SCR - Viper Safety Relays
SEU-31-i

The new generation of safety relays from IDEM

- Expansion unit for SCR base units
- 3 NC Safety output contacts
1 NO Auxiliary output contacts
- Fault monitored by feedback contacts
- Easy diagnosis of status via 3 LEDs
- Possible to connect multiple expansion units to single base unit
- 24Vac/dc operation
- Up to PLe, SILCL 3, Category 4
- Stop Category 0
- 22.5mm enclosure
- DIN rail mounting

The Viper Safety Relays range from IDEM are designed to meet the latest safety standards and offer enhanced LED diagnostics and simplified wiring. Applications include safety interlock switches, emergency e-stop devices, door guard monitoring.

The Viper Safety Relays range includes output expansion units that can be directly wired to SCR-21-i / SCR-31-i / SCR-31P-i safety relay base units to increase the number of safety output contacts. The expansion module are available with either Instant or time-delayed output contacts.

The SEU-31-i uses force guided relays to provide extra output contacts and monitoring of faults by the base unit via feedback contacts, this ensures that a single fault does not lead to the loss of the safety function and that all faults are detected at or before the next safety demand.



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Product Safety Functional Safety
www.tuv.com ID 0600000000

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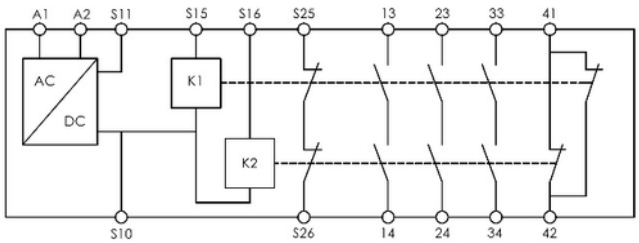
Functional Description

The SEU-31-i expansion unit can be used with any SCR base unit – SCR-21-i / SCR-31-i / SCR-31P-i / SCR-73-i / SCR-31-42TD-i to provide extra output contacts. Multiple SEU expansion unit can be used together including SEU-31-I and SEU-31TD-i to add many extra contacts and expand functionality of the base unit safety relays.

When the base unit safety relay outputs close the inputs of the expansion unit are activated and the expansion unit outputs close. The expansion unit outputs open when in the inputs are de-activated or in the event of a power failure. Due to the feedback check contacts of the expansion unit and the logic of the base unit safety relay the system requires both internal relays to move to open position before the safety relay can be activated again.

Block Diagram and Connections

SEU-31-i



Terminal	Description
A1	Power Supply
A2	Power Supply
S11	24Vd.c. Control Voltage
S15	Control Line Channel 1 Input
S16	Control Line Channel 2 Input
S25	Feedback Check Contact
S26	Feedback Check Contact
S10	0Vd.c. Control Voltage
13-14	Safety Output Contact 1
23-24	Safety Output Contact 2
33-34	Safety Output Contact 3
41-42	Auxiliary Output Contact 1

Variants

Part No.	Description
280007	SEU-31-i, AC/DC 24 V, (50-60Hz), Fixed screw terminals
280007-P	SEU-31-i, AC/DC 24 V, (50-60Hz), Pluggable terminals

Application Circuits

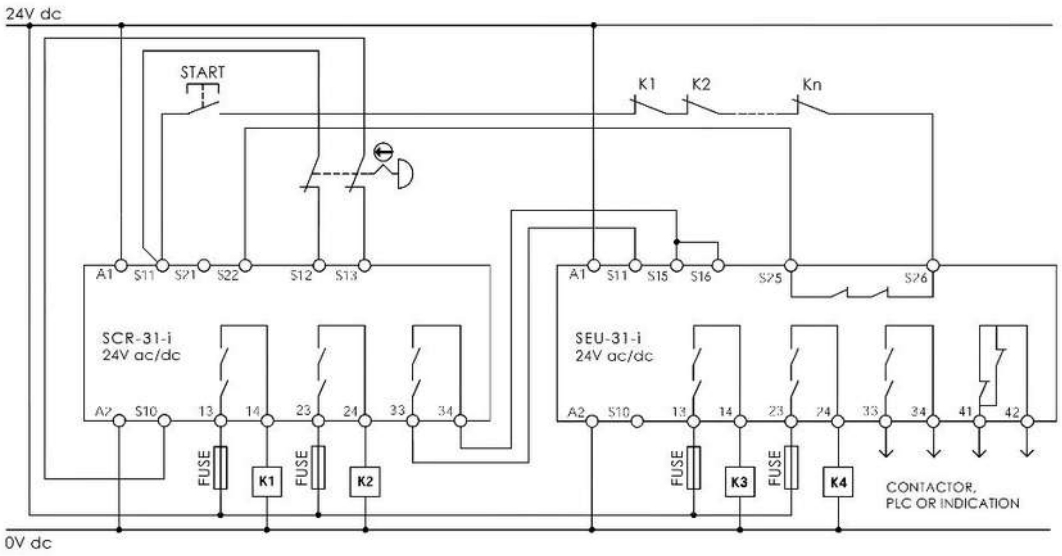


Fig.1 SCR-31-*i*, Dual Channel, E-Stop, Manual Reset with Expansion Unit SEU-31-*i*

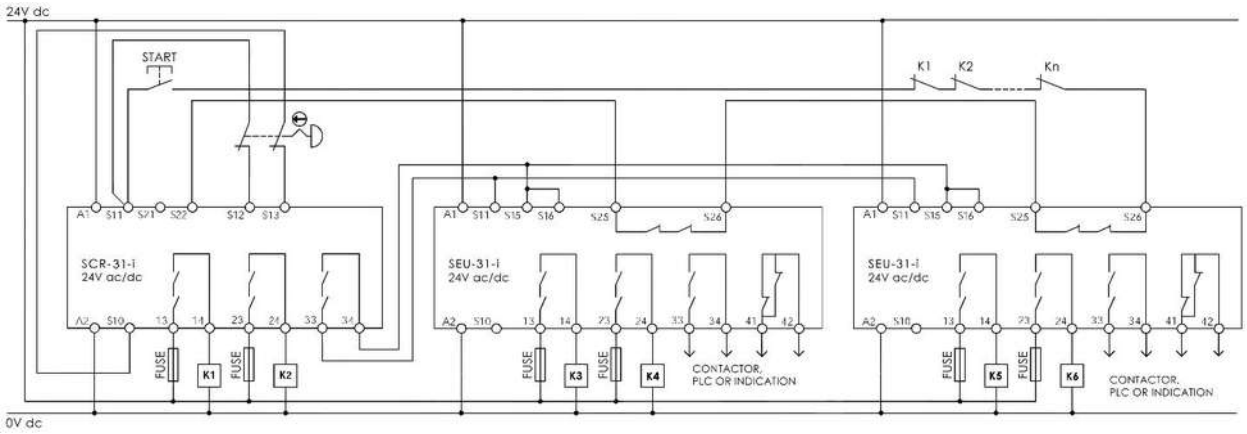


Fig.2 SCR-31-*i*, Dual Channel, E-Stop, Manual Reset with Multiple Expansion Units SEU-31-*i*

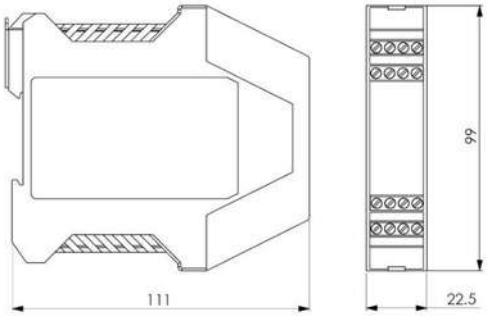
Electrical Connection

- A safety transformer according to EN 61558-2-6 or a power supply unit with electrical isolation from the mains supply must be connected.
- External fusing of the safety contacts (6A slow-blow or 8A quick action or 10 AgG) must be provided.
- A maximum length of the control lines of 1000 meters with a line cross section of 0.75mm^2 must not be exceeded.
- The line cross section must not exceed 2.5mm^2.
- If the device does not function after commissioning, it must be returned to the manufacturer unopened.
- Opening the device will void the warranty.

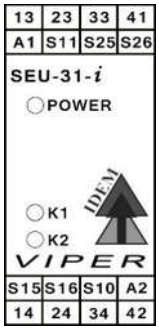
IDEM Safety Switches

Viper Safety Relays
SEU-31-*i*

Dimensions



Diagnostic LEDs



POWER	Power to the safety relay.
K1	Power to Internal relay K1.
K2	Power to Internal relay K2.

Safety Characteristics

Characteristic Data according to **IEC 62061**

Safety Integrity Level	SIL3
PFH	8.4 E -10 (1/h) (0.8 % of SIL3 (1 E -07 (1/h))
PFD_{av}	7.2 E -05 (1/h) (7.2 % of SIL3 (1 E -03)

Characteristic Data according to **EN ISO 13849-1**

Performance Level	E
Category	4
$MTTF_d$	71a (High)
Diagnostic Coverage	99% (High)

Specification

Standards		EN ISO 13849-1; EN ISO 13849-2; EN62061; EN60204-1; EN ISO 12100
Power supply Circuit		
Operating voltage		24V AC/DC
Operating voltage tolerance		-15% - +10%
Rated supply frequency		50Hz – 60Hz
Rated supply current		60mA
Power consumption	24V AC/DC	1.6W
Control Circuits		
Rated output voltage	S11	24V DC
Input current	S15, S16	100mA
Response Time		25ms
Release Time		25ms
Recovery Time		Approx. 1s
Output Circuits		
Rated Output Voltage		250VAC
Max. Current per output		6A
Max. Total current all outputs		8A
Safety contact breaking Capacity	AC	250V, 1500V, 6A, Ohmic 230V, 4A for AC-15
	DC	24V, 30W, 1.25A, Ohmic 24V, 30W, 2A, DC-13
Minimum contact load		10V 10mA
Min. Contact fuses		4A slow blow, 6A fast blow
Contact material		$AgSnO_2$
Contact service life		10×10^6
General Data		
Rated impulse withstand voltage		4kV (Creepage and Clearance: Outputs -> Control Circuits: 5.5mm)
Rated insulation voltage		250V
Degree of protection		IP
Temperature range		-20C + 55C
Degree of contamination		2
Overvoltage Category		III
Weight		0.3kg
Mounting		Any Position

SAFETY WARNINGS



- **Installation should only be carried out by competent and authorised personnel and in accordance with the instructions in this manual.**
- **Only make electrical connections when the device is isolated from the main supply.**
- **If "Automatic Start" is selected be aware that safety output contacts will switch immediately after the power supply is connected.**
- **Opening the device will void the warranty. Never attempt to repair any device.**
- **Adhere to Safety Checks.**
- **DO NOT DEFEAT, TAMPER, OR BYPASS THE SAFETY FUNCTION. FAILURE TO DO SO CAN RESULT IN DEATH OR SERIOUS INJURY.**

- **L'installation doit être effectuée par un personnel compétent et autorisé et en conformité avec les instructions de ce manuel.**
- **faites uniquement des connexions électriques lorsque l'appareil est isolé de l'alimentation principale.**
- **Si "Démarrage automatique" est sélectionné être conscient que les contacts de sortie de sécurité passeront immédiatement après l'alimentation est connectée.**
- **Ouverture de l'appareil annule la garantie. Ne jamais tenter de réparer tout appareil.**
- **Adhérer à des contrôles de sécurité.**
- **NE DÉFAITE PAS, SABOTAGE, OU DE CONTOURNER LA FONCTION DE SÉCURITÉ. MANQUEMENT À S'Y PEUT ENTRAÎNER LA MORT OU DES BLESSURES GRAVES**

Installation and Maintenance

Installation should as per EN 60204-1 in addition to any local regulations. The safety relay should be mounted inside a cabinet enclosure and on a 35mm DIN rail according to DIN EN 60715. No maintenance is required, there are no serviceable parts. (Refer to Safety Checks). The product is designed to be a component of a customised safety orientated control system. It is the responsibility of the user to ensure the correct overall functionality of its systems and machines. IDEM, its subsidiaries and affiliates, are not in a position to guarantee all of the characteristics of a given system or product not designed by IDEM. To achieve up to Category 4, PLe a short between S11-S15/S16 must be ruled out by using a protected wiring space.

Information Regarding UL 508

Pilot Duty R300, B300
Single contact must be used

250V AC/DC / 6,0A Resistive Single contact must be used	250V AC/DC / 6,0A General Purpose All contacts at once can be used.

USE COPPER OR COPPER-CLAD ALUMINUM CONDUCTORS

Maximum surround air temperature 40°C

Safety Checks

1. Ensure the appropriate safety level is achieved for the application function.
2. The safety functions must be tested regularly. For applications were infrequent use is foreseeable, the system must have a manual function test. At least once per month for PLe Cat3/4 or once per year for PLd Cat3 (ISO13849-1 / ISO14119).

EC Declaration of Conformity

Manufacturer: IDEM SAFETY SWITCHES Ltd.
2 Ormside Close, Hindley Industrial Estate, Hindley Green, Wigan, WN2 4HR, UK

Product: Safety Emergency Stop Devices

Model types: SEU-31-i

The above products conform to the safety requirements of the following directives and standards:

Machinery Directive 2006/42/EC
EMC Directive 2004/108/EC
Low Voltage Directive 2006/95/EC

EN 13849-1:2008+AC:2009
EN 13849-2:2012
EN 62061:2005+AC:2010+A1:2013
EN 61508 (Parts 1-7): 2011-02
EN 60204-1:2006+A1:2009+AC:2010
EN 50178:1997

Third Party Certification: NB 0035 TUV Rheinland Industrie Service GmbH

M. Mohtasham Managing Director