



 **GEMINI**  
**INSTRATECH**  
LIMITED

# **EPOXY RESIN CAST INSTRUMENT TRANSFORMERS**

***MEDIUM VOLTAGE***

• *For Outdoor Applications*

## INTRODUCTION

Incorporated in 1992, Gemini Instratech Ltd. is, presently, a Manufacturer of OIP (Oil Impregnated Paper) insulated Instrument Transformers from 12 kV to 145 kV Class, Epoxy Resin Cast Instrument Transformers from 3.6 kV to 36 kV Class for Indoor and Outdoor applications, LT (Low Tension) Ring Type Current Transformers for Power Transformers and GIS (Gas Insulated Switchgear), OIP Insulated Condenser Bushings for Power Transformers from 72.5 to 145 kV Class and Components (Pole shoe, Grid Chokes, Aluminium Doors) for Generators in the Wind Energy Industry.

Armed with a domain experience of around twenty years, we, at Gemini, are committed to offer high quality and reliable products to sub serve the MV (Medium Voltage) Distribution and HV (High Voltage) Transmission Ranges of Electrical Substation segments of Electrical Power Industry.

Gemini's Product Portfolio is designed to cater to a wide customer base which includes HT (High Tension) Switchgear Manufacturers such as Siemens, ABB, Crompton Greaves etc., Electrical Turnkey / EPC (Engineering Procurement & Construction) Contractors including Siemens, ABB etc. and Utilities including The Kenya Power and Lighting Company and various OEMs (Original Equipment Manufacturers) including ENERCON and Suzlon in the windmill energy sector.

Gemini's MISSION is to relentlessly strive to leverage our expertise and expand the footprints of our offering and purview of our operations in the MV Distribution and HV Transmission Ranges of Electrical Power Industry with the goal of excellence in TOTAL CUSTOMER SATISFACTION.

Gemini's VISION is to develop ourselves into a Competitive, World Class, One-Stop-Shop for Instrument Transformers and Critical Components of Power Transformers for applications in Medium Voltage and High Voltage Electrical Power Industry.

We have the domain experience, competence and capability to manufacture and test and supply World Class products in compliance with local and International standards.

With our policy of constant pursuit of excellence, we, at Gemini, reserve our rights to modify and improve our designs with or without notice. Hence we wish to inform that the dimensional details, weights etc. given in our Product brochures are for general informative purpose and Clients are requested to contact us with their detailed Specifications and RFQ (Request For Quote).

## RESIN CAST INSTRUMENT TRANSFORMERS

Resin Cast Outdoor Instrument Transformers use Cycloaliphatic resin which is well proven and is the most adopted outdoor insulation and is most suitable for outdoor applications worldwide and products are cast with Gravity Casting under controlled fine vacuum or by Pressure Gelation using controlled pressures. Designs are available up to 36 kV system voltages.

## TESTS AND PERFORMANCE

Reliability and performance of Current and Voltage Transformers have been verified by type testing at Central Power Research Institute (CPRI) Test Stations at Bhopal and Bangalore, India and Electrical Research And Development Association (ERDA), India.

The Instrument transformers are type tested for all type tests specified in Reference standards, such as short Circuit Performance, Lightning Impulse test, temperature rise test and partial discharge etc. as per IEC 61869 : 1, 2 & 3 – 2007 - 2012.

## TESTING FACILITIES

Our Instrument Transformers are designed, manufactured and tested as per IEC. Our Testing Setup has the following equipment :

- Omicron CT Analyzer.
- Digital Accuracy Testing Bridge for CT and VT.
- Precision Standard CTs and VTs.
- High Current Source.
- High Voltage PD Free Transformer 350 kV.
- Coupling Capacitor 1000 pF, 350 kV.
- Standard Capacitor 100 kV, 37pF.
- Digital Partial Discharge Measuring System.
- Automatic Capacitance and Tandelata Measuring System.
- High Frequency Voltage Generators 150/300 Hz.
- Fluke Manufactured Multimeters.
- Toroidal CRGO Core Testing Setup.

# OUTDOOR APPLICATIONS

Cyclo-aliphatic resin is well proven and the most adopted outdoor insulation worldwide, which is suitable for outdoor use in a wide range of climatic conditions. Designs are available up to 36 kV system voltages.

# PRODUCT FEATURES

## LIQUID EPOXY SYSTEM

- Low viscosity liquid resin and hardener is used before casting.
- System with plasticizer assures flexibility and thereby has better temperature cycle performance and crack resistance.
- Suitable for temperature range  $-5^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$ .

## HIGH TRACKING RESISTANCE AND BETTER AESTHETICS

- Moulds are made from steel.
- Moulds are diamond polished and hard chrome plated.
- Application of uniform and thin layer of liquid mould release agent.
- Non-painted, natural smooth surface of high tracking resistance on every casting.

## CASTING PROCESS

- Every mould assembly (with active parts inside) undergoes heating and degassing to ensure effective drying of all insulating materials used.
- Casting is made in a single casting process under controlled temperature and vacuum for Gravity casting. We also use Pressure Gelation technique for most products.
- Predefined & Steady Epoxy flow rate is maintained during encapsulation.

## PRIMARY WINDING AND TERMINATION - CTS

- Primary winding is made in a double disc form with rectangular, multiple paper covered copper conductor which offers high mechanical strength against the forces developed during dynamic currents.
- Compact Winding and consistent dimensions are achieved.
- Winding is terminated into specially designed sockets. The joints are high temperature soldered and epoxy entering the electrical joints are totally avoided.
- Joints are designed to meet STC up to 40 kA/ 3s and also to meet continuous currents up to 2000 A.

## PRIMARY (HV) WINDING - VTS

- Primary winding is made in a trapezoidal shape with continuous reduction of turns, which offers high mechanical stability of the winding and high strength against impulse and surge voltages.
- High quality Kraft paper insulation is used for inter-layer insulation.
- The coil is dried, de-gassed and then impregnated with low viscosity resin under controlled temperature & vacuum for Gravity Casting System and controlled pressure for Pressure Gelation System.

# OD RC CT & VT TECHNICAL DETAILS

## GENERAL TECHNICAL PARTICULARS

Sr. No.	Particulars	Unit	Voltage Class		
			12 kV	24 kV	36 kV
1	Rated System Voltage	kV	11	22	33
2	Highest System Voltage	kV	12	24	36
3	1 Min. Power Frequency Dry/Wet withstand Voltage on Primary Winding	kV	28/38	50/55	70/95
4	1 Min. Power Frequency Dry/Wet withstand Voltage on Secondary Winding	kV	3 or as per relevant standard	3 or as per relevant standard	3 or as per relevant standard
5	Lightning Impulse Withstand Voltage (1.2 $\mu$ s / 50 $\mu$ s)	kVp	95/110	125/150	170/200
6	Total Creepage Distance (25mm/kV) (Higher creepage on request)	mm	400	600	900
7	Altitude of operation	m	up to 1000 meters above mean sea level (Higher altitudes on request)		
8	Frequency	Hz	50 (60 Hz on request)		

## CURRENT TRANSFORMERS - TECHNICAL PARTICULARS

Sr. No.	Particulars	Unit	Voltage Class		
			12 kV	24 kV	36 kV
1	Applicable Standard	-	IS 2705:1992 & IEC 61869-1:2007-10, IEC 61869-2:2012-09		
2	Type Designation	-	GDC 12-2	GDC 36-1	GDC 36-1,5
3	Rated Primary Current	A	up to 1600 A	up to 1600 A	up to 1600 A
4	Rated Secondary Current	A	1 or 5	1 or 5	1 or 5
5	Short Time Thermal Withstand Current / Duration	kA/s	up to 40/3	up to 40/3	up to 40/3
6	Short Time Dynamic Withstand Current	kAp	up to 100	up to 100	up to 100
7	Number of Cores	-	2, 3 or as per requirement		
8	Output / Accuracy	-	As per requirement		

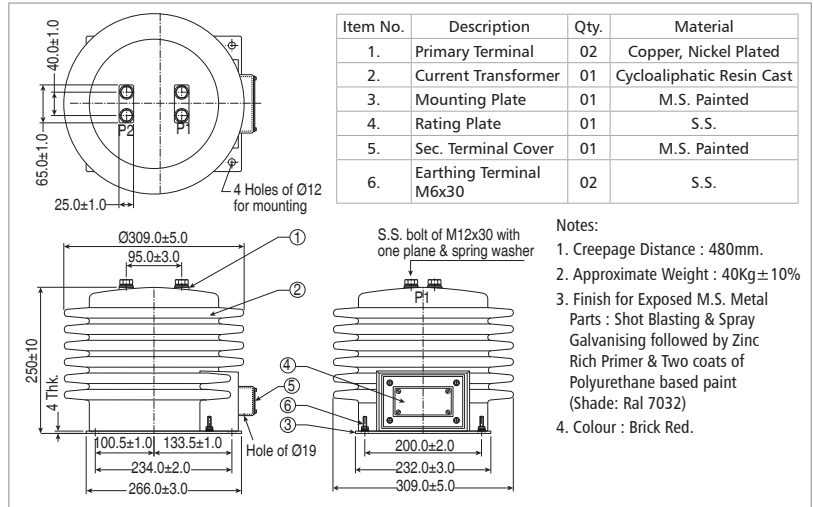
## VOLTAGE TRANSFORMERS - TECHNICAL PARTICULARS

Sr. No.	Particulars	Unit	Voltage Class		
			12 kV	24 kV	36 kV
1	Applicable Standard	-	IS 3156:1992 & IEC 61869-1:2007-10, IEC 61869-3:2011		
2	Type Designation	-	GDV 12-2, 3	GDV 36-1	GDV 36-1, 3
3	Rated Primary Voltage	kV	11 kV, 11 kV / $\sqrt{3}$	22 kV / $\sqrt{3}$	33 kV / $\sqrt{3}$
4	Rated Secondary Voltage	kV	110/ $\sqrt{3}$ or 110/3 or 110V		
5	Voltage Factor	-	1.2 Cont. / 1.9 for 8 hrs		
6	Output / Accuracy	-	As per requirement		
7	Short Circuit Withstand Capability	s	1		
8	Number of Secondary Windings	-	up to 3		

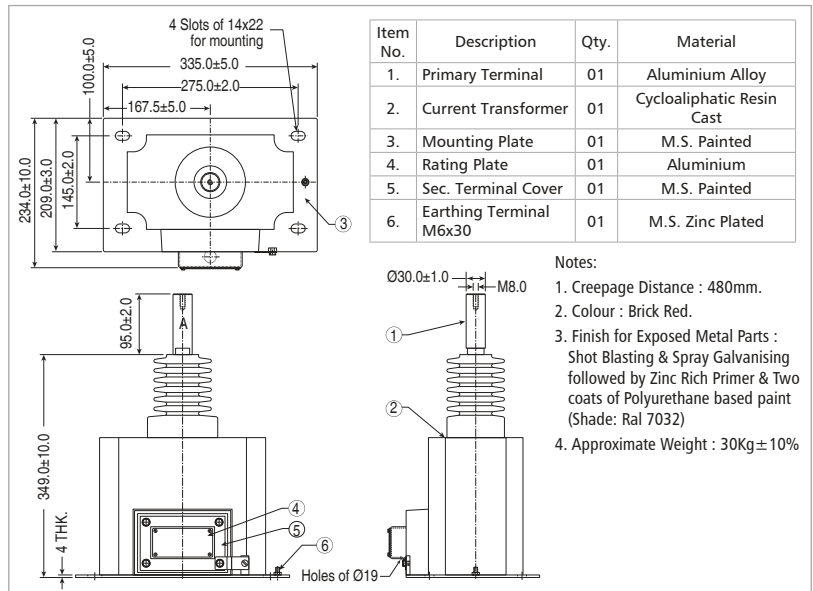
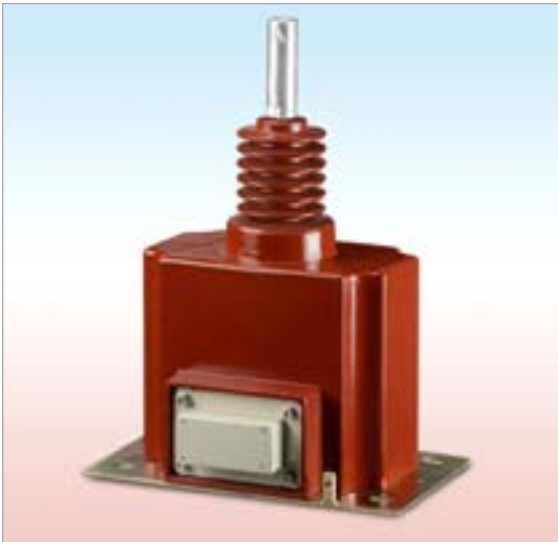
Note: The technical particulars given above and dimensions given in drawings are indicative. For specific requirement kindly seek specific quotes against RFQs (Request For Quotes) with detailed specifications.

### GDC 12-2

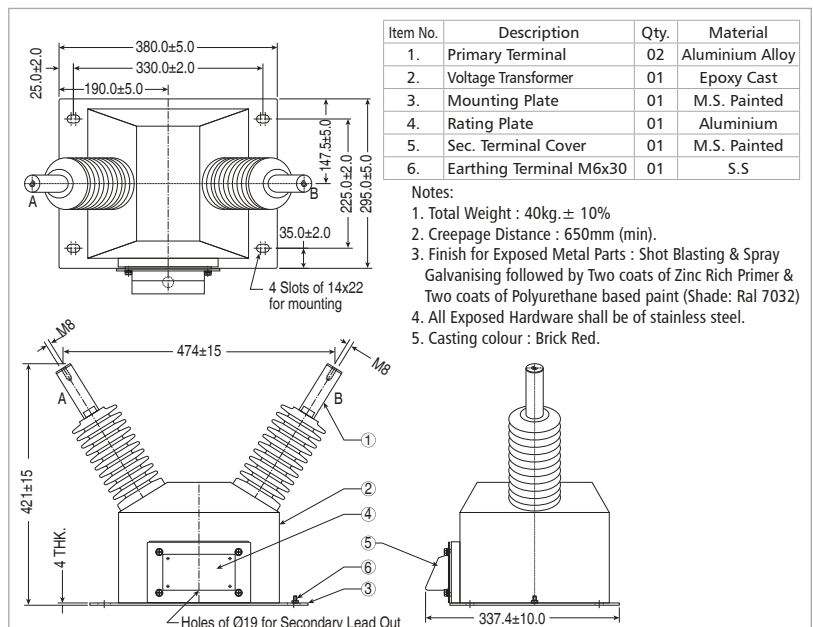
All Dimensions are in 'mm'



### GDV 12-3



### GDV 12-3



### GDC 36-1

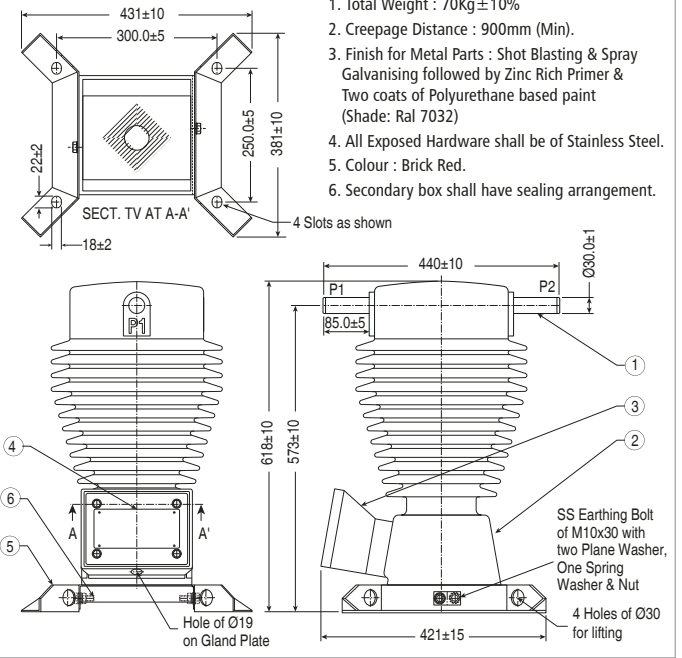


All Dimensions are in 'mm'

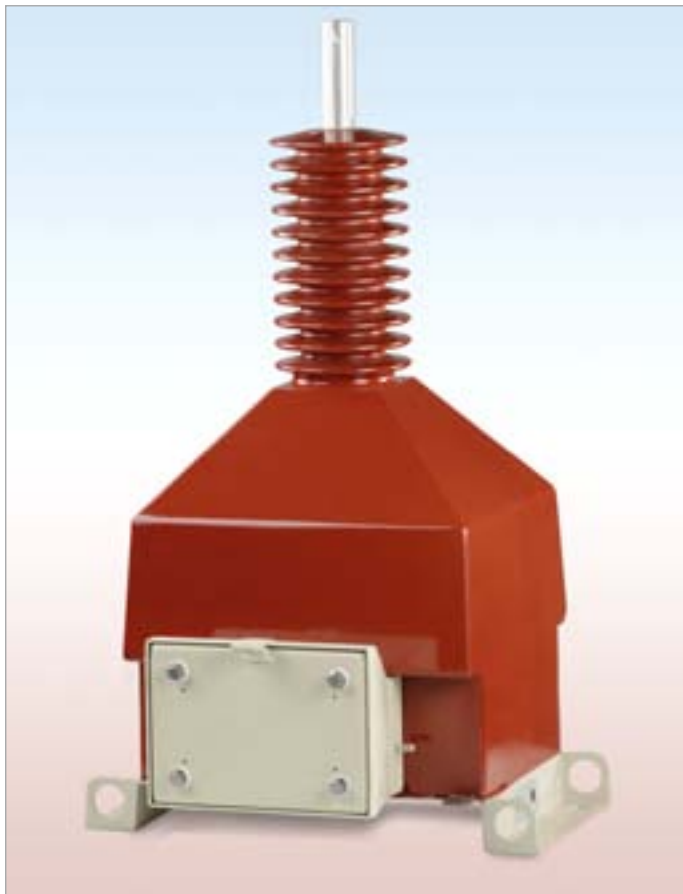
Item No.	Description	Qty.	Material
1.	Primary Terminal	02	Copper, Nickel Plated
2.	Base	01	Cycloaliphatic Resin Cast
3.	Secondary Terminal Box	01	M.S. Painted
4.	Rating Plate	01	S.S.
5.	Base Frame	01	M.S. Painted
6.	Earthing Terminal	02	S.S.

**Notes:**

- Total Weight : 70Kg ± 10%
- Creepage Distance : 900mm (Min).
- Finish for Metal Parts : Shot Blasting & Spray Galvanising followed by Zinc Rich Primer & Two coats of Polyurethane based paint (Shade: Ral 7032)
- All Exposed Hardware shall be of Stainless Steel.
- Colour : Brick Red.
- Secondary box shall have sealing arrangement.



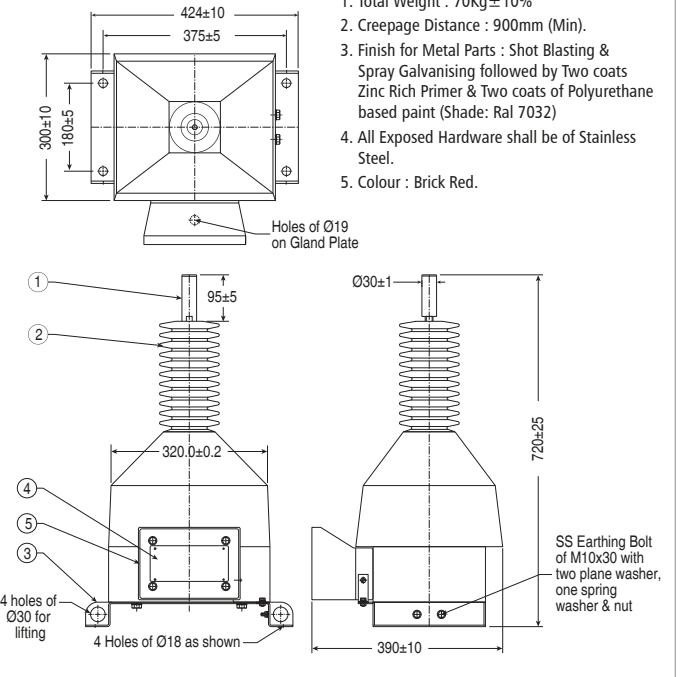
### GDV 36-1



Item No.	Description	Qty.	Material
1.	Primary Terminal	01	Aluminium Alloy
2.	Voltage Transformer	01	Epoxy Cast
3.	Base	01	M.S. Painted
4.	Rating Plate	01	S.S.
5.	Secondary Terminal Box & Cover	01	M.S. Painted

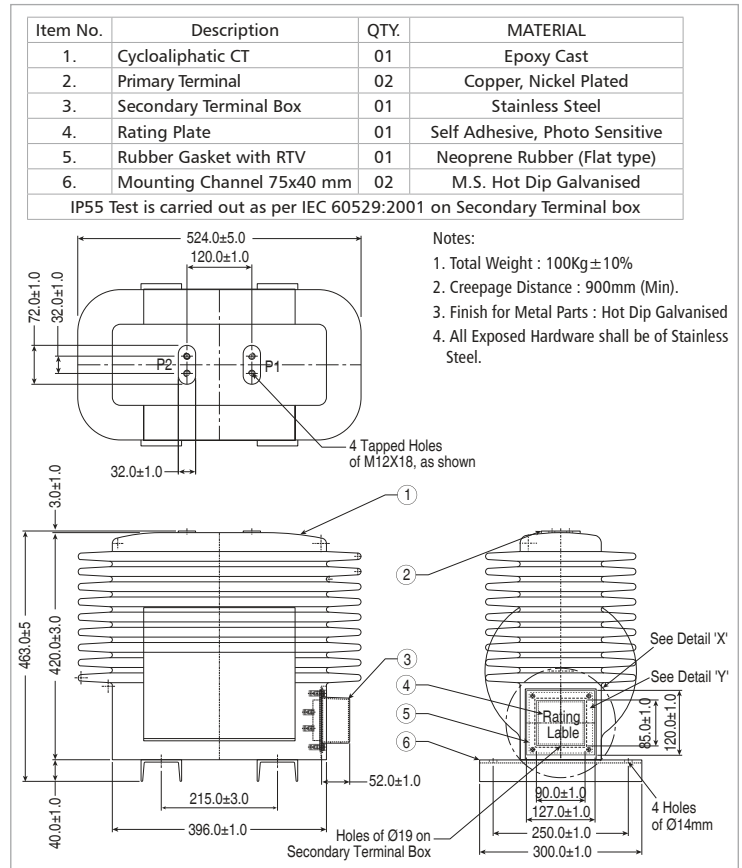
**Notes:**

- Total Weight : 70Kg ± 10%
- Creepage Distance : 900mm (Min).
- Finish for Metal Parts : Shot Blasting & Spray Galvanising followed by Two coats Zinc Rich Primer & Two coats of Polyurethane based paint (Shade: Ral 7032)
- All Exposed Hardware shall be of Stainless Steel.
- Colour : Brick Red.

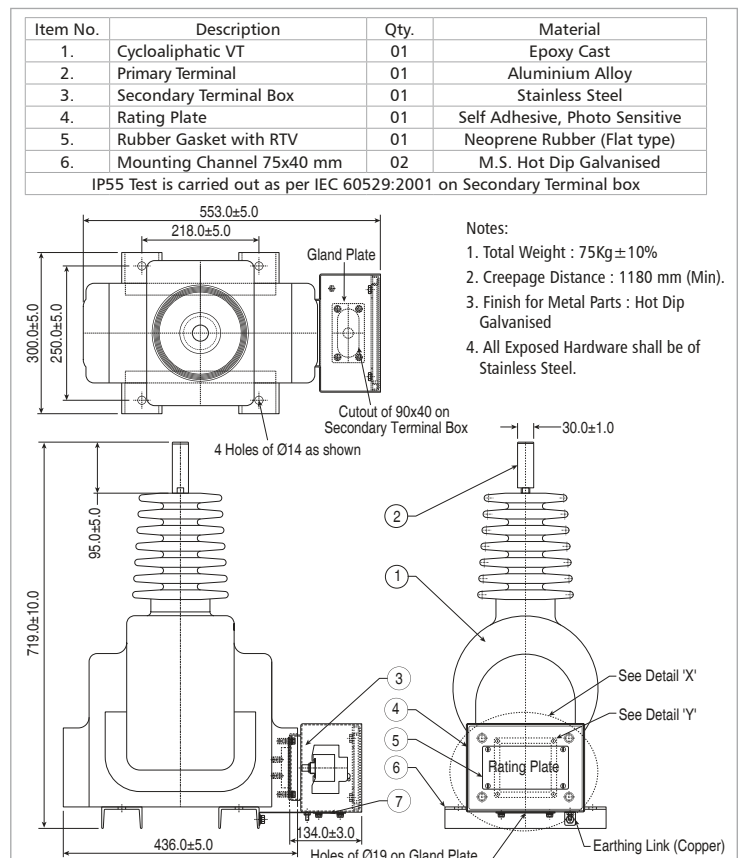


## GDC 36-5

All Dimensions are in 'mm'



## GDV 36-3



Note : The dimensions shown here are purely indicative in nature. In view of continuous in improvements, the dimensions on products may vary. We request Clients to contact us and seek specific quotes against RFQ with clear specifications.

# QUALITY CERTIFICATION

We at GEMINI INSTRATECH are committed to achieve technical excellence in Design, Manufacture and Services at reasonable prices to satisfy the stated and implied needs of our valued customers.

Quality Goals and Objectives will be achieved by directing collective efforts in 'Doing The Right Thing First Time and Every Time' and by complying with requirements of Quality Management System (QMS), statutory and regulatory requirements and continually improving our Product Quality & effectiveness of QMS.

## PRODUCT QUALITY

Gemini Instratech is committed to producing a quality product. This is ensured by maintaining the quality systems in accordance with the ISO 9001: 2008 requirements as well as by adhering to quality norms for every product we manufacture.

Raw materials and processed components are procured to engineered drawings and Material Specifications and their receipts are subjected to rigorous Quality Assurance Plan. The incoming inspection is in accordance to the relevant quality plan. Furthermore, various in-process tests are conducted as per the quality plan during the manufacturing process. Each unit of any product undergoes Final Routine Electrical testing and a final inspection as defined by the Customer's requirements prior to dispatch.



### **GEMINI INSTRATECH LIMITED**

B-83, MIDC, Ambad, Nashik - 422 010

Maharashtra, India

Email : [marketing@geminctvt.com](mailto:marketing@geminctvt.com)

Tel : + 91 253 2306881/82

Fax : + 91 253 - 2383717

URL : [www.geminctvt.com](http://www.geminctvt.com)