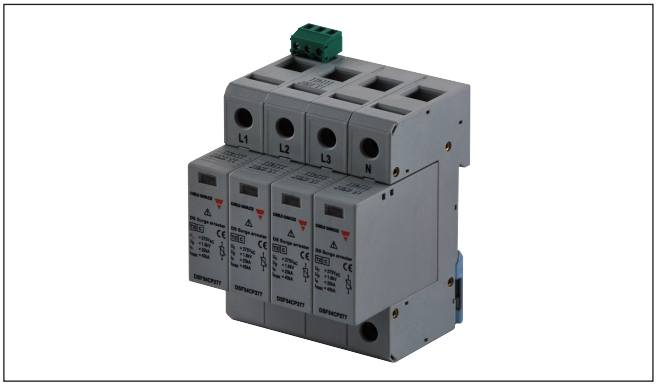
Monitoring Relays
Surge Arresters for AC systems
Type DSF A/P



- **Type 2 (class C) according to EN61643-11 (VDE 0675, part 6-11)**
- **Approved UL1449 3rd Edition**
- **Complies with IEC-61643-1, UTE C 61-740-51**
- **Do not require backup fuse up to 200kArms (UL 1449 3rd Ed.)**
- **Innovative tecnology to prevent dangerous failures in case of temporary overvoltages**
- **Suitable for unstable networks where sustainend over-voltages may persist for some minutes or longer**
- **Plug-in cartridges**
- **Optical indication of exhausted cartridges (red window)**
- **Voltage-free contact, for remote function monitoring**
- **Including thermal and dynamic separating device**
- **Assembled unit ready for mounting**
- **Marked connections**
- **For DIN-rail mounting**

Product Description

DSF A/P are Type 2 (Class C) surge arresters according to EN 61643-11 (VDE 0675, part 6-11) and UL1449 3rd edition suitable for protecting AC systems from transient overvoltage due to both indirect atmospheric discharges and switching actions.
It is available for both single and three phase AC lines, TN-S and TN-C.
The control windows (no/red indication) and the contact allow both a local and a remote monitoring of the status of the plug-in cartridges, warning the operator about the need to promptly replace the cartridges themselves.
These surge protecting devices are Tipe II hence suitable for installation in main distribution cabinet, or secondary distribution board, in installations without external LPS (Lightning Protection System) or where the distance between the LPS elements and the solar panel frames is >50m.
These devices do not require any external backup fuse thus saving space and cost. In according to UL1449 3rd Ed. and UTE C 61-740-51 DSF and can be installed on a DIN-rail in any commercially available distribution box.

Ordering Key

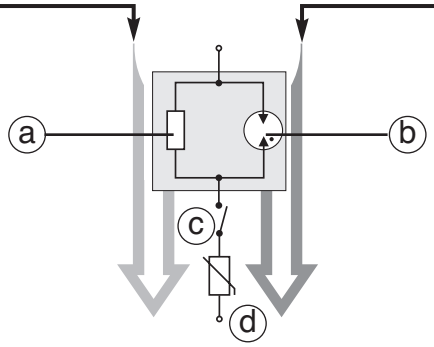
DSF 52 C A 277

Description	Code
Mounting	
DIN-rail	D
Function	
Surge arresters	S
Type	
Type 2 (class C) “Fuseless”	F
Cartridge dimensions	
17.5 mm	5
Configuration	
Single pole	1
Two poles (2+0)	2
Three poles (3+0)	3
4 poles (4+0)	4
Contact	
None	X
1 (relay)	C
Network	
AC 1 phase	A
AC 3 phases	P

MCOV	(AC)
150 VAC	150
300 VAC	277
385 VAC	385
460 VAC	440
550 VAC	550
750 VAC	750

No backup-fuse tecnology

Long duration overvoltage path
The arrester is activated in the event of electric power system failure. The voltages are much lower than transient voltages but substantially more destructive. The system is composed of a current limiter and a varistor. In the event of increased voltage level the current limiter circuit limits the current through the varistor. When the normal condition is re-established (rated line voltage), the surge arrester continues to perform its normal function.



Transient (short duration) overvoltage path
The arrester is activated at the occurence of instantaneous high voltage surges lasting only a few microseconds. Such condition states are experienced at switching operations and atmospheric discharges. The system is composed of a gas tube surge arrester and a varistor. Both components have a very short response time which is reflected in a low protective residual voltage level. This provides an efficient protection of sensitive electronic devices.

a) Current limiter **b**) Gas tube **c**) Thermal disconnector **d**) Varistor

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Product specifications

Max. continuous operating voltage AC	MCOV
DSF5xxx150	150V
DSF5xxx277	300V
DSF5xxx385	385V
DSF5xxx440	460V
DSF5xxx550 (1)	550V
DSF5xxx750	750V
Nominal Voltage AC	
DSF5xxx150	120V
DSF5xxx277	277V
DSF5xxx385	347V
DSF5xxx440	440V
DSF5xxx550 (1)	480V
DSF5xxx750	690V
SPD (Surge Protection Device) according to EN 61643-11	Class 2
SPD (Surge Protection Device) according to IEC 61643-1	Class 2
LPZ (Lightning Protection Zone)	1 --> 2
Nominal discharge surge current (8/20)	**In**
DSF5xxx150	20kA/pole
DSF5xxx277	20kA/pole
DSF5xxx385	20kA/pole
DSF5xxx440	20kA/pole
DSF5xxx550 (1)	20kA/pole
DSF5xxx750	10kA/pole
Max. discharge surge current (8/20)	**Imax**
DSF5xxx150	50kA/pole
DSF5xxx277	50kA/pole
DSF5xxx385	50kA/pole
DSF5xxx440	50kA/pole
DSF5xxx550 (1)	50kA/pole
DSF5xxx750	20kA/pole

Voltage protection level according to UL 1449 3rd Ed.	VPR
DSF5xxx150	< 1.2kV
DSF5xxx277	< 1.6kV
DSF5xxx385	< 1.8kV
DSF5xxx440	< 2.0kV
DSF5xxx550 (1)	< 2.5kV
DSF5xxx750	< 2.5kV
Response time	t_A < 25 ns
Protection fuse size (UL 1449 3rd Ed.)	Not required up to 200 kA rms
Follow current	No
Thermal Protection	Yes
Short-circuit current rating	**Isc** 25kA/50Hz
Front window	No indication: working cartridge. Red: exhausted cartridge (to be replaced)
Operating temperature	-40 to +80 °C

Note:
(1) 550V version only for DSF51xx550, DSF53xx550

Output Specifications

Output	
DSF5xCxxxx	SPDT
Rating	AC: 250V/0.5A 125V/3A
Cable cross-section area	max 1.5 mm^2
Terminal torque	0.25 Nm max

General Specifications

Protection degree	IP 20
Dimensions	See drawings pag.4 fig.8
Screw terminals	
Cable cross-section area	25mm^2 / 3AWG (stranded) 35mm^2 / 2AWG (solid)
Terminal torque	3.5Nm / 2.58lb/ft max
Housing material	Thermoplastic, extinguishing degree UL 94 V-0
Approvals	CE, UL1449 3rd Edition CSA

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Installation notes

Protection distance

• If DSF is installed less than 10 m from the device to be protected, the distance can be ignored.

• If DSF and its connection wires have a total protection level $U_{p/f}$ (U_{prot}) <0.5 U_w, where U_w is the breaking voltage of the device to be protected, the distance can be neglected.

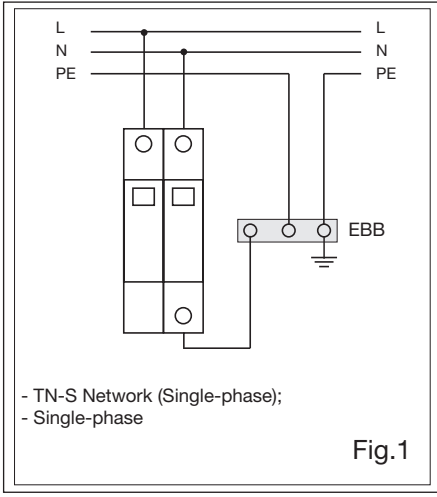
• If the protection distance is longer than 10 m, the real protection distance l_{po} can be calculated by the following formula:

$l_{po} = (U_w - U_{p/f}) / K$ [m]
with K = 25 V/m.

Protection against overcurrents and indirect contacts

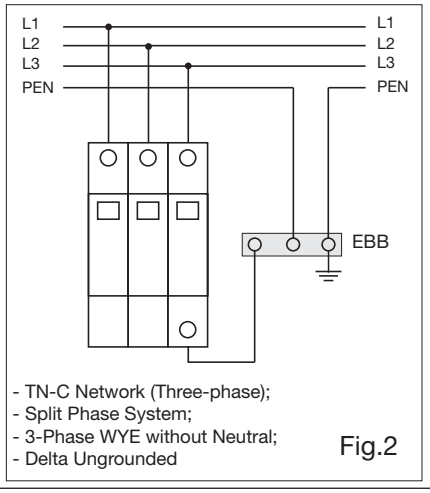
DSF can be installed without further integrative protections even if a general circuit breaker/fuses with nominal current >125 kA is installed and if in the DSF installation point the short circuit current is >25 kA (but <200kArms). No protection fuses are needed for backup protection.

Wiring Diagrams



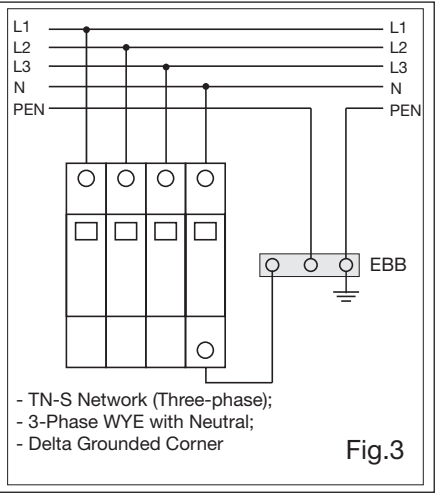
- TN-S Network (Single-phase);
- Single-phase

Fig.1



- TN-C Network (Three-phase);
- Split Phase System;
- 3-Phase WYE without Neutral;
- Delta Ungrounded

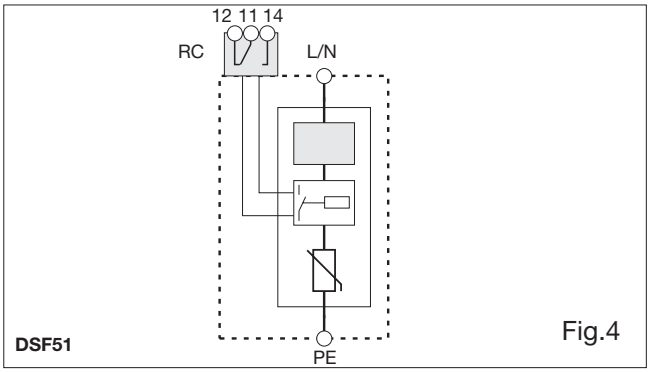
Fig.2



- TN-S Network (Three-phase);
- 3-Phase WYE with Neutral;
- Delta Grounded Corner

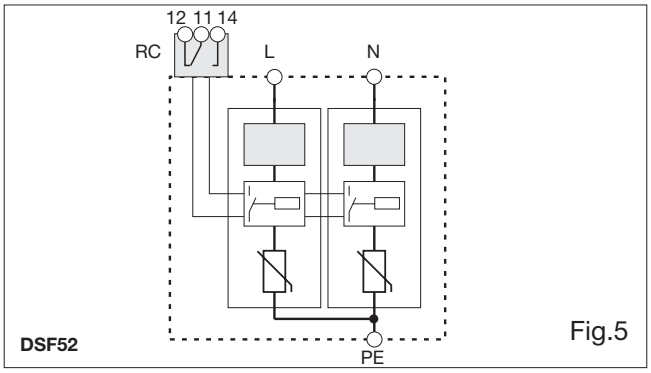
Fig.3

Connection Diagrams



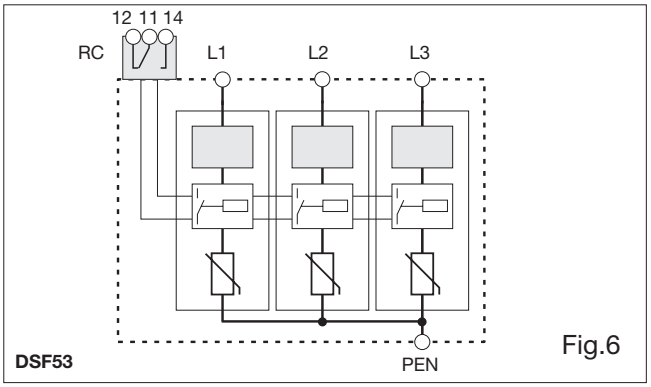
DSF51

Fig.4



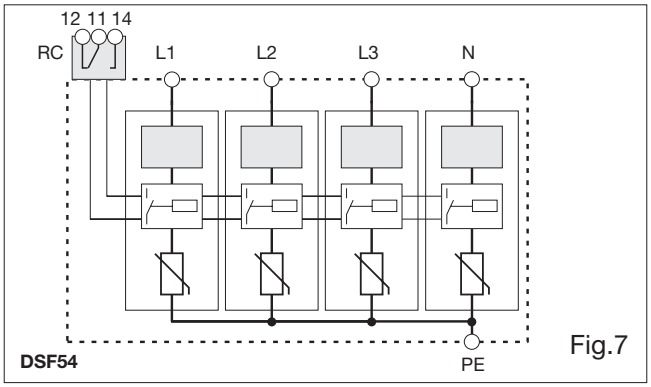
DSF52

Fig.5



DSF53

Fig.6



DSF54

Fig.7

Dimensions

DSF51 DSF52 DSF53 DSF54

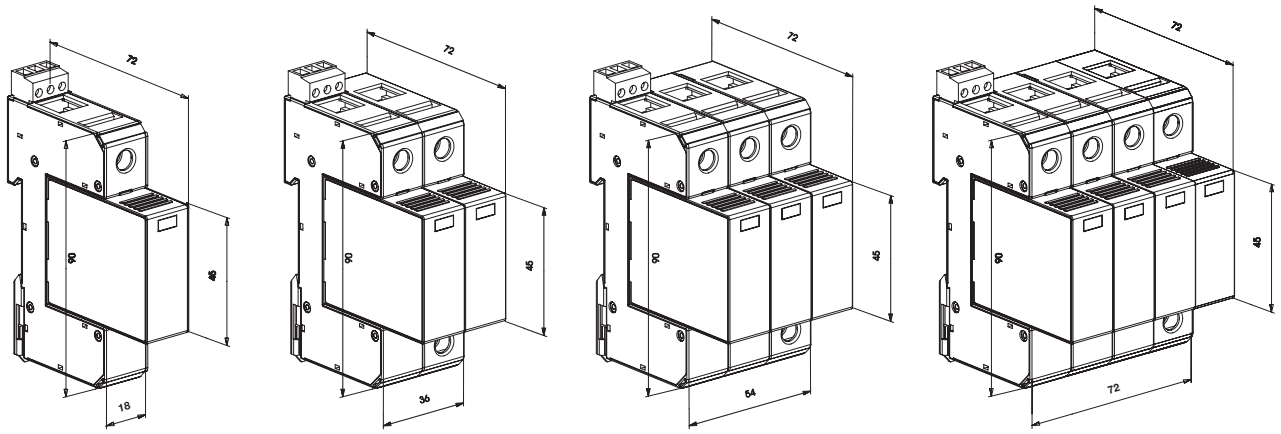


Fig.7

Cartridges

Ordering Codes

FOR DSF5xxx120	DS0120F
FOR DSF5xxx277	DS0277F
FOR DSF5xxx347	DS0347F
FOR DSF5xxx440	DS0440F
FOR DSF5xxx480	DS0480F

Cartridges Dimensions

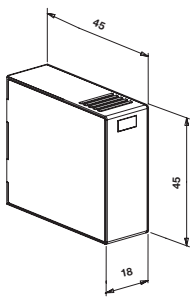


Fig.8