

1) Introduction

The BExBG05D is a flameproof beacon which is certified to meet the requirements of the ATEX directive 94/9/EC and the IECEx scheme. The beacon produces synchronised visual warning signals and can be used in hazardous areas where potentially flammable gas and dust atmospheres may be present. The BExBG05D has a flash energy level of 5 joules and can be used in Zone 1 and Zone 2 areas with gases in groups IIA, IIB and IIC and Temperature Classifications of T1, T2, T3 and T4. The unit can also be used in a temperature classification T5, if the upper ambient temperature is restricted to +55°C and T6 if the upper ambient temperature is restricted to +40°C. The unit can be used in Zone 21 and Zone 22 areas for combustible dusts and has an IP rating of IP 67 and a surface temperature rating of T115°C or T100°C if the upper ambient temperature is restricted to +55°C and T85°C if the upper ambient temperature is restricted to +40°C.

2) Marking


All units have a rating label, which carries the following important information:-

Unit Type No. BExBG05D

Input Voltage: DC Units 12V or 24V or 48V
AC Units 230V or 115V

Codes: Ex d IIC T4 for Ta -50°C to +70°C
Ex d IIC T5 for Ta -50°C to +55°C
Ex d IIC T6 for Ta -50°C to +40°C
Ex tD A21 IP67 T115°C based on max. Ta of +70°C

Certificate No's KEMA 00ATEX2006
IECEx KEM 10.0002

Epsilon x
Equipment Group and
Category:  II 2G/D

CE Marking
Notified Body No.  0518

“Warnings” DO NOT OPEN WHEN AN EXPLOSIVE
GAS OR DUST ATMOSPHERE IS PRESENT

COVER BOLTS CLASS A4-80

USE HEAT RESISTING CABLES AND CABLE GLANDS
(Rated 110°C) AT AMB. TEMPERATURES OVER 40°C

Year of Construction /
Serial No. i.e. 10 / 1DB13000001

3) Type Approval Standards

The beacon has EC Type Examination and IECEx certificates issued by KEMA and have been approved to the following standards:-

EN60079-0:2006 IEC60079-0:2004 (Ed4) General Requirements
EN60079-1:2007 IEC60079-1:2007 (Ed6) Flameproof Enclosure 'd'

EN61241-0:2006 IEC61241-0:2004 (Ed1) Dust General
Requirements
EN61241-1:2004 IEC60079-1:2004 (Ed1) Dust Enclosures tD

4) Installation Requirements

The beacons must be installed in accordance with the latest issues of the relevant parts of the EN60079 standards or the equivalent IEC standards – Selection, Installation and maintenance of electrical apparatus for use in potentially explosive atmospheres (other than mining applications or explosive processing and manufacture):-

EN60079-14:2008 Electrical Installations in Hazardous
IEC60079-14:2007 (Ed4) Areas (other than mines)

EN60079-10:2003 Classification of Hazardous Areas
IEC60079-10:2008 (Ed1)

The installation of the units must also be in accordance with any local codes that may apply and should only be carried out by a competent electrical engineer who has the necessary training.

5) Zones, Gas Group, Category, IP Rating and Temperature Classification

The BExBG05D beacons have been certified Ex d IIC T4 for Ta -50°C to +70°C, Ex d IIC T5 for Ta -50°C to +55°C and Ex d IIC T6 for Ta -50°C to +40°C for gas and IP67 T115°C based on max. Ta of +70°C. This means that the units can be installed in locations with the following conditions:-

Area Classification Gas:

Zone 1	Explosive gas air mixture likely to occur in normal operation.
Zone 2	Explosive gas air mixture not likely to occur, and if it does, it will only exist for a short time.

Gas Groupings:

Group IIA	Propane
Group IIB	Ethylene
Group IIC	Hydrogen and Acetylene

Temperature Classification:

T1	400° C
T2	300° C
T3	200° C
T4	135° C

T5	100° C	Amb. +55°C
T6	85° C	Amb. +40°C

Area Classification Dust:

Zone 21	Explosive dust air mixture likely to occur in normal operation.
Zone 22	Explosive dust air mixture not likely to occur, and if it does, it will only exist for a short time.

IP Rating: IP67 T115°C Ta ≤ +70°C
 T100°C Ta ≤ +55°C
 T85°C Ta ≤ +40°C

Equipment Category: 2G/D

Ambient Temperature Range: -50°C to +70°C
 (T5 = +55°C)
 (T6 = +40°C)

6) Beacon Location and Mounting

The location of the beacons should be made with due regard to the area over which the warning signal must be visible. They should only be fixed to services that can carry the weight of the unit.

The beacons should be securely bolted to a suitable surface using the 7mm diameter boltholes in the stainless steel U shaped mounting bracket (see figure 1). The required angle can be achieved by loosening the two large bracket screws in the side of the unit, which allow adjustment of the beacon in steps of 18°. On completion of the installation the two large bracket adjustment screws on the side of the unit must be fully tightened to ensure that the unit cannot move in service.

SAFETY WARNING:

The flashdome guard must not be removed from the unit at any time.

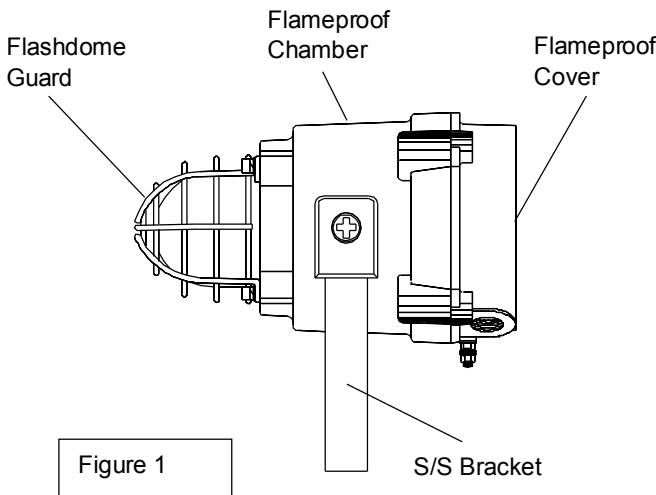


Figure 1

7) Access to the Flameproof Enclosure

In order to connect the electrical supply cables to the beacon it is necessary to remove the flameproof cover to gain access to the flameproof chamber. To achieve this remove the four M6 hexagon socket head screws (see figure 2) and withdraw the flameproof cover taking extreme care not to damage the flameproof joints in the process.

Note the four **M6 screws are Class A4-80 stainless steel and only screws of this category can be used on the beacons.** It is therefore important that these screws and their spring washers are kept in a safe place during installation.

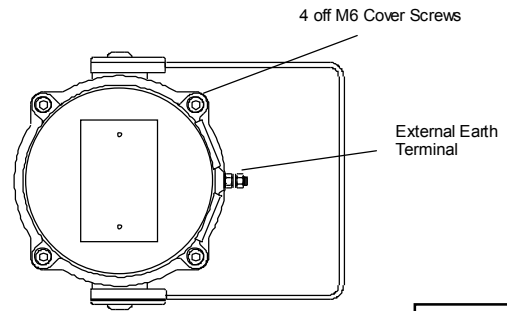


Figure 2

On completion of the cable wiring installation the flameproof joints should be inspected to ensure that they are clean and that they have not been damaged during installation. Also check that the earth bonding wire between the two casting sections is secure and the 'O' ring seal is in place. When replacing the flameproof cover casting ensure that it is square with the flameproof chamber casting before inserting. Carefully push the cover in place allowing time for the air to be expelled. Only after the cover is fully in place should the four M6 Stainless Steel A4-80 cover bolts and their spring washer be inserted and tightened down. If the cover jams while it is being inserted, carefully remove it and try again. Never use the cover bolts to force the cover into position.

8) Power Supply Selection

It is important that a suitable power supply is used to run the beacons. The power supply selected must have the necessary capacity to provide the input current to all of the beacons

The following table shows the input current taken by the various beacons:-

Unit Type	Nominal I/P Voltage	Input Current	Max. I/P
BExBG05D	12V DC	750mA	15V
BExBG05D	24V DC	300mA	30V
BExBG05D	48V DC	180mA	58V
BExBG05D	230V AC	55mA	253V
BExBG05D	115V AC	140mA	126V

The input current will vary according to the voltage input level. The current levels shown above are for nominal input voltage. The 12V, 24V and 48V DC units have a converter circuit and therefore the input current level will decrease slightly as the input voltage is increased and will increase slightly as the input voltage is reduced.

The above table also shows the maximum voltages at which the beacons can be operated.

9) Cable Selection

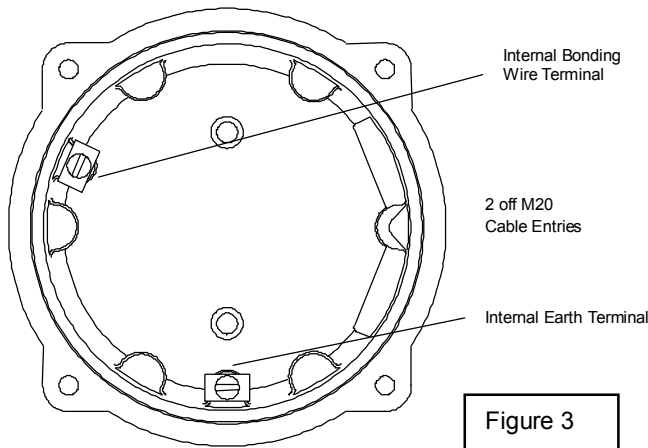
When selecting the cable size consideration must be given to the input current that each unit draws (see table above), the number of beacons on the line and the length of the cable runs. The cable size selected must have the necessary capacity to provide the input current to all of the beacons connected to the line.

SAFETY WARNING: If the BExBG05D beacons are used at high ambient temperatures, i.e. over +40°C, then the cable entry temperature may exceed +70°C and therefore suitable heat resisting cables must be used, with a rated service temperature of at least 110°C.

10) Earthing

Both AC and DC beacon units must be connected to a good quality earth. The units are provided with internal and external earthing terminals which are both located on the terminal chamber section of the unit (see figures 2 and 3).

BExBG05D Beacon Cover Internal View



When using the internal earth terminal ensure that the stainless steel M4 flat washer is between the incoming earth wire and the enclosure.

When using the external earth terminal a cable crimp lug must be used. The cable lug should be located between the two M5 stainless steel flat washers. The M5 stainless steel spring washer must be fixed between the outer flat washer and the M5 stainless steel nut to ensure that the cable lug is secured against loosening and twisting.

The internal earth bonding wire ensures that a good quality earth is maintained between the flameproof chamber casting and the flameproof cover casting.

11) Cable Glands

The BExBG05D beacons have dual cable gland entries which have an M20 x 1.5 entry thread as standard. Only cable glands approved for Ex 'd' applications can be used, which must be suitable for the type of cable being used and also meet the requirements of the Ex 'd' flameproof installation standard EN60079-14:2008 / IEC60079-14:2007.

When only one cable entry is used the other one must be closed with an Ex 'd' flameproof blanking plug, which must be suitably approved for the installation requirements.

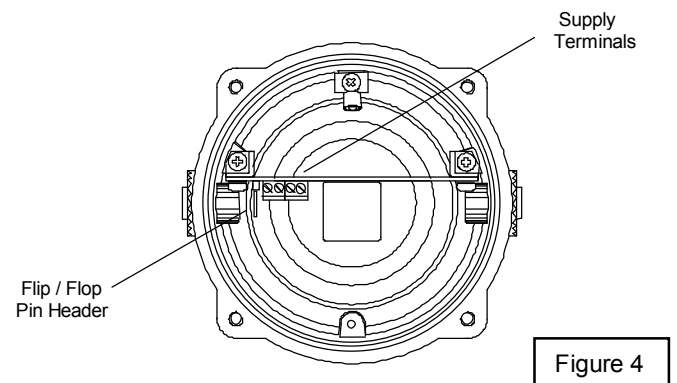
For combustible dust applications, the cable entry device and blanking elements shall be in type of explosion protection increased safety "e" or flameproof enclosure "d" and shall have an IP 6X rating according to EN60529:1992.

SAFETY WARNING: If the BExBG05D beacons are used at high ambient temperatures, i.e. over +40°C, then the cable entry temperature may exceed +70°C and therefore suitable heat resisting cable glands must be used, with a rated service temperature of at least 110°C.

12) Cable Connections

The cable connections are made into the terminal blocks on the electronic pcb assembly located in the flameproof enclosure. See section 7 of this manual for access to the flameproof enclosure. A four-way terminal block is provided on both AC and DC beacons. Therefore there are two live terminals and two neutral terminals for the input and output wiring on AC units. On the DC units there are two +ve terminals and two -ve terminals for the input and output wiring.

BExBG05D 5 Joule Beacons



Wires having a cross sectional area of up to 2.5mm² can be connected to each terminal way. If an input and output wire is required a 2.5mm² wire can be connected to each terminal way. When connecting wires to the terminals great care should be taken to dress the wires so that when the cover is inserted into the chamber the wires do not exert excess pressure on the terminal blocks. This is particularly important when using cables with large cross sectional areas such as 2.5mm².

13) Synchronised Operation

All BExBG05D beacons that are connected to the same supply line will have a synchronised flash rate at one flash every second. To ensure that the units will be synchronised check that the pin header is not fitted, i.e. the two header pins are not shorted together (see Figure 4).

14) Flip-Flop Operation

Two beacons can be mounted close to each other to form a flip-flop operation, where the beacons will flash alternately. To achieve this mode of operation, fit a pin header to the flip-flop header pins on the electronics board, i.e. the two header pins are shorted together, (see figure 4) on one of the two beacons. The first flash on the beacon that has the header fitted will be delayed by ½ second. The two beacons will then flash alternately every ½ a second.

15) End of Line Monitoring (DC Units)

On the BExBG05D DC beacons, dc reverse line monitoring can be used if required. All DC beacons have a blocking diode fitted in their supply input lines. An end of line monitoring diode or an end of line monitoring resistor can be connected across the +ve and –ve terminals. If an end of line resistor is used it must have a minimum resistance value of 3k3 ohms and a minimum wattage of 0.5 watts or a minimum resistance value of 500 ohms and a minimum wattage of 2 watts.

2) Marking


All units have a rating label, which carries the following important information:-


Unit Type No. BExBG05D

Input Voltage: DC Units 12V or 24V or 48V
 AC Units 230V or 115V

Codes: Ex d IIC T4 for Ta -50°C to +70°C
 Ex d IIC T5 for Ta -50°C to +55°C
 Ex d IIC T6 for Ta -50°C to +40°C
 Ex tD A21 IP67 T115°C based on max. Ta of +70°C

Certificate No's KEMA 00ATEX2006
 IECEx KEM 10.0002

Epsilon x Equipment Group and Category:  II 2G/D

CE Marking Notified Body No.  0518

“Warnings” DO NOT OPEN WHEN AN EXPLOSIVE GAS OR DUST ATMOSPHERE IS PRESENT

COVER BOLTS CLASS A4-80

USE HEAT RESISTING CABLES AND CABLE GLANDS (Rated 110°C) AT AMB. TEMPERATURES OVER 40°C

4) Installation Requirements

Beacons must be installed in accordance with the following or equivalent standards.

EN60079-14:2008 Electrical Installations in Hazardous Areas (other than mines)
 IEC60079-14:2007 (Ed4)
 EN60079-10:2003 Classification of Hazardous Areas
 IEC60079-10:2008 (Ed1)

Installation should only be carried by competent personnel and any local codes of practice applied.

5) Zones, Gas Group, Category and Temperature Classification

The units can be installed in locations with the following conditions:-

Area Classification Gas:

Zone 1	Explosive gas air mixture likely to occur in normal operation.
Zone 2	Explosive gas air mixture not likely to occur, and if it does, it will only exist for a short time.

Gas Groupings:

Group IIA	Propane
Group IIB	Ethylene
Group IIC	Hydrogen and Acetylene

Temperature Classification:

T1	400° C
T2	300° C
T3	200° C
T4	135° C

T5	100° C	Amb. +55° C
T6	85° C	Amb. +40° C

Area Classification Dust:

Zone 21	Explosive dust air mixture likely to occur in normal operation.
Zone 22	Explosive dust air mixture not likely to occur, and if it does, it will only exist for a short time.

IP Rating IP67 T115°C Ta ≤ +70°C
 T100°C Ta ≤ +55°C
 T85°C Ta ≤ +40°C

Equipment Category: 2G/D

Ambient Temperature Range:

-50°C to +70°C
 (T5 = +55°C)
 (T6 = +40°C)

6) Beacon Location and Mounting

See drawing A

SAFETY WARNING: The flashdome guard must not be removed from the unit at any time.

7) Access to the Flameproof Enclosure

See drawing B

Note the four **M6 screws** are **Class A4-80 stainless steel** and **only screws of this category can be used on the beacons**. It is therefore important that these screws and their spring washers are kept in a safe place during installation.

8) Power Supply Selection

The system power supply must have the necessary capacity to provide the input current to all of the beacons connected to the system.

The following table shows the input current taken by the various units:-

Unit Type	Nominal I/P Voltage	Input Current	Max. I/P Volts
BExBG05D	12V DC	750mA	15V
BExBG05D	24V DC	300mA	30V
BExBG05D	48V DC	180mA	58V
BExBG05D	230V AC	55mA	253V
BExBG05D	115V AC	140mA	126V

The above table also shows the maximum voltages at which the beacons can be operated.

9) Cable Selection

Cables must be capable of handling the current drawn from all of the units on the line.

SAFETY WARNING: If the BExBG05D beacons are used at high ambient temperatures, i.e. over +40°C, then the cable entry temperature may exceed +70°C and therefore suitable heat resisting cables must be used, with a rated service temperature of at least 110°C.

10) Earthing

Both AC and DC beacon units must be connected to a good quality earth. The units are provided with internal and external earthing terminals which are both located on the terminal chamber section of the unit (see figures 2 and 3).

When using the internal earth terminal ensure that the stainless steel M4 flat washer is between the incoming earth wire and the enclosure.

When using the external earth terminal a cable crimp lug must be used. The cable lug should be located between the two M5 stainless steel flat washers. The M5 stainless steel spring washer must be fixed between the outer flat washer and the M5 stainless steel nut to ensure that the cable lug is secured against loosening and twisting.

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11) Cable Glands

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When only one cable entry is used the other one must be closed with an Ex 'd' flameproof blanking plug, which must be suitably approved for the installation requirements.

For combustible dust applications, the cable entry device and blanking elements shall be in type of explosion protection increased safety "e" or flameproof enclosure "d" and shall have an IP 6X rating according to EN60529:1992.

SAFETY WARNING: If the BExBG05D beacons are used at high ambient temperatures, i.e. over +40°C, then the cable entry temperature may exceed +70°C and therefore suitable heat resisting cable glands must be used, with a rated service temperature of at least 110°C.

12) Cable Connections

See drawings C and D / wiring diagram E

13) Synchronised Operation

All BExBG05D beacons that are connected to the same supply line will have a synchronised flash rate at one flash every second. To ensure that the units will be synchronised check that the pin header is not fitted, i.e. the two header pins are not shorted together (see Figure 4).

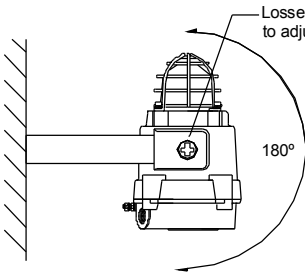
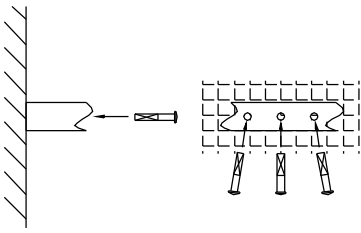
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15) End of Line Monitoring (DC Units)

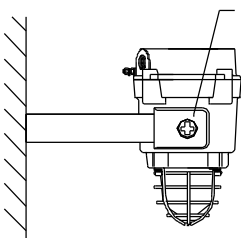
On the BExBG05D DC beacons, dc reverse line monitoring can be used if required. All DC beacons have a blocking diode fitted in their supply input lines. An end of line monitoring diode or an end of line monitoring resistor can be connected across the +ve and -ve terminals. If an end of line resistor is used it must have a minimum resistance value of 3k3 ohms and a minimum wattage of 0.5 watts or a minimum resistance value of 500 ohms and a minimum wattage of 2 watts.

Drawing A



Lassen screw to adjust

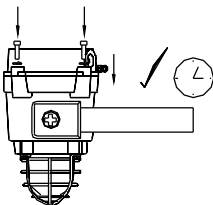
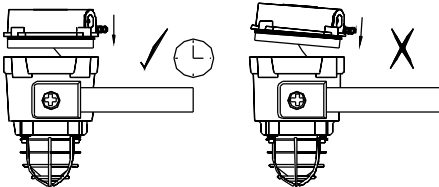
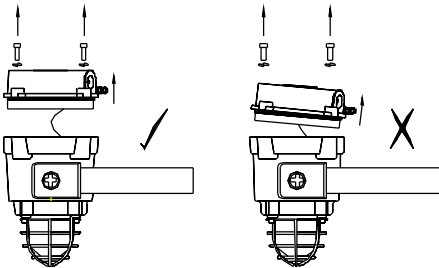
Loosen screw to adjust.
Løsn skruen for at tilpasse.
Schroef losdraaien om af te stellen.
Desserrer la vis pour régler.
Zum Regulieren Schraube lockern.
Allentare la vite per poter effettuare la regolazione.
Løsne skruen for å justere.
Desaperte o parafuso para ajustar.
Afloje el tornillo para ajustar.
Lossa skruven för att justera.



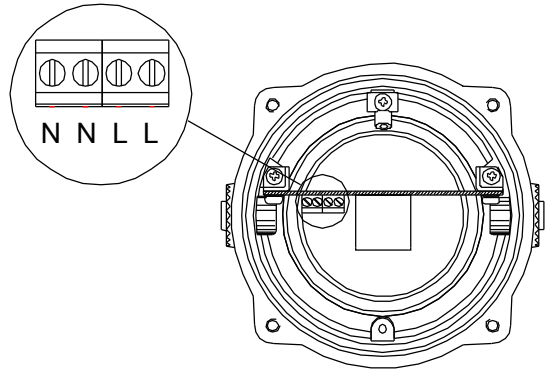
Tighten screw to secure

Tighten screw to secure.
Spænd skruen for at fastgøre.
Schroef aandraaien om vast te zetten.
Serrer la vis pour une fixation sûre.
Zum Sichern Schraube anziehen.
Stringere la vite per il fissaggio.
Stram skruen for å feste.
Aperte o parafuso para fixar.
Apriete el tornillo para asegurar.
Dra åt skruven för att fästa.

Drawing B

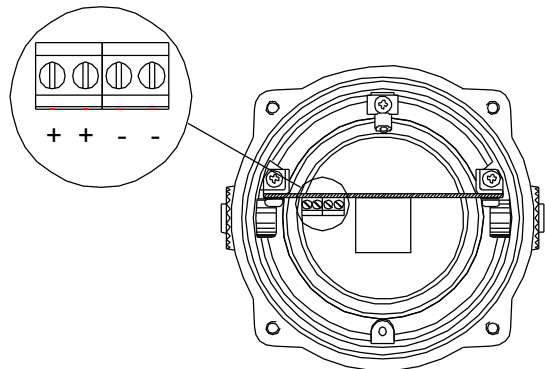


Drawing C



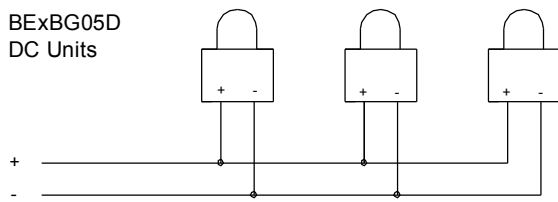
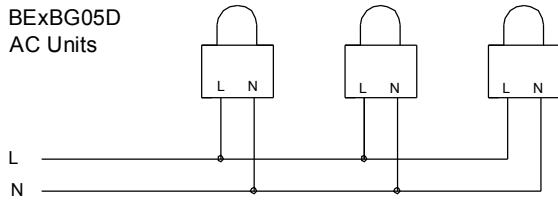
BExBG05D AC units

Drawing D



BExBG05D DC units

Wiring Diagram E



INSTRUKSJONSHÅNDBOK (ATEX / IECEx) (NOR)

BExBG05D Flammesikre Xenon varsellys

For bruk i atmosfærer med brennbar gass og brennbart støv

2) Merking

Alle enheter har en etikett med følgende viktige informasjon:

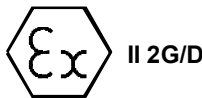
Enhetsstypenr. BExBG05D

Inngangsspenning: DC-enheter 12 V eller 24 V eller 48 V
AC-enheter 230 V eller 110 V eller 115 V

Kode: Ex d IIC T4 for Ta -50°C to +70°C
Ex d IIC T5 for Ta -50°C to +55°C
Ex d IIC T6 for Ta -50°C to +40°C
Ex tD A21 IP67 T115°C based on max. Ta of +70°C

Sertifikat nr. KEMA 00ATEX2006
IECEx KEM 10.0002

Epsilon x:
Utstyrsguppe og –
kategori:



CE-merking:
Varslet organ nr.



“Advarsler”

MÅ IKKE ÅPNES I ATMOSFÆRE
MED EKSPLOSIV GASS
ELLER EKSPLOSIVT STØV

DEKKEBOLTER KLASSE A4-80

BRUK VARMEBESTANDIGE KABLER OG
KABELMUFFER (godkjent for 110°C) VED
OMGIVELSESTEMPERATURER OVER 40°C

4) Installasjonskrav

Varsellys må installeres i samsvar med følgende eller tilsvarende standarder.

EN60079-14:2008 Elektriske installasjoner i farlige
IEC60079-14:2007 (Ed4) områder (unntatt gruver)
EN60079-10:2003 Klassifisering av farlige områder
IEC60079-10:2008 (Ed1)

Installering må kun utføres av kompetente personer, og alle gjeldende lokale bransjestandarder må overholdes.

5) Soner, gassgruppe, kategori og temperatur klassifisering

Enheterne kan installeres på steder med følgende forhold:

Soneklassifisering, gass:

Sone 1	Ekspllosiv gass/luft-blanding som sannsynligvis forekommer ved normal drift.
Sone 2	Ekspllosiv gass/luft-blanding som ikke vanligvis vil forekomme, og om den gjør det, kun vil forekomme i kort tid.

Gassgrupperinger:

Gruppe IIA	Propan
Gruppe IIB	Etylen
Gruppe IIC	Hydrogen og acetylen

Temperaturklassifisering:

T1	400° C
T2	300° C
T3	200° C
T4	135° C

T5	100° C	Amb. +55°C
T6	85° C	Amb. +40°C

Soneklassifisering, støv:

Sone 21	Ekspllosiv støv/luft-blanding vil sannsynligvis opptre ved normal bruk.
Sone 22	Ekspllosiv støv/luft-blanding vil sannsynligvis ikke opptre, og hvis det skjer, vil den kun foreligge i kort tid.

IP-klasse: IP67 T115°C Ta ≤ +70°C
T100°C Ta ≤ +55°C
T85°C Ta ≤ +40°C

Utstyrskategori: 2G/D

Omgivelsestemperaturområde:

-50°C to +70°C
(T5 = +55°C)
(T6 = +40°C)

6) Plassering og montering av varsellys

Se tegningen. A

SIKKERHETSADVARSEL: Kuppelen må ikke på noe tidspunkt fjernes fra enheten.

7) Tilgang til flammesikkert hus

Se tegningen. B

Merk: De fire **M6-skrue**ne er av rustfritt stål klasse **A4-80**, og kun skrueer i denne kategorien kan brukes til disse lydalarmene. Derfor er det viktig at disse skrueene med tilhørende fjærskiver oppbevares på et sikkert sted under installeringen.

8) Valg av strømforsyning

Systemets strømforsyning må ha tilstrekkelig kapasitet til å forsyne alle varsellysene som er koplet til systemet med strøm.

Tabellen nedenfor viser hvor mye inngangsstrøm de forskjellige varsellysene benytter:

Enhetsstype	Inngangsspenning	Inngangsstrøm	Maks I/P volt
BExBG05D	12V DC	750mA	15V
BExBG05D	24V DC	300mA	30V
BExBG05D	48V DC	180mA	58V
BExBG05D	230V AC	55mA	253V
BExBG05D	115V AC	140mA	126V

Tabellen ovenfor viser også maksimale spenninger som varsellys kan benyttes ved.

9) Valg av kabler

Kablene må kunne håndtere strømmen som trekkes fra alle enhetene på linjen.

SIKKERHETSADVARSEL: Hvis BExBG05D varsellys brukes ved høye omgivelsestemperaturer, dvs. over +40 °C, kan kabelinngangstemperaturen overstige +70 °C. Derfor må egnede varmebestandige kabler brukes, med nominell tjenestetemperatur på minst 110 °C.

10) Jording

Både AC- og DC-alarmer må koples til jordforbindelse av god kvalitet. Enhetene leveres med interne og eksterne jordingsterminaler, som begge sitter på terminalkammerdelen av enheten (se figur 2 og 3).

Ved bruk av eksterne jordterminaler må en benytte en kabelkrympesko. Kabelskoen skal settes mellom de to flate M5-fjærskivene av rustfritt stål. M5-fjærskiven må festes mellom den ytre flate skiven og M5-mutteren av rustfritt stål for å sikre at kabelskoen ikke kan løsnes eller vrís.

11) Kabelmuffer

Varsellys har doble kabelmuffeinnganger med M20 x 1,5 inngangsgjenger. Kun kabelmuffer godkjent for Ex 'd'-bruk kan brukes, og de må være egnet for typen kabel som brukes, samt overholde kravene i standarden for Ex 'd' flammesikker installering, EN60079-14:2008 / IEC60079-14:2007.

Når kun én kabelinngang benyttes, må den andre lukkes med en Ex 'd' flammesikker lukkeplugg, som må være godkjent for de aktuelle installasjonskravene.

For bruk med brennbar støv skal kabelinnføringsenheten og tetningsdelene være av typen med økt eksplosjonssikkerhet "e" eller flammesikker kapsling "d", og den skal ha IP 6X-klasse ifølge EN60529:1992.

SIKKERHETSADVARSEL: Hvis BExBG05D varsellys brukes ved høye omgivelsestemperaturer, dvs. over +40 °C, kan kabelinngangstemperaturen overstige +70 °C. Derfor må egnede varmebestandige kabler brukes, med nominell tjenestetemperatur på minst 110 °C.

12) 12) Kabelforbindelser

Se tegningen. C og D / kablings skjemaet. E

13) Synkronisert drift

Alle BExBG05D-varsellys som er koplet til samme ledning har synkronisert blinkhastighet med ett blink i sekundet. For å sikre at enhetene blir synkronisert, må du kontrollere at stiftsamleren* ikke er montert, dvs. de to stiftene skal ikke være kortsluttet (se figur 4).

14) Flipflop

To varsellys kan monteres nær inntil hverandre for å gi flipflop-drift, der varsellysene blinker vekselvis. For å oppnå dette, monteres en stiftsamler på flipflop-stiftene på elektronikkortet, dvs. de to stiftene kortsluttes sammen (se figur 4) på ett av de to varsellysene. Det første blinket på varsellyset med samleren blir forsinket med ½ sekund. De to varsellysene blinker så vekselvis hver ½ sekund.

15) Slutt på linje-overvåking (DC-enheter)

På BExBG05D-DC-enheter, kan likestrømsreversert linjeovervåking benyttes om nødvendig. Alle DC-alarmer har en blokkeringsdiode montert i inngangslinjene. En slutt på linje-overvåkingsdiode eller slutt på linje-overvåkingsresistor kan kobles over +ve- og -ve-terminalene. Hvis en slutt på linje-resistor benyttes, må den ha minste motstandsverdi 3k3 ohm, og minste wattverdi 0,5 watt, eller minste motstandsverdi 500 ohm og minste wattverdi 2 watt.