

ANNEXURE - 1

Datasheet for Commercial Diaphragm Gas Meter						Rev.
General	1	Meter Type	Commercial Gas Meters			
	2	Quantity	Refer Table below			
	3	Service	Natural Gas			
	4	Governing Standard	EN 1359:2000 (or latest) / OIML R137-1&2 / T4S.			
	5	Approval	Type approval certificate as per Governing Standard			
	6	Installation	Suitable for outdoor / indoor installations, tamper proof and corrosion resistance for a life period of 10 years.			
	7	Environment Protection	Mechanical Environment M1 & Electronic Environment E1			
Process Conditions	9	Flow (Min / Max)	Refer Table below			
	10	Accuracy Class	Class 1.5			
	11	Accuracy	± 3% (Qmin to 0.1Qmax) and ±1.5% (0.1Qmax to Qmax)			
	12	Rangeability	150:1 or better			
	13	Cyclic Volume	Minimum*			
	14	Operating Pressure	500 mbar			
	15	Pressure Drop	As per governing standard (Refer Note- 4)			
	16	Operating Temperature	-10° to 55°C			
	19	Meter Capacity	Refer table below			
Flow Meter	20	Body Casing	Steel/Cast Aluminium Alloy with suitable coating on inside and outside for corrosion protection of casing.			
	21	Corrosion Protection	Suitable coating on inside and outside of casing			
	22	End Connections	Threaded *			
	23	Centre to Centre Distance	Refer Table below			
	24	Ingress Protection	IP-54 or better			
	25	Sensor MOC	Polyester fabric coated with rubber for an endurance life cycle of 80,000 cum.			
	26	Other Internal Parts	All meter internals shall be non - metallic to prevent from tampering like magnet.			
	27	Back-run Stop	Required to prevent the meter from running backwards in case of tampering or back flow condition.			
	28	Transmission Rate	0.01 m ³ / rotation for G4 & G6 and 0.10 m ³ / rotation for G10-G40.			
	29	Transmission System	Tamperproof			
	30	Max. Index Reading	8 Digit index with auto reset facility			
	31	Unit of Measurement	M3 (Cubic Meter)			
	32	Ingress Protection	IP-54 or better			
	Misc.	47	Reverse Flow Restriction	Meter shall be provided with a device in the outlet to prevent reverse flow.		
S No.	Meter Capacity	Quantity (Nos.)	End Connections *	C-C Distance *	Min / Max. Flow (At Actual Conditions)	
1	G-4	Refer MR	DN20/ 3/4" NPT	110±2 mm	0.04 / 6.0 m ³ /hr	
2	G-6	Refer MR	DN 25/ 1" NPT	250±2 mm	0.06 / 10.0 m ³ /hr	
3	G-10	Refer MR	DN 40/ 1 1/2" NPT	250±2 mm	0.10 / 16.0 m ³ /hr	
4	G-16	Refer MR	DN 40/ 1 1/2" NPT	280±2 mm	0.16 / 25.0 m ³ /hr	
5	G-25	Refer MR	DN 50/ 2" NPT	335±2 mm	0.25 / 40.0 m ³ /hr	
Notes:						
1	Vendor to specify. *					
2	Type approval certificate and weights & measures certificate along with model & make information shall be provided for meters supplied.					
3	Calibration certificate (original + soft copy) shall be provided to M/s GNGPL. One copy of the certificate shall be provided within the packing box of each meter.					
4	Meters shall be provided with suitable brass adaptors with free loose nut & PTFE washer (2mm) to meet above specified dimensions. Spare washer (5 pairs) shall be provided with each meter.					
5	Vendor to provide detailed GAD, technical catalogue of meter supplied along with datasheet.					
6	Refer Standard Specification (VPC-SPC-5601) for more information.					
7	The meters shall have the provision of upgrading it with Automatic Meter Reading (AMR) devices for future purpose.					
8	End connections shall be provided with plastic caps for protection during transportation.					
CLIENT:	GOA NATURAL GAS PRIVATE LIMITED (GNGPL).	D2	18.08.2021	AS	AB	AA
PROJECT:	SUPPLY OF NATURAL GAS METER	C1	19.06.2021	AS	AB	AA
		REV.	DATE	PRPD	CHKD	APPD
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ANNEXURE - 2



Goa Natural Gas Pvt.Ltd.
A Joint Venture of GAIL Gas Ltd & BPCL

QUALITY ASSURANCE PLAN FOR GAS METERS

Project : CITY GAS DISTRIBUTION PROJECT OF NORTH GOA GA.

Client : Goa Natural Gas Pvt.Ltd. (GNGPL).

Consultant : VCS Quality Services Pvt.Ltd.

QAP. No.: 1023-CGD-IN-QAP-5001 Rev: D2

Prepared By: AS

CHK: AB

Approved: AA

Date 18.06.2021

S.No	Components & Operations	Description of Test	Category	Extent of Check	Ref. Doc. & Cl.no.	Acceptance Criteria	Format of Record	Inspection		Remark
								Manufacturer	TPIA	
1	Body & internal parts	Material of Body & Trim	Physical properties/ Chemical composition	1 sample per heat	Approved data sheet	Applicable Material std.	Material test Reports	P	R	
2	Assembly	Dimension-Size,rating,end connection	visual	100%	Approved drwg/doc	Approved drwg/doc	Inspection Format	P	R	
		Degree of protection	Test	10%	Approved data sheet	Applicable stdard.	Test report	P	R	
		Body Hydro Test	Test	100%	Approved data sheet	No leakage	Test report	P	W	Witness of quantity shall be as per inspection level 1 AQL 1% as per IS 2500 (part 1) : 2000
		Calibration, accuracy	Test	100%	Approved data sheet	Approved data sheet	Test report	P	W	
		Functional test	Test	100%	Approved data sheet	Approved data sheet	Test report	P	W	

LEGENDS: R - Review, W - Witness, P - Perform, TPIA - Third Party Inspection Agency, R/W-Review and witness

Notes: -

- 1) The above mentioned testing and acceptance criteria are minimum requirements , however , supplier shall ensure that the product also comply to the additional requirements as per technical specifications and data sheets.
- 2) The supplier shall submit their own detailed QAP prepared on the basis of the above for approval of Owner / Owner's representative and TPIA.
- 3) TPIA shall have right to inspect minimum 10% of all manufacturing activities on each day or as apecified above.
- 4) TPIA along with Owner / Owner's representative shall review / approve all the documents related to QAP / Quality manuals Drawings etc. submitted by supplier.
- 5) TPIA shall also review the test certificates submitted by the manufacturer.
- 6) Supplier shall in coordination with sub vendor shall issue detailed production and inspection schedule indicating the dates and the locations to facilitate Owner / Owner's representative to organise Inspection.
- 7) TPIA shall review all the reports 100%.

D2

ANNEXURE - 3

ELECTRONIC VOLUME CORRECTOR (EVC)			Rev.	
General	1	Type	Microprocessor based battery operated volume corrector with integral pressure transmitter and temperature sensor suitable for mounting in the field location and applicable for custody transfer	
	2	Service	Natural Gas	
	3	Site conditions	Temp.: -10 to 60 degC, Hot, Humid, tropical, Saline environment	
	4	Governing Standard	EN 12405-1+A1 or Latest	
	5	Approval	Type Approval Certificate as per Governing Standard	
	6	Area Classification	Zone 1 Group IIB /IIC T4 Ex ' ia'	
	7	Enclosure Protection	IP 65	
	8	Quantity	Refer MR and P&ID	
	9	Function	To measure actual gas volume, pressure, temperature and compressibility factors of the gas and based on which calculates standard volume of gas. The unit shall be complete in all respects to achieve functionality. Base parameters for calculation of corrected gas flow shall be as under or configurable Pressure: 1.01325 Bar, Temperature: 15.5 Deg. C	
	10	Accuracy	Typical accuracy better than $\pm 0.5\%$ as per governing standard	
Electronic Volume Corrector	11	Input	1.EVC input shall be either LF/ HF pulse	
	12		2.Temperature signal from RTD measured value PT100/1000. All interconnecting cable shall be screened and armoured	
	13		3. Pressure sensor shall be directly mounted on the meter and wired to EVC with a range in accordance with max. working pressure and design pressure	
	14	Output	1.Correct Flow rate in standard cubic meter per hour (SCMH)	
	15		2.Correct Totalized volume (sm3)	
	16		3.Temperature	
	17		4.Pressure	
	18		5.Correction factor	
	19		6.Uncorrected flow rate	
	20		7.Uncorrected volume	
	21	Isolation	All Inputs, Outputs and power supply shall be individually isolated	
	22	Display	2 or 1 Line LCD Alfa Numeric Display (all parameters should be displayed by scrolling)	
	23	Power Supply (Note 5)	Lithium battery along with mounting hardware.	1
	24	Calculations / Corrections	Compressibility : AGA8 (Detail method), NX-18,S-GERG	
	25	Features	Built in diagnostics to detect proper functioning. EVC shall be capable of continuing with flow measurement even when downloading / uploading of data is going on.	
	26		Data security to password / key-lock. Hardware and software seals required.	
	27		Parameters and programmed constants shall be stored in EEPROM / non-volatile memory	
	28		Conduit connection of 1/2" NPTF with plugs shall be provided for output.	
	29		Alarm output for unit malfunctioning. No setup data should be lost while changing battery. It should be possible to change battery in field.	
	30		EVC can store monthly data of minimum 24 months.	
	31		Large and configurable database and can store hourly, daily, monthly data with date & time stamp for pressure, temperature and corrected flow and consumption up to 1500 records or better.	
	32		Facility for entry and accessing live and stored data through Keypad / Laptop / SCADA system.	
	33		EVC should be supplied with single SIM GSM/GPRS modem. Modem shall be powered by EVC battery. Polling frequency shall be once in a day. Vendor shall consider life of EVC battery accordingly.Modem shall be 3G/4G/LTE/Latest and upcoming technology compatible. This shall be an intelligent and running 24x7. IPsec encrypted VPN shall be supported.	
	34		Identification	Unique Addressing Facility
	35	Communication Ports	1. RS 232/ 485 serial port for SCADA facility (configurable up to 9600 bps); 2. USB 2.0 / 3.0 port for PC/Laptop connectivity; 3. Optical port	

	36	Software	Suitable communication protocol adaptor with 2.5 mtr of communication cable along with driver software to communicate with EVC and Windows 7 and Windows 10 based laptop shall be supplied with each EVC					
	37	Mounting Accessories	Required					
	38	Automatic Meter Reading (AMR)	Required, In built AMR with compatible technology for Data transmission					
	39	Fittings	1.Pressure sensor : 1/4"NPTM. 2.Temperature Sensor : 1/4" NPTM (RTD Diameter Max.6mm) from RPD meter body.					
	40	Cable Entry	1/2" NPTF					
	41	Canopy	Prefabricated FRP canopy with required installation accessories.					
	42	Communication Cable	Required, 2.5 mtrs length					
	43							
Misc:	44	Make	*					
	45	Model	*					
Notes:								
	1	Vendor to specify. *						
	2	EVC shall be certified for type test and custody transfer from NMI / PTB or equivalent independent international laboratories as per EN standards.						
	3	The Calibration certificate for RTD, PT and EVC (original + soft copy) shall be provided to Client/Owner. One copy of the certificate shall be provided within the packing box of each EVC.						
	4	Vendor shall provide 5 sets of volume corrector documentation including product literature, software / hardware manual, operation manual, maintenance instruction, certificates etc.						
	5	Battery life shall be minimum 5 year if replaceable considering polling once in a day and if not replaceable battery life shall be 10 years. Battery capacity shall be sufficient for 24 hr. continuous operation with all the equipment powered.						
	6	The communication protocol and message structure details to be used on the RS 232 / 485 serial communication port (for SCADA) shall be supplied after placement of order.						
	7	ATEX Certificate confirming to 2014/34/EU along with Weights & Measures Certificate shall be provided for EVC supplied.						
	8	Tagplate (SS 316) stamped with instrument tag number and service in 10mm characters shall be attached via SS wire (1 mm)						
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