WatchfulEyE

Surge Protective Device

Paperless Datasheet

Going green and protecting environment is manufacturers' responsibility. Each WatchfulEyE product has a link of downloading data sheet on its enclosure:
http://datasheet.watchfuleyesolutions.com/US120154.html

Model & Ordering Code

Model	Ordering Code	MCOV/Uc	Remote Contacts	UPC/EAN Code
WTH-20/D/R/4P-275	US120154	275VAC	YES	(0) 811914031291
WTH-20/D/4P-275	US120144		NO	(0) 811914031598
WTH-20/D/R/4P-320	US120155	320VAC	YES	(0) 811914031307
WTH-20/D/4P-320	US120145		NO	(0) 811914031604
WTH-20/D/R/4P-385	US120156	385VAC	YES	(0) 811914031314
WTH-20/D/4P-385	US120146		NO	(0) 811914031611
WTH-20/D/R/4P-420	US120157	420VAC	YES	(0) 811914031321
WTH-20/D/4P-420	US120147		NO	(0) 811914031628

Certificates of Products

LISTED E345944 CE RoHS IEC61643-11

WatchfulEyE

Surge Protective Device

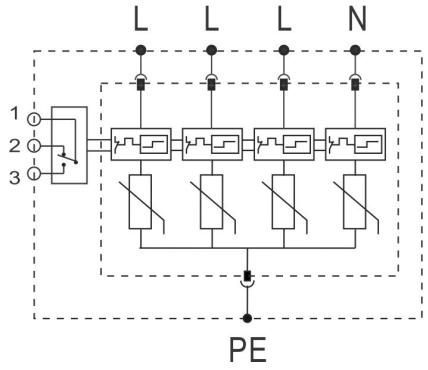
Description

In accordance with: IEC 61643-11 - Class III and UL1449 Type 4 Location
Location of use: branch sub-distribution boards
Plug-in module and separate base design enables convenient maintenance.
Internal thermal disconnect devices help ensure safe or at end-of-life

WTH-20/D/R/4P Series Technical Data	
Requirement Class to IEC61643-11	Class III
IEEE Category Rating	B & A
Nominal Discharge Current (In)	10kA
Max. Discharge Current (Imax)	20kA
Open circuit voltage (Uoc)	20kV
Protection Modes	L-PE, N-PE
Protective Element	MOV
Follow Current (If)	NO
Response Time (tA)	<5ns
Leakage Current (at 75%U1mA)	<20μA
Thermal Protection	YES
Protection Rating (IP Code)	IP 20
Short Circuit Current Ratings (SCCR)	25kA rms
Max. Back-up Fuse (if mains >50A)	50A gL (circuit-breaker: <20A)
Surge Life at 3kA (8/20μs)	>5000 events
Temperature Range	- 40°F to 176°F (-40°C to 80°C)
Relative Humidity	0% to 95% noncondensing
Maximum Operating Altitude	10,000 feet (3000m)
Terminal Cross Section	35mm² (solid) / 25mm² (stranded)
Stripping Length Contacts	0.6inches (15mm)
Terminal Screw Torque	Max. 3.5Nm
DIN Rail EN60715	35mm top-hat rail
Dimensions DIN 43880	72mm (4TE)
Housing Material	Thermoplastic (UL94 V-0)
Housing Design	Modular design
Net Weight Per Unit	1Lb (450g)

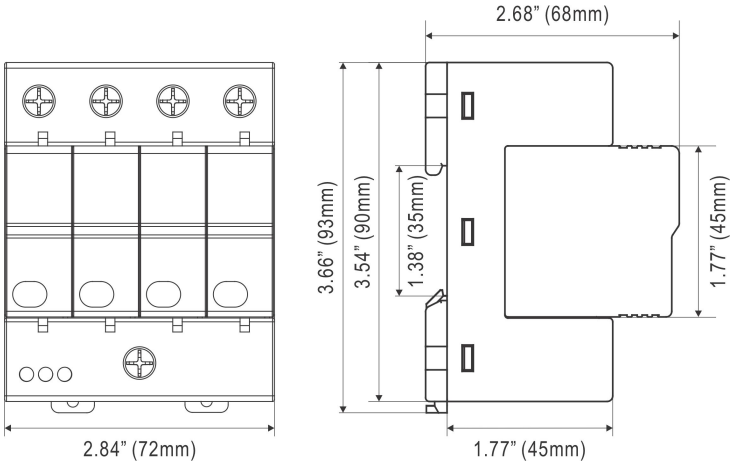
Surge Protective Device

Surge Protection Connection Diagram



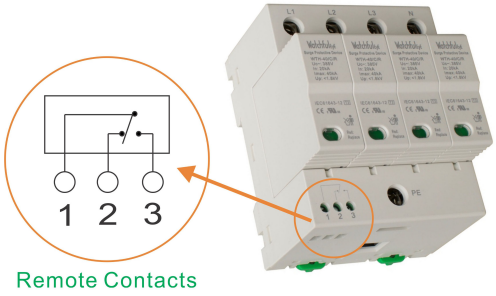
Maximum Continuous Operating Voltage (MCOV/Uc)	275VAC	320VAC	385VAC	420VAC
Voltage Protection Level (Up)	1.3kV	1.4kV	1.5kV	1.7kV
Residual Voltage (Ures)	1.0kV	1.1kV	1.2kV	1.4kV

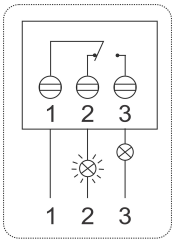
Dimensions



Remote Contacts

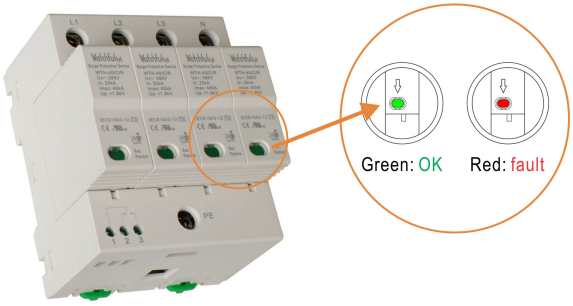
1: COM (Common)
2: NC (Normally Close)
3: NO (Normally Open)

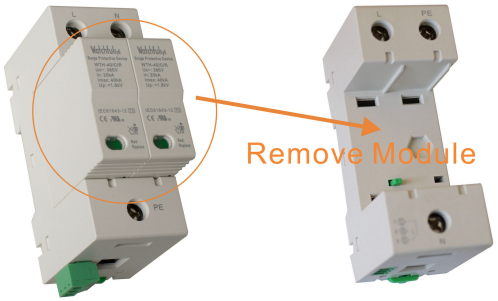




Contact Ratings	125VAC/3A, 250VAC/1.5A
Terminal Cross Section	Max. 1.5mm²
Stripping Length Contacts	0.25 inches (6-7mm)
Remote Terminal Torque	0.25Nm

Fault Indication (same indication in 1P/2P/3P/4P/1P+NPE/3P+NPE models)





Common Terms and Definitions

1. Normal operating voltage rating (Un)
2. Maximum Continuous Operating Voltage (Uc/MCOV):
Maximum r.m.s. voltage, which may be continuously applied to the surge protective device's mode of protection.
3. Nominal Discharge Current for Class II Test (In):
crest value of the current through the surge protective device having a current waveshape of 8/20μs.
4. Maximum Discharge Current (Imax):
Crest value of a current through the surge protective device having an 8/20μs waveshape and magnitude according to the manufacturers specification. Imax is equal to or greater than In.
5. Voltage Protection Level (Up):
Maximum voltage to be expected at the surge protective device terminals due to an impulse stress with defined voltage steepness and an impulse stress with a discharge current with given amplitude and waveshape.
6. Residual Voltage (Ures):
Crest value of voltage that appears between the terminals of an surge protective device due to the passage of discharge current.
7. IEEE 62.41
CATEGORY C: outdoor overhead lines, service entrance (most severe)
CATEGORY B: major feeder, short branch circuits, service panel (indoor)
CATEGORY A: long branch circuits, receptacles (indoor) (least severe)

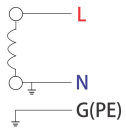
How to choose a suitable Uc(MCOV) value

Note: Uc >1.15Un
The relationship between two parameters Uc and Up of a surge protective device is proportional.
If Uc is small, the value of Up is also small; surge protective devices with smaller Up can provide better surge protection.
Whether to choose smaller Uc depends on the voltage stability of the grid.
If you choose surge protective devices with smaller Uc for the grid with instable voltage, the surge protective devices will frequently work while the grid voltage fluctuates, resulting in shortening surge protective device's product life.
If you choose larger Uc, and the value of Up is accordingly large, the surge protective efficiency will not be so fine.
If you are unsure of the voltage stability of the grid,
it is suggested to calculate MCOV(Uc) using the following formula: $\sqrt{2}$ Un < Uc < $\sqrt{3}$ Un

AC Network (Un)	MCOV(Uc), L/N-PE Protection Mode
110V	150V
120/208V	150V
127/220V	150V
220/380V	275V, 320V, 385V
230/400V	275V, 320V, 385V, 420V
240/415V	320V, 385V, 420V
277/480V	320V, 385V, 420V
347/600V	550V, 690V

AC Network Connection Diagram (1/2)

1



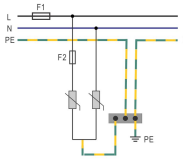
Single Phase
2 Wire + Ground

AC System Voltage

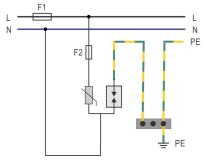
L-N:

110V, 120V, 127V
220V, 230V, 240V
277V, 480V

2P Combination



1P+NPE Combination



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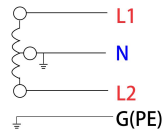


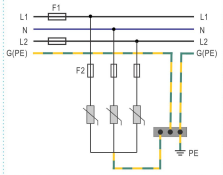
Split Phase
3 Wire + Ground

AC System Voltage

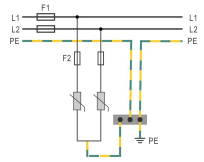
L-N/L-L:

120/240V
127/254V
240/480V
277/480V

3P Combination



2P Combination



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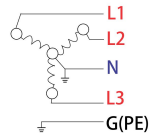


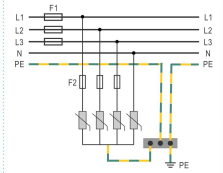
3 Phase Wye
4 Wire + Ground

AC System Voltage

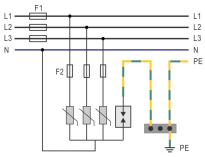
L-N/L-L:

120V/208Y
127V/220Y
220V/380Y
230V/400Y
240V/415Y
277V/480Y
347V/600Y

4P Combination



3P+NPE Combination



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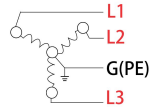


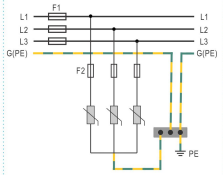
3 Phase Wye
3 Wire + Ground

AC System Voltage

L-L:

480V

3P Combination



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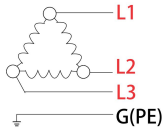


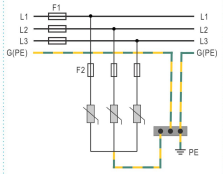
3 Phase Delta
3 Wire + Ground

AC System Voltage

L-L:

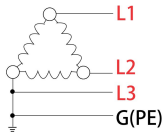
240V
480V
600V

3P Combination



AC Network Connection Diagram (2/2)

6

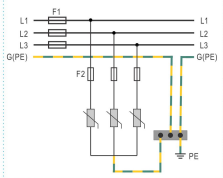


3 Phase Delta
3 Wire + Ground

AC System Voltage

L-L:
240V
480V
600V

3P Combination



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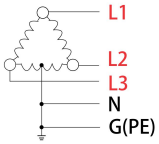
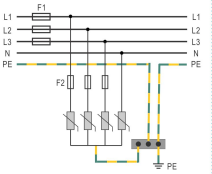


3 Phase Delta
4 Wire + Ground

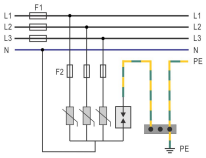
AC System Voltage

L-N/L-L:
120/240V
240/480V

4P Combination



3P+NPE Combination



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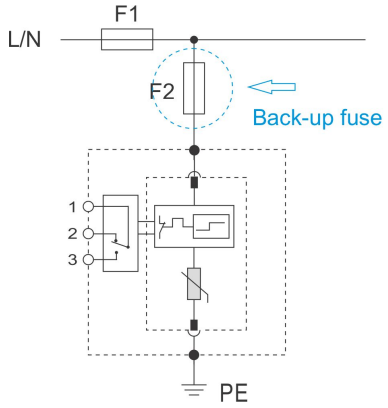
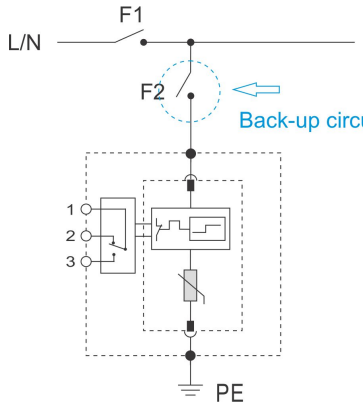
Selection of back-up fuse



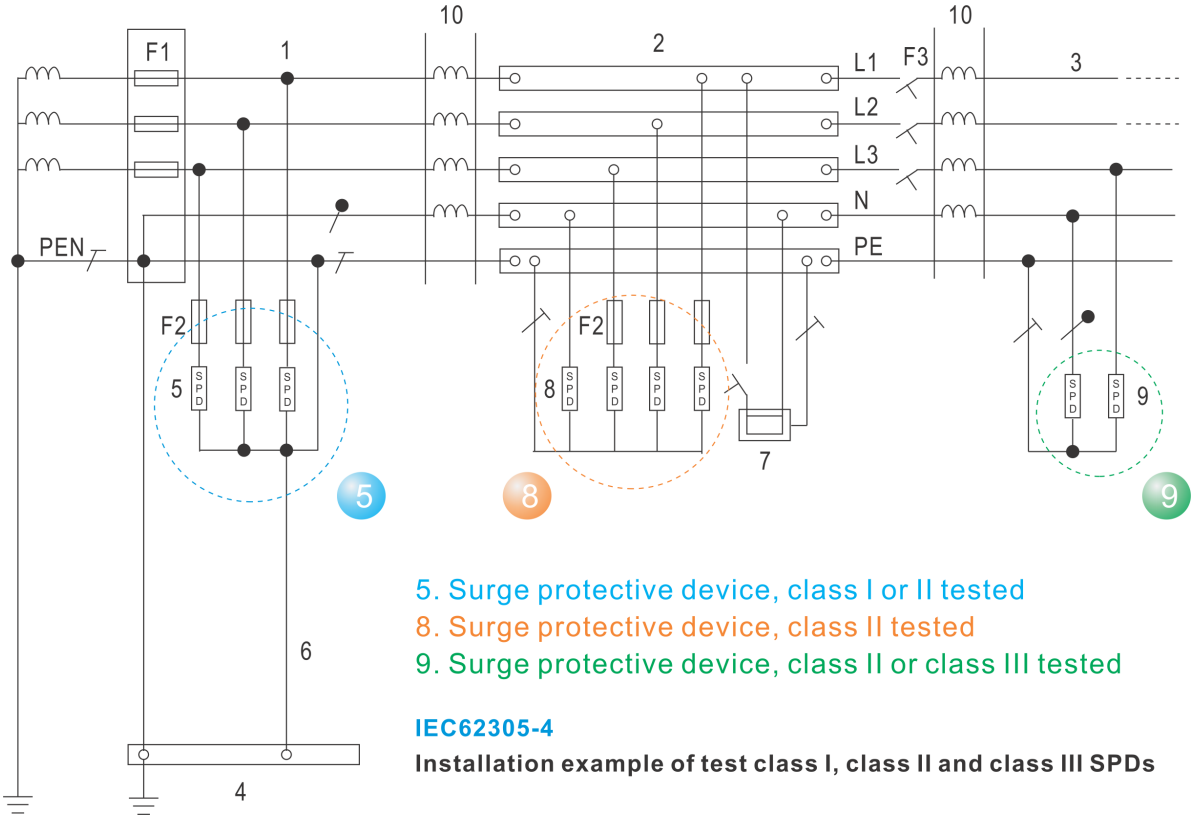
F1 > 50A gL ⇨ F2 = 50A gL
F1 ≤ 50A gL ⇨ ~~F2~~

Selection of back-up circuit-breaker



F1 > 20A ⇨ F2 = 20A
F1 ≤ 20A ⇨ ~~F2~~

Application



5. Surge protective device, class I or II tested
8. Surge protective device, class II tested
9. Surge protective device, class II or class III tested

IEC62305-4

Installation example of test class I, class II and class III SPDs

Key
1. Origin of the installation
2. Distribution board
3. Distribution outlet
4. Main earthing terminal or bar
5. Surge protective device, class I or II tested
6. Earthing connection (earthing conductor) of the surge protective device
7. Fixed equipment to be protected
8. Surge protective device, class II tested
9. Surge protective device, class II or class III tested
10. Decoupling element or line length

F1, F2, F3 overcurrent protective disconnectors
NOTE Refer to IEC 61643-12 for further information.

FAQ & Help

1. What should I do if I can't find the paper manual in the product packaging?
Watchful Eye products is committed to going green with paperless data sheets. On the side of each product enclosure is an engraved link with URL for downloading paperless data sheet and QR code of the website. If you need the paper data sheet, you can open the link and print the data sheet by yourself.

2. The advantages of fault indication windows?
If surge protection fails, the fault indication windows will turn red, thus it can be seen intuitively, and the surge protective device can be replaced in time to avoid damage to the equipment caused by a second surge.

3. What instruments can be used to test whether its surge protection function is normal or not?
Test with a Watchful Eye surge protector tester

4. Can you list more applications?
Power supply panel, whole house

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After-sale Services

Watchful Eye provides a 5-year quality warranty globally.

I have a question