

NOVARIS

Application Note
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REMOTE ALARM CONNECTIONS FOR NOVARIS SPD'S

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Introduction

This document provides guidance in how to use the internal alarm contacts that are options on many Novaris SPDs. These contacts are available via terminals or a small plug so that the status of the SPDs can be monitored by a remote system such as the Novaris Surge Indicator Panel (SIP), a building management system or a PLC/SCADA system.

Details of the Novaris SIP's can be found in datasheets NDS21.1464 and NDS21.1466.

Description

Three general categories of alarm contacts are utilised as detailed below for the majority of Novaris products.

1. A changeover voltage free contact system following the IEC numbering convention driven by electronic systems inside the SPD. Normally used on power SPDs.
2. A single normally closed voltage free contact operated by a fuse and mechanical system, normally used on signal line SPDs.
3. A single voltage free contact system operated by a thermal overload detector inside the SPD. This system is used exclusively on the IDD2 range of power system SPDs.

There is also a range of Novaris Modular Power Products (MPP) with changeover voltage free alarm contacts that are detailed separately in a later section of this document as they have subtle operational differences to those detailed in (1.)

The electronic alarms (1) monitor the state of the internal components inside the SPD as well as status of the connected power supply. This means the alarms can also provide the status of any protecting overcurrent protection devices such as Novaris Surge Circuit Breaker (SCB), Miniature Circuit Breakers (MCB) or fuses. In this way the alarms can indicate if the power is applied to the device as well as if there is any internal component damage due to surges or other faults.

The mechanical alarm (2) monitors the status of an internal safety fuse in the SL2 range of SPD products. If the SPD is exposed to a common mode surge current greater than its rating the internal fuse ruptures releasing a mechanical flag and opening the alarm contact. The ruptured fuse breaks the earth connection to the SPD providing a fail-safe isolation function.

The alarms (3) are triggered if the internal temperature of the SPD components exceeds a pre-set limit. The alarm is single operation, once operated it will not self reset.

Changeover Contact System

This system is electronic and is used on all the power SPD products as an option.

The external connections to this voltage free alarm are made via a small plug and socket as shown in figure 1 below.



Figure 1. Remote Alarm Connection Plug and Terminal Numbering

The use of the plug with screw terminals allows the circuits to be tested without disconnection of any wiring.

The diagram in figure 2 below shows the arrangement of the voltage free contacts, how they operate and how to connect them to get the desired function into the monitoring system. In this context the term “Normally” refers to the status when the SPD is not powered up.

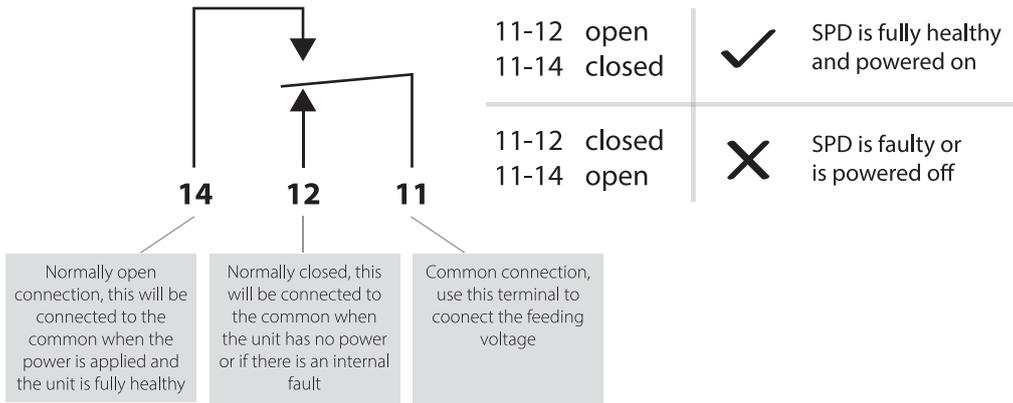


Figure 2. Alarm Contact Details

The most common connection method is the failsafe one where the alarm circuit is closed when the unit is healthy and powered up. This means terminals 11 and 14 are used. This connection method will also detect any breaks in the external alarm system wiring as well as issues in the SPD itself.

Electrical Specifications of Alarm Interface

This system is electronic and is used on all the power SPD products as an option. The external connections to this voltage free alarm are made via a small plug and socket as shown in figure 1 below.

Isolation to internal circuits	4000Vrms
Isolation between open contacts	1000Vrms
Maximum contact switching voltage	250V AC, 125V DC
Maximum contact current AC	8A
Maximum contact current DC	5A
Contact resistance	≤30mΩ

Single Contact System

The single contact system is also voltage free and is fitted to the SL2 range of products as well as the IDD2 range of power protectors. There are different methods of connections for the two product ranges as shown in the following sections.

SL2 Products

The connections are made via the DIN rail mounted base as shown in figure 3 below.

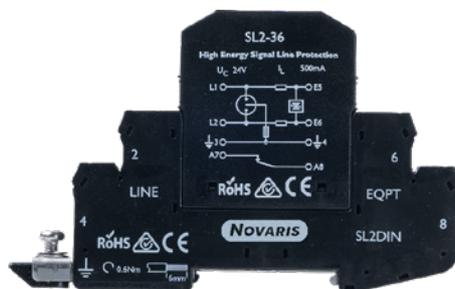


Figure 3. Typical SL2 Showing Alarm Connections

The detection circuits are connected between terminals 7 and 8 and the circuit is continuous, normally closed, when the SL2 surge cassette is healthy. When the surge cassette is removed the alarm circuit is interrupted.

If an internal fault or surge damage triggers the internal fuse to rupture, the alarm contact opens permanently, and the surge cassette will require replacement.

Electrical Specifications of Alarm Interface

Isolation to internal circuits	100Vrms
Maximum operating voltage	24V DC
Maximum current DC	10mA
Contact resistance	≤500mΩ

IDD2 Products



Figure 4. Alarm Connections on IDD2 Products

The alarm circuit is a single normally closed voltage free contact that is closed when the SPD is healthy. If the unit suffers overheating this contact will open permanently and the SPD will need to be replaced. The operation of the alarm function is not affected by the status of the connected power.

Electrical Specifications of Alarm Interface

Isolation to internal circuits	4000Vrms
Isolation between open contacts	1000Vrms
Maximum contact switching voltage	250V AC, 100V DC
Maximum contact current AC	2A
Maximum contact current DC	1.4A
Contact resistance	≤200mΩ

Novaris Modular Power Products

The alarm connections to these products are made via a 3 way terminal block that plugs into the unit. Some units have a single plug, others have more than one.

Figure 5 below shows a typical example of the connection terminal block.



Figure 5. Example of Alarm Connections for Modular Power Protector SPDs

The connection details of the changeover contacts are shown in Figure 6 below.

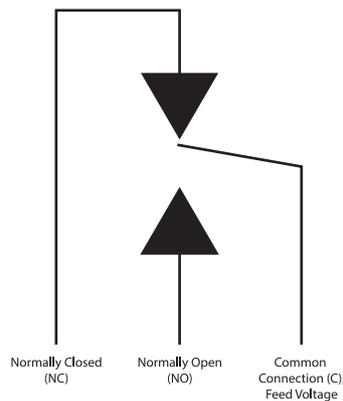


Figure 6. Novaris MPP Alarm Connection Details

When the SPD is in the healthy condition the alarm circuit is continuous between the Common connection and the Normally closed connection. If the SPD suffers damage or overheats this circuit will open and a circuit established between the Common connection and the Normally open connection.

The power supply to the SPD does not affect the operation of the alarm circuits.

The most common connection method is the failsafe one where the alarm circuit is closed when the unit is healthy. This means terminals C and NC are used. This connection method will also detect any breaks in the external alarm system wiring as well as issues in the SPD itself.

The Novaris MPP range includes the SG, SDPV, SDH and NSP range of SPDs.

Electrical Specifications of Alarm Interface

Isolation to internal circuits	4000Vrms
Isolation between open contacts	500Vrms
Maximum contact switching voltage	250V AC, 125V DC
Maximum contact current AC	0.5A@250V
Maximum contact current DC	0.2A@125V
Contact resistance	≤50mΩ

Installation

The alarm circuits should be wired using typical stranded signal type wire and this kept as far away from any AC power wiring as practical to avoid induction into the monitoring system, Novaris recommends a minimum wire cross section of 0.5mm².

The alarm circuits can be connected individually, or several SPDs connected in series to give an overall 'group' alarm where this is more economic.

Maintenance

Novaris alarm circuits are virtually maintenance free. Maintenance is limited to routine visual inspections and periodic checking of the tightness of the terminals.

If required by the monitoring system maintenance schedule, then the circuits can be operated by removing the plug or surge cassette as appropriate to test the system response.