

ICP SERIES HANDBOOK



**Increase Production
Reduce Downtime**



TABLE OF CONTENTS

ICP-110, ICP-110S, ICP-40DC, ICP-40DCS, ICP-24ACS

Features & Specifications2

Installation Instructions3-4

Wiring Diagrams5

Example Installations6-7

Operation and Maintenance8

Dimensional Drawings9

ICP-100 Plus, ICP-120 Plus, ICP-301 Plus, ICP-401 Plus

Features & Specifications10

Installation Instructions11-13

Wiring Diagrams14

Example Installations15-20

Operation and Maintenance21

Dimensional Drawings22

ICP-CRA

Features & Specifications23

Configuration Options24

Installation Instructions25-27

Wiring Diagrams28

Operation and Maintenance29-30

Dimensional Drawings30

Contact Information31



FEATURES & SPECIFICATIONS

ICP-110, ICP-110S, ICP-40DC, ICP-40DCS, ICP-24ACS

- Made In The USA & BABA Compliant
 - Non-Ground Dependent
 - Listing: ANSI/UL 1449 5th Edition
 - Enclosure: NEMA® Type 1
 - Filtering: UL 1283
 - UL & IEC Type: 4
 - Environmental: RoHS
 - Operating Temperature: -40° C to 85° C
- Operating Humidity: 1% to 95%
 - EMI-RFI Noise Attenuation: < 40 dB
 - Visual Indication: Blue Flag
 - Alarm Indication: Remote Alarm
 - Capacitance: 1 to 1.5 µF / Line
 - Frequency Range: 50-400 Hz
 - Response Time: <1 ns
 - Fusing: Individually Fused Components

Model	Nominal System Voltage	Clamp Voltage**	MCOV***	Configuration
ICP-110	120 VAC	180 VAC	140 VAC	2 Wire
ICP-110S	120 VAC	180 VAC	140 VAC	2 Wire
ICP-40DC*	12-48 VDC	60 VAC	48 VAC	2 Wire
ICP-40DCS*	12-48 VDC	60 VAC	48 VAC	2 Wire
ICP-24ACS*	24 VAC	56 VAC	35 VAC	2 Wire

*Listing does not apply to noted devices.

**Clamping voltage is the voltage at which the suppression components begin significant conduction under the specified test conditions. It is not a fixed voltage limit and will vary with surge current, waveform, temperature, conductor impedance, and system conditions. Clamping voltage is not equivalent to UL 1449 Voltage Protection Rating (VPR).

***Maximum Continuous Operating Voltage





INSTALLATION INSTRUCTIONS

ICP-110, ICP-110S, ICP-40DC, ICP-40DCS, ICP-24ACS

DANGER: HAZARDOUS VOLTAGE

- Contact with energized conductors can cause electric shock, serious injury, or death.
- Before beginning installation:
 - Have a qualified person identify and disconnect every electrical source that could energize the conductors or equipment, including control power, alternate sources, and possible backfeed.
 - Follow employer's written energy control procedure and all applicable Lockout/Tagout (LOTO) requirements.
 - Do not rely on push buttons, selector switches, interlocks, or other control circuit devices as the sole means of de-energization.
 - Verify absence of voltage at every exposed conductor and circuit part using appropriately rated test equipment.
 - Treat conductors and equipment as energized until de-energized condition has been verified.

- These instructions identify product specific safety requirements. They do not establish or replace the employer's energy control procedure.

WARNING: INSTALLATION BY QUALIFIED PERSONNEL ONLY

- Improper installation may result in electrical shock, equipment damage, or loss of protection.
- Requirements:
 - Installation must be performed by qualified electrical personnel.
 - Follow all applicable national, state, local, and facility electrical codes.
 - Review the applicable wiring diagram before making connections.



INSTALLATION INSTRUCTIONS

ICP-110, ICP-110S, ICP-40DC, ICP-40DCS, ICP-24ACS

NOTICE: INSTALLATION PROCEDURE

1. Mount the 8-Pin Octal Base
 - Mount the 8-pin base as close as practical to the power source. (See Page 5 for more information on 8-Pin Octal Base.)
 - To maintain optimum protection performance, conductor length should not exceed 18 inches (457 mm).
2. Make Electrical Connections
 - Wire the 8-pin base in accordance with the applicable wiring diagram.
 - Verify all connections are secure before energizing the circuit.
3. Install the ICP Module
 - Insert the ICP module into the octal base and ensure it is fully seated.
4. Energize the System
 - Re-energize the circuit using its normal switching or disconnecting means. Verify proper operation.

NOTICE: PERFORMANCE REQUIREMENTS

- For optimum transient voltage protection performance:
 - Keep conductor lengths as short as practical.
 - Avoid unnecessary conductor routing.
 - Maintain secure electrical connections.
- Excess conductor length increases impedance and may reduce protection performance.

NOTICE: STATUS OUTPUT OPERATION

- The status output provides remote indication of ICP operating condition.
- Under normal operating conditions:
 - Pin 1 is isolated from Pin 7.
- When the ICP module expends:
 - The voltage present on Pin 7 will be present on Pin 1.
- Verify compatibility of connected monitoring, alarm, PLC, or control system inputs before energizing the circuit.





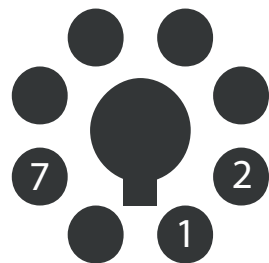
BASIC WIRING DIAGRAMS

ES-8 is a DPDT 8-pin octal base designed for industrial relay applications, featuring box lug terminal connections for secure and reliable wiring. Rated for 300 Volts and 10 Amps, it is UL recognized (File No. E113714) and CSA certified (File No. LR26716).

ICP-110, ICP-110S, ICP-40DC, ICP-40DCS, and ICP-24ACS require the use of this 8-pin octal base per device.

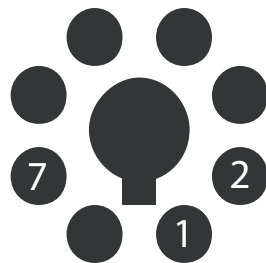


ICP-110



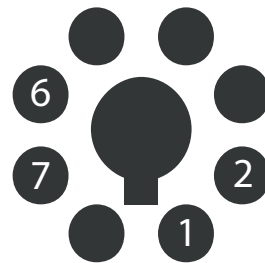
Pin 7 to Phase (L1)
Pin 2 to Neutral
Pin 1 to Alarm

ICP-40DC



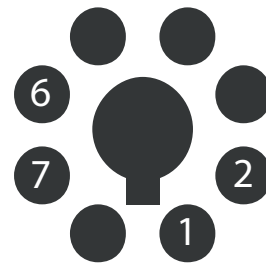
Pin 7 to "+"
Pin 2 to "-"
Pin 1 to Alarm

**ICP-110S
ICP-24ACS**



Pin 7 to Phase (L₁)
Pin 2 to Neutral
Pin 1 to Alarm
Pin 6 to Load

ICP-40DCS



Pin 7 to "+"
Pin 2 to "-"
Pin 1 to Alarm
Pin 6 to Load

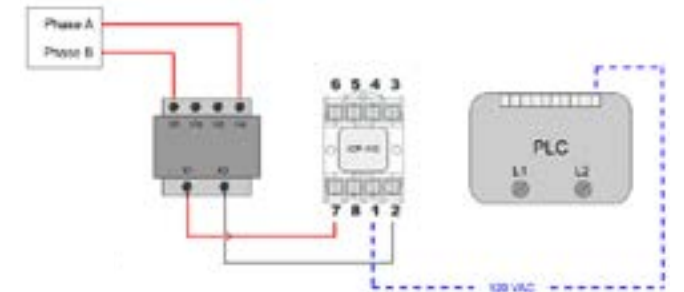
EXAMPLE INSTALLATIONS

Certain Maxivolt ICP Series models designated for series operation can only be installed in series with the protected load. Other ICP models are intended for parallel installation but can also be installed in series with the protected load. Refer to applicable wiring diagram.

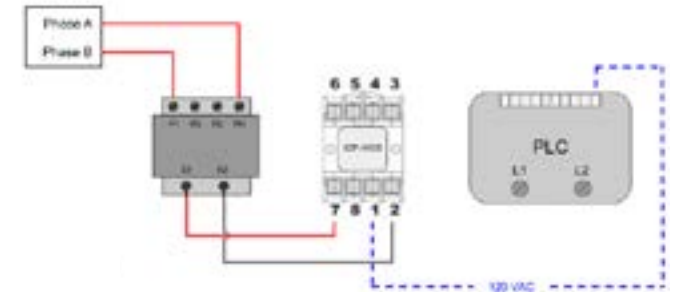
WARNING: INSTALLATION REQUIREMENTS

- Failure to install the ICP in a suitable enclosure may expose personnel to hazardous voltage and environmental conditions.
- To avoid injury and equipment damage:
 - Install the ICP only within a properly rated electrical enclosure.
 - Ensure the enclosure complies with applicable electrical codes and installation requirements.

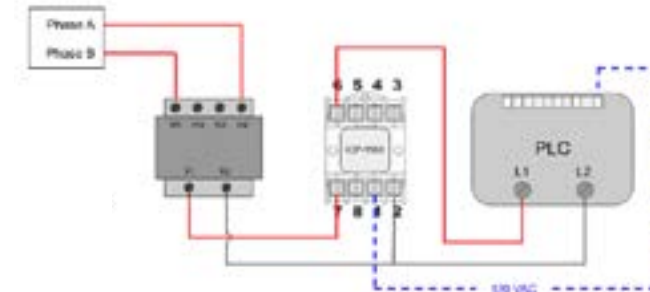
ICP-110



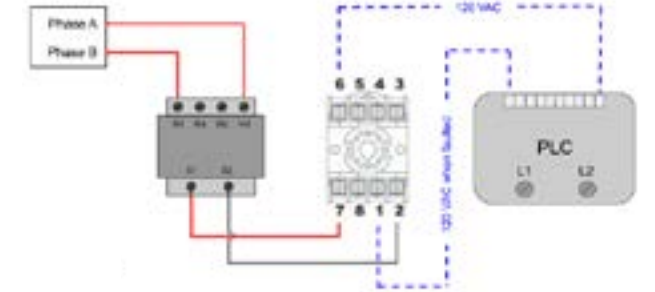
ICP-110S (Parallel)



ICP-110S (Series)



ICP-110S (Parallel / Fail Safe)





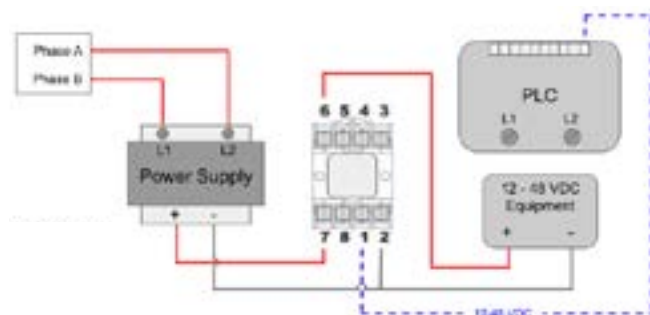
EXAMPLE INSTALLATIONS

NOTICE: SERIES INSTALLATION LIMITATIONS

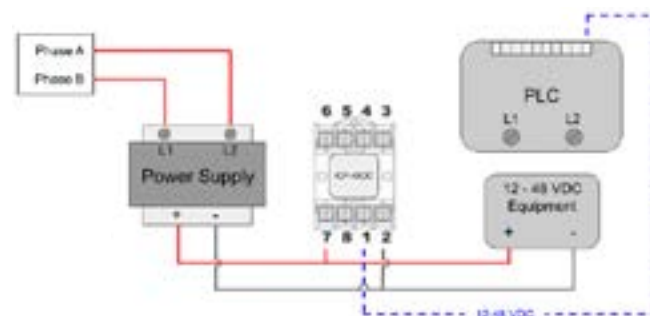
- The ICP may be installed in series with the protected load only when the continuous load current does not exceed 3 amps.
- Do not exceed the maximum allowable load current for series installations.

NOTICE: SERIES INSTALLATION OPERATION

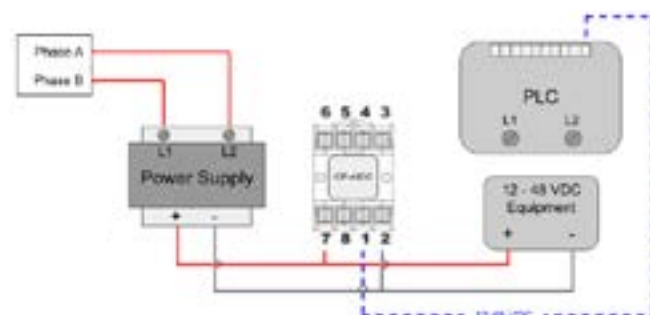
- For series-installed applications:
 - The ICP carries load current during normal operation.
 - If the ICP expends, power to the protected load will be interrupted.
 - The alarm output will activate to indicate the expended condition.
- Verify connected equipment can safely tolerate loss of power when applying the ICP in a series configuration.



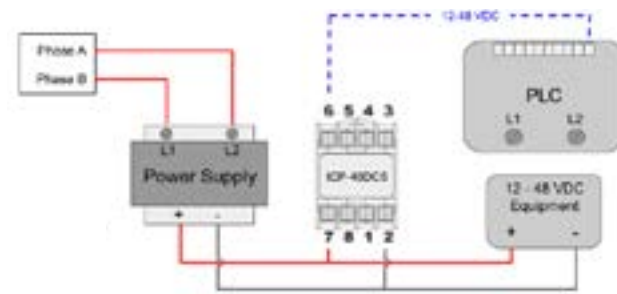
ICP-40DC



ICP-40DCS (Parallel)



ICP-40DCS (Parallel / Fail Safe)



OPERATION AND MAINTENANCE

ICP-110, ICP-110S, ICP-40DC, ICP-40DCS, ICP-24ACS

WARNING: NO FIELD-SERVICEABLE PARTS

- This device contains no field-serviceable parts.
- Opening, modifying, or attempting to repair the device may result in equipment damage, loss of protection, or exposure to hazardous voltage.
- To avoid injury and equipment damage:
 - Do not disassemble the device.
 - Do not attempt to repair the device.
 - Replace expended ICP modules with approved replacement units.

NOTICE: ROUTINE INSPECTION REQUIREMENTS

- Add the following inspection items to facility preventive maintenance and inspection programs.

VISUAL INSPECTION

Normal Operating Condition

- The blue status flag should remain concealed beneath the fuse head.
- The blue status flag should not be visible when viewed from above.
- No corrective action is required.



Normal Operating Condition:
Blue flag under hood



Expended Condition:
Blue flag not under hood

Expended Condition

- If the blue status flag is visible when viewed from above:
 - The ICP has expended.
 - Surge protection is no longer being provided by the ICP.
 - The ICP must be replaced.

CORRECTIVE ACTION

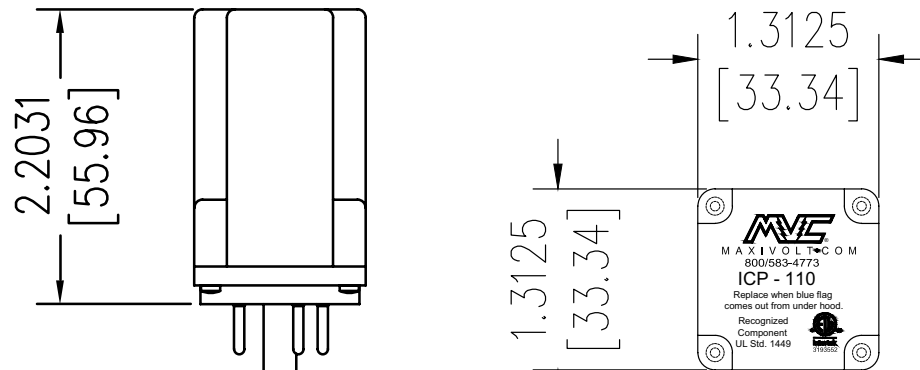
- Before removing or replacing an ICP device, have a qualified person identify and de-energize every source supplying the enclosure, apply Lockout/Tagout (LOTO) controls, and verify the absence of voltage in accordance with the employer's written energy control procedure.
- Remove the expended ICP and install the appropriate replacement ICP.
- Verify the blue status flag is no longer visible after installation.





DIMENSIONAL DRAWINGS

ICP-110
ICP-110S
ICP-40DC
ICP-40DCS
ICP-24ACS



FEATURES & SPECIFICATIONS

ICP-100 Plus, ICP-120 Plus, ICP-301 Plus, ICP-401 Plus

- Made In The USA & BABA Compliant
- Phase Loss Monitoring
- Listing: ANSI/UL 1449 5th Edition & IEC 61643-11
- Enclosure: NEMA® Type 1
- Filtering: UL 1283
- UL & IEC Type: 4
- Environmental: RoHS
- Operating Temperature: -40° C to 85° C
- Operating Humidity: 1% to 95%
- EMI-RFI Noise Attenuation: < 40 dB
- Visual Indication: Normally On Green LED
- Alarm Indication: Form C Dry Contacts
- Capacitance: 1 to 1.5 µF / Line
- Frequency Range: 50-400 Hz
- Response Time: <1 ns
- Fusing: Individually Fused Components
- Dry Contact Rating AC: 1A / 120 VAC
- Dry Contact Rating DC: 2A / 30 VDC

Model	Nominal System Voltage	Clamp Voltage* L-N (L-L)	MCOV ** L-N (L-L)	Configuration	Modes of Protection
ICP-100 Plus	120/240 VAC	180 (360)	140 (280)	Split Ø 3 Wire	L-N and L-L
ICP-120 Plus	120 VAC	180	140	2 Wire	L-N
ICP-301 Plus	240 VAC	360	280	2 Wire	L-N or L-L
ICP-401 Plus	277 VAC	420	300	2 Wire	L-N

*Clamping voltage is the voltage at which the suppression components begin significant conduction under the specified test conditions. It is not a fixed voltage limit and will vary with surge current, waveform, temperature, conductor impedance, and system conditions. Clamping voltage is not equivalent to UL 1449 Voltage Protection Rating (VPR).

**Maximum Continuous Operating Voltage



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09



Increase Production
Reduce Downtime

10



INSTALLATION INSTRUCTIONS

ICP-120 Plus, ICP-301 Plus, ICP-401 Plus, ICP-100 Plus

DANGER: HAZARDOUS VOLTAGE

- Contact with energized conductors can cause electric shock, serious injury, or death.
- Before beginning installation:
 - Have a qualified person identify and disconnect every electrical source that could energize the conductors or equipment, including control power, alternate sources, and possible backfeed.
 - Follow employer's written energy control procedure and all applicable Lockout/Tagout (LOTO) requirements.
 - Do not rely on push buttons, selector switches, interlocks, or other control circuit devices as the sole means of de-energization.
 - Verify absence of voltage at every exposed conductor and circuit part using appropriately rated test equipment.
 - Treat conductors and equipment as energized until de-energized condition has been verified.
- These instructions identify product specific safety requirements. They do not establish or replace the employer's energy control procedure.

WARNING: INSTALLATION BY QUALIFIED PERSONNEL ONLY

- Improper installation may result in electrical shock, equipment damage, or loss of surge protection.
- Requirements:
 - Installation must be performed by qualified electrical personnel.
 - Follow all applicable national, state, local, and facility electrical codes.
 - Review the applicable wiring diagram before making connections.

CAUTION: EQUIPMENT DAMAGE HAZARD

- Improper wiring may damage the ICP Plus and reduce protection performance.
- Do Not:
 - Connect the Neutral conductor to Ground.
 - Exceed the conductor size limitations of the terminal block.



INSTALLATION INSTRUCTIONS

ICP-120 Plus, ICP-301 Plus, ICP-401 Plus, ICP-100 Plus

NOTICE: POWER CONNECTION

1. Mount the Bracket
 - Mount the ICP Plus mounting bracket as close as practical to the electrical connection points.
 - Secure the mounting bracket using hardware suitable for the mounting surface and application.
2. Install the ICP Plus
 - Secure the ICP Plus into the mounting bracket.
3. Prepare Conductors
 - Cut conductors as short as practical without placing strain on the conductors or creating sharp bends.
 - Excess conductor length and sharp bends increase impedance and may reduce surge protection performance.
4. Terminate Conductors
 - Strip approximately 1/4 inch (6 mm) of insulation from each conductor.
 - Insert conductors into the appropriate terminals according to the applicable wiring diagram.
 - Tighten all terminal screws securely.

- Refer to the applicable model wiring diagram for specific terminal assignments.
- Terminal Capacity:
 - The L1 and N terminals accept conductor sizes from #10 AWG through #18 AWG.
- 5. Energize the System
 - Verify all connections are correct and secure.
 - For an ICP Plus connected between two ungrounded conductors, energize both conductors together using a common two-pole switching device.
 - Do not energize one ungrounded conductor at a time.
 - Re-energize the circuit and confirm proper operation.





INSTALLATION INSTRUCTIONS

ICP-120 Plus, ICP-301 Plus, ICP-401 Plus, ICP-100 Plus

COMMUNICATION / ALARM CONNECTIONS NOTICE: ALARM OUTPUT FUNCTION

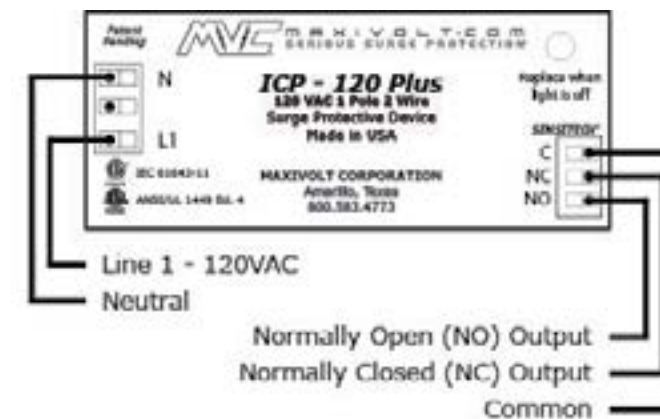
- The communication/alarm interface provides an isolated dry contact output for connection to control systems, interlocks, alarms, and monitoring equipment.
- The alarm contact may be configured as either:
 - Normally Open (NO)
 - Normally Closed (NC)
- The alarm output may be used to:
 - Indicate an expended ICP Plus module.
 - Indicate voltage conditions below 75% of nominal system voltage.
 - Initiate process shutdowns or control actions through a connected control system.

- Electrical Ratings:**
 - 5 to 120 VAC, 1 Amp maximum
 - 1 to 30 VDC, 2 Amps maximum
- Alarm Wiring Procedure:**
 - Connect the Common (C) terminal to the power source serving the control interface.
 - Connect either the Normally Open (NO) or Normally Closed (NC) terminal to the control system input.
 - Verify proper operation of the alarm circuit after installation.
- Refer to the communication wiring diagram for additional connection details.

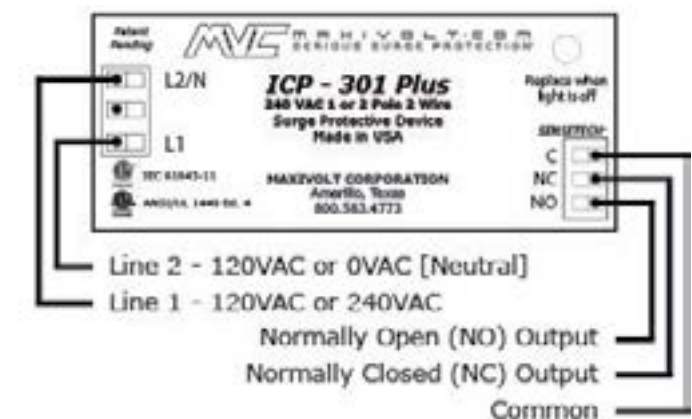


WIRING DIAGRAMS

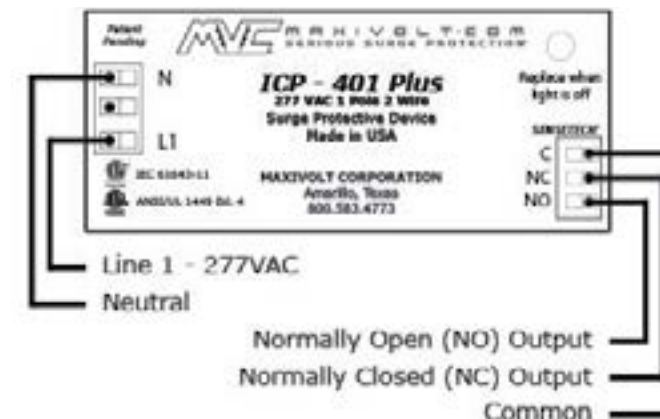
ICP-120 Plus



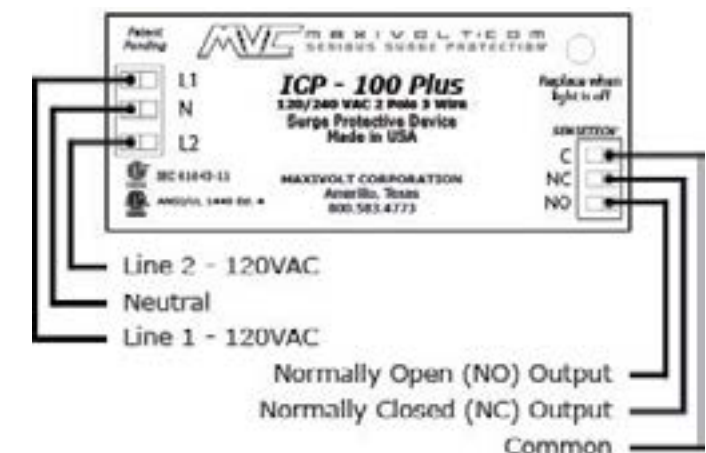
ICP-301 Plus



ICP-401 Plus



ICP-100 Plus



Note: In an operational condition, the NO contact is closed, and the NC contact is open.



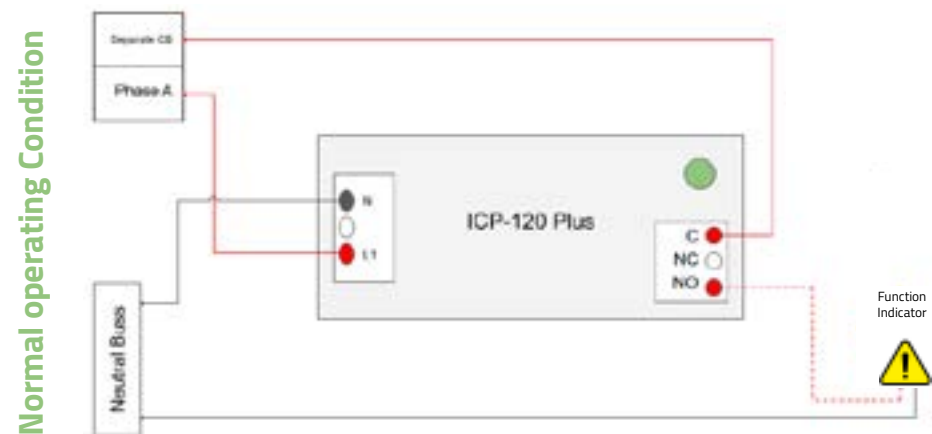


EXAMPLE INSTALLATIONS

ICP-120 Plus (Using NO Contacts)

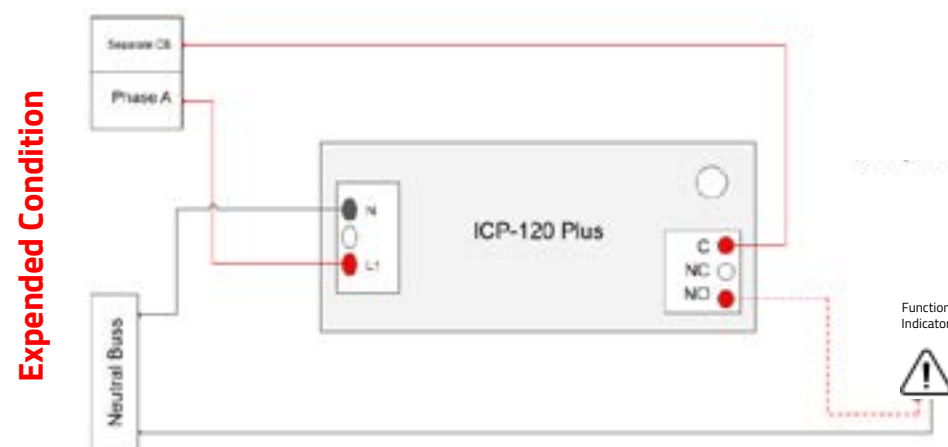
WARNING: INSTALLATION REQUIREMENTS

- Failure to install the ICP within a suitable enclosure may expose personnel to hazardous voltage and environmental conditions.
- To avoid injury and equipment damage:
 - Install the ICP only within a properly rated electrical enclosure.
 - Ensure the enclosure complies with applicable electrical codes and installation requirements.



NOTICE: STATUS CONTACT OPERATION

- The Normally Open (NO) status contact may be used to drive a remote indicator, alarm, monitoring system, or control input.
- Under normal operating conditions:
 - The NO contact will be closed.
 - A connected indicator light will remain illuminated.
- When the ICP expands:
 - The NO contact will open.
 - A connected indicator light will turn OFF.
- Verify connected monitoring and control systems are configured to interpret changes in contact status.



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15

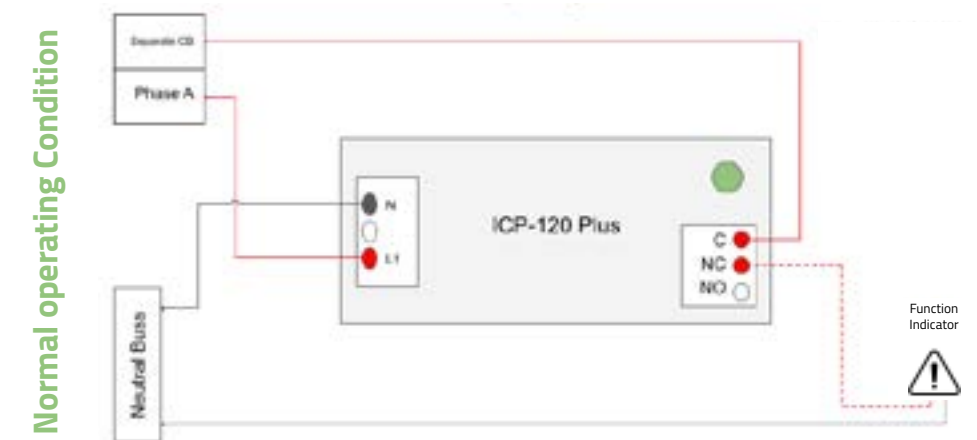


EXAMPLE INSTALLATIONS

ICP-120 Plus (Using NC Contacts)

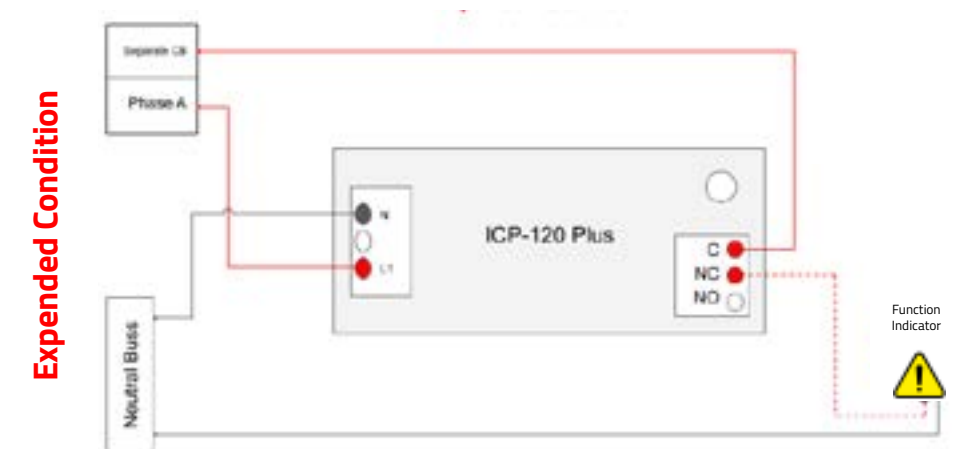
WARNING: INSTALLATION REQUIREMENTS

- Failure to install the ICP within a suitable enclosure may expose personnel to hazardous voltage and environmental conditions.
- To avoid injury and equipment damage:
 - Install the ICP only within a properly rated electrical enclosure.
 - Ensure the enclosure complies with applicable electrical codes and installation requirements.



NOTICE: STATUS CONTACT OPERATION

- The Normally Closed (NC) status contact may be used to drive a remote indicator, alarm, monitoring system, or control input.
- The NC contact will close when:
 - The ICP has expanded, or
 - Operating power to the ICP is lost.
- Verify connected monitoring and control systems are configured to properly interpret both expanded and loss-of-power conditions.



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16

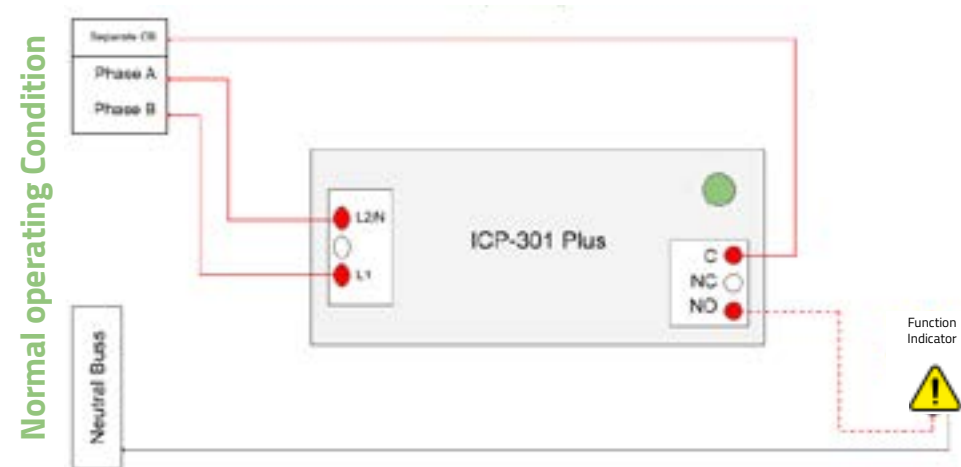


EXAMPLE INSTALLATIONS

ICP-301 Plus (Using NO Contacts)

WARNING: INSTALLATION REQUIREMENTS

- Failure to install the ICP within a suitable enclosure may expose personnel to hazardous voltage and environmental conditions.
- To avoid injury and equipment damage:
 - Install the ICP only within a properly rated electrical enclosure.
 - Ensure the enclosure complies with applicable electrical codes and installation requirements.



NOTICE: STATUS CONTACT OPERATION

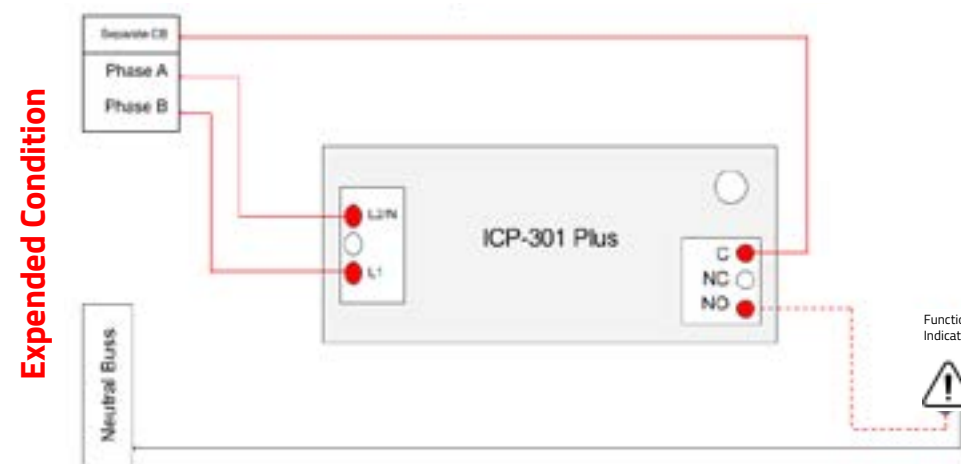
- The Normally Open (NO) status contact may be used to drive a remote indicator, alarm, monitoring system, or control input.

- Under normal operating conditions:
 - The NO contact will close.
 - A connected indicator light will remain illuminated.

When the ICP expands:

- The NO contact open.
- A connected indicator light will turn OFF.

- Verify connected monitoring and control systems are configured to interpret changes in contact status.

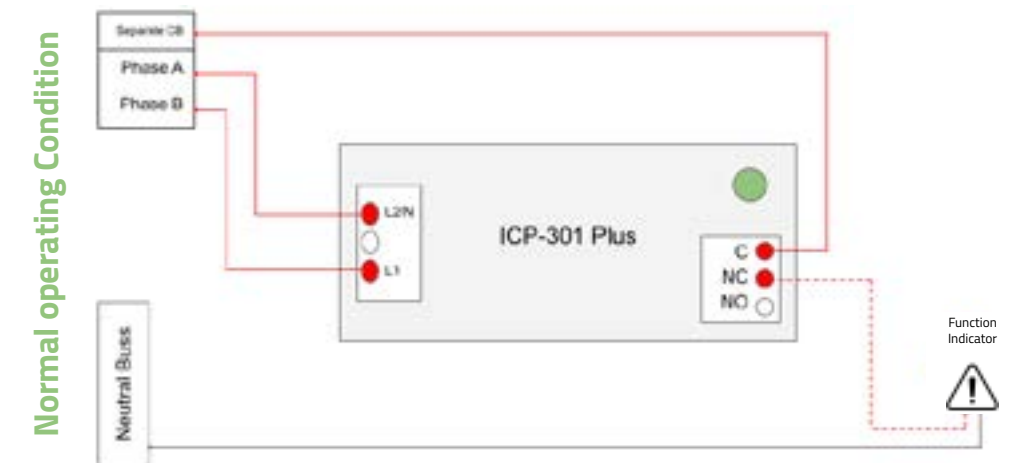


EXAMPLE INSTALLATIONS

ICP-301 Plus (Using NC Contacts)

WARNING: INSTALLATION REQUIREMENTS

- Failure to install the ICP within a suitable enclosure may expose personnel to hazardous voltage and environmental conditions.
- To avoid injury and equipment damage:
 - Install the ICP only within a properly rated electrical enclosure.
 - Ensure the enclosure complies with applicable electrical codes and installation requirements.

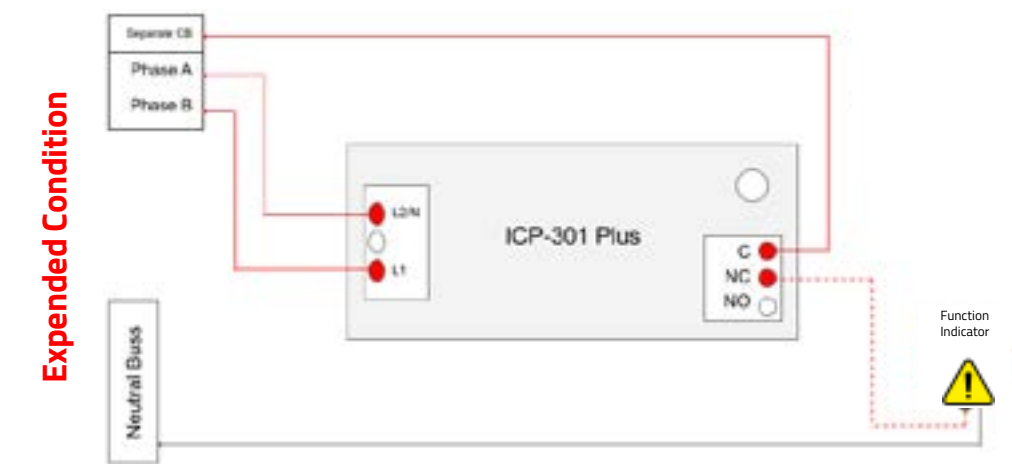


NOTICE: STATUS CONTACT OPERATION

- The Normally Closed (NC) status contact may be used to drive a remote indicator, alarm, monitoring system, or control input.

- The NC contact will close when:
 - The ICP has expanded, or
 - Operating power to the ICP is lost.

- Verify connected monitoring and control systems are configured to properly interpret both expanded and loss-of-power conditions.





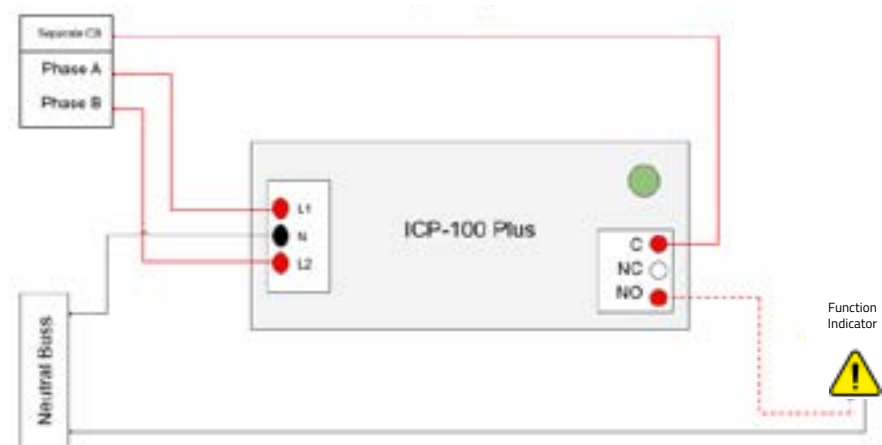
EXAMPLE INSTALLATIONS

ICP-100 Plus (Using NO Contacts)

WARNING: INSTALLATION REQUIREMENTS

- Failure to install the ICP within a suitable enclosure may expose personnel to hazardous voltage and environmental conditions.
- To avoid injury and equipment damage:
 - Install the ICP only within a properly rated electrical enclosure.
 - Ensure the enclosure complies with applicable electrical codes and installation requirements.

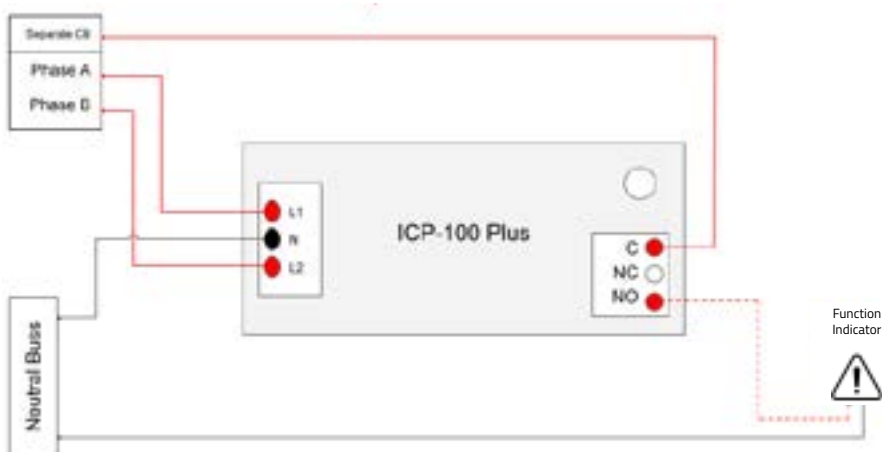
Normal operating Condition



NOTICE: STATUS CONTACT OPERATION

- The Normally Open (NO) status contact may be used to drive a remote indicator, alarm, monitoring system, or control input.
- Under normal operating conditions:
 - The NO contact will be close.
 - A connected indicator light will remain illuminated.
- When the ICP expends:
 - The NO contact will open.
 - A connected indicator light will turn OFF.
- Verify connected monitoring and control systems are configured to interpret changes in contact status.

Expend Condition



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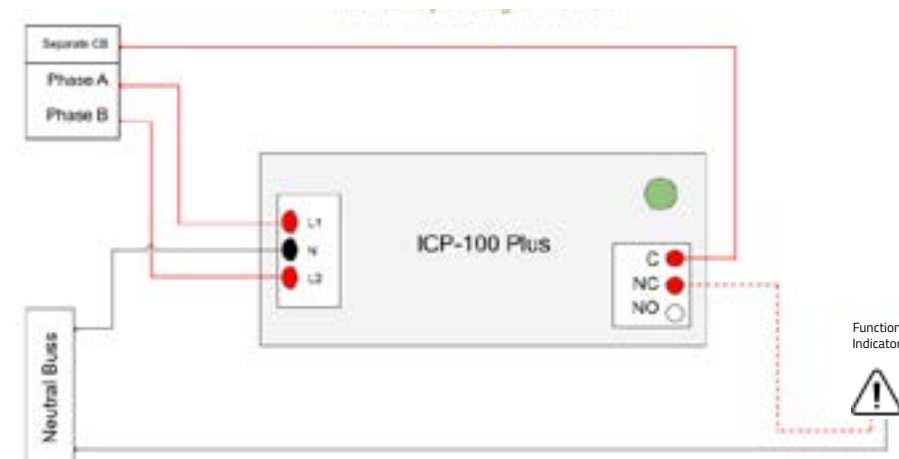
EXAMPLE INSTALLATIONS

ICP-100 Plus (Using NC Contacts)

WARNING: INSTALLATION REQUIREMENTS

- Failure to install the ICP within a suitable enclosure may expose personnel to hazardous voltage and environmental conditions.
- To avoid injury and equipment damage:
 - Install the ICP only within a properly rated electrical enclosure.
 - Ensure the enclosure complies with applicable electrical codes and installation requirements.

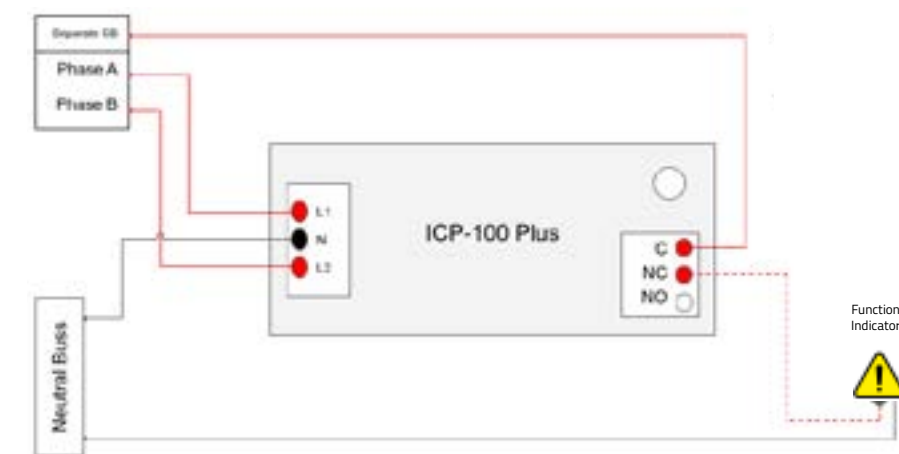
Normal operating Condition



NOTICE: STATUS CONTACT OPERATION

- The Normally Closed (NC) status contact may be used to drive a remote indicator, alarm, monitoring system, or control input.
- The NC contact will close when:
 - The ICP has expended, or
 - Operating power to the ICP is lost.
- Verify connected monitoring and control systems are configured to properly interpret both expended and loss-of-power conditions.

Expend Condition



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OPERATION AND MAINTENANCE

ICP-120 Plus, ICP-301 Plus, ICP-401 Plus, ICP-100 Plus

WARNING: NO FIELD-SERVICEABLE PARTS

- This device contains no field-serviceable parts.
- Opening, modifying, or attempting to repair the device may result in equipment damage, loss of protection, or exposure to hazardous voltage.

To avoid injury and equipment damage:

- Do not disassemble the device.
- Do not attempt to repair the device.
- Replace expended ICP Plus units with approved replacement units only.

NOTICE: ROUTINE INSPECTION REQUIREMENTS

Add the following inspection items to facility preventive maintenance and inspection programs.

VISUAL INSPECTION

ICP PLUS MODELS

Normal Operating Condition

- The green status LED shall be illuminated.
- The device is operational and providing protection.
- No corrective action is required.

Abnormal Operating Condition

- If the green status LED is OFF:
 - Verify that the proper operating voltage is present at the device.
 - Confirm all electrical connections are secure.
 - Verify the system voltage is within the specified operating range.

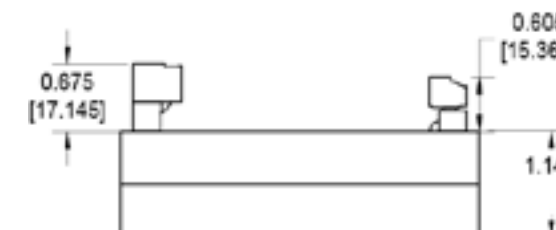
Expended Condition

- If proper operating voltage is present and the green status LED remains OFF:
 - The ICP Plus has expended.
 - Surge protection is no longer being provided.
 - The ICP Plus must be replaced.
- Corrective Action:
 - Before removing or replacing an ICP device, have a qualified person identify and de-energize every source supplying the enclosure, apply Lockout/Tagout (LOTO) controls, and verify the absence of voltage in accordance with the employer's written energy control procedure.
 - Remove the expended ICP Plus.
 - Install the appropriate replacement unit.
 - Re-energize the system.
 - Verify the green status LED is illuminated.



DIMENSIONAL DRAWINGS

ICP-100 Plus
ICP-120 Plus
ICP-301 Plus
ICP-401 Plus





FEATURES & SPECIFICATIONS

ICP-CRA

- Made in USA & BABA Compliant
 - AC & DC Capabilities in One Product
 - Service modules without opening panels
 - Replacement module storage
- Audible & Visual Alarms
 - SenseTech® Communication Options
 - Form C Dry Contacts Optional

Model	ICP-CRA-160DC	ICP-CRA-120	ICP-CRA-100
Nominal System Voltage	160 VDC	120 VAC	120/240 VAC
Clamp Voltage*	175 VDC	180 VAC	180 (360) VAC
MCOV**	170 VDC	140 VAC	140 (280) VAC
Configuration	2 Wire	1 Pole / 2 Wire	2 Pole / 3 Wire
Fusing	Individually Fused Components	Individually Fused Components	Individually Fused Components
Indication	Neon Light	Neon Light	Neon Light
Enclosure	NEMA® Type 4X	NEMA® Type 4X	NEMA® Type 4X
Environmental	RoHS	RoHS	RoHS
Modes of Protection	(+)(-)	L-N	L-N, L-L
Operating Temperature	-40° C to 85° C	-40° C to 85° C	-40° C to 85° C
Operating Humidity	1% to 95%	1% to 95%	1% to 95%
Filtering	UL 1283	UL 1283	UL 1283
EMI-RFI Noise Attenuation		< 40 dB	< 40 dB
Capacitance	1 µF / Line	1 to 1.5 µF / Line	1 to 1.5 µF / Line
Component Response Time	< 1 ns	< 1 ns	< 1 ns
Dry Contact Rating AC	10A at 240 VAC	10A at 240 VAC	10A at 240 VAC
Dry Contact Rating DC	10A at 30 VDC	10A at 30 VDC	10A at 30 VDC

*Clamping voltage is the voltage at which the suppression components begin significant conduction under the specified test conditions. It is not a fixed voltage limit and will vary with surge current, waveform, temperature, conductor impedance, and system conditions. Clamping voltage is not equivalent to UL 1449 Voltage Protection Rating (VPR).

**Maximum Continuous Operating Voltage



ICP-CRA CONFIGURATION

CONFIGURATION WORKSHEET

Using the options below, fill in your configuration chart.

Voltage	Slot One	Slot Two	Audible Alarm	Dry Contacts	Series with Load	Hub Configuration

CONFIGURATION OPTIONS

Voltage	Slot One	Slot Two	Audible Alarm	Dry Contacts	Series with Load	Hub Configuration
120VAC	ICP-110S	Optional Spare	Available	Yes or No	Yes or No	Top or Bottom
120VAC/120VAC	ICP-110S	ICP-110S				
120VAC/40DCS	ICP-110S	ICP-40DCS				
120VAC/24VAC	ICP-110S	ICP-24ACS				
240VAC	ICP-110S	ICP-110S				
120VAC/240VAC	ICP-110S	ICP-110S				
40VDCS	ICP-40DCS	Optional Spare				
40VDCS/40VDCS	ICP-40DCS	ICP-40DCS				
80VDC	ICP-80DC	Optional Spare				
120VDC	ICP-80DC	ICP-40DCS				
160VDC	ICP-80DC	ICP-80DC				
24VAC	ICP-24ACS	Optional Spare				
24VAC/24VAC	ICP-24ACS	ICP-24ACS				





INSTALLATION INSTRUCTIONS

ICP-CRA

DANGER: HAZARDOUS VOLTAGE

- Contact with energized conductors can cause electric shock, serious injury, or death.
- Before beginning installation:
 - Have a qualified person identify and disconnect every electrical source that could energize the conductors or equipment, including control power, alternate sources, and possible backfeed.
 - Follow employer's written energy control procedure and all applicable Lockout/Tagout (LOTO) requirements.
 - Do not rely on push buttons, selector switches, interlocks, or other control circuit devices as the sole means of de-energization.
 - Verify absence of voltage at every exposed conductor and circuit part using appropriately rated test equipment.
 - Treat conductors and equipment as energized until de-energized condition has been verified.
- These instructions identify product specific safety requirements. They do not establish or replace the employer's energy control procedure.

WARNING: INSTALLATION BY QUALIFIED PERSONNEL ONLY

- Improper installation may result in electrical shock, equipment damage, or loss of protection.
- Requirements:
 - Installation must be performed by qualified electrical personnel.
 - Follow all applicable national, state, local, and facility electrical codes.
 - Review the applicable wiring diagram before making connections.

NOTICE: INSTALLATION PROCEDURE

1. Mount the Enclosure

- Mount the ICP-CRA enclosure as close as practical to the power conductor connection points.
- Attach the supplied mounting feet to the rear of the enclosure and secure the enclosure using the external mounting holes.

2. Route Conductors

- Insert conductors through the panel opening and secure with the provided locknut.



INSTALLATION INSTRUCTIONS

ICP-CRA

3. Prepare Conductors

- Cut conductors as short as practical without placing strain on the conductors or creating sharp bends.

NOTE: Excess conductor length and sharp bends increase impedance and may reduce protection performance.

4. Make Electrical Connections

- Connect conductors in accordance with the wiring diagram shown on Page 27.
- Verify all connections are secure before energizing the system.

5. Install Protection Modules

- Insert the ICP module(s) into the corresponding 8-pin base(s).

NOTICE: MULTI-POLE ENERGIZATION REQUIREMENT

- For an ICP configuration connected to multiple ungrounded conductors of the same AC System:
 - Energize all associated conductors together using common multi-pole switching device.
 - Do not energize the conductors individually or sequentially.
- Improper energization may cause one or more internal fuses to operate, resulting in a loss of surge protection.

6. Final Checks and System Energization

- Verify all connections are correct and secure.
- For configurations connected to multiple ungrounded conductors of the same AC system, energize all associated conductors together using common multi-pole switching device.
- Do not energize the conductors individually or sequentially. This requirement does not apply to modules protecting electrically independent circuits.
- Re-energize the system and verify proper operation.

ALARM INTERFACE CONNECTIONS NOTICE: ALARM OUTPUT FUNCTION

- The alarm interface provides an isolated dry contact output for connection to a control system, interlock circuit, audible alarm, or visual indicator.
- The contact may be configured as either:
 - Normally Closed (NC)
 - Normally Open (NO)
- The alarm output may be used to initiate a control action or indicate when an ICP module has expended.





INSTALLATION INSTRUCTIONS

ICP-CRA

Electrical Ratings

- Compatible with system interface voltages from:
 - 5 V to 240 V AC
 - 5 V to 240 V DC

Alarm Wiring Procedure

- Connect the Common (COM) conductor to the power source serving the control interface.
- Connect either the Normally Closed (NC) or Normally Open (NO) conductor to the input of the control interface.
- Verify proper operation of the alarm circuit after installation.

Alternative Applications

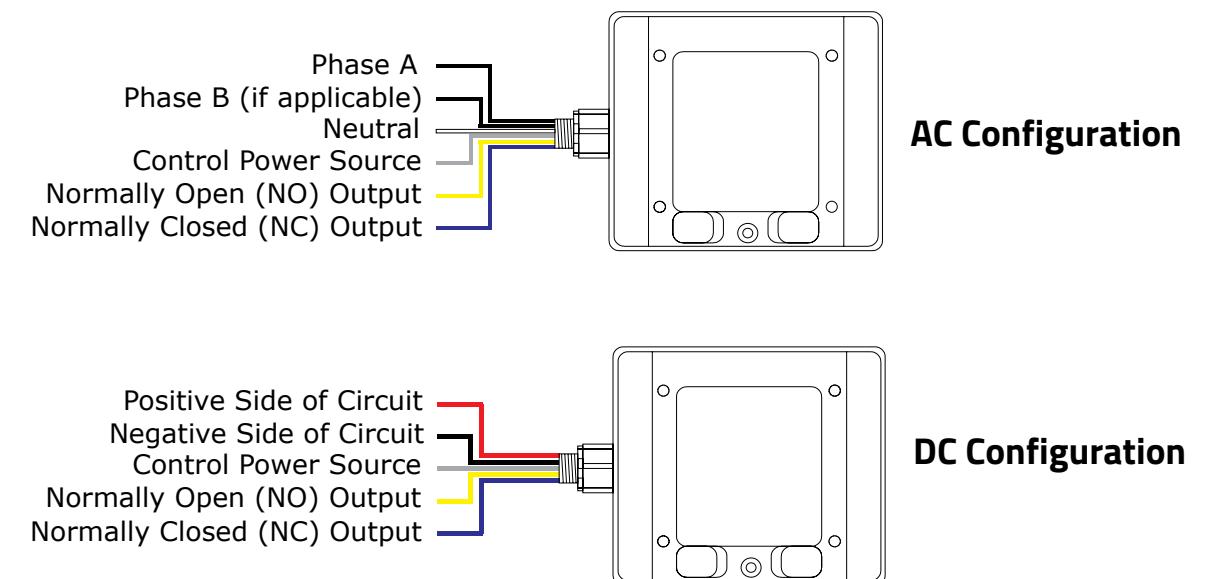
- The alarm output may also be connected to:
 - Audible alarm devices
 - Visual indicator lights
 - PLC inputs
 - SCADA monitoring systems
 - Process interlock circuits



WIRING DIAGRAMS

Custom-built for every application and mounted externally to electrical enclosures, the ICP-CRA houses up to two original ICP Series devices (designed for sensitive individual circuit protection).

The following diagrams are common configurations, but do not represent *every* possible setup; other configurations are available upon request. **Please contact us with wiring questions at 1-800-583-4773.**





OPERATION AND MAINTENANCE

ICP-CRA

NOTICE: ROUTINE INSPECTION REQUIREMENTS

Add the following inspection items to facility preventive maintenance and inspection programs.

DANGER: HAZARDOUS VOLTAGE

- Perform energized inspection only through externally visible indicators. Do not open the enclosure, remove protective barriers, or touch internal components while system is energized.
- If internal energized inspection is ever required, that procedure needs a separate qualified personnel and energized work evaluation. It should not be implied by the routine inspection instructions.

VISUAL INSPECTION

ICP CRA Models

- Verify the device is energized before performing the inspection.

Normal Operating Condition

- Under normal operating conditions:
 - The neon indicator light shall be OFF.
 - The ICP status indicator shall not be visible.
 - The Normally Open (NO) alarm contact shall be closed when connected to a control circuit.
 - The Normally Closed (NC) alarm contact shall be open when connected to a control circuit.

- No corrective action is required.

Expendable ICP Module

- If the neon indicator light is ON:
 - Inspect the ICP module(s).
 - View the top of the ICP module and check for the status indicator beneath the protective hood.
 - If the blue status flag is visible, the ICP module has expended and must be replaced.
- Additional indications of an expended ICP include:
 - The Normally Open (NO) contact will open.
 - The Normally Closed (NC) contact will close.

Corrective Action

- If an ICP module has expended:
 - Before opening the enclosure or removing an ICP module, have a qualified person identify and de-energize every source supplying the enclosure, apply Lockout/Tagout (LOTO) controls, and verify the absence of voltage at all exposed circuit parts in accordance with the employer's written energy control procedure.



OPERATION AND MAINTENANCE

ICP-CRA

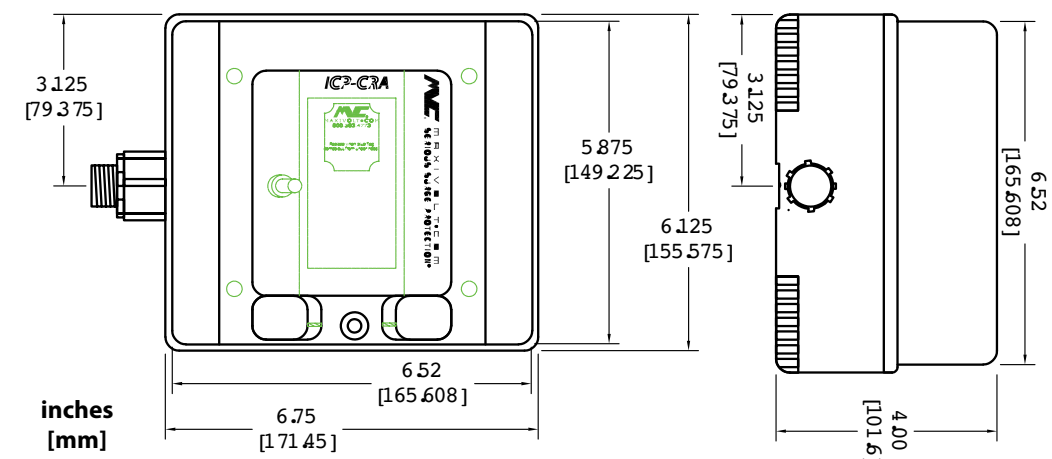
- Remove and replace the expended ICP module with the appropriate replacement module.
- Before re-energize the circuit:
 1. Confirm all electrical connections are correct and secure.
 2. Confirm tools, jumpers, temporary grounds, and other installation materials have been removed.
 3. Replace all covers, barriers, and enclosure components.
 4. Confirm all personnel are clear of equipment.
 5. Remove locks/tags in accordance with employer's written energy control procedure.

- Re-energize the system.

NOTE: For an ICP configuration connected to multiple ungrounded conductors of the same AC System, energize all associated conductors together using common multi-pole switching device. Do not energize the conductors individually or sequentially.

- Verify the neon indicator light is OFF and the alarm contacts have returned to their normal operating state.

DIMENSIONAL DRAWINGS





ABOUT

Maxivolt delivers reliable solutions for our clients' highest priorities. Prioritizing safety and efficiency, we engineer comprehensive mitigation systems to extend equipment lifespan, minimize downtime, and produce a measurable return on investment. We aren't conformists, but instead advocate for the best possible outcomes for end-users.

For more information, contact Maxivolt:

800-583-4773

info@maxivolt.com

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