BHAGYANAGAR GAS LIMITED

(A JOINT VENTURE OF HPCL & GAIL)

BID DOCUMENT FOR

Rate Contract for Procurement of Metering & Regulating Skids (MRS) for a period of Two Years at Hyderabad, Vijayawada & Kakinada GAs

UNDER OPEN DOMESTIC COMPETITIVE BIDDING

Bid Document No.: BGL/626/2024-25

VOLUME-II of II

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SECTION – 7

MATERIAL REQUISITION

MATERIAL REQUISITION

Sl.No	Description of MRS	Unit	Qty.
MRS.1	Supply, Delivery of **Single stream Wall Mounted** Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatibility system with GPRS Modem, JB, Power Supply etc.), **G16 RPD meter**, Rangeability 1:100 or better, **43 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g) with assistance in commissioning.	No.	2
MRS.2	Supply, Delivery of **Single stream Wall Mounted** Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatibility system with GPRS Modem, JB, Power Supply etc.), **G25 RPD meter**, Rangeability 1:100 or better, **68 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g) with assistance in commissioning.	No.	2
MRS.3	Supply, Delivery of **Single stream Wall Mounted** Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatibility system with GPRS Modem, JB, Power Supply etc.), **G40 RPD meter**, Rangeability 1:100 or better, **111 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g) with assistance in commissioning.	No.	2
MRS.4	Supply, Delivery of **Single stream** Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatibility system with GPRS Modem, JB, Power Supply etc.), **G16 RPD meter**, Rangeability 1:100 or better, **43 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g) with assistance in commissioning.	No.	3
MRS.5	Supply, Delivery of **Single stream** Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic corrector, Regulators, PG, DPG, Valves, AMR Compatibility system with GPRS Modem, JB, Power Supply etc.), **G25 RPD meter**, Rangeability 1:100 or better, **68 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g) with assistance in commissioning.	No.	10
MRS.6	Supply, Delivery of **Single stream** Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatibility system with GPRS Modem, JB, Power Supply etc.), **G40 RPD meter**, Rangeability 1:100 or better, **111 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g) with assistance in commissioning.	No.	10

MRS.7	Supply, Delivery of **Single stream** Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatablity system with GPRS Modem , JB, Power Supply etc.), **G65 RPD meter**, Rangeability 1:160 or better, **171 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g) with assistance in commissioning.	No.	10
MRS.8	Supply, Delivery of **Single stream** Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatablity system with GPRS Modem , JB, Power Supply etc.), **G100 RPD meter**, Rangeability 1:160 or better, **273 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1.5 bar (g) with assistance in commissioning.	No.	10
MRS.9	Supply, Delivery of **Double stream** Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatablity system with GPRS Modem, JB, Power Supply etc.), **G160 RPD meter**, Rangeability 1:160 or better, **532 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1.5 bar (g) with assistance in commissioning.	No.	5
MRS.10	Supply, Delivery of **Double stream** Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatablity system with GPRS Modem, JB, Power Supply etc.), **G250 RPD meter**, Rangeability 1:160 or better, **851 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1.5 bar (g) with assistance in commissioning.	No.	5
MRS.11	Supply, Delivery of **Double stream** Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatablity system with GPRS Modem, JB, Power Supply etc.), **G400 RPD meter**, Rangeability 1:160 or better, **1383 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1.5 bar (g) with assistance in commissioning.	No.	2
MRS.12	Supply, Delivery of Double stream Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatablity system with GPRS Modem, JB, Power Supply, Gas Detector System etc.), **G250 RPD** meter, Rangeability 1:160 or better, **851 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1.5 bar (g) with assistance in commissioning.	No.	1

Note:

1. The RPD meter to be installed in the downstream of Regulator.
2. The indicated SCMH for each MRS is considered at 45ºC.
3. The outlet pressures are as mentioned against each MRS. If any specific requirement required for any MRS in the outlet pressures (i.e, 0.5/1.0/1.5/2.0 bar), Vendor to install suitable regulator with spring range.
4. The RPD meter with integral EVC or separate is acceptable, provided the PT, TT probes can be calibrated at site.
5. Sl.No 1 to 3 shall be wall mounted.
6. Delivery shall be at any of the BGL's GA locations at Hyderabad, Vijayawada or Kakinada.
7. The Quoted Rates should include the **Third Party Inspection Charges.**
8. Only BGL approved Third Party Inspection Agencies are to be deployed.
9. Scope of Third Party Inspection – Inspection as per SCC document.
10. The Rates should be in INR only.

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 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 vendor.

2.0 SCOPE OF SUPPLY

2.1 General

This Specification covers, supply of Metering & Regulating Skids to be used in City Gas Distribution for BGL GAs at Hyderabad/Vijayawada/Kakinada Cities.

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 Material Requisition.

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.

2.3.3 Supplier's Scope

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

2.3.4 Performance and Inspection

Adequate data on capacity, range ability, lock –up, minimum and maximum operating pressure, dynamic performance characteristics and predicted noise level emissions, set point of PCV cum shut off valve, relief valve etc. should be given by the manufacture in order to determine the performance of the regulators under various operating conditions. Result of such tests carried out by the manufacture to determine operational performance and thereby confirm these design data and manufacturing Test Certificate for all components/parts of the MRS, NDT result, Welding Procedure Specification, Welders Performance Qualification records Etc. should be made available prior to offering the complete skid for witnessing the performance testing by BGL/Third Party Inspection agency.

Stage wise Inspection shall be carried out by respective Sub vendors. Completed Skid shall be finally witnessed &inspected by TPI / Client. TPI shall review Test certificates, traceability and certification by Sub vendors. 3.1 Certification is accepted.

Supplier shall submit with his bid a list of 3 well known Third Party inspection Agencies as per enclosed vendor list, which he intends to use for inspection. This agency will issue all relevant certificates as per specification & codes. The final performance test of complete MRS skid shall be carried out in presence of third party inspecting agency/BGL representative before accepting the skid and giving clearance for dispatch. Inspection shall also be performed by a designated Third Party Inspection agency and/or purchaser as set out & specified in the codes & particular documents forming this MR.

3.0 SPECIAL INSTRUCTIONS TO BIDDERS

3.1 The installation shall be designed to pass maximum designated gas flow rate at the lowest expected inlet pressure and the designed outlet pressure.

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

3.3 TPI shall review Test certificates, traceability and certification by Sub vendors. 3.1 certification is accepted. Stage wise inspection for complete fabrication, testing including raw material inspection to be carried out.

3.4 The maximum velocity of the gas must be limited to 20 m/sec before filtration, and 30m/sec after pressure regulation, velocity at metering will be limited to 20 m/sec or limiting to the maximum specified flow of RPD meter whichever is less.
The maximum velocity of the gas must be limited to 30 m/sec.

3.5 All pipe work and equipment must be capable of withstanding the maximum pressure resulting from a fault condition.

3.6 The provision of the inlet and outlet valve for every stream should be incorporated.

3.7 The Skid manufacturer must deliver a Certificate EN 10204 3.1 stating the quality, the mechanical properties, the chemical analysis the process of manufacture and the marking for the skid.

3.8 All bought out Items like Flanges, Fittings, Valves to be used in manufacturing of Skids shall have Certificates confirming to EN 10204 3.2 or EN 10204 3.1

3.9 All material shall be delivered at Company's designated storage yard. The destination for delivery of items is at Hyderabad.

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

3.11 For the MRS, inlet pressure will be 4 - 2 bar and outlet pressure will be 1–1.5 bar and **Also if any modification will be required while change in the pressure, the same will be in the scope of supplier.**

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 07 days from LOI/ FOI.

4.5 WPS & PQR, as required.

4.6 Within two (2) weeks of FOI/PO, the detailed fabrication drawings along with process and mechanical design calculations for Purchaser's approval.

4.7 Detailed completion schedule activity wise (Bar Chart), within one week of placement of FOI/PO.

4.9 Weekly & fortnightly progress reports for all activities including procurement.

4.10 Manufacturer's drawings for bought out items, in 4 copies, for Purchaser's approval within 2 weeks.

4.11 Manufacturer related information for design of civil foundation& other matching items within 2 weeks of FOI / LOI/PO.

4.12 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.

4.13 A list of documents to be furnished along with supply.

5.0 PERFORMANCE GUARANTEE:

Vendor shall submit SD/CPBG @ 10% of Annualized Order/ Contract Value excl. of taxes & duties within 30 days of FOA/ notification of award.

OR

The Contract Performance Security shall be with Initial Security Deposit (ISD) @ 2.5% of basic contract value and deduction @ 7.5% of the RA bill subsequently from RA bills till the total amount of security deposit (including ISD and deducted amount) reaches 10% of annualized basic contract value (without GST therein) towards faithful performance of the contractual obligations.

The Contract Performance Guarantee will be valid for a period of 90 days beyond the contract period/ duration and applicable Warranty/ Guarantee Period.

6.0 TERMS OF PAYMENTS

The Payment shall be made in the following manner subject to completion of all contractual requirements as per tender document.

a) **90% of supply value** will be paid against receipt and acceptance of material by Owner & against receipt of the following documents : -

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) A certificate from manufacturer that the all items/ equipment under supply including its component or raw material used with manufacturing are new and conform to the tender requirement. In case manufacturer is not the contractor this certificate will duly be endorsed by the contractor owning overall responsibility.
vii) Final technical file as per Technical Specifications/ Material Requisition including all test certificates.
viii) Performance Bank Guarantee(s) of 10% of Contract Value. If already submitted, a copy of the same.
ix) Document related to ITC credit to be claimed by Owner, if applicable.
x) Documents as specified in the Technical Specifications/Material Requisition, Volume-II of II of the Bid Document.

b) 10% payment shall be released after submission following documents:

i) No Claim Certificate.
ii) Final acceptance of material by BGL
iii) After successful commissioning of MRS.

7.0 PRICE BASIS

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 EVALUATION & ORDERING:

Bids shall be evaluated and order shall be placed as per Evaluation & Ordering criteria as mentioned in Section: Bidder Evaluation Criteria.

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:

Quantity under 1st lot will be procured immediately, and remaining quantities will be ordered from time to time upon the project 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 name of Vessel/Trailer description 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 supplier agrees that time of supply shall be of the essence of the Contract. If the supplier fails to supply within the respective scheduled / fixed date for supply. Company may without prejudice to any other right or remedy available to the company:

Recover from the supplier as curtained and agreed, genuine pre-estimate price reduction and not by way of penalty, a sum equivalent to ½% per week or part thereof for each week's delay, prorated for part thereof beyond the scheduled supply date of each lot subject to maximum of 5% of Purchase Order value, even though the company may accept delay in supply after the expiry of the scheduled supply date.

15.0 REPEAT ORDER: as per ITB

16.0 DELIVERY

The delivery of the MRS shall be anywhere in Hyderabad/Vijayawada/Kakinada GA location. **It was estimated that approximately 90% of the total MRS requirement given in the SOR are for Hyderabad location only**. The exact location of the site/store shall be informed before dispatch of MRS 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

Rate Contract Period: 2 years from the date of issue of FOA/ Purchase Order.

Delivery Period of individual lots/orders as intimated by EIC vide letter /e-mail(s). 1st Lot of MRS requirement as mentioned below to be supplied within 08 Weeks from the date of FOA/PO:

For remaining lots, the supply of Meter Regulating Skids (MRS) shall be completed within 06 Weeks from the date of letter of intimation for supply through e-mail/letter on FOT Purchaser's Store basis. The date of receipt of MRS'(s) at Purchaser's store shall be considered as date of delivery.

MRS requirement under 1st Lot

Sl. No.	MRS	Qty.
1	Single stream Wall Mounted MRS, G16 RPD meter, Rangeability 1:100 or better, 43 SCMH, Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g)	0
2	Single stream Wall Mounted MRS, G25 RPD meter, Rangeability 1:100 or better, 68 SCMH, Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g)	2
3	Single stream Wall Mounted MRS, G40 RPD meter, Rangeability 1:100 or better, 111 SCMH, Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g)	1
4	Single stream MRS, G16 RPD meter, Rangeability 1:100 or better, 43 SCMH, Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g)	0
5	Single stream MRS, G25 RPD meter, Rangeability 1:100 or better, 68 SCMH, Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g)	4
6	Single stream MRS, G40 RPD meter, Rangeability 1:100 or better, 111 SCMH, Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g)	3
7	Single stream MRS, G65 RPD meter, Rangeability 1:100 or better, 171 SCMH, Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g)	1
8	Single stream MRS, G100 RPD meter, Rangeability 1:160 or better, 273 SCMH, Inlet pressure-2 to 4 bar (g), Outlet pressure – 1.5 bar (g)	2
9	Double stream MRS, G160 RPD meter, Rangeability 1:160 or better, 532 SCMH, Inlet pressure-2 to 4 bar (g), Outlet pressure – 1.5 bar (g)	0
10	Double stream MRS, G250 RPD meter, Rangeability 1:160 or better, 851 SCMH, Inlet pressure-2 to 4 bar (g), Outlet pressure – 1.5 bar (g)	1
11	Double stream MRS, G400 RPD meter, Rangeability 1:160 or better, 1383 SCMH, Inlet pressure-2 to 4 bar (g), Outlet pressure – 1.5 bar (g)	0
	Total	14

Note:

- **The delivery shall be at any of the BGL GAs at Hyderabad/Vijayawada/Kakinada sites.**
- **Price Reduction Schedule (PRS) will be based on contract value for the items covered under each lot, excluding GST.**

SECTION – 10
TECHNICAL SPECIFICATION
FOR
METER REGULATING SKID (MRS)

TABLE OF CONTENT

1.0 GENERAL

1.1 This specification together with all annexure enclosed, covers the requirements for the design, engineering, manufacturing, testing, inspection and supply of MRS units along with all the accessories.

1.2 In the event of any conflict between this specification, datasheets, related standards codes etc., the more stringent shall apply.

1.3 Purchaser datasheet for Cartridge filters, Pressure regulators with Slam shut valve, Pressure relief valves, Pressure/Differential pressure gauges, Control valves and accessories indicating materials for body, internals etc. has been attached. However, this does not absolve the vendor of the responsibility for proper selection with respect to the fluid & its operating conditions. Proper sizing & selection of Cartridge filters, Pressure Regulators, Slam shut valves, Pressure relief valves, etc. and accessories are vendor's responsibility. Sizing Calculation required for Cartridge filter, PCV's, SSVs, PSV etc and Noise calculation required for PCVs. Process parameters for skids are attached. Vendor shall take single point responsibility for the design & performance of the skids based on the data sheet and specification furnished and taking into consideration successful operation, safety as per the established international standards for complete skids.

1 .4 Vendor shall consider all the requirements of this specification along with those as per relevant standards and shall assume total responsibility including all aspects of engineering, design, certification etc. for filtration, pressure reducing and metering units.

1.5 Vendor to note that all the items including cartridge filters, pressure regulators and slam shut valves, pressure safety valves, flow computer etc. shall be procured from reputed vendors and shall follow the attached vendor list.

1 .6 Vendor's quotations shall include the detailed specifications for all the items of filtration, The vendor shall also offer any instruments /equipments required for safe and efficient operation of the system.

1.7 Vendor to furnish

a) The maximum flow rate (in Sm3/hr) at minimum inlet pressure for all PCVs at valve full open condition.

b) Min. flow rate (in Sm3/hr) through each PCV without damaging the trim and valve internals at min. inlet pressure.

c) Flow rate vs. trim lift curve to justify the valve range ability and valve regulation characteristics.

1.8 All units of measurements in vendor's specification sheets shall be same as those in purchaser's data sheets.

All material specification for the various parts in the vendor's specifications sheets shall be to the same standard as those in purchaser data sheets.

1.9 Vendor shall enclose catalogues giving detailed technical specification and other information for cartridge filters, self actuated pressure control valve, and slam shut valves, pressure relief valves, pressure / temperature gauges, control valves etc.

covered in the bid.

Vendor's quotation, catalogues, drawings, operating and maintenance manuals etc. shall be only in English language.

Vendor shall submit subsequent to award of contract the sizing details & specification of all the instruments and piping items make and model, skid details etc. The relevant catalogue, technical literature shall also be furnished.

All drains/vents should be having provision for putting end cap and shall be complete with wire seal.

2.0 GENERALITIES

2.1. Definition

Subject to the requirements of the context, the terms used in this specification are given the following meaning:

OWNER	Designates the purchaser of the GOODS and/or
SERVICES	which are the subject of the AGREEMENT.
VENDOR	Designates the individual or legal entity with whom the order has been concluded by the OWNER. The term "VENDOR" may be used indifferently or a supplier, a manufacturer, anerection contractor, etc.
OWNER'S REPRESENTATIVE	Any Third Party Inspecting agency or BGL's representative asbeing involved in the project.
GOODS and/or SERVICES	Designate, depending on the case, all or part of the drawings or documents, substances, materials, material, equipment, structures, plant, tools, machinery etc., to be studied, designed, manufactured, supplied, erected, built, assembled, adapted, arranged or put into service by the CONTRACTOR under the AGREEMENT, including all the studies, tasks, works andservices 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 CONTRACTORS
SHALL	This verbal form indicates requirements strictly to be followed in order to confirm to the standards and from which no deviation is permitted.
SHOULD	This verbal form indicates that among several possibilities one is particularly suitable without mentioning or excluding others or that a certain course of action is preferred but not necessarily required.
MAY	This verbal form indicates a course of action permissible within the limits of this standard.

CAN	This verbal form used for statements of possibility & capability, whether material, physical or casual.

3.0 STANDARD CODES

Mechanical Equipment shall generally be mechanically designed in accordance with the relevant institute of Gas Engineers (IGE) codes and the following principal codes of practice (Latest Edition).

ASME Boiler and Pressure vessel Code. / American National Standard Code

ANSI/ASME B 16.5	Flanges & Flange fittings
ANSI/ASME B 31.8	Gas Transmission and Distribution Systems.
ANSI/ASME B 16.20	Metallic Gaskets for pipe flanges
ANSI/ASME B 1.20.1	Pipe threads general purpose (inch) valveflanged
ANSI/ASME B 16.34	threaded & welding ends.

American Petroleum Institute (API)

API RP 520	Part 1 & 2,Design and Installation pressure relieving systems in refineries.
API RP 521	Guide for Pressure relief and Depressing Systems
API RP 550	Manual on Installation of refinery instrument and control system
API 6D	Specification for pipe line valves, end closures and swivels.
API 527	Commercial seat tightness of safety relief valves with metal to metal seats

British Standard Specifications

BS 449 BS 1515 Structural Steel work materials of filters & scrubbers.

4.0 SCOPE OF WORK:

4.1 Vendor's scope shall include complete design, engineering, manufacturing, integration, performance testing, inspection, FAT, supply, supervision of erection, testing & commissioning, & documentation of MRS skids as per the respective P & IDs, data sheets and other specifications enclosed herewith.

4.2 MRS units shall be comprised of the following items as per enclosed P & IDs, but not limited to (Refer design basis) the followings:

i) In each stream, One cartridge filters with differential pressure gauges, Safety Relief Valves, along with all accessories (as indicated in P & ID).

ii) In each stream, One pilot operated monitor pressure regulators with integral slam shut as indicated in respective P&ID's & one pilot operated Active regulator.

iii) Single stream with RPD Meter from G16 to G100 & Double stream with RPD Meter from G160 to G400 capacity. RPD Meter's shall be with Battery operated EVC having integral/external GPRS & GSM Battery operated

Modem, Software's, Cables between EVC & Modem, local communication / configuration cable for EVC to Laptop, Additional external Power supply will be provided to EVC and Modem with suitable power supply unit for 230 VAC input and Modem at Host computer, as per P&ID and other technical details of tender.

iv) Pressure control Regulator shall be ***Pilot Type***.

4.3 If any deviation from the specified technical specification, vendor should highlight in advance to BGL.

4.4 The data sheets provided by BGL along with the tender document should be filled up completely and enclosed with Technical BID.

4.5 All the connection in the skid where the pressure is more than 19 bar or more should be welded type.

4.6 Flanged end connections should be in size of 2", 4", 6", 8" only.

4.7 Vendor shall confirm that the MRS are suitable for outdoor installation in tropical climate with following conditions:

- Ambient temperature:-10 -60°C
- Humidity: 100%

4.8 Vendor shall furnish Bill of Materials for the skid, and completeness of the Bill of Materials for the skid to meet the functional requirement of specifications of tender document is vendor's responsibility.

4.9 All materials to be used in construction of valves shall be suitable for Natural Gas services.

4.10 Vendor shall be responsible for the design of filters for the successful operation of the of the skids. Filter shall be cartridge type with 5 microns filtration capacity and shall be provided with a differential pressure gauge.

4.11 Flow direction shall be clearly marked on the meter body.

4.12 Accuracy Class for RPD Meters shall be Qt to Qmax: +/- 1% & Qmin to Qt: +/- 2% as per EN 12480.

4.13 All field mounted instruments shall be suitable for continuous working in outdoor installation, considering temperatures, humidity etc as per the data provided elsewhere in bid.

5.0 CERTIFICATION FOR CUSTODY TRANSFER

5.1 The vendor shall furnish the regulations of the certifying authority considered by him for custody transfer applications. If other instruments also need to be certified as per the regulations the same shall be complied with.

6.0 TESTING AND INSPECTION

All materials and equipment shall be factory tested before shipment in the presence of BGL's representative. No material shall be transported to site until all required tests have been carried out and equipment is certified as ready for shipment. Acceptance of

equipment or the exemption of inspection or tests thereof, shall in no way absolve supplier of the responsibility for delivering equipment meeting the requirements of the specifications. Following tests shall be included.

i) Material test certificate, hydrostatic test certificate for self actuated pressure control valves, slam shut valves, pressure relief valves, control valves, isolation valves and for all piping /valves of skid.

ii) Testing to demonstrate set-point accuracy and actuation time for integral Slam shut valves.

iii) Testing to demonstrate the set point accuracy for self actuated pressure control valves for the complete range of pressure and flow conditions.

iv) Calibration certificate for pressure relief for set pressure and all field instruments.

v) Seat tightness test for self actuated integral slam shut valves, pressure relief valves

vi) Test certificate for all field instruments such as PGs, TGs, DPGs, and PTs& TTs.

vii) Certificates from statutory body for limit switch being flame proof and weather proof.

viii) Skid piping material testing and NDT of welds as per PMS.

ix) Pneumatic Test report with air/N2 at 39 bar(g).

x) Skid functional testing considering pressure regulation, limiting and safety characteristics.

6.2 Supplier shall perform the usual standard tests to maintain quality control Procedures. Purchaser shall submit these certificates for review before starting inspection. Supplier shall be responsible for testing and complete integration of the system.

6.3 Detailed procedures of test and inspection shall be submitted by the supplier for review before order and mutually agreed upon.

6.4 Inspection will be done by Owner/ Third Party Inspector at vendor's shop. For this inspection, labor, consumable, equipment and utilities as required shall be in vendor's scope.

6.6 Testing and inspection works have to be carried out at Vendor's works or works designated by the Vendor.

6.7 The Vendor must submit a certificate EN 10204 3.1 stating the relevant quality of the Supplied MRS.

7.0 DOCUMENTATION

The Purchaser in vendor data requirement sheets indicates detailed drawings, data and catalogs required from the vendor. The required number of reproducible and prints should be dispatched to the address mentioned, adhering to the time limits attached.
Final drawings from the vendor shall include dimensional details, weight, mounting details and any other special requirements etc. for the skids. All dimensions in general shall be in millimeters. Vendor shall furnish all manuals necessary to test, operate and maintain the system. The Vendor shall submit the following documents in Minimum 3 sets,

a. Performance specification and Test certificate.
b. Certificate from DVGW or equivalent.
c. Construction drawings, material specification and technical data sheets.
d. Instructions and recommendations regarding installation, operation and maintenance of all the components of the unit.
e. Spare part list.
f. Material test certificate for all the pipe and fittings material.
g. Hydrostatic and Pneumatic test certificates.

8.0 NAME PLATE

Each skid and all the instruments in the skid shall have a SS nameplate attached firmly to it at a visible place furnishing the following information:

- Tag number as per Purchaser's data sheets.
- Body sizes in inches and the valve Cv.
- Set pressure range or flow range.
- Flow range in Sm3/hr
- Rating
- Manufacturer's Name & model number
- On the MRS cabinet the following instructions shall be inscribed in ENGLISH.
  - ☞ Danger – Inflammable Gas
  - ☞ Bhagyanagar Gas Ltd
  - ☞ MRS NO –
- No smoking or spark flame or naked flame within a radius of 1.5 meters.

9.0 PAINTING

9.1 All exposed carbon steel parts to be painted shall be thoroughly cleaned from inside and outside to remove scale, rust, dirt and other foreign materials by wire brushing and sand blasting. Minimum acceptable standard in case of power tool cleaning shall be St. 3 and in case of blast cleaning shall be Sa 2-1/2 as per Swedish Standard SIS 0055900.

9.2 Non-ferrous materials, austenitic stainless steels, plastic or plastic coated materials, insulated surfaces of equipment and pre-painted items shall not be painted.

9.3 Stainless steel surfaces both inside and outside shall be pickled and passivity.

9.4 Machined and bearing surfaces shall be protected with varnish or thick coat of grease. Vendor to ship supply of primer and the paint to permit on-site repair of shipping damage (if any) to the factory coatings.
The direction of the flow of gas in the piping system of the skid shall be indicated on the pipes on the both streams.

10.0 SHIPPING

All threaded and flanged opening shall be protected to prevent entry of foreign material.
All the field mounted instruments shall be supplied loose to avoid damages during transportation. Skids shall bear proper shipping markings.

11.0 REJECTION

Vendor shall make his offer in detail, with respect to every item of the Purchaser's specification. Any offer not conforming to this shall be summarily rejected.

12.0 INFORMATION TO BE SUPPLIED WITH TENDER

The Vendor shall provide at the time of tendering a complete detailed engineering package in accordance with the vendor data requirement and shall include but not necessarily be limited to the same.

13.0 WARRANTY & DEFECT LIABILITY PERIOD

The Vendor shall as required by the Engineer and without additional cost to Owner (unless it can be shown that defects and deficiencies have occurred through Owner's negligence), amend repair or replace with new materials any defects or deficiencies in the plant and/or work which become apparent at any time or from time to time, within the period of twelve (12) months occurring from the date of commissioning or 24 months from the date of shipment, whichever is earlier.

If the Vendor does not make good those defects or deficiencies in the plant and/or work within a reasonable time of having been given prior written notice by the Engineer to do so, the Engineer may arrange for such defects or deficiencies to be remedied by others at the risk and expenses of the Vendor, but without prejudice to any other rights which Owner has under the Contract in respect of those defects or deficiencies.

14.0 Technical Specification for Single Stream/ Double Stream Meter Regulating Skid for Natural Gas for inlet pressure up to 4 bar (g).

SCOPE:
This specification covers the requirements of design, material, manufacturing, construction features, inspection, testing and commissioning of a complete Single Stream Metering and Regulating Station (MRS) including all packing, preservation and transportation to sites /BGL's Store. The maximum inlet pressure to the MRS shall be 4 bar (g). Unless otherwise specified, all the pressures indicated in this specification are gauge pressures.

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

A. General Specifications.

1. **The meter and governing components should be designed not in isolation, but as a single installation. Normally both should be sized for the same load and consideration must be given to the effect that each may have on the other.**
2. **The installation should be designed to pass the maximum designed gas flow rate at the lowest expected inlet pressure and the designed outlet pressure.**
3. **Suitable for the use with natural gas of specific gravity 0.6**
4. **Gas velocities in pipe work must not exceed 20 meters/ second up to the inlet of the filter and 30 meters/ second downstream of filter, when the maximum flow rate occurs at the lowest expected inlet pressure. All pipe work and equipment upstream of strainer must be capable of withstanding the maximum pressure that might result from a fault condition. The allowable sound pressure values should not be exceeded, and materials selected should be suitable to prevent erosion at such high velocities.**
5. **All pipe work and equipment's must be capable of withstanding the maximum pressure resulting from a fault condition.**
6. **In case of twin stream MRS should have a provision for stream selection wherever specified / mentioned in the specific requirements. Automatic switch over from active stream to the hot standby stream should take place in the event of shut down of the active stream for any abnormal reason.**
7. **There shall be an inlet and an outlet valve on each governor(s). Each valve shall be designed to seal on both upstream and downstream faces and the space between the faces shall be fitted with vents.**

   Upto 6", Floating Ball Valve is acceptable. For, size larger than 6", Trunnion Mounted Ball Valve shall be used.
8. **When viewing the index, the gas flow direction through the meter is from the left to the right. General piping arrangement shall be made in such a way that meter with EVC to be installed on downstream of regulator.**
9. **Pressure test points, purge and vent points shall be fitted as indicated in the Installation Schematic drawing attached herewith. When a test point is not provided on an item of equipment, a point shall be provided on the adjacent pipe work. All the ends of drain and vent points shall be plugged. The vent purge valves provided at the inlet and outlet ends shall not be fitted very close to the base level of the skid, which will be very difficult to be operated.**

10. **Means to avoid entrainment of liquids in the gas entering regulator assembly & if necessary, suitable provision for their removal should be provided. Sizing of components should be done considering avoidance of unacceptably low temperatures, which may lead to requirement of preheating.**

11. **Technical literature (in English language only), dimensional details of the equipment and system hook up drawing shall be submitted along with the technical bid.**

12. **Installation arrangement for guidance is as shown in the schematic drawing enclosed. Actual arrangement should be proposed by vendor and shall be reviewed and certified by BGL.**

13. **Any deviation from the specified technical specification should be highlighted and vendor may also quote advanced / latest models (with all the details) to reduce overall cost as an alternate. However, the acceptance of the same shall be at the sole discretion of BGL.**

14. **The data sheets should be filled up completely and should be enclosed along with the Technical Bid.**
15. **Compliance with Technical Specification will be taken for granted, if deviations are not specifically mentioned.**

16. **Hole tight / leak tight should not be used on threaded / flange joints. Stud nuts only are to be provided on flange joints.**

17. **Flanges made of cast iron, ductile iron and non-ferrous materials (brass or bronze) shall not be used. For piping class 150 or above all the flanges shall be with raised face. Flanged end connections (inlet and outlet) of the MRS should be in sizes of 2", 4", 6" and 8" only, to ensure compatibility with the transition fittings employed by BGL. All stud bolts and nuts used in CGD networks shall be hot dipped galvanized as per ASTM A 153 or equivalent.**

18. **Vendor shall confirm that the MRS is suitable for outdoor installation in tropical climate with the following conditions:**
    - □ **Ambient temperature: 05 – 60 °C.**
    - □ **Humidity: 100 %.**

B. Gas Pressure Regulator.

1. Purpose

For regulating pressure in gas service lines supplying industrial and commercial customers from 4 bar (g) distribution systems and incorporating appropriate safety devices to protect against excess and lack of downstream pressure.

Regulator should be proved as satisfactory pressure vessels by hydrostatic and pneumatic tests and test certificates should be provided by manufacturers / Third party Inspection agency appointed by BGL.

2. Standard Features

Pressure shut-off device should be provided to protect against excess and lack of downstream pressure. Accuracy of slam shut operation should be as per the requirements of EN 14382: 2009 or better.

Relief valve should be provided to protect against downstream over pressure at low flows or in the event of seat malfunction. Creep relief valves shall not have a capacity larger than 1% of stream fault capacity. Vent shall be provided to discharge gas from relief valve to a safe place at least 3 meters away from the working platform in MRS vicinity and it should be terminated with suitable flame arrestors.

Preferably separate slam-shut valves should be provided upstream of the regulators in each stream.

Isolation Valve is required for CRV.

Lock up: As the flow through a governor is slowly reduced from 2% of maximum flow to zero, the governor must not allow the outlet pressure to rise by more than 5 mbar or 1% of the set pressure (g), whichever is greater, above the value at 2% of the maximum flow.

The burst pressure of a diaphragm should be at least three times the maximum working differential pressure.

Adequate clearance should be provided between the top of the regulator and the skid in order to carry out the adjustment and maintenance of regulator without any inconvenience.

3. Marking

The regulator shall be marked with the details of Sr. No., Type, year of manufacture, flow range & flow at set outlet pressure, inlet pressure range, outlet pressure range and set point, over pressure shut off range and set point, under pressure shut off range and set point, relief pressure range and set point, and orifice size.

4. Performance characteristic curves

The following performance characteristic curves should be furnished:

a) Outlet pressure v/s flow (for various inlet pressures)
b) Inlet pressure v/s flow (for various outlet pressures)

5) All regulators shall be EN334 complied with OPSO, UPSO & SSV. Certificate to be submitted.

6) All regulators upto G40 RPD meter shall be direct acting / for G65 and above it should be pilot operated.

7) Regulator end connection should be 150 # flanged type.

C. Gas Meter & Electronic Volume Converters (EVC).

1. Purpose.

For measuring the flow of natural gas, each meter & EVC should have calibration certificates duly signed by Weights and Measures Authority. Alternatively vendors' in- house calibration certificate is also acceptable provided the uncertainty of vendors' meter proven system is traceable to National / International mass standards. Vendors shall furnish certificate indicating the uncertainty of meter prover system.
Meter & EVC shall be installed outdoors in open environment. Vendor shall confirm that the meter is suitable for outdoor installation in tropical climate with the following conditions:

- **Ambient temperature: 05 – 60 $_0$C**
- **Humidity: 100 %**

Vendor in the offer shall include accessories such as lubrication pumps (if required). RPD meter should in addition be fitted with an open ended top hat type strainer (Conical type of the strainer is acceptable) inserted in horizontal pipe work between governors and meters. The strainer mesh size shall not be finer than the mesh size of the main filter, nor should it be coarser than 250 microns. Provision should be made in the design of pipe work to enable removal of strainer for cleaning and inspection.

Maximum working pressure requirement for RPD Meter shall be 7 bar(g). HF pulse input from RPD meter is acceptable. Integral / External (as a separate unit) EVC with RPD Meter is acceptable.

Meter should be with Electronic Volume Converters (EVC). The EVC to be used shall comply EN 12405 & ATEX.

Proper lubrication arrangement should be provided. Inlet and outlet straight piping requirement and flow straightening device should be as per PTB/EC/TRG13 or equivalent.

Meter with EVC should be IP-65 protection

Meter end connections should be 150 # flanged type.

2. Nameplate

A nameplate should be fixed on the meter, which will give the following information:

- □ **Name and trademark of the manufacturer,**
- □ **Type of the meter,**
- □ **The serial number,**
- □ **The maximum flow,**
- □ **The minimum flow,**
- □ **Maximum working pressure, and**
- □ **Direction of the gas flow.**

A) AMR System

BGL needs to pull data of Pressure, Temperature, Corrected Volume Flow, Uncorrected Volume Flow, 24 hrs Flow Data etc twice in a day to its control room. The mode of communication shall be GPRS.

- **GSM Modem in AMR system shall be ATEX approved for connection with a device in hazardous area.**

The power supply shall be installed at a distance of around 20 meters from the meter i.e., from Zone 0 (if it is external). The electrical cabling required for the connectivity between various accessories (i.e., from External Power Supply to GSM Modem etc) is in Vendor's scope.

AMR shall be programmed to send the data by both the means i.e., periodically as well as at convenient time.

Note: The bidder should submit the technical datasheets as applicable for AMR system at the time of submission of the bid.

E. Filters & Strainers

Design and construction shall meet the requirements as per ASME Boiler & Pressure Vessel (BPV) Code, Section VIII: 2007. The filters & strainers shall be of horizontal design only. However, in case of vertical design / alignment of the filter (in special cases and with prior BGL approval only), there should be enough clearance provision between the top end of the filter and the roof of the skid for removing the filter element from the top end. Differential pressure indicator (clogging indicator) should be provided. All the filters shall have purge, vent and drain connections with valve (with positive blind arrangement), and should be suitably located and sized to ensure a reasonably short blow down time. Filters are acceptable with blind covers with davit arm. All welded joints should be radio graphically examined and acceptance criteria should comply with ASME BPV Codes.

F. Pipe Work, Fittings and General Construction.

MRS skid construction / fabrication, reinforcement pads, etc. shall meet the requirements of codes ASME B31.8: 2007 and or ASME BPV Code, Section VIII: 2007. The design and assembly of all the equipments shall be such that there is no difficulty in the operation and maintenance of the same.

Pipe work and fittings shall be of seamless type and as per ASTM A 106 Gr. B / API 5L Gr. B and ASTM A 234 Gr. WPB & ASTM A 105. All branch connections should be of weldolet type up to d\D ratio less than 0.3 and sweepolet type up to d\D ratio less than
0.6. All valves for pressure / vent, pressure gauge and bleed should have positive blind arrangement.

Size of sensing line and pressure test points is left to manufacturer's discretion. On impulse line valves, the mean of actuation must be capable of being removed. The MRS should be a skid mounted. Welders and welding procedures have to be qualified in accordance with ASME BPV Code Section IX / API 1104: 2005. All the welded joints should be radio graphically examined and acceptance criteria should comply with ASME BPV Code, Section VIII: 2007 / API 1104: 2005.

Vendor shall furnish details of foundation and anchor bolts. Supply of foundation bolts of adequate strength is in the scope of the vendor. The position of the foundation bolts in the drawing (to be submitted for approval) should be clearly indicated in all the views of the MRS. The center point of the inlet and outlet flanged connections should be clearly marked / visible in all the views in the drawing submitted for BGL approval.
The shut off valve of the MRS shall be easily accessible and shall be clearly marked in English and Marathi language. Also it should indicate the directions of opening as well as closing.

The direction of flow of gas in the piping system of the skid shall be indicated on the pipes on both the streams.

Painting shall be carried out by application of one coat (DFT 35-50 microns) of zinc phosphate primer followed by two coats (DFT 60 microns each) of chlororubber high build paint of colour canary yellow. Before painting, surfaces shall be thoroughly cleaned by applying mechanical methods. However the outlet valves should be painted with red colour. On the MRS skid, the following instructions shall be inscribed in English and Marathi language:

- **Danger – Inflammable Gas.**
- **BGL Toll Free No.:** 18005996991/92/93 for HYD/VJA/KKD
- **Fire Brigade Tel. No:**
- **No Smoking or spark flame or naked flame within a radius of 3 meters.**

In case screws are used to fix nameplates etc., on the skid, all the sharp points should be adequately filed and smoothened.

Hooks of adequate strength should be provided to facilitate lifting and convenient handling of the MRS. Working platforms, if required should be provided in the

skids at appropriate locations (and shown clearly in the drawing) to facilitate easy access to all parts of the skid and to avoid any operational or maintenance problems.

Isolation valve – isolation valves 6" size and above shall be gear operated.

Transition Fitting (TF):

1"x 32mm – NPT threaded TF shall be provided along with the SRM/ MRS of which inlet pipe size is 1".

2" x 63mm, 4" x 125mm & 6" x 180mm – TF should be provided along with the MRS of the respective inlet pipe size. TF should be welded along with the spool piece of inlet pipe, as per the approved GAD. Radiography report for the same is to be provided.

G. Cabinet.

A protecting cabinet should be provided to cover the MRS and to avert the ingress of water. It should be constructed with durable, corrosion resistant and non-inflammable materials and should have adequate strength so that it should not get damaged / deformed during handling, transportation and installation.

The cabinet supplied by the vendor should have free ventilation of at least 5% of the surface area. It should have front doors that open fully on either sides, and also be lockable from the outside by padlocks, and rear doors that are lockable from the inside, which are to be supplied by the vendor.

Regulator vents should protrude through the cabinet wall and terminate with flame arrestors. The constructional details of the flame arrestor are also to be provided. Lever handle of outlet valves should protrude through the cabinet wall.

Cabinet sheet is of MS & the thickness shall be of 1.6 mm minimum.

H. Tests.

a) Hydrostatic Testing.

Hydrostatic test should be carried out up to the test pressure as detailed in the specific requirements. Wherever necessary, regulators, relief valves and similar components that have been tested independently should be removed from the line. Blind flanges or double flange pipes should be installed temporarily in their place. All small bore connections and impulse lines should be disconnected and suitable plugs or blank flanges should be installed.

b) Leakage Testing:

i. **Pneumatic testing using air or an inert gas should be undertaken on all installations and should include all equipment and associated small bore pipe work. Care must be taken to disconnect equipment, which might get damaged at the testing pressure.**

ii. **It should be confirmed that all main, by pass and impulse valves within the section under test are in the open position. Any open ends should be blanked off. The installation should be pressurized slowly up to the recommended test level as detailed in specific requirements column.**
iii. **All joints, flanges and glands on valves and fittings should be tested for leakage with a suitable foaming fluid.**

Test Certificates: **A record of all hydrostatic testing and pneumatic testing carried out should be prepared for every installation. A material test certificate for all components of MRS should be furnished at the time of inspection by third party / BGL representative. BGL reserves the right to witness all the tests.**

I. Spare Parts.

The spare parts required in the warranty period (24 months from the date of delivery or 12 months from the date of commissioning, whichever is earlier) should be supplied free of cost. Also, a separate detailed list in addition to the spare parts mentioned below (with the rates valid for 2 years after the warranty period) for the requirement of spare parts after the warranty period should be submitted along with the technical bid. However, BGL may or may not or defer the purchase of spare parts.

List of spare parts:

- **Regulators: Standard spare kit containing diaphragms springs, 'O' rings and gaskets.**
- **Slam shut valve: Standard spare kit containing diaphragms springs, 'O' rings and gaskets.**
- **Relief valve: Standard spare kit containing diaphragms springs, 'O' rings and gaskets.**
- **Filter element & Gasket.**

J. Special Tools and Equipment:

Any special tools or equipment required for the installation or routine maintenance of MRS should be listed and priced separately.

K. Documentation required (minimum 3 sets):

a. **Performance specification and test certificate.**
b. **Certificate from DVGW or equivalent.**
c. **Construction drawings, material specifications and technical data sheets. (In English language only)**
d. **Instructions and recommendations regarding installation, operation, and maintenance of all the components of the unit.**
e. **Parts list.**
f. **Material test certificate for all the pipe and fittings material.**

g. Hydrostatic & pneumatic test certificate

L. Commissioning.

The supplier's technical personnel should carry out commissioning of the MRS at our site.

M. Performance and Inspection

Adequate data on capacity, range ability, lock-up, minimum and maximum operating pressure differentials, dynamic performance characteristics and predicted noise level emissions, set points of slam-shut valve, relief valve, active and monitor regulators, etc., should be given by the manufacturer in order to determine the performance of the regulators under various operating conditions. Results of such tests carried out by the manufacturer to determine operational performance and thereby confirm these design data and Manufacturing Test Certificates (MTC) for all components / parts of MRS, NDT results, Welding Procedure Specification (WPS), Welder's Performance Qualification Record (WPQR), Welding Procedure Qualification Record (PQR), etc., should be made available prior to offering the complete skid for witnessing the performance testing by BGL / Third party Inspection agency appointed by BGL.

The final performance test of complete MRS skid shall be carried out in presence of third party inspecting agency / BGL representative before accepting the skid and giving clearance for dispatch. Party should quote separately towards Third party Inspection charges for the inspection, which is to be carried out only by renowned agencies like Lloyds, Baxcouncil, BV, TUV, and DNV, EIL or any other agency only with prior approval of BGL. Inspection is to be carried out as per the inspection plan stated below.

Inspection plan:

a. Review / checking of all test certificates which includes but not limited to, as stated in clauses 'G', 'L' and documents as per clause 'J'.

b. Visual inspection of the MRS assembly:

c. Witnessing of:

- **Hydrostatic & pneumatic testing of the MRS assembly, as per the parameters given in 'Specific requirements'.**
- **Performance testing of regulator: Outlet pressure v/s flow (for various inlet pressures), inlet pressure v/s flow (for various outlet pressures),checking of lock up pressure to be within limits, slam shut operation & its setting, regulator and relief valve operation & its setting.**

d. Stage-wise inspection to be carried out for inspection of workmanship quality and for inspection of surface preparation and primer coat / intermediate coats to ensure proper adhesion / paint quality.

N. Technical Bid Evaluation Criteria (TBEC)

1. **Bidder's offer should comply with all requirements of BGL Technical Specification. Duly filled and signed data sheet, including specific**

requirements of MRS and technical specification should be enclosed with technical bid as a token of acceptance.

2. **The bidder should have past experience either in supply / fabrication / assembly of regulating stations, or should be manufacturers of similar type of regulators (as listed in Sr. No. 3 below) used in the MRS, and should have a facility to test the MRS units. Documentary evidences (in English language only) such as copy of POs of past supply including technical specification, Third Party inspection release notes / completion test certificate, one-year trouble free performance certificate, etc., should be furnished along with the technical bid.**

3. **Bidder should confirm that they shall supply following major components of MRS from reputed manufacturers as given below. Bidder may offer the models of any other manufacturer apart from those listed below, provided they furnish the documentary evidence (like copy of appropriate approvals, proof of past supply of the offered models by the manufacturers to other gas industries, along with inspection certificate or at least one-year satisfactory performance, etc.) along with the technical bid. The same shall be considered only with prior approval of BGL, and acceptance / rejection of the same shall be at the sole discretion of BGL. In case of bidders who are not Original Items Manufacturers (OIM) as listed in table below, shall furnish, a confirmation letter from OIM that their product can be marketed through the bidder and they stand guarantee for any manufacturing defect / non performance found during the operation and guarantee period and also furnish a delivery schedule of OIM to the bidder. Approved List for Bought item is attached.**

4. **A full-fledged facility for carrying out MRS assembly test should be available with the bidder and should specify the details of the equipment's available for the same in the technical bid.**
5. **Type and model number of all components of MRS shall be mentioned clearly in the offer, sizing calculation, CV/Kg value for selected regulator and slam shut, filter pressure drop calculation, performance curve and specific technical catalogue (in English language only) of the models offered shall be furnished with the technical bid.**
6. **Offers not complying with requirements stated at TBQC Clause No. 1 to 5 are liable to be rejected.**
7. **BGL reserves the right to consider the offer of vendor based on its past performance in BGL.**

15.) DATA SHEET FOR MRS - to be filled by bidders

Sl. No.	BGL specification	Requirements	Vendor's Offer	Deviations, if any	Remarks
I	**REGULATOR:**				
1	MAKE	VENDOR TO SPECIFY			
2	TYPE / MODEL	VENDOR TO SPECIFY			
3	TYPE	PILOT ACTING			
4	MAXIMUM OPERATING TEMPERATURE	60 deg. C			
5	MINIMUM OPERATING TEMPERATURE	10 deg. C			
6	REGULATION ACCURACY	+/- 2.5% OF SET OUTLET PRESSURE (G) OR BETTER			
7	CONNECTION DETAILS	FLANGED ENDS - ANSI 150#			
8	MATERIAL OF CONSTRUCTION				
A	BODY	STEEL ASTM A216 WCB OR SUITABLE FOR WITHSTANDING THE PRESSURE REQUIREMENTS			
B	INTERNALS	S.S. OR BRASS OR SUITABLE MATERIAL FOR WITHSTANDING THE PRESSURE REQUIREMENTS			
C	DIAPHRAGM	SYNTHETIC RUBBER OR SUITABLE MATERIAL FOR WITHSTANDING THE PRESSURE REQUIREMENTS			
9	STANDARDS				
A	REGULATOR	EN 334: 2005 (+A1:2009)			

B	COMPONENTS FOR GAS	DIN 30690-1: 2006 / DIN 30690-			
	SUPPLY	2: 1980 OR EQUIVALENT			
II	**RELIEF VALVE PROTECTION**	AGAINST DOWNSTREAM OVER PRESSURE AT LOW FLOWS			
1	MAKE	VENDOR TO SPECIFY			
2	TYPE / MODEL	VENDOR TO SPECIFY			
3	MAX. CAPACITY	1 % OF STREAM FAULT CAPACITY			
4	STANDARD	DIN 33821: 2009 OR EQUIVALENT			
III	**SLAM SHUT VALVE**				
1	MAKE	VENDOR TO SPECIFY			
2	TYPE/ MODEL	VENDOR TO SPECIFY			
3	BODY	ASTM A216 WCB OR SUITABLE FOR WITHSTANDING THE PRESSURE REQUIREMENTS			
4	ACCURACY	AS PER EN 14382: 2009			
5	CONNECTION	FLANGED 150#			
6	STANDARD	EN 14382: 2009			
IV	**INLET / OUTLET VALVE**				
1	MAKE	VENDOR TO SPECIFY			
2	TYPE/ MODEL	VENDOR TO SPECIFY			
3	STANDARD	API 6D: 2008			
4	NOMINAL SIZE (INCH / NB)	TO BE SPECIFIED BY VENDOR			
5	PRESSURE CLASS	ANSI 150#			
6	SERVICE	NATURAL GAS			
7	PATTERN	FULL BORE			
8	END CONNECTIONS	FLANGED, RAISED FACE			
9	VALVE OPERATOR	LEVER OPERATED			

10	MATERIAL SPECIFICATION (EQVT. OR SUPERIOR)				
A	BODY	ASTM A 216 Gr. WCB			
B	BALL	ASTM A 182 Gr. F6 / F 304			
C	STEM	ASTM A 182 Gr. F6 / F 304			
D	STEM SEAL	PTFE			
E	STUD BOLTS / NUTS	ASTM A 193 Gr B7 / ASTM A			
		194 Gr 2H			
11	OTHER REQUIREMENTS				
A	VALVE TYPE / DESIGN	BALL VALVE, 1 PIECE CONSTRUCTION / BOLTED 2 PIECE CONSTRUCTION			
B	BALL MOUNTING	TRUNNION MOUNTED /FLOATING TYPE			
C	STEM DESIGN	ANTI BLOW OUT TYPE			
D	ANTI STATIC DESIGN	YES			
E	BALL POSITION INDICATOR	OPEN / CLOSE INDICATOR			
		REQUIRED			
F	MECHANICAL STOPS	FOR OPEN / CLOSE LIMITS			
		REQUIRED			
G	FIRE SAFE DESIGN	API 6 FA: 2008			
V	**ISOLATION VALVES FOR PRESSURE GAUGE & OTHER SMALL BORE VALVES (LESS THAN 2")**				
1	MAKE	VENDOR TO SPECIFY			
2	TYPE / MODEL	VENDOR TO SPECIFY			
3	STANDARD	BS EN ISO 17292: 2004			

4	NOMINAL SIZE (INCH)	TO BE SPECIFIED BY VENDOR			
5	PRESSURE CLASS	ANSI 800#			
6	SERVICE	NATURAL GAS			
7	PATTERN	FULL BORE			
8	END CONNECTIONS	SOCKET WELDING ENDS			
9	VALVE OPERATOR	LEVER OPERATED			
10	MATERIAL SPECIFICATION (EQVT. OR SUPERIOR)				
A	BODY	ASTM A 105			
B	BALL	ASTM A 182 Gr. F6 / F 304			
C	STEM	ASTM A 182 Gr. F6 / F 304			
D	STEM SEAL	PTFE			
11	OTHER REQUIREMENTS				
A	VALVE TYPE / DESIGN	BALL VALVE, 1 PIECE CONSTRUCTION / BOLTED 2 PIECE CONSTRUCTION			
B	STUD BOLTS / NUTS	A 193 Gr B7 / A 194 Gr 2H			
C	BALL MOUNTING	TRUNNION MOUNTED / FLOATING TYPE			
D	STEM DESIGN	ANTI BLOW OUT TYPE			
E	ANTI STATIC DESIGN	YES			
F	BALL POSITION INDICATIOR	OPEN / CLOSE INDICATOR			
		REQUIRED			
G	MECHANICAL STOPS	FOR OPEN / CLOSE LIMITS			
		REQUIRED			
H	FIRE SAFE DESIGN	API 607: 2005			
VI	**PRESSURE GAUGE**				
1	MAKE	VENDOR TO SPECIFY			
2	MODEL	VENDOR TO SPECIFY			
3	STANDARD	BS EN 837			
4	TYPE	BOURDON			

5	MOUNTING	DIRECT			
6	DIAL SIZE	100 MM			
7	WINDOW MATERIAL	SHATTER PROOF GLASS.			
8	PRESSURE ELEMENT	SS 316			
9	ACCURACY	+/- 1 % SCALE RANGE			
		0 – 10 BAR (INLET) & 0 – 4 BAR (OUTLET). OTHERS MAY BE			
10	RANGE	AS SUITABLE			
VII	**FILTER**				
1	MAKE	VENDOR TO SPECIFY			
2	TYPE / MODEL	VENDOR TO SPECIFY			
3	TYPE	CARTRIDGE			
4	FINENESS	5 MICRONS			
5	EFFICIENCY	99%			
6	MAXIMUM WORKING PRESSURE	6 BAR			
7	CONNECTION DETAILS	FLANGED END ANSI 150 #			
8	DESIGN & CONSTRUCTION	AS PER ASME BPV CODE, SECTION VIII: 2007			
VIII	**PIPE WORK & FITTINGS**				
1	PIPE WORK	API 5L OR ASTM A 106 Gr. B			
2	FITTINGS	ASTM A 234 GR WPB, ASTM A			
		105			
IX	**PAINTING**				
1	SPECIFICATION	BS 4800 CANARY YELLOW FINISH			
X	**GENERAL CONSTRUCTION**				
1	**SKID MOUNTED**	VERTICAL TYPE INSIDE CABINET			
2	**NOISE LEVEL**	AT 1 METRE < 80 dBA			
	SPARES REQUIREMENTS	SEPERATE PRICES FOR THE SPARES LISTED AT CLAUSE 'G' TO BE QUOTED			

		1) PROCEDURES & SPECIFIC INSTRUCTION SHOULD BE PROVIDED.			
		2) COMMISSIONING ASSISTANCE TO BE PROVIDED FREE OF COST			
4	**COMMISSIONING**				
		TO TERMINATE WITH FLAME ARRESTORS AT LEAST 3 METRES AWAY FROM			
	RELIEF VALVE VENTS TO TERMINATE	GROUND LEVEL			
XI	**DELIVERY PERIOD**	As Per Section: Time Schedule			
XII	**SKID / CABINET SIZE**	VENDOR TO SPECIFY			
		(LENGTH * WIDTH * HEIGHT)			
XIII	**WEIGHT OF SKID**	VENDOR TO SPECIFY (KGs)			
XIV	**RDP METER**				
1	MAKE	VENDOR TO SPECIFY			
2	TYPE / MODEL NO.	VENDOR TO SPECIFY			
3	ACCURACY	+/- 2% (Qmin - 0.2 Qmax) +/- 1% (0.2 Qmax - Qmax)			
4	MAXIMUM INDEX READING	99999999 m3			
5	REVOLUTION OF LAST- COUNTER	0.1 m3			
6	WORKING TEMPERATURE RANGE	10 - 60 deg C			
7	METER HEAD	IP - 67 PROTECTION, 8 DIGIT, SILICA GEL UNIT			
8	PULSE GENERATOR	HF			
9	APPROVAL	EN 12480/OIML R137 Part 1			
10	CONNECTION	FLANGED END, ANSI 150#			
11	SIZE	TO BE SPECIFIED BY VENDOR			
12	REPEAT ABILITY	BETTER THAN +/- 0.2%			
13	CONSTRUCTION STANDARD	BS EN 12480:2002			
14	METER BODY	CORROSION RESISTANT STEEL OR OTHER SUITABLE MATERIAL FOR PRESSURE REQUIREMENT AND OUTDOOR INSTALLATION			

Remark :- Sizing calculations of RPD Meter should be given in a data sheet.

Mandatory Spares:

List of One set of following mandatory spares with cost to be provided for each MRS skid.

1) One set of Diaphragm for each type of SSV, Monitor Regulator & Active Regulator
2) One set of Filter cartridge installed in filter.
3) 10% or minimum 1 no (whichever is higher) of each size/rating of gasket installed.

DATASHEET FOR RPD METER		
S.No.	**Description**	**Specifications**
1	Material	The material used for the manufacturing of RPD meters should be aluminium or any other compatible material which can cater the load of designed pressure and protect the corrosion. *Note: Ductile Iron is not acceptable as material of construction for meter.
2	Spare Parts	Vendor shall provide the list of spares all required for the maintenance and repair of the meter
3	Design Pressure	Meter shall be manufactured in line with the below given pressure requirements: 1. Max 19 Bar (g)- 150# (ANSI 150) 2. Max 49 Bar (g)- 300# (ANSI 300) 3. Max 99 Bar (g)- 600# (ANSI 600)
4	Operating pressure range	1. 0.5 to 16 bar (g) for 150# 2. 17 to 40 bar (g) for 300# 3. 41 to 75 bar (g) for 600#
5	Pressure Test	Pressure test shall be carried out as per the design pressure of meter in line with the relevant standard and vendor shall submit the pressure test certificate for the same. Owner representative/Third party inspection Agency shall witness finish goods testing as per the approved QAP.
		Meter shall be designed with accuracy class # 1, in line with EN12480 as detailed in table below:

<table>
<tr><td>6</td><td>Accuracy of meter</td><td>
<table>
<tr><th>Q(m3/h)</th><th>Permissible error</th></tr>
<tr><td>Qmln <= Q <Qt</td><td>(+/-) 2%</td></tr>
<tr><td>Qt<= Q<Qmax</td><td>(+/-) 1%</td></tr>
</table>
</td></tr>
<tr><td>7</td><td>Rangeability</td><td>Meter shall have minimum Rangeability as described in table below:
<table>
<tr><th>G- size</th><th>Rangeability</th><th>Q_{min} (ACMH)</th><th>Q_{max} (ACMH)</th></tr>
<tr><td>RPD G16</td><td>1:100</td><td>0.25</td><td>25</td></tr>
<tr><td>RPD G25</td><td>1:100</td><td>0.40</td><td>40</td></tr>
<tr><td>RPD G40</td><td>1:100</td><td>0.65</td><td>65</td></tr>
<tr><td>RPD G65</td><td>1:160</td><td>1.00</td><td>100</td></tr>
<tr><td>RPD G100</td><td>1:160</td><td>1.60</td><td>160</td></tr>
<tr><td>RPD G160</td><td>1:160</td><td>2.50</td><td>250</td></tr>
<tr><td>RPD G250</td><td>1:160</td><td>2.50</td><td>400</td></tr>
<tr><td>G400</td><td>1:160</td><td>4.06</td><td>650</td></tr>
<tr><td>G650</td><td>1:160</td><td>6.25</td><td>1000</td></tr>
</table>
</td></tr>
<tr><td>8</td><td>Flange to flange connection</td><td>In general flange to flange distance for individual G-size meter shall be as per table below:</td></tr>
<tr><td></td><td></td><td>
<table>
<tr><th>G-Size of meter</th><th>Q_{max} (ACMH)</th><th>DN Size</th><th>Flange to flange size</th></tr>
<tr><td>G16</td><td>25</td><td>50</td><td rowspan="5">171mm</td></tr>
<tr><td>G25</td><td>40</td><td>50</td></tr>
<tr><td>G40</td><td>65</td><td>50</td></tr>
<tr><td>G65</td><td>100</td><td>50</td></tr>
<tr><td>G100</td><td>160</td><td>80</td></tr>
<tr><td>G160</td><td>250</td><td>80</td><td rowspan="3">241 mm</td></tr>
<tr><td>G250</td><td>400</td><td>100</td></tr>
<tr><td>G400</td><td>650</td><td>100</td></tr>
<tr><td>G650</td><td>1000</td><td>150</td><td>*450mm</td></tr>
</table>
* In case of any other sizes, vendor to furnish the same.
</td></tr>
<tr><td>9</td><td>Facing and Finish</td><td>150# / 300 # /600# RF Finish/ANSI</td></tr>
</table>

150#	Marking	Each meter shall have name plate placed with below details. Vendor shall ensure that marking are as per CCC/MID/CN 124000. Name plate should not be affected by external factors like corrosion 1. Make 2. Model 3. Serial No. 4. Pressure Range 5. Temperature Range 6. Flow Range 7. Qmin,Qmax,Qt 8. Manufacturing year 9. Flow direction 10. Class 11. Size 12. Impulse rate or K factor 13. Compliance to standard 14. Cyclic volume
11	Gas Type	Natural Gas
12	Applicable standard	EN12480
13	Area Specification	IEC , Zone 1, Gr. IIA, 11B, T3 Vendor to provide the certification for the same
14	Pressure drop across meter	Vendor to furnish calculation for pressure drop. The pressure drop calculation shall be approved by
15	Differential pressure at Max flow	Vendor to furnish
16	Temperature range	-20 to 55 deg C (as per EN 12480)
17	F low Range	Vendor to furnish
18	Typical start flow	Vendor to furnish
19	Indication accuracy	Accuracy Class #1
20	Linearity	(+/- 0.5%)
21	Repeatability	(+/-0.1 %)
22	Compressibility factor	2.09-0.99

23	Over ra nge protection	Meter shall have over range protection of at least 120% maximum flow. Suitable flow restrictor should be provided to limit the gas velocity flowing thru the meter and preventing the meter damage in case of excessive flow
24	Calibration Certificate	Vendor shall ensure the meter is calibrated with air at atmospheric condition and meets the rangeability, linearity and repeatability requirement. Master shall have been calibrated at flow rates as defined below : Qmin, 0.25 Qmax, 0.5 Qmax, 0.75 Qmax, Qmax (5 Point Calibration)
25	Calibration requirements	Vendor shall provide the details for calibration requirements of the meter: 1. Recommended periodicity for the calibration 2. Volume based frequency If any recommended by OEM
26	Model No. of Meter and Pulsar	Vendor to furnish
27	Pulsar	Vendor to furnish details for both HF and LF pulsar Vendor shall ensure that RPD meter is compatible with any make EVC via LF/HF pulsar Necessary cables with connector to be provided with meter to connect EVC with meter Meter should be compatible to give correct pulses (no excess/ short pulses) to be conveyed to EVC. Pulse values shall normally be expressed in the form of "1 IMP = _ m3" (*as per EN12480)
28	Enclosure	IP 66 or better
29	Cable Entry	½" NPTF
30	Installation	Horizontal/Vertical (*vendor to quote both the alternative)
31	Corrosion control	Vendor shall ensure that the meter internals/externals are Non-corrosive and field proven in respect to design, material and Application
32	Impeller and Impeller shaft	High grade Alloy steel, Synthetic Elastomer or Extruded Aluminium Alloy
33	O-Rings / Gaskets	Synthetic Elastomer
34	Magnetic	Hard Ferrite Ceramic Magnet

	coupling	
35	Timing and reduction Gears	Steel Alloy/Steel
36	Rotor	Aluminium
37	Bearing	SS 316/ High Carbon Steel
38	Other wetted Parts	SS 316
39	Studs/Bolt	To be provided by bidder
Power, Counter and Others		
40	Power Supply	From battery operated EVC/Volume correctors
41	Cable Entry	½" NPTF
42	Output	Pulses
43	Enclosure	NEMA 4 & 7 or any equivalent standard
44	Sealing	Meter shall have proper manufacturing / calibration seal on index head and meter body. The meter body shall have suitable provision for wire sealing with an objective to ensure meter internals are not accessible without tampering / breaking of wire seal. Mechanical counter to be made intact with meter body through wire seal
45	Security	Meter Counter/index head shall have facility to provide the output to EVC/Modem in case of the un-authorized opening of counter. Detailed specification shall be provided by vendor.
46	Intrinsically safe	Vendor to furnish the certification
47	Counter Mounting	Inside of Meter
48	Local Mechanical Counter	Local mechanical counter should indicate the volume of the measured gas in cubic meters at metering conditions without any formula or correction. It shall have minimum 8 digits & unit of measure should be m3 and marked on index plate. The meter index should be weather proof to IP 66 and UV protection certificate should be available
49	Index of meter	Oriented as per EN12480 or relevant standard with IP 66 or better rating. The meter index should be flexible for orientation for the purpose of ease in meter reading
50	Cover of index	UV resistant (number plate should be fixed inside the counter)
51	Pressure Tap	¼" NPT. Inbuilt in meter(*As per EN 12480)

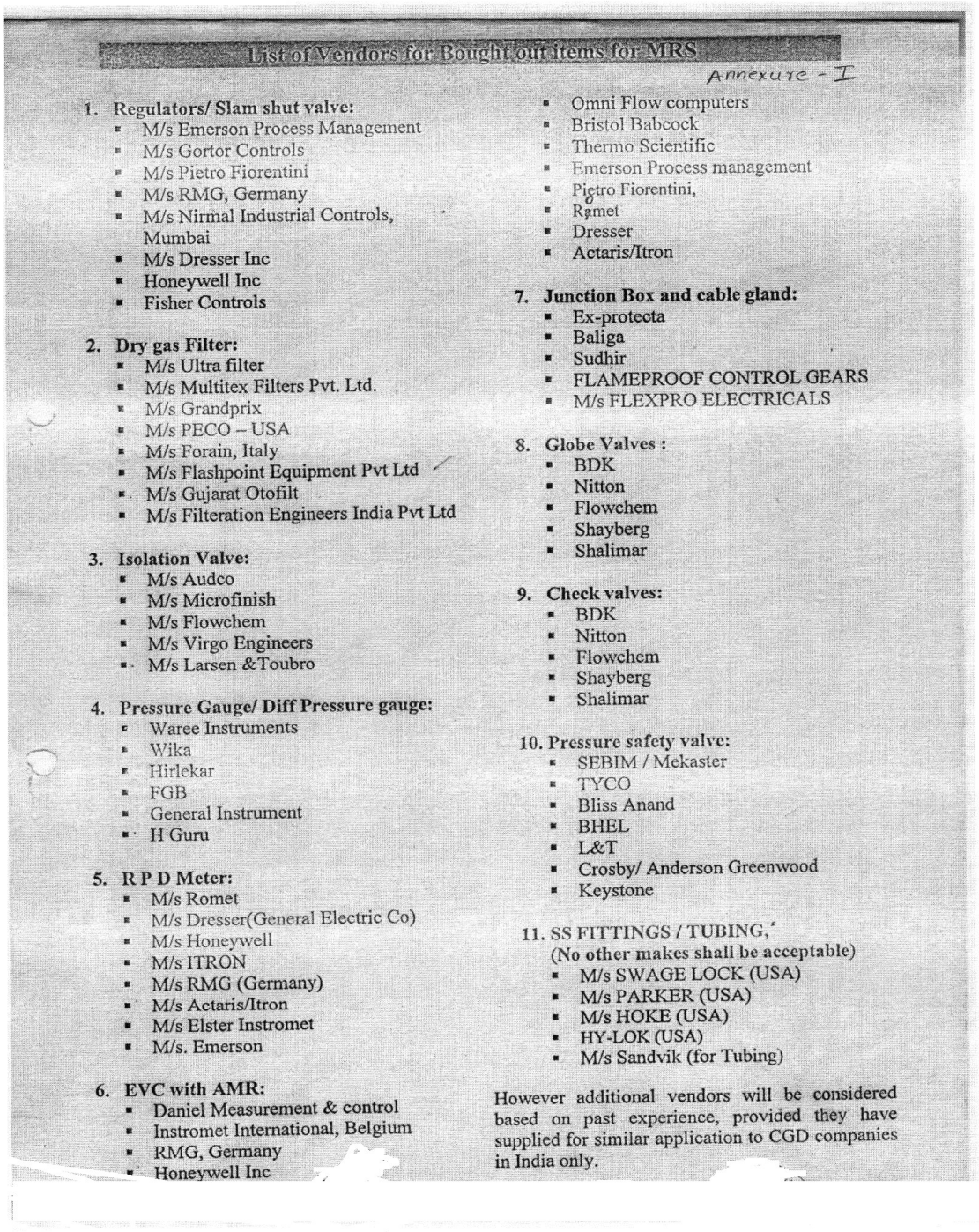
52	Temperature Tap	Inbuilt in meter(*As per EN 12480} Tapping dimensions shall be according to ISO 228-1, G1/2 *Vendor shall provide the thermo well with meter
53	Lubricator with accessories	500 ml of suitable oil with each meter and all necessary accessories. Bidder shall provide the specification of oil. Oil indicator should be available on meter body for both mounting option (Vertical and horizontal)
54	Meter coating	Coating & painting of the body (*as per EN 12480)
55	Flow restrictor	Vendor to furnish the detail
56	Adherence certificate	Meter shall have valid type test certificate or MID certificate complying to EN 12480 issued by DVGW, NMI, PTB, LNE, FCRI or other certifying/approving bodies notified by European Commission Meter shall have valid certificate of approval issued by department of legal metrology (Government of India)
57	Other Documents	Manufacturer's calibration certificate, warranty certificate, Operation & maintenance Manual, product Brochure(with each meter), Legal Metrology Certificate
58	Protection against RF/FM Interference	The meter shall have proper protection against RF/FM interference
59	Warranty	All meter parts shall be warranted for 18 months from supply or 12 months from commissioning date whichever is earlier.
60	Others	Meter testing should comply to Annexure A,B and C of EN12480 Manufacturer shall furnish Cv values, Torque data, weight and selected meter model along with GA drawing and QAP for approval of before commencing supplies.
61	Packaging	Appropriate material and method shall be used for packing to protect the material from damage during transportation. All necessary markings like normal position, handle with care etc shall be mentioned on package

DATASHEET FOR EVC		
PROJECT:		
TAG NO: N/A	For: Metering	Bidder Remarks / confirmation
GENERAL		
1 Make:	: Vendor To Provide	

1 Model No.	: Vendor To Provide	
2 Typ E	Microprocessor based battery operated Volume corrector with integral/external smart pressure transmitter and temperature sensor suitable for mounting in the field location.	
3 Function	: Measures actual Gas Volume, Pressure and Temperature, calculates compressibility factors of the gas and based on which calculates standard volume of gas. Unit will be complete in all respect to achieve this function.	
4 Input	: 1. HF Pulse from RPD Meter for flow /volume	
	2. Temp sensor :-40 deg C to 50 DegC	
	: 3. Pressure Sensor :1.5 BarA to 7.0 BarA	
5 Output	: 1. Corrected volume ,Uncorrected Volume,Alarm outputs for unit Malfunctioning	
	: 2. RS 232 serial port (01 no.) for PC/Laptop connectivity or GSM connectivity.	
	More than 16 parameters including the Temperature , Pressure, Actual Volume , Correction factor etc. provided through RS -232 port	
6 Isolation	: All inputs, outputs and power supply shall be individually isolated	
7 Display	: 2 line 16 large character LCD display with selectable decimal, Displaying all units, messages, alarms (Battery Low, Pressure out of range, Temp. out of range, flow over range, fault in measurement) etc in English.	
8 Power Supply :	Lithium Battery	
9 Battery Life:	5 years typical	
10 Configuration :	To be done in factory for all volume corrector fully taking into account the process conditions, sensor & flow meter's characteristics and calibration for direct on site operations.	
11 Calculation	: 1. AGA7 latest for Volume measurement	
Standard	2. Compressibility: AGA 8 (Latest) Detail or Gross 1, 2 method	
12 Hazardous area:	Certified intrinsically safe for area classification Class 1 , Div 1,Group D	
13 Site conditions :	Temperature 0 - 65°C, Hot, humid, tropical, saline environment.	
15 Mounting	: Integral with respective RPD meter	
16 Accuracy	: ± 0.5% of reading at ambient temp. And ± 0.3% of reading at 20°C	
17 Facility	**:** 1. Built in diagnostics to detect proper functioning.	
	: 2.Modbus Facility for any third party software with Modbus register address changing facility.	
	: 3. Data security through password/key-lock facility and volume conversion and configuration to be sealed.	
	: 4. Parameters and programmed constants shall be stored in EEROM / non-volatile memory.	
	: 5. Will store at least 40 days data (on hourly basis) for flowing pressure, temperature and corrected flow with data and time stamping.	
	: 6. The stored data is retrievable and programming can be done by using portable PCs. Suitable dedicated port is available on the Electronic Volume Corrector for portable PC connection.	

LIST OF RECOMMENDED THIRD PARTY INSPECTION AGENCY

S.NO	NAME OF VENDOR	ADDRESS	PHONE NO	FAX NO
1	Tata Projects Ltd	22,Sarvodaya Society, Nizampura,Baroda-390002	0265-2392863	0265-2785952
2	Indian Register of Shipping	52 AAdiShankaracharyaMarg Opp. Powai Lake, MUMBAI,400 072	91-22-30519400	91-22-25703611
3	Bax counsel InsepectionBureau Pvt. Ltd.	303, Madhava,BandraKurla Complex Bandra(E)-400051	022-26591526,022-26590236	022-26591526
4	Bureau VeritasQI	The Leela Galleria, 5th floor, Andheri-KurlaRoad,Andheri(E), Mumbai-00059	022-26956300	022-26956309
5	Germanischer Lloyd	304-305, Anna Salai,Teyanampet,Chennai-600018	044-24320335	044-24328186
6	Velosi Certification Serrvices, Mumbai	Velosi Certification Services(l)PVT.LTD,212,SHIVKRUPA Complex Centre,OffGhokhaleRoad,Navpad	022-25376770	022-25426777
7	ABS Industrial Verification Ltd., Mumbai	404,Mayuresh Chambers,Sector-11,CBD Belapur(E),Navi Mumbai-400614	022-27578780 /112	022-27578784 / 5
8	Certification Engineers International Ltd.	EIL Bhavan, 5th floor,1,Bhikaji CammaPlace,New Delhi-110066	011-26167539,26102121	011-26101419
9	Dalai Mott MacDonald	501, Sakar -II, Ellisbridge, Ahmedabad-380006	079-26575550	079-6575558
10	International Certification Systems	E-7,Chand Society, Juhu Road, Juhu, Mumbai-4000049	022-26245747	022-226248167
11	SGS	SGS India Pvt. Ltd.,SGS House,4B,A.S.Marg,Vikhroli(W), Mumbai	022-25798421 to 28	022-25798431 to 33



List of Vendors for Bought out items for MRS

Annexure - I

1. **Regulators/ Slam shut valve:**
   - M/s Emerson Process Management
   - M/s Gortor Controls
   - M/s Pietro Fiorentini
   - M/s RMG, Germany
   - M/s Nirmal Industrial Controls, Mumbai
   - M/s Dresser Inc
   - Honeywell Inc
   - Fisher Controls

2. **Dry gas Filter:**
   - M/s Ultra filter
   - M/s Multitex Filters Pvt. Ltd.
   - M/s Grandprix
   - M/s PECO – USA
   - M/s Forain, Italy
   - M/s Flashpoint Equipment Pvt Ltd
   - M/s Gujarat Otofilt
   - M/s Filteration Engineers India Pvt Ltd

3. **Isolation Valve:**
   - M/s Audco
   - M/s Microfinish
   - M/s Flowchem
   - M/s Virgo Engineers
   - M/s Larsen &Toubro

4. **Pressure Gauge/ Diff Pressure gauge:**
   - Waree Instruments
   - Wika
   - Hirlekar
   - FGB
   - General Instrument
   - H Guru

5. **R P D Meter:**
   - M/s Romet
   - M/s Dresser(General Electric Co)
   - M/s Honeywell
   - M/s ITRON
   - M/s RMG (Germany)
   - M/s Actaris/Itron
   - M/s Elster Instromet
   - M/s. Emerson

6. **EVC with AMR:**
   - Daniel Measurement & control
   - Instromet International, Belgium
   - RMG, Germany
   - Honeywell Inc
   - Omni Flow computers
   - Bristol Babcock
   - Thermo Scientific
   - Emerson Process management
   - Pietro Fiorentini,
   - Romet
   - Dresser
   - Actaris/Itron

7. **Junction Box and cable gland:**
   - Ex-protecta
   - Baliga
   - Sudhir
   - FLAMEPROOF CONTROL GEARS
   - M/s FLEXPRO ELECTRICALS

8. **Globe Valves :**
   - BDK
   - Nitton
   - Flowchem
   - Shayberg
   - Shalimar

9. **Check valves:**
   - BDK
   - Nitton
   - Flowchem
   - Shayberg
   - Shalimar

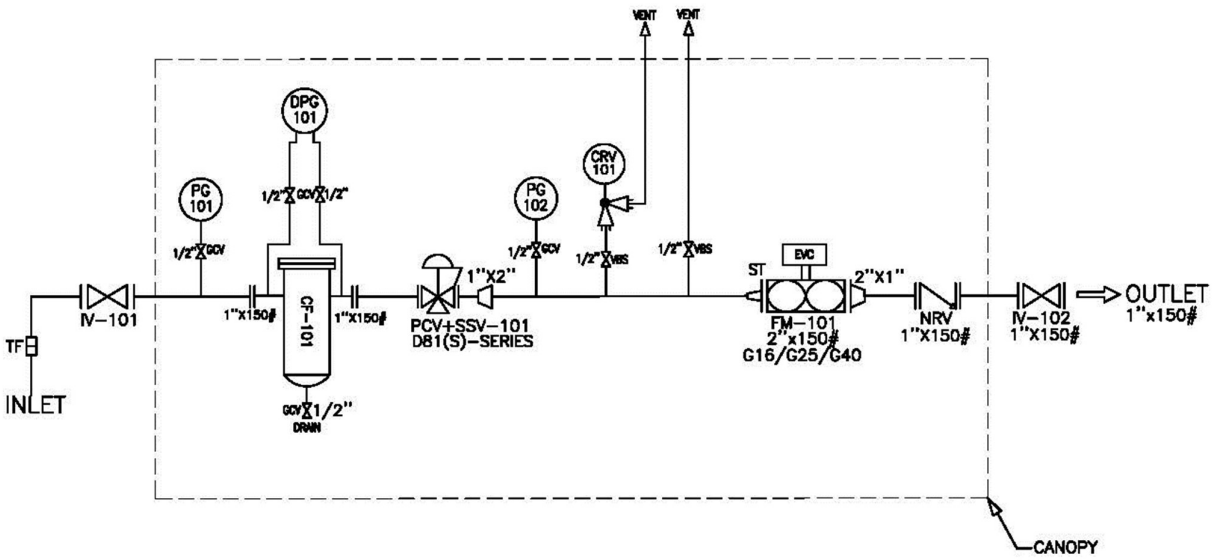
10. **Pressure safety valve:**
    - SEBIM / Mekaster
    - TYCO
    - Bliss Anand
    - BHEL
    - L&T
    - Crosby/ Anderson Greenwood
    - Keystone

11. **SS FITTINGS / TUBING,**
    (No other makes shall be acceptable)
    - M/s SWAGE LOCK (USA)
    - M/s PARKER (USA)
    - M/s HOKE (USA)
    - HY-LOK (USA)
    - M/s Sandvik (for Tubing)

However additional vendors will be considered based on past experience, provided they have supplied for similar application to CGD companies in India only.

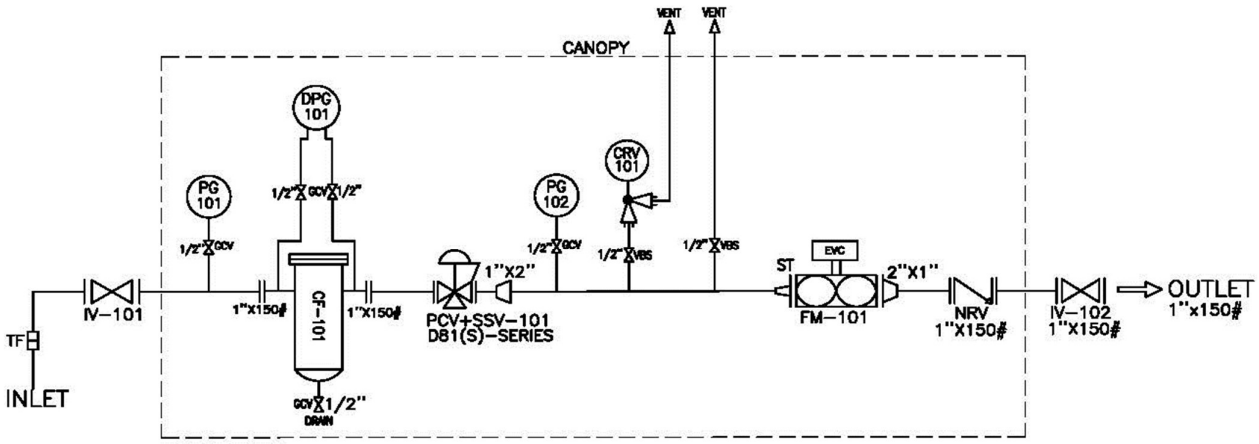
LIST OF VENDORS FOR BOUGHT OUT ITEMS FOR MRS

P& ID Diagrams



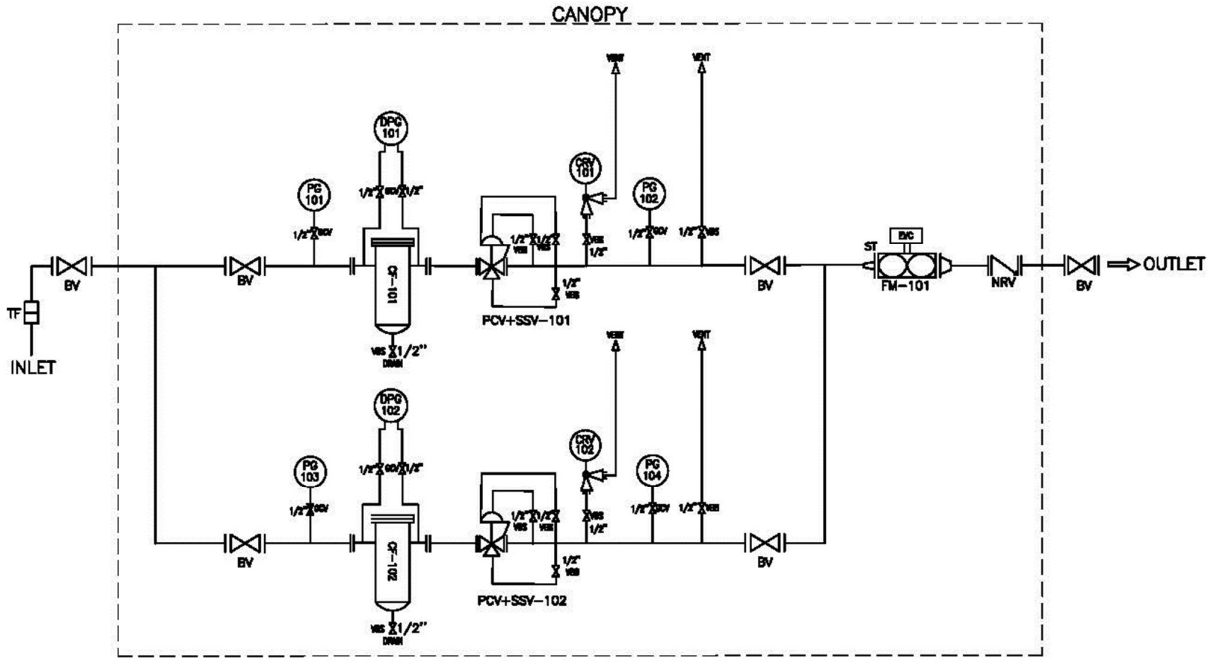
<u>Wall Mounted MRS</u>: Line sizing is tentative; may vary; AMR System is compulsorily needed…..

PROCESS DATA (G16/G25/G40)	
Inlet pressure of the Skid	**2 to 4 bar**
Outlet pressure of the Skid range	**0.5 to 1.5 bar**
Flow rate of the Skid	**Various capacities**
Design Pressure	**19 bar**
Design Temp	**60 deg C**



Floor Mounted MRS – Single Stream : Line sizing is tentative; may vary; AMR System is compulsorily needed…..

PROCESS DATA (G16/G25/G40/G65/G100)	
Inlet pressure of the Skid	**2 to 4 bar**
Outlet pressure of the Skid range	**0.5 to 1.5 bar**
Flow rate of the Skid	**Various capacities**
Design Pressure	**19 bar**
Design Temp	**60 deg C**



<u>Floor Mounted MRS – Double Stream</u> : Line sizing is tentative; may vary; AMR System is compulsorily needed…..

PROCESS DATA (G160/G250/G400)	
Inlet pressure of the Skid	**2 to 4 bar**
Outlet pressure of the Skid range	**1.0 to 2.0 bar**
Flow rate of the Skid	**Various capacities**
Design Pressure	**19 bar**
Design Temp	**60 deg C**

SECTION – 11

SCHEDULE OF RATES (SOR)

Schedule Of Rate

Annual Rate Contract for Procurement of Metering & Regulating Skids (MRS) for a period of 2 years at Hyderabad, Vijayawada & Kakinada Gas
Bid Document No. BGL/626/2024-25

Name of Bidder										
Sr.No.	**Description**	**UOM**	**Qty**	**HSN Code**	**Per Unit Ex-Works price (Including packing, forwarding and Taxes & Duties but excluding Inland Transportation to Delivery Location)**	**Per Unit GST Charges**		**Per Unit freight Charges upto site mentioned in SOW by Road including GST, transit insurance & all other taxes like octroi, entry tax ,(INR)**	**Per UnitPrice on FOT basis(incl of P&F, Freight, transit insurance , GST etc) as mentioned in SOW (8=5+6+7)**	**Total Amount on FOT basis(Incl of P&F, freight, transit insurance, GST etc) as mentioned in SOW (9=8*3)**
1	**2(a)**	**2(b)**	**3**	**4**	**5**		6	**7**	**8**	**9**
	Details of Material				**(INR)**	**%**	**(INR)**	**(INR)**	**(INR)**	**(INR)**
1	Supply, Delivery of Single stream Wall Mounted Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatablity system with GPRS Modem, JB, Power Supply etc.), **G16 RPD meter**, Rangeability 1:100 or better, **43 SCMH,** Inlet pressure-2 to 4 bar (g), Outlet	No	2			0.18				

	pressure –1 bar (g) with assistance in commissioning.									
2	Supply, Delivery of **Single stream Wall Mounted** Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatablity system with GPRS Modem, JB, Power Supply etc.), **G25 RPD meter**, Rangeability 1:100 or better, **68 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g) with assistance in commissioning.	No	2			0.18				
3	Supply, Delivery of **Single stream Wall Mounted** Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatablity system with GPRS Modem, JB, Power Supply etc.), **G40 RPD meter**, Rangeability 1:100 or better, **111 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g) with assistance in commissioning.	No	2			0.18				

4	Supply, Delivery of **Single stream** Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatablity system with GPRS Modem, JB, Power Supply etc.), **G16 RPD meter**, Rangeability 1:100 or better, **43 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g) with assistance in commissioning.	No	3			0.18				
5	Supply, Delivery of Single stream Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic corrector, Regulators, PG, DPG, Valves, AMR Compatablity system with GPRS Modem, JB, Power Supply etc.), **G25 RPD meter**, Rangeability 1:100 or better, **68 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g) with assistance in commissioning	No	10			0.18				
6	Supply, Delivery of Single stream Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatablity system with GPRS Modem, JB, Power Supply etc.), **G40 RPD meter**, Rangeability 1:100 or better, **111 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure	No	10			0.18				

	–1 bar (g) with assistance in commissioning.									
7	Supply, Delivery of Single stream Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatablity system with GPRS Modem , JB, Power Supply etc.), **G65 RPD meter**, Rangeability 1:160 or better, **171 SCMH,** Inlet pressure-2 to 4 bar (g), Outlet pressure –1 bar (g) with assistance in commissioning.	No	10			0.18				
8	Supply, Delivery of Single stream Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatablity system with GPRS Modem , JB, Power Supply etc.), **G100 RPD meter**, Rangeability 1:160 or better, **273 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1.5 bar (g) with assistance in commissioning.	No	10			0.18				

9	Supply, Delivery of Double stream Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatablity system with GPRS Modem, JB, Power Supply etc.), **G160 RPD** meter, Rangeability 1:160 or better, **532 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1.5 bar (g) with assistance in commissioning.	No	5			0.18				
10	Supply, Delivery of Double stream Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatablity system with GPRS Modem, JB, Power Supply etc.), **G250 RPD meter**, Rangeability 1:160 or better, **851 SCMH**, Inlet pressure-2 to 4 bar (g), Outlet pressure –1.5 bar (g) with assistance in commissioning.	No	5			0.18				
11	Supply, Delivery of Double stream Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatablity system with GPRS Modem, JB, Power Supply etc.), **G400 RPD meter,** Rangeability 1:160 or better, **1383 SCMH**, Inlet	No	2			0.18				

	pressure-2 to 4 bar (g), Outlet pressure –1.5 bar (g) with assistance in commissioning.									
12	Supply, Delivery of Double stream Metering & Regulating skid inside a cabinet arrangement (Filter, RPD Meter with electronic volume corrector, Regulators, PG, DPG, Valves, AMR Compatablity system with GPRS Modem, JB, Power Supply, Gas Detector System etc.), **G250 RPD meter**, Rangeability 1:160 or better, **851 SCMH,** Inlet pressure-2 to 4 bar (g), Outlet pressure –1.5 bar (g) with assistance in commissioning.	No	1			0.18				
GRAND TOTAL										