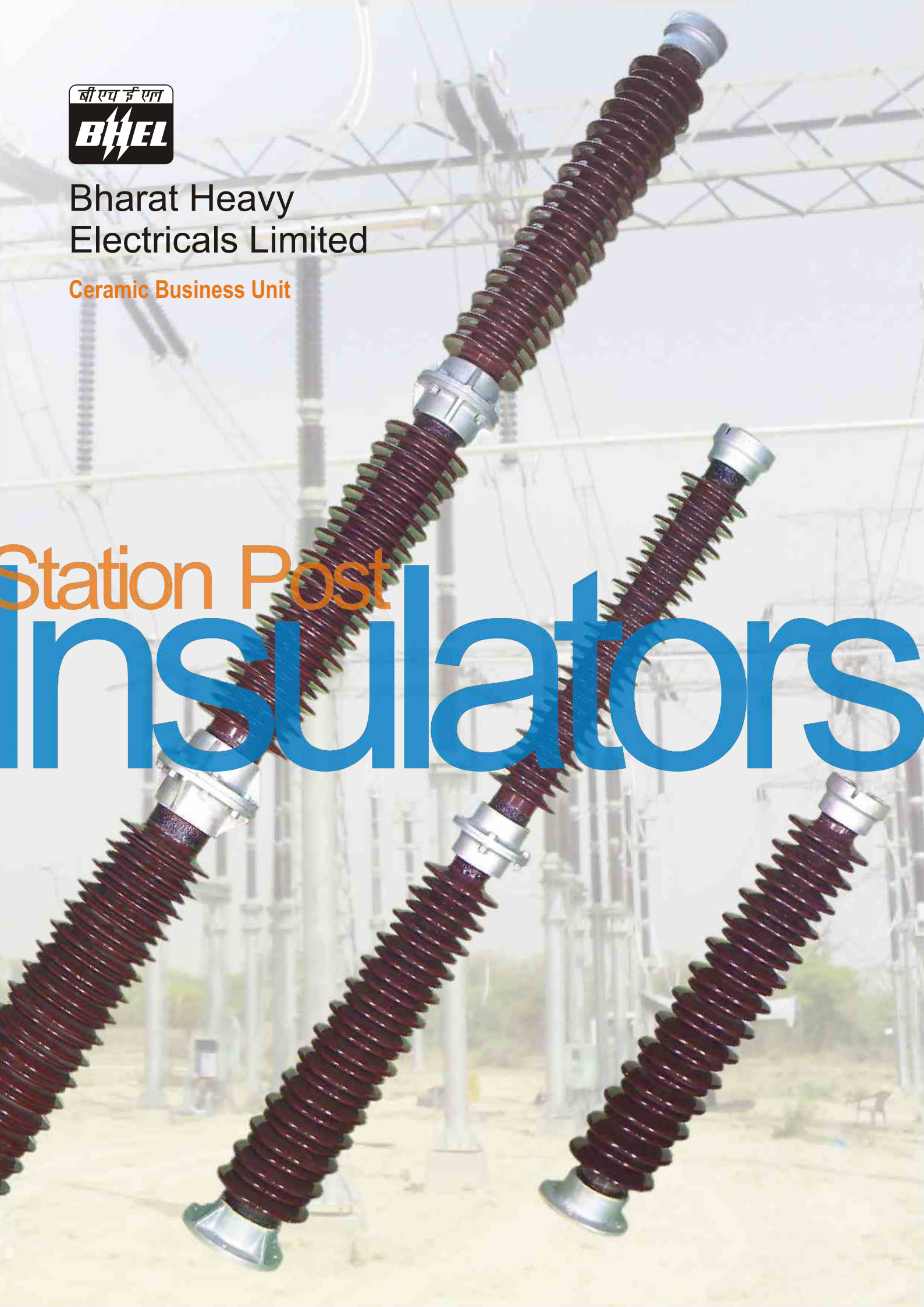




Bharat Heavy
Electricals Limited
Ceramic Business Unit

Station Post Insulators



Solid Core Post Insulators

BHEL, Ceramic Business Unit is a leading manufacturer of High Voltage Porcelain Insulators, with 75 years of experience in designing and manufacturing of insulators. BHEL, CBU produces a most diverse range of insulators, upto the highest voltages in both AC and DC systems, using the latest of technologies and state-of-art manufacturing processes.

Features

Post Insulators are an important cog in the electrical system in switchyards and substations. Post Insulators manufactured at BHEL, CBU are designed to comply with desired levels of insulation and mechanical strengths, in addition to meeting the harshest of environment conditions when in service. BHEL, CBU manufactures all ranges of Post insulators from 11kV to 400 kV for isolator, and bus support applications.

Solidcore post insulators are manufactured for outdoor applications with metal fittings conforming to IEC 60273 and IS 2544. Special customer requirements can be supplied upon request.

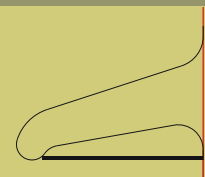
Insulator Types

BHEL manufacturers post insulators to suit different insulation levels, mechanical strengths and pollution levels. The insulators are designed with Plain and Alternate sheds depending on the creepage distance requirements of the customer. Plain and Alternate sheds are designed to conform to IEC 60815. BHEL can supply both upright and underhung types of post insulators

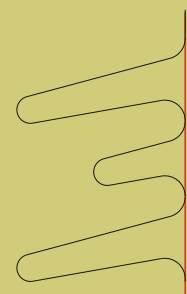


Type of Sheds

PLAIN SHED



ALTERNATE SHED





Ordering Information

To specify the correct outdoor solidcore post insulator the following characteristics need to be defined:

- Lightning Impulse withstand voltage, dry
- Switching impulse withstand voltage, wet (when required)
- Power frequency Withstand voltage, wet
- Mechanical (Cantilever) failing load
- Minimum nominal creepage distance
- Fixing arrangement of top and bottom metal fitting
- Colour of glaze

Manufacturing Capabilities

kV Rating	: 11 kV to 400 kV
Cantilever Strength	: 4 kN to 12 kN
Tensile Strength	: Upto 160 kN
Torsion Strength	: 2 kN to 4 kN
Shed Type	: Plain or Alternate
Specific Creepage Distance	: 25 mm/ kV to 40 mm/kV
Insulator Type	: Upright and underhung
Application	: Isolator, Support
Testing Standard	: IEC 60273, IS 2544, IS 5350

Insulating Material

The solid core post insulator is made from high quality Aluminium Oxide porcelain, conforming to IEC 60672. Glaze of colour Brown or Munsel Grey can be provided. The glaze forms a protective dirt repellent layer on the surface of the insulator.

Metal Fittings

Fittings are made in Spheroidal Graphite Iron (SGI) of grade in accordance with IS 8350. All fittings are hot dip galvanized in conformance with IEC with minimum 600 g/m² mass of zinc. The following figures show the end metal fittings:



Mounting Dimensions are in conformance with IEC 60273 / IS 5350.

Threads are generally tapped after hot dip galvanizing. The threads are protected by application of Lubricant Grease or by plastic plugs for safe storage and transportation.

Multiple unit insulators can be supplied with suitable hardware (bolts, nuts & spring washers) for assembly of the insulator units.

Manufacturing Facilities

BHEL has state-of-art manufacturing facilities for the manufacture of Bus Post Insulators



The Leather hard pugs are shaped to the required profile on CNC Vertical lathes. The turned models are then dried.



Raw materials are wet ground in Ball Mills



The models are glazed (brown or munsell grey colour) and fired in fully automated kilns where thorough vitrification is assured.



The resultant slurry is de-watered in filter presses



The fired porcelain are cut to the required size, fitted with metal fittings using high strength Portland cement and cured adequately to obtain the maximum mechanical strength.



Filter Cakes are fed to de-airing pugmills and fully compacted solid pugs are extruded. The extruded pugs are dried to leather hard condition.



The porcelain insulators are subjected to electrical routine test and mechanical cantilever test.



Quality & Reliability

A well established Quality Assurance Programme ensures that our customers get value for their money. All raw materials undergo rigorous tests and inspections in our well equipped and sophisticated ceramic laboratory, to ensure conformity to the specifications.

In-process checks are meticulously planned and carried out at all stages of the manufacturing process to ensure defect free products. The fired porcelains are subject to visual, dimensional, ultrasonic crack detection, and other routine tests in conformance to standards.

In addition, insulators, after assembly with metal fittings are subjected to 8 directional bend test to ensure soundness of the porcelain.



Test & Standard

Station post insulators can meet the requirements and tests specified in the following standards.

IEC Standard

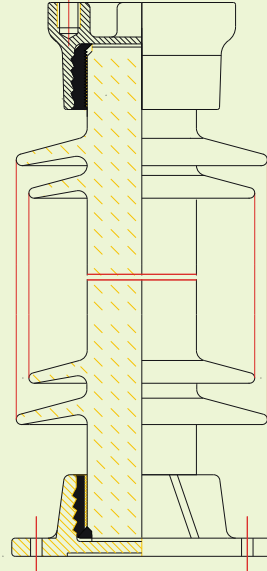
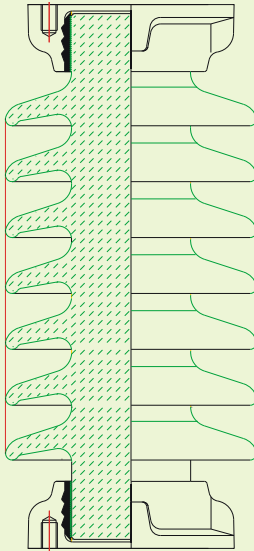
60060-1	High-voltage test techniques Part1: General definitions and test requirements
60168	Test on indoor and outdoor post insulators of ceramic material or glass for systems with normal voltages greater than 1000V
60273	Characteristics of indoor and outdoor post insulators for systems with normal voltages greater than 1000V
60437	Radio interference test on high-voltage insulators
60507	Artificial pollution tests on high-voltage insulators to be used on AC systems
60815	Guide for the selection of insulators in respect of polluted conditions
61245	Artificial pollution tests on high-voltage insulators to be used on D.C. systems

ANSI Standard

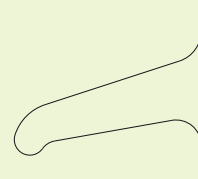
C29.1	Electrical Power Insulators - Test methods
C29.9	Wet-Process Porcelain insulators - Apparatus, Post-type

Solid Core Post Insulator

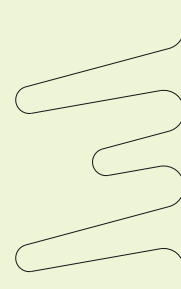
Type 33 kV



SHED PROFILE



PLAIN SHED



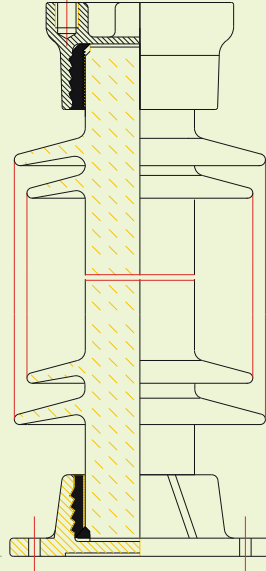
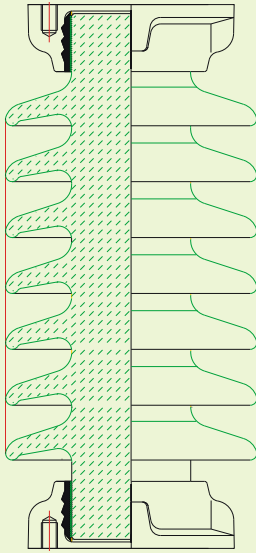
LONG AND SHORT SHED

SL. No.	PARAMETERS	Unit	
1	TYPE		SOLID CORE
2	VOLTAGE CLASS	kV	33
3	HEIGHT OF INSULATOR		445 ± 1
4	TOTAL CREEPAGE DISTANCE	mm	900
5	WITHSTAND TEST VOLTAGE		
	DRY	kV	75
	WET	kV	75
	IMPULSE	kVp	170
6	MECHANICAL STRENGTH		
	CANTILEVER STRENGTH	kN	8
	TENSILE STRENGTH	kN	40
	TORSION STRENGTH	kN	2
	COMPRESSION STRENGTH	kN	80
7	PITCH CIRCLE DIAMETER		
	TOP	mm	76
	BOTTOM	mm	76
8	SPECIFICATION		IS: 2544/ IS: 5350/ IEC: 60273

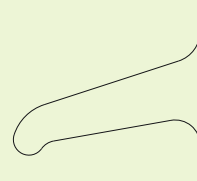
1. Sketch is indicative only.
2. Specific creepage distance from 16 mm /kV to 40 mm / kV
3. Height ranges from 254 mm to 3650 mm
4. Cantilever/Bending strengths from
 - a) 2 kN to 16 kN for 33 kV to 132 kV.
 - b) 2 kN to 10 kN for 220 kV.
 - c) 2 kN to 8 kN for 400 kV.
5. Top PCD varying from 50 mm to 127 mm.
6. Bottom PCD varying from 50 mm to 300 mm.
7. For specific requirement, contact: CBU / Marketing, Malleshwaram, Bangalore....560012

Solid Core Post Insulator

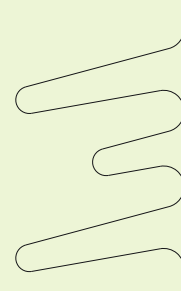
Type 66 kV



SHED PROFILE



PLAIN SHED



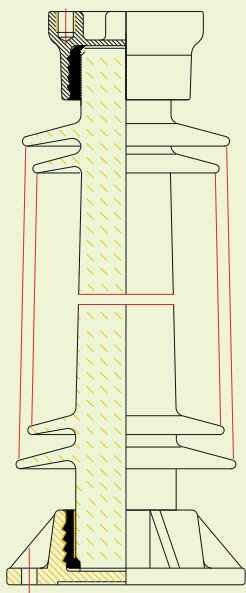
LONG AND SHORT SHED

SL. No.	PARAMETERS	Unit	
1	TYPE		SOLID CORE
2	VOLTAGE CLASS	kV	66
3	HEIGHT OF INSULATOR		770 ± 1
4	TOTAL CREEPAGE DISTANCE	mm	1815
5	WITHSTAND TEST VOLTAGE		
	DRY	kV	140
	WET	kV	140
	IMPULSE	kVp	325
6	MECHANICAL STRENGTH		
	CANTILEVER STRENGTH	kN	8
	TENSILE STRENGTH	kN	50
	TORSION STRENGTH	kN	3
	COMPRESSION STRENGTH	kN	100
7	PITCH CIRCLE DIAMETER		
	TOP	mm	127
	BOTTOM	mm	127
8	SPECIFICATION		IS: 2544/ IS: 5350/ IEC: 60273

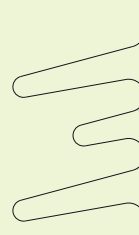
1. Sketch is indicative only.
2. Specific creepage distance from 16 mm /kV to 40 mm / kV
3. Height ranges from 254 mm to 3650 mm
4. Cantilever/Bending strengths from
 - a) 2 kN to 16 kN for 33 kV to 132 kV.
 - b) 2 kN to 10 kN for 220 kV.
 - c) 2 kN to 8 kN for 400 kV.
5. Top PCD varying from 50 mm to 127 mm.
6. Bottom PCD varying from 50 mm to 300 mm.
7. For specific requirement, contact: CBU / Marketing, Malleshwaram, Bangalore....560012

Solid Core Post Insulator

Type 132 kV



SHED PROFILE



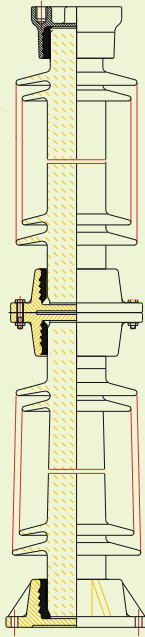
LONG AND SHORT SHED

SL. No.	PARAMETERS	Unit	
1	TYPE		SOLID CORE
2	VOLTAGE CLASS	kV	132
3	HEIGHT OF INSULATOR		1500 ± 2.5
4	TOTAL CREEPAGE DISTANCE	mm	3625
5	WITHSTAND TEST VOLTAGE		
	DRY	kV	275
	WET	kV	275
	IMPULSE	kVp	650
6	MECHANICAL STRENGTH		
	CANTILEVER STRENGTH	kN	8
	TENSILE STRENGTH	kN	95
	TORSION STRENGTH	kN	4
	COMPRESSION STRENGTH	kN	190
7	PITCH CIRCLE DIAMETER		
	TOP	mm	127
	BOTTOM	mm	225
8	SPECIFICATION		IS: 2544/ IS: 5350/ IEC: 60273

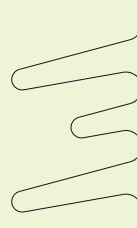
1. Sketch is indicative only.
2. Specific creepage distance from 16 mm /kV to 40 mm / kV
3. Height ranges from 254 mm to 3650 mm
4. Cantilever/Bending strengths from
 - a) 2 kN to 16 kN for 33 kV to 132 kV.
 - b) 2 kN to 10 kN for 220 kV.
 - c) 2 kN to 8 kN for 400 kV.
5. Top PCD varying from 50 mm to 127 mm.
6. Bottom PCD varying from 50 mm to 300 mm.
7. For specific requirement, contact: CBU / Marketing, Malleshwaram, Bangalore....560012

Solid Core Post Insulator

Type 220 kV



SHED PROFILE

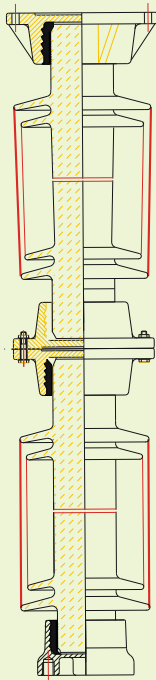


LONG AND SHORT SHED

SL. No.	PARAMETERS	Unit	
1	TYPE		SOLID CORE
2	VOLTAGE CLASS	kV	220
3	HEIGHT OF INSULATOR		2300 ± 3.5
4	TOTAL CREEPAGE DISTANCE	mm	6125
5	WITHSTAND TEST VOLTAGE		
	DRY	kV	460
	WET	kV	460
	IMPULSE	kVp	1050
6	MECHANICAL STRENGTH		
	CANTILEVER STRENGTH	kN	8
	TENSILE STRENGTH	kN	130
	TORSION STRENGTH	kN	4
	COMPRESSION STRENGTH	kN	260
7	PITCH CIRCLE DIAMETER		
	TOP	mm	127
	BOTTOM	mm	225
8	SPECIFICATION		IS: 2544/ IS: 5350/ IEC: 60273

1. Sketch is indicative only.
2. Specific creepage distance from 16 mm /kV to 40 mm / kV
3. Height ranges from 254 mm to 3650 mm
4. Cantilever/Bending strengths from
 - a) 2 kN to 16 kN for 33 kV to 132 kV.
 - b) 2 kN to 10 kN for 220 kV.
 - c) 2 kN to 8 kN for 400 kV.
5. Top PCD varying from 50 mm to 127 mm.
6. Bottom PCD varying from 50 mm to 300 mm.
7. For specific requirement, contact: CBU / Marketing, Malleshwaram, Bangalore....560012

Solid Core Post Insulator Type 220 kV Under Hung



SHED PROFILE



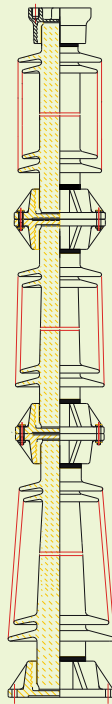
LONG AND SHORT SHED

SL. No.	PARAMETERS	Unit	
1	TYPE		SOLID CORE (UNDER HUNG)
2	VOLTAGE CLASS	kV	220
3	HEIGHT OF INSULATOR		2300 ± 3.5
4	TOTAL CREEPAGE DISTANCE	mm	6125
5	WITHSTAND TEST VOLTAGE		
	DRY	kV	460
	WET	kV	460
	IMPULSE	kVp	1050
6	MECHANICAL STRENGTH		
	CANTILEVER STRENGTH	kN	8
	TENSILE STRENGTH	kN	130
	TORSION STRENGTH	kN	4
	COMPRESSION STRENGTH	kN	260
7	PITCH CIRCLE DIAMETER		
	TOP	mm	225
	BOTTOM	mm	127
8	SPECIFICATION		IS: 2544/ IS: 5350/ IEC: 60273

1. Sketch is indicative only.
2. Specific creepage distance from 16 mm /kV to 40 mm / kV
3. Height ranges from 254 mm to 3650 mm
4. Cantilever/Bending strengths from
 - a) 2 kN to 16 kN for 33 kV to 132 kV.
 - b) 2 kN to 10 kN for 220 kV.
 - c) 2 kN to 8 kN for 400 kV.
5. Top PCD varying from 50 mm to 127 mm.
6. Bottom PCD varying from 50 mm to 300 mm.
7. For specific requirement, contact: CBU / Marketing, Malleshwaram, Bangalore....560012

Solid Core Post Insulator

Type 400 kV



SHED PROFILE



LONG AND SHORT SHED

SL. No.	PARAMETERS	Unit	
1	TYPE		SOLID CORE
2	VOLTAGE CLASS	kV	400
3	HEIGHT OF INSULATOR		3650 ± 5.5
4	TOTAL CREEPAGE DISTANCE	mm	10500
5	WITHSTAND TEST VOLTAGE		
	DRY	kV	680
	WET	kV	680
	IMPULSE	kVp	1550
6	MECHANICAL STRENGTH		
	CANTILEVER STRENGTH	kN	8
	TENSILE STRENGTH	kN	160
	TORSION STRENGTH	kN	4
	COMPRESSION STRENGTH	kN	320
7	PITCH CIRCLE DIAMETER		
	TOP	mm	127
	BOTTOM	mm	300
8	SPECIFICATION		IS: 2544/ IS: 5350/ IEC: 60273

1. Sketch is indicative only.
2. Specific creepage distance from 16 mm /kV to 40 mm / kV
3. Height ranges from 254 mm to 3650 mm
4. Cantilever/Bending strengths from
 - a) 2 kN to 16 kN for 33 kV to 132 kV.
 - b) 2 kN to 10 kN for 220 kV.
 - c) 2 kN to 8 kN for 400 kV.
5. Top PCD varying from 50 mm to 127 mm.
6. Bottom PCD varying from 50 mm to 300 mm.
7. For specific requirement, contact: CBU / Marketing, Malleshwaram, Bangalore....560012

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(A Government of India undertaking)

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Efforts are constantly being made to improve the product design and hence the products supplied may differ in minor details from that given in the catalogue.



For enquiries please contact:

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(A Government of India Undertaking)

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