



## Absolute rotary encoder CAX60---CB with CAN2.0B output



★Before using the encoder, please read the following instructions and use it correctly!

| Mechanical Spec.    |                                             | Electrical Spec.      |                             |
|---------------------|---------------------------------------------|-----------------------|-----------------------------|
| Max Speed           | 6000 RPM                                    | Power supply          | 10-30Vdc (5Vdc optional)    |
| Load                | Axial 40N, Radial 100N                      | Current consumption   | < 50mA (24Vdc)no load       |
| Shock               | 1000m/s <sup>2</sup> (6ms), 等于 100g         | output                | CAN 2.0B protocol           |
| Vibration           | 200m/s <sup>2</sup> (10-2000Hz), 等于 20g     | Linear resolution     | 1/16384FS max.              |
| Allow axial runout  | ±1.5mm                                      | Working circle        | 4096 (16384 turns optional) |
| Allow radial runout | ±0.2mm                                      | positioning accuracy  | 0.1°                        |
| Structure           | 60mmouter, solid shaft or Blind hole        | Operating temperature | -40℃~100℃                   |
| Connection Type     | 8-core shielded cable or aviation connector | Storage temperature   | -40℃~85℃                    |
| IP                  | IP65(IP68 optional)                         | Patent No             | ZL 2014 2 0140870.4         |

### connection:

|          |       |       |       |        |       |         |           |
|----------|-------|-------|-------|--------|-------|---------|-----------|
| function | Vcc   | GND   | CAN H | CAN L  | reset | setting | shield    |
| color    | Brown | White | Green | Yellow | Grey  | Blue    | Thick red |

Note: 1. Use of reset line (gray)

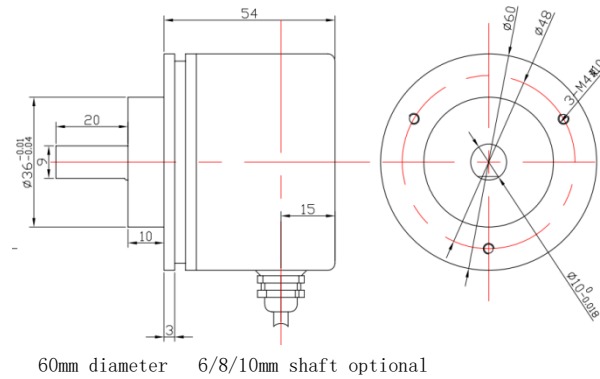
When the reset line (gray) touches Vcc for more than 1 second, the current data of the encoder becomes the reset value (zero point)

### Factory specifications:

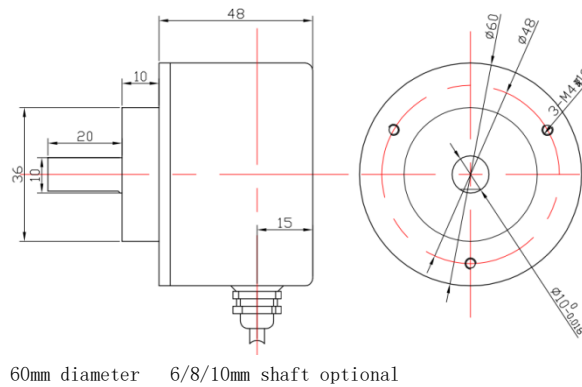
| add | Baud rate | Operating mode    | Frame format   | direction | resolution | Reset value | Transmission cycle |
|-----|-----------|-------------------|----------------|-----------|------------|-------------|--------------------|
| 182 | 125K      | Asynchronous mode | Standard frame | CW        | 16384      | 1           | 16ms               |

## Mechanical drawing:

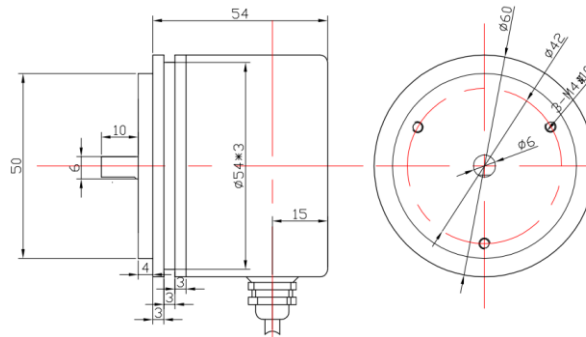
Clamping synchronous flange (optional cable output or connector output)



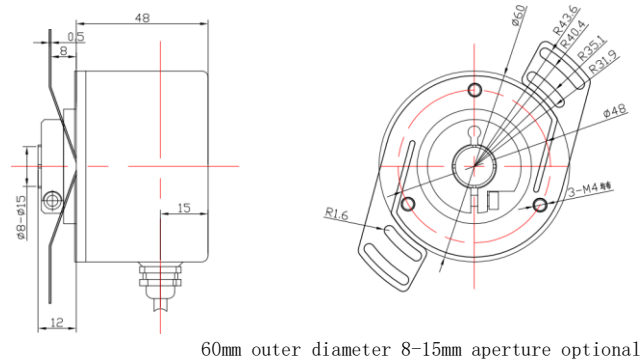
Clamping flange (optional cable output or connector output)



Synchronous flange / servo flange (optional cable output or connector output )



Blind-hole flange (optional cable output or connector output)



Encoder parameter setting: the setting line must be connected to the high level when modifying parameters. The baud rate is fixed at 250K.

The message for modifying the node number is as follows: The default node number of the encoder is 16 # 182, and the sending ID is 182

ID DATA

182 22 00 30 00 82 01 00 00

Encoder feedback:

ID DATA

182 23 00 30 00 82 01 00 00

Set the value to 16#10, then the node number of the encoder after modification is 16#10, and the new node number will take effect immediately after modification.

Modify the baud rate message as follows: the default baud rate of the encoder is 125K,

ID DATA

182 22 01 30 00 04 00 00 00

Encoder feedback:

ID DATA

182 23 01 30 00 04 00 00 00

|    |       |
|----|-------|
| 08 | 10K   |
| 07 | 20K   |
| 06 | 50K   |
| 05 | 100K  |
| 04 | 125K  |
| 03 | 250K  |
| 02 | 500K  |
| 01 | 800K  |
| 00 | 1000K |

Modify the working mode message as follows: The encoder defaults to asynchronous mode 08

ID DATA

182 22 02 30 00 08 00 00 00

|    |                   |
|----|-------------------|
| 08 | Asynchronous mode |
| 09 | Synchronous mode  |

Encoder feedback:

ID DATA

182 23 02 30 00 08 00 00 00

Modify the output frame mode message as follows: the encoder default standard frame

ID DATA

182 22 03 30 00 00 00 00 00

|    |                |
|----|----------------|
| 00 | Standard frame |
| 04 | Extended frame |

Encoder feedback:

ID DATA

182 23 03 30 00 00 00 00 00

The modification direction message is as follows: the encoder defaults clockwise data increase

ID DATA

182 22 00 60 00 04 00 00 00

|    |     |
|----|-----|
| 04 | CW  |
| 05 | CCW |

Encoder feedback:

ID DATA

182 23 00 60 00 04 00 00 00

Modify the encoder single-turn resolution message as follows: encoder default resolution 262144

ID DATA

182 22 00 30 00 00 00 04 00

Encoder feedback:

ID DATA

182 23 00 30 00 00 00 04 00

The message to modify the encoder setting value is as follows: the encoder default encoder setting value 1

ID DATA

182 22 03 60 00 01 00 00 00

Encoder feedback:

ID DATA

182 23 03 60 00 01 00 00 00

Modify the encoder transmission cycle message as follows: the encoder default encoder transmission cycle 16ms

ID DATA

182 22 17 10 00 10 00 00 00

Encoder feedback:

ID DATA

182 23 17 10 00 10 00 00 00

The encoder reset message is as follows:

ID DATA

182 22 06 00 00 00 00 00 00

Encoder feedback:

ID DATA

182 23 06 00 00 00 00 00 00

The encoder reads the parameter message as follows: ID is fixed at 601

ID DATA

601 22 18 20 00 00 00 00 00

Encoder feedback:

ID DATA

182 00 02 00 00 00 10 00 00

address + resolution 4 bytes + reset value 4 bytes

182 04 05 08 00 32 00 00 00

address + baud rate + direction + Active/passive mode + Frame format + Output time

|      |     |      |          |   |                         |   |
|------|-----|------|----------|---|-------------------------|---|
| 发送成功 | 601 | DATA | STANDARD | 8 | 22 18 20 00 00 00 00 00 | 1 |
| 接收   | 182 | DATA | STANDARD | 8 | 00 02 00 00 00 10 00 00 | 1 |
| 接收   | 182 | DATA | STANDARD | 8 | 04 05 08 00 32 00 00 00 | 1 |

The encoder read data message is as follows:

| ID  | DATA                           |
|-----|--------------------------------|
| 182 | 22 00 00 00 <u>00 00 00 00</u> |

Encoder feedback:

| ID  | DATA        | Speed       |
|-----|-------------|-------------|
| 182 | 00 02 00 00 | 00 10 00 00 |

Notes for RS485 communication:

1. Communication speed and transmission distance are a pair of contradictions. The higher the rate, the closer the transmission distance, but the more stable, and vice versa.
2. When the external electromagnetic interference is strong, the external setting line needs to be connected to a high level when setting the encoder, but it is recommended to be forced to connect to a low level after the setting is completed to prevent the encoder from suddenly returning to zero due to external interference.
3. When the external electromagnetic interference is strong, it is best to use double-shielded cables for RS485 wiring.
4. When multiple encoders are connected to the upper computer, since the data returned by the encoder does not have a parity check, it is recommended to distinguish the data returned by each encoder in time when the upper computer is programmed.
5. When there is a motor in the system, the encoder power supply needs to be isolated from other power supplies.

Since the RS485 circuit is in a differential form, A+ and B- are both voltage-carrying, and the RS485 circuit will be damaged if it is grounded or connected to a high level for a long time.