

## PRELIMINARY - CANopen ABSOLUTE MULTI-TURN ENCODERS, THM5 RANGE

THM5, the new generation of CANopen absolute multi-turn encoders :

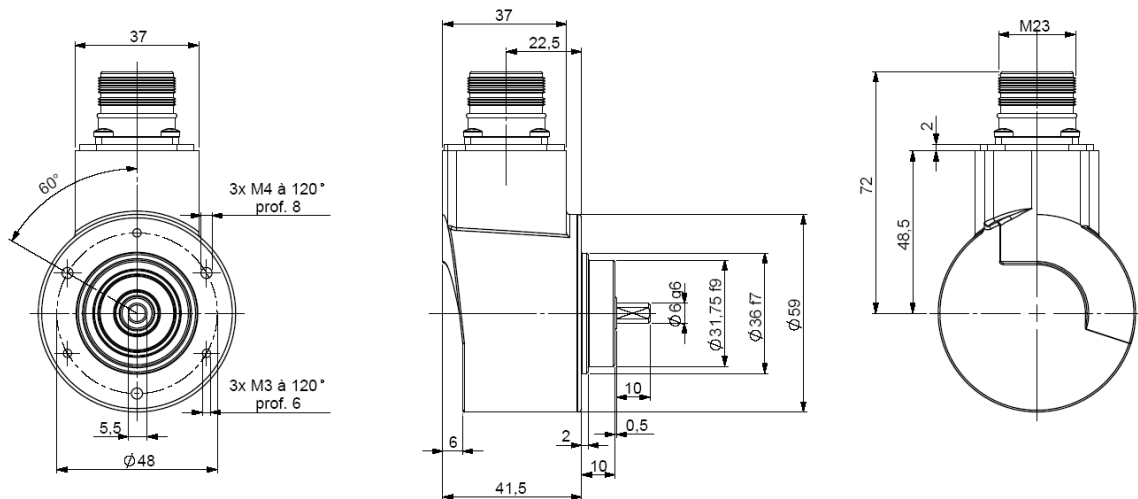
- Magnetic technology,
- 58mm encoder, extra-flat,
- Ø 6 & Ø 10 mm solid shaft version,
- Robustness and excellent resistance to shocks / vibrations,
- High protection level IP65,
- High performances in temperature -20°C to 85° (-30°C option)
- Universal power supply from 5 to 30 Vdc,
- High resolutions up to 4 096 points per turn (2<sup>12</sup>),
- Turns numerisation up to 65 536 (16 bits).

# CANopen

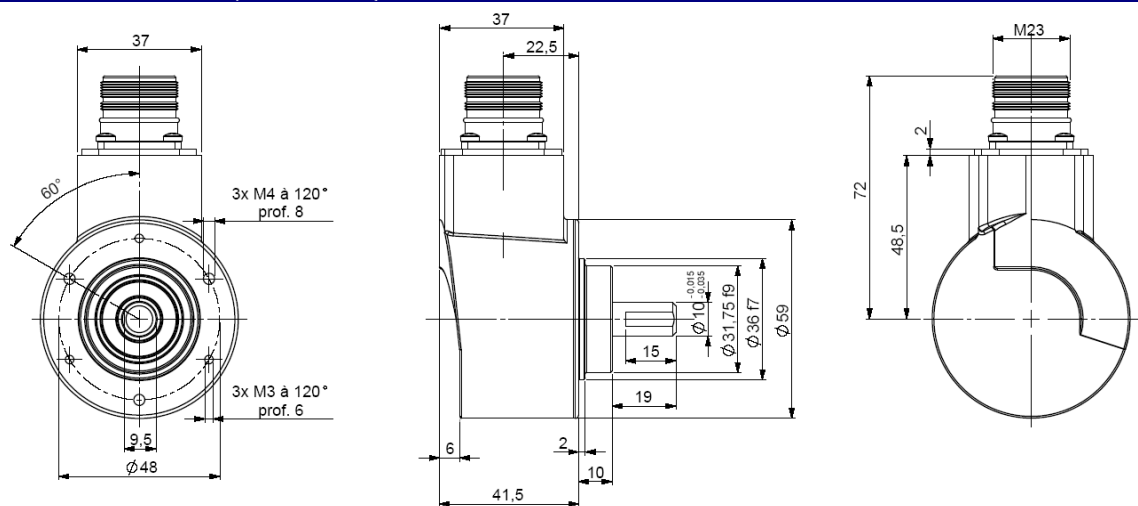
DS 301 V4.02  
DS 406 V3.1



### THM5\_06 connection BCR (radial M23)



### THM5\_10 connection BCR (radial M23)



## MECHANICAL DATA

|                        |  |   |  |
|------------------------|--|---|--|
| Material               | Cover : steel                          | Shock (EN60068-2-27)  | ≤ 2000 m.s <sup>-2</sup> (during 6 ms)   |
|                        | Body: aluminium                        | Vibration (EN60068-2-6)   | ≤ 200 m.s <sup>-2</sup> (10... 2 000 Hz) |
|                        | Shaft : stainless steel                | EMC   | EN 61000-6-4, EN 61000-6-2               |
| Bearings               | 6 000 serie                            | Isolation   | 500V (1 min.)                            |
| Maximal load           | Axial : 50 N                           | Weight (connector)  | 0,520 kg                                 |
|                        | Radial : 100 N                         | Operating temperature   | - 20 ... + 85 °C (encoder T°)            |
| Shaft inertia          | ≤ 1.10 <sup>-6</sup> kg.m <sup>2</sup> | Storage temperature   | - 20 ... + 85 °C                         |
| Torque                 | ≤ 4.10 <sup>-3</sup> N.m               | Protection(EN 60529)  | IP 65 (IP67 with flange option)          |
| Permissible max. speed | 6 000 min <sup>-1</sup>                | Theoretical mechanical lifetime 10 <sup>9</sup> turns (F <sub>axial</sub> / F <sub>radial</sub> ) |  |
| Continuous max. speed  | 6 000 min <sup>-1</sup>                | 25 N / 50 N : 99  | 50 N / 100 N : 12                        |

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### ELECTRICAL DATA

|                          |                   |                |         |
|--------------------------|-------------------|----------------|---------|
| Power supply             | 5-30Vdc           | Sampling rate* | 1 kHz   |
| Consumption without load | < 40mA (at 24Vdc) | Accuracy       | ± 0.3 % |
| Resolution in the turn   | 12 bits           | Repeatability  | ± 0.1 % |
| Number of turns          | 16 bits max.      | Introduction   | < 1s    |
| Total resolution         | Up to 28 bits     | Refresh rate   | < 400µs |

\* Nota : Internal data refresh rate

### PROGRAMMABLE PARAMETERS

**Resolution:** defines the resolution per revolution (0 à 4 096).

**Transmission speed :** programmable from 10kbaud (1 000m) to 1 Mbaud (25 m) ; value per default : 20 Kbaud.

**Address :** defines the software address of the encoder on the bus (1 à 127, Value per default : id = 1).

**Direction :** defines the direction of count of the encoder.

**RAX :** define the value of the current position (stationary shaft).

**Comes :** high and low limits.

### COMMUNICATION MODES

Encoder configuration : Reading/Writing of the encoder objects dictionary (SDO mode).

3 modes are available to interrogate the encoder position/speed :

**CYCLIC mode :** the encoder transmits its position in an asynchronous manner. The frequency of the transmission is defined by the programmable cyclic timer register from 0 to 65 535 ms,

**SYNCHRO mode :** the encoder transmits its position on a synchronous demand by the master.

**POOLING mode (Answer to a RTR signal) :** the encoder only answers to a request.

### CANOPEN CONNECTION

|          |         |         |          |          |          |          |          |    |           |
|----------|---------|---------|----------|----------|----------|----------|----------|----|-----------|
| 1        | 2       | 3       | 4        | 5        | 6        | 7        | 8, 9, 11 | 10 | 12        |
| Reserved | CAN LOW | CAN GND | Reserved | Reserved | Reserved | CAN HIGH | Reserved | 0V | + 5/30Vdc |

Pinout 3 (CAN GND) and 10 (0V) are connected together (intern the encoder).

Nota : Refer to the bus standards for the maximal derivation length.

### ORDERING CODE (Special versions upon request, for ex. special flanges/electronics/connections...)

|      | Shaft Ø                         | Power supply          | Output stages       | Code             | Resolution   | Nb of turns                                     | Connection                                | Connection orientation |
|------|---------------------------------|-----------------------|---------------------|------------------|--|---|---|------------------------|
| THM5 | 10 :<br>10mm<br><br>06 :<br>6mm | P :<br><br>5 to 30Vdc | BB :<br><br>CANopen | B:<br><br>Binary | 12 :<br><br>4096 points<br>per turn (2 <sup>12</sup> ) | B16 :<br><br>65 536 turns<br>(2 <sup>16</sup> ) | BC:<br><br>M23<br>12 pinouts<br>clockwise | R :<br><br>radial      |
| THM5 | _ 10 //                         | P                     | BB                  | B //             | 12   | B16 //  | BC  | R                      |

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