TRIDELTA
MEIDENSHA

The arrester company.

MADE IN GERMANY
TRUSTED WORLDWIDE
SINCE 1961

Brochure No. 1301 I Issue 2020/04

TRIDELTA MEIDENSHA SURGE ARRESTERS
Best solution and superior quality for every requirement

- **Comprehensive product portfolio**
- **Stable continuous duty and lowest failure rates ensuring a long service life**
- **Best protection levels and bending strength**
- **Efficiency and the highest quality in manufacturing**

Tridelta Meidensha GmbH provides arresters for every requirement. Our products are especially developed for service in all environmental conditions around the world. They are successfully installed in coastal and desert regions, in areas with high industrial air pollution, heavy windload and extreme climatic conditions, in seismic zones and other areas that require special protection.
TRIDELTA arresters protect outdoor equipment such as transformers, motors, generators, traction vehicles or other equipment from atmospheric and switching overvoltages.

Furthermore, Tridelta Meidensha GmbH provides surge arresters for special applications:

- **arresters for capacitor banks in static compensators**
- **AC and DC railway arresters**
- **arresters for indoor applications in MV cubicles**

In addition Tridelta Meidensha GmbH offers an extensive range of transmiss on line arresters – a cost-effective solution to protect overhead transmission lines, reduce potential line outages and enhance system reliability.

A wide range of porcelain and polymer housings in various designs and versions is the basis to provide the optimum surge arrester for every application.

Fast, flexible and customer-oriented

The Tridelta Meidensha GmbH, since 2015 being part of MeidenshaGroup/Japan, has more than 50 years of experience and is specialized in producing high quality surge arresters. Tridelta Meidensha GmbH is an ideal partner not only for utilities but also for contractors and EPC´s looking for products from an independent source.

Tridelta Meidensha GmbH stands for fast, flexible and customer-oriented solutions. As a result of the stable continuous duty, the long lifetime, the low failure rate and a very good price performance ratio of our surge arresters, Tridelta Meidensha GmbH is one of the leading surge arrester manufacturers worldwide.

The TRIDELTA surge arrester portfolio covers all areas of application, no matter which environmental conditions the surge arresters need to withstand. Based on high technical knowledge new innovative products are added constantly to the portfolio.

MOV blocks – The heart of reliability

Metal Oxide Varistor (MOV) blocks are the heart of surge arresters. They define the electrical properties and the protective function of a surge arrester. Since 2015 Tridelta Meidensha GmbH is part of the Meidensha Group/Japan, the first company that introduced the concept of MOV blocks to the market more than 40 years ago. Since then Meidensha Corporation as well as other leading manufacturers supply their MOV blocks to Tridelta Meidensha GmbH.

Our suppliers know-how in developing and manufacturing MOV blocks leads to high quality arresters with excellent energy absorption capability and best protective levels ensuring a long lifetime of TRIDELTA surge arresters.

High Voltage Surge Arresters with Silicone Housing

- **Three different designs for applications with standard, advanced or highest technical requirements**
- **Outstanding pollution performance**
- **Resistance to tracking erosion and UV radiation**
- **Fire retardant and self extinguishing**
- **Lifetime hydrophobicity**

Tridelta Meidensha GmbH offers three different arrester designs for high voltage applications with silicone housing for standard, advanced and highest technical requirements:
Solid Core, Cage and Tube Design. They all use high quality silicone as insulation material with outstanding pollution performance. All three of the designs benefit from important silicone properties such as resistance to tracking erosion and UV radiation, being fire retardant and self extinguishing plus being water-repellent. Genuine silicone rubber housings, compared to other polymeric materials, retain their hydrophobicity during the lifetime of the arrester. This results in a long service life of all TRIDELTA arresters with silicone housings.

All three of the designs use the same high quality MOV blocks ensuring excellent electrical performance. They benefit from easy transportation and installation thanks to their reduced weight compared to porcelain arresters. The differences between these three product lines are their internal design and the method of fixing the column of MOV blocks into the housing of arrester. Please refer to the next page for more details.

Solid Core design:

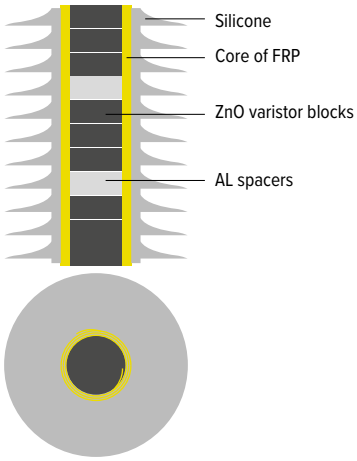
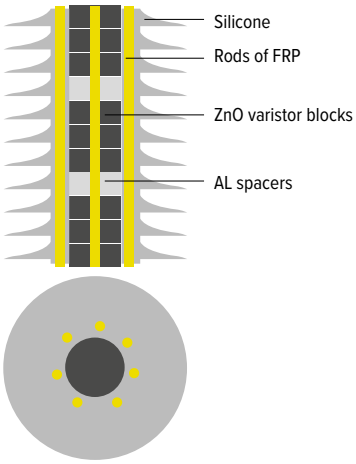
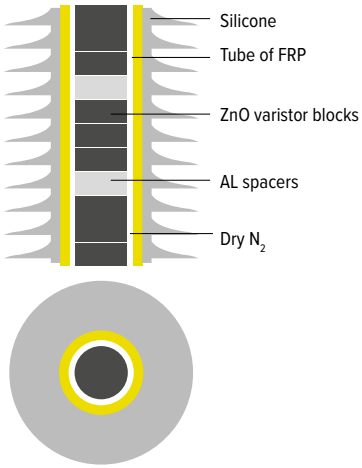
Mechanical stability is given by a solid core of prefabricated modules of fiberglass reinforced woven structure ensuring mechanical stability of the arrester for standard requirements.

Cage design:

A cage of FRP rods around the stack of MOV block, fixed into the terminals by a patented wedge clamping system, ensures higher mechanical strength for advanced requirements.

Tube design:

A FRP tube with enclosed gas volume, including a pressure relief device, ensures greatest possible mechanical strength, for highest mechanical requirements, i. e. for areas with high seismic activity, heavy wind load, extreme climatic conditions or additional mechanical loads.

Solid Core design	Cage design	Tube design
		
Description: MOV blocks are pre-arranged in „Solid Design Modules“, prefabricated modules of a fiberglass reinforced woven structure with silicone sheds ensure high flexibility regarding custumer demands	Cage of FRP rods around MOV blocks, FRP rods fixed into the end terminals by a patented wedge clamping; silicone sheds directly moulded onto MOV blocks/cage, no enclosed gas volume, no sealing/pressure relief device needed	FRP tube with enclosed gas volume (hollow insulator), silicone sheds directly moulded onto FRP tube
Network Voltage Um: up to 170 kV*	up to 420 kV*	up to 800 kV
Weight: very low weight	lower weight than tube	lower weight than comparable porcelain
Mechanical strength (SSL): 1,1 kNm	up to 4 kNm	up to 23 kNm
Key Parameters: - short delivery time - easy transport (also in horizontal position) reduced transportation costs - easy and fast installation without special equipment	- high safety margin regarding electrical and mechanical overloads - no violent destruction after overload or short circuit events - shorter than tube design - easy transport (also in horizontal position) reduced transportation costs - easy and fast installation without special equipment	- excellent pollution behaviour due to highly hydrophobic behaviour of silicone - highest safety margin regarding electrical and mechanical overloads, no ejection of internal parts in case of short circuit - even after short circuit/pressure relief remains 75% of mechanical stability - delivery time similar to porcelain arresters - easier transport than porcelain arresters (less risk of damage) - installation similar to porcelain arresters but lower weight
Applications: - for standard mechanical requirements - excellent for line arrester applications (NGLA and EGLA type)	- for standard and advanced mechanical requirements - excellent for line arrester applications (NGLA and EGLA type)	- for highest mechanical and safety requirements - for arrester applications as support/post insulator - for applications with seismic requirements
Summary: - competitive arrester for applications with standard/basic mechanical requirements - for applications up to 170 kV networks	- arrester with best price/performance ratio - for applications with advanced mechanical requirements - for applications up to 420 kV networks	- arrester for applications with highest requirements to mechanical strength and safety

* higher ratings available for transmission line applications

High Voltage Surge Arresters up to 800 kV

		Porcelain Housing		
Product		**SB size 0**	**SB size I**	**SB size II**
Design		Hollow Insulator, type A as per IEC 60099-4		
Application		Protection of Outdoor Medium voltage and High Voltage equipment	Protection of Outdoor High Voltage equipment	Protection of Outdoor High Voltage equipment, HVDC, SC and SVC applications
Housing Material		porcelain	porcelain	porcelain
Specification		IEC 60099-4	IEC 60099-4	IEC 60099-4
max. Nominal System Voltage U_n	kV	400	765	765
max. Highest Voltage for Equipment U_m	kV	420	800	800
max. Rated Voltage U_r	kV	396	624	612
max. Nominal Discharge Current I_n (at 8/20 µs waveshape)	kA	20	20	20
Energy Capability				
- max. Thermal Energy Capability	kJ per kV of U_r	13	18	13
- max. Line Discharge Class		5	5	5
- Arrester classification		SL, SM, SH	SM, SH	SM, SH
- max. Q_{rs} (accord. IEC 60099-4 Edt. 3.0)	C	3,6	4,4	4,0
Discharge Current Withstand Strength				
- High Current 4/10 µs	kA	100	100	100
- Low Current 2 ms	A	2.000	2.600	2.000
max. Short Circuit / Pressure Relief Capability	kA	65	65	63
Mechanical Strength				
- Specific long-term load SLL	Nm	4.000	10.000	14.000
- Specific short-term load SSL	Nm	10.000	25.000	35.000
Service Conditions				
- Frequency		48 Hz ... 62 Hz	48 Hz ... 62 Hz	48 Hz ... 62 Hz

Silicone Housing				
SBK	**SBKC size 0**	**SBKC size II**	**SBKT size I**	**SBKT size II**
Solid Core Design type B1 as per IEC 60099-4 fiberglass reinforced woven structure with silicone sheds	**Cage Design** type B2 as per IEC 60099-4 silicone directly moulded onto MOV blocks		**Tube Design** Hollow Insulator, type A as per IEC 60099-4 silicone directly moulded onto FRP tube	
Protection of Outdoor Medium Voltage and High Voltage equipment, protection of transmission lines	Protection of Outdoor Medium Voltage and High Voltage equipment, protection of transmission lines		Protection of Outdoor High Voltage equipment, HVDC, SC and SVC applications	
silicone rubber	silicone rubber		silicone rubber	
IEC 60099-4	IEC 60099-4		IEC 60099-4	
170*	170	400*	500	765
170*	170	420*	550	800
150*	144	396*	444	624
10	10	20	20	20
8	4,5	10	10	18
3	2	4	4	5
SM	SL	SM, SH	SM, SH	SM, SH
2,4	1,2	2,4	3,6	4,4
100	100	100	100	100
1.200	500	1.200	1.700	2.600
40	40	65	65	80
500	1.000	2.800	6.000	12.000
1.100	1.200	4.000	12.000	23.000
16 Hz ... 62 Hz	48 Hz ... 62 Hz	16 Hz ... 62 Hz	16 Hz ... 62 Hz	

* higher ratings for line arrester applications (TLA) available on request

Medium Voltage Metal Oxide Surge Arresters up to 51 kV





	DC Railway Arresters		Distribution Type Arresters		
Product	**SBKB**	**SBB**	**SBK LDC1/ SBK LDC2**	**SBK-0**	**SBK-0 with insulated cable**
Design	Solid Core	-	Solid Core		
Application	protection of DC railway equipment		protection of outdoor and indoor distribution networks	protection of indoor distribution networks, especially for application in compact air insulated switchgears	
Housing Material	silicone rubber	porcelain	silicone rubber	silicone rubber	silicone rubber
Specification	EN 60123-5		IEC 60099-4	IEC 60099-4	IEC 60099-4
max. Phase to Phase voltage under normal conditions U_s kV			72	52	52
max. Rated Voltage U_r kV	4,8	4,8	51	51	51
Nominal Discharge Current I_n (8/20 waveshape) kA	10	10	10	10	10
Energy Absorption Capability					
- max. Thermal Energy Absorption Capability W_{th} kJ per kV of U_r	10	10	4,5	2,8	2,8
- max. Line Discharge Class	4	4	2	1	1
Current Impulse Withstand					
- High Current 4/10 kA	100	100	100	100	100
- Low Current 2000 µs A	1.000	1.000	500	250	250
max. Short Circuit / Pressure Relief Capability 0,2 s kA	40	40	20	20	20
Mechanical Strength					
- Specific long-term load SLL Nm			160	160	160
- Specific short-term load SSL Nm			230	230	230
Service Conditions					
- Frequency	DC		16 Hz ... 62 Hz	16 Hz ... 62 Hz	16 Hz ... 62 Hz

High Voltage Surge Arresters for GIS up to 500 kV

	GLS Arresters		
Product	**500kV Single Phase**	**220kV Single Phase**	**132kV Three Phase**
Name of product	Y20WF-444/1057	Y10WF-216/562	Y10WF-120/293S
Max. system voltage kV	550	252	145
Max. highest voltage for equipment kV	550	252	145
Max. rated voltage kV	444	216	120
Max. nominal discharge current kV	20	10	10
Max. thermal energy capability kA	16,5	7,9	7,9
Max. line discharge class	5	3	3
Discharge current withstand strength			
- High current 4/10 µs kA	100	100	100
- Low current 2 ms A	2000	1000	1000
Partial discharge capability			
Material of tank	Aluminum/steel	Aluminum/steel	Aluminum/steel
Height mm	2260	1360	870
Diameter mm	920	460	620
Weight mg	670	150	370
Connection	Insulator	Insulator	Insulator

* price on request

Meidensha Corporation, headquartered in Tokyo, Japan, is an electrical equipment manufacturer and with an extensive product portfolio, ranging from power generation, transmission and distribution and control systems for electric utilities and railways, to motors and controls for various industrial applications. The company was founded in 1897 and now operates manufacturing facilities in Japan, China, Singapore, Thailand and India.

Meidensha's innovative spirits have produced many new technologies, including the development of an epoch-making metal oxide gapless surge arresters for electric power systems in 1975. This has set new industrial standards for protection of power equipment and was awarded an IEEE Milestone in 2014.

Meidensha has since then been a world leader in surge arrester technologies and a global supplier of surge arresters as well as high-quality, high-performance metal oxide blocks (metal oxide varistors) to surge arrester manufacturers in various countries for use in their products, helping to protect power equipment in every corner of the world.

Tridelta Meidensha GmbH R&D and HV Test Laboratory – Investment in the future!

The combination of continuous development for our products and investment into modern high voltage test facilities specialized for surge arresters is one key factor for the success of Tridelta Meidensha GmbH. Based on constant interaction between development and production we are continuously improving our manufacturing lines ensuring high standard of our arresters. Our development processes are certified according to ISO 9001. Each MOV block and surge arrester is individually tested during and at the end of the manufacturing process.

Our modern and powerful high voltage laboratory is equipped with:

- **Impulse Generator up to 1.200 kV**
- **Power Frequency Transformer 600 kV**
- **High Current Impulse Generator 150 kA**
- **Long Duration Current Impulse Generator for line discharge classes 1 to 5**
- **Test Facilities for 5000h weather ageing test**
- **Climate testing laboratory with capability of -40°C ... +100°C**
- **Mechanical Bending and Tensile Test machine with capability of up to 30.000 Nm for bending moment and up to 50.000 N for tensile strength tests**

Tridelta Meidensha GmbH is able to conduct most of the usual type tests as well as acceptance tests and tests for R&D activities.

Mechanical bending test equipment

5000 h weather ageing test

testing facility for varistors

Monitoring Equipment

In addition to our wide range of surge arresters we offer devices for monitoring and recording of the discharge process and the condition of the arrester.

SmartCOUNT is an intelligent surge arrester monitoring system. **smartCOUNT** can measure leakage current as well as impulse currents fully automatically and can deliver a trend curve on a website.

Our Surge Counter DCC2 provides information about the number of events. With model DCC-M2 you can also check the total leakage current.

The Monitoring Spark Gap is a device to provide information about the type and energy of discharge events.

TRIDELTA Quality Products
Made in Germany

Our arresters are manufactured in Hermsdorf, Germany. German art of engineering, best materials and approved testing technologies make TRIDELTA arresters a synonym for quality. Our tradition and knowledge over decades, the innovative potential of our engineers and employees and our uncompromising quality demands lead to outstanding products and best solutions.

Tridelta Meidensha GmbH has implemented a process oriented quality management system according DIN ISO EN 9001. The system, all processes, technologies, procedures and activities are described in our QA manual, process instructions and related operating instructions.
These documents define the requirements of all business processes, in particular quality planning and the development, manufacturing and testing of high-quality products. To ensure that every customer can rely on the high quality of our products, all arresters are manufactured and extensively routine-tested during and at the end of the manufacturing process in compliance with IEC 60099-4.

The very low failure rates of our arresters resulting in their long service life are confirmation to us of our efforts to constantly maintain highest quality standards for our products.

Tridelta Meidensha GmbH is certified to DIN EN ISO 9001 and 14001.

Tridelta Meidensha GmbH | Hermsdorf / GERMANY

Test lab | Hermsdorf / GERMANY

Tridelta Meidensha GmbH global presence

More than 5 million of TRIDELTA surge arresters are currently in reliable service in more than 120 countries all over the world.

Tridelta Meidensha GmbH agents and distributors provide local technical and commercial service for our products in most countries worldwide.

The agents and distributors are supported by our sales engineers located in our headquarter Germany who will prepare technical and commercial proposals based on your requirements.

Tridelta Meidensha GmbH is Your supplier for high quality surge arrester products focused on any specific technical and commercial requirement.

Thank you for your interest in our products. Please contact your local Tridelta Meidensha GmbH agent or distributor or our headquarter at:

Tridelta Meidensha GmbH

Marie-Curie-Str. 3 | 07629 Hermsdorf / Germany

Phone: +49 (0) 3 66 01 93 283 - 00

Fax: +49 (0) 3 66 01 93 283 - 01

E-Mail: arrester@tridelta-meidensha.de

www.tridelta-meidensha.de