Emerson KJ2231X1-EA1

DeltaV SIS Relay Module



Emerson KJ2231X1-EA1 is a DeltaV SIS relay module that extends a logic solver's discrete output to field loads requiring higher switching current or voltage. It provides the relay interface between the safety-system command and the final load, opening the field-power contacts when de-energized. Three internal relays operate together during normal service and lose coil power on a shutdown demand; each can be proof-tested in the field. This makes the module relevant to safety applications that require relay switching beyond the native output capability.

Technical Specifications

Product Identity	
Manufacturer	Emerson
Complete identification	KJ2231X1-EA1
Product type	SIS relay module
Dimensions (H × W × D)	100 × 22.5 × 114 mm
Functional Configuration	
System	DeltaV SIS
AC contact rating	250 VAC at 2.5 A
DC contact rating	30 VDC at 2.5 A
Operating action	Field-power contacts open when de-energized
Internal relay arrangement	Three relays; each field proof-testable
Mounting	Horizontal or vertical DIN rail
Family software prerequisite	DeltaV v8.3 or later
Performance & Power	
Input power	24 VDC, 70 mA
Environment	
Operating temperature	–40 to +70 °C horizontal; –40 to +60 °C vertical
Relative humidity	5–95%, non-condensing
Protection	IP20

Selected original manufacturer material follows on pages 3–5.

Compatibility & Selection Guide

System compatibility. KJ2231X1-EA1 is a conditioning component for the DeltaV SIS system. Emerson lists DeltaV v8.3 or later for this component family. Confirm the logic-solver application, load rating and proof-test procedure; the module rating alone does not establish the integrity level of the complete safety function.

Wiring & Installation Reference

Mounting and safe handling

1. Apply the orientation limit. Horizontal DIN-rail mounting permits -40 to +70 C; vertical mounting is limited to -40 to +60 C.

2. De-energize before replacement. The July 2021 ATEX18 instruction permits removal or insertion with system power energized only where the area is known to be non-hazardous. Follow the applicable DeltaV SIS installation instructions.

Installation precautions

Use the approved field proof-test procedure for the relay arrangement. The component rating does not establish the integrity level of a complete safety function.

Do not disassemble the module. Verify the actual unit identification and the documented load before connection.

View product reference (PDF) — page 3 · View product reference (PDF) — page 4

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 *See Page 8 for SIS Conditioning Components Common Specifications*

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.

KJ2231X1-EA1 SIS Relay Module

Hazardous Atmosphere

II 3G Ex ec nC IIC Gc
FM16ATEX0056U
FM21UKEX0017U

CL. I Div. 2 GP. A,B,C,D
CL. I Zone 2 AEx/Ex ec nC IIC Gc
FM17US0286U
FM17CA0145U

Power Specifications

Input Power	24 VDC at 70 mA
Relay Contact	30 VDC at 2.5 A 250 VAC at 2.5 A

Environmental Specifications

Ambient Temperature	-40°C to +70°C
Shock	10g ½ Sinewave for 11msec
Vibration	1mm Peak to Peak from 2 to 13.2Hz; 0.7g from 13.2 to 150Hz
Airborne Contaminants	ISA-S71.04 –1985 Airborne Contaminants Class G3
Relative Humidity	5 to 95% Non-Condensing

Note: Refer to the product label for serial number and location and date of manufacture.

Warning: This product has specific instructions for installation, removal and operation in hazardous areas. Refer to document 12P2046 *"DeltaV™ Scalable Process System Zone 2 Installation Instructions".* Other installation instructions are available in the *"DeltaV™ M-Series Hardware Installation and Reference"* manual.

Removal and Insertion

This unit cannot be removed or inserted with system power energized unless the area is known to be non-hazardous.

Maintenance and Adjustment

This unit contains no user serviceable parts and should not be disassembled for any reason. Calibration is not required.

Other Safety Approvals

LR87534

exida
APPROVED
TO IEC
61508 SIL3