



TD-201 Rev No. 00 Form No.	 HYDERABAD	<b>PRODUCT STANDARD</b> <b>PROJECT ENGINEERING &amp; SYSTEMS DIVISION</b> <b>HYDERABAD</b>				<b>PY 56672</b> REV 00 Page 1 of 7
<p><b><u>PROJECT:HPCL-Vizag CPP</u></b></p> <p><b>SPECIFICATION</b></p> <p><b>FOR</b></p> <p><b>CHAMBERS FOR RADAR LEVEL TRANSMITTERS</b></p>						
Ref. Doc	<b>Revision :00</b>  <b>Refer Record of Revisions</b>	<b>Prepared:</b>  <b>Sunil</b>	<b>Checked:</b>  <b>Sonalika</b>	<b>Approved :</b>  <b>Kamal</b>	<b>Date :</b>  <b>21.12.2022</b>	

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	Form No.  <b>HYDERABAD</b>	<b>PRODUCT STANDARD</b> <b>PROJECT ENGINEERING &amp; SYSTEMS DIVISION</b> <b>HYDERABAD</b>	<b>PY 56672</b> REV. 00 Page 2 of 7
<b>COPYRIGHT AND CONFIDENTIAL</b> The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.	<p><b>1. Scope</b></p> <p>This technical specification covers the requirements for the Engineering, manufacturing, assembly, with accessory requirements, nameplate marking, testing at vendor works, transportation to site with necessary documentation like data sheets, statutory approvals, O&amp;M manuals etc., and erection &amp; commissioning assistance as required.</p> <p><b>2. Proven Track Record</b></p> <p>The equipment being offered as per specification should be operating satisfactorily in hydrocarbon industry like Refinery, Petrochemical and Gas Processing Plant under similar process conditions for <u>at least 4000 Hours</u>. The above criteria shall be applicable to main equipments, sub- components as well as brought out instrument if any.</p> <p>Prototype instrument or retrofit instrument or absolute instrument or instrument under phase out cycle shall not be offered or supplied. Vendor shall submit necessary supporting documents / past users confirmation supporting to above PTR requirements .</p> <p>If the Bidder's offered model already supplied to BHEL in past 5 years then this PTR may not be considered.</p> <p><b>3. Instructions to Bidders</b></p> <p>3.1 Bidders are advised to contact BHEL for essential technical queries in writing within one week of issue of Enquiry. Offers with incomplete information will not be considered for evaluation, and are likely to be rejected outright without any further interaction with the Bidder.</p> <p>3.2 Unsolicited requests from bidders for alterations to their already submitted offer will not be entertained. These would not be taken cognizance and offers will be evaluated without taking into account such requests/correspondence.</p> <p>3.3 Any technical features [over &amp; above BHEL enquiry specification requirements] proposed by Bidder will not be given preference for the purpose of evaluation.</p> <p>3.4 Bidders are advised to comply to specifications in total, unless the requirement is not feasible. Incomplete offers will be rejected without intimating to bidders. In case feasible deviations are proposed by the bidder and subsequently withdrawn, no commercial implications can be claimed by the bidder.</p> <p>3.5 Bidders are advised to quote models and brands with proven track record of testing and successful operation. Offers shall include supporting catalogue and published literature. In case of discrepancy between vendor's offer and published documents, details furnished in published documents will be taken for the purpose of evaluation.</p> <p>3.6 In the event of any conflict between these specifications, data sheets, related standards, codes etc. the vendor shall refer the matter to the purchaser for clarifications and only after obtaining the same shall proceed with the manufacture of the items in question.</p>		
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**4. CHECK LIST** (To be filled by BIDDER and submitted along with Technical offer)

Vendor shall submit the following documents mandatorily as part of COMPLETE technical offer.

Enquiry No. / Date :

Name of the Bidder :

Project Name :

Item Description :

S. No	Document	Supplier confirmation (Yes/No)	Remarks
1	Technical offer complies with the specifications in Toto and there are no technical deviations		
2	In case of deviation, vendor to confirm that these are technically not feasible deviations and same are submitted in BHEL format. In case technically feasible deviations are proposed by the bidder and subsequently withdrawn, <u>no commercial implications can be claimed by the bidder</u>		
3	All items are manufactured confirming to latest version of material grade standard and manufacturing standard mentioned in this specifications/instrumentation standards.		
4	Material packing is confirmed as per Cl.15 of this specification		
5	Inspection & testing requirements are complied as per Cl.9 of this specifications		
6	Unpriced Price schedule is submitted		
7	For addition/reduction of quantity, unit rate quoted in the present offer shall be considered during ordering and shall be valid up to execution of the contract to the extent of $\pm 10\%$ of order Value.		
8	All the equipments / items / etc., supplied by bidder are having valid statutory approval certificates and same will be produced at any stage of contract execution to BHEL. The same were eligible to take local statutory regulatory body approval during commissioning of the system (if applicable)		

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(Bidder's Signature and stamp with date)

**5. Standards**

The related standards referred to herein and mentioned below shall be of the latest edition prior to the date of purchaser's enquiry:

IEC 529 / IS 2147	Dust proof and weather proof enclosure
IEC-79-11	Certification for Intrinsically safe equipment
IEC-79-1 / IS 2148	Certification for Flame proof equipment
IEC 529	Classification of degree of protection provided by enclosure
IEC 801	Electromagnetic compatibility for Industrial Process measurement and Control equipment
ASME B16.20	Metallic gaskets for pipe flanges
ASTM	American Society for Test & Materials
ANSI B2.1	Threaded end connections
ANSI B16.5	Flange dimensions and ratings
API 3.1B	Standard practice for level measurement of liquid hydrocarbons
OIML	International organization for level measurements
ISO 4266	Petroleum & liquid petroleum products level & temperature measurement in storage tanks

**6. Technical requirements**

The chamber to be supplied by bidder, shall house the guided wave radar level transmitter(supplied by others).The transmitter shall be mounted on top of chamber through flanged connection. The chamber shall be mounted on side of vessel. The MOC ,process connection, centre to centre distance of chamber shall be as per Detailed GA drawing of chamber & BOM table(Annexure-1) as enclosed with this specification. **Bidder to supply the chamber, to exactly match the GA drawing enclosed with this specification.**

**7. Paint & coating**

Manufacture well proven anticorrosive paint shall be used (If painting is done on any part).

**8. Inspection And Testing**


Chamber and its accessories shall be subjected to inspection and testing at vendor works by BHEL/Third party Inspector (TPI) and /or BHEL's customer. Test procedure shall include but not be limited to the following. All the tests being conducted shall clearly bring out in the Quality Assurance Plan (QAP) by Vendor.

S.No	Radars assembly	:	Test
8.1	Dimensional and physical verification and name plate	:	100 % Witness
8.2	BOM verification & Visual check	:	100 % Witness
8.3	Material test (physical properties and chemical properties)	:	100%, Certificate review
8.4	Radiography test for joints & weld.	:	100%, Certificate review
8.5	IBR Form IIIc as applicable	:	100%, Certificate review
8.6	Hydrostatic test at 1.5 times of max pressure.	:	100%, Certificate review
8.7	PMI test for SS & AS materials (If applicable)	:	100%, Certificate review

**9. Name Plate**

Each equipment shall have a 316SS nameplate attached firmly to it at a visible place furnishing the following information:

- Tag number as per Purchaser's data sheet.
- Manufacturer's Model No.
- BHEL P.O. No.
- Manufacture's Name

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<b>COPYRIGHT AND CONFIDENTIAL</b> The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED . It must not be used directly or indirectly in any way detrimental to the interest of the company.	<p><b>10. Documentation</b></p> <p>10.1 Information to be included with offer</p> <p>Vendor shall make the offer in detail, with respect to every item of the Purchaser’s specifications. Any offer not conforming to this shall be summarily rejected.</p> <ol style="list-style-type: none"> <li>a) Duly filled &amp; Signed copy of Check list</li> <li>b) Deviation list, if any (as per “No deviation format” given in this specification). If there are no deviations, bidders shall submit “Deviation format” by mentioning deviations “Nil”.</li> <li>c) Unpriced price schedule (To be submitted compulsorily without fail)</li> <li>d) Proven Track record and reference list (if applicable)</li> <li>e) Bill of materials (only for information)</li> </ol> <p>10.2 Documentation submission within 1 weeks of placement of LOI (for approval by BHEL and / or BHEL’s customer in 4 sets)</p> <ol style="list-style-type: none"> <li>a) Consolidated BOM sheet along with accessories of instruments, finalized make /models of instruments, etc for approval.</li> <li>b) Detail GA drawings &amp; Data sheets</li> <li>c) Type tests, statutory certificates</li> <li>d) Comprehensive Quality Assurance plan (QAP).</li> <li>f) Vendor shall obtain final approvals on all technical + quality aspect documents before inspection dates.</li> </ol> <p>10.3 Documents to be submitted during final shop testing and before equipment dispatch. <b>(Note: submission of these documents are commercially linked)</b> - all in 16 sets (2 sets to be included with item dispatch and balance to BHEL purchase department).</p> <ol style="list-style-type: none"> <li>a) Approved Engg documents</li> <li>b) As-Shipped documents</li> <li>c) As-Built documents</li> <li>d) Guarantee and all test certificates for review and acceptance by BHEL and / or BHEL’s Customer</li> </ol> <p>3 sets of CD-ROM – containing <b>O&amp;M manual and Engineering documents</b> (1 set to be included with item dispatch and balance to BHEL purchase department).</p> <p><b>11. Guarantee certificate</b></p> <p>Vendor shall furnish a full guarantee for the performance of the Radar level transmitter. Unless noted otherwise in the BHEL Tender enquiry, this guarantee shall be applicable for a period of 2 years from the date of dispatch or 12 months from the date of commissioning whichever is earlier.</p> <p><b>12. Shipping</b></p> <ol style="list-style-type: none"> <li>a) The equipment shall be transported to site by the vendor in fully assembled condition.</li> <li>b) However, in case some components are liable to be damaged during transit, the same shall be dismantled and supplied separately, to be reassembled at site by the vendor.</li> <li>c) Each item shall be suitably wrapped in polythene sheets, packed in wooden crates, etc. properly tagged and secured before dispatch.</li> <li>d) The vendor shall send each consignment to site with a detailed packing list.</li> </ol>		
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DEVIATION FORMAT

Enquiry No.:Item:Name of Bidder:Offer Ref. No.:

Sl. No.	Clause no. & Spec. no.	Description as per Specification	Deviation taken	Nature of Deviation	Remarks

## NOTES:

1. Deviations, if any, shall be clearly brought out only in this format. Deviations mentioned / taken elsewhere or in any other format will be ignored.
2. If the "Deviation Schedule" is not submitted along with the offer, the bidder's offer is likely to be rejected without any further interaction with the bidder. Only the accepted deviations in conjunction with the original tender shall constitute the contract document for the award of job to the bidder
3. Additional sheets in the same format can be attached by the vendor, if necessary.
4. Nature of Deviations shall only be of Design / Manufacturing constraints and non-availability of items / components / makes in market.
5. No price implications shall be entertained for deviations withdrawn during the technical scrutiny. If any deviations are accepted by BHEL during technical scrutiny then also there will be no price implication. Hence, in no case there will be consideration of Price implications.
6. Reasons for the deviations shall be specified in the Remarks column.
7. If there are no deviations from the specifications, bidder still has to submit the signed copy of this format by writing "NO Deviations" on this format.

SIGNATURE OF THE BIDDER \_\_\_\_\_

NAME \_\_\_\_\_

DESIGNATION \_\_\_\_\_

DATE \_\_\_\_\_

COMPANY SEAL

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**PROJECT-HPCL-VIZAG  
BOM FOR RADAR LEVEL TRANSMITTER  
Annexure-1 of Specification PYS6672**

S.No.	Tag No.	Description/Service	Probe length (as per GA drawing) in mm	Chamber C-C in mm	Chamber MOC	Side Process connection of chamber	Transmitter connection on chamber	Process Pressure(in Kg/cm2) (min/Nor/Max/Desg)	Process Temperature(in DegC) (min/Nor/Max/Desg)	
1	CHAMB-LT-8807	Overhead tank Level	1113	813	SS304	2"300RF SS304	2"SORF300# SS304 with 1.5" NPTF hole	-/-ATM/-	-/65/-/	00
2	CHAMB-LT-2015 CHAMB-LT-2012	IBD Tank Level	1800	1500	CS A105	2",150RF,CSA105	2"SORF300# SS304 with 1.5" NPTF hole	1/1/1/3	60/60/60/100	00
3	CHAMB-LT-1619	ACC condensate tank level	1800	1500	CS A105	2"300RF CS A105	2"SORF300# SS304 with 1.5" NPTF hole	-/-3.5/5.5	-/-133/150	00
4	CHAMB-LT-4602A CHAMB-LT-4602B CHAMB-LT-4602C	Expansion/Surge tank level	1800	1500	SS304	1"300RF SS304	2"SORF300# SS304 with 1.5" NPTF hole	3/4/5/12.5	Amb/Amb/Amb/6	00

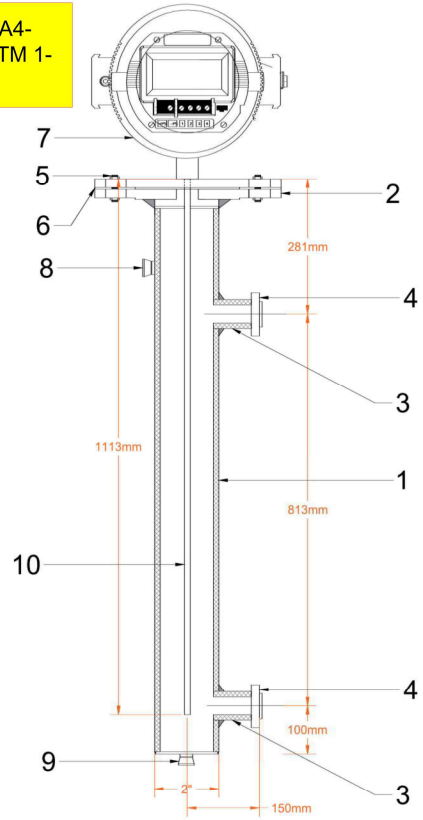
**NOTE:**Bidder to refer the GA drawing of chamber as enclosed with specification for other details of chamber & to supply exactly the same chamber matching to GA drawing.

**BOM & PRICE FORMAT:**

S.No.	Tag No.	Description/Service	Probe length (as per GA drawing) in mm	Chamber C-C in mm	Chamber MOC	Quantity [A]	Units	Unit Rate in Rs. [B]	Total in Rs. [C=AxB]	
1	CHAMB-LT-8807	Overhead tank Level	1113	813	SS304	1	Nos.			00
2	CHAMB-LT-2015 CHAMB-LT-2012	IBD Tank Level	1800	1500	CS A105	2	Nos.			00
3	CHAMB-LT-1619	ACC condensate tank level	1800	1500	CS A105	1	Nos.			00
4	CHAMB-LT-4602A CHAMB-LT-4602B CHAMB-LT-4602C	Expansion/Surge tank level	1800	1500	SS304	3	Nos.			00
								<b>Total Price</b>		

GENERAL ARRANGEMENT DRAWING FOR  
RADAR LEVEL TRANSMITTER(CHAMBER)

Transmitter( FMP51-BA-A-C-C-D-AC-A4-  
RGJ) ,supplied with Thread ANSI NPTM 1-  
1/2, 316L



BILL OF MATERIAL				
S.NO	DESCRIPTION	SIZE	MOC	QTY
1	CHAMBER PIPE	2 INCH XS	SS	1
2	CHAMBER FLANGE	Refer Note	SS	1
3	SIDE PROCESS CONN PIPE	2"	SS	2
4	SIDE PROCESS CONN FLANGE	2" 300# RF / 3	SS	2
5	STUD/NUT	TO SUIT 2" FLANGE	-	AS REQ
6	GASKET	TO SUIT 2" FLANGE	-	1
7	TRANSMITTER			1
8	VENT PLUG	1/2" NPTF	SS316L	1
9	DRAIN PLUG	1/2" NPTF	SS316L	1
10	PROBE-ROD TYPE	12 mm		1

Note:Chamber flange & counter flange should be suitable for mounting Transmitter with ANSI NPTM 1-1/2 .  
Stud,nuts & gaskets are to be supplied for chamber flange.

<b>BHARAT HEAVY ELECTRICALS LIMITED</b> Project Engineering & Systems Division Hyderabad		Approved/Comment/Reason (either within the vendor from his responsibility to comply with NF Specification and all applicable code and standards. Vendor has to ensure safe and smooth operation and meet the intended performance of the equipment. Reviewed by: <b>Sonalika Sahu</b> Date: <b>17.01.2020</b>
Code	DOCUMENT REVIEW DETAILS	
1	No comments. Proceed with manufacture / fabrication.	
2	Proceed with manufacture / fabrication as per the commented document. Resubmit the revised document for approval.	
3	Drawing/document does not conform to basic requirements as marked. Re-submit for approval.	
4	Retained for Records.	

TAG NO: 606-LT-8807

QUANTITY: 1 NO

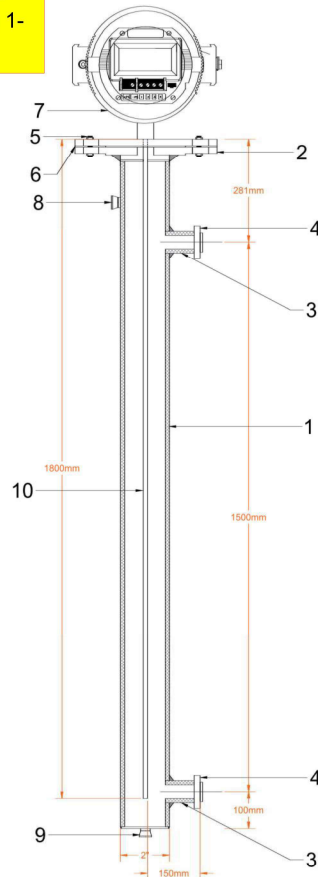
2	25.10.19	AS PER COMMENTS	MK	RVS	VB	CUSTOMER: BHEL HYDERABAD	PO.NO: T719A00283 & T719A00284, DATED: 14.08.2019
1	20.9.19	AS PER COMMENTS	MK	RVS	VB	PROJECT: VISHAKHA REFINERY MODERNISATION PROJECT HPCL VIZAG	TITLE: GENERAL ARRANGEMENT DRAWING FOR RADAR LEVEL TRANSMITTER(CHAMBER)
0	27.8.19	FOR APPROVAL					
REV	DATE	DESCRIPTION	PRPD BY	CHKD BY	APPD BY	DRAWING NO: TM-CS034&035-19-DS-005	SHEET NO: 1 OF 3 SCALE: 1:1

Annexure-1 of Specification PY56672

GENERAL ARRANGEMENT DRAWING FOR  
RADAR LEVEL TRANSMITTER(CHAMBER)

Transmitter( FMP51-BA-A-C-C-D-AC-A4-  
RGJ) ,supplied with Thread ANSI NPTM 1-  
1/2, 316L

<b>BHARAT HEAVY ELECTRICALS LIMITED</b> Project Engineering & Systems Division Hyderabad	
<b>BHEL</b> Bharat Heavy Electricals Limited	Code: DOCUMENT REVIEW DETAILS
1 No comments. Proceed with manufacture / fabrication.	2 Proceed with manufacture / fabrication as per the commented document. Re-submit the revised document for approval.
3 Drawing/document does not conform to basic requirements as marked. Resubmit for approval.	4 Retained for Records.
Approval conveyed herein neither relieves the vendor from his responsibility with RT specification and all applicable code and standards nor does it constitute a warranty of smooth operation and meet the intended life of the equipment.	
Reviewed by: <b>Sonalika Sahu</b>	Date: 17



2"150#RF

BILL OF MATERIAL				
S.NO	DESCRIPTION	SIZE	MOC	QTY
1	CHAMBER PIPE	2 INCH XS	CS-A105	1
2	CHAMBER FLANGE	Refer Note	CS-A105	1
3	SIDE PROCESS CONN PIPE	2 INCH	CS-A105	2
4	SIDE PROCESS CONN FLANGE	2" 300# RF	CS-A105	2
5	STUD/NUT	TO SUIT 2" FLANGE	-	AS REQ
6	GASKET	TO SUIT 2" FLANGE	-	1
7	TRANSMITTER			1
8	VENT PLUG	1/2" NPTF	SS316L	1
9	DRAIN PLUG	1/2" NPTF	SS316L	1
10	PROBE- ROD TYPE	12mm		1

Side process flange rating shall be 150#RF only.

Note:Chamber flange & counter flange should be suitable for mounting Transmitter with ANSI NPTM 1-1/2 . Stud,nuts & gaskets are to be supplied for chamber flange.

TAG NO: 606-LT-2015  
606-LT-2012

QUANTITY: 2 NO'S

1	20.9.19	AS PER COMMENTS	MK	RVS	VB	CUSTOMER: BHEL HYDERABAD	PO.NO: T719A00283 & T719A00284, DATED: 14.08.2019
0	27.8.19	FOR APPROVAL	MK	RVS	VB	PROJECT: VISHAKHA REFINERY MODERNISATION PROJECT HPCL VIZAG	TITLE: GENERAL ARRANGEMENT DRAWING FOR RADAR LEVEL TRANSMITTER(CHAMBER)
REV	DATE	DESCRIPTION	PRPD BY	CHKD BY	APPD BY	DRAWING NO: TM-CS034&035-19-DS-005	SHEET NO: 2 OF 3 SCALE: 1:1

Annexure-1 of Specification PY56672

GENERAL ARRANGEMENT DRAWING FOR  
RADAR LEVEL TRANSMITTER(CHAMBER)

**BHARAT HEAVY ELECTRICALS LIMITED**  
Project Engineering & Systems Division  
Hyderabad

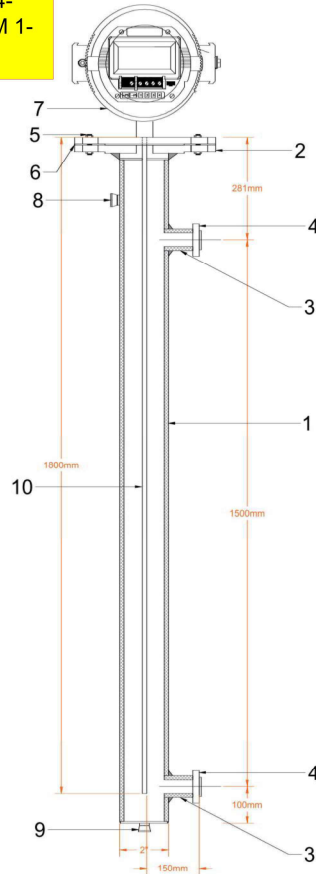
**DOCUMENT REVIEW DETAILS**

Code	1	No comments. Proceed with manufacture / fabrication.
2	Proceed with manufacture / fabrication as per document. Resubmit the revised document.	
3	Drawing/document does not conform to be marked. Resubmit for approval.	
4	Retained for Records.	

Approval covered herein neither relieves the vendor of his responsibility nor does it constitute an approval of the equipment.

Reviewed by: **Sonalika Sahu**

Transmitter( FMP51-BA-A-C-C-D-AC-A4-RGJ) ,supplied with Thread ANSI NPTM 1-1/2, 316L



BILL OF MATERIAL				
S.NO	DESCRIPTION	SIZE	MOC	QTY
1	CHAMBER PIPE	2 INCH XS	CS-A105	1
2	CHAMBER FLANGE	Refer Note	CS-A105	1
3	SIDE PROCESS CONN PIPE	2 INCH	CS-A105	2
4	SIDE PROCESS CONN FLANGE	2" 300# RF/3	CS	2
5	STUD/NUT	TO SUIT 2" FLANGE	-	AS REQ
6	GASKET	TO SUIT 2" FLANGE	-	1
7	TRANSMITTER			1
8	VENT PLUG	1/2" NPTF	SS316L	1
9	DRAIN PLUG	1/2" NPTF	SS316L	1
10	PROBE- ROD TYPE	12mm		1

Note:Chamber flange & counter flange should be suitable for mounting Transmitter with ANSI NPTM 1-1/2 . Stud,nuts & gaskets are to be supplied for chamber flange.

TAG NO: 606-LT-1619

QUANTITY: 1 NO

1	20.9.19	AS PER COMMENTS	MK	RVS	VB	CUSTOMER: BHEL HYDERABAD	PO.NO: T719A00283 & T719A00284, DATED: 14.08.2019
0	27.8.19	FOR APPROVAL	MK	RVS	VB	PROJECT: VISHAKHA REFINERY MODERNISATION PROJECT HPCL VIZAG	TITLE: GENERAL ARRANGEMENT DRAWING FOR RADAR LEVEL TRANSMITTER(CHAMBER)
REV	DATE	DESCRIPTION	PRPD BY	CHKD BY	APPD BY	DRAWING NO: TM-CS034&035-19-DS-005	SHEET NO: 3 OF 3 SCALE: 1:1

Annexure-1 of Specification PY56672

GENERAL ARRANGEMENT DRAWING FOR  
RADAR LEVEL TRANSMITTER(CHAMBER)

**BHARAT HEAVY ELECTRICALS LIMITED**  
Project Engineering & Systems Division  
Hyderabad

**DOCUMENT REVIEW DETAILS**

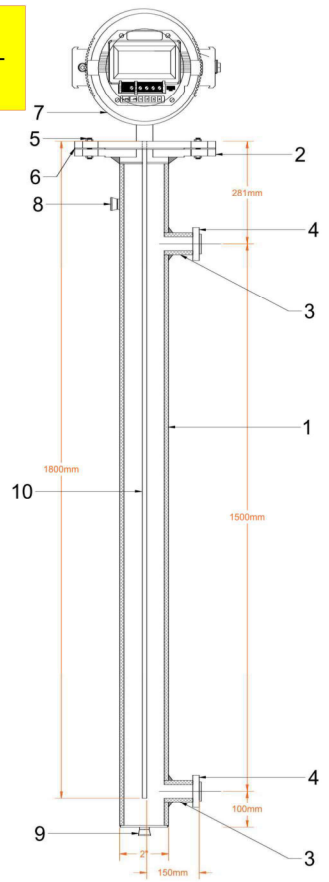
Code	DESCRIPTION	DATE	BY	REASON
1	No comments. Proceed with manufacture / fabrication.			
2	Proceed with manufacture / fabrication document. Resubmit the revised document.			
3	Drawing/Document does not conform marked. Resubmit for approval.			
4	Retained for Records.			

Approved conveyed herein neither relieves the contractor nor the manufacturer from their respective obligations to ensure safe and smooth operation and maintenance of the equipment.

Reviewed by: **Sonalika Sahu**

20

Transmitter (FMP51-BA-A-C-C-D-AC-A4-RGJ), supplied with Thread ANSI NPTM 1-1/2, 316L



**BILL OF MATERIAL**

S.NO	DESCRIPTION	SIZE	MOC	QTY
1	CHAMBER PIPE	2 INCH XS	SS304	1
2	CHAMBER FLANGE	Refer Note	SS304	1
3	SIDE PROCESS CONN PIPE	1 INCH	SS304	2
4	SIDE PROCESS CONN FLANGE	1" 300# RF / 3	SS	2
5	STUD/NUT	TO SUIT 1" FLANGE	-	AS REQ
6	GASKET	TO SUIT 1" FLANGE	-	1
7	TRANSMITTER			1
8	VENT PLUG	1/2" NPTF	SS316L	1
9	DRAIN PLUG	1/2" NPTF	SS316L	1
10	PROBE-ROD TYPE	12mm		1

Note: Chamber flange & counter flange should be suitable for mounting Transmitter with ANSI NPTM 1-1/2 . Stud,nuts & gaskets are to be supplied for chamber flange.

TAG NO: 606-LT-4602A  
606-LT-4602B  
606-LT-4602C

QUANTITY: 3 NO'S

2	25.10.19	AS PER COMMENTS	MK	RVS	VB	CUSTOMER: BHEL HYDERABAD	PO.NO: T719A00283 & T719A00284, DATED: 14.08.2019	
1	20.9.19	AS PER COMMENTS	MK	RVS	VB			PROJECT: VISHAKHA REFINERY MODERNISATION PROJECT HPCL VIZAG
0	27.8.19	FOR APPROVAL	PRPD BY	CHKD BY	APPD BY	DRAWING NO: TM-CS034&035-19-DS-006	SHEET NO: 1 OF 1	
REV	DATE	DESCRIPTION						