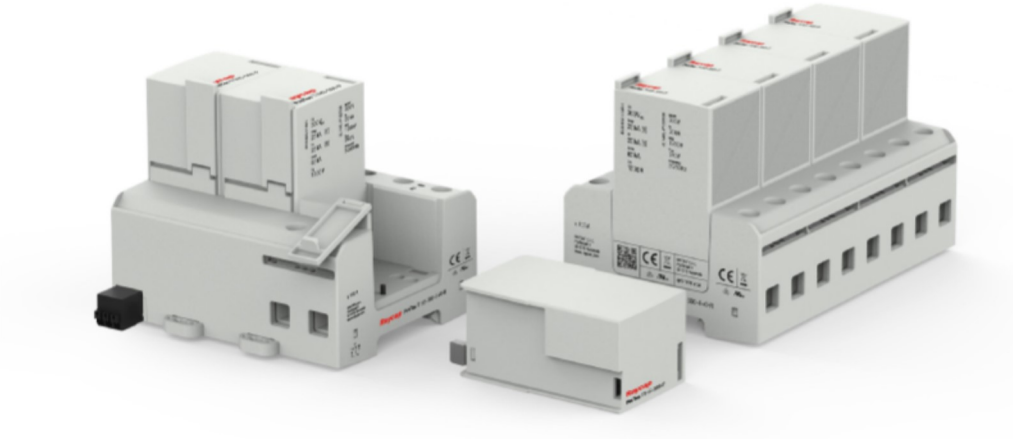
Pluggable Single Pole & Multi-pole Surge Protective Devices (SPDs)

Lightning and Overvoltage Protection
ProTec T1HS

LEAKAGE CURRENT FREE

Special features:

- Leakage free hybrid topology
- High discharge capacity due to unique design impulse discharge current of 25 kA
- Energy coordinated with other ProTec families without additional cable length
- State-of-the-art thermal disconnector
- Backup fuse up to 315 A gG
- Short circuit current rating up to 50 kA
- Vibration and shock withstand capability
- All modules, also N-PE, with operating state green-red
- Optional remote contact (RC) signaling
- VDE-IEC Class I & II / EN Type 1+2 and UL Type 4CA certified



Compliance	IEC 61643-11:2011	EN 61643-11:2012	UL 1449 4th Edition
ProTec T1HS Series	✓	✓	✓

The Type 1+2 surge protective device contains two high rated stand-alone varistors in series with a gas discharge tube that, in combination with a state-of-the-art space-saving thermal disconnection mechanism, ensure optimal system protection under all kinds of overloads. The series connection isolates the varistor from the grid, making it suitable for use upstream of meter panels in low-voltage consumer installations while making it immune to temporary overvoltage. The operating state requires no power to operate and instantly shows the health of the surge protective indicator. Besides a visual mechanical indicator, an optional remote contact (RC) device features a three-pole remote signaling terminal to remotely monitor the operating state of the device.

RoHS COMPLIANT

Lightning and Overvoltage Protection

ProTec T1HS 3+0

Class I • Class II • Type 1 • Type 2 • Type 4CA

25 kA Series

Location of Use: Main Distribution Boards
Network Systems: TN-C
Mode of Protection: L-PEN
IEC/EN/UL Category: Class I+II, Type 1+2, Type 4CA
Technology: Hybrid
Leakage Current Free: Yes
Housing: Pluggable Design
Compliance: IEC 61643-11: 2011
EN 61643-11: 2012
UL 1449 4th Edition

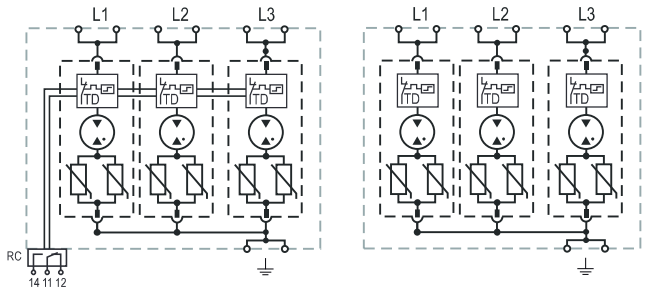
Technical Data

ProTec T1HS-xxx-3+0(-R)		300
IEC Electrical		
Nominal AC Voltage (50/60Hz)	U_o/U_n	240 V
Maximum Continuous Operating Voltage (AC)	U_c	300 V
Nominal Discharge Current (8/20 µs)	I_n	25 kA
Maximum Discharge Current (8/20 µs)	I_{max}	65 kA
Impulse Discharge Current (10/350 µs)	I_{imp}	25 kA
Specific Energy	W/R	156.2 kJ/Ω
Charge	Q	12.5 As
Voltage Protection Level	U_p	1500 V
Rated Load Current	I_L	100 A
Response Time	t_A	< 100 ns
Overcurrent Protection (max)		315 A gG
Short-Circuit Current Rating (AC)	I_{SCCR}	50 kA
TOV Withstand 120min	U_T	442 V
Number of Ports		1
UL Electrical		
Maximum Continuous Operating Voltage (AC)	MCOV	300 V
Measured Limiting Voltage	MLV	1280 V
Nominal Discharge Current (8/20 µs)	I_n	20 kA
Mechanical & Environmental		
Operating Temperature Range	T_a	-40 °F to +185 °F [-40 °C to +85 °C]
Permissible Operating Humidity	RH	5%...95%
Altitude		13123 ft [4000 m]
Terminal Screw Torque	M_{max}	39.9 lbf·in [4.5 Nm]
Conductor Cross Section (max)		2 AWG (Solid, Stranded) / 4 AWG (Flexible)
		35 mm² (Solid, Stranded) / 25 mm² (Flexible)
Mounting		35 mm DIN Rail, EN 60715
Degree of Protection		IP 20 (built-in)
Housing Material		Thermoplastic: Extinguishing Degree UL 94 V-0
Thermal Protection		Yes
Operating State / Fault Indication		Green Flag / Not Green Flag
Remote Contacts (RC)		Optional
RC Switching Capacity		AC: 250 V / 1A, 125 V / 1 A; DC: 48 V / 0.5 A, 24 V / 0.5 A, 12 V / 0.5 A
RC Conductor Cross Section (max)		16 AWG (Solid) / 1.5 mm² (Solid)
Order Information		
Order Code		**300**
ProTec T1HS-xxx-3+0		59.0304
ProTec T1HS-xxx-3+0-R (with remote contacts)		59.0305
ProTec T1HS-xxx-P (plug)		59.0302

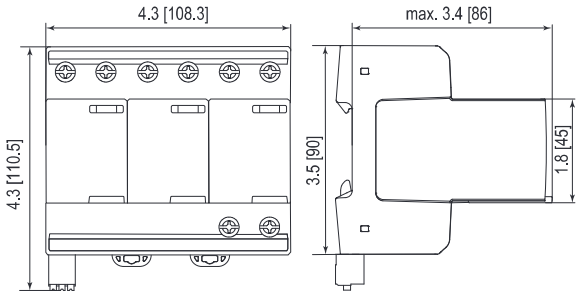
Internal Configuration

Legend

L	*Line Conductor Terminal*
⏚	*PE/G Conductor Terminal*
RC	*Remote Contacts Terminal (Optional)*
TD	*Thermal Disconnector*



Complete Unit

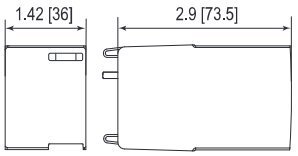


Complete Unit Dimensions & Packaging		
ProTec T1HS-xxx-3+0		**300**
Weight	pounds [grams]	1.892 [858]
ProTec T1HS-xxx-3+0-R		
Weight	pounds [grams]	1.914 [868]
DIN 43880 Dimension		6 TE / 4.3" [108.3]
Packaging Dimensions (HxWxL)		4.3 x 4.5 x 13.8" [109 x 115 x 352 mm]
Standard Order Quantity		2 Units

Plug Internal Configuration

ProTec T1HS-xxx-P

Spare Plug



Single Unit Dimensions & Packaging		
ProTec T1HS-xxx-P		**300**
Weight	pounds [grams]	.364 [165]
DIN 43880 Dimension		2 TE / 1.42" [36]
Packaging Dimensions (HxWxL)		4.3 x 4.5 x 13.8" [109 x 115 x 352 mm]
Standard Order Quantity		14 Units

inches
[mm]

RoHS COMPLIANT

Applicable connection configurations can be found beginning on page 16.

Lightning and Overvoltage Protection

ProTec T1HS 4+0

Class I • Class II • Type 1 • Type 2 • Type 4CA

25 kA Series

Location of Use: Main Distribution Boards
Network Systems: TN-S
Mode of Protection: L-PE, N-PE
IEC/EN/UL Category: Class I+II, Type 1+2, Type 4CA
Technology: Hybrid
Leakage Current Free: Yes
Housing: Pluggable Design
Compliance: IEC 61643-11: 2011
EN 61643-11: 2012
UL 1449 4th Edition

Technical Data

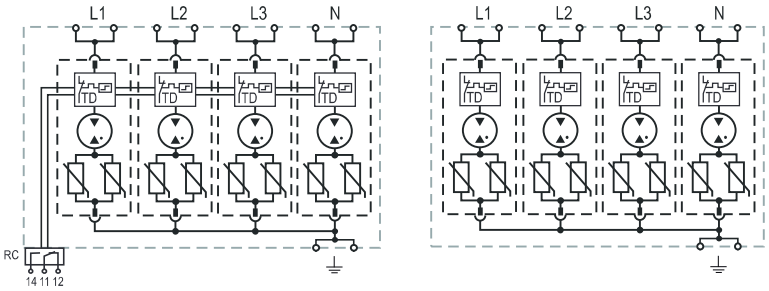
ProTec T1HS-xxx-4+0(-R)		300
IEC Electrical		
Nominal AC Voltage (50/60Hz)	U_o/U_n	240 V
Maximum Continuous Operating Voltage (AC)	U_c	300 V
Nominal Discharge Current (8/20 µs)	I_n	25 kA
Maximum Discharge Current (8/20 µs)	I_{max}	65 kA
Impulse Discharge Current (10/350 µs)	I_{imp}	25 kA
Specific Energy	W/R	156.2 kJ/Ω
Charge	Q	12.5 As
Voltage Protection Level	U_p	1500 V
Rated Load Current	I_L	100 A
Response Time	t_A	< 100 ns
Overcurrent Protection (max)		315 A gG
Short-Circuit Current Rating (AC)	I_{SCCR}	50 kA
TOV Withstand 120min	U_T	442 V
Number of Ports		1
UL Electrical		
Maximum Continuous Operating Voltage (AC)	MCOV	300 V
Measured Limiting Voltage	MLV	1280 V
Nominal Discharge Current (8/20 µs)	I_n	20 kA
Mechanical & Environmental		
Operating Temperature Range	T_a	-40 °F to +185 °F [-40 °C to +85 °C]
Permissible Operating Humidity	RH	5%...95%
Altitude		13123 ft [4000 m]
Terminal Screw Torque	M_{max}	39.9 lbf·in [4.5 Nm]
Conductor Cross Section (max)		2 AWG (Solid, Stranded) / 4 AWG (Flexible)
		35 mm² (Solid, Stranded) / 25 mm² (Flexible)
Mounting		35 mm DIN Rail, EN 60715
Degree of Protection		IP 20 (built-in)
Housing Material		Thermoplastic: Extinguishing Degree UL 94 V-0
Thermal Protection		Yes
Operating State / Fault Indication		Green Flag / Not Green Flag
Remote Contacts (RC)		Optional
RC Switching Capacity		AC: 250 V / 1A, 125 V / 1 A; DC: 48 V / 0.5 A, 24 V / 0.5 A, 12 V / 0.5 A
RC Conductor Cross Section (max)		16 AWG (Solid) / 1.5 mm² (Solid)
Order Information		
Order Code		300
ProTec T1HS-xxx-4+0		59.0260
ProTec T1HS-xxx-4+0-R (with remote contacts)		59.0261
ProTec T1HS-xxx-P (plug)		59.0302

ProTec T1HS 4+0 — 25kA Series

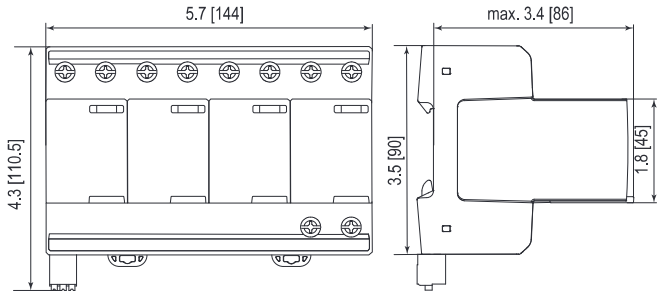
Internal Configuration

Legend

L	*Line Conductor Terminal*
N	*Neutral Conductor Terminal*
⏚	*PE/G Conductor Terminal*
RC	*Remote Contacts Terminal (Optional)*
TD	*Thermal Disconnector*



Complete Unit

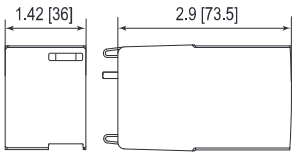


Complete Unit Dimensions & Packaging		
ProTec T1HS-xxx-4+0		**300**
Weight	pounds [grams]	2.502 [1135]
ProTec T1HS-xxx-4+0-R		
Weight	pounds [grams]	2.522 [1144]
DIN 43880 Dimension		8 TE / 5.7" [144]
Packaging Dimensions (H x W x L)		4.3 x 4.5 x 13.8" [109 x 115 x 352 mm]
Standard Order Quantity		2 Units

Plug Internal Configuration

ProTec T1HS-xxx-P

Spare Plug



Single Unit Dimensions & Packaging		
ProTec T1HS-xxx-P		**300**
Weight	pounds [grams]	.364 [165]
DIN 43880 Dimension		2 TE / 1.42 [36]
Packaging Dimensions (H x W x L)		4.3 x 4.5 x 13.8" [109 x 115 x 352 mm]
Standard Order Quantity		14 Units

inches
[mm]

RoHS COMPLIANT

Applicable connection configurations can be found beginning on page 16.

Lightning and Overvoltage Protection

ProTec T1HS 3+1

Class I • Class II • Type 1 • Type 2 • Type 4CA

25 kA Series

Location of Use: Main Distribution Boards
Network Systems: TT, TN-S
Mode of Protection: L-N, N-PE
IEC/EN/UL Category: Class I+II, Type 1+2, Type 4CA
Technology: Hybrid
Leakage Current Free: Yes
Housing: Pluggable Design
Compliance: IEC 61643-11: 2011
EN 61643-11: 2012
UL 1449 4th Edition

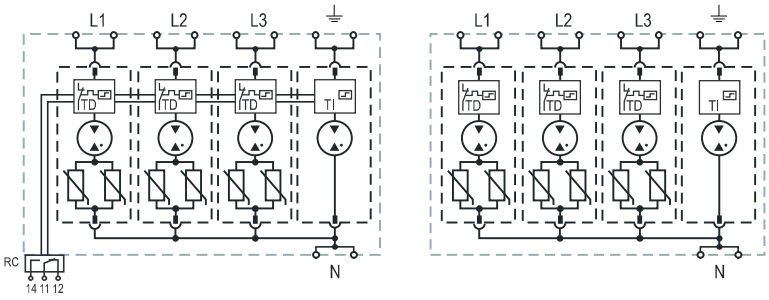
Technical Data

ProTec T1HS-xxx-3+1(-R)			300
IEC Electrical			
Nominal AC Voltage (50/60Hz)		U_o/U_n	240 V
Maximum Continuous Operating Voltage (AC)	(L-N) / (N-PE)	U_c	300 V / 305 V
Nominal Discharge Current (8/20 µs)	(L-N) / (N-PE)	I_n	25 kA / 100 kA
Maximum Discharge Current (8/20 µs)	(L-N) / (N-PE)	I_{max}	65 kA / 130 kA
Impulse Discharge Current (10/350 µs)	(L-N) / (N-PE)	I_{imp}	25 kA / 100 kA
Specific Energy	(L-N) / (N-PE)	W/R	156.2 kJ/Ω / 2500 kJ/Ω
Charge	(L-N) / (N-PE)	Q	12.5 As / 50 As
Voltage Protection Level	(L-N) / (N-PE)	U_p	1500 V / 1500 V
Rated Load Current		I_L	100 A
Response Time	(L-N) / (N-PE)	t_A	< 100 ns / < 100 ns
Overcurrent Protection (max)			315 A gG
Short-Circuit Current Rating (AC)		I_{SCCR}	50 kA
Follow Current Interrupt Rating	(N-PE)	I_{fi}	100 A_{RMS}
TOV Withstand 120min	(L-N)	U_T	442 V
TOV Withstand 200ms	(N-PE)	U_T	1200 V
Number of Ports			1
UL Electrical			
Maximum Continuous Operating Voltage (AC)	(L-N)/(N-G)	MCOV	300 V / 305 V
Measured Limiting Voltage	(L-N)/(N-G)	MLV	1280 V / 1000 V
Nominal Discharge Current (8/20 µs)	(L-N)/(N-G)	I_n	20 kA
Mechanical & Environmental			
Operating Temperature Range		T_a	-40 °F to +185 °F [-40 °C to +85 °C]
Permissible Operating Humidity		RH	5%...95%
Altitude			13123 ft [4000 m]
Terminal Screw Torque		M_{max}	39.9 lbf·in [4.5 Nm]
Conductor Cross Section (max)			2 AWG (Solid, Stranded) / 4 AWG (Flexible)
			35 mm² (Solid, Stranded) / 25 mm² (Flexible)
Mounting			35 mm DIN Rail, EN 60715
Degree of Protection			IP 20 (built-in)
Housing Material			Thermoplastic: Extinguishing Degree UL 94 V-0
Thermal Protection			Yes
Operating State / Fault Indication			Green Flag / Not Green Flag
Remote Contacts (RC)			Optional
RC Switching Capacity			AC: 250 V / 1 A, 125 V / 1 A; DC: 48 V / 0.5 A, 24 V / 0.5 A, 12 V / 0.5 A
RC Conductor Cross Section (max)			16 AWG (Solid) / 1.5 mm² (Solid)
Order Information			
Order Code			**300**
ProTec T1HS-xxx-3+1			59.0306
ProTec T1HS-xxx-3+1-R (with remote contacts)			59.0307
ProTec T1HS-xxx-P (plug L-N)			59.0302
ProTube T1HS-100-P (plug N-PE)			59.0303

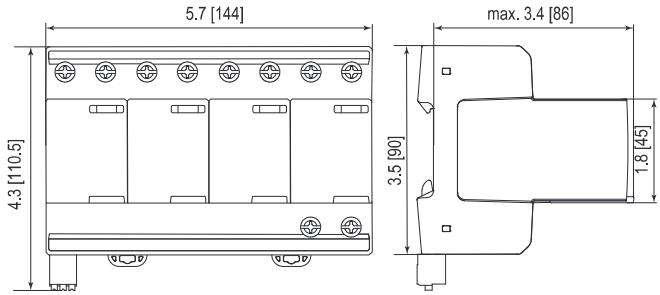
Internal Configuration

Legend

L	*Line Conductor Terminal*
N	*Neutral Conductor Terminal*
⏚	*PE/G Conductor Terminal*
RC	*Remote Contacts Terminal (Optional)*
TD	*Thermal Disconnector*
TI	*Thermal Indication*



Complete Unit

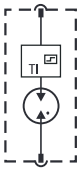


Complete Unit Dimensions & Packaging		
ProTec T1HS-xxx-3+1		**300**
Weight	pounds [grams]	2.348 [1065]
ProTec T1HS-xxx-3+1-R		
Weight	pounds [grams]	2.368 [1074]
DIN 43880 Dimension		8 TE / 5.7 [144]
Packaging Dimensions (HxWxL)		4.3 x 4.5 x 13.8" [109 x 115 x 352 mm]
Standard Order Quantity		2 Units

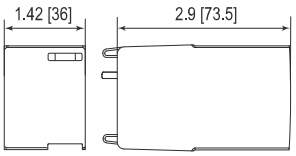
Plug Internal Configuration

ProTec T1HS-xxx-P

ProTube T1HS-100-P



Spare Plug



Single Unit Dimensions & Packaging		
ProTec T1HS-xxx-P		**300**
Weight	pounds [grams]	.364 [165]
ProTube T1HS-100-P		**100**
Weight	pounds [grams]	0.209 [95]
DIN 43880 Dimension		2 TE / 1.42 [36]
Packaging Dimensions (HxWxL)		4.3 x 4.5 x 13.8" [109 x 115 x 352 mm]
Standard Order Quantity		14 Unit

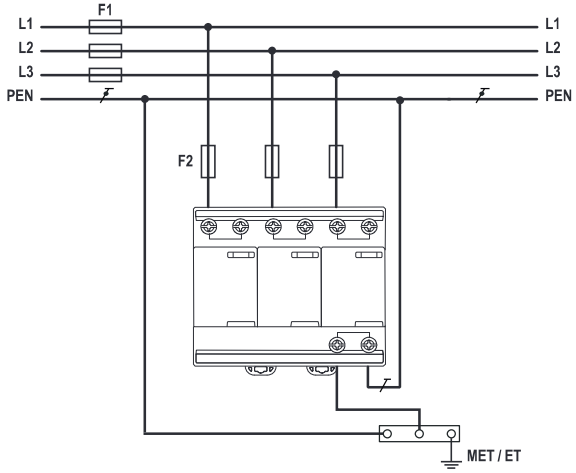
inches
[mm]

RoHS COMPLIANT

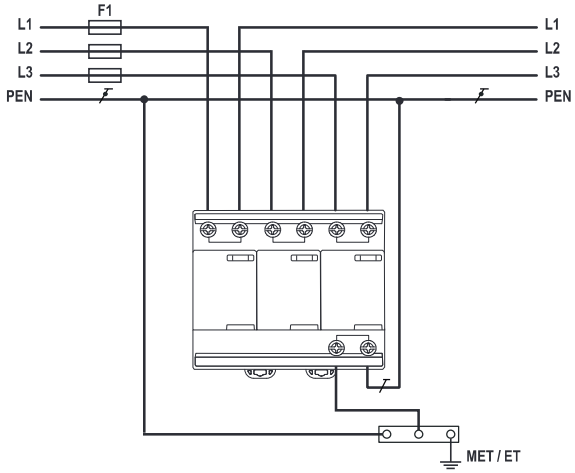
Applicable connection configurations can be found beginning on page 16.

Pluggable Multi-pole SPD Connection Configurations
ProTec T1HS Series

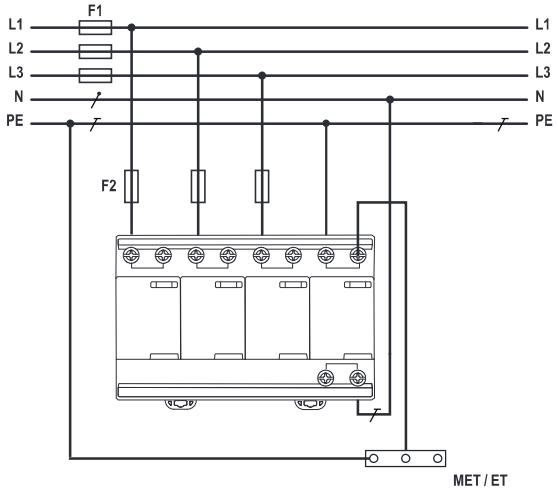
TN-C (Three-phase, 3+0)
T Connection



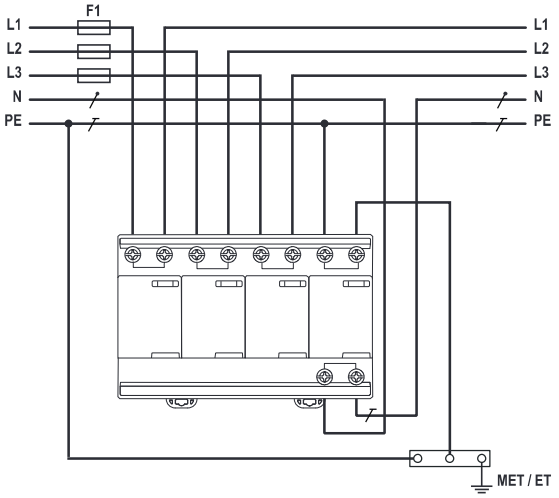
TN-C (Three-phase, 3+0)
V Connection (only if F≤ 100 A)



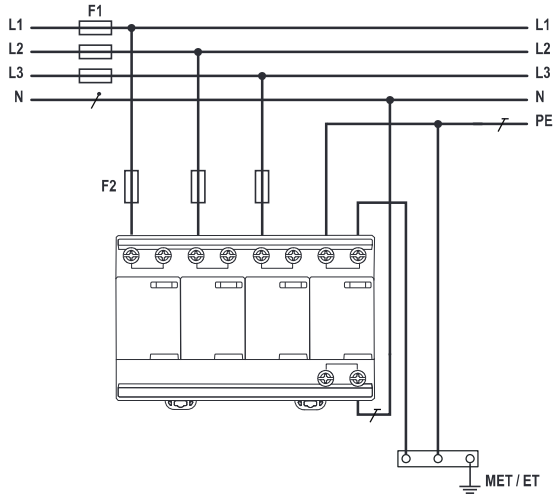
TN-S (Three-phase, 3+1)
T Connection



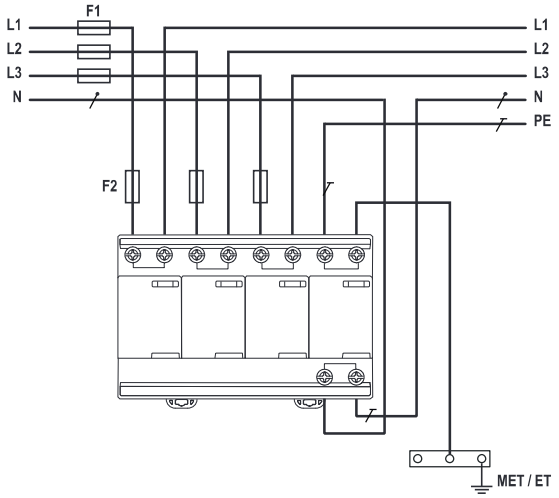
TN-S (Three-phase, 3+1)
V Connection (only if F≤ 100 A)



TT (Three-phase, 3+1)
T Connection



TT (Three-phase, 3+1)
V Connection (only if F≤ 100 A)



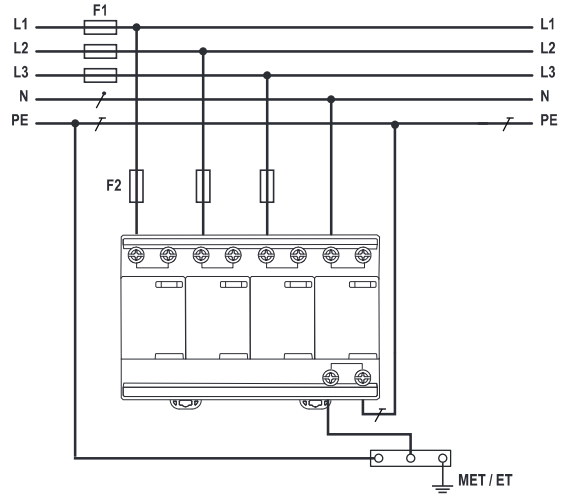
/ N Neutral
/ PE Protective Earth
/ PEN Protective Earth & Neutral

Overcurrent Protection Rating for I_{SCCR}

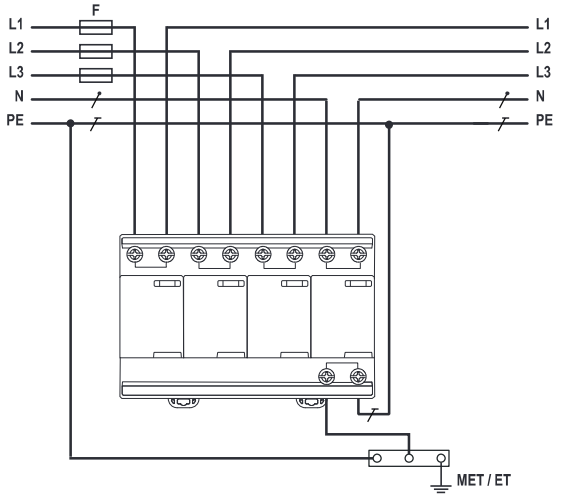
F1 > 315 A gG → F2 = 315 A gG
F1 ≤ 315 A gG → ~~F2~~

Pluggable Multi-pole SPD Connection Configurations
ProTec T1HS Series

TN-S (Three-phase, 4+0)
T Connection



TN-S (Three-phase, 4+0)
V Connection (only if F≤ 100 A)



N Neutral
PE Protective Earth
PEN Protective Earth & Neutral

Overcurrent Protection Rating for I_{SCCR}

F1 > 315 A gG → F2 = 315 A gG
F1 ≤ 315 A gG → F2