MS Enclosed Surge Protective Device

Installation and Operating Manual

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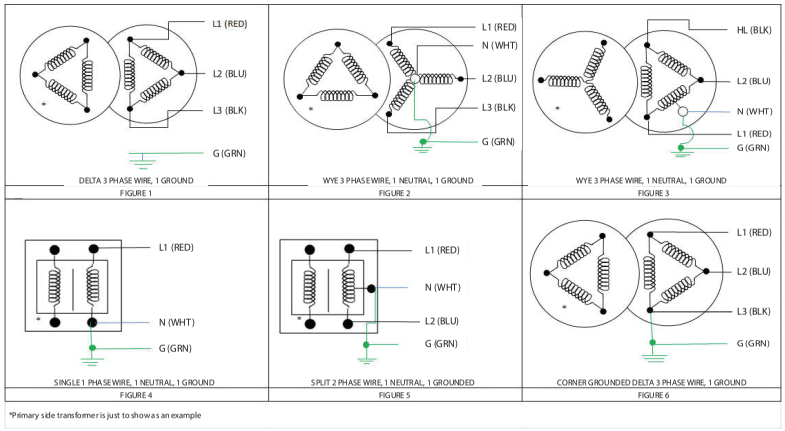
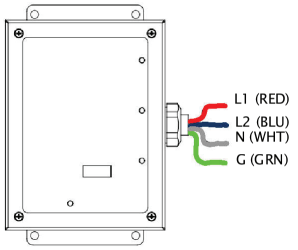


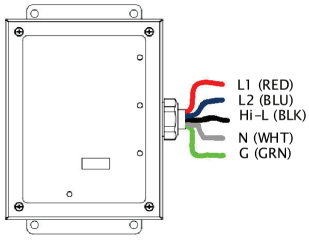
*Primary side transformer is just to show as an example

P/N	MSXXX(-C,-L,-H,-1C,-HC)-120T	MSXXX(-C,-L,-H,-1C,-HC)-120Y	MSXXX(-C,-L,-H,-1C,-HC)-240Y	MSXXX(-C,-L,-H,-1C,-HC)-240 DCT	MSXXX(-C,-L,-H,-1C,-HC)-240 D	MSXXX(-C,-L,-H,-1C,-HC)-277Y	MSXXX(-C,-L,-H,-1C,-HC)-347Y	MSXXX(-C,-L,-H,-1C,-HC)-480D
2000 m ma x. 6500 ft max. / -40/+185°C max. -40/+85°F max.								
System								
120T (Fig. 5)	●							
120Y (Fig. 2)		●						
240Y (Fig. 2)			●					
240D (Fig. 1)					●			
240D High Leg Delta (Fig. 3)				●				
277Y (Fig. 2)						●		
347Y (Fig. 2)							●	
480D (Fig. 1)								●
Max. *VPR L-N	700/150	700/150	1000/320	700/150	-	1000/320	1800/550	-
Max. *VPR L-G	700/150	700/150	1200/320	700/150	1200/320	1200/320	1800/550	1800/550
Max. *VPR L-L	1000/150	1000/150	1800/320	1000/150	1800/320	1800/320	3000/550	3000/550
Max. *VPR N-G	700/150	700/150	1000/320	700/150	-	1000/320	1800/550	-
In	20kA 8/20µs							
SCCR	200kA							

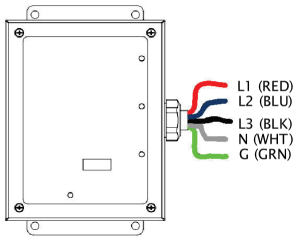
XXX can be 80, 100, 160, 200:Represents Imax Per Phase



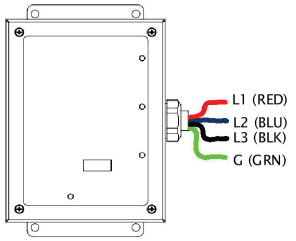
Split



Hi-Leg Delta



Wye



Delta

MS series Standard Application

Electrical Drawing

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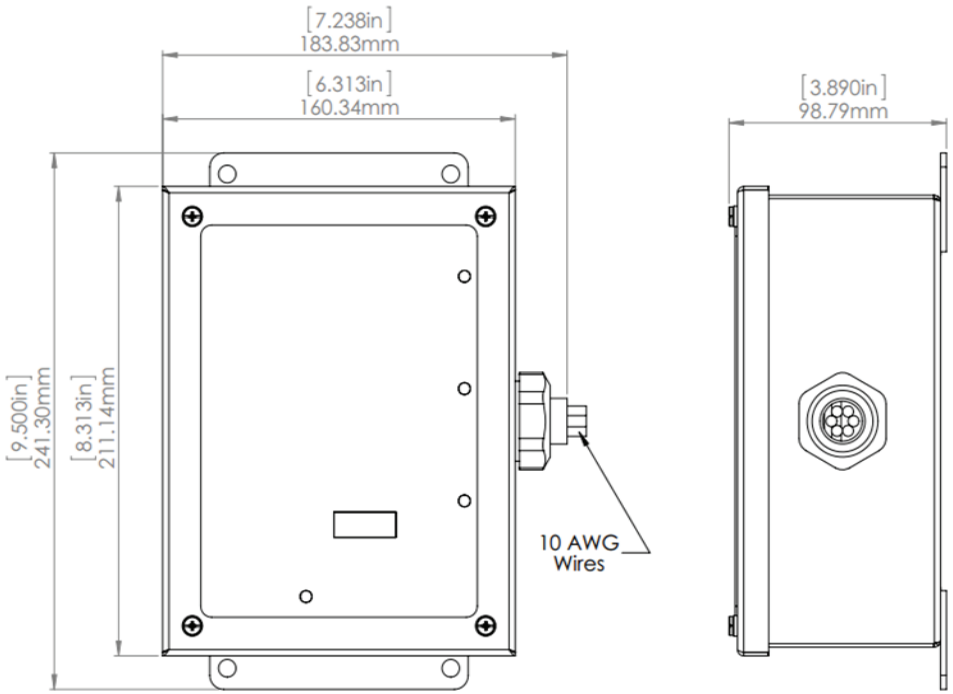
Mechanical Drawings



Installation and Operating Manual

MS Series Enclosure

Type 1 & 2 AC Surge Protection Device

READING AND UNDERSTANDING THIS MANUAL IN ITS ENTIRETY IS ESSENTIAL PRIOR TO INSTALLING AND COMMISSIONING THE SURGE PROTECTIVE DEVICE

Safety Precautions

The electrical system on which this surge protective device will be installed must be in proper working condition. Consult with trained personnel before proceeding with the installation, if there are any questions regarding system status. The potential exists for this unit to be damaged if the requirements of this manual are not followed. Failure to comply with the applicable requirements of this manual may result in warranty void. Removal of warranty label will result in warranty void.

Introduction

Proper installation of CITEL MS series surge protective device is essential to maximize performance and effective protection. Please read the entire installation manual process prior to installing the device. This manual does not replace national and local codes, please verify with electrical codes.

WARNING

Hazard of electric shock

- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- This equipment must be effectively grounded per all applicable codes.

Failure to follow these instructions may result in serious injury or death

Product Description

CITEL MS series products are designed to protect electrical equipment's from damaging effects of transient voltages created from direct and indirect lightning strikes, equipment switching or other cause of disturbances. Metal Oxide Varistors (MOV) technology is utilized to achieve a high level of protection performance. Each MS series comes standard with status light, alarm auxiliary contacts.

Characteristics

Series	MS80	MS100	MS160	MS200
Maximum discharge current Imax	80 kA	100 kA	160 kA	200 kA
Type of network				
120/240 Vac Split Phase 3Ph+G	MS80-120T	MS100-120T	MS160-120T	MS200-120T
120/208 Vac Wye 3Ph/N+G	MS80-120Y	MS100-120Y	MS160-120Y	MS200-120Y
220/380 Vac Wye 3Ph/N+G	MS80-220Y	MS100-220Y	MS160-220Y	MS200-220Y
277/480 Vac Wye 3Ph/N+G	MS80-277Y	MS100-277Y	MS160-277Y	MS200-277Y
240/415 Vac Wye 3Ph/N+G	MS80-240Y	MS100-240Y	MS160-240Y	MS200-240Y
120/120/240 Vac Hi-Leg Delta 3Ph/N G	MS80-240DCT	MS100-240DCT	MS160-240DCT	MS200-240DCT
240 Vac Delta 3Ph+G	MS80-240D	MS100-240D	MS160-240D	MS200-240D
347/600 Vac Wye 3Ph/N+G	MS80-347Y	MS100-347Y	MS160-347Y	MS200-347Y
480 Vac Delta 3Ph+G	MS80-480D	MS100-480D	MS160-480D	MS200-480D
Protection modes	L/N - L/G - N/G - L/L			
UL short-circuit current rating	200 kA			
Standards compliance	UL1449 5th Edition and Type 1 and Type 2			
UL File Number	E326289			
Safety				
Thermal disconnector	Internal to each component			
Electrical disconnector	Internal to each surge protector			
Failure indicators	LED, audible alarm, and remote signaling			
Mechanical Characteristics				
Relative Humidity	5% to 95% non condensing			
Housing material	Painted Steel or Stainless Steel (Depending on Version)			
Operating temperature	-40/+85 °C			
Mounting	Wall mounting by screws (not supplied)			
Connection to AC network	Hard-Wired			
Dimensions (H x L x D)	95 x 63.1 x 35 mm			
Specific features				
Disconnection switch	No			

In the event of product end of life of the MS series, installed MOV's will safely disconnect from the circuit, will give visual and audible indication to the user.

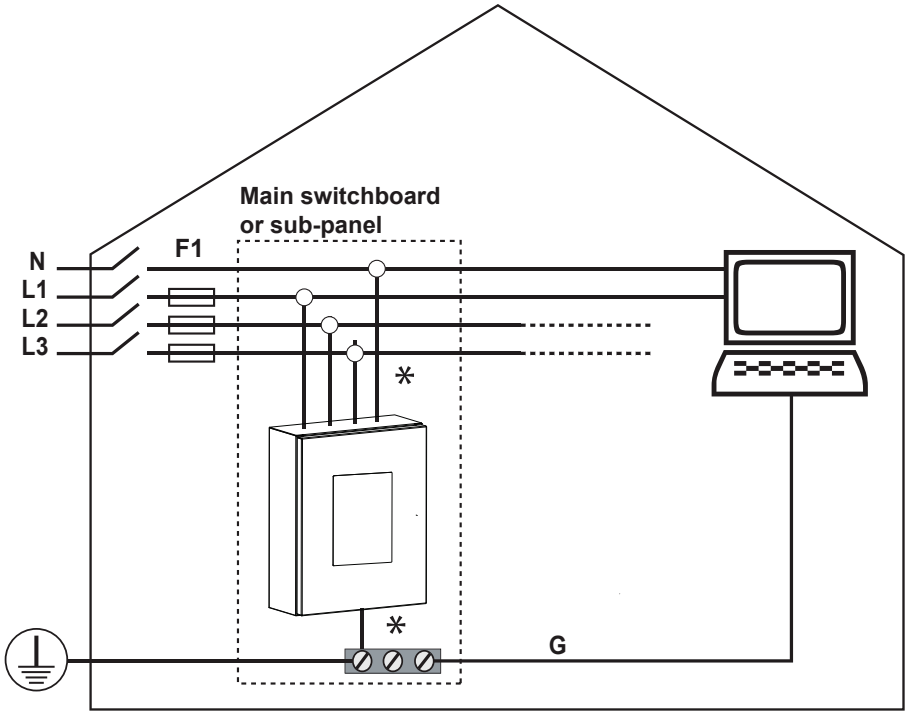
WARNING

Verify that a proper neutral-ground bond has been made when power is supplied from an upstream transformer or any other type of separately derived power source.

• Power must be disconnected prior to installation, inspection or servicing. Failure to do so may cause injury, death and/or equipment damage.

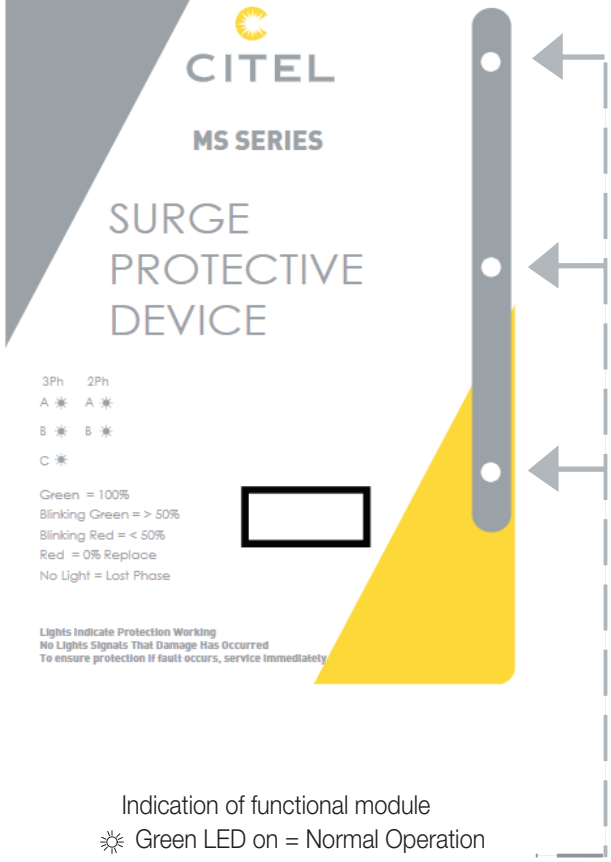
• Failure to provide this bond, as required by NEC 250.30, will void the warranty and can result in elevated phase to ground source voltage potentials. These voltages can cause damage to electrical equipment, pose a fire hazard or a safety hazard such as electrical shock, injury or death.

Application



* Shortest distance possible

MS Display



Indication of functional module

- Green LED on = Normal Operation
- Blinking Green LED on = > 50%
- Blinking Red LED on = < 50%
- Red LED on = Replace SPD

Product Selection

Selecting the proper surge protection device can be a complicated task. Consult with qualified personnel to ensure the electrical system is in good working condition and proper sizing for an SPD.

Product Pre-Installation

Prior to installing your new MS series SPD, please read and understand the following safety instructions of this installation manual. Ensure that all safety precautions are taken and follow all applicable electrical codes.

1. Power must be disconnected before installing to circuit panel. Failure to do so may lead to serious injury or death and equipment damage.

2. Ensure that the selected MS series product is the correct electrical system and voltage rating for your application.

3. National Electric Code (NEC) Article 285 states that Type 2 SPDs may only be placed on the load side of the main breaker or fuse at each utility service entrance.

4. Per National Electric Code (NEC), ensure that proper neutral-ground bond has been made when power is supplied from an upstream transformer or any type of separately derived power source. NEC Article 250.30 this bond must be placed in all 3 phases WYE, Single phase and Split phase system.

Installation

Mounting Instruction

MS series enclosures are constructed with NEMA 3R, 4 and 12 (description below) painted steel enclosure. The dimensions and drawing can be viewed on page 8. Enclosure can be installed on indoor/outdoor locations as close as possible to the protected circuit. Avoid long wire runs from the SPD to the circuit, as it will reduce performance. Make sure that the surface of where the unit is to be installed on is stable and capable of bearing the load.

Wire	Color
Ground	Green or Green/Yellow
Neutral	White
Hot	Red, Blue, Black (Hi-Leg)

Recommended Circuit Breaker/Fuse

Wire Size	Circuit Breaker/Fuse
#12 AWG	20A rms
#10 AWG	30A rms
#8 AWG	50A rms
#6 AWG	60A rms

Features

MS series High Environment – H
High Environment (-H) option are for MS series products to be installed in incoming main panels located at outside building locations. Product will be equipped with a Liquid tight straight connector for outdoor conditions. The MS series High Environment (-H) are optional with surge counters for transients to count events due to lightning and switching.

MS series Low Environment – L
Low Environment (-L) option are for MS series products to be installed at panels within building facility. Product will be equipped with a Concrete tight straight connector for indoor conditions. MS series Low Environment (-L) are optional with surge counters for transient to count events due to lightning and switching.

MS series Counter – C
Counter (-C) is MS series with counter embedded option to count the event of transients due to lightning and switching. This series can be placed for both environments, high and low locations.

IMPORTANT! Remember to keep conductor lead length to a minimum; 3ft or less. The minimum length of wire is defined by the limit of the enclosure. A minimum gauge of 10 AWG is to be used.

Type 4 - Steel Type 3R, 4, 12
Enclosures constructed for either indoor or outdoor use to provide a degree of protection to personnel against access to hazardous parts; to provide a degree of protection of the equipment inside the enclosure against ingress of solid foreign objects (falling dirt and windblown dust); to provide a degree of protection with respect to harmful effects on the equipment due to ingress of water (rain, sleet, snow, splashing water, and hose directed water); and that will be undamaged by the external formation of ice on the enclosure.

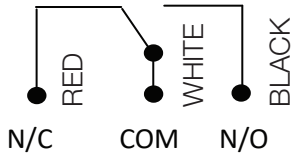
Maintenance

A preventive maintenance is not specified, MS series should be checked periodically by a qualified personnel to ensure proper operation. When inspecting the unit, check the connection integrity to the network.

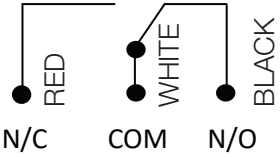
Diagnostics

Upon energizing the MS series unit, check to ensure proper operation and should show all green lights to all phases. Should there be of any red or blinking lights turn off unit and disconnect from circuit. Check to make sure the voltage electrical network is in good working order and all instruction in this manual has been followed. If issues remain the same please contact CITEL for technical support at 800-248-3548 or visit our website at www.citel.us.

Alarm Conditions – Contact Status



1. SPD de-energized
2. SPD energized, (All LEDs Green)
3. NC-COM (Red-White)
4. NO-COM (Black-White)



1. SPD energized, Fault or Phase out
2. NC-COM (Red-White)
3. NO-COM (Black-White)

Connection: #24-16 AWG (0.2mm – 1.5.mm^2)
Rating: 0.5A, 125VAC, 1A 30Vdc

Troubleshooting

Check for proper connection from the unit to the circuit, check unit that it properly match circuit voltage network for operation. If all display LEDs are green, the unit is properly working. If any red LED display is shown at first time power up then may be a defective unit and will be needed to return for replacement.