



British Approvals Service for Electrical  
Equipment in Flammable Atmospheres

1 **Certificate of Conformity**

2. **BAS No Ex 96D2067**

3. This certificate is issued for the electrical apparatus.:

**BA324C 4½ DIGIT INDICATOR**

4. manufactured and submitted for certification by:

**BEKA ASSOCIATES**  
of Hitchin, Herts, SG5 2DA

5. This electrical apparatus and any acceptable variation thereto is specified in the Schedule to this Certificate and the documents therein referred to.

6. BASEEFA being an approved Certification Body in accordance with Article 14 of the Council Directive of the European Communities of 18 December 1975 (76/117/EEC) certifies that the apparatus has been found to comply with harmonised European Standards

**EN 50 014 (1977) + Amendments A1 to A5**  
**EN 50 020 (1977) + Amendments A1 to A5**

and has successfully met the examination and test requirements as recorded in confidential Report No 95(C)0868 (ERA Report Ref 3627/780), dated May 1996.

7. The apparatus marking shall include the code

**EEx ia IIC T5**  
( $T_{amb} = -40^{\circ}C$  to  $60^{\circ}C$ )



File No: **EECS 0121/02/012**

Sheet 1/5  
VKV4/C2648



**I M CLEARE**  
**DIRECTOR EECS**  
**3 July 1996**

This certificate is issued under NACCB accreditation No. 020



**Electrical Equipment Certification Service**  
Health and Safety Executive  
Harpur Hill, Buxton, Derbyshire, SK17 9JN, United Kingdom  
Tel: 0298 26211 Fax: 0298 79514 Telex: 668113 RLSD G





British Approvals Service for Electrical  
Equipment in Flammable Atmospheres



Certificate of Conformity BAS No Ex 96D2067

8. The manufacturer of the electrical apparatus referred to in this certificate, has the responsibility to ensure that the apparatus conforms to the specification laid down in the Schedule to this certificate and has satisfied routine verifications and tests specified therein.
9. This apparatus may be marked with the Distinctive Community Mark specified in Annex II to the Commission Directive of 16 January 1984 (Doc 84/47/EEC). A facsimile of this mark is printed on sheet 1 of this certificate.

Sheet 2/5

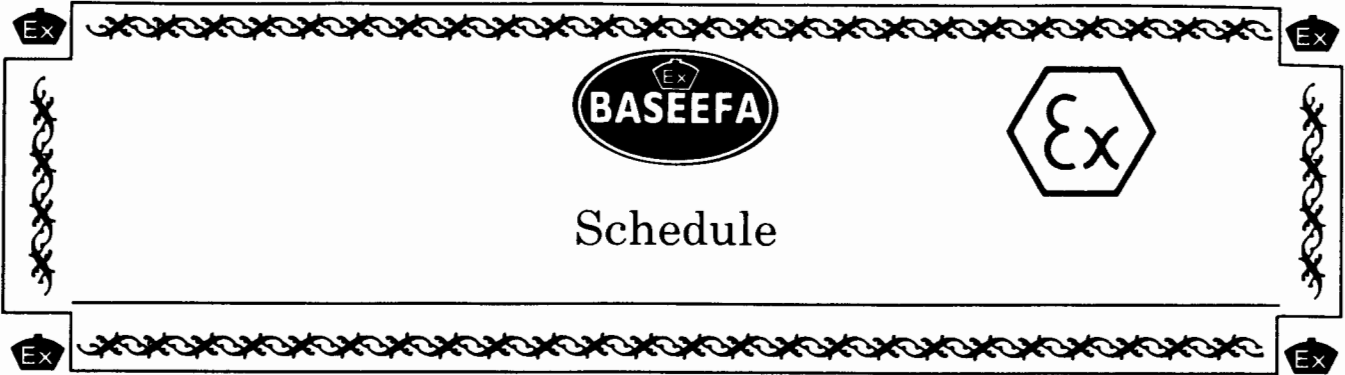
---

This certificate is granted subject to conditions applicable to the Approval Service, it does not necessarily indicate that the apparatus may lawfully be used in particular industries or circumstances.



**Electrical Equipment Certification Service**  
Health and Safety Executive  
Harpur Hill, Buxton, Derbyshire, SK17 9JN, United Kingdom  
Tel: 0298 262111 Fax: 0298 79514 Telex: 668113 RLSD G





Certificate of Conformity BAS No Ex 96D2067

## **APPARATUS**

THE BA324C 4½ DIGIT INDICATOR is a two wire apparatus designed to be connected in a 4/20 mA process loop and provide a display in engineering units.

The BA324C may alternatively be identified as a DA4-Ex/50 4½ DIGIT INDICATOR.

The BA324C is a field mounting indicator comprising a terminal board, a main/display board and an optional alarm interface board, all housed within a metallic enclosure or conductive plastics enclosure, which may have a conductive coating on the inside surfaces. The enclosure provides a Degree of Protection of at least IP20.

Intrinsic safety is assured by limitation of voltage, current and power, limitation of capacitance, suppression of inductance, use of intrinsically safe transformers (alarm interface board) and infallible segregation.

The equivalent resistance of the apparatus at terminals 1 and 3 is 14.85  $\Omega$  minimum in normal operation and 24.75  $\Omega$  minimum under fault conditions.

The maximum intrinsically safe input parameters are as follows:

### **Terminals 1 and 3**

$$\begin{aligned}U_i &= 30 \text{ V dc} \\I_i &= 200 \text{ mA dc} \\P_i &= 0.8 \text{ W}\end{aligned}$$

The equivalent parameters are:

$$\begin{aligned}C_i &= 0.02 \text{ } \mu\text{F} \\L_i &= 0.01 \text{ mH}\end{aligned}$$



## Schedule

Certificate of Conformity BAS No Ex 96D2067

### Terminals 8 and 9; 10 and 11

$$U_i = 28 \text{ V dc}$$

$$I_i = 200 \text{ mA dc}$$

$$P_i = 0.8 \text{ W}$$

The equivalent parameters are:

$$C_i = 0.04 \mu\text{F}$$

$$L_i = 0.02 \text{ mH}$$

For intrinsic safety considerations, under fault conditions the voltage, current, power and energy at terminals 1 and 3, 8 and 9, and 10 and 11 do not exceed those specified in Clause 1.3 of EN50 014. The equivalent capacitance and inductance are the result of r.f suppression components directly connected to the apparatus terminals.

The segregation between each of the circuits connected to terminals 1 - 3, 8 - 9 and 10- 11 satisfies the requirements for the peak voltage of 60 V.

### DRAWINGS

Number	Issue	Date	Description
CI320-01			
Sheets 1 to 25	1	Sept 95	BA320C Certification Information

### VARIATION ONE

To permit the following changes to form a BA327C 4½ DIGIT INDICATOR.

- Re-arrangement of electronic components onto a main board and a display board which are mounted in a metallic enclosure for panel mounting.
- Optional backlight board fitted to the BA327C only.



## Schedule

Certificate of Conformity BAS No Ex 96D2067

The intrinsically safe input parameters at terminals 12 and 13 are:

$$U_i = 28 \text{ V dc}$$

$$I_i = 159 \text{ mA dc}$$

$$P_i = 0.8 \text{ W}$$

The equivalent parameters are:

$$C_i = 0.03 \text{ } \mu\text{F}$$

$$L_i = 0.01 \text{ mH}$$

The segregation between the circuit connected to terminals 12 - 13 and the remaining circuits satisfies the requirements for a peak voltage of 60 V.

The BA327C may alternatively be identified as a DA4-Ex/40 4½ DIGIT INDICATOR.

### VARIATION TWO

To permit the use of a larger display board than the BA327C to form a BA328C 4½ DIGIT INDICATOR.

The equivalent parameters are unchanged ie.

#### Terminals 1 and 3

$$C_i = 0.02 \text{ } \mu\text{F}$$

$$L_i = 0.01 \text{ mH}$$

#### Terminals 8 and 9; 10 and 11

$$C_i = 0.04 \text{ } \mu\text{F}$$

$$L_i = 0.02 \text{ mH}$$

The BA328C may alternatively be identified as a DA4-Ex/45 4½ DIGIT INDICATOR.

British Approvals Service for Electrical  
Equipment in Flammable Atmospheres



## *Certificate of Conformity - Variation*

**SUPPLEMENTARY CERTIFICATE BAS No. Ex 96D2067/1**

This is to certify that Apparatus Certificate number:

**Ex 96D2067**

held by:

**BEKA ASSOCIATES**

of:

**Hitchin, Herts, SG5 2DA**

for the:

**BA324C 4½ DIGIT INDICATOR**

is hereby extended to apply to the apparatus designed and constructed in accordance with the specification set out in the Schedule of the said Certificate but having any variations specified in the Schedule attached to this certificate and the documents therein referred to.

This Supplementary Certificate shall be held with the original Certificate.

File No: EECS 0121/02/012

Report No. 97(C)0322 (ERA Report Ref. 3627/838), July 1997

Sheet 1 of 3

This certificate is granted subject to the general conditions of the Electrical Equipment Certification Service. It does not necessarily indicate that the apparatus may be used in particular industries or circumstances. Representation of equipment as "Certified" is valid only when the number of the prime certificate to which this certificate is a supplement is given on the relevant EECS Manufacturing Licence or Verification Certificate.



**I M CLEARE**  
**DIRECTOR**  
13 August 1997



Registration Number  
020  
The use of the Accreditation  
Mark indicates accreditation in  
respect of those activities  
covered by the accreditation  
certificate number 020.



**Electrical Equipment Certification Service**  
Health and Safety Executive  
Harpur Hill, Buxton, Derbyshire. SK17 9JN. United Kingdom  
Tel: 01298 28000 Fax: 01298 28244



Supplementary Certificate BAS No. Ex 96D2067/1

**VARIATION THREE**

To permit the following changes:

- i) The BA324C, BA327C and BA328C 4½ Digit Indicators may alternatively be identified as GS1 24, GS1 27 and GS1 28 4½ Digit Indicators respectively.
- ii) Optional backlight board may be fitted to the BA324C and BA328C.
- iii) Alternative terminal board, PC78.
- iv) Alternative terminals for external connections.
- v) Minor changes to the circuit diagram and minor changes to the printed circuit boards.

The intrinsic safety and segregation requirements are not affected.

- vi) Minor changes to the certification labels.
- vii) Maximum input power increased from  $P_i = 0.8W$  to  $P_i = 0.85W$ .

The Temperature Class T5 at +60°C is not affected.

The intrinsically safe input parameters are as follows:

**Terminals 1 and 3**

$U_i = 30V$  d.c.  
 $I_i = 200$  mA d.c.  
 $P_i = 0.85W$

The equivalent parameters are unchanged, i.e.

$C_i = 0.02$   $\mu F$   
 $L_i = 0.01$  mH

**Terminals 8 and 9; 10 and 11**

$U_i = 28V$  d.c.  
 $I_i = 200$  mA d.c.  
 $P_i = 0.85W$

The equivalent parameters are unchanged, i.e.

$C_i = 0.04$   $\mu F$   
 $L_i = 0.02$  mH

EX

EX

British Approvals Service for Electrical  
Equipment in Flammable Atmospheres



## Schedule

Supplementary Certificate BAS No. Ex 96D2067/1

### Terminals 12 and 13

Intrinsically safe input parameters are unchanged, i.e.

$$U_i = 28\text{V d.c.}$$

$$I_i = 159\text{ mA d.c.}$$

$$P_i = 0.8\text{W}$$

The equivalent parameters for the BA327C are unchanged, i.e.

$$C_i = 0.03\ \mu\text{F}$$

$$L_i = 0.01\ \text{mH}$$

The equivalent parameters for the BA324C and BA328C are:

$$C_i = 0.04\ \mu\text{F}$$

$$L_i = 0.02\ \text{mH}$$

### DRAWING

<u>Number</u>	<u>Issue</u>	<u>Date</u>	<u>Description</u>
CI320-01, sheets 1 to 27	2	Mar 97	BA320C Certification Information

EX

EX