QUALITY ASSURANCE PLAN

FOR INDUSTRIAL METERING SKID

Document No.: GGL/TS/PE-PNG/SUPPLY/IMS/QAP

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GUJARAT GAS		**SPECIMEN COPY QUALITY ASSURANCE PLAN FOR IMS**			**QAP No.: IMS/QAP/2024**		**PROJECT : IMS**				
					DATE: 14.06.2024						
					MANUFACTURE'S NAME & ADDRESS:						
SR No	**Component & Stage**	**Characteristic**	**Type of Check**	**Quantum of Check**	**Reference Standard/ Documents**	**Acceptance Standard / Documents**	**Format of Records**	**Inspection By**			**Remarks**
								M	**TPA**	**CLIENT**	
1	**Drawings & Calculations**										
1.1	P & ID, GAD, BOM, QAP, Technical Datasheet, FAT ,SAT	Complete Skid	Submittals	100%	Technical Spec. and Datasheets	Approved Datasheet	Mfrs Format	P	RF	A	
2	**Incoming Material Identification of Brought out Items**										
2.1	Ball valves, Globe valves & Check Valves	Material TC for valves	Chemical test	Per heat No	ASTM 370	**1)-Ball Valve- Below 2"** I)- BODY-ASTM A 105 (Charpy test at 0°C) II) Ball & STEM- ASTM A479 Gr. SS316/ A351 Gr. CF8M **2)-Ball Valve- 2" and above** I) Body For 150# - ASTM A 216 Gr. WCB (Charpy test at 0°C) (Investment Casting) II) Ball & STEM- ASTM A479 Gr. SS 316/ASTM A 351 Gr. CF8M **3)-Globe Valve-** I)- BODY& BONNET- -ASTM A 105 (Charpy test at 0°C) - for Operating pressure 19 bar-g II)DISC & STEM-ASTM A 479 SS 316 **4)-Check Valve-** I)-Body &DISC: For 150# -ASTM A 216 Gr. WCB (Charpy test at 0 Deg C)	Inspection Report 3.1	P	R	R	
			Physical Test (tensile, yield ,elongation& Hardness)	Per heat No							
			Impact Test	Per heat No							

		Dimension- Size, Rating,	Visual, Measurement	100%	Approved Datasheet	1)- Ball Valve: a)- Below 2” as per BS 17292 b)- Above 4” as per API 6D 2)-Globe valve:0.5-15” As per BS 15761	Inspection Report 3.1	P	R	R	--
		RT for casting	Test	100%	ASME B16.34 Appendix 1	ASME B16.34 Appendix 1	Inspection Report	P	R	R	
		UT for Forging	Test	100%	ASME B16.34 Appendix 1	ASME B16.34 Appendix 1	Inspection Report	P	R	R	
	Ball valves, Globe valves & Check Valves	Hydro Body Test	Leak Test	100%	Approved datasheet/API6D/API 598	1.5 x Design Pressure For 800# = 207 kg/cm2 FOR 150# = 28.5 kg/cm2 Holding Time shall be as per the standard	Inspection Report 3.1	P	R	R	
		Hydro seat test	Leak Test	100%	Approved datasheet/API6D/API 598	1.1 x Design Pressure For 800# = 151.8 kg/cm2 For 150# = 20.9 kg/cm2 Holding Time shall be as per the standard	Inspection Report 3.1	P	R	R	
		High Pressure closer seat test	Leak Test	100%	Approved datasheet/API6D/API 598	Approved datasheet/API6D/API 598	Inspection Report 3.1	P	R	R	
		LOW PRESSURE (AIR) CLOSER(SEAT) TEST AT 7 KG/CM²	Leak Test	100%	Approved datasheet/API6D/API 598	at 7 kg/cm2 pressure Holding Time shall be as per the standard	Inspection Report 3.1	P	R	R	
		Back seat test	Leak Test	100%	Approved datasheet/API6D/API 598	Approved datasheet/API6D/API 598	Inspection Report 3.1	P	R	R	Not Applicable for Check Valves
		High Pre. Pneumatic Shell Test	Leak Test	100%	Approved datasheet/API6D/API 598	1.1 x Design Pressure For 800# = 151.8 kg/cm2 For 150# = 20.9 kg/cm2 Holding Time shall be as per the standard	Inspection Report 3.1	P	R	R	
		External Leak test at 7 kg/cm2	Leak test	100%	Approved datasheet/API6D/API 598	at 7 kg/cm2 pressure Holding Time shall be as per the standard	Inspection Report 3.1	P	R	R	
		Fire Safe Test	Type Test	100%	Approved datasheet/API6D/API 598 API 6FA	Approved datasheet/API6D/API 598 API 6FA	Inspection Report 3.1	P	R	R	
		Double Block & Bleed Test for 4" and above		100% for TMBV	Approved datasheet/API6D/API 598	Approved datasheet/API6D/API 598	Inspection Report 3.1	P	R	R	
		Anti-Static Test (as Applicable)		100%	Approved datasheet/API6D/API 598	Direct current <12V and resistance on dry valves shall not exceed 10 ohms	Inspection Report 3.1	P	R	R	
		Operational Torque Test (As applicable)		100%	Approved datasheet/API6D/API 598	Breakaway torque or thrust shall not exceed 360 N (80 lbf)	Inspection Report 3.1	P	R	R	
		Functional Inspection (Open/Close Operation for flange end valves)	MINIMUM 10 CYCLES	100%	ASME B 16.34/ API 598	ASME B 16.34/API 598	Inspection Report	P	W	V	

		Hydro test before installation in skid at skid supplier premise (Applicable to Pup end & Screwed end Valves in as welded and as screwed condition respectively on pipe spools)		100%	Approved datasheet/API6D/API598	For 150# = 28.5 kg/cm2 Holding Time shall be as per the standard	Inspection Report	P	W	V	Not applicable for Flange end Valves
2.2	PG/DPG	Calibration, Accuracy, Range, Size, End connection)	Visual, Measurement Checks	100%	As per Approved Datasheet	As per Approved Datasheet	Inspection Report 3.1	P	R	R	--
2.3	Pipe, Pipe Fitting, Flanges for Interconnecting Piping & Fasteners	Material TC, Size & Dimension	Chemical test	Per heat No	ASTM 370,ASME B 16.20 & B16.5 ASTM A320 & ASTM A194	As per GGL PMS and Datasheet	Inspection Report 3.1	P	R	R	As per PMS, Impact Test is not applicable on fasteners
			Physical Test (tensile, yield, elongation & hardness)	Per heat No							
			Impact test	Per heat No							
2.4	Gaskets	Material TC	Chemical test & Physical Test	Per heat No	As per GGL Data sheet/Specification	As per drawing and Data sheet	Inspection Report 3.1	P	R	R	
		Size & Dimension	Visual, Measurement	100%							
3	**Equipments**										
3.1	Filter	Raw Material -Material TC, Size & Dimension	Chemical test	Per heat No	ASTM 370	As per Filter datasheet	Inspection Report 3.1	P	R	R	
			Physical Test (tensile, yield ,elongation& Hardness)	Per heat No							
			Impact Test	Per heat No							
3.2	Filter	WPS & PQR	Welders Qualification & Welding	100%	ASME Sec. IX, Article II, follow QW200.1, QW482 for WPS & QW 483 for PQR or API 1104	As per ASME SEC. IX	WPS / PQR from Record	P	R	R	
3.3		In Process Inspection	Fit Up	100%	Approved Drawing	Approved Drawing & Standards	Inspection Reports	P	R	R	
3.4		DP test on Fillet Welds	Surface Defects	100%	As per ASME SEC. V	As per ASME SEC. VIII Div: 1	Inspection Reports	P	R	R	
3.5		Radiography after Final Weld	Soundness of weld joints	100%	As per ASME SEC. V	As per ASME SEC. VIII Div: 1	Inspection Reports	P	R	R	
3.6		Visual & Dimensional Check of Filter & Filter Element	Surface Finish & Dimensions	100%	Approved Drawing	Approved Drawing	Inspection Reports	P	W	R	
3.7		Hydro Test (4 hours Holding time)	Strength of weld joints	100%	Approved Drawing/1.5 times of Design Pressure/ASME SEC VIII DIV 1 UG 99	Approved Drawing/1.5 times of Design Pressure/ASME SEC VIII DIV 1 UG 99	Inspection Reports	P	W	V	
4	**Welding, NDT & Testing for Interconnecting Piping**										
4.1	WPS / PQR	Welders Qualification & Welding	Welders Qualification & Welding	100%	ASME Sec. IX, Article II, follow QW200.1, QW482 for WPS & QW 483 for PQR or API 1104	As per ASME SEC. IX//ASME B 31.8	WPS / PQR	P	R	R	

4.2	Liquid Penetrant Examination (DPT)	On Fillet Welds	Surface Weld Defects	100%	ASME Sec V	ASME SEC.31.3	Internal Inspection Report	P	R	R	
4.3	Radiography Test	To identify internal surface defects	Soundness of weld	100%	ASME Sec V	ASME SEC.31.3	Interpretation Report - Review of report	P	R	R	
4.4	Hydro Testing of Interconnecting Piping	Hydro test of weld joints	Strength of weld joints	100%	1.5 times of Design Pressure for 4 hrs	For 150#: 28.5 kg/cm2 Holding time: 4 Hours	Inspection Report	P	W	V	
5	**Final Inspection of Skid Assembly**										
5.1	Final Dimensional/ Visual Inspection	Complete Skid	Visual Inspection	100%	Approved P&ID & GAD	Approved Drawings	Test Reports	P	W	V	--
5.2	Cleaning & Painting of complete Skid	Surface preparation of Pipe Spools, Filter Housing & Base Frame as per SA 2.5	Visual	100%	Surface preparations per Approved Painting Spec.	Surface Preparation as per GGL approved Painting Spec.	Internal Inspection Report	P	R	R	
		Galvanizing of Piping Spools as per ASTM A 153	Visual	100%	Hot Dip as per Approved Painting Spec.	Hot dip galvanized as per approved Painting Spec.	Inspection Report	P	R	R	
		Galvanizing of Piping Spools as per ASTM A 153	Visual after Galvanizing & before Painting	Random 20%	Hot Dip as per Approved Painting Spec.	Hot dip galvanized as per approved Painting Spec.	Inspection	P	W	R	
		Check total DFT at Random location of complete Skid	Visual & Final DFT Measurement	100%	Visual & DFT check as per Approved Painting Spec.	Painting as per GGL Approved painting procedure	Inspection	P	W	V	
5.3	FRP Canopy	Thickness, Colour, dimension, Material & specification check	Visual & Thickness	100%	Approved Specification	Approved Specification	Inspection	P	W	V	Test on FRP Canopy shall be performed as per IS 1456, IS 6746 and IS4020
5.4	Verification of Material from approved vendor of equipments	Each Material (valves, Piping ,fittings & Filter)	Approved Vendor	100%	Approved Vendor List of GGL	Approved Vendor List of GGL	Inspection	P	V	V	
5.5	Factory Acceptance Test	Pneumatic Test	No leakage from bolt Joints	100%	Approved FAT procedure	1) Pneumatic Test @ 7 kg/cm2 2) Holding Time 30 mins	FAT Report	P	W	V	--
6	**Final Documentation:**										
6.1	Design & Calculation, Material compliance report as per EN 10204 3.1 , Calibration Certificate, GAD & P & ID, Final FAT report, NDT reports, Hydro & Pneumatic report, Test certificate of ORV,PSV,SSV,CRV	History docket	Verification of records	100%	Approved specification	As per approved specification	History Docket	P	R	R	
M : Manufacturer; P : Performer; W : Witness ; R : Review ; A: Approval; RW: Random Witness ; V : Verification											
Prepared By:			Reviewed By:				Approved By:				

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