproof protected by other methods equipment/instrument/systems, which are manufactured outside India. If required, bidder shall provide necessary certification/approvals/authentication, for all such intrinsically safe /flameproof equipment/instrument/systems, by the Indian authority–Chief Controller of Explosive (CCOE), Nagpur, India.
 - For all flame proof equipment manufactured within India, the testing shall be carried out by any of the approved testing houses-Central Mining Research Institute (CMRI)/ERTL etc. The item shall in addition bear the valid certification from CCOE and also the manufacturer shall hold a valid Bureau of Indian Standards(BIS) license.
 - For all intrinsically safe equipment manufactured within India the testing shall be carried out by any of the approved testing houses–Central Mining Research Institute (CMRI)/ERTL etc. The items shall in addition bear the valid certification from CCOE.

2. Specifications of MFM:

2.1 Specifications of MFM sensor (Coriolis CNG-Series Sensor;1/2-inch (15mm); 316L stainless steel):

- a) Coriolis CNG-Series Sensor;1/2-inch (15mm);
- b) 316L stainless steel
- c) Process Connections: 3/4-inch NPT female adapter ; CAJON
- d) compatible size 12VCO union fittings
- e) Case Options: Standard case
- f) Electronics Interface: For integral mount transmitter
- g) Approvals: ATEX equipment category 2 (Zone 1) / PED compliant
- h) Language: English installation manual
- i) Factory Options: Standard product

2.2 Specifications of MFM transmitter (Coriolis MVD Flow & density transmitter):

- a) Coriolis MVD Flow & density transmitter
- b) Mounting/Housing Material: Integral mount transmitter
- c) Power: 18 to 100VDC and 85 to 265VAC; self-switching.
- d) Display: Backlit dual line display for process variables and totalizer reset
- e) Output: One mA; one frequency; RS485
- f) Conduit Connections: 1/2-inch NPT.
- g) Approvals: ATEX - Equipment Category 2 (Zone 1 – Flameproof terminal compartment)
- h) Language: English installation manual and English configuration manual
- i) Software Options 1: Petroleum measurement
- j) Software Options 2: Weights & Measures custody transfer & meter verification
- k) Standard product

- For applications requiring simultaneous monitoring of multiple flow variables
- Selected combinations of outputs including milliamp, frequency, and discrete I/O
- Modbus, HART, WirelessHART, FOUNDATION fieldbus, and PROFIBUS-PA digital Communications.
- Simultaneously outputs multiple variables, including: mass flow rate, volume flow rate, Gas standard volume flow rate, density, temperature, and drive gain
- Compact, integral mounting to sensor with 360 degrees of rotation
- Class I, Division 1/Zone 1 local operator interface
- View process variables, handle alarms, control totalizers, meter configuration, and more
- Interface functions shall be customized and password protected
- Shall Support English language
- 20 Hz / 100 Hz selectable response time

3. Coriolis True Mass Flow Meter with Integral Display Unit **should be provided to ensure Accuracy and direct Mass Flow measurement shall confirm to AGA 11 standard** and approved for custody transfer metering of CNG.

The Mass Flow Meter design consideration, piping, meter installation, zero verification and proving facility shall confirming to AGA 11 standard. Mass flow meter (Indicating Type) should be designed for custody transfer metering of CNG and meet the following requirements:

Principle of metering - **Coriollis**

Flow Rate : **1 to 100 kg/min**

Accuracy : **- /+ 0.5% (inclusive of linearity, hysteresis & Repeatability error)**

Repeatability : **- /+ 0.3 % or better**

Zero Stability : **0.009 kg/min**

Pressure rating:

Flow tube rating : **Max: 345 bar, normal: 255 bar.**

Process fluid temperature limits: **-40 to +125°C**

Ambient temperature limits : **-40 to +60°C.**

Materials of construction

Wetted parts : **316L stainless steel**

Sensor housing : **304L stainless steel**

Totaliser - **Non resettable Type**

Enclosure - **IP65, NEMA 4 & Ex.Proof**

Pressure & Temp influence - **Nil**

Calibration Traceability – **NIST**

Pressure Rating of wetted parts - **5365.605 (5200 psi) at 25 deg c as per ANSI BV 31.3/ASME**

EMI effect on sensor and Transmitter- **To the requirement of EMC to latest IEC/EN standard**

Vibration effect - **As per IEC 68.2.6 / SAMA PMC 31.1 (1980) or latest standard**

Approval - **ATEX/CSA/ FM/CENELEC /SEV**

W & M - **Statutory authority of Country of Origin and From Ministry of Consumer Affairs, Govt. of India.**

Output - **RS 485/ frequency**

Output to be available - **RS485/frequency/Analog duly programmed**

Each flow meter should be provided with a liquid crystal display (LCD) for ongoing flow monitoring and totaliser.

Mass Flow Meter shall have diagnostic facility to check live zero, configurable parameter, constants etc. through Laptop.

Provision for sealing/locking of Mass Flow Meter / Transmitter shall be provided to avoid possibility of tempering during use of MFM.

CALIBRATION & CERTIFICATION:

Mass flow meter should be calibrated and such calibration certificates should be presented upon at the time of delivery to site. If any of the calibration certificates is not in order, the Supplier's should replace the affected equipment with valid certificate at Supplier cost. A documentation and obtaining statutory approval from the country of origin is in Vendor's scope. The offered

Mass Flow Meter must be approved and certified for specified flow & accuracy by recognized authority, i.e., "Weights and Measures" or other statutory authorities (of the Country of Origin. Vendor should also get the Mass Flow Meter certified from Weights and Measures, India. (Ministry of Consumer Affairs).

All the certificates(s) shall be in English language or in the language of originating country along with English translation.

4.0 DATA SHEETS:

Vendor shall furnish all the filled data sheets for the approval of BGL. Vendor shall clearly indicate deviation if any in the respective data sheet.

4.1 MASS FLOW METERS

GENERAL	1.	Tag No.		*	
	2.	Service		*	
	4.	Line Size & Schedule		* STD	
	5.	Electrical Area Classification		IEC Zone 1 Gr IIA,IIB	
HAZ. LOC SENSOR	6.	Type		Coriolis	
	7.	Function		Massflow	
	8.	Connection Size Rating, Facing & Finish		* * RF 125AARH	
	9.	Body Material		316SS	
	10.	Sensor Housing Material leads		SS Hermatically Sealed	
	11.	Sensor/Wetted Parts Material		316SS	
	12.	Enclosure		WP to IP 65	
	13.	Intrinsic Safety		Required	
	14.	Range Min Max	Kg/h	* *	
	15.	Accuracy		±0.5% flow rate	
	16.	Conduit Connection		1/2" NPTF	
	17.	Jacketing		Required	
	TRANSMITTER	18.	Function		Transmit
		19.	Load Driving Capability in		600
		20.	Output Type Signal / Protocol		*
		21.	Enclosure		FLAMEPROOF + WP (IP65)
		22.	Intrinsic Safety		Required
23.		Power Supply		*	
24.		Conduit connection		1/2" NPTF	
25.		Mounting Location		*	
26.		Max. Distance Allowable Sensor To Transmitter Tx To Control Room Receiver		* *	
27.		Power Consumption in Watts		*	
FLUID	28.	Fluid State		CNG GAS	
	29.	Flow: Min Nor Max	Kg/h	As per Tech spec	
	30.	Pressure: Operating: Maximum	Kg/cm ² (g)	As per TS	
	31.	Temp Operating Maximum	^o C	As per MR	
	32.	Operating Relative Density			
	33.	Relative Molecular Mass			
	34.	Operating Viscosity	cP		

OPTIONS	35.	Maximum Allowable Press	Kg/cm ²	
	36.	Filter Mesh Size		
	37.	Mounting Brackets		Required
	38.	Inter Connecting Cables		Required
	39.	Cable Glands Size		Required
	40.	Switch Type		
		Contact Rating		
OTHERS	41.	Accessories for Hot Tap		
	42.	Manufacturer		*
	43.	Model No. Meter		*
	44.	Converter		*

SECTION – 11

SCHEDULE OF RATES (SOR)

**Item: Procurement of Mass Flow Meter (MFM)
Project: CNG & CGD Projects in Hyderabad**

SCHEDULE OF RATES

S.No	Description	UOM	Qty	Unit Price Ex-works Including cost of imported raw material/components & project Rate of customs Duty thereon, Pkg/fwd, but excluding ED & ST on finished goods	per unit terminal Excise Duty	per unit sales tax with 'C' Form	per unit freight upto project site by Road including transit insurance & all other taxes like octroi, entry tax	per unit FOT site (5+6+7+8)	total FOT project site (4*9)
1	2	3	4	5	6	7	8	9	10
1	Supply of Coriolis CNG-Series Sensor;1/2-inch (15mm); 316L stainless steel with Coriolis MVD Flow & density transmitter with detailed specification of Sensor and transmitter as per the technical specifications and data sheet attached.	NO	3						

Note:

1. The Rates should be in INR only.
2. Evaluation will be done at lowest cost to Owner(BGL)
3. Bidder should quote for all the items.