

## PRODUCT DATASHEET

# ES-SM-A03-180G-T19P1NM-3000W-002

## AC Servo Motors

AC Servo Motors | ES-SM-A03-180G Compact 180 mm AC Servo Motor Series

### Product Overview

AC Servo Motors with rated Torque 19.1 Nm, instantaneous Maximum Torque 57.3 Nm and rated Speed 1500 rpm.

### Key Specifications

| PARAMETER                     | VALUE                                                          | UNIT |
|-------------------------------|----------------------------------------------------------------|------|
| Rated Torque                  | 19.1                                                           | N·m  |
| Instantaneous Maximum Torque  | 57.3                                                           | N·m  |
| Rated Speed                   | 1500                                                           | rpm  |
| Continuous Rated Output Power | 3000                                                           | W    |
| Rated Voltage                 | 380                                                            | V AC |
| Instantaneous Maximum Current | 31.8                                                           | A    |
| Flange Size                   | 180                                                            | mm   |
| Torque Constant               | 1.98                                                           | Nm/A |
| Altitude and Derating Rule    | highest altitude2000m,1000mabove,every rise100m,Power drop1.5% |      |

## Technical Specifications

| PARAMETER                     | SPECIFICATION   | UNIT   |
|-------------------------------|-----------------|--------|
| PERFORMANCE                   |                 |        |
| Rated Torque                  | 19.1            | Nm     |
| Instantaneous Maximum Torque  | 57.3            | Nm     |
| Rated Speed                   | 1500            | rpm    |
| Continuous Rated Output Power | 3000            | W      |
| Torque Constant               | 1.98            | Nm/A   |
| Rated Power                   | 3000            | W      |
| ELECTRICAL                    |                 |        |
| Rated Voltage                 | 380             | V AC   |
| Instantaneous Maximum Current | 31.8            | A      |
| Back EMF Constant             | 120             | V/krpm |
| Insulation Class              | F               |        |
| Motor Outlet Mode             | Standard socket |        |
| Pole Pairs                    | 5               |        |
| Rated Current                 | 10.6            | A      |
| Rotational Back-EMF Constant  | 120             | V/krpm |
| Electrical Time Constant      | 13.8            | ms     |

## Technical Specifications

| PARAMETER                        | SPECIFICATION                                                                    | UNIT               | NOTES                              |
|----------------------------------|----------------------------------------------------------------------------------|--------------------|------------------------------------|
| <b>ELECTRICAL</b>                |                                                                                  |                    |                                    |
| Position Feedback Device         | 17-bit multi-turn communication magnetic absolute encoder                        |                    |                                    |
| <b>MECHANICAL</b>                |                                                                                  |                    |                                    |
| Flange Size                      | 180                                                                              | mm                 |                                    |
| Inertia Level                    | High inertia                                                                     |                    |                                    |
| Holding Brake Available          | With holding brake                                                               |                    |                                    |
| Mechanical Time Constant         | 1.27 / 1.11                                                                      | ms                 | Brake Configuration: without_brake |
| Rotor Inertia                    | 52.43 / 46                                                                       | Kg-cm <sup>2</sup> | Brake Configuration: without_brake |
| Bearing Radial Force Capacity    | 1470                                                                             | N                  |                                    |
| Bearing Axial Force Capacity     | 490                                                                              | N                  |                                    |
| <b>ENVIRONMENTAL</b>             |                                                                                  |                    |                                    |
| Altitude and Derating Rule       | highest altitude 2000m, 1000m above, every rise 100m, Power drop 1.5%            |                    |                                    |
| Operating Environment            | Keep away from corrosive or flammable gases, oil droplets and dust               |                    |                                    |
| Operating Humidity               | ≤90% RH, non-condensing                                                          |                    |                                    |
| Operating Temperature            | -20 to 40°C (no freezing)                                                        |                    |                                    |
| Protection Rating                | IP65, shaft end IP54 (Note: with shaft-end oil seal IP54, without oil seal IP50) |                    |                                    |
| <b>CONFIGURATION</b>             |                                                                                  |                    |                                    |
| Output Shaft Type                | Keyed shaft                                                                      |                    |                                    |
| <b>ADDITIONAL SPECIFICATIONS</b> |                                                                                  |                    |                                    |
| Holding Brake                    | 1                                                                                |                    |                                    |



## 2D Drawing Dimensions & Callouts

| VIEW              | FIELD                                 | VALUE                                            |
|-------------------|---------------------------------------|--------------------------------------------------|
| Mechanical View 1 | Mounting hole diameter                | Ø13.5 mm                                         |
|                   | Flange bolt circle diameter           | Ø200 mm                                          |
|                   | Flange overall width                  | 180 mm                                           |
| Mechanical View 3 | Aviation connector positioning note   | Aviation connector convex point near front shaft |
|                   | Perpendicularity tolerance to datum A | ⊥ 0.06 A                                         |
|                   | Keyway identifier                     | KEY                                              |
|                   | Mounting threaded hole specification  | M12 × 25 deep                                    |
|                   | Maximum envelope dimension            | 204 max                                          |
|                   | Motor shaft diameter with tolerance   | Ø114.3 0/-0.035                                  |
|                   | Shaft section length                  | 38 -0.31                                         |
|                   | Output shaft diameter with tolerance  | Ø35 -0.016                                       |
|                   | Cylindricity tolerance to datum A     | 0.06 A                                           |
|                   | Keyway width                          | 3.2                                              |
|                   | Keyway length                         | 19                                               |
|                   | Datum A                               |                                                  |
|                   | Angularity tolerance                  | ∠ 0.03                                           |
|                   | Overall length segment 1              | 79±1                                             |
|                   | Overall length segment 2              | 215±1                                            |

2D Drawing Dimensions & Callouts

| VIEW              | FIELD                        | VALUE           |
|-------------------|------------------------------|-----------------|
| Mechanical View 4 | Shaft length                 | 65 mm           |
|                   | Shaft diameter               | Ø8 mm           |
|                   | Keyway depth or key position | 10 mm           |
|                   | Threaded through hole        | M3 through hole |
|                   | Keyway identifier            | KEY             |

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01 Specifications are subject to change without notice. Verify the current product configuration before final design release.

02 2D drawings, CAD files and integration documentation are controlled documents and are supplied separately on request.