

# M57SH56-Txx

HIGH TORQUE Bipolar Stepping motor - 1,8°



## Introduction

The M57SH56-Txx is a bipolar stepper motor with terminal-box, optionally equipped with a, incremental Push-Pull or Line-Driver incremental encoder, or a multiturn absolute encoder (WIEGAND technology, without battery). The connection of the motor and the ecoder is made through M12 circular connectors.



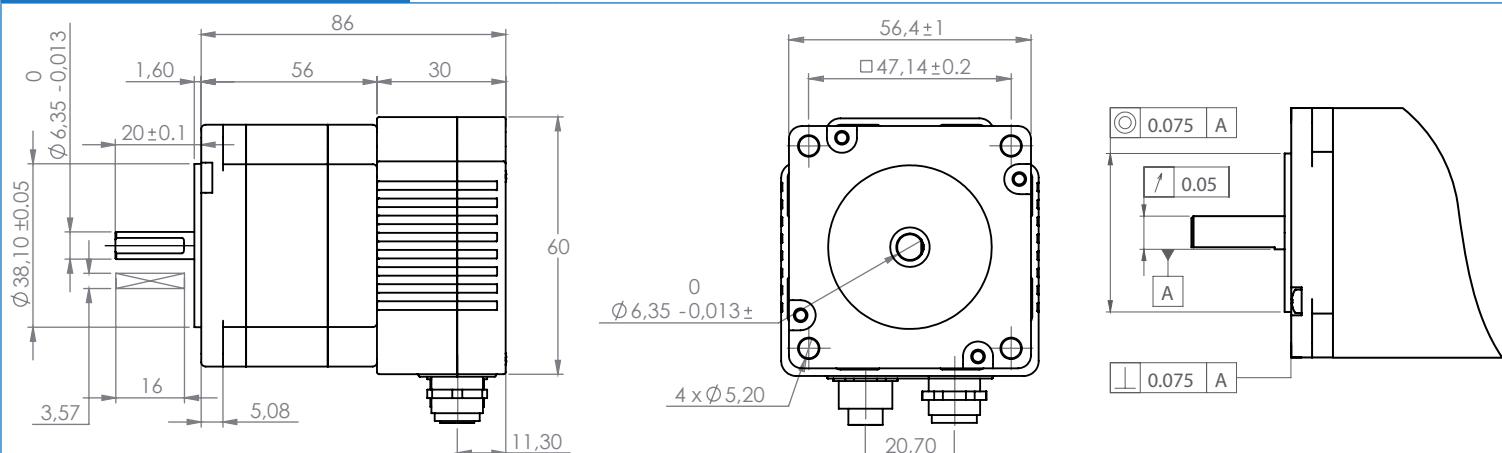
Without battery



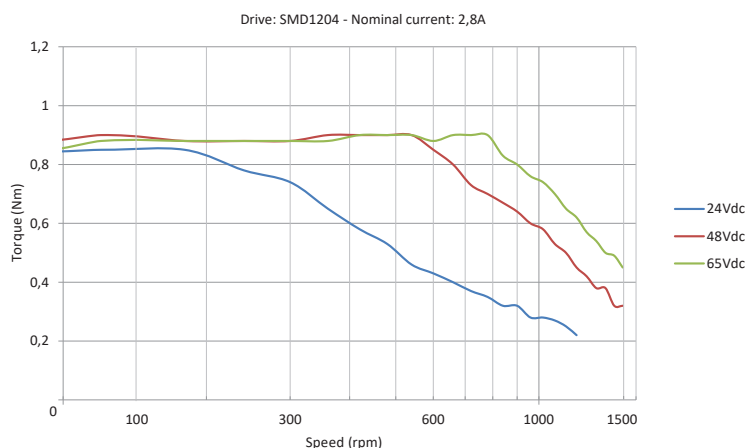
## Specifications

| Model              | Encoder                      | Current/<br>phase | Resistance/<br>phase | Inductance/<br>phase | Detent<br>torque | Holding<br>torque | Rotor<br>inertia     | Weight |
|--------------------|------------------------------|-------------------|----------------------|----------------------|------------------|-------------------|----------------------|--------|
| M57SH56-T-C        | -                            | 2,8 A             | 0,9 $\Omega$         | 2,5 mH               | 40 mNm           | 1,26 Nm           | 300 gcm <sup>2</sup> | 0,7 Kg |
| M57SH56-TO0512P24C | Push-pull                    |                   |                      |                      |                  |                   |                      |        |
| M57SH56-TO0512L05C | Line-driver                  |                   |                      |                      |                  |                   |                      |        |
| M57SH56-TM1611S05C | SSI<br>multiturn<br>absolute |                   |                      |                      |                  |                   |                      |        |

## Mechanical dimensions



## Speed vs Torque curve



The torque curves are made with AEP torque transducer mod. MRT250NM

## Motor characteristics

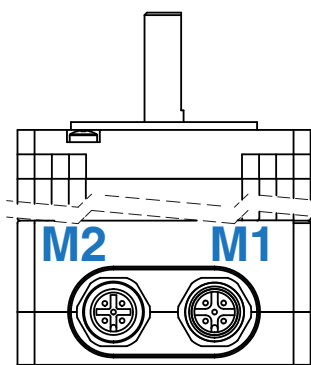
|                       |                              |
|-----------------------|------------------------------|
| Step Angle            | 1,8° ± 5%                    |
| Insulation Class      | B                            |
| Ambient Temperature   | -20 °C .. +50 °C             |
| Temperature Rise      | 80°C max (2 phase ON)        |
| Insulation Resistance | 100 M $\Omega$ min 500Vdc    |
| Dielectric Strength   | 500 VAC FOR ONE MINUTE       |
| Shaft Radial Play     | 0,02mm (with 450g load)      |
| Shaft Axial Play      | 0,08mm (with 450g load)      |
| Max Radial Force      | 75N (20mm FROM FRONT FLANGE) |
| Max Axial Force       | 10 N                         |

## Caution

Insert and tighten firmly the connectors before powering the motor. **Never disconnect any connector when powered.** Installation and maintenance must be carried out by qualified technicians only. The operator must have detailed information to be able to carry out this work.

- Unexpected dangers may be encountered
- An incorrect use may destroy this product and the connected equipments.

### Connectors layout



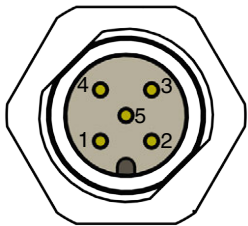
### Incremental encoders

|                            | PUSH-PULL          | LINE DRIVER |
|----------------------------|--------------------|-------------|
| V <sub>SUPPLY</sub>        | +24 VDC            | +5 VDC      |
| I <sub>MAX</sub> (NO LOAD) | 80 mA              |             |
| I <sub>MAX</sub>           | 60 mA each channel |             |
| F <sub>OUT</sub> MAX       | 300 KHz            |             |
| COUNT/REV                  | 512                |             |
| PROTECTION DEGREE          | IP54               |             |
| WORKING TEMPERATURE        | -20 .. +80 °C      |             |

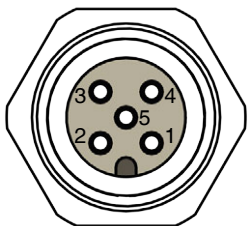
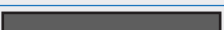
### Absolute encoder

| TYPE                   | SSI MULTITURN |
|------------------------|---------------|
| V <sub>SUPPLY</sub>    | +5 VDC        |
| I <sub>MAX</sub>       | 100 mA        |
| FRAME TOTAL LENGTH     | 35            |
| INITIAL IGNORED BITS   | 8             |
| MULTITURN RESOLUTION   | 16 BIT        |
| SINGLE TURN RESOLUTION | 11 BIT        |
| ALIGNMENT              | RIGHT         |
| DATA CODING            | BINARY        |
| PROTECTION DEGREE      | IP54          |
| WORKING TEMPERATURE    | -20 .. +80 °C |

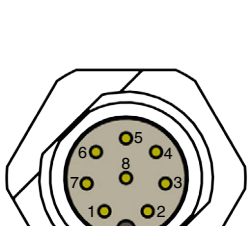
### Motor connector

|    |                |                                                                                   | PIN | Description | Cable color matching |                                                                                     |
|----|----------------|-----------------------------------------------------------------------------------|-----|-------------|----------------------|-------------------------------------------------------------------------------------|
| M1 | M12 5 Pin male |  | 1   | Phase A -   | BROWN                |  |
|    |                |                                                                                   | 2   | Phase A     | WHITE                |  |
|    |                |                                                                                   | 3   | Phase B -   | BLUE                 |  |
|    |                |                                                                                   | 4   | Phase B     | BLACK                |  |
|    |                |                                                                                   | 5   | Shield      | GREY                 |  |

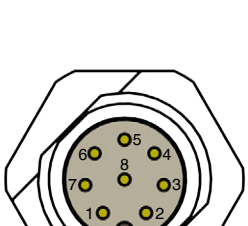
### Push-Pull encoder connector

|    |                  |                                                                                     | PIN | Description              | Cable color matching |                                                                                       |
|----|------------------|-------------------------------------------------------------------------------------|-----|--------------------------|----------------------|---------------------------------------------------------------------------------------|
| M2 | M12 5 Pin female |  | 1   | V <sub>IN</sub> (+24VDC) | BROWN                |  |
|    |                  |                                                                                     | 2   | Channel A                | WHITE                |  |
|    |                  |                                                                                     | 3   | Common                   | BLUE                 |  |
|    |                  |                                                                                     | 4   | Channel B                | BLACK                |  |
|    |                  |                                                                                     | 5   | Channel Z                | GREY                 |  |

### Line-Driver encoder connector

|    |                |                                                                                     | PIN | Description             | Cable color matching |                                                                                       |
|----|----------------|-------------------------------------------------------------------------------------|-----|-------------------------|----------------------|---------------------------------------------------------------------------------------|
| M2 | M12 8 Pin male |  | 1   | Channel Z +             | WHITE                |  |
|    |                |                                                                                     | 2   | V <sub>IN</sub> (+5VDC) | BROWN                |  |
|    |                |                                                                                     | 3   | Channel A +             | GREEN                |  |
|    |                |                                                                                     | 4   | Channel A -             | YELLOW               |  |
|    |                |                                                                                     | 5   | Channel B +             | GREY                 |  |
|    |                |                                                                                     | 6   | Channel B -             | PINK                 |  |
|    |                |                                                                                     | 7   | Common                  | BLUE                 |  |
|    |                |                                                                                     | 8   | Channel Z -             | RED                  |  |

### Absolute encoder connector

|    |                |                                                                                     | PIN | Description             | Cable color matching |                                                                                       |
|----|----------------|-------------------------------------------------------------------------------------|-----|-------------------------|----------------------|---------------------------------------------------------------------------------------|
| M2 | M12 8 Pin Male |  | 1   | Common                  | WHITE                |  |
|    |                |                                                                                     | 2   | V <sub>IN</sub> (+5VDC) | BROWN                |  |
|    |                |                                                                                     | 3   | Clock +                 | GREEN                |  |
|    |                |                                                                                     | 4   | Clock -                 | YELOW                |  |
|    |                |                                                                                     | 5   | Data +                  | GREY                 |  |
|    |                |                                                                                     | 6   | Data -                  | PINK                 |  |
|    |                |                                                                                     | 7   | Preset                  | BLUE                 |  |
|    |                |                                                                                     | 8   | Complement              | RED                  |  |