



# ZDTSEC

- Transformer Bushings
- ANSI/IEEE Standard
- 25kV-46 kV



Jiangsu Zhida High Voltage Electric Co., Ltd.



Jiangsu Zhida High Voltage Electrical Co., Ltd, doing business as (D/B/A) ZDVolt, specializes in advanced high-voltage solutions, including transformer bushings, GIS and breaker bushings, substation post insulators, and bushing/instrument current transformers. Its products are engineered for exceptional reliability and high performance.

Founded in 2003, ZDVolt is a privately held company with hundreds of patents. Its high-voltage bushing product line supports ratings up to 1000 kV and complies with IEC and ANSI/IEEE/CSA standards. ZDVolt's transformer bushings are available in OIP, RIP, RIS, SEC™, and P&O™ series. The company maintains an annual manufacturing capacity of approximately 30,000 bushings and bushing-type current transformers, with average 1-5 months lead times.

By the end of 2025, ZDVolt has installed more than 200,000 high-voltage bushings worldwide (including over 80,000 OIP bushings), including China, the United States, and Europe. Its patented "Porcelain & Oil" (P&O™) technology is the only field-proven, commercially available thermosiphon bushing solution in the industry, with over 10,000 installations.

ZDVolt operates fully integrated manufacturing facilities supported by a dozen in-house testing laboratories. These capabilities enable the production of key components such as porcelain using enhanced isostatic cold pressing, composite insulators, windings, metal parts, and fiberglass. ZDVolt also manufactures its patented BambuX™ composite insulators.

ZDVolt holds valid ISO 9001 (Quality), ISO 14001 (Environment), ISO 45001 (Occupational Health & Safety), GOST, UL, and ISO/IEC 17025 laboratory accreditations.

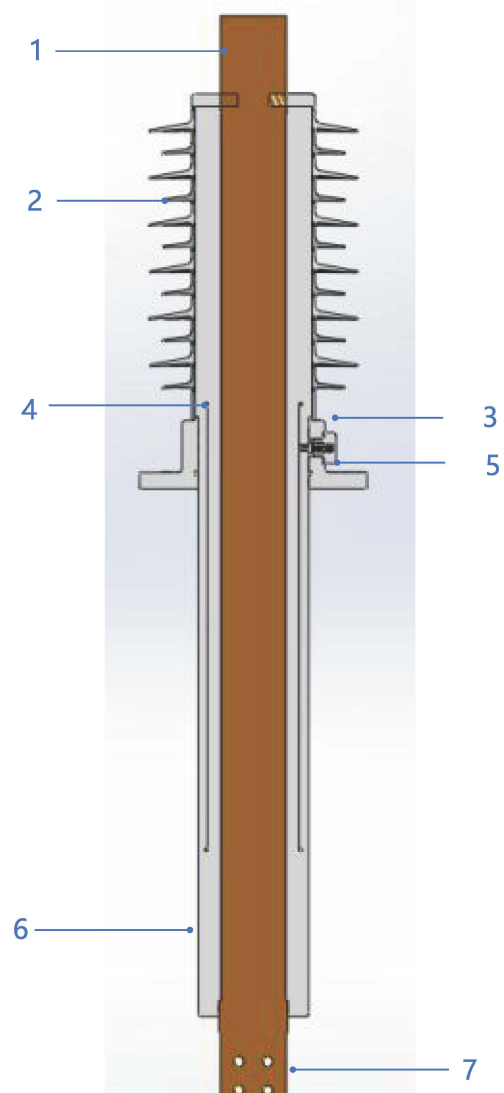


## ZDTSEC bushings designed for IEEE standard bushings.

ZDTSEC is a series of SEC bushings developed by ZDVolt, with dimensional and electrical performance strictly complying with IEEE Std. C57.19.01-2017 and IEEE Std. C57.19.00-2023. Voltage and current ratings fully cover standard rated levels. The cast-resin bushing comprises a central copper conductor encapsulated in epoxy resin, with rubber sheds bonded to the epoxy surface, and a high-strength aluminum alloy flange bonded to the epoxy body for convenient installation. All functional surfaces are precision machined to ensure optimum fitting. The flange is designed to ensure maximum sealing performance, preventing any leakage between the flange and the epoxy body. The grading shield is cast into the resin together with the copper conductor to optimize the electric field distribution. The shield is permanently grounded to the metal flange through a test tap. When the test tap cap is removed, the pin is insulated from the flange, facilitating power factor measurement.

### Bushing structure

1. **Top terminal:** Connected to the outer terminal .
2. **External insulator:** The external insulation is bonded to the core. Standard creepage distance of 54mm/kV (extra heavy).
3. **Mounting flange:** Aluminum alloy .
4. **Shielding:** Uniform magnetic field distribution.
5. **Test tap:** This tap is connected to the shielding and must be grounded during operation.
6. **Main insulator:** Filled epoxy resin.
7. **Bottom terminal:** Tinned copper.



## Bushing electric performance

All the bushings are tested in accordance with IEEE Std. C57.19.00-2023.

### Design test

- Leak test
- Cantilever strength
- Power factor
- Tap withstand voltage
- Full-wave lightning-impulse withstand voltage
- Chopped-wave lightning-impulse withstand voltage
- Rated frequency wet withstand voltage (900-kV BIL and below)
- Switching-impulse withstand voltage
- Rated frequency dry withstand test with partial discharge measurement
- Temperature rise
- Verification of nameplate markings

### Routine test

- Leak test
- Power factor
- Tap withstand voltage
- Rated frequency dry withstand with partial discharge measurement
- Verification of nameplate markings

Electric performances exceed ANSI/IEEE standard requirements.

Higher electric performances	PD at 1.5 times L-G voltage	C1 Power factor
IEEE Std. C57.19.01-2017	25pC	1%
ZDVolt level	15pC	0.8%

## Bushing service condition

### Ambient temperature

Normally -40~+40°C. Min. ambient temperature affects the selection of the sealing gasket material.

Option (after catalog No.)	Min. ambient temperature	Sealing gasket material
Default	Above -30°C	Nitrile rubber
L	-30°C to -45°C	Low temperature-resistant nitrile rubber
LL	Below -45°C	Fluorosilicone rubber

**Note:**

- 1, Special temperature must emphasize in the order document.
- 2, If the max. temperature exceeds 40°C, it is best to choose the higher grade current.

**Mounting angle**

Any angle

**High anti-corrosion area**

Most of the bushing metal parts are made of aluminum alloy material, which has high corrosion resistance. For areas below C5 level, no special treatment is required, while for areas at C5 and above, special painting treatment is required.

**High pollution area**

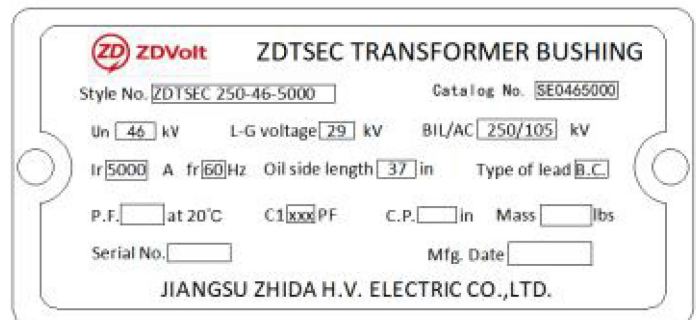
ZDTSEC bushings' porcelains are designed in accordance with the extra heavy pollution level (USCD:54mm/kV), So it can satisfy with high pollution area. If the customer needs higher pollution level, ZDVolt can also specially design for it. Add option "H" after catalog No..

**High altitude area**

At high altitudes, it is necessary to improve the external insulation level of the bushing, that is, to increase the arcing distance of the bushing. Each voltage level of bushings has a maximum applicable altitude. If the altitude exceeds it, the bushing needs to be specially designed. If the altitude is high enough, it is recommended to increase the voltage level for use. Add option "H" after catalog No..

**Nameplate sample**

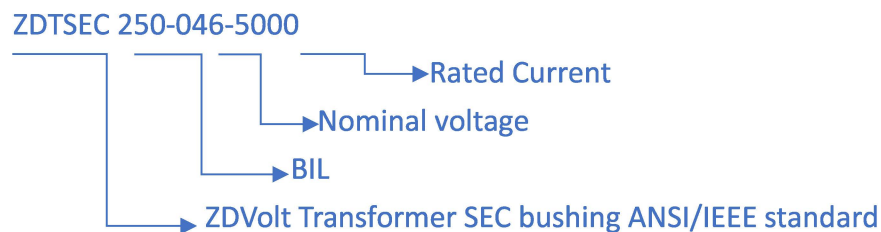
Every bushing is provided with a nameplate made of stainless steel. It contains all the electric data , Serial No. and all the information in accordance with ANSI/IEEE standard.



## Style No. and catalog No.

Bushing is defined by the style No. and the catalog No. together. The style No. determines the bushing's type, BIL, voltage and current. The catalog No. determines the unique of the bushing including the dimension and structure. Usually, for special requirements that affect the dimension and structure of the bushing, some letters will be added after the Catalog No. to indicate specific meanings.

Style No. example:



Special requirements		Style No.	Catalog No.
Standard name		ZDTSEC 250-46-5000	SE0465000
High altitude/high pollution area		ZDTSEC 250-46-5000	SE0465000H
Low temperature	-30°C~-45°C	ZDTSEC 250-46-5000	SE0465000L
	Below -45°C	ZDTSEC 250-46-5000	SE0465000LL

## ZDVolt solution

- ZDVolt can provide all related accessories of bushings, including top& bottom terminals and shields.
- ZDVolt has sufficient replacement experience, replacing various types of bushings in the industry, not limited to IEEE Std.

ZDTSEC range from 25 to 46kV ratings & dimensions

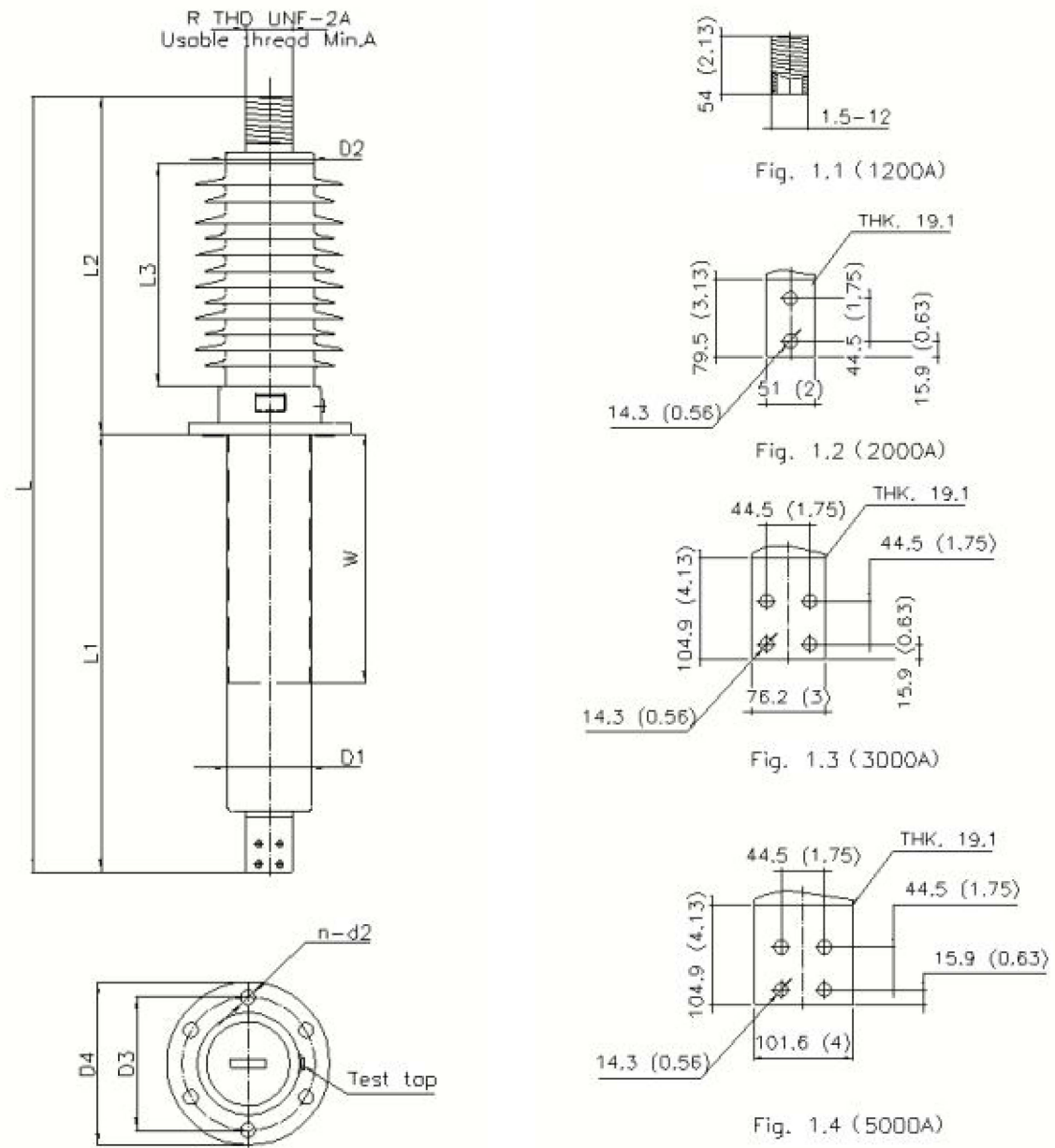


Fig.1 Bushings 25 to 46kV& Bottom terminals per ANSI/IEEE Std. C57.19.01-2017

## ZDTSEC TRANSFORMER BUSHINGS ANSI/IEEE STD

Style No.	Catalog No.	Nominal voltage	BIL	Rated current	Creepage distance Min.		Arcing distance Min. (L3)		Max. altitude		Overall length (L)		Length above flange (L2)		Length below flange (L1)	
		kV	kV	A	mm	in	mm	in	m	ft	mm	in	mm	in	mm	in
ZDTSEC 150-25-1200	SE0251200	25	150	1200	780	30.71	300	11.81	2700	8856	1239	57.64	490	19.29	749	29.49
ZDTSEC 150-25-2000	SE0252000	25	150	2000	780	30.71	300	11.81	2700	8856	1300	59.06	500	19.68	800	31.5
ZDTSEC 150-25-3000	SE0253000	25	150	3000	780	30.71	300	11.81	2700	8856	1310	60.24	510	20.07	800	31.5
ZDTSEC 150-25-5000	SE0255000	25	150	5000	780	30.71	300	11.81	2700	8856	1373	63.7	535	21.06	838	32.99
ZDTSEC 200-34.5-1200	SE0341200	34.5	200	1200	1076	42.36	400	15.75	2700	8856	1390	63.58	590	23.23	800	31.5
ZDTSEC 200-34.5-2000	SE0342000	34.5	200	2000	1076	42.36	400	15.75	2700	8856	1451	65	600	23.62	851	33.5
ZDTSEC 200-34.5-3000	SE0343000	34.5	200	3000	1076	42.36	400	15.75	2700	8856	1461	66.18	610	24.01	851	33.5
ZDTSEC 200-34.5-5000	SE0345000	34.5	200	5000	1076	42.36	400	15.75	2700	8856	1486	68.54	635	25	851	33.5
ZDTSEC 250-46-1200	SE0461200	46	250	1200	1435	56.5	485	19.09	2700	8856	1526	68.94	675	26.57	851	33.5
ZDTSEC 250-46-2000	SE0462000	46	250	2000	1435	56.5	485	19.09	2700	8856	1587	70.75	685	26.96	902	35.51
ZDTSEC 250-46-3000	SE0463000	46	250	3000	1435	56.5	485	19.09	2700	8856	1597	71.93	695	27.36	902	35.51
ZDTSEC 250-46-5000	SE0465000	46	250	5000	1435	56.5	485	19.09	2700	8856	1660	75	720	28.34	940	37.01





72.5-252kV OIP Bushings



550kV OIP Bushings



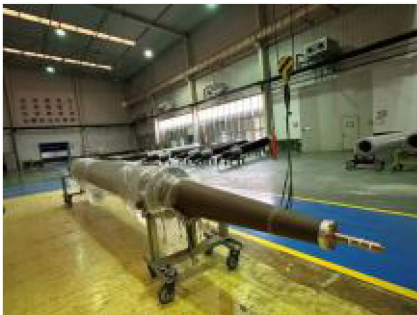
145kV RIP Bushings



550kV RIP Bushings



±800kV SF<sub>6</sub> HVDC Bushing



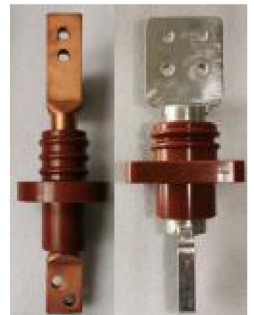
±400kV RIP DC Bushing



Type P&O I



Type P&O II



SEC bushings



Oil-Oil/Gas RIP bushings



GIS/GCB SF<sub>6</sub> Outlet Bushings



Turret with BCTs



CNAS Accreditation



±2400kV DC system



1650kV Power frequency system



4000kV Lightning impulse system



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