

**TECHNICAL SPECIFICATION OF POLYCARBONATE METER BOX FOR SINGLE PHASE
& THREE PHASE ENERGY METERS. SPECIFICATION NO: DIST /MM-IV/T/04/09, dtd. 09.03.09.
(Amended on 21.11.09)**

1.0 SCOPE:

This specification covers design, manufacturing, testing and supply of fully transparent Polycarbonate Meter Box confirming to IS: 14772 / 2000 (Amended upto date) and IS: 14434. The Meter Box shall be suitable for housing Single Phase as well as Three Phase Energy Meters on wall mounting in indoor as well as outdoor applications.

2.0 QUALIFYING REQUIREMENTS:

- 2.1 Offers of manufacturers / suppliers of Energy Meters Boxes shall be accepted against the Tender.
- 2.2 The following qualifying requirement shall be fulfilled by the bidders.
- (a) The bidder should have turnover of 60% of the estimated cost of the tender during any one of the last three financial years.
- (b) The bidder should have supplied one lakh meter boxes during the last three financial years.
- (c) The bidder should have minimum experience of three years of supply or manufacturing of meter boxes upto the end of the last financial year.
- 2.3 The offers of Indian subsidiary company, whose parent company is located abroad fulfilling the qualifying requirements, shall be considered provided the Indian participant subsidiary company fulfils the minimum experience of three years of supply or manufacturing of meters boxes upto the end of the last financial year. However, the conditions of turnover of 50% of the estimated cost of the tender during any one of the last three financial years and supply of minimum quantity of one lakh meter boxes during last three financial years can be fulfilled by the parent company located in abroad on behalf of their Indian subsidiary company. The parent company shall furnish undertaking for accepting responsibility for supplying quality meter boxes as per specifications and execution of the contract on behalf of its India based subsidiary unit who has participated in the tender in Annexure U-I.
- 2.4 In case of offers of foreign bidders/manufacturers, they shall fulfill Qualifying Requirement as per Sr. No. 2.1 and 2.2 above.

3.0 SERVICE CONDITIONS:

The meter box to be supplied against this specification shall be suitable for satisfactory continuous operation under the following service conditions.

SN	Details	Service conditions
1.	Maximum & ambient air temperature	50° C
2.	Maximum relative humidity	100 %
3.	Maximum annual rainfall	1450 mm
4.	Maximum wind pressure	150 Kg / mtr ²
5.	Maximum altitude above mean sea level	1000 mtrs.
6.	Seismic level (Horizontal acceleration)	0.3 g
7.	Climatic condition	Moderately hot and humid tropical climate conducive to rust and fungus growth
8.	Ref. Ambient temperature for temperature rise	50° C

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4.0 APPLICABLE STANDARDS:

Unless otherwise modified in this specification, the meter box shall generally confirm to IS: 14772 / 2000 (Amended upto date) and material of construction i.e. Polycarbonate shall confirm to IS: 14434 and requirement of this specification

5.0 DESIGN & CONSTRUCTION:

- 5.1 The meter box shall be so constructed as to have roof tapering down on both sides for easy flow of rainwater. It should be prepared by using 100% virgin raw Polycarbonate material. The box shall be totally transparent polycarbonate material natural white in colour & weather proof, unbreakable, scratch resistant having good workmanship.
- 5.2 The meter box shall be made of anti corrosive, dust proof, rust proof, vermin and water proof, ultra violet stabilized and flame retardant, high grade virgin polycarbonate material having good dielectric and mechanical strength property.
- 5.3 The minimum inside dimensions of the meter box shall be suitable for installation of all types of meters purchased from various meter manufacturers.
- 5.4 The three phase meter box shall be such that there shall be minimum 100 mm clearance at the bottom, 75 mm clearance on all three sides, 25 mm clearance at the front and 10 mm clearance at the back between meter and meter box inner wall.
- 5.5 The single phase meter box shall be such that there shall be minimum 60 mm clearance at the bottom, 40 mm clearance on all three sides, 25 mm clearance at the front and 10 mm clearance at the back between meter and meter box inner wall.
- 5.6 The wall thickness of the meter box base shall be minimum 3 mm and cover shall be minimum 2 mm. It should have base raised by about 10 mm in the box for easy wiring for fixing the meter. The meter screws shall not protrude outside.
- 5.7 Minimum Internal Dimensions of the meter box shall be as follows, when box kept vertical.
Single Phase Meter Box: 260 mm (H) x 190 mm (W) x 120 mm (B)
Three Phase Meter Box: 485 mm (H) x 340 mm (W) x 185 mm (B)
- 5.8 The tolerance permissible on the various dimensions of the meter box shall be $\pm 1\%$.
- 5.9 The meter box base shall be made from fully transparent polycarbonate material grade ISPCXXXILRC11243F34 as per IS: 14434 & requirement of this specification and cover from fully transparent polycarbonate material grade ISPCXXXILRC11243F34 as per IS: 14434 & requirement of this specification.
- 5.10 The base and cover of meter box shall be individually in one piece except for fixing of accessories like push fit clamps, handles, meter mounting, etc and all metal parts excluding hardware shall be of stainless steel only.
- 5.11 The base and cover must be UV stabilized to ensure that it does not get 'Yellow' over a period of time. It should not change in colour, shape, size, dimensions when subjected to 200 hrs on UV ageing test as per ASTM: G53 (Cl. No. 9.3), 4 Hours UV at 60° C and 4 Hours condensation at 50° C. The

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- base and cover shall be capable of withstanding temperature of boiling water for five minutes continuously without distortion or softening.
- 5.12 The cover shall be made overlapping type having collars on all four sides. The cover of meter box shall have 4 nos. of non-detachable self-locking push fit type arrangement. It shall have suitable non-detachable fitting to base such that if pushed once inside, the cover shall rest on the base of box in such a way that any access from outside to the meter is not possible.
- 5.13 The cover in closed position shall be overlapped on base such that direct entry of screwdriver, tool or film is not possible. The cover shall be provided with semi circular / circular gasket of sufficient size to completely fit to the base. The gasket should be made out of good quality neoprene rubber.
- 5.14 The cover of Transparent Polycarbonate Material shall have light transmission of 80% or more (to be tested as per ASTM D 1003). This will facilitate photometer reading as well as transparency.
- 5.15 Meter Box Base and cover shall have minimum 2 Nos. matching Wire Sealing holes as shown in drawing for MSEDCL sealing purpose.
- 5.16 Meter box shall conform to IP-51.
- 5.17 The mounting arrangement of the meter in the meter box shall be by way of adjustable slotted stainless steel strips of thickness 3 mm which shall be fixed on the base by providing raised groove with internal threads and 4 Nos. of 4 mm diameter, 8 mm long full thread screws as per drawing enclosed to suit mounting of various make of meters.
- 5.18 4 nos. of keyholes of diameter 6 mm shall be provided at the backside of the meter box to facilitate mounting of the meter box on the wall or pole. 4 nos. of 75 mm long, 6 mm diameter mounting screws with washers shall be provided along with the meter box.
- 5.19 2 nos. of holes with polymeric material collapsible glands of maximum diameter of 12 mm for single phase and 25 mm for three phase meters shall be provided at the bottom of meter box base for incoming and outgoing cables.
- 5.20 The surface appearance or part of Meter Box must be smooth, non porous and homogeneous, free from ripples, defects and marks. No fillers or fibres should be visible at any place.
- 5.21 The Meter Box shall comply with magnetic influence of AC / DC / 0.5 Tesla Permanent Magnet when tested as per Meter Testing Method of CBIP Tech. Report 88 with Meter having 0.5 Tesla Magnetic Immunity mounted on it.

6.0 TESTS:

The meter box shall be fully type tested as per IS 14772 / 2000 (amended up to date), IS: 13410 / 1992 & IS: 14434. The type test report of meter box having identical constructional and other features carried out during last three years will be valid. The type test report shall clearly indicate the constructional features identifying material of construction and its grade / composition as per respective IS. All the Type Tests shall be carried out from Laboratories which are accredited by the National Board of Testing and Calibration Laboratories (NABL) of Govt. of India such as CPRI, Bangalore / Bhopal, ERDA Baroda, to prove that the meter box meets the requirements of specification. Type Test Reports conducted in manufacturers own laboratory and certified by testing institute shall not be acceptable. The tenderer shall also furnish the particulars

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giving specific required details of Meter boxes in schedule 'A' attached (As per Guaranteed Technical Particulars uploaded on e - Tendering site). The offers without the details in Schedule 'A' stand rejected. The tenderer shall submit all the type test reports as below along with offer. Separate type Test Reports for each offered type of meter box shall be submitted. The purchaser reserves the right to demand repetition of some or all the type tests in presence of purchaser's representative at purchaser's cost.

The meter box shall pass all the acceptance and routine tests as laid down in IS 14772 / 2000 (amended up to date) & IS: 14434 and also additional acceptance tests as prescribed in this specification.

The Type Test certificates as per table below shall be got approved from the Chief Engineer (Distribution) before commencement of supply.

TYPE TEST & ACCEPTANCE TESTS (Test 1 to 9 for Base & Cover Both)

SN	Test	Reference Standard	Required Value
1	Flammability	UL-94 / IS: 1173	V2
2	Self extinguishing	IS: 4249	SE
3	Heat Deflection Temperature @ 1.8 MPA	IS: 13411 Annex. H / ISO 75	Base = $\geq 150^{\circ}$ C Cover = $\geq 150^{\circ}$ C
4	Glow Wire Test	IS: 11000 (P2/ S1) or IEC - 695-2-1	Base = 900°C Cover = 900°C
5	Ball Pressure Test	IS: 14772 / 2000 / IEC 335	Confirms
6	Water Absorption	IS:14772 / 2000	= $\leq 0.25\%$.
7	Mechanical strength	IS:14772 / 2000	≥ 50 MPA
8	Marking, Dimension & Construction	IS:14772 / 2000	As per IS
9	Material Identification of Base	N.A.	Polycarbonate
10	Material Identification of Cover	N.A.	Polycarbonate
11	UV Ageing Test for 200 Hours	ASTM G53 (9.3)	Confirms
12	Light Transmission (Transparency) for Cover	ASTM D 1003	$\geq 80\%$

In addition to above, all other tests according to IS: 14772 / 2000.

For Acceptance Test, 10 samples for each lot offered for inspection shall be selected randomly.

7.0 TESTING AND MANUFACTURING FACILITIES:

- 7.1 The Bidder shall have necessary machinery for production of Transparent Polycarbonate meter box.
- 7.2 Manufacturer shall have in house testing facilities for carrying out routine and acceptance tests as per IS: 14772 / 2000 and Annexure 'A' excluding material identification, UV Ageing Test for 200 Hours and light transmission tests (Sr. No. 10, 11 & 12). (As per Guaranteed Technical Particulars uploaded on e - Tendering site)
- 7.3 The Bidder shall have the testing facility of flammability test of V₀.

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8.0 DRAWINGS / SAMPLES:

Enclosed drawings are only for general guidelines, however, the detailed dimensional drawing showing clearly the dimensions and material for meter box and its constructional features shall invariably be furnished with the offer.

9.0 GUARANTEE:

The meter box shall be guaranteed for a period of five years from the date of commissioning or five and half years from the date of dispatch whichever is earlier. The meter boxes found defective within above guarantee period shall be replaced by the supplier free of cost within one month of receipt of intimation. If the defective material is not replaced within specified period as above, the Company shall recover an equivalent amount plus 15% supervision charges from any of the bills of the supplier.

10.0 MARKINGS:

The following information shall clearly & indelibly be printed on the cover of the meter box.

- 1) Purchaser's Name : **MSEDCL**
- 2) Code name of manufacturer :
- 3) Purchase order number and date :
- 4) Year and month of manufacture :
- 5) Guarantee : Years
- 6) Sign of Danger
- 7) Meter Box Sr. No. :

11.0 INSPECTION:

The manufacturer shall give minimum 14 days notice for inspection of material.

12.0 PACKING:

The meter box shall be suitably packed in corrugated boxes in order to avoid damage during transit or handling.

13.0 SCHEDULES:

The tenderer shall fill in the following schedules and submit along with the offer. If the schedules are not submitted duly filled in with the offer, the offer shall be rejected.

Schedule `A' ... Guaranteed Technical particulars (As per GTP parameters uploaded on e- Tendering site.)

Schedule `C' ... Tenderer Experience

The discrepancies if any between the specification and the catalogs and/or literatures submitted as part of the offer by the bidders, the same shall not be considered and representations in this regard will not be entertained. If it is observed that there are deviations in the offer in Guaranteed Technical Particulars other than those specified in the deviation schedules then such deviations shall be treated as deviations.

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SCHEDULE 'A'

GUARANTEED TECHNICAL PARAMETERS

ITEM NAME: LT AC STATIC SINGLE PHASE 5 – 30 AMPS. AND THREE PHASE 10 – 40 AMPS. ENERGY METER POLYCARBONATE METER BOX.		
SN	GUARANTEED TECHNICAL PARAMETERS	GTP VALUES
1.	MANUFACTURER'S / SUPPLIER'S NAME AND ADDRESS WITH WORKS ADDRESS	TEXT
2.0	MATERIAL OF CONSTRUCTION:	
2.1	WHETHER POLY CARBONATE MATERIAL OF GRADE ISPCGFXXXRC11243F34 IS USED FOR CONSTRUCTION OF BASE OF METER BOX (YES / NO)	BOOLEAN
2.2	WHETHER POLY CARBONATE MATERIAL OF GRADE ISPCGFXXXC11243F34 IS USED FOR CONSTRUCTION OF COVER OF METER BOX (YES / NO)	BOOLEAN
2.3	CONFIRM WHETHER POLYCARBONATE MATERIAL USED IS VIRGIN (YES / NO)	BOOLEAN
2.4	CONFIRM POLYCARBONATE MATERIAL USED IS UV STABILIZED (YES / NO)	BOOLEAN
3.0	CONSTRUCTIONAL FEATURES OF THE METER BOX:	
3.1	DIMENSIONS OF METER BOX L X B X H	TEXT
3.2	SHEET THICKNESS OF BASE OF METER BOX IS 3 MM MINIMUM (YES / NO)	BOOLEAN
3.3	SHEET THICKNESS OF COVER OF METER BOX IS 2 MM MINIMUM (YES / NO)	BOOLEAN
3.4	LIFE EXPECTED IS 5.5 YEARS (YES / NO)	BOOLEAN
3.5	MINIMUM CLEARANCE OF 25 MM AT FRONT SIDE BETWEEN METER AND METER BOX INNER WALL (YES / NO)	BOOLEAN
3.6	MINIMUM CLEARANCE OF 10 MM AT BACK BETWEEN METER AND METER BOX INNER WALL (YES / NO)	BOOLEAN
3.7	MINIMUM CLEARANCE OF 100 MM AT BOTTOM BETWEEN METER AND METER BOX INNER WALL FOR THREE PHASE METER BOX (YES / NO)	BOOLEAN
3.8	MINIMUM CLEARANCE OF 75 MM ON ALL THREE SIDES BETWEEN METER AND METER BOX INNER WALL FOR THREE PHASE METER BOX (YES / NO)	BOOLEAN
3.9	MINIMUM CLEARANCE OF 60 MM AT BOTTOM BETWEEN METER AND METER BOX INNER WALL FOR SINGLE PHASE METER BOX (YES / NO)	BOOLEAN
3.10	MINIMUM CLEARANCE OF 40 MM ON ALL THREE SIDES BETWEEN METER AND METER BOX INNER WALL FOR SINGLE PHASE METER BOX (YES / NO)	BOOLEAN
3.11	WEIGHT OF COMPLETE METER BOX IN KGS.	TEXT
3.12	METER BOX IS TYPE TESTED (YES / NO)	BOOLEAN
3.13	METER BOX CONFORMS TO IP 51 (YES / NO)	BOOLEAN
3.14	TYPE TEST REPORT NO. (QUOTE SEPARATELY FOR THREE PHASE & SINGLE PHASE)	TEXT
3.15	APPLICABLE STANDARD IS: 14772 / 2000 (AMENDED UPTO DATE), IS: 13410 & IS: 14434 (YES / NO)	BOOLEAN

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4.0	PROPERTIES OF THE MATERIAL OF CONST. OF METER BOX BASE & COVER:	
4.1	CONFIRM FLAMMABILITY AS V2 AS PER UL - 94 (YES / NO)	BOOLEAN
4.2	CONFIRM SELF EXTINGUISHING AS SE AS PER IS: 4249 (YES / NO)	BOOLEAN
4.3	FURNISH HEAT DEFLECTION TEMPERATURE $\geq 150^{\circ}$ C @ 1.8 MPA AS PER IS: 13411, ANNEXURE 'H' (YES / NO)	BOOLEAN
4.4	CONFIRM GLOW WIRE TEST AT 900° C AS PER IS: 11000 (PART 2 / SECTION 1) (YES / NO)	BOOLEAN
4.5	CONFIRM BALL PRESSURE TEST AS PER IS: 14772 / 2000	BOOLEAN
4.6	CONFIRM 200 HRS UV AGEING TEST IS CARRIED OUT (YES / NO)	BOOLEAN
4.7	CONFIRM WATER ABSORPTION VALUE $\leq 0.25\%$. (YES / NO)	BOOLEAN
4.8	CONFIRM MECHANICAL STRENGTH ≥ 50 MPA. (YES /NO)	BOOLEAN
4.9	CONFIRM FLEXURE STRENGTH ≤ 155 MPA. (YES /NO)	BOOLEAN
4.10	CONFIRM MODULUS OF ELASTICITY 12×10^2 MPA. (YES /NO)	BOOLEAN
4.11	CONFIRM IZOD IMPACT STRENGTH NOTCHED = 45 KJ / METER ² MINIMUM. (YES /NO)	BOOLEAN
4.12	CONFIRM LIGHT TRANSMISSION $\geq 80\%$ AS PER ASTM D 1003 (YES / NO)	BOOLEAN
5.0	OTHER FEATURES	
5.1	SELF LOCKING ARRANGEMENT 4 NOS. MINIMUM (YES / NO)	BOOLEAN
5.2	MINIMUM 2 NOS. HOLES FOR WIRE SEAL FOR BASE (YES / NO)	BOOLEAN
5.3	MINIMUM 2 NOS. HOLES FOR WIRE SEAL FOR COVER (YES / NO)	
5.4	MINIMUM 2 NOS. COLLAPSIBLE POLYMERIC GLANDS ON THE BOTTOM OF BASE (YES / NO)	BOOLEAN
5.5	METER BOX WITHSTANDS 0.5 TESLA MAGNETIC INFLUENCE TEST (YES / NO)	BOOLEAN
5.6	METER BOX CONFIRMS TO IP - 51 (YES / NO)	BOOLEAN
5.7	LIFE EXPECTED IS 5.5 YEARS (YES / NO)	BOOLEAN
5.8	INHOUSE TESTING FACILITY IS AVAILABLE (YES / NO)	BOOLEAN
5.9	WHETHER YOU AGREE TO SUPPLY METERS AS PER ANNEXURE - D i.e. TECHNICAL SPECIFICATIONS OF THE TENDER (YES / NO)	BOOLEAN
5.10	WHETHER TYPE TEST REPORTS ALONGWITH THE COPY OF THE SAME IN TWO CDs ARE SUBMITTED (YES / NO)	BOOLEAN
5.11	WHETHER 10 NOS. OF TENDER SAMPLE METER BOXES ARE SUBMITTED (YES / NO)	BOOLEAN
5.12	WHETHER THE FIRM IS SUBSIDIARY (YES / NO)	BOOLEAN
5.13	ADDITIONAL INFORMATION REQUIRED IN CASE OF FOREIGN BIDDER / MANUFACTURER (A) RATE OF CUSTOMS DUTY	TEXT
5.14	(B) OFFER SUBMITTED BY FOREIGN BIDDER / MANUFACURER	TEXT
5.15	(C) WHETHER THE OFFER SUBMITTED THROUGH AUTHORISED ASSIGNEE / NOMINEE (YES / NO)	BOOLEAN
5.16	IN CASE OFFER SUBMITTED THROUGH AUTHORISED ASSIGNEE / NOMINEE, WHETHER ANNEXURE UII SUBMITTED (YES / NO)	BOOLEAN

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SCHEDULE - "C"

TENDERER'S EXPERIENCE

Tenderer shall furnish here list of similar orders executed /under execution for supplying meters boxes by him to whom a reference may be made by purchaser in case he considers such a reference necessary.

Sr. No.	Name of client	Order No. & date	Qty. ordered	Qty. supplied
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NAME OF FIRM _____

NAME & SIGNATURE OF TENDERER _____

DESIGNATION _____

DATE _____

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**ANNEXURE U-I
“INDEMNITY BOND”**

UNDERTAKING TO BE SUBMITTED BY THE PARENT COMPANY SITUATED
ABROAD IN CASE OF THE PARTICIPANT BIDDER WHO IS AN INDIAN BASED
SUBSIDIARY ON GENERAL STAMP OF RUPEES 200/-

To,
The Executive Director (Stores),
Maharashtra State Electricity Distribution Co. Ltd.,
Prakashgad, Bandra (E),
Mumbai – 400 051.

Dear Sir:

Sub:- Undertaking against Tender _____ for procurement of _____

We, M/s. _____ having registered office at _____ are the Parent Company of M/s. _____ who have participated against your tender No. ____ for procurement of _____.

We have carefully read and have thoroughly understood and agree to the terms and conditions of the subject tender.

We hereby undertake that in case of placement of order against the subject tender on our subsidiary company, M/s. _____ in the event of we accept all the responsibilities and liabilities for supply of quality meters as per specification of the tender and execution of the contract. We further hereby undertake that we shall be responsible for any liability arising out of the contract placed on M/s. _____ and to pay MSEDCL on demand the sum of rupees as per agreement in the event of any breach of condition of the purchase order, loss and damage of the material till expiry of guarantee period as stipulated in the order. Our liability here under shall not be impaired or discharged by extension of time or variation or alteration made with or without our knowledge or consent by or between the parties to the said contract. This undertaking shall be valid and binding on us upto and including the execution and guarantee period of the order and shall not be terminable by notice or change in the constitution of any of the companies. In case of any dispute arising out of or in connection with this tender or contract, if concluded, the same shall be subject to the exclusive jurisdiction of the “Court in Mumbai (India).”

Yours faithfully,

(Authorised Signatory)
FOR _____