

Annexure-I
Pre-Qualifying Criteria for Resin Cast PTs upto 11 KV against Rate Contract for 1 year
(PI No. 240922086)

Sl. No.	Description of Requirement	Bidder to Furnish	Vendor Compliance
1.	Bidder should be OEM & approved in minimum two PSUs/Central/State Govt. company as a supplier of Resin cast PTs upto 11 kV.	(i) Bidder to furnish OEM Certificate. (ii) Bidder to furnish approval letter or approved vendor list from two separate customers for Resin cast PTs upto 11 KV OR Bidder to furnish Invoices or any document establishing that Resin cast PTs (up to 11kV) has been supplied directly or indirectly to the PSUs/Central/ State Govt. company by the supplier.	
2.	Bidder to offer Type Tested PTs only	Bidder to furnish (i) Lightning Impulse and (ii) Partial Discharge Type Test report of NABL Accredited Test lab or Govt. approved independent test lab within 7 years from date of techno commercial bid opening date for 1 Phase, 1 Pole Resin cast PTs upto 11 KV.	
3.	Bidder must have supplied min. 325 Nos. Resin cast PTs upto 11 KV in at least one of the last 5 Financial years ending 31st March'2022 or 31st Dec'2021 whichever is applicable.	Invoice copies in support of quantity supplied in any of the last 5 financial years OR List of Past supplies certified by practicing Chartered Accountant (With membership number and firm registration number).	

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ANNEXURE-A TO Rate Contract PI 240922086

REV.NO.00

BHEL | Technical Spec. of :PTs | Sht. 01 of Page - 1 - of 3
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 SWE | PI no. : 240922086 | Enq. No: | PO No:

FOR DETAILED TECHNICAL SPECIFICATION REFER PRODUCT STANDARD SG12913 REV.04 - PTS

TABLE : 1 - GENERAL TECHNICAL PARAMETERS FOR PTS

CLAU SE NO.	DESCRIPTION	BHEL'S REQUIREMENT			BIDDERS CONFIRMAT ION/ COMMENTS
1.0	TECHNICAL PARAMETERS	For 11KV Items	For 6.6KV Items	For 3.3KV Items	
1.1	System Voltage (3Phase, 50 Hz)kV	11	6.6	3.3	
1.2	Insulation level				
1.2.1	System highest voltage kV	12	7.2	3.6	
1.2.2	Power freq. withstand voltage (primary) kV Power freq. withstand voltage (secondary) kV	28/ 2.5	20 / 2.5	10/2.5	
1.2.3	Lightening Impulse withstand voltage kVp	75	60	40	
1.3	Insulation class kV/kVrms/kVp	12/28/75	7.2/20/60	3.6/10/40	
1.4	Continuous Over voltage factor	1.2 cont & 1.9 for 8 Hrs.			
1.5	Application	For mounting inside sheet steel cubicle			
1.6	Insulation class of PTs	B or better			

1.1 SPECIAL REQUIREMENT

S.NO	REQUIREMENT	BIDDERS COMPLIA NCE
1.1	In case of requirement by end customer Bidder shall be required to submit Type Test reports as per IS/IEC without any price or time implication to BHEL.	

TABLE : 2 - SPECIFIC TECHNICAL PARAMTERS PTs,

IT. NO.	PT RATIO	1PH.1POLE/ 1PH.2POLE/ 3P(WITH HT FUSE)	BURDEN/ACCURACY			BHEL's drg. ref.	Remark/ Deviation
			WDG.I SEC.WDG	WDG.II SEC.WDG	WDG.III TERT. WDG		
01	Primary: 3.3 KV or 6.6 KV or 11 KV	1 PH , 1-POLE	Wdg-I Secondary: 110/√3V	Wdg-II Secondary: 110/√3V	Wdg-III Secondary: 110/3V	35210051218 Rev 07 (IT-1)	
			50VA, 0.2/3P	50VA,3P	50VA, 3P		
Bidders Confirmation							
02	Ratio Primary: 3.3 KV or 6.6 KV or 11 KV	1 PH, 1-POLE	Wdg-I Secondary: 110/√3V	Wdg-II Secondary: 110/3V	-	35210051218 Rev 07 (IT-1)	
			50VA, 0.2/3P	50VA,3P	-		

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Bidders Confirmation							
03	Ratio Primary: 3.3 KV or 6.6 KV or 11 KV	1 PH, 1-POLE	Wdg-I Secondary: 110/√3V	-	-	35210051218 Rev 07 (IT-1)	
			100VA,0.2/ 3P	-	-		
Bidders Confirmation							
04	Ratio Primary: 3.3 KV or 6.6 KV or 11 KV	1 PH , 1-POLE	Wdg-I Secondary: 110/√3V	Wdg-II Secondary: 110/√3V	-	35210051218 Rev 07 (IT-1)	
			100VA, 0.2/3P	100VA,3P	-		
Bidders Confirmation							
05	Ratio Primary: 3.3 KV or 6.6 KV or 11 KV	1 PH, 2-POLE	Wdg-I Secondary: 110V	-	-	35210051219 Rev. 06	
			50VA, 0.5/3P	-	-		
Bidders Confirmation							

TABLE : 3

3.0	CLIMATIC CONDITIONS	VENDOR'S COMPLIANCE
3.1	Ambient Air Temp. - -5°C (min) & 50°C (max.)	
3.2	Relative humidity - 10%(min) & 95%(max)	
3.3	Height above MSL - ≤ 1000 meters (consider suitable Altitude correction factor in Impulse withstand for height more than 1000 mtrs)	
3.4	Pollution Severity - Heavily polluted (with coal dust & Fly ash) & Highly corrosive environment.	
3.5	Seismic Coefficient - 0.3g	
3.6	Design Ambient Temp.- 50 Deg.C	

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FOR DETAILED TECHNICAL SPECIFICATION REFER PRODUCT STANDARD SG12913 REV.04 - PTS

TABLE:4

4.0	PACKING AND SHIPPING	BHEL'S REQUIREMENT	VENDOR'S CONFIRMATION
4.1	Identification marking on PTs	Will be informed at ordering stage	

ANNEXURE -D (SCHEDULE OF DEVIATIONS)				
	Current/Potential Transformers	Deviation in		
Item no.	PT Details	Technical Parameters	Dimensional Drawing	Type Test
1				
2				

NOTE: IF NO DEVIATION IS MENTIONED IN THIS ANNEXURE THEN IT WILL BE CONSIDERED AS TOTAL COMPLIANCE TO OUR SPECIFICATION

5.0 IMPORTANT NOTES

5.1	VENDORS TO ENCLOSE COPY OF SG12913 Rev. 04 DULY FILLED IN THE SPECIFIED FORMAT, FAILING WHICH THE OFFER MAY NOT BE CONSIDERED.	YES/NO
5.2	Vendor shall provide warranty for successful operation of PTs for 24 months from the date of supply at BHEL Bhopal or 18 months from the date of commissioning at site whichever is earlier.	YES/NO

Prepared by : Navneet Mishra
 Date : 13.08.2022

Approved by : Murtaza Hussain
 Date : 13.08.2022



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SWITCHGEAR ENGINEERING DIVISION

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Annexure-I

General Technical Specification & Format for Offers 3.3kV to 33kV Indoor Resin Cast Potential Transformers

GENERAL :


Resin cast PTs are used in indoor metal clad switchgears for metering and protection purposes. This product standard is intended to cover the general technical requirement common to all indoor resin cast current transformers.

GENERAL REQUIREMENT & GUIDELINES TO VENDORS:

SL. NO.	BHEL'S REQUIREMENT	BIDDERS CONFIRMATION/ COMMENTS
1	OFFERS SUBMITTED IN THIS SPECIFIED FORMAT (ANNEXURE-I) ONLY SHALL BE EVALUATED. OFFERS IN ANY OTHER FORMAT MAY NOT BE CONSIDERED FOR EVALUATION. SOFT COPY OF THE FORMAT SHALL BE MADE AVAILABLE TO SUPPLIERS ON DEMAND.	
2	Offers shall be opened in single bid only. Incomplete offers in any respect will be rejected without any correspondence/ clarification with/from the vendor.	
3	The specification 'Annexure-A' given alongwith the enquiry document will be overriding in case of difference.	
4	Mounting plate shall be rigidly fixed with PT using suitable inserts and shall be zinc plated.	
5	Clear space for fixing the mounting plate in switchgear with pneumatic tool shall be provided.	
6	10% each of extra primary fuse covers, fuse clamps & secondary terminal covers shall be provided with each order.	
7	1 complete set of loose rating plates shall be provided for all PTs.	


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<div>COPYRIGHT AND CONFIDENTIAL</div> <div>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 interest of Co.</div>		CLAU E NO.	DESCRIPTION	BIDDERS CONFIRMATION/ COMMENTS	
		1.0	TECHNICAL PARAMETERS - AS PER ANNEXURE-A.		
		2.0	PT RATIO, ACCURACY AND BURDEN - AS PER ANNEXURE-A.		
		3.0	APPLICABLE STANDARDS :		
			IEC 185 - 1/IS 3156 - for PTs.		
			IEC 44 - for Partial Discharge Test		
		4.0	CLIMATIC CONDITIONS - AS PER ANNEXURE-A.		
		5.0	DIMENSIONS		
			For PT dimensions, suppliers to follow the following BHEL drgs for various ratings & type of PTs -		
		5.1	For SINGLE PHASE SINGLE POLE (upto 11kV) drg. no. 35210051218 Rev.07 (It-1 for VM12-820, It-2 for VM12-700)		
		5.2	For SINGLE PHASE DOUBLE POLE (upto 11kV) drg. no. 35210051219 Rev.06.		
		5.3	For THREE PHASE PT (upto 11kV) drg. no. 35210050951 Rev.03. (It-1 for VM12 Truck, It-2 for VN12 Kiosk)		
		5.4	For SINGLE PHASE SINGLE POLE (20kV & 33kV) drg. no. 45226001512 Rev.02 (Item-003) .		
		6.0	DESIGN AND CONSTRUCTION		
		6.1	The potential transformer cores shall be made of suitable grade non-ageing cold rolled grain oriented silicon steel of low hysteresis loss and permeability to ensure accuracy at both normal and over voltages of 120 percent of the rated voltage. There shall be no saturation under service conditions.		
6.2	The potential transformer shall be designed to withstand the indicated climatic conditions without temperature rise exceeding beyond permissible limits and PT shall be designed to withstand the thermal and mechanical stresses due to rated short circuit condition. Ambient temp. of 50°C shall be considered for design purpose.				
6.3	The primary conductor / secondary winding layer should be insulated with polyester film tape. Transparent cover shall be provided over secondary terminal.				

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<div>COPYRIGHT AND CONFIDENTIAL</div> <div>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 interest of Co.</div>		6.4	The PTs shall be completely encapsulated and terminal marking shall be properly & legibly provided without any requirement to interfere with wiring connections.	
		6.5	The resin to be used in construction shall be high grade, mixed under high vacuum and poured also in vacuum to prevent any void remaining in the casting.	
		6.6	The PTs should be cured properly so that the final product is non hygroscopic.	
		6.7	VI characteristic for each winding shall be in straight line upto 120% of rated voltage.	
		6.8	Upto 11kV class, PTs shall be complete with GEC Alstom make HT fuses type VTF11-3A or equivalent, rated 3A and of 50KA rupturing capacity. In case any other make fuses are provided, the type test certificates and performance certificate shall be furnished on demand.	
		6.9	For voltage class above 11kV and upto 33kV, PTs shall be supplied without fuses and loose HT fuses (qty. as per cl.6.11 below) of Anand Fuses type - AVT (Eswari Electrical Make or equivalent) shall be supplied against separate item of respective enquiry. Length = 500mm, Dia. = 23mm	
		6.10	2 nos. fuse mounting brackets & 1 no. L-clamp shall be supplied loose alongwith each PT of voltage class above 11kV and upto 33kV.	
		6.11	For voltage class above 11kV and upto 33kV, the quantities of fuses (to be supplied loose) shall be as below:- Single Pole PT - 1 No. with each PT. Double Pole PT - 2 Nos. with each PT. Three phase PT - 3 Nos. with each PT.	
		7.0	Q.A. PLAN	
			As per BHEL's standard Q.A. plan ref. QAQC/SCR/15/053 enclosed. Suppliers to specifically confirm adherence to this Q.A. plan in their offers.	
		8.0	INSPECTION	
			PTs shall be tested & inspected at supplier's works by BHEL/BHEL's customer/BHEL's authorized representative in line with above Q.A. plan. Supplier shall give 2 weeks advance intimation.	
		9.0	TESTS	
		9.1	TYPE TESTS	
		9.1.1	Preferably TYPE TESTED design of PTs shall be offered. Type test reports for Impulse and temperature rise shall be furnished for all varieties of PTs.	



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9.1.2	In case, type test report is not directly applicable to the offered PT(s) the applicability justification of Impulse test certificate & temperature rise for each variety of PTs shall be submitted in format as per Annexure-A, Table-5 .	
9.1.3	Wherever the type tests have not been carried out, the offer should indicate clearly such cases and the party should specifically mention in the offer itself to 'conduct and clear' the type tests required at a govt. approved independent test laboratory without any extra charges or delivery repercussions.	
9.1.4	It may be required to repeat the TYPE TESTS, if so desired by our customer. In such a case, separate charges shall be quoted for TYPE TEST.	
9.2	ROUTINE TESTS	
	As per enclosed QA plan.	
9.3	SPECIAL TESTS	
	Temperature rise test, shall be conducted free of cost on each type of PT against each order and report to be furnished to BHEL.	
10.0	PACKING AND SHIPPING	
10.1	Identification marking on PTs shall be as per Annexure-A	
10.2	The equipment is to be transported adequately sealed against water ingress. They shall be packed and security clamped against movement in robust, non returnable packing cases to ensure safe transit in rough terrain, cross country road conditions and in heavy rains from the manufacturer's works to the specified destinations.	
10.3	It shall be the responsibility of the supplier to make good the damage caused due to insufficient packing.	
10.4	Each packing case shall be indelibly marked with the following :- Individual serial number. Purchaser's name. P.O. number/date. Destination. Manufacturer's name. Customer/Project name	
10.5	Each crate or container shall be marked clearly on the outside of the case to show TOP and BOTTOM positions.	

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11.0DOCUMENTS

11.1Documents to be furnished along with the offer -

11.1.11 copy of offer in the format as per Annexure-I.

11.1.21 copy of technical parameters of offered PTs as per Annexure-A, Table-1, 2, 3 & 4.

11.1.33 copies of dimensional drawings for approval.

11.1.4VI characteristic for each winding(s).

11.1.51 copy of impulse test certificates.

11.1.61 copy of temperature rise test report.

11.1.7Applicability of type test certificates as per Annexure-A, Table-5.

11.1.8Signed copy of BHEL's standard Q.A. plan ref. QAQC/SCR/15/053, rev-00.

11.1.9Schedule of deviations, if any, as per Annexure-D duly filled.

11.2Documents to be furnished at the time of delivery

11.2.12 copies of routine test certificates alongwith the consignment and 1 copy along with the dispatch document.

12.0PERFORMANCE GUARANTEE

- The supplier shall guarantee the satisfactory performance of the PTs for a period of 24 months from the date of receipt at BHEL Bhopal or 18 months from the date of commissioning, whichever is earlier.

- For suppliers, supplying these type of PTS to BHEL for the first time, guarantee for satisfactory performance shall be 5 ½ yrs from the date of receipt at BHEL Bhopal or 5 yrs from the date of commissioning, whichever is earlier.

- Alongwith offer, the supplier shall also submit the proof of supplying indoor PTs to BHEL for last 5 orders failing which performance guarantee will be changed to 5 years.

13.0ACCEPTANCE CRITERIA

13.1BHEL/BHEL's authorized representative's report for adhering to BHEL's standard QA Plan during manufacturing process.

13.2Visual checks for crack and surface finish.

13.3Rating plate as per specification parameters.

13.4Dimensions as per approved drawing.

13.5Availability of all routine test certificates.


13.6Availability of 10% extra fuse covers, 10% fuse clamps & 10% secondary terminal covers.

13.71 complete set of loose rating plates for all PTs

13.8For voltage class above 11kV and upto 33kV, availability of fuse mtg brackets & L-clamp as per cl.6.11.

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		<div>TABLE-5</div> <div>(FORMATS TO BE FILLED BY SUPPLIERS FOR EACH ITEM)</div> <table><tr><td>9.0</td><td colspan="9">TYPE TESTS</td></tr><tr><td>9.1</td><td colspan="9">APPLICABILITY OF TYPE TESTS</td></tr><tr><td colspan="10">PART A FOR IMPULSE TEST CERTIFICATE JUSTIFICATION</td></tr><tr><td>IT. NO.</td><td>IMPULS E TEST REPORT NO.</td><td>DATE OF TEST</td><td colspan="3">DETAILS OF TESTED PT</td><td colspan="3">DETAILS OF OFFERED PT</td><td>REMAR KS/ DEVIATION</td></tr><tr><td></td><td></td><td></td><td>IMPULSE TEST IN KV PEAK</td><td>CREEPA GE</td><td>DRG. NO.</td><td>IMPULSE TEST IN KV PEAK</td><td>CREEPA GE</td><td>DRG. NO.</td><td></td></tr><tr><td>001</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>002</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>						9.0	TYPE TESTS									9.1	APPLICABILITY OF TYPE TESTS									PART A FOR IMPULSE TEST CERTIFICATE JUSTIFICATION										IT. NO.	IMPULS E TEST REPORT NO.	DATE OF TEST	DETAILS OF TESTED PT			DETAILS OF OFFERED PT			REMAR KS/ DEVIATION				IMPULSE TEST IN KV PEAK	CREEPA GE	DRG. NO.	IMPULSE TEST IN KV PEAK	CREEPA GE	DRG. NO.		001										002																			
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TABLE-6

(FORMATS TO BE FILLED BY SUPPLIERS FOR EACH ITEM)

(TABLE-6 PART-A)

REFER SPEC.CLAUSE 5.1 FOR SINGLE PHASE SINGLE POLE PT (UPTO 11KV) DRG. NO. 35210051218 REV.07 (DEVIATIONS TO BE INDICATED AGAINST RESPECTIVE ITEM)

SL. NO.	REQUIREMENT	VENDOR TO CONFIRM DIMENSION					
		It. No.	It. No.				It. No.
1.	Mounting dimension of offered PT shall be 280±1 mm (along depth) X 160±1 mm (along width) for VM128 & 140±1 mm (along width) for VM127						
2.	Mounting plate dimension of offered PT shall be 355 mm max. (along depth) X 180 mm max. (along width) for VM128 & 160 mm max. (along width) for VM127						
3.	Overall height from bottom of mounting plate shall be 305 mm max.						
4.	Overall height of primary terminal from bottom of mounting plate shall be between 205 to 260 mm..						
5.	Width of PT shall be 180 mm max for VM128 & 160 mm max. for VM127						
6.	Mounting (plate) slot dimension shall be open slot dia.11 mm.						

(TABLE-6 PART-B)

REFER SPEC.CLAUSE 5.2 FOR SINGLE PHASE DOUBLE POLE PT (UPTO 11KV) DRG. NO. 35210051219 REV.06. (DEVIATIONS TO BE INDICATED AGAINST RESPECTIVE ITEM)

SL. NO.	REQUIREMENT	VENDOR TO CONFIRM DIMENSION					
		It. No.	It. No.				It. No.
1.	Mounting dimension of offered PT shall be 280±1 mm (along depth) X 200±1 mm (along width)						
2.	Mounting plate dimension of offered PT shall be 355 mm max (along depth) X 250 mm max (along width)						
3.	Overall height from bottom of mounting plate shall be 305 mm max.						
4.	Overall height of primary terminal from bottom of mounting plate shall be between 210±5 mm.						
5.	Width of PT shall be 250 mm max						
6.	Mounting (plate) slot dimension shall be open slot dia.11 mm.						

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(TABLE-6 PART-C)

REFER SPEC.CLAUSE 5.3 FOR FOR THREE PHASE PT (UPTO 11KV) DRG. NO. 35210050951 REV.03. (IT-1 FOR VM12 TRUCK, IT-2 FOR VN12 KIOSK) (DEVIATIONS TO BE INDICATED AGAINST RESPECTIVE ITEM)

SL. NO.	REQUIREMENT	VENDOR TO CONFIRM DIMENSION					
		It. No.	It. No.				It. No.
1.	Mounting dimension of offered PT shall be (Exact multiple of 40)±1(along depth) X 280±2(along width) mm. Supplier to indicate exact dimension						
2.	Mounting plate dimension of offered PT shall be 580 mm max(along depth) X 355 mm max (along width)						
3.	Overall height from bottom of mounting plate shall be 305mm max.						
4.	Depth of PTs shall be 580mm max.						
5.	Mounting (plate) slot dimension shall be 11Wx25L mm.						

(TABLE-6 PART-D)

REFER SPEC.CLAUSE 5.4 FOR SINGLE PHASE SINGLE POLE PT (20KV & 33KV) DRG. NO. 45226001512 REV.02 ITEM-3. (DEVIATIONS TO BE INDICATED AGAINST RESPECTIVE ITEM)

SL. NO.	REQUIREMENT	VENDOR TO CONFIRM DIMENSION					
		It. No.	It. No.				It. No.
1.	Mounting dimension of offered PT shall be 270±1 mm (along depth)X 220±1 mm (along width)						
2.	Mounting plate dimension of offered PT shall be 300 mm max (along depth) X 250 mm max(along width)						
3.	Overall height from bottom of mounting plate shall be 408±2 mm max.						
4.	Width of PT shall be 250 mm max.						
5.	Depth of PTs shall be 300 mm max.						
6.	Mounting (plate) slot dimension shall be open slots dia.10 mm.						

ANNEXURE -D (SCHEDULE OF DEVIATIONS)

	Potential Transformers	Deviation in		
Item no.	PT Details	Technical Parameters	Dimensional Drawing	Type Test
1.				
2.				

NOTE: IF NO DEVIATION IS MENTIONED IN THIS ANNEXURE THEN IT WILL BE CONSIDERED AS TOTAL COMPLIANCE TO OUR SPECIFICATION



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 QUALITY PLAN FOR INDOOR RESIN CAST POTENTIAL TRANSFORMERS (3.3 kV to 33 kV)											QP NO. : QAQC/SCR/15/053 REV. : 00 REVIEWED BY APPROVED BY DATE: 10.03.04 PAGE: 01 OF 02		
SL. NO.	COMPONENT & PROCESS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	FORMAT OF RECORD	AGENCY			REMARKS		
1	2	3	4	5	6	7	8	9	10	11			
A. RAW MATERIALS :													
1.00	LAMINATION	a) PHYSICAL	B	V	5%	SUPPLIER'S SPEC.+++	T.C	P	V	RR			
		b) ELECTRICAL	B	T	100%-M		T.C.	P	V	RR			
2.00	ENAMELLED COPPER	a) WIRE SIZE	C	M	10%	IS4800/IS 13730	T.R.	P	V	RR			
		b) ENAMEL COATING	B	T	10%		T.R.	P	V	RR			
		c) ELECTRICAL PROPERTY	A	T	10%		T.R.	P	V	RR			
3.00	H.T.FUSE	PHYSICAL	C	M	100%	SUPPLIER'S SPEC.+++	T.C./T.R.	P	V	RR			
4.00	RESIN & HARDENER	CHEMICAL	B	T	100%	SUPPLIER'S SPEC.+++	T.C.	P	V	RR			
5.00	POLYESTER FILM	a) DIMENSION	C	M	100%-M,10%-C	SUPPLIER'S SPEC.+++	T.C.	P	V	RR			
		b) ELECTRICAL PROPERTY	B	T	100%-M,10%-C		T.C.	P	V	RR			
B: MANUFACTURING PROCESS:													
1.00	MOULDING PROCESS	a) LEVEL OF VACUUM DURING POURING	A	M	FOR EACH BATCH	SUPPLIER'S SPEC.+++	P.R.	P	V	RR			
		b) CURING TEMPERATURE AND	A	M			P.R.	P	V	RR			
2.00	EPOXY CASTING	SHAPE & SURFACE FINI	B	V	100%	SHAPE: AS PER APPROVED DRG./FINISH: DEFECT FREE	O.S	V	RR				
LEGEND : A:CRITICAL,B:MAJOR,C:MINOR;M:MEASUREMENT,V:VISUAL,T:TEST,RR:RECORD REVIEW,P.R: PROCESS RECORD,T.C:TEST CERTIFICATE,T.R.:TEST REPORT,O.S:OBSERVATION SHEET; QA DOCUMENTATION ; M:MANUFACTURER/SUB CONTRACTOR, C: SUPPLIER,I:BHEL/INSPECTION AGENCY (P:PERFORM,W: WITNESS & V: VERIFICATION AS APPROPRIATE,CHP :CUSTOMER'S HOLD POINT;+++ SUPPLIER'S SPECIFICATION TO BE APPROVED BY BHEL, ***SP (SAMPLING PLAN) AS PER IS:2500,PART I,AQL : 0.65, GENERAL INSPECTION LEVEL -II,SINGLE SAMPLING PLAN (REDUCED INSPECTION;TABLE-2C)													



PRODUCT STANDARD

SWITCHGEAR ENGINEERING DIVISION

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QUALITY PLAN FOR INDOOR RESIN CAST POTENTIAL TRANSFORMERS (3.3 kV to 33 kV)

QP NO. : QAQC/SCR/15/053

REV. : 00 REVIEWED BY APPROVED BY

DATE:

09.03.04

PAGE: 02

OF 02

SL. NO.	COMPONENT & PROCESS	CHARACTERISTICS	CLASS	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	FORMAT OF RECORD	AGENCY	REMARKS
1	2	3	4	5	6	7	8	9	10
C. ROUTINE TESTS:									
1.00	FINISHED PT	a) OGA DIMENSION	B	M	AS PER SAMPLING PLAN (SP)***	BHEL'S APPROVED DRAWING	O.S.	P V	
		b) SIZE OF BASE PLATE	B	T			O.S.	P V	
2.00	ELECTRICAL TESTING	a) TERMINAL MARKINGS & POLARITY	A	T	100%-C, SP-I	S-3156/IEC-18	T.R.	P W	CHP
		b) DETERMINATION OF ERROR	A	T	100%-C, SP-I		T.R.	P W	CHP
		c) HV TEST	A	T	100%-C, SP-I		T.R.	P W	CHP
		d) INDUCED VOLTAGE TEST ON PRIMARY WDG.	A	T	100%-C, SP-I		T.R.	P W	CHP
		e) PARTIAL DISCHARGE TEST	A	T	100%-C, SP-I		T.R.	P W	CHP
3.00	ADDITIONAL TESTS	AS PER BHEL'S P.O.	A	T	100%-C, SP-I		T.R.	P W	CHP
D. TYPE TESTS (AS PER BHEL'S P.O.):									
	a) IMPULSE		A	T		S3156 / IEC-18	T.R.	P W	CHP
	b) TEMPERATURE RISE		A	T			T.R.	P W	CHP

LEGEND : A:CRITICAL,B:MAJOR,C:MINOR;M:MEASUREMENT,V:VISUAL,T:TEST,RR:RECORD REVIEW,P,R: PROCESS RECORD,T,C:TEST CERTIFICATE,T,R.:TEST REPORT,O,S:OBSERVATION SHEET; QA DOCUMENTATION : M:MANUFACTURER/SUB CONTRACTOR, C: SUPPLIER,I:BHEL/INSPECTION AGENCY (P:PERFORM,W: WITNESS & V: VERIFICATION AS APPROPRIATE,CHP :CUSTOMER'S HOLD POINT;*** SUPPLIER'S SPECIFICATION TO BE APPROVED BY BHEL, ***SP (SAMPLING PLAN) AS PER IS:2500,PART I,AQL : 0.65, GENERAL INSPECTION LEVEL -II,SINGLE SAMPLING PLAN (REDUCED INSPECTION; TABLE-2C)

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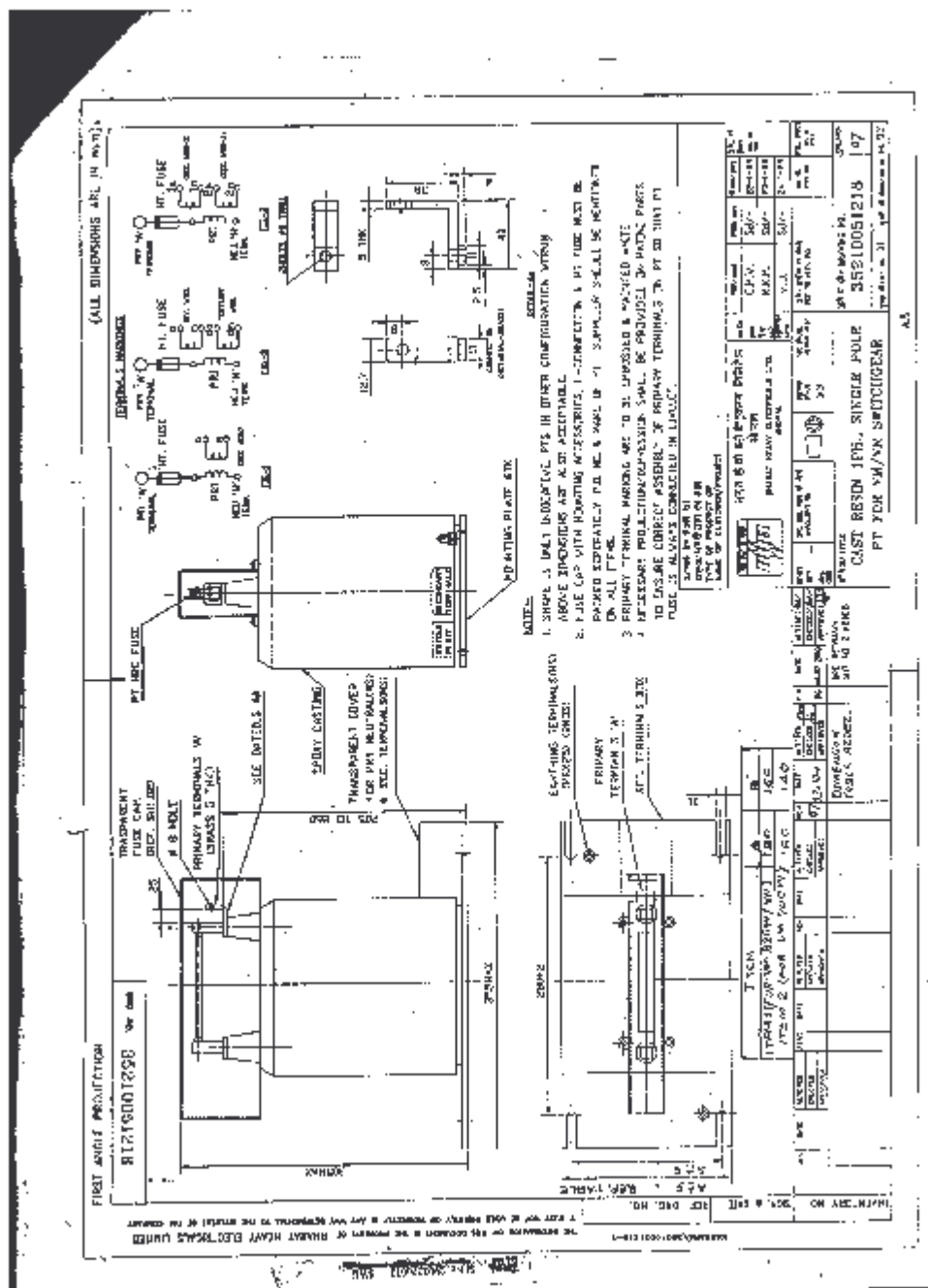
SG12913 REV.04

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Annexure-1



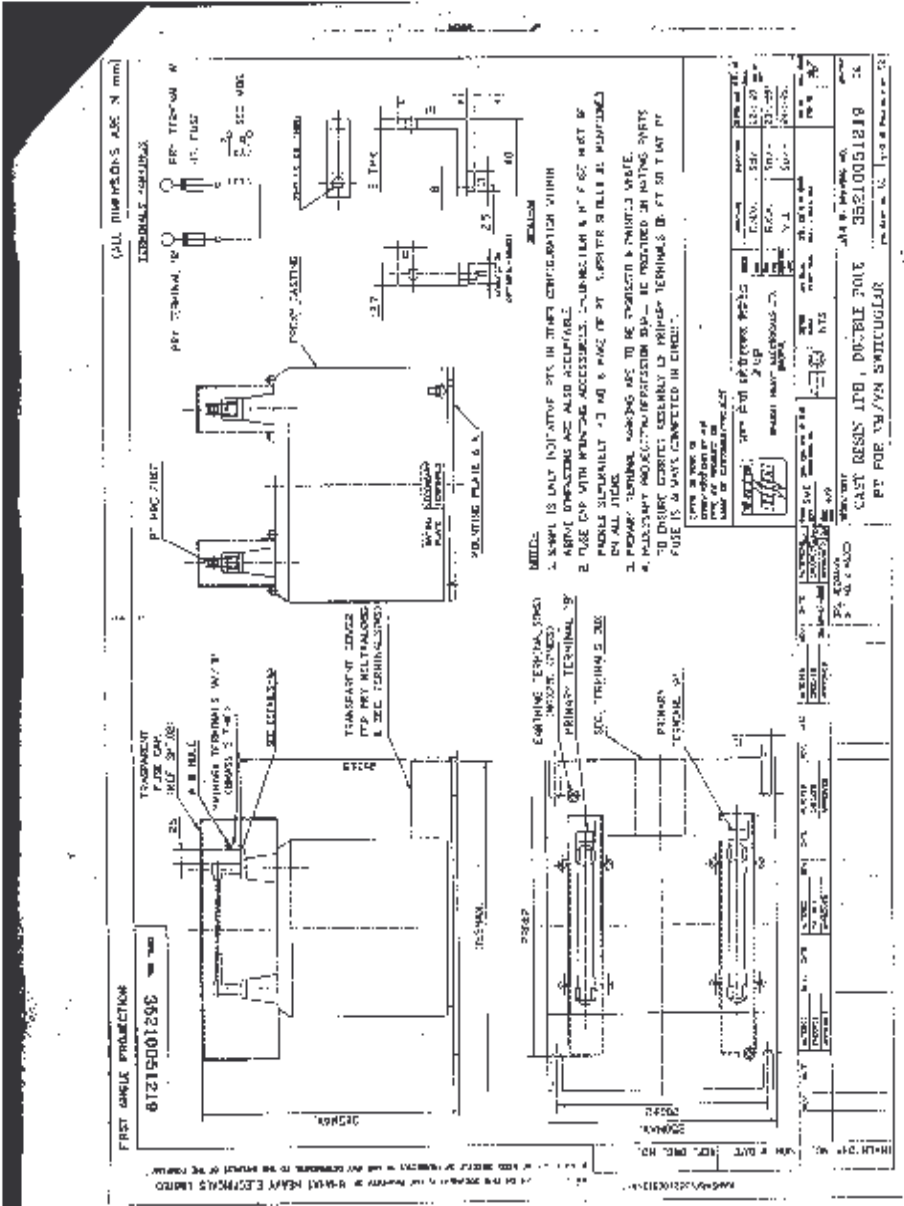


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Annexure-2



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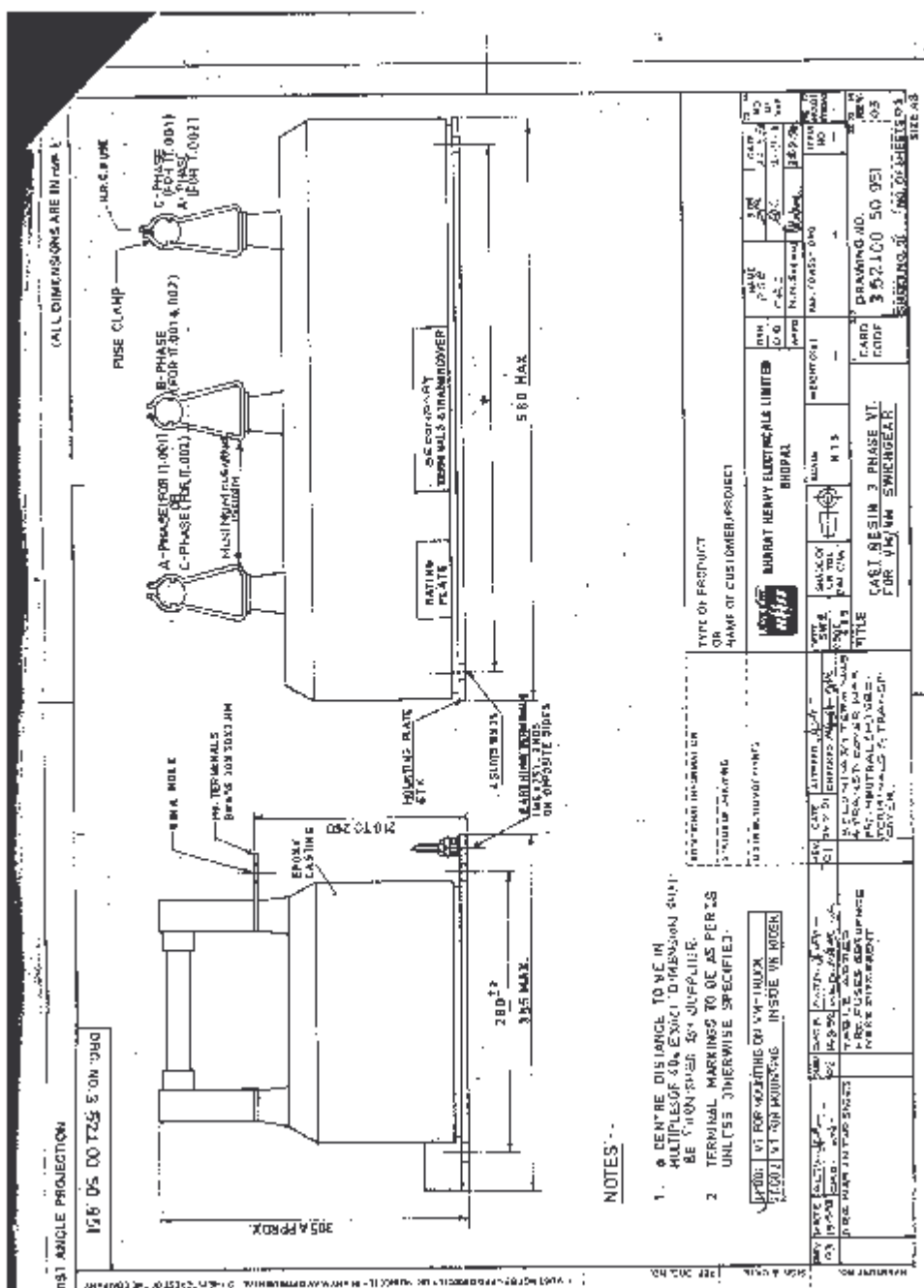
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Annexure-3





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Annexure-4

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REV. DATE ALTERED SUS

02 11/05/09 CHECKED DJ

REV. DATE ALTERED SUS

01 24/07/07 CHECKED DB

ADDITIONAL INFORMATION

STATUS OF DRAWINGS

DISTRIBUTION OF PRINTS

0/C-1 SWN-3

TCX-1

LOCATION OF SECONDARY TERMINAL CHANGED

(DCA 287330)

ITEM 003 ADDED

(DCA 26905)

IT. NO.	A(MM.)	B(MM.)	C(MM.)	D(MM.)
001	450	480	220	280
002	280	310	225	280
003	270	300	220	280

NOTE:-

1. REVISED DRG DATED 31.05.08 (TOLERANCE & EARTHING TERMINALS PROTON PROVIDED)

2. TOLERANCES WHEREVER NOT MENTIONED $\pm 0.3MM$.

DEPT. SWE

CODE 409

UN TOL. DIM. GR.

SCALE

WEIGHT (Kg)

TITLE

33KV (INDORE)

POTENTIAL TRANSFORMER

DRAWING No.

45226001512

SHEET NO. 01

NO. OF SHEETS 01



PRODUCT STANDARD

SWITCHGEAR ENGINEERING DIVISION

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FORMAT FOR ANNEXURE-A**ANNEXURE-A** TO PURCHASE INDENT NO.

REV.NO.

BHEL | Technical Spec. of : PTs | Sht. 01 of

Bhopal |

SWE | PI no. : | Enq. No: | PO No:

W.O. Nos. :

FOR DETAILED TECHNICAL SPECIFICATION, REFER PRODUCT STANDARD SG12913
REV.04

TABLE : 1

CLAUSE NO.	DESCRIPTION	BHEL'S REQUIREMENT		BIDDERS CONFIRMATION/COMMENTS
1.0	TECHNICAL PARAMETERS	Upto 11kV	20kV & 33kV	
1.1	System Voltage (3Phase, 50 Hz) kV	11	33	
1.2	Insulation level			
1.2.1	System highest voltage kV	12	36	
1.2.2	Power freq. withstand voltage (primary) kV Power freq. withstand voltage (secondary) kV	28 2.5	70 2.5	
1.2.3	Lightening Impulse withstand voltage kVp	75	170	
1.3	Insulation class kV/kVrms/kVp	12/28/75	36/70/170	
1.4	Continuous Over voltage factor	1.2 continuous & 1.9 for 8 Hrs.		
1.5	Application	For mounting inside sheet steel cubicle		
1.6	Insulation class of PTs	B or better		

TABLE : 2**11kV, 3 Phase, 50 Hz.**

IT. NO.	PT RATIO	1PH.1POLE/ 1PH.2POLE/3P (WI THOUT HT FUSE)	ACCURACY / BURDEN		Vendor's drg.ref.	REMARKS/ DEVIATION
			WDG. I (SEC. WDG)	WDG. II (TERT. WDG)		
001					Ref.cl.5.0 of Ann-I	
Bidders confirmation/ Comments						
002					Ref.cl.5.0 of Ann-I	
Bidders confirmation/ Comments						

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994488/2022/HEP-SWE40904



PRODUCT STANDARD

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TABLE : 3

4.0	CLIMATIC CONDITIONS	VENDOR CONFIRMATION/ COMMENTS
4.1	Ambient Air Temp. - -5°C (min) & 50°C (max.)	
4.2	Relative humidity - 10%(min) & 95%(max)	
4.3	Height above MSL - ≤ 1000 meters (consider suitable Altitude correction factor in Impulse withstand for height more than 1000 mtrs)	
4.4	Pollution Severity - Heavily polluted (with coal dust & Fly ash) & Highly corrosive environment.	
4.5	Seismic Coefficient - 0.3g	
4.6	Design Ambient Temp.- 50 Deg.C	

TABLE : 4

11.0	PACKING AND SHIPPING	BHEL'S REQUIREMENT	VENDORS CONFIRMATION / COMMENTS
11.1	Identification marking on PTs	Indicate 'Project name'	

14.0 SPECIAL REQUIREMENT (if any) -

SL. NO.	REQUIREMENT	BIDDERS CONFIRMATION/ COMMENTS
14.1	ALL TYPE TEST REPORTS SHALL NOT BE MORE THAN --- -- YRS OLD. REPEAT TYPE TEST DUE TO THIS SHALL NOT ATTRACT ANY SEPARATE CHARGE.	

15.0 IMPORTANT NOTES

15.1	DEVIATION SHALL BE INDICATED ONLY IN ANNEXURE-D (SCHEDULE OF DEVIATIONS) . NO DEVIATION SHALL BE ACCEPTED IF WRITTEN ELSE WHERE. IF NO DEVIATION IS MENTIONED IN ANNEXURE-D THEN IT WILL BE CONSIDERED AS TOTAL COMPLIANCE TO OUR SPECIFICATION	
15.2	VENDORS TO ENCLOSE COPY OF SG12913 REV.04 DULY FILLED IN THE SPECIFIED FORMAT WITH EVERY ENQUIRY, FAILING WHICH THE OFFER MAY NOT BE CONSIDERED.	
15.3	ALL DRAWINGS / DOCUMENTS AS PER ANNEXURE-I CL.11.0 ENCLOSED.	

Prepared by :
Date :

Approved by :
Date :

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