

TECHNICAL SPECIFICATION COVER SHEET

Document No: ENG-LV-3014

Document Title: SPECIFICATION FOR 100/5A, 200/5A & 400/5A LTCT METER BOXES

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05	For Tender purpose	15-10-2018	1819ED 2942	SC	---sd--	RMB	---sd--	BND	---sd--	DRD	---sd--
04	For Tender purpose	19-11-2018	NA	IA	---sd--	PS	---sd--	DRD	---sd--	DRD	---sd--
03	For Tender purpose	24-07-2015	NA	IA	---sd--	MJ	---sd--	DRD	---sd--	DRD	---sd--
02	For Tender purpose	11-03-2011	NA	PG	---sd--	AK/RKS/SD/AKG	---sd--	SM/HCS	---sd--	KG/HCS	---sd--
01	For Tender purpose	20-03-2006	NA	RKS	---sd--	AS	---sd--	SM/HCS	---sd--	SM/HCS	---sd--
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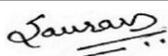
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Prepared By: Saurav Chandel	Reviewed By: Brajanath Dey	Approved By: Brajanath Dey	Issued By: HC Sharma

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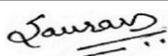
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1.	SCOPE	<p>This specification covers the technical requirements of design, manufacturing, testing at manufacturer's works ,packing, forwarding, supply and unloading at store/site of Three phase four Wire, 100/5A, 200/5A and 400/5A all types of LTCT Meter Boxes along with respective resin cast CT with bar primary, complete with all accessories for efficient and trouble free operation.</p> <p>It is not the intent to specify completely herein all the details of tech design and construction of material. However, the material shall conform in all respects to high standards of engineering, design and workmanship and shall be capable of performing in continuous commercial operation in manner acceptable to the TATA POWER - DDL, who will interpret the meanings of drawings and specification and shall have the power to reject any work or material which, in his judgment is not in accordance therewith. The offered material shall be complete with all components necessary for their effective and trouble free operation. Such components shall be deemed to be within the scope of Bidder's supply irrespective of whether those are specifically brought out in this specification and/or the commercial order or not. The parameters defined in the specification shall be common for both the LTCT Non-smart Meter Box and LTCT Smart Meter Box, unless stated separately.</p>																								
2.	APPLICABLE STANDARDS	<p>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.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">IS: 14772-2000</td> <td>General requirements for enclosure for accessories for household and similar fixed electrical installations-Specification.</td> </tr> <tr> <td>IS: 8623(Part 1)-1993</td> <td>Specification for low-voltage switchgear and control gear assemblies: Part 1 for type tested and partially type tested assemblies.</td> </tr> <tr> <td>IS: 11731(Part II)-1992</td> <td>Methods of test for determination of Flammability of solid electrical insulating materials when exposed to an igniting source</td> </tr> <tr> <td>IS 4249-1967</td> <td>Specification for classification and method of test for non-ignitable and self-extinguishing properties of solid electrical insulating materials.</td> </tr> <tr> <td>IS 8828-1996</td> <td>Electrical Accessories- Circuit Breakers for Over Current Protection for Household and Similar Installations</td> </tr> <tr> <td>IS 5133(Part II)-1969</td> <td>Specification for boxes for the enclosure of electrical accessories</td> </tr> <tr> <td>IS 2500(Part 1)-2000</td> <td>Sampling procedure for inspection by attributes part 1 sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection</td> </tr> <tr> <td>IS 2705:1992</td> <td>Specification of current transformer</td> </tr> <tr> <td>UL 746-C</td> <td>Polymeric Materials in Electrical equipment</td> </tr> <tr> <td>IS 6746</td> <td>Specifications for Unsaturated Polyester Resin Systems</td> </tr> <tr> <td>IS 10192</td> <td>Synthetic resin bonded glass-fibre sheets for electrical purpose.</td> </tr> <tr> <td>IS 7078 (1973)</td> <td>Plastics used in instrument industry</td> </tr> </table>	IS: 14772-2000	General requirements for enclosure for accessories for household and similar fixed electrical installations-Specification.	IS: 8623(Part 1)-1993	Specification for low-voltage switchgear and control gear assemblies: Part 1 for type tested and partially type tested assemblies.	IS: 11731(Part II)-1992	Methods of test for determination of Flammability of solid electrical insulating materials when exposed to an igniting source	IS 4249-1967	Specification for classification and method of test for non-ignitable and self-extinguishing properties of solid electrical insulating materials.	IS 8828-1996	Electrical Accessories- Circuit Breakers for Over Current Protection for Household and Similar Installations	IS 5133(Part II)-1969	Specification for boxes for the enclosure of electrical accessories	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	IS 2705:1992	Specification of current transformer	UL 746-C	Polymeric Materials in Electrical equipment	IS 6746	Specifications for Unsaturated Polyester Resin Systems	IS 10192	Synthetic resin bonded glass-fibre sheets for electrical purpose.	IS 7078 (1973)	Plastics used in instrument industry
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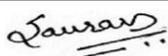
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3.	CLIMATIC CONDITIONS OF INSTALLATION	a) Max. Ambient Temperature : 50 deg. C b) Max. Daily average ambient temp. : 40 deg. C c) Min Ambient Temp : 0 deg. C d) Maximum Humidity : 95% e) Minimum Humidity : 10% f) Average No. of thunderstorm days per 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 : 126 kg/sq.mm up to an elevation of 10M. The atmosphere is generally laden with mild acid and dust in suspension during the dry months and is subjected to fog in cold months. The design of equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.1 g.																																				
		4.	GENERAL TECHNICAL REQUIREMENTS	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">S. No.</th> <th style="text-align: center;">Parameters</th> <th style="text-align: center;">Tata Power-DDL Requirements (100/5A, 200/5A and 400/5A)</th> </tr> </thead> <tbody> <tr> <td colspan="3">A. For Polycarbonate enclosure</td> </tr> <tr> <td style="text-align: center;">1.</td> <td>Application</td> <td>Outdoor</td> </tr> <tr> <td style="text-align: center;">2.</td> <td>Degree of protection</td> <td>IP 55</td> </tr> <tr> <td style="text-align: center;">3.</td> <td>Flammability requirement</td> <td>FV0</td> </tr> <tr> <td style="text-align: center;">4.</td> <td>Grade of material</td> <td>Virgin Polycarbonate with fire retardant, Self-extinguishing, UV stabilized and anti-oxidation properties</td> </tr> <tr> <td style="text-align: center;">5.</td> <td>Gasket material</td> <td>EPDM rubber (ethylene propylene diene monomer)</td> </tr> <tr> <td style="text-align: center;">6.</td> <td>Material a) Base : b) Cover :</td> <td>a) Virgin Polycarbonate equivalent to Lexan 943 A or Makrolon 6457/6557, transparent b) Polycarbonate equivalent to Lexan 943 A or Makrolon 6457/6557, clear transparent For 400/5A LTCT Meter box: SMC/ Virgin Polycarbonate equivalent to Lexan 943A (subject to prior sample approval)</td> </tr> <tr> <td style="text-align: center;">7.</td> <td>Thickness of box</td> <td>3 mm (min.)</td> </tr> <tr> <td style="text-align: center;">8.</td> <td>Material withstand temperature</td> <td>125 deg. C +/- 2 deg. C</td> </tr> <tr> <td style="text-align: center;">9.</td> <td>Dielectric withstand for the box</td> <td>5 kV for 1 minute</td> </tr> <tr> <td style="text-align: center;">10.</td> <td>Dimensions</td> <td> For LTCT Non-smart Meter Boxes: 100/5A and 200/5A: Length- 350mm±2%, Depth- 230 ± 2% mm and Breadth- 650 ±2% mm 400/5A: Length- 860mm+2%, Depth- 250 ± 2% mm and Breadth- 450 ±2% mm For LTCT Smart Meter Boxes: 100/5A and 200/5A: Length- 350mm±2%, Depth- 260 ± 2% mm and Breadth- 700 ±2% mm 400/5A: Length- 860mm+2%, Depth- 270 ± 2% mm and Breadth- 450 ±2% mm </td> </tr> </tbody> </table>	S. No.	Parameters	Tata Power-DDL Requirements (100/5A, 200/5A and 400/5A)	A. For Polycarbonate enclosure			1.	Application	Outdoor	2.	Degree of protection	IP 55	3.	Flammability requirement	FV0	4.	Grade of material	Virgin Polycarbonate with fire retardant, Self-extinguishing, UV stabilized and anti-oxidation properties	5.	Gasket material	EPDM rubber (ethylene propylene diene monomer)	6.	Material a) Base : b) Cover :	a) Virgin Polycarbonate equivalent to Lexan 943 A or Makrolon 6457/6557, transparent b) Polycarbonate equivalent to Lexan 943 A or Makrolon 6457/6557, clear transparent For 400/5A LTCT Meter box: SMC/ Virgin Polycarbonate equivalent to Lexan 943A (subject to prior sample approval)	7.	Thickness of box	3 mm (min.)	8.	Material withstand temperature	125 deg. C +/- 2 deg. C	9.	Dielectric withstand for the box	5 kV for 1 minute	10.
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		11.	Cable entry/exit gland size (diameter)	<p>For 100/5A: The SGG brass gland shall be suitable for 4Cx95 sq. mm cable.</p> <p>For 200/5A: The SGG brass gland shall be suitable for 4Cx150 sq. mm cable.</p> <p>For 400/5A: The SGG brass gland shall be suitable for 4Cx300 sq. mm cable.</p>
		B.	For Current Transformers	
		1.	Rated voltage	415 V
		2.	System frequency	50 Hz
		3.	Transformation ratio	100/5A, 200/5A, 400/5 A
		4.	Current Density (Maximum)	1.6 Amp/sq.mm
		5.	Accuracy Class	0.5
		6.	Rated Burden	5 VA
		7.	Instrument security factor (max.)	5
		8.	Short Time withstand current	5 kA for 1 sec
		9.	Rated dynamic peak current	12.5 kA for 1 sec
		10.	Power frequency dry withstand voltage (kV rms)	3.0 kV
		11.	Temperature rise	Maximum permissible temperature rise above ambient temp at 200% load not exceeding 110 deg. C
		12.	Insulation level and type	0.66 kV / 3 kV , Class B
		13.	Pin-configuration	<p>For LTCT Non-smart Meter Boxes: 100/5A, 200/5A and 400/5A: 12-pin zigzag (dimension should be as per the meter sample)</p> <p>For LTCT Smart Meter Boxes: 100/5A and 200/5A: 12-pin zigzag (dimension should be as per the meter sample) 400/5A: 12-pin zigzag (dimension should be as per the meter sample)</p>
		14.	Bus-bar material	Tinned Copper
		15.	Resin material	Epoxy resin
16.	Bus-bar size	<p>100/5A: 20mmX5mm (100 sq. mm min). 200/5A: 25mmX8mm (200 sq. mm min). 400/5A: 40mmX8mm (320 sq. mm min). All bus-bars shall have extended length of 50 mm at top, above box and 70 mm at lower end, below box.</p>		
17.	Colour code of CT	<p>100/5A: Blue (Pantone 2727C) 200/5A: Green (Pantone 2427C) 400/5A: Brick red</p>		

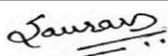
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C. For PVC Caps	
1.	Material PVC compound Black (FR Grade).
2.	Color Black
3.	Thickness 1.4 mm (+1.0mm)
4.	Heat Stability Material shall be tested at 90°C for 24 hrs. and no cracking, melting and defect should be observed
5.	Tensile strength Min. 7.0 MPa
6.	Elongation Min. 400%
7.	Dielectric strength 5 kV/mm
8.	Shore Hardness (Shore-A) 55 +/-5
9.	Viscosity 20-22 cP (centi Poise)
10.	Specific Gravity 1.12- 1.25 gm/cc

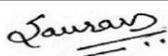
5. GENERAL CONSTRUCTION

5.1 Enclosure	<p>The LTCT meter box shall be weather proof, tamper proof and shall be made of Injection moulded reinforce virgin polycarbonate material with FV0 fire retardant, self-extinguishing, UV stabilization and Anti oxidation properties. Base and cover both shall be completely transparent, made of virgin polycarbonate material (for 100/5 Amps and 200/5 Amps LTCT meter box, and white cream color in case of SMC material (only for 400/5 Amps, subject to sample approval). The material for base and cover shall be Lexan 943 A or Makrolon 6457/6557 with 3 mm thickness.</p> <p>The box shall be of adequate strength, unbreakable and shall be made in two pieces (case and cover). The Enclosure shall be provided with IP55 degree of protection. Base shall have U groove all around to accommodate 'O' ring/gasket provided all around at the cover. Cover shall be placed on base and fixed by means of sealable bolts at all the corners and middle. Suitable rubber gasket (EPDM rubber - ethylene propylene diene monomer) of round shape (properly provided throughout the periphery) all around the base shall be provided for protection. The box shall be provided with suitable overlap between base and cover. Base shall be provided with meter mounting arrangement along with 3 numbers GI strips suitably made into a channel and fixed horizontally for supporting all the components inside the box. The meter shall be mounted on CT base such that there is a clearance of 50 mm between the meter box and top of the meter. A minimum clearance of 50 mm (between meter and the box) shall be maintained on both sides.</p> <p>The Resin casting arrangement should be such that the CT should not come out from the meter box; necessary locking arrangement and anti-tamper features should be provided. A unique RFID tag must also be placed during the resin casting itself, covering the R, Y & B-phase CTs to maximum possible extent. This RFID tag must not be visible from outside. The CT should have manufacturer code & ratio embossed on CT body.</p> <p>The design of the LTCT box shall be such as to facilitate easy wiring and access to the meter terminals. The cable entry shall be from bottom of the box and further connected to the primary of the CT (Copper Bars) with suitable size single compression SGG brass gland as approved by the Purchaser (as per technical specification ENG-LV-3006)</p> <p>For 100/5A- The SGG brass gland shall be suitable for 4Cx95 sq. mm cable. For 200/5A- The SGG brass gland shall be suitable for 4Cx150 sq. mm cable. For 400/5A- The SGG brass gland shall be suitable for 4Cx300 sq. mm cable.</p>
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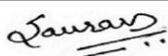
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	<p>A. For LTCT Non-smart Meter Boxes: The overall dimension of the LTCT Non-smart meter box shall be as below: For 100/5A, 200/5A- length-350mm±2%, Depth- 230 ± 2% mm and Breadth- 650 ±2% mm and the same shall be approved by the Purchaser. For 400/5- length-860mm±2%, Depth- 250 ± 2% mm and Breadth- 450 ±2% mm and the same shall be approved by the Purchaser.</p> <p>B. For LTCT Smart Meter Boxes: The overall dimension of the LTCT smart meter box shall be as below: For 100/5A, 200/5A- Length- 350mm±2%, Depth- 260 ± 2% mm and Breadth- 700 ±2% mm and the same shall be approved by the Purchaser. For 400/5A- Length- 860mm±2%, Depth- 270 ± 2% mm and Breadth- 450 ±2% mm and the same shall be approved by the Purchaser.</p>
5.2 Current Transformer	<p>5.2.1 CTs shall be manufactured with high grade CRGO lamination. The current transformer shall be Resin Cast, Bus-bar Primary type. Three CTs for three phases and fourth CT for Neutral shall be casted as one unit. The resin cast CT unit shall have pin type secondary current terminals and potential terminal on which the meter shall be directly plugged, in such a way that after plug-in of the meter, the pin type terminals (CT secondary terminals / potential terminals) shall be accessible for connections. The suitable Pin type terminals for various type of meter shall be provided for plug in arrangement (the meter/ drawing shall be provided by Purchaser to the successful bidder).</p> <p>5.2.2 The primary of the CT side shall be in form of bar with no joints and secondary shall be of plug in pin type. The bus-bar shall be made of tinned copper whereas the pin shall be made of tinned brass with fine polish. For 100/5A- The bus-bar size shall be 20mmX5mm (100 sq. mm min). For 200/5A- The bus-bar size shall be 25mmX8mm (200 sq. mm min). For 400/5A- The bus-bar size shall be 40mmX8mm (320 sq. mm min). All bus-bars shall have extended length of 50 mm at top, above box and 70 mm at lower end, below box. The bus-bar shall be provided with single hole of dia. 8 mm at both ends for cable termination through suitable size lugs. The clear phase-phase spacing between bus-bar shall be 35 mm (min). The terminations of leads taken from CT shall be suitably brazed on CT end so as to avoid any loose contact.</p> <p>5.2.3 For LTCT Non-smart Meter Boxes: GSM/ GPRS Modem shall be installed inside the box (top right corner). Cast resin unit shall have female part of plug for supplying power to GSM modem. Power shall be tapped from primary bars (2 Numbers 2.5 sq.mm control cable, one from each phase and neutral). The details/drawings of the mounting arrangement of all the meters and modems shall be provided to the successful bidder, by the Purchaser.</p> <p>5.2.4 A unique RFID tag shall be placed above the CTs while resin casting them, such that the RFID tag is not be visible from outside.</p>
5.3 PVC Caps	<p>5.3.1 PVC cap shall be used for covering the bare part of each bus-bar and termination of LTCT meter box.</p> <p>5.3.2 Cap shall be made of PVC compound (FR grade) through Dip molding process.</p> <p>5.3.3 Cap shall be made of FR grade and UV resistant material.</p> <p>5.3.4 Cap should have good finishing with no crack and air bubbles.</p>

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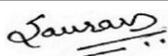
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		<p>5.3.5 Dimensions of Cap shall be as per drawing depicted in Annexure II.</p> <p>5.3.6 PVC caps shall be packed in poly bags/Boxes and shall also be labelled or marked to show the description of material, Manufactures name, Month & Year of manufacturing and quantity.</p>												
	5.4 Mounting Arrangement	The box shall be provided with three numbers MS channels of 2 mm thickness provided horizontally below the base and outside the box for fastening the box on the wall. Two mounting holes shall be provided on each channel. The fixation of CT in the box, should be such that it should not be removed without damage.												
	5.5 Earthing	At bottom of the enclosure, an Electro Galvanized Earthing plate with minimum 1.2 mm thickness shall be provided with two numbers of earthing nut and bolt of suitable size for providing earth connection. The earth terminal shall be identified by means of the earthing symbol, marked in a legible and indelible manner on or adjacent the terminal.												
6.	NAME PLATE AND MARKING	<p>The equipment shall be provided with durable and legible name plate, effectively secured against removal. Name plate shall be embossed with "RC/PO & RO No. with date" , "PROPERTY OF TATA POWER – DDL" , "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> <ol style="list-style-type: none"> Manufacturer's name Unique Serial number Month and Year of manufacture (MM/YYYY) Guarantee period Rated CT ratio No supply number : 19124 / 1800-208-9124 Property of TATA POWER – DDL 												
7.	TESTS	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 LTCT meter box in addition to others specified in IS/IEC standards.												
	7.1 Type-tests	<p>For the Box:</p> <table border="1"> <thead> <tr> <th>S. No.</th> <th>Tests/ Standard</th> <th>Requirements</th> </tr> </thead> <tbody> <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 reliable connection to earthing</td> </tr> <tr> <td>3</td> <td>Resistance to ageing, humid conditions, Ingress of solid objects and to harmful ingress of water (IS : 14772-2000)</td> <td> <p>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.</p> <p>Humid conditions: Enclosure shall be kept in a cabinet with humidity between 91 to 95 % for 7</p> </td> </tr> </tbody> </table>	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 reliable connection to earthing	3	Resistance to ageing, humid conditions, Ingress of solid objects and to harmful ingress of water (IS : 14772-2000)	<p>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.</p> <p>Humid conditions: Enclosure shall be kept in a cabinet with humidity between 91 to 95 % for 7</p>
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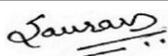
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			<p>days as per IS. After completion of the test, the enclosure shall not show any cracks.</p> <p>Resistance against ingress of solid objects and to harmful ingress of water: Enclosure shall be subjected to test for degree of protection (IP 55) as per IS 12063.</p>
4	Mechanical strength/ Impact Resistance Test (IS : 14772-2000)/(UL : 746 C)		<p>The sample shall be subjected to Impact resistance test as per the respective standards and shall not show occurrence of any of the following:</p> <ol style="list-style-type: none"> 1. Making uninsulated live parts accessible to contact. 2. 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)		<p>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.</p>
6	Resistance to Abnormal heat and fire/ Glow wire test (IS : 14772-2000)		<p>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.</p>
7	Resistance to Tracking (IS 14772-2000)		<p>The sample when tested as per clause no 17 of IS: 14772, shall show no flashover after completion.</p>
8	Flammability test (IS : 11731 (Part II)-1986)/UL :94)		<p>The sample shall comply to flammability requirements of category FV0/V0 as per respective standards.</p>
9	Test for self-extinguishing property (IS:4249-1967)		<p>The sample when tested as per clause 3.5.1 of IS 4249, shall comply to the specified requirements.</p>
10	Resistance to rusting		<p>As per clause 16 of IS 14772 (2000)</p>
11	Verification of Dielectric properties (IS :8623 (Part I)-1993)		<p>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.</p>
12	UV Light Exposure (UL-746C)		<p>The sample when exposed to UV light as per the defined test method, shall comply to following</p> <ol style="list-style-type: none"> 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 flammability requirement of FV0 shall remain unchanged.

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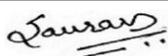
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		<p>c) Flexural Strength: After the UV light exposure, Flexural strength shall not be lower than 70% of its initial value (without UV aging) i.e. the variation shall not be more than 30 %.</p>
		<p>Type test for the CT:</p> <ol style="list-style-type: none"> Short-time current tests Temp rise test at rated current Lighting impulse test for CT for service in electrically exposed installation High voltage power frequency wet withstand voltage test Determination of errors or other characteristics according to the requirements of the appropriate designation or accuracy class. Accuracy test Instrument Security Current test <p>Note :</p> <ol style="list-style-type: none"> The dielectric type test for CT in S. No. (3) and (4) shall be carried out on the same transformer unless otherwise agreed. After the current transformers have been subjected to the dielectric type test (4) and (5), they shall be subjected to all the routine tests <p>Type test for the PVC Cap:</p> <ol style="list-style-type: none"> .Dielectric Strength @ 5kV for 1 min.
	7.2 Routine Tests	<p>For Boxes :</p> <ol style="list-style-type: none"> Marking Visual Examination and Dimensions Protection against electric shock Provision for earthing. <p>For CT :</p> <ol style="list-style-type: none"> Verification of terminals marking and polarity. CT surface finish on both sides. power frequency dry withstand voltage test on primary windings power frequency dry withstand voltage test on secondary windings Over-voltage inter-turn test. Determination of errors or other characteristics according to the requirements of the appropriate designation or accuracy class.
	7.3 Acceptance tests	<ol style="list-style-type: none"> Markings, as per this technical specification Visual Examination and Dimensions, as per this technical specification Protection against electric shock, as per IS 14772: 2000 Provision for earthing, as per IS 14772: 2000 Resistance to Abnormal heat and fire/ Glow wire test @ 960°C Test for self-extinguishing property as per clause 3.5.1 of IS 4249 Verification of Die-electric properties @ 5kV for 1 min. CT accuracy test at 20%, 100% and 120% of rated current, as per IS 2705 (Part 1&2) Heat Stability: PVC Cap shall be tested at 90°C for 24 hrs. and no cracking, melting and defect should be observed

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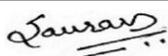
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8.	TYPE-TEST CERTIFICATES	<p>The bidder shall furnish the type test certificates for the tests as mentioned above as per the corresponding standards. All the tests shall be conducted at CPRI/ERDA/National Test House/EQDC/Third-party NABL accredited laboratory, 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.</p>
9.	PRE-DISPATCH INSPECTION	<p>The successful bidder shall submit one prototype samples for further testing and compliance as per specifications and getting approval 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 it's authorized representatives shall not relieve the supplier of his obligation of furnishing equipment in accordance with the specifications. One copy of the report shall be sent to Plant Engineering Group. Material shall be dispatched after specific MDCC (Material Dispatch Clearance Certificate) is issued by the Purchaser. Following documents shall be sent along with material :</p> <ol style="list-style-type: none"> a) Test reports b) MDCC issued by Purchaser c) Invoice in duplicate d) Packing list e) Drawings & catalogue f) Guarantee / Warrantee card g) Delivery Challan h) Other Documents (as applicable)
10.	INSPECTION AFTER RECEIPT AT STORES	<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.</p>
11.	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>The outage period i.e. period from the date of failure till unit is repaired/replaced shall not be counted for arriving at the guarantee period.</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>

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12.	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. Further, each LTCT Meter box must be dispatched with cable-ties holding the cover and base of the box together, at the 6 bolting positions. The hot-dip galvanized nuts, washers and bolts must be provided inside the box in a paper/cardboard packet.
13.	SAMPLE	<p>1. Tender Sample: Bidders are required to send two numbers of the tender sample of LTCT Meter boxes to TATA POWER – DDL Meter Testing Lab at Rohini Sector 13, Delhi, as a part of their technical bid submission.</p> <p>2. Pre-manufacturing Sample: BA(s) shall submit two numbers of the pre-manufacturing sample of LTCT Meter boxes (after incorporating all the improvements asked in the technical evaluation) to TATA POWER – DDL Meter Testing Lab at Rohini Sector 13, Delhi, within 4 days of receipt of RC/PO.</p>
14.	TRAINING	NA
15.	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.
16.	MINIMUM TESTING FACILITIES	Bidder shall have adequate in house testing facilities for carrying out all routine tests, acceptance tests as per Indian/International standards
17.	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 along with GTP & Drawing.
18.	SPARES, ACCESSORIES AND TOOLS	NA.
19.	DRAWINGS AND DOCUMENTS	<p>Following drawings and documents shall be prepared based on Purchaser specifications and statutory requirements and shall be submitted with the bid :</p> <ol style="list-style-type: none"> Completely filled in General Technical Particulars General description of the equipment and all components including brochures General arrangement and pin configuration at CT for meter box Experience List Type test certificates Sample as applicable <p>After the award of the contract, soft copies of following GTP & drawings, describing the equipment in detail shall be forwarded for approval:</p>

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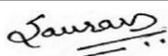
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S. No.	Description	For Approval	For Review Information	Final Submission
1	Technical Parameters	✓		✓
2	GA Drawing of meter box, CT & PVC Cap	✓		✓
3	Installation Instruction			✓
4	Manual/Catalogues		✓	
5	Transport/ Shipping dimension drawing		✓	✓
6	QA & QC Plan	✓	✓	✓
7	Test Certificates	✓	✓	✓

Bidder shall subsequently provide soft copy of all the drawings, GTP and data-sheet of virgin polycarbonate material for the final approval of TATA POWER-DDL, before mass manufacturing. All the documents & drawings shall be in English language.

20.	GUARANTEED TECHNICAL PARTICULARS	Clause-wise compliance to this specification.
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20.	SCHEDULE OF DEVIATIONS	<p style="text-align: center;"><u>(TO BE ENCLOSED WITH THE BID)</u></p> <p>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:</p> <table border="1" style="width: 100%;"> <thead> <tr> <th>S. No.</th> <th>Clause No.</th> <th>Details of deviation with justifications</th> </tr> </thead> <tbody> <tr> <td style="height: 150px;"></td> <td></td> <td></td> </tr> </tbody> </table> <p>We confirm that there are no deviations apart from those detailed above.</p> <p>Seal of the Company Signature :</p> <p style="text-align: right;">Designation :</p>	S. No.	Clause No.	Details of deviation with justifications			
S. No.	Clause No.	Details of deviation with justifications						

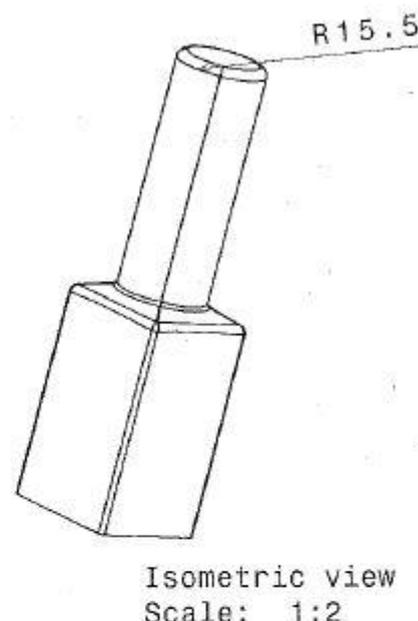
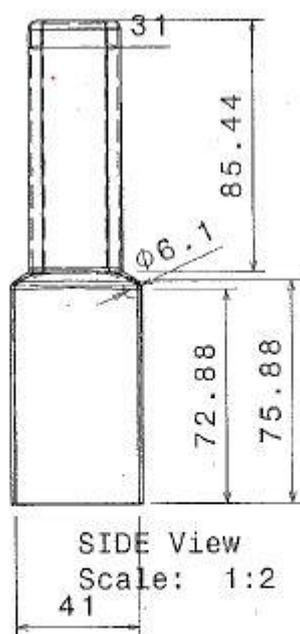
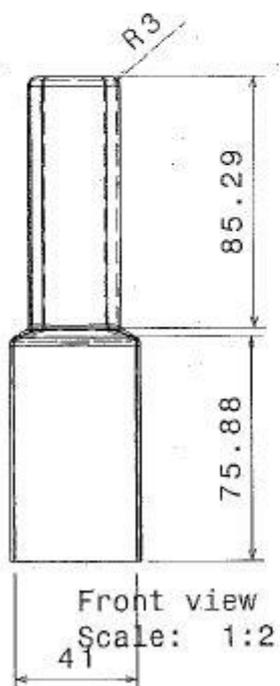
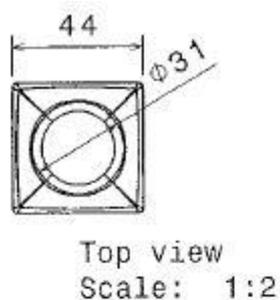
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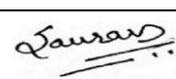
Annexure I:
Tests to be carried out during pre-dispatch inspection

1. Markings, as per this technical specification
2. Visual Examination and Dimensions, as per this technical specification
3. Protection against electric shock, as per IS 14772: 2000
4. Provision for earthing, as per IS 14772: 2000
5. Resistance to Abnormal heat and fire/ Glow wire test @ 960°C
6. Test for self-extinguishing property as per clause 3.5.1 of IS 4249
7. Verification of Die-electric properties @ 5kV for 1 min.
8. CT accuracy test at 20%, 100% and 120% of rated current, as per IS 2705 (Part 1&2)
9. Heat Stability: PVC Cap shall be tested at 90°C for 24 hrs. and no cracking, melting and defect should be observed

Annexure II:
Illustrative Drawing of PVC Cap



THICKNESS 1.4MM
ALL DIMENSIONS ARE IN MM

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TECHNICAL SPECIFICATION COVER SHEET

Document No: ENG-LV-3026

Document Title: Technical Specification of Meter Box for Three Phase Whole Current Energy Meters

00	To incorporate improvements ENG-LV-3025	15.04.2021	2021 ED62 68	SC		BND		BND		HCS	
02	For tender purpose (ENG-LV-52-01)	16.08.2017	1718 ED14 55	RMB	-sd-	PS	-sd-	DRD	-sd-	HCS	-sd-
01	For tender purpose (ENG-LV-52)	16.02.2017	-	RMB	-sd-	PS	-sd-	DRD	-sd-	HCS	-sd-
00	For tender purpose (PEC-GEN-101)	16.08.2010	-	PG	-sd-	AK/RKS/ SD/SB	-sd-	KG	-sd-	HCS	-sd-
Rev No.	Remarks	Date	ERM No.	Initials	Sign	Initials	Sign	Initials	Sign	Initials	Sign
				Prepared By		Reviewed By		Approved By		Issued By	

Issuing Office

HoG/HoD/ Head (Plant Engineering)

<Tata Power Delhi Distribution Limited>

<Behind MTNL office, Yogashram Marg, Institutional Area, Sector-3, Rohini – 110085>

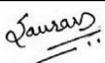
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- 6.0 NAME PLATE AND MARKING
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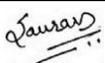
1.0	SCOPE	<p>This specification covers the technical requirements of design, manufacture, testing at manufacturer's works, packing, forwarding, supply and unloading at store/site and performance of Meter Box for Three Phase Whole Current Smart and Non-smart meters, with all accessories, for trouble free and efficient operation.</p> <p>It is not the intent to specify completely herein all the details of tech design and construction of material. However, the material shall conform in all respects to high standards of engineering, design and workmanship and shall be capable of performing in continuous commercial operation in manner acceptable to the TATA POWER - DDL, who will interpret the meanings of drawings and specification and shall have the power to reject any work or material which, in his judgment is not in accordance therewith. The offered material shall be complete with all components necessary for their effective and trouble free operation. Such components shall be deemed to be within the scope of Bidder's supply irrespective of whether those are specifically brought out in this specification and/or the commercial order or not.</p>																		
2.0	APPLICABLE STANDARDS	<p>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.</p> <table border="1" style="width: 100%;"> <tr> <td style="width: 30%;">IS: 14772-2000</td> <td>General requirements for enclosure for accessories for household and similar fixed electrical installations-Specification</td> </tr> <tr> <td>IS/IEC 61439-1 : 2011</td> <td>Low-Voltage Switchgear and Controlgear Assemblies Part 1 General Rules</td> </tr> <tr> <td>IS/IEC 61439-2 : 2011</td> <td>Low Voltage Switch Gear and Controlgear Assemblies Part 2 Power Switch Gear and Control Gear Assemblies</td> </tr> <tr> <td>IS: 11731(Part II)-1992</td> <td>Methods of test for determination of Flammability of solid electrical insulating materials when exposed to an igniting source</td> </tr> <tr> <td>IS 4249-1967</td> <td>Specification for classification and method of test for non-ignitable and self-extinguishing properties of solid electrical insulating materials</td> </tr> <tr> <td>IS 8828-1996</td> <td>Electrical Accessories- Circuit Breakers for Over Current Protection for Household and Similar Installations</td> </tr> <tr> <td>IS 5133(Part II)-1969</td> <td>Specification for boxes for the enclosure of electrical accessories</td> </tr> <tr> <td>IS 2500(Part 1)-2000</td> <td>Sampling procedure for inspection by attributes part 1 sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection</td> </tr> <tr> <td>UL 746-C</td> <td>Polymeric materials in electrical equipment</td> </tr> </table> <p><i>Note: In case of any conflict on any technical particular in the specification, the stricter requirement mentioned in the relevant standard shall be valid.</i></p>	IS: 14772-2000	General requirements for enclosure for accessories for household and similar fixed electrical installations-Specification	IS/IEC 61439-1 : 2011	Low-Voltage Switchgear and Controlgear Assemblies Part 1 General Rules	IS/IEC 61439-2 : 2011	Low Voltage Switch Gear and Controlgear Assemblies Part 2 Power Switch Gear and Control Gear Assemblies	IS: 11731(Part II)-1992	Methods of test for determination of Flammability of solid electrical insulating materials when exposed to an igniting source	IS 4249-1967	Specification for classification and method of test for non-ignitable and self-extinguishing properties of solid electrical insulating materials	IS 8828-1996	Electrical Accessories- Circuit Breakers for Over Current Protection for Household and Similar Installations	IS 5133(Part II)-1969	Specification for boxes for the enclosure of electrical accessories	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	UL 746-C	Polymeric materials in electrical equipment
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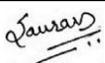
3.0	CLIMATIC CONDITIONS OF THE INSTALLATION	<p>The atmosphere is generally laden with mild acid and dust suspended during dry months and subjected to fog in cold months. The design of the equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.3g.</p> <p>a) Max. Ambient Température : 50 deg.C b) Max. Daily average ambient temp. : 40 deg.C c) Reference temperature for design : 50 deg. C d) Min Ambient Temp : 0 deg C e) Maximum Humidity : 95% f) Minimum Humidity : 10% g) Average No. of thunderstorm days per annum : 50 h) Average Annual Rainfall : 750 mm i) Average No. of rainy days per annum : 60 j) Rainy months : June to Oct. k) Altitude above MSL not exceeding : 300 meters l) Wind Pressure : 126kg/sq. m. up to an elevation of 10m.</p> <p>The atmosphere is generally laden with mild acid and dust suspended during dry months and subjected to fog in cold months, along with harsh polluted environment. The design of the equipment and accessories shall be suitable to withstand seismic forces corresponding to an acceleration of 0.3g</p>
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4.0	GENERAL TECHNICAL REQUIREMENTS	<table border="1"> <thead> <tr> <th>S. No.</th> <th>Description</th> <th>Requirements</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Application</td> <td>Outdoor</td> </tr> <tr> <td>2</td> <td>Degree of protection</td> <td>IP55</td> </tr> <tr> <td>3</td> <td>Flammability requirement</td> <td>FV0</td> </tr> <tr> <td>4</td> <td>Grade of material</td> <td>fire retardant, self-extinguishing, UV stabilization and Anti oxidation properties</td> </tr> <tr> <td>5</td> <td>Material a) Base : b) Cover :</td> <td>a. Clear transparent - Polycarbonate b. Clear transparent- Polycarbonate</td> </tr> <tr> <td>6</td> <td>Thickness of box (Base and Cover)</td> <td>Base-3 mm (minimum) Cover-2.5mm (Minimum) Tolerance + 0.02mm</td> </tr> <tr> <td>7</td> <td>Material of the gasket</td> <td>Rubber (Nitrile/ Neoprene/ Silicone)</td> </tr> <tr> <td>8</td> <td>Glow wire tested at</td> <td>960°C</td> </tr> <tr> <td>9</td> <td>Dielectric withstand capacity</td> <td>5kV for 1 min.</td> </tr> <tr> <td>10</td> <td>Construction features of the box</td> <td></td> </tr> <tr> <td>a)</td> <td>Clear inside dimensions of meter box: Length X Width X Depth</td> <td>460X340X170 mm With 2% tolerance (With minimum clear space of 450mm x330mm without any tolerance)</td> </tr> </tbody> </table>	S. No.	Description	Requirements	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 a) Base : b) Cover :	a. Clear transparent - Polycarbonate b. Clear transparent- Polycarbonate	6	Thickness of box (Base and Cover)	Base-3 mm (minimum) Cover-2.5mm (Minimum) Tolerance + 0.02mm	7	Material of the gasket	Rubber (Nitrile/ Neoprene/ Silicone)	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 X Width X Depth	460X340X170 mm With 2% tolerance (With minimum clear space of 450mm x330mm without any tolerance)
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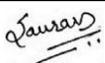
		b)	Minimum clearance between meter and box on sides	50 mm
		c)	Min. Clearance from meter on Top of meter mounting plate	35mm
		d)	Minimum clearance of meter terminal cover from base of box (bottom)	45 mm
		e)	Min. clearance from meter front to cover	50 mm
		f)	Earthing arrangement Nut & Bolt	1 Numbers with M8x 35 or 40mm long
		g)	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 3mm
		h)	U shaped GI latches	4 number GI U shape latches having 1.2mm thick and Min. 25mm long with sealing hole
		i)	Box mounting arrangement	Provision for four number screws at four corners provided
		j)	Box Mounting Screw	4 Number Gitti and screws provided with M6 Screw with min. length 40mm
		k)	Cover overlapping on base	a) Inside- 25 mm overlapping at hinges sides, top and bottom side and 20 mm overlapping at pad lock side. b) Outside overlapping 20mm throughout border
		l)	A. Size of incoming & outgoing gland hole B. location of hole from bottom side	A. 35mm B. around 40mm
		m)	Meter mounting plate as per clause no. 5.4	GI plate of 1.2m thick for meter mounting provided on Top side (without sharp corners)
		n)	Meter mounting Screws	Minimum 3 number of 13mm length
		o)	Hinges	40mm long Stainless Steel (SS 304), both end riveted hinges, with following options: i. Two nos. of hinges with 3 screws in each ii. Three nos. of hinges with 2 screws in each
		p)	Angle of Box opening	120 degrees

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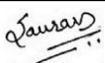
		q)	Polycarbonate hinges on base are covered with box cover material such that tampering is not possible from outside	Yes/No
		r)	Antenna mounting provision	GI square piece of around 30x30mm to be riveted/ fixed inside on bottom face of box at around 60mm distance from right side (if asked for in tender)
		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.
		t)	Earthing sign	A tag with green background on GI sheet to be provided on earth bolt outside box
		u)	A. Gland size – inside diameter-around 29mm on incoming and outgoing B. Gland type – straight	Yes/no
		11	The earth connectivity plate between incoming gland and earth bolt provided with 1.2mm thick GI (HDG)	Yes/no

5.0	GENERAL CONSTRUCTIONS	<p>5.1 The meter box shall be weather proof, tamper proof and shall be made of injection moulded reinforce virgin 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 and cover shall be completely transparent of virgin polycarbonate material with minimum cover thickness of 2.5mm & base of 3mm thickness.</p> <p>5.2 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.</p> <p>5.3 The box shall be provided with meter mounting arrangement along with GI plate (should be HDG) 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.</p> <p>5.4 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 internal dimensions of meter box shall be: Length- 460 mm, Width- 340 mm ,Depth- 170 mm with 2% tolerance.</p>
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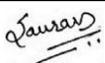
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		<p>5.5 The design of the meter box shall be such as to easy facilitate easy wiring and access to meter terminals. Nylon gland of internal diameter of approx. 30 mm shall be provided for incoming and outgoing cables of size 4Cx25 sq.mm .The holes for incoming and outgoing cables gland shall be provided in left and right side of meter box at bottom.</p> <p>5.6 The successful bidder shall take the details of meter mounting arrangement of different meters, from TATA POWER – DDL, and ensure the same in pre-manufacturing sample. Further, the number of pillars to be provided in box as per 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 without any extra cost.</p> <p>5.7 The box cover shall be fixed to the base through Stainless Steel (SS 304) hinges having minimum length 40mm. The arrangement of the hinges shall be provided on left side of the box. The screws shall not be fixed from outside so that it cannot be visible/accessible from outside to avoid any manipulation. The overlapping on hinges should be such that it metallic portion should not be accessible from outside when closed, to achieve this the cove lapping to be provided. The pin of hinges must be suitably locked at both ends (as depicted below) so that, it could not be removed. The box cover shall be open able by 120 degrees (min.). The hinges can be provided in the following two options of design</p> <p style="margin-left: 40px;">a. Two nos. of hinges with 3 screws in each b. Three nos. of hinges with 2 screws in each</p> <p><u>Hinge pin locking:</u></p> <div style="text-align: center;">  </div> <p>5.8 For holding and sealing the box, four U-shaped latches of approx. size 30 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 (hot-dip galvanized) 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 easily be installed.</p>
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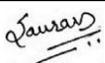
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		<p>5.9 Nitrile/ neoprene/ silicone rubber gasket of round shape (properly provided throughout the periphery) for protection all around the cover shall be provided. The gasket shall have only one cut/joint (max.).</p> <p>5.10 The box shall be provided with four fixing holes of M6 screws. The four nos. M6 screws (of 50 mm length) with gitti to be provided with each box.</p> <p>5.11 After closing and sealing the meter box, it shall not be possible to forcefully enter any sharp object inside the box without breaking base/cover. The material should not be flexible to allow any deformation for any object entry like SUA (long sharp needle). Suitable overlapping (minimum 20 mm) 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.</p> <p>5.12 Box shall be provided with 1 no. GI (hot dip galvanized) 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.</p>						
6.0	NAME PLATE AND MARKING	<p>The meter box shall be provided with durable and legible name plate, effectively secured against removal. TATA POWER – DDL. The name plate shall be indelibly and distinctly marked with all essential particulars as per the relevant standards along with the following information :</p> <ol style="list-style-type: none"> Manufacturer's name RC and RO/PO No. with date Item Code Serial number Month and Year of manufacturing (MM/YYYY) No supply number : 19124 Property of 'TATA POWER-DDL' Voltage 415V 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 TATA POWER - DDL/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>						
7.1	TYPE TEST	<table border="1"> <thead> <tr> <th>SNo</th> <th>Tests/ Standard</th> <th>Requirements</th> </tr> </thead> <tbody> <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> </tbody> </table>	SNo	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.
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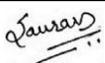
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		2.	Provision for earthing (IS : 14772-2000)	Enclosure shall be provided with a facility for permanent and reliable connection to earthing
		3.	Resistance to ageing, humid conditions, Ingress of solid objects and to harmful ingress of water (IS : 14772-2000)	<p>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.</p> <p>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.</p> <p>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</p>
		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 with the specified requirements.

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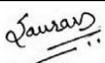
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		10.	Verification of Die-electric properties (IS 61439 Part 1)	The enclosure shall be tested as per clause no. 10.9 of IS 61439 Part 1.
		11.	UV Light Exposure (UL-746C)	<p>The sample when exposed to UV light as per the defined test method, shall comply to following</p> <p>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%.</p> <p>b) Flammability Test: After the UV light exposure, the flammability requirement of FV0 shall remain unchanged.</p> <p>c) Flexural Strength: After the UV 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 %.</p>
7.2	ROUTINE TESTS	<ol style="list-style-type: none"> 1. Marking 2. Visual Examination and Dimensions 3. Protection against electric shock 4. Provision for earthing 		
7.3	ACCEPTANCE TESTS	<ol style="list-style-type: none"> 1. Marking 2. Visual Examination and Dimensions 3. Protection against electric shock 4. Provision for earthing 5. Mechanical strength/Impact Resistance Test 6. Resistance to Abnormal heat and fire/ Glow wire test 7. Flammability test 8. Verification of Die-electric properties 9. Finishing of box 10. Screw Driver penetration test 		
8.0	TYPE TEST CERTIFICATES	<p>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/NABL accredited Laboratory 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 TATA POWER - DDL.</p>		

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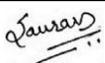
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9.0	PRE-DISPATCH INSPECTION	<p>Equipment shall be subject to inspection by a duly authorized representative of TATA POWER - DDL. Inspection may be made at any stage of manufacture at the option of TATA POWER - DDL and the equipment if found unsatisfactory as to workmanship or material, the same is liable to rejection. Bidder shall grant free access to the places of manufacture to TATA POWER - DDL's representatives at all times when the work is in progress. Inspection by TATA POWER - DDL or it's 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 TATA POWER - DDL.</p> <p>Following documents shall be sent along with material :</p> <ol style="list-style-type: none"> a) Test reports b) MDCC issued by Purchaser c) Invoice in duplicate d) Packing list e) Drawings & catalogue f) Guarantee / Warrantee card g) Delivery Challan h) Other Documents (as applicable)
10.0	INSPECTION AFTER RECEIPT AT STORE	<p>The material received at TATA POWER - DDL store shall be inspected for acceptance and shall be liable for rejection, if found different from the reports of the pre-dispatch inspection.</p> <p>TATA POWER - DDL 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 TATA POWER - DDL 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 TATA POWER - DDL, failing which TATA POWER - DDL will be at liberty to get it replaced/rectified at Bidder's risks and costs and recover all such expenses plus TATA POWER - DDL'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, TATA POWER - DDL 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 TATA POWER - DDL.</p>

Initiator		HOG (Plant Engineering)	
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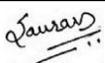
	TATA POWER - DDL DELHI DISTRIBUTION LIMITED, DELHI		
	TECHNICAL SPECIFICATION		
Document Title	Technical Specification of Meter Box for Three Phase Whole Current Energy Meters		
Document No.	ENG-LV-3026	Eff. Date: 15.04.2021	
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12.0	PACKING	Bidder shall 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>Tendering stage: Bidders are required to manufacture 01 number of sample meter box as per the TATA POWER-DDL specification and submit the samples (non-returnable) along with bid for approval. These samples should be submitted at Meter Testing Lab, Rohini Sector 13.</p> <p>Pre-manufacturing approvals: The successful bidder shall submit 01 number of prototype sample of meter box at Meter Testing Lab, Rohini Sector 13, for further testing and compliance as per specifications and shall get approval before mass manufacturing.</p>
14.0	TRAINING	NA
15.0	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. TATA POWER - DDL's engineer or its nominated representative shall have free access to the manufacturer's/sub-supplier's works to carry out inspections.
16.0	MINIMUM TESTING FACILITIES	Bidder shall have adequate in house testing facilities for carrying out all routine tests, acceptance tests as per Indian/International standards.
17.0	MANUFACTURING ACTIVITIES	The successful bidder will have to submit (after placement of RC) technical compliance document and drawing of cable as per RC line items for getting approval before mass manufacturing. Manufacturing mass quantity to start only after getting CAT-A approved drawings or as per intimation from Tata POWER-DDL. 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.
18.0	SPARES, ACCESSORIES AND TOOLS	NA.
19.0	DRAWING AND DOCUMENTS	<p>Following documents to be submitted along with the bid for evaluation :</p> <ol style="list-style-type: none"> Completely filled-in clause wise compliance of this specification. Signed and stamped copy of drawing Complete Type test reports Completely filled signed and stamped copy of tender document. Any other requisite document.

Initiator		HOG (Plant Engineering)	
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	TATA POWER - DDL DELHI DISTRIBUTION LIMITED, DELHI		
	TECHNICAL SPECIFICATION		
Document Title	Technical Specification of Meter Box for Three Phase Whole Current Energy Meters		
Document No.	ENG-LV-3026	Eff. Date: 15.04.2021	
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Prepared By: Saurav Chandel	Reviewed By : Brajanath Dey	Approved By: Brajanath Dey	Issued By: H C Sharma

		<p>Following documents shall be submitted after award of RC/PO before manufacturing:</p> <ol style="list-style-type: none"> Completely filled-in clause wise compliance of the specification. Signed and stamped copy of Drawing Compliance of all undertaking submitted during technical evaluation, if any <p>All the Documents and Drawings shall be in English Language.</p>						
20.0	GUARANTEED TECHNICAL PARTICULARS	Clause wise compliance of this specification to be submitted.						
21.0	SCHEDULE OF DEVIATION	<p>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 TATA POWER - DDL's specifications.</p> <p style="text-align: center;"><u>(TO BE ENCLOSED WITH THE BID)</u></p> <p>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 TATA POWER - DDL's specifications:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">S. No.</th> <th style="width: 20%;">Clause No.</th> <th style="width: 65%;">Details of deviation with justifications</th> </tr> </thead> <tbody> <tr> <td style="height: 200px;"></td> <td></td> <td></td> </tr> </tbody> </table> <p>We confirm that there are no deviations apart from those detailed above.</p> <p>Seal of the Company Signature :</p> <p style="text-align: right;">Designation :</p>	S. No.	Clause No.	Details of deviation with justifications			
S. No.	Clause No.	Details of deviation with justifications						

Initiator		HOG (Plant Engineering)	
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TATA POWER DELHI DISTRIBUTION LIMITED									
INSPECTION TEST PLAN FOR METER BOX FOR THREE PHASE WHOLE CURRENT ENERGY METER									
(TW-Test Witness,TP-Test performed,DR-Document review,H-Hold Point)									
No extra test to be performed without approval and standard process of testing declared from QAG/PE									
Sr. No.	Item Requirement	Characteristics	Acceptance Criteria	Reference Document	Sample size	Responsibility		OK/Not OK	Annexure No. (if applicable)
						BA	Tata Power DDL		
RAW MATERIAL INSPECTION									
1	Meter Box	Degree of protection	IP55	ENG-LV-3026		DR	DR		
		Flammability requirement	FV0			DR	DR		
		Grade of material	fire retardant, self-extinguishing, UV stabilization and Anti oxidation properties			DR	DR		
		Material							
		a) Base :	a. Clear transparent - Polycarbonate			DR	DR		
		b) Cover :	b. Clear transparent- Polycarbonate			DR	DR		
		Thickness of box(Base and Cover)	Base-3 mm (minimum)			DR	DR		
			Cover-2.5mm (Minimum)			DR	DR		
			Tolerance + 0.02mm			DR	DR		
		Material of the gasket	Rubber (Nitrile/ Neoprene/ Silicone)			DR	DR		
		Glow wire tested at	960°C			DR	DR		
		Dielectric withstand capacity	5kV for 1 min.			DR	DR		
		Clear inside dimensions of meter box: Length X Width X Depth	460X340X170 mm With 2% tolerance (With minimum clear space of 450mm x330mm without any tolerance)			DR	DR		
		Minimum clearance between meter and box on sides	50 mm			DR	DR		
		Min. Clearance from meter on Top of meter mounting plate	35mm			DR	DR		
		Minimum clearance of meter terminal cover from base of box (bottom)	45 mm			DR	DR		
		Min. clearance from meter front to cover	50 mm			DR	DR		
		Earthing arrangement Nut & Bolt	1 Numbers with M8x 35 or 40mm long			DR	DR		
		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 3mm			DR	DR		
		U shaped GI latches	4 number GI U shape latches having 1.2mm thick and Min. 25mm long with sealing hole			DR	DR		
Box mounting arrangement	Provision for four number screws at four corners provided	DR	DR						
Box Mounting Screw	4 Number Gitti and screws provided with M6 Screw with min. length 40mm	DR	DR						
Cover overlapping on base	a) Inside- 25 mm overlapping at hinges sides, top and bottom side and 20 mm overlapping at pad lock side.	DR	DR						
	b) Outside overlapping 20mm throughout border	DR	DR						
A. Size of incoming & outgoing gland hole	A. 35mm	DR	DR						

Sr. No.	Item Requirement	Characteristics	Acceptance Criteria	Reference Document	Sample size	Responsibility		OK/Not OK	Annexure No. (if applicable)
						BA	Tata Power DDL		
		B. location of hole from bottom side	B. around 40mm			DR	DR		
		Meter mounting plate as per clause no. 5.4	GI plate of 1.2m thick for meter mounting provided on Top side (without sharp corners)			DR	DR		
		Meter mounting Screws	Minimum 3 number of 13mm length			DR	DR		
		Hinges	40mm long Stainless Steel (SS 304), both end riveted hinges, with following options: i. Two nos. of hinges with 3 screws in each ii. Three nos. of hinges with 2 screws in each			DR	DR		
		Angle of Box opening	120 degrees			DR	DR		
		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 (if asked for in tender)			DR	DR		
		Location of earthing bolt	On left Sides (when viewed from front) & bolt is fixed & engaged within gland through GI sheet 1.2mm from inside.			DR	DR		
		Earthing sign	A tag with green background on GI sheet to be provided on earth bolt outside box			DR	DR		
Acceptance Tests									
1	Marking	As per TPDDL SPECIFICATION	ENG-LV-3026	ENG-LV-3026		TP	TW		
2	Visual Inspection and Dimensions	As per TPDDL SPECIFICATION	ENG-LV-3026	ENG-LV-3026		TP	TW		
3	Provision of earthing	Enclosure shall be provided with a facility for permanent and reliable connection to earthing	IS : 14772 - 2000	ENG-LV-3026		TP	TW		
4	Protection against electric shock	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.	IS : 14772 - 2000	ENG-LV-3026		TP	TW		

Sr. No.	Item Requirement	Characteristics	Acceptance Criteria	Reference Document	Sample size	Responsibility		OK/Not OK	Annexure No. (if applicable)
						BA	Tata Power DDL		
5	Mechanical strength/Impact Resistance Test	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	IS : 14772-2000// (UL : 746 C)	ENG-LV-3026		TP	TW		
6	Resistance to Abnormal heat and fire/ Glow wire test	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.	IS : 14772 - 2000	ENG-LV-3026		TP	TW		
7	Flammability test	The sample shall comply to flammability requirements of category FV0/V0 as per respective standards	(IS : 11731 (Part II)-1986)/UL :94)	ENG-LV-3026		TP	TW		
8	Verification of Die-electric properties	The enclosure shall be tested as per clause no 10.9 of IS 61439 Part 1.	(IS 61439 Part 1)	ENG-LV-3026		TP	TW		
9	Finishing of box	As per TPDDL SPECIFICATION	ENG-LV-3026	ENG-LV-3026		TP	TW		
10	Screw Driver penetration test	Forceful entry using screw driver should not happen. Overlapping of box's base and top) should be ensured as mentioned below: a) Inside- 25 mm overlapping at hinges sides, top and bottom side and 20 mm overlapping at pad lock side. b) Outside overlapping 20mm throughout border	ENG-LV-3026	ENG-LV-3026		TP	TW		
11	Name Plate and Marking	The meter box shall be provided with durable and legible name plate, effectively secured against removal. TATA POWER – DDL. The name plate shall be indelibly and distinctly marked with all essential particulars as per the relevant standards along with the following information : a) Manufacturer's name b) RC and RO/PO No. with date c) Item Code d) Serial number e) Month and Year of manufacturing (MM/YYYY) f) No supply number : 19124 g) Property of 'TATA POWER-DDL' h) Voltage 415V Danger logo/icon on the cover	As Per Tata Power DDL Specification	ENG-LV-3026		TP	TW		

SECTION –IV

TECHINICAL SPECIFICATIONS

FOR

HTTV METER WITH BOX,

NIT-TPNODL/OT/2021-22/066 ON DTD 16.09.2021

**TECHNICAL SPECIFICATION
FOR
TAMPER PROOF BOX**

**TECHNICAL SPECIFICATION OF
SMC MAKE PILFER PROOF METER BOX TO HOUSE THE THREE PHASE FOUR WIRE
HTTV ENERGY METERS**

1.0 SCOPE:

- 1.a This specification covers the design, manufacture and testing of SMC Meter Box of excellent weather ability.
- 1.b The meter box shall be anti-corrosive, dust proof, rust proof, shock proof, dust and vermin proof, U.V. stabilized and flame retardant property. Base door or other joint should not bend or soften on heating so as to ensure tamper proof construction.
- 1.c The body of box & door each should be single piece moulded without any construction joint.
The meter box shall have double door (i.e. inner & outer) arrangement.
- 1.d Meter Box should be suitable for indoor & outdoor use.
- 1.e Meter Box should not melt at high temperature.
- 1.f The meter box will be suitable to house one number three-phase four-wire HTTV energy meter & a modem of any make. The meter box shall comply with
IS: 14772: 2000 (For Box)
IS: 13410- 1992 [For SMC Material]

2. MATERIAL

The meter box will be made of high grade Engineering Plastic (Polycarbonate) or SMC or combination of Polycarbonate & SMC. It will be weather proof, capable to withstanding temperatures of boiling water for 5 minutes continuously without distortion or softening. Box will be made of Flame Retardant material which will pass Glow wire test, Environment friendly and easily recyclable.

3. CONSTRUCTION

- 3.1 Meter Box will have a roof tapering arrangement for easy flow of rainwater.
- 3.2 The thickness of the box will not be less than 2.5 mm from load bearing side (i.e. back side of the box) and other sides, doors & roof will not be less than 2.0 mm.
- 3.3 The overall dimensions of the box will be approximately Length-47 cm, Breadth-38 cm, Depth-20 cm. The box shall be suitable to accommodate 3phase 4wire HTTV Meter & a modem of any make such as Secure, L&T, Genus etc. (a)Outer door - Opaque with view in g win do w o r T r a n s p a r e n t a n d p r o v i s i o n o f „D“p o r t i n i n n e r d o o r w i t h p r o p e r s e a l i n g a r r a n g e m e n t f o r D p o r t & m e t e r b o x.
- 3.4 Box cover will be fixed with minimum three nos. hinges, well protected against corrosion. Box cover will be able to open by more than 120 degrees.
- 3.5 Soft rubber gasket for protection from ingress of dust and water will be provided on all around the box.
- 3.6 Handle/Knob will be provided on the Box door for easy door opening.
- 3.7 Concealed hinges should be fixed for easy door opening using proper size of hardware from inside in such a manner that neither it will be visible nor interfered from outside.
- 3.8 The External door in closed position should be overlapped on base such way that direct entry of screwdriver, tool or rod is not possible.
- 3.9 Adjustable Meter Mounting Arrangement may be provided to accommodate any make of Meter .
- 3.10 Box shall be provided with 4 nos. fixing holes of 6 mm diameter at all four corners of meter box. The base support of meter mounting shall be raised by about 10m.m in the meter box for easy wiring.

- 3.11 For holding rigidly the inner & outer door, latches/clamps with two sealing holes shall be provided. Latches/clamps shall be provided on the body of the box with proper sealing arrangements at two locations. All metallic parts will be protected against corrosion.
- 3.12 The viewing window for meter reading will be made of break resistant, UV stabilized, transparent Polycarbonate of minimum 2.0 mm thickness. The transparent Window will be ultrasonically welded/ fixed in rigid way with meter opaque door from inside. The viewing window will have a Shade arrangement to protect meter display from direct sunlight. Size of the viewing window shall be 10.0 CM x12.0 CM approximately.
- 3.13 Adjustable meter mounting arrangement may be provided in such a way that the display portion of any make meter can be easily aligned with the viewing window of outer door , So that meter reading can be done easily without opening any door of meter box.
- 3.14 The box colour will be dark admiralty gray/off white/Transparent.
- 3.15 Meter Box should comply IP-54. Type test report will be submitted along with offer.
- 3.16 For cable entry, one suitable circular holes fitted with adjustable glands will be provided at the bottom of the box for cable inlet and outlet. Internal diameter of the gland will be such as to accommodate the control cable having outer diameter 25-30mm.The cable entry hole position can be changed by TPNODL as per the field requirement & will be narrated during the placement of Purchase Order.
- 3.17 Purchase order No. & Date, Property of TPNODL, Purchased under CAPEX Programme will be mentioned on metallic name plate in such a manner that it will not be erased & removed easily. Name of Manufacturer will be embossed on meter box cover.

4. TESTS:

4.1 Type Tests:

The type tests report of the box, including identification of the materials carried out at CPRI/ any NABL Accredited laboratory shall be submitted with the tender.

4.2 Acceptance Tests:

The following will constitute acceptance test for box:

- i. Physical verification of dimensions of the box.
- ii. Compatibility of the box for housing the meter for ensuring ease of connections and reading the meter.

5. Sample Test for acceptance:-

A- The bidders will submit one sample boxes along with the tender, the box will be tested at TPNODL MRT Lab. to know the Compatibility of the box for housing the meter for ensuring ease of connections and reading the meter basing on the type test report submitted with sample.

B- Two random samples will be collected from first lot supply meter box. One will be tested at Govt. approved independent test house for compliance of performance parameters as given in IS including Material identification to be carried out by CIPET or some other standard Lab. & other will be tested at TPNODL MRT Lab. to know the Compatibility of the box for housing the meter for ensuring ease of connections and reading the meter before acceptance. Subsequent lot will be accepted after successful verification by TPNODL MRT Laboratory.

GUARANTEED TECHNICAL PARTICULARS FOR SMC PILFER PROOF **METER BOX TO HOUSE
THE THREE PHASE FOUR WIRE HTTV ENERGY METERS**

Sl. No.	Characteristics	Requirements	Bidders Data
1.	Manufacturer's / Supplier's name and address with works address.		
2.	Material used for box body	SMC (Sheet Moulding Compound) ref- IS:13410/1992 /IS:14772:2000Combined	
3.	Color of Box	Dark Admiral Gray/off White/Transparent	
4.	Dimensions of box (L x W x H)	45x38x20 CM (approx)	
5.	Meter Fixing Arrangement	Adjustable Meter Mounting Arrangement may be provided to accommodate any make of Meters .	
6.	Earthing Provisions	To be provided	
7.	Thickness of meter box a. From Back Side b. From all other sides	2.5 mm Back Side 2.0 mm all other side.	
8.	Clearance of meter from box surface approx. :(Varies from meter to meter) a. Right , Left b. Top side c. Bottom side (from meter terminals) d. Bottom side (from terminals cover) e. Front side	a. 10 cm b. 1 cm c. 12 cm d. 8 cm e. 11cm	
9	Additional "D" Port	Additional "D" Port provision provided in the inner door of the box with sealing arrangement for downloading data through MRI.	
10	Doors	Provision of two (Inner door & outer door) arrangement to be provided.	
11	Push button hole	Push button hole shall be done by TPNODL at the time of installation.	
12	The material of inner door shall be	SMC	
13	Cable Entry Hole.	For cable entry, one suitable circular holes fitted with adjustable glands will be provided at	

		the bottom of the box for cable inlet and outlet. Internal diameter of the gland will be such as to accommodate the control cable having outer diameter 25-30mm. The cable entry hole position can be changed by TPNODL as per the field requirement & will be narrated during the placement of Purchase Order.	
14	Type of Use Meter Box should be suitable for	Meter Box should be suitable for indoor & outdoor use.	
15	Suitable to house	The meter box will be suitable to house one number three-phase four-wire HTTV energy meter & a modem of any make.	
16	The meter box shall comply with	IS:13410- 1992	
17	Roof tapering	Meter Box will have a roof tapering arrangement for easy flow of rainwater, as per sample.	
18	Hinges	Box cover will be fixed with minimum three nos hinges in each door well protected against corrosion. Box cover will be able to open by more than 120 degrees. Concealed hinges should fix the Box and cover, with hardware from inside in such a manner that it can't be manipulated from outside.	
19	Gasket	Soft rubber gasket for protection from ingress of dust and water will be provided on all around the box.	
20	Handle	Handle/Knob will be provided on the Box door for easy door opening.	
21	Inner door, viewing window & D-Port.	The box shall be provided with two (inner & outer) doors. A viewing window must be provided in inner door if not transparent. One D-Port provision for communication must be provided in the inner door of each box with sealing arrangements.	
22	Fixing Holes	Box shall be provided with 4 nos. fixing holes of 6 mm diameter at all four corners of meter box.	
23	Sealing & Latches.	For holding and sealing the outer door, U-shaped latches/clamps with two sealing holes will be provided. Two nos Latches will be provided on the base of the box. These latches will also hold the box cover with base. All metallic parts will be protected against corrosion. Provision shall be made for sealing of doors at two locations.	
24	Viewing window	The viewing window for meter reading will be made of break resistant, UV stabilized, transparent Polycarbonate of minimum 2.0 mm	

		thickness. The transparent Window will be properly welded/fixed in rigid way with meter opaque door from inside. The viewing window will have a Shade arrangement to protect meter display from direct sunlight. The viewing window shall be 10.0 CM x12.0 CM approximately.	
25	Adjustable meter mounting Arrangement.	Adjustable meter mounting arrangement to be provided in such a way that the display portion of any make meter can be easily aligned with the viewing window of outer door, So that meter reading can be done easily without opening any door of meter box.	
26	Name Plate.	Purchase order No. & Date, Property of TPNODL, Purchase under CAPEX Programme etc. will be mentioned on metallic name plate in such a manner that it will not be erased & removed easily. Name of Manufacturer will be embossed on meter box cover.	

Signature of the bidder with seal