



British Approvals Service for Electrical
Equipment in Flammable Atmospheres

1 **Certificate of Conformity**

2. **BAS No Ex 94C2249**

3. This certificate is issued for the electrical apparatus:

BA350B- BATCH CONTROLLER

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) + A1 to A5
EN 50 020 (1977) + A1 and A2

and has successfully met the examination and test requirements as recorded in confidential Report No. ERA Ref 3627/697, dated August 1994.

7. The apparatus marking shall include the code

EEx ia IIC T5
(T_{amb} = 60°C)



File No: **EECS 0121/02/010**

Sheet 1/4
REP7/R0454A

I M CLEARE
DIRECTOR EECS
14 October 1994

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 94C2249 dated 14 October 1994

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 2/4

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 795114 Telex: 668113 RLSD G





Schedule

Certificate of Conformity BAS No Ex 94C2249 dated 14 October 1994

APPARATUS

THE BA350B- BATCH CONTROLLER is a panel mounting unit designed to provide batch control of liquids, solids or components in the hazardous area.

The Batch Controller is fitted with alternative input cards to form a BA350BP PULSE I/P BATCH CONTROLLER or a BA350BC 4/20 mA I/P BATCH CONTROLLER.

The Batch Controller consists of five printed circuit boards namely a main board PC43, a display board PC44, a terminal board PC45, either a pulse input sub-board PC46 or a 4/20 mA input sub-board PC47, and an EEPROM board PC55 which is encapsulated.

The boards are housed within a plastics enclosure.

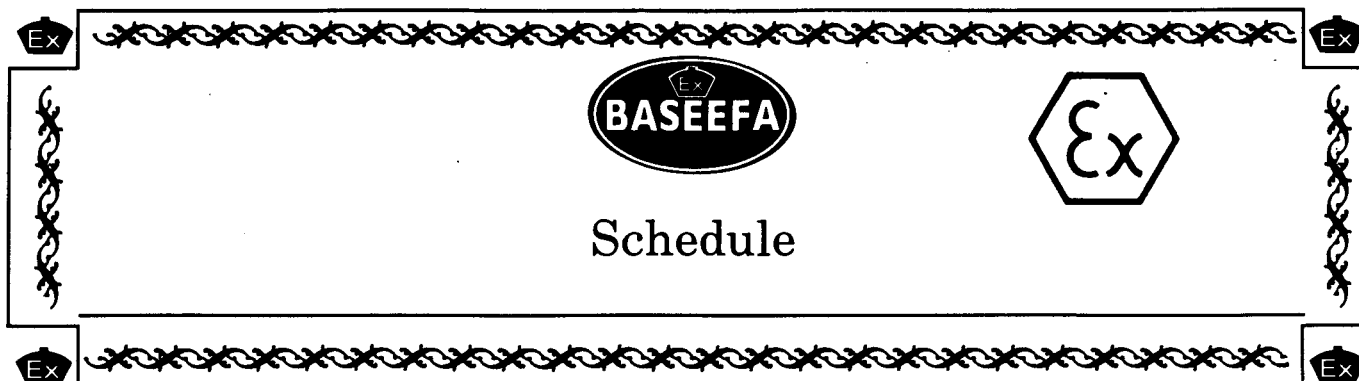
The enclosure provides a degree of protection of IP20.

Intrinsic Safety is assured by limitation of voltage, current and power, limitation of capacitance, suppression of inductance, use of an intrinsically safe transformer and infallible segregation. Isolation of the output circuits and on the 4/20 mA input sub-board is provided by certified opto-isolators type SSI-8900 Series, Certificate BAS No Ex 89C2096U.

The maximum intrinsically safe input parameters are as follows:

Circuit	Terminals	$U_{\max : \text{in}}$	$I_{\max : \text{in}}$	$W_{\max : \text{in}}$
Power Supply	1-2	28V	159 mA	0.8W
Output 1	5-6	28V	93 mA	0.66W
Output 2	9-10	28V	93 mA	0.66W
Reset	23-24	28V	93 mA	0.66W
Flow	26-27	28V	93 mA	0.66W
Pulse output	29-30	28V	93 mA	0.66W
Remote Switches	14-19 incl	.*	.*	.*
Signal Input	11-12	28V	93 mA	0.66W

*Switch terminals may only be connected to intrinsically safe galvanically isolated relay contacts



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The equivalent parameters of the apparatus at the supply terminals and each pair of signal terminals are:

$$C_{eq} = 0.04 \mu F$$

$$L_{eq} = 0.01 \text{ mH}$$

The equivalent output parameters at the signal input terminals are:

Circuit	Terminals	$U_{\max : \text{out}}$	$I_{\max : \text{out}}$	$W_{\max : \text{out}}$	C_{ext}	L_{ext}
Pulse Input	11-12	9.4V	22 mA	52 mW	3.76 μF	69 mH
4/20 mA Input	11-12	0.3V	6 mA	8 mW	10000 μF	900 mH
Remote Switches	14-19 incl	9.4V	10 mA	24 mW	3.76 μF	330 mH

DRAWINGS

Number	Issue	Date	Description
CI350-01			
Sheets 1 to 27	1	Oct 93	Certification Information



British Approvals Service for Electrical
Equipment in Flammable Atmospheres

Certificate of Conformity Variation

THIS IS TO CERTIFY THAT CERTIFICATE BAS No Ex 94C2249

Held by **BEKA ASSOCIATES**

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

for the **BA350B-BATCH CONTROLLER**

is hereby extended to apply to apparatus designed and constructed in accordance with the specification set out in the Schedule of the said Certificate but having the variation specified in the attached Schedule.

A copy of this Supplementary Certificate shall be attached to the original certificate.

File No. EECS 0121/02/010
Report 95(C)0167
(ERA Report Ref 3627/762)



CERTIFICATE BAS No Ex 94C2249/1
Sheet 1/3
VKV3/C1567

I M CLEARE
DIRECTOR EECS
20 September 1995

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





Schedule

Certificate of Conformity BAS No. Ex 94C2249/1

VARIATION ONE

To permit the following changes:

- i) Addition of a new optional RS232 Serial Interface Sub-board, PC48.
- ii) Potted EEPROM assembly, PC55, replaced by C47 and IC10 on the main board.
- iii) Value of capacitors C82 and C342 changed from 10 nF to 100 nF nominal and 100 nF to 33 nF nominal respectively.
- iv) The pulse input sub-board, PC46, changed from a single sided board to a plated through board and track added on the component side to replace links.
- v) Minor corrections to the drawings.

The maximum intrinsically safe input parameters at the RS232 serial interface sub-board terminals 36, 38 and 40 are:

$$U_{\max:\text{in}} = 25.6 \text{ V dc } (\pm 12.8 \text{ V dc})$$

$$I_{\max:\text{in}} = 164 \text{ mA dc}$$

$$W_{\max:\text{in}} = 0.54 \text{ W}$$

The equivalent parameters of the apparatus are unchanged ie.

$$C_{\text{eq}} = 0.04 \text{ } \mu\text{F}$$

$$L_{\text{eq}} = 0.01 \text{ mH}$$



Schedule

Certificate of Conformity BAS No. Ex 94C2249/1

The equivalent output parameters at the RS232 serial interface input/output terminals 36, 38 and 40 are:

$$U_{\text{max:out}} = \pm 13 \text{ V dc}$$

$$I_{\text{max:out}} = 69 \text{ mA dc}$$

$$W_{\text{max:out}} = 0.23 \text{ W}$$

The equivalent output parameters at the two control and three auxiliary output terminals 5,6; 9,10; 23,24; 26,27 and 29,30 are zero.

DRAWINGS

Number	Issue	Date	Description
CI350-01 sheets 1 to 31	2	1.95	Certification Information

British Approvals Service for Electrical
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Certificate of Conformity - Variation

SUPPLEMENTARY CERTIFICATE BAS No. Ex 94C2249/2

This is to certify that Apparatus Certificate number:

Ex 94C2249

held by:

BEKA ASSOCIATES

of:

Hitchin, Herts, SG5 2DA

for the:

BA350B - BATCH CONTROLLER

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 0121/02/010

Sheet 1 of 2

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.



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



I M CLEARE
DIRECTOR
12 January 1996



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

British Approvals Service for Electrical
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Schedule

Supplementary Certificate BAS No. Ex 94C2249/2

VARIATION TWO

To permit the Batch Controller to have an alternative type designation of (i) BC-Ex 1.C, (ii) BC-Ex 1.P, (iii) MEW 50i, or (iv) MEW 50i-MA.

The intrinsic safety assessment is not affected by these changes.

DRAWINGS

<u>Number</u>	<u>Issue</u>	<u>Date</u>	<u>Description</u>
CI 350-01 Sheets 2 and 27	3	1.96	Modification Record and Label

British Approvals Service for Electrical
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Certificate of Conformity - Variation

SUPPLEMENTARY CERTIFICATE BAS No. Ex 94C2249/3

This is to certify that Apparatus Certificate number:

Ex 94C2249

held by:

BEKA ASSOCIATES

of:

Hitchin, Herts, SG5 2DA

for the:

BA350B-BATCH CONTROLLER

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 0121/02/010

Report No. 97(C)0299 (ERA Report Ref. 3627/835), July 1997

Sheet 1 of 2

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**

12 August 1997



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



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



British Approvals Service for Electrical
Equipment in Flammable Atmospheres



Schedule

Supplementary Certificate BAS No. Ex 94C2249/3

VARIATION THREE

To permit the following changes:-

- i) Typographical corrections to the drawings.
- ii) Minor modifications to the RS232 Serial Interface Sub-Board, PC48, artwork on the solder side. IS segregation requirements are not affected.
- iii) Resistor R715 value and power rating changed from $2 \text{ k}\Omega \pm 1\%$, 0.6W to 1.98 k Ω minimum, 0.5W.
- iv) The maximum intrinsically safe input parameters at Output 1, Output 2, Reset Status, Flow Alarm and Re-transmitted output, i.e. terminals 5-6, 9-10, 23-24, 26-27 and 29-30 are as follows:-

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

$$I_i = 110 \text{ mA}$$

$$P_i = 0.75\text{W}$$

The Intrinsic Safety and Temperature Classification are unaffected.

DRAWINGS

<u>Number</u>	<u>Issue</u>	<u>Date</u>	<u>Description</u>
CI350-01 Sheets 2, 17, 28, 29	4	Jan 97	Certification Information

