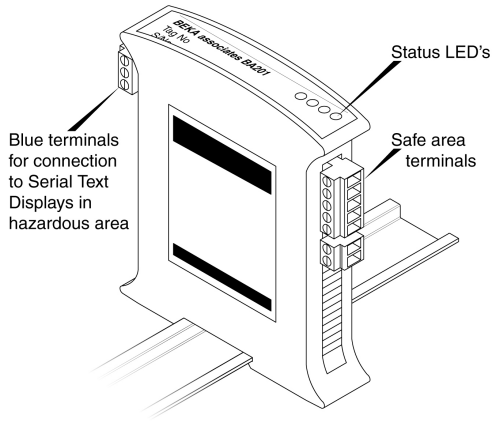
# Instruction sheet for BA201
# Communications Isolator




## 1. INTRODUCTION

**The BA201 Communications Isolator is CE marked to show compliance with the *European Explosive Atmospheres Directive 2014/34/EU* and the *European EMC Directive 2014/30/EU*.**

**The BA201 Communications Isolator is UKCA marked to show compliance with UK statutory requirements *Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations UKSI 2016:1107 (as amended)* and with the *Electromagnetic Compatibility Regulations UKSI 2016:1091 (as amended).***

These instructions describe the function, certification, installation, safe use and maintenance of the BEKA BA201 Communications Isolator. This isolator is primarily intended for communicating with and powering BEKA intrinsically safe Serial Text Displays, but may be used with other intrinsically safe hazardous area equipment having compatible intrinsic safety parameters.

## 2. DESCRIPTION

The BA201 Communications Isolator is a dedicated interface for connecting intrinsically safe BEKA Serial Text Displays, such as the BA484D and the BA488C, to a safe area computer system. It is certified as intrinsically safe *associated apparatus* and must be installed in a non-hazardous safe area. The BA201 provides intrinsically safe galvanic isolation between the safe and hazardous areas, plus conversion of RS232 or RS485 serial data to the dedicated 2 or 3-wire communications signalling required by BEKA Serial Text Displays.

The BA201 Communications Isolator also powers the Serial Text Display and, depending upon the wiring configuration, up to four displays may be connected to each BA201 Isolator. To prevent earth loops, both communications ports are functionally isolated from the BA201 power supply allowing an earthed or floating supply to be used.

## 3. CERTIFICATION

The BA201 Communications Isolator has the following intrinsic safety *associated apparatus* certifications that permit installation throughout the world:

IECEx IECEx ITS 07.0014

ATEX ITS07ATEX25602

UKCA ITS21UKEX0086

FM Entity & Nonincendive
File number 3029711

cFM Entity & Nonincendive
File number 3029711C

The IECEx, ATEX and UKCA certifications and installations, which comply with similar standards, are described in the main section of this instruction sheet.

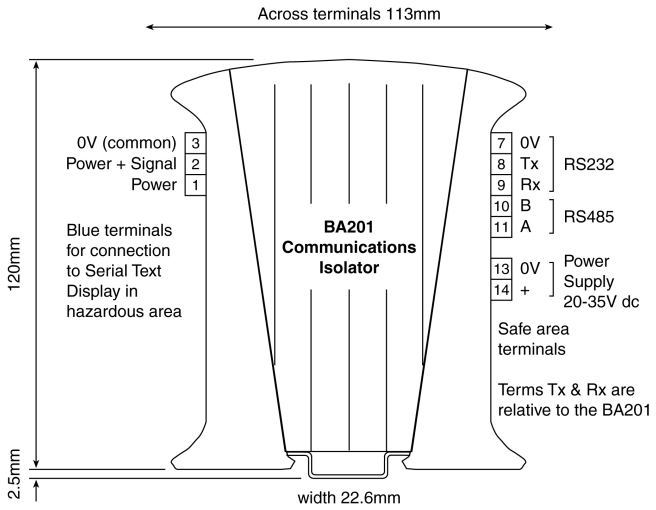



Fig 1 BA201 dimensions and terminal numbers

### 3.1 IECEx, ATEX and UKCA certification

UK Approved Body Intertek Testing & Certification Ltd have issued the BA201 Communication Isolator with an IECEx Certificate of Conformity IECEx ITS 07.0014. They have also issued a UK-Type Examination Certificate ITS21UKEX0086 which has been used to claim compliance with UK statutory requirements for II (1) G [Ex ia Ga] IIC *associated apparatus*.

Notified Body Intertek Italia S.p.A. have issued the BA201 Communication Isolator with EU-Type Examination Certificate ITS07ATEX25602. which has been used to claim compliance with the European ATEX Directive 2014/30/EU for II (1) G [Ex ia Ga] IIC *associated apparatus*.

The Communications Isolator carries the Community and UKCA Marks, subject to local codes of practice, it may be installed in any of the EEA member countries and in the UK. The IECEx certificate allows worldwide installation, either directly or as a means to obtain local approval. This instruction sheet describes installations which conform to EN 60079:14 *Electrical installations design, selection and erection*. When designing systems for installation outside the UK, the local Code of Practice should be consulted. Fig 2 shows the certification information label that is on the side of the BA201 isolator.

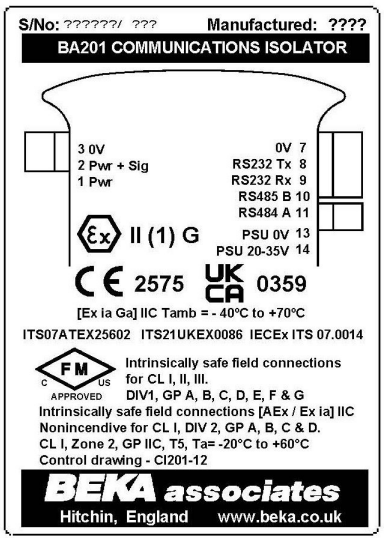



Fig 2 Certification information label

### 3.3 Safety parameters

The IECEx, ATEX and UKCA certifications specify the following intrinsic safety parameters:

Um = 250V

**Terminals 1 with respect to 3**

Uo = 21.2V
Io = 96mA
Po = 0.51W
Co = 183nF
Lo = 3.2mH

**Terminals 2 with respect to 3**

Uo = 13.7V
Io = 84mA
Po = 0.45W
Co = 0.78µF
Lo = 4.1mH

**Terminals 1, 2 & 3**

Uo = 21.2V
Io = 159mA
Po = 0.85W
Ci = 11nF
Li = 0
Co = 0.172µF
Lo = 1mH

## 4. INSTALLATION

The BA201 should only be installed by trained competent personnel.

### 4.1 Location

The BA201 Communications Isolator is certified as *associated apparatus* and may only be installed in a safe area where it will not be exposed to flammable gases or combustible dusts. Additional protection is required if the installation is damp or susceptible to impact. If the Communications Isolator is required in a hazardous area it must be protected by a flameproof, pressurised or purged enclosure. Although certified for uses between –40 and +70°C, the guaranteed operating temperature range is –20 to +60 °C.

### 4.2 Mounting

The isolator is DIN rail mounting and may be clipped to any low or high profile 35mm wide *'top hat'* rail complying with DIN46277, EN50022 or BS5584. Horizontal or vertical rail may be used, but if the ambient temperature is likely to exceed 30°C a horizontal rail is recommended. A gap of at least 2mm should be left between adjacent BA201 isolators increasing to 5mm if the ambient temperature is likely to exceed 50°C.

Wiring to the hazardous area from the BA201 blue terminals should be segregated from all safe area wiring as specified in EN 60079-14.

To remove a BA201 isolator from the DIN rail, use a screwdriver to gently slide the red securing clip outwards as shown in Fig 3.

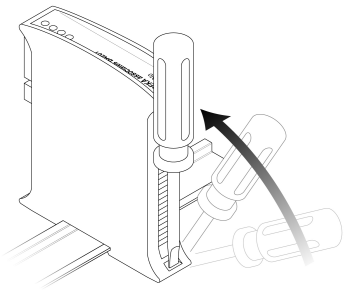


Fig 3 Removing BA201 from the DIN rail

## 5. ELECTRICAL SYSTEM DESIGN

The BA201 is primarily designed for powering and communicating with BEKA intrinsically safe Serial Text Displays such as the BA484D and BA488C, but it may be used with other certified hazardous apparatus with compatible entity parameters.

These instructions should be read in conjunction with those for the BEKA Serial Text Display which define the connections between the isolator and the Serial Text Display(s) for 2 and 3-wire systems.

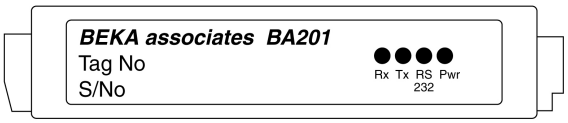
### 5.1 Power supply

The BA201 Communications Isolator requires a 20 to 35V dc supply. The isolator power supply terminals are electrically isolated from the serial communications terminals allowing an earthed of floating supply to be used. The current drawn depends upon the number of Serial Text Displays connected to the isolator.

| No of Serial Text Displays | Display Brilliance | Typical current |
|---|---|---|
| 1 | Full | 70mA |
| 1 | Half | 55mA |
| 2 | Full | 100mA |
| 3 | Half | 85mA |
| 4 | Half | 100mA |

### 5.2 Serial communication

The BA201 Communications Isolator has an RS232 and an RS485 safe area port, but only one of them may be used at a time. No configuration is required, it is only necessary to connect to the required port, the isolator will automatically function at any of the Serial Text Display communication rates between 300 and 19.2k baud. The unused port should be left unconnected.
Four green LEDs on the top of the BA201 indicate the isolator's status as shown in Fig 4.




| LED | FUNCTION |
|---|---|
| Pwr | Power supply |
| RS232 | RS232 serial communication functioning |
| Tx | Serial communication being transmitted by isolator |
| Rx | Serial communication being received by the isolator (Does not imply that the message is valid) |

Fig 4 LED status indicators

## 6. ACCESSORIES

### 6.1 Tag number

BA201 isolators can be supplied identified by a tag number thermally printed onto the label adjacent to the status LEDs protected by a hinged transparent window. Alternatively a tag number may be added on-site using a self-adhesive label.

## 7. ROUTINE MAINTENANCE

The mechanical condition of the isolator and terminations should be regularly checked. Inspection frequency should be adjusted to suit the environmental conditions.

## 8. SERVICING

No attempt should be made to repair a faulty BA201 Communications Isolator. Suspect isolators should be returned to BEKA associates or our local agent for repair.

## 9. GUARANTEE

Communication Isolators which fail within the guarantee period should be returned to BEKA associates or our local agent. It is helpful if a brief description of the fault symptoms is provided.

## 10. CUSTOMER COMMENTS

BEKA associates is always pleased to receive comments from customers about our products and services. All communications are acknowledged and whenever possible, suggestions are implemented.

## 11. INSTALLATION IN THE USA & CANADA

The BA201 has intrinsic safety and nonincendive FM & cFM Approval allowing installation in the USA and Canada. Installations must comply with the BEKA associates Control Drawing CI201-12 which may be downloaded from the BEKA web site, www.beka.co.uk.

# EU Declaration of Conformity

**This certificate is issued for electrical apparatus BA201**

**Description**
BA201 is a communications isolator

**Manufactured by**
BEKA associates Ltd, Old Charlton Road, Hitchin, Herts. UK. SG5 2DA

**Council Directives this equipment complies with:**

**2014/34/EU (ATEX Directive)**

Relating to equipment and protective systems intended for use in potentially explosive atmospheres.

**Provisions of the Directive fulfilled by the equipment:**

Group II Category (1)G [Ex ia] IIC Ta –40ºC to +70ºC

**Notified Body for EU-Type Examination and production**
INTERTEK ITALIA SPA 2575 Via Guido Miglioli, 2/A 20063 Cernusco sul Naviglio (MI) Italy

**EU-Type Examination Certificate**
ITS07ATEX25602 issue 2 dated 07/04/2008

**Standards used:**
EN 60079-0:2006; EN 60079-11:2007
*Compliant with EN IEC 60079-0:2018 and EN 60079-11:2012*

**2014/30/EU (EMC Directive)**

**Standards used:**
EN 61326-1:2021

**2011/65/EU (RoHS Directive)** relating to hazardous substances in electronic and electrical equipment.

**2015/863/EU** additional substances added by amending Annex II to Directive 2011/65/EU as regards the list of restricted substances.

**CE mark first affixed in 2007**

**Authorised Signatory**:

Olivier Lebreton CEng MIET
Managing Director

Issue 11 18th August 2021
Issue 12 11th January 2022

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