



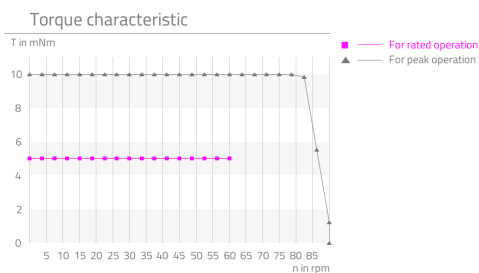
Attributes

| Highlights | Description |
|--|---|
| <ul style="list-style-type: none"> ▪ High repeatability ▪ Custom designed output shaft ▪ Zero backlash with optimised fit between speed and resolution ▪ Robust control without feedback system ▪ Preloaded ball bearing | <p>The MaalonDrive® SpecialShaft 10mm - type 2 micro positioning system is characterised by an application-specific geometry of the output shaft and, as a result, can be optimally integrated. The zero-backlash MaalonDrive® gear with a reduction ratio of 160:1 is combined with a stepper motor with 20 steps per rotation and can thereby be operated in an open loop control. Preloaded ball bearings mounted on the output side allow the application to be directly connected.</p> |

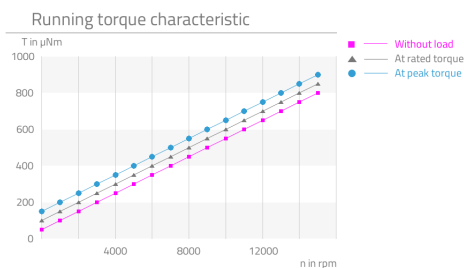
Technical parameter

The stated values are based on calculations and measurements by Micromotion GmbH, carried out according to the current state of the art. You can find our definitions at www.micromotion-drives.com.
 For further information please contact sales@micromotion.de.

P-019 Curve measured with 5x nominal voltage and load inertia $6 \cdot 10E-9$ kg/m² in 1/4 micro steps.



P-029 Curve measured with 5x nominal voltage and load inertia $6 \cdot 10E-9$ kg/m² in 1/4 micro steps.



Technical Supply Specifications: MaalonDrive® SpecialShaft 10mm - Type 2



Micromotion GmbH, Phone: +49 (0) 6431 – 569 18 – 25, E-mail: sales@micromotion.de

| Nr. | Parameter | Symbol | Value | Hint |
|-------|--|--------|-------------------------------------|------|
| P-003 | Ratio | i | 160 : 1 | |
| P-004 | Self-locking | | yes | |
| P-008 | Repeatability unidirectional | | 35.25 arcsec | |
| P-009 | Repeatability bidirectional | | 20.675 arcmin | |
| P-010 | Accuracy | | 13.35 arcmin | |
| P-011 | Transmission accuracy | | 26.7 arcmin | |
| P-012 | Resolution | | 0.1125 ° | |
| P-013 | Torsional stiffness | | 8.25 $\frac{\text{Nm}}{\text{rad}}$ | |
| P-014 | Lost motion | | 12 arcmin | |
| P-015 | Backlash | | 0 arcmin | |
| P-016 | Rated torque | T | 5 mNm | |
| P-017 | Peak torque | T | 10 mNm | |
| P-018 | Momentary peak torque | T | 23 mNm | |
| P-021 | Rated input speed | n | 10000 rpm | |
| P-022 | Maximum input speed | n | 21000 rpm | |
| P-023 | Rated output speed | n | 62.5 rpm | |
| P-024 | Maximum output speed | n | 131.25 rpm | |
| P-026 | No-load starting torque | T | 75 μNm | |
| P-027 | No-load running torque | T | 50 μNm | |
| P-028 | Rated running torque | T | 600 μNm | |
| P-034 | Lifetime for rated operation | | 1000 h | |
| P-035 | Radial backlash output shaft | | 0 μm | |
| P-036 | Axial backlash output shaft | | 0 μm | |
| P-037 | Radial stiffness | c | 2.3 N/ μm | |
| P-038 | Axial stiffness | c | 40 N/ μm | |
| P-039 | Max. radial load on output shaft (non-operating, constant load) | F | 55 N | |
| P-040 | Max. radial load on output shaft (non-operating, impulsive load) | F | 20 N | |
| P-041 | Max. radial load on output shaft (operating, constant load) | F | 7 N | |
| P-042 | Max. radial load on output shaft (operating, impulsive load) | F | 7 N | |
| P-043 | Max. axial load on output shaft (non-operating, constant) | F | 150 N | |
| P-044 | Max. axial load on output shaft (non-operating, impulsive load) | F | 50 N | |

Technical Supply Specifications: MaalonDrive® SpecialShaft 10mm - Type 2



Micromotion GmbH, Phone: +49 (0) 6431 – 569 18 – 25, E-mail: sales@micromotion.de

| Nr. | Parameter | Symbol | Value | Hint |
|-------|---|--------|---|------|
| P-045 | Max. axial load on output shaft (operating, constant load) | F | 380 N | |
| P-046 | Max. axial load on output shaft (operating, impulsive load) | F | 127 N | |
| P-055 | Moment of inertia | I | $923 \cdot 10^{-4}$ gcm ² | |
| P-056 | Weight | m | 15 g | |
| P-057 | Min. permissible ambient temperature (non-operating) | T | -35 °C | |
| P-058 | Min. permissible ambient temperature (operating) | T | -20 °C | |
| P-059 | Max. permissible ambient temperature (non-operating) | T | 130 °C | |
| P-060 | Max. permissible ambient temperature (operating) | T | 70 °C | |

Motor data: Stepper AM 1020-2R-A0.25

(Data are provided by the manufacturer or are based on the data sheets of the manufacturer)

| Nr. | Parameter | Symbol | Value | Hint |
|-------|--|------------------|----------------------|------|
| P-100 | Motortype | | Stepper | |
| P-102 | Maximum speed of motor | n | 21000 rpm | |
| P-103 | Resonance frequency of motor | f | 140 Hz | |
| P-105 | Holding torque of motor (unpowered) | T | 0.2 mNm | |
| P-109 | Rated current of motor | I | 250 mA | |
| P-111 | Rated voltage of motor | U | 2 V | |
| P-112 | Phase resistance of motor | R | 8 ohm | |
| P-113 | Inductance of motor | L | 2.4 mH | |
| P-114 | Amplitude BEMF of motor | U | 0.6 mV/rpm | |
| P-115 | Full step angle of motor | | 18 ° | |
| P-116 | Angular accuracy of step of motor | | ±1.8 ° | |
| P-117 | Electrical time constant of motor | t | 0.32 ms | |
| P-118 | Max. coil temperature of motor | T | 130 °C | |
| P-119 | Thermal resistance of motor between coil and housing | R _{th1} | 3.9 ^K /W | |
| P-120 | Thermal resistance of motor between housing and air | R _{th2} | 53.8 ^K /W | |
| P-121 | Thermal time constant of the coil of the motor | T _{w1} | 3200 ms | |
| P-122 | Thermal time constant of the housing of the motor | T _{w2} | 200000 ms | |
| P-123 | Insulation voltage of motor | U | 200 V | |

Technical Supply Specifications: MaalonDrive® SpecialShaft 10mm - Type 2



Micromotion GmbH, Phone: +49 (0) 6431 – 569 18 – 25, E-mail: sales@micromotion.de

Material information

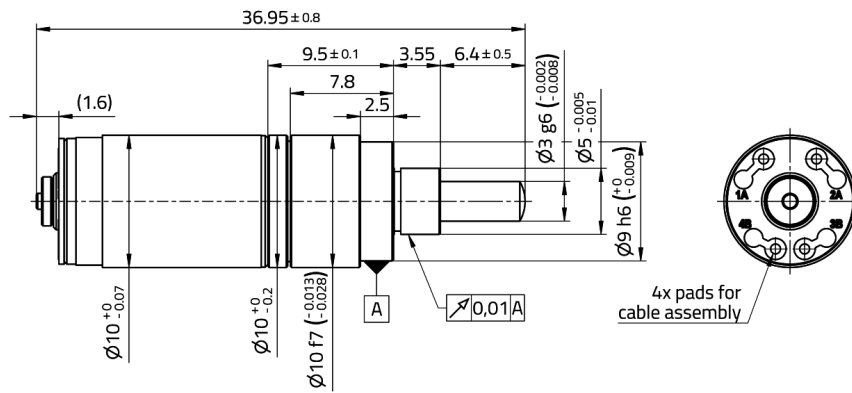
| Nr. | Parameter | Symbol | Value | Hint |
|-------|---------------------------------------|--------|---------------------------|------|
| P-900 | RoHS compliant | | yes | |
| P-901 | Lubrication of output bearing gearbox | | Longtime PD2 | |
| P-903 | Lubrication of gear component set | | Molykote BR 2 plus | |
| P-904 | Lubrication of bearing motor | | Synthetic light ester oil | |
| P-908 | Material of gear component set | | NiFe | |
| P-909 | Material of output bearing gearbox | | 1.4108 DIN EN | |
| P-911 | Material of bearing motor | | Stainless steel | |
| P-912 | Material of gearbox output side | | 1.4305 DIN EN | |
| P-914 | Material of motor housing | | Anodized aluminum | |

Technical Supply Specifications: MaalonDrive® SpecialShaft 10mm - Type 2



Micromotion GmbH, Phone: +49 (0) 6431 – 569 18 – 25, E-mail: sales@micromotion.de

Technical drawing



Micromotion GmbH | Hoenbergstraße 14 | 65555 Limburg
+49(0)6431-59618-25 | sales@micromotion.de | www.micromotion-drives.com