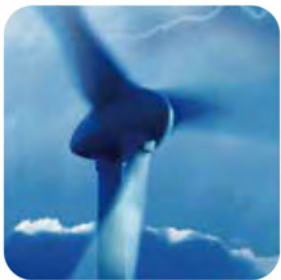




Lightning and overvoltage protection



Surge Protection For Wind Turbines

note: subject to change without any notice, JDA pay no responsibility



Wind turbines are in opened and exposed environment and the tall windmill is highly prone to the direct and indirect lightning damages.

The unique nature of wind power installations make them vulnerable to overvoltages and surges from lightning strikes and static discharges.

These surges need to be intercepted before they take down the entire system by damaging the wind power arrays, charge controller/inverter and combiner boxes.

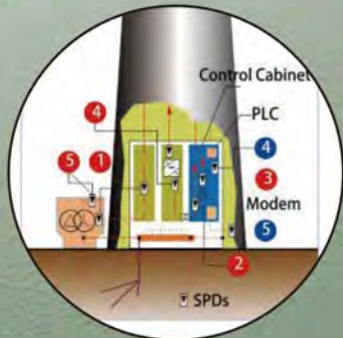
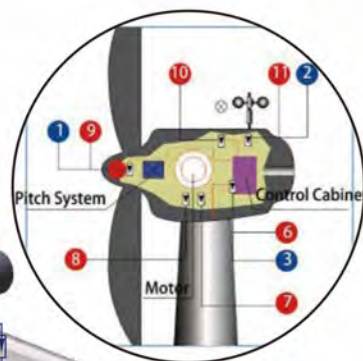
JDA is a professional surge protection solution provider whom understand better for customers' needs, to design specific surge and lightning protection dedicated to wind towers that will help clients to avoid losses causing by lightning and surge damage and make their equipment safer.

Surge Protection for Power Supply

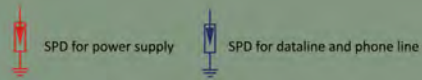
- 1 Heading protection
- 2 Control cabinet protection
- 3 Control cabinet protection
- 4 Inverter protection for rotor power supply
- 5 Control breaker protection
- 6 Engine room control cabinet protection
- 7 Rotor protection
- 8 Stator protection
- 9 Pitch system protection
- 10 Obstruction lighting protection
- 11 Anemometer protection

Surge Protection for dataline network

- 1 Pitch system communication line protection
- 2 Dataline anemometer protection
- 3 Engine room control cabinet Databus protection
- 4 Dataline or Databus protection
- 5 Modem and telephone line protection



SPD's Location	JDA Models
1 4 7 8	JDA 5G35-760/3P or JDA D3-40/760-3MV-R
3 10 11	JDA PV20/24-MVCR
9	JDA PV20/48-MVCR
2 5 6 9	JDA D3-40/760-3MV-R
10	JDA D1-50/440-2MV-R
1 2 3 4 5	JDA DN24/4-20mA -G JDA DN48/G, DN24/RS485 JDA DN05/RS485-2G JDA DN24/RS232-G JDA DN250/AT



Because the windmills are high and exposed outdoor, the wind turbines are highly vulnerable to the effects of direct lightning strikes, therefore we recommends to install a Type 1 SPD in the Main Switch Board. In addition, Type 2 SPDs are also required to be 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 pitch system,...) 48V / 230V between Phase and Neutral, 380V / 480V / 690V or 1000V (for stator protection,...) between Phases.

Technical remarks

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

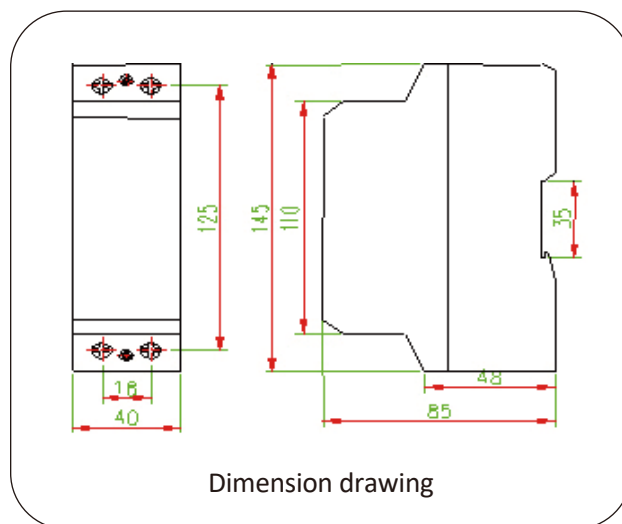
In some wind turbines, the transformer (690 / 20 000V) can be located in the nacelle. In that case, please contact us for the appropriate protection.

In case of 690V or 1000V IT network, use a 3+1 system (please consult us).





POWER SUPPLY SYSTEMS SURGE ARRESTERS - CLASS I+II



- Surge arrester for low-voltage power supply system protection against surges at the boundaries from lightning protection zone OB -2 and higher.

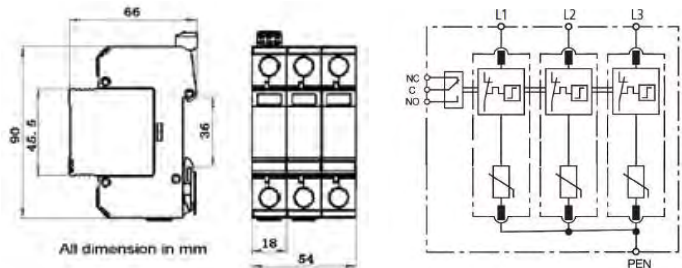
Type	SG35/760-S
In accordance with	760
Category IEC/VDE	IEC61643-11:2013; UL1449 3 ^d
Max. continuous operating voltage (V)	I+ II / B+C
Nominal discharge current(8/20) In	760Vac
Max. discharge current(8/20) I _{max}	35kA
Lightning impulse current (10/350) I _{imp}	120kA
Voltage protection level (1.2/50)	35kA
Response time	≤4kV
short-circuit current rating (I _{sc}) & follow current	≤100 ns
interrupt rating (I _{fi})	I _{sc} = 10kArms ; I _{fi} ≥ 10kArms@255Vac
Backup fuse(only required if not already provided in	250A gL/gG
Operating temperature range	- 400°C ~ + 800°C
Cross-section of connection wire	Single-strand 35mm ² ; multi-strand 25mm ²
Mounting	35mm DIN-rail in accordance with EN 50022/DIN46277-3
Enclosure material	thermoplastic; extinguishing degree UL94 V-0
Degree of protection	IP20
Installation width	2 modules, DIN 43880
Approvals, Certifications	CE



Three Phase (3 MOV Modules) Surge Protection Devices TYPE: D3-40/760-3MV-R

Surge arrester for low-voltage power supply system protection against surges at the boundaries from lightning protection zone OB-1 and higher.

- Class II (C) arrester in accordance with IEC61643-11:2013, UL1449 3rd
- Two part design consisting of base and plug-in protection module.
- High energy MOV (Metal Oxide Varistor) inside.
- Reliable supervision due to disconnection device.
- Fault indication by red indication flag in window.
- Fast response.
- With remote alarm terminal optional.



Technical Data

Type	D3-40/760-3MV-R 760
In accordance with	IEC61643-11:2013: UL1449 3rd
Category IEC/VDE	II/ C
Max. continuous operating voltage (AC/DC)	760/970
Nominal discharge current (8/20) In (L-PE)	20kA
Max. discharge current (8/20) I _{max}	50kA
Voltage protection level at In	3.2kV
Let through voltage @3KA (8/20)	2.5kV
Response time	≤25 ns
Follow current	No
Backup fuse(only required if not already provided in mains)	125A gL/gG
Operating temperature range	-400°C~ + 800°C
Cross-section of connection wire	Single-strand 35mm ² ; multi-strand 25mm ²
Mounting	35mm DIN-rail in accordance with EN 50022/DIN46277-3
Enclosure material	thermoplastic; extinguishing degree UL94 V-0
Degree of protection	IP20
Installation width	3 modules, DIN 43880
Thermal disconnecter	Internal green -normal red -failure
Remote alarm contact	Optional
Additional data for Remote Alarm Contacts	
Remote alarm contact type	floating changeover contact
Switching capability U _N /I _N	AC: 250V/0.5A DC: 250V/0.1A; 125V/0.2A; 75V/0.5A
Cross-section of connection wire	Max. 1.5mm ²



Three Phase (2 MOV Modules) Surge Protection Devices

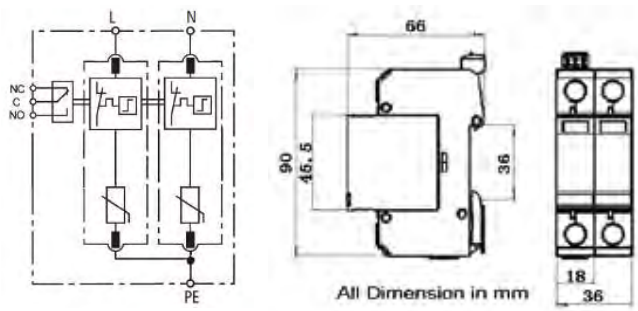
TYPE: D1-50/440-2MV-R

Surge arrester for low-voltage power supply system protection against surges at the boundaries from lightning protection zone OB-1 and higher.

- Class II (C) arrester in accordance with IEC61643-11:2013, UL1449 3rd
- Two part design consisting of base and plug-in protection module.
- High energy MOV (Metal Oxide Varistor) inside.
- Reliable supervision due to disconnection device.
- Fault indication by red indication flag in window.
- Fast response.
- With remote alarm terminal optional.



CONFORM TO UL1449
CERTIFIED TO CSA C22.2#8



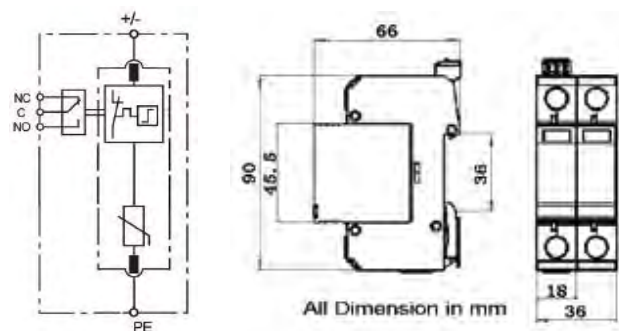
Type	D1-50/440-2MV-R	
	440	
In accordance with	IEC61643-11:2013: UL1449 3rd	
Category IEC/VDE	II/ C	
Max. continuous operating voltage (AC/DC)	440/585	
Nominal discharge current(8/20) In	L-PE	20kA
	N-PE	20kA
Max. discharge current(8/20) I _{max}	L-PE	50kA
	N-PE	50kA
Voltage protection level	@In	2.2kV
	@3KA	1.5kV
Response time	L-PE	≤25 ns
	N-PE	≤25 ns
Follow current	L-PE	No
	N-PE	No
Backup fuse(only required if not already provided in mains)	125A gL/gG	
Operating temperature range	-400°C~ + 800°C	
Cross-section of connection wire	Single-strand 35mm ² ; multi-strand 25mm ²	
Mounting	35mm DIN-rail in accordance with EN 50022/DIN46277-3	
Enclosure material	thermoplastic; extinguishing degree UL94 V-0	
Degree of protection	IP20	
Installation width	2 modules, DIN 43880	
Thermal disconnecter	Internal green - normal red - failure	
Remote alarm contact	Optional	
Approvals, Certifications	cETLus,KEMA,CE	



Three Phase (2 MOV Modules) Surge Protection Devices TYPE: PV20/24-MVCR

Surge arrester for low-voltage power supply system protection against surges at the boundaries from lightning protection zone OB-1 and higher.

- Class II (C) arrester in accordance with IEC61643-11:2013, UL1449 3rd
- Two part design consisting of base and plug-in protection module.
- High energy MOV (Metal Oxide Varistor) inside.
- Reliable supervision due to disconnection device.
- Fault indication by red indication flag in window.
- Fast response.
- With remote alarm terminal optional.



Technical Data

Type	PV20/XXX-V (-S)	
	24	48
In accordance with	IEC61643-11:2013: UL1449 3rd	
Category IEC/VDE	II/ C	
Protection mode	Common mode protection	
Nominal voltage Un (DC)	24VDC	48VDC
Max. Continuous Voltage Uc (DC)	38VDC	56VDC
Nominal discharge current (8/20) In	10VDC	
Max. discharge current(8/20) Imax	20VDC	
Voltage protection level at In	200V	280V
Response time	≤25 ns	
Follow current	No	
Backup fuse (only required if not already provided in mains)	125A gL/gG	
Operating temperature range	- 40°C ~ + 80°C	
Cross-section of connection wire	Single-strand 35mm ² ; multi-strand 25mm ²	
Mounting	35mm DIN-rail in accordance with EN 50022/DIN46277-3	
Enclosure material	thermoplastic; extinguishing degree UL94 V-0	
Degree of protection	IP20	
Installation width	2 modules, DIN 43880	
Thermal disconnecter	Internal green-normal red-failure	
Remote alarm contact	Optional	
Additional data for Remote Alarm Contacts		
Remote alarm contact type	floating changeover (-S)	
Switching capability UN/IN	AC:250V/0.5A DC: 250V/0.1A; 125V/0.2A:75V/0.5A	
Cross-section of connection wire	Max. 1.5mm ²	
Approvals, Certifications	cETLus,CE	

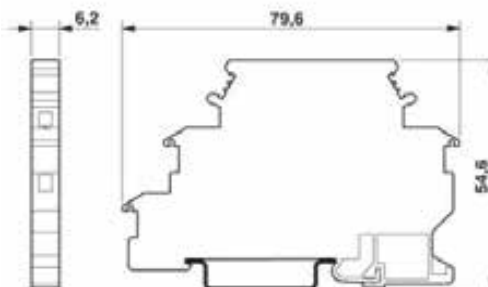
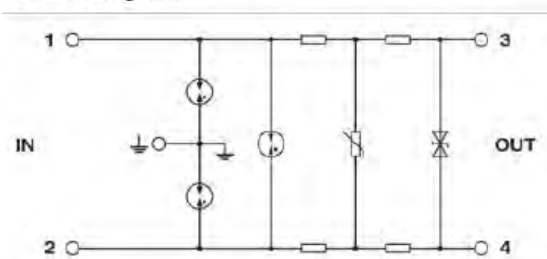


Terminal Block Modules series DNxxx-G (6.2mm wide)

For installation at LPZ OB-2 or higher, applied in protection for 2 single wires of balanced interfaces with measuring and controlling system, providing coarse and fine protection.



Circuit diagram



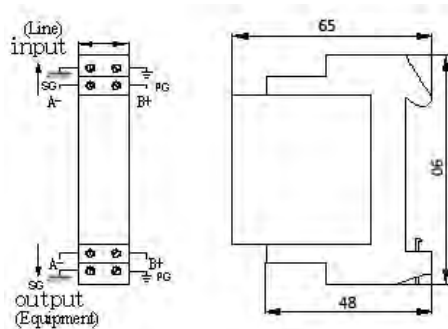
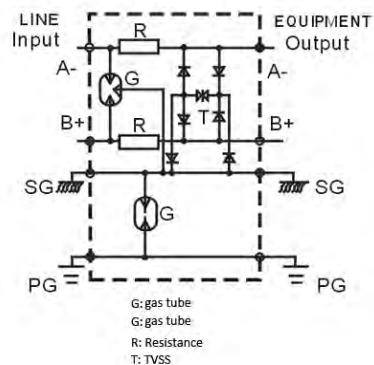
Model No		DN/12-G	DN24-G	DN48-G	DN110-G
Nominal voltage	U_N	12V	24V	48V	110V
Rated voltage (max. continuous d.c.voltage)	U_c	14V	33V	55V	170V
Rated voltage (max. continuous a.c.voltage)	U_c	9.5V	23V	38.5V	120V
Nominal current	I_L	0.5A	0.5A	0.5A	0.5A
Lightning impulse current (10/350) per line	I_{imp}	0.5kA	0.5kA	0.5kA	0.5kA
Nominal discharge current (8/20) per line	I_n	5kA	5kA	5kA	5kA
Nominal discharge current (8/20) Total	I_n	10kA	10kA	10kA	10kA
Voltage protection level at In line-line	U_p	≤25V	≤50V	≤100V	≤260V
Voltage protection level at In line-PG	U_p	≤750V	≤750V	≤750V	≤750V
Voltage protection level at 1kV/us line-line	U_p	≤19V	≤45V	≤70V	≤230V
Voltage protection level at 1kV/us line -PG	U_p	≤650V	≤650V	≤650V	≤650V
Bandwidth line -line	f_G	2.5MHz	6MHz	10MHz	16MHz
Series impedance per line	R	4.0Ω	4.0Ω	4.0Ω	4.0Ω
Capacitance line -line	C	≤2.4nF	≤1nF	≤0.6nF	≤0.4nF
Capacitance line -PG	C	≤5pF	≤5pF	≤10pF	≤5pF
Response time line-line	t_A	≤1ns	≤1ns	≤1ns	≤1ns
Response time line-PG	t_A	≤100ns	≤100ns	≤100ns	≤100ns
Operating temperature range		-40°C...+80°C			
Cross-sectional area		0.08mm ² ~ 4mm ² solid / 2.5mm ² flexible			
Mounting on		35mm DIN rail			
Enclosure material		Black thermoplastic, UL94-V0			
Test standards		IEC 61643-21			



Terminal Block Modules series DN-xx/xxxx-2G

Surge protective devices with plug-in protection modules for high-frequency signal transmission systems against surges at the boundaries from lightning protection zone OB>2.

- Data network protector in according with IEC61643-21.
- Two parts design, surge protection modules to be exchanged easily.
- Limit the transients with gas discharge tubes and diodes.
- Two-stage protection circuit.
- 35 mm DIN-rail mounting design.

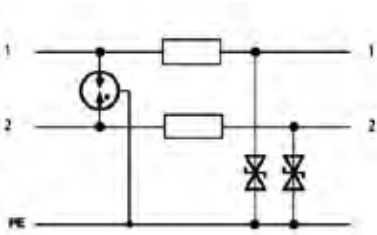


Model No.	DN-05/xxxx-2G
Appliance	xxxxx:RS232,RS422,RS423,RS485,0/4-20mA,0-5V,0-10V
Configuration	twisted pair + shield
Nominal line voltage (Un)	5V
Max line voltage	8V
Max line current	300mA
Nominal Discharge Current (8/20μs, KA)In 10 times	10kA
Total Max. Discharge Current(8/20μs,KA)Imax 1 time	20kA
Impulse current (Iimp) (10/350us KA) impulse 2 times	5kA
Nominal Current (A) I _L	0.5A
Protection level(U _p) 8/20us impulse-5KA	35V
Series impedance per line (Ohm)	2.2 Ohm
Insertion loss at 10MHz (dB)	≤3.0
Degree of protection	IP20
Mounting on	35 mm DIN-rail
Enclosure Material	UL94 V0
Environment Temperature (°C)	-40~+80

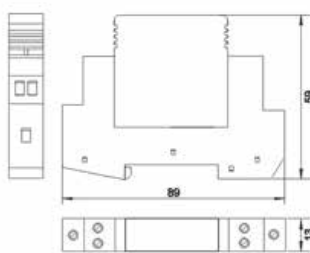


Terminal Block Modules series DN-xxx/AT

Surge protective devices with plug-in protection modules for analogue telecommunication systems against surges at the boundaries from lightning protection zone OB >2.



Basic circuit diagram



Dimension drawing




Type		DN-xxx/AT	
		110	250
In accordance with		IEC 61643-21	
Nominal voltage (Vdc)	U_n	110	250
Max. continuous operating voltage (Vdc/ac)	U_c	180/140	280/190
C2 Nominal discharge current(8/20)	I_n	5kA	
C2 Total nominal Discharge Current (8/20us)		10kA	
Voltage protection level (V)	L-L@C2(8/20μs)Up	≤500V	≤1000V
	L-G@C2(8/20μs)Up	≤500	≤750
	L-L@C3 (1KV/μs)Up	≤350	≤900
	L-G@C3(1KV/μs)Up	≤180	≤450
Nominal Current (A)	I_L	0.5A	
Transmission Speed (bps)		2Mbps	
Insertion loss (dB)		≤0.5	
Series impedance per line (Ohm)		2.2 Ohm	
Protection line		One pair	
Mounting		35mm DIN-rail in accordance with EN 50022/DIN46277-3	
Type of Connection IN/OUT		screw/screw	
Dimensions (mm)		89 X 13 X 59	
Operating temperature range		- 400°C ~ + 800°C	



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