



BHAGYANAGAR GAS
LIMITED

**Tender for Procurement & Comprehensive AMC of 5
No's Car Dispensers For BGL**

VOLUME
II OF II

Bid Document No. BGL/278/2014-15



Bhagyanagar Gas Ltd.

BHAGYANAGAR GAS LIMITED

(A JOINT VENTURE OF HPCL & GAIL)

BID DOCUMENT FOR

**TENDER FOR PROCUREMENT & COMPREHENSIVE
AMC OF 5 No's CAR DISPENSERS FOR BGL.**

**UNDER LIMITED DOMESTIC
COMPETITIVE BIDDING**

Bid Document No.: BGL/278/2014-15

VOLUME-II of II



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SECTION – 7

SPECIAL CONDITIONS OF CONTRACT (SCC)



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1.0 GENERAL

The following article shall supplement the General conditions of Contract. Where any portion of the General Conditions of Contract and Instruction to Bidders is repugnant to or at variance with any provisions of the Special conditions of contract, then unless a different intention appears, the provision (s) of the Special Conditions of Contract shall be deemed to override the provision (s) of General Conditions of Contract to bidders, only to the extent that such repugnancies of variations in the Special Conditions of Contract as are not possible reconciled with the provisions of General Condition of Contract to Bidders.

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 Award/ Purchase Order
- ii. Letter of Acceptance/ FOI along with Statement of Agreed Variations.
- iii. Schedule of Rates as enclosures to Letter of Award/ Purchase Order
- iv. Special Conditions of Contract
- v. Drawings
- vi. Technical/ Material Specifications
- vii. Instruction to Bidder
- viii. General Conditions of Contract (Goods) for supply part of the contract and GCC (for procurement of works) for other than supply part of the contract.
- ix. Applicable standards as specified.
- x. Applicable standards not specified.

1.1 This enquiry envisages total responsibility for complete work from design, engineering, manufacture, supply upto the designated Project Sites, all taxes, duties, levies, fees, encumbrances, octroi, etc. as applicable and payable by the bidders under the Contract, all insurance handling of goods at all stages, storage, associated works including materials, tools/ tackles etc., for such civil works obtaining statutory approvals if any from the local authorities prior to start of work at sites till the time of handing over, installation, testing, pre commissioning, performance test, Site Acceptance Test, Trial Run, system commissioning and handing over at site to the Owner and Operation and Maintenance Work as specified in technical parts for the items stated in Price Schedule and in Technical Part.

1.2 Owner shall be issuing concessional forms like Form-C or any other such forms, for availing concessional taxes/ duties by the bidder, if available. As such bidder shall include full rates of all taxes/ duties as applicable and percentages of the same shall be filled in at Agreed Terms and Conditions- Section-V of this tender document.

1.3 The quoted price shall be deemed to be inclusive of all applicable taxes & duties including Service Tax, works contract tax, sales tax, local taxes, import duty, excise duty, octroi and other levies etc. till the complete execution of the order as applicable in



India under this contract and the bidder shall not be eligible for any compensation on this account.

Both Indian and Foreign Bidders shall not be eligible for compensation by the Owner for any variations whatsoever in the aforesaid taxes/ duties/ levies, etc. as included in the total price except for statutory variation as provided under tender document. Non-compliance to the provisions of this Article as aforesaid shall lead to rejection of offer.

- 1.4 At the designated site the Owner shall make available to the Bidder requisite space for the purpose of storage.
- 1.5 Payments shall be made as per 'Terms of Payment' Clause no. 3.0 of SCC enclosed herewith.
- 1.6 All Bidders are requested to indicate positively the division of work To be directly undertaken by the Bidder Envisaged to be undertaken by Bidder's Sub-contractor under Bidder's Overall responsibility. A copy of MOU (Memorandum of Understanding) shall be furnished along with the offer.
- 1.7 The activities listed in the scope of proposal in this document as well as in the price break-up shall be only broad categories and shall in no way absolve the Bidder in executing and completing of the turnkey philosophy of the Owner within the quoted lump sum price. Any item/equipment/services/ activities/ taxes/duties, if not specifically identified in the Bid document or in the offer but is necessary for the completion of work, shall be deemed to be included in the quoted lump sum price and no extra charges are payable by the Owner.
- 1.8 As regards the Income tax, surcharge on Income tax or any other corporate tax payable by the Bidder for reason of the contract awarded, then Owner shall not bear any tax liability whatsoever irrespective of the mode of construction of contract. The bidder shall be liable and responsible for payment of such tax, if attracted under the provision of Indian Income tax Act. Bidder may note that if any tax is deductible at source as Permanently Indian Income Tax Law, the same will be so deducted before releasing any payment of the bidders. Accordingly, bidder shall have the responsibility to check and include such provisions of taxes in their prices.

1.9 CONTRACT AGREEMENT

1.9.1 Contract Documents for agreement shall be prepared, after award of works to the successful tenderer by Fax/Detailed letter of Intent in line with format F-5 to GCC. Until the final Contract documents are prepared and executed this tender document together with the annexed documents, modifications, deletions agreed upon by the OWNER and Tenderer's acceptance there of shall constitute a binding contract between the successful tenderer and the OWNER based on terms contained in the aforesaid documents and the finally submitted and accepted prices.

- 1.9.2 The Contract document shall consist of the following :-
- a) Original tender documents issued with its enclosures.



- b) Addendum/Corrigendum to tender documents issued if any.
- c) Fax of Intent.
- d) The detailed letter of Intent/Acceptance along with statement of Agreed Variation (if any) and enclosures attached there with.

1.9.3 The statement of agreed deviations shall be prepared based on the finally retained deviations if any by the Tenderer and all correspondences and MOM's held between the OWNER and the Tenderer prior to issue of Telegram/Fax of intent shall be treated as Null and Void. Any deviation or stipulations made and accepted by the owner after award of the jobs shall be treated as amendments to the contract documents as above.

1.10 Additional Works/Extra Works

OWNER reserves their right to execute any additional works/extra works, during the execution of work, either by themselves or by appointing any other agency even though such works are incidental to and necessary for the completion of works awarded to the contractor. In the event of such decisions taken by OWNER, contractor is required to extend necessary cooperation, and act as per the instructions of Engineer-in-Charge.

1.11 Preliminary Examination:

- 1.11.1 The OWNER will examine the Bids to determine whether they are complete, whether any computational errors have been made, whether required sureties have been furnished, whether the documents have been properly signed, and whether the bids are generally in order.
- 1.11.2 Arithmetical errors will be rectified on the following basis. If there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected. If the Bidder does not accept the correction of the errors, its Bid will be rejected. If there is a discrepancy between words and figures, the amount in words will prevail.
- 1.11.3 Prior to the detailed evaluation, the OWNER will determine the substantial responsiveness of each Bid with reference to the Bidding Documents. For this purpose a substantially responsive Bid is one which confirms to all other terms and Conditions of the Bidding documents without material deviations. The OWNER'S determination of a Bids responsiveness is to be based on the contents of the Bid itself without recourse to extrinsic evidence.
- 1.11.4 A bid determined as not substantially responsive will be rejected by the OWNER and may not subsequently be made responsive by the Bidder by correction of the non-conformity.
- 1.11.5 The OWNER may waive any minor informality or non- conformity or irregularity in a Bid which does not constitute a material deviation, provided such waiver does not prejudice or affect the relative ranking of any Bidder.



1.12 Complete Scope of Work

The scope of work is mentioned in Tender Document. Offers of those Bidders who take total Responsibility for complete scope of work for the SOR item in case evaluation is item wise basis otherwise for all the items. as mentioned in Tender Document shall be considered for detailed evaluation.

1.13 Clarification of Bids

After opening of the Bids to assist in the examination, evaluation and comparison of Bids, the OWNER may, at its discretion, ask the Bidder for a clarification of its Bid. The request for such clarification and the response shall be in writing and no change in the price or substance of Bids shall be sought, offered or permitted.

1.14 Deduction at source

1.14.1 Owner will release the payment to the Contractor after effecting deductions as per applicable law in force & after offsetting all dues to the Owner payable by the Contractor under the Contract.

1.15 Tests and Inspection

The contractor shall carry out the various tests as enumerated in the technical specifications of this tender document and the technical documents that will be furnished to him during the performance of the work and no separate payment shall be made unless otherwise specified in schedule of rates.

1.16 Registration Under Sales Tax Act (Wherever applicable)

Attested copy of certificate for registration under State Government Sales Tax Act in the proforma prescribed by State Govt. should accompany the tender. The registration should be in the name of the Firm / Individual quoting for the work. In absence of the above registration, tenderer may not be awarded the work tendered for, in the light of State Govt. directive /instruction.

1.17 Provident Fund Act (Wherever applicable)

- 1.17.1 The bidder shall submit the EPF code number along with the bid document.
- 1.17.2 The Contractor shall strictly comply with the provisions of Employees Provident Fund Act and register themselves with RPFC before commencing work. The Contractor shall deposit Employees and Employers contributions to the RPFC every month. The contractor shall furnish along with each running bill, the Challan/receipt for the payment made to the RPFC for the preceding months.
- 1.17.3 In case the RPFC's Challan/receipt, as above, is not furnished, Owner shall deduct 16 % (Sixteen percent) of the payable amount from contractor's running bill and retain the same as a deposit. Such retaining amounts shall be refunded to Contractor on production of RPFC Challan/receipt for the period covered by the related running bill.



1.18 Labour Licence

Before starting of work, contractor shall obtain a license from concerned authorities under the Contract Labour (Abolition and Regulation) Act 1970, and furnish copy of the same of Owner.

2.0 Scope of work

2.1 The Scope of Work shall be as set out in MR, specification, Data Sheets and Technical Specifications and AMC doc and supplemented by all stipulation in the total tender document.

Dispensers shall be utilized at Hyderabad and Vijayawada Locations of BGL. However clear instruction shall be given by Engineer in Charge during Dispatch.

3.0 Payment Terms:

The payment shall be made progressively against supply, installation and successful commissioning of each dispenser in the following manner.

- a. 90% of supply portion value will be paid upon receipt of material (along with invoice) at site within 30days after due acceptance by EIC.
- b. Balance 10% of supply portion value will be paid after successful commissioning and acceptance of EIC.
- c. Installation and commissioning charges will be paid after successful commissioning and acceptance of EIC
- d. Invoice in triplicate.
- e. Insurance cover note
- f. Performance Bank Gurantee(s) of 10% of contract value(If already submitted, a copy of the same)

3.2 Erection, Testing, commissioning & field performance etc.

100 % Payment on erection, installation, testing of individual items and successful trial-run of the system, completion of all works and on final acceptance.

3.3 Annual Maintenance Service charges

Monthly payment on pro-rata basis as certified by Engineer-in-charge shall be made against the invoices raised.

3.4 General Notes

- i) Invoice shall be raised on the basis of not less than one fortnight interval.
- ii) All efforts shall be made to release the payment within 30 days after receipt of relevant documents complete in all respects.
- iii) All bank charges incurred in connection with payments shall be to vendor's accounts.
- iv) The contractor shall be responsible, on completion of contract, or wherever required, to undertake customs reconciliation work with Indian customs authorities and finalise the customs assessment by furnishing the necessary technical information etc. to the said authorities.
- v) Unless otherwise specifically stated in bid document, all payments shall be made in the currency quoted.



- vi) No interest charges for delay in payments, if any, shall be payable by Owner.
- vii) In case of Indian bidder (Contractor), statutory variation, if any, on account of customs duty on their built-in import content, as per terms of bid document, shall be claimed separately by Contractor after receipt of goods at site(s). However, any price benefits to the Owner, on account of such variation as per terms specified in the bid document, shall be passed on to the Owner along with invoicing itself. Copy of necessary documentary evidence in support of statutory variation shall be submitted along with claim/ invoicing.

4.0 INLAND TRANSIT INSURANCE FOR PROCUREMENT OF GOODS

Contractor will be required to submit documentary proof for the transit insurance before despatch.

5.0 INDEMNITY BOND

After award of work, bidder has to furnish legal indemnity bond to owner equivalent to 110% of total value of equipment before Owner hands over such equipment to them for the purpose of further action as per scope of work in the Annexure-I to GCC-Services/Works. The Indemnity Bond shall be valid from the date of receipt of 1st consignment at site & remain valid upto 06(six) months from date of the receipt of last consignment at site.

6.0 BANK GUARANTEE

Performance Bank Guarantee is required from the Contractor for 10% of the total contract value valid for 90 days beyond completion of contractual period including AMC.

7.0 REPEAT ORDER

Repeat order upto 50% of contact value within 6(six) months from the date of basic order as per terms of bid document.

7.1 ADDITIONAL WORKS/EXTRA WORKS

OWNER reserves their right to execute any additional works/extra works, during the execution of work, either by themselves or by appointing any other agency even though such works are incidental to and necessary for the completion of works awarded to the contractor. In the event of such decisions taken by OWNER, contractor is required to extend necessary cooperation, and act as per the instructions of Engineer-in-Charge.



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SECTION – 8

TECHNICAL SPECIFICATION



TECHNICAL SPECIFICATIONS FOR CNG CAR DISPENSER

SECTION:A: General Specification:

1.0 SCOPE

- 1.1 Designing, Engineering, Manufacturing, Inspection & Testing at Works, Painting, Packaging & forwarding, Supply to Sites/Stores, Installation & Commissioning along with accessories and Performance Testing including on site training to BGL personnel for max. 2 days at Sites of 5 nos. of CNG Car Dispensers complete with all auxiliaries & features required for efficient & safe operation, in accordance with this specification, data sheets & other enclosures of this Material Requisition.
- 1.2 Annual comprehensive maintenance services after successful completion of **testing at site, commissioning & commencement of commercial operation of the dispenser** for a period of 1 year during the warranty period, including manpower, all spares and consumables items.
- 1.3 Annual Maintenance service for a period of 3(Three) years after the warranty period including manpower, all spares and consumables items.
- 1.4 The Car Dispensers shall be complete including all required auxiliary equipment for efficient & safe operation as a whole. Vendor shall be responsible for furnishing all electrical, instrumentation, inter connecting Piping & Safety Items as required to make the Dispensers complete.
- 1.5 It is not the intent of Purchaser to specify every piece of equipment/item but nevertheless any item not specifically mentioned but required as per Good Engineering Practice and for the safe & trouble free operation of the dispensers deemed to have been specified & shall be in the scope of Vendor without any implication in the price or schedule.

2.0 INSTRUCTIONS TO VENDOR

- 2.1 The specification states the scope of supply and services as completely and clearly as possible. Any additional work/equipment or technical requirement not mentioned in the specification but required to make the offered system complete in accordance with the specification or required for safe operation shall be deemed to be included in the scope of vendor.
- 2.2 Vendor may contact and obtain clarifications from BGL, if required, at any stage, before submission of offer.



- 2.3 The offered dispenser units' model shall have certification for specified flow and accuracy from the Weights & Measurement Department. In case it is not available for dispenser unit than offered mass flow meter model shall have certification for specified flow and accuracy from the Weights & Measurement Department. Bids received without copy of such certificate(s) shall be liable to be rejected.
- 2.4 The offered dispensers for dispensing CNG shall be type approved by the Chief Controller of Explosives, Govt. of India as per Gas Cylinder Rules, 2004
- 2.5 The offered dispensers for dispensing CNG shall be type approved by the Weights & Measurement Department
- 2.6 The Vendor shall carry out modification required by the statutory bodies either during the approval or during inspection of the installation. All expenses shall be done and borne by the vendor. Unless the above formalities are cleared, supply part would be deemed incomplete.
- 2.7 The Vendor shall provide civil foundation/ dispenser frame drawings within two weeks of placement of order.
- 2.8 Any work, which is considered to be unsatisfactory and of poor workmanship shall be rectified by the vendor without any extra cost and time implications.
- 2.9 The approval from concerned Govt. Bodies in respect of complete installation of a CNG Dispensing Station shall be obtained by the BGL. Necessary Information/Data as may be required by Govt. Bodies shall be furnished by vendor to facilitate BGL in obtaining approval.

3.0 SCOPE OF SUPPLY FOR CAR DISPENSERS

Supply of double arm type Dispenser having flow capacity of > 15 kg/min for a single arm under discharge to atmospheric condition. **Natural Gas shall not be used for pneumatic controls of Dispenser** and Instrument air / Exe proof electronically controlled solenoid shall be used for such purpose. **Instruments Air if required for pneumatic operation of Solenoid Valve suitable of Dispensers has to be provided by the Client at Dispenser end** at a pressure of 7 to 9 kg/cm²g. The end connection for instruments air line will be ¼" Further tubing with necessary pressure reduction (if required), one pressure gauge with isolation valve for inlet pressure of instruments air line shall be provided by the bidder.

3.1 Each Dispenser shall have following as a minimum:-

- 3.1.1 Two CNG flexible electrically conductive twin (fill & vent) hoses, with each one hoses fitted with NGV-I fill nozzle for filling of vehicles. However, both the two hoses shall be suitable to be attached with either NGV or NZS-5425 nozzles by providing suitable approved SS fittings like hex nipple of required sizes etc. Vendor shall include the supply of 3-way valve with each hose for filling & venting of gas. Vendor shall also include supply of Breakaway Coupling, suitable for NGV Industry,



in the hose. Hose shall be 3/8" ID 5000 psig, at least 4m long. Vendor shall demonstrate the function of breakaway coupling during performance test.

- 3.1.2 Two numbers of Coriolis true mass flow metering system with data recording system
- 3.1.3 Three rows liquid crystal backlit display for night viewing (Explosion proof backlighting / LED) showing total sale in Rupees (0000.00), quantity of gas sold in kg (000.00), unit price of CNG in Rs/kg (000.00) for each hose on both sides of the dispenser (total two sets of three rows for each Dispenser). There shall be a provision for shifting the decimal point through software. Display shall be IP 55 and shall show proper error code during shutdown.
- 3.1.4 Non-resettable and non-volatile totalizer up to 999999.99 for total CNG sold in Kg with an independent battery backup. Since these dispensers are used for custody transfer purpose, the totalisers should not reset in any eventuality not even in case of electronic failure. Reset to zero of totaliser shall be performed by the dispenser electronics automatically when the maximum value reached. Further details refer **Section B: Instrumentation & Control specification.**
- 3.1.5 One number of three banks electronic software and controller including hardware.
- 3.1.6 The dispensers would be fitted with "Preset Auto Cut off" arrangement. This arrangement would enable customers to preselect the fill total (in Rs.) before beginning filling process, allowing accurate shut off of the fill at pre-selected value. This would help in avoiding dealing in small change while taking the payments.
- 3.1.7 Two number of holster/ cradle for fill nozzles along with weather caps for the protection of nozzles. Holster/ cradle shall be suitable for both NZS and NGV nozzles.
- 3.1.8 Two number of hi mast for flexible hose or a high body dispenser so that the hose doesn't touch the ground.
- 3.1.9 Emergency stop switch on either side of dispenser and shall be easily accessible. ESD provision shall be made available for connecting to main interlock/ESD/ROV trip interlock.
- 3.1.10 Two nos. Of liquid filled 4" dia (0-400 Kg/cm²g) pressure gauges showing the vehicle filling pressure for each filling arm.
- 3.1.11 Two Nos. Bubble tight manual shut-off valve for fill hose.
- 3.1.12 One Stainless Steel body of cabinet thickness 1.6 mm with door/panel.
- 3.1.13 Front/side mounted fill nozzle shall be supplied with lockable holder and safety lever / latch to firmly hold the fill nozzle when it is not in use.



- 3.1.14 Vendor has an option to supply the dispensers either with pneumatic or with Electrical operated solenoid operated full-bore bubble tight ball valve made of ANSI 316 SS, for ON-OFF control of flow, on the gas inlet with 1/2" tube OD end connection. Valves shall be provided for each bank per hose separately. Valve make shall be approved by BGL and during detail engineering. BGL has an option to choose the type of valve for supply of Dispensers. Vendor to ensure the system design in such a way that in both options any gas if passes, should be recorded by mass flow meter and there should not be any possibility of unmetered gas supply through dispenser in case of malfunctioning of ball valves.

In case of pneumatic operated Ball valve, the actuator and Ball valve assembly shall be fatigue free and retain tight shut off characteristics at least for 8000 operation hours. These actuators would be air fail to close spring-loaded type. Linkage with ball valve would be tamper proof by providing a sealed sleeve so that ball valve stem is not accessible from outside easily. Also, the actuator cannot be mechanically rotated from outside even though position indicator would be provided on its body. Venting of air would be passaged in such a way that venting of air cannot be obstructed either in the solenoid or in the actuator. The combination of SOV, pneumatic actuator and Ball valve would constitute power fail safe type. The whole system to be very fast acting and response time to be fraction of second so that if the flow is terminated at any point of dispensing, the slippage would be always within the accuracy limit.

The gas tubing inside the dispensers shall be seamless SS 316 conforming to ASTM A 269 with maximum hardness of RB 80 or less and suitable for bending and flaring. The tubes shall be fully annealed (bright annealed), 1/2" OD with a 1/2" SS 2-way Ball valve at inlet and 1/2" OD end connection suitable for connecting with 1/2" OD SS Tube. Any open ends on fittings and vents shall be provided with caps/ dust plugs. The tubing shall be of Sandvik / FAE make. Valves shall be of Swagelok / Parker makes. The fittings shall be of Swagelok / Parker make.

In case of pneumatic operated full bore ball valve, the size of the air tubing inside the dispenser shall be 1/4" OD and shall be of SS 316 material.

- 3.1.15 Coalescent and particulate filter to be provided at inlet of each bank supply line with manual drain valve to ensure that the oil carryover in the CNG being filled to vehicle is < 5 ppm and particulate size is < 2 Micron and Moisture separator before Actuators so as to avoid failure/passing. Filter elements made of paper shall not be accepted. Vendor to provide appropriately plugged drain valve outside the dispenser housing with suitable tubing /arrangement to collect the drained oil. Filter size shall be in accordance with max flow through the dispenser. Vendor to provide & installed one liquid filled differential pressure gauge across the filter.
- 3.1.16 Vendor shall ensure that the system design in such a way that in both options any gas if passes, should be recorded by mass flow meter and there should not be any possibility of unmetered gas supply through dispenser in case of malfunctioning



of ball valves. Any unmetered gas passing shall be recorded in the dispenser is retrievable as and when required.

- 3.1.17 Any other item required for safe and accurate operation of Dispenser.
- 3.1.18 Any spare(s) required during commissioning shall be in the scope of vendor.
- 3.1.19 All tools & tackles required for Dispenser installation, commissioning & performance testing at sites.
- 3.1.20 Supply of complete O&M manual (along with instruments datasheet & schedule, bill of materials, instrument hook-up diagram, electrical wiring diagram, control logic algorithm & flowchart and certificates & user guide of bought out items) for each dispenser for easy operation & trouble shooting.
- 3.1.21 Supply of application program, ladder logic, list of error codes with description for programming the dispenser parameter.
- 3.1.22 If dedicated programming unit is required for programming/ parameter change. The same shall be included in the supply.
- 3.1.23 Supply of drawings & documents.
- 3.1.24 Instrumentation & Electrical items specified in section B & C of the Job Specification. All electrical equipments shall be supplied with double compression type of cable glands tested & certified to be used in hazardous area classified as Zone-I.
- 3.1.25 On-Site Training to BGL personnel (Max. 02 days).

4.0 SCOPE OF SERVICES

- 4.1 Design & engineering
- 4.2 Manufacturing & Assembling
- 4.3 Procurement from Sub-vendors.
- 4.4 Inspection & Testing at Works.
- 4.5 Documentation and obtaining statutory approvals from the country of origin.
- 4.6 Packing, Forwarding and Transportation up to Job Sites/BGL's stores.
- 4.7 Testing and commissioning, after site installation, of each Dispenser, individually.
- 4.8 Apply post-order and do necessary follow-up for obtaining weight & measure certificate for offered dispenser unit's model.



4.9 Submit/ apply for obtaining type approval for the offered dispensers from Chief Controller of Explosives, Govt of India as per the provisions of Gas Cylinder Rules, Latest.

5.0 EXCLUSION

5.1 Civil Foundation

5.2 Trenches for pipes

6.0 Experience Record Schedule for Dispensers

Sr. No.	Parameter	Information on offered Model
1.	Number of Units	
2.	Fluid handled	CNG
3.	Gas molecular weight range	
4.	Site min/max temp.	1.7/47.5 °C
5.	Dispenser rated flow	
6.	Dispenser overall Cv	
7.	Dispenser batch accuracy %	$\leq \pm 1.0\%$
8.	Dispenser with temperature Compensation	Yes
9.	Number of Hoses	Double arm
10.	Mass flow meter make/model.	
11.	Where dispenser is located: Address and fax/telephone number of contact person.	
12.	Any other information on Installation	
13.	Date of commissioning of Dispenser	
14.	Number of hours completed as on bid due date.	
15.	Major problems encountered, if any	
16.	Mass Meter Accuracy	$\pm 0.5\%$



7.0 DESIGN BASIS

7.1 Area Classification

For details refer Electrical Specification at section-C attached with this Job Specification.

7.2 Codes and Standards

Following Codes and Standards are referenced to and made part of this Material Requisition.

NFPA52	Standards for CNG Vehicular Fuel Systems
NGV 4.1/AG.A 2-92	Requirements for CNG Dispensing Equipment for Vehicles
NGV 4.2/AG.A 1-93	Requirements for Hoses for NGVs and Fuel Dispensers.
ANSI/NGV1	Compressed Natural Gas Fueling Connection Devices Standard for fueling nozzles and receptacles.
NGV 4/AG.A	Requirements for Breakaway Devices for CNG Vehicle Fuel Dispensers and Fueling Hoses
AG.A 2-90	Compressed Natural Gas Fueling Appliances.
AG 901	Code of practice for NGV refueling stations.
IS 5572	Classification of hazardous areas (other than mines) for electrical installations.
IS 5571	Guide for selection of electrical equipment for hazardous area.
OISD 113	Classification of areas for electrical installations at hydrocarbon processing and handling facilities.
OISD 179	Safety requirements of compression, storage, handling and refueling of CNG for use in Automotive sector.
OIML TC8/SC7	Recommendation with regards to CNG dispensers, December 2000.
	The Standards of Weights and Measures Act 1976.
	The Standards of Weights and Measures (Enforcement) Act, 1985.
	The Consumer Protection Act, 1986.
	The Standards of Weights and Measures (General), Amendment Rules, 2005 – Part X (Compressed Gaseous Fuel (CNG) Measuring Systems for Vehicles



Any other Codes & Standards mentioned elsewhere in this Job Specification/M.R. or which are required to be complied with as per the prevailing Government of India regulations shall also be followed.

7.3 Precedence

In case of any conflict between Job Specification & other documents, the following order of precedence shall apply:

- Data sheets.
- Job Specifications.
- Indian Standards/Codes as applicable, International Standards/Codes as applicable.

7.4 Gas Compositions to Be Handled by Dispensers:

GAS COMPOSITION		
	Normal Gas Composition	Design Gas Composition
C1	84.5 – 98.77	89.0
C2	0.069 – 9.00	5.0
C3	0.03 – 4.00	1.5
C4	0.00 – 2.00	0.5
C5	0.00 – 0.35	0.35
C6	0.00 – 0.15	0.15
C7	0.00 – 0.00	0.00
CO2	0.00 – 4.5	3.0
N2	0.05 – 1.25	0.5
Total	100	100
Average C.V. (kcal/SCM)		

NOTE:

Oxygen – Max. 0.5% b y mole.

Total Non- hydrocarbon – Max. 2.0%

Total Sulphur including H2S max – 10ppm by weight.

Water Content range: 112 to 144 Kg/ MMSCM

7.5 **Safety**

7.5.1. All Electrical devices shall meet the requirement for the area classification specified under Cl. 7.1 above.

7.5.2 Tubing & other devices shall be so arranged that there is proper access for operation & maintenance.

7.6 Location

All the Dispensers shall be suitable for Outdoor installation without roof/shed.



8.0 TECHNICAL SPECIFICATIONS for dispenser

- 8.1 The specifications described herewith are intended to give vendor the technical & operating conditions the Dispenser must fulfil. These are to be referred along with relevant description including in earlier sections. Vendor may indicate in his bid, the additional features, which his dispenser has in terms of better design, enhance reliability etc., however such feature may be accepted subject to BGL's review and approval.
- 8.2 The specifications of FLOW METER are described under Instrumentation & Control Specification Section-B attached with this Job Specification/Material Requisition.
- 8.3 The Car dispensers shall be designed to handle flow rate of ≥ 15 kg/min under discharge to atmospheric condition. The dispensers shall be suitable for a turn down of not less than 50:1 on flow.
- 8.4 Dispensers shall be based on three banks sequential filling. The sequential panel shall be within the cabinet of the dispenser itself and not as a separate unit. Sequencing should be on flow rate and pressure.
- 8.5 The normal operating pressure of CNG at dispenser inlet shall be 250Kg/cm² (g). However, supply from dispenser to the Car shall get positively cut off at outlet pressure of 200 Kg/ cm² (g) to ensure the safety of the vehicle.
- 8.6 Once the particular-cycle of filling has been completely stopped (on achieving the maximum fill pressure and/or minimum flow rate) then next filling can be started only after initialization.
- 8.7 The normal operating temperature of wetted parts of dispenser shall be (-) 10 °C to 60°C.
- 8.8 The Dispenser shall automatically and immediately shut-off CNG supply to fill hose individually in case of:
- Power failure or excursion beyond permissible limit.
 - Loss of display
 - Power failure of mass meter
 - Failure for metering
 - Flow beyond high and low limits
 - Failure of totalizer
 - Overfill by quantity and/or pressure
 - Failure of pressure sensing transmitter
 - Passing of Pneumatic ball valve / electro valve



- Repeated operation of reset or start/ stop switch.
- Removal of any electrical wire connected to controller.
- Program step is in hold due to any error.

8.9 Cabinet

- 8.9.1 Complete cabinet shall be of Stainless Steel (SS-304) with door/ panel and shall have tamper proof locking arrangement. Cabinet wall thickness shall not be less than 1.6 mm. Cabinet shall be sized to accommodate all electrical, electronic and mechanical components for metering and display within the cabinet. Cabinet shall be designed to protect all tubing, pressure gauges, valves, fittings, electrical & electronics item from tampering, rain, dust, vermin etc. Dispenser cabinet shall be provided with adequate size bottom opening for the entry of gas supply line/lines and power supply connections. Adequate ventilation shall be provided so that there is natural convection current and cooling takes place inside. Cabinet shall be structurally robust and should not resonate at the frequencies emanated during normal flow or during choked flow through the nozzles, breakaway coupling or valves etc.
- 8.9.2 Appropriately plugged drain valves of the filter outside the dispenser housing with suitable arrangement to collect the drained oil to facilitate the operator to drain the oil on regular basis without requiring to open the lock of the dispenser cabinet. The layout of tubing and other component should be such that it gives unhindered access to all parts and maintenance becomes easy.
- 8.9.3 BGL's Logo and name to be displayed on both sides of dispensers, in BGL approved colour scheme. BGL's Logo and name shall be painted on stainless steel panel with an appropriate coloured background or alternatively, vendor shall provide self-adhesive PE film sheet with BGL's Logo and name. The artwork shall be of three colours. The colours, Logo size and name size shall be informed to successful bidder during detailed engineering.
- 8.9.4 The dispensers shall be shipped in fully wired and assembled condition. Only gas, air supply and power supply connection shall be made at Site.
- 8.10 Hi-Mast shall be of appropriate height and shall allow free movement of flexible hose, prevent strain on the fill hose connection and avoid touching of ground.
- 8.11 Fill Hose & Fill Nozzle
- 8.12 Two CNG flexible electrically conductive twin (fill & vent) hose shall be included for supply of Dispensers meeting the requirement of NFPA-52 and NGV 4.2.
- 8.12.1 One fill hose shall be fitted with NGV-I and second hose fitted with NZS-5425 fill nozzle for filling of vehicles. The nozzle shall meet the requirements of NGV-1 Type-2, Class A nozzle. Vendor shall include the supply of 3-way valve with each hose for Filling & venting of gas. Vendor shall also include supply of Breakaway Coupling, suitable for NGV Industry, in the hose. Hose shall be 3/8" ID 5000



psig, at least 4m long. Vendor shall demonstrate the function of breakaway coupling during performance test.

Vendor shall provide the test certificates of fill hose assembly.

8.12.2 Designing of the dispensers would take into account severity of service. The dispensers shall be designed in such a way as to operate in cyclic (start, fill, stop, start.) round the clock basis with about 1 minute (typical) interval between stop and start modes. The dispenser also to work satisfactorily when the time between stop and start is indefinitely high, e.g. during lull time or when the dispenser is commissioned after it was decommissioned for prolonged period or in storage after initial commissioning. For this purpose if any specific storage facility is required, the same to be indicated by the bidder.

8.13 Dispensers should be ergonomically designed.

9.0 DATA SHEETS

Vendor shall fill up data the as per enclosed Data Sheet, attached with this job specification and submit along with bid.

10.0 CLIMATIC CONDITIONS

- The climatic conditions to be considered for selection, design and derating of equipment shall be as indicated below:
- Amb. Temp min/max⁰C : 7⁰C / 47.5⁰C
- Design wet bulb temp (WBT), ⁰C : 27⁰C
- Design relative humidity % : 90
- Altitude above MSL, M : 12
- Wind velocities km/hr (max) : 160

11.0 UTILITY SPECIFICATION

11.1 Electric Power Supply

Single phase, AC, 230 Volts \pm 10%, 50Hz \pm 3% will be provided by BGL. Surge protector is to be provided by the vendor at the 230 VAC inlet. All instrument (such as mass meter, solenoid, pressure transmitter/ switch etc.) power supply shall be of 24 VDC only. Suitable voltage conditioning unit shall be in the scope of vendor wherever required.

Note: Vendor to confirm that supplied dispensers are suitable with the above power supply and indicate the maximum and minimum tolerable values of voltage for accurate metering and safe operation of dispenser. Vendor to include suitable voltage conditioning unit in their scope, if required.

For further details refer Electrical Specification, Section-C, attached with this job specification.



11.2 Instrument air (if required)

Instrument air pressure range: 5-15 Kg/cm²g. Necessary air regulator shall be in the scope of the vendor.

12.0 INSPECTION AND TESTING

12.1 At Vendor's Works

Vendor shall appoint anyone of the TPIA which are listed in M.R. for inspection purpose after approval by BGL.

Apart from inspection by TPIA, inspection shall also be witnessed by BGL delegate if required, as set out and specified in the codes and Technical specifications.

12.1.1 'The following activities shall be covered under inspection:

- Review of Q.A. documents.
- Review of calibration certificates for flow meter, dispenser, pressure transmitters, pressure gauges and all instruments.
- Review of all statutory certificates including W &M, type approval from CCOE, Govt. Of India.
- Review of area classification compatibility of all items including bought out items.
- Review of Mill Test reports.
- Review of NDT reports.
- Review of bought out sub-assemblies/major components, test/inspection certificates.
- Dimensional checks as per approved drawings and data sheets.
- Safety shutdown of dispensers.
- Immediate cut off of dispensers due to abnormalities.

12.1.2 Functional Test

All the dispensers shall be tested to demonstrate the functioning of all the components and controls.

12.1.3 Performance Test

All the dispensers shall be performance tested for flow capacity, measuring accuracy and dispenser functioning with CNG. CNG shall be arranged by vendor.



12.1.3.1 During the shop test of dispenser, in case the dispenser flow capacity from inlet of dispenser to the outlet of filling nozzle is found below the specified capacity the dispenser shall stand rejected.

12.1.3.2 During the shop testing if the dispenser batch accuracy is found beyond $\pm 1.5\%$ dispenser shall stand rejected.

12.2 At BGL Sites

All the dispensers shall be tested by vendor for their function & performance in presence of BGL authorised representative. Any part or components, which are not functioning to the satisfaction of BGL, shall be repaired or replaced by the vendor without cost & time implication to purchaser and performance test again carried out.

12.3 Performance Guarantee

12.3.1 The vendor shall guarantee the satisfactory performance of each dispenser as per the operating parameters indicated in data sheets. The dispensers shall be performance tested after installation at site by vendor. Vendor shall carry out tests as required by Govt. Statutory Agencies.

12.3.2 Guaranteed Performance for the Dispensers shall be as follows:

- Flow Rate (≥ 15 kg/min for Car Dispenser).
- Batch Accuracy of $\leq \pm 1.5\%$

In case above guaranteed parameters are not achieved at site, vendor shall carryout necessary rectification/modification to achieve the guaranteed parameters, without cost & time implication to the purchaser.

13.0 VENDOR DATA REQUIREMENT

Vendor data requirement shall be as per attached specification Annexure-2.

14.0 PACKAGING

The dispensers shall be packaged to withstand rough handling during in-land journey. It shall be vendor's responsibility to make good any deterioration that occurs during shipment. Sling points shall be clearly indicated on crates.

15.0 COMMISSIONING OF DISPENSERS

Vendor shall carry out commissioning of Dispensers within 3 days of receipt of intimation from BGL.



16.0 SCOPE OF WORK FOR COMPREHENSIVE MAINTENANCE OF DISPENSERS

16.1 GENERAL

All spare parts required for replacement/rectification of faulty parts, consumables etc .required for smooth operation and carrying out preventive / any type of maintenance shall be in the scope of supplier.

All tools, tackles and fixtures required for carrying out the maintenance of the dispenser shall be in scope of the bidder. The scope will also include handling equipments required during the any maintenances activity. At the end of AMC contract Bidder will handover all tools and tackles required for smooth operation and maintenance to the owner.

The Bidder shall make his own arrangement for the accommodation of his personnel at respective locations and subsequent transportation arrangement for them from their place of residence to work place or any other place as required and company shall have no obligation in this respect. The Owner shall not be responsible for providing any medical assistance to the contractor personnel.

The Bidder shall be responsible for the discipline and good behavior of all his personnel deployed in the services.

The contract shall arrange to supply/renew identity card to his workforce at his own cost, Those Bidder's personnel shall be required to carry their respective identity cards while on duty and produce on demand.

The Bidder shall deploy adequate number of technicians / supervisors/ Engineers / helpers as well as tools and equipment for smooth and proper operation and maintenance of the dispensers supplied in terms of the contract. In case required to meet operational requirements, the Bidder shall augment the same as per direction of Engineer-in –Charge.

The Bidder is required to carry out all services as mentioned in the Scope of Services and Schedule of Rates on all the 365 days including Sunday and all Holiday and around the clock.

The Bidder shall allow weekly rest and daily working hours to his workmen as per the relevant Act / Law / and Rule made there under. However, no work shall be left incomplete, unattended on any holiday/weekly rest. Technician/operators provided shall have minimum qualification of ITI. Bidder in person or his authorized representative shall provide the services on daily basis to interact with Engineer-in –Charge and deployed workman.

The work force deployed by the Bidder for maintenance services at CNG installation shall be of sound relevant technical professional expertise, which is otherwise also essential from the safety point of view of the personnel of the Bidder as well as for the installation.

Bidder has to ensure the safety of man and machine all the times. Damages of



equipment due to negligence will be recovered as per the decision of Engineer-in-Charge, which will be final.

Regarding work completion, the decision of the Engineer-in-Charge will be final and binding.

The Bidder shall make his own arrangements to provide all facilities like boarding and transport etc. to his workmen.

All personnel of the Bidder entering on work premises shall be properly and neatly dressed and shall wear uniform, badges and personnel protection equipments (PPE) like helmets, ear plugs etc. while working on premises of the company including work sites. The colour and design of uniform shall be approved by BGL.

Bidder shall maintain proper record of his working employee's attendance and payment made to them.

The Bidder will strictly adhere to all the safety rules and regulations prevailing and applicable from time to time at the installations as directed by BGL.

All arrangements for communication from control room to the contract person working on job under the services shall be the responsibility of the Bidder viz. pagers / mobiles / walky-talky.

All the jobs mentioned under scope of services shall be carried out as per sound engineering practices, work procedure documentation recommendation of the manufacturer and as per the guidelines/direction of engineer-in-Charge of authorized representative.

Summary of breakdown hours station wise with analysis shall be submitted to CNG control room on a fortnightly basis both in hard and soft form as per BGL format.

16.2 COMPREHENSIVE ANNUAL MAINTENANCE OF DISPENSER PACKAGES

Any correspondence required to be made with the principal company or OEM or various offices shall be made by the bidder or bidders agent. All arrangements like phone, fax, computer, Internet etc required for above correspondences shall be arranged by the bidder at his own cost.

The periodic maintenance required to be done as per OEM recommendation shall be taken up promptly. The bidder shall provide the detailed preventative maintenance schedule along with

- a) Estimated down time required for each type of maintenance schedule.
- b) List of spares and their quantities required for each type of maintenance schedule per Dispenser.
- c) Type and number of man days required for each type of maintenance schedule per Dispenser.



The bidder shall plan such maintenances during non-peak hours and in consultancy with the Engineer In Charge (EIC) of BGL. Any maintenance that needs to be taken up shall be well planned in advance with due approval of the EIC.

The bidder shall use only OEM's certified spares during maintenances. All spares shall be kept in sealed OEM stamped packages. The packages shall be opened in front of BGL representative during maintenance. In case, the schedule maintenance of the OEM manual recommends to check and replace parts like filter, valve repair kit, display, reset switches etc. after certain time interval, same shall replaced or used further only on approval from the BGL representative. However any unto ward consequences for non-replacement of such parts shall be the responsibility of the bidder and spares, repair required to put back the unit into operation will be to bidders account.

All routine and periodic checks / inspections required to be done as per OEM recommendation shall be done by the bidder. Instruments required for above inspection like vernier caliper, micrometer screw gauge, fill gauges, bore gauge etc shall be in scope of the bidder and these instruments shall be calibrated every year.

The entire maintenance / inspection job carried out by the bidder shall be recorded in a service report and the report of the same shall be jointly signed by BGL representative and submitted immediately after carrying out the maintenance. Service report format shall be approved by BGL.

The EIC will be final authority to take decision with regards to maintenance or replacement of parts or any disagreement between the bidder and BGL, during the execution of the contract.

The bidder shall carryout calibration of all instruments such as pressure gauges, transmitters, switches, mass flow meters etc shall be in the scope of the bidder. In addition to the above all safety relief valves shall also be tested and calibrated every year.

Calibration shall be done from government-approved laboratories and shall be carried out at least 15 days prior to the calibration due date.

17.0 COMPENSATION FOR NON-FULFILLMENT OF OBLIGATION UNDER ANNUAL MAINTENANCE CONTRACT & PENALTY

17.1 During the one-year warranty period and 3-year post warrantee period the Contractor must ensure that the dispenser is performing required services as define in the contract documents well round the 24 hours a day & 365 days. During AMC services if dispensers break down any time then Client have right to impose penalty as defined in Contract.

17.2 Penalty: If the Contractor fails to provide the required services any time more than 6 hours & upto 12hours, the contractor would be penalised Rs. 1000/ per day and for more than 12 hours for any day, compensation shall be imposed, which will be



@Rs.100/- per hour per arm per dispenser. In any case the dispenser has to rectify within 24 hrs with all possible effort.

The day start will be considered from 0000 hrs for the calculation purpose. Contractor shall be allowed 24 hours downtime of the each arm of dispenser per month to carry out the periodic /scheduled / breakdown maintenance/ routine checking of dispenser package. This can be adjusted considering the penalty clause as define above only once in a month. In case Contractor has utilized less down time of the dispenser package than that allowed, the Contractor could carry forward only max unutilized 12 hours downtime to immediately next month.

In any case, the maximum penalty imposed in a month for non- performance of the equipment would be limited to 70 % of the amount of Maintenance charges to be paid to the contractor per month per dispenser. A logbook for time record shall be maintained in the Central control room wherein the records shall be made for the time Dispenser develops trouble and the time at which the Contractor rectifies the same and Dispenser put back to service.

- 17.3 The penalty clause and maintenance charges will come into force immediately after successful performance test as defined in the tender.
- 17.4 In case of any complaint regarding non-fulfilment of any obligation under the contract, Client reserves the right to withhold payment to the Contractor and out of such amount and the security deposit which may held, Client can make such payment as it may consider necessary for smooth and unhindered working of the contract.



SECTION – B

- 1.0 SCOPE
- 2.0 BID PROPOSAL
- 3.0 DESIGN PHILOSOPHY
- 4.0 SPECIAL INSTRUCTION TO VENDOR
- 5.0 EXCLUSION
- 6.0 VENDOR DATA REQUIREMENTS
- 7.0 INSPECTION AND TESTING
- 8.0 ENVIRONMENTAL AND SITE CONDITIONS ARE AS FOLLOWS
- 9.0 LIST OF ATTACHMENTS



SECTION: B: INSTRUMENTATION & CONTROL SPECIFICATION

1.0 SCOPE

The purpose of this specification is to define the minimum general requirements and philosophy of instrumentation & control for the dispenser package of BGL.

This specification cover the design, engineering, procurement, supply and testing, calibration & commissioning of instrumentation and control system with all accessories and materials and any special test requirements required for completing the job in all respects.

Coriolis mass flow meter, electronics and other accessories shall be provided as required for the Dispenser arms.

Vendor's scope of instrumentation and control for the dispenser package shall include the following as:

- a) Basic instrumentation and control indicated in this document.
- b) All local and field-mounted instruments in dispenser panel.
- c) All additional instruments and control system necessary for safe and efficient operation of the dispensers which are not listed specifically in this document but which are required as per vendor's experience/recommendations.
- d) Impulse & pneumatic piping/tubing including all miniature valves, fittings and mounting to install all sub vendor supplied instruments.
- e) All other erection material necessary for mounting of instruments in vendor's scope as per BGL installation standard.
- f) Shop testing of all instruments and control system under vendor supply.
- g) Calibration, loop checking, pre commissioning and commissioning of the complete system.
- h) All weather proof and explosion proof double compression type cable glands for all instruments, junction boxes, dispenser panel etc.
- i) All pressure relief valves as a part of 1.4 a) above.

In case of further clarifications, bidder shall obtain clarification/confirmation from BGL before proceeding.

All instruments must be procured from BGL approved vendor as per Annexure-1. However for those instrument/equipment, which are not covered in the list, the sub vendors shall be approved by BGL.



2.0 BID PROPOSAL

The bid proposal shall be accompanied by the following as minimum for technical evaluation of offer.

- a) Filled in data sheet of all instrument.
- b) Deviation list.
- c) Write up on control philosophy.
- d) Power supply consumption for each item & type of power supply whether earthed/ floating.
- e) Utility requirement & consumption.
- f) Weights & Measure (W&M) Certificate for Mass Flow meter
- g) CCOE approval for explosion proof enclosure for all electrical & electronic instruments.
- h) Type approval certificate from Chief Controller of Explosives, Govt. Of India.
- i) Type approval of dispenser from legal Meteorology

3.0 DESIGN PHILOSOPHY

All Electrical and electronic instruments shall be installed in accordance with NFPA 70, IEC for Gas Group IIA, IIB & Temperature Class T3 and shall have approval of a recognized certifying authority.

Mass flow meter shall be Coriolis type and shall conform to AGA 11 draft standard.

Each and every mass flow meter 'zeroing' shall be done before delivery from vendor's works.

Mass flow meter design considerations, piping, meter, zero verification and proving facility shall be as per AGA 11 draft standard.

For offered Mass flow meters, vendor shall apply post-order and do necessary follow-up for obtaining Weight & Measure (W&M) certificate from statutory authority of India.

All tube fittings & pipefitting shall be leak proof & shall be Swagelok/Parker make and suitable for pressure ratings. The tubing shall be of Sandvik / FAE make and suitable for pressure rating.

Control valve, actuator and solenoid valves shall be of conventional type design, no integral design is acceptable.



Control valve body and trim materials selection shall be done by the bidder to ensure that there is no erosion, cavitations and flashing. Trim & seat shall be fully stellite.

4.0 SPECIAL INSTRUCTION TO VENDOR

Supply of Car dispenser with two arm of flow rate > 15 kg/min under differential pressure of 200 kg/cm² g.

Each dispenser arm shall have Coriolis type mass flow meter with necessary sensor, electronic and special cable recommended by vendor. Performance record and Weight and Measure (W&M) certification of the meter to be submitted for acceptance.

Three rows liquid crystal backlit displays for night viewing (Explosion proof backlighting / LED) showing total sale in Rupees of (000000.00), quantity of gas sold in Kg.(000.00), unit price of CNG in Rs/Kg (000.00) for each hose of the dispenser (total two sets and three rows for each dispenser). There shall be a provision for shifting the decimal point through software. Display shall be IP 55 and shall show proper error code during shutdown.

Vendor shall make a provision to change the price of CNG through the keypad inside the dispenser unit that shall be covered with security lock. RS 485 port shall also be provided for price change. In case standard RS485 port is not available in the dispenser, then RS232C to RS485 convertor with all relevant hardware and software to be provided by vendor.

Non-resettable and non-volatile totalizer upto 999999.99 (8 digits and a decimal) for total CNG sold in Kgs. Since the dispensers are used for custody transfer purpose, the totalizer must not reset in any eventuality not even in the case of electronic failure. Dispenser electronics shall be common for both totalizers.

Totalizer figure would be displayed only when it is recalled through keypad or some device integral to dispenser. The totalizer value would cover up to the last transaction details at the time of recall. These key pad device should not be used for any programming of the dispenser and are distinct from those, if used for programming the dispenser while operating these keys in no way shall hinder the operations, functioning, veracity of display, storage of parameters and values. These keys can be used even when the filling is on without affecting up-counting/real time data.

A programming, tuning, adjusting of the controller would be through dedicated software residing to a PC with the Windows OS. For this purpose a dedicated RS485 port to be made available to the dispenser. In case standard RS485 port is not available in the dispenser, then RS232C to RS485 convertor with all relevant hardware and software to be provided by vendor. For this purpose vendor shall supply a licensed multi-user software and OS in English. All necessary software shall be provided for calibration of transmitter from control room. Vendor to provide Manuals & troubleshooting guides of OS & software and a hard copy of application program.

Dispenser shall be capable of communicating with outside system using the open system architecture/protocol. It should be possible to transfer the data through twisted pair wires, transaction data as also flow meter data (both process and diagnostic) to RTU of SCADA.



RTU and inter connecting cable shall be provided by BGL. Detailed requirement of SCADA is as follows:

Parameters required for SCADA

We want to monitor / control following parameters through SCADA system.

- a. Mass Totaliser from Dispenser Motherboard
- b. Mass Flow per Filling
- c. To Read Gas Selling Price from Dispenser
- d. To download the gas selling price into the dispenser from SCADA system
- e. Mass Flow Meter Status
- f. Tripping Status Dispenser
- g. Reset Switch Operation Status
- h. Dispenser Power Supply Status
1. Hardware Details: Connector Type, Communication Standard, Communication port Pin details,
2. Communication Port Configuration: Baud Rate, data bits, stop bit, parity
3. Polling Constraints: Minimum time period between two consecutive poll cycles.
4. Protocol Details: Protocol name and message structure for different read / write functions.
5. Function codes for reading digital and Analog inputs
6. Function code for writing analog values in the IED registers
7. List of parameters available in the IED which can be accessed from the IED through serial port.
8. Register address of each parameter in the IED.

A Sample of the details is given below for understanding:

PROTOCOL DETAILS:

Sr.No.	Description	Content/Details
1	Protocol	MODBUS RTU
2	Connection Type	FCC -68 RJ45
3	Communication standard	RS232D
4	Signals supplied	Tx, Rx, GND
5	Baud Rate(Speed)	300, 600,1200,4800,9600,19200
6	Format	Software configurable
7	Port Configuration	Speed - 19,200 bps Data Bits – 8 Bits Stop Bit - 1 Bit Parity - None
8	Min. Time period between consecutive Query	2 Sec.



- PORT PIN Details:
- Example: RS232 Pin Details:

IED	:	SCADA
RJ45		
1.GND	:	GND
2.DTR	:	
3.RTS	:	
4 TX	:	RX
5 RX	:	TX
6 CTS	:	
7 DCR	:	
8 DCD	:	

- Function Code & Message Structure:

Function Code	:	3 – Read Output Register
Poll Format		
Address	:	1 Byte
Function	:	1 Byte
Start Item	:	2 Byte

NO. ITEM2 BYTE

Response Format:	:	
Address	:	1 Byte
Function	:	1 Byte
Length	:	1 Byte
Date Item 1	:	4 Byte
Date Item n	:	4 Byte



Function Code & Message Structure:

Function Code: 2 – Read Input Status

Poll Format: :
Address : 1 Byte
Function : 1 Byte
Start item : 2 Byte

NO. ITEM2 BYTE

Response Format: :
Address : 1 Byte
Function : 1 Byte
Length : 1 Byte
Date Item 1 : 2 Byte
Date Item n : 2 Byte

Memory Mapping, Data Type & Parameter Information:

1 Digital Parameters:

Sr. No.	Description	Address
1	Flow computer malfunction Alarm	8247
2	Mass Flow Low alarm	8245
3	Mass Flow High alarm	8246

Parameter	Register details			
	Engineering Range and Unit	GC Register	Register Format	
Density	Kg/m3 (500-600)	8655-56	Float	



Pressure		8657-58	Float	
Temperature		8659-60	Float	
Mass Flow Rate		8661-62	Float	
Totalized mass flow		8663-64	Float	
Yesterday's Total Mass flow		8665-66	Float	
Today's Total Mass Flow		8667-68	Float	
Corrected volumetric Flow rate		8669-70	Float	
Yesterday's Total corrected Volumetric Flow		8671-72	Float	
Totalized Mass Flow at 6 AM(Snapshot of cumulative)		8673-74	Float	

One number of three bank electronic software and controller including hardware. Vendor shall include either with pneumatic or electrical operated solenoid operated full-bore bubble tight ball valve made of ANSI 316 SS for dispensing of gas. In case of pneumatic operated ball valve, actuator would be air fail to close the valve. However, in both the cases, vendor to ensure the system design in such a way that in both options any gas if passes, should be recorded by mass flow meter and there should not be any possibility of unmetered gas supply through dispenser in case of malfunctioning of ball valves. The actuator and ball valve assembly shall be fatigue free and tight shut off characteristics at least for 8000 operation hours. Bidder to include necessary serial port for printing the sale data.

Two number of liquid filled 4 dia. (0-400 kg/cm²g) pressure gauge showing the vehicle filling pressure. Pressure gauge shall be provided with shatterproof glass. Vendor to provide a bypass isolation valve with associated tubing to facilitate routine servicing/calibration of Pressure gauge without shut down of the dispenser.

Temperature compensator to limit fill pressure to an adjustable value (with normal value 200 Kg/cm²g) equivalent at 15 degree C. A temperature compensation facility button shall be provided to enable or disable the temperature compensator.

To limit fill pressure to 200 Kg/ cm² g, Vendor to provide the following options per hose / arm of the dispenser:

- 1 One number of pressure limiter (electronics transducer) (with adjustable value up to 250 Kg/cm² g) and one number of mechanical pressure regulator and one number pressure relief valve as final safety to avoid overfilling. Pressure regulator shall be designed such that there shall not be any flow restriction to the maximum flow of dispenser. Otherwise, minimum flow through the regulator shall be 15 Kg/min at 5 kg/cm²g differential pressure.



Back-up Power supply for displays so that display remains at least for 15 minutes after power failure. Vendor shall provide battery backup of 72 hours to the RAM of dispenser controller.

Hardware required with the dispenser for Weights and Measures (W&M) certification.

All parameter setting shall be password protected. Facility of change of password also to be provided to enhance the security of password.

FLOW METER

Principle of mass metering:	Coriolis
Approval	ATEX/CSA/FM/CENELEC/SEV
W& M	Statutory authority of Country of Origin and from Ministry of Consumer Affairs, Govt. Of India.
Output to dispenser	RS 485/ Frequency
Output to be available	RS 485/ Frequency / Analog duly programmed
Max. Flow rate	≥ 15 kg/min
Mass Flow accuracy for gas meter:	+ 0.5% (inclusive of linearity, hysteresis & repeatability errors.)
Mass flow meter (indicating type):	with totalizer of non-resettable type
Calibration traceability:	NIST
Repeatability:	+ 0.25%
Enclosure	Certified W.P. to IP 66, NEMA 4 & EX.PROOF (Display boards fitted on dispenser with IP 66 level of protection)
Pressure rating of wetted Parts:	5365.605 (5200psig) AT 25°C as per ASME/ ANSI BV 31.3
Process Temperature effect:	Nil
Surge and frequency Transient effect:	Shall be in compliance with ANSI/EEE (EFT) c 6241 (1991)
EMI effect on sensor and Transmitter:	To the requirement of EMC directive 89/336/EEC, EN 50081-1(JAN.'94).
Vibration effect:	As per SAMA PMC 31.1 – 1980, Condition 2.



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

Each flowmeter should be provided with a liquid crystal display (LCD) for ongoing flow monitoring and totalizer. Flow meter signal shall be considered as the highest level of interruption. It shall not be possible to fill any vehicle cylinders by repeated operations of reset switches.

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

Vendor should include one set necessary system and application software with hardware including communication cable / converter etc. With licensed required for calibration and faultfinding diagnostics of Mass Flow meter Electronics through Client's Laptop.

Car Dispensers shall be designed for handling flow rate of more than or equal to 15 kg/min. flow capacity with turn down of not less than 50:1.

The batch accuracy of dispensed gas shall be within $\pm 1.5\%$ or better.

Bidder shall indicate overall flow coefficient Cv of dispenser from inlet to the dispenser upto outlet of nozzle including mass flow sensor, interconnecting tubing, valves, hose, fill valve etc.

Normal operating inlet pressure of dispenser shall be 220-250 Kg/cm²g. The dispenser supply to the vehicle shall be positively cut off at outlet pressure of 200 Kg/cm²g.

Normal operating temperature of wetted parts of dispenser shall be -10 to 60 deg.C.

Dispenser shall automatically and immediately shut-off CNG supply to fill hose individually in case of:

Power failure or excursion beyond permissible limit.

Loss of display.

Power failure of mass meter.

Failure of metering.

Flow beyond high and low limits

Failure of totalizer

Overfill by quantity and / or pressure.

Failure of pressure sensing transmitter.

Passing of Pneumatic ball valve / electro valve.

Repeated operation of reset or start / stop switch.

Removal of any electrical wire connected to controller.

Program step is in hold due to any error

(Seal & Stamp of Bidder)



Vendor shall confirm that any momentarily flow of gas shall be registered in mass flow meter totalizer and simultaneously in dispenser totalizer. Vendor shall envisaged a temper proof design. Dispenser shall generate error signal in case of passing valve with date and time and display on the dispenser LCD.

After power on, the controller delay time to start filling be such that the mass meter and pressure transmitter are initialized properly to avoid any un-metered gas.

Complete control loop would be so fast that if the filling is terminated at any point of filling, the flow would stop immediately.

Reset switch assembly should be suitable for failure free operation and the same shall be supported with proper PTR for CNG duty.

Controller shall be in reset state for the SOV open signal to be generated. Any departure to this shall stop the dispenser. Dispenser controller shall monitor the status of flow, monitor the status of flow meter / transmitter and in case of any abnormality from set condition the dispenser shall shut down.

In case the power supply is beyond acceptable limit the dispenser shall not start at all. The controller shall provide an operational alarm and it shall be displayed on LCD display.

Flow meter signal shall be considered as the highest level of interrupt. It shall not be possible to fill any vehicle cylinders by repeated operations of reset switches. Reset time delay is required with adjustable time.

A Provision shall be available in dispenser unit, which shall be suitable for programmable/changeable filling pressure from 180kg/cm²g to 220kg/cm²g in vehicle. Original filling shall be same as defined elsewhere in data sheet.

Emergency stop switch shall also be provided on either side of dispenser and shall be easily accessible.

DATA RECORDER:

The dispenser should have an inbuilt Automatic Refueling Data Recorder unit for the each independent refueling line. The dispenser system should be capable of storing up to 1,250 refueling transactions data with date & time stamping and such data should be downloaded frequently into another portable computer with compatible Microsoft software (software in CD to be provided by Supplier together with the license) to store the transactions data. This information can either be down loaded as a report from a POS system of client through RS 485 communication. Vendor shall provide battery back up of 72 hrs to the RAM of dispenser electronics independent refueling line.

The dispenser electronics software should be capable to print all alphanumeric refueling data (as stated below) of each fill point of the dispenser as a receipt for the respective vehicle through the point of sale (POS) Computer / printer (both of client) and shall generate the cash receipt for each refueling operation. The Communication port for the interconnection of



dispenser to POS shall be available in the dispenser and shall be intrinsically safe. Following information required on the receipt for each refueling:

- Vehicle Identification Number.
- Quantities of gas dispensed in kg (4 digits in 2 decimal points i.e., 00.00).
- Unit cost of gas dispensed in Rupees, Rs/kg (4 digits in 2 decimal points i.e., 00.00).
- Complete transaction value in Rs (6 digits in 2 decimal points i.e., 0000.00).

One number Non-resettable and non-volatile inbuilt totalizer up to 999999.99 (8 digit and a decimal) for total CNG sold in KGs (Total refueling transaction) with an independent battery backup shall be provided for each dispenser. The display should have facility to read previous batch reading even after power off/ failure. The dispenser electronics totaliser shall get updated continuously with each batch filling and must retain the transaction value even after power supply off/failure any time during online filling cycle.

The dispenser parameter setting shall be password protected. Facility of change of password also to be provided to enhance the security of password

OVERFILL PROTECTION:

Overfill protection shall be through electronically programmed hose to terminate the fill after 200 Kg/cm²g. Vendor shall include either 2 nos. Transducers per hose or one number pressure transducer and one number pressure regulator per hose. Pressure relief valve shall be provided to avoid overfilling. Relief valve set pressure shall be at 220kg/cm²g with resetting at 215kg/cm²g. Relief valve setting to be adjustable from 205kg/cm²g to 240kg/cm²g with resetting at 200 to 235 kg/cm²g respectively. Calibration certificate shall be provided.

ELECTRONICS:

Electronics shall be microprocessor based. The processor shall be the latest available in the field and shall be capable of processing the data faster. All the electronic cards shall be located in flameproof boxes inside the dispenser cabinet. No parts of electronics shall be filled with epoxy resin etc. The controller electronics should have immune to EMI interference and vendor to provide relevant certification in this regard.

The dispenser electronics should have self-diagnostic features and should generate error code accordingly. Vendor should define such error codes in trouble shooting guide and procedure of their rectification. Error code related to operational parameters should also be displayed and defined in trouble shooting guide. Password protection should be provided for entry of critical data through key pad.

RS 485 serial port shall be provided for down loading the CNG sale data with the help of Purchaser's Personal Computer for each shift (8 hours interval). In case standard RS485 port is not available in the dispenser, then RS232C to RS485 converter with all relevant hardware and software to be provided by vendor. Suitable software shall be provided to obtain the same



for each shift (8 hours interval). This port shall be made available outside the explosion proof electronic housing for Purchaser's use.

The change in setting shall be done either through lap top computer or through hand held configurator through the port provided for this purpose with security lock.

Vendor shall provide suitable electronics for processing both arms dispenser data. Totalizer display and display for both arms in the dispenser shall be shown separately

Vendor shall provide a common processor and RS 485 port for RTU SCADA for Car dispenser. In case standard RS485 port is not available in the dispenser, then RS232C to RS485 converter with all relevant hardware and software to be provided by vendor.

TUBING:

Materials used for the tubing shall be SS 316 fully annealed (Bright annealed) seamless conforming to ASTM A269 with maximum hardness of RB80 or less and suitable for bending and flaring. Open ends on fittings and vents shall be provided with caps/dust plugs. The tubing shall be of Sandvik / FAE make. Valves shall be Parker/ Swagelok/ Compac make & fittings shall be of Parker/Swagelok make.

CERTIFICATION:

- a) Equipment/instrument/systems shall be certified for use by statutory authorities for their use in area of their application.
- b) For all intrinsically safe/flame proof equipment/instruments/systems, certification by any approving authority like BASEEF A, FM, UL, PTB, LCIE, Chief Controller of Explosives (CCOE), India is mandatory.

For offered mass flowmeters, separate dedicated transmitter with display type totalizer (of the same make as mass flow meter) shall be provided by vendor. Mass flow transmitter signal shall be wired to the motherboard used in the dispenser. Mass flow meter signal directly to the motherboard without transmitter is not acceptable".

Bidder to provide two nos. of non-resettable and non-volatile totalizers per hose of dispenser i.e. one integral digital totalizer with display along with mass flow meter transmitter. Second totalizer of liquid crystal backlit display in kg (999999.99) on front panel of dispenser.

The configuration data for the offered mass flow meter should be stored in a nonvolatile memory or in a dedicated battery backed RAM such that this remain unchanged because of power fluctuations or power off conditions. In case mass flow meter vendor standard instrument has battery backed RAM, vendor must indicate the protection time and battery life in their offer.

MAKE OF MASS FLOW METERS

Emerson Process Management (Micromotion) – CNG 050 with 2700 transmitter

COMPAC KG 80

(Seal & Stamp of Bidder)



REJECTION CRITERIA.

During the shop test of dispenser, in case the dispenser flow capacity from inlet to dispenser to the outlet of filling nozzle is found below the specified capacity the dispenser shall stand rejected.

During the shop testing if the dispenser batch accuracy is found beyond $\pm 1.5\%$ dispenser shall stand rejected. "Separately, the Mass flow meter accuracy shall be $+ 0.5\%$ (inclusive of linearity, hysteresis & repeatability error) and the repeatability will be $+ 0.3\%$ or better.

The bids received without the certification from the Weights and Measurement department of the Country of origin for offered mass flow meter (Coriolis type) as well as of dispenser model as per specifications shall be rejected. In case country of origin of mass flow meter does not issue weights and measure certificate then the same shall be provided from approved agency for weights and measure from other country.

5.0 EXCLUSION

Vendor's offer shall exclude following:

- a) Instrument air

6.0 VENDOR DATA REQUIREMENTS

Vendor data requirement shall be strictly as per Annexure – 2 & 3 this job specification.

7.0 INSPECTION AND TESTING

Functional and simulation test for the following shall be carried out at vendor's works and shall be witnessed by BGL/Third party.

Control panels along with all instruments mounted in it.

Following tests shall be carried out by bidder at his works or his sub-vendor's works and test certificates shall be furnished.

Calibration/test certificates for all instruments, control valves & safety valves.

Seat leakage test for control valve and safety valve.

Test certificates for safety valve set pressure and reset pressure.

Radiographic test certificates for control valve and safety valve used for ANSI 600 lbs and above rating.

Material test certificates for all line mounted instruments.

Sub-vendors conformity certificates.



8.0 ENVIRONMENTAL AND SITE CONDITIONS ARE AS FOLLOWS

Temperature:	Minimum:	7°C
	Maximum:	47.5°C
	Maximum Shed:	47.5
	Relative humidity:	90% Non condensing

9.0 LIST OF ATTACHMENTS

Instrument Job specifications for Dispenser

Data sheets formats (along with calibration certificate wherever applicable) for

- Mass flow meter
- Control valve
- Solenoid valve
- Self actuated control valve
- Pressure relief valve
- Pressure Gauge
- Pressure Transmitter
- PTR format for Mass Flow meter



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- 2.0 CODES AND STANDARDS**
- 3.0 AREA CLASSIFICATION AND EQUIPMENT SELECTION**
- 4.0 EQUIPMENT SPECIFICATIONS**



SECTION: C: ELECTRICAL SPECIFICATION

1.0 GENERAL

1.1 This specification defines the requirements of design, engineering, supply and installation, testing and commissioning of electrical facilities for CNG Dispenser Package.

1.2 It is not intended to cover all aspects of design but to indicate the basic requirements only. Vendor shall ensure that the design and installation on the skid is carried out as per good engineering practice to meet the requirements of safety, reliability, ease of maintenance and operation, aesthetics and interchange ability of equipment.

2.0 CODES AND STANDARDS

2.1 All electrical equipment and complete package shall meet the requirement of relevant Publications and Codes of Practice of Bureau of Indian Standards, statutory regulations and good engineering practices. Complete system must conform to the latest revisions of the following:

- a. Indian Electricity Act and Rules framed there under.
- b. Fire Insurance Regulations.
- c. Petroleum Rules and any other regulations laid down by Chief Controller of Explosives.
- d. Regulations laid down by local statutory authorities and Electrical Inspectorate.

2.2 Vendor shall provide all assistance required for obtaining approvals from statutory authorities for materials, plant design/drawings and complete installation.

2.3 Where Indian Standards do not exist, the relevant IEC/British/ German (VDE) standards shall apply. Any Other international standard may also be followed provided it is equivalent to or more stringent than the standards specified above.

2.4 In case of any discrepancy/conflict between the specified codes and standards, the following order of decreasing precedence shall govern:

Statutory Regulations.

ii) Codes and Standards.

Owner's concurrence shall, however, be sought before taking a decision in the matter.



3.0 AREA CLASSIFICATION AND EQUIPMENT SELECTION

- 3.1 In case of storage, handling or processing of flammable materials within the battery limits of the package, area classification shall be carried out in line with IS: 5572 & Petroleum Rules and OISD-179 guidelines where applicable.
- 3.2 Selection of the type of equipment for use in hazardous areas shall be done in accordance with IS: 5571 and other safety regulations as applicable. The electrical equipment shall meet the requirements of relevant IS, IEC or NEC standards. Increased safety type Ex (e) equipment shall not be permitted for use in Zone-1 areas.
- 3.3 Electrical equipment for hazardous areas shall be certified by CMRI and approved by CcoE (or equivalent statutory authority of the country of origin) for installation and use in the specified hazardous area. Flameproof equipment of indigenous origin shall be BIS marked. Vendor shall furnish the necessary certificates indicating such approvals.
- 3.4 All the electrical and electronic component shall be in flame/explosion proof housing suitable for area classification: Hazardous area, Class 1, Division 1, Group D as per NEC or Class 1, Zone 1, Group IIA/IIB as per IS/IEC, Temperature Class T3, and completely enclosed in a securely lockable dispenser cabinet. No component of the dispenser shall be installed outside the cabinet.

Certificate from recognized agency to the effect is required to be produced that equipment supplied and/or installed conforms to above area classification.”

4.0 EQUIPMENT SPECIFICATIONS

- 4.1 Specifications of equipment shall be furnished for review by the owner. All equipment and components shall be new and supplied by approved reputed manufacturers. Equipment requiring specialized maintenance or operation shall be avoided as far as possible and prototype equipment shall not be accepted. All equipment shall be complete with all necessary weather protection including tropicalization to prevent damage due to climate, dust and corrosive vapours.
- 4.2 Vendor shall be responsible for any damage to the equipment during transit. All packages shall be clearly, legibly and durably marked with uniform block letters giving the relevant equipment material details. Each package shall contain a packing list in a waterproof envelope.
- 4.3 All electrical components and equipment shall be sized to suit the maximum load under the most severe operating conditions.
- 4.4 All electrical equipments shall be supplied with double-compression cable glands, made of nickel-plated brass, tested and certified to be used in zone-1, hazardous area.



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- 4.5 All electrical components should be suitably weather proof to prevent short circuits, corrosion and should be suitable for installation in Hazardous classification as class I, Division 1, Group D
- 4.6 Although the supply is being arranged through UPS System, but in some remote occasions, the power supply may be from DG sets with poor regulations and thus power supply available from BGL may contain harmonics, transients and surges etc. The Electronics shall be compatible to the supply system as no transient, surge or harmonics protection is provided by BGL. Bidder to include suitable surge protection device/ voltage conditioning unit, as required, in their scope for accurate and safe operation of dispenser.
- 4.7 Rated voltage and frequency for the equipment shall be indicated below:

Ambient Temp :	Max. 47.5 °C & Min. 1.7 °C
System Voltage:	230V + 10% Single Phase AC
System Frequency:	50 Hz + 3%
System Earthing:	Solidly Earthed

We have envisaged solid earthing for the system. However, if specific earthing is required for the system –electronics, the same to be highlighted by bidder; otherwise system earthing including making of earth-pits etc. Shall be provided by the successful bidder.

Name of the manufacturer, type of enclosure protection and certificate no. With name of testing/Certifying agency shall be furnished with bids / for approval



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DATA SHEETS



CNG DISPENSER FOR CAR

SR. NO.	PARAMETER	SPECIFICATION	OFFERED
1.0	Dispenser	Car	
1.1	Make		
1.2	Model		
1.3	Normal Inlet Pressure Kg/cm ² g	250	
1.4	Maximum Fill Pressure Kg/cm ² g	200	
1.5	Operating Temperature range of wetted parts	(-) 10 °C to 60°C	
1.6	Flow Rate (kg/min)	≥ 15	
1.7	Nominal flow (kg/min)		
1.8	Minimum flow (kg/min)		
1.9	Overall Cv of dispenser from inlet of dispenser to outlet of fill nozzle		
1.10	Batch accuracy	± 1.5%	
1.11	Electrical Supply	AC 230 Volts ± 10% 50Hz ± 3%	
1.11.1	Tolerable value of voltage range for accurate operation		
1.12	Fill Nozzle		
1.12.1	Type	NGV1 & NZS 5425	
1.12.2	Make	-	
1.12.3	Pressure Rating Kg/cm ² g	250 Kg/cm ² g	
1.13	Flexible fill & vent hose	Double	
1.13.1	Type		
1.13.2	Make		
1.13.3	Pressure Rating Kg/cm ² g		
1.14	Sequential filling	Three bank	
1.15	Mass Flow Meter		
1.15.1	No. of metering lines	One independent	
1.15.2	Metering principle	Coriolis	
1.15.3	Make		
1.15.4	Model		
1.15.5	Mass Flow accuracy for gas meter (inclusive of linearity, hysteresis, repeatability errors)	± 0.5%	
1.15.6	Repeatability	±0.25%	
1.16	Temperature compensation	Yes	
1.17	Breakaway coupling	YES	
1.18	Data Recorder	YES	

NOTE:For all Electrical/Instrumentation items vendor shall provide certificates issued by statutory Inspection Authority confirming suitability of Design/Construction for specified Hazardous Area Classification.



MASS FLOW METERS (CORIOLIS TYPE) for car dispenser				
Units:	Flow -> CNG	CNG-Kg/Hr Pressure->	Temperature-> °C	Level /Length->mm
General	1.	Tag No.		
	2.	Line No.		
	3.	Service		
	4.			
Meter	5	Type		
	6	Function		
	7	Conn. Size: Size &Rating, Facing & Finish		
	8	Body Material		
	9	Wetted Parts Material		
	10	Enclosure		
	11	Conduit connection		
	12	Range		
	13	Accuracy		
	14			
	15			
	Convertor	16	Load Resistance – ohms.	
17		Output		
18		Power Supply		
19		Area Classification		
20		Intrinsically safe /Expl. Proof		
21		Enclosure		
22		Conduit connection		
23		Mounting		
24		Distance from control room		
25				
Options	27	Filter/Mesh Wire		
	28	Mounting Brackets		
	29	Interconnecting		
	30	Special cabling		
	31	Cable glands		
	32	Accessories for hot tap		
	33			
	34			
	35			
	Service Conditions	36	Fluid & state	
37		Maximum Flow		
38		Minimum Flow		
39		Normal Flow		
40		Pressure – Open. Max.		



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	41	Temp. C – Open. Max.			
	42	Oper. S.G. Mol. Wt			
	43	Max. order Viscosity mpa . s(cp)			
	44	Max. Allowable Pr. Drop			
	45	Model No. Meter convertor			
	46	Specification Remarks			
	47	Specification Remarks			

Notes:

DEVIATION

NO DEVIATION



CONTROL VALVES					
Units:		Flow -> CNG	CNG-Kg/Hr Pressure->	Temperature-> °C	Level /Length->mm
General	1	Tag No.			
	2	Inlet Line No.			
	3	Outlet Line No.			
	4	Service			
	5	Line Size Schedule			
	6	Inlet Line I.D. Outlet line ID			
Body	7	Type of Body			
	8	Body Size Port Size			
	9	Guiding No. of Ports			
	10	End Conn: Flgd. Size & Rating			
	11	Facing & Finish			
	12	Body Material			
	13	Bonnet Type			
	14	Packing Material			
	15	Lubricator Isol. Valve			
	16	Trim form			
	17	Trim Mat. Plug. /Disc/Ball & Seat			
	18	Other wetted parts			
	19	Soft seating Materials			
	20	ANSI Leakage Class			
Act.	21	Type			
Uat or.	22	Close at Open at			
	23	Failure Position			
	24	Handwheel & Location			
Position	25	Air Supply Pressure			
	26	Input Output			
	27	Bypass Gauges			
Options	28	Solenoid Valve			
	29	I/P convertor			
	30	Filter with Gauge			
	31	Limit Switch			
	32				
	33				
Service Conditions	34	Fluid State			
	35	Flow Liquid Min: Normal: Max			
	36	Flow vapour Min : Normal : Max			



	37	Flow Water Min Normal Max			
	38	Inlet Pr. Nor. Min.			
	39	P @Flow rat Min :Normal : Max			
	40	Pressure Shut Off			
	41	Temp. Open. Max.			
	42	Open S.G. Mol. Wt.			
	43	Cp/Cv Compress Factor			
	44	Flash% visc.mPas (open)			
	45	Deg. Of Superheat % Solids			
	46	Vapour Pr. Critical Pr.			
	47				
Valve Data	48	CV Min. Cv Max.			
	49	CV Nor. Selected CV			
	50	Predicted Sound Level Db			
	51	Inlet Velocity m/s			
Model Nos.	52	Valve Actuator			
	53	Positioner Solenoid Valve			
	54	IBR Certification			



Solenoid Valves					
Units:		Flow -> CNG	CNG-Kg/Hr Pressure->	Temperature-> °C	Level /Length->mm
General	1	Tag No.			
	2	Line No.			
	3	Line Size & Sch.			
	4	Service			
Valve	5	No. of ways			
	6	Size – Body Port			
	7	End Connection			
	8	Material Body			
	9	Trim			
	10	Body Rating			
	11	Operating mode NC/NO/Univ.			
	12	Packing			
	13				
	14				
	15	Enclosure			
Electrical	16	Area Classification			
	17	Cable Entry			
	18	Ty. Of Energisation Dropout			
	19	Power Supply			
	20	Power Consumption VA/W			
	21	Inrush Current			
	22	Insulation Class			
	23	Voltage – Energising – Dropout			
	24				
Options	25	Manual reset			
	26	Latching on Energ./De-Energ.			
	27	Bug screen for vent port			
	28	Intrinsically safe			
	29				
	30				
Service Conditions	31	Fluid			
	32	Press. Open / Max.			
	33	Temperature C-Open/ Max			
	34	Maximum Flow			
	35	S.G. at open Temp. Mol. Wt.			
	36	Viscosity mPa.s (cp)			
	37	Allowable Press Frop			
	38	Del. P Shut Off			
	39	Valve CV			
	40				
	41				
	42	Model No.			
	43	Specification Remarks			



SELF ACTUATED PRESSURE CONTROL VALVES

Units:	Flow -> CNG	CNG-Kg/Hr Pressure->	Temperature-> °C	Level /Length- >mm
General	1	Tag. No		
	2	Line No.		
	3	Line Size & Sch.		
	4	Service		
	5			
Valve	6	Ty. Of Regulator: Std/pilot op		
	7	Size: Body Port		
	8	End Conn.: - Size & Rating		
	9	- Facing & Finish		
	10	Body Material		
	11	Trim Material		
	12	Set Point		
	13	Impulse Conn.: Int. / Ext.		
	14	Conn. Size & Type if external		
	15	Material of Diaphragm		
	16	Bonnet Type		
	17	Cv: Min. Max.		
	18	Cv: Normal		
	19	Selected Valve CV.		
	20	Predicted Sound Level (dBA)		
	21	Inlet Velocity		
	22	Packing of Seals		
	23	Lubricator ISO – Valve		
	24	Guiding No. of Ports		
	25			
Accessories	26	Pressure Indicator		
	27	Relief Valve		
	28	Line Stainer		
Service conditions	29	Fluid & State		
	30	Flow - Min. / Max.		
	31	Flow - Normal		
	32	Inlet Pr. - Max. / Min		
	33	Inlet Pr. - Normal		
	34	Del. Pr. – Max. Min		
	35	Del. Pr. - Shut Off		
	36	Temperature °C - Oper. Max.		
	37	Oper. S.G. Mol Wt.		
	38	Cp/ Cv compress factor		
	39	Flash% open visc. Mpa. S (cp)		
	40	Deg. Of Superheat % solids		
	41	Vapour Pr. / Critical Pr.		
	42	Model No. Valve / Actuator		
	43			
	44	IBR certificate		
	45	Specification Remarks		



PRESSURE RELIEF VALVES				
Units:	Flow -> CNG	CNG-Kg/Hr Pressure->	Temperature-> °C	Level /Length->mm
General	1	Tag No.		
	2	Line No.		
	3	Vessel Protected		
	4	Safety / Relief		
Valve	5	Type:		
	6	Full Nozzle Full Lift/ Mod Nozzle		
	7	Bonnet Type		
	8	Conv. / Bellows / Pilot Operated		
	9	Inlet Conn.: Size & Rating		
	10	Facing & Finish		
	11	Outlet Conn.: Size & Rating		
	12	Facing & Finish		
	13	Cap Over Adj. Bolt		
	14	Screwed/Bolted		
	15	Lifting Gear – Type		
	16	Test Gag		
	17			
Material	18	Body and bonnet		
	19	Nozzle and Disc		
	20	Spring		
	21	Bellows		
	22	Resilient Seat seal		
Options	23			
	24			
Basis	25	Code		
	26	Basis of selection		
	27			
Service conditions	28	Fluid and state		
	29	Corrosive constituent		
	30	Required flow capacity		
	31	Mol. Wt./ S.G. at Ref Temp.		
	32	Open Pressure		
	33	Open temp C / Ref Temp C		
	34	Valve discharge to		



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	35	Back Press. / Const or variable			
	36	Set Pressure			
	37	Cold Bench Test pressure			
	38	% Over pressure/ % blow down			
	39	Cp/cv [compressibility Factor]			
	40	Viscosity At Ref. Temp. mPa s(cp)			
	41	Vess.: Walltemp.C/ Surf Area-m ²			
	42				
Orifice	43	Calculated Area cm ²			
	44	Sel. Area cm ² / Orifice Design			
	45	No. of valves Reqd. for capacity			
	46	Total Area - cm ²			
	47	Actual Flow Capacity			
	48				
	49	Model No.			
	50				
	51	IBR Certification			



PRESSURE INSTRUMENTS

Units: Flow -> CNG CNG-Kg/Hr Pressure-> Temperature-> °C Level /Length->mm

General	Measuring Unit
1. Function 2. Type: - 3. Case: - 4. Mounting: - 5. Electrical Area Classification 6. Enclosure : Enclosure Class 7. Intrinsically safe: - 8. Air Supply 9. Power Supply 10. Cable Entry: 11. Accuracy: - 12. Repeability: - TRANSMITTER 13. Output 14. Trans. Power Supply Controller 15. Output:- 16. A/M switch:- No. of positions:- 17. Set point adjustment 18. Manual Regulator 19. Mode 20. Chart 21. Chart Driver 22. Moving parts matl.; - 23. Chart Speed: -	24. Service: - 25. Element : - 26. Body Material: - 27. Element Material 28. Process conn.: - process conn. Location 29. Diaphragm seal wetted parts materials: - other Material Process Conn.: Size & Rating Facing & Finish: - Capability Material:- Armour Flexible: - Armour Flexible Matl.: - Capillary length:- mm Flushing/filling conn. With Miscellaneous 30. Over range protection 31. Options: - (a) Intrinsically Safe Output meter (b) Air Filter Regulator (c) Mounting Accessories (d) 3-way manifold (e) ----- 32. Load Capability:-

TAG NO.	OPERATING PRESSURE	MAXIMUM PRESSURE	MAXIMUM TEMPERATURE	RANGE		CONTROL	SERVICE	OPTIONS
				Span	Set			



PRESSURE GAUGES

Units:	Flow -> CNG	CNG-Kg/Hr	Pressure->	Temperature-> °C	Level /Length->mm
1. Type: -				13	Connection
2. Mounting: -					connection location: -
3. Dial Size: -				14	Movement: -
Colour: -				15	Diaphragm Seal:-
4. Case Matl. :-					Type
5. Bezel Ring :-					wetted parts material – Element Matl.
6. Window Matl.:-					Lower Boy
7. Enclosure : -					Matl.
8. Pressure Element :-					Non-wetted parts materials :
9. Element Matl.:-					Process connection: size & Rating
10. Socket Material					Facing & Finish
11. Accuracy					Capability Material
12. Zero adjustment					Armour – Flexible – Matl.
					capability Length
					Flushing / filling connection
				16	Over Range Protection:-
				17	Blow out Protection:-
				18	Options: (a) Snubber
					(b) Syphon
					(c) Gauge Saver
					(d) Liquid filled casing
					(e)-----

TAG No.	Range	Operating Pressure	Maximum Service Pressure	Maximum Service Tempe.	Fluid	Service	Options



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ANNEXURES



Annexure-1: Approved Vendor List

Item code / Description	AIR FILTER / REGULATORS
VENDOR NAME	Remark
ASEA BROWN BOVERI LTD.	
BLUE STAR LTD	
DIVYA CONTROL ELECMENTS PVT. LTD.	
JANATICS INDIA PVT. LTD.	
P.RAI AND COMPANY	
PLACKA INSTRUMENTS & CONTROLS PVT. LTD	
SHAH PNEUMATICS	
SHAVO NORGREN (I) PVT. LTD	
V AUTOMAT & INSTRUMENTS PVT. LTD.	
VELJAN HYDRAIR PVT. LTD.	
ITEM CODE / DESCRIPTION	FIELD INSTRUMENTS (P, DP, F,L,T)
VENDOR NAME	REMARKS
ABB AUTOMATION LTD.	
BROWN BOVERT LTD.	
FISHER ROSEMOUNT INDIA LIMITED	
FISHER ROSEMOUNT SINGAPORE PTE LTD.	
FUJI ELECTRIC CO. LTD.	
HONEYWELL INC.	
ASHCROFT	
MURPHY	
CCS	
WAREE	
TATA HONEYWELL	
YOKOGAWA ELECTRIC CORPORATION	
YOKOGAWA BLUE STAR LTD.	
WIKA	
MSI	
ITEM CODE / DESCRIPTION	MASS FLOW METERS
VENDOR NAME	REMARK
EMERSON PROCESS MANAGEMENT	CORIOLIS TYPE
COMPAC KG-80	CORIOLIS TYPE
ITEM CODE / DESCRIPTION	PRESSURE GAUGES
VENDOR NAME	REMARKS
AN INSTRUMENTS PVT. LTD.	
BADOTHERM PROCESS INSTRUMENTS B. V.	
BOURDON HAENNI S.A	
BRITISH ROTOTHERM CO . LTD	
BUDENBERG GUAGE CO. LTD.	
DRESSER INC	
GENERAL INSTRUMENTS CONSORTIUM	
MANOMETER (INDIA) PVT. LTD.	
NAGANO KEIKI SEISAKUSHO LTD.	
WAAREE INSTRUMENTS LIMITED	
WALCHANDNAGER INDUSTRIES LTD.	
WIKA ALEXANDER WIEGAND & CO GMBH	
WIKA INSTRUMENTS INDIA PVT. LTD.	
DRUCK	



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ITEM CODE / DESCRIPTION	PRESSURE RELIEF VALVE
VENDOR NAME	REMARKS
ALSTHOM FLUIDS SAPAG	
ANDERSON GREENWOOD CROSBY	
BHEL (TRICHY)	
DRESSER INC.	
FUKUI SEISAKUSHO CO. LTD.	
INSTRUMENTATION LTD. (PALGHAT)	
NAKAKITA SEISAKUSHO CO LTD.	
NUOVO PIGNONE SPA (ITALY)	
PARCOL SPA	
SAFETY SYSTEMS UR LTD.	
SARASIN RSBD	
DK-LOK	
TAI MILANO SPA	
TYCO SANMAR LTD.	
TYCO VALVES & CONTROLS INDIA PVT. LTD	
ITEM CODE / DESCRIPTION	SELF ACTUATED PR. CONTROL VALVE
VENDOR NAME	REMARK
DANIEL INDUSTRIES INC	
DRESSER PRODUITS INDUSTRIES	
ESME VALVES LTD.	
FISHER ROSEMOUNT SINGAPORE PTE LTD.	
FISHER EXMOX SANMAR LIMITED	
GORTER CONTROLS B.V.	
INSTROMET INTERNATIONAL NV	
KEYE & MACDONALD INC	
NUOVO PIGNONE SPA (ITALY)	
PIETRO FIORENTINI SPA	
RICHARDS INDUSTRIES (FORMERLY TRELOAR)	
RMG REGEL + MESSTECHNIK GMBH	
COMPAC INDUSTRIES LTD., NZL.	
ITEM CODE / DESCRIPTION	SOLENOID VALVES
VENDOR NAME	REMARK
ALCON ALEXANDER CONTROLS LIMITED	
JEFFERSONS	
ASCO (INDIA) LIMITED	
ASCO JOUCOMATIC LTD.	
ASCO JOUCOMATIC SA	
PARKER HANNIFIN, USA	
AVCON CONTROLS PVT. LTD.	
BARKSDALE INC.	
Rotex	
HERION WERKE	
SCHRADER SCOVILL DUNCAN LIMITED	
ITEM CODE /DESCRIPTION	SPECIAL CONTROL VALVES
VENDOR NAME	REMARK
FISHER ROSEMOUNT SIGAPORE PTE. LTD.	
FLOWERVE PTE. LTD. (FORMERLY DURIRON)	
HOPKINSONS LIMITED	
METSO AUTOMATION PTE LTD. (FORMERLY NELES)	



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NUOVO PIGNONE SPA (ITALY)	
SPX VALVES & CONTROLS (FORMERLY DEXURIK)	
COMPAC IND. LTD. NZL	
ITEM CODE /DESCRIPTION	REGULATORS
VENDOR NAME	REMARK
COMPAC IND. LTD.	
ITEM CODE /DESCRIPTION	TWO WAY / THREE WAY VALVES / FITTINGS/TUBE/NEEDLE VALVE/
VENDOR NAME	REMARK
SWAGelok, PARKER, COMPAC	
ITEM CODE /DESCRIPTION	BREAKAWAY COUPLING
VENDOR NAME	REMARK
STABULI	
ITEM CODE /DESCRIPTION	NOZZLE CAR
VENDOR NAME	REMARK
STABULI	
ITEM CODE /DESCRIPTION	HOSE
VENDOR NAME	REMARK
SYNFLEX	



Annexure-2: VENDOR DATA REQUIREMENT

1.0 DRAWING AND DATA REQUIREMENT

1.1 The following data and information marked "X" shall be furnished by the vendor for Car Dispenser:

S. No.	Description	With Bid	After Job Award		
			For Review	For Information	Final in Book Form
1	2	3	4	5	6
1.0	GENERAL				
1.1	Filled in Material Requisition Compliance Schedule.	X			
1.2	Filled in Deviation Schedule.	X			
1.3	Duly filled up "Experience Record Schedule". Vendor to note that information furnished by them shall be used to assess the provenness of offered Dispensers and Qualification of vendor, Accordingly vendor to furnish references of those cases which are matching with offered Dispensers.	X			
1.4	Installation manual			X	X
1.5	List of components of Dispenser with Make & Specification of components. Vendor shall also submit "Technical Catalogues" of components	X			
1.6	Start-up, operation & maintenance manual showing assembly details and critical tolerances. A copy of all certified drawings & documents to be enclosed.			X	X
1.7	Lubricant list with specification			X	X
1.8	Battery limit (interface) drawing/ information	X	X		
1.9	Drawing list and submission schedule		X		
1.10	Project implementation schedule, ordering and inspection schedule for long lead and major items		X		
1.11	Pre-commissioning & commissioning procedure		X		
1.12	Performance guarantee test procedure		X		
1.13	Weights & Measures Certificates from the country of origin for offered models of Car Dispensers unit model as well as mass flow meter model for dispensing specified mass flow rate at specified overall batch accuracy.	X	X		X



1.14	The "Test Certificate" for mass flow meter.		X		
1.15	Weights & Measures approval from Indian Authorities.		X		
2.0	DESIGN				
2.1	Process flow diagrams (PFDs) and Piping & Instrumentation diagrams (P&IDs) of sub systems and complete system with write-up on operation	X	X		X
2.2	Data sheets of Car Dispensers duly filled up.	X	X		X
2.3	Basic design calculations for system design, equipment selection		X		X
2.4	Test certificates for Hose assembly		X		X
2.5	Performance data, vendor literature for equipment selection, performance curves with duty point marked for individual equipment		X		X
2.6	Specification for piping material & valves.		X		X
2.7	Utility requirement	X	X		X
2.8	Detail of control wiring diagram, interlock/ shutdown/ control scheme with write up on operation. Sizing calculation for instrument items.	X	X		X
3.0	CONSTRUCTIONAL FEATURES				
3.1	G.A. drawing of Dispensers showing maintenance clearances required.	X	X		X
3.2	Cross section drawings of individual equipment/ skid, material & parts list.				
3.3	Termination & Wiring Diagrams			X	X
4.0	Drawings, documents, data as asked under Electrical & Instrumentation specifications of this Material Requisition.		X		

1.2 Document Distribution Schedule

- 1.2.1 Documents and drawings under column no. 3 shall be submitted with each copy of the bid.
- 1.2.2 Documents listed under column 4 are to be submitted in 3 copies
- 1.2.3 Documents listed under column 5 are to be submitted in 3 copies.
- 1.2.4 Final technical file shall be supplied in hard copy as indicated in column 06, and in electronic format (.pdf Acrobat files) on Six (6) CD-ROMs / pen drive.

1.3 Details to be included in Final Documents Books

- 1.3.1 Copy of P.O. and all amendments.
- 1.3.2 Copy of Purchase Requisition and all amendments.
- 1.3.3 Manufacturing Data Book containing all test certificates of components, raw materials, stage manufacturing tests and inspections, final tests & inspection documents including welders' qualification & welding procedure qualification, repairs & reworking carried out in shops. All raw material test certificates must be correlated to the P.O. Item No. & component to which they relate by clear stating on the certificates.



- 1.3.4 All design calculations carried out by the vendor.
- 1.3.5 Final Drawing Index and all as-built drawings reduced to A3/ A4 size and wherever reduction is not possible, full size copies duly folded and placed in plastic pockets.
- 1.3.6 Catalogues/leaflets of sub-vendors/suppliers of various bought out components highlighting the components actually supplied correlated to P.O. Item Numbers.
- 1.3.7 Operating and maintenance instructions including lubrication schedules with details of suppliers for procurement by OWNER for subsequent needs.
- 1.3.8 Release Note and Packing List.
- 1.3.9 Any other documents asked for in the Purchase Requisition.
- 1.3.10 All final drawings shall also be given to purchaser in digitized form on CD-ROM compatible to AUTOCAD software.

1.4 Special instructions for submission of Dwgs. /Documents:

- 1.4.1 Fold all prints to 216 MM x 279 MM size.
- 1.4.2 Contractor to forward the drawings and documentation to BGL (Attention vendor prints control department) clearly specifying purchasers Job no. & Req. No.
- 1.4.3 The drawing/Document no. with Rev. No. is essential. The number may be upto a maximum of 28 characters in length.
- 1.4.4 Each Drawing/Document submitted to BGL must be checked and signed/stamped by contractor before it is submitted to BGL.
- 1.4.5 Revision number must change during subsequent submission of vendor document.
- 1.4.6 Multi-sheet documents other than drawings must be submitted in their entirety in the event of a re-submission even if only a few sheets are revised.
- 1.4.7 Final submission in bound volumes shall necessarily have a cover page giving project title, Item name, P.O. No. Particulars of owner & vendor and an index giving list of drawings & documents included (with revision no.).
- 1.4.8 All vendor drawings to be provided with a blank space measuring 75 mm W x 38 mm H for marking of review codes etc. by BGL.
- 1.4.9 The review of the vendor drawings shall be done by BGL, as applicable, under the following review codes:

Review Code A	No comments.
Review Code B	Proceed with manufacture/fabrication as per commented drawings. Revise drawings required
Review Code C	Document does not conform to basic requirements.

- 1.4.10 Review of vendor drawings by BGL would be only to check compatibility with basic designs & concepts & would in no way absolve the contractor/vendor of his responsibility to meet applicable codes, specifications & statutory rules/regulations.

Vendor shall submit within 10 days after placement of FOI, the complete list of drawings/ documents with submission dates against each. Critical drawings, only, the list of which will be agreed during kick-off meeting shall be reviewed jointly at BGL's office.



Annexure-3: VENDOR DATA REQUIREMENT (INSTRUMENTATION)

S.No.	Description	Document Category		
		Inf.	Review	As built
1.	Drag and Document Schedule		*	*
2.	Piping and Instrument Diagram		*	*
3.	Instrument Index	*		*
4.	Sub- Vendor List for Instruments and accessories		*	
5.	Instrument Sizing calculations		*	*
6.	Utility requirements	*		
7.	Level Sketches			
8.	Material requisition		*	
9.	Purchase Requisition	*		*
10.	Functional schematic	*		*
11.	Logic diagrams		*	*
12.	Instrument loop drawings	*		*
13.	Control room layout			
14.	Panel front arrangement		*	*
15.	Power Supply Distribution		*	*
16.	Wiring diagram	*		*
17.	Configuration diagram		*	*
18.	I/O assignment if applicable	*		*
19.	Instrument Duct/Tray layout			
20.	Instrument Cable schedule			
21.	Instrument location plans			
22.	Installation drawings			
23.	Bill of material for installation items	*		*
25.	Inspection and test procedures	*	*	
26.	Complete catalogues with part list for all vendor supplied instruments, controls etc	*		*
27.	Installation, operation and maintenance manuals			*

Note: This list indicates the minimum drawings and document requirements. However vendor shall submit a complete list of document and drawing schedule listing all drawings and documents to be submitted by them during the course of execution of the job. The schedule shall list all drawings and documents along with their number and expected date of submission.



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Annexure - 4 QUALITY ASSURANCE PLAN

Coding Structure						Manufacturer
Codes for Extent of Inspection, Tests & Test Certificates				Codes for Documents		MFR – Manufacturer BGL – Owner TPIA – Third party appointed by Vendor PMC - TEPL
Code	Description	Code	Description	Code	Description	
1	Visual	12	Power failure	D1	Approved GA Drawing	Customer's Information Customer: M/s BGL Item : As listed in M.R.
2	Dimensional	13	Failure of metering	D2	Approved P&ID	
3	Fitment & Alignment	14	Failure of totaliser	D3	Approved data sheet	
4	Physical Test	15	Calibration	D4	Approved Bill of material	
5	Chemical Test	16	Pressure test	D5	Purchase requisition	
6	Running Test	17	Noise & vibration	D6	W&M Certificate from country of origin	
7	Leak Test	18	Enclosure protection test	D7	Calibration certificate of all measuring test / instruments and gauges	
8	Dispenser should automatically stop in case of failure of tantalizer	19	Paint shade verification			
9	Check for single bank system	20	Test certificate for bought out components			
10	Check for manual shut off	21	Flow capacity test			
11	Batch accuracy test					



INSPECTION AND TEST PLAN

EQUIPMENT DETAILS			INSPECTION AND TESTS				SCOPE OF INSPECTION AND TESTS		
Sr. No	Description	Qty.	RAW MATERIAL AND Stage Inspection		FINAL INSPECTION		Documents for submission to BGL/PMC/TPI	Acceptance Criteria	Activity by BGL/PMC/TPI
			MFR	BGL / PM C/T PI	MFR	BGL/PMC/TPI			
1	Dispenser Frame	each	1, 2, 3, 4 & 5		1,2, 3	1,2,3	D1,D2,D3, D4	Tech. Specs in PO	Review of documents
2	Mass Flow Meter	each	1,2,3,4, 5,15		1,2,3,1 5	1,2,3,15	D1,D2,D3, D4,D7	D7 & Tech Specs in PO	Review of documents
3	Actuator Valves	each	1,2,3,4, 5,6,7		1,2,3,6 ,7	1,2,3,6,7	D1,D2,D3, D4,D7	D7 & Tech Specs in PO	Review of documents
4	Filling hose	each	1,2,3,4, 5,16		1,2,3,1 6	1,2,3,16	D1,D2,D3, D4	Tech. Specs in PO	Review of documents
5	Totaliser	each	1,2,3,8		1,2,3,8	1,2,3,8	D1,D2,D3, D4,D7	D7 & Tech Specs in PO	Review of documents
6	Software	1	9		9	9	D3	Tech. Specs in PO	Witness
7	Pressure Gauge	each	1,2,3,4, 5,15		1,2,3,1 5	1,2,3,15	D1,D2,D3, D4,D7	D7 & Tech Specs in PO	Review of documents
8	Pressure Transducer	each	1,2,3,4, 5,15		1,2,3,1 5	1,2,3,15	D1,D2,D3, D4,D7	D7 & Tech Specs in PO	Review of documents
9	Shut off valves	each	1,2,3,4, 5,10		1,2,3,1 0	1,2,3,10	D1,D2,D3, D4,D7	D7 & Tech Specs in PO	Review of documents
10	Performance Test (using CNG)	each	11,21		11,21	11,21	D3,D7	D6, D7 & Tech Specs in PO	Witness
11	Dispenser response	each	12,13,1 4,17,19 ,20		12,13, 14,17, 19,20	12,13,14,17, 19,20	D3,D7	D7 & Tech Specs in PO	Witness

Note:

1. The Above Testing and acceptance criteria are minimum requirements, however, manufacturer shall ensure that the product shall also comply to the additional requirements as per Particular Technical specifications(PTS).
2. The supplier shall submit their own detailed QAP prepared on the basis of the above for approval of Owner/Owner's representative and TPIA.
3. Supplier shall submit Calibration certificates of all Instruments/Equipment to be used for Inspection and Testing to TPIA with relevant procedures and updated standards for TPIA review/Approval.
4. All bought out items will be procured with 3.2 Certificates.
5. Vendor shall in coordination with Supplier/Sub vendor shall issue detailed Production and Inspection schedule indicating the dates and the locations to facilitate Owner/Owner's representative and TPIA to organize Inspection.
6. Owner/Owner representative shall review/approve all the documents related to QAP/Quality manuals/Drawings etc. submitted by supplier.
7. All reference Codes/ Standards, Documents, P.O. Copies shall be arranged by vendor / supplier for reference of TPIA/BGL at the time of Inspection
8. At the time of delivery of material in stores, vendor will submit copy of all related document of inspection along with release note & MTC.

(Seal & Stamp of Bidder)



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SECTION – 9

MATERIAL REQUISITION



DESCRIPTION OF GOODS AND/OR SERVICES

Item	Quantity Unit	Description
1	05 Nos.	CNG Dispenser Package
		Design, Engineering, Manufacturing, Assembly, Inspection and Testing at works and Supply of CNG Dispensers with flow rate as mentioned below along with Comprehensive AMC during warranty period & defined in the Tender document.
		Services for Unloading Erection, Testing, Commissioning and field performance testing of dispenser as defined in specifications.
		Lump Sum annual Maintenance charges per dispenser for the period of three year after the warranty period as defined in specifications.
		Car Dispensers, with Dual arm, capacity ≥ 15 kg/min (each arm), along with all necessary accessories as defined in Technical specification

B. REMARKS / COMMENTS

1. General notes

VENDOR's compliance

Vendor shall submit his bid in full compliance with the requirements of this MR and attachments.

Vendor must include the following statement in his bid :

We certify that our bid is fully complying with your enquiry dated.....,and referenced.....

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

2. Compliance with specification

The VENDOR shall be completely responsible for the design, materials, fabrication, testing, inspection, preparation for shipment and transport of the item strictly in accordance with the Material Requisition and all attachments thereto.

3. VENDOR's scope

In Vendor's scope of work is included the items with all internals and accessories shown on the data sheets, specifications and all unmentioned parts necessary for a



satisfactory operation and testing except those which are indicated to be out of the Vendor's supply.

4. Inspection

Vendor shall appoint anyone of the following TPIA for inspection purpose after approval by consultant / purchaser:

- a) Lloyd Register of Industrial Services
- b) Technische Ulierwachungs Verein (TUV)
- c) Det Norske Veritas (DNV)
- d) AIB-Vincotte
- e) Bureau Veritas
- f) SGS
- g) American Bureau Services (ABS)
- h) Velosi Certification Services

Apart from inspection by TPIA, inspection shall also be performed by BGL delegate, as set out and specified in the codes and particular documents forming this MR if required.

5. Applicable documents

General prescriptions, requirements and information are listed in Annexure C of this Material Requisition.

6. VENDOR's documents

Vendor shall supply the documentation as listed under Technical specification.



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SECTION – 10
SCHEDULE OF RATES



S.No	Description of item	Unit	Qty (A)	Unit rate in Rs (B)	Total Amount in Rs.(C)=(A)X(B)
1	Design, detail engineering, manufacturing, assembly, factory testing, supply of dispenser including packaging, handling transportation of Dispenser, loading/unloading at BGL sites, documentation etc. and providing all related services including installation, integration, site acceptance testing, trial run and drawings, documents and licensed software & hardware, converters, cables etc. confirming to BGL and providing Comprehensive AMC during Warranty period of 01 year as mentioned in specification enclosed with tender				
	SUPPLY				
1.a	Design, Engineering, Manufacturing and supply of CNG CAR DISPENSER as per scope of work defined in the tender documents	No's	5		
	Excise duty @ _____%				
	Sales Tax @ _____% without C-Form				
	Freight and Insurance @ _____%				
	Total Amount inclusive of all applicable taxes and duties towards supply (Rs.):				
	INSTALLATION AND COMMISSIONING:				
1.b	Erection, Testing, commissioning & calibration, guaranteed performance test of each supplied CNG CAR DISPENSERS at BGL locations inclusive of all required manpower, tools, tackles, spares if necessary etc., and as per directions of EIC	No's	5		
	Service Tax @ _____%				
	Total amount inclusive of all applicable taxes and duties towards Installation and commissioning (Rs.)				



2	COMPREHENSIVE AMC				
2.a	Lump-sum Comprehensive Maintenance charges of each supplied CNG CAR DISPENSER for 02 years after Post-Warranty inclusive of supply of all consumable, all spares & Manpower etc., and as per directions of EIC	No's	5		
2.b	Lump-sum Comprehensive Maintenance charges of each supplied CNG CAR DISPENSER for 03rd year after Post-Warranty inclusive of supply of all consumable, all spares & Manpower etc., and as per directions of EIC	No's	5		
	Service Tax @ _____%				
	Total amount inclusive of all applicable taxes and duties towards Comprehensive AMC for 04 years				
	Total Amount for supply, installation, commissioning and comprehensive AMC for 04 years in Rs.(1.a+1.b+2.a+2.b)				

Notes:

1. **The Price Quoted above for supply must be on FOT site basis.**
2. **Dispensers shall be utilized at Hyderabad & Vijayawada Location of BGL. However, instruction shall be given by EIC during Dispatch. Bidder Shall be consider while quoting the rates.**
3. **Bidder shall quote the Unit Rate for Comprehensive AMC of SOR item (2.a) considering one no. of Dispenser for a period of 24 Months.**
4. **Bidder shall quote the Unit Rate for Comprehensive AMC of SOR item (2.b) considering one no. of Dispenser for a period of 12 Months.**
5. **Evaluation will be done at lowest cost to Owner (BGL).**