



Hazardous Area Solutions

BARTEC
Approved Partner



Banelec are proud to announce their further development into the hazardous area market, as approved partners with Bartec Banelec can now open up this industry to offer a truly one stop option, seriously reducing lead times.

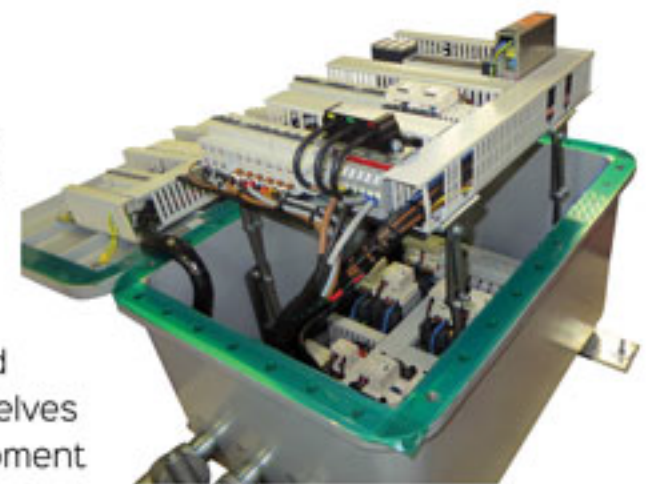
BARTEC

How?

With our new partnership all services can be handled in house..

- ✓ No need for a third party design company to design your system, your involvement: ...
- ✓ Simply tell us, what you need to control, how you would like it to operate, the area classification, and climatic environment and we will do the rest...
- ✓ Drawings will be issued for your approval
- ✓ Banelec can produce the appropriate system to suit all ATEX, IECEX, NEC500, NEC505, INMETRO and so even Russian and Kazak approvals are no problem.
- ✓ Leave all the Calculations to us. Following design approval, we use our in-house developed software to produce a detailed calculation sheet to size the enclosure, considering such facts as heat dissipation, heat rise, volumetric capacity and pressure piling.
- ✓ Manufacturing. We have a team of highly professional, experienced staff who are dedicated to hazardous area projects. We pride ourselves on our fast turnaround and incredible finish of every piece of equipment that leaves our premises.
- ✓ Testing. All equipment is tested either in its basic form or as part of an overall system, third party inspection is welcomed and our tests vary to suit your needs. Including flash tests, primary / secondary injection testing to full function testing.
- ✓ Documentation, we are experienced enough to know that the basic documents are rarely enough for many projects, our quotes will include your document requirements and can be produced in multiple languages.
- ✓ Delivery. Need special crating or air freight? No problem, need a better delivery time? We have done it before.
- ✓ Installation and commissioning, at any one time we have a team of hazardous area competent engineers around the world installing / supervising and commissioning systems in all environments on and offshore, within various regulatory authorities.

Finally, as we have also a strong background within the automotive industry we have the ability to supply and program most makes of PLC equipment including HMI's along with frequency inverter set up..
.....yes we can install frequency inverters within an Exd housing.



We have experience in the automation industry, PLC, HMI and inverter programming can be included within our scope.

Radio control receivers can be mounted within the main control panel to reduce costs and save space, Aerial bushings are installed too.

Banelec can design, manufacture install and commission almost all hazardous area systems worldwide

A bit about Banelec..

Banelec have always strived to be the best all round control system firm in the UK. We feel that we are unique as we are the only control system engineering company that offers, basic off the shelf control panels right the way through to hazardous area equipment and on to fully automatic control systems for the automotive and high end engineering.

With the exception of a few pre-designed systems, Banelec engineers start the ball rolling by producing full designs for a system that the customer has merely described to us, that is where the limit of many firms stop, with Banelec however, we complete the job, following design, we manufacture, test, deliver and install and commission anywhere in the world with our dedicated team whether they be office based or out in the field.

It's all about experience

From its humble beginnings Banelec have gradually achieved and maintained an excellent customer base with almost all customers returning to us time and again, a true testament to our quality and devotion to customer satisfaction.

Customers return to us time and again, a true testament to our quality and devotion to customer satisfaction



Although our team have always been involved with hazardous area products, we have a very diverse range of capabilities, our projects include semi and fully automatic systems for the automotive industry with projects for Jaguar, Land Rover – Aston Martin – BMW – Nissan – GKN to name but a few, and high end engineering projects for Rolls Royce – Alstom and SAESL (Singapore Aero Engine Services Limited) right through to oil and gas hazardous area projects which have taken Banelec into more than 50 countries – so far.....

Daring to be different

Although Banelec have always produced hazardous area control systems, we were typically held back from operating under our own banner by the supplier of the enclosures, with our new deal this has all changed and we can now offer the full service to our customers.

We are also able to offer most worldwide standards including ATEX, IECEx, NEC500, NEC505, INMETRO and EAC.



Banelec build to most world-wide standards, including.....
ATEX, IECEx, NEC, INMETRO
and EAC



We are adaptable

At Banelec we will do our utmost to ensure that your control system is the most economical and maintenance friendly solution. We know that our competitors all too often concentrate on the best value to suit their own means.

Because Banelec – when contracted to – also maintain systems following handover where as our competitors very rarely offer this option, we have learned the value of ensuring very neat and well-constructed control systems are a great benefit to the future reliability of such vital control systems.

As standard all terminations are marked with indelible fully wrapped markers.



We are flexible

Some customers insist that our marking system adapts the point to point system, or each cable core is colour coded, this is of course no problem and we will always follow specifications as closely as possible, we do our utmost to find a mutually satisfactory solution.

Colour coded cable cores,
non-standard cable marking,
no problem, we can adapt

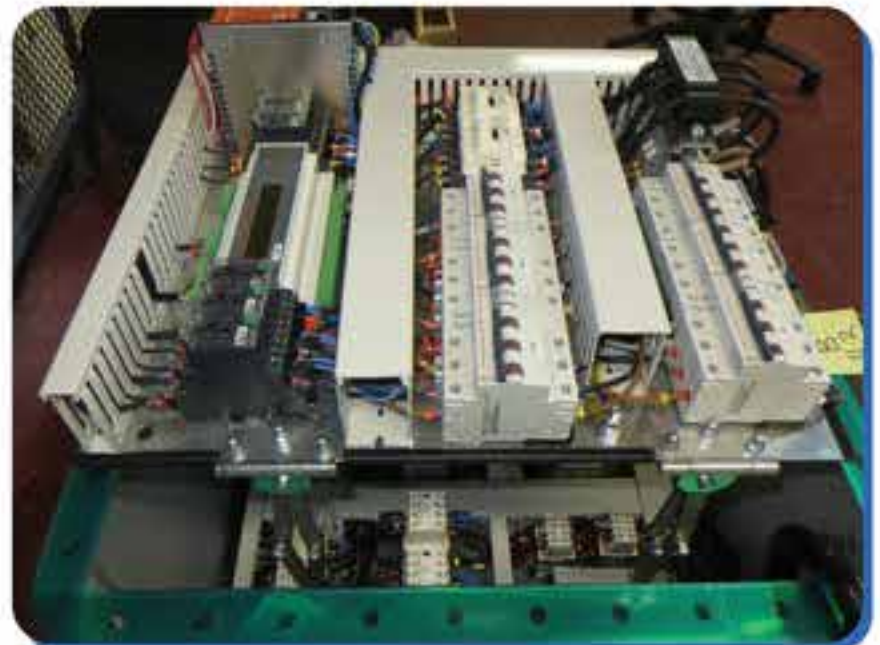
Need a non-standard
operating temperature range?
We can comply

We are inventive

In the case shown here, space for the electrical enclosure was limited, typically the equipment required would be installed into a larger enclosure or even split into multiple enclosures, at Banelec we designed and installed special bespoke brackets which allowed a secondary component mounting plate to be populated and installed.

The brackets allow this intermediate component plate to be brought forward and swung on hinges to allow complete unrestricted access to the components below.

Our unique triple layer design
saved our customer the expense
of a larger enclosure and more
importantly the space on his
equipment



We are quality

At Banelec we pride ourselves in the quality of our workmanship, and very often this is noted by our customers. As we are often on site we know from the front line how frustrating it can be to work with and fault find in panels that are not to our standard.

We are flexible

Banelec have designed and manufactured thousands of electrical systems, from basic starter panels to major automotive PLC and robot control suites. Of course from time to time things change and adjustments need to be made, our competitors may make an issue and cause delays or extra costs, whether the system you order be from your own design or an in-house Banelec design, any minor issues arising from any oversight will be quickly resolved, Banelec will always strive to keep projects on budget and to schedule.

We understand that sometimes a customer requires a change mid project, we won't make a big issue about it.



Our quality workmanship benefits Banelec as much as you – the customer. Maintenance is made much easier and quicker with good quality.

Customer satisfaction is our aim and the main reason we have such a large percentage of repeat business.



Let Banelec remove the headaches surrounding your next project

Stainless Steel, Carbon Steel and Aluminium construction offered

We are your choice

At Banelec we believe that we offer the best all round solution to your hazardous area requirements, our professional manner and supreme quality makes us your number one choice. Banelec removes the headaches surrounding the design, manufacture and tedious paperwork which goes with it.

Why not give Banelec a try?



Design

Using the very latest AutoCAD software, our design team are the first in line getting your project moving, based upon your specification and function of the system a full review is held to discuss the best option for your project.



Manufacture

Drawings approved by the customer will be used to compile the parts list taking into consideration the calculations necessary to ensure the system complies with the relevant regulations and gas or dust group. To reduce the delivery times even further Banelec carry a stock of enclosure mounting plates onto which we populate with the components so that it is simply a matter of installation into the enclosure when this arrives. Although Banelec carry the burden of the mounting plate stock the delivery time reduction far outweighs this expense.



Testing

Banelec offer more than just the typical testing offered by our competitors, very often more stringent testing is preferred, as a standard all our panels are continuity, and flash tested, but we also offer primary and secondary injection testing. If possible then we will fully function test any system too.



Packaging and Delivery

Let us take the strain of organizing appropriate packing and delivery of the product, all our cases are treated for circumstances as dictated by you, very often we have equipment which must be stored for many months likewise some customers require a fast air freight delivery, Banelec can arrange it all.



Installation & Commissioning

Banelec have dealt with the whole project from inception to delivery, our engineers are qualified and experienced enough to complete the job. With successful works carried out in over 50 countries we feel that we offer the complete package.



From initial concept to final handover, Banelec can be with you all the way

In House Software~

To make the job of determining the allowable heat dissipation and free volume of an enclosure in relation to the components to be housed within. Our software engineers developed the spreadsheets shown below to speed this process up immensely.

Drop down list scrolls to locate the components

Essential details such as component volume, weight and dissipation is shown

Item No.	TAG No.	Component Reference	Manufacturer	Description	Resistance (Ω)	Heat Dissipation (w)	Dimensions LxWxD (mm)	Volume (cm3)	Weight (kg)	Data sheet	Certificate	Quantity
1		TC00451622	Sartec Technor	Stainless Steel, 18, IP65, Exde combination	0	0	150 150 200	1035.75	271	0	0	1
2		Bushing (4 core x 25mm2)	Sartec Technor	Exde bushing (4 cores, 25mm2, 20 pins, Black)	0	0	0 0 0	0.00	0	0	0	1
3		Bushing (4 core x 16mm2)	Sartec Technor	Exde bushing (4 cores, 16mm2, 20 pins, Black)	0	0	0 0 0	0.00	0	0	0	2
4		Bushing (5 core x 25mm2)	Sartec Technor	Exde bushing (5 cores, 25mm2, 20 pins, Black)	0	0	0 0 0	0.00	0	0	0	2
5		Bushing (20 core x 15mm2)	Sartec Technor	Exde bushing (20 cores, 15mm2, 20 pins, Black)	0	0	0 0 0	0.00	0	0	0	4
6	K30	LC1DBS477	Schneider	55A, 3 pole Contactor	0	8	120 50 120	80.52	0.80	LC1DBS477	0	1
7	Q40	LC1D907	Schneider	Thermal Magnetic MCB (0.63 - 1.5k)	0	7.5	88 48 79.2	31.32	0.26	QV2M035	0	2
8	Q101	LC1D907	ABB	3200 range MCB, 2p, 10kA, D type, 6A	0	3.8	88 38 88	20.94	0.23	3200-M-04	0	3
9	F100	LC1D907	ABB	230Vac - 42Vac, 40% & 10%, 250Va	0	23	120 118 91	128.58	3.8	0	0	4
10	Q102	LC1D907	ABB	3200 range MCB, 2p, 10kA, C type, 4A	0	3.8	88 38 88	20.94	0.23	3200-M-04	0	5
11	P400	LC1D907	ABB	3-phase monitoring relay (160-690Vac)	0	2	92 22.5 91	18.54	0.16	0	0	6
12	K21	LC1D907	Schneider	15A, 4 pole Contactor (2HC24V)	0	3	35 48 92	35.18	0.36	LC1D1287	0	7
13	K32	LC1D907	Schneider	5A, 4 pole Contactor (2HC24V) (N range)	0	1.3	58 48 57	14.88	0.16	LC1D909E7	0	8
14	K11	LC1D907	Schneider	25A, 3 pole Contactor	0	8	88 48 88	35.18	0.37	LC1D1287	0	9
15	Q11	QV2 M035	Schneider	Thermal Magnetic MCB (0.63 - 1.5k)	0	7.5	88 48 79.2	31.32	0.26	QV2M035	0	10
16	Q21	3200-M-04	ABB	3200 range MCB, 2p, 10kA, D type, 6A	0	3.8	88 38 88	20.94	0.23	3200-M-04	0	11
17	T200	250 VA Transformer	Shan Transformers	230Vac - 42Vac, 40% & 10%, 250Va	0	23	120 118 91	128.58	3.8	0	0	12
18	Q202	3200-M-04	ABB	3200 range MCB, 2p, 10kA, C type, 4A	0	3.8	88 38 88	20.94	0.23	3200-M-04	0	13
19	K22	LC1D1287	Schneider	15A, 4 pole Contactor (2HC24V)	0	3	35 48 92	35.18	0.36	LC1D1287	0	14
20	K2A	CAD507	Schneider	15A, Contactor Relay, 5NO	0	8	77 48 88	25.80	0.58	CAD507	0	15
21	K2B	LADN04	Schneider	D range Aux Contact (4NC)	0	0	40 44 38	6.16	0.08	LADN04	0	16
22	K2C	CAD507	Schneider	15A, Contactor Relay, 5NO	0	8	77 48 88	25.80	0.58	CAD507	0	17
23	K2D	LADN04	Schneider	D range Aux Contact (4NC)	0	0	40 44 38	6.16	0.08	LADN04	0	18
24	K2E	CAD507	Schneider	15A, Contactor Relay, 5NO	0	8	77 48 88	25.80	0.58	CAD507	0	19
25	K2F	LADN04	Schneider	D range Aux Contact (4NC)	0	0	40 44 38	6.16	0.08	LADN04	0	20

Component details automatically entered

Data sheets are hyperlinked to Banelec website

The resulting details are automatically fed to the title page for the project which will show essential details and the precise calculations for any number of enclosures for a single project.

Project details are entered on the title page

Resulting calculations ensure the enclosure is suitable

		Enclosure # 1 (A11) (Main Panel)	Enclosure # 2 (A16) (Main Hoist Panel)	Enclosure # 3 (A17) (Aux Hoist Panel)
Job Number:	J101628	Enclosure Usable Volume	19353.75	5890.50
Customer:	Offshore Cranes	Free Space in Enclosure	86.28%	91.94%
Project:	BOP Crane	<i>Note: Free space must be equal to or above 40% for ITC and 20% for ISE</i>		
Customer Reference:	Tengizchevroil	Total Volume (cm3)	1420.56	474.77
Customer PO:	PO1012345/79	Allowable heat dissipation	590 Watts	410 Watts
Date:	20th July 2016	Total Heat Dissipation (w)	221.8	54.8
Revision:	0	Total Weight (Kg)	290.97	154.47

Products

Although our main service is our custom built control systems we can offer a large range of 'off the shelf' products to suit all environments and standards.

Gravity X - Intrinsically safe camera

Do you need a user friendly point and shoot HD camera when you work in hazardous areas? This intrinsically safe digital camera is designed to help you take high quality images where no other cameras are allowed. The Gravity X intrinsically safe camera is ATEX and IECEx Zone 1 and Zone 2, as well as CSA Class 1, Zone 1 (for US and Canada). The Gravity X also has a powerful LED light as well as sunlight readable display, Glove compatible touch and HD video recording capabilities.

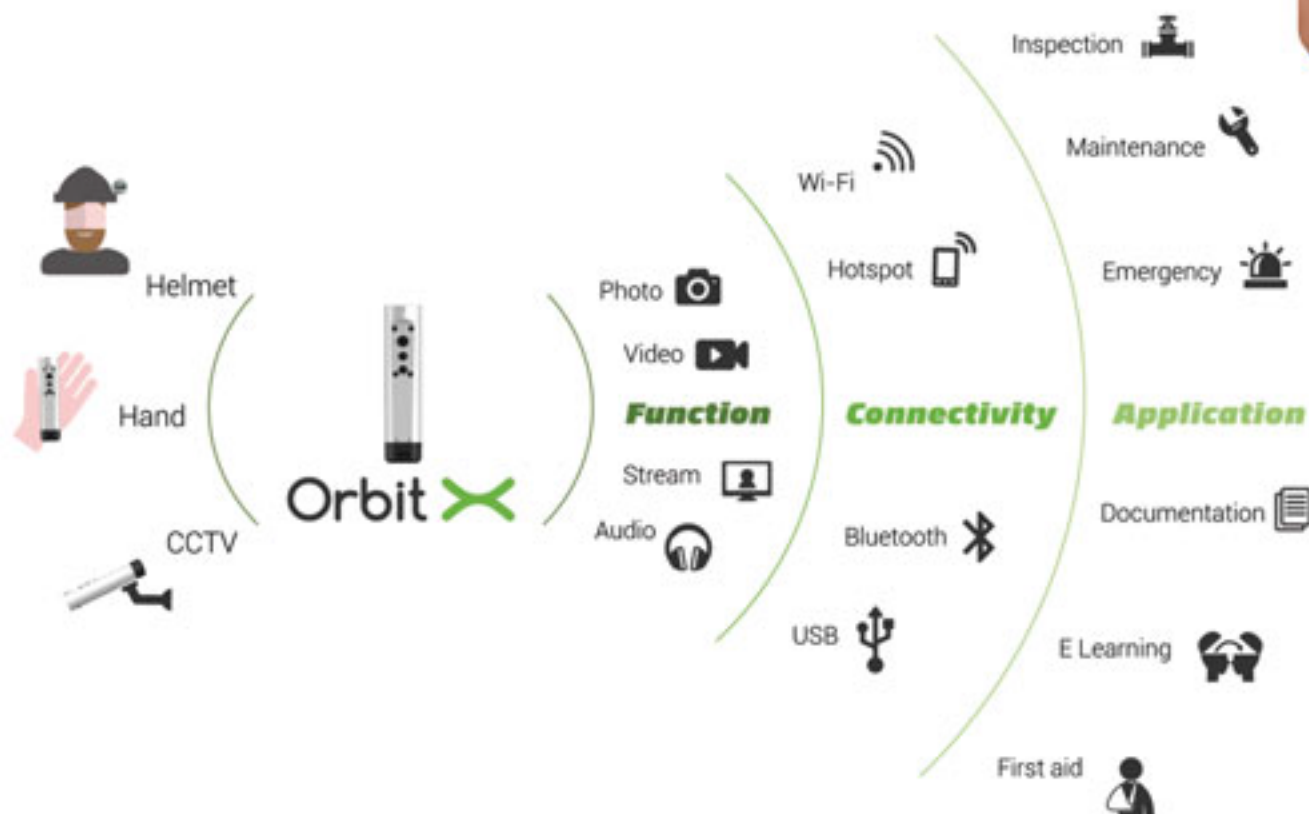
Specification

- 8 Mpix Full HD image sensors
- 4,3' sunlight readable display
- Waterproof, IP68
- Wi-Fi & Bluetooth



Orbit X – Explosion proof Wi-Fi Camera

The Orbit X Explosion Proof Wi-Fi Camera represents a revolution within communication in hazardous area. The Orbit X is a small, lightweight, battery operated wearable camera which enables you to transmit the "eyesight" of users in the field. The Orbit X supports full duplex audio communication and crystal crisp full HD video. The camera has an HD imaging sensor, two powerful LED lights and laser pointer fitted into an extremely compact form. The Orbit X enables you to capture images and video in HD as well as conduct live video conferencing and CCTV type video streaming sessions wirelessly in zone 1 hazardous area.



Lumen X4 & Lumen X7 – Zone 2 Tablets

Banelec through Bartec now offers two Smaller Android devices certified for Zone 2. The newly developed Lumen X4 is a handy 4.3" industrial mobile computer. Lumen X7 is a 7" industrial tablet for use in harsh environments.

The extremely robust devices are splashproof and can withstand extreme temperatures. Equipped with a display that is readable in direct sunlight and a powerful quad-core processor, they allow for fast work with the latest applications, offer numerous configuration options for corporate use and have an extremely long standby time. This can be extended even further by the replaceable battery, which ensures uninterrupted field work. In addition, the devices have NFC, Bluetooth 3.0 and two powerful cameras. The Lumen X4 may also be also equipped with an optional high-performance scanner for bar code scanning with a 1D/2D imager or for the detection of RFID HF tags.



Intrinsically safe Wi-Fi access points

Banelec offer a range of stainless steel and aluminium is an ATEX and IECEx Zone 1 and Zone 2 certified explosion proof Intrinsically Safe Wi-Fi access point. It is highly customizable and supports both 2.4 GHz and 5 GHz frequency ranges. The Intrinsically Safe Wi-Fi Aluminium access point has been custom designed to accommodate a wide range of configurations such as PoE/Cat6, lightning protection, amplification and several antenna connections and configurations.



Explosion Proof Wi-Fi Antenna

To complement the Wi-Fi system we offer the Bartec Pixavi Xbeam A EX antenna this is an IECEx and ATEX Zone 1 and Zone 2 approved Explosion Proof Wi-Fi omnidirectional antenna for hazardous areas. The antenna is optimized for use in steel and concrete environments where multipath effects and reflections are present. The antenna can be used for 2.4 GHz and 5 GHz Wi-Fi, dual band Wi-Fi (2,4 + 5 Ghz), bluetooth, zigbee and other Explosion Proof Wi-Fi applications. It is tested to work up to 6 ghz.



Plug and Sockets

Banelec offer a range of multipole, variable amperage plug and sockets. The plug connections are suitable for use in potentially explosive areas of Zones 1 and 2 and of Zones 21 and 22. The quality materials used for the enclosure, including the external metal parts, guarantee the appropriate corrosion protection and chemical resistance for the application in "normal industrial atmospheres":



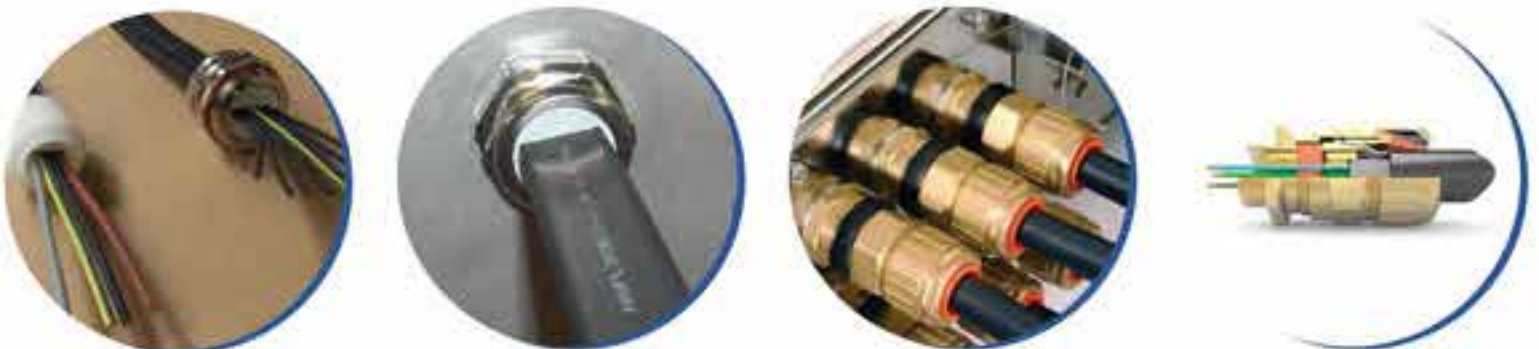
Warning Devices

Banelec offer a multitude of warning and signaling devices to suit all areas, from basic strobe lights to multi tone combination strobe and audible alarm warning devices, along with manual and tool resettable call points



Cable Glands

With a vast amount of cable gland types for various cables on the market, Banelec are sure to supply the correct gland for your project, whether it is a simple Exe stuffing gland, an Exd mounted barrier gland or a specialist flat cable gland, let Banelec select and supply the correct gland for you cable project.



Lighting

Banelec offers intrinsically safe, explosion proof lighting for use in hazardous Ex zones. All products including flood lights, work lights, fluorescent lights, helideck lighting beacons, luminaires, safety lighting, fire exit signs and torches are certified accordingly.

What's true in heavy-duty applications holds true in general use: the quality of a lighting system doesn't just depend on its luminaires. In order to provide even lighting with well-defined intensity thresholds, it's important that lighting systems are designed to fit the facility – whether it's an office building, a factory or a car park. Whether you're planning a new site or want to upgrade your existing assets, our lighting experts analyse spatial geometry, reflectance and the number, size and placement of all installations. After everything is taken into account, we will design a lighting system that fits all of your needs – with the perfect lighting geometry and distribution, the optimal light colour and the ideal light flux and power consumption. And since the lighting concept will be an integral part of your day-to-day operations for years to come, we also calculate your maintenance requirements in terms of pollution as well as durability



Disconnect Switches

Our range of hazardous area disconnect switches comprise of our standard range manufactured from GRP or sheet stainless steel covering multiple hazardous area standards, zones and groups. As Banelec also design control systems then we also have the ability to build bespoke disconnect switches within Exd housings which for example may contain fuse equipment or control contactors. Once again these are available in Carbon Steel, Aluminium and Stainless Steel.



Control Stations

Typically when Banelec design a control system it will involve field mounted operator control stations, our engineers will design and manufacture such equipment, however we are happy to produce control stations to your design and we are sure that you will find our service very professional and competitively priced.



Features:

- ABS plastic, GRP or stainless steel construction
- Many options of control and monitoring components –
 - Emergency stop buttons
 - Spring return pushbuttons in multiple colours and legend
 - Indicator lamps in various colours and control voltage
 - Ammeters, voltmeters, power meters etc
 - Buzzers

Electronic Control and Monitor

With our extensive knowledge of automation technology, Banelec make the ideal partner for the full integration of your whole control system, our range of HMI's and operator control panels ensures that the operation of your system is covered.

Our engineers are capable of programming any of our HMI's and operator panels in conjunction with almost all types of PLC master controllers.

Our extensive knowledge of automation systems, make Banelec the ideal supplier of electronic control panels



Radio Control Systems

Banelec Ltd. Have dealt a great deal with the hazardous area lifting industry, supplying control systems to many of the world's largest hazardous area lifting equipment manufacturers; with improved technology radio control systems have become the norm for the operation of such equipment, Banelec can now offer a full range of hazardous area radio transmitters with multiple features such as load display, toggle switching, joystick or pushbutton commands, of course each transmitter needs a receiver which we can supply mounted in its own enclosure or even mounted within the master control panel itself to save space and cost on the equipment.

Transmitters features:

- Robust hand held or waist strap mounted ABS design
- Emergency stop system fully compliant with the latest standards
- Single or dual pressure operation for multi speed operation or 0-10V analogue for inverter drive
- Toggle switches or select switches for special operations
- Optional LED display can be used for load monitoring or system status signals

Receiver features:

- Mounted in stainless steel, carbon steel or Aluminium enclosures
- Optional relays to allow secondary control system in the event of a failure
- Can be mounted in with the main control system to cut costs and save space

Banelec can mount the receiver in the main panel to save space, time and money

Receiver mounted within the main control panel



Receiver mounted in a dedicated enclosure

Special Projects - Heat Tracing

As suggested Banelec are leaders in the design, manufacture and installation of special systems for hazardous area environments, among these systems we offer full heat tracing systems, for protection of pipework and steel work in the most hostile environment.

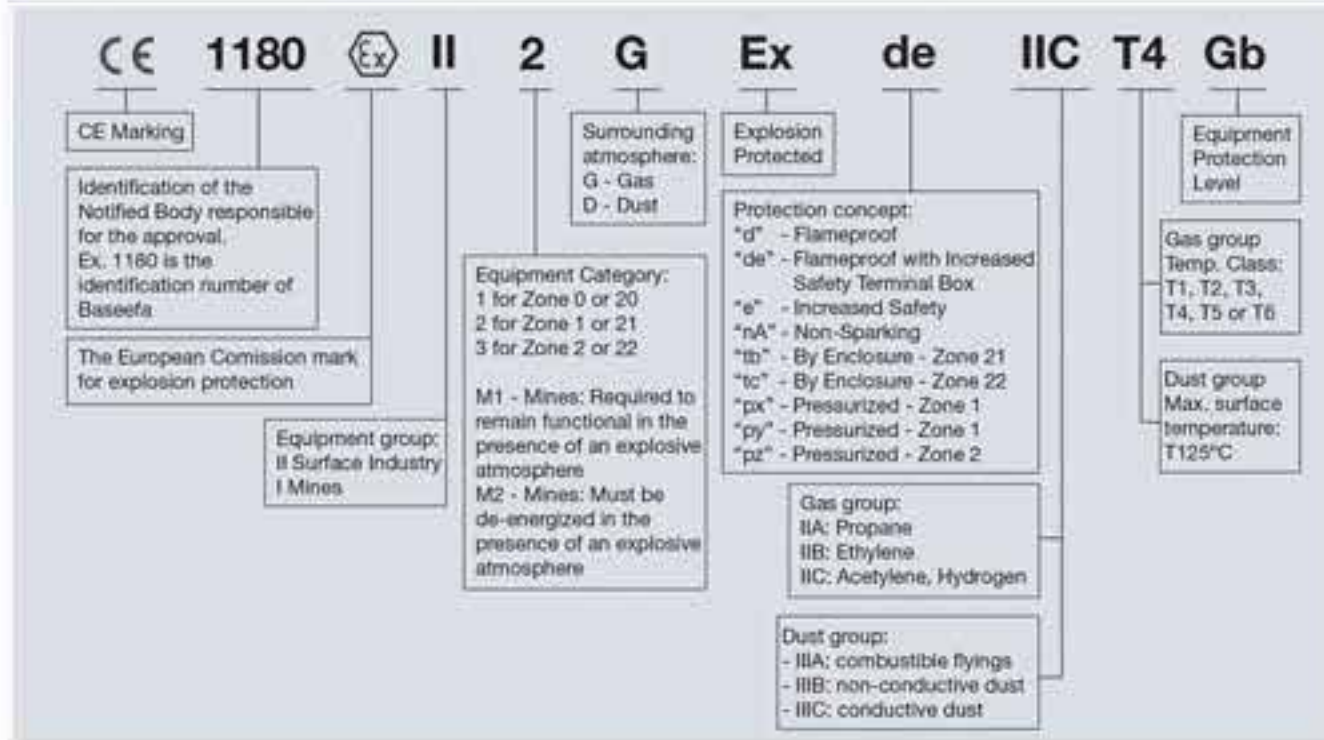


Guide to Explosive Atmospheres

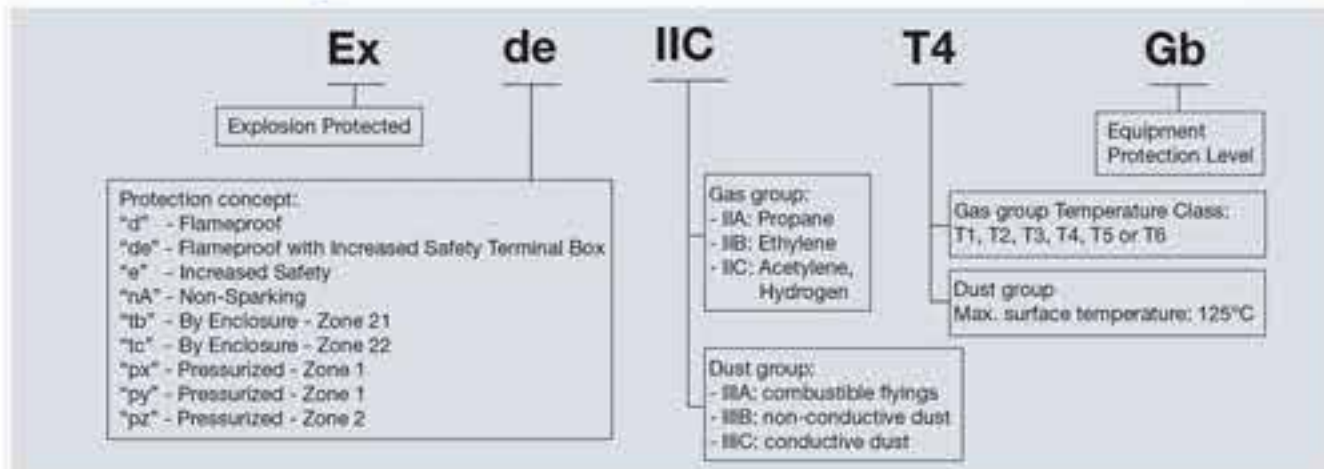
Equipment Protection Level (EPL)

Equipment Group	ATEX Directive 94/9/EC Equipment Category	Zone	Equipment Protection Level	Atmosphere	Protection Level	Use
I (Mines)	M1	-	Ma	Methane	Very High	Operable in Ex atmosphere
	M2	-	Mb	(Fire damp)	High	De-energised in Ex atmosphere
II (All other)	1	0	Ga	G - Gas, Vapours D - Dust	Very High	Zones 0, 1 and 2
		20	Da			Zones 20, 21 and 22
	2	1	Gb		High	Zones 1 and 2
		21	Db			Zones 21 and 22
	3	2	Gc		Enhanced	Zone 2
		22	Dc			Zone 22

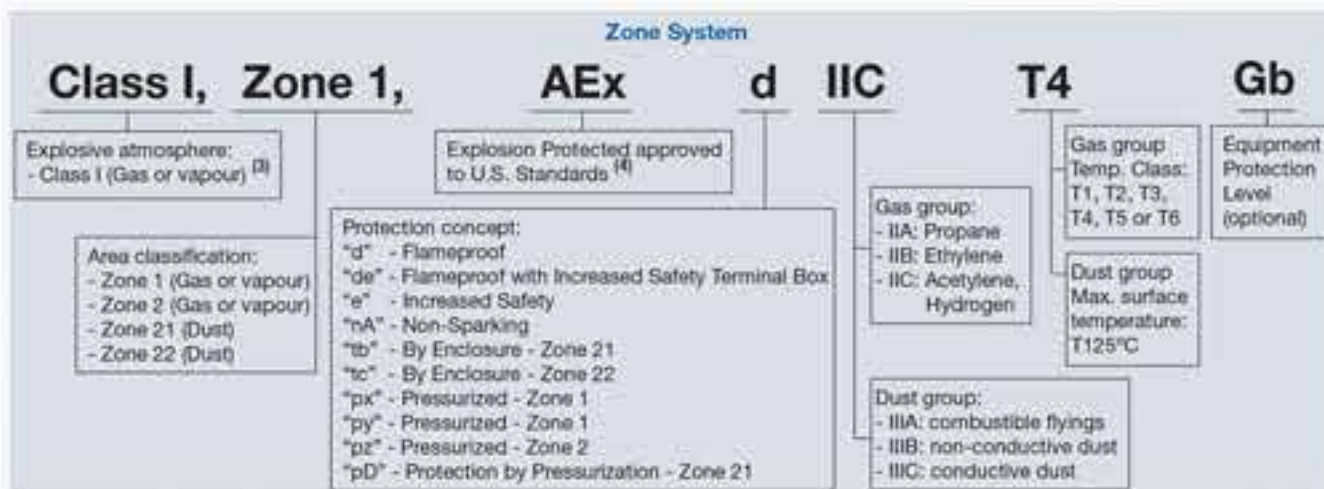
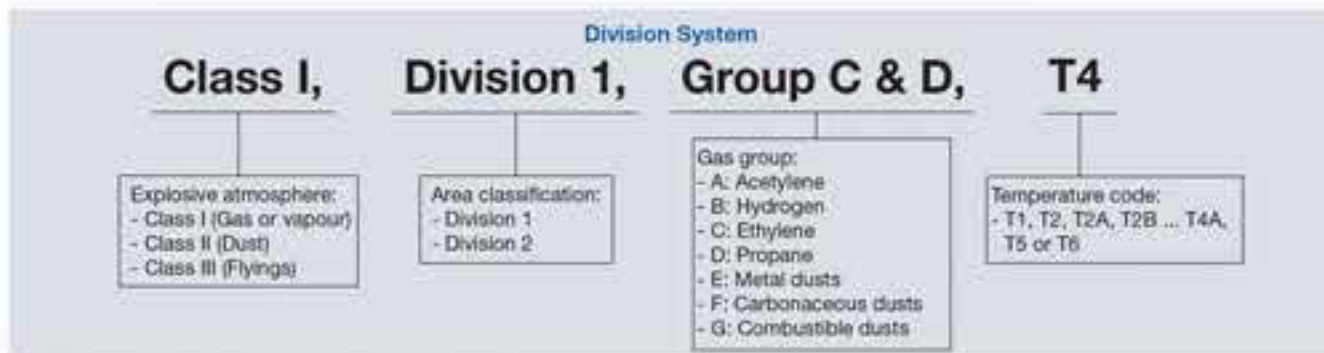
ATEX Marking



IECEx Marking



North American Marking



⁽¹⁾ For Dust environments (Zone 21 or 22) the Class of the hazard (Class II) shall not be mentioned in the marking e.g. Zone 21, AEx tb IIC T125°C Db

⁽²⁾ For Canadian Standards letter "A" shall not be mentioned in the marking e.g. Class I, Zone I, Ex d IIC T4 Gb

Temperature Classes

IEC / CENELEC NEC / CEC 505 & 506	NEC / CEC 500	Maximum Surface Temperature
T1	T1	450 °C (842 °F)
T2	T2	300 °C (572 °F)
	T2A	280 °C (536 °F)
	T2B	260 °C (500 °F)
	T2C	230 °C (446 °F)
	T2D	215 °C (419 °F)
T3	T3	200 °C (392 °F)
	T3A	180 °C (356 °F)
	T3B	165 °C (329 °F)
	T3C	160 °C (320 °F)
T4	T4	135 °C (275 °F)
	T4A	120 °C (248 °F)
T5	T5	100 °C (212 °F)
T6	T6	85 °C (185 °F)

Area Classification

Standard		Flammable Material	Present Continuously ⁽¹⁾	Present Intermittently	Present Abnormally
IEC / CENELEC	IEC / EN 60079-10-1	Gas / Vapour	Zone 0	Zone 1	Zone 2
	IEC / EN 60079-10-2	Combustible Dust or Ignitable Fibers	Zone 20	Zone 21	Zone 22
ATEX	Directive 99/92/EC	Gas / Vapour	Zone 0	Zone 1	Zone 2
		Combustible Dust or Ignitable Fibers	Zone 20	Zone 21	Zone 22
NEC 501	ANSI/NFPA 70 National Electrical Code Article 501	Gas / Vapour	Class I, Division 1	Class I, Division 1	Class I, Division 2
NEC 505	ANSI/NFPA 70 National Electrical Code Article 505	Gas / Vapour	Class I, Zone 0	Class I, Zone 1	Class I, Zone 2
NEC 502	ANSI/NFPA 70 National Electrical Code Article 502	Combustible Dust or Ignitable Fibers	Class II, Division 1	Class II, Division 1	Class II, Division 2
NEC 506	ANSI/NFPA 70 National Electrical Code Article 506	Combustible Dust or Ignitable Fibers	Zone 20	Zone 21	Zone 22
CEC Sec. 18	CSA C22.1 Canadian Electrical Code Section 18	Gas / Vapour	Class I, Zone 0	Class I, Zone 1	Class I, Zone 2
	CSA C22.1 Canadian Electrical Code Section 18	Combustible Dust or Ignitable Fibers	Class II, Division 1	Class II, Division 1	Class II, Division 2

⁽¹⁾Electric motors are not allowed in Zone 0/20 locations;

Protection Concepts

Type of Protection	Code / Symbol	Division / Zone	Market	Standard	Concept of Protection		
Electrical Equipment for Flammable Gas, Vapours and Mist							
Flameproof	Ex d(e)	Zone 1	IECEX / ATEX	IEC / EN 60079-1	Contain the explosion and prevent flame propagation		
	Ex d(e)	Class I, Zone 1	Canada	CAN/CSA-C22.2 No. 60079-1			
	AEx d(e)	Class I, Zone 1	US	ANSI / UL 60079-1			
Explosion Proof	(XP)	Class I, Division 1	Canada	CSA-C22.2 No. 145 / No. 30			
	(XP)	Class I, Division 1	US	UL 674 / UL 1203			
Increased Safety	Ex e	Zone 1	IECEX / ATEX	IEC / EN 60079-7		No arcs, sparks or hot surfaces	
	Ex e	Class I, Zone 1	Canada	CAN/CSA-C22.2 No. 60079-7			
	AEx e	Class I, Zone 1	US	ANSI / UL 60079-7			
Non-sparking	Ex nA	Zone 2	IECEX / ATEX	IEC / EN 60079-15			Keep flammable gas out
	Ex nA	Class I, Zone 2	Canada	CAN/CSA-C22.2 No. 60079-15			
	AEx nA	Class I, Zone 2	US	ANSI / UL 60079-15			
Nonincendive	(NI)	Class I, Division 2	Canada	CSA-C22.2 No. 0 / No. 213			
	(NI)	Class I, Division 2	US	UL 674 / ISA 12.12.01			
Pressurized	Ex px	Zone 1	IECEX / ATEX	IEC / EN 60079-2	Keep flammable gas out		
	Ex px	Zone 1	Canada	CAN/CSA-C22.2 No. 60079-2			
	AEx px	Class I, Zone 1	US	ANSI / UL 60079-2			
	Ex py	Zone 1	IECEX / ATEX	IEC / EN 60079-2			
	Ex py	Zone 1	Canada	CAN/CSA-C22.2 No. 60079-2			
	AEx py	Class I, Zone 1	US	ANSI / UL 60079-2			
	Ex pz	Zone 2	IECEX / ATEX	IEC / EN 60079-2			
	Ex pz	Zone 2	Canada	CAN/CSA-C22.2 No. 60079-2			
	AEx pz	Class I, Zone 2	US	ANSI / UL 60079-2			
	Type X	Class I, Division 1	Canada / US	NFPA 496			
	Type Y	Class I, Division 1	Canada / US	NFPA 496			
Type Z	Class I, Division 2	Canada / US	NFPA 496				
Electrical Equipment for Combustible Dusts							
Protection by Enclosure	Ex tb	Zone 21	IECEX / ATEX	IEC / EN 60079-31	Keep combustible dust out		
	Ex tb	Class II, Zone 21	Canada	CAN/CSA-C22.2 No. 60079-31			
	AEx tb	Class II, Zone 21	US	ANSI/UL 60079-31			
	Ex tc	Zone 22	IECEX / ATEX	IEC / EN 60079-31			
	Ex tc	Class II, Zone 22	Canada	CAN/CSA-C22.2 No. 60079-31			
AEx tc	Class II, Zone 22	US	ANSI/UL 60079-31				
Dust Ignition Proof	(DIP)	Class II, Division 1	Canada	CSA-C22.2 No. 25			
	(DIP)	Class II, Division 1	US	UL 1203			
Pressurized / Protection by Pressurization	Ex pD	Zone 21	IECEX / ATEX	IEC / EN 61241-4		Keep combustible dust out	
	AEx pD	Zone 21	US	ANSI/ISA 61241-2			
	(PX)	Class II, Division 1	Canada / US	NFPA 496			
	(PY)	Class II, Division 1	Canada / US	NFPA 496			
	(PZ)	Class II, Division 2	Canada / US	NFPA 496			
	Ex pD	Zone 22	IECEX / ATEX	IEC / EN 61241-4			

Atmosphere Groups

Substance	ATEX IECEX	North America		
	Group	Class	NEC / CEC Division System	NEC / CEC Zone System
Methane (Fire damp)	I	-	Gaseous	Mines ⁽²⁾
Propane	IIA	I	Group D	IIA
Ethylene	IIB		Group C	IIB
Hydrogen	IIC		Group B	IIC
Acetylene	IIC		Group A	IIC
Fibers and Flyings	IIIA	III	-	IIIA
Grain Dust	IIIB	II	Group G	IIIB
Coal Dust	IIIB		Group F	IIIB
Metal Dust	IIIC		Group E	IIIC

⁽²⁾ Not within scope of NEC or CEC. Mining applications under jurisdiction of MSHA (Mine Safety & Health Association).

Banelec *In Control*

3 Old Bush Street, Brierley Hill, West Midlands, DY5 1UB. United Kingdom

