

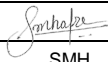




Plant CAUSTIC SODA	Client Punjab Alkali	Contract Code PACL	Document ID 0215-INS-00-EC-0010	Contract No. 66- 0215-700	
	TECHNICAL SPECIFICATIONS – MASS FLOWMETERS				
				Rev	00

<p>tkIS India / Vendor</p> <p>Category Codes (Submission Purpose)</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1 For Approval <input type="checkbox"/> 2 For Review / Comments <input type="checkbox"/> 3 For Information <input type="checkbox"/> 4 For Engineering <input type="checkbox"/> 5 For Enquiry <input type="checkbox"/> 6 For Order Placement <input type="checkbox"/> 7 Final & Approved <input type="checkbox"/> 8 Released for Construction <hr/> <p>Acceptance Codes (Approval Codes)</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1 Approved <input type="checkbox"/> 2 Approved for Manufacturing / Fabrication with Comments as marked <input type="checkbox"/> 3 Not Approved / Resubmit <input type="checkbox"/> 4 Retained for Information / Records <input type="checkbox"/> 5 Reviewed <input type="checkbox"/> 6 Reviewed as Noted / Resubmit <p>Remarks for AC2 : This marked-up drawings is hereby approved for fabrication / manufacturing and shall be re-submitted after revision. This drawing should be revised only to the extent of tkIS India / Owner / Client comments. Any other changes made by you will not be considered unless clearly highlighted in covering letter asking for approval.</p> <p>This approval / review does not absolve the supplier from the full responsibility for design and fabrication.</p> <p>Date : ___/___/___ Name : _____</p>	<p>tkIS India / Owner / Client</p> <p>Category Codes (Submission Purpose)</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1 For Approval <input type="checkbox"/> 2 For Review / Comments <input type="checkbox"/> 3 For Information <input type="checkbox"/> 4 For Engineering <input checked="" type="checkbox"/> 5 For Enquiry <input type="checkbox"/> 6 For Order Placement <input type="checkbox"/> 7 Final & Approved <input type="checkbox"/> 8 Released for Construction <hr/> <p>Acceptance Codes (Approval Codes)</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1 Approved <input type="checkbox"/> 2 Approved for Manufacturing / Fabrication with Comments as marked <input type="checkbox"/> 3 Not Approved / Resubmit <input type="checkbox"/> 4 Retained for Information / Records <input type="checkbox"/> 5 Reviewed <input type="checkbox"/> 6 Reviewed as Noted / Resubmit <p>Date : ___/___/___ Name : _____</p>
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Rev.	Status	Description	Date	Prepared	Date	Checked	Date	Approved	AC	
Based on : PIN-LES-INS-033 08-2017					Barcode					Category Code: -
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	TECHNICAL SPECIFICATIONS – MASS FLOWMETERS			
				Rev

CONTENTS:

NO.	DESCRIPTION	PAGE NOS.
1.	Standard general specification – Mass Flowmeters	2 ~ 4
2.	Project specific requirements	5
3.	Inspection and testing requirements	6 ~ 7
4.	Documentation requirements	8 ~ 9
5.	Compliance Declaration & PTR	10 ~ 12
6.	Tag List – Mass Flowmeters	11
7.	Data Sheets – Mass Flowmeters	S1

DOCUMENTS ATTACHED:

NO.	DESCRIPTION	NO. OF PAGES	DOCUMENT NO.	LATEST REV.
1.				
2.				

Plant CAUSTIC SODA	Client Punjab Alkali	Contract Code PACL	Document ID 0215-INS-00-EC-0010	Contract No. 66- 0215-700
	TECHNICAL SPECIFICATIONS – MASS FLOWMETERS			
				Rev
		of	12	

STANDARD GENERAL SPECIFICATION - MASS FLOWMETERS

1.0 GENERAL

This specification covers the general requirements of Mass Flow meters. Detailed specifications are as per the individual data sheets attached.

The order of precedence in case of conflict should be

1. Individual data sheets
2. Project specific requirement
3. Standard General Specification



2.0 TYPE AND CONSTRUCTION

2.1 Sensor

- 2.1.1 Sensor shall preferably be suitable for bi-directional flow measurement.
- 2.1.2 Sensor design shall be such that it is insensitive to external vibrations encountered frequently in plant installations.
- 2.1.3 Spare cable entries in sensor head shall be plugged with aluminum plugs.
- 2.1.4 Sensor Electronics shall be weatherproof to IP65 as a minimum. In case of Hazardous area application, the sensor shall be additionally intrinsically safe or explosion proof as specified in the individual datasheet. Intrinsic safety shall be achieved through use of suitable barrier in the associated transmitter electronics.
- 2.1.5 Secondary flow containment chamber shall be provided wherever called for in the datasheet. These shall have provision for monitoring for leaks.

2.2 Transmitter

- 2.2.1 In case the transmitter is separately mounted (not integral with sensor), 10m of special signal cable between sensor and transmitter with necessary cable glands, mounting brackets etc. shall be supplied along with each instrument.
- 2.2.2 The transmitter outputs (analog and pulse) shall be fully isolated from each other, from power supply and signal from sensor.
- 2.2.3 In case intelligent (SMART) transmitters are specified, a suitable device for configuring the same is included in scope of supply.
- 2.2.4 The transmitter shall be weatherproof to IP65 as a minimum. For Hazardous area application, the transmitter housing shall be explosion proof to the area classification specified in datasheets. This shall also house necessary barrier to achieve intrinsic safety for the sensor if called for in the data sheet.
- 2.2.5 In case of hazardous area application, power supply terminals, non-intrinsically safe signals shall be physically separated from intrinsically safe signals and shall be clearly identified.

Plant CAUSTIC SODA	Client Punjab Alkali	Contract Code PACL	Document ID 0215-INS-00-EC-0010	Contract No. 66- 0215-700
	TECHNICAL SPECIFICATIONS – MASS FLOWMETERS			
				Rev
		of	12	

- 2.2.6 Separate cable entries to be provided for Power and signal cables. Spare cable entries in the transmitter housing shall be plugged with aluminum plugs.
- 2.2.7 Transmitter shall be compliant to NAMUR NE43 requirement.
- 2.2.8 All instruments shall be tropicalized.

3.0 IDENTIFICATION



- 3.1 Each flow meter (sensor and transmitter wherever the same are separate) shall be provided with the following details engraved on a tag-plate. The tag-plate shall be permanently fixed to the sensor housing/transmitter.
 - a. Manufacturer’s name.
 - b. Model number.
 - c. Serial number.
 - d. Tag number. This shall be available on sensor as well as transmitter.
 - e. Calibrated range.
 - f. Flameproof certification (if applicable).
 - g. Power supply.
 - h. Meter size and pressure rating. This shall be punched on the flange of sensor housing.

4.0 INFORMATION REQUIRED WITH THE BID



- 4.1 Vendor shall submit the following with the bid.
 - a. Catalogues/literature for all models offered.
 - b. Sizing data, pressure drop calculations and accuracy data at specified flow rates.
 - c. Flameproof certification and Approval of Chief Controller of Explosives (CCoE), Petroleum and Explosives Safety Organization (PESO), wherever applicable.
 - d. Spare parts required for two years continuous trouble free operation.
 - e. Commissioning spares
 - f. Compliance declaration

5.0 SPECIAL REQUIREMENTS

- 5.1 Vendor shall size the mass flow meter with the following criteria:
 - a. Maximum velocity shall be limited to 8~10 m/sec. and it shall be ensured that velocity is limited to 4~5 m/sec. for normal flow conditions. However, with abrasive media e.g. liquids containing solids, maximum velocity shall be less than or equal to 1 m/sec.
 - b. Vendor shall ensure that pressure drop offered by the meter is less than or equal to value specified in individual data sheet. In case the same is not possible due to accuracy considerations, optimum value will be selected on case by case basis.

Plant CAUSTIC SODA	Client Punjab Alkali	Contract Code PACL	Document ID 0215-INS-00-EC-0010	Contract No. 66- 0215-700	
	TECHNICAL SPECIFICATIONS – MASS FLOWMETERS				
				Rev	00

- 5.2 Vendor shall submit the sizing sheets clearly indicating the total error (including base accuracy, zero stability, linearity and hysteresis) pressure drop and velocity values at minimum, normal, maximum flow as specified in the datasheet.

Plant CAUSTIC SODA	Client Punjab Alkali	Contract Code PACL	Document ID 0215-INS-00-EC-0010	Contract No. 66- 0215-700	
	TECHNICAL SPECIFICATIONS – MASS FLOWMETERS				
				Rev	00



PROJECT SPECIFIC REQUIREMENTS – MASS FLOWMETERS

Following specification covers the project specific requirements:

he order of precedence in case of conflict should be

1. Individual data sheets
2. Project specific requirement
3. Standard General Specification

Sr. No.	STD GS Clause No.	Project specific requirements	Remarks
	2.1.3 2.2.6	Spare cable entries in sensor/ transmitter housing shall be plugged with SS316 plugs	
	2.2	All transmitters shall be SMART (HART) type	
	2.2.3	Clause not applicable	

Plant CAUSTIC SODA	Client Punjab Alkali	Contract Code PACL	Document ID 0215-INS-00-EC-0010	Contract No. 66- 0215-700	
	TECHNICAL SPECIFICATIONS – MASS FLOWMETERS				
				Rev	00

INSPECTION AND TESTING

The vendor shall be fully responsible for completing all the in-house testing and test reports as indicated below.

The same shall be submitted to clients / tkIS – India / Illrd party minimum 7 days before inspection. Any delay due to late submission will not be considered as reason for delay in delivery.



Following tests shall be offered as a minimum. Percentages indicated are for each lot offered for inspection. These are indicative only and the number of instruments selected as well as the inspection procedure followed, shall be at the sole discretion of inspection engineer of the clients / tkIS-India / Ill party. The inspecting authority may, if desired, request for additional tests over and above those listed below, or decide to waive the inspection partly or fully.

SR. NO.	DESCRIPTION	INSPECTION QUANTITY			REMARKS
		VENDOR	CLIENTS / tkIS-India	IIIRD PARTY	
1.	Visual inspection for quantity, tag number, model number, general conformity with specifications.	100%	100%		
2.	Hydrostatic test on sensor as per applicable standard.	100%			
3.	Calibration at more than two equispaced points over entire range besides zero and span.	100%	10%		Note-1
4.	Permissible load resistance test.	As per vendor standard			
5.	Power supply variation test for satisfactory operation.	As per vendor standard			
6.	Bi-directional communication test with hand held configurator and checking the configuration.	As per vendor standard	10%		
7.	Tests for correct cable entries on sensor head and transmitter.	As per vendor standard	10%		

Note 1 : In case of fully imported meters, vendor shall provide relevant internal test reports, confirmatory certificates from the original manufacturing facility shall be submitted for review by tkIS-India. Any problem arising due to exemption of the above mentioned tests shall be promptly attended and rectified free of cost by the vendor.



Test and Calibration Instruments

Vendor shall arrange for all the test and calibration instruments and provide all the facilities/assistance for inspection and testing. Accuracy of test and measuring instruments used by the vendor shall be at least two times better than the accuracy of the instrument being tested. All the test and measuring

Plant CAUSTIC SODA	Client Punjab Alkali	Contract Code PACL	Document ID 0215-INS-00-EC-0010	Contract No. 66- 0215-700	
	TECHNICAL SPECIFICATIONS – MASS FLOWMETERS				
				Rev	00

instruments shall be calibrated in a standard laboratory and the vendor shall produce valid calibration documents for the purposes of verification. The calibration shall be traceable to any of the approved national laboratories.

Hand held configurator (HART or Foundation Fieldbus as applicable) required for testing communication and configuration.

Plant CAUSTIC SODA	Client Punjab Alkali	Contract Code PACL	Document ID 0215-INS-00-EC-0010	Contract No. 66- 0215-700	
	TECHNICAL SPECIFICATIONS – MASS FLOWMETERS				
				Rev	00

DOCUMENTATION REQUIREMENTS

S. NO.	DOCUMENT	FOR INFORMATION AFTER PO/LOI				FOR APPROVAL AFTER PO/LOI				FINAL COPIES	
		TIME SCH. WEEK	COPIES (NOTE A)			TIME SCH. WEEK	COPIES (NOTE B)			S (1)	P (1)
			CLIENTS	tkIS- India			CLIENTS	tkIS- India			
1.	Installation, operation and maintenance manual	---	---	---	---	---	---	---	---	3	4
2.	Parts list	---	---	---	---	---	---	---	---	3	4
3.	Dimensional drawings	2	1S+1P	1S+1P	---	---	---	---	---	3	4
4.	Internal test reports	Minimum 7 days before Inspection	1S+1P	1S+1P	---	---	---	---	---	3	4
5.	Flameproof / intrinsically safe certification wherever applicable	Minimum 7 days before Inspection	1S+1P	1S+1P	---	---	---	---	---	3	4
6.	CCOE approval wherever applicable	Minimum 7 days before Inspection	1S+1P	1S+1P	---	--	---	---	---	3	4
7.	Configuration sheet of instruments	---	---	---	---	---	---	---	---	3	4

1. Abbreviations:

S : Soft copies (.pdf files) (1 copy to client + 2 copies to tkIS (India))

P : Prints

2. Notes:

- a) For Vendor documentation, wherever review/approval is specified, soft copy shall be sent to anand.nalawade@thyssenkrupp.com with copy to tkisindia.pacitf@thyssenkrupp.com. Once the document is reviewed / approved, final sets of documents shall be sent to tkIS DMS office for further compilation as per following address. These shall not be dispatched to site directly.

- tkIS India Private Limited, UHDE House,
L.B.S. Marg, Vikhroli (West),
Mumbai 400083, India
Attention: Mr. K S Srinivasan (Telephone: +91-22-4047 8131)

