42-SDMS-01A

REV. 2.3

SPECIFICATION

FOR

METERBOX WITH STEEL ENCLOSURES

Prepared by:

EDILFREDO R. TARENIO

Engineering Services Division

Recommended by:

MUSAB M. AL-BURIKAN

Division Manager
Material Submission Analysis Division

Reviewed by:

MOHAMMED A. AL-NADHARY

Engineering Development Department

Approved by:

ABDULAZIZ A. AL-IBRAHIM

Department Manager
Distribution Contracts & Qualification Department

42-SDMS-01A

REV. 2.3

SPECIFICATION

FOR

METERBOX WITH STEEL ENCLOSURES

Revision History

#	Date	Revision No.	Major Revision Description
1	17-01-2023	0	1st Published Edition (Prepared By: Edilfredo R. Tarenio)
2	12-04-2023	1	ERT: Updated all drawings
3	15-08-2023	2	ERT: - Unify enclosure material to stainless steel grade 304. - Add double meterbox details and drawings.
4	20-11-2023	2.1	ERT: - Change enclosure material from stainless steel (grade 304) to Aluzinc - Updated incoming terminal block for double meterbox
5	15-09-2024	2.2	ERT: This version replaces revision 2.1 with the following notes: - Change enclosure material to galvanized steel sheets (GI) G90 - Specify paint system corrosivity category to C5 (Durability: Very High) - Delete grey finish color combinations - Provision for arc-flash & shock hazard warning plate - Provision for maintenance info ID tags - Provision for the source/consumer ID tags - Provision for anti-tampering warning sign - Provision for lifting facility for double meterbox - Provision for busbar (standoff) insulator as mounting support/footing for mounting rails and plates - Add detail of the top inner door camlock (key-operated locking mechanism) for padlocking provision - Add one extra set of wall-mounting brackets for the double meterbox - Provision for the gasket for the main door - Provision for terminal blocks mounting screw covers/insulating barriers

			- Provision to add bakelite (insulation boards) at the lateral sides inside the enclosures - Drawing updates
6	23-09-2024	2.3	ERT: This version replaces revision 2.2 with the following notes: - Provision for 200/250A CT meterbox - Provision for 300/400A CT meterbox - Provision for 500/600A CT meterbox - Provision for remote meterbox - Provision for window-type CTs for CT meterboxes - Provision for test terminal blocks for CT meterboxes - Provision for CT meterboxes CT metering wires/connections - Provision to add the recommendations from Network Planning Department, i.e.: a. For customers requiring 400A CT meterbox, the outgoing cable shall be 1 x 4C x 240 mm^2 copper cable. b. For customers requiring 500A CT meterbox, the outgoing cable shall be 2 x 4C x 185 mm^2 copper cables. c. For customer requiring 600A CT meterbox, the outgoing cables shall be 2 x 4C x 240 mm^2 copper cables. - Provision to verify tin-coating thickness to applicable parts/components using x-ray spectrometry in routine tests. - Drawing updates

Table of Contents

1 SCOPE

This specification defines the minimum technical requirements for the design, engineering, fabrication, testing, inspection, and performance of meterbox with steel enclosures including all its components designed for outdoor installations, intended to be used in the distribution system of Saudi Electricity Company (SEC) in Saudi Arabia.

2 CROSS REFERENCES

This specification shall always be read in conjunction with the latest revisions of the following SEC specifications which shall be considered as an integral part of this specification.

It shall also be read in conjunction with SEC purchase order and/or contract schedules and scope of work/technical specifications for projects, as applicable.

Specification	Title
01-SDMS-01	General Requirements for all Equipment/Materials
11-SDMS-05	Specification for Control Cables Links with Terminal Lugs for ECB & Smart Meter
12-SDMS-02	Specification for Lugs and Connectors for Low-Voltage and Medium-Voltage Distribution System
37-SDMS-01	Specification for Low-Voltage Molded Case Circuit Breaker for Service Connections
37-SDMS-05	Specification for External Circuit Breaker
40-SDMS-01	Specification for Bottom Connected Kilo-Watthour Meters
40-SDMS-02A	Specification for Electronic Revenue CT and CT-VT Meters
40-SDMS-02B	Specification for Electronic Revenue Whole-Current Meter
42-SDMS-01	Specification for Fiberglass Reinforced Polyester Meterboxes
50-SDMS-01	Specification for Current Transformers Rated up to 36kV

Table 1: Applicable SEC specifications.

3 APPLICABLE CODES AND STANDARDS

The latest versions of the following codes and standards shall be applicable for the equipment/materials covered in this specification. In case of any deviation, the vendor/manufacturer may propose equipment/materials conforming to alternate codes or standards subject to review and acceptance by SEC. However, the provisions of SEC standards shall supersede the provisions of these alternate standards in case of any difference.

IEC	International Electro-technical Commission
IEC 60529	Degrees of Protection Provided by Enclosures (IP Code)
IEC 60695-11-10	Fire Hazard Testing – Part 11-10: Test Flames – 50 W Horizontal and Vertical Flame Test Methods
IEC 60947-1	Low-Voltage Switchgear and Controlgear - Part 1: General Rules
IEC 60947-2	Low-Voltage Switchgear and Controlgear – Part 2: Circuit-Breakers
IEC 61439-1	Low Voltage Switchgear and Controlgear Assemblies – Part 1: General Rules
IEC 61439-2	Low Voltage Switchgear and Controlgear Assemblies – Part 2: Power Switchgear and Controlgear Assemblies
IEC 61439-5	Low Voltage Switchgear and Controlgear Assemblies – Part 5: Assemblies for Power Distribution in Public Networks

Table 2: Applicable Codes and standards (IEC).

ASTM	American Society for Testing and Materials
ASTM A90/A90M	Standard Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings
ASTM A370	Standard Test Methods and Definitions for Mechanical Testing of Steel Products
ASTM A568/A568M	Standard Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for
ASTM A653/A653M	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

ASTM	American Society for Testing and Materials
ASTM A902	Standard Terminology Relating to Metallic Coated Steel Products
ASTM A924/A924M	Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
ASTM A1122/A1122M	Standard Test Method for Bend Testing of Metallic-Coated Steel Sheet to Evaluate Coating Adhesion
ASTM B6	Standard Specification for Zinc
ASTM B852	Standard Specification for Continuous Galvanizing Grade CGG Zinc Alloys for Hot-Dip Galvanizing of Sheet Steel
ASTM B117	Standard Practice for Operating Salt-Spray (Fog) Apparatus
ASTM B221	Standard Specification for Aluminum Alloy Extruded Bus
ASTM B236M	Standard Specification for Aluminum Bars for Electrical Purposes (Bus Bars) (Metric)
ASTM B317	Standard Specification for Aluminum Bars for Electrical Purposes (Bus Bars)
ASTM B545	Standard Specification for Electrodeposited Coatings of Tin
ASTM D1535	Standard Practice for Specifying Color by the Munsell System
ASTM D1654	Standard Test Methods for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
ASTM D3359	Standard Test Methods for Measuring Adhesion by Tape Test
ASTM D7396	Standard Guide for Preparation of New, Continuous Zinc-Coated (Galvanized) Steel Surfaces for Painting
ASTM E353	Standard Test Method for Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys
ASTM E517	Standard Test Method for Plastic Strain Ratio *r* for Sheet Metal
ASTM E646	Standard Test Method for Tensile Strain-Hardening Exponents (*n*-Values) of Metallic Sheet Materials
ASTM E1086	Standard Test Method for Optical Emission Vacuum Spectrometric Analysis of Stainless Steel by the Point-to-Plane Excitation Technique

Table 3: Applicable Codes and standards (ASTM)

ISO	The International Organization for Standardization
ISO 12944	Paints and Varnishes – Corrosion Protection of Steel Structures by Protective Paint Systems – (All Parts)
ISO 4628	Paints and Varnishes – Evaluation of Degradation of Coatings – Designation of Quantity and Size Defects, and of Intensity of Uniform Changes in Appearance – (All Parts)
ISO 8501-3	Preparation of Steel Substrates Before Application of Paints and Related Products – Visual Assessment of Surface Cleanliness – Part 3: Preparation Grades of Welds, Edges, and Other Areas with Surface Imperfections
ISO 8504	Preparation of Steel Substrates Before Application of Paints and Related Products – Surface Preparation Methods – (All Parts)
ISO 16276	Corrosion Protection of Steel Structures by Protective Paint Systems – Assessment of, and Acceptance Criteria for, the Adhesion/Cohesion (Fracture Strength) of a Coating – (All Parts)
ISO 16474-2	Paints and Varnishes – Methods of Exposure to Laboratory Light Sources – Part 2: Xenon-Arc Lamps
ISO 1513	Paints and Varnishes – Examination and Preparation of Test Samples
ISO 2409	Paints and Varnishes – Cross-cut Test
ISO 2808	Paints and Varnishes – Determination of Film Thickness
ISO 2812-2	Paints and Varnishes – Determination of Resistance to Liquids – Part 2: Water Immersion Method
ISO 3270	Paints and Varnishes and Their Raw Materials – Temperatures and Humidities for Conditioning and Testing
ISO 4624	Paints and Varnishes – Pull-Off Test for Adhesion
ISO 6270-1	Paints and Varnishes – Determination of Resistance to Humidity – Part 1: Condensation (Single-Sided Exposure)
ISO 6506-1	Metallic Materials – Brinell Hardness Test – Part 1: Test Method
ISO 7384	Corrosion Tests in Artificial Atmosphere – General Requirements
ISO 9227	Corrosion Tests in Artificial Atmosphere – Salt Spray Tests
ISO15528	Paints, Varnishes, ad Raw Materials for Paints and Varnishes - Sampling

Table 4: Applicable Codes and standards (ISO)

4 SERVICE CONDITIONS

The meterboxes with steel enclosure shall be suitable for outdoor operation under the service conditions specified in the latest revision of SEC specification 01-SDMS-01. The meterbox with all its respective components, fittings, and attachments shall withstand the effects of direct solar radiation at their installed locations. The temperature of exposed surfaces shall be regarded as 75°C plus the effects of internal heating.

5 DESIGN AND CONSTRUCTION REQUIREMENTS

5.1 General

The meterboxes with steel enclosure and all its components shall meet applicable electrical and environmental requirements of low-voltage systems for outdoor applications stipulated in the latest version of SEC specification 01-SDMS-01.

5.1.1 It shall meet or exceed the requirements of this specification in all respects and shall be manufactured in conformance with international standards and best engineering practices.

5.1.2 All cable terminations shall be accessible from the front and have sufficient workspace for technicians to use applicable tools to prepare and maneuver the cables for termination.

5.1.3 All metallic parts like fasteners, fittings, and components of the enclosure shall be stainless-steel of grade 304.

5.1.4 All tin-coated current-carrying parts of the electrical parts/components shall be of bright tin-electroplated having an overall average coating thickness between 15µm to 20µm and has very smooth surface finish. Coating thickness at any point shall not be less than 15µm.

5.1.5 The design of the meterboxes with steel enclosure shall ensure that all electrical conducting parts/components are sufficiently insulated and have safe clearance with non-current carrying metallic parts of the enclosure at any point.

5.1.6 Any clarifications with the requirements of this specification shall be addressed to SEC authorized technical representatives. Suppliers/manufacturers may be allowed propose alternatives but are not authorized to make their own interpretations of any requirements stipulated in this specification.

5.2 Enclosure

5.2.1 The meterboxes enclosure shall be made of galvanized steel sheet (GI) with G90 coating designation as per ASTM A653/A653M with minimum thickness of 1.5 mm. It is mandatory that it should be sourced locally.

5.2.2 The main enclosures of the meterboxes shall be fabricated from a single-piece steel sheet.

5.2.3 The summary of schedules of meterboxes with steel enclosures are shown below:

Enclosure Type	No. & Type of Meter	Meter Circuit-Breaker Rating	No. & Max Size of SEC (Incoming) Cables	Meterbox Continues Current Rating	Internal Wiring
Single Meterbox	1 x Whole-Current Meter	Rated up to 150 A	2 x 4C x 70 mm^2 AL	200 A	35 mm^2 CU
Double Meterbox	2 x Whole-Current Meters	Each rated up to 150 A	2 x 4C x 300 mm^2 AL	400 A	35 mm^2 CU
200/250A CT Meterbox	1 x CT Meter	Rated up to 250 A	1 x 4C x 300 mm^2 AL + 1 x 4C x 185 mm^2 AL	400 A	120 mm^2 CU + 2.5 mm^2 CU (Single Strand)
300/400A CT Meterbox	1 x CT Meter	Rated up to 400 A	1 x 4C x 300 mm^2 AL + 1 x 4C x 185 mm^2 AL	400 A	185 mm^2 CU + 2.5 mm^2 CU (Single Strand)
500/600A CT Meterbox	1 x CT Meter	Rated up to 600 A	2 x 4C x 300 mm^2 AL	600 A	240 mm^2 CU + 2.5 mm^2 CU (Single Strand)
Remote Meterbox	1 x CT Meter	(CB is in the Service Cabinet)	1 x 12C x 2.5 mm^2 CU (Single Strand)	5 A	2.5 mm^2 CU (Single Strand)

Table 5: Schedules of meterboxes with steel enclosures.

5.2.4 The meterboxes enclosure shall be designed for both semi-flush mounting and direct wall-mounting. It shall be weather-proof with IP54 degree of protection.

5.2.5 It must allow adequate ventilation by natural air circulation through louvers on the sides and on the removable bottom section. Ventilation shall be screened to prevent entry of vermin and foreign bodies. Screen material shall be stainless-steel guaranteed to last with the lifetime of the meterbox.

5.2.6 Lifting facilities shall be provided with the meterboxes, except for the single and remote meterboxes.

The lifting facility shall be fit for M10 eyebolts *(as removable lifting lug)* and shall be provided with silicone rubber plugs. It shall be supported by a stainless-steel cylindrical rod with M10 threaded hole and is full welded on the enclosures to prevent ingress through it. Details of the stainless-steel cylindrical rod lifting support are provided in *Drawing No. 17.0.*

The M10 eyebolts are not included in the scope of supply of this specification.

5.2.7 The enclosure main door shall be provided with heavy-duty stainless-steel butterfly-type spring-return (self-closing) hinge with M6 welded stud fasteners as illustrated in *Drawing No. 16.0*.

The welded stud fasteners of the hinges shall be precision mounted onto dedicated holes in the enclosures and main door, then secured using nylon-insert (self-locking) hexagonal lock nuts.

Lengths of the studs shall be sized such that a maximum of 2.0 mm extra thread length is exposed when the locknuts are fully tightened.

The hinges shall be provided with a hinge cover which is removable only from the inside, as shown in the drawings.

5.2.8 Facility to detach the enclosure main door shall be made available only from the inside.

5.2.9 The enclosure main door shall be equipped with full-frame stiffeners or minimum 15.0 mm hemming on all sides to add rigidity.

5.2.10 The enclosure main door shall be gasketed to prevent ingress. It shall be of Formed-In-Place-Foam-Gasket (FIPFG).

5.2.11 The enclosure main door shall be provided with heavy-duty mirror finish spring-loaded pull-out door lock with welded stud fasteners. Rubber gasket shall be provided to prevent water ingress.

5.2.12 The enclosure main door shall be openable up to 120° open position with stainless-steel locking elbow-type door-stopper as shown in the drawings.

5.2.13 ID tags shall be supplied as loose accessories. The sizes of the ID tags are as follows:

a. Source/consumer ID tag size: 150.0 $mm_{(length)}$ x 70.0 $mm_{(height)}$ x 3.2 $mm_{(thickness)}$ x 8.0 $mm_{(corner\ radius)}$ with 2 x 4.0 mm∅ mounting holes.

b. Maintenance info ID tag size: 150.0 $mm_{(length)}$ x 100.0 $mm_{(height)}$ x 3.2 $mm_{(thickness)}$ x 10.0 $mm_{(corner\ radius)}$ with 2 x 4.0 mm∅ mounting holes.

5.2.13.1 For single, 200/250A CT, 300/400A CT, 500/600A CT, and remote meterboxes:

a. 1-piece source/consumer ID tag with 2-pieces 3.0 mm∅ x 12.0 $mm_{(length)}$ stainless-steel blind rivets shall be provided.

b. 1-piece maintenance info ID tag with 2-pieces 3.0 mm∅ x 12.0 mm(length) stainless-steel blind rivets shall be provided.

5.2.13.2 For double meterbox:

a. 2-piece source/consumer ID tags with 4-pieces M3 x 12.0 mm(length) stainless-steel blind rivets shall be provided.

b. 1-piece maintenance info ID tag with 2-pieces 3.0 mm∅ x 12.0 mm(length) stainless-steel blind rivets shall be provided.

The dedicated holes for mounting the source/consumer ID tags in front of the main door shall be provided with silicone rubber plugs.

The dedicated holes for mounting the maintenance info ID tag in front of the inner door are shown in each meterbox respective drawings, silicone rubber plugs are not required.

5.2.14 The maintenance info and source/consumer ID tags shall be a 2-ply acrylic based material. The cap (top surface) is laser engravable with authentic brushed metallic finish *(samples shall be submitted to SEC for selection and approval)*. It shall be UV-resistant, and suitable for outdoor use. Engraving depth shall be 0.08 mm.

ID tags finish: Cap is Brushed Stainless Steel, Base is Black.

It shall be supplied pre-cut to specified dimensions using laser or saw cutting method and shall be provided with a removable clear protective film on the cap to prevent nicks and scratches.

5.2.15 At the back of the enclosure main door, a 10.0 mm thermal insulation board shall be provided sandwiched between the main door and 1.0 mm thick aluminum plate.

The paint finish of the aluminum plate shall be the same as the main door.

The thermal insulation board shall be manufactured from polyisocyanurate foam, covered on both sides by craft paper and aluminum foil. It shall be non-flammable with a thermal conductivity of 0.0189 W/m·K.

5.2.16 An arc-flash & shock hazard warning plate as specified in latest version of SEC specification *SEC-04-01*, and the manufacturer's nameplate shall be positioned at the back of the main door, as shown in the drawings.

5.2.17 The inside of the meterbox enclosure (front, left-side and right-side) shall be covered by a 1.0 mm thick bakelite insulation sheet.

5.2.18 The single and double meterboxes shall have 2 inner doors. The top inner door shall provide covering to the smart meter, circuit breaker, and the incoming (SEC) terminal block assembly. While the bottom inner door covers the outgoing (consumer) terminal block assembly.

The inner doors shall be removable provided with stainless-steel spring-loaded pin and pivot hinges, secured using stainless-steel camlocks.

The top inner door camlock shall be provided with a padlocking provision key-operated cylindrical head, while the bottom inner door camlock shall be provided with a wing-type head without locking provision.

Details of the internal locking mechanism of the top inner door camlock are provided in *Drawing No. 19.0.*

The top inner door shall be provided with a 154 mm x 75 mm sight window for the smart meter. The sight window shall have a 6.0 mm thick clear tempered glass fixed either by using Formed-In-Place-Foam

adhesive or by folding-type frame insert at the back then caulked on the outer edges using a clear high-temp silicone sealant.

At the front of the top inner door, it shall be directly printed with anti-tampering warning sign and note as shown in the drawings.

5.2.19 The 200/250A CT, 300/400A CT, 500/600A CT, and remote meterboxes shall only have 1 inner door providing full coverage of all the internal parts of the enclosures.

It shall also be provided with smart meter viewing window and printed with an anti-tampering warning sign and note.

The inner door shall be made rigid, not easily removable, provided with heavy-duty stainless-steel hinges, and secured with camlocks with padlocking provisions, as illustrated in their respective drawings.

5.2.20 All meterbox enclosures shall be provided with a removable vermin-proof bottom to allow ease-of-installation on a semi wall-flushing on a wooden frame.

Details of the removable bottom are illustrated in the meterboxes respective drawings.

5.2.21 All meterbox enclosures shall be provided with M8 threaded blind nodes to support its structure for wall-mounting.

The single and remote meterboxes shall have 3 nodes, 1 on top (mid-section) and 2 on the bottom (left-and-right corners).

The double, 200/250A CT, 300/400A CT and 500/600A CT meterboxes shall have 6 nodes, 3 on top (left-mid-right) and 3 on the bottom (left-mid-right).

The blind nodes shall allow fastening of stainless-steel mounting brackets for use as a stand-off direct wall-mounting of the meterboxes.

A set of stainless-steel mounting brackets and fasteners shall be provided with each meterbox as loose accessories.

Details of blind nodes are provided in *Drawing No. 13.0.*

Details of top and bottom wall mounting brackets are provided in *Drawing No 14.0* and *Drawing No. 15.0*, respectively.

5.2.22 6 x 6.0 mm∅ mounting holes with snap-on silicone rubber plugs shall be provided on the free spaces at the lateral sides of the enclosure (3 on the left, 3 on the right). To facilitate securing the meterbox semi-flush mounted in a wall with wooden frame.

Also, 6 x M5 x 40.0 mm stainless-steel self-drilling screws shall be provided as loose accessories.

5.2.23 Range-taking cable clamps with rubber sleeves shall be provided on the bottom section inside the enclosure.

Cable clamps shall be round shape, and each cable shall be clamped individually.

5.2.24 All normally non-current-carrying metallic parts or components of the enclosure shall be effectively bonded (grounded) together.

5.2.25 The enclosure shall be equipped with adjustable mounting rails and plates to be able to accommodate various sizes of the smart-meters and circuit-breakers (MCCBs or ECBs).

Rails shall be provided with a sliding fastener (user adjustable, not free moving).

Mounting plates shall be provided with slotted mounting holes as shown in the drawings.

Rails and mounting-plates shall be of stainless steel with thickness of 1.0 mm and 2.0 mm, respectively.

Low-height busbar (standoff) insulators shall be used to isolate the rails and mounting plates to the enclosure. It must provide a strong base or footing for the rails and mounting plates. On the side facing the enclosure, a high-strength threadlocker (red color) shall be applied.

5.3 Power Terminal Blocks

All incoming and outgoing terminal blocks shall be manufactured and tested in conformance with IEC 60947-7-1 and shall be suitable for use with copper and aluminum cables.

The heads of the mounting screws of the terminal blocks shall be properly insulated using an adaptive plastic cover or an insulating barrier either applied individually to each terminal block or to the whole terminal block assembly.

The housing and top cover shall be made of PA66 with UL94-VO classification. Housing shall be color GREY or same with respective phases and the top cover shall be RED-YELLOW-BLUE-BLACK depending on the phase it shall be used to.

5.3.1 Terminal Blocks for Single Meterbox

5.3.1.1 Incoming (SEC) terminal blocks for single meterbox shall be rated up to 1000 volts with minimum current rating of 200 amperes, IP20 (Touch-proof), 4 x 1P (R-Y-B-N) each phase shall be separate and are suitable for DIN-rail and M5 screw mounting to hold it securely on a 2.0 mm stainless steel mounting plate as shown in *Drawing No. 1.7*. There shall be no gap between the terminal blocks and the mounting plate.

The connector body shall be bright tin-coated with an overall average thickness of 20.0 µm with M14 x 5.0 mm internal hex socket-head screws. The minimum tightening torque shall be 22.0 N·m.

Each terminal block must be able to hold up to 2 x 70 mm^2 aluminum cable on the incoming side (bottom), and 1 x 35 mm^2 copper cable on the outgoing side (top). Range-taking may be accepted provided it does not exceed the dimensional requirements presented in the drawings and with written approval from SEC authorized technical representative.

Physical and layout details are presented in the drawings.

5.3.1.2 Outgoing (Consumer) terminal blocks for single meterbox shall be the same as the incoming terminal blocks. There shall be 5 x 1P (R-Y-B-N + E) to include the earthing terminal. The earthing terminal housing and top cover shall be color GREEN as presented in the drawings. The whole terminal block assembly on a DIN rail shall be mounted on a mounting plate with details shown in *Drawing No. 1.12*. There shall be no gap between the terminal blocks and the mounting plate.

5.3.2 Terminal Blocks for Double Meterbox

5.3.2.1 Incoming (SEC) terminal blocks for double meterbox shall be a two-level cable entry on the incoming (bottom) side, the upper

level terminal screw shall be provided with a silicone rubber cap, and it shall be rated up to 1000 volts with nominal current rating of 400 amperes, IP20 (Touch-proof), 4 x 1P (R-Y-B-N) each phase shall be separate and are suitable for M6 screw mounting to hold it securely on a 2.0 mm stainless steel mounting plate as shown in *Drawing No. 2.7.*

The connectors shall be bright tin-coated with an overall average thickness of 20.0 µm with M24 x 10.0 mm internal hex socket-head screws. The minimum tightening torque shall be 55.0 N.m.

By default, each terminal block must be able to hold on the incoming (bottom) side lower-level cable entry, either 1x185 mm^2 or 1 x 300 mm^2 aluminum cable. The upper-level cable entry can hold 1 x 70mm^2 aluminum cable, but it can also accommodate either 1 x 185 mm^2 or 1 x 300 mm^2 aluminum cable by removing the terminal spacer screwed on the sleeve connector of the terminal as shown in *Drawing No. 2.7.*

The outgoing (top) side of the terminal block shall be able to hold 2 x 35 mm^2 copper cable with M10 internal 5.0 mm hex socket-head screws.

Physical and layout details are presented in the drawings.

5.3.2.2 Outgoing (Consumer) terminal blocks for double meterbox shall be the same as the outgoing terminal block of single meterbox as mentioned in clause 5.3.1.2.

5.3.3 Terminal Blocks for 200/250A CT Meterbox

5.3.3.1 Incoming (SEC) terminal blocks for 200/250A CT meterbox shall be a two-level cable entry on the incoming (bottom) side, and it shall be rated up to 1000 volts with nominal current rating of 400 amperes, IP20 (Touch-proof), 4 x 1P (R-Y-B-N) each phase shall be separate and are suitable for M6 screw mounting to hold it securely on a 2.0 mm stainless steel mounting plate.

The connectors shall be bright tin-coated with an overall average thickness of 20.0 µm with M24 x 10.0 mm internal hex socket-head screws. The minimum tightening torque shall be 55.0 N.m.

By default, each terminal block must be able to hold on the incoming (bottom) side lower-level cable entry of up to 1 x 300 mm^2 aluminum cable. The upper-level cable entry can hold either 1 x 185 mm^2 or 1 x 300 mm^2 aluminum cables.

The outgoing (top) side of the terminal block shall be able to hold 1 x 120 mm^2 copper cable with M24 x 10.0 mm internal hex socket-head screws.

Physical and layout details of the terminal block assembly for 200/250A CT meterbox are presented in the drawings.

5.3.3.2 Outgoing (Consumer) terminal blocks for 200/250A CT meterbox shall be able to hold up to 1 x 4C x 120 mm^2 copper cable. It shall be designed with a continues current rating of up to 250 amperes. There shall be 5 x 1P (R-Y-B-N + E) to include the earthing terminal.

In addition, a dedicated entry slot for holding a 2.5 mm^2 copper single-strand CT metering wire shall be provided on the incoming (top) side of each terminal block.

5.3.4 Terminal Blocks for 300/400A CT Meterbox

5.3.4.1 No incoming (SEC) terminal blocks are needed for the 300/400A CT meterbox, as the incoming (SEC) cables size of up to 1 x 4C x 300 mm^2 + 1 x 4C x 185 mm^2 aluminum cables are directly terminated back-to-back at the terminal spreaders of the circuit-breakers using SEC standard terminal lugs.

However, a terminal block for the incoming (SEC) cable neutral wires shall be provided. The terminal block shall be a two-level cable entry on the incoming (bottom) side to fit the cable sizes mentioned above. The outgoing (top) side of the terminal block shall be able to hold up to 185 mm^2 copper cable.

5.3.4.2 Outgoing (Consumer) terminal blocks for 300/400A CT meterbox shall be able to hold up to 185 mm^2 copper cable on the incoming (top) side and 1 x 4C x 240 mm^2 copper cables on the outgoing (bottom) side.

In addition, a dedicated entry slot for holding a 2.5 mm^2 copper single-strand CT metering wire shall be provided on the incoming (top) side of each terminal block.

There shall be 5 x 1P (R-Y-B-N + E) to include the earthing terminal. The earthing terminal housing and top cover shall be color GREEN as presented in the drawings.

5.3.5 Terminal Blocks for 500/600A CT Meterbox

5.3.5.1 No incoming (SEC) terminal blocks are needed for the 500/600A CT meterbox, as the incoming (SEC) cables size of up to 2 x 4C x 300 mm^2 aluminum cables are directly terminated back-to-back at the terminal spreaders of the circuit-breakers using SEC standard terminal lugs.

However, a terminal block for the incoming (SEC) cable neutral wires shall be provided. The terminal block shall be a two-level cable entry on the incoming (bottom) side to fit the cable sizes mentioned above. The outgoing (top) side of the terminal block shall be able to hold up to 240 mm^2 copper cable.

5.3.5.2 Outgoing (Consumer) terminal blocks for 500/600A CT meterbox shall be able to hold up to 240 mm^2 copper cables on the incoming (top) side and up to 1 x 4C x 240 mm^2 copper cables on the outgoing (bottom) side.

For consumers with 500 ampere load requirements, outgoing (consumer) cable shall be 2 x 4C x 185 mm^2 copper.

For consumers with 600 ampere load requirements, outgoing (consumer) cable shall be 2 x 4C x 240 mm^2 copper.

In addition, a dedicated entry slot for holding a 2.5 mm^2 copper single-strand CT metering wire shall be provided on the incoming (top) side of each terminal block.

There shall be 5 x 1P (R-Y-B-N + E) to include the earthing terminal. The earthing terminal housing and top cover shall be color GREEN as presented in the drawings.

5.4 Test Terminal Blocks

5.4.1 The CT meterboxes and remote meterbox shall be equipped with test terminal blocks for current and voltage circuits.

5.4.2 It shall be pre-wired in the factory with proper wire markings and color-coded wires.

5.4.3 It shall consist of 12 terminal safety test devices for use with metering current transformers and voltage circuits.

There shall be 12 poles (3-voltages, 3-neutral, and 6-current) with test jack, current element shorting provision, voltage measuring and voltage disconnecting facilities without disturbing *(in and out of wires)* from this device.

Terminal arrangement shall be as shown in the respective drawings.

5.4.4 The wiring shall be of 2.5 mm^2 single-strand copper and shall be identified by colors and numbers.

5.4.5 The test terminal blocks shall be indelibly numbered from left to right as per the following:

Phases : 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10

Neutral : N

Earth : E

5.4.6 Color coding and numbering schemes (from left to right) of wires for CT meterboxes and remote meterbox shall be as shown in the tables below:

VOLTAGE CONNECTIONS

Phase	Color	Corresponding Number in the Testing Terminals
Phase A (1)	Red	2
Phase B (2)	Yellow	5
Phase C (3)	Blue	8
Neutral (N)	Black	10

Table 6: CT meterboxes and remote meterbox voltage connections color and numbering schemes.

CURRENT CONNECTIONS

Phase	Color	Corresponding Number in the Testing Terminals
Phase A (1)	Red	1 & 3
Phase B (2)	Yellow	4 & 6
Phase C (3)	Blue	7 & 9

Table 7: CT meterboxes and remote meterbox current connections color and numbering schemes.

5.4.7 The test terminal blocks shall have a continuous current rating of 5 amperes, nominal voltage of 1000V, degree of protection of IP20 (Touch-proof), and DIN rail mounted.

5.4.8 The plastic housing of the test terminal blocks shall be made of PA66 with UL94-VO classification.

5.5 Current Transformers

5.5.1 The 200/250A CT, 300/400A CT, and 500/600A CT meterboxes shall be provided with window-type current transformers conforming to the latest version of SEC specification 50-SDMS-01.

5.5.2 The CTs shall be mounted on a mounting plate and are arranged in a way that the whole CT assembly consumes less space, as shown in the drawings.

5.5.3 The connecting leads of the CTs shall be provided with wire-end sleeves/ferrules *(if not readily available)* and are pre-wired in the factory.

5.5.4 The CT connecting leads are terminated in the test terminal blocks in sequence mentioned in *Table-7*.

5.5.5 Proper cable management shall be exercised to ensure that the CT metering cables (internal wiring) are organized and neat.

5.6 Internal Wiring

5.6.1 The manufacturer shall carry out internal wiring whichever possible and provide the rest as loose wires to make it available for SEC installers (contractors) to complete the installation and wiring of the smart KWH meters and MCCBs/ECBs.

5.6.2 Internal wiring configurations shall be arranged such that smart KWH meters shall go first before the MCCB/ECB, as illustrated in the drawings.

5.6.3 All internal wires shall be single-core cables rated 1000 volts, insulated and supported by clamps or ties, stripped to fit in the terminals of the equipment to be installed by SEC, such as, terminal block assembly, smart-meters, circuit breakers (MCCB or ECB), etc.

The maximum permissible continuous conductor temperature shall be 90°C.

5.6.4 The internal wirings of meterbox with steel enclosure shall be fire-resistant cables.

The cables shall withstand carrying rated electric current with nominal voltage of 1000 volts at 750°C flame for 90 minutes.

It shall be manufactured and tested in full conformance with IEC 60228 and other relative standards.

5.6.5 The sizes of the internal wirings shall be as follows:

SN	Meterbox Type	Internal Wiring (Main Current-Carrying Conductors)	Internal Wiring (CT Metering Conductors)
1	Single Meterbox	35 mm^2 soft-drawn copper	N/A
2	Double Meterbox	35 mm^2 soft-drawn copper	N/A
3	200/250A CT Meterbox	120 mm^2 soft-drawn copper	2.5 mm^2 soft-drawn copper (Single-Strand)
4	300/400A CT Meterbox	185 mm^2 soft-drawn copper	2.5 mm^2 soft-drawn copper (Single-Strand)
5	500/600A CT Meterbox	240 mm^2 soft-drawn copper	2.5 mm^2 soft-drawn copper (Single-Strand)
6	Remote Meterbox	N/A *(Main current-carrying conductors are in the Service Cabinet)*	2.5 mm^2 soft-drawn copper (Single-Strand)

Table 8: Size of internal wiring of meterboxes.

5.6.6 Internal wirings shall be color coded (from left to right) as shown in the table below:

Phase	Color
Phase A (1)	Red
Phase B (2)	Yellow
Phase C (3)	Blue
Neutral (N)	Black
Earth (E)	Green and Yellow

Table 9: Color coding scheme of internal wirings of meterboxes with steel enclosures.

5.6.7 Each end of the internal wirings shall be provided with tin-coated copper wire-end sleeves/ferrules to prevent the strands of the wires from spreading out, except for the 2.5 mm^2 copper single-strand.

5.6.8 The technical requirements of fire-resistant cables shall be as shown in the table below:

Design and Construction Data		
Reference Manufacturing Standards	IEC 60228	
Max. Permissible Continuous Conductor Temp	°C	90
Max. Conductor Short Circuit Temp for 5 Seconds	°C	250
Rated Voltage	V	1000
Conductor Size	mm^2	*
Conductor Material & Shape		Copper & Stranded Class 2 non-compacted Round Shape
Number of wires per conductor	*	*
Insulation Material	LS0H-XL	
Nominal Insulation Thickness	mm	*
Insulation Color	RED / YELLOW / BLUE / BLACK / YELLOW-GREEN STRIPE	*
Approximate Wire Overall Diameter	mm	*

Electrical Data		
Max Conductor DC resistance @ 20 °C	ohms/km	*
Max Conductor AC resistance @ 90 °C (Two/Three) Conductors	ohms/km	*
Max Conductor Short Circuit Current @ 1 Second	KA	5
Current Carry Capacity @ 30 °C Ambient Temperature		
- Enclosed in conduit(1)		
Two Insulated Conductors Single Phase ac or dc	A	*
Three or Four Insulated Conductors Three Phase ac	A	*
- Clipped direct(2)		
Two Insulated Conductors Single Phase ac or dc	A	*
Three or Four Insulated Conductors Three Phase ac	A	*

(1) Current carrying capacity based on IEE wiring regulation method B cables single ac or dc / three phase ac, enclosed in conduit on a wall or in trunking etc. at 30°C ambient temperature".

(2) Current carrying capacity based on IEE wiring regulation method C cables single ac or dc / three phase, clipped direct at 30°C ambient temperature".

Reference (IEE Wiring Regulations 17th edition Table 4E1A)

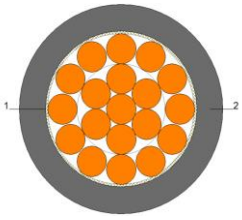
The Cable shall meet all Test requirements of: IEC/BS EN 60228, BS 7211, IEC 60332-1, IEC 60754-1, IEC 61034 Fire Resistant as per IEC 60331 for 90 minutes at 750°C.

Packing Data		
Drum Type		Non-Returnable
Length of Cable per drum (± 5%)	m	1000
Drum Dimensions "Height x Width" (Approx.)	m	*
Gross Weight (Approximate without Lagging)	kg	*

Cable Marking

'MANUFACTURER' 'COUNTRY OF ORIGIN' *** mm^2 CU/MICA/LS0H-XL 1000 V IEC 60332-1-2 LS0H IEC 61034-2 IEC 60754 1&2 'Manufacturing Year'

Cable Drawing



Note:

- *Drawing provided is for illustrative purposes only to show the structure of the cables. Number and sizes of the strands including all other technical parameters of the cable varies as per cable size and manufacturer data.*

Description	Cu / MICA / LS0H-XL 1000 V H07Z-R *** mm^2 RM 'COLOR'	Approx. Diameter
1	Copper conductor with round shape, wrapped with mica tape	*
2	LS0H-XL Insulation	*
Additional Remarks		
(*)	Cable manufacturer data varies accordingly with cable sizes. To be filled-up by the enclosure manufacturer and submitted as part of the technical offer.	

Table 10: Technical Data Sheet for Fire-Resistant Cable.

5.7 Earthing

5.7.1 Internal Earthing

5.7.1.1 All normally non-current-carrying metallic parts or components of the enclosure shall be effectively bonded (grounded) together then connected to the earthing terminal on the outgoing (consumer) terminal block.

5.7.1.2 All neutral phases (both incoming and outgoing terminal blocks) shall be effectively connected and bonded onto the earthing terminal, and then connected to the grounding stud with 35 mm^2 tin-coated copper terminal lug.

5.7.1.3 Grounding stud (earthing) shall be size M10 full-thread stainless-steel. It shall be welded inside (to the right side near the bottom) the enclosure body to provide a rigid termination point for 35 mm^2 bare copper ground wire with terminal lugs. Length shall be sufficient to terminate 2 x 35 mm^2 tin-coated copper terminal lugs. Stainless-steel fasteners shall be provided i.e., 2 sets of flat-washers, lock-washers, and nuts.

5.8 Dimensions

The maximum allowable dimensions of the meterboxes with steel enclosure shall be as provided in the drawings.

5.9 Finishing Color

5.9.1 The meterbox enclosure shall be powder coated using adequate super durable UV resistant paint and protected against corrosion with

atmospheric-corrosivity category classification of C5 with very high durability in conformance with ISO 12944.

5.9.2 It is mandatory that the C5 category paint finish shall be done in-house at the manufacturer's facility where the production line is completely capable of handling from surface preparation of the substrate (base material), application and curing of the base coat (primer), and up to application and curing of the topcoat (finish) in one complete cycle.

5.9.3 Manufacturers' facilities that can provide a batch of single coat (primer) processes then recalibrate the same facility or proceed to another facility to apply the 2nd coat (topcoat) is not acceptable.

5.9.4 Laboratory performance test results as per applicable tests and methods stipulated in ISO 12944-6 with SST requirement of 1440 hours (minimum) shall be submitted and regarded as an integral part of the submittals of type test reports submitted to SEC for approval.

5.9.5 All surfaces of the enclosure shall be painted with RAL 1019 (smooth finish) color except for the main and inner doors.

5.9.6 The meterbox enclosure main and inner doors shall be painted with RAL 9001 with a smooth finish.

5.9.7 The color combination of the meterboxes shall be as per table below.

Enclosure Surface	Color Combination
Body (Inside & Out)	RAL 1019
Main Door & Inner Doors	RAL 9001

Table 11: Finishing color combination of meterboxes.

5.9.1 The front of the enclosure main door shall also be provided with a silk-screen print (or better printing technology) of SEC logo, SEC themed graphic designs, and warning sign that is guaranteed full adhesion on the base paint finish of the main door, and shall not fade, peel, or crack for at least 10 years.

Also, the front of the top inner door shall be printed with an anti-tampering warning sign/note.

5.9.2 Accelerated aging test shall be requested on a sample to represent the whole batch of the issued purchase orders to verify the performance of the printed graphics.

5.9.3 Printed graphics shall be allowed to cure on a preheated oven at 150°C for 5 to 10 minutes and leave to rest to cool down for 20 minutes or until it reaches touch temperature to ambient temperature prior to preparation for application of clear topcoat for UV protection.

6 MARKING

6.1 Nameplate Information

6.1.1 Nameplate shall be placed inside the enclosure at the back of the main door. It is not allowed to attach the nameplate to the outer surface of the enclosure. For each requested meterbox with steel enclosure, the supplier shall give the following data:

a. Manufacturer Name
b. Manufacturer Serial Number
c. SEC Serial Number (Information shall be filled by SEC)
d. Year/Month of Manufacture
e. SEC Issued PO Number
f. Reference SEC Specification
g. SEC Item Code
h. Rated frequency (hertz)
i. Protection degree (IP)
j. Length (mm)
k. Width (mm)
l. Height (mm)
m. Total weight (kg)
n. CT information (for CT meterboxes)

6.1.2 Nameplate information/entries that are not fixed shall either be engraved or stamped legibly on the blank entries on the nameplate. Blank fillable entries on the nameplates shall have a black background.

7 TESTING AND INSPECTION

The meterbox with steel enclosures shall be tested in conformance with the applicable standards.

7.1 Type Tests

7.1.1 Meterbox enclosures shall be type tested in conformance with applicable tests requirements per IEC 61439-5.

7.1.2 Terminal blocks shall be type tested in conformance with IEC 60947-7-1.

7.1.3 Fire-resistant cables shall be type tested in conformance with IEC 60228 and other related standards.

7.1.4 Corrosion protection (paint protective system) laboratory performance tests shall be performed in conformance with ISO 12944-6.

7.1.5 Performance of printed graphics shall be verified by accelerated aging test in conformance with ISO 16474-2.

7.1.6 Thermal insulation board shall be tested and SASO approved in conformance with the requirements of SBC 602.

7.1.7 Chemical analysis in conformance with the test methods stipulated in ASTM E 1086 shall be performed on all metallic parts, fittings, fasteners, and components to verify conformance with the composition of stainless-steel grade 304.

7.1.8 Type test shall be performed at SEC approved laboratories. SEC reserves the right to attend and witness the tests. SEC reserves the right to request the supplier/manufacturer to repeat the type test every five (5) years, or as needed should the supplied meterbox with steel enclosures have frequent faults and failures or non-compliance.

7.2 Routine Tests

The following tests shall be carried out on a randomly selected sample after fabrication and assembly, enabling an official test certificate to be produced for the whole batch provided it is conducted under the supervision of SEC authorized technical personnel.

a. Insulation Test
b. Temperature Rise Test
c. Design Verification Tests
d. Paints (Corrosion Protection) Tests
e. Verification of Tin-coating Thickness by X-Ray Spectrometry per ASTM B568

7.3 Sample Inspection and Acceptance Testing

7.3.1 Samples together with actual CAD drawings, Design Assembly STEP file, user manuals and routine test reports shall be subject for inspection/evaluation prior to issuance of approval for mass production.

7.3.2 Sample inspection/evaluation shall be conducted at the manufacturer facilities. The following attributes shall be checked:

a. Dimensional Verification
b. Routine Tests
c. Markings
d. Accessories
e. Conformity with the requirements of this specification

7.3.3 Acceptance testing shall be performed to samples selected by SEC authorized personnel prior to issuance of release of the requested batch.

8 PACKING AND SHIPPING

8.1 Packing and shipping requirements shall be generally as per the latest revision of SEC General Requirements for Equipment/Materials, 01-SDMS-01 or as per purchase order requirements.

8.2 Each meterbox with steel enclosure shall be covered by a durable cling plastic film to protect the surface finish from nicks and scratches. It shall then be packed as a complete unit in a 5-ply double-walled cardboard box, and then re-wrapped in a plastic film.

8.3 Packing shall protect the meterbox against damage during shipment, site handling, and outdoor storage.

8.4 Suppliers/manufacturers should coordinate with SEC Warehousing Department for additional packing, handling, and or shipping instructions, as applicable.

8.5 Packing crates shall be marked with the following information:

a. Manufacturer’s Name and Model/Type
b. Country of Origin
c. SEC Purchase Order Number / Tender Number
d. SEC Item Code
e. Gross Weight, (kg)
f. Handling Instructions
g. Destination (SEC Warehouse)

9 GUARANTEE

9.1 The supplier/manufacturer shall guarantee the meterboxes including all its respective internal parts and components against all defects arising out of faulty design, manufacturer misinterpretation of the requirements, manufacturing defects and/or defective materials for a period of five (5) years from the date of delivery.

9.2 The supplier/manufacturer shall guarantee the uniformity of the products delivered with the approved samples and drawings.

9.3 The supplier/manufacturer shall guarantee that all the materials, parts, and components used in the fabrication and assembly of the meterboxes shall be the same as to what have been declared in the prequalification files. Any changes on the supplier and sources of any parts of the meterbox must be technically evaluated and have written approval from SEC authorized technical representative.

SEC reserves the right to reject the meterboxes or return all of the delivered meterboxes at the expense of the supplier/manufacturer should it discovered that the parts supplied in the meterboxes did not pass SEC pre-approval.

9.4 The supplier/manufacturer shall guarantee that the meterbox with steel enclosures manufactured under this specification are designed to operate normally outdoor at an ambient temperature of 50°C in Saudi Arabia environmental conditions.

9.5 The supplier/manufacturer shall guarantee full compliance with the requirements of this specification. Any clarifications shall be addressed to SEC authorized technical personnel. SEC reserves the sole right to interpret all subject matters involving this specification.

9.6 Any deviations or modifications must have written approval from SEC authorized technical representative. Should any unauthorized deviations or modifications be discovered that could potentially compromise the quality, safety, and security of the equipment, SEC reserves the right to blacklist the supplier/manufacturer and impose legal actions effective immediately.

9.7 The supplier/manufacturer shall guarantee upon request of SEC personnel the full disclosure of the documents related to purchase, shipping, conformance testing, and QA & QC processes of all the materials, parts, components, fittings, etc., related directly or indirectly on the fabrication and assembly of meterbox with steel enclosures. Copies of the documents shall be submitted upon request of SEC

authorized personnel, and presentation of the original documents shall be done if requested.

10 SUBMITTALS

10.1 Submittals required with tender/inquiry

10.1.1 Summary in table form with the following information: list of items offered, B.O.Q. for each unit offered, manufacturer, origin, catalogue number, and quantity

10.1.2 Clause-by-clause compliance with the latest revision of this specification

10.1.3 General arrangement of the meterbox with steel enclosure showing all important dimensions, together with mountings and accessories

10.1.4 General arrangement showing masses, main dimensions, arrangement of auxiliary components and the minimum clearances required for ventilation and safety during operation and maintenance.

10.1.5 Schematic and connection diagrams

10.1.6 Details of cable terminations

10.1.7 Technical manual giving installation, operation and maintenance instructions

10.1.8 Detailed summary of deviations from the specification, if any.

10.1.9 Certificate stating that the raw material has been sampled, tested and inspected in accordance with relevant standard specifications

10.1.10 Product type test and special test reports and certificates carried out from SEC approved laboratories

10.1.11 Filled-up technical data schedule on each of the items offered, e-copy in Excel (*.xlsx) format

10.1.12 Manufacturer CAD drawings like: meterbox with steel enclosure outlines showing the position of the fittings and attachments, mounting arrangements, lifting arrangements, cable clamps, etc. E-copies of Design Assembly STEP Files with portable viewers or SolidWorks, and AutoCAD 2013 (*.dwg) format, for each of the items offered

10.1.13 USB Flash Drive containing e-copy of all the documents mentioned above

10.2 Submittals required following award of contract

10.2.1 Fabrication CAD drawings

10.2.2 Design Assembly STEP files

10.2.3 Bill of Quantity showing the detailed description of each part or components, origin, manufacturer, and/or model number

10.2.4 Quality assurance tests

10.2.5 Manufacturing and routine test schedules

10.2.6 Special tests, if applicable

10.2.7 USB Flash Drive containing e-copies of all the documents mentioned above.

11 TECHNICAL DATA SCHEDULE:

11.1 The vendor shall complete and return one copy of the attached data schedule with quotation. In addition to data schedule, clause-by-clause compliance to this specification shall be confirmed/ submitted.

11.2 Detail dimensional drawing of each item shall be submitted.

11.3 Type test certificates.

TECHNICAL DATA SCHEDULE

METERBOX WITH STEEL ENCLOSURE

SEC Inquiry No. _____ *Item No.* _____

No	Description	SEC Specified Values (*)	Vendor Proposed Values (**)
1	**General**		
1.1	Reference Standard	IEC 61439-5	
2	**Design Requirements**		
2.1	Enclosure	Meterbox w/ Steel Enclosure	
2.2	Type	*	
2.3	Enclosure Material (Sheet Metal)	GI: G90	
2.4	Enclosure Thickness, mm	1.5	
2.5	Rated Frequency, Hz	60	
2.6	Nominal Voltage, volts	400 volts	
2.7	No. of Phases	3-Phase + N	
2.8	Short-Circuit Withstand for 1 second, kA	25	
2.9	Degree of Protection (IP Code), Enclosure	IP54	
3	**Supplementary Fittings**		
3.1	Is the meterbox with steel enclosure fitted with all the components and accessories mentioned in this specification?	Yes	
3.2	Is the meterbox with steel enclosure fitted with all applicable components and accessories mentioned in reference specification 42-SDMS-01?	Yes	
4	**Testing**		
4.1	Product is Type Tested	Yes	
4.2	SEC Approved Laboratory	**	

TECHNICAL DATA SCHEDULE

METERBOX WITH STEEL ENCLOSURE

SEC Inquiry No. _____ *Item No.* _____

No	Description	SEC Specified Values (*)	Vendor Proposed Values (**)
4.3	Date Tested	**	
4.4	Manufacturer	**	
4.5	Model/Type	**	
4.6	Country of Origin	**	
4.7	Submittals Required with Tender/Inquiry Included or Not?	**	

TECHNICAL DATA SCHEDULE

METERBOX WITH STEEL ENCLOSURE

SEC Inquiry No. _____ *Item No.* _____

Additional Technical Information or Features Specified by SEC

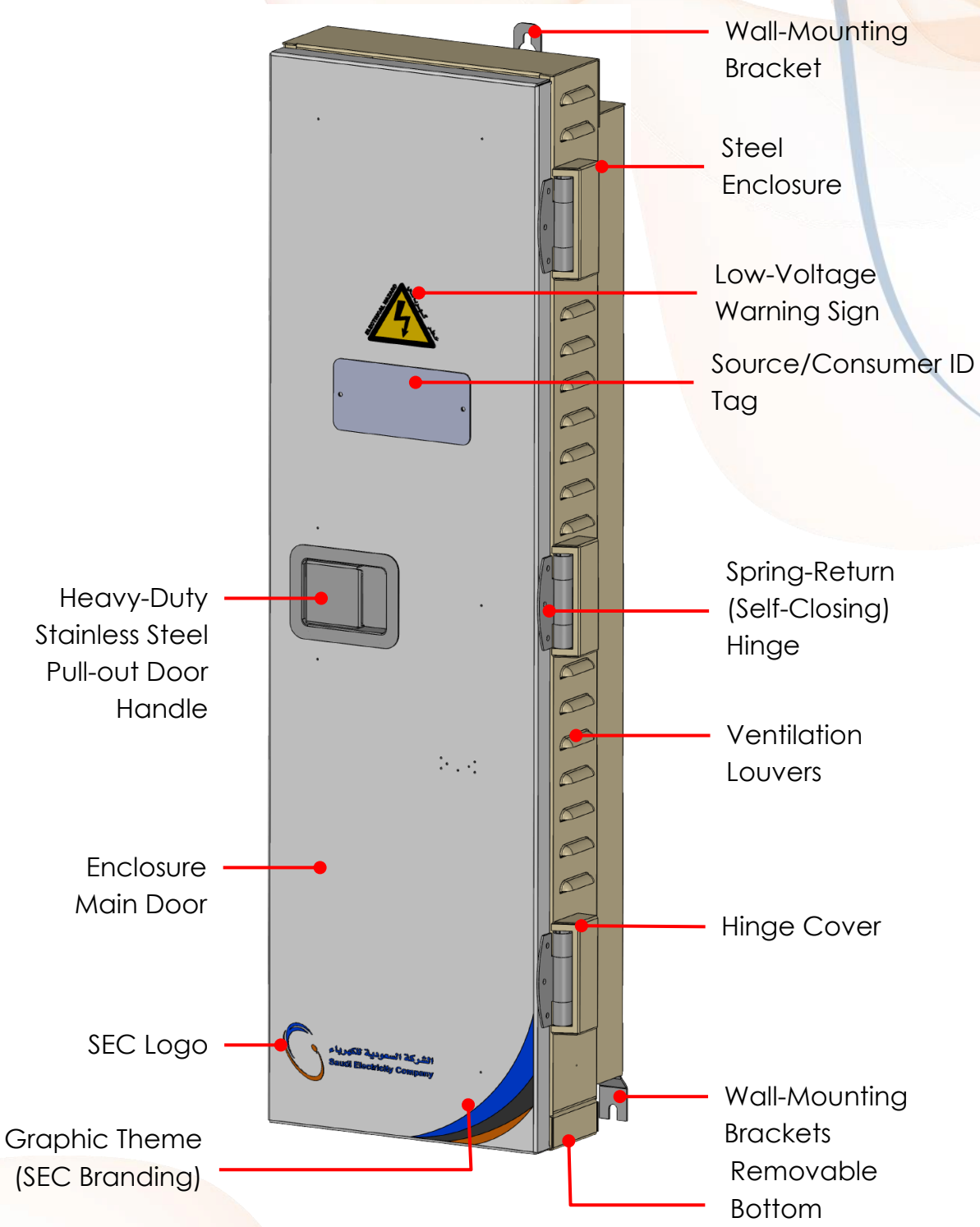
Additional Supplementary Data or Features Proposed by Bidder/Vendor/Supplier.

Other Particulars to be filled-up by the Bidder/Vendor/Supplier.

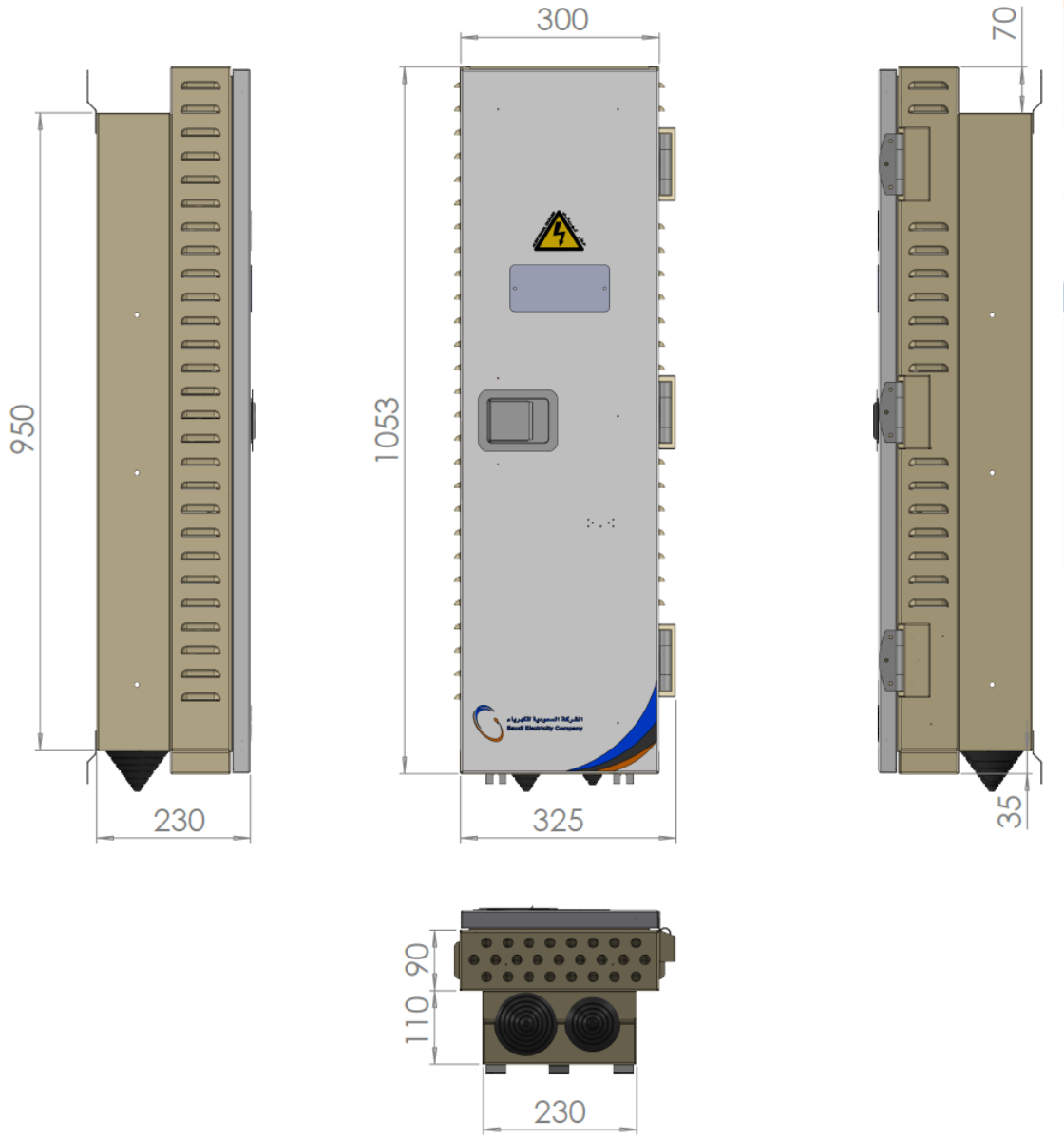
List of Deviations and Clauses to which exception is taken by the Bidder/Vendor/Supplier. (Use separate sheet, if necessary).

Description	Manufacturer of Material/Equipment	Vendor/Supplier
Name of Company		
Location and Office Address		
Name and Signature of Authorized Representative with Date		
Official Seal / Stamp		

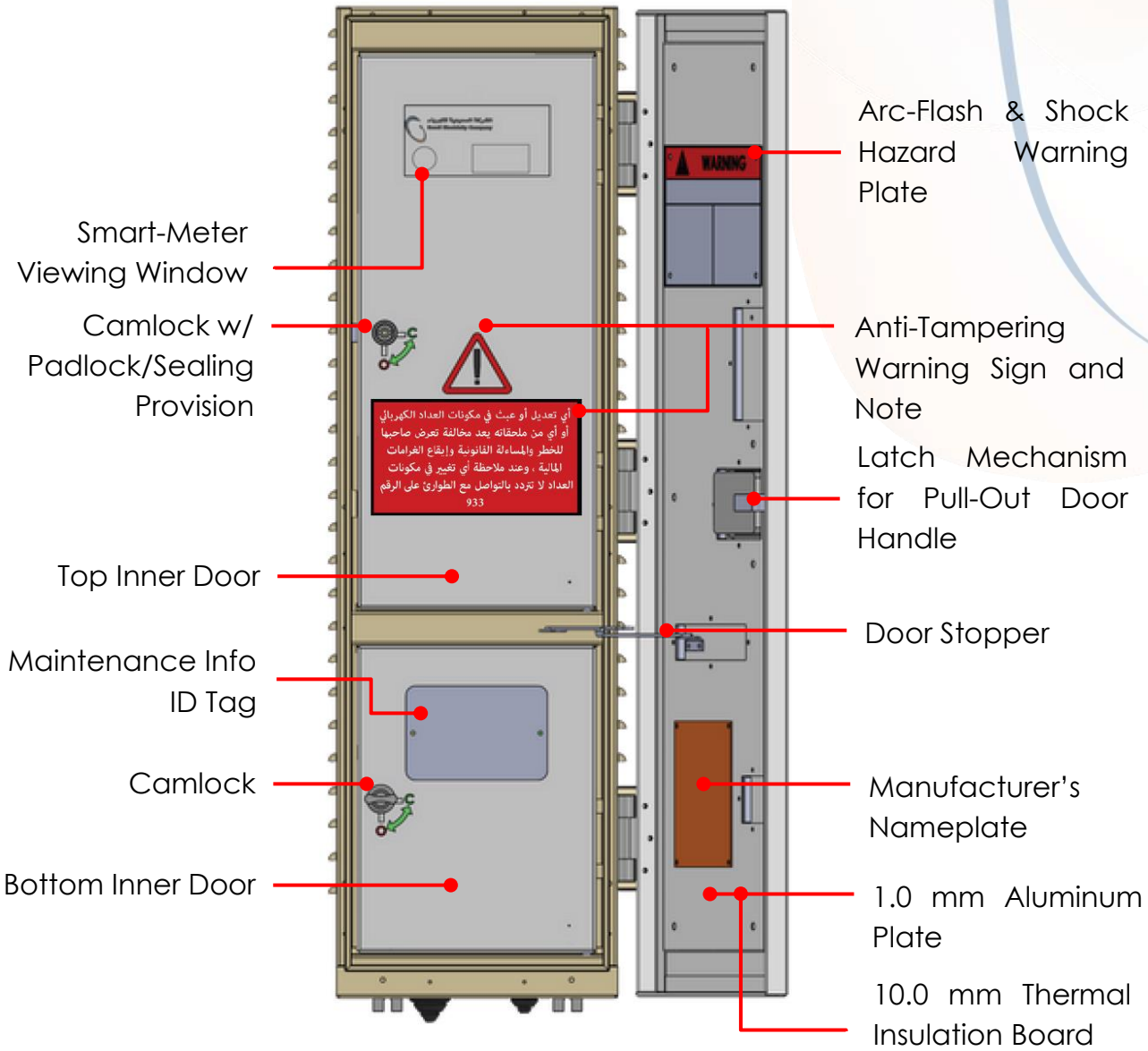
12 DRAWINGS



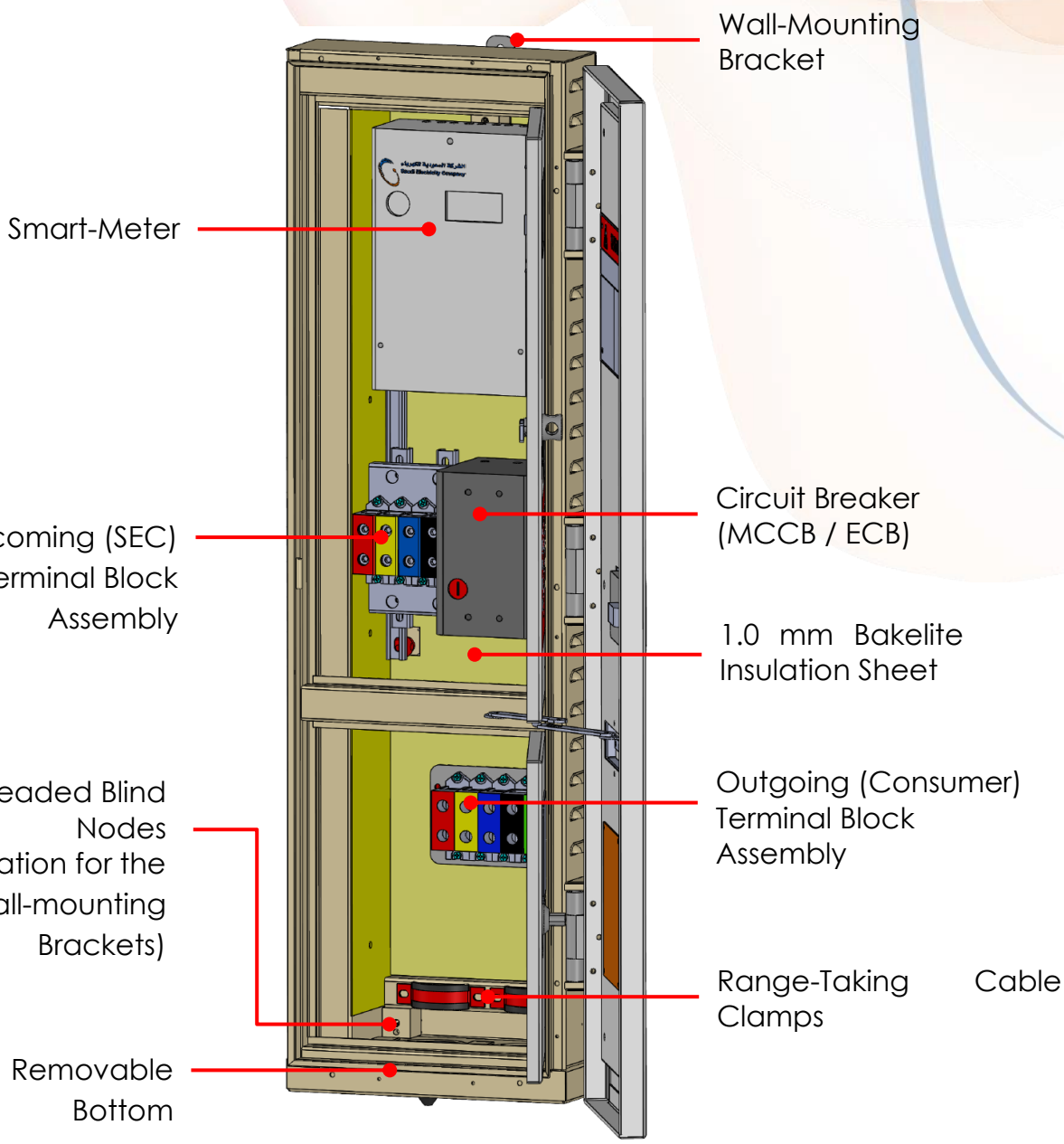
Drawing No. 1.0: Perspective Drawing of a Single-Meterbox with Steel Enclosure



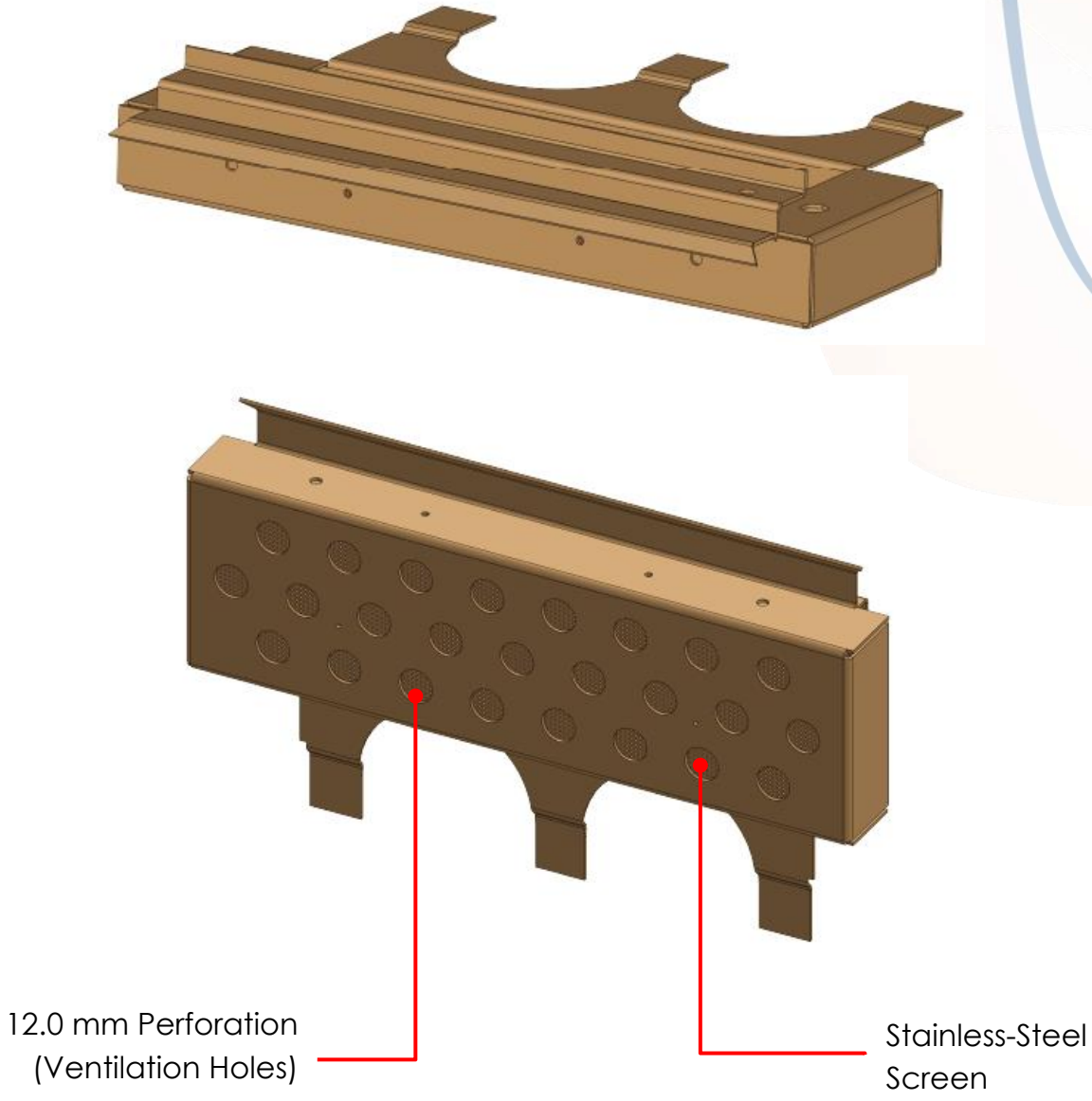
Drawing No. 1.1: Layout Drawing of Single-Meterbox with Steel Enclosure Showing the Maximum Allowable Dimensions



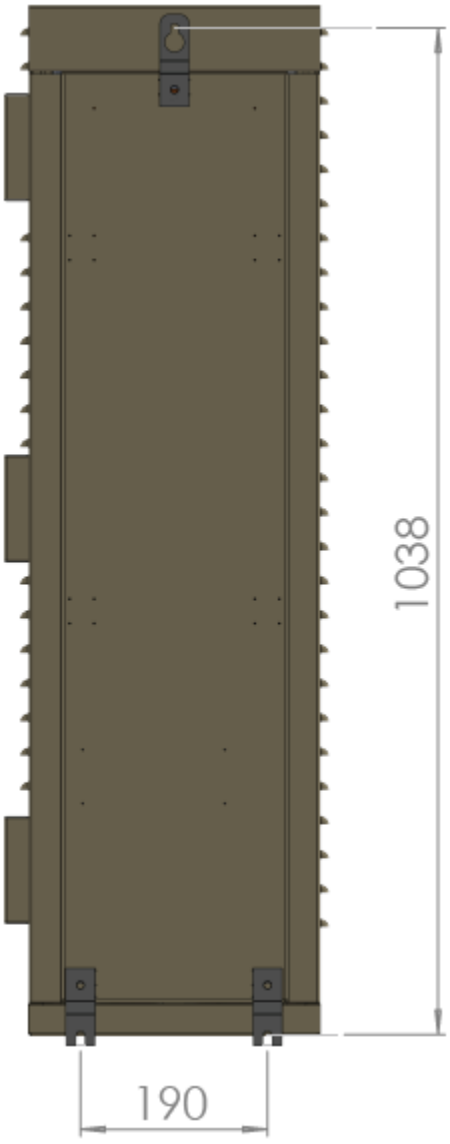
Drawing No. 1.2: Layout Drawing of Single-Meterbox with Steel Enclosure with Main Door Opened



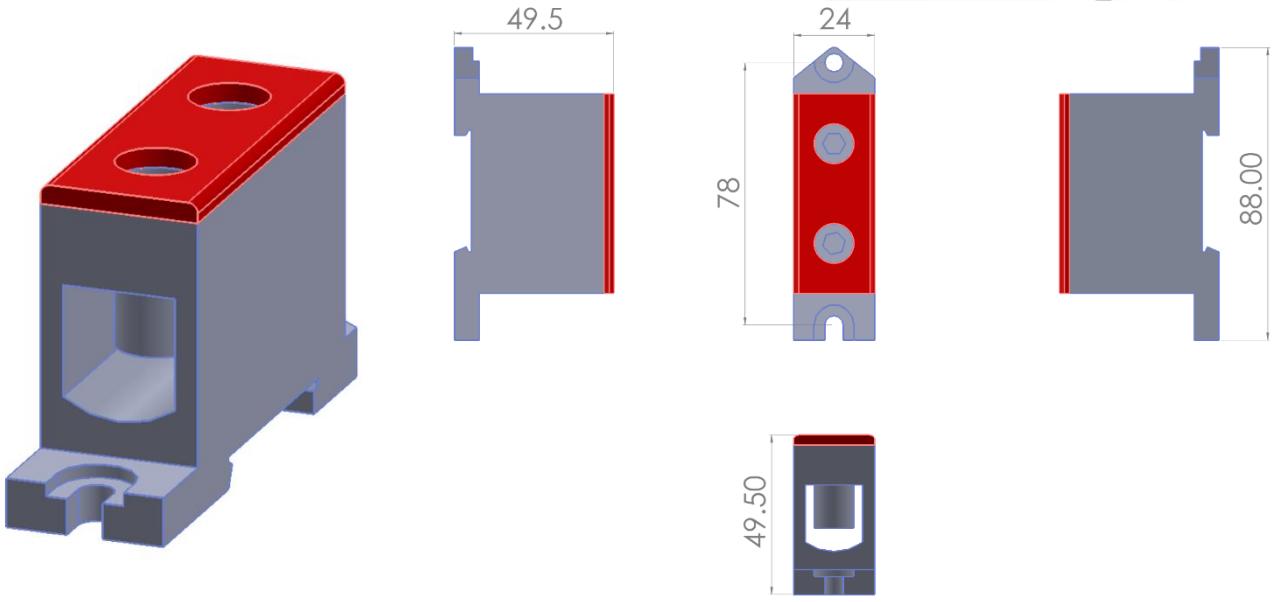
Drawing No. 1.3: Perspective Drawing of Single-Meterbox with Steel Enclosure with Main Door, and Upper and Lower Covers Opened

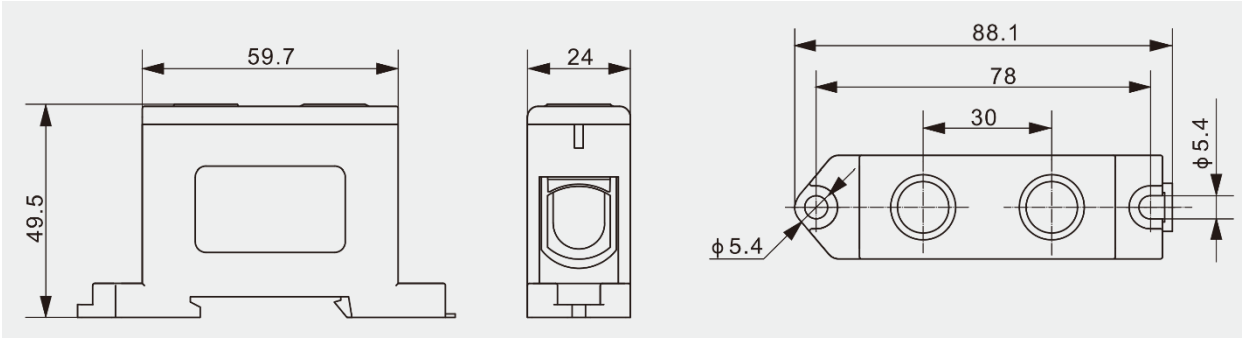


Drawing No. 1.4: Perspective Drawings (Front and Bottom View) of the Removable Bottom of a Single-Meterbox with Steel Enclosure

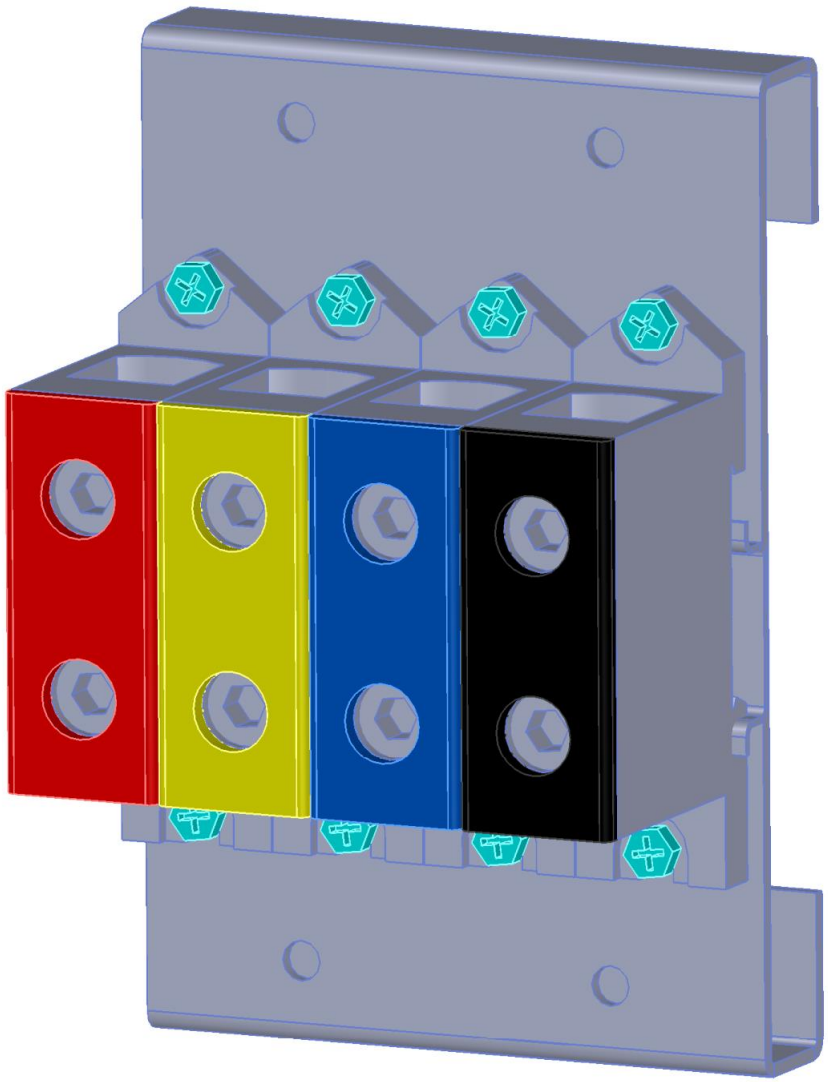


Drawing No. 1.5: Enclosure Rear View Drawing Showing Details of the Wall-Mounting Brackets for Single-Meterbox with Steel Enclosure

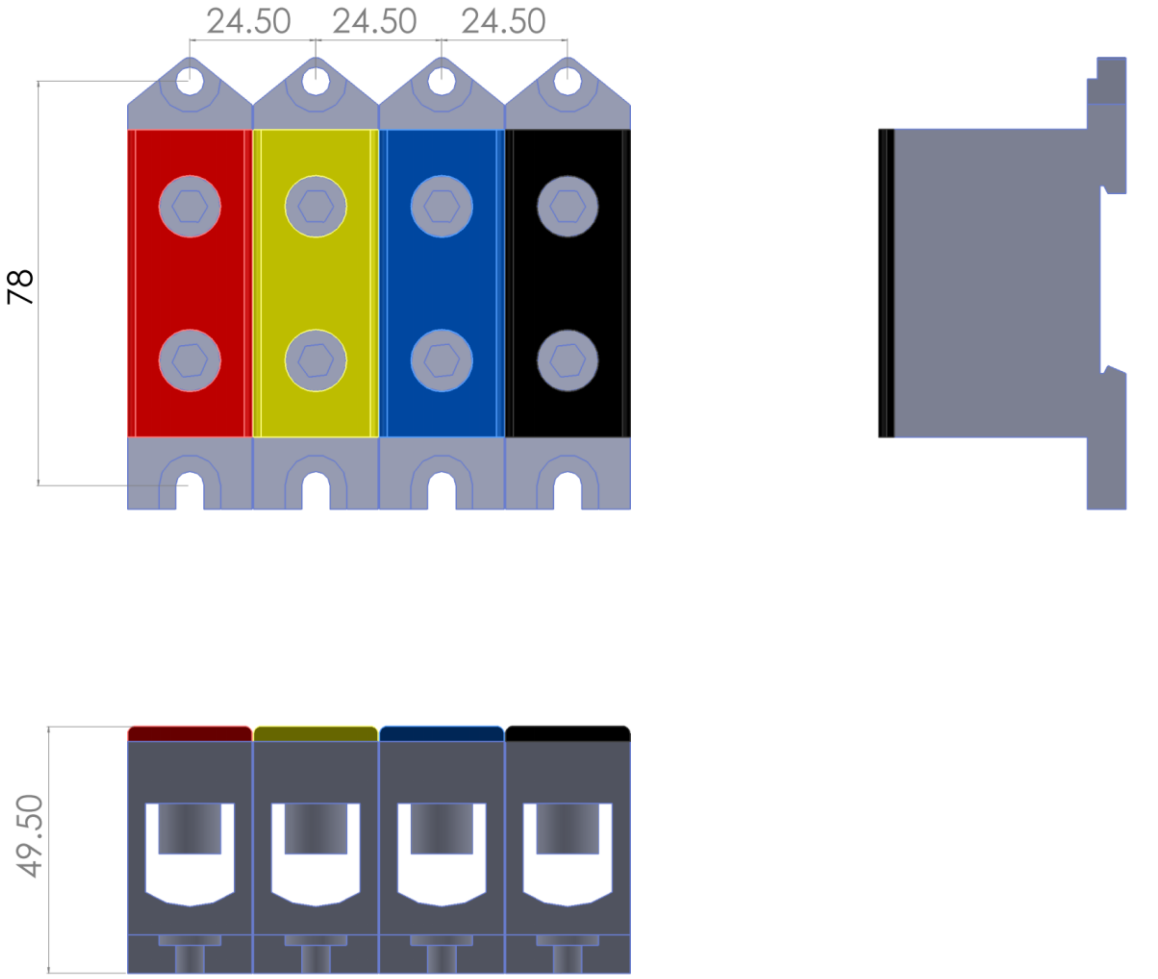




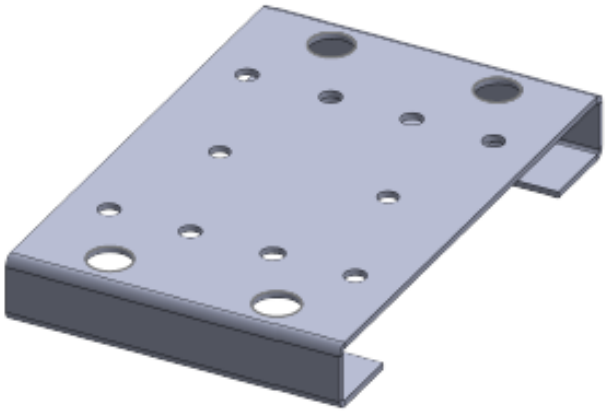
Drawing No. 1.6: Perspective, Layout, and Technical Drawings of 1-Pole Terminal Block for Single-Meterbox with Steel Enclosure

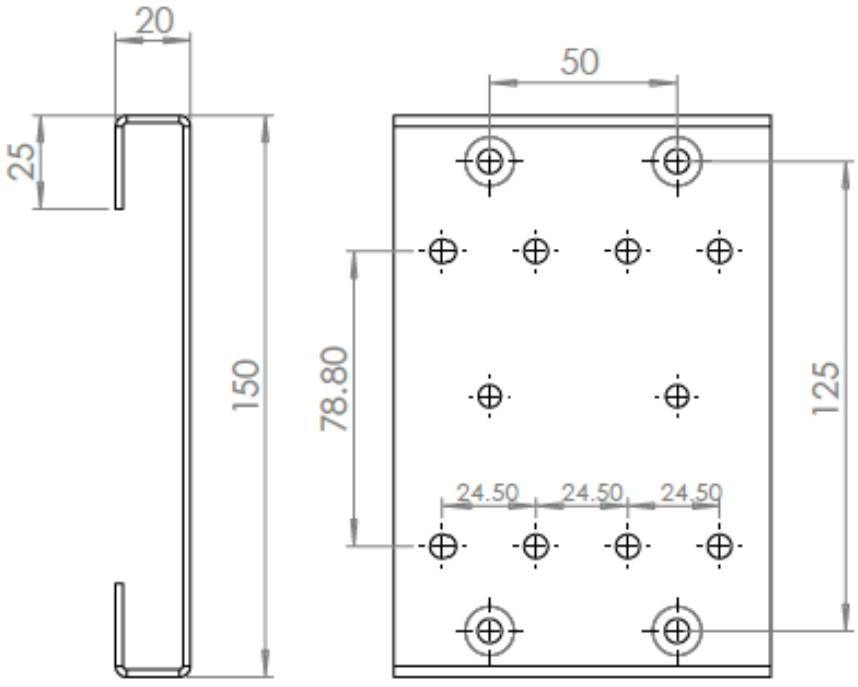


Drawing No. 1.7: Perspective Drawing of Incoming (SEC) Terminal Block Assembly for Single-Meterbox with Steel Enclosure

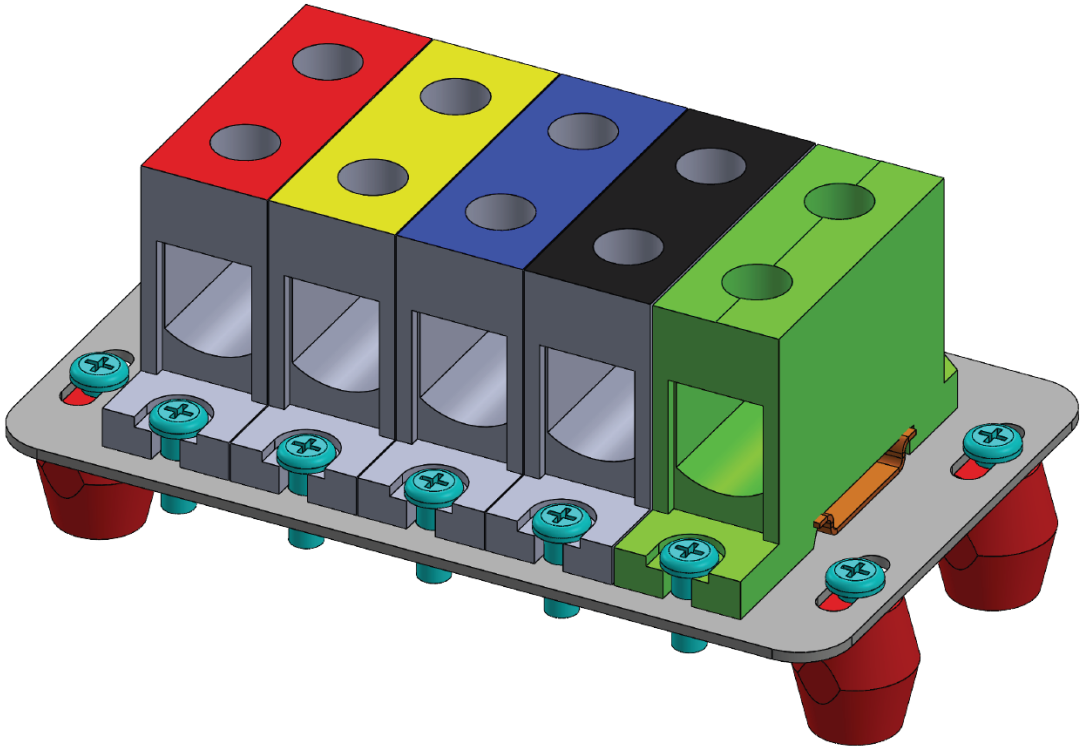


Drawing No. 1.8: Layout Drawing of Incoming (SEC) Terminal Block Assembly for Single-Meterbox with Steel Enclosure

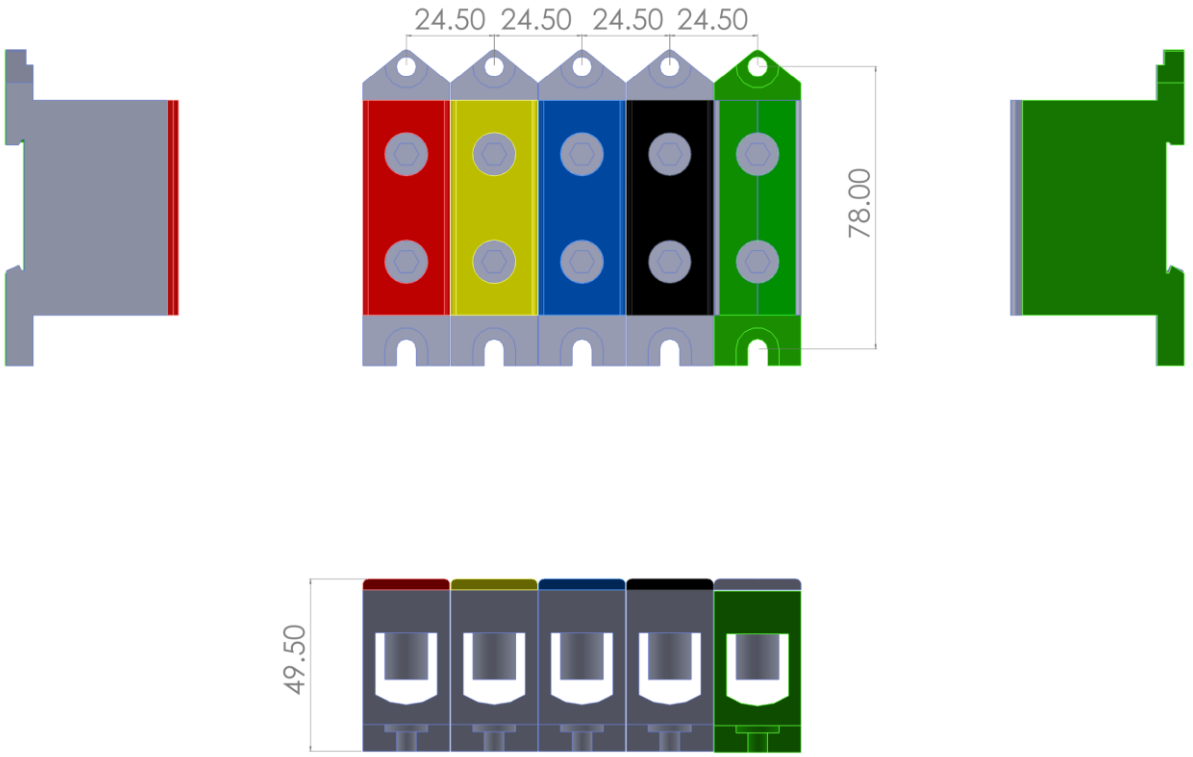




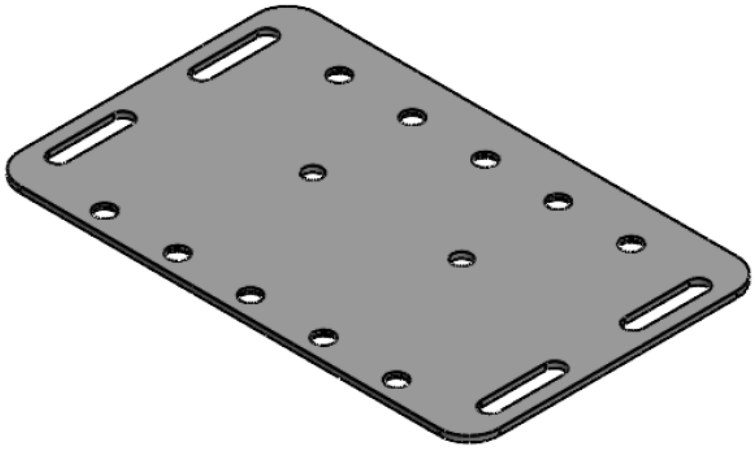
Drawing No. 1.9: Detail Drawing of Incoming (SEC) Terminal Block 2.0 mm Stainless Steel Mounting Plate for Single-Meterbox with Steel Enclosure

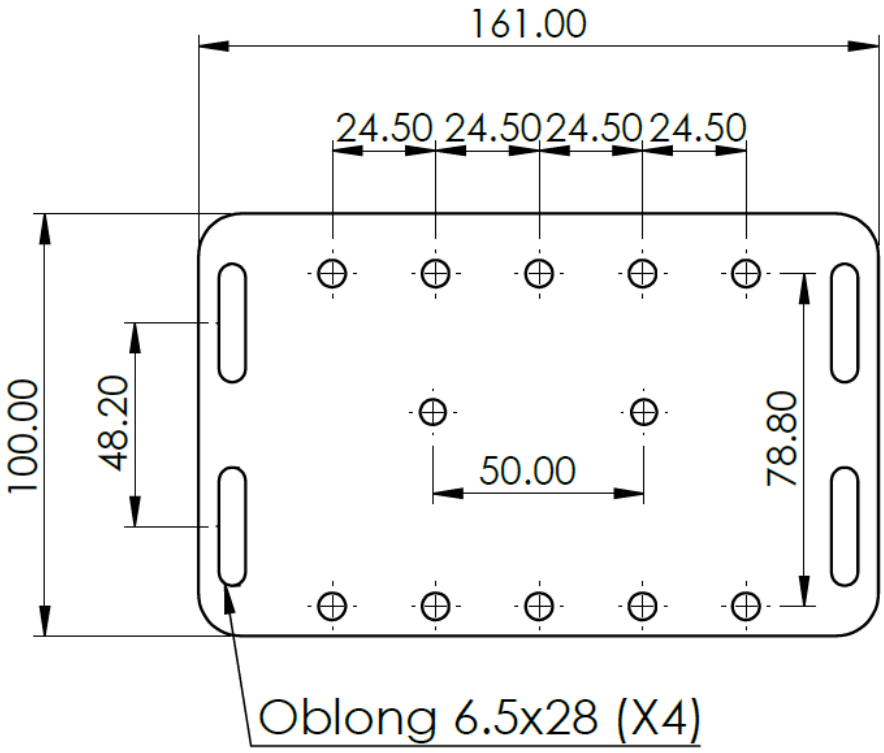


Drawing No. 1.10: Perspective Drawing of Outgoing (Consumer) Terminal Block Assembly for Single-Meterbox with Steel Enclosure

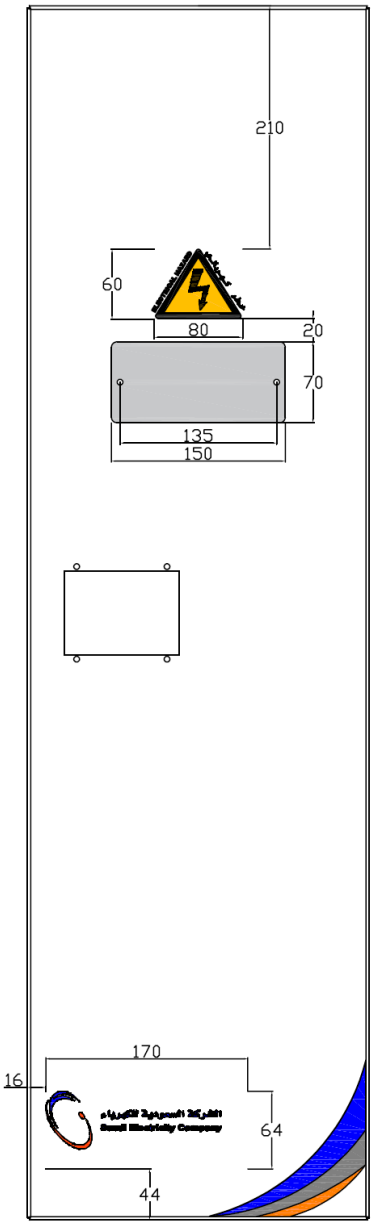


Drawing No. 1.11: Layout Drawing of Outgoing (Consumer) Terminal Block Assembly for Single-Meterbox with Steel Enclosure

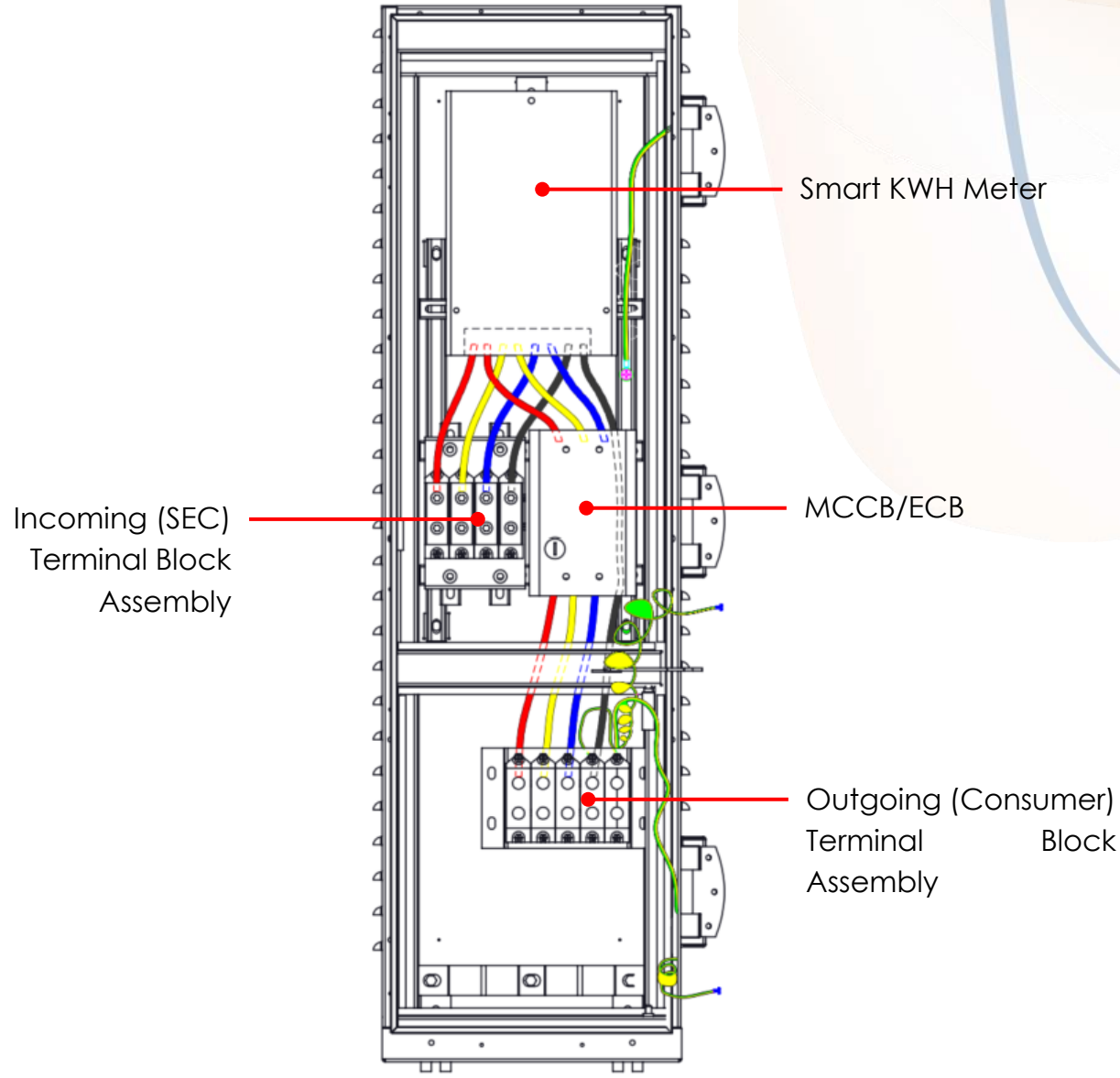




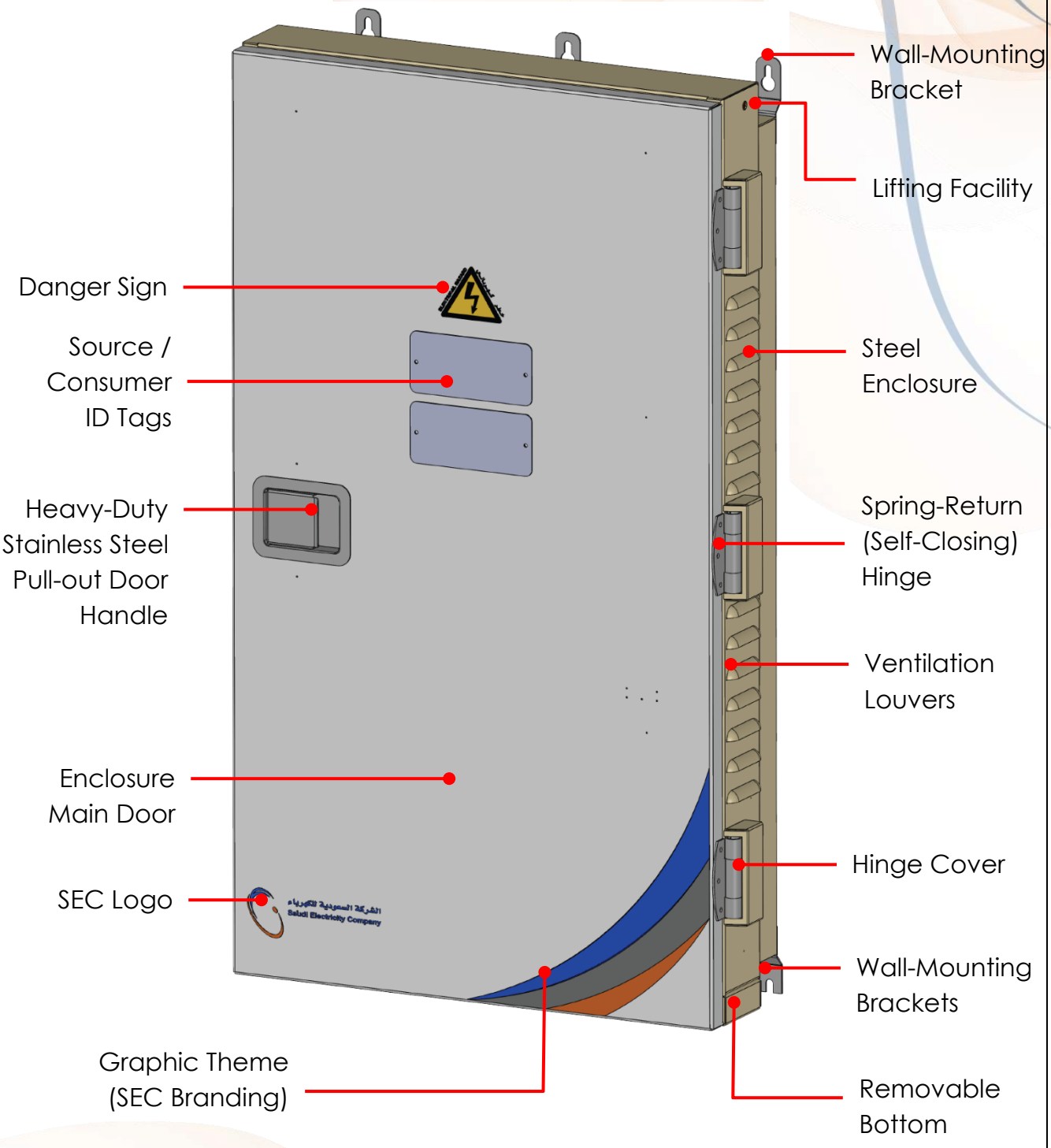
Drawing No. 1.12: Detail Drawing of Outgoing (Consumer) Terminal Block 2.0 mm Stainless Steel Mounting Plate for Single-Meterbox with Steel Enclosure



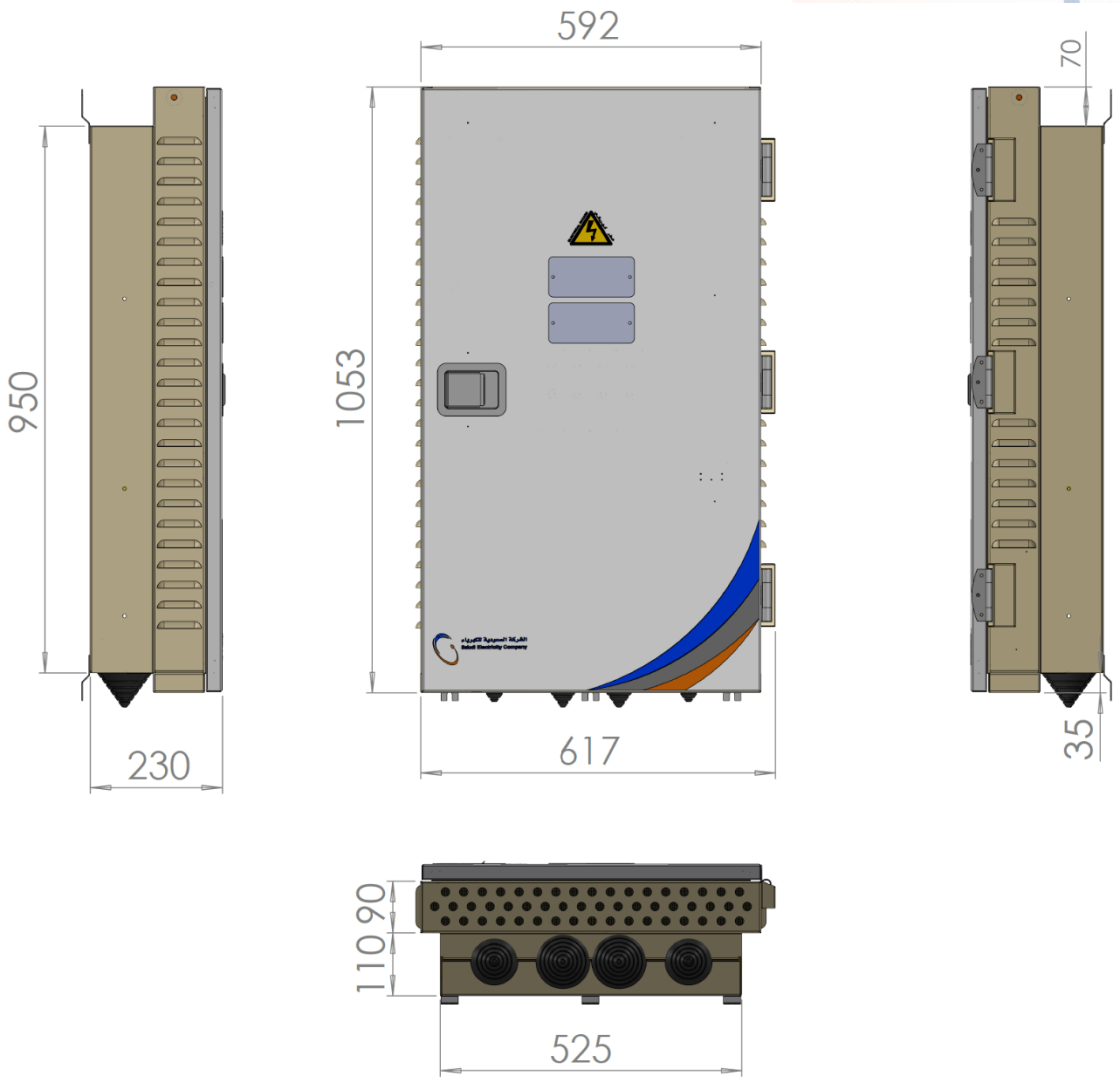
Drawing No. 1.13: Layout Drawing Showing the Exact Positioning of SEC Logo and Danger Sign for Single-Meterbox with Steel Enclosure



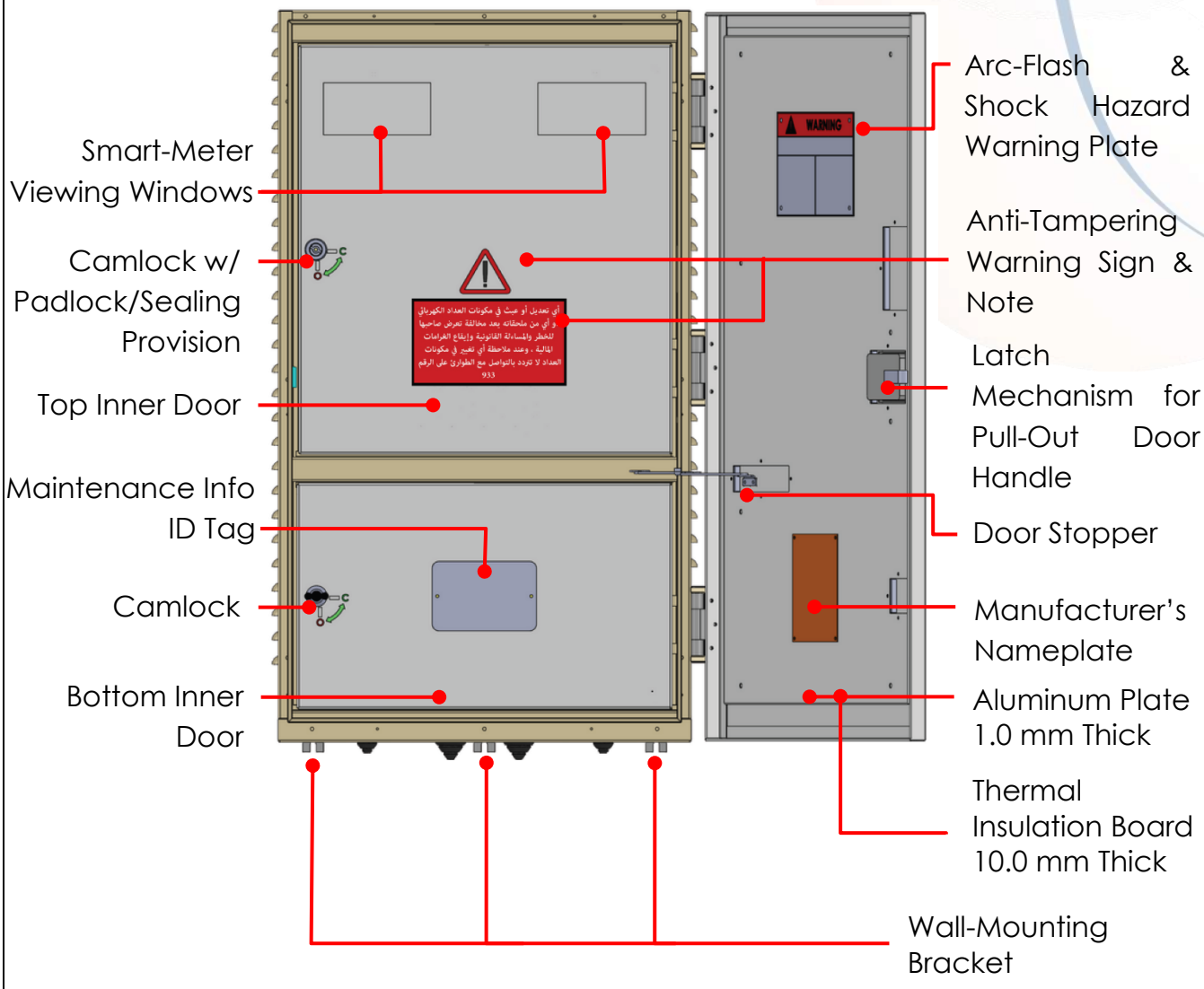
Drawing No. 1.14: Internal Wiring Configuration for Single-Meterbox with Steel Enclosure



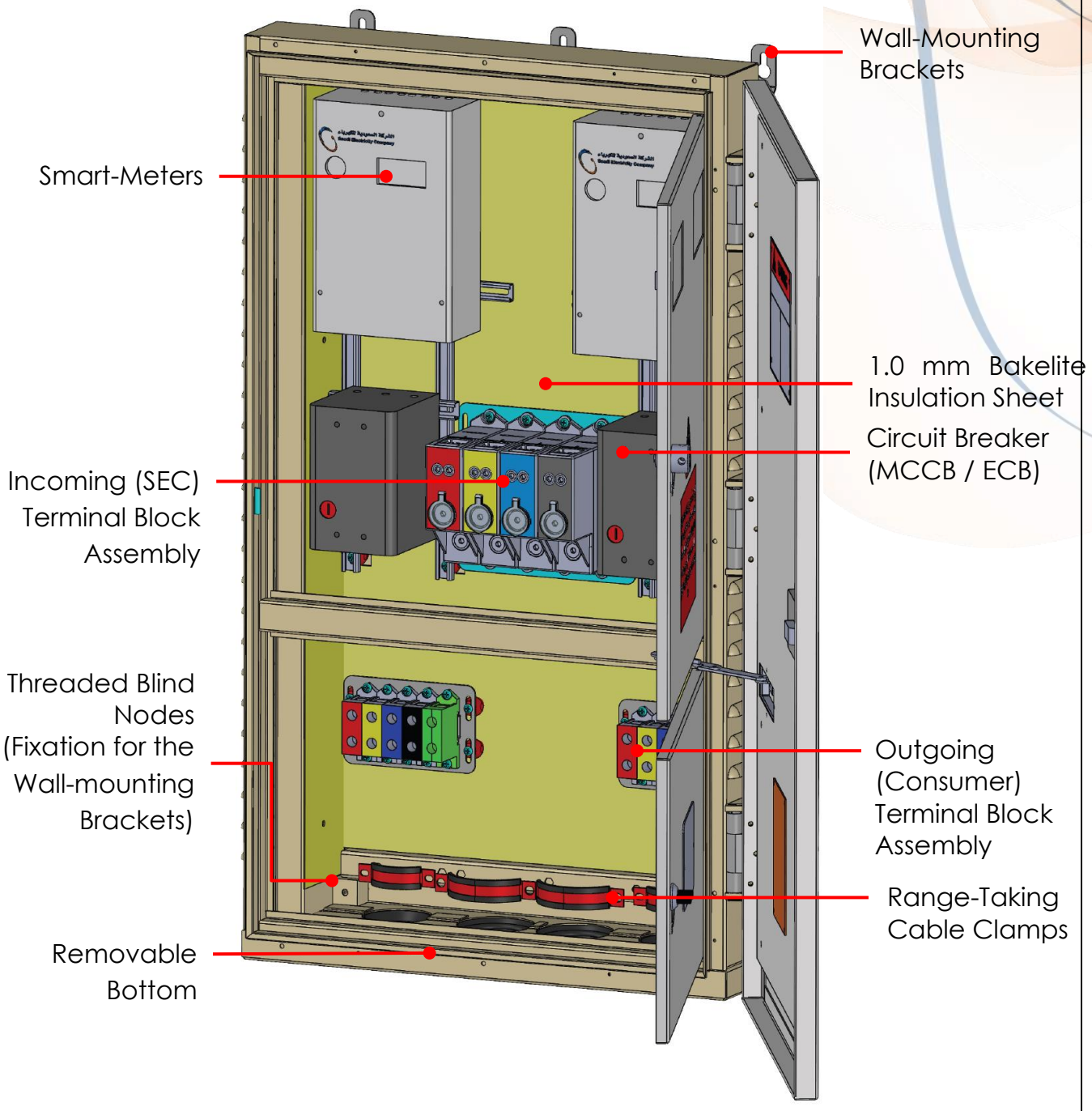
Drawing No. 2.0: Perspective Drawing of a Double-Meterbox with Steel Enclosure



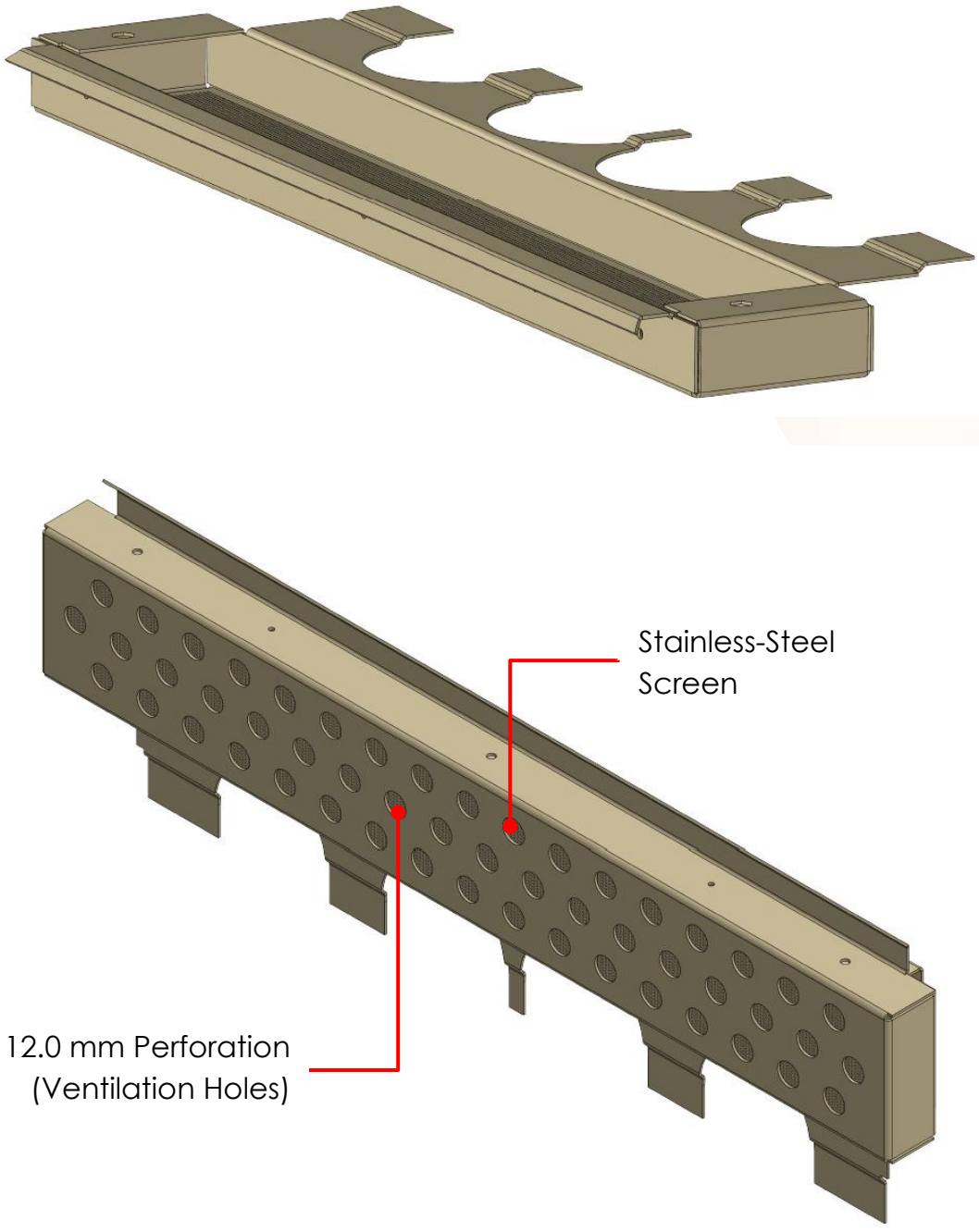
Drawing No. 2.1: Layout Drawing of Double-Meterbox with Steel Enclosure Showing the Maximum Allowable Dimensions



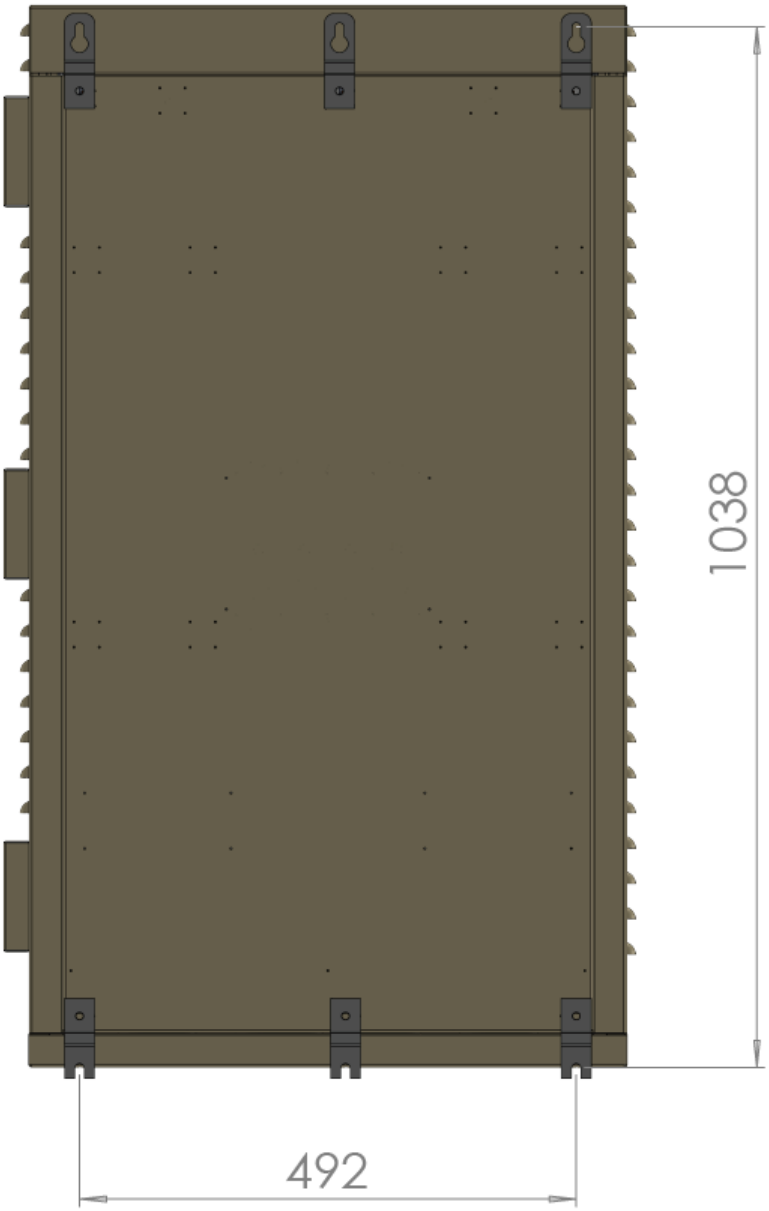
Drawing No. 2.2: Layout Drawing of Double-Meterbox with Steel Enclosure with Main Door Opened



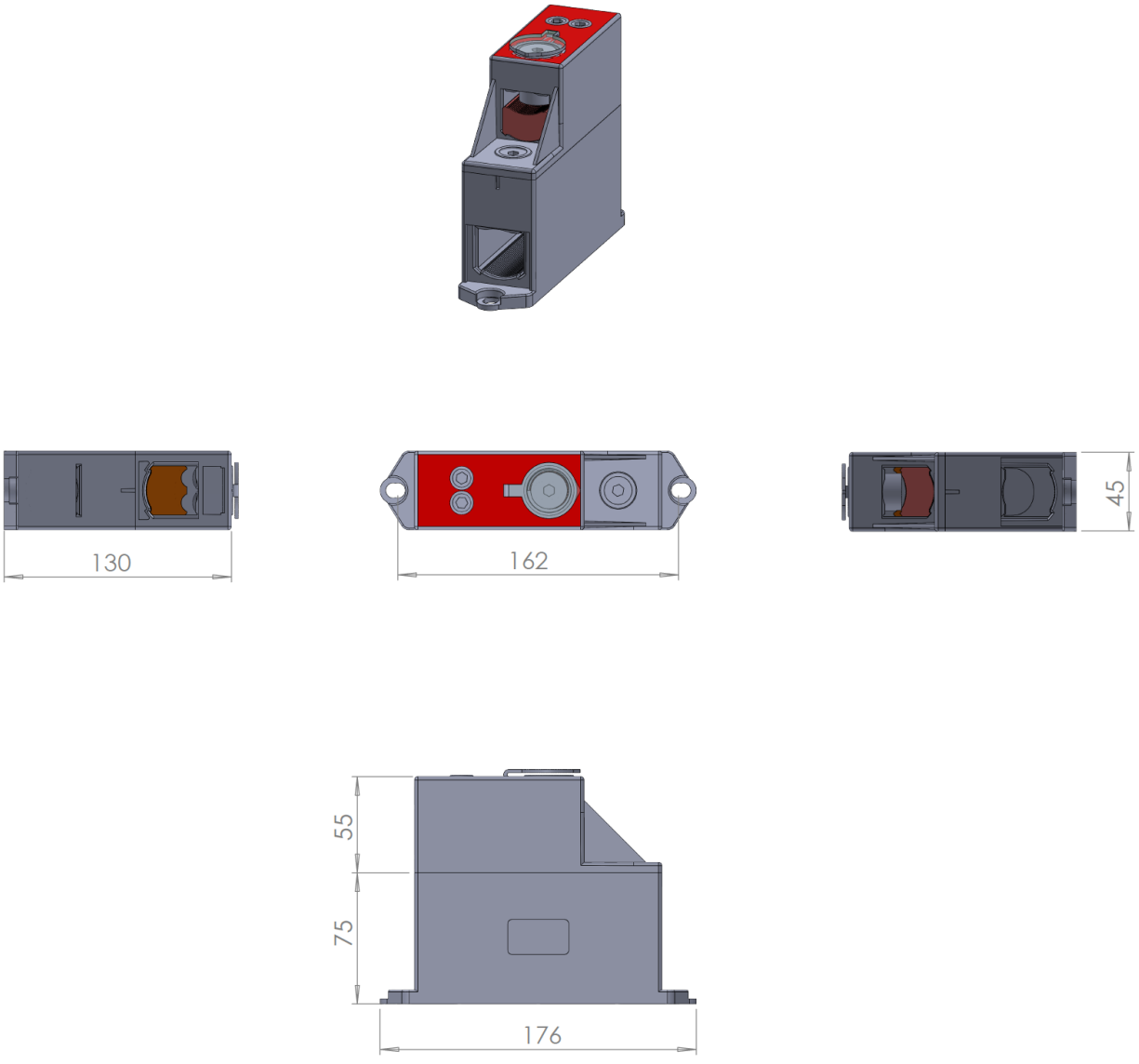
Drawing No. 2.3: Perspective Drawing of Double-Meterbox with Steel Enclosure with Main Door, and Upper and Lower Covers Opened



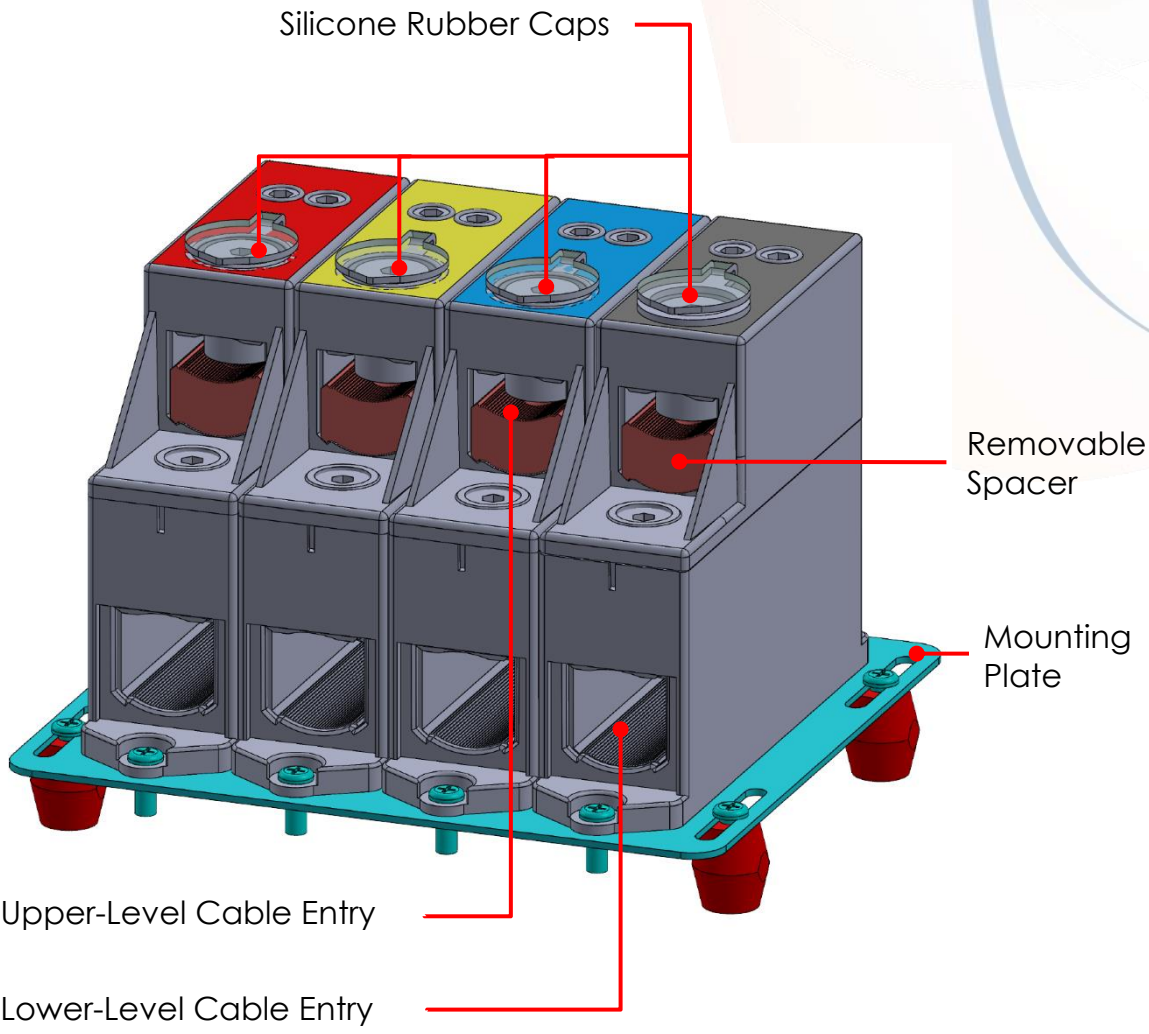
Drawing No. 2.4: Perspective Drawings (Front and Bottom View) of the Removable Bottom of a Double-Meterbox with Steel Enclosure



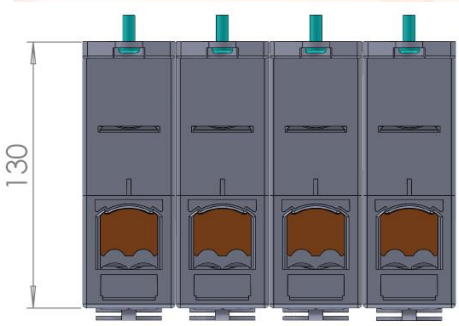
Drawing No. 2.5: Enclosure Rear View Drawing Showing Details of the Wall-Mounting Brackets for Double-Meterbox with Steel Enclosure



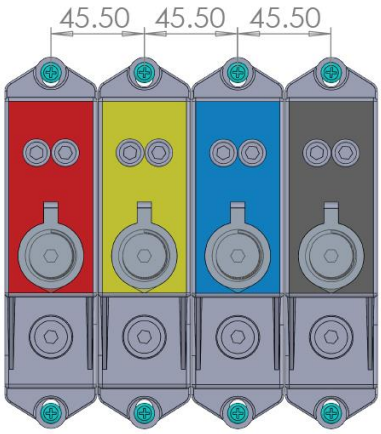
Drawing No. 2.6: Perspective, Layout, and Technical Drawings of 1-Pole, Incoming (SEC) Terminal Block for Double-Meterbox with Steel Enclosure

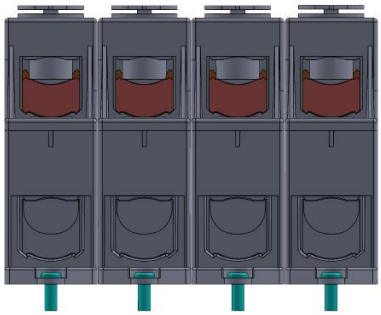


Drawing No. 2.7: Perspective Drawing of Incoming (SEC) Terminal Block Assembly for Double-Meterbox with Steel Enclosure (Two-Level Cable Entry on Incoming Side)



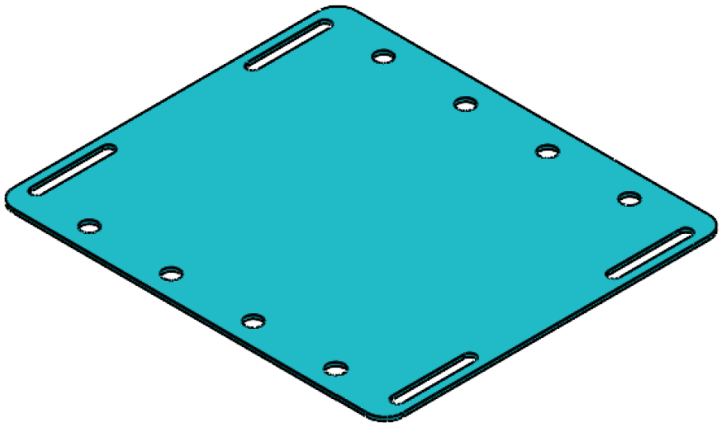
Wire Termination
(Outgoing Side)

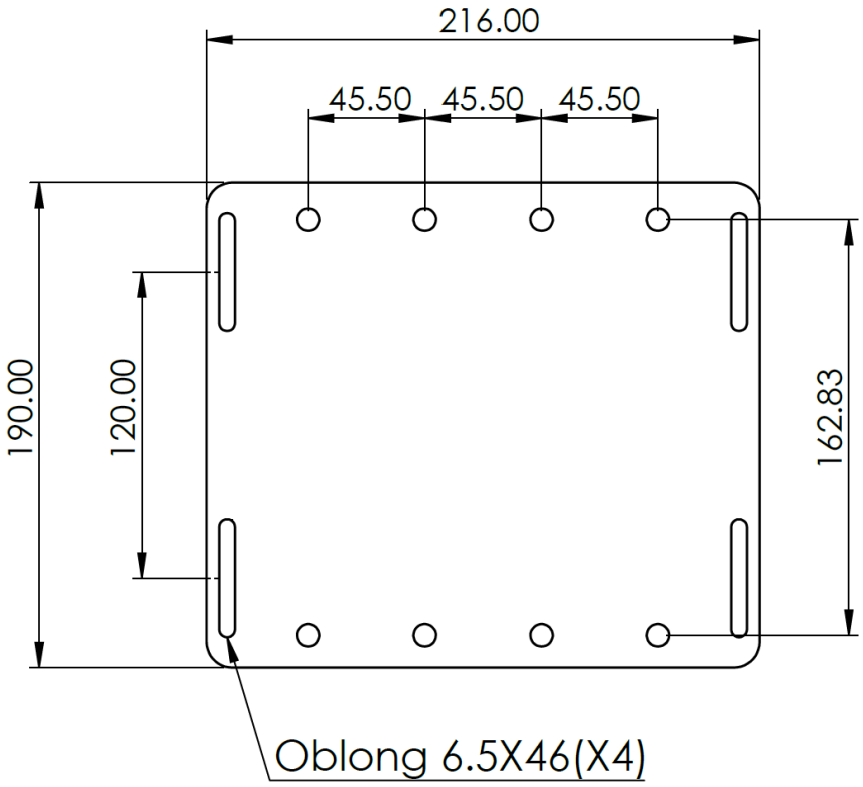




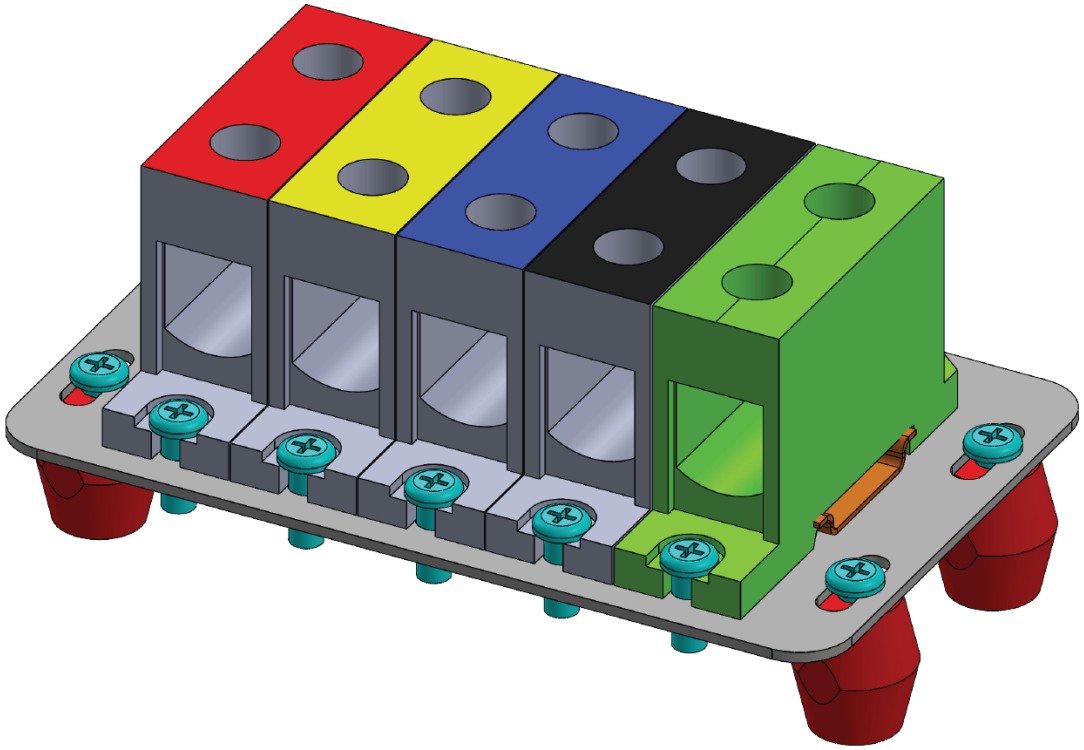
Wire Termination
(Incoming Side)

Drawing No. 2.8: Layout Drawing of Incoming (SEC) Terminal Block Assembly for Double-Meterbox with Steel Enclosure

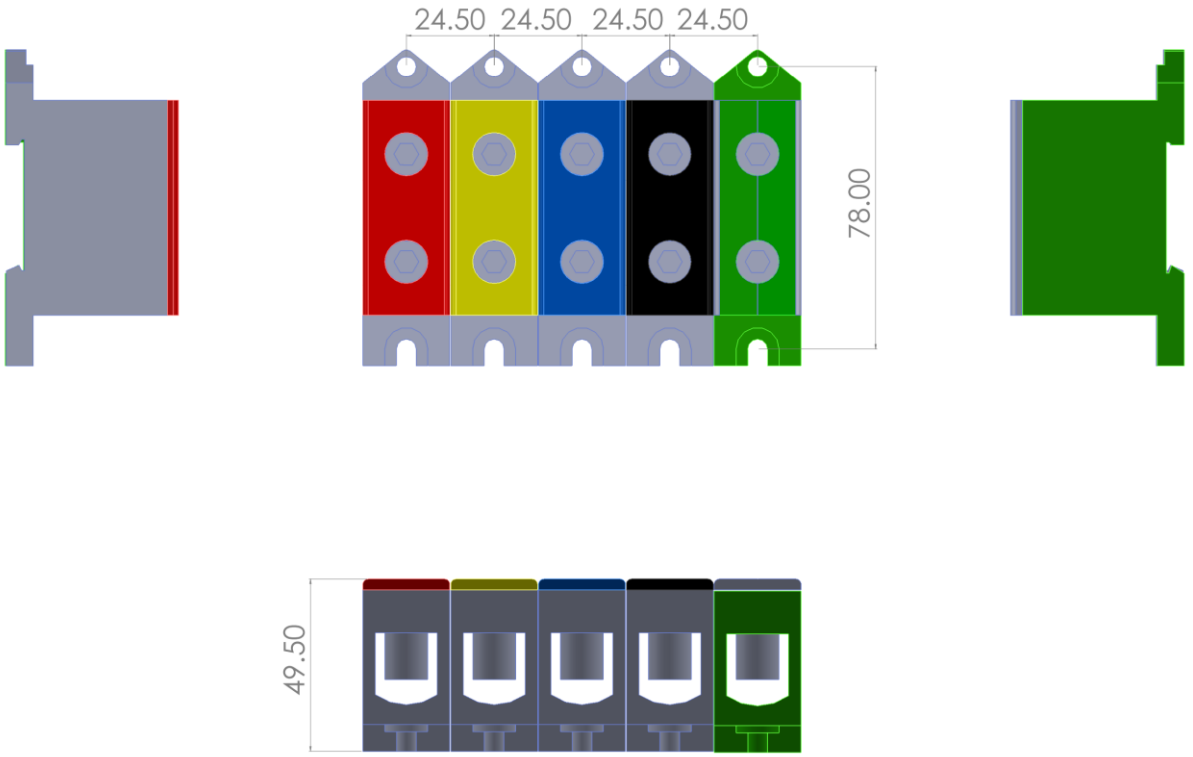




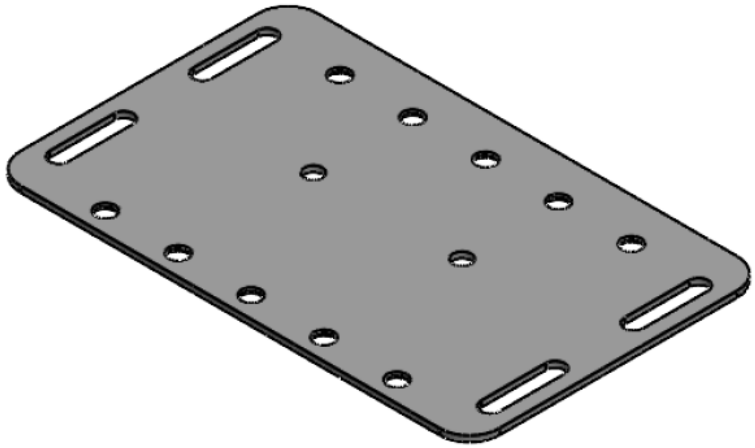
Drawing No. 2.9: Detail Drawing of Incoming (SEC) Terminal Block 2.0 mm Stainless Steel Mounting Plate for Double-Meterbox with Steel Enclosure

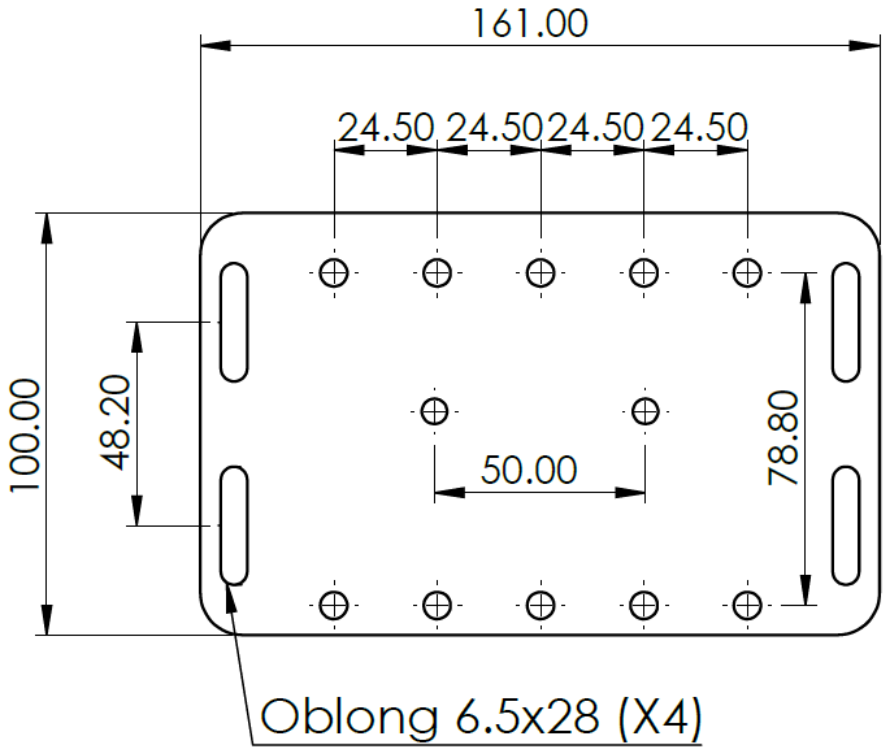


Drawing No. 2.10: Perspective Drawing of Outgoing (Consumer) Terminal Block Assembly for Double-Meterbox with Steel Enclosure

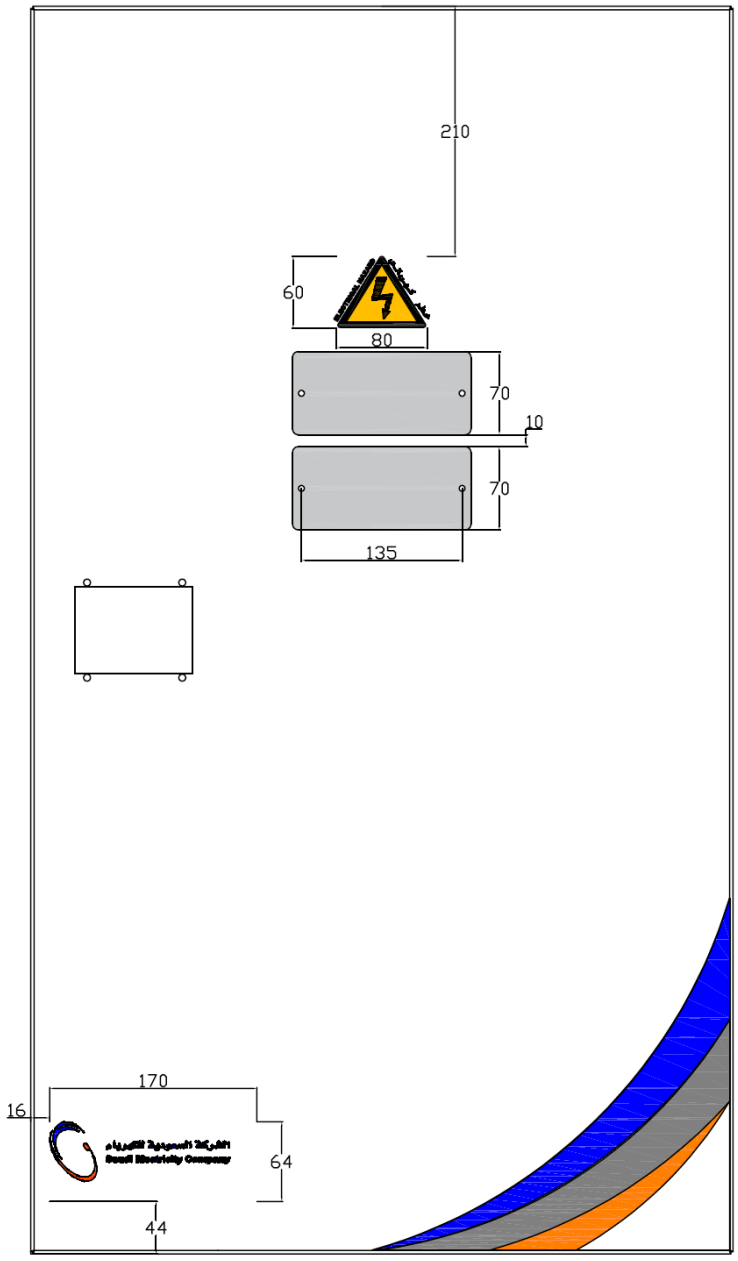


Drawing No. 2.11: Layout Drawing of Outgoing (Consumer) Terminal Block Assembly for Double-Meterbox with Steel Enclosure

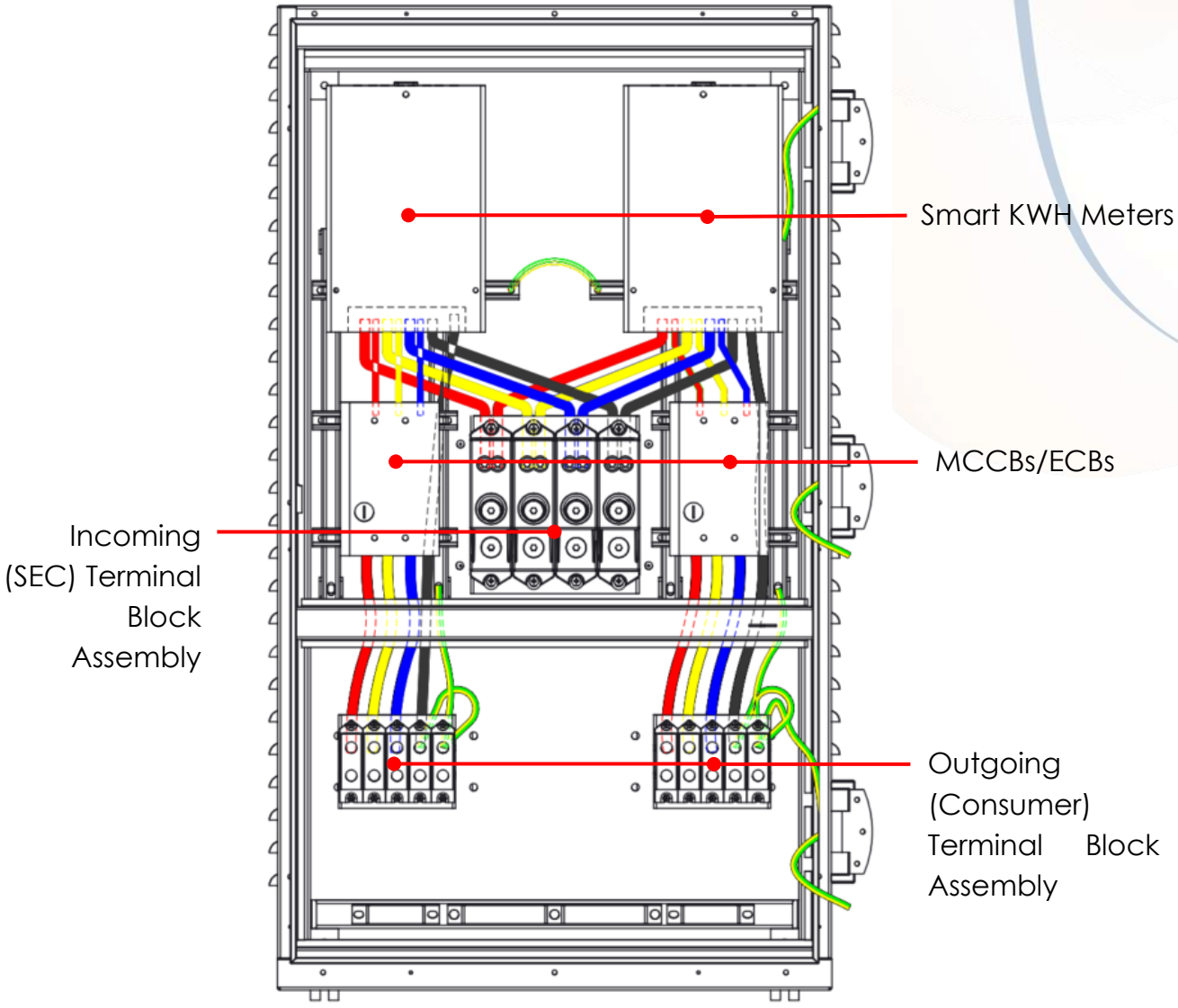




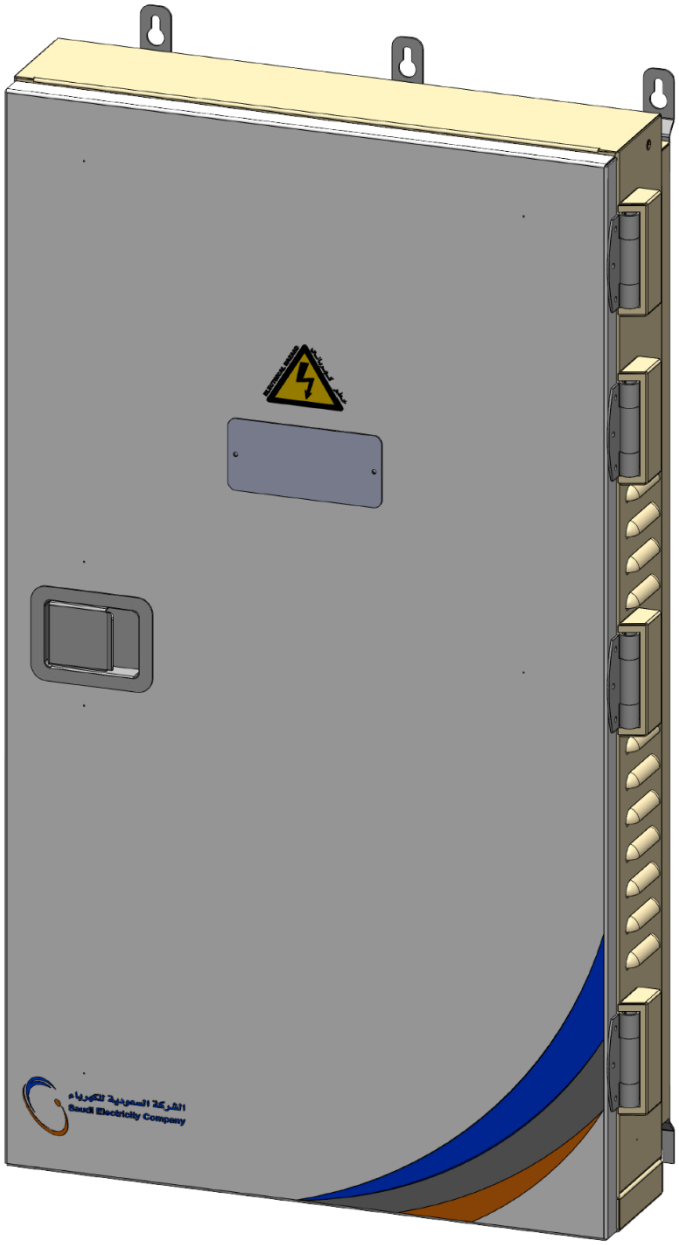
Drawing No. 2.12: Detail Drawing of Outgoing (Consumer) Terminal Block 2.0 mm Stainless Steel Mounting Plate for Double-Meterbox with Steel Enclosure



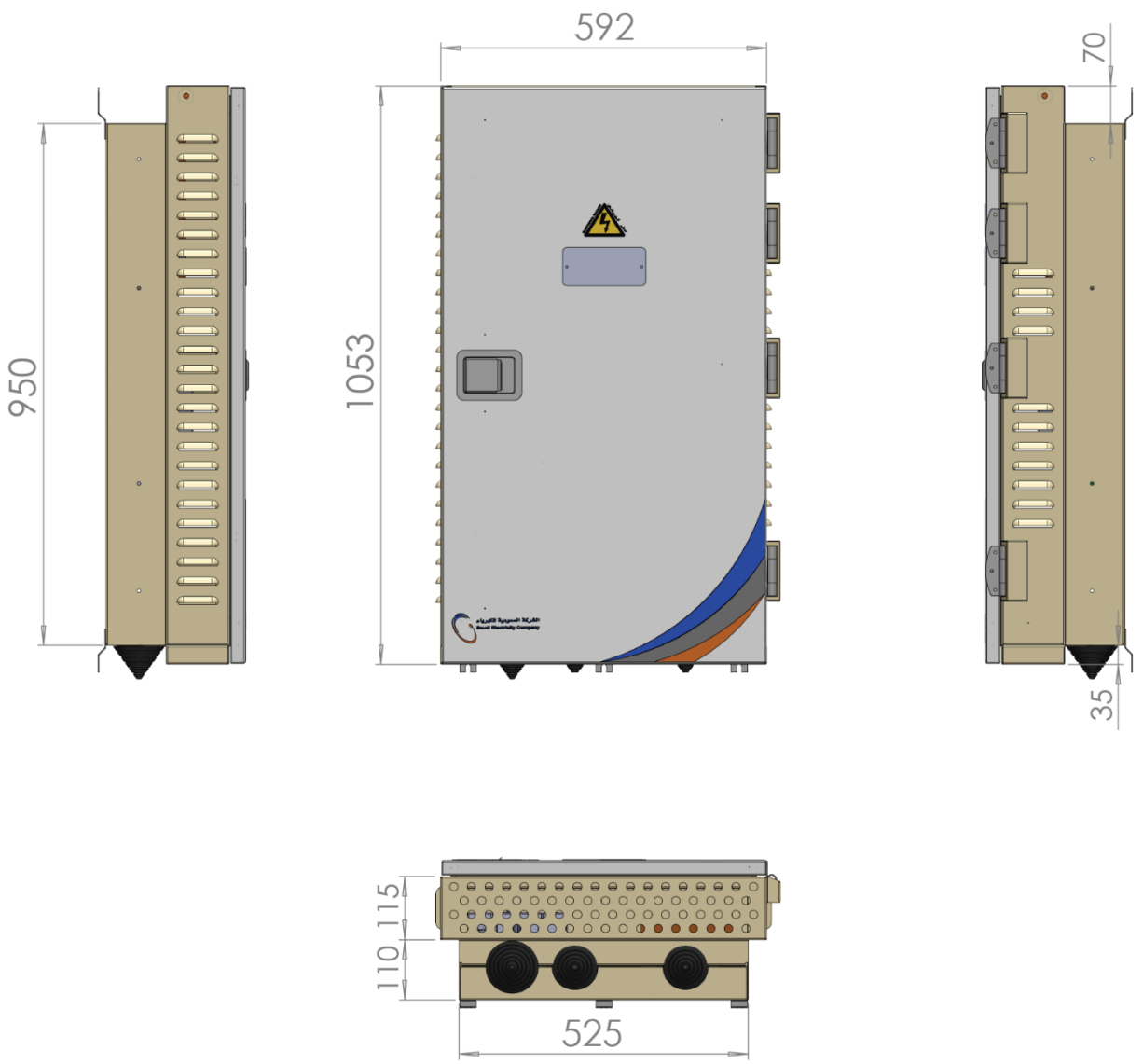
Drawing No. 2.13: Layout Drawing Showing the Exact Positioning of SEC Logo and Danger Sign for Double-Meterbox with Steel Enclosure



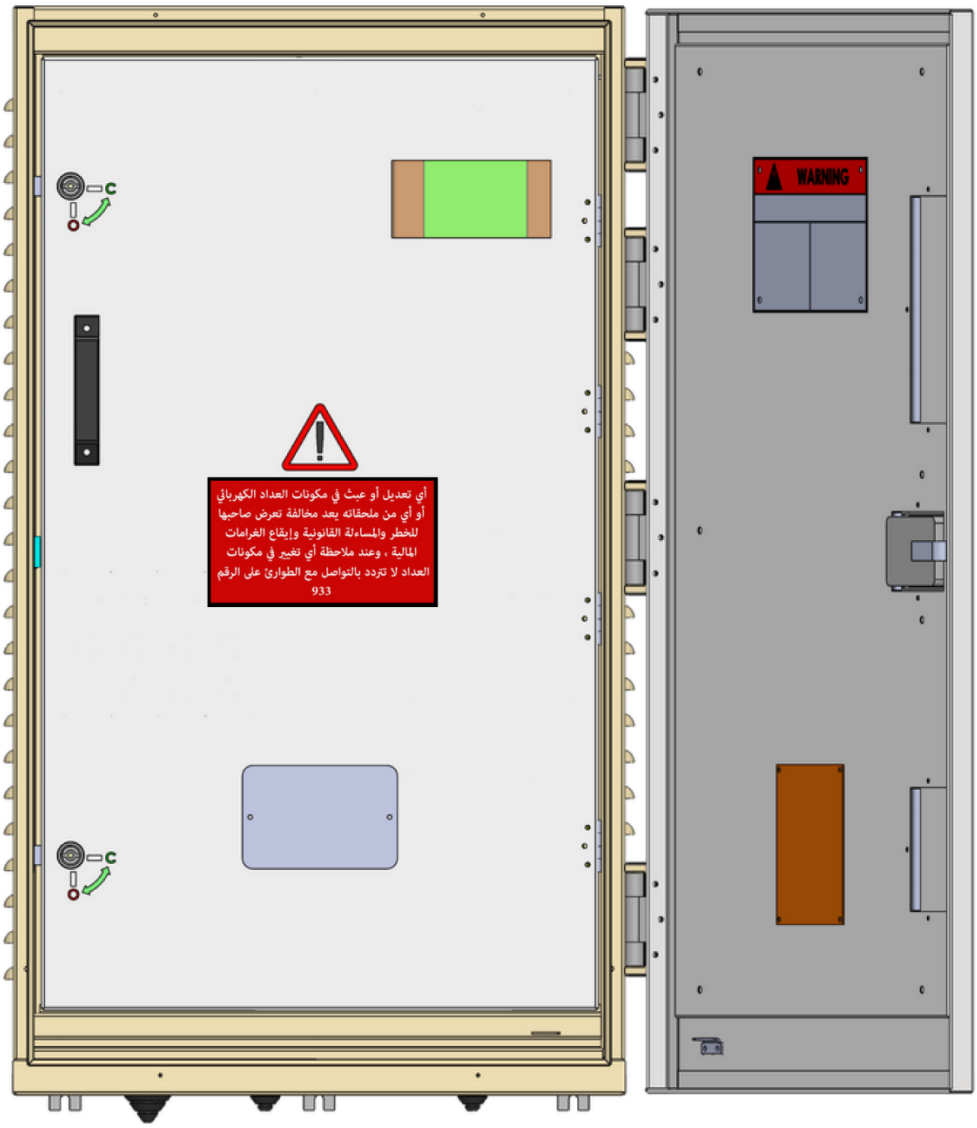
Drawing No. 2.14: Internal Wiring Configuration for Double-Meterbox with Steel Enclosure



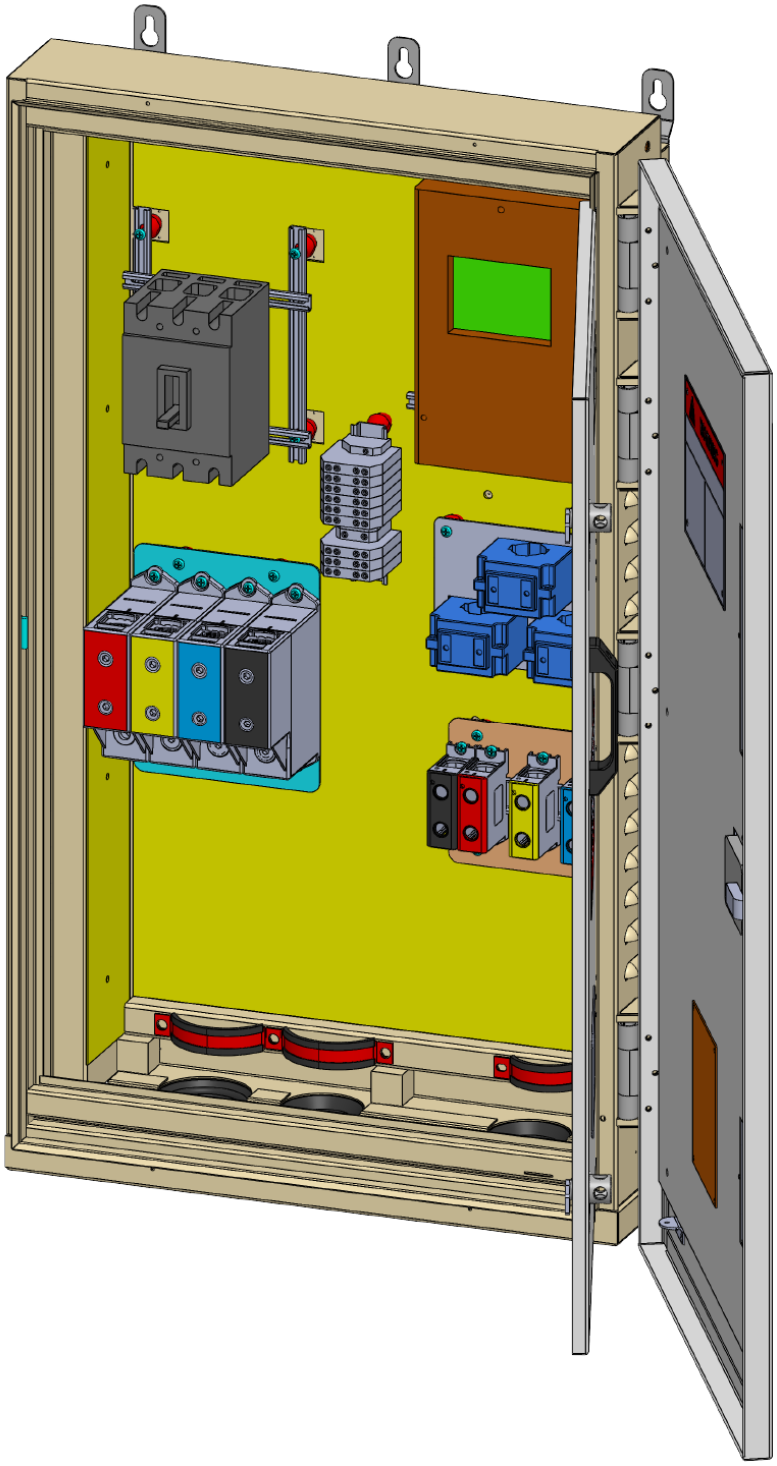
Drawing No. 3.0: Perspective Drawing of a 200/250A CT-Meterbox with Steel Enclosure



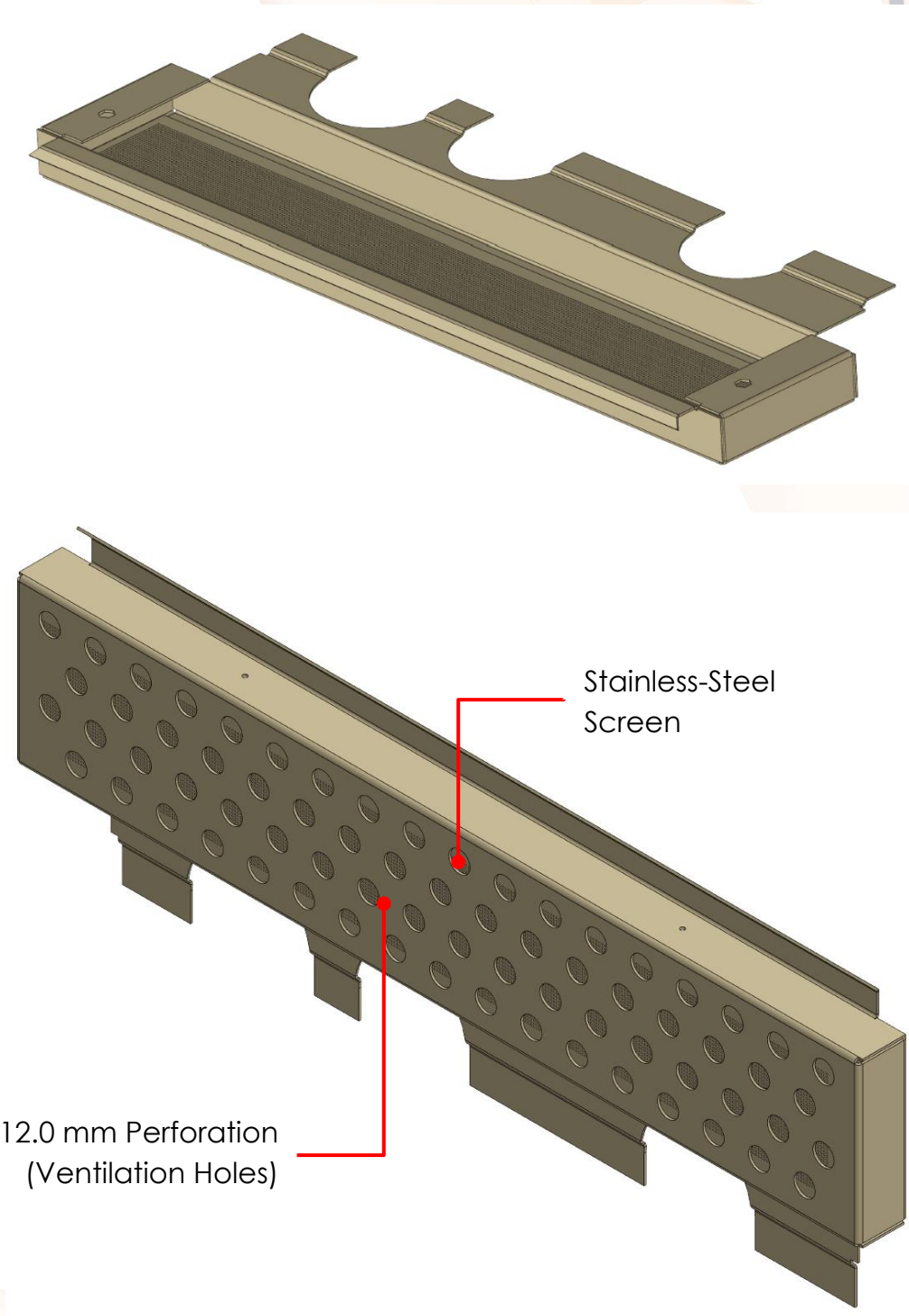
Drawing No. 3.1: Layout Drawing of 200/250A CT-Meterbox with Steel Enclosure Showing the Maximum Allowable Dimensions



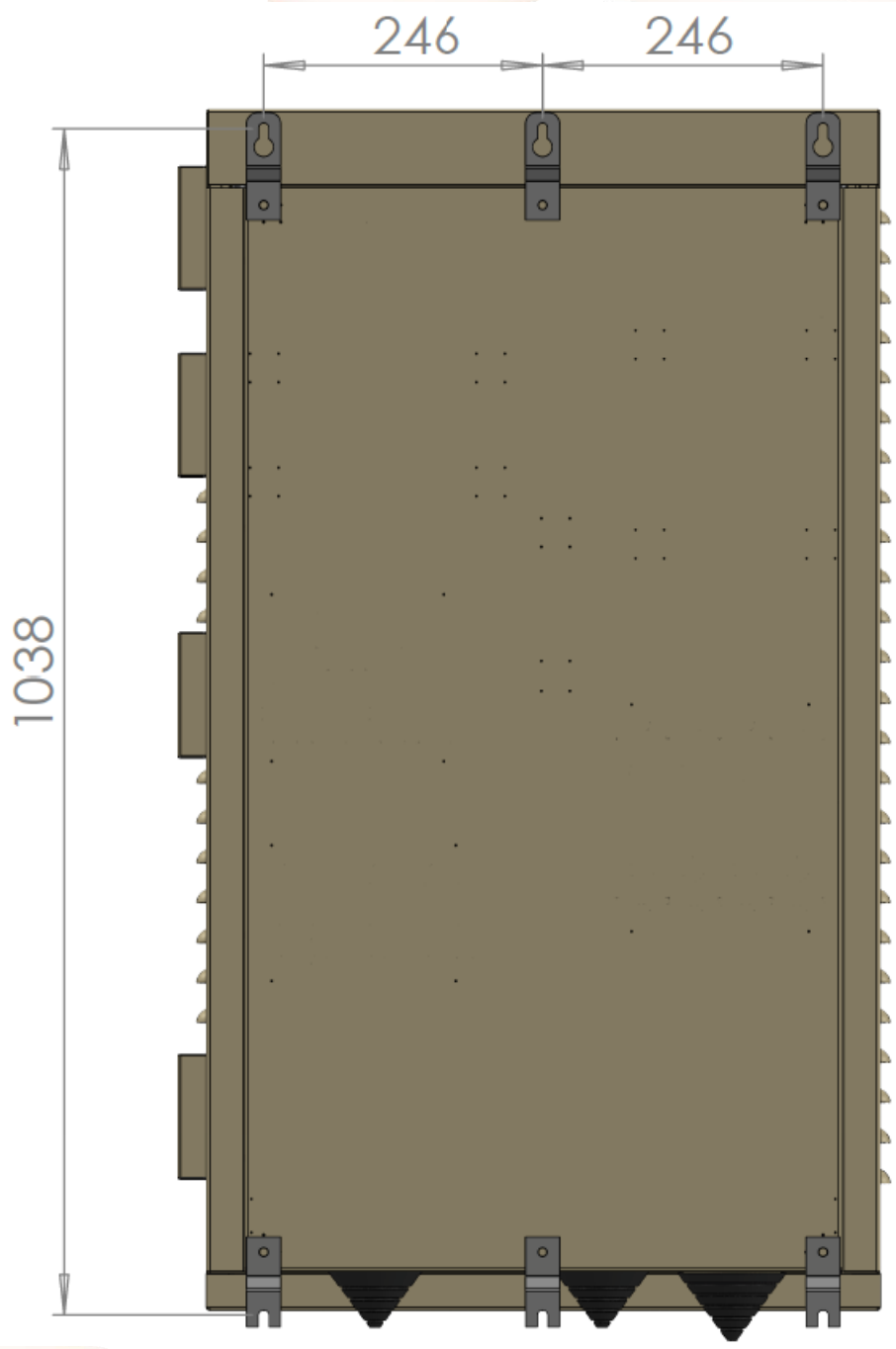
Drawing No. 3.2: Layout Drawing of 200/250A CT-Meterbox with Steel Enclosure with Main Door Opened



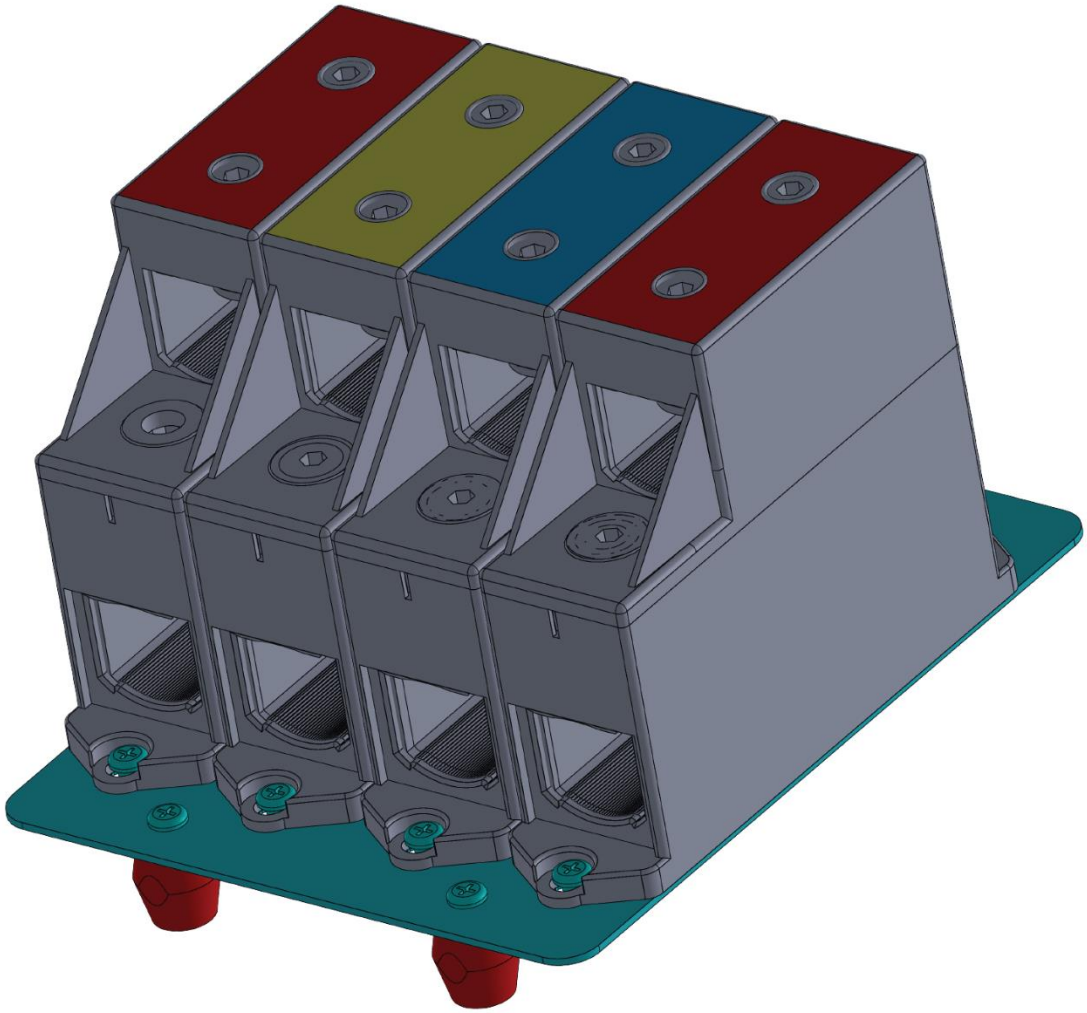
Drawing No. 3.3: Perspective Drawing of 200/250A CT-Meterbox with Steel Enclosure with Main and Inner Door Opened



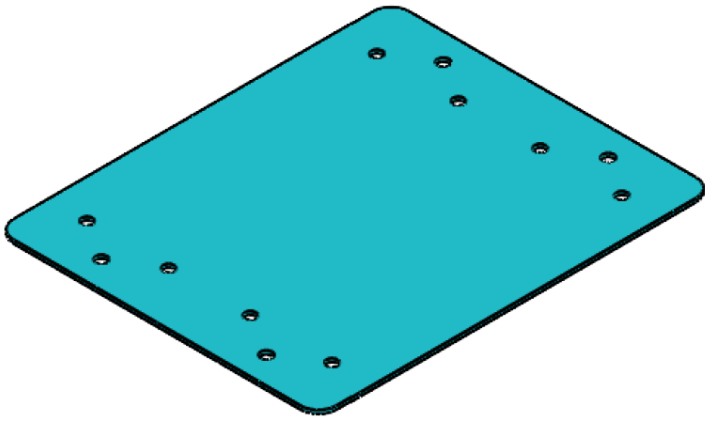
Drawing No. 3.4: Perspective Drawings (Front and Bottom View) of the Removable Bottom of a 200/250A CT Meterbox with Steel Enclosure

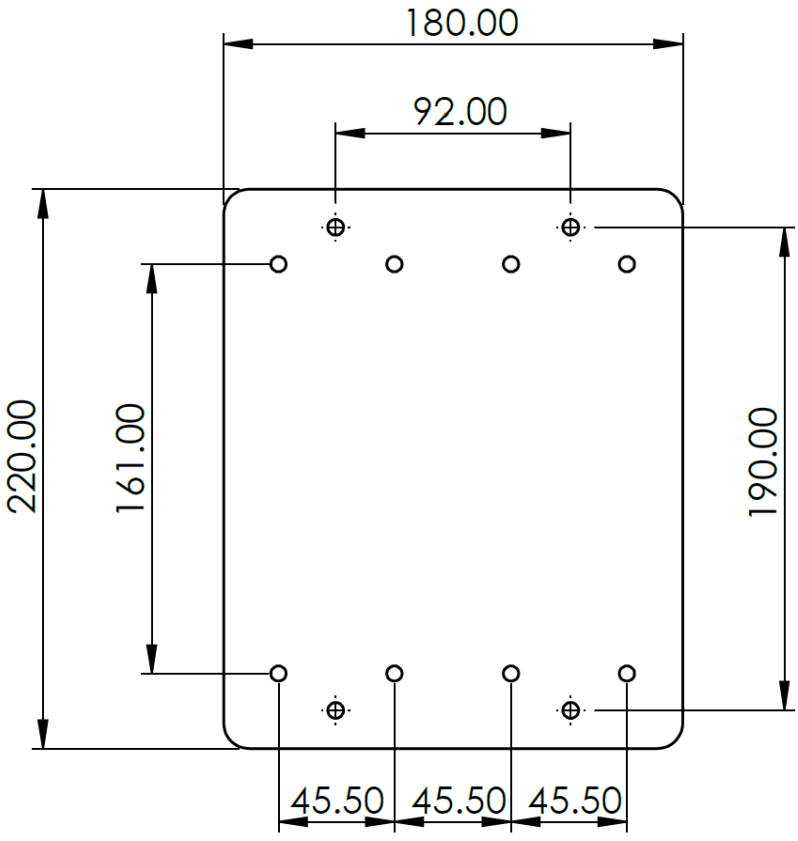


Drawing No. 3.5: Enclosure Rear View Drawing Showing Details of the Wall-Mounting Brackets for 200/250A CT-Meterbox with Steel Enclosure

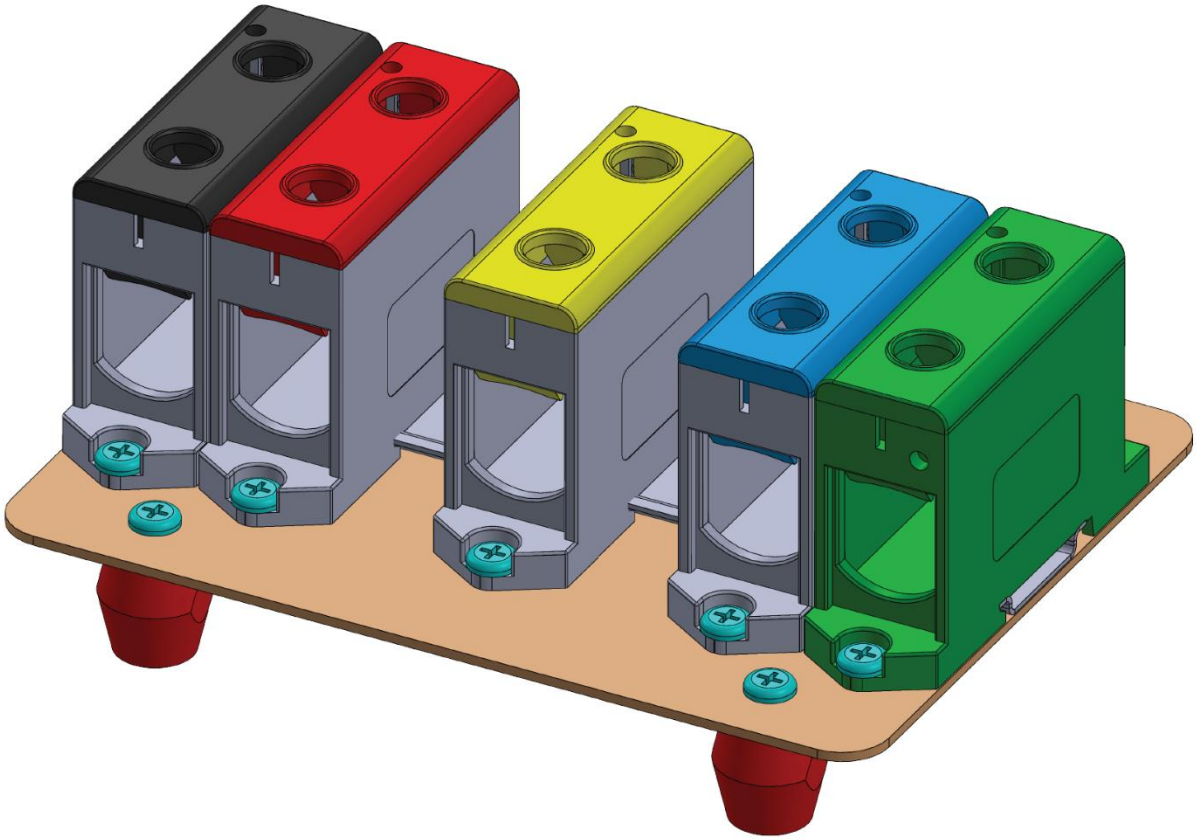


Drawing No. 3.6: Perspective Drawing of Incoming (SEC) Terminal Block Assembly for 200/250A CT-Meterbox with Steel Enclosure (Two-Level Cable Entry on Incoming Side)

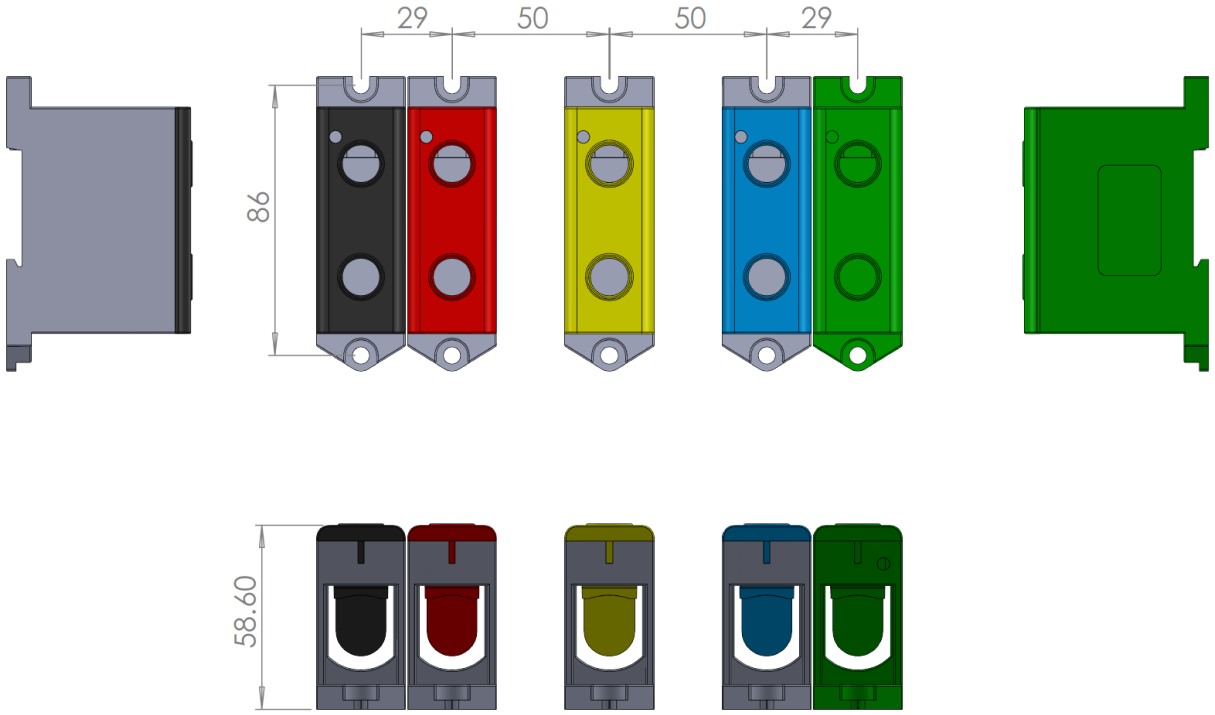




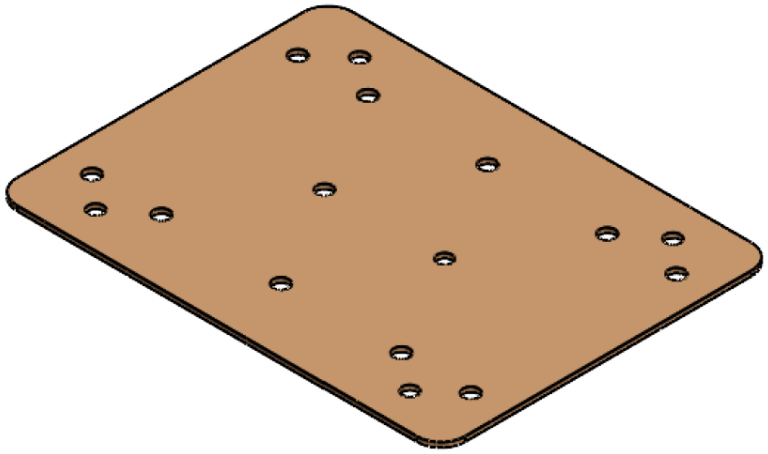
Drawing No. 3.7: Detail Drawing of Incoming (SEC) Terminal Block 2.0 mm Stainless Steel Mounting Plate for 200/250A CT-Meterbox with Steel Enclosure

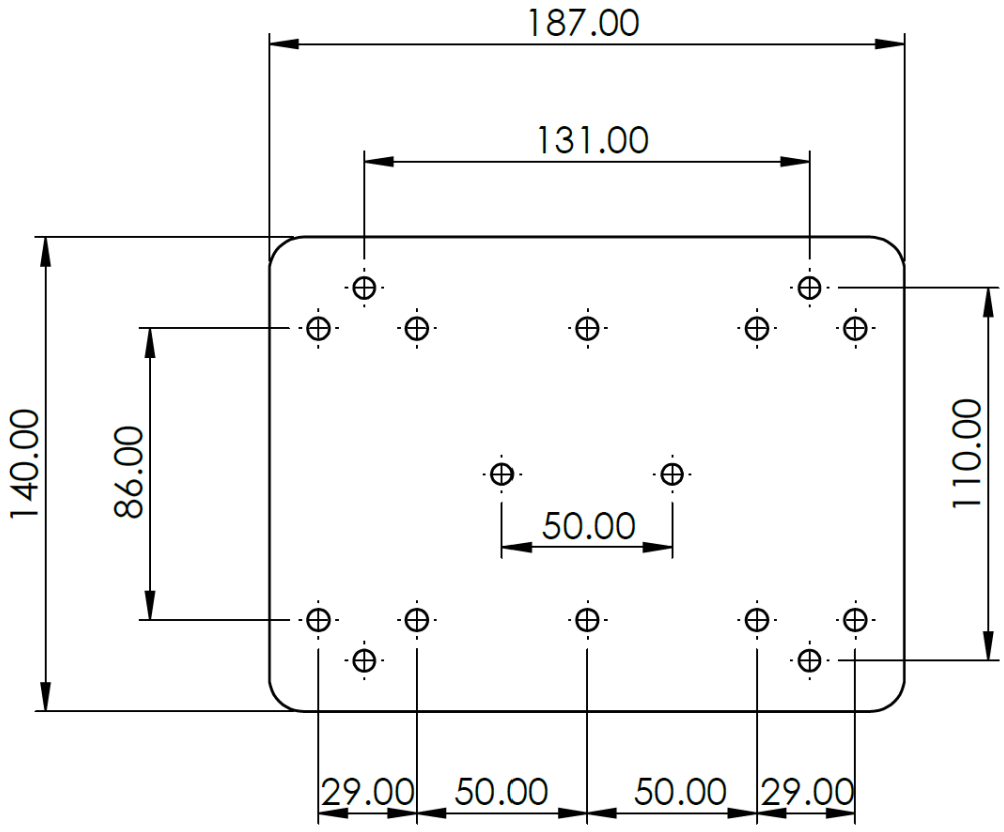


Drawing No. 3.8: Perspective Drawing of Outgoing (Consumer) Terminal Block Assembly for 200/250A CT-Meterbox with Steel Enclosure

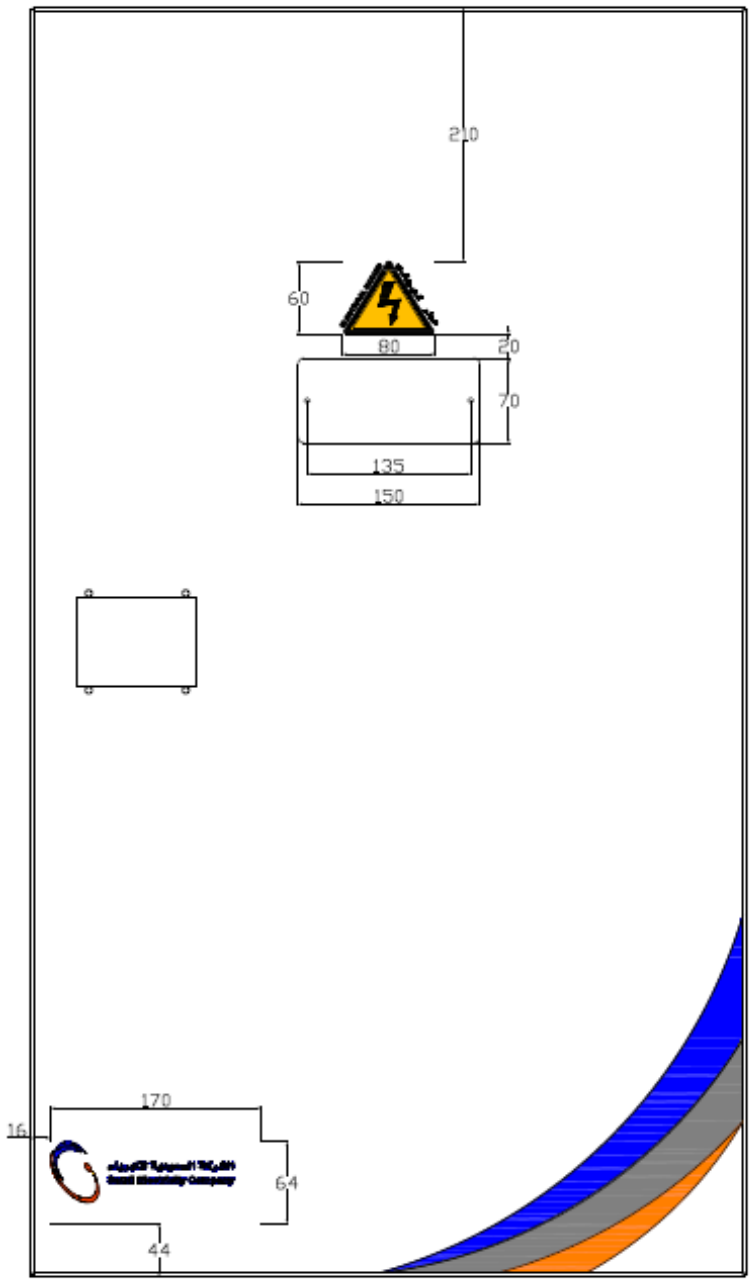


Drawing No. 3.9: Layout Drawing of Outgoing (Consumer) Terminal Block Assembly for 200/250A CT-Meterbox with Steel Enclosure

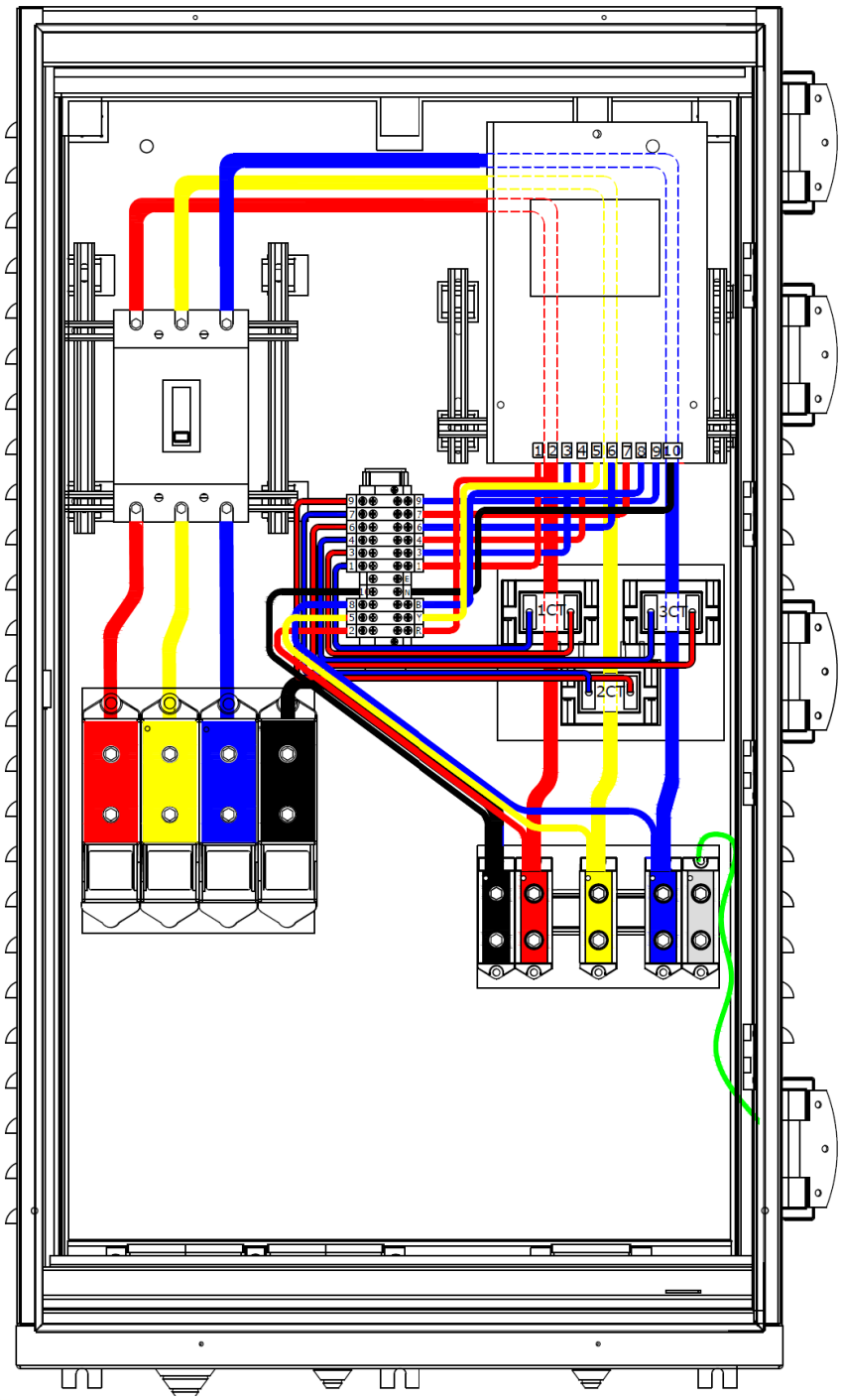




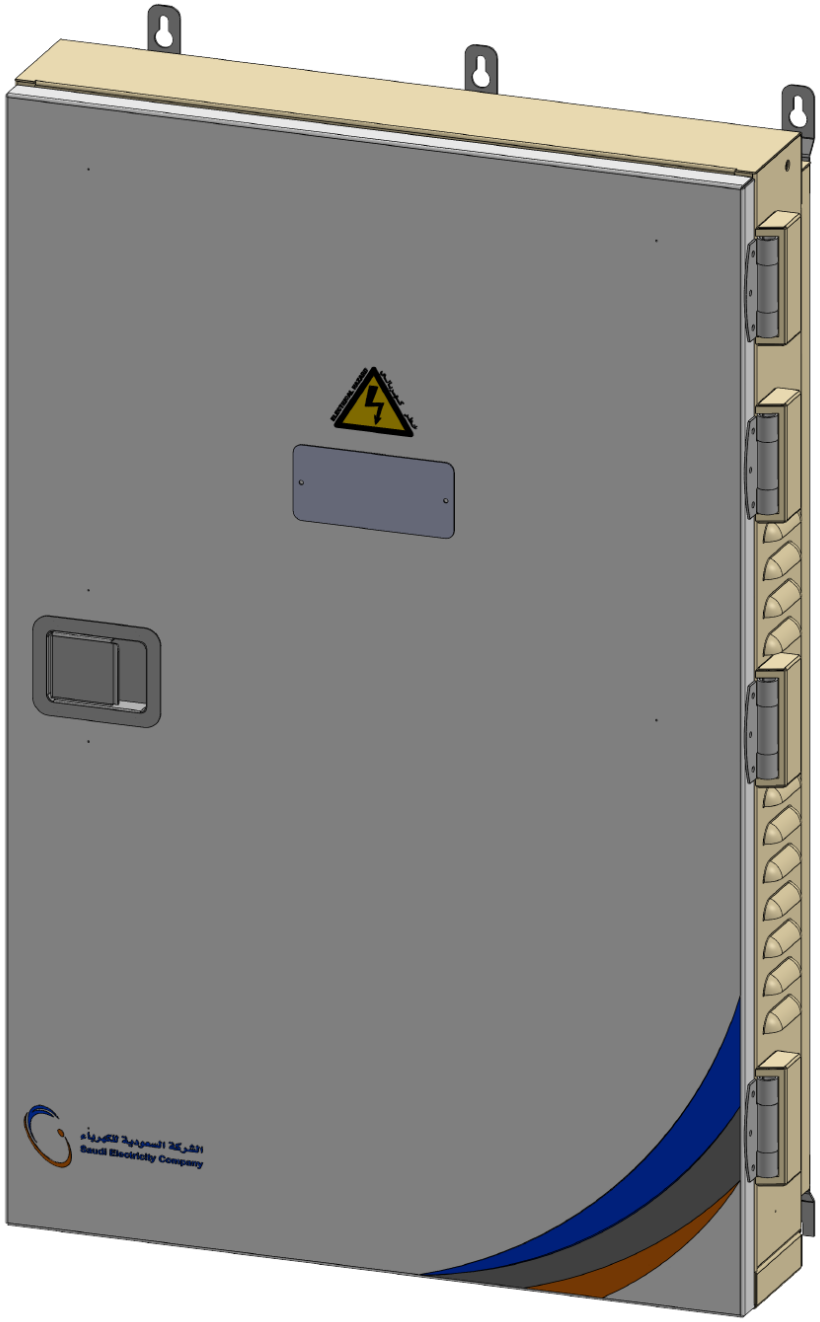
Drawing No. 3.10: Detail Drawing of Outgoing (Consumer) Terminal Block 2.0 mm Stainless Steel Mounting Plate for 200/250A CT-Meterbox with Steel Enclosure



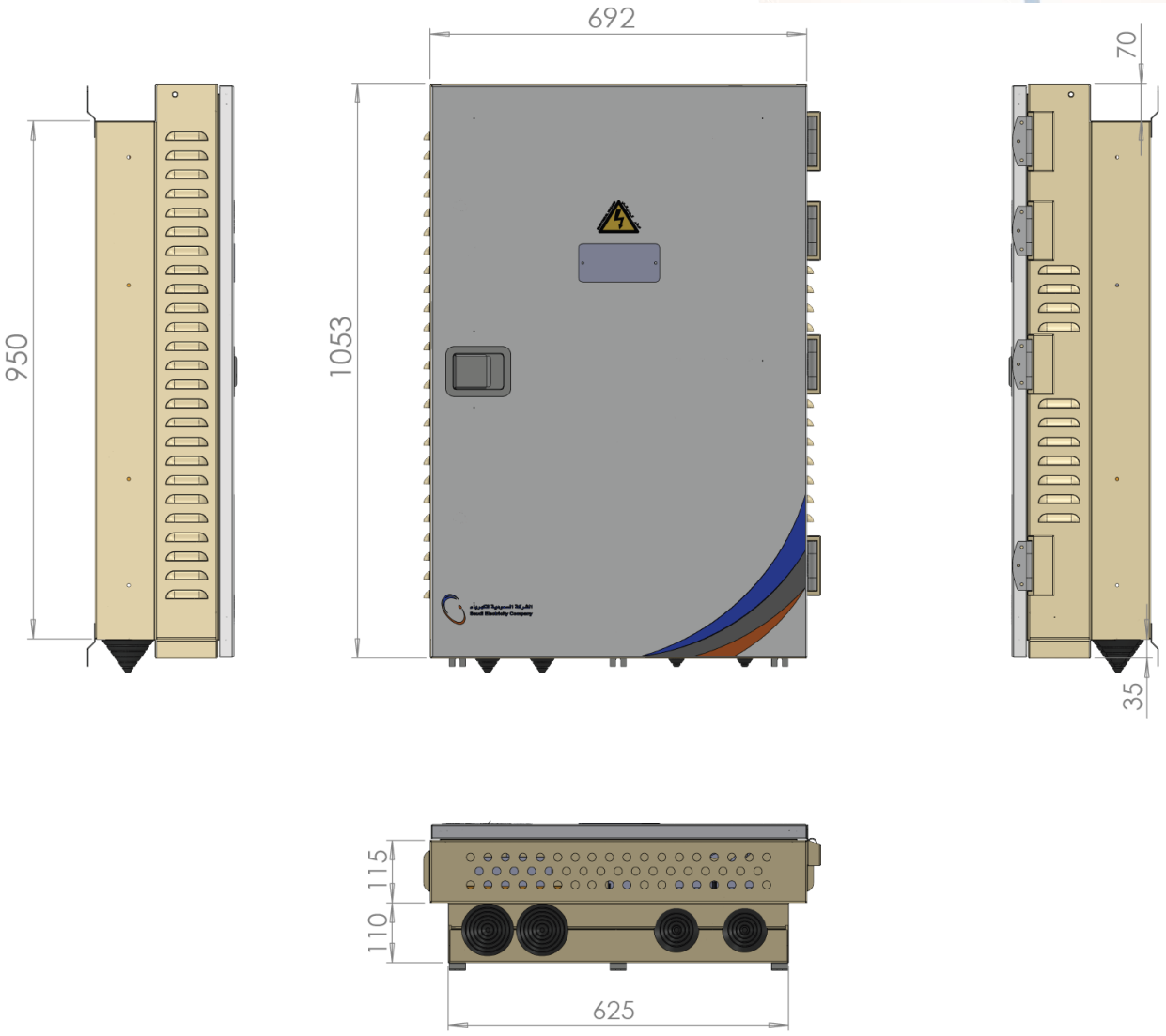
Drawing No. 3.11: Layout Drawing Showing the Exact Positioning of SEC Logo and Danger Sign for 200/250A CT-Meterbox with Steel Enclosure



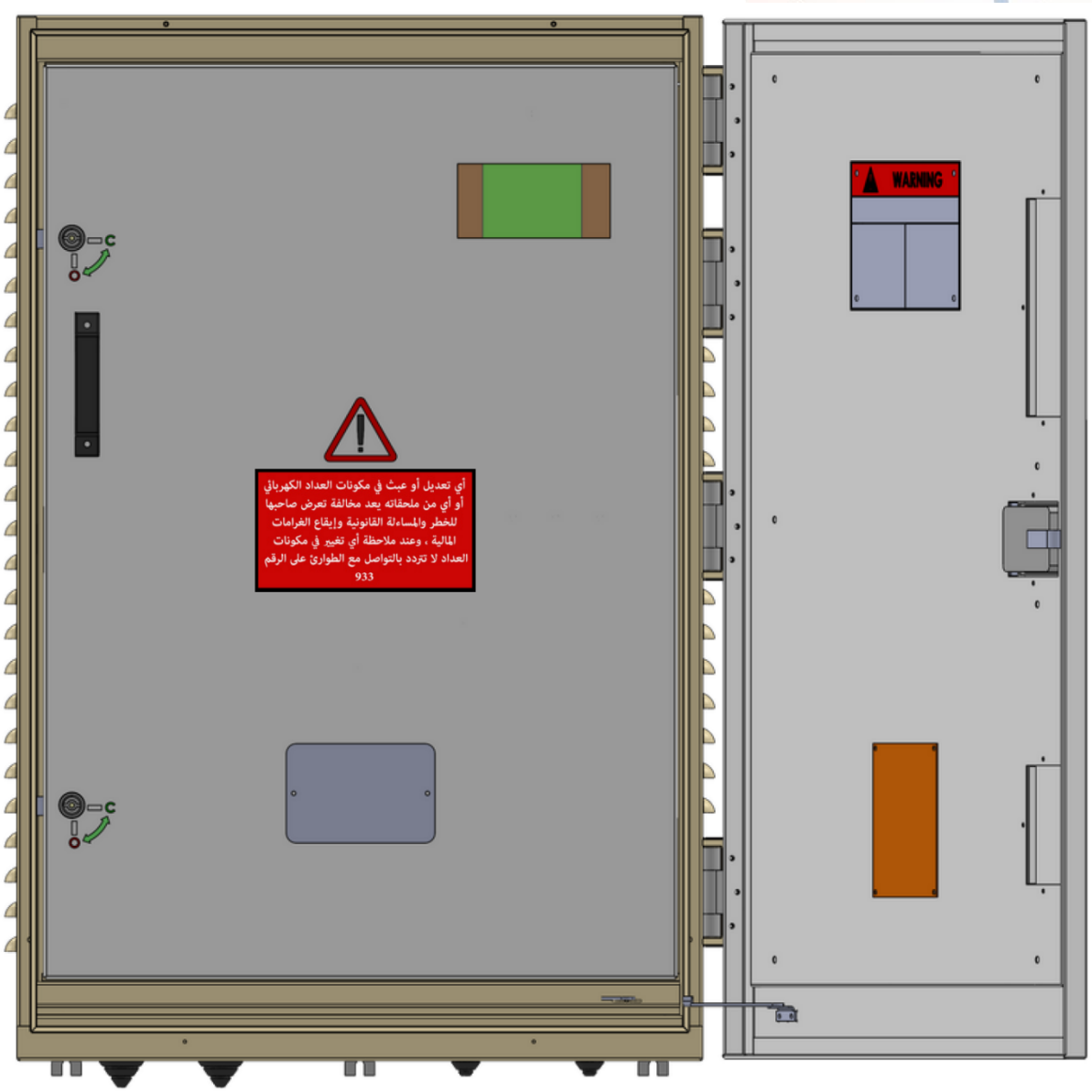
Drawing No. 3.12: Internal Wiring Configuration for 200/250A CT-Meterbox with Steel Enclosure



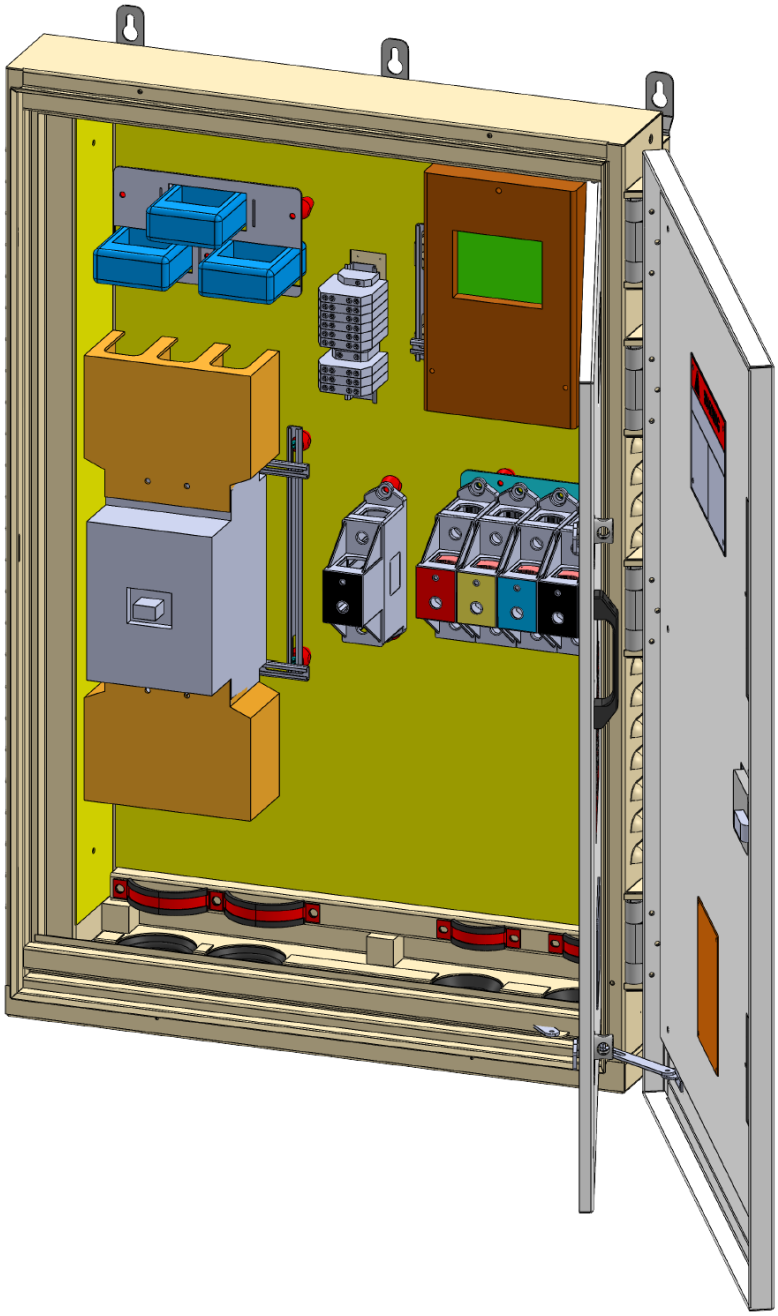
Drawing No. 4.0: Perspective Drawing of a 300/400A and 500/600ACT-Meterboxes with Steel Enclosures



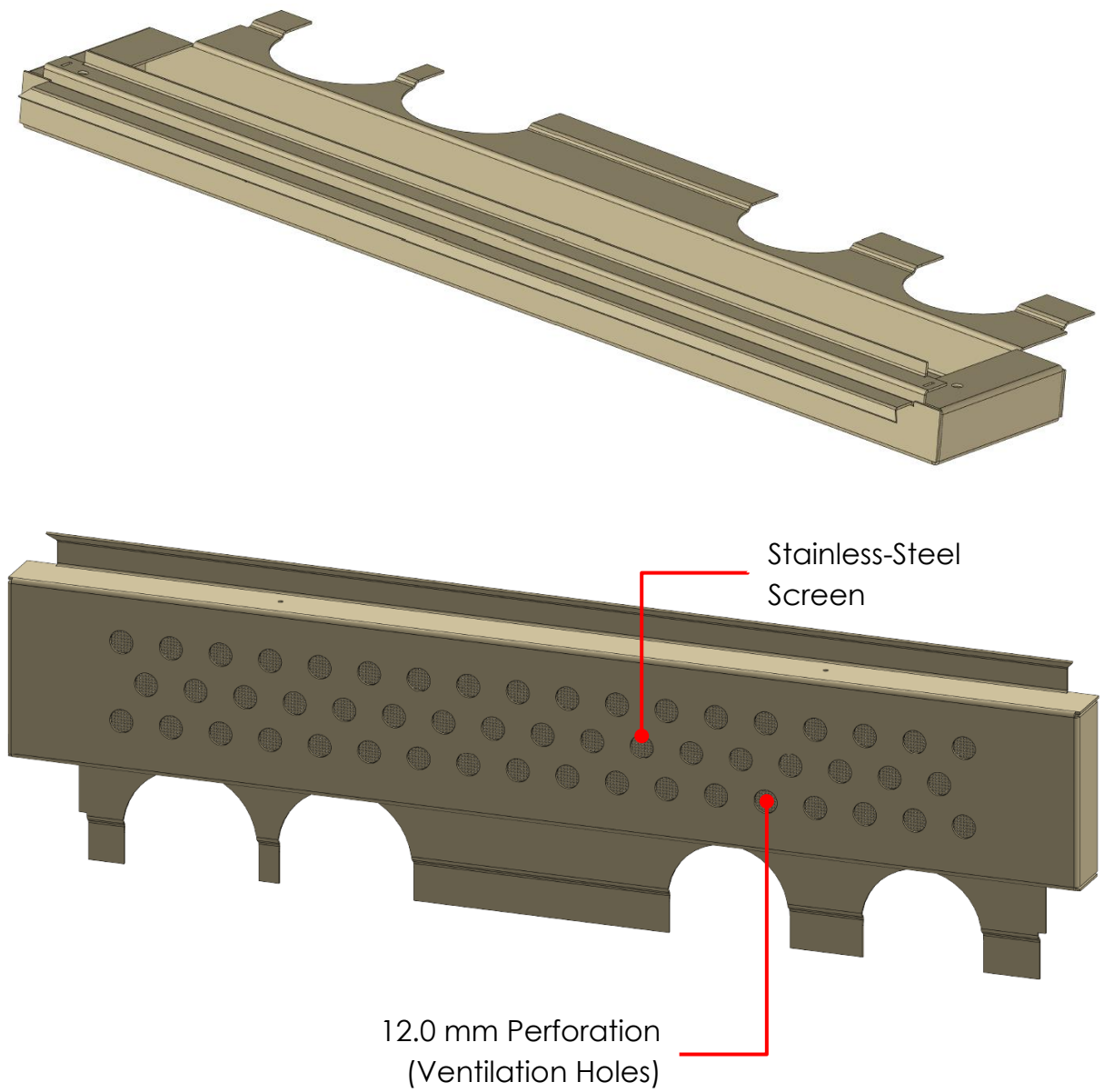
Drawing No. 4.1: Layout Drawing of 300/400A and 500/600A CT-Meterboxes with Steel Enclosures Showing the Maximum Allowable Dimensions



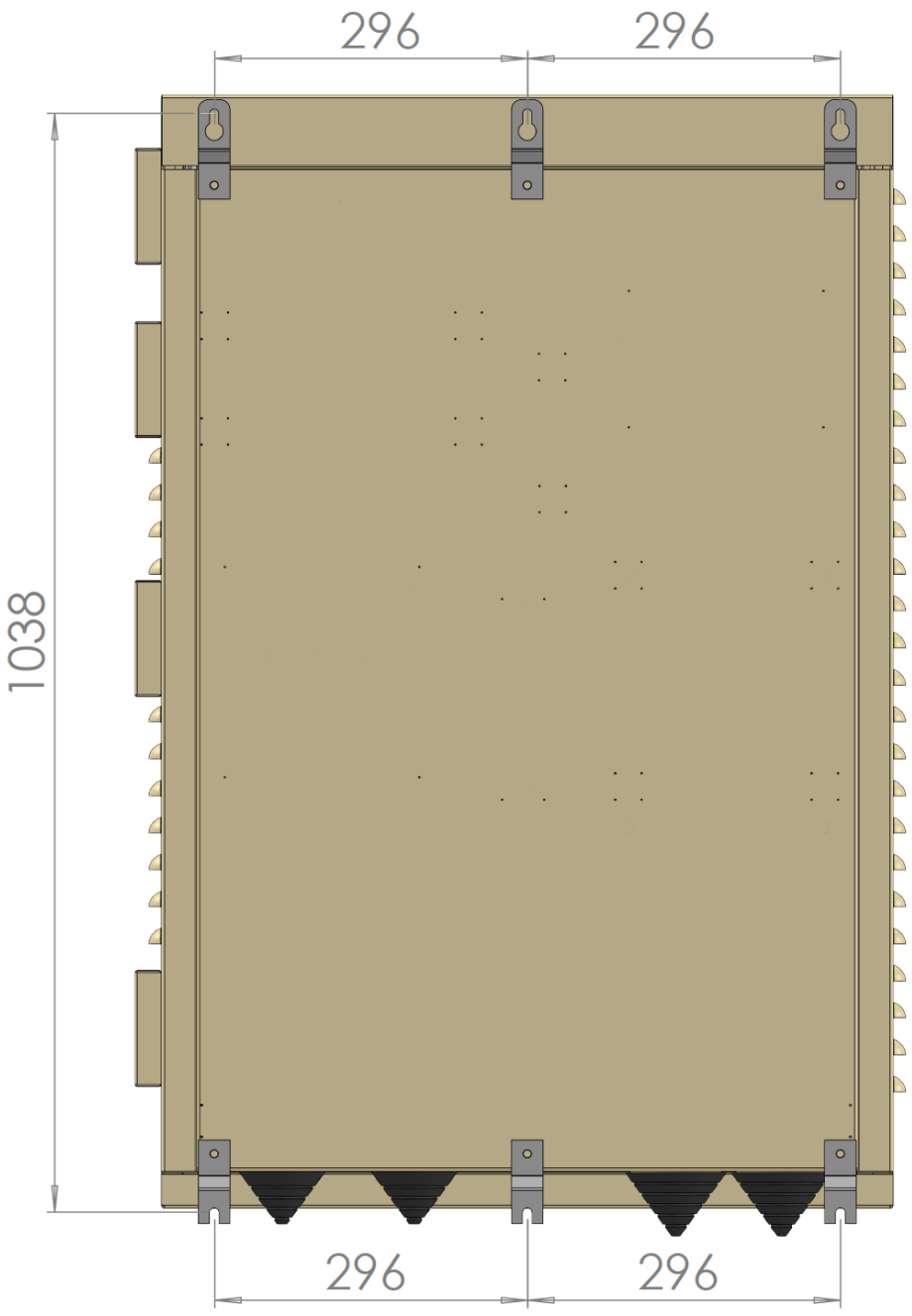
Drawing No. 4.2: Layout Drawing of 300/400A and 500/600A CT-Meterboxes with Steel Enclosures with Main Door Opened



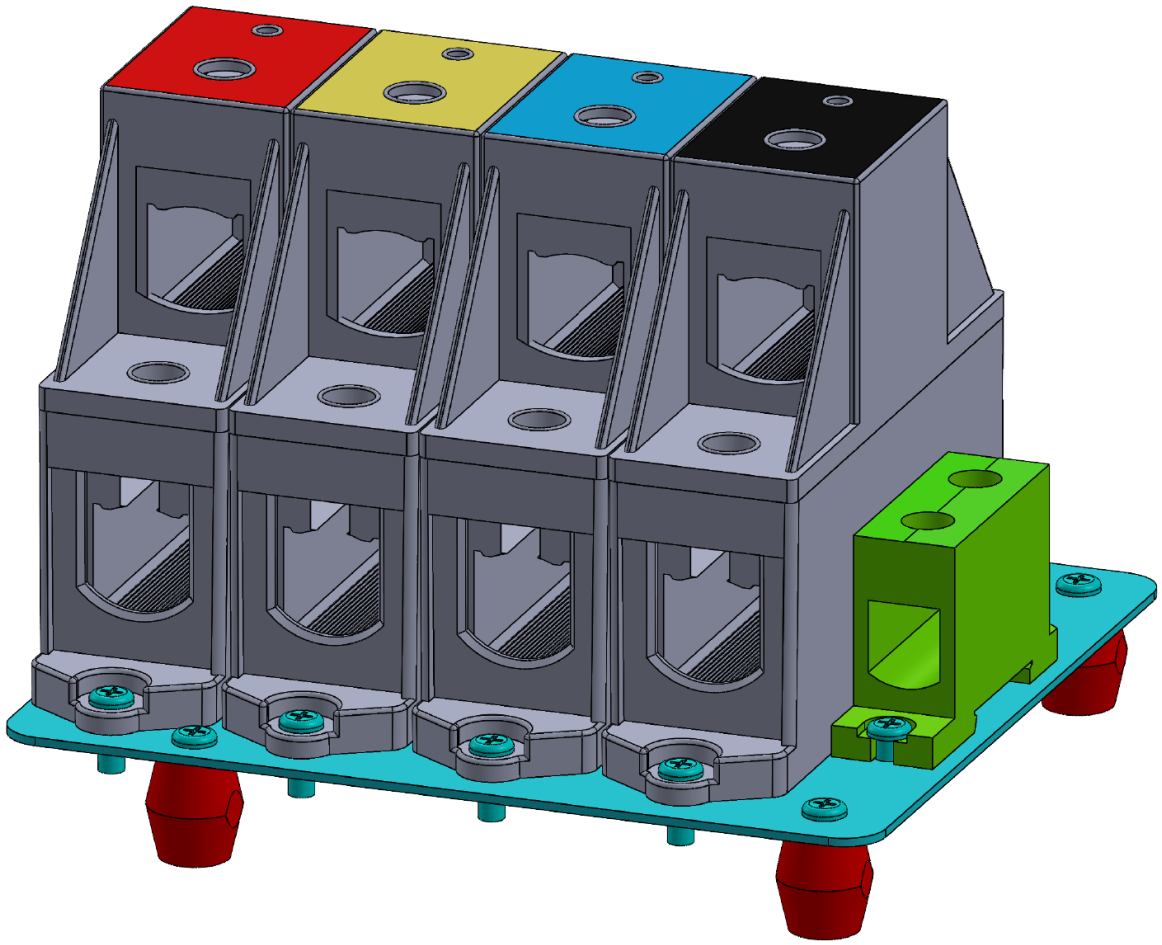
Drawing No. 4.3: Perspective Drawing of 300/400A and 500/600A CT-Meterboxes with Steel Enclosures with Main and Inner Door Opened



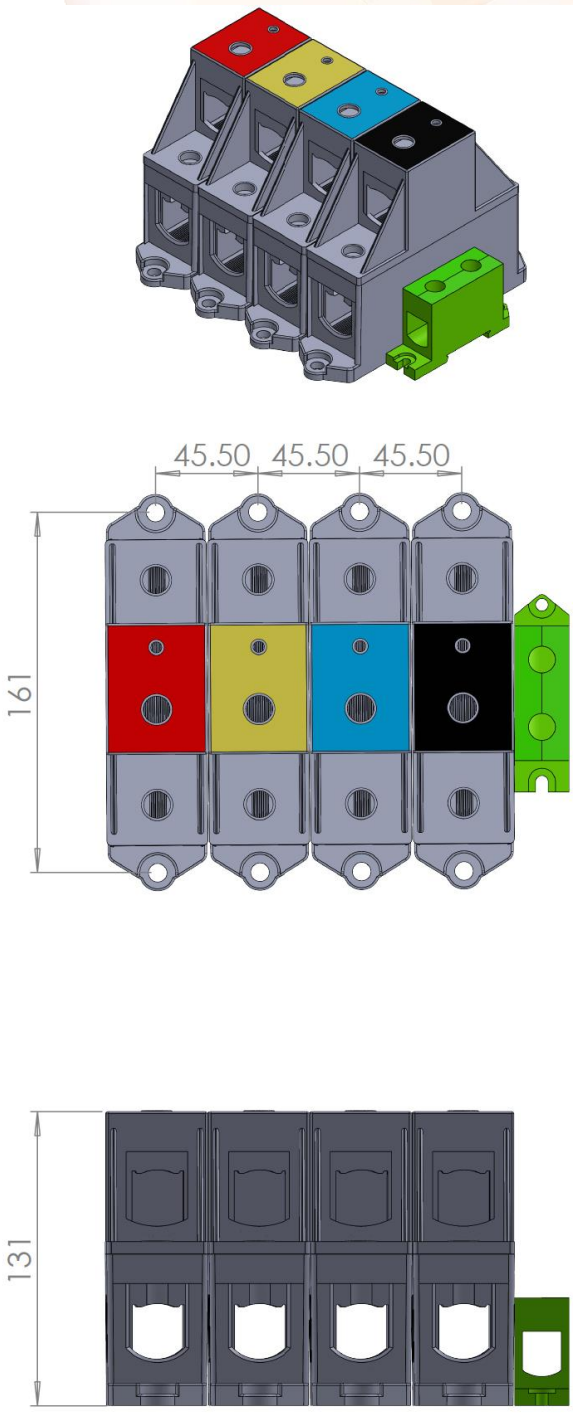
Drawing No. 4.4: Perspective Drawings (Front and Bottom View) of the Removable Bottom of a 300/400A and 500/600A CT-Meterboxes with Steel Enclosure



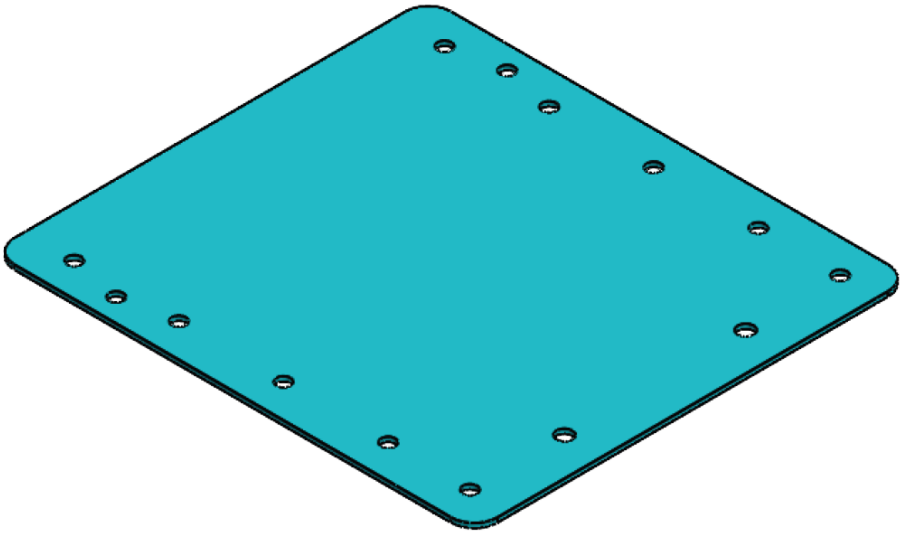
Drawing No. 4.5: Enclosure Rear View Drawing Showing Details of the Wall-Mounting Brackets for 300/400A and 500/600A CT-Meterboxes with Steel Enclosures

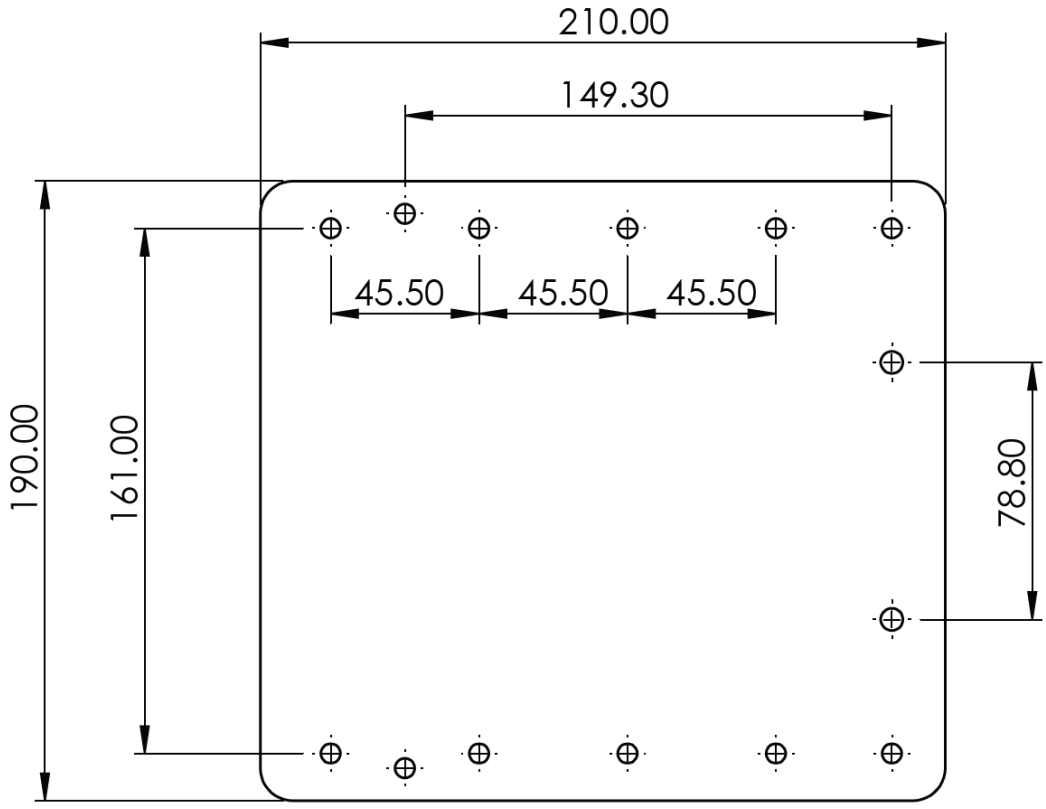


Drawing No. 4.6: Perspective Drawing of Outgoing (Consumer) Terminal Block Assembly for 300/400A and 500/600A CT-Meterboxes with Steel Enclosures

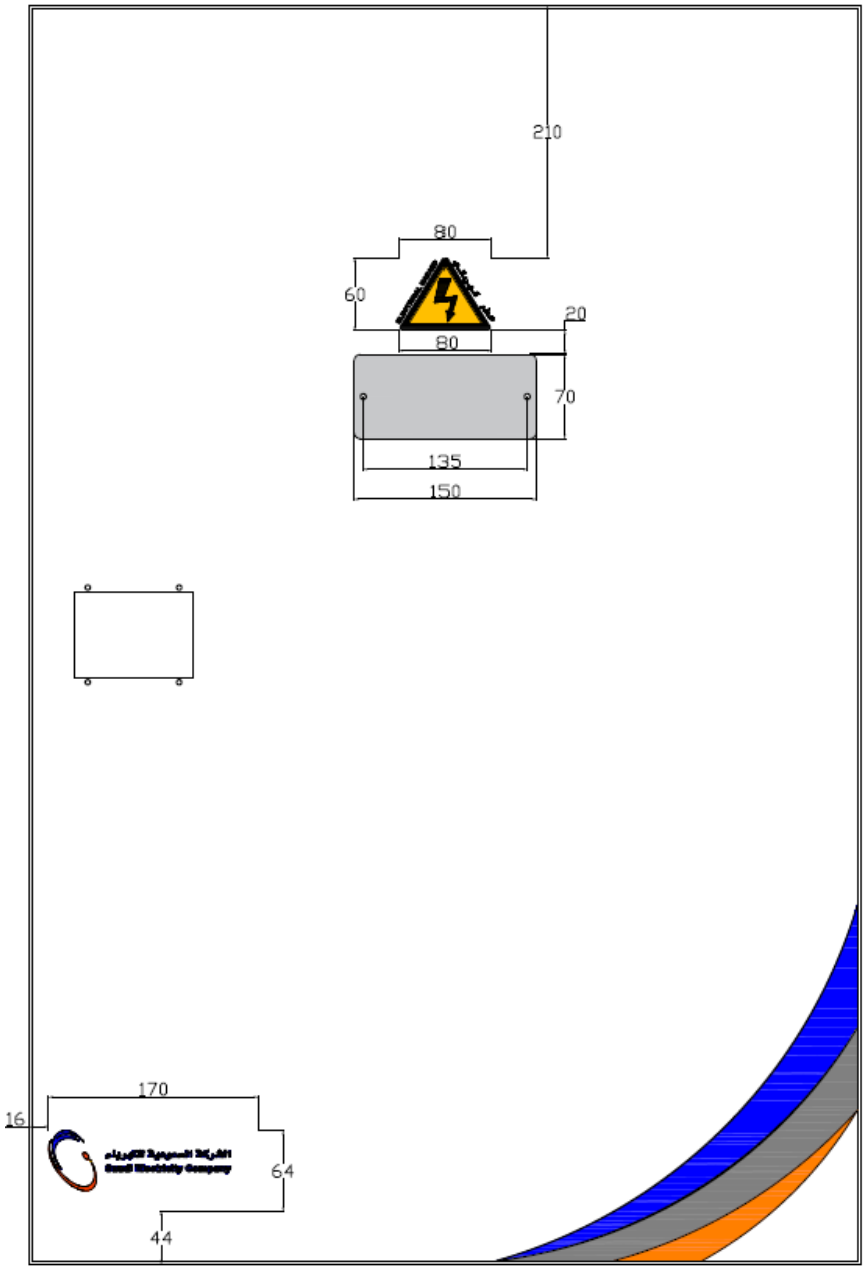


Drawing No. 4.7: Layout Drawing of Outgoing (Consumer) Terminal Block Assembly for 300/400A and 500/600A CT-Meterboxes with Steel Enclosures

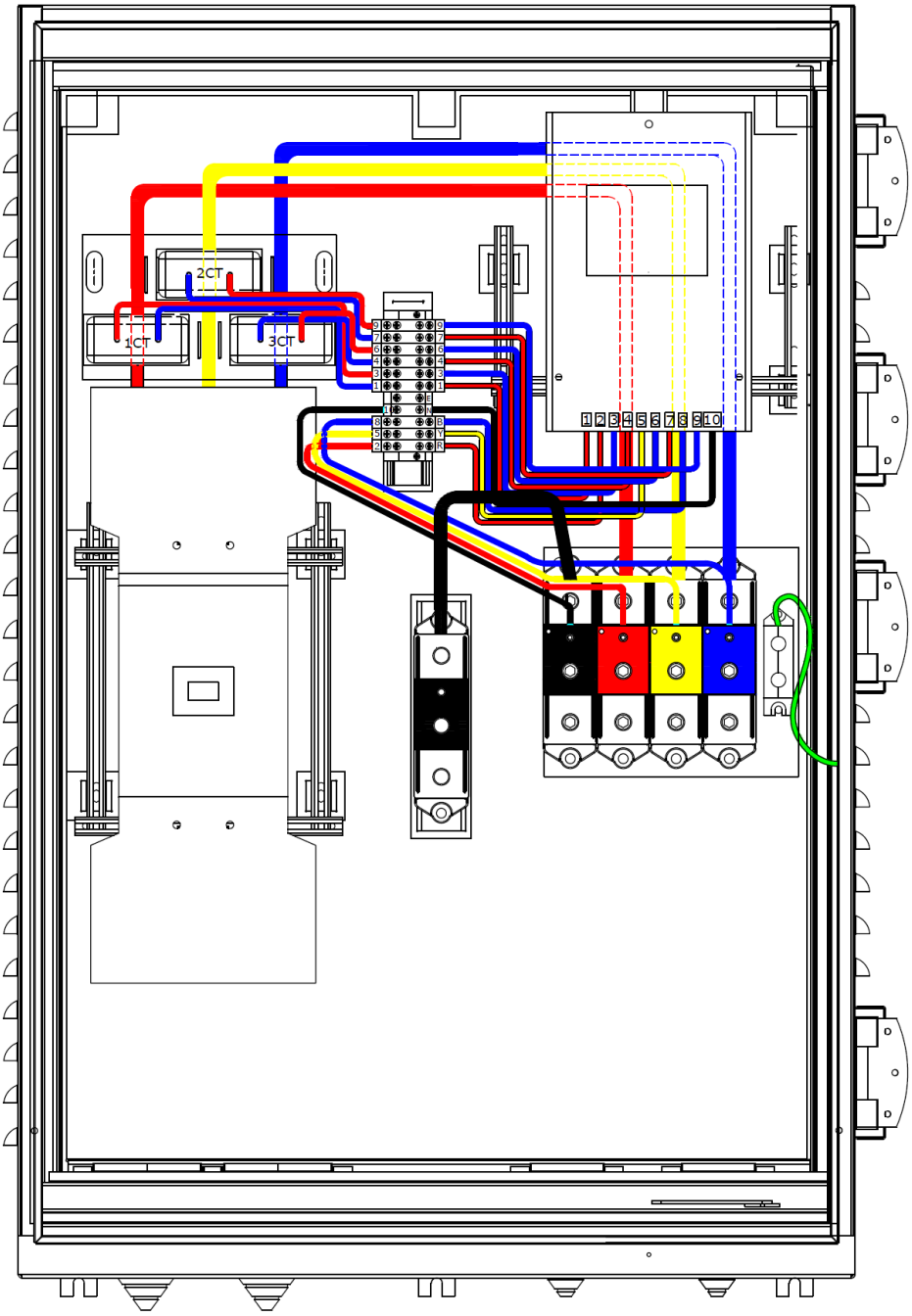




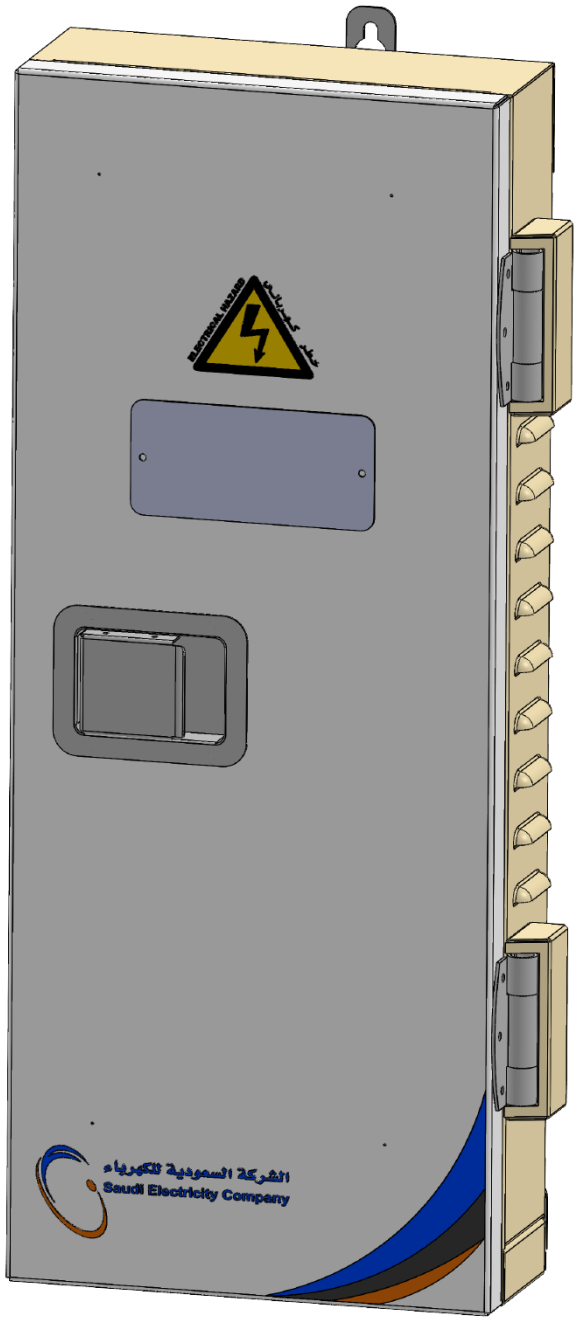
Drawing No. 4.8: Detail Drawing of Outgoing (Consumer) Terminal Block 2.0 mm Stainless Steel Mounting Plate for 300/400A and 500/600A CT-Meterboxes with Steel Enclosures



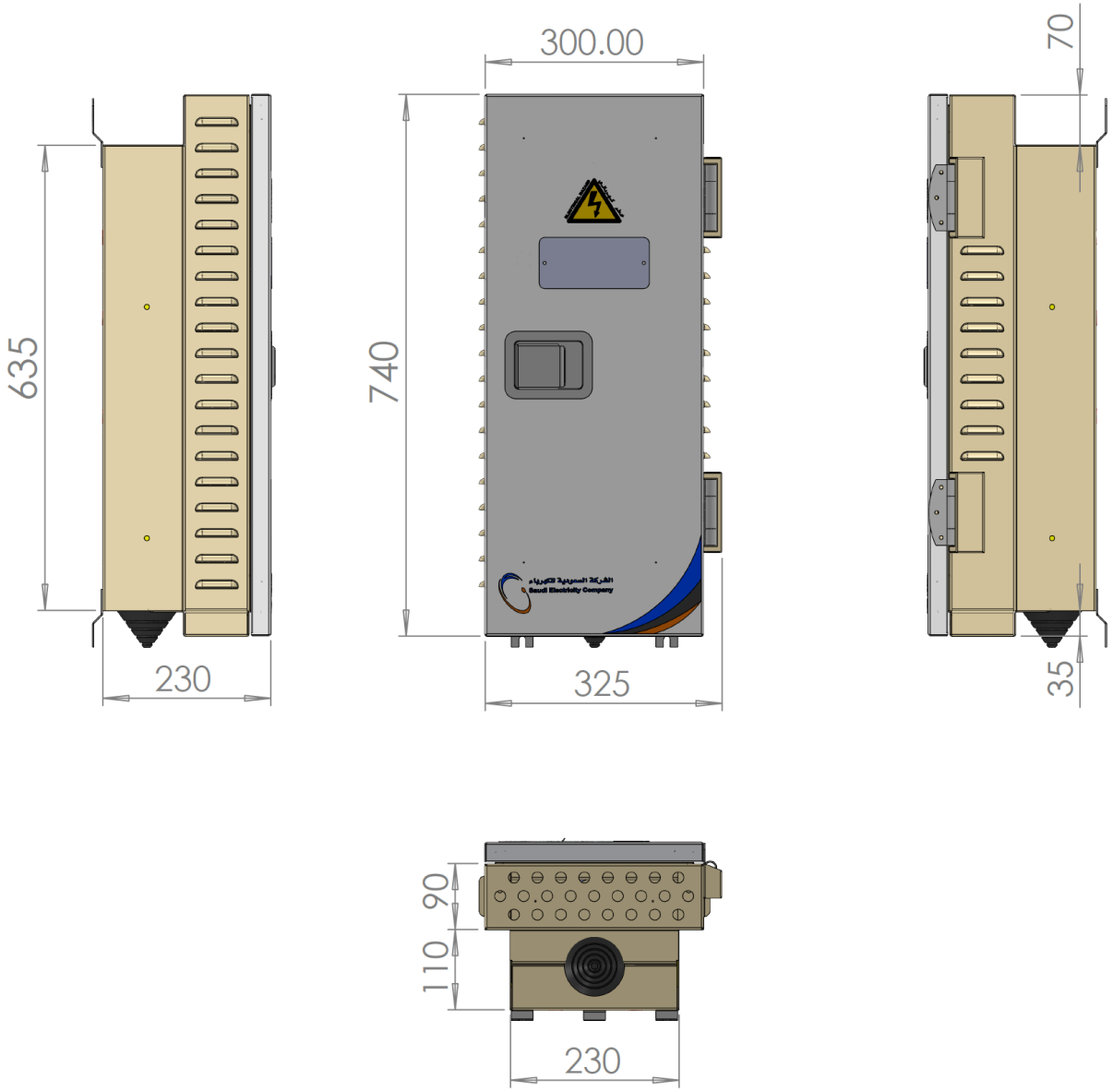
Drawing No. 4.9: Layout Drawing Showing the Exact Positioning of SEC Logo and Danger Sign for 300/400A and 500/600 CT-Meterboxes with Steel Enclosures



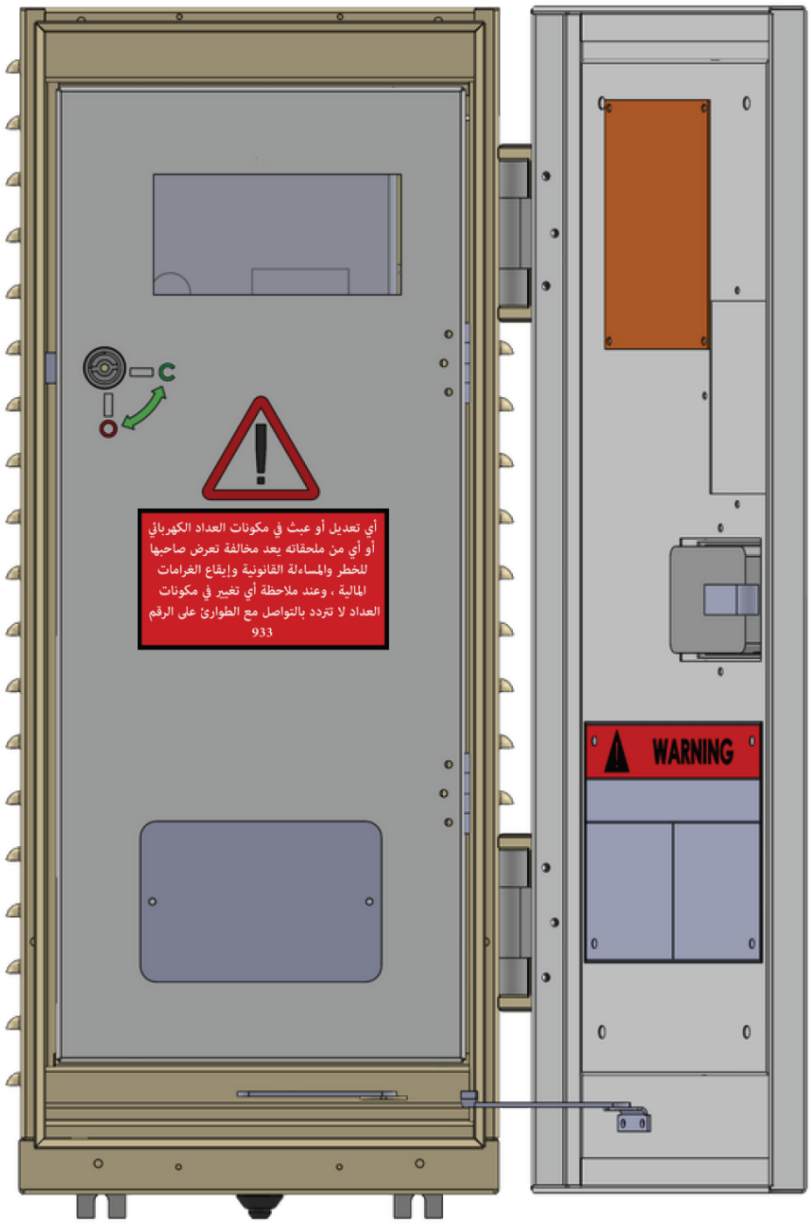
Drawing No. 4.10: Internal Wiring Configuration for 300/400A and 500/600A CT-Meterboxes with Steel Enclosures Drawing



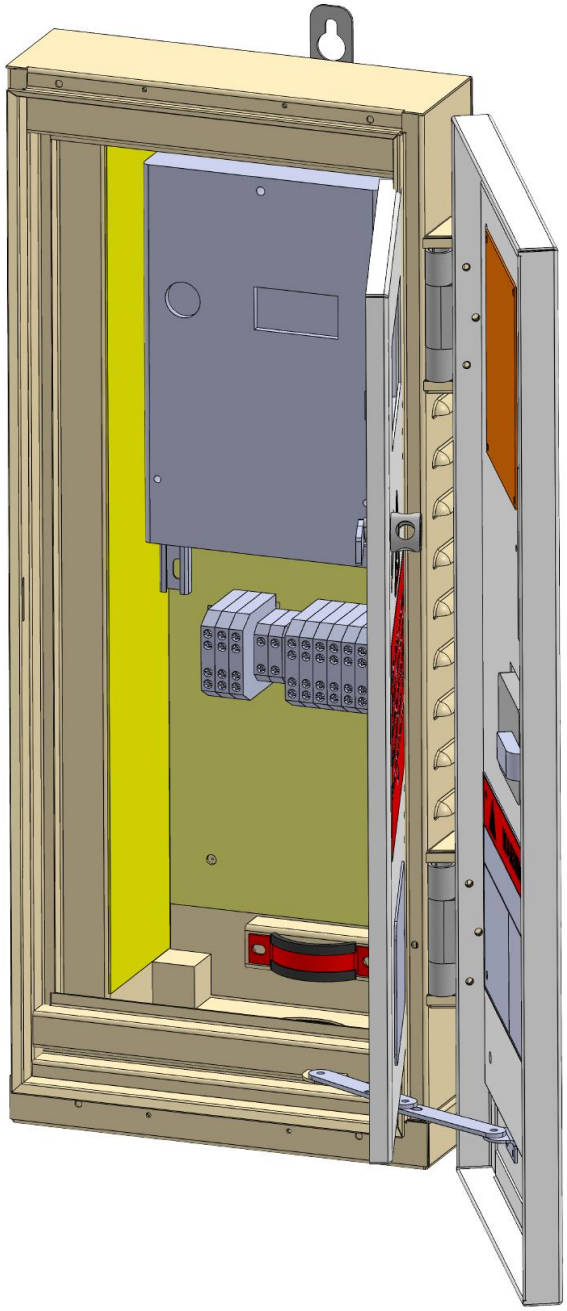
No. 5.0: Perspective Drawing of a Remote Meterbox with Steel Enclosure



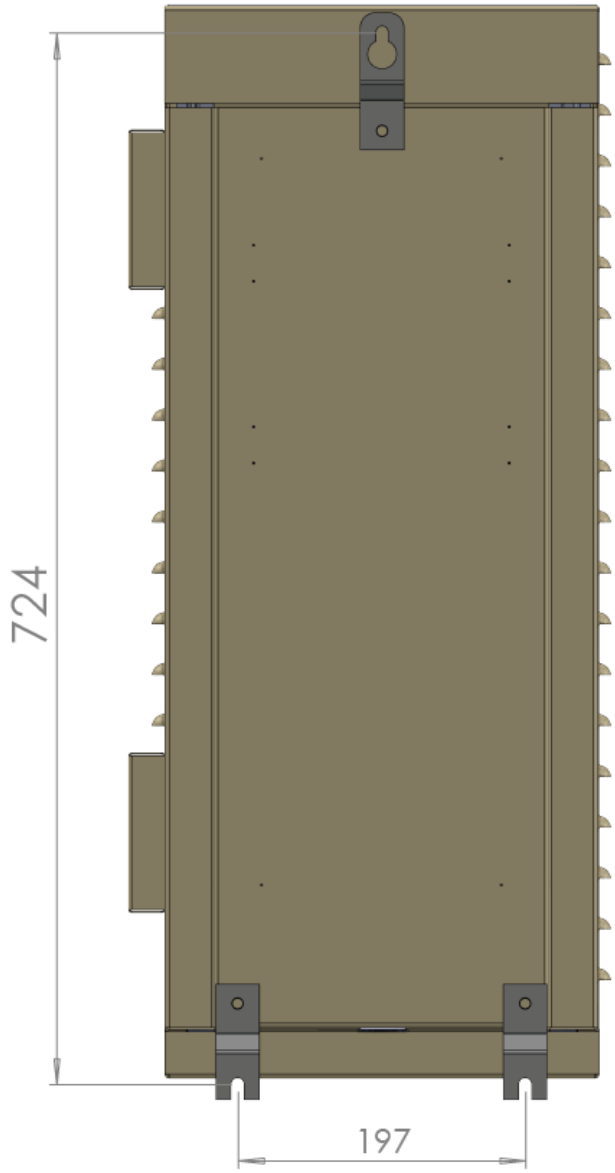
Drawing No. 5.1: Layout Drawing of Remote Meterbox with Steel Enclosure Showing the Maximum Allowable Dimensions



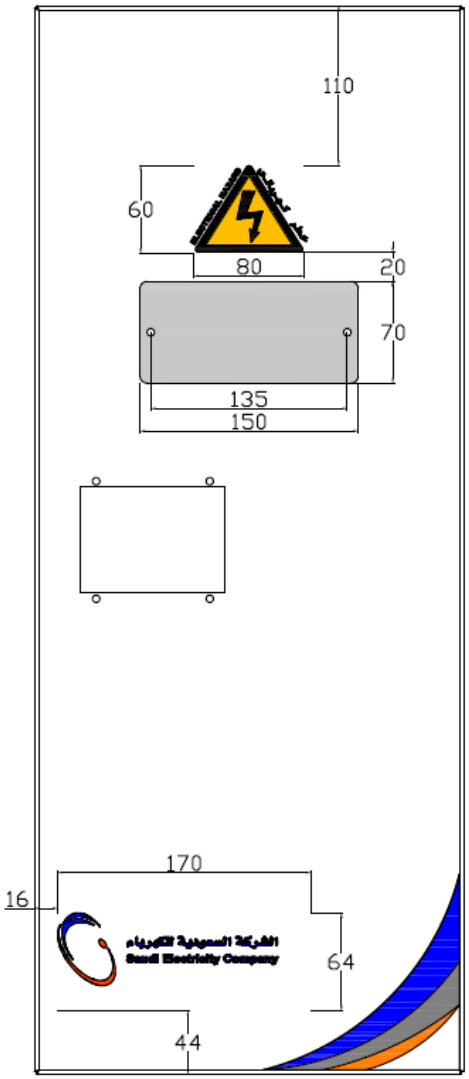
Drawing No. 5.2: Layout Drawing of Remote Meterbox with Steel Enclosure with Main Door Opened



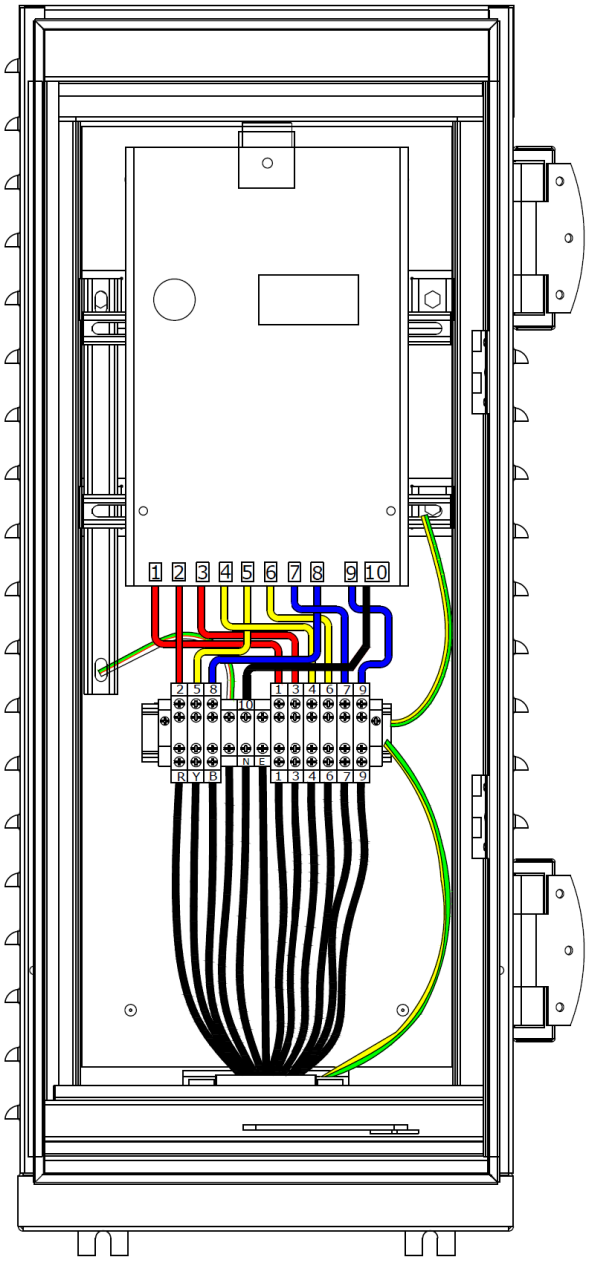
Drawing No. 5.3: Perspective Drawing of Remote Meterbox with Steel Enclosure with Main and Inner Door Opened



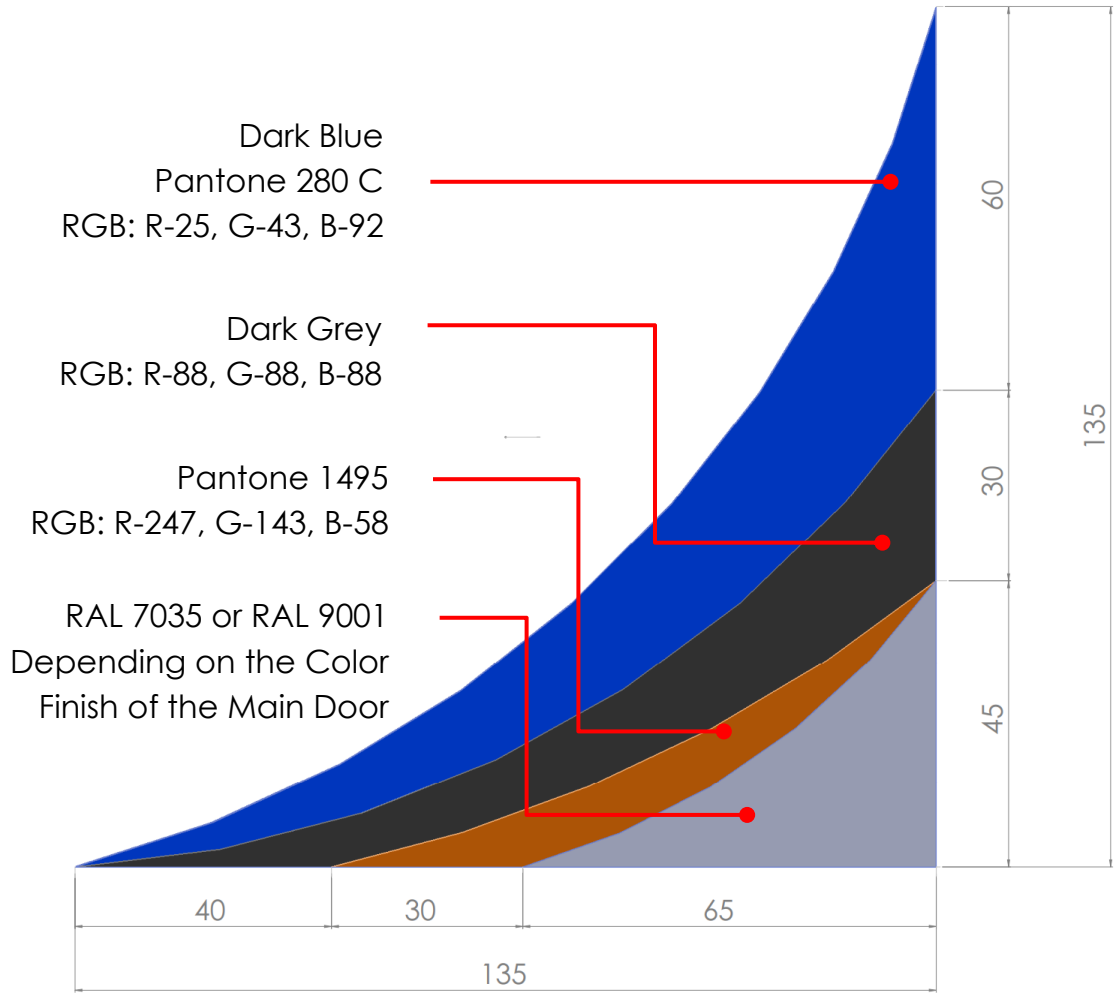
Drawing No. 5.4: Enclosure Rear View Drawing Showing Details of the Wall-Mounting Brackets for Remote Meterbox with Steel Enclosure



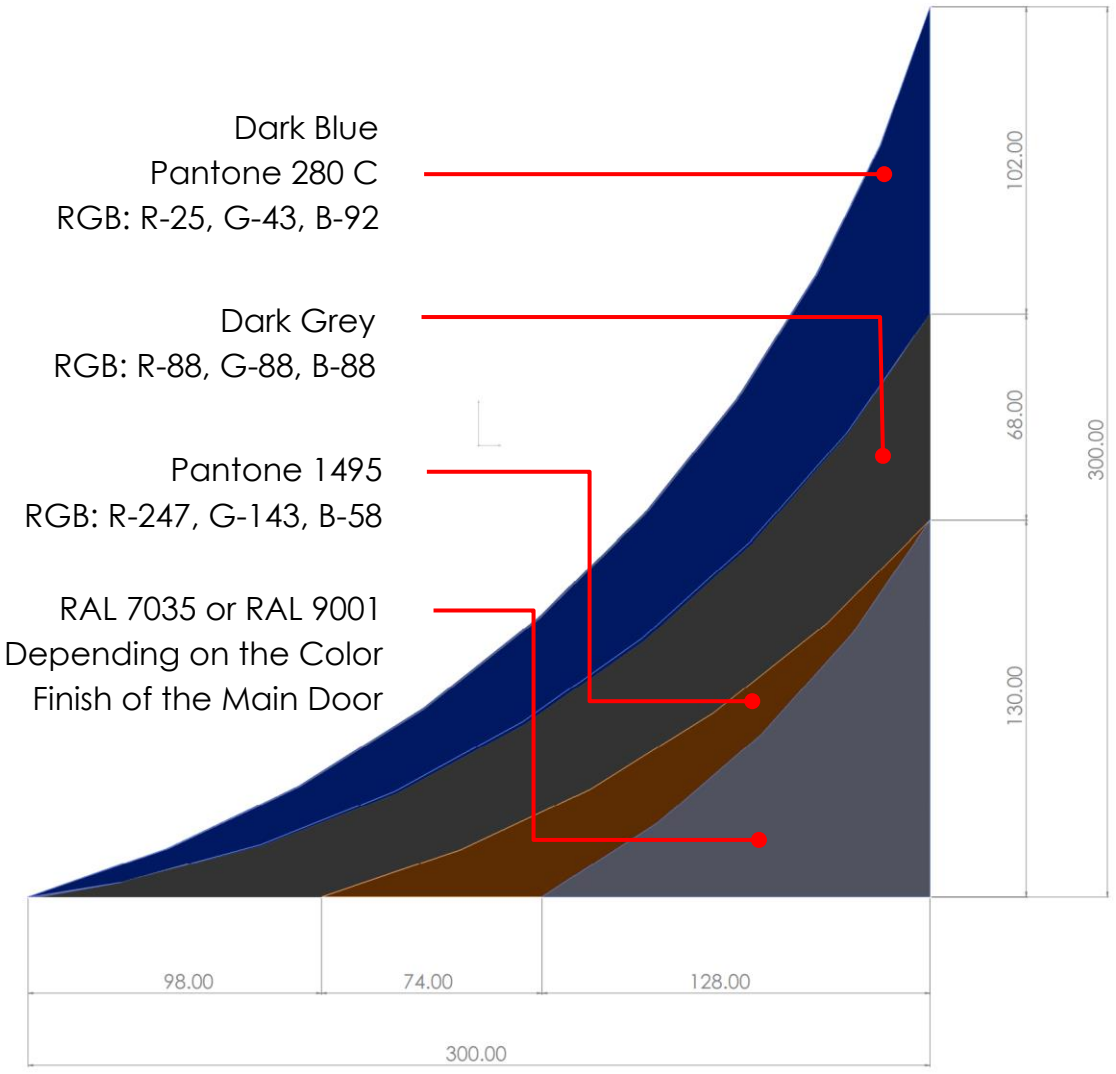
Drawing No. 5.5: Layout Drawing Showing the Exact Positioning of SEC Logo and Danger Sign for Remote Meterbox with Steel Enclosure



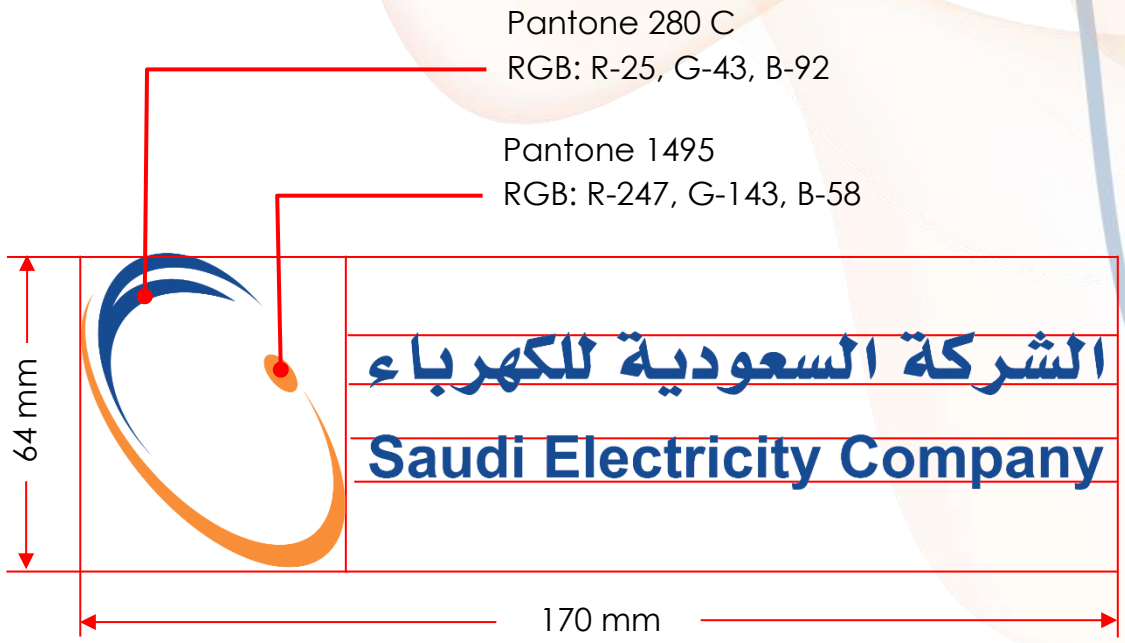
Drawing No. 5.6: Internal Wiring Configuration for Remote Meterbox with Steel Enclosure Drawing



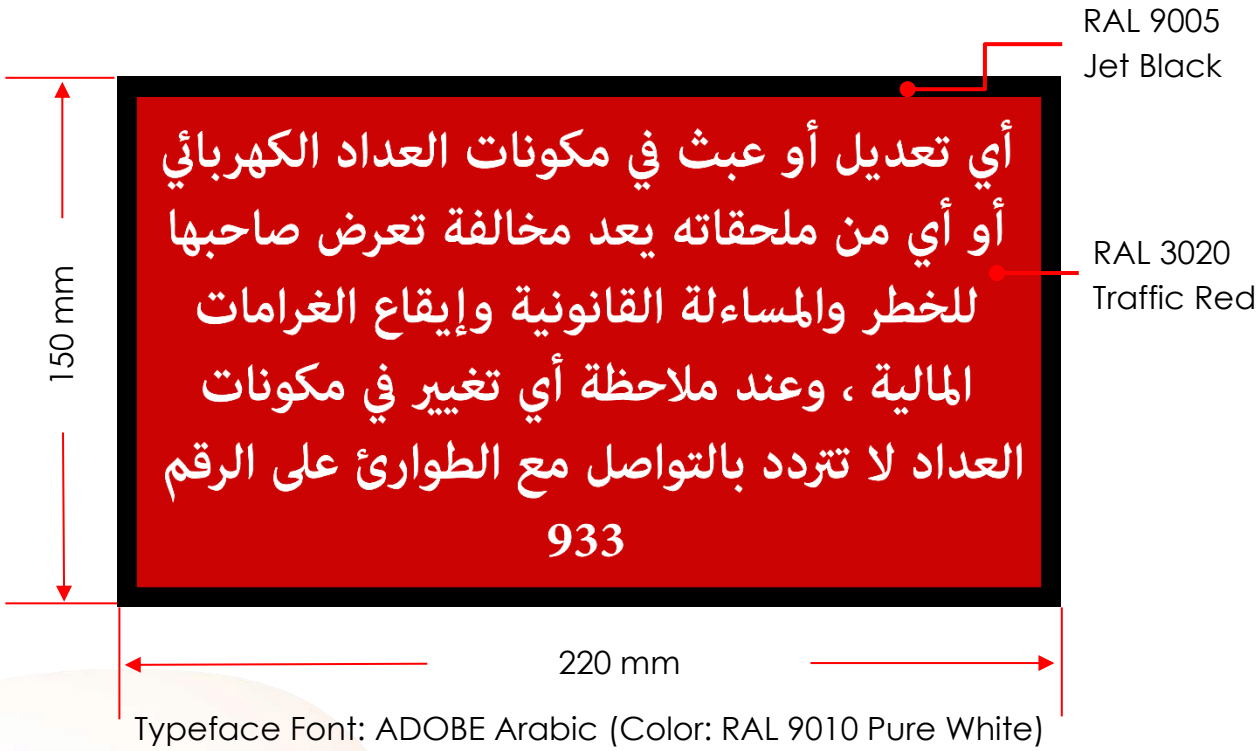
Drawing No. 6.0: Detail Drawing of SEC Standard Graphic Theme (SEC Branding) for Single and Remote Meterboxes with Steel Enclosures



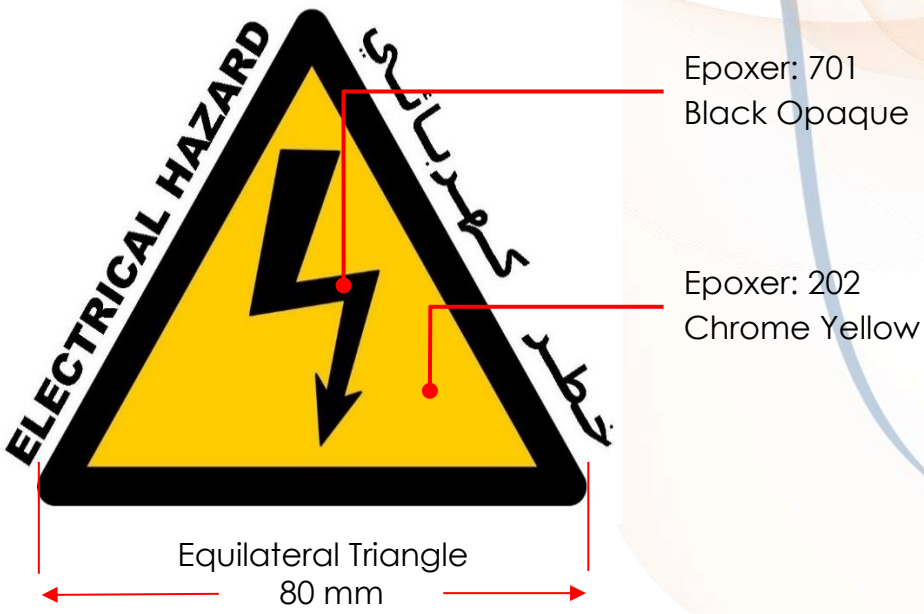
Drawing No. 7.0: Detail Drawing of SEC Standard Graphic Theme (SEC Branding) for Double-Meterbox and CT-Operated Meterboxes with Steel Enclosure



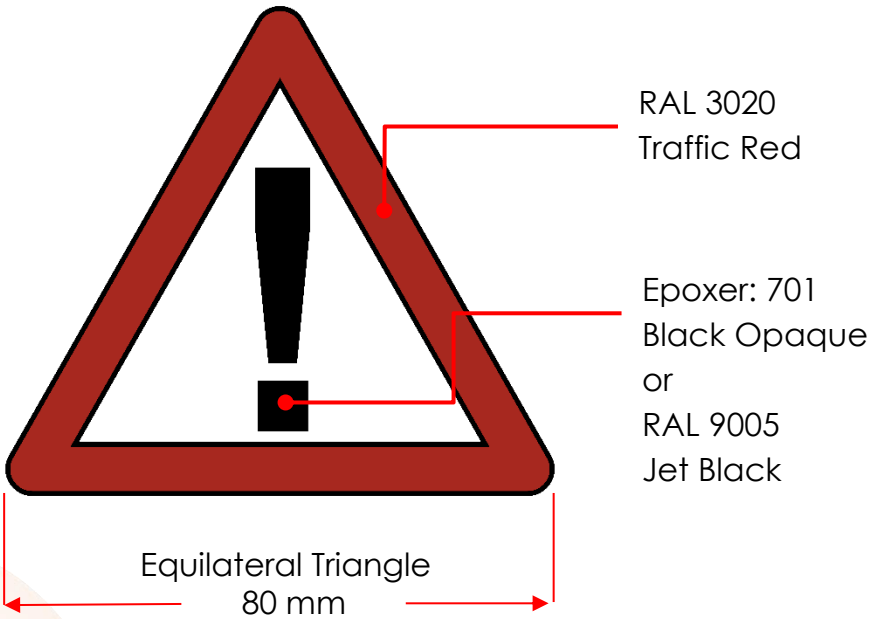
Drawing No. 8.0: Details of SEC Logo for Meterboxes with Steel Enclosure



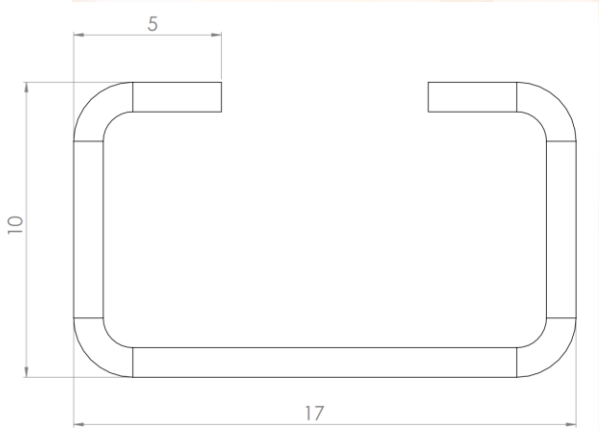
Drawing No. 9.0: Details of Anti-Tampering Warning Note for Meterboxes with Steel Enclosure



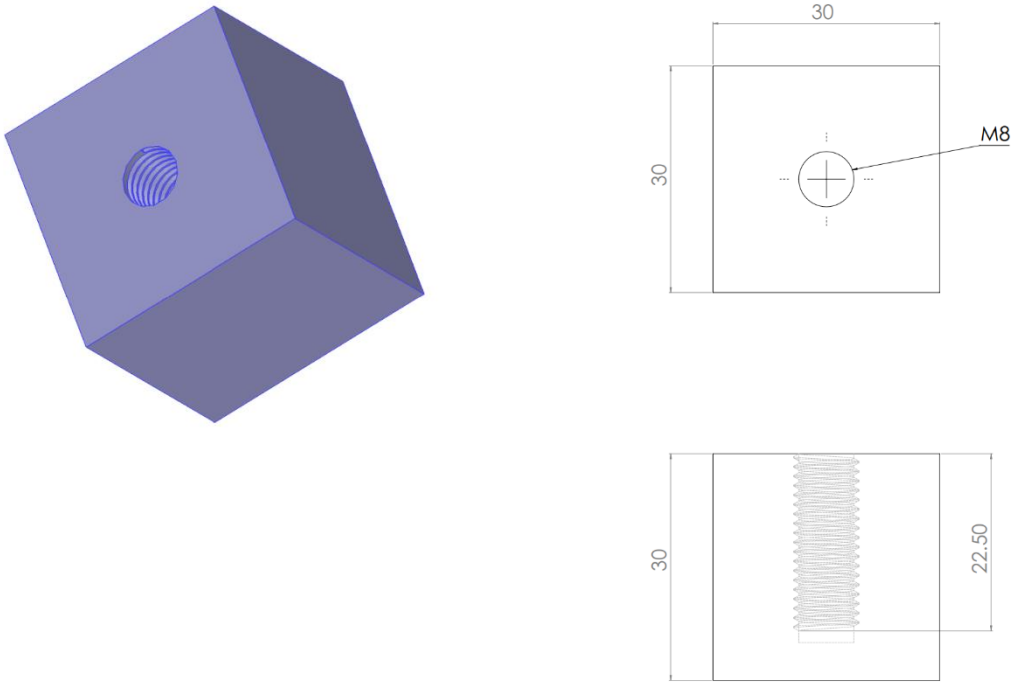
Drawing No. 10.0: Details of Low-Voltage Electrical Hazard Warning Sign for Meterboxes with Steel Enclosure



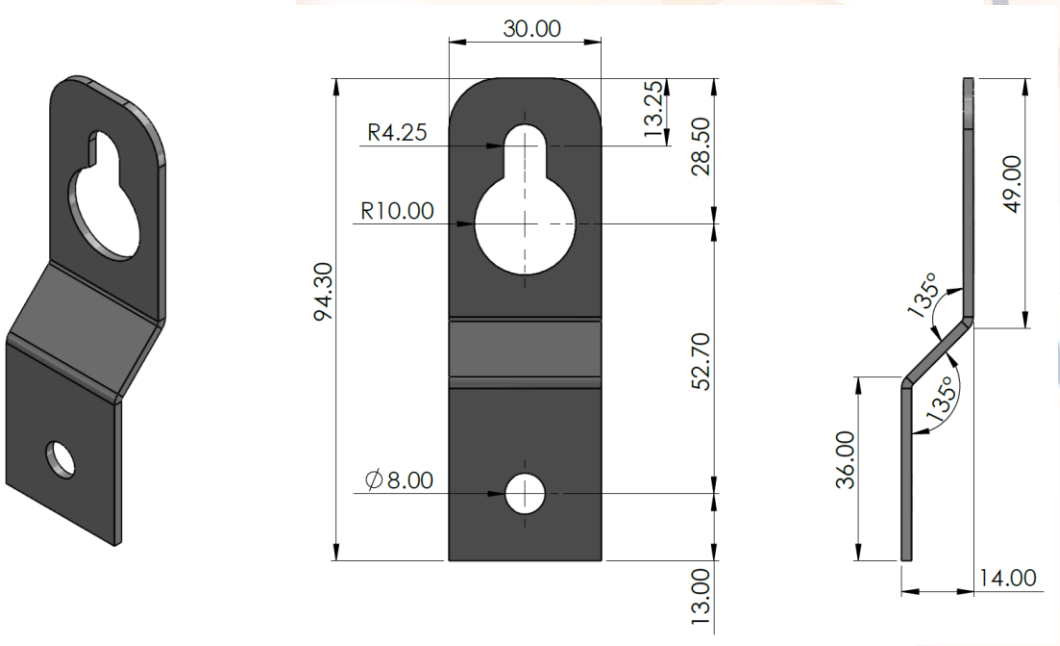
Drawing No. 11.0: Details of Anti-Tampering Warning Sign for Meterboxes with Steel Enclosure



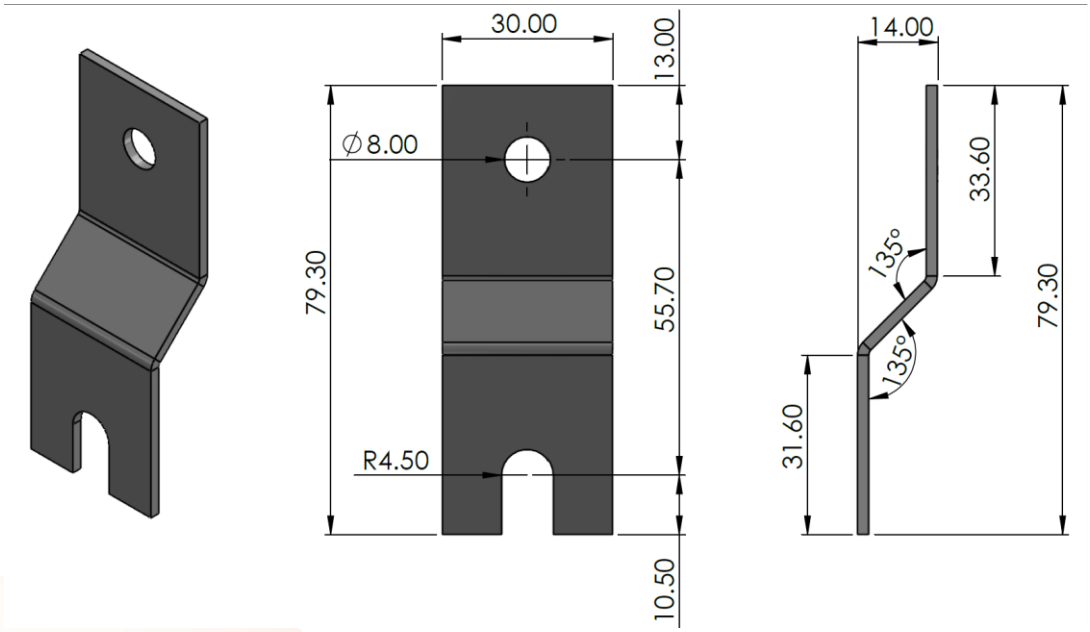
Drawing No. 12.0: Details of 1.0 mm Thickness Stainless-Steel Profile for C-Type Rail Channels



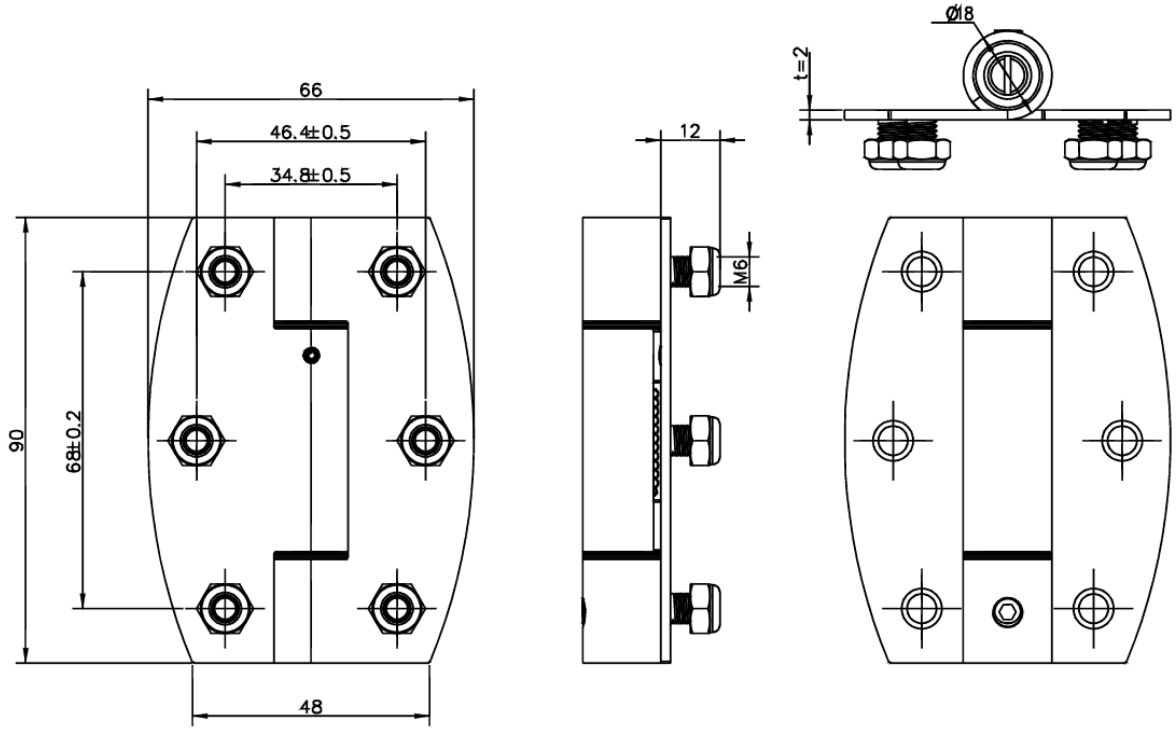
Drawing No. 13.0: Details of Stainless-Steel Threaded Blind Nodes for Fixing the Wall-Mounting Brackets at the Back of the Meterboxes



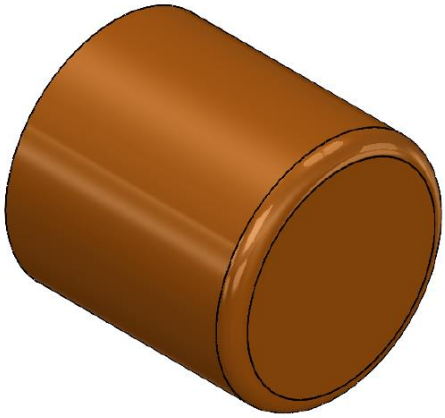
Drawing No. 14.0: Details of Stainless-Steel 2.0 mm Thickness (Top) Wall-Mounting Brackets



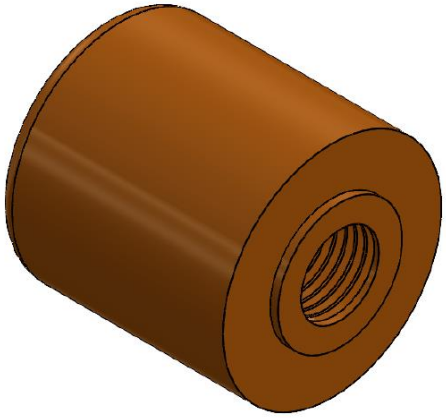
Drawing No. 15.0: Details of Stainless-Steel 2.0 mm Thickness (Bottom) Wall-Mounting Brackets



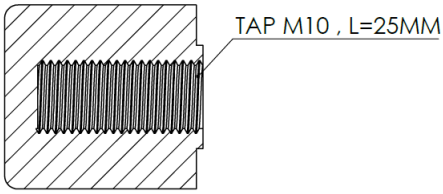
Drawing No. 16.0: Illustrative Sample of a Self-Closing (Spring-Return) Heavy-Duty Stainless-Steel Hinge



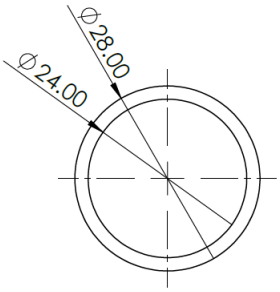
ISOMETRIC VIEW



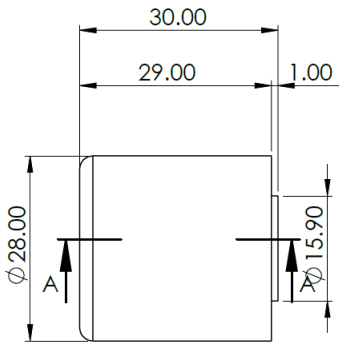
ISOMETRIC VIEW



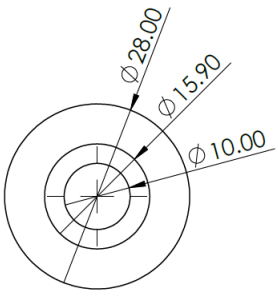
SECTION A-A



LEFT VIEW

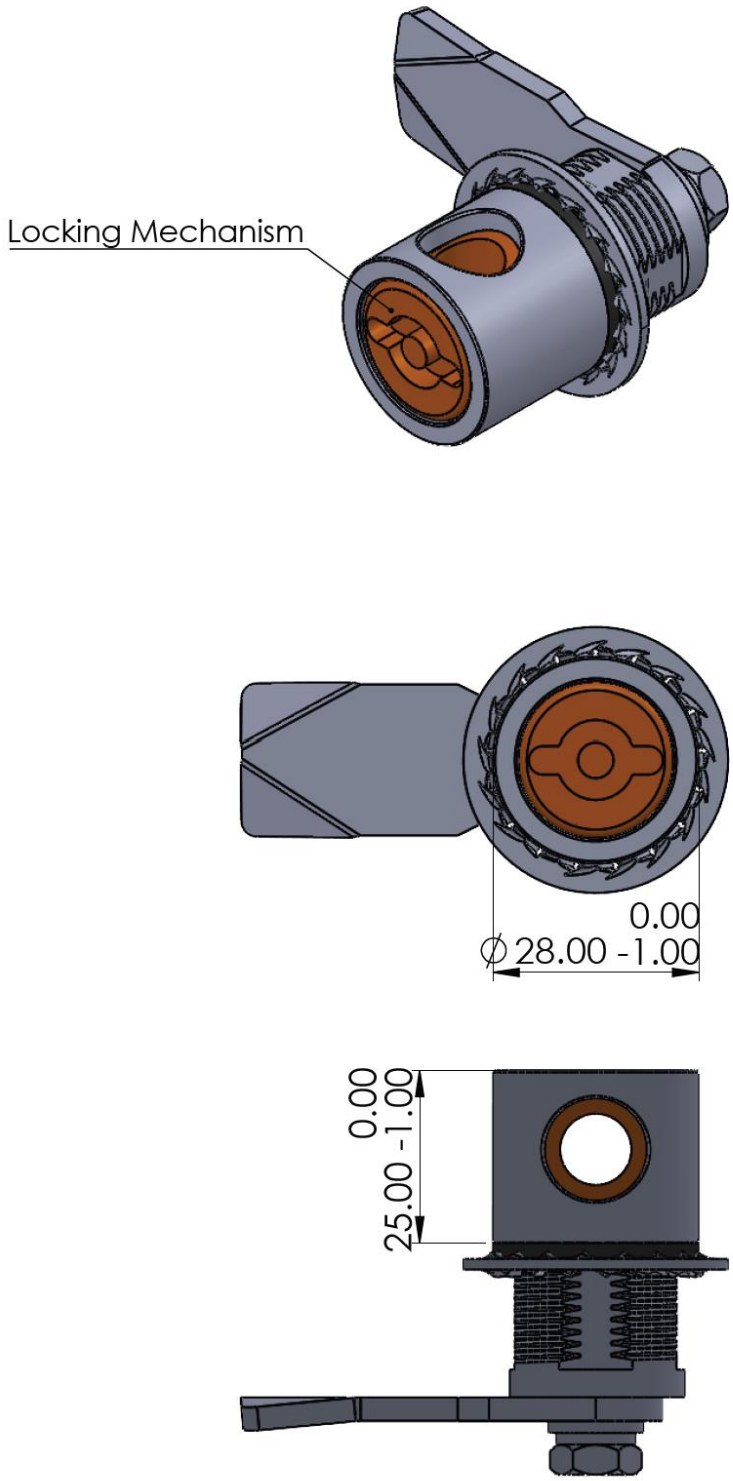


FRONT VIEW

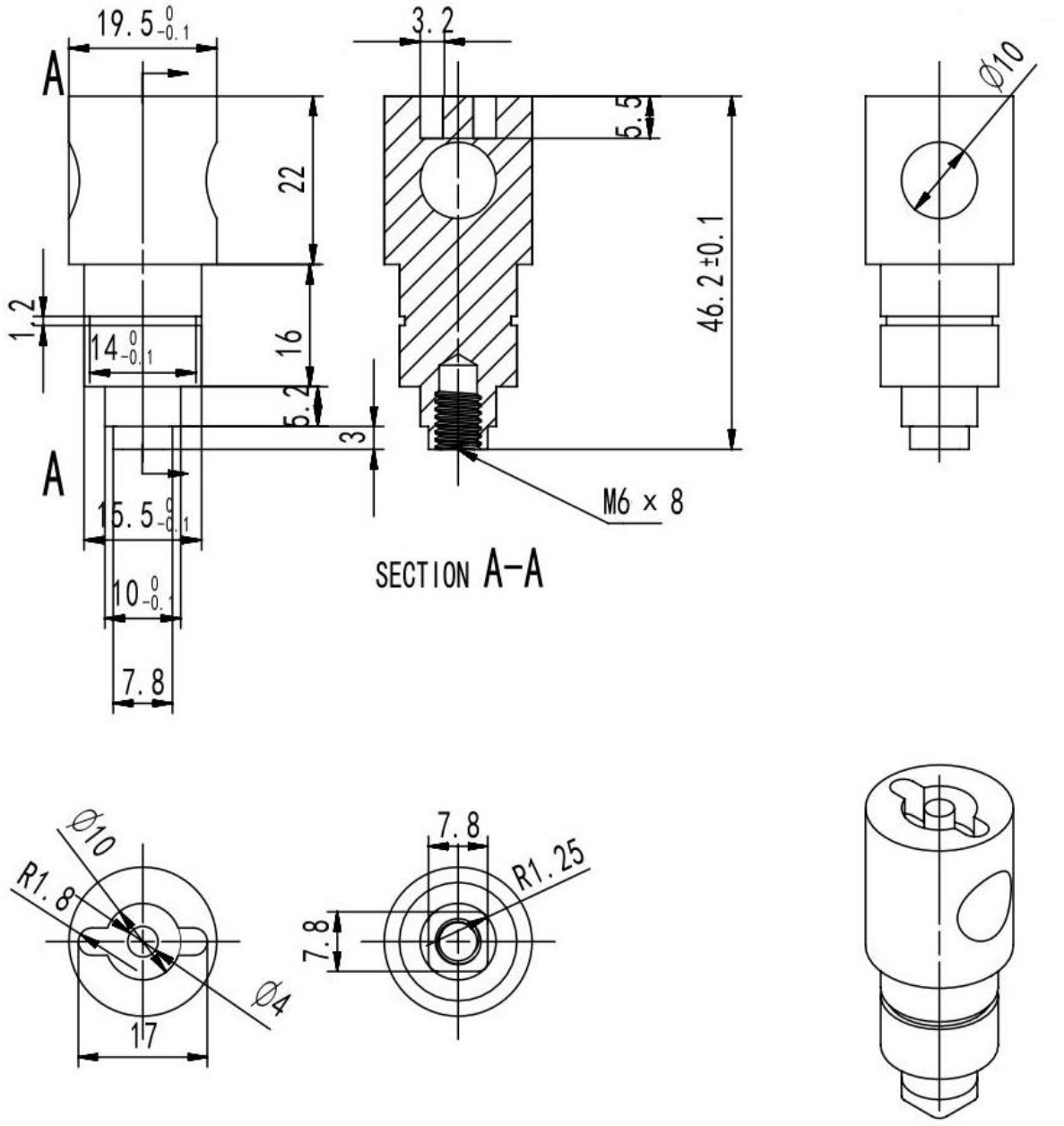


RIGHT VIEW

Drawing No. 17.0: Details of Stainless-Steel Cylindrical Rod Lifting Support



Drawing No. 18.0: Details of Top Inner Door Camlock with Padlocking Provision



Drawing No. 19.0: Details of Locking Mechanism for Top Inner Door Camlock