

- Low profile package saves space
- Excellent resistance to shock and vibration
- 30mm standard through shaft, PEEK reduction hub available
- High protection level of IP66
- High performance in temperatures from -40°C to $+100^{\circ}\text{C}$
- 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
- Terminal box connection (also available with M12 or cable output)
- Also designed for use in hazardous areas (contact factory)



Certifications:

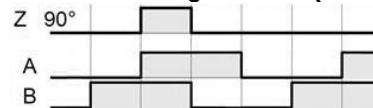
The LP Incremental Encoder is available with the following certifications



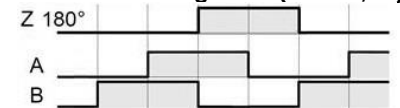
Output Waveform:

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

Index calibration gated A & B (code 9)



Index calibration gated B (code V/US)



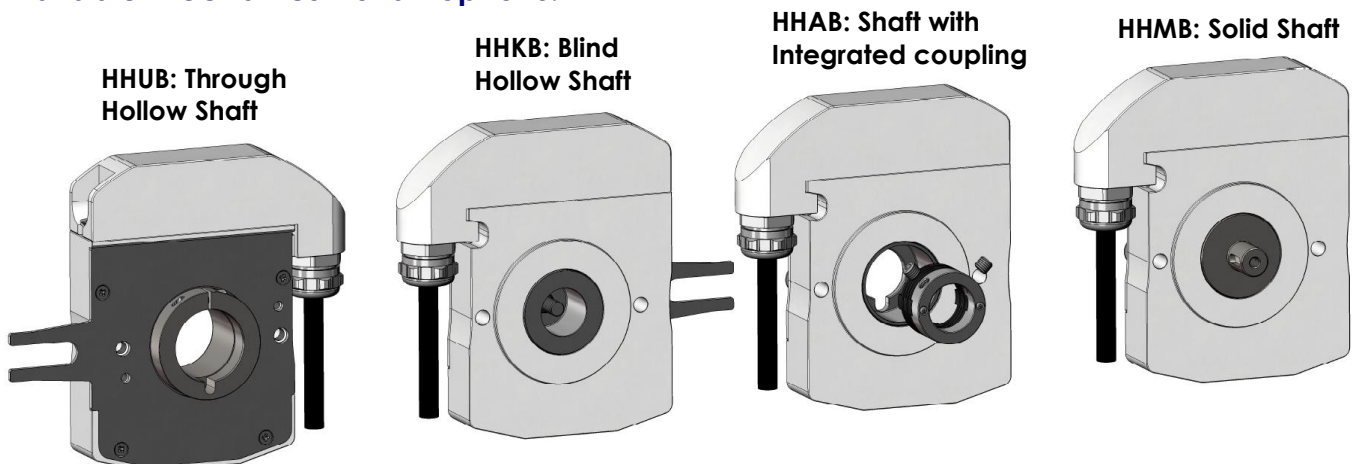
Mechanical Characteristics:

Material	Cover : anodised aluminum	Vibrations (EN60068-2-6)	$\leq 200\text{m.s}^{-2}$ (55 ... 2 000 Hz)
	Body : anodised aluminum	Shaft inertia	$< 84000\text{ g.mm}^2$
	Shaft : AISI 303 stainless steel	Static/Dynamic torque	30 / 300 mN.m
Ball bearings	6807 - Sealed	Continuous max. speed*	6000 min^{-1}
Maximum loads	Axial: 40 N	Theoretical mechanical lifetime L_{10h}^{**}	$> 18.10^9$ turns / 100000 hours
	Radial: 80 N	Encoder weight (approx.)	790g
Shocks (EN60068-2-27)	$\leq 3000\text{m.s}^{-2}$ (during 5 ms)		

* please reference the user manual heat derating curves

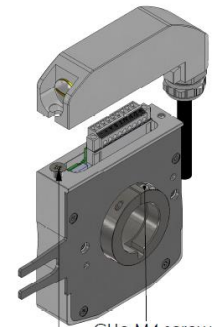
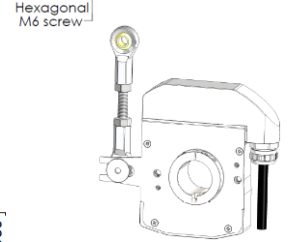
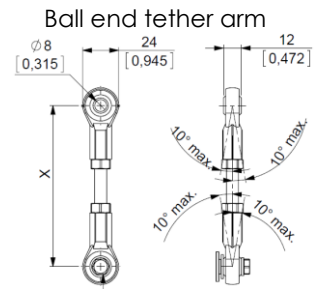
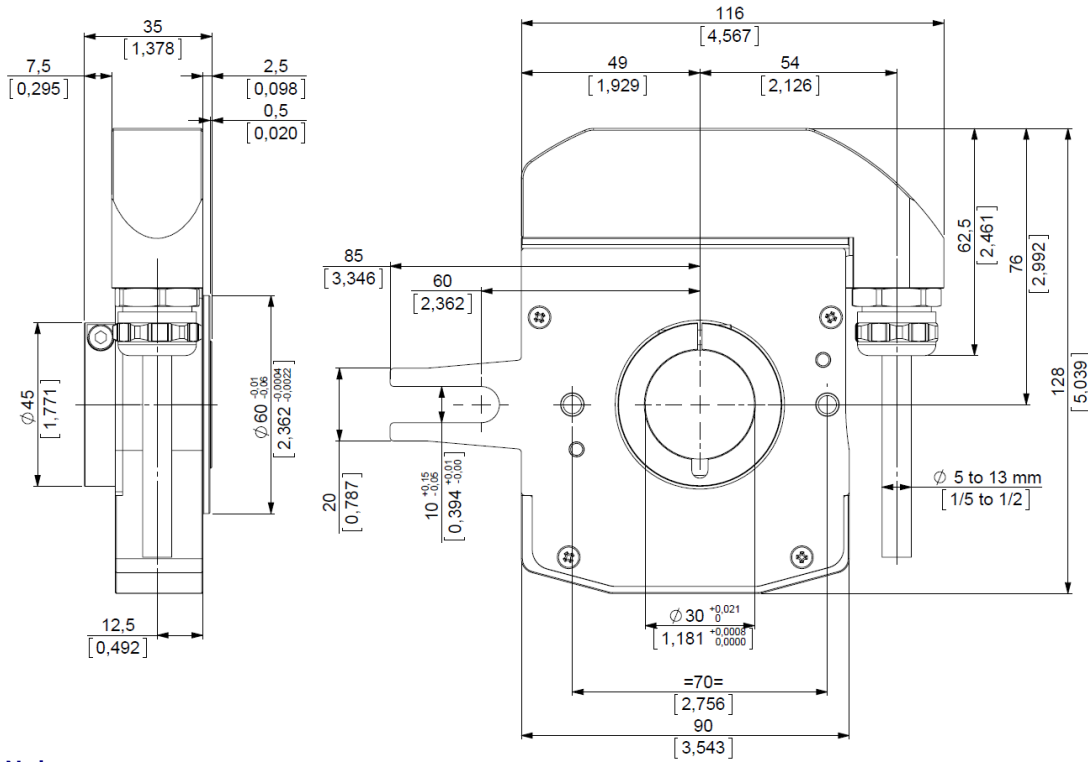
** continuous max. speed – ½ max. load – ISO 281, L_{10}

Available mechanics – shaft options:



Dimensions

HHUB – Through hollow shaft – with terminal box



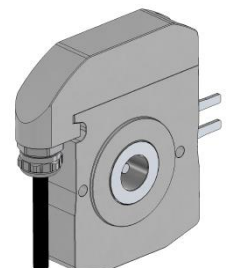
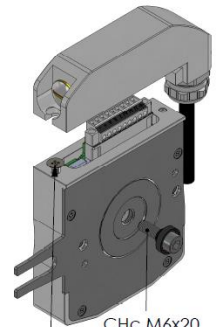
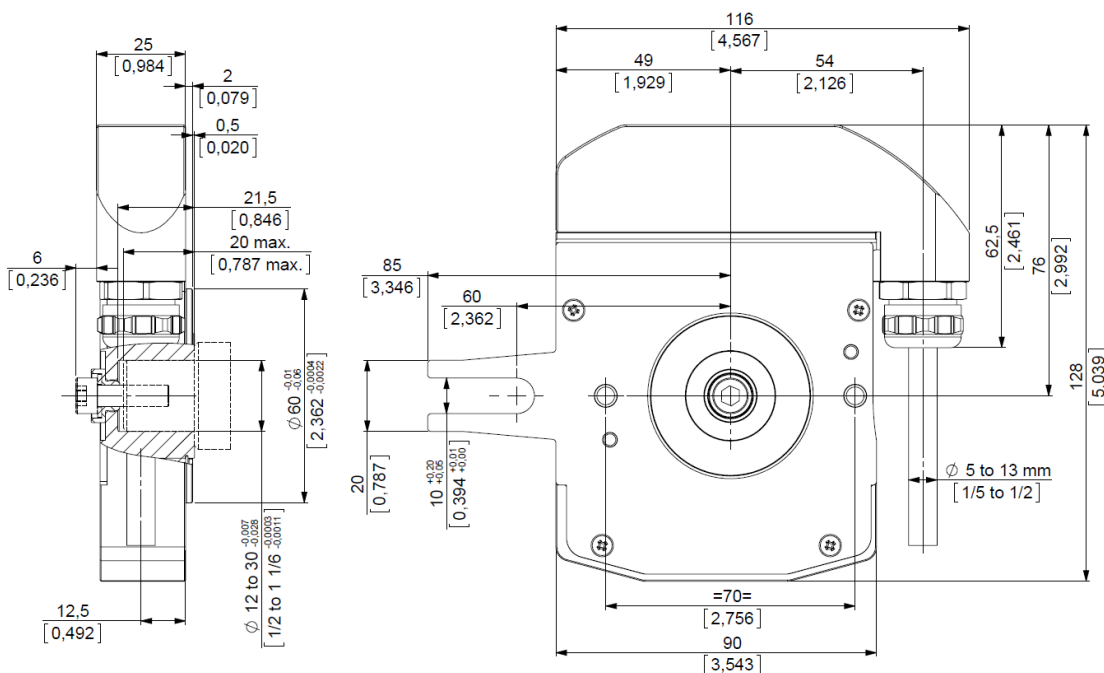
Note :

CHc : Hexagonal Socket head cap screws

HC : Hexagonal socket set screws

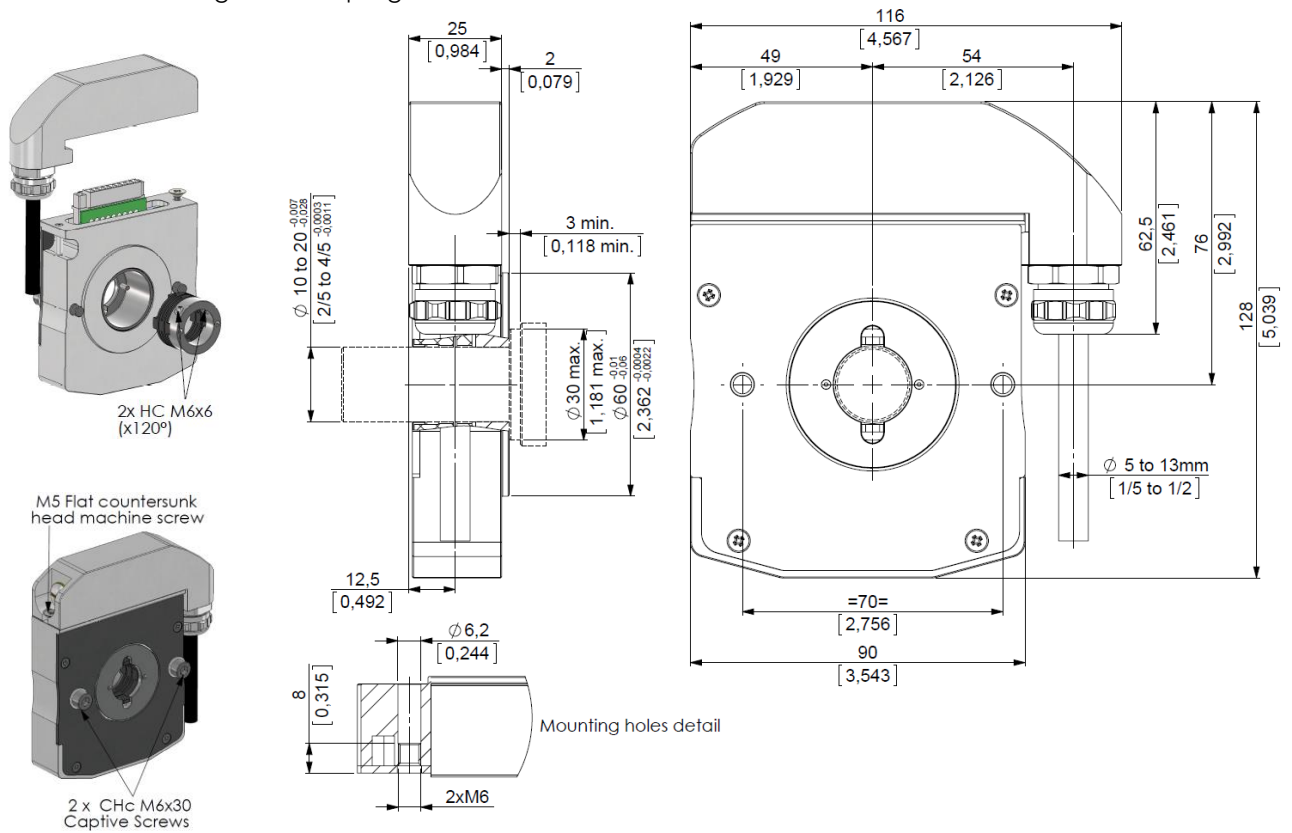
Dimensions

HHKB – Blind hollow shaft – with terminal box



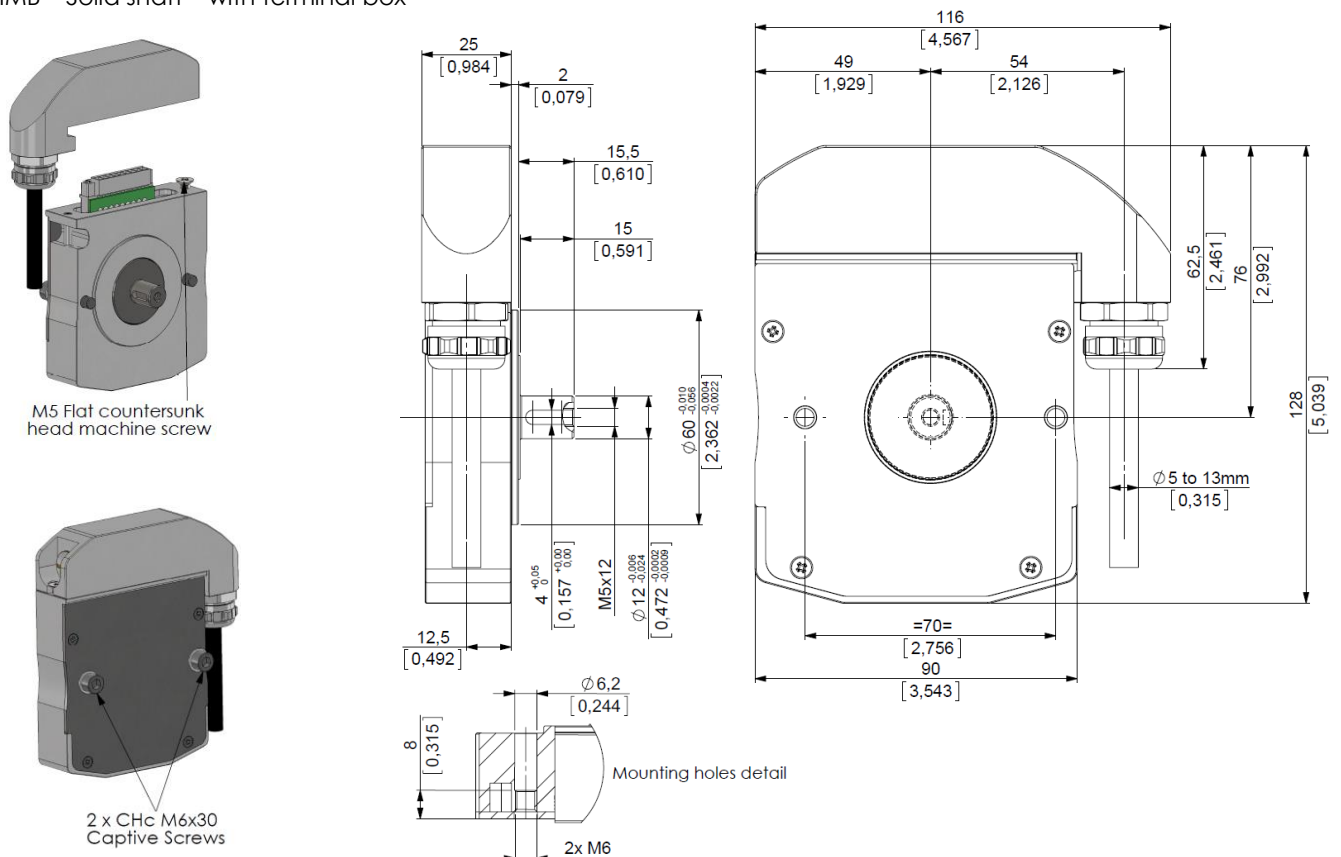
Dimensions

HHAB – Shaft with integrated coupling – with terminal box



Dimensions

HHMB – Solid shaft – with terminal box



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 10000	11-30V --- 250mA	100mA	75mA	Low max: 1.5V High min: Vcl - 3.5V	Up to 300kHz	Yes	Yes	Yes Up to 60Vdc	-40°C +85°C (1)
PG5			5-30V --- 250mA	75mA	40mA	Low max: 0.5V High min: Vcl - 2.5V	Up to 1MHz			Yes (except to Vcl)	No
2G2	5V+/-5% --- 250mA		Low max: 0.5V High min: 4V								
RG2	TTL RS422		4.75-30V --- 250mA								

(1) UL listed: -20°C +80°C. Device must be supplied by a Class 2, LPS or SELV limited energy source.

Connection:

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

Available resolutions:

Standard: 32 64 100 128 250 256 360 500 512 600 720 1000 1024 1200 1250 1500 2000 2048 2500 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 : **HHAB_E6//PG5V/US/01024//GXR//U6******)

HH_B	--	//	---	-	//	-----	//	GXR	//	--	---**
TYPE:	SHAFT BORE:		VOLTAGE/ OUTPUT:	CHANNELS:		CYCLES/ TURN:		OUTPUT TERMINATION:		HUB:	ANTI-ROTATION
HHUB = 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)		GXR = Terminal box		U3 = With insulated sleeve	B2** = Anti-rotation fork (always with HHUB and HHKB)
HHKB = blind shaft			PG5 = 5-30V voltage and push-pull output	V/US = AA/BB/ZZ/ B before A Z gated on B		See available resolutions above			U5 = Blind sleeve U6 = Through sleeve	**** = No anti-rotation for HHAB and HHMB	
HHAB = hollow shaft with integrated coupling	E6 = 3/4" 14 = 14mm 20 = 20mm		RG2 = 4.75-30V voltage and RS422 output						** = no sleeve		
HHMB = solid shaft	E3 = 3/8" 12 = 12mm										

Stainless steel option available

Anti-rotation accessory: M9230-04/xxx Ball end tether arm (xxx = length in cm) to be ordered separately

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