

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

OVRHTP series SPDs



Guide to installation and assistance

WARNING

Do not HIPOT the SPD unit or the electrical system to which the SPD unit is connected without disconnecting the SPD unit's conductors, including phases, neutral and ground.

Ne procédez PAS à des ESSAIS DE RIGIDITÉ DIÉLECTRIQUE sur le SPD ou le système électrique auquel il est connecté sans déconnecter les conducteurs des SPD, y compris les phases, le neutre et la terre.

WARNING

The SPD warranty is voided if the unit is damaged as a result of improper installation. Improper installation or misapplication may result in serious personal injury or damage to the electrical system. Read the complete installation instructions before proceeding with installation.

La garantie du SPD est annulée si l'appareil est endommagé à la suite d'une mauvaise installation. Une mauvaise installation, ou utilisation, peut entraîner des blessures graves ou des dégâts au système électrique. Lisez les instructions d'installation en intégralité avant de procéder à l'installation.

WARNING

The equipment covered by these instructions should be installed and serviced only by competent qualified personnel utilizing proper safety practices and procedures. These instructions are written for such personnel and are not intended as a substitute for adequate training and experience in safe procedures for this type of equipment

L'équipement couvert par ces instructions doit être installé et entretenu uniquement par un personnel compétent et qualifié, utilisant des pratiques et des procédures de sécurité appropriées. Ces instructions sont rédigées à l'intention de ce personnel et ne sauraient se substituer à une formation adéquate et à une expérience des procédures de sécurité pour ce type d'équipement

WARNING

Remove all power to the electrical panel before installing or servicing the SPD. All work must be performed by licensed and qualified personnel. Follow applicable electrical codes and regulations for the country/location in which the unit is being used.

Coupez l'alimentation du panneau électrique avant d'installer ou de procéder à l'entretien du SPD. Tous les travaux doivent être effectués par un personnel qualifié et agréé. Respectez les codes et réglementations électriques en vigueur dans le pays / lieu où l'appareil est utilisé.

CAUTION

Ungrounded power systems are inherently unstable and can produce excessively high line-to-ground voltages during certain fault conditions. During these fault conditions any electrical equipment, including an SPD, may be subjected to voltages, which exceed their designed ratings. This information is being provided to the user so that an informed decision can be made before installing any electrical equipment on an ungrounded power system.

Les réseaux électriques non mis à la terre sont intrinsèquement instables et peuvent produire des tensions ligne-terre excessivement élevées dans certaines conditions de défaut. Dans ces conditions de défaut, tout équipement électrique, y compris un SPD, peut être soumis à des tensions qui dépassent les valeurs nominales prévues. Cette information est fournie à l'utilisateur afin qu'il puisse prendre une décision réfléchie avant d'installer un équipement électrique sur un réseau électrique non mis à la terre.


WARNING

Check to ensure that a proper bond is installed between neutral and ground at the transformer upstream from all 3-phase wye, 3-phase high-leg or 2-phase SPD devices. If the transformer is not accessible, check the main service disconnect/panel for the NG bond. Lack of a proper bond may damage the SPD and void the warranty. Failure to provide this bond, as required per article 250.30 of the National Electrical Code, can result in elevated phase-to-ground source voltage potentials. These voltages can cause damage to electrical equipment as well as safety hazards including fire, electrical shock, serious injury or death.

Vérifiez qu'une liaison correcte est installée entre le neutre et la terre au niveau du transformateur en amont de tous les SPD triphasés en étoile, triphasés en triangle ou biphasés. Si le transformateur n'est pas accessible, vérifiez la liaison NG sur le sectionneur / panneau de service principal. L'absence d'une liaison appropriée peut endommager le SPD et annuler la garantie. L'absence de cette liaison, telle que requise par l'article 250.30 du Code national de l'électricité, peut entraîner des potentiels de tension élevés entre la phase et la terre. Ces tensions peuvent causer des dégâts aux équipements électriques ainsi que des risques en matière de sécurité, notamment des incendies, des chocs électriques, des blessures graves ou la mort.


WARNING

Installation by persons with electrotechnical expertise only.

WARNING!

Installation nur durch elektrotechnische Fachkraft.

AVERTISSEMENT!

Installation uniquement par des personnes qualifiées électrotechnique.

ADVERTENCIA!

La instalación deberá ser realizada únicamente por electricistas especializados.

Pre-installation checklist



Confirm that the voltage(s) and service configuration shown on the OVRHTP series product label are consistent with the voltage and service configuration of the facility. The SPD model number can be found on the UL label affixed to the SPD enclosure. The SPD selection can be verified by comparing the model number to the correct electrical system.

Sample model number scheme

Example of an SPD model number: OVRHTP1001201PPB1.

Please note if the model number ends with T2 the unit is compliant with UL 1283.

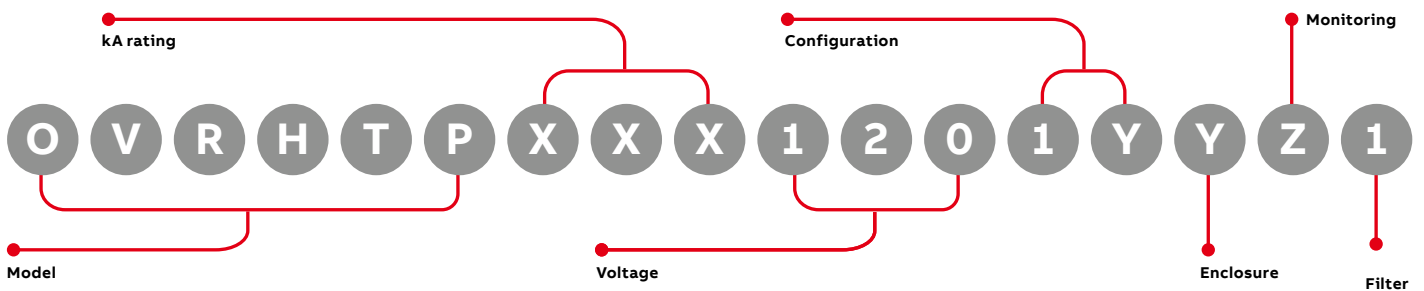


Table 1a: Operating voltage ranges

Model number	Unit voltages (V)	L-N voltage range (V)	L-L operating voltage range (V)	Configuration
OVRHTPXXX201PYZ1	120	108-132	-	1-phase, 2-wire + ground
OVRHTPXXX1271PYZ1	127	114-139	-	1-phase, 2-wire + ground
OVRHTPXXX2201PYZ1	220	198-242	-	1-phase, 2-wire + ground
OVRHTPXXX2301PYZ1	230	207-253	-	1-phase, 2-wire + ground
OVRHTPXXX2401PYZ1	240	216-264	-	1-phase, 2-wire + ground
OVRHTPXXX2771PYZ1	277	249-304	-	1-phase, 2-wire + ground
OVRHTPXXX3471PYZ1	347	312-381	-	1-phase, 2-wire + ground
OVRHTPXXX4801PYZ1	480	432-528	-	1-phase, 2-wire + ground
OVRHTPXXX1202SYZ1	240/120	108-132	216-264	2-phase, 3-wire + ground
OVRHTPXXX2402SYZ1	480/240	216-264	432-528	2-phase, 3-wire + ground
OVRHTPXXX1203HYZ1	240Δ/120	108-132	216-264	3-phase high-leg, 4-wire + ground
OVRHTPXXX1203YZ1	208Y/120	108-132	187-229	3-phase wye, 4-wire + ground
OVRHTPXXX2203YZ1	380Y/220	198-242	342-418	3-phase wye, 4-wire + ground
OVRHTPXXX2303YZ1	400Y/230	207-253	360-440	3-phase wye, 4-wire + ground
OVRHTPXXX2403YZ1	415Y/240	216-264	374-457	3-phase wye, 4-wire + ground
OVRHTPXXX2773YZ1	480Y/277	249-305	432-528	3-phase wye, 4-wire + ground
OVRHTPXXX3473YZ1	600Y/347	312-381	540-660	3-phase wye, 4-wire + ground
OVRHTPXXX2083DYZ1	208	-	187-228	3-phase Delta, 3-wire + ground
OVRHTPXXX2403DYZ1	240	-	216-264	3-phase Delta, 3-wire + ground
OVRHTPXXX4153DYZ1	415	-	373-456	3-phase Delta, 3-wire + ground
OVRHTPXXX4803DYZ1	480	-	432-528	3-phase Delta, 3-wire + ground
OVRHTPXXX6003DYZ1	600	-	540-660	3-phase Delta, 3-wire + ground

XXX is 60, 80, 100, 120, 160, 200, 240, 300 or 400 kA per phase

Y = 4 or P

4 = Metal

P = Polycarbonate

Z = B, U or UE

B = Standard monitoring

U = Advanced monitoring

UE = Advanced monitoring and surge counter

Table 1b: Operating voltage ranges

Model number	Unit voltages (V)	L-G voltage range (V)	Configuration
OVRHTPXXX230IPYZ1	230	207–253	1-phase, 2-wire + ground (for TNC grounding systems)
OVRHTPXXX2301PJYZ1	230	207–253	1-phase, 2-wire + ground (for TNS grounding systems)
OVRHTPXXX2301PKYZ1	230	312–381	1-phase, 2-wire + ground (for IT grounding systems)
OVRHTPXXX2301PLYZ1	230	249–305	1-phase, 2-wire + ground (for TT grounding systems)

XXX is 60, 80, 100, 120, 160, 200, 240, 300 or 400 kA per phase

Y = 4 or P

4 = Metal

P = Polycarbonate

Z = B, U or UE

B = Standard monitoring

U = Advanced monitoring

UE = Advanced monitoring and surge counter



Confirm that the environmental conditions are consistent with the following ranges:

- Ambient temperatures: Between -35 to 70 °C (-31 to 158 °F).
- Relative humidity: Between 5% and 95% non-condensing.
- Altitude: Less than 4000 m (13,000 feet).

Service configurations

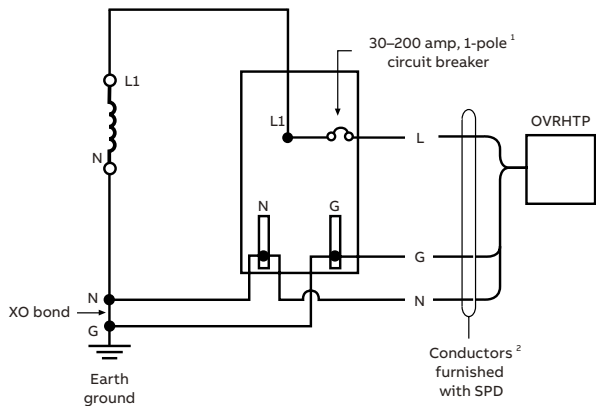


Figure 1: 1-phase, 2-wire

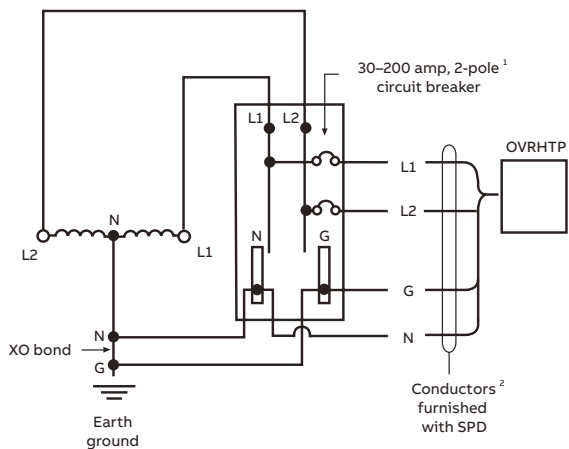


Figure 2: 2-phase, 3-wire

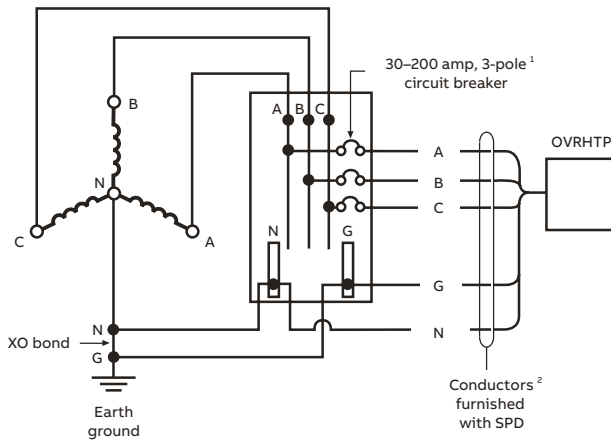


Figure 3: 3-phase wye, 4-wire

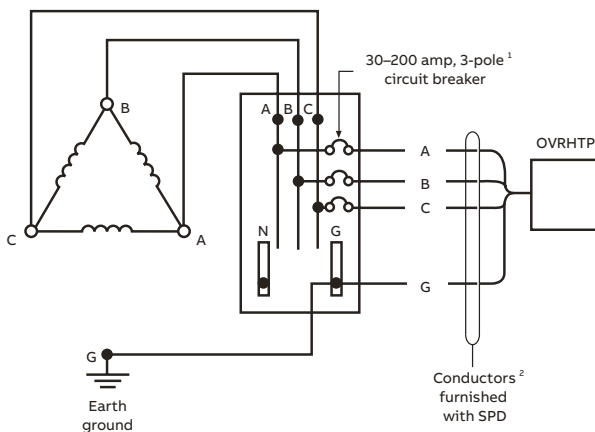


Figure 4: 3-phase delta, 3-wire

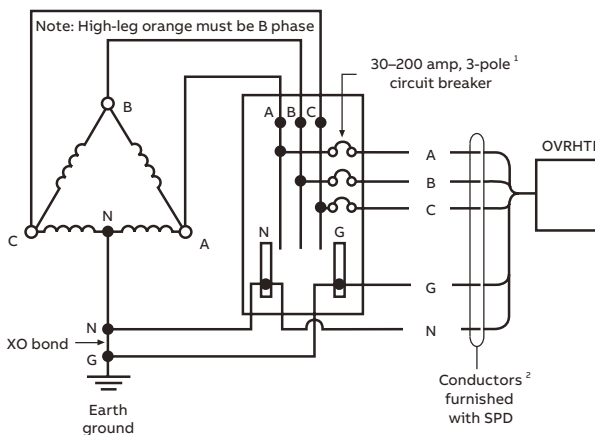


Figure 5: 3-phase high-leg delta, 4-wire

¹Please refer to the "OCPD" chart to determine if the SPD requires an upstream breaker/fuse.

²OVRHTP 60 through 100 kA are furnished with #10 AWG leads. OVRHTP 120 through 200 kA are furnished with #6 AWG leads. 200 through 400 kA are furnished with #10-#4 AWG Lugs. Additionally, units with a ML, PL, or SL in part number.

Conductors

NOTICE

The SPD unit's performance will be degraded if the conductors are (a) too long, (b) are of too small a wire gauge, (c) have too many bends or (d) have sharp bends.

Les performances du SPD seront dégradées si les conducteurs sont (a) trop longs, (b) d'un calibre de fil trop faible, (c) présentent trop de courbures ou (d) ont des courbures trop prononcées.

The factors listed above should be addressed during the design of an installation to reserve a suitable place for the OVRHTP series unit next to its point of connection to the electrical system. The selected mounting location should allow for the shortest possible conductor runs and a direct route with a minimum of bends. If bends are required, they should be sweeping bends. Do not make sharp 90° bends for appearance purposes because they will decrease the effectiveness of the OVRHTP series unit.

Binding or twisting conductors together using cable ties or electrical tape improves the protection performance of the device.

Wiring color installation guide

Voltage (V)	A, L1	B, L2	C, L1	Neutral	Ground
120	–	Black	–	White	Green/yellow
127	–	Black	–	White	Green/yellow
220	–	Brown	–	Blue	Green/yellow
230	–	Brown	–	Blue	Green/yellow
240	–	Black	–	White	Green/yellow
277	–	Black	–	White	Green/yellow
347	–	Black	–	White	Green/yellow
480	–	Black	–	White	Green/yellow
240/120	Black	–	Red	White	Green/yellow
480/240	Brown	–	Orange	White	Green/yellow
208Y/120	Black	Red	Blue	White	Green/yellow
380Y/220	Black	Brown	Gray	Blue	Green/yellow
400Y/230	Black	Brown	Gray	Blue	Green/yellow
415Y/240	Brown	Orange	Yellow	White	Green/yellow
480Y/277	Brown	Orange	Yellow	White	Green/yellow
600Y/347	Black (A)	Black (B)	Black (C)	White	Green/yellow
240Δ /120	Black	Orange (HL)	Blue	White	Green/yellow
208	Black	Red	Blue	–	Green/yellow
240	Black	Red	Blue	–	Green/yellow
380, 400, 415	Black	Brown	Gray	–	Green/yellow
480	Brown	Orange	Yellow	–	Green/yellow
600	Black (A)	Black (B)	Black (C)	–	Green/yellow
230 (for TNC grounding systems)	Brown	–	–	Blue	Green/yellow
230 (for TNS grounding systems)	Brown	–	–	Blue	Green/yellow
230 (for IT grounding systems)	Brown	–	–	Blue	Green/yellow
230 (for TT grounding systems)	Brown	–	–	Blue	Green/yellow

Upstream overcurrent protection device (OCPD)

The OVRHTP series units can either be Type 1 or Type 2. Please refer to the SPD types chart to determine the SPD type for the unit.

SPD types

Country SPD is installed in	Polycarbonate enclosure		Metal and stainless steel enclosure	
	UL 1283	Not UL 1283	UL 1283	Not UL 1283
United States and all other countries	SPD Type 2	SPD Type 1	SPD Type 2	SPD Type 1
Canada	SPD Type 2	SPD Type 1	SPD Type 2	SPD Type 2

The OVRHTP series unit is a one-port SPD and is to be connected in parallel with the electrical system. It may be connected via a circuit breaker, molded case switch, fused switch, or connected directly to the bus of the panelboard or switchboard (local and national electric codes take precedence). If direct bus connection is used, ABB recommends installing the OVRHTP series unit behind a disconnect switch or other disconnecting means for ease of serviceability.

If the unit is Type 2, the following OCPD is recommended:

Si l'unité est de type 2, il est recommandé d'utiliser le dispositif suivant de protection contre les surintensités:

kA	United States and all other countries		Canada
	États-Unis et tous les autres pays		
60–100	30 A max.		30 A max.
120–200	100 A max.		50 A max.
240–400	200 A max.		90 A max.

Mounting

Optional flush-mount plate can be purchased for flush-mount installation of the OVRHTP 60–200 kA pre-wired units. It is assumed that the facing layer of wall board has not been installed yet.

First, the enclosure should be mounted to the rear wall or studs with the appropriate hardware. It should be positioned so that when the next steps are followed, the enclosure will project through the wall by the desired amount. Next, the wall board should be installed. The wall board should be installed over the SPD, so that the SPD projects through the wall board.

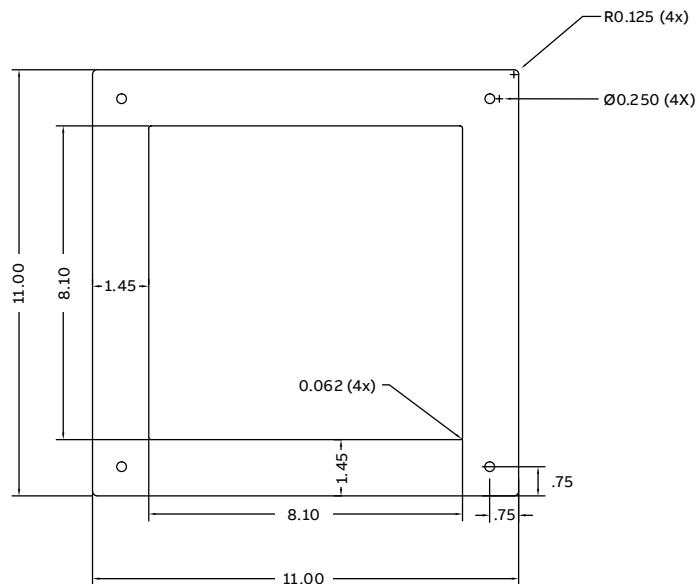


CAUTION

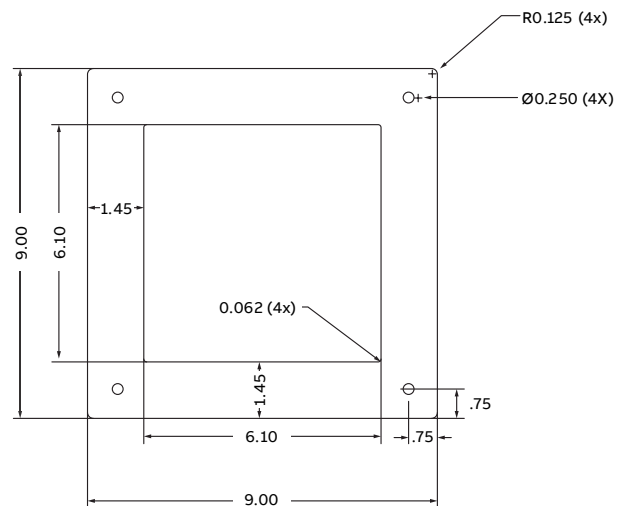
If the SPD has become energized, it must be de-energized now. Appropriate high voltage safety procedures should be followed here.

The lid of the enclosure must be unscrewed. It is generally not necessary to disconnect the monitor cables from the lid. It is permissible to allow the lid dangle on its ground lead, so long as the lid is gently lowered into place. The lid should be maneuvered through the rectangular hole in the wall board. The flush-mount plate (FMP) is placed over the SPD enclosure.

Mark the mounting hole locations through the 4 holes in the FMP. Remove the FMP. Drill holes at the marked locations. (These should be wide enough for the wall anchors to fit snugly.) Push the wall anchors into the holes. Tighten the screws that were in the wall anchors, until the wall anchors expand against the wall board. Remove and discard the 4 screws. (The anchors will remain in place.) Place the FMP over the SPD enclosure again. Fasten the FMP to the anchors with the (nicer looking) truss mount screws. Fasten the lid back onto the enclosure body. When fastening the lid, be careful that cables do not get pinched! **Now, power may be restored to the SPD.**



120–200 kA pre-wired units



60–100 kA pre-wired units

Electrical connections



CAUTION

Prior to installation, ensure the system configuration and voltage is equivalent to the SPD unit being installed.

Avant l'installation, assurez-vous que la configuration et la tension du système sont équivalentes à celles du SPD en cours d'installation.

*The 3-wire delta + ground SPD units do not have a neutral conductor.

*Les appareils triphasés en triangle + terre n'ont pas de conducteur neutre.

Connecting form C dry contacts

Units supplied with form C dry relay contact provide the means for customer-supplied remote status indication that operates in tandem with the SPD's inherent LED status indication. These contacts are for connection to a user-provided remote alarm and monitoring circuit. The relay contacts are rated maximum 1 A/30 V DC, 6 A/125 V AC. The form C contacts come pre-wired with 914 mm (36 in.) of #20 AWG conductors.

When input power is present on all phases, terminals "NO" black (normally open) and "COM" white (common) are an open circuit, and terminals "NC" red (normally closed) and "COM" are a closed circuit. The contacts change state when the unit has encountered failure to one or more phases.

The installer must provide the appropriate raceway and wiring for the monitoring circuit, observing the restrictions and conduit openings illustrated in an earlier section of this manual.

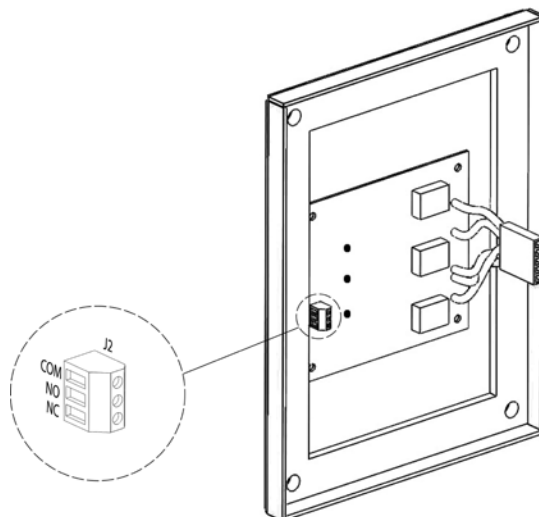
Remote monitoring

Use butt splices within the panelboard to connect the form C leads to the user's monitoring circuits. Alternatively, install a junction box between the OVRHTP series and the panelboard to connect form C leads to user's monitoring circuits. If the form C contacts are not used, user has the option of either cutting off the leads or coiling up the leads. Consult applicable local codes to ensure proper installation.

For these models, the form C contacts must be wired by the installer.

See terminal block cover rear view diagram for the form C contact configuration and terminal location on the monitor board. The annotations on the diagram match the markings on the terminal block.

The installer must route the monitoring conductors to the terminal blocks on the main monitoring board. Tighten screws on terminals to 0.4 Nm (3.5 in-lb). This terminal block will accept wire sizes #28 AWG–#16 AWG. #20–#18 AWG is recommended.



Terminal block cover rear view
Contacts shown in energized normal state (no fault condition).

Verification and power up

WARNING

The cover of the OVRHTP series unit along with its associated cabling must be installed prior to applying power. The monitoring harness contains line voltage when power is applied to the unit.

Le couvercle du parafoudre et le câblage associé doivent être installés avant la mise sous tension. Le faisceau de surveillance contient la tension de ligne lors de la mise sous tension de l'unité.

Apply power to the SPD by closing the OCPD or switch feeding the suppressor.

Mettez sous tension le parafoudre en fermant le dispositif de protection contre les surintensités ou l'interrupteur qui alimente le parasurtenseur.

Upon energization of the SPD, if any of the LED(s) or alarms indicates an abnormal condition, power should promptly be disconnected from the SPD. The electrical system should be inspected and the pre-installation requirements should be validated. Do not attempt to leave power applied to the SPD, or re-energize the SPD in the event of an alarm condition. Please contact your local ABB representative for further assistance.

Lors de la mise sous tension du parafoudre, si l'une des LED ou des alarmes indique une anomalie, l'alimentation doit être rapidement déconnectée du parafoudre. Le système électrique doit être inspecté et les exigences préalables à l'installation doivent être validées. N'essayez pas de laisser le parafoudre sous tension ou de le remettre sous tension en cas d'alarme. Veuillez contacter votre représentant ABB local pour obtenir de l'aide.

Standard monitoring package

Verify that the indicating LED(s) are illuminated. The indicating lights extinguish only upon failure of one or more phases (indicating an alarm condition).

Advanced monitoring package

Verify that all “phase protection status” indicating lights are illuminated. The “service required” indicating light illuminates only upon failure of one or more phases. Audible alarm should not operate under normal conditions. The audible alarm can be “muted” by pressing the “alarm ON/OFF” button, which subsequently will illuminate the “alarm silenced” light. Pressing the “alarm ON/OFF” button again will enable the alarm.

Units with surge counter

The number of surges detected by the SPD is displayed on an eight-digit LCD display on the front of the door. The LCD counter is battery backed to maintain the number of surges even during a power loss. Press the button on the lid to reset the surge count.

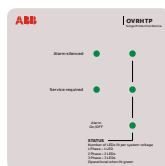
NOTICE

Pressing the “Alarm ON/OFF” button when the alarm has not triggered will prevent the audible alarm from sounding during a failure.

En appuyant sur le bouton « Alarm ON/OFF » lorsque l'alarme ne s'est pas déclenchée, vous empêchez l'alarme sonore de retentir en cas de panne.



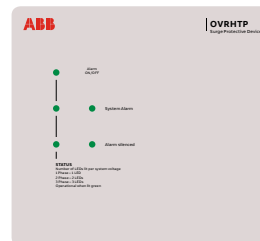
60–100 kA enclosure with standard monitoring



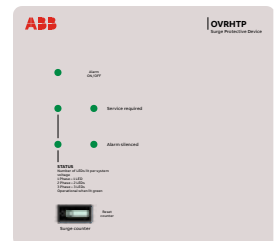
60–100 kA enclosure with advanced monitoring



120–400 kA enclosure with standard monitoring



120–400 kA enclosure with advanced monitoring



120–400 kA enclosure with advanced monitoring and surge counter

Serviceability

ABB does not provide a specific schedule for preventative maintenance as conditions will vary based on location and the environmental factors presented at each installation site. However, periodic inspections should be scheduled to verify that the SPD does not indicate a failure mode. Inspections should also be made to check the integrity of the electrical supply connections to the SPD to ensure continued reliable performance.

The unit's heavy-duty construction is designed to provide years of uninterrupted service.

The unit contains no serviceable parts.

L'unité ne contient aucune pièce réparable.

NOTICE

In the event of an SPD alarm condition, do not attempt to dis-assemble the SPD to replace fusing or other components. The SPD contains thermally protected MOVs that will only open when the SPD has failed in a non-serviceable condition. The entire SPD must be replaced. Verify that the input power feeding the SPD unit is energized using a voltage tester.

En cas de condition d'alarme du SPD, n'essayez pas de démonter le SPD pour remplacer les fusibles ou d'autres composants. Le SPD contient des MOV protégés thermiquement qui ne s'ouvrent que lorsque le SPD tombe en panne et ne fonctionne plus. L'ensemble du SPD doit être remplacé. Vérifiez que la puissance d'entrée qui alimente le SPD est sous tension à l'aide d'un testeur de tension.

Troubleshooting

LED(s) indication

Please contact ABB Technical Support if one of the following three conditions occur:

1. One or more phase protection status indicating lights are off.
2. System alarm indicating light is on.
3. Form C alarm contacts have changed state.

Standards and listings

The following standards and listings apply to the OVRHTP series product line:

- UL Listed 1449 5th Edition for Type 1 and Type 2 SPD applications, cUL and UL 1283
- Type 1 SPDs meet requirements for UL 96A
- Compliant to IEEE C62.41.1-2002, C62.41.2-2002 and C62.45-2002
- NFPA 70 [NEC], Article 242, Part II
- RoHS compliant



Warranty period

OVRHTP series — 10 years



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