Saudi Electricity Company	الشركة السعودية للكهرباء

SEC DISTRIBUTION MATERIALS SPECIFICATION	31-SDMS-02 Rev. 02
	DATE: April 2017G

31-SDMS-02

REV. 02

SPECIFICATIONS

FOR

LOW-VOLTAGE DISTRIBUTION PILLAR (MINI-PILLAR)

C O N T E N T S

1.0 SCOPE

This specification describes the minimum technical requirements for design, materials, manufacture, testing, inspection and performance of Low-Voltage Distribution Pillar (Mini-Pillar) to be used in the distribution system of Saudi Electricity Company (SEC).

2.0 CROSS REFERENCE

This specification shall be read in conjunction with SEC specification 01-SDMS-01 (latest revision) titled "General Requirement for all Equipment/ Materials", which shall be considered as an integral part of this specification. Also, it shall be read in conjunction with SEC purchase order requirements or contract schedules.

3.0 APPLICABLE CODES & STANDARDS

The latest revision of the following codes and standards shall be applicable to the equipment/material covered by this specification. In case of any deviation, the manufacturer/vendor may propose equipment/material conforming to alternate codes or standards. However, the provision of SEC standards shall supersede the provisions of these standards in case of any conflict.

IEC 61439-5	Low-Voltage Switchgear and Controlgear Assemblies – Part 5: Assemblies for Power Distribution in Public Networks
IEC 60529	Degrees of Protection Provided by Enclosures (IP Code)
IEC 60269-2	Low-Voltage Fuses – Part 2: Supplementary Requirements for Fuses for Use by Authorized Persons (Fuses Mainly for Industrial Application) – Examples of Standardized Systems of Fuses A to K
DIN 16911	Polyester Resin Molding Materials
DIN 43629	Dimensions of Cabinet

In case of any deviation from the listed standards, it should be indicated in the list of deviations submitted by the supplier.

4.0 SERVICE CONDITIONS

4.1 The mini-pillar shall be suitable for operation under the service conditions as per latest revision of SEC General Specification No. 01-SDMS-01.

4.2 The mini-pillar with all its accessories, fittings, and attachments shall withstand the effect of direct solar radiation at their installed locations. The temperature of exposed surfaces shall be regarded as 75°C plus the effect of internal heating.

5.0 DESIGN & CONSTRUCTION REQUIREMENTS

5.1 General

5.1.1 All cable terminations on the mini-pillar shall be easily accessible from the front.

5.1.2 All insulating materials shall be non-hygroscopic and resistant to tracking and cracking.

5.1.3 All parts with equal size and shape shall be interchangeable.

5.1.4 The mini-pillar shall be equipped with seven (7) 3-Phase, 4-Wire System terminal connections for aluminum cables with lugs, i.e. two (2) incoming and five (5) outgoing circuits as shown in drawings SEC/DP-02 and SEC/DP-04.

5.1.5 The two (2) incoming circuits shall be located on each side of the mini-pillar, and the five (5) outgoing circuits through the use of 3-phase fuse-rails shall be positioned in between the incoming circuits.

5.2 Enclosure

5.2.1 The mini-pillar shall be outdoor type (IP54), made of impact-proof, heat-resistant, self-extinguishing, hot-molded, non-flammable, UV protected fiberglass reinforced polyester with a minimum thickness of 5.0 mm. The minimum glass fiber content is 25%. It shall be of freestanding-type mounted on a fiberglass reinforced polyester base with mounting dimensions in accordance with drawings: SEC/DP-01, SEC/DP-02, SEC/DP-03, and SEC/DP-04. It shall be with a canopy-type roof.

5.2.2 The mini-pillar shall have the original color of the SMC, i.e. light gray RAL 7035 with smooth finish, free of cracks and molding imperfections except the top part which shall be covered with epoxy coating.

5.2.3 The mini-pillar shall have adequate mechanical strength to withstand rough handling as may be expected in normal uses.

5.2.4 Access to the mini-pillar shall be on the front by means of a hinged-door.

The door shall be fitted with three (3) stainless steel concealed hinges, two (2) spring-loaded for the top and bottom right-corners, and one (1) in the mid-section.

The door shall be provided with two (2) stainless steel quarter-turn tubular cam-locks at the top and bottom with locking provisions.

The door shall be fitted with 2.0 mm thick braided nylon strapping band, minimum width of 25.0 mm to restrict opening angle to 120°.

The door shall be able to withstand a minimum weight of 80 kg.

5.2.5 The mini-pillar door shall have a door-stay made of 10.0 mm diameter stainless steel rod or better assembly to hold the door at 120° open position.

5.2.6 The inner side of the door shall have the following provisions:
a) Storing pocket
b) Docking station for the NH-Type fuse replacement handle
c) Nameplate with single-line diagram made of 1.0 mm thick aluminum plate

5.2.7 Mounting holes for fixing circuit numbering plate per drawings SEC/DP-01 and SEC/DP-03 shall be provided.

5.2.8 Danger sign per Figure-49A of 20-SDMS-02 (latest revision) shall be provided.

5.3 Mini-Pillar Base

5.3.1 The base shall comply with DIN 43629. It shall be made of the same material as the enclosure.

5.3.2 The design of the base shall conform to drawings SEC/DP-03 and SEC/DP-05. The front plate of the base shall be made of two removable parts with the upper part to enable cable clamping, while the lower part to enable access for cable installation. Four fixing bolts with spring washers and lock washers shall be provided for fixing the cabinet on the base.

5.3.3 Cable clamps with cable support bar suitable for holding securely either copper or aluminum cables of sizes from 4 x 70 mm² up to 4 x 300 mm².

5.3.4 All metallic parts and fasteners shall be made of hot-dip galvanized steel.

5.4 Busbars

5.4.1 Busbars shall be made of hard-drawn, high conductivity tinned copper of uniform cross-section.

5.4.2 The busbars shall carry a rated nominal continuous current of 400 Amperes. It shall be supported by epoxy-resin insulators in a robust and secure manner. The configuration shall be three (3) busbars for the phases and one (1) for the neutral.

5.4.3 The busbars shall be covered with heat-shrink tubes. Phase busbars shall be color-coded in sequence from top to bottom (RED, YELLOW, BLUE) and (BLACK) for the neutral busbar.

5.5 Fuse-Rails and Fuses

5.5.1 The fuse-rail shall be NH Type, Size 2, and rated 250 Amperes according to IEC 60269-2.

5.5.2 The fuse-rail shall enable the use of NH Type, Low-Voltage High-Rupture, Size 2, g1 class, 200 Ampere fuses per SEC specification 34-SDMS-02 (latest revision).

5.5.3 The contacts of the fuse-rail shall be pure silver-plated with a minimum plating thickness of 4.0 µm, and mechanically assisted by two (2) stainless steel springs to ensure continuous contact pressure.

5.5.4 The contacts shall be finger-safe (IP 20), even if the fuse links are removed.

5.5.5 The fuse-rail shall be completely insulated so that all live parts of the fuse block is protected against accidental touch. All plastic parts shall be made from self-extinguishing materials.

5.5.6 All active parts shall be made of pure electrolytic copper, tin-plated with minimum thickness of 6.0 µm, and strongly fixed to the base of the fuse-rail to withstand mechanical efforts on installation, operation, and cable termination.

5.5.7 The fuse-rails shall be suitable for M12 screw mounting on the busbars.

5.5.8 The terminal connectors of the fuse-rails shall be separated by space barrier made of self-extinguishing insulating material.

5.6 Cable Terminations

5.6.1 The two (2) incoming circuit cable terminations shall be suitable for fixing aluminum cable of size 185 mm^2 or 300 mm^2 with the use of cable lugs.

5.6.2 The five (5) outgoing circuit cable terminations on the fuse-rails shall be suitable for fixing aluminum cable of size 185 mm² or 70 mm² with the use of cable lugs.

5.6.3 The lugs shall be provided by SEC. However, the nuts, bolts, and washers Grade 8.8 shall be provided by the manufacturer.

6.0 TESTS AND INSPECTIONS

6.1 The mini-pillar shall be type tested in SEC approved independent test laboratory in conformance with IEC 61439-5.

6.2 The fuse-rails shall be type tested in SEC approved independent test laboratory in conformance with IEC 60269-2.

6.3 Certified type test reports carried out on SEC approved independent test laboratory for both mini-pillar and fuse-rail shall be submitted along with the tender documents.

6.4 SEC reserves the right to witness the routine tests, or visit the factory at any time to conduct inspection on the production lines.

6.5 Routine Tests

A sample/representative of the batch randomly selected shall be inspected and tested at the vendor/manufacturers facilities.

It is the manufacturer's responsibility to make sure that it has the appropriate facility to carry out the applicable tests in conformance with IEC 61439-5 and this specification. Routine test shall include but not limited to:

6.5.1 Mechanical Impact Test per IEC 61439-5.
6.5.2 Resistance to Torsional Stress Test per IEC 61439-5.
6.5.3 Verification of Mechanical Strength of Doors per SEC requirement.

6.6 In case of issuance of orders, if required, sample (complete assembly) shall be inspected and tested at the manufacturer's facility prior to approval of mass production.

6.7 Special test like: Quality Verification of the SMC/Resins, Glass Fiber Content, Degree of Protection (IP), Environmental Test, etc. shall be carried out, if required.

7.0 MARKING

7.1 The following information shall be clearly embossed on the outer surface of the mini-pillar door:

7.1.1 SEC Monogram
7.1.2 SEC Item Number
7.2.3 Manufacturer's Name
7.2.4 Cam-lock Position Indicator

7.2 The nameplate mentioned in Item c) of Clause 5.2.6 shall have the following information:

7.2.1 Nominal Current Rating
7.2.2 Reference Specification: 31-SDMS-02 Rev.02
7.2.3 Gross Weight (Complete Assembly)
7.2.4 Year of Manufacture
7.2.5 Serial Number
7.2.6 SEC Purchase Order

8.0 PACKING AND SHIPMENT

Each mini-pillar shall be packed separately in a wooden frame for easy handling and storage. The whole unit shall be shrouded with polyethylene bags to protect for outdoor storage.

9.0 GUARRANTEE

9.1 Vendor shall guarantee the mini-pillar against all the defects arising out of faulty design, workmanship or defective material for a period of five (5) years from the date of delivery.

9.2 If no exception/deviations are taken to this specification and no list of deviations is submitted, it shall be deemed that, in every respect, the offered mini-pillar and its accessories conform to this specification.

10.0 SUBMITTALS

The following documents shall be submitted with the tender.

10.1 Duly filled-in, signed and stamped technical data schedule attached to this specification.

10.2 Detailed drawings of the mini-pillar showing full constructional details and dimensions.

10.3 Catalogues of equipment and internal components offered.

10.4 Type test reports from SEC approved test laboratory.

11.0 TECHNICAL DATA SCHEDULE
LOW-VOLTAGE DISTRIBUTION PILLAR (MINI-PILLAR)
(Sheet 1 of 2)

SEC Enquiry No. _____ Item No. _____

SN	DESCRIPTION	SEC SPECIFIED VALUES	VENDOR PROPOSED VALUES
5.0	DESIGN AND CONSTRUCTION	-	
	Reference Standard, Enclosure	IEC 61439-5, DIN 43629, 31-SDMS-02 REV.02	
	Reference Standard, Fuse-Rail	IEC 60269-2	
5.2	Enclosure	-	
	Thickness, mm	5.0 mm $\pm^{2}_{0}$	
	Glass Fiber Content, %	25%	
	Degree of Protection	IP54	
	Color	RAL 7035	
	Door Restricted Opening Angle	120°	
5.4	Busbars	-	
	Configuration	3P + 1N	
	Color Coding	Heat Shrink Tubes (Red, Yellow, Blue, Black)	
	Material	Electrolytic Copper, Tin-Plated	
	Size	*	
	Nominal Current Rating	400 Amperes	
	Support Insulators	Epoxy Resin	
5.5	Fuse-Rail and Fuses	-	
	Type and Size	NH, Size 2	
	Current Rating	250 Amperes	
	Fuse Type	NH, Size 2, g1-class, 200A	
	Contacts	Silver-Plated	
	Contact, Degree of Protection	IP20	
	Fuse-Rail, Busbars	Electrolytic Copper Tin-Plated	
5.6	Cable Termination	-	
	Fasteners (Bolts, Nut, Flat & Lock washers)	Grade 8.8 M12 x 25mm	

11.0 TECHNICAL DATA SCHEDULE
LOW-VOLTAGE DISTRIBUTION PILLAR (MINI-PILLAR)
(Sheet 2 of 2)

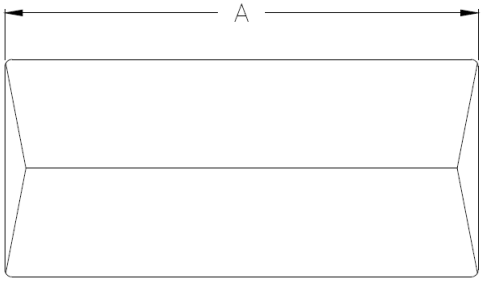
A) Additional technical information or features specified by SEC.

B) Additional supplementary data or features proposed by Vendor/Supplier.

C) Other particulars to be filled up by Vendor/Supplier. (Use separate sheet if needed).

D) List of deviations and clauses to which exceptions is taken by the Bidder/Vendor/Supplier. (Use separate sheet, if needed).

Address	Manufacturer	Vendor/Supplier
Name of the Company		
Location & Office Address		
Authorized Name & Signature		
Date		
Official Seal / Stamp		

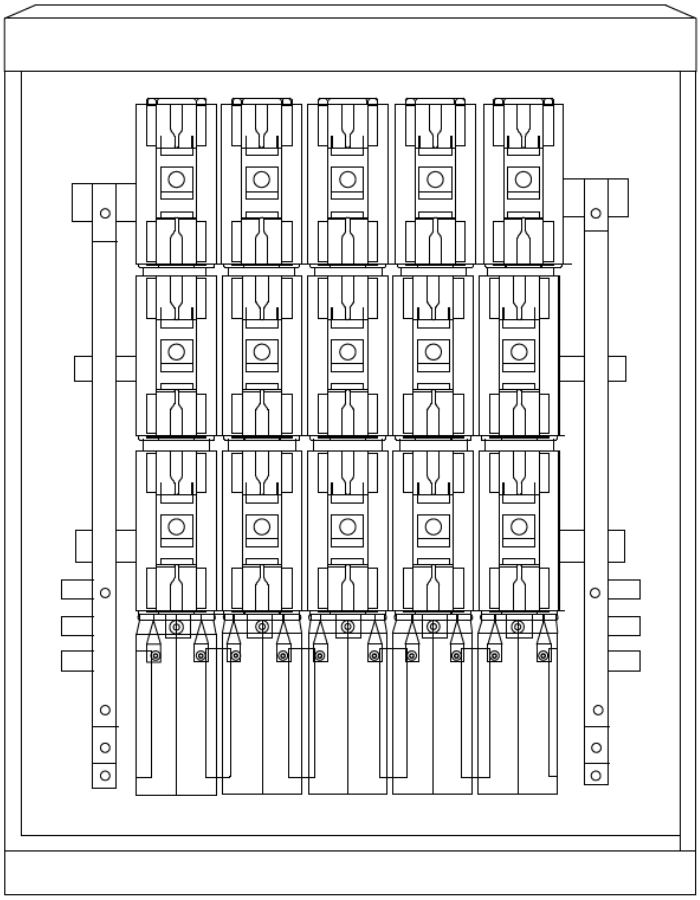


TOP VIEW

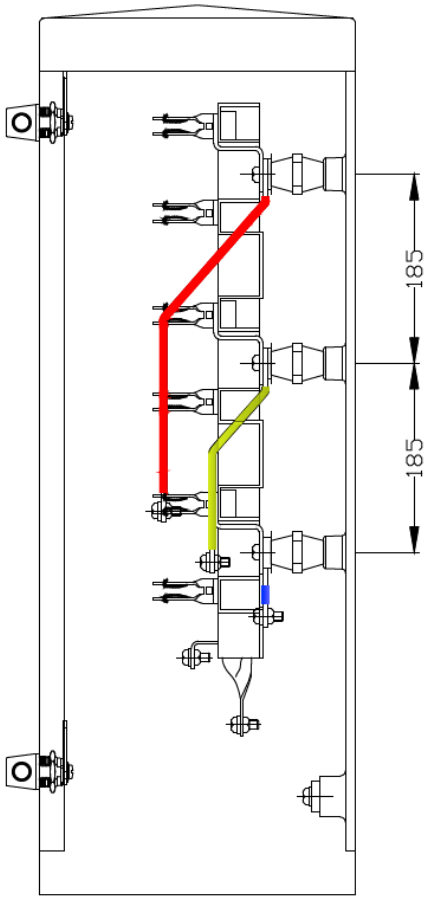
FRONT VIEW SIDE VIEW

	A	B	C
DIMENSIONS, mm	800	830	310
DEVIATION, mm	±30	±30	±30

DRAWING SEC/DP-01: LOW-VOLTAGE DISTRIBUTION PILLAR ENCLOSURE

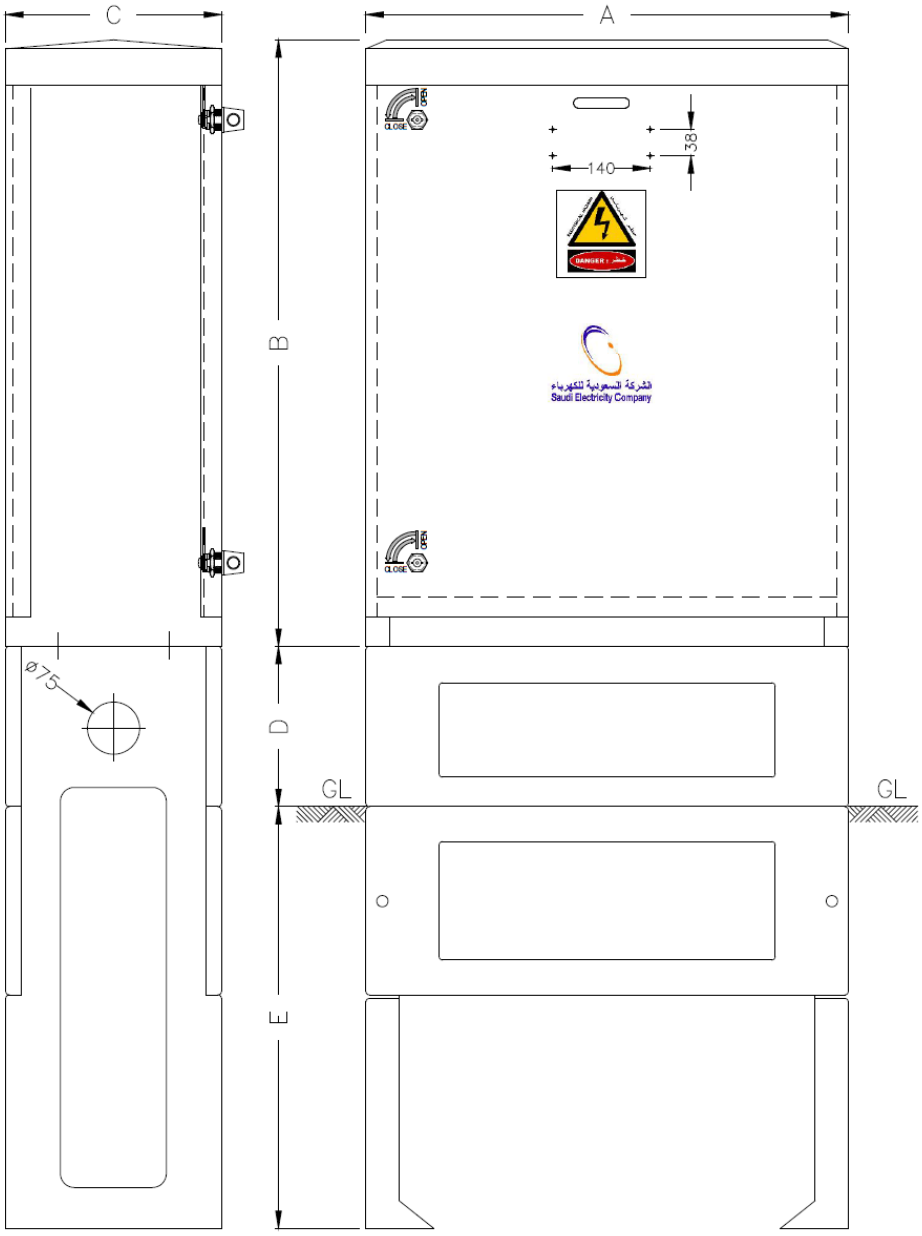


FRONT VIEW
(DOOR OPENED POSITION)



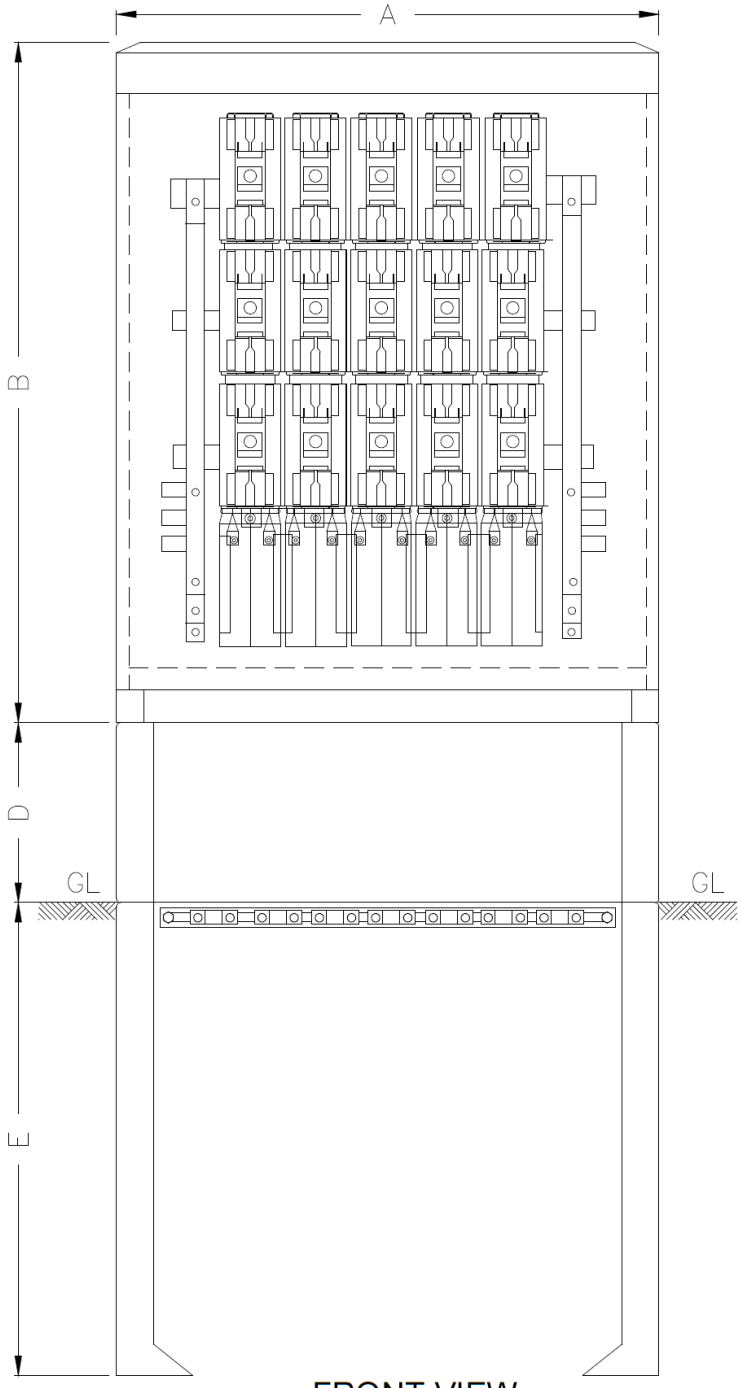
SIDE VIEW
(INTERNAL)

DRAWING SEC/DP-02: LOW-VOLTAGE DISTRIBUTION PILLAR (INTERNAL DETAILS)



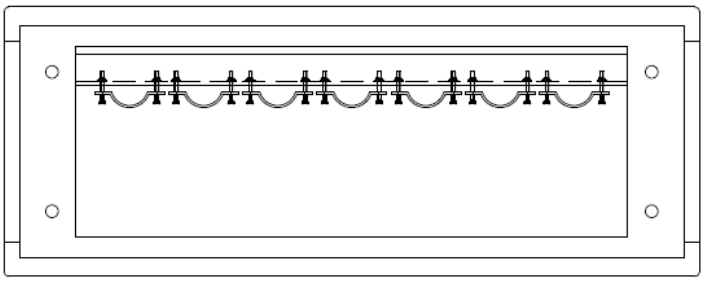
	A	B	C	D	E
DIMENSIONS, mm	800	830	310	280	600
DEVIATION, mm	±30	±30	±30	±30	±30

DRAWING SEC/DP-03: MINI-PILLAR (ENCLOSURE WITH BASE)

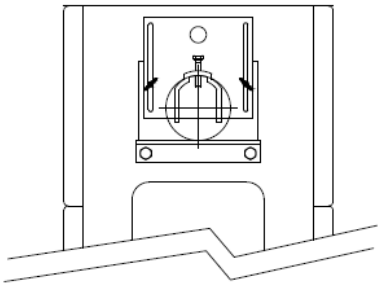


FRONT VIEW
(INTERNAL)

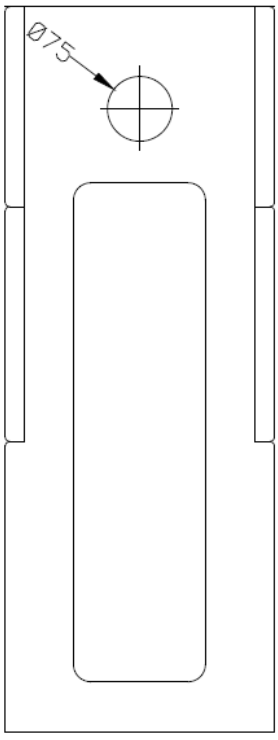
DRAWING SEC/DP-04: ENCLOSURE WITH BASE (INTERNAL)



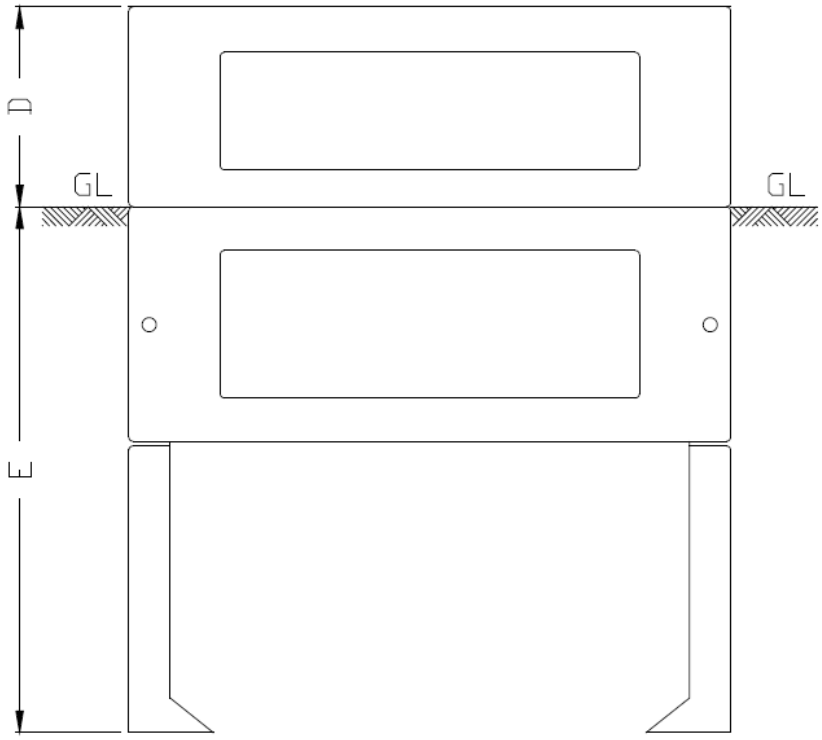
TOP VIEW



TEMPORARY CABLE CLAMPING DETAIL

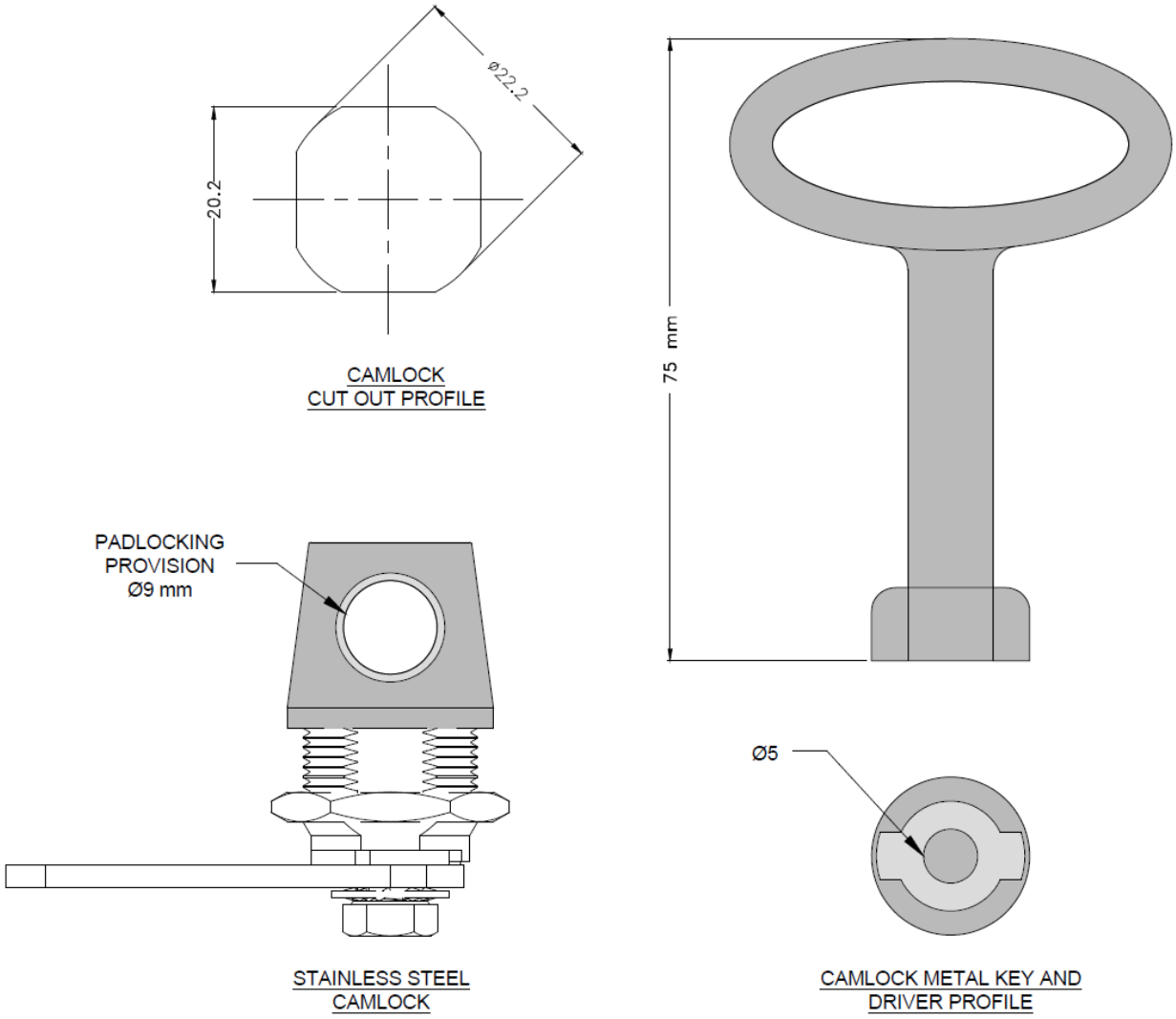


SIDE VIEW



FRONT VIEW

DRAWING SEC/DP-05: MINI-PILLAR BASE DETAIL



DRAWING SEC/DP-06: CAMLOCK DETAILS