Absolute Rotary Encoder CAX60---SGB User Manual

* Absolute digital encoder disk, high-precision digital, no signal interference and zero drift in fear.

* SSI digital output, the fastest clock frequency can be set to 500KHz, high-speed, high-precision control

* 4096 resolution per revolution, 1 parity bit, single-turn or multi-turn loop continuous operating range 4096

* Wide operating voltage, low current consumption

* Clamping flange or synchro flange, the international standard shape structure

Specifications:

Operating voltage	10 ... 30Vdc polarity protection (recommended 24Vdc power supply)
Current consumption	<35mA (24Vdc) no-load
Output signal	SSI synchronous serial signal
Signal transmission	Two pairs of RS422, 100 meters (125KHz and recommend special cables, more distance please consult factory)
Linear Resolution	1/8192FS
Max laps	4096
Repeatability	Repeatability ± 2BIT (actual accuracy relate to precision of installation and the shaft concentricity)
Clock frequency	The fastest clock frequency can be set 500KHz, recommend 125KHz.
Working temperature	-25 ~ 80 ℃
Storage temperature	-40 ~ 80 ℃
Protection class	Shell IP67, IP65 shaft
Vibration and shock	10g, 10 ~ 2000Hz; 100g, 6ms
Allowed speed	2400 rev / min
Connection cable	1 m shielded cable radial side (rest form can be ordered)
Shape characteristics	Metal shell, sealed double bearing

Output Interface: (Refer to product manual)

Wire	Signal
Brown	10…30Vdc
White	0V GND
Blue	DIR
Black	MID P
Green	CLOCK+
Yellow	CLOCK-
Gray	DATA+
Pink	DATA-

DIR --- rotation direction. When the core wire is low, top view of the shaft clockwise to increase data. When working power plus high, change of direction is counterclockwise to increase data;

MID P --- midpoint positioning. When the core wire with high level short contact , the current position data output is the midpoint of the whole data ; When working properly, it should connected to 0V.

Clock/Data--- four- wire RS422 mode, ± 5V, one pair of clock trigger, a pair of data output.

SSI protocol description:

SSI is a synchronous serial signal, two pairs of RS422, one pair of clock trigger, a pair of data transmission.
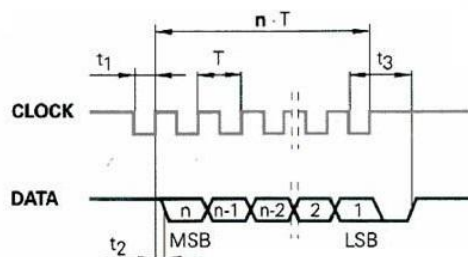
As shown, the absolute position value of the encoder is triggered by clock signal of the receiving device, from the high bit of Gray code(MSB),output serial signal synchronized with clock signal. The clock signal sent from the receiving device, refer to the total number bits of the encoder, output N interrupt pulse. When the signal is not transmitted, the clock and data bits are high, at the first falling edge of the clock signal, storing the current value, from the rising edge of the clock signal, sending data signal, A clock pulse synchronization a data.

Wherein: t3 is the restore signal, waiting for the next transmission; N = 13; 16; 25; 28. (Total number of digits according to the encoder)

T = 4-11us; t1 = 1-5.5us; t2 $\leqslant$ 1us; t3 = 11-15.5us (Clock-and Date-omit not shown).

In actual use, in order to ensure the stability of the signal with the transmission distance farther, recommended the following parameters:

T = 8us (125KHz); t1 = 4us; t2 (the actual reading latency = 3 ~ 4us); t3 = 15us

Data processing:

Encoder output is Gray cyclic code, first, receiving device decode it into binary code by XOR way. AS Gray code is cyclic code, there are mutations between maximum code value and 0, therefore, in order to avoid abrupt stroke data, recommended the middle of encoder position data value as the start bit. When the encoder is installed, turn it to the starting position of the actual work, take MIDP core wire short contact to power +, and the current signal is the middle of encoder position data value, then take MIDP wire back to power 0. After the current measured values received into binary code, it should be handled as follows:

The actual position value = (C-MidP) $\times$ Dir + starting position value

The above formula, C is the encoder output current measured values; MidP is the middle position value , 2n-1, 13 bits is 4096, 16 bits is 32768, 25 bits is 2048 $\times$ 8192; 28 bits is 2048 $\times$ 65536 . DIR is the direction of rotation of the encoder coefficients, if same to the direction of calculation, defined 1; if opposite, defined -1.

The starting point is not necessarily zero, calibrated by the user to determine their own position, due to multi-turn encoder can have 4096 Circle of continuous measurement, from the start point, both forward and reverse loop continuously working stroke 2048.

Note:

Encoder is a precision instrument, do not knock, bump or drop encoders, especially in the shaft end, please gently, with care.

Guarantee encoder power supply in the range of 10 ~ 30Vdc and good isolation, to prevent large-scale activation of the electrical grid and the impact of the encoder.

In strong electromagnetic interference in the environment, to extend the signal lines should use the recommended special lines, such as right angle shielded cable.

Encoder signal lines should be done well grounded: close within two meters, the cable inside the shield should be grounded at both ends; greater distance, grounded metal enclosure encoder, the encoder comes with shielded cable shield unconnected, signal extension cable shielding receiving end single-grounded; if the signal cable longer or outdoor use, should signal cable sleeve metallic iron pipes and metal pipes grounded at its ends.

SSI signal line is band voltage, the signal should be used to prevent short-circuiting or short-circuited the power supply; prohibit hot plug, ensure that the cable is energized each wire on simultaneously. Encoder must be powered down no static soldering or connection, or connect the 0V line before welding; cable, do not pull the cable violently.

Encoder protection class IP65, waterproof to use, but the encoder shaft at the Do not flooded.
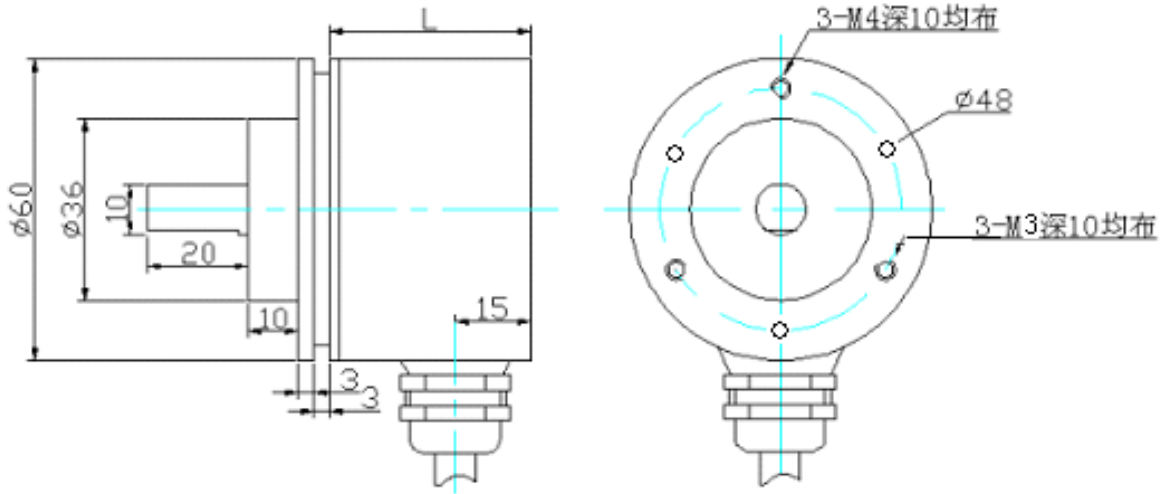
Encoder shaft and mechanical connections should use a dedicated flexible coupling.

Dimensions:

a. Clamping flange:
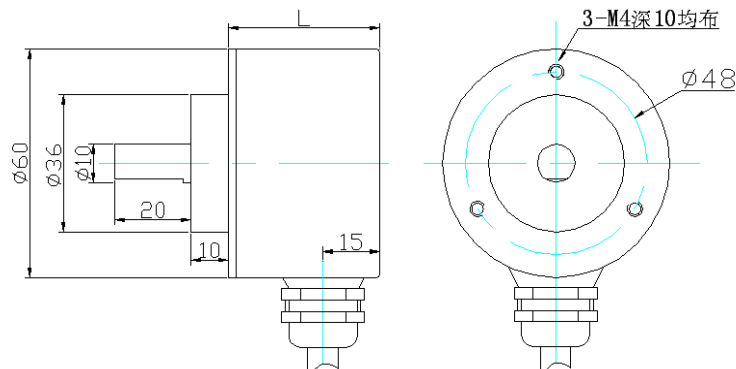
b. Clamping & synchro flange

c. Hollow shaft flange:

安装尺寸图：