

ULTRASONIC FLOWMETER											Rev.
S.No.											Rev.
General	1	Tag No.				As per P&ID					
	2	Quantity				Refer MR and P&ID					
	3	Line No./ Equipment No				Refer P&ID					
	4	Location									
	5	Line Size & Schedule				Refer PMS					
	6	Service				Natural Gas					
	7	Type				Multipath (Minimum 4 path)					
Flow Meter	8	End connection		Size and Rating			Flanged MOC should be min SS316				As per P&ID
	9	Facing & Finish				RF					
	10	Pulses / M3				*					
	11	Flow Range (MMSCMD)(max.)				Vendor to specify					
	12	Enclosure				Flameproof cum Weather proof IP67 as per IEC 60529 / IS 2147 & IS 2148					
	13	Material		Body			*MOC should be min SS316L				
	14	Bi-directional /Unidirectional				Uni-directional					
	15	Radiography/Charpy test				Required					
	16	Overall uncertainty (including lab)				±0.3% OF READING(for Qt<Qi<Qmax)					
	17	Accuracy				±0.1 %					
	18	Repeatability				±0.1% for qt<qi<qmax & ±0.2% for qmin<qi<qt					
Pre - amplifier	19	Transducer type				Piezo-electric					
	20	Transducer				ASTM A182F316					
	21	Type - 2 wire/ 3 wire				*					
	22	Preamplifier location				Meter Mounted					
	23	Power supply				From transmitter					
	24	Cable Entry				1/2" NPT(F)					
	25	Enclosure				Weather proof IP65 as per IEC 60529 / IS 2147					
Transmitter	26	Intrinsic safe				Certification Exia IIB T4 as per CENELEC					
	27										
	28	Power Supply		Cable Entry			24 VDC		M20 Cable gland connection		
	29	Output				4-20 ma , Smart HART Frequency & RS422/485					
	30	Enclosure				Weather proof IP67 as per IEC 60529 / IS 2147					
	31	Intrinsic safe				Certification Exia IIB T4 (min) as per CENELEC/UL/BASIEFA/FM/PTB					
	32	Mounting				Meter Mounted					
Options	33	Transmitter Type				Electronics SMART compatible with HART protocol of latest version					
	34	Meter runs (Up & Down stream)				Required					
	35	Flow Conditioner/ Profiler				Required (material should be min SS316)					
	36	Retractable Probes				Required					
	37	Pressure Tap on Meter Body				Required - 1/2" NPT(F)					
	38	Cold Insulation									
	39	On Meter (Jacket type)									
	40	On Meter tube (Up & down stream)				Required					
Service Conditions	41	Thermowell & Impulse tubing				Required					
	42	Fluid and State				Natural Gas & Gas					
	43	Flow	Min.	Normal	Max.	Design	Refer Process Datasheet/PI&D				
	44	Temp.	Min.	Normal	Max.	Design					
	45	Pressure	Min.	Normal	Max.	Design					
	46	Molecular Wt.	Specific Gravity								
	47	Viscosity (cP)									
	48	Cp/ Cv ratio									
	49	Max.allowable pressure drop									
	50	Compressibility Factor									
51	Area Classification				Hazardous Zone 1 Group IIA /IIB as per IEC						
	52	Model No.		Meter			*		*		
	53	Transmitter					*				
Notes: Vendor to specify.*											
1	Vendor to provide meter sizing calculations based on process conditions for review and approval										
2	Maximum permitted velocity through USM is 30 m/sec.										
3	Vendor offer shall include mandatory spares and operating spares for 2 years.										
4	Vendor shall provide detailed GA drawing along with all parts name and MOC for the ultrasonic flow meter along with data sheet.										
5	Number of paths to be confirmed by vendor confirming to the performance specifications, but minimum 4 path or above for natural gas custody transfer flow metering application & the design , construction & operation shall conform to AGA9 (latest version) for multipath is preferred										
6	Meter shall be USM Type. Straight Run Before and after meter shall be as per AGA9 and meter OEM recommendation, Whichever is stringent. Minimum indication. Available in the flow Computer display shall be PI, TI & FL.										
7	A qualified flow conditioner and upstream and down stream pipe runs shall be supplied by the meter manufacturer and shall be used										
8	During wet calibration.(7 point calibration before adjustment, 2 point verification after adjustment in USM electronics)										
9	Straight meter run of 10 ND(Nominal pipe diameter) between upstream of the flow conditioner, 10 ND between flow conditioner and the meter and 5D downstream of meter shall be supplied by the meter manufacturer and used during wet calibration.										
10	Flow transmitter housing material shall be SS-316										
11	Supply of USM flowmeter software & Speed of sound (SOS) software loaded in a laptop is to be provided by the vendor.										
12	USM shall not be equal to or less than half of inlet pipe size										
13	EVC to be provided with Facility communication through GSM/AMR										
14	Transducer shall be facilitated with online-replacable.										
		CLIENT:		HOGPL (HONGKONG GAS PRIVATE LIMITED)							
		PROJECT:		CITY GAS DISTRIBUTION PROJECT AT GEOGRAPHICAL AREAS OF DIMAPUR NAGALAND			C1	15.09.26	AK	SKM	SKM
							REV.	DATE	PRPD	CHKD	APPR
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