
DA149 Series Intrinsically Safe Relay

For isolated signal transfer between safe and hazardous areas

Inputs/outputs galvanically isolated – no earth required

Certified equivalent to “simple apparatus” – no system certificate needed

Extremely low power, avoids affecting operation of connected equipment

Relay coil – AC or DC energized over a wide voltage range

Can be supplied in safe or hazardous area mounting versions

DIN-rail mounting slim case

Using the DA149 intrinsically safe isolating relays, control signals and other data can be exchanged between items of equipment in hazardous areas and between hazardous- and safe-area equipment.

The range includes four models, two of which are designed for safe-area location and two of which can be located within hazardous areas.

Since the relays need very little power, they do not affect operation of other equipment to which they are connected. Additionally, as inputs and outputs are classified as ‘simple apparatus’, system certification is not needed.

The slimline units are suitable for universal DIN-rail mounting.



Specification

Electrical Safety

Non energy storing simple apparatus (hazardous-area terminals will not generate or store more than 1.2V, 0.1A, 20µJ, or 25mW when connected to IS equipment with a Umax of not more than 40V (30V for the DAD149))

EMC compliance

Immunity to EN61000-6-2:2001
Emissions to EN61000-6-4:2001

Maximum cable parameters

Always defined by associated circuits

Terminals

For conductors up to 12 AWG (2.5mm²)

Construction

Resin-filled polyamide casing

Mounting

DIN rail to EN50035 DIN46277-1 ('G' profile) or EN50035 DIN46277-3 ('Top-hat' profile)

Operating principle

Each relay is a solid-state device consisting of an oscillator and an intrinsically safe transformer to provide the necessary isolated coupling to a MOSFET switch. For all practical purposes, each can be regarded as a coil and a normally open contact. Diodes are connected in series with the hazardous-area input and/or output terminals to make them electrically equivalent to 'simple apparatus', i.e they can be included in any IS loop without further certification. Inputs and outputs are galvanically isolated so the relays do not need IS earthing.

Power requirements

The only power required is less than 60µA at 4V to energise the 'coil', by comparison with certified opto-isolators or relays which need at least 10mA to function, so the relays can be used in virtually any loop-powered systems without affecting operation.

Relay Choice

The safe-area mounting relays are the DAA149 and DAE149 units. The DAA149 transfers signals from the hazardous area to the safe area while the DAE149 transfers signals the other way. The DAE149 is fitted with a 250mA fuse.

The two models that can be located within the hazardous area are the DAB149 fitted with a 100mA contact fuse certified for use in ambient temperatures up to 104°F (40°C) and the DAD149 fitted with a 50mA fuse and certified for ambient temperatures up to 158°F (70°C).

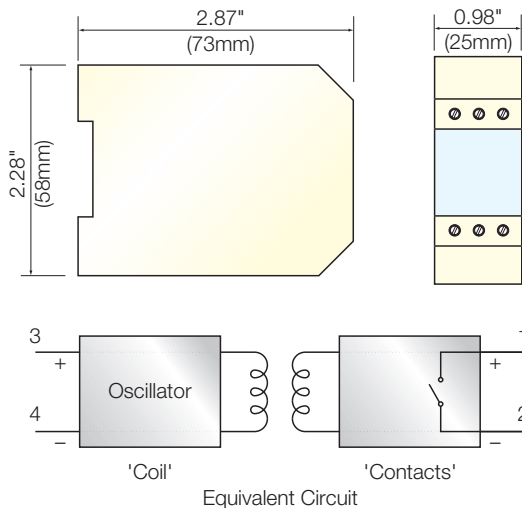
Ordering Information

DAA149 IS relay, Zone 0 to safe area

DAB149 IS relay, Zone 0 to Zone 0
100mA fuse, 104°F (40°C)

DAD149 IS relay, Zone 0 to Zone 0
50mA fuse, 158°F (70°C)

DAE149 IS relay, safe area to Zone 0
(250mA fuse)



Electrical Specification

	DAA149	DAB149	DAD149	DAE149
Location	Safe area	Zone 0	Zone 0	Safe area
Protection	IP20	IP20	IP20	IP20
Ambient temp. limits	-4-158°F (-20-70°C)	-4-104°F (-20-40°C)	-4-158°F (-20-70°C)	-4-158°F (-20-70°C)
Relative Humidity	5-95%	5-95%	5-95%	5-95%
Coil terminals				
Connections to (area)	Zone 0	Zone 0	Zone 0	Safe area
Min. voltage (VDC [VAC rms])	4 [10]	4 [10]	4 [10]	4[10]
Max. voltage (VAC/DC)	40	40	40	250
Min. current (µA)	60	60	60	20
Current at Vmax (mA)	3	3	3	0.07
Contact terminals				
Connections to (area)	Safe area	Zone 0	Zone 0	Zone 0
'On' resistance (Ω)	30	30	15	30
'On' voltage (V)	0	2.1	2.1	2.1
'Off' resistance (kΩ)	>10000	60	60	60
Max. voltage (V)	52	40	30	40
I _{max} (mA)	90	90	45	225

Approvals

BASEEFA to CENELEC standards

Model	Standard	Certificate	Approved for
DAA149	EN50020	Baseefa 03ATEX0624	[EEx ia] IIC T _{amb} 158°F (70°C)
DAB149	EN50020	Baseefa 03ATEX0625X	EEx ia IIC T _{amb} 104°F (40°C)
DAD149	EN50020	Baseefa 03ATEX0625X	EEx ia IIC T _{amb} 158°F (70°C)
DAE149	EN50020	Baseefa 03ATEX0624	[EEx ia] IIC T _{amb} 158°F (70°C)

Due to our policy of continuous product development, we reserve the right to amend specifications without notice.



RTK Instruments
1531 Stuyvesant Avenue
Union
New Jersey 07083
USA

Telephone: 908 688 6709
Facsimile: 908 688 9040
Email: sales@rtkinstruments.com
Web: www.rtkinstruments.com