VCS Quality Services Private Limited

SUPPLY OF CNG/CBG CAR, COMBO AND BUS DISPENSERS IN THE CGD OF IRM ENERGY LIMITED (IRMEL) IN 4 GA's OF BANASKANTHA, DIU & GIR SOMNATH, FATEHGARH SAHIB & NAMAKKAL & TIRUCHIRAPPALLI.

Tender For Procurement of

CNG/CBG CAR, COMBO & BUS DISPENSERS

TENDER NO: -

DOCUMENT NO: -C261159/TECH VOL./ IRMEL / 25

TECHNICAL VOLUME

IRM ENERGY LIMITED (IRMEL)

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ENERGISING QUALITY	**PROJECT NUMBER: VCS-IRMEL-C261159**	IRM Energy

MATERIAL REQUISITION(MR) FOR CNG/CBG CAR DISPENSERS			Client Job Number	C261159	
			Total Sheets	09	
DOCUMENT NO	C261159	00	ME	MR	3001(A)

SUPPLY OF CNG/CBG CAR DISPENSERS IN THE CGD OF IRM ENERGY LIMITED (IRMEL) IN 4 GA's OF BANASKANTHA, DIU & GIR SOMNATH, FATEHGARH SAHIB & NAMAKKAL & TIRUCHIRAPPALLI.

REV	DATE	DESCRIPTION	PREP	CHK	APPR
C4	23.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C3	05.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C2	30.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C1	22.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB

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1. DEFINITION

Where used in this document, the following terms shall have the meanings indicated below, unless clearly indicated by the context to this order:

PROJECT: CGD PROJECT AT IRMEL GA

OWNER/COMPANY: IRM ENERGY LIMITED (IRMEL).

CONSULTANT: VCS QUALITY SERVICES PVT. LTD.

MANUFACTURER: THE PARTY WHO MANUFACTURERS & SUPPLIES EQUIPMENT & PROVIDE SERVICES TO OWNER OR TO CONTRACTOR.

MR: MATERIAL REQUISITION

2. DOCUMENT PRECEDENCE

It shall be the responsibility of the MANUFACTURER/ VENDOR to inform the PURCHASER of any errors, ambiguities, inconsistencies, discrepancies, or conflict of information that may be found to exist in any document, specification or drawing submitted by the PURCHASER.
In case of conflict, the order of precedence shall be as follows:

a) Material Requisition
b) Scope of work
c) Data Sheets
d) Technical Specifications
e) Basic Documents
f) Codes and Standards

As a general rule in the event of any discrepancy between technical matter and local laws/ regulations (and documents above listed) the most stringent shall be applied.
MANUFACTURER / VENDOR shall notify PURCHASER of any apparent conflicts between MR, specifications, related datasheets, any code and standards and any other specifications noted herein. (Resolution and/ or interpretation precedence shall be obtained from PURCHASER in writing before proceeding with the design/ manufacturer or completion of services.

3. SCOPE OF SUPPLY & SERVICES FOR CAR DISPENSER

Design, procurement of bought out components, manufacture, assembly at shop, testing at manufacturer's works, statutory approval like valid W&M & PESO, packing (if any), delivery of CNG Car cum Auto Dispensers, supply of all Pre-commissioning, Commissioning and documentation as per the enclosed

engineering standard, specifications and data sheets etc. attached or referred. Supply of Dispensers shall be at M/s IRM Energy Limited.

Item. No.	Description of items	Unit	Qty.
(1)	(2)	(3)	(4)
1.0	**'SUPPLY OF CAR-CUM AUTO (DUAL ARM) CNG/CBG DISPENSERS AT GEOGREPHICAL AREA(GA) OF IRM ENERGY LIMITED**		
1.1	The Scope of work includes Design, detail engineering, manufacturing, Assembly, factory testing and Inspection, wooden packaging, handling, transportation of Dispenser, loading, unloading at sites, documentation, etc., and providing all related services including installation, commissioning, integration, Factory acceptance testing (FAT) and Providing Comprehensive Maintenance Services during Warranty Period including supply of all spares, consumables, providing licensed software & hardware, converters, cables etc. On-site Training of Purchaser's Dispenser operator to be provided, if required. The system shall have integrated with 3 Bank configuration on each arm for CNG car-cum-Auto Dual arm dispenser with flow capacity of ≥ 15 kg/min. on each side with NGV nozzle + NZS Probe for fueling pressure up to 200 kg-f/cm2 and dispenser MAWP up to 255 kg-f/cm2 as per Gas Cylinder Rules-2016, SMPV (U) Rules-2016, ISO 16923, NFPA 52, NGV 4.1/ AGA 2-92, OISD 179, IS 5571, OIML TC8/SC7, Consumer Protection Act, W&M Act. and other applicable codes. Complete in all respect defined in the Tender Documents including Installation & commissioning spares. The materials shall be delivered as per PO on written intimation. The Bidder has to provide all necessary certificates from the statutory authorities like Approved W&M & PESO approval along with the bid and during supply of equipment's. The documentation includes All Material test certificates (MTC), Instruments calibration certificates, PESO & W&M model approvals along with Manufacturing, Repair, and dealership valid W&M certificates for CNG dispenser and other	Nos.	01

	certificates as per ITP and tender requirements. Maintenance and support services during the warranty period, including supply of all spare parts and rectification of any defects or faults during warranty periods. (The Bidder shall strictly adhere to all the relevant statutory and MR, SOW and technical specifications(TS) of technical volume)		
1.2	Comprehensive Annual Maintenance (CAMC) Contract of CNG CAR-CUM AUTO (DUAL ARM) Dispensers including repair, Support during Re-validation of W&M stamping approval during CAMC, Support during Calibration of all instruments & Dispenser, supply of all consumables, Spare parts, Tools, & Manpower, etc. after the completion of warranty periods. A. Preventive Maintenance at Regular intervals as per schedule by OEM / authorized contractor as per the recommendation of OEM or as per requirement of IRMEL. B. Breakdown Maintenance as & when Required within CAMC by OEM. Equipment downtime shall be as per agreed service level agreement/penalty terms. Note: comprehensive Annual maintenance (CAMC) During warranty period is included in supply of Dispenser package, i.e., Sl. No. 1.1.		
1.2.1	Comprehensive Maintenance Charges for 1st year i.e., after the warranty period	Machine Months	12
1.2.2	Comprehensive Maintenance Charges for 2nd year i.e., after the warranty period	Machine Months	12
1.2.3	Comprehensive Maintenance Charges for 3rd year i.e., after the warranty period	Machine Months	12
1.2.4	Comprehensive Maintenance Charges for 4th year i.e., after the warranty period	Machine Months	12
1.2.5	Comprehensive Maintenance Charges for 5th year i.e., after the warranty period	Machine Months	12
1.2.6	Comprehensive Maintenance Charges for 6th year i.e., after the warranty period	Machine Months	12
1.2.7	Comprehensive Maintenance Charges for 7th year i.e., after the warranty period	Machine Months	12
1.2.8	Comprehensive Maintenance Charges for 8th year i.e., after the warranty period	Machine Months	12

1.2.9	Comprehensive Maintenance Charges for 9th year i.e., after the warranty period	Machine Months	12

Note: -

The Bidders must ensure that the total price quoted for comprehensive maintenance services for each year during the four-year post-warranty period (excluding GST) is reasonable and proportionate to the total price quoted for supply, erection/installation, testing, and commissioning (exclusive of taxes and duties).

The CAMC in this SOR is considered 10 years including one year during warranty period and 9 years post warranty periods.

4. INSPECTION

The inspection shall be carried out by the Owner. However, prior to the witness test at the Vendor's facility, the Vendor shall perform a complete internal inspection of the dispenser. This inspection shall be conducted in accordance with the approved Quality Assurance Plan (QAP) / Inspection and Test Plan (ITP).

All inspection procedures and plans shall be executed by the Vendor before dispatching the equipment to the site. In addition to the Vendor's internal inspection, the Owner's representative will witness the inspection during the factory visit at the Vendor's facility.

5. SPECIAL INSTRUCTIONS TO VENDOR

5.1 Vendor to note that no correspondence shall be entered into or entertained after the bid submission.

5.2 Vendor shall furnish quotation only in case he can supply material strictly as per this Material Requisition and specification/data sheets forming part of Material Requisition.

5.3 If the technical bid contains any deviations or clarifications (if not in line with MR requirements) and does not include complete scope & technical / performance data required to be submitted with the technical bid, in that case the offer shall be liable for rejection and no further deviation shall be accepted after receipt of purchase order.

5.4 The submission of prices by the Vendor shall be construed to mean that he has confirmed compliance with all technical specifications of the corresponding item (s).

5.5 Vendor must submit all documents as listed in checklist along with his offer.

5.6 The Supplier shall deliver a Certificate confirming to BS EN 10204 3.2/3.1 & BS EN 10204 2.1/2.2 stating the quality of materials as wherever is required, the mechanical properties, the chemical analysis, the process of manufacture for SS tubing & other fittings, pressure gauges for complete assembly works.

5.7 All materials shall be delivered to consortium Warehouse / sites of M/s IRMEL detailed addresses will be provided by IRMEL at a time of

requirement of the material.

6. INFORMATION/ DOCUMENTS/ DRAWINGS TO BE SUBMITTED BY SUCCESSFUL VENDOR & DURING BID SUBMISSION.

Successful Vendor shall submit four copies unless noted otherwise, each of the following:

6.1 Piping & Instrumentation Diagram (P&ID) & schematic diagram.

6.2 General arrangements Drawings, Hookup drawings including hoses/pipes & Tubing's connection & specifications.

6.3 Foundation drawings & civil works detailed requirements.

6.4 OEM Datasheets & catalogs for all Instrumentation to be provided by vendors.

6.5 Inspection & test reports for all mandatory tests as per the applicable code as well as test reports for any supplementary tests.

6.6 Material test certificates (physical property, chemical composition, make, heat treatment report, etc.) as applicable for items.

6.7 Statutory test certificates like W&M & PESO approval.

6.8 Filled in Quality Assurance Plan (QAP) for Purchaser's/ Consultant's approval. These QAPs shall be submitted in four copies within 15 days from LOI / FOI.

6.9 Other Drawing & document as specified in vendor data & drawing requirements as with Tender.

6.10 Purchase Orders / Certificate of origin of material of bought out items soon after placement of order.

6.11 Manufacturer's drawings/documents for bought out items, in 4 copies, for Purchaser's / Consultant's approval within 4 weeks.

6.12 Manufacturer related information for design of civil foundation & other matching items within 6 weeks of FOI / LOI.

6.13 All approved drawings / design calculation / maintenance & operating manual documents as well as inspection and test reports for Owner's / Consultants reference / record in nicely category-wise bound volumes (in Hard Copy) and in Soft Copy separately.

6.14 Filled in data sheet for each instrument tag after sizing, range selection, proper selection of materials etc. shall be Vendor's responsibility. Any necessary change required later for meeting the specification shall be done by the vendor without any price or delivery implications.

6.15 Vendor shall provide P&ID drawing, foundation drawing, and tubing specification in line with technical specification.

6.16 Vendor shall provide daily checklist, monthly maintenance checklist, breakdown report format, monthly maintenance format and site acceptance (SAT) test procedure.

6.17 Vendor shall be providing list of special tools and tackles as required during commissioning works at site.

6.18 Vendor shall provide W&M related document like Approval of model for dispenser, Approval of model for mass flowmeter, License of manufacture, License of Dealership, License of Repairing and any other document as required by W&M dept.

6.19 W&M approval Certificates of Mass flow meter during Bid submission.

6.20 Valid CCOE approval certificates of all Ex-electrical equipment's including Mass flow meter Sensor & Transmitter unit, pressure transducer, JB's, cable glands etc. during bid documents.

6.21 Valid CCOE approval certificates of CNG dispenser model/type during submission of bid documents.

7. INSTRUCTION TO VENDOR

7.1 Vendor to furnish filled up documents / formats as per "Special Instruction to Vendors" along with the offer.

7.2 Dispenser (including all components) shall be designed and suitable for Natural Gas as well as CBG (Compressed Bio Gas) and shall comply the technical specification of this document.

7.3 All physical and mechanical testing shall be in accordance with the requirements of connected line pipe.

7.4 Delivery of Dispensers shall be at M/s IRM Energy Limited. designated storage yard/site and shall be in the Vendor's scope.

7.5 The submission of prices by the Vendor shall be construed to mean that he has confirmed compliance with all technical specifications of the corresponding item(s).

7.6 Purchaser's inspector reserves the right to perform stage wise inspection and witness tests, as indicated in specification of Dispensers / ITP at manufacture's works prior to shipment. Manufacturer shall give reasonable notice of time and shall provide without charge reasonable access and facilities require for inspection to the purchaser's inspector. Inspection and tests performed/witnessed by purchaser's inspector shall in no way relieve the manufacturer's obligation to perform the required inspection and test.

7.7 All drawings, instructions, catalogues, etc. shall be in English language and all dimensions shall be metric units.

8. LIST OF ATTACHMENTS

Sl. No.	Name of Documents	Documents No.
01.	Material Requisition	C261159-00-ME-MR 3001(A)/(B)/(C)
02.	Scope of work– CNG Car, Combo & Bus Dispensers	C261159-00-ME-SOW-3001/(A)/(B)

03.	Comprehensive Annual Maintenance contract (CAMC)	C261159-00-ME-CAMC-3001
04.	Data sheet – a. Mass flow meter b. Car Dispenser c. Bus Dispenser d. Combo Dispenser e. Pressure Gauge f. Safety relief valves	C261159-00-ME-DS-3001 C261159-00-ME-DS-3002 C261159-00-ME-DS-3003 C261159-00-ME-DS-3004 C261159-00-ME-DS-3005 C261159-00-ME-DS-3006
05.	Technical Specification	C261159-00-ME-TS-3001
06.	Vendor Drawing & Data Requirement	C261159-00-ME-VDDR-3001
07.	Quality Assurance plan-CNG Dispensers	C261159-00-ME-QAP-3001
08.	Approved Vendor List	C261159-00-ME-AVL-3001

ENERGISING QUALITY	**PROJECT NUMBER: VCS-IRMEL-C261159**	IRM Energy

MATERIAL REQUISITION(MR) FOR COMBO DISPENSER			Client Job Number	C261159	
			Total Sheets	9	
DOCUMENT NO	C261159	00	ME	MR	3001(B)

SUPPLY OF CNG/CBG CAR CUM BUS, (COMBO) DISPENSERS IN THE CGD OF IRM ENERGY LIMITED (IRMEL) IN 4 GA's OF BANASKANTHA, DIU & GIR SOMNATH, FATEHGARH SAHIB & NAMAKKAL & TIRUCHIRAPPALLI.

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MANUFACTURER / VENDOR shall notify PURCHASER of any apparent conflicts between MR, specifications, related datasheets, any code and standards and any other specifications noted herein. (Resolution and/ or interpretation precedence shall be obtained from PURCHASER in writing before proceeding with the design/ manufacturer or completion of services.

3. SCOPE OF SUPPLY & SERVICES FOR CAR-CUM BUS COMBO DISPENSER

Design, procurement of bought out components, manufacture, assembly at shop, testing at manufacturer's works, statutory approval like valid W&M & PESO, packing (if any), delivery of CNG Car cum bus Dispensers, supply of all Pre-commissioning, Commissioning and documentation as per the enclosed

engineering standard, specifications and data sheets etc. attached or referred. Supply of Dispensers shall be at M/s IRM Energy Limited.

Item. No.	Description of items	Unit	Qty.
(1)	(2)	(3)	(4)
1.0	**'SUPPLY OF CAR-CUM BUS (DUAL ARM) CNG/CBG COMBO DISPENSERS AT GEOGREPHICAL AREA(GA) OF IRM ENERGY LIMITED**		
1.1	The Scope of work includes Design, detail engineering, manufacturing, Assembly, factory testing and Inspection, wooden packaging, handling, transportation of Dispenser, loading, unloading at sites, documentation, etc., and providing all related services including installation, commissioning, integration, Factory acceptance testing (FAT) and Providing Comprehensive Maintenance Services during Warranty Period including supply of all spares, consumables , providing licensed software & hardware, converters, cables etc. On-site Training of Purchaser's Dispenser operator to be provided, if required. The system shall integrated with 3 Bank configuration on each arm for CNG car-cum-Bus Dual arm combo dispenser with flow capacity of ≥ 15 kg/min. for car side & ≥ 75 kg/min. for Bus side with NGV nozzle + NZS probe for Car & Heavy duty bus nozzle as per NGV1 & ISO14469 Type 1 for fueling pressure up to 200 kg-f/cm2 and dispenser MAWP up to 255 kg-f/cm2-g as per Gas Cylinder Rules-2016, SMPV (U) Rules-2016, ISO 16923, NFPA 52,NGV 4.1/ AGA 2-92,OISD 179,IS 5571, OIML TC8/SC7, Consumer Protection Act, W&M Act. and other applicable codes. Complete in all respect defined in the Tender Documents including Installation & commissioning spares. The materials shall be delivered as per PO on written intimation. The Bidder has to provide all necessary certificates from the statutory authorities like Approved W&M & PESO approval along with the bid and during supply of equipment's. The documentation includes All Material test certificates (MTC), Instruments calibration certificates, PESO & W&M model approvals along	Nos.	01

	with Manufacturing, Repair and dealership valid W&M certificates for CNG dispenser and other certificates as per ITP and tender requirements. Maintenance and support services during the warranty period, including supply of all spare parts and rectification of any defects or faults during warranty periods. (The Bidder shall strictly adhere to all the relevant statutory and MR, SOW, and technical specifications (TS) of technical volume)		
1.2	Comprehensive Annual Maintenance (CAMC) Contract of CNG CAR-CUM BUS (DUAL ARM) Combo Dispensers including support during re-validation of W&M stamping approval during CAMC, Support during Calibration of instruments & Dispenser, supply of all consumables, Spare parts, Tools, & Manpower, etc. after the completion of warranty periods. A. Preventive Maintenance at Regular intervals as per schedule by OEM / authorized contractor as per the recommendation of OEM or as per requirements of IRMEL. B. Breakdown Maintenance as & when Required within CAMC by OEM. Equipment downtime shall be as per agreed service level agreement/penalty terms. Note: Comprehensive Annual maintenance (CAMC) During warranty period is included in supply of Dispenser package, i.e., Sl. No. 1.1.	Nos.	01
1.2.1	Comprehensive Maintenance Charges for 1st year i.e., after warranty period	Machine Months	12
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1.2.8	Comprehensive Maintenance Charges for 8th year i.e., after warranty period	Machine Months	12

1.2.9	Comprehensive Maintenance Charges for 9th year i.e., after warranty period	Machine Months	12

Note: -

1) The Bidders must ensure that the total price quoted for comprehensive maintenance services for each year during the four-year post-warranty period (excluding GST) is reasonable and proportionate to the total price quoted for supply, erection/installation, testing, and commissioning (exclusive of taxes and duties).

2) The CAMC in this SOR is considered 10 years including one year during warranty period and 9 years post warranty periods.

4. INSPECTION

The inspection shall be carried out by the Owner. However, prior to the witness test at the Vendor's facility, the Vendor shall perform a complete internal inspection of the dispenser. This inspection shall be conducted in accordance with the approved Quality Assurance Plan (QAP) / Inspection and Test Plan (ITP).

All inspection procedures and plans shall be executed by the Vendor before dispatching the equipment to the site. In addition to the Vendor's internal inspection, the Owner's representative will witness the inspection during the factory visit at the Vendor's facility.

5. SPECIAL INSTRUCTIONS TO VENDOR

5.1 Vendor to note that no correspondence shall be entered into or entertained after the bid submission.

5.2 Vendor shall furnish quotation only in case he can supply material strictly as per this Material Requisition and specification/data sheets forming part of Material Requisition.

5.3 If the technical bid contains any deviations or clarifications (if not in line with MR requirements) and does not include complete scope & technical / performance data required to be submitted with the technical bid, in that case the offer shall be liable for rejection and no further deviation shall be accepted after receipt of purchase order.

5.4 The submission of prices by the Vendor shall be construed to mean that he has confirmed compliance with all technical specifications of the corresponding item (s).

5.5 Vendor must submit all documents as listed in checklist along with his offer.

5.6 The Supplier shall deliver a Certificate confirming to BS EN 10204 3.2/3.1 & BS EN 10204 2.1/2.2 stating the quality of materials as wherever is required, the mechanical properties, the chemical analysis, the process of manufacture for SS tubing & other fittings, pressure gauges for complete assembly works.

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requirement of the material.

6. INFORMATION/ DOCUMENTS/ DRAWINGS TO BE SUBMITTED BY SUCCESSFUL VENDOR & DURING BID SUBMISSION.

Successful Vendor shall submit four copies unless noted otherwise, each of the following:

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6.3 Foundation drawings & civil works detailed requirements.

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6.5 Inspection & test reports for all mandatory tests as per the applicable code as well as test reports for any supplementary tests.

6.6 Material test certificates (physical property, chemical composition, make, heat treatment report, etc.) as applicable for items.

6.7 Statutory test certificates like W&M & PESO approval.

6.8 Filled in Quality Assurance Plan (QAP) for Purchaser's/ Consultant's approval. These QAPs shall be submitted in four copies within 15 days from LOI / FOI.

6.9 Other Drawing & document as specified in vendor data & drawing requirements as with Tender.

6.10 Purchase Orders / Certificate of origin of material of bought out items soon after placement of order.

6.11 Manufacturer's drawings/documents for bought out items, in 4 copies, for Purchaser's / Consultant's approval within 4 weeks.

6.12 Manufacturer related information for design of civil foundation & other matching items within 6 weeks of FOI / LOI.

6.13 All approved drawings / design calculation / maintenance & operating manual documents as well as inspection and test reports for Owner's / Consultants reference / record in nicely category-wise bound volumes (in Hard Copy) and in Soft Copy separately.

6.14 Filled in data sheet for each instrument tag after sizing, range selection, proper selection of materials etc. shall be Vendor's responsibility. Any necessary change required later for meeting the specification shall be done by the vendor without any price or delivery implications.

6.15 Vendor shall provide P&ID drawing, foundation drawing, and tubing specification in line with technical specification.

6.16 Vendor shall provide daily checklist, monthly maintenance checklist, breakdown report format, monthly maintenance format and site acceptance (SAT) test procedure.

6.17 Vendor shall be providing list of special tools and tackles as required during commissioning works at site.

6.18 Vendor shall provide W&M related document like Approval of model for dispenser, Approval of model for mass flowmeter, License of manufacture, License of Dealership, License of Repairing and any other document as required by W&M dept.

6.19 W&M approval Certificates of Mass flow meter during Bid submission.

6.20 Valid CCOE approval certificates of all Ex-electrical equipment's including Mass flow meter Sensor & Transmitter unit, pressure transducer, JB's, cable glands etc. during bid documents.

6.21 Valid CCOE approval certificates of CNG dispenser model/type during submission of bid documents.

7. INSTRUCTION TO VENDOR

7.1 Vendor to furnish filled up documents / formats as per "Special Instruction to Vendors" along with the offer.

7.2 Dispenser (including all components) shall be designed and suitable for Natural Gas as well as CBG (Compressed Bio Gas) and shall comply the technical specification of this document.

7.3 All physical and mechanical testing shall be in accordance with the requirements of connected line pipe.

7.4 Delivery of Dispensers shall be at M/s IRM Energy Limited. designated storage yard/site and shall be in the Vendor's scope.

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7.6 Purchaser's inspector reserves the right to perform stage wise inspection and witness tests, as indicated in specification of Dispensers / ITP at manufacture's works prior to shipment. Manufacturer shall give reasonable notice of time and shall provide without charge reasonable access and facilities require for inspection to the purchaser's inspector. Inspection and tests performed/witnessed by purchaser's inspector shall in no way relieve the manufacturer's obligation to perform the required inspection and test.

7.7 All drawings, instructions, catalogues, etc. shall be in English language and all dimensions shall be metric units.

8. LIST OF ATTACHMENTS

Sl. No.	Name of Documents	Documents No.
01.	Material Requisition	C261159-00-ME-MR 3001(A)/(B)/(C)
02.	Scope of work– CNG Car, Combo & Bus Dispensers	C261159-00-ME-SOW-3001/(A)/(B)
03.	Comprehensive Annual Maintenance contract (CAMC)	C261159-00-ME-AMC-3001

04.	Data sheet – Mass flow meter Car Dispenser Bus Dispenser Combo Dispenser Pressure Gauge Safety relief valves	C261159-00-ME-DS-3001 C261159-00-ME-DS-3002 C261159-00-ME-DS-3003 C261159-00-ME-DS-3004 C261159-00-ME-DS-3005 C261159-00-ME-DS-3006
05.	Technical Specification	C261159-00-ME-TS-3001
06.	Vendor Drawing & Data Requirement	C261159-00-ME-VDDR-3001
07.	Quality Assurance plan-CNG Dispensers	C261159-00-ME-QAP-3001
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d) Basic Documents
e) Codes and Standards

As a general rule in the event of any discrepancy between technical matter and local laws/ regulations (and documents above listed) the most stringent shall be applied.
MANUFACTURER / VENDOR shall notify PURCHASER of any apparent conflicts between MR, specifications, related datasheets, any code and standards and any other specifications noted herein. (Resolution and/ or interpretation precedence shall be obtained from PURCHASER in writing before proceeding with the design/ manufacturer or completion of services.

3. SCOPE OF SUPPLY & SERVICES FOR BUS DISPENSER

Design, procurement of bought out components, manufacture, assembly at shop, testing at manufacturer's works, statutory approval like valid W&M & PESO, packing (if any), delivery of bus Dispensers, supply of all Pre-commissioning, Commissioning and documentation as per the enclosed engineering standard,

specifications and data sheets etc. attached or referred. Supply of Dispensers shall be at M/s IRM Energy Limited.

Item. No.	Description of items	Unit	Qty.
(1)	(2)	(3)	(4)
1.0	**'SUPPLY OF CNG/CBG BUS (SINGLE ARM) DISPENSERS AT GEOGREPHICAL AREA(GA) OF IRM ENERGY LIMITED**		
1.1	The Scope of work includes Design, detail engineering, manufacturing, Assembly, factory testing and Inspection, wooden packaging, handling, transportation of Dispenser, loading, unloading at sites, documentation, etc., and providing all related services including installation, commissioning, integration, Factory acceptance testing (FAT) and Providing Comprehensive Maintenance Services during Warranty Period including supply of all spares, consumables , providing licensed software & hardware, converters, cables etc. On-site Training of Purchaser's Dispenser operator to be provided, if required. The system shall integrated with Single Bank configuration on Bus arm for CNG Bus dispenser single arm with flow capacity of ≥ 75 kg/min . for Bus side with Heavy duty bus nozzle as per NGV1 & ISO14469 Type 1 for fueling pressure up to 200 kg-f/cm2 and dispenser MAWP up to 255 kg-f/cm2 as per Gas Cylinder Rules-2016, SMPV (U) Rules-2016, ISO 16923, NFPA 52, NGV 4.1/ AGA 2-92, OISD 179, IS 5571, OIML TC8/SC7, Consumer Protection Act, W&M Act. and other applicable codes. Complete in all respect defined in the Tender Documents including Installation & commissioning spares. The materials shall be delivered as per PO on written intimation. The Bidder has to provide all necessary certificates from the statutory authorities like Approved W&M & PESO approval along with the bid and during supply of equipment's. The documentation includes All Material test certificates (MTC), Instruments calibration certificates, PESO & W&M model approvals along	Nos.	01

	with Manufacturing, Repair and dealership valid W&M certificates for CNG dispenser and other certificates as per ITP and tender requirements. Maintenance and support services during the warranty period, including supply of all spare parts and rectification of any defects or faults during warranty periods. (The Bidder shall strictly adhere to all the relevant statutory and MR, SOW, and technical specifications (TS) of technical volume)		
1.2	Comprehensive Annual Maintenance (CAMC) Contract of CNG BUS (SINGLE ARM) Dispensers including repair, support during re-validation of W&M stamping approval during CAMC, Calibration of instruments & Dispenser, supply of all consumables, Spare parts, Tools, & Manpower, etc. after the completion of warranty periods. A. Preventive Maintenance at Regular intervals as per schedule by OEM / authorized contractor as per the recommendation of OEM or as per requirements of IRMEL. B. Breakdown Maintenance as & when Required within CAMC by OEM. Equipment downtime shall be as per agreed service level agreement/penalty terms. Note: comprehensive Annual maintenance (CAMC) During warranty period is included in supply of Dispenser package, i.e., Sl. No. 1.1.	Nos.	01
1.2.1	Comprehensive Maintenance Charges for 2nd year i.e., after warranty period	Machine Months	12
1.2.2	Comprehensive Maintenance Charges for 3rd year i.e., after warranty period	Machine Months	12
1.2.3	Comprehensive Maintenance Charges for 4th year i.e., after warranty period	Machine Months	12
1.2.4	Comprehensive Maintenance Charges for 5th year i.e., after warranty period	Machine Months	12
1.2.5	Comprehensive Maintenance Charges for 6th year i.e., after warranty period	Machine Months	12
1.2.6	Comprehensive Maintenance Charges for 7th year i.e., after warranty period	Machine Months	12
1.2.7	Comprehensive Maintenance Charges for 8th year i.e., after warranty period	Machine Months	12
1.2.8	Comprehensive Maintenance Charges for 9th year i.e., after warranty period	Machine Months	12
1.2.9	Comprehensive Maintenance Charges for 10th year i.e., after warranty period	Machine Months	12

Note: -

1) The Bidders must ensure that the total price quoted for comprehensive maintenance services for each year during the four-year post-warranty period (excluding GST) is reasonable and proportionate to the total price quoted for supply, erection/installation, testing, and commissioning (exclusive of taxes and duties).

2) The CAMC in this SOR is considered 10 years including one year during warranty period and 9 years post warranty periods.

4. INSPECTION

The inspection shall be carried out by the Owner. However, prior to the witness test at the Vendor's facility, the Vendor shall perform a complete internal inspection of the dispenser. This inspection shall be conducted in accordance with the approved Quality Assurance Plan (QAP) / Inspection and Test Plan (ITP).

All inspection procedures and plans shall be executed by the Vendor before dispatching the equipment to the site. In addition to the Vendor's internal inspection, the Owner's representative will witness the inspection during the factory visit at the Vendor's facility.

5. SPECIAL INSTRUCTIONS TO VENDOR

5.1 Vendor to note that no correspondence shall be entered into or entertained after the bid submission.

5.2 Vendor shall furnish quotation only in case he can supply material strictly as per this Material Requisition and specification/data sheets forming part of Material Requisition.

5.3 If the technical bid contains any deviations or clarifications (if not in line with MR requirements) and does not include complete scope & technical / performance data required to be submitted with the technical bid, in that case the offer shall be liable for rejection and no further deviation shall be accepted after receipt of purchase order.

5.4 The submission of prices by the Vendor shall be construed to mean that he has confirmed compliance with all technical specifications of the corresponding item (s).

5.5 Vendor must submit all documents as listed in checklist along with his offer.

5.6 The Supplier shall deliver a Certificate confirming to BS EN 10204 3.2/3.1 & BS EN 10204 2.1/2.2 stating the quality of materials as wherever is required, the mechanical properties, the chemical analysis, the process of manufacture for SS tubing & other fittings, pressure gauges for complete assembly works.

5.7 All materials shall be delivered to consortium Warehouse / sites of M/s IRMEL detailed addresses will be provided by IRMEL at a time of

requirement of the material.

6. INFORMATION/ DOCUMENTS/ DRAWINGS TO BE SUBMITTED BY SUCCESSFUL VENDOR & DURING BID SUBMISSION.

Successful Vendor shall submit four copies unless noted otherwise, each of the following:

6.1 Piping & Instrumentation Diagram (P&ID) & schematic diagram.

6.2 General arrangements Drawings, Hookup drawings including hoses/pipes & Tubing's connection & specifications.

6.3 Foundation drawings & civil works detailed requirements.

6.4 OEM Datasheets & catalogs for all Instrumentation to be provided by vendors.

6.5 Inspection & test reports for all mandatory tests as per the applicable code as well as test reports for any supplementary tests.

6.6 Material test certificates (physical property, chemical composition, make, heat treatment report, etc.) as applicable for items.

6.7 Statutory test certificates like W&M & PESO approval.

6.8 Filled in Quality Assurance Plan (QAP) for Purchaser's/ Consultant's approval. These QAPs shall be submitted in four copies within 15 days from LOI / FOI.

6.9 Other Drawing & document as specified in vendor data & drawing requirements as with Tender.

6.10 Purchase Orders / Certificate of origin of material of bought out items soon after placement of order.

6.11 Manufacturer's drawings/documents for bought out items, in 4 copies, for Purchaser's / Consultant's approval within 4 weeks.

6.12 Manufacturer related information for design of civil foundation & other matching items within 6 weeks of FOI / LOI.

6.13 All approved drawings / design calculation / maintenance & operating manual documents as well as inspection and test reports for Owner's / Consultants reference / record in nicely category-wise bound volumes (in Hard Copy) and in Soft Copy separately.

6.14 Filled in data sheet for each instrument tag after sizing, range selection, proper selection of materials etc. shall be Vendor's responsibility. Any necessary change required later for meeting the specification shall be done by the vendor without any price or delivery implications.

6.15 Vendor shall provide P&ID drawing, foundation drawing, and tubing specification in line with technical specification.

6.16 Vendor shall provide daily checklist, monthly maintenance checklist, breakdown report format, monthly maintenance format and site acceptance (SAT) test procedure.

6.17 Vendor shall be providing list of special tools and tackles as required during commissioning works at site.

6.18 Vendor shall provide W&M related document like Approval of model for dispenser, Approval of model for mass flowmeter, License of manufacture, License of Dealership, License of Repairing and any other document as required by W&M dept.

6.19 W&M approval Certificates of Mass flow meter during Bid submission.

6.20 Valid CCOE approval certificates of all Ex-electrical equipment's including Mass flow meter Sensor & Transmitter unit, pressure transducer, JB's, cable glands etc. during bid documents.

6.21 Valid CCOE approval certificates of CNG dispenser model/type during submission of bid documents.

7. INSTRUCTION TO VENDOR

7.1 Vendor to furnish filled up documents / formats as per "Special Instruction to Vendors" along with the offer.

7.2 Dispenser (including all components) shall be designed and suitable for Natural Gas as well as CBG (Compressed Bio Gas) and shall comply the technical specification of this document.

7.3 All physical and mechanical testing shall be in accordance with the requirements of connected line pipe.

7.4 Delivery of Dispensers shall be at M/s IRM Energy Limited. Designated storage yard/site and shall be in the Vendor's scope.

7.5 The submission of prices by the Vendor shall be construed to mean that he has confirmed compliance with all technical specifications of the corresponding item(s).

7.6 Purchaser's inspector reserves the right to perform stage wise inspection and witness tests, as indicated in specification of Dispensers / ITP at manufacture's works prior to shipment. Manufacturer shall give reasonable notice of time and shall provide without charge reasonable access and facilities require for inspection to the purchaser's inspector. Inspection and tests performed/witnessed by purchaser's inspector shall in no way relieve the manufacturer's obligation to perform the required inspection and test.

7.7 All drawings, instructions, catalogues, etc. shall be in English language and all dimensions shall be metric units.

8. LIST OF ATTACHMENTS

Sl. No.	Name of Documents	Documents No.
01.	Material Requisition	C261159-00-ME-MR 3001(A)/(B)/(C)
02.	Scope of work– CNG Car, Combo & Bus Dispensers	C261159-00-ME-SOW-3001/(A)/(B)
03.	Comprehensive Annual Maintenance contract (CAMC)	C261159-00-ME-AMC-3001

04.	Data sheet – a. Mass flow meter b. Car Dispenser c. Bus Dispenser d. Combo Dispenser e. Pressure Gauge e. f. Safety relief valves	C261159-00-ME-DS-3001 C261159-00-ME-DS-3002 C261159-00-ME-DS-3003 C261159-00-ME-DS-3004 C261159-00-ME-DS-3005 C261159-00-ME-DS-3006
05.	Technical Specification	C261159-00-ME-TS-3001
06.	Vendor Drawing & Data Requirement	C261159-00-ME-VDDR-3001
07.	Quality Assurance plan- CNG Dispensers	C261159-00-ME-QAP-3001
08.	Approved Vendor List	C261159-00-ME-AVL-3001

ENERGISING QUALITY	**PROJECT NUMBER : VCS-IRMEL- C261159**	IRM Energy

SCOPE OF WORK-CNG/CBG CAR DISPENSERS	Client Job Number	C261159
	Total Sheets	26

DOCUMENT NO	C261159	00	ME	SOW	3001

SUPPLY OF CNG/CBG CAR, DISPENSERS IN THE CGD OF IRM ENERGY LIMITED (IRMEL) IN 4 GA's OF BANASKANTHA, DIU & GIR SOMNATH, FATEHGARH SAHIB & NAMAKKAL & TIRUCHIRAPPALLI.

REV	DATE	DESCRIPTION	PREP	CHK	APPR
C4	23.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C3	05.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C2	30.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C1	22.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB

CONTENTS

1. DEFINITION

Where used in this document, the following terms shall have the meanings indicated below, unless clearly indicated by the context to this order:

PROJECT: CGD PROJECT AT IRMEL

OWNER/COMPANY: IRM ENERGY LIMITED (IRMEL).

CONSULTANT: VCS QUALITY SERVICES PVT. LTD.

MANUFACTURER: THE PARTY WHO MANUFACTURS & SUPPLIES EQUIPMENT & PROVIDES SERVICES TO OWNER OR TO CONTRACTOR.

SOW: SCOPE OF WORK FOR CNG CAR DISPENSER

2. INSTRUCTION TO VENDOR

M/s OWNER has been authorized by PNGRB for setting up infrastructure and operation of City Gas Distribution Project. The dispensers shall be installed at various refueling outlets for dispensing CNG/CBG to all types of Natural Gas Vehicles.

2.1 The dispensing stations shall be spread throughout allotted Geographical Area (GA).

2.2 The specification states the scope of supply and services as completely and clearly as possible. Any additional work/equipment or technical requirement not mentioned in the specification but required as per OWNER to make the offered system complete in accordance with the specification or required for safe operation shall be deemed to be included in the scope of vendor.

2.3 Vendor may contact and obtain clarifications from OWNER, if required, at any stage, before submission of offer.

2.4 The offered dispenser units' model shall have certification for specified flow and accuracy from the Weights & Measurement Department. The certificate(s) shall be in English language or in the language of originating country along with English translation. Bids received without copy of such certificate(s) shall be liable to be considered for rejection. Vendor to arrange for Weights and Measures approval from Indian Authorities. The dispenser model/Type has to be approved by the Indian Weights & Measurement Department.

2.5 Further manufacturing license, dealer of weights & measures, importer (where ever applicable) and license to repair by the Vendor is mandatory at the time of bid due date.

2.6 The offered dispensers for dispensing CNG shall be approved by the Petroleum & Explosive safety organization (PESO), Govt. of India as per PESO latest guidelines. If the vendor is yet to get the dispenser model/Type approved, the vendor shall have to give the model/Type approval as on bid due date.

2.7 The Vendor shall carry out modification required by the statutory bodies either during the approval or during inspection of the installation. All expenses shall be done and borne by the vendor. Unless the above formalities are cleared, supply part would be deemed incomplete.

2.8 The Vendor shall provide civil foundation/ dispenser frame drawings within two weeks of placement of order.

2.9 Any work, which is considered to be unsatisfactory and of poor workmanship shall be rectified by the vendor without any extra cost and time implications.

2.10 The approval from concerned Govt. Bodies in respect of complete installation of a CNG/CBG Dispensing Station shall be obtained by the OWNER. Necessary Information / Data as may be required by Govt. Bodies shall be furnished by vendor to facilitate OWNER in obtaining approval.

2.11 The offered Dispenser shall be suitable for Both design condition of CNG composition and Bio Gas Based CNG/CBG as per compliance requirements to meet the std. as per **IS 16087(latest edition) & IS 15958 (latest edition)**. Accordingly, vendor should consider required seal, gaskets and filtration system to optimize their dispenser unit.

3. DESIGN BASIS

Gas from CNG storage cascade or CNG compressor through priority panel is dispensed to CNG Vehicles like Car, buses via CNG dispenser. The Dispenser shall have Twin Arms, both side arm flow capacity of ≥ 15 kg/min. discharge to empty cylinder under std. atmospheric condition depending upon cylinder residual pressure and cylinder capacity. Pneumatic actuated Ex. Proof solenoid valve (or) 2/2-way Electromagnetic solenoid valve shall be used for flow and pressure controls of Dispenser through Ex. proof electronic controller, which shall be used for such purpose. Each unit to have fully automatic microprocessor based

sequencing of 3 banks storage system connected to dispenser through independent high pressure Stainless Steel (SS) tubes. Dispenser to have pressure control device to restrict fill pressure up to 200 kg/cm2 (g) at maximum allowable filling pressure for natural gas vehicle cylinder as per PESO & other international standard requirements. Pressure control devices to ensure complete shut off of gas flow at the pre-set pressure or Preset price limit or Normal filling cycle with auto cutoff with dead band shift and shut off error within ±2% of range. The preset fill pressure can vary from 150 kg/cm2 (g) to 200 kg/cm2 (g). The pressure control devices to have provision to manually set the pressure between above range as per site requirements.

4. SCOPE OF WORK FOR CNG/CBG CAR DISPENSER

4.1 This document covers the details of supply of CNG/CBG car Dispenser with Dual arm hoses. All works and clauses of this document shall be applicable unless specifically mentioned otherwise.

4.2 This document shall be read in conjunction with Material requisition, Data Sheets, Technical Specifications, Codes & standards, Drawings, and other documents forming a part of the MR Document.

4.3 The Vendor shall Design, detail engineering, manufacture, assemble, perform factory test, supply CNG dispensers including packaging, insurance, handling transportation of Dispenser, load and unload at sites/store, documentation etc. and provide all related services including installation, integration, site acceptance testing, trial run and commissioning, Comprehensive Annual Maintenance Contract (CAMC), commissioning spares, all drawings, documents and licensed software & hardware, converters, cables etc.

4.4 Complete in all respect for project conforming to Technical Specification for CNG Dispenser: **TS. No. C261159-00-ME-TS-3001** enclosed with tender. Each CNG Dispenser shall have following as a minimum:

4.5 Any other required items not covered in dispenser items for safe and accurate operation of Dispenser, however vendor should include in their scope of work to complete the job.

4.6 Any spare required during commissioning shall be in the scope of vendor. If any spare during commissioning borrowed from CAMC spare, It shall be replaced by vendor, at free of cost within short time.

4.7 Supply of complete O&M manual (along with instruments datasheet &

schedule, bill of materials, instrument hook-up diagram, electrical wiring diagram, control logic algorithm, process flowchart, valid & approved certificates & detailed user guide of all bought out items) for each dispenser for easy operation & troubleshooting.

4.8 Supply of all engineering drawings & detailed documents, application program, complete list of error codes, Modbus/pulse communication details with description for programming of all dispenser parameters.

4.9 If dedicated programming unit is required for programming/ parameter change the same shall be submitted in "CD", "Software" along with supply of dispenser. Also detailed hard copy of the same to be submitted.

4.10 Supply of Instrumentation & Electrical items required as per Approved Specification & Make. All Power interconnecting supply cables shall be FRLS type with double compression type of cable glands tested & certified to be used in hazardous area classified as Zone-I/II.

4.11 All equipment's, Ex. Proof JB for dispenser electronics controller and other power supply unit and accessories also to be supplied and erected as per IRMEL requirements. Any other item required for safe and accurate operation of Dispensers shall be in the scope of Vendor.

4.12 The supplier shall provide Onsite training of dispenser regarding operability procedure to client personals if required as per purchaser EIC instructions.

5. SCOPE OF SUPPLY & SERVICES

FOR CAR DISPENSER

5.1 The supply of double arm **CNG car cum Auto dispensers** have specified with following requirements mentioned below: -

5.2 Two CNG flexible electrically conductive twin (fill & vent) hoses, with both hoses fitted with NGV-I for filling of vehicles. Both the hoses shall be suitable to be attached with Fill and vent breakaway coupling connection and Type-2 / 3 fueling nozzles (class-A nozzle) for fast and slow filling of car & other NGV vehicles.

5.3 Nozzle shall be equipped with NGV1 & receptacles complies as per ANSI/CSA NGV1 for car side and complies as per ISO14469 standards. Vendor shall include the supply of 3-way valve for filling & venting of gas at car side.

5.4 Venting of gas on every NGV fueling cycle and SRV venting should be safely vented with min. 3 meters height from working area with suitable fixing arrangement's.

5.5 Two CNG flexible electrically conductive twin (fill & vent) hose, with both hoses fitted with NGV-I nozzle and both the NGV nozzles should be suitable to attached with NZS-5425 nozzles and same NZS-5425 nozzles should be supplied along with CNG car dispensers.

5.1 Vendor shall also include supply of Breakaway Coupling, suitable for NGV Industry, in the hose. Fill Hose shall be 3/8" ID 5000 psi (g), at least 4.0 Mtr. long. & venting shall have done through 1/4" ID hose for maintaining low noise & high gas velocity effects.

5.2 The dispensers shall be designed in such a way that free movement of hoses is possible with appropriate arrangement to maintain that the hose should not touch into the ground level.

5.3 The CNG dispenser hose shall be supplied with spiral guards for protecting the hoses from damage during frequent NGV filling at site.

5.4 Two numbers of Coriolis mass flow meter system with local Display (For Flow & Totalizer Reading).

5.5 For Fast fill of NGV, vendor should provide 3-bank Auto sequencing system for car cum Auto dispenser and same sequencing system should be configured with dispenser controller unit.

5.6 Vendor shall supply electrically conductive fill hose (Fill & Vent) meeting the requirement of NFPA-52 and NGV 4.2.

5.7 Vendor shall demonstrate the function of breakaway coupling during performance test at low pressure condition ≤ 10 bar (g) due to safety concern with proper Safety precautions as if it is required. The dispensers shall be designed in such a way that free movement of hoses is possible, by spring loaded high mast or other arrangements.

5.8 Three rows of liquid crystal backlit display for night viewing showing total sale in Rupees (000000.00), quantity of gas sold in kg (000000.00), unit price of CNG in R.S. /Kg (000.00).

5.9 The display should show previous batch reading even after the power failure.

5.10 For Car dispenser with dual arm hose on either side of the dispenser there should be 4 displays, two on each side of the Car dispenser i.e. CNG sales in Rs. CNG Mass in Kg. and CNG unit price Rs. /Kg.). (May be common for each side, i.e. Total 2 Nos. per dispenser) The whole dispenser microcontroller unit should be with IP - 65 protection. All the displays should be with back cover to make the display free from dust and display cabinet shall have IP 54 protection.

5.11 There is a Provision for Pre-set of Dispenser Electronic meter with (R.s. 500.00) or Gas to be sold in Kg. (i.e. 5 kg) or Normal filling mode without entering R.s or kg. etc. by Manual key-pad display or any other Push buttons. The decimal point required being adjustable through software Program.

5.12 Non-resettable and non-volatile totalizer up to 999999.99 for total CNG sold in Kg with an independent battery backup.

5.13 Emergency stop switch is required on both side of the dispenser. However, the filling on both sides should stop in emergency condition, when any one of the emergency switches is pressed. During activation of emergency switch, the power supply to the dispenser should be available with no filling cycle initiated or stop of CNG filling supply if it is already in running condition.

5.14 Two nos. of liquid filled 4" dia. (0-400 Kg/cm2g) pressure gauges showing the vehicle filling pressure for each filling arm on either sides of the dispenser.

5.15 The pressure gauges should be provided with two units reading i.e. Bar-g & kg-f/cm2g as it is required.

5.16 Two Nos. bubble tight manual shut-off valves to be provided on each side for filling hose.

5.17 Complete Stainless Steel (SS304) outer body of cabinet & Body thickness 1.6 mm with door/panel & Including Interior supports angle & other bracket to selected min. (SS304) as per suitable thickness for proper rigid and smooth fitments work.

5.18 On-site support during stamping activity from local W&M department of CNG Dispensers shall be in scope of Vendor prior to commencement of commercial

sale.

5.19 If any other incident/problem occurs during the warranty period which needs breaking of W&M seal, then Vendor will pay W&M charges and coordinate with W&M department for further re-stamping.

5.20 Compressed Natural Gas(CNG) operated Ex-proof solenoid controls 2/2 electromagnetic valve for Dispenser fueling control (or) Pneumatic operated actuator Ex-proof electronically controlled solenoid through microcontroller programmed based system for switching the transducers, flow and fueling philosophy control to meet the desired target fill pressure based on preset parameters. Instruments Air required for pneumatic operation of Ex-Proof Solenoid Valve suitable for Dispensers has to be provided by the Client at Dispenser end at a pressure of 7 to 9 kg/cm2g.

All Ex-proof electronically controlled solenoid valves are subject to comply with Pressure Equipment Directive (PED) and the Explosion Protection Directive (ATEX) and CCOE approved.

5.21 The end connection for instruments airline will be ¼" OD with SS316/SS316L MOC. Further tubing with necessary pressure reduction (if required), one pressure gauge with isolation valve for monitoring of inlet pressure of instruments airline shall be provided by the Vendor.

5.22 The Dispensers shall be supplied as complete package including all required auxiliary equipment for efficient & safe operation as a whole. Vendor shall be responsible for furnishing all electrical, instrumentation, inter connecting Piping & Safety Items as required to make the Dispensers complete.

5.23 Hose crimp should be provided with protective sleeve.

5.24 Hose crimp should be of SS and have protection sleeve over it to avoid short circuit with battery terminals.

5.25 It is not the intent of Purchaser to specify every piece of required equipment / item but nevertheless any item not specifically mentioned but required as per Good Engineering Practice and for the safe & trouble-free operation of the dispensers deemed to have been specified & shall be in the scope of Vendor without any additional implication in the price or schedule.

5.26 For Dispenser & Both Mass Flow meters, obtaining statutory approvals from

the country of origin as well from India is in Vendor's scope. The offered Dispenser / Mass flow meters model used for measurement of CNG/CBG must be certified by the Weights and Measures or any other statutory authority from the country of origin. The Vendor shall also get the offered Dispenser model certified by the Weights and Measures; India (Ministry of Consumer affairs) complied with latest Legal metrology act.

5.27 The offered Dispenser model must also be approved by the Chief Controller of Explosive (CCOE) Nagpur now PESO (Petroleum and Safety Organization) and the Vendor shall submit the all the corresponding certificates along with the offer.

5.28 Any model certified by W & M India as on date offered by the Vendor for supply will be, the responsibility of the vendor. Model approval certification from local W&M / revalidation of model approval throughout the life span of dispenser will be done by IRMEL but vendor on-site support if required by Owner. Undertaking has to be furnished with the bid covering acceptance of this requirement.

5.29 The CNG Dispenser manufacturer must have valid PESO Certificate for the CNG Dispensers approved Model considered for supply under this bid & same has to be furnished along with the bid.

5.30 The CNG Dispenser manufacturer must have valid Model approval from Legal Metrology Department (W&M) of the CNG Dispensers Model considered for supply under this bid & same has to be furnished along with the bid.

5.1 The CNG Dispenser Manufacturer shall provide complete General arrangement drawing and indicative P&ID along with technical bid. If any modifications will be required in the drawings/documents, Vendor will have to incorporate the same suggested by IRMEL.

5.2 Vendor shall note that the calibration of Dispensers at manufacture's works will be done only with Master calibrator certified by statutory authority (valid certification from W&M India and FCRI/ NABL accredited lab for the accuracy better than the Dispenser) .Vendor has to furnish all the valid calibration reports during Inspection & FAT.

5.31 All spares & consumables required during commissioning shall be in the scope of Vendor. The list of such spares shall be furnished at the time of detail engineering.

5.32 The Vendor shall note that the calibration of the Dispenser Instruments, Mass Flow Meter / Electronics, other major items shall be valid at the time of commissioning. Due to any reason if the validity of the calibration (to be considered one year from the last calibration date, if not indicated) expired, then Vendor shall arrange / complete the calibration before commissioning. The Performance Guarantee test shall be conducted positively within two months of commissioning. Vendor has to provide all the necessary arrangements including technical man-power for PG test.

5.33 The Vendor shall ensure to provide necessary supports and input for client's SCADA (Supervisory Control and Data Acquisition) system and provide all data (Analog, Digital, Alarms, Set points etc.) register address details, error codes, & protocol for automation / SCADA integrations.

5.34 The CNG/CBG specification should meet the ISO 15403:2000 (E) or IS: 15958, IS:16087 natural gas quality designation for use as a compressed fuel for vehicles.

5.35 Coalescent and particulate filter of Grade 6 or better to be provided at inlet of each bank supply line with manual drain valve to ensure that the oil carryover in the CNG being filled to vehicle is < 5 ppm and particulate size is < 2 Micron. Filter housing for said filter must be capable for collection of oil for a minimum drain interval of 24 Hrs. with oil carryover < 5 ppm.

5.36 Filter elements made of paper shall strictly not be accepted. Vendor shall provide appropriately plugged drain valve outside the dispenser housing with suitable arrangement to collect the drained oil. Filter size shall be in accordance with max/min. flow through the dispenser. Filtration efficiency shall not be less than 99.99%. Vendor shall provide liquid filled DP (differential pressure) gauges across all the banks of inlet filters for observing the pressure drop on each filters units.

5.37 Vendor shall ensure that the system is designed in such a way that any gas if passes, should be recorded by mass flow meter and there should not be any possibility of unmetered gas supply through dispenser in case of malfunctioning of solenoid valves. Any unmetered gas passed shall be recorded in the dispenser microcontroller & it will be retrievable as and when required. Vendor shall also provide surge protection device of approved make at 230 V AC power inlet to protect the dispenser from any electrical surge/spike to safeguard all the installed devices & components.

5.38 All spare required during pre-commissioning shall be in the scope of vendor.

5.39 Vendor shall make a provision to change the price of CNG through the keypad inside the dispenser unit that shall be covered with security lock. It shall also be possible to change the price from remote station (from SCADA/ from any part of the city). RS 485 port shall also be provided for price change. In case standard RS485 port is not available in the dispenser, then RS232C to RS485 convertor with all relevant hardware and software to be provided by vendor.

5.40 Vendor will design microcontroller program in such a way that it should keep all the previous records of CNG Rate change done with precise date & time.

5.41 RS 485 serial port shall be provided for downloading the CNG sale data with the help of Purchaser's Personal Computer for each shift (8 hours' interval). Suitable software with license (if required) shall be provided to obtain the same for each shift (8 hours' interval).

5.42 Vendor shall provide a common processor and open communication protocol/ RS 485 port for RTU to transfer all the dispenser data to central SCADA system.

5.43 Vendor must note that non-standard/ propriety type communication protocol in dispenser for communication with RTU will not be acceptable. Protocol must be standard & universally accepted as specified above or any standard protocol with compatible convertor. Also, it shall be made available and must be compatible to communicate with any make of RTU. RTU will have provision of Serial communication RS 485 port /Ethernet TCP/IP communication with RJ45 port to interface with dispenser.

5.44 Vendor is responsible to provide the communication port compatibility with RTU. Vendor is required to carry the communication port functional test and display all the values in Lap top or in applicable device during dispenser inspection (FAT) at vendor premises. Also, functional test shall be carried out by vendor after installation and communication establishment with OWNER's SCADA. Vendor shall also share the dispenser protocol/RS485 details with OWNER during FAT at vendors works and all submit relevant documents in desired format (both hardware/ software).

5.45 Vendor must furnish/share the details of implemented MODBUS/RS485 protocol for all function codes read, write & slave Id, list of signals to be

transferred, Baud Rate, signal communication for Modbus communication, CRC implementation, register addressing methods/mapping etc. with M/s owner and provide their assistance during interfacing with RTU to automation vendor. Vendor must provide information about looping details and number of dispensers connected in one loop.

5.46 Owner shall loop (multi drop) all the dispensers in common junction box per station in the safe area. Supply of Communication Cables, cable glands, termination of cable within the dispenser are under vendor scope. However, cable laying from dispenser JB to power distribution board(PDB) is under owner scope. Supply of standard make, WP IP 65 junction boxes, terminal blocks and installation of junction box shall be is in dispenser Vendor's scope.

5.47 During installation & commissioning of dispenser same will be checked by OWNER's Engineer.

5.48 Supply of communication cable will be supplied, installed & terminated by OWNER.

5.49 Vendor must share junction box termination details with OWNER. Owner shall Loop all the dispensers in junction box and looping shall be ring type or re-loop so that is case of communication break or physical loop break then only faulty dispenser should isolate, all others dispensers remain connected and continue to report.

5.50 Vendor must configure the CNG dispenser controller in such way that all error code message should be displayed for easy communication with wire break failures and other breakdown to be easily identified against CNG dispenser breakdown during dispenser in operational stage.

5.51 The K-Factor adjustment port /switch should be exclusively dedicated without any additional functionalities and parameter controls. If any incident/problem occurs during the warranty period and CAMC period, which needs breaking of W&M seal, W&M charges for re-stamping, will be recovered from CAMC charges.

5.52 Vendor must submit the following documents within 2 weeks of placement of LOI/ PO for review and approval of OWNER:

5.53 Detailed project schedule giving all activities such as Design and review, Major bought out items (such as Mass flow meter, electronics, Valves, Hoses

etc.), Sub-assemblies, Stage inspection, Final Assembly, Final factory testing of dispensers, Final inspection, dispatch etc.

5.54 Process and instruments diagram (P&ID) of gas flow giving Bill of Material. The Bill of Material shall clearly indicate all items, quantity of all items installed per dispenser, make and part number etc.

5.55 Certification from Weights and Measures department, PESO Department or other statutory authorities of the country of origin for offered model dispenser for specified flow and accuracy.

5.56 All spares required during CAMC (Operations & Maintenance) are in the Vendor's Scope. The Vendor shall submit the list of critical spares which are to be stored necessarily in the Vendor's store during CAMC.

5.57 One number of three banks configuration electronic software with additional bank provision along with controller including hardware for car dispenser.

5.58 Vendor has to supply the dispensers with solenoid operated valve made of ANSI 316 SS, for ON-OFF control of flow, on the gas inlet with 1/2" tube OD end connection for car filling with 1/2'' inlet isolation ball valve arrangements on each bank for both side Car dispensers to achieve the required flow rate on each arm. Valves shall be provided for each bank per hose separately.

5.59 Vendor to ensure the system design in such a way that any gas if passes, should be recorded by dispenser and there should not be any possibility of unmetered gas supply through dispenser in case of Malfunctioning of solenoid valves.

5.60 The vendor is required to design the inlet filter for the car dispenser with a primary focus on optimizing the filling process for the car dispenser. This is to ensure the achievement of the required flow rate and fast filling efficiency for both the car /auto filling arms simultaneously. Accordingly, the vendor should select inlet filter with higher rated flow capacity suitable for car filling while still ensuring effective operation for car fueling.

5.61 The gas tubing inside the dispensers shall be seamless SS 316, fully annealed (bright annealed), conforming to ASTM A 269. The tubing shall have a maximum hardness of RB 80 or less and be suitable for bending and flaring. The tubes shall be available in ½" OD, with corresponding 1/2" SS 2-way ball valves at the line filter inlet. The end connections shall be provided with

reducer to be consider from ¾'' to ½'' connection for Car side. Other than that Any open ends on fittings and vents shall be provided with caps or dust plugs.

5.62 Supply of Detailed manual for list of error codes with description for programming of all parameters of the dispenser.

5.63 Dispenser tubing work shall be properly arranged with flow direction of gas, banking details, Side of dispenser, Standard operation procedure, on-off indication, ESD labelling & other display label printing as per mentioned in technical documents. All instrumentation Serial numbers & calibration Tag list to be mentioned and shared with IRMEL EIC for easy traceability.

5.64 Tubing & other devices arranged in such a way that they can be properly accessed for operation & maintenance work during operational stage.

Type of Dispenser	Type of flow	Flow Rate kg/min	Target Fill pressure (kg/cm2g)	Fill & Vent hose/ Dispenser
Car-Cum-Auto Dispenser	**Car-** Low/Med/High	Min-0.1 Normal-7.5 Max-15	200 kg-f/cm2g	For Car Side- Fill-3/8'' ID Vent-1/4'' ID

6. DESIGN & ENGINEERING SCOPE FOR CNG CAR DISPENSER: -

a) Design & Detailed Engineering
b) Manufacturing & Assembling
c) Procurement from Sub-Vendors
d) Inspection & Testing at Works (TPI will be arrange by OWNER).
e) Documentation and obtaining statutory approvals as per specification.
f) Packing, Forwarding and Transportation up to Job Sites/ Client's stores.
g) Testing and commissioning, trial run etc.
h) Calibration of the Mass Flow Meter of the supplied dispensers by Master Meter before commencement of performance test.
i) CAMC after site installation of each Dispenser, individually.
j) The sites/station shall be at CGD of IRMEL GA. The Vendor shall be responsible for supply of dispenser at client stores/sites depending upon the availability of sites. The Transportation from client stores to respective sites for erection, installation, testing & commissioning shall be in Vendor's scope.

EXCLUSION

Civil Foundation & Trenches for pipes / Tubes, Instruments air for Dispenser,

cable laying from dispenser to Power distribution board & Erection of Dispenser will be done by another contractor. However, Vendor shall provide Dispenser Foundation Design & drawing details during detail Engineering.

7. SAFETY

All Electrical devices shall meet the requirement for the area classification specified elsewhere in tender document. Tubing & other devices shall be so arranged that there is proper access for operation & maintenance.

8. AS BUILT DOCUMENTS

On successful completion of hydrostatic testing and Factory test by TPIA, the Vendor shall prepare As Built drawings & reports of entire Dispenser package as specified in scope of work. All "As Built" drawings / reports shall be submitted as below.

Two sets of hard copies & 1 set of soft copies through E-mail of following documents shall be submitted by Vendor. All documents shall be bounder together:

i) As-built drawing of Dispenser package GAD / Fabrication Drawing / P&ID etc.

j) Test Reports/Results/Records In addition, the above documents shall also be submitted in electronic media i.e. CD drive/Pen drive.

k) Test Reports/Results/Records MS Word/Excel (MS Office)

l) Drawings AutoCAD

m) Mod-scan data, I/O list, cable schedule, O&M manual, operational philosophy & testing procedure.

If any other document/drawing/data corresponding to Dispenser will be required then Vendor will submit it as suggested by OWNER.

If any changes/modifications in any document/drawing/data corresponding to Dispenser will be required then Vendor will submit modified/updated document as suggested by OWNER on priority.

9. CHECK-LIST FOR SCOPE OF SUPPLY

a) Vendor shall furnish all the equipment of Dispenser System instruments and gauges and safety devices as per the enquiry document. Anything required over the above what is specified, for safe and satisfactory operation of the equipment package shall be included by the Vendor in his scope.

b) 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 is reply is 'NO', Vendor should give reason for the same:

c) Vendor's scope of supply shall include but not limited to be following:

Sl. 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 line filter and elements on each bank with individual needle valve for oil drain.	YES		
1.3	Certificate of "Weights & Measures" approval for Dispenser & Mass Flow Meters & mater meter.	YES		
1.4	Certificate of "CCOE" / PESO approval for Dispenser & Mass Flow Meters & master meter (as applicable).	YES		
1.5	Certificate by Weights and Measures or the other statutory authorities of the country of origin is Provided.	YES		
1.6	Fast fill sequence type Low, Med & High and along with electronic display	YES		
1.7	Dispenser with Tamper-Proof Locking arrangement	YES		
1.8	Cabinet suitable to accommodate all valves, fitting both flow meters and all required electronic equipment	YES		
1.9	Front/Side mounted Nozzles with lockable holder and safety lever/latch to firmly hold when	YES		

	not in use			
1.10	Separate non-resettable straight forward reading Totalizers per side.	YES		
1.11	Liquid filled Pressure Dial gauges of 4"size (Min) per side.	YES		
1.12	ESD buttons mounted on both side of the dispenser or front panel.	YES		
1.13	One set of Isolation Valve complete with venting line valve and end plug installed on the inlet of the inlet steel pipes of dispenser.	YES		
1.14	Certificate by Weights and Measures or from the other statutory authorities of the country of origin is Provided.			
1.15	All electrical equipment and Instrumentation wiring are provided with Certificate of Area Classification.			
1.16	Dispenser automatically and immediately shut off CNG supply to each fill hose individually in case of -Power failure, Failure of metering, Low flow, Failure of Totalizer, Overfill, pressure transducer failure etc.	YES		
1.17	Overall CV is indicated of dispenser from inlet of the dispenser up to outlet probe including mass flow meter, interconnecting tubing, valves, hoses, nozzles etc.,	YES		

1.18	Dispenser is shipped in fully wired and assembled condition only gas supply connection, Instrument Air supply connection and power supply connection shall be made at site.	YES		
1.19	Warranty for a period of 12 months is provided from the date of final site acceptance at CNG facilities by the Company's Engineer In-Charge.	YES		
2.0	**Spares**			
2.1	All necessary Spares and consumables during warranty & CAMC period are in the scope of supplier.	YES		
3.0	**Inspection & Testing**			
3.1	As specified on the datasheets and Technical Specifications	YES		
4.0	**Vendor Data and drawings**			
4.1	All data & drawings as required per VDR format	YES		
5.0	**Erection, commissioning, and trial runs at site of the Dispenser**	YES		
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 the proposal)	YES		
6.0	**Technical parameters to be confirmed by Vendor**			
6.1	Inlet Pressure Kg/cm2(g) -255	YES		
6.2	Target Fill Pressure Kg/cm2(g) -200	YES		

6.3	Operating Temperature range –[-10°C to 70°C]	YES		
6.4	Electrical Supply Single Phase AC, 230V±} 10%, 50Hz±} 2%.	YES		
6.5	**Fill Nozzle CAR**: NGV-1 for car side arm, along with supply of NZS 5425 with adaptor for car dispenser	YES		
6.6	Fill hose pressure rating – Working pressure 5000 PSIG	YES		
6.7	**Sequential filling-** Three bank for Car Dispenser.	YES		
6.8	Temperature compensation – 200 kg/cm2 (g) equivalent at 15°C	YES		
6.9	Breakaway couplings for Fill and Vent Hoses for All type CNG Dispenser	YES		
6.10	Principle of mass metering – 2 nos. Coriolis Mass Flow Meters (for Side A & B)	YES		
6.11	Flow meters Coriolis type Model with integral display – For each side of CNG dispenser	YES		Vendor to confirm the model
6.12	Min. Flow rate – CAR: 0.1 kg/min Normal Flow Rate-7.5 kg/min. & Max. flow rate ≥ 15 Kg/min.	YES		
6.13	Batch delivery accuracy - ± 1.5% of batch	YES		
6.14	Mass flow accuracy for gas meter - ± 0.5% (inclusive of sis & linearity, hysteresis & repeatability errors	YES		
6.15	Calibration traceability - To NIST as per ISO 5168	YES		
6.16	Repeatability - ±} 0.3 %	YES		
6.17	Enclosure weatherproofs to - IP55, NEMA-4x	YES		

6.18	Pressure rating of Wetted parts - 5000 psi(g) At 25°C as per ASME/ANSI B 31.3	YES		
6.19	Process Temperature effect - ±} 0.01% of nominal flow	YES		
6.20	Surge and frequency Transient - Shall be in compliance with ANSI/EEE(EFT)c 62.41(1991)/ IEC std.	YES		
6.21	EMI effect on sensor and Transmitter - To the requirement of EMC directive	YES		
6.22	Vibration effect - As per SAMA PMC std./ as per IEC limit range	YES		

10. SCOPE OF WORK FOR COMPREHENSIVE ANNUAL MAINTENANCE

10.1 General:

10.1.1 This contract covers the provision of services to undertake the Comprehensive Maintenance as per Company schedule and Breakdown repair of CNG dispensers as & when complaints are received at CNG control room. For the purpose of clarity, the agency providing maintenance services for above dispensers shall, herein after be referred to as "Contractor" and the company hiring the services of the agency will, herein after be referred to as "Company" (IRM ENERGY LIMITED (IRMEL).)

10.1.2 "Comprehensive Maintenance refers to preventive maintenance of equipment as per schedule which includes breakdown, equipment spare parts replacement, engineering and labor charges."

10.2 Preventive Maintenance:

To carry out the Preventive & Breakdown maintenance of dispensers strictly in accordance with the schedule provided by Company / OEM Manual. The Contractor shall confirm to Company their availability to carry out the Maintenance in advance.

The spares required for carrying out preventive maintenance shall be in the scope of Contractor. The contractor personnel shall inform the exact time to the EIC before and after carrying out the maintenance.

The Contractor shall ensure all required consumables such as cotton waste, cleaning solvent, insulation tapes, thinner, soap solution, Teflon tape etc. including required tools & tackles, are available on site. Supply of all consumables, tools & tackles etc. is in the scope of Contractor. Tools shall include all type of mechanical & electrical tools, multi meters, instruments, Laptop with required software (Pro-link etc.) etc.

Contractor shall note down the dispenser performance before and after carrying out the maintenance. Contractor to submit report of Percentage difference between Mass Flow Meter and Non-rest-table Totalizer on fortnight or Monthly basis as per order of EIC. Later on after continuous operation, if calibration of installed Mass Flow Meter will be required. Same should be perform by Contractor at site with the help of laptop and suitable software.

Only in case of lab calibration, if established by Contractor in front of IRM Energy Limited Site in charge through proving exercise by Standard Master Calibration Device, During CAMC Contractor will be entitled to send the Mass Flow Meter, PG, PT, safety relief valve for calibration at its own cost.

Preventive maintenance will be carried out on Monthly basis during non-peak hours in consultation with EIC. Any maintenance that needs to be taken up shall be well planned in advance with due approval of EIC.

The contractor shall produce the compliance report of each maintenance activity on the next Working day to the Engineer - In – Charge in soft & Hard Copy both. Compliance report shall be descriptive in nature. Provide proper communication facilities to all contractor personnel such as engineers, Technicians etc.

The contractor shall inform the Company, names and mobile numbers of all the service personnel who will be deployed for providing the services during the CAMC. An alternate number will also be informed to the company, which can be contacted in case all service personnel's mobile are not reachable. Changes, if any, will be notified to the company.

The contractor shall produce Escalation Matrix for Preventive Maintenance from service person up to Contractor's authorized person for all the maintenance activities of all the dispensers to the Company.

Contractor's authorized person will be liable to monitor that all the maintenance activities performed in satisfactory manner at Company's all sites

& in all dispensers.

If any type of issues will be raised by Company's engineer in-charge to Contractor's authorized person via telephonic/e-mail communication, then it will be immediately taken into count by the contractor & issue will be incorporated within mean time.

10.3 Break down Repair:

On receiving information from the CNG control room/Dealer, contractor shall ensure that his team reaches the concerned retail outlet. Attend to dispenser breakdown service calls on 24X7 basis. The service personnel will report to the call site within 2 hours from the time of receiving service call in M/s IRM Energy Limited site or at whatever site dispensers are installed, (Prior Information will be provided for location of installation of Dispensers).

Before proceeding to the outlet, the contractor personnel shall collect all necessary spares required for the repair depending on the nature of the complaints received. Upon reaching the retail outlet, the contractor personnel shall contact the CNG Control room to advise his attendance on site and confirm the breakdown reporting.

The contractor shall coordinate with the Company representative for instructions on undertaking the repair work. After solving the complaint, the contractor shall inform CNG control room. Provide proper communication facilities to all contractor personnel such as engineers, technicians etc., Maintain records of the services provided, and submit the same to the company, once in a Month.

10.4 Reports to be submitted

10.4.1.1 Reports (in soft copy and print form) of individual equipment as and when the dispensers are undertaken for preventive maintenance/break down/on complaint service. Report shall be descriptive in nature including nature and quantity of material used or repaired.

10.4.1.2 Monthly cumulative list on preventive maintenance/breakdown repair/ on complaint service of dispensers carried out with actual date and time of service.

10.4.1.3 Monthly cumulative list on consumption of spares in each dispenser consumed during preventive maintenance/breakdown repair/ on complaint service attend. Separate analysis report on breakdown if anything occurred which needs special attention.

10.4.1.4 Report of Percentage difference between Mass Flow Meter and Non-Resettable Totalizer as per guaranteed parameter declared at the time of supply.

10.5 Breakdown Penalty

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

10.5.1 Penalty for 1-hour delay (After 1 Hours from complaint notification time) in reaching at all site (e.g., within 2 hours instead of 1 hours) – Rs 200/- per hour arm per dispenser.

10.5.2 If the shutdown time, which will be calculated from the complaint notification time, is extended beyond 4 hours, a penalty of Rs 500/- per hour (After 4 Hours) will be applicable.

10.5.3 Contractor shall not deploy the employee of age less than 18 years in any of the activities. If it is found, then it will be viewed seriously and heavy penalty of Rs. 20000/-per instance and also the termination/blacklist will be done from our approved vendor list.

10.5.4 The contractor shall provide full Personal Protective Equipment (PPE) to each individual employee as per Job requirement & instruction of IRMEL. It is mandatory for all personnel to wear said PPE whilst performing their duties, failing which a penalty @ Rs. 500/- per incidence will be levied in addition to dismissal of the person.

10.6 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.

10.7 The penalty clause and maintenance charges will come into force immediately after successful commissioning & sales commencement as defined in the tender.

10.7.1.1 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.

10.7.1.2 Vendor has to maintain all spares / consumables required for uninterrupted operations of at least 06 months for each Dispenser Unit.

10.7.1.3 The Contractor/vendor has to provide scheduled maintenance details and list of normal Operation spares required for operation & maintenance along with bid as per mentioned in **Annexure -1A**. The

Vendor should maintain sufficient spares for breakdown & scheduled maintenance. OWNER can check/ audit spare Stock and vendor has to ensure availability of required spares as per list*. *The provided list is only indicative. Vendor has to maintain all spares / consumables required for uninterrupted operations of at least 06 months for each Dispenser Unit.

ANNEXURE-1A

- The contractor has to maintain following minimum spares of each GA location.
- The list is indicative only; actual list of items and qty. may be depending upon site usage and OEM recommendation/IRMEL requirement.

Sl. no.	Full Description	Base Stock Qty./10 Dispenser unit (Nos.)
01	2 way ball valve seal Kit	2 Nos.
02	Start Push-Button	2 Nos.
03	STOP Push-Button	2 Nos.
04	Battery for Dispenser	1 Nos.
05	Three Way Ball Valve	1 Nos.
06	¼" Vent Tube	2 Nos.
07	2 way Teflon sheet	2 Nos.
08	3 way Ball Valve Probe	2 Nos.
09	Keypad Display	1 Nos.
10	Keypad controller	1 Nos.
11	3 way ball valve seal Kit	01 set

12	Solenoid valve / Actuated ball valve along with seal kit-For Combo dispenser	02 nos.
13	NGV to NZS probe/nozzle	02 nos.
14	NZS O-ring and other seal kit	02 set
15	Long Hose (4.5 Mtr.)	01 set
16	Short Hose (1.8 Mtr.)	01 set
17	Breakaway coupling – (Fill & Vent)	02 nos.
18	Mother Board / microcontroller unit	01 nos.
19	Power supply unit	01 nos.
20	Fuse card	02 set
21	Line Filter O-ring	05 set
22	Filter Element	02 nos.
23	SRV	1 Nos.

ENERGISING QUALITY	**PROJECT NUMBER : VCS-IRMEL-C261159**	IRM Energy

SCOPE OF WORK-CNG/CBG COMBO DISPENSERS	Client Job Number	C261159
	Total Sheets	27

DOCUMENT NO	C261159	00	ME	SOW	3001-A

SUPPLY OF CNG/CBG COMBO DISPENSERS IN THE CGD OF IRM ENERGY LIMITED (IRMEL) IN 4 GA's OF BANASKANTHA, DIU & GIR SOMNATH, FATEHGARH SAHIB & NAMAKKAL & TIRUCHIRAPPALLI.

REV	DATE	DESCRIPTION	PREP	CHK	APPR
C4	23.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C3	05.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C2	30.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C1	22.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB

CONTENTS

1. DEFINITION

Where used in this document, the following terms shall have the meanings indicated below, unless clearly indicated by the context to this order:

PROJECT: CGD PROJECT AT IRMEL

OWNER/COMPANY: IRM ENERGY LIMITED (IRMEL).

CONSULTANT: VCS QUALITY SERVICES PVT. LTD.

MANUFACTURER: THE PARTY WHO MANUFACTURS & SUPPLIES EQUIPMENT & PROVIDES SERVICES TO OWNER OR TO CONTRACTOR.

SOW: SCOPE OF WORK FOR COMBO DISPENSER

2. INSTRUCTION TO VENDOR

M/s OWNER has been authorized by PNGRB for setting up infrastructure and operation of City Gas Distribution Project. The dispensers shall be installed at various refueling outlets for dispensing CNG to all types of Natural Gas Vehicles.

2.1 The dispensing stations shall be spread throughout allotted Geographical Area (GA).

2.2 The specification states the scope of supply and services as completely and clearly as possible. Any additional work/equipment or technical requirement not mentioned in the specification but required to make the offered system complete in accordance with the specification or required for safe operation shall be deemed to be included in the scope of vendor.

2.3 Vendor may contact and obtain clarification from OWNER, if required, at any stage, before submission of the offer.

2.4 The offered dispenser units' model shall have certification for specified flow and accuracy from the Weights & Measurement Department. The certificate(s) shall be in English language or in the language of originating country along with English translation. Bids received without copy of such certificate(s) shall be liable to be considered for rejection. Vendor to arrange for Weights and Measures approval from Indian Authorities. The dispenser model/Type has to be approved by the Indian Weights & Measurement

Department.

2.5 Further manufacturing license, dealer of weights & measures, importer (where ever applicable) and license to repair by the Vendor is mandatory at the time of bid due date.

2.6 The offered dispensers for dispensing CNG shall be approved by the Petroleum & Explosive safety organization (PESO), Govt. of India as per PESO latest guidelines. If the vendor is yet to get the dispenser model/Type approved, the vendor shall have to give the model/Type approval as on bid due date.

2.7 The Vendor shall carry out modification required by the statutory bodies either during the approval or during inspection of the installation. All expenses shall be done and borne by the vendor. Unless the above formalities are cleared, supply part would be deemed incomplete.

2.8 The Vendor shall provide civil foundation/ dispenser frame drawings within two weeks of placement of order.

2.9 Any work, which is considered to be unsatisfactory and of poor workmanship shall be rectified by the vendor without any extra cost and time implications.

2.10 The approval from concerned Govt. Bodies in respect of complete installation of a CNG/CBG Dispensing Station shall be obtained by the OWNER. Necessary Information / Data as may be required by Govt. Bodies shall be furnished by vendor to facilitate OWNER in obtaining approval.

2.11 The offered Dispenser shall be suitable for Both design condition of CNG composition and Bio Gas Based CNG (CBG) as per compliance requirements to meet the std. as **per IS 16087(latest edition) & IS 15958 (latest edition).** Accordingly, vendor should consider required seal, gaskets and filtration system to optimize their dispenser unit.

3. DESIGN BASIS

Gas from CNG storage cascade or CNG compressor through priority panel is dispensed to CNG Vehicles like Car, buses via CNG dispenser. The Car cum Bus Combo Dispenser shall have Twin Arms, on side arm flow capacity of ≥ 15 kg/min. depending on cylinder residual pressure and cylinder capacity & on Bus Side Arm flow capacity of ≥ 75 kg/min. discharge to empty cylinder under std. atmospheric condition. Pneumatic actuated Ex. Proof solenoid valve (or) 2/2-way Electromagnetic solenoid valve shall be used for flow and pressure

controls of Dispenser through Ex. proof electronic controller, which shall be used for such purpose. Each unit to have fully automatic microprocessor based sequencing of 3 banks storage system connected to dispenser through independent high pressure Stainless Steel (SS) tubes. Dispenser have to pressure control devices to restrict fill pressure up to 200 kg/cm2 (g) at maximum allowable filling pressure for natural gas vehicle cylinder as per PESO & other international standard requirements. Pressure control devices to ensure complete shut off of gas flow at the pre-set pressure or Preset price limit or Normal filling cycle with auto cutoff with dead band shift and shut off error within ±2% of range. The preset fill pressure can vary from 150 kg/cm2g to 200 kg/cm2 (g). The pressure control device to have provision to manually set the pressure between above range as per site requirements.

4. SCOPE OF WORK FOR CNG COMBO DISPENSER

4.1 This document covers the details of supply of CNG/CBG Combo Dispenser with Dual Arm hoses configuration for both Car and Bus dispenser filling provision. All works and clauses of this document shall be applicable unless specifically mentioned otherwise.

4.2 This document shall be read in conjunction with Material requisition, Data Sheets, Technical Specifications, Codes & standards, Drawings, and other documents forming a part of the MR Document.

4.3 The Vendor shall Design, detail engineering, manufacture , assemble, perform factory test, supply CNG dispensers including packaging, insurance, handling transportation of Dispenser, load and unload at sites/store, documentation etc. and provide all related services including installation, integration, site acceptance testing, trial run and commissioning, Comprehensive Annual Maintenance Contract (CAMC), commissioning spares, all drawings, documents and licensed software & hardware, converters, cables etc.

4.4 The Vendor shall Design, detail engineering, manufacture, assemble, perform factory test, supply CNG dispensers including packaging, insurance, handling transportation of Dispenser, load and unload at sites/store, documentation etc. and provide all related services including installation, integration, site acceptance testing, trial run and commissioning, Comprehensive Annual Maintenance Contract (CAMC), commissioning spares, all drawings, documents and licensed software & hardware, converters, cables etc.

4.5 Complete in all respect for project conforming to Technical Specification for

CNG Dispenser: **TS. No. C261159-00-ME-TS-3001** enclosed with tender. Each CNG Dispenser shall have following as a minimum:

4.6 Any other required items not covered in dispenser items for safe and accurate operation of Dispenser, however vendor should include in their scope of work to complete the job.

4.7 Any spare required during commissioning shall be in the scope of vendor. If any spare during commissioning borrowed from CAMC spare, It shall be replaced by vendor, at free of cost within short time.

4.8 Supply of complete O&M manual (along with instruments datasheet & schedule, bill of materials, instrument hook-up diagram, electrical wiring diagram, control logic algorithm, process flowchart, valid & approved certificates & detailed user guide of all bought out items) for each dispenser for easy operation & troubleshooting.

4.9 Supply of all engineering drawings & detailed documents, application program, complete list of error codes, Modbus/pulse communication details with description for programming of All dispenser parameters.

4.10 If dedicated programming unit is required for programming/ parameter change, the same shall be submitted in "CD", "Software" along with supply of dispenser. Also detailed hard copy of the same to be submitted.

4.11 Supply of Instrumentation & Electrical items required as per Approved Specification & Make. All Power interconnecting supply cables shall be FRLS type with double compression type of cable glands tested & certified to be used in hazardous area classified as Zone-I/II.

4.12 All equipment's, Ex. Proof JB for dispenser electronics controller and other power supply unit and accessories also to be supplied and erected as per IRMEL requirements. Any other item required for safe and accurate operation of Dispensers shall be in the scope of Vendor.

4.13 The supplier shall provide Onsite training of dispenser regarding operability procedure to client personals if required as per purchaser EIC instructions.

5. SCOPE OF SUPPLY & SERVICES

FOR COMBO DISPENSER

5.1 The supply of double arm **CNG car cum bus dispensers** have specified with following requirements mentioned below: -

For Car End: -

5.2 One CNG flexible electrically conductive twin (fill & vent) hoses, with both hoses fitted with NGV-I for filling of vehicles. Both the hoses shall be suitable to be attached with Fill and vent breakaway connection and Type-2/3 fueling nozzles (class-A nozzle) for fast and slow filling of car & other NGV vehicles & nozzle shall be equipped with NGV1 & receptacles complies as per ANSI/CSA NGV1 for car side and complies as per ISO14469 standards.

5.3 Vendor shall include the supply of 3-way ball valve for filling & venting of gas at car side. Vendor shall also include supply of Breakaway Coupling, suitable for NGV Industry, in the hose. Fill Hose shall be 3/8" ID 5000 psi (g), at least 4.0 Mtr. long. & venting shall have done through 1/4'' ID hose for low noise & high gas velocity effects.

5.4 Venting of gas on every NGV fueling cycle and SRV venting should be safely vented with min. 3 meters' height from working area, the vent tube shall be properly fixed with support clamps.

5.5 One CNG flexible electrically conductive twin (fill & vent) hose, also hoses should have fitted with NGV-I for filling of vehicles. However, the car side hoses shall be suitable to be attached with NZS-5425 nozzles probe.

5.6 Vendor should supply NGV to NZS probe connection along with NGV nozzle for all type of CNG vehicle filling as per requirements.

5.7 For Fast fill of NGV, vendor should provide 3-bank sequencing system for combo dispenser and same sequencing system should be configured with dispenser controller unit.

For Bus End: -

5.8 One CNG flexible electrically conductive twin (fill and vent) hoses with nozzles and vent hose with one CT-5000 (with captive vent) transit fill nozzle including Bus/Heavy duty truck nozzle valve for filling & venting are required with weather caps for the protection of nozzles. Vendor should also include supply of breakaway coupling, suitable for NGV Industry, in fill line hose shall be 1/2"ID, with MAWP 4532 psig & service pressure rated to 3600 psig. And at least 4.0 Meter long. End Connection of main and vent hose shall be SAE (JIC) 37° female swivel 1 1/16-12 UNF.

5.9 Both hoses fitted through fill and vent break-way NGV-I (for filling of transit buses & large trucks vehicles with high flow/fast fill capabilities. However, both the hoses shall be suitable to be attached with Type-1 nozzles complied with NGV-I & ISO 14469 Type-1. Vendor shall include the supply of Bus/Heavy duty truck nozzle with each hose for filling & venting of gas. Vendor shall also include supply of Breakaway Coupling, suitable for NGV Industry, in the hose. Fill Hose shall be 1/2" ID 5000 psi (g), at least 4.0 Mtr. Long & venting shall have done through 3/8'' or ¼'' ID for low noise effects.

5.10 Bus nozzle shall provide with Nozzle holder for protecting the nozzle from dust, rain & direct sun light during dispenser idle condition at CNG stations and vehicles and which nozzle holder shall place with SS304 stand for smooth operation and free from burrs and sharp edges for minor injury during repeatable operation.

5.11 Bus Nozzle shall be designed for high frequency use with a minimum cycle of 100000.

5.12 Vendor should supply Electrically conductive fill hose (Fill & Vent) meeting the requirement of NFPA-52 and NGV 4.2.

5.13 Two numbers of Coriolis mass flow meter shall be provided on both side of CNG Combo dispenser.

5.14 Vendor shall demonstrate the function of breakaway coupling during performance test at low pressure condition ≤ 10 bar (g) due to safety concern with proper Safety precautions as if it is required. The dispensers shall be designed in such a way that free movement of hoses is possible, by spring loaded high mast. Supply of NZS 5425 probe is in Vendors' scope.

5.15 Three rows of liquid crystal backlit display for night viewing showing total sale in Rupees (000000.00), quantity of gas sold in kg (000000.00), unit price of CNG in R.S. /Kg (000.00).

5.16 The display should show previous batch reading even after the power failure.

5.17 For Combo dispenser with dual arm hose on either side of the dispenser there should be 4 displays, two on each side of the combo dispenser **i.e. CNG sales in Rs. CNG Mass in Kg. and CNG unit price Rs. /Kg. (May be common for each side, i.e Total 2 Nos. per dispenser).** The whole dispenser microcontroller unit should be with IP - 65 protection. All the displays should

be with back cover to make the display free from dust and display cabinet shall have IP 54 protection.

5.18 There is a Provision for Pre-set of Dispenser Electronic meter with (R.s. 500.00) or Gas to be sold in Kg. (i.e. 5 kg) or Normal filling mode without entering R.s or kg. etc. by Manual key-pad display or any other Push buttons. The decimal point required being adjustable through software Program.

5.19 Non-resettable and non-volatile totalizer up to 999999.99 for total CNG sold in Kg with an independent battery backup.

5.20 Dispenser design should be such so that hose doesn't touch the ground.

5.21 Emergency stop switch is required on both side of the dispenser. However, the filling on both sides should stop in emergency condition, when any one of the emergency switches is pressed. During activation of emergency switch, the power supply to the dispenser should be available with no filling cycle initiated or stop of CNG filling supply if it is already in running condition.

5.22 Two nos. of liquid filled 4" dia. (0-400 Kg/cm2g) pressure gauges showing the vehicle filling pressure for each filling arm on either sides of the dispenser.

5.23 The pressure gauges should be provided with two units reading i.e. Bar-g & kg/cm2g as it is required.

5.24 Two Nos. bubble tight manual shut-off valves to be provided on each side for filling hose.

5.25 Complete Stainless Steel (SS304) outer body of cabinet & Body thickness 1.6 mm with door/panel & Including Interior supports angle & other bracket to selected min. (SS304) as per suitable thickness for proper rigid and smooth fitments work.

5.26 On-site support during stamping activity from local W&M department of CNG Dispensers shall be in scope of Vendor prior to commencement of commercial sale.

5.27 If any other incident/problem occurs during the warranty period which needs breaking of W&M seal, then Vendor will pay W&M charges and coordinate with W&M department for further re-stamping.

5.28 Compressed Natural Gas(CNG) operated Ex-proof solenoid controls 2/2 electromagnetic valve for Dispenser fueling control (or) Pneumatic operated actuator Ex-proof electronically controlled solenoid through microcontroller programmed based system for switching the transducers, flow and fueling philosophy control to meet the desired target fill pressure based on preset parameters. Instrument Air required for pneumatic operation of Ex-Proof Solenoid Valve suitable for Dispensers has to be provided by the Client at Dispenser end at a pressure of 7 to 9 kg/cm2g.

5.29 All Ex-proof electronically controlled solenoid valves are subject to comply with Pressure Equipment Directive (PED) and the Explosion Protection Directive (ATEX) and CCOE (chief controller of explosives) approved.

5.30 The end connection for instruments airline will be ¼" OD with /SS316 MOC. Further tubing with necessary pressure reduction (if required), one pressure gauge with isolation valve for monitoring of inlet pressure of instruments airline shall be provided by the Vendor.

5.31 The Dispensers shall be supplied as complete package including all required auxiliary equipment for efficient & safe operation as a whole. Vendor shall be responsible for furnishing all electrical, instrumentation, inter connecting Piping & Safety Items as required to make the Dispensers complete.

5.32 Hose crimp should be provided with protective sleeve.

5.33 Hose crimp should be of SS and have protection sleeve over it to avoid short circuit with battery terminals.

5.34 It is not the intent of Purchaser to specify every piece of required equipment / item but nevertheless any item not specifically mentioned, but required as per Good Engineering Practice and for the safe & trouble-free operation of the dispensers deemed to have been specified & shall be in the scope of Vendor without any additional implication in the price or schedule.

5.35 For Dispenser & Both Mass Flow meters, obtaining statutory approvals from the country of origin as well from India is in Vendor's scope. The offered Dispenser / Mass flow meters model used for measurement of CNG/CBG must be certified by the Weights and Measures or any other statutory authority from the country of origin. The Vendor shall also get the offered Dispenser model certified by the Weights and Measures; India (Ministry of Consumer affairs) complied with latest Legal metrology act.

5.36 The offered Dispenser model must also be approved by the Chief Controller of Explosive (CCOE) Nagpur now PESO (Petroleum and Safety Organization) and the Vendor shall submit the all the corresponding certificates along with the offer.

5.37 Any model certified by W & M India as on date offered by the Vendor for supply will be the responsibility of the vendor. Model approval certification from local W&M.

5.38 / revalidation of model approval throughout the life span of dispenser will be done by IRMEL but Vendor will provide on-site support if required by Owner. Undertaking has to be furnished with the bid covering acceptance of this requirement.

5.39 The CNG Dispenser manufacturer must have valid PESO Certificate for the CNG Dispensers approved Model considered for supply under this bid. & same has to be furnished along with the bid.

5.40 The CNG Dispenser manufacturer must have valid Model approval from Legal Metrology Department (W&M) of the CNG Dispensers Model considered for supply under this bid. & same has to be furnished along with the bid.

5.41 The CNG Dispenser Manufacturer shall provide complete General arrangement drawing and indicative P&ID along with technical bid. If any modifications will be required in the drawings/documents, Vendor will have to incorporate the same suggested by IRMEL.

5.42 Vendor shall note that the calibration of Dispensers at manufacture's works will be done only with Master calibrator certified by statutory authority (valid certification from W&M India and FCRI/ NABL accredited lab for the accuracy better than the Dispenser). Vendor has to furnish all the valid calibration reports during Inspection & FAT.

5.43 All spares& consumables required during commissioning shall be in the scope of Vendor. The list of such spares shall be furnished at the time of detail engineering.

5.44 The Vendor shall note that the calibration of the Dispenser Instruments, Mass Flow Meter / Electronics, other major items shall be valid at the time of commissioning. Due to any reason if the validity of the calibration (to be

considered one year from the last calibration date, if not indicated) expired, then Vendor shall arrange / complete the calibration before commissioning. The Performance Guarantee test shall be conducted positively within two months of commissioning. Vendor has to provide all the necessary arrangements including technical man-power for PG test.

5.45 The Vendor shall ensure to provide necessary supports and input for client's SCADA (Supervisory Control and Data Acquisition) system and provide all data (Analog, Digital, Alarms, Set points etc.) register address details, error codes, & protocol for automation / SCADA integrations.

5.46 The CNG/CBG specification should meet the ISO 15403:2000 (E) or IS: 15958 IS:16087natural gas quality designation for use as a compressed fuel for vehicles.

5.47 Coalescent and particulate filter of Grade 6 or better to be provided at inlet of each bank supply line with manual drain valve to ensure that the oil carryover in the CNG being filled to vehicle is < 5 ppm and particulate size is
5.48 < 2 Micron. Filter housing for said filter must be capable for collection of oil for a minimum drain interval of 24 Hrs. with oil carryover < 5 ppm.

5.49 Filter elements made of paper shall strictly not be accepted. Vendor shall provide appropriately plugged drain valve outside the dispenser housing with suitable arrangement to collect the drained oil. Filter size shall be in accordance with max/min. flow through the dispenser. Filtration efficiency shall not be less than 99.99%. Vendor shall provide liquid filled DP (differential pressure) gauges across all the banks of inlet filters for observing the pressure drop on each filter units.

5.50 Vendor shall ensure that the system is designed in such a way that any gas if passes, should be recorded by mass flow meter and there should not be any possibility of unmetered gas supply through dispenser in case of malfunctioning of solenoid valves. Any unmetered gas passed shall be recorded in the dispenser microcontroller & it will be retrievable as and when required. Vendor shall also provide surge protection device of approved make at 230 V AC power inlet to protect the dispenser from any electrical surge/spike to safeguard all the installed devices & components.

5.51 All spare required during pre-commissioning shall be in the scope of vendor.

5.52 Vendor shall make a provision to change the price of CNG through the keypad

inside the dispenser unit that shall be covered with security lock. It shall also be possible to change the price from remote station (from SCADA/ from any part of the city). RS 485 port shall also be provided for price change. In case standard RS485 port is not available in the dispenser, then RS232C to RS485 convertor with all relevant hardware and software to be provided by vendor.

5.53 Vendor will design microcontroller program in such a way that it should keep all the previous records of CNG Rate change done with precise date & time.

5.54 RS 485 serial port shall be provided for downloading the CNG sale data with the help of Purchaser's Personal Computer for each shift (8 hours' interval). Suitable software with license (if required) shall be provided to obtain the same for each shift (8 hours' interval).

5.55 Vendor shall provide a common processor and open communication protocol/ RS 485 port for RTU to transfer all the dispenser data to central SCADA system.

5.56 Vendor must note that non-standard/ propriety type communication protocol in dispenser for communication with RTU will not be acceptable. Protocol must be standard & universally accepted as specified above or any standard protocol with compatible convertor. Also, it shall be made available and must be compatible to communicate with any make of RTU. RTU will have provision of Serial communication RS 485 port /Ethernet TCP/IP communication with RJ45 port to interface with dispenser.

5.57 Vendor is responsible to provide the communication port compatibility with RTU. Vendor is required to carry the communication port functional test and display all the values in Lap top or in applicable device during dispenser inspection (FAT) at vendor premises. Also, functional test shall be carried out by vendor after installation and communication establishment with OWNER's SCADA. Vendor shall also share the dispenser protocol/RS485 details with OWNER during FAT at vendors works and all submit relevant documents in desired format (both hardware/ software).

5.58 Vendor must furnish/share the details of implemented MODBUS/RS485 protocol for all function codes read, write & slave Id, list of signals to be transferred, Baud Rate, signal communication for Modbus communication, CRC implementation, register addressing methods/mapping etc. with M/s owner and provide their assistance during interfacing with RTU to automation vendor. Vendor must provide information about looping details and number

of dispensers connected in one loop.

5.59 During installation & commissioning of dispenser same will be checked by OWNER's Engineer.

5.60 Supply of Communication cable will be supplied, installed & terminated by OWNER.

5.61 Vendor must share termination details for RS-485, TCP/IP communication with OWNER.

5.62 Vendor must configure the CNG dispenser controller in such way that all error code message should be displayed for easy communication with wire break failures and other breakdown to be easily identified against CNG dispenser breakdown during dispenser in operational stage.

5.63 The K-Factor adjustment port /switch should be exclusively dedicated without any additional functionalities and parameter controls. If any incident/problem occurs during the warranty period and CAMC period which needs breaking of W&M seal, W&M charges for re-stamping will be recovered from CAMC charges.

5.64 Vendor must submit the following documents within 2 weeks of placement of LOI/ PO for review and approval of OWNER:

5.65 Detailed project schedule giving all activities such as Design and review, Major bought out items (such as Mass flow meter, electronics, Valves, Hoses etc.), Sub-assemblies, Stage inspection, Final Assembly, Final factory testing of dispensers, Final inspection, dispatch etc.

5.66 Process and instruments diagram (P&ID) of gas flow giving Bill of Material. The Bill of Material shall clearly indicate all items, quantity of all items installed per dispenser, make and part number etc.

5.67 Certification from Weights and Measures department, PESO Department or other statutory authorities of the country of origin for offered model dispenser for specified flow and accuracy.

5.68 All spares required during CAMC (Operations & Maintenance) are in the Vendor's Scope. The Vendor shall submit the list of critical spares which are to be stored necessarily in the Vendor's store during CAMC.

5.69 One number of three banks electronic software and controller including

hardware for car dispensing and one number of single bank electronic software and controller including hardware for Bus Dispensing.

5.70 Vendor has to supply the dispensers with solenoid operated valve made of ANSI 316 SS, for ON-OFF control of flow, on the gas inlet with 3/4" tube OD end connection for Bus filling and ½'' tube OD end connection for Car side with ¾'' inlet common isolation valve arrangements on each bank for both Car and Bus side to achieve the required flow rate on each arm.

5.71 Valves shall be provided for each bank per hose separately. Vendor to ensure the system design in such a way that any gas if passes, should be recorded by dispenser and there should not be any possibility of unmetered gas supply through dispenser in case of Malfunctioning of solenoid valves.

5.72 The vendor is required to design the inlet filter for the combo dispenser with a primary focus on optimizing the filling process for the bus dispenser. This is to ensure the achievement of the required flow rate and fast filling efficiency for both the car and bus arms simultaneously. Accordingly, the vendor should provide select inlet filter with a higher rated flow capacity suitable for bus filling while still ensuring effective operation for car filling.

5.73 The gas tubing inside the dispensers shall be seamless SS 316, fully annealed (bright annealed), conforming to ASTM A 269. The tubing shall have a maximum hardness of RB 80 or less and be suitable for bending and flaring. The tubes shall be available in ½" and ¾" OD, with corresponding ¾" SS 2-way ball valves at the line filter inlet. The end connections shall be compatible with ½" and ¾" OD SS tubes for connection to the car side and bus side, respectively suitable reducer to be consider from ¾'' to ½'' connection for Car side. Other than that Any open ends on fittings and vents shall be provided with caps or dust plugs.

5.74 Supply of Detailed manual for list of error codes with description for programming of all parameters of the dispenser.

5.75 Dispenser tubing work shall be properly arranged with flow direction of gas, banking details, Side of dispenser, Standard operation procedure, on-off indication, ESD labelling & other display label printing as per mentioned in technical documents. All instrumentation Serial numbers & calibration Tag list to be mentioned and shared with IRMEL EIC for easy traceability.

5.76 Tubing & other devices arranged in such a way that they can be properly accessed for operation & maintenance work during operational stage.

Type of Dispenser	Type of flow	Flow Rate kg/min	Target Fill pressure (kg/cm2g)	Fill & Vent hose/ Dispenser
Combo	**Car-** Low/Med/High **Bus-** Low/Med/High	Low-0.1 Nor-7.5 Max-15 (For Car side) Low-0.1 Nor-37.5 High-75 (For Bus side)	**For Car & Bus** 200	For Car Side- Fill-3/8'' ID Vent-1/4'' ID For Bus Side- Fill-3/8'' ID Vent-1/2'' ID

6. DESIGN & ENGINEERING SCOPE FOR DISPENSER: -

a) Design & Detailed Engineering
b) Manufacturing & Assembling
c) Procurement from Sub-Vendors
d) Inspection & Testing at Works (TPI will be arranged by IRMEL).
e) Documentation and obtaining statutory approvals as per specification.
f) Packing, Forwarding and Transportation up to Job Sites/ Client's stores.
g) Testing and commissioning, trial run etc.
h) Calibration of the Mass Flow Meter of the supplied dispensers by Master Meter before commencement of performance test.
i) CAMC after site installation of each combo Dispenser, individually.
j) The sites/station shall be at CGD of IRMEL GA. The Vendor shall be responsible for supply of dispenser at client stores/sites depending upon the availability of sites. The Transportation from client stores to respective sites for erection, installation, testing & commissioning shall be in Vendor's scope.

EXCLUSION

Civil Foundation & Trenches for pipes / Tubes, Instruments air for Dispenser, cable laying from dispenser to Power distribution board & Erection of Dispenser will be done by another contractor. However, Vendor shall provide Dispenser Foundation Design & drawing details during detail Engineering.

7. SAFETY

All Electrical devices shall meet the requirement for the area classification specified elsewhere in tender document. Tubing & other devices shall be so arranged that there is proper access for operation & maintenance.

8. AS BUILT DOCUMENTS

On successful completion of hydrostatic testing and Factory test by TPIA, the Vendor shall prepare As Built drawings & reports of entire Dispenser package as specified in scope of work. All "As Built" drawings / reports shall be submitted as below.

Two sets of hard copies & 1 Set of Soft Copies through E-mail of following documents shall be submitted by Vendor. All documents shall be bounder together:

i) As-built drawing of Dispenser package GAD / Fabrication Drawing / P&ID etc.
j) Test Reports/Results/Records In addition, the above documents shall also be submitted in electronic media i.e. CD drive/Pen drive.
k) Test Reports/Results/Records MS Word/Excel (MS Office)
l) Drawings AutoCAD
m) Mod-scan data, I/O list, cable schedule, O&M manual, operational philosophy & testing procedure.

If any other document/drawing/data corresponding to Dispenser will be required then Vendor will submit it as suggested by OWNER.

If any changes/modifications in any document/drawing/data corresponding to Dispenser will be required then Vendor will submit modified/updated document as suggested by OWNER on priority.

9. CHECK-LIST FOR SCOPE OF SUPPLY

a) Vendor shall furnish all the equipment of Dispenser System instruments and gauges and safety devices as per the enquiry document. Anything required over the above what is specified, for safe and satisfactory operation of the equipment package shall be included by the Vendor in his scope.

b) 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 is reply is 'NO', Vendor should give reason for the same:

c) Vendor's scope of supply shall include but not limited to be following:

Sl. 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 line filter and elements on each bank with individual needle valve for oil drain.	YES		
1.3	Certificate of "Weights & Measures" approval for Dispenser & Mass Flow Meters & master meter.	YES		
1.4	Certificate of "CCOE" / PESO approval for Dispenser & Mass Flow Meters & master meter (as applicable).	YES		
1.5	Certificate by Weights and Measures or the other statutory authorities of the country of origin is Provided.	YES		
1.6	Fast fill type and electronic display – **Combo: 4 Sets of 3 rows**	YES		
1.7	Dispenser with Tamper-Proof Locking arrangement	YES		
1.8	Cabinet suitable to accommodate all valves, fitting both flow meters and all required electronic equipment	YES		
1.9	Front/Side mounted Nozzles with lockable holder and safety lever/latch to firmly hold when not in use	YES		
1.10	Separate non-resettable straight forward reading Totalizers per side.	YES		
1.11	Liquid filled Pressure Dial gauge of 4"size (Min) per side.	YES		
1.12	ESD buttons mounted on both side of the dispenser or front panel.	YES		
1.13	One set of Isolation Valve complete with venting line valve and end plug installed on the inlet of the inlet steel pipes of dispenser.	YES		

1.14	Certificate by Weights and Measures or from the other statutory authorities of the country of origin is Provided.	YES		
1.15	All Electrical equipment and Instrumentation wiring are provided with Certificate of Area Classification.	YES		
1.16	Dispenser automatically and immediately shut off CNG supply to each fill hose individually in case of -Power failure, Failure of metering, Low flow, Failure of Totalizer, Overfill, pressure transducer failure etc.	YES		
1.17	Overall CV is indicated of dispenser from inlet of the dispenser up to outlet probe including mass flow meter, interconnecting tubing, valves, hoses, nozzles etc.,	YES		
1.18	Dispenser is shipped in fully wired and assembled condition only gas supply connection, Instrument Air supply connection and power supply connection shall be made at site.	YES		
1.19	Warranty for a period of 12 months is provided from the date of final site acceptance at CNG facilities by the Company's Engineer In-charge.	YES		
1.20	**Spares**			
1.21	All necessary Spares and consumables during warranty & CAMC period are in the scope of supplier.	YES		
2.0	**Inspection & Testing**			
2.1	As specified on the datasheets and Technical Specifications	YES		
3.0	**Vendor Data and drawings**			

3.1	All data & drawings as required per VDR format	YES		
4.0	**Erection, commissioning, and trial runs at site of the Dispenser**	YES		
4.1	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 the proposal)	YES		
5.0	**Technical parameters to be confirmed by Vendor**			
5.1	Inlet Pressure Kg/cm2(g) -255	YES		
6.0	Target Fill Pressure Kg/cm2(g) -200	YES		
6.1	Operating Temperature range –[-10°C to 70°C]	YES		
6.2	Electrical Supply Single Phase AC, 230V±} 10%, 50Hz±} 2%.	YES		
6.3	**Fill Nozzle CAR**: NGV-1 for car side arm, along with supply of NZS 5425 with adaptor for car dispenser F**ill Nozzle Bus** :Heavy duty bus/truck nozzles (NGV1 & ISO14469 Type 1) with in built venting provision for Hose connection.	YES		
6.4	**Fill & Vent Hose-Car** Flexible fill hose-3/8'' ID & vent hose-1/4'' ID **Fill & Vent Hose-Combo** Fill & Vent for car side 3/8'' ID & ¼'' ID Fill & Vent for bus side ½'' ID or ¼'' ID	YES		
6.5	Fill hose pressure rating – Working pressure 5000 PSIG	YES		
6.6	**Sequential filling-** Three bank for Car Dispenser. **Sequential Filling**-Three Bank on each Arm for combo	YES		

	dispenser.			
6.7	Temperature compensation – 200 kg/cm2 (g) equivalent at 15°C	YES		
6.8	Breakaway couplings for Fill and Vent Hoses for All type CNG Dispenser	YES		
6.9	Principle of mass metering – 2 nos. Coriolis Mass Flow Meter (for Side A & B)- Combo dispenser	YES		
6.10	Flow meters Coriolis type Model with integral display – For each type side of CNG dispenser	YES		
6.11	**For Car** Min. Flow rate – CAR: 0.1 kg/min Normal flow Rate-7.5 kg/min. Max. flow rate- ≥ 15 Kg/min. **For Bus** Min. Flow rate – 0.1 kg/min. Normal Flow Rate-37.5 kg/min. Max. flow rate ≥75 Kg/min.	YES		
6.12	Batch delivery accuracy - ± 1.5% of batch	YES		Vendor to confirm the model
6.13	Mass flow accuracy for gas meter - ± 0.5% (inclusive of sis & linearity, hysteresis & repeatability errors	YES		
6.14	Calibration traceability - To NIST as per ISO 5168	YES		
6.15	Repeatability - ±} 0.3 %	YES		
6.16	Enclosure weatherproofs to - IP55, NEMA-4x	YES		
6.17	Pressure rating of Wetted parts - 5000 psi(g) At 25°C as per ASME/ANSI B 31.3	YES		
6.18	Process Temperature effect - ±} 0.01% of nominal flow	YES		
6.19	Surge and frequency Transient - Shall be in compliance with ANSI/EEE(EFT)c 62.41(1991)/ IEC std.	YES		
6.20	EMI effect on sensor and Transmitter - To the requirement of EMC directive	YES		
6.21	Vibration effect - As per SAMA PMC std. / IEC limit	YES		

10. SCOPE OF WORK FOR COMPREHENSIVE ANNUAL MAINTENANCE

10.1 General:

10.1.1 This contract covers the provision of services to undertake the Comprehensive Maintenance as per Company schedule and Breakdown repair of CNG dispensers as & when complaints are received at CNG control room. For the purpose of clarity, the agency providing maintenance services for above dispensers shall, herein after be referred to as "Contractor" and the company hiring the services of the agency will, herein after be referred to as "Company" (IRM ENERGY LIMITED (IRMEL).)

10.1.2 "Comprehensive Maintenance refers to preventive maintenance of equipment as per schedule which includes breakdown, equipment spare parts replacement, engineering and labor charges."

10.2 Preventive Maintenance:

To carry out the Preventive & Breakdown maintenance of dispensers strictly in accordance with the schedule provided by Company / OEM Manual. The Contractor shall confirm to Company their availability to carry out the Maintenance in advance.

The spares required for carrying out preventive maintenance shall be in the scope of Contractor. The contractor personnel shall inform the exact time to the EIC before and after carrying out the maintenance.

The Contractor shall ensure all required consumables such as cotton waste, cleaning solvent, insulation tapes, thinner, soap solution, Teflon tape etc. including required tools & tackles, are available on site. Supply of all consumables, tools & tackles etc. is in the scope of Contractor. Tools shall include all type of mechanical & electrical tools, multi meters, instruments, Laptop with required software (Pro-link etc.) etc.

Contractor shall note down the dispenser performance before and after carrying out the maintenance. Contractor to submit report of Percentage difference between Mass Flow Meter and Non-rest-table Totalizer on fortnight or Monthly basis as per order of EIC. Later on after continuous operation, if calibration of installed Mass Flow Meter will be required. Same should be perform by Contractor at site with the help of laptop and suitable software.

Only in case of lab calibration, if established by Contractor in front of IRM Energy Limited Site in charge through proving exercise by Standard Master Calibration Device, During CAMC Contractor will be entitled to send the Mass

Flow Meter, PG, PT, safety relief valve for calibration at its own cost.

Preventive maintenance will be carried out on Monthly basis during non-peak hours in consultation with EIC. Any maintenance that needs to be taken up shall be well planned in advance with due approval of EIC.

The contractor shall produce the compliance report of each maintenance activity on the next Working day to the Engineer - In – Charge in Soft & Hard Copy both. Compliance report shall be descriptive in nature. Provide proper communication facilities to all contractor personnel such as engineers, Technicians etc.

The contractor shall inform the Company, names and mobile numbers of all the service personnel who will be deployed for providing the services during the CAMC. An alternate number will also be informed to the company, which can be contacted in case all service personnel's mobile are not reachable. Changes, if any, will be notified to the company.

The contractor shall produce Escalation Matrix for Preventive Maintenance from service person up to Contractor's authorized person for all the maintenance activities of all the dispensers to the Company.

Contractor's authorized person will be liable to monitor that all the maintenance activities performed in satisfactory manner at Company's all sites & in all dispensers.

If any type of issues will be raised by Company's engineer in-charge to Contractor's authorized person via telephonic/e-mail communication, then it will be immediately taken into count by the contractor & issue will be incorporated within mean time.

10.3 Break down Repair:

On receiving information from the CNG control room/Dealer, contractor shall ensure that his team reaches the concerned retail outlet. Attend to dispenser breakdown service calls on 24X7 basis. The service personnel will report to the call site within 2 hours from the time of receiving service call in M/s IRM Energy Limited site or at whatever site dispensers are installed, (Prior Information will be provided for location of installation of Dispensers).

Before proceeding to the outlet, the contractor personnel shall collect all necessary spares required for the repair depending on the nature of the complaints received. Upon reaching the retail outlet, the contractor personnel shall contact the CNG Control room to advise his attendance on site and confirm the breakdown reporting.

The contractor shall coordinate with the Company representative for instructions on undertaking the repair work. After solving the complaint, the contractor shall inform CNG control room. Provide proper communication facilities to all contractor personnel such as engineers, technicians etc., Maintain records of the services provided, and submit the same to the company, once in a Month.

10.4 Reports to be submitted

10.4.1.1 Reports (in soft copy and print form) of individual equipment as and when the dispensers are undertaken for preventive maintenance/break down/on complaint service. Report shall be descriptive in nature including nature and quantity of material used or repaired.

10.4.1.2 Monthly cumulative list on preventive maintenance/breakdown repair/ on complaint service of dispensers carried out with actual date and time of service.

10.4.1.3 Monthly cumulative list on consumption of spares in each dispenser consumed during preventive maintenance/breakdown repair/ on complaint service attend. Separate analysis report on breakdown if anything occurred which needs special attention.

10.4.1.4 Report of Percentage difference between Mass Flow Meter and Non-re-settable Totalizer as per guaranteed parameter declared at the time of supply.

10.5 Breakdown Penalty

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

10.7.2 Penalty for 1-hour delay (After 1 Hours from complaint notification time) in reaching at all site (e.g., within 2 hours instead of 1 hours) – Rs 200/- per hour arm per dispenser.

10.7.3 If the shutdown time, which will be calculated from the complaint notification time, is extended beyond 4 hours, a penalty of Rs 500/- per hour (After 4 Hours) will be applicable.

10.7.4 Contractor shall not deploy the employee of age less than 18 years in any of the activities. If it is found, then it will be viewed seriously and heavy penalty of Rs. 20000/-per instance and also the termination/blacklist will be done from our approved vendor list.

10.7.5 The contractor shall provide full Personal Protective Equipment (PPE) to each individual employee as per Job requirement & instruction of IRMEL. It is mandatory for all personnel to wear said PPE whilst performing their duties, failing which a penalty @ Rs. 500/- per incidence will be levied in addition to dismissal of the person.

10.8 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.

10.9 The penalty clause and maintenance charges will come into force immediately after successful commissioning & sales commencement as defined in the tender.

10.9.1.1 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.

10.5.1.1 The Vendor should maintain sufficient spares for breakdown & scheduled maintenance. OWNER can check/ audit spare

10.5.1.2 Stock and vendor has to ensure availability of required spares as per list*. *The provided list is only indicative. Vendor has to maintain all spares / consumables required for uninterrupted operations of at least 06 months for each Dispenser Unit.

ANNEXURE-1B

- The contractor has to maintain following minimum spares of each GA location.
- The list is indicative only, actual list of items and qty. may be depending upon site usage and OEM recommendation.

Sl. no.	Full Description	Base Stock Qty./10 Dispenser unit (Nos.)
01	2 way ball valve seal Kit	2 Nos.
02	Start Push-Button	2 Nos.
03	STOP Push-Button	2 Nos.
04	Battery for Dispenser	1 Nos.
05	Three Way Ball Valve	1 Nos.

06	¼" Vent Tube	2 Nos.
07	2 way Teflon sheet	2 Nos.
08	3 way Ball Valve Probe	2 Nos.
09	Keypad Display	1 Nos.
10	Keypad controller	1 Nos.
11	3 way ball valve seal Kit	01 set
12	Solenoid valve / Actuated ball valve along with seal kit-For Combo dispenser	02 nos.
13	NGV to NZS probe/nozzle	02 nos.
14	NZS O-ring and other seal kit	02 set
15	Long Hose (4.5 Mtr.)	01 set
16	Short Hose (1.8 Mtr.)	01 set
17	Breakaway coupling (Fill & Vent)	02 nos.
18	Mother Board / microcontroller unit	01 nos.
19	Power supply unit	01 nos.
20	Fuse card	02 set
21	Line Filter O-ring	05 set
22	Filter Element	03 nos.
23	SRV	1 Nos.
24	NZS 5425 Nozzle	1 Nos.
25	Heavy duty bus/truck nozzles (NGV1& ISO14469 Type 1)	1 Nos.

ENERGISING QUALITY	**PROJECT NUMBER : VCS-IRMEL-C261159**	IRM Energy

SCOPE OF WORK–CNG/CBG BUS DISPENSERS			Client Job Number	C261159	
			Total Sheets	26	
DOCUMENT NO	C261159	00	ME	SOW	3001-B

SUPPLY OF CNG/CBG BUS DISPENSERS IN THE CGD OF IRM ENERGY LIMITED (IRMEL) IN 4 GA's OF BANASKANTHA, DIU & GIR SOMNATH, FATEHGARH SAHIB & NAMAKKAL & TIRUCHIRAPPALLI.

REV	DATE	DESCRIPTION	PREP	CHK	APPR
C4	23.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C3	05.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C2	30.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C1	22.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB

CONTENTS

1. DEFINITION

Where used in this document, the following terms shall have the meanings indicated below, unless clearly indicated by the context to this order:

PROJECT: CGD PROJECT AT IRMEL

OWNER/COMPANY: IRM ENERGY LIMITED (IRMEL).

CONSULTANT: VCS QUALITY SERVICES PVT. LTD.

MANUFACTURER: THE PARTY WHO MANUFACTURS & SUPPLIES EQUIPMENT & PROVIDES SERVICES TO OWNER OR TO CONTRACTOR.

SOW: SCOPE OF WORK FOR BUS DISPENSER

2. INSTRUCTION TO VENDOR

M/s OWNER has been authorized by PNGRB for setting up infrastructure and operation of City Gas Distribution Project. The dispensers shall be installed at various refueling outlets for dispensing CNG to all types of Natural Gas Vehicles.

2.1 The dispensing stations shall be spread throughout allotted Geographical Area (GA).

2.2 The specification states the scope of supply and services as completely and clearly as possible. Any additional work/equipment or technical requirement not mentioned in the specification but required to make the offered system complete in accordance with the specification or required for safe operation shall be deemed to be included in the scope of vendor.

2.3 Vendor may contact and obtain clarifications from OWNER, if required, at any stage, before submission of offer.

2.4 The offered dispenser units' model shall have certification for specified flow and accuracy from the Weights & Measurement Department. The certificate(s) shall be in English language or in the language of originating country along with English translation. Bids received without copy of such certificate(s) shall be liable to be considered for rejection. Vendor to arrange for Weights and Measures approval from Indian Authorities. The dispenser Model/Type has to be approved by the Indian Weights & Measurement Department.

2.5 Further manufacturing license, dealer of weights & measures, importer (where ever applicable) and license to repair by the Vendor is mandatory at the time of bid due date.

2.6 The offered dispensers for dispensing CNG shall be approved by the Petroleum & Explosive safety organization (PESO), Govt. of India as per PESO latest guidelines. If the vendor is yet to get the dispenser Model/Type approved, the vendor shall have to give the Model/Type approval as on bid due date.

2.7 The Vendor shall carry out modification required by the statutory bodies either during the approval or during inspection of the installation. All expenses shall be done and borne by the vendor. Unless the above formalities are cleared, supply part would be deemed incomplete.

2.8 The Vendor shall provide civil foundation/ dispenser frame drawings within two weeks of placement of order.

2.9 Any work, which is considered to be unsatisfactory and of poor workmanship shall be rectified by the vendor without any extra cost and time implications.

2.10 The approval from concerned Govt. Bodies in respect of complete installation of a CNG/CBG Dispensing Station shall be obtained by the OWNER. Necessary Information / Data as may be required by Govt. Bodies shall be furnished by vendor to facilitate OWNER in obtaining approval.

2.11 The offered Dispenser shall be suitable for Both design condition of CNG composition and Bio Gas Based CNG/CBG as per compliance requirements to meet the std. as per **IS 16087(latest edition) & IS 15958 (latest edition)**. Accordingly, vendor should consider required seal, gaskets and filtration system to optimize their dispenser unit.

3. DESIGN BASIS

Gas from CNG storage cascade or CNG compressor through priority panel is dispensed to CNG Vehicles like Car, buses via CNG dispenser. The Bus dispenser shall have single Arms; design flow capacity of bus side should be ≥ 75 kg/min. under discharge to empty cylinder under std. atmospheric condition. Pneumatic actuated Ex. Proof solenoid valve (or) 2/2-way Electromagnetic solenoid valve shall be used for flow and pressure controls of Dispenser through Ex. proof electronic controller, which shall be used for such purpose, each unit to have fully

automatic microprocessor based sequencing of 3 banks storage system connected to dispenser through independent high pressure Stainless Steel (SS) tubes. Dispenser to have pressure control device to restrict fill pressure up to 200 kg/cm2 (g) at maximum allowable filling pressure for natural gas vehicle cylinder as per PESO & other international standard requirements. Pressure control device to ensure complete shut off of gas flow at the pre-set pressure or Preset price limit or Normal filling cycle with auto cutoff with dead band shift and shut off error within ±2% of range. The preset fill pressure can vary from 150 kg/cm2g to 200 kg/cm2 (g). The pressure control devices to have provision to manually set the pressure between above range as per site requirements.

4. SCOPE OF WORK FOR CNG/CBG BUS DISPENSER

4.1 This document covers the details of supply of CNG/CBG Bus Dispenser with Single Arm Bus Dispensers. All works and clauses of this document shall be applicable unless specifically mentioned otherwise.

4.2 This document shall be read in conjunction with Material requisition, Data Sheets, Technical Specification, Codes & standards, Drawings, and other documents forming a part of the MR Document.

4.3 The Vendor shall Design, detail engineering, manufacture, assemble, perform factory test, supply CNG dispensers including packaging, insurance, handling transportation of Dispenser, load and unload at sites/store, documentation etc. and provide all related services including installation, integration, site acceptance testing, trial run and commissioning, Comprehensive Annual Maintenance Contract (CAMC), commissioning spares, all drawings, documents and licensed software & hardware, converters, cables etc.

4.4 Complete in all respect for project conforming to Technical Specification for CNG Dispenser: **TS. No. C261159-00-ME-TS-3001** enclosed with tender. Each CNG Dispenser shall have following as a minimum:

4.5 Any other required items not covered in dispenser items for safe and accurate operation of Dispenser, however vendor should include in their scope of work to complete the job.

4.6 Any spare required during commissioning shall be in the scope of vendor. If any spare during commissioning borrowed from CAMC spare, It shall be replaced by vendor, at free of cost within short time.

4.7 Supply of complete O&M manual (along with instruments datasheet &

schedule, bill of materials, instrument hook-up diagram, electrical wiring diagram, control logic algorithm, process flowchart, valid & approved certificates & detailed user guide of all bought out items) for each dispenser for easy operation & troubleshooting.

4.8 Supply of all engineering drawings & detailed documents, application program, complete list of error codes, Modbus/pulse communication details with description for programming of all dispenser parameters.

4.9 If dedicated programming unit is required for programming/ parameter change the same shall be submitted in "CD", "Software" along with supply of dispenser. Also detailed hard copy of the same to be submitted.

4.10 Supply of Instrumentation & Electrical items required as per Approved Specification & Make. All Power interconnecting supply cables shall be with FRLS type with double compression type of cable glands tested & certified to be used in hazardous area classified as Zone-I/II.

4.11 All equipment's, Ex. Proof JB for dispenser electronics controller and other power supply unit and accessories also to be supplied and erected as per IRMEL requirements. Any other item required for safe and accurate operation of Dispensers shall be in the scope of Vendor.

4.12 The supplier shall provide Onsite training of dispenser regarding operability procedure to client personals if required as per purchaser EIC instructions.

5. SCOPE OF SUPPLY & SERVICES

FOR SINGLE ARM BUS DISPENSER

5.1 The supply of double arm **CNG bus dispensers** have specified with following requirements mentioned below: -

5.2 One CNG flexible electrically conductive twin (fill and vent) hoses with nozzles and vent hose with one CT-5000 (with captive vent) transit fill nozzle including Bus/Heavy duty truck nozzle valve for filling & venting are required with weather caps for the protection of nozzles. Vendor should also include supply of breakaway coupling, suitable for NGV Industry, in fill line hose shall be 1/2"ID, with MAWP 4532 psig & service pressure rated to 3600 psig. And at least 4.0 Meter long. End Connection of main and vent hose shall be SAE (JIC) 37° female swivel 1 1/16-12 UNF.

5.3 Both hoses fitted through fill and vent break-way NGV-I (for filling of transit buses & large trucks vehicles with high flow/fast fill capabilities. However, both the hoses shall be suitable to be attached with Type-1/2 nozzles complied with NGV-I & ISO 14469 Type-1.

5.4 Vendor shall include the supply of Bus/Heavy duty truck nozzle with each hose for filling & venting of gas. Vendor shall also include supply of Breakaway Coupling, suitable for NGV Industry, in the hose. Fill Hose shall be 1/2" ID 5000 psi (g), at least 4.0 Mtr. Long & venting shall have done through 3/8'' or ¼'' ID for low noise effects during captive venting through bus nozzle.

5.5 Bus nozzle shall provide with Nozzle holder for protecting the nozzle from dust, rain & direct sun light during dispenser idle condition at CNG stations and vehicles and which nozzle holder shall place with SS304 stand for smooth operation and free from burrs and sharp edges for minor injury during repeatable operation.

5.6 Bus Nozzle shall be designed for high frequency use with a minimum cycle of 100000.

5.1 Vendor shall supply electrically conductive fill hose (Fill & Vent) meeting the requirement of NFPA-52 and NGV 4.2.

5.7 One numbers of Coriolis mass flow meter shall be provided on single arm Bus dispenser.

5.8 Vendor shall demonstrate the function of breakaway coupling during performance test at low pressure condition ≤ 10 bar (g) due to safety concern with proper Safety precautions as if it is required. The dispensers shall be designed in such a way that free movement of hoses is possible, by spring loaded high mast.

5.9 Three rows of liquid crystal backlit display for night viewing showing total sale in Rupees (000000.00), quantity of gas sold in kg (000000.00), unit price of CNG in R.S. /Kg (000.00).

5.10 The display should show previous batch reading even after the power failure.

5.11 For Bus dispenser with dual arm hose on one side of the dispenser there should be 2 displays i.e. CNG sales in Rs., CNG Mass in Kg. and CNG unit price Rs./Kg.(May be common for each side, i.e. Total 2 Nos. per dispenser).

The whole dispenser microcontroller unit should be IP - 65 protection. The display should be with back cover to make the display free from dust and display cabinet shall have IP 54 protection.

5.12 There is a Provision for Pre-set of Dispenser Electronic meter with (R.s. 500.00) or Gas to be sold in Kg. (i.e. 5 kg) or Normal filling mode without entering R.s or kg. etc. by Manual key-pad display or any other Push buttons. The decimal point required being adjustable through software Program.

5.13 Non-resettable and non-volatile totalizer up to 999999.99 for total CNG sold in Kg with an independent battery backup.

5.14 Dispenser design should be such so that hose doesn't touch the ground.

5.15 Emergency stop switch is required on both side of the dispenser. The filling should stop in emergency condition, when any one of the emergency switches is pressed. During activation of emergency switch, the power supply to the dispenser should be available. With no filling cycle initiate or stop of CNG filling supply if it already in running condition.

5.16 One nos. of liquid filled 4" dia. (0-400 Kg/cm2g) pressure gauges showing the vehicle filling pressure for single filling arm.

5.17 Other side of dispenser body shall be properly encapsulated with sealing caps, protection against rain, dust and other ingress matter inside the dispenser cabinets.

5.18 The pressure gauges should be provided with two units reading i.e. Bar-g & kg-f/cm2g as it is required.

5.19 one Nos. bubble tight ¾'' manual shut-off valves to be provided on each side for filling hose.

5.20 Complete Stainless Steel (SS304) outer body of cabinet & Body thickness 1.6 mm with door/panel & Including Interior supports angle & other bracket to selected min. (SS304) as per suitable thickness for proper rigid and smooth fitments work.

5.2 On-site support during stamping activity from local W&M department of CNG Dispensers shall be in scope of Vendor prior to commencement of commercial sale.

5.21 If any other incident/problem occurs during the warranty period which needs breaking of W&M seal, then Vendor will pay W&M charges and coordinate with W&M department for further re-stamping.

5.22 Compressed Natural Gas(CNG) operated Ex-proof solenoid controls 2/2 electromagnetic valve for Dispenser fueling control (or) Pneumatic operated actuator Ex-proof electronically controlled solenoid through microcontroller programmed based system for switching the transducers, flow and fueling philosophy control to meet the desired target fill pressure based on preset parameters. Instruments Air required for pneumatic operation of Ex-Proof Solenoid Valve suitable for Dispensers has to be provided by the Client at Dispenser end at a pressure of 7 to 9 kg/cm2g.

All Ex-proof electronically controlled solenoid valves are subject to comply with Pressure Equipment Directive (PED) and the Explosion Protection Directive (ATEX) and PESO approved.

5.23 The end connection for instruments airline will be ¼" OD with SS316/SS316L MOC. Further tubing with necessary pressure reduction (if required), one pressure gauge with isolation valve for monitoring of inlet pressure of instruments airline shall be provided by the Vendor.

5.24 The Dispensers shall be supplied as complete package including all required auxiliary equipment for efficient & safe operation as a whole. Vendor shall be responsible for furnishing all electrical, instrumentation, inter connecting Piping & Safety Items as required to make the Dispensers complete.

5.25 Hose crimp should be provided with protective sleeve.

5.26 Hose crimp should be of SS and have protection sleeve over it to avoid short circuit with battery terminals.

5.27 It is not the intent of Purchaser to specify every piece of required equipment / item but nevertheless any item not specifically mentioned but required as per Good Engineering Practice and for the safe & trouble-free operation of the dispensers deemed to have been specified & shall be in the scope of Vendor without any additional implication in the price or schedule.

5.28 For Dispenser & Mass Flow meters, obtaining statutory approvals from the country of origin as well from India is in Vendor's scope. The offered

Dispenser / Mass flow meters model used for measurement of CNG/CBG must be certified by the Weights and Measures or any other statutory authority from the country of origin. The Vendor shall also get the offered Dispenser model certified by the Weights and Measures; India (Ministry of Consumer affairs) complied with latest Legal metrology act.

5.29 The offered Dispenser model must also be approved by the Chief Controller of Explosive (CCOE) Nagpur now PESO (Petroleum and Safety Organization) and the Vendor shall submit the all the corresponding certificates along with the offer.

5.30 Any model certified by W & M India as on date offered by the Vendor for supply will be, the responsibility of the vendor. Model approval certification from local W&M / revalidation of model approval throughout the life span of dispenser will be done by IRMEL but vendor on-site support if required by Owner. Undertaking has to be furnished with the bid covering acceptance of this requirement.

5.31 The CNG Dispenser manufacturer must have valid PESO Certificate for the CNG Dispensers approved Model considered for supply under this bid & same has to be furnished along with the bid.

5.32 The CNG Dispenser manufacturer must have valid Model approval from Legal Metrology Department (W&M) of the CNG Dispensers Model considered for supply under this bid & same has to be furnished along with the bid.

5.33 The CNG Dispenser Manufacturer shall provide complete General arrangement drawing and indicative P&ID along with technical bid. If any modifications will be required in the drawings/documents, Vendor will have to incorporate the same suggested by IRMEL.

5.34 Vendor shall note that the calibration of Dispensers at manufacture's works will be done only with Master calibrator certified by statutory authority (valid certification from W&M India and FCRI/ NABL accredited lab for the accuracy better than the Dispenser) during Inspection & FAT. Vendor has to furnish all the valid calibration reports during Inspection & FAT.

5.35 All spares & consumables required during commissioning shall be in the scope of Vendor. The list of such spares shall be furnished at the time of detail engineering.

5.36 The Vendor shall note that the calibration of the Dispenser Instruments, Mass Flow Meter / Electronics, other major items shall be valid at the time of commissioning. Due to any reason if the validity of the calibration (to be considered one year from the last calibration date, if not indicated) expired, then Vendor shall arrange / complete the calibration before commissioning. The Performance Guarantee test shall be conducted positively within two months of commissioning. Vendor has to provide all the necessary arrangements including technical man-power for PG test.

5.37 The Vendor shall ensure to provide necessary supports and input for client's SCADA (Supervisory Control and Data Acquisition) system and provide all data (Analog, Digital, Alarms, Set points etc.) register address details, error codes, & protocol for automation / SCADA integrations.

5.38 The CNG/CBG specification should meet the ISO 15403:2000 (E) or IS: 15958 IS: 16087 natural gas quality designation for use as a compressed fuel for vehicles.

5.39 Coalescent and particulate filter of Grade 6 or better to be provided at inlet of each bank supply line with manual drain valve to ensure that the oil carryover in the CNG being filled to vehicle is < 5 ppm and particulate size is < 2 Micron. Filter housing for said filter must be capable for collection of oil for a minimum drain interval of 24 Hrs. with oil carryover < 5 ppm.

5.40 Filter elements made of paper shall strictly not be accepted. Vendor shall provide appropriately plugged drain valve outside the dispenser housing with suitable arrangement to collect the drained oil. Filter size shall be in accordance with max flow through the dispenser. Filtration efficiency shall not be less than 99%. Vendor shall provide liquid filled DP (differential pressure) gauges across all the banks of inlet filters for observing the pressure drop on each filters.

5.41 Vendor shall ensure that the system is designed in such a way that any gas if passes, should be recorded by mass flow meter and there should not be any possibility of unmetered gas supply through dispenser in case of malfunctioning of solenoid valves. Any unmetered gas passed shall be recorded in the dispenser microcontroller & it will be retrievable as and when required. Vendor shall also provide surge protection device of approved make at 230 V AC power inlet to protect the dispenser from any electrical surge/spike to safeguard all the installed devices & components.

5.42 All spare required during pre-commissioning shall be in the scope of vendor.

5.43 Vendor shall make a provision to change the price of CNG through the keypad inside the dispenser unit that shall be covered with security lock. It shall also be possible to change the price from remote station (from SCADA/ from any part of the city). RS 485 port shall also be provided for price change. In case standard RS485 port is not available in the dispenser, then RS232C to RS485 convertor with all relevant hardware and software to be provided by vendor.

5.44 Vendor will design microcontroller program in such a way that it should keep all the previous records of CNG Rate change done with precise date & time.

5.45 RS 485 serial port shall be provided for downloading the CNG sale data with the help of Purchaser's Personal Computer for each shift (8 hours' interval). Suitable software with license (if required) shall be provided to obtain the same for each shift (8 hours' interval).

5.46 Vendor shall provide a common processor and open communication protocol/ RS 485 port for RTU to transfer all the dispenser data to central SCADA system.

5.47 Vendor must note that non-standard/ propriety type communication protocol in dispenser for communication with RTU will not be acceptable. Protocol must be standard & universally accepted as specified above or any standard protocol with compatible convertor. Also, it shall be made available and must be compatible to communicate with any make of RTU. RTU will have provision of Serial communication RS 485 port /Ethernet TCP/IP communication with RJ45 port to interface with dispenser.

5.48 Vendor is responsible to provide the communication port compatibility with RTU. Vendor is required to carry the communication port functional test and display all the values in Lap top or in applicable device during dispenser inspection (FAT) at vendor premises. Also, functional test shall be carried out by vendor after installation and communication establishment with OWNER's SCADA. Vendor shall also share the dispenser protocol/RS485 details with OWNER during FAT at vendors works and all submit relevant documents in desired format (both hardware/ software).

5.49 Vendor must furnish/share the details of implemented MODBUS/RS485 protocol for all function code read, write & slave Id, list of signals to be transferred, Baud Rate, signal communication for Modbus communication,

CRC implementation, register addressing methods/mapping etc. with M/s owner and provide their assistance during interfacing with RTU to automation vendor. Vendor must provide looping details and number of dispensers connected in one loop.

5.50 During installation & commissioning of dispenser all the data in SCADA will be checked by OWNER's Engineer.

5.51 Cables for RS-485/TCP/IP communication will be supplied, installed & terminated by OWNER.

5.52 Vendor must share RS-485 or TCP/IP communication termination details with OWNER.

5.53 Vendor must configure the CNG dispenser controller in such way that all error code message should be displayed for easy communication with wire break failures and other breakdown to be easily identified against CNG dispenser breakdown during dispenser in operational stage.

5.54 The K-Factor adjustment port /switch should be exclusively dedicated without any additional functionalities and parameter controls.

5.55 If any incident/problem occurs during the warranty period and CAMC period which needs breaking of W&M seal, W&M charges for re-stamping will be recovered from CAMC charges.

5.56 Vendor must submit the following documents within 2 weeks of placement of LOI/ PO for review and approval of OWNER:

5.57 Detailed project schedule giving all activities such as Design and review, Major bought out items (such as Mass flow meter, electronics, Valves, Hoses etc.), Sub-assemblies, Stage inspection, Final Assembly, Final factory testing of dispensers, Final inspection, dispatch etc.

5.58 Process and instruments diagram (P&ID) of gas flow giving Bill of Material. The Bill of Material shall clearly indicate all items, quantity of all items installed per dispenser, make and part number etc.

5.59 Certification from Weights and Measures department, PESO Department or other statutory authorities of the country of origin for offered model dispenser for specified flow and accuracy.

5.60 All spares required during CAMC (Operations & Maintenance) are in the Vendor's Scope. The Vendor shall submit the list of critical spares which are to be stored necessarily in the Vendor's store during CAMC.

5.61 One number of three banks electronic software and controller including hardware for Bus dispensing and Two number additional bank provision in electronic software and controller including hardware for Bus Dispensing.

5.62 Vendor has to supply the dispensers with solenoid operated valve made of ANSI 316 SS, for ON-OFF control of flow, on the gas inlet with 3/4" tube OD end connection for Bus filling with ¾'' inlet isolation ball valve arrangements on Bus dispenser to achieve the required flow rate.

5.63 Vendor to ensure the system design in such a way that any gas if passes, should be recorded by dispenser and there should not be any possibility of unmetered gas supply through dispenser in case of Malfunctioning of solenoid valves.

5.64 The vendor is required to design the inlet filter for the Bus dispenser with a primary focus on optimizing the filling process for the bus dispenser. This is to ensure the achievement of the required flow rate and fast filling efficiency for bus arms. Accordingly, the vendor should provide a filter with a higher rated flow capacity with suitable for bus filling while still ensuring effective operation for Bus filling.

5.65 The gas tubing inside the dispensers shall be seamless SS 316, fully annealed (bright annealed), conforming to ASTM A 269. The tubing shall have a maximum hardness of RB 80 or less and be suitable for bending and flaring. The tubes shall be available in ¾" OD, with corresponding ¾" SS 2-way ball valves at the line filter inlet. The end connections shall ¾" OD SS tubes for connection to the bus dispenser, respectively suitable reducer to be consider from ¾'' to 1'' connection for Bus dispenser. Other than that Any open ends on fittings and vents shall be provided with caps or dust plugs.

5.66 Supply of detailed manual for list of error codes with description for programming of all parameters of the dispenser.

5.67 Dispenser tubing work shall be properly arranged with flow direction of gas, banking details, Side of dispenser, Standard operation procedure, on-off indication, ESD labelling & other display label printing as per mentioned in technical documents. All instrumentation Serial numbers & calibration Tag list to be mentioned and shared with IRMEL EIC for easy traceability.

5.68 Tubing & other devices arranged in such a way that they can be properly accessed for operation & maintenance work during operational stage.

Type of Dispenser	Type of flow	Flow Rate kg/min	Target Fill pressure (kg/cm2g)	Fill & Vent hose/ Dispenser
Bus	**Bus-** High Bank	Low-0.1 Nor.-37.5 High-75	**For Bus** 200	For Bus Side- Fill-1/2'' ID Vent-3/8'' or ¼'' ID

6. DESIGN & ENGINEERING SCOPE FOR DISPENSER: -

a) Design & Detailed Engineering
b) Manufacturing & Assembling
c) Procurement from Sub-Vendors
d) Inspection & Testing at Works (TPI will be arranged by IRMEL).
e) Documentation and obtaining statutory approvals as per specification.
f) Packing, Forwarding and Transportation up to Job Sites/ Client's stores.
g) Testing and commissioning, trial run etc.
h) Calibration of the Mass Flow Meter of the supplied dispensers by Master Meter before commencement of performance test.
i) CAMC after site installation of each Bus Dispenser, individually.
j) The sites/station shall be at CGD of IRMEL GA. The Vendor shall be responsible for supply of dispenser at client stores/sites depending upon the availability of sites. The Transportation from client stores to respective sites for erection, installation, testing & commissioning shall be in Vendor's scope.

EXCLUSION

Civil Foundation & Trenches for pipes / Tubes, Instruments air for Dispenser, cable laying from dispenser to Power distribution board & Erection of Dispenser will be done by another contractor. However, Vendor shall provide Dispenser Foundation Design & drawing details during detail Engineering.

7. SAFETY

All Electrical devices shall meet the requirement for the area classification specified elsewhere in tender document. Tubing & other devices shall be so arranged that there is proper access for operation & maintenance.

8. AS BUILT DOCUMENTS

On successful completion of hydrostatic testing and Factory test by TPIA, the Vendor shall prepare As Built drawings & reports of entire Dispenser package as specified in scope of work. All "As Built" drawings / reports shall be submitted as below.

Two sets of hard copies & 1 Set of Soft Copies through E-mail of following

documents shall be submitted by Vendor. All documents shall be bounder together:

i) As-built drawing of Dispenser package GAD / Fabrication Drawing / P&ID etc.

j) Test Reports/Results/Records In addition, the above documents shall also be submitted in electronic media i.e. CD drive/Pen drive.

k) Test Reports/Results/Records MS Word/Excel (MS Office)

l) Drawings AutoCAD

m) Mod-scan data, I/O list, cable schedule, O&M manual, operational philosophy & testing procedure.

If any other document/drawing/data corresponding to Dispenser will be required then Vendor will submit it as suggested by OWNER.

If any changes/modifications in any document/drawing/data corresponding to Dispenser will be required then Vendor will submit modified/updated document as suggested by OWNER on priority.

9. CHECK-LIST FOR SCOPE OF SUPPLY

a) Vendor shall furnish all the equipment of Dispenser System instruments and gauges and safety devices as per the enquiry document. Anything required over the above what is specified, for safe and satisfactory operation of the equipment package shall be included by the Vendor in his scope.

b) 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 is reply is 'NO', Vendor should give reason for the same:

c) Vendor's scope of supply shall include but not limited to be following:

Sl. 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 line filter and elements on each bank with individual needle valve for oil drain.	YES		
1.3	Certificate of "Weights & Measures" approval for Dispenser, Mass Flow Meters .	YES		

1.4	Certificate of "CCOE" / PESO approval for master meter (as applicable).	YES		
1.5	Certificate by Weights and Measures or the other statutory authorities of the country of origin is Provided.	YES		
1.6	Dispenser with Tamper-Proof Locking arrangement	YES		
1.7	Cabinet suitable to accommodate all valves, fitting both flow meters and all required electronic equipment	YES		
1.8	Front/Side mounted Nozzles with lockable holder and safety lever/latch to firmly hold when not in use	YES		
1.9	Separate non-resettable straight forward reading Totalizers Per Side.	YES		
1.10	Liquid filled Pressure Dial gauges of 4"size (Min) Per Side.	YES		
1.11	ESD buttons mounted on both side of the dispenser or front panel.	YES		
1.12	One set of Isolation Valve complete with venting line valve and end plug installed on the inlet of the inlet steel pipes of dispenser.	YES		
1.13	Certificate by Weights and Measures or from the other statutory authorities of the country of origin is Provided.	YES		
1.14	All Electrical equipment and Instrumentation wiring are provided with Certificate of Area Classification.	YES		
1.15	Dispenser automatically and immediately shut off CNG	YES		

	supply to each fill hose individually in case of -Power failure, Failure of metering, Low flow, Failure of Totalizer, Overfill, pressure transducer failure etc.			
1.16	Overall CV is indicated of dispenser from inlet of the dispenser up to outlet probe including mass flow meter, interconnecting tubing, valves, hoses, nozzles etc.,	YES		
1.17	Dispenser is shipped in fully wired and assembled condition only gas supply connection, Instrument Air supply connection and power supply connection shall be made at site.	YES		
1.18	Warranty for a period of 12 months is provided from the date of final site acceptance at CNG facilities by the Company's Engineer In-Charge.	YES		
1.19	**Spares**			
1.20	All necessary Spares and consumables during warranty & CAMC period are in the scope of supplier.	YES		
1.21	**Inspection & Testing**			
1.22	As specified on the datasheets and Technical Specifications	YES		
1.23	**Vendor Data and drawings**			
1.24	All data & drawings as required per VDR format	YES		
1.25	**Erection, commissioning, and trial runs at site of the Dispenser**	YES		

1.26	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 the proposal)	YES		
2.0	**Technical parameters to be confirmed by Vendor**			
2.1	Inlet Pressure Kg/cm2(g) -255	YES		
3.0	Target Fill Pressure Kg/cm2(g) -200	YES		
3.1	Operating Temperature range –[-10°C to 70°C]	YES		
4.0	Electrical Supply Single Phase AC, 230V±} 10%, 50Hz±} 2%.	YES		
4.1	**Fill & Vent Hose-Bus** Fill & Vent for bus side ½'' ID or ¼'' ID	YES		
4.2	Fill hose pressure rating – Working pressure 5000 PSIG	YES		

5.1	**Auto Sequential filling-Single Bank Bus Dispenser**	YES		
6.0	Temperature compensation – 200 kg/cm2 (g) equivalent at 15°C	YES		
6.1	Breakaway couplings for Fill and Vent Hoses for All type CNG Dispenser	YES		
6.2	1 nos. Coriolis(for Side A)-Bus dispenser	YES		
6.3	Flow meters Coriolis type Model with integral display – For each side of CNG dispenser	YES		
6.4	Min. Flow rate – Bus : 0.1 kg/min & Design Flow rate ≥75 Kg/min.	YES		
6.5	Batch delivery accuracy - ± 1.5% of batch	YES		
6.7	Mass flow accuracy for gas meter - ± 0.5% (inclusive of sis & linearity, hysteresis & repeatability errors	YES		
6.8	Calibration traceability - To NIST as per ISO 5168	YES		
6.9	Repeatability - ±} 0.3 %	YES		
6.10	Enclosure weatherproofs to - IP55, NEMA-4x	YES		
6.11	Pressure rating of Wetted parts - 5000 psi(g) At 25°C as per ASME/ANSI B 31.3	YES		
6.12	Process Temperature effect - ±} 0.01% of nominal flow	YES		Vendor to confirm the model
6.13	Surge and frequency Transient - Shall be in compliance with ANSI/EEE(EFT)c 62.41(1991)/ IEC std.	YES		
6.14	EMI effect on sensor and Transmitter - To the	YES		

	requirement of EMC directive			
6.15	Vibration effect - As per SAMA PMC / IEC latest edition requirements	YES		

10. SCOPE OF WORK FOR COMPREHENSIVE ANNUAL MAINTENANCE

10.1 General:

10.1.1 This contract covers the provision of services to undertake the Comprehensive Maintenance as per Company schedule and Breakdown repair of CNG dispensers as & when complaints are received at CNG control room. For the purpose of clarity, the agency providing maintenance services for above dispensers shall, herein after be referred to as "Contractor" and the company hiring the services of the agency will, herein after be referred to as "Company" (IRM ENERGY LIMITED (IRMEL).)

10.1.2 "Comprehensive Maintenance refers to preventive maintenance of equipment as per schedule which includes breakdown, equipment spare parts replacement, engineering and labor charges."

10.2 Preventive Maintenance:

To carry out the Preventive & Breakdown maintenance of dispensers strictly in accordance with the schedule provided by Company / OEM Manual. The Contractor shall confirm to Company their availability to carry out the Maintenance in advance.

The spares required for carrying out preventive maintenance shall be in the scope of Contractor. The contractor personnel shall inform the exact time to the EIC before and after carrying out the maintenance.

The Contractor shall ensure all required consumables such as cotton waste, cleaning solvent, insulation tapes, thinner, soap solution, Teflon tape etc. including required tools & tackles, are available on site. Supply of all consumables, tools & tackles etc. is in the scope of Contractor. Tools shall include all type of mechanical & electrical tools, multi meters, instruments, Laptop with required software (Pro-link etc.) etc.

Contractor shall note down the dispenser performance before and after carrying out the maintenance. Contractor to submit report of Percentage difference between Mass Flow Meter and Non-rest-table Totalizer on fortnight

or Monthly basis as per order of EIC. Later on after continuous operation, if calibration of installed Mass Flow Meter will be required. Same should be perform by Contractor at site with the help of laptop and suitable software.

Only in case of lab calibration, if established by Contractor in front of IRM Energy Limited Site in charge through proving exercise by Standard Master Calibration Device, During CAMC Contractor will be entitled to send the Mass Flow Meter, PG, PT, safety relief valve for calibration at its own cost.

Preventive maintenance will be carried out on Monthly basis during non-peak hours in consultation with EIC. Any maintenance that needs to be taken up shall be well planned in advance with due approval of EIC.

The contractor shall produce the compliance report of each maintenance activity on the next Working day to the Engineer - In – Charge in soft & Hard Copy both. Compliance report shall be descriptive in nature. Provide proper communication facilities to all contractor personnel such as engineers, Technicians etc.

The contractor shall inform the Company, names and mobile numbers of all the service personnel who will be deployed for providing the services during the CAMC. An alternate number will also be informed to the company, which can be contacted in case all service personnel's mobile are not reachable. Changes, if any, will be notified to the company.

The contractor shall produce Escalation Matrix for Preventive Maintenance from service person up to Contractor's authorized person for all the maintenance activities of all the dispensers to the Company.

Contractor's authorized person will be liable to monitor that all the maintenance activities performed in satisfactory manner at Company's all sites & in all dispensers.

If any type of issues will be raised by Company's engineer in-charge to Contractor's authorized person via telephonic/e-mail communication, then it will be immediately taken into count by the contractor & issue will be incorporated within mean time.

10.3 Break down Repair:

On receiving information from the CNG control room/Dealer, contractor shall ensure that his team reaches the concerned retail outlet. Attend to dispenser breakdown service calls on 24X7 basis. The service personnel will report to the call site within 2 hours from the time of receiving service call in M/s IRM Energy Limited site or at whatever site dispensers are installed, (Prior Information will be provided for location of installation of Dispensers).

Before proceeding to the outlet, the contractor personnel shall collect all necessary spares required for the repair depending on the nature of the complaints received. Upon reaching the retail outlet, the contractor personnel shall contact the CNG Control room to advise his attendance on site and confirm the breakdown reporting.

The contractor shall coordinate with the Company representative for instructions on undertaking the repair work. After solving the complaint, the contractor shall inform CNG control room. Provide proper communication facilities to all contractor personnel such as engineers, technicians etc., Maintain records of the services provided, and submit the same to the company, once in a Month.

10.4 Reports to be submitted

10.4.1.1 Reports (in soft copy and print form) of individual equipment as and when the dispensers are undertaken for preventive maintenance/break down/on complaint service. Report shall be descriptive in nature including nature and quantity of material used or repaired.

10.4.1.2 Monthly cumulative list on preventive maintenance/breakdown repair/ on complaint service of dispensers carried out with actual date and time of service.

10.4.1.3 Monthly cumulative list on consumption of spares in each dispenser consumed during preventive maintenance/breakdown repair/ on complaint service attend. Separate analysis report on breakdown if anything occurred which needs special attention.

10.4.1.4 Report of Percentage difference between Mass Flow Meter and Non-Resettable Totalizer as per guaranteed parameter declared at the time of supply.

10.5 Breakdown Penalty

In case, the contractor's service personnel are unable to reach the break down site within stipulated time or is unable to complete the maintenance within stipulated time, following penalty will be applicable.

This amount will be deducted from the invoice raised by the contractor, at the end of the month.

10.9.2 Penalty for 1-hour delay (After 1 Hours from complaint notification time) in reaching at all site (e.g., within 2 hours instead of 1 hours) – Rs 200/- per hour arm per dispenser.

10.9.3 If the shutdown time, which will be calculated from the complaint notification time, is extended beyond 4 hours, a penalty of Rs 500/- per hour (After 4 Hours) will be applicable.

10.9.4 Contractor shall not deploy the employee of age less than 18 years in any of the activities. If it is found, then it will be viewed seriously and heavy penalty of Rs. 20000/-per instance and also the termination/blacklist will be done from our approved vendor list.

10.9.5 The contractor shall provide full Personal Protective Equipment (PPE) to each individual employee as per Job requirement & instruction of IRMEL. It is mandatory for all personnel to wear said PPE whilst performing their duties, failing which a penalty @ Rs. 500/- per incidence will be levied in addition to dismissal of the person.

10.10 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.

10.11 The penalty clause and maintenance charges will come into force immediately after successful commissioning & sales commencement as defined in the tender.

10.11.1 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.

10.11.2 The Vendor should maintain sufficient spares for breakdown & scheduled maintenance. OWNER can check/ audit spare.

10.11.3 The Contractor/vendor has to provide scheduled maintenance details and list of normal Operation spares required for operation & maintenance along with bid as per mentioned in **Annexure -1C**. The Vendor should maintain sufficient spares for breakdown & scheduled maintenance. OWNER can check/ audit spare

10.11.4 Stock and vendor has to ensure availability of required spares as per list*. *The provided list is only indicative. Vendor has to maintain all spares / consumables required for uninterrupted operations of at least

06 months for each Dispenser Unit.

ANNEXURE-1C

- The contractor has to maintain following minimum spares of each GA location.
- The list is indicative only, actual list of items and qty. may be depending upon site usage and OEM recommendation.

	Full Description	Base Stock Qty./10 Dispenser unit (Nos.)
01	2 way ball valve seal Kit	2 Nos.
02	Start Push-Button	2 Nos.
03	STOP Push-Button	2 Nos.
04	Battery for Dispenser	1 Nos.
05	Three Way Ball Valve	1 Nos.
06	¼" Vent Tube	2 Nos.
07	2 way Teflon sheet	2 Nos.
08	Keypad Display	1 Nos.
09	Keypad controller	1 Nos.

10	Solenoid valve / Actuated ball valve along with seal kit-For Bus dispenser	02 nos.
11	NGV to NZS probe/nozzle	02 nos.
12	NZS O-ring and other seal kit	02 set
13	Long Hose (4.5 Mtr.)	01 set
14	Short Hose (1.8 Mtr.)	01 set
15	Breakaway coupling	02 nos.
16	Mother Board / microcontroller unit	01 nos.
17	Power supply unit	01 nos.
18	Fuse card	02 set
19	Line Filter O-ring	05 set
20	Filter Element	02 nos.
21	Safety Relief valve(SRV)	1 Nos.

Energising Quality	**PROJECT NUMBER: VCS-IRMEL-C261159**	IRM Energy

COMPREHENSIVE ANNUAL MAINTENANCE CONTRACT (CAMC)–CNG/CBG DISPENSERS			Client Job Number		C261159
			Total Sheets		12
Document No	C261159	00	ME	CAMC	3001

SUPPLY OF CNG/CBG CAR, COMBO AND BUS DISPENSERS IN THE CGD OF IRM ENERGY LIMITED (IRMEL) IN 4 GA's OF BANASKANTHA, DIU & GIR SOMNATH, FATEHGARH SAHIB & NAMAKKAL & TIRUCHIRAPPALLI.

REV	DATE	DESCRIPTION	PREP	CHKD	APPR
C3	23.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C2	05.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C1	22.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB

CONTENTS

1.0 INTRODUCTION:

The date of successful commissioning and performance test at site will considered date of start of the warranty periods for 12 months. After completion of warranty periods Comprehensive annual maintenance contract (CAMC) will start. The supplier must follow the COMPREHENSIVE ANNUAL MAINTENANCE (CAMC) 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 CAMC 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 organization without prior permission of Client.

2.6 Compliance of laws

The contractor deploying workmen as contract labor 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 labor laws legislation's including labor license from the competent authority under the Contract Labor ("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 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 necessary proof of 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

- 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.
- During the currency of this contract, Client can increase or decrease the number of the services / technicians to meet contractual requirements.
- 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 & TERMINATION:

- CLIENT shall reserve 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 if any.

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 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 PENALTY OBLIGATION AGAINST CAMC:

- During the one-year warranty period and 4-year post warrantee period the Contractor must ensure that the dispenser is performing required services as define in the contract documents well round the 24 hours a day & 365 days. During CAMC services if dispensers break down any time then Client have right to impose penalty as defined in Contract.

5.1 **Penalty:**

- In case, the contractor's service personnel are unable to reach the break down site within stipulated time or is unable to complete the maintenance within stipulated time, following penalty will be applicable. This amount will be deducted from the invoice raised by the contractor, at the end of the month.
- Penalty for 1-hour delay (After 1 Hours from complaint notification time) in reaching at all site (e.g., within 2 hours instead of 1 hours) – Rs 200/- per hour arm per dispenser.
- If the shutdown time, which will be calculated from the complaint notification time , is extended beyond 4 hours, a penalty of Rs 500/- per hour (After 4 Hours) will be applicable.
- Contractor shall not deploy the employee of age less than 18 years in any of the activities. If it is found, then it will be viewed seriously and heavy penalty of Rs. 20000/-per instance and also the termination/blacklist will be done from our approved vendor list.

- The contractor shall provide full Personal Protective Equipment (PPE) to each individual employee as per Job requirement & instruction of IRMEL. It is mandatory for all personnel to wear said PPE whilst performing their duties, failing which a penalty @ Rs. 500/- per incidence will be levied in addition to dismissal of the person.

5.2 In any case, the maximum penalty imposed in a month for non-performance of the equipment would be limited to 75 % of the amount of Maintenance charges to be paid to the contractor per month per dispenser.

5.3 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.

5.4 The penalty clause and maintenance charges will come into force immediately after successful commissioning & sales commencement as defined in the tender.

5.5 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-change or his representative.

7.0 EMPLOYMENT LIABILITY OF CONTRCATOR:

7.1 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.

7.2 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.

7.3 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.

7.4 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 what-so-ever 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 :

8.1 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 (Tentatively 1 Nos. per 5 Nos. CNG Stations) 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.

iv) Contract in person or his authorized representative shall provide the services on daily basis to interact with Engineer-in-charge and deployed workman.

v) 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.

vi) 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.

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

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

ix) 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.

x) 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.

xi) 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.

xii) 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.

xiii) 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.

xiv) 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.

xv) 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 hrs.) 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.

xvi) 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 hrs.) to whom client can inform any problem regarding dispenser for corrective action immediately.

xvii) 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.

xviii) The successful Contractor shall indemnify the company from any claim of the contract labor.

xix) 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.

xx) 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.

9.0 MAINTENANCE OF DISPENSER PACKAGES :

During one-year warranty, period and Nine years post warranty period. (As applicable, refer respective SOR / scope of work in tender).

9.1 SCOPE OF SUPPLY & CAMC SERVICE DURING WARRANTY PERIODS: -

All consumables, man power, sealant etc. required for carrying out the maintenance of the complete dispenser package during the warranty period, including periodic, breakdown maintenance for continuous and uninterrupted operation of the dispenser shall be in scope of the Contractor. A consolidate list has to be provided during detailed engineering for such type of spare. All the damaged part has to be replaced with new within the stipulated time. Electricity shall be supplied free of cost to the Contractor.

9.2 SCOPE OF SUPPLY & CAMC SERVICE DURING POST WARRANTY PERIODS : -

Any spare parts including consumables required during CAMC service period, shall be in scope of Bidder. All the consumables, man Power etc.

required for carrying out the maintenance of the complete dispenser package during the Warranty period, and post warranty including periodic, breakdown maintenance for continuous and uninterrupted operation of the dispenser shall be in scope of the Contractor and shall be kept in stock. Electricity shall be supplied free of cost to the Contractor.

9.2.1 SCOPE OF SERVICES : -

- The Contractor shall have to keep all the spares, consumables, grease, 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.

- 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 the any maintenance activity.

- 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.

- The periodic maintenance required to be done, as per OEM recommendation & as per IRMEL requirement shall be taken up promptly. The Contractor shall follow the detailed preventative/planned/corrective maintenance schedule provided by IRMEL.

- 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.

- Arrangement, Supply, Transfer & Delivery of All the required Spares, Consumables, Equipment, & Material etc. the at IRMEL site/stores will be completely in the Scope of Contractor. Also, transfer of all the required material from IRMEL store, Contractor Store or from any other location to IRMEL Site location will be in Contractor's scope.

- 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 consequences for non-replacement of such parts shall be the Responsibility of the Contractor.

- All routine and periodic checks / inspections required to be done as per OEM manual/recommendation shall be done by the Contractor as per the schedule provided by IRMEL. Instruments required for above inspection

like Vernier caliper, micrometer screw gauge, fill gauges, bore gauge etc. shall be in scope of the Contractor and contractor shall calibrate these instruments/ shall submit calibration report to IRMEL.

- The supplier shall submit a copy of the daily / weekly / fortnightly / monthly / bimonthly / quarterly and yearly maintenance report to the EIC in both soft and hard form. All stationery including the printed material shall be in scope of the Contractor.

- 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.

- 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.

- The Contractor shall provide support in calibration of all instruments such as pressure gauges, transmitters, mass flow meters along with all safety relief valves. However, calibration of these instruments shall be in scope of IRMEL.

ENERGISING QUALITY	**PROJECT NUMBER: VCS-IRMEL-C261159**	IRM Energy

DATA SHEET OF CNG/CBG MASS FLOW METER			Client Job Number	C261159	
			Total Sheets	24	
DOCUMENT NO	C261159	00	ME	DS	3001

SUPPLY OF CNG/CBG CAR, COMBO AND BUS DISPENSERS IN THE CGD OF IRM ENERGY LIMITED (IRMEL) IN 4 GA's OF BANASKANTHA, DIU & GIR SOMNATH, FATEHGARH SAHIB & NAMAKKAL & TIRUCHIRAPPALLI.

C3	23.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C2	05.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C1	22.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
REV	**DATE**	**DESCRIPTION**	**PREP**	**CHK**	**APPR**

MASS FLOW METER (CORIOLIS TYPE) DATA SHEET				
	Sl. No.	**Description**	**Client Specifications**	**Vendor to Provide**
General	01.	Tag No.	#	#
	02.	Service	#	#
	03.	Model No.	#	#
	04.	Make	Emerson / E&H	#
	05.	Measuring principle	Coriolis type	-
	06.	Fluid	Natural Gas	-
	07.	Design Pressure	345 bar(g)	-
	08.	Working pressure	250 bar(g)	-
	09.	Nominal Line size (inches)	½'' to ¾''(DN15 to DN20)	-
Hazardous Area Requirements	10.	Electrical Area classifications	IEC Zone 1 Gr IIA, IIB	-
	11.	Ingress Protection Rating	IP 66/67	-
	12.	Certification Required	ATEX IECEx / Exi/Exd	-
	13.	Hazardous area classifications	Class I, Div. 1, Groups C and D	-
Sensor unit	14.	Sensor unit series	CNG/CBG Mass	-
	15.	Type	Coriolis	-
	16.	Function	Mass flow	-
	17.	Connection size / ratings	#	#
	18.	Facings & finish	RF 125AARH	-
	19.	Custody transfer	#	#
	20.	Flow tube Design pressure ratings	#	#
	21.	Combined sensor and process fitting ratings	#	#
	22.	Union to NPT adapter piece ratings	#	#
	23.	Body Material	SS316	-
	24.	Sensor Housing Material leads	SS Hermetically Sealed	-

	25.	Sensor/Wetted Parts Material	SS316	-
	26.	Enclosure	WP to IP 66/67 (EN60529)	-
	Sl. No.	**Description**	**Client Specifications**	**Vendor to Provide**
Sensor unit	27.	Non-Wetted Parts Material	#	#
	28.	Intrinsically safe	Required	-
	29.	Flow range Max./Min.(kg/min)	#	#
	30.	Batch Accuracy	+/-0.5 %	-
	31.	Repeatability	+/-0.25 %	-
	32.	Jacketing	Required	-
	33.	Zero stability	0.009 kg/min.	-
	34.	Sensor weight (kg)	#	#
	35.	Turn down	10:1	#
	36.	Pressure Relief path	Required	#
Transmitter unit	37.	Enclosure	FLP+WP	-
	38.	Mass & Vol. Flow display	Required	-
	39.	Density	N/a	-
	40.	Display configuration	Integrated display with sensor module	-
	41.	Power	Both AC & DC supply applicable	-
	42.	Transmitter Output	4-20 mA	-
	43.	10KHz pulse	Required	-
	44.	Modbus communication	Required	-
	45.	HART wireless communication	Required	-
	46.	Transmitter Design Temperature	-40° to 120°C	-
	47.	Transmitter Housing	NEMA 4X(IP66/67)	-
	48.	Electronics interface	#	#
	49.	Load Driving Capability in ohms	600 Ω	-
	50.	Conduit connection	1/2-inch NPTF (Applicable for Brass gland FLP Type)	-

	51.	Diagnosis application software	As per latest application software	-
	52.	Power consumption in watt	#	#
	53.	Baud Rate	#	#
	54.	Meter ID	#	#
	55.	Flow rate Measured	Kg/min.	-
Transmitter unit	**Sl. No.**	**Description**	**Client Specifications**	**Vendor to Provide**
	56.	Low flow cutoff @	0.1 kg/min.	-
	57.	High flow cutoff @	#	#
	58.	Transmitter Earthing point	Required	-
	59.	Equipment Ground	Required	-
	60.	Totalizer	shall be non-volatile and non-resettable	-
	61.	Local Display with touchless sensor	Integral with Transmitter unit	_
Fluid data	62.	Fluid / State	CNG/CBG / GAS	-
	63.	Pressure: Operating / Max.	200 Bar(g) / 250 Bar(g)	-
	64.	Temperature: Operating / Max.	Refer Technical specifications	-
	65.	Operating density (kg/m3)	170 to 219 kg/m3 @ 15°C	-
	66.	Relative Molecular mass	16.80 kg/k mol.	-
	67.	Operating viscosity	Cp	-
	68.	Maximum allowable pressure drops	Bar(g)	-
Parameter Display	69.	Mass flow rate (kg/Min.)	#	#
	70.	Gas Temperature (°C)	#	#
	71.	Volume flow rate (L/min.)	#	#
	72.	Volume total (Liter)	#	#
	73.	Mass total (kg)	#	#
Certification	74.	AGA11 conformance	Required	#
	75.	Hazardous Area PESO	Required	#
	76.	Hazardous Area ATEX	Required	#
	77.	Custody Transfer-W&M India approval	Required	#
	78.	Calibration Certificates as per ISO 17025	Required	-

Inspection & Testing	79.	Material Inspection certificates	Required	-
	80.	Radiographic Test certificates	Required	-
	81.	Pressure Testing	Required	-
		Weld examination	Required	-
Mounting Condition	82.	Inlet to Outlet Connection	Inline type to process connection	_

NOTE: -

I. Vendor to provide the data as marked "#".

II. Vendor to provide individual data sheet along with operating manual & other compliance certificates during detail engineering.

III. Vendor shall provide proper earthing of mass flow meter as per oem standards.

IV. Vendor shall verify three common types of field verification checks, which include meter zero verification, sensor diagnostic checks, and transmitter diagnostic checks. Performing these verification procedures will confirm accurate performance of the Coriolis meter and when an out of tolerance condition exists where re-calibration of the sensor maybe required.

V. Vendor shall mount the mass flow meter in gas service the ideal orientation of the sensor is with the flow tubes in the upright position.

VI. Bidder shall check meter **Zero stability periodically** and reset if it does not meet the manufacturer's / OEM specifications.

VII. Bidder shall establish Mass flow meter in accuracy measurement & Mass totalizer jumping issue diagnosis details In order to adjust the zero of the meter there must be no flow through the flow sensor and the sensor must be filled with gas at process conditions by using both upstream & downstream Ball valve to be provided for on-site Zero calibration.

VIII. The meter zero must be established at process conditions of temperature, pressure and density. Even though the stream is not flowing, the flow meter may indicate a small amount of flow, either positive or negative. Which shall referred as per OEM standards.

IX. The bidder shall replace or diagnosis the mass flow meter if meter Calibration fail & Mass totalizer Jumping issues continuously at site.

ENERGISING QUALITY	**PROJECT NUMBER: VCS-IRMEL-C261159**	IRM Energy

DATA SHEET OF CNG/CBG CAR DISPENSER

DOCUMENT NO	C261159	00	ME	DS	3002

SUPPLY OF CNG/CBG CAR, COMBO AND BUS DISPENSERS IN THE CGD OF IRM ENERGY LIMITED (IRMEL) IN 4 GA's OF BANASKANTHA, DIU & GIR SOMNATH, FATEHGARH SAHIB & NAMAKKAL & TIRUCHIRAPPALLI.

C3	23.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C2	05.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C1	22.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
REV	**DATE**	**DESCRIPTION**	**PREP**	**CHK**	**APPR**

CAR DISPENSER DATASHEET			
S. No.	**DESCRIPTION**	**SPECIFICATION**	**OFFERED**
1	**Dispenser**	Car	
1.1	Make	#	
1.2	Model	#	
1.3	Normal inlet Pressure Kg/cm2 g	255	
1.4	Maximum Fill Pressure kg/cm2g	200	
1.5	Operating Temperature range of wetted parts	(-) 10 °C to 60 °C	
1.6	Flow Rate (kg/min)	15	
1.7	Normal flow (kg/min)	#	
1.8	Minimum flow (kg/min)	#	
1.9	Overall Cv of dispenser from inlet of dispenser to outlet of fill nozzle	#	
1.10	Batch accuracy	1.5%	
2	**Electrical supply**	AC 230 Volts 10% 50 Hz 3 %	
2.1	Tolerance value of voltage range for accurate operation	#	
3	**Fill Nozzle**	#	
3.1	Type	NGV1 Type2 Class A in both arm with NZS adopter (NGV to NZS)	
3.2	Make	Refer approved vendor list	
3.3	Pressure Rating kg/cm2 g	255 Kg/cm2 g	
3.4	Fill pressure through NGV nozzle	200 kg/cm2 g	
4	Flexible fill & vent hose	Both should separate	
4.1	Type	#	
4.2	Make	#	
4.3	Pressure rating kg/cm2 g	#	
5	**Sequential filling**	Three Bank	
6	Mass flow meter	#	
6.1	No. of metering lines	Two independents	
6.2	Metering principle	Coriolis mass flow with integral Display	
6.3	Make	#	
6.4	Model	#	
6.5	Mass flow accuracy for gas meter (inclusive of linearity, hysteresis, repeatability errors)	0.5%	

6.6	Repeatability	0.25%	
7	Temperature compensation	YES	
S. No.	**DESCRIPTION**	**SPECIFICATION**	**OFFERED**
8	Frame Material / Internal accessories	SS316 /SS 304	
9	Breakaway coupling	YES	
10	Vent Return coupling	YES	
11	Fill Breakaway coupling size	3/8''	
12	Vent Return coupling size	1/4''	
13	Total Power consumption by dispenser	#	
14	Tube pressure rating	5000 Psi(g)	
15	Fill Valve Type	3-way ball valve	
16	Fill Hose Length	Min. 4 Mtr.	
17	Hose Burst Pressure	4 time of working Pressure	
18	ESD switch	Required on Both side	
19	Earth Quake zone	III	
20	Temperature Compensation	Required	
21	Installation	Outdoor	
22	Captured vent	Yes	
23	Electrical Area hazard	Class I, Zone I	
24	Gas Group	D, Group-IIA/IIB	
25	Dispenser tubing	SS316	
26	FLP Solenoid Valve / Pneumatic valve	Required	
27	FLP Solenoid Valve / Pneumatic valve supply	AC/DC (#)	
28	LCD Display supply	AC/DC (#)	
29	Electronics Mother Board	AC/DC (#)	
30	Overall, Power consumption at Min. flow rate (Watt)	#	
31	Overall, Power consumption at Max. flow rate (Watt)	#	
32	Spares & Consumables	Required	
33	Shipping Weight of Dispenser	#	
34	Gas Group	D, Group-IIA/IIB	
35	Bleed & Needle valve	Required	

NOTE: -

I. Fill checklist for completeness of the Scope of Supply.
II. 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.

III. Two no's of holster/cradle for filling nozzles along with weather caps for the protection of nozzles. Holster / cradle shall be suitable for NGV/NZS Nozzles.

IV. Vendor to Provide the Data as Marked "#".

V. Vendor To provide Individual data sheet of Solenoid valve, Actuator, SRV, Pressure Transmitter, Ball valves, Electronics Mother Board, Hoses, Surge protection device, fill Nozzle, Breakaway coupling, Coalescing Filter during Detail Engineering.

ENERGISING QUALITY	**PROJECT NUMBER:** **VCS-IRMEL-C261159**	IRM Energy

DATA SHEET OF CNG/CBG BUS DISPENSER

DOCUMENT NO	C261159	00	ME	DS	3003

SUPPLY OF CNG/CBG CAR, COMBO AND BUS DISPENSERS IN THE CGD OF IRM ENERGY LIMITED (IRMEL) IN 4 GA's OF BANASKANTHA, DIU & GIR SOMNATH, FATEHGARH SAHIB & NAMAKKAL & TIRUCHIRAPPALLI.

REV	DATE	DESCRIPTION	PREP	CHK	APPR
C3	23.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C2	05.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C1	22.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB

BUS DISPENSER DATASHEET			
S. No.	**DESCRIPTION**	**SPECIFICATION**	**OFFERED**
1	**Dispenser**	Bus	
1.1	Make	#	
1.2	Model	#	
1.3	Normal inlet Pressure Kg/cm2 g	255	
1.4	Maximum Fill Pressure kg/cm2g	200	
1.5	Operating Temperature range of wetted parts	(-) 10 °C to 60 °C	
1.6	Flow Rate (kg/min)	75	
1.7	Normal flow (kg/min)	#	
1.8	Minimum flow (kg/min)	#	
1.9	Overall Cv of dispenser from inlet of dispenser to outlet of fill nozzle	#	
1.10	Batch accuracy	1.5%	
2	**Electrical supply**	AC 230 Volts 10% 50 Hz 3 %	
2.1	Tolerance value of voltage range for accurate operation	#	
3	**Fill Nozzle**	#	
3.1	Type	NGV1 Type1 Class A Nozzle as per ISO14469	
3.2	Make	Refer Approved vendor list	
3.3	Pressure Rating kg/cm2 g	255 Kg/cm2 g	
3.4	Fill pressure through NGV nozzle	200 kg/cm2 g	
4	Flexible fill & vent hose	Single Side	
4.1	Type	#	
4.2	Make	#	
4.3	Pressure rating kg/cm2 g	#	
5	**Sequential filling**	Single Bank	
6	Mass flow meter	#	
6.1	No. of metering lines	Single	
6.2	Metering principle	Coriolis mass flow with integral Display	
6.3	Make	#	
6.4	Model	#	
6.5	Mass flow accuracy for gas meter (inclusive of linearity, hysteresis, repeatability errors)	0.5%	
6.6	Repeatability	0.25%	

7	Temperature compensation	YES	
Sl. No.	**DESCRIPTION**	**SPECIFICATION**	**OFFERED**
8	Frame Material / Internal accessories	SS316 /SS 304	
9	Breakaway coupling	YES	
10	Vent Return coupling	YES	
11	Fill Breakaway coupling size	1/2''	
12	Vent Return coupling size	3/8'' (or) ¼''	
13	Total Power consumption by dispenser	#	
14	Tube pressure rating	5000 Psi(g)	
15	Fill Valve Type	Type-1 Class-A Nozzle CT5000	
16	Fill Hose Length	Min. 4 Mtr.	
17	Hose Burst Pressure	4 time of working Pressure	
18	ESD switch	Required on Both side	
19	Earth Quake zone	III	
20	Temperature Compensation	Required	
21	Installation	Outdoor	
22	Captured vent	Yes	
23	Electrical Area hazard	Class I, Zone I	
24	Gas Group	D, Group-IIA/IIB	
25	Dispenser tubing	SS316	
26	FLP Solenoid Valve / Pneumatic valve	Required	
27	FLP Solenoid Valve / Pneumatic valve supply	AC/DC (#)	
28	LCD Display supply	AC/DC (#)	
29	Electronics Mother Board	AC/DC (#)	
30	Overall, Power consumption at Min. flow rate (Watt)	#	
31	Overall, Power consumption at Max. flow rate (Watt)	#	
32	Spares & Consumables	Required	
33	Shipping Weight of Dispenser	#	
34	Bleed & Needle valve	Required	

NOTE: -

I. Fill checklist for completeness of the Scope of Supply.

II. 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 clients Laptop shall also be provided.

III. 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.

IV. Vendor to Provide the Data as Marked "#".

V. Vendor To provide pro-link latest software for online diagnosis if troubles found during operation

ENERGISING QUALITY	**PROJECT NUMBER: VCS-IRMEL-C261159**	IRM Energy

DATA SHEET OF CNG/CBG CAR CUM BUS DISPENSER			Client Job Number	C261159	
			Total Sheets	04	
DOCUMENT NO	C261159	00	ME	DS	3004

SUPPLY OF CNG/CBG CAR, COMBO AND BUS DISPENSERS IN THE CGD OF IRM ENERGY LIMITED (IRMEL) IN 4 GA's OF BANASKANTHA, DIU & GIR SOMNATH, FATEHGARH SAHIB & NAMAKKAL & TIRUCHIRAPPALLI.

C3	23.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C2	05.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C1	22.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
REV	**DATE**	**DESCRIPTION**	**PREP**	**CHK**	**APPR**

CNG/CBG CAR CUM BUS DISPENSER DATASHEET			
Sl. No.	**DESCRIPTION**	**SPECIFICATION**	**OFFERED**
1	**Dispenser**	Car Cum Bus	
1.1	Make	#	
1.2	Model	#	
1.3	Normal inlet Pressure Kg/cm2 g	255	
1.4	Maximum Fill Pressure kg/cm2g	200	
1.5	Operating Temperature range of wetted parts	(-) 10 °C to 60 °C	
1.6	Design Flow Rate (kg/min) (Min./Norm. /Max.)	0.1 kg/min./37.5 kg/min. & ≥75 kg/min. **for Bus side** 0.1 kg/min./7.5 kg/min./ ≥ 15 kg/min. **for Car side**	
1.7	Normal flow (kg/min)	#	
1.8	Minimum flow (kg/min)	#	
1.9	Overall Cv of dispenser from inlet of dispenser to outlet of fill nozzle	#	
1.10	Batch accuracy	+/-1.5%	
2	**Electrical supply**	AC 230 Volts 10% 50 Hz 3 %	
2.1	Tolerance value of voltage range for accurate operation	#	
3	**Fill Nozzle**	#	
3.1	Type	NGV1 Type2 Class A in one arm with adopter (NGV to NZS) & Heavy-duty Bus nozzle NGV1 & ISO14469 Type 1	
3.2	Make	Refer Technical specification	
3.3	Pressure Rating kg/cm2 g	255 Kg/cm2-g	
3.4	Fill pressure through NGV nozzle	200 kg/cm2-g	
4	Flexible fill & vent hose	Both should separate	
4.1	Type	#	
4.2	Make	#	
4.3	Pressure rating kg/cm2 g	#	
5	**Sequential filling**	Three Bank for Car & Three Bank for Bus	
6	Mass flow meter	#	
6.1	No. of metering lines	Two independents	

6.2	Metering principle	Coriolis mass flow with integral Display	
6.3	Make	#	
6.4	Model	#	
6.5	Mass flow accuracy for gas meter (inclusive of linearity, hysteresis, repeatability errors)	0.5%	
6.6	Repeatability	0.25%	
7	Temperature compensation	YES	
8	Frame Material / Internal accessories	SS 304	
9	Breakaway coupling	YES	
10	Vent Return coupling	YES	
11	Fill Breakaway coupling size	3/8" For Car Arm & ½" ID for Bus Arm	
12	Vent Return coupling size	1/4"	
13	Total Power consumption by dispenser	#	
14	Tube pressure rating	5000 Psi(g)	
15	Fill Valve Type	3-way valve	
16	Fill Hose Length	Min. 4 Mtr.	
17	Hose Burst Pressure	4 time of working Pressure	
18	ESD switch	Required on Both side	
19	Earth Quake zone	III	
20	Temperature Compensation	Required	
21	Installation	Outdoor	
22	Captured vent	Yes	
23	Electrical Area hazard	Class I, Zone I	
24	Gas Group	D, Group-IIA/IIB	
25	Dispenser tubing	SS316	
26	FLP Solenoid Valve / Pneumatic valve	Required	
27	FLP Solenoid Valve / Pneumatic valve supply	AC/DC (#)	
28	LCD Display supply	AC/DC (#)	
29	Electronics Mother Board	AC/DC (#)	
30	Overall, Power consumption at Min. flow rate (Watt)	#	
31	Overall, Power consumption at Max. flow rate (Watt)	#	
32	Spares & Consumables	Required	
33	Shipping Weight of Dispenser	#	
34	Gas Group	D, Group-IIA/IIB	
35	Bleed & Needle valve / Block & bleed valve	Required	

NOTE: -

VI. Fill checklist for completeness of the Scope of Supply.

VII. 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.

VIII. 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.

IX. Vendor to Provide the Data As Marked "#".

X. Vendor To provide Individual data sheet of Solenoid valve, Actuator, SRV, Pressure Transmitter, Ball valves, Electronics Mother Board, Hoses, Surge protection device, fill Nozzle, Breakaway coupling, Coalescing Filter during Detail Engineering.

ENERGISING QUALITY	**PROJECT NUMBER: VCS-IRMEL-C261159**	IRM Energy

DATA SHEET OF GLYCERINE FILLED PRESSURE GAUGE			Client Job Number	C261159	
			Total Sheets	03	
DOCUMENT NO	C261159	00	ME	DS	3005

SUPPLY OF CNG/CBG CAR, COMBO AND BUS DISPENSERS IN THE CGD OF IRM ENERGY LIMITED (IRMEL) IN 4 GA's OF BANASKANTHA, DIU & GIR SOMNATH, FATEHGARH SAHIB & NAMAKKAL & TIRUCHIRAPPALLI.

C3	23.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C2	05.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C1	22.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
REV	**DATE**	**DESCRIPTION**	**PREP**	**CHK**	**APPR**

PRESSURE GAUGE DATASHEET			
S. No.	**DESCRIPTION**	**SPECIFICATION**	**OFFERED**
1.	Type of service	CNG/CBG	
2.	Pressure Gauge Type	Bourdon sensing	
3.	Mounting	Local	
4.	Model	#	
5.	Case Filling	Liquid Filled Case	
6.	Dial Size	100 mm	
7.	Color	White with black inscriptions	
8.	Case Material	SS316 with bayonet bezel Phenol with screwed bezel	
9.	Bezel Ring	Bayonet type SS316	
10.	Window	Shatterproof glass	
11.	Enclosure	WP to IP 65 as per IEC 60529 / IS 2147	
12.	Pressure Elements	Bourdon type	
13.	Elements/Socket Material	SS 316	
14.	Accuracy	+/-0.5% FSD	
15.	Zero Adjustments	Micro pointer	
16.	Connection	½'' NPTM Centre / back mount	
17.	Connection location	Bottom	
18.	Movements	SS316	
19.	Range	0 to 400 kg/cm2	
20.	Least Count	10 kg/cm2	
21.	Ref. Standards	EN 837 Latest version	
22.	Protection	WP to IP68 (IS:13947 part I / IEC:60529)	
23.	Bourdon	SS316	
24.	Connection	½'' NPT(M)	
25.	Over Range	As per EN 837	
26.	Zero Adjustment	#	
27.	Socket	22 mm SQ. in SS316	
28.	Blow out Disc	Required	
29.	Temperature Suitability	-20°C to 60°C	
30.	Temperature Effects	Within +/-0.4 % FSD/10°C	

31.	Diaphragm seal	#	
32.	Wetted parts materials	#	
33.	Process connection size & ratings	#	
34.	Flushing & filling connection with	#	
35.	Over range protection	130 % of FSD	
36.	Temperature error	#	
37.	Approvals	#	
38.	Make	Refer AVL	
39.	CE conformity	Pressure equipment directive 97/23/EC, PS > 200 bar, module A, pressure accessory	
39.	Approvals	#	
40.	Certificates	2.2 Test report per EN 10204 (e.g., state-of-the-art manufacturing, material proof, indication accuracy) 3.1 inspection certificate per EN 10204 (e.g., indication accuracy)	
41.	Shipping weight(kg)	#	

42	**Notes.**
a.	(#) Marked data to be furnished by Vendor/Manufacturer
b.	At the time of approval of DS, Supplier shall furnish DS with Catalogues.
c.	Vendor to provide all Pressure Tag List with Aluminum embossed plate (where mention with Tag no./Date of calibration/Due date of Calibration /Items serial no etc.)
d.	Vendor to provide Pressure gauge spare items like Glycerin Liquid & Rubber filling cap with mandatory spares.
e.	Vendor to provide Operating and Instruction manual before dispatch.
f.	Vendor to provide Leak rate of pressure gauge on High pressure application of natural gas.
g.	Gauge shall withstand steady pressure, over pressure & cyclic pressure.
h.	Gauge shall withstand mechanical shock & Vibration within accuracy range.
i.	Gauge shall be equipped with Manifold valve or bleed valve and venting system in case of maintenance.
j.	Gauge shall have designed to satisfy requirements to operate in aggressive Environment.

ENERGISING QUALITY	**PROJECT NUMBER: VCS-IRMEL-C261159**	IRM Energy

DATA SHEET OF SAFETY RELIEF VALVES			Client Job Number	C261159	
			Total Sheets	04	
DOCUMENT NO	C261159	00	ME	DS	3006

SUPPLY OF CNG/CBG CAR, COMBO AND BUS DISPENSERS IN THE CGD OF IRM ENERGY LIMITED (IRMEL) IN 4 GA's OF BANASKANTHA, DIU & GIR SOMNATH, FATEHGARH SAHIB & NAMAKKAL & TIRUCHIRAPPALLI.

C3	23.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C2	05.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C1	22.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
REV	**DATE**	**DESCRIPTION**	**PREP**	**CHK**	**APPR**

SAFETY-RELIEF VALVE DATASHEET			
S. No.	**DESCRIPTION**	**SPECIFICATION**	**OFFERED**
1.	Type of Service	CNG/CBG	
2.	Tag No.	#	
3.	Model No. / valve series	#	
4.	Make/Model	Refer approved vendor list	
5.	Orifice	#	
6.	Inlet specification	½'' NPTM	
7.	Outlet specification	1'' NPTF	
8.	Set pressure	Refer Technical specifications	
9.	CDS pressure	#	
10.	Relieving temperature	45°C	
11.	Back pressure	#	
12.	Min. Seat Leakage pressure	#	
13.	Max. Seat Leakage pressure	#	
14.	Allowable Leakage rate @ BPM (bubble per min.) at Min. seat leakage	#	
15.	Allowable Leakage rate @ BPM (bubble per min.) at Max. seat leakage	#	
16.	Design code	**ASME sec. VIII & XIII**	
17.	Operating Temperature Range	-10°C to 60°C	
18.	Valve Design temperature Range	#	
19.	Min. Set pressure point	#	
20.	Max. Set pressure point	#	
21.	Max. outlet pressure	#	
22.	Seal Type	Metal to Metal seat /O-ring soft seal	
23.	**Material of Construction**		
a.	Base	SS316	
b.	Cylinder	Carbon steel SA-216 gr. WCB	
c.	Disc Insert	SS316	

d.	Disc Holder	SS316	
e.	O-Ring	#	
f.	Guide	SS316	
g.	Spindle	416 SS	
h.	Spring	17-7 PH SS	
i.	Spring washers	416 SS	
j.	Adjusting Bolt	SS 316	
K.	Adjusting Bolt Nut	SS 316	
l.	Threaded Cap	#	
L.	Metal to Metal Seat material	#	
24.	Effective area in Sq. mm @ Min. set pressure	#	
25.	Effective area in Sq. mm @ Max. set pressure	#	
26.	**Service Condition**		
a.	Fluid	Natural gas	
b.	State	Pure compressible gas (Natural Gas)	
c.	Molecular weight	16.04	
d.	Specific heat Ratio (Cp/Cv) @ 15.5°C, 1 atm.	1.31	
e.	Relieving temperature	#	
f.	Overpressure %	10 %	
g.	Max. Fixed Blowdown %	≤ 20 %	
h.	Blow down %	#	
i.	Back pressure	#	
j.	Critical flow nozzle pressure	#	
k.	Effective coefficient of discharge (Kd)	#	
l.	Combination correction factor (Kc)	#	
m.	Compressibility factor(z)	0.9	
n.	Required effective discharge area	#	
o.	Recommended std. effective orifice area	#	
27.	Seat Leakage Test Pressure	#	
28.	Shell Pneumatic Test pressure & Media	#	

29.	Cylinder Hydro-test pressure & Media	#	
30.	Base Hydro Test Pressure	#	

31.	Notes.
a.	(#) Marked data to be furnished by Vendor/Manufacturer
b.	At the time of approval of DS, Supplier shall furnish DS with Catalogues.
c.	Vendor to provide all pressure safety valve Tag List with Aluminum embossed plate (where mention with Tag no. /Date of calibration/Due date of Calibration /Items serial no etc.)
d.	Vendor to provide Operating and Instruction manual before dispatch.
e.	Process data shall be as per tender specification mentioned elsewhere.
f.	At the time of approval, vendor shall furnish sizing calculation and catalogues of SRV.
g.	Vendor to confirm SRV cold differential test pressure (CDTP).
h.	This Relief requires valves OPEN when system pressure reaches the set pressure and CLOSE when system pressure falls below the set pressure.
i.	Vendor to provide Inlet pressure of relief valve Vs Flow rate curve during detail engineering.
j.	Vendor to provide Maximum & Min. set pressure range of safety relief valve during detail engineering.
l.	Differential pressure (ΔP) equals inlet pressure (set pressure plus overpressure) at flowing conditions minus backpressure.
m.	Vendor to share Backpressure flow correction factor curves.

ENERGISING QUALITY	**PROJECT NUMBER: VCS-IRMEL-C261159**	IRM Energy

TECHNICAL SPECIFICATION-CNG/CBG DISPENSERS			Client Job Number	C261159	
			Total Sheets	30	
DOCUMENT NO	C261159	00	ME	TS	3001

SUPPLY OF CNG/CBG CAR, COMBO AND BUS DISPENSERS IN THE CGD OF IRM ENERGY LIMITED (IRMEL) IN 4 GA's OF BANASKANTHA, DIU & GIR SOMNATH, FATEHGARH SAHIB & NAMAKKAL & TIRUCHIRAPPALLI.

C3	23.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C2	05.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C1	22.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
REV	**DATE**	**DESCRIPTION**	**PREP**	**CHK**	**APPR**

CONTENTS

1. PROJECT REQUIREMENTS

The project requirements will be as define in respective SOW for CNG 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 type of Dispenser and Instrument air / Exe proof electronically controlled solenoid shall be used for such purpose.** The metering system shall be Coriolis true Mass Flow System.

The Dispenser Model and Mass Flow Meter or Dispenser Model using a Mass Flow Meter as a 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).

2.1 Vendor shall use Calibration Unit During testing of Dispenser at Factory & site for checking the Batch accuracy in the form of Master Meter (Master Mass Flow Meter) The Calibrator Master Meter should be certified by Weights and Measures or any other statutory authorities as certified Custody transfer meter of the Country of Origin (such as PTB, NMI, Trans Canada Calibrations, (TCC) Canada, Colorado Engineering Experiment Station Inc. (CEESI) USA, South West Research Inc. (SWRI) USA, PISGAR, etc.) and in India by FCRI. The calibration report of Master meter shall be furnished at a time of inspection at Vendor's factory. The calibration of mass flow meters installed in the dispenser shall be not more than 2 months old at the time of supply.

2. PROJECT DETAILS & GUIDELINE FOR EQUIPMENTS DEESIGN

Technical Data of CNG/CBG:

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

-Gas Temperature -10°C to +70°C
-Oil Content <5PPM
-Particulate Matter Less than 5 microns
-Odorant 20 mg/m3 (THT i.e.Tetra hydrothiophene /TBM i.e. Tert-butyl mercaptan)

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 easy operation & maintenance. All the Dispensers shall be suitable for Outdoor installation without roof/shed.

3. OPERATIONS & CONTROL PHILOSOPHY

4.1 The CNG dispensing facilities should be designed with minimum operator intervention. Routine maintenance work will be carried out during normal working hours and outside the scheduled refueling activities. The control system will be fully automated, only requiring manual intervention for connection of the hose and to initiate the filling operations.

4.2 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 twenty years or At least 1,31,400 hrs. Filling cycle whichever comes first, without major breakdown of the CNG Dispenser.

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

4. DESIGN PHILOSOPHY

It is anticipated that CNG Feed consumption, Flow rate, pressure & ambient temperature will be fluctuating. Hence, supplier should design the CNG dispenser with optimum degree of flexibility, operability & reliability to accommodate the varying composition of CNG/CBG feed, other unexpected flow rate, composition & pressure.

The CNG dispensing facilities should consist of standardized modules, which are assembled into a complete system. Each system should be designed in packaged frame, housing as a whole dispensing system.

The design life of the CNG dispensing facilities should be 20 years as minimum. The entire valve operation etc. of dispenser shall be of by Instruments air/ electronically controlled Solenoid valves. All necessary provisions for Valve Operations shall be available in the dispenser.

Gas from storage cascade or compressor through priority panel is dispensed to CNG vehicles like Car/Auto, via dispenser.

The CNG Car cum Bus Dispenser shall have Twin Arms, each with a flow capacity of ≥ 15 kg/min & ≥ 75 Kg/min. under discharge to normal atmospheric condition. Pneumatic actuated or electronically controlled valves shall be used, If Pneumatic actuated valve, Instrument air / Exe-proof electronically controlled solenoid is used then Instrument Air shall be used for pneumatic controls of Dispenser. For electro valves operations power requirement shall be provided by bidder during detail engineering.

Each unit to have fully automatic microprocessor/microcontroller-based sequencing of 3-cylinder banks connected to dispenser through independent high pressure Stainless Steel (SS) tubes. Dispenser to have pressure control device to restrict fill pressure to 210 kg/cm2g at maximum allowable filling pressure for natural gas vehicle cylinder as per standard supply. Pressure control device to ensure complete shut off of gas flow at the pre-set pressure with dead band shift and shut off error within 2% of range. The preset fill pressure can vary from 150 kg/cm2g to 210 kg/cm2g. The pressure control device to have provision to manually set pressure between above range.

5. APPLICABLE CODE & STANDARDS

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:

NFPA 52: Standards for CNG Vehicular Fuel Systems
NGV 4.1/ AGA 2-92: Requirements for CNG Dispensing Equipment for

Vehicles

NGV 4.2/ AGA 1-93: Requirement for Hoses for NGVs and Fuel Dispensers.

ANSI / NGV1: Compressed Natural Gas Fueling Connection Devices Standard for Fueling Nozzles and Receptacles.

NGV4 / AGA: Requirements for Breakaway Devices for CNG Vehicle Fueling Dispensers and Fueling Hoses.

IS 5572: Classification of Hazardous areas (other than Mines) for Electrical Installations

IS 5571: Guide for selection of Electrical Equipment's for hazardous area

OISD 179: Safety requirements for Compression, Storage, Handling and Refueling of CNG for use in Automotive Sector.

OISD 113: Classification of areas for Electrical Installations at Hydrocarbon Processing and Handling facilities

NFPA-52: 1992, ANSI, ASTM, NEC, NEMA, ASNZ, OIML, Indian Electricity Rules, Indian Explosives Act, Australian / New Zealand Refueling Standard. AG901 / NZS 5425

OIML TC8/SC7: Recommendation with regards to CNG dispensers,

The Standards of Weights and Measures Act

The Standards of Weights and Measures (Enforcement) Act,

The Consumer Protection Act, 1986.

The standards of Weights and Measures (General), Amendment Rules, 2009 – Part (Compressed Gaseous Fuel (CNG) Measuring Systems for Vehicle.

Any other Codes & Standards mentioned elsewhere in this Job Specification / M.R. or which has required to be complied with as per the prevailing Government of India regulations shall also be followed. All Electrical devices shall meet the requirement for the area classification specified in the documents. Tubing & other devices shall be so arranged that there is proper access for Operation & Maintenances.

6. GAS COMPOSITION TO BE HANDLED BY DISPENSERS AS PER IS 16087(latest edition) & IS 15958 (latest edition)

Component	Design case Mole %
Methane	94.9
Ethane	1.2
Propane	1.0
i-Butane	0.4
n- Butane	0.00
i- Pentane	0.00
n- Pentane	0.00
Carbon Dioxide	1.8
Carbon Monoxide	0.00
Nitrogen	1.6
SUM	100

NOTE: -

- Oxygen: Not more than 0.5% mole.
- Total non-hydrocarbon: Not more than 2.0 mole%
- Total Sulphur including H2S: Not more than 100 ppm by weight.
- Expected H2S content not more than 4 ppm by volume.
- Water content: Less than 112 kg/MMSCM specific gravity.
- Mass density (kg/Sm3): 0.736
- Molar mass (kg/K-mol): 17.3551
- Apart from Gas composition, the proposed specification of the CNG is as follows:
- Gas Temperature: -10ºC to +70ºC
- Oil Content: 10 PPM
- Particulate matter: Less than 5 microns
- Odorant: ≤20 mg/sm3 (Ethyl Mercaptan).
- The CNG specification should meet the **ISO 15403:2000 (E)/ IS 15958** natural gas quality designation for use as a compressed fuel for vehicles.
- The above-mentioned feed gas composition data is indicative data and same shall be varies as per site condition

7. TECHNICAL SPECIFICATIONS OF MAJOR ITEMS

The specifications described herewith are intended to give vendor the technical & operating conditions the Dispenser must fulfill. These are to be referred along with relevant description including in earlier sections. Vendor may indicate the additional features, which his dispenser has in terms of better design, enhance reliability etc., however such feature may be accepted & it is subject to Client's review and approval.

FOR DISPENSER CABINET

7.1 Complete cabinet shall be of Stainless Steel (SS304) and shall have tamper proof locking arrangement. Dispenser 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.

7.2 Each dispenser shall be equipped with provisions for wired seals on all doors, accessible from both sides. The system must be capable of detecting and monitoring any seal break activity. Upon detection of a seal break, the system shall automatically record the following details in compliance with IRMEL EIC instructions:
Name of the operator involved

Exact date and time of the seal break event
Door/compartment identification where the seal break occurred
This information must be securely stored and made retrievable for auditing and compliance purposes.

Appropriately lockable/needle 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 & other component should be such too gives unhindered access to all parts & maintenance becomes easy. Each filter drain line should have NRV 1/4" OD SS with needle valve on each line for manual drain terminated to outside of dispenser cabinet & ½'' Inlet Ball Valve arrangement in series for gas supply connection from compressor.

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

7.4 The hose shall be free movement and prevent strain on the fill hose connection and avoid touching of ground.

7.5 Dispenser shall be supplied with Hardware required for Weights & Measures certification i.e., provision for sealing of Mass Flow Meter by Weights & Measures shall be provided.

7.6 Vendor shall include ball valves associated with pneumatic actuation / Exd /Exe proof electronically controlled solenoid for dispensing of gas. Three actuator valves / Exe proof electronically controlled solenoids per hose outlet (total of 6 valves per dual hose dispenser) and in addition to this there should be one main actuator valve / Exe proof electronically controlled solenoid per hose (After mass flow meter) for control of the final delivery banks on each side of dispenser.

7.7 The number of start / stop of reset switch for starting gas refueling operation shall be counted. If it exceeds 03 nos. in a span of 20 seconds, then the dispenser shall stop the further operation and display an error in dispenser.

FILL HOSE & FILL NOZZLE

7.8 Electrically conducive (fill & Vent) hose shall be included for supply of Dispensers meeting the requirement of NFPA-52 / CSA NGV 4.2-2014 /CSA 12.52-2014 Fill hose shall have Sherex CT-5000 Nozzle or equivalent suitable to fill Car receptacle or factory fitted NGV. Nozzle shall be designed for high frequency use with a min. cycle of 1,00,000. The end connection for the main and the vent hose shall be SAE (JIC) 37 deg. Female Swivel 1-1/16″ - 12 UNF.

7.9 Specific Conductivity of Filling Hose shall be 0.512 Mega ohms for length Up to 180″ (appx. 4.5 Meter) and, 3.5 Mega ohms for length Over 180″ and up to 1200″ (Appx. 30 Meter).

Each Dispenser should have following specifications:

7.10 It should be fast fill electronic type and display the following key information on the dispenser with liquid crystal back-lit display for both day & night viewing showing:

7.11 Quantities of gas dispensed in kg (Min. 6 digits in 2 decimal points i.e., 000000.00) in one row.

7.12 Unit cost of gas dispensed in Rupees, Rs./kg (Min. 5 digits in 2 decimal points i.e., 000.00)

7.13 Complete transaction value in Rs.(Min. 7 digits in 2 decimal points i.e., 000000.00) in one row.

7.14 Displays must remain active for at least 15 minutes after power failure.

7.15 There should be provision for Manual pre-set of meter in dispenser unit by key pad or other methods with (Min. RS. 000000.00) & (Min. kg. 000000.00) during fueling to vehicle.

7.16 The decimal point required being adjustable through software programmed.

7.17 The complete transaction value can be round off to nearest Rs (less than 0.5 considered to be 0 and ≥ 0.5 will be considered to 1 Rs) through software to avoid transaction related dispute.

7.18 The display should read previous batch reading even after power failure.

7.19 Dispenser electronics shall be so designed that it would always record flow detected by the flow meter irrespective of start stop of the dispenser. I.e., the dispenser totalizer and the mass flow meter totalizer shall record the flow.

7.20 On restoration of power, after power failure or on repeated switching "on & off" power, the dispenser control shall not take any command till the measurement circuit is fully activated (Measurement circuit includes mass flow meter, totalizers, dispenser display etc.). After the full activation of measurement circuit, the dispenser shall start normal dispensing operation after activation of neutral switch, i.e. even if the dispenser neutral switch is in "ON" position immediately after the power restoration, dispenser should not start until measurement circuit is fully energized.

7.21 The Non-resettable and non-volatile inbuilt **totalizers up to 999999.99 for total CNG** sold in KGs with an independent battery backup. Since these dispensers are used for custody transfer purpose, the totalizers should not reset in any eventuality not even in case of electronic failure. Reset to zero of totalizer shall be performed by the dispenser electronics automatically when the maximum value reached.

7.22 The Non- Resettable Mechanical Type Totalizer Counters for Each side of the dispenser shall be provided which can be visible from front compulsorily if Mass

Flow meter is not having integral display the vendor should provide suitable arrangement outside the flameproof electronic box (on the dispenser's body) for reading of the totalizer.

7.23 Physical design should be of stainless steel body with doors/ panels to minimize corrosion and ongoing wear and tear. The dispenser should have tamper-proof locking arrangement. The cabinet should be suitably designed to accommodate all valves, fitting flow meter and all required electronic equipment. Additionally, both sides all the doors of the dispenser will have provision for wired tags. **Wire mesh net to be provided at the base of dispenser to avoid entry of rats, lizards etc.**

7.24 Front/side mounted nozzle come with lockable holder and safety lever / latch to firmly hold the nozzle when not in use. Two nos of holster/cradle for filling nozzles along with weather caps for the protection of nozzles. Holster / cradle shall be suitable for CT-5000 Nozzles or equivalent for Bus in compliance with NGV1 & ISO14469 Type 1 and NGV/NZS for Car and one each type for Car cum Bus Dispensers.

7.25 Each dispenser side should be equipped with authorization / on-off switch and liquid filled 4 inches dial pressure gauge (0-400 kg/cm2) showing the vehicle filling pressure for each filling arm. Vendor shall provide a bypass isolation valve with associated tubing to facilitate routine servicing calibration of pressure gauges without shutdown of the dispenser.

7.26 The Dispenser shall have ready to start delay of around one minute after each Power On and to start next batch filling. (Adjustable on site).

7.27 One no. Bubble tight Manual Shut-off valve for each fill hose has to be considered.

7.28 NRV's Shall provide on each individual banking system for flow smoothness & zero reverse flow.

8.10 **Fast Fill 3 Bank sequencing System for Car (Low/Med./High) , Combo Dispenser have three bank fill system (Low/Med./High) and Bus dispenser have single bank(High) fill system should be provided.**

7.29 **Overfill protection** shall be through electronically programmed hose to terminate the fill after 200 Kg/cm²g. Vendor shall include 2 nos. transducers or one transducer with one no. pressure micro switch or one transducer with one no. pressure regulator per hose of suitable range for sensing the pressure. **Pressure relief valve shall be provided to avoid overfilling. Pressure Relief valve set pressure shall be at 255 kg/cm²g with resetting at 215 kg/cm²g. Relief valve setting has to be adjustable from 205 kg/cm²g to 240kg/cm²g with resetting at 200 to 255 kg/cm²g respectively.** 2 Nos. transducer or one transducer with one no. Pressure micro switch or one transducer with one no. pressure regulator per hose has been envisaged to terminate the filling. If due to some malfunctioning, transducers or switch are not working well, relief valve shall POP for safety purpose to avoid over filling.

7.30 Built-in coalescing unit of 3-5 microns at inlet of each bank to be able to trap particulate and carried over oil at the inlet with manual drain valve. Vendor has to provide Suitable differential pressure Gauge across each filter with indication to detect the filter status and to collect the drained oil outside the dispenser by necessary tubing.

7.31 Easy to read lighted display – explosion proof backlighting or LED to be provided. Display must be of IP 54. Display should show the proper error code during shutdown.

7.32 The components of the flexible hoses are to be factory tested after assembly and before use to at least 5,000 Psig. Copies of test certificates should be provided together before the delivery of the dispenser unit.

7.33 Connection for the flexible hose should be designed with a burst pressure of at least four times the most severe pressure and temperature conditions expected. Necessary certificate shall be submitted along with supply.

7.34 ESD button (ESD Button to be of Mushroom Type Only) to be mounted on both side of the dispenser front panel and to be easily reached during emergencies. This should close filling from each arm of dispenser.

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

7.36 Dispenser electrical equipment and instrumentation wiring should be approved to meet the hazardous area classification Class-I, Division I, Group D as per NEC or Zone I, Group II A/ II B as per IS/ IEC, certification required on all components.

7.37 Filling of vehicle from the dispenser (Car cum combo) should be of the sequence with 6 nos. of Valve (Electromagnetic type or Pneumatic type) & make shall be as per approved list.

7.38 Filling of vehicle from the dispenser should be of the following Auto sequence mode:

1st Sequence-From Low bank (initially) for car side
2nd sequence-From Med. Bank
3rd sequence-From High Bank

1st Sequence-From High bank (for single Bank Single Arm Bus dispenser)

7.39 Filling of vehicle from the dispenser (Bus) should be of the sequence with 1 nos. of Valve (Electromagnetic or Pneumatic type) per Single hose bus dispenser & make shall be as per approved list.

7.40 The following sequence shall automatic and controlled by microprocessor or PLC based.

7.41 The on-off solenoid valve shall have brass body & only in case of mounting aluminum body. Venting of air should be passage in such a way that venting of air cannot be obstructed either in the solenoid or in the actuator. The valve with actuator assembly and its accessories like solenoid valve should be designed as per Fail to close / Air to open. The opening and closing time of the actuator should be well specified to Client/PMC and should be designed so that to operate with in minimum required time.

7.42 All Instrumentation shall have equipped with Bleed valve or manifold valve for venting of gas on maintenance conditions.

7.43 All sequencing valve shall be designed to operate on Fail safe to close mode.

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

7.45 Temperature compensator to limit fill pressure to an adjustable value (the normal value 200 kg/cm2 (g)) equivalent at 15 deg. C and pressure with normal value 200 kg/cm2g shall be provided. Temperature compensation provision shall be provided and the facility to enable or disable from keypad Screen & from SCADA also to be available in dispenser.

7.46 Dispenser should be automatically and immediately & other condition for shut off CNG supply to each fill hose individually in case of:

I. Power failure or Excursion beyond permissible limit.
II. Loss of Display
III. Power Failure of Mass Flow Meter
IV. Flow beyond High and low limits
V. Failure of Metering
VI. Failure of Totalizer
VII. Overfill of quantity or pressure
VIII. Failure of pressure sensing transducer.
IX. Failure of Pneumatic ball valve / electro valve
X. Repeated operation of Reset or Start/ Stop switch. The number of start / stop of reset switch for starting gas refueling operation shall be counted. If it exceeds three times in a span of 20 seconds, then the dispenser shall stop the further operation and display an error.
XI. Removal of any electrical wire connection to controller.
XII. Program step is in "HOLD" due to any error.
XIII. Flow meter signal shall be considered as the highest level of interrupt. Thus, it shall not be possible to fill any vehicle cylinders by repeated operation of reset switch. If reset switch is operated very frequently beyond the set value, it shall disable the dispensing operation.
XIV. The open circuit / short circuit faults in totalizers shall be detected and dispenser shall display an error and inhibit the operation.
XV. Dispenser shall start counting Gas as soon as gas flow is detected & should not wait for "ON" command. An error shall be generated on dispenser

display in case of gas flow with Dispenser in "OFF" condition. The error shall be resettable only by Authorized personnel.

xvi. 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 ½ to 1 minute (typical) interval between stop and start modes.

xvii. Dispenser interlock deactivates & no gas flow occurs when nozzle return to original hanging position on that situation display must be return to zero automatically.

xviii. Dispenser must be able to dispense the gas flow by pressing manual push button & similarly stop the sequence flow by pressing stop push button.

xix. Total Price and Quantity of gas delivered shall be displayed in dispenser display at least 5 Min. until next transaction is initiated.

7.47 Vendor should indicate overall pressure loss of dispenser from inlet of the dispenser up to outlet probe including mass flow meter, interconnecting tubing, valves, hoses, nozzles etc.

7.48 Momentarily flow of gas shall be registered in mass flow meter totalizer and simultaneously in dispenser totalizer.

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

7.50 Vendor should include in his scope provision of base frame & Foundation bolt to be embedded in the foundation. Base frame to be supplied during dispatch. Frames to be supplied in separate packing.

7.51 All the vents (e.g., Actuator, PSV, Vent hose) shall be taken out from top of the dispenser & height of vent tube shall as per PNGRB Guideline **INFRA/T4S/SC-6/4/18.**

7.52 The vertical portion of the vent pipe shall not be provided with any intermediate thread joint. And if vent tube fitted nut & ferrule arrangement then it shall be properly clamped through clamp support angle for wind & high gas velocity effects may bend the tubes.

7.53 Vendor should include necessary licensed system and application software for dispenser electronics one set each for Car and Bus, required for calibration and faultfinding diagnostics. (As applicable).

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

7.55 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.

7.56 The normal operating temperature of wetted parts of dispenser shall be (-) 10 °C to +70°C.

7.57 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 ½ to 1 minute (typical to be adjusted as per requirement) 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 fill time or when the dispenser is commissioned after it was decommissioned for prolonged period or is in storage facility after initial commissioning. For this purpose, if any specific storage facility is required, the same to be indicated by the bidder.

7.58 Vendor shall include any other item required for safe and accurate operation of Dispenser.

NOTE: - Vendor to demonstrate the function of breakaway coupling at Site in presence of client Representatives.

NOTE: - Breakaway shall be as per the ANSI/IAS NGV 4.4 -1999.

A) <u>FOR NOZZLES</u>

-Both hoses shall be fitted with NGV-I nozzle for filling of vehicles Specification for NGV1 nozzle is as follows:

Nozzle Type	NGV-1 TYPE 2, CLASS B
Normal working pressure	PN 200 bar
Temperature Range	0 deg C to +85 deg C
Max. Length	Max. 115 mm
Cv minimum	1.05
Max. weight	0.65 kg
Min flow rate	1500 SCFM @ 3000 Psig
Max nozzle body diameter	2 inches
Filling Line Male Thread	UNF 9/16"-18 Female or ¼" Male NPT

D) <u>FOR 3-WAY VALVE</u>

Vendor shall include the supply of 3-way valve with each hose for filling & venting of gas. Specifications are as follows:

Connection Size	¼ "NPT Female (All three end)
Pressure Rating	5000 PSI (Min.)
Temperature Rating	0 to 70 deg. C
Minimum Life	40000 cycles at site conditions (one on & off is considered as one cycle)
Material of construction	
Body	SS 316 as per ASTM A276 or as per ASTM A479 or ASTM A 182
Ball	SS 316 ASTM A479 or Alloy S21800 as per ASTM A276
Stem	SS 316 ASTM A479 or as per ASTM A276
End connection	SS 316 ASTM A479 or ASTM A 276
Seat carrier	SS 316 as per ASTM A276
Seat springs	Alloy X-750 / AMS 5542 / 17-7 PH
Seat	PEEK
O-rings	BUNA-N or BUNA-C or Fluorocarbon FKM
Backup rings/bearings	PEEK / PTFE
Orifice Size / Cv	min 4.75 mm / min 0.62
Weight	Max. 350 grams.

Design Features

1. The valve should be of trunnion ball design.
2. Blow out resistant two-piece ball/stem.
3. Should have positive handle stoppers.
4. Flow direction indication must be there on handle.
5. Directional indication must be provided for panel mounting.
6. Complete repair kit must be available and comprises of (all internals installed in valve body) following items:

a) Stem

b) Stem washer

c) All sealing rings for stem i.e., stem O-rings, primary backup rings, secondary backup rings etc.

d) All Seat with carrier

e) All Seat Retainer O-rings, backup rings, guide, springs etc.

f) Connector end seals

g) Ball trunnion

h) Trunnion bearing

7.59 One number of holster/cradles for fills nozzles along with weather caps for the protection of nozzles. Front/Side mounted Nozzle with lockable holder and safety lever/latch to firmly hold the nozzle when not in use shall be provided.

7.60 Vendor has an option to supply the dispensers either with pneumatic operated ON-OFF control valve or with electrically operated full-bore leak free ball valve made valve made of ANSI 316 SS for ON-OFF control of flow. Vendor shall take approval of make of valve from Client/ Consultant. Vendor shall ensure that the system is designed in such a way that in both options, any gas if passes, should be recorded by mass flow meter and there should not be any possibility of un metered gas supply through dispenser in case of malfunctioning of ball valves.

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

The Instruments air tubing inside the Dispenser shall be minimum ¼" OD and shall be of SS 316/SS316L material. The pressure gauge & Filter in inlet line of instrument air has to be provided.

7.62 Coalescent filter shall be provided at inlet of bank supply line with manual drain valve to ensure that the oil carryover in the **CNG being filled to Vehicle is <5 PPM. Filter elements made of paper shall not be accepted. For filter status, necessary Differential pressure gauge (DPG) shall be provided with indication marking on each bank.** Vendor to provide appropriately plugged/needle/lockable drain valve outside the dispenser housing with suitable arrangement to collect the drained oil outside the dispenser by necessary tubing. Filter size shall be in accordance with max flow through the Dispenser.

7.63 Vendor shall supply the application program, ladder logic, and list of error codes with description for programming the dispenser parameter used in Dispenser Electronics.

7.64 After power on, the controller delay time to start filling be such that the Mass Flow Meters and Pressure Transmitters are initialized properly to void any un-metered gas.

7.65 Vendor shall ensure that the system is designed in such a way that in the process, any gas if passes, should be recorded by mass flow meter and there should not be any possibility of unmetered gas supply through dispenser in case of malfunctioning of ball valves.

7.66 The offered Dispensers for dispensing CNG/CBG shall be Type/ Model approved by from Statutory Authority of Country of Origin and the Chief Controller of Explosive (CCOE), Govt. Of India as per Cylinder Rules, 2016 & its latest amendments. **The equipment's & their make for particular model shall be same as specified in the certificate issued by CCOE, for any change fresh CCOE certificate has to be obtained and submitted before commissioning.**

E) DATA RECORDER

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

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

- Quantities of gas dispensed in kg (6 digits in 2 decimal points i.e., 0000.00).
- Unit cost of gas dispensed in Rupees, Rs /kg (5 digits in 2 decimal points i.e., 000.00).
- Complete transaction value in Rs (7 digits in 2 decimal points i.e., 00000.00).
-Last stop/start stop bits details.
-Last alarms history records for trips & shut down details.
-Dispenser total filling hours.

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

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

F) INSTRUMENTATION & CONTROL

- All the Electrical and Electronics Instruments shall be installed in accordance with NFPA 70, IEC for gas Group II A, II B & Temperature Class T3 and shall have approval of a recognized certifying authority. For all intrinsically safe /flameproof equipment / instruments the certifying authority will be BASEEFA, FM, UL, PTB, LCIE and in India CCOE, India, Nagpur. All the applicable certificates shall be provided at the time of Inspection & Testing at works.

- All the auxiliary instruments like Mass Flow Meter, Pressure Transducer / switch, ESD, SOV etc. shall be on 24 V DC supply only. Vendor shall provide suitable power conditioning unit / Stabilizer, barrier / isolator etc. for fail safe operation in Hazardous areas, class 1 div 1 Group D as per NEC. Vendor shall provide all the details of the power & utility consumption for the instruments used in the Dispensers.

- All tubes, Valves and fitting shall be leak proof & shall be Swagelok / Parker make and suitable for respective Pressure rating.

- The tubes used in the dispenser shall be as per approved Make & suitable for respective pressure rating.
- Complete control loop would be so fast that if filling were terminated at any point of filling, the flow would stop immediately. Reset Switch assembly should be suitable for failure free operation.

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

G) DISPENSER ELECTRONICS

- The Dispenser Electronics shall be Microprocessor/Microcontroller based and inbuilt with the dispenser. All the electronic cards shall be located in flameproof boxes inside the dispenser cabinet. The controller electronics shall be immune to EMI interference. The dispenser electronics shall have self-diagnostics features and should generate error code accordingly. The error code shall be shown on display (for some time for even power failure) & in the SCADA.

- Vendor should define such error codes and procedure for their rectification in Maintenance manual. Password protection should be provided for entry of data through keypad. The keypad shall be provided inside the display electronics cabinet and can't be accessible from outside. The change in dispenser setting shall be done through laptop computer or hand held communicator through the port provided for this purpose with security lock.

- For downloading the CNG refueling transaction data to Client's POS computer, RS 485 serial port (for RS 232 port, provide with Converter for RS 232 to 485 including all hardware and software) shall be provided. The programming, tuning, adjusting of the controller would be through dedicated software residing to a PC with the window Operating System.

- Dispenser shall be capable of communicating with outside system using the open system architecture / Protocol. It is possible to transfer the data through twisted pair wires, transaction data, and flow meter data to RTU of SCADA. All the flow data, Alarms data, analog data, digital data, trip status and power supply status shall be available.

- The client shall provide SCADA and RTU. The Dispenser shall have facility to read & write all the data from remotely through SCADA. The dispenser should have provision and dedicated communication card & port for connection to RTU for monitor and control the transaction parameter through serial communication.

- The detail requirements of SCADA will be communicated to the successful vendor during detail engineering. For selection of equipment's compatibility for SCADA system vender shall considered the Modbus RTU protocols, FCC-68 RJ 45 connection type, RS 232 D communication standard, Baud rates up to 19.2K, with configurable software.

- Emergency shut down (ESD) system shall be provided in both side of dispenser and this device, when activated, shall shut off the power supply to the dispenser and gas supply to the dispenser immediately;

The configuration data for the Mass Flow Meter should be stored in a non-volatile memory or in a dedicated battery backed RAM to protect the data from power off or fluctuations.

H) MASS FLOW METER

- Coriolis True Mass Flow Meter with Integral Display Unit should be provided to ensure accuracy and direct Mass Flow measurement shall confirm to AGA 11 standard and approved for custody transfer metering of CNG at each of the refueling hose. The microprocessor based control system should be provided to sense, monitor and control complete filling operations on a continuous, uninterrupted basis. The integral display unit shall be mounted inside the dispenser body. The difference in reading between this integral display unit and non-resettable type totalizer shall not be > 1.0%. Each and every Mass Flow Meter "Zeroing" shall be done before delivery from works.

The Mass Flow Meter design consideration, piping, meter installation, zero verification and proving facility shall be confirming to AGA 11 standard. Mass flow meter (Indicating Type) should be designed for custody transfer metering of CNG and meet the following requirements:

Principle of metering	Coriolis
Max. Flow Rate	≥ 15 kg/min for Car side (Refer Design case)
Accuracy	+ 0.5% (inclusive of linearity, hysteresis Repeatability
Repeatability	+ 0.3 % or better
Totalizer	Non resettable Type
Enclosure	IP65, NEMA 4 & Ex. Proof
Pressure & Temp influence	Nil
Calibration Traceability	NIST
Pressure Rating of wetted parts	5365.605 (5200 psi) at 25°C as per ANSI BV 31.3/ASME
EMF effect on sensor and Transmitter	To the requirement of EMC to latest IEC/EN standard
Vibration effect	As per IEC 68.2.6 / SAMA PMC 31.1 (1980) or latest standard
Approval	CE Marking, ATEX, EXi/Exd & CSA-Class I, Div. I
W&M	Statutory authority of Country of Origin and from Ministry of Consumer Affairs, Govt. of India
Output to Dispenser Electronics	RS 485/ frequency
Output to be available	RS485/frequency/Analog duly programmed
Inlet to Outlet connection	In line with process connection

- Each flowmeter should be provided with a liquid crystal display (LCD) for ongoing flow monitoring and totalizer. Flow meter signal shall be considered as the highest level of interruption. It shall not be possible to fill any vehicle cylinders by repeated operations of reset switches. Reset time delay is required with adjustable time. Mass Flow Meter shall have diagnostic facility to check live zero, configurable parameter, constants etc. through Laptop.

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

- Vendor should include one set necessary system and application software with hardware including communication cable / converter etc. with licensed required for calibration and fault finding diagnostics of Mass Flowmeter Electronics through Clients Laptop.

- The Mass Flow Meter shall be Coriolis type and shall confirm to AGA 11 standard.

- The Mass Flow Meter shall be ATEX Certified (EXd, Exi) for Zone-I gas environment & CE marked.

- The Mass flow meter Sensor & Transmitter units both shall have CCOE approval certificates.

- The Bidder shall only use approved make mass flow meter as mentioned in vendor list.

- The measuring devices comply with the applicable standards and regulations in accordance with EN 61010-1, "Safety requirements for electrical equipment for measurement, control and laboratory use" and with the EMC requirements of IEC/EN 61326. The measuring system described in these Operating Instructions thus complies with the statutory Requirements of the EC Directives.

- For Car & Bus dispenser Min., Normal and Max. design flow case shall be Achieving this flow rate depends on multiple interdependent design and operating conditions. Here's a breakdown of what conditions must be met as follow:-

Design flow capacity of CNG dispenser under following conditions

- Flow capacity for Car dispensers (Min/Nor. & Max.)-0.1/7.5/≥ 15 kg/min.

- Flow capacity for Bus dispensers (Min/Nor. & Max.)-0.1/37.5/≥ 75 kg/min. or Higher

- Dispenser flow capacity will depend on following parameters as mentioned below: -
  a) Storage Pressure: CNG is usually stored at 250 bar (3600 psi).
  b) Discharge Pressure: To maintain flow, pressure must be significantly higher than the pressure in the onboard storage system in the vehicles.
  c) To achieve ≥15 kg/min or ≥ 75 kg/min. the dispenser must have access to storage at least 250 bar, along with CNG cascade storage configuration with (high, medium, and low pressure banks) to maintain high flow.
  d) Gas temperature to be consider at 15 deg. C and 1 atm. Condition.
  e) Dispenser valve and nozzle orifice selection.
  f) Gas composition

- **UTILITY SPECIFICATIONS**

Electric Power Supply

- Single phase, AC, 230 Volts ± 10%, 50Hz ± 3% will be provided by Client. Surge protector is to be provided by the vendor at the 230 VAC inlets. All instrument (such as mass meter, solenoid, pressure transmitter/ switch etc.) supply as approved by PESO & ATEX. Suitable voltage conditioning unit shall be in the scope of vendor wherever required & System Earthing Shall Solidly Earthed.

  Note: Vendor to confirm that supplied dispensers are suitable with the above power supply. Vendor to include suitable voltage conditioning unit in their scope, if required. Instrument air supply @ 7-9 bar (g) will be provided by client.

- For further details, refer Electrical Specification, attached with this job

specification.

g) CODES & 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:

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

- 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, Owner's confirmation shall be sought before considering of any decision for execution of work.

h) PIPE WORK, VALVES & FITTINGS

- Pipe work should be designed, tested and installed to ensure its safe operation at the worst conceivable conditions of flow, pressure and temperature. All tube fitting and pipe fitting shall be leak Proof All the SS fittings shall be double compression ferrule fittings.

- All high-pressure tubing work should be of (1/2" OD SS for car) fully annealed (Bright annealed) seamless conforming to ASTM 316. The system should be verified through "go-no-go" also by soap solution methods for finding the leakages.

- Gauge able to demonstrate that fittings are properly tightened. Where ever possible valves and control devices should incorporate the same end connector system. The number of fittings used should be minimized. The Supplier should ensure that personnel assembling the pipe work should be competent in the system employed.

- The preferred valve types for isolation are ¼" 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.

8. HAZARDOUS AREA CLASSIFICATION & EQUIPMENT SELECTION

8.1 In case of storage, handling or processing of flammable materials within the battery limits of the package, area classification shall be carried out in line with IS: 5572 & Petroleum Rules and 0ISD-179 guidelines where applicable.

8.2 Selection of the type of equipment for use in hazardous areas shall be done in accordance with IS: 5571 and other safety regulations as applicable. The electrical equipment shall meet the requirements of relevant IS, IEC or NEC standards. Increased safety type Ex (e) equipment shall not be permitted for use in Zone-1 areas. 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).

8.3 Electrical equipment for hazardous areas shall be certified by CMRI and approved by CCOE (or equivalent statutory authority of the country of origin) for installation and use in the specified hazardous area. Flameproof equipment of indigenous origin shall be BIS marked. Vendor shall furnish the necessary certificates indicating such approvals.

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

8.5 The Supplier should specify the hazardous area in accordance with the IS 5572 / Australian Refueling Standard AG901 / NZS5425.

8.6 All Instruments should 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 ".

8.7 All dispenser mounted transmitters & pressure, temperature element should be intrinsic safe "Exia" as per IEC 79 latest version and solenoid valves, switches and related junction boxes should be flame proof "D" as per IEC 79 latest version. Other special equipment's/instruments, where intrinsic safety is not feasible or available, should be flame proof as per IEC 79-1 latest version.

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

EQUIPMENT SPECIFICATIONS

8.9 All equipment shall be complete with all necessary weather protection & dust protection including tropicalization to prevent damage due to climate, dust and corrosive vapors. The enclosure protection of all equipment's shall be IP: 55 as per IEC specifications.

8.10 Vendor shall be responsible for any damage to the equipment during transit. All packages shall be clearly, legibly and durably marked with uniform block letters giving the relevant equipment material details. Each package shall contain a packing list in a waterproof envelope.

8.11 All electrical components and equipment shall be sized to suit the maximum load under the most severe operating conditions.

8.12 All electrical equipment's shall be supplied with double-compression cable glands, made of nickel-plated brass, tested and certified to use in zone-1, hazardous area. Although the supply is being arranged through UPS System, but in some remote occasions, the power supply may be from DG sets with poor regulations and thus power supply available from Client may contain harmonics, transients and surges etc. The Electronics shall be compatible to the supply system as no transient, surge or harmonics protection has to be provided by Client. Bidder to include suitable voltage protection device/ conditioning unit / voltage stabilizer, as required, in their scope for accurate and safe operation of dispenser.

8.13 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, the successful bidder shall provide system earthing including making of earth-pits etc.

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

GENERAL REQUIREMENTS

8.15 All power supply J.B.'s shall be flame-proof type as per area classification.

8.16 Fill hoses should be conductive type to mitigate the static charges.

8.17 Provision for connecting earth strip at two points inside the dispenser.

8.18 Supply cable entry to dispenser shall be suitable for armoured 2.5sq.mm. 4 cores.

8.19 There should be effective static charges (as generated in hoses) mitigation design. All hoses shall be Conductive so that auto earthing of static charges (as generated in system) could be ensured. Vendor shall submit the requisite documents/demonstration against the same at vendors shop.

9. CALIBRATION & CERTIFICATIONS

- **Mass flow meter, instrument gauges, etc should be calibrated** and such calibration certificates should be presented upon at the time of delivery to site. If any of the calibration certificates is not in order, the Supplier's should replace the affected equipment with valid certificate at Supplier cost. Documentation and obtaining statutory approvals from the country of origin is in Vendor's scope.

- **The offered** Dispenser Model and Mass Flow Meter **must be approved and certified for specified flow & accuracy by recognized authority, i.e.," Weights** and Measures" **or other statutory authorities (of the Country of Origin. Vendor should also get the** Dispenser Model & Mass Flow Meter certified from Weights and Measures, India. (Ministry of Consumer)**. The** Calibrator Master Meter **for calibration purpose must also be certified sfrom** Weights and Measures, Country of origin **or other statutory authorities** (such as PTB, NMI, PISGAR, CEESI etc.) and for India from FCRI. **The offered** Dispenser Model **must be approved from** Chief Controller of Explosive **(CCOE) Nagpur as per Gas Cylinder Rules, 2016.**

- All the certificates(s) shall be in English language or in the language of originating country along with English translation.

10. INSPECTION & TESTING

Inspection will be done by client/ consultant in the works of vendor as per the approved QAP. At Vendor's Works

- All the dispensers shall be subjected to Inspection ("Stage wise" if required by Client) by Client's or their Authorized Representative.
- The following activities shall be covered under inspection:

a) Review of Q.A. documents.
b) Review of calibration certificates for Mass Flow Meter, dispenser, pressure transmitters, pressure gauges and all instruments.
c) Review of all statutory certificates including W &M and CCOE certificate.
d) Review of area classification compatibility of all items including bought out items.
e) Review of bought out sub-assemblies/major components, test/inspection certificates.
f) Safety shutdown features as per technical specification.
g) Automatically and immediately shut-off CNG supply due to abnormalities.
h) Dimensional checks as per approved drawings and data sheets.
I) Functional Test All the dispensers shall be tested to demonstrate the functioning of all the components and controls. The simulation test for all the Instrumentation shall also be carried out.
J) Leak Test of complete dispenser package including final assembly of hoses, PT, PG, manifold block & Safety valves etc.

Performance Test

- All the dispensers shall be performance tested for flow capacity, measuring accuracy and dispenser functioning with CNG or Nitrogen. Vendor shall arrange CNG or Nitrogen as required. Seat leakage test for the Valves and setting of safety valves shall be check.

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

- During factory inspection & testing vendor shall do the calibration / set point check of all major instruments including Mass Flow Meter and Valves. The calibration of Dispenser Mass Flow Meters shall be done at factory with certified valid Master Meter (Weighing Scale / Prover Kit) with accuracy better than supplied MFM with CNG / Compressed N2 at 200 bar pressure with at least 10 readings of filling. The accuracy shall be within the range of +/- 0.5 %.

  The weighing scale used for calibration purposes must have an accuracy higher than that of the dispenser's mass flow meter or the reference weighing scale—whichever has the higher accuracy specification. The calibration process shall consider the stricter (i.e., more precise) of the two accuracy standards to ensure traceability and measurement integrity.

- All the functional testing as per approved QAP shall be done and recorded. During the shop testing if the dispenser batch accuracy is found beyond ± 1.5 % dispenser shall stand rejected.

- In case, during the shop testing, the tests for dispenser performance to stabilize the flow capacity, calibration / set point check of all major instruments & batch accuracy cannot be done, then same shall be executed during site performance test. The dispensers shall be accepted based on the satisfactory results of all the parameters as per tender.

- Functioning with Nitrogen gas requirements shall be arranged by vendor for dispenser delivery test and leak test at vendor site.

11. DISPENSER PERFORMANCE TEST AT FACTORY

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 at factory by OWNER's TPI. Vendor shall carry out tests as required by Govt. Statutory Agencies. Guaranteed performance for Dispensers shall be as follows:

1. Max. flow capacity of the car dispenser shall be ≥ 15 kg/min based on gas composition, Max. Temperature limited to 52°C with no negative tolerance for errors in instruments and measurements.

2. Max. flow capacity of the Combo dispenser shall be ≥ 15 kg/min based on gas composition for Car Side & Max. flow capacity ≥ 75 kg/min based on gas composition for Bus Side, Max. Temperature limited to 52°C with no negative tolerance for errors in instruments and measurements.

3. Design capacity of the Bus dispenser shall be ≥ 75 kg/min based on gas composition, Max. Temperature limited to 52°C with no negative tolerance for errors in instruments and measurements.

4. Batch Accuracy of ±1.5 % or better per Arm. The Mass Flow Meter Accuracy shall be +0.5% as per certificate. (Inclusive of linearity, hysteresis & Repeatability error) and the Repeatability will be +0.3 % or better.

In case above guaranteed parameters i.e. dispenser Batch Accuracy and Testing parameters are not achieved at Factory, vendor shall carryout necessary rectification/modification to achieve the guaranteed parameters, without cost & time implication to the purchaser.

Following Design flow capacity of CNG dispenser to be maintain during Factory Performance Test /Site Acceptance Test (SAT): -

- Flow capacity for Car dispensers (Min/Nor. & Max.)-0.1/7.5/≥ 15 kg/min.

- Flow capacity for Bus dispensers (Min/Nor. & Max.)-0.1/37.5/≥ 75 kg/min. or Higher.

- Dispenser flow capacity will depend on following parameters as mentioned below: -
  a) Storage Pressure: CNG is usually stored at 250 bar (3600 psi).
  i) Discharge Pressure: To maintain flow, pressure must be significantly higher than the pressure in the onboard storage system in the vehicles.
  j) To achieve ≥15 kg/min or ≥75 kg/min. the dispenser must have access to storage at least 250 bar, along with CNG cascade storage configuration with (high, medium, and low pressure banks) to maintain high flow.
  k) Gas temperature to be consider at 15 deg. C and 1 atm. Condition.
  l) Dispenser valve and nozzle orifice selection.
  m) Gas composition

- In the above design case, the system must be capable of achieving flow rates of ≥**15 kg/min for car dispensers** and ≥**75 kg/min or higher for bus dispensers**. However, during Factory Acceptance Testing (FAT) or Site Acceptance Testing (SAT), the vendor may demonstrate these **instantaneous or maximum design flow rates** (≥ 15 kg/min and ≥75 kg/min respectively) by performing **multiple batch readings** to validate the system's capability to achieve the specified design flow rates.
- **COMISSIONING AT SITE**

All the dispensers have to be tested for functioning & performance by vendor in presence of Client authorized representative. Any part or component, which is not functioning to the satisfaction of Client, shall be repaired or replaced by the vendor without cost & time implication to purchaser and performance test again carried out. Vendor has to execute performance test of all the dispensers after commissioning for accuracy, 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.

DEMOSTRATION OF OVERFILL PROTECTION

Vendor shall demonstrate the Overfill protection at site with auto cut off at 200 kg/cm2 (g) and it shall be through electronically programmed so that the hose has to terminate the fill after 200 Kg/cm²-g. The performance of 2 nos. transducers or one transducer with one pressure micro switch / Regulator per hose and the Pressure relief valve shall be to be monitored to avoid overfilling. Relief valve set pressure shall be checked after final installation and demonstrate during trial run of dispenser.

Calibration certificate for all instruments shall be provided at the time of inspection.

12. TECHNICAL SUPPORT

The Supplier's should be responsible to maintain a workshop / warehouse and a team of competent technical support personnel in India to rectify and trouble shoot the problems encountered during the operations of the CNG dispenser. Upon receiving a call from the Company's, the Supplier is expected to response within a 1 hour from the time of call during an emergency situation. During normal maintenance situation, the Company expects the Supplier to response at the earliest from the time of call.

13. REQUIREMENT FOR AUTOMATION SYSTEM IN DISPENSER

It is intended to monitor / control following parameters through automation system:
Vendor shall ensure availability of following parameters at communication port of dispenser to connect with automation system for monitoring & control purpose.

These parameters shall also be checked during inspection at vendor's works.

a. Mass Totalizer from Dispenser Motherboard.

b. Mass Flow per Filling. (Note that Gas sale data- the reading which is visible to customer and used for billing purpose is mandatory to be transmitted to server whether it is from flow meter or motherboard or from both).

c. To Read Gas Selling Price from Dispenser.

d. To download the gas selling price into the dispenser from Server system.

e. Mass Flow Meter Status.

f. Tripping Status Dispenser.

g. Reset Switch Operation Status.

h. Dispenser Power Supply Status.

i. Identity of vehicle using RFID (In-built optional future provision).

In addition to above bidder shall make provision for monitoring and control of following parameters as well

A. Shift Reports
(Shift – A: 6:00 to 14:00)
(Shift – B: 14:00 to 22:00)
(Shift – C: 22:00 to 06:00)

a) Showing Date /Start time/ Finish time of every shift

b) Individual Arm-wise and Dispenser-wise totals.

c) Total sale for each shift in Kgs and Rs.

d) Total sale with variable pricing.

e) Full day report with total Sale for the 24 Hr. period.

B. Remote Price Change facility to facilitate

-Station-wise sortable and selectable
-Time-wise selectable
-Area-wise selectable
-Variable price change in a day

C. Transaction reports

Remotely the following parameters can be viewed in transaction reports
- Station Name and Dispenser serial number.
- Showing Date /Start time/ End time of every filling.
- Individual Arm-wise and Dispenser-wise totalizer at start of filling and end of filling.
- Transaction number totals for individual Arm-wise, Dispenser-wise and Station-wise to count number of fills in selectable particular duration. (Monthly and daily basis)
- Batch reading of fill.
- Sale for each batch in Kgs and Rs.
- Unit price Data.
- Dispenser power ON/OFF count.

Pressure during last fill
- Vehicle pressure at start of filling
- Vehicle pressure at end of filling
- Temperature during the last fill
- Dispenser Rate change (Through Keypad controller/SCADA) History.
- End of sale indicator (Code number showing the reason that the last sale stopped.

- This is useful if a dispenser stops during a fill for no apparent reason).

The remote monitoring and automation will consist of reading, transferring and controlling all the data/parameter from the dispensers to RTU and then to any centralized remote server in India as per OWNER requirement.

The above list is tentative and final list shall be decided during execution phase.

14. TRAINING REQUIREMENTS

-The training program should be phased to suit the construction program such that the Client'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, of the overall system.

-Commissioning will not be deemed to have completed and formal acceptance will not be granted until training has been completed to the satisfaction of the Company's. The training program should cover but not limited to the following subject areas:

- The physical characteristics of the gas and the procedure and precautions to be observed in handling and control.

- Start-up, operations and maintenance, troubleshooting during problems procedures for the CNG dispenser and equipment.

- Filling Procedure, safety and preventive daily maintenance.

- CNG system management & Record keeping.

15. PACKAGING & PROTECTION DURING SHIPPING

- 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.

- During shipping of dispensers, the dispensers shall pack with wooden pallets & bolted with base frame.

- Dispenser display unit area covers by Foam or Polystyrene Thermo-col for any damages & Hose shall properly clamed in cradle bars.

16. PERFORMANCE GUARANTEE

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

a. Guaranteed Performance for the Dispensers shall be as follows: Design Flow Rate (≥ 15 kg/min for Car & ≥ 75 kg/min. for Bus) Batch Accuracy of +/- 1.5%.

Note:

i. All the dispensing units shall be tested by Vendor for their function & performance in presence of Client's authorized representative.

ii. Vendor to execute performance test of all the dispensing unit after commissioning for accuracy and repeatability and safety parameters.

iii. Vendor to make all arrangements for carrying out performance test viz. Std. Mass Flow Meter, Laptop etc., and Vendor shall also carry out tests as required by Govt. statutory agencies.

iv. Any part or component, which is not functioning to the satisfaction of Client, shall be repaired or replaced by the vendor without cost & time implication to purchaser and performance test shall be carried out all over again.

17. DATA & DRAWING DETAILS

Vendor data requirement shall be as per document number: -**C261159-00-ME-VDDR-3001.**

Energising Quality	**PROJECT NUMBER: VCS-IRMEL-C261159**	IRM Energy

VENDOR DRAWING AND DATA REQUIREMENT – CNG/CBG DISPENSER			Total Sheets		15
Document No	C261159	00	ME	VDDR	3001

SUPPLY OF CNG/CBG CAR, COMBO AND BUS DISPENSERS IN THE CGD OF IRM ENERGY LIMITED (IRMEL) IN 4 GA's OF BANASKANTHA, DIU & GIR SOMNATH, FATEHGARH SAHIB & NAMAKKAL & TIRUCHIRAPPALLI.

REV	DATE	DESCRIPTION	PREP	CHKD	APPR
C3	23.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C2	05.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C1	22.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB

S. No.	DESCRIPTION	To be submitted with Bid	To be submitted for Approval		To be submitted for Shipment		Submit as certified Final / As Built	
			Required	Days after PO	Required	Days after PO	Required	Days after PO
1.0	**GENERAL**							
1.1	Filled in Material Requisition Compliance Schedule & checklist	√						
1.2	Filled in Deviation Schedule.	√						
1.3	Duly filled up "Experience Record Schedule". Vendor to note that information furnished by them shall be used to assess the provenances of offered Dispensers and Qualification of vendor, accordingly vendor to furnish references of those cases, which are matching with offered Dispensers.	✓						
1.4	Installation manual						√	√
1.5	List of components of Dispenser with Make & Specification of components. Vendor shall also submit "Technical Catalogues" of components	√	√		√		√	
1.6	Start-up, (SOP) operation & maintenance manual showing assembly details and critical tolerances. A copy of all certified drawings & documents to be enclosed.				√		√	
1.7	List O-rings and other seal kit part code along with Maintenance schedule.				√		√	

S. No.	DESCRIPTION	To be submitted with Bid	To be submitted for Approval		To be submitted for Shipment		Submit as certified Final / As Built	
			Required	Days after PO	Required	Days after PO	Required	Days after PO
1.8	Battery limit (interface) drawing/ information	√	√	21				
1.9	Drawing list and submission schedule		√	14				
1.10	Project implementation schedule, ordering and inspection schedule for long lead and major items		√	14				
1.11	Pre-commissioning & commissioning procedure		√	21				
1.12	Performance guarantee test procedure		√	21				
1.13	Weights & Measures Certificates from the country of origin for offered models of CNG Dispensers unit model/mass flow meter model for dispensing specified mass flow rate at specified overall batch accuracy.		√	14			√	
1.14	The "Test Certificate" for Mass flow meter.		√	21			√	
1.15	Weights & Measures approval from Indian Authorities.		√				√	
1.16	Type approval for the offered dispenser from Petroleum& Explosive safety organization, Govt. of India	√	√				√	

S. No.	DESCRIPTION	To be submitted with Bid	To be submitted for Approval		To be submitted for Shipment		Submit as certified Final / As Built	
			Required	Days after PO	Required	Days after PO	Required	Days after PO
2.	**DESIGN**							
2.1	Process flow diagrams (PFDs) and Piping &Instrumentation diagrams (P&IDs) of sub systems and complete system with write-up on operation		√				√	
2.2	Data sheets of Bus & Car CNG Dispensers, Mass flow meter duly filled up.	√	√				√	
2.3	Basic design calculations for system design, equipment selection		√				√	
2.4	Performance data, vendor literature for equipment selection, performance curves with duty point marked for individual equipment		√				√	
2.5	Specification for piping material & valves.		√				√	
2.6	Utility requirement	√	√				√	
2.7	Detail of control wiring diagram, interlock/ shutdown/control scheme with write up on operation. Sizing calculation for instrument items.		√				√	

S. No.	DESCRIPTION	To be submitted with Bid	To be submitted for Approval		To be submitted for Shipment		Submit as certified Final / As Built	
			Required	Days after PO	Required	Days after PO	Required	Days after PO
2.8	Dispenser communication port details and requirement information as per specification and list of signals		√				√	
3.0	**CONSTRUCTIONAL FEATURES**							
3.1	G.A. drawing of Dispensers showing maintenance clearances required.	√	√				√	
3.2	Cross section drawings of individual equipment/ skid, material & parts list.		√		√			
3.3	Termination & Wiring Diagrams		√		√			
4.0	**SPARES**							
4.1	List of spares with rates for two years normal operation per CNG Dispensers.	√						
4.2	Drawings, documents, data as asked under Electrical & Instrumentation specifications of this Material Requisition.		√		√		√	

VENDOR DATA REQUIREMENT (INSTRUMENTATION)

S. No.	DESCRIPTION	To be submitted with Bid	To be submitted for Approval		To be submitted for Shipment		Submit as certified Final / As Built	
			Required	Days after PO	Required	Days after PO	Required	Days after PO
1.	Drag and Document Schedule	√						
2.	Piping and Instrument Diagram	√	√				√	
3.	Instrument Index	√					√	
4.	Sub- Vendor List for Instruments and Accessories		√					
5.	Instrument Sizing calculations		√	21			√	
6.	Utility requirements	√	√		√		√	
7.	Level Sketches	√						
8.	Functional schematic	√						
9.	Electrical/Elec. SLD diagrams		√	21			√	
10.	Instrument loop drawings		√				√	
11.	Panel front arrangement		√	21			√	
12.	Power Supply Distribution		√				√	

S. No.	DESCRIPTION	To be submitted with Bid	To be submitted for Approval		To be submitted for Shipment		Submit as certified Final / As Built	
			Required	Days after PO	Required	Days after PO	Required	Days after PO
13.	Wiring diagram for panels		√				√	
14.	Configuration diagram		√					
15.	I/O assignment	√					√	
16.	Details of OPC, configuration port, signals details etc.		√				√	
17.	Instrument Duct/Tray layout		√				√	
18.	Instrument Cable schedule		√				√	
19.	Instrument location plans		√				√	
20.	Instrument installation drawings		√				√	
21.	Bill of material for installation items		√				√	
22.	Spare part list for							
23.	(a) 2 years operation						√	
24.	(b) Start up and commissioning						√	

S. No.	DESCRIPTION	To be submitted with Bid	To be submitted for Approval		To be submitted for Shipment		Submit as certified Final / As Built	
			Required	Days after PO	Required	Days after PO	Required	Days after PO
25.	(C) Spare instruments (10%).				√		√	
26.	Inspection and test procedures		√		√			
27.	Complete catalogues with part list for all vendor supplied instruments, controls etc.	√					√	
28.	Installation, operation and maintenance manuals						√	

Note: -

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

CHECKLIST – TECHNICAL

Bidder confirms following, as a minimum, has been enclosed in the offer.

S.NO.	Requirements	Compiled by Bidder(Tick)
1	Reference List of previous supply of Procured item	☐
2	Filled – up Data Sheets, duly signed and stamped by bidderenclosed.	☐
3	List of recommended commissioning spares and accessories for Procured item.	☐
4	List of recommended spares and accessories for two-year normal operation for procured item.	☐
5	Compliance statement duly filled and stamped enclosed.	☐
6	GA & assembly drawings, cross section drawings including part list & material list enclosed.	☐
7	Other technical details & vendor's product catalogues enclosed.	☐

COMPLIANCE STATEMENT

S. No.	Requirement	Bidder's Confirmation
1	Bidder confirms that all materials proposed by the bidder are same/ superior to those specified in specification/ data sheets enclosed.	
2	Bidder confirms that the offer is in total compliance with the Technical requirements of the Material Requisition. Bidder confirms that deviation expressed or implied anywhere else in the offer shall not be considered valid.	
3	Bidder confirms that all spares and accessories required for two years of normal operation have been Quoted separately.	
4	Bidder confirms that prices for start-up/commissioning spares and accessories have been included in the quoted items.	
5	Bidder confirms that in the event of securing order for the requisitioned item(s), good for manufacturing drawings of ordered item(s) shall have complete details with dimensions, part list and material list including back-up calculations in the first submission, failing which the vendor shall be solely responsible for any likely delay in delivery of item(s).	

Bidder's Signature with Stamp

	DEVIATION SHEET	VCS-SD-DS-001

DEVIATION/ EXCEPTION/ CLARIFICATION SHEET

Sr. No.	Contractor's Inquiry Reference	Contractor's Requirement	Proposed Deviation by Supplier, with Technical Justification	Cost Impact, if any	Contractor's Conclusions

NOTES

1- Bidder confirms that apart of from the deviations/exceptions/clarifications listed above, the bid is in full compliance with Inquiry requisition.
2- Bidder shall submit this sheet duly filled up and signed by him along with his bid. In case there is no deviation, then also supplier shall submit this sheet along with his bid indicating NIL deviation.

(Contractor's Name and Signature with Seal)

0	25.05.2017	ISSUED AS STANDARDS	AS	GS	AD
REV	**DATE**	**DESCRIPTION**	**PREP**	**CHK**	**APPR**

	DRAWINGS & DOCUMENTS	VCS-SD-DD-001

INFORMATION/ DOCUMENTS / DRAWINGS TO BE SUBMITTED BY SUCCESSFUL BIDDER

Successful Bidder shall submit four copies unless noted otherwise, each of the following:

1. Inspection & test reports for all mandatory tests as per the applicable code as well as test reports for any supplementary tests, in nicely bound volumes.

2. Filled in Quality Assurance Plan (QAP) for Purchaser / Consultant's approval. These QAPs shall be submitted in two copies within 15 days from LOI/ FOI.

3. Detailed completion schedule activity wise (Bar Chart), within one week of placement of order.

Note: All drawings, instructions, catalogues, etc., shall be in English language and all dimensions shall be metric units.

0	25.05.2017	ISSUED AS STANDARDS	AS	GS	AD
REV	**DATE**	**DESCRIPTION**	**PREP**	**CHK**	**APPR**

INSTRUCTION TO BIDDERS

1. Bidder to note that no correspondence shall be entered into or entertained after the bid submission.

2. Bidder shall furnish quotation only in case he can supply material strictly as per this Material Requisition and specification/data sheet forming part of Material Requisition.

3. If the offer contains any technical deviations or clarifications or stipulates any technical specifications (even if in line with MR requirements) and does not include complete scope & technical / performance data required to be submitted with the offer, the offer shall be liable for rejection.

4. Bidder must submit all documents as listed in checklist with his offer.

5. Supplier must note that stage wise inspection for complete fabrication, testing including the raw material inspected to be carried out.

6. Vendors for bought out items to be restricted to the approved vendor list attached with bid document. Approval of additional vendor if required, for all critical bought out items shall be obtained by the supplier from the purchaser before placement of order. Credentials/PTR of the additional vendor proposed to be submitted by supplier for review and approval of Purchaser/ Purchaser's representative

	LIST OF SPARES	VCS-SD-LS-001

LIST OF SPARES FOR MAINTENANCE

S. No.	Part No.	Description	Base Quantity (Minimum)

NOTE:- This spare list is indicative only. Actual list of spare and quantities shall may vary as per site condition and OEM recommended spare for smooth operation dispensers.

- Bidder shall maintain following minimum spare list as mentioned above GA wise in their centralized location also, OEM Should consider this minimum list of spare for CNG combo dispenser along with the bid.

0	25.05.2017	ISSUED AS STANDARD	AS	GS	AD
REV	**DATE**	**DESCRIPTION**	**PREP**	**CHK**	**APPR**

	REFERENCE LIST	**VCS-SD-RL-001**

REFERENCE LIST

Sl. No.	Project	Year of Supply	Client, Address and Contact No.	Email	Size and Rating / thk	Service	‖ Bidder' s Signature with stamp

REV	DATE	DESCRIPTION	PREP	CHK	APPR
0	25.05.2017	ISSUED AS STANDARDS	AS	GS	AD

Energising Quality	**PROJECT NUMBER:** **VCS-IRMEL-C261159**	IRM Energy

QUALITY ASSURANCE PLANOF CNG/CBG DISPENSER				**TOTAL SHEET NO.**	06
DOCUMENT NO.	C261159	00	ME	QAP	3001

SUPPLY OF CNG/CBG CAR, COMBO AND BUS DISPENSERS IN THE CGD OF IRM ENERGY LIMITED (IRMEL) IN 4 GA's OF BANASKANTHA, DIU & GIR SOMNATH, FATEHGARH SAHIB & NAMAKKAL & TIRUCHIRAPPALLI.

REV	DATE	DESCRIPTION	PREP	CHK	APPR
C3	23.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C2	05.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C1	22.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB

S.NO.	OPERATION / PARAMETER	CHARACTERISICS / PARAMETERS	ACCEPTANCE CRITERIA &CERTIFICATION	VENDOR	TPIA	CLIENT/PMC	REMARKS
Bought Out items & Equipment details							
1.	Dispenser Outer body cabinet	Visual, Thickness check, Fitment & Alignment, Material Test certificates, Chemical Test	As per Technical specification	P	W/R	R	
2.	Dispenser Inside frame & support structure	Visual, Thickness check, Fitment & Alignment, Material Test certificates, Chemical Test	As per Technical specification	P	W/R	R	
2.	Mass flow meter	Visual, Functional & operational of flow meter totalizer, Fitment & Alignment, Test certificates for Bought out items, Calibration reports	Calibration report/Test report & other parameters as per approved data sheet & Technical specifications	P	W/R	W/R	
3.	Actuator valves/Electro-magnetic solenoid valve	Visual, Functional & operational, Fitment & alignment, leak test, Test certificates for Bought out items, supply voltage, Output signal voltage, Flow sequencing check as per P&ID & control philosophy.	Test Report, Conformity report & Model verifications as per Approved data sheet	P	W/R	W/R	
4.	Filling hose	Visual, Dimensional, Sizing verifications, Fitment & Alignment, Physical Test, Chemical Test, Hydrotest Report, Leak test reports, Hose conductivity test, Compliance report.	Technical specification & Approved data sheets	P	W/R	W/R	
5.	Mechanical & electronics totalizer	Operational & functional test, Accuracy match, calibration report Test certificates for bought out items	Technical specification	P	W/R	W/R	
6.	Software	Latest software version, Modbus register, Communication protocol, Baud rate, check single & three bank sequencing system, Check sequencing rate of each bank w.r.t flow rate(kg/min.)	Approved data sheet	P	W/R	W/R	
7.	Pressure gauge	Visual, Size verification, Fitment & alignment, Functional & operational, Calibration report, Test certificates for bought out items, Hydrotest, pressure test	Technical specification & Approved data sheets	P	W/R	W/R	

8.	Differential pressure gauge	Visual, Size verification, Fitment & alignment, Functional & operational, Calibration report, Test certificates for bought out items, Hydrotest, pressure test	Technical specification & Approved data sheets	P	W/R	W/R	
9.	Pressure Transducer & Transmitter	Location as per P&ID, Fitment & alignment, calibration report, Test certificates of bought out items, pressure test, Leak test, Operational & functional, current consumption w.r.t pressure, IP ratings, supply voltage, Output signal voltage	Technical specification & Approved data sheets	P	W/R	W/R	
10.	Emergency Shut-off valve	Visual, Dimensional, Fitment & Alignment, Physical Test, Chemical Test, Operational & functional, Leak test, Test certificates of bought out items, C_v verification w.r.t data sheet	Technical specification & Approved data sheets	P	W/R	W/R	
11.	Isolation Ball valve	Visual, Dimensional, Fitment & Alignment, Physical Test, Chemical Test, Operational & functional, Leak test, Test certificates of bought out items, Cv verification w.r.t data sheet	Technical specification & Approved data sheets	P	W/R	W/R	
12.	Three way Valve	Visual, Dimensional, Fitment & Alignment, Physical Test, Chemical Test, Operational & functional, Leak test, Test certificates of bought out items, Cv verification w.r.t data sheet	Technical specification & Approved data sheets	P	W/R	W/R	
13.	SS Needle & Bleed valve	Visual, sizing verifications, Fitment & Alignment, Operational & functional, Leak test, Test certificates of bought out items	Technical specification & Approved data sheets	P	W/R	W/R	
14.	SS Tubing & Fittings	Visual, Dimensional, Fitment & Alignment as per P&ID shown, Physical Test, Chemical Test, Operational & functional, Leak test, Test certificates of bought out items	Technical specification & Approved data sheets	P	W/R	W/R	
15.	SS Non-return Valve	Visual, sizing verifications, Fitment & Alignment, Operational & functional, Leak test, Test certificates of bought out items, Flow direction as per P&ID	Technical specification & Approved data sheets	P	W/R	W/R	
16.	SS Manifold	Visual, sizing verifications, Fitment & Alignment, Operational & functional, Leak test, Test certificates of bought out items, Flow direction as per P&ID	Technical specification	P	W/R	W/R	

17.	Inlet filter	Visual, Dimensional, Fitment & Alignment, Physical Test, Chemical Test report, Operational & functional, Leak test, Hydro test, filter sizing calculation	Technical specification / Approved data sheets/ Filter Sizing calculation sheet	P	W/R	W/R	
18.	Filter Elements	Visual, Dimensional, Fitment & Alignment, Test certificates of bought out items Operational & functional, Leak test, Hydro test, filter sizing & pressure drop calculation with elements	Technical specification / Approved data sheets/ Filter Sizing calculation sheet	P	W/R	W/R	
19.	Display card	Visual, Functional and operational, Bakelite function, Supply voltage, digit segments functional test, Display cable crimping, Test certificates of bought out items, Number of display Rows, Digits shown.	Technical specification & Vendor data sheets	P	W/R	W/R	
20.	Micro-processor base Electronic Mother board	Visual inspection of Battery, fuse, SMPS, SPD, Relay, Coupler communication, all mass flow meter communication, RS485, SCADA port, UPS & Main power supply and Bench test certificates, Functional & Operational test	Technical specification & Electrical wiring Circuit diagram	P	W/R	W/R	
21.	FLP/WP junction Box	Visual, Dimensional, Fitment & alignment, Test Certificates of bought out items, Junction Box Body earthing & all extra termination point with FLP dead plug & other are with Hood cap for cables.	Technical specification & Electrical wiring Circuit diagram	P	W/R	W/R	
22.	Fill & Vent break-way	Visual, Fill & vent Hose size verification & Pressure ratings Pneumatic leak test, De-coupling functional test at low pressure < 5kg/cm2, Test Certificates of bought out items.	Technical specifications	P	W/R	W/R	
23.	Safety Relief valve	Visual, Verification of Tag plate, Set pressure, Leakage rate (BPM) from Vent line if any, Test Certificates of bought out items, Leak Test @ 250 Bar(g.)	Technical specifications & Data sheet.	P	W/R	W/R	
Complete Assembly Testing Details							
24.	**Complete Assembly Leak Test**	Leak Test Throughout on all Joints By using Soap solution and Holding Time up to 30 Min. @ Pressure 250 Bar(g) Media-Nitrogen	Technical specifications & Data sheet.	P	W	W/R	
25.	**Performance (Batch Accuracy Test)**	Overall Batch Accuracy to Be +/-1.5 % otherwise Complete assembly to be Rejected	Factory Test procedure & Technical specifications	P	W	W/R	

25.1		Review of Weight scale, Mass flow meter, Electronics Totalizer, Mechanical Totalizer Reading to be match during sample records.	Factory Test procedure & Technical specifications	P	W	W/R	
25.2		Calibration Report of Master Meter or Weight scale, Tare procedure before inspection, Calibration of Mass flow meter	Factory Test procedure & Technical specifications	P	W	W/R	
25.3		Review of Dispenser Flow capacity during Filling of Cylinder @ Pressure between 120 Bar(g) to 80 Bar (g) during Performance Test at facilities.	Factory Test procedure & Technical specifications	P	W	W/R	
26	**Dispenser Response Test**	**Dispenser should shut off immediately & automatically on following conditions**					
26.1		Power failure or Excursion beyond permissible limit.	Technical specifications	P	W	W/R	
26.2		After power Loss of Display Backup up to 15 min.	Technical specifications	P	W	W/R	
26.3		Power Failure of Mass Flow Meter	Technical specifications	P	W	W/R	
26.4		Design Flow beyond High limit and low limits (0.1 kg/min.)	Technical specifications	P	W	W/R	
26.5		Failure of Metering	Technical specifications	P	W	W/R	
26.6		Failure of Totalizer	Technical specifications	P	W	W/R	
26.7		Overfill of quantity of gas or pressure	Technical specifications	P	W	W/R	
26.8		Failure of pressure sensing transducer.	Technical specifications	P	W	W/R	
26.9		Failure of Pneumatic ball valve / electro valve	Technical specifications	P	W	W/R	
26.10		Repeated operation of Reset or Start/ Stop switch.	Technical specifications	P	W	W/R	
26.11		Removal of any electrical wire connection to controller.	Technical specifications	P	W	W/R	
26.12		Program step is in "HOLD" due to any error.	Technical specifications	P	W	W/R	
26.13		The number of start / stop of reset switch for starting gas refueling operation shall be counted. If it exceeds three times in a span of 20 seconds then the dispenser shall stop the further operation and display an error in dispenser.	Technical specifications	P	W	W/R	

Notes:

1. The above testing and acceptance criteria are minimum requirements; however, manufacturer shall ensure that the product shall also comply to the additional requirements as per Technical Specification (TS) and Data Sheet.
2. The supplier shall submit their own detailed QAP prepared on the basis of above / Technical specification for approval of Owner/Owner's representative.
3. Supplier shall submit calibration certificates of all instruments/Equipment to be used for inspection and Testing to TPIA with relevant procedures and updated standards for TPIA review/Approval. All reference codes / documents shall be arranged by vendor for reference of TPIA at the time of inspection.
4. Owner / Owner's representative include TPIA will have the right to inspect activity of manufacturing at any time.
5. TPIA along with Owner / Owner's representative shall review/approval all the documents related to QAP/Quality manuals/Drawing s etc., submitted by supplier.
6. Contractor shall in coordination with supplier/sub vendor shall issue detailed production and inspection schedule indicating the dates and the location of facilities Owner/Owner's representative and TPIA to organize inspection.
7. Special manufacturing procedure have to be specially approved or only previously approved procedures have to be used, in case of conflict between specification more stringent condition shall be applicable.
8. Bus Nozzle Flow Capacity (Combo/Bus Dispenser) Test during FAT is subject to Viability of the test in the Bidder's Factory. If Bidder have adequate facility available then only it will be tested during FAT by OWNER's authorized TPI.

ENERGISING QUALITY	**PROJECT NUMBER: C261159**	IRM Energy

VENDOR LIST FOR BOUGHT OUT ITEMS

DOCUMENT NO	C261159	00	ME	AVL	3001

SUPPLY OF CNG/CBG CAR, COMBO AND BUS DISPENSERS IN THE CGD OF IRM ENERGY LIMITED (IRMEL) IN 4 GA's OF BANASKANTHA, DIU & GIR SOMNATH, FATEHGARH SAHIB & NAMAKKAL & TIRUCHIRAPPALLI.

C3	23.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C2	05.06.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
C1	30.05.2025	ISSUED FOR CLIENT REVIEW	SA	RKP	AB
REV	**DATE**	**DESCRIPTION**	**PREP**	**CHK**	**APPR**

Bought Items Name	Vendor Name
Mass Flow meter	-M/s Micro Motion (CNG 50) with integral display -M/s E&H (CNG Mass DCI) with integral display
Pressure Transmitter	-M/s Wika -M/s Honeywell -M/s ABB -M/s WAREE
Pressure Regulator	-M/s Parker -M/s Emerson Process Management -M/s RMG-Regel Mess Technik (Germany) -M/s NIRMAL (UPTO # 600)
Ball Valve	-M/s Parker (USA) -M/s Swagelok (USA)
Pressure Safety Valve	-M/s Fisher Rosemount (Now M/s Emerson) -M/s Parker -M/s Swagelok
SS Valves, Fittings	-M/s Swagelok (USA) -M/s Parker (USA)
SS Tubing's	-M/s SANDVIK -M/s TUBACEX
Solenoid & Electromagnetic Valve	-M/s ASCO -M/s JEFFERSONS -M/s Rotex -M/s parker Hanifen -M/s Eugen Seitz
Actuators / On off Pneumatic Valve	-M/s Parker -M/s Swagelok -M/s Rotex
Cables & Wires	-M/s Polycab -M/s Universal -M/s Finolex -M/s KEI
Barrier / Isolators/Surge protector	-M/s MTL -M/s Phoenix -M/s P&F

Fueling Nozzle(NGV nozzle)	-M/s OPW 500 series -M/s WEH -M/s STABULI
Breakaway Coupling	-M/s Parker -M/s OPW -M/s SATBULI -M/s WEH
Hoses	-M/s Eaton Synflex -M/s Parker -M/s ZEC spa.
Pressure & Temperature gauge	-M/s AN Instruments Pvt. Ltd., New Delhi -M/s General Instruments Ltd., Mumbai -M/s WIKA

NOTES: -

1) Successful bidders shall take prior approval of the Makes / Items not covered above for which complete technical credentials (must be for CNG applications) of the proposed vendors shall be submitted for evaluation by Purchaser/Consultant.

2) The Dispenser Manufacturer having / develop the specific products for the use with their own brand name are also accepted subjected to submission of proven track record and the acceptance/ testing /certification. Decision of the client / consultant will be final.