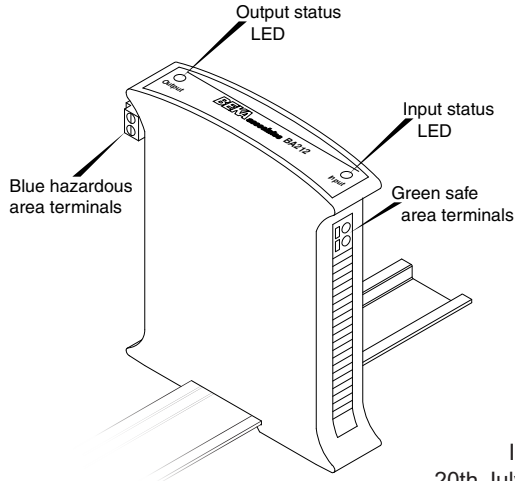


BA212 Power Isolator Instructions



Issue 1
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The BA212 Power Isolators are CE marked to show compliance with the European Explosive Atmospheres Directive 2014/34/EU and the European EMC Directive 2014/30/EU.

The BA212 Power Isolators are also UKCA marked to show compliance with UK statutory requirements Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016 SI 2016 No 1107 and with the Electromagnetic Compatibility Regulations SI 2016 No 1091.

1. INTRODUCTION

These instructions describe the function, certification, installation, safe use and maintenance of the BEKA BA212 Power Isolator. This isolator is primarily intended for powering BEKA intrinsically safe Pageant equipment, but may be used to power other intrinsically safe hazardous area apparatus having compatible intrinsic safety input parameters.

2. DESCRIPTION

The BA212 Power Isolator is a galvanically isolated power supply with an intrinsically safe output which has associated apparatus certification. It may be installed in a safe area or with additional mechanical protection in Zone 2.

The BA212 clips onto a standard 35mm DIN rail and may be powered by any 20 to 30V dc, SELV or PELV supply, or from a supply with double or reinforced insulation. No earth connection is required. The power supply status is indicated by two green LEDs adjacent to the input and the output terminals.

3. CERTIFICATION

The BA212 Power Isolator has IECEx, ATEX and UKCA [Ex ia Ga] IIC intrinsic safety associated apparatus certification for installation in a safe area. It also has increased safety Ex ec component certification permitting installation in Zone 2 when housed in an Ex e enclosure.

3.1 Associated apparatus Ex i certification

The BA212 has IECEx, ATEX and UKCA associated apparatus intrinsic safety Ex ia IIC certification:

IECEX	IECEX CML 20.0080X
ATEX	CML 20 ATEX 2122X
UKCA	CML 21 UKEX 2278X

Copies of these certificates may be downloaded from the BEKA associates website www.beka.co.uk.

The certificates 'X' suffix indicates that the BA212 must be powered from a 30V maximum SELV, PELV or supply providing double or reinforced insulation as explained in section 5.1.

The IECEx, ATEX, UKCA, and UKCA approvals specify the same certification code and output safety parameters.

Location

Safe area

Certification code

IECEX	[Ex ia Ga] IIC	$-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$
ATEX	II (1) G [Ex ia Ga] IIC	$-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$
UKCA	II (1) G [Ex ia Ga] IIC	$-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$

Output parameters

	IIC	Gas group IIB	IIA
Uo =	12.4V	12.4V	12.4V
Io =	2.66A	2.66A	2.66A
	<i>Maximum output current 500mA</i>		
Po =	5.2W	5.2W	5.2W
Co =	1.24 μ F	7.9 μ F	30.0 μ F
Lo =	5 μ H	20 μ H	40 μ H
Lo/Ro =	4.3 μ H/ Ω	17 μ H/ Ω	34 μ H/ Ω

3.2 Increased safety Ex ec certification

To allow the BA212 to be mounted in Zone 2, it has been issued with IECEx, ATEX and UKCA Ex ec increased safety component certification:

IECEX	IECEX CML 20.0081U
ATEX	CML 20 ATEX 2123U
UKCA	CML 21UKEX 3279U

Location

Zone 2

Certification code

IECEX	Ex ec [ia Ga] IIC Gc	$-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$
ATEX	II 3(1) G Ex ec [ia Ga] IIC Gc	$-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$
UKCA	II 3(1) G Ex ec [ia Ga] IIC Gc	$-40^{\circ}\text{C} \leq T_a \leq +70^{\circ}\text{C}$

Output parameters

As associated apparatus Ex ia certification – see 3.1 above.

Copies of these certificates may be downloaded from the BEKA associates website www.beka.co.uk.

The 'U' suffix indicates that these are component certificates. They specify that the BA212 must be installed in an enclosure providing a minimum of IP54 protection which complies with IEC60079-0 and IEC60079-7, such as an Ex e component approved enclosure.

3.3 Certification information label

BA212 Power isolators have a label on the side of the enclosure showing a summary of certification information together with a serial number and year of manufacture.

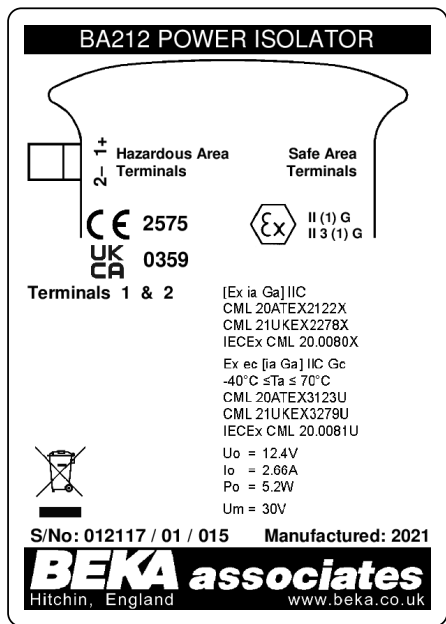


Fig 1 Certification information label

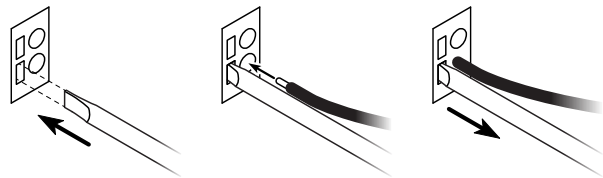


Fig 3 Inserting a wire into a safe area terminal

The BA212 intrinsically safe output has a removable blue terminal block.

To remove a BA212 isolator from the DIN rail, use a screwdriver to gently slide the red securing clip outwards as shown in Fig 4.

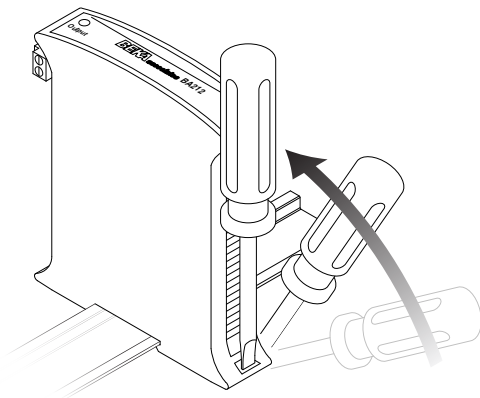


Fig 4 Removing BA212 from the DIN rail

4. INSTALLATION

The BA212 should only be installed by trained competent personnel.

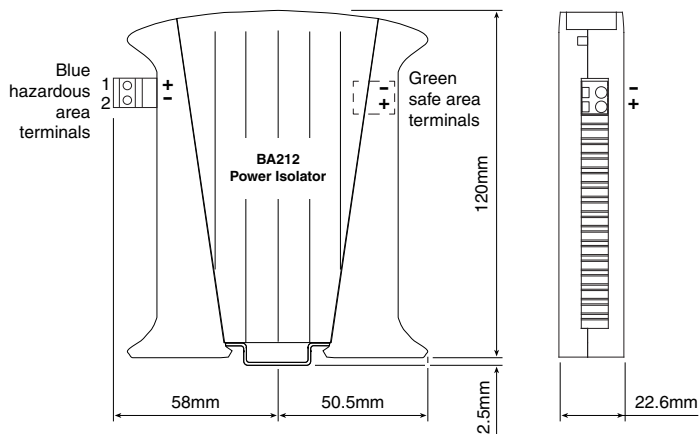


Fig 2 BA212 dimensions & terminals

4.1 Mounting

The BA212 is DIN rail mounting and may be clipped onto any low or high profile 35mm wide 'top hat' rail complying with DIN46277, EN50022 or BS5584. A horizontal or vertical rail may be used, but if the ambient temperature is likely to exceed 30°C a horizontal rail with an unrestricted layout that permits air to be convected through the BA212's ventilation slots is recommended. The gap between adjacent BA212 isolators should be increased to 5mm if the ambient temperature is likely to exceed 40°C.

The safe area green terminals, which connect the BA212 to a power supply, are Ex e approved. To fit a wire into a terminal, insert an instrument screwdriver into the slot at the side of the wire entry and gently push the screwdriver towards the entry as shown in Fig 3. This will open the gripping spring and allow a wire to be inserted into the terminal. When the screwdriver is withdrawn the wire will be secured. Only one wire should be inserted into each terminal.

4.2 Installation in safe area

The BA212 Power Isolator is intrinsically safe associated apparatus and should be installed in a safe area. The BA212 enclosure provides IP20 protection, therefore for most industrial installations additional protection will be required.

4.3 Installation in Zone 2

The BA212 isolator has IECEX, ATEX and UKCA Ex ec increased safety component certification. When mounted inside an enclosure complying with the requirements specified by EN/IEC 60079-0 Clause 1 and providing at least IP54 protection required by IEC 60079-7, the assembly may be located in Zone 2. An Ex e component certified enclosure satisfies these requirements.

Component certificates are only intended to be used as part of a certified assembly, the Power Isolator and the enclosure should therefore be assessed to ensure they are compatible.

4.4 Installation in Zone 22

The IECEX, ATEX and UKCA Ex ec certificates for the BA212 isolator specify that it is suitable for use in Ex tb applications when installed inside a suitable enclosure.

5. ELECTRICAL SYSTEM DESIGN

The BA212 is primarily intended for powering BEKA intrinsically safe Pageant displays, but it may be used to power other certified hazardous apparatus having compatible intrinsic safety input parameters.

The isolator is designed to output the maximum permissible power into the hazardous area, therefore the external inductance L_o that can be connected is very small. Applications in group IIC gases (hydrogen) are only possible when the BA212 Power Isolator and the hazardous area load are only a few metres apart. For applications in a IIC gas where the load and the isolator are separated, please see BEKA power isolator BA243.

Ex ec component certification permits the BA212 Power Isolator to be installed in Zone 2 when mounted inside an Ex e component certified enclosure or cabinet. Ex component equipment is not intended to be used alone. When an Ex ec component certified BA212 Power Isolator is mounted in an Ex e component certified enclosure, the resulting Ex equipment requires assessment to confirm that the two may be safely used together. Please see BEKA Application Guide AG210 for additional information about installation of the BA212 Power Isolator in Zone 2, selection of an enclosure and recommended equipment assessment.

5.1 Power supply

The BA212 has a U_m of 30V dc and should be powered from a 20 to 30V dc supply complying with one of the following:

- SELV (separated or safety extra low voltage)
- PELV (protected extra-low voltage supply)
- Employing a safety isolating transformer with double or reinforced insulation.
- Complying with IEC60950 series, IEC81010-1 or technically equivalent standard.
- Fed directly from cells or batteries

Most low voltage instrument supplies satisfy this requirement. Compliance with the European or UK Low Voltage Directive confirms the supplies suitability.

5.2 Intrinsically safe output

The BA212 output safety parameters are shown in section 3. The isolator employs active voltage and current limits and has the typical output characteristic shown in Fig 5.

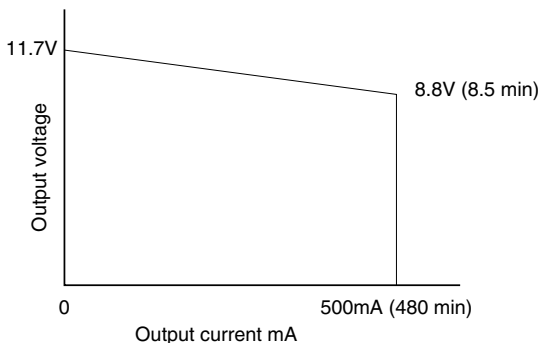


Fig 5 BA212 typical output characteristic

When the output load exceeds the current limit the output voltage falls to zero. When the load is reduced the output voltage is automatically restored.

5.3 Operation

Immediately power is applied the BA212 will start to function. Status is shown by two green LED indicators adjacent to the input and output terminals. The LED by the green input terminals is illuminated when the BA212 is receiving power. The LED adjacent to the blue output terminals indicates the output status as shown below.

CAUTION

When the BA212 is mounted in Zone 2, live maintenance should only be performed when it is permitted by risk analysis, or when there is no risk of a flammable atmosphere being present.

Input LED	Output LED	Meaning	Cause / Action
On	On	BA212 is functioning correctly.	
On	Flashing	Output current limit has been activated.	The BA212 load is too large and it is trying to draw more than 500mA. Reduce load to resume normal operation.
On	Off	The output hazardous area wiring is faulty. or The BA212 is faulty.	Remove the BA212 load by unplugging the blue terminals. If the output LED is then illuminated check the field wiring. If the output LED is not illuminated when the blue terminals are unplugged, replace the BA212 Power Isolator.

5.4 Application Guide

Application Guide AG210, which contains additional information about the BA212 Power Isolator, may be downloaded from the BEKA website www.beka.co.uk.

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