

## CANopen ABSOLUTE MULTI-TURN ENCODERS, PHM9 RANGE

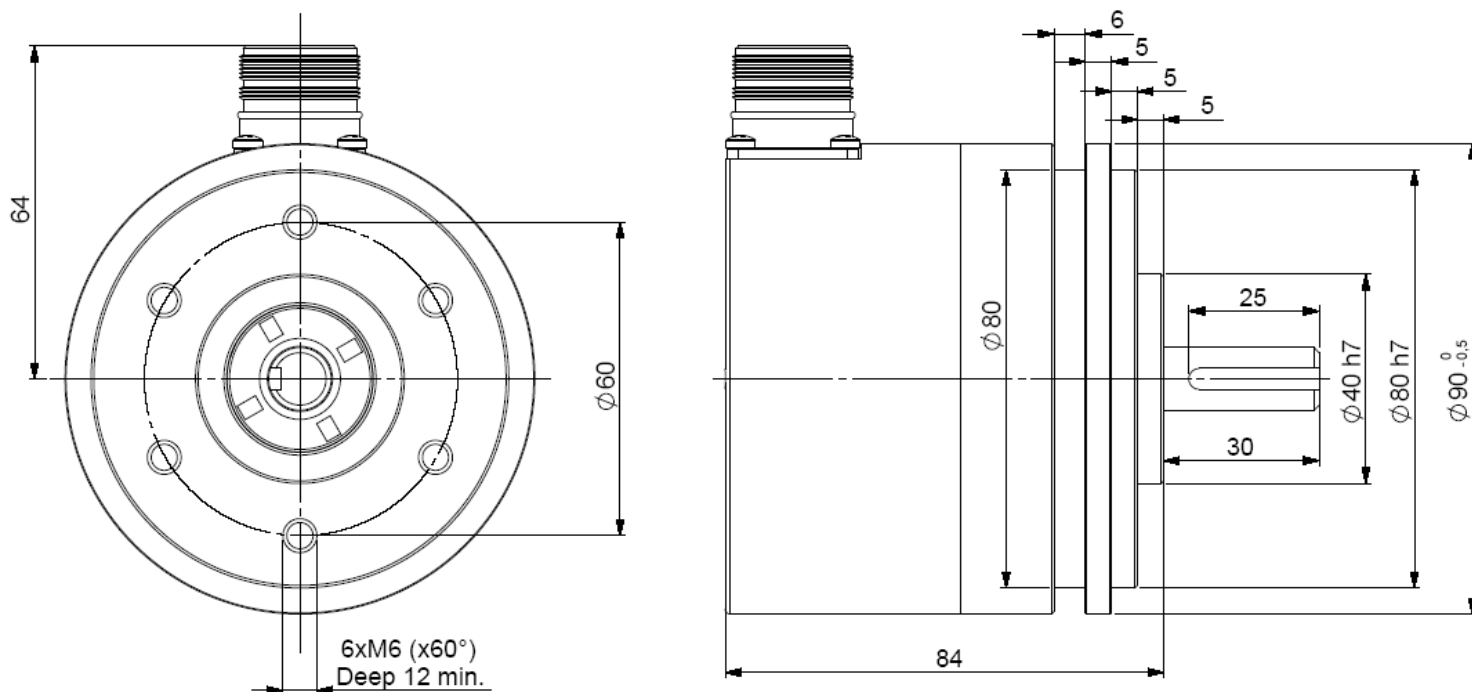
PHM9, 90mm encoder, the new generation of CANopen multi-turn encoder:

- Heavy Duty version, 11 & 12 mm solid shaft.
- Robustness and excellent resistance to shocks / vibrations.
- High protection level IP65.
- High performances in temperature -20°C to +85°C.
- Universal electronic circuits from 5 to 30Vdc.
- High resolutions available: 8192 (13 bits) per turn.
- Turn counting up to 65 536 (16 bits).
- Available with incremental channels – 2048 points – 5 to 30 Vdc.
- Also available with SSI, Profibus and RS232 interface.

**CANopen**  
DS 301 V4.02  
DS 406 V3.1



### PHM9\_12 connection BCR (M23 radial)



## MECHANICAL CHARACTERISTICS

|                        |                                         |                                                                                                   |              |                                          |  |
|------------------------|-----------------------------------------|---------------------------------------------------------------------------------------------------|--------------|------------------------------------------|--|
| Material               | Cover : steel                           | Shocks (EN60068.2.27)                                                                             |              | ≤ 500m.s <sup>-2</sup> (during 6 ms)     |  |
|                        | Body: aluminium                         | Vibrations (EN60068.2.6)                                                                          |              | ≤ 100m.s <sup>-2</sup> (10 ... 2 000 Hz) |  |
| Shaft                  | Stainless steel                         | EMC                                                                                               |              | EN 61000-6-4, EN 61000-6-2               |  |
| Bearings               | 6001 serie                              | Isolation                                                                                         |              | 100V (1 min.)                            |  |
| Maximal loads          | Axial : 100 N                           | Encoder weight (approx.)                                                                          |              | 1,600 kg                                 |  |
|                        | Radial : 200 N                          | Operating temperature                                                                             |              | - 20 ... + 85 °C (encoder T°)            |  |
| Shaft inertia          | ≤ 15.10 <sup>-6</sup> kg.m <sup>2</sup> | Storage temperature                                                                               |              | - 20 ... + 85 °C                         |  |
| Torque                 | ≤ 10.10 <sup>-3</sup> N.m               | Protection(EN 60529)                                                                              |              | IP 65                                    |  |
| 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>                 | 20 N / 30 N                                                                                       | 50 N / 100 N | 100 N / 200 N                            |  |
| Shaft seal             | Viton double lips                       | 360                                                                                               | 18           | 2,2                                      |  |

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### ELECTRICAL CHARACTERISTICS

|                            |                   |
|----------------------------|-------------------|
| Power supply               | 5 – 30Vdc         |
| Introduction               | < 1 s             |
| Consumption (without load) | < 50mA (at 24Vdc) |
| Accuracy                   | ± ½ LSB (13 bits) |

### Programmable parameters

**Resolution:** defines the resolution per revolution (0 to 8 192),

**Global resolution :** total amount of codes for the encoder (2 to 536 870 912),

**Transmission speed :** programmable from 10kBaude (1000m) to 1 Mbaude (40 m) ; value per default: 20 Kbaud,

**Address:** define the software address of the encoder on the bus (1 to 127, value by default: id = 1),

**Direction :** define the direction of count of the encoder ,

**RAX :** defines the value of its preset position (non turning shaft),

**CAM:** Low and High Limits.

### Communication modes

3 modes are available to interrogate the encoder :

**POLLING mode:** (Response to a RTR message): The position value is only given upon request (SDO mode),

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

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

### 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 |
|--------|------------|-------------------|-----------------|---------------|----------------------------------------------------|---------------------------------------------|---------------------------------------|------------------------|
| PHM9   | 12<br>12mm | P :<br>5 to 30Vdc | BB :<br>CANopen | B :<br>Binary | 13 :<br>8192 points<br>per turn (2 <sup>13</sup> ) | B16 :<br>65 536 turns<br>(2 <sup>16</sup> ) | BC:<br>M23<br>12 pinouts<br>clockwise | R :<br>radial          |
| PHM9 _ | 12 //      | P                 | BB              | B //          | 13                                                 | B16 //                                      | BC                                    | R                      |

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