



Bhagyanagar Gas Ltd.

**BHAGYANAGAR GAS LIMITED
(A Joint Venture of GAIL & HPCL)**

**BID DOCUMENTS FOR
PROCUREMENT OF CNG DISPENSERS ON ARC BASIS FOR
A PERIOD OF 18 MONTHS**

**UNDER OPEN DOMESTIC COMPETITIVE BIDDING
Bid Document No.:043-LEPL-BGL-08**

**VOLUME- II of II
TECHNICAL**



Lyons Engineering Pvt. Ltd.

**INDEX
OF
BID DOCUMENT**

TECHNICAL VOLUME – II OF II

<u>SL. NO.</u>	<u>ITEM DESCRIPTION</u>
1.0	MATERIAL REQUISITION
2.0	TECHNICAL SPECIFICATION
3.0	ANNUAL MAINTENANCE CONTRACT

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 2 OF 74	

**MATERIAL REQUISITION
FOR
CNG DISPENSER**



**PREPARED AND ISSUED BY
LYONS ENGINEERING LIMITED**
India

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 3 OF 74	

MATERIAL REQUISITION

Sr. No.	Item Description	Units	Qty
A	Design, Detail Engineering, Manufacturing, assembly, factory testing, supply of dispenser including packaging, insurance, handling, transportation of dispenser, loading and unloading at BGL store/sites, re-transportation of the dispenser from store to actual site / station in Hyderabad, Vijayawada & Kakinada geographical area, documentation and providing all related services including installation, integration, site acceptance testing, trial run and commissioning spares, comprehensive annual repair & maintenance services, all drawings, documents and licensed software & hardware, converters, cables, etc. complete in all respect for BGL Projects confirming to MR specification & technical specification for CNG Dispenser enclosed with tender. Statutory clearance from W&M India for the field installation before start of commercial operations is in bidder's scope.		
A.1	CAR CUM AUTO DISPENSER		
	Design, Engineering, Manufacturing, Testing and Supply of CNG Car Cum Auto Dispenser (double arm) as per scope of work defined in the tender documents inclusive of commissioning spares (the list has to be furnished with the offer by the bidder). The supply of surge protection device with enclosure at CNG Station and it's mounting arrangement shall also be included in the quoted price. Bidder shall also include TPIA (Third Party Inspection Agency) Charges, mandatory spares as specified in the bid documents.		
A.1.1	Hyderabad	Nos.	25
A.1.2	Vijayawada	Nos.	5
A.1.3	Kakinada	Nos.	1
A.2	Erection, Testing, commissioning & Calibration, performance test and statutory clearance from W&M India for the field installation before start of commercial operations of each Dispenser as defined in the tender document.		
A.2.1	Hyderabad	Nos.	25
A.2.2	Vijayawada	Nos.	5
A.2.3	Kakinada	Nos.	1



**PROCUREMENT OF CNG DISPENSERS
ON ARC BASIS**

DOCUMENT NO.

043-LEPL-BGL-08

REV

A

SHEET 4 OF 74

B.1	BUS CUM CAR (COMBO) DISPENSER		
	Design, Engineering, Manufacturing, Testing and Supply of CNG Bus Cum Car Dispenser (double arm) as per scope of work defined in the tender documents inclusive of commissioning spares (the list has to be furnished with the offer by the bidder). The supply of surge protection device with enclosure at CNG Station and it's mounting arrangement shall also be included in the quoted price. Bidder shall also include TPIA (Third Party Inspection Agency) Charges, mandatory spares as specified in the bid documents.		
B.1.1	Hyderabad	Nos.	9
B.1.2	Kakinada	Nos.	1
B.2	Erection, Testing, commissioning & Calibration, performance test and statutory clearance from W&M India for the field installation before start of commercial operations of each Dispenser as defined in the tender document.		
B.2.1	Hyderabad	Nos.	9
B.2.2	Kakinada	Nos.	1
C.1	BUS DISPENSER		
	Design, Engineering, Manufacturing, Testing and Supply of CNG Bus Dispenser (single arm) as per scope of work defined in the tender documents inclusive of commissioning spares (the list has to be furnished with the offer by the bidder). The supply of surge protection device with enclosure at CNG Station and it's mounting arrangement shall also be included in the quoted price. Bidder shall also include TPIA (Third Party Inspection Agency) Charges, mandatory spares as specified in the bid documents.		
C.1.1	Hyderabad	Nos.	4
C.2	Erection, Testing, commissioning & Calibration, performance test and statutory clearance from W&M India for the field installation before start of commercial operations of each Dispenser as defined in the tender document.		
C.2.1	Hyderabad	Nos.	4
D	ANNUAL REPAIR AND MAINTENANCE FOR DISPENSER PACKAGES		
D.1	Lump sum Comprehensive Annual Repair & Maintenance (CARM) charges per Dispenser Package for first year (i.e. after warranty period) inclusive of supply of all consumables & Manpower and all spares.		
D.1.1	Hyderabad	Nos.	38
D.1.2	Vijayawada	Nos.	5
D.1.3	Kakinada	Nos.	2



D.2	Lump sum Comprehensive Annual Repair & Maintenance (CARM) charges per Dispenser Package for second year after CARM period (SOR Item No. D.1) inclusive of supply of all consumables & Manpower and all spares.		
D.2.1	Hyderabad	Nos.	38
D.2.2	Vijayawada	Nos.	5
D.2.3	Kakinada	Nos.	2
D.3	Lump sum Comprehensive Annual Repair & Maintenance (CARM) charges per Dispenser Package for third year after CARM period (SOR Item No. D.2) inclusive of supply of all consumables & Manpower and all spares.		
D.3.1	Hyderabad	Nos.	38
D.3.2	Vijayawada	Nos.	5
D.3.3	Kakinada	Nos.	2
D.4	Lump sum Comprehensive Annual Repair & Maintenance (CARM) charges per Dispenser Package for fourth year after CARM period (SOR Item No. D.3) inclusive of supply of all consumables & Manpower and all spares.		
D.4.1	Hyderabad	Nos.	38
D.4.2	Vijayawada	Nos.	5
D.4.3	Kakinada	Nos.	2

**TECHNICAL SPECIFICATION
FOR
CNG DISPENSER**



**PREPARED AND ISSUED BY
LYONS ENGINEERING LIMITED**
India

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 7 OF 74	

TABLE OF CONTENTS

1.0	INTRODUCTION	9
2.0	PROJECT REQUIREMENTS.....	9
3.0	SCOPE OF WORK.....	9
4.0	PROJECT DETAILS & GUIDELINE FOR EQUIPMENT	10
5.0	FEED GAS SPECIFICATION.....	11
6.0	CLIMATIC CONDITIONS.....	12
7.0	UTILITY SPECIFICATION	12
8.0	OPERATIONS & CONTROL PHILOSOPHY.....	13
9.0	DESIGN PHILOSOPHY.....	13
10.0	APPLICABLE STANDARDS AND CODES	14
11.0	SCOPE OF SUPPLY.....	15
12.0	TECHNICAL SPECIFICATIONS FOR CAR / BUS / COMBO DISPENSERS.....	16
13.0	TECHNICAL SPECIFICATIONS FOR CAR CUM BUS COMBO DISPENSERS.....	24
14.0	INSPECTION AND TESTING.....	27
15.0	CALIBRATIONS AND THIRD-PARTY CERTIFICATION	28
16.0	DISPENSER PERFORMANCE	28
17.0	TRAINING REQUIREMENTS	28
18.0	WARRANTY SERVICING AND SPARE PARTS	28
19.0	TECHNICAL SUPPORT	29
20.0	DATA AND DRAWING DETAIL.....	29
21.0	PACKAGING.....	29
22.0	COMMISSIONING OF DISPENSERS.....	30
23.0	DATA SHEET OF MASS FLOW METERS.....	31
24.0	DATA SHEET OF SOLENOID VALVE	32
25.0	DATA SHEET OF BUS DISPENSERS	33
26.0	DATA SHEET OF CAR DISPENSERS.....	37
27.0	DATA SHEET FOR CAR CUM BUS (COMBO) DISPENSER	40
28.0	VENDOR DATA REQUIREMENT FOR BUS, CAR & COMBO DISPENSERS.....	43
29.0	CHECK LIST: BUS, CAR & COMBO DISPENSER PACKAGE	46

1.0 INTRODUCTION

M/s Bhagyanagar Gas Limited, a joint venture of GAIL (India) Limited, and HPCL is engaged in development of CNG (Compressed Natural Gas) as fuel to commercial & private vehicles through filling stations in the automobile sector & PNG (piped Natural Gas) to Industrial, household, commercial sector through City Gas Distribution Networks (CGDN) at different Geographical Areas in the country. PNGRB has awarded to BGL the work of development of City Gas Distribution Network for Hyderabad, Vijayawada & Kakinada Geographical Area. Presently, Bhagyanagar Gas Limited is planning to implement CNG & City Gas Distribution Network (CGDN) to supply Natural Gas to domestic, commercial, industrial and automobile consumers distributed over the Geographical Area (GA) of Hyderabad, Vijayawada & Kakinada Geographical Area.

The quantities of CNG Dispenser required shall be as per SOR (Schedule of Rates) cited elsewhere in the tender document.

2.0 PROJECT REQUIREMENTS

- 1.1 The project requirements will be as defined in respective MR Specification for CNG Bus, Car & Combo Car cum Bus Dispenser. The Supply and Installation complete with all auxiliaries & features required for efficient & safe operation, in accordance with this Technical Specification, Data sheets & other enclosures at the CNG station is included in the Scope of Vendor. 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. The metering system shall be Coriolis type Mass Flow System. CNG Bus, Car & Combo Dispenser shall be as per the Data sheet & Specification defines elsewhere in this Technical Specification.
- 1.2 The Dispenser Model and Mass Flow Meter or Dispenser Model using a Mass Flow Meter part of Dispenser offered by the vendor shall be certified from the Weights and Measures or any other statutory authority of the Country of Origin as well as shall also certified by the Weights and Measures, India. (Ministry of Consumer Affairs). The offered Dispenser model must also be Type Approved by the Chief Controller of Explosive (CCOE), Govt. of India as per Gas Cylinder Rules, 2016 (latest).

3.0 SCOPE OF WORK

- 1.3 The intent of this technical specification is to outline the requirement under which the vendor shall Design, Engineering, Manufacture, Inspect & Test the equipment at Works, Painting, Packaging & forwarding, Insurance, supply to Sites/Stores, Installation testing, trial run, Commissioning and Performance Testing at Sites, with all auxiliaries & features required for efficient & safe operation.
- 1.4 Since It is not possible to specify every piece of equipment/item, 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 Vendor without any cost or time implication.

1.5 SCOPE OF SERVICES

- Design & Engineering.
- Manufacturing & Assembling.
- Procurement from Sub-vendors.

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 9 OF 74	

- Inspection & Testing at Works Internal as well as third party certifications.
- Documentation and obtaining statutory approvals from the country of origin and in India.
- Packing, Forwarding and Transportation up to Job Sites/ BGL stores.
- Testing and commissioning, of each Bus or Car Dispenser, individually.

EXCLUSION: Civil Foundation & Trenches for Pipes / Tubes.

1.6 INSTRUCTIONS TO VENDOR

- The Vendor shall carry out modification required by the statutory bodies either during the approval or during inspection of the installation. All expenses shall be borne by the vendor. Unless the above formalities are cleared, supply part shall be deemed incomplete.
- Any work, which is considered to be unsatisfactory and of poor workmanship shall be rectified by the vendor without any extra cost and time implications.
- The approval from concerned Govt. Bodies in respect of complete installation of a CNG Dispensing Station shall be obtained by the BGL. Necessary Information/ Data as may be required by Govt bodies shall be furnished by vendor to facilitate BGL in obtaining approval without any cost implication to the owner.
- The bidder shall provide necessary manpower, tools & tackle, transport, communication, cranes, scaffolding etc. required for simultaneous working at any site or more than one site to suit overall erection program within the scheduled time.
- All safety and warnings 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.
- The bidder shall provide civil foundation drawing and Base frame within two weeks of placement of order.
- The Bidder shall not vary the scope of work as detailed in tender and approved drawings without written permission of owner.
- Loading, unloading, transportation to BGL store are in the bidder's scope. Receipt and storage maintenance by BGL including watch and ward of material. Supervision of installation and erection of dispensers shall be in the bidder's scope. Dispenser destination shall be as specified in Cl. 1.0 of Material Requisition.

4.0 PROJECT DETAILS & GUIDELINE FOR EQUIPMENT

Technical Data of CNG

The CNG specification should meet the ISO:15403: 2000 / IS-15958 / IS:15320-2012 natural gas quality designation for use as a compressed fuel for vehicles. The proposed specification of the CNG is as follows:

Gas Temperature -10°C to +70°C

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 10 OF 74	

Oil Content	10 PPM
Particulate matter	Less than 5 microns
Odorant	(80% TBM+20%MES) Spot leak 12 ppm / 20 mg/m3 (Ethyle Mercaptan)

The dispenser shall be suitable for the Climatic Conditions as define in the MR specification.

All Electrical devices shall meet the requirement for the area classification specified in this Technical Specification.

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.

5.0 FEED GAS SPECIFICATION

➤ Gas Composition

The expected gas composition of the feed gas to the CNG dispenser is given below. The CNG equipment shall be designed to meet the changes in the gas compositions from gas fields, India.

S. No.	COMPONENT	AVG. GAS COMPOSITION (mol%)
1	Nitrogen	0.3505
2	Methane	94.6591
3	CO2	0.5502
4	Ethane	2.3547
5	Propane	1.0458
6	i-Pentane	0.2135
7	n-Butane	0.3223
8	i-Pentane	0.1427
9	n-Pentane	0.1414
10	n-Hexane	0.2199
11	GCV	9721.00
12	NCV	8775.00
13	Specific Gravity	0.59 - 0.625

➤ Gas Delivery Parameter

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

NOTES:

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 11 OF 74	

- O₂ not more than 0.5% mole. Total non-hydrocarbon not more than 2.0%.
- Total S including H₂S not more than 10 ppm by weight.
- H₂S not more than 4 ppm by volume.
- Moisture: No Free water

6.0 CLIMATIC CONDITIONS

A. HYDERABAD

- Minimum ambient temperature : 5 Deg.C
- Maximum ambient temperature : 50 Deg.C
- Relative Humidity : 94% Max.
- Altitude above mean sea level : 100-601 m
- Wind velocity : NA

B. VIJAYAWADA

- Minimum ambient temperature : 4 Deg.C
- Maximum ambient temperature : 50 Deg.C
- Relative Humidity : 90% Max.
- Altitude above mean sea level : 100-540 m
- Wind velocity : NA

C. KAKINADA

- Minimum ambient temperature : 5 Deg.C
- Maximum ambient temperature : 45 Deg.C
- Relative Humidity : 95% Max., Non condensing
- Altitude above mean sea level : 2-100 m
- Wind velocity : 120 km/hr

7.0 UTILITY SPECIFICATION

Electric Power Supply : 230 Volt AC, 1 Phase, 50 Hz

Note: Vendor 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. Vendor has to provide AC/DC convertor.

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 12 OF 74	

Electromagnetic valves shall be used for operation of SOVs. & tap off for the same shall be taken from the upstream of the mass flow meter.

8.0 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 refuelling activities. The control system will be fully automated, only requiring manual intervention for connection of the hose and to initiate the filling operations.

Dispenser shall use instrumentation air / electronically controlled Solenoid for operation and made available necessary provision for it. The dispensing facilities should be designed to operate for a two-year or 10,000 hr whichever comes first, without major overhaul of the gas dispensers.

To commence refuelling of CNG vehicles, the drivers / operators need to unhook the NGV/NZS connector from the dispenser and hook-up to the inlet of the CNG vehicles. Thereafter, the refuelling would commence upon activation either through manual reset switch or through card reader. The dispenser will automatically stop the refuelling process at 200 kg/cm²(g) or the amount in Rupees entered by the operator and all such refuelling transaction data would be stored and subsequently downloaded into a computer or forecourt management system. The printer attached with the dispenser will generate a cash memo for each hose separately after completion of refilling Process.

9.0 DESIGN PHILOSOPHY

It is anticipated that the natural gas feed composition, flow rate and pressure will be fluctuating. Hence, Supplier should design the CNG dispensing facilities with optimum degree of flexibility, reliability, and operability to accommodate the varying composition of feed, other unexpected contaminants, flow rate and pressure.

Sr. No.	Type of Dispenser	Type of Flow (High/Low)	Flow Rate kg/min	Fill Pressure kg/cm ² (g)	No. of Fill Hoses per Dispenser	Remarks
1	Car	High/Low	15	200	02 (Two)	Inlet Pressure: 250 kg/cm ²
2	Bus	High (Bus)	75	200	01 (One)	
3	Car cum Bus (Combo)	High/Low (Car) & High (Bus)	15 for Car & 75 for Bus	200	01 (One) for Car & 01 (One) for Bus	

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.

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 13 OF 74	

The design life of the CNG dispensing facilities should be 20 years as minimum.

The entire valve operation etc. of dispenser shall be by Instruments air electronically controlled Solenoid. Necessary provision shall be available in the dispenser.

10.0 APPLICABLE STANDARDS AND CODES

The design, construction, manufacture, supply, 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.

The Vendor 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:

Sr. No.	Codes/Standards	Description
1.	NFPA 52	Standards for CNG Vehicular Fuel Systems
2.	NGV 4.11 AGA 2-92	Requirements for CNG Dispensing Equipment for Vehicles
3.	NGV 4.21 AGA 1-93	Requirement for Hoses for NGVs and Fuel Dispensers.
4.	ANSI / NGV1	Compressed Natural Gas Fuelling Connection Devices - Standard for Fuelling Nozzles and Receptacles.
5.	NGV41AGA	Requirements for Breakaway devices for CNG vehicle fuelling dispensers and fuelling 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 Refuelling of CNG for use in Automotive Sector
9.	OISD 113	Classification of areas for electrical installations at hydrocarbon processing and handling facilities
10.	OIML TC8 / SC7	Recommendation with regards to CNG dispensers
11.	NFPA-52:1992, ANSI, ASTM, NEC, NEMA, ASNZ, OIML, Indian Electricity rules, Indian explosives act, Australian / New Zealand refueling standard AG 901/NZS 5425	



12.	The Standards of Weights and Measures Act
13.	The Standards of Weights and Measures (Enforcement) Act,
14.	The Consumer Protection Act, 1986.
15.	The standards of Weights and Measures (General), Amendment Rules, 2009 – Part X (Compressed Gaseous Fuel (CNG) Measuring Systems for Vehicle.
16.	Legal metrology (General) rules 2011, eighth schedule, part IX (Compressed Gaseous Fuel (CNG) Measuring Systems for Vehicle).

Precedence

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

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

11.0 SCOPE OF SUPPLY

- 11.1 The Car, Bus and Combo Dispensers shall be complete with all required auxiliary equipment for efficient & safe operation as a whole. Vendor shall be responsible for furnishing all electrical, instrumentation, inter connecting Piping & Safety Items as required to make the Dispensers complete and functional
- 11.2 Supply of CNG Bus Dispensers, single arm type having min. flow capacity > 75 kg/min at 255 bar inlet under discharge to atmospheric condition. Bus Dispenser shall be as per the specification defined in this document.
- 11.3 Supply of CNG CAR Dispensers, double arm type having min. flow capacity > 15 kg/min at 255 bar inlet under discharge to atmospheric condition. Car Dispenser shall be as per the specification define in this document.
- 11.4 Supply of CNG Combo Dispensers, double arm type having min. flow capacity > 15 kg/min (for Car arm) and > 75 kg/min (for Bus arm) at 255 bar inlet under discharge to atmospheric condition. Combo Dispenser shall be as per the specification define in this document
- 11.5 Any other items required for safe and accurate operation of Dispenser shall be included by the supplier even the same is not specifically mentioned in this document

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 15 OF 74	

- 11.6 To commence refueling of CNG vehicles, the drivers / operators need to unhook the filling Probe connector from the dispenser and hook-up to the inlet of the CNG vehicles. Thereafter, the refueling shall commence upon activation through manual reset switch. The dispenser will automatically stop the refueling process at 200 bar (g) and all such refueling transaction data shall be stored and subsequently downloaded into a computer.
- 11.7 Any spare required during commissioning shall be in the scope of vendor. If any spare during commissioning borrowed from Mandatory spare the same shall be replenished by vendor free of cost.
- 11.8 Vendor/Bidder shall provide the list of Mandatory spares including filters etc.
- 11.9 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.
- 11.10 Supply of application program, ladder logic, list of error codes with description for programming the dispenser parameters.
- 11.11 Supply of drawings & documents as per Drawing & documents Schedule at S.No.19.
- 11.12 Supply of Instrumentation & Electrical items required as per Specification. All cable shall be supplied with double compression type of cable glands tested & certified to be used in hazardous area classified as Zone-I. All trays, Ex. Proof JB and accessories also to be supplied and erected As per requirements. Supply and laying of Copper armored cable from electrical room at CNG stations to dispenser unit is in the bidder's scope (approx. length of cable/ dispenser required is 50 meters of 2.5mm² x3 core Cable).
- 11.13 The supplier shall quote for On-Site Training to BGL personals for Three days.
- 11.14 NGV nozzle setup is required for both the arms to fill cars/autos providing required fittings for dispensing to autos.

12.0 TECHNICAL SPECIFICATIONS FOR CAR / BUS / COMBO DISPENSERS

The specifications described herewith are intended to give vendor the technical & operating conditions, the Dispenser must fulfill. These are to be referred to along with relevant description including in earlier sections.

Each dispenser shall adhere to following specifications:

- 12.1 It 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 including 2 decimal points i.e., 0000.00)
 - Unit cost of gas dispensed in Rupees, Rs/kg (5 digits including 2 decimal points i.e., 000.00)
 - Complete transaction value in Rs (6 digits including 2 decimal points i.e., 0000.00)

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 16 OF 74	

- There should be 2 displays, one on each side of the dispenser.
 - 1 set of numeric Display (two nos. on either side) for bus dispensers & 2 sets (four nos.-two each side) for combo/car dispensers. The display should have three rows. Display should be crystal back-lit display for night viewing. Unit cost of gas dispensed in Rupees, Rs/kg (5 digits in 2 decimal points i.e., 000.00). The display should read previous batch readings even 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.
 - A suitable SS-304 foldable protection guard for each display to be provided to avoid direct sun light facing on display with option of closing it during transit.
- 12.2 Non-reset-table and non-volatile totalizers' 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 totalizers shall not reset in any eventuality not even in case of electronic failure. The vendor shall provide suitable arrangement outside the flameproof electronic box (on the dispenser's body) for reading the dispenser totalizers.
- 12.3 Physical design shall be of stainless steel body with doors/ panels to minimize corrosion and on-going wear and tear. The dispenser shall have tamper-proof locking arrangement of the flow meter-transmitter configuration as per requisite of W&M for any custody meter used for Public. The cabinet shall be suitably designed to accommodate all valves, fitting flow meter and all required electronic equipment.
- 12.4 Dispenser shall be supplied with front/side mounted nozzle fitted with lockable holder and safety lever / latch to firmly hold the nozzle when not in use.
- 12.5 Each dispenser side shall be equipped with authorization / on-off switch and 4 inches dial pressure gauge (0-400 bar) c/w red sectors. Vendor 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. Display shall be visible 24 hours of the day.
- 12.6 Each dispenser unit shall have 2 flexible electrically conductive connector hoses, CSA approved and vent hose. Vendor shall also include supply of Breakaway coupling in the hoses. Hose shall be of 3/8" ID for Car dispenser and 1/2" for Bus dispenser.
- 12.7 One no. Manual Shut-off valve for each fill hose has to be considered.
- 12.8 Interconnecting 3/4 "tubing /piping, fittings, high flow valves as required shall be provided for NGV type nozzles for bus dispensers and Interconnecting 1/2" tubing /piping, fittings, high flow valves as required shall be provided for NZS type nozzles for car dispensers
- 12.9 Overfill protection shall be through electronically programmed hose to terminate the fill after fill pressure reaches 200 bar (g). Vendor shall include 2 nos of pressure transmitter out of which the Primary sensing Pressure Transmitter shall be SIL Certified, a pressure transducer of suitable range for sensing of pressure. Pressure relief valve shall be provided to avoid overfilling in case of failure of control system.

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 17 OF 74	

- 12.10 Vendor to provide means of temperature compensation the final limit fill pressure to 200 bar (g) equivalent at 15 degree C, if ambient temperature is below 15 degree C. There shall be an option of activating and deactivating Temperature Compensation in the filling Logic and the same shall be password protected.
- 12.11 Built-in coalescing filter with differential pressure gauge at inlet of each bank and carried over oil at the inlet with manual drain valve with locking arrangement. Vendor to provide suitable arrangement To collect the drained oil outside the dispenser by necessary tubing. Oil content shall be < 5ppm in the filtered gas.
- 12.12 Easy to read lighted display - explosion proof backlighting (Intrinsic Safe Backlighting) or LED.
- 12.13 Separate non-resettable straight forward reading totalizers. Totalizers will be only at dispenser. (The totalizers shall be displayed on the Alpha Numeric Display at the press of a single button on the Keypad).
- 12.14 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 shall be provided together before the delivery of the dispenser unit.
- 12.15 Connection for the flexible hose shall be designed with a burst pressure of at least four times the most severe pressure and temperature conditions expected.
- 12.16 ESD button to be mounted on both side of the dispenser front panel and shall be easily accessible during emergencies.
- 12.17 Isolation valves complete with venting line valve and end plug shall be installed on the inlet steel tube of the dispenser. The valve shall be located immediately before the dispenser and shall be accessible to the maintenance personnel.
- 12.18 Refueling procedure / instruction complete with diagram or icons type figures shall be installed on each side of refueling hoses for each dispenser unit.
- 12.19 Electrical equipments and instrumentations wiring shall be approved to meet the hazardous area classification Class-I, Division I, Group D as per NEC or Zone I, Group II A/ IIB as per IS/ IEC, certification required on all components.
- 12.20 Filling of vehicle from the dispenser shall follow single bank sequencing system for Bus dispensers and filling of vehicle from the dispenser shall follow three bank sequencing system 1st sequence from low bank and (high) initially, 2nd sequence from medium bank and 3rd sequence from high bank for CAR dispensers.
- 12.21 Dispenser shall be automatically and immediately shut off CNG supply to each fill hose individually in case of: **i.** Power failure **ii.** Failure of metering **iii.** Failure of Totalizers **iv.** Overfill. **v.** Failure of pressure transducer. **vi.** Bursting of the Hose **vii.** Snapping off the filling Hose when the Break Away Mechanism comes in to effect
- 12.22 Vendor shall indicate overall CV of dispenser from inlet of the dispenser up to outlet probe including mass flow meter, interconnecting tubing, valves, hoses, nozzles etc.,
- 12.23 The dispenser shall be shipped in fully wired and assembled condition. Only gas supply and power supply connection shall be made on site.

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 18 OF 74	

- 12.24 Vendor shall include in his scope provision of base frame to be embedded in the foundation. Bidder shall supply base frames in separate packing.
- 12.25 Vendor shall provide facility required for calibration and fault finding diagnostics of mass flow meter and configuration of data in the electronic control unit.
- 12.26 Dispenser end connections shall be 1/2" & 3/4 " tube respectively for bus and car fitted with 1/2" & 3/4" union with nut and front and back ferrule respectively. One set of valve to be provided immediately before the dispenser at the inlet of the piping
- 12.27 All the vents (e.g., PSV, fill hose) shall be taken out from top of the dispenser in a single header.
- 12.28 The Bus dispensers shall be designed to handle min flow rate of > 75 kg/min under discharge to atmospheric condition. The dispensers shall be suitable for a turn down of not less than 20:1 on flow. The CAR dispensers shall be designed to handle min flow rate of > 15 kg/min under discharge to atmospheric condition. The dispensers shall be suitable for a turn down of not less than 50:1 on flow. The Combo dispenser shall be designed to handle both for Bus arm and Car arm respectively as above.
- 12.29 The normal operating pressure of CNG at dispenser inlet shall be 255 Kg/cm² (g). However, supply from dispenser to the BUS & CAR shall get positively cut off at outlet pressure of 200 Kg/cm² (g) to ensure the safety of the vehicle.
- 12.30 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.
- 12.31 The normal operating temperature of wetted parts of dispenser shall be (-) 1°C to 60°C.
- 12.32 Designing of the dispensers shall 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.
- 12.33 Any other item required for safe and accurate operation of Dispenser.
- 12.34 Supply of application program, ladder logic, and list of error codes with descriptions for programming the dispenser parameter.
- 12.35 Dispenser equipment such as pressure gauges, authorization switch, emergency shut-off valve, filling nozzle, ESD button shall be provided with labelling / tagging

12.36 DISPENSER CABINET

- 12.36.1 Complete cabinet shall be of Stainless Steel (SS-304) and shall have tamper proof locking arrangement. Cabinet wall thickness shall be min 1.6 mm. Cabinet shall be sized to accommodate all electrical, electronic and mechanical components for metering and display within the cabinet. Cabinet shall be designed to protect all tubing, pressure gauges, valves, fittings, electrical & electronics item from tampering, rain, dust, vermin etc. Dispenser cabinet shall be provided with adequate size bottom opening for the entry of gas supply line/lines and power supply connections.

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 19 OF 74	

Adequate ventilation shall be provided so that there is natural convection current and cooling takes place inside. Cabinet shall be structurally robust and shall not resonate at the frequencies emanated during normal flow or during choked flow through the nozzles, breakaway coupling or valves etc.

- 12.36.2 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. The layout of tubing and other component shall be such that it gives unhindered access to all parts and maintenance becomes easy.
- 12.36.3 BGL Logo and name shall be displayed on both sides of dispensers, which shall be made available to the vendor, on stainless steel panel with an appropriate coloured background or alternatively, vendor shall provide self-adhesive PE film sheet with BGL Logo and name. The artwork shall be of three colours. The colours, Logo size and name size shall be informed to successful bidder during detailed engineering.
- 12.36.4 The dispensers shall be shipped in fully wired and assembled condition. Only gas, supply and power supply connection shall be made at Site.
- 12.36.5 Wherever provided, 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.

12.37 FILL HOSE & FILL NOZZLE

BUS DISPENSER

- a. Electrically conducive fill hose (Fill & Vent) meeting the requirement of NFPA-52 and NGV 4.2.
- b. Fill hose shall have Sherex CT-5000 Nozzle or WEH TK-25 or Equivalent suitable to fill Sherex/OPW CL-5078 bus receptacle. Nozzle shall be designed for high frequency use with a minimum cycle of 1,00,000. Vendor shall also include supply of breakaway coupling, suitable for NGV Industry, in the hose as complete dispensing Arm. Hose shall be 1/2" ID working pressure 255 bar (g) and 4 m long.

CAR DISPENSER

- a. Electrically conducive fill hose (fill & Vent) meeting the requirement of NFPA-52 and NGV 4.2.
- b. The nozzles in the filling Hose in the CAR dispensers should be as per the following table:

NZS-5424 fill nozzle in one arm and NGV 4.2 fill nozzle having NZS adapter assembly in another
NZS-5424 fill nozzle in both arm

Vendor shall also include supply of Breakaway coupling, suitable for NGV industry, in the hose as complete dispensing Arm. Hose shall be 3/8" ID 5000 psig, at least 4 m long. Vendor shall demonstrate the function of breakaway coupling during performance test.

Long refilling hose should be provided with protective guard. Hose crimp to be provided with protective sleeve. Hose crimp should be of SS and have protection sleeve over it to avoid short circuit with battery terminal.

- 12.38 One number of holster/cradle for fills nozzles along with weather caps for the protection of nozzles.
- 12.39 Vendor has to supply the dispensers with pneumatic operated full-bore bubble tight ball valve made of SS for ON-OFF control of flow. Vendor to ensure the system design in such a way that any gas if passes, shall be recorded by mass flow meter & there shall not be any possibility of unmeasured gas supply through dispenser in case of malfunctioning of ball valves.
Linkage with ball valve shall 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 shall be provided on its body. The combination of SOV, pneumatic actuator and Ball valve shall 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 shall be always within the accuracy limit. The Solenoid Valves shall have Intrinsic Safe Coil.
- 12.40 The dispenser should have mechanical counter for recording cumulative Gas dispensed in Kg. The maximum reading of mechanical counter should be compatible to that of mass flow meter. Mechanical counter reading should be visible from outside, without opening the dispenser cover.
- 12.41 All vents to be provided at 3.0 M height from the working platform to be taken out from top of the dispenser with ½” ss tube size suitable for withstanding the discharge pressure without bending.

12.42 MASS FLOW METER

Mass flow meter with integral display unit shall 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 shall be provided to sense, monitor and control complete filling operations on a continuous, uninterrupted basis. The integral display unit shall be mounted in side the dispenser body. There shall not be any difference in reading between this integral display unit and non resettable display in the Electronic control unit.

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

- Batch Accuracy ± 0.2% to 0.5% of Measured Value
- Repeatability ± 0.3% of Measured Value
- Enclosure - IP65
- Pressure influence - Nil
- Surge and frequency - Shall be in compliance with ANSI/IEEE(EFT) transient effect c 62.41v (1991)
- EMI effect on sensor and - To the requirement of EMC direct 89/336/
- Transmitter EEC , EN 50081-1(jan'94)
- Vibration effect - As per SAMA PM31.1-1980 condition2.
- Mass flow meter model shall have Indian W&M certification.
- Custody transfer certificate testing must be accordance with OIML.
- The offered model must have CCOE approval
- The offered model shall have digital protection like HART OR MODBUS

	<p align="center">PROCUREMENT OF CNG DISPENSERS ON ARC BASIS</p>	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 21 OF 74	

The flow meter shall be provided with a liquid crystal display (LCD) for ongoing flow monitoring and totalizers.

12.43 AUTOMATIC REFUELING DATA RECORDER

The dispenser shall have an automatic refueling data recorder unit for the each independent refueling line. The dispenser system shall be capable of storing up to 1,250 refueling transactions data and such data shall be downloaded frequently into another portable computer with compatible Microsoft and Linux software (Software for 03 cities for downloading the data to be provided by Supplier together with the license,) to store the transactions data. This information can either be downloaded as a report from a POS system.

Software shall have preset option, whenever consumer wants gas on money basis/quantity basis. Feasibility for remote option price changing only may be provided.

Data recorder details to be provided. Future provision of Scada compatibility/ automation with open protocol to be there. The dispenser should have an inbuilt automatic refueling recorder unit for each independent refueling line. Data longer for recording of dispensing transaction with nos. may be there for downloading through laptop or portable computer. This information can either be downloaded as a report from a POS system of the client through RS 485 communication.

12.44 PIPE WORK, VALVES AND FITTINGS

Pipe work shall 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 shall be of 1/2", 3/4" & 1" OD SS fully annealed (Bright annealed) seamless conforming to ASTM A269 TP 316L. The piping/tubing, valves, fittings shall be of Parker, sandvik, & Swagelok make. The system shall be "go-no-go" gaugeable to demonstrate that fittings are properly tightened. Wherever possible valves and control devices shall incorporate the same end connector system. The Supplier shall ensure that personnel assembling the pipe work shall be competent in the system employed. The preferred valve types for isolation are 90 degree 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.

12.45 ELECTRICAL SPECIFICATION

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

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:

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 22 OF 74	

- 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.
- Vendor 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 armoured wiring. The wiring between the IS Connections shall be Blue in Color

AREA CLASSIFICATION AND EQUIPMENT SELECTION

- 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 (or equivalent statutory authority of the country of origin) for installation and use in the specified hazardous area. Flameproof equipment of indigenous origin shall be BIS marked. Vendor shall furnish the necessary certificates indicating such approvals.
- All the electrical and electronic component shall be in flame/explosion proof housing suitable for area classification: Hazardous area, Class 1, Division 1, Group D as per NEC or Class 1, Zone 1, Group IIA/IIB as per IS/IEC, Temperature Class T3, and completely enclosed in a securely lockable dispenser cabinet. No component of the dispenser shall be installed outside the cabinet. Certificate from recognized agency to the effect is required to be produced that equipment supplied and/or installed conforms to above area classification.

EQUIPMENT SPECIFICATIONS

- All equipment shall be complete with all necessary weather protection including tropicalization to prevent damage due to climate, dust and corrosive vapours. The enclosure protection of all equipments shall be IP: 55 as per IEC specifications.
- 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.
- All electrical components and equipment shall be sized to suit the maximum load under the most severe operating conditions.

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 23 OF 74	

- All electrical equipments shall be supplied with double-compression cable glands, made of nickel-plated brass, tested and certified to be used in zone-1, hazardous area.
- We have envisaged solid earthing for the system. However, if specific earthing is required for the system -electronics, the same to be highlighted by bidder; otherwise, system earthing including making of earth-pits etc. shall be provided by the successful bidder.

13.0 TECHNICAL SPECIFICATIONS FOR CAR CUM BUS COMBO DISPENSERS

- 13.1 The specifications described herewith are intended to give vendor the technical & operating conditions the Dispenser must fulfil. These are to be referred along with relevant description including in earlier sections. Vendor may indicate in his bid, the additional features, which his dispenser has in terms of better design, enhance reliability etc., however such feature may be accepted subject to BGL's review and approval.
- 13.2 The specifications of FLOW METER are described under Instrumentation & Control Specification Section-B attached with this Specification.
- 13.3 The Car & Bus dispensers shall be designed to handle flow rate of ≥ 15 kg/min and ≥ 75 kg/min respectively, under discharge to atmospheric condition. The dispensers shall be suitable for a turn down of not less than 1:50 on flow.
- 13.4 Dispensers shall be based on three banks sequential filling. The sequential panel shall be within the cabinet of the dispenser itself and not as a separate unit. Sequencing should be on flow rate and pressure. The design of 3 bank system should be such that, the gas from all the 3 banks flow should be through the low bank.
- 13.5 The normal operating pressure of CNG at dispenser inlet shall be 250Kg/cm²(g). However, gas supply from dispenser to the vehicles (i.e. Car & Bus) shall get positively cut off at outlet pressure of 200 Kg/ cm² (g) to ensure the safety of the vehicle.
- 13.6 Once the particular-cycle of filling has been completely stopped (on achieving the maximum fill pressure and/or minimum flow rate) then next filling can be started only after initialization by pressing/giving start command from keypad/switch/button.
- 13.7 The normal operating temperature of wetted parts of dispenser shall be (-) 10 °C to 65°C.
- 13.8 Necessary NRV's should be provided to prevent reverse flow of gas.
- 13.9 The holes in doors for installing wire seals should be provided. The location of the holes will be finalized during the inspection of the first lot of the dispensers at vendor's works.
- 13.10 The Dispenser shall automatically and immediately shut-off CNG supply to fill hose individually (with errorcodes for diagnose) in case of:
- Power failure or excursion beyond permissible limit.
 - Power failure of display
 - Power failure of mass meter (Provided with Single Error code for Power failure In Mass meter).
 - Failure for metering
 - Reading creeping problem
 - Flow beyond high and low limits

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 24 OF 74	

- Failure of totalizer
- Overfill by quantity and/or pressure
- Failure of pressure sensing transmitter
- Difference between the measured value exceeds 5 barg (if two pressure transmitters are used per side of dispenser)
- Malfunctioning of electro valve
- Repeated operation of reset or start/ stop/Emergency switch as per BGL customization.
- Removal or break of any electrical wire, communication wire connected to controller and other electronics cards.
- Program step is in hold due to any error.
- ESD (Emergency Switch) pressed

13.11 DISPENSER CABINET

13.11.1 Complete cabinet (except base frame) shall be of Stainless Steel (SS-304) Cabinet wall thickness shall not be less than 1.6 mm. Cabinet shall be sized to accommodate all electrical, electronic and mechanical components for metering and display within the cabinet. Cabinet shall be designed to protect all tubing, pressure gauges, valves, fittings, electrical & electronics item from tampering, rain, dust, vermin etc. Dispenser cabinet shall be provided with adequate size bottom opening for the entry of gas supply line/lines and power supply connections. Adequate ventilation shall be provided so that there is natural convection current and cooling takes place inside. Cabinet shall be structurally robust and should not resonate at the frequencies emanated during normal flow or during choked flow through the nozzles, breakaway coupling or valves etc.

13.11.2 Appropriate drain valves of the filter outside the dispenser housing with suitable arrangement to collect the drained oil to facilitate the operator to drain the oil on regular basis without requiring to open the lock of the dispenser cabinet. The layout of tubing and other component should be such that it gives unhindered access to all parts and maintenance becomes easy.

13.11.3 BGL's Logo and name to be displayed on both sides of dispensers, in BGL approved colour scheme. BGL's Logo and name shall be painted on stainless steel panel with an appropriate coloured background or alternatively, vendor shall provide self- adhesive PE film sheet with BGL's Logo and name. The artwork shall be of three colours. The colours, Logo size and name size shall be informed to successful bidder during detailed engineering.

13.11.4 The dispensers shall be shipped in fully wired and assembled condition. Only gas and power supply connection shall be made at Site.

13.12 Two number of Hi-mast with flexible hose arrangement or Appropriate arrangement to be provided in order to allow free movement of flexible hose, prevent strain on the fill hose connection and to avoid touching the ground.

13.13 FILL HOSE & FILL NOZZLE

Two CNG flexible electrically conductive twin (fill & vent) hose shall be included for supply of Dispensers meeting the requirement of NFPA-52 and NGV 4.2.

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 25 OF 74	

One fill hose shall be fitted with NGV-I for filling of vehicles. The nozzle shall meet the requirements of NGV-1 Type-2, Class B nozzle (As per specification & make provided in tender doc). Vendor shall include the supply of 3-way valve with each hose for Filling & venting of gas. Vendor shall also include supply of Breakaway Coupling, suitable for NGV Industry, in the hose (As per specification & make provided in tender doc.). Hose shall be 3/8" ID 5000 psig. Vendor shall demonstrate the function of breakaway coupling during performance test.

One CNG flexible electrically conductive twin (fill & vent) hose, with both hoses fitted with One Sherex CT-5000 (with captive vent) transit fill nozzle include the supply of 3-way valve for filling & venting of gas. Vendor shall also include supply of Breakaway Coupling, suitable for NGV Industry, in the hose. Hose shall be 1/2" ID 5000 psig.. Vendor shall demonstrate the function of breakaway coupling during performance test.

- 13.14 Designing of the dispensers would take into account severity of service. The dispensers shall be designed in such a way as to operate in cyclic (start, fill, stop, start.) round the clock basis with about 1 minute (typical) interval between stop and start modes. The dispenser also to work satisfactorily when the time between stop and start is indefinitely high, e.g. during lull time or when the dispenser is commissioned after it was decommissioned for prolonged period or in storage after initial commissioning. For this purpose if any specific storage facility is required, the same to be indicated by the bidder.
- 13.15 Dispensers should be ergonomically designed.
- 13.16 All gas flow from dispenser, flow meter under normal filling conditions must be recorded in electronic totalizer and mechanical (user non-resettable) totalizer
- 13.17 Any un-intentional flow of gas from dispenser, flow meter (without filling initialization by user) must be recorded in electronic totalizer and mechanical (user non- resettable) totalizer
- 13.18 The communicating port/switch for adjusting flow meter mass/meter factor should not have any other functionalities and parameter controls
- 13.19 Annual W&M fee (Routine / Statutory stamping requirement) shall be paid by BGL. Apart from annual W&M routine / statutory stamping requirement, in case of faulty flowmeter and consequent replacement of the same (irrespective of number of occurrences per dispenser per month) during the warranty and comprehensive AMC period which needs breaking of W&M seal, W&M charges for re-stamping during the entire contract period or any other incident/problem occurs during the warranty, then Vendor will pay W&M fee and coordinate with W&M department for stamping.
- 13.20 All expenses incurred against the initial stamping process for all new dispensers shall be in the bidder scope. W&M certificate for all dispenser units to be obtained from W&M department for starting of commercial sales.
- 13.21 All totalizer readings, batch filled reading, transaction details, which are accessible in motherboard should also be accessible in open system architecture/protocol (OPC)/RS 485 for remote monitoring and data acquisition.

All vents to be provided 3.0 M height from the working platform to be taken out from top of the dispenser with 1/2" ss tube size suitable for withstanding the discharge pressure without bending.

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 26 OF 74	

13.22 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 as per IS/ IEC"
- All dispenser mounted transmitters & temperature element and Solenoid Valves shall be intrinsic safe Ex 'ia' as per IEC 60079-11 and solenoid valves, switches and related junction boxes shall be flame proof Ex'd' as per IEC 60079-1. Other special equipment's/instruments, where intrinsic safety is not feasible or available, shall be flame proof as per IEC 60079-1.
- A complete dossier of all electrical equipment will be provided, showing area classification and certification of equipment.

14.0 INSPECTION AND TESTING

14.1 All the dispensers shall be subjected stage wise inspection by TPI as per approved QAP which shall be in the scope of the Vendor and witness by BGL / WGI.

14.2 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.
- g) Review of bought out sub-assemblies/major components, test/inspection certificates.
- h) Dimensional checks as per approved drawings and data sheets.

14.3 Functional Test

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

14.4 Performance Test

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

14.5 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.

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 27 OF 74	

14.6 During the shop testing if the dispenser batch accuracy is found beyond $\pm 1.0\%$ dispenser shall stand rejected.

15.0 CALIBRATIONS AND THIRD-PARTY CERTIFICATION

All mass flow meter, instrument gauges, etc shall be calibrated and calibration certificates shall be presented during factory acceptance test. Documentation and obtaining statutory approvals from the country of origin is in Bidders scope. The offer dispenser must be approved and certified by statutory authority, Weights and Measures or the other statutory authorities of the Country of Origin.

16.0 DISPENSER PERFORMANCE

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

Guaranteed performance for Dispensers shall be as follows:

1. Capacity of the Bus dispenser shall be $\Rightarrow 75$ kg/min under atmospheric discharge at inlet pressure of 255 bar(g) with design case gas composition, temperature of 150°C with no negative tolerance for errors in instruments and measurements.
2. Capacity of the CAR dispenser shall be $\Rightarrow 15$ kg/min under atmospheric discharge at inlet pressure of 255bar (g) with design case gas composition, temperature of 150 °C with no negative tolerance for errors in instruments and measurements.
3. Overall Dispensers Batch Accuracy of $\pm 1.0\%$ or better of the quantity filled In case above guaranteed parameters are not achieved at site, vendor shall carryout necessary rectification/modification to achieve the guaranteed parameters, without cost & time implication to the purchaser

After Commissioning at Site:

All the dispensers shall be tested by vendor for their function & performance in presence of BGL/PMC. Any part or component, which is not functioning to the satisfaction of BGL, shall be repaired or replaced by the vendor without cost & time implication to purchaser and performance test again carried out. Vendor to execute performance test of all the dispensers after commissioning for accuracy and repeatability and safety parameters. Vendor to make all arrangements for carrying out performance test viz. Std. Mass Flow Meter, Laptop etc. Vendor shall carry out tests as required by Govt. statutory agencies

17.0 TRAINING REQUIREMENTS

The training program shall be phased to suit the construction program such that the Company's personnel are fully conversant with all aspects of the operations and maintenance of the overall system including all aspects of operations, including operation, maintenance CNG, Commissioning will not be deemed to have completed and formal acceptance will not be granted until training has been completed to the satisfaction of BGL.

18.0 WARRANTY SERVICING AND SPARE PARTS

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 28 OF 74	

The supplier's shall provide a warranty period of 12 months from the date of commercial operations (subject to acceptance of the equipment after installation & commissioning) at site OR 24 months from the date of delivery of dispenser at site, whichever expires first.

19.0 TECHNICAL SUPPORT

The bidder should have adequate service backup facility in the city of installation. The bidder should be able to respond customer complains within 4 hrs of lodging of complain.

20.0 DATA AND DRAWING DETAIL

A) Document with Technical bid:

1. P & Id
2. General arrangement drawing of the dispenser giving overall dimensions and erection / shipping weight of both dispensers
3. Filled in technical data sheet of both Dispensers.
4. List of commissioning spares per dispenser.

B) Post order within 4 weeks from date of PO

1. General arrangement drawing of the dispenser giving overall dimension and erection / shipping weight.
2. Detailed foundation drawing of the dispenser for casting foundation giving load pattern etc.
3. Details of inlet gas termination including X, Y, Z co-ordinates with respect to centre of dispenser or any reference.
4. Training schedule with contents.

C) With supply.

1. Operation and maintenance manuals - 3 sets all in original for each dispenser model and soft copies. The instruction manual shall describe in details the construction and recommended procedure for maintaining, operating and trouble shooting of the dispenser shall also include cross-sectional drawings, exploded views of all spare parts along with part nos., quantity installed per dispenser. The manual shall provide detailed catalogues of all bought out items.
2. Mechanical and electrical installation drawing including interconnection and wiring diagram
3. Test certificates and catalogues of all major components like valves, mass flow meter, and tubing Etc.
4. Calibration certificates for all measuring and protection devices (eg. Mass flow meter, pressure Transducer, pressure gauges).
5. Test records of mechanical running, performance test.
6. Complete wiring diagram of internal wiring of dispenser.
7. Software (logic diagram) of dispensers on CD-ROM with suitable communication Protocol for communication with dispenser in order to change dispenser parameters if required.
8. Certificates from statutory authorities confirming suitability of design / construction of all electrical and electronic items for use in hazardous area classification.

21.0 PACKAGING

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 29 OF 74	

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

22.0 COMMISSIONING OF DISPENSERS

Vendor shall carry out commissioning of Dispensers within two (02) weeks of receipt of intimation from PMC/ BGL.

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 30 OF 74	

23.0 DATA SHEET OF MASS FLOW METERS

(Vendor shall furnish all the filled data sheets for the approval of PMC/ Client. Vendor shall clearly indicate deviation if any in the respective data sheet)

MASS FLOW METERS (CORIOLIS TYPE)						
Units:-		Service:- Gas		Features/ Dimension	Pressure Rating	Temperatur e Rating
General	1	Tag No.				
	2	Line No.				
	3	Service				
	4	Overall CV				
Meter	5	Type/Model				
	6	Function				
	7	Conn.Size: Size & Rating				
	8	Facing & Finish				
	9	Body Material				
	10	Wetted Parts Material				
	11	Enclosure				
	12	Conduit connection				
	13	Flow Range				
	14	Batch Accuracy				
	15	Repeatability				
	16	W&M Lockout Configuration				
Converter	17	Load Resistance - ohms.				
	18	Output				
	19	Power supply				
	20	Area classification				
	21	Intrinsically safe /Expl.Proof				
	22	Enclosure				
	23	Conduit connection				
	24	Mounting				
	25	W&M Lockout Configuration				
Options	26	Filter/Mesh Wire				
	27	Mounting Brackets				
	28	Interconnecting				
	29	Special cabling				
	30	Cable glands				
	31	Accessories for hot tap				



Note:-

- a) Vendor / Bidder to provide separate Vendor List of all accessories / Parts / Boughtout items with makes to be provided Separately after award of contract.
- b) Integral display for flow meter shall be provided.

24.0 DATA SHEET OF SOLENOID VALVE

SOLENOID VALVES					
Units:-		Service:- Gas	Features/ Dimension	Pressure Rating	Temperature Rating
General	1	Tag No.			
	2	Line No.			
	3	Line Size & Sch.			
	4	Service			
Valve	5	No. of ways			
	6	Size - Body Port			
	7	End Connection			
	8	Material Body			
	9	Trim			
	10	Body rating			
	11	Operating mode NC/NO/Univ			
	12	Packing			
	13	Enclosure			
Electrical	14	Area Classification			
	15	Cable Entry			
	16	Type. Of Energisation Dropout			
	17	Power Supply			
	18	Power Consumption VA/W			
	19	Inrush Current			
Options	20	Insulation Class			
	21	Voltage -Energizing -Dropout			
	22	Manual reset			
	23	Latching on Ener. /De-Energ.			
	24	Bug screen for vent port			
	25	Intrinsically safe			
Service Condition	26	Fluid			
	27	Press. Open / Max.			
	28	Temperature C-Open / Max			
	29	Maximum Flow			
	30	S.G.at Open Temp. Mol. Wt.			
	31	Viscosity Mpas (CP)			



	32	Allowable press drop			
	33	Del. P Shut Off			
	34	Valve CV			
	35	Model No.			
	36	Specification Remarks			

25.0 DATA SHEET OF BUS DISPENSERS

1	GENERAL	
2	PROJECT: CITY GAS DISTRIBUTION	
3	OWNER: M/S BGL LIMITED	
4	SERVICE: DISPENSER FOR CNG DISPENSING	
5	DISPENSER CONFIGURATION	DUAL HOSE -One side
6	NOTE: ■ SCOPE OPTION / INFORMATION SPECIFIED BY PURCHASER □ INFORMATION REQUIRED FROM VENDOR.	
7	□ MANUFACTURER:.....	□ MODEL NO.:.....
8	□ PLACE OF MANUFACTURE:	
9	■ No OF LINES: One	FRAME MATERIAL: STAINLESS STEEL 304
10	POWER REQUIREMENTS: SINGLE PHASE AC 230 V ±15%, 50 HZ ± 3%.	□ POWER CONSUMPTION:.....
11	■ INLET GAS PRESSURE: 255 bar(g)	■ FILL PRESSURE: 200 bar (g)
12	■ METERING: CORRIOLIS MASS FLOW MTER WITH INTEGRAL TRANSMITTER & DISPLAY and HAVING W&M LOCKOUT CONFIGURATION AND PROVISION OF MECHANICAL COUNTER	■ FLOWRATE: Min 75kg/min at 255 bar inlet and discharge at atmosphere.
13	■ TEMPERATURE RANGE: (-)10° C to 60° C	
14	■ TUBE PRESSURE RATING 6000psi	
15	■ FILL NOZZLE TYPE: NGV1 Type2 Class A	■ FILL VALVE TYPE: 3-way Valve
16	■ BREAKAWAY COUPLING: YES	■ COUPLING SIZE: 1/2"
17	■ VENT RETURN COUPLING: YES	■ COUPLING SIZE: 1/8"
18	■ FILL HOSE TYPE: TWIN	■ FILL HOSE SIZE: 1/2"



19	■ FILL HOSE LENGTH: 4 M	■ MAX BURST PRESSURE: FOUR TIMES THE WORKING PRESSURE			
	□ SPECIFIC CONDUCTIVITY OF FILL HOSE:				
20	■ SOLENOID / PNEUMATIC VALVE: YES	■ EMERGENCY SHUTDOWN BUTTON (ESD):REQUIRED			
21	■ HOSE RETRACTOR: YES				
22	■ CAPTURED VENT: YES				
23	■ TEMPERATURE COMPENSATION: YES (Selectable)				
24	■ SITE / INSTALLATION DATA				
25	DATA:				
26	■ AMBIENT TEMP.(°C):	MAX - 40 °C			
		MIN 12 °C			
27	■ RELATIVE HUMIDITY (%)	MAX: 100			
28	■ ALTITUDE (M):				
29	■ EARTH QUAKE:	■WIND VELOCITY (KM/HR): 160 (MAX)			
30	■ INSTALLATION	OUTDOOR			
31	■ MOUNTED ON	DISPENSER ISLAND IN THE FOURECOURT			
32	■ ELECTRICAL AREA HAZARD				
33	CLASS/ZONE: CLASS I ZONE I DIVISION: I GAS GROUP: D, GROUP IIA, IIB				
34	APPLICABLE CODES AND STANDARDS:				
35	■ DISPENSER APPROVALS: AS Defined in the Technical Specification above		■TUBING: STAINLESS STEEL 3/8"		
	□ VALVE PRESSURE TEST:				
37	UTILITIES DATA				
38	■ Electricity: AC230 V ± 15% single phase				
39	□ Solenoid Valves	A.C/D.C.	V	Ph	Hz
40	□ Electronic PCBs:	A.C/D.C.	V	Ph	Hz



41	<input type="checkbox"/> Mass Flow meters	A.C/D.C.	V	Ph	Hz
42	Electrical connection (Cable gland to be provided by the vendor for 2.5mm ² x3 Cable):				
43	<input type="checkbox"/> Total Consumption				
44	Solenoid Valves:(Watts)				
45	Electronic PCBs (Watts)				
46	Mass Flow meters: (Watts)				
47	■ MATERIALS :		Pneumatic Instrument :		
48	Component Materials		(Gas Consumption)		
49	Solenoid Valve		SS/Brass		
50	Spring Loaded Regulator	SS/Brass		Nos. Transaction:	
51	Pneumatic Valve	SS		Consumption (SCM):	
52	2-way Isolation Valve		SS		
53	3-way filling valve		SS		
54	Coalescing Filter		SS / BRASS		
55	Tube 3/8"		SS		
56	Bleed Valves		SS		
57	INSPECTION AND TESTS				
58	Material Composition and Physical Properties Certificates Required For:				
59	■ Solenoid Valve	■ Spring Loaded Regulator	■ Safety Valves		
60	■ Tube	■ Hose	■ Fittings		
61	<input type="checkbox"/> Coalescing Filter..... <input type="checkbox"/> Bleed Valve.....				
62			Required	Observe	Witness
63	■ Shop inspection	by Purchaser during manufacture	■	<input type="checkbox"/>	■
64	■ Functional/Tests		■	<input type="checkbox"/>	■
65	■ Field performance test for 4 hrs and Field Trial Run 72 Hrs. Under Vendor's Supervision (Dispenser)		■	<input type="checkbox"/>	■
66	<input type="checkbox"/> WEIGHTS				
67	<input type="checkbox"/> Overall supply (including, all components and packing crate) Kg. approx.....				



68	<input type="checkbox"/> Maximum erection weight Kg. Approx.....
69	SCOPE OF SUPPLY
70	■ Dispenser Assembly complete.
71	■ Vendor Data as specified
72	<p>NOTE:</p> <p>a) Fill Checklist for completeness of the Scope of Supply.</p> <p>b) The Specific Conductivity of Filling Hose must be specified.</p> <p>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.</p> <p>d) Two nos. of holster / cradle for filling nozzles along with weather caps for the protection of nozzles. Holster / cradle shall be suitable for both Sherex CT-5000 and NGV/NZS Nozzles.</p>

26.0 DATA SHEET OF CAR DISPENSERS

1	GENERAL	
2	PROJECT: CITY GAS DISTRIBUTION	
3	OWNER: M/S BGL LIMITED	
4	SERVICE: DISPENSER FOR CNG DISPENSING	
5	DISPENSER CONFIGURATION	DUAL HOSE –Fill & Vent-Two side
6	NOTE: ■ SCOPE OPTION / INFORMATION SPECIFIED BY PURCHASER □ INFORMATION REQUIRED FROM VENDOR.	
7	□ MANUFACTURER:.....	□ MODEL NO.:.....
8	□ PLACE OF MANUFACTURE:	
9	■ No OF LINES: One	FRAME MATERIAL: STAINLESS STEEL 304
10	POWER REQUIREMENTS: SINGLE PHASE AC 230 V ±15%, 50 HZ ± 3%.	□ POWER CONSUMPTION:.....
11	■ INLET GAS PRESSURE: 255 bar(g)	■ FILL PRESSURE: 200 bar (g)
12	■ METERING: CORRIOLIS MASS FLOW METER WITH INTEGRAL TRANSMITTER & DISPLAY and HAVING W&M LOCKOUT CONFIGURATION AND PROVISION OF MECHANICAL COUNTER	■ FLOWRATE: Min 15kg/min at 255 bar inlet and discharge at atmosphere.
13	■ TEMPERATURE RANGE: (-) 10°C to 60°C	
14	■ TUBE PRESSURE RATING 6000psi	
15	■ FILL NOZZLE TYPE: NZS 5424	■ FILL VALVE TYPE: 3-way Valve
16	■ BREAKAWAY COUPLING: YES	■ COUPLING SIZE: 3/8"
17	■ VENT RETURN COUPLING: YES	■ COUPLING SIZE: 1/8"
18	■ FILL HOSE TYPE: TWIN	■ FILL HOSE SIZE: 3/8"
19	■ FILL HOSE LENGTH: 4M □ SPECIFIC CONDUCTIVITY OF FILL HOSE:	■ MAX BURST PRESSURE: FOUR TIMES THE WORKING PRESSURE
20	■ SOLENOID / PNEUMATIC VALVE: YES	■ EMERGENCY SHUTDOWN BUTTON (ESD):REQUIRED
21	■ HOSE RETRACTOR: YES	
22	■ CAPTURED VENT: YES	
23	■ TEMPERATURE COMPENSATION: YES (Selectable)	
24	■ SITE / INSTALLATION DATA	
25	DATA:	
26	■ AMBIENT TEMP.(°C):	MAX - 50 °C MIN - 12 °C
27	■ RELATIVE HUMIDITY (%)	MAX: 98
28	■ ALTITUDE (M):	
29	■ EARTH QUAKE:	■ WIND VELOCITY (KM/HR): 160 (MAX)
30	■ INSTALLATION	OUTDOOR



31	■ MOUNTED ON		DISPENSER ISLAND IN THE FORECOURT		
32	■ ELECTRICAL AREA HAZARD				
33	CLASS/ZONE: CLASS I ZONE I DIVISION: I GAS GROUP: D, GROUP IIA, IIB				
34	APPLICABLE CODES AND STANDARDS:				
35	■ DISPENSER APPROVALS: AS Defined in the Technical Specification above		■ TUBING: STAINLESS STEEL 3/8"		
36	<input type="checkbox"/> VALVE PRESSURE TEST:				
37	UTILITIES DATA				
38	■ Electricity: AC230 V ± 15% single phase				
39	<input type="checkbox"/> Solenoid Valves	A.C/D.C.	V	Ph	Hz
40	<input type="checkbox"/> Electronic PCBs:	A.C/D.C.	V	Ph	Hz
41	<input type="checkbox"/> Mass Flow meters	A.C/D.C.	V	Ph	Hz
42	Electrical connection (Cable gland to be provided by the vendor for 2.5mm2 x3 Cable):				
43	<input type="checkbox"/> Total Consumption				
44	Solenoid Valves:(Watts)				
45	Electronic PCBs (Watts)				
46	Mass Flow meters: (Watts)				
47	■ MATERIALS :		Pneumatic Instrument :		
48	Component Materials		(Gas Consumption)		
49	Solenoid Valve		SS/Brass		
50	Spring Loaded Regulator	SS/Brass	Nos. Transaction:		
51	Pneumatic Valve	SS	Consumption (SCM):		
52	2-way Isolation Valve		SS		
53	3-way filling valve		SS		
54	Coalescing Filter		SS / BRASS		
55	Tube 3/8"		SS		
56	Bleed Valves		SS		
57	INSPECTION AND TESTS				
58	Material Composition and Physical Properties Certificates Required For:				
59	■ Solenoid Valve	■ Spring Loaded Regulator	■ Safety Valves		
60	■ Tube	■ Hose	■ Fittings		
61	<input type="checkbox"/> Coalescing Filter.....		<input type="checkbox"/> Bleed Valve.....		
62			Required	Observe	Witness
63	■ Shop inspection	by Purchaser during manufacture	■	<input type="checkbox"/>	■
64	■ Functional/Tests		■	<input type="checkbox"/>	■
65	■ Field performance test for 4 hrs and Field Trial Run 72 Hrs. Under Vendor's Supervision (Dispenser)		■	<input type="checkbox"/>	■
66	<input type="checkbox"/> WEIGHTS				



67	<input type="checkbox"/> Overall supply (including, all components and packing crate) Kg. approx.....
68	<input type="checkbox"/> Maximum erection weight Kg. Approx.....
69	SCOPE OF SUPPLY
70	■ Dispenser Assembly complete.
71	■ Vendor Data as specified
72	<p>NOTE:</p> <ul style="list-style-type: none"> 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. 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.

27.0 DATA SHEET FOR CAR CUM BUS (COMBO) DISPENSER

1	GENERAL	
2	SERVICE	DISPENSER FOR CNG STATIONS
3	MODEL NO.:	
4	FRAME MATERIAL	STAINLESS STEEL 304
5	NO. REQD.:	AS PER PR/SOR
6	DISPENSER CONFIGURATION:	DUAL HOSE (One for Car & One for bus) – One Side
7	MASS FLOW METER:	
8	MANUFACTURER:	
9	PLACE OF MANUFACTURE:	
10	NO OF LINES: Three Banks	
11	POWER REQUIREMENTS: SINGLE PHASE AC 230 V \pm 10%, 50 HZ \pm 3%.	POWER CONSUMPTION:
12	INLET GAS PRESSURE: 255 kg/cm ² (g)	FILL PRESSURE: 200 kg/cm ² (g)
13	METERING: CORRIOLIS MASS FLOW METER WITH INTEGRAL TRANSMITTER & DISPLAY AND HAVING W&M LOCKOUT CONFIGURATION AND PROVISION OF MECHANICAL COUNTER FOR BOTH CAR & BUS	FLOWRATE: For CAR Max :15 kg/min; Nom: 9 kg/min; Min: 2.5 kg/min FLOWRATE: For BUS Max: 75 kg/min; Nom: 40 kg/min; Min: 10 kg/min
14	TEMPERATURE RANGE: (-) 10°C to 70°C	
15	TUBE PRESSURE RATING: 5000 psi	
16	FILL NOZZLE TYPE: Sherex CT5000 in one arm I NGV1 Type-2 Class-A with adopter of NZS type in second Arm	FILL VALVE TYPE: 3-way Valve
17	BREAKAWAY COUPLING: YES	COUPLING SIZE: 3/8" for CAR & 1/2" for BUS
18	VENT RETURN COUPLING: YES	COUPLING SIZE: 1/8"
19	FILL HOSE TYPE: TWIN	FILL HOSE SIZE: 3/8" for CAR & 1/2" for BUS
20	FILL HOSE LENGTH: MINIMUM 4.0M	MAX BURST PRESSURE: FOUR TIMES TO THE WORKING PRESSURE



21	SOLENOID / PNEUMATIC VALVE: YES	EMERGENCY SHUTDOWN BUTION (ESD): REQUIRED		
22	HOSE RETRACTOR: YES			
23	CAPTURED VENT: YES			
24	TEMPERATURE COMPENSATION: YES (Selectable)			
25	SITE / INSTALLATION DATA:			
26	AMBIENT DATA: REFER CL. NO. 6.0 – CLIMATIC CONDITION			
27	EARTH QUAKE: ZONE-III	WIND VELOCITY (m/s):	(MAX)	
28	INSTALLATION: OUTDOOR			
29	MOUNTED ON: DISPENSER ISLAND IN THE FOURECOURT			
30	ELECTRICAL AREA HAZARD:			
31	CLASS/ZONE: CLASS-I, ZONE-I, DIVISION-I, GAS GROUP: D, GROUP IIA, IIB			
32	APPLICABLE CODES AND STANDARDS			
33	DISPENSER APPROVALS: AS PER APPLICABLE STANDARD	TUBING: STAINLESS STEEL		
34	VALVE PRESSURE TEST: IF USED			
35	UTILITIES DATA			
36	Electricity: AC 230 V ±10%, 1 pH, 50 Hz ±3%			
37	Solenoid Valves: AC/DC	V	Ph	Hz
38	Electronic PCBs: AC/DC	V	Ph	Hz
39	Mass Flow Meters: AC/DC	V	Ph	Hz
40	Electrical connection (Cable gland to be provided by the vendor for 2.5mm ² x 3 Cables):			
41	Total Consumption			
42	Solenoid Valves (Watts):			
43	Electronic PCBs (Watts):			
44	Mass Flow meters (Watts):			
45	MATERIALS			
46	Component Materials			
47	Solenoid Valve	SS/Brass		
48	Spring Loaded Regulator	SS/Brass		
49	Pneumatic Valve	SS		
50	2-way Isolation Valve	SS		



51	3-way Filling Valve	SS		
52	Coalescing Filter	SS/Brass		
53	Tube 3/8"	SS		
54	Bleed Valves	SS		
55	INSPECTION AND TESTS			
56	Material Composition and Physical Properties Certificates Required For:			
57	Solenoid Valve	Spring Loaded Regulator		
58	Tube	Hose	Fittngs	
59	Coalescing Filter	Bleed Valve		
60		Required	Observed	Witnessed
61	Shop Inspection by Purchaser during Manufacture			
62	Functional / Tests			
63	Field performance test for 4 hrs and Field Trial Run for 72 Hrs. Under Vendor's Supervision (Dispenser)			
64	WEIGHTS			
65	Overall supply (including, all components and packing crate) Kg. approx.			
66	Maximum erection weight Kg. Approx.			
67	SCOPE OF SUPPLY			
68	Dispenser Assembly complete.			
69	Vendor Data as specified			
70	<p>NOTE:</p> <p>a) Fill Checklist for completeness of the Scope of Supply.</p> <p>b) The Specific Conductivity of Filling Hose must be specified.</p> <p>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.</p> <p>d) Two nos. of holster / cradle for filling nozzles along with weather caps for the protection of nozzles. Holster / cradle shall be suitable for both Sherex CT-5000 and NGV/NZS Nozzles.</p>			

28.0 VENDOR DATA REQUIREMENT FOR BUS, CAR & COMBO DISPENSERS

28.1 DRAWING AND DATA REQUIREMENT

a) The following data and information marked "X" shall be furnished by the vendor:

S. No.	Description	With Bid	After Job Award		
			For Review	For Information	Final in Book Form
1	2	3	4	5	6
1.0	GENERAL				
1.1	Installation manual			X	X
1.2	Start-up, operation & maintenance manual Showing assembly details and critical tolerances. A copy of all certified drawings & documents to be enclosed.			X	X
1.3	Lubricant list with specification			X	X
1.4	Battery limit (interface) drawing/information	X	X		
1.5	Drawing list and submission schedule		X		X
1.6	Project implementation schedule, ordering and inspection schedule for long lead and major items		X		
1.7	Pre-commissioning & commissioning procedure		X		
1.8	Performance guarantee test procedure		X		
1.9	Certificate of Weights & Measures of mass flow meter from the country of origin for offered models of Bus & Car Dispenser.	X	X		X
1.10	Dispensers unit model/mass flow meter model for dispensing specified mass flow rate at specified overall batch accuracy.	X	X		X
1.11	The "Test Certificate" for mass flow meter.	X	X		X
1.12	Weights & Measures approval of Mass Flow meter from Indian Authorities.	X	X		X
2.0	DESIGN				
2.1	Process flow diagrams (PFDs) and Piping & Instrumentation diagrams (P&IDs) of sub systems and complete system with write-up on operation	X	X		X
2.2	Data sheets of Bus & Car Dispensers for, Mass flow meter duly filled up.	X	X		X



2.3	Performance data, vendor literature for equipment selection, performance curves with duty point marked for individual equipment		X		X
2.4	Specification for piping material & valves.		X		X
2.5	Utility requirement		X		X
2.6	Detail of control wiring diagram, interlock/ shutdown/ control scheme with write up on operation. Sizing Calculation for instrument items.		X		X
3.0	CONSTRUCTIONAL FEATURES				
3.1	G.A. Drawing of Dispensers showing maintenance clearances required.	X	X		X
3.2	Cross section drawings of individual equipment/ skid, material & parts list.			X	X
3.3	Termination & Wiring Diagrams		X	X	X
4.0	SPARES				
4.1	List of spares as listed in the mandatory Spares table				
4.2	Drawings, documents, data as asked under Electrical & Instrumentation specifications of this Material Requisition.		X		X

28.2 LIST OF MANATORY SPARES: To be supplied along with supply (1st lot) of dispenser units

a) Dispenser - Car cum Auto / Combo (Car Arm)

Sr. No.	ITEM DESCRIPTION	UNIT PRICE (Rs.) (for information only)	Hyderab ad (Qty.)	Vijayaw ada (Qty)	Kakina da (Qty)
1	3 Way Valve		2	1	1
2	3 Way Valve Repair Kit		2	1	1
3	NGV Nozzle		2	1	1
4	Long Hose (4 Mtr)		2	1	1
5	Short Hose (3 Mtr)		2	1	1
6	Breakaway Coupling		2	1	1
7	Flow Meter		2	1	1
8	Mother Board		2	1	1
9	SOV		2	1	1
10	Filter		6	3	3

b) Dispenser - Bus / Combo (Bus Arm)

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 44 OF 74	

11	Bus Nozzle		1	-	-
12	Long Hose (4 Mtr)		1	-	-
13	Short Hose (3 Mtr)		1	-	-
14	Breakaway Coupling		1	-	-

NOTE: The list of mandatory spares is indicative only. Bidder/ vendor shall add other spares if required for warranty and 04 Years normal operation. Bidder to furnish indicative price of above-mentioned spare in unpriced bid. These rates will be not part of bid evaluation. These are for information only.

b) Document Distribution Schedule

- Documents and drawings under column no. 3 shall be submitted with each copy of the bid.
- Documents listed under column 4 are to be submitted in 3 copies
- Documents listed under column 5 are to be submitted in 3 copies.
- Documents listed in column 6 are to be submitted as hard bound indexed book containing the following details in four (4) copies & 1 transparencies and to be submitted within 2 weeks of release note/dispatch of materials/ equipment from vendor's works. All transparencies to be supplied in rolls (in two sets).

c) Details to be included in Final Documents Books

- Manufacturing Data Book containing all test certificates of components, raw materials, stage manufacturing tests and inspections, final tests & inspection documents including welders' qualification & welding procedure qualification, repairs & reworking carried out in shops. All raw material test certificates must be correlated to the P.O. Item No. & component to which they relate by clear noting on the certificates.
- Spares details including assembly drawings, part numbers, delivery, prices and ordering information
- All design calculations carried out by the vendor.
- Final Drawing Index and all as-built drawings reduced to A3/ A4 size and wherever reduction is not possible, full-size copies duly folded and placed in plastic pockets.
- Catalogues/leaflets of sub-vendors/suppliers of various bought out components highlighting the components actually supplied correlated to P.O. Item Numbers.
- Operating and maintenance instructions including lubrication schedules with details of suppliers for procurement by OWNER for subsequent needs.
- Release Note and Packing List.
- Any other documents asked for in the Purchase Requisition.
- All final drawings shall also be given to purchaser in digitized form on CD-ROM compatible to AUTOCAD software

d) Special instructions for submission of Dwgs. /Documents:

- Fold all prints to 216 MM x 279 MM size & roll transparencies.
- Contractor to forward the drawings and documentation to BGL clearly specifying purchasers Job no. & Req. No.
- The drawing/Document no. with Rev. No. is essential.
- Each Drawing/Document submitted to BGL/WGI must be checked and signed/stamped by contractor before it is submitted to BGL/WGI.
- Multi-sheet documents other than drawings must be submitted in their entirety in the event of a re-submission even if only a few sheets are revised.
- Final submission in bound volumes shall necessarily have a cover page giving project title, Item name, P.O. No. particulars of owner & vendor and an index giving list of drawings & documents included (with revision no.).
- All vendor drawings to be provided with a blank space measuring 75 mm W x 38 mm H for marking of review codes etc. by BGL.
- Review of vendor drawings by BGL/JPK would be only to check compatibility with basic designs & concepts & shall in no way absolve the contractor/vendor of his responsibility to meet applicable codes, specifications & statutory rules/regulations.
- Vendor shall submit within 10 days after placement of FOI, the complete list of drawings/documents with submission dates against each.

29.0 CHECK LIST: BUS, CAR & COMBO DISPENSER PACKAGE

Notes:

- 1) Vendor shall furnish all the equipment of Dispenser, auxiliary systems, instruments and controls and safety devices as per the enquiry document. Anything required over and above what is specified, for safe and satisfactory maintenance of the equipment package shall be included by the Vendor in his scope.
- 2) Vendor to write YES/NO against each item. Vendor is required to include complete scope, as such 'NO' is not warranted. However, in case for any of the items if vendor's reply is 'NO', vendor shall give reason for the same:
- 3) Vendor's scope of supply shall include but not limited to the following:

S. No	Description	Specified by Purchaser (YES/NO)	Included by Vendor (YES/NO)	Remarks
1.0	Each dispenser package complete with			

S. No	Description	Specified by Purchaser (YES/NO)	Included by Vendor (YES/NO)	Remarks
1.1	Frame material – STAINLESS STEEL 304	YES		
1.2	Built-in Coalescing unit of 3-5 microns with manual drain	YES		
1.3	Certificate of Weight & Measure	YES		
1.4	CCOE Approval	YES		
1.5	- Electronic display (2 sets of 3 rows) for Bus Dispenser - Electronic display (2 sets of 3 rows) for Car/ Combo Dispenser -1 set of numeric Display (two nos. on either side) for bus dispensers & 2 sets (four nos.- two each side) for combo/car dispensers. The display should have three rows. Display should be crystal back-lit display for night viewing.	YES		
1.6	Tamper proof locking arrangement for flow meter	YES		
1.7	Front/side mounted locking /latch for nozzle holding	YES		
1.8	Pressure dial gauge-dial/Digital 4" with c/w Red sector	YES		
1.9	Separate non-resettable straight forward totaliser	YES		
1.10	ESD button mounted on both sides	YES		
1.11	One set of isolation valves at the inlet of the piping with venting arrangement	YES		
1.12	Electrical equipment and instrumentations wiring are provided with certificate of area classifications	YES		
1.13	Dispenser automatically stop dispensing in case of: power failure, meter failure, overfill, failure of totalizers, transducer failure etc.	YES		
1.14	BGL's Logo and name displayed on both sides of dispensers	YES		
1.15	Common venting on the top of the dispenser	YES		
1.16	Overall CV is indicated of dispenser from inlet of the dispenser upto outlet probe including mass flowmeter, interconnecting tubing, valves, hoses, nozzles e.t.c.,	YES		
1.17	Dispenser is shipped in fully wired and assembled condition only gas supply connection and power supply connection shall be made at site.	YES		
1.18	Warranty for a period of 12 months form the date of commercial operations (subject to acceptance after Installation & commissioning) at Site or 24 months from the date of delivery of dispenser at site, whichever first expires.	YES		
2.0	Spares and Tools / Tackles			



S. No	Description	Specified by Purchaser (YES/NO)	Included by Vendor (YES/NO)	Remarks
2.1	All necessary spare parts to sustain the maintenance of the CNG dispenser facilities within the warranty period are supplied and stock at the supplier workshop/ warehouse located in India for immediate replacement of parts	YES		
2.2	Mandatory spares as specified in the "Mandatory Spares" (Indicate separate price for each item)	YES		
2.3	Quote for Warranty Maintenance	Not Reqd.		
3.0	Inspection and Testing			
3.1	As specified on the datasheets and Technical specifications	YES		
4.0	Vendor Data and drawings			
4.1	All data & drawings are required per VDR format	YES		
5.0	Erection, commissioning and trial runs at site of the Dispenser			
5.1	Additional Items not specified by purchaser but recommended by Vendor for safe smooth and normal operation. (Vendor shall indicate separate list of such items in his proposal)	YES		
5.2	Warranty maintenance including all operating and maintenance spares as applicable for dispenser.	YES		
6.0	Technical parameters to be confirmed by Vendor			
6.1	Inlet pressure [bar(g)] - 255	YES		
6.2	Fill Pressure [bar(g)] - 200	YES		
6.3	Operating temp range (-55°C to 70°C)	YES		
6.4	Power supply (Single Ph AC 230V ±15V)	YES		
6.5	a) Fill Nozzle; NGV-1 Type 2 Class A with 9/16" NZS type Refueling Adopter for Bus dispensers b) Fill nozzle: Both fill hose shall be fitted with NZS-5424 fill nozzle for Car Dispensers	YES		
6.6	Flexible fill & vent Hose (twin type) - Parker / Synflex / Mac	YES		
6.7	Flexi-Hose rating- 5000psi, Length -4 meters	YES		
6.8	Sequential filling - Three bank for Car Dispenser and single bank for Bus Dispenser	YES		
6.9	Temp compensation - 200bar (g) equivalent at 15°C	YES		
6.10	Break-away coupling - 3/8"	YES		
6.11	Principle of Metering – Coriolis	YES		



S. No	Description	Specified by Purchaser (YES/NO)	Included by Vendor (YES/NO)	Remarks
6.12	Flow meter with integral transmitter having display of flow rate, totalizers, and provision of mechanical counter, etc. Note: flow meter-transmitter must have tamper proof lock out configuration as per norms of W&M for use in public transactions.	YES		
6.13	a) Minimum flow rate 75Kg/min under atmospheric discharge at 255 bar(g) inlet pressure for Bus Dispenser b) Minimum flow rate 15Kg/min under atmospheric discharge at 255 bar(g) inlet pressure for Car Dispensers	YES		
6.14	Overall batch accuracy of Dispenser $\pm 0.2\%$ to $\pm 0.5\%$ of Measured Value	YES		
6.15	Mass flow meter accuracy $\pm 0.5\%$ of delivered qty or better	YES		
6.16	Repeatability $\pm 0.3\%$ of Measured Value	YES		
6.17	Calibration - traceable to NIST as per ISO 5168	YES		
6.18	Enclosure whether proof to IP65, NEMA4x	YES		
6.19	Pressure rating of wetted part - 5000psi at 25oC as per ASME/ANSI31.3	YES		
6.20	Process temp effect - $+0.01\%$ of nominal flow rate per degree C on zero offset	YES		
6.21	Pressure influence – NIL	YES		
6.22	Surge and frequency transient- shall be in compliance with ANSI/EEE(EFT)c62.41(1991)	YES		
6.23	EMI effect on sensor and transmitter-to the requirement of EMC directive1(jan'94)	YES		
6.24	Vibration effect - As per SAMA PMC31.1 1994	YES		
6.25	Mass flow meter model shall have Indian W&M certification	YES		
6.26	Custody transfer certificate, testing must be in accordance with OIML	YES		
6.27	The offered model must have CCOE approval	YES		
6.28	The offered model shall have digital protocol like HART OR MODBUS	YES		



**ANNUAL MAINTENANCE CONTRACT
FOR
CNG DISPENSER**



**PREPARED AND ISSUED BY
LYONS ENGINEERING LIMITED
India**

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 50 OF 74	

TABLE OF CONTENTS

- 1.0 INTRODUCTION
- 2.0 GENERAL GUIDELINE & INFORMATION
- 3.0 REPATRIATION AND TERMINATION
- 4.0 INDEMNITY AGREEMENT
- 5.0 COMPENSATION FOR NON-FULFILLMENT OF OBLIGATION UNDER ANNUAL MAINTENANCE CONTRACT & PENALTY
- 6.0 CONTRACTOR'S RESPONSIBILITY
- 7.0 EMPLOYMENT LIABILITY OF CONTRACTOR
- 8.0 GENERAL INSTRUCTION:
- 9.0 MAINTENANCE OF DISPENSER PACKAGES

1.0 INTRODUCTION:

The date of start of commercial operations successful commissioning and performance test at site will consider the date of start of the annual maintenance contract. The supplier must follow the ANNUAL MAINTENANCE REQUIREMENT as stated below but not limited to and ensure to provide trouble free services to the satisfaction of the owner.

2.0 GENERAL GUIDELINE & INFORMATION:

The content of this clause will provide guidelines for the contractor for performing AMC during contract period.

2.1 Accommodation / Transportation / Medical:

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

2.2 Discipline:

The contractor shall be responsible for the discipline and good behavior of all his personnel deployed in the services contracted out and should any complaint be received against any of his employee, he shall arrange to replace such persons within 24 hours of notice issued by the Engineer-in-Charge. The decision of the Engineer –in-Charge in this matter shall be final and binding on the contractor.

2.3 Gate pass/identity card

The contract shall arrange to supply / renew identity card to his workforce at his own cost, if so required by Client for security or for any other reasons. Those contractor's personnel shall be required to carry and display their respective identity cards while on duty and produce on demand.

2.4 Right to get services carried out through other agencies

If the contractor fails to provide the said services any time, nothing contained herein shall restrict Client from accepting similar service through other agencies, at its discretion and at the risk and cost of the contractor.

2.5 Sub-letting of contract

No part of this contract nor any share or interest therein in any manner or extent, will be transferred or assigned or sub-let, directly or indirectly to any person/firm or organisation without prior permission of Client.

2.6 Compliance of laws

The contractor deploying 20(twenty) or more workmen as contract labour shall have to obtain license from appropriate licensing authority, if required. The contractor (which shall include the Contracting firm / company) shall be solely liable to obtain and to abide by all necessary licenses from the concerned authorities as provided under the various labour laws legislation's including labour license from the competent authority under the Contract Labour ("Regulation & Abolition") Act 1970 and Acts made thereafter.

The Contractor shall be responsible for necessary contributions towards PF, Family Pension, ESIC or any other statutory payments to Government Agencies as applicable under the laws in

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 52 OF 74	

respect of the contract and personnel deployed by the contractor for rendering services to client and shall deposit the required amount with the concerned statutory authorities on or before due dates.

The contractor shall obtain a separate PF number from the concerned Regional Provident Fund Commissioner and submit having deposited the employees as well as the employer's contribution to the Provident Fund.

The contractor shall not engage /deploy any person of less than 18 years under this contract and the persons to be deployed should be physically and mentally fit.

The installations where job is to be carried out are live and have hydrocarbon environment. Contractor shall comply with all safety and security rules and regulations and other rules laid down by Client for its operation. It shall be the duty/responsibility of the contractor to ensure the compliance of fire, safety, security and other maintenance rules and regulations by his personnel. Disregard to these rules by the contractor's personnel will lead to the termination of the contract in all respects and shall face penal/legal consequences.

The contractor shall arrange for insurance of all his workers engaged on the job as per the relevant Acts, rules and regulations, etc. In case by virtue of provisions of worker's compensation Act, 1923 or any other laws in force. Client has to pay compensation for a workman employed by the contractor due to any cause whatsoever the amount so paid shall be recovered from the dues payable to the contractor and /or security deposit.

2.7 The officer in charge shall have power to

- i) Issue the contractor from time to time during the running of the contract such further instructions as shall be necessary for the purpose of proper and adequate execution of the contract and the contractor shall carry out and bound by the same.
- ii) During the currency of this contract, Client can increase or decrease the number of the services / technicians to meet contractual requirements.
- iii) Order the contractor to remove or replace any workman whom the company considers incompetent or unsuitable and opinion of the company representative as to the competence of any workman engaged by the contractor shall be final and binding on the contractor.

3.0 REPATRIATION AND TERMINATION

CLIENT shall reserves the right at any time during the currency of the contract, to terminate it by giving 30 days notice to contractor, and upon expiry of such notice period the contractor shall vacate the site/office occupied by him immediately.

4.0 INDEMNITY AGREEMENT

Contractor shall exclusively be liable for non-compliance of the provision of any act, laws, rules and regulations having bearing over engagement of workers directly or indirectly for execution of work and the contractor hereby undertake to indemnify the company against all actions, suits, proceedings, claims, damages demands, losses, etc. which may arise under minimum wages act, payment of wages act, workman compensation act, personnel injury (compensation insurance) act ESI Act, Fatal Accident Act, Industrial Dispute Act, Shops and Establishment Act, Employees Provident Fund Act, Family Pension and deposit Linked Insurance Scheme or any other act or statutes not herein specifically mentioned but having direct or indirect

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 53 OF 74	

application for the persons engaged under this contract. (A certificate to this effect shall be submitted by the contractor immediately on receipt of LOA).

5.0 COMPENSATION FOR NON-FULFILLMENT OF OBLIGATION UNDER WARRANTY AND 4 YEARS COMPREHENSIVE ANNUAL REPAIR & MAINTENANCE CONTRACT & PENALTY

5.1 During warranty and CARM services, the Contractor must ensure that the dispenser is performing required services as defined in the Contract.

During the above services, if dispensers breakdown at any times, then Client have right to impose penalty as defined in Contract.

5.2 Penalty: If the Contractor fails to provide the required services any time more than 6 hours & upto 12 hours, the contractor would be penalized Rs. 1000/ per day and for more than 12 hours for any day, compensation shall be imposed, which will be @Rs.100/- per hour per arm per dispenser. In any case the dispenser has to rectify within 24 hrs with all possible effort.

The day start will be considered from 00:00 hrs for the calculation purpose. OEM shall be allowed 24 hours downtime of the each arm of dispenser per month / 4000hrs / 8000hrs to carry out the periodic / scheduled / breakdown maintenance/ routine checking of dispenser package. This can be adjusted considering the penalty clause as define above only once in a month. In case Contractor has utilized less down time of the dispenser package than that allowed, the Contractor could carry forward only max unutilized 12 hours downtime to immediately next month.

In any case, the maximum penalty imposed in a month during 4 years CARM period, for non- performance of the equipment would be limited to 70% of the amount of Maintenance charges (to be paid to the contractor per month per dispenser).

A logbook for time record shall be maintained in the Central control room wherein the records shall be made for the time Dispenser develops trouble and the time at which the Contractor rectifies the same and Dispenser put back to service.

5.3 The penalty clause and maintenance charges will come into force immediately after successful performance test as defined in the tender.

5.4 In case of any complaint regarding non-fulfillment of any obligation under the contract, Client reserves the right to withhold payment to the Contractor and out of such amount and the security deposit which may held, Client can make such payment as it may consider necessary for smooth and unhindered working of the contract.

6.0 CONTRACTOR'S RESPONSIBILITY

Contractor shall depute a technically competent person for the maintenance services and to receive instructions from Engineer-in-charge or his representative.

7.0 EMPLOYMENT LIABILITY OF CONTRACTOR

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 54 OF 74	

The contractor shall indemnify purchase & shall be solely and exclusively responsible for any liability arising due to any difference or dispute between him and his employer for the execution of this contract at any time during/after the contract period is over. All workmen engaged by the contractor shall be on his roll and be paid by him and CLIENT shall have no responsibility towards them. The contractor shall ensure and will be solely responsible for payment of wages and other dues latest by 7th of the following month to the personnel deployed by him in the presence of the Company's representative.

The contractor shall be directly responsible and indemnify the company against all charges, claims, dues etc. arising out of disputes relating to the dues and employment of personnel deployed by him.

The contractor shall indemnify the company against all losses or damages caused to it on account of acts of the personnel deployed by the contractor. The contractor shall ensure regular and effective supervision of the personnel deployed by him.

The contractor shall be liable for making good all damages/losses arising out of loss or theft of each handled, leakage, pilferage of any office, furniture equipment fitting and fixtures whatsoever as may be caused directly or indirectly by the engaged persons through him/work carried out by them.

During the period of the job, if the work progress does not commensurate with the time elapsed in respect of any person/persons engaged by the contractor; the contractor shall be liable to pay the compensation to the company as may be considered reasonable by the company.

8.0 GENERAL INSTRUCTION:

The maintenance services shall be provided as per Client's requirement and to be finalized immediate after installation in consultation with Client / Consultant.

- i) The contractor shall deploy adequate number of technicians / supervisors / Engineers / helpers as well as tools & equipment for smooth and proper maintenance of the dispensers supplied in terms of the contract. In case required to meet operational requirements, the contractor shall augment the same as per direction of Engineer –in-Charge.
- ii) The contractor is required to carry out all services as mentioned in the Scope of Services and Schedule of Rates on all the 365 days including Sunday and all Holiday & as per Client's requirement.
- iii) The contractor shall allow weekly rest and daily working hours to his workmen as per the relevant Act/Law/and Rule made there under. However, no work shall be left incomplete/unattended on any holiday/weekly rest. Technician/operators provided shall have minimum qualification of ITI. Contract in person or his authorized representative shall provide the services on daily basis to interact with Engineer-in-charge and deployed workman
- iv) The work force deployed by the contractor for Maintenance services at CNG installation shall be of sound relevant technical professional expertise, which is otherwise also essential from the safety point of view of the personnel of the contractor as well as for the installation.

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 55 OF 74	

- v) Contractor has to ensure the safety of man and machine all the times. Damages of equipment due to negligence will be recovered as per the decision of Engineer-in-Charge, which will be final.
- vi) Regarding work completion, the decision of the Engineer-in-Charge will be final and binding.
- vii) The contractor shall make his own arrangements to provide all facilities like boarding and transport etc. to his workmen.
- viii) All personnel of the contractor entering on work premises shall be properly and neatly dressed and shall wear uniform, Safety Shoe, badges while working on premises of the company including work sites.
- ix) Contractor shall maintain proper record of his working employee's attendance and payment made to them. The contractor's representative/supervisor shall report daily to the Shift-in-Charge for day to day working.
- x) All the safety rules and regulations prevailing and applicable from time to time at the installations as directed by Client and will be strictly adhered to by the contractor.
- xi) The rates quoted by the Contractor must be inclusive of all the taxes, duties, services tax, work contract tax and any other levies, contractor's share of P.F. and insurance charges, contractor's profit and any other expenditure etc.
- xii) It will be the responsibility of the contractor to pay as per the minimum wages of the appropriate government applicable under the Minimum Wage Act 1948.
- xiii) The services shall be provided as per the Clients requirements. The contractor is responsible to provide effective and efficient services and assure that there is no disruption in the services for want of any resources.
- xiv) For any complain regarding non-performance of dispenser can be communicated to Contractor for further necessary action at the earliest. For this purpose the Contractor has to inform the concern person with contact details such as Mobile no. , fax no. etc. / address (available 24 hr) to whom Client can inform any problem regarding dispenser for corrective action immediately. Further, the contractor shall deploy adequate number of technicians/ supervisors / engineers at various site offices if required in consultation with Engineer-in-Charge to provide trouble free maintenance of the dispensers.
- xv) For any complain regarding non-performance of dispenser will be communicated to bidder for further necessary action at the earliest. For this purpose, the bidder has to provide inform the concern person with contact details such as Mobile no., fax no. etc. / address (available 24 hr) to whom client can inform any problem regarding dispenser for corrective action immediately.
- xvi) All arrangements for communication from control room to the contract person working on job under the services shall be the responsibility of the contractor, viz. pagers / walky-talky.
- xvii) The successful Contractor shall indemnify the company from any claim of the contract labour.
- xviii) The Contractors / contractor who fail to furnish any proof in respect of separate PF Code/No of the concerned RPF Commissioner / Authority their bids shall be liable for rejection.
- xix) All the jobs mentioned under scope of services shall be carried out as per sound engineering practices, work procedure documentation, recommendation of the manufacturer and as per the guidelines/direction of engineer-in-charge of authorized representative.

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 56 OF 74	

- xx) The Agency / contractor shall be responsible for ensuring that its employees conduct themselves in a proper manner and are courteous to customers. The Agency / contractor shall not engage or employ any person with a criminal record / background. The Agency / contractor shall remove the employee or worker who is found guilty of misconduct or negligence while on duty or whose conduct is not in order. The decision regarding this shall be taken by the EIC or his authorized representative.
- xxi. The Agency / contractor shall take due care of the equipment installed and ensure that the same are operated by properly trained people in a prudent manner. In case of any breakdown in or damage to or defect in the equipment, the Agency / contractor shall immediately notify to the BGL officer and shall not operate the equipment till clearance is given by Bhagyanagar Gas.
- xxii. The Agency / contractor shall follow the safety procedures, issued from time to time, specified by Bhagyanagar Gas Ltd. The Agency / contractor shall ensure full and strict compliance of the guidelines, norms, rules, stipulations etc. as may be prescribed by Petroleum & Explosives Safety Organization (PESO) Nagpur, Chief Fire Officer (CFO), and any other statutory authorities from time to time at the Site.
- xxiii. The Agency / contractor shall ensure compliance with all such safety guidelines / directives given by Bhagyanagar Gas from time to time.
- xxiv. The work is to be carried out in "Restricted Area" (i.e. operating area not open for all being hazardous in nature) and Agency / Contractor shall work as per the instructions of Site Engineer / EIC.
- xxv. Contractor shall provide suitable mode for communication (Telephone or Mobile phone) at each location. The rates quoted for operations shall be inclusive of this and no separate payment will be made to Contractor on this account. This communication line shall be used for communication of breakdown complaints and routine maintenance work.
- xxvi. The Agency / Contractor shall provide proper identification cards to his personnel duly signed by the Agency/Contractor or his authorized representative.
- xxvii. During contract period, qualified bidder or his staff / crew cannot resort to strike or other means of agitation on any ground, which affects the operations. Any Absence of crew / staff shall be viewed seriously and contract is liable to be terminated by Bhagyanagar Gas withholding all balance dues of contract and deposits and including encashment of performance guarantee.
- xxviii. Contractor shall open bank accounts of all the work force and supervisors working under him and transfer their payments to their respective accounts. The Bonus and LE charges shall be paid to the technician/ operator on Monthly basis. Payment by Cash / Cheque is strictly NOT permitted. Contractor has to submit bank statement showing the details of payment made to work force on monthly basis along with the bill.

9.0 MAINTENANCE OF DISPENSER PACKAGES during the warranty and 4 years Comprehensive Annual Repair and Maintenance period. (As applicable, refer respective SOR / Scope of Work in tender)

9.1 Scope of supply / work during warranty:

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 57 OF 74	

All spares, manpower, etc. required for carrying out the maintenance of the complete dispenser package during the warranty, including periodic, breakdown maintenance for continuous and uninterrupted operation of the dispenser shall be in the scope of the Contractor and the necessary spares (required under warranty) shall be kept in stock. A consolidated list has to be provided during detailed engineering for such types of spares. All the damaged part has to be replaced with new ones within the stipulated time. Electricity shall be supplied free of cost to the Contractor. No charges shall be paid during the warranty. Penalty shall be deducted for downtime of dispenser package, as applicable in clause 5.2.

9.2 Scope of supply/ work during four years comprehensive annual repair and maintenance period after completion of warranty:

9.3 All spares, consumables, man power, sealant etc. required for carrying out the maintenance of the complete dispenser package after the warranty, including periodic, breakdown maintenance for continuous and uninterrupted operation of the dispenser shall be in scope of the Contractor and the necessary spares (after warranty) shall be kept in stock. A consolidate list has to be provided during detailed engineering for such type of spares. However the minimum required spares to be kept in stock is enclosed as Annexure-1. All the damaged part has to be replaced with new within the stipulated time. Electricity shall be supplied free of cost to the Contractor. Charges shall be paid as per the respective year of CARM service. Penalty shall be deducted for downtime of dispenser package, as applicable in clause 5.2.

9.4 **Scope of services**

The Contractor shall have to keep all the spares, consumables, lubricants, etc required for carrying out periodic, breakdown, emergency maintenance etc of the package so as to minimize the down time of the dispenser. Non-availability of dispenser for non-availability of spares shall be liable for compensation.

9.4.1 All tools tackles and fixtures required for carrying out the above maintenance of the dispenser shall be in scope of the Contractor. The scope will also include handling equipment required during any maintenance activity.

9.4.2 Any expert services required from principal company or OEM has to be arranged by the supplier or his agent at his own cost. All arrangements like phone, fax, computer, Internet etc required for correspondences with above personnel has to be arranged by the Contractor.

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

a. Estimated down time required for each type of maintenance schedule.

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 58 OF 74	

- b. List of spares and their quantities required for each type of maintenance schedule per dispenser.
- c. Type and number of man-days required for each type of maintenance schedule per dispenser.

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

- 9.4.4 The Contractor shall use only OEM's certified spares during maintenance. In case, the schedule maintenance of the OEM manual recommends check and replace parts like valve spring, valve seat etc after certain time interval, same shall be replaced or used further only on approval from Client representative. However any untoward consequences for non-replacement of such parts shall be the responsibility of the Contractor.
- 9.4.5 All routine and periodic checks / inspections required to be done as per OEM recommendation shall be done by the Contractor. Instruments required for above inspection like vernier caliper, micrometer screw gauge, fill gauges, bore gauge etc shall be in scope of the Contractor and these instruments shall be calibrated every year.
- 9.4.6 All parts replaced by the Contractor during the above contract period shall be properly packed and handed over to Client on replacement.
- 9.4.7 The supplier shall submit a copy of the daily / weekly / fortnightly / monthly / bi-Monthly / quarterly and yearly performance report to the EIC in both soft and hard form. All stationery, including the printed material shall be in scope of the Contractor.
- 9.4.8 All the maintenance / inspection job carried out by the Contractor shall be recorded and the report of the same shall be jointly signed by Client representative.
- 9.4.9 The EIC will be final authority to take decision with regards to maintenance or replacement of parts or any disagreement between the Contractor and Client, during the execution of the contract.
- 9.4.10 The Contractor shall carryout yearly calibration of all instruments such as pressure gauges, transmitters, mass flow meters etc. In addition to the above all safety relief valves shall also be tested and calibrated every year.

Calibration shall be done during warranty and CARM at site with the help of Master Meter / Calibrator instruments for Mass Flow Meter / Instruments in presence of client / consultant representative. The Prover/ Master calibration Unit shall be arranged by the client.

The Mass Flow Meter / Calibrator shall be certified / calibrated from the government approved laboratory and will be provided by the client.

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 59 OF 74	

- 9.4.11 The periodic maintenance required to be done, as per OEM recommendation shall be taken up promptly. The Contractor shall plan such maintenance during non-peak hours and in consultation with the Engineer in Charge (EIC) of Client. Any maintenance that needs to be taken up shall be well planned in advance with due approval of the EIC. The Bidder shall provide the detailed preventative maintenance schedule along with estimated down time required for each type of maintenance schedule, List of spares and their quantities required for each type of maintenance schedule per Dispenser, Type and number of man days required for each type of maintenance schedule per Dispenser.
- 9.4.12 The scope includes providing services for maintenance on Comprehensive basis of CNG Dispensers (Car / Auto dispensers, Combo and Bus Dispensers) along with all equipment / instruments for the Dispensers, Mass Flow Meter, LCD display / Panel, Solenoid Valves, Isolation Valve, switching units, Tubing, Pressure Gauges, Hoses, Nozzles etc. (complete dispenser unit) including supply of all consumables, spares, manpower, Tools & tackles etc. for regular & breakdown maintenance of Dispensers to the satisfaction of EIC.
- 9.4.13 During the Comprehensive AMC period the contractor / vendor must ensure that the dispenser in fully operation condition is available round the clock 24hours a day and 365 days a year for performing the required services.
- 9.4.14 Contractor to carry out the calibration of all Mass Flow meter used in Dispensers by using the master calibrator supplied by BGL. This calibration is required during the witness of authorities from Legal Metrology department in lieu of periodic annual calibration, replacement of failed Mass Flow Meter, breakage of W&M seals, any doubt regarding accuracy / performance of dispenser as per the instruction of EIC. The calibration of Master Mass Flow meter prover is under scope of Bhagyanagar Gas Ltd. Arranging of yearly W&M recertification during O&M period & liasoning with officials of Legal metrology department, submitting the required documents to W&M officials will be in the scope of contractor. The liasoning charges shall be in the quoted rates of contractor. For payment of inspection charges in the form of DD etc in favour of Legal Metrology department during warranty and 4 years CARM period shall be as per applicable clause 13.19 & 13.20.
- 9.4.15 The contractor shall ensure the healthiness of W&M seals and to be jointly witnessed by Forecourt Operator after each and every maintenance activity. After maintenance activity, the dispenser needs to be locked and the key of dispenser should be with contractor and another key to be provided to BGL for safety reasons. The contractor needs to bring to the notice of BGL immediately, if seal found broken. The contractor needs to change the price of dispensers to ensure interactivity of seals. Necessary transportation shall be arranged by BGL for price changing.
- 9.4.16 Calibration of all Dispenser instruments yearly / annually such as Pressure Gauges, Temperature gauges, display units, Hydro-testing by approved agency for all the Hoses / parts (as per requirement of statutory) and all related parts which are not mentioned but required are in contractor's scope
- 9.4.17 Submission of monthly Preventive, Scheduled and Breakdown maintenance reports to EIC of respective location along with supported documents.

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 60 OF 74	

- 9.4.18 Ensure 98% availability of each package on monthly basis.
- 9.4.19 The maintenance team will assist any unplanned / emergency maintenance of equipment installed at CNG Station.
- 9.4.20 A detailed report of all spares & consumables used have to be maintained by Contractor, having details of part no., quantity used, date, expected running hours before replacement, etc. The same has to be submitted monthly to BGL.
- 9.4.21 All routine and periodic checks / inspections required to be done as per OEM recommendation shall be done by Contractor. Instruments required for above inspection shall be in scope of Contractor and these instruments shall be calibrated every year.
- 9.4.22 All spares required for carrying out the maintenance of the complete dispenser package during AMC period, including scheduled / breakdown maintenance for continuous and uninterrupted operation of the dispenser shall be in the scope of contractor / vendor.
- 9.4.23 All spare parts to be replaced in the CNG Dispenser package should be brand new and unused. However, repair of valves and packing assembly shall be permitted. Random Inspection of spare part to be utilized in the CNG Dispenser may be carried out by BGL representative.
- 9.4.24 All routine leak checks / inspections of the associated SS tubing, fittings valves and hoses outside the CNG Dispenser Unit (i.e. inlet & outlet) shall be done by contractor.
- 9.4.25 Contractor shall submit a copy of the weekly / monthly / quarterly and yearly maintenance schedule and the reports for the same to the EIC in both soft and hard form including safety interlock checks. Further, contractor shall submit Standard Work Procedure / Standard Operating Procedure (SWP/SOP) for all the activities for BGL perusal. If any modifications in these SWP/SOP suggested from BGL shall be implemented for safe O&M. All stationary including the printed material shall be in the scope of Contractor. A separate register is to be maintained for recording the time of occurrence and time of rectification and the same should be signed by the EIC / his Representative for each such event.
- 9.4.26 No part of this contract nor any share or interest therein in any manner or extent, will be transferred or assigned or sub-let, directly or indirectly to any person / firm or organization without prior approval of Client.
- 9.4.27 The Contractor is required to carry out all services as mentioned in the Scope of Services and Schedule of Rates on all the 365 days including Sunday and all Holiday & around the clock.
- 9.4.28 Contractor has to ensure the safety of man and machine all the times. Damages of equipment due to negligence will be recovered as per the decision of EIC, which will be final.
- 9.4.29 The rates quoted by the Contractor must be inclusive of all the taxes, duties, services tax, work contract tax and any other levies, Bidder's share of P.F. and insurance charges, Contractor's profit and any other expenditure etc. It will be the responsibility of the

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 61 OF 74	

Contractor to pay as per the minimum wages of the appropriate government applicable under the Minimum Wage Act

- 9.4.30 All the jobs mentioned under scope of services shall be carried out as per sound engineering practices, work procedure documentation, recommendation of the manufacturer and as per the guidelines / direction of engineer-in-charge of authorized representative.
- 9.4.31 All tools, tackles and fixtures required for carrying out the above maintenance of the compressor shall be in the scope of the Contractor. The scope will also include handling equipment like crane, forklift, chain pulley block, etc. required during any maintenance activity.
- 9.4.32 The Contractor shall use only OEM's certified spares during maintenance. In case, the schedule maintenance of the OEM manual recommends checking and replacing parts like valve spring, valve plates, piston rings etc. after certain time interval, same shall be replaced or used further only on approval from the PURCHASER representative. However, any untoward consequences for non-replacement of such parts shall be the responsibility of the Contractor.
- 9.4.33 All parts replaced by the Contractor during the above contract period shall be properly packed and handed over to PURCHASER, on replacement.
- 9.4.34 The Compliance of all statutory regulations and safety norms shall be in Contractor's scope.
- 9.4.35 The EIC will be final authority to take decision with regards to maintenance or replacement of parts or any disagreement between the Contractor and PURCHASER, during the execution of the contract.

9.5 Periodic Maintenance: Periodic maintenance required to be done as per OEM recommendation shall be taken up promptly:

- 9.5.1 Suggested six monthly or 4000 Dispenser Run Hour services other than routine monthly maintenance:
- Check the dispenser for leaks.
 - Check the Coalescing filter elements, replace if necessary.
 - Check damage and electrical continuity of Re-fuelling Hoses.
 - Replace Breakaway seals.
 - Replace 3-way Re-fuelling Valve seals and inspect ball for scratches and wear.
 - Replace ball if necessary.
 - Replace Re-fuelling probe O-ring, Check the condition of probe and replace if necessary.
 - Check OEM Nozzles and breakaways and replace if necessary.
- 9.5.2 Suggested Yearly or 8000 Dispenser Run Hour services other than routine monthly maintenance: In addition to all the checks mentioned in 6 monthly service above, Contractor shall carry out the following:

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 62 OF 74	

- Dismantle and clean the Solenoid Valves and replace the seals and O-rings.
- Dismantle and clean the Regulators Valves and Replace the seals and O-rings.

- Check all the Processor and electronic cards and make it dust-free and healthy.
- Check Dispenser that whether proper voltage input is received or not, rectification to be done if not.
- Check Flame proof Processor unit is proper or not with all bolts etc, rectification to be done if not.
- Maintaining of Reports after the AMC to be confirmed.

9.6 Bhagyanagar Gas Ltd. Obligations / Scope

- 9.6.1 Provide working place (having basic utilities including power supply etc.) for maintenance team.
- 9.6.2 Provide proper storage facility for spares at each station.
- 9.6.3 Provide uninterrupted controlled power supply for Dispenser unit and other related electrical equipment


	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV
		043-LEPL-BGL-08	A
		SHEET 63 OF 74	

LIST OF RECOMMENDED THIRD PARTY INSPECTION AGENCY (TPIA)

SL. NO	NAME OF TPI	ADDRESS	PHONE NO	FAX NO
1	Tata Projects Ltd.	22, Sarvodaya Society, Nizampura, Baroda-390002	0265-2392863	0265-2785952
2	Bax counsel Insepection Bureau Pvt. Ltd.	303, Madhava, Bandra Kurla Complex, Bandra(E), Mumbai-400051	022-26591526, 022-26590236	022-26591526
3	Germanischer Lloyd	4th Floor, Dakshna Building, Sec-11, Plot NO.2, CBD Belapur, Navi Mumbai 400 614	022-4078 1000	022-4024 2935
4	ABS Industrial Verification Ltd., Mumbai	404, Mayuresh Chambers, Sector-11, CBD Belapur(E), Navi Mumbai-400614	022-27578780 /1 /2	022-27578784 /5
5	Certification Engineers International Ltd.	EIL Bhavan, 5th floor, 1, Bhikaji Camma Place, New Delhi-110066	011-26167539, 26102121	011-26101419
6	Dalal Mott MacDonald	501, Sakar -II, Ellisbridge, Ahemedabad-380006	079-26575550	079-6575558
7	International Certification Systems	E-7, Chand Society, Juhu Road, Juhu, Mumbai-4000049	022-26245747	022-226248167
8	SGS	SGS India Pvt. Ltd., SGS House, 4B, A.S. Marg, Vikhroli(W), Mumbai-400083	022-25798421 to 28	022-25798431 to 33
9	Intertek Moody	9th Floor, Kanchenjunga Building, 18-Barakhamba Road, New Delhi-110001	011-4713 3900	011-4713 3999
10	TUV SUD South Asia	C-153/1, Okhla Industrial Ara, Phase-1, New Delhi-110020	011-3088 9611/9797	011-3088 9598
11	TUV Rheinland (India) Pvt. Ltd.	F-51, Kailash Complex GF, Veer Savarkar Marg, Vikhroli Park Site, Vikhroli(W), Mumbai-400079	022-4215 5435	022-4215 5434
12	Vincott International India Assessment Service Pvt. Ltd.	C-301, Mangalya Premises Cooperative Soc. Ltd, Off. Marol Maroshi Road, Andheri(E), Mumbai-400959	022-4247 4100	022-4247 4101



13	Meenar Global Consultants	Mr. Nitin Taneja (Project Manager)	M: +91-9711212783 T: +91-129-4072836	Web : www.meenaar.in Email : nitin.taneja@meenaar.in
14	VCS Quality Services Pvt. Ltd.	505, 5th floor, 360 Degree Business Park, Next to R-Mall, L.B.S. Marg, Mulund West, Mumbai 400080	Tel: 91 22 21649720	091 22 21646392

	CONTRACTOR		QUALITY ASSURANCE PLAN FOR CNG DISPENSER	CLIENT:	BGL
	ORDER NO. & DATE			PROJECT:	CNG & CITY GAS DISTRIBUTION PROJECT
	SUB-CONTRACTOR			PACKAGE NO.:	
	ORDER NO. & DATE			PACKAGE NAME:	CNG DISPENSERS

INSTRUCTIONS FOR FILLING UP:	CODES FOR EXTENT OF INSPECTION, TESTS, TEST CERTIFICATES & DOCUMENTS:					
<p>1. QAP shall be submitted for each of the equipment separately with breakup of assembly/subassembly & part/component or for group of equipment having same specification.</p> <p>2. Use numerical codes as indicated for extent of inspection & tests and submission of test certificates & documents. Additional codes & description for extent of inspection & tests may be added as applicable for the plant and equipment</p> <p>3. Separate identification number with quantity for equipment shall be indicated wherever equipment having same specifications belonging to different facilities are grouped together.</p> <p>4. Weight in tonnes (T) must be indicated under column 5 for each item. Estimated weights may be indicated wherever actual weights are not available.</p>	Code Description	Code Description	Code Description	Code Description	DOCUMENTS:	
	1. Visual	12. Routine test as per relevant IS / other standards	23. Short time rating	34. Calibration	D1. Approved GA drawings	
	2. Dimensional	13. Type test as per relevant IS / other standards	24. Operational & functional check	35. Power Failure	D2. Approved single line / schematic diagram	
	3. Fitment & Alignment	14. Impulse Test	25. Over Speed Test	36. Failure of metering	D3. Approved data sheet	
	4. Physical Test (Sample)	15. Partial Discharge Test	26. Flame Proof Test	37. Failure of Totalizer	D4. Approved bill of Material	
	5. Chemical test	16. Heat run rise test \ temperature	27. Clearance and Creepage Distance	38. Check for Single Bank System	D5. Unpriced P.O. copy	
	6. Ultrasonic Test	17. Enclosure Protection Test	28. Acceptance Test	39. Check for manual Shut-off	D6. Calibration Certificate of all measuring instruments & gauges	
	7. Magnetic Particle Test (MPT)	18. Calibration	29. Leak Test	40. Dispenser should Automatically stop in case of failure	D7. W & M Certificate from country of origin	
	8. Radiography Test	19. Noise & Vibration	30. Batch Accuracy Test		D8. CCOE approval certificate	
	9. Dye Penetration Test	20. Test certificates for bought-out components	31. Running Test		D9. Test certificate	
	ABBREVIATIONS USED: CONTR : CONTRACTOR MFR : MANUFACTURER	10. Measurement of IR Value	21. Tank Pressure Test	32. Flow Capacity Test		
		11. High Voltage test / Di-electric test	22. Paint shade verification	33. Pressure Test		

	PROCUREMENT OF CNG DISPENSERS ON ARC BASIS	DOCUMENT NO.	REV. 0
		043-LEPL-BGL-08	A
		SHEET 66 OF 33	

EQUIPMENT DETAILS							INSPECTION AND TESTS						Test Certificates & documents to be submitted to LEPL	Acceptance Criteria Standards /IS/BS/ASME/ Norms and Documents	REMARKS/ SAMPLING PLAN
Sl. No.	Description	Identification No.	Quantity		Manufacturer's Name and Address	Expected schedule of Final Inspection	Raw Material and in process stage inspection			Final Inspection / Test by					
			No/M	T			MFR	TPI	LEPL/ CLIENT	MFR	TPI	LEPL/ CLIENT			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
01	Dispenser Frame	Refer MR Spec. & Tech. Spec.	-	-		-	1,2,3,4,5	-	-	1,2,3	1,2,3	1,2,3	D1, D2, D3	MR Spec. & Tech. Spec.	Review of documents
02	Mass Flow Meter	Refer MR Spec. & Tech. Spec.	-	-		-	1,2,3,4,5,3,4	-	-	1,2,3,4,34	1,2,3,4,34,36,20,24	1,2,3,4,34,36,20,24	D1, D2, D3, D4, D5, D7, D8, D9	AGA11, D6 & MR Spec. & Tech. Spec.	Review of documents
03	Actuator Valves	Refer MR Spec. & Tech. Spec.	-	-		-	1,2,3,4,5,29,31	-	-	1,2,3,29,31	1,2,3,29,31,20,24	1,2,3,29,31,20,24	D3, D8, D9	MR Spec. & Tech. Spec.	Review of documents
04	Filling Hose	Refer MR Spec. & Tech. Spec.	-	-		-	1,2,3,4,5,33	-	-	1,2,3,3,3	1,2,3,33,20,24	1,2,3,3,20,24	D1, D2, D3, D4, D9	MR Spec. & Tech. Spec.	Review of documents



PROCUREMENT OF CNG DISPENSERS
ON ARC BASIS

DOCUMENT NO.

043-LEPL-BGL-08

SHEET 67 OF 74

REV

A

05	Totalizer	Refer MR Spec. & Tech. Spec.	-	-	-	1,2,3,40	-	-	1,2,3,40	1,2,3,37,40	1,2,3,37,40	D1, D2, D3, D4, D6, D9	MR Spec. & Tech. Spec.	Review of documents
06	Software	Refer MR Spec. & Tech. Spec.	-	-	-	38	-	-	38	38	38	D3	Refer MR Spec. & Tech. Spec.	100 % Witness
07	Pressure Gauge	Refer MR Spec. & Tech. Spec.	-	-	-	1,2,3,4,5,34	-	-	1,2,3,34	1,2,3,34,33,20,24	1,2,3,34,33,20,24	D1, D2, D3, D4, D6, D9	D6 & Refer MR Spec. & Tech. Spec.	Review of documents
08	Pressure Transducer	Refer MR Spec. & Tech. Spec.	-	-	-	1,2,3,4,5,34	-	-	1,2,3,34	1,2,3,34,4,20,24	1,2,3,34,20,24	D1, D2, D3, D4, D6, D9	D6 & MR Spec. & Tech. Spec.	Review of documents
09	Shut off Valves	Refer MR Spec. & Tech. Spec.	-	-	-	1,2,3,4,5,39	-	-	1,2,3,39	1,2,3,39,20,24	1,2,3,39,20,24	D1, D2, D3, D4, D9	MR Spec. & Tech. Spec.	Review of documents
10	Performance Test	Refer MR Spec. & Tech. Spec.	-	-	-	30, 32	-	-	30, 32	30, 32	30, 32	D4, D6, D7	D6, D7 & MR Spec. & Tech. Spec.	100 % Witness



**PROCUREMENT OF CNG DISPENSERS
ON ARC BASIS**

DOCUMENT NO.

043-LEPL-BGL-08

REV

A

SHEET 68 OF 74

11	Dispenser Response	Refer MR Spec. & Tech. Spec.	-	-	-	20,35,36,37	-	-	20,35,36,37	20,35,36,37	20,35,36,37	D1, D3, D8	MR Spec. & Tech. Spec.	100 % Witness
12	Inlet Filter	Refer MR Spec. & Tech. Spec.	-	-	-	1,2,3,4	-	-	1,2,3	1,2,3,20,24	1,2,3,20,24	D1, D2, D4, D9	D9 & MR Spec. & Tech. Spec.	Review of documents
13	Ball Valve	Refer MR Spec. & Tech. Spec.	-	-	-	1,2,3,4	-	-	1,2,3	1,2,3,20,24	1,2,3,20,24	D1, D2, D4, D9	D9 & MR Spec. & Tech. Spec.	Review of documents
14	Solenoid Valve	Refer MR Spec. & Tech. Spec.	-	-	-	1,2,3,4	-	-	1,2,3	1,2,3,20,24	1,2,3,20,24	D1, D2, D4, D9	D9 & MR Spec. & Tech. Spec.	Review of documents
15	Electrical Box.	Refer MR Spec. & Tech. Spec.	-	-	-	1,2,3,4	-	-	1,2,3	1,2,3,20	1,2,3,20	D1, D2, D4, D9	D9 & MR Spec. & Tech. Spec.	Review of documents
16	Three way Valve	Refer MR Spec. & Tech. Spec.	-	-	-	1,2,3,4	-	-	1,2,3	1,2,3,20,24	1,2,3,20,24	D1, D2, D4, D9	D9 & MR Spec. & Tech. Spec.	Review of documents



**PROCUREMENT OF CNG DISPENSERS
ON ARC BASIS**

DOCUMENT NO.

043-LEPL-BGL-08

SHEET 69 OF 74

REV

A

17	Needle Valve	Refer MR Spec. & Tech. Spec.	-	-	-	1,2,3,4	-	-	1,2,3	1,2,3,20,24	1,2,3,20,24	D1, D2, D4, D9	D9 & MR Spec. & Tech. Spec.	Review of documents
18	Electronic Board/Card	Refer MR Spec. & Tech. Spec.	-	-	-	1,2,3,4	-	-	1,2,3	1,2,3,20,24	1,2,3,20,24	D1, D2, D4, D9	MR Spec. & Tech. Spec.	Review of documents
19	Display Card	Refer MR Spec. & Tech. Spec.	-	-	-	1,2,3,4	-	-	1,2,3	1,2,3,20,24	1,2,3,20,24	D1, D2, D4, D9	D9 & MR Spec. & Tech. Spec.	Review of documents
20	Non Return Valve	Refer MR Spec. & Tech. Spec.	-	-	-	1,2,3,4	-	-	1,2,3	1,2,3,20	1,2,3,20	D1, D2, D4, D9	D9 & MR Spec. & Tech. Spec.	Review of documents
21	SS Tubes & Fitting	Refer MR Spec. & Tech. Spec.	-	-	-	1,2,3,4	-	-	1,2,3	1,2,3,20,33,29	1,2,3,20,33,29	D1, D2, D4, D9	D9 & MR Spec. & Tech. Spec.	Review of documents
For Contractor / Sub-Contractor (Stamp & Signature)					For TPIA (Stamp & Signature)					For CLIENT/PMC (Stamp & Signature)				



**PROCUREMENT OF CNG DISPENSERS
ON ARC BASIS**

DOCUMENT NO.

043-LEPL-BGL-08

SHEET 70 OF 74

REV

A

QUALITY ASSURANCE PLAN – CAR / BUS DISPENSER

CODING STRUCTURE						Manufacturer
Codes for Extent of Inspection, Tests & Test Certificates				Codes for Documents		Customer's Information Customer: Owner Name Consultant : None LOA No.: OWNER/ND/ dated Item : Car Dispensers
Code	Description	Code	Description	Code	Description	
1	Visual	12	Power failure	D1	Approved GA Drawing	
2	Dimensional	13	Failure of metering	D2	Approved P&ID	
3	Fitment & Alignment	14	Failure of totalizer	D3	Approved data sheet	
4	Physical Test	15	Calibration	D4	Approved Bill of material	
5	Chemical Test	16	Pressure test	D5	Purchase requisition	
6	Running Test	17	Noise & vibration	D6	W&M Certificate from country of origin	
7	Leak Test	18	Enclosure protection	D7	Calibration certificate of all measuring test / instruments and gauges	
8	Dispenser should automatically stop in case of failure of totalizer	19	Paint shade verification			
9	Check for single bank system	20	Test certificate for bought out			
10	Check for manual shut	21	Flow capacity test			
11	Batch accuracy test					



DETAILED INSPECTION AND TEST PLAN

EQUIPMENT DETAILS			INSPECTION AND TESTS				SCOPE OF INSPECTION AND TESTS		
Sr. No	Description	Qty.	RAW MATERIAL AND Stage Inspection		FINAL INSPECTION		Documents for submission to OWNER/PMC/TPI	Acceptance Criteria	Activity by OWNER/PMC/TPI
			MFR	OWNER/PMC/TPI	MFR	OWNER/PMC/TPI			
1	Dispenser Frame	360	1.2.3.4.5		1.2.3.	1.2.3	D1,D2,D3,D4	Tech. Specs in PO	Review of documents
2	Mass Flow Meter	720	1.2.3.4.5.15		1.2.3.15	1.2.3.15	D1,D2,D3,D4,D7	D7 & Tech Specs in PO	Review of documents
3	Filling hose	720	1.2.3.4.5.16		1.2.3.16	1.2.3.16	D1,D2,D3,D4	Tech. Specs in PO	Review of documents
4	Totalizer	720	1.2.3.8		1.2.3.8	1.2.3.8	D1,D2,D3,D4,D7	D7 & Tech Specs in PO	Review of documents
5	Software	1	9		9	9	D3	Tech. Specs in PO	Witness
6	Pressure Gauge	720	1.2.3.4.5.15		1.2.3.15	1.2.3.15	D1,D2,D3,D4,D7	D7 & Tech Specs in PO	Review of documents
7	Pressure Transducer	720	1.2.3.4.5.15		1.2.3.15	1.2.3.15	D1,D2,D3,D4,D7	D7 & Tech Specs in PO	Review of documents
8	Shut off valves	720	1.2.3.4.5.10		1.2.3.10	1.2.3.10	D1,D2,D3,D4,D7	D7 & Tech Specs in PO	Review of documents
9	Performance Test (using CNG)	360	11.21		11.21	11.21	D3,D7	D6, D7 & Tech Specs in PO	Witness
10	Dispenser response	360	12.13.14.17.19		12.13.14.17.19.20	12.13.14.17.19.20	D3,D7	D7 & Tech Specs in PO	Witness
<p>Note:</p> <ol style="list-style-type: none"> The Above Testing and acceptance criteria are minimum requirements, however, manufacturer shall ensure that the product shall also comply to the additional requirements as per Particular Technical specifications(PTS) Owner/Owner's representative shall review/approve all the documents related to QAP/Quality manuals/Drawings etc. submitted by supplier. All reference Codes/ Standards, Documents, P.O. Copies shall be arranged by vendor / supplier for reference of TPIA/OWNER at the time of Inspection At the time of delivery of material in stores, vendor will submit copy of all related document of inspection along with release note & MTC. TPI/PMC/OWNER have right to inspect minimum 10% of all manufacturing activities as specified above 									



**PROCUREMENT OF CNG DISPENSERS
ON ARC BASIS**

DOCUMENT NO.

043-LEPL-BGL-08

REV

A

SHEET 72 OF 74

QUALITY ASSURANCE PLAN – CAR CUM BUS DISPENSER

CODING STRUCTURE						Manufacturer
Codes for Extent of Inspection, Tests & Test Certificates				Codes for Documents		Customer's Information Customer: Owner's Name Consultant : None LOA No.: OWNER/ND/ dated Item : CNG Car Cum Bus Dispensers
Code	Description	Code	Description	Code	Description	
1	Visual	12	Power failure	D1	Approved GA Drawing	
2	Dimensional	13	Failure of metering	D2	Approved P&ID	
3	Fitment & Alignment	14	Failure of totalizer	D3	Approved data sheet	
4	Physical Test	15	Calibration	D4	Approved Bill of material	
5	Chemical Test	16	Pressure test	D5	Purchase requisition	
6	Running Test	17	Noise & vibration	D6	W&M Certificate from country of origin	
7	Leak Test	18	Enclosure protection	D7	Calibration certificate of all measuring test / instruments and gauges	
8	Dispenser should automatically stop in case of failure of totalizer	19	Paint shade verification			
9	Check for single bank system	20	Test certificate for bought out			
10	Check for manual shut	21	Flow capacity test			
11	Batch accuracy test					



DETAILED INSPECTION AND TEST PLAN

EQUIPMENT DETAILS			INSPECTION AND TESTS				SCOPE OF INSPECTION AND TESTS		
Sr. No	Description	Qty.	RAW MATERIAL AND Stage Inspection		FINAL INSPECTION		Documents for submission to OWNER/PMC/TPI	Acceptance Criteria	Activity by OWNER/PMC/TPI
			MFR	OWNER/PMC/TPI	MFR	OWNER/PMC/TPI			
1	Dispenser Frame	360	1.2.3.4.5		1.2.3.	1.2.3	D1,D2,D3,D4	Tech. Specs in PO	Review of documents
2	Mass Flow Meter	720	1.2.3.4.5.15		1.2.3.15	1.2.3.15	D1,D2,D3,D4,D7	D7 & Tech Specs in PO	
3	Filling hose	720	1.2.3.4.5.16		1.2.3.16	1.2.3.16	D1,D2,D3,D4	Tech. Specs in PO	Review of documents
4	Totalizer	720	1.2.3.8		1.2.3.8	1.2.3.8	D1,D2,D3,D4,D7	D7 & Tech Specs in PO	Review of documents
5	Software	1	9		9	9	D3	Tech. Specs in PO	Witness
6	Pressure Gauge	720	1.2.3.4.5.15		1.2.3.15	1.2.3.15	D1,D2,D3,D4,D7	D7 & Tech Specs in PO	Review of documents
7	Pressure Transducer	720	1.2.3.4.5.15		1.2.3.15	1.2.3.15	D1,D2,D3,D4,D7	D7 & Tech Specs in PO	Review of documents
8	Shut off valves	720	1.2.3.4.5.10		1.2.3.10	1.2.3.10	D1,D2,D3,D4,D7	D7 & Tech Specs in PO	Review of documents
9	Performance Test (using CNG)	360	11.21		11.21	11.21	D3,D7	D6, D7 & Tech Specs in PO	Witness
10	Dispenser response	360	12.13.14.17.19		12.13.14.17.19.20	12.13.14.17.19.20	D3,D7	D7 & Tech Specs in PO	Witness

Note:

- The Above Testing and acceptance criteria are minimum requirement; however, manufacturer shall ensure that the product shall also comply to the additional requirements as per Particular Technical specifications (PTS).
- Owner/Owner representative shall review/approve all the documents related to QAP/Quality manuals/Drawings etc. submitted by supplier.
- All reference Codes/ Standards, Documents, P.O. Copies shall be arranged by vendor / supplier for reference of TPIA/OWNER at the time of Inspection
- At the time of delivery of material in stores, vendor will submit copy of all related document of inspection along with release note & MTC.
- TPI/PMC/OWNER have right to inspect minimum 10% of all manufacturing activities as specified above.

