

OVR NE12 Enclosed Surge Protective Devices - Type 2 Installation and operation manual

Safety precautions

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

The electrical system on which this surge protective device (SPD) will be installed must be in proper working order. Consult a trained electrician 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 void the warranty.



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.
- Replace all devices, doors and covers before turning on power to this equipment.
- This equipment must be effectively grounded per all applicable codes.

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

Introduction

Proper installation of the ABB OVR NE12 enclosed surge protective device (SPD) is essential to maximize performance and effective protection. Read the entire Installation and Operation Manual prior to beginning installation. This manual does not replace national and local electrical codes. Verify compliance with all electrical codes. Only qualified electrical personnel should install this product.

Product

Applicable models			
OVRNE12	160	120SP	X
	A	B	C

A. Surge capacity - 160 or 320 kA

B. Service voltage

120SP - 120/240V Split phase

277Y - 480/277V Wye

480D - 480V Delta

C. X - Optional surge counter/diagnostic LCD display



Unpacking and inspection

Upon receipt of the OVR NE12 unit(s), inspect the entire package to ensure there are no signs of damage or mishandling. Remove packing material and inspect device for any obvious shipping damage.

Immediately file a claim with the shipping company if any damage is found that is a result of shipping or handling.

Package contents

Each package contains the following:

- (1) OVR NE12 enclosed SPD
- (1) Door handle with (2) screws
- (1) Handle-to-disconnect switch shaft and (1) Allen wrench
- (1) Door key
- (1) Installation and Operation Manual
- (1) Wall mounting bracket set

Accessories (sold separately):

- Terminal lugs (part number OZXA-24)

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OVR NE12 Enclosed Surge Protective Devices - Type 2

Installation and operation manual

Product description

The ABB OVR NE12 enclosed SPD series is designed to protect electrical equipment from the damaging effects of transient voltages created by direct and indirect lightning strikes, equipment switching or other surge causing disturbances.

Metal Oxide Varistor (MOV) technology is utilized to achieve a high level of protection performance. MOVs in OVR NE12 units are replaceable modules, which allows for efficient serviceability. Each OVR NE12 comes standard with status lights, alarm, auxiliary contacts, EMI filtering and a fused disconnect. A surge counter/ diagnostic LCD display is optional.

The OVR NE12 devices described in this manual are UL/cUL Listed, conforming to UL 1283 and UL 1449 3rd Edition (UL file number E322885), and CSA 22.2 No.8. The enclosure is rated NEMA Type 12. All ratings are in accordance with ANSI C62.11, C62.33, C62.41 and NEMA LS1.

Product selection

Selecting the proper surge protection device can be a complicated task. Consult qualified personnel to ensure the electrical system is in good working order and for proper sizing of an SPD. Information below is provided as a guide to help understand SPDs and their capabilities:

- The OVR NE12 enclosed SPD is a Type 2 SPD and can only be installed on the load side of the main breaker or fuse.
- The maximum discharge current (I_{max}) is 160 or 320kA per phase, depending on the model selected. I_{max} is the highest current level an MOV can withstand from a single surge. An MOV is capable of withstanding a non-linear number of surges lower than I_{max} in magnitude.
- The Maximum Continuous Operating Voltage (MCOV) is the maximum voltage that can be applied continuously between terminals of the surge protector. MCOV on ABB OVR NE12 enclosed SPDs are set at 115% of nominal system voltage for the 480V Delta and 480Y/277V networks, and 125% for the 240/120V Split Phase.
- Nominal Discharge Current (I_n): 10kA.
- Short Circuit Current Rating (SCCR): 200kA.
- AC power frequency: 50-60Hz
- Choice of a Basic or Surge Counter/Diagnostic LCD Display. The Surge Counter/Diagnostic LCD Display shows a count of all surges 2kA and greater and protection level. See page 7 for more information.

Type 2 MOVs have a finite life. The ABB OVR NE12 is designed such, that upon the end of life of an MOV, it will disconnect from the circuit, and signal the need for replacement visually and audibly. Consult pages 8-11 of this manual for instructions on troubleshooting and replacement of MOV modules.

The possibility exists of a surge current greater than the rated capacity of an SPD, potentially allowing surge energy through to the protected equipment. Even though the SPD is working properly, additional SPDs may be required. These additional SPDs should be placed closer to the load(s).

Pre-installation checklist

Prior to installing any OVR NE12 enclosed SPD, please read and understand this operation manual, ensure that all safety precautions are taken and follow all applicable electrical codes.

- 1) Power must be disconnected prior to installation. Failure to do so may cause injury, death and/or equipment damage.
- 2) Ensure that the OVR NE12 model selected is the proper one for the electrical system and voltage ratings.
- 3) Per National Electric Code (NEC), ensure 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. NEC Article 250.30 states this bond must be in place on all 3 Phase WYE and Single Phase Split Systems.
- 4) 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.



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

Installation

Prior to installation please ensure that you have followed the "Pre-Installation Checklist" and understand all requirements.

1) Mounting

All ABB OVR NE12 enclosed SPDs are constructed with a NEMA Type 12 (description below) painted steel enclosure and have the following dimensions and weight (approximately): 24"H x 16"W x 8"D and 40 lbs. See pages 12-13 for dimension drawings.

The OVR NE12 enclosed SPD should be installed in an indoor location as close to the protected circuit as possible. Avoid long wire runs between the SPD and protected circuit, as this will reduce performance.

Take care to ensure the surface or structure the unit will be mounted to is stable and capable of bearing the load. Mounting brackets are included.

NEMA Type 12 Description

Enclosures constructed (without knockouts) for indoor 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 circulating dust, lint, fibers, and flyings); and to provide a degree of protection with respect to harmful effects on the equipment due to the ingress of water (dripping and light splashing).



WARNING

Do not mount this device by electric welding. ABB does not assume any liability for damages caused by electric welding as the welding circuit may damage electronic circuits in the enclosure.

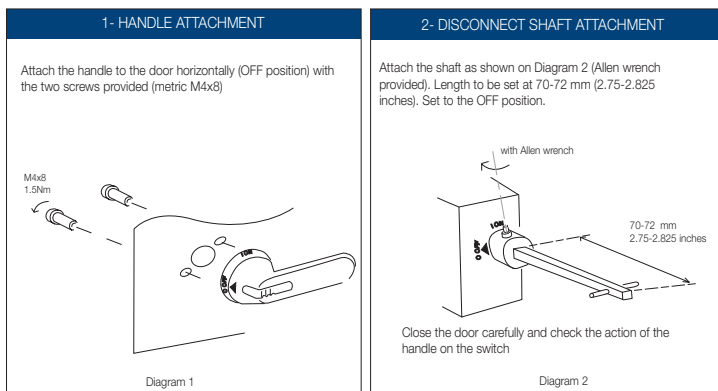
2) Connection to Network

It is recommended that wiring or conduit from the power network to the OVR NE12 unit enter the enclosure from the bottom or lower left back (facing the unit from the front). Keep the length of wire to a minimum to ensure the best performance. Refer to the wiring diagrams on pages 4-6 for applicable model connection. UL 1449 3rd Edition (Sec. 11.4) requires line and ground connecting conductors to not be smaller than 14 AWG (copper) or 12 AWG (aluminum) for Type 2 SPDs. For the easiest and most efficient connection, use an ABB terminal lug kit OZXA-24 (not included). The OZXA-24 uses wire sizes 14 - 2/0 AWG.

Each model comes standard with an auxiliary contact for remote monitoring. Pages 4-6 show the auxiliary contact connection scheme for each service voltage.

3) Disconnect Handle and Shaft Attachment

Connect the handle and shaft as shown on Diagrams 1 and 2 shown below. This allows the unit to be energized and de-energized for startup and servicing, respectively. When the handle is in the OFF position, the unit is disconnected from the circuit, and the circuit is not protected.



4) Final check and energization

Ensure that all requirements of this manual have been met and the unit is installed properly. Upon verifying this, power can be re-connected and the unit energized. Close the unit door, re-connect power and turn the handle to the ON position. The unit is now connected to and is protecting the circuit.

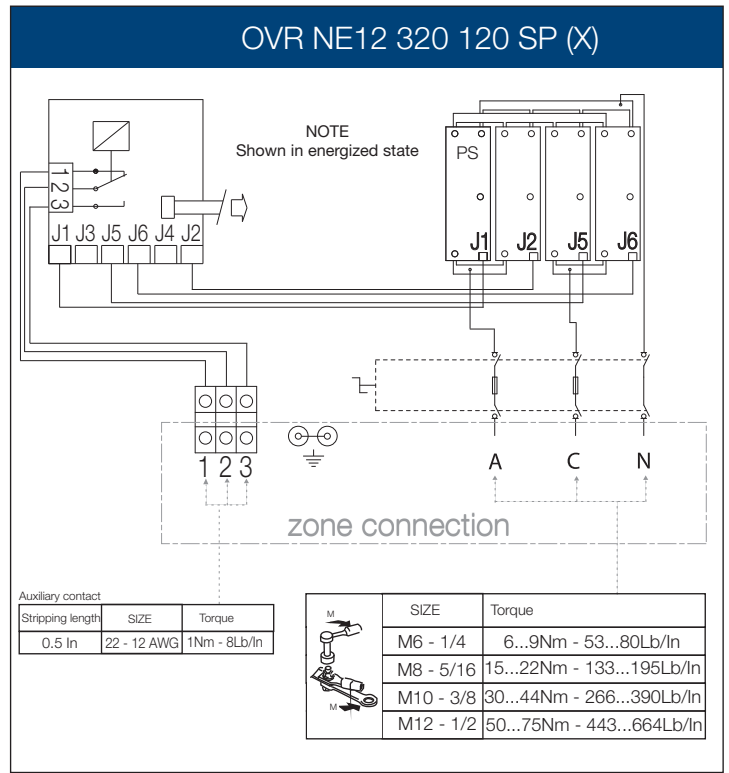
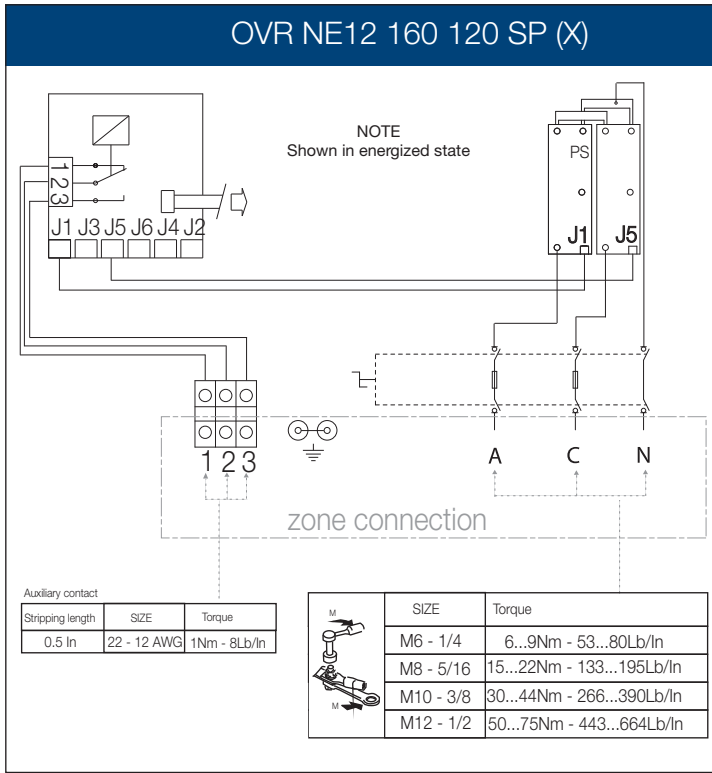
Operation

Upon energizing the OVR NE12 unit, check to ensure proper operation. OVR NE12 units with the Basic Display will show green LEDs for all modules and no alarms. Units with the Surge Counter/Diagnostic LCD Display will show green LEDs for all modules, the LCD Display will read "PROTECTION 100%" and no alarms. Should the status of the unit be other than above, turn the handle to the OFF position, disconnecting the unit from the circuit. Check to make sure the electrical network is in good working order and all instructions in this manual have been followed. If the condition persists, consult pages 8-11 of this manual to determine if any MOV modules are defective. Call ABB Technical Support at 1-800-385-1221 Option 4 if assistance is required.

Maintenance

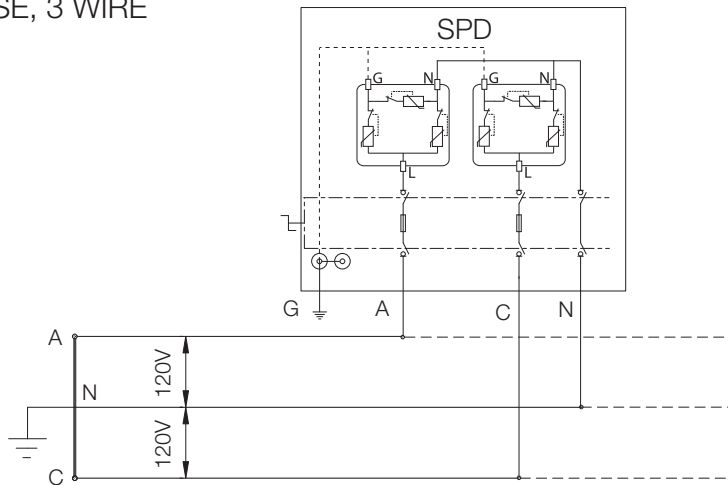
As each installation is different, a preventative maintenance schedule is not specified. The OVR NE12 should be periodically checked by qualified personnel to ensure proper operation. When inspecting the unit, check the connection integrity to the network.


Characteristics and power diagram - 240/120V SPLIT PHASE



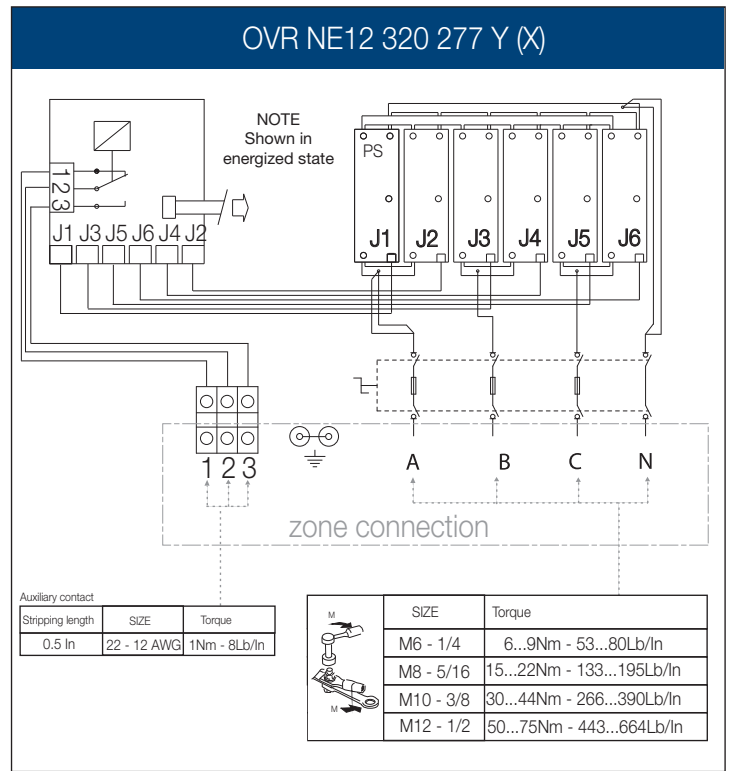
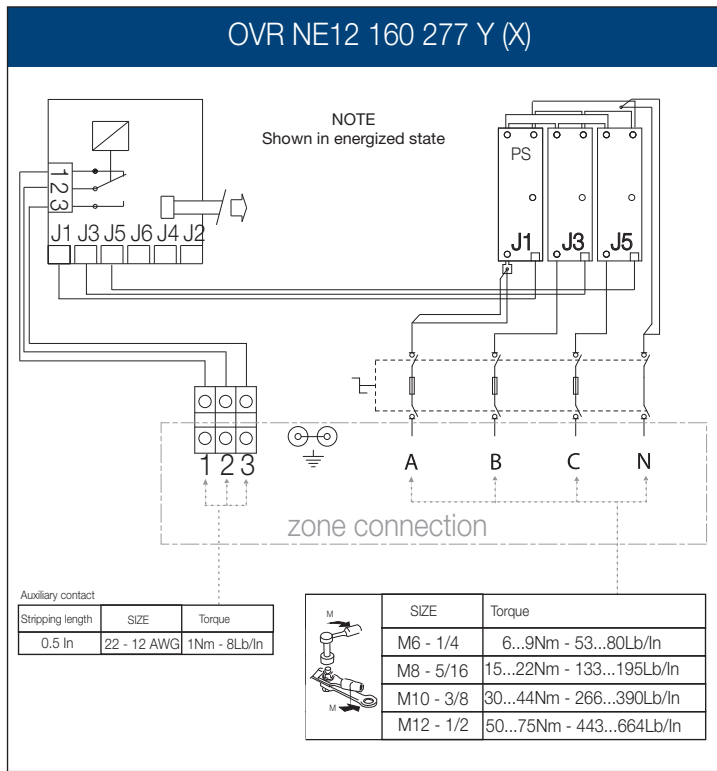
NETWORK DIAGRAM

240/120 VAC, 2 PHASE, 3 WIRE

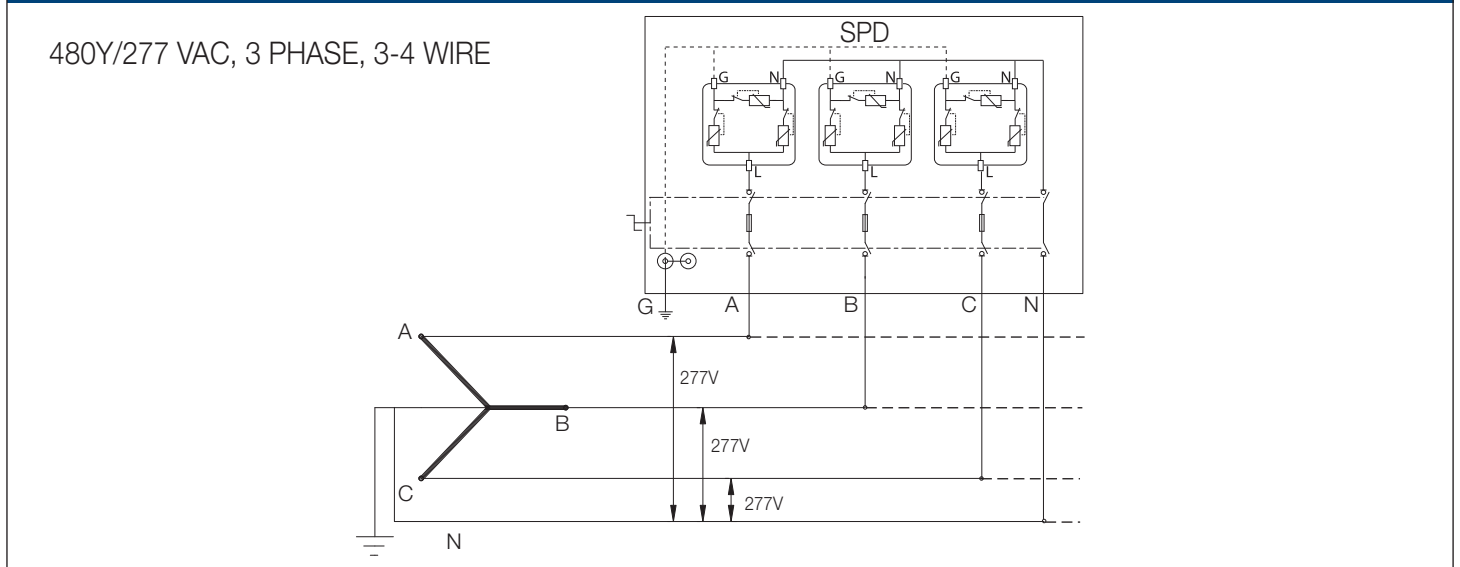




	Operating Voltage	Surge Capacity (I _{max})	Nominal Discharge Current (I _n)	Maximum Continuous Operating Voltage (MCOV)	Short Circuit Current Rating (SCCR)	Fuse	Voltage Protection Rating			
							L - N	L - L	L - G	N - G
OVR NE12 160 120 SP	120V	160kA	10kA	150V	200kA	Type J 100A	900V	1200V	800V	800V
OVR NE12 160 120 SP X	120V	160kA	10kA	150V	200kA	Type J 100A	900V	1200V	800V	800V
OVR NE12 320 120 SP	120V	320kA	10kA	150V	200kA	Type J 100A	900V	1200V	800V	800V
OVR NE12 320 120 SP X	120V	320kA	10kA	150V	200kA	Type J 100A	900V	1200V	800V	800V

Characteristics and power diagram - 480/277V WYE

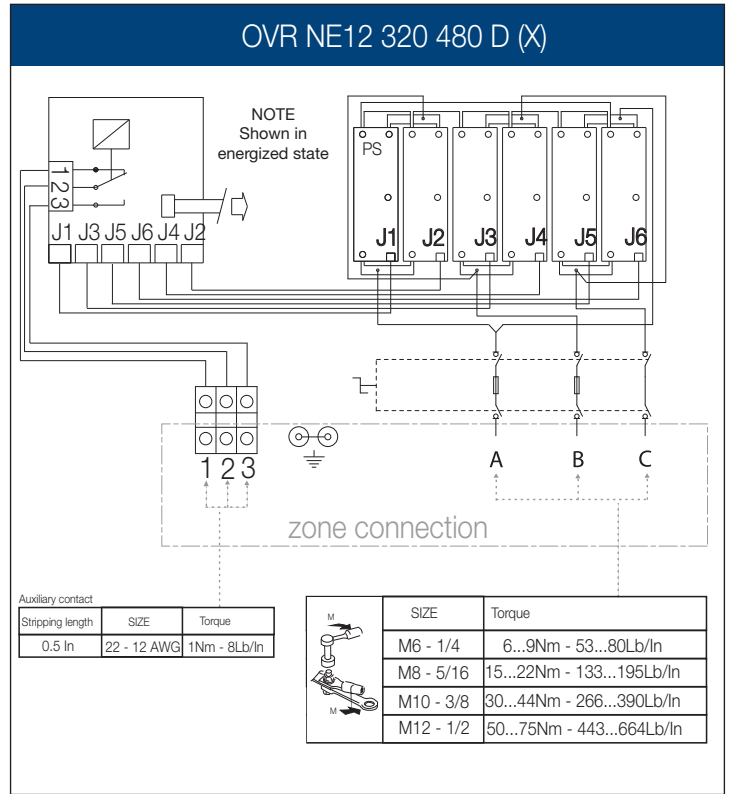
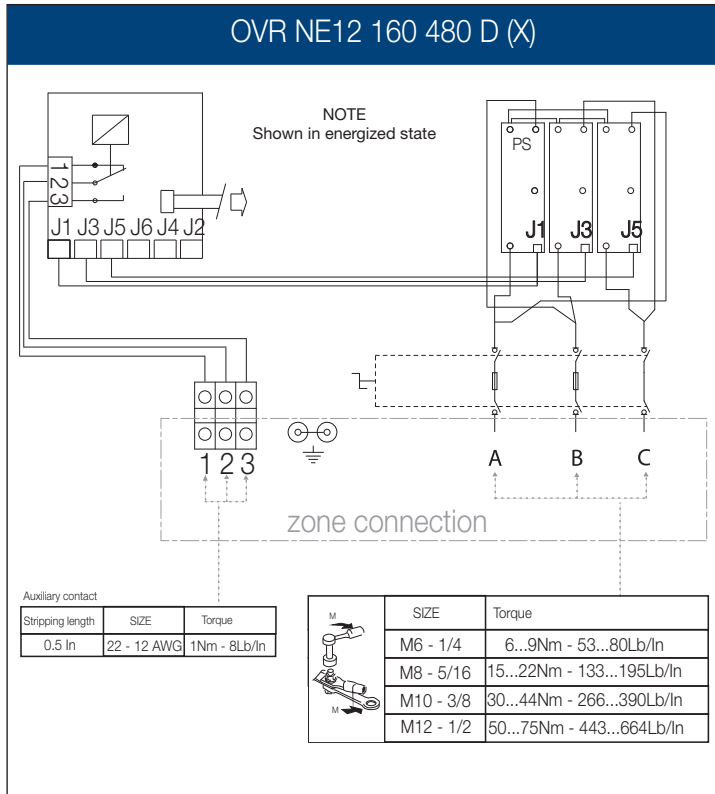


NETWORK DIAGRAM

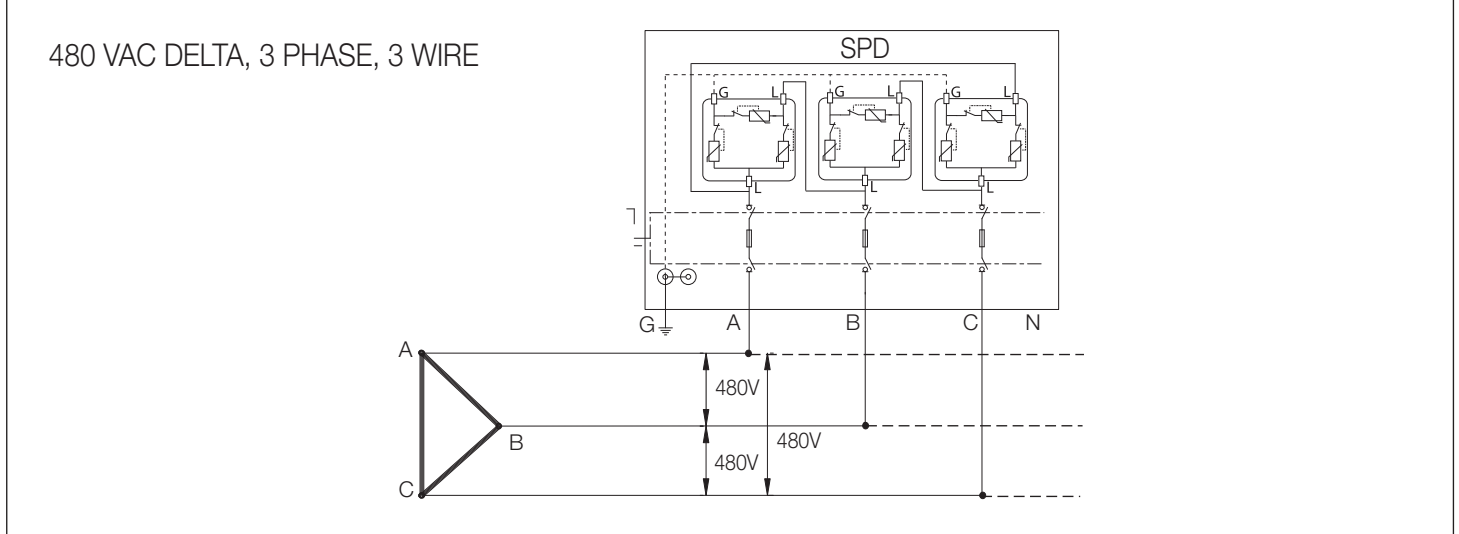




	Operating Voltage	Surge Capacity (I _{max})	Nominal Discharge Current (I _n)	Maximum Continuous Operating Voltage (MCOV)	Short Circuit Current Rating (SCCR)	 Fuse	Voltage Protection Rating			
							L - N	L - L	L - G	N - G
OVR NE12 160 277 Y	277V	160kA	10kA	320V	200kA	T _{type J} 100A	1200V	2000V	1200V	1200V
OVR NE12 160 277 Y X	277V	160kA	10kA	320V	200kA	T _{type J} 100A	1200V	2000V	1200V	1200V
OVR NE12 320 277 Y	277V	320kA	10kA	320V	200kA	T _{type J} 100A	1200V	2000V	1200V	1200V
OVR NE12 320 277 Y X	277V	320kA	10kA	320V	200kA	T _{type J} 100A	1200V	2000V	1200V	1200V

Characteristics and power diagram - 480V DELTA



NETWORK DIAGRAM



	Operating Voltage	Surge Capacity (I _{max})	Nominal Discharge Current (I _n)	Maximum Continuous Operating Voltage (MCOV)	Short Circuit Current Rating (SCCR)	 Fuse	Voltage Protection Rating			
							L - N	L - L	L - G	N - G
OVR NE12 160 480 D	480V	160kA	10kA	550V	200kA	Type J 100A		1800V	1800V	
OVR NE12 160 480 D X	480V	160kA	10kA	550V	200kA	Type J 100A		1800V	1800V	
OVR NE12 320 480 D	480V	320kA	10kA	550V	200kA	Type J 100A		1800V	1800V	
OVR NE12 320 480 D X	480V	320kA	10kA	550V	200kA	Type J 100A		1800V	1800V	

BASIC DISPLAY

Indication of functional module

- ☀ Green LED on = Module OK
- ☀ Red LED on = Module NOT OK - replace module
- LED off = No module or no supply

- ☀ Green = OK
- ☀ Red = replace module
- No module or no supply

“TEST” Button (B1):

First function:

1st push : ☀ 3 green LEDs on

2nd push : ☀ 3 red LEDs on

3rd push : ○ LEDs off; buzzer on as well as the auxiliary contact

To close test : 4th push or 10 seconds without pushing

Second function: only version with Surge Counter/Diagnostic LCD Option

Setting mode; increments the figure highlighted by the cursor

“RESET ALARM” Button (B2):

First function:

1st push : stops the buzzer ☐

only version with Surge Counter/Diagnostic LCD Option

Second function:

Setting mode; moves the cursor to the right

SURGE COUNTER/DIAGNOSTIC LCD DISPLAY (OPTION X)

SPD status check

Count of surges 2kA and higher

Date and time from the last surge if this one is higher than 0; if this one is equal to 0, it is date of re-setting (YY/MM/DD HH:MM)

Date and time actual (YY/MM/DD HH:MM)

PROTECTION 100 %

COUNTER = 0000

LAST 090101 0800

NOW 090101 0800

SETTING MODE

- Push more than 5 seconds on the “RESET ALARM” (B2) until the cursor appears.
- Incrementation - button B1; moving the cursor - button B2.

SPD STATUS CHECK

Status Level:

PROTECTION 100% -> All modules are operational

PROTECTION 66% -> 1 module is defective (1/3)

PROTECTION 50% -> 1 module is defective (1/2)

PROTECTION 33% -> 2 modules are defective (2/3)

PROTECTION 0% -> All modules are defective, no protection

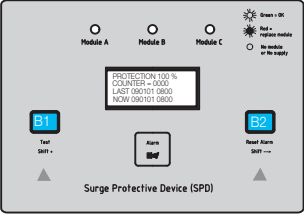
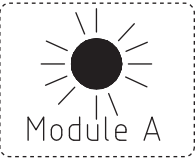
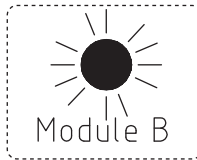
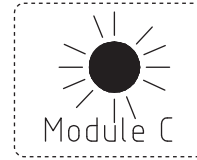
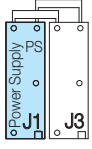
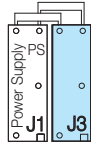
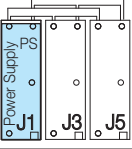
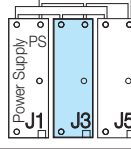
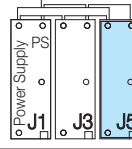
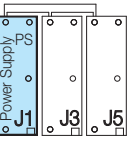
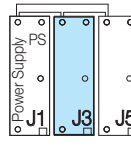
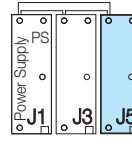
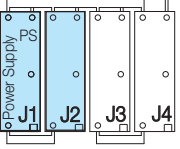
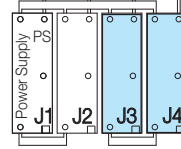
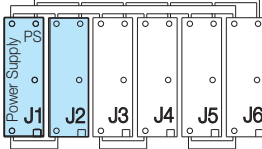
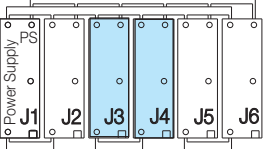
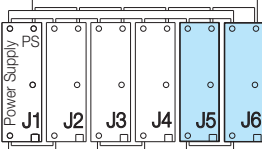
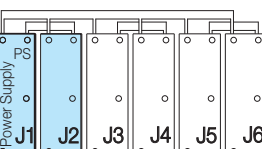
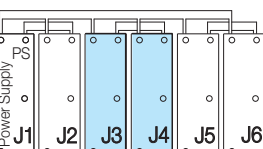
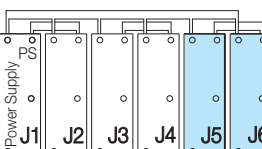
RE-SETTING THE COUNTER and MODULE RECOGNITION

- Push the two buttons B1 and B2 simultaneously for more than 10 seconds.

1- TROUBLESHOOTING

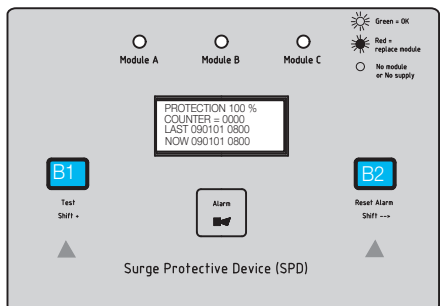
First, check the disconnect fuse status. Replace any defective fuses (see Item 3, Replace FUSE, for fuse type). If no fuses are defective, proceed to Items 2-7 on identifying defective modules, replacing and re-starting the unit. Should defective fuses be identified, replace. Upon replacing any defective fuses, energize the unit by closing the door and turning the handle to the ON position. If all module LEDs are green, the unit is working properly. If any LEDs are red or not lit, refer to Items 2-7 on identifying defective modules, replacing and re-starting the unit.

2- DEFECTIVE MODULE IDENTIFICATION

Identify Defective Module(s)				
	 <p>Module A</p> <p>If RED, blue colored modules below are defective</p>	 <p>Module B</p> <p>If RED, blue colored modules below are defective</p>	 <p>Module C</p> <p>If RED, blue colored modules below are defective</p>	
	OVR NE12 160 120 SP (X)			
	OVR NE12 160 277 Y (X)			
	OVR NE12 160 480 D (X)			
	OVR NE12 320 120 SP (X)			
	OVR NE12 320 277 Y (X)			
	OVR NE12 320 480 D (X)			

Note: The power supply module is always located at the left end of the module row. See Item 3, REPLACEMENT MODULE GUIDE, page 9, for part number information.

3-REPLACEMENT MODULE GUIDE



Replacement Module Part Numbers

	Module A	Module B	Module C
OVR NE12 160 120 SP (X)	OVR 1N 160 120 PS		OVR 1N 160 120
OVR NE12 160 277 Y (X)	OVR 1N 160 277 PS	OVR 1N 160 277	OVR 1N 160 277
OVR NE12 160 480 D (X)	OVR 1N 160 480 PS	OVR 1N 160 480	OVR 1N 160 480
OVR NE12 320 120 SP (X)	OVR 1N 160 120 PS		2 x OVR 1N 160 120
OVR NE12 320 277 Y (X)	+ OVR 1N 160 277 PS OVR 1N 160 277	2 x OVR 1N 160 277	2 x OVR 1N 160 277
OVR NE12 320 480 D (X)	+ OVR 1N 160 480 PS OVR 1N 160 480	2 x OVR 1N 160 480	2 x OVR 1N 160 480

Replace FUSE

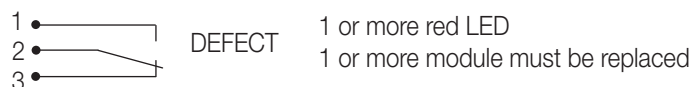
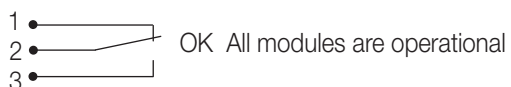
FUSE AJT 100A (by others)



Temperature

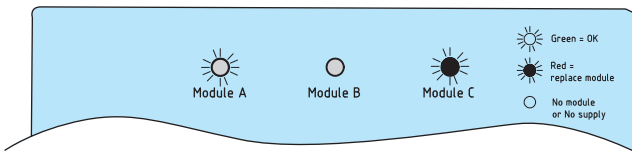
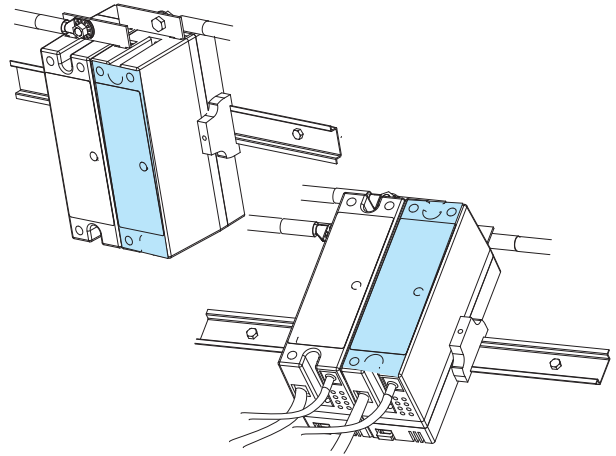
Use : 0°...+40°C / +32°...+104°F
Storage : 0°...+40°C / +32°...+104°F

AUXILIARY CONTACT



4- EXAMPLE

- OVR NE12 160 120 SP seems defective: "Module C" LED appears in red on the display and the alarm buzzer is on
- Turn off the buzzer (see page 7, "RESET ALARM")
- Check the disconnect fuses (see page 8, Item 1 - TROUBLESHOOTING)
- If fuses are OK, defective module is located at the right end, connected to J3 data wire (see page 8, Item 2 - DEFECTIVE MODULE IDENTIFICATION)
- Order the replacement module (see page 9, Item 3 - REPLACEMENT MODULE GUIDE, for correct catalog number reference)
- Replace the defective module according to instructions (see page 10, Item 5 - REMOVE THE DEFECTIVE MODULE and page 11, Item 6 - INSTALL THE REPLACEMENT MODULE)
- The unit is now ready to be put back in service (see page 11, Item 7 - STARTUP AND RESETTING)

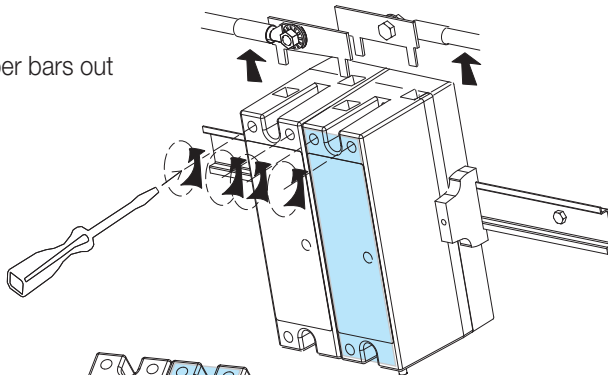


5- REMOVE THE DEFECTIVE MODULE

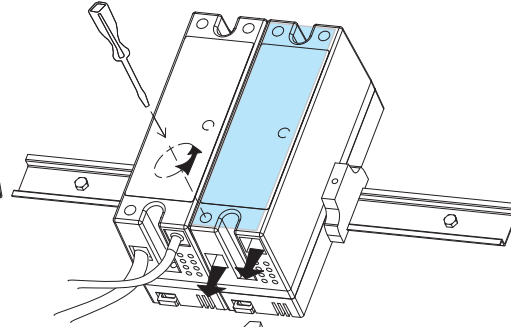
I- Loosen every screw on the upper part of all modules. Loosen until cages are fully open →



II- Push the copper bars out



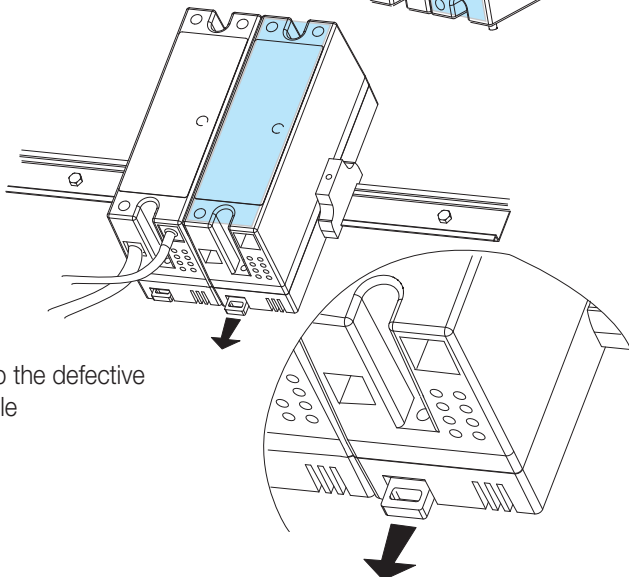
III- Loosen every screw on the lower part of the defective module only. Loosen until cages are fully open



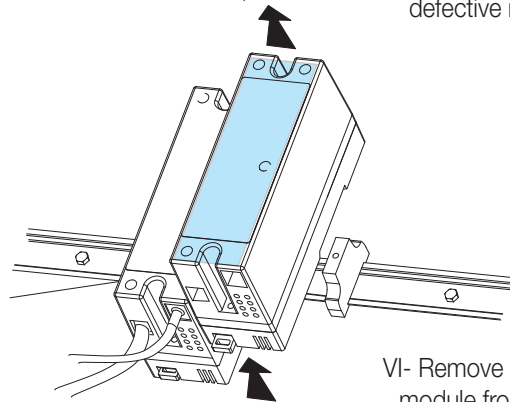
IV- Unplug the RJ connector and wire from the defective module base



V- Unclip the defective module

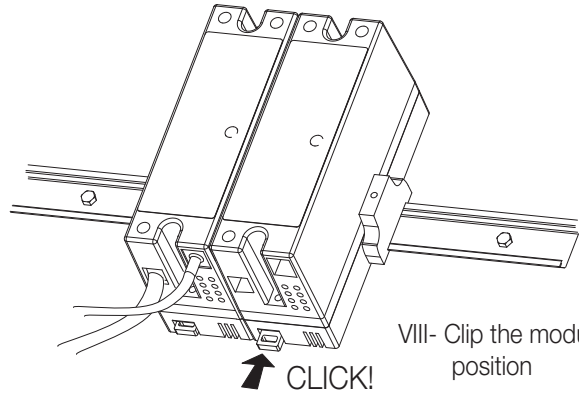
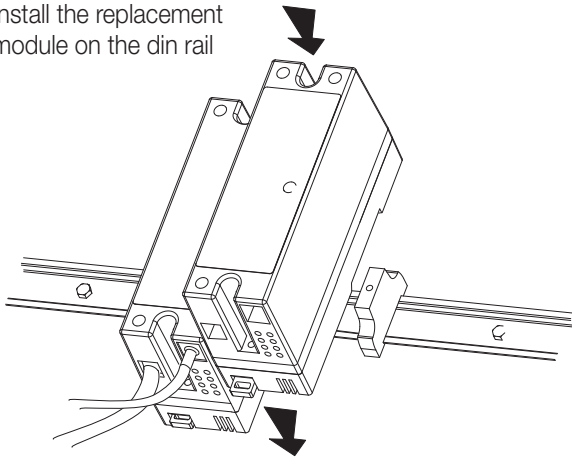


VI- Remove the defective module from the din rail



6 - INSTALL THE REPLACEMENT MODULE

VII- Install the replacement module on the din rail

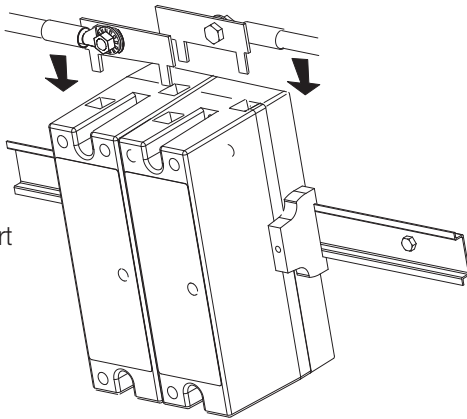


VIII- Clip the module in position

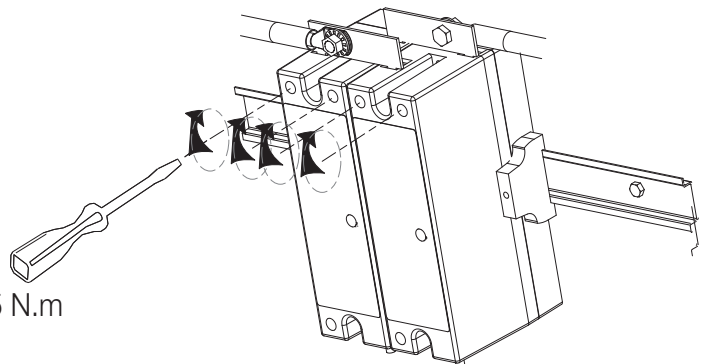
X- Tighten every screw on the upper part of all modules
Tighten until copper bars are firmly secured



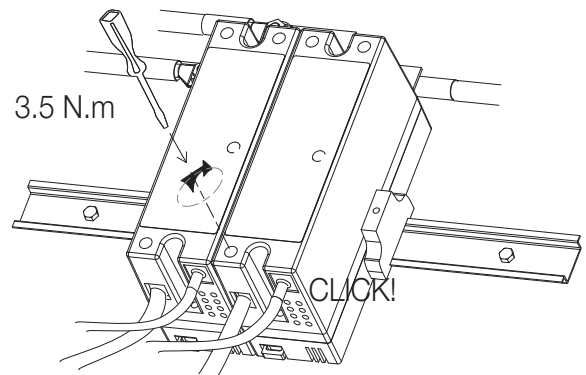
IX- Properly insert the copper bars into the module cages



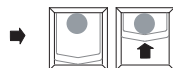
3.5 N.m



3.5 N.m



XI- Insert the wire in the module base cage and tighten firmly



XII- Plug the RJ connector into the module

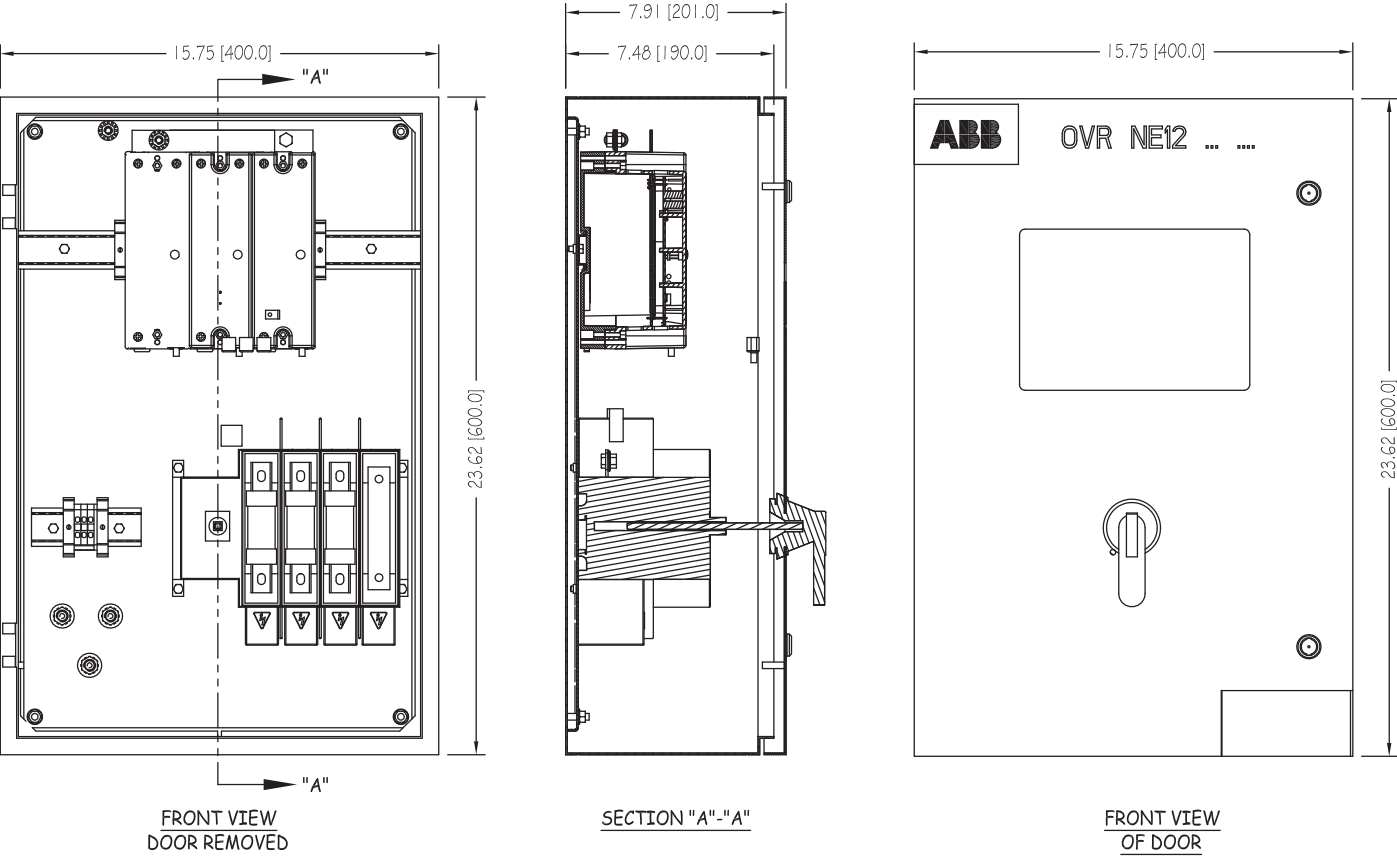
7 - STARTUP AND RESETTING

Check to ensure all connections are secure. Close the door, re-connect power and turn the handle to the ON position, energizing the unit. The display will start and automatically reset (main parameters have been saved at shut down). The OVR NE12 unit is fully operational if all module status LEDs are green.

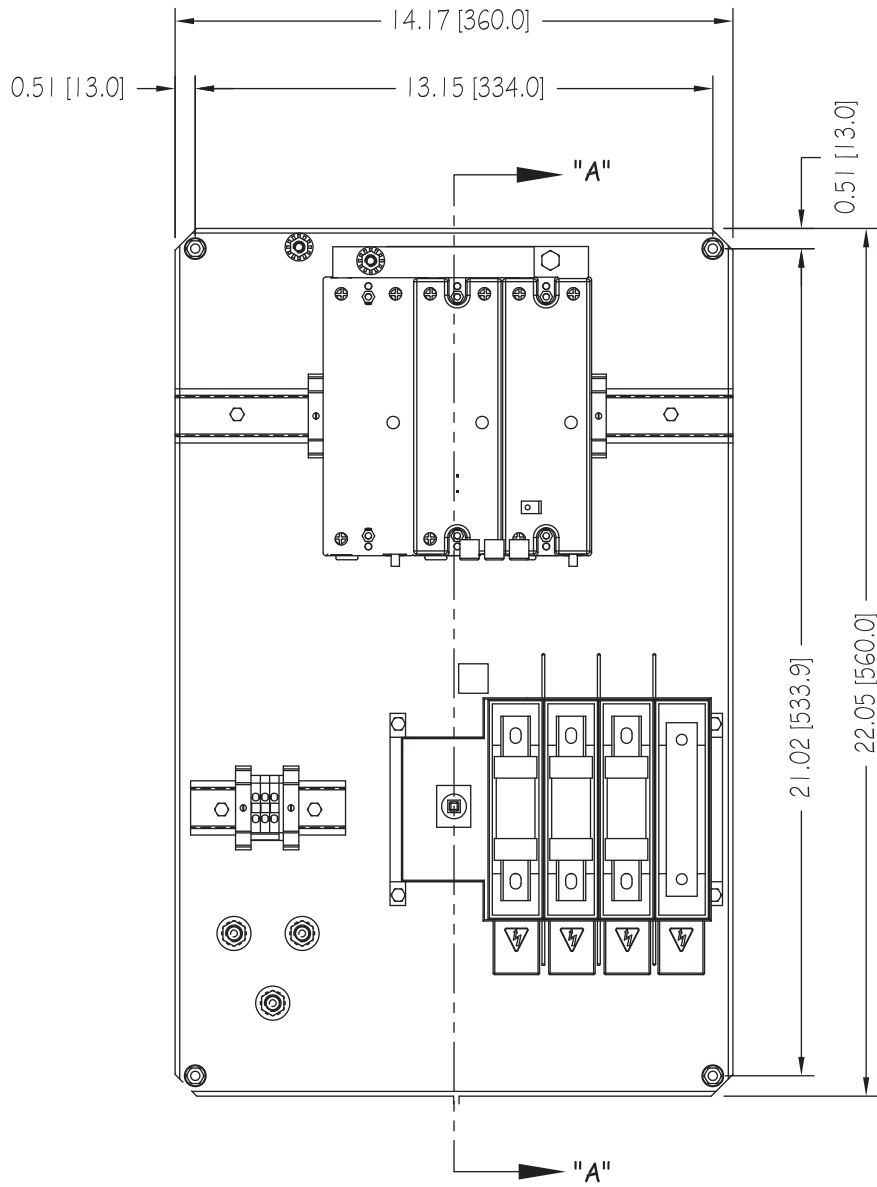
OVR NE12 Enclosed Surge Protective Devices - Type 2

Installation and operation manual

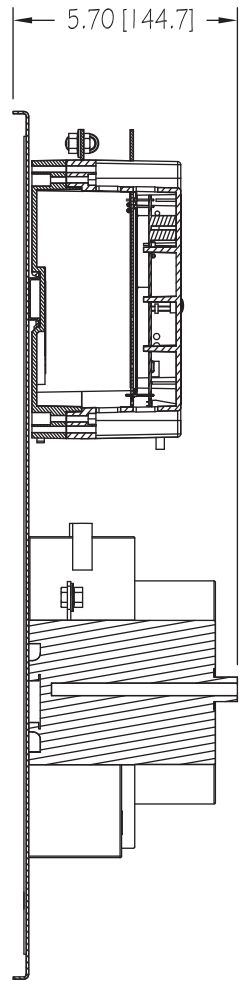
Approximate dimensions



Approximate dimensions



FRONT VIEW
Without enclosure



SECTION "A"-"A"

OVR NE12 Enclosed Surge Protective Devices - Type 2

Installation and operation manual

OVR NE12 product selector

OVR NE12 enclosed SPD

Catalog number	Description
OVRNE12160120SP	OVR NE12 Enclosed SPD, 240/120V Split Phase, 160kA
OVRNE12160120SPX	OVR NE12 Enclosed SPD, 240/120V Split Phase, 160kA, w/ Surge Counter
OVRNE12320120SP	OVR NE12 Enclosed SPD, 240/120V Split Phase, 320kA
OVRNE12320120SPX	OVR NE12 Enclosed SPD, 240/120V Split Phase, 320kA, w/ Surge Counter
OVRNE12160277Y	OVR NE12 Enclosed SPD, 480Y/277V, 160kA
OVRNE12160277YX	OVR NE12 Enclosed SPD, 480Y/277V, 160kA, w/ Surge Counter
OVRNE12320277Y	OVR NE12 Enclosed SPD, 480Y/277V, 320kA
OVRNE12320277YX	OVR NE12 Enclosed SPD, 480Y/277V, 320kA, w/ Surge Counter
OVRNE12160480D	OVR NE12 Enclosed SPD, 480V Delta, 160kA
OVRNE12160480DX	OVR NE12 Enclosed SPD, 480V Delta, 160kA, w/ Surge Counter
OVRNE12320480D	OVR NE12 Enclosed SPD, 480V Delta, 320kA
OVRNE12320480DX	OVR NE12 Enclosed SPD, 480V Delta, 320kA, w/ Surge Counter

Replacement power supply and MOV block

Catalog number	Description
OVR1N160120PS	OVR NE12 Power Supply, 240/120V Split Phase, 160kA
OVR1N160120	OVR NE12 MOV, 240/120V Split Phase, 160kA
OVR1N160277PS	OVR NE12 Power Supply, 480Y/277V, 160kA
OVR1N160277	OVR NE12 MOV, 480Y/277V, 160kA
OVR1N160480PS	OVR NE12 Power Supply, 480V Delta, 160kA
OVR1N160480	OVR NE12 MOV, 480V Delta, 160kA

Service parts and accessories

Catalog number	Description
OS100GJ03	3P Fusible Disconnect Switch - 480V Delta and 240/120V Split Phase
OS100GJ04N2	3P+N Fusible Disconnect Switch - 480Y/277V
OHB65J6	Enclosure Door Handle for Fusible Disconnect Switch
OSP6X150	Metal Shaft for Fusible Disconnect Switch
OZXA-24	Terminal Lug Kit
AA1206	Enclosure Mounting Brackets

Further information

Product inquiries

- Address any inquiries to your local ABB representative or ABB Low Voltage Products technical support (1-888-385-1221 Option 4 or lvps.support@us.abb.com).

Document library

- You can find manuals and other product documents in PDF format by going to www.abb.com and selecting Low Voltage Products and Systems. You can browse, or search for specific documents by name or document number.

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