



GASONET SERVICES (RJ) LIMITED



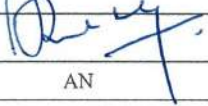
ANNUAL RATE CONTRACT FOR SUPPLY, INSTALLATION & COMMISSIONING OF CNG CAR AND COMBO (CAR-BUS) DISPENSER PACKAGE AT CHURU, MANDI, PAURI GARWAL (RISHIKESH) & CHAMPAWAT GA



RESONANCE ENERGY PVT LTD

TECHNICAL VOLUME II OF II



TENDER NO.: GSL/REPL/004/DP

OPEN DOMESTIC COMPETITIVE BIDDING

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Rev.	Date	Prepared By	Checked By	Approved By

	<p>ANNUAL RATE CONTRACT FOR SUPPLY, INSTALLATION & COMMISSIONING OF CNG CAR AND COMBO (CAR-BUS) DISPENSER PACKAGE AT CHURU, MANDI, PAURI GARWAL (RISHIKESH) & CHAMPAWAT GA</p>	
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TECHNICAL SPECIFICATION

	<p style="text-align: center;">ANNUAL RATE CONTRACT FOR SUPPLY, INSTALLATION & COMMISSIONING OF CNG CAR AND COMBO (CAR-BUS) DISPENSER PACKAGE AT CHURU, MANDI, PAURI GARWAL (RISHIKESH) & CHAMPAWAT GA</p>	
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Detailed Technical Specification & Scope of work for Auto-Car, Combo (Car-Bus)

1 SCOPE OF WORK

1.1 The intent of this technical specifications is to outline the Purchaser's requirement under which the Bidder shall Design, Engineering, Manufacture, Erection & Commissioning , Inspection & Testing at Works, Painting, Packaging & forwarding, Insurance, supply to Sites/Stores, Installation testing, trial run, installation & Commissioning and Performance Testing at Sites complete with all auxiliaries & features required for efficient & safe Operation during 1 year warrantee period, In accordance with this specification, data sheets & other enclosures of this Technical specifications of the tender.

THE DESCRIPTION OF TOTAL SUPPLY OF DISPENSERS UNIT IS AS UNDER: -

Sr. No	Type	Flow Rate
1	Auto- Car Dispenser (Dual Arm)	>15 kg/min
2	Car- Bus Dispenser (Dual Arm)	>15 kg/min (Car) >75 kg/min (Bus)



- 1.2 The dispensers shall be complete including all required auxiliary equipment for efficient & safe operation. Bidder shall be responsible for furnishing all electrical, instrumentation, interconnecting Piping, tubing & Safety Items as required to make the Dispensers complete and functional. Tubing and valves (supply and erection) from Air Compressor to Dispenser is in the scope of GSL.
- 1.3 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 shall deemed to have been specified & shall be in the scope of Bidder without any implication in the price or schedule.
- 1.4 Obtaining **statutory approvals from the country of origin as well as from India is in the Bidders scope. The offered Dispenser model must be approved by the Chief Controller of Explosive (CCOE) Nagpur which shall be submitted along with bid documents. Bidder must have W&M manufacturing license and modal approval which shall be submitted along with bid documents.**
- 1.5 **The model of mass flow meter installed in the dispenser must be approved by the Chief Controller of Explosive (CCOE) Nagpur and Indian Weights & Measurement Department. Approval certificates shall be submitted along with bid documents**

2 SCOPE OF SUPPLY FOR DISPENSERS

Supply of double arm type dispensers having flow capacity of 75 kg/min (Bus Nozzle) and 15 kg/min (Car and Auto) respectively at 250 bar inlets under discharge to atmospheric condition. For combo dispenser, 1/2" hose for bus filling on one side and 3/8" hose on other side for car filling shall be considered. Each dispenser shall have following as a minimum: -

For Car End- One CNG flexible electrically conductive twin (fill & vent) hose, fitted with NGV-I (with all accessories) fill nozzle for filling of vehicles. However, hose shall be suitable to be attached with NGV nozzle. Bidder shall include the supply of 3-way valve with hose for Filling & venting of gas. Bidder shall also include supply of Breakaway Coupling, suitable for NGV Industry, in the hose. Hose shall be 3/8" ID 5000 psig, at least 4 m long. Bidder shall ensure the function of breakaway coupling during performance test at own factory and submit test certificate to the consultant (REPL) and purchaser (GSL). The car filling side (Car Dispenser) shall be equipped with preset filling facility.

For Bus End- One CNG flexible electrically conductive twin (fill & vent) hose, with one Sherex CT-5000 (with directed vent) transit fill nozzle including the supply of three internal valves for Filling and Venting of Gas. Bidder shall also include supply of Breakaway Coupling, suitable for NGV Industry, in the hose. Hose shall be 1/2" ID 5000 psig, at least 4 m long. The end connection of main and vent hose shall be SAE (JIC) 37 deg female swivels 1 1/16"-12 UNF or the main and vent hose shall be SAE (JIC) 37 deg female swivel 7/ 8"- 14 UNF & 9/ 16" - 18 UNF respectively. Bidder shall ensure the function of breakaway

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coupling during performance test at own factory and submit test certificate to the consultant (REPL) and purchaser (GSL). The bus filling side (for Combo Dispenser) shall be equipped with preset filling facility.

All necessary software & hardware shall be provided for calibration of transmitter from control room. Bidder to provide Manuals & troubleshooting guides of OS & software and hard copy of application program. The change in setting shall be done either through laptop, computer & through hand held configurator through the port provided for this purpose with security lock. (PC/Laptop – Not in Bidder’s Scope).

- 2.1 Two numbers of Coriolis true mass flow metering system with data recording system.
- 2.2 Any other items required for safe and accurate operation of Dispenser shall be included by the supplier even if the
- 2.3 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 & troubleshooting.
- 2.4 Supply of application program, ladder logic, list of error codes with description for programming the dispenser parameters.
- 2.5 Supply of drawings & documents.

3 SCOPE OF SERVICES

- 3.1 Design & Engineering.
- 3.2 Manufacturing & assembling.
- 3.3 Procurement from Sub-Bidders/Sub-Bidders.
- 3.4 Inspection & Testing at Works (Internal as well as third party certifications).
- 3.5 Documentation and obtaining statutory approvals from the country of origin and in India.
- 3.6 Packing, Forwarding and Transportation up to Job Sites / GSL stores.
- 3.7 Testing, Erection and commissioning
- 3.8 Supply of base frame (of MS angles etc.) for proper grouting of dispenser on the civil foundation
- 3.9 The Bidder shall also get the offered Dispenser model certified by the Weights and Measures, India. The offered Dispenser model must also be approved by the Chief Controller of Explosive (CCOE)/ Petroleum and Explosives Safety Organization (PESO) and the Bidder shall submit the certificate along with the bid. In case the certificate from Weights & Measure (W&M) of Indian authorities for dispenser manufacturing and model approval is not available at the time of bid, the offer of the part shall be rejected.

4 EXCLUSION



- 4.1 Civil Foundation & Trenches for pipes / Tubes, Instrument’s air availability for Dispenser will be done by GSL.
- 4.2 Supply of electrical cables (from GSL electrical room up-to dispenser location of installation) for dispenser operation.

5 FEED GAS SPECIFICATION

5.1 Gas Composition

The expected gas composition of the feed gas to the CNG Storage Cascade is given below.

Component	Average Gas Composition(mole%)
Methane	92.352

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Ethane	5.305
Propane	1.778
I Butane	0.270
N Butane	0.220
I Pentane	0.006
N Pentane	0.001
Carbon Dioxide	0.023
N- Hexane	0.000
Nitrogen	0.045
Total	100

- O₂ not more than 0.5 % mole
- Total non-hydrocarbon –Not more than 1.0 %
- Total S including H₂S Not more than 10 PPM by weight
- H₂S not more than 4 PPM by volume
- Moisture content in the range 112 to 144 Kg/ MMSCM
- Specific gravity to be calculated by Bidder
- Calorific value Net Kcal/SCM to be calculated by Bidder
- Temp of gas shall be max 55 °C
- Climate
- Max. Height above Mean Sea level: 130 meters (Approx.)
- Max. site temp.: 48 °C
- Minimum site temp.: 0 °C
- RH: 90%



5.2 Gas Delivery Parameter

The inlet gas pressure to the CNG dispenser is as follows: Maximum 255 bar (g) Gas Delivery Temperature: Maximum 70°C
Dependent on ambient temperature.

CNG Specification

The CNG specification should meet the ISO 15403:2000 (E) natural gas quality designation for use as a compressed fuel for vehicles.

The proposed specification of the CNG is as follows:

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Gas Temperature : -20°C to +70°C

Oil Content: 10 PPM

Particulate matter : Less than 5 microns

All Electrical devices shall meet the requirement for the area classification specified in tender. Tubing & other devices shall be so arranged that there is proper access for operation & maintenance. All the dispensers shall be suitable for Outdoor installation without roof/shed.

5.3 Utility Specification Electric Power Supply

AC 230 V ±1%, 1PH, 50 Hz ± 1%. (UPS supply through UPS ACDB shall be provided by the M/s GSL)

- i) The bidder shall 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 include suitable voltage conditioning unit in their scope, if required.
- ii) Bidder has to provide & install Surge Protection device at the Junction Box of each Dispenser where 230-volt AC UPS incoming power supply through UPS ACDB shall be terminated. The Dispenser equipment should be protected from any problem in the input supply. The surge protection device shall be pluggable and Testable with Thermal Disconnection and Indication facility.

5.4 Pneumatic Control

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 5 to 9 kg/cm²g. The end connection for instruments airline will be

¼" Further tubing with necessary pressure reduction (if required), one pressure gauge with isolation valve for inlet pressure of instruments airline shall be provided by the bidder.

5.5 Operations & Control Philosophy

The CNG dispensing facilities should be designed with minimum operator intervention. Routine maintenance work will be carried out during normal working hours and outside the scheduled refueling activities. The control system will be fully automated, only requiring manual intervention for connection of the hose and to initiate the filling operations. The dispensing facilities should be designed to operate for four years or 26,000 hrs. Whichever comes first, without major overhaul of the gas dispensers.



The normal operating pressure of CNG at dispenser inlet shall be 255Kg/cm² (g). However, supply from dispenser to the Vehicle shall get positively cut off at outlet pressure of 200 Kg/ cm² (g) or as per guidelines of PNGRB to ensure the safety of the vehicle.

5.6 Design Philosophy

It is anticipated that the natural gas feed composition, flow rate and pressure will be fluctuating. Hence, bidder should design the CNG dispensing facilities with optimum degree of flexibility, reliability, and operability to accommodate the varying composition of feed gas, other unexpected contaminants, flow rate and pressure. The CNG dispensing facilities should consist of standardized modules, which are assembled into a complete system. Each system should be designed in packaged frame, housing the dispensing system. The design life of the CNG dispensing facilities should be 20 years as minimum.

5.7 Design Basis

The Bidder should prepare the design basis required to meet the demands mentioned above and hereafter and liaise with client to obtain necessary confirmation and approval.

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5.8 Applicable Standards and Codes

The design, construction, manufacture, supply, erection & commissioning, testing and other general requirements of the dispenser equipment should be strictly in accordance with the data sheets, applicable codes, and should comply fully with relevant National & International standards, Indian Electricity Act, Indian Electricity Rules, regulations of Insurance Association of India and Factories Act while carrying out work as per this specification.

Bidder must comply with The Legal & Metrology Act 2009 and its subsequent amendment if any.

The Bidder without any additional cost and delivery implications should carry out any modification suggested by the statutory bodies either during drawing approval or during inspection, if any. The following codes and standards (versions/ revisions valid on the date of order) are referenced to & made part of specification:



1. NFPA 52 Standards for CNG vehicular fuel systems
2. NGV 4.1/ AGA 2-92 Requirements for CNG Dispensing Equipment for vehicles
3. NGV 4.2/ AGA 1-93 Requirement for Hoses for NGVs and fuel dispensers.
4. ANSI / NGV1 / NGV2 Compressed Natural Gas Fueling Connection Devices: Standard for fueling nozzles and receptacles.
5. NGV4 / AGA Requirements for Breakaway devices for CNG vehicle Fueling dispensers and fueling hoses.
6. IS 5572 Classification of hazardous areas (other than mines) for electrical installations.
7. IS 5571 Guide for selection of electrical equipment for hazardous area.
8. OISD 179 Safety requirements for compression, storage, handling and refueling of CNG for use in automotive sector.
9. OISD 113 Classification of areas for electrical installations at hydrocarbon processing and handling facilities.
10. NFPA-52: 1992, ANSI, ASTM, NEC, NEMA, ASNZ, OIML, Indian Electricity Rules, Indian Explosives Act., Australian / New Zealand Refueling Standard. AG901 / NZS 5425.
11. OIML TC8/SC7 Recommendation with regards to CNG dispensers, December 2000.
12. The Standards of Weights and Measures Act 1976.
13. The Standards of Weights and Measures (Enforcement) Act, 1985.
14. The Consumer Protection Act, 1986.

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

Precedence

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

- PNGRB/CCOE.
- W&M Act.
- Data sheets
- Technical Specifications.
- Indian Standards/Codes as applicable
- International Standards/Codes as applicable.

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6 TECHNICAL SPECIFICATIONS FOR MAJOR ITEMS

The specifications described herewith are intended to give Bidder the technical & operating conditions the Dispenser must fulfil. These are to be referred along with relevant description including in earlier sections. Bidder 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 GSL/REPL review and approval.

6.1 DISPENSER:

Each dispenser should have the following specifications:

Should be fast fill electronically controlled operation type and display the following key information on the dispenser with – Intrinsic Safe backlighting or LED display for night viewing showing:

- Quantities of gas dispensed in kg (6 digits in 2 decimal points i.e., 0000.00)
- Unit cost of gas dispensed in Rupees, Rs/kg (5 digits in 2 decimal points i.e., 000.00) Complete transaction value in Rs (6 digits in 2 decimal points i.e., 0000.00)
- There should be 4 displays, two on each side of the dispenser (total 4 sets of 3 rows displays for each dispenser, for Bus Dispenser only 2 Displays).

Bidder must have communication ports in the dispenser to connect the dispenser through Laptop/PC or any other communication medium for collection of data/alterations/modifications in data/parameters stored in mother boards and other electronics installed in the dispenser. Bidder shall provide the communication cables and necessary licensed multi- user software OS in English.

The change in setting shall be done either through lap top, computer & through hand held configurator through the port provided for this purpose with security lock. (PC/Laptop – Not in Bidder’s Scope).



In addition to local ports, change of price should be possible Remotely (From Central Control Room of GSL) both, with or without SCADA. Dispenser electronics shall have necessary provision and security features in its electronics for the same.

UPS supply 230 VAC through UPS ACDB shall be provided by client for computer & control room accessories. Bidder shall make a provision to change the price of CNG through the keypad inside the dispenser unit that shall covered with security lock. RS 485 port shall also be provided for price change. In case standard RS485 port not, available in the dispenser then RS232C to RS485 convertor with all relevant hardware and software to be provided by Bidder.

- 1 set of Alphanumeric Display along with a Keypad.
- Displays must remain active for at least 15 minutes after power failure.
- Provision for adjusting the intensity of the digits in decimal points.
- Easy-to-read backlit displays for maximum visibility- Power conditioning and protection

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 totalizer should not reset in any eventuality not even in case of electronic failure. Reset to zero of the totalizer shall be performed by the dispenser electronics automatically when the maximum value reached. The Non-Resettable Mechanical Type Totalizer Counter shall also to be provided which can be visible from front. The Bidder should provide suitable arrangement outside the flameproof electronic box (on the dispensers’ body) for reading the dispenser totalizers.

6.2 Physical design should be of stainless-steel body with doors/ panels to minimize corrosion and on- going wear and tear. **The**

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dispenser should have tamper-proof locking arrangement of the flow meter / flow meter- transmitter configuration which is the requisite of W&M for any custody meter used for Public. The cabinet should be suitably designed to accommodate all valves, fitting flow meter and all required electronic equipment.



- 6.3 Front/side mounted nozzle come with lockable holder and safety lever / latch to firmly hold the nozzle when not in use.
- 6.4 Each dispenser side should be equipped with authorization / on-off switch and 4 inches dial pressure gauge (0-400 bar) c/w red sectors. Bidder shall provide a bypass isolation valve (2 Valve Manifold) with associated tubing to facilitate routine servicing calibration of pressure gauges without shutdown of the dispenser.
- 6.5 Dispenser unit should have 2 flexible electrically conductive connector hoses, CSA approved and vent hose. Bidder should also include supply of Breakaway coupling in the hoses. Hose shall be of 3/8" ID for auto/ car filling dispenser & 1/2" ID for bus filling in Combo dispenser.

Specific Conductivity of Filling Hose: 0.512 Mega ohms for length up to 180", 3.5 Mega ohms for length over 180" and up to 1200"

- 6.6 One no. Manual Shut-off valve for each fill hose must be considered.

Interconnecting (1/2" car with 1/2" to 3/4" adpoter) 3/4" for bus (Combo) tubing/piping, fittings, high flow valves and NRV's as required.

- 6.7 All instruments (such as mass Flow meter, pressure transmitter/switch etc.) power supply shall be of 24 VDC, if not then deviation to be submitted along with bid. Suitable voltage conditioning unit shall be in the scope of vendor wherever required.
- 6.8 Dispensers shall be based on three banks sequential filling and priority shall be given to dispensing arm. The sequential panel shall be within the cabinet of dispenser itself and not as a separate unit. Sequencing should be on flow rate and pressure.
- 6.9 The dispensers on the car side & bus side would be fitted with "Preset Auto Cut off" arrangement Therefore, for car fill hose, dispenser shall be equipped with facility to preset the total fill value before commencement of 'Preset-facility shall restrict the fill total to multiple of Rs. 10/-. The minimum pre-settable shall be 1.5 times in Kg. x Unit Price in Rs. Per Kg., rounded off to the nearest Rs.10 The total error of this preset facility including meter accuracy shall be no greater than +/- 0.5 %. This arrangement would enable customers to preselect the fill total (in Rs.) before beginning filling process, allowing accurate shutoff of the fill at pre- selected value. This would help in avoiding dealing in small change while taking the payments.
- 6.10 Overfill protection shall be through electronically programmed hose to terminate the fill after 200 Kg/cm²g or amount in Rupees entered by the operator as sometime consumer wants gas on money basis. Vendor shall include 2 nos. transducers or one transducer with one no. pressure micro switch or one transducer with one no. pressure regulator per hose of suitable range for sensing the pressure. Pressure relief valve shall be provided to avoid overfilling. Pressure Relief valve set pressure shall be at 220 kg/cm²g with resetting at 215kg/cm²g. Relief valve setting has to be adjustable from 205 kg/cm²g to 240kg/cm²g with resetting at 200 to 235 kg/cm²g respectively. 2 Nos. transducer or one transducer with one no. Pressure micro switch or one transducer with one (1) no. pressure regulator per hose has been envisaged to terminate the filling. If due to some malfunctioning, transducers or switch are not working well, relief valve shall POP for safety purpose to avoid over filling. If due to some malfunctioning, transducers or switch are not working well, relief valve shall POP for safety purpose to avoid over filling.
- 6.11 Built-in coalescing unit with Grade 6 or better 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 < 1ppm and particulate size is < 0.5 Micron. Filter housing for said filter must be capable for collection of oil for a drain interval of 24 hrs. with oil carry over < 1ppm. Filter elements made of paper shall not be accepted. Vendor to provide appropriately plugged drain valve outside the dispenser housing with suitable arrangement to collect the drained oil. Filter size shall be in accordance with max. flow through the dispenser. Filtration eff. Shall not be less than 95%. Bidder shall provide liquid filled DP Gauge across all filters for observing the pressure drop in filter.

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6.12 The CNG specification should meet the ISO 15403:2000(E) or IS :15958 natural gas quality designation for use as a compressed fuel for vehicles.

6.13 Easy to read lighted display – **explosion proof backlighting (Intrinsic Safe Backlighting) or LED.**

6.14 Separate non-resettable straight forward reading totalizer. Totalizer will be only at dispenser. (The totalizer should be displayed on the Alpha Numeric Display at the press of a single button on the Keypad). These keypad devices 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.

6.15 The components of the flexible hoses are to be factory tested after assembly and before use to at least 5,000 psig. Copies of test certificates should be provided together before the delivery of the dispenser unit. **The dispensing hose of both arms of the dispenser shall be covered with PVC spiral guard sleeve.**

6.16 Connection for the flexible hose should be designed with a burst pressure of at least four times the most severe pressure and temperature conditions expected.

6.17 **ESD button to be mounted on both side** of the dispenser front panel and to be easily reached during emergencies & there must be a provision of one ESD for both nozzles that to be located in Control room & failure or activation of the above ESD will stop the gas supply. Cable laying will be in the scope of client, however it's commissioning & functioning will be in scope of bidder.

6.18 One set each of (½ “for car with ½” to ¾” adpoter and ¾” for bus (Combo) Isolation valves with end plug should be installed on the inlet steel tube of the dispenser. The valve should be located immediately before the dispenser and should be accessible to the maintenance personnel.

6.19 Refueling procedure / instruction complete with diagram or icons type figures should be installed on each side of refueling hoses for each dispenser unit.

6.20 Electrical equipment's and instrumentations wiring should be approved to meet the hazardous area classification Class- I, Division I, Group D as per NEC or Zone I, Group II A/ IIB, Temp. Class T3 as per IS/ IEC, certification required on all components.



6.21 Filling of vehicle from the dispenser shall follow three banks sequencing system

- 1st sequence - from low bank and (high) initially
- 2nd sequence - from medium bank
- 3rd sequence - from high bank

6.22 Dispenser equipment such as pressure gauges, authorization switch, emergency shut-off valve, filling nozzle, ESD button should be provided with labeling / tagging.

6.23 Dispenser should be automatically and immediately shut off CNG supply to each fill hose individually & will not start up to rectification in case of:

- 6.23.1 Power failure
- 6.23.2 Loss of Display
- 6.23.3 Failure of Totalizer
- 6.23.4 Overfill.

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6.23.5 Failure of pressure sensing transmitters

6.23.6 Bursting of the Hose

6.23.7 Snapping off the filling Hose when the Break Away Mechanism comes in to effect

6.23.8 Loss of Display

6.23.9 Power Failure of Mass Flow meter

6.23.10 Failure of metering

6.23.11 Passing of pneumatic ball valve / electro valve

6.23.12 Repeated operation of re-set or start/stop switch

6.23.13 Removal of any electrical wire connected to controller

6.24 Bidder shall indicate overall flow coefficient (Cv) of dispenser from inlet to the dispenser up to outlet probe including mass flow meter, interconnecting tubing, valves, hoses, nozzles, valves etc.,

6.25 The dispenser shall be shipped in fully wired and assembled condition. Only gas supply connection and power supply connection shall be made on site.

6.26 Bidder should include in his scope provision of base frame to be embedded in the foundation. Bidder shall supply base frames in separate packing.

6.27 Bidder shall include either with pneumatic or electrically operated solenoid operated full-bore bubble tight ball valve made of 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 the mass flow meter & Dispenser totalizer, 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.



6.28 Dispenser all end connections must be left at the bottom of the dispenser (i.e., 6" from the dispenser base) & should be [½" for car with ½" to ¾" adapter, ¾" for bus (Combo)] tube respectively for Car & Combo (bus) fitted with ½" & ¾" union with nut and front and back ferrule respectively.

6.29 All the vents (e.g., Actuator, PSV, fill hose) shall be taken out from top of the dispenser in a single header.

6.30 The Combo dispensers shall be designed to handle flow rate ≥ 15 kg/min for car side dispensing arm and ≥ 75 kg/min for bus side dispensing arm. The dispensers shall be suitable for a turn down of not less than 50:1 on flow. The Car dispensers shall be designed to handle flow rate of 15 kg/min (for both side arms) under discharge to atmospheric condition. The dispensers shall be suitable for a turn down of not less than 50:1 on flow.

6.31 The normal operating pressure of CNG at dispenser inlet shall be 255 Kg/cm²(g). However, supply from dispenser to the COMBO, BUS & CAR shall get positively cut off at outlet pressure of 200 Kg/ cm² (g) to ensure the safety of the vehicle.

6.32 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.

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6.33 The normal operating temperature of wetted parts of dispenser shall be (-) 1°C to 70°C.

6.34 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 1-10 seconds 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 full 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.

6.35 Any other item not specified but required for safe and accurate operation of Dispenser system shall also be provided by the bidder.

6.36 Vendor shall make a provision to change the price of CNG through the keypad inside the dispenser that shall be covered with security lock. It shall also be possible to change the price from remote station (from SCADA/from any part of the city) RS485 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 & software to be provided by vendor.

6.37 RS485 serial port shall be provided for downloading the CNG sale data with the help of Purchaser's Personal Computer/Laptop for each shift (08 Hours Interval). Suitable software shall be provided to obtain the same for each shift (8 hours Interval).

6.38 Vendor shall provide a common processor and open communication protocol/RS485 port for RTU to transfer all the dispenser data to central SCADA system. Vendor must note that non-standard/propriety type communication protocol in dispenser for communication with RTU is not acceptable. Protocol must be standard as specified above or any standard protocol with compatible convertor shall be made available & must be compatible to any make of RTU. RTU will have serial communication port RS485 protocol to interface with dispenser. Vendor is responsible to provide the communication port compatibility with RTU. Vendor is required to carry out the communication port functional test & display all the values in Laptop or in applicable device during dispenser inspection at vendor premises. Vendor shall also share the dispenser protocol/RS485 details with client during Inspection at vendors works & submit relevant documents in desired format (both Hardware/Software)



6.39 Supply of application program, ladder logic, and list of error codes with descriptions for programming the dispenser parameter. If dedicated programming unit is required for programming/ parameter change. The same shall be included in the supply.

6.40 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 interconnecting cable shall be provided by GSL.

Detailed requirement of SCADA is as follows:

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

- 6.40.1 Mass Totalizer from Dispenser Motherboard
- 6.40.2 Mass Flow per Filling
- 6.40.3 To Read Gas Selling Price from Dispenser
- 6.40.4 To download the gas selling price into the dispenser from SCADA system
- 6.40.5 Mass Flow Meter Status
- 6.40.6 Tripping Status Dispenser

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6.40.7 Reset Switch Operation Status

6.40.8 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.

6.41 Cabinet

- 6.41.1 Complete cabinet shall be of Stainless Steel (SS-304) and shall have tamper proof locking arrangement. Cabinet wall thickness shall not be less than 1.0 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.
- 6.41.2 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 opening the lock of the dispenser cabinet. Arrangement for collecting drain oil in such a way that NO SPILLAGE shall be in trench. The layout of tubing and other component should be such that it gives unhindered access to all parts and maintenance becomes easy.
- 6.41.3 **Gasonet Services Ltd. Logo and name to be displayed** on both sides of dispensers, which shall be made available to the Bidder, on stainless steel panel with an appropriate colored background or alternatively, Bidder shall provide self-adhesive PE film sheet with logo and name. The artwork shall be provided by **Gasonet Services Ltd.**
- 6.41.4 The dispensers shall be shipped in fully wired and assembled condition. Only gas, supply and power supply connection shall be made at Site.
- 6.41.5 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.
- 6.42 Fill Hose & Fill Nozzle
The dispensing hose of both arms of the dispenser shall be covered with PVC Spiral Guard Sleeve.

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FOR BUS FILLING SIDE

- A Two CNG flexible electrically conductive fill hose (Fill & Vent) shall be included for supply of Dispensers meeting the requirement of NFPA-52 and NGV 4.2.
- B Fill hose shall have Sherex CT-5000 Nozzle or Equivalent suitable to fill Sherex/OPW CL-5078 Combo receptacle. Nozzle shall be designed for high frequency use with a minimum cycle of 1,00,000.
- C CNG flexible electrically conductive twin (fill and vent) hoses with nozzles with directed vent including NGV1 TYPE 2–CT5000 for filling or venting are required. Bidder should also include supply of breakaway coupling, suitable for NGV Industry, in the hose as complete dispensing Arm. Hose should be 1/2” ID for bus (combo) working pressure 250 bar (g) and 5 m long. Dispensers should be ergonomically designed.

FOR CAR FILLING SIDE

- D Electrically conductive fill hose (fill & Vent) shall be included for supply of Dispensers meeting the requirement of NFPA- 52 and NGV 4.2.
- E Fill hose shall be fitted with NGV-1(with all accessories) and second hose fitted with NZS-5424 fill nozzle for filling of vehicles. The nozzle shall meet the requirement of NGV-1 Type1, class A nozzle. Bidder shall include the supply of 3-way valve with each hose for filling & venting of gas. Bidder shall also include supply of Breakaway coupling, suitable for NGV industry, in the hose. Hose shall be 3/8” ID 5000 psig, at least 4 m long. Bidder shall demonstrate the function of breakaway coupling during performance test.
- F Dispensers should be ergonomically designed.

6.43 One number of holster / cradles for fills nozzles along with weather caps for the protection of nozzles.



6.44 **Bidder has to supply the dispensers with pneumatic operated full-bore bubble tight ball valve made of ANSI 316 SS or electromagnetic valve for ON- OFF control of flow. Bidder to ensure the system design in such a way that any unmetered gas if passes, should be recorded by mass flow meter & Electronic display & there should not be any possibility of unmetered gas supply through dispenser in case of malfunctioning of ball valves.**

6.45 **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 5000 operation hours. 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. The combination of SOV, pneumatic actuator and Ball valve would constitute power fail-safe valve. The whole system has to be very fast acting and response time fraction of second so that if the flow were terminated at any point of dispensing, the slippage would be always within the accuracy limit.**

6.46 One coalescent filter at inlet of bank supply line with manual drain valve to ensure that the oil carryover in the CNG being filled to Vehicle is < 1 PPM. Filter elements made of paper shall not be provided. Bidder to provide appropriately plugged drain valve outside the dispenser housing with suitable arrangement to collect the drained oil outside the dispenser by necessary tubing. Bidder to provide one liquid filled pressure gauge across the filter to know the pressure drop across the filter.

6.47 Bidder 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.

Provision for sealing of Mass Flow Meter and Transmitter shall be provided.

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6.48 Mass Flow Meter

Mass Flow meter must have integral Display. Mass flow meter with integral display unit should be provided to ensure high accuracy and direct mass flow measurement approved for custody transfer metering of CNG at each of the refueling hose. The microprocessor-based control system should be provided to sense, monitor and control complete filling operations on a continuous, uninterrupted basis. There should not be any difference in reading between this integral display unit and non-resettable display in the electronic control unit.

Mass flow meter unit should be designed for custody transfer metering of CNG and meet the following requirements:

Accuracy - + 0.2% to 0.5% of Measured Value

Repeatability -+ 0.1% of Measured Value

Enclosure - IP65

Pressure influence - Nil

Surge and frequency-Shall be in compliance with ANSI/IEEE(EFT) transient effect 62.41(1991)

EMI effect on sensor and-To the requirement of EMC directs 89/336/Transmitter EEC, EN 50081-1(Jan '94) Vibration effect
- As per SAMAPM31.1-1980 condition 2

Make/ Model: Emerson (Micro-motion) / Compac / E&H or equivalent (PESO approved make or model).

- a) Back-up Power supply, for displays so that display remains at least for 15 minutes after power failure. Bidder shall provide battery backup of 72 hours to the RAM of dispenser controller.
- b) The configuration data for the offered mass flow meter shall be stored in a non-volatile memory or in a dedicated battery backed RAM such that this remains unchanged because of power fluctuations or power off conditions. In case mass flow meter Bidder standard instrument has battery backed RAM, Bidder must indicate the protection time and battery life in their offer.

6.49 PIPE, TUBING WORK, VALVES AND FITTINGS



Pipe & Tubing work should be designed, tested and installed to ensure its safe operation at the worst conceivable conditions of flow, pressure and temperature.

All high-pressure tubing work should be of 1/2", 3/4" & 1" OD SS (1/2" OD SS for car and 3/4" OD SS for bus (Combo)) fully annealed (Bright annealed) seamless conforming to ASTM A269 TP 316L. The tubing shall be Sandvik, Tubex, Parker make and fittings shall be of Parker/ Swagelok/Hylok/SSP/TUBACEX/D-LOK/ or equivalent manufacture make only. The system should be "go-no-go" gauge able to demonstrate that fittings are properly tightened. Wherever possible valves and control devices should incorporate the same end connector system. The Supplier should ensure that personnel assembling the pipe work should be competent in the system employed.

Tubing and valves (supply and erection) from Air Compressor to Dispenser is also in the Bidder's scope.

The preferred valve types for isolation are 1/4 turn ball valves. Such valves have similar material to the tube they are attached to. Ball valves must be of good quality and be appropriately selected frequency of use. Ball seats must be suitable for natural gas operation of the gas composition indicated. Valves and fittings subject to corrosion must be either inherently resistant, or be coated with a corrosion inhibiting paint or surface treatment.

6.50 ELECTRICAL SPECIFICATION

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It is not intended to cover all aspects of design but to indicate the basic requirements only. Bidder 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.

6.51 CODES AND STANDARDS

- 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:
 - Indian Electricity Act and Rules framed there under
 - a. Fire Insurance Regulations.
 - b. Petroleum Rules and any other regulations laid down by Chief Controller of Explosives.
 - c. Regulations laid down by local statutory authorities and Electrical Inspectorate.
- Bidder shall provide all assistance required for obtaining approvals from statutory authorities for materials, plant design/drawings and complete installation.
- 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.
- In case of any discrepancy/conflict between the specified codes and standards, the order of decreasing precedence shall govern.
- Wiring: -All the Non-Safe Wiring between the Ex'd' boxes shall be armored wiring. The wiring between the IS Connections shall be Blue in Color.
- Legal & Metrology Act 2009 and its amendment's time to time.

6.52 AREA CLASSIFICATION AND EQUIPMENT SELECTION

- ii) 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. 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. For Zone-2 areas, increased safety type Ex 'e' or non-sparking Type Ex 'n' equipment shall be provided as a minimum, subject to the same being acceptable to statutory authorities. Ordinary safe area type electrical equipment shall not be used in Zone-2 areas (even though this may be permitted by NEC for Div.2 areas).
- Electrical equipment for hazardous areas shall be certified by CMRI and approved by CCOE/PESO Nagpur (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. Bidder shall furnish the necessary certificates indicating such approvals.
- iii) All the electrical and electronic component shall be in flame/explosion proof housing suitable for Hazardous area classification: Class 1, Division 1, Group D as per NEC or Zone 1, Group IIA/IIB as per IS/IEC, Temperature Class T3, and completely

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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.

6.53 EQUIPMENT SPECIFICATIONS

- i) All equipment shall be complete with all necessary weather protection including tropicalization to prevent damage due to Climate, dust and corrosive vapors. The enclosure protection of all equipment's shall be IP: 55 as per IEC specifications.
- ii) Bidder 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.
- iii) All electrical components and equipment shall be sized to suit the maximum load under the most severe operating conditions.
- iv) All electrical equipment's shall be supplied with double-compression cable glands, made of nickel- plated brass, tested and certified to be used in zone-1, hazardous area.
- v) Although it is planned to provide power supply from UPS, but in some cases, the supply may be fed from GG/ DG Set with poor regulation which may contain harmonics, transients and surges. The owner shall not provide protection against such harmonics, transients & surges. Therefore, the equipment supplied by bidder must include suitable voltage conditioning unit and other protection devices so that equipment provides safe and accurate operation of dispenser.
- vi) The system shall be solidly earthed. However, if specific earthing is required for the system - electronics, the same to be highlighted and earth pits to be provided by bidder; otherwise, system earthing including making of earth-pits etc. shall be provided by M/s GSL and bidder to provide connections to the grid.
- vii) Name of the manufacturer, type of enclosure protection and certificate no. with name of testing/Certifying agency shall be furnished with bids / for approval.

7 HAZARDOUS AREA

The Supplier shall specify the hazardous area in accordance with the IS 5572 / relevant Standard of country of origin.

All electrical equipment cabling and earthing shall be appropriate for the zone in which it is fitted, and all cables passing from the hazardous to safe area shall be equipped with appropriate barriers where necessary.

All Instruments shall be suitable for an area classification of "Class 1, Group D, Division 1 as per NEC" OR "Zone 1, Group IIA /IIB Temp Class T3 as per IS/ IEC".



All dispenser mounted transmitters & temperature element and Solenoid Valves shall be intrinsic safe Ex 'ia' as per IS/IEC 60079-11 and solenoid valves, switches and related junction boxes shall be flame proof Ex'd' as per IS/IEC60079-

5.1.1 Other special equipment's/instruments, where intrinsic safety is not feasible or available, shall be flame proof as per IS/IEC 60079-1.

A complete dossier of all electrical equipment will be provided, showing area classification and certification of equipment.

8 INSPECTION AND TESTING

8.1 At Bidder's Works

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All the dispensers shall be subjected to Inspection stage wise or final by third party which shall be in the scope of the Bidder and witness by GSL/REPL.

8.2 The following activities shall be covered under inspection:

- a) Review of Q.A. documents.
- b) Review of calibration certificates for flow meter, dispenser, pressure transmitters, pressure gauges and all instruments.
- c) Review of all statutory certificates including W & M.
- d) Review of area classification compatibility of all items including bought out items.
- e) Review of Mill Test reports.
- f) Review of NDT reports if any.
- g) Review of bought out sub-assemblies/major components, test/inspection certificates.
- h) Dimensional checks as per approved drawings and data sheets.

8.3 Functional Test

All the dispensers shall be tested to demonstrate the functioning of all the components and controls. Functional & simulation test shall be carried out at vendor's works & shall be witnessed by GSL/REPL. Communication through RS485 with necessary software in Laptop/PC to be shown with demonstration of Price change, Totalizer value for each shift & 24 hours respectively, Kg of gas filled in each vehicle etc.,

8.4 Performance Test

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

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

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

9 CALIBRATIONS AND THIRD-PARTY CERTIFICATION



All mass flow meter, instrument gauges, etc. should be calibrated and such calibration certificates should be presented before conducting final shop test at Bidder Works. If any of the calibration certificates is not in order, the Supplier's should replace the affected equipment at Supplier cost. Documentation and obtaining statutory approvals from the country of origin is in Bidder's scope. The offer dispenser must be approved and certified by recognized authority, Weights and Measures or the other statutory authorities of the Country of Origin.

10 DISPENSER PERFORMANCE

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

During the shop test of dispenser, in case the dispenser flows capacity from inlet of 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.

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Performance test at workshop shall be done in presence of GSL/REPL personal. Test certificate shall be submitted by the vendor as per given guaranteed parameters: -

Guaranteed performance for Dispensers shall be as follows:

- i) Capacity of the CAR dispenser shall be 15 kg/min under atmospheric discharge at inlet pressure of 255 Kg/cm²(g) with design case gas composition.
- ii) Capacity of the Combo (Bus) dispenser shall be 75 kg/min under atmospheric discharge at inlet pressure of 255 Kg/cm² (g) with design case gas composition.
- iii) Overall Dispensers Batch Accuracy of ±1.5% or better of the quantity filled.

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

11 WARRANTY SERVICING

The suppliers should provide a warranty period of 12 months from the date of commissioning and final site acceptance of Dispenser or 24 months from the date of receipt of material site, whichever is earlier.

All necessary spare parts to be kept at site to sustain the maintenance of the CNG dispenser facilities within the one-year warranty & 4 Year Post warranty period.

12 PACKAGING INSTRUCTIONS

Packing shall be strong and sturdy such that it can withstand loading/unloading & pushing by mechanical devices. All packaging shall be done in such a manner as to reduce volume and weight as much as possible without jeopardizing the safety of the material. All packing materials shall be new.

Fragile articles should have special packing materials depending on type of materials.

All soft and delicate surfaces on equipment/material should be carefully protected / painted with suitable coating and wrapped to prevent rusting and damage. All mechanical and electrical equipment and other heavy articles should be securely fastened to the bottom of the case, to avoid damage.

Attachments and spare parts of equipment and all small pieces shall be packed separately in wooden cases with adequate protection inside the case and sent along with main equipment. Each item shall be tagged so as to identify it with the main equipment and part number and reference number shall be indicated.

All protrusions shall be suitably protected and openings shall be blocked by wooden/steel covers as may be required.

Detailed case wise packing list in water proof envelope shall be inserted in each package together with equipment/material. One copy of 'Detailed Packing List' shall be fastened outside of the package in waterproof envelope and covered by metal cover.

Each package shall be marked on three sides with proper paints/indelible waterproof ink as follows:



PURCHASER:

DESTINATION:

Purchase Order No.....

Net Wt..... Kgs,

Gross Wt..... Kgs.

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Dimensions.....X.....X.....CM.
 Package No. (Sl. No. of total packages).....
 Seller's Name.....

Permits are to be obtained separately for entry/use of vehicles/trailers etc. inside the plant. The following requirements are to be met to obtain vehicle permit:-

- a) Vehicle/Equipment etc. should be brought to site in good conditions.
- b) Valid Road Tax Certificate, fitness certificate and insurance policy from Competent Authority
- c) Valid operating/driving license of driver/operator
- d) Any other requirement mentioned elsewhere in Tender Document

LIST OF APPROVED MAKES



Item no.	Description	Approved Makes
1	St. Stl. High Pressure Tubing for CNG	Sandvik/Parker or equivalent
2	SS Fitting, High pressure	Parker/Swagelok/SSP/Hylok/DK Lok or equivalent
3	SS Ball Valves, High Pressure	Parker/Swagelok/SSP/Hylok/ DK Lok or equivalent
4	Non-return valve/ Check Valve	Parker/Swagelok/SSP/Compaq/Hylok/ DK Lok or equivalent
5	Ball Valve/ Needle Valve	Swagelok/Parker/SSP/Hylok/ DK Lok or equivalent
6	Actuator	Rotex/Swagelok/Parker or equivalent
7	Solenoid / Electromagnetic Valve	Rotex/Parker/Compaq or equivalent (PESO approved make or model)
8	Safety Relief Valve	Swagelok/Parker/Compaq or equivalent
9	Breakaway coupling	OPW/Parker/WEH/Staubli or equivalent
10	Electric Cables	Ploycab/ Finolex/ Havells/ Torrent Power/KEI or equivalent
11	Flexible hose 1 feet	Parker/Synflex or equivalent
12	Main Filling Hose	Parker/Synflex or equivalent
13	CAR/BUS Nozzle	OPW/Parker/WEH/ Staubli or equivalent
14	Mass flow meter	Emerson (Micro-motion) / Compac / E&H or equivalent (PESO approved make or model) or equivalent

Note:

For all flow meters installed in dispenser their performance report of 2 years to be submitted without any defects relevant documents to be submitted along with the bid.

13 INSPECTION



Vendor shall appoint the PNGRB authorized TPIA for inspection purpose in line with approved QAP, Drawings, Data Sheets and tender conditions. Cost of TPI shall be to bidder's scope. Vendor to propose minimum 03 TPI agencies, from which one

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shall be selected/ approved by GSL / REPL.

14 DATA SHEET FOR CAR DISPENSER

1	GENERAL		
2	SERVICE	DISPENSER FOR CNG STATIONS	
3	MODEL NO.:		
4	FRAME MATERIAL	STAINLESS STEEL 304	
	NO. REQD.:	AS PER PR/SOR	
5	DISPENSER CONFIGURATION:	DUAL HOSE	
6	MASS FLOW METER :		
7	<input type="checkbox"/> MANUFACTURER	:	
8	<input type="checkbox"/> PLACE OF MANUFACTURE	:	
9	<input checked="" type="checkbox"/> No OF LINES:	:Three.	
10	<input checked="" type="checkbox"/> POWER REQUIREMENTS: SINGLE PHASE AC 230 V ±1%, 50 HZ ± 1%.	<input type="checkbox"/> POWER CONSUMPTION:	
11	<input checked="" type="checkbox"/> INLET GAS PRESSURE: 250 kg/cm ² (g)	<input checked="" type="checkbox"/> FILL PRESSURE: 200 kg/cm ² (g)	
12	Provision to enter amount by the operator (6 digits in 2 decimal points i.e., 0000.00) as sometimes consumer wants gas on money bases		
13	<input checked="" type="checkbox"/> METERING: CORIOLIS MASS FLOW WITH W&M APPROVAL	<input checked="" type="checkbox"/> FLOWRATE: Max : 15/ Kg/Min. Nom : 9kg/min, Min : 2.5 kg/min.	
14	<input checked="" type="checkbox"/> TEMPERATURE RANGE: (-) 20°C to 70°C		
15	<input checked="" type="checkbox"/> TUBE PRESSURE RATING: 5000psi		
16	<input checked="" type="checkbox"/> FILL NOZZLE TYPE: NGV1 Type2 Class A in one arm with adopter (NGV to NZS) /NZS type in second Arm	<input checked="" type="checkbox"/> FILL VALVE TYPE: 3-way Valve	
17	<input checked="" type="checkbox"/> BREAKAWAY COUPLING: YES	<input checked="" type="checkbox"/> COUPLING SIZE: 3/8"	
18	<input checked="" type="checkbox"/> VENT RETURN COUPLING: YES	<input checked="" type="checkbox"/> COUPLING SIZE: 1/8"	
19	<input checked="" type="checkbox"/> FILL HOSE TYPE: TWIN (FILL & VENT)	<input checked="" type="checkbox"/> FILL HOSE SIZE: 3/8"	
20	<input checked="" type="checkbox"/> FILL HOSE LENGTH: MINIMUM 4.0M	<input checked="" type="checkbox"/> MAX BURST PRESSURE: FOUR TIMES TO THE WORKING PRESSURE	
21	<input checked="" type="checkbox"/> SOLENOID VALVE: YES	<input checked="" type="checkbox"/> EMERGENCY (ESD): REQUIRED SHUTDOWN BUTTON	
22	<input checked="" type="checkbox"/> HOSE RETRACTOR: YES		
23	<input checked="" type="checkbox"/> CAPTURED VENT: YES		
24	<input checked="" type="checkbox"/> TEMPERATURE COMPENSATION: YES (Selectable)		
25	EARTH QUAKE ZONE II WIND VELOCITY (m/s) 33 (MAX)		
26	INSTALLATION: <input checked="" type="checkbox"/> OUTDOOR		
27	<input checked="" type="checkbox"/> MOUNTED ON A FOURCOURT,		
28	<input checked="" type="checkbox"/> ELECTRICAL AREA HAZARD:		
29	CLASS/ZONE: CLASS I ZONE I DIVISION: I GAS GROUP: D, GROUP IIA, IIB		
30	APPLICABLE CODES AND STANDARDS		

	ANNUAL RATE CONTRACT FOR SUPPLY, INSTALLATION & COMMISSIONING OF CNG CAR AND COMBO (CAR-BUS) DISPENSER PACKAGE AT CHURU, MANDI, PAURI GARWAL (RISHIKESH) & CHAMPAWAT GA	
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31	DISPENSER APPROVALS: AS PER APPLICABLE STANDARD	TUBING: STAINLESS STEEL		
32	■ VALVE PRESSURE TEST: IF USED			
33	UTILITIES DATA			
34	■ Electricity: AC230V± 1%, 1 pH, 50Hz± 1%			
35	Solenoid Valves: A.C/D.C V Ph Hz			
36	Electronic PCBs: A.C/D.C V Ph Hz			
	Mass Flow meters A.C/D.C V Ph Hz			
37	Electrical connection (Cable gland to be provided by the vendor for 2.5mm ² x3 Cable) :			
38	<input type="checkbox"/> Total Consumption			
39	Solenoid Valves:(Watts)			
40	Electronic PCBs (Watts)			
41	Mass Flow meters: (Watts)			
42	■ MATERIALS			
43	Component Materials			
44	Solenoid Valve	Brass		
45	Spring Loaded Regulator	Brass		
46	2-way isolation Valve	SS		
47	3-way filling Valve	SS		
48	Coalescing Filter	SS / BRASS		
49	Tube 3/8"	SS		
50	Bleed Valves	SS		
51	INSPECTION AND TESTS			
52	Material Composition and Physical Properties Certificates Required For:			
53	■ Solenoid Valve			■ Spring Loaded Regulator
54	■ Tube ■ Hose			
55	<input type="checkbox"/> Coalescing Filter			<input type="checkbox"/> Bleed Valve
56		Required	Observed	Witnessed
57	■ Shop inspection by Purchaser during Manufacture	■	<input type="checkbox"/>	■
58	■ Functional/Tests	■	<input type="checkbox"/>	■
59	■ Field performance test for 4 hrs and Field Trial Run 72 Hrs. Under Vendor's Supervision (Dispenser)	■	<input type="checkbox"/>	■
60	<input type="checkbox"/> WEIGHTS			
61	Overall supply (including, all components and packing crate) Kg. approx.			
62	Maximum erection weight Kg. Approx.			
63	SCOPE OF SUPPLY			
64	■ Dispenser Assembly complete.			
65	■ Vendor Data as specified			
66	NOTE :			
	a. Fill checklist for completeness of the Scope of Supply.			
	b. The Specific Conductivity of Filling Hose must be specified.			
	c. All necessary software with license for dispenser electronics and mass flow meter shall be provided. Necessary converter with connecting cables for downloading the data into client's Laptop shall also be provided.			

	ANNUAL RATE CONTRACT FOR SUPPLY, INSTALLATION & COMMISSIONING OF CNG CAR AND COMBO (CAR-BUS) DISPENSER PACKAGE AT CHURU, MANDI, PAURI GARWAL (RISHIKESH) & CHAMPAWAT GA	
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	d. Two nos of holster/cradle for filling nozzles along with weather caps for the protection of nozzles. Holster / cradle shall be suitable for NGV/NZS Nozzles.
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15 DATA SHEET FOR BUS DISPENSER

1	GENERAL	
2	SERVICE	DISPENSER FOR CNG STATIONS
3	MODEL NO.	
4	FRAME MATERIAL	STAINLESS STEEL 304
	NO. REQD.	As per PR/SOR
5	DISPENSER CONFIGURATION	DUAL HOSE
6	MASS FLOW METER	
7	<input type="checkbox"/> MANUFACTURER	
8	<input type="checkbox"/> PLACE OF MANUFACTURE:	
9	<input checked="" type="checkbox"/> No OF LINES:	One
10	<input checked="" type="checkbox"/> POWER REQUIREMENTS: SINGLE PHASE AC 230 V $\pm 1\%$, 50 HZ $\pm 1\%$.	<input type="checkbox"/> POWER CONSUMPTION:
11	<input checked="" type="checkbox"/> INLET GAS PRESSURE: 250 kg/cm ² (g)	<input checked="" type="checkbox"/> FILL PRESSURE: 200 kg/cm ² (g)
12	<input checked="" type="checkbox"/> METERING: CORIOLIS MASS FLOW WITH W&M APPROVAL	<input checked="" type="checkbox"/> FLOWRATE: Max :75/ Kg/Min. Nom: 40kg/min, Min : 10 kg/min.
13	<input checked="" type="checkbox"/> TEMPERATURE RANGE: (-) 20°C to 70°C	
14	<input checked="" type="checkbox"/> TUBE PRESSURE RATING: 5000 psi	
15	<input checked="" type="checkbox"/> FILL NOZZLE TYPE: Sherex CT5000	<input checked="" type="checkbox"/> FILL VALVE TYPE: 3-way Valve
16	<input checked="" type="checkbox"/> BREAKAWAY COUPLING: YES	<input checked="" type="checkbox"/> COUPLING SIZE: 1/2"
17	<input checked="" type="checkbox"/> VENT RETURN COUPLING: YES	<input checked="" type="checkbox"/> COUPLING SIZE: 1/4"
18	<input checked="" type="checkbox"/> FILL HOSE TYPE: TWIN (FILL & VENT)	<input checked="" type="checkbox"/> FILL HOSE SIZE: 1/2"
19	<input checked="" type="checkbox"/> FILL HOSE LENGTH: MINIMUM 5.0 M	<input checked="" type="checkbox"/> MAX BURST PRESSURE: FOUR TIMES TO THE WORKING PRESSURE
20	<input checked="" type="checkbox"/> SOLENOID VALVE: YES	<input checked="" type="checkbox"/> EMERGENCY SHUTDOWN BUTTON (ESD): REQUIRED
21	<input checked="" type="checkbox"/> HOSE RETRACTOR: YES	
22	<input checked="" type="checkbox"/> CAPTURED VENT: YES	
23	<input checked="" type="checkbox"/> TEMPERATURE COMPENSATION: YES (Selectable)	
24	EARTH QUAKE ZONE II	WIND VELOCITY (M/S) 33 (MAX)
25	INSTALLATION: OUTDOOR	
26	<input checked="" type="checkbox"/> MOUNTED ON A FOURECOURT,	
27	<input checked="" type="checkbox"/> ELECTRICAL AREA HAZARD:	
28	CLASS/ZONE: CLASS I ZONE I	DIVISION: I GAS GROUP: D, GROUP IIA, IIB
29	APPLICABLE CODES AND STANDARDS	
30	DISPENSER APPROVALS: AS PER APPLICABLE	TUBING: STAINLESS STEEL 3/4"

	ANNUAL RATE CONTRACT FOR SUPPLY, INSTALLATION & COMMISSIONING OF CNG CAR AND COMBO (CAR-BUS) DISPENSER PACKAGE AT CHURU, MANDI, PAURI GARWAL (RISHIKESH) & CHAMPAWAT GA	
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31	■ VALVE PRESSURE TEST: IF USED		
32	UTILITIES DATA		
33	■Electricity: AC230V± 1%, 1 pH, 50Hz± 1%		
34	Solenoid Valves: A.C/D.C	V	Ph Hz
35	Electronic PCBs: A.C/D.C	V	Ph Hz
36	Mass Flow meters: A.C/D.C	V	Ph Hz
	Electrical connection (Cable gland to be provided by the vendor for 2.5mm ² x3 Cable) :		
37	<input type="checkbox"/> Total Consumption		
38	Solenoid Valves:(Watts)		
39	Electronic PCBs (Watts)		
40	Mass Flow meters: (Watts)		
41	■MATERIALS		
42	Component Materials		
43	Solenoid Valve	Brass	
44	Spring Loaded Regulator	Brass	
45	2-way Isolation Valve	SS	
46	3-way filling valve	SS	
47	Coalescing Filter	SS / BRASS	
48	Tube 3/8"	SS	
49	Bleed Valves	SS	
50	INSPECTION AND TESTS		
51	Material Composition and Physical Properties Certificates Required For:		
52	■ Solenoid Valve	■ Spring Loaded Regulator	
53	■ Tube	■ Hose	
54	<input type="checkbox"/> Coalescing Filter	<input type="checkbox"/> Bleed Valve	
55		Required	Observed Witnessed
56	■ Shop inspection by Purchaser during Manufacture	<input type="checkbox"/>	<input type="checkbox"/>
57	■ Functional/Tests	<input type="checkbox"/>	<input type="checkbox"/>
58	■ Field performance test for 4 hrs and Field Trial Run 72 Hrs. Under Vendor's Supervision (Dispenser)	<input type="checkbox"/>	<input type="checkbox"/>
59	<input type="checkbox"/> WEIGHTS		
60	Overall supply (including, all components and packing crate) Kg. Approx.		
61	Maximum erection weight Kg. approx.		
62	SCOPE OF SUPPLY		
63	■ Dispenser Assembly complete.		
64	■ Vendor Data as specified		
65	NOTE : a. Refer checklist for scope of supply b. Specific Conductivity of Filling Hose must be specified. c. All necessary software with license for dispenser electronics and mass flow meter shall be provided. Necessary		

	<p style="text-align: center;">ANNUAL RATE CONTRACT FOR SUPPLY, INSTALLATION & COMMISSIONING OF CNG CAR AND COMBO (CAR-BUS) DISPENSER PACKAGE AT CHURU, MANDI, PAURI GARWAL (RISHIKESH) & CHAMPAWAT GA</p>	
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	<p>converter with connecting cables for downloading the data into client's Laptop shall also be provided. d. Two nos of holster/cradle for filling nozzles along with weather caps for the protection of nozzles. Holster / cradle shall be suitable for Sherex CT-5000 Nozzles.</p>
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Comprehensive Annual Maintenance (AMC)

1. SCOPE OF WORK

The scope of work under this Tender shall include, but not limited to, as below –

1.1 General:

This contract covers the provision of services to undertake the Comprehensive Maintenance as per Company schedule and Breakdown repair of CNG dispensers as & when complaints are received at CNG control room.



For the purpose of clarity, the agency providing maintenance services for above dispensers shall, herein after be referred to as "Contractor" and the company hiring the services of the agency will, herein after be referred to as "Company" (GSL).

1.2 Preventive Maintenance: Contractor's Scope:

- To carry out the Preventive & Breakdown maintenance of dispensers strictly in accordance with the schedule provided by Company / OEM Manual. However tentative schedule for PM is mentioned later in this section.
- The Contractor shall confirm to Company their availability to carry out the Maintenance in advance.
- The spares required for carrying out preventive maintenance shall be in the scope of Contractor.
- The contractor personnel shall inform the exact time to the EIC before and after carrying out the maintenance.
- The Contractor shall ensure all required consumables such as cotton waste, cleaning solvent, insulation tapes, thinner, soap solution, Teflon tape etc. including required tools & tackles are available on site. Supply of consumables, tools & tackles etc. is in the scope of Contractor. Tools shall include multi meters, Laptop with required software (prolink etc.,) etc.
- In case of a situation, when contractor's stock has exhausted, the company will provide the spares on loan basis to the contractor, and the same shall be replenished by the contractor.



1.3 List of mandatory spares to be available with the Contractor every time (excluding Parts mentioned in Serial No. 6) strictly but not limited to are mentioned here.

- a. QRC Male/ Female (Quick Release Coupling)
- b. Probes/Probes 'O' ring
- c. Keypad with silicon cover and keypad display.
- d. 3 way ball valve (make-Parker/ Swagelok / SSP / Hamlet/ or equivalent)
- e. Display of Rs/Kg, Rupees quantity and totalizer display.
- f. Red and Green signals LED.

	<p style="text-align: center;">ANNUAL RATE CONTRACT FOR SUPPLY, INSTALLATION & COMMISSIONING OF CNG CAR AND COMBO (CAR-BUS) DISPENSER PACKAGE AT CHURU, MANDI, PAURI GARWAL (RISHIKESH) & CHAMPAWAT GA</p>	
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- g. Mother Board/Electronic Control Unit
 - h. Pressure Transmitter/Pressure Gauge
 - i. Temperature gauge.
 - j. O Ring and QRC ring
 - k. Two way Ball valve seal kit (make-as per approved vendor list) with both O ring type bush and spring plate type bush.
 - l. Two way ball valve assemble (make: approved make in this tender document)
 - m. Vent needle ball valve repairing kit
 - n. Dispenser door lock
 - o. Electromagnetic valve/Control Valve SOV Coil
 - p. Power supply card.
 - q. Wires for electronic devices inter connection (with jacks)
 - r. Quarter tubes with fittings/PU tubes.
 - s. Oil filter element.
 - t. Break away coupling seal kit for repair
 - u. Glands for mass flow meter cable connection.
 - v. Pressure gauge.
 - w. Hose pipe spiral casing for protection from abrasion because of friction.
 - x. GSL name and logo imprinted stickers for dispenser's bodies.
 - y. TG PG/PT calibration.
 - z. Pressure Safety Valve calibration.
- Contractor shall provide sufficient number of probe "O" Rings at all CNG Stations to ensure uninterrupted operation of Dispensers.
 - Contractor shall note down the dispenser performance before and after carrying out the maintenance as per format.
 - Contractor to submit report of Percentage difference between Mass Flow Meter and Non-rest- table Totalizer on fortnight or Monthly basis as per order of EIC.. Later on after continuous operation, if calibration of installed Mass Flow Meter will be required Same will be executed by Contractor at site with the help of laptop and suitable software. Only in case of lab calibration, if established by Contractor in front of GSL Site Incharge through proving exercise by Standard Master Calibration Device (CNG Prover), GSL will be entitled to send the Mass Flow Meter for calibration at its own cost.
 - Preventive maintenance will be carried out on Monthly basis during non-peak hours in consultation with EIC. Any maintenance that needs to be taken up shall be well planned in advance with due approval of EIC.
 - The contractor shall be liable for the consequential cost, in addition to repair cost, arising out of poor workmanship e. g. failure of spare part due to improper fitment.
 - The contractor shall produce the compliance report of each maintenance activity on the next Working day to the Engineer - In - Charge. Compliance report shall be descriptive in nature. Provide proper communication facilities to all contractor personnel such as engineers, Technicians etc.
 - The contractor shall inform the Company, names and mobile numbers of all the service personnel who will be deployed for providing the services during the AMC. An alternate number will also be informed to the company, which can be contacted in case all service personnel's mobile are not reachable. Changes, if any, will be notified to the company.

1.4 **Schedule for Preventive Maintenance of Dispenser: -**

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- a. Visual inspection of Hose assembly including in line break away couplings
- b. Check probe
- c. Check three-way ball valve
- d. Check ON/OFF KNOB & Switch
- e. Check keypad working digits
- f. Check Quick Release Coupling
- g. Check all the three display i.e. Rate, quantity, rupee and Totalizer display
- h. Check oil filter and drain accumulated oil from filter
- i. Clean Air filter and change if it is required passing.
- k. Check control valves for programmed bank wise operation.
- l. Check all the loose electrical connections
- m. Clean dispensers' interiors and exteriors
- n. Cut off pressure transmitter to be monitored and if it is found not working then it should be replaced

2. Break down Repair: Contractor Scope:

- a) On receiving information from the CNG control room/Dealer, contractor shall ensure that his team reaches the concerned retail outlet.
- b) Attend to dispenser breakdown service calls on 24X7 basis.
- c) The service personnel will report to the call site within 2 hours from the time of receiving service call in CHURU, MANDI, PAURI GARWAL (RISHIKESH) & CHAMPAWAT GA site or at whatever site dispensers are installed (Prior Information will be provided for location of installation of Dispensers).
- d) Before proceeding to the outlet, the contractor personnel shall collect all necessary spares required for the repair depending on the nature of the complaints received.
- e) Upon reaching the retail outlet, the contractor personnel shall contact the CNG Control room to advise his attendance on site, and confirm the breakdown reporting.
- f) The contractor shall coordinate with the Company representative for instructions on undertaking the repair work.
- g) After solving the complaint, the contractor shall inform CNG control room.
- h) Provide proper communication facilities to all contractor personnel such as engineers, technicians etc.,
- i) Maintain records of the services provided, and submit the same to the company, once in a Month.

3. Reports to be submitted:

- a. Reports (in soft copy and print form) of individual equipment as and when the dispensers are undertaken for preventive maintenance/break down/on complaint service. Report shall be descriptive in nature including nature and quantity of material used or repaired.
- b. Monthly cumulative list on preventive maintenance/breakdown repair/ on complaint service of dispensers carried out with actual date and time of service.
- c. Monthly cumulative list on consumption of spares in each dispenser consumed during preventive maintenance/breakdown repair/ on complaint service attend.

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- d. Separate analysis report on breakdown if anything particular occurred which needs special attention.
- e. Report of Percentage difference between Mass Flow Meter and Non-rest-table Totalizer as per guaranteed parameter declared at the time of supply.
- f. Stock list of spares duly certified by GSL Officer with monthly RA bill.

4. Minimum Manpower Requirement:

The Maintenance team shall have minimum of one Engineer (preferably instrumentation) and onetechicians (min. ITI qualification) to cover CHURU, MANDI, PAURI GARWAL (RISHIKESH) & CHAMPAWAT GA site for less than 10 Dispensers. In case of more than 10 operational dispensers, two technicians of required qualification will be required.

Contractor shall maintain an office cum store room where its team shall be readily available in general shift and all the equipment shall be strictly available at this place only. Location of this establishment shall also be chosen by keeping the location of all GSL station in view. Location of all GSL station in view.

5. Exclusions

This AMC covers Preventive and Breakdown maintenance of above dispensers, by way of repairs / replacement of defective components, except for the following items.

- a. These Items are excluded from the AMC.
 - i) Mass Flow meter repair is exclusive. But Fault diagnosis at site including on-site calibration with suitable software via laptop is in contractor scope. Contractor has to submit proper elaborative fault diagnosis report with recommended corrective measures in case of issue in Mass Flow Meter.
 - ii) Flexible Hose pipe of all sizes.
 - iii) Supply of in line Break-away Coupling is exclusive. But repairing, inclusive of seal kit is in Contractor's scope.



6. The Company shall be responsible for the following activities as a partner in the AMC:

- a. Ensure security of the dispensers in all manners. The company shall ensure that the dispenser/its components are not subject to theft, abuse, sabotage, improper &/or unauthorized handling, and illegal usage.
- b. Providing adequate (a minimum of 4 hrs., from the time the dispenser is offered to the service personnel for repairs, but can be more depending on nature of work) shut down time for preventive maintenance, acknowledging & approving the work done on record.
- c. Providing shut down time for preventive maintenance, acknowledging and approving the work done on record.
- d. Release payment against the invoices raised by the contractor, on a monthly basis, as per agreed payment terms of the AMC.
- e. The company shall inform the Contractor, names & mobile numbers of max. two personnel from the company, who have been authorized to log a service call.
- f. Before logging a service call, the company authorized person will verify that the service call is on account of dispenser, and log the call with clarity about the nature of failure. An alternate number will also be informed to the contractor, which can be contacted in case the above two persons are not reachable. Changes if any will be notified to the contractor.

7. Performance Indicators:

The contractor's performance shall be measured by:

- 1. Preventive maintenance
 - a. Carry out preventive maintenance in accordance with the schedule.

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- b. Carry out preventive maintenance as per the scheduled maintenance task (mentioned in Serialno. 2).
- c. Carry out preventive maintenance within specified down time given in the schedule.
- 2. Breakdown repair:
 - a. Achieving response time (mentioned in serial no. 3).
 - b. Correct diagnosis of the cause of breakdown and submission of correct analysis report. c.Rectification of the breakdown within the acceptable timescale dictated by Contractor experience.
 - d. Spares availability at site.
 - e. Min. repairing time/day if any equipment is sent out of station for repairing.
 - f. Well-disciplined team at site and their overall cooperation with company representatives.

8. Break down penalty: (During AMC Period)

In case, the contractor's service personnel is unable to reach the break down site within stipulated time, or is unable to complete the maintenance within stipulated time, following penalty will be applicable. This amount will be deducted from the invoice raised by the contractor, at the end of the month.

- a. Penalty for 1 hour delay in reaching at all site (ie, within 3 hours instead of 2 hours) - Rs 500/- per arm per dispenser.
- b. Penalty for 2 hour delay in reaching at all site (ie, within 4 hours instead of 2 hours) - Rs 1000/- per arm per dispenser.
- c. If the shutdown time, which will be calculated from the time the dispenser is offered to service person on reaching site, is extended beyond 4 hours, a penalty of Rs 500/- per hour will be applicable.
- d. Penalty of Rs2500 towards non availability of mandatory spares at operational sites.
- e. Contractor shall not deploy the employee of age less than 18 years in any of the activities. If it is found, then it will be viewed seriously and heavy penalty of Rs.20000/-per instance and also the termination/blacklist will be done from our approved vendor list.
- f. The contractor shall provide full Personal Protective Equipment (PPE) to each individual employee including, soft hat, eye protection, ear plug, and safety shoes. In case, the contractor does not provide PPE, the same will be arranged by GSL at the risk and cost of the contractor. It is mandatory for all personnel to wear said PPE whilst performing their duties, failing which a penalty @ Rs.500/- per incidence will be levied in addition to dismissal of the person.

Note: The Vendor shall maintain spare parts inventory including proprietary items/motherboards/display units/keyboards etc., for efficient repair and AMC work.

