Operating Instructions

RTK Instruments Limited
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Web: www.rtkinstruments.com
Email: enquiry@ rtkinstruments.com

DA-149 Series Intrinsically Safe Relay

Description

RTK Instrument's range of DIN rail mounted Intrinsically Safe Solid State Relays provide a means of switching control signals and other data between items of equipment in hazardous areas and between hazardous and safe area equipment. The relays provide a isolated barrier between the different equipment. Models are available for mounting in the safe area and within the hazardous area

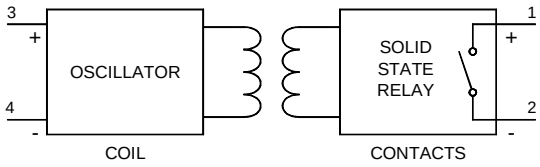

Figure 1
Equivalent Circuit

Connections

The terminals are designated as follows:
Terminal 1 : Positive contact
Terminal 2 : Negative contact
Terminal 3 : Positive coil
Terminal 4 : Negative coil
Refer to Table 1 for the exact specifications of the model supplied. Refer to Figure 1 for the equivalent circuit.

WARNING
Both contacts and coil are polarised, ensure this is observed as incorrect connection may damage the unit

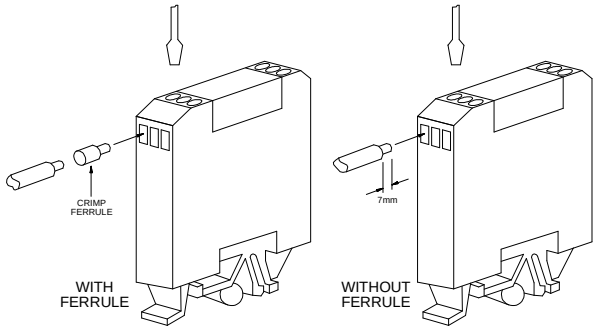

Figure 2

Installation

The unit should be mounted on standard top-hat section TS32 or G-section DIN rail TS35 as shown in Figure 3.

We recommend that bootlace ferrules be used, to provide a secure termination.

Select a suitable ferrule, strip the insulation from the wire and crimp on the ferrule. Insert the crimped assembly into the correct terminal and tighten the screw.
Refer to Figure 2.

If ferrules are not to be used, strip back the wire's insulation by 7mm and insert the wire directly into the correct terminal. Tighten the screw.

Warning

Models intended for use in safe areas must not be located within hazardous areas, unless mounted in a suitably certified explosion proof enclosure. Please contact RTK Instruments for further information

Manufacturers of
Alarm Annunciators and Systems
Event Recorders
Hazardous Area Notification Products
Engineered Solutions

ISO 9001
FM 14290

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Dimensions

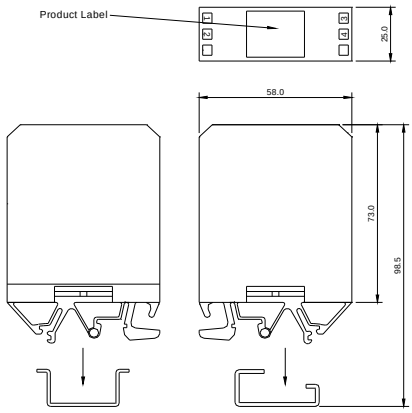

Figure 3

Specification

ELECTRICAL SPECIFICATION	DAA149	DAB149	DAD149	DAE149
Location:	Safe Area	Zone 0	Zone 0	Safe Area
Operating temperature:	-20 to +70°C	-20 to +40°C	-20 to +70°C	-20 to +70°C
Relative humidity:	5-95%	5-95%	5-95%	5-95%
Protection:	IP20	IP20	IP20	IP20
Coil terminals TM 3&4				
Connect to:	Zone 0	Zone 0	Zone 0	Safe area
Min. voltage to operate VDC (VAC):	4 (10)	4 (10)	4 (10)	4 (10)
Min. Current (μA):	60	60	60	20
Max. voltage to operate VDC/VAC:	40	40	30	250
Current at Vmax (mA):	3	3	3	0.07
Contact terminals TM 1&2				
Connect to:	Safe area	Zone 0	Zone 0	Zone 0
Imax (mA):	90	90	45	225
Max. contact drop (V) at Imax:	3.4	5.8	3.0	4.5
On voltage (V)	0	2.1	2.1	2.1
On resistance (Ω):	30	30	15	30
Off resistance (kΩ):	>10000	60	60	60
Max. voltage (V):	52	40	30	40
Response time				
Max. energise (ms):	6	6	6	6
Max. de-energise (ms):	21	21	21	21

Response time is measured whilst switching a nominal 51Ω load from 5V, using end points of 250μA and 39mA.

Table 1

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Electrical Safety

When connected in an intrinsically safe circuit the internal stored energy, voltage and current of the DA-149 Relay will not add more then the values specified for “Simple Apparatus” in Clause 5.4 of EN 50020:2002 to the parameters of the circuit which it is connected. The assumes the Ui is less than 40V (30V for the DAD149)

Please note the DAA149 and the DAE149 are designed to interface equipment between the safe and hazardous areas and MUST be mounted within the safe area. The DAB149 and DAD149 are suitable for mounting within the hazardous area itself

Certification

The DA-149 range of Intrinsically Safe Relays are certified to EN 50014:1997, EN 50020:2002 and EN 50824:1999 (Except DAA149 & DAE149) standards and are marked with the following info:

DAA149

Ex II (1)G [EEx ia] IIC (Tamb = -20 to 70°C),
Certificate Number: Baseefa03ATEX0624

DAB149

Ex II 1G EEx ia IIC T4 (Tamb = -20 to 40°C),
Certificate Number: Baseefa03ATEX0625X

DAD149

Ex II 1G EEx ia IIC T5 (Tamb = -20 to 70°C),
Certificate Number: Baseefa03ATEX0625X

DAE149

Ex II (1)G [EEx ia] IIC (Tamb = -20 to 70°C),
Certificate Number: Baseefa03ATEX0624

Special Conditions for Safe Use
Units whose certificate has an X suffix (DAB149 and DAD149) have the following warning:

WARNING - ELECTROSTATIC HAZARD - DO NOT RUB

Maintenance & Fault Finding

No repair work can be carried out by the user, as there are no user-serviceable parts in the units..

Note: observe the polarity of the connections to the coil (terminals 3 & 4) as series protection diodes are fitted
DAA149 This can be tested as a conventional type relays, treating the output terminals as contacts.

DAB149, DAD149, DAE149.
Test in safe area only using test circuit in Fig 4. Do not test output terminals for closure using a conventional resistance meter, as internal components may result in incorrect readings

Faulty units should be returned to RTK Instruments for investigation and possible repair or replacement

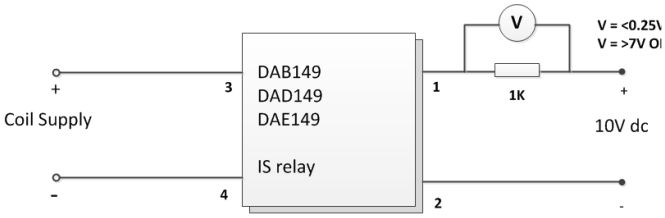

Figure 4 Test circuit for DAB149,DAD149,DAE149

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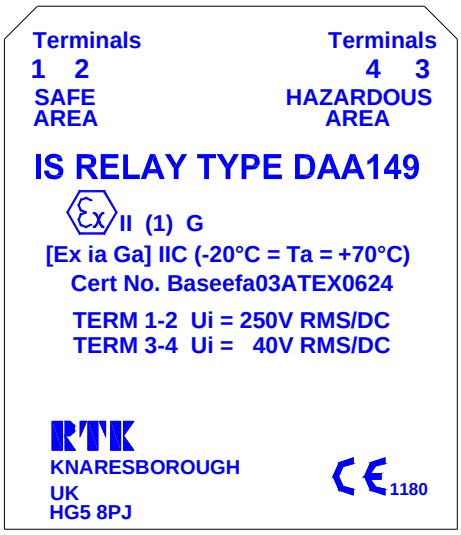
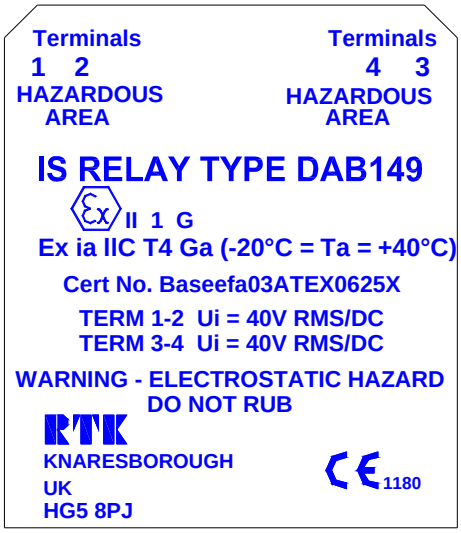
Certification Labels

DAA149 IS RELAY



DAB149 IS RELAY



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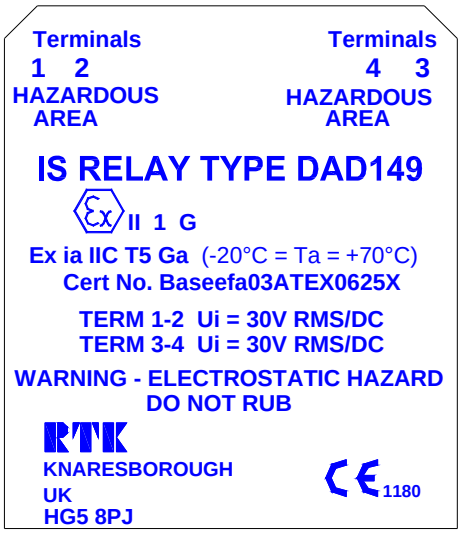
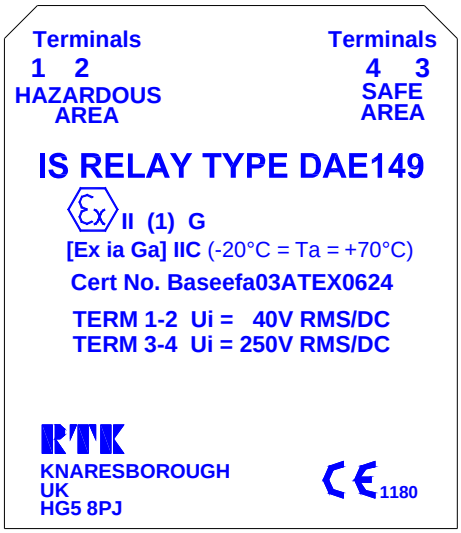
DAD149 IS RELAY



DAE149 IS RELAY



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EC DECLARATION OF CONFORMITY

This is to certify that the DA-149 Intrinsically Safe Relays

Manufactured by:-

RTK INSTRUMENTS LTD
ST JAMES BUSINESS PARK
KNARESBOROUGH
NORTH YORKSHIRE
HG5 8PJ

Conforms to the protection requirements of the following directives:

- Council directive 89/336/EEC (EMC Directive) to BS EN 61000-6-4 and BS EN 61000-6-2
- Council Directive 94/9/EC (ATEX Directive) to EN60079-0:2009 and EN60079-11:2007 (DAA and DAB only)
  Where products were initially assessed for compliance with the Essential Health and Safety requirements of the Directive using earlier harmonised standards, a subsequent review has determined that 'technical knowledge' is unaffected by the current harmonised standards listed above.

The DAA149 and DAE149 products are certified to:

Ex II (1) G [Ex ia Ga] IIC ($-20^{o}C \leq Ta \leq +70°C$)

Certificate No: Baseefa03ATEX0624

The DAD149 product is certified to:

Ex II 1 G Ex ia IIC T5 Ga ($-20^{o}C \leq Ta \leq +70°C$)

Certificate No: Baseefa03ATEX0625X

The DAB149 product is certified to:

Ex II 1 G Ex ia IIC T4 Ga ($-20^{o}C \leq Ta \leq +40°C$)

Certificate No: Baseefa03ATEX0625X

The Quality System is certified and monitored by Baseefa Ltd notified body number 1180, Rockhead Business Park, Staden Lane, Buxton, Derbyshire, SK17 9R

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PAUL HARTLEY - MANAGING DIRECTOR
Date: 18th May 2012

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Other RTK Products

RTK Instruments produce a range of complementary products for many applications in the Industrial Control and Instrumentation field for both safe and hazardous areas, as listed below. All standard products come with a **5 year warranty** from this ISO9001:2000 approved company:

- **Alarm Annunciators**
- **Remote Logic Alarm Systems**
- **Alarm Management software and Video Annunciators**
- **Lamp-boxes and Display Facias**
- **Sequence of Event Recorders**
- **Power Supplies**
- **Intrinsically Safe Alarm annunciators**
- **Explosion Proof Alarm annunciators**
- **Intrinsically Safe LED Beacons**
- **Intrinsically Safe Light Towers**
- **Intrinsically Safe LED indicators**
- **Intrinsically Safe Illuminated switches and pushbuttons**
- **Intrinsically Safe Sounders**
- **IS Interface units including Zener Barriers, IS Isolators and Multiplexers**

Please ring our sales office to obtain our latest brochure.

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

REV	Detail of Change	Date
0	**Original Issue**	Nov 2004
1	Various Revisions	Dec 2005
2	Declaration added	Nov 2008
3	Certification Labels Updated	May 2012
4	Test diagram updated, terminal designation clarified, certification updated	Dec 2012

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