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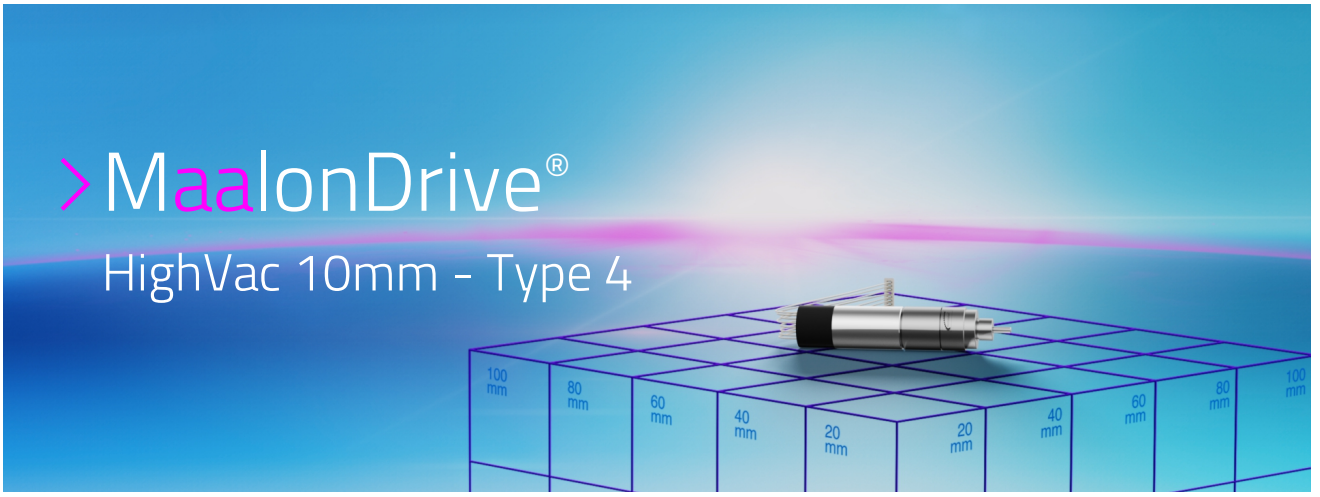

Attributes

Highlights	Description
▪ **Zero backlash at ultra high resolution** ▪ **Easy controllability** ▪ **High repeatability** ▪ **Vacuum suitable lubrication** ▪ **Preloaded ball bearing**	The MaalonDrive® HighVac 10mm - type 4 micro positioning system was designed for use in high-vacuum environments and is lubricated with Fomblin. It is characterised by its extremely high-reduction gear and the high positioning resolution thereby made possible. The combination of a zero-backlash MaalonDrive® gear with a reduction ratio of 1000:1 with a DC motor with rated voltage of 6V and an integrated encoder with a resolution of 256 pulses per rotation results in a high-performance, durable micro actuator. On the output side, the zero-backlash MaalonDrive® gear is equipped with a preloaded ball bearing and an application-specific shaft geometry by means of which the application can be directly connected to the micro actuator.

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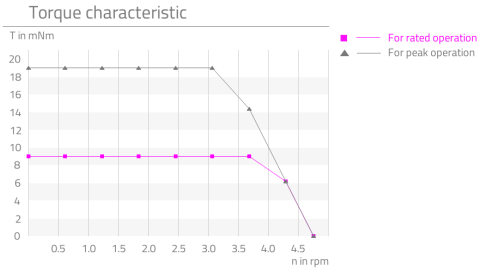
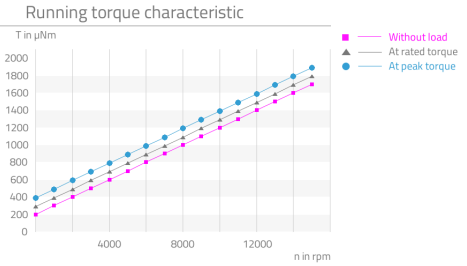
Technical parameter

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



P-029



Nr.	Parameter	Symbol	Value	Hint
P-001	Vacuum suitable		HV	
P-003	Ratio	i	1000 : 1	
P-004	Self-locking		yes	
P-008	Repeatability unidirectional		15 arcsec	
P-009	Repeatability bidirectional		30 arcmin	
P-010	Accuracy		15 arcmin	
P-011	Transmission accuracy		30 arcmin	
P-012	Resolution		0.00141 °	
P-013	Torsional stiffness		3.80 Nm/rad	
P-014	Lost motion		30 arcmin	
P-015	Backlash		0 arcmin	
P-016	Rated torque	T	9 mNm	
P-017	Peak torque	T	19 mNm	
P-018	Momentary peak torque	T	47 mNm	
P-021	Rated input speed	n	10000 rpm	
P-022	Maximum input speed	n	22000 rpm	
P-023	Rated output speed	n	10 rpm	
P-024	Maximum output speed	n	22 rpm	
P-026	No-load starting torque	T	300 µNm	

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Nr.	Parameter	Symbol	Value	Hint
P-027	No-load running torque	T	200 µNm	
P-028	Rated running torque	T	1440 µNm	
P-034	Lifetime for rated operation		500 h	
P-035	Radial backlash output shaft		0 µm	
P-036	Axial backlash output shaft		0 µm	
P-037	Radial stiffness	c	2.31 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	
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	$855 * 10^{-4}$ gcm^2	
P-056	Weight	m	16 g	
P-057	Min. permissible ambient temperature (non-operating)	T	-30 °C	
P-058	Min. permissible ambient temperature (operating)	T	-10 °C	
P-059	Max. permissible ambient temperature (non-operating)	T	85 °C	
P-060	Max. permissible ambient temperature (operating)	T	85 °C	1)

Motor data: DC-Motor 1016L006G K440 with lubrication for high vacuum

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

Nr.	Parameter	Symbol	Value	Hint
P-100	Motortype		DC	
P-102	Maximum speed of motor	n	22000 rpm	
P-104	Speed constant of motor	Kn	3173 $^{rpm}/_{V}$	
P-106	Stall torque of motor	T	0.9 mNm	

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Nr.	Parameter	Symbol	Value	Hint
P-107	Torque constant of motor	Km	3.01 $^{mNm}/_{A}$	
P-108	No-load current of motor	I	10 mA	
P-110	Max. continuous current of motor	I	170 mA	
P-111	Rated voltage of motor	U	6 V	
P-112	Phase resistance of motor	R	19.3 ohm	
P-113	Inductance of motor	L	0.09 mH	
P-114	Amplitude BEMF of motor	U	0.315 mV/rpm	
P-118	Max. coil temperature of motor	T	85 °C	1)
P-119	Thermal resistance of motor between coil and housing	R_{th1}	26 $^{K}/_{W}$	
P-120	Thermal resistance of motor between housing and air	R_{th2}	56 $^{K}/_{W}$	
P-121	Thermal time constant of the coil of the motor	τ_{w1}	3100 ms	
P-122	Thermal time constant of the housing of the motor	τ_{w2}	260000 ms	

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		256	
P-202	Channels of encoder		A, B, I	
P-203	Frequency range of encoder	f	128 kHz	
P-204	Operating voltage of encoder	U	3.3 ±0.3 V	
P-205	Rated current consumption of encoder	I	16 mA	
P-206	Output current of encoder	I	2 mA	
P-207	Signal/phase shifting of encoder		90±45 °	
P-208	Signal build-up/decay time of encoder	t	0.1/0.1	

Material information

Nr.	Parameter	Symbol	Value	Hint
P-900	RoHS compliant		yes	
P-901	Lubrication of output bearing gearbox		FomblinGRM60	
P-902	Lubrication of input bearing gearbox		FomblinGRM60	
P-903	Lubrication of gear component set		FomblinGRM60	

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Nr.	Parameter	Symbol	Value	Hint
P-904	Lubrication of bearing motor		Invoil C	
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		1.4301 DIN EN	
P-914	Material of motor housing		Steel, nickel-plated	

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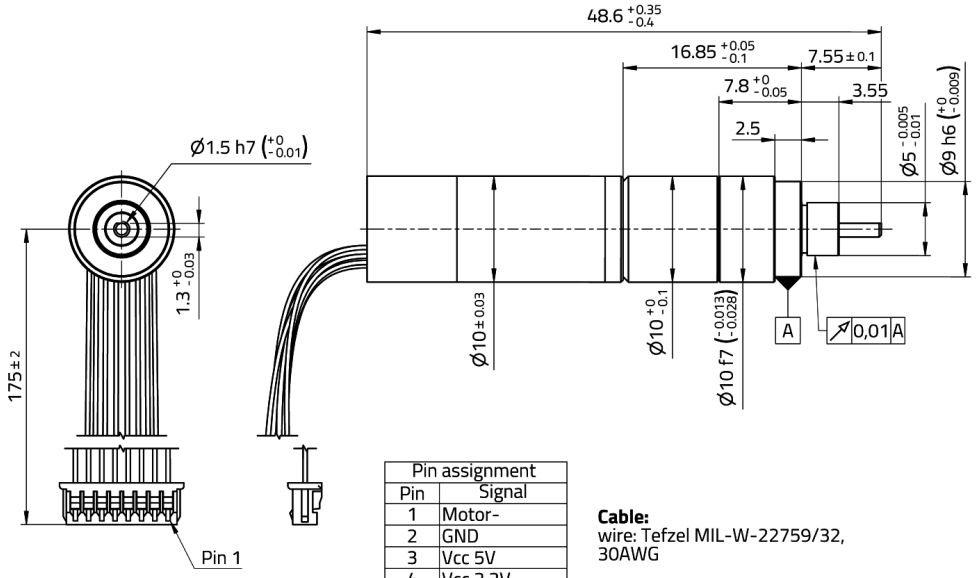
Technical drawing



Pin assignment	
Pin	Signal
1	Motor-
2	GND
3	Vcc 5V
4	Vcc 3.3V
5	Enc. A
6	Enc. B
7	Enc. I
8	Motor +

Cable:
wire: Tefzel MIL-W-22759/32, 30AWG

Recommended connector:
Pitch: 1.25mm, 8poles, Molex 51021-0800

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