

# GAMX

## ATEX INCREMENTAL ENCODERS, GAMX RANGE



### ATEX certified Explosion-proof encoders

Explosion-proof rotary encoders for hazardous environments gas & dust. Robust design for heavy-duty applications. Application fields: explosive atmospheres except for firedamp mines.

LCIE ATEX & IECEX approved

⚠ II 2 GD

Ex d IIC T6, T5, T4 Gb

Ex tb IIIC T(\*)°C Db IP 6x

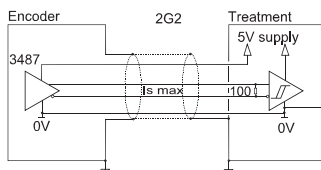
\* See below table

## SPECIFICATIONS

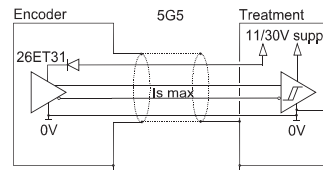
<b>Material</b>	Cover : aluminum
<b>Stainless steel option</b>	Body: aluminum
<b>Shaft</b>	Stainless steel
<b>Bearings</b>	Ball bearings
<b>Maximal loads</b>	Axial: 50 N, Radial: 100 N
<b>Shaft inertia</b>	$\leq 16 \cdot 10^{-6} \text{ kg} \cdot \text{m}^2$
<b>Torque</b>	$\leq 15 \cdot 10^{-3} \text{ N} \cdot \text{m}$
<b>Permissible max. speed</b>	6 000 min <sup>-1</sup>
<b>Continuous max. speed</b>	4 000 min <sup>-1</sup>
<b>Shaft seal</b>	Nitril
<b>Shocks (EN60068-2-27)</b>	$\leq 500 \text{ m} \cdot \text{s}^{-2}$ (during 6 ms)
<b>Vibrations (EN60068-2-6)</b>	$\leq 200 \text{ m} \cdot \text{s}^{-2}$ (10 ... 1 000 Hz)
<b>EMC</b>	EN 50081-1, EN 61000-6-2
<b>Isolation</b>	1 000 V eff
<b>Weight</b>	3,5kg aluminium body and cover 7,2kg stainless steel body and cover
<b>Operating temperature</b>	- 40... + 80°C (encoder T°)
<b>Storage temperature</b>	- 40... + 80°C
<b>Protection(EN 60529)</b>	IP 65
<b>Theoretical mechanical lifetime 10<sup>9</sup> turns (Faxial / Fradial)</b>	
<b>20 N / 30 N</b>	360
<b>50 N / 100 N</b>	18
<b>100 N / 200 N</b>	2,2

T <sub>amb</sub>	Temperature class for gas atmosphere	Temperature class for dust atmosphere
-20°C ≤ Ta ≤ +40°C	T6	T80°C
-20°C ≤ Ta ≤ +55°C	T5	T95°C
-20°C ≤ Ta ≤ +60°C	T4	T100°C

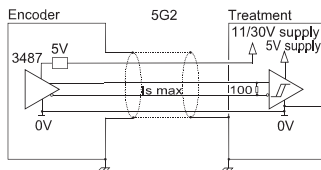
## OUTPUT ELECTRONIC / SUPPLY



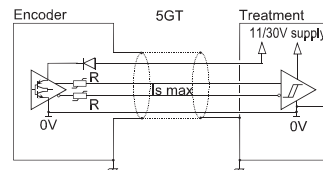
**2G2 electronic (100kHz)**  
 Supply : 5Vdc ± 10%  
 Cons. without load : 100mA max  
 Intensity per channel: 40mA max 0  
 max (I<sub>s</sub>=20mA) : V<sub>ol</sub> = 0,5Vdc  
 1 min (I<sub>s</sub>=20mA) : V<sub>oh</sub> = 2,5Vdc



**5G5 electronic (100kHz)**  
 Supply: 11 to 30Vdc  
 Cons. without load : 75mA max  
 Intensity per channel: 40mA max 0  
 max (I<sub>s</sub>=20mA) : V<sub>ol</sub> = 0,5Vdc  
 1 min (I<sub>s</sub>=20mA) : V<sub>oh</sub> = V<sub>cc</sub>-3Vdc



**5G2 electronic (100kHz)**  
 Supply: 11 to 30Vdc  
 Cons. without load : 75mA max  
 Intensity per channel: 40mA max 0  
 max (I<sub>s</sub>=20mA) : V<sub>ol</sub> = 0,5Vdc  
 1 min (I<sub>s</sub>=20mA) : V<sub>oh</sub> = 2,5Vdc



**5GT electronic, option (100kHz)**  
 Supply: 11 to 30Vdc  
 Cons. without load : 75mA max  
 Intensity per channel: 40mA max  
 0 max (I<sub>s</sub>=20mA) : V<sub>ol</sub> = 0,5Vdc  
 1 min (I<sub>s</sub>=20mA) : V<sub>oh</sub> = V<sub>cc</sub>-2,5Vdc

5GT electronic helps to drive very long cables (contact our factory)  
 Available : 3G3 electronic, supply between 15 and 30Vdc, push-pull  
 output regulated 12Vdc

Protection against short circuits of the electronics: 5G5, 5GT, 3G3  
 Protection against inversion of polarity for all the electronics except  
 2G2

## STANDARD CONNECTION

		-	+	A	B	0	A/	B/	0/	Ground
<b>G3</b>	PVC cable 8 wires 8230/020	WH white	BN brown	GN Green	YE yellow	GY grey	PK pink	BU blue	RD red	General shielding
<b>GP</b>	PUR cable 12 wires 8230/050	WH white + WH/GN white/green	BU blue + BN/GN brown/green	GY grey	BN brown	RD red	PK pink	GN green	BK black	General shielding

**Available Resolutions :** 1 2 3 4 5 6 7 8 9 10 12 13 14 15 16 19 20 21 24 25 26 28 29 30 32 35 36 39 40 43 45 46 48 50 54 56 58 60 62 63 64 66 67 70 72 74 75 76 80 84 86 88 89 90 91  
 94 96 100 107 110 120 122 123 125 127 128 130 132 135 138 140 147 150 157 159 160 168 169 170 172 175 180 188 191 196 200 201 205 220 222 225 234 240 241 242 245 246 248 250  
 254 255 256 258 259 267 268 275 283 285 295 300 305 314 315 318 320 330 340 350 360 367 375 378 380 381 388 390 397 400 405 410 424 425 438 443 450 471 480 489 495 500 505  
 512 515 534 540 550 565 580 600 623 625 628 630 632 635 650 660 700 720 746 750 752 754 800 810 840 860 880 891 900 942 990 1000 1024 1080 1100 1131 1200 1225 1250 1260  
 1280 1290 1400 1414 1440 1500 1536 1570 1600 1620 1630 1750 1800 1885 2000 2048 2250 2400 2500 2640 3000 3456 3600 3680 3750 4000 4096 4500 4900 5000 7200 9000 10000

### Special Conditions For Safe Use

The gaps of the different flamepath are less than the values specified in the tables of the IEC 60079-1 standard.  
 The width of the different flameproof joints are superior to these specified in tables of IEC 60079-1 standard.

### ASSEMBLY CAUTION

#### Never Open The Encoder

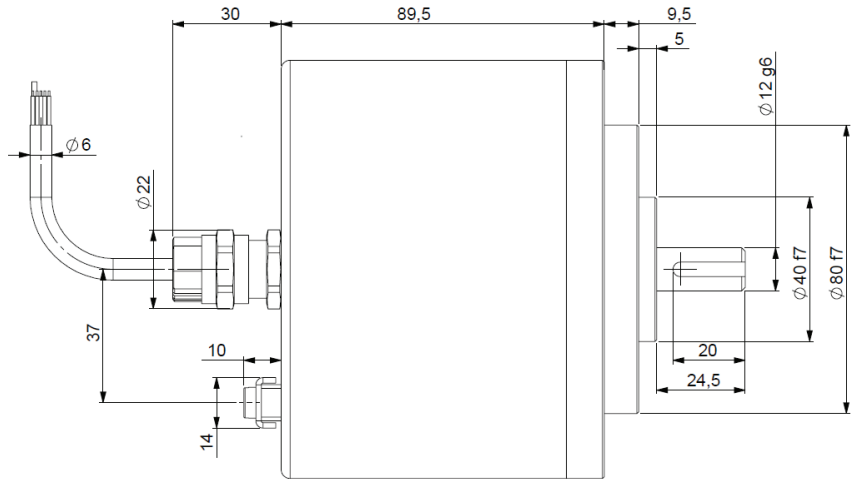
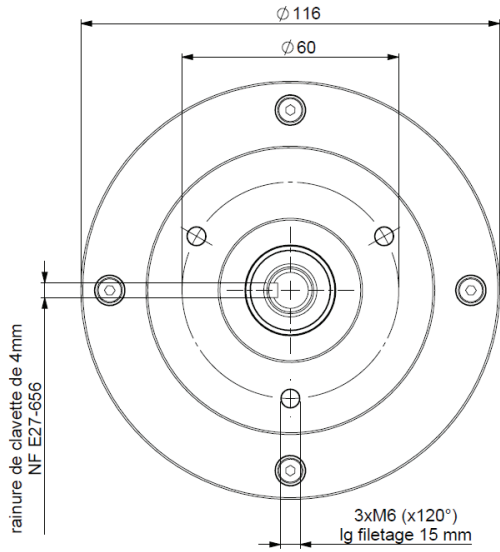
#### Never Connect/Disconnect Under Power Supply/In Presence Of Dusts Atmosphere

For electrical installation use the standard EN/IEC 60079-14.

The customer obliges to take up and to use our products, according to our specifications and to the manners of the profession. Our company would not be responsible for any defect resulting from a defective or erroneous assembly, from a use superior to the standard, or in abnormal conditions. The breakdowns resultant of shocks, bad electric supply, put in low capacity or overcapacity of the product, the environment of bad conditions (humidity, projection, dust, etc) cannot be imputed to us. The converter doesn't require any maintenance. Any encoder presenting a dysfunction will have to be the object of immediate return for control in our facilities. The encoder mustn't be open in any case (cable gland and/or cover). An earth situated on the cover must be linked with the ground of the installation.



# GAMX – GEMX DIMENSIONS



## ORDERING OPTIONS

Example : GAMX\_12-5G59-5000-GPA030

**GAMX\_** 12 - 5 G5 9 - 5 000 - GP A030

**Family**  
**GAMX** = Aluminium cover & body  
**GAMX** = Stainless steel cover & body

**Shaft Ø**  
 12 = 12mm

**Supply**  
 [ Available electronic ] - [ 2G2, 5G2, 5G5, 5GT, 3G3 ]  
 2 = 5Vdc  
 3 = 15 to 30Vdc  
 5 = 11 to 30Vdc

**Output Stage**  
 [ Available electronic ] - [ 2G2, 5G2, 5G5, 5GT, 3G3 ]  
 G2 = driver 5Vdc RS422  
 G3 = driver 12Vdc  
 G5 = push- pull 11-30Vdc  
 GT = push- pull 11-30Vdc transistorized

**Output Signals**  
 9 = A,A/, B,B/, 0,0/ (0, gated A&B)

**Resolution**  
 10 000 max

**Connection**  
 G3 = PVC cable 8 wires  
 GP = PUR cable 12 wires

**Connection Orientation**  
 Example:  
 A030 = axial cable 3m



## AGENCY APPROVALS & CERTIFICATIONS



### 1) Déclaration UE de conformité

2) Nous, société BEI Sensors, certifions que ce matériel :  
capteurs antidéflagrants, type  
**CAMX, CEMX, GAMX, GEMX, NAMX, NEMX, PAMX, PEMX**

3) Avec les inscriptions suivantes :  
**CE 0081 II 2 GD, Ex d IIC T6, T5, T4 Gb Ex tb IIIC T(\*)°C Db IP 6x**  
A été conçu et fabriqué conformément à la directive applicable suivante :  
**ATEX : 2014/34/UE**  
**CEM : 2014/30/UE**

4) La certification a été obtenue grâce à l'application des normes suivantes :  
(\* ) ATEX: EN60079-0:2012+A11:2013, EN60079-1:2014, EN60079-31:2014  
IECEx: IEC60079-0:2011+IS1 2013, IEC60079-1:2014, IEC60079-31:2013  
(\* ) Une étude comparative des normes EN 60079-0 (2009 et 2012+A11 2013), EN 60079-1 (2007 et 2014) et EN 60079-31 (2009 et 2014) montre que le matériel n'est pas concerné par les modifications substantielles.

5) Une attestation d'examen CE de type a été obtenu :  
**LCIE 03 ATEX 6235**  
et une notification :  
**LCIE 03 ATEX Q 8060**

6) Un certificat de conformité IECEx a été obtenu :  
**IECEx LCIE 13.0029X**  
et une notification :  
**FR/LCI/QAR08.0002**

7) L'application des normes suivantes a participé à l'obtention de la certification :  
EN 60-529, NFC 23-520, NFC 23-539, EN 50081-1, EN 55022 classe B, EN 55014, EN 61000-6-2, CEI 61000-4-2, CEI 61000-4-3, CEI61000-4-4, CEI 61000-4-5, CEI 61000-4-6, CEI 61000-4-8, CEI 61000-4-11

8) L'organisme notifié responsable du suivi de la directive **ATEX** est le  
LCIE, B.P.8, F92260 Fontenay-aux-Roses  
Numéro d'identification : 0081

9) La société chargée de la certification **CEM** est nommée ci-après :  
GRME, Cellule CEM, B.P.8, 68840 Pulversheim

10) Nous certifions que nos produits désignés ci-dessus sont conformes à la directive et aux normes spécifiées

DATE:  
ATEX Certified Product Approved Person Jean-Marc HUBSCH :

### 1) EU Declaration of conformity

2) We, BEI Sensors, certify that this material : sensor  
explosion-proof standard  
**CAMX, CEMX, GAMX, GEMX, NAMX, NEMX, PAMX, PEMX**

3) With the following inscriptions :  
**CE 0081 II 2 GD, Ex d IIC T6, T5, T4 Gb Ex tb IIIC T(\*)°C Db IP 6x**  
Conceived and manufactured has the directive applicable following :  
**ATEX : 2014/34/EU**  
**EMC : 2014/30/EU**

4) Certification to summer obtained thanks to the application of the standards :  
(\* ) ATEX: EN60079-0:2012+A11:2013, EN60079-1:2014, EN60079-31:2014  
IECEx: IEC60079-0:2011+IS1 2013, IEC60079-1:2014, IEC60079-31:2013  
(\* ) A comparative study of the standards EN 60079-0 (2009 and 2012+A11 2013), EN 60079-1 (2007 and 2014) and EN 60079-31 (2009 and 2014) shows that the product is not concerned by the substantial modifications.

5) EC type examination certificate was obtained :  
**LCIE 03 ATEX 6235**  
and a notification :  
**LCIE 03 ATEX Q 8060**

6) IECEx certificate of conformity was obtained :  
**IECEx LCIE 13.0029X**  
and a notification :  
**FR/LCI/QAR08.0002**

7) The application of the following standards took part in obtaining certification :  
EN 60-529, NFC 23-520, NFC 23-539, EN 50081-1, EN 55022 classe B, EN 55014, EN 61000-6-2, CEI 61000-4-2, CEI 61000-4-3, CEI61000-4-4, CEI 61000-4-5, CEI 61000-4-6, CEI 61000-4-8, CEI 61000-4-11

8) The notified organization responsible for the follow-up of the directive **ATEX** is the  
LCIE, B.P.8, F92260 Fontenay-aux-Roses  
Numéro d'identification : 0081

9) The company in charge of certification **CEM** is named :  
GRME, Cellule CEM, B.P.8, 68840 Pulversheim

10) We certify that our indicated products so above are in conformity with the directive and the specified standards

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