BAC®
CORROSION CONTROL

Infinity POWER

# Hazardous Area Power Supplies


MEMBER OF
MIDROC EUROPE

# Hazardous Area Transformer Rectifiers

BAC Corrosion Control Ltd manufacture a wide range of hazardous area rated power supply, control and surge protection equipment including a range of transformer rectifiers which have been independently approved and certified for Zone 1 and 2 classification.

All units manufactured by BAC are accredited by a notifying body and are certified to ATEX , UK Ex or IEC Ex classification standards.

**Features**

- Approved for zones 1, 2, 21 & 22
- Both manual control and auto potential control
- Bespoke design to meet customer size requirements
- Viewing window for ease of monitoring
- High quality paint finish
- Surge protection
- Audited systems with complete traceability
- Unit Testing

Prior to dispatch all units undergo rigorous testing. All TR units are built and tested to BS EN 60079 Explosive atmospheres and BS EN 61439 Low-voltage switchgear and control gear assemblies

- Technical Datasheet available upon request
- Flexibility Offered
- Single or multi-channel channel units
- Choice of non-synchronous timer / - GPS synchronous timer
- Options for Remote Monitoring and Control
- Phase fail alarm option
- Over temperature alarm option
- Digital meters



BAC® CORROSION CONTROL

Infinity POWER

## ATEX / UKEX Marking

Ex II 2 G / D

## IECEx Marking

Ex db eb ob II# T* Gb
Ex tb III## T**°C Db
Tamb: up to -40°C to +60°C

T* / T**°C – All temperature classes are available to suit customer requirements.

These include:
* Gas: T6 / T5 / T4 / T3 / T2 / T1
** Dust: T450°C / T300°C / T200°C / T135°C / T100°C / T85°C
# Gas : IIA / IIB / IIB+H2 / IIC
## Dust : IIIA / IIIB / IIIC

Our CE and UKCA marking and notified body number:

CE 2776 UKCA 2503

EAC Ex certification available on special request

EAC Ex

**Remote Monitoring and Control System**
The RMCS is factory set up and tested to ensure the system is ready to go. The only on site configuration required is related to the communications networks.

The RMCS is configured specifically to the project requirements including but not limited to:

- Project/Site Name
- Number of DC outputs
- DC output ratings
- Number of Reference electrodes
- Project specific naming of DC outputs and reference electrodes
- DC output logging and switching schedules

The RMCS software is licensed to the system with no on going costs..

The RMCS system can be accessed and operated from the following:

- RMCS PC, Using web browser interface
- Local PC, A PC on the same LAN network using a web browser
- Remote PC via the internet and remote desktop software e.g. Team Viewer or web browser.

# Hazardous Area Build Specifications

**Transformer Rectifier units designed for plinth mounting and consisting of:**

- Ex o oil tank with channels at base, housing all power components including transformer, rectifier and DC choke. All cabinet terminations in Ex e air space above the oil.
- Ex d control cabinet mounted to front of tank housing all control & monitoring circuitry including HMI
- Ex d DC cabinet mounted to rear of tank, housing HSF fuses, DC MCB, terminals, smoothing & switching circuitry (Optional)
- Add Ex d/e AC isolator mounted to right side of control cabinet (optional)
- Sunshade (Optional)
- All interconnections via Ex rated glands & conduits

**Local Metering and Controls via HMI Panel with Push Buttons, complete in service control and monitoring of:**

The HMI has an OLED screen and 5-way keypad. To enable operation in hazardous area without opening the control cabinet door, the HMI screen is visible through a viewing window and momentary push buttons are fitted to the external to mimic the 5 way keypad.

**Monitoring:**

- DC voltage and current
- Up to 8x References
- Control mode
- Alarms
- AC ripple
- Oil and cabinet Temperature
- Oil Level

**Control:**

- Control Mode
- Control set point and limits
- Alarms
- DC Timer (GPS Optional)
- Datalogging
- Instant off

Controls integrated into the HMI include optional DC Timer Interrupter with or without GPS time synchronisation.

# Hazardous Area Build Specifications

BAC® CORROSION CONTROL

Infinity POWER

**Surge Protection and Safety comes as standard with all units. AC Isolator Cabinet with Exd Rated Isolator Switch available as an option.**

**All Transformer Rectifier units are designed, manufactured and tested at our UK works located in Telford. Witness FAT testing is available and we work hand in hand with Our customers every step of the way to ensure complete product satisfaction.**

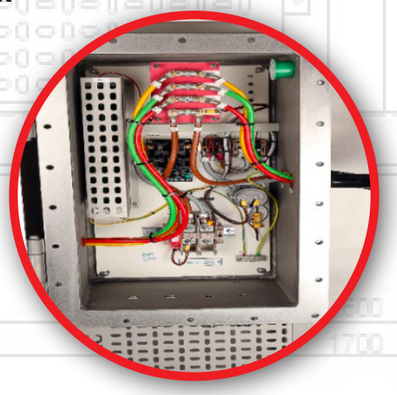
**Every detail is considered and designed to comply, right down to the Hazardous Area rated desiccant gel tank breathers**

**BAC's Infinity Thyristor Control technology is at the heart of every unit offering industry leading functionality, monitoring and control along with reliability you can depend upon**

**Transformer rectifier can be manufactured from the following materials:**

- **Mild Carbon Steel**
- **316L Stainless Steel**
- **Aluminium**

**Completed with a natural or painted finish to suit our clients specification and in line with standards and product certification.**



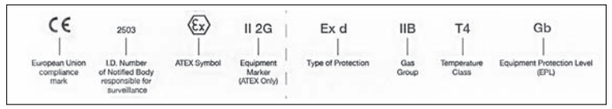
**Exd Cabinets for AC Input and DC Control. These are generally supplied in Cast Aluminium, however Stainless Steel and mild steel Models are Available**

**Fully certified GPS interrupters (inc GPS antenna) are available for synchronous switching of units during surveys and periodic system monitoring**

# Hazardous Area Guide for ATEX & IECEx
## (zones/groups)

BAC can guide you through the classification process to ensure you meet specification and produce the correct certification to meet the project requirements. A brief summation of the different classification categories are detailed below for your reference.

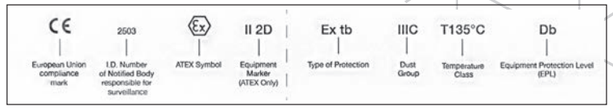
Typical equipment marking for gas atmospheres




2014/34/EU ATEX Directive Marking

EN/IEC 60079-0 General Requirements Marking

Typical equipment marking for dust atmospheres




2014/34/EU ATEX Directive Marking

EN/IEC 60079-0 General Requirements Marking

### Gas Zones

| Gas Zones | Definition | ATEX Category | EPL | Required Protection |
|---|---|---|---|---|
| Methane | Mines with methane and dust. Equipment remains energised in explosive atmosphere | M1 | Ma | Two Faults |
| Methane | Mines with methane and dust. Equipment is deenergised in explosive atmosphere | M2 | Mb | Severe Normal Operation |
| Zone 0 | Explosive atmosphere present continuously or for long periods, frequently | 1G | Ga | Two Faults |
| Zone 1 | Explosive atmosphere is likely to occur under normal conditions, occasionally | 2G | Gb | One Fault |
| Zone 2 | Explosive atmosphere is unlikely to occur under normal conditions, short periods | 3G | Gc | Normal Operation |

### Dust Zones

| Dust Zones | | ATEX Category | EPL | Required Protection |
|---|---|---|---|---|
| Zone 20 | Explosive atmosphere present continuously or for long periods, frequently | 1D | Da | Two Faults |
| Zone 21 | Explosive atmosphere is likely to occur under normal conditions, occasionally | 2D | Db | One Fault |
| Zone 22 | Explosive atmosphere is unlikely to occur under normal conditions, short periods | 3D | Dc | Normal Operation |

### Temperature Class (T Class)

| Tempera-ture Class | Highest temperature achieved |
|---|---|
| (T Class) | under the most adverse equipment rating and heating conditions. (Flashpoint temper-ature of some gases) |
| T1: 450°C | Ammonia (630°C), Hydrogen (560°C), Methane (537°C), Propane (470°C) |
| T2: 300°C | Ethylene (425°C), Butane (372°C), Acetylene (305°C) |
| T3: 200°C | Cyclohexane (259°C), Kerosene (210°C) |
| T4: 135°C | Di-ethyl Ether (160°C) |
| T5: 100°C | - |
| T6: 85°C | Carbon Disulphate (95°C) |

### Dust Groups

| Dust Groups | Dusts are classified by the types of material that make up the dust |
|---|---|
| IIIA | Combustible Fibres and Flyings |
| IIIB | Group IIIA dusts plus, Non-Conductive Dusts |
| IIIC | Group IIIA and IIIB dusts plus, Conductive Dusts |

### Protection Concept - Electrical

| Type of Protection | Reference |
|---|---|
| Gas – Flameproof enclosures “d” | IEC 60079-1: |
| Gas and dust – Pressurised enclosure “p” | IEC 60079-2: |
| Gas – Powder filling “q” | IEC 60079-5: |
| Gas – Liquid immersion “o” | IEC 60079-6: |
| Gas – Increased safety “e” | IEC 60079-7: |
| Gas and dust – Intrinsic safety “i” | IEC 60079-11: |
| Gas and dust – Pressurised room “p” & ventilated room “v” | IEC 60079-13: |
| Gas – Type of protection “n” | IEC 60079-15: |
| Gas and dust – Encapsulation “m” | IEC 60079-18: |
| Gas and dust – Intrinsically safe electrical systems | IEC 60079-25: |
| Gas – Equipment with equipment protection level (EPL) Ga | IEC 60079-26: |
| Gas and dust – Optical radiation | IEC 60079-28: |
| Gas detectors | IEC 60079-29: |
| Gas and dust – Electrical resistance trace heating | IEC 60079-30-1: |
| Dust – Protection by enclosure “t” | IEC 60079-31: |
| Gas and dust – Special protection “s” | IEC 60079-33: |
| Caplights for use in mines susceptible to firedamp | IEC 60079-35-1: |
| Gas – Intrinsically safe systems with spark limitation | IEC TS 60079-39: |
| Gas – Requirements for process sealing | IEC TS 60079-40: |
| Gas and dust – Non electrical equipment | ISO 80079-36: |

### Gas Groups

| Gas Groups | Gases are classified accorinding to the ignit-ability of the gas / air mixture as defined in EN/IEC 60079-20-1 |
|---|---|
| IIA | Acetic Acid, Acetone, Ammonia, Butane, Cyclohexane, Propane, Gasoline (petrol), Methane (natural gas, non-mining), Toluene, Xylene. Methanol (methyl alcohol), Propane 2-ol (iso-propyl alcohol) |
| IIB | Group IIA gases plus, Di-ethyl ether, Ethylene, Ethanol Methyl ethyl ketone (MEK), Propane-1-ol (n-propyl alcohol) |
| IIC | Group IIA and IIB gases plus, Acetylene, Hydrogen |

### Ambient Temperature Range (Tamb)

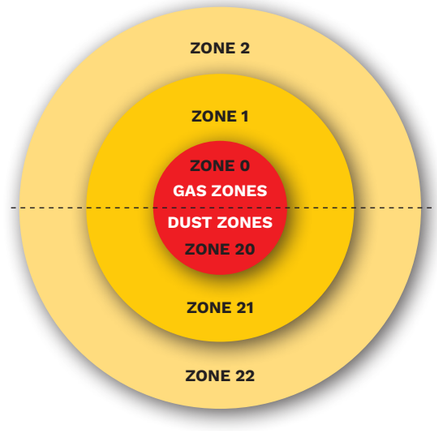
| | |
|---|---|
| Tamb = | BAC Temperature range is from - 40°C to +60°C |

# Zones of Use Explosive Atmospheres

**Suitable for Zone 0, 1 & 2**
ATEX Group & Category: II 1G
IECEx Equipment Protection Level: Ga

**Suitable for Zone 1 & 2**
ATEX Group & Category: II 2G
IECEx Equipment Protection Level: Gb

**Suitable for Zone 2 only**
ATEX Group & Category: II 3G
IECEx Equipment Protection Level: Gc




**Suitable for Zone 20, 21 & 22:**
ATEX Group & Category: II 1D
IECEx Equipment Protection Level: Da

**Suitable for Zone 21 & 22:**
ATEX Group & Category: II 2D
IECEx Equipment Protection Level: Db

**Suitable for Zone 22 only:**
ATEX Group & Category: II 3D
IECEx Equipment Protection Level: Dc

# Hazardous Area Products

BAC also manufacture a complete range of Hazardous Area Rated Junction Boxes and Solid State Surge Divertors to ensure that any Zone rated requirements can be met in full and without compromise.

Exd Junction Boxes for Zone 1 & 2 Hazardous Areas


Zone 1 & 2 Hazardous Area EDD Devices

Terminal Boxes for Zone 2 Hazardous Areas

Infinity POWER


BAC®
CORROSION CONTROL

**BAC CORROSION CONTROL LTD**
Stafford Park 11, Telford, Shropshire, TF3 3AY, UK

**T:** +44 (0) 1952 290321
**F:** +44 (0) 1952 290325
**E:** sales@bacgroup.com

**www.bacgroup.com**

Member of
MIDROC

cpa · IC · NACE · bmtrada · bmtrada · bmtrada · UKAS