

# WatchfulEye

Watchful Eye Solutions, Inc.

## WTH-20/D/... Class III Series Lightning & Surge Protection





WTH-20/D/...2P Series



WTH-20/D/...3P Series



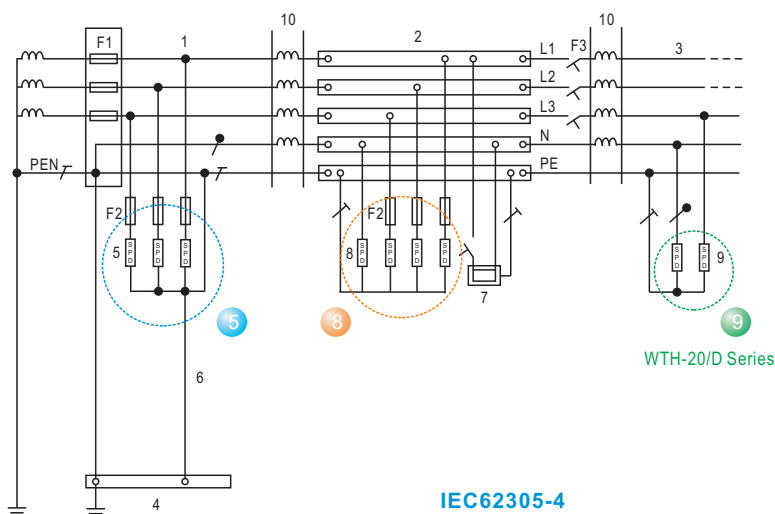
WTH-20/D/...4P Series

## Technical Data

Requirement Class to IEC61643-1	Class III
IEEE Category Rating	B & A
Protection Modes	L-N, L-PE, N-PE
Nominal Discharge Current (In @8/20µs)	10kA
Max. Discharge Current (Imax @8/20µs)	20kA
Open circuit voltage (Uoc @ 1.2/50µs)	20kV
Follow Current (If)	NO
Short Circuit Current Ratings (SCCR)	20kA rms
Response Time (tA)	< 25ns
Leakage Current (at 75%U1mA)	<20µA
Thermal Protection	YES
Back-up Fuse (if mains > 50A)	50A gL
Temperature Range	-40° to 176°F (-40° 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
Protection Rating (IP Code)	IP 20
Surge Life at 3kA (8/20µs)	>5000 events
Din Rail EN60715	35mm top-hat rail
Housing Material	Thermoplastic; extinguishing degree UL 94 V-0

### Surge Protective Device for Low Voltage Power Supply System

- Different types for your choosing according to different voltages (110V, 120/208V, 220/380V, 277/480V, 347/600V)
- In accordance with: IEC 61643-1 - Class II and UL1449 Type 4 Location
- Location of use: branch sub-distribution boards
- The convenient plug-in module, and separate base design
- Internal thermal disconnect devices help ensure safe or at end-of-life
- Combinations: 1P, 1P+NPE, 2P, 3P, 3P+NPE, 4P
- Remote Contact: optional



#### 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.

### IEC62305-4

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



WTH-20/D/...1P+NPE Series



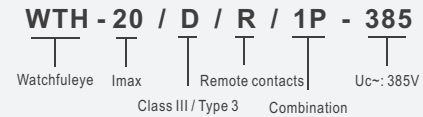
WTH-20/D/...3P+NPE Series

Technical Data

Type:	Uc (MCOV)	Up	Ures
WTH-20/D/...75 Series	75VAC	0.8kV	0.6kV
WTH-20/D/...115 Series	115VAC	1.0kV	0.7kV
WTH-20/D/...150 Series	150VAC	1.1kV	0.8kV
WTH-20/D/...275 Series	275VAC	1.3kV	1.0kV
WTH-20/D/...320 Series	320VAC	1.4kV	1.1kV
WTH-20/D/...385 Series	385VAC	1.5kV	1.2kV
WTH-20/D/...420 Series	420VAC	1.7kV	1.4kV
WTH-20/D/...550 Series	550VAC	2.0kV	1.8kV
WTH-20/D/...690 Series	690VAC	2.4kV	2.1kV

Power Supply System	Uc(MCOV), L-PE Mode, Uc>1.15Un
110V, 120/208	150VAC
220/380	275VAC, 320VAC, 385VAC
230/400V	275VAC, 320VAC, 385VAC, 420VAC
240/415V	320VAC, 385VAC, 420VAC
277/480V	320VAC, 385VAC, 420VAC
347/600V	550VAC, 690VAC

How to name our products



Un: Normal operating voltage rating  
 Uc (MCOV - UL): Max. continuous operating voltage  
 Up: Voltage protection level (at In)  
 Ures: Residual voltage at 6kV 1.2/50µs & 3kA 8/20µs  
 Frequency: 50Hz to 60Hz

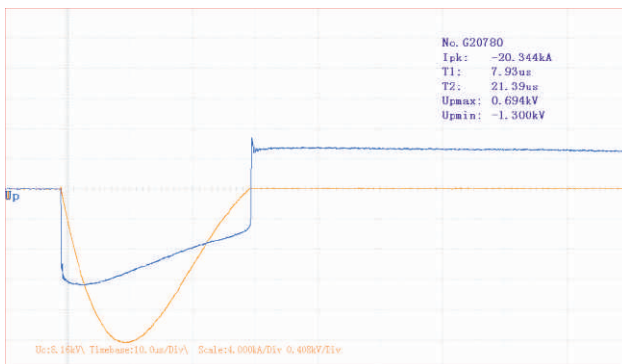
Note: Uc>1.15Un

The relationship between two parameters Uc and Up of a SPD is proportional. If Uc is small, the value of Up is also small; SPDs with smaller Up can provide better surge protection.

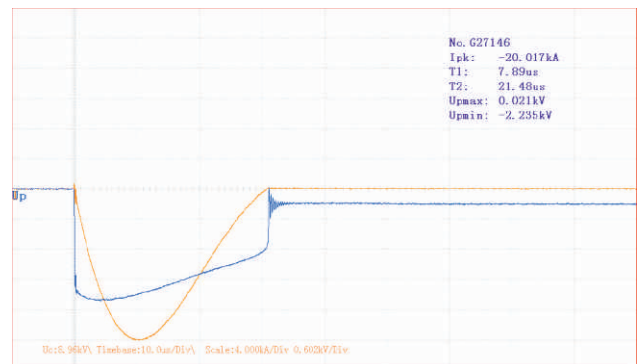
Whether to choose smaller Uc depends on the voltage stability of the grid. If you choose SPDs with smaller Uc for the grid with instable voltage, the SPDs will frequently work while the grid voltage fluctuates, resulting in shortening SPD's product life.

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 Uc using the following formula:  $\sqrt{2}Un < Uc < \sqrt{3}Un$



The impulse current and residual voltage curve in I<sub>max</sub>=-20kA (WTH-20/D/3P+NPE-275(L-N))



The impulse current and residual voltage curve in I<sub>max</sub>=-20kA (WTH-20/D/3P+NPE-690(L-N))



WTH-20/D/...1P Series



WTH-65/G/1P-255

WTH-65/G/1P-255 (N-PE Only)

Technical Data

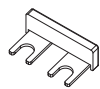
Uc	255VAC
In	25kA
I <sub>max</sub>	65kA
Up	1.0kV
Ures	0.3kV

## Application

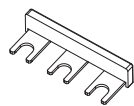
- Customized and designed by professional and experienced engineers according to your systems
- Different specifications for your choices (plastic shell and metal shell box; single-phase, three-phase power supply system)
- Suitable for 110V, 120/208V, 220/380V, 277/480V, 347/600V AC voltage systems
- Able to assemble fuses, circuit breakers, lightning counter and monitoring, etc. in accordance with the requirements of your surge protection systems
- Realize remote intelligent monitoring through wireless, wired network or cloud service



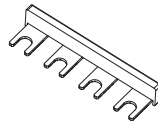
## Bus Bar



WTH-2P/40  
(1P+NPE, 2P Mode)



WTH-3P/40  
(2P+NPE, 3P Mode)



WTH-4P/40  
(3P+NPE, 4P Mode)

- Single modules can be combined with a bus bar in multiple combination methods

## Type: WTH-20/D/ R /3P-385

### Remote contacts

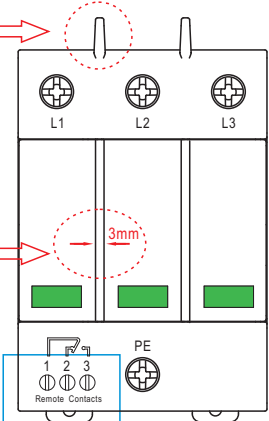
Remote Contacts	
Contact Ratings	AC:125V/1A
Terminal Cross Section	Max. 1.5mm <sup>2</sup>
Stripping Length Contacts	0.25inches (6-7mm)
Remote Terminal Torque	0.25Nm

## Two details strengthening the protection

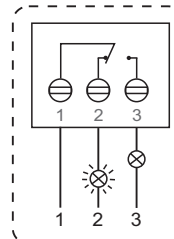
The isolated barrier between two modules

- Increase creepage distance
- Make the connection more secured
- Increase the capacity of insulation isolation
- More important for the application with UC higher than 550V

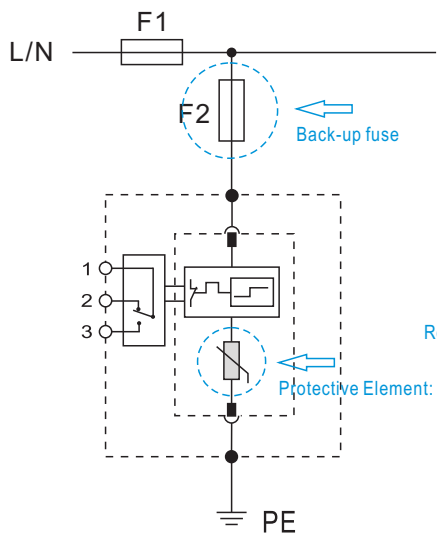
3mm-wide gap between two modules



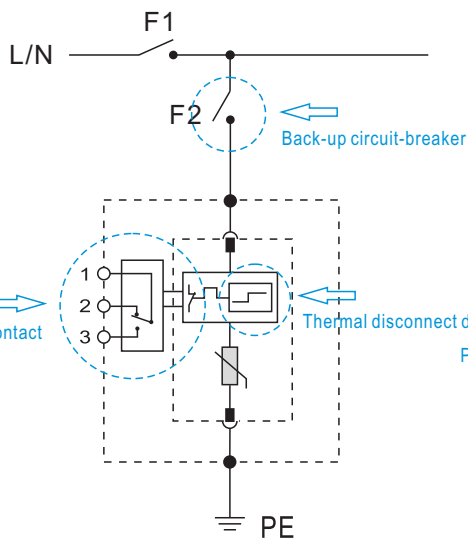
## Remote Contacts



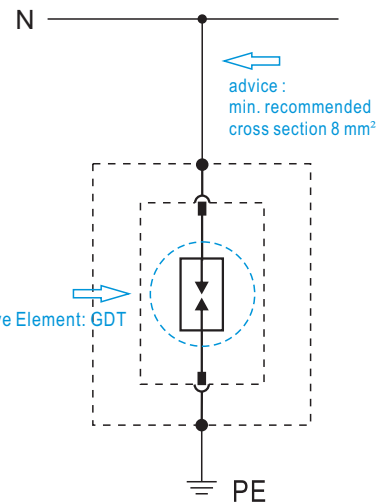
- 1: COM(Common)
- 2: NC(Normally Close)
- 3: NO(Normally Open)



WTH-20/D/...1P Series



WTH-20/D/...1P Series



WTH-65/G/1P-255

**Selection of back-up fuse**

$F1 > 50A_{gL} \Rightarrow F2 = 50A_{gL}$

$F1 \leq 50A_{gL} \Rightarrow \cancel{F2}$

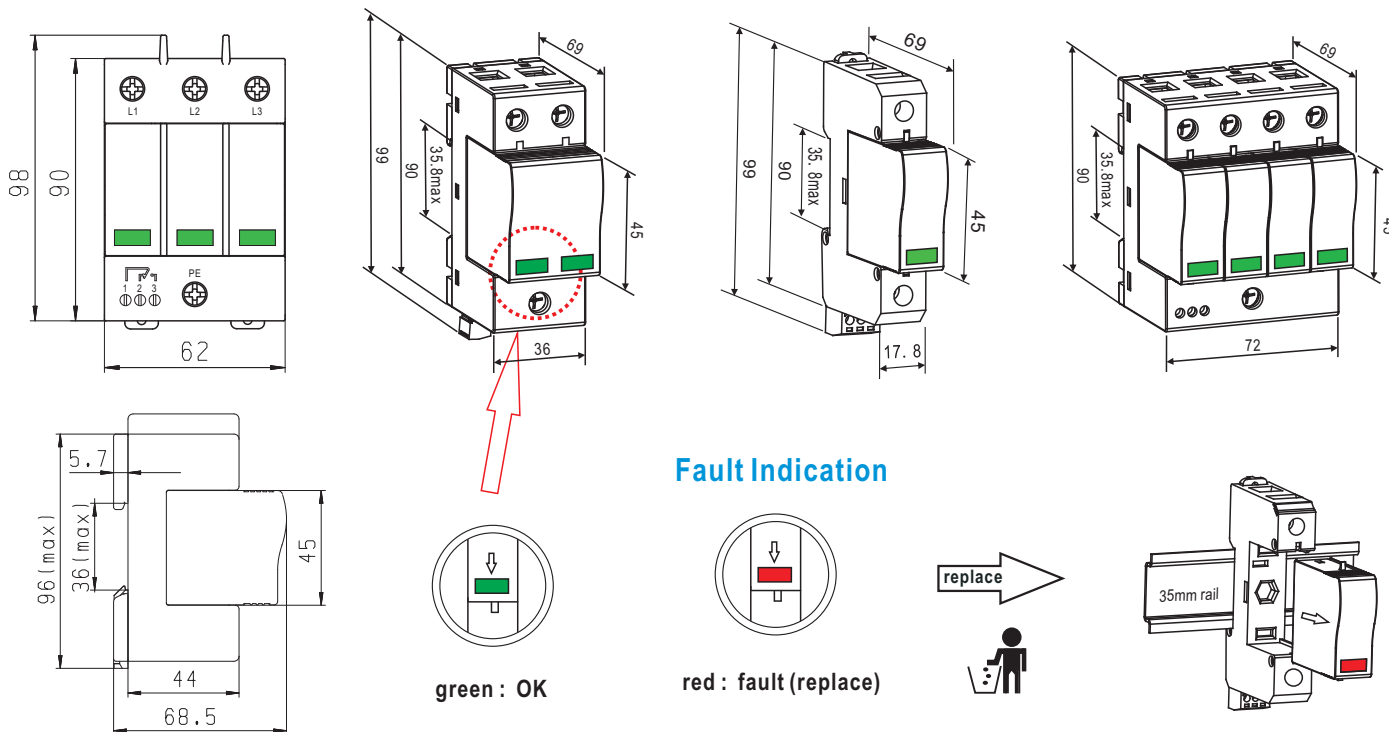
**Selection of back-up circuit-breaker**

$F1 > 20A \Rightarrow F2 = 20A$

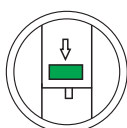
$F1 \leq 20A \Rightarrow \cancel{F2}$

**N-PE Only**

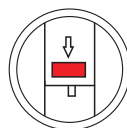
**Dimensions**



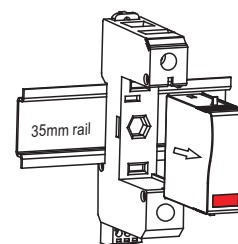
**Fault Indication**



green : OK



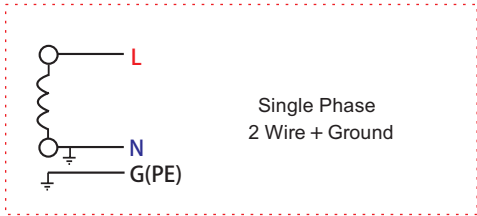
red : fault (replace)



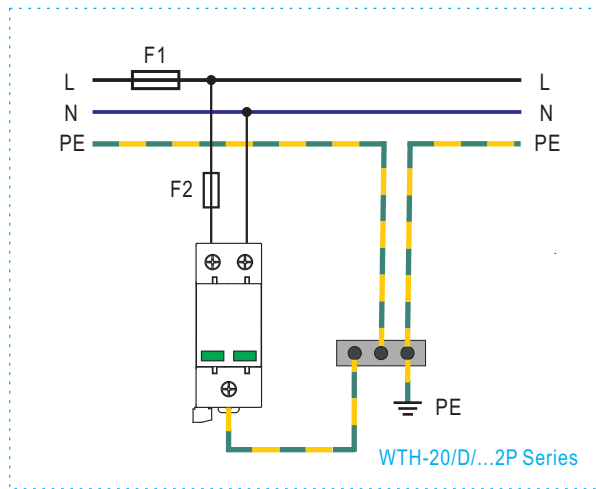
Pull out upward

## Lightning and Surge Protection for 2 Wire + Ground System

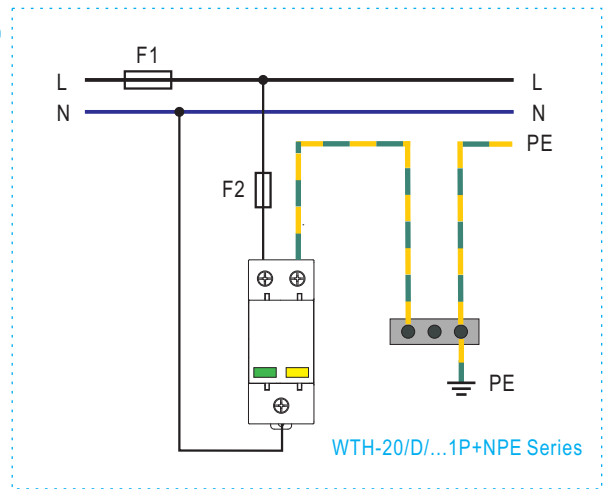
1



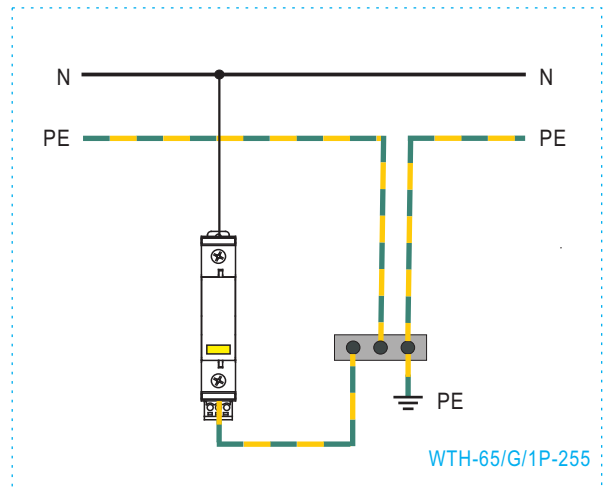
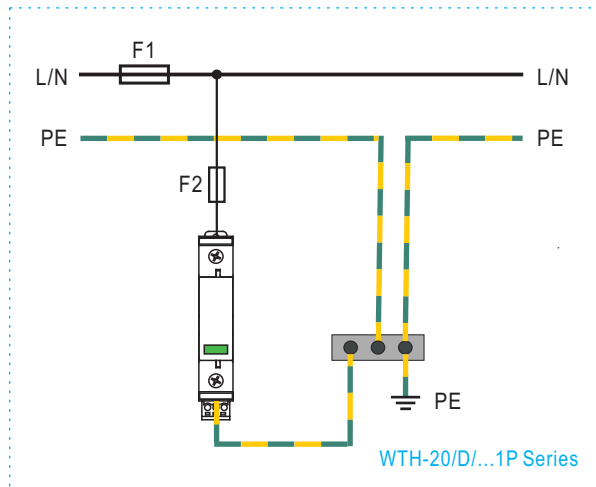
A



B

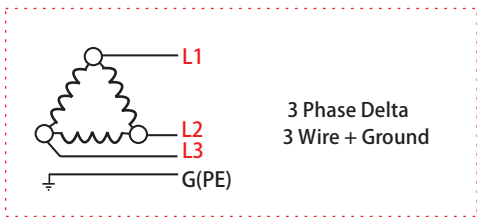


C

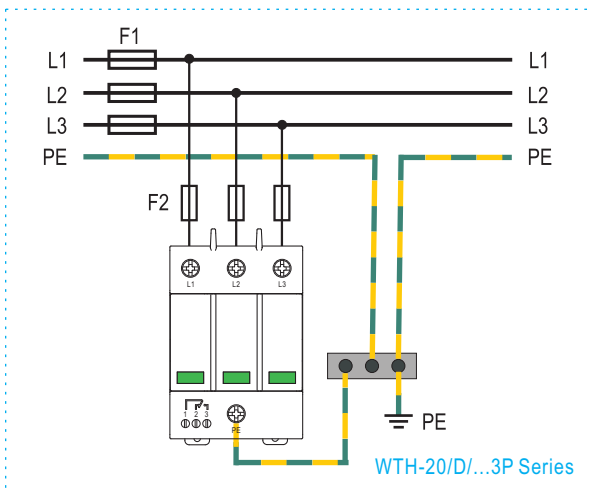


# Lightning and Surge Protection for 3 Wire + Ground System

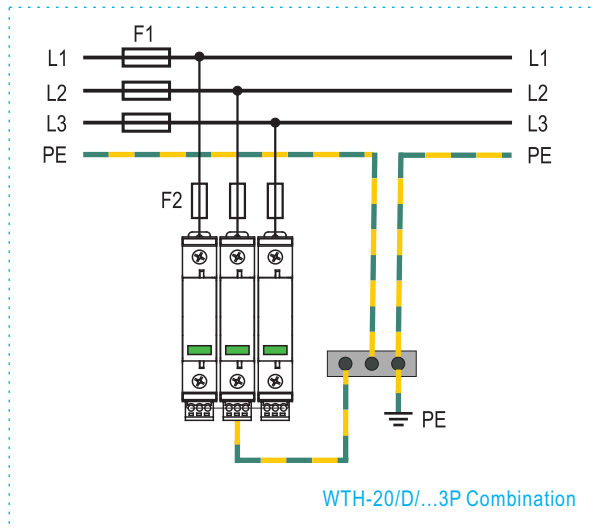
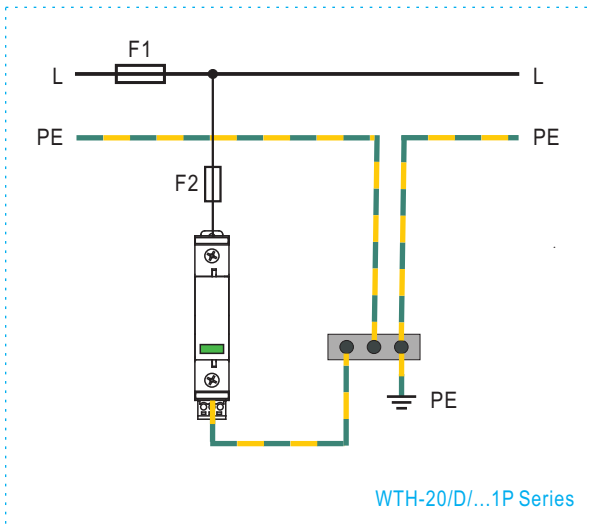
2



D

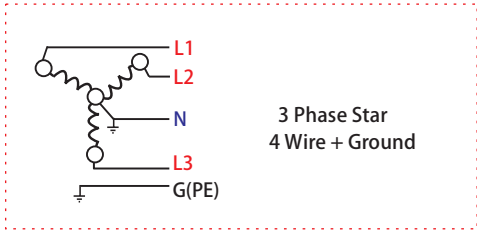


E

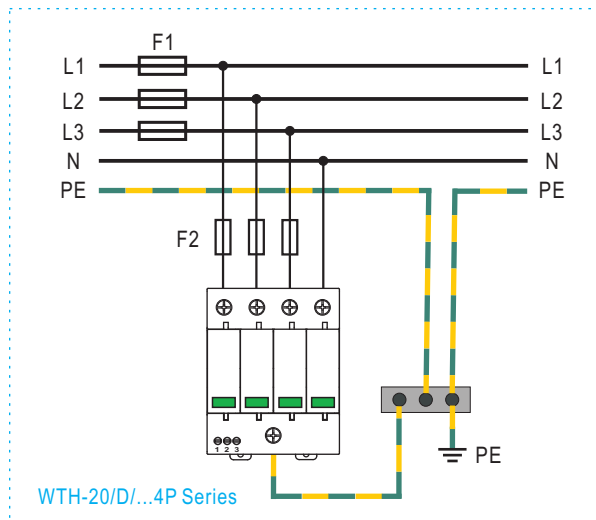


## Lightning and Surge Protection for 4 Wire + Ground System

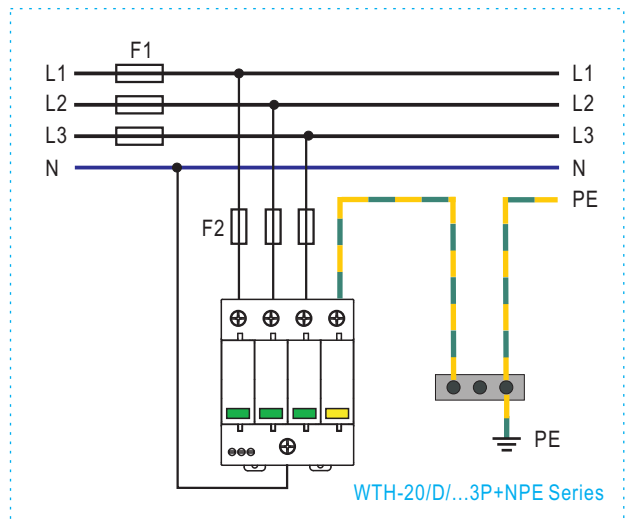
3



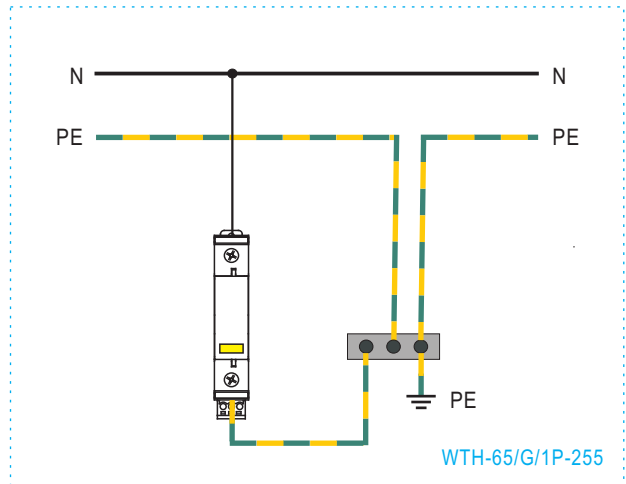
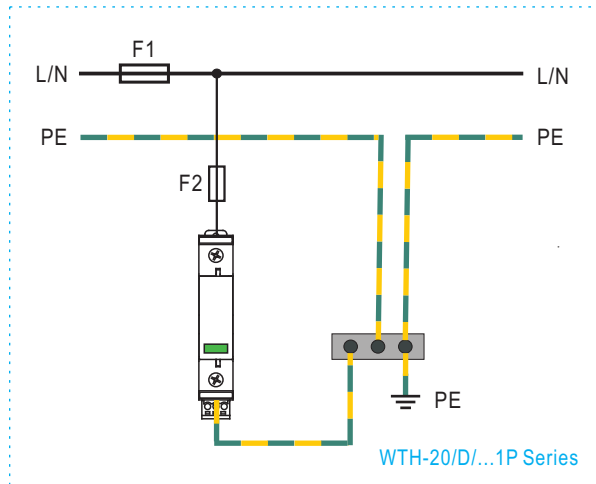
F



G



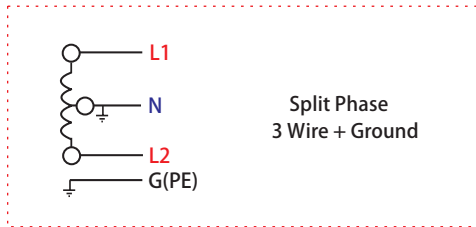
H



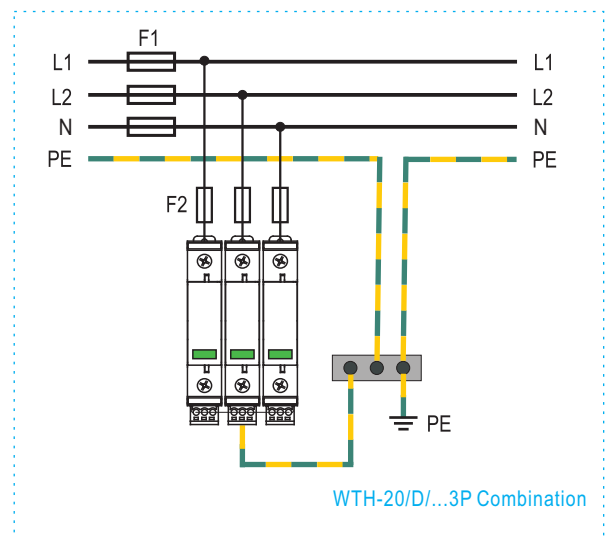
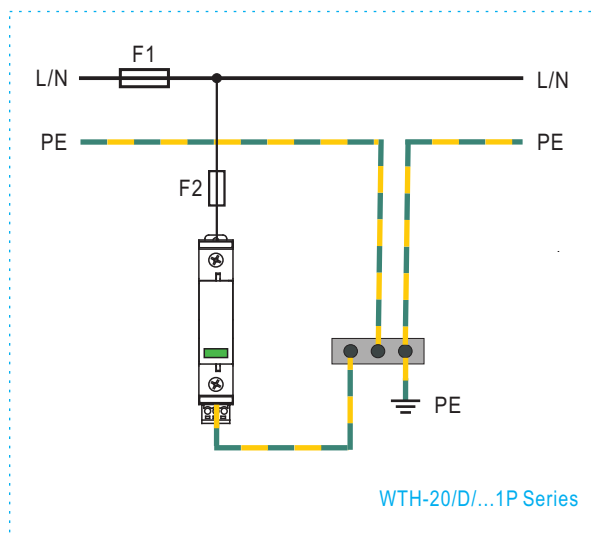


# Lightning and Surge Protection for 3 Wire + Ground System

4



I



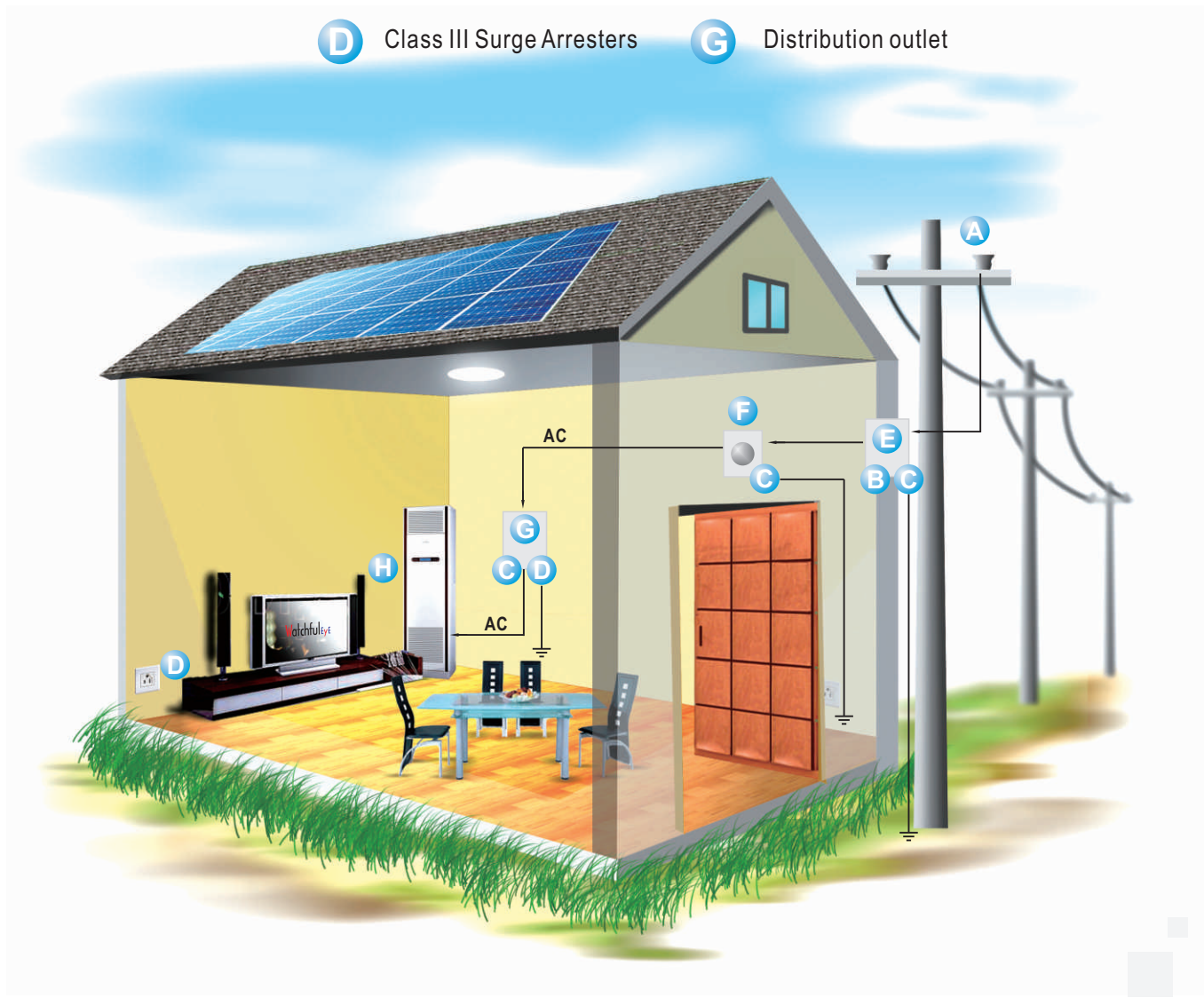
Watchful Eye offers complete and reliable technical solutions for AC power supply systems, protecting the electrical facilities throughout buildings against lightning and surge, providing a guarantee for the security of your systems and avoid unnecessary losses.

# Ordering Code

Type:	Ordering code	Type:	Ordering code	Type:	Ordering code
WTH-20/D/1P-75	US 120 181	WTH-20/D/1P+NPE-75	US 120 121	WTH-20/D/2P-75	US 120 101
WTH-20/D/1P-115	US 120 182	WTH-20/D/1P+NPE-115	US 120 122	WTH-20/D/2P-115	US 120 102
WTH-20/D/1P-150	US 120 183	WTH-20/D/1P+NPE-150	US 120 123	WTH-20/D/2P-150	US 120 103
WTH-20/D/1P-275	US 120 184	WTH-20/D/1P+NPE-275	US 120 124	WTH-20/D/2P-275	US 120 104
WTH-20/D/1P-320	US 120 185	WTH-20/D/1P+NPE-320	US 120 125	WTH-20/D/2P-320	US 120 105
WTH-20/D/1P-385	US 120 186	WTH-20/D/1P+NPE-385	US 120 126	WTH-20/D/2P-385	US 120 106
WTH-20/D/1P-420	US 120 187	WTH-20/D/1P+NPE-420	US 120 127	WTH-20/D/2P-420	US 120 107
WTH-20/D/1P-550	US 120 188	WTH-20/D/1P+NPE-550	US 120 128	WTH-20/D/2P-550	US 120 108
WTH-20/D/1P-690	US 120 189	WTH-20/D/1P+NPE-690	US 120 129	WTH-20/D/2P-690	US 120 109
WTH-20/D/3P-75	US 120 361	WTH-20/D/3P+NPE-75	US 120 161	WTH-20/D/4P-75	US 120 141
WTH-20/D/3P-115	US 120 362	WTH-20/D/3P+NPE-115	US 120 162	WTH-20/D/4P-115	US 120 142
WTH-20/D/3P-150	US 120 363	WTH-20/D/3P+NPE-150	US 120 163	WTH-20/D/4P-150	US 120 143
WTH-20/D/3P-275	US 120 364	WTH-20/D/3P+NPE-275	US 120 164	WTH-20/D/4P-275	US 120 144
WTH-20/D/3P-320	US 120 365	WTH-20/D/3P+NPE-320	US 120 165	WTH-20/D/4P-320	US 120 145
WTH-20/D/3P-385	US 120 366	WTH-20/D/3P+NPE-385	US 120 166	WTH-20/D/4P-385	US 120 146
WTH-20/D/3P-420	US 120 367	WTH-20/D/3P+NPE-420	US 120 167	WTH-20/D/4P-420	US 120 147
WTH-20/D/3P-550	US 120 368	WTH-20/D/3P+NPE-550	US 120 168	WTH-20/D/4P-550	US 120 148
WTH-20/D/3P-690	US 120 369	WTH-20/D/3P+NPE-690	US 120 169	WTH-20/D/4P-690	US 120 149
WTH-20/D/R/1P-75	US 120 191	WTH-20/D/R/1P+NPE-75	US 120 131	WTH-20/D/R/2P-75	US 120 111
WTH-20/D/R/1P-115	US 120 192	WTH-20/D/R/1P+NPE-115	US 120 132	WTH-20/D/R/2P-115	US 120 112
WTH-20/D/R/1P-150	US 120 193	WTH-20/D/R/1P+NPE-150	US 120 133	WTH-20/D/R/2P-150	US 120 113
WTH-20/D/R/1P-275	US 120 194	WTH-20/D/R/1P+NPE-275	US 120 134	WTH-20/D/R/2P-275	US 120 114
WTH-20/D/R/1P-320	US 120 195	WTH-20/D/R/1P+NPE-320	US 120 135	WTH-20/D/R/2P-320	US 120 115
WTH-20/D/R/1P-385	US 120 196	WTH-20/D/R/1P+NPE-385	US 120 136	WTH-20/D/R/2P-385	US 120 116
WTH-20/D/R/1P-420	US 120 197	WTH-20/D/R/1P+NPE-420	US 120 137	WTH-20/D/R/2P-420	US 120 117
WTH-20/D/R/1P-550	US 120 198	WTH-20/D/R/1P+NPE-550	US 120 138	WTH-20/D/R/2P-550	US 120 118
WTH-20/D/R/1P-690	US 120 199	WTH-20/D/R/1P+NPE-690	US 120 139	WTH-20/D/R/2P-690	US 120 119
WTH-20/D/R/3P-75	US 120 371	WTH-20/D/R/3P+NPE-75	US 120 171	WTH-20/D/R/4P-75	US 120 151
WTH-20/D/R/3P-115	US 120 372	WTH-20/D/R/3P+NPE-115	US 120 172	WTH-20/D/R/4P-115	US 120 152
WTH-20/D/R/3P-150	US 120 373	WTH-20/D/R/3P+NPE-150	US 120 173	WTH-20/D/R/4P-150	US 120 153
WTH-20/D/R/3P-275	US 120 374	WTH-20/D/R/3P+NPE-275	US 120 174	WTH-20/D/R/4P-275	US 120 154
WTH-20/D/R/3P-320	US 120 375	WTH-20/D/R/3P+NPE-320	US 120 175	WTH-20/D/R/4P-320	US 120 155
WTH-20/D/R/3P-385	US 120 376	WTH-20/D/R/3P+NPE-385	US 120 176	WTH-20/D/R/4P-385	US 120 156
WTH-20/D/R/3P-420	US 120 377	WTH-20/D/R/3P+NPE-420	US 120 177	WTH-20/D/R/4P-420	US 120 157
WTH-20/D/R/3P-550	US 120 378	WTH-20/D/R/3P+NPE-550	US 120 178	WTH-20/D/R/4P-550	US 120 158
WTH-20/D/R/3P-690	US 120 379	WTH-20/D/R/3P+NPE-690	US 120 179	WTH-20/D/R/4P-690	US 120 159
WTH-2P/40	US 129 007	WTH-3P/40	US 129 008	WTH-4P/40	US 129 009
WTH-65/G/1P-255	US 120 000				

# Lightning and Surge Protection for AC Power Supply System

- A** Utility Service
- B** Class I Surge Arresters
- E** Origin of the installation
- H** Electric Equipment
- C** Class II Surge Arresters
- F** Distribution board
- D** Class III Surge Arresters
- G** Distribution outlet



**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)

# UL Listed [\(http://www.ul.com/database\)](http://www.ul.com/database)

<http://www.ul.com/database>

**UL ONLINE CERTIFICATIONS DIRECTORY**

**BEGIN A BASIC SEARCH**

To begin a search, please enter one or more search criteria in the parameters below.

**Company Name (options)**

**City**

**US State**

**US Zip Code**

**Country**

**Region**

**Postal Code (non-US)**

**UL Category Code (opt)**

**UL File Number (help)**

**Keyword**

## Search results

You may choose to **Refine Your Search**.

Company Name	Category Name
WATCHFUL EYE SOLUTIONS INC	Surge-protective
WATCHFUL EYE SOLUTIONS INC	Surge-protective

Model number information is not published for all product number, please contact [Customer Service](#) for further assi

**UL ONLINE CERTIFICATIONS DIRECTORY**

**VZCA2.E345944**  
**Surge-protective Devices - Component**

[Page Bottom](#)

**Surge-protective Devices - Component**

[See General Information for Surge-protective Devices - Component](#)

**WATCHFUL EYE SOLUTIONS INC**  
 24E Hudson View Dr  
 Beacon, NY 12508 USA

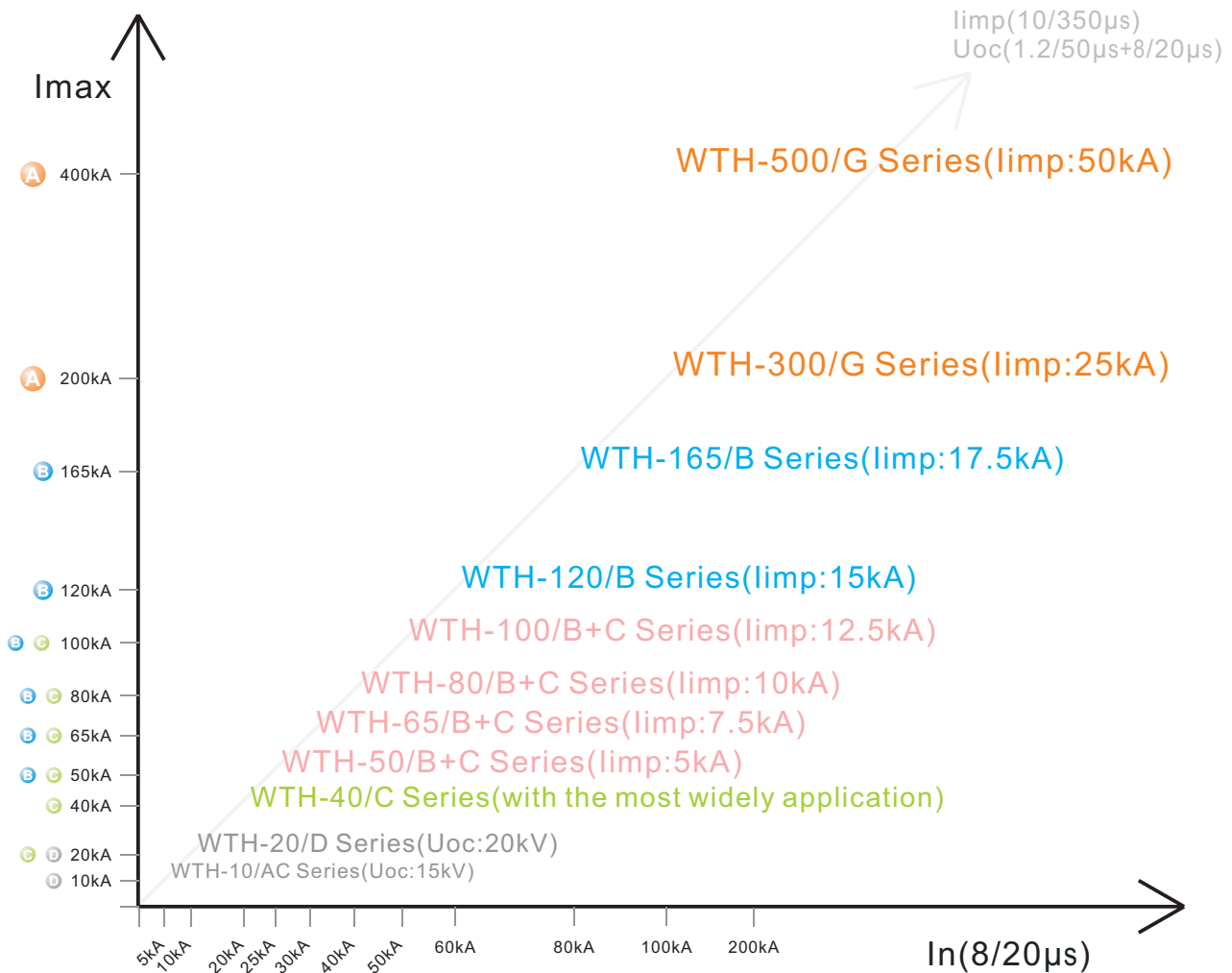
E345944

Effective May 3, 2010

Cat No.	SPD Type	Volts (V)	AC/ DC/ DC PV	PH	AMPS (A)	AMB (°C)	MODE	VPR (Vpk)	MLV (Vpk)	MCOV (V)	Vn (Vdc)	In (kA)	SCCR (kA)	NOTES
WTH-50/ B+ C/ 1P-385	4CA	277	AC	1	n/a	65	Ld-Ld	-	1830	385	n/a	20	n/a	1
WTH-50/ B+ C/ R/ 1P-385	4CA	277	AC	1	n/a	65	Ld-Ld	-	1830	385	n/a	20	n/a	1
WTH-65/ B+ C/ 1P-385	4CA	277	AC	1	n/a	65	Ld-Ld	-	1830	385	n/a	20	n/a	1
WTH-65/ B+ C/ R/ 1P-385	4CA	277	AC	1	n/a	65	Ld-Ld	-	1830	385	n/a	20	n/a	1
<b>Din Rail Moudle, Series WTH-385</b>														
WTH-100/ B+ C/ 1P-385	4CA	277	AC	1	n/a	65	Ld-Ld	-	1620	385	n/a	20	n/a	1

# Lightning and Surge Protection for AC Power Supply System

- A Class I Surge Arresters (voltage switching type)
- C Class II Surge Arresters
- B Class I Surge Arresters (voltage limiting type)
- D Class III Surge Arresters



**IEC61643-1**

- 5 Standard ratings
- 5.1 Preferred values of impulse current for class I tests I<sub>imp</sub>
- 5.2 Preferred values of nominal discharge current for class II tests I<sub>n</sub>
- 5.3 Preferred values of open-circuit voltage for class III tests U<sub>oc</sub>

Watchfuleye is specialized in a complete range of lightning and surge protective devices, with wide applications in low voltage DC & AC power supply system, data and control system, intelligent monitoring system and new energy industry like solar and wind power system, etc. Our company also offers reliable custom technical solutions in lightning & surge protection for global customers.

Headquartered in New York, watchful Eye has a network of sales to serve our customers world wide. with high quality products and optimal service, Watchful Eye can meet your strict technical standards and unique requirements.

# Watchful Eye

## The Guardian that Protects Your System against Surge and Lightning

Watchful Eye Solutions, Inc.



[www.watchfuleyesolutions.com](http://www.watchfuleyesolutions.com)

