



Attributes

Highlights	Description
▪ Vacuum suitable lubrication ▪ Robust control without feedback system ▪ Zero backlash with optimised fit between speed and resolution ▪ Custom designed tool holder ▪ Custom designed output shaft	The BryleeDrive® HighVac 40mm - type 1 micro positioning system, which is designed for use in high-vacuum environments and lubricated with Fomblin, combines four movement axes in the smallest of spaces. All four axes of the micro positioning system are driven by stepper motors with 200 steps per rotation and can thereby easily be operated in an open loop control. The rotative axes are also equipped with application-specific adapters by means of which the system can be integrated in the application without additional effort. At the heart of this multi-axis microsystem are zero-backlash MaalonDrive® gears with a reduction ratio of 160:1.

Technical Supply Specifications: BryleeDrive® HighVac 40mm - Type 1



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

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.

Global system

Nr.	Parameter	Symbol	Value	Hint
P-001	Vacuum suitable		HV	
P-034	Lifetime for rated operation		500 h	
P-056	Weight	m	70 g	
P-057	Min. permissible ambient temperature (non-operating)	T	0 °C	
P-058	Min. permissible ambient temperature (operating)	T	0 °C	
P-059	Max. permissible ambient temperature (non-operating)	T	80 °C	
P-060	Max. permissible ambient temperature (operating)	T	60 °C	

Additional technical data:

- Bar magnets have to be provided. Tilting at point (A) approx. 10 µm/N

Data limit switch

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

Nr.	Parameter	Symbol	Value	Hint
P-300	Type of limit switch		4x mechanical reference switches with connection for wire diameter 1.3 mm (cables not included)	
P-302	Configuration Limit switches		n.o.	

Axis 1: rotational axis with magnet adapter

Technical Supply Specifications: BryleeDrive® HighVac 40mm - Type 1



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		12.025 arcsec	
P-009	Repeatability bidirectional		20.0675 arcmin	
P-010	Accuracy		15.135 arcmin	
P-011	Transmission accuracy		30.27 arcmin	
P-012	Resolution		0.01125 °	
P-013	Torsional stiffness		9.30 $\frac{\text{Nm}}{\text{rad}}$	
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-021	Rated input speed	n	100 rpm	
P-022	Maximum input speed	n	100 rpm	
P-023	Rated output speed	n	0.625 rpm	
P-024	Maximum output speed	n	0.625 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	670 μNm	
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	

Technical Supply Specifications: BryleeDrive® HighVac 40mm - Type 1



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	900023 * 10 ⁻⁴ gcm ²	

Motor data: Stepper VSS 19.200.0,3-UHV-4LP-2g5 dry lubrication
(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	100 rpm	
P-105	Holding torque of motor (unpowered)	T	0.9 mNm	
P-109	Rated current of motor	I	300 mA	
P-111	Rated voltage of motor	U	42 V	
P-112	Phase resistance of motor	R	6 ohm	
P-113	Inductance of motor	L	2.2 mH	
P-115	Full step angle of motor		1.8 °	
P-116	Angular accuracy of step of motor		±0.09 °	
P-117	Electrical time constant of motor	t	0.367 ms	
P-118	Max. coil temperature of motor	T	300 °C	1)

Material information

Nr.	Parameter	Symbol	Value	Hint
P-900	RoHS compliant		yes	
P-901	Lubrication of output bearing gearbox		MoS ₂ (dry lubrication)	
P-903	Lubrication of gear component set		Molykote BR 2 plus	
P-904	Lubrication of bearing motor		dry coated	
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	

Technical Supply Specifications: BryleeDrive® HighVac 40mm - Type 1



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

Nr.	Parameter	Symbol	Value	Hint
P-914	Material of motor housing		Stainless steel	

Axis 2: rotational axis with magnet adapter

Nr.	Parameter	Symbol	Value	Hint
P-003	Ratio	i	160 : 1	
P-004	Self-locking		yes	
P-008	Repeatability unidirectional		12.025 arcsec	
P-009	Repeatability bidirectional		20.0675 arcmin	
P-010	Accuracy		15.135 arcmin	
P-011	Transmission accuracy		30.27 arcmin	
P-012	Resolution		0.01125 °	
P-013	Torsional stiffness		9.30 $\frac{\text{Nm}}{\text{rad}}$	
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-021	Rated input speed	n	100 rpm	
P-022	Maximum input speed	n	100 rpm	
P-023	Rated output speed	n	0.625 rpm	
P-024	Maximum output speed	n	0.625 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	670 μNm	
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	

Technical Supply Specifications: BryleeDrive® HighVac 40mm - Type 1



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

Nr.	Parameter	Symbol	Value	Hint
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	900023 * 10 ⁻⁴ gcm ²	

Motor data: Stepper VSS 19.200.0,3-UHV-4LP-2g5 dry lubrication
(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	100 rpm	
P-105	Holding torque of motor (unpowered)	T	0.9 mNm	
P-109	Rated current of motor	I	300 mA	
P-111	Rated voltage of motor	U	42 V	
P-112	Phase resistance of motor	R	6 ohm	
P-113	Inductance of motor	L	2.2 mH	
P-115	Full step angle of motor		1.8 °	
P-116	Angular accuracy of step of motor		±0.09 °	
P-117	Electrical time constant of motor	t	0.367 ms	
P-118	Max. coil temperature of motor	T	300 °C	1)

Material information

Nr.	Parameter	Symbol	Value	Hint
P-900	RoHS compliant		yes	
P-901	Lubrication of output bearing gearbox		MoS ₂ (dry lubrication)	
P-903	Lubrication of gear component set		Molykote BR 2 plus	
P-904	Lubrication of bearing motor		dry coated	

Technical Supply Specifications: BryleeDrive® HighVac 40mm - Type 1



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

Nr.	Parameter	Symbol	Value	Hint
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		Stainless steel	

Axis 3: rotational axis with magnet adapter

Nr.	Parameter	Symbol	Value	Hint
P-003	Ratio	i	160 : 1	
P-004	Self-locking		yes	
P-008	Repeatability unidirectional		12.025 arcsec	
P-009	Repeatability bidirectional		20.0675 arcmin	
P-010	Accuracy		15.135 arcmin	
P-011	Transmission accuracy		30.27 arcmin	
P-012	Resolution		0.01125 °	
P-013	Torsional stiffness		9.30 $\frac{\text{Nm}}{\text{rad}}$	
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-021	Rated input speed	n	100 rpm	
P-022	Maximum input speed	n	100 rpm	
P-023	Rated output speed	n	0.625 rpm	
P-024	Maximum output speed	n	0.625 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	670 μNm	
P-035	Radial backlash output shaft		0 μm	
P-036	Axial backlash output shaft		0 μm	

Technical Supply Specifications: BryleeDrive® HighVac 40mm - Type 1



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

Nr.	Parameter	Symbol	Value	Hint
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	900023 * 10 ⁻⁴ gcm ²	

Motor data: Stepper VSS 19.200.0,3-UHV-4LP-2g5 dry lubrication
(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	100 rpm	
P-105	Holding torque of motor (unpowered)	T	0.9 mNm	
P-109	Rated current of motor	I	300 mA	
P-111	Rated voltage of motor	U	42 V	
P-112	Phase resistance of motor	R	6 ohm	
P-113	Inductance of motor	L	2.2 mH	
P-115	Full step angle of motor		1.8 °	
P-116	Angular accuracy of step of motor		±0.09 °	
P-117	Electrical time constant of motor	t	0.367 ms	
P-118	Max. coil temperature of motor	T	300 °C	1)

Technical Supply Specifications: BryleeDrive® HighVac 40mm - Type 1



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		MoS ₂ (dry lubrication)	
P-903	Lubrication of gear component set		Molykote BR 2 plus	
P-904	Lubrication of bearing motor		dry coated	
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		Stainless steel	

Axis 4: rotational axis with magnet adapter

Nr.	Parameter	Symbol	Value	Hint
P-003	Ratio	i	160 : 1	
P-004	Self-locking		yes	
P-008	Repeatability unidirectional		12.025 arcsec	
P-009	Repeatability bidirectional		20.0675 arcmin	
P-010	Accuracy		15.135 arcmin	
P-011	Transmission accuracy		30.27 arcmin	
P-012	Resolution		0.01125 °	
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-021	Rated input speed	n	100 rpm	
P-022	Maximum input speed	n	100 rpm	

Technical Supply Specifications: BryleeDrive® HighVac 40mm - Type 1



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

Nr.	Parameter	Symbol	Value	Hint
P-023	Rated output speed	n	0.625 rpm	
P-024	Maximum output speed	n	0.625 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	670 µNm	
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 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	900023 * 10 ⁻⁴ gcm ²	

Motor data: Stepper VSS 19.200.0,3-UHV-4LP-2g5 dry lubrication
(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	100 rpm	
P-105	Holding torque of motor (unpowered)	T	0.9 mNm	
P-109	Rated current of motor	I	300 mA	
P-111	Rated voltage of motor	U	42 V	
P-112	Phase resistance of motor	R	6 ohm	
P-113	Inductance of motor	L	2.2 mH	
P-115	Full step angle of motor		1.8 °	

Technical Supply Specifications: BryleeDrive® HighVac 40mm - Type 1



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

Nr.	Parameter	Symbol	Value	Hint
P-116	Angular accuracy of step of motor		±0.09 °	
P-117	Electrical time constant of motor	t	0.367 ms	
P-118	Max. coil temperature of motor	T	300 °C	1)

Material information

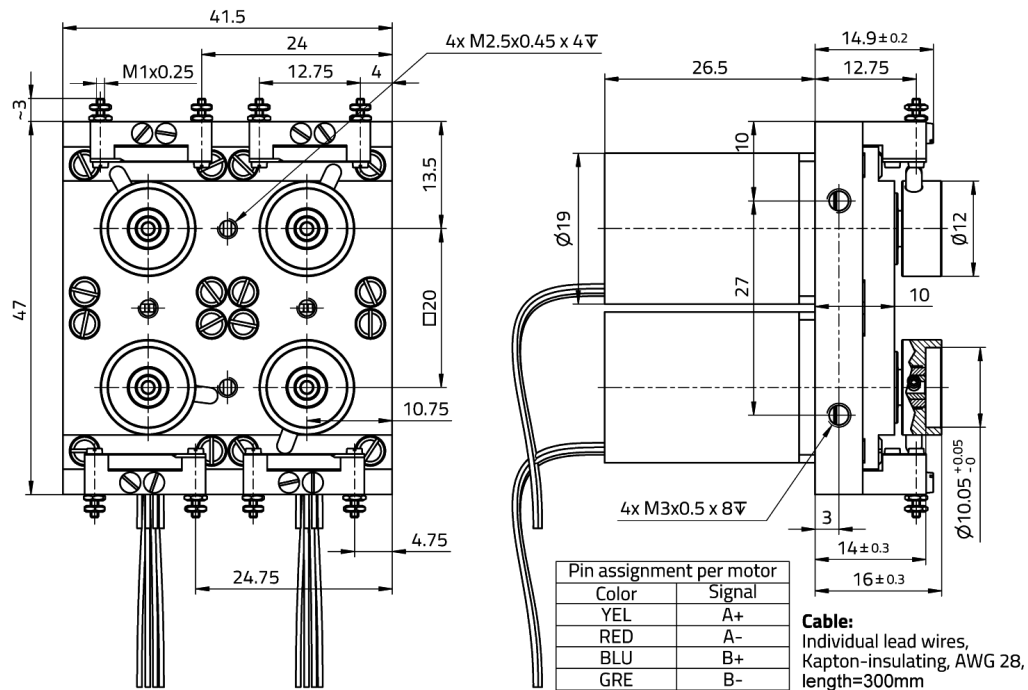
Nr.	Parameter	Symbol	Value	Hint
P-900	RoHS compliant		yes	
P-901	Lubrication of output bearing gearbox		MoS ₂ (dry lubrication)	
P-903	Lubrication of gear component set		Molykote BR 2 plus	
P-904	Lubrication of bearing motor		dry coated	
P-908	Material of gear component set		NiFe	
P-909	Material of output 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		Stainless steel	

Technical Supply Specifications: BryleeDrive® HighVac 40mm - Type 1



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