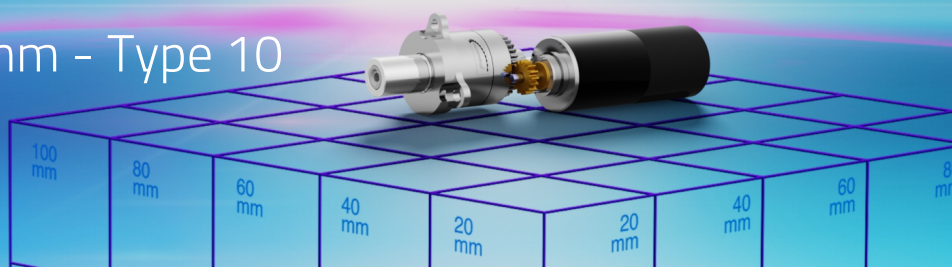


> MaalonDrive® Hollow 10mm - Type 10



Attributes

Highlights	Description
▪ Hollow shaft thru center of rotational axis ▪ Prestage gear set for parallel situated motor ▪ Zero backlash with optimised fit between speed and transmission ratio ▪ Preloaded ball bearing ▪ Lifetime lubrication	The MaalonDrive® Hollow 10mm - type 10 micro positioning system combines hollow shaft, tool holder, parallel-offset motor arrangement and housing flange in one system. The toothing on the input shaft enables positioning of the stepper motor with 20 steps per rotation and integrated encoder with a resolution of 10 pulses per rotation parallel to the hollow shaft. The possibilities of the hollow shaft can thereby be optimally used. The robust bearing of the output shaft and the possibility to connect the application directly to the output shaft further characterise this solution. A zero-backlash MaalonDrive® gear with a reduction ratio of 160:1 forms the core of this precise and dynamic micro gearbox.

Technical Supply Specifications: MaalonDrive® Hollow 10mm - Type 10



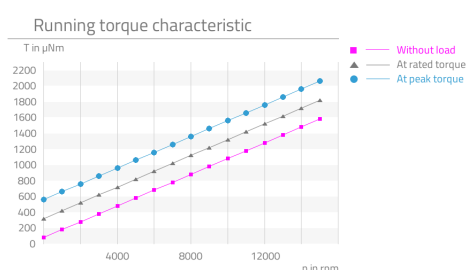
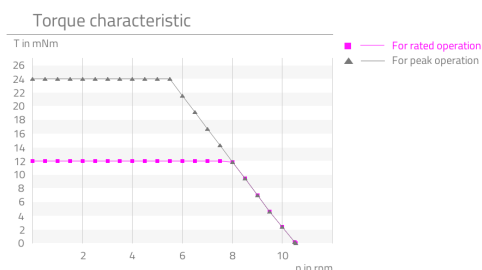
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Technical parameter

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 nominal voltage and load inertia $6 \cdot 10^{-9} \text{ kg/m}^2$ in $\frac{1}{2}$ micro steps. P-029 Curve measured with nominal voltage and load inertia $6 \cdot 10^{-9} \text{ kg/m}^2$ in $\frac{1}{2}$ micro steps.



Nr.	Parameter	Symbol	Value	Hint
P-003	Ratio	i	320 : 1	
P-004	Self-locking		yes	
P-006	Hollow shaft		ja	
P-008	Repeatability unidirectional		20.125 arcsec	
P-009	Repeatability bidirectional		20.3375 arcmin	
P-010	Accuracy		15.675 arcmin	
P-011	Transmission accuracy		31.35 arcmin	
P-012	Resolution		0.056 °	
P-013	Torsional stiffness		9.30 Nm/rad	
P-014	Lost motion		20 arcmin	
P-015	Backlash		0 arcmin	
P-016	Rated torque	T	12 mNm	
P-017	Peak torque	T	24 mNm	
P-018	Momentary peak torque	T	55 mNm	
P-020	Torque constant gear	Km	20 $\mu\text{Nm/mNm}$	
P-021	Rated input speed	n	5000 rpm	
P-022	Maximum input speed	n	15000 rpm	
P-023	Rated output speed	n	15.625 rpm	
P-024	Maximum output speed	n	46.875 rpm	

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Nr.	Parameter	Symbol	Value	Hint
P-025	Speed constant gear	K _n	0.1 µNm/rpm	
P-026	No-load starting torque	T	170 µNm	
P-027	No-load running torque	T	80 µNm	
P-028	Rated running torque	T	1215 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	40 N/µm	
P-039	Max. radial load on output shaft (non-operating, constant load)	F	35 N	
P-040	Max. radial load on output shaft (non-operating, impulsive load)	F	10 N	
P-041	Max. radial load on output shaft (operating, constant load)	F	5 N	
P-042	Max. radial load on output shaft (operating, impulsive load)	F	5 N	
P-043	Max. axial load on output shaft (non-operating, constant load)	F	150 N	
P-044	Max. axial load on output shaft (non-operating, impulsive load)	F	50 N	
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	1860 * 10 ⁻⁶ gcm ²	
P-056	Weight	m	14 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	
P-061	Tool fitting		Ø3.17G6 – 8 deep	
P-063	Kind of gear wheel input shaft		Spur gear DIN 867	
P-064	Module gear wheel input shaft		0.25	
P-065	Number of teeth gear wheel input shaft		16	
P-066	Pitch diameter gear wheel input shaft		4	

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Nr.	Parameter	Symbol	Value	Hint
P-067	Pressure angle gear wheel input shaft		20	
P-069	Material gear wheel input shaft		Messing	
P-071	Kind of gear wheel output shaft		spur gear DIN 867	
P-072	Module gear wheel output shaft		0.25	
P-073	Number of teeth gear wheel output shaft		32	
P-074	Pitch diameter gear wheel output shaft		8	
P-075	Pressure angle gear wheel output shaft		20	
P-077	Material gear wheel output shaft		1.4305	

Additional technical data:

- magnetic index and cable 2 m, 4 wire, shielded, outer diameter 4.4 mm

Motor data: Stepper AM 1020-RV-V3-16-01

(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	180 mA	
P-111	Rated voltage of motor	U	3 V	
P-112	Phase resistance of motor	R	16 ohm	
P-113	Inductance of motor	L	5.2 mH	
P-114	Amplitude BEMF of motor	U	0.867 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 °/W	
P-120	Thermal resistance of motor between housing and air	R _{th2}	53.8 °/W	
P-121	Thermal time constant of the coil of the motor	τ _{w1}	3200 ms	
P-122	Thermal time constant of the housing of the motor	τ _{w2}	200000 ms	
P-123	Insulation voltage of motor	U	200 V	

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Encoder data

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

Nr.	Parameter	Symbol	Value	Hint
P-201	Impulses per revolution of encoder		10	
P-202	Channels of encoder		A, B	
P-203	Frequency range of encoder	f	7.2 kHz	
P-204	Operating voltage of encoder	U	5 ±0.5 V	
P-205	Rated current consumption of encoder	I	5 mA	
P-207	Signal/phase shifting of encoder		90±45 °	
P-208	Signal build-up/decay time of encoder	t	5 / 0.2	

Material information

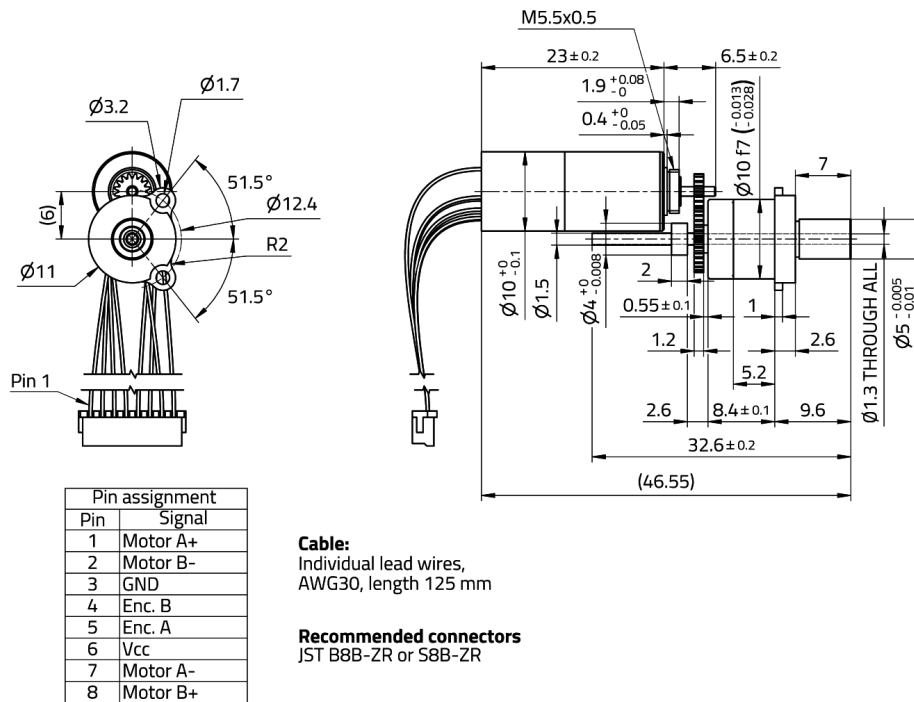
Nr.	Parameter	Symbol	Value	Hint
P-900	RoHS compliant		yes	
P-901	Lubrication of output bearing gearbox		Longtime PD2	
P-902	Lubrication of input bearing gearbox		Longtime PD2	
P-903	Lubrication of gear component set		Molykote BR 2 plus	
P-904	Lubrication of bearing motor		Synthetic light ester oil	
P-908	Material of gear component set		NiFe	
P-909	Material of output bearing gearbox		1.4108 DIN EN	
P-910	Material of input 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-913	Material of gearbox input side		1.4305 DIN EN	
P-914	Material of motor housing		Anodized aluminum	

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Technical drawing



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