



**Benefits:**

- Directly Connected, Discrete Protection Elements Between All Possible Modes
- UL 1449 Fourth Edition Recognized
- 150kA - 300kA per phase ratings
- All UL required OCP & Safety Coordination included inside
  - Type 1 SPDs intended for Line or Load Side of Main Disconnect
  - Type 2 SPDs intended for Load Side of Main Disconnect
- 20kA Inominal ( $I_n$ )
- 200kA SCCRs (most models)
- UL 96A Lightning Protection Master Label compliant
- Voltage Specific Design – Highly configurable
- All MOV suppression elements monitored
- All Modes of Protection
- Display on 28" cable
- 10 Year Warranty (longer optional)

**Performance Specifications**

**Directly Connected, Discrete Protection Elements Between All Possible Modes with True 10-Mode Protection**

Surge Capacities	L-N	L-G	N-G	L-L
<b>150kA Per Phase</b>	50kA	50kA	50kA	50kA
<b>300kA Per Phase</b>	100kA	100kA	100kA	100kA

UL 1449 4th Edition Recognized Type 1 CA, CSA 22.2 No. 269.4-1

Optional UL 1449 4th Edition Type 2 CA, UL 1283 Recognized, CSA 22.2 No. 269.4-2

UL 1449 Fourth Edition tested Inominal ( $I_n$ ): 20kA

UL 1449 Fourth Edition tested SCCR: 200kA & 100kA

UL 1449 Fourth Edition Voltage Protection Ratings (VPRs):

- 208Y/120V: as low as 600V
- 480Y/277V: as low as 1000V

AC Sinewave Tracking Filter with EMI/RFI Filtering up to -50dB from 10kHz to 100MHz (Type 2 option only, incl. UL 1283 Rec.)

Repetitive Impulse: 5,000 hits

Less than 1 nanosecond response time

**Physical Specifications**

Relative Humidity Range: 0 - 95% non-condensing
Operating Frequency: 47 - 63Hz
Operating Temperature: -25°C (-15°F) to +60°C (140°F)
Weight: 5 lbs (2.3 kg)
Standard size: 6.5" x 11" x 4.5" (16.5cm x 29.9cm x 11.4cm)
Lug size: #2 - #14 AWG (w/opt. disconnect: #6 - #1/0)
Typical connection: #6 AWG and 60A breaker

**Quality, Standards & Validation**

Type 1: UL 1449 4th Edition, CSA 22.2 No. 269.4-1
Type 2 (Opt.): UL 1449 4th Edition, CSA No. 269.4-2, UL 1283 Rec.
UL file: VZCA.E321351 at <a href="http://www.UL.com">www.UL.com</a>
RoHS-compliant
Burn-In tested prior to shipment
ISO 9001:2008 Quality Management System
ISO 17025:2005 Laboratory Qualification

**Design Attributes**

Designed, Manufactured & Tested consistent with:

- ANSI/IEEE C62.41.1-2002, C62.41.2-2002, C62.45-2002, C62.62-2010, C62.72-2016, IEEE SA 1100-2005 (Emerald Book)
- NEC® Article 285
- NEC® Articles 620.51(E), 645.18, 670.6, 695.15, 700.8 & 708 requiring SPDs
- UL 96A and NFPA 780 Lightning Protection
- IEC 61643, CE

High Energy Parallel Design for Category C-High applications

For Mounting Internal to Switchgear, Motor Controls Centers, Panelboards or Control Panels

Individually Fused & Thermally Protected MOVs

Large-Block, 34mm square, 50kA MOVs

Replaceable Module Construction

Solid State Bidirectional Operation

**Diagnostic Monitoring**

100% monitoring – Every MOV is monitored, including N-G
Green LED Status indicator per phase
Red LED service indicator
Audible Alarm with Silence Switch
Test Function: Toggles Red Service LED, Audible Alarm & Dry Contact
N-G overvoltage detection
Phase Loss monitoring (toggles LED & dry contacts)
Electrically isolated circuitry ensures surges do not damage diagnostics
Form C Dry Contacts, 240V, 5A (two sets)
Optional Surge Counter, six-digit LCD, with test function, reset & no-maintenance Eprom memory
Installer-locatable display on 28" cable

# Model 451 Number Configurator & Options

**451**

Model 451 Product Line

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Voltage Codes

**P**

Per Phase kA Rating System

□□

kA Rating Per Phase

**A**

Modes of Protection (Default)

□

Connection Type

□

Monitoring Options

**N**

Enclosure (Default)

□

UL 1449 Type1/Type 2

**0**

Accessory/Option(s)

## Common Systems

- 120S = 240/120V Split Phase - 1Ø, 3W+Grnd, (Fig 1)
- 120Y = 208Y/120V Wye - 3Ø 4W+Grnd, (Fig 2)
- 240H = 240/120V High Leg Delta (B High), (Fig 3)
- 277Y = 480Y/277V Wye - 3Ø 4W+Grnd, (Fig 2)

## Other Available Systems - Confirmation Encouraged

- 127S = 254/127V Split Phase - 1Ø 3W+Grnd, (Fig 1)
- 127Y = 220Y/127V Wye - 3Ø 4W+Grnd (Fig 2)
- 220Y = 380Y/220V Wye - 3Ø 4W+Grnd (Fig 2)
- 230Y = 400Y/230V Wye - 3Ø 4W+Grnd (Fig 2)
- 240Y = 415Y/240V Wye - 3Ø 4W+Grnd (Fig 2)
- 254Y = 440Y/250V Wye - 3Ø 4W+Grnd (Fig 2)
- 277S = 480/240V Split Phase, or Two legs of Wye, (Call)

15 = 150kA  
30 = 300kA

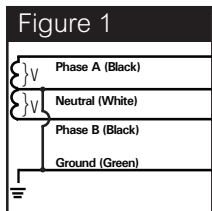
C = Compression Lugs  
R = Internal Rotary Disconnect Switch

A = All Standard Modes for that Voltage Code

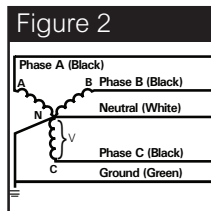
1 = UL 1449 Type 1  
2 = UL 1449 Type 2, (Includes UL1283 Filter)

0 = No Trailing Accessory/Option

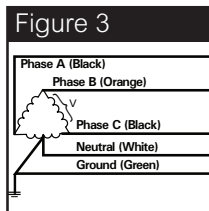
A = LEDs/Audible Alarm/Relay  
C = LEDs/Audible Alarm/Relay/ Surge Counter



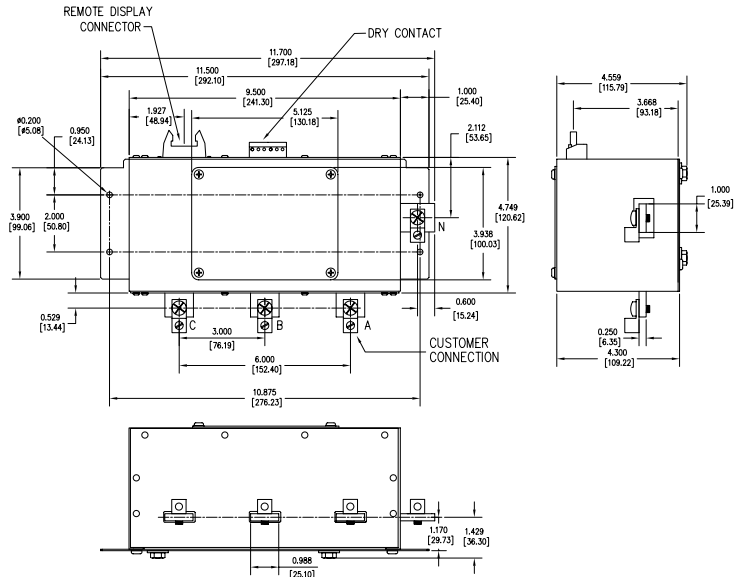
**SPLIT**  
2 Phases, 1 Neutral, 1 Ground



**WYE**  
3 Phases, 1 Neutral, 1 Ground



**HIGH LEG DELTA**  
(B High) 3 Phases, (B High), 1 Neutral, 1 Ground



## Performance Data

Common Power Systems		UL 1449 Fourth Edition Test Data						
		Voltage Protection Ratings (VPR - 3kA)				I <sub>n</sub>	SCCR	MCOV
		L-N	L-G	N-G	L-L			
120S	= 240/120V Split Phase	700	700	700	1200	20kA	100kA	150
120Y	= 208Y/120V 3Ø Wye	700	700	700	1200	20kA	200kA	150
240H	= 240Y/120V B High Leg Delta	700/1200	700/1200	700	1800	20kA	200kA	150 / 320
277Y	= 480Y/277V 3Ø Wye	1200	1200	1200	2000	20kA	200kA	320
347Y	= 600Y/347V 3Ø Wye	1500	1500	1500	2500	20kA	200kA	420

\*VPRs with disconnect switch option could vary. Contact the factory for details.