


	TATA POWER NORTHERN ODISHA DISTRIBUTION LIMITED, BALASORE		
	TECHNICAL SPECIFICATION		
Document Title	Three Phase Energy Meter Box		
Document No.	ENG – LV – 052	Eff. Date: 15 – 10 – 2025	
Revision No.	01	Page 1 of 10	
Prepared By: Udit Sankar Das	Reviewed By: Ved Prakash Upadhyay	Approved By: Tapan Behera	Issued By: Sandip Pal



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1.0	SCOPE	This specification covers the technical requirements of design, manufacture, testing at manufacturer's works, packing, forwarding, supply and unloading at store/site and performance of three phase meter box with all accessories for trouble free and efficient operation.		
2.0	APPLICABLE STANDARDS	The equipment covered by this specification shall unless otherwise stated, be designed, manufactured and tested in accordance with the latest editions of the following Indian/International standards and shall conform to the regulations of the local statutory authorities.		
		1	IS: 14772-2000	General requirements for enclosure for accessories for household and similar fixed electrical installations-Specification
		2	IS: 8623(Part 1)-1993	Specification for low-voltage switchgear and control gear assemblies Part 1 for type tested and partially type tested assemblies
		3	IS: 11731 (Part II) – 1992	Methods of test for determination of Flammability of solid electrical insulating materials when exposed to an igniting source
		4	IS 4249-1967	Specification for classification and method of test for non-ignitable and self-extinguishing properties of solid electrical insulating materials
		5	IS 8828-1996	Electrical Accessories- Circuit Breakers for Over Current Protection for Household and Similar Installations
		6	IS 5133(Part II)-1969	Specification for boxes for the enclosure of electrical accessories
		7	IS 2500(Part 1)-2000	Sampling procedure for inspection by attributes part 1 sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection
		8	UL 746-C	Polymeric materials in electrical equipments
3.0	CLIMATIC CONDITIONS OF THE INSTALLATION	<p>The atmosphere is generally laden with mild acid and dust suspended during dry months and subjected to fog in cold months. The design of the equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.1g.</p> <p>a) Max. Ambient Temperature – 50 deg.C b) Max. Daily average ambient temp – 40 deg.C c) Min Ambient Temp – 0 deg C d) Maximum Humidity – 95% e) Minimum Humidity – 10% f) Average No. of thunderstorm days per annum – 50 g) Average Annual Rainfall – 750 mm h) Average No. of rainy days per annum – 60 i) Rainy months – June to Oct. j) Altitude above MSL not exceeding – 300 meters k) Wind Pressure – 126kg/sq m up to an elevation of 10mtrs</p>		

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		The atmosphere is generally laden with mild acid and dust suspended during dry months and subjected to fog in cold months. The design of the equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.1g		
4.0	GENERAL TECHNICAL REQUIREMENTS	Sl. No.	Description /Requirements	TPNODL clarification
		1	Application	Outdoor
		2	Degree of protection	IP55
		3	Flammability requirement	FV0
		4	Grade of material	fire retardant, self-extinguishing, UV stabilization and Anti oxidation properties
		5	Material	Base – Clear transparent – Polycarbonate Cover – Clear transparent – Polycarbonate
		6	Thickness of box (Base and Cover)	Base – 3 mm (minimum) Cover – 2.5mm (Minimum) Tolerance – (+) 0.02mm Note – Base shall be provided with 6 no of RIBS for better strength.
		7	Material of the gasket	Rubber or better
		8	Glow wire tested at	960°C
		9	Dielectric withstand capacity	5kV for 1 min.
		10	Construction features of the box	
		a)	Clear inside dimensions of meter box	Length – 460mm Width – 340mm Depth – 170mm With 2% tolerance (With minimum clear space of 450X330 without any tolerance)
		b)	Minimum clearance between meter and box on all sides	50 mm
		c)	Min Clearance from meter on top of meter mounting plate	35mm
		d)	Minimum clearance from back of meter to base	10 mm
		e)	Earthing arrangement Nut & bolt	1 Numbers with M8X35/40mm long
		f)	Sealing Arrangement polycarbonate extension for sealing and latch with concentric sealing holes on U shaped latches	4 Numbers of Min. 30mm length (Two on opening side and one at top and bottom side) Sealing hole diameter 3 mm
		g)	U shaped GI latches	4 number GI U shape latches having 1.2mm thick and Min. 25mm long with sealing hole
		h)	Box mounting arrangement	Provision for four number screws at four corners provided
		i)	Box Mounting Screw	4 Number Gitti and screws provided with M6 screw with min. length 40mm
		j)	Cover overlapping on base	Inside –25 mm overlapping at hinges sides, top and

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			bottom side and 20 mm overlapping at pad lock side. Outside overlapping 20mm throughout border
k)	A. Size of incoming & outgoing gland hole B. location of hole from side entry	A. 35 mm (Suitable for 12CX2.5mm ² armoured cable) B. around 40mm	
l)	Meter mounting plate as per clause no. 5.4	GI plate of 1.2 m thick for meter mounting provided on Top side (without sharp corners)	
m)	Meter mounting Screws	Minimum 3 number of 13 mm length	
n)	Hinges	Three nos. GI Hinges having 1.2 mm thickness and Minimum length 30 mm.	
n)	Angle of Box opening	120 degree	
o)	Polycarbonate hinges on base are covered with box cover material such that tampering is not possible from outside	Yes	
p)	Antenna mounting provision	GI square piece of around 30X30mm to be riveted/ fixed inside on bottom face of box at around 60mm distance from right side. Note – To be decided during the detailed engineering time.	
s)	Location of earthing bolt	On left Sides (when viewed from front) & bolt is fixed & engaged within gland through GI sheet 1.2mm from inside.	
u)	Earthing sign	A tag with green background on GI sheet to be provided on earth bolt outside box	
v)	Gland size – inside diameter – around 29 mm on i/c and o/g (Suitable for 12CX2.5 mm ² control cable) Gland type – Straight	Required. Note – Cable gland size will be decided during the detailed engineering time.	
11	The earth connectivity plate between incoming gland and earth bolt provided with 1.2mm thick GI	Yes	
12	Type of meter box	Shall be decided during the detailed engineering time.	
13	Meter mounting dimension	Will be decided during the detailed engineering time.	

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5.0	GENERAL CONSTRUCTIONS	1	The meter box shall be weather proof, tamper proof and shall be made of Injection moulded reinforce polycarbonate material with FV0 fire retardant, self-extinguishing, UV stabilization and Anti oxidation properties. The box shall be of adequate strength, unbreakable and shall be made in two pieces (base and cover). The base shall be dark grey color whereas the cover shall be completely transparent for polycarbonate material .The material for base and cover shall be polycarbonate with minimum cover thickens of 2.5 mm & base – 3 mm thickness (with 6 RIBS)
		2	The meter box shall have a taper roof for easy flow of rain water and shall have degree of IP55 for protection against dust and water.
		3	The box shall be provided with meter mounting arrangement along with GI plate on top for mounting the meter from different manufacturers, having different mounting dimensions. The top GI plate shall be fixed on the base taking care of the alignment with the fixing holes provided in the base of the box. The box shall have suitable modem mounting arrangement on the right-hand side in the base of meter box for mounting the modem from different manufacturers with the help of base plate. The location of the same shall be 100 mm below the top of the box base (as measured from inside) and 35 mm away from right side of the box. The detail drawing of the mounting arrangement of all the meters shall be provided to successful bidders by the TPNODL.
		4	The meter shall be mounted with the help of GI plate such that there is clearance of 50 mm between the meter box and top of the cover. A minimum clearance of 50 mm shall be maintained on both sides, between meter and box. The overall dimensions of meter box shall be Length – 460 mm, Width – 340 mm, Depth – 170 mm with 2% tolerance.
		5	The design of the meter box shall be such as to easy facilitate easy wiring and access to meter terminals. Nylon gland of internal diameter of approx. 30 mm shall be provided for I/C and O/G cables of size 12CX2.5 mm ² armoured control cable or as approved by TPNODL. The holes for I/C and O/G cables shall be provided in left and right side of meter box at bottom.
		6	The number of pillars to be provided in box as per TPNODL different type of meters. If there is any change in existing meter design or new meter introduced, bidder shall provide meter mounting pillar accordingly in meter box with modification in their mould without any extra cost.
		7	The box cover shall be fixed to the base through three no's Hinges . The arrangement of the hinges shall be provided on left side of the box and shall be such as to avoid entry inside of the box. The screws shall not be fixed from outside so that it cannot be visible from outside to avoid any manipulation. The box cover shall be open able by more than 120 degrees.
		8	For holding and sealing the box, four U-shaped latches of approx. size 25 mm shall be provided on three side of box (two on right side and one each on top and bottom side). The latch shall be GI with minimum thickness of 1.2 mm. The latch shall be provided along with suitable clamp assembly in base as well as cover, such that these are fully covered by the latch after closing. The clamp along with the latch shall be provided with a sealing hole such as to provide a sealing arrangement in the assembly and alignment of holes should be perfect so that seal wire may be easily install.
		9	Suitable rubber gasket of round shape (properly provided throughout the periphery) for

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			protection all around the cover shall be provided. The box shall be provided with four fixing holes of M6 screws. The four no's M6 screw with gitti to be provided with each box.																
		10	After closing and sealing the meter box, it shall not be possible to forcefully enter anysharp object inside the box without breaking base/cover. Suitable overlapping as mentioned in GTP shall be provided between base and cover to avoid access to the meter or its accessories inside the meter box by any means after sealing the box.																
		11	Box shall be provided with 1 no. earthing nut and bolt of size M8x35 mm on the left-hand side in the base of meter box for providing earth connection. The earth terminal shall be identified by means of the earth sign, marked in a legible manner on or adjacent the terminal.																
6.0	NAME PLATEAND MARKING	<p>The meter box shall be provided with durable and legible name plate, effectively secured against removal. Name plate shall be embossed with “PO No with date” , “PROPERTY OF TPNODL” , “ITEM CODE NUMBER” , The name plate shall be indelibly and distinctly marked with all essential particulars as per the relevant standards along with the following information:</p> <ul style="list-style-type: none">• Manufacturer’s name• Serial number• Month and Year of manufacturing• No supply number – To be decided during the detailed engineering time• Property of ‘TPNODL Company’• Voltage 440V Danger• PO no. and date• Danger logo/icon on the cover																	
7.0	TESTS	<p>All routine, acceptance & type tests shall be carried out in accordance with the relevant IS/IEC. All routine & acceptance tests shall be witnessed by the purchaser/his authorized representative. All the components shall also be type tested as per the relevant standards. Following tests shall be necessarily conducted on the meter box in addition to others specified in IS/IEC standards.</p> <table><tr><th colspan="3">A. TYPE TEST</th></tr><tr><th>S.no.</th><th>Tests/ Standard</th><th>Requirements</th></tr><tr><td>1</td><td>Protection against electric Shock (IS: 14772 - 2000)</td><td>Enclosure shall be so designed that when they are mounted as for normal use, the live parts of any correctly installed accessories or any parts of these accessories which may become live due to a fault shall not be accessible.</td></tr><tr><td>2</td><td>Provision for earthing (IS: 14772-2000)</td><td>Enclosure shall be provided with a facility for permanent and reliableconnection to earthing</td></tr><tr><td rowspan="2">3</td><td rowspan="2">Resistance to ageing, humid conditions, Ingress of solid objects and to harmful ingress of water (IS : 14772-2000)</td><td>Resistance to Ageing – Enclosure shall be kept in a heating cabinet with temp 70 ± 2 deg C for 7 days as per IS. After completion of the test, the enclosure shall not show any cracks.</td></tr><tr><td>Humid conditions – Enclosure shall be kept in a cabinet with humidity between 91 to 95 % for 7 days as per IS. After completion of the test, the enclosure shall not show any cracks.</td></tr></table>		A. TYPE TEST			S.no.	Tests/ Standard	Requirements	1	Protection against electric Shock (IS: 14772 - 2000)	Enclosure shall be so designed that when they are mounted as for normal use, the live parts of any correctly installed accessories or any parts of these accessories which may become live due to a fault shall not be accessible.	2	Provision for earthing (IS: 14772-2000)	Enclosure shall be provided with a facility for permanent and reliableconnection to earthing	3	Resistance to ageing, humid conditions, Ingress of solid objects and to harmful ingress of water (IS : 14772-2000)	Resistance to Ageing – Enclosure shall be kept in a heating cabinet with temp 70 ± 2 deg C for 7 days as per IS. After completion of the test, the enclosure shall not show any cracks.	Humid conditions – Enclosure shall be kept in a cabinet with humidity between 91 to 95 % for 7 days as per IS. After completion of the test, the enclosure shall not show any cracks.
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				Resistance against ingress of solid objects and to harmful ingress of water – Enclosure shall be subjected to test for degree of protection (IP 55) as per IS 12063/ IS 60529
		4	Mechanical strength / Impact Resistance Test (IS: 14772-2000) / (UL: 746 C)	The sample shall be subjected to Impact resistance test as per the respective standards and shall not show occurrence of any of the following: making uninsulated live parts accessible to contact, producing a condition that might affect the mechanical performances of the enclosure, producing a condition that would increase the likelihood of an electric shock
		5	Resistance to heat / Ball Pressure Test (IS: 14772-2000)	The test shall be made on a sample in a heating cabinet at a temp of 125 ±2 deg C for 1 per IS. After completion of test, the diameter of the impression caused by the ball shall be measured and should not exceed 2 mm.
		6	Resistance to Abnormal heat and fire/ Glow wire test (IS: 14772-2000)	Parts of insulating materials which might be exposed to thermal stresses due to electric effects shall not be affected by abnormal heat and by fire. The compliance shall be checked by means of the glow wire test performed at 960 deg C, according to IS 11000(Part 2/sec 1) with no flame and glowing.
		7	Resistance to Tracking(IS 14772-2000)	The sample when tested as per clause no 17 of IS: 14772, shall show no flashover after completion.
		8	Flammability test (IS : 11731 (Part II) – 1986)/UL :94)	The sample shall comply to flammability requirements of category FV0/V0 as per respective standards
		9	Test for self- extinguishing property(IS:4249-1967)	The sample when tested as per clause 3.5.1 of IS 4249, shall comply to the specified requirements.
		10	Test for water absorption (IS: 5133 (Part II)-1969)	The sample shall be heated to a temperature of 50 ± 3 deg. C for 24h, as per IS and after completion, the water absorbed should not be more than 1%.
		11	Verification of Die-electric properties (IS :8623 (Part I)-1993)	The enclosure shall be tested as per clause no 8.2.2 of IS 8623(Part 1), with test voltage of 5 kV for 1 minute and withstand it satisfactorily.
		12	UV Light Exposure (UL-746C)	The sample when exposed to UV light as per the defined test method, shall comply to following a) Physical Properties: The average value of physical properties after the UV light exposure shall not be lower than 70% of its initial value (without UV aging) i.e. the variation shall not be more than 30%. b) Flammability Test: After the UV light exposure, the

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			flammability requirement of FV0 shall remain unchanged. c) Flexural Strength: After the light exposure, Flexural strength shall not be lower than 70% of its initial value (without UV aging) i.e. the variation shall not be more than 30 %.
		B. ROUTINE TEST	
		<ul style="list-style-type: none"> • Marking • Visual Examination and Dimensions • Provision for earthing • Protection against electric shock 	
		C. ACCEPTANCE TEST	
		<ul style="list-style-type: none"> • Marking • Visual Examination and Dimensions • Protection against electric shock • Provision for earthing • Mechanical strength/Impact Resistance Test • Resistance to Abnormal heat and fire/ Glow wire test • Flammability test • Verification of Die-electric properties • Finishing of box • Screw Driver penetration test 	
8.0	TYPE TEST CERTIFICATE	The bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI/ERDA/UL or equivalent as per the relevant standards. Type tests should have been conducted in certified Test laboratories during the period not exceeding 5 years from the date of opening the bid. In the event of any discrepancy in the test reports, i.e. any test report not acceptable, same shall be carried out without any cost implication to the Purchaser.	
9.0	PRE- DISPATCH INSPECTION	<p>The successful bidder shall submit two pre-manufacturing sample samples (non- returnable) for further testing and compliance as per specifications and should get approval from TPNODL before mass manufacturing. Equipment shall be subject to inspection by a duly authorized representative of the Purchaser. Inspection may be made at any stage of manufacture at the option of the purchaser and the equipment if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to the Purchaser's representatives at all times when the work is in progress. Inspection by the Purchaser or its authorized representatives shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specifications. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by the Purchaser.</p> <p>Following documents shall be sent along with material:</p> <ul style="list-style-type: none"> • Test reports • MDCC issued by Purchaser 	

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		<ul style="list-style-type: none"> • Invoice in duplicate • Packing list • Drawings & catalogue • Guarantee / Warrantee card • Delivery Challan • Other Documents (as applicable)
10.0	INSPECTION AFTER RECEIPT AT STORE	<p>The material received at Purchaser's store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection and one copy of the report shall be sent to Engineering department.</p> <p>TPNODL can send any of the supplied material for further testing at any lab for compliance of material in line with the specifications and the material shall be liable for rejection, if test results are found different from the reports of the pre-dispatch inspection or tender test reports.</p>
11.0	GUARANTEE	<p>Bidder shall stand guarantee towards design, materials, workmanship & quality of process/manufacturing of items under the contract for due and intended performance of the same, as an integrated product delivered under this contract. In the event any defect is found by the Purchaser up to a period of 60 months from the date of commissioning or 66 months from the date of last supplies made under the contract, whichever is earlier. Bidder shall be liable to undertake to replace/rectify such defects at his own costs, within mutually agreed timeframe, and to the entire satisfaction of the Purchaser, failing which the Purchaser will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus the Purchaser's own charges (@ 20% of expenses incurred), from the Bidder or from the "Security cum performance Deposit" as the case may be. In case box fails within the guarantee period, the purchaser will immediately inform the bidder who shall take back the failed box within 15 days from the date of intimation at his own cost and replace/repair the box within forty-five days of date of intimation with a roll over guarantee.</p> <p>Bidder shall further be responsible for 'free replacement' for another period of THREE years from the end of the guarantee period for any 'Latent Defects' if noticed and reported by the Purchaser.</p>
12.0	PACKING	Bidder shall ensure that all the equipment covered under this specification shall be prepared for rail/road transport in a manner so as to protect the equipment from damage in transit. The material used for packing shall be environmentally friendly.
13.0	SAMPLE	<p>Tender Sample – Bidders are required to manufacture two sample boxes as per the TPNODL specification and submit the sample boxes along with the bid for further testing and approval of samples.</p> <p>Pre-manufacturing Sample – The successful bidder shall submit two prototype samples of meter box at Meter Testing Lab, at location informed by TPNODL during submission time, for further testing and compliance as per specifications and get approval before mass manufacturing.</p>
14.0	QUALITY CONTROL	The bidder shall submit with the offer Quality assurance plan indicating the various stages of inspection, the tests and checks which will be carried out on the material of construction, components during manufacture and bought out items and fully assembled component and equipment after finishing. As part of the plan, a schedule for stage and final inspection within the parameters of the delivery schedule shall be furnished. The Purchaser's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.
15.0	MINIMUM TESTING	Bidder shall have adequate in-house testing facilities for carrying out all routine tests, acceptance



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	FACILITIES	tests as per Indian/International standards.				
16.0	MANUFACTURING ACTIVITIES	The successful bidder will have to submit the bar chart for various manufacturing activities clearly elaborating each stage, with quantity. This bar chart should be in line with the Quality assurance plan submitted with the offer. This bar chart will have to be submitted within 15 days from the release of the order.				
17.0	SPARES, ACCESSORIES AND TOOLS	04 no's M6 screws with Gitti				
18.0	DRAWING AND DOCUMENTS	Following drawings and documents shall be prepared based on Purchaser specifications and statutory requirements and shall be submitted with the bid: a) Completely filled in Technical Particulars b) General description of the equipment and all components including brochures c) General arrangement for meter box d) Experience List e) Type test certificates After the award of the contract, soft copies of following drawings, drawn to scale, describing the equipment in detail shall be forwarded for approval.				
		Sr. No.	Description	For Approval For Review	Information Final	Submission
		1	Technical Parameters	√		√
		2	GA Drawing of meter box	√		√
		3	Installation instruction			√
		4	Manual / Catalogues		√	
		5	Transport /Shipping dimension drawing		√	√
		6	QA & QC Plan	√	√	√
		7	Test Certificates	√	√	√
		Bidder shall subsequently provide of all the drawing, GTP, Test certificates shall submit after RC for the final approval of TPNODL. All the documents & drawings shall be in English language.				
19.0	GUARANTEED TECHNICAL PARTICULARS	Bidder has to submit clause wise compliance.				
20.0	SCHEDULE OF DEVIATION	The bidders shall set out all deviations from this specification, Clause by Clause in this schedule. Unless specifically mentioned in this schedule, the tender shall be deemed to confirm the purchaser's specifications. (TO BE ENCLOSED WITH THE BID)				
		S.No	Clause No.	Details of deviation with justifications		
		All deviations from this specification shall be set out by the bidders, clause by Clause in this schedule. Unless specifically mentioned in this Schedule, the tender shall be deemed to confirm the purchaser's specifications:				

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