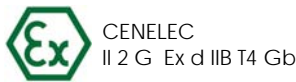


- Low profile package saves space
- Designed for use in hazardous areas
- Excellent resistance to shock and vibration
- 30mm standard through shaft, PEEK reduction hub available
- Hard anodized housing and high protection level of IP66
- High performance in temperatures from -40°C to +85°C
- Ruggedized HTL 11-30V push-pull
- Wiring fault tolerant output and overvoltage protection up to 60Vdc
- Long cables drive capability
- Resolutions from 1 to 10000 PPR



### Certifications:

The LP Incremental Encoder is available with the following certifications

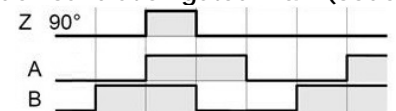


DEMKO 16 ATEX 1691X rev.0

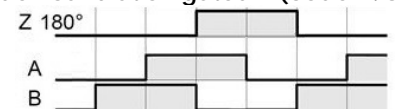
IECEx UL 16.0064X Issue 0

### Output Waveform:

Index calibration gated A & B (code 9)



Index calibration gated B (code V/US)

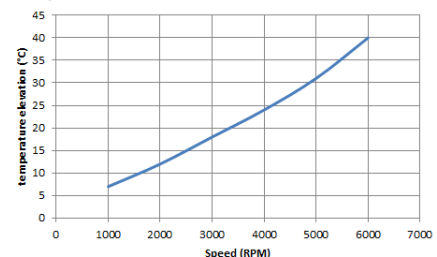


Waveform AA/ BB/ 00/ Channel B before A Clockwise

### Mechanical Characteristics:

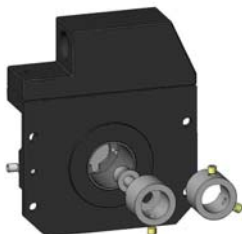
Material	Cover : Hard anodized aluminum	Vibrations (EN60068-2-6)	≤ 200m.s <sup>-2</sup> (55 ... 2 000 Hz)
	Body : Hard anodized aluminum	Shaft inertia	< 130 000 g.mm <sup>2</sup>
	Shaft : AISI 303 stainless steel	Static/Dynamic torque	30 / 300 mN.m
Ball bearings	6807 - Sealed	Continuous max. speed*	6000 min <sup>-1</sup>
Maximum loads	Axial: 40 N	Theoretical mechanical lifetime L <sub>10</sub> h**	> 18.10 <sup>9</sup> turns / 100000 hours
	Radial: 80 N	Encoder weight (approx.)	1.6 kg
Shocks (EN60068-2-27)	≤ 3000m.s <sup>-2</sup> (during 5 ms)	** Continuous max. Speed – ½ max. load – ISO 281, L <sub>10</sub>	

\* The temperature given on the following chart has to be added to the ambient temperature. The total must never exceed the maximum T°C given by the datasheet. These temperature elevations are typical values which should be considered as indications only.



### Available mechanics – shaft options:

HHAX: Shaft with Integrated coupling



HHUX: Through Hollow Shaft



HHKX: Blind Hollow Shaft



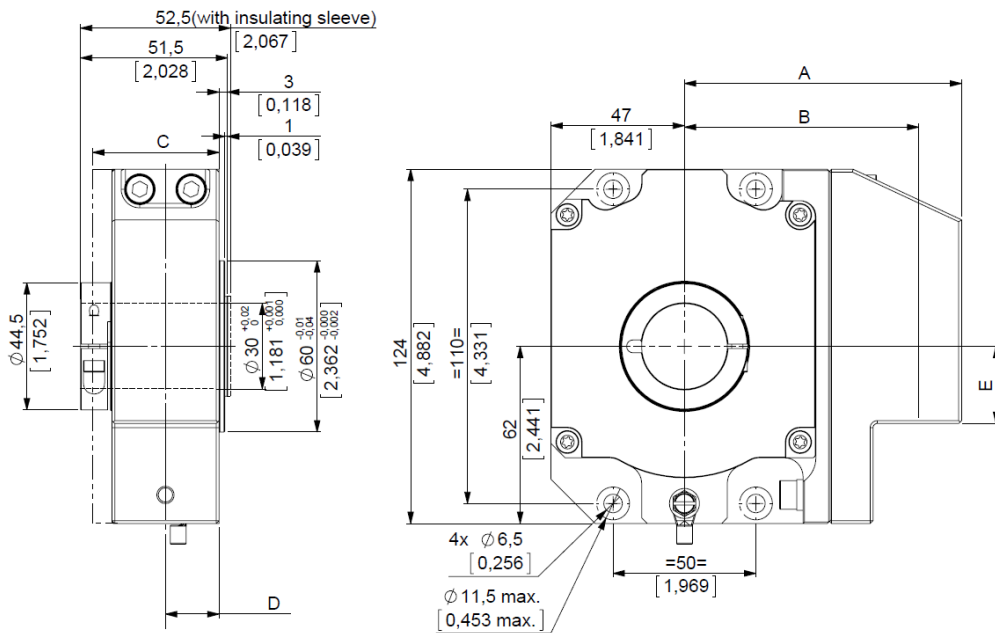
HHMX: Solid Shaft



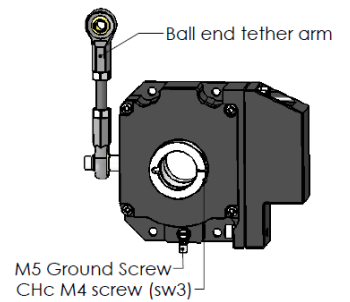
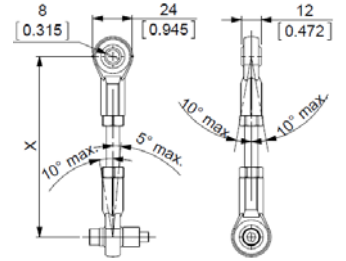
### Floating Mountings

#### Dimensions

HHUX – Through hollow shaft



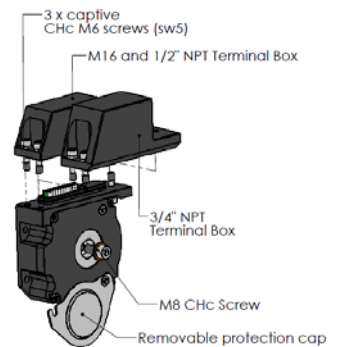
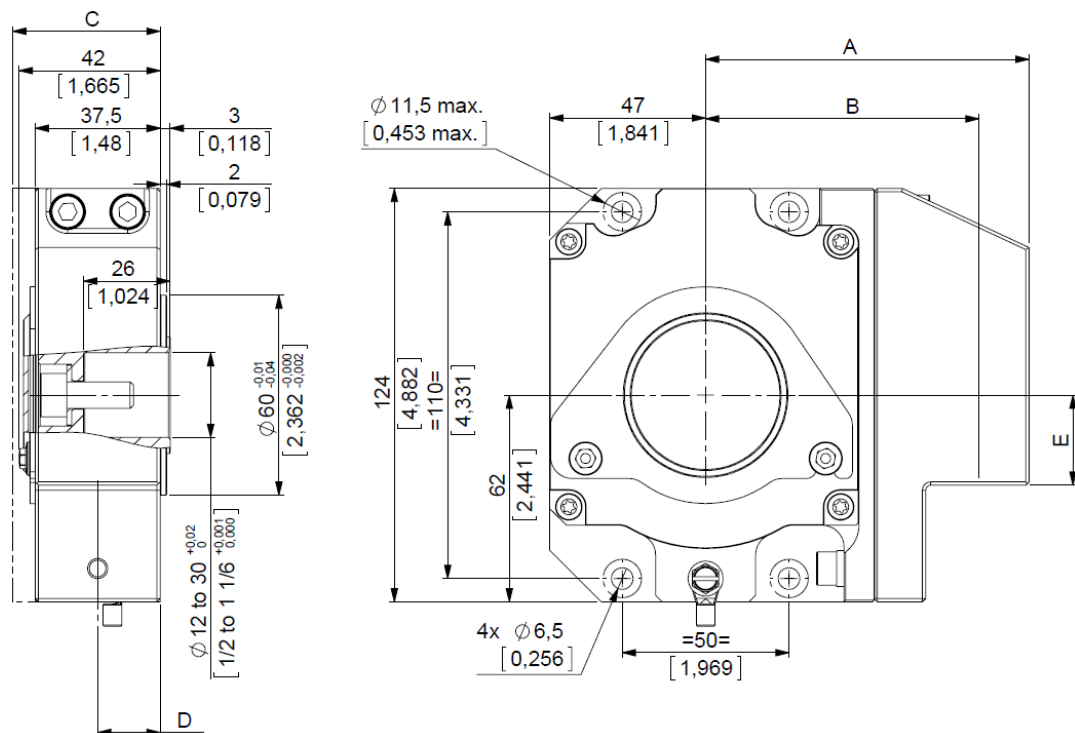
Optional Ball end tether arm:  
P/N :M9230-03/xxx  
xxx = length in mm



**Note :**  
CHc : Hexagonal socket head cap screws (recommended torque clamp screw CHc M4=3,5N.m, and Terminal Box CHc M6=6,5N.m)  
HC : Hexagonal socket set screws (recommended torque Hc M6 : 2,5N.m)

#### Dimensions

HHKX – Blind hollow shaft

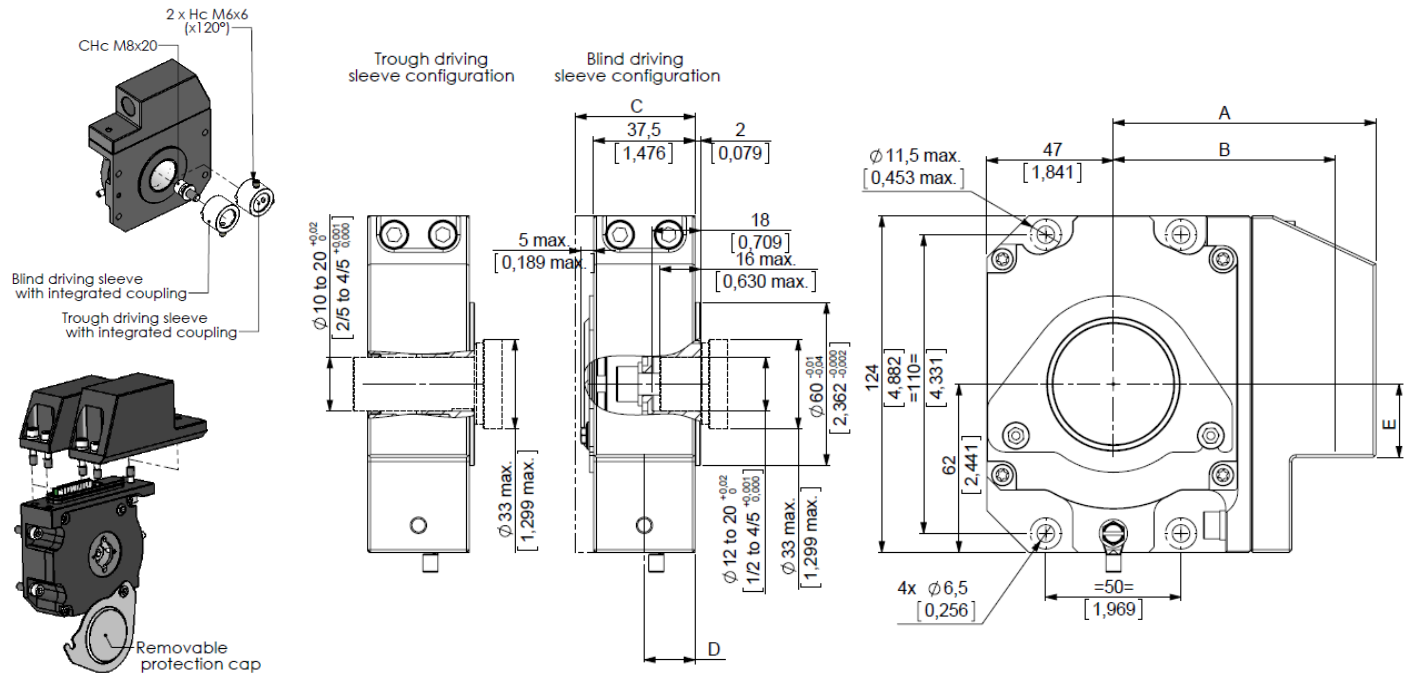


	M16-1/2" NPT Terminal Box	
	mm	inch
A	97	3.819
B	82	3.228
C	37,50	1.437
D	18,25	0.719
E	27	0.945
ØG (Cable gland)	31	1.220
Cable Ø	9 to 16	3/8 to 5/8

### Flange Mountings

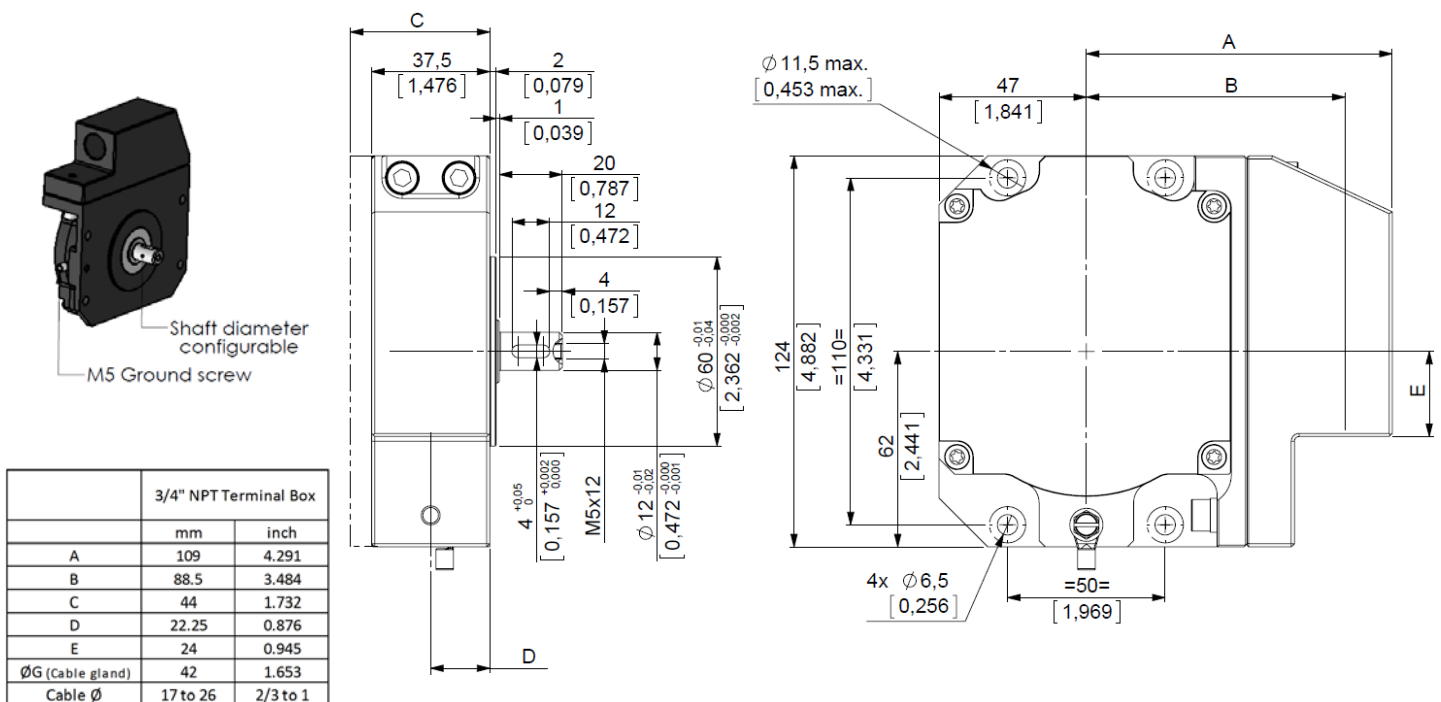
#### Dimensions

HHAX – Shaft with integrated coupling



#### Dimensions

HHMX – Solid shaft



## Explosion-proof and Flameproof Incremental Encoder

### Electrical Characteristics:

Version	Output signals	Resolution	Operating Voltage Vcl	Supply current (no loads)	Current per channel pair	Output Levels (Is=20mA)	Frequency capability	Short circuits proof	Reverse polarity tolerant	Wiring fault tolerant & Overvoltage protection	Temperature range
5GE	HTL	1 to 10 000	11-30V	100mA	60mA	Low max: 1.5V High min: Vcl - 3.5V	Up to 300kHz	Yes	Yes	Yes Up to 60Vdc	-40°C +85°C
PG5			5-30V	75mA	40mA	Low max: 0.5V High min: Vcl - 2.5V	Up to 1MHz			Yes (except to Vcl)	
2G2	5V+/-5%		4.75-30V			4V					
RG2	TTL RS422										

### Terminal Box Connection:

-	+	A	B	Z	A/	B/	Z/	Ground
1	2	3	4	5	6	7	8	9

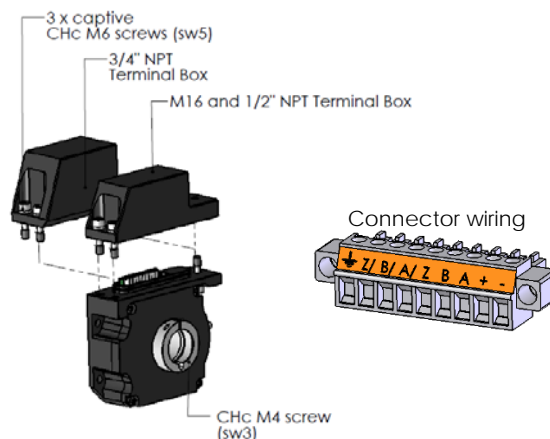
Available Terminal Box versions:

- E0R: M16 without cable-gland
- E4R: 1/2" NPT without cable-gland
- E6R: 3/4" NPT without cable-gland

### Available resolutions:

Standard: 32 64 100 128 250 256 360 500 512 600 720 1000 1024 1200 1250 1440 1500 2000 2048 2500 2880 3600 4096 5000 7200 8192 10000

For non-standard and resolutions above 10000 ppr, please contact factory



### LP Incremental Ordering Options

Use this diagram, working from left to right to construct your model number (Example: **HHAX\_E6//5GEV/US//01024//E6R//U6**)

HH_X	--	//	---	-	//	----	//	---	---	//	--
TYPE:	SHAFT BORE:		VOLTAGE/ OUTPUT:	CHANNELS:		CYCLES PER TURN:		OUTPUT TERMINATION:	CABLE LENGTH:		HUB:
HHUX = hollow shaft	E5 = 5/8" E6 = 3/4" E8 = 1" 30 = 30mm		2G2 = 5V voltage and RS422 output  5GE = 11-30V voltage and reinforced Push-Pull output	9 = AA/ BB/ ZZ/ B before A Z gated A&B		(Enter Cycles)  See available resolutions above		G3R <sup>(1)</sup> = M16 cable-gland with PVC cable GPR <sup>(1)</sup> = M16 cable-gland with PUR cable  E0R = M16 radial terminal box (without cable-gland) E4R = 1/2" NPT radial terminal box (without cable-gland) E6R = 3/4" NPT radial terminal box (without cable-gland)	xxx = cable length ex. 020 = 2meters  Blank = No cable		U3 = With insulated Sleeve (1" max)  U5 = Blind sleeve U6 = Through sleeve  ** = no sleeve
HHKX = blind shaft			PG5 = 5-30V voltage and push-pull output  RG2 = 4.75-30V voltage and RS422 output	V/US = AA/BB/ZZ/ B before A Z gated on B							
HHAX = hollow shaft with integrated coupling	E6 = 3/4" 14 = 14mm 20 = 20mm										
HMMX = solid shaft	E3 = 3/8" 12 = 12mm										

<sup>(1)</sup>Atex IECEx certified only

Stainless steel option available.

Anti-rotation accessory: M9230-03/xxx Ball end tether arm (xxx = length in mm) to be ordered separately.

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Fax: 800-960-2726 or 805-968-3154  
email: beisales@beisensors.com  
www.beisensors.com

## SPECIAL CONDITIONS FOR SAFE USE:

### None required.

The gaps of the different flame paths 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.  
See Document 08329-001 for construction details.

### ASSEMBLY CAUTION/WARNING:

**Keep terminal cover closed and cable gland secured while in presence of hazardous atmosphere.  
Open all circuits to this product prior to removal of terminal block cover.**

Electrical installation shall use standard EN/IEC 60079-14 and/or NEC Class 2 circuit specifications. UL certified installations require the use of a sealing fitting certified to 60079-0 Ex d IIB within 18 in. (46 cm) of the encoder. Terminal block covers are marked near the threaded hole with the basic thread size to aid with selection of fittings or glands. Conductor insulation must be rated for at least 105°C ambient temperature. External case ground connection is provided by means of a screw and ring type terminal which accepts up to 10 AWG (5.26 mm<sup>2</sup>) size conductor.

The customer shall use our products according to our specifications and to the manners of the profession. BEI Sensors will not be responsible for any defect resulting from improper installation or from operating outside of the specification limits of the product. Malfunctions caused by excessive shocks, bad electric supply, under or over voltage, the environmental conditions outside of the design specifications, are not covered by warranty. The encoder doesn't require any maintenance. There are no user serviceable parts inside. Any defective encoder shall be returned to the nearest BEI Sensors facility for evaluation and repair/replacement. A high integrity case ground connection must be made at or near the encoder installation location.

See LP series User Manual for installation details and Specification Documents (no. 2000/008 or 2000/009) for product details not otherwise indicated on this document.

## EU Declaration of Conformity

1. We, BEI Sensors, certify that **Models HH\_X and AH\_X** all resolutions, channel and output type options are explosion proof and flame proof as noted on the UL, IECEX and DEMKO certificates cited below.
2. With the following marking: II 2 G Ex d IIB T4 Gb
3. Designed and manufactured to comply with these directives:  
**ATEX : 2014/34/EU and CEM : 2014/30/EU**
4. Complies with these standards:  
ATEX: EN60079-0:2012+A11:2013, EN60079-1:2014,  
IECEX: IEC60079-0:2011+IS1 2013, IEC60079-1:2014
5. As detailed in EC type examination certificates:  
**DEMKO 16 ATEX 1691X rev.0 and IECEx UL 16.0064X Issue 0**  
Product Quality Assurance Notification: **LCIE 03 ATEX Q8060**  
Product Quality Assurance Report: **FR/LCI/QAR08 0002**
6. **EMC:** The following standards were also investigated for this certification: 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, CEI61000-4-11
7. The notified organization responsible for the follow-up of the **ATEX** directive is (Assessed by):  
LCIE, B.P.8, F92260 Fontenay-aux-Roses - Identification number: 0081
8. The company in charge of certification **CEM** is: LCIE BUREAU VERITAS, Aire de la Thur 68840 Pulversheim

## UL Declaration of Conformity

Part number **Model HH\_X and AH\_X** model for use in Class I, Group C & D

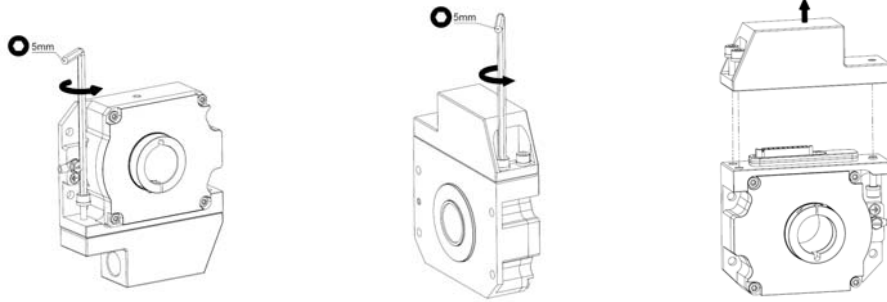
UL 1203 Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for Use in Hazardous (Classified) Locations  
C22.2 No. 30-M1986 - Explosion-Proof Enclosures for Use in Class I Hazardous Locations

UL Certificate No. E78446

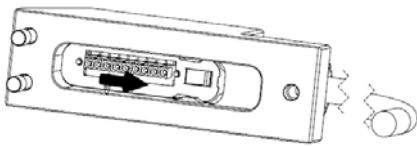
The notified organization responsible for the follow-up inspections for this **UL listing** is (Assessed by):

UL International (France) SA  
Espace Technologique de Saint-Aubin, Immeuble Explorer  
Route de l'Orme des Merisiers – F-91190 SAINT AUBIN:  
Identification number: 675

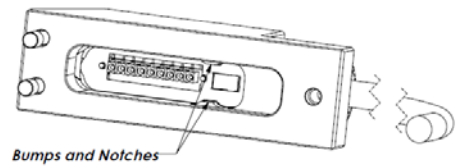
Unscrew the 3 CHc M6 screws to remove the connection box



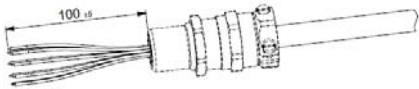
Slide right to unlock Connector Wiring



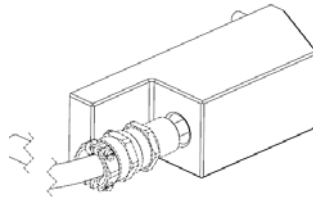
Align Bumps and Notches to take Connector out



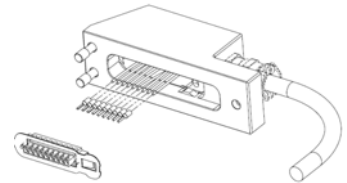
Prepare the wires



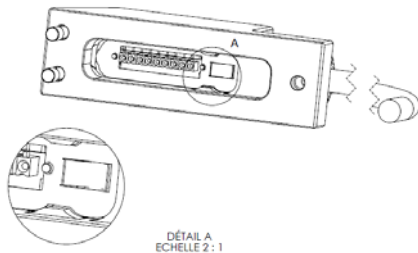
Tighten Pressure screw



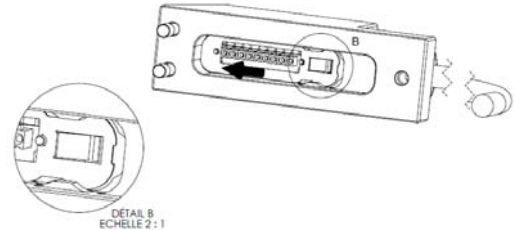
Crimp the wires and screw it on connector



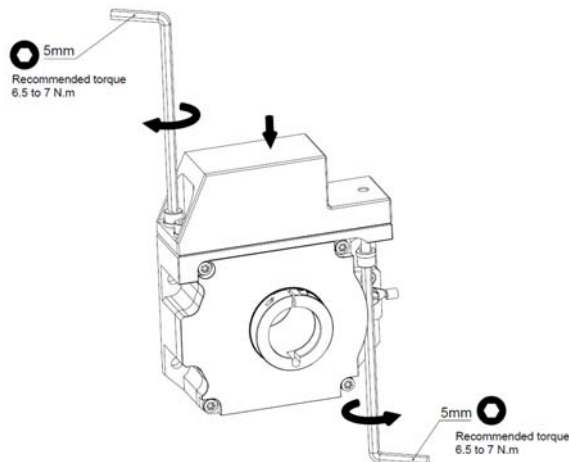
Align Bumps and Notches and push-in



Slide left to lock connector in place



Put Connection box in place and screw 3 CHc screws on recommended torque



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