

The VLH-35 is a member of the VLH series of Electric Encoders™ a product line based on Netzer Precision Position Sensor proprietary technology. EE products are characterized by features that enable unparalleled performance:

- Low profile (6 mm)
- Hollow shaft (Stator / Rotor)
- No bearings or other contact elements
- High resolution and unparalleled precision
- High tolerance to temperature extremes, shock, moisture, EMI, RFI and magnetic fields
- Very low weight
- Holistic signal generation
- Digital interfaces for absolute position

### General

Angular resolution	17-19 bit
Maximum tested static error	±0.05°
Maximum operational speed	6,000 rpm
Measurement range	Single turn, unlimited
Rotation direction	Adjustable CW/CCW*

\* Default same direction from bottom side of the encoder

### Mechanical

Allowable mounting eccentricity	±0.1 mm
Allowable axial mounting tolerance	±0.15 mm
Rotor inertia	1,930 gr · mm <sup>2</sup>
Total weight	5.5 gr
Outer Ø /Inner Ø/ Profile	35 / 11/ 6 mm
Material (stator, rotor)	FR4
Nominal air gap (stator, rotor)	0.6 mm +/- 0.15 mm

### Electrical

Supply voltage	External 5V DC ±5%
Current consumption	< 82 mA
Interconnection	Connector DF52-10P

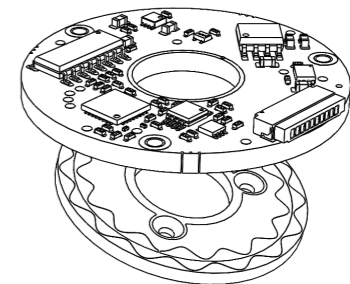
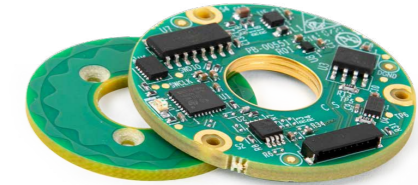
The holistic structure of the Electric Encoder™ makes it unique: Its output reading is the averaged outcome of the entire area of the rotor. This feature allows the EE a tolerant mechanical mounting and to deliver outstanding precision.

Due to the absence of components such as ball bearings, flexible couplers, glass discs, light sources and detectors along with very low power consumption enables the EE to deliver virtually failure-free performance in nearly all types of conditions.

The internally shielded, DC operated EE includes an electric field generator, a field receiver, sinusoidal-shaped dielectric rotor, and processing electronics.

The EE output is a digital serial synchronous with absolute position single turn.

This combination of high precision, low profile and, low weight has made Netzer Precision encoders highly reliable and particularly well suited to a wide variety of industrial automation applications.



### Environmental

EMC	IEC 6100-6-2, IEC 6100-6-4
Operating temperature	-25°C to +105°C
Storage temperature	-40°C to +105°C
Relative humidity	98% Non condensing
Shock endurance	40 g for 11 ms
Vibration endurance	20 g 10 – 2000 Hz
Protection	IP 40

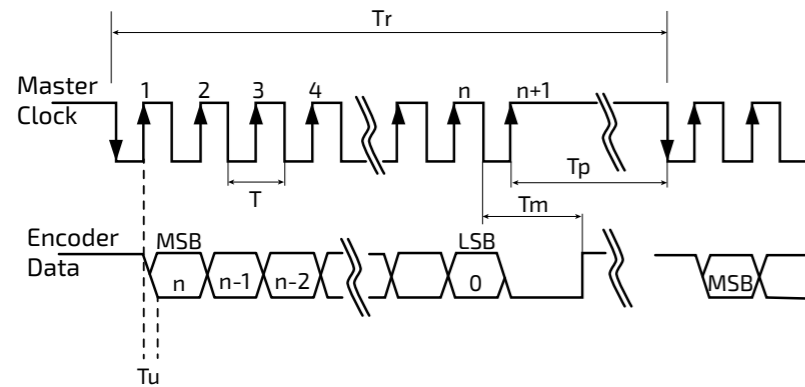
### Calibration / Compensation

Offsets	Manual
Signals level	Manual
Signals integrity	Error
Zero position	Manual

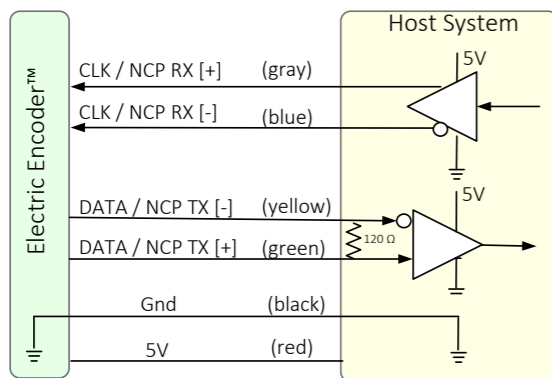


### Digital SSI Interface

Synchronous Serial Interface (SSI) is a point to point serial interface standard between a master (e.g. controller) and a slave (e.g. sensor) for digital data transmission.



	Description	Recommendations
n	Total number of data bits	17-19
T	Clock period	
f= 1/T	Clock frequency	0.1 ÷ 1 MHz
Tu	Bit update time	90 nsec
Tp	Pause time	26 - ∞ µsec
Tm	Monoflop time	>25 µsec
Tr	Time between 2 adjacent requests	Tr > n*T+26 µsec
fr=1/Tr	Data request frequency	



### SSI / BiSS output signal parameters

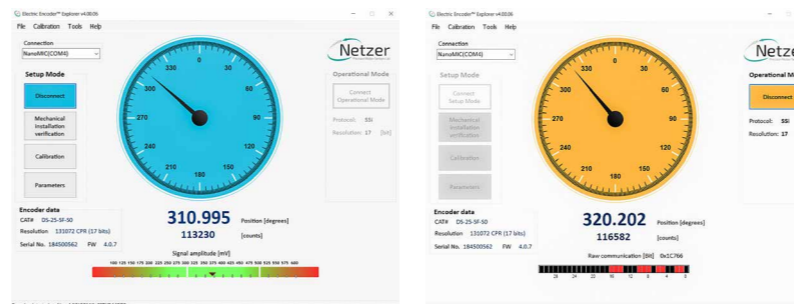
Output code	Binary
Serial output	Differential RS-422
Clock	Differential RS-422
Clock frequency	0.1 ÷ 1 MHz
Position update rate	35 kHz

### SSI/BiSS interface pin/cable color code

DF52 Connector pin no.	DB9 F (cable end) pin no.	Cable Color	Function
8	2	Grey	CLK + / NCP RX +
7	1	Blue	CLK - / NCP RX -
6	4	Yellow	DATA - / NCP TX -
5	3	Green	DATA + / NCP TX +
4	5	Black	GND
3	8	Red	5V

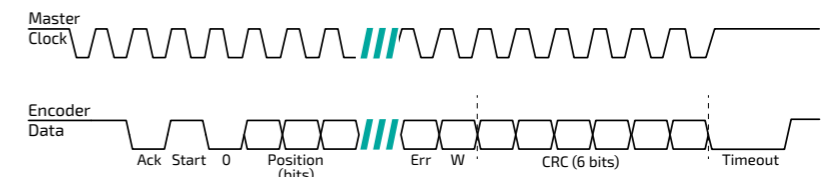
### Software tools: (SSI / BiSS-C)

Advanced calibration and monitoring options are available by using the factory supplied [Electric Encoder Explorer software](#). This facilitates proper mechanical mounting, offsets calibration and advanced signal monitoring.



### Digital BiSS-C Interface

BiSS-C Interface is unidirectional serial synchronous protocol for digital data transmission where the Encoder acts as "slave" transmits data according to "Master" clock. The BiSS protocol is designed in B mode and C mode (continuous mode). The BiSS-C interface as the SSI is based on RS-422 standards.



Bit #	Description	Default	Length
28	Ack	0	1/clock
27	Start	1	1 bit
26	"0"	0	1 bit
8...25	AP		
7	Error	1	1 bit
6	Warn.	1	1 bit
0...5	CRC		6 bits
	Timeout		25 µs

### Ordering Code

### Cable Information

VLH - 35 - S H - C H - n n n

VLH Product line

Outer Diameter

Output

S	SSi
I	BiSS

Resolution

Code	Bit	CPR
F	17	131,072
G	18	262,144
H	19	524,288

nnn Custom

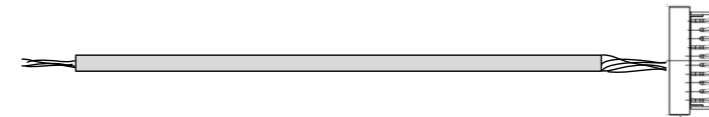
Interconnection

H Horizontal (Connector)

C Connector

#### Cable (optional)

SSi / BiSS	Remarks
CB-00165	AWG30, 250 mm

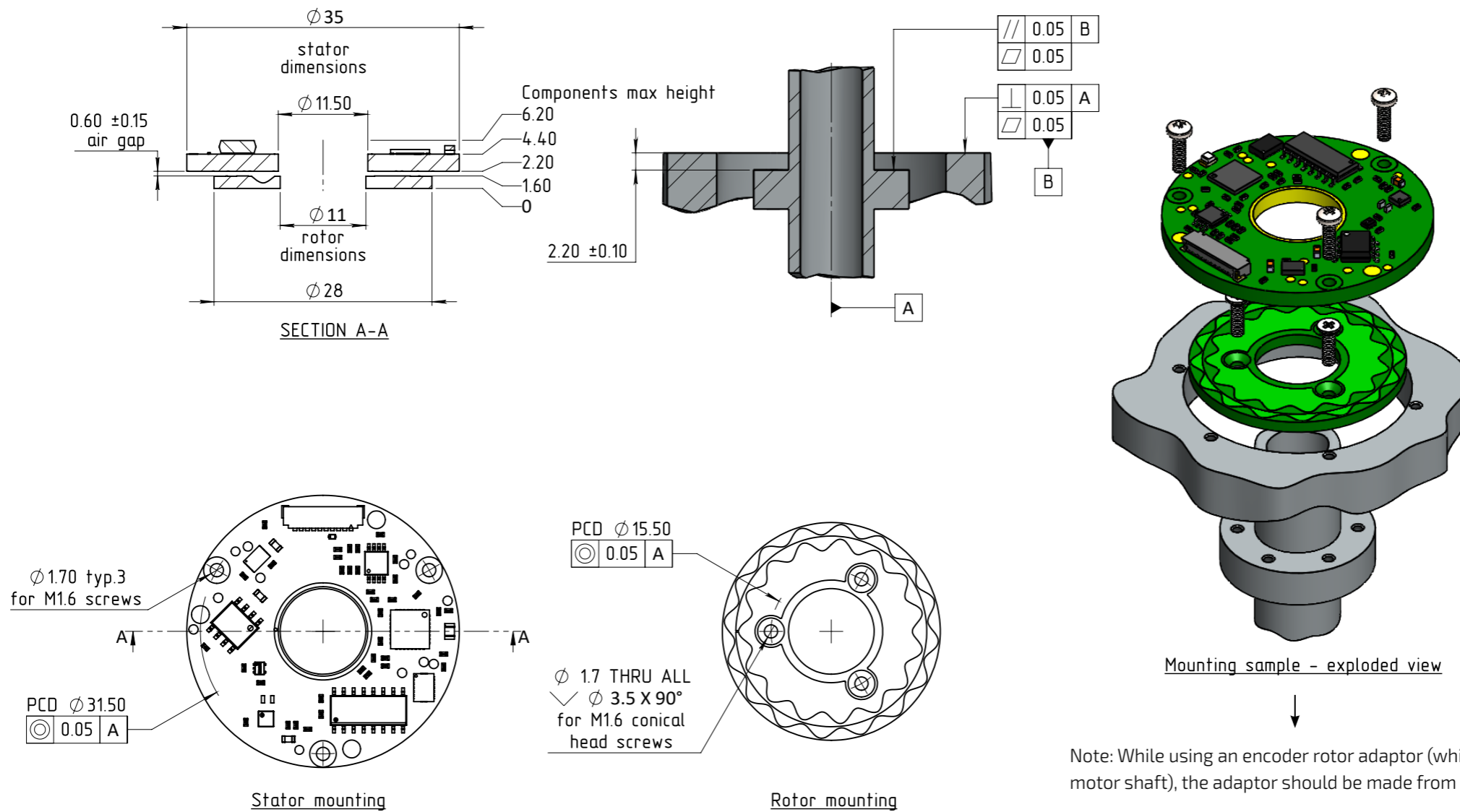


Part No. on board connector: Crimping plug, 1 10pin DF52-10P-0.8C

#### Related documents

VLH-35 User Manual: mechanical , electrical and calibration setup.

ICD



Note: While using an encoder rotor adaptor (which isn't part of the motor shaft), the adaptor should be made from a nonmetal material.

Unless Otherwise Specified

Dimensions are in: mm	Surface finish: N6
Linear tolerances	
0.5-4.9: $\pm 0.05$ mm	5-30: $\pm 0.1$ mm
31-120: $\pm 0.15$ mm	121-400: $\pm 0.2$ mm