

- 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 $+100^{\circ}\text{C}$
- HTL or TTL electronic
- Programmable resolutions from 1 to 10000 PPR
- M12 or cable output (also available with terminal box connection)



Certifications:

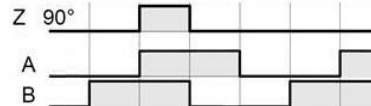
The LP Incremental Encoder is available with the following certifications



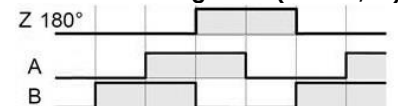
Output Waveform:

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:

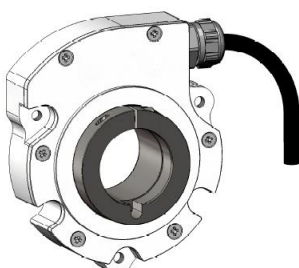
Material	Cover : anodised aluminum	Vibrations (EN60068-2-6)	$\leq 200\text{m.s}^{-2}$ (55 ... 2 000 Hz)
	Body : anodised aluminum	Shaft inertia	$< 84000\text{ g.mm}^2$
	Shaft : AISI 303 stainless steel	Static/Dynamic torque	30 / 300 mN.m
Ball bearings	6807 - Sealed	Continuous max. speed*	6000 min ⁻¹
Maximum loads	Axial: 40 N	Theoretical mechanical lifetime L_{10h} **	$> 18.10^9$ turns / 100000 hours
	Radial: 80 N	Encoder weight (approx.)	450g
Shocks (EN60068-2-27)	$\leq 3000\text{m.s}^{-2}$ (during 5 ms)		

* please reference the user manual heat derating curves

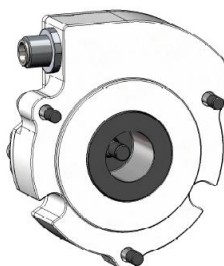
** continuous max. speed – ½ max. load – ISO 281, L_{10}

Available mechanics – shaft options:

HHU9: Through Hollow Shaft



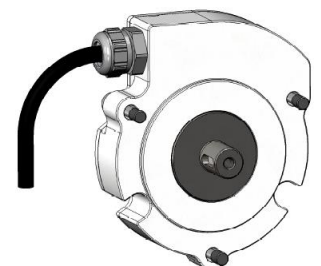
HHK9: Blind Hollow Shaft



HHA9: Shaft with Integrated coupling

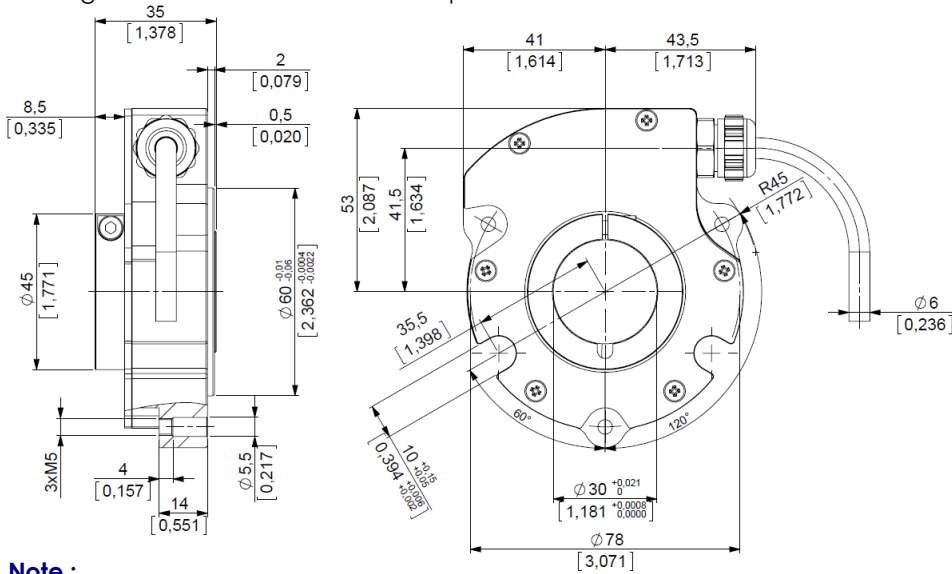


HHM9: Solid Shaft

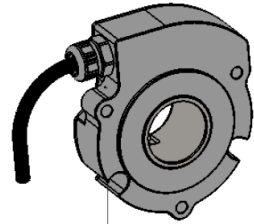
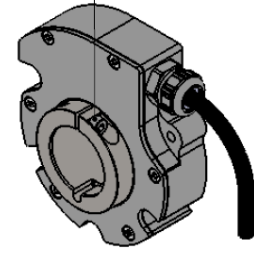


Dimensions

HHU9 – Through hollow shaft – with cable output



CHc M4 Screw (SW3)



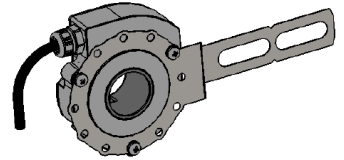
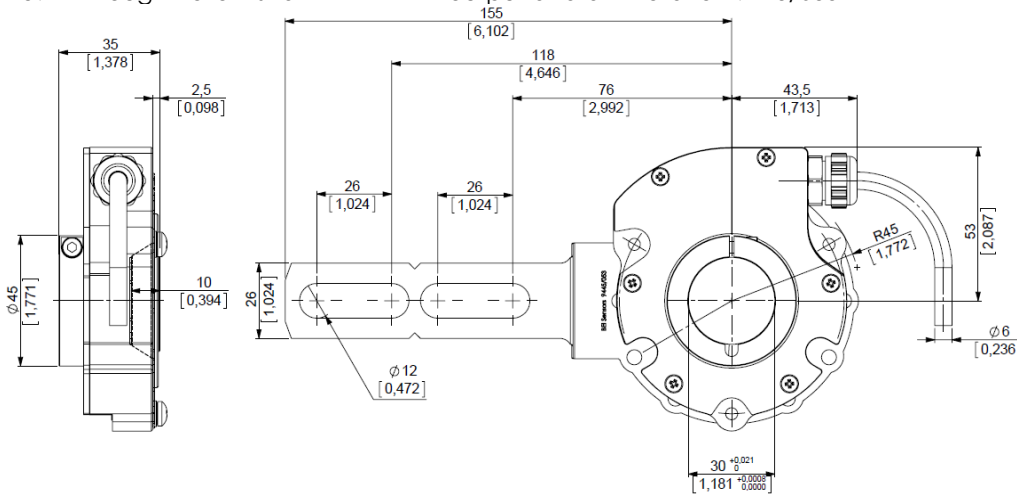
Anti-rotation slots

Note :

CHc : Hexagonal Socket head cap screws HC : Hexagonal socket set screws

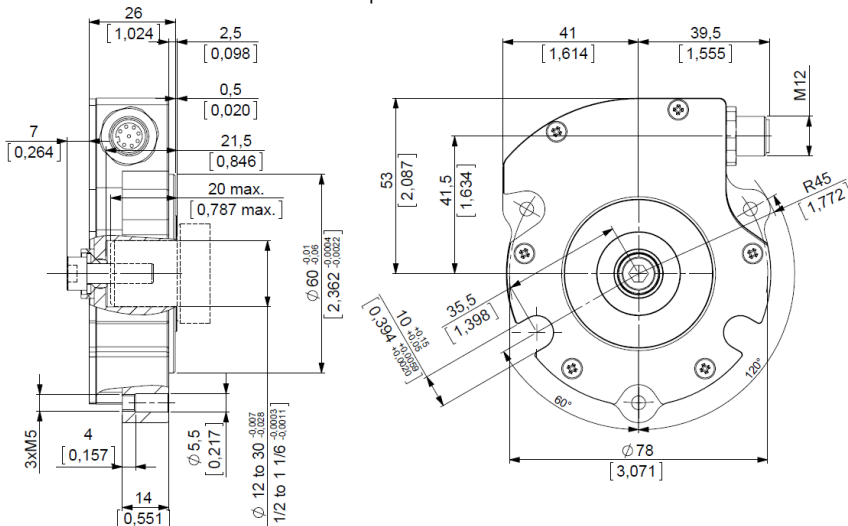
Dimensions

HHU9 – Through hollow shaft – with M12 output and anti-rotation 9445/053

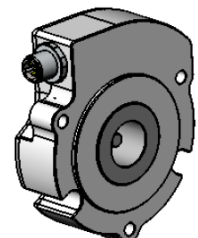
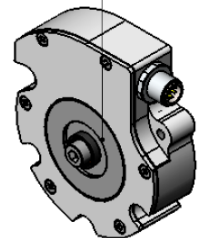


Dimensions

HHK9 – Blind hollow shaft – with cable output



CHc M6x20 Screw



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	Temperature range
PP5	HTL	1 to 10000	5-30V --- 250mA	75mA	40mA	Low max: 0.5V High min: Vcl - 2.5V	Up to 1MHz	Yes	Yes	-40°C +100°C (1)
RP2	TTL RS422		4.75-30V --- 250mA	75mA	40mA	Low max: 0.5V High min: 4V		Yes (except to Vcl)		

(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
GM	M12 - 8 pins	1	2	3	4	5	6	7	8	Connector Body
G3	PVC cable 8 wires	WH white	BN brown	GN green	YE yellow	GY grey	PK pink	BU blue	RD red	General shielding
GC	PUR cable 8 wires	BK black	RD red	GN green	BN brown	VT violet	YE yellow	OG orange	BU blue	General shielding
GP	PUR cable 12 wires (not UL)	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
TE	Silicon cable (2) 8 wires (not UL)	WH white	BN brown	GN green	YE yellow	GY grey	PK pink	BU blue	RD red	General shielding

(2) Advised cable for mobile application, in extreme temperature from -40°C to +100°C

Programmable possibility:

The programmable LP incremental encoder features a patented dynamic encoder resolution capability that allows users to easily program the encoder resolution to any value between 1 and 10000 counts per turn. The LP allows for virtually unlimited resolution variations. Index calibration and index position can also be programmed.

Using the simple programming interface software and USB interface cable, users can program the encoder resolution on site as needed. In the software, type the encoder resolution and click 'Program'. A new resolution is now programmed. It's that easy!

With the LP, resolution can be programmed and reprogrammed at any time by the user. For users with multiple requirements, LP can be kept in stock and programmed as needed. LP programming cable has to be ordered separately: consult us.

LP Incremental Ordering Options

Use this diagram, working from left to right to construct your model number (Example : **HHA9_E6//PP5X//XPROG//GMR//U6**)

HH_9	--	//	---	X	//	XPROG	//	---	---	//	--
TYPE:	SHAFT BORE:		VOLTAGE/ OUTPUT:	CHANNELS:		CYCLES/ TURN:		OUTPUT TERMINATION:	CABLE LENGTH:		HUB:
HHU9 = hollow shaft	E5 = 5/8'' E6 = 3/4'' E8 = 1'' 30 = 30mm		PP5 = 5-30V voltage and push-pull output	X = Programmable channels		XPROG = Programmable resolution		G3R = PVC cable GCR = PUR cable GPR = PUR cable (not UL) TER = Silicone cable (not UL)	xxx = cable length ex. 020 = 2meters		U3 = With insulated sleeve
HHK9 = blind shaft			RP2 = 4.75-30V voltage and RS422 output	Factory setting = AA/ BB/ ZZ/ B before A Z gated A&B		Factory setting = 1024PPR		GMR = M12	Blank (no cable)		U5 = Blind sleeve U6 = Through sleeve
HHA9 = hollow shaft with integrated coupling	E6 = 3/4'' 14 = 14mm 20 = 20mm										** = no sleeve
HHM9 = solid shaft	E3 = 3/8'' 12 = 12mm										

Stainless steel option available. Anti-rotation accessory: M9445/053 to be ordered separately

BEI SENSORS Europe

9, rue de Copenhague
Espace Européen de l'Entreprise-Schiltigheim
BP 70044 - 67013 STRASBOURG Cedex France
Tel: +33 (0)3-88-20-80-80 | Fax: +33 (0)3-88-20-87-87
email: info@beisensors.com

BEI SENSORS North America

1461 Lawrence Dr | Thousand Oaks, CA 91320 USA
Tel: 800-350-2727 or 805-968-0782
Fax: 800-960-2726 or 805-968-3154
email: beisales@beisensors.com
www.beisensors.com