



TECHNICAL SPECIFICATION FOR SUPPLY OF CNG DISPENSER



GUJARAT ENERGY

TECHNICAL SPECIFICATION
SUPPLY OF CNG DISPENSER

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TECHNICAL SPECIFICATION FOR SUPPLY OF CNG DISPENSER

1. INTRODUCTION

GUJARAT ENERGY LIMITED (GEL) (erstwhile Gujarat Gas Ltd.) having City Gas Distribution Networks for distributing Natural Gas to Industrial/Commercial and Domestic Customers and CNG Stations across 41 districts in the state of Gujarat, Rajasthan, Madhya Pradesh, Haryana, Punjab, Maharashtra and Union Territory of Dadra & Nagar Haveli. GEL is committed to develop eco-friendly infrastructure and transportation fuel for public services in its operating areas as awarded by PNGRB from time to time.

2. GENERAL

Complete Design, Engineering, Manufacturing, Fabrication, Assembling, Packaging, Inspection and Testing at Vendor Works, Supply, Transportation, Loading, Unloading, Installation, Erection, Testing, Commissioning, Mandatory Spares, Annual Maintenance and Documentation for CNG dispensers for dispensing CNG to automobiles.

3. AMBIENT CONDITIONS

The climatic conditions to be considered for selection, design and rating of equipment shall be as indicated below:

- Design Ambient temp min/max °C - -5 °C / 50 °C
- Design relative humidity - 90 %
- Design Temperature - 60 °C

The equipment offered shall be suitable for smooth, efficient and trouble free service in the tropical climate prevailing at site as indicated above.

The equipment shall be designed to give efficient and reliable performance under industrial conditions and shall be rendered proof against rats, lizards and other vermin's.

4. INSTRUCTIONS TO BIDDER

- 4.1 This specification describes the technical specification of the equipment to be supplied and installed at CNG stations.
- 4.2 Various parts of the specification shall be read in conjunction with each other. In cases where requirements given in different parts differ, the most stringent shall govern.
- 4.3 The specification indicates the scope and requirements completely and clearly to the extent 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 offer.
- 4.4 The drawings and reference information mentioned elsewhere in this specification shall be considered as part of this document. Anything specified in this specification but not clearly shown in the drawings, or vice versa shall be treated as indicated in both specifications and drawings.
- 4.5 It will be the responsibility of the Bidder to comply fully with relevant National/ International standards, Indian Electricity Act, Indian Electricity Rules, Regulations of Insurance association of India and Factories Act.
- 4.6 It shall also be the responsibility of the Bidder to prepare and submit all necessary drawings, calculations, test certificates, reports, etc. as required by concerned inspectorate as per requirement.



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- 4.7 The Bidder shall carry out modification required by the statutory bodies either during the approval or during inspection of the installation. All expenses shall be borne by the Bidder. The responsibility of Owner shall be limited to the extent of reimbursement of inspection fee charged by any statutory authority.
- 4.8 The Bidder shall provide dispenser data address and protocol address for automation and SCADA.
- 4.9 All necessary manpower, tools & tackles, transport, communication, cranes, scaffolding etc required to suit overall erection program within the scheduled time shall be provided by bidder.
- 4.10 All safety and warning notices, barriers, padlocks, etc. required during installation, testing and commissioning for the safety of all site personnel and equipment shall also be provided by the Bidder.
- 4.11 The Bidder shall supply, install, maintain and subsequently remove all temporary supplies and lighting as may be required by the Bidder during the installation.
- 4.12 Civil foundation drawings shall be submitted within two weeks of placement of order. In case the requisite information regarding requirement of slots, holes, pipe and other fixing inserts, etc. as required for proper installation of equipment is not indicated by the Bidder within two weeks from placement of order, such facilities shall have to be arranged/ provided by the Bidder at their own cost.
- 4.13 In case the proper execution of the work depends upon the performance of the other contractors or where the Vendor considered that his work is being unreasonably interrupted by the activities of the other contractors, he shall so notify Owner in writing immediately. If the Bidder fails to do so, it shall be deemed that he is satisfied with the current conditions.
- 4.14 Any work which is considered to be unsatisfactory and of poor workmanship shall be rectified by the Bidder without any extra cost implication.
- 4.15 The Bidder shall not vary the scope of work as detailed in tender and approved drawings without written permission of the Owner.
- 4.16 Necessary care shall be taken so that during welding and/ or high voltage testing, current do not pass or voltage do not appear across terminals/components either directly or otherwise which may damage them.
- 4.17 Bidder shall hire the services of manufacturer's erection/ commissioning engineer (at their own cost) for supervision of erection, testing and commissioning of the equipment supplied by them.
- 4.18 The Bidder engaged for carrying out installation work shall appoint full time supervisor(s) and depute him/ them at site to supervise the installation work. All work shall be done under direct supervision of these supervisors.
- 4.19 The Bidder shall complete and fulfil all formalities with the statutory authorities having jurisdiction in the area. Bidder shall also arrange for inspection and approval of installation.
- 4.20 The Bidder shall attend weekly progress meetings and all other meetings called by the Owner. The Bidder's representative shall have the authority to make all decisions related to the Contract.
- 4.21 The Bidder shall correct all project original drawings with "As Built" information and shall on completion of erection of the equipment submit originals of all finalized drawings to the Owner.
- 4.22 The bidder shall fulfil the PESO requirement and obtain required PESO as well as statutory valid approvals before the bidding for dispensers, without valid approvals, the bids may be liable to reject.



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5. SCOPE OF WORK

The scope of work / services to be provided by the Bidder shall be inclusive of but not limited to:

- 5.1 Complete Design, Engineering, Manufacturing, Fabrication, Assembling, Packaging, Inspection and Testing at Vendor Works, Supply, Transportation, Loading, Unloading, Installation, Erection, Testing, Commissioning, Mandatory Spares, Annual Maintenance and Documentation for CNG dispensers for dispensing CNG to automobiles as per this tender document.
- 5.2 Packaging, dispatching to site including transportation, handling and transit insurance.
- 5.3 Receipt of material, unloading, loading, shifting, Storage as per manufacturer's recommendation and Supply of drawings & documents.
- 5.4 Supply of erection & commissioning spares.
- 5.5 Supply of spares as per Gujarat Energy Ltd requirement.
- 5.6 Documentation and statutory approvals.
- 5.7 Shop inspection and testing by third party inspection agency.
- 5.8 TPI Inspection charges shall be borne by the bidder. List of TPI agency is provided in Vendor list
- 5.9 The Bidder shall be responsible for supply of dispenser at Gujarat Energy Ltd stores/sites depending upon the availability of sites. The Transportation from stores to respective sites for erection, testing & commissioning shall be in Bidder's scope.
- 5.10 Bidder shall submit compliance certificate required by statutory authority to GGL without any cost.
- 5.11 Bidder will deploy the required manpower for meeting GGL requirements
- 5.12 Bidder shall submit necessary data addresses and protocol along with Quality Assurance Plan (QAP) and drawing approval and also whenever sought by GGL without any additional cost.
- 5.13 Bidder will provide service set-up in the locations falling under Gujarat Energy Limited for handling maintenance activities.
- 5.14 Bidder shall ensure that Dispenser supplier shall have Valid License from Legal Metrology Department for Manufacturing of the CNG Dispenser Model. License shall be submitted by the bidder during detailed engineering.
- 5.15 Bidder (OEM/ASP of OEM) shall ensure that all the Dispenser services will be carried out by Dispenser OEM or Dispenser Service Provider having valid license issued by Legal Metrology Department for Service of the CNG Dispenser Model. License shall be submitted by the bidder during detailed engineering.
- 5.16 Training of Gujarat Energy Ltd personnel at Bidder's works/site shall be in Bidder's scope. The travelling, lodging and boarding of GGL personnel for training shall be borne by Gujarat Energy Ltd. The Bidder's proposal shall include outlines of course contents, duration of training sessions.
- 5.17 Bidder shall comply all requirement of PNGRB T4S RO for designing of dispenser.
- 5.18 Dispensing unit shall be suitable for use of CNG in accordance with NGV 4.1 and hoses as per NGV 4.2 and breakaway as per NGV 4.4



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6. DETAILED SCOPE OF SUPPLY OF CAR/ BUS DISPENSERS

The purpose is to outline minimum requirement for design, Engineering, Manufacture, assembly, testing, supply, erection, testing at site, commissioning and Maintenance of CNG Car Dispensers.

6.1 CODES & STANDARDS

All the applicable statutory codes (indicative list mentioned below), national laws and local regulations for safety and environment protection shall be followed by the vendor for design, engineering, fabrication etc. The bidder shall obtain from concerned authorities all necessary approvals.

- 6.1.1 OISD 179
- 6.1.2 NFPA 52,70
- 6.1.3 ANSI 31.3,31.8
- 6.1.4 ASTM 269
- 6.1.5 NEC
- 6.1.6 IS 5572
- 6.1.7 IS 5571
- 6.1.8 NZS 2425,NZS 2525
- 6.1.9 NGV 4.1 /CSA 12.5
- 6.1.10 NGV 4.2 /CSA12.52
- 6.1.11 NGV 4.4 /CSA 12.54
- 6.1.12 NGV 4.6 /CSA 12.56
- 6.1.13 NGV 4.7 /CSA 12.57
- 6.1.14 IEC 60079-11
- 6.1.15 Indian Explosive Act.
- 6.1.16 Indian Electricity rule
- 6.1.17 NEMA
- 6.1.18 CENELEC,
- 6.1.19 IEC
- 6.1.20 Gas Cylinder Rule 2016
- 6.1.21 PNGRB-T4S (Retail outlet)

6.2 PRECEDENCE

In case of any conflict between job specifications and other documents, the following order of precedence shall apply:

- 6.2.1 Data Sheets.
- 6.2.2 Job specification.
- 6.2.3 Indian Standards/Codes applicable International standards/codes applicable.

6.3 AREA CLASSIFICATION

- 6.3.1 All the electrical and electronic components shall be in flame/explosion proof housing suitable for area classification: Hazardous area, Class 1, Division 1, Group D as per NFPA or Zone 1 Class 1, Group IIA/IIB, T3 as per IS/IEC and completely enclosed in a securely lockable dispenser cabinet. No component of the dispenser shall be installed outside the cabinet.



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- 6.3.2 Certificate from statutory body in India or agency approved by statutory body in India to the effect is required to be produced that equipment supplied and/or installed conforms to above area classification.

6.4 SAFETY

- 6.4.1 All electrical devices shall meet the requirement for the specified area classification in which they are installed.
- 6.4.2 Tubing shall be arranged in a manner so as to provide clear room for easy maintenance.
- 6.4.3 In addition to the dispenser base frame, the supplier shall provide a metal frame with bottom wire mesh screen for Dispenser protection from vermin suitable for installation of the dispenser. This frame shall be grouted in the dispenser island. The frame shall have slots for bolting the dispenser base-frame on it.
- 6.4.4 Specification of Wire Mesh
- Material – SS 304,
Diameter of Wire – 0.039 inch / 1 mm,
Mesh/Inch – 1,
Mesh Type – Square Mesh

6.5 GENERIC GAS COMPOSITION

COMPONENTS	RANGE (% by Volume)
Methane	83.6553 (May vary up to 97)
Ethane	10.9330
propane	3.1570
i-butane	1.1002
n-butane	0.6188
i-pentane	0.1468
n-pentane	0.09219
C6+	0.05065
N2	0.2337
Co2	0.01184
Neo Pentane	0.0003
Odorant	10 PPM

6.6 ELECTRICAL POWER SUPPLY

For Dispenser Unit:-

Single phase, AC, 230 Volts + 5%, 50Hz + 3% Uninterrupted Power Supply shall be provided for Dispenser Unit by Gujarat Energy Ltd,

For Critical Equipments like Mother Board, Mass Flow meter etc.

24 V DC Power supply with suitable protection shall be provided by Bidder for the critical equipments like Mother Board and Mass Flow meter etc.

Note: Bidder 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. Bidder shall indicate the power consumption.



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Necessary barriers/ equipments for protection of dispenser and its accessories (i.e. control electronic / electrical / instrumentation etc.) against power fluctuations (i.e. voltage and current) to be provided by the bidder. Any material required to be changed due to power fluctuation shall be in scope of bidder.

Necessary communication barrier/signal isolator/converter if any required for dispenser for serial communication with RTU/SCADA to be provide by bidder.

6.7 PNEUMATIC/ ELECTRO-MAGNETIC CONTROL FOR DISPENSERS

6.7.1 Pneumatic Control:

- a. Bidder shall install approved make regulator to use CNG as air equipment, by reducing CNG from 255 bar (max) to required pressure of actuator ball valves.
- b. SRV (conform to the requirements of API 520 or equivalent equipment design standards) shall be provided in downstream of Regulator.

6.7.2 Electro-Magnetic Control:

- a. Bidder shall install PESO approved electro-magnetic valve with compliance of all statutory requirement.
- b. Require Power supply (Including voltage or current rectifiers/ amplifiers) for valve with suitable protection shall be provided by Bidder. GGL will provide Single phase, AC, 230 Volts + 5%, 50Hz +/- 3% Uninterrupted Power Supply to CNG Dispenser.
- c. Valve shall meet hazardous area classification of GGL site/ CNG Station.

6.8 BATTERY LIMIT

- 6.8.1 Cabling from Electrical room of Gujarat Energy Ltd to Dispenser shall be in the scope of the Gujarat Energy Ltd. Size of the cable shall be FRLS conforming to IEC 332 Part 3 cat. A. Single pair/ 3C cable shall be 2.5mm² and.
- 6.8.2 Bidder shall provide necessary union / fittings for connecting / termination / hook- up of HP SS tubings at inlet as per the specified size.

7. SCOPE OF SUPPLY OF CAR DISPENSERS

Supply of dual arm dispenser, each arm with a flow capacity of more than 15 kg/min including the following as a minimum:

- 7.1 Two numbers of Coriolis true mass flow metering system with necessary sensor and electronics. Performance record and weights & measures certification of the meter to be submitted for acceptance. Coriolis meter shall have local integral display and it shall be programmable and security lockable.
- 7.2 The port of the mass flow meter from which the display is connected should be different from the port, where mother board is connected, the totalizer of mass flow meter and totalizer of Mother board of dispenser should have different address with unique values without interference, so we can take reference reading in event of jumping of reading/malfunction of totalizer.
- 7.3 Three rows liquid crystal backlit displays or any other display unit as approved by PESO for night viewing showing for each fill, total sale in Rupees (0000.00), quantity of gas sold in Kg (000.00) or (0000.00), unit price of CNG in Rs/Kg (000.00) for each hose on both sides of the dispenser. Displays shall be weather proof to IP65 and relevant certificate shall be provided.
- 7.4 Non-resettable and non-volatile totalizer up to 9999999999/ 9999999999 for total CNG sold in Kgs. with an independent battery backup. Since the dispensers are used for custody transfer purpose, the totalizer must



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not reset in any eventuality not even in the case of electronic failure. Bidder to provide suitable electronic digital display unit separately for the totalizer such that all the statutory requirements are complied. Displays shall be tamper proof & it shall only be resettable under 'engineering mode' of programming.

- 7.5 Two CNG flexible electrically conductive twin fill and vent hoses with NGV-1, type-2 class -A fill nozzles with captive vent including 3-way vent valve are required. Bidder shall also include supply of breakaway coupling in each hose. Each hose shall be 3/8" ID 5000 psig, minimum 3.5m long. Bidder shall include ball valves associated with pneumatic actuation for dispensing of gas.
- 7.6 Protective sleeve/cover for each main Filling hose and vent hose shall be provided by supplier. Design of the protective sleeve/cover shall be such that hose does not rub ground under normal operation.
- 7.7 First fill hose of car dispenser: NZS (hex type/1 feet flexible hose) nozzle shall be provided. Suitable NZS to NGV adaptor for hose shall also be included.
- 7.8 Second fill hose of car dispenser: NGV 1 fill nozzle. Nozzle shall be designed for high frequency use with a minimum cycle of 100,000 and shall meet all requirements of NGV-1 Type-2, Class A nozzle. Suitable NGV to NZS adaptor for hose shall also be included.
- 7.9 Minimum one numbers of three bank electronic software and controller including hardware for both arms as per OEM design. Bidder to include active serial port with OSI for interfacing with future printer, smart card or SCADA, etc.
- 7.10 Two numbers of holster/cradle for fill nozzles along with weather caps for the protection of nozzles.
- 7.11 Two number of liquid fill 4" dia (0-400 kg/cm²) pressure gauge along with block and bleed arrangement showing the vehicle filling pressure. No bypass shall be provided as a safety requirement. Pressure gauge glasses shall be Shatter Proof.
- 7.12 One number of manual shut-off valves for each fill hose.
- 7.13 One stainless steel body cabinet with door/panel.
- 7.14 Temperature compensator to limit fill pressure to 250 Kg/cm²g equivalent at 15 degree C with two numbers of pressure limiter to limit fill pressure to about 250 Kg/cm²g. Bidder to include two pressure transducers per hose. Temperature compensator shall be programmable with 200 kg/cm² gas nominal value with range from 190 to 250 kg/cm²g. Provision to deactivate /activate temperature compensation mode is also required.
- 7.15 Back-up Power supply for displays so that display remains for at least for 15 minutes after power failure.
- 7.16 Interconnecting ½" OD SS tubing, fittings, valves, NRV's as required. Fittings shall be double ferruled compression fittings certified for use in CNG application.
- 7.17 Hardware and software required with the dispenser for Weights and Measures certification.
- 7.18 One number of power fail-safe valves for each hose. Fail safe valve to be zero leakage under worst operating conditions and also during power failure.
- 7.19 Coalescent type filter element of approved make shall be fitted in the approved housing at inlet of each bank supply line with manual drain valve to ensure that the oil carry over in the CNG being filled to Vehicle is < 5 PPM. Bidder shall supply dispenser having separate drain arrangement to be taken outside the cabinet, which shall be extended by Gujarat Energy Ltd upto the pit / chamber, so that Coalescent filters can be drained



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without giving access to remaining parts of the dispenser. Bidder to provide liquid filled differential pressure gauge of 2" dia across the filter to know the pressure drop across the filter.

- 7.20 Any other item required for safe and accurate operation of dispenser.
- 7.21 One set of erection, commissioning & mandatory spares for each dispenser as recommended by Bidder, Bidder to furnish list separately. If any spare other than those recommended is consumed during commissioning, Bidder to supply the required spares free of cost. The fill hose including the break-way coupling, three-way valves and fill nozzles are prone to wear and tear during the operation of the dispenser. Bidder shall include in his offer of mandatory spares all such items requiring replacement during use. Bidder shall also include all consumables and lubricants in his scope.
- 7.22 **NOTE:-** Wherever word "Set" has been used, Bidder shall detail out item-wise the components & their quantities in his bid. 50 sets means total quantity installed in 50 dispensers. Flexible hose and vent hose supplied with dispensers i.e. including three-way valve, nozzle and any other item that makes the assembly complete.
- 7.23 Bidder to recommend and include all spares required for 2 years normal operation & maintenance of dispensers.
- 7.24 Foundation: - Bidder shall include in his scope provision of base frame to be embedded in the foundation. Bidder shall supply base frame in advance.
- 7.25 The dispenser shall be shipped in fully wired and assembled condition. Only gas supply connection and power supply connection shall be made at site. The dispenser shall be packaged to withstand rough handling during ocean shipment and land journey. It shall be Bidder's responsibility to make good any deterioration, which occurs during shipment. Sling points shall be clearly indicated on crates.
- 7.26 Full-bore isolation SS ball valves on the gas inlet (all banks) with 1/2" Tube OD end connection for dispensers shall be provided by bidder.
- 7.27 Common drain arrangement outside the dispenser cabinet (with only one outlet) shall be provided for safe draining of condensate without opening the cabinet. Common drain valve (one inside cabinet and second outside cabinet) with separate NRV on each bank (i.e. High Pressure, Medium Pressure and Low Pressure) to be provided for common drain arrangement. However, bidder can provide separate drain arrangement for all bank with separate drain valve (one inside cabinet and second outside cabinet) along with separate NRV on each bank (i.e. High Pressure, Medium Pressure and Low Pressure).
- 7.28 Bidder shall provide dispenser sale batch data in dispenser mother board memory for min. 30 days sale data, which include time, date, initial pressure, final pressure, initial totalizer & MFM reading, final totalizer & MFM reading and sold qty. in mass, the same data to be accessible through any of the universal communication protocol i.e USB, Serial port, RS 485 or Modbus TCP/IP. The data shall be compatible to existing MS office and same to be provided as and when required by EIC.
- 7.29 GGL may ask bidder to demonstrate above function after commercialization of operation and if bidder fails to show one month data then bidder shall perform necessary corrective action. In case necessary corrective action is not performed by the bidder, then GGL reserve rights to appoint a third party for corrective actions and all charges levied by the third party shall be recovered from the bidder.
- 7.30 Dispenser shall be suitable for remote price change and fetching required data from dispenser from remote control room by using RS 485 Serial Port.



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7.31 Bidder shall paste 2 Nos. of CNG filling procedure on dispenser.

7.32 Bidder shall paste below signage on CNG dispenser:

- 7.32.1 No Smoking
- 7.32.2 No Open Flame Permitted
- 7.32.3 Flammable Gas
- 7.32.4 No Mobile Phone
- 7.32.5 Switch off the Mobile Phones

Signage drawing are submitted by the bidder during detailed engineering for GGL review.

8. SCOPE OF SUPPLY OF BUS DISPENSERS

Supply of single arm dispenser, single arm with a flow capacity of more than 75 kg/min including the following as a minimum:

- 8.1 One numbers of Coriolis true mass flow metering system with necessary sensor and electronics. Performance record and weights & measures certification of the meter to be submitted for acceptance. Coriolis meter shall have local integral display and it shall be programmable and security lockable.
- 8.2 The port of the mass flow meter from which the display is connected should be different from the port, where mother board is connected, the totalizer of mass flow meter and totalizer of Mother board of dispenser should have different address with unique values without interference, so we can take reference reading in event of jumping of reading/malfunction of totalizer.
- 8.3 Three rows liquid crystal backlit displays or any other display unit as approved by PESO for night viewing showing for each fill, total sale in Rupees (0000.00), quantity of gas sold in Kg (000.00) or (0000.00), unit price of CNG in Rs/Kg (000.00) for each hose on both sides of the dispenser. Displays shall be weather proof to IP65 and relevant certificate shall be provided.
- 8.4 Non-resettable and non-volatile totalizer up to 9999999999/ 9999999999 for total CNG sold in Kgs. with an independent battery backup. 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. Bidder to provide suitable electronic digital display unit separately for the totalizer such that all the statutory requirements are complied. Displays shall be tamper proof & it shall only be resettable under 'engineering mode' of programming.
- 8.5 One CNG flexible electrically conductive twin fill and vent hoses with NGV-1 fill nozzles. Bidder shall also include supply of breakaway coupling on hose. Hose shall be 1/2" ID 5000 psig, minimum 4.0m long. Bidder shall include ball valves associated with pneumatic actuation for dispensing of gas.
- 8.6 Protective sleeve/cover for main Filling hose and vent hose shall be provided by supplier. Design of the protective sleeve/cover shall be such that hose does not rub ground under normal operation.
- 8.7 Fill hose shall have NGV 1 fill nozzle. Nozzle shall be designed for high frequency use with a minimum cycle of 100,000 and shall meet all requirements of NGV1 nozzle for bus (OPW CT-5000, WEH or similar).
- 8.8 One number of three bank electronic software and controller including hardware. Bidder to include active serial port with OSI for interfacing with future printer, smart card or SCADA, etc.
- 8.9 One numbers of holster/cradle for fill nozzles along with weather caps for the protection of nozzles.



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- 8.10 One number of liquid fill 4" dia (0-400 kg/cm²) pressure gauge along with block and bleed arrangement showing the vehicle filling pressure. No bypass shall be provided as a safety requirement. Pressure gauge glasses shall be Shatter Proof.
- 8.11 One number of manual shut-off valves for fill hose.
- 8.12 One stainless steel body cabinet with door/panel.
- 8.13 Temperature compensator to limit fill pressure to 250 Kg/cm²g equivalent at 15 degree C with two numbers of pressure limiter to limit fill pressure to about 250 Kg/cm²g. Bidder to include two pressure transducers per hose. Temperature compensator shall be programmable with 200 kg/cm² gas nominal value with range from 190 to 250 kg/cm²g. Provision to deactivate /activate temperature compensation mode is also required.
- 8.14 Back-up Power supply for displays so that display remains for at least for 15 minutes after power failure.
- 8.15 Interconnecting 3/4" OD SS tubing, fittings, valves, NRV's as required. Fittings shall be double ferruled compression fittings certified for use in CNG application.
- 8.16 Hardware and software required with the dispenser for Weights and Measures certification.
- 8.17 One number of power fail-safe valves for each hose. Fail safe valve to be zero leakage under worst operating conditions and also during power failure.
- 8.18 Coalescent type filter element of approved make shall be fitted in the approved housing at inlet of each bank supply line with manual drain valve to ensure that the oil carry over in the CNG being filled to Vehicle is < 5 PPM. Bidder shall supply dispenser having separate drain arrangement to be taken outside the cabinet, which shall be extended by Gujarat Energy Ltd up to the pit / chamber, so that Coalescent filters can be drained without giving access to remaining parts of the dispenser. Bidder to provide liquid filled differential pressure gauge of 2" dia across the filter to know the pressure drop across the filter.
- 8.19 Any other item required for safe and accurate operation of dispenser.
- 8.20 One set of erection, commissioning & mandatory spares for each dispenser as recommended by Bidder, Bidder to furnish list separately. If any spare other than those recommended is consumed during commissioning, Bidder to supply the required spares free of cost. The fill hose including the break-way coupling and fill nozzles are prone to wear and tear during the operation of the dispenser. Bidder shall include in his offer of mandatory spares all such items requiring replacement during use. Bidder shall also include all consumables and lubricants in his scope.
- 8.21 **NOTE:-** Wherever word "Set" has been used, Bidder shall detail out item-wise the components & their quantities in his bid. 50 sets means total quantity installed in 50 dispensers. Flexible hose and vent hose supplied with dispensers i.e. including three-way valve, nozzle and any other item that makes the assembly complete.
- 8.22 Bidder to recommend and include all spares required for 2 years normal operation & maintenance of dispensers.
- 8.23 Foundation: - Bidder shall include in his scope provision of base frame to be embedded in the foundation. Bidder shall supply base frame in advance.



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- 8.24 The dispenser shall be shipped in fully wired and assembled condition. Only gas supply connection and power supply connection shall be made at site. The dispenser shall be packaged to withstand rough handling during ocean shipment and land journey. It shall be Bidder's responsibility to make good any deterioration, which occurs during shipment. Sling points shall be clearly indicated on crates.
- 8.25 Full-bore isolation SS ball valves on the gas inlet (all banks) with 3/4" Tube OD end connection for dispensers shall be provided by bidder.
- 8.26 Common drain arrangement outside the dispenser cabinet (with only one outlet) shall be provided for safe draining of condensate without opening the cabinet. Common drain valve (one inside cabinet and second outside cabinet) with separate NRV on each bank (i.e. High Pressure, Medium Pressure and Low Pressure) to be provided for common drain arrangement. However, bidder can provide separate drain arrangement for all bank with separate drain valve (one inside cabinet and second outside cabinet) along with separate NRV on each bank (i.e. High Pressure, Medium Pressure and Low Pressure).
- 8.27 Bidder shall provide dispenser sale batch data in dispenser mother board memory for min. 30 days sale data, which include time, date, initial pressure, final pressure, initial totalizer reading, final totalizer reading and sold qty. in mass, the same data to be accessible through any of the universal communication protocol i.e. USB, Serial port, RS 485 . The data shall be compatible to existing MS office and same to be provided as and when required by EIC.
- 8.28 GGL may ask bidder to demonstrate above function after commercialization of operation and if bidder fails to show one month data then bidder shall perform necessary corrective action. In case necessary corrective action is not performed by the bidder, then GGL reserve rights to appoint a third party for corrective actions and all charges levied by the third party shall be recovered from the bidder.
- 8.29 Dispenser shall be suitable for remote price change and fetching required data from dispenser from remote control room by using RS 485 Serial Port.
- 8.30 Bidder shall paste 2 Nos. of CNG filling procedure on dispenser.
- 8.31 Bidder shall paste below signage on CNG dispenser:
- 8.31.1 No Smoking
 - 8.31.2 No Open Flame Permitted
 - 8.31.3 Flammable Gas
 - 8.31.4 No Mobile Phone
 - 8.31.5 Switch off the Mobile Phones

Signage drawing are submitted by the bidder during detailed engineering for GGL review.

9. GGL SCOPE OF WORK

Full-bore isolation SS ball valves on the gas inlet with 1/2" or 3/4" Tube OD end connection in all banks dispensers shall be provided by the bidder and installed by Gujarat Energy Ltd in the upstream of dispensers preferably in trench.

10. DETAILED TECHNICAL SPECIFICATIONS OF CAR DISPENSERS

Following specifications are intended to give Bidder the technical and operating conditions the dispenser must fulfil. Features other than those indicated which calls for a better design, increase in efficiency, and



TECHNICAL SPECIFICATION FOR SUPPLY OF CNG DISPENSER

enhance reliability, optimization etc. may be accepted subject to Gujarat Energy Ltd.'s approval and to be indicated separately describing all advantages.

All the applicable statutory codes, National laws and local regulation for safety and environment protection shall be followed by the Bidder for design, engineering, fabrication of dispensers and necessary approvals shall be obtained from the concerned authorities by Bidder.

- 10.1 Dispensers shall be designed for handling flow rate of more than 15 kg/min. flow capacity with turn down of not less than 20:1
- 10.2 The batch accuracy of dispensed gas shall be within $\pm 1\%$.
- 10.3 Bidder shall indicate overall flow coefficient Cv of dispenser from inlet to the dispenser up to outlet of NGV-1 nozzle including mass flow sensor, interconnecting tubing, valves, hose, fill valve etc.
- 10.4 Normal operating inlet and outlet pressure of dispenser shall be 250 Kg/cm²g and 200-Kg/cm²g respectively. Bidder to mention inlet pressure range in which the dispenser is rated.
- 10.5 Normal operating temperature of wetted parts of dispenser shall be -55°C to 70°C.
- 10.6 Vender to mention inlet pressure range in which dispenser is related
- 10.7 Dispenser shall automatically and immediately shut-off CNG supply to fill hose individually in case of:
 - a. Power failure.
 - b. Loss of display.
 - c. Failure of metering.
 - d. Low flow
 - e. High flow
 - f. Failure of totalizer
 - g. Overfill
- 10.8 SCADA connectivity, port for testing/calibration, hazardous area compatibility, type calibration certification on gas shall be provided.
- 10.9 OVERFILL PROTECTION: - Overfill protection shall be through electronically programmed hose to terminate the fill after 220 Kg/cm²g or as specified by Bidder. Bidder shall include 2 nos. transducers per hose. Pressure relief valve (conform to the requirements of API 520 or equivalent equipment design standards) shall be provided to avoid overfilling. Set point shall be programmable with nominal valve of 200kg/cm² as specified elsewhere.
- 10.10 FILL NOZZLE: -
 - a. NZS (hex type/1 feet flexible hose) nozzle shall be provided for one hose of Car Dispensers. Suitable NZS to NGV adaptor for hose shall also be included.
 - b. Second fill hose shall have NGV 1 fill nozzle. Nozzle shall be designed for high frequency use with a minimum cycle of 100,000 and shall meet all requirements of NGV-1 Type-2, Class A nozzle. Suitable NGV to NZS adaptor for hose shall also be included.



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- 10.11 CABINET: Complete cabinet shall be of stainless steel and shall have tamper proof locking arrangement. 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 etc. Dispenser cabinet shall be provided with adequate size bottom opening for the entry of gas supply line and power supply connections.
- 10.12 KEYPAD:- Necessary alphanumeric keypad facility on each side of the dual hose arm, to enter the Customer/ Vehicle (name/number, date, time etc) data, separate push button/key to be provided to get the totalizer data and it will be kept at outside cabinet.
- 10.13 Separate push button/key to be provided to get the totalizer data
- 10.14 Accounting Display with key pad facility on both side of dispenser ELECTRONICS :
- 10.15 Electronics shall be microprocessor based on latest state of art. 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.
- 10.16 RS 485 Serial Port (Dual / 2 way communication) shall be provided for downloading the CNG sale data with the help of Personal Computer, Printer Port shall be intrinsically safe. Suitable software shall be provided for the above purpose so that hard copy print outs of the sale data shall be obtained for each shift (8 hours interval).
- 10.17 Gujarat Energy Ltd logo sticker shall be pasted by bidder on both sides of cabinet panel. However, Gujarat Energy Ltd. logo design will be provided by GGL to bidder. The paint shall be chosen, primed and applied as to have a service life of ten years. The exterior of dispenser body is required to be corrosion free for ten years and to have fade free life without oxidation of paint surface for five years in an environment of bright sun light with an intensive UV content.
- 10.18 TUBING:
- Materials used for the tubing shall be 3/4" OD for Bus Dispenser and 1/2" OD for Car Dispenser SS 316 fully annealed (Bright annealed) seamless conforming to ASTM A269 with maximum hardness of Rb80 or less and suitable for bending and flaring. OD tolerance shall not exceed $\pm 0.005\%$. Open ends on fittings and vents shall be provided with caps/dust plugs. The piping, tubing and valves shall be as per BOM.
- 10.19 No un-metered gas shall be acceptable under any circumstances.' Pneumatic valves shall be tamper proof. Variation / relationship between mass flow meter and dispenser reading to be furnished. Mass flow meter shall have separate port for SCADA connectivity and for testing. Operating time of SOV /Pneumatic actuated valves/ Electro-Magnetic Valves & attendant flow during the period between actuation signal and closing of valve to be furnished by the bidder. Site training to the owner shall be provided by the bidder. Immunity towards static electricity hazard in design and construction shall be taken care of by the bidder. Earth pits shall be provided as per requirement and its electrical characteristics shall be furnished by the bidder for the owner's approval.

11. DETAILED TECHNICAL SPECIFICATIONS OF BUS DISPENSERS

Following specifications are intended to give Bidder the technical and operating conditions the dispenser must fulfil. Features other than those indicated which calls for a better design, increase in efficiency, and enhance reliability, optimization etc. may be accepted subject to Gujarat Energy Ltd.'s approval and to be indicated separately describing all advantages.



TECHNICAL SPECIFICATION FOR SUPPLY OF CNG DISPENSER

All the applicable statutory codes, National laws and local regulation for safety and environment protection shall be followed by the Bidder for design, engineering, fabrication of dispensers and necessary approvals shall be obtained from the concerned authorities by Bidder.

- 11.1 Dispensers shall be designed for handling flow rate of more than 75 kg/min. flow capacity with turn down of not less than 20:1
- 11.2 The batch accuracy of dispensed gas shall be within $\pm 1\%$.
- 11.3 Bidder shall indicate overall flow coefficient Cv of dispenser from inlet to the dispenser up to outlet of NGV-1 nozzle including mass flow sensor, interconnecting tubing, valves, hose, fill valve etc.
- 11.4 Normal operating inlet and outlet pressure of dispenser shall be 250 Kg/cm²g and 200-Kg/cm²g respectively. Bidder to mention inlet pressure range in which the dispenser is rated.
- 11.5 Normal operating temperature of wetted parts of dispenser shall be -55°C to 70°C.
- 11.6 Vender to mention inlet pressure range in which dispenser is related
- 11.7 Dispenser shall automatically and immediately shut-off CNG supply to fill hose individually in case of:
 - h. Power failure.
 - i. Loss of display.
 - j. Failure of metering.
 - k. Low flow
 - l. High flow
 - m. Failure of totalizer
 - n. Overfill
- 11.8 SCADA connectivity, port for testing/calibration, hazardous area compatibility, type calibration certification on gas shall be provided.
- 11.9 OVERFILL PROTECTION: - Overfill protection shall be through electronically programmed hose to terminate the fill after 220 Kg/cm²g or as specified by Bidder. Bidder shall include 2 nos. transducers per hose. Pressure relief valve shall be provided to avoid overfilling. Set point shall be programmable with nominal valve of 200kg/cm² as specified elsewhere.
- 11.10 FILL NOZZLE: - Fill hose shall have NGV 1 fill nozzle. Nozzle shall be designed for high frequency use with a minimum cycle of 100,000 and shall meet all requirements of NGV-1 nozzle.
- 11.11 CABINET: Complete cabinet shall be of stainless steel and shall have tamper proof locking arrangement. 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, electronic item from tampering, rain, dust etc. Dispenser cabinet shall be provided with adequate size bottom opening for the entry of gas supply line and power supply connections.
- 11.12 KEYPAD:- Necessary alphanumeric keypad facility on hose arm, to enter the Customer/ Vehicle (name/number, date, time etc) data, separate push button/key to be provided to get the totalizer data



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- 11.13 Separate push button/key to be provided to get the totalizer data
- 11.14 Accounting Display with key pad facility on both side of dispenser ELECTRONICS :
- 11.15 Electronics shall be microprocessor based on latest state of art. 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.
- 11.16 RS 485 Serial Port (Dual / 2 way communication) shall be provided for downloading the CNG sale data with the help of Personal Computer, Printer Port shall be intrinsically safe. Suitable software shall be provided for the above purpose so that hard copy print outs of the sale data shall be obtained for each shift (8 hours interval).
- 11.17 Smart Card compatibility:- Smart card (POS) compatible facility shall be provided in the dispenser unit for dispensing the gas. Suitable hardware & software facility shall be provided along with dispenser unit such that future requirement can be handled with minor modification. Smart card reading Machine shall be provided separately by the purchaser and shall be located separately from the dispenser.
- 11.18 Dispenser shall have RFID compatibility to install Device for Radio Frequency identification to read CNG kit installation data and authenticity/ testing validity to refill or reject the vehicle for refill.
- 11.19 The color code for the dispenser shall be white. Gujarat Energy Ltd logo sticker shall be pasted by bidder on both sides of cabinet panel. However, Gujarat Energy Ltd. logo design will be provided by GGL to bidder. The paint shall be chosen, primed and applied as to have a service life of ten years. The exterior of dispenser body is required to be corrosion free for ten years and to have fade free life without oxidation of paint surface for five years in an environment of bright sun light with an intensive UV content.
- 11.20 TUBING:
- Materials used for the tubing shall be 3/4" OD for Bus Dispenser SS 316 fully annealed (Bright annealed) seamless conforming to ASTM A269 with maximum hardness of Rb80 or less and suitable for bending and flaring. OD tolerance shall not exceed $\pm 0.005\%$. Open ends on fittings and vents shall be provided with caps/dust plugs. The piping, tubing and valves shall be as per BOM.
- 11.21 No un-metered gas shall be acceptable under any circumstances.' Pneumatic valves shall be tamper proof. Variation / relationship between mass flow meter and dispenser reading to be furnished. Mass flow meter shall have separate port for SCADA connectivity and for testing. Operating time of SOV /Pneumatic actuated valves/ Electro-Magnetic Valves & attendant flow during the period between actuation signal and closing of valve to be furnished by the bidder. Site training to the owner shall be provided by the bidder. Immunity towards static electricity hazard in design and construction shall be taken care of by the bidder. Earth pits shall be provided as per requirement and its electrical characteristics shall be furnished by the bidder for the owner's approval.

12. GENERAL REQUIREMENTS

- 12.1 All other accessories/ internals/ hardware shall be of reputed make and of durable material.
- 12.2 Common drain arrangement outside the dispenser cabinet (with only one outlet) shall be provided for safe draining of condensate without opening the cabinet. Common drain valve (one inside cabinet and second outside cabinet) with separate NRV on each bank (i.e. High Pressure, Medium Pressure and Low Pressure) to be provided for common drain arrangement. However, bidder can provide separate drain arrangement for



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all bank with separate drain valve (one inside cabinet and second outside cabinet) along with separate NRV on each bank (i.e. High Pressure, Medium Pressure and Low Pressure).

12.3 Painting is not required for the dispenser panels, which are of SS material.

12.4 Actuated Valves shall be tampered-proof.

12.5 All electrical items shall be intrinsically safe only as IEC- 60079

Or

If electrical component installed on Ex-proof box, then ensure valid PESO type approval of Ex-proof box and to be submit during the details engineering.

12.6 Variation/ relationship between mass flow meter and dispenser reading to be furnished.

12.7 Mass flow meter shall have separate ports for connecting to SCADA and for testing.

12.8 Operating time of SOV/ pneumatic/ electro-magnetic actuated valves and attendant flow during the period between actuation signal and closing of valve to be indicated.

12.9 Required no. of earth pits to be indicated with electrical characteristics

12.10 The contractor shall submit detailed communication protocol documentation for the dispenser as a part of dispatched document. The communication documentation is must with all command sets and address for the parameters and error function of dispensers, used for remote monitoring and communication via standard forecourt controller.

13. INSPECTION AND TESTING

The flow capacity, measuring accuracy and dispenser functioning as per specification shall be tested at Bidder's works in presence of Gujarat Energy Ltd or Gujarat Energy Ltd.'s authorized representative.

During the shop test of dispenser functioning, all components and controls shall be demonstrated.

Bidder shall demonstrate the performance and operation of the entire supplied dispenser at site to Gujarat Energy Ltd or Gujarat Energy Ltd authorized representative. Any part or components, which are not functioning to the satisfaction of Gujarat Energy Ltd, shall be repaired or replaced.

The flexible hoses with their connections shall be tested after assembly and prior to use to at least two times the working pressure and also tested to a pneumatic pressure of at least 400 bar under water and thereafter, all the hoses shall be examined visually and tested for leaks with soapsuds or equivalent.

Bidder shall perform one time Rain test of all dispenser during FAT. During rain test water shall not ingress inside dispenser body

Smart card and RFID port compatibility shall be demonstrated by the bidder during FAT.

Bidder shall demonstrate successful decoupling of breakaway coupling during FAT of minimum one dispenser in the lot 5 dispenser.

Bidder shall perform Leak Test of entire dispenser at 200 bar.

Bidder shall perform megger test of hose during FAT of dispenser.



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14. PROTECTION DURING SHIPPING

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

15. WARRANTY

Bidder shall warranty all material and equipment to be free from defects in design, material and workmanship.

Bidder shall warranty all dispensers satisfying the requirement of intended use.

Replacement of any defective item/equipment found damaged at delivery by Gujarat Energy Ltd or Gujarat Energy Ltd's representative.

Assume responsibility for obtaining manufacturer's warranty of all bought out items.

16. LIST OF ATTACHMENTS

- Data Sheet For Dispenser
- Indicative Bill of Materials – Car
- Indicative Bill of Materials – Bus

DISPENSER DATASHEET

Sr. No.	Description	Dispenser for Car (15 kg/m)	Dispenser for Bus (75 kg/m)
1	Service	Outdoor suitable for tropical weather	Outdoor suitable for tropical weather
2	Type	Automatic, dual hose, fast fill and simultaneous filling with both hoses	Automatic, single hose, fast fill
3	Quantity	As per SOR	As per SOR
4	Characteristic of CNG	Non Corrosive, Explosive and Odorised 5 PPM with/ without Ethyl Mercapton	Non Corrosive, Explosive and Odorised 5 PPM with/ without Ethyl Mercapton
5	Maximum flow (kg/min)	> 15	> 75
6	Nominal flow (kg/min)	*	*
7	Minimum flow (kg/min)	*	*
8	CNG pressure at inlet of	255 kg/cm ² (g) Max.	255 kg/cm ² (g) Max.
9	Fill Pressure	200 kg/cm ² (g)	200 kg/cm ² (g)
10	CNG operating	0° C to + 58° C max.	0° C to + 58° C max.
11	CNG temperature of filling	Ambient	Ambient
12	Overall Cv of dispenser from inlet of dispenser to	*	*
13 i	Electrical Supply	Single phase, AC, 230 Volts + 5%, 50Hz +3%	Single phase, AC, 230 Volts + 5%, 50Hz + 3%



TECHNICAL SPECIFICATION FOR SUPPLY OF CNG DISPENSER

ii		All instruments shall be intrinsically safe	All instruments shall be intrinsically safe
14	Batch accuracy	+1%	+1%
15	Tolerable value of voltage range for accurate	*	*
16	Hoses		
i	Hoses Arrangements	A dispenser with dual hoses both hoses suitable for car/ three wheeler/ two wheeler/ commercial vehicle, There shall not be any restriction on upper value of filling.	A dispenser with hose suitable for bus/ heavy commercial vehicle
ii	Applicable standard for hoses for CNG dispensing	CSA 12.52, CSA 12.54 and NZS	CSA 12.52, CSA 12.54 and NGV
iii	Length of Hose (length higher or lower than what is specified shall not be acceptable)	Minimum 3.5 meters each	Minimum 4.00 meters for bus
iv	Hose type, rating, and size	Electrical conductive suitable for CNG application, 350 kg/cm ² (g), 3/8 " ID for Car	Electrical conductive suitable for CNG application, 350kg/cm ² (g), 1/2 " ID for Bus
v	Approved make for hose	As per Vendor List	As per Vendor List
17	Dispensers' Hose arm	Fixed with break-way coupling as per NGV4.4 with proper mounting / resting support and with safety coupling. No tripol or QRC shall be considered	Fixed with break-way coupling as per NGV4.4 with proper mounting / resting support and with safety coupling No tripol or QRC shall be considered
18	Fill Nozzle		
i	Type	NZS type (hex type/1 feet flexible hose) nozzle to be provided for one hose. Suitable NZS to NGV adaptor for hose shall also be included with second fill hose. Second fill hose shall have NGV-1 Type-2, Class A nozzle. Suitable NGV to NZS adaptor for hose shall also be included with second fill hose.	NGV fill nozzle for bus
ii	Make	As per Vendor List	As per Vendor List
19	Flexible fill and Vent hose		
i	Type	Twin	Twin
ii	Make	As per Vendor List	As per Vendor List
iii	Pressure rating(Kg/cm ² g)	350	350



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iv	Hoses shall be provided with Protective Sleeves	Yes	Yes
20.	Mass flow meter		
i	Metering principles	Coriolis type with integral display (shall be mounted on the meter itself). Integral display shall be locked for local setting, the meter shall have a provision to identify the last cumulative reading to identify any reading jump.	Coriolis type with integral display (shall be mounted on the meter itself). Integral display shall be locked for local setting, the meter shall have a provision to identify the last cumulative reading to identify any reading jump.
ii	Make	As per Vendor List	As per Vendor List
iii	Model	*	*
iv	Batch delivery accuracy	+ 0.5% of batch	+ 0.5% of batch
v	Mass flow accuracy for gas meter	+0.5 % (Inclusive of linearity, hysteresis and repeatability errors)	+0.5 % (Inclusive of linearity, hysteresis and repeatability errors)
vi	Repeatability	+ 0.25%	+ 0.25%
vii	Calibration traceability	To NIST as per ISO 5168	To NIST as per ISO 5168
viii	Process temperature effect influence	+0.01% of nominal flow rate per degree C on zero offset	+0.01% of nominal flow rate per degree C on zero offset
ix	Pressure influence	Nil	Nil
x	Surge and frequency transient effect	Shall be in compliance with ANSI/EEE (EFT)c 62.41	Shall be in compliance with ANSI/EEE (EFT)c 62.41
xi	EMI effect on sensor and transmitter	To the requirement of EMC directive 89/336/EEC, EN 50081-1	To the requirement of EMC directive 89/336/EEC, EN 50081-1
xii	Vibration effect	As per SAMA PMC 31.1	As per SAMA PMC 31.1
21	Temperature compensation	Required for vehicle tank fill pressure of 200 kg/cm ² (g)./15°C and to be provided at each arm of dispenser. Provision to deactivate/ activate temperature compensation mode is required	Required for vehicle tank fill pressure of 200 kg/cm ² (g)./15°C and to be provided at each arm of dispenser. Provision to deactivate/ activate temperature compensation mode is required.
22	Breakaway coupling for fill hose and vent line	YES (Approved make shall be as per Vendor List) , shall withstand the pressure rating of 4200 psi , shall have flow blocking arrangement while decouple the hose due to any reason	YES (Approved make shall be as per Vendor List) , shall withstand the pressure rating of 4200 psi , shall have flow blocking arrangement while decouple the hose due to any reason



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23	Type of Control	Pneumatic (Natural gas) actuated BV with gas to open philosophy to achieve the power fail safe condition/ Electro-magnetic valve with signal to open philosophy to achieve the power fail safe condition 100% Redundancy of actuated Ball Valve/ Electro-magnetic valve isolation is required to prevent un-metered gas Additional Actuator Ball Valve/ Electro-magnetic valve in delivery line of each dispenser arm shall be provided	Pneumatic (Natural gas) actuated BV with gas to open philosophy to achieve the power fail safe condition/ Electro-magnetic valve with signal to open philosophy to achieve the power fail safe condition 100% Redundancy of actuated Ball Valve/ Electro-magnetic valve isolation is required to prevent un-metered gas Additional Actuator Ball Valve/ Electro-magnetic valve in delivery line of each dispenser arm shall be provided
24	Gas regulator make	Approved make shall be as per Vendor list (bidder shall select a model to meet the requirement for continuous/trouble free operation of dispensers). Gas regulators are not necessary for electro-magnetic valve controlled dispenser.	Approved make shall be as per Vendor list (bidder shall select a model to meet the requirement for continuous/trouble free operation of dispensers). Gas regulators are not necessary for electro-magnetic valve controlled dispenser.
25	Totalizer display	Non-re-settable, non-volatile type with 10 digits for the CNG sold for each arm/hose. Inbuilt Battery back -up for 15 minutes with suitable charging device required	Non-re-settable, non-volatile type with 6 digits for the CNG sold for each arm/hose. Inbuilt Battery back -up for 15 minutes with suitable charging device required



TECHNICAL SPECIFICATION FOR SUPPLY OF CNG DISPENSER

26	Additional facility required at Totalizer display	Necessary serial port on each arm for printing sold data and its hardware/software for swipe-card machine compatibility. Necessary alphanumerical keypad facility on each side of the dual hose arm, to enter the Customer/ Vehicle (name/number, date, time etc.) data. Accounting Display with key pad facility on both side of dispenser Unit price in Rs and Paise per kg. 3 Digits for Rs. and 2 digits for fractions in Paise Total price of filled CNG in 4 Digits for Rs. and 2 digits for fractions in Paise Qty. of filled CNG, in kg. 3/ 4 Digits and 2 digits fraction CNG Cumulative Kg, 9/ 10 Digits	Necessary serial port on each arm for printing sold data and its hardware/software for swipe-card machine compatibility. Necessary alphanumerical keypad facility on each side of the dual hose arm, to enter the Customer/ Vehicle (name/number, date, time etc.) data. Accounting Display with key pad facility on both side of dispenser Unit price in Rs and Paise per kg. 4 Digits for Rs. and 2 digits for fractions in Paise Total price of filled CNG in 4 Digits for Rs. and 2 digits for fractions in Paise Qty. of filled CNG, in kg. 4 Digits and 2 digits fraction CNG Cumulative Kg, 9/ 10 Digits
27	LCD Display or any other display unit as approved	Back lit LCD, Suitable for tropical conditions	Back lit LCD, Suitable for tropical conditions
28	Language of display	English	English
29	On / Off switch	Required	Required
30	Emergency stop switch	Required on dispenser for two sides	Required on dispenser
31	Inlet Isolation valve Outside the dispenser	Full bore ball valve required at the inlet Isolation valves for dispensers shall be provided by the bidder / installed by Gujarat Energy Ltd in the upstream of dispensers preferably in trench	Full bore ball valve required at the inlet Isolation valves for dispensers shall be provided by the bidder / installed by Gujarat Energy Ltd in the upstream of dispensers preferably in trench
32	Tubing	½" x 0.065" thk, ¼" x 0.035" Annealed SS316 seamless.	¼" x 0.035", ¾" x 0.095" thk. Annealed SS316 seamless.
33	Tube Make	Approved make shall be as per Vendor list	Approved make shall be as per Vendor list
34	Valve/fitting Make of valve/fitting	SS316 Approved make shall be as per Vendor list	SS316 Approved make shall be as per Vendor list



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35	Enclosure with door	Weather/water proof to IP54, NEMA 4x and made of SS 304 sheet metal body.	Weather/water proof to IP54, NEMA 4x and made of SS 304 sheet metal body.
36	Special tools (Allen Key)	Required with each dispenser	Required with each dispenser
37	Drain	Common drain arrangement outside the dispenser cabinet (with only one outlet) shall be provided for safe draining of condensate without opening the cabinet. Common drain valve (one inside cabinet and second outside cabinet) with separate NRV on each bank (i.e. High Pressure, Medium Pressure and Low Pressure) to be provided for common drain arrangement. However, bidder can provide separate drain arrangement for all bank with separate drain valve (one inside cabinet and second outside cabinet) along with separate NRV on each bank (i.e. High Pressure, Medium Pressure and Low Pressure).	Common drain arrangement outside the dispenser cabinet (with only one outlet) shall be provided for safe draining of condensate without opening the cabinet. Common drain valve (one inside cabinet and second outside cabinet) with separate NRV on each bank (i.e. High Pressure, Medium Pressure and Low Pressure) to be provided for common drain arrangement. However, bidder can provide separate drain arrangement for all bank with separate drain valve (one inside cabinet and second outside cabinet) along with separate NRV on each bank (i.e. High Pressure, Medium Pressure and Low Pressure).
38	Locking / Sealing	Required	Required
39	Over all	length, * width, * height in m/*weight in kgs	length, * width, * height in m/*weight in kgs
40	Venting Arrangement	Separate vent line for hose, SRV and actuator of each side and terminated at 3m height from Finished Ground Level	Separate vent line for hose, SRV and actuator of each side and terminated at 3m height from Finished Ground Level
41	Metal frame with bottom wire mesh screen	Metal frame with bottom wire mesh screen for Dispenser protection from vermin should be provided	Metal frame with bottom wire mesh screen for Dispenser protection from vermin should be provided



TECHNICAL SPECIFICATION FOR SUPPLY OF CNG DISPENSER

INDICATIVE BILL OF MATERIAL FOR CAR

TENDER NO.:

VENDOR / MAKE :

PURCHASE ORDER NO.

TENTATIVE BILL OF MATERIAL (BOM) FOR CNG CAR DISPENSERS FOR GUJARAT ENERGY LTD CNG PROJECTS/O&M

Sr. No.	Item Description	Part No.	Tender Specification / Certification	Actual Supply Make	Unit	Approved Qty.	Actual Qty.
1	Pressure Gauge		100mm Dial, Range: 0-400 Kg/cm ² , Jelly filled		Nos.	02	
2	Differential Pressure Gauge		2"/ 63mm Dial, Range: OEM Recommended, Jelly filled		Nos.	03	
3	Pressure Transducer		6000 PSI ,1/4" MNPT		Nos.	04	
4	Filter Assembly with Element		1/2" OD NPTF		Nos.	03	
5	Actuator Ball Valve		1/2" OD Trunion 83 series		Nos.	08	
6	Check Valve (NRV)		1/2" OD Crack Pressure 6000 psi		Nos.	09	
7	Mass Flow Meter		1700 / 2700 Transmitter with CNG 50 Sensor with integral display		Set	02	
8	Emergency Shut Off Valve (Manual / Auto)		1/2" Full Bore, SS, 6000 psi, Actuated type Ball Valve		Nos.	02	
9	Junction Box with required Tag / Identification		Flame Proof CMRI certified, PESO / CCoE approved		Set	01	
10	Solenoid Valve		150 psi, 3 / 2 way Direct acting normally close. Fit for Hazardous area, Intrinsically safe, CMRI approved		Nos.	08	
11	Electronic Control Unit		CSA approved contains Mother Board, Display & harness set (All instruments / devices should protect against its input AC / DC spikes)		Set	01	



TECHNICAL SPECIFICATION FOR SUPPLY OF CNG DISPENSER

12	Fill & Vent Hose with proper Resting / Holding provision & common safe venting arrangement		Minimum 3.50 Meter Length, Fill Hose: 3/8" ID & Vent Hose: 1/4" ID, CSA approved		Set	02	
13	Three Way Ball Valve With 180° Rotation/ 90° Rotation		1/4" NPTF Trunnion		Nos.	02	
14	SS Tube		1/2" x 0.065" WT, Seamless, SS 316		Set	01	
15	SS Tube		1/4" x 0.035" WT, Seamless, SS 316		Set	01	
16	Safety Valve (Safety Relief Valve / Pressure Relief Valve)		1/2 x 1/2 " / 1/4" NPTF both sides, 6000 psi		Nos.	02	
17	Needle Valve / Drain Valve		1/4" OD, Arrangement for common/ separate drain outside the Dispenser with header.		Nos.	02/ 06	
18	Pressure Line Tube Fittings / Double Ferrule Fittings				Set	01	
19	Dispenser Body, Frame & Foundation Bolt		SS, Durable, Weather Proof, 10 Years Guarantee with proper Locking, OEM make with Stable Frame of required size including Bolt / Accessories for proper Mounting / Anchoring, Water should not enter in display panel (water resistant display panel)		Set	01	
20	Pressure Control Valve / Gas Regulator		5000 psi Inlet, 120 psi Outlet, 1/4" x 1/4" NPTF		Nos.	01	
21	Fill & Vent Breakaway Coupling/ Quick Connect Breakaway		3/8" x 3/8" ST Female thread, 4200 psi, NGV-4.2 Type		Nos.	01	
22	Nozzle		NGV fill Nozzle		Nos	01	
23	Nozzle Adaptor		NGV to NZS adaptor		Nos	01	
24	Nozzle NZS Car (1" feet)		Nozzle NZS Car (1" feet)		Nos	01	
25	Bleed Valve				Nos.	02	



TECHNICAL SPECIFICATION FOR SUPPLY OF CNG DISPENSER

26	Special Tools		As per the OEM specification with each Dispenser		Set	01	
27	Key Pad, Three Level Display		Both side, Clear visible in day and night operations		Set	01	
28	Start / Stop Push Button		With NO / NC Contacts		Set	02	
29	Provision of additional Port (Should be plug & play) & Software suitable for any hardware device like smart card, printer, etc		RS 232 C Serial Port with Smart Card / Swipe Card compatibility		Set	01	
30	Dispenser Software		Latest version compatible for sequence filling as well as preset cut off and temp. compensation		Set	01	
31	Emergency Stop Switch on Dispenser		Individual for Both Hoses with Common Shut-off arrangement on the Dispenser Cabinet		Nos.	02	
32	Emergency Stop Switch on Dispenser		1/4" NPTF Trunnion		Nos.	02	
33	Solenoid Operated Valve				Nos.	08	
34	Nozzle adaptor		NGV to NZS adaptor		Nos.	01	

Note:

1. Bidder can consider either Three Way Ball Valve With 180° Rotation or Three Way Ball Valve With 90° Rotation for BOM of dispenser (Make shall be as per Vendor List).
2. All make of material used in dispenser shall be as per vendor list



TECHNICAL SPECIFICATION FOR SUPPLY OF CNG DISPENSER

INDICATIVE BILL OF MATERIAL FOR BUS

TENDER NO.:

VENDOR / MAKE :

PURCHASE ORDER NO.

TENTATIVE BILL OF MATERIAL (BOM) FOR CNG BUS DISPENSERS FOR GUJARAT ENERGY LTD CNG PROJECTS/O&M

Sr. No.	Item Description	Part No.	Tender Specification / Certification	Actual Supply Make	Unit	Approved Qty.	Actual Qty.
1	Pressure Gauge		100mm Dial, Range: 0-400 Kg/cm ² , Jelly filled		Nos.	01	
2	Differential Pressure Gauge		2"/ 63mm Dial, Range: OEM Recommended, Jelly filled		Nos.	03	
3	Pressure Transducer		6000 PSI ,1/4" MNPT		Nos.	02	
4	Filter Assembly with Element		3/4" OD NPTF		Nos.	03	
5	Actuator Ball Valve		3/4" OD Trunnion 83 series		Nos.	05	
6	Check Valve (NRV)		1/2" OD Crack Pressure 6000 psi		Nos.	03	
			1/4" OD Crack Pressure 6000 psi		Nos.	03	
7	Mass Flow Meter		1700 / 2700 Transmitter with CNG 50 Sensor with integral display		Set	01	
8	Emergency Shut Off Valve (Manual / Auto)		3/4" Full Bore, SS, 6000 psi, Actuated type Ball Valve		Nos.	02	
9	Junction Box with required Tag / Identification		Flame Proof CMRI certified, PESO / CCoE approved		Set	01	
10	Solenoid Valve		150 psi, 3 / 2 way Direct acting normally close. Fit for Hazardous area, Intrinsically safe, CMRI approved		Nos.	05	
11	Electronic Control Unit		CSA approved contains Mother Board, Display & harness set (All instruments / devices should protect against its input AC / DC spikes)		Set	01	



TECHNICAL SPECIFICATION FOR SUPPLY OF CNG DISPENSER

12	Fill & Vent Hose with proper Resting / Holding provision & common safe venting arrangement		Minimum 4 Meter Length, Fill Hose: 1/2" ID & Vent Hose: 1/4" ID, CSA approved		Set	01	
13	SS Tube		3/4" x 0.095" WT, Seamless, SS 316		Set	01	
14	SS Tube		1/4" x 0.035" WT, Seamless, SS 316		Set	01	
15	Safety Valve (Safety Relief Valve / Pressure Relief Valve)		1/2" x 1/2" / 1/4" NPTF both sides, 6000 psi		Nos.	01	
16	Needle Valve / Drain Valve		1/4" OD, Arrangement for common/ separate drain outside the Dispenser with header.		Nos.	02/ 06	
17	Pressure Line Tube Fittings / Double Ferrule Fittings				Set	01	
18	Dispenser Body, Frame & Foundation Bolt		SS, Durable, Weather Proof, 10 Years Guarantee with proper Locking, OEM make with Stable Frame of required size including Bolt / Accessories for proper Mounting / Anchoring, Water should not enter in display panel (water resistant display panel)		Set	01	
19	Pressure Control Valve / Gas Regulator		5000 psi Inlet, 120 psi Outlet, 1/4" x 1/4" NPTF		Nos.	01	
20	Fill & Vent Breakaway Coupling/ Quick Connect Breakaway		1/2" x 1/2" ST Female thread, 4200 psi, NGV-4.2 Type		Nos.	01	
21	Nozzle		NGV1 type nozzle for Bus		Nos	01	
24	Bleed Valve		SS 316, 6000 PSIG		Nos.	01	
25	Special Tools		As per the OEM specification with each Dispenser		Set	01	
26	Key Pad, Three Level Display		Clear visible in day and night operations		Set	01	



TECHNICAL SPECIFICATION FOR SUPPLY OF CNG DISPENSER

27	Start / Stop Push Button		With NO / NC Contacts		Set	01	
28	Provision of additional Port (Should be plug & play) & Software suitable for any hardware device like smart card, printer, etc		RS 232 C Serial Port with Smart Card / Swipe Card compatibility		Set	01	
29	Dispenser Software		Latest version compatible for sequence filling as well as preset cut off and temp. compensation		Set	01	
30	Emergency Stop Switch on Dispenser		Individual for Hoses with Common Shut-off arrangement on the Dispenser Cabinet		Nos.	01	
31	Emergency Stop Switch on Dispenser		1/4" NPTF Trunnion		Nos.	01	
32	Solenoid Operated Valve				Nos.	05	

Note:

1. All make of material used in dispenser shall be as per vendor list