

# DeltaV SIS™ Conditioning Components



The DeltaV SIS™ conditioning components allow you to use the DeltaV SIS system with a variety of different field signal requirements.

- Enables diagnostics of field wiring all the way to a discrete-input end device
- Provides diagnostics of field wiring all the way to a discrete-output end device with high inductance
- Allows for higher current and voltage ratings for discrete outputs
- Delivers higher voltage ratings for discrete inputs
- Enables non-incendive discrete outputs

## Introduction

In most cases, DeltaV SIS™ will connect to either 4 - 20 mA analog signal devices or discrete I/O devices rated at up to 500 mA per channel. However, there will be some output signals that require higher currents and in some applications non-incendive outputs are required. For applications that simply need high current, the DeltaV solution offers the SIS Relay module. For applications where the current to the final device needs to be limited for non-incendive ratings, there is the current limiter module. Using the RC compensator module ensures that the monitoring of field wiring is performed correctly when using inductive loads. Using the SLS End of Line module ensures that monitoring of field wiring is performed correctly when using discrete switches.

## DeltaV SIS Conditioning Components

### Benefits

**Enables diagnostics of field wiring all the way to a discrete-input end device:** Many safety systems monitor the field wiring from their I/O modules. If the I/O channel is connected to a contact, then the monitoring requires a series and parallel resistor at the contact in order to function. The *SLS End of Line Resistance Module* allows DeltaV SIS' automatic testing of field wiring to work with field contacts.

**Provides diagnostics of field wiring all the way to a discrete-output end device with high inductance:** Many safety systems monitor the field wiring from their I/O modules. However, if the I/O channel is connected to an inductive load, such as a relay or solenoid, then the monitoring may give a false indication when the load is de-energized due to inductive kickback. The *R-C Compensator Module* allows DeltaV SIS' automatic testing of field wiring to work with inductive loads.

**Allows for higher voltage ratings for discrete inputs:** For applications that require higher voltage inputs than the DeltaV SIS system natively supports, an external relay is often required. The *Voltage Monitor* meets the requirements for suitability for SIL 3 applications with testability in situ.

**Delivers higher current and voltage ratings for discrete outputs:** For applications that require switching higher current than the DeltaV SIS system natively supports or for switching higher voltages, a safety relay is often required. However, the safety relay needs to be proof tested at some interval as determined by the SIL requirement. The *SIS Relay* meets the requirements for suitability for SIL 3 applications with testability in situ.

**Enables non-incendive discrete outputs:** Many safety systems applications are deployed with non-incendive I/O. The *SIS Current Limiter Module* allows the DO to be energy-limited to meet the requirements of a non-incendive installation.

### Product Description

#### SIS Relay Module

The SIS Relay module can be used with DeltaV SIS to switch up to 2.5A at 250V AC for safety applications. It opens contacts for field power when de-energized. The SIS Relay module contains three relays from different manufacturers.

A relay coil is energized for all three relays in normal operation. If a demand occurs, the SLS removes the power from the coil for all three relays at the same time. Each relay can be proof-tested in the field.



SIS Relay Module.

SIS Relay Module	
Item	Specifications
Input Power Rating	70.0 mA @24V DC ± 20%
Relay Current Rating	2.5 A @ 250V AC 2.5 A @ 30V DC
Mounting	Horizontal or vertical Din rail
Dimensions	Height 100.0 mm (4 in.) Width 22.5 mm (0.9 in.) Depth 114.0 mm (4.5 in.)
Functional Safety Certification	IEC 61508 SIL3
Hazardous Area Certifications	Class I Div. 2 GP A,B,C,D HAZ. LOC. TEMP. Rating T4 Ta=70~C ATEX II 3 G EEx nC IIC NEMKO 02ATEX431U <i>See Page 8 for SIS Conditioning Components Common Specifications</i>

## DeltaV SIS Conditioning Components

### SIS Voltage Monitor

The Voltage Monitor can be used with the DeltaV SIS system to drive a Logic Solver's Discrete Input channel or a DeltaV Series 2 DI Dry Contact channel based on the output of the Safety Relay module. The Voltage Monitor has the following connections:

- Four-pin connections for connecting input to DC or AC power sources
- Four-pin connections for connecting outputs to two SLS DI channels
- Four-pin connections for connecting outputs to two DI, Dry Contact

SIS Voltage Monitor Specifications	
Item	Specifications
Input Power Rating	6 mA @ 24V DC $\pm$ 20% 15 mA @ 120/230V AC 15 mA @ 120V DC
Mounting	Horizontal or vertical DIN rail
Dimensions	Height 100.0 mm (4 in.) Width 22.5 mm (0.9 in.) Depth 114.0 mm (4.5 in.)
Functional Safety Certification	IEC 61508 SIL3
Hazardous Area Certifications	Class I Div. 2 GP A,B,C,D HAZ. LOC. TEMP. Rating T4 Ta=70~C ATEX II 3 G EEx nA IIC NEMKO 02ATEX431U <i>See Page 8 for SIS Conditioning Components Common Specifications</i>



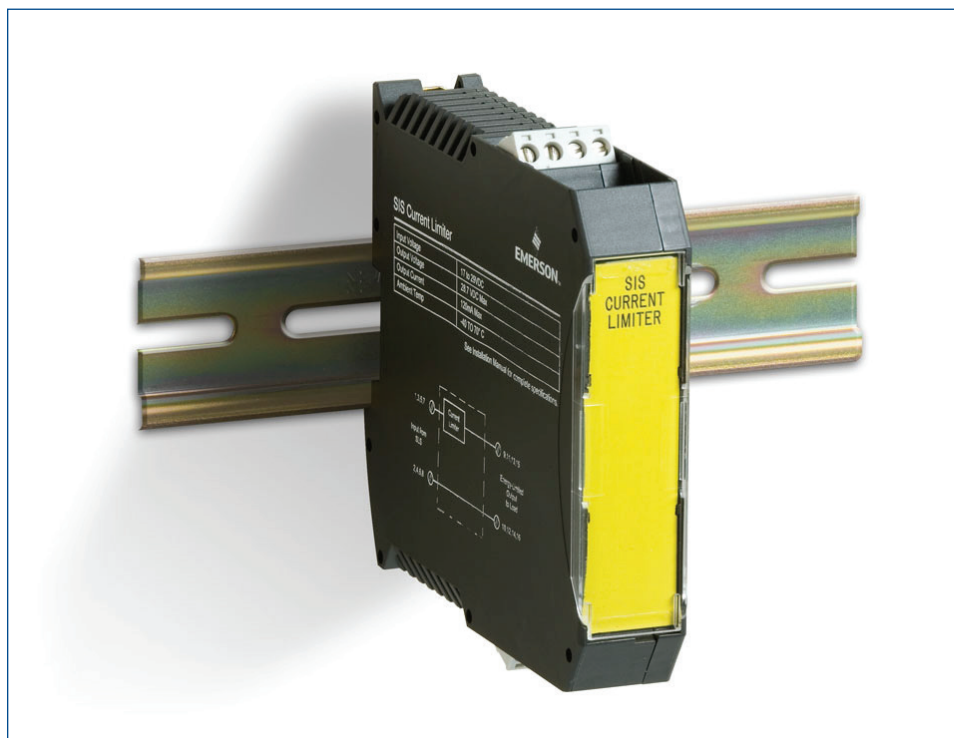
SIS Voltage Monitor.

**SIS Current Limiter**

The SIS Current Limiter limits the current from the SLS Discrete Output channels to levels below the ignition curves for Class 1 Div 2 and Zone 2 installations. Field wiring from the Current Limiter output to the field can be removed and reconnected under power. The SLS Current Limiter has the following connections:

- Four-pin connections for input from the SLS DO channels
- Four-pin connections for output to energy-limited loads

SIS Current Limiter Module	
Item	Specifications
Input Power Rating (from SLS DO Channels)	17 to 29V DC; 22V DC nominal
Output Power	28.8V DC (max)
Output Current Range	0-100 mA (max)
Output Current Limit Threshold	100 mA (min); 120 mA (max)
Mounting	Horizontal DIN rail
Dimensions	Height 100.0 mm (4 in.) Width 22.5 mm (0.9 in.) Depth 14.0 mm (4.5 in.)
Hazardous Area Certifications	Class I Div. 2 GP A,B,C,D HAZ. LOC. TEMP. Rating T4 Ta=70~C ATEX II 3 G EEx nL IIC T4 NEMKO 02ATEX431U <i>See Page 8 for SIS Conditioning Components Common Specifications</i>



SIS Current Limiter.

**RC Compensator Module**

When using line monitoring on outputs that are driving inductive loads greater than or equal to 0.8 Henry in simplex or 0.3 Henry in redundant, an RC compensator may be required. The RC compensator module is sized at 3.3 kΩ and 0.47 μf for simplex and 2.7 kΩ and 0.22 μf for redundant. This module can be used for simplex and redundant applications.

RC Compensator	
Item	Specifications
Dimensions	H 2.31 cm (0.91 in.) W 3.48 cm (1.37 in.) Depth 1.7 cm (.67 in.)
Hazardous Area Certifications	Class I Div. 2 GP A,B,C,D HAZ. LOC. TEMP. Rating T4 Ta=70~C ATEX II 3 G EEx nA II C NEMKO 02ATEX431U <i>See Page 8 for SIS Conditioning Components Common Specifications</i>



RC Compensator Module.

**End of Line Resistance Module**

The Discrete Input channel on the SLS1508 and some LS DI CHARMS have line fault detection for detecting open or short circuits in field wiring. The End of Line Resistance Module provides a 12 K $\Omega$  resistor in parallel (allows the open circuit detection) and a 2.4 K $\Omega$  resistor in series (allows short circuit detection) to provide the appropriate resistance for line fault detection. This module connects to the Discrete Input channel on the SLS1508 or to LS DI CHARM types that support fault detection and to a field contact.

End of Line Resistance Module	
Item	Specifications
Dimensions	H 2.31 cm (0.91 in.) W 3.48 cm (1.37 in.) Depth 1.7 cm (.67 in.)
Hazardous Area Certifications	Class I Div. 2 GP A, B, C, D HAZ. LOC. TEMP. Rating T4 Ta=70~C ATEX II 3 G EEx nA II C NEMKO 02ATEX431U <i>See Page 8 for SIS Conditioning Components Common Specifications</i>



*End of Line Resistance Module.*

## System Compatibility

### SIS Conditioning Components Common Specifications

Common Environmental Specifications For SIS Conditioning Components	
Category	Specifications
Storage Temperature	-40° to 85°C (-40° to 185°F)
Operating Temperature*	-40° to 70°C (-40° to 158°F) -40° to 60°C (-40° to 140°F) for vertical mounted SIS Relay Module and Voltage Monitor
Relative Humidity	5 to 95%, non-condensing
Airborne Contaminants	ISA-S71.04-1985 Airborne Contaminants Class G3 Conformal Coating
Protection Rating	IP 20
Certifications	European EMC Directive per EN61326-1, Criterion A NAMUR NE21 EMC Requirements Low Voltage Directive IEC 61010-1 CSA C22.2 No. 1010.1
Shock	10 g ½-sine wave for 11 ms
Vibration	1 mm peak-to-peak from 5 to 16 Hz; 0.5 g from 16 to 150 Hz

\*Operating any electronics at the higher end of its temperature range for long periods of time will shorten its expected lifetime, see **Effects of Heat and Airflow Inside an Enclosure White Paper** for more information.

## Ordering Information

Description	Model Number
SIS Relay Single Channel	VS6907
SIS Voltage Monitor Dual Channel	VS6906
SIS Current Limiter Quad Channel	VS6908
RC Compensator Module, Box Of 10	VS6905
SIS End Of Line Resistance Module, Box Of 10	VS6904

## Prerequisites

- DeltaV v8.3 software or later.

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