



Surge Tec® Secondary Arresters



Electricity users, from the homeowner to big business, are more interested today in the quality of the power they receive than in the past, and with good reason. Advances in technology have introduced new electronic equipment and appliances that are more susceptible to damage by power surges. Replacing or repairing damaged equipment is inconvenient and can be costly.

Lightning or an interruption in the power line can generate a power surge. These high energy surges can enter a home or building through the electric service entrance. Once the surge enters the building, there is a possibility that high voltages resulting from the surge current will damage electrical wiring or equipment. Surge Tec® arresters are designed to limit surge voltages by discharging (bypassing) surge current to ground.

Individuals should assess their risk by evaluating the potential impact that a power surge may have on their property. In many cases, the cost of protection is relatively inexpensive compared to the possible loss. The Surge Tec® arrester is designed to provide brute force protection against surges at the service entrance, where protection is needed the most. The family of Surge Tec® arresters provides an excellent first line of defense for any critical electrical service, whether it is in a home, business or industrial applications.

Surge Arrester Application

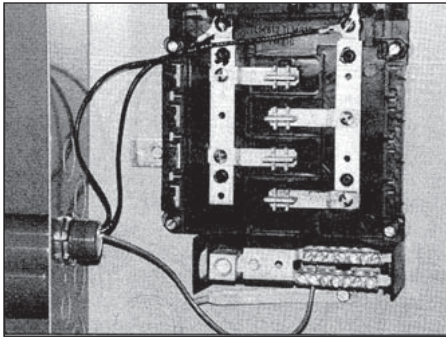
MPS' Surge Tec® arresters are designed for service entrance installations. The arresters are designed for repeated operation and continuous protection.

Surge arresters provide the path of least resistance to ground for surges on a system. THE ARRESTERS SHOULD BE INSTALLED BY A LICENSED ELECTRICIAN. To provide the best protection, the lead wires should be kept as short as possible. When installed properly, they will divert lightning surges to ground very quickly. Surge Tec® arresters offer the first line of defense for the entire electrical service and protect wiring, major appliances, pumps, and heating/air conditioning equipment. For added protection to computers, MPS recommends plug-in-strip type of device with lower clamping voltages as a second line of defense. This type of coordination provides excellent surge protection for the entire electric service.

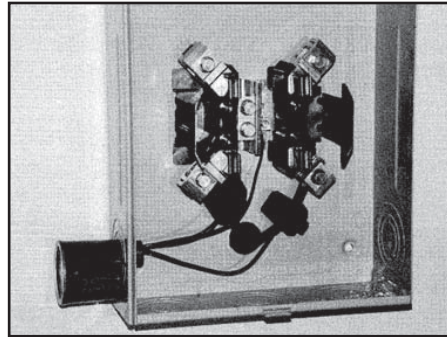
Features

Surge Tec® arresters incorporate special features that make them stand above other Secondary Arresters and Transient Voltage Surge Suppressors (TVSS). These arresters use a patented (#5,502,612) fault withstand design along with replacement indication. The arresters are available in 175 volt, 480 volt and 650 volt AC ratings for application on system voltages below 650 volts phase to ground and operate at frequencies between 48 and 62 Hz. The units come with 18 inch, #14 AWG solid copper wire leads and are designed to be mounted outdoors or indoors.

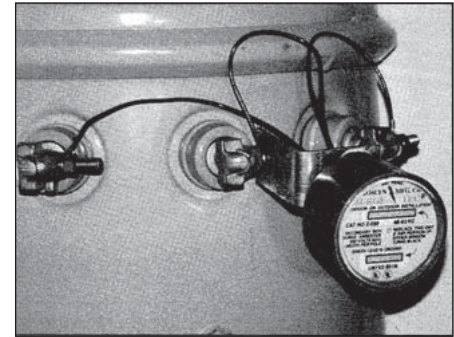
- **METAL OXIDE VARISTORS**—Surge Tec® arresters use metal oxide varistors (MOV). This takes advantage of our experience with metal oxide production for the utility industry. The arresters meet ANSI/IEEE C62.11-1993 for secondary arresters. In addition, they have passed a 5kA Duty Cycle test. They provide high speed response and excellent energy capability for today's critical electric loads.
- **REPLACEMENT INDICATION**—A visual indication on the front label permits routine checks of the arrester's operational status. Indication windows on the label turn black if the arrester has faulted. The arrester should be replaced when any area of any window turns black.
- **FAULT WITHSTAND CAPABILITY**—The Surge Tec® secondary arresters have a patented fault withstand design. This unique design has been tested at high current failure modes to verify its ability to withstand a failure without a violent fracture of the housing. Fault current is the full available system current that the device conducts in the event it is short circuited by conducting a surge beyond the designed capability. This provides significant advantages in the area of secondary voltage protection. There currently is not a standard requirement or test specification for fault withstand capability of secondary arresters. The Surge Tec® arresters were tested by failing them with an overvoltage and then applying fault currents of 4kA and 10kA. The arresters achieved the fault withstand capability of 10kA rms without the use of, or the requirement for, any external fusing.
- **COST EFFECTIVE**—The Surge Tec® arresters are very inexpensive compared to potential equipment damage.



Knockout Mounting
Z2-175-0



Meterbase Mounting
with insulating piercing connector



Transformer Mounting
Z2-480-4C
Z2-650-4C
(for 3/8" hardware)

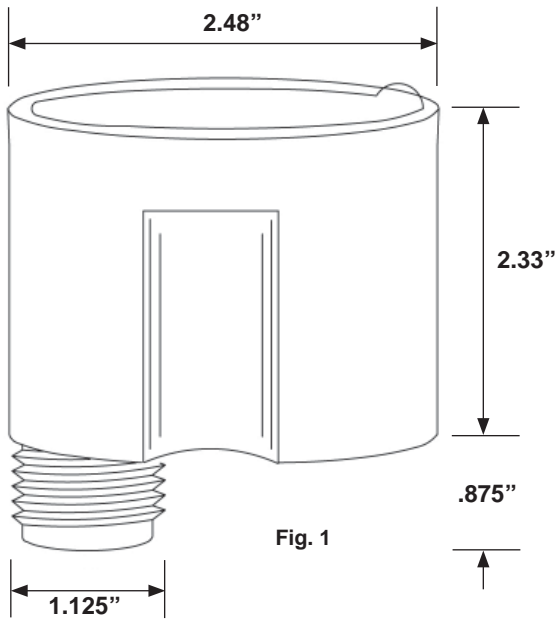


Fig. 1

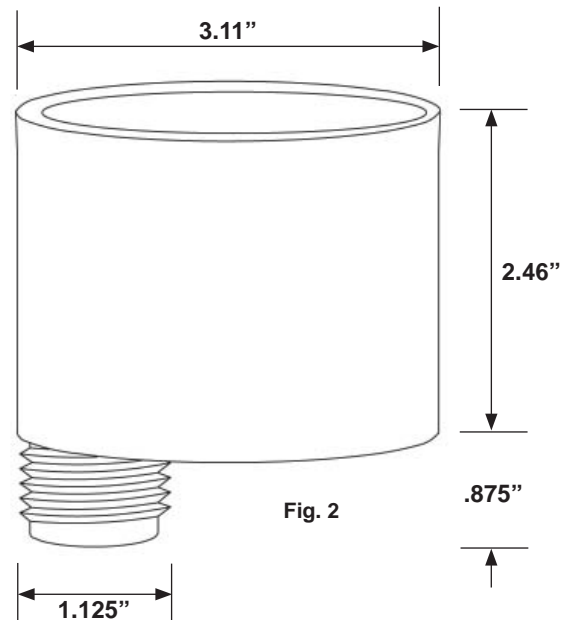


Fig. 2

Physical and Electrical Characteristics

| Catalog No. | Voltage Rating MCOV | Poles | Weight Oz (Gram) | Figure | Energy Capability (Joules/Phase) | Response Time (nsec) | Front-of-Wave Protection Level (kV-Crest) | Max. Discharge Voltage Clamping Using an 8/20 μsec Current Wave (units-kV) | | |
|-------------|---------------------|-------|------------------|--------|----------------------------------|----------------------|---|--|-------|------|
| | | | | | | | | 1.5kA | 5.0kA | 10kA |
| Z1-175-0 | 175 | 1 | 14 (435) | 1 | 427 | <5 | 1.21 | 0.75 | 0.95 | 1.27 |
| Z2-175-0 | | 2 | 15 (466) | | | | | | | |
| Z3-175-0 | | 3 | 18 (560) | 2 | | | | | | |

*Add an "A" suffix to obtain the mounting bracket (e.g. Z1-175-0A)

| | | | | | | | | | | |
|----------|-----|---|----------|---|-----|----|------|------|------|------|
| Z1-480-0 | 480 | 1 | 15 (466) | 1 | 742 | <5 | 1.90 | 1.42 | 1.76 | 2.16 |
| Z2-480-0 | | 2 | 19 (590) | | | | | | | |
| Z3-480-0 | | 3 | 20 (622) | 2 | | | | | | |

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| | | | | | | | | | | |
|----------|-----|---|----------|---|-----|----|------|------|------|------|
| Z1-650-0 | 650 | 1 | 19 (590) | 1 | 919 | <5 | 2.48 | 2.01 | 2.44 | 2.55 |
| Z2-650-0 | | 2 | 20 (622) | | | | | | | |
| Z3-650-0 | | 3 | 21 (653) | 2 | | | | | | |

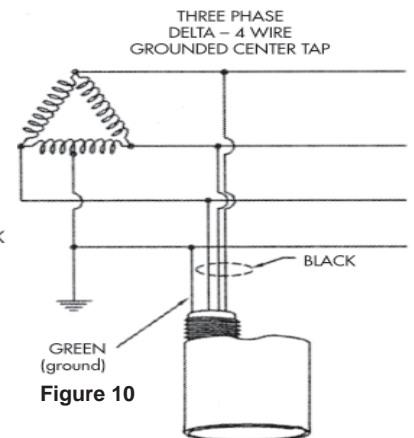
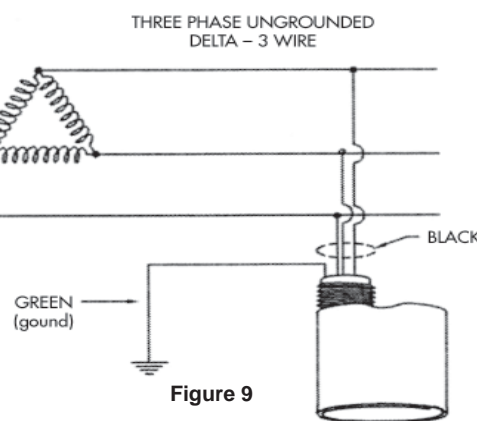
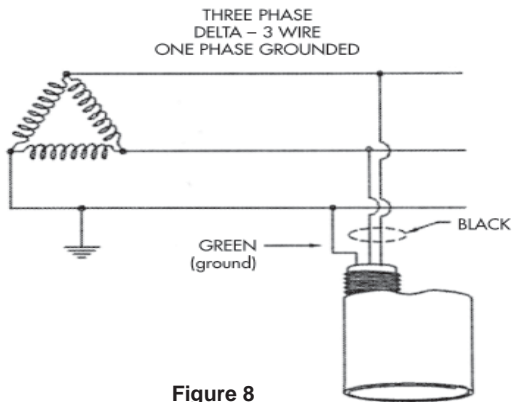
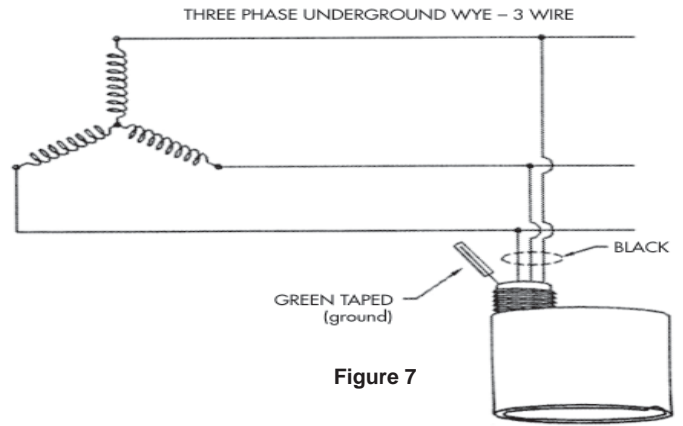
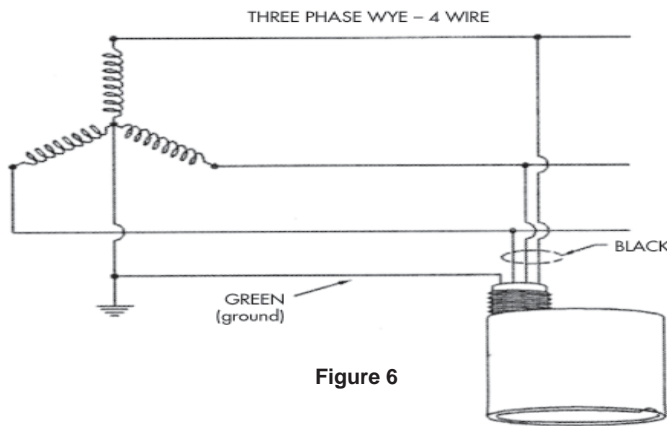
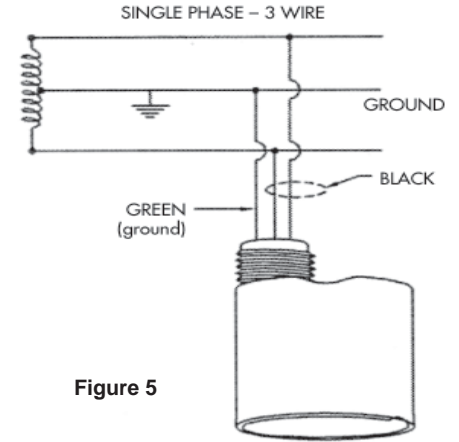
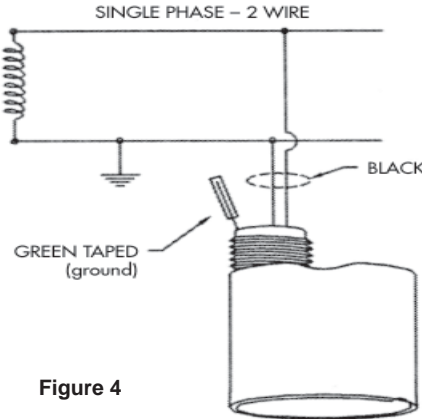
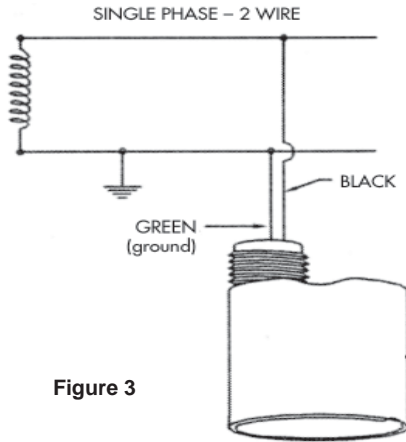
*Add an "A" suffix to obtain the mounting bracket (e.g. Z1-650-0A)



Surge Tec® Typical Wiring Connections

| Maximum Phase-Phase/Phase-Ground Voltages | | | | | | | | | |
|---|--------|---------|---------|--------|---------|---------|--------|----------|----------|
| Figure No. | Z1-175 | Z2-175 | Z3-175 | Z1-480 | Z2-480 | Z3-480 | Z1-650 | Z2-650 | Z3-650 |
| 3 | 175/NA | | | 480/NA | | | 650/NA | | |
| 4 | | 350/NA | | | 960/NA | | | 1300/NA | |
| 5 | | 350/175 | | | 960/480 | | | 1300/650 | |
| 6 | | | 303/175 | | | 831/480 | | | 1125/650 |
| 7 | | | | | | | | | |
| 8 | | 175 | | | 480 | | | 650 | |
| 9 | | | 175/101 | | | 480/277 | | | 650/375 |
| 10 | | | | | | | | | |

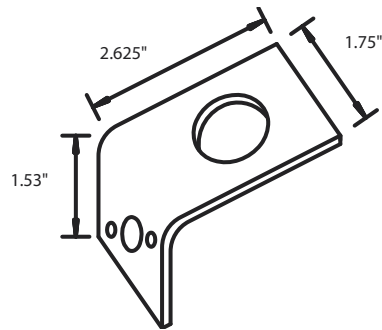
For severe duty applications, select arrester with next highest voltage rating.



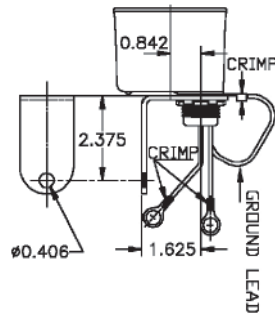


Surge Tec® Catalog Numbering System

| | | | | | | |
|----------|--|----------|--|----------|---|--|
| Z | 2 | - | 175 | - | 0 | A |
| | Number of Poles | | Max. Voltage per Pole (MCOV) | | Lead Wire Length (in/mm) | Mounting Bracket/Hardware Options |
| | 1 - One pole 2 - Two poles 3 - Three poles | | 175 - 175 volt 480 - 480 volt 650 - 650 volt | | 0 - 18"/457 1 - 24"/610 2 - 36"/914 | A - Aluminum 'A' Bracket C - Aluminum 'C' Bracket 1" Ring Terminals - Ground 3/8" Ring Terminals - Line Connections |



'A' Bracket
Part No. 8340903



Option 'C'



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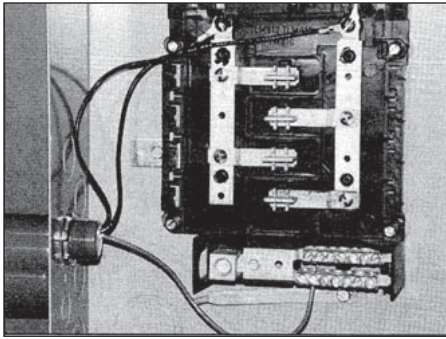
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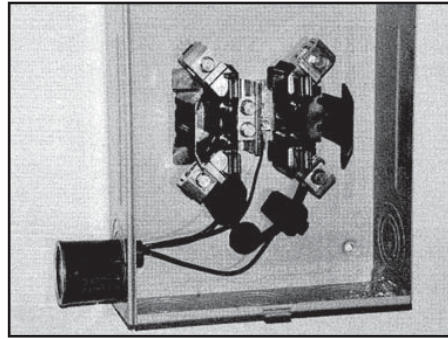
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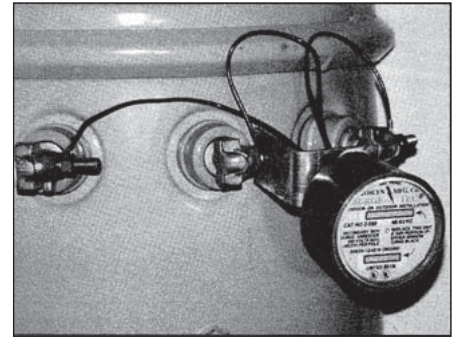
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Knockout Mounting
Z2-175-0



Meterbase Mounting
with insulating piercing connector



Transformer Mounting
Z2-480-4C
Z2-650-4C
(for 3/8" hardware)

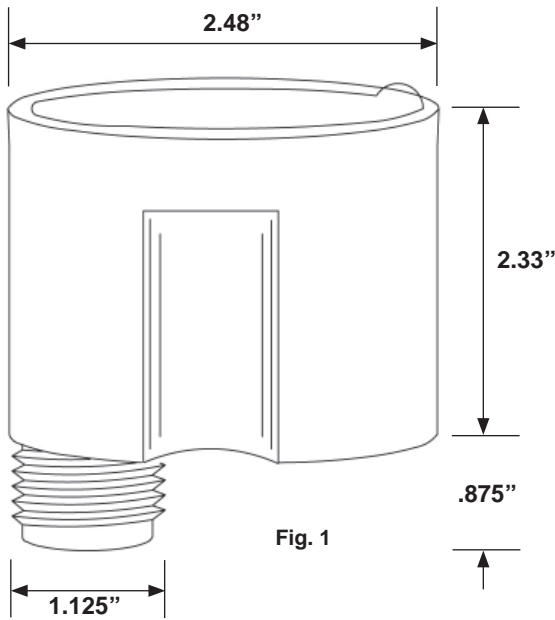


Fig. 1

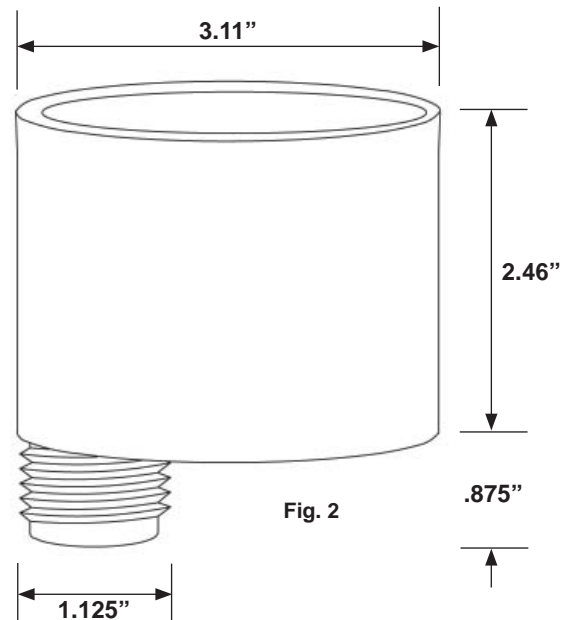


Fig. 2

Physical and Electrical Characteristics

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|-------------|---------------------|-------|------------------|--------|----------------------------------|----------------------|---|--|-------|------|
| | | | | | | | | 1.5kA | 5.0kA | 10kA |
| Z1-175-0 | 175 | 1 | 14 (435) | 1 | 427 | <5 | 1.21 | 0.75 | 0.95 | 1.27 |
| Z2-175-0 | | 2 | 15 (466) | | | | | | | |
| Z3-175-0 | | 3 | 18 (560) | 2 | | | | | | |

*Add an "A" suffix to obtain the mounting bracket (e.g. Z1-175-0A)

| | | | | | | | | | | |
|----------|-----|---|----------|---|-----|----|------|------|------|------|
| Z1-480-0 | 480 | 1 | 15 (466) | 1 | 742 | <5 | 1.90 | 1.42 | 1.76 | 2.16 |
| Z2-480-0 | | 2 | 19 (590) | | | | | | | |
| Z3-480-0 | | 3 | 20 (622) | | | | | | | |

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| | | | | | | | | | | |
|----------|-----|---|----------|---|-----|----|------|------|------|------|
| Z1-650-0 | 650 | 1 | 19 (590) | 1 | 919 | <5 | 2.48 | 2.01 | 2.44 | 2.55 |
| Z2-650-0 | | 2 | 20 (622) | | | | | | | |
| Z3-650-0 | | 3 | 21 (653) | | | | | | | |

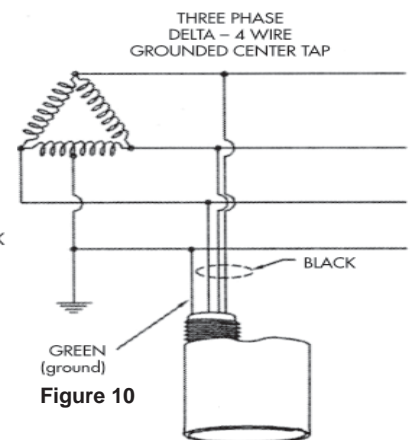
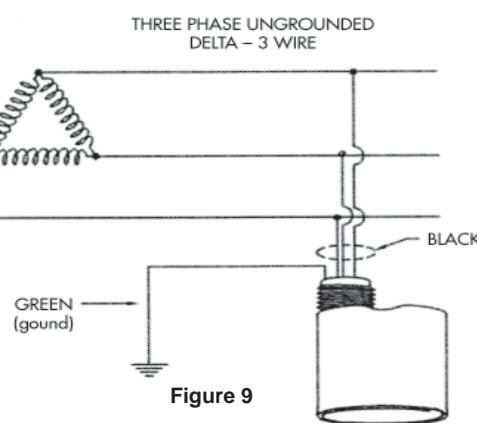
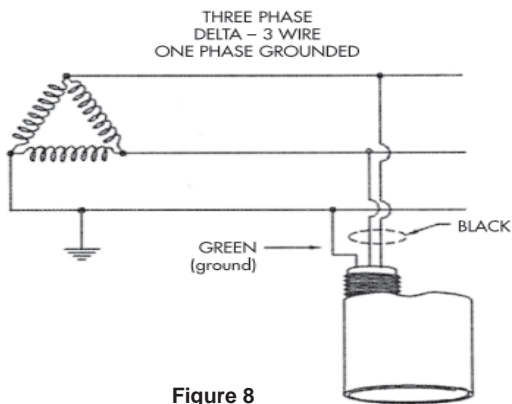
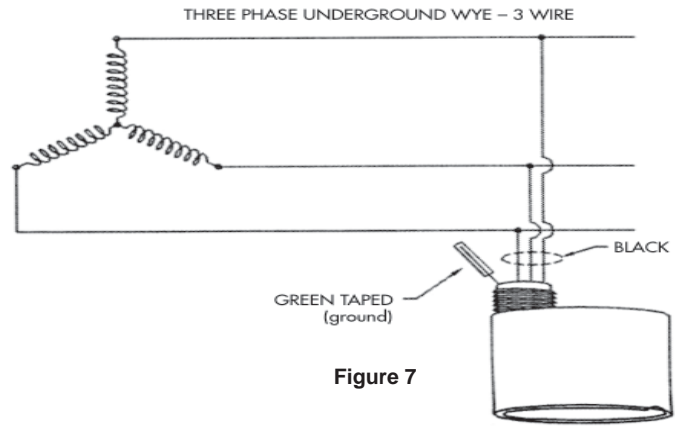
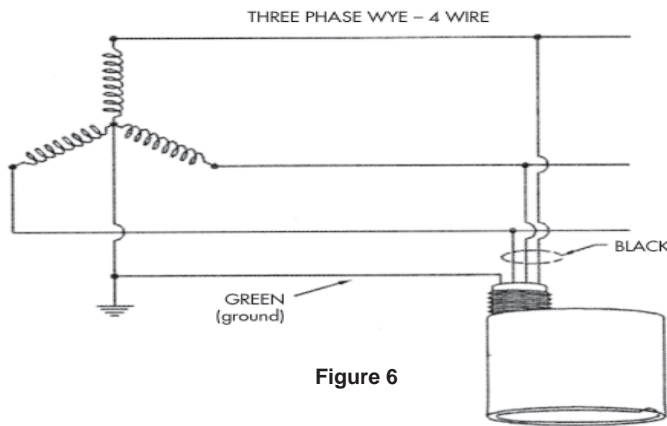
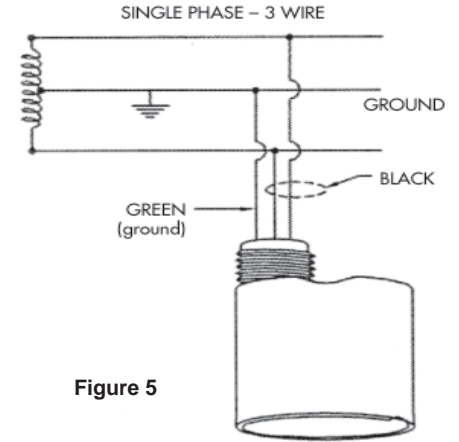
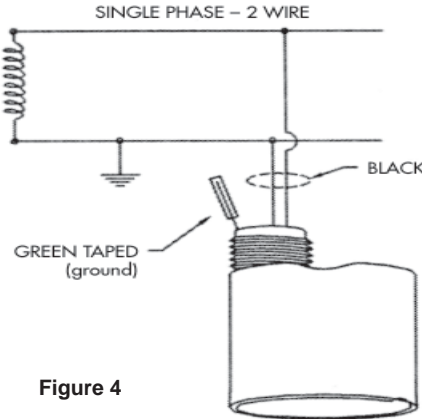
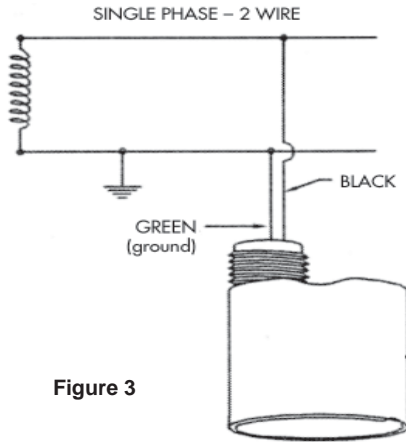
*Add an "A" suffix to obtain the mounting bracket (e.g. Z1-650-0A)



Surge Tec® Typical Wiring Connections

| Maximum Phase-Phase/Phase-Ground Voltages | | | | | | | | | |
|---|--------|---------|---------|--------|---------|---------|--------|----------|----------|
| Figure No. | Z1-175 | Z2-175 | Z3-175 | Z1-480 | Z2-480 | Z3-480 | Z1-650 | Z2-650 | Z3-650 |
| 3 | 175/NA | | | 480/NA | | | 650/NA | | |
| 4 | | 350/NA | | | 960/NA | | | 1300/NA | |
| 5 | | 350/175 | | | 960/480 | | | 1300/650 | |
| 6 | | | 303/175 | | | 831/480 | | | 1125/650 |
| 7 | | | | | | | | | |
| 8 | | 175 | | | 480 | | | 650 | |
| 9 | | | 175/101 | | | 480/277 | | | 650/375 |
| 10 | | | | | | | | | |

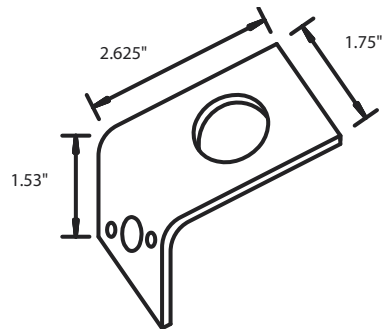
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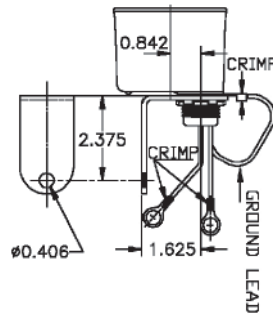


Surge Tec® Catalog Numbering System

| | | | | | | |
|----------|--|----------|--|----------|---|--|
| Z | 2 | - | 175 | - | 0 | A |
| | Number of Poles | | Max. Voltage per Pole (MCOV) | | Lead Wire Length (in/mm) | Mounting Bracket/Hardware Options |
| | 1 - One pole 2 - Two poles 3 - Three poles | | 175 - 175 volt 480 - 480 volt 650 - 650 volt | | 0 - 18"/457 1 - 24"/610 2 - 36"/914 | A - Aluminum 'A' Bracket C - Aluminum 'C' Bracket 1" Ring Terminals - Ground 3/8" Ring Terminals - Line Connections |



'A' Bracket
Part No. 8340903



Option 'C'