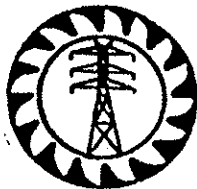


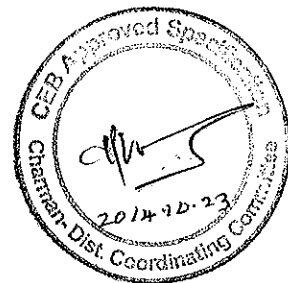
038: 2014

CEB
SPECIFICATION

**SPECIFICATION FOR ENCLOSURE FOR
MEASURING AND PROTECTION
EQUIPMENT**



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SPECIFICATION FOR ENCLOSURE FOR MEASURING AND PROTECTION EQUIPMENT

1.0 SCOPE

This Specification covers the Design, Manufacture and Testing and delivery of Enclosure for Measuring and Protection Equipment.

2.0 SYSTEM PARAMETERS

(a)	Nominal voltage	230/400 V
(b)	System highest voltage	240/440 V
(c)	System frequency	50 Hz
(d)	Method of earthing	Effectively earthed Neutral at Substation
(e)	System faults level	25 kA

3.0 SERVICE CONDITIONS

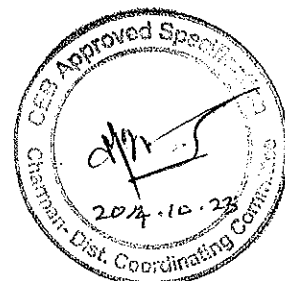
(a)	Annual average ambient temperature	30 °C
(b)	Maximum ambient temperature	40 °C
(c)	Maximum relative humidity	90%
(d)	Environmental conditions	Humid tropical climate with polluted atmosphere
(e)	Operational altitude	From M.S.L. to 1900 m above M.S.L.
(f)	Isokeruanic (Thunder days) level	100 days

4.0 APPLICABLE STANDARDS

The equipment and components supplied shall be in accordance with the latest editions of the standards specified below and amendments thereof.

(a)	ISO 62	Plastics — Determination of water absorption
(b)	ISO 75-1	Plastics — Determination of temperature of deflection under load — Part 1: General test method
(c)	ISO 75-2	Plastics — Determination of temperature of deflection under load — Part 2: Plastics and ebonite
(d)	ISO 180	Plastics — Determination of Izod impact strength
(e)	ISO 4582	Plastics — Determination of changes in colour and variations in properties after exposure to daylight under glass, natural weathering or laboratory light sources
(f)	ISO 4611	Plastics — Determination of the effects of exposure to damp heat, water spray and salt mist
(g)	ISO 9773	Plastics — Determination of burning behaviour of thin flexible vertical specimens in contact with a small-flame ignition source
(h)	IEC 60529	Degrees of protection provided by enclosures (IP Code)

The requirement stated in CEB specification supersedes the requirements in the above standards.



5.0. BASIC FEATURES

The dimensions of the (Enclosure) hole positions and number of holes shall be as indicated in the Drawing No. DS&S/2014/038.

The Enclosure shall be made of Poly Carbonate material. It shall be of Injection moulded construction and shall conform to the standards stipulated in Clause 4.0 above.

The material of the Enclosure shall be UV protected and fire retardant. It shall withstand ultra violet radiation to prevent the deterioration of the material due to direct sunlight and natural weathering.

The Enclosure shall carry the following main features.

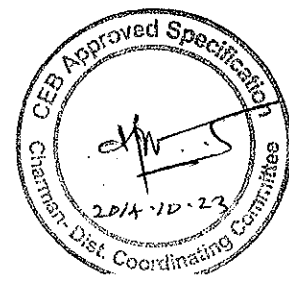
- i. 'DIN' Rail which is moulded and integrated with the base for the purpose of fixing a Miniature Circuit Breaker (MCB) (Ref. Cl. 5.1.1.e)
- ii. A slit shall be provided for the purpose of operating the MCB with a Spring Loaded Rectangular Shutter to cover the slit to prevent ingress of moisture and dust. Hinge of the Spring Loaded Shutter shall be of tamper proof type.
- iii. Sealing arrangement shall be provided to seal the cover to the base and the Spring Loaded Shutter with rotary type synthetic seals.

5.1 Design

The Enclosure shall have a base and a cover, moulded separately and assembled to form a complete Unit. The design shall conform to this specification and to the Drawing No. DS&S/2014/038.

5.1.1 Base

- a) The base of the Enclosure shall be of injection moulded construction and the dimensions shall be as indicated in the Drawing No. DS&S/2014/038. It shall have a uniform thickness not less than 3 mm except for reinforced area where the thickness shall not be less than 6mm.
- b) The base shall be strong enough to carry equipment of weight 2.0 kg max. without deformation during its life span. Reinforcement ribs as specified in the drawing shall be provided to strengthen the base.
- c) Three holes of 6mm diameter (indicated as B₁, B₂, B₃ in the drawing) with counter sunk, shall be provided for mounting the base to the wall with screws. Suitable spacers shall be unit moulded with the base at the mounting hole area to prevent any warping of base while tightening the base mounting screws.
- d) Three holes (indicated as M₁, M₂, M₃ in the diagram) shall be provided in the base to fix the metering equipment. As a reinforcement measure the thickness of the base around these holes are shall be increased to not less than 6mm as indicated in the Drawing No. DS&S/2014/038 to withstand the weight of the equipment without warping or causing any damage to the base.
- e) For the purpose of fixing the Miniature Circuit Breaker (MCB) to the base, a DIN RAIL moulded and integrated with the base shall be provided. The DIN RAIL shall be a strong fabrication that withstands the force applied to reset the MCB. Length of the "DIN RAIL" shall be sufficient to fix an MCB.
- f) A hole shall be provided on the base to accommodate Snap Fitting Pin as described in Clause 5.1.2.e



5.1.2 Cover

- a) The cover shall be of injection moulded construction made out of clear poly carbonate material with a translucent finish. Reinforcement ribs as shown in the Drawing No. DS&S/2014/038 shall be provided to strengthen the Cover. The cover shall have a uniform thickness not less than 2.5mm except for reinforced area.
- b) A transparent area for viewing the dial shall be provided. The position of this transparent area shall be as per the Drawing No. DS&S/2014/038.
- c) When closing, the cover shall firmly locked into a snap fitting mechanism provided in the base.
- d) The cover shall be provided with a rectangular opening and spring loaded shutter which when opened shall make it possible to operate the Miniature Circuit Breaker (MCB) through the open slit. When closed it shall be possible to lock the Spring Loaded Shutter to the cover with a rotary type synthetic seal.
- e) Snap Fitting Pin on the cover and an appropriate hole on the base shall be provided to fix the cover to the base in the closed position.

5.1.3 Enclosure Assembly

The cover shall be fixed to the base at a minimum of two hinged points. Hinged Mechanisms separately fabricated and fixed to the base/cover shall not be accepted. Once assembled the cover to the base, the hinges shall not be able to be removed without damaging it, permitting no access to unauthorized persons.

An arrangement shall be provided to seal the cover to the base (with a rotary type synthetic seal) so as to prevent access to the equipment to any unauthorized persons.

Enclosure shall have IP 53 rating or higher complying with IEC 60529.

5.1.4 Finish

The Enclosure shall be of sturdy construction, perfect alignment and of high quality workmanship.

There shall be no imperfection such as cracks, blisters, bubbles, stains voids & foreign matter etc. and corners shall be rounded without any sharp edges.

The Enclosure shall not be applied with any paint and shall have a smooth surface and good finish to provide a pleasing appearance.

5.1.5 Colour

The base of the enclosure shall be beige in colour. The cover shall be of translucent finish with a clear area for viewing the meter dial as specified in the Drawing No. DS&S/2014/038.

6.0 TECHNICAL REQUIREMENT

The enclosure and enclosure material shall accomplish the following technical requirements

- a) Minimum Izod Impact Strength of Enclosure in accordance with ISO 180 (ISO 180/A) shall be 60 kJ/m².
- b) Flammability Category of Enclosure Material in accordance with ISO 9773 shall be VTM2 or better.



- c) Maximum Water Absorption of Enclosure Material in accordance with ISO 62 shall be 0.2%.
- d) Heat Distortion Temperature of Enclosure Material in accordance with ISO 75-1,2 shall be greater than 85°C.
- e) UV Resistance as a measure of Change of appearance shall conform to the requirements of ISO 4582.

7.0 TESTS

7.1 Type Test

Following Type Test Certificates shall be provided with the offer.

- a) Izod impact strength test (ISO 180/A) as per ISO 180
- b) Determination of burning behaviour of thin flexible vertical specimens in contact with a small-flame ignition source as per ISO 9773
- c) Determination of water absorption as per ISO 62
- d) Determination of temperature of deflection under load as per ISO 75-1,2
- e) Determination of changes in colour and variations in properties after exposure to daylight under glass, natural weathering or laboratory light sources as per ISO 4582

Test certificates referred to shall be from an **accredited independent testing laboratory acceptable to the purchaser**. Proof of accreditation by a national/ international authority shall be forwarded with the offer. Test reports shall be complete including all the pages as issued by the testing authority. Parts of test reports shall not be acceptable.

7.2 Routine Test

Routine Tests report shall be furnished for the observation of the inspector appointed by the purchaser at the time of inspection.

- (a) External visual inspection for functionality, dimensions and finish of the product.

8.0 QUALITY ASSURANCE

The manufacturer shall possess ISO 9001:2008 Quality Assurance Certification valid throughout the delivery period of this bid, for the manufacture of Plastic Meter Enclosures for the plant where the Plastic Meter Enclosures are being manufactured. The Bidder shall furnish a copy of the ISO certificate certified as true copy of the original by the manufacturer, along with the offer.

9.0 OTHER MANDATORY REQUIREMENTS

9.1 Marking

Each Meter Enclosure shall be clearly marked with the following particulars.

- a) The mark "CEB"
- b) Manufacturer's identification mark
- c) Year of manufacture
- d) Batch identification number (It is preferred to have not more than 100 in one batch)

These markings shall be engraved on the box with letters of height 4–5mm.



9.2 Packing and Delivery

The Enclosures shall be supplied in sound, clean and dry condition and shall be individually packed in a suitable box to prevent any damage which could occur in handling and transportation.

Pre-delivery certificate from an Independent Testing Agency shall be provided conforming that the enclosure fully complies with CEB Specification in respect of the material used, required features and workmanship. Identification details such as Description of the Item, Name of the Manufacturer, Year of Manufacture and Batch Number of the test specimen shall clearly be indicated in the test report.

The full details of the Testing Agency shall be given along with the offer

10.0 SAMPLE

10.1 Material Sample

Samples of clear and transparent poly-carbonate material (of size at least 6" x 6") shall be submitted along with the offer.

10.2 Prototype Sample

Bidders shall also furnish a sample made using 'Acrylic' material as per the Drawing No. DS&S/2014/038, including all the required features and with sufficient strength to install the meter as done with the actual meter enclosure.

This prototype sample shall also be submitted in addition to the material sample along with the offer.

If the samples stated in Clause 10.1 & 10.2 are not furnished, the offer shall be rejected.

10.3 Product Sample

Successful Bidder shall provide a sample meter enclosure as per the Specification and obtain the approval of the purchaser before he commences the mass production under the order.

If the product sample is satisfactory and acceptable the purchaser, he shall intimate the bidder to commence the production.

The Bidder shall commence mass production **only** if the purchaser inform him to do so after satisfied with the product sample submitted by the bidder.

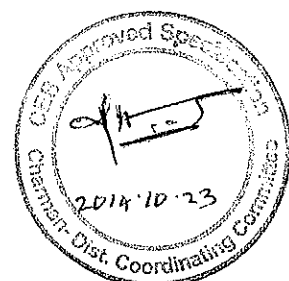
11 INSPECTION & TESTING

During manufacture or delivery to purchaser's stores, the purchaser retains the right to inspect the goods (enclosures) and perform quality checks on the material and finished goods (enclosures) to determine their conformity to the specification (External visual inspection for functionality, dimensions and finish of the product).

12 MANUFACTURING EXPERIENCE

The manufacturer shall have at least 05 years of experience in injection moulding type fabrications and documentary proof shall be submitted in this regard.

It shall be clearly stated the Items sold, name of the purchaser, quantity sold, year of sale.



13 INFORMATION TO BE SUPPLIED WITH THE OFFER

The following shall be furnished with the offer.

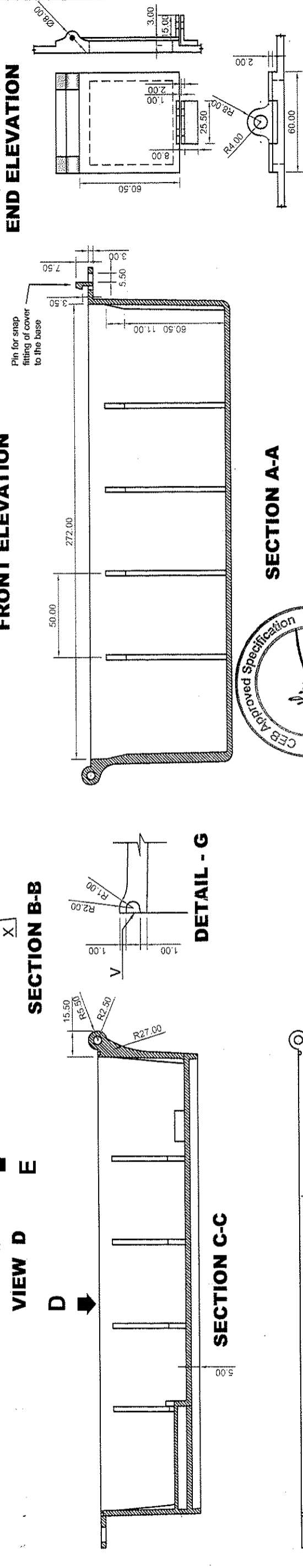
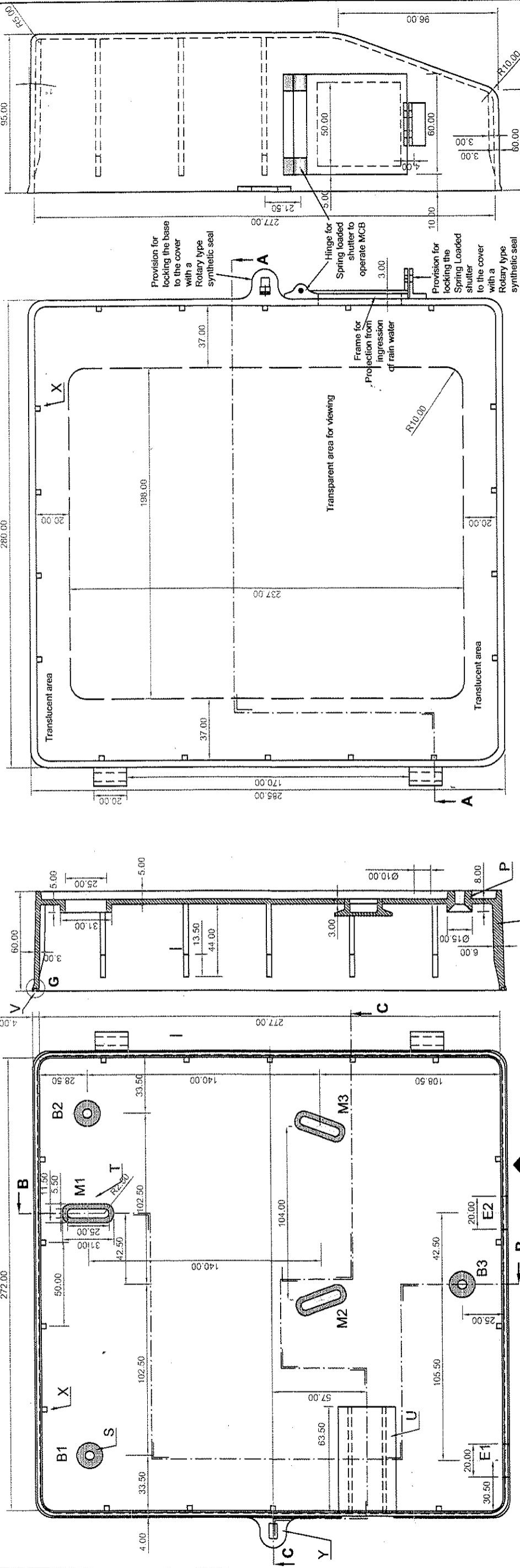
- (a) Construction features and relevant technical literature (materials used for components, Details of hinges and sealing arrangement, mechanical strength, weight, electrical characteristics and etc.)
- (b) Complete Dimensional Drawings
- (c) Duly filled schedule of particulars (Annex A)
- (d) Proof for manufacturing experience in accordance with clause 12.
- (e) Type Test certificates in accordance with clause 7.1.
- (f) ISO 9001:2008 quality assurance certification

Failure to furnish the above information and sample as per clause 10.0 will result in the offer being rejected.

14.0 ANNEX

- Annex A - Drawing No DS&S/2014/38
- Annex B - Guaranteed Schedule of Particulars,





SPRING LOADED SHUTTER

COVER

SECTION A-A

SECTION B-B

SECTION C-C

DETAIL - G

VIEW D

VIEW E

BASE

SCALE : 1 : 2.5
DRAWN : LALANI
DATE : Sep., 2014
DRG. NO : DS&S/2014/038
CAD NO :

DISTRIBUTION STANDARDS & SPECIFICATION
ENCLOSURE FOR MEASURING & PROTECTION EQUIPMENT
DESIGNED BY
APPROVED BY
CHAIRMAN, SPECIFICATION COMMITTEE

CEYLON ELECTRICITY BOARD
RE PROJECTS & PROC. BRANCH

DESIGNED BY
APPROVED BY
CHAIRMAN, SPECIFICATION COMMITTEE

REINFORCED SPACES TO FIX THE BASE TO THE WALL
SLOTTED AND REINFORCED SPACES FOR FIXING THE NECESSARY EQUIPMENT
UNIT MOULDED DIN RAILING FOR MCB
GROOVE FOR RUBBER STRIP TO AVOID WATER SEEPAGE TO THE BOX
REINFORCEMENT RIBS (FOR THE COVER & THE BASE)
PROVISION FOR LOCKING THE BASE TO THE COVER WITH A ROTARY TYPE SYNTHETIC SEALING



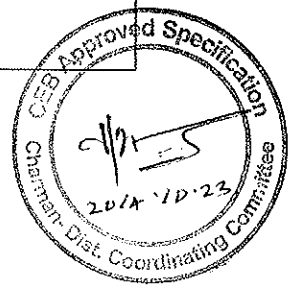
- M1, M2, M3 - Slotted holes of 5.5mm x 25mm
- B1, B2, B3 - Base fixing holes 5.5mm Ø
- E1, E2 - Slots 20mm x 15mm (for wire terminals)

S Reinforced spaces to fix the base to the wall
T Slotted and reinforced spaces for fixing the necessary equipment
U Unit Moulded DIN railing for MCB
V Groove for rubber strip to avoid water seepage to the box
X Reinforcement ribs (for the Cover & the Base)
Y Provision for locking the base to the cover with a Rotary type synthetic sealing

SCHEDULE OF PARTICULARS

(Following Information shall be furnished with the offer)

1.	Applicable Standards	
2.	Manufacturer's name	
3.	Country of origin	
4.	Model no.	
5.	Material	
	(i) Impact Resistance (notched ISO 180/A)	kJ/m ²
	(ii) Heat Distortion Temperature	°C
	(iii) Water Absorption % (max.)	
	(vi) Ultraviolet Radiation Protection in accordance with ISO 4582	
	(v) Flammability Category in accordance with ISO 9773	
6.	Whether the Enclosure is injection moulded type?	Yes/No
7.	Base	
	(i) Material	
	(ii) Type of construction	
	(iii) Colour	
	(iv) Minimum Thickness	
	(v) Minimum thickness at reinforced area	
	(vi) maximum weight that could be carried without deformation	kg
	(vii) Whether the mounting holes provided with the spacers?	Yes/No
	(viii) Whether the Snap Fitting Pin provided ?	Yes/No
	(ix) Whether the "DIN RAIL" is moulded integrally with the base?	Yes/No
	(x) Whether necessary holes are provided as indicated in the Drawing No DS&S/2014/038 ?	Yes/No
	(xi) Whether required reinforcement provided to prevent warping?	Yes/No
8.	Cover	
	(i) Material	
	(ii) Type of Construction	
	(iii) Colour	
	(iv) Minimum thickness	mm
	(v) Whether the reinforcement ribs as per Drawing No. DS&S/2014/038 is provided?	Yes/No
	(vi) Whether the transparent area is as per Drawing No. DS&S/2014/038?	Yes/No
	(vii) Whether the cover is provided with rectangle opening with sliding shutter to operate MCB?	Yes/No
	(viii) Whether the provision to lock the spring loaded shutter to the cover provided	Yes/No
9.	Whether the arrangement to seal the cover with the base is provided?	Yes/No



10.	Whether the hinging mechanism is unitary moulded or separate? Yes/No	
11.	Marking	
	(i)Method of Marking	
	(ii)Height of letters	
	(iii)Particulars of marking	
12	Indicate the details of testing agency who will provide the pre delivery certificate (as per Clause 9.2)	
13	Whether the manufacture has minimum of 5 years experience in injection moulding type fabrications? Yes/No	
14	Whether documentary proof for the same is furnished? Yes/No	
15	Whether the material sample as per Clause 10.1 is furnished? Yes/No	
16	Whether the proto type sample as per clause 10.2 is furnished? Yes/No	
17	Whether inspection and testing as per clause 11.0 is acceptable? Yes/No	

.....
Signature of the Manufacturer and seal
(Bidder shall certify this through Manufacture)

.....
Date

