MAAX-MAUX SERIES

EXPLOSION PROOF, MULTI-TURN, PROFIBUS ENCODER

Features

- ATEX/IECEx Explosion Proof Certified
- Profibus interface standard
- 30mm max. thru shaft, 20mm max. integrated coupling versions
- Robustness and excellent resistance to shock / vibration
- Double or triple mounting possible
- High protection level IP65
- Wide temperature range –40°C to +85°C
- 5 to 30 Vdc power supply
- High resolution available: 65 536 counts per revolution (16 bits resolution)
- Standard number of turns: 4096 (12 bits), 16 bits option available upon request

SPECIFICATIONS

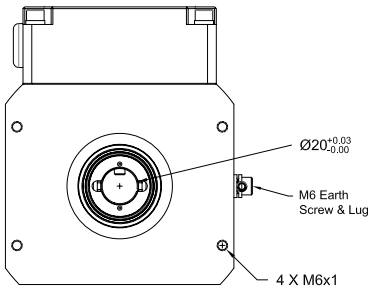
Mechanical

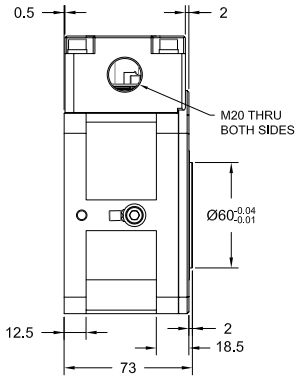
Material	**Cover and body:** aluminum hard anodized **Shaft:** Stainless Steel
Bearings	Chrome steel ball bearings
Maximum load	**Axial:** 50 N **Radial:** 80 N
Shaft inertia	≤ 55.10^{-6} kg.m^2
Torque	≤ 25.10^{-3} N.m
Permissible max. speed	3 000 RPM
Continuous max. speed	3 000 RPM
Shaft seal	Nitrile
Shock (EN60068-2-27)	≤ 500 m.s^{-2} (during 6ms)
Vibration (EN60068-2-6)	≤ 100 m.s^{-2} (10 … 2 000 Hz)
EMC	EN 61000-6-4, EN 61000-6-2
Isolation	500V (1 min)
Weight (approx.)	3,200 kg
Operating temperature	See T_{amb} chart below
Storage temperature	- 40... + 85 °C
Protection(EN 60529)	IP 65
Torque (ring pressure screw)	4N.m
Theoretical mechanical lifetime 10^9 turns (F_{axial} / F_{radial})	25 N / 40 N: 140 50 N / 80 N: 17

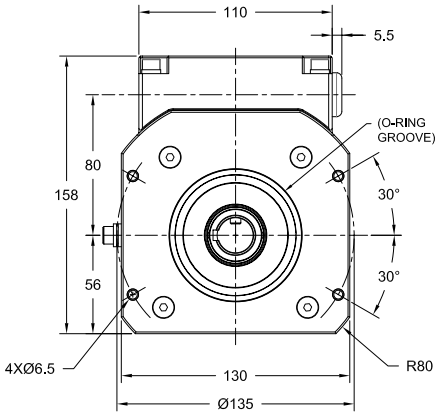
T_{amb}	Temperature class for gas atmosphere
-20°C ≤ Ta ≤ +40°C	T6
-20°C ≤ Ta ≤ +55°C	T5
-20°C ≤ Ta ≤ +60°C	T4

DIMENSIONS

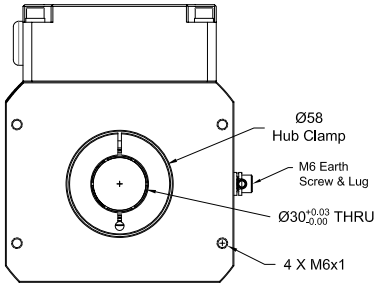
MAAX

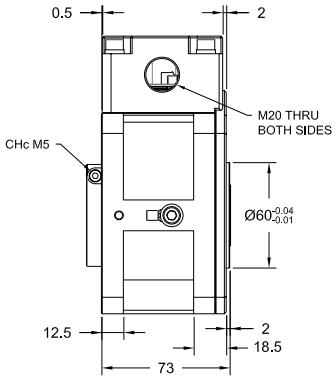


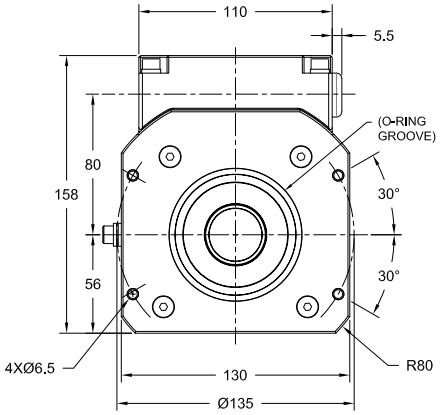




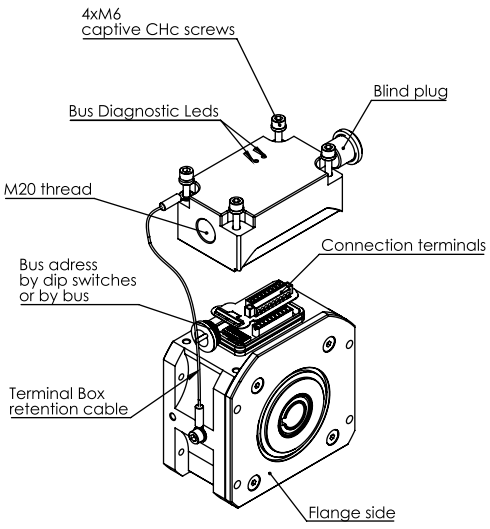
MAUX

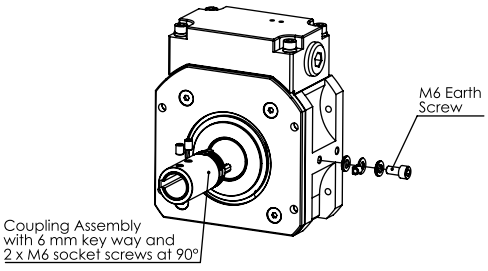






MAAX/MAUX





INTERNAL DIP SWITCH SETTINGS

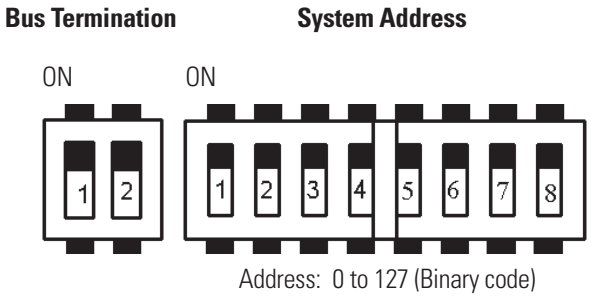
Power supply: 5-30V consumption < 200 mA

Transmission frequency: from 9.6Kbaud to 12Mbaud

Electronic interface: opto-isolated RS 485

Bus Termination: Bus termination resistors both set to ON if device is at the beginning or end of the line.

Address: permits the addressing of each encoder in an installation (32 master stations or slave stations per segment without repeater, 127 maximum with repeater).



Address: 0 to 127 (Binary code)

Switch ON	1	2	3	4	5	6	7	8 [A]
Value	1	2	4	8	16	32	64	By bus

Switch 8 "OFF":
[A] ***The address is set by bus (Set Slave Address)***
Example: Address 5: Switch 1 & 3 on "ON", other "OFF".

PROGRAMMABLE PARAMETERS

(Consult MAAX Profibus User's Manual for more detail)

Direction: Permits setting the counting direction of the encoder (CW or CCW) after installation.
Resolution: The number or counts per turn (CPT) can be between 0 and 65536.
Total measuring range: Total number of steps of the encoder (maximum is 4096 turns x 65536 CPT =268435456.
Preset: Defines the value of its actual position.
Time base: Defines the base time for the speed acceleration calculation (10 ms , 100 ms, 1 s, speed in rpm).

CONNECTION

+	+Power supply
-	0V
A	Bus line A
B	Bus line B

ORDERING OPTIONS

Example : MAAX_20 // PBGB // 16B12 // E2R //

MA	AX	20	//	P	BG	B	//	16	B12	//	E2	R	//

Family

Multi-turn Absolute Encoders, stackable and black anodized.

Mounting

AX: Hollow Shaft, Integrated Coupling ATEX/IECEx Flameproof
UX: Hollow Shaft, Through Bore ATEX/IECEx Flameproof

Shaft

20: 20mm (standard)
12: 12mm
E4: 1/2"
E5: 5/8"
E6: 3/4"
E8: 1"

Power Supply

P: 5 to 30 VDC

Interface

BG: Profibus [B]

Code

B: Natural Binary

Resolution

Bits, up to 16: 65536 counts per turn

Turns

B12: 12 Bits = 4096 turns, up to 16 Bits available on request

Termination

E2: Terminal box with dual M20 threaded conduit connections

Connection orientation

R: Radial

[B] ***Consult Factory for CANOpen and SSI options***

AGENCY APPROVALS & CERTIFICATIONS

CE 2004 / 108 / CE

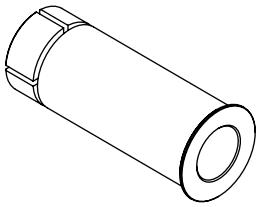
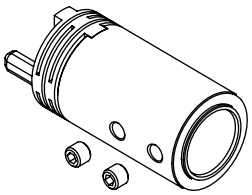
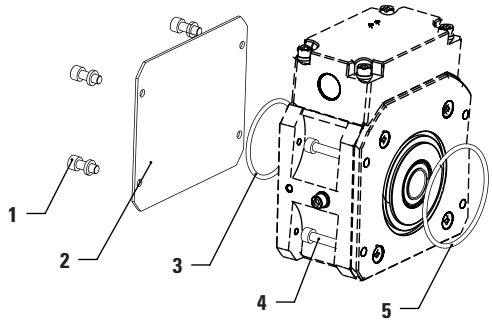
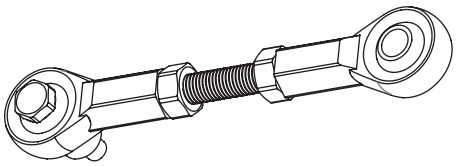
IEC IECEx Ex db IIC T6...T4 Gb
Ex tb IIIC T80°C Db IP6X

Ex II 2 GD Ex db IIC T6...T4 Gb
Ex tb IIIC T80°C Db IP6X

Certificates:
IECEx LCIE 17.0070X
LCIE 17 ATEX 3033X

ACCESSORIES

The following accessories are included with your MAAX encoder as defined by your part number selection.

Bore Reduction Sleeve (For use with MAUX version) 	9419/F20 for XX=20mm 9419/F25 for XX=25mm 9419/FE6 for X= 3/4" 9419/FE7 for X= 7/8" 9419/FE8 for X= 1"
Integrated Coupling Kit (For use with MAAX version) 	M9410/011-E3 for X=3/8" M9410/011-E4 for X=1/2" M9410/011-E5 for X=5/8" M9410/011-E6 for X=3/4" M9410/011-10 for X=10mm M9410/011-12 for X=12mm M9410/011-14 for X=14mm M9410/011-20 for X=20mm
Installation Kit (For use with MAAX version) 	M9301/196 Accessories Kit: **1:** M6 X 16 Screws with washers (4) **2:** Closure plate (1) **3:** 54 X 3 mm O-Ring (1) **4:** M6 X 25 Screws with washers (4) **5:** 69 X 3 mm O-Ring (1)
Ball End Tether (For use with MAUX version) 	M9230-03/XXX (XXX=Center-to-center nominal distance in mm)

CONTROL DRAWINGS

Accompanying the spec is a control drawing. This is specific for the MAAX - MAUX family and consist of Installation Requirements, Special Conditions of Operation and a EU Declaration of Conformity.

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Rest of Asia +886 (2) 27602006 ext 2808

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.
To avoid excessive heating caused by the friction of shaft seals and shaft bearings, the encoder must be linked to the drive system with an adapted flexible coupling (integrated in MAAX or anti-rotation for MAUX), in order to compensate shaft misalignment and thus limit the axial and radial loads on the sensor as shown in the manufacturer's instructions.
The used power cable should be suitable for a temperature of at least +80°C.
The user must install certified ATEX and IECEx cable glands and plugs for the intended use.
The user must wait at least 10 min after de-energizing before opening the connection box.
The flameproof joints are not intended to be repaired (article 5.1 standard 60079-1:2014).
AFTER DE-ENERGIZING, DELAY **10 MIN** BEFORE OPENING.

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.

1) **EU Declaration of conformity**

2) We, BEI Sensors, certify that this material : sensor explosion-proof standard
MAAX, MAUX

3) With the following inscriptions :
CE 0081 II 2 GD
Ex db IIC T6…T4 Gb
Ex tb IIIC T 80°C Db IP6X

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 ATEX
and a notification :
LCIE ATEX

6) IECEx certificate of conformity was obtained :
IECEx LCIE
and a notification :
FR/LCI

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

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

Identification number : 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

Date :

ATEX Certified Product Approved Person
Jean-Marc HUBSCH