METAL OXIDE SURGE ARRESTERS

Add：5# Zhongtian Road , Natong Economic&Technolagical Development Area,Jiangsu,P.R.China P.C.:226009

Tel:86-513-83599669/83599671 Fax:86-513-83599670

E-mail:International@zttcable.com Http://www.zttcable.com

www.zttcable.com

CONTENTS

6 ~ 500kV Metal Oxide Surge Arresters for Power Systems

6 ~ 500kV Metal Oxide Surge Arresters for Power Systems

01 / SUMMARY

In the process of production, transmission, distribution to the load terminal of electric energy equipment used for generation- transmission - distribution is inevitably suffered overvoltage attack. No matter where such over-voltages comes from, the atmosphere or the interior, damage or permanent damage to the equipment may occur, which result in power interruption and substantial economic loss. It is necessary to take appropriate protective measures. At present, metal-oxide surge arresters are recognized as the most excellent over-voltage protection devices on a global scope. When atmospheric over-voltage or internal over-voltage occurs to the system, the core element of the arrester - the zinc oxide arrester keeps its resistance value at a low level. The current of kilo-amperes flows into the earth through the resistor sheet. The residual voltage pressure at both ends of the arrester is limited below the allowable value, thereby providing a reliable protection for the insulation of the power equipment and cutting off power-flow current; when the arrester is running under normal voltage, due to its excellent non-linear, its resistance will be high and the current flowing through the arrester will be only a few hundred micro amps, which limit the power loss to a minimum.

METAL OXIDE SURGE ARRESTERS

02 / EXECUTION STANDARDS

ZTT arresters design, manufacture in full compliance with GB11032, IEC60099-4 standards.

03 / QUALITY, DESIGN AND SERVICE

3.1 Superior Product Quality

● **Excellent performance of the core components--- Varistors.**

With high quality raw materials and strict manufacturing process, varistors comprehensive performance reaches the domestic advanced level, especially the withstand capacity, high current impact and residual pressure voltage ratio performance reach the leading domestic level.

● **To prevent moisture intrusion.**

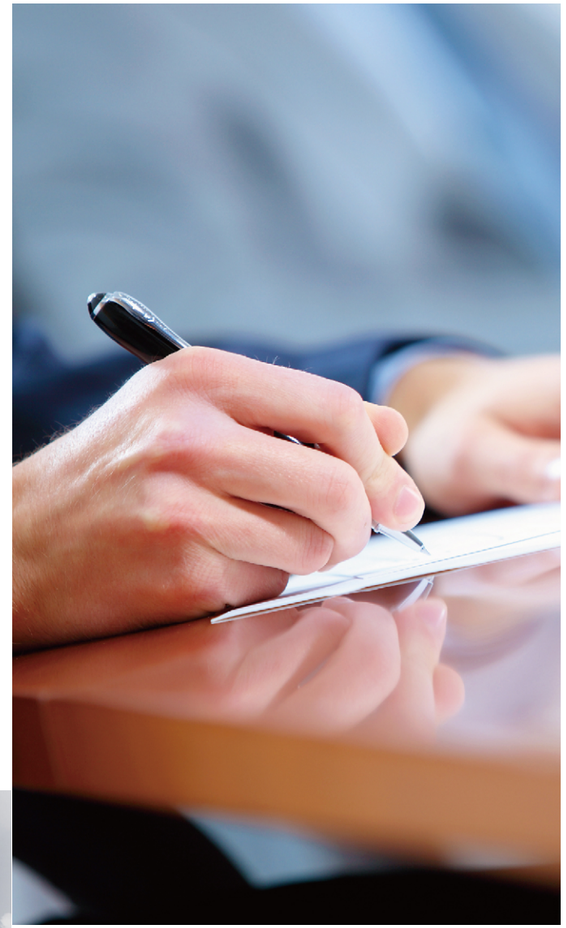
The use of Durethan packaging materials or epoxy composite bushing fundamentally solves the problem of product failure caused by moisture. Even in high-temperature environment where humidity reaches up to 90%, there will no failure occurred.

● **High-quality insulation to prevent external flashover.**

Silicone rubber material is highly hydrophobic, it can prevent rainwater from forming continuous channels during use and prevent the accumulation of any pollutants, which make the products corrosion-resistant and cut off the leakage current path. And the material's flame retardant and self-extinguishing performance can achieve a free-cleaning function product.

● **Manufacturers have access to ISO9001 quality certification.**

● **Products have passed independent third party laboratory type test.**



3.2 Safe and Reliable Design

● **The package structure achieves the maximum mechanical performance and electrical insulation reliability.**

Integrated package structure makes the product core more rigid, even force of 1000N applied at the top, the product has no damage. The resistivity of the encapsulation material is as high as 1013Ω.m, and it has strong insulation tolerance.

● **Design, development and application of new Nano-silicone rubber materials significantly improve the electrical insulation and hydrophobic properties of the umbrella.**

The use of silicone rubber Nano-materials, achieve a further improvement of the properties to resist ultraviolet, ozone, organic solvents and inorganic solvent, and the electrical corrosion class increases from 4.5 to 6. The use of Nano-materials enhances rainwater agglomeration, making it extremely difficult to form a continuous water film, which is critical for coping with extreme weather (e.g. drizzle) flashover.

● **New interface coupling technology to eliminate the possibility of product internal breakdown.**

Repeated tests of Suitable coupling agent make the product's separation strength between the core and the silicone rubber reaches up to at least 15kN / m, eliminating product internal breakdown caused by interface problems.

● **Product design using up to 3000m above sea level.**

3.3 Worldwide Service Network

ZTT has more than 60 offices, sales and service staff of more than 800 people over the world. In any place, you will get service faster.

04 / TYPE INSTRUCTIONS

Additional feature code：
G- Plateau type S- Three-phase type
K-Seismic resistance type F- Explosion proof type
T- With disconnector type W- Anti-pollution type

Residual voltage of nominal discharge current（kV）

Rated voltage（kV）

Design No.

Occasions: Z- Substation S - Power distribution
R - Protective Capacitor banks T - Electric railway
D - Motors F-GIS Combined Electrical Apparatus

Structural feature：W- Without gap C-Gap

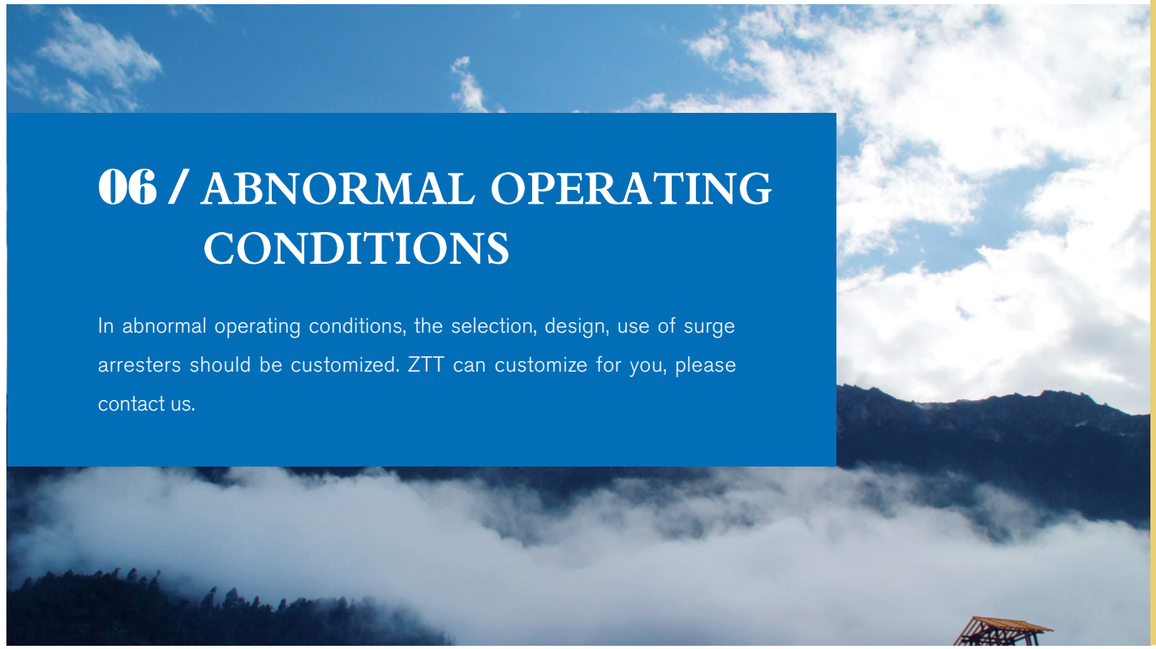
Nominal discharge current（kA）

Type：Y- Ceramic Shell YH- Composite Shell

e.g.：YH5WS-17/50T means this product for composite metal oxide surge arrester of distribution type, nominal discharge current: 5kA，rated voltage: 17kV, residual voltage less than: 50kV, with disconnector.

05 / NORMAL OPERATING CONDITIONS

—Ambient temperature: + 40℃ ~ − 40℃;
—Altitude: ⩽ 1000m;
—Maximum wind speed: ⩽ 35m/s;
—Maximum ice thickness:20mm;
—illumination intensity:0.1w/cm^2;
— Mains frequency: 48Hz ~ 62Hz;
—Seismic intensity: ⩽ 7 degrees;
—Long-term power-frequency voltage is applied to surge arresters less than continuous operating voltage of surge arresters.

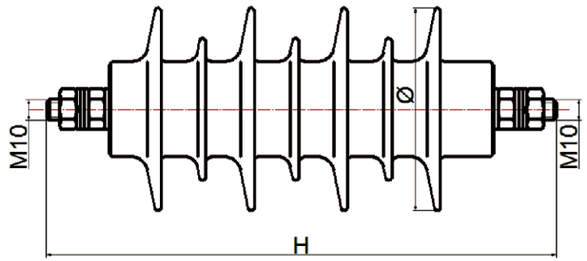


06 / ABNORMAL OPERATING CONDITIONS

In abnormal operating conditions, the selection, design, use of surge arresters should be customized. ZTT can customize for you, please contact us.

07 / Main Specifications and Technical Parameters of 6 ~ 10kV Composite Metal-oxide Surge Arresters

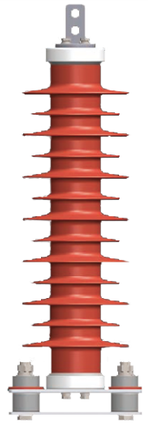
System voltage level		10kV					6kV		
Type		YH5WZ-17/45	YH5WS-17/50	YH5WX-17/50	YH5WR-17/46	YH2.5WD-12/30	YH5WZ-10/27	YH5WD-8/18.7	YH5WR-10/27
Electric parameters	Rated voltage UR （kV）	17	17	17	17	12	10	8	10
	Continuous operating voltage Uc （kV）	13.6	13.6	13.6	13.6	9.6	8.0	6.3	8
	1mA DC reference voltage U1mA （kV）	24	25	25	25	15	15.2	12	14.4
	Nominal discharge current （kA）	5	5	5	5	2.5	5	5	5
	Steep current impulse residual voltage （kV）	51.8	57.5	57.5	/	34.6	31	21.5	/
	Lightning impulse residual voltage （kV）	45	50	50	46	30	27	18.7	27
	Switching impulse residual voltage （kV）	38.3	42.5	42.5	35	23	23	15	21
	Square wave impulse withstand Current （A）	150	150	150	600	400	150	600	600
	High Current impulse withstand Current（kA）	65	65	65	100	65	65	100	100
	Pollution class	IV	IV	IV	IV	IV	/	/	IV
Structural parameters	Overall height H （mm）	252	252	252	240	240	252	240	240
	Cree-page distance （mm）	405	405	405	390	390	405	390	390
	Shed diameter Φ （mm）	100	100	100	120	120	100	120	120
	Weight （kg）	1.3	1.3	1.3	1.7	1.7	1.3	1.7	1.7
	Outline Drawing	Fig1	Fig1	Fig1	Fig1	Fig1	Fig1	Fig1	Fig1
Protected object		Substation	Power transmission and distribution	Substation	Capacitor bank	Motors	Substation	Motors	Capacitor bank

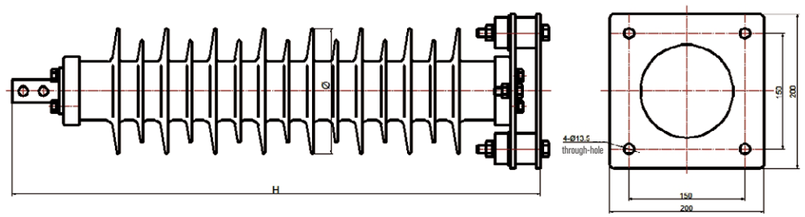


— Fig1 —

08 / Main Specifications and Technical Parameters of 35kV Composite Metal-oxide Surge Arresters

System voltage level		35kV						
Type		YH5WZ-51/125	YH5WZ-51/134	YH5WZ-54/142	YH5WR-51/134	YH1.5W-30/80	YH1.5W-33/90	YH5WT-42/120
Electric parameters	Rated voltage UR （kV）	51	51	54	51	30	33	42
	Continuous operating voltage Uc （kV）	40.8	40.8	43.2	40.8	24	26.4	34
	1mA DC reference voltage U1mA （kV）	73	73	77	73	44	49	65
	Nominal discharge current （kA）	5	5	5	5	1.5	1.5	5
	Steep current impulse residual voltage （kV）	145	154	163	154	/	/	138
	Lightning impulse residual voltage （kV）	125	134	142	134	80	90	120
	Switching impulse residual voltage （kV）	106	114	121	114	75	84	98
	Square wave impulse withstand Current （A）	400	400	400	600	600	600	600
	High Current impulse withstand Current （kA）	100	100	100	100	100	100	100
	Pollution class	IV	IV	IV	IV	/	/	IV
Structural parameters	Overall height H （mm）	684	684	684	684	684	684	684
	Cree-page distance （mm）	1400	1400	1400	1400	1400	1400	1400
	Shed diameter Φ （mm）	162	162	162	162	162	162	162
	Weight （kg）	13	13	13	13	13	13	13
	Outline Drawing	Fig2	Fig2	Fig2	Fig2	Fig2	Fig2	Fig2
Protected object		Substation	Substation	Substation	Capacitor bank	Neutral point	Neutral point	Electric railway

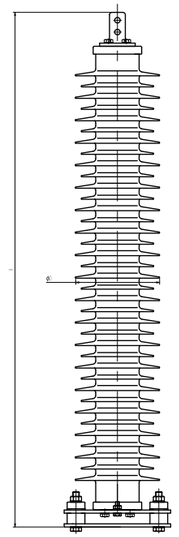


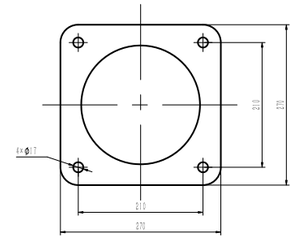


— Fig2 —

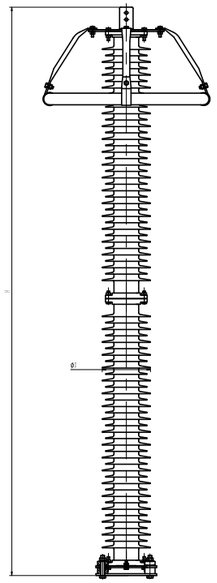
09 / Main Specifications and Technical Parameters of 110 ~ 220kV Composite Metal-oxide Surge Arresters for Substation.

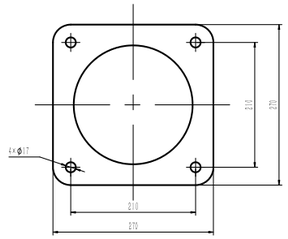
System voltage level		110kV			220kV	
Type		YH10WZ-100/260	YH10WZ-102/266	YH10WZ-108/281	YH10WZ-204/532	YH10WZ-216/562
Electric parameters	Rated voltage UR（kV）	100	102	108	204	216
	Continuous operating voltage Uc（kV）	80	81.6	86.4	163.2	172.8
	1mA DC reference voltage U1mA（kV）	153	155	164	310	328
	Nominal discharge current（kA）	10	10	10	10	10
	Steep current impulse residual voltage（kV）	291	297	314	594	628
	Lightning impulse residual voltage（kV）	260	266	281	532	562
	Switching impulse residual voltage（kV）	221	225	239	451	477
	Square wave impulse withstand Current（A）	600/800	600/800	600/800	600/800	600/800
	High Current impulse withstand Current（kA）	100	100	100	100	100
	Pollution class	IV	IV	IV	IV	IV
Structural parameters	Overall height H（mm）	1305	1305	1305	2523	2523
	Cree-page distance（mm）	4035	4035	4035	8070	8070
	Shed diameter Φ（mm）	214	214	214	214	214
	Weight （kg）	47	47	48	97	102
	Outline Drawing	Fig 3	Fig 3	Fig 3	Fig 4	Fig 4
Protected object		Substation	Substation	Substation	Substation	Substation





— Fig3 —

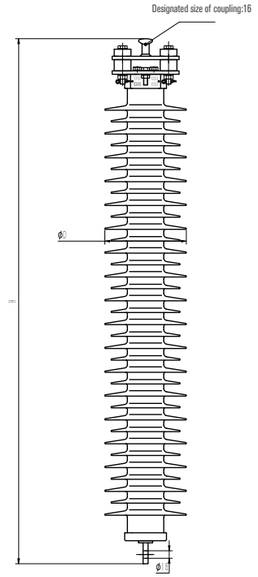




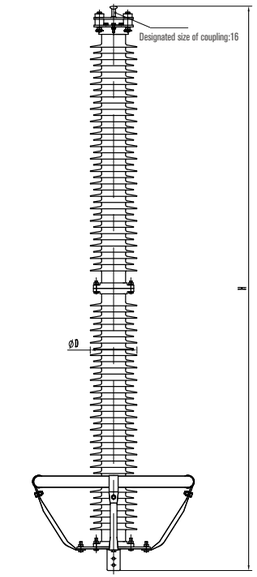
— Fig4 —

10 / Main Specifications and Technical Parameters of 110 ~ 500kV Composite without Gap Metal-oxide Surge Arresters for Transmission Line

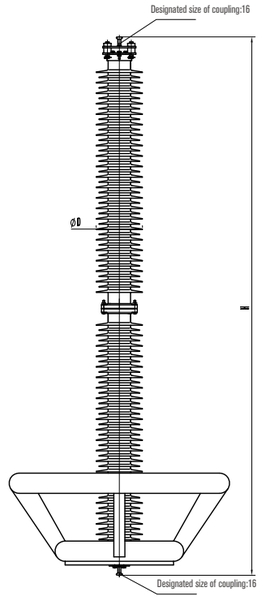
System voltage level		110kV		220kV		330kV	500kV	
Type		YH10WX-96/250	YH10WX-108/266	YH10WX-192/500	YH10WX-216/562	YH10WX-312/760	YH20WX-444/1106	YH20WX-468/1166
Electric parameters	Rated voltage UR （kV）	96	108	192	216	312	444	468
	Continuous operating voltage Uc （kV）	75	84	153.6	168.5	237	324	330
	1mA DC reference voltage U1mA （kV）	140	157	292	314	442	597	630
	Nominal discharge current （kA）	10	10	10	10	10	20	20
	Steep current impulse residual voltage （kV）	288	315	560	630	847	1238	1306
	Lightning impulse residual voltage （kV）	250	281	500	562	760	1106	1166
	Switching impulse residual voltage （kV）	213	239	424	630	643	907	956
	Square wave impulse withstand Current （A）	600	600	600/800	600/800	800/1000	1200/1800	1200/1800
	High Current impulse withstand Current（kA）	100	100	100	100	100	100	100
	Pollution class	IV	IV	IV	IV	IV	IV	IV
Structural parameters	Overall height H （mm）	1256	1256	2588	2588	2931	4307	4307
	Cree-page distance （mm）	3946	3946	8070	8070	11526	17289	17289
	Shed diameter Φ （mm）	195	195	214	214	252	252	252
	Weight （kg）	26	27	47	48	113	170	167
	Outline Drawing	Fig 5	Fig 5	Fig 6	Fig 6	Fig 7	Fig 8	Fig 8
Protected object		Transmission line	Transmission line	Transmission line	Transmission line	Transmission line	Transmission line	Transmission line



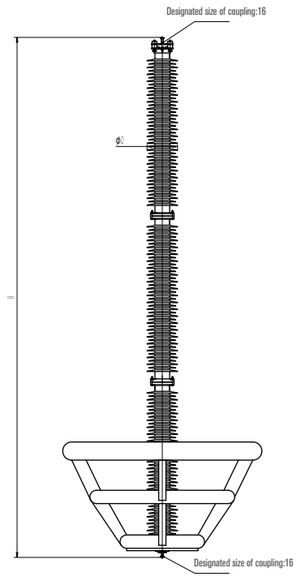
— Fig5 —



— Fig6 —



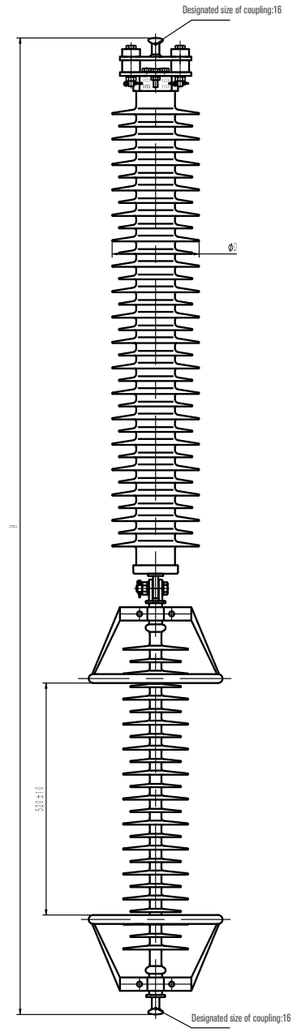
— Fig7 —



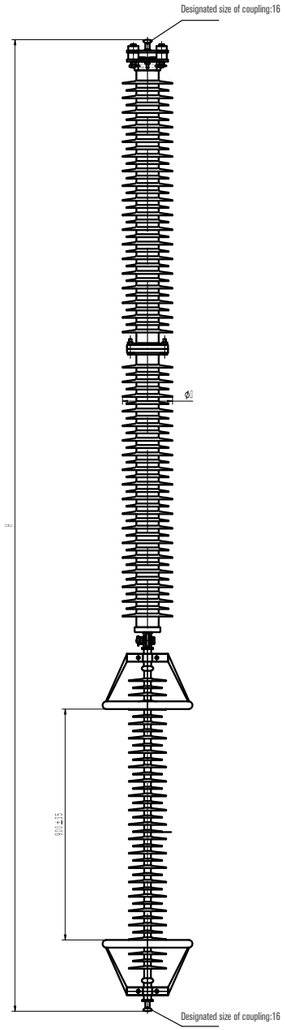
— Fig8 —

11 / Main Specifications and Technical Parameters of 110 ~ 500kV Composite with Gap Metal-oxide Surge Arresters for Transmission Line

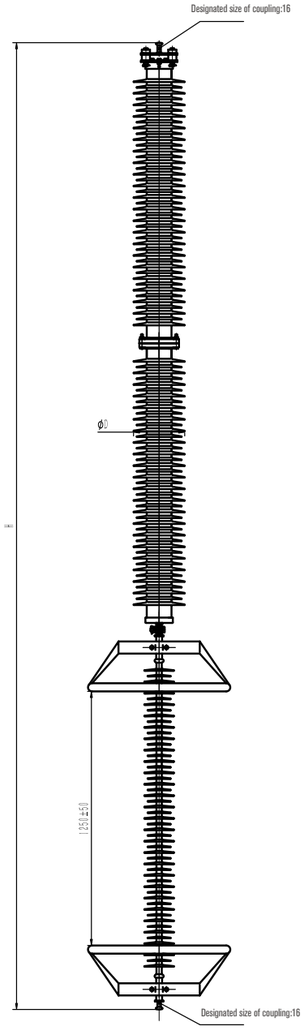
System voltage level		110kV		220kV		330kV	500kV
Type		YH10CX-102/296	YH10CX-108/320	YH10CX-192/560	YH10CX-204/592	YH10CX-288/775	YH20CX-396/1050
Electric parameters	Rated voltage UR（kV）	102	108	192	204	288	396
	1mA DC reference voltage U1mA（kV）	148	160	280	296	408	561
	Nominal discharge current（kA）	10	10	10	10	10	20
	Steep current impulse residual voltage（kV）	331	358	628	662	817	1171
	Lightning impulse residual voltage（kV）	296	320	560	592	775	1050
	Square wave impulse withstand Current（A）	500/600	500/600	600/800	600/800	800/1200	1200/1800
	High Current impulse withstand Current（kA）	100	100	100	100	100	100
	Power-frequency discharge voltage (kV)	185	185	370	370	510	567
	impulse discharge voltage (kV)	525	525	900	900	1300	1760
Structural parameters	Overall height H（mm）	1256	1256	3783	3783	4757	6971
	Cree-page distance（mm）	3946	3946	8018	8018	11526	17289
	Shed diameter Φ（mm）	195	195	195	195	252	252
	Weight （kg）	31	33	57	59	105	152
	Outline Drawing	Fig 9	Fig 9	Fig 10	Fig 10	Fig 11	Fig 12
Protected object		Transmission line	Transmission line	Transmission line	Transmission line	Transmission line	Transmission line



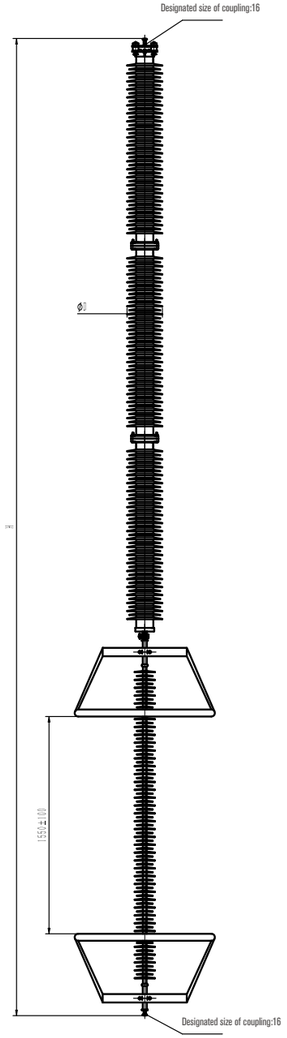
— Fig9 —



— Fig10 —



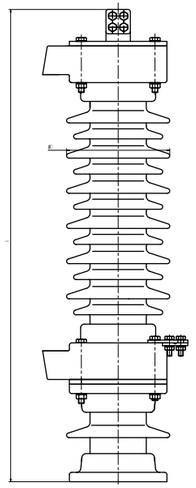
— Fig11 —

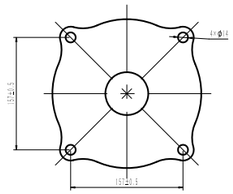


— Fig12 —

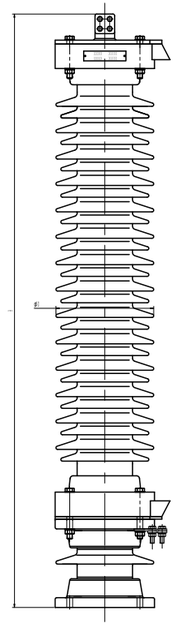
12 / Main Specifications and Technical Parameters of 35 ~ 500kV Porcelain Metal-oxide Surge Arresters for Substation

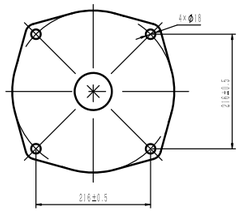
System voltage level		35kV	110kV		220kV		330kV	500kV	
Type		Y5WZ-51/134	Y10WZ-102/266	Y10WZ-108/266	Y10WZ-192/500	Y10WZ-216/562	Y10WZ-312/760	Y20WZ-444/1015	Y20WZ-468/1070
Electric parameters	Rated voltage UR（kV）	51	102	108	204	216	312	444	468
	Continuous operating voltage Uc（kV）	40.8	81.6	86.4	163.2	172.8	237	324	330
	1mA DC reference voltage U1mA（kV）	75	155	164	310	328	442	597	630
	Nominal discharge current（kA）	5	10	10	10	10	10	20	20
	Steep current impulse residual voltage（kV）	154	297	314	594	628	847	1137	1198
	Lightning impulse residual voltage（kV）	134	266	281	532	562	760	1015	1070
	Switching impulse residual voltage（kV）	114	225	239	451	477	643	900	950
	Square wave impulse withstand Current（A）	400	600/800	600/800	600/800	600/800	1000/1200	2000	2000
	High Current impulse withstand Current（kA）	65	100	100	100	100	100	100	100
	Pollution class	IV	IV	IV	IV	IV	IV	IV	IV
Structural parameters	Overall height H（mm）	1007	1821	1821	3283	3283	3780	5850	5850
	Cree-page distance（mm）	1285	3976	3976	7952	7952	11400	17300	17300
	Shed diameter Φ（mm）	220	300	300	300	300	300	480	480
	Weight （kg）	64	200	203	384	386	575	1850	1850
	Outline Drawing	Fig 13	Fig 14	Fig 14	Fig 15	Fig 15	Fig 15	Fig 16	Fig 16
Protected object		Substation	Substation	Substation	Substation	Substation	Substation	Substation	Substation



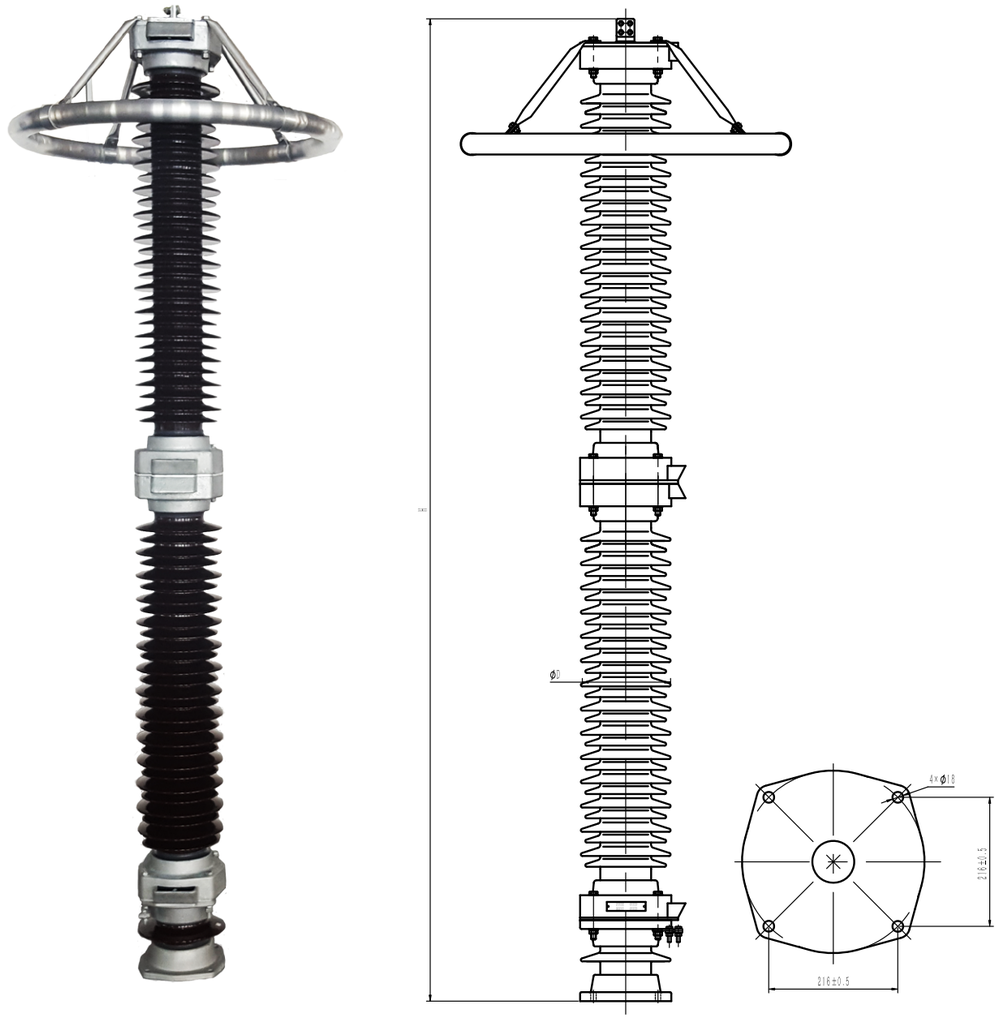


— Fig13 —

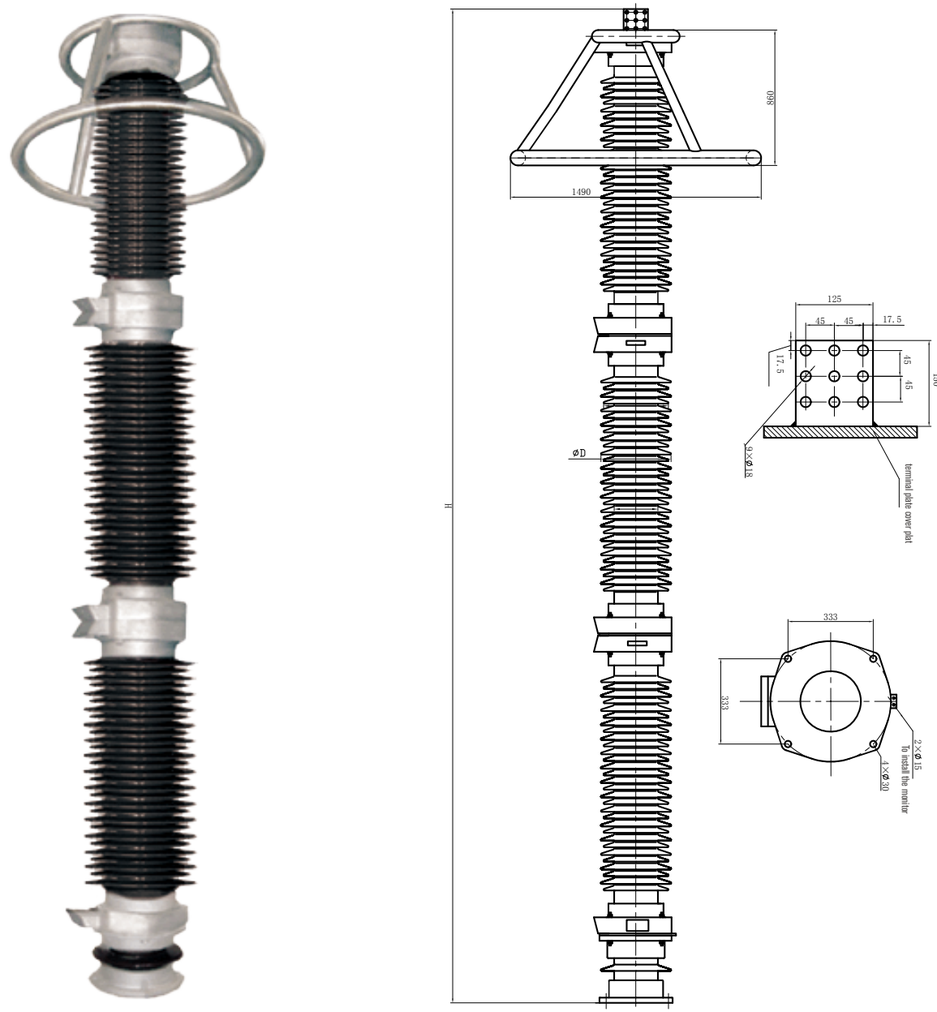




— Fig14 —


ØD
4×Ø18
216±0.5

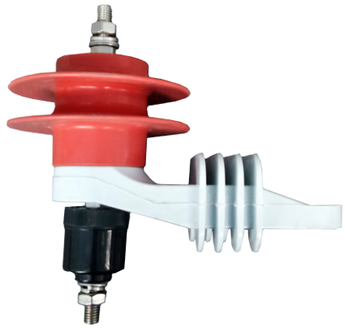
— Fig15 —

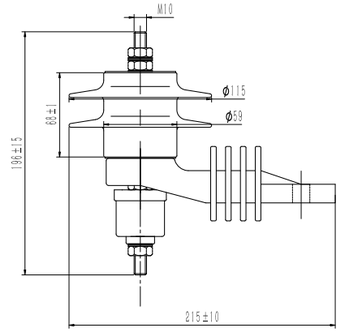

1490
Ø98
H
125
45
45
17.5
45
45
150
4×Ø18
Terminal plate cover plat
333
333
2×Ø15
To install the monitor
4×Ø30

— Fig16 —

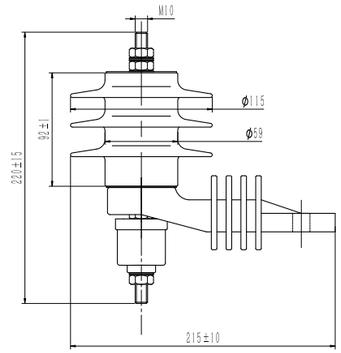
13 / Main Specifications and Technical Parameters of 3 ~ 36kV Composite Metal-oxide Surge Arresters for Outlet

Type	Rated voltage	Continuous operating voltage	Steep current impulse residual voltage	Lightning current impulse residual voltage	switching current impulse residual voltage	Rectangular current impulse withstand	High Current impulse withstand	Outline Drawing
	kV（r.m.s）		kV ≤			A	kA	
HY5W-3	3	2.55	11.3	9	8.9	150	65	Fig 17
HY5W-6	6	5.1	22.6	18	16.8	150	65	Fig 18
HY5W-9	9	7.65	33.7	27	23.8	150	65	Fig 19
HY5W-10	10	8.4	36	30	26.4	150	65	Fig 19
HY5W-11	11	9.4	40	33	30	150	65	Fig 20
HY5W-12	12	10.2	42.2	36	31.7	150	65	Fig 20
HY5W-15	15	12.7	51	45	38.5	150	65	Fig 21
HY5W-18	18	15.3	61.5	54	46.2	150	65	Fig 22
HY5W-21	21	17.0	71.8	63	54.2	150	65	Fig 23
HY5W-24	24	19.5	82	72	62	150	65	Fig 24
HY5W-27	27	22.0	92	81	69.8	150	65	Fig 25
HY5W-30	30	24.4	102	90	79	150	65	Fig 26
HY5W-33	33	27.5	112	99	86.7	150	65	Fig 27
HY5W-36	36	29.0	123	108	92.4	250	65	Fig 28
HY10W-3	3	2.55	11.3	9	8.9	250	100	Fig 17
HY10W-6	6	5.1	22.6	18	16.8	250	100	Fig 18
HY10W-9	9	7.65	33.7	27	23.8	250	100	Fig 19
HY10W-10	10	8.4	36	30	26.4	250	100	Fig 19
HY10W-11	11	9.4	40	33	30	250	100	Fig 20
HY10W-12	12	10.2	42.2	36	31.7	250	100	Fig 20
HY10W-15	15	12.7	51	45	38.5	300	100	Fig 21
HY10W-18	18	15.3	61.5	54	46.2	300	100	Fig 22
HY10W-21	21	17.0	71.8	63	54.2	300	100	Fig 23
HY10W-24	24	19.5	82	72	62	300	100	Fig 24
HY10W-27	27	22.0	92	81	69.8	300	100	Fig 25
HY10W-30	30	24.4	102	90	79	300	100	Fig 26
HY10W-33	33	27.5	112	99	86.7	300	100	Fig 27
HY10W-36	36	29.0	123	108	92.4	300	100	Fig 28

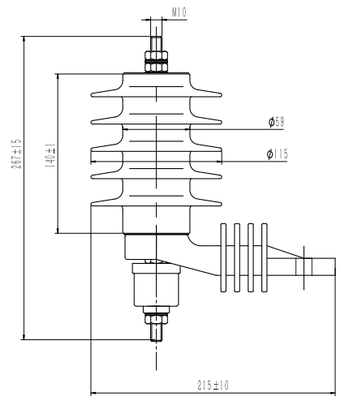




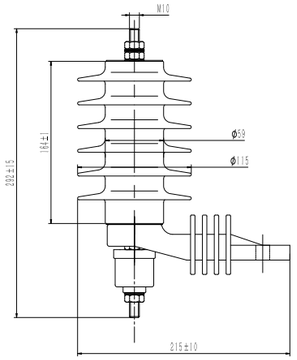
—Fig17 —



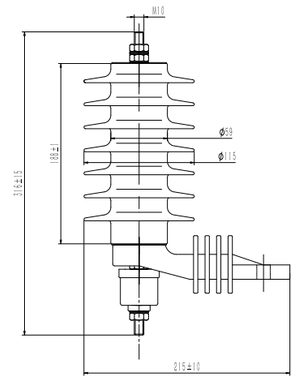
—Fig18 —



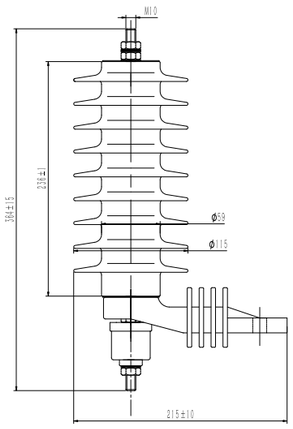
— Fig19 —



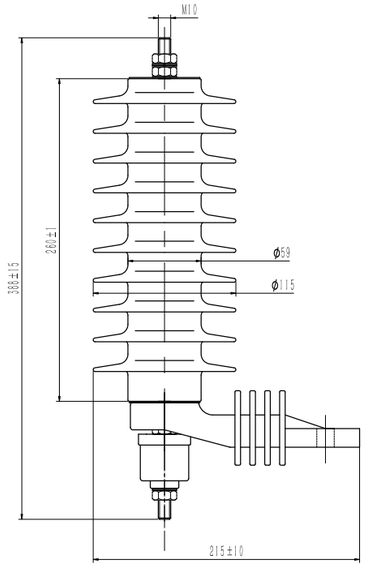
— Fig20 —



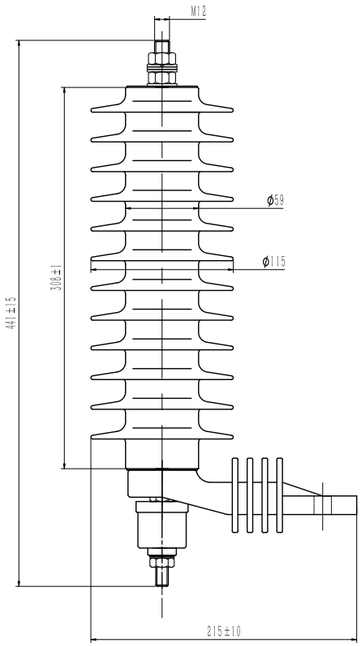
— Fig21 —



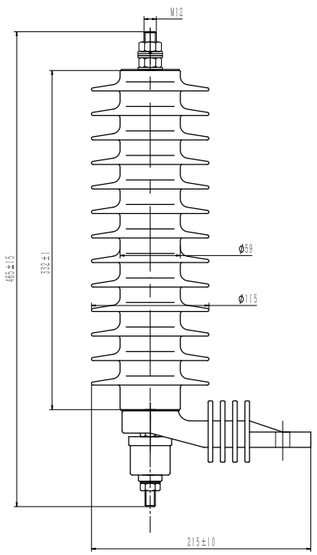
— Fig22 —



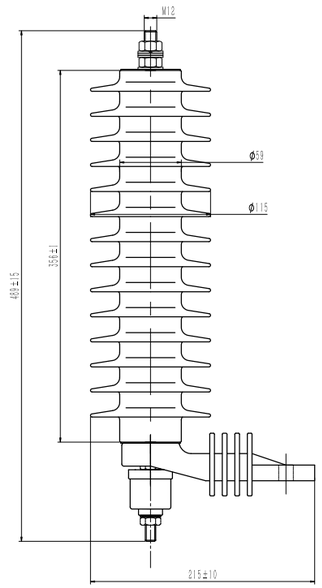
— Fig23 —



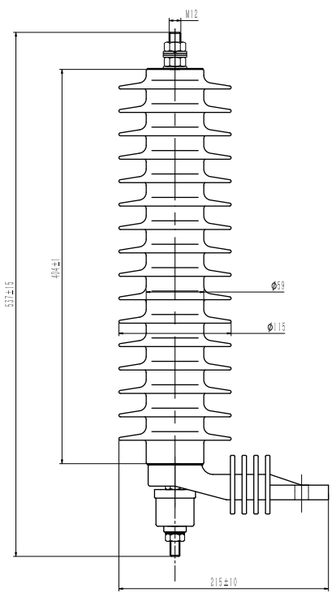
— Fig24 —



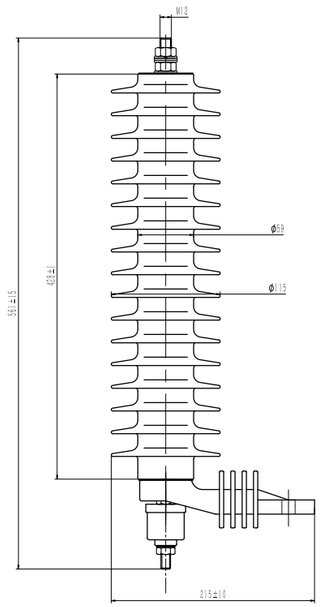
— Fig25 —



— Fig26 —



— Fig27 —

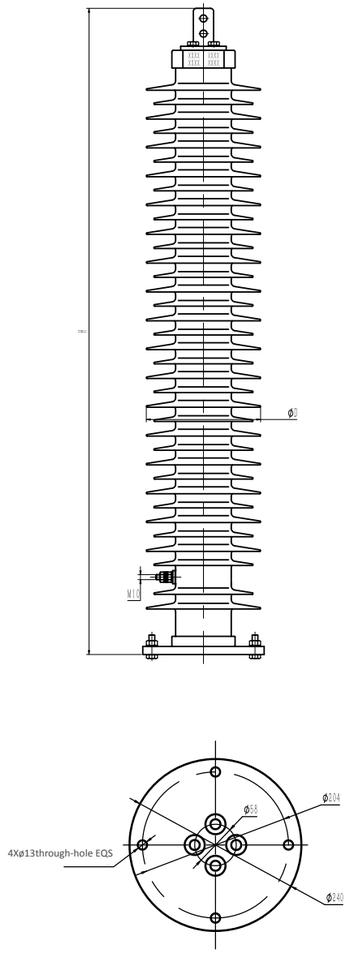


— Fig28 —

METAL OXIDE SURGE ARRESTERS

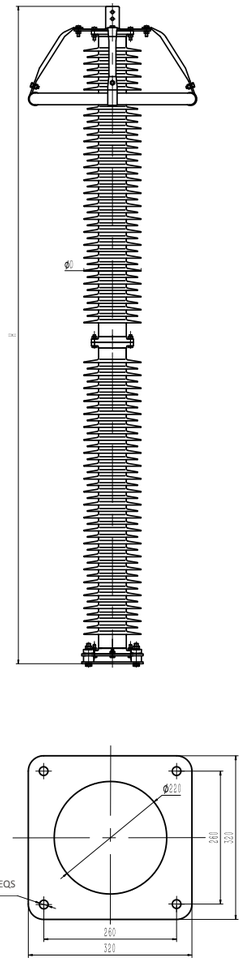
14 / Main Specifications and Technical Parameters of 110 ~ 275kV Composite Metal-oxide Surge Arresters for Outlet

System voltage level		110kV	132kV	154kV	220kV	275kV
Type		YH10WZ-96/256	YH10W-120/296	YH10WZ-144/374	YH10WZ-192/466	YH10WZ-242/620
Electric parameters	Rated voltage UR（kV）	96	120	144	192	242
	Continuous operating voltage Uc（kV）	75	96	108	154	194
	Nominal discharge current（kA）	10	10	10	10	10
	Steep current impulse residual voltage（kV）	296	365	410	504	670
	Lightning impulse residual voltage（kV）	256	315	374	460	620
	Switching impulse residual voltage（kV）	225	275	309	375	530
	Square wave impulse withstand Current（A）	600	800	600/800	1000	1200/1500
	High Current impulse withstand Current（kA）	100	100	100	100	100
	Pollution class	IV	IV	IV	IV	IV
Structural parameters	Overall height H（mm）	1277	1277	1277	2523	2895
	Cree-page distance（mm）	4000	4000	4000	7952	8066
	Shed diameter Φ（mm）	226	226	226	214	252
	Weight （kg）	30	35	40	70	90
	Outline Drawing	Fig 29	Fig 29	Fig 29	Fig 30	Fig 31
Protected object		Substation	Substation	Substation	Substation	Substation



— Fig29 —

— Fig30 —



— Fig31 —