

# Lightning arresters

## Type 1 TVSS



**ABB**

# Type 1 TVSS Lightning arrester

## General Description

Type 1 TVSS is designed to dissipate energy caused by an overvoltage comparable to that of a direct lightning strike. It has successfully passed testing to the standard with the 10/350 wave (Class I test).

Type 1 units are recommended for locations having a high exposure to lightning, for example, line entrances to buildings protected by lightning rods or powered by aerial lines, wind mills and cell towers. These products are installed at the entrance of the installation (such as main distribution board).



Safety open technology:  
- Electronic ignition system  
- Spark gap  
- Arc breaking chamber

High TOV (Temporary Overvoltage) withstand:  
the lightning arrester OVR T1 withstands high variations of the electrical network voltage, more than 600 V.

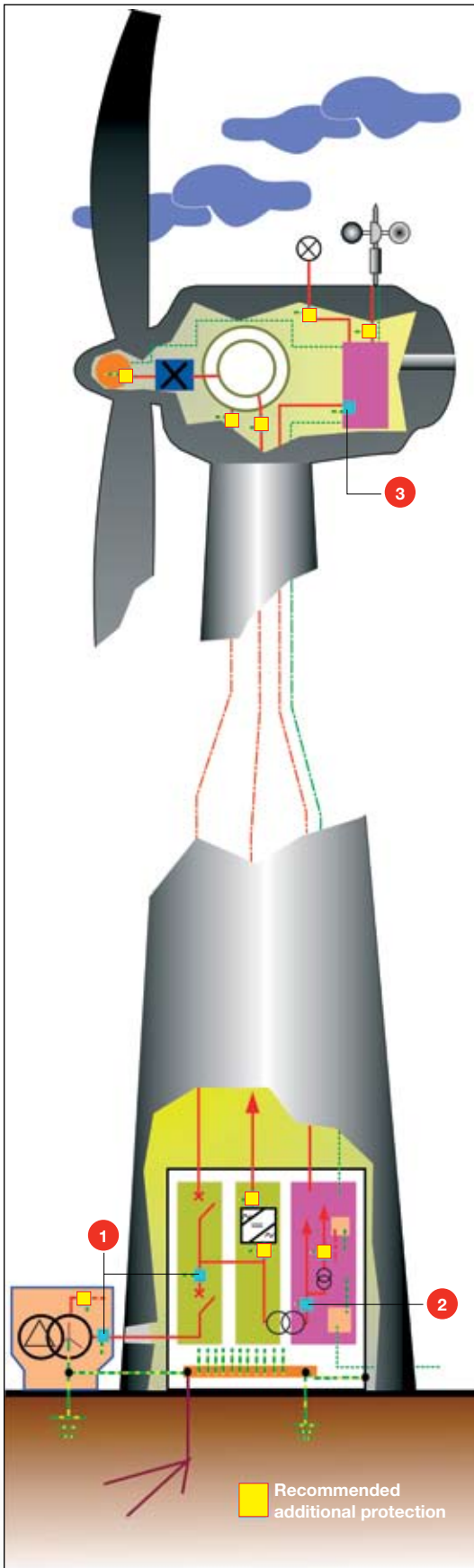
Secured end of life of the lightning arrester OVR T1 (in open circuit), and eliminates blowing and fire risk... no need of protective enclosure.

Divert very high impulses of lightning current.  
Impulse current (Iimp) of up to 25 kA (10/350).

Very compact TVSS: 17.5 mm per pole  
for line protection

Protection in common mode and differential mode (between live wires Line/Line, Line/Neutral and between live wires and ground).

# Wind Turbine Application



## 1 Heading protection

Description	Nominal voltage : Un (L-L)
3 x OVR T1 25 440-50	690V

## 2 3 Control cabinet protection

Description	Nominal voltage : Un (L-N)
OVR T1 3N 15 255	230V

Wind turbines, connected to the public electricity network provide power as a renewable energy source.

Due to their height (over 100 meters) and location (isolated areas), wind turbines are often exposed to direct & indirect lightning strike consequences i.e transient surges, overvoltages and overcurrents.

These induced consequences will directly affect power & signal leads and damage costly equipment i.e PDP (Primary Distribution Panel), TCU (Tower Control Unit) and all signal & communications lines.

Lightning consequences can be very costly :

- Loss of operating equipment
- Production loss for the utilities in terms of power generation

Therefore, wind generation towers need high capacity and reliable lightning and surge protection.

The close cooperation of ABB with manufacturers' engineers helped ABB to understand better their needs to design specific lightning arresters dedicated to wind towers that will help them to avoid those losses and make their equipment safer.




## Recommended additional protection

Additional protection may be required with Type 2 TVSSs installed close to the sensitive equipment of the installation (like the anemometer for instance). Moreover, windmill applications are specific because many different voltages exist : 24V (for HUB protection,...) 48V/230V between Phase and Neutral, and 380V / 480V / 690V or 1000V (for stator protection,...) between Phases. For more information about those protections, please consult your local ABB representative.

## Technical remarks

The wind turbine and all its equipment have to be grounded properly and, should be equipotential.

In some wind turbines, the transformer (690/20,000V) can be located in the nacelle. In that case, please contact us for the appropriate protection.

				
		OVRT1 25 440-50	OVRT1 3N15255	OVRT1 1N20255
<b>ELECTRICAL CHARACTERISTICS</b>				
Network Voltage (L-N / L-L)		400V / 690V	230V / 400V	230V / 400V
Mode of protection		common	common + differential	common + differential
Number of poles		1	4	2
Number of modules		2	5	3
Type / Test class		T1 / I	T1 / I	T1 / I
Type of current		A.C.	A.C.	A.C.
Nominal voltage Un	V	400	230	230
Nominal current In	kA	25	15	20
Maximal continuous operating voltage Uc	V	440	255	255
Voltage protection level Up	V	2000	1700	2000
Impulse current Iimp (10/350)	kA	25	15 / 45	20 / 45
Follow current if under Uc	kA	50	7	7
TOV characteristics Ut (5 s / 200 ms)	V	690	650 / 1200	650 / 1200
Short circuit withstand	kA	50	50	50
End of life		Open circuit	Open circuit	Open circuit
Degree of protection		IP 20	IP 20	IP 20
Disconnecter				
gG fuse	A	125 A max	125 A max	125 A max
Curve C circuit breaker	A	-	-	-
Indication		-	Green led	Green led
<b>MECHANICAL CHARACTERISTICS</b>				
Wire range L-N / PE				
- solid wire	mm <sup>2</sup>	2.5 ... 50	2.5 ... 50	2.5 ... 50
- standard wire	mm <sup>2</sup>	2.5 ... 35	2.5 ... 35	2.5 ... 35
Stripping length L-N / PE	mm	14.5	14.5	14.5
Tightening torque L-N / PE	Nm	3.5	3.5	3.5
<b>MISCELLANEOUS CHARACTERISTICS</b>				
Stocking temperature	°C	-40 to +95	-40 to +95	-40 to +95
Operating temperature	°C	-40 to +85	-40 to +85	-40 to +85
Maximal altitude	m	2000	2000	2000
Weight	g	500	800	800
Material of housing		PA grey RAL 7035	PA grey RAL 7035	PA grey RAL 7035
Fire resistance according to UL 94		VO	VO	VO
Reference standards		UL 1449 Ed. 2 IEC 61643-1	UL 1449 Ed. 2 IEC 61643-1	UL 1449 Ed. 2 IEC 61643-1



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