



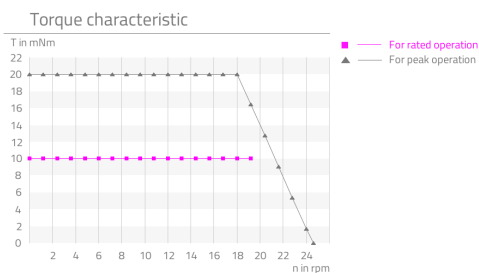
## Attributes

Highlights	Description
<ul style="list-style-type: none"> <li>▪ <b>High repeatability</b></li> <li>▪ <b>Zero backlash at high resolution</b></li> <li>▪ <b>Robust control without feedback system</b></li> <li>▪ <b>Custom designed output shaft</b></li> <li>▪ <b>Preloaded ball bearing</b></li> </ul>	<p>The MaalonDrive® SpecialShaft 8mm - type 1 micro positioning system is an especially high-resolution positioning system that can easily be integrated in a drive train. The system is driven by a stepper motor with 20 steps per rotation, thereby enabling operation in a simple, open loop control. The zero-backlash MaalonDrive® gear with a reduction ratio of 500:1 is directly connected to the motor and is equipped with a preloaded ball bearing on the output side.</p>

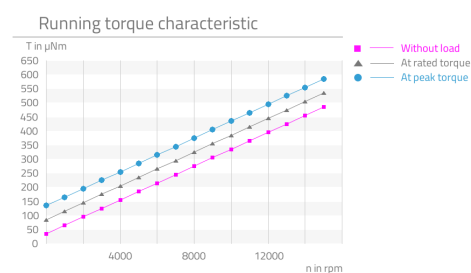
## Technical parameter

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](http://www.micromotion-drives.com).  
 For further information please contact [sales@micromotion.de](mailto:sales@micromotion.de).

P-019 Curve measured with 5x nominal voltage and load inertia  $6 \cdot 10E-9$  kg/m<sup>2</sup> in  $\frac{1}{4}$  micro steps.



P-029 Curve measured with 5x nominal voltage and load inertia  $6 \cdot 10E-9$  kg/m<sup>2</sup> in  $\frac{1}{4}$  micro steps.



# Technical Supply Specifications: MaalonDrive® SpecialShaft 8mm - Type 1



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Nr.	Parameter	Symbol	Value	Hint
P-003	Ratio	i	500 : 1	
P-004	Self-locking		yes	
P-008	Repeatability unidirectional		18.48 arcsec	
P-009	Repeatability bidirectional		15.216 arcmin	
P-010	Accuracy		12.432 arcmin	
P-011	Transmission accuracy		24.864 arcmin	
P-012	Resolution		0.036 °	
P-013	Torsional stiffness		2.86 <sup>Nm</sup> /rad	
P-014	Lost motion		15 arcmin	
P-015	Backlash		0 arcmin	
P-016	Rated torque	T	10 mNm	
P-017	Peak torque	T	20 mNm	
P-018	Momentary peak torque	T	46 mNm	
P-021	Rated input speed	n	10000 rpm	
P-022	Maximum input speed	n	21000 rpm	
P-023	Rated output speed	n	20 rpm	
P-024	Maximum output speed	n	42 rpm	
P-026	No-load starting torque	T	52.5 µNm	
P-027	No-load running torque	T	35 µNm	
P-028	Rated running torque	T	385 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	0.87 N/µm	
P-038	Axial stiffness	c	18.5 <sup>N</sup> /µm	
P-039	Max. radial load on output shaft (non-operating, constant load)	F	20 N	
P-040	Max. radial load on output shaft (non-operating, impulsive load)	F	5 N	
P-041	Max. radial load on output shaft (operating, constant load)	F	3 N	
P-042	Max. radial load on output shaft (operating, impulsive load)	F	3 N	
P-043	Max. axial load on output shaft (non-operating, constant load)	F	64 N	
P-044	Max. axial load on output shaft (non-operating, impulsive load)	F	20 N	

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Nr.	Parameter	Symbol	Value	Hint
P-045	Max. axial load on output shaft (operating, constant load)	F	185 N	
P-046	Max. axial load on output shaft (operating, impulsive load)	F	66 N	
P-055	Moment of inertia	I	$283 \cdot 10^{-4}$ gcm <sup>2</sup>	
P-056	Weight	m	6 g	
P-057	Min. permissible ambient temperature (non-operating)	T	-30 °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	

Additional technical data:

- cable HiFlex PVC-ribbon, AWG28, pitch 1.27 mm, length 0.2 m

## Motor data: Stepper AM 0820-2R-A0.225

(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	170 Hz	
P-105	Holding torque of motor (unpowered)	T	0.17 mNm	
P-109	Rated current of motor	I	225 mA	
P-111	Rated voltage of motor	U	2 V	
P-112	Phase resistance of motor	R	7.3 ohm	
P-113	Inductance of motor	L	1.4 mH	
P-114	Amplitude BEMF of motor	U	0.267 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	0.21 ms	
P-118	Max. coil temperature of motor	T	130 °C	
P-119	Thermal resistance of motor between coil and housing	R <sub>th1</sub>	4.1 <sup>k</sup> /W	
P-120	Thermal resistance of motor between housing and air	R <sub>th2</sub>	65.3 <sup>k</sup> /W	
P-121	Thermal time constant of the coil of the motor	τ <sub>w1</sub>	3500 ms	

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Nr.	Parameter	Symbol	Value	Hint
P-122	Thermal time constant of the housing of the motor	$T_{w2}$	160000 ms	
P-123	Insulation voltage of motor	U	200 V	

## Material information

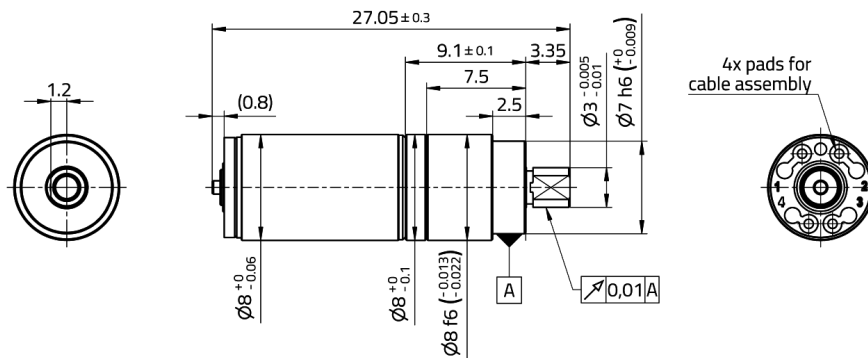
Nr.	Parameter	Symbol	Value	Hint
P-900	RoHS compliant		yes	
P-901	Lubrication of output bearing gearbox		Longtime PD2	
P-903	Lubrication of gear component set		Molykote BR 2 plus	
P-904	Lubrication of bearing motor		Synthetic light ester oil	
P-908	Material of gear component set		NiFe	
P-909	Material 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	

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## Technical drawing



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