

**DETAILED TECHNICAL SPECIFICATIONS OF  
GUIDED WAVE RADAR TYPE  
LEVEL TRANSMITTER**

**1.SPECIFICATION**

SN	DESCRIPTION	TENDER SPECS	VENDOR OFFERED SPECS	DEVIATION
<b>IDENTIFICATION</b>				
1	TAG NO	As per Annexure-A		
2	MAKE/MODEL	Vendor to Specify		
3	SERVICE	As per Annexure-A		
<b>PROCESS PARAMETER</b>				
4	VESSEL HEIGHT	As per Annexure-A		
5	VESSEL ORIENTATION			
6	RANGE			
7	OPERATING PRESSURE			
8	OPERATING TEMPERATURE			
9	DESIGN PRESSURE			
10	DESIGN TEMPERATURE			
11	DIELECTRIC CONSTANT			
12	LIQUID VISCOSITY			
13	DENSITY			
<b>MOC &amp; PROCESS CONNECTION</b>				
14	WETTED PARTS MOC	As per Annexure-A		
15	PROCESS CONNECTION	As per Annexure-A		
16	FLANGE MATERIAL	Hastelloy-C (Cladding is not acceptable)		
17	FLANGE SURFACE	As per ASME B16.1		
18	MOUNTING KIT MATERIAL	Vendor to Specify		
19	BOLTING MATERIAL	Vendor to Specify		
<b>SENSING ELEMENT</b>				
20	MEASUREMENT PRINCIPLE	Guided Wave RADAR Type (Time Domain Reflectometry)		
21	MEASURED VARIABLE	Continuous Level		
22	OPERATING FREQUENCY	Vendor to Specify		
23	PROBE TYPE	Coax		
24	PROBE (ROD & COAX) MOC	Hastelloy-C		
25	PROBE LENGTH	As per Annexure-A		
26	SEAL (GASKET) MATERIAL	Vendor to Specify (Shall be suitable for Process Service)		
<b>TRANSMITTER</b>				
27	TRANSMITTER TYPE	Integral (Smart Type)		
28	VERSION	Microprocessor based Smart Transmitter (2 wire loop powered)		

29	OUTPUT SIGNAL TYPE	4-20 mA DC, 24V DC, 2 wire system		
30	DIGITAL COMMUNICATION STD	HART		
31	SIGNAL POWER SOURCE	12-30 VDC preferable		
32	INTEGRAL INDICATOR STYLE	LED/LCD display with Push Buttons, Digital meter, Linear scale		
33	VARIABLE FOR LOCAL DISPLAY	Level in mm		
34	SIGNAL TERMINATION TYPE	Screw type		
35	ENCLOSURE TYPE / CLASS	Weather proof confirming to IP 65		
36	HAZARDOUS AREA CERT/APPROVAL TYPE OF ENCLOSURE	Intrinsically Safe suitable for group IIC Ex-ia IIC T4 Certified		
38	FAILURE/DIAGNOSTIC ACTION	Preferable		
39	ENCLOSURE MATERIAL	Die cast Aluminium with Epoxy polyurethane/polyster coating		
40	ELECTRICAL CONNECTION	1/2" NPT double compression SS cable gland		
	<b>PERFORMANCE CHARACTERISTICS</b>			
41	ACCURACY	±3 mm or better ( including linearity, hysteresis, & repeatability)		
42	DEAD BAND	Vendor to Specify		
43	TEMP ERROR	Vendor to Specify		
44	POWE SUPPLY EFFECT	Vendor to Specify		
45	PROCESS DIELECTRIC EFFECT	Vendor to Specify		
46	STABILITY	Vendor to Specify		
47	AMBIENT WORKING TEMP	9-50 degree Celsius		
48	AMBIENT HUMIDITY LIMITS	85% to 100%		
49	EMC COMPLIANCE	Tx. Should be RFI & EMI immune & EMC compliance as relevant EN/IEC/ equivalent standard		

**2. GENERAL SPECIFICATION**

- 2.1 Each Instrument shall have SS Name plate permanently fastened to the Body, which shall be visible when instrument is in service.
- 2.2 All studs/bolts shall be according to ASTM A 193 gr B8 and all nuts according to ASTM A 194 Gr 8.
- 2.3 All the wetted parts wherever not specified shall be Hastelloy-C.
- 2.4 Copper material shall not be used for any part of the Instrument.
- 2.5 All accessories such as nuts, bolts, U clamps etc. for installation of Transmitters shall be supplied by bidder.

**3. GENERAL REQUIREMENT**

- 3.1 The vendor shall give guarantee for the material for the period of 12 months from the date of receipt and acceptance of last lot of material at site.
- 3.2 Vendor should specify online make & model no. in Technical Bid format enclosed along with the Tender.
- 3.3 Materials are required to be delivered to Stores Officer, Heavy Water Plant (Tuticorin), PO-HWP Colony, Muthiapuram, Tuticorin-628007.
- 3.4 **Installation & commissioning of these transmitters are not in the scope of supplier.**

**4. DOCUMENTS TO BE SUBMITTED ALONG WITH THE OFFER**

- 4.1 Vendor should submit duly signed and stamped copy of Tender Specification and deviation if any to be brought out.
- 4.2 Vendor should list out supplier's offered specs & deviations if any w.r.t. technical specs & submit along with the bid duly signed and stamped by him.
- 4.3 The detail catalogue of the offered models of sensor / transmitter shall be submitted along with the offer.
- 4.4 List of location / company in India with Name of concerned person, address, phone no. , fax no. where the similar type of Guided Wave Radar Transmitters (for the similar Pressure & Temperature service) are installed and working satisfactorily from last five years shall be enclosed along with the offer.
- 4.5 The performance of the Guided Wave Radar Transmitters already installed by the vendor shall be checked after opening of bid. If the same is found to be not satisfactory, then the bid may be rejected.

**5. TESTS AND INSPECTION TO BE CARRIED OUT AT SUPPLIER WORKS**

- 5.1 Vendor shall submit the QAP for approval from HWB after the placement of PO and before carrying out inspection which will minimum include the tests mentioned below at Sr. No. 5.3 & 6.
- 5.2 Vendor shall offer all the Transmitters for inspection at their works before dispatch. 15 days advance notice informing readiness of the item at their works along with the internal test reports for final inspection shall be provided to HWB.
- 5.3 Following Tests and Inspections shall be carried out on randomly selected 2 nos. out of 4 nos. of Transmitters by HWB at Supplier's works before dispatch clearance

A	Functional Checks ( Five Point Calibration, Accuracy)	Shall be witnessed by HWB
B	Hydro test @1.5 times of Maximum Working pressure (MWP) / Design Pressure	Certificate Submission
C	Reverse polarity Check	Shall be witnessed by HWB
D	HART Communication Checks	Shall be witnessed by HWB
E	Suitability of Transmitters for Vacuum Service (Applicable for Tag No 43LT18 & 43LT19)	Certificate of Compliance Submission
F	Visual checks for sizes & dimension, serial no. model no. as per approved datasheet	Shall be witnessed by HWB for 100% qty

G	IP65 Certificate	Type test Certificate Submission
H	Explosion Proof Certificate	Type test Certificate Submission
I	MOC Test Certificate	Type test Certificate Submission for Wetted parts & Flange.

**6.DOCUMENTS & TEST CERTIFICATES TO BE SUBMITTED ALONG WITH DISPATCH**

6.1 The supplier shall show the following documents in English language in 3 sets at the time of call of inspection and during Pre dispatch Inspection for 100% qty of instruments and submit the same at the time of delivery.

- I. Certified final dimensional drawings and weight.
- II. Catalogue, Operation & Maintenance Manual giving complete details about that instrument.
- III. Performance test certificate for Calibration, Accuracy, Hydrostatic test, Reverse polarity protection, HART Communication etc.
- IV. Certificate of Compliance from OEM for Suitability of Guided Wave Radar Transmitters being supplied for Vacuum Service (Applicable for Tag No 43LT18 & 43LT19).
- V. Material Composition test certificate from OEM or authorized Lab with tracking details which can clearly show the same material is being used for transmitter parts as per the approved datasheet.
- VI. IP 65 certificate.
- VII. Hazardous area classification certificate (Intrinsically safe certificate as per Ex ia IIC T4).

**7. TECHNICAL BID FORMAT**

Sr. no	Item Category	Item Description (TAG No.)	Qty.	Unit	Make	Model
1	<b>Instrumentation</b> <b>(Guided Wave Radar Type Level Transmitter)</b>	43LT18	1	No.	<b>These Columns to be filled in Technical Bid Template</b>	
2	-DO-	43LT19	1	No.		
3	-DO-	53LT01	1	No.		
4	-DO-	53LT02	1	No.		

**Note:** “Post supply inspection in respect of supplies made is not permitted. Any offer containing the condition of post supply inspection will be out-rightly rejected. It is therefore, mandatory for the bidders, while quoting, to indicate in clear terms the requirement of post supply inspection by any outside agency.”

## PROCESS PARAMETER GUIDED WAVE RADAR TYPE LEVEL TRANSMITTER

SN	TAG NO.	VESSEL HEIGHT (MM)	PROBE LENGTH (MM)	VESSEL ORIENTATION	SERVICE	RANGE (%)	OPERATING TEMP (DEG C)	DESIGN TEMP (DEG C)	OPEARTING PRESSURE KG/SQ CM(g)	DESIGN PRESSURE KG/SQ CM(g)	DIELECTRIC CONSTANT	LIQUID VISCOSITY (CP)	DENSITY (KG/SQM)	PROCESS CONNECTION	WETTED MOC & PROBE MOC
1	43LT18	2100	1800	Vertical	POCL3, PCI3, TEA, OC, DHA, HEXANE, XYLENE, SODIUM, HCL, EHA, Na2CO3 (Soln.)	0-100	-5 to 170	200	0 to 2 KG/SQ CM	Full Vacuum to 6	14	1 to 3	800 to 1645	2" RF Flanged with Serrations, 150#, ASME B16.5 MOC: Hastelloy-C	Hastelloy-C
2	43LT19	2100	1800	Vertical	POCL3, PCI3, TEA, OC, DHA, HEXANE, XYLENE, SODIUM, HCL, EHA, Na2CO3 (Soln.)	0-100	-5 to 170	200	0.01 Torr to 2 KG/SQ CM	Full Vacuum to 6	14	1 to 3	800 to 1645	2" RF Flanged with Serrations, 150#, ASME B16.5 MOC: Hastelloy-C	Hastelloy-C
3	53LT01	2800	2650	Vertical	AQUEOUS EFFLUENT + FeCL3+HCL/NaOH+ SUSPENDEED SOLIDS	0-100	40	70	0 KG/SQ CM	Hydrostatic Head (Max liquid Level: 2300mm)	4.6-8	2	1000-2000	2" RF Flanged with Serrations, 150#, ASME B16.5 MOC: Hastelloy-C	Hastelloy-C
4	53LT02	2800	2650	Vertical	AQUEOUS EFFLUENT + FeCL3+HCL/NaOH+ SUSPENDEED SOLIDS	0-100	40	70	0 KG/SQ CM	Hydrostatic Head (Max liquid Level: 2300mm)	4.6-8	2	1000-2000	2" RF Flanged with Serrations, 150#, ASME B16.5 MOC: Hastelloy-C	Hastelloy-C